E84

IMS Connector for Java: A Perspective on Web-enabling Your IMS Transactions

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RETURN TO INDEX

Agenda

- Terminology
- IMS Connector for Java
- WebSphere Development
- EAB Commands and Navigators
- Create an EAB Command Using VisualAge for Java
- Create a Servlet from an EAB Command Using WebSphere Studio
- Helpful References

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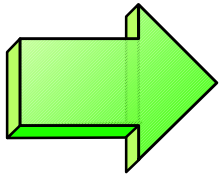
Terminology

Things are changing...

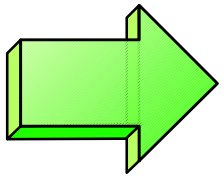
IMS TOC Connector for Java



IMS Connector for Java *VAJEE3.5*

Feature

IMS TCP/IP OTMA Connection



Product

IMS Connect 1.1

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Terminology *(continued)*

- Servlet
  - Java program that resides and runs on the server side of a Java Web server
  - Receives input from and returns output to a Web browser
- Java Web server (a.k.a application server)
  - A servlet engine that runs in a Web (HTTP) server
  - Provides an execution environment for the servlet
  - IBM's WebSphere Application Server plugs into major Web (HTTP) servers, turning them into Java Web servers

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Terminology *(continued)*

- Web application
  - Made up of a group of application components that can be accessed from the Web
  - Consists of:
    - Java servlets that contain the application logic
    - An HTML page which serves as the initial input page used to start the application
    - One or more JSPs (Java Server Pages) for obtaining input data & displaying output data
  - Executes in JVM on application server
  - "Grownup" Java applet

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Terminology *(continued)*

- Java bean
  - Reusable program part that adheres to a well-defined, easy-to-use interface
  - Can be elements of a program seen at run time, such as push buttons or entry boxes, or elements of a program that are not seen at run time, such as communication protocol beans
- VisualAge for Java
  - Visual integrated development environment that supports the complete cycle of Java program development

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Terminology *(continued)*

- Enterprise Access Builder
  - VisualAge for Java's Enterprise Access Builder consists of frameworks and tools that allow you to create Java applications that access existing host applications and data.

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IMS Connector For Java

- One of the IBM e-business Connectors included in VisualAge for Java Enterprise Edition
- Allows Java applications and servlets to submit IMS transactions via IMS Connect
- Implements the Common Connector Framework architecture
- Consists of Java bean components and class libraries
- Runtime platforms:
  - OS/390, Windows, AIX, Solaris

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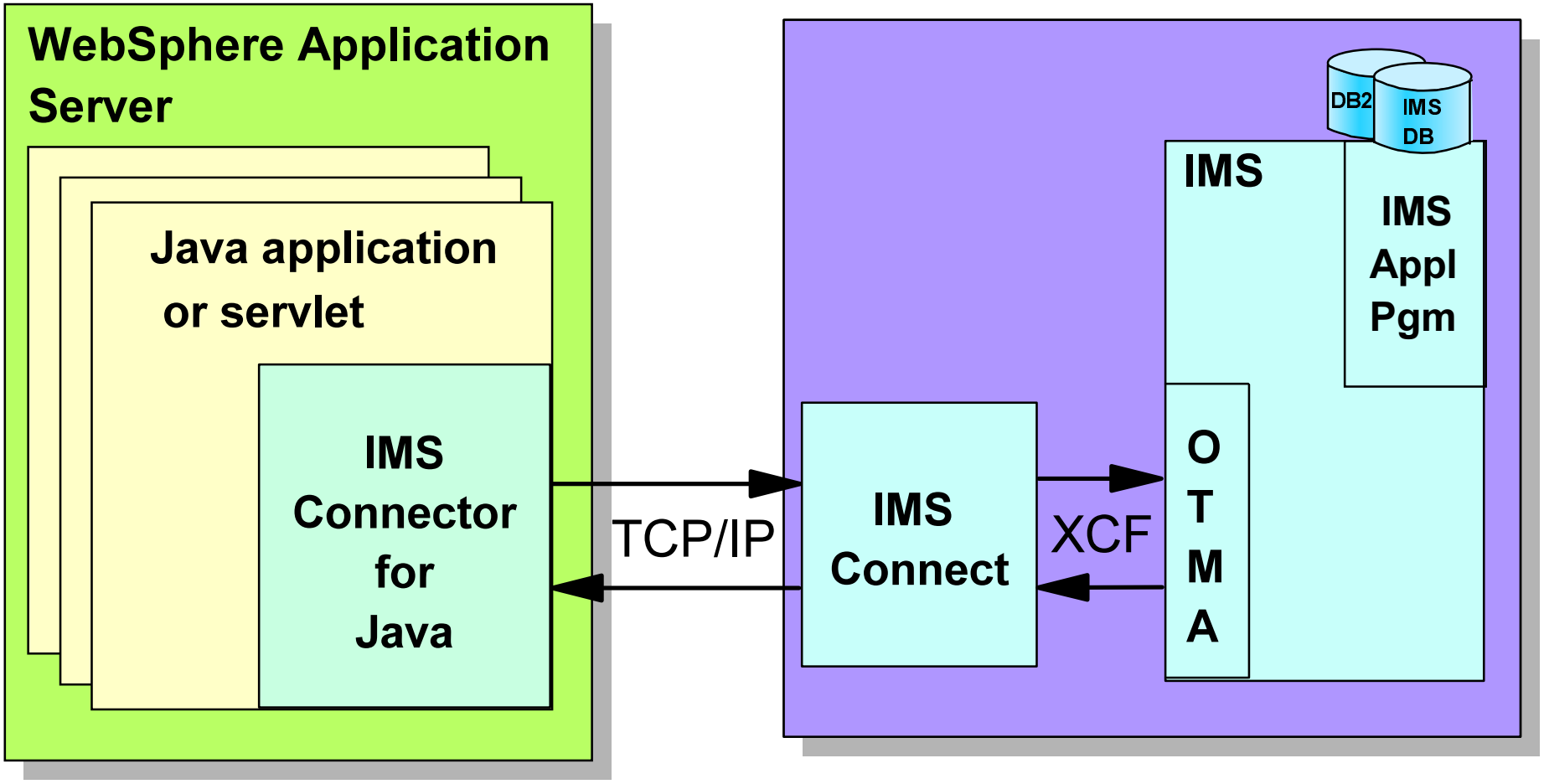
IMS Connector for Java



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Transaction Types

- Nonconversational
  - One in - one out
  - Run the transaction by executing a **single** EAB command
- Conversational
  - Connected series of interactions with IMS application program
  - Each interaction consists of an IMS input message and an IMS output message
  - Intermediate data for interactions stored in SPA (Scratch Pad Area)
  - Only the first IMS input message contains the transaction code

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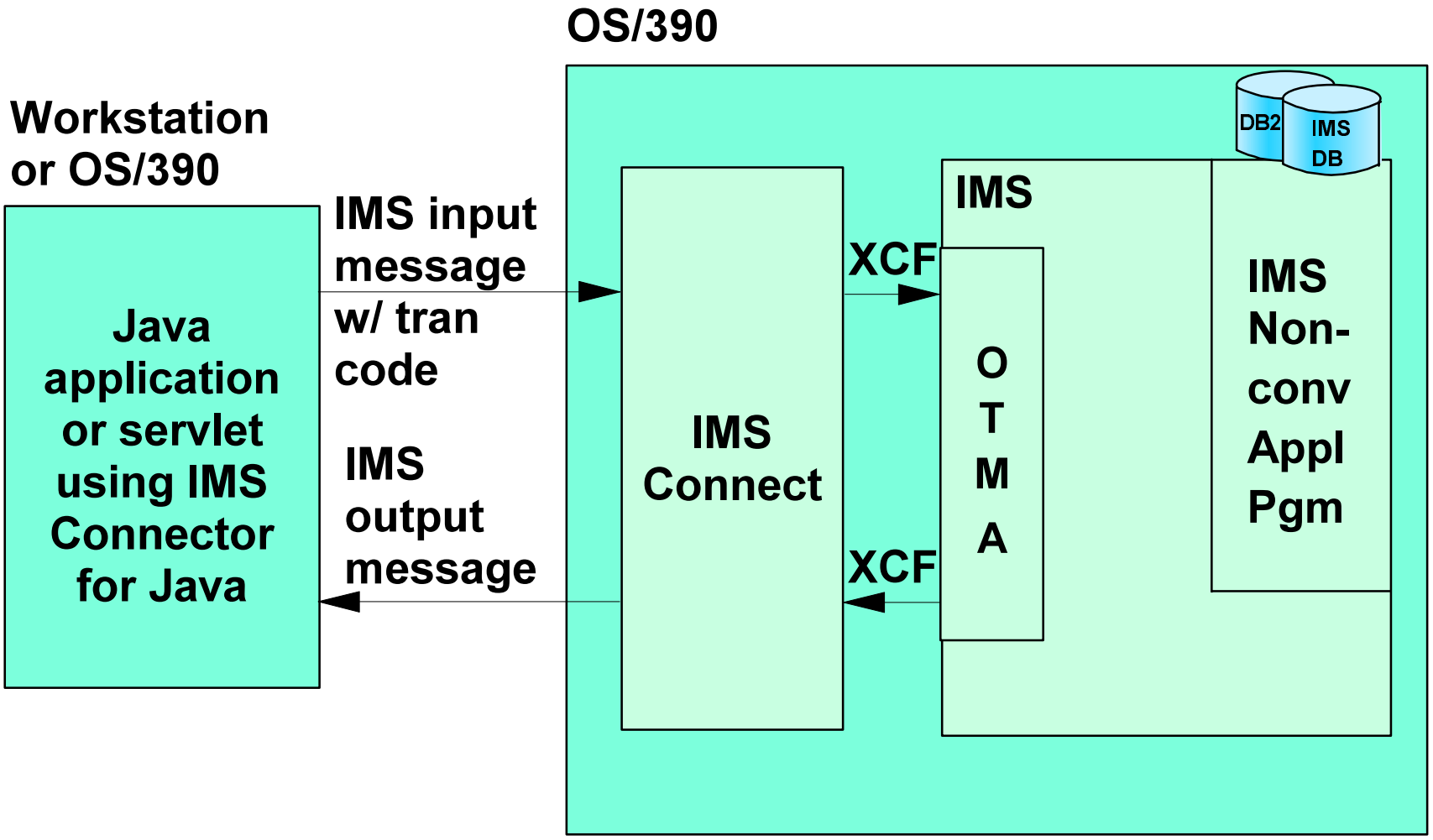
Nonconversational



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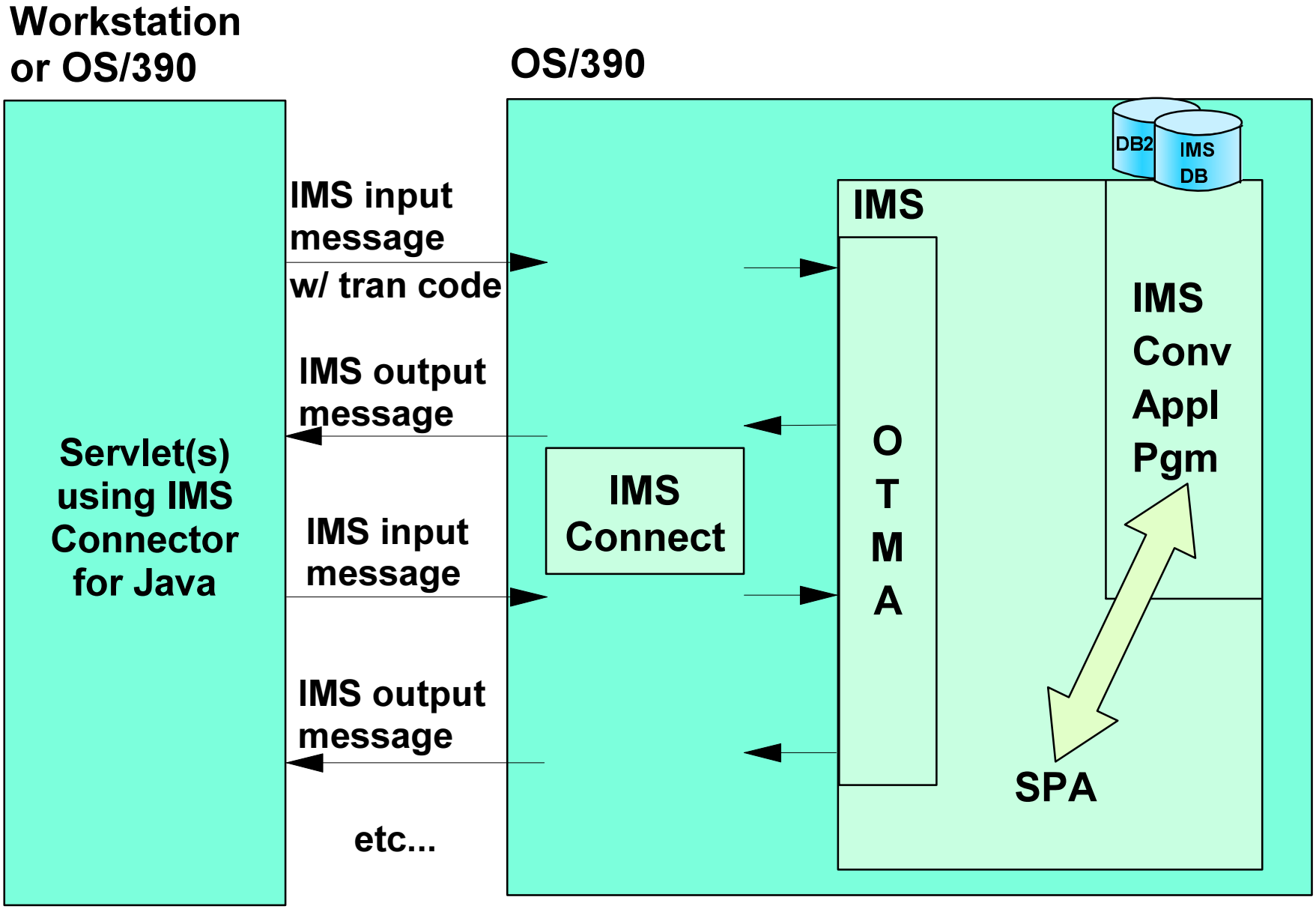
Conversational



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Common Connector Framework Architecture

- A common set of Java interfaces and class definitions that all CCF connectors implement
- Provides a consistent means of interacting with enterprise resources (e.g., IMS or CICS transactions) and services from any Java execution environment
- API's for all CCF connectors are similar. For example,
  - Use IMSConnectionSpec to connect to IMS
  - Use CICSConnectionSpec for connecting to CICS

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CCF Infrastructure Services

- Connection Management
  - ConnectionManager
    - supports connection pooling - reuse of existing connections
    - Must be single global instance
  - DefaultConnectionManager does not support connection pooling - used if a connection manager is not specified
- Coordination
  - JavaCoordinator
    - Single phase commit protocol
    - Use commit(), rollback()

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CCF Infrastructure Services (continued)

- Coordination (cont.)
  - NullCoordinator
    - User creates logic to coordinate commit/ rollback processing
- RAS
  - Error logging and tracing services
  - User sets trace level in Java app/servlet
- Security
  - Passes userid, password, and group
  - IMS Connect authenticates users
  - IMS checks authorization of users

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CCF Infrastructure Services (continued)

- SessionID
  - Enables you to group the interactions between a browser and a servlet in order to save context information between interactions
  - ConvContext which is a key component of conversational support in IMS Connector for Java 3.5, extends SessionID

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Runtime Context

- Runtime Context
  - Mechanism for delivery of CCF Infrastructure Services to the Java servlet or application
  - RuntimeContext
    - Currently implemented by WebSphere on OS/390
    - Provides a global ConnectionManager which supports connection pooling
    - Other services are default
  - JavaRuntimeContext
    - Extends RuntimeContext to provide a set of services with greater function

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EAB Commands and Navigators

- An EAB command represents an interaction with a back-end system such as IMS
  - A typical interaction would be to send transaction input data to an IMS application program and receive the transaction output data back from IMS
- An EAB command is a composite Java bean made up of other Java beans
- An EAB navigator is made up of multiple EAB commands and/or navigators

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An EAB Command Contains:

- Java beans provided by IMS Connector for Java:
  - IMSConnectionSpec
  - IMSInteractionSpec
  - DFSMsg
- Java beans created by VisualAge for Java's Enterprise Access Builder:
  - A record bean representing the IMS transaction input message
  - Record beans representing the IMS transaction output messages

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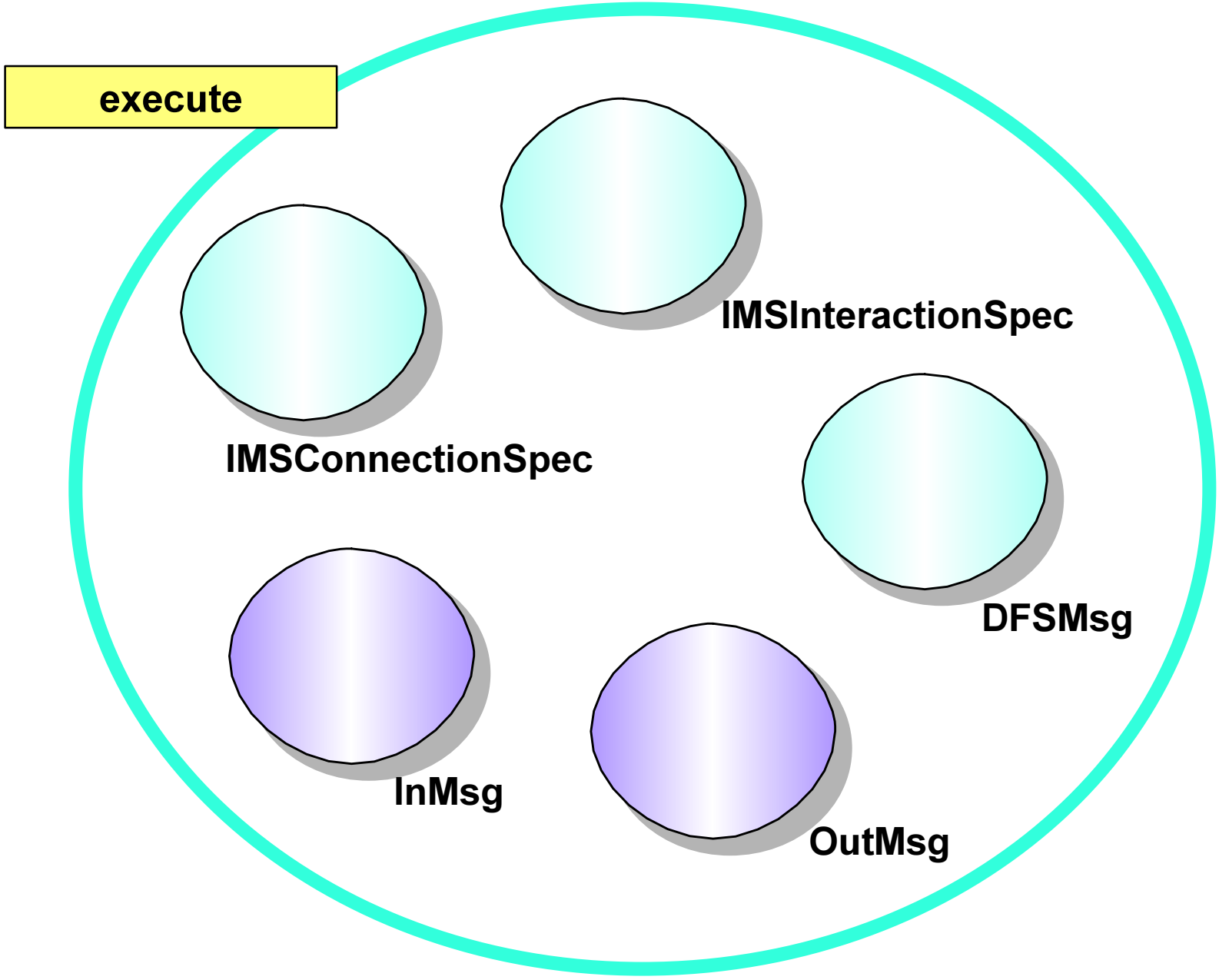
EAB Command



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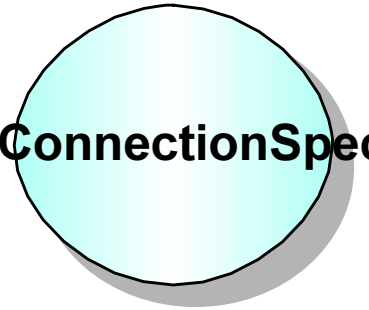
IMSConnectionSpec



- Defines properties of the connection between the Java application or servlet and IMS Connect
- IMS Connector specific properties are:
  - TCP/IP host name of machine running IMS Connect
  - TCP/IP port number of IMS Connect
- Additional IMSConnectionSpec properties are defined by the Common Connector Framework
  - Connection management properties

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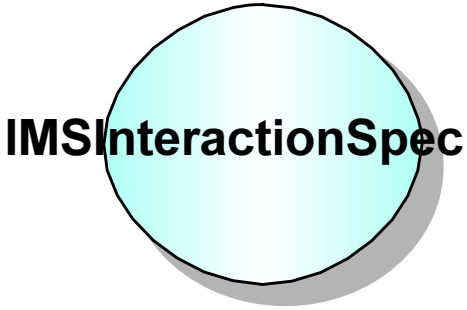
IMSInteractionSpec



- Defines interaction between Java application or servlet and IMS accessed via IMS Connect and OTMA
- IMS Connector for Java specific properties are:
  - Type of interaction
    - MODE_SEND_RECEIVE
    - SYNC_LEVEL_CONFIRM
  - Name of IMS datastore

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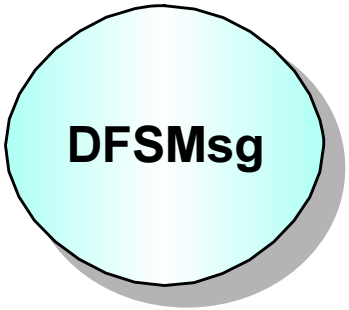
DFSMsg



- Represents IMS "DFS" messages
- "DFS" messages are always a possibility instead of transaction output
- At runtime, the Enterprise Access Builder populates either the EAB command's DFSMsg bean or (one of) the transaction output bean(s)

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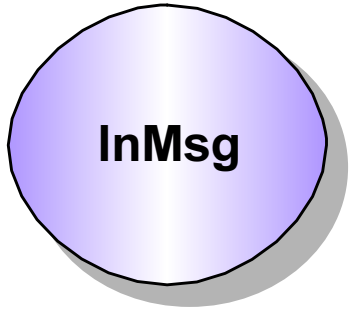
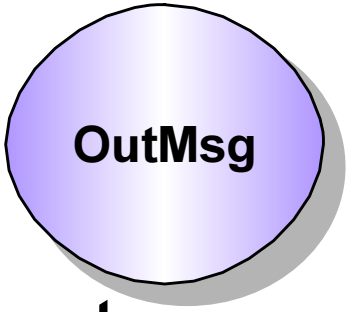
Input/Output Record Beans





- Represent IMS transaction input/output messges
- Created using VisualAge for Java's Enterprise Access Builder tool
- Create beans from COBOL data structures
  - Use the data structures (01 commareas) for the I/O PCB input/output area descriptors
- EAB tool uses a two-step process to create beans:
  - Import COBOL source to generate record type
  - Create record bean from record type

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Developing with IMS Connector

1. Create record beans representing the IMS transaction's input message and its output message(s)
2. Create an EAB command representing the IMS transaction
3. Use the EAB command to create a:
   a. Java application
   b. Servlet using WebSphere Studio
4. Deploy the Java application or publish the servlet to your WebSphere Application Server environment

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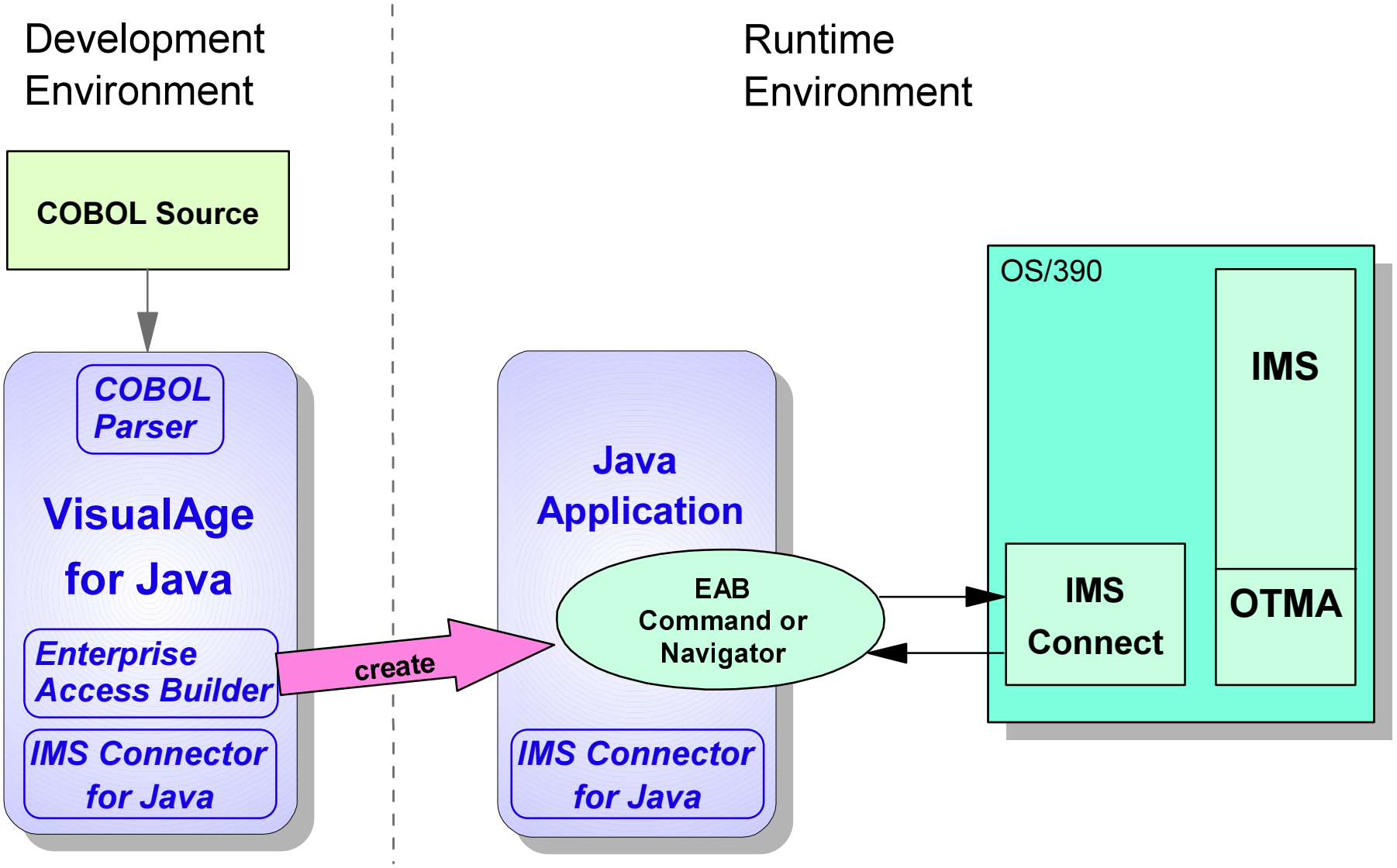
Developing a Java Application



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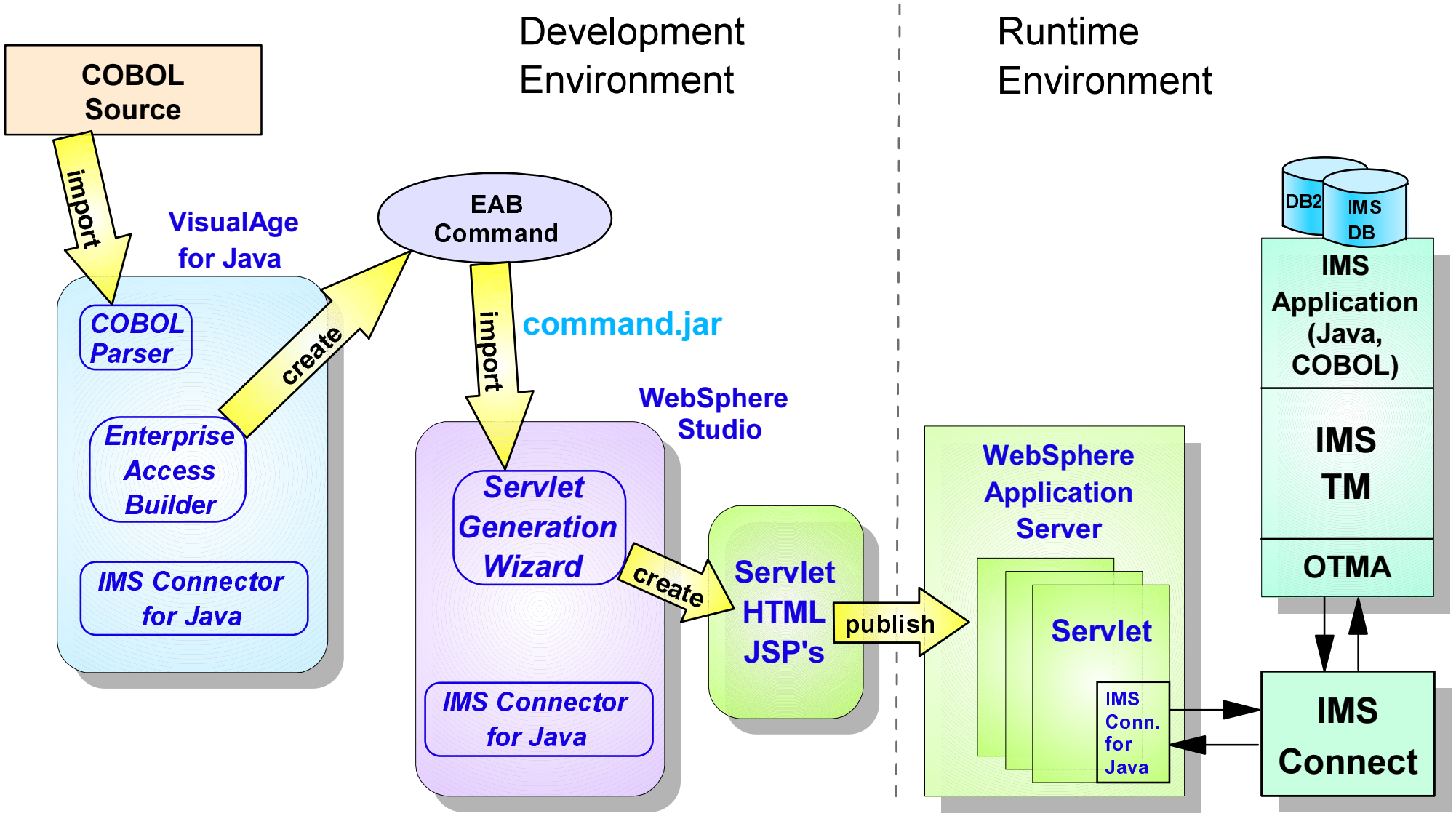
Developing a Servlet



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WebSphere Development

- Develop Enterprise Access Builder (EAB) commands and navigators using VAJava
  - EAB commands and navigators can be used to build Java applications
  - Run in VAJava (test mode) or outside VAJava
- Develop servlets from EAB commands using WebSphere Studio
  - A WebSphere Studio wizard generates code for servlet and HTML pages and JSP's
- Use WebSphere Studio's PUBLISH facility to copy servlet files to WebSphere Application Server

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Servlet files generated by WebSphere Studio

- Input HTML page (.html) for input of IMS transaction data
- Output JavaServer page (.jsp) for dynamic output of IMS transaction data
- Output JavaServer page (.jsp) for dynamic output of error data
- Java source (.java) for the servlet
- Servlet configuration file (.servlet)
- Style sheet (Master.css)

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Running the Servlet

- Invoke input HTML page from Web browser to run IMS transaction, for example:
  - For WebSphere Application Server 3.0/3.5:
    - http://<servername>/yourServletInput.html

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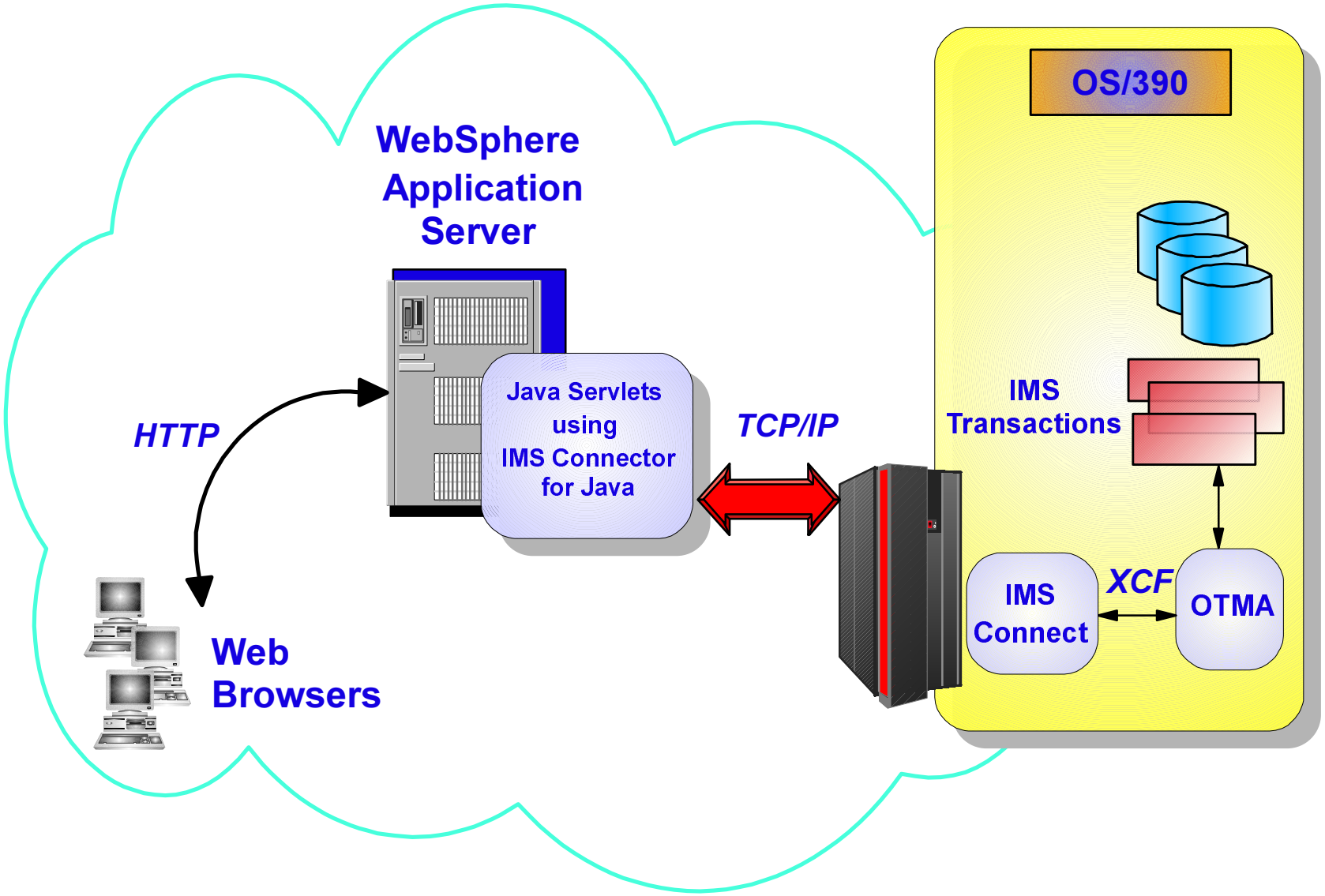
Running the Servlet



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Related Web Sites

- IMS Connector for Java and IMS Connect:
  - follow links from http://www.software.ibm.com/data/ims
- VisualAge for Java:
  - http://www.software.ibm.com/ad/vajava/
- WebSphere Studio:
  - http://www.software.ibm.com/webservers/studio/index.html
- WebSphere Application Server:
  - http://www.software.ibm.com/webservers/appserv/

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IMS Connector for Java Documentation

- Online Help
  - Under Help->Tasks->Accessing the Enterprise
    - User's Guide
      - ->Accessing transactions with the IMS TOC Connector
    - Diagnosis Guide
      - ->Building IMS Applications
- Softcopy books
  - User's Guide and Reference PDF is accessible in VisualAge for Java Help:
    - Help->PDF Index->PDF Documents->IMS Connector for Java

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IMS Connector for Java Documentation (continued)

- Javadoc for IMS Connector for Java classes
  - Help->Reference->IBM APIs->Connectors-> IMS Connector->Package com.ibm.connector.imstoc

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IMS Connector for Java 1.2 Documentation

- Online Help
  - Under Help->Tasks->Accessing the Enterprise
    - User's Guide
      - ->Accessing transactions with the IMS TOC Connector
    - Diagnosis Guide and Reference
      - ->Building IMS Applications
- Softcopy books
  - Available in a PDF directory on a VisualAge for Java installation CD
  - Index can be found in VisualAge for Java Help:
    - Help->PDF Index

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IMS Connector for Java 1.2 Documentation (continued)

- Javadoc for IMS Connector for Java classes
  - Help->Reference->IBM APIs->Connectors->IMS TOC->Package com.ibm.connector.imstoc

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