

E05

Introduction to IMS e-business Enabling Tools

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Anaheim, California

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Topics

- Why IMS e-business?
- Open Transaction Manager Access (OTMA)
- MQ
- IMS Connect
- IMS Connector for Java
- Open Database Access (ODBA)
- IMS Java
- XML
- Futures



The Path to e-business: Two Cultures

Web - from publishing to collaboration to commerce

- Universal access
- Standards

Transforming Relationships:

Customers from *a transaction to lifetime loyalty*
Employees from *competent to responsive*
Suppliers from *independence to interdependence*

e-business

Using Internet technologies to transform key business processes & relationships. Converging at the need to connect to enterprise data and transactions.

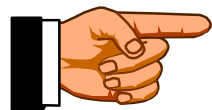
IT - from the existing infrastructure

- Data/applications
- Core business processes
- Reliability, security and availability

IMS Is Ideal For e-business

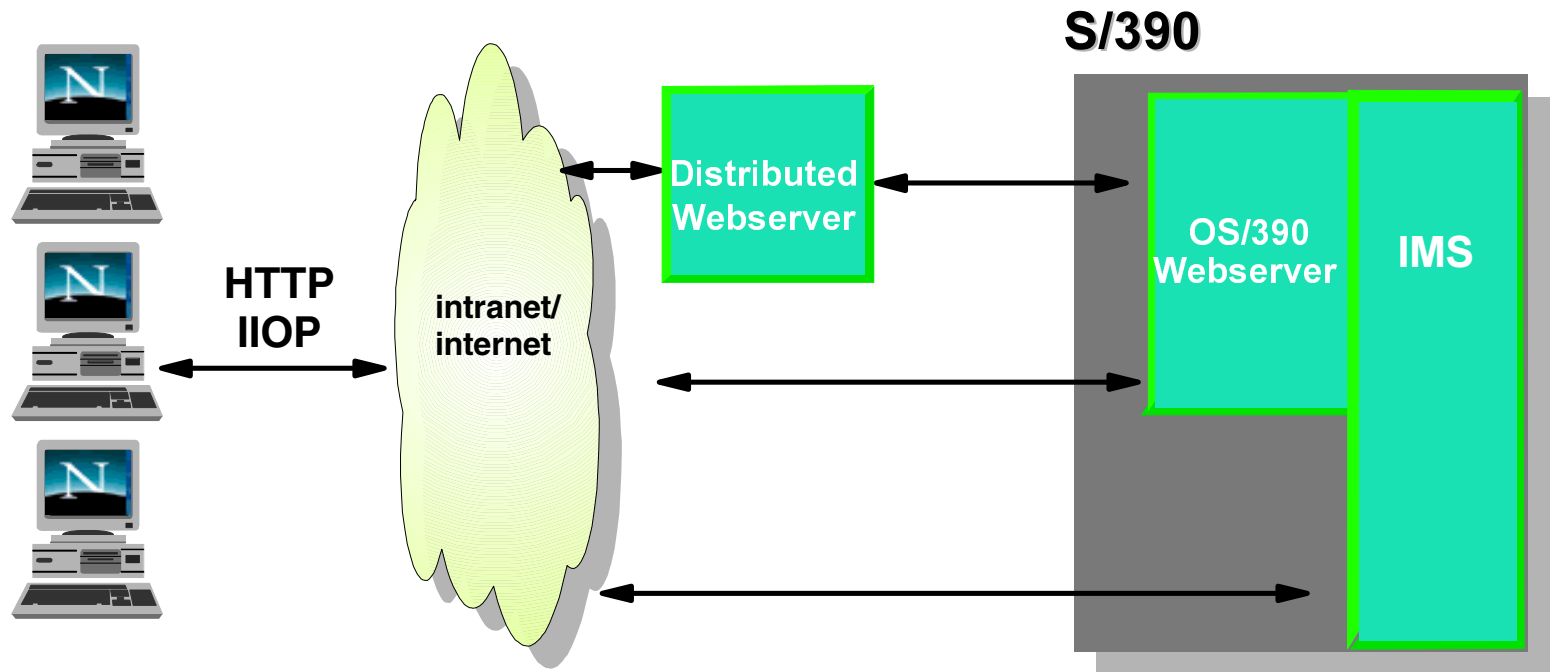
- For many enterprises, e-business solutions are all about accessing host transactions and data

- IMS is ideally suited to this role:
 - **IMS is scalable with high performance**
 - the Internet can introduce unpredictable volumes
 - IMS already drives the worlds largest workloads
 - **IMS is highly available**
 - the Internet requires 24 x 7 x 365
 - **IMS is secure**
 - OS/390 and IMS offer significant security options
 - **e-business with IMS offers investment protection**



e-business enablement is the number one applications issue today for many IMS users

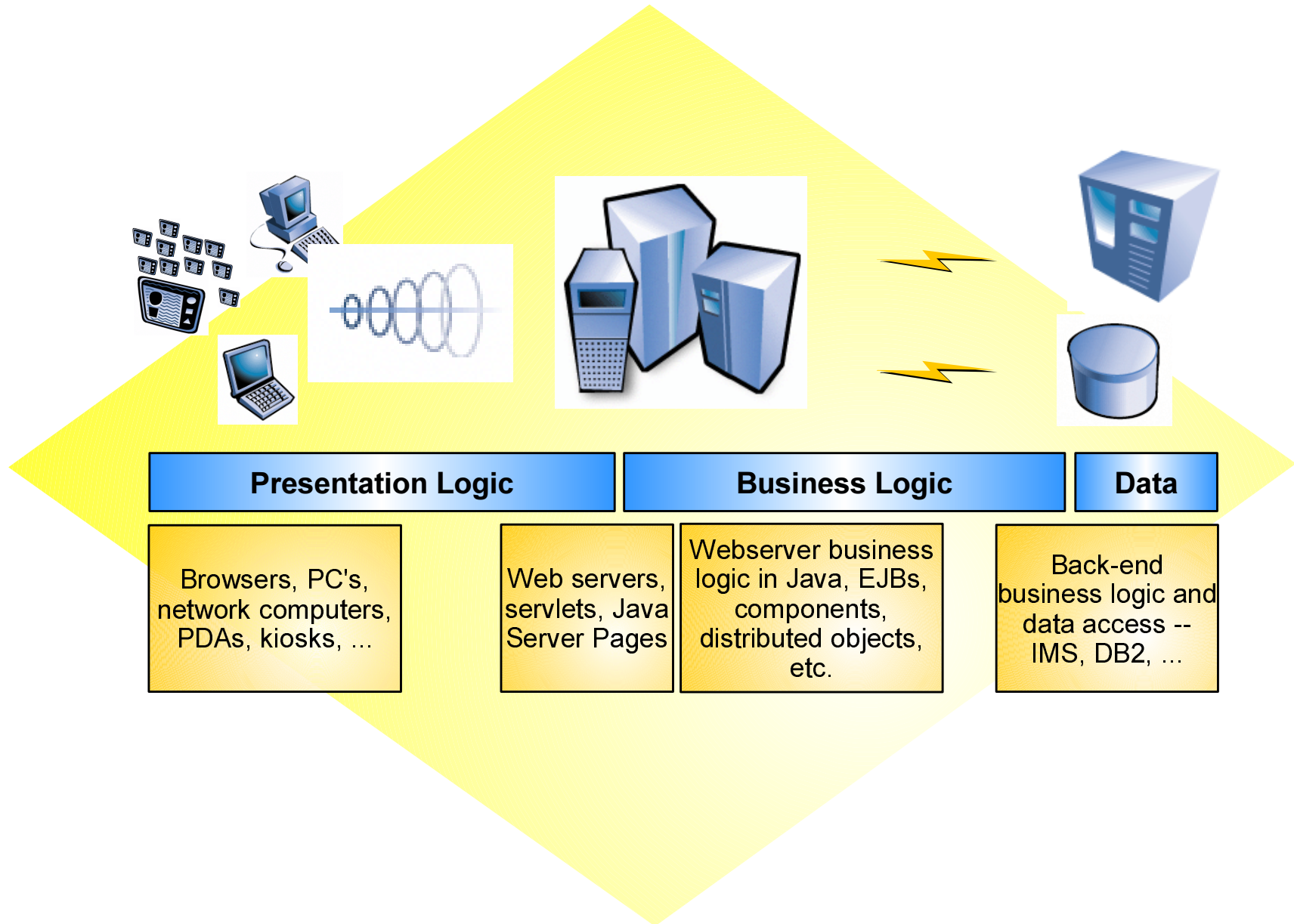
IMS e-business Strategy



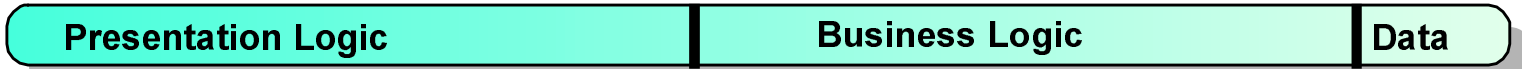
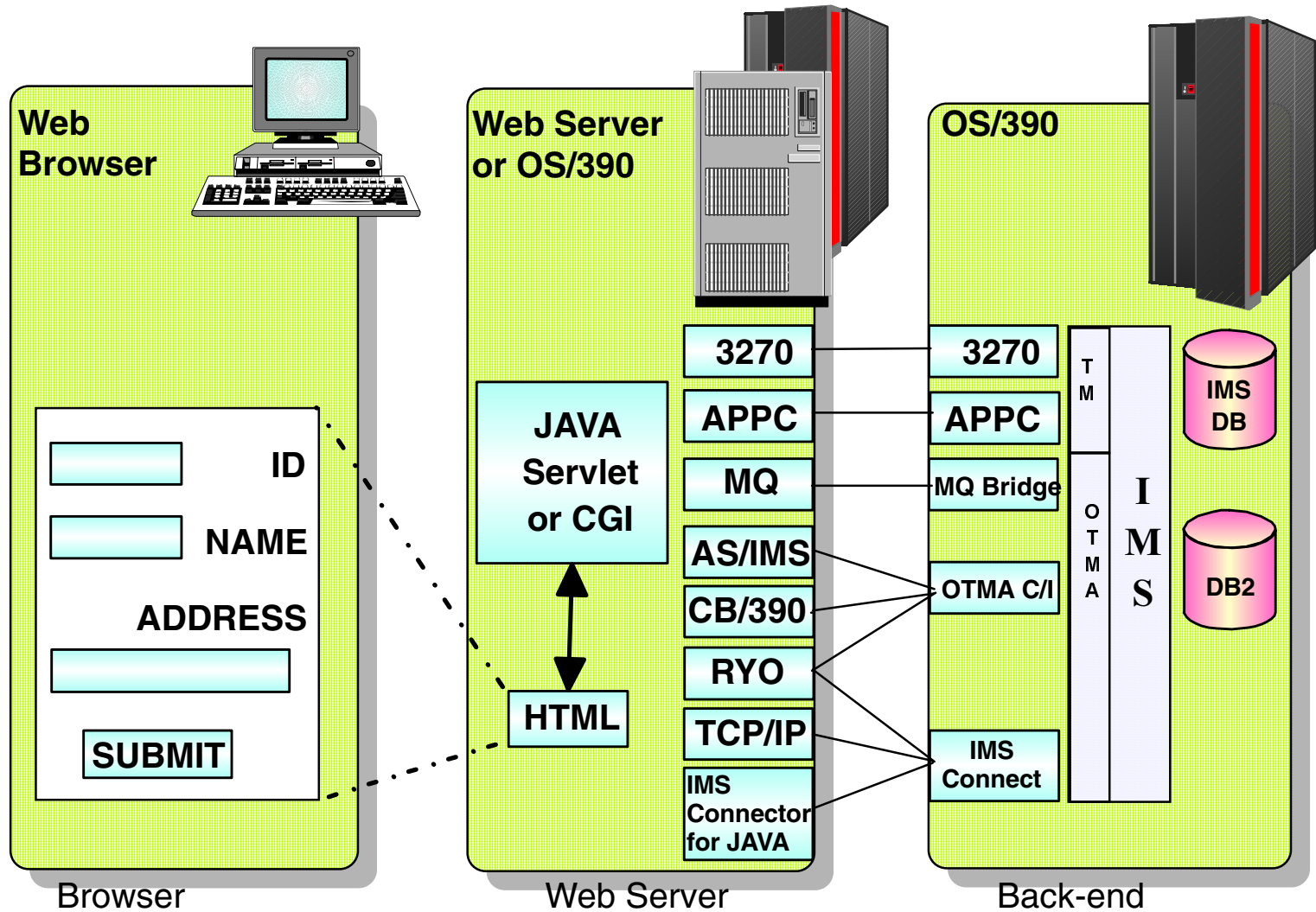
- Enable Web Browsers to invoke IMS applications
- Full access to IMS transactions and data
- Leverage existing transactions
- Encourage new applications (Java)
- Support industry standards for tooling (Java, XML, CAM)



The Three Tier Solution



Web Access and IMS Today



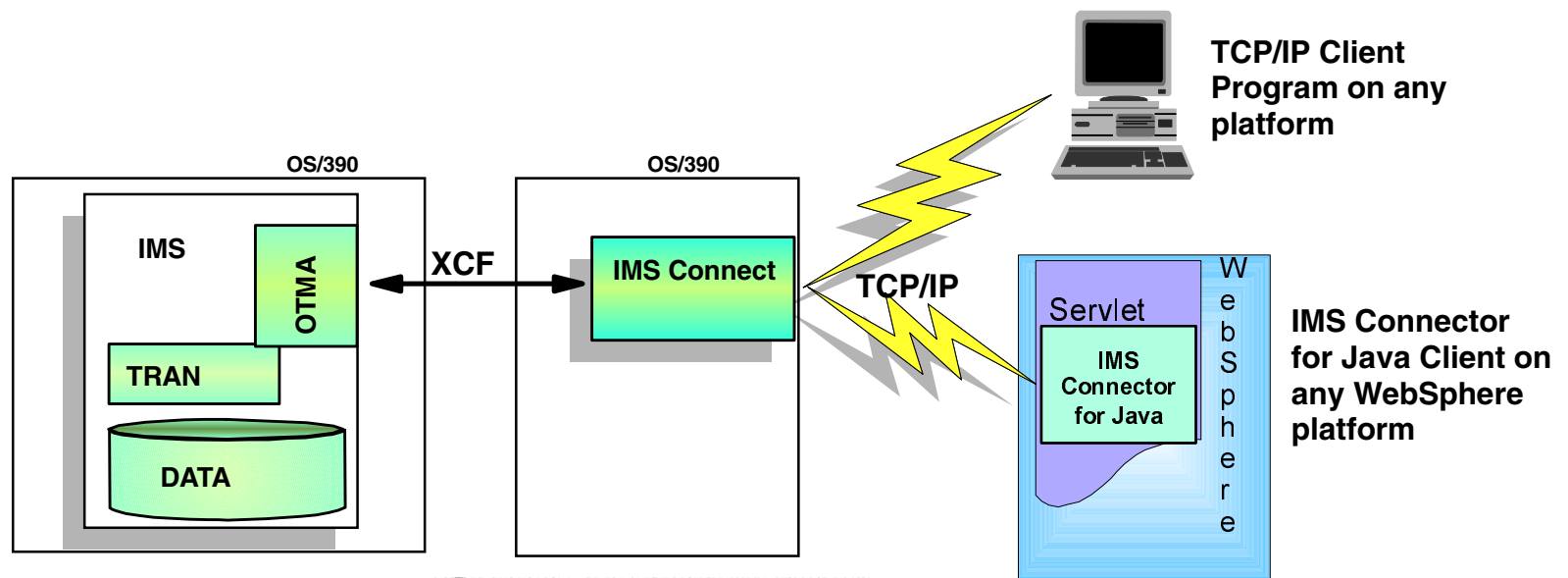
Connection Components

- **IMS Connectors**
 - **eNetwork Host On-Demand**
 - **CICS Internet Gateway**
 - **CICS Gateway for Java**
 - **DCE Encina Lightweight Client**
 - **MQSeries Internet Gateway**
 - **MQSeries Client for Java**
 - **Net.Data**
 - **NotesPump**
 - **JDBC**
- **Universal Web access to all IT assets**
- **Increased productivity of application developers**

IMS Connect

High Performance TCP/IP access to IMS

- Provides e-business access to IMS Applications
 - Can be used with a TCP/IP client on any platform
 - Applications can be developed without heavy workstation development effort when used with the IMS Connector for Java
- Provides flexible communications and workload balancing between TCP/IP clients and one or more IMS systems (through OTMA)
 - Separately managed address space with command interface
 - User & init exits offer a great degree of message flexibility



IMS Connect V1



- Separately orderable, priced product that works with IMS V5, V6, and V7
 - Improved performance with persistent sockets
 - Enhanced usability with asynchronous output support (V7 only)
 - Enhanced usability with user exit improvements
 - Increased serviceability with Dump formatting enhancements
 - Maintained like IMS (SMP/E enhanced manageability)

AGF-SI Group



First in EMEA in production!



Challenge:

Provide the quickest access to IMS transactions possible from a thin client (less middleware)



Solution:

TCP/IP client access and Intranet access to existing IMS transactions (2-tier implementation)



Benefits:

Maximized value of existing OS/390 investment in IMS/DB2 applications and data

Recent IMS Connect Throughput Enhancements

■ Measurement Goals

- Test the highest throughput that IMS Connect can handle
- Evaluate key performance enhancements added to IMS Connect V1
 - Persistent Sockets
 - Unix System Services latch elimination
 - OTMA latch contention reduction

■ Measurement Environment

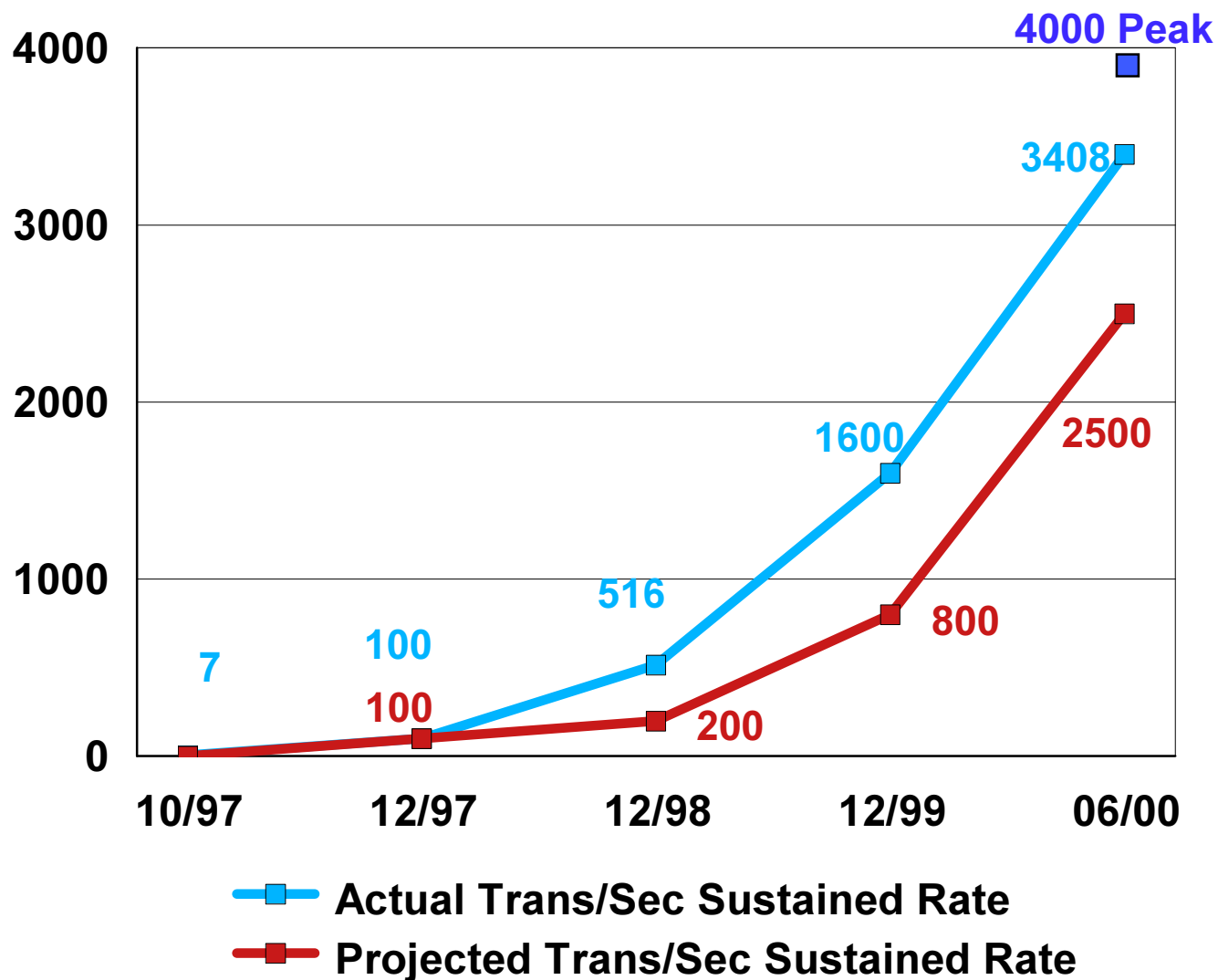
- IMS Fast Path workload (TPC-C like) with TPNS as a transaction driver
- OS/390 2.7; TCP/IP 3.7; IMS Connect V1
- Ran on 9672-ZZ7 CMOS 12-way

■ Results

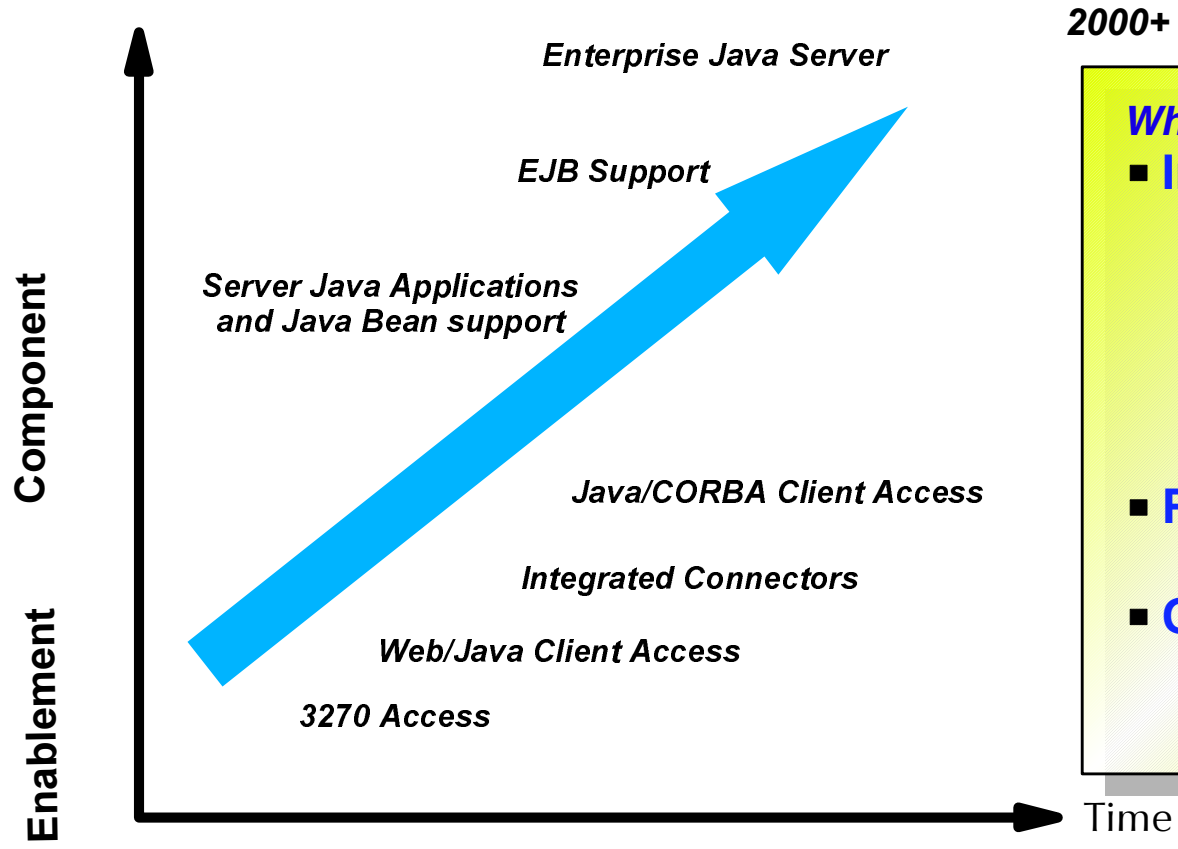
- 3408 transactions/second steady throughput with one IMS and one IMS Connect
 - CPU 39.2% busy
- Reached a peak of over 4000 trans/sec !

IMS Connect Performance History

TPNS DRIVING IMS CONNECT THROUGH TCP/IP



IMS Java Roadmap



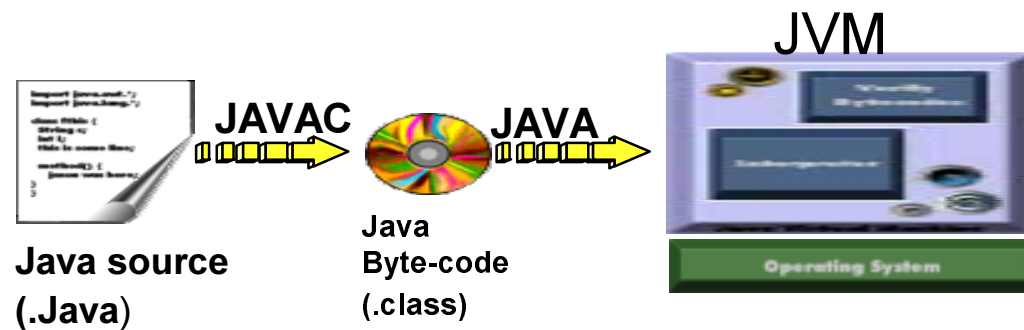
Why Java?

- **Improves AD Productivity**
 - Simpler and faster to program
 - Visual AD tools
 - Strong component model (OO)
 - Easier application deployment and manageability
- **Robust, Portable, Ubiquitous**
- **Quickly becoming the preferred language**

Java Technology

■ What is Java?

- Object Oriented Programming Language
- Write once, run anywhere
- Requires Java Virtual Machine (JVM)
 - the platform specific environment that enables Java to be Open
- Designed for Web processing
 - programs automatically understand about connecting to, sending and receiving data on the internet
- Programmers use Java Development Kit (JDK)
- To run, Java requires the Java Runtime Environment (JRE)



JAVA Technology...

■ What is a JAVA Bean?

- A Java Bean is a reusable software component, similar to a JAVA class, that can be manipulated visually in a builder tool

■ What is an Enterprise Application Builder (EAB) Command ?

- A composite Java bean made up of other Java beans
- An EAB command represents an interaction with a back-end system. For IMS, it sends transaction input data to an IMS application and it receives transaction output data from an IMS application
- An EAB command is created using VisualAge for Java

■ What is an Enterprise Java Bean (EJB)?

- An EJB is a non-visual component of a distributed, transaction-oriented, enterprise application
 - Exist on a server
 - Can be assembled into applications by Developers
 - Are deployed in EJB containers which provide a framework of common services
 - Run on a EJB server which provides services such as load balancing and connections to back-end servers

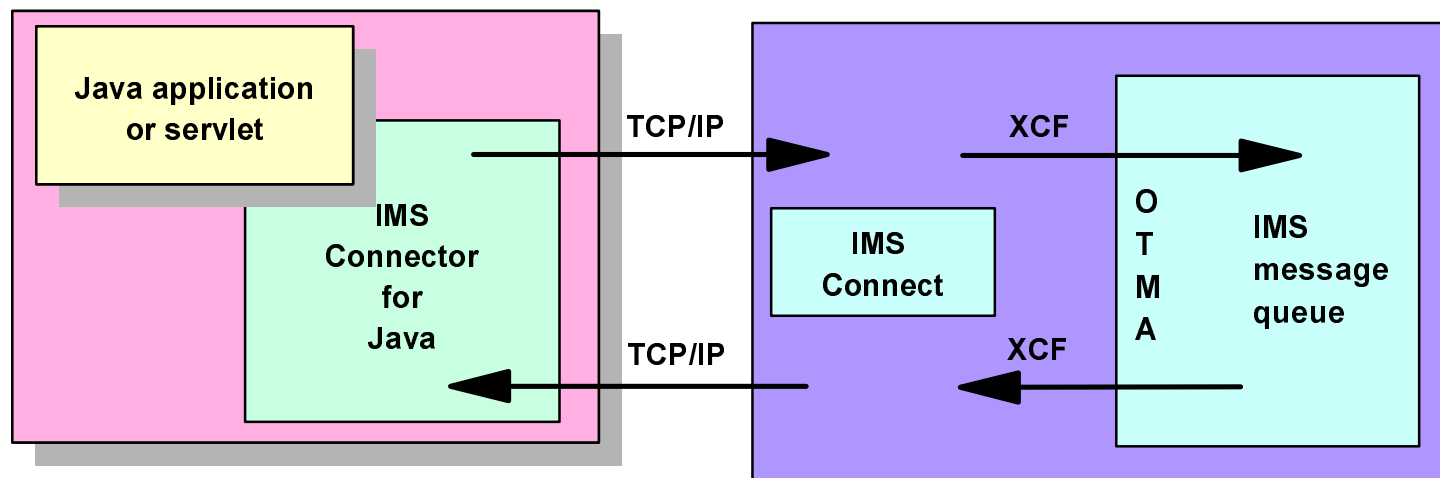
JAVA Runtime Environments

- **What is a JAVA Application?**
 - Runs in local JVM or Java compiler
 - General purpose processing
- **What is a JAVA Applet?**
 - Accessed via HTML
 - Uses a web browser based JVM
 - JAVA code downloaded from Web Server
- **What is a JAVA Servlet**
 - Special purpose code written in JAVA
 - Normally creates HTML output
 - Runs in a Web Server
 - Replacement for CGI-BIN

IMS Connector for Java

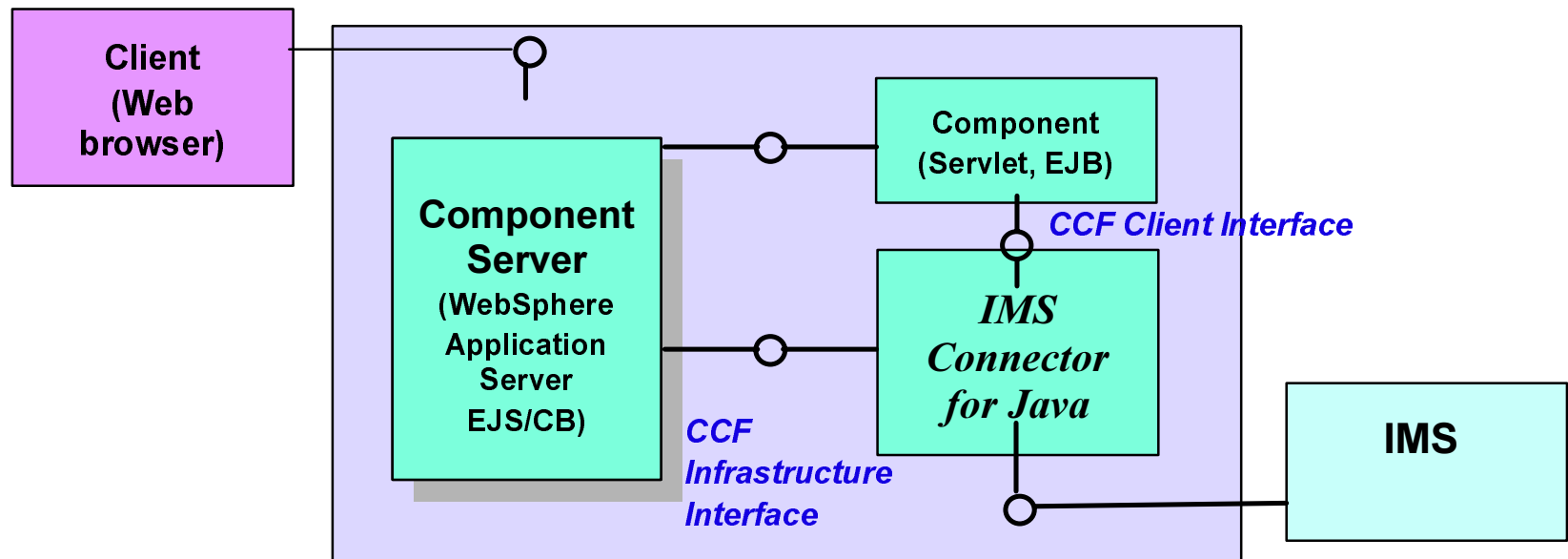
Helping IMS Users make the transition to e-business easier

- Create Java applications or servlets that can access IMS transactions
- Provides CCF-compliant Java Class libraries which interact with IMS via IMS Connect
- Provides Java bean classes to aid in composing applications using the VisualAge for Java Command Editor
- Ships with *Visual Age for Java Enterprise Edition* as one of the IBM e-business Connectors

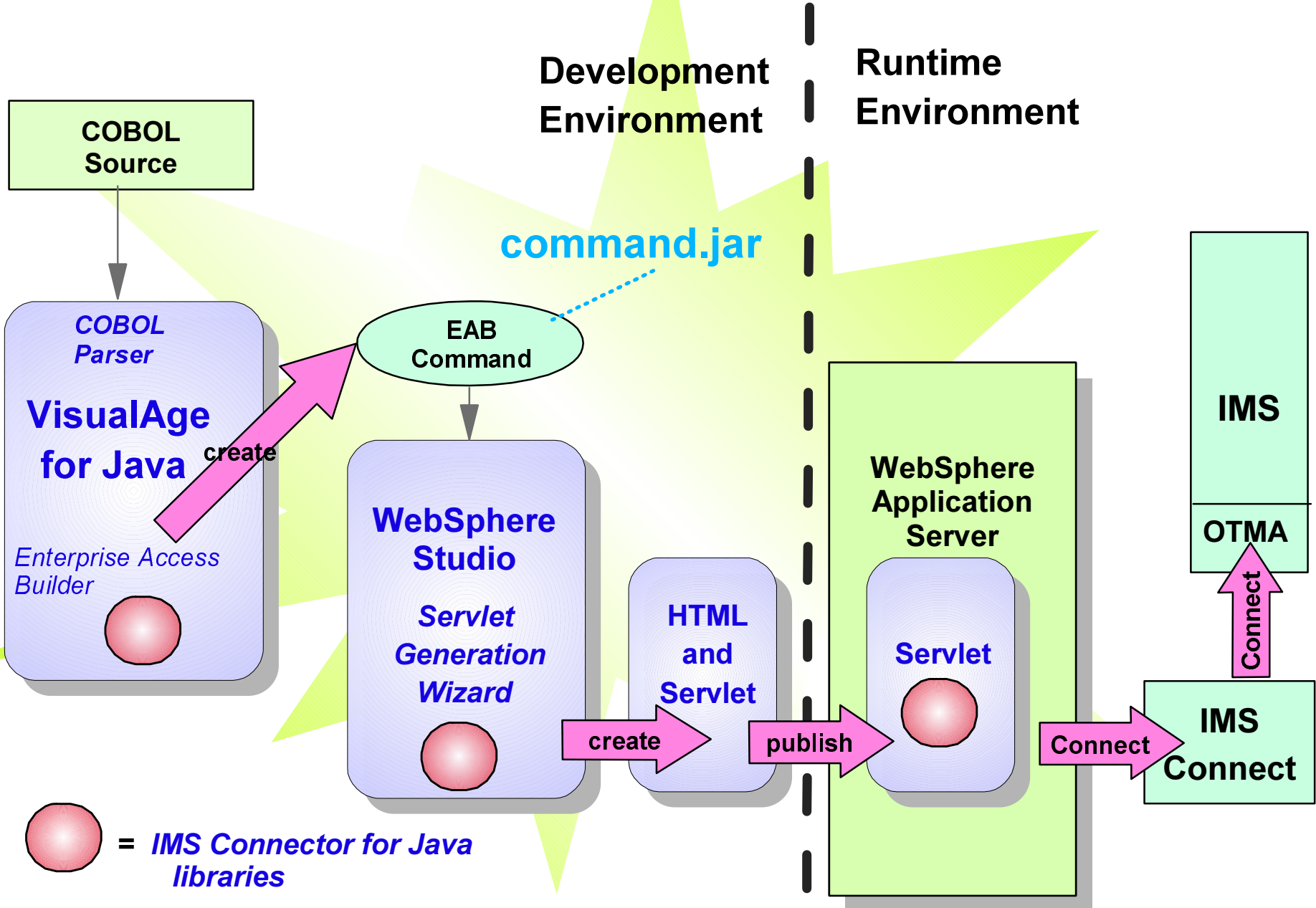


Common Connector Framework

- Defines a common and consistent set of Java interfaces that all connectors implement
- Implements common functions like connections and interactions with back-end resources
- Programmer does not have to deal with many differences among different connectors when building applications
- Other connectors include CICS, MQ, Encina, SAP, HOD, etc.



Developing A Java Servlet



United Parcel Service

Challenge

- Maintain leadership in the logistics industry
- Redirect shipment tracking requests from call center to 24x7, w-w online services

Solution

- Package tracking system

Value

- Real-time shipment tracking
- 700,000 tracking requests serviced - online, daily
- \$450K saved daily due to fewer calls
- Used by over 10,000 companies

www.ups.com



Products

- DB2 UDB for OS/390
- IMS TM & DB

Sanlam South Africa



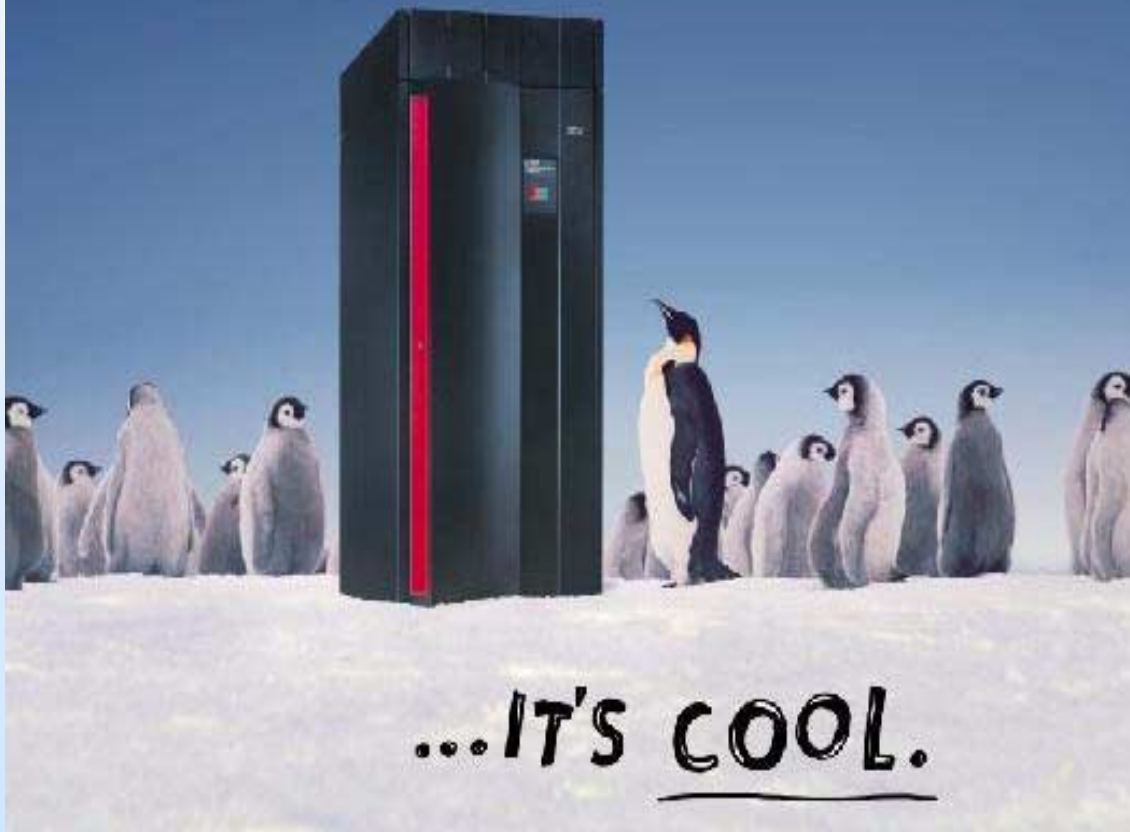
First in South African Insurance Industry to implement Java Servlets on OS/390

Challenge: Allow commercial banks to execute IMS transactions which administer the ceding of life insurance policies

Solution: Write Java servlets using IMS Connect, Websphere Application Server, RACF and OS/390 HTTP server

Benefits: Banks could now administer the ceding of policies via the Internet without having to incur network infrastructure costs.

LINUX FOR S/390...

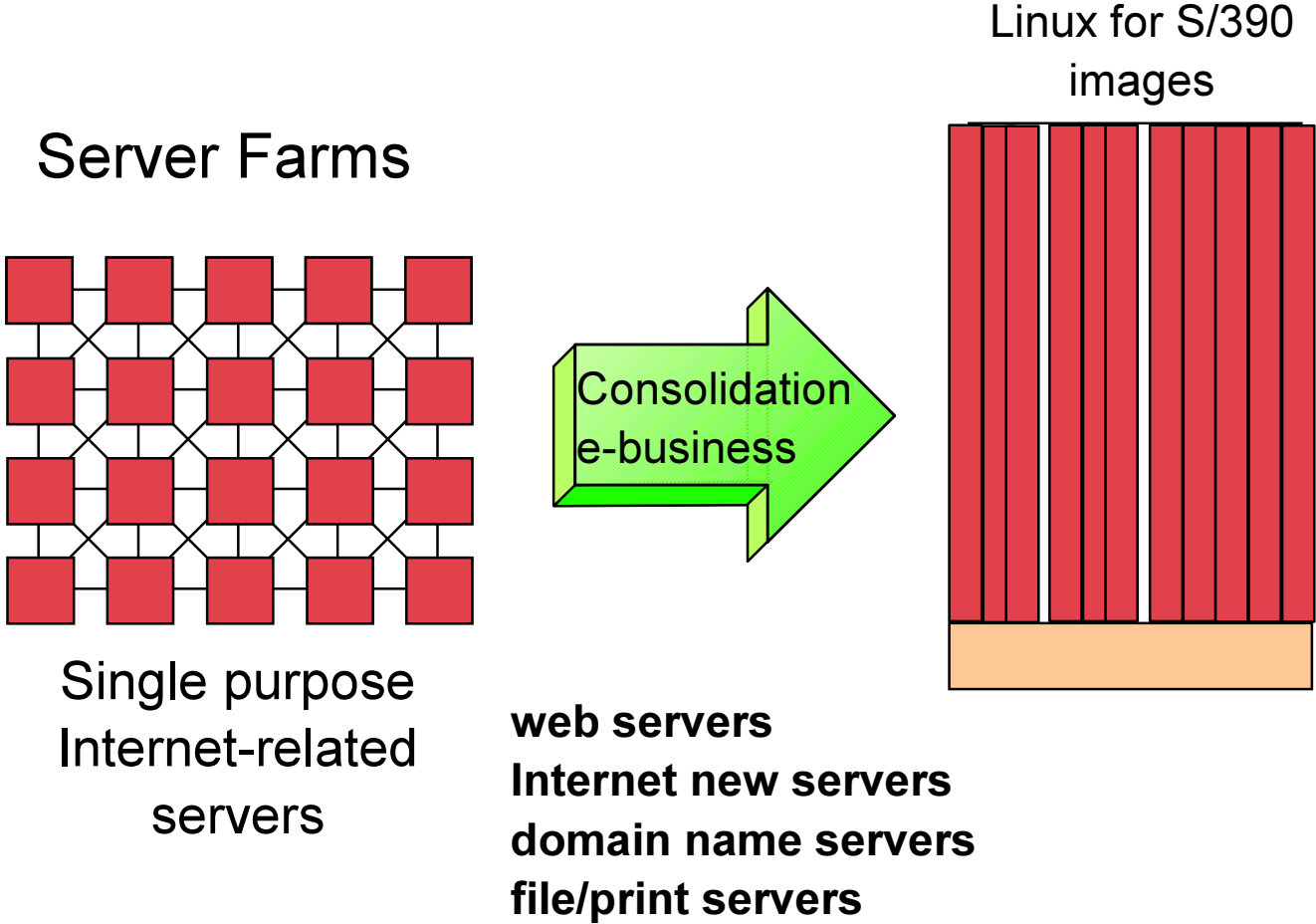


Visit our website at
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IBM

How Customers Are Using Linux/390

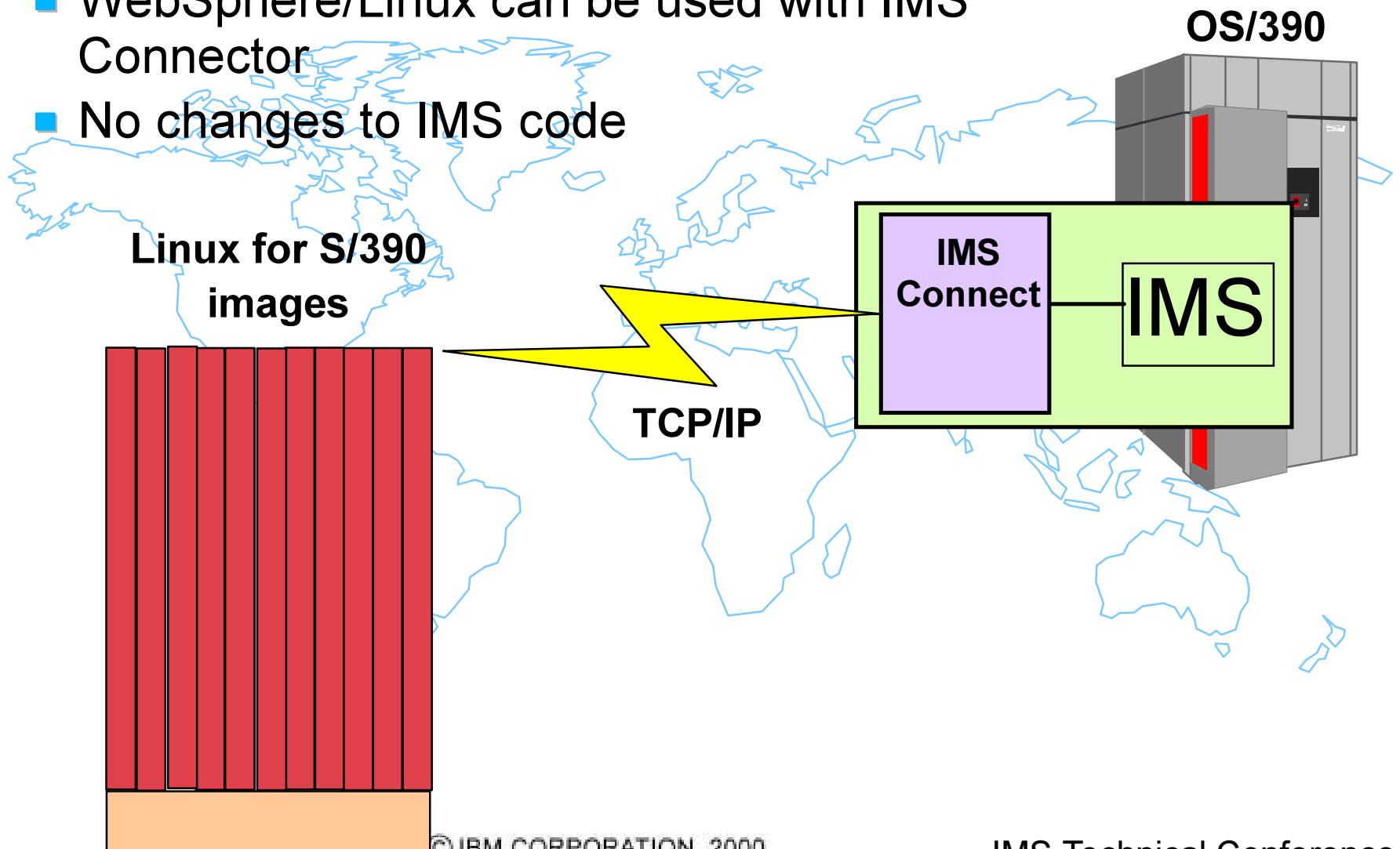
Consolidation of Servers



IMS Connect Support Linux for S/390

High Performance TCP/IP access to IMS

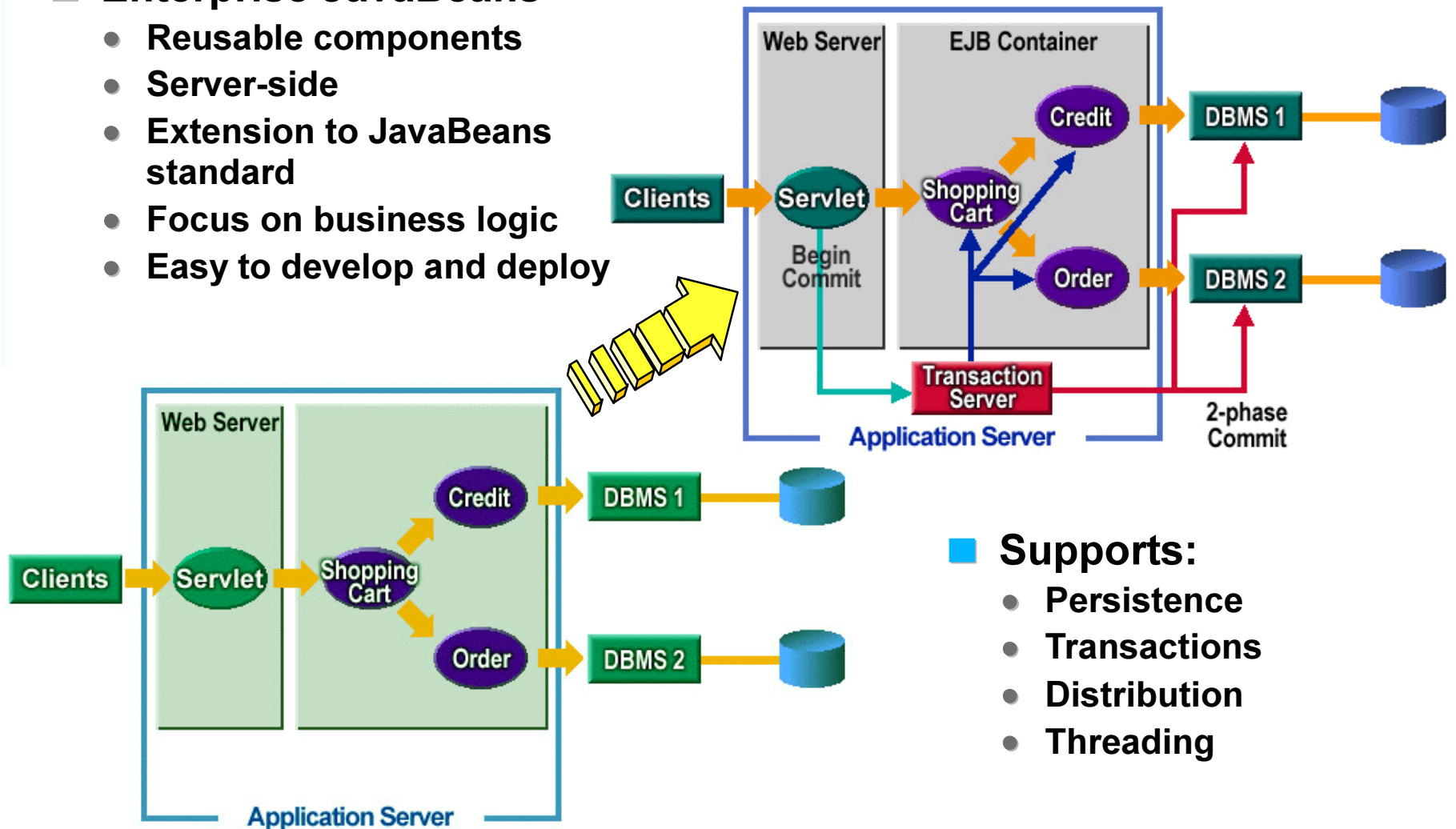
- Uses IMS Connect functions
- WebSphere/Linux can be used with IMS Connector
- No changes to IMS code



WebSphere Enterprise (formerly Component Broker)

Enterprise JavaBeans

- Reusable components
- Server-side
- Extension to JavaBeans standard
- Focus on business logic
- Easy to develop and deploy



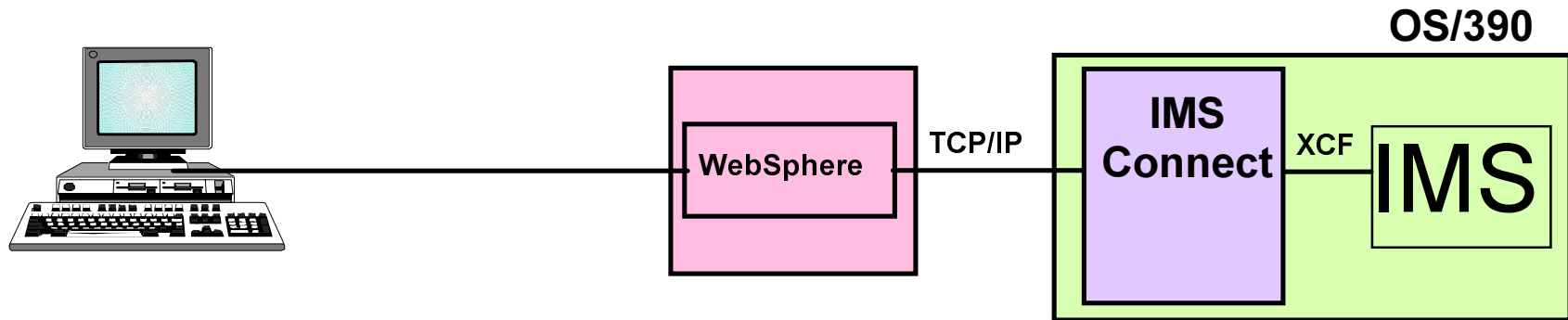
Supports:

- Persistence
- Transactions
- Distribution
- Threading

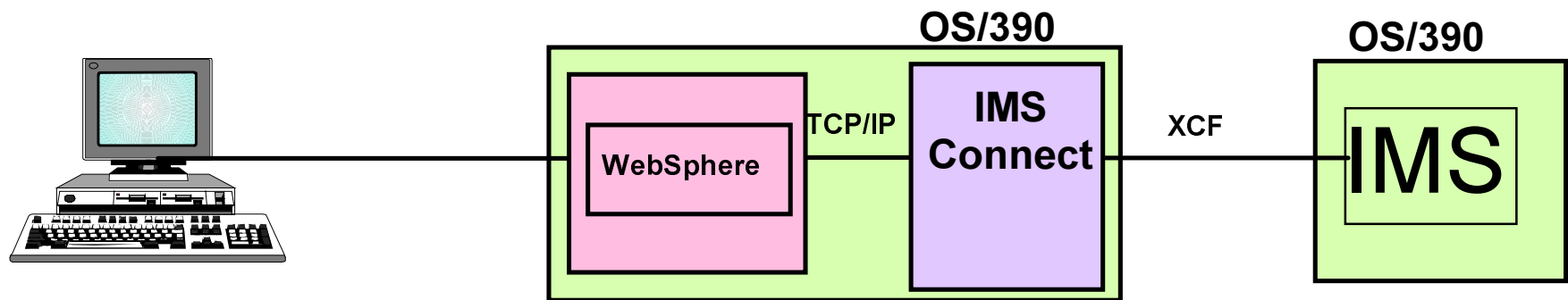
Enables new business processes from existing ones

IMS Connect/IMS Connector Scenarios

- Non-OS/390 WebSphere

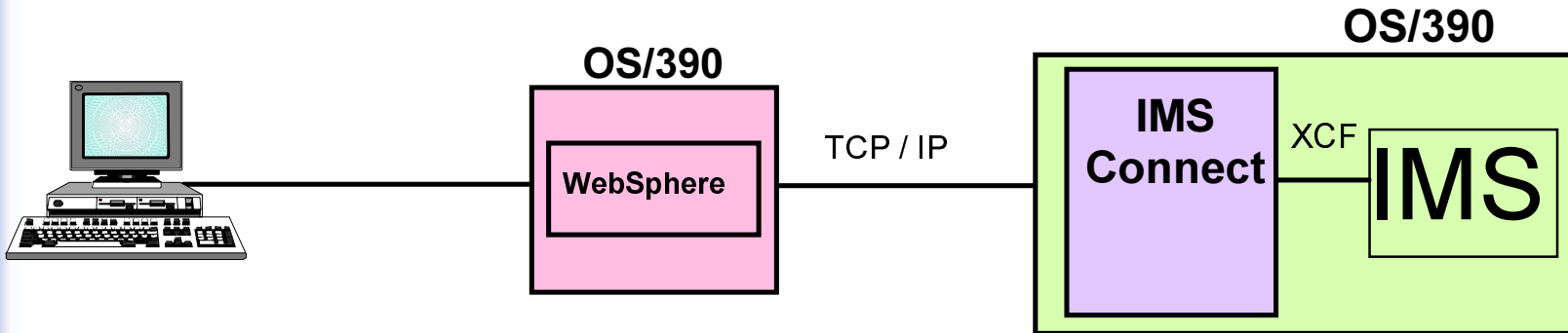


- OS/390 WebSphere in the same sysplex as IMS

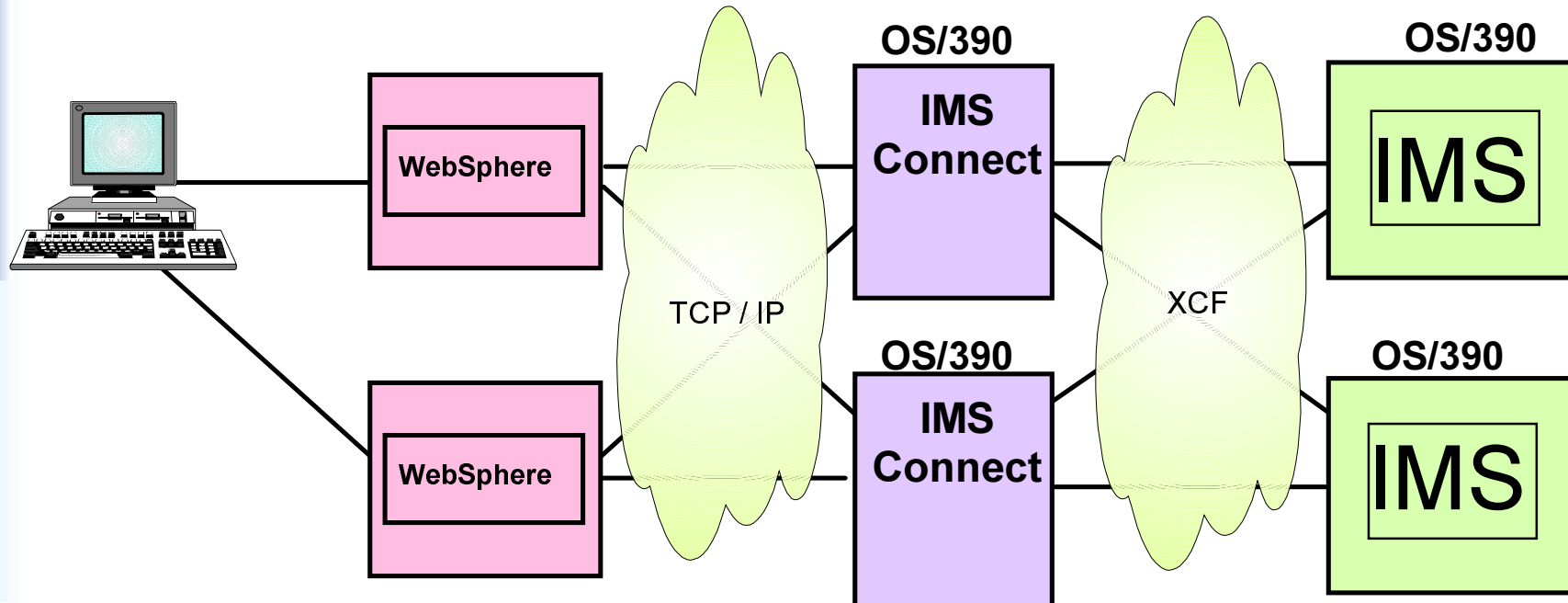


IMS Connect/IMS Connector Scenarios...

- OS/390 WebSphere in a different sysplex as IMS



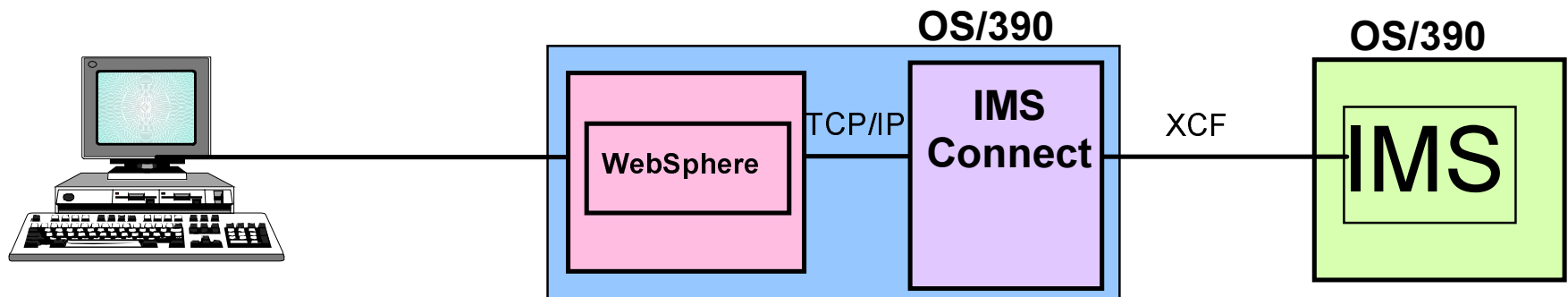
- Multiple connections



IMS Connectors Requirements

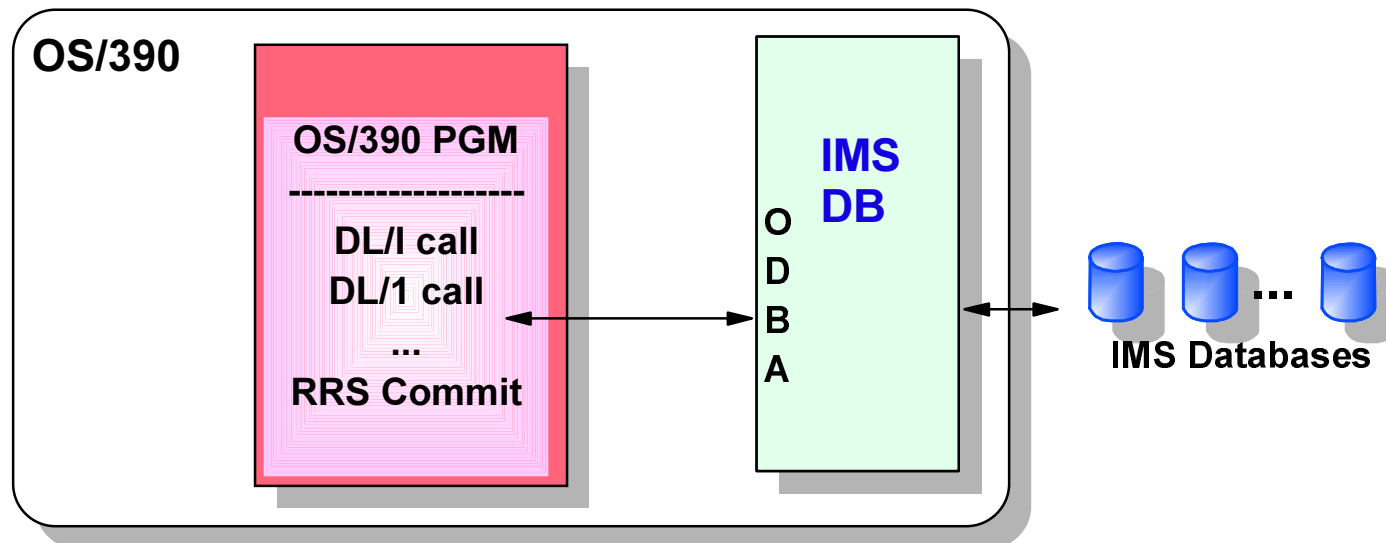
■ Connection to IMS applications

- Conversational IMS transaction support (IMS Connector)
- Unicode
- CCF migration to J2EE (IMS Connector)
- Connect to IMS from OS/390 server without TCP/IP Socket interface - Local Option
- EJB support (Distributed Commit support)
- Connectivity enhancements for two-phase commit, security, and local/390 support
- Additional environment support
- Performance enhancements
- XML for Transaction input
- HTTP/SOAP Support
- Systems Management, usability, serviceability enhancements



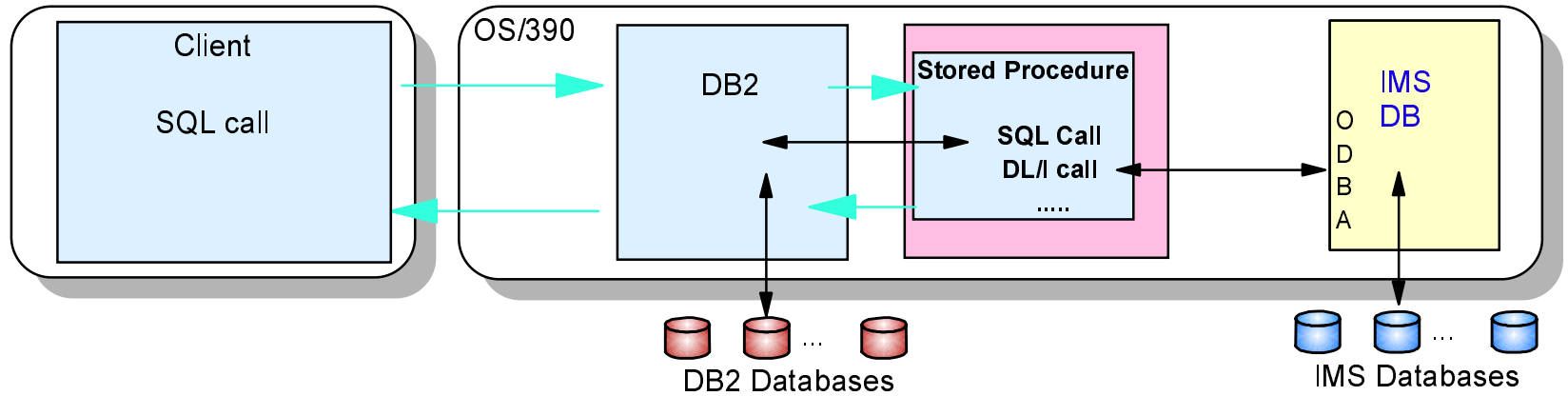
What is Open Database Access?

- A callable interface to access databases managed by IMS DB
- Provides another means for IMS users to access the valuable information stored in their IMS Databases.
- Provides for failure isolation and independent resource recoverability
- Syncpoint processing is coordinated through the use of OS/390 Resource Recovery Services (RRS)

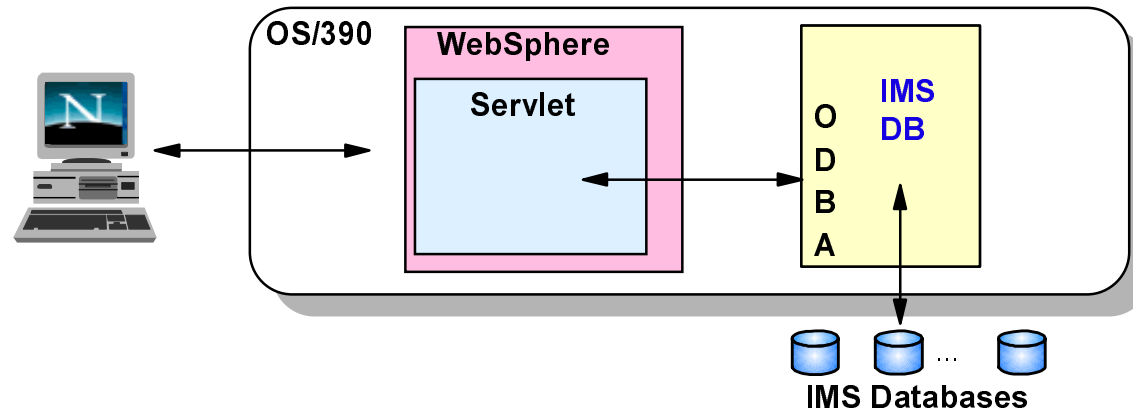


IMS Open Database Access

- **IMS DB access from DB2 Stored Procedures**



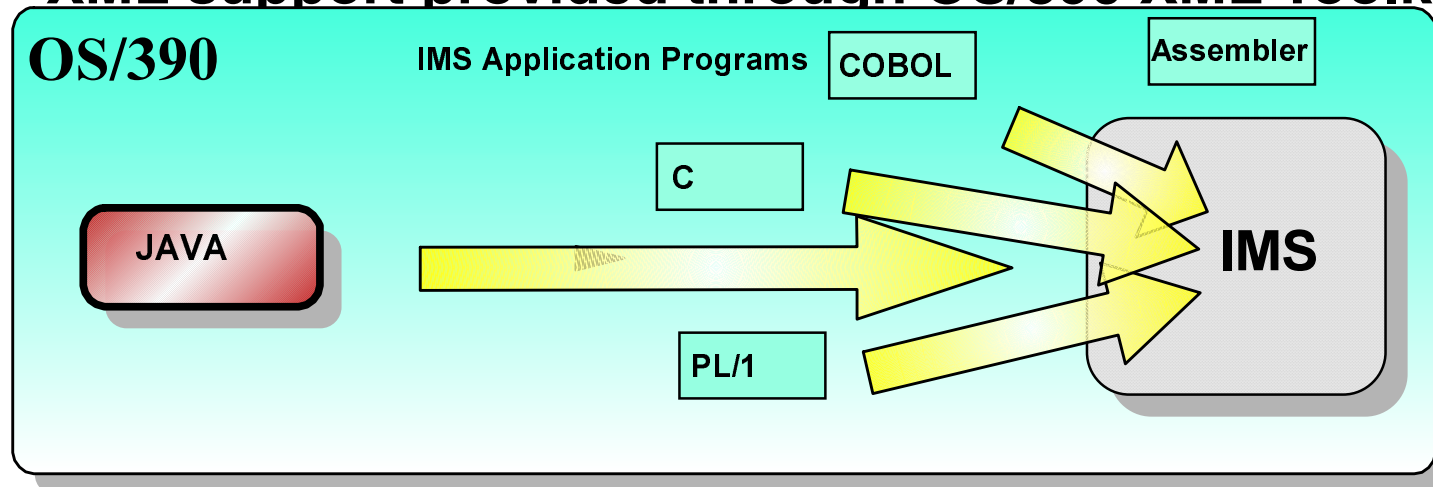
- **IMS DB access from a Web Server**



IMS V7 Java

Integrated e-business Application Development in IMS IMS V7 Supports Applications Written In Java !

- Provides Class libraries for input-output message handling
- Uses JDBC for data access to DB2 and IMS DB
- Can use Host and workstation tools for development
 - Compile using High Performance Java Compiler
 - Create/edit/debugg using VisualAge
- XML support provided through OS/390 XML Toolkit



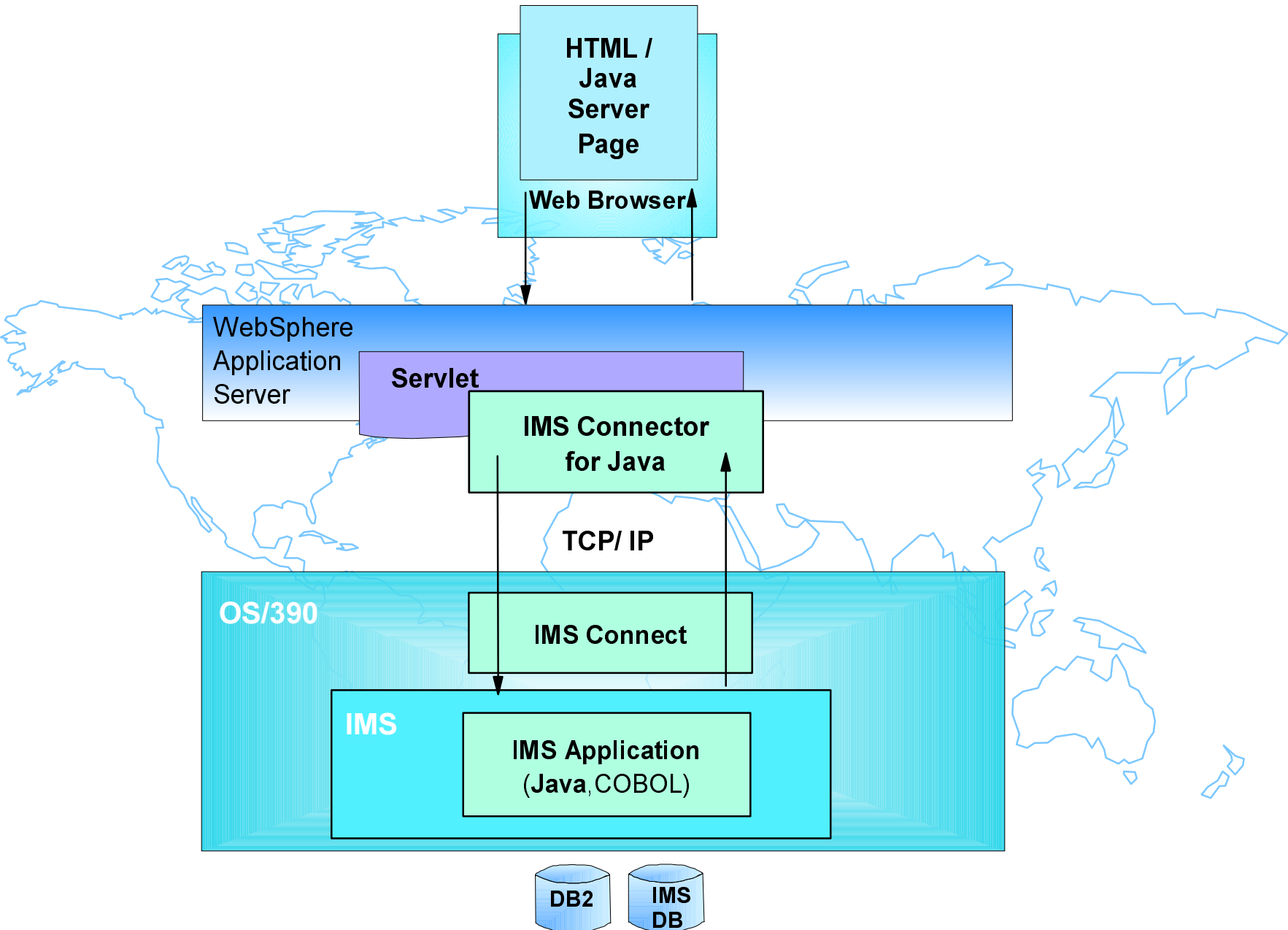
IMS V7 Java

- **Objective - To provide a Java class library that:**
 - Is easy-to-use by experienced Java programmers
 - Provides the infrastructure for automated tool support and integration with VisualAge for Java
 - Robustly supports all major IMS capabilities
 - Provides best-possible Java performance
- **Supports**
 - Conversational and non-conversational transactions
 - MFS
 - Dependent regions, not Batch
 - JDBC 1.0 access to IMS DB
 - Will support JDBC/SQLJ 1.0 access to DB2
 - HPJ compiled (layered on LE/370 interface for C); no JVM support initially
 - Usable from VisualAge for Java's ET/390

IMS Java Requirements

- Enhance performance by exploiting OS/390 scaleable JVM - provide new IMS region types
- Extend access to IMS DB in other environments
- Support evolving Java Standards
 - JDBC 2.0
 - Java Transaction API
 - Java2 Message API
- Provide Client Object Request Broker - RMI over IIOP
- Enhance tools support
 - VisualAge for Java class definition tool
 - Enhance Stored Procedure Builder to support visual development

Bringing It All Together



What is XML?

- XML (Extensible Markup Language) is a new technology for web apps
 - A text-based tag language, similar in style to HTML, but with user-definable tags
 - XML is a World Wide Web Consortium standard
 - XML simplifies business-to-business transactions on the web
 - XML's strength is data interchange
 - XML makes it easy to send structured data across the web and between applications
- XMI (XML Metadata Interchange) overcomes weakness of XML
 - XMI uses tools to generate schemas (rules, grammar, tags) for you
 - This facilitates standardized application interchanges



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HTML vs. XML

HTML

```
<p><b>Mr. Chip Becker </b>
<br>
1001 Main Street
<br>
San Jose, CA 95001</p>
```

XML

```
<address>
<name>
<title>Mr.</title>
<first-name>Chip</first-name>
<last-name>Becker</last-name>
</name>
<street>1001 Main
Street</street>
<city>San Jose </city>
<state>CA</state>
<zipcode>95001</zipcode>
</address>
```

Display on a browser

Mr. Chip Becker
1001 Main Street
San Jose, CA 95001

XSL

IMS Supports XML Today

■ MQSeries Integrator

- Bridging XML and existing IMS applications
 - Dictionary support for messages
 - Routing and processing based on message content

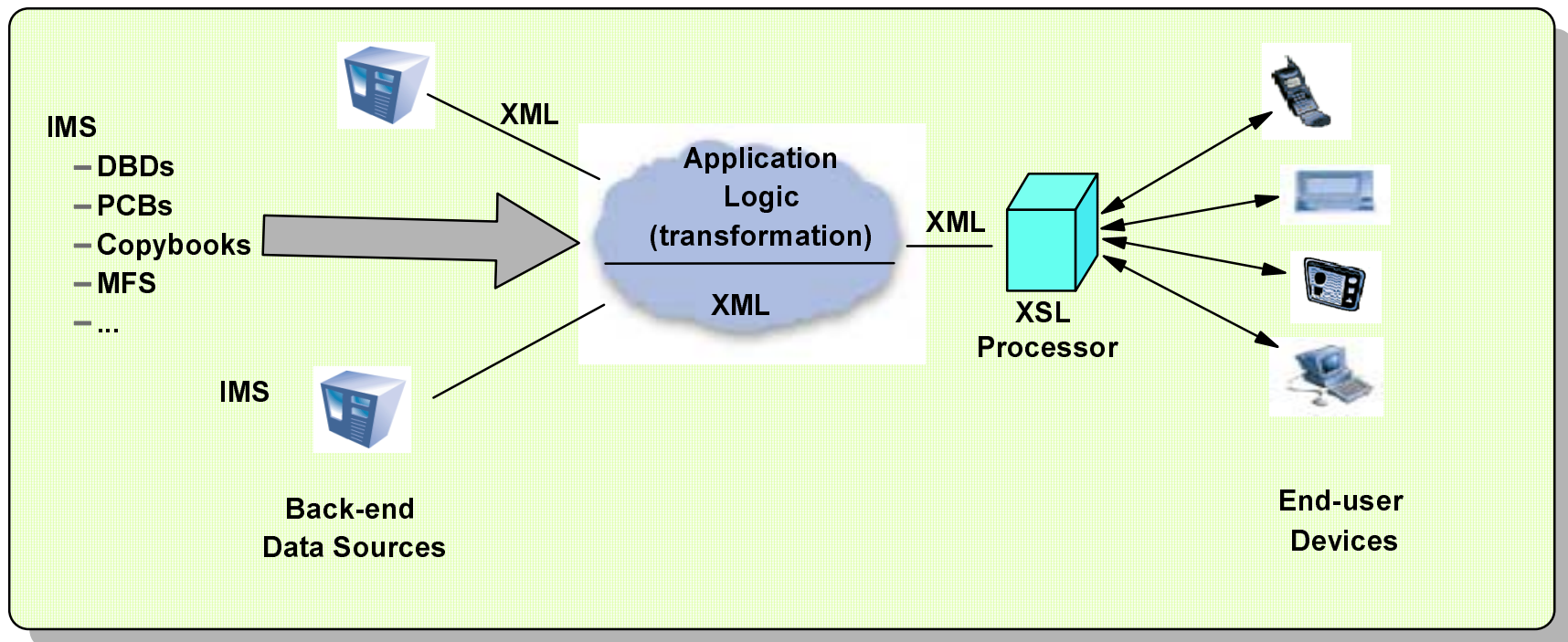
■ IMS C++ or IMS Java programs in V7

- IMS users can write applications which use the XML toolkit for OS/390
 - Tran code still must be EBCDIC, rest of data can be XML
 - Java/C++ program can invoke XML parser to convert to non-tagged data



IMS XML Requirements

1. Provide Integrated Tool support for IMS applications
 - Model IMS definitional information in XML documents
 - IMS DB data (DBD files, PSBs/PCBs, copybooks, ...)
 - IMS Transactional messages and MFS
 - Metadata eases the building of connector tools for existing applications
2. Support sending XML documents to/from IMS applications
 - Leverage XMI
3. Other



US Utility Company



Building a cost-effective e-business Infrastructure with Java and XML



Challenge: Utility industry deregulation required differentiation by providing proliferating information to energy traders, providers, producers, consumers (eg. viewing account history online for reconciliation)



Solution: Establish generic e-business infrastructure based on thin-client architecture using XML and transaction processing between Internet client and existing IMS system through EJB, a Web Application Server Java Servlet, and MQSeries



Benefits: Enable device independence with respect to the client and to leverage its existing investment in legacy IMS transaction systems

Summary

- **IMS is providing industrial strength e-business solutions**
 - **Connectors/gateways**
 - **Application Development improvements/tools**
 - Java
 - XML
 - **IMS is partnering with industry leading tools to provide our users with solutions they need**

IMS is ideal for e-business !