



IBM Software Group | IMS

IMS: An Update

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This presentation covers the upcoming announce for IMS 11 and the new enhancements for IMS 10 users.

Agenda

- IMS Strategy and IMS Today
- IMS 10
- IMS 10 New News
- IMS 11
- Summary

Key message: Agenda will cover IMS a number of solutions

IMS Solutions are being provided for access to applications/operations/data, development of industry standard applications, as well as providing simplified operations and the ultimate performance/ availability for unlimited growth. Here I'll be covering the IMS Strategy and where we are today, IMS 10 and new enhancements being provided for IMS 10, and what we see coming with IMS 11.

Let's Talk about IMS



- * IMS Business is Thriving
- * IMS Development is Growing
- * IMS Usage is Increasing
- * IMS Growth is Keeping Pace
- * IMS Applications are Undergoing Business Transformation



I am continually asked if IMS is “strategic”. The answer is YES. Strategic means that the IMS business is growing and that IBM continues to invest in IMS. As long as IMS continues to deliver an attractive ROI to IBM, it will be a strategic product.

Development capacity in the IMS Lab continues to grow. We have grown our team by nearly 10% each year for the past several years. We’ve added a new test team in Russia. This year we are bringing 9 new college hires into IMS. We’ve grown our education and services team. We’ve added new developers, both core IMS and the SOA integration area.

In 2007, the top 10% of IMS customers increased their IMS usage by 84% from a year earlier! Customers are extending their classic IMS applications, and also adding new applications to IMS.

Over the past several years that I’ve been looking at the data, IMS has been growing (as measured by revenue and also MIPS) at least as fast or even faster than both CICS and DB2 for z/os.

Customers are seeing that IMS has a “new lease on life”. A large part of the reason is the focus on application renovation. Customers want to modernize their IMS apps, many of which were written in the 70s. We (IMS Lab) is leading an effort to do SOA seminars and workshops with applications architects at customer sites, and the focus is working. Customers are seeing that it is much more cost effective to reuse the investment they already have in IMS and extend their applications with our SOA capabilities. We have many, many Proofs of Concepts and SOA projects going at with IMS customers.

IMS Systems Are Here To Stay

“Pre-relational databases don't die, nor do they fade away.”

“While industry watchers such as Gartner Inc. once encouraged customers to think about transitioning away from pre-relational DBMSes, they're now backtracking. In a recent report, Feinberg said organizations should also do a thorough cost/benefit analysis before embarking on any such migration...**the risks and additional costs entailed by migrating away from a pre-relational DBMS outstrip the costs.**”

“Odd though it may sound, there is **no reason for IBM not to continue to refresh IMS with the latest technologies**, to fit its users for integration into SOAs and event-driven architectures of the future.”
 Stephen Swayer, *Enterprise Systems*, 11/06/2007

“An ongoing IT fear is that **IMS experts will become thin**. I believe that **these fears are entirely overblown**. One of the nicest features of IMS is its **simplicity**. Unlike object-oriented programming, **IMS requires relatively little training for programming or administration**. Big Blue has ample opportunity to keep on keeping on as far as IMS is concerned...”

“Time and again, enterprises found that **migrating** from existing database to enterprise-standard one **involves extraordinary time, effort, and risk**. Migrating may involve a **multi-year rewrite of dependent business-critical applications, somehow without affecting tIT organization's imperative to 'keep the business running.'** Small wonder that IMS is one of the 'tough nuts to crack' of today's legacy modernization.”
 Wayne Keinochan, *Illuminata Perspectives*, 10/19/2007

“The new version of IMS is a great example of one of the things IBM does best: leverage its deep technical expertise to develop and deliver solutions for customers' fundamental business challenges. In most large enterprises, heterogeneous I.T. infra-structures are the rule, not the exception.” Charles King, Principal analyst at Pund-IT

“IMS is one of the fine things to stick with.”
 Curt Monash, database analyst

And Analysts agree that IMS is here to stay.

IMS Continues to Address Challenges of a Rapidly Changing World

Providing Quality with On-Demand Service Oriented Architecture Solutions

- **Integration/Open Access with New Application Development/Connectivity**
 - ✓ Ease/broaden user access
 - ✓ Web, Java, XML and Linux access
 - ✓ Ease application developer effort
 - ✓ Auto-application-generation tools
- **Manageability Ease with Autonomic Computing**
 - ✓ Ease installation and operations efforts
 - ✓ High levels of security
 - ✓ End-to-end transaction integrity
 - ✓ Real time data currency
 - ✓ Highest code quality
- **Scalability with Virtualization in Performance/Capacity/Availability/Recovery**
 - ✓ Handling increasing workload
 - ✓ Handling unpredictable volumes
 - ✓ More hours for workload
 - ✓ Continuous up time for applications and user access
- **IMS extends the investment for your on demand business needs**



Key Message: IMS continues to provide quality solutions with new technology

IMS is continuing to address the challenges of a rapidly changing world. It is providing the utmost in quality through Information Integration with new Application Development/Connectivity solutions. These solutions ease and broaden user access, opening IMS applications and data up to the Web, Java, XML and Linux environments. New technology and automatic application generation tooling ease application developer efforts.

IMS along with the S/390 and the z/Series have been providing solutions to ease Manageability as well. These solutions ease installation and operations efforts, provide a high level of security, end-to-end transaction integrity, and real time data currency,




Systems Scalability is also provided to handle the increasing workload and unpredictable volumes, as well as more hours for workload and the continuous uptime demands for applications and user access.

All of this is provided with the highest quality and availability and for the lowest cost of computing. Customers are using this power to take on new on demand business related applications, greatly extending their investments.

IMS

IMS Value for Business Transformation:

IMS "Value Proposition" : Continuous Core Systems Improvement

	IMS	IMS V9	IMS V10
	<ul style="list-style-type: none"> Most efficient run-time, maintains application investment protection Fully integrated into today's AD toolsets Fully integrates with WebSphere Process Server 	<ul style="list-style-type: none"> 22K tps on a single IMS instance on z9 for classic fast path transactions with data base update (lowest cost per tran) JDK 1.4 JAVA performance 	<ul style="list-style-type: none"> IMS classic, estimated to double performance with z10 IMS Connect doubles performance to over 12K tps DBRC parallelism reduces batch window 22% Improved support for BPEL RDz licenses included
	<ul style="list-style-type: none"> Fully supports SOA Improved efficiency and reduced skill requirements for systems and development staff Flexibility: JAVA, COBOL, PL/I... 	<ul style="list-style-type: none"> Natural XML DB Integrated IMS connect function, the high performance gateway to the internet Improved WAS resource adapter 	<ul style="list-style-type: none"> XQUERY for XML DB IMS Callout, IMS as a client Improved support for DB2 stored procedures Improved JAVA, XML, PL/I tooling, MFS web support
	<ul style="list-style-type: none"> Continuous improvement to Rock solid availability Continuous improvement to operations and serviceability tools Fully supported by IMS DB & Tivoli tools 	<ul style="list-style-type: none"> On-line reorg Improved RACF security Reduced Installation and Sysgen effort Enhanced IMS log analysis, restart, recoverability 	<ul style="list-style-type: none"> Dynamic Resource Definition Improved Operations management, audit trail Enhanced installation, serviceability, recoverability, utilities

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Key Message: IMS provides Value today with solutions for business transformation.

IMS continues to provide core systems improvements. Efficiency, Growth and resilience are IMS strengths and new function has been rolling out to continue to address these.

- IMS has provided remarkable performance: 22K tps on an eight-core z9 which translates to the most cost efficient run-time environment and early testing is showing IMS performance to double with the z10

- IMS is your core services integration focal point for SOA on zOS, providing

- Integrated message queuing, transaction processing and data base management
- Open, standard interfaces allowing 'any-to-any' connectivity and access
- Fully integrated into today's A/D toolsets
- Natural XML support
- Flexibility and investment protection: Robust runtime support including JAVA, C, COBOL, PLI and Assembler

- *IMS offers rock-solid reliability and security: customers have gone years without unplanned outages

A Service Oriented Architecture (SOA) is Key to Providing an Integrated Environment for On Demand Solutions

Services are the Building Blocks

- Packaging business functions from new and existing applications in a simple and standardized way creates services that are available for use
- Services are used to help get the right information to the right people at the right time
- Services can be reused and combined to deploy composite applications to address new opportunities
- Increasing use of “Web” services based on open standards complements existing services technology



IMS applications and data are enabled as Services

Key Message: Enhanced Integration is required to address the increasing complexity.


A Service Oriented Architecture (SOA) and services as building blocks are key to providing an integrated environment for on demand solutions. Customers need the flexibility to treat elements of business processes and the underlying IT infrastructure as secure, standardized components (i.e. services) that can be reused and combined to address changing business priorities.

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IMS SOA Objectives

- **Leverage and Access Existing IMS Assets, and Promote Integration with other systems**
 - Integrate IMS with IBM WebSphere and other application servers in both z/OS and distributed platforms
- **Offer IMS as Both Service Provider and Service Consumer for Participation in SOA Environments as an Integration Focal Point**
 - Provide bi-directional access and communication
 - Facilitates migration from terminal-based SNA to TCP/IP networks
- **Support Industry standards and wide variety of Java and SOA clients**
 - Java application, Servlets/JSP, EJB/MDB, Web Service, SCA, SOA Composite application, BPEL Choreographed service
- **Provide Rapid SOA Enablement**
 - Provide automatic code generation when used with IBM Tooling for rapid application development and deployment
 - Generated code handles data transformation
- **Ease Integration with Solution Packages and Education**

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Key Message: These are the IMS SOA Objectives

IMS SOA objectives include leveraging IMS assets, promoting integration, participating as an Integration focal point, supporting industry standards with rapid enablement for a wide variety of clients.

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

Java support in IMS Eases Integration for Application Development and Connectivity

- **Set of packages (groups of classes) with Visual Tools** to ease development
 - For I/O message handling and access to IMS services and support Java APIs
- **Java Dependent Regions (JMP/JBP) support**
 - Providing Java Virtual Machine (JVM) support to run IMS Java applications
- **Language interoperability** improves productivity, simplifies operations
 - Ability for Java and OO COBOL to invoke each other within same transaction
- **Java access to IMS input/output message queues**
- **Java access to IMS data - JDBC driver for IMS**
 - Implements Industry standards JDBC 2.0 API
 - Offers SQL and XQuery support for IMS DB
 - Provides access to IMS DB and DB2 data for IMS TM/Batch, CICS applications DB2 Stored Procedures, or WebSphere ejbs in local z/OS environments
- **Database interoperability - access IMS and DB2 data in same transaction**
 - Use either the DB2 JDBC or SQLJ drivers to access DB2
 - IMS and DB2 activity in the same unit of work
- **zAAP processor support** for lowering cost of running Java applications

Key Message: Java is the base for new application development and connectivity.

IMS Java application support enhances the ability of our customers and business partners to provide integrated on demand business application development with IMS. The object of this function is to provide support for you to write Java applications and run them as IMS applications using WebSphere/Rational workstation and host tools for development and testing.

Major facilities of IMS Java include:

Language interoperability, with this we have the ability to have a Java program invoke an OO Cobol program under the same transaction and vice versa.

We also have interoperability with DB2, which this means is that we can access an IMS database and DB2 database under the same transaction or the same unit of work

The Java TM API offers transaction processing support as IMS message queue processing, program switching etc.

The Java DB API offers Database access support and process all IMD DB commands

The JDBC driver for IMS implements the standard JDBC 2.0 API. The JDBC driver also offer SQL support for IMS databases.

All of the Java APIs are available for use within the IMS dependent regions. The DB API and JDBC driver are available for use in external environments.

Defines a standard Java API for accessing databases

Provides an API for sending SQL statements to a relational database and processing the tabular data returned

JDBC application model

Establish and open connection to database

Execute query and obtain results

Process results

Commit the results

Close connection

Provides application interoperability

IBM Java support for the new IBM zSeries Application Assist Processor (zAAP) helps reduce overall cost of computing for Java applications, increase system productivity by reducing the demands on general purpose processors, and makes capacity available for other workloads.

zAAP – z/Series Application Assist Processor -- Lowers the cost of running Java applications

- Specialized processing unit for z890, z990 and z10 processors
- Provides a highly strategic z/OS Java execution environment
 - Increases system productivity by reducing the demands on general purpose processors, making capacity available for reallocation to other workloads.
 - Allows Java workloads to run at a lower total cost of ownership
 - Java workloads are transparently executed on the zAAP processors
 - No requirement to change applications



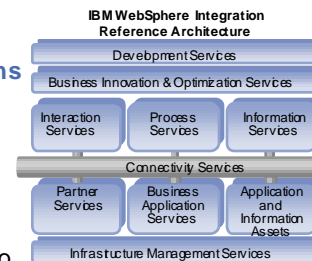
Key Message: IMS Java can be used with the zAAP processors for reducing costs

IMS JAVA support for the IBM zSeries Application Assist Processor (zAAP) for the IBM zSeries 990 (z990) and IBM zSeries 890 (z890) and z10 servers allows Java workloads to transparently execute on the zAAP processors without requiring application change. This allows you to integrate and run Java workloads on the same server as your database at a significantly lower total cost of ownership than previously possible. This helps reduce the overall cost of computing for Java applications, increase system productivity by reducing the demands on general purpose processors, and makes capacity available for other workloads.

zAAPs are designed to operate asynchronously with the general CPs to execute Java programming under control of the IBM Java Virtual Machine (JVM). This is an important point as zAAPs can only help execute Java applications and application servers that use the IBM JVM. The IBM JVM processing cycles can be executed on the configured zAAPs with no anticipated modifications to the Java application(s). Execution of the JVM processing cycles on a zAAP is a function of the IBM Software Developers Kit (SDK) for z/OS, Java 2 Technology Edition, V1.4 with PTF (or later) for APAR PQ86689, z/OS and the Processor Resource/Systems Manager (PR/SM).

IMS Integrated Connect Function For High Performance, Secure, Transparent Access

- Provides easy install/use, high volume/performance, secure transparent access to IMS applications and operations from other environments (incl. LINUX)
 - **Integrates function of IMS Connect**
 - Simplify administration and reduce costs
 - **Reduces design/coding effort for client applications**
 - Ease access to IMS applications and operations
 - Improve programmer productivity
 - **Provides commands to manage the network** and balance workload
 - Better resource utilization.
 - **Used with IBM WebSphere/Rational Server/Tools to**
 - Quickly transform static web sites into sources of dynamic Web Content to improve marketing effectiveness and enhance customer service
 - Transform IMS Transactions into Web services for Service-Oriented Architectures (SOAs), enabling quick response to new customer requirements, business opportunities and competitive threats.
 - **Used with DB2 and the IMS Control Center for Distributed Operations**
 - Improve system availability and operator productivity




Key Message: A key element of the On Demand environment is the Integrated IMS Connect function.

Integrated IMS Connect Function provides easy-to-install, easy to use, high performance/high volume and secure transparent access to IMS applications and data from any application environment, including LINUX.

- It provides commands to manage the network environment and assist with workload balancing resulting in better resource utilization.
- It reduces design/coding effort for client applications and provides easier access to IMS applications and operations, thereby improving programmer productivity.
- It can be used with IBM WebSphere/Rational Servers/Tools to quickly transform static web sites into sources of dynamic Web Content improving marketing effectiveness and customer service, and also to transform IMS Transactions into Web services for Service-Oriented Architectures (SOA), enabling quick response to new customer requirements, business opportunities and competitive threats.
- It can be used with DB2 and the IMS Control Center to control both IMS and DB2 operations, improving system availability and operator productivity.
- This integrated function can be used to replace the separately orderable/priced IMS Connect Tool offered for earlier IMS Versions, simplifying administration and reducing cost.

IMS

Wachovia Corporation



"With the IMS Connect solution, users can access all of the client's core business applications—such as its retail banking, customer information, relationship and deposit systems—on the IMS system. Currently, the SOA environment supporting the online banking channel supports more than four million users."

— Keith Harris
Manager of Architecture
Wachovia

Business Challenge

Simplify the IT environment and provide consistent information across all delivery channels to reduce costs and better support new services.

Business Benefits

- Provides a single set of business and foundational services to support existing and future delivery channels
- Helps eliminate duplicate business logic to reduce IT maintenance and support costs
- Reduces costs by leveraging common services
- Offers a high performance server environment to support more than 4 million customers

Solution

- IBM IMS with integrated IMS Connect Function
- IBM WebSphere Business Integration Server Foundation
- IBM System z 990
- IBM Business Consulting Services
- IBM Software Services for WebSphere

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Headquartered in Charlotte, North Carolina, Wachovia Corporation is the largest financial holding company in the eastern United States and the fourth largest in the country. The company maintains approximately 322 billion USD in total assets and 46 billion USD in market capitalization.

Challenge

Wachovia needed to implement a service oriented architecture (SOA) to support multiple delivery channels and reduce IT maintenance and support costs. Additionally, the bank wanted to provide consistent information across delivery channels, such as its online banking, call center and interactive voice response channels.

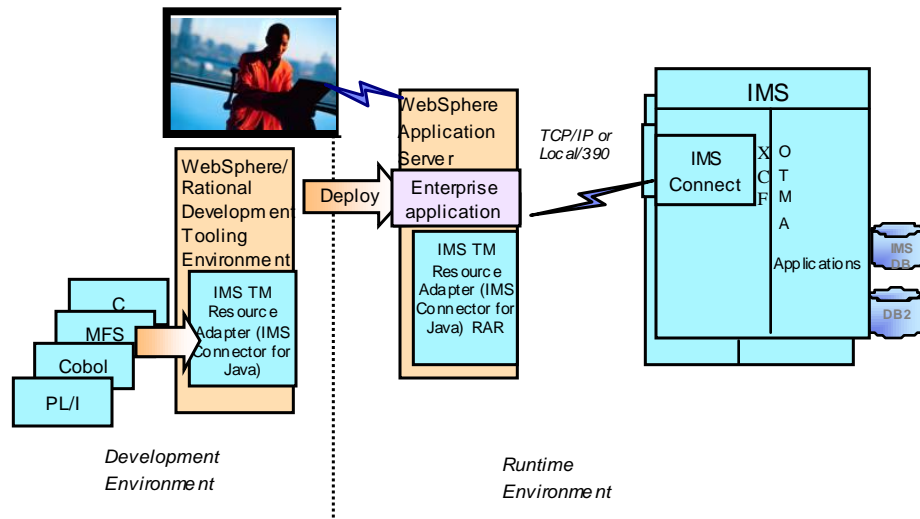
Solution

Wachovia worked with IBM Business Consulting Services and IBM Software Services for WebSphere to implement a SOA environment. With the new SOA environment supported by IBM WebSphere and IMS software and IBM System z platform, Wachovia acquired the single set of business and foundational services needed to support existing and future delivery channels. The solution also helps staff eliminate duplicate business logic. The IMS Connect solution enables the WebSphere platform to connect with Wachovia's core IMS systems. With IMS Connect software, users can access all of Wachovia's core business applications—including retail banking, customer information, relationship and direct deposit systems—on the IMS system. Wachovia expects to realize considerable cost savings as the other delivery channels use the common services provided by the SOA solution. With the high-performance and secure System z platform, Wachovia can support the transaction and response time requirements for its large user base.

Benefits

- Provides a single set of business and foundational services to support existing and future delivery channels
- Helps eliminate duplicate business logic to reduce IT maintenance and support costs
- Reduces costs by leveraging common services
- Offers a high performance server environment to support more than 4 million customers

IMS On Demand Business Application Development and Connectivity Utilizes Industry Standard Tools

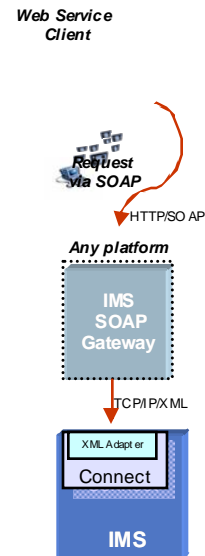


Key Message: IMS TM Resource Adapter can be utilized with the development tooling for Connectivity to IMS

The IMS TM Resource Adapter (aka IMS Connector for Java) Development support, which enables development of Java applications running under WebSphere Servers, originally shipped with VisualAge Java, evolved and now provides mapping of Cobol, C, and MFS IMS applications, and ships as part of the WebSphere Studio Application Development Integration Edition (WSADIE). The IMS Connector for Java J2EE Runtime piece, ships as part of IMS Connect and can be downloaded to a WebSphere Server platform for deployment in connecting to IMS transactions via IMS Connect. IMS Connector for Java interacts with the J2EE server to provide you transparent support of Quality of Service (like Transaction management, Connection management, Security management). Your application is unaware of all the complicated issues. The Connector for Java continues to be enhanced for the latest WebSphere and RAD tooling.

IMS SOAP Gateway Widens Access

- Maximize re-use of customer enterprise assets via standard interfaces
- Provide and request services independently of platform, environment, application language or programming model
- Use 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
- Provide HTTP/SOAP transport and processing
 - SOAP envelope and headers handled by the gateway
- Utilize WebSphere Developer for z tooling to create converters for transforming XML messages to COBOL data and vice versa
 - Without changes to existing IMS application
- Run on any Java supported platform – initially Windows



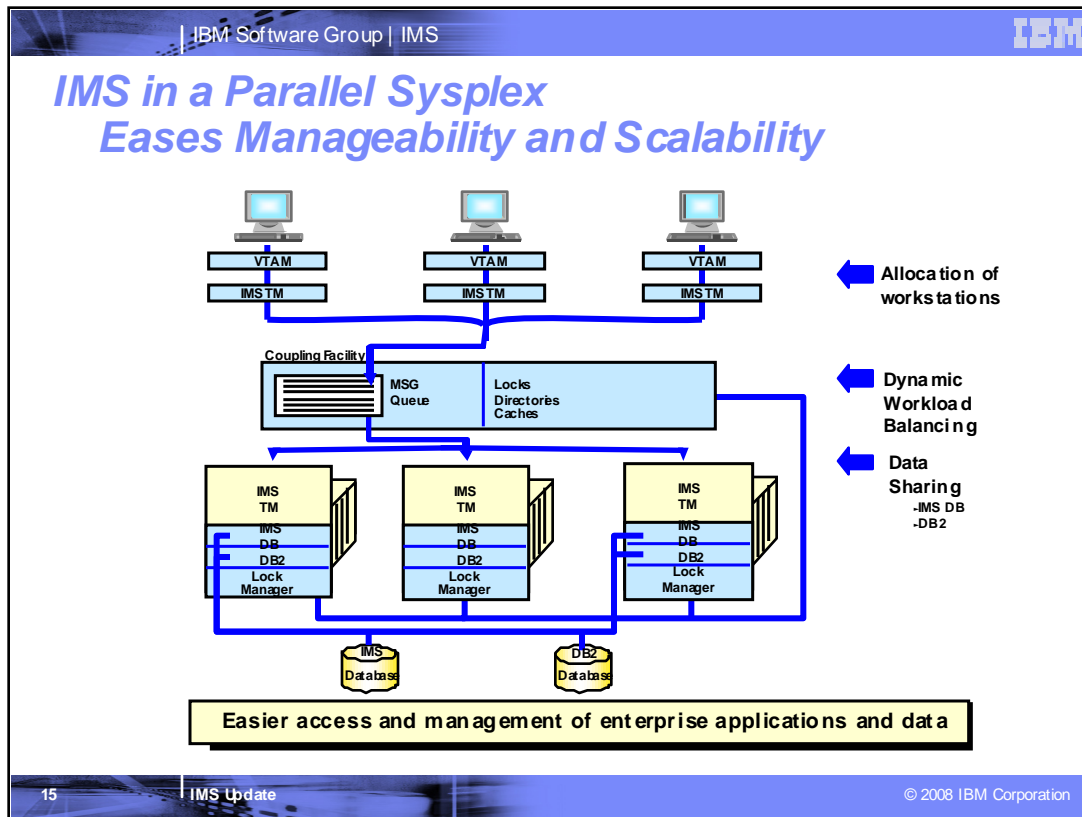
Key Message: IBM is widening IMS access with the IMS SOAP Gateway to help minimize reuse and support collaboration

IBM has provided the IMS SOAP Gateway as a web downloadable using open source code to enable SOAP access to IMS applications through IMS Connect from any web service client.

The soap gateway provides the ability for customers to maximize reuse of their assets using standard interfaces to non-IBM, as well as IBM components, within and beyond the enterprise boundaries. It provides HTTP/SOAP transport and processing and utilize WebSphere Developer for z/Series tooling to create converters for transforming XML messages to COBOL data and vice versa.

SOAP Gateway for IMS V9 had been providing enhancements for:

- XML data transformation with IMS XML Adapter/task manager with messages coming into the soap gateway using the HTTP/SOAP protocol and are sent to IMS using TCP/IP and conversion in IMS task manager:
 1. The Application developer uses Cobol Copybook and WDz tooling to create a correlator file and WSDL input for the soap gateway and an XML Converter for the XML Adapter (to translate to/from Binary).
 2. The Systems programmer configures IMS Connect and its XML Adapter and compiles/deploys the XML converters.
 3. The Admin deploys WSDL to IMS SOAP Gateway, and specifies connection and interaction.
 4. The Client developer generates client code from WSDL and writes client application.
- SSL/HTTPS Security enhancements to provide reliable, secure communication between the IMS SOAP Gateway and the integrated IMS Connect function with Client/Server authentication (hand shake and data encryption)
- Support of zLinux run-under environments, in addition to Windows and AIX
- SDK update for windows
- Accessibility enablement



Key Message: IMS has been exploiting the parallel sysplex environment.

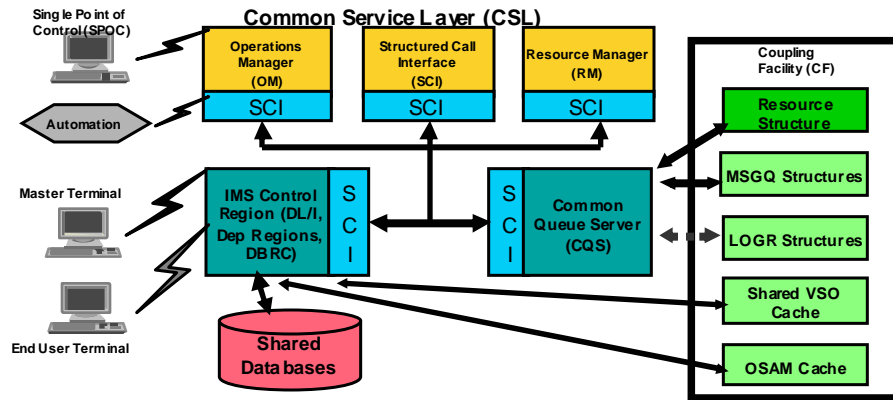
IMS continues to strengthen its support of the Enterprise by providing the highest in performance, availability, security, integrity, at the least cost per transaction. In doing this it has been exploiting the hardware/software environments that it has grown up along side of. IMS fully exploits for customer advantage the new technology and power of z/OS and the Parallel Sysplex. Early IMS data sharing capability was enhanced to take advantage of the coupling facility for storing lock information and for easy availability of that information by all systems in the Sysplex environment. The lock manager in each system could access the locks as they needed to. In addition to data sharing, IMS provided necessary information to the MVS workload manager to assist with workload balancing of resources across the Sysplex. IMS also enhanced message routing between systems to take advantage of workload balancing information, and IBM provided the IMS Workload Router to use these facilities to push the work to the available system. Significant enhancements have been added to complement the Parallel Sysplex hardware and operating systems facilities. IMS also provided Remote Site Recovery, which allowed backing up an IMS system with another at a different location. A database at another system is maintained to match the primary database and/or a log is maintained that can dynamically and quickly update that remote data base to allow takeover in the event of failure.

IBM improved the IMS Data Sharing and Workload manager enhancements with additional data sharing (storing changes and unaltered data on the coupling facility for Sysplex access, and providing additional Fast Path sharing), message sharing (providing message queues and fast path messages on the coupling facility for Sysplex access), and message routing enhancements (utilizing VTAM Generic resource support). As customer workload grows, the power that distributing data and applications across the Sysplex provides is needed. End users want to be able to access applications and data transparently, regardless where the work is processing. This enhanced support provides improved end user interaction, improved IMS availability, improved workload balancing, and offers increased capacity and growth in moving into Parallel Sysplex environments.

IMS's Fast Path capabilities continue to be enhanced to provide the fastest access through the system, continuing to lead database products. Against industry standard benchmarks it continues to show as the best price performance at the lowest cost, confirming that nothing in the transaction market matched the speed and power of the IBM zSeries with IMS.

IMS Common Service Layer For Enhanced Manageability

- Present single system image and ease use through a single point of control
- Enable users to resume status on another IMS in IMSplex
- Coordinate/manage online change across the IMSplex



Structured Call Interface provides communication interface between IMS address spaces on same or across CPCs using XCF

Key Message: IMS was restructured to provide enhanced management of IMS.

In the Sysplex area as well as non-Sysplex environments we are helping our customers address the following requirements: The IMSs in a Sysplex, or in other environments can present a single system image and be provided ease of use through a single point of control. System management of IMSs sharing databases and/or message queues in a Sysplex becomes more difficult as you add IMSs. Most commands and automation processes today can only affect an individual IMS. Commands may be entered using E-MCS console to route command to all IMSs in IMSplex. Commands that affect the Sysplex can be issued on each IMS. VTAM Generic resource users need to be able to resume state on another IMS in the Sysplex. The user cannot resume state if routed to another IMS. Online Change should be coordinated and managed across the IMS Sysplex. Manual online change process is extremely difficult in IMSplex. Each IMS today manages its resources locally. Resources must be gen'ed on each IMS. Resource definition consistency is not enforced. A transaction defined on one IMS can be defined as an LTERM on another. Multiple users with the same name can sign on at the same time. Multiple nodes with the same name can log on at the same time. Multiple LTERMs with the same name can be active at the same time.

Additional IMS requirements: Eliminate restriction that resource names and IMS keywords must be unique. Provide synchronous responses for IMS commands. For this, IMS V8 provides the following management infrastructure and enhanced support: The IMS V8 Structured Call Interface is a new IMS address space which provides an interface for communication between IMS address spaces. Communication is provided on the same CPC or across CPC's using the MVS Cross Coupling Facility (XCF). The Resource Manager is a new IMS address space maintaining global resource information accessible by IMSs in the IMS Sysplex. It enables a user to resume work on another IMS and to enforce single active user signon in and IMS Sysplex, if requested. It enables name uniqueness enforcement for message destinations and provides support for IMS to coordinate Online Change across IMS Sysplex. It maintains local transaction tables to optimize performance. The Operations Manager is an IMS Address space which routes IMS commands to interested IMS Modular Units across the IMSplex and consolidates IMS command responses. It provides an Application Programming Interface to allow a user or vendor to write tools to automate IMS operations. And it supports a Single Point of Control (SPOC) to present a single system image for the IMSplex by allowing the user to enter commands to all IMSs in the IMSplex from a single console. This SPOC is a 3270 TSO/ISPF Application running on S/390. It could also support a workstation Application connecting to OM.

Sysplex Terminal Management allows VTAM to manage Generic Resource affinity while IMS can maintain VTAM terminal and user state data, if requested. It enforces resource type consistency for message destinations and resource name uniqueness. It supports global callable services for terminals/users allowing user exits to obtain node and user information across IMS Sysplex. It uses the Resource Manager (RM) to share VTAM terminal-related resources in the IMS Sysplex. IMS is providing more componentization, rewriting systems services with cleaner interfaces and extending its layered approach for Systems Management. The Structured Call Interface (SCI) ties it all together. The BPE (Base Primitives Environment) exploited this further with each subsequent version. The Common Queue Server (CQS), the "Queue Unit", was the first of the modular units for this componentization. The Common Service Layer is providing a single system image and easier systems management for the Sysplex environment.

IMS Integrated HALDB Online Reorganization For Ultra-High Database Capacity and Availability

IMS High Availability Large Database (HALDB) support provided Improved Capacity and Data Availability

- ✓ Scaled up IMS Full Function databases
 - ➔ **1001 Partitions x 10 data set groups x 4G = 40 Terabytes**
- ✓ Providing data availability through partition independence
- ✓ Providing easier manageability with smaller partitions of the database

IMS Version 9 Integrated HALDB Online Reorganization delivered Continuous Availability of Business-critical Databases

- ▶ Fully integrated online reorganization by partition of IMS HALDBs, simplifying administration and reducing costs
- ▶ Concurrent online update and availability
- ▶ Totally non-disruptive
- ▶ No outage, minimal additional DASD required
- ▶ Adjustable pace to further minimize any online impact
 - Multiple partitions can be reorganized in parallel
 - Provides greatly enhanced database availability

Key Message: IMS Integrated HALDB Online Reorganization provides ultra high capacity and availability

High Availability Large Database (HALDB) greatly increased, by orders of magnitude, the maximum database size permitted in earlier releases. HALDB delivers the first requirement for information management in the unpredictable on demand operating environment: virtually unlimited database capacity.

IMS HALDB Online Reorganization (OLR) delivers on the second: continuous availability of business-critical databases. IMS OLR provides a fully integrated online reorganization by partition of HALDBs, with concurrent online update and availability. This is totally non-disruptive. There is no outage, and minimal additional DASD is required during reorganization. Users can adjust the pace of OLR to further minimize any online impact. Multiple partitions can be reorganized in parallel. Coordination is provided through the IMS DBRC facility. This online reorganization function provides for greatly enhanced database availability.

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IMS Transaction and Database Server Version 10

- Easing Integration for Business Flexibility with New Technology for SOA**
 - XQuery for Universal Information Interchange
 - Enhancing IMS Web Services Connectivity and interoperability
 - Broadened Java and XML coding to ease development
 - Extending Integration of IMS Applications/Data across Environments
 - Reuse extensive customer investment in IMS applications/data
- Simplifying Installation and Management to Reduce Skills and Total Cost of Ownership**
 - Easing use in Installation, Management, and Maintenance
 - Defining Resources Dynamically to simplify installation and change
 - Simplifying Operations and Systems Management
 - Enhancing automation, security, and serviceability
 - Reduced power, cooling & requirements for environmental efficiency
- Providing High Performance, Scalable, Available, Reliable and Secure Solutions to Enable Growth**
 - Breaking barriers in Scalability with over 2 billion trans/day with DB update on a single IMS
 - Increasing Parallelism in Recovery and Multiple Systems Connectivity
 - Eliminating bottlenecks to growth, removing limits and providing storage constraint relief
 - New security capabilities for greater control and business flexibility
 - Virtualization in assuring flexibility for growth

THE WORLD DEPENDS ON IMS
Trusted Platform for SOA

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Key Message: IMS Transaction and Database Server Version 10 highlights are shown here.

IMS SOA Solutions are being provided for the IMS Transaction and Database Server

Earlier IMS 9 had been providing new technology to ease integration, installation and management. And enhancements continued to be delivered through the service stream and web downloads. IMS transactions and data, enabled as web services, leverage standards for Java Connector Architecture, Message Format Services Web support, 64-bit WAS, and JDK 5 for better business integration. Integrated Connect provided high speed access from practically any environment. Its XML Adapter eases access for the SOAP Gateway using WebSphere Developer for z, assisting with modernization, application development and business integration.

For universal interchange of information, IMS stored and retrieved XML data natively. Both being hierarchical, there's a natural fit with no overhead required for translation or conversion. It also converts non-XML data to XML for interchange, and provides the flexibility to convert back or store it natively.

The IMS integrated High Availability Large Database support and its online reorganization capability provided for ultra-high scalable/available data, continuous access to critical business information, and virtually unlimited data management capacity to handle unpredictable volumes.

With IMS V10, XQuery & Enhanced XML and Web Services Connectivity solutions extend Universal B2B Data Interchange. These open up IMS to the emerging market of off-the-shelf third party tools, such as query generation tools, and offers a standard, shareable integration point between IMS and other industry databases.

IMS Database Web Services support extends service-oriented architecture (SOA) capabilities to IMS data in a language- and database-independent way. This IMS support enables read-only use of IMS data in a disconnected mode (holding no locks in the database). This provides a way of representing IMS data as industry standard business objects, allowing IMS to transparently participate in SOA as a standard Service component. This support is being provided through the IMS V10 service process.

XML DB mapping enhancements allow for expanded mappings between new or existing IMS databases and visualized XML documents or collections. These enhancements widen the scope of supported XML documents for new IMS databases, and ease disparate data integration across the enterprise.

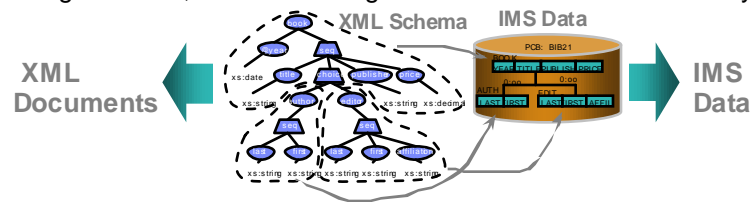
IMS enhances support for IMS as client and in Composite Business Applications to expand client and application interoperability. These enable an IMS application to call a web serving application and to include IMS conversational transactions as SOA-based composite business applications. This maximizes re-use of IMS assets in new applications for rapid business innovation and reduced costs.

Dynamic Resource Definition, operations/systems management and security/integrity enhancements simplify installation and management. These simplify definition and change of IMS systems and resources, allow IMS to maintain and query global status for DBs, Areas, Transactions, start/remove work, turn on/off logging, provide an audit trail, and much more.

And for increasing high performance, available, scalable solutions, IMS 10 has demonstrated over 22,000 trans/second (over 2 billion transactions/day) with database update on a single IMS. IMS 10 provides more parallelism in Database recovery and Systems Connectivity and removed bottlenecks for growth with enhancements for Fast Path, Virtual storage constraint relief, and more

Enabling New Development, Access, and Storage/Retrieval with IMS and XML

- Hierarchical IMS offers a natural mapping for XML
- XML processing in IMS transactions available since 1999
- IMS Databases align with XML for storing XML data natively
- Retrieval and Storage of IMS records as XML documents require **no change** to existing IMS databases
- IMS 10 enables XQuery of IMS data
 - Enabling off-the-shelf, third-party tools
 - Offering standard, shareable integration of IMS with other industry databases



Key Message: IBM is enabling new development, access and storage retrieval with XML.

IMS provides and continues to enhance and integrate XML support.

IMS has been taking advantage of XML which is critical for future transparent application and data integration. This can be done to enhance your existing high performance IMS transactions written in COBOL and PL/I in a Business-to-Business environment by receiving and sending XML documents. IMS supports the transmission of XML documents in the data portion of the IMS message. The messages can be placed and retrieved for the IMS messages queue for all messages regions.

IMS also introduced a way to **start viewing** your IMS data (from existing or new IMS databases) as collections of XML documents, by aligning the hierarchical structure of an IMS database (and therefore the IMS records stored within it) with a corresponding hierarchically structured XML Schema (and therefore the XML documents valid to it).

IMS XML-DB allows you to retrieve and automatically convert an IMS record into an XML document. Similarly, it allows you to store an XML document into IMS by automatically converting the XML document into an IMS record.

It does not, however, offer a meaningful way to query this new view of a collection of XML documents. In order to really be useful as a business tool, we need to be able to search, aggregate, evaluate, and essentially **pick and choose** the parts of our XML collection that are important, and then convert that resulting data into XML. This is exactly why IBM, Oracle, Microsoft and many more of the industry database leaders joined together in creating the w3c standard **XQuery** language. **XQuery** is a powerful query language that can be thought of as the **SQL** for hierarchically structured data. IMS being the world's fastest, most stable, (more of your favorite adjectives), hierarchical database, is possibly in a position to get the greatest advantage from this powerful emerging standard.

In order to take the fullest advantage of XQuery, IMS teamed up with Watson research to build a fully functional, performance oriented XQuery implementation on top of IMS.

Providing IMS Data in Web Services

- IMS provides industry standard access to IMS data
- IMS 10 enables transparent integration of IMS data as web services for SOA
- IMS 10 provides a user-friendly interface for viewing and generating IMS data metadata with its DLIModel Utility plugin
 - Rapid application development
 - Reduced cost of development and ownership



Key Message: IMS Data is being made available in Web Services

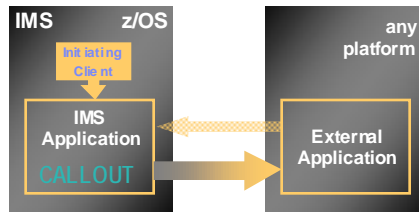
IMS is providing industry standard distributed web services access to IMS data. Using IMS data as Web services leverages your existing investment in application development and information. This can also eliminate, or greatly reduce, new development efforts, reduce end-to-end business process transformation, and facilitate integration with partners, suppliers, and customers.

JDBC access to IMS data was first delivered in IMS 7 and enhanced in IMS 9 for distributed J2EE application access without requiring z/OS application programming. This support provides transparent integration of IMS data as a web service for SOA through WAS, and provides for the use of IMS data with industry tooling. IMS 10 enhancements further ease the usability and integration of IMS data. This includes the ability to query an IMS database and convert IMS data into a DB2 result set, enhancing the interaction between DB2 and IMS. Support for GSAM databases is also provided for enhanced consistency with other IMS database types and to more fully leverage the existing Java library built-in data conversion routines. And IMS 10 further extends its SOA capabilities to IMS data, independent of language and database, with Web Services support for IMS data. This provides a way of representing IMS data as industry standard business objects, allowing IMS to transparently participate in SOA as a standard service architecture component.

Java Tooling initially introduced an IMS utility called DLIModel, which automatically constructs the required IMS Java metadata from IMS data sources. With this, the Java libraries can understand the complete hierarchic layout of an IMS database -- including relationships, keys, secondary indexes, segment names, field names, and field types. This utility allows the Java libraries to perform automatic type conversion as well as translation from an SQL query or XML-DB expression to the native IMS DB query language. This utility can produce XML descriptions of databases that conform to the Industry standard body (Object Management Group)'s metamodel, greatly easing development of Java applications and JDBC access to IMS Data. IMS 10 further enhances this with the DLIModel Utility GUI, providing a graphical version of the DLIModel Utility, built as an Eclipse plug-in. This simplifies IMS metadata generation, eases IMS Java and XML Database application development, and offers a visual representation of IMS databases.

IMS as Integration Focal Point

- IMS applications can access other environments and data
- IMS 10 enables IMS applications as clients to interoperate with web services outside IMS
 - Better integration of IMS applications for SOA
- IMS 10 enhances integration of IMS transactions as Web services for conversational composite business applications
 - Maximizes re-use of IMS applications for rapid business innovation and reduced costs



Key Message: IMS as Integration Focal Point is evolving.

One of the key customer requirements that we have 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 is being 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.

IMS Easing Use

- * IMS 10 eases installation by simplifying changes to IMS resources
- * IMS 10 simplifies operations and systems management with broadened auditability and single point of operations control
- * IMS 10 enhances automation and security
- * IMS 10 enhances serviceability



Key Message: IBM is easing use of IMS to address skills constraints.

IMS 10 provides Dynamic Resource Definition enhancements to help simplify the method of definition and change of your IMS resources. This offers a nondisruptive capability to add, change and delete databases, applications, routing codes, and transactions in IMS. It reduces the number of required user decision points and uses intelligence to determine system default values while allowing users to define and override definition choices. New commands are provided to dynamically define, update and manage certain resources without a system generation or online change. These simplify resource definition and decrease the need for the system generation, reducing the number of resources that must be defined through the system generation process. This capability can rapidly ease application development, with changes being made quicker and easier, without waiting till the system can be brought down.

IMS V10 Systems and Operations Management (OM) enhancements simplify management of IMS. The OM, first delivered in IMS V8, provided an interface to issue IMS commands from a single point of control (SPOC). IMS 10 enhances this capability. There is a new audit trail that can be used by all IMS systems and written to the common MVS logger. Each OM can use its own log, or a common, merged log, for coordinated recovery. The SPOC consoles can initiate IMS transactions, including sending a single transaction to all IMS systems in a parallel sysplex, especially useful for transactions that run on multiple systems for audit or diagnostic purposes. IMS can maintain global status for databases and transactions, improving the resource sharing between the IMS systems. (eg. if a database is taken offline for batch processing, other IMS systems that are started after the database is taken offline, recognize the offline state and will not try to access the data until it is brought back online.) These functions can improve output and auditability and provides improved integration with other products. IMS 10 also simplifies Systems Management and provides more granular control of logging. It does this for the IMS Sysplex and for those using the new commands for automated operations or secondary master logging. Enhancements utilizing the IMS Resource Manager to save global command status for propagation to an unavailable IMS when a command is issued during restart, adding IMSplex wide parameter support, and additional new command enhancements.

Additional automation enhancements are provided to improve programmer productivity and connectivity. They include the ability to activate message flood detection by suppression of the input messages if needed, the detection of wait synchpoint hangs and taking the time-out action if needed, member start/stop to suppress new input transactions and to resume the stopped member to accept new input transactions, member level security with each member having its own security level, additional information on the DISPLAY commands, and callout descriptors that identify alternate destinations and allow customers to define routing information, thus eliminating the need for customers to code exits to perform these tasks.

Security enhancements are provided for RACF users. They include error message reduction, support for mixed case passwords, faster auditing, enriched conversational security, mechanism to change the password associated with the client ID on input or for a customer-written application to change the client password, and the ability to define the aging value within IMS.

Serviceability enhancements are also provided to improve problem determination. For example, Base Primitive Environment Trace Table contents can be preserved, providing the ability to trace events over longer periods of time with more diagnostic data available the first time, requiring fewer recreates. In addition, Abend Search and Notification support can reduce problem determination time by providing "real-time" automatic email notification that an event, such as abnormal termination, has occurred, including the hyperlinks (URLs) to IBM-supplied Internet resources for understanding, analyzing and resolving problems. This function can automatically notify system programmers of a system failure with direct, up to date, real time access to abend information and descriptions, reducing the skill level necessary to identify and find solutions, thus easing

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IMS 10 Dynamic Resource Definition Support Eases IMS Manageability

Simplifies definition of IMS resources

The diagram illustrates the simplified definition of IMS resources using Dynamic Resource Definition (DRD). It shows the 'Operations Management' layer, which includes a 'Single Point of Control' (Mainframe) and a 'Control Center' (Workstation). This layer is connected to the 'IMS' layer, which includes 'System Services', 'Transaction Management', and 'Database Management'. Callouts highlight key features: 'SPOC used to define IMS resources', 'Export definitions to other IMS systems', 'Define resources once for all IMS systems', and 'Define transactions On Demand'.

- Dynamic commands to query and change resources
- Quiescing of only affected resources
- Eliminates system definition and online change for DBs, programs, routing codes, transactions
- Provides dynamic definition with non-disruptive addition, change, deletion of these resources

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Key Message: IMS 10 provides simplified definition of resources

Dynamic Resource Definition (DRD) is a simplified method of defining IMS resources. Enhanced support continues to be rolled out over subsequent IMS deliverables. The next step is for dynamic change of the MODBLKS resources and providing new user interfaces. Additional transactions would be able to be defined dynamically, On Demand, via a user exit.

Dynamic Resource Definition (DRD) provides for increased productivity by introducing a new, easier to use, user interface. DRD for MODBLKS reduces the need for system definition and online change. It reduces the number of required user decision points and the need for Assembler skills to define an IMS system. The rollout of DRD is scheduled to occur over multiple releases. The TSO SPOC and the IMS Control Center would be enhanced to provide a DRD user interface. Syntax Checker could build resources and descriptors. And the IMS Control Center could provide command wizards.

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IMS 10 Systems and Operations Management (OM) Enhancements

- Allow command processing clients to send unsolicited messages through OM
- Provide audit trail for OM commands
- Define new API for unsolicited messages.
- Create new log records for commands entered through OM API
- Add IMSplex-wide parameter support, Type 2 command enhancements
- Provide more granular control of logging
- Improve output and auditability for commands entered through SPOC
- Improve integration with other products and simplify management

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Key Message: IMS provides and continues to enhance Systems and Operations Management support

IMS V8 introduced Single Point Of Control (SPOC). IMS provides two types of SPOCs, one is a TSO/ISPF application running on zOS, the other is IMS Control Center, a workstation GUI tool. IMS Control Center is integrated in the DB2 Control Center, using IMS Connect for communication with IMS.

A new command syntax was introduced to make it easier to operate IMS in a parallel sysplex. The improved syntax can clearly distinguish between IMS keywords and user defined resource names. New keywords added to commands do not become reserved words, the user can use the keywords as resource names. A single command can be sent to all IMS systems with a single consolidated response returned to the user. Wildcards can be used in the commands for resource names. The command response can be filtered to show only that information that is required, reducing the workload on the operator. The SPOC can sort output. The IMS Control Center provides command wizards to construct IMS commands. IMS V8 facilitates customer automation by providing enhanced commands and by providing a machine readable command response. The important features for automation are the Operations Manager programming APIs, the command response returned in XML which can be parsed by automation, and Netview support. New QUERY and UPDATE commands allow automation programs to monitor the IMS resources and to alter workload parameters. The command response is in XML which allows automation programs to clearly interpret the response. Vendor and customer automation can be written in assembler programs or in REXX programs. Rexx programs can run under TSO or in Tivoli Netview.

IMS V10 Systems and Operations Management enhancements simplify management of IMS systems. These enhancements for the Common Service Layer and the commands, include:

A new audit trail that can be used by all IMS systems. The user can configure this so each OM uses its own log or all OMs, use the same merged log. When all OMs write to the same log, there is a single, merged log for all SPOC activity. The audit trail is written to the MVS system logger.

The Single Point of Control consoles can initiate an IMS transaction. Users can initiate a transaction to all IMS systems in a parallel sysplex. This is especially useful for transactions that run on each system for audit or diagnostic purposes.

IMS can maintain global status for databases and transactions in the IMS Resource Manager Resource Structure (i.e., CF List Structure). This improves the resource sharing between the IMS systems. For example, if a database is taken offline for batch processing, other IMS systems that are started after the database is taken offline, recognize the offline state and will not try to access the data until it is brought back online.

This can improve output and auditability for commands entered through the single point of control and provides improved integration with other products.

IMS continues to enhance Systems Management for IMS Sysplex and those using Type 2 auto ops or secondary master logging. Enhancements also include utilizing the Resource Manager to save global command status, propagate to unavailable IMS when command is issued during restart, adding IMSplex wide parameter support, and additional Type-2 commands enhancements. These provide simplified Systems Management, and more granular control of logging.

Eliminating Bottlenecks for Growth with IMS and z

- * IMS 10 reduces recovery control contention
- * IMS 10 improves multiple systems coupling bandwidth for improved efficiency, transaction performance, and output message response times
- * IMS 10 removes buffer limits and sequential dataset size limits
- * IMS 10 provides storage constraint relief
- * IMS 10 improves recovery with fast replication support
- * IMS 10 and z10 double thruput



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Key Message: IBM is eliminating bottlenecks for customer growth with IMS and z.

Scalability enhancements are also being provided to increase performance, capacity, availability and recovery with:

Parallel Recon Access relieves contention for the Database Recovery Control (RECON) data sets in the IMS Sysplex. As the Sysplex grows, this relieves bottlenecks to growth.

The Multiple Systems Coupling (MSC) facility, connecting IMS systems across the network is being enhanced to improve bandwidth performance across the network and to improve upon the links for connectivity,

Additional enhancements to IMS Scalability are also provided for Fast Path, VSCR, Large Sequential Data sets, ACBGen, and HALDB Online Reorg.

Fast Path (FP) enhancements Data Entry Database (DEDDB) buffer pool, command, options, and Virtual Storage Option (VSO) are enhanced; Extended Message Handler (EMH) increases buffers and usability/availability items; and Single Dependent Segments (SDEPs) Utilities function QUITCI are enabled as system default.

VSCR is moving blocks from CSA to 31 bit storage for capacity relief

Large sequential dataset size limit is increased for capacity relief

Application Control Block Library (ACBLIB) Online Change (OLC) enhancements are provided for enhanced availability.

Application Control Block Library (ACBLIB) online change (OLC) commit and /DISPLAY MODIFY ALL are changed to no longer treat messages on the local queues in a non-shared queue environment as work in progress for transactions indirectly affected by online change. This improves the usability of online change by increasing the chances that commit will succeed, especially for an ACBLIB-only online change.

ACBGen 31 bit support provides capacity relief

Display Active enhancements improve availability

Additional enhancements to IMS DBRC and Utilities are provided:

The IMS DBRC API, provided since V9, would also be enhanced to address additional vendor and customer requirements to access the Recovery Control dataset with a single, standard, release-independent interface, providing the Recon Update function for users and programs. This would ease access by vendor tools and ease version to version migration for customers using tools that interface the RECON. DBRC and Utility enhancements also include:

READ ONLY Access to the RECON Data Set is added from the DBRC API and the DBRC Utility DSPURX00.

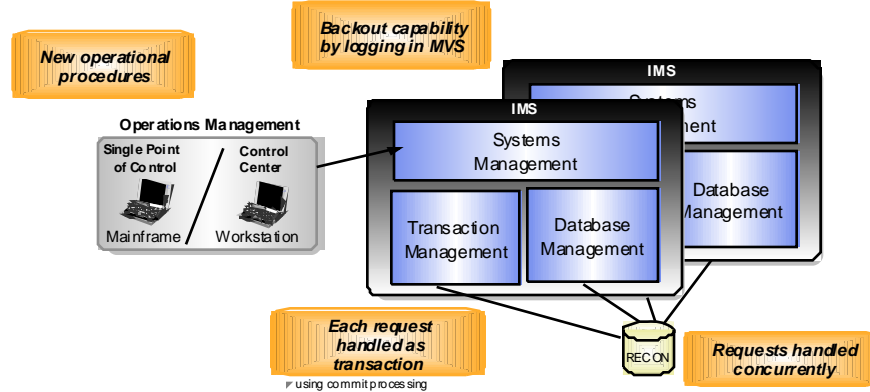
DBRC Time stamp precision enhancements provide full DBRC support of timestamps with microsecond precision to reduce timestamp collisions.

And there are also enhancements to SORT, ILDS utility and Image Copy 2. Image Copy 2 (IC2) enhancements include support for the fast replication capability of Data Set FlashCopy on Enterprise Storage Servers and SnapShot on RAMAC Virtual Array (RVA) DASD subsystems for database image copy/restore processing. Enhancements also include an improved, statement-driven interface of the SET Patch feature of DFSMSdss. Support is provided for recording alternative DB backup methods as concurrent/fuzzy user image copies. These items speed and improve recovery by exploiting the latest storage technology and alternative/concurrent methods, and provide additional information to ease use.

Early measurements on the z10 processor show that IMS 10 thruput for a full function workload is more than twice that achieved on a z990 with the same number of dedicated cp's.

IMS 10 Parallel RECON Access Extends IMS Scalability in Performance

Improves REcovery CONtrol performance by reducing contention



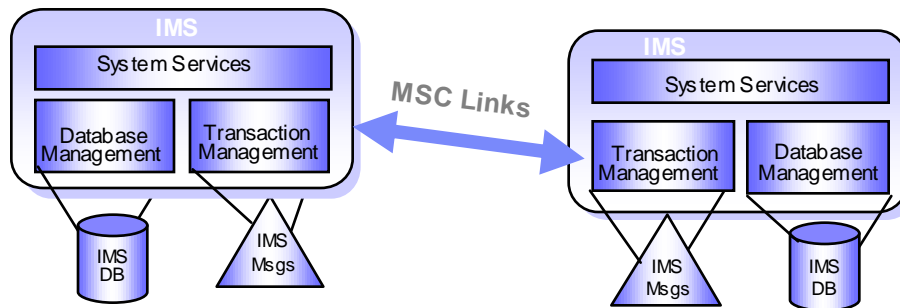
- Eliminate performance bottlenecks caused by contention for the RECON
- Utilizes DFSMS to provide record level locking and logging for the RECON data set
- Eliminates transaction response time issues, unplanned IMS system quiesces for OLDS switches

Key Message: IMS 10 provides improved RECON performance by reducing contention

IMS 10 is providing Parallel Recon Access for jobs sharing the RECON dataset. This could eliminate performance bottlenecks caused by contention for the RECON by exploiting DFSMS Transactional VSAM to provide record level locking and logging for the RECON data set. This could eliminate transaction response time issues, and unplanned IMS system quiesces for Online Log Dataset (OLDS) switches.

DBRC requests from multiple IMS systems are processed concurrently. Record level sharing is implemented for the RECON. Data set level (or volume level) serialization is eliminated. It uses Transactional VSAM which requires coupling facility for locking and buffer caching and it also uses the MVS System Logger which uses a coupling facility for logging. Undo' logging provides backout capability for transactional processing. RRS (Resource Recovery Services) is used for commit processing. Parallel RECON access requires new MVS operational procedures -- presents new failure scenarios.

IMS 10 Multiple Systems Coupling (MSC) Bandwidth Enhancements Extend IMS Transaction Performance



- Relieves bandwidth problems across the MSC network
- Makes Link Protocols more efficient/dynamic
- Improves blocking technology for greater bandwidth across MSC links
- Enables dynamic display/query/change or link buffer size
- Improves efficiency, transaction performance, output message response times, easing use and reducing links required
- Provides statistics to fine tune/analyze/improve link performance

Key Message: IMS V10 provides MSC bandwidth enhancements

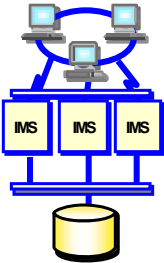
The IMS Multiple Systems Coupling Facility (MSC) provides connectivity between IMSs. MSC would be enhanced for broader bandwidth and for support of newer technology links. It makes the three (CTC MTM, VTAM) Link Protocols more efficient/dynamic. It improves blocking technology for greater bandwidth across MSC links, exploiting concept used in DASD/Tape media, blocking multiple records into a single buffer. It dynamically display/query/change link buffer size. Improves efficiency, transaction performance and output message response times, easing use and reducing links required. It provides statistics to fine tune/analyze/improve link performance. By using improved blocking technology and new MSC link Types, performance improvements and response times could result for transaction and output messages.

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IMS...So What's Next

Ideal for Driving On Demand Business

- ✓ Integration with Application Development and Connectivity
- ✓ Manageability toward autonomic computing
- ✓ Scalability in Performance, Capacity, Availability, Recovery



**Strategic Open Access
z/OS Enterprise Servers**

Benefits

- ✓ Enable Customer Growth
- ✓ Enhance Workload Balancing
- ✓ Increase Availability; Ease of Use
- ✓ Preserve Current Application Investment
- ✓ Enable New Applications

Enhancements

- Integration
 - ▶ Enhance Application Connectivity
 - ▶ Enhance Distributed Database Access
 - ▶ Broaden Java/XML Tooling
- Manageability
 - ▶ Broaden dynamic resource definition
 - ▶ Improve systems resource management
 - ▶ Ease Operations
 - ▶ Ease Serviceability/Usability
 - ▶ Enh Systems/Data Mgmt Tools
- Scalability
 - ▶ Reduce Planned Outages
 - ▶ Improve Availability for applications
 - ▶ Enhance Recovery/Control
 - ▶ System Growth

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Key Message: IMS has still more coming after IMS Version 10

IMS is being enhanced still further, following the announcement of IMS Version 10, with subsequent deliverables of function through new versions, service stream enhancements, and new tooling.

IMS continues on into the future, further strengthening its leadership role, helping customers in their on demand business enablement and the growth, availability, and systems management that evolving environments and cost measures require. IMS focus continues with providing Information Integration with open access and supporting tools for the on demand business environment, continually improving, systems management/usability, and system scalability with increased availability, performance and capacity. The goal is to continue to deliver the next stages of this function.

Java and XML continue to be key areas for new application development. IMS Java and XML support and the IMS Connector for Java would be enhanced for the latest in standards and ease of use to allow customers to take advantage of the latest in tooling. IMS continues providing enhanced performance for this environment, and providing better integration with the WebSphere/Rational development tool set as it evolves. New Technology as it evolves with XML and Web Services is also continuing to be exploited to enable new Application Development tooling. IMS is forging a strong alliance with the AD community to provide an integrated tool solution for supporting IMS Java and connectivity to the Internet.

IMS has been providing Sysplex support to ensure the highest in availability/performance for Systems growth. IMS would continue to enhance support for this environment and provide support for new capabilities in it.

Systems Management through autonomic computing continues to be a key area with IMS customers in managing their systems. IMS would continue to enhance its single system image with expanded standard user-friendly commands and interfaces accessible across environments. IMS would also continue to ease the installation process, reducing/eliminating the gen requirement. Enhanced security and serviceability for application access and database usage would also be provided.

Additional IMS Tools are also being provided to better integrate and ease use of IMS as an on demand business server. As tooling evolves we will continue to take advantage of the latest technologies for our customers to enhance their ability to use our products with these tools.

IMS is also providing continued enhancements to eliminate bottlenecks and impediments to growth in the IMS systems and in connectivity to the IMS systems. IMS is improving availability, performance, and capacity in the Multiple Systems Coupling (MSC), HALDB, Fast Path and Database Recovery Control (DBRC) areas of IMS.

In addition we continue to provide whatever we can for education and usability of our products. We also continue to enhance the ways our users can access and use our information.

Additional items for IMS 10 users

- Being provided through the IMS 10 Service Stream:
 - **DB Web Services** and DLIModel Utility support
 - **Synchronous Callout** for Invoking External Applications
 - **Dynamic Resource Definition (DRD)** Export/Import and Maintenance Utilities and **New Single Point of Operations Control (SPOC) print options**
 - **Connectivity enhancements** for Reconnect, Reroute, Client Options and Sessions, Transaction Expiration and Monitoring, and User Exit support.
 - **Connect Application Program Interface (API)** to Simplify Design, Development, Testing of IMS Access from other Clients
 - **Routing and Control User Exit enhancement**
 - **Dynamic command for changing LOCKTIME** to Synchronize with Changing Business Conditions, without a System Outage.
 - **DBRC Change Accum and Command enhancements** to Minimize Disruption and Improve Performance
 - **Fast Path (FP) Data Entry Database (DEDB) enhancements** to Improve Flexibility, Usability, Availability, and Capacity Constraints
 - **Database Recovery Control (DBRC) DELETE.DB Performance enhancement**
- Additional Products supporting IMS 10 users
 - **IBM Mashup Center IMS Info 2.0 support**
 - **WebSphere Transformation Extender (WTX) IMS support**
 - **IMS SOAP Gateway** on z/OS, Callout, and Multi-segment support

Key Message: These are many additional enhancements being provided for IMS 10 users.

IMS 10 enhancements are being provided through the IMS 10 service process or as enhancements to separate related products.

Customers have asked for still more IMS connectivity enhancements that extend access to IMS TM while reducing existing complexity and resource requirements. These enhancements can improve reliability and serviceability and enhance resilience, performance and availability.

The IMS Connect API shields IMS Connect client application developers from complexities by providing a simple API which allows them to interact with IMS Connect. This is being accomplished by providing simple ways of describing the connections that they want made and the interactions that they want performed along with the data that they want sent to IMS for those interactions using re-usable profiles and by providing them with simple methods which will perform those interactions.

Separate related products, like the WebSphere Transformation Extender (WTX), provide support to invoke IMS transactions while leveraging standards-based transaction support on distributed platforms of complex data formats and unique industry requirements. This support provides faster standards compliance and improved data quality with automated data validation using industry and regulatory standards.

I'll expand on a few of these items.

IBM Mashup Center IMS Web 2.0 support: Unleash and Reshape IMS

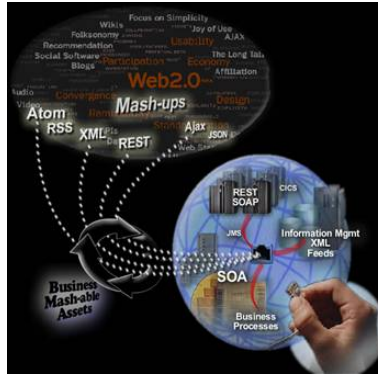


I want my IMS Assets to be mashable...

Enterprises will be *exposing* more services to the web, transforming the web into a platform...

...and *consuming* more services and feeds from the web

...what should I keep in mind?



Mashup Scenarios:

- Compose services (data or function) into a composite service
- Compose widgets / HTML segments into a composite UI or an application template
- Binding service (data or function) to the composite UI

Key Message: IBM Mashup Center's IMS Web 2.0 support unleashes and reshapes IMS for the internet.

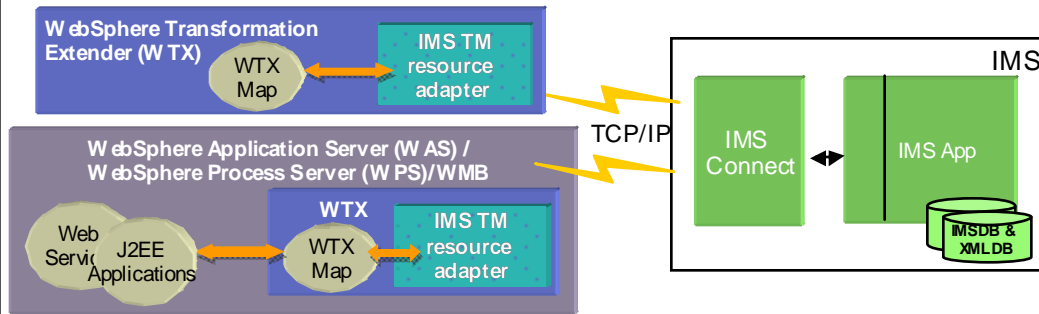
Web 2.0 initiates a new age of web-based communities. It empowers users to manipulate data and combine various services into a single Web experience. It also enables businesses to gain a competitive edge when they put the vast amounts of data they own about themselves and their customers to creative uses. The openness of the Web 2.0 era enables the larger-than-ever portion of Web users to develop Web mashups based on any other services.

The IMS™ Web 2.0 strategy encompasses far greater beyond what Web 2.0 can offer, that is to unleash enterprise data by enabling the transformation of IMS assets into RESTful (Representational State Transfer) services. These services can consume and be consumed by other RESTful services such as XML, ATOM, or RSS feeds. Data such as inventory status or banking transaction information can be made available to the Web 2.0 community, allowing users to remix and mashup data to meet their needs and thereby extending the value and usability of your IMS assets!

IMS Info 2.0 makes Web 2.0 go to work to simplify the integration of data and content and shortens the development and deployment cycles. IMS Info 2.0 lets you integrate your existing IMS assets into Web 2.0 mashup to compose and build services and widgets into composed services and UI. IMS Info 2.0 is part of the

Websphere Transformation Extender (WTX)

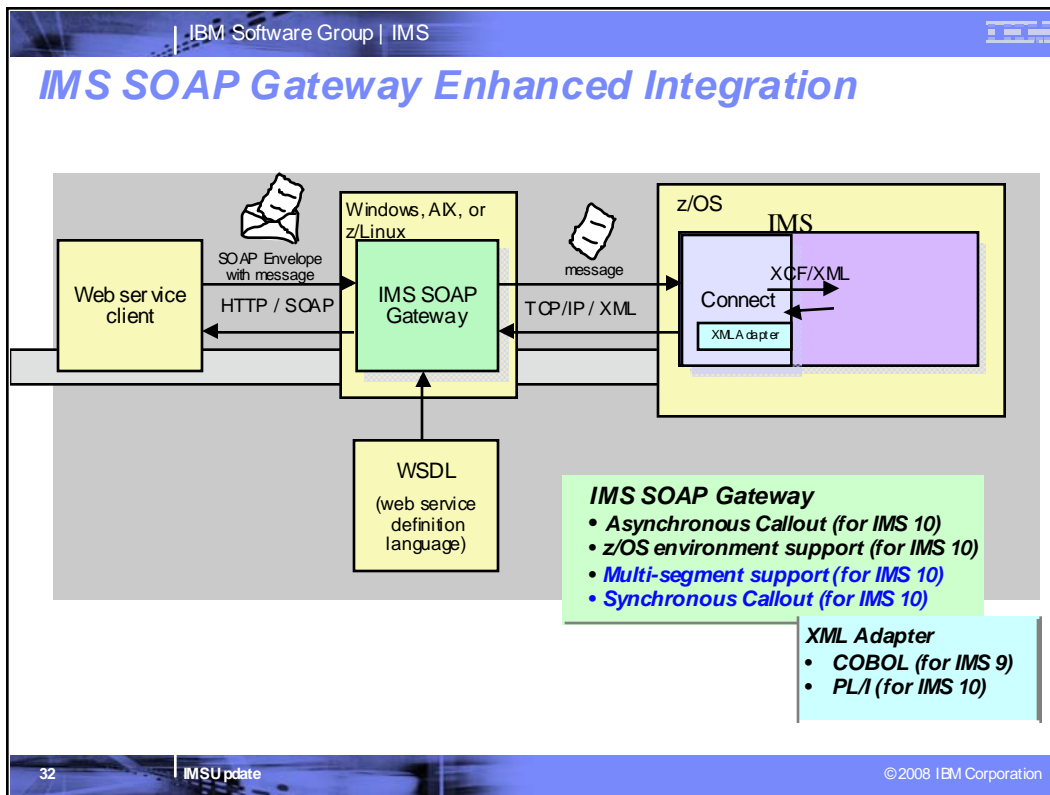
- Enables customers to leverage the WTX support of complex data formats on distributed platforms
- IMS integration with WTX enables an IMS customer to be compliant with complex data formats like SEPA, SWIFT (financial services), HIPAA (healthcare), and EDI (cross-industry)



- 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.

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.



Key Message: IBM is enhancing the IMS SOAP Gateway and the IMS XML Adapter support

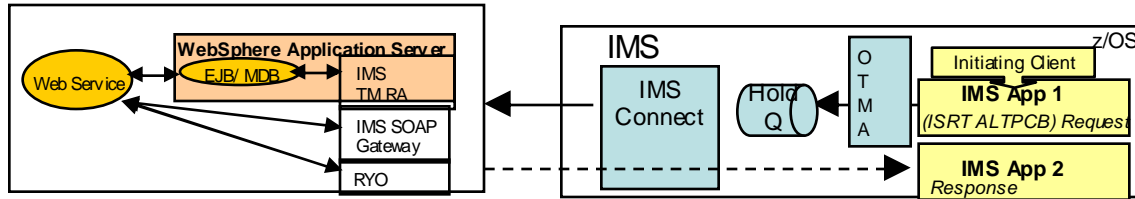
IMS is using the Rational Developer for z XML Adapter for COBOL with its IMS SOAP gateway code to generate aq COBOL XML Adapter.. The IMS SOAP Gateway is Generally Available (GA), downloadable at www.ibm.com/ims. IMS SOAP Gateway support was enhanced for z/OS environments and for Asynchronous callout for IMS 10. And we plan to deliver Multi-segment support.

Synchronous callout support is also being added for SOAP Gateway clients and also for WebSphere Application Server clients using the IMS TM Resource Adapter. IMS synchronous callout enhances the current callout capability to allow IMS application to wait for the response to come back in the same IMS transaction instance. This enables IMS application to synchronously callout to WebSphere applications, Web Service Providers and other external applications. This enhancement enforces IMS to be positioned as both a client and a server and allow SOA integration for both coming into IMS to access IMS transaction as well as going out from IMS to access other servers and applications.

IMS as Integration Focal Point

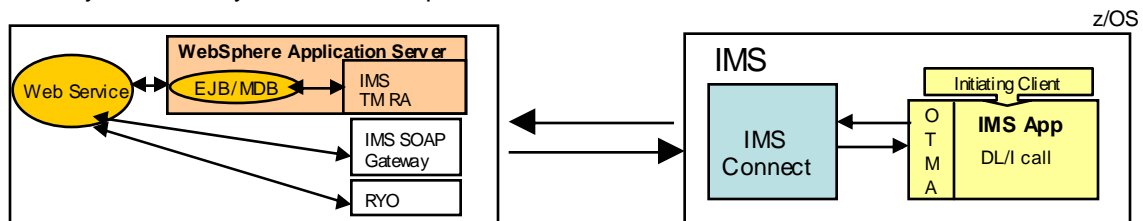
IMS V10 Asynchronous Callout

- Enable IMS applications to act as a client to asynchronously invoke Java EE applications and Web Services
- Receiving output from external application is possible



IMS V10 SPE Synchronous Callout Support

- Enable IMS applications to invoke Java EE applications and Web Services, and synchronously wait for the response



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

One of the key customer requirements that we have 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

Representing IMS Data with Web Services Easing IMS Data Access

- Provides Web Services for IMS 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 (eg. IMS)
 - 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

- IMS DLIModel utility plugin being enhanced to generate web service definitions for IMS data

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

IMS Database Web Services support extends service-oriented architecture (SOA) capabilities to IMS data in a language- and database-independent way. IMS Web Services support enables read-only use of IMS data in a disconnected mode (holding no locks in the database). This provides a way of representing IMS data as industry standard business objects, allowing IMS to transparently participate in SOA as a standard Service Component Architecture (SCA) component. This support is being provided through the IMS V10 service process.

The IMS DLIModel utility was enhanced in IMS 10 as a GUI based Eclipse plugin. It is also being enhanced to support this IMS Database Web Services support. IMS 10 is the last release to support the batch z/OS version, so users will want to migrate to this DLIModel Utility plugin version.

Dynamic Resource Definition (DRD) Enhancements Easing IMS Management

- **Commands to IMPORT/EXPORT Definitions** provide a dynamic method for users to port one or more IMS MODBLKS resources from one system to another.
 - Simplifies the migration of resource and descriptor definitions from one IMS to another, in a DRD environment
 - DRD CRE|UPD|DELETE commands allow users to create, update, or delete MODBLKS resources at one or more IMS systems dynamically.
 - Provide the EXPORT DEFN command to save resource and descriptor definitions to both system and non-system Resource Definition Data Sets (RDDSs)
 - Allows users to easily move resource and descriptor definitions from one IMS to another
 - Provides an additional option for saving resource and descriptor definitions
- **DRD Maintenance Utilities** enhance usability by providing a set of utilities and mechanisms to generate JCL streams that create an RDDS or generate CREATE commands from IMS Sysgen macros, a MODBLKS data set, or log records.
 - Invoke utilities from the "Manage Resources" panel, with the ISPF IMS Application Menu
 - Improves DRD usability by providing additional ability to create or re-create an RDDS
 - Facilitates cutover to DRD by reducing the manual effort required to create an RDDS.
- **New Single Point of Operations control (SPOC) print options** to ease usability and reduce operations efforts

Key Message: Dynamic Resource Definition enhancements are being provided

Dynamic Resource Definition Enhancements include

- EXPORT and IMPORT commands are provided to save and restore resource definitions to and from an external data source. The EXPORT DEFN command can be used to export resource and descriptor definitions to a resource definition data set (RDDS). The RDDS can be one of the system RDDSs used by automatic import and automatic export, or the RDDS can be a non-system RDDS. This item is being provided through the IMS V10 service process.
- IMS would also provide Dynamic Resource Definition (DRD) maintenance utilities which enhance usability by providing a set of utilities and mechanisms to generate JCL streams that create an RDDS or generate CREATE commands from IMS Sysgen macros, a MODBLKS data set, or log records. Support is provided to invoke the utilities from the "Manage Resources" panel, with the ISPF IMS Application Menu. This improves DRD usability by providing additional ability to create or re-create an RDDS. It also facilitates cutover to DRD by reducing the manual effort required to create an RDDS.

The Continuing Journey ...with IMS 11 Trusted, Resilient, Low Cost, Growth

Business Flexibility to Ease Integration and Simplified Access using SOA

- Direct, Distributed Access to IMS Data for Cost Efficient Data Access and Application Growth
- Optimized Connectivity for Ultra-High Availability and Resilience
- Broad Java and XML Tooling for Easy Development and Access, and Web Services for Business Transformation

Simplification to Streamline Installation and Management

- New Commands and User Exit Management to Facilitate Operations and Heighten Availability
- Advanced Syntax Checking for Rapid Installation

Efficient Growth: Scalable, Available, Reliable and Secure

- 64-bit storage Use for Ultra-High Availability and Overall Systems Performance
- Secured Investment

Key Message: IBM continues to enhance IMS, addressing customer requirements with IMS 10

IMS continues to address customer requirements for lowering Costs in the continuing journey.

Solutions provide ease of integration with new technology for a service oriented architecture -- focusing on

- IMS Open Database access for direct distributed TCP/IP access to IMS data providing cost efficiency, enabling application growth, and improving resilience,
- Enhanced IMS Connect, the TCP/IP gateway to IMS transactions, operations, and now data, to improve IMS flexibility, availability, resilience, and security.
- Broadened Java and XML tooling eases IMS application development and connectivity, and enhances IMS web services to assist developers with business transformation. broadened Java and XML tooling to ease development and access of IMS data

Solutions help simplify installation and management -- focusing on

- Enhanced commands and User exits that simplify operations and improve availability
- Syntax checking that ease installation

And enhancements address your requirements for high performance, scalable, reliable, and secure solutions -- focusing on.

- IMS Fast Path Buffer Manager, Application Control Block library, and Local System Queue Area storage reduction utilize 64-bit

IMS 11 Highlights

- **Database Management**
 - Open DB -- Direct, Distributed Access to IMS Data
 - Database Quiesce
 - ACBLIB usability enhancements
 - Database RAS enhancements
 - Database Level Trace
 - OLR Performance Enhancements
 - FP 64-bit Buffer Manager
 - FP Usability and Serviceability enhancements
- **Transaction Management**
 - Type-2 Query DC commands
 - OTMA Type 2 commands
 - OTMA enhancements
 - Transaction Expiration
 - TM Resource Adapter BPEL
 - Sysplex Manager Affinity Routing Enhancement
 - Reduce number of Aliases
 - RACF Mixed Case Password
- **Database Recovery Control (DBRC)**
 - Business Process E-based DBRC
 - Unconditional deletion of PRILOG information
 - Security Override for Non-production RECON
 - DBRC Migration/Coexistence from IMS V9 and IMS V10
- **Systems Management**
 - IMS Connect enhancements
 - DIAG command
 - User Exit Interface Enhancements
 - Dump Formatter enhancements
 - Syntax Checker enhancements
 - LSQA Reduction
 - KBLA enhancements

Key Message: These are many areas of IMS being enhanced with IMS 11.

We've tried to balance the work across the board to satisfy a variety of our customers requirements. These are IMS 11 items provided for customers using the IMS Database Manager (DB) with IMS TM, CICS or WebSphere and those using IMS TM with DB or DB2. Also, systems enhancements and DBRC enhancements are provided for these IMS customers as well.

Our customers have been asking us for these:

IMS connectivity enhancements that extend access to IMS TM and DB, while reducing existing complexity and resource requirements. These enhancements improve reliability and serviceability and enhance resilience, performance and availability.

IMS Manageability enhancements that simplify the process to create/modify database resources and enhance availability when integrating or modifying existing business functions. Extensions would be provided for Commands and user exits. These would reduce skill requirements, reduce manual efforts, and improve business application availability.

IMS scalability enhancements that increase availability, recovery, capacity and performance of the IMS environment. DBRC would continue to be enhanced for performance/capacity with multithreading capability. And the Integrated HALDB Online Reorg function would be enhanced to reduce CPU time, elapsed time and log volume. And Fast Path buffer management enhancements would improve usability, flexibility and ease ECSA usage. This additional parallelism and reduced resource consumption would improve database availability and performance.

I have selected some of the major items to talk further about here...

IBM Software Group | IMS IBM

IMS 11: Growth with Ultimate in IMS Connectivity

IMS as the Enterprise Integration Focal Point

Connecting with other Application and Data Servers, using advanced technology for client and server connectivity

Connecting IMS Transactions, Operations, and Data

Providing High Availability, Resilience, Performance, and Operations Ease, advanced commands/messages, error checking/trace/diagnostics

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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 with a single point of control.

With IMS Version 9 this function was integrated in.

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

IBM Software Group | IMS

IMS 11: Cost Efficient, Application Growth, and Resilience with Open Database

Addressing businesses that rely on data stored in IMS that want:

- Direct, distributed access to IMS DB with language independent interfaces
- Ultra-high Availability through isolation of open IMS DB access components
- Broad Integration and Application Development, using standard, state of the art tooling
- Cost efficiencies, application growth, and resilience

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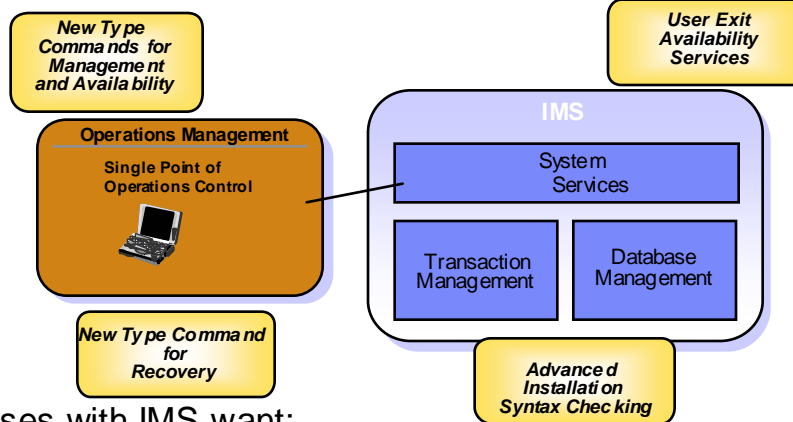
Key Message: IMS 11 is also addressing requirements for extended distributed database access.

LPARA is the existing solution for IMS database access, with access from distributed environments requiring a transaction interface through IMS TM or another z/OS subsystem; for example, WebSphere z/OS can be the TCP/IP endpoint on the mainframe with IMS libraries using the Open Database Access (ODBA) API to access IMS databases.

IMS 11 provides direct access to IMS data, leveraging the integrated IMS Connect function as the TCP/IP endpoint on the mainframe for data, as well as transactions and operations provided earlier. This nicely positions IMS Connect as the complete gateway to IMS resources...both TM and DB related. This is shown in LPAR B. This separate LPAR approach also provides for failure isolation between IMS DB and subsystems, such as WAS z/OS, enhancing resilience, cost efficiencies, and enabling application growth.

IMS 11: Streamlined IMS Installation and Operations

Easy installation and management of IMS resources



Businesses with IMS want:

- Dynamic commands to query and change resources
- Command to create point of consistency to reduce time the databases are offline
- User exit services to dynamically refresh modules without an IMS outage
- Advanced Syntax Checking for rapid installation
- Faster problem resolution

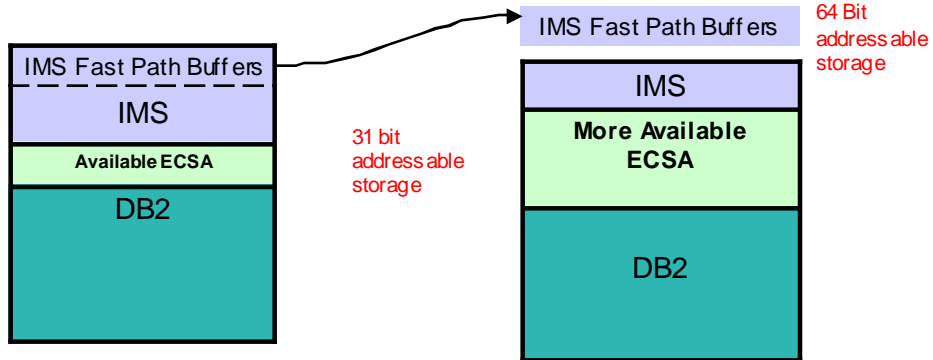
Key Message: IMS simplifies Operations and eases installation

IMS continues to ease the installation and management of IMS resources with

- Enhanced Syntax Checking for simplifying installation



IMS 11: Supporting Growth with Optimized IMS System Performance/Capacity and Ultra High Availability



Addressing businesses with system storage constraints that want ultra high availability and overall system performance and storage use with

- Reduced ECSA use for IMS Fast Path Buffers
- Additional 64-bit storage use for ACB members and/or content directory elements

Key Message: IMS also continues to enable growth with the 64 bit storage

IMS enables growth with 64 bit support, improving availability and overall system performance with

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IMS Information and Education

- “An Introduction to IMS” book available
- IMS on the Web at www.ibm.com/ims
 - IMS Education schedule
 - Schedule of Seminars, Webcasts, and Teleconferences
 - Presentations/Papers, Newsletters, Fact sheets, Announce Letters, Redbooks, Demos
- Technical support info (search on IMS)
- Information Center - enables search across IMS, DB2, Tools documentation
- Migration, skills transfer, customized offerings at ibmdds@us.ibm.com



Key Message: IMS provides information and education to help grow your skills

We are trying to reduce the people costs further. A major factor we hear in the people costs of the mainframe, are the skill requirements. To help you with your people costs for IMS, we are doing everything possible to reduce skill requirements and ease installation and management. Some of these are represented here:

We've provided a new textbook for an Introduction to IMS.

And we've also been providing new redbooks – One on IMS Connectivity came out last February, and one on IMS Performance will be coming out shortly.

Additional IMS Education through classes, seminars, webcasts, teleconferences and consulting services are also available to help ease installation and migration. Find out more at the IMS website.

Also available are migration and skills transfer, as well as customized offerings through IBMDDS@us.ibm.com

And within the IMS product itself, with the V9 Installation Verification Program (IVP), we continued to provide expanded samples. These samples test and demonstrate new and existing function, to ease customers installation and use of IMS. Our customers can take advantage of these samples to tailor their own environments.

IMS: Providing Leadership in the Marketplace

**Simplifying Information Integration
through Connectivity and New
Application Development**



**Easing Manageability
Reducing the Cost of
Computing**

**Enabling System Scalability
with Availability/Recoverability
Performance/Capacity**

Key Message: IMS continues to provide leadership in the marketplace.

The on demand business cycle focuses on leveraging your existing knowledge and information and transforming your core business processes, managing technology in building new applications, and providing organizational efficiency. In all this you need to be running a high performance, available, scalable, secure environment. You use existing data to sharpen decision making and responsiveness. You prioritize which processes and applications need to be extended. You build new reusable applications integrated with existing ones. And you maximize deployment on secure platforms. And for each of these elements of the cycle, we are providing you the IMS solutions that you will need to help make all this work easily. Built on the power of the S/390, billions of dollars worth of IMS applications have been developed to run your mission-critical work in a safe environment with IMS. If you have money in a bank, feed, house, clothe your family, or protect them with health or insurance services, use educational or government information, etc., most of the information about this is kept securely in IMS databases, accessed through high performance IMS transactions and rapidly being processed across the Internet for wider use. IBM will continue to invest heavily in IMS to enhance IMS to meet the stringent requirements of its customers -- to help them transform their core business processes with emerging technologies using IMS. Exploiting the latest in technologically-advanced hardware and software, IMS will help customers achieve new levels of price-performance and, at the same time, leverage their existing investment in skills and applications for information access across the Internet.

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