

E81

Variety of techniques to Access IMS Using Java Part 1



Anaheim, California

October 23 - 27, 2000

Ken Blackman

kblackm@us.ibm.com

© IBM CORPORATION 2000

■ Terminology and Trademarks

■ Terminology

- ▶ JDK - Java Development Kit
- ▶ JVM - Java Virtual Machine
- ▶ EAB -Enterprise Access Builder
- ▶ EJB - Enterprise Java Bean
- ▶ HPJ - High Performance Java
- ▶ JAR - Java Archive
- ▶ JDBC - JDBC

Trademarks

MVS/ESA

IMS/ESA*

DB2*

S/390*

ESA/390

IBM*

IBM COBOL for MVS

System/390*

CICS

CICS/ESA

JDBC

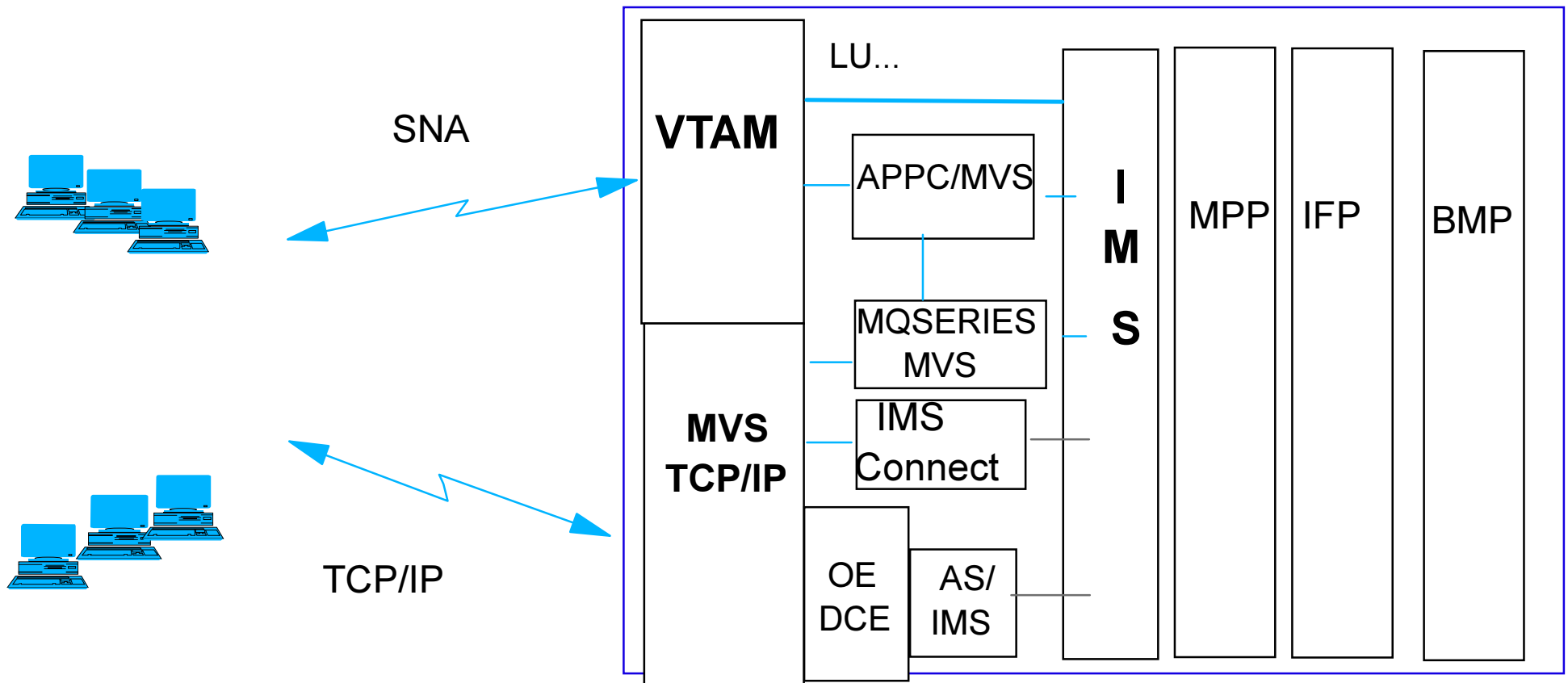
Java

* Trademarks followed by an asterisk (*) are registered.

Contents

- JAVA and IMS Connectors
- Building an IMS e-business Application
- Using IMS Java classes to build an IMS Application Program
- Summary

Access to IMS Application Programs



What is JAVA

Object Oriented

Platform Neutral

Object References

Java Development Kit(JDK)

Java Virtual Machine(JVM)

Automatic Garbage Collection

Web based computing

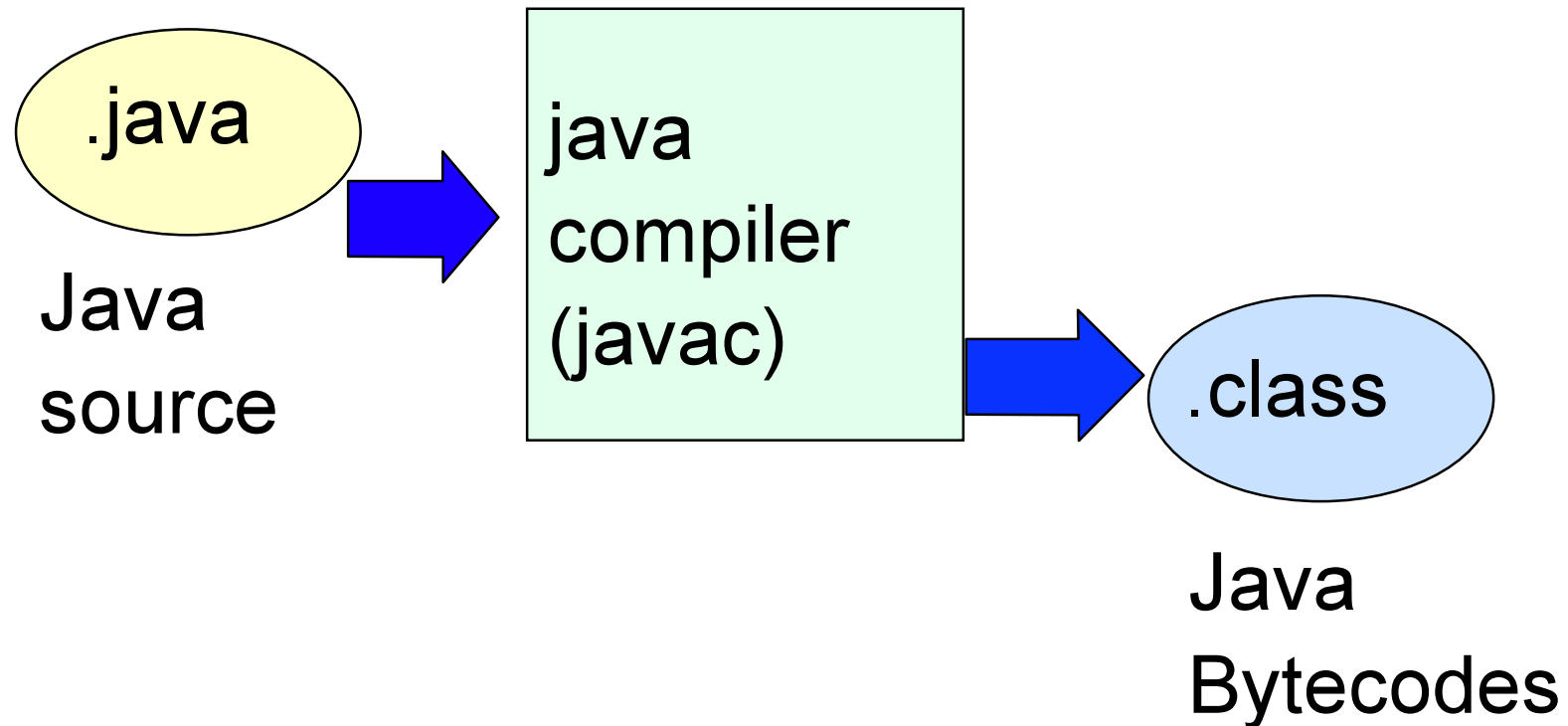
APPLET

APPLICATION

SERVLET

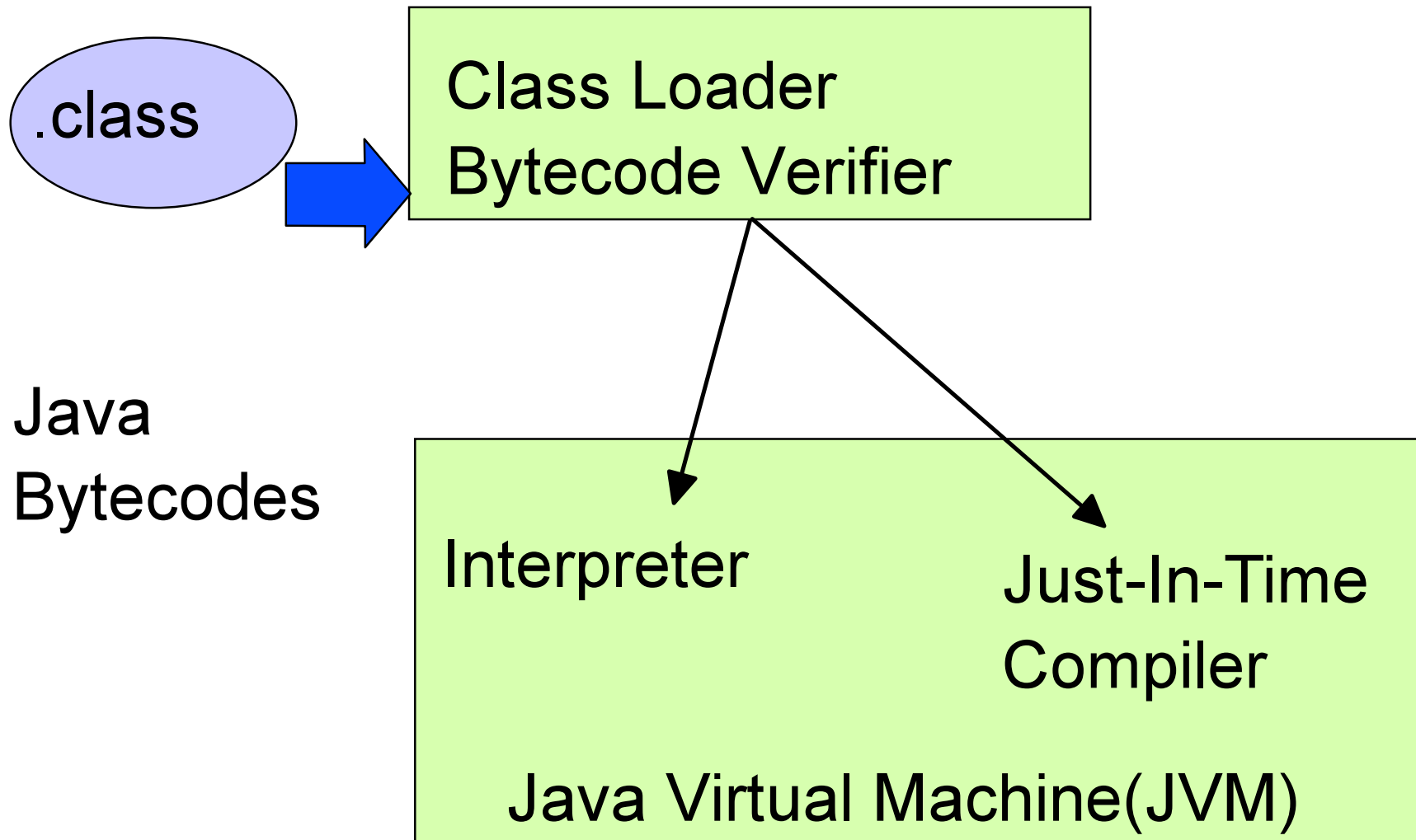
JAVA Basics - JAVA Development Kit

- What is a JAVA Development Kit (JDK)



JAVA Basics - JAVA Virtual Machine

- What is a JAVA Virtual Machine (JVM)



JAVA Basics - JAVA Applet / Application

- What is a JAVA Applet?
 - ▶ Accessed via HTML
 - ▶ Web browser based JVM
 - ▶ JAVA code downloaded from Web Server
- What is a JAVA Application?
 - ▶ Accessed from local machine
 - ▶ Runs in local JVM
 - ▶ General purpose processing
 - ▶ Can be used as CGI Program

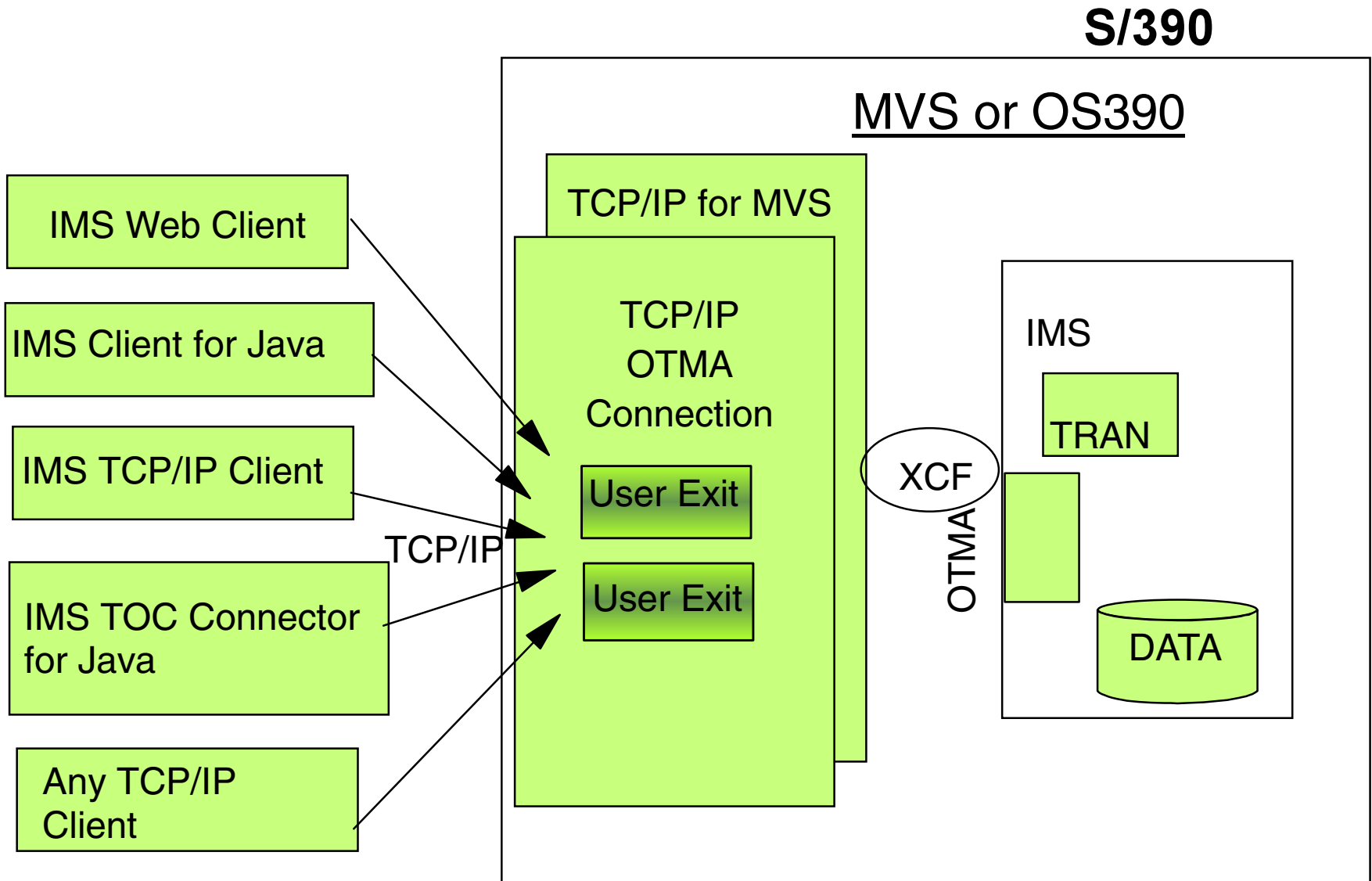
JAVA Basics - JAVA Servlet

- What is a JAVA Servlet
 - ▶ Special purpose code written in JAVA
 - ▶ normally creates HTML output
 - ▶ processed locally - can serve multiple clients
 - ▶ runs in Web Server
 - ▶ replacement for CGI Program

IMS e-business Connectors

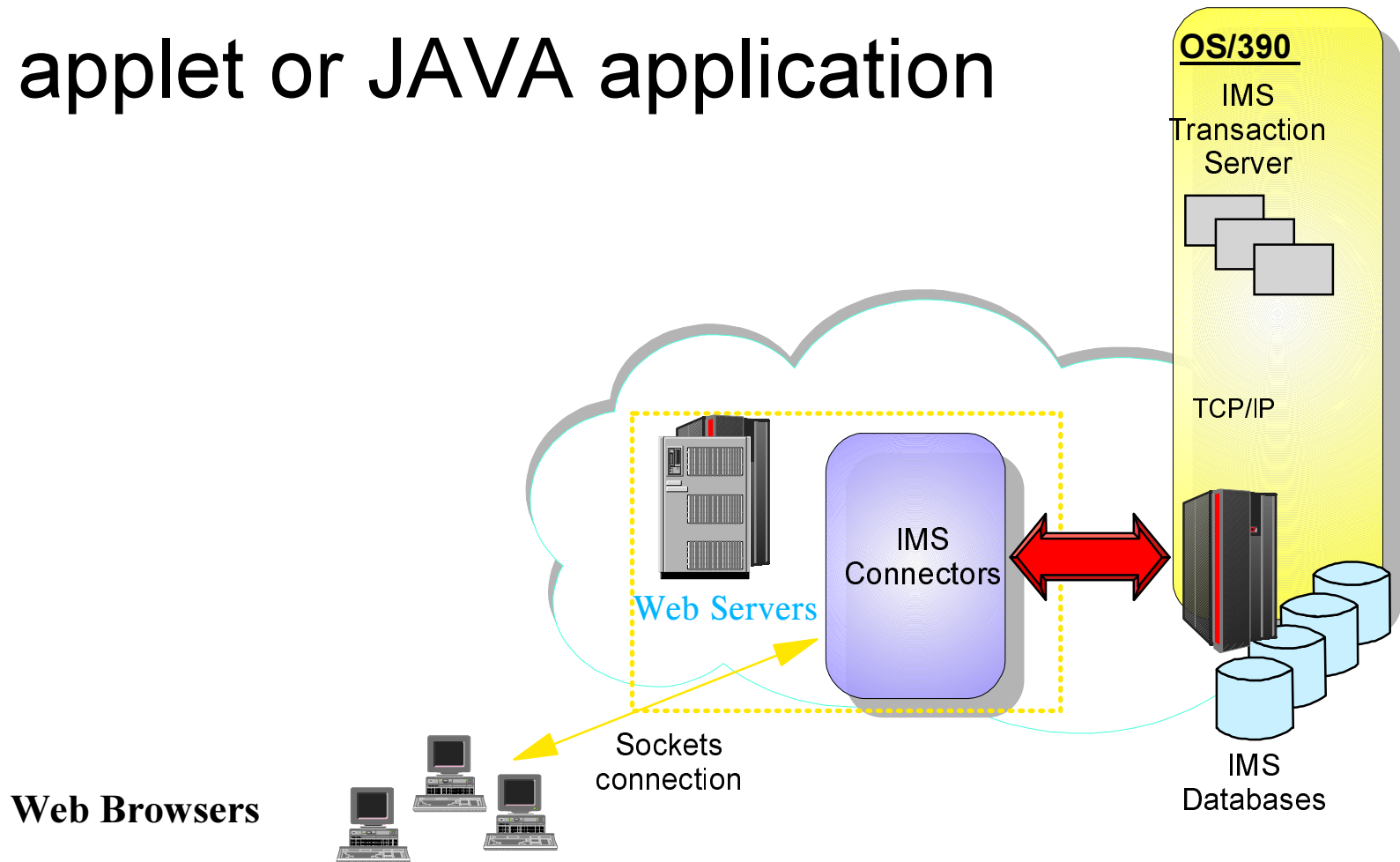
- **IMS Connect**
 - TCP/IP
- **OTMA Callable Interface**
 - XCF
- **IMS Client for Java**
 - Applet
 - Application
- **IMS Connector for Java**
 - Application
 - Servlet
- **IMS Java Classes**
 - Application
 - Servlet
- **Enterprise Java Beans(EJB)**
 - Component Applications

IMS Connect

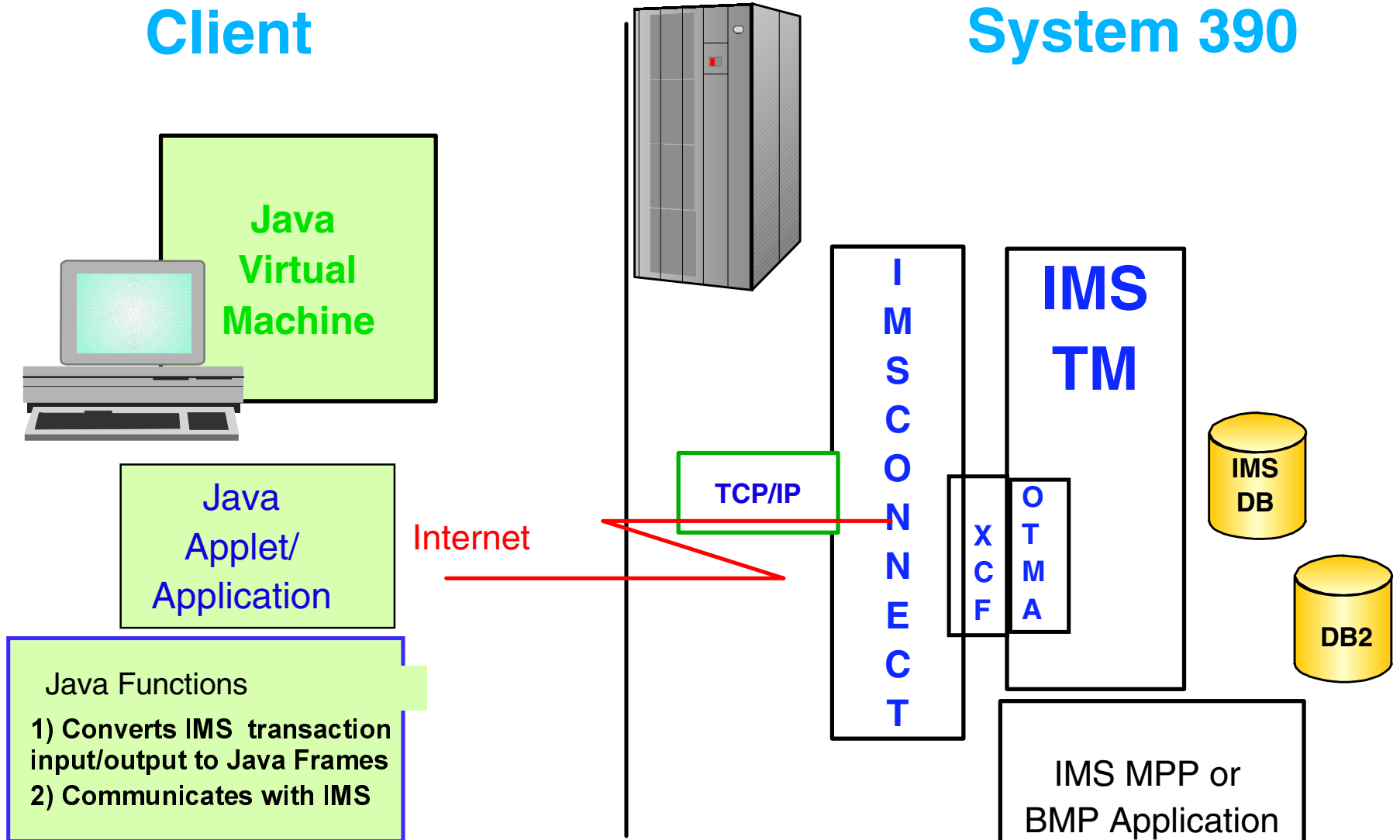


IMS Client for JAVA

- Java source classes for preparing a Java program to access IMS applications and data
- JAVA applet or JAVA application



IMS Client for Java



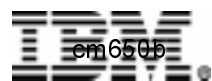
IMS Client for Java...

Transaction Data

INPUT DATA		OUTPUT DATA	
HostName	IMS.connect.com	TRAN :	
Transaction		RC =	
Client ID		MOD :	
RACFID		OUTPUT	
Sync Level		TEXT :	
Password			
Input Text			
Port	<input checked="" type="radio"/> 34xx		
Port	<input type="radio"/> 34xx		
DataStore ID	IMSP		
GROUP			
Commit Mode			

Submit Receive Only Send Only Nack Ack /Exit Close

Unsigned Java Applet Window



Updating Java Source File

▲ File **FramelInput.java** Requires Changes

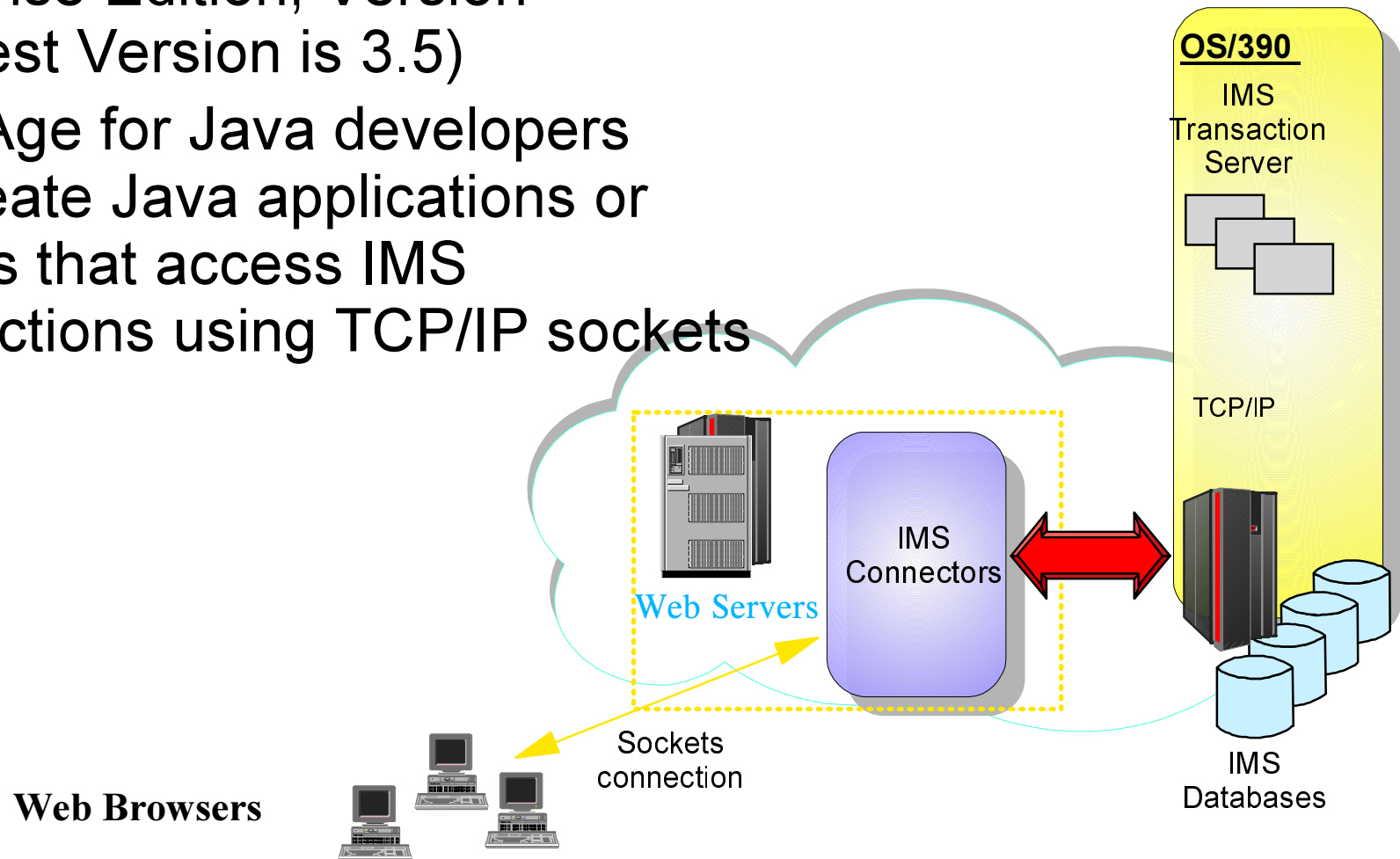
- Change port 9999 to YOUR port number
 - ▶ radioButtonPort1 = new Checkbox("Port **PORT**", groupPort, true);
 - ▶ choicePORT.addItem("**PORT**");

▲ Following java **choice** options create List Boxes

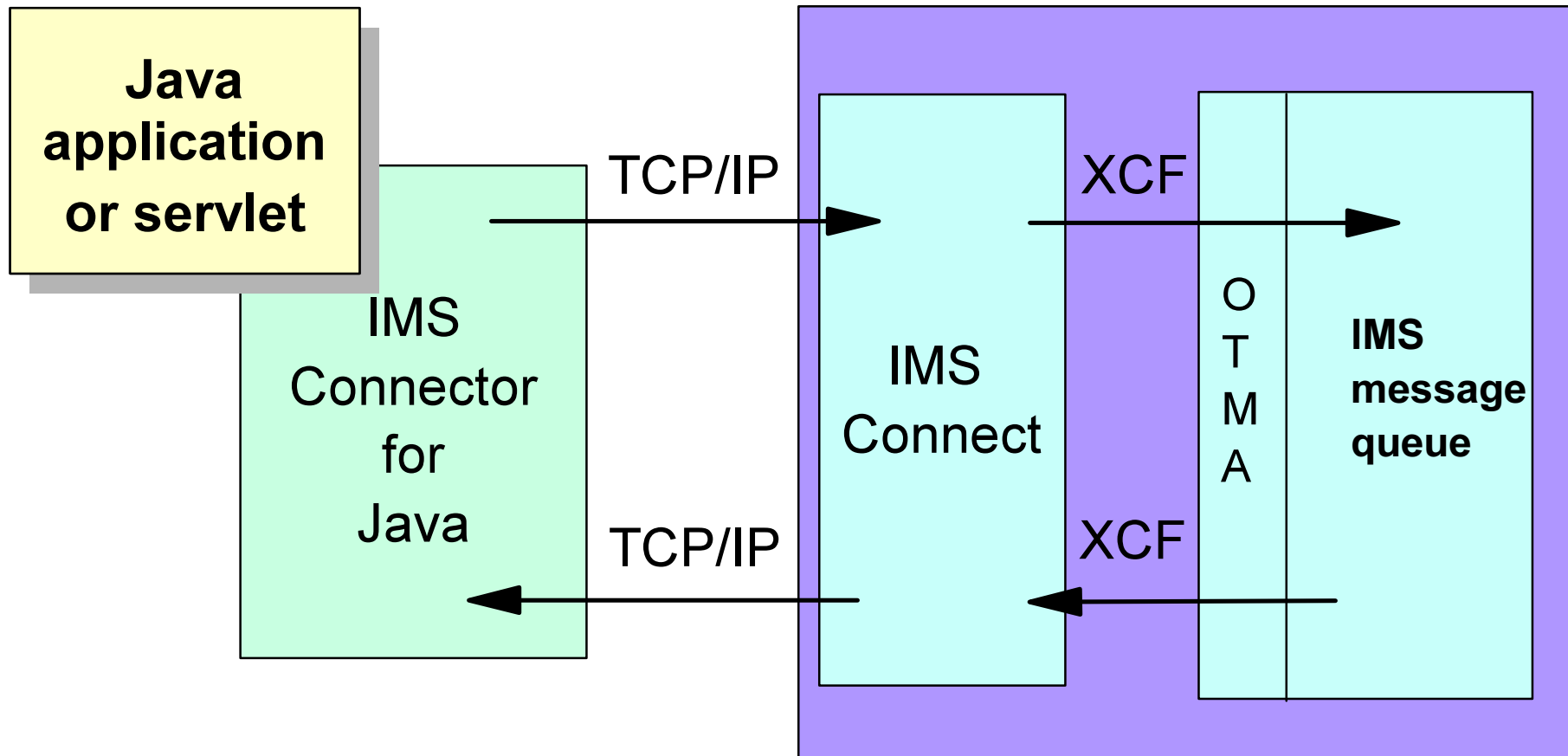
- All Java Client Choices need to be included
 - ▶ Sample doesn't support dynamic change during execution
 - Change USRT001 to **your** Userid
 - ▶ choiceRACFUser.addItem("**USERID**");
 - Change Trans
 - ▶ choiceTran.addItem("**TRANCD**");
 - Change DSN
 - ▶ choiceHostName.addItem("**HOSTNAMEDSN**");
 - Change Datastore
 - ▶ choiceDS.addItem("**DATASTOREID**");
 - Change RACF Group to **VALID or BLANK** Group
 - ▶ choiceGRP.addItem("**VALIDGROUP**");

IMS Connector for JAVA

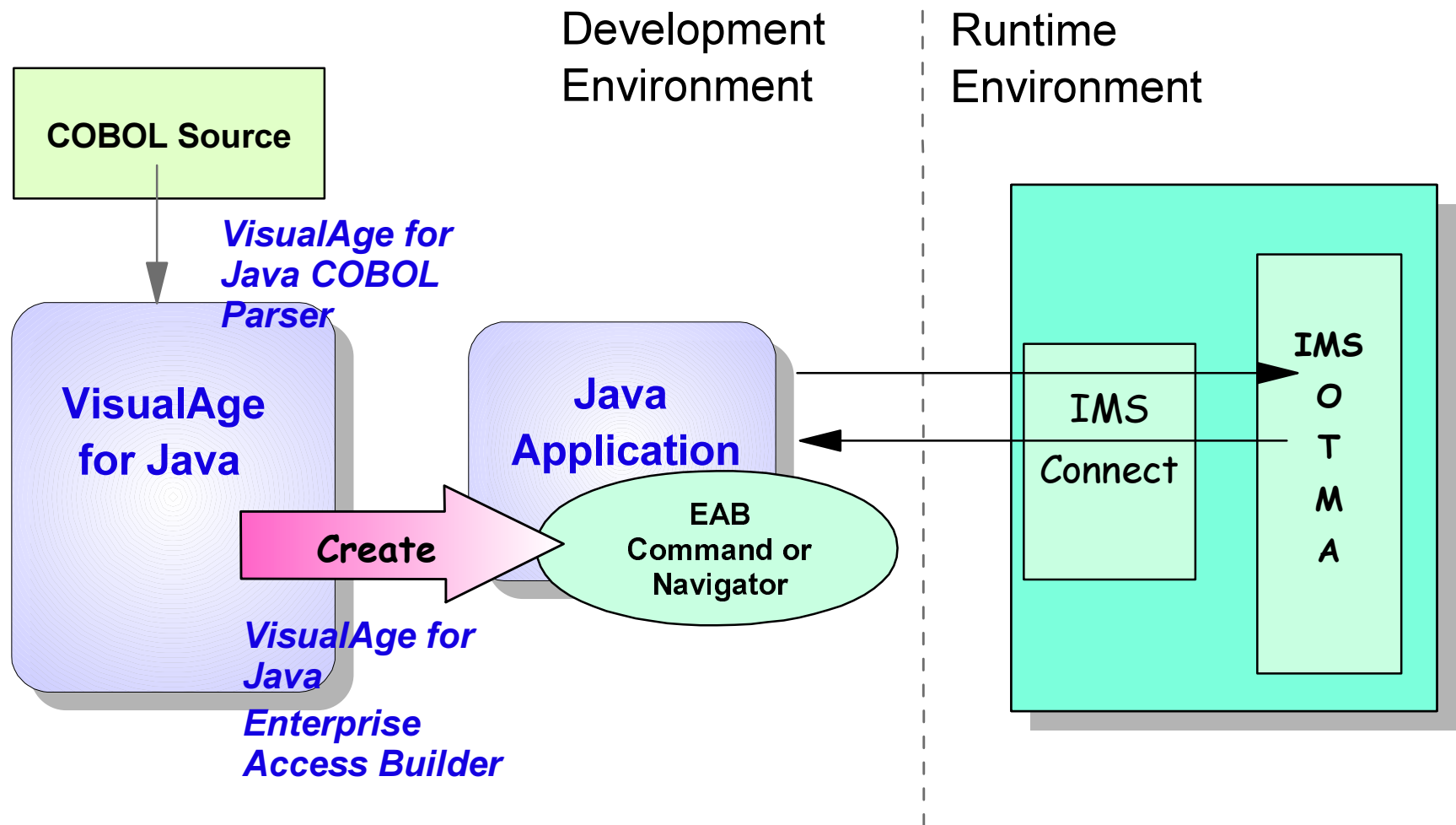
- Java Beans for building JAVA applications that access IMS
- Part of VisualAge for Java, Enterprise Edition, Version 3.0 (latest Version is 3.5)
- VisualAge for Java developers can create Java applications or servlets that access IMS Transactions using TCP/IP sockets



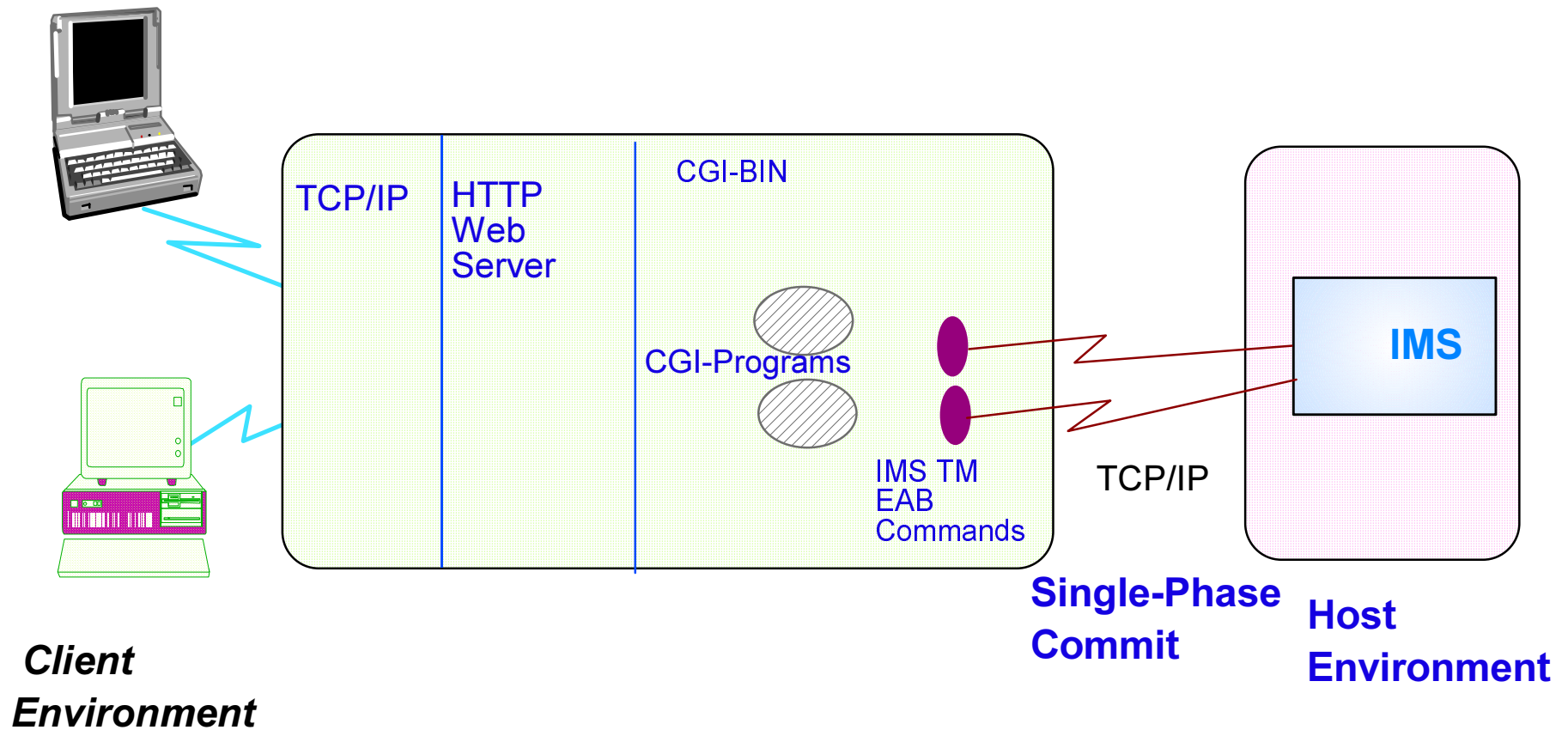
What is IMS Connector for Java?



Developing a Java Application



WebSphere Application Server



IMS Connector for Java

The screenshot shows the IBM Workbench IDE interface. The main window is titled "TechConfCommand(6/8/99 10:54:18 AM) in techconf [Administrator]". The "Composition Editor" shows two objects: "IMSInteractionSpec1" and "IMSConnectionSpec1". A "Properties" window for "IMSConnectionSpec1" is open, displaying the following configuration:

Property	Value
beanName	IMSConnection
Connection timeout	0
Host name	YourHost
Maximum connections	0
Minimum connections	0
Port	0

The status bar at the bottom indicates "IMSConnectionSpec1 [com.ibm.connector.imstoc.IMSConnectionSpec] selected." The bottom of the IDE shows the file path "techconf.TechConfCommand", the date and time "(6/8/99 10:54:18 AM)", and the user "Administrator".

IMS Connector for Java

Property Method Event

Promoted features:

- class **R**
- Connection timeout **RWB**
- Maximum connections **RWB**
- Minimum connections **RWB**
- Port **RWB****
- Realm **RWB**
- Reap time **RWB**
- this **R**
- Unused timeout **RWB**

>>
<<

Details

Description:
Port number of IMS TCP/IP OTMA
Connection

Property Type: int

Show expert features

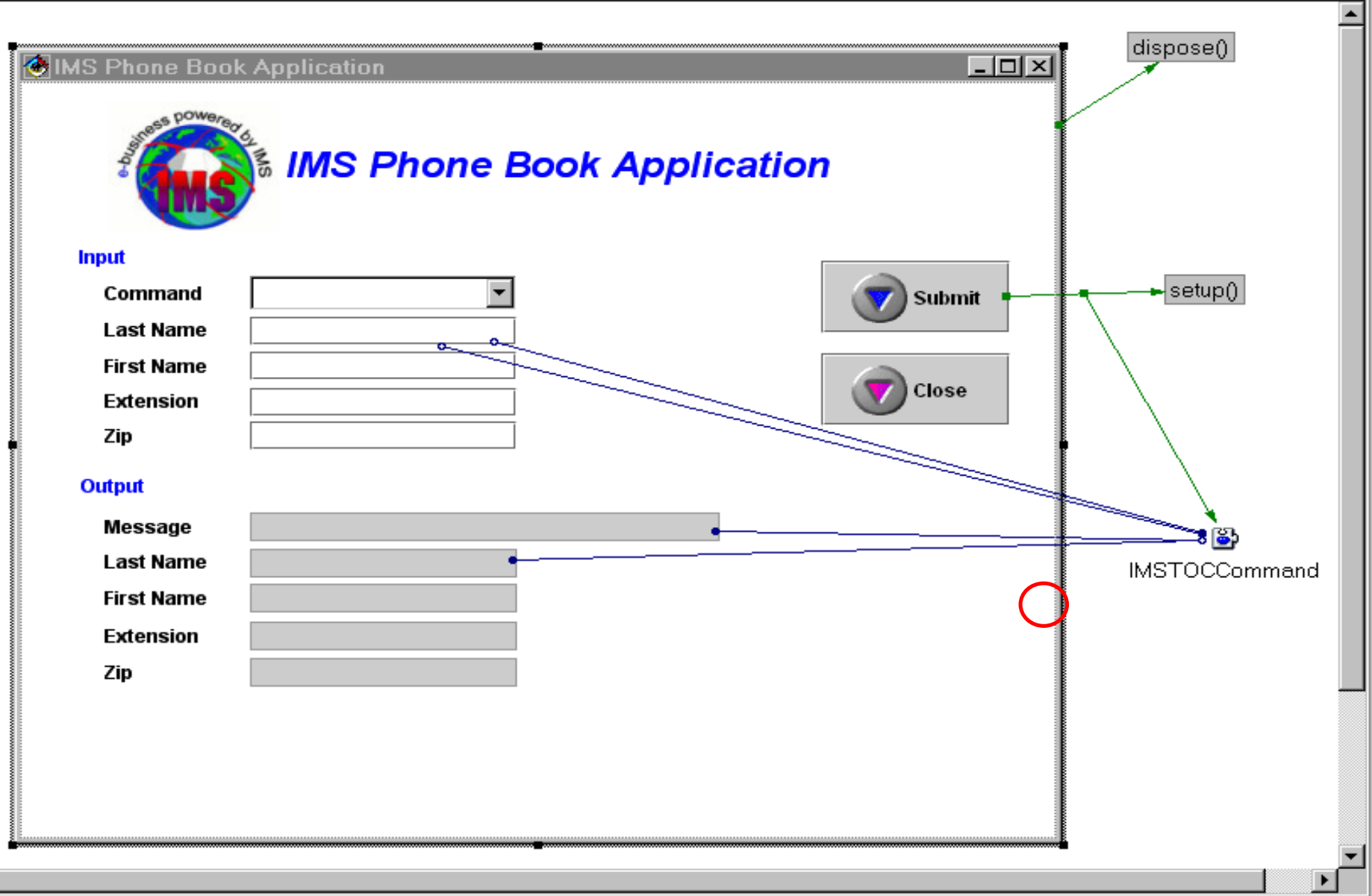
Type	Promote Name	Signature
Property	IMSConnectionSpec1HostName	Host name

OK Cancel

IMS Connector for Java



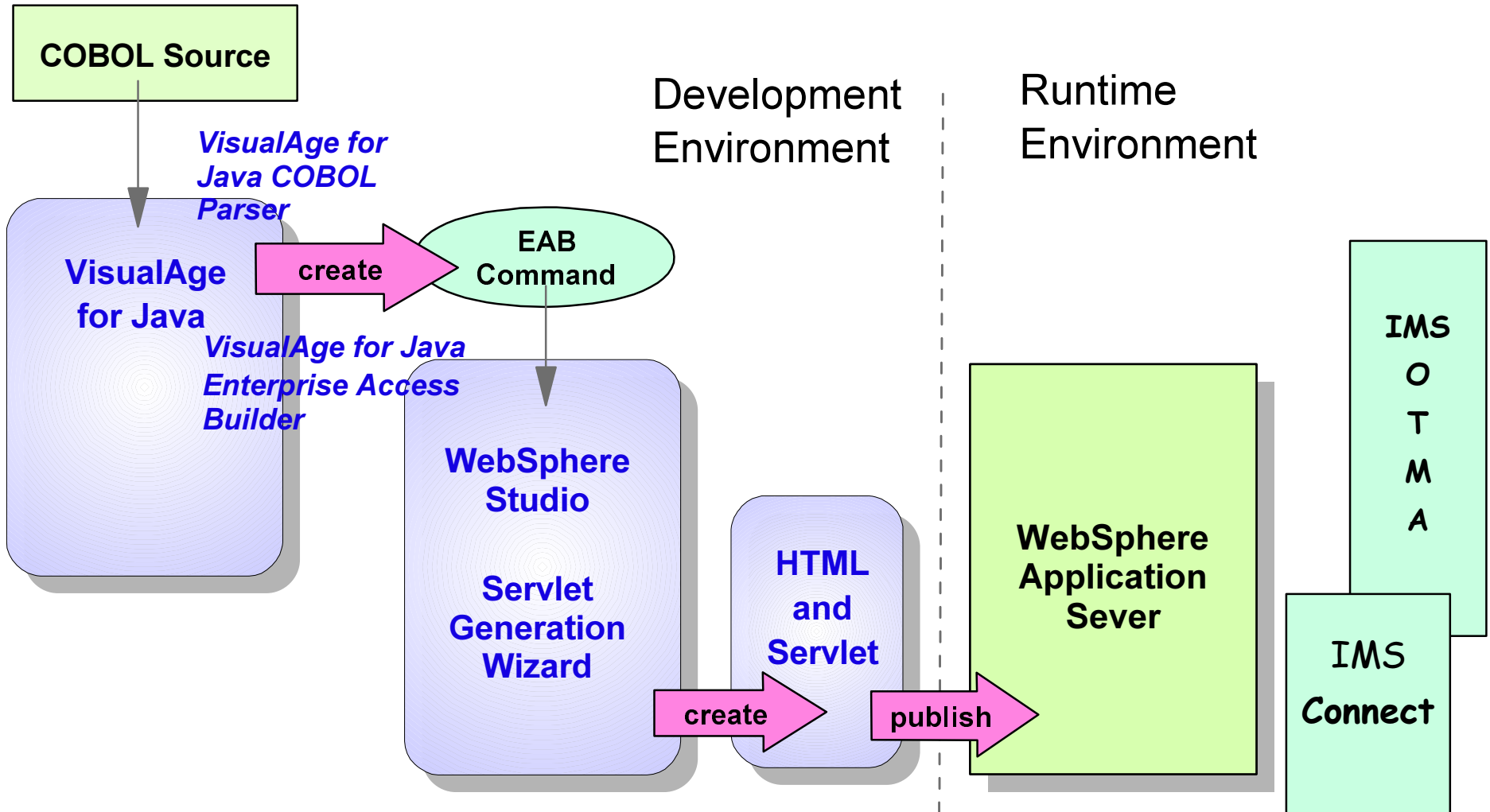
AWT



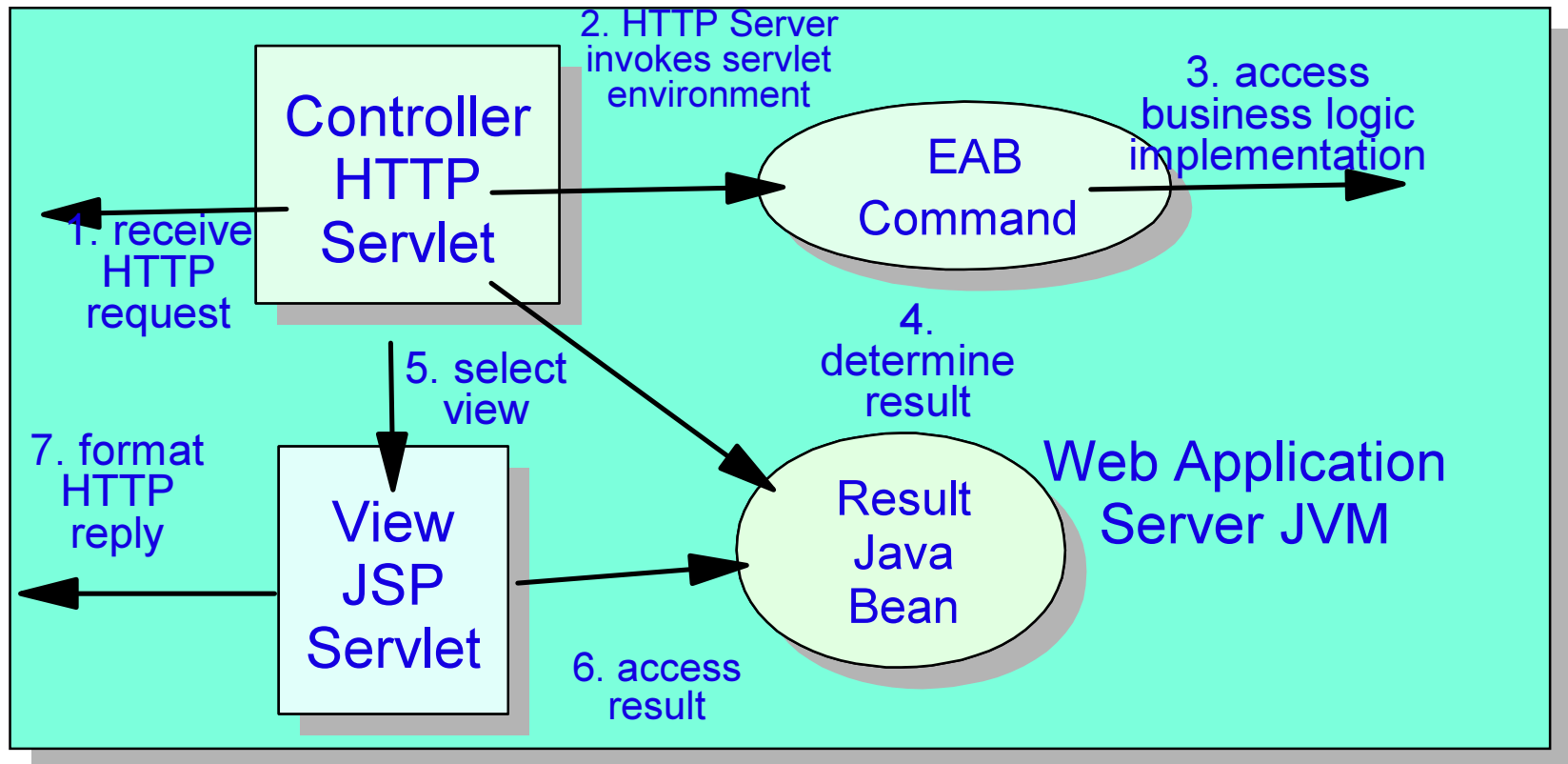
MainDialog [java.awt.Dialog] selected.



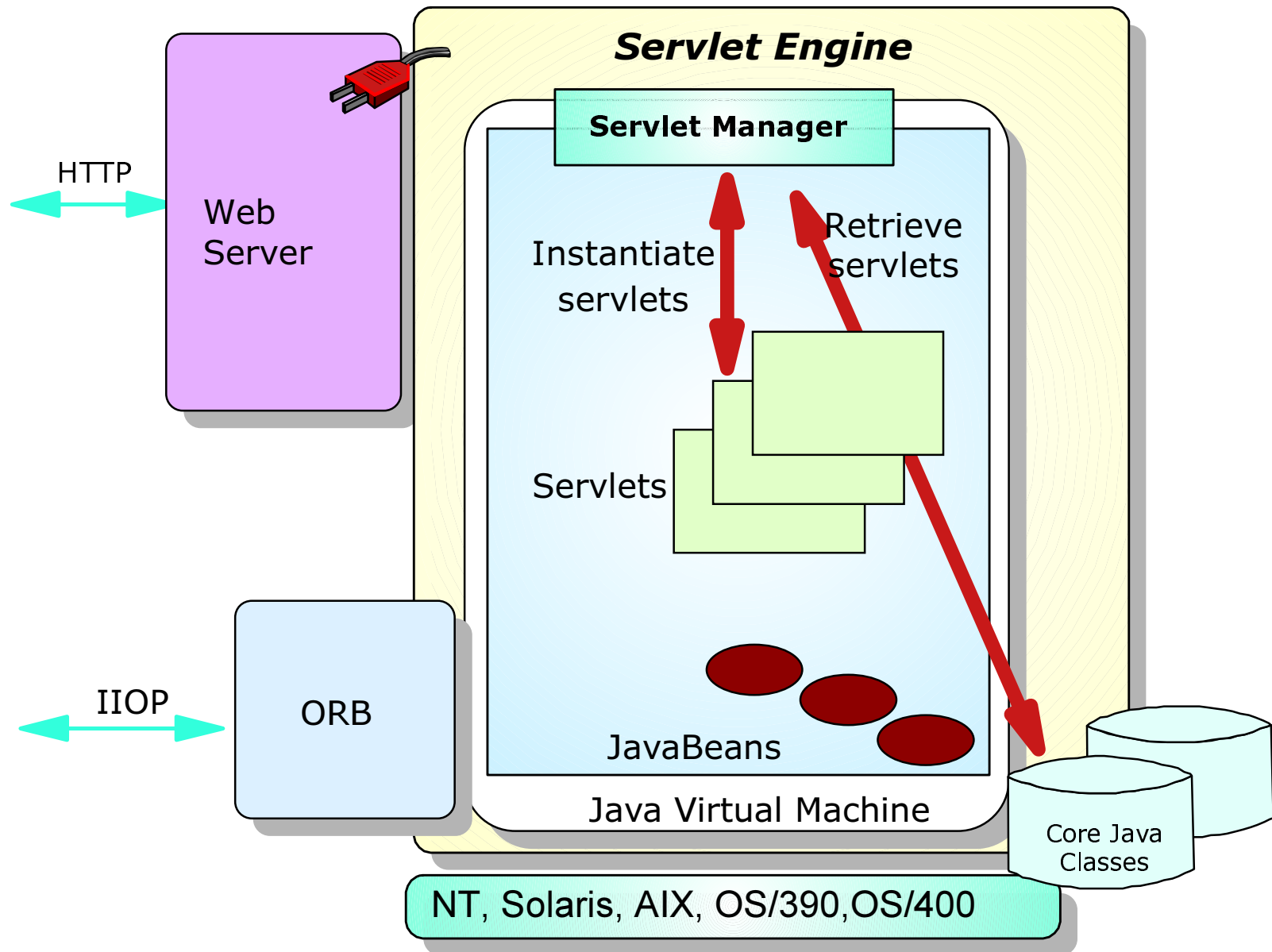
Developing a Servlet



EAB Model Flow Diagram

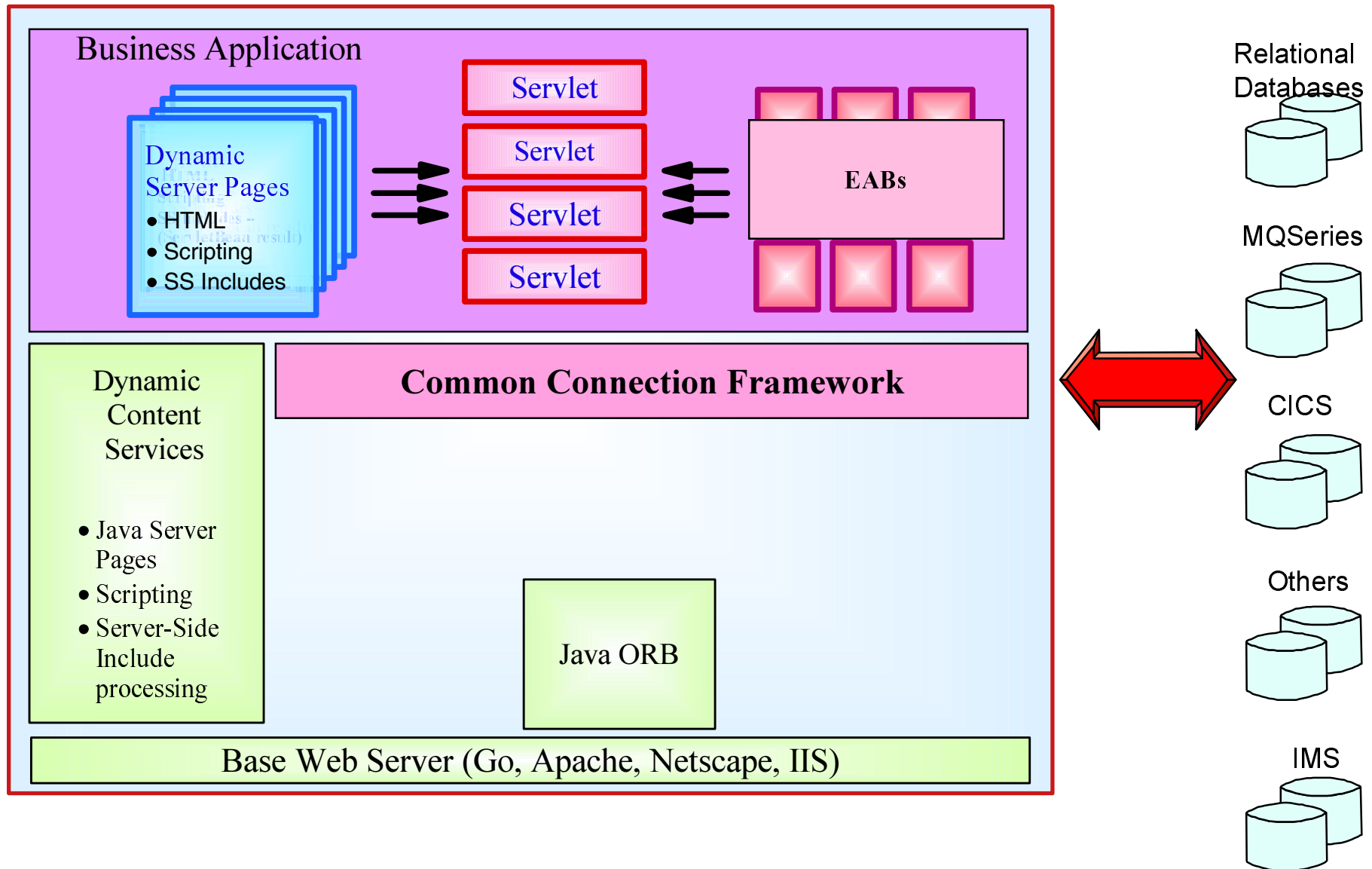


WebSphere Application Server Architecture

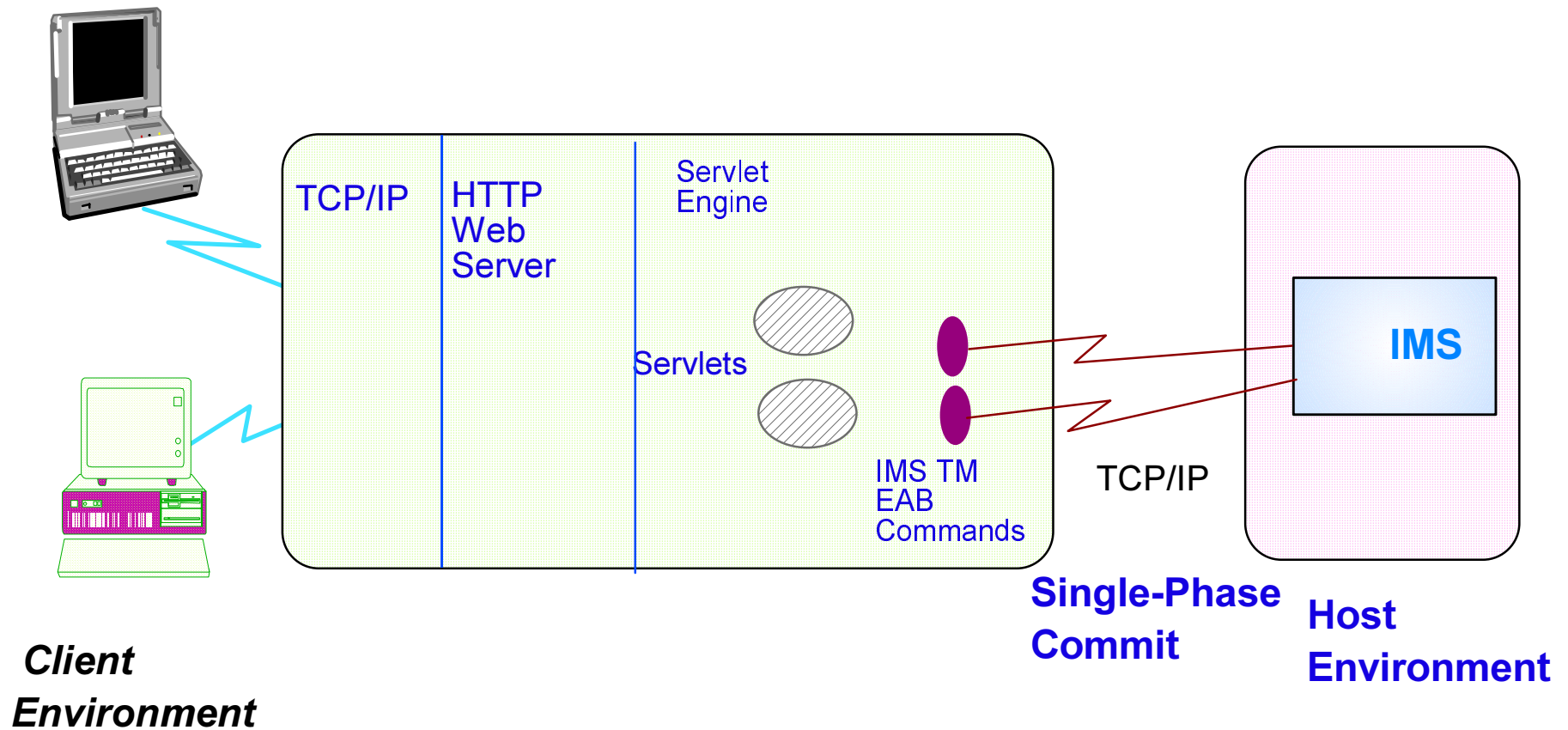


WebSphere Application Server

"standard edition"

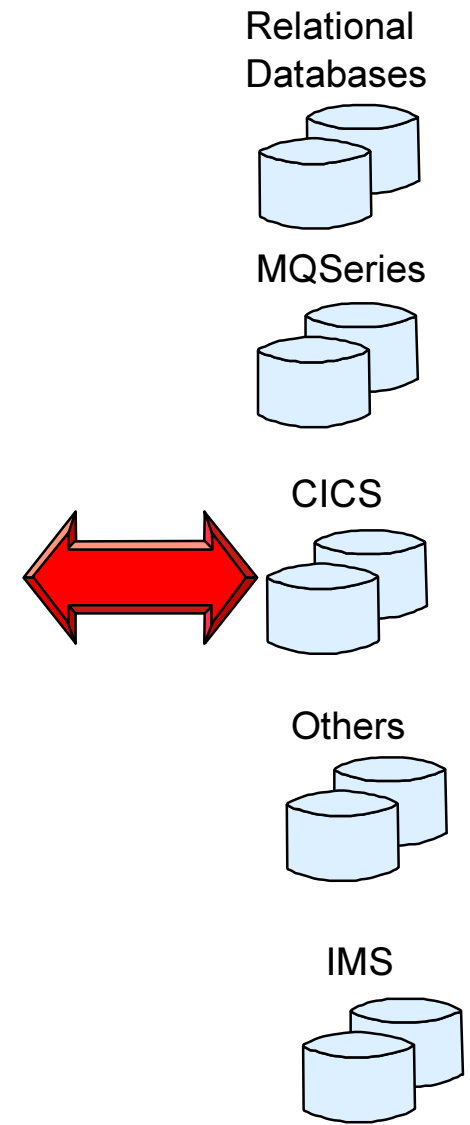
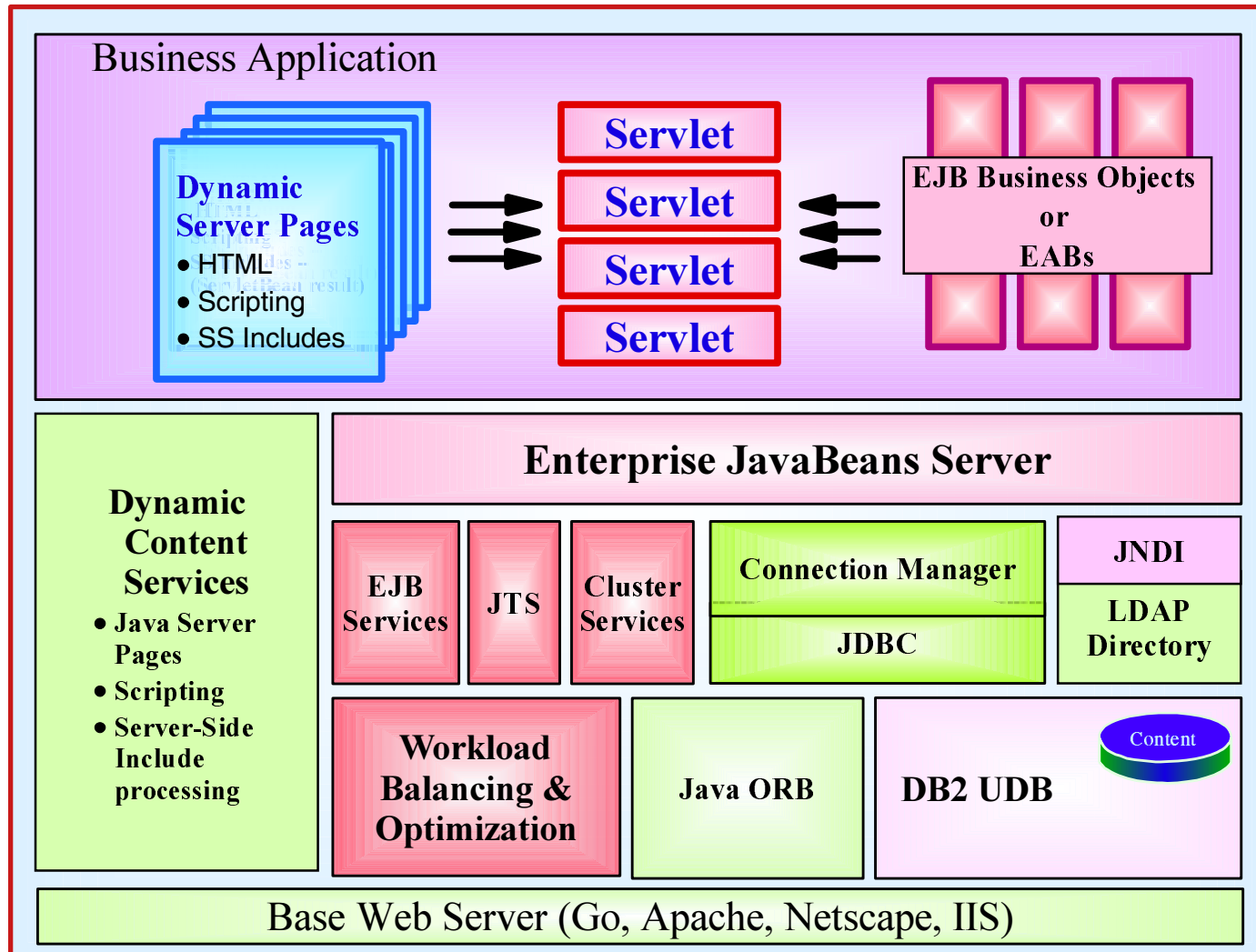


WebSphere Application Server

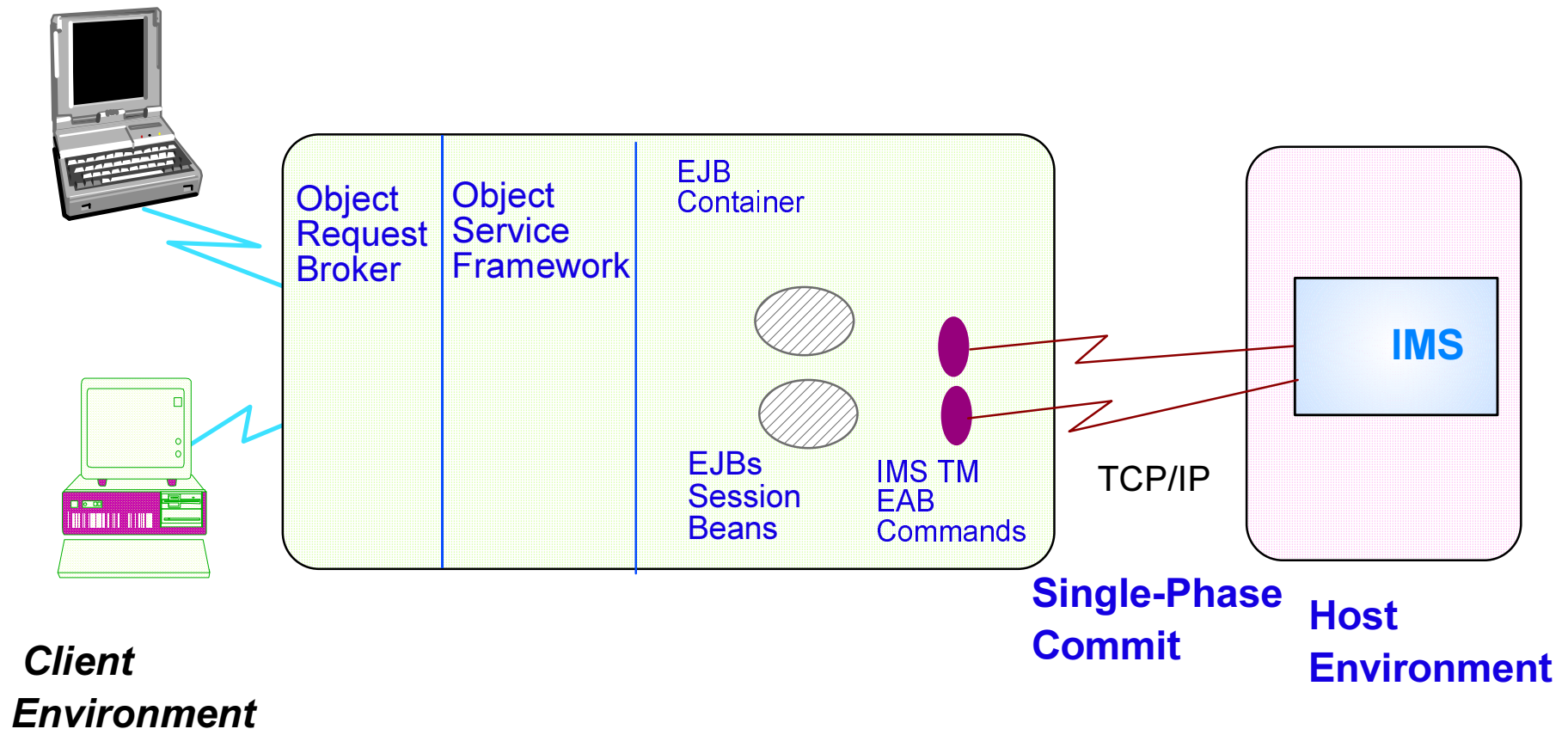


WebSphere Application Server

"Advanced Edition"



WebSphere Application Server



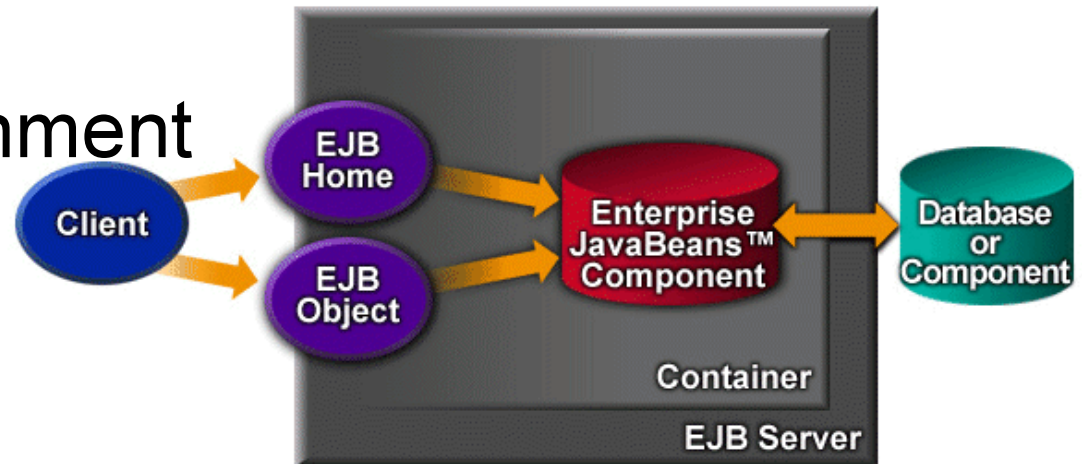
What are Enterprise JavaBeans?

Self-describing Java components

- Non-visual, server-side use
- Two types:
 - Session Beans
 - Entity Bean
- Session Beans are transient
- Entity Beans are persistent
- Deployment descriptor
- Packaged in a JAR file

EJB Architecture

EJB Environment



■ EJB Server

- Execution system
- Standard set of services to support enterprise bean components
- Access to a distributed transaction management service
- Activation/deactivation services
- Load balancing
- Fail-over support
- The home for all EJB objects

■ EJB Container

- Remote access/network interoperability
- Transaction management
- Authentication and authorization
- Resource pooling
- Concurrent service for multiple clients
- Thread and process management
- Clustering and high availability
- Runtime for all EJB's

■ EJB Object

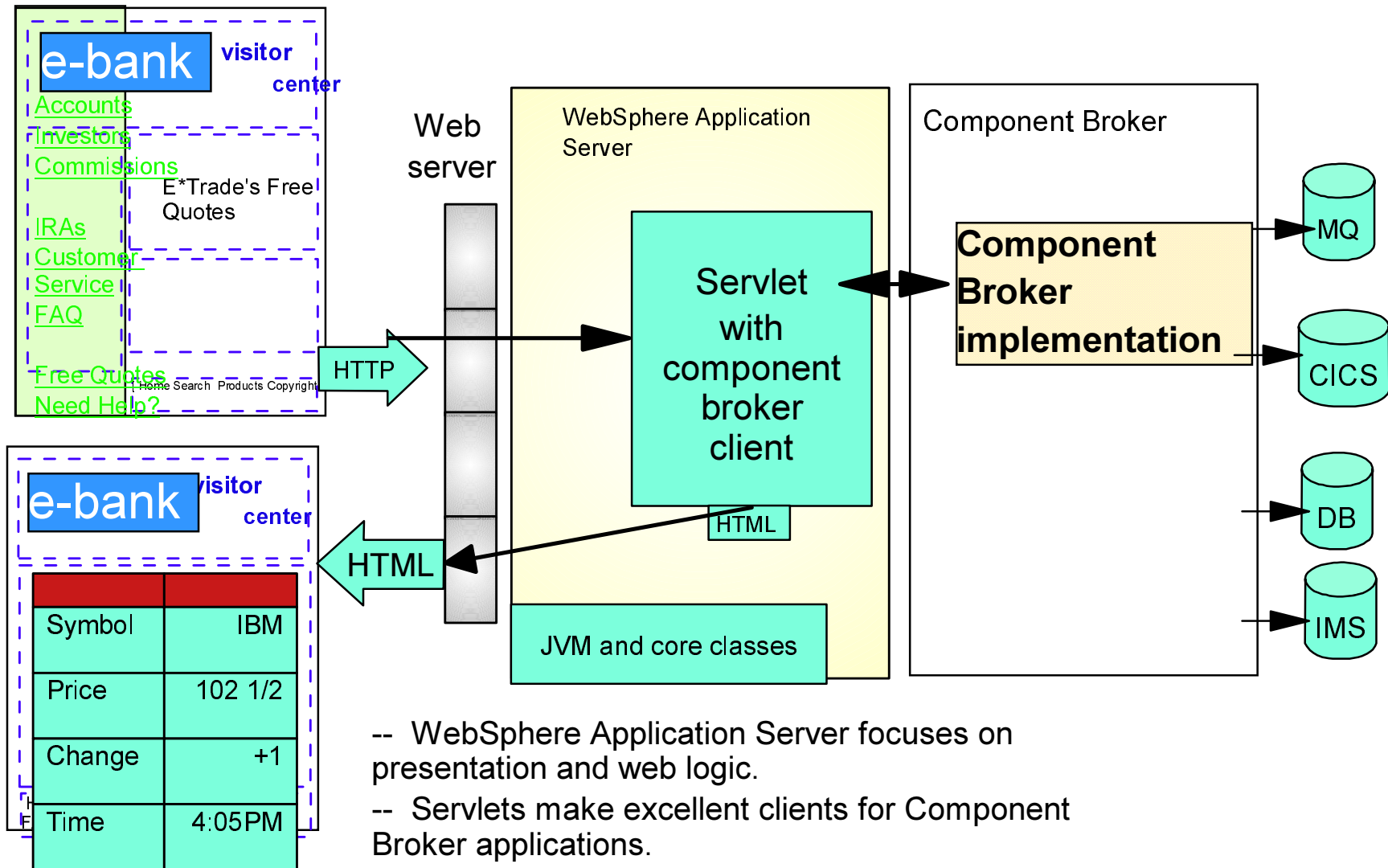
- External representation of EJB
- Generated by the container at deployment
- Exposes all application-related interfaces for the object but not interfaces that allow container to manage and control the object

■ EJB Home

- Container implements for each bean deployed in the container
- Container makes available to a client via JNDI
- Client uses Home interface to create and remove EJB objects

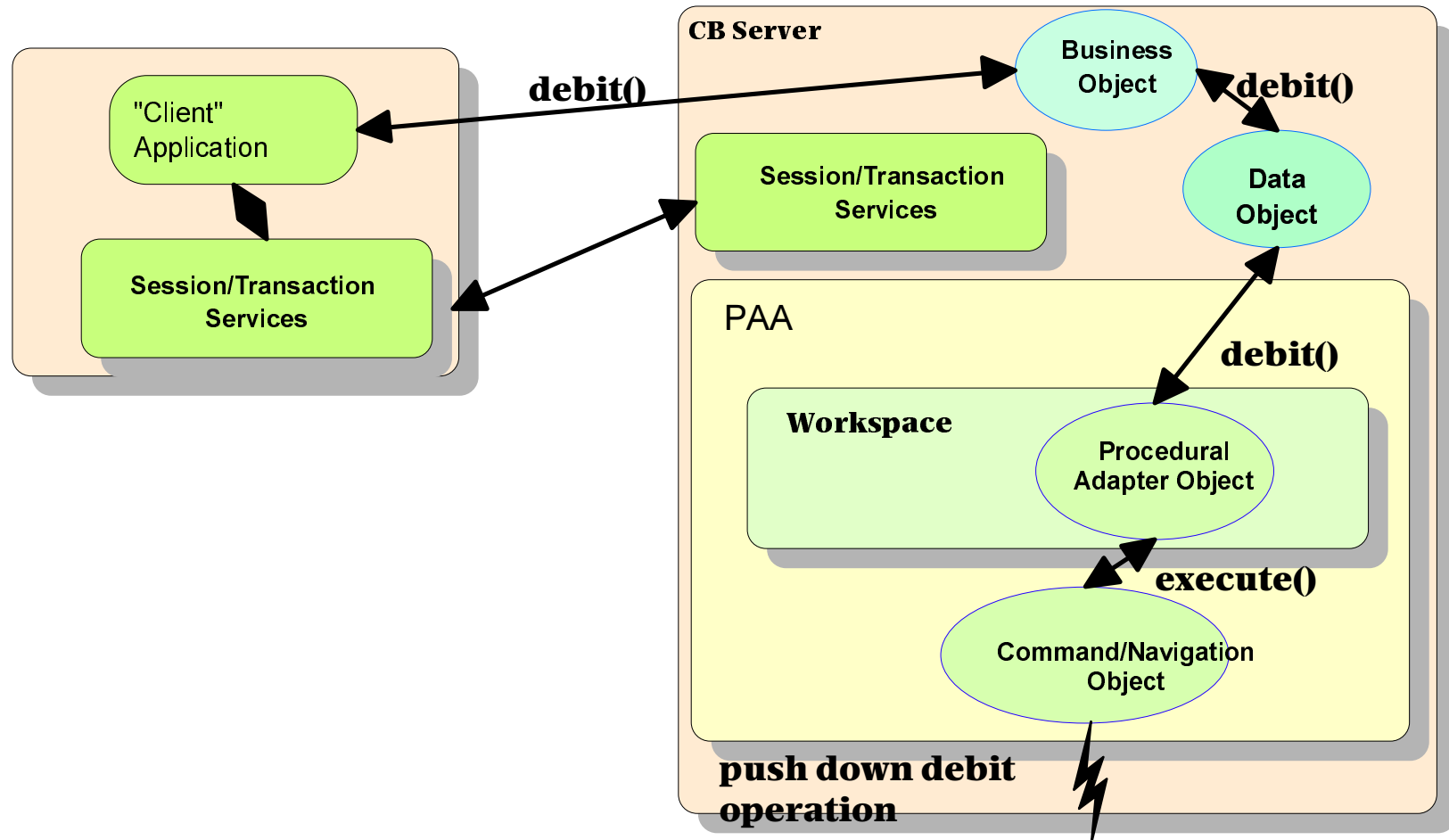
WebSphere Enterprise Edition

Flow of a Web Application

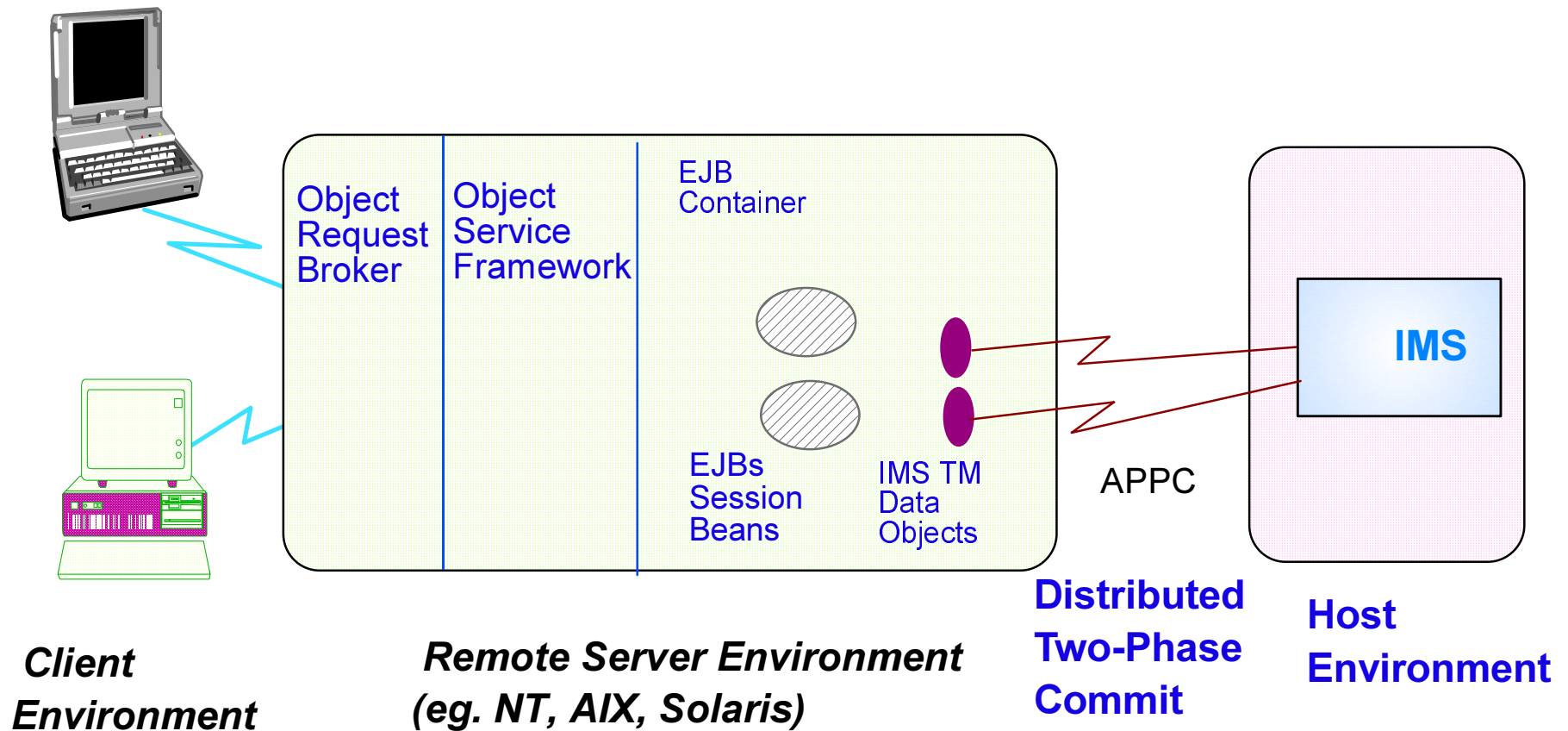


WebSphere Enterprise Edition

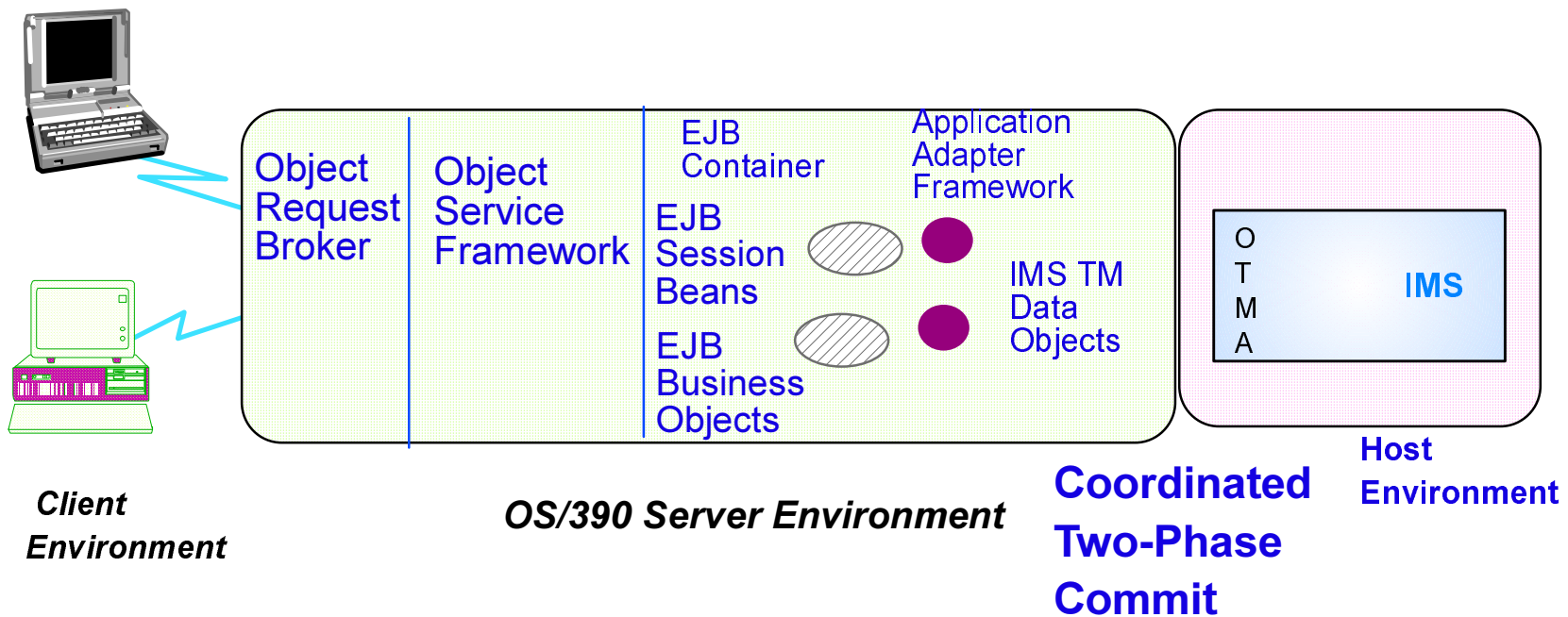
Procedural Application Adapters (PAA)



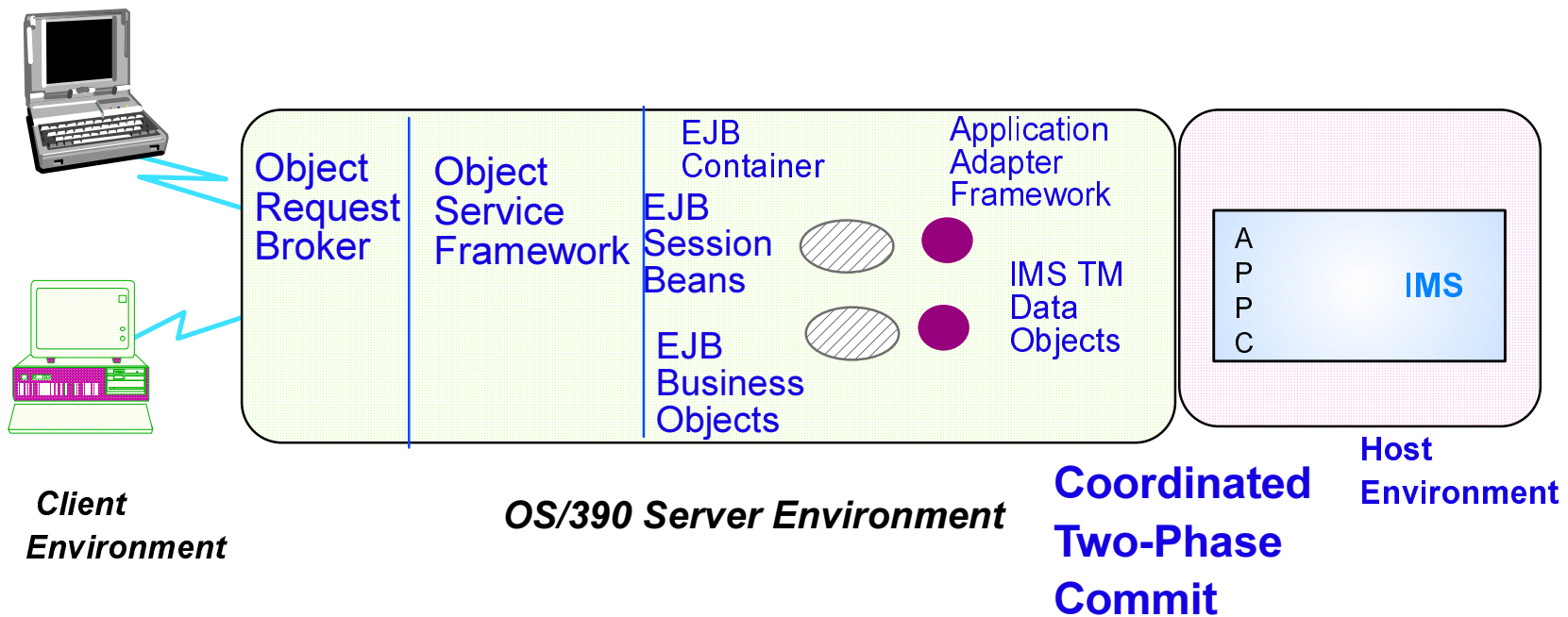
WebSphere Enterprise Edition



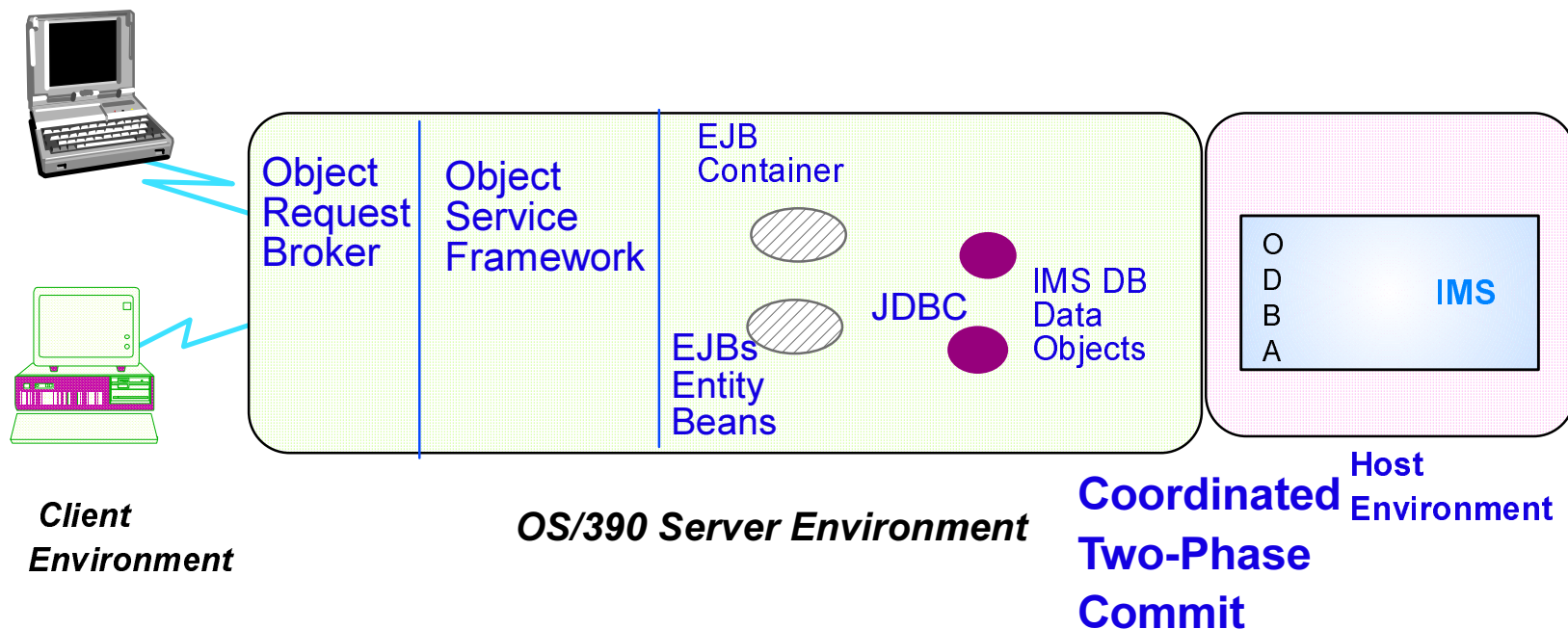
OS/390 WebSphere Enterprise Edition



OS/390 WebSphere Enterprise Edition



OS/390 WebSphere Enterprise Edition- Future IMS Java function



Summary - Part 1

