VSE/ESA 2.6

connectors

WAVV 2002
FT. Mitchell, KY April 12-16, 2002

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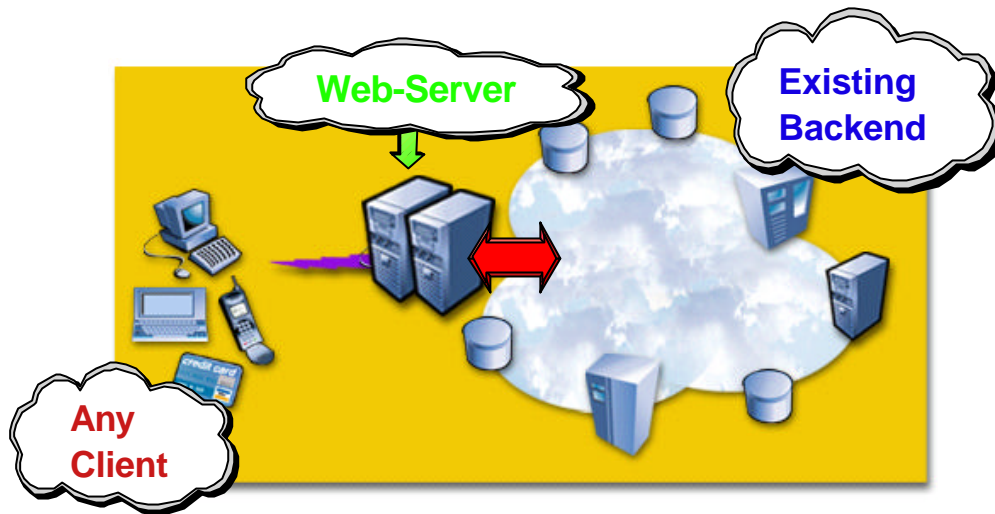IBM @server. For the next generation of e-business.

Business Objectives with VSE/ESA

Clients to Services

Customer Information

Billing

Inventory

Logistics

Human Resources

- Leverage existing investments and skills
- Integration of all business systems
- Integration of business systems with the Web
- Utilize and promote open standards for portability and productivity
- Deploy applications for dynamic content access
- Secure, scalable, and manageable

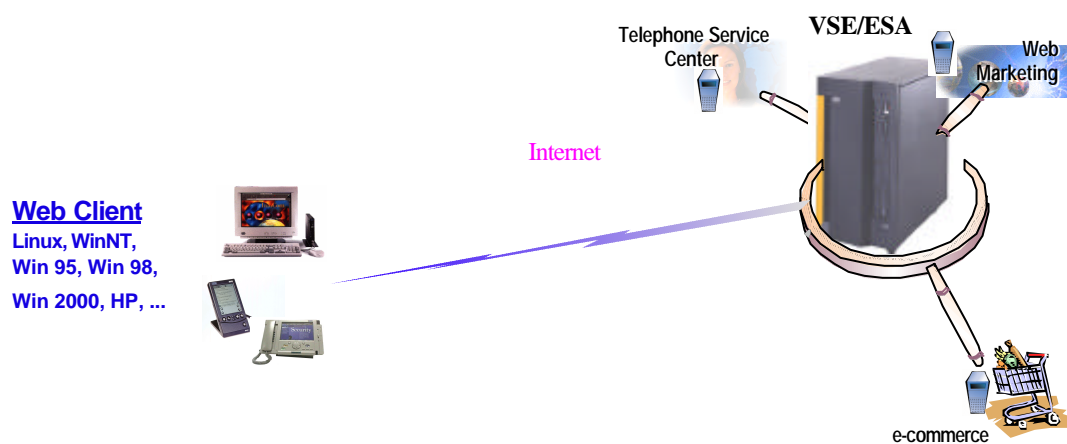IBM @server. For the next generation of e-business.

e-business Infrastructure

- **Supports any client device**
- **Applications are built independent of deployment platforms**
- **Universal access to data and services across all types of networks**
- **Workload can be optimized across servers**

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Direct access to VSE/ESA

Telephone Service Center

VSE/ESA

Web Marketing

Internet

Web Client
Linux, WinNT,
Win 95, Win 98,
Win 2000, HP, ...

e-commerce

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Direct Access from Internet

VSE Enterprise Server

WWW Browser

F I R E W A L L

Powered by
IpServer
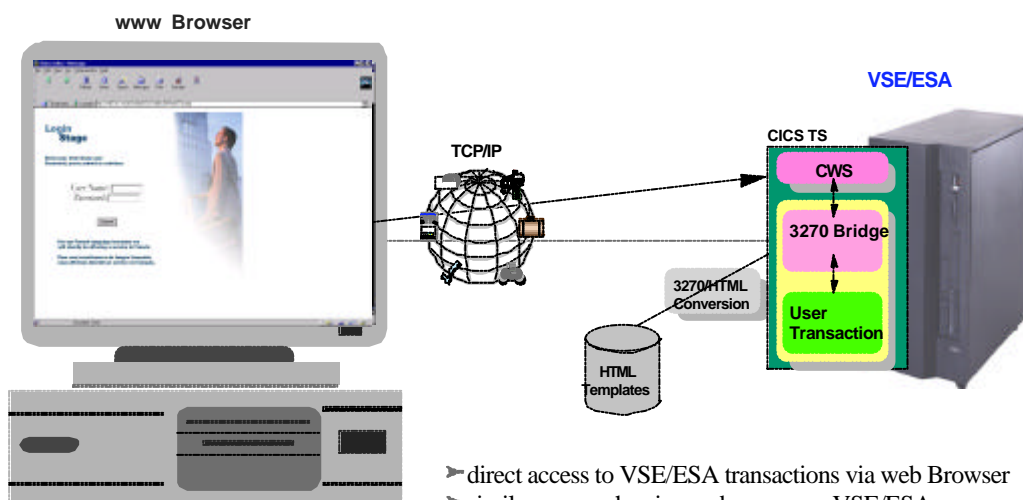*for CICS/ESA*

IBM CICS Web Support (CWS)

HTTP TCP/IP
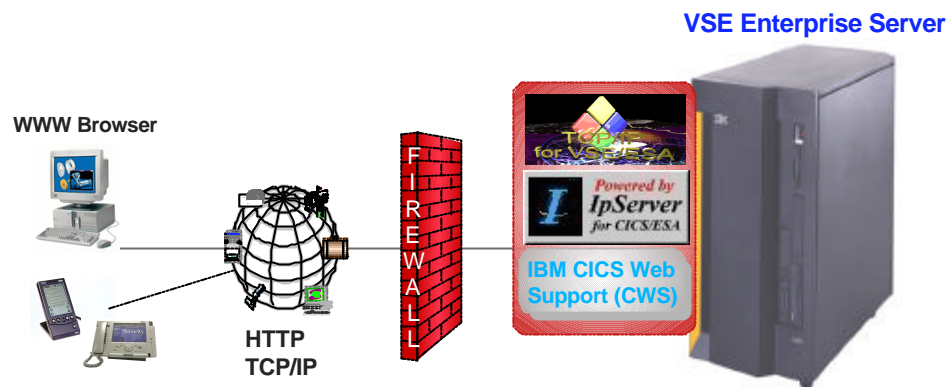
➤ Web Server delivered in Application Pack with IBM's TCP/IP for VSE/ESA
➤ IpServer from Data21, Inc.
➤ IBM CICS Web Support

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Integration of VSE/ESA transaction processes
IBM CICS Web Support

www Browser

VSE/ESA

TCP/IP

CICS TS

CWS

3270 Bridge

3270/HTML Conversion

User Transaction

HTML Templates

➤ direct access to VSE/ESA transactions via web Browser
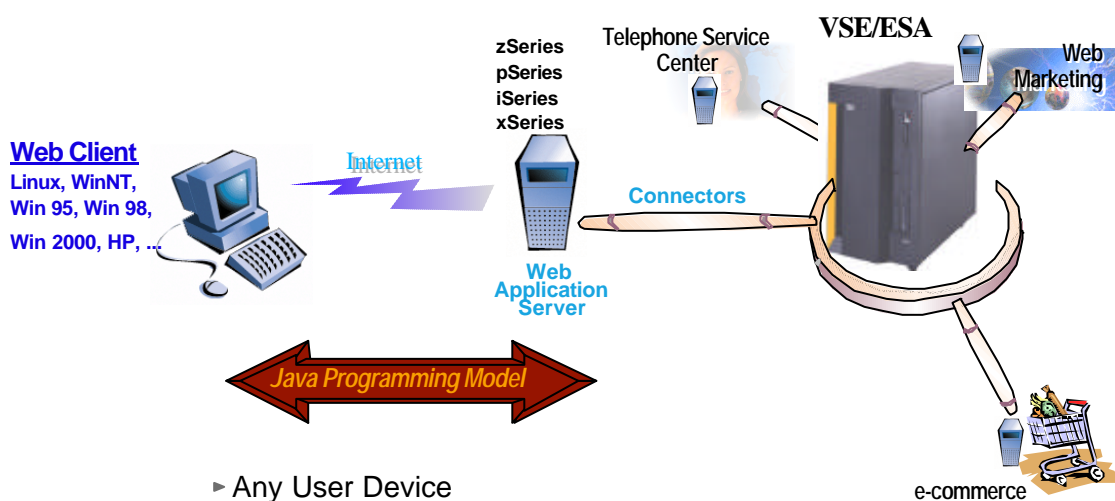➤ similar approach using web server on VSE/ESA

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IBM CICS Web Support

- functional characteristics
  - ➤ direct access to VSE CICS transactions via a simple web browser
  - ➤ transaction security for the called transaction
  - ➤ secured connections (SSL) with VSE/ESA 2.6

- requirements
  - ➤ VSE/ESA 2.5 and higher

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Connections to VSE/ESA via middle tier

zSeries
pSeries
iSeries
xSeries

Telephone Service Center

VSE/ESA

Web Marketing

Web Client
Linux, WinNT,
Win 95, Win 98,
Win 2000, HP, ...

Internet

Connectors

Web Application Server

Java Programming Model

e-commerce

- ➤ Any User Device
- ➤ Any Server Platform
- ➤ Integration with Business Systems

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Connections to VSE/ESA via middle tier

zSeries, S/390 Enterprise Server

Telephone Service Center

Web Application Server

Web Marketing

VSE/ESA

Web Browser

Internet

Java Programming Model

Connectors

Linux for S/390

e-commerce
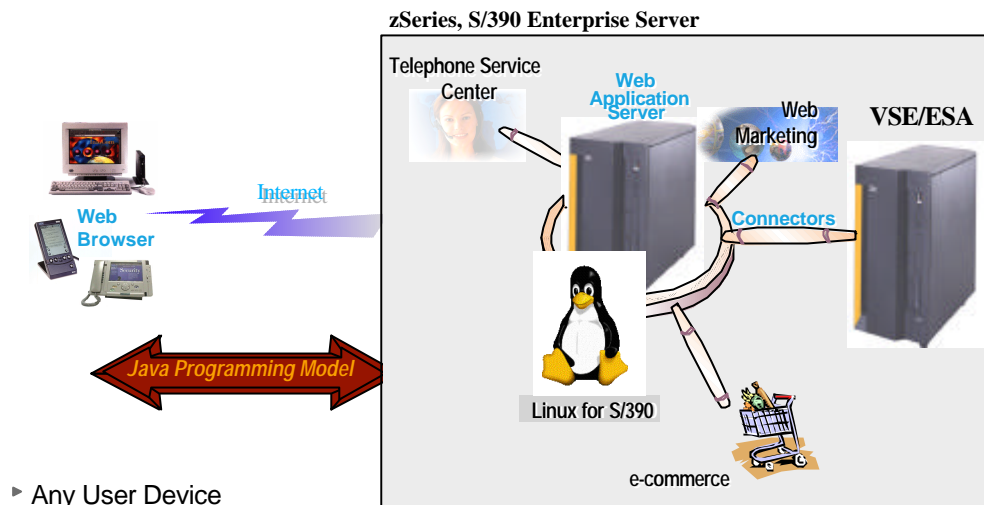
- ▸ Any User Device
- ▸ Any Server Platform
- ▸ Integration with Business Systems
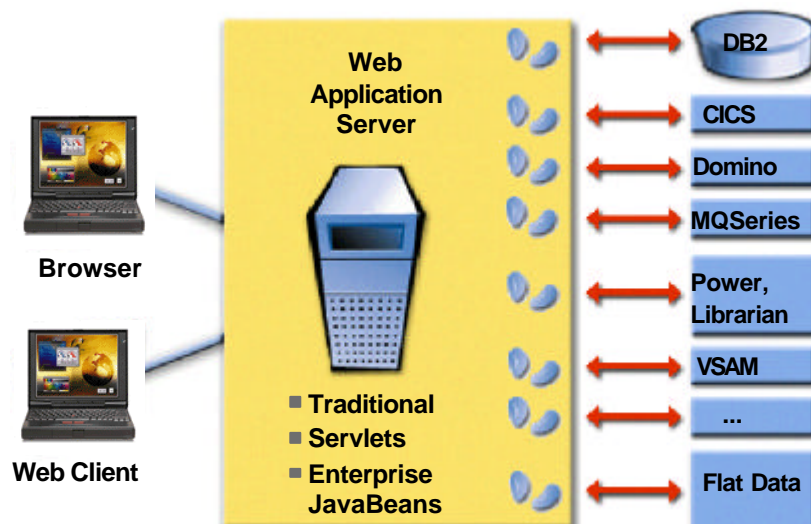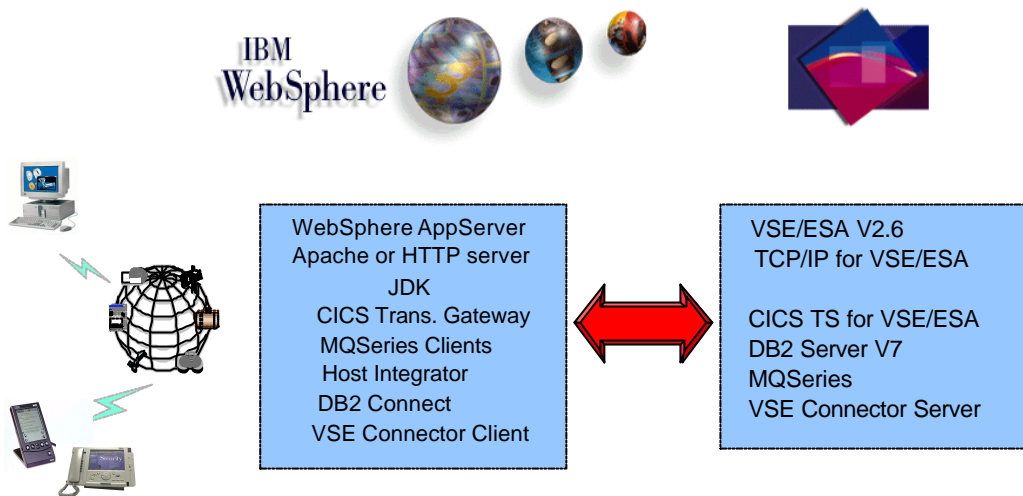
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Connector definition

Web Application Server

DB2

CICS

Domino

MQSeries

Power, Librarian

VSAM

...

Flat Data

Browser

Web Client

- ■ Traditional
- ■ Servlets
- ■ Enterprise JavaBeans

- ■ **Allows native connection to Backend systems from within a Web application**
- ■ **No changes to Backend application required**
- ■ **Consistent developer interface (Java)**

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Middleware for 3-tier logical Model

IBM
WebSphere

WebSphere AppServer Apache or HTTP server JDK CICS Trans. Gateway MQSeries Clients Host Integrator DB2 Connect VSE Connector Client	VSE/ESA V2.6 TCP/IP for VSE/ESA CICS TS for VSE/ESA DB2 Server V7 MQSeries VSE Connector Server

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Chart 17

e-business with VSE/ESA

Objectives

➤ integration of VSE/ESA transaction processes

➤ integration of VSE/ESA data

➤ remote system interactions (automation)

➤ services available via standard interfaces

➤ support for new technologies

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Integration of VSE/ESA transaction processes

➤ transaction initiation

➤ transaction control

➤ integration possibilities

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Integration of VSE/ESA transaction processes

☛ CICS Transaction Gateway
   ➤ transaction control on remote
☛ MQ Series
   ➤ asynchronous transaction
☛ CICS Web Support (CWS)
   ➤ direct interaction with transactions
☛ WebSphere Host Integration
   ➤ host interactions via web browser

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Integration of VSE/ESA transaction processes

CICS Transaction Gateway (CTG)
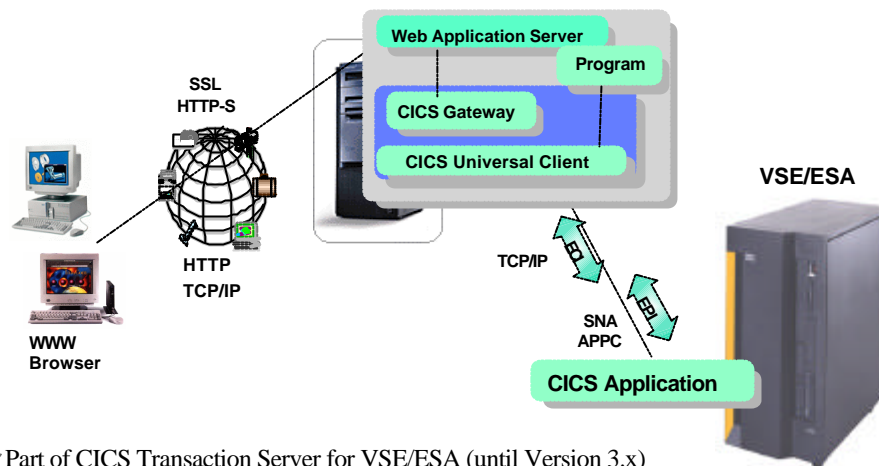
- Part of CICS Transaction Server for VSE/ESA (until Version 3.x)
- CTG Version 4.x is a charged product
- TCP/IP support for ECI in VSE/ESA 2.6
- Secured Connections (SSL) supported
- integration into WebSphere Application server

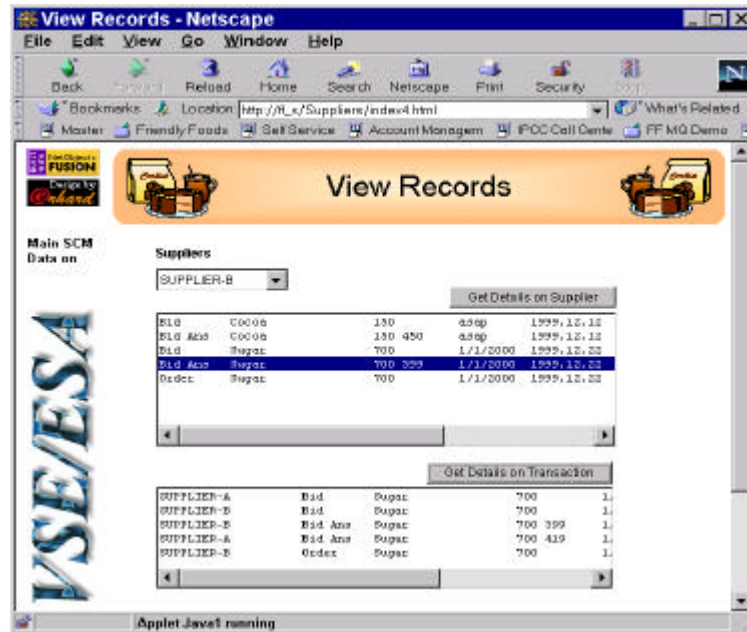IBM @server. For the next generation of e-business.

CICS Transaction Gateway

- functional characteristics
  - access to VSE transactions from a remote platform (program communication)
  - transaction security for the called transaction
    therefore, good integration in e-business Processes and WebSphere Application Server.
  - secured connections (SSL) to CICS Transaction Gateway

- requirements
  - VSE/ESA and the Product: CICS Transaction Gateway (CTG)
    - CTG Version 3 packaged for free with CICS TS (APPC only protocol)
  - for External CICS Interface (ECI) with TCP/IP, VSE/ESA 2.6 and CICS Transaction Gateway Version 4

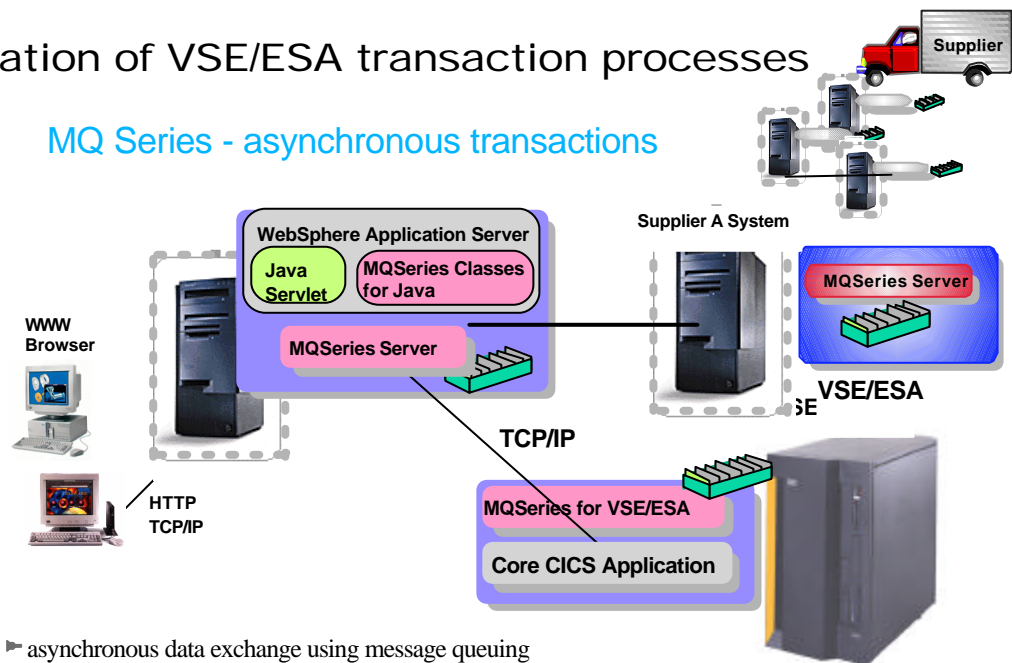IBM @server. For the next generation of e-business.

Integration of VSE/ESA transaction processes

View Records - Netscape

File Edit View Go Window Help

Back Forward Reload Home Search Netscape Print Security

Bookmarks Location http://H_x/Suppliers/index4.html

Master Friendly Foods Self Service Account Managem IPCC Call Center FF MQ Demo

View Records

Main SCM Data on

Suppliers
SUPPLIER-B

Get Details on Supplier

Bid	Cocoa	150	ddsp	1999.12.12
Bid Ans	Cocoa	150 450	ddsp	1999.12.12
Bid	Sugar	700	1/1/2000	1999.12.22
Bid Ans	Sugar	700 399	1/1/2000	1999.12.22
Order	Sugar	700	1/1/2000	1999.12.22

Get Details on Transaction

SUPPLIER-A	Bid	Sugar	700	1.
SUPPLIER-B	Bid	Sugar	700	1.
SUPPLIER-B	Bid Ans	Sugar	700 399	1.
SUPPLIER-A	Bid Ans	Sugar	700 419	1.
SUPPLIER-B	Order	Sugar	700	1.

Applet Java1 running

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Integration of VSE/ESA transaction processes

MQ Series - asynchronous transactions

Supplier

Supplier A System

WebSphere Application Server

Java Servlet **MQSeries Classes for Java**

MQSeries Server

WWW Browser

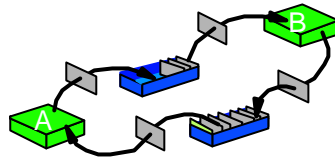**MQSeries Server**

VSE/ESA

TCP/IP

HTTP TCP/IP

MQSeries for VSE/ESA

Core CICS Application

- ► asynchronous data exchange using message queuing
- ► Various platforms supported
- ► integration into Web Application servers (WebSphere)

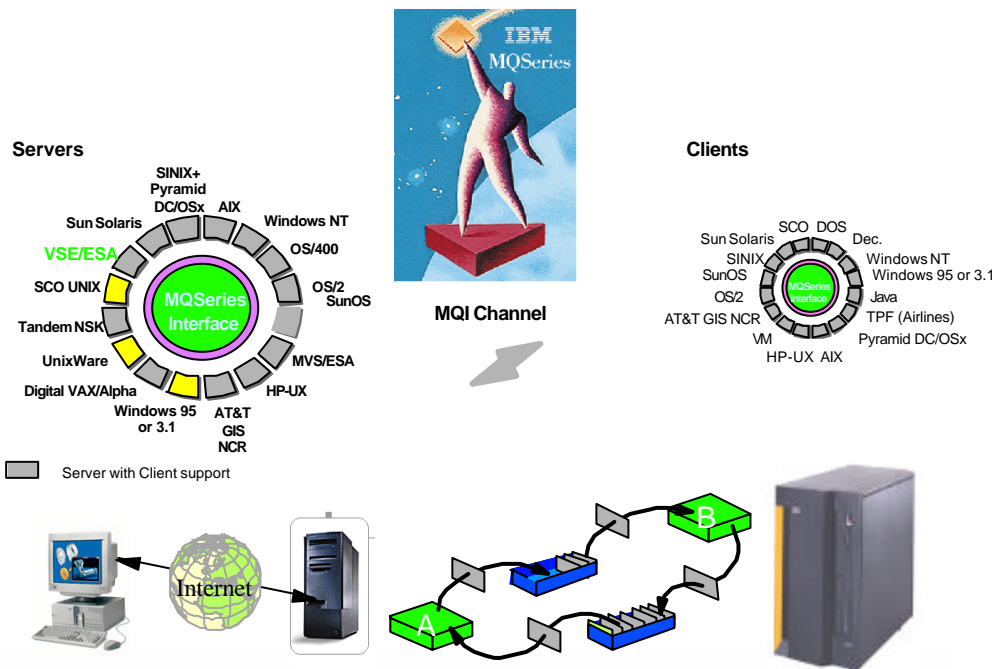**IBM @server. For the next generation of e-business.**

MQ Series - asynchronous transactions

- **functional characteristics**
  - ➤ **guaranteed, secured asynchronous data access for remote systems**
  - ➤ **same API for all supported MQ Series platforms**
  - ➤ **transaction security, therefore appropriate for e-business transactions**
  - ➤ **integration with WebSphere Application Server**
  - ➤ **works well for Business-to-Business (B2B) environments**

- **requirements**
  - ➤ **VSE/ESA and MQ Series for VSE**
  - ➤ **MQ Series Client/Server on each system**

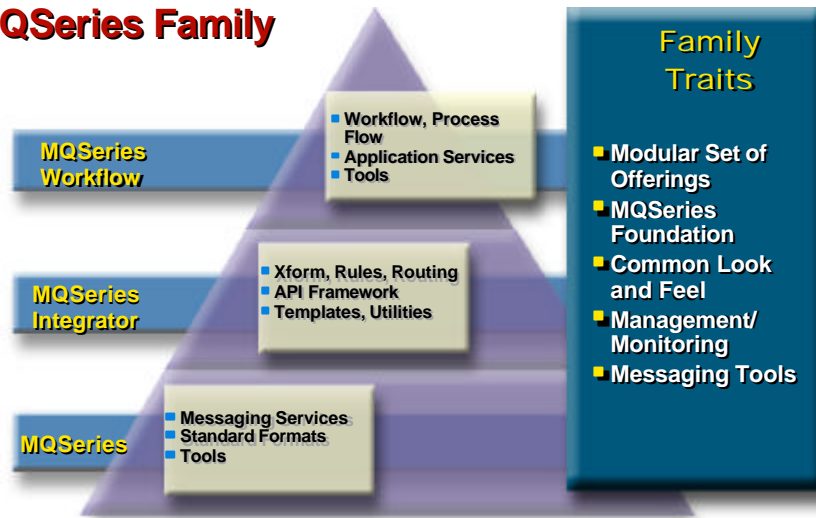IBM @server. For the next generation of e-business.

MQSeries and MQSeries Clients

Servers

SINIX+
Pyramid
DC/OSx   AIX

Sun Solaris   Windows NT

VSE/ESA   OS/400

SCO UNIX   **MQSeries Interface**   OS/2
SunOS

Tandem NSK

UnixWare   MVS/ESA

Digital VAX/Alpha   HP-UX

Windows 95   AT&T
or 3.1   GIS
             NCR

☐ Server with Client support

MQI Channel

Clients

SCO DOS Dec.
Sun Solaris   Windows NT
SINIX   Windows 95 or 3.1
SunOS
OS2   **MQSeries Interface**   Java
AT&T GIS NCR   TPF (Airlines)
VM   Pyramid DC/OSx
         HP-UX AIX

Internet

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Business Integration with MQSeries

MQSeries Family

Family Traits

MQSeries Workflow
- Workflow, Process Flow
- Application Services
- Tools

MQSeries Integrator
- Xform, Rules, Routing
- API Framework
- Templates, Utilities

MQSeries
- Messaging Services
- Standard Formats
- Tools

- Modular Set of Offerings
- MQSeries Foundation
- Common Look and Feel
- Management/ Monitoring
- Messaging Tools

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Business Integration with MQSeries
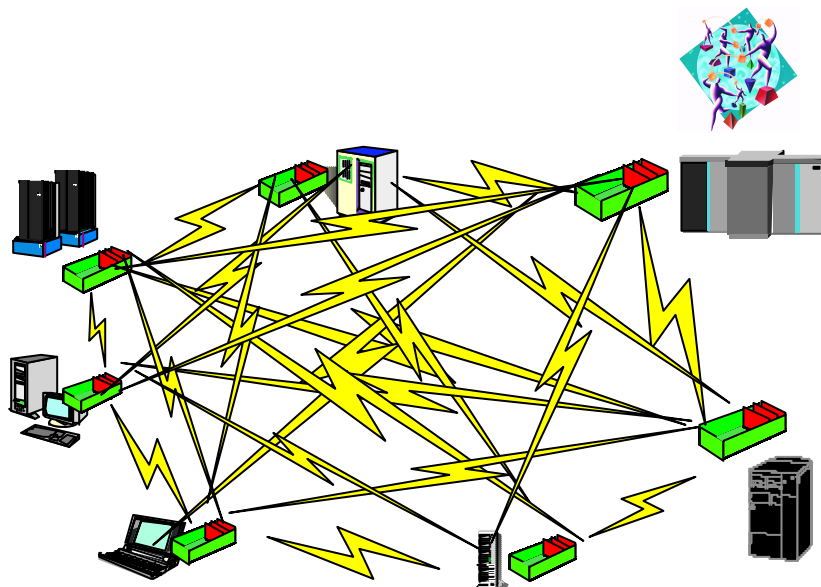
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Integration of VSE/ESA transaction processes

WebSphere Host Integration

Why Redirector?
Hide real IP address of VSE/ESA systems, SSL Support

Web Application Server

WebSphere Host on-Demand Server

Redirector Function

HTTP
Get Java applet

Telnet Connections
SSL

WWW
Browser

Telnet Connections

VSE/ESA

TN3270 Server

- Remote 3270 access to VSE/ESA via web Browser
- No changes in VSE/ESA required
- Java classes to make interaction more fancy or integrate interaction in web application server processes

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WebSphere Host Integration

- functional characteristics
  - access to VSE/ESA via browser
  - the access is similar with a local access via 3270 emulator
  - Java classes to make interaction more fancy or integrate interaction in web application server processes
  - 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

- Requirements
  - WebSphere Host Integration products on middle tier
  - NO additional software on VSE/ESA required
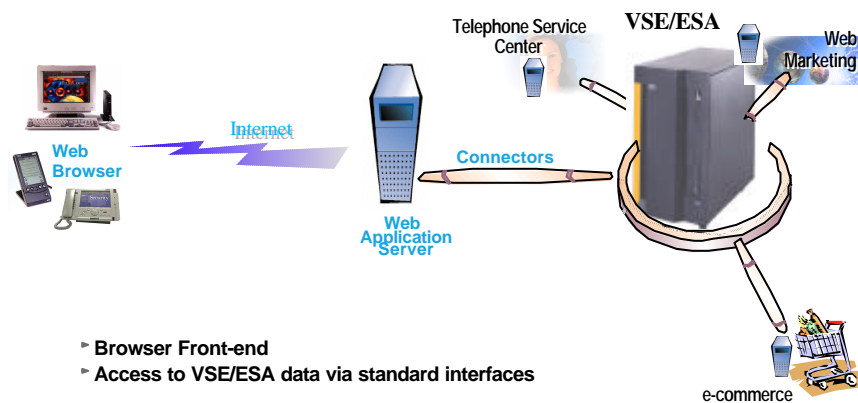
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Interaction with VSE/ESA via browser
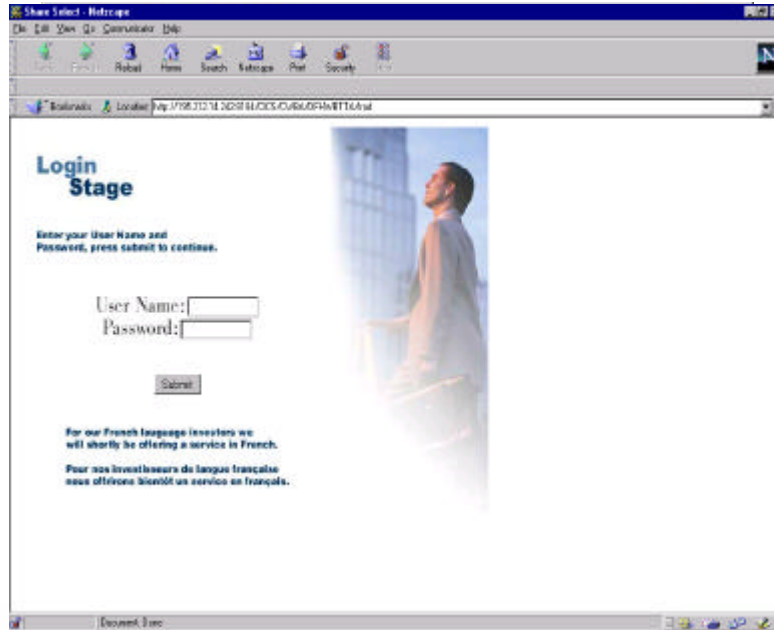
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Integration of VSE/ESA data

Real time access to VSE/ESA data

- Browser Front-end
- Access to VSE/ESA data via standard interfaces

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Real time access to VSE/ESA data

Connectors for data access in VSE/ESA

☞ **Java-Based Connectors**

➤ access VSE/ESA data via Java Beans
(ICCF, Librarian, VSAM)

➤ JDBC access to VSE/VSAM data

☞ **DB2 Connect**
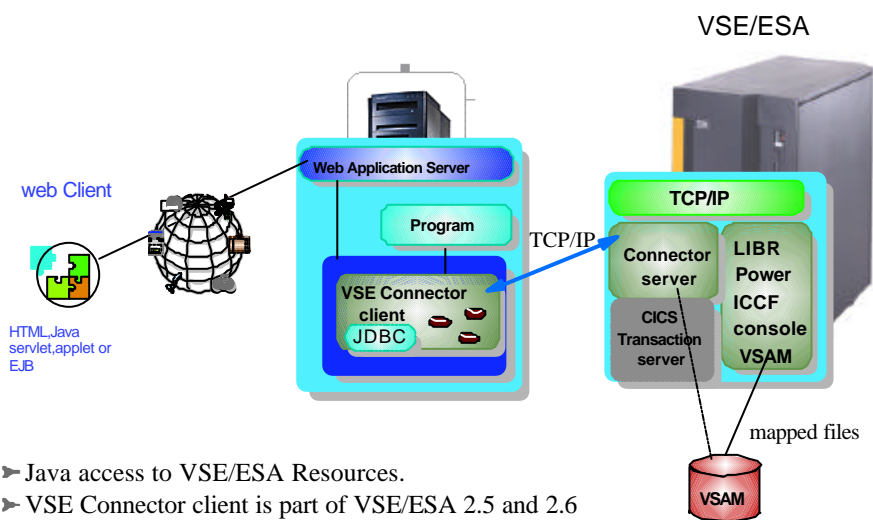
➤ access of DB2 VSE data from standard interfaces

☞ **DB2-Based Connector**

➤ standard interfaces for all kinds of VSE/ESA data
(JDBC,ODBC,DB2 CLI)

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Real time access to VSE/ESA data

Java-Based Connectors

VSE/ESA

web Client

HTML,Java
servlet,applet or
EJB

Web Application Server

Program

TCP/IP

**VSE Connector
client**

JDBC

TCP/IP

**Connector
server**

**CICS
Transaction
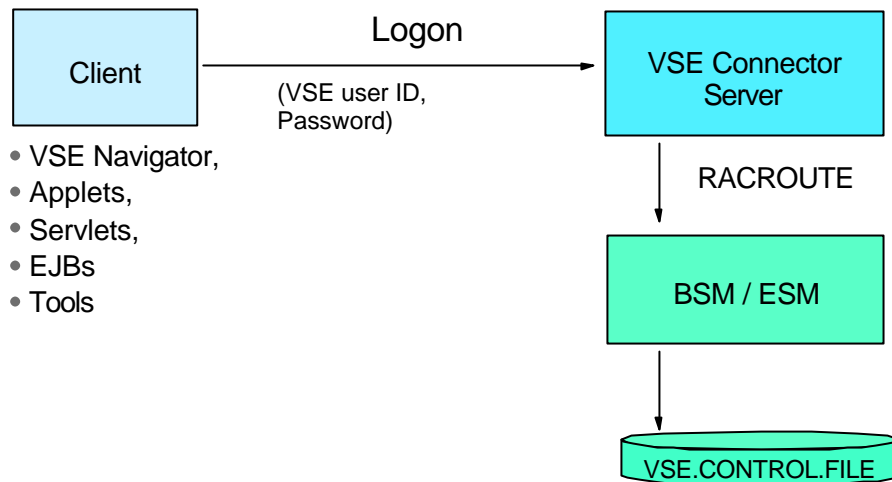server**

**LIBR
Power
ICCF
console
VSAM**

mapped files

VSAM

➤ Java access to VSE/ESA Resources.
➤ VSE Connector client is part of VSE/ESA 2.5 and 2.6
➤ To reduce network traffic - VSAM mapped file access only
➤ better integration with WebSphere using VSAM JDBC driver

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VSE Connector Server

Logon-mechanism

```
┌──────────┐      Logon       ┌──────────────┐
│  Client  │ ───────────────> │ VSE Connector│
│          │   (VSE user ID,  │    Server    │
└──────────┘    Password)     └──────────────┘
                                      │
• VSE Navigator,                      │ RACROUTE
• Applets,                            ▼
• Servlets,                    ┌──────────────┐
• EJBs                         │  BSM / ESM   │
• Tools                        └──────────────┘
                                      │
                                      ▼
                               ╭──────────────────╮
                               │ VSE.CONTROL.FILE │
                               ╰──────────────────╯
```

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VSE Connector Server Configuration

Logon Security

Include and exclude list for userids
and IP addresses:

- Server configuration member SKVCSUSR
- Job-Skeleton in ICCF Lib.59

```
IP = 9.164.123.456, LOGON = DENIED
IP = 9.165.*       , LOGON = DENIED
IP = 10.0.0.*      , LOGON = ALLOWED
```

```
USER = SYS*,        LOGON = ALLOWED
USER = PROG,        LOGON = DENIED
```

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VSE Connector Server Configuration

SSL Security

Include and exclude list for userids
and IP addresses:

- Server configuration member SKVCSSSL
- Job-Skeleton in ICCF Lib.59

```
; ****************************************************************
;       SSL CONFIGURATION MEMBER FOR VSE CONNECTOR SERVER
; ****************************************************************


; ****************************************************************
; SSLVERSION   SPECIFIES THE MINIMUM VERSION THAT IS TO BE USED
;              POSSIBLE VALUES ARE:   SSL30 AND TLS31
; ****************************************************************
SSLVERSION = SSL30


; ****************************************************************
; CIPHERSUITES SPECIFIES A LIST OF CIPHER SUITES THAT ARE ALLOWED
; ****************************************************************
CIPHERSUITES =      ; COMMA SEPARATED LIST OF NUMERIC VALUES
               01,  ; RSA512_NULL_MD5
               02,  ; RSA512_NULL_SHA
               08,  ; RSA512_DES40CBC_SHA
               09,  ; RSA1024_DESCBC_SHA
               0A,  ; RSA1024_3DESCBC_SHA
               62   ; RSA1024_EXPORT_DESCBC_SHA
```

SSL Configuration in VSE/ESA 2.6
Relationship with CSI utilities
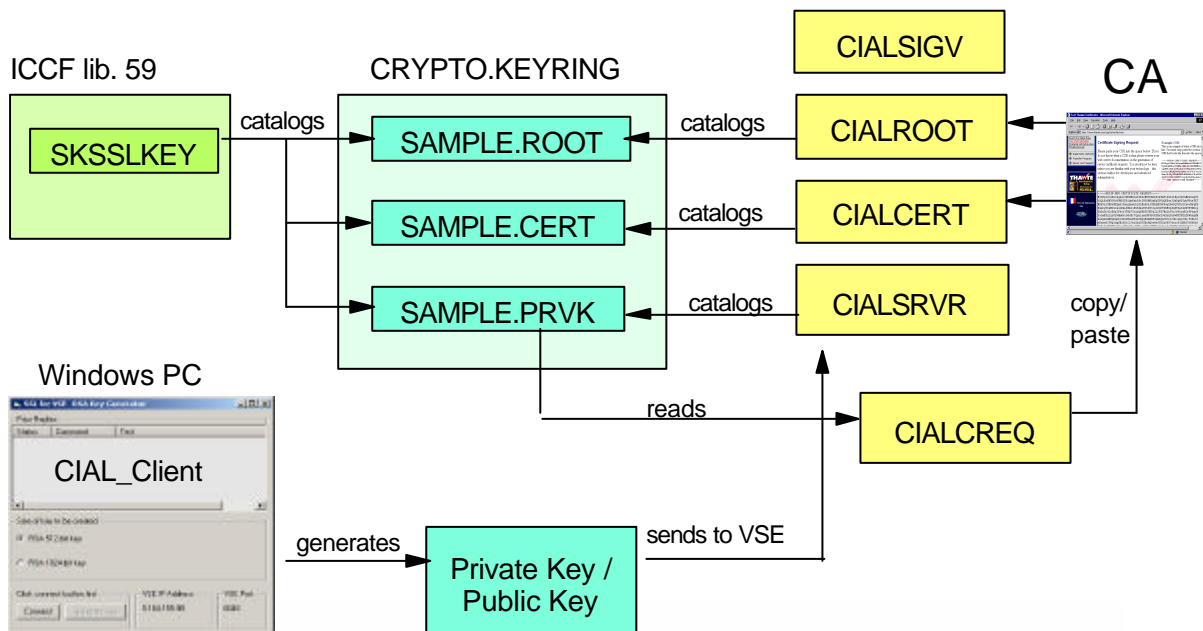
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VSAM JDBC Driver

- Based on VSE Connector Client
- Maps SQL statements in VSE Connector calls
- Standard JDBC API
- Requirement:
  - VSAM Record Mapping

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

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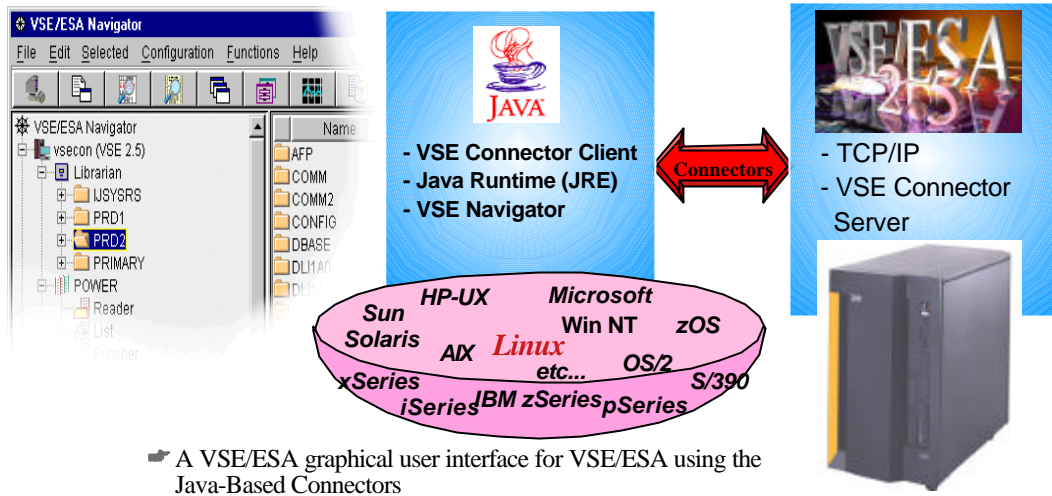

Real time access to VSE/ESA data

Benefits using Java-based connectors

- usage of modern technologies to interact with VSE/ESA resources

- integration of VSE data into front end applications (statistic, decision)

- faster actions possible using real time data

- full integration in WebSphere technologies

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VSE Navigator
(100% pure Java application)

- **VSE Connector Client**
- **Java Runtime (JRE)**
- **VSE Navigator**

Connectors

- TCP/IP
- VSE Connector
  Server

HP-UX   *Microsoft*
Sun   *Win NT*   *zOS*
Solaris   *AIX*   *Linux*   *OS/2*
xSeries   *etc...*   *S/390*
iSeries *IBM zSeries* *pSeries*

☞ A VSE/ESA graphical user interface for VSE/ESA using the Java-Based Connectors

☞ remote monitoring and supervisor functions

☞ **More Details in session 'VSE Navigator' on Saturday**

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Sample: JDataMig
From Front-end Tools to VSE/ESA data

user views

Lotus 1-2-3

- **DB2 UDB V7**
- **VSE Connector Client**
- **JDK 1.1.8**
- **JDataMig**

Connectors

- VSAM
- TCP/IP
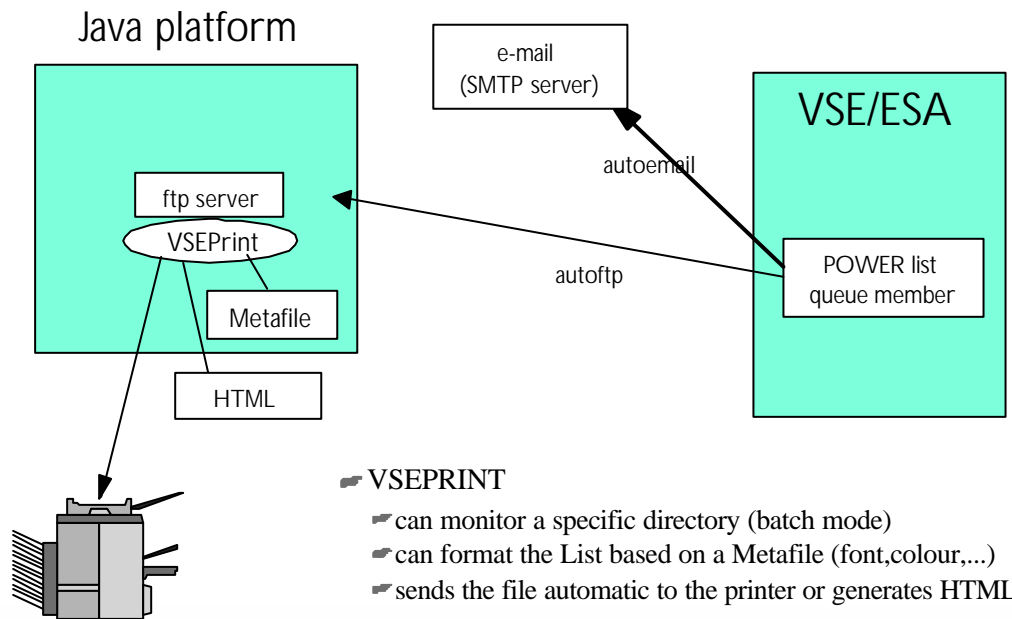- VSE Connector
  Server
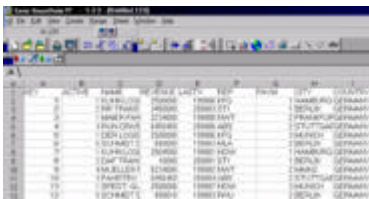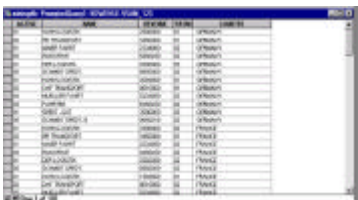
DB2 & QMF
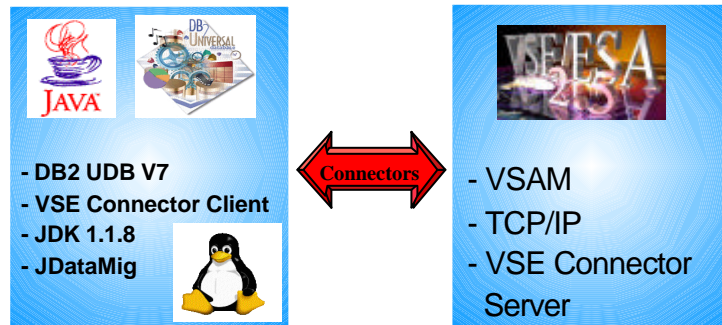
interact with VSE Connectors via Visual Basic (VBA), or Script language.

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Java-based Console support for VSE/ESA

VSE Print - Tool
AUTOFTP and AUTOEMAIL functions

Java platform

e-mail
(SMTP server)

VSE/ESA

ftp server

VSEPrint

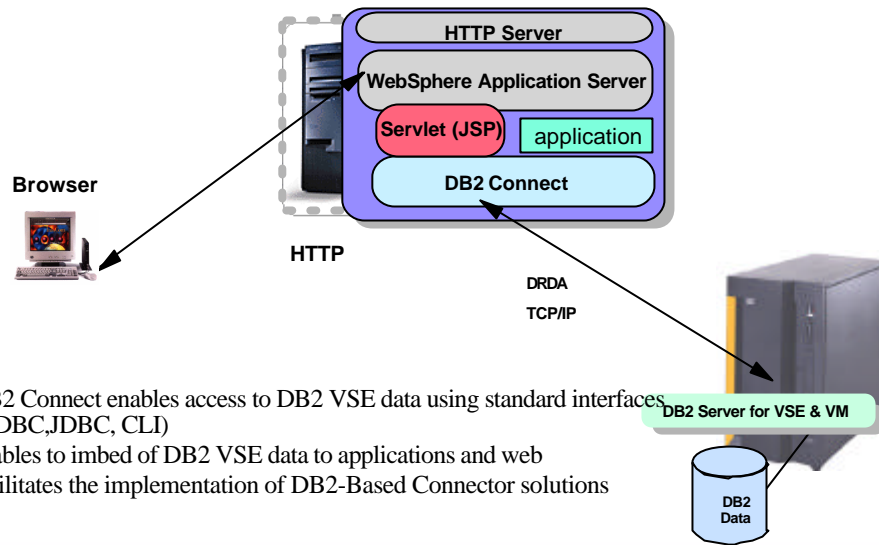autoemail

Metafile

autoftp

POWER list
queue member

HTML

☛ VSEPRINT
  ☛ can monitor a specific directory (batch mode)
  ☛ can format the List based on a Metafile (font,colour,...)
  ☛ sends the file automatic to the printer or generates HTML

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Real time access to VSE/ESA data

DB2 Connect

Browser

HTTP Server

WebSphere Application Server

Servlet (JSP) | **application**

DB2 Connect

HTTP

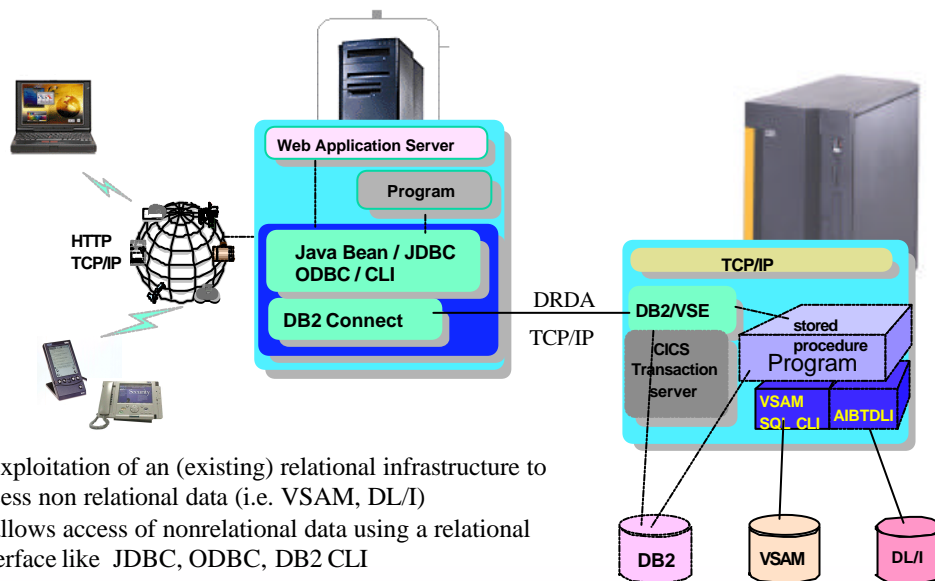**DRDA**
TCP/IP

DB2 Server for VSE & VM

DB2 Data

➤ DB2 Connect enables access to DB2 VSE data using standard interfaces (ODBC,JDBC, CLI)

➤ enables to imbed of DB2 VSE data to applications and web

➤ facilitates the implementation of DB2-Based Connector solutions

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Real time access to VSE/ESA data

DB2-Based Connector

Web Application Server

Program

HTTP
TCP/IP

Java Bean / JDBC ODBC / CLI

DB2 Connect

DRDA
TCP/IP

TCP/IP

DB2/VSE

CICS Transaction server

stored procedure Program

VSAM SQL CLI | **AIBTDLI**

DB2 | **VSAM** | **DL/I**

➤ exploitation of an (existing) relational infrastructure to access non relational data (i.e. VSAM, DL/I)

➤ allows access of nonrelational data using a relational interface like JDBC, ODBC, DB2 CLI

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Real time access to VSE/ESA data

Major benefits using DB2-based connector

- ► encapsulates the business logic on mainframe

- ► full control of requests to DB2 Databases

- ► integration of various types of VSE/ESA data for one web request (DB2, VSAM,DL/I...)

- ► reduced network traffic

- ► standard interfaces for all kinds of data (JDBC,ODBC,DB2 CLI)
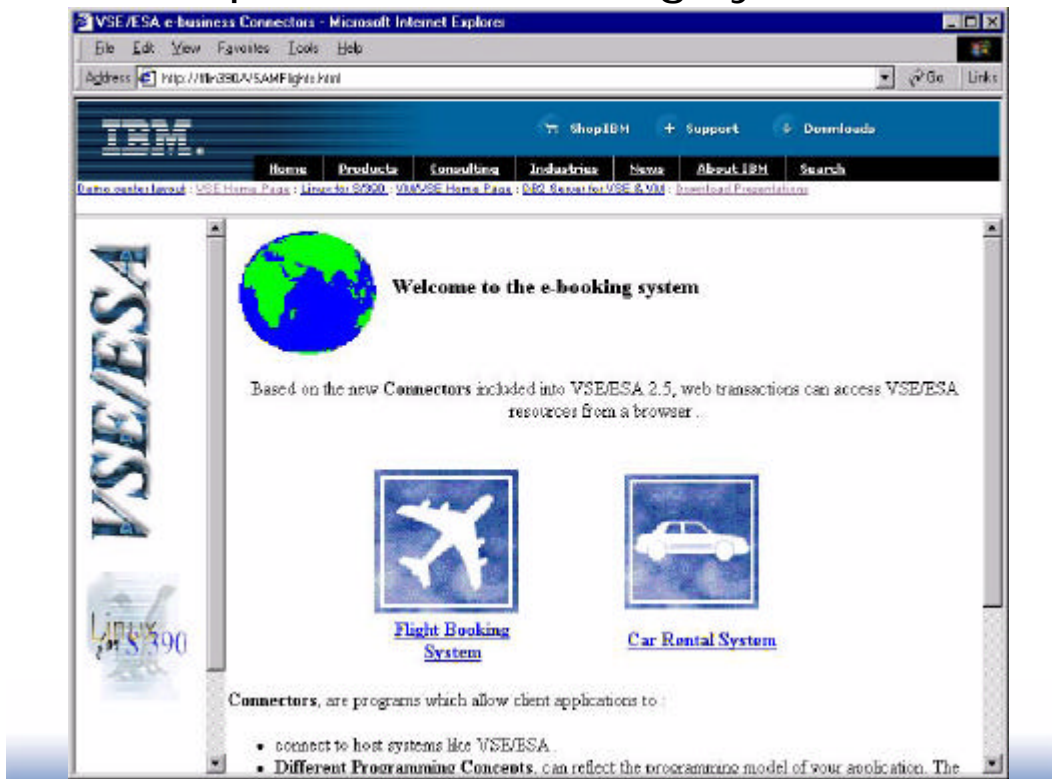
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Sample: VSE/VSAM access via DB2 JDBC

Sample: Web e-booking system

Business Intelligence Solution using
VSE/ESA e-business connectors

Creating intimate knowledge of customers, competitors and supply-chain partners

DB2 OLAP Server

Intelligent Miner

Lotus Approach

Operational Data

VSAM, DL/I, FLAT, SQL, Oracle, DB2

Extract Transform Load

DB2 Visual Warehouse
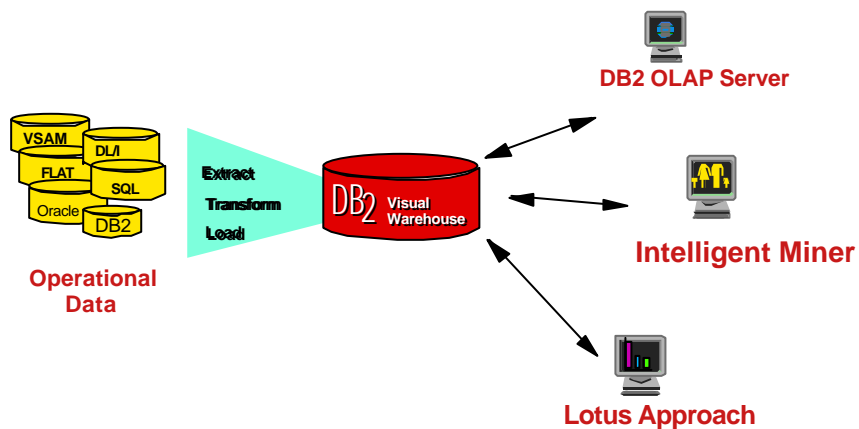
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Universal Access to a Universe of data with DB2

DB2 Family
OS/390   AIX
OS/400   OS/2
VM   HP-UX
VSE   SUN
NUMA-Q   NT
SCO   Linux

DB2 CAE
DB2 Connect

to Universal Data

DB2

Relational Connect & DataJoiner

Oracle
Sybase
Informix
Microsoft
other...

Non-Relational
IMS
VSAM

OLE DB

Data Links

Third-party Gateway

Extenders

MS Access
MS SQL Server
Excel
others

External Files

TAIV
XML
Net.Search
Spatial

Cross Access
EDA/SQL
Supported Data
Sources

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DB2 Database Family

- Heterogeneous and Flexible

Hosts
- DB2 UDB for OS/390
- DB2 for VM and VSE
- DB2 UDB for OS/400

Sources
- Oracle
- Sybase
- Informix
- SQL Server
- IMS
- VSAM

DB2 Connect

Enterprise-Extended
- Win NT
- Windows 2000
- AIX, HP-UX, Solaris
- Linux
- Dynix/PTX

Middleware
- DB2 Connect
- DataJoiner
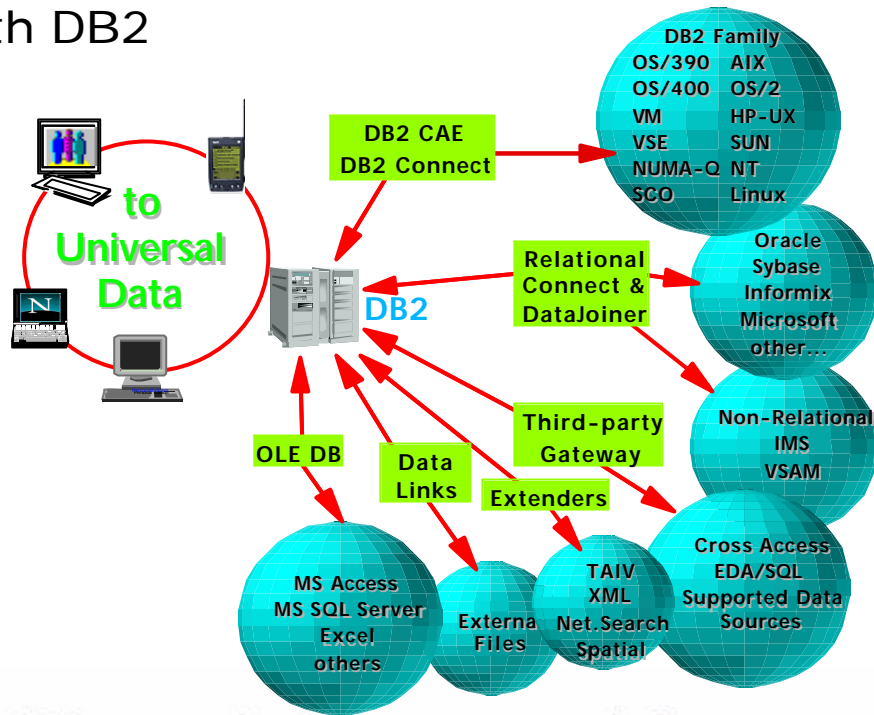- Net.Data

Enterprise
- Win NT
- Windows 2000
- AIX, HP-UX, Solaris
- Linux
- OS/2

Satellite
- Win 95, 98
- Win NT
- Windows 2000

Clients

Workgroup
- Win NT
- Windows 2000
- Linux
- OS/2

Personal
- Win 95, 98
- Win NT
- Windows 2000
- Linux
- OS/2

DB2 Everyplace
- PalmOS
- Windows CE

DB2 Universal Database

Management
Tivoli TME 10
Tivoli Readiness

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General overview Connectors for VSE/ESA

client

- MQ-Client (Java)
- App.. ODBC/JDBC
- App. (C, Java)
- Browser
  - Applet
  - Conn. Client
- VSE Navigator
  - Conn. Client
- Browser
- Applet
  - Conn. Client

middle tier

- MQ-Server
- DB2-Connect
- CICS-Trans. Gateway

- Web-Server
- WebSphere
  - Servlet
  - EJB
  - VSE Connector Client
- VSEAppletServer

VSE/ESA

- MQ-Server
- DB2-Server
- CICS-TS
- VSE HTTP-Server
- VSE Connector Server
  - VSAM
  - POWER
  - Librarian
  - ICCF
  - Console

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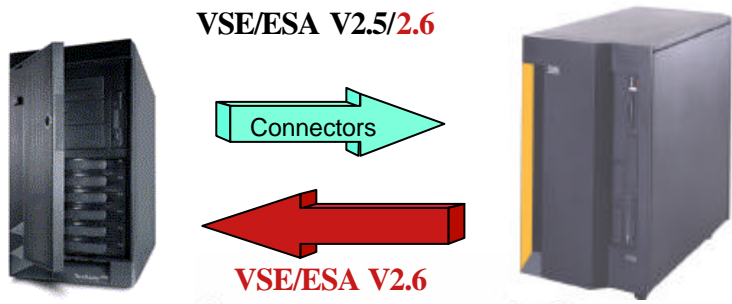

VSE/ESA and it's connections.

VSE/ESA V2.5/2.6 - VSE as server
➤ remote access to VSE data
  ➤ e-business connectors

VSE/ESA V2.6 - VSE as a client
➤ VSE access to remote data
  ➤ VSAM Redirector
  ➤ Virtual tape support

New
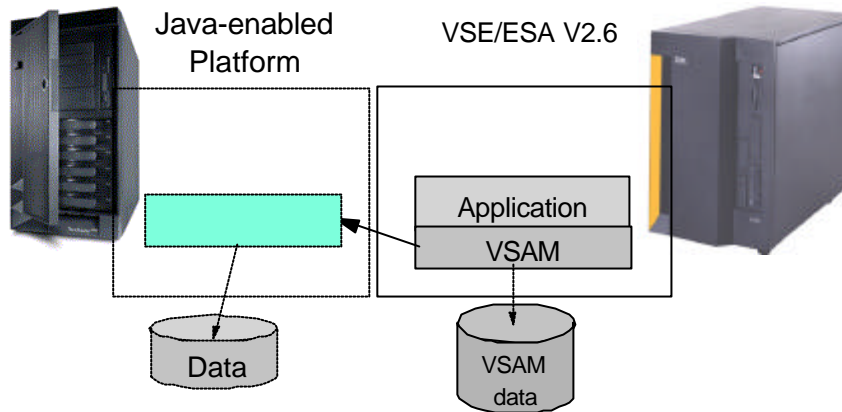
VSE/ESA V2.5/2.6

Connectors

VSE/ESA V2.6

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VSE/VSAM Redirector

A mechanism for VSE programs working with VSAM data:

- ☛ gain transparent access to remote data
- ☛ synchronize VSAM files with remote data stores
- ☛ without any changes to VSE programs

Java-enabled Platform

VSE/ESA V2.6

Application

VSAM

Data

VSAM data

☛ **More Details in session 'VSE 2.6 new functions' on Wednesday**

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VSE/ESA Virtual Tape support

VSE/ESA V2.6

Application

tape operation

Java platform
(Linux on zSeries)

Data

Virtual Tape Server

Virtual Tape handler

I/O supervisor

TCP/IP

VSAM
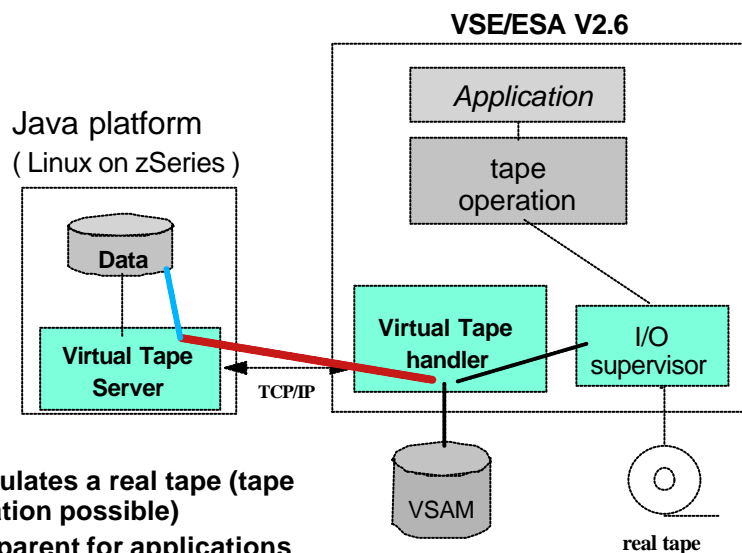
real tape

- ➤ **it simulates a real tape (tape operation possible)**
- ➤ **transparent for applications**

☛ **More Details in session 'VSE/ESA 2.6 new functions' on Wednesday**

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Open/Standards-based Application Deployment

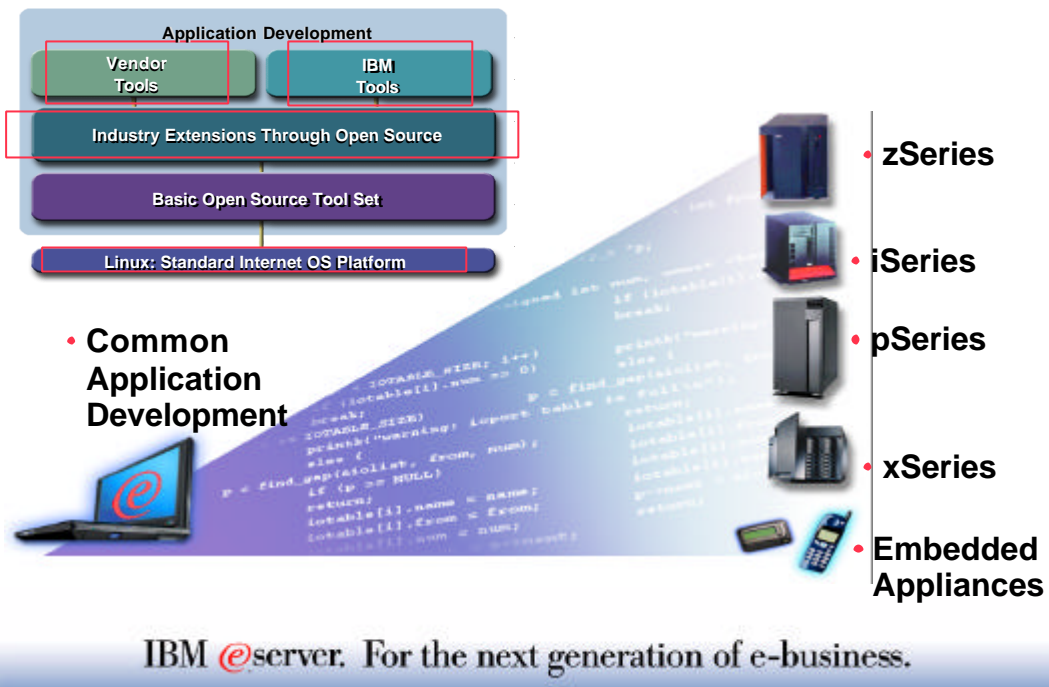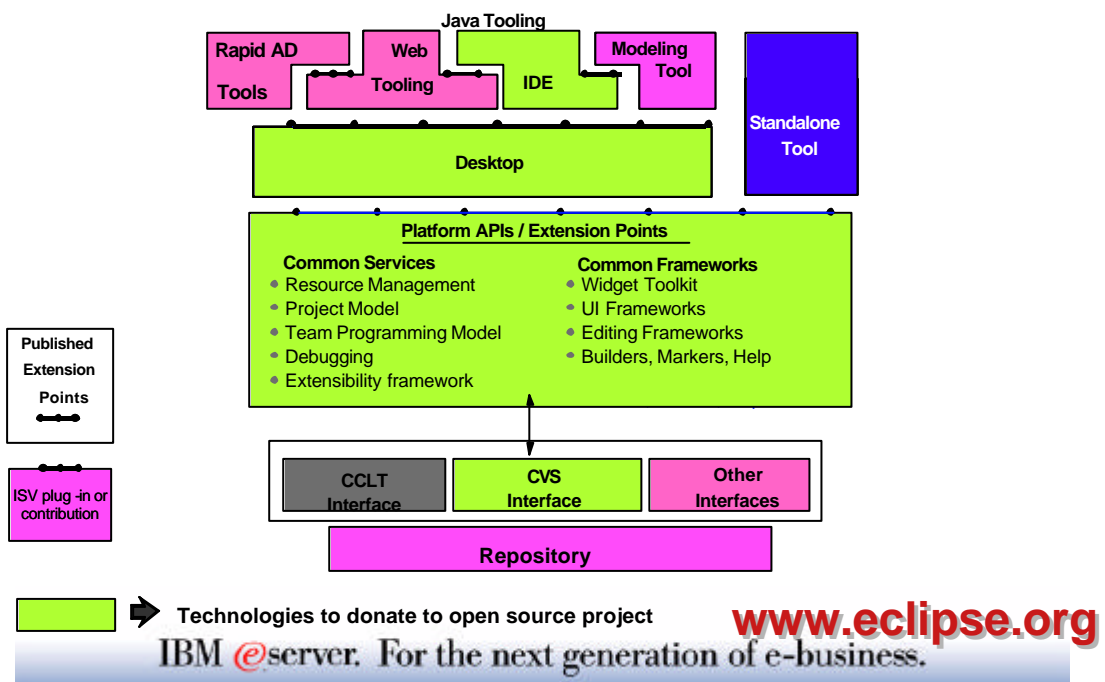**Application Development**

Vendor Tools

IBM Tools

Industry Extensions Through Open Source

Basic Open Source Tool Set

Linux: Standard Internet OS Platform

- **Common Application Development**

- **zSeries**
- **iSeries**
- **pSeries**
- **xSeries**
- **Embedded Appliances**

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WebSphere Studio
App. Developer & Site Developer

Java Tooling

Rapid AD Tools

Web Tooling

IDE

Modeling Tool

Standalone Tool

Desktop

Platform APIs / Extension Points

Common Services
- Resource Management
- Project Model
- Team Programming Model
- Debugging
- Extensibility framework

Common Frameworks
- Widget Toolkit
- UI Frameworks
- Editing Frameworks
- Builders, Markers, Help

Published Extension Points

ISV plug -in or contribution

CCLT Interface

CVS Interface

Other Interfaces

Repository

➤ **Technologies to donate to open source project**

www.eclipse.org

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Choices

VSE/ESA?

all other?

Linux for zSeries?

OS/400?

VSE/ESA

Windows?

z/OS?

AIX-5L

Linux?

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e-business solutions on *@* server

Sales Support

WebSphere

WebSphere Transcoding

WebSphere

Telephone Service Center

Collaboration

Domino Notes

@ server

WebSphere Studio

Web Marketing

Business Intelligence

DB2 Visual Warehouse OLAP Mining

VSE/ESA CICS TS DB2 Server MQSeries

WebSphere DB2

Customer Self-service

Business Partners

MQSeries MQIntegrator MQWorkflow

Net.Commerce Payment WebSphere DB2

Online Sales
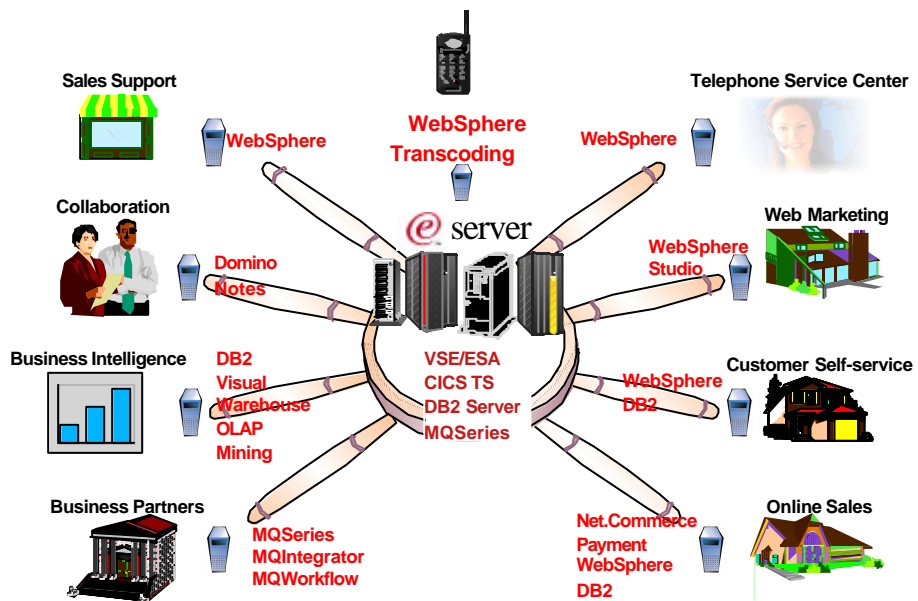
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Additional Information

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

🐦 VSE/ESA e-business Connectors and Utilities
   http://www-1.ibm.com/servers/eserver/zseries/os/vse/support/vseconn/conmain.htm

🐦 e-business Connectors User's Guide   SC33-6719

Redbooks:
🐦 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

We appreciate your comments at :   VSEESA@de.ibm.com

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