

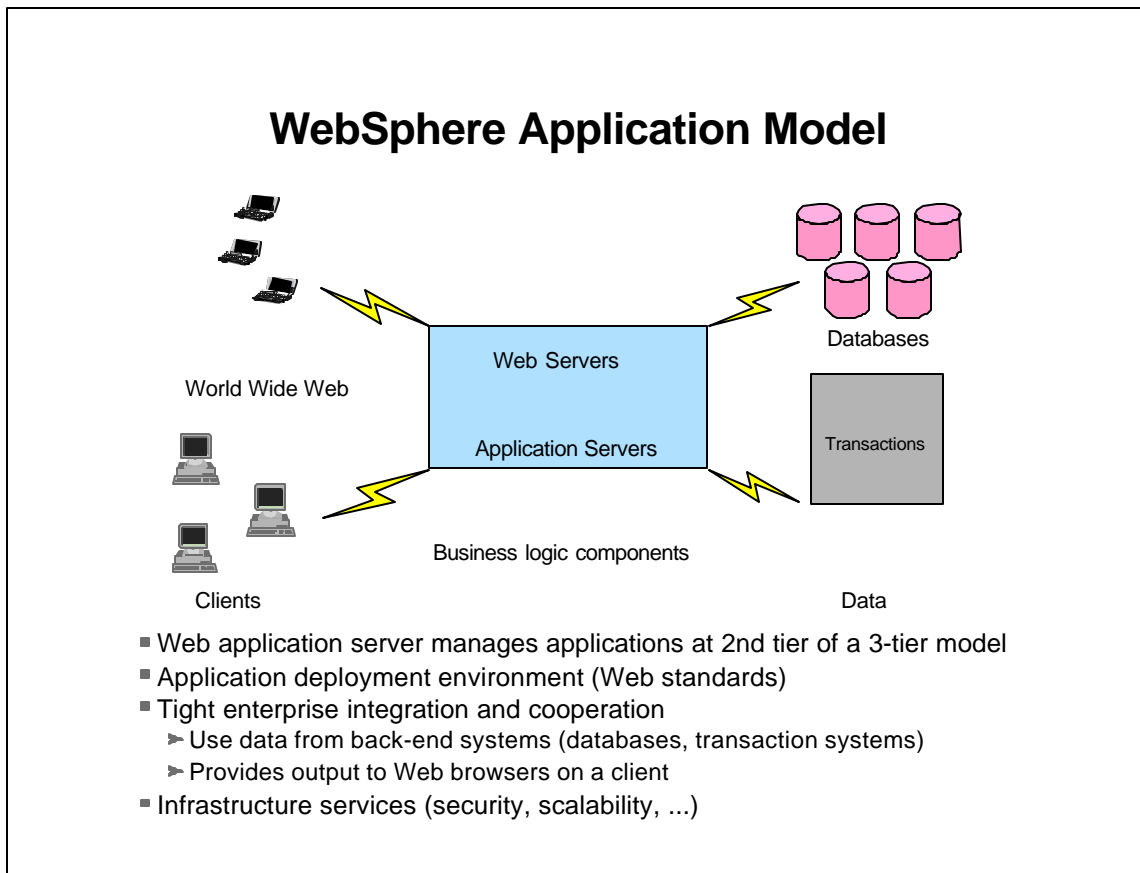
# **IBM WebSphere Application Server**

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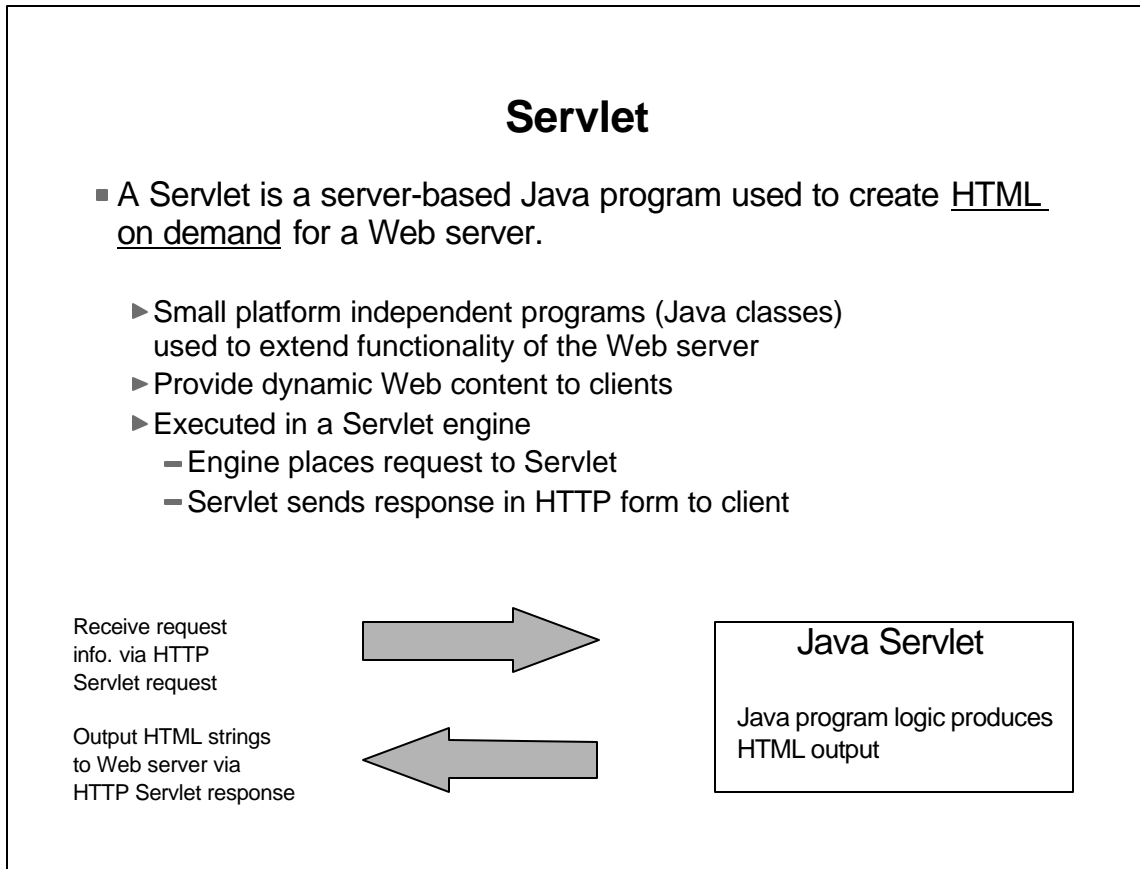
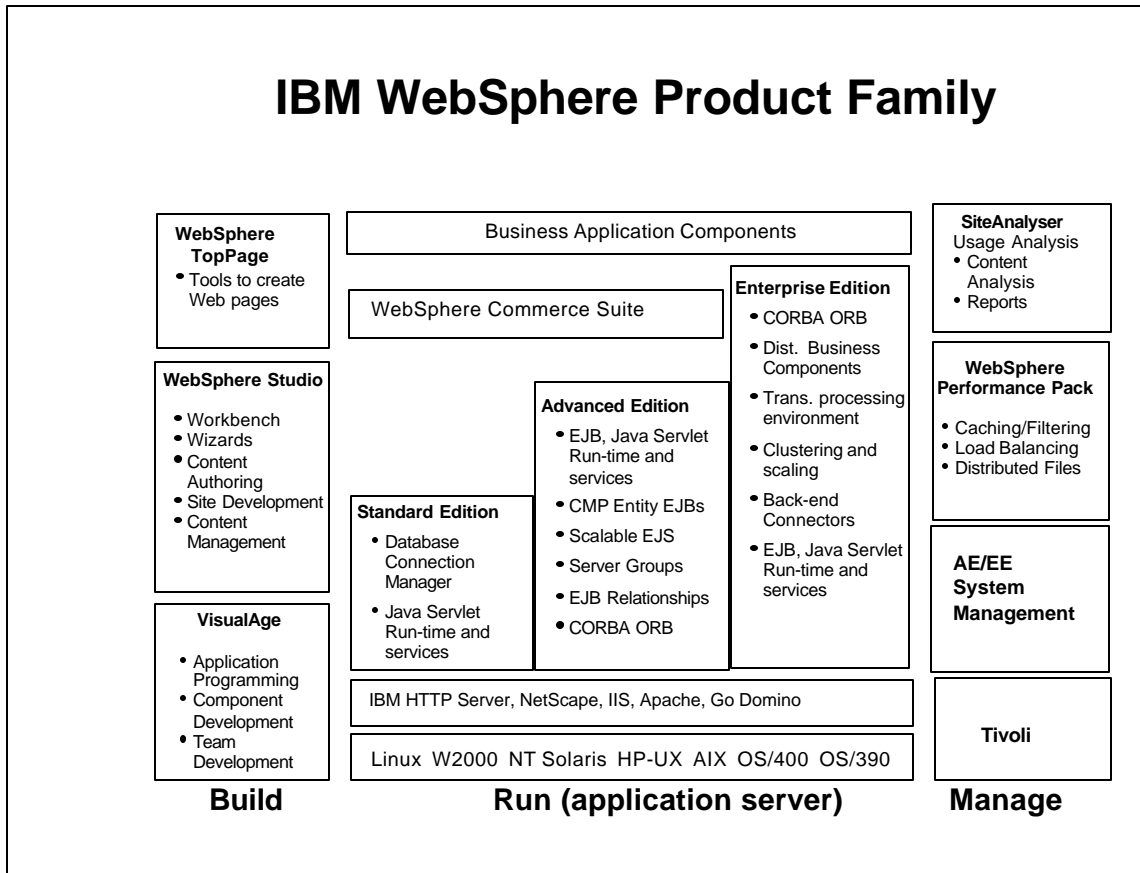
## **Agenda**

- WebSphere Product Family - Overview
- WebSphere Components
- WebSphere Application Server
- Connectors
- VSE e-business Connectors
- Value of WebSphere Model
- More information



## IBM WebSphere Family

- Open, standards-based Java server runtime environment
- Web site development tools
- Commerce software
- Management software
- To build, manage and deploy powerful, portable e-business applications.

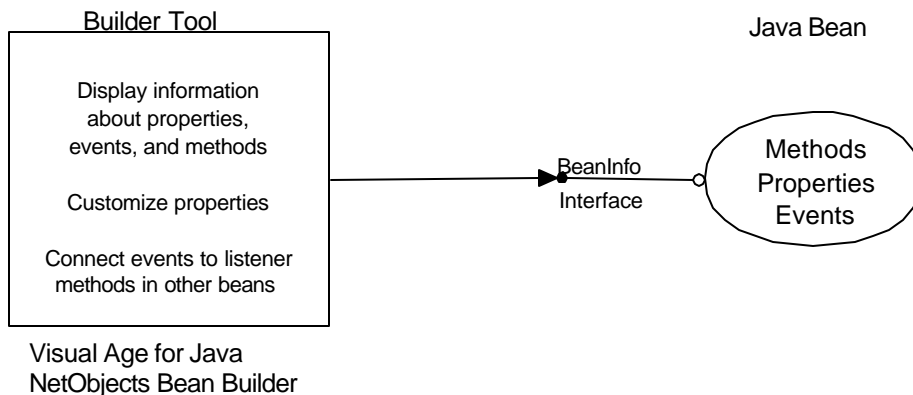


## Java Server Pages

- Java Server Pages (JSP) are a new JavaSoft specification for dynamic page generation.
  - ▶ HTML source files that include Java extensions (<java> tag) for
    - Dynamic content and increased functionality
  - ▶ Compiled into Servlet before deployment
    - Recompiled only, if page changes
  - ▶ Code is fully functional Java
  - ▶ Code has access to Servlet and the Servlet object model
  - ▶ Embed results from Servlet and beans
  - ▶ Helps to separate HTML coding from business logic

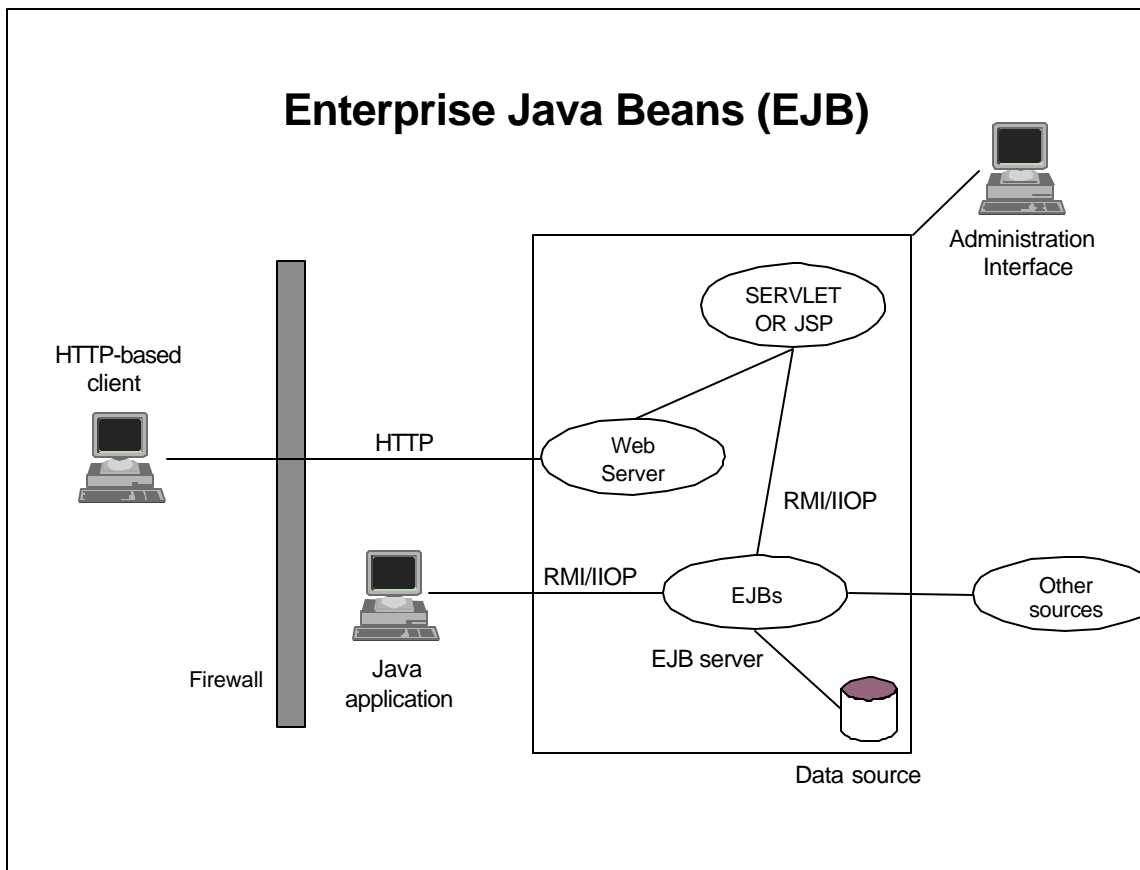
## Java Beans

- A Java Bean is a reusable software component that can be manipulated in a builder tool. Java Beans are usually used to represent items on a GUI, and are generally client-side only.
  - ▶ Java classes that conform to certain coding standards
  - ▶ Can be described in terms of properties, methods, and events
  - ▶ May or may not be visual components (e.g. push buttons, sliders, ...)



## Enterprise Java Beans (EJB)

- Enterprise Java beans are server-side Java components that are designed for distributed environments.
- A business object
  - ▶ Either a long-lasting entity (like a bank account)
  - ▶ Or a short-lasting session (like a "visit" to the bank)
- It exists within an EJB container, running on an enterprise Java server
  - ▶ WebSphere is such a container, that provide services such as
    - security, naming, directory services
    - persistent storage
- It is accessible remotely or locally



## WebSphere Studio

- Delivers a complete set of Web deployment tools
- Combines graphical development wizards with tools for Web site design and Java development (Servlet, Java Beans, ...), including
  - ▶ Workbench environment to organize / manage Web development projects
  - ▶ Integrated visual page designer for Web page development (based on NetObjects TopPage technology)
  - ▶ Integrated Applet designer based on NetObjects Bean Builder technology
  - ▶ Integrated remote debug facility of server side logic
  - ▶ Tight integration with Visual Age for Java
  - ▶ and more ...

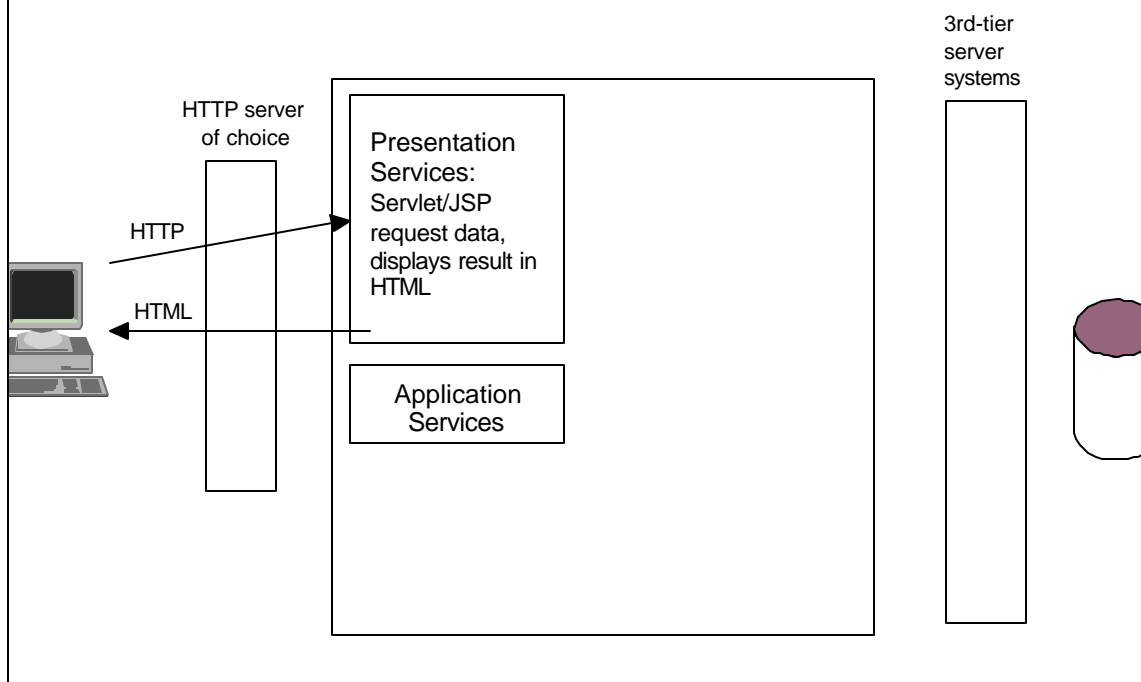
## Visual Age for Java -- Usage Concepts

- Develop business logic
- VAJava closely linked with WebSphere (tight integration with WebSphere Studio)
- Generation of middleware connectors. e.g.
  - ▶ Data access beans
  - ▶ Stored procedure builder
  - ▶ Simplified SQL coding
  - ▶ Enterprise Access Builder for connectors like MQSeries, Host-on-Demand, EJB support for SAP R/3, ...
- Roles based development
- "Build with Visual Age for Java, run with WebSphere"
  - ▶ Visually construct Servlet, build JSP's from Java Beans
  - ▶ Use powerful debugging functions
  - ▶ Debug target servers remotely

## WebSphere Application Server (WAS) Product Editions

- Most current Version = Version 3.5 or Version 3.02  
dependent on operating system platform
- WAS Standard Edition
  - ▶ Web Application Server
    - HTTPd -- HTML pages, files, JSPs, Java Classes, Servlet
    - Security plug-in
- WAS Advanced Edition adds
  - ▶ Web Application Server
    - Plus IIOp plug-in
    - EJB server
- WAS Enterprise Edition adds
  - ▶ Component Broker -- Workstation and 390
  - ▶ Integration of transactional environment (TXSeries)

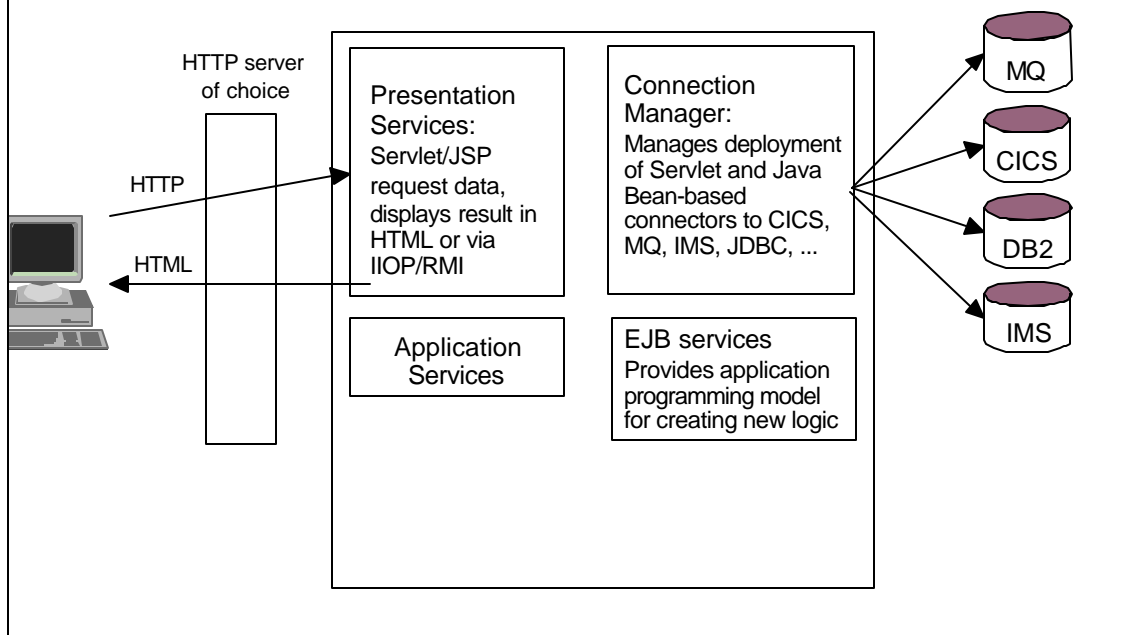
### WAS Standard Edition



## Standard Edition V3

- Java-based application environment
- WAS to build, deploy and manage Internet / Intranet Web applications
  
- IBM HTTP server
  - ▶ Administration GUI
  - ▶ Support for LDAP connectivity
- Plugins for other web servers
- Administration and Monitoring
- Configuration and Management
- Improved integration with VAJava
- Full support of Java Servlet, JavaBeans, JSP, XML
- High speed pooled database access using JDBC for DB2 UDB and Oracle
- Servlet samples

## WAS Advanced Edition

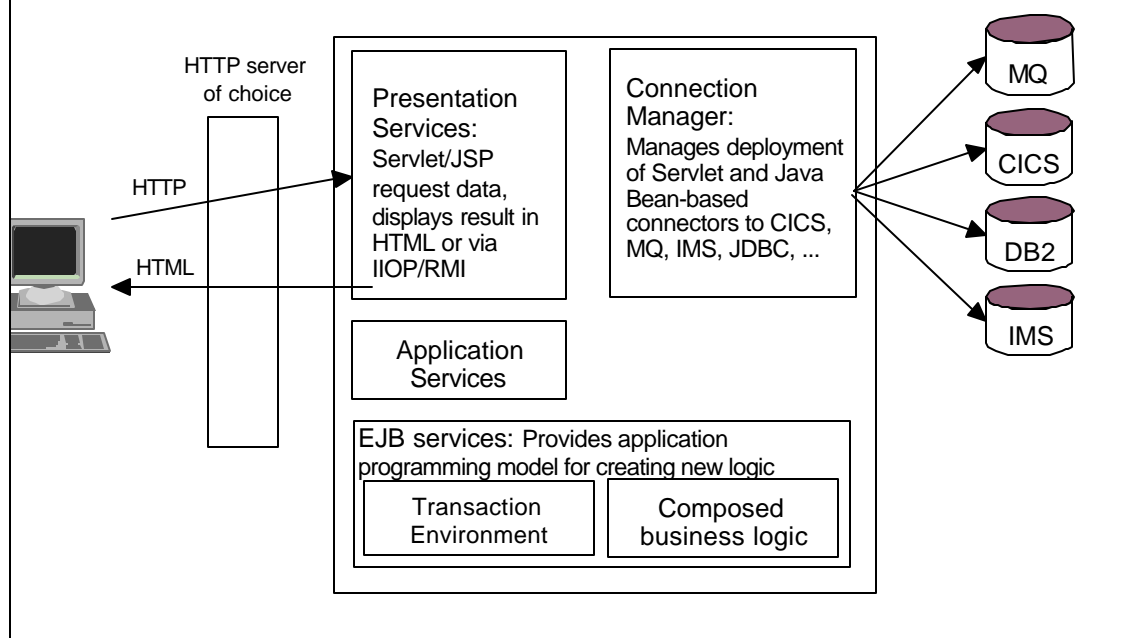




## Advanced Edition V3

- Standard Edition enhancements +
- Enterprise Java Server
  - ▶ Scalability features for EJBs, Servlet and JSPs
    - EJB, Servlet, JSP code all executes in the same runtime
    - Application-level load balancing
    - Application-level partitioning
    - Workload management for applications
  - ▶ Java database connectivity
  - ▶ Enhanced support for distributed transactions and transaction processing
  - ▶ Improved security controls and management
- Connection Manager

## WAS Enterprise Edition

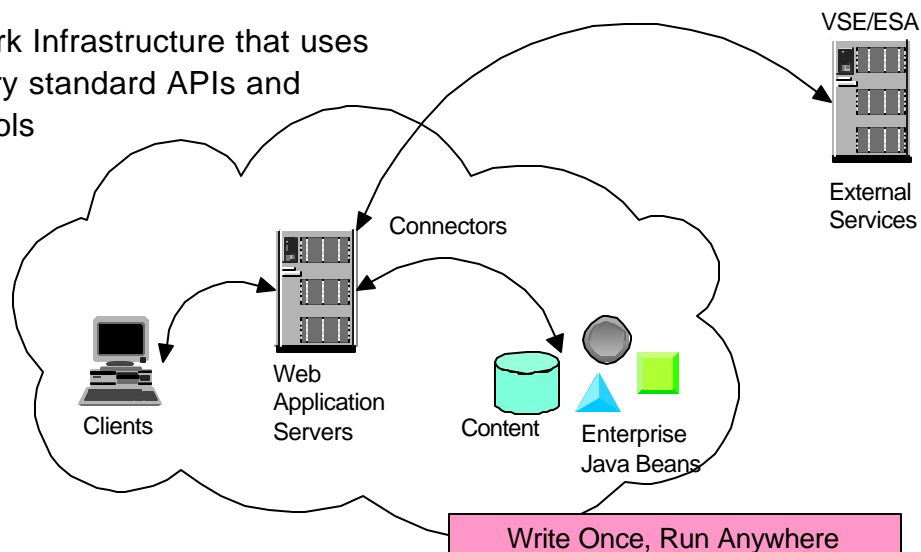


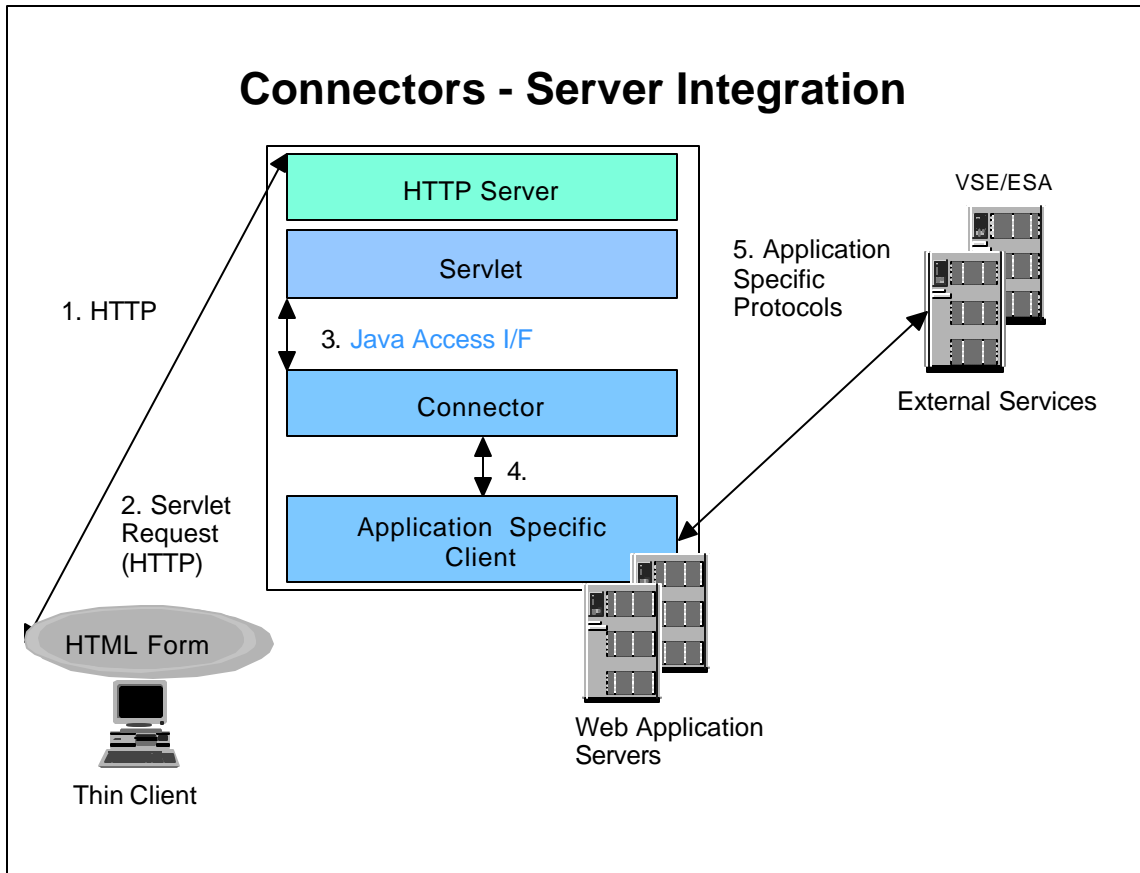
## Enterprise Edition V3

- Advanced Edition enhancements +
  - Enables full e-business transactions over the Web
  - Provides high quality middleware runtime services for distributed applications
  - Enables integration of new and existing business applications in heterogeneous systems
  - Supports sophisticated business transactions
    - ▶ Integrated, mission-critical applications
  - Provides high-end enterprise scalability, manageability, robustness, performance
    - ▶ Transaction environment (CICS, TxSeries)
    - ▶ IBM Component Broker (CORBA, EJB) technology

## System Model (Connectors)

Network Infrastructure that uses industry standard APIs and protocols





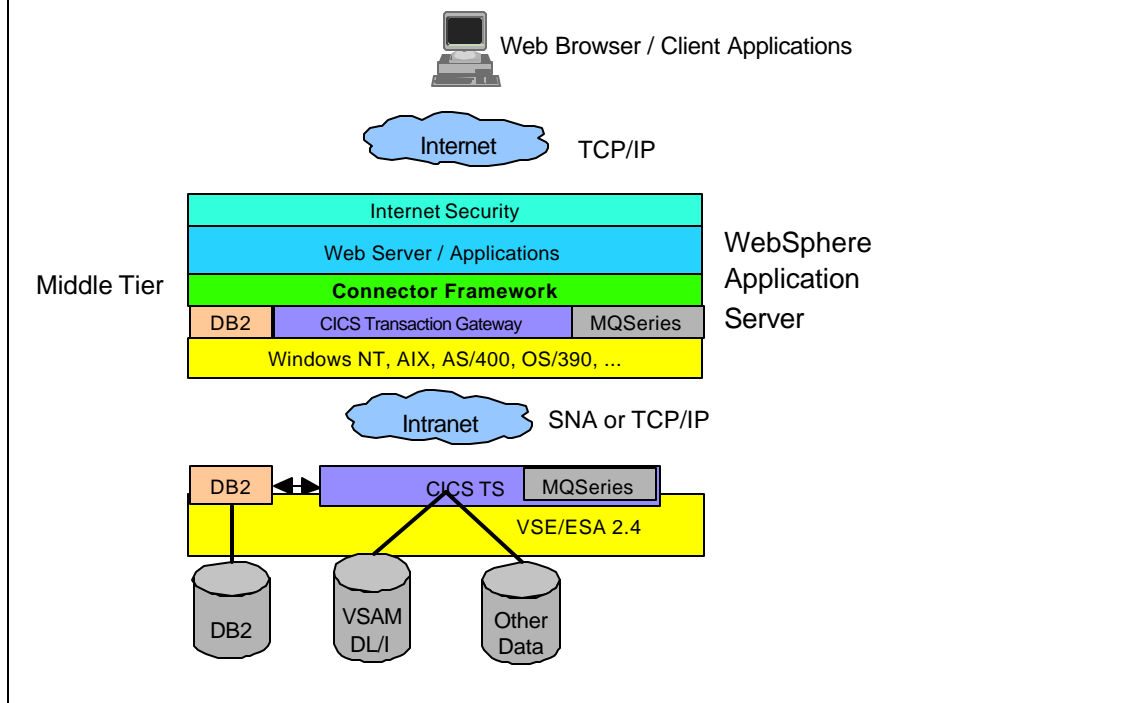
## VSE e-business Connectors

- Easy access to VSE/ESA resources from other systems
- VSE e-business connectors include
  - ▶ Server code running on VSE/ESA
  - ▶ JAVA beans, Servlet and samples on Java capable clients
    - Such as IBM's WebSphere Application Server (3-tier approach) which may run on Windows 2000, NT, Linux, AIX, OS/390, ...
      - VSE e-business connectors best integrated with WAS advanced edition
    - May also be used in 2-tier environments
- VSE/ESA 2.5 provides new VSE e-business connectors.

## VSE e-business Connectors ...

- Advantages
  - ▶ Exploitation of non-VSE e-business infrastructure
  - ▶ Always newest e-business components
    - Java, web server, security
    - Platform independent
  - ▶ VSE/ESA resources can be easily integrated into new e-business applications
    - ▶ New VSE e-business connectors
    - ▶ e-business connectors available today (DB2 Connect, MQ Series client, CICS TS Gateway, ...)
  - ▶ E-business offerings can be exploited
  - ▶ Generalized interfaces

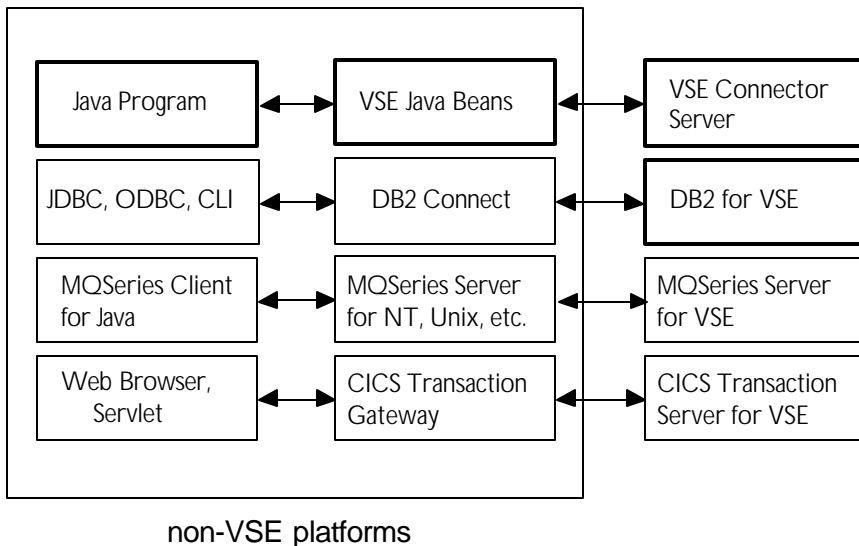
## VSE Scenario (before VSE/ESA 2.5)

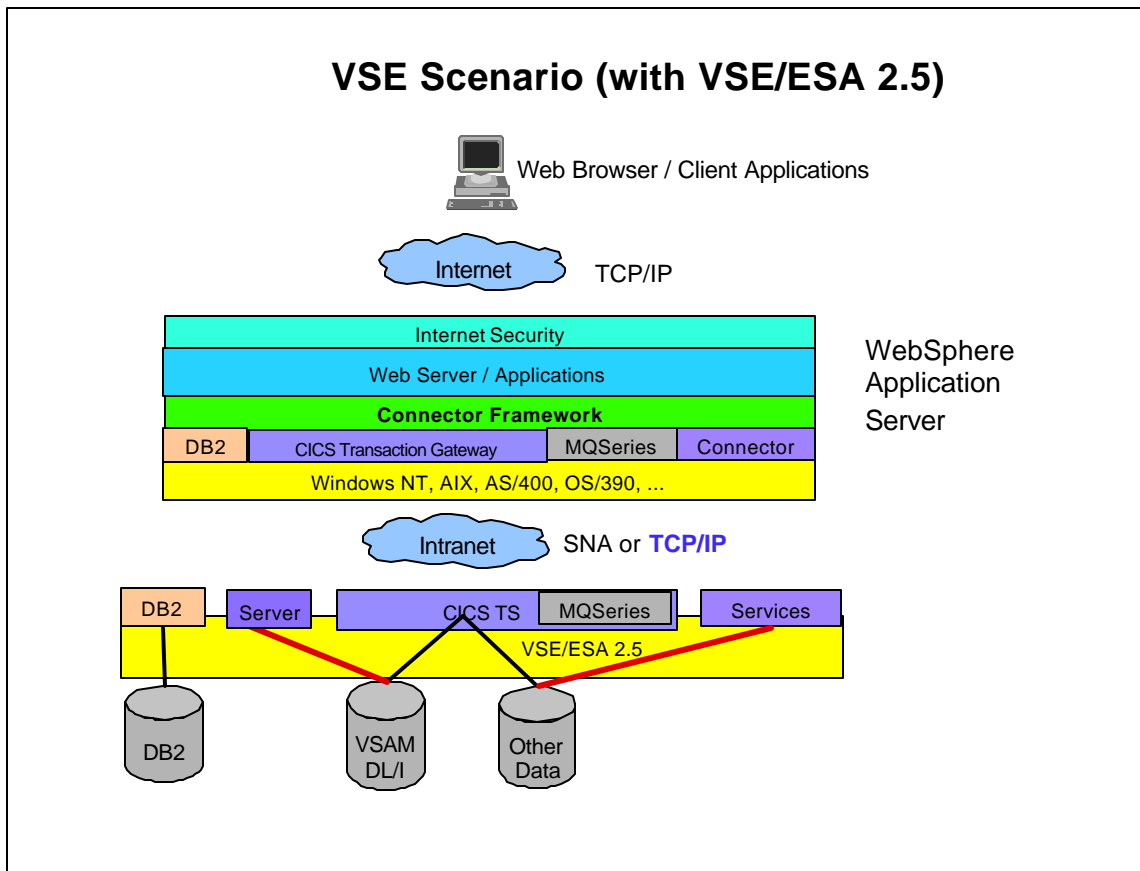


## e-business Connectors

- DB2 Connect (JDBC)
  - ▶ TCP/IP based connection with DB2 V7
- CICS Transaction Gateway
  - ▶ SNA based connection
- MQSeries Connector
  - ▶ TCP/IP based connection
- And more ...

## Connector Interfaces (with VSE/ESA 2.5)

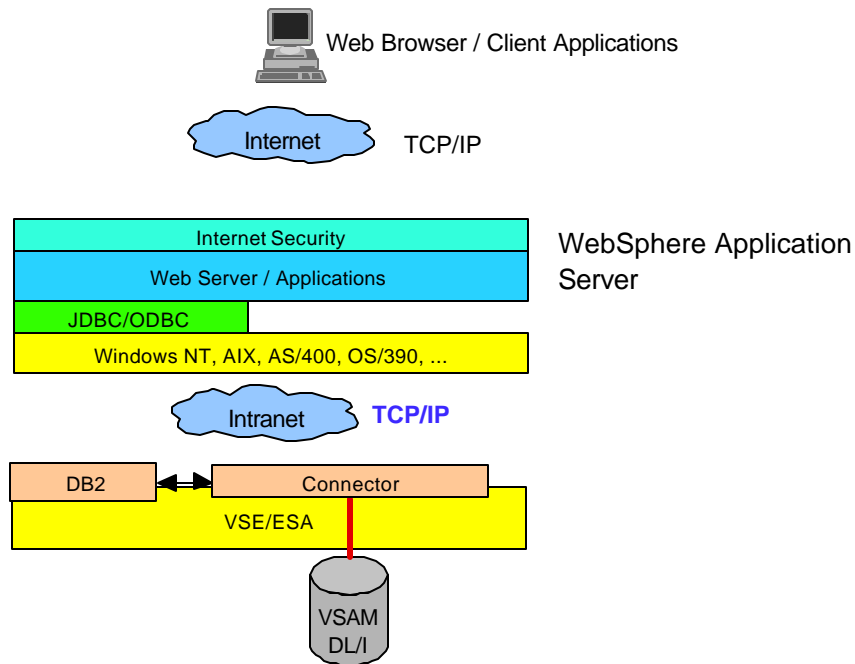




## VSE/ESA 2.5 e-business Connectors ...

- DB2 based connectors for VSAM and DL/I
  - ▶ Exploitation of DB2 infrastructure (JDBC/ODBC, DB2 Connect, DB2 server, DB2 stored procedures)
  - ▶ Mapping of SQL requests to VSAM and DL/I data
  - ▶ VSE/ESA provides APIs to
    - Access VSAM and DL/I data
    - Do the mapping to VSAM and DL/I data
  - ▶ Sample mappings and applications provided
  - ▶ Communication via DRDA (SNA or TCP/IP based with DB2 V7)

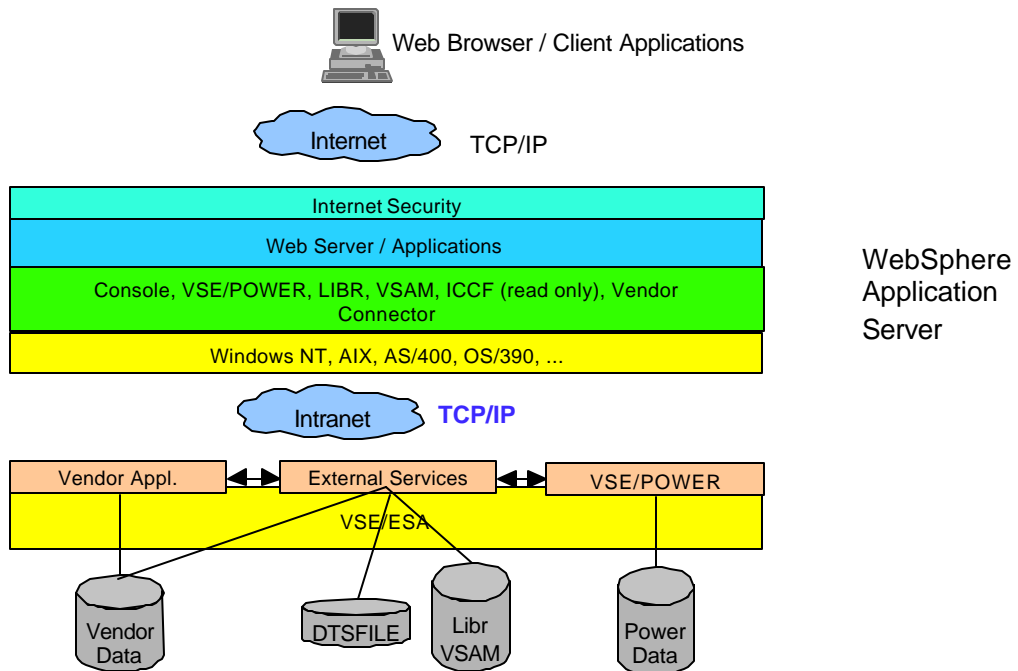
## DB2-based Connectors



## VSE/ESA 2.5 e-business Connectors ...

- External services based VSE connectors
  - ▶ Access to VSE/ESA resources, such as VSE/VSAM files, VSE/POWER, VSE/ICCF, VSE Librarian, VSE consoles, job submission
  - ▶ Access provided via
    - external services running on VSE/ESA
    - Java-based services running on e.g. web application server environments
    - Plug-in capabilities for subsystems and vendors on VSE/ESA and middle tier
  - ▶ Java samples (Applets / Servlet) are provide
  - ▶ Communication TCP/IP based

## Connectors based on External Services



## Samples

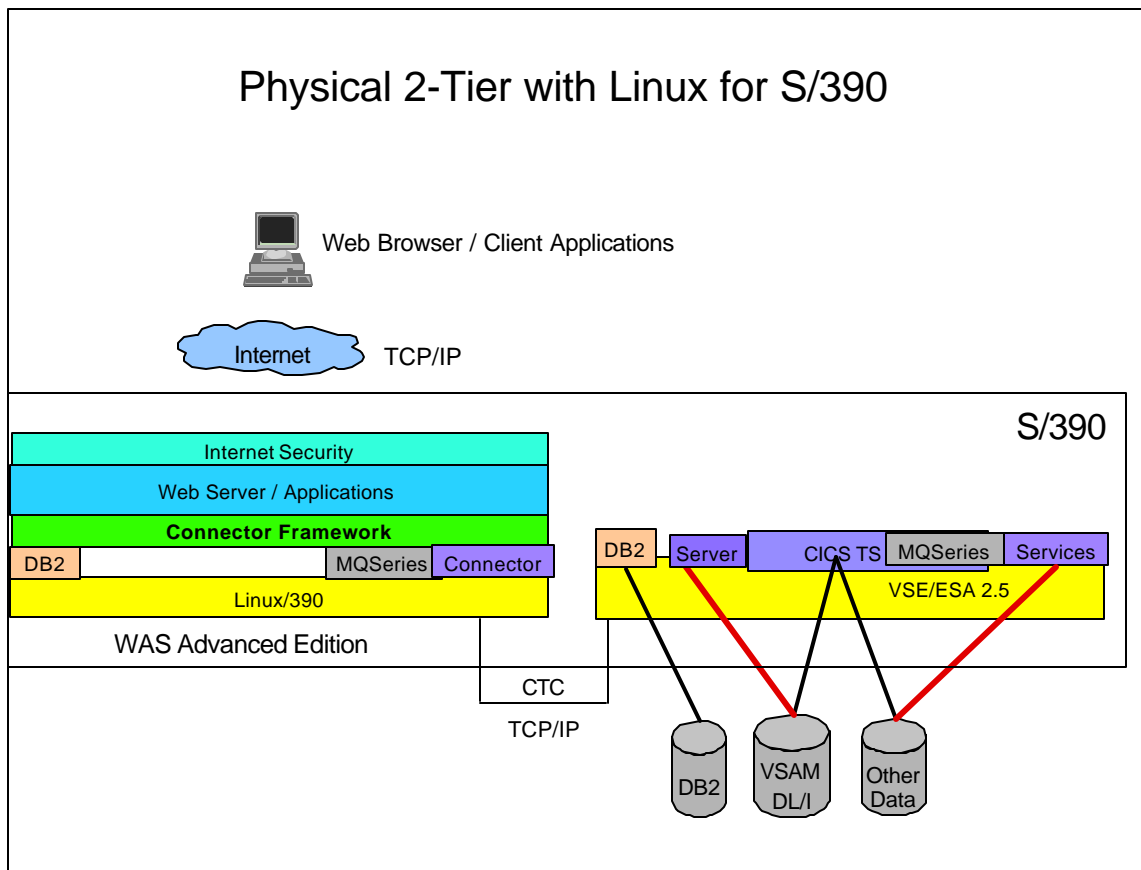
- VSE connector client
- Java applications
  - ▶ Access to VSE/POWER queues, VSE Libraries, ICCF, VSE console, job submission
  - ▶ Display and change of VSAM data
  - ▶ Monitoring of VSAM space usage
- Java applets
  - ▶ Mapping of VSAM data into a relational structure
  - ▶ Display of VSAM used and free space
- Java Servlet
  - ▶ Search utility for VSE databases
  - ▶ More ...



## Value of WebSphere Model

- Select best platform for e-business applications
- Extend core business applications into Web applications via Connectors
- Implementation of internet standards (Servlet, Java Beans, JSP, HTTP)
  - ▶ Increased productivity (reuse)
  - ▶ Isolation from server APIs
  - ▶ Portability of applications
- Exploit development tools
  - ▶ Source control via visual tools (VAJava, NetObject Fusion)
  - ▶ Open to any tool or editor
- Provide an environment that grows
  - ▶ Caching and filtering for improved response times
  - ▶ Load balancing for high performance and scalability
  - ▶ Security

## Physical 2-Tier with Linux for S/390



## More Information

- IBM e-business connectors
  - ▶ <http://www.software.ibm.com/webservers/connectors>
- Application Framework for e-business
  - ▶ <http://www.software.ibm.com/ebusiness>
- WebSphere
  - ▶ <http://www.software.ibm.com/webservers>
- CICS Gateways
  - ▶ <http://www.ibm.com/software/ts/cics/products/>
- DB2 related connectors (net.data, DB2 Connect, ...)
  - ▶ <http://www.software.ibm.com/data>
  
- VSE Applications - How e-business Fits, GF22-5137
  
- Redbook: e-business Solutions for VSE/ESA, SG24-5662-00
- Redbook: e-business Connectivity for VSE/ESA, SG24-5950-00
  
- ▶ VSE/ESA home page  
(includes links to VSE/ESA and e-business, TCP/IP for VSE/ESA, Turbo Dispatcher, ...)
  - ▶ <http://www.s390.ibm.com/vse/>

## More Information ...

- TCP/IP in General
  - ▶ TCP/IP Tutorial and Technical Overview - GG24-3376
  
- TCP/IP for VSE/ESA
  - ▶ Getting Started with TCP/IP for VSE/ESA 1.4, SG24-5626-00
  - ▶ The native TCP/IP Solution for VSE - SG24-2041
  - ▶ VSE as a Webserver - SG24-2040
  
- CICS Gateways
  - ▶ Running CICS Transactions Through the Web:  
The CICS Internet Gateway for VSE/ESA - SG24-4799
  - ▶ External Presentation Interface (EPI):  
New VSE/ESA Support for CICS - SG24-2038
  - ▶ Revealed ! CICS Transaction Gateway  
with more CICS Clients unmasked - SG24-5277
  
- WebSphere Application Servers:  
Standard and Advanced Editions - SG24-5460
  
- WebSphere V3 Performance Tuning Guide - SG24-5657