



## Transformation Techniques for Open Access of IMS on z

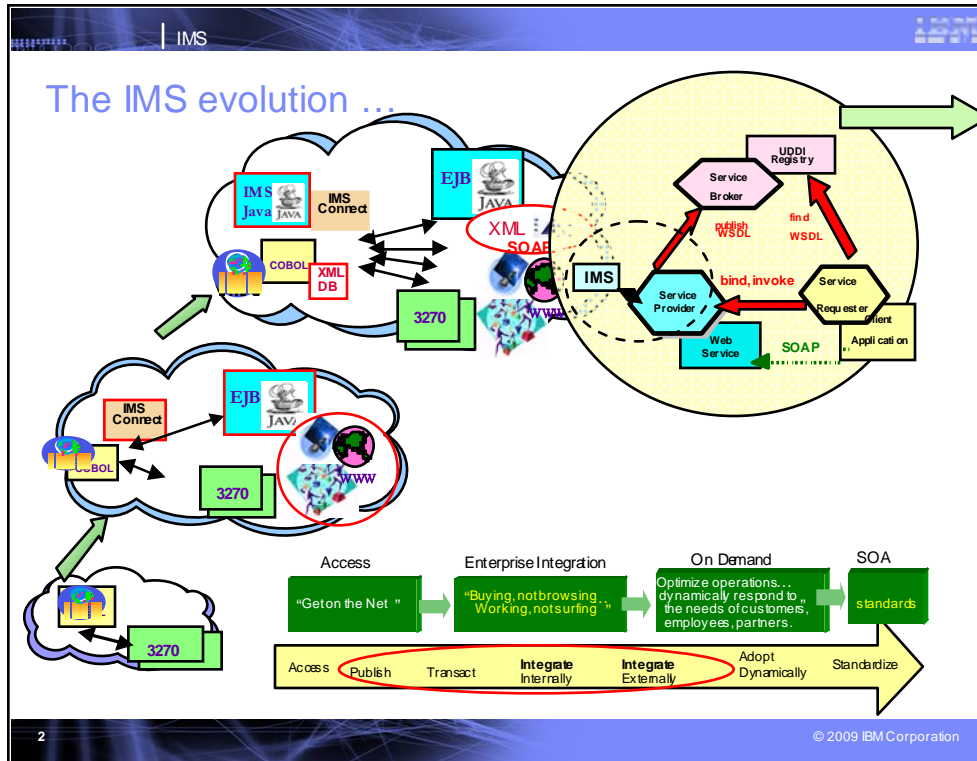
- Accessing IMS Transactions
- Accessing IMS Data
- Outbound Access From IMS Transactions
- Continuing on with Emerging Technologies

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IBM is providing transformation techniques for easing access to IMS data and IMS transactions. It is also enhancing outbound access from IMS transactions. And it is continuing to provide support with emerging technologies into the future.



IMS has been evolving into the SOA Web Services environment. IMS has been evolving with the latest technologies, from the SNA 3270 terminals of the 70s, subsystem access of the 80s to TCP/IP and the internet of the 90s, and into the Java, Enterprise Java Beans, SOAP, XML, XML database, and web services of the 2000s. The Internet has evolved from initially offering Marketing access through publication of information, Enterprise integration of applications/data, On demand, dynamic optimization of operations, to standardization with SOA.

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## ... To SOA and Web Services

- Definition:
  - Web Service**
    - Standards-based type of service
    - Software component (*callable piece of code*) that is capable of being accessed (*described, published and located*) via *standard* network protocols such as *SOAP over HTTP*
      - Independent of platform or programming language
  - Web Services Description Language (WSDL)**
    - XML document describing network services, e.g., what a Web Service can do, where it resides, and how to invoke it
      - Follows an open standard

Industry standards

**3 basic components:**

- Service Provider
- Service Broker
- Service Requestor

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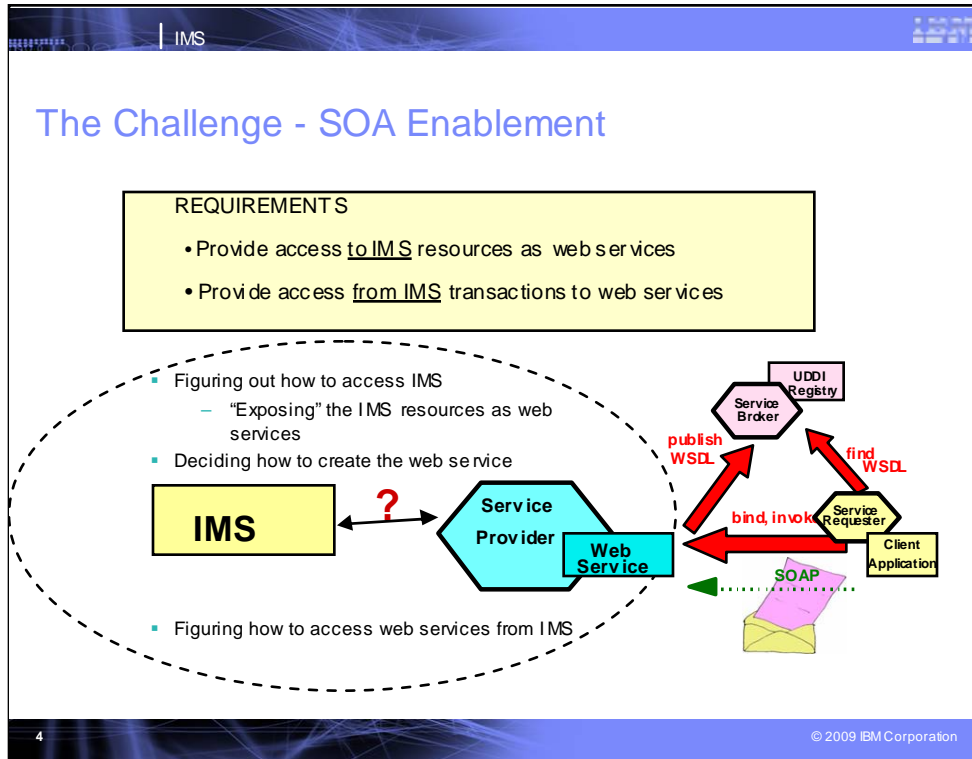
Standardization was needed in order to create applications, packages, and solutions that could provide access with newer technology across disparate systems and data

Terminology:

Web Services, SOAP, and Web Services Description language (WSDL)

Provider–Broker–Requester

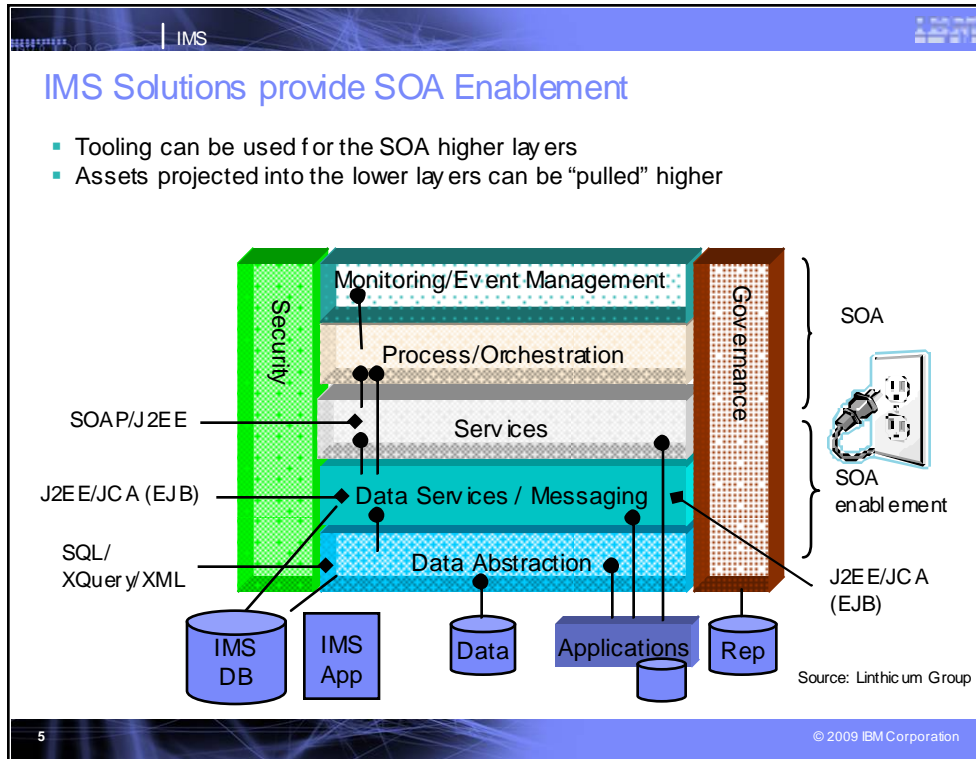
This was needed to invoke code to access resources as subroutines across web platforms



And the concepts of registry and brokers were developed to provide access through those interfaces

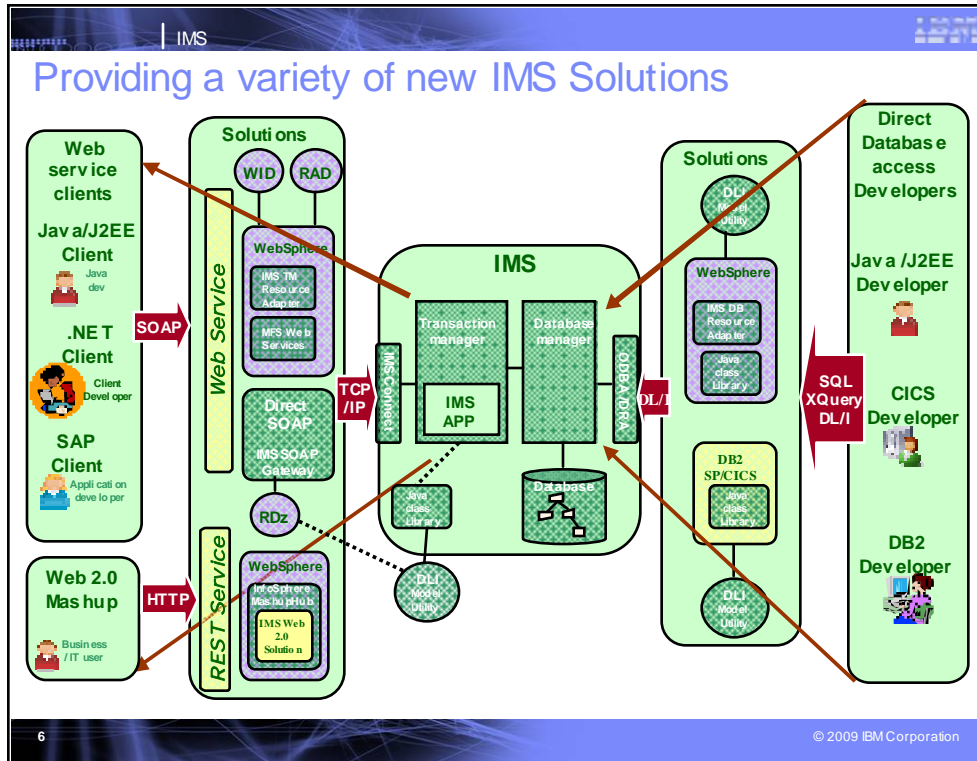
IMS needed to provide support for the standardized web services interface support to better integrate IMS into this environment.

And IMS has been growing into this.

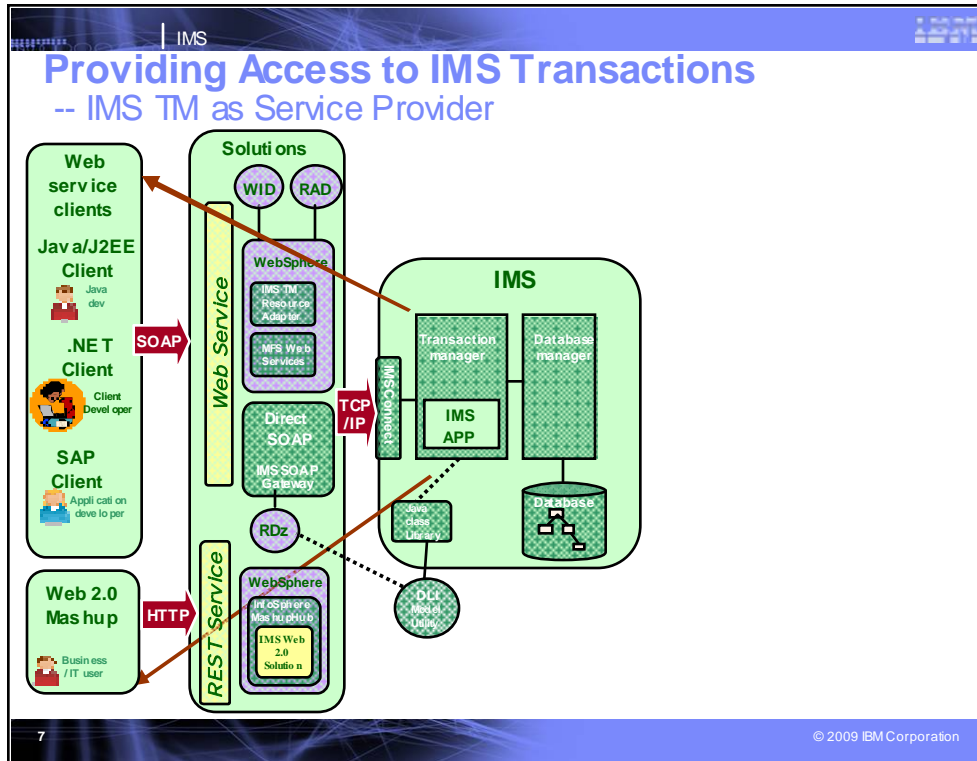


The SOA Architecture is a layered architecture, providing access through SOAP Services, JCA/EJBs, and XML to resources, such as your IMS Applications and Data.

SOA and SOA enablement provides the connections to plug into your resources, as you would plug in to access electricity with appliance plugs (such as a hair dryer or refrigerator might use)



And IMS applications and data are plugging in, using standard interfaces



Let's first discuss the facilities available for access to IMS transactions.

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## Accessing IMS resources (IMS as service provider)

### Accessing IMS applications

- First step – Understanding your applications
  - SOA enables “Reuse”
    - Reuse as is
      - Next step, determine which communication access solution to use
    - Optimize for new access patterns
      - A set of toolkits are available to help you
  - IMS supports new technology (Java, JDBC) and interoperability

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IBM is providing access to your IMS resources and IMS can be a service provider. There are a number of solutions available, but first you'll need to gain an understanding of your applications. Opening up IMS to providers/users requires an understanding of your environment and needs so as to determine what you are going to reuse and how to do so efficiently. You need to determine if your environment is efficient and well structured or do you run through other code that is not needed. You'll need to see if your applications can be reused as is or need to be optimized for your new access needs. Reuse also applies to your available skills (eg. COBOL, PL/I or Java). You may choose to renovate your applications for efficiencies. IBM is providing a variety of solutions to enable access and a set of toolkits to help in optimization.



The image is a screenshot of a presentation slide. At the top, there is a blue header bar with the text 'IMS' on the left and some small, illegible icons on the right. Below the header, the main title 'Enabling Enterprise Modernization' is displayed in a large, blue, sans-serif font. Underneath the title, there are two main sections, each starting with a blue arrow icon. The first section is 'Asset Modernization tools', which contains three bullet points: 'IBM WebSphere Studio Asset Analyzer', 'IBM Rational Asset Analyzer', and 'IBM Rational Asset Manager'. The second section is 'Enterprise Modernization solutions', which contains three bullet points: 'Analyze source in Rational Developer for z', 'Create a repository to use for analysis', and 'Determine resolution patterns of dynamic calls to programs, files, screens etc.'. At the bottom of the slide, there is a blue footer bar with the number '9' on the left and the copyright notice '© 2009 IBM Corporation' on the right.

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## Enabling Enterprise Modernization

- **Asset Modernization tools**
  - **IBM WebSphere Studio Asset Analyzer** helps IT personnel with the discovery and analysis (DNA) of existing enterprise applications. Understand and gain intellectual control over your application relationships and structures
  - **IBM Rational Asset Analyzer** helps accelerate strategic and tactical modernization initiatives by allowing development team to quickly transform existing assets and discover reusable business logic for creating services
  - **IBM Rational Asset Manager** helps improve productivity and software delivery through asset reuse with a solution that enables you to create, modify, govern and locate any type of development assets, including SOA and systems development assets
  - **IBM WebSphere Service Registry and Repository** helps you achieve tangible business value from your SOA by enabling better management and governance of your services.
- **Enterprise Modernization solutions** provide a mechanism for synchronizing the sources for analysis to assist with changes for ongoing maintenance and enhancement
  - Analyze source in **Rational Developer for z** local and remote z/OS projects
    - Programs- including JCL, DDL, PSB and DBD files and IDMS schemas
  - Create a repository to use for analysis
  - Determine resolution patterns of dynamic calls to programs, files, screens etc.

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There are a number of tools available from vendors and IBM that support IMS access. Here are some of the IBM tools available to help you understand and modernize your assets and modernize your enterprise. These tools provide assistance in breaking apart the complexity of applications. And IBM provides solutions that can help you provide a mechanism for synchronizing the sources for ongoing maintenance and enhancement.

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## Accessing IMS resources

➤ Next Step - How do you choose a solution?

- *By understanding your requirements:*
  - *The Environment - **SNA or TCP/IP***
    - Different solutions by network type
  - *Application requirements*
    - Access to IMS transactions
      - **Direct connection model Characteristics**
        - Processing begins only if connections can be established
        - Immediate notification of problems
      - **Messaging and Queuing model Characteristics**
        - Processing occurs whether or not a connection is made
        - Assured delivery of message when path is available
    - Access to IMS data
    - Replicating IMS data
    - Access from IMS applications
  - *Development requirements*
    - Programming language
    - Toolkits

- **Don't forget to design for failure !!**

**First define your requirements**



**There are a variety of solutions**

10

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The next step is choosing a solution for access. You need to understand your requirements, for example, how quickly does it need to be sent out?

What are your environment, application and development requirements? When you choose tooling, don't forget to design for failure. The good news for IMS is that there are many vendors, and many solutions available to address your needs.

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## Comparing Solution Types – TCP/IP vs MQ

**▲ Direction Connection**

- Natively synchronous (connection-oriented), supports asynchronous (connectionless)
- Direct correlation between input and output
- Potential issues with program-to-program switches when spawning multiple transactions
- Easily supports IMS conversational transactions (relatively transparent)
- Designing for failure:
  - ▶ If connection can not be made, try later
  - ▶ Decide what to do when the connection breaks - understand IMS actions

**▲ Messaging and Queuing**

- Natively asynchronous (connectionless), simulates synchronous (connection-oriented)
- Need to consider how to correlate output to input
- Easily supports program-to-program switches even when spawning multiple transactions
- Requires keeping track of the conversation id to continue an IMS conversation
- Designing for failure:
  - ▶ No knowledge of whether entire connection path is available
  - ▶ Handle late reply messages and the dead letter queue

<http://w3-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP100638>

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In assessing your needs, you'll need to decide between connection solutions that are Direct or provide Messaging and Queuing. Here are some of the considerations in evaluating the options for making that decision – synchronous or asynchronous, correlation of input/output, program-to program switching, conversational transactions, designing for failure. There is a white paper with more information on this at <http://w3-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP100638>

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## Messaging and Queuing

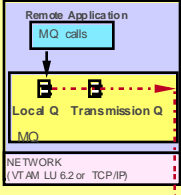
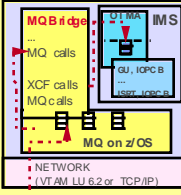
- WebSphere MQ (MQSeries)
  - Supports the use of MQ API
    - Remote program is not sensitive to the network type
      - MQ provides its own high-level standard API
      - Same applications can be deployed on TCP/IP or SNA
  - Supports the use of JMS (Java Message Service) API
    - Messaging standard that allows application components based on J2EE to create, send, receive, and read messages

**MQ IMS Adapter**

- uses the IMS ESS interface
- Supports the use of explicit MQ calls in the IMS application

**MQ IMS Bridge**

- uses the OTMA interface
- Takes advantage of the DL/I call interface in the IMS application

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For Messaging and Queuing, WebSphere MQ can provide a solution. It provides a couple of options – through the IMS Adapter with explicit calls or through the IMS Bridge to take advantage of the DL/I Call interface.

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## Direct Connection Model - 3270 emulation

- Benefits and value
  - Straightforward and simple
    - Traditional IMS communication model
      - Leverages standard TCP/IP Telnet (TN3270) capabilities
- IBM's Host Integration Solution – WebSphere Host Access Transformation Server (HATS)
  - Out of the box - transforms 3270 data streams to HTML
    - Provides customization and access to multiple hosts
  - Access provided as Java Applets or as Host Servlets
  - Supports the creation of Web Services

```

graph TD
    HATS_Studio[HATS Studio] -- creates --> HATS_Application[HATS Application]
    WebSphere_Studio[WebSphere Studio / RAD] --> HATS_Application
    User_Browser[User's Web Browser] <--> HATS_Application
    HATS_Application <--> WebSphere_Server[WebSphere Application Server]
    WebSphere_Server <--> TCP_IP[TCP/IP Telnet]
    WebSphere_Server <--> VTAM[VTAM]
    TCP_IP <--> IMS[IMS]
    VTAM <--> IMS
  
```

13

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For Direct Connections, 3270 emulation is still important and is a viable solution that leverages the IMS model.

WebSphere Host Access Transformation Server (HATS) provides a solution that lets you use 3270 as a communication mechanism under the covers

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## Direct Connection Model - 3270 emulation ...

- HATS
  - Toolkit
    - Provides a set of wizards and editors that create J2EE applications
  - Runtime
    - Provides connection management
      - The runtime program is packaged within the J2EE application built by the toolkit

- Input properties for macro prompts
- Output properties for macro extracts

Scripts that define navigation through a set of host terminal Screens

Each screen in a macro includes:

- a description of the screen
- actions to perform for the screen
- screen or screens that are presented after the actions are performed

HATS Integration Objects  
 - Java beans that run HATS macros

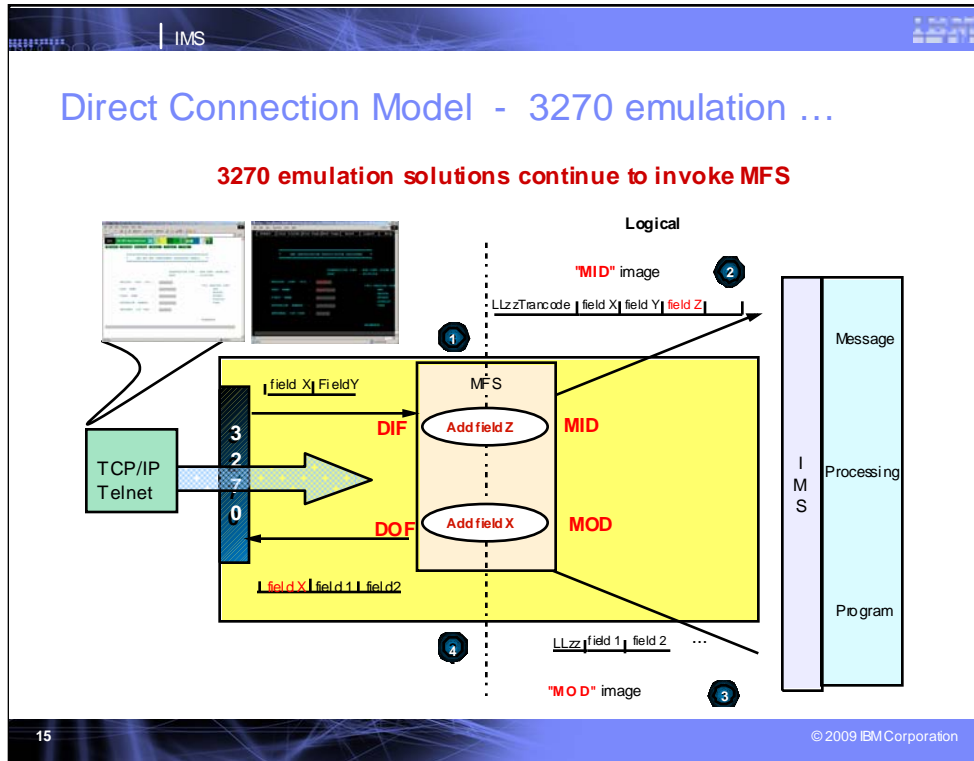
HATS Macros

Web Service

14

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HATS consists of a Toolkit with wizards and editors that create the J2EE application. It also provides a runtime environment for connection management. It allows you to pull apart the application and create a web service and end user screens.



IBM provides solutions which invoke the IMS MFS outbound and convert. Environments sensitive to this are still popular drop-in solutions.

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## Direct Connection Model -- IMS Connect

- A capability that provides connectivity support between TCP/IP applications and IMS transactions – Integrated into IMS V9
  - Configured on a z/OS server
- Benefits and Value
  - Supports TCP/IP sockets access to IMS transactions and commands
  - Provides a general purpose and structured interface
  - Provides a strategic base for new connection technologies
    - IMS TM Resource Adapter and MFS web Services
    - IMS SOAP Gate way
    - Data Power
    - IMS Web 2.0
    - IMS 11 Open DB

16

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IMS Connect function provides the architectural foundation for IMS as a TCP/IP socket server.



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## For All IMS Open Transaction Manager Access (OTMA) based Solutions

**Consider whether or not the remote application or exit routines need to provide the additional information that MFS would have provided**

Remote Program

OTMA MQ or IMS Connect headers LLzzTrancode | field X | field Y | field Z

Message GU, IOPCB

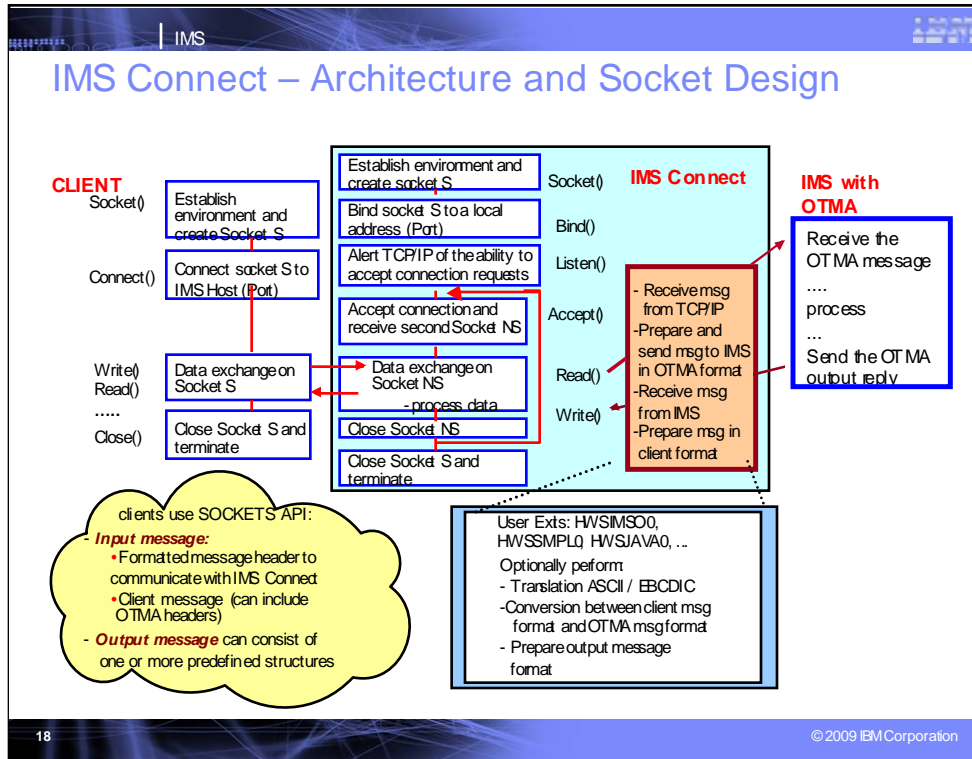
Processing Program ISRT, IOPCB

OTMA MQ or IMS Connect headers LLzz | (field X ?) | field 1 | field 2

Allows existing IMS programs to be invoked by the OTMA client  
 - Possible additional logic on the remote program to deal with some applications  
 Supports new IMS programs that can be coded to existing DLI interface

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The IMS Open Transaction Manager Access (OTMA) is the interface to the message queue for WebSphere MQ, IMS Connect, and OTMA Callable API RYO users. But since you no longer go through MFS for inbound/outbound fields, remote programs must add any necessary additional information that it would have provided.. You will need to consider whether the output can be used as is or whether you need to use exit routines for modifying the data stream.



IMS Connect function is part of the overall restructure of IMS for the 21st Century and is architected as the base for all future IMS Connectivity. Much of the function of IMS Connect was available with earlier IMS Versions so you could start to take advantage of it before migrating your networks/applications/databases to IMS 9/10. The structure of IMS Connect is also designed such that drivers can be interchangeable. That is, alternatives for the TCP/IP front end or OTMA back end interfaces are already being provided. These are allowing IMS to exploit newer, additional, and enhanced protocols and/or interfaces.

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## IMS Connect Solutions

- IMS Connect provides the IMS interface for TCP/IP solutions
  - IMS SOA Integration Suite
    - For IMS V9 or later at <http://www.ibm.com/ims>
      - IMS TM Resource Adapter
        - IMS MFS Web Support
      - IMS SOAP Gateway
      - IMS Web 2.0 Solution
      - And more.
    - Write your own clients
    - Other Vendor solutions

Existing IMS transactions can be integrated into the SOA by implementing a Web service as a front-end access-point interface

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IMS Connect provides TCP/IP access to IMS.

For access to IMS through IMS Connect from a J2EE environment, IMS provides the IMS TM Resource Adapter (aka IMS Connector for Java) for access from Java applications, SOAP Gateway and parsers, and samples for other language access as well. Support for MFS is also available. Other solutions providing access to IMS through IMS Connect include the IMS SOAP Gateway for access from non-J2EE environments, IMS Web 2.0 support for Mashups, and many more. solutions.

IMS has also extended its use of the MVS Cross Coupling Facility for use by IMS Connect for distributed operations access through the Structured Call Interface to the Operations Manager from the DB2 Version 8 Control Center as a single point of control.

With this structure IMS Connect is evolving to address other connectivity requirements, such as distributed database access to IMS DB, being provided with IMS 11.

## IMS TM Resource Adapter ...

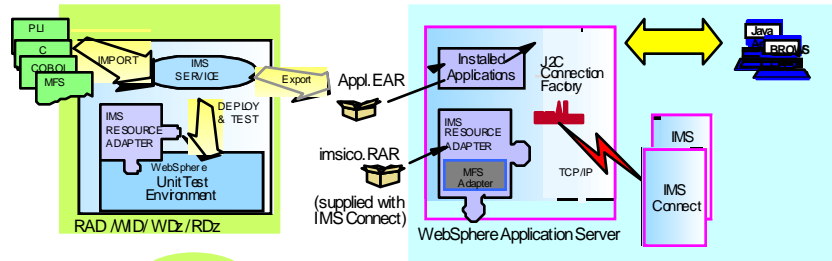
- Supports the development of J2EE applications, Web services, and business processes that can interface with IMS Connect

- Development component*

- RAD, WID, RDz

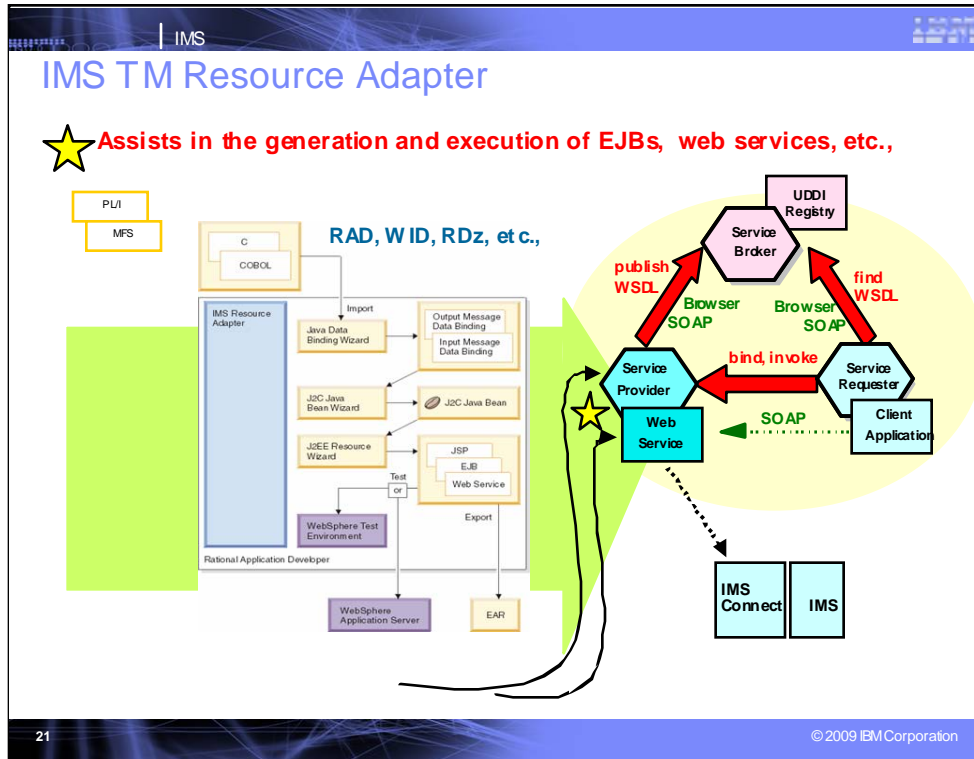
- Runtime component*

- Must be installed into an application server, e.g., WAS, WPS



Tool kits that generate web services, EJBs, JSP, etc. for IMS, CICS, DB2

IMS TM Resource Adapter enables IMS application access through Connect from a J2EE server (eg. WebSphere Application Server).



Tooling can make this access more dynamic, enable it to work in an SOA architecture, and create the web services. It creates a file to know how to get to IMS and back.

Rational Application Developer (RAD) and Rational Developer for z (RDz) help modernize your IMS application by parsing existing IMS application source and generating J2EE application and web service without changing the IMS application.

WebSphere Integration Developer (WID) provides the process flows for WebSphere Process Server. For IMS the best place is in your web server. If WPS runs on z with IMS it is more efficient.

IMS

## IMS TM Resource Adapter Capabilities

- **Supports J2EE Connection Architecture (JCA) 1.0 & 1.5**
  - Supports various types of interactions and programming models with IMS
    - Invokes IMS transactions or commands
      - Conversational and non-Conversational
      - MFS, COBOL, C, PLI, Java
    - Send Recv, Send Only
    - Retrieve Asynchronous output
      - Options for handling undelivered output messages: purge or reroute
      - Single no wait, single wait
      - Alternate Client ID
    - Commit mode 1 or 0 processing
    - SyncLevel none or Confirm

- **Connection Management**
- Connection pooling
- TCP/IP and Local Option connections
- Handles execution or socket timeouts
- **Transaction Management**
- Global z/OS RRS transactions support and Distributed XA transaction support with Two Phase Commit (i.e. SyncLevel Syncpt)
- **Security Management**
- J2EE EIS Sign-on
- SSL, RACF keyring
- **Enhancements in complex environment**
- Sysplex distributor environment
- zWAS 64 bit support

22

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IMS TM Resource Adapter supports various types of interactions and programming models with IMS, supports the J2EE Connection architecture capabilities of Connection, Transaction and Security Management. And it also provides enhancements needed for complex environments, taking advantage of capabilities, such as Sysplex distributor and 64 bit support.

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## IMS SOA Composite Business Application Support with IMS TM Resource Adapter

Provides Visual Composition tooling and runtime, leveraging WebSphere Integration Developer (WID) and WebSphere Process Server (WPS)

➤ **Streamlines process design hand-off between business and IT**

- Enable existing IMS transactions as SOA-based composite business applications
- Enable IMS transactions for broad reuse and service development and assembly technologies

➤ **Maximizes re-use and service development and assembly**

- Ability to leverage existing services & save components for future service reuse
- Build and run IMS sub-process flows that can be reused within multiple external processes

```

graph TD
    A[Customer eligibility] --> B{Review application}
    B --> C[Retrieve credit report]
    C --> D{Credit assessment}
    D --> E[Request additional info]
    E --> F{Final application review}
    F --> G[Generate approval & account info]
    F --> H[Generate decline]
    B --> G
  
```

23

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**Key Message: IBM is providing visual composition tooling and runtime support for IMS**

IMS SOA Composite Business application support provides for the next generation business process tooling and servers that integrate J2EE resources, services and activities (like user interventions), based on Web Services with the Business Process Execution Language (BPEL). This extends existing transactions to include conversational transactions as SOA-based composite business applications using the IMS TM Resource Adapter and WebSphere tooling and runtime, maximizing re-use of IMS assets in new applications for rapid business innovation and reduced costs.

IMS 11 is enhancing this for MFS as well.

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## IMS TM Resource Adapter (IMS TM RA) and Websphere Transformation Extender (WTX)

- Enables customers to leverage the WTX support of complex data formats on distributed platforms
- IMS integration with WTX enables an IMS customer to be compliant with complex data formats like SEPA, SWIFT (financial services), HIPAA (healthcare), and EDI (cross-industry)

WebSphere Transformation Extender (WTX) and IMS TM resource adapter are connected via WTX Map.

WebSphere Application Server (WAS) / WebSphere Process Server (WPS) / WebSphere Message Broker (WMB) contains Web Services Applications, WTX, and IMS TM resource adapter.

WTX and IMS TM resource adapter are connected to the IMS system (IMS Connect and IMS App) via TCP/IP.

The IMS system includes IMSDB & XML DB.

- Runs on Microsoft™ Windows™, AIX®, z/OS Batch, z/OS IMS™, z/OS UNIX® System Services, Red Hat and SUSE Linux™, Solaris, and HP-UX.

24

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### Key Message: Websphere Transformation Extender's IMS support provides new industry standards compliance

WebSphere Transformation Extender enables customers to leverage the WTX support of complex data formats on distributed platforms. IMS integration with WTX enables an IMS customer to be compliant with complex data formats, like SEPA (XML Format requirement for European banks), SWIFT (financial services), HIPAA (healthcare), EDI (cross-industry) and others. This support provides faster standards compliance and improved data quality with automated data validation using industry and regulatory standards.



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## IMS TM Resource Adapter MFS Web Solutions

Support for the modernization of MFS-based IMS transactions

- MFS SOA / Web Services (B2B)**
  - Enables business applications to interact with MFS-based IMS transactions (Transform IMS MFS-based transactions to Web Services)
- MFS Web Enablement (B2C)**
  - Enables users to seamlessly navigate through dynamically generated MFS-like Web pages on Web browser

25

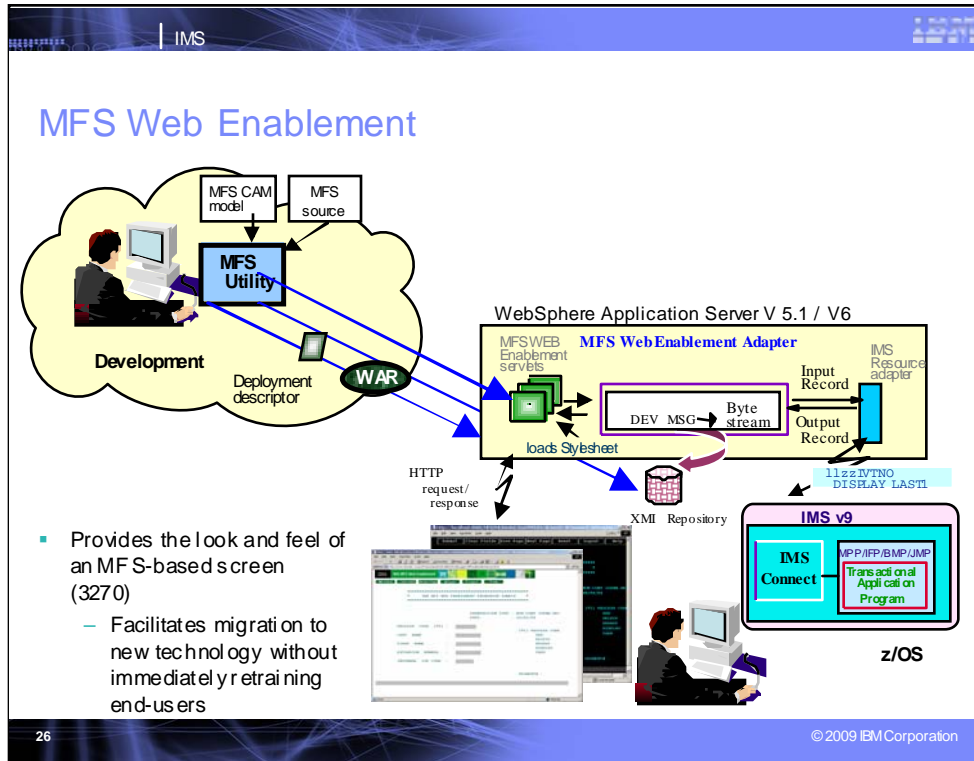
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For development environments:

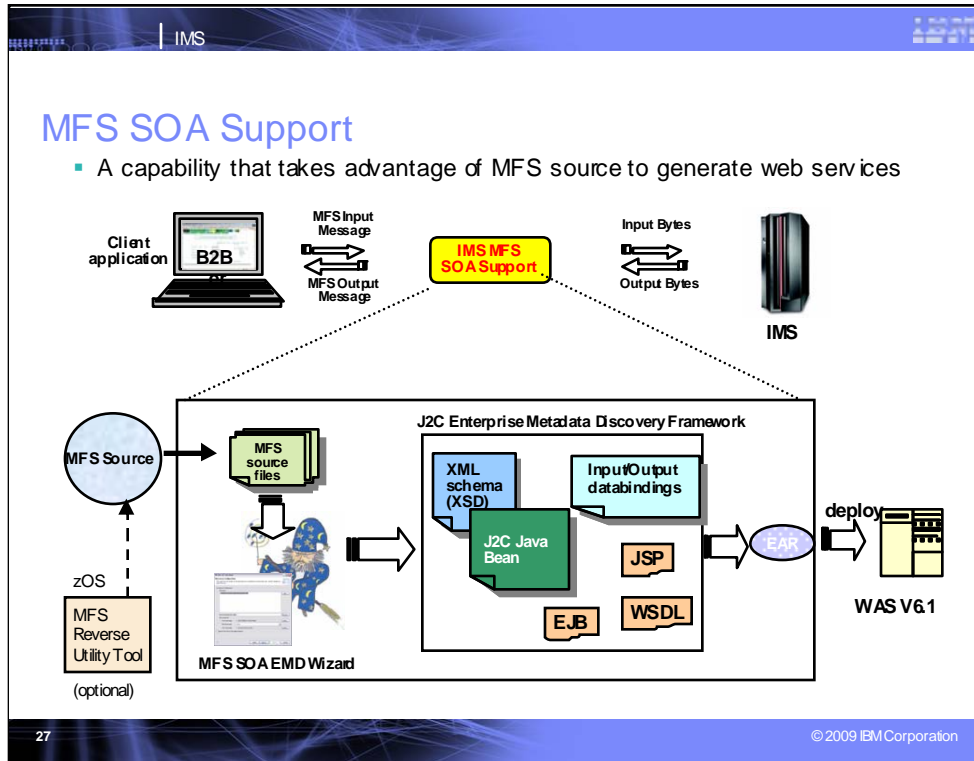
IMS MFS Web Services is included as part of the IMS TM Resource Adapter (RA). It has evolved into IMS MFS SOA Support, which is included in IMS TM RA for Rational Application Developer (RAD) 7.5 and eventually Websphere Integration Developer (WID). IMS MFS SOA support is for Business to Business (B2B) for integration with other tools. RAD support is J2C for developers and has a slightly different runtime from WID, which is Service Component Architecture (SCA) for Architects.

IMS MFS Web Enablement is also provided for web download for Business to Consumer (B2C) for use directly with Browsers. Also shipped with this is the MFS XML Utility for parsing XMI for MFS Web Enablement

For runtime, both solutions currently require WAS 6.1 or later.



MFS Web Enablement makes use of TCP/IP sockets to look like a 3270 screen for customers who want first to migrate technology without retraining end users which can take a lot of time.



MFS SOA Support uses MFS Source for parsing as input to tooling. It is used to send to IMS and back. The MFS Reversal tool can help you create source if you don't have it. MFS SOA Support can create the WSDL files, JSP, EJBs.

IMS

## IMS SOAP Gateway

- IMS Soap Gateway
  - Uses SOAP messages to support end-to-end integration between IMS transactions and
    - Microsoft .Net & Java applications
    - Any third party applications, e.g. SAP XI
    - RYO applications
  - Provides HTTP/SOAP transport and processing
    - SOAP envelope and headers handled by the gateway
  - Utilizes Rational Developer for System z tooling to create converters for transforming XML messages to IMS messages and vice versa
    - No need to change existing IMS application code

SOAP  
a standardized way of using XML to define both a message and the target application

IMS message  
application-specific message vocabulary

SOAP vocabulary  
SOAP envelope

```

    graph LR
      Client[.NET client] -.-> Gateway[IMS Soap Gateway]
      Gateway --- Connect[IMS Connect]
      Connect --- IMS[IMS]
  
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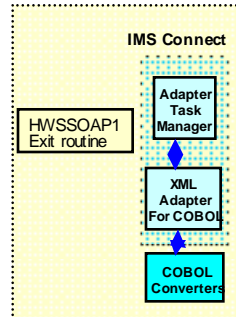
28

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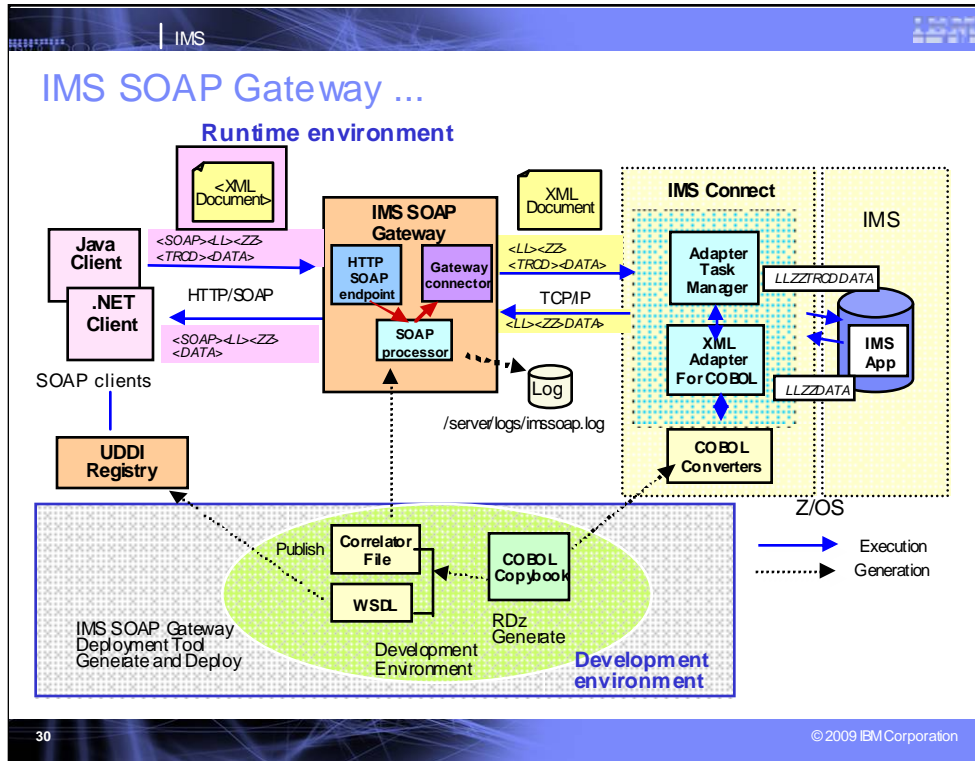
IMS SOAP Gateway provides direct SOAP access to IMS transactions. SOAP gateway is a lighter weight solution, and is for when you don't have J2EE servers. If you have J2EE servers, you should use the IMS TM RA. With the SOAP Gateway SOAP XML format is sent in. SOAP Gateway support provides for the translation back and forth without requiring application servers. It creates WSDL and tells about the web location and correlator files. IMS Connect calls the converter file to have the message come in as an LLzz format.

## IMS SOAP Gateway XML Conversion Support

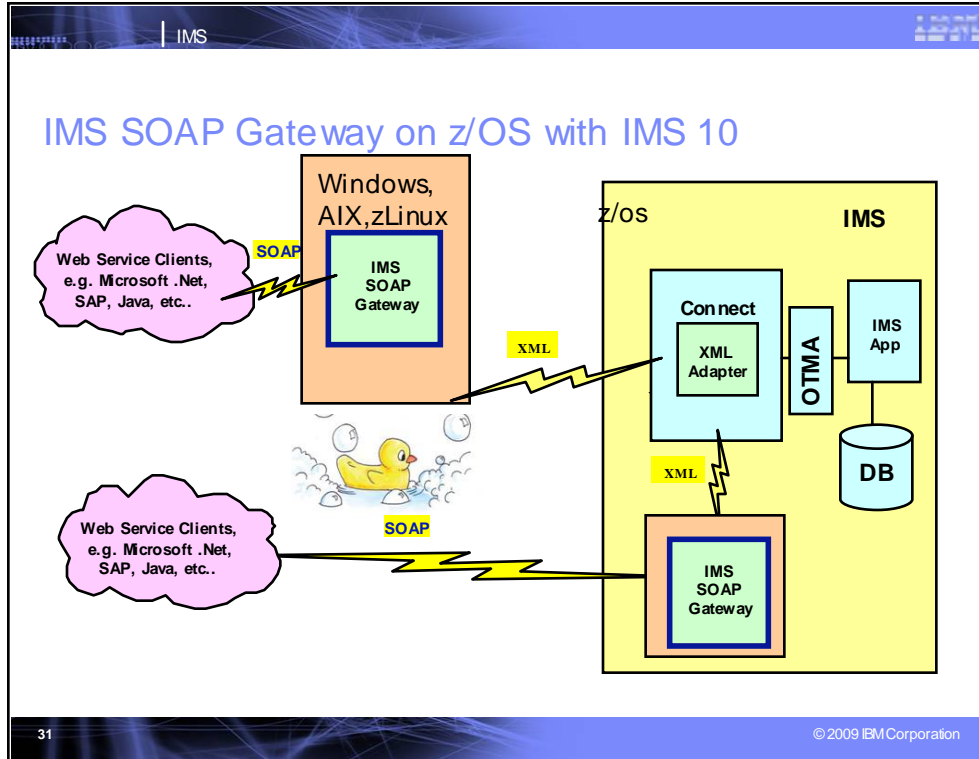
- XML converter routines
  - Cobol / PLI source code
    - Provide the information needed to perform conversion from tagged data to a byte stream
      - *Unique to each message definition*
      - Can be generated by RDz toolkit
    - Compiled and bound into file that is concatenated into IMS Connect STEPLIB
- Without converter routines in IMS Connect
  - IMS application will need to perform the conversion



There is a converter routine per transaction. The XML Flow would otherwise need conversion in the IMS application or WebSphere server.



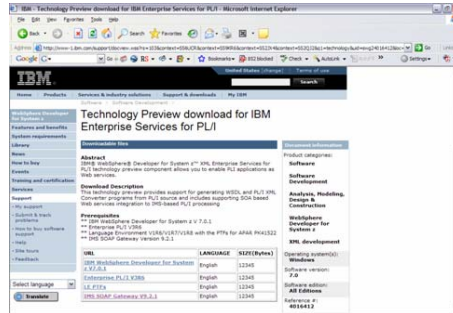
This is an example of the development environment and the runtime environment when using the IMS SOAP Gateway.



z/OS support was provided more recently, in addition to the Windows, AIX, zLinux support provided earlier.

## IMS SOAP Gateway PL/I support

- Technology preview download
  - [http://www1.ibm.com/support/docview.wss?rs=103&context=SS6UCR&context=SS9KR6&context=SS2JK4&context=SS2QJ2&q=technology&uid=swg24016412&loc=en\\_US&cs=utf-8&lang=en](http://www1.ibm.com/support/docview.wss?rs=103&context=SS6UCR&context=SS9KR6&context=SS2JK4&context=SS2QJ2&q=technology&uid=swg24016412&loc=en_US&cs=utf-8&lang=en)



- support for generating WSDL and PL/I XML Converter programs from PL/I source
- Support for SOA Web services integration to IMS-based PL/I processing

PL/I support is being made available for generating WSDL and PL/I XML Converter programs from PL/I source.



IMS

## And then there is DataPower

- XML is the foundation of SOA, but brings new challenges:
  - Scalability: XML is bandwidth, CPU and memory intensive
  - Performance: some XML apps literally grind to a halt
  - Security: connecting systems never before connected
  - Security: clear text over HTTP with no inherent security
  - Standards are still in flux
- An IBM solution: DataPower SOA Appliances
  - Purpose-built hardware to address these challenges
  - Simplify, accelerate and help secure XML Web services for SOA

33

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Data Power is a set of hardware/software from IBM. It is a set of SOA appliances to address the new service challenges with SOA.

IMS

## DataPower ...

DataPower products offer customers significant performance, ease of use, and packaging advantages for managing rapidly growing XML-based data

Add: DataPower XML Integration & existing systems connectivity SW

Add: DataPower XML Security SW

- **XI50 Integration Appliance**

  - Expands support to non-XML solutions
  - Advanced architecture
  - Integrated message-level security
- **XS40 XML Security Gateway**

  - Security, agility and performance
  - Device can off-load application security software
  - Performs XML Web services security functions (parse, filter, validate schema, encrypt/decrypt, signatures, access control, and more)
- **XA35 XML Accelerator**

  - Offloads overtaxed servers by processing XML, XSD, XPath and XSLT at wire speed
  - SW provides significant performance improvements over WebSphere solutions
  - HW + SW provides enterprise-class performance

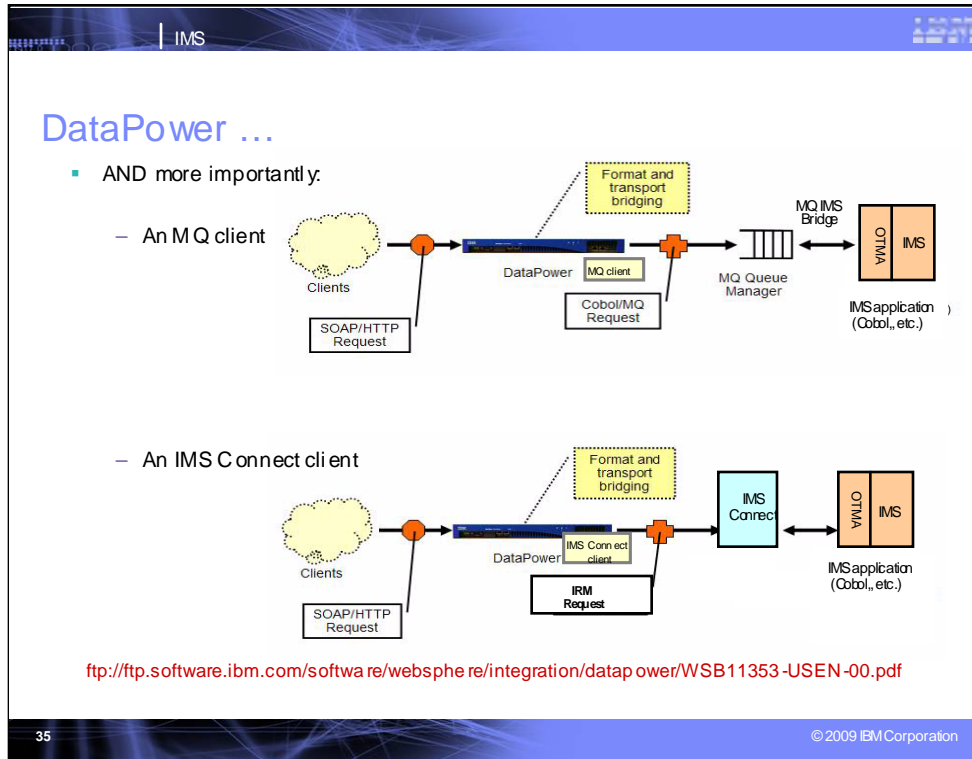
34

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Data Power offers 3 appliances for integration. The highest level understands the mainframe with SOAP, XML, and Firewall support.

The mid level operating at wire speed provides security outside the mainframe with encryption/decryption at the gateway level.

The lowest level offloads XML processing into the Data Power box and creates converter files off the mainframe



Data Power provides MQ and IMS Connect clients. For MQ, once it comes in, it can access IMS and backout. It has a special client for IMS. It can also talk to CICS and understand the differences.

Data Power provides an IMS Connect Client that understands the message, supports Commit level 1, synchronous level none, and handles simple in and out requests.

IMS

## Extending SOA with Web 2.0

*Personalizing SOA for efficiency and innovation*  
**And being more responsive, more productive, more knowledgeable, wiser, and faster**

Simple to use, quick to develop and deploy

- Rapidly assemble mashups
- Simply create widgets, feeds
- Reuse information and services
- Unlock enterprise and web contents
- Increase effectiveness with rich interface

Simple to access

- Access resources with simple RESTful (Representational State Transfer) interface
- Reduce development time and skills needed
- Quickly transform and mix information
- Wider access from a variety of consumers (web apps, outside partners, etc.)
- REST Uses HTTP alone to interact, with XML or JSON (java script object notation) payloads
- SOAP involves POSTing more elaborate XML messages and requests to a server that may contain quite complex, but pre-defined, instructions for the server to follow

**Web 2.0 Interface**

**Enterprise Content**

IMS Inventory Application  
 DB2 Finance Application  
 SAP Product data  
 ...

**Web-based Content**

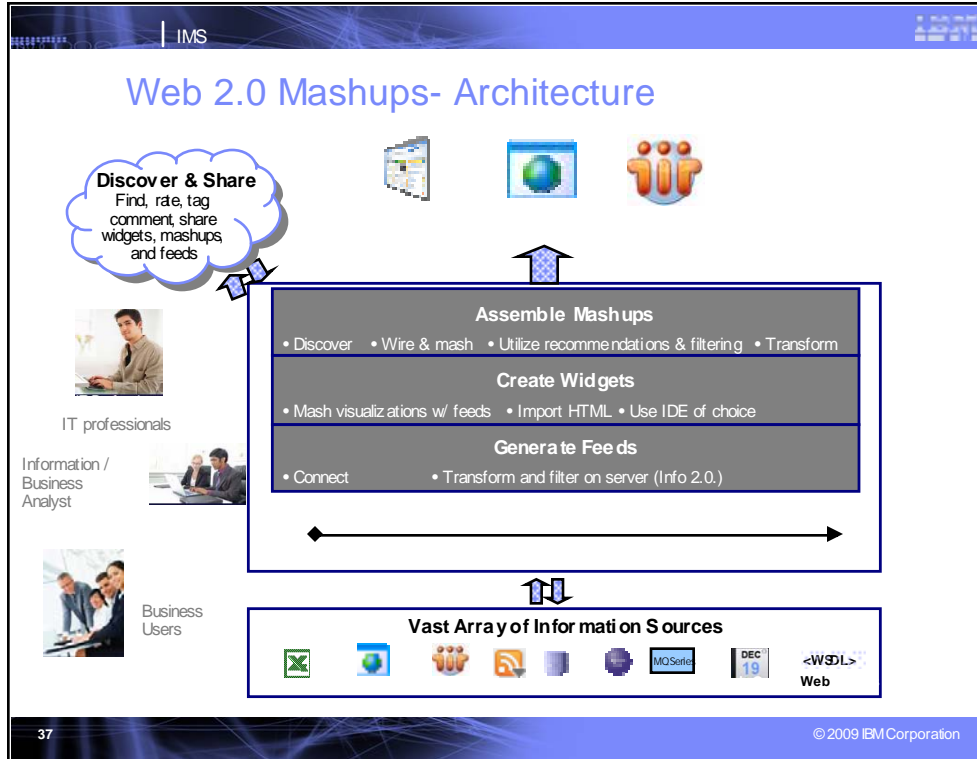
Stock Market data  
 Competitor customer references  
 Competitor product information

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Web 2.0 was a meeting to discuss using web as platform, putting into place the whole web as a single platform.

It provides a second generation of web communities and hosted services, transitioning from websites with isolated information to interlinked environments. It is use for interacting with web services. It simplifies use, with a subset of verbs when working with uniform resource information.

It leverages two approaches to web APIs: REST using HTTP alone to interact with XML or JSON; and SOAP involving POSTing more elaborate XML messages and requests to a server that may contain quite complex, but pre-defined instructions for the server to follow. We now have solutions that take advantage of IMS in this.



Mashups is a term from the music industry – music containing songs previously released by artists.

For the web, it is an application that combines data or content (FEEDs) from more than one source.

IMS

## Web 2.0 Scenarios:

**Rapidly Extend Business Logic**  
 Customers can extend their IMS investment by converting an IMS asset into an IMS RESTful service, which has the ability to consume and be consumed by other Web 2.0 services.

IMS customer can then remix and mashup their data rapidly with IBM Info 2.0 tools to extend their business logic without the need to write a single line of code.

**Extending Business Value**  
 By publishing an IMS RESTful Service to the Web 2.0 community, this opens up the possibility of 3rd parties to generate creative mashups which can benefit both 3rd party developers as well as the original IMS service provider. The 3rd party developer will now have IMS assets available to them. While, the IMS service provider can benefit from new business opportunities and increased partnership on the web.

The top screenshot shows a web application with a table of inventory items and a map of California. Callouts include 'IMS Inventory & branch locations' pointing to the table, 'Google Maps' pointing to the map, and 'Other web feed' pointing to the table's data source.

The bottom screenshot shows a web application with a table of inventory items and logos for 'RT', 'NT', and 'Alvoez Tractors'. Callouts include 'Existing web page/porta' pointing to the table, 'New Mashup' pointing to the logos, and 'IMS Inventory & branch locations' pointing to the table's data source.

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Web 2.0 allows you to more easily open your environment and take advantage of other applications available on the web.

Use includes:

Integrating data elements from multiple sources with a simplified front-end, e.g. Google maps.

Mixing data of similar types from different sources with a graphical front-end (e.g. Manufacturer's product description with additional map on closest retailers to a zip code)

Combination of these, focusing on both data aggregation and presentation and adding collaborative functionality.

IMS

## IBM Mashup Center Web 2.0 support

*A visual tool for creating, storing, transforming, and remixing feeds to be utilized in mashup, and a central catalog for users to tag, rate, and share mashable assets.*

**Create Feeds from:**

- Domino
- IBM Information Server
- IMS Transaction
- LDAP
- pureXML Document
- Relational
- SAP
- Tivoli Directory Integrator
- Web Service
- Excel or CSV
- Feed Registration
- MS Access Document
- XML Document

**Transform and Mix Feeds:**

- Import
- Filter
- Annotate
- Merge
- Publish
- Group/ Sort/ Union

**Catalog Feeds:**

- Share and discover mashable assets
- Rate and comment

**Webcast: "Harnessing the power of Web 2.0 and enterprise mashups"**  
<http://www.ibm.com/developerworks/db2/event/s/inf020.html>

39

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IBM Mashup center includes components for creating, storing, transforming, and remixing fees and for sharing with the Web 2.0 community.

IMS

## Web 2.0 and IMS

- IMS Web 2.0 development/runtime support

Service developer

IMS COBOL copybook

Web server

Mashup Hub

IMS feed generator

IMS

publish

REST services registry

REST service

IMS REST Service Adapter

XML

IMS Connect XML converters

IMS application

bytes

Development phase

Runtime phase

Web client

HTTP request

HTTP response

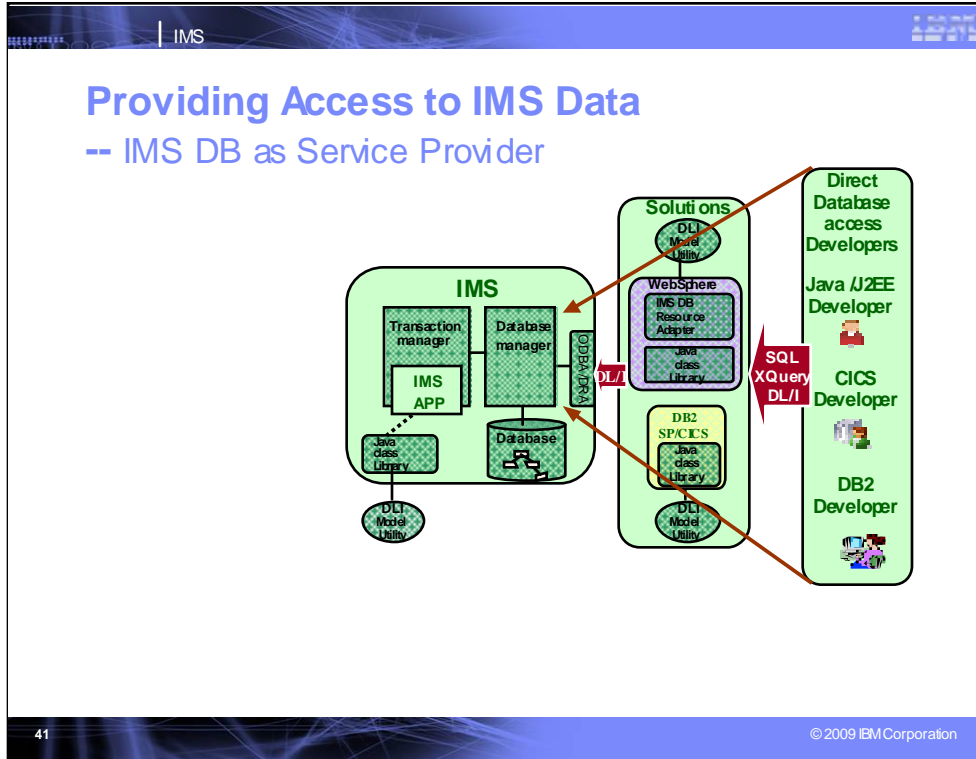
IMS Info 2.0 demo at  
<http://www.youtube.com/watch?v=BWJGSC-RyXQ>

40

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IMS Web 2.0 support brings IMS into the Web 2.0 world. It provides development and runtime support. Converters are created and put in IMS Connect. Connectivity to IMS applications is through IMS Connect using the XML converters. The application is accessed and the information goes back out. There is a demo out at <http://www.youtube.com/watch?v=BWJGSC-RyXQ>





Now we turn to facilities available for access to IMS data

IMS

## Application Access to IMS Data

- Direct Connection (database)
  - Characteristics
    - Access to data without invoking an IMS transaction
  - ODBA interface (Open DataBase Access)
    - Programs that issue DB calls must reside on the same MVS as IMS
  - IMS Integration Suite - DB interfaces
    - IMS DB Resource Adapter
      - IMS Java with JDBC support and the IMS DLI Model utility
    - IMS XML DB
  - Classic Federation Products

42

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Direct connection to IMS Data is provided, without invoking an IMS transaction, by using the Open Database Access (ODBA) interface. This can be done through the IMS DB Resource Adapter (earlier referred to as the JDBC Connector), the XML DB interfaces, and the Classic Federation products.

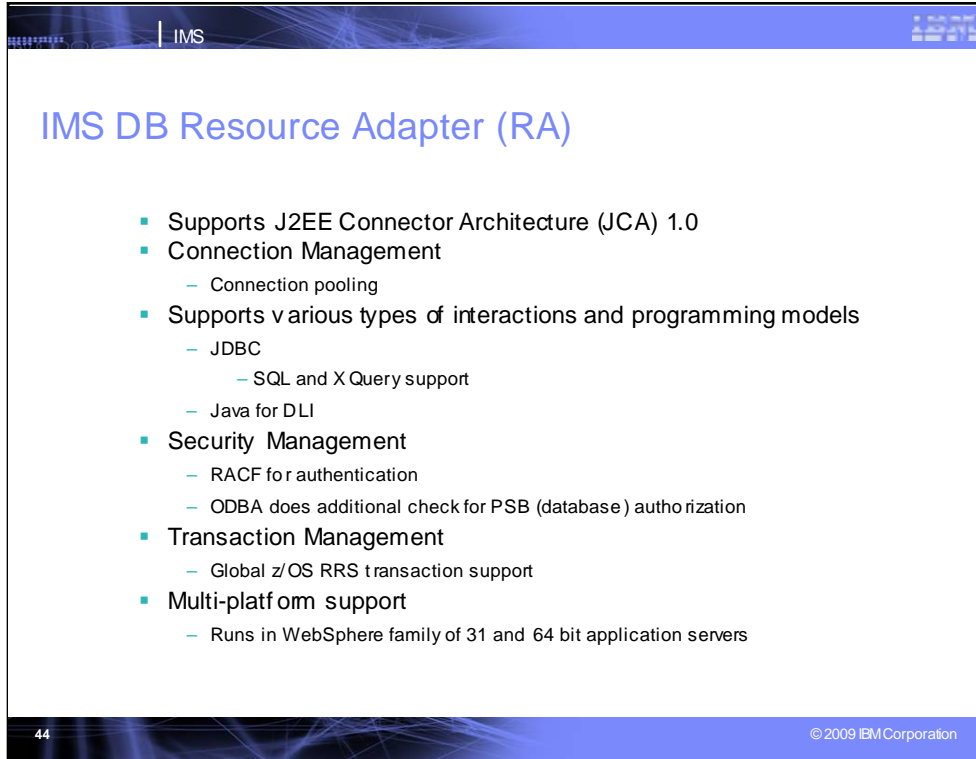
IMS

## Java in IMS

- **Java Support APIs - Java Classes**
  - Java TM - message queue processing, program switching, etc.,
  - Java DB - ability to process all IMS DB access commands
  - JDBC Driver for IMS
    - SQL type statements to access IMS hierarchic structure
    - DLI Model Utility to create and SQL view of IMS DB
    - Supports IMS applications issuing JDBC calls
    - Support Java applications outside IMS issuing JDBC calls
      - ODBA interface
- **IMS Dependent Regions - JVM support**
  - JMP - Java Message Processing region
  - JBP - Java Batch Processing region
- **Language Interoperability**
  - Java and OO Cobol

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In JDBC mapping, each segment is mapped out to look like SQL and under the covers is done the join, the SQL to DLI conversion, and fields become columns selected from the Application Program Control Block (APCB) to look like the standard IMS hierarchical structure.



The slide features a blue header with the IMS logo on the left and navigation icons on the right. The main content area is white with a blue border. The title 'IMS DB Resource Adapter (RA)' is in blue. A bulleted list follows, with sub-bullets. The footer is blue with the number '44' on the left and the copyright notice '© 2009 IBM Corporation' on the right.

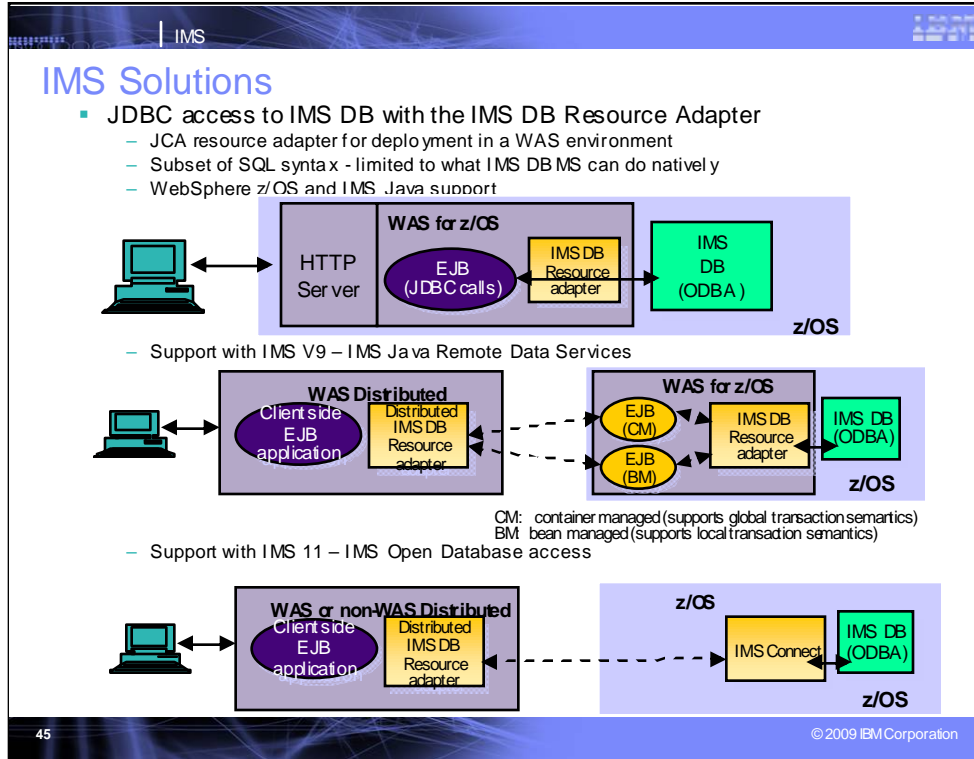
## IMS DB Resource Adapter (RA)

- Supports J2EE Connector Architecture (JCA) 1.0
- Connection Management
  - Connection pooling
- Supports various types of interactions and programming models
  - JDBC
    - SQL and XQuery support
  - Java for DLI
- Security Management
  - RACF for authentication
  - ODBA does additional check for PSB (database) authorization
- Transaction Management
  - Global z/OS RRS transaction support
- Multi-platform support
  - Runs in WebSphere family of 31 and 64 bit application servers

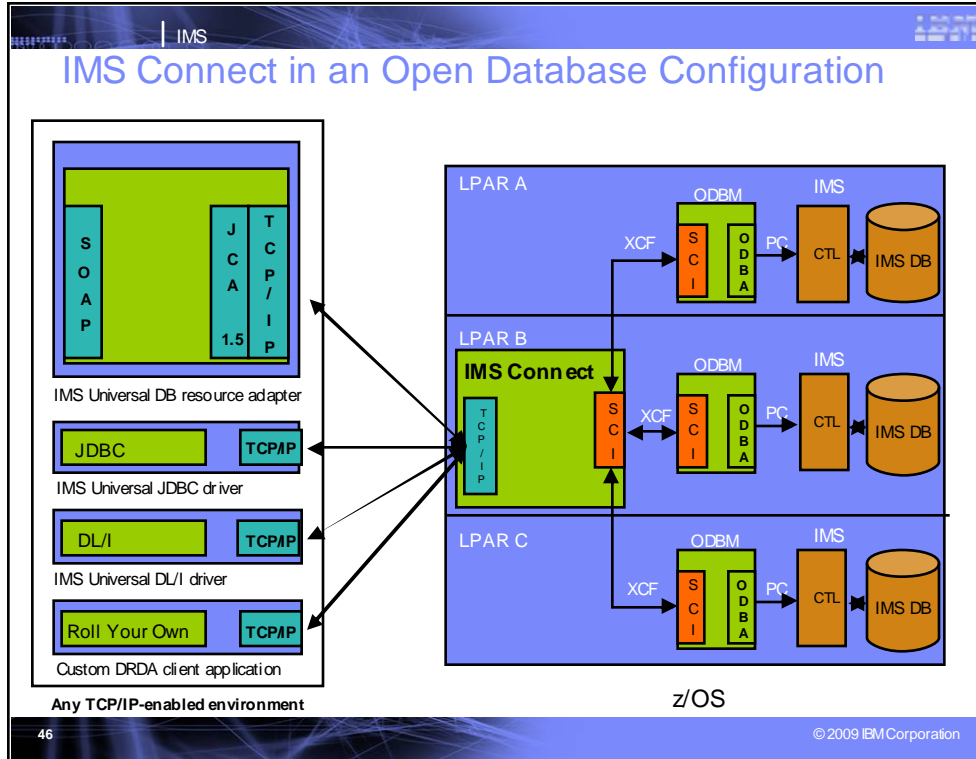
44

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The IMS DB RA supports the Java specification architecture and standards to make it easy for Java programmers to provide access. It provides JCA interaction with a direct connection to IMS data, allowing applications to directly query and manipulate IMS DB information using JDBC with both SQL and XQuery. It projects IMS Database assets into the SOA “Data Services/Messaging layer”.



The IMS DB Resource Adapter provides access to IMS databases through a server on the same z image as IMS from a remote browser. IMS V9 Remote Data Services (RDS) support removed the need for z application programming to allow a remote server to come into IMS through a local z server. Now, IMS 11 is making it possible to go directly to IMS data through IMS connect.



This leads us to our real goal, which is to leverage IMS Connect as the complete gateway solution for IMS TM, OM, and now DB. IMS Connect will become an ODBM client. This will allow distributed applications to leverage the TCP/IP protocol to communicate with IMS Connect, which can then access any database in the entire IMSplex.

-----  
 IMS Connect becomes the IMS Gateway to both IMS TM and IMS DB.

WebSphere and DB2 Stored Procedures no longer have to be on the same LPAR with IMS when they interface with the IMS ODBM (Open Database Manager) address space. The ODBM address space must be on the same LPAR with IMS due to the use of the ODBA (Open Database Access) interface.

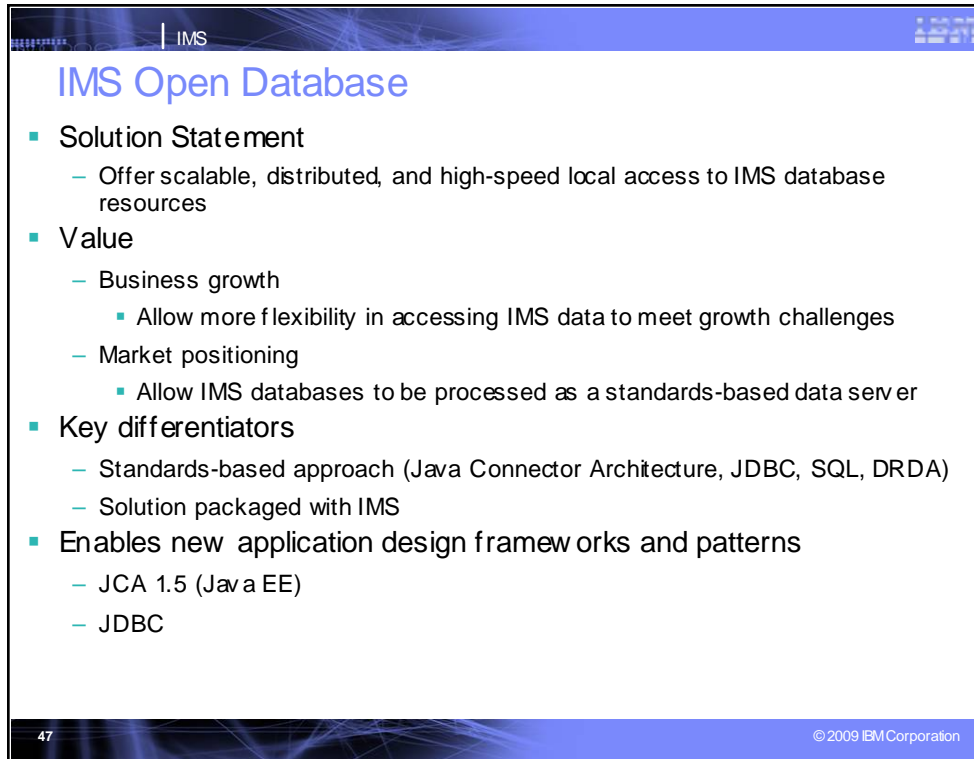
Distributed clients would now have the option of going directly to IMS Connect for IMS DB requests.

The Protocol we have chosen to communicate to IMS Connect is DRDA

DRDA is the industry standard for DB access in a distributed transaction processing environment

The Two Phase Commit and Security flows are imbedded in DRDA

The DLI API will be both IMS DLI traditional and advanced concepts (Like DELETE does not require the caller to make a hold call first)



The image shows a presentation slide titled "IMS Open Database". The slide is framed with a blue header and footer. The header contains the "IMS" logo. The main content area is white with a blue border. It lists several key points under the heading "IMS Open Database". The footer contains the number "47" on the left and the copyright notice "© 2009 IBM Corporation" on the right.

**IMS Open Database**

- **Solution Statement**
  - Offer scalable, distributed, and high-speed local access to IMS database resources
- **Value**
  - Business growth
    - Allow more flexibility in accessing IMS data to meet growth challenges
  - Market positioning
    - Allow IMS databases to be processed as a standards-based data server
- **Key differentiators**
  - Standards-based approach (Java Connector Architecture, JDBC, SQL, DRDA)
  - Solution packaged with IMS
- **Enables new application design frameworks and patterns**
  - JCA 1.5 (Java EE)
  - JDBC

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New function in IMS 11 is modernizing IMS DB access and application development. It helps address significant bottlenecks for business growth in client install base

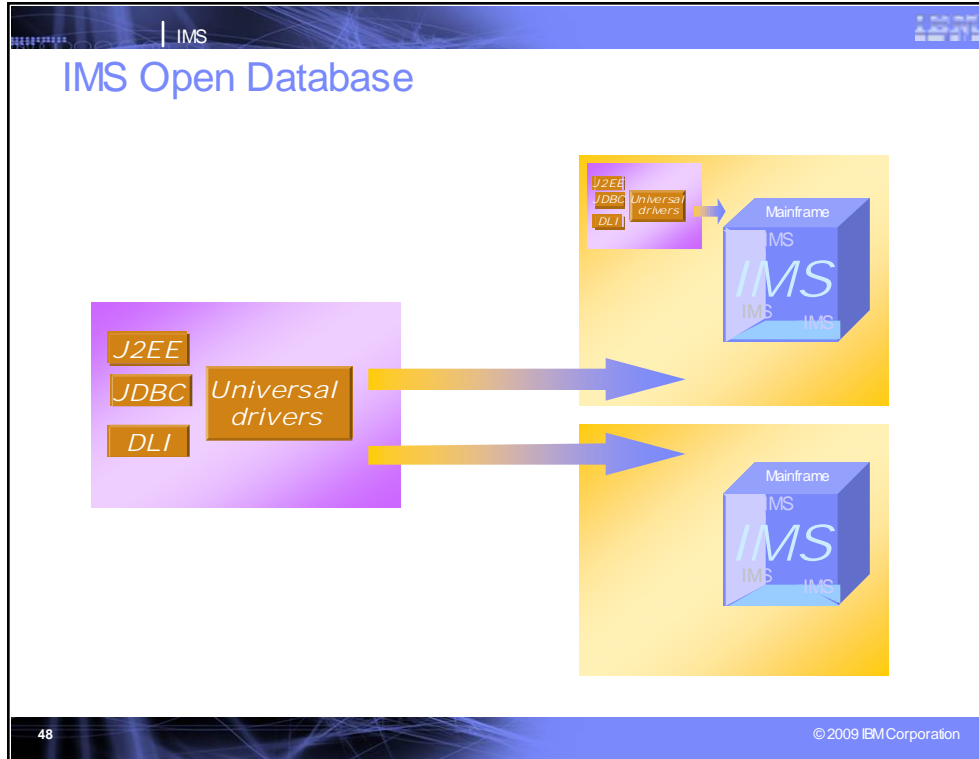
- Connectivity – IMS Data has been historically grounded to mainframe with ways to get to it that could be simplified
- Programmatic access – even when connectivity isn't an issue, skills could impact new application workload development.

IMS 11 Open Database support is:

- Rolling out a complete suite of Universal drivers in support of IMS database connectivity and programmatic access. Its intent is to provide access to IMS in a uniform way using the most relevant industry standards from any platform and from within the most strategic runtimes
  - Providing a standards-based approach opens a lot of growth and expansion opportunity
  - Providing a single Universal driver in support of both type-4 and type-2 connectivity in all supported runtimes – no need to learn another driver's semantics to toggle between environments and desired connectivity – all built in to the framework.
- Distribution of resources within an IMSplex included
- Extending the reach of IMS by extending the data

IMS DB metadata exposed via standard JDBC API and therefore can be consumed and visualized by JDBC tooling by allowing inspection of metadata, the next step is query. Its Query syntax uses standard query language syntax.

Differentiators include First-time compliance for JCA 1.5, First-time JDBC metadata compliance, Standardized the SQL in support of IMS access. IMS now hosts DRDA servers, both as source and target.



The Universal drivers have a framework capable of processing any of the three main programming models: J2EE, JDBC, DLI. The Universal drivers are able to connect to any IMS subsystem on any mainframe system. The same application can have active connections to any number of IMS systems on any number of mainframe installations.

We also have a requirement for providing type 2 access (IMS access from the same LPAR in WAS z/OS, IMS, CICS, DB2 z stored procedures) using these same Universal drivers. Again, the same framework would be capable of handling both type 2 and type 4 connectivity so the applications themselves do not change, only the connection properties would change.



IMS

## Representing IMS DB data as Web Services

- A simplified way to expose existing IMS data as a WebSphere-hosted Web Service.
- Provides web services for data
  - Uniform way to access and manipulate data from heterogeneous data sources, including relational databases, hierarchical databases, XML data sources, Web services, and Enterprise Information System (e.g. IMS & CICS)
  - Provides a common unifying format for exchanging data and messages among services and interacting with existing data sources without having to learn the intricacies of countless data access conventions
- Enhance IMS DLIModel utility to generate web service definitions for IMS data
  - The Web Service (an EAR file) is generated by the DLIModel utility.

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### **Key Message: IMS data is also being extended to support the latest standards for web services**

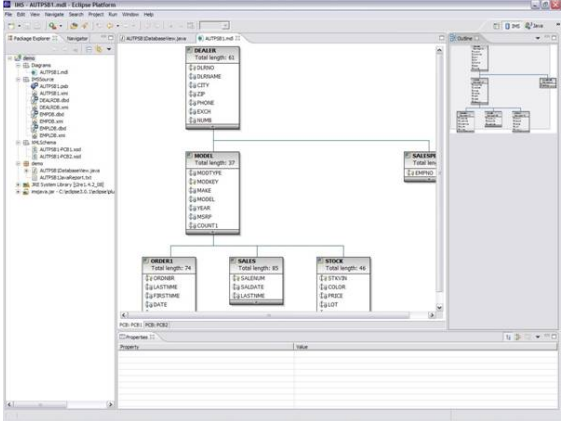
The IMS DB web services support is provided through the IMS 10 service stream. It offers a simplified way to expose existing IMS data as a WebSphere-hosted web service. This provides a single uniform way to access and manipulate data from heterogeneous data sources including relational databases, **hierarchical databases**, XML data sources, Web services, and Enterprise Information System (e.g. IMS & CICS). And it also provides a common unifying format for exchanging data and messages among services and interacting with existing data sources without having to learn the intricacies of countless data access conventions

**We have also enhanced the IMS DLIModel utility to generate the web service for IMS data.**

IMS

## DLIModel Utility

- IMS Database Visualization Tool
  - Visualize an entire IMS PSB
    - Can view each PCB individually
      - ▶ Hierarchy, segments, fields, types, etc
- IMS Database Metadata Generation tool
  - Generates the necessary metadata that is consumed at runtime by IMS JDBC driver, XML-DB support
    - Database metadata
    - XML schema
- Bottom up Tooling Approach
  - Parses PSB and DBD source
    - Optionally COBOL copybook definitions of segments
- An Eclipse 3.x Plug-in

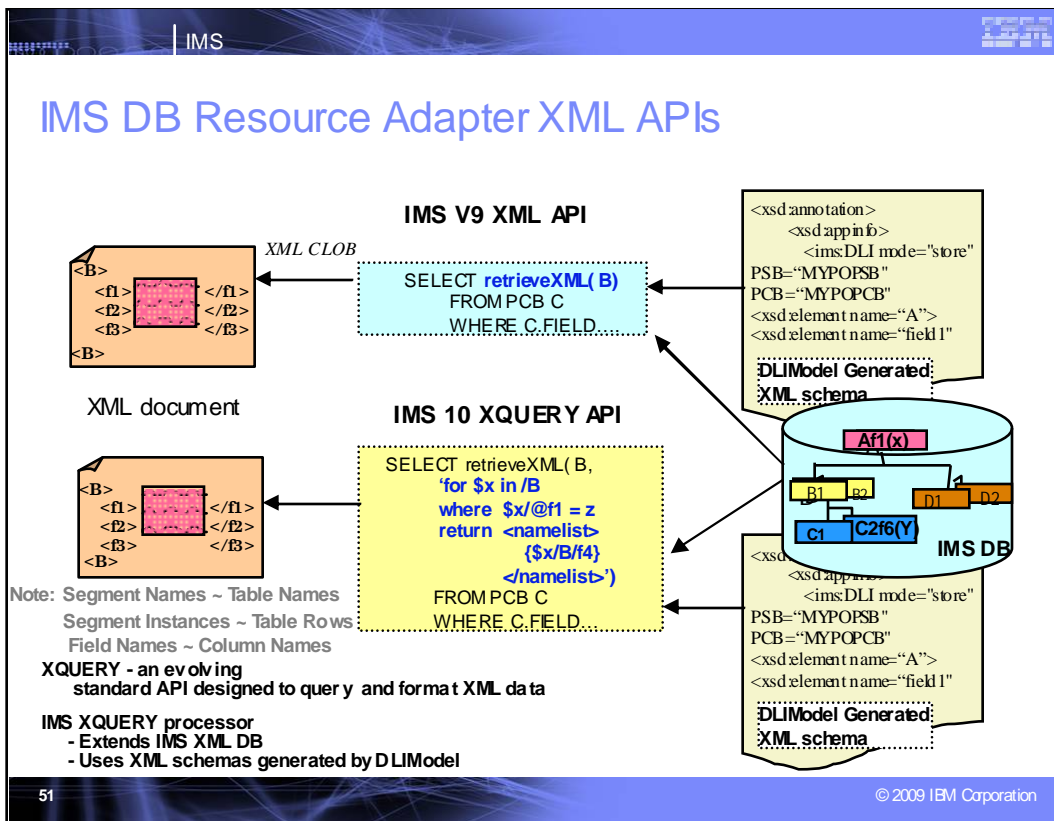


50

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The DLIModel Utility is a plug-in on top of Eclipse. You can download this eclipse plug in and it lets you visualize IMS PSBs and generate metadata for XML DB support.

With the DLIModel Utility, you are provided the metadata and a visualization of your databases in a GUI manner.



IMS V9 provided access to XML data for you to store and retrieve the document.

IMS 10 is a step up with XQuery support, which is the evolving standard API. With XQuery, you can look at the individual fields in the document.

IMS

## XML Database ...

- XML is Hierarchical
  - A standard that is well-suited to an IMS implementation
  - More natural fit for hierarchical data querying
- IMS has a 35+ year head start
  - Immediately usable with no migration of IMS data
- Introduces a way to view/map native IMS hierarchical data to XML documents
  - Aligns IMS Database (DBD) with XML Schema
- Allows the retrieval and storage of IMS Records as XML documents with no change to existing IMS databases
  - Enables query of IMS data using XQuery
  - Creation of IMS segments from XML documents (decomposition)
  - Intact storage of XML documents (without decomposition)

The diagram illustrates the mapping between XML and IMS. On the left, 'XML Documents' are shown with a large arrow pointing to an 'XML Schema' tree. The schema has a root 'book' node with children 'year', 'title', 'author', 'publisher', and 'price'. 'author' and 'publisher' have 'first' and 'last' children. 'price' has a 'value' child. Below these are 'xs:date', 'xs:string', and 'xs:decimal' data type labels. In the center is an 'IMS DBD' cylinder labeled 'PCB: BIB21'. It contains a table with columns: 'YEAR', 'TITLE', 'PUBLISH', 'PRICE', 'LAST', 'FIRST', 'LAST', 'FIRST', 'AFFIL'. On the right, a large arrow points from the IMS DBD to 'IMS Data'.

52

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Since XML and IMS DB are both hierarchical, IMS is a natural match for the XML Data. IMS is a perfect place to store intact or decomposed XML data.

IMS provides a natural flow. Say you have 20 year old history data, IMS can use XML support to retrieve it as XML data. It can take the structure, create XML schema, create a Java program to use and bring it out as XML data.

IMS

## InfoSphere Classic Federation Server -- Federated Data Access

- SQL Read/Write access with 1PC & 2PC to mainframe data
- Distributed & mainframe clients via JDBC, ODBC, or Call Level Interface
- Metadata-driven:
  - No Mainframe Programming Required
  - Fast Installation Dynamic Configuration and Mapping
  - Ease of Maintenance
- Works with existing and new:
  - Mainframe infrastructure
  - Application infrastructure
  - Toolsets

53

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IBM also provides a more general set of solutions for data access. The Classic Federation server can retrieve your IMS data from a variety of distributed and mainframe clients, along with other data types.

IMS

## InfoSphere Classic Data Event Publisher for z/OS -- Pushing Data Out

- Real-Time Asynchronous Change Capture for mainframe
- “Push” technology delivers before and after images of committed changes.
- Native data normalized into relational rows using same meta-data catalog as CF (and same internal SQLDA msg format)
- Data capture of Table VIEWS supports record filtering
- 3-Tier service oriented architecture for maximum efficiency
- Recovery capability
- Publications in Table
- Publishing options
  - MQ Series
  - Flat file – USS
- Publishing formats
  - XML
  - Delimited (CSV)
  - Raw

The diagram shows a central box labeled "InfoSphere Classic Data Event Publisher" with a binary code background. Below it, five database icons are shown on a green base, each with a label: "Native VSAM", "IMS", "Software AG Adabas", "CICS VSAM", and "CA IDMS".

54

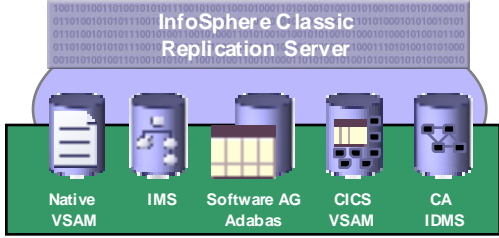
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The Classic Data Event Publisher can push IMS changed data out into a relational database, for other uses, such as a Data Warehouse.

IMS

## InfoSphere Classic Replication Server -- Pushing Data Out

- Same Capture engine as WebSphere Data Event Publisher
- Adds ability to Load from "Classic" sources using Classic Federation
- Unidirectional Classic to RDBMS via Replication Server's Q Apply
  - DB2 on all platforms
  - Oracle, SQL Server, Informix and Sybase on distributed
- Uses Compact Message format of Replication Server
  - Messages put on Websphere MQ queues
- Subscriptions stored in Replication Server relational format



The diagram illustrates the InfoSphere Classic Replication Server architecture. At the top, a grey box labeled "InfoSphere Classic Replication Server" contains a binary code pattern. Below this, five server icons are shown on a green base, each representing a different data source: Native VSAM, IMS, Software AG Adabas, CICS VSAM, and CA IDMS.

55

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The Classic Replication Server also pushes data out.

IMS

## Providing Outbound Access from IMS Transactions -- IMS as Service Requester

- IMS Solutions for Consuming Web Services
  - WebSphere MQ/MB
  - SQL Call to DB2 stored procedure
  - IMS Java
  - IMS Callout support

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Now we turn to a number of tools providing ways to write outbound access from IMS to other applications and position IMS as a service consumer.



IMS

## Consuming Web Services...

- Websphere MQ/MB/ESB
  - MQ API calls in IMS applications can participate in solutions provided by WebSphere Message Broker and the ESB (enterprise service bus)
  - Transforms messages formats between MQ applications and web services

**Transformation, Routing and Data Integration**

- Provides an ESB solution
- Powerful engine for message/data transformation and integration
- XSLT engine for XML transformation
- Web services (HTTP/SOAP) protocols support

WebSphere Message Broker  
WebSphere Event Broker  
WebSphere MQ (including JMS)

57

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WebSphere MQ is a viable solution if you already have MQ. IMS applications can issue an MQ put/get with an asynchronous call from IMS.

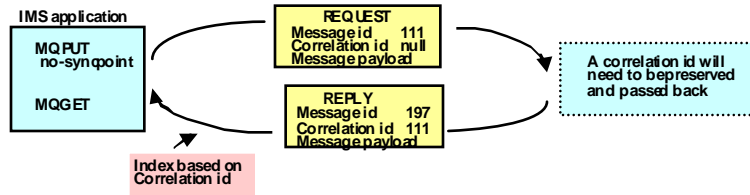
ESB code, with or without hardware, allows applications to send in one way and out another. WebSphere Enterprise Service Broker is targeted at J2EE calls.

WebSphere Message Broker is intended as a more generic tool for conversion/transformation.

With these solutions the message is called and transformed to a web service and back.

## Consuming Web Services...

- Websphere MQ/MB/ESB...
  - Considerations
    - MQ - correlation ids, indexes, ...
    - MB - mapping, nodes, ...
    - IMS - dependent region occupancy, locks, ...



- References
  - SG24-7163 Enabling SOA Using WebSphere Messaging
  - SG24-7137 WebSphere Message Broker Basics
  - [http://www1.ibm.com/support/docview.wss?rs=171&uid=swg24009880&loc=en\\_US&cs=utf-8&lang=en](http://www1.ibm.com/support/docview.wss?rs=171&uid=swg24009880&loc=en_US&cs=utf-8&lang=en)

Websphere MQ recommendation is not to use synchpoint, but you need to keep touch of the message ID, and look for correlation ID .

IMS

## Consuming Web Services...

- “SQL CALL” to DB2 stored procedures
  - IMS application program must include logic to
    - Set the host variables prior to executing the CALL
    - Handle any error conditions returned by the stored procedure

```

graph LR
    subgraph IMS_application [IMS application]
        direction TB
        I1[01 aaa PIC X(30).]
        I2[01 bbb..]
        I3[....]
        I4[EXEC SQL:]
        I5[CALL MYPROC ( :aaa]
        I6[                :bbb]
        I7[                )]
        I8[END_EXEC.]
    end

    subgraph DB2
        direction TB
        S[Stored procedure]
    end

    subgraph WebSphere_Application_Server [WebSphere Application Server]
        direction TB
        WS[Web service]
    end

    I5 --> S
    S --> WS
    WS -.->|UDFs - user defined functions| S
  
```

- References
  - SG24-7083 DB2 for z/OS Stored Procedures: Through the CALL and Beyond
    - Chapter 24.4 - Accessing DB2 stored procedures from IMS
  - SG24-7064 WebSphere for z/OS V6 Connectivity Handbook
    - Chapter 13.2 - Calling a web service from DB2

59

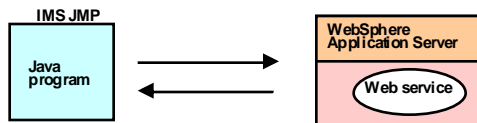
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Another solution is issuing a DB2 call from IMS to a DB2 table or procedure, have DB2 call web service and come back out. But you will need to hold IMS during the DB2 call. There is a redbook that can tell you how to set up this environment.

## Consuming Web Services...

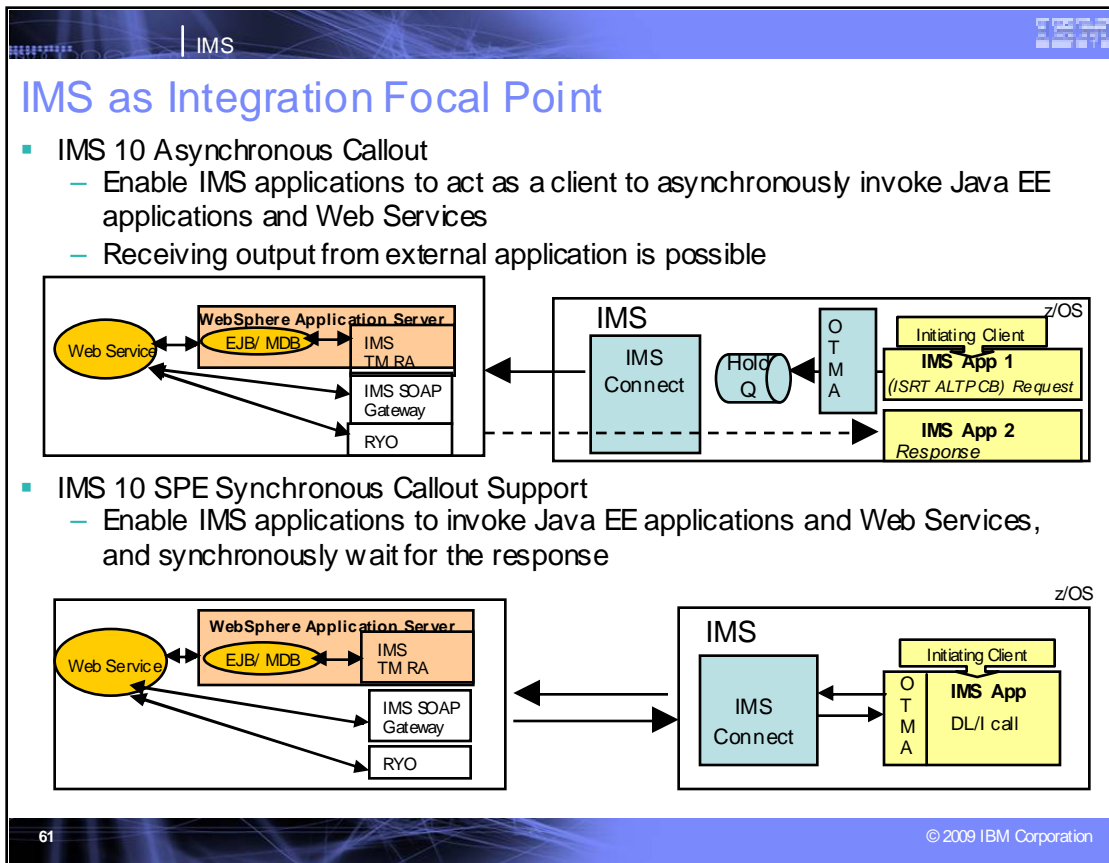
- IMS Java application capabilities

- Natively, this capability exists today natively in Java.
  - Direct call (synchronous and asynchronous)
  - JAX-WS
  - JAX-RPC



- References
  - SC18-7821 IMS Java Guide and Reference

IMS Java applications can themselves call out.



### Key Message: IMS 10 Callout support enables IMS as the Integration Focal Point

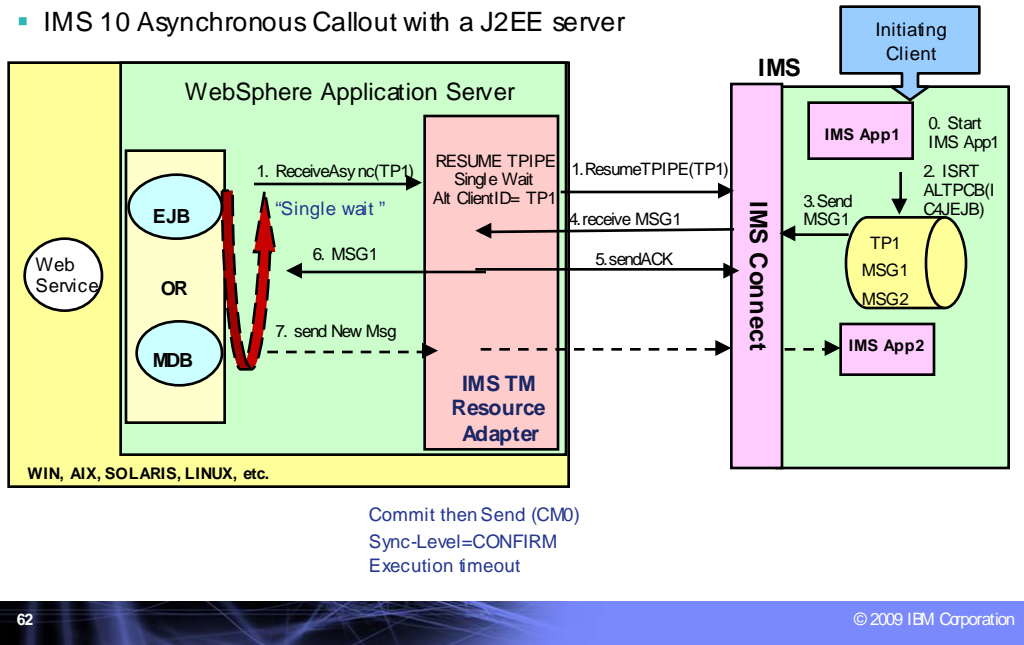
One of the key customer requirements we had heard regarding SOA support for IMS is for Callout support, where an IMS application could call out to another application across the IMS TM Resource Adapter to WebSphere server applications or to SOAP application environments. IMS Callout support enables IMS applications as clients, interoperating with business logic outside of the IMS environment. This support includes correlation mapping between the callout request and the external application, enhanced security, and assistance on destination routing. This support allows for better integration in an SOA environment.

For example, an application may need to know the current stock price, or may need to look up the current sales tax rate.

Callout support has been provided for IMS 10, first as an asynchronous transaction, and later as a synchronous call where the IMS application will wait for the response before continuing. Synchronous callout support is being provided through the service process

## Consuming Web Services ...

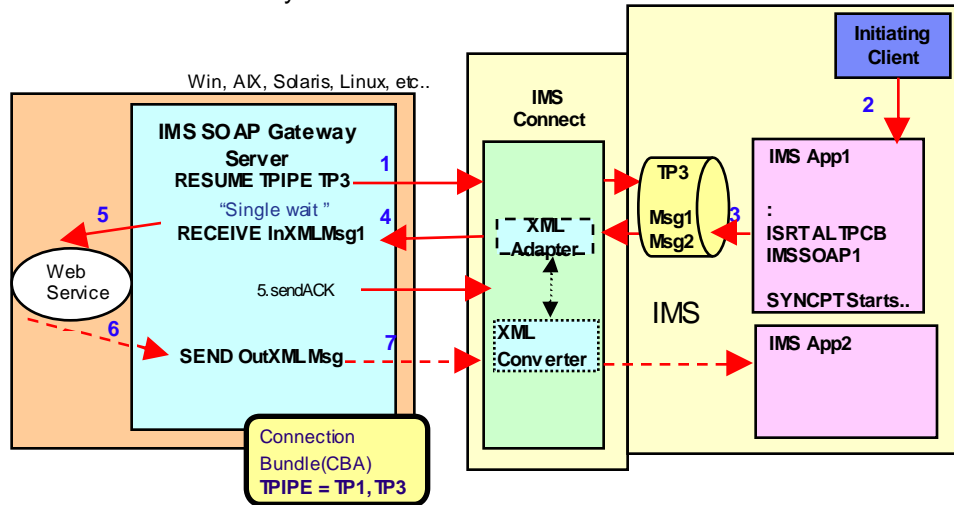
- IMS 10 Asynchronous Callout with a J2EE server



IMS 10 introduced the ability for an asynchronous callout with a J2EE Server using IMS TM RA.

## Consuming Web Services...

- IMS 10 Asynchronous Callout with XML and the IMS SOAP Gateway



Asynchronous callout is also provided through the IMS SOAP Gateway

IMS

## IMS Today is SOA Enabled with Solutions for Distributed, Integrated Access

- **Protecting customer investments by enabling access to/from IMS transactions and to IMS data**
  - Designed to support open integration technologies
  - Modernize IMS transactions and data
- **Fully integrating with WebSphere and Tools and utilizing a common programming model for a service-oriented architecture (SOA) based on standards**
- **Encouraging new application development by supporting standards**
  - **Java for rapid application development**
  - **XML for clean/structured documents with powerful views/search**
  - **SOAP for structured info exchange in loosely-coupled distributed environment**

64

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### **Key Message: IMS is SOA Enabled.**

IMS distributed, integrated on demand solutions protect customer investments by enabling access to IMS transactions and data. These solutions are designed to support open, integrated technologies and modernize use of IMS transactions and data.

These solutions fully integrate with WebSphere and industry tooling. They utilize a common programming model for a service-oriented architecture (SOA), based on standards, such as XML, SOAP, Java, JDBC, etc., and new ones as they develop.

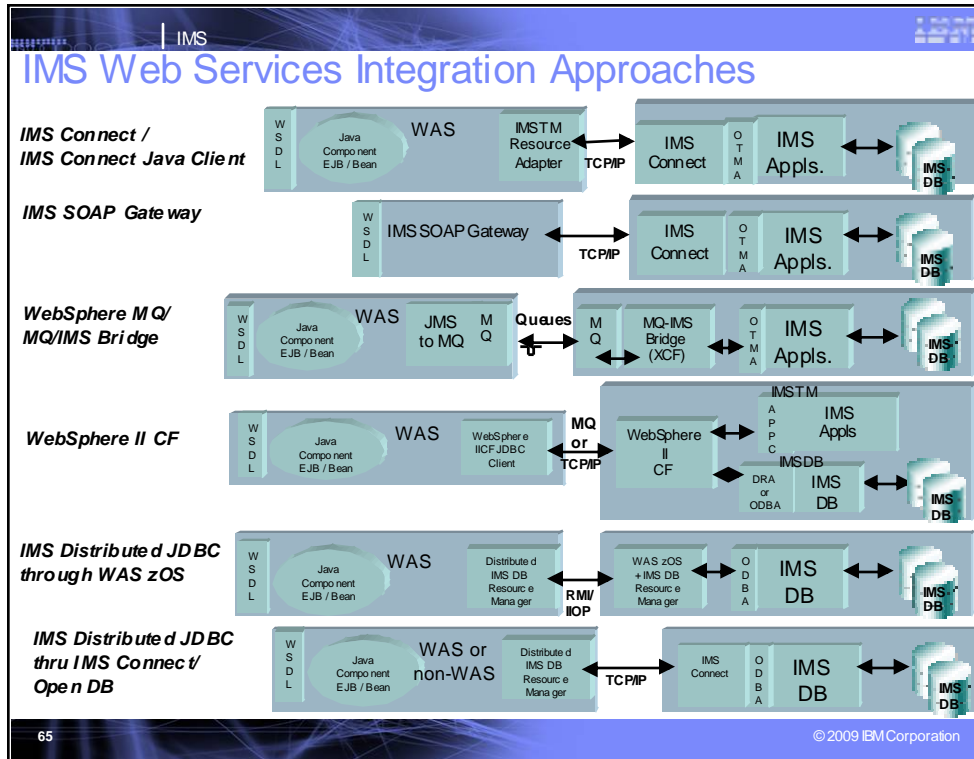
- Java can be used for rapid application development of new applications that access IMS transactions and data, and for new applications that run under IMS control. It offers reuse of applications in a variety of environments. And it leverages standards, such as Java Connectivity Architecture (JCA) for enhanced IMS application access and JDBC for enhanced IMS data access.

- XML allows us to create clean, structured documents with powerful views and search capabilities. It can be used for data exchange of documents containing structured and non-structured information from a variety of sources. And it is hierarchical, a natural fit for IMS, ensuring the ultimate performance our clients expect.

- SOAP (simple object access protocol) is an XML based standard for exchanging structured information in a loosely coupled distributed environment. It is platform-neutral and can communicate with and take advantage of individual functions of distributed applications

Support of this advanced technology would then encourage new application development and new application developers.





**Key Message: IMS Transactions and data can now be enabled as Web services, and be supported in a Service Oriented Architecture (SOA) with a variety of techniques.**

Web services provides the next step in the evolution of the internet, allowing programmable elements to be placed on sites for distributed web access across platforms.

WebSphere tooling today enables IMS transactions using COBOL, C, PL/I and MFS-based applications as Web services.

Using IMS Transactions as Web services leverages your past investment in application development and information. It can also eliminate or greatly reduce new programming effort, reduce end-to-end business process transformation, and facilitate application integration with partners, suppliers, and customers.

- A key element of the OnDemand environment is the Integrated IMS Connect function. This function provides easy-to-install, easy to use, high performance/high volume and secure transparent access to IMS applications and their data. This can be done from any application environment, including LINUX. It utilizes the IMS Open Transaction Manager Access (OTMA) interface for access to IMS applications and the Structured Call Interface (SCI) for access to IMS operations.
- The IMS TM Resource Adapter (aka IMS Connector for Java), provided as development and runtime code, works with IMS Connect to enable development and connectivity of Java applications running under WebSphere Servers.
- The IMS Soap Gateway broadens IMS application integration to other web serving environments.
- WebSphere MQ also provides access to IMS applications through the OTMA interface.
- As we move down the page, WebSphere Information Integration Classic Federation (IICF) offers SQL and JDBC access to IMS Data through the IMS Open Database Access (ODBA) interface. This provides distributed, common access to IMS Databases along with non-IMS databases, using the Information Integration product family. IICF can also be used to provide access to IMS applications.
- Also providing Distributed JDBC access to IMS database resources is the integrated IMS DB Resource Adapter support. This support provides an IMS Distributed DB Resource Adapter driver for a distributed J2EE application server and requires no additional z/OS application programming.
- And with IMS 11 the Open DB support further extends and eases this distributed access

IMS

## Continuing on with Emerging Technologies...

### *Addressing IMS SOA Requirements*

- Extend access to IMS applications/data
- Enhanced IMS application development/deployment
- Provide easier to use interfaces, APIs
- Continue to enrich functionality in SOAP, XML, and IMS WS\*
- Provide additional support with WebSphere/Rational tools
- Simplify Installation

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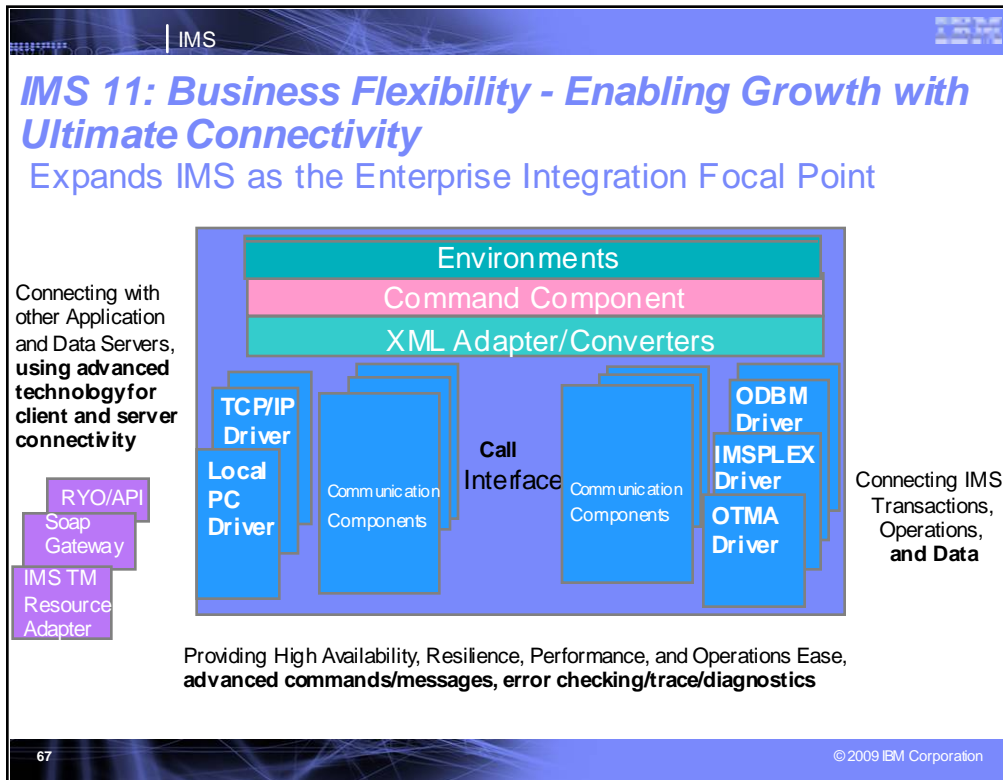
We are continuing to extend access to IMS applications and data to enable IMS as the SOA integration focal point for you with:

- Enhance access and encouraging the growth of new client applications for IMS
- MashupHub support for IMS data (in addition to the Transaction access provided earlier)
- IMS Connect Enhancements of availability, usability and scalability.
- Open Transaction Manager Access (OTMA) enhancements to improve storage utilization, reduce dependency on RRS, enhanced Security.
- Open Database Access

**SOAP, XML, and IMS Web Services** and other standards support, enhanced MFS BPEL support for WebSphere Integration Developer (WID) and Websphere Process Servers (WPS).

We also plan to continue to provide enhanced **WebSphere and Rational** Tools for IMS application development and enablement.

And we are continuing to simplify installation



**Key Message: IMS provides and continues to enhance the integrated IMS Connect function.**

IMS Connect function is part of the overall restructure of IMS for the 21st Century and is architected as the base for all future IMS Connectivity. Much of the function of IMS Connect can also be used with earlier IMS Versions so you can start to take advantage of it before migrating your networks/applications/databases to IMS V9. The structure of IMS Connect is designed such that drivers can be interchangeable. That is, alternatives for the TCP/IP front end or OTMA back end interfaces are already being provided. These are allowing IMS to exploit newer, additional, and enhanced protocols and/or interfaces. Along with IMS Connect is provided the IMS Connector for Java for access from Java applications, SOAP Gateway and parsers, and samples for other language access as well.

With IMS Version 8, IMS extended its use of XCF for use by other IBM subsystems, such as IMS Connect, for distributed operations access through the Structured Call Interface to the Operations Manager from the DB2 Version 8 Control Center as a single point of control.

With IMS Version 9 this function was integrated in.

With this structure IMS 11 Connect is evolving to address other connectivity requirements -- distributed database access to IMS DB, enhanced client connections,

IMS  
IMS Enterprise Suite Version 1 Release 1  
Announce Oct 27, 2009 for General Availability Nov 6, 2009  
Product ID 5655-T60 (\$0), S&S 5655-T61(\$0)  
Also downloadable from IMS SOA Integration Suite

**Base Content**

**Lowering Costs, Opening Up IMS Applications and Data with innovation through:**

**Business Flexibility.**

- Expand Java Application Development with Java Callout
- Ease access with Connect API for Java and for C
- Extended Standards and Tools for SOA with SOAP Gateway
  - WS-Security
  - Business Event support for WebSphere Business Events and WebSphere Business Monitoring tools
- Ease Application Development and Data Administration with DLIModel Utility plug-in
- Expanded Graphical Data Functionality

**Simplification:**

- Ease Installation with SMPe and Installation Manager support
- Simplify Interface with GUI Eclipse PlugIn
- Streamline open source access

**Migration**

**Upgrade/Coexistence for IMS Enterprise Suite from**  
IMS 10 DLIModel Utility plug in  
IMS SOAP Gateway 10

**Publications**

Announce Letters:

- o 209-350 (US)
- o A09-1196 (Canada)
- o ZP09-04 09 (E MEA)
- o AP09-0339 (AP)

IMS Enterprise Suite Program Directory (GI10-8816-00)  
IMS Enterprise Suite License Information (GC19-2807-00)

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**Key Message: IBM continues to enhance IMS, addressing customer requirements, with the IMS Enterprise Suite**

IMS Enterprise Suite Version 1 Release 1 (V1.1) with product numbers 5655-T60, and 5655-T61 (for service and support) announces on 10/27/09 its General Availability of 11/6/09. It features independent components that extend IMS access and use industry standard tools/interfaces to modernize/speed application development/deployment, enrich functionality and ease installation and use.

IMS Enterprise Suite V1R1 is a separate, no charge, product that provides enhanced IMS application development and integration. It is a collection of IMS middleware functions and tools that support your IMS on demand systems and your distributed IMS application environment. IMS Enterprise Suite V1.1 components are designed to enhance your use of IMS applications and data. In this initial release of the suite, components deliver innovative new capabilities for your IMS environment that enhance connectivity, expand application development, extend standards and tools for a Service Oriented Architecture (SOA), ease installation, and provide simplified interfaces. It includes the JMS API open source used for IMS Java application callout, the Connect API for Java and for C (though C support is being provided through the service process), the IMS SOAP Gateway for enhanced connectivity to/from IMS applications and data along with its open source and enhancements for WS-Security and Business Events, and the DLI Model Utility plug in, with its enhancements, and required open source. Also provided is the Installation Manager and SMP/E support to ease installation on the distributed and z/OS platforms.

IBM is providing IMS solutions that ease integration with new technology for a service oriented architecture -- focusing on open, distributed connectivity, expanded application development access support, extended Web Services and connectivity for SOA

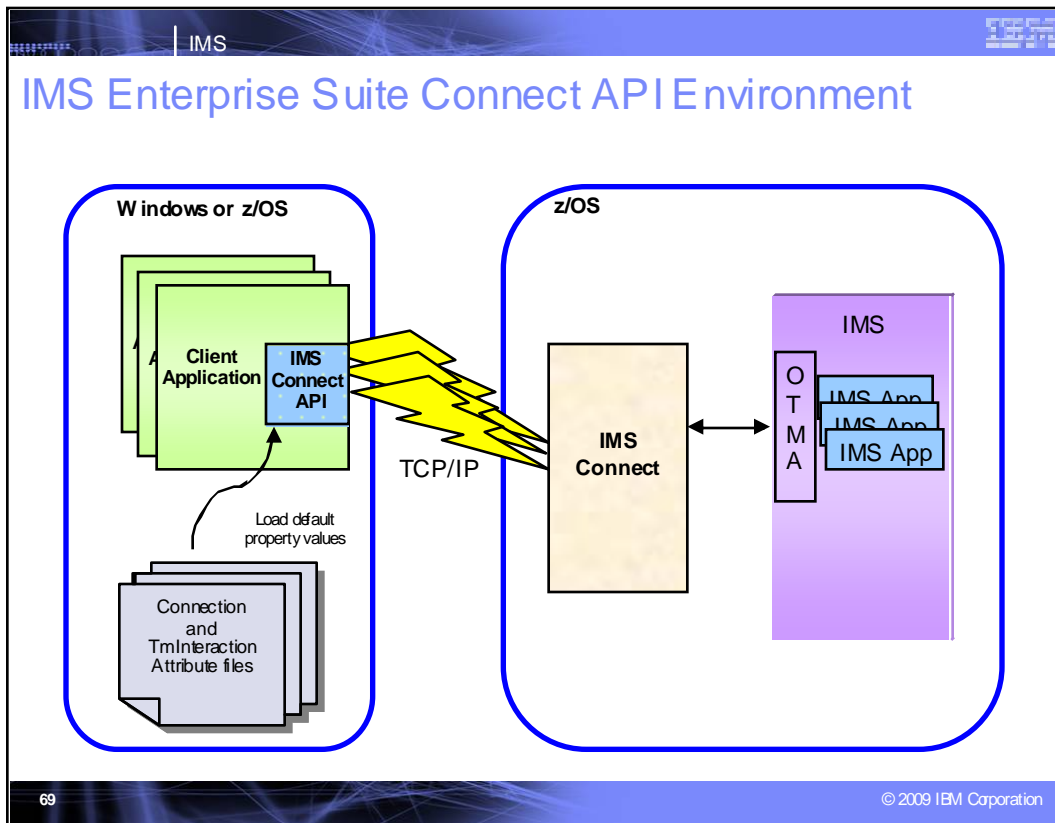
We are also providing solutions that help simplify installation and management.

Migration support is provided to the IMS Enterprise Suite from both the IMS SOAP Gateway 10 and the IMS 10 DLIModel Utility. Migration support will be provided for z/OS and AIX environments. For Windows environments, instructions will be provided.

The following publications are provided for IMS Enterprise Suite V1.1:

IMS Enterprise Suite Program Directory (GI10-8816-00)

IMS Enterprise Suite License Information (GC19-2807-00)



**Key Message: IBM is enhancing IMS Connect use with the IMS Enterprise Suite Connect API**

The IMS Enterprise Suite Connect API simplifies design, development, and test of IMS access for client TCP/IP applications. This provides an extensive set of profiles that define the types of interactions to be performed and high- and low-level methods for performing these interactions. This simple API allows interaction while shielding the complexities of protocols, provides the IMS Request Message header, and allows socket programming. Using reusable profiles, it provides a simple way to describe TCP/IP socket connections, interaction protocols, message headers, and data. For more direct control, more granular lower-level calls are provided. Support for Java applications in Windows and z/OS environments is supported initially, and support for C applications in Windows environments is being delivered next through the service process.

This figure shows the environment in which the IMS Connect API can be used. It also depicts the fact that multiple client applications that use the IMS Connect API can be invoked simultaneously. The API will communicate with IMS Connect. Upon request by the client application, for example, in an execute() or connect() call, the API will create a connection object for use by that application only, which the client must keep track of, calling disconnect() on the connection object before exiting. Of course in Java, orphaned connections would eventually be cleaned whenever there are no longer any references to those connection objects, but this still requires that the application developer does not keep references to connection objects that it no longer needs.

In addition to IMS transactions, the initial release of the IMS Connect API will support the IMS Connect user message exit-supported PING and RACF password change commands along with all IMS commands supported by OTMA.

IMS

## IMS Enterprise Suite JMS API Support for Synchronous Callout Requirement

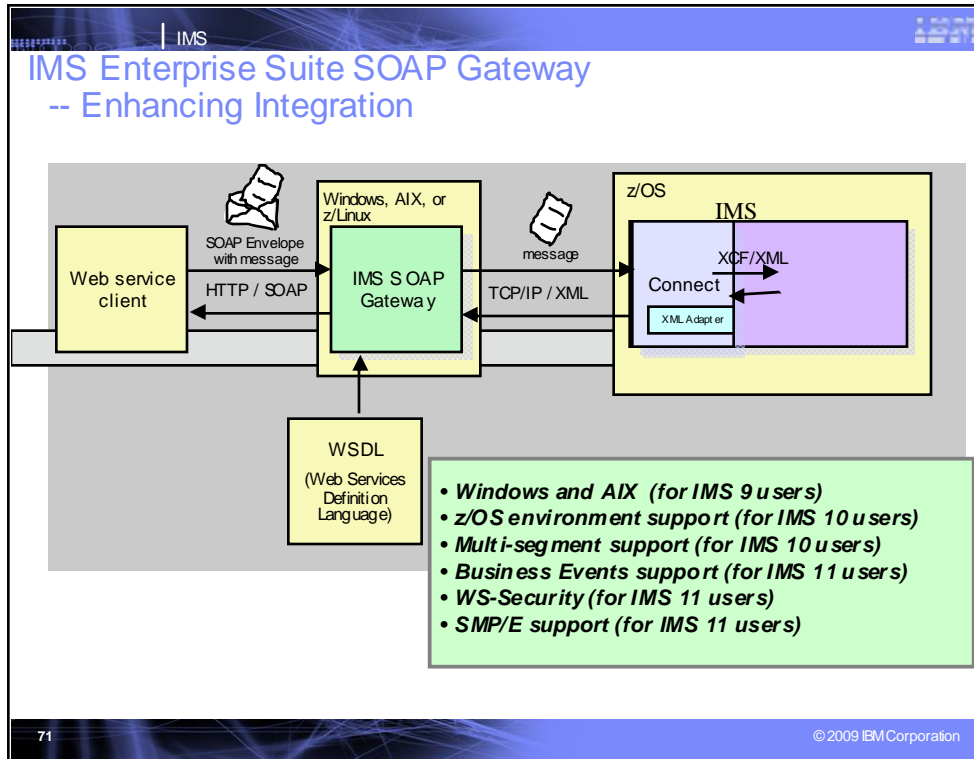
- Provides Java Message Server (JMS) API for accessing IMS Synchronous Callout function.
  - Enables business growth -- Allows more flexibility in accessing cross enterprise data and functionality from within IMS applications to meet growth challenges.
  - Exposes core IMS functionality through a Java standard interface - Makes IMS function more accessible to application developers with modern skill sets.
  - Offers standards-based approach - Exposes IMS industry leading transaction management capability through a Java standard interface, JMS
  - IMS Callout function included in IMS; JMS API packaged with IMS Enterprise Suite.
  - Enables new application design frameworks and patterns
  - Synchronous callout support is the first IMS function to fully embrace the JMS standard in IMS application development.

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The Java Message Server (JMS) API can be used for synchronous callout from an IMS Java application.

The JMS API improves programmer productivity by defining a common set of messaging concepts and programming strategies that will be supported by all JMS technology-compliant messaging systems. By making IMS a JMS provider we address the skills issue impacting client's ability to develop new applications which goes to revenue. Although heavily used by IMS customers, the DL/I API isn't an industry standard and skills may be limited. Providing modern standards based access to IMS functions reduces customer costs.

Synchronous callout support is the first IMS function to fully embrace the JMS standard in IMS application development. We are considering future enhancements to front-end IMS message queue processing with the JMS interface.



**Key Message: IBM is enhancing the IMS SOAP Gateway support**

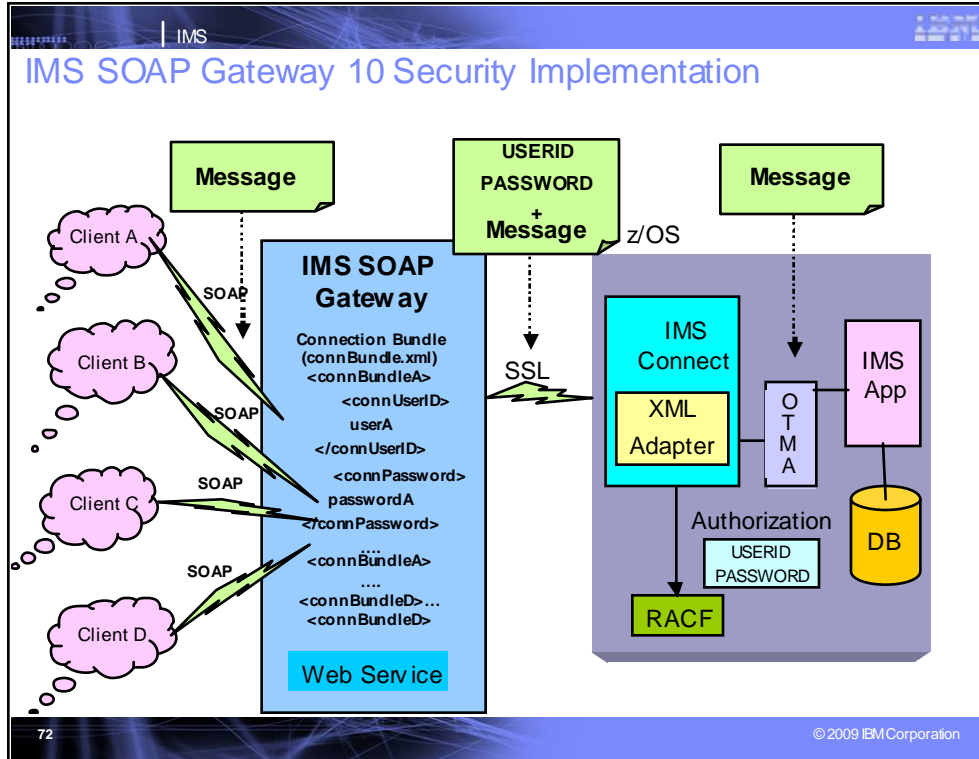
The IMS SOAP Gateway provides direct SOAP access to IMS transactions. The SOAP gateway is a lighter weight solution, and is for when you don't have J2EE servers. If you have J2EE servers, you would want to use the IMS Transaction Manager Resource Adapter. With the SOAP Gateway, SOAP XML format is sent it. It translates back and forth without application servers. It creates WSDL and tells about the web location and correlator files. Connect calls the converter file to have the message come in as an LLz format. IMS could use the Rational Developer for zXML Adapter for COBOL with its SOAP gateway code. The SOAP Gateway has been Generally Available (GA) for IMS 10, downloadable at [www.ibm.com/ims](http://www.ibm.com/ims). The IMS Connect XML adapter initially provided support for COBOL and SOAP Clients. z/OS support was provided more recently, in addition to the Windows, AIX, zLinux support provided earlier. PL/I support is also being made available for generating WSDL and PLI XML Converter programs from PL/I source.

Additional requirements for IMS SOAP Gateway include:

-WS-Security support implements WS\*Security in IMS SOAP Gateway in order to be able to authenticate the user who is executing the SOAP requests at IMS. SOAP Gateway includes the WS-Security enhancements to SOAP messaging that provide security through message integrity, message confidentiality, and message authentication. What this provides is the industry standard of WS-Security to the already existing SOAP message standard. In other words, this adds WS-Security capabilities to the SOAP Gateway's previous SOAP message now any SOAP message can take advantage of the granular security benefits. Prior to this IMS SOAP Gateway customers did not have a way to dynamically provide security information (user-id/password) at runtime on a per message basis. Lack of such support inhibited them from moving the IMS SOAP Gateway solution to production environments where they have strict security requirements. This support provides customers the ability to ship a UserID with or without a password from the requesting client all the way to IMS Connect or IMS itself, where that request in turn will be validated against SAF and allow/disallow the userID to execute the requested transaction. This offers a simplified way to inject the user ID/Password into the SOAP header/Message and use SAF to validate the requested transaction. RDZ-generated Adapter code can be used to execute the validation in order, reducing work and constraints in manually picking out the security items manually and calling SAF. With this support, users/client applications can send in requests into IMS SOAP Gateway using their own security information (for example: login id/password) instead of relying on static pre-defined security information on a web service-wide basis. This SOAP Gateway support can use tooling support from RDz V7.5+. This support enables customers to have more fine grained security authentication in place. This support will complement and beef-up the already existing security features available in IMS SOAP Gateway today (SSL, HTTPS). Customers could then send in security information on a per request basis rather than having pre-defined security information. This support will be provided for both the adapter and non-adapter scenarios. In addition, the WS-Security support will be provided only for the "provider" (inbound - both request/response) scenario and not for the "consumer" (callout) scenario; for callout this support will be a future version (need to build WS-Security compatible messages when invoking external web services).

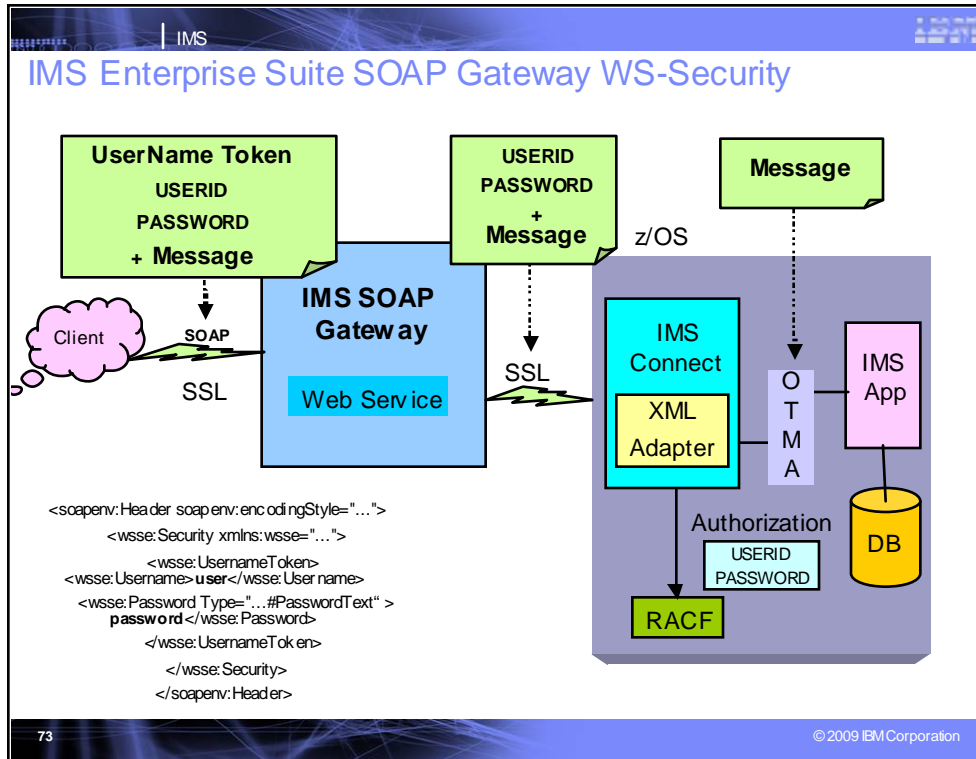
- Business Event support enables IMS users to modify their IMS application to emit business event data to WebSphere Business Events (WBE), WebSphere Business Monitor (WBM) and ILOG for business rules execution and business activities monitoring. This uses IMS callout capability, and the IMS SOAP Gateway to feed events from IMS applications to WBE, WBM and ILOG via the SOAP/Web Services protocol. IMS SOAP Gateway would be enhanced to map the events from IMS into the appropriate format for the designated events servers if needed. It also utilizes new Haifa and RDz tooling to provide assistance to customer for modify existing IMS application to emit events. IMS to support and integrate with IBM Business processing engines and monitoring dashboards (WBE, WBM and ILOG). This support helps business users and line of business owners gain insight into business activity and processing, or drive new processing to respond to business opportunities or threats and accelerating development time and reduce total cost of ownership. For example, a banking customer can use WebSphere Business Events to send an automatic alert to initiate a Fraud investigation when they detect a event sequence that there are multiple failed login attempt and followed by a large withdrawal in which these events could be detected and emitted by an IMS application. Uses RDz 7.6\* IMS Business Event assistant tooling, and WBE 6.2.x\*/WBM 7\*/ILOG.





The IMS SOAP Gateway 10 uses the userid and password from the connection bundle for basic RACF authentication on the host. This security information is static per web service.





WS-Security (Web Services Security) is a communications protocol providing a means for applying security to Web services.

WS-Security incorporates security features in the header of a SOAP message, working in the application layer. Thus it ensures end-to-end security.

Adding WS-Security, the SOAP Gateway is able to support userid/password at a more granular level and customers can pass the security information on a per-message basis.

This SOAP Gateway function is provided for IMS 11 use.

IMS 11 Connect function is required for IMS access

Rational Developer for System z (RDz) V7.6 is required for XML conversion.

Use of WS-Security message-level protection to sign and encrypt the UsernameToken (or any other parts of a SOAP message) requires the use of a protection token (for example X.509, Security Context Token, Kerberos, etc.).

Support is for “provider” (inbound) scenario and UsernameToken, but not other WS-Security standard tokens (eg. binarySecurityToken, DigitalSignature, EncryptionKey), since there is currently no tool support to generate required binding and policy files.

Transportation level support is required. SSL is needed to protect user id and password in the SOAP Header between Web client and SOAP Gateway server.

IMS

## IMS Enterprise Suite SOAP Gateway Business Event Support for WebSphere Business Events

- Enable WebSphere Business Events (WBE) to receive business event data from IMS applications for business events processing and execution
- Empower business users to define and proactively manage business events with easy-to-use graphical tools
- Provide the ability to detect, decide and dynamically react to both simple and complex relationships among people, events and information

The diagram shows a flow from left to right. On the left, a blue oval labeled 'Generate and publish events' contains icons for 'Systems', 'Sensors', 'BAM', 'Other', 'IMS Applications', and 'Business'. An arrow labeled 'Event' points to a central box labeled 'WebSphere Business Events' which contains 'Event Processing' and a gear icon. Below this box is a screenshot of a graphical rule configuration tool with the text 'Perform operations on events'. An arrow labeled 'Events' points from the central box to a blue oval on the right labeled 'Event Consumer'. Below the Event Consumer is the text 'Consume, react to events' followed by a list: Alerts, Trigger Workflow, and Automated actions. The bottom left of the slide has the number '74' and the bottom right has '© 2009 IBM Corporation'.

IBM WebSphere Business Events (WBE) is a software solution representing the convergence of power and ease-of-use. WBE supports advanced event processing features for detecting, evaluating, correlating and responding to events and complex patterns of events. These capabilities are exposed through graphical, non-programming user interfaces allowing IT to manage the environment while equipping the business users to manage the event process themselves.

The requirement for IMS Business Event to support WebSphere Business Events would enable WBE to receive business event data from IMS applications for business activities monitoring. It helps IMS customer to leverage existing IMS assets to explore business event processing solutions. With the use WBE, it helps customer to:

- Make business process more efficient and increase business agility with rapid respond to business rules and market changes
- Detect and analyze business activates easily for identifying new business opportunities, mitigate risks and improve customer satisfaction
- Accelerate application growth with easy-to-use tooling and automation that can be enacted by business users

IMS

## IMS Enterprise Suite SOAP Gateway Business Event Support for WebSphere Business Monitor

- Enable WebSphere Business Monitor (WBM) to receive business event data from IMS applications to provide business users visibility into business activities
- WBM calculates business metrics and presents key performance indicators through visual business dashboards for a near real-time view of business performance
- WBM helps if something goes wrong. Alerts can be delivered to make organization or administrators aware of potential problems and proactively take directed action.
- WBM can identify business problems, and predict future trends for improved decision making and faster reaction

The diagram illustrates the data flow from IMS on z applications to WebSphere Business Monitor. On the left, a box labeled 'IMS on z' contains three overlapping boxes labeled 'IMS Application'. An arrow labeled 'Common Base Events to WBM' points to a central box labeled 'WebSphere Business Monitor' which displays a dashboard with various charts and graphs. Surrounding this central box are several feature descriptions:

- Scorecards**: Key Performance Indicators for business units
- KPI History and Prediction**: Predict future trends for improved decision making and faster reaction
- Reports & Analyses**: Understanding trends by combining real-time performance and historical information
- Mobile Dashboards**: Access from smartphone, Lotus and MS Excel
- Modeled Alerts**: Notification of situations that require response
- Dynamic Alerts**: Notifications defined by business user for agile decision making
- Visual Dashboards**: Web based easy to configure and customize dashboards

75

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IBM WebSphere Business Monitor (WBM) is a comprehensive business activity monitoring (BAM) solution that provides a near real-time view of your business performance

WBM provides visibility into the performance of business activities by processing events, calculating business metrics and presenting key performance indicators through business dashboards

- It identifies business problems, correct exceptions, and change processes to increase business competitiveness by improving process efficiencies
- It helps when something goes wrong. Alerts can be delivered to make an organization aware of potential problems and proactively take directed action.
- It can monitor business events from any application via a variety of protocols

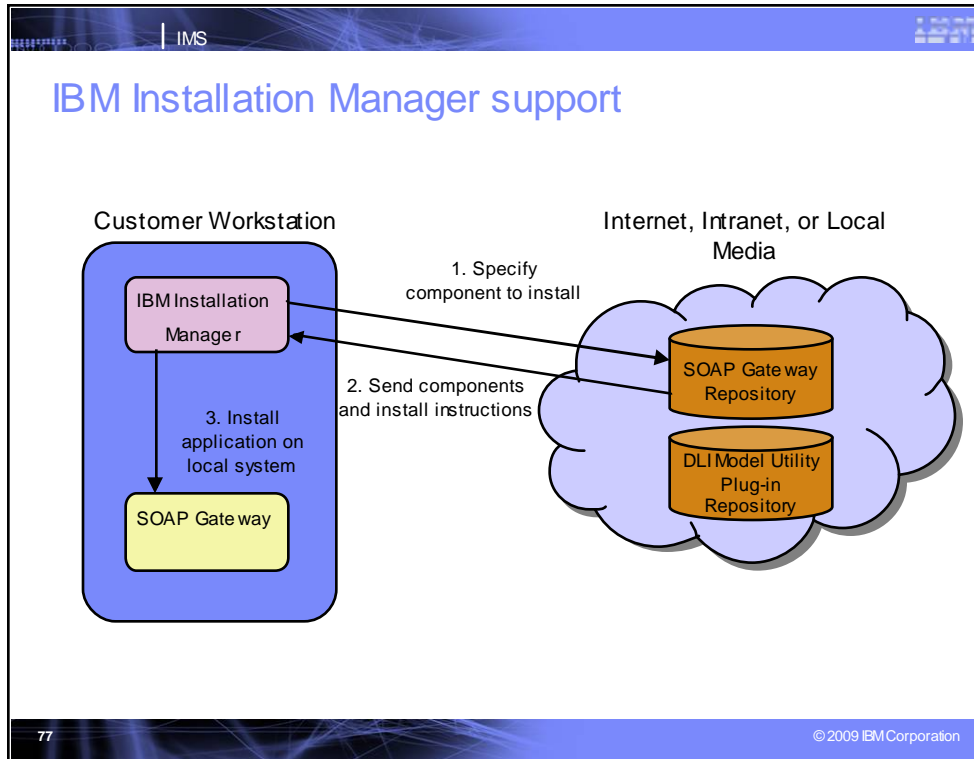
The requirement for IMS Business Event to support WebSphere Business Monitor would enable WBM to receive business event data from IMS applications for business activities monitoring. It helps IMS customer to leverage existing IMS assets to explore business event monitor solutions identify business problems, correct exceptions, and change processes to increase business competitiveness by improving process efficiencies

**IMS Enterprise Suite DL/Model Utility Plug-in**

- **Graphical User Interface (GUI)**
  - Leverages Eclipse, Eclipse Modeling Framework (EMF) and Graphical Editor Framework (GEF)
  - Can be installed as a stand-alone function or on top of other Eclipse based products (i.e. RAD 7.5, RDz 7.5, Data Studio) **using IBM Installation Manager**
- **IMS Database Visualization Tool**
  - User can visualize an entire IMS PSB and DBD in a multi-page graphical editor.
    - Each PCB can be viewed, saved and **printed** individually. Each PCB editor shows the IMS DB hierarchy with the segments, fields, field types, etc.
  - User can also **search** an entire IMS PSB for a specific PCB, segment, or field.
- **IMS Database Metadata Generation Tool**
  - Can be used to generate the necessary metadata that is consumed at runtime by the IMS Universal driver, XML-DB, XQuery and IMS DB Web services.
    - **DLIDatabaseView for IMS Universal driver**
    - XML schema for XML DB and XQuery
    - Deployable artifacts (EAR and WSDL files) for IMS DB Web services via the DAS commands in a syntax assist and syntax highlight editor.
  - Uses a bottom-up approach, parsing PSB and DBD source using either Control statements or Wizard panels. User can optionally import COBOL copybook and **PL/I Include** definitions to define field layouts for each segment.

DL/Model Utility plug-in provides a user friendly interface, simplifies IMS metadata generation, eases IMS Java and XML database application development and access, and offers a visual representation of IMS databases. Enhancements ease use of this utility, and its users can now import PL/I Include to redefine segment layout in IMS metadata, as well as take advantage of the new IMS Universal JDBC driver. Enhancements also include:

- Export PSB graphical view as graphic files (JPG or BMP)
- Auto select DBDs that referred by a PSB in wizard
- Support PL/I Include Import
- Add PROCOPT to IMS metadata for the IMS JDBC driver
- Add Virtual Foreign Key view to the PSB graphical editor
- Change GUI messages to match with product messages prefixes
- Add the search capability to the PSB graphical view
- Update the existing metadata with newly updated PSB/DBD source
- Ship under the new IMS Enterprise Suite through IBM Installation Manager



The Installation Manager is provided for use with the IMS Soap Gateway for Windows, Linux and AIX component installs, and the IMS Enterprise Suite DLIModel utility plug-in for Windows and Linux component installs. This support eases installation of these components on these distributed platforms. It gives the administrator full control of the installation. The administrator can script these components to install on multiple machines silently, issuing a single command in a command prompt to run the installation instead of going through the GUI interface. And, since it's done through the command prompt, user-written scripts could allow the components to run on multiple machines. This also gives the administrator control of where they place the repository associated with these components. This would also give the administrator better control over what software version is installed. A repository is provided for the DLIModel Utility and also for the Soap Gateway.

To reduce the download footprint there's another free downloadable utility, called the IBM Packaging Utility. The Packaging utility can be used to combine our multiple repositories into one.

The customer would first install IBM Installation Manager onto their local Windows, Linux or Unix workstation. From there the customer would point the IBM Installation Manager to a repository containing the product they wish to install. These repositories can be located on the internet, intranet (private network), or on their local media (e.g., hard drives, thumb drive, dvd, etc). The IBM Installation Manager will search the repository for installable products. The repository will send the components for building the desired product as well as the build instructions. The IBM Installation Manager will then build the product on the local machine.

IMS

## IMS Enterprise Suite Version 1 Release 1

Hardware Requirements	Software Requirements
<p>Any 64-bit IBM processors capable of running z/OS V1.9 for functions that are to run on z/OS.</p> <p>Workstations capable of running Linux, AIX, or Windows XP for functions that are to run on these operating systems</p>	<ul style="list-style-type: none"> <li>➤ z/OS V1.9 (5694-A01) or later is required, for those functions running on z Servers.</li> <li>➤ Connect API for Java runs on Windows and z/OS, with IMS 10 or later and requires JDK/JRE V5 or later</li> <li>➤ Connect API for C runs on Windows, with IMS 10 or later. This function is being delivered through the IMS Enterprise Suite V1.1 service process,</li> <li>➤ JMS API open source runs on z/OS with IMS 10 or later</li> <li>➤ SOAP Gateway runs on z/OS, zLinux, AIX, or Windows.               <ul style="list-style-type: none"> <li>o Base function runs with IMS 10 or later and RDz 7.6 or later</li> <li>o WS-Security runs with IMS 11 or later and RDz 7.6 or later</li> <li>o Business Events runs with IMS 11 or later, WebSphere Business Events 6.2 or WebSphere Business Monitor 6.2, and RDz 7.6 or later.</li> </ul> </li> <li>➤ DLIModel utility plug-in runs on Windows XP and Red Hat Linux, with IMS 10 or later.</li> </ul>

Additional line item requirement information is in the IMS Enterprise Suite Program Directory

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### Hardware requirements

IMS Enterprise Suite V1.1 (5655-T60, 5655-T61) operates on the following hardware:

Any 64-bit IBM processors that are capable of running the required z/OS V1.9 for functions that are to run on z/OS.

Workstations capable of running Linux, AIX, or Windows XP for functions that are to run on these operating systems.

Additional line item requirement information is provided in the IMS Enterprise Suite Program Directory

### Software requirements

IMS Enterprise Suite V1.1 (5655-T60, 5655-T61) component function operates with IMS Version 10 (5635-A01) and/or IMS Version 11 (5635-A02), with the following software requirements:

z/OS V1.9 (5694-A01) or later is required, for those functions running on z Servers.

IMS Enterprise Suite DLIModel utility runs on Windows XP, and Red Hat Linux with IMS Version 10 or later.

IMS Enterprise Suite JMS API open source runs on z/OS with IMS Version 10 or IMS Version 11 or later.

IMS Enterprise Suite SOAP Gateway runs on z/OS, zLinux, AIX, or Windows.

Base function runs with IMS Version 10 or later.

WS-Security runs with IMS Version 11 or later.

Business Events runs with WebSphere Business Events Version 6.2 or WebSphere Business Monitor Version 6.2 and IMS Version 11 or later.

IMS Enterprise Suite Connect API for Java runs on Windows and z/OS, with IMS Version 10 or later and JDK/JRE Version 5 or later.

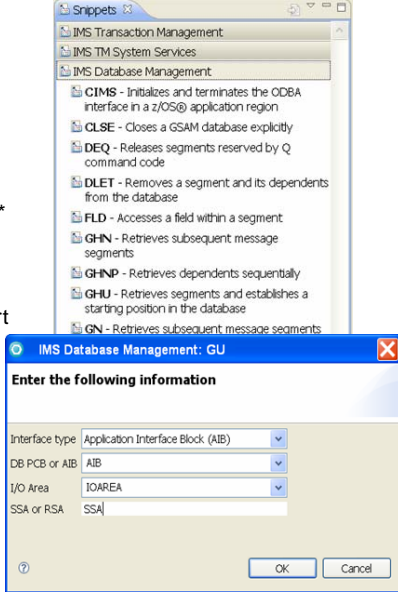
IMS Enterprise Suite Connect API for C runs on Windows, with IMS Version 10 or later.

Additional line item requirement information is provided in the IMS Enterprise Suite Program Directory

IMS

## Rational Developer for System z V7.6

- IMS V11 support
  - IMS code generation and snippet insertion (over 70 wizards to help create new IMS code)
  - Updated SOAP gateway code generation
    - Multi-segment messages
    - XMLSS statement generation for offloading
  - IMS Business Events support **\*\*COMING SOON\*\***
- Multi-runtime enhancements
  - PL/I real-time syntax checking support
  - Expanded COBOL real-time syntax checking support
  - COBOL data item tooltips
  - Content assist performance improvement (Some lab tests up to 80% faster!!!)
  - Improved project and build property usability
  - Rational Team Concert and Endeavor Integration
  - Integration with Rational Asset Analyzer



The image shows two overlapping windows from the Rational Developer for System z V7.6 interface. The top window is titled 'Snippets' and contains a list of IMS database management commands with their descriptions: CIMIS (Initializes and terminates the ODBA interface), CLSE (Closes a GSAM database), DEQ (Releases segments reserved by Q command), DLET (Removes a segment and its dependents), FLD (Accesses a field within a segment), GHN (Retrieves subsequent message segments), GHNP (Retrieves dependents sequentially), GHU (Retrieves segments and establishes a starting position), and GVN (Retrieves subsequent message segments). The bottom window is titled 'IMS Database Management: GU' and is a dialog box titled 'Enter the following information'. It contains four dropdown menus: 'Interface type' (Application Interface Block (AIB)), 'DB PCB or AIB' (AIB), 'I/O Area' (IOAREA), and 'SSA or RSA' (SSA). There are 'OK' and 'Cancel' buttons at the bottom right.

79

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A number of the IMS items use IBM's Rational Developer for System z and IBM has recently announced IBM Rational Developer for System z V7.6.

Rational and IMS continue to work together to bring both traditional IMS DB/DC and service-based modernization tools to the IMS developer. RDz has added new features to make it easier for the traditional developer to maintain or create new code. Such as:



- New code wizards specifically for IMS. Helps to create IMS COBOL code inline with existing applications
- Real-time syntax check shows coding errors as they occur, as you type them, now for COBOL and PL/I. Similar to the Java development environment from Eclipse and IBM.
- Improved usability to make it easier and faster to work within the RDz interface
- Integration with Source code management systems such as Endeavor and Rational Team Concert, helps speed the process of creating changes and pushing them to production
- Integration with Rational Asset Analyzer helps inspect existing IMS regions (called a IMS run unit) to see linkages between code, data, and configuration so that you can see the impact of every code change and make sure nothing is missed

RDz also helps to modernize IMS workloads through new architectures such as Web Services and the upcoming IMS business events



IMS

## Additional IMS Information at <http://www.ibm.com/ims>

- Presentations, Papers, Newsletters, Fact Sheets, Announce Letters, Technical Support Information, Information Center, Information Roadmap, Training and Certification, Events, and Additional Documentation, plus
  - **IMS SOA Integration Suite** -- presentations/demos/download code (including IMS Resource Managers and the IMS Enterprise Suite)
  - **Information Center** - enables search across IMS, DB2 and Tools documentation
  - **Examples Exchange**
  - **Developerworks** - technical papers
- Redbooks/Redpieces - Release Guides, Sysplex Guides, Java Guides, etc
  - **IMS Connectivity In an On Demand Environment Redbook**
  - **IMS 11 Redbook**
-  "An Introduction to IMS" book 
- WW IMS Conferences and Seminars
  - **IMS Seminars coming to a city near you**
  - **IMS User Groups**
  - **IMS Teleconferences, with replays available**
- Additional technical support info at [www.ibm.com/support/techdocs](http://www.ibm.com/support/techdocs) (search on IMS)
- Migration, skills transfer, customized offerings at [ibmdds@us.ibm.com](mailto:ibmdds@us.ibm.com)

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### **Key Message: IMS continues to provide information and services for our clients**

A wide range of IMS Information is available

The IMS solutions are generally available along with other IBM products in support of IMS. Additional documentation and information is available from the IMS home page at <http://www.ibm.com/ims>. The IMS SOA Integration Suite includes function and components for enterprise modernization. The Technical Support, Information Center and Information roadmap now ease search and easy link to information. Links also exist here to an examples exchange, and to developerworks where additional technical papers and other development information can be found. Links also exist for training, certification, events and presentations/papers.

The IBM International Technical Support Organization has been producing redbooks and redpieces with additional information. One of the latest is the IMS Connectivity in an On Demand Environment Redbook.

One piece of IMS literature we mentioned earlier is the new comprehensive textbook called "An Introduction to IMS".

A number of IMS Technical Conferences are also being provided on an on going basis. Upcoming conferences featuring both IMS and DB2 include the Information Management conference in The Haag in May and the Information On Demand Conference in Anaheim in October. Both of these conferences provide an extensive amount of education on IMS and the transformation/Integration of IMS for On Demand environments.

We also are beginning this spring worldwide seminars/roadshows.

And we are continuing to provide IMS webcasts and teleconferences, with replays of these available afterwards



IMS

## IMS COBOL/PL/I Application Development Workshop Overview

**Unique Offering**

- Free lecture and hands-on lab exercises using latest application development tools for System z.

**Workshop Description:**

- Learn how to more easily modify, enhance and extend our current COBOL/PL/I applications for IMS using the latest application development tools for System z including Rational Asset Analyzer, Rational Developer for System z, IMS DLI Model Utility and IMS MFS Web enablement.

**Target Audience:**

- Application Architects and Application Developers who are responsible for maintaining and enhancing COBOL/PL/I applications for IMS.

81


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We have been offering some COBOL/PL/I workshops, should you like to request one. We are also now offering Java workshops as well.

IMS

## The Message

- IMS continues to be a premier server with architected standard interfaces
  - New products and tools from a variety of vendors provide access to IMS transactions and data



- SOA is revolutionizing the way businesses are being designed and run. For it to make sense:
  - *All assets must be easily accessible in a standard way*
  - *All data must be represented and manipulated in a standard way*
- Our goal is to leverage IMS as an integral part of the enterprise in the evolving business world through
  - *Addition of support for complimentary standards surrounding IMS connectivity, data representation, and application development*
- And to allow you to realize the promises of building a Service Oriented Architecture:
  - *Simplify the business environment*
  - *Respond to market changes more quickly and cheaply*

82

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IMS continues to be a premier server with architected standard interfaces

New products and tools from a variety of vendors provide access to IMS transactions and data

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