IMS: What's New and What's Next

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Agenda

- **IMS Strategy**
- **IMS Today and What's New**
  - Integration/Open Access
  - Manageability
  - Scalability
  - Some Additional enhancements
- **What's Next**
  - IMS 10
  - And What's next after IMS 10
- **Summary**

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Key message: IMS is providing a number of solutions

IMS Solutions are being provided for access to applications/operations/data, writing industry standard applications, storing/retrieving XML data in IMS and accessing other applications from IMS

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**

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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.

Integrated/Open Access with New Application Development/Connectivity

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Key Message: IMS Integration/Open enhancements can help with application development/connectivity

First we'll discuss the enhancements for Integration and Open Access provided for new application development and connectivity

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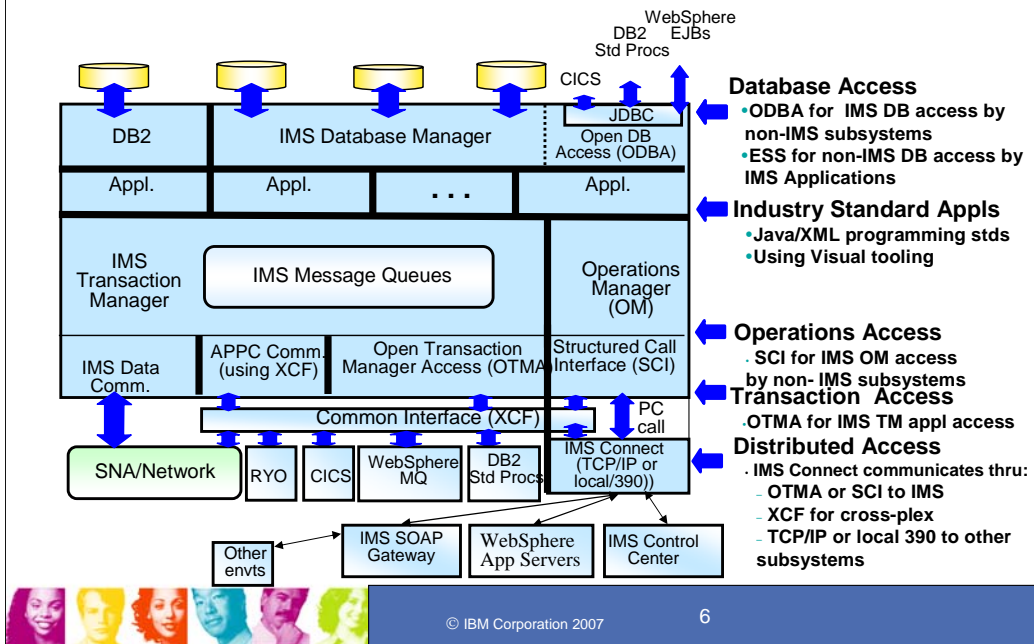
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Key Message: Enhanced Integration is required to address the increasing complexity.

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.

IMS Standard Interfaces enable IMS Transactions and Data as Services

WebSphere
DB2   EJBs
Std Procs

CICS

Database Access
- ODBA for IMS DB access by non-IMS subsystems
- ESS for non-IMS DB access by IMS Applications

DB2	IMS Database Manager	JDBC / Open DB Access (ODBA)

| Appl. | Appl. | . . . | Appl. |

IMS Transaction Manager

IMS Message Queues

Operations Manager (OM)

Industry Standard Appls
- Java/XML programming stds
- Using Visual tooling

| IMS Data Comm. | APPC Comm. (using XCF) | Open Transaction Manager Access (OTMA) | Structured Call Interface (SCI) |

Operations Access
- SCI for IMS OM access by non- IMS subsystems

Transaction Access
- OTMA for IMS TM appl access

Common Interface (XCF)

PC call

SNA/Network   RYO   CICS   WebSphere MQ   DB2 Std Procs   IMS Connect (TCP/IP or local/390))

Distributed Access
- IMS Connect communicates thru:
  - OTMA or SCI to IMS
  - XCF for cross-plex
  - TCP/IP or local 390 to other subsystems

Other envts   IMS SOAP Gateway   WebSphere App Servers   IMS Control Center

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Key Message: IMS Architecture is evolving to provide open interfaces, and support latest standards

Traditionally messages came into IMS through its SNA data communication protocol from VTAM. With APPC/IMS support in Version 4, IMS took advantage of the new Cross Coupling facility (XCF) to communicate with APPC/MVS. This was a software facility that allowed MVS subsystems to communicate more efficiently. With the IMS Version 5 Open Transaction Management Access (OTMA) facility, IMS extended its use of XCF for use by other IBM subsystems, such as TCP/IP, MQSeries, and DCE/RPC, providing them more efficient and richer capabilities in accessing IMS. OTMA allows access to existing, unchanged IMS applications on any IMS TM system on any MVS system of an MVS Sysplex as well. For TCP/IP, IMS Connect was provided, and then IMS V9 provided the integrated Connect function.

The Open Database Access facility (ODBA), for easier database access, has also been provided and extended for JDBC access to IMS data

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

With IMS V9, IMS Database access for distributed Websphere environments was also provided

IMS Java support *Eases Integration of Application Development and Connectivity*

✓Application Programmer Productivity
- Set of packages (groups of classes) for I/O message handling and access to IMS services and support Java APIs
- Java access to IMS input/output message queues
- JDBC access to IMS DB and DB2 data for IMS TM/Batch, CICS applications, DB2 Stored Procedures, or WebSphere ejbs in local z/OS environments
- Visual tools to ease development
- New Java Dependent Regions (JMP/JBP) with Java Virtual Machine (JVM) support
- Java Installation and Usability Enhancements to ease use
- IMS DB/DB2 interoperability from within a java dependent region
- Java-Cobol Interoperability/usability improves productivity, simplifies operations
- COBOL-XML support for parsing/transforming XML documents through WSED-generated XML converters
- SQL enhancements for new SQL keywords and Aggregate functions enhancements
- JDK 1.4 and JDBC 2.0 support, including ability to obtain scroll insensitive result sets
- JDBC Deferred Program Switch support
- zAAP processor support for lowering cost of running Java applications

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

Since IMS Version 7 IMS Java application support enhanced 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 workstation and host tools for development and testing.

IMS provides access to IMS TM message queues and to IMS DB and DB2 data through JDBC.

Enhancements were provided to this support for IMS DB access from CICS/zOs Java applications, DB2/z/OS Java Stored procedures and WebSphere z/OS applications, opening IMS DB up to better integration and use across platforms and across application environments. New Java Region Types were also being provided to replace initial support utilizing the High Performance Java Compiler. The newer support enhances the initial Java support to run with the new Scalable JVM, providing enhanced tool support for developing these Java applications to run in IMS.

And we are providing new Java Tooling, as well as installation and usability enhancements and supporting Java/Cobol and XML Interoperation.

IMS support for Java is augmented by IBM's Eclipse-based Application Development tools for J2EE programmers, as well as a broad array of AIM tools designed to facilitate building Innovative Services Oriented Architecture based applications that provide the best of the z/Series world with the best of the Java world.
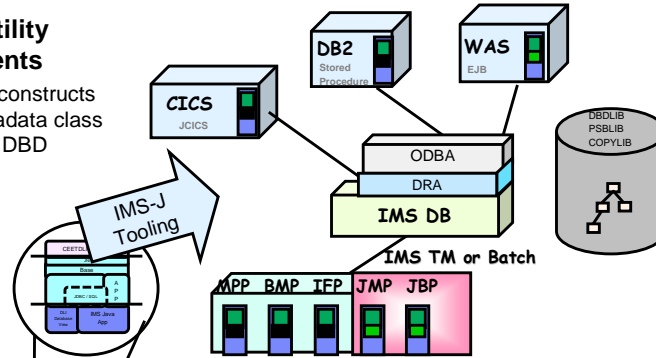
Support is also provided for the latest SQL and JDBC standards and enhance interoperability between IMS DB and DB2 for JDBC access within a Java Dependent region. JDBC Deferred Program Switch support was also added providing deferred program switch support of a Java application operating in a JMP region (in addition to immediate program switch). This enables conversational Java transaction applications to accomplish deferred program switch to other conversational transactions applications (both Java and non-Java) and adds the new setTransactionID (string) method

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.

JDBC Access to IMS Data with IMS Java enhancements

DLIModel Utility enhancements

• Automatically constructs IMS Java metadata class from PSB and DBD

DB2
Stored Procedure

WAS
EJB

CICS
JCICS

IMS-J Tooling

ODBA
DRA
IMS DB

DBDLIB
PSBLIB
COPYLIB

IMS TM or Batch

MPP BMP IFP JMP JBP

```
"SELECT CheckingAcct.Balance,
SavingAcct.Balance,CheckingAcct.Name" +
  "FROM MyBankPCB.Accounts " +
  "WHERE CheckingAcct.Balance > 10000" +
  "AND SavingAcct.Balance > 20000 "
```

Installation and Usability enhancements

• Expanded samples/examples
• IVP and install program improvements
• Expanded documentation

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Key Message: IMS continues to provide the IMS Java environment with enhanced tooling, installability and usability

IMS has been taking advantage of the Java environment for Web connectivity to IMS applications, for writing IMS applications running in IMS, and for writing applications running in other environments that access IMS DB data. And IMS continues to enhance its Java application support and access to IMS DB through JDBC.

JDBC support enhances the IMS Java support for enabling JDBC access to IMS DB data not only from IMS TM environments but also now from a CICS/z/OS Java application, DB2/z/OS Java Stored procedure, and/or a WebSphere/z/OS Enterprise Java Bean.

Java tooling can be used. Java Tooling introduces an IMS utility called DLIModel utility, which automatically constructs the required IMS Java metadata class from PSB and DBD source (earlier users were responsible for creating this class manually). This utility allows information on additional fields, long Java-style names and data types to be supplied from user-coded control statements and/or from XMI descriptions of COBOL copybook members. If desired, it will produce XML descriptions of databases that conform to the OMG's Common warehouse Metamodel 1.1. This greatly eases development of Java applications and JDBC access to IMS DB.

Java Installation and Usability enhancements are also provided - with expanded sample applications for IMS, WebSphere, CICS and DB2 Stored Procedures, expanded examples for logically related databases and secondary indexes, improvements for installation and Installation Verification program (IVP) applications and expanded documentation.

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

- **Specialized processing unit for z890 and z990 processors**
  - Requires z/OS 1.6
- **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

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

IMS JAVA support for the new IBM zSeries Application Assist Processor (zAAP) for the IBM zSeries 990 (z990) and IBM zSeries 890 (z890) 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 1.6, and the Processor Resource/Systems Manager (PR/SM).

XML and IMS for Transparent Application Integration

- **Processing XML Documents in New IMS Applications Today**
  - ➤ Customers can write IMS C, C++ applications using the XML Toolkit for z/OS
  - ➤ Customers can write IMS Java applications using the SDK for z/OS, Java 2 Technology Edition
  - ➤ Customers can write IMS Cobol/PL/I applications using parsers in Enterprise COBOL/PL/I z/OS compilers
  - ➤ Customers can use WebSphere Developer for z XML Converters for COBOL to generate/parse XML inputs/outputs from COBOL applications
- **Bridging XML and Existing IMS Applications Today**
  - ➤ Using MQSeries Integrator to support IMS COBOL and C applications
  - ➤ Supports publishing as Web Services existing IMS C, COBOL, PL/I, MFS applications with connections thru SOAP and EJB bindings
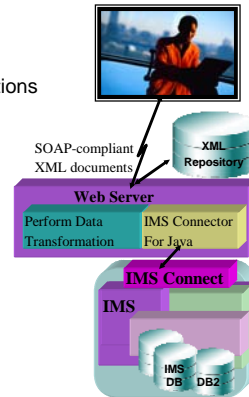 - ➤Transform XML for existing IMS applications within IMS Connect (V9)
- **IMS XML DB Support**
  - ➤ Support storing, retrieving, and querying XML in IMS databases (V9)
  - ➤ Generate XML schema for existing IMS databases (V9)
  - ➤ XPATH/XQUERY support (V10)
  - ➤ XML DB mapping enhancements (V10)
- **Additional XML and IMS Requirements**
  - ➤Enhanced PL/I support thru WDz (V10)
    - • Enable IMS PL/I applications as Web Services
    - • Generate XML output from PL/I applications
  - ➤ Create new IMS databases from users' XML Schema

- **IMS is Strategic in any Services Oriented Architecture (SOA)**

SOAP-compliant XML documents

XML Repository

Web Server

Perform Data Transformation | IMS Connector For Java

IMS Connect

IMS

IMS DB | DB2

Key Message: IMS provides and continues to enhance and integrate XML support

IMS has also been taking advantage of XML which is critical for future transparent application integration. Today, IMS documents can be processed in new IMS Java applications using the XML toolkit for z/OS. We are also making available IMS COBOL and PL/I XML Application Capability, using the IBM Enterprise COBOL and PL/I compilers, which allows you to develop new or modify existing IMS applications using XML support for COBOL and PL/I. This can be used 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 for IMS Message Processing Programs, Fast Path Programs and Batch Message Processing Programs.

You can also enable existing IMS COBOL, C, PL/I and MFS applications as Web Services by connecting SOAP and EJBs to IMS.

IMS V9 provided XML Database support, supporting the storing, retrieving and querying of XML in IMS databases and the generating of XML Schema for existing IMS databases.

Additional enhancements support transformation and industry tooling and XML Database Mapping.

XML transformation processing can be contained within the integrated IMS Connect, using WebSphere Developer for z.
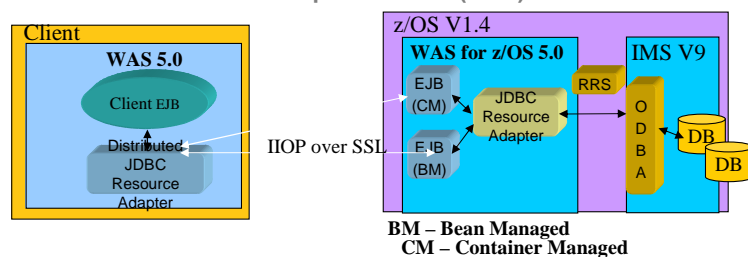
XML DB mapping enhancements allow for expanded mappings between new or existing IMS databases and visualized XML documents or collections. These enhancements widen the scope of supported XML documents for new IMS databases, and ease disparate data integration across the enterprise.

With new WebSphere Developer for z tooling you would be able to generate XML documents for outputs from PL/I applications.

Today IMS Databases can generate XML Schema. With new tooling you would be able to create new IMS Databases from a users' XML Schema

IMS V9 Integration/Openness

- **Integrated Connect Function**
- **OTMA/APPC Enhancements**
- **RACF Enhancements**
- **Greater then 255 Transaction Classes, up to a value of 999**
- **IMS Java/XML Enhancements**
  - ►Symbolic Checkpoint/Restart for the Java Batch Region
  - ►COBOL XMI plug-in to parse COBOL copy libs as input to DL/I Model Utility
  - ►XML data in IMS Database support
  - ►Remote DB Services providing remote data access to IMS DB from a distributed client
  - ►DLIModel utility enhancements for XML DB
  - ►DLIModel utility GUI (Technology Preview)
  - ►XResettable option removal enhances Java performance (2005)

Client

WAS 5.0

Client EJB

Distributed JDBC Resource Adapter

IIOP over SSL

z/OS V1.4

WAS for z/OS 5.0

EJB (CM)

JDBC Resource Adapter

EJB (BM)

RRS

IMS V9

ODBA

DB
DB

BM – Bean Managed
CM – Container Managed

Key Message: IMS V9 provided a number of Integration/open enhancements

Included in IMS V9 for Integration in application development/Connectivity are:

Java and XML Tooling is enhanced

Remote data access to IMS DB from a distributed client, initially from ejbs running on a distributed J2EE application server without requiring additional z/OS application programming

Symbolic Checkpoint/Restart for the Java Batch Region

COBOL XMI plug-in to parse COBOL copy libs as input to the DL/I Model Utility, producing metadata to ease application development

Supports XML document data storage an retrieval into and from IMS Databases

Generates XML schemas from IMS Database information to accelerate application development using the DL/I Model utility

Other items are for enhanced OTMA Security and Serviceability and RACF enhancements to enable migration from SMU security.

You can assign scheduling-class values for a transaction. These values allow you to isolate, organize, or retrieve certain transactions based on the class value. Prior to Version 9, the maximum number of transaction scheduling-class values was 255. The maximum value is now 999

IMS V9 XML Database support provides Universal transparent information interchange

- Introduces a way to view/map *native* IMS hierarchical data to XML documents
- Aligns IMS Database (DBD) with XML Schema
- Allows the retrieval and storage of IMS Records as XML documents with *no change* to existing IMS databases
- Decomposed XML data for use by non-XML enabled applications
- DL/I Model Utility can generate XML schema at runtime improving development time and reducing errors
- Query IMS data using industry standard XQuery

XML Schema   IMS DBD

XML Documents   →   IMS Data
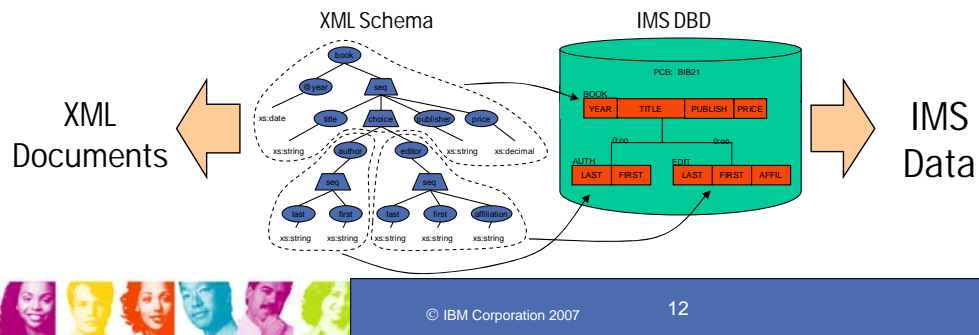
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Key Message: Another key element is XML Database support for storage and retrieval of XML data in IMS databases
The implementation is native IMS, not merely a mapping as must be done with other technologies, providing efficient utilization of resources and top overall performance. IMS data can be easily converted to XML to facilitate integration with business processes, improve programmer productivity and reduce development lead times. XML data can be decomposed for use by non-XML enabled applications, thereby preserving and extending past investment and enhancing programmer productivity. Data descriptions can be the same for distributed and host environments to reduce overhead and improve data consistency and integrity.

DL/IModel Utility Enhancements generate XML schema from existing IMS Database Definitions (DBDs) and Program Status Blocks (PSBs) for XML storage and retrieval at runtime. This improves application development time, reduces errors and makes it possible to consolidate skills by allowing programmers to code in an industry standard interface. Support for this XML visualization was first introduced in IMS Version 9. The DLIModel utility enables you to create this XML view of an IMS database by generating a corresponding annotated XML Schema. Once in place, our Java middleware uses this XML Schema to transform retrieved existing IMS Records into XML documents. These documents can then be manipulated directly, returned as the result of a transaction, participate in the result of a Web Service, or displayed directly to a web page using XSLT. Additionally, incoming XML documents matching that XML Schema definition can be stored back into the database as native IMS records.

The biggest advantage of IMS's XML database solution is that XML data is stored transparently to both IMS and to existing non-XML applications. This mean there are no migration issues and databases can be accessed simultaneously by XML and non-XML transactions. Our intent with IMS V9 XML database support was simply exposing existing IMS databases as collections of XML documents that could easily participate in the SOA arena. However, we are now seeing growing interest in actually creating NEW IMS databases capable of storing XML documents based on an existing XML Schema. In such a scenario a business is conforming to a new standard and given an XML Schema that defines the incoming XML documents. These incoming XML documents can operate on the data (never knowing or needing to know it was XML).

In IMS V10, we are introducing XQuery support --a powerful integration point for IMS and emerging IMS tools, and also an extremely powerful query language designed around hierarchical data access. It allows you to search, aggregate, evaluate, and essentially pick and choose the parts of our XML collection that are important, and then convert to or even construct new XML documents from the data.

IMS Connect 2.2 and IMS V9 Connectivity

- **IMS Connect 2.2 GA June 25, 2004**
  - Command enhancements for ease of manageability
  - Improved performance and availability reporting
  - Connector for Java also adds
    - Commit Mode 0/persistent socket for improved performance
    - Socket timeout for enhanced usability
    - Retry for improved availability
- **IMS V9 GA Oct 29, 2004 provided *Integrated Connect Function***

Notes:
IMS Connect V1.1/1.2 ended service earlier
IMS Connect V2.1 ended service September 30, 2006
IMS Connect V2.2 along with IMS V8 end service Nov 5, 2008
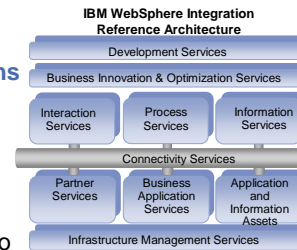
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Key Message: Enhancements continue to be provided
A number of additional items are now being delivered with IMS Connect V2R2. The IMS Connect V2.2 enhancements include:
•Command enhancements for ease of manageability - IMS Connect commands can now be issued through the MVS modify interface. This is an MVS command and the response to it will be presented by MVS to the issuer of the command, thus enhancing consistency and ease of use. In addition, Query Member Command enhancements add IMS Connect IP address and version.

•Commit Mode 0 / Persistent Socket to improve performance

•IMS Connect Extensions for z/OS, V1.1 support to enhance performance and availability reporting

•IMS Connector for Java™ also adds Commit Mode 0/ Persistent Socket for improved performance, Socket timeout for enhanced usability, and Retry to broaden availability

IMS V9 with its GA is now providing Integrated Connect Function, supporting the existing function, enhancing it and ensuring a base for future enhancements.

IMS V9 Integrated Connect Function

- **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

IBM WebSphere Integration Reference Architecture

Development Services

Business Innovation & Optimization Services

| Interaction Services | Process Services | Information Services |

Connectivity Services

| Partner Services | Business Application Services | Application and Information Assets |

Infrastructure Management Services
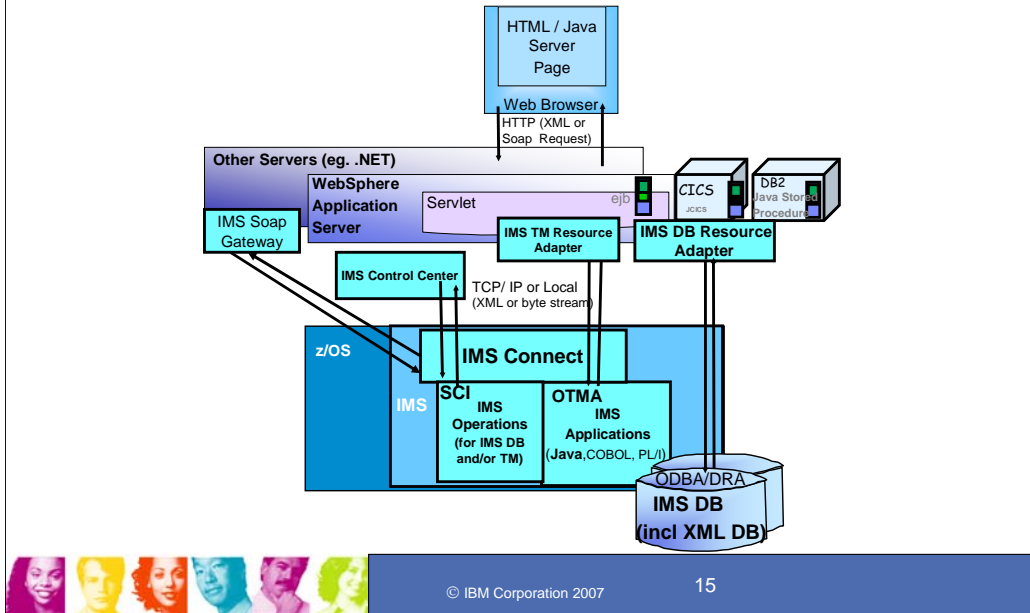
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Key Message: A key element of the On Demand environment in IMS V9 is the Integrated IMS Connect function.

Integrated IMS Connect Function is provided with IMS V9 and 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.

Integrated/Open Access with IMS for On Demand Business

Application Enablement and Connectivity Solutions

HTML / Java Server Page

Web Browser

HTTP (XML or Soap Request)

Other Servers (eg. .NET)

WebSphere Application Server

Servlet   ejb

IMS Soap Gateway

IMS TM Resource Adapter

IMS DB Resource Adapter

CICS   JCICS

DB2   Java Stored Procedure

IMS Control Center

TCP/ IP or Local (XML or byte stream)

z/OS

IMS Connect

IMS

SCI   IMS Operations (for IMS DB and/or TM)

OTMA   IMS Applications (Java, COBOL, PL/I)

ODBA/DRA

IMS DB (incl XML DB)

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Key Message: For application, information, and operational integration, IMS exploits the latest programming technologies for the Internet and Java.

With industry standard, open interfaces of Java, users can transparently download and seamlessly run applications. It is platform independent and widely used.

IBM supports industry standard J2EE with a set of common, consistent Java interfaces that connectors from any subsystem implement, making it easier for programmers to deal with differences between subsystems. For such, IMS has provided 2 resource adapters – the IMS Connector for Java for IMS Application access and the IMS Java JDBC Connector for IMS Database access.

In the middle here is the runtime environment of a Java Servlet Application running under z/OS, Linux, or other environments. IMS Connector for Java within the Java Application establishes a connection with IMS Connect through TCP/IP (or the Local Option, if in the same LPAR as Connect). IMS Connect, running under z/OS can run in the same or separate LPAR from the rest of IMS. It passes the transaction request to the IMS application through IMS OTMA (Open Transaction Manager Access) interface, using MVS XCF (Cross-system Coupling Facility). The IMS application could be written in Java or another language. Similarly IMS Connect sends the output back to the IMS Connector for Java application. In the servlet runtime environment, the user invokes an HTML page using the browser and submits data to a webserver servlet invoked by the WebSphere application server. The servlet uses the IMS Connector for Java to establish a connection with IMS and invoke the requested transaction through IMS Connect. The output is handed back to the IMS Connector for Java in the servlet via IMS Connect and out to the HTML page.

The IMS Connector for Java environment is also being used to provide new IMS applications that map XML documents. XML mapping has already been enhanced for COBOL and PL/I as well. XML mapping to existing IMS MFS applications is provided. Additional Java standards, enhancements, and tooling continue to be provided. IMS V9 is also providing distributed JDBC access to IMS DB data from a distributed WebSphere Server.

On the right, this shows IMS-provided Java application support with the IMS Java JDBC Connector as a second IMS Resource Adapter -- for access to IMS DB. Local JDBC access to IMS DB from DB2, CICS, and Websphere environments is also available. Java applications in these environments could use JDBC calls for access to IMS DB data. New Java applications can be developed in all these areas with access to existing IMS applications and data.

On the left, this also shows distributed, integrated IMS Operations provided through the IMS Operations Manager, the Structured Call Interface, the DB2 Control Center, and IMS Connect.

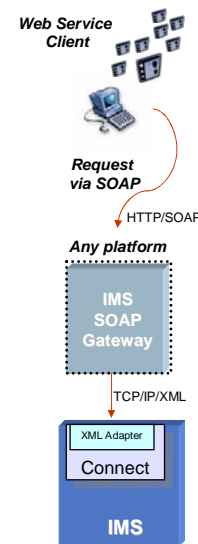**IMS On Demand Business Application Development and Connectivity Environment**
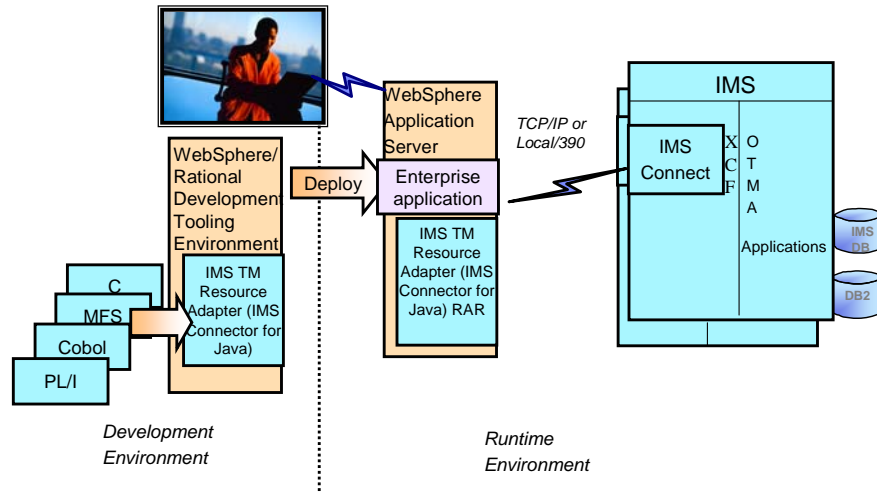
Key Message: IMS TM Resource Adapter (also known as the IMS Connector for Java) can be utilized with the development tooling for Connectivity to IMS

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

- **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**

Web Service Client

Request via SOAP

HTTP/SOAP

Any platform

IMS SOAP Gateway

TCP/IP/XML

XML Adapter

Connect

IMS

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

IBM has recently 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 9.2 provides 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 specifiies connection and interaction.
    4. The Client developer generates client code from wSDL and writs 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

IMS Connectivity Enhancements 2006-2007 through Service Process

- **Connect enhancements**
  - Connect reroute and purge not deliverable
  - Connect Client application NAK with output purge or reroute option
  - Connect Sysplex Distributor enhanced
    - Connect Super member support provides for shared asynch messages
  - Connect Send-only
    - Reroute option (IMS V9 only)
    - With acknowledgement (2007)
    - With Serial delivery (2007)
  - Resume TPIPE with alternate client ID (2007, IMS V9 only)
- **Additional Connector for Java enhancements**
  - Sysplex distributor reroute and purge
  - WID/WBI V6 support (IMS V9 only)
  - RAD V7 (IMS V9 only)
  - SSL Null cypher encryption (2007, IMS V9 only)
  - 64-bit local option support for WAS z/OS (2007, IMS V9 only)
- **MFS Web enhancements**
  - WSADIE Attributes/extended attributes support (IMS V9 only)
  - Web Enablement V9.3 display enh, WAS V6 support (Web Download for IMS V9)
- **XML Adapter and Task Manager (IMS V9) for IMS SOAP Gateway V9.2**

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Key Message: Enhancements are continuing to roll out for IMS Connectivity.

IMS Connectivity enhancements include Connect Purge not deliverable extensions, which provides the user the ability to decide which messages to purge for Commit Mode 0 transactions that start as Commit Mode 1 and transfer to Commit Mode 0. (Previously only Commit Mode 1 transactions were supported).

IMS Connect client application NAK with output purge or reroute option offers an extended CM0 message output purge or reroute support based on an NAK message from the IMS Connect client application. Nak on IMS CM0 I/O PCB output message can be either purged or rerouted to a different TPIPE queue than the inputting TPIPE queue. Additionally, when OTMA cannot deliver an CM0 I/O PCB output message to IMS Connect, the output message can be rerouted using the reroute TPIPE name specified in the OTMA input message prefix. This support is provided for IMS Connect/Connector for Java V2R2 and above and can be used to support z/OS sysplex distributor for higher availability.

Connect and Connector for Java function enhancements for Sysplex distributor -- the first of these is Connect support to reroute persistent socket messages (if Connect has a problem delivering a message it goes back to OTMA to reroute, but if OTMA cannot IOPCB to connect, there will be no reroute) and Connector for Java support to reroute sharable persistent socket messages. Also included are new Connector for Java JCA 1.5 and WAS V6 environment support as well as RACF Key Ring support. There are some additional RAS enhancements.

IMS Connect send only enhancements provide additional options to ensure that messages get enqueued to the transaction in the order sent in and that the client application can then read the acknowledge before sending the subsequent send-only transaction, provides consistency with SNA.
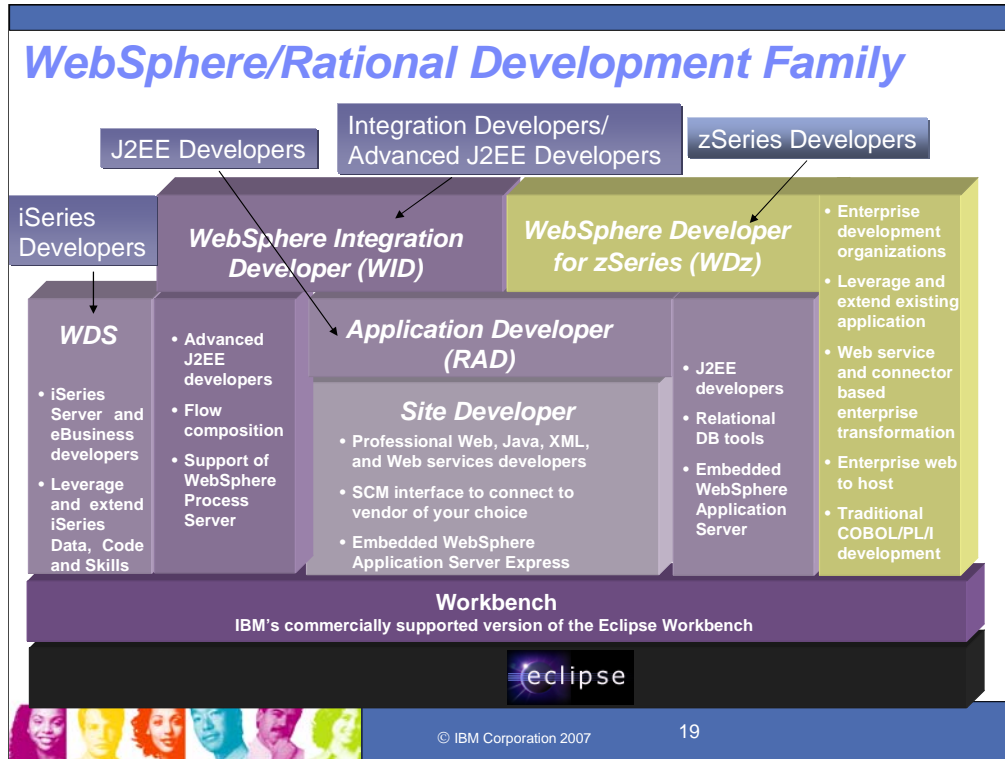
> SendOnly reroute option (3/06), With the new option, IMS Connect can request that OTMA reroutes the I/O PCB output message from the inputting TPIPE queue to the user requested reroute TPIPE queue. This feature could be used to support z/OS sysplex distributor for higher availability.
> Send-only with acknowledgement -- an acknowledgement will be sent to the client application for each Send-Only interaction. This will ensure that the transactions to the same TPIPE that are issued from the same OTMA Client are enqueued in the order in which they were received.
> Send-Only with Serial Delivery -- via the DELIVERMSG=ORDERED option of the XCF's IXCMSGO macro. This allows the Send-Only transactions to the same TPIPE that are issued from the same OTMA client to be delivered to the IMS system in the same order they are entered.

Resume Tpipe with Alternate ClientID addresses Sysplex Distributor and callout requirements. This allows a TCP/IP client application to retrieve the asnch output messages from an output queue specified in the IRM ALTCID field. This provides customers the ability to do resume tpipe on one client id to get a customer to get output sent to a different client id .

MFS Web Support provides access to existing IMS applications from WAS environments, protecting customer assets. MFS Web Services enhancements expose attributes and extended attributed fields for web services applications. MFS Web Enablement now includes access from WAS for zOS, in addition to Windows and AIX, and adds customizable display enhancements, allowing drop down list boxes and infopops on familiar look-and-feel 3270 web pages.

WebSphere/Rational Development Family

J2EE Developers

Integration Developers/
Advanced J2EE Developers

zSeries Developers

iSeries Developers

WDS
- iSeries Server and eBusiness developers
- Leverage and extend iSeries Data, Code and Skills

WebSphere Integration Developer (WID)
- Advanced J2EE developers
- Flow composition
- Support of WebSphere Process Server

Application Developer (RAD)

Site Developer
- Professional Web, Java, XML, and Web services developers
- SCM interface to connect to vendor of your choice
- Embedded WebSphere Application Server Express

WebSphere Developer for zSeries (WDz)
- J2EE developers
- Relational DB tools
- Embedded WebSphere Application Server

- Enterprise development organizations
- Leverage and extend existing application
- Web service and connector based enterprise transformation
- Enterprise web to host
- Traditional COBOL/PL/I development

Workbench
IBM's commercially supported version of the Eclipse Workbench

eclipse

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Key Message: IBM has also been providing Websphere/Rational tools to help with IMS Development and Connectivity
IBM provides an array of Websphere and Rational development tools designed to support existing enterprises in their on demand application enablement.
Simplifying in a framework that is consistent across the development spectrum.
Based on the open source eclipse workbench, we now Enable Developers within a company to share one common development environment, which supports enhanced collaboration among developers using different technologies and facilitates moving developers to different technologies. IMS SOAP Gateway, the IMS TM and DB Resource Managers, IMS Java and the DLIModel Utility have all been taking advantage of these for IMS use.

Key Message: IBM provides tooling for IMS application development and problem determination

In particular, IBM provides a suite of problem determination tools. Note that since OS/VS COBOL is no longer supported, customers can use the IBM Debug Tool to help convert old COBOL programs to supported levels of COBOL

Application Performance Analyzer for z/OS, File Manager for z/OS, Fault Analyzer for z/OS, Debug Tool for z/OS and Debug Tool Utilities and Advanced Functions, and File Export for z/OS were all announced with function that provides additional emphasis on the building of SOA applications, tighter integration among the problem determination tools and other related tools sets, and an ongoing emphasis on supporting and exploiting the latest subsystem levels. These tools can be combined with IBM workload simulator, IBM application time facility for z/OS, IBM Rational Performance Tester for z/OS and Rational Functional Tester Extension for Terminal-based applications, when additional testing needs are required.

APPLICATION PERFORMANCE ANALYZER FOR z/OS V7.1 helps programmers and systems personnel tune applications and resolve performance constraints. It is a non-intrusive application performance analyzer that aids developers in the design, development, and maintenance cycles.

DEBUG TOOL UTILITIES AND ADVANCED FUNCTIONS FOR z/OS V7.1 builds on the function in Debug Tool for z/OS V7.1, providing even more debugging capability. It helps you debug applications running in a variety of environments, such as CICS, IMS, DB2 Stored Procedures, and UNIX System Services. To support the latest DB2 V8 and CICS V3.1 requirements, it also includes features to help developers identify old OS/VS and VS COBOL II source code and to migrate the code to Enterprise COBOL.

FAULT ANALYZER FOR z/OS V7.1 assists developers in analyzing and fixing application and system failures. It offers programmers the information required to help determine the cause of failure and provides assistance in how to resolve the problem. Fault Analyzer delivers expanded application coverage and related business value beyond traditional applications with integrated support for WebSphere Application Server for zSeries and Java. Users can leverage one tool to assist in mixed workload application abend analysis, including 64-bit DB2 V8 support.

FILE MANAGER FOR z/OS V7.1 provides comprehensive, user-friendly tools for working with z/OS data sets, DB2 data, or IMS data. The developer can create, browse, copy, edit, print, and format or reformat data files in the most popular z/OS file formats. Programmers can manipulate data using COBOL and PL/I record layouts in batch and an online facility.   The FM/CICS component provides similar functions on CICS file, temporary storage, and transient data queue resources.

FILE EXPORT FOR z/OS V1.2 offers highly selective data copying capabilities that simplify the complex task of populating test environments, or migrating applications to new or additional environments. This powerful tool provides flexible methods of exporting and then importing related sets of DB2, IMS, VSAM, and sequential data. It can generate test data on demand and support altering sensitive data while maintaining data relationships. The ability to "scramble" sensitive information while extracting the data is a highly sought after security related function.
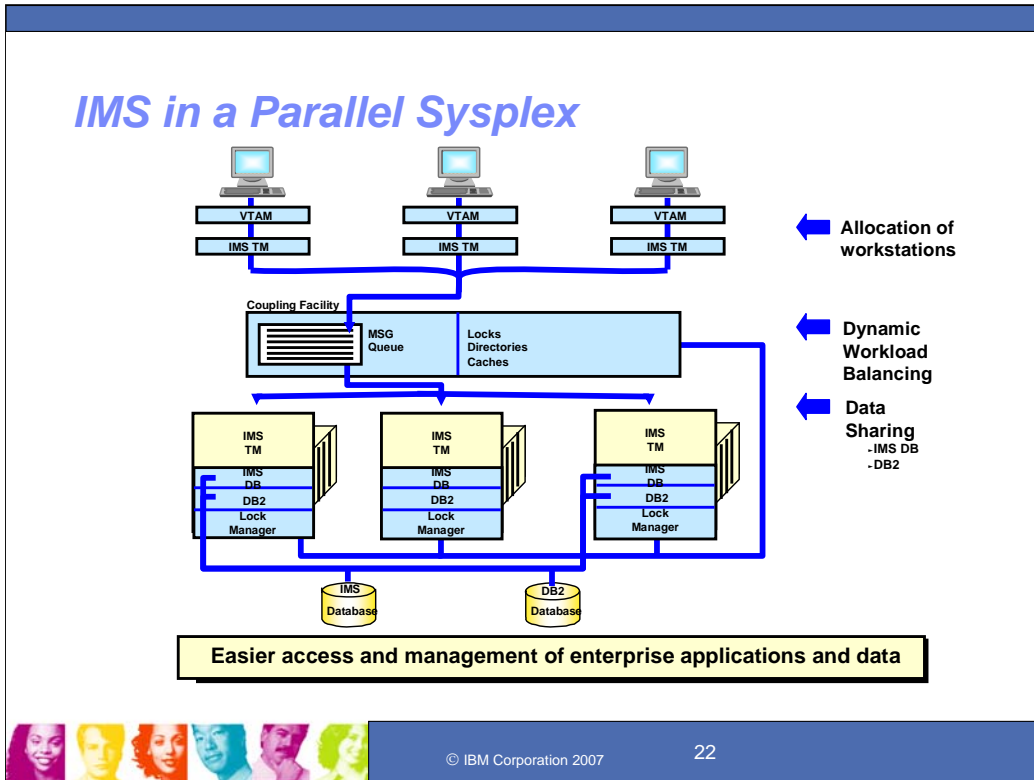
Manageability Ease with Autonomic Computing

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Key Message: IMS also provides for manageability Ease toward Autonomic Computing

Manageability enhancements are being provided to ease installation and operations efforts

IMS in a Parallel Sysplex

VTAM — IMS TM
VTAM — IMS TM
VTAM — IMS TM

Allocation of workstations

Coupling Facility

MSG Queue | Locks Directories Caches

Dynamic Workload Balancing

Data Sharing
- IMS DB
- DB2

IMS TM | IMS DB | DB2 | Lock Manager
IMS TM | IMS DB | DB2 | Lock Manager
IMS TM | IMS DB | DB2 | Lock Manager

IMS Database
DB2 Database

Easier access and management of enterprise applications and data

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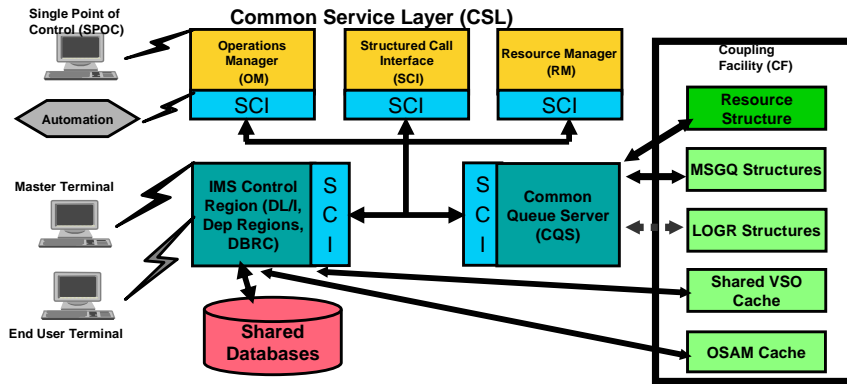**Key Message: IMS has been exploiting the parallel sysplex environment.**

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 Enhanced Management

- 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

Common Service Layer (CSL)

Single Point of Control (SPOC)

| Operations Manager (OM) | Structured Call Interface (SCI) | Resource Manager (RM) |
| SCI | SCI | SCI |

Automation

Coupling Facility (CF)
- Resource Structure
- MSGQ Structures
- LOGR Structures
- Shared VSO Cache
- OSAM Cache

Master Terminal

IMS Control Region (DL/I, Dep Regions, DBRC) — SCI

End User Terminal

Common Queue Server (CQS) — SCI

Shared Databases

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

Key Message: IMS Version 8 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 genned 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 componetization, 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 componetization. The Common Service Layer is providing a single system image and easier systems management for the Sysplex environment.

Distributed Operations via the Control Center

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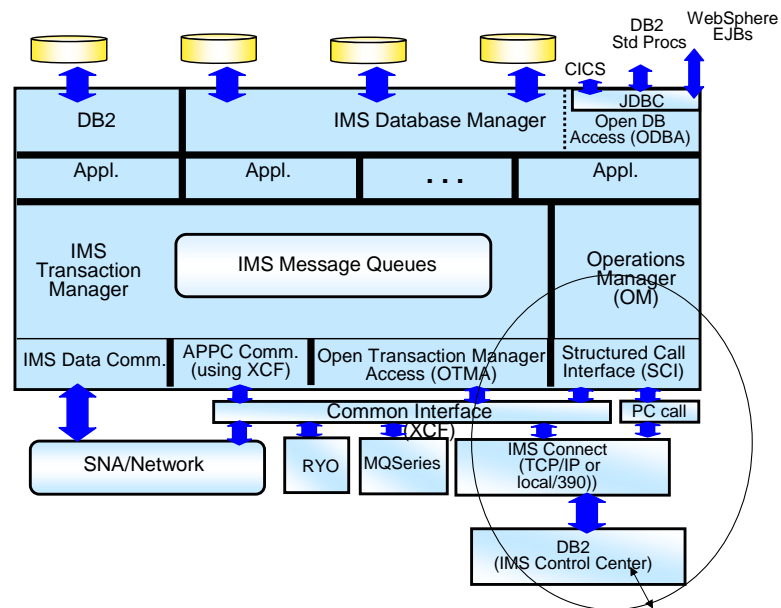
Key Message: IMS utilizes IMS Connect and the Control Center in a DB2 workstation to provide distributed Operations With IMS Version 8, IMS extended its use of XCF for use by other IBM subsystems, such as IMS Connect , for distributed operations access through the Structured Call Interface to the Operations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

IMS Resource Definition Manageability

- **Current System Generation Process:** 2-stage, batch, assembler, process requiring cold start; system quiesce required with online change (DBs, Trans route codes, Appls, Security)

- **Requirements:** Reduce system generation time/effort and Improve availability during change

Staging

- **IMS V4** stopped using sysgen to support new function
- **IMS V5/6** removed conditional assembly modules
- **IMS V7** put non-conditional link-edit modules under SMP control
- **IMS V8**
  - Removed RSR RLT/DLT feature install checking
  - Resource Manager/Coordinated Online Change
  - Syntax Checker – new ISPF application for
  - Packaging/Installation/IVP enhancements
- **IMS V9**
  - Conditional link-edit elimination
  - Online change modules moved from the Nucleus
  - Dynamic change/addition of Type 4 SVC and resource cleanup module
  - IVP and Syntax Checker enhancements

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Key Message: Another area of Manageability that IMS is addressing is that of the IMS Resource Definition.

IMS resource definition currently is a two stage, batch, assembler system generation process. This originally requiring cold start, has provided online change for some resources. These resources are the Databases, Trans route codes, Appls, Security. But this online change requires a quiesce of the entire system. Requirements in this area are to reduce system generation time/effort and to improve availability during change. In the more recent IMS versions we have been focused on reducing the IMS System Generation time and effort. IMS V4 stopped using sysgen to support new function. IMS V5/6 removed conditional assembly modules. IMS V7 put non-conditional link-edit modules under SMP control. IMS V8 provided the Resource Manager/Coordinated Online Change, Syntax Checker, Packaging/Installation/IVP enhancements, and removed the RSR RLT/DLT features install checking. Syntax Checker is a new addition to the IMS installation process. Syntax Checker helps reduce the system generation effort by assisting the system programmers in defining and maintaining selected input parameter members residing in the IMS PROCLIB. It provides parameter syntax checking, parameter value verification and detailed help text at the parameter level tailored to the IMS release. It also provides assistance in migrating to a new release by identifying any new and/or obsolete parameters. Syntax Checker displays the proclib member in an ISPF panel. Any parameters or values in error are highlighted. The user may add, change or correct the value of the parameters. Detailed help text for a parameter is also available at the touch of a key. Using Syntax Checker, the system programmer can ensure the parameters are valid prior to shutting down and restarting IMS control regions. It eliminates the risk of parameter error during a start-up of IMS and the time-consuming process of tracking down and correcting parameter syntax or value errors.

There were also new IMS Packaging and Installation Changes: The SMP/E jobs have been removed from the Install/IVP Process. Instead: JCL is provided in the Program Directory to unload jobs that perform the SMP/E processing. The SMP/E install jobs contain instructions to customize the install to the customers site. This is a major change to the IMS install process. It was made to be consistent with IBM's installation standards. The Installation Verification Program (IVP) process continues to provide the facility for verifying (testing) the installation of IMS. SMP/E Receive Apply Accept Processing. The SMP/E install portion of IMS will use the standard Receive, Apply, Accept process. SYSGEN is still required to complete the IMS install process. New SMP/E target and distribution datasets provided a target dataset for source code, target and distribution datasets for optional user exits, and Java libraries. No DFSJCLIN job is provided. This job was used to install non-SYSGEN parts. These part are now created by the SMP/E Apply process. The SMP/E GENERATE command will be used to build any JCL necessary to recreate the non-SYSGEN parts after the install. IVP Enhancements include: OM, RM, SCI, SPOC Sample Application; IVP will provide jobs and tasks to test and demonstrate the defining and starting of an IMSPLEX and the use of SPOC to issue commands to the IMSPLEX; Syntax Checker Sample Application; IVP will provide tasks to demonstrate the general use of Syntax Checker and the use of Syntax Checker to convert the IMS "PB" Proclib members (DFSPBxxx) from V7.1 to V8.1 .

And V9 provided additional enhancements for Resource definition manageability.

IMS V9 Manageability

- **New/Enhanced Commands/Environment**
  - ► Expanded Command Environment for simplifying operations
  - ► Sysplex-wide Database Commands to expand operations management
  - ► New command to ease serviceability
  - ► New messages for easing usability
  - ► Command Recognition Character Registration
- **Knowledge Based Log Analyzer (KBLA) eases serviceability**
- **Eased Resource Definition by further reducing IMS sysgen time/effort**
  - ► Conditional link-edit elimination
  - ► Online Change Modules moved from the Nucleus
  - ► Dynamic change/addition of Type 4 SVC and resource cleanup module
  - ► IVP and Syntax Checker enhancements

Key Message: A number of additional IMS Manageability Enhancements are provided with IMS V9

IMS V9 Manageability enhancements provide: Enhanced Command Environment simplifying the common service layer for use by new and enhanced commands and providing a single point of control without requiring a Resource Manager. IMS Sysplex Database Commands - The Operations Manager was delivered in IMS V8 and provided an OM API to allow IMS commands to be issued from OM. All existing commands now referred to as 'classic' IMS commands can be issued from OM API. A new command format called the IMSplex commands was introduced. The IMSplex commands are allowed only from OM API call. The command responses are encapsulated in XML tags. The output from all IMSs is consolidated and presented back to the SPOC or application that issued the OM API call. In IMS V8, IMSplex commands for transaction resources were added to provide the user better ability to manage the IMSplex and also to provide a single system image. The IMSplex commands for database and area resources would be added to provide the user the ability to better manage the IMSplex and provide a single system image. The following IMSplex commands would be added in IMS V9 to allow the user to query and update databases and to update DEDB areas: QUERY DB, UPDATE AREA, UPDATE DB, and UPDATE DATAGRP. The new IMSplex database commands are allowed only from OM API and the command response is returned to OM encapsulated in XML tags. In this release, these commands provide the same function as their similar classic commands - the input format and output format is different. Command Recognition Character Registration is being provided to uniquely register the subsystem so an operator can enter a command from any system in a Sysplex and have it routed to the right subsystem. With it the operating system can detect collisions between subsystems as well as be able to inform operators/systems programmers which prefixes are currently in use, thus easing operations management. New DFS 41721 Message is being provided as a new WTO message, replacing the earlier WTOR message, so that if the tracker starts before the active, it can wait for the active and continue without awaiting an operator reply message, thus enhancing usability. Enhanced HALDB Usability eases partition initialization without requiring DBRC commands. New /Diagnose Command eases serviceability. Requirements addressed in V9 are to reduce system generation time/effort by Removing conditional link edit modules, removing Online Change modules from the nucleus Linkedit step and places them in their own load module, Removing the ETO install checking, Dynamic Change of Type 4 SVC, Dynamic Add of Resource cleanup module, providing enhancements to Syntax Checker would continue to dynamically define resources for syntax, validity, an consistency of the IMS Definitions during the Sysgen process, and IVP Release support provides general release upgrades for utilities running in the IVP

IMS Tools Portfolio

Database Administration
- IMS Audit Management Expert, V1.1 5655-R23
- IBM Data Encryption for IMS and DB2 Databases, V1.1 5655-P03
- IMS Database Repair Facility, V1.2 5655-E03
- IMS HALDB Conversion and Maintenance Aid, V3.1 5655-N46
- IMS HD Compression- Extended, V2.2 5655-E02
- IMS Library Integrity Utilities, V1.1 5655-I42
- IMS Online Reorganization Facility, V1.2 5655-H97
- IMS Parameter Manager, V1.1 5655-L69
- IMS Sequential Randomizer Generator, V1.1 5655-E11
- IMS Sysplex Manager, V1.2 5655-P01
- IMS Tools Knowledge Base, V1.1 5655-R34

Recovery Management
- IBM Application Recovery Tool for IMS and DB2 Databases, V1.2 5697-F56
- IMS Database Recovery Facility, V3.1 5655-N47
- IMS DEDB Fast Recovery, V2.2 5655-E32
- IMS High Perf Image Copy, V4.1 5655-N45
- IMS High Perf Change Accumulation, V1.4 5655-F59

Utilities Management
- ✓Fast Path
  - IMS High Performance Fast Path Utilities, V3.1 5655-R05
- ✓Full Function
  - IMS High Performance Load, V2.1 5655-M26
  - IMS High Performance Pointer Checker, V2.2 5655-K53
  - IMS High Performance Prefix Resolution, V3.1 5655-M27
  - IMS High Performance Unload, V1.2 5655-E06
  - IMS Index Builder, V2.3 5655-E24
  - IMS Parallel Reorganization, V3.2 5655-M28
- ✓Administration
  - IMS Database Control Suite, V3.2 5655-L08

Information Integration
- WebSphere Classic Data Event Publisher for z/OS, V9.1 5655-R54
- WebSphere Classic Federation Server for z/OS, V9.1 5655-R52
- WebSphere Classic Replication Server for z/OS, V9.1 5655-R53
- IMS DataPropagator, V3.1 5655-E52

Performance Management
- IMS Buffer Pool Analyzer, V1.1 5697-H77
- IMS Network Compression Facility, V1.1 5655-E41
- IMS Performance Analyzer, V4.1 5655-R03
- IMS Problem Investigator, V2.1 5655-R02
- IBM Tivoli OMEGAMON XE for IMS on z/OS, V4.1 5698-A34

Application Management
- IMS Batch Terminal Simulator, V3.1 5655-J57
- IMS Batch Backout Manager, V1.1 5697-H75
- IMS Connect, V2.2 5655-K52
- IMS Connect Extensions V2.1 5655-S56
- IMS MFS Reversal Utilities, V1.1 5655-F45
- IMS Program Restart Facility, V2.1 5655-E14

TM Management
- IMS Command Control Facility, V2.1 5655-R58
- IMS ETO Support, V3.1 5655-L61
- IMS HP Sysgen Tools, V2.2 5655-P43
- IMS Queue Control Facility, V3.1 5697-N50
- IMS Workload Router, V2.4 5697-B87

Announced 1H07
Announced Oct 2007

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In addition to the IBM Application Development tools, IBM has also been providing a wide range of price/performance, competitive Systems Management tools for IMS. This shows a summary of the IBM IMS tools currently available. The tools provide support for speeding up and reporting on performance, extending the functions of and assisting with the testing of IMS, and provide system tools for querying, validating, managing, and tuning IMS Databases. These include for example tools necessary to maintain and repair databases (reorganization solution). Many tools serve multiple purposes. IBM offers tool functionality like IMS Database Control Suite that is not available from any other vendor. IBM offers high performance tools that are competitive within the industry at an affordable price. In fact when taken together "price/performance and functionality", IBMs IMS tools can be considered the best in the industry.

We have over 38 products to support all aspects of IMS usage.

Utilities for full function and fast path database provide a high performance solution that improves IMS availability.

Administrative tools make managing large and small IMS systems easier and faster.

Performance management tools help you tune IMS systems and avoid outages.

Recovery and replication tools enable fast and effective transfer of data from transactional to informational systems.

And application management tools make application runtime environments more effective

Enhanced IMS Tools - 1-3Q06

- **IMS Database Recovery Facility** *Version 3 Release 1*
  - ► Recovers and processes IMS data from an earlier point in time; Creates IC copy data sets during the recovery process
  - ► Creates index data sets during the recovery process; Creates off-line, cloned copies of the databases
  - ► Validates data during the recovery process; Automatic deletion and creation of database data sets during the recovery process
- **IMS HP Change Accumulation Utility** *Version 1 Release 3*
  - ► Merges most recent database changes quickly, safely, and accurately; Saves DB Admin resources as well as supplementary software costs
  - ► Protects your data; New SCAN function – analyzes setup and JCL conversion prior to running update processing
  - ► Additional formats to summary reports for transfer to external report interfaces and viewers
  - ► Directly processes secondary log database by using Database Recovery Control (DBRC)
- **IMS Performance Analyzer** *Version 4 Release 1*
  - ► End-to-end transit analysis for all trans workload types, incl Shd Qs by merging sysplex log file
  - ► End-to-end IMS Connect and log reporting, providing complete picture of transaction life cycle
  - ► Offers DBRC Log selection for quick and easy log report requests; Report Forms allow you to design your own transit reports
  - ► Comprehensive IMS monitor reporting including Fast Path
- **IMS Problem Investigator** *Version 2 Release 1*
  - ► Browse, analyze, and interpret IMS log and monitor, user log, CQS, and IMS Connect records; Gain end-to-end picture of trans in Sysplex
  - ► Determine transaction times and event latencies; Analyze IMS Connect event data collected by IMS Connect Extensions for z/OS
- **IMS Command Control Facility** *Version 2 Release 1*
  - ► Issues commands for DBCTL, DCCTL or DB/DC regions; Executes IMS cmds from batch utility, TSO session via ISPF I/F, or Callable API
  - ► Ensures successful processing of database START, STOP, DBR, and DBD cmds; Synchronizes OLC and DB cmds across all regions in sysplex
  - ► Keeps members of a IMSplex synchronized; Views combined messages from different IMS tasks, and IMSs in different z/OS systems
- **IMS HP Pointer Checker** *Version 2 Release 2*
  - ► Usability enhancements
  - ► Fast, easy detection of database status
- **IMS Parallel Reorganization** *Version 3 Release 2*
  - ► Automatically issuing /DBD and /DBR cmds at start of reorg and /STA cmd at completion
  - ► Using an unload data set as an input data set to the reorganization
- **IMS Sysplex Manager** *Version 1 Release 2*
  - ► Ability to query IMS resources across IMSplex by status or attribute; Enh Dep Region display with more filtering criteria,cmd issuing ability
  - ► Consolidated master terminal operator messages across an IMSplex in an audit log; IMS cmd/response journal for audit and trouble-shooting
  - ► Automatic archive function for log data; Enhanced shared queue support

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Key Message: IMS Management tooling continue to be enhanced in 1H06

IMS Database Recovery Facility z/OS, V3.1:

 - provides all functions of the previous version for recovery of an IMS DB to a designated recovery point plus new features:

- creation of IC data sets during recovery process which eliminates the need to follow recovery with a separate IC invocation

- creation of Index data sets during recovery process including primary, secondary and HALDB index list data sets which eliminates the need to follow recovery with a separate index build invocation

- creation of off-line, cloned copies of the db that can be used for purposes such as application program testing, audit, and db recovery

- validation of data during recovery process which eliminates the need to follow recovery with a separate validation procedure

- Automatic deletion and creation of database data sets during the recovery process which eliminates the need to precede recovery with a separate data set deletion and creation procedure

HP Change Accum Utility, V1.3:

- New functions:

 - SCAN function that analyzes setup and JCL conversion prior to running of the Change Accum update processing

 - Additional formation for the Change Accum summary reports for transfer to external report interfaces and report viewers

 - Ability to directly process secondary log data sets by using DBRC

 - Type 29 log records are accumulated or Online Reorganization (OLR) processing

 - Standard procedure mode for processing JCL by using dynamic allocation and no requirement for write access to a procedure library.

IMS Performance Analyzer *Version 4 Release 1*

End-to-end transit analysis for all trans workload types, incl Shd Qs by merging sysplex log file

End-to-end IMS Connect and log reporting, providing complete picture of transaction life cycle

Offers DBRC Log selection for quick and easy log report requests

Report Forms allow you to design your own transit reports

Comprehensive IMS monitor reporting including Fast Path

IMS Problem Investigator *Version 2 Release 1*

Browse, analyze, and interpret IMS log and monitor, user log, CQS, and IMS Connect records

Gain an end-to-end picture of transactions in the Sysplex

Determine transaction times and event latencies

Analyze IMS Connect event data collected by IMS Connect Extensions for z/OS

IMS CCF

- Synchronizes Online Change and database commands across all regions in a sysplex using the batch interface of callable API

- Keeps members of a IMSplex synchronized by storing commands that failed due to an IMS being unavailable, and issuing the stored commands at IMS start up

- Can view combined messages from different IMS tasks (IMS CTL, DL/I, DRBC, and secondary MTO) via an ISPF interface

IMS HP Pointer Checker new function includes :

- Ease of use - Site default; History data set maintenance improvement

- Fast, easy detection of database status for Error descriptions in HASH checking, Exception notification in HD Pointer Checker and Space Monitor, and monitoring database data set size in Space Monitor

- All maintenance provided for IMS HP Pointer Checker for z/OS, V2.1 is included in the new release.

IMS Parallel Reorganization for z/OS, V3.2 provides all of the features and functions of V3.1 and has the following enhancements:

- Automated /STA DB after reorganization - IMS Parallel Reorganization now issues IMS commands to IMS online subsystems. The /STA DB command is issued automatically after completion of the database reorganization. The /DBD and the /DBR command can also be issued before starting the database reorganization. The results of the commands on each subsystem are shown in detail in a new report.

- Using an unload data set as input - A new option is added to IMS Parallel Reorganization to enable the use of an unload data set as an input data set. This new option allows you to use IMS Parallel Reorganization as a reload utility to which one or more optional functions can be added; for example, IMS Index Builder, IMS High Performance Prefix Resolution, and IMS High Performance Image Copy with IMS High Performance Pointer Checker. These functions run concurrently and directly access the database data sets, instead of the shadow data sets. All types of record formats supported by the IMS Parallel Reorganization Unload utility can be used.

IMS Sysplex Manager - The following new features and enhancements are included:

- Ability to query IMS resources across IMSplex by status or attribute

- Enhanced Dependent Region display with more filtering criteria and ability to issue commands

- Consolidated master terminal operator messages across an IMSplex in an audit log

- IMS command and response journal for audit and trouble-shooting purposes

- Automatic archive function for log data

- Enhanced shared queue support for Destination filtering, Delete, Browse, and Recover messages from cold queue

- Type-II command support and IMSplex-wide capability for commands against resources

- Enhanced panel navigation for quick movement from one resource display to another

- Commands issued from IMS Sysplex Manager for z/OS share the same security RACF profile with IMS

- Basic z/OS address space information such as CPU time and storage usage for IMS-related address spaces

Enhanced IMS Tools - 4Q06

- **Tivoli OMEGAMON XE for IMS** *Version 4 Release 1*
  - ► Transaction Reporting Facility (TRF) reporting capabilityincreased precision, expanding transactions to the millisecond.
  - ► DL/I call reporting for FF and FP WFI regions, accumulaties appl call types/numbers issued by appl during trans processing.
  - ► Key feature migration from OMEGAMON classic component; region occupancy percentage added to Dep Region statistics.
  - ► High Availability Large Database (HALDB) support providing database summaries, partition details, VSAM/OSAM statistics.
  - ► DBCTL detailed thread reporting for monitoring allowing detection/prevention of appl bottlenecks, response time problems.
  - ► Connect reporting enhancements expandicapability for trans perf summary, details, and Connect task auto-discovery.
  - ► Product provided Dynamic Workspace Links to other OMEGAMONs (DB2 and CICS) added for greater integration.
- **IMS Audit Management Expert** *Version 1 Release 1 (new)*
  - ► Centralized IMS auditing tool to collect/correlate IMS Resource data access info, save in a repository; Provides a user interface with options for examining data in repository; Has comprehensive reporting facilities with multiple options to view and report on collected data; Includes a separate user interface to be used in configuring the data query portion of the product
- **IMS High Performance Fast Path (FP) Utilities** *Version 3 Release 1*
  - ► IMS FP Advanced Tool (formerly HP FP Reorganization Tool), including new Extract function to retrieve segment data from multiple DEDB areas, DMAC print utility for printing contents of the DMAC block for multiple DEDB areas, and ability to input or generate image copies with the Analyze, Change, DMAC print, Extract, Reload, and Unload function
  - ► IMS FP Online Tools, including Online Expert Reorganization utility to enable reorg of a DEDB set of units of work (UOWs) and a DMAC print utility to enable printing the contents of the DMAC block for multiple DEDB areas
- **IMS High Performance Sysgen Tools** *Version 2 Release 2*
  - ► Provides IMSplex support; Contains the ability to undo a resource update list, Provides reverse sysgen for in-core MODBLKS definitions; Includes enhanced IMS command interface; Execute IMS commands in a resource update list; Dynamically update selected Security Maintenance Utility (SMU) definitions; Reload ACBLIB definitions for database descriptions (DBDs) and program specification blocks (PSBs); Contains additional IMS Sysgen Source maintenance options
- **IMS Online Reorganization Facility** *Version 1 Release 2*
  - ► Supports BMPs that allow you to pause BMPs during /DBRECOVERY commands; Supports CICS & OTMA applications that quiesces database access during /DBRECOVERY commands
  - ► Reorganization all High Availability Large Database (HALDB) partitions in a single job step
- **WebSphere Classic Data Event Publisher for z/OS** *Version 9 Release 1*
- **WebSphere Classic Federation Server for z/OS** *Version 9 Release 1*
- **WebSphere Classic Replication Server for z/OS** *Version 9 Release 1*

Key Message: IMS Management tooling continue to be enhanced in 4Q06

The IBM Tivoli OMEGAMON XE for IMS on z/OS is a powerful management tool to help you optimize the performance and availability of your vital IMS systems. It provides a single point of control over IMS in parallel Sysplex environments and reports on performance of coupling facility structure statistics, shared queue counts, database lock conflicts and a number of other key IMS attributes that help you stay ahead of potential delays or outages.

Version 3.1 combined the functions offered by OMEGAMON XE for IMS and OMEGAMON XE for IMSPlex into a single product with enhancements for OTMA, Connect, Shared Queues, Lock Tables, and the Extended Transaction Reporting Facility (TRF).

Version 4.1 now extends this further with a number of enhancements for Transaction Reporting Facility reporting, DLI Call Reporting, migration. HALDB, DBCTL detailed tread reporting, and IMS Connect reporting. It also provides dynamic workspace links to other OMEGAMON products for better integration.

Today, OMEGAMON XE for IMS is a powerful management tool to help you optimize the performance and availability of your vital IMS systems. It provides a single point of control over IMS in Parallel Sysplex environments and reports on performance of coupling facility structure statistics, shared queue counts, database lock conflicts, and a number of other key IMS attributes that help you stay ahead of potential delays or outages. Function in V4.1.0 include:

-Transaction Reporting Facility (TRF) reporting capability has increased precision, expanding transactions to the millisecond.

-DL/I call reporting for full function and Fast Path WFI regions — accumulation of all call types issued by an application during the processing of a transaction and the number of each call type issued by an application during transaction processing will be provided for display.

-Key feature migration from OMEGAMON classic component; the region occupancy percentage has been added to Dependent Region statistics High Availability Large Database (HALDB) support providing database summaries, partition details, VSAM/OSAM statistics.

-DBCTL detailed thread reporting for monitoring activity allowing the detection and prevention of application bottlenecks and response time problems.

-IMS Connect reporting enhancements expanding capability to provide summary of transaction performance, details about every transaction processed, and auto-discovery of IMS Connect task.

-Product provided DWL to other OMEGAMONs (DB2 and CICS) added for greater integration.

Additionally, OMEGAMON XE for IMS on z/OS V4.1.0 is planned to be translated into the group one languages, provide IBM Support Assistance (ISA) plug-ins for product support, include problem determination guide, include agent versioning for improved migration, support running the TEPS on Linux and AIX, and include other enhancements to functions, ease of use, and maintainability.

IMS Audit Management Expert *Version 1 Release 1 (new)*

Centralized IMS auditing tool that collects and correlates data access information from a variety of IMS resources (primarily from the IMS logs and SMF) and saves it into an audit repository

Provides a user interface (UI) with different options for examining the data in the repository

Has comprehensive reporting facilities with multiple options to view and report on collected data

Includes a separate user interface to be used in configuring the data query portion of the product

IMS High Performance Fast Path Utilities *Version 3 Release 1*

IMS Fast Path Advanced Tool (formerly High Performance Fast Path Reorganization Tool) includes:

A new Extract function that retrieves segment data from multiple DEDB areas.

A DMAC print utility which enables printing the contents of the DMAC block for multiple DEDB areas

Ability to input or to generate image copies with the Analyze, Change, DMAC print, Extract,   Reload, and Unload function

IMS Fast Path Online Tools includes:

An Online Expert Reorganization utility which enables the reorganization of a set of units of work (UOWs) in a DEDB

A DMAC print utility enables printing the contents of the DMAC block for multiple DEDB areas

IMS High Performance Sysgen Tools *Version 2 Release 2*

Provides IMSplex support

Contains the ability to undo a resource update list

Provides reverse sysgen for in-core MODBLKS definitions

Includes enhanced IMS command interface.

Execute IMS commands in a resource update list

Dynamically update selected Security Maintenance Utility (SMU) definitions

Reload ACBLIB definitions for database descriptions (DBDs) and program specification blocks (PSBs)

Contains additional IMS Sysgen Source maintenance options, including history log reports which produce IMS sysgen macros, additional options for reverse sysgen, & the ability to generate a resource update list to synchronize IMS sysgen source with current resource definitions for an IMS subsystem

IMS Online Reorganization Facility *Version 1 Release 2*

Supports batch message processing programs (BMPs) that allow you to pause BMPs during /DBRECOVERY commands

Support for CICS & OTMA applications that quiesces database access during /DBRECOVERY commands

Reorganization of all High Availability Large Database (HALDB) partitions in a single job step

Ability to reorganize just an index (including PSINDEX) database while it remains online & to unload a database while it is being updated online

Enhanced IMS Tools - 2007

- **IMS HALDB Conversion and Maintenance Aid** *Version 3 Release 1*
  - ► Single-step conversion - convert a database in batch mode (must have dynamic allocation member (MDA) descriptions).
  - ► DBDLIB conversion - creates the JCL to convert entire database description (DBD) libraries.
  - ► Offline Reorganization of PSINDEX databases - used offline & includes index pointer healing.
  - ► Delete Partition - removes the PSINDEX records of the deleted partition.
  - ► Add Partition using LOAD processing - improves performance as the PSINDEX records are sorted and inserted sequentially.
  - ► Merge HALDBs - merge identical HALDBs and used to combine user-partitioned databases into one multipartition HALDB.
- **IMS HP Change Accumulation Utility** *Version 1 Release 4*
  - ► Simplified setup and configuration using a single address space
  - ► Priority scheduling for change accumulation groups
  - ► Improved elapsed time performance
  - ► Reduction or elimination of cross-memory data transfers
  - ► In-memory spill files using 64-bit addressing
- **IMS Tools Knowledge Base** *Version 1 Release 1*
  - ► Retains reports to provide a history of database analysis and actions taken
  - ► Provides easy administration through a central repository
  - ► Offers powerful search capabilities to help you quickly find reports
  - ► Preserves data for future trend analysis and decision making
- **IMS Connect Extensions** *Version 2 Release 1*
  - ► New interface for issuing IMS Connect commands and viewing the responses
  - ► New utility allows users to create and modify, in batch, all IMS Connect Extensions definitions
  - ► New group definition which supports viewing and controlling multiple IMS Connect systems in a Sysplex
  - ► View active sessions on a group of IMS Connect systems
- **IMS High Performance Unload** *Version 1 Release 2*
  - ► Fast segment retrieval from databases
  - ► User exit facility to allow additional processing for retrieved segments
  - ► Ability to continue processing after sequence errors
- **IMS Queue Control Facility** *Version 3 Release 1*
  - ► Re-architecture allows different QCF functions to run on multiple CECs within a sysplex
  - ► New Q Space Utilization Notification mechanism for definition of up to 10 areas of total queue space to monitor for messages
  - ► Automatically detects an IMS cold start and IMS warm start and initiates the requeue of messages
  - ► Automatically offloads messages that were on the queue during message overflow

Key Message: IMS Management tooling continue to be enhanced in 1H07
IMS HALDB Conversion and Maintenance Aid for z/OS, V3.1 provides all of the features and functions of IMS HALDB Conversion and Maintenance Aid for z/OS, V2.1 and is extended to provide the following new features and functional improvements:
   o Single-step conversion allows converting a database in batch mode (DB must have dynamic allocation member (MDA) descriptions).
   o The new data set allocation uses the same System Managed Storage (SMS) constructs or the same volume serial when running outside SMS. You can create the job control language (JCL) by using the ISPF interface.
   o DBDLIB conversion creates the JCL to convert entire database description (DBD) libraries. DBDLIB conversion uses the single-step conversion to create the JCL for each primary database.
   o Offline Reorganization of PSINDEX databases can be used offline and includes index pointer healing. It reclaims VSAM space.
   o Delete Partition removes the PSINDEX records of the deleted partition. It is not necessary to rebuild the PSINDEX by scanning all
      partitions.
   o Add Partition using LOAD processing improves performance because the PSINDEX records are sorted and inserted sequentially.
   o   Merge HALDBs allows you to merge identical HALDB databases and can be used to combine user-partitioned databases into one multipartition HALDB.
IMS HALDB Conversion and Maintenance Aid dynamically detects the existence of the following tools and utilizes them accordingly:
   o IMS High Performance Unload for OS/390, V1.1 (5655-E06)
   o IMS High Performance Load for z/OS, V2.1 (5655-M26)
   o IMS High Performance Image Copy for z/OS, V4.1 (5655-N45)
   o IMS High Performance Pointer Checker for z/OS, V2.2 (5655-K53)
  The tools listed must be at the latest maintenance level. If these tools are not available on the system, then IMS HALDB Conversion and Maintenance Aid uses the IMS utilities instead.

IMS Online Reorganization Facility is needed to support the following new functions available in IMS HALDB Conversion and Maintenance Aid for z/OS, V3.1:
   o   Near online conversion converts the database to HALDB while the non-HALDB database is still updated. Only a short outage occurs during "takeover."
   o   Near online maintenance allows you to split or combine partitions with a very short outage. Additionally, attributes of the partitions (block size, randomizing parameter) can be changed.

IMS High Performance Change Accumulation Utility for z/OS, V1.4 is a high-performance tool that merges most recent database changes quickly, safely, and accurately. The tool saves you time and   protects your data, saving both DBA resources as well as supplementary software costs. It provides all of the functions of the previous release and is extended to offer improved performance with single address space support. Additionally, it offers the following new key features:
   o Simplified setup and configuration using a single address space
   o Priority scheduling for change accumulation groups
   o Improved elapsed time performance
   o Reduction or elimination of cross-memory data transfers
   o In-memory spill files using 64-bit addressing

IMS Tools Knowledge Base   Version 1 Release 1
           Retains reports to provide a history of database analysis and actions taken
           Provides easy administration through a central repository

Scalability with Virtualization in
  Performance/Capacity/Availability/Recovery

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Key Message: IMS Scalability enhancements with Virtualization improve performance, capacity, availability and recovery.

Scalability enhancements are being provided to improve performance, capacity, availability, and recovery.

IMS V9 Integrated HALDB Online Reorganization

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

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Message: Providing ultra high availability is the IMS V9 Integrated Online Reorganization (OLR) of High Availability Large Databases support

High Availability Large DataBase was introduced in IMS Version 7. It 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 Version 9 Online Reorganization delivers on the second: continuous availability of business-critical databases. IMS V9 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.

IMS V9 Scalability items

- ► *Integrated HALDB Online Reorganization for Improved Availability*
- ► *Additional HALDB easing Usability*
  - • Ease partition initialization without requiring DBRC Commands
  - • Provide Unload/Reload Statistics reports for each HALDB partition
- ► *DBRC, Log, and Utility Enhancements for Enhanced Recovery*
  - •DBRC Support for Online Reorganization
  - •DBRC Interface for Easy Tools access to RECON data
  - •Command Authorization for /RM
  - •Move DBRC Modules above the line
  - •Reuse DMB slots to register DBs to DBRC when last DMB number is reached
  - •Logger enhancements for OLDS and WADS
  - •Large Tape Block size support
  - •DB2 Indoubt notification
- ► **Fast Path Enhancements for Enhanced Availability/Perfomance**
  - •Multiple Areas Shared VSO structures
  - •Provide Parallel TCB Area Open/Close
  - •Optional EMHQ Structure
  - •Fast Database Recovery (FDBR) Extended CSA relief for DEDBs
  - •IRLM Reconnect option
  - •Enhance Serviceability/Usability enhancements

Key Message: IMS V9 provided additional scalability items

For Scalability IMS HALDB Integrated Online Change provides enhanced availability. Additional HALDB enhancements are also provided for easing partition initialization without requiring DBRC commands, and unload/reload statistics reporting on each HALDB partition.

IMS Database Recovery Control Enhancements include DBRC support for the new Online Reorganization capability.

There are also enhancements for DBRC Application Program Interface for Vendor tools to interface with DBRC; Command Authorization security, initially provided in V8 for batch commands, would now also be provided for the online /RM command; Move of DBRC Modules above the line providing enhanced capacity; Logger enhancements for taking corrective action where possible and for comparing dual WADS for additional data; Removing some no longer used code for CICS I/O Checking; supporting in the Image Copy and Recovery utilities Large Tape Block sizes >32K to provide customers a performance advantage; Enhancing Fast Database Recovery to inform a user exit of the indoubt DB2 Unit of Work and the final resolution.

Additional items for capacity/usability are also provided with Fast Path Multiple Areas Shared Virtual Storage Option (VSO) structures allows Fast Path customers to create VSO structures in the Coupling Facility that house multiple VSO Areas, where currently each VSO area must have its own VSO structure; and Parallel TCB Area Open/Close Enhancements also exploit parallel TCBs to open/close areas, thus improving the performance of area open when there are many areas to open.

Reliability is also being enhanced by reducing abends that can bring down the IMS Control Region with toleration of the error conditions (E.g. Avoid abending due to errors returned from DBRC) and by making optional the EMHQ structure reduces the allocation of resources when not being used.

A number of additional serviceability and usability customer requirements are also addressed: Adding Fast Path system event trace and Online Utility trace tables, removal of V5 Sequential Dependent (SDEP) Control Interval (CI) format, and enhancing the SDEP CI Allocation algorithm. Additional items also include: Changing the FP latch wait chains to use separate wait chain (EPSTHNXT); Adding trace entries to the new IMS Fast Path Table Trace; Allowing the activation of the Fast Path Toolkit via an MVS command; Adding the IMS/FP log record dsects in ILOGREC; Adding SDEP statistics information in existing log records for IMSPA. And a number of additional Fast Path changes provide more efficient/serviceable operations.

Some Additional Enhancements

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Key Message: IMS has also been providing a number of additional enhancements through the service process

There have also been additional enhancements provided through the service process for integration, manageability and scalability.

Enhancements for IMS V8 (and V9) in 2006/2007 through the Service Process

Integration
- IMS Connectivity enhancements shown earlier
- Java-PL/I Interoperability
- OTMA enhancements for Message Flood
- Start OTMA option for ERE = reduces outage due to message flood
- APPC/OTMA Synch SHQs removal of system affinity for program to program switches for improved workload balancing and availability (2007)

Manageability
- Eliminate STATUSBAs during command processing reduces partition unavailable responses
- PI/Stop ABDUMP region allows stop command completion avoiding an abend U113
- LOCKTIME enhancement allows status code for timeouts rather than abend and allows different timeout value for different regions
- Format ID in REXX SPOC API gives programmer ability to turn format ID on/off

Scalability
- HALDB Change status code GG to BA for PROCOPT GON/GOT for status clarification
- XRF/GDPS Coex provides XRF takeover and GDPS hyperswap synchronization exit
- HALDB Partition Range Processing (2007)
- Release call for FF/FP DL/I Calls releases the DB locks before synhcpoint (2007)

Note: IMS V7 end of service Nov 8, 2005; IMS V8 end of service Nov 5, 2008

Key Message: Additional enhancements were provided for V8+ customers through the service process

 A number of enhancements have been provided for IMS V8 via the service process. These are also available in the base or in the service stream for later versions. They include:
Java-PL/I Interoperability for Java and PL/I applications to call each other.

START OTMA enhancement for ERE gives customer the option to not recover the /START OTMA command during emergency restart. Customers can either specify a new OTMA=M (for manual) parameter in DFSPBxxx proclib member or to issue /START OTMA NOCHECK command to activate the new option. This reduces the potential system outage due to OTMA message flood.

Eliminate STATUSBAs during command processing eliminates partition unavailable responses, STATUSBA or STATUSGG, by allowing the user to indicate whether or not PROCOPT=GOx transactions that access HALDB partitions should be terminated and automatically rescheduled when encountering a partition that is unavailable due to a database command in progress. This provides pseudo-abending with a response and allows transaction to be rescheduled.

PI/Stop Region ABDUMP allows a /STOP REGION ABDUMP command to recognize that an IMS region or thread is waiting for a PI lock. It will remove it from the lock wait chain and allow the /STOP command to complete. Today IMS regions or threads waiting for a PI lock cannot be stopped using the /STOP REGION ABDUMP command. The customer is forced to use the /STOP REGION CANCEL command which could result in an IMS abend U0113.

IMS Super Member support for IMS Connect enhancement allows IMS asynchronous messages to be shared by multiple IMS Connect for data availability. This enhancement provides the asynchronous message support for IMS Connect customers using WebSphere Load Balancer or z/OS Sysplex Distributor.

LOCKTIME enhancements allows status code for timeouts of the LOCKTIME parameter rather than abend U3310 and allows different timeout values for different region types (eg. BMP and Batch). If locktime is set too short, unpredictable Batch/BMP abend will occur. If locktime is set too long, system crash will occur. Locktime currently issues an abend for timeouts, which requires more application handling and system costs.

Format ID in REXX SPOC API gives programmer ability to turn format ID on or off (V8 8/06, V9 9/15)

XRF-GDPS Coexistence provides an exit for synchronization between XRF takeover and GDPS hyperswap functions. The exit is driven when IMS reserves devices and when it releases them. This could prevent log problems where I/O comes in from both new and old IMS systems simultaneously.

HALDB Partition Range Processing - Enhancement to single partitioning restriction to support a range of partitions in addition to a single partition

RLSE call provides a Full Function or Fast Path DL/I call to release the database locks before synchpoint

Enhancements for IMS V9 in 2006/2007 through the Service Process

Integration
- Connectivity Enhancements shown earlier
- 64 bit WAS support for IMS DB/TM Resource Adapters (2007)
- Java JDK 5.0 support (2007)

Manageability
- SMU to RACF Conversion Utilities (2007) to read/convert SMU source to comparable RACF input

Scalability
- Allocation of DSAB and TIOT blocks above the 16M line for capacity constraint relief
- DBRC Intent to reorg flag for FF DBs (including HALDB) to prevent subsequent reorgs and batch access
- DBRC INIT.PART keyword for remote disaster recovery partner DBDs created in Recovery Control data set (RECON)
- XRF/GDPS Coexistence provides exit for synchronization between take-over and hyperswap
- HALDB OLR no automatic resume option, so job can resume OLR on its own

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Key Message: IMS Continues to roll out new enhancements for IMS V9 Integration, Manageability and Scalability.

A number of enhancements have also been rolling out for IMS V9 via the service process in 2006/7. They include:

IMS Connectivity enhancements discussed earlier

IMS support for 64 bit Java Virtual Machine and JDK 5.0 support

SMU to RACF Conversion utilities

HALDB Change status code GG to BA for PROCOPT GON/GOT clarifies status code for PROCOPT GON/GOT DL/I calls against an unavailable HALDB partition by changing the misleading GG status code (usually meaning logic errors) to BA (unavailable data) for these situations

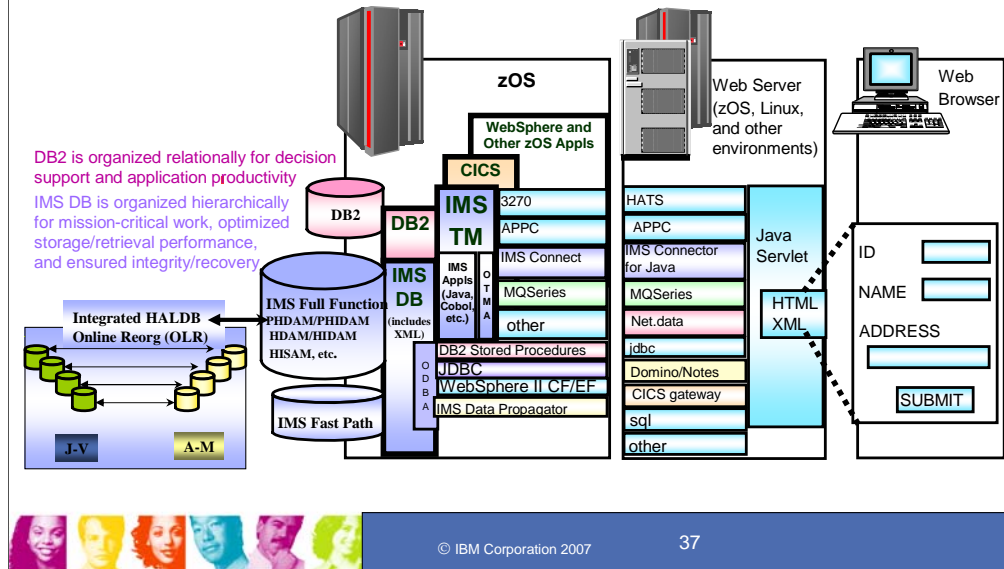Allocation of DSAB and TIOT blocks above the 16 M line

DBRC intent to reorganize flag

DBRC INIT.PART enhancement for remote disaster recovery

XRF/GDPS Coexistence support

HALDB OLR no automatic resume option.

IBM Solutions Provide Integration and Scalability -- Leveraging IMS Applications and Data for On Demand Solutions

zOS

DB2 is organized relationally for decision support and application productivity

IMS DB is organized hierarchically for mission-critical work, optimized storage/retrieval performance, and ensured integrity/recovery

WebSphere and Other zOS Appls

CICS

DB2

IMS DB (includes XML)

IMS TM

IMS Appls (Java, Cobol, etc.)

Integrated HALDB Online Reorg (OLR)

IMS Full Function PHDAM/PHIDAM HDAM/HIDAM HISAM, etc.

IMS Fast Path

J-V   A-M

ODBA

OTMA

3270
APPC
IMS Connect
MQSeries
other
DB2 Stored Procedures
JDBC
WebSphere II CF/EF
IMS Data Propagator

Web Server (zOS, Linux, and other environments)

HATS
APPC
IMS Connector for Java
MQSeries
Net.data
jdbc
Domino/Notes
CICS gateway
sql
other

Java Servlet

HTML XML

Web Browser

ID
NAME
ADDRESS

SUBMIT

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Key Message: IBM has been providing a variety of solutions with IMS consistent with other database and transaction servers.

Connectivity and Integration has always been a priority with IMS. IMS has provided solutions that can use workstations or servers to access IMS data. Information can be retrieved from the server system in a two-tier environment or in a three-tier environment.   Our strategy here is to support standard connectivity solutions, as well as those tailored to the IMS environment. IMS tooling shipped with WebSphere can provide connectivity with IMS applications and data as well as to other environments regardless of the tools used or what they want to connect with. Consistent integrated data access is provided for relational DB2 databases and hierarchical IMS Databases, both its IMS Fast Path and IMS Full Function databases. IMS is now also adding XML Database Support for these databases. And IMS is enhancing its full function database capability with its integrated High Availability Large Database (HALDB) Online Reorganization (OLR) support, offering ultra-high availability to its virtually unlimited size databases.

IMS views integration as a continuing journey and continues to support and enhance new technology for connectivity and on demand business enablement into the foreseeable future.

What's Next

Key Message: IMS has more coming after this and is now announcing the new IMS Version 10

IMS is being enhanced still further with the announcement this month of IMS Version 10.

IMS Version 10

Integration in Application Development/Connectivity
- Enhanced Connectivity in APPC, OTMA, ODBA, and Connect
- SOAP gateway enhancements for additional environment support
- XQuery and additional standards support for IMS Database access
- Broadened Java/XML/SOA Tooling to ease development
- XML DB emerging standards and usability enhancements

Manageability
- Simplified Install/Definition with Dynamic Resource Definition
- Enhanced ACBLIB Online Change (OLC)
- Extended Commands and Systems Management Enhancements
- Configuration and Operational Manager and other enhancements
- Syntax Checker and IVP Enhancements
- Serviceability enhancements
- Enhanced accounting statistics

Scalability in Performance/Capacity/Availability/Recovery
- HALDB and Fast Path performance and usability enhancements
- MSC Increased Bandwidth
- Parallel Recon access
- DBRC, Log, Utility Enhancements

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Key Message: IMS enhancements are being provided in V10

IMS Enhancements are being provided through follow-on versions and service stream enhancements.

IMS Version 10 is providing items for Integration in application development/Connectivity:

Additional Java/XML Tooling and connectivity enhancements in support of the latest technology with SOAP, XQuery, etc.

Additional IMS Manageability Enhancements are also being provided

Dynamic Resource Definition simplifies the method to define IMS systems and resources. It allows dynamic additions, changes and deletions, reduce the number of required user decision points and use intelligence to determine system default values while allowing users to define and override definition choices.

The Operations Manager was delivered in IMS V8 and provided an OM API to allow IMS commands to be issued from OM. In V9 commands for database and area resources were added to provide the user the ability to better manage the IMSplex and provide a single system image. Continued commands enhancements are being provided to allow IMS to maintain and query global status for databases, areas, and transactions in the Resource Manager using IMS type-2 commands and the type-1 Global commands; installations could enqueue/dequeue messages to start/remove work for a transaction or LTERM from OM, similar to a message switch from the terminal to a transaction or LTERM; commands could turn ON or turn OFF logging of all system messages to the secondary master; Type-2 AOI exit parameter list could indicate if the command being passed was entered at a master terminal or system console; and Log Transaction and Statistical Analysis utilities could work in a Shared Queues Environment. Operations enhancements are also being provided for IMS event messages to be displayed on the SPOC or accessible via an Automation program using the OM API; an Audit Trail for all work going through OM (e.g. commands entered from SPOC and command responses); Transactions initiated and messages Iterms sent through the OM API; and a TSO user interface and an IMS Control Center interface for DRD.
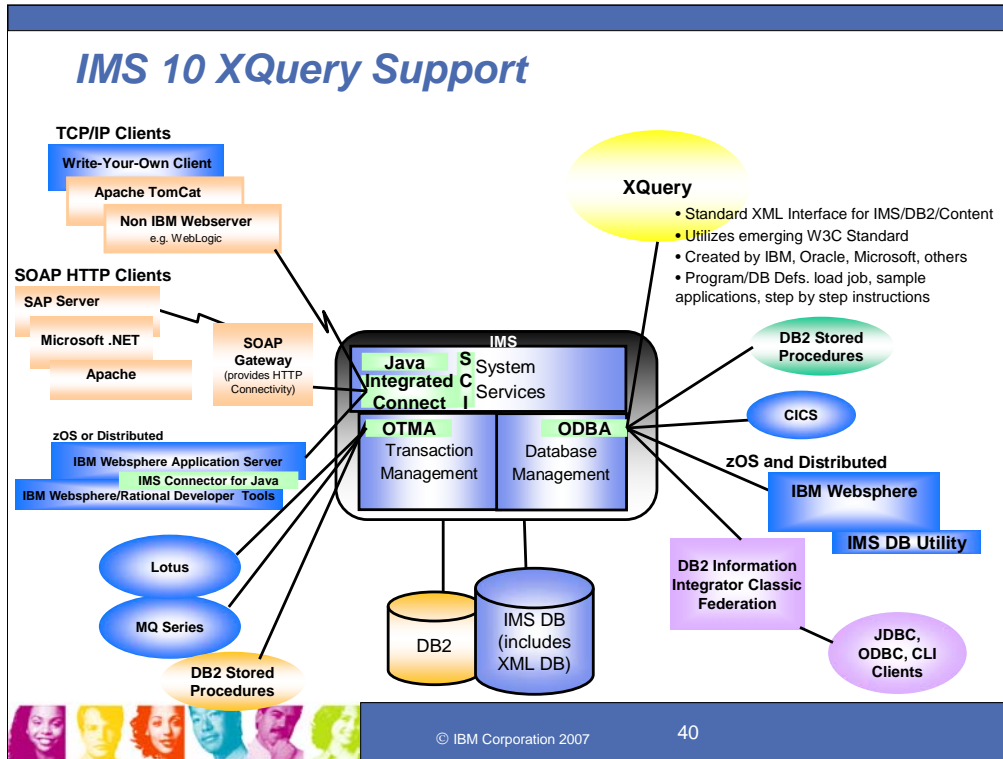
Additional enhancements are also being provided to ease installation, serviceability and usability.

Scalability enhancements for Performance/Capacity/Availability/Recovery include:

Fast Path enhancements to continually improve performance and usability

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,

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.

IMS 10 XQuery Support

TCP/IP Clients
- Write-Your-Own Client
- Apache TomCat
- Non IBM Webserver
  e.g. WebLogic

SOAP HTTP Clients
- SAP Server
- Microsoft .NET
- Apache

SOAP Gateway (provides HTTP Connectivity)

zOS or Distributed
- IBM Websphere Application Server
- IMS Connector for Java
- IBM Websphere/Rational Developer Tools

- Lotus
- MQ Series
- DB2 Stored Procedures

IMS

Java Integrated Connect | **S C I** | System Services

OTMA Transaction Management | **ODBA** Database Management

DB2 | IMS DB (includes XML DB)

XQuery
- Standard XML Interface for IMS/DB2/Content
- Utilizes emerging W3C Standard
- Created by IBM, Oracle, Microsoft, others
- Program/DB Defs. load job, sample applications, step by step instructions

- DB2 Stored Procedures
- CICS

zOS and Distributed
- IBM Websphere
- IMS DB Utility

- DB2 Information Integrator Classic Federation
- JDBC, ODBC, CLI Clients

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Key Message: IMS provides integration with other IBM products for common network, application, data and operations access.

For application and information integration, and for operational integration, IMS is exploiting the latest programming technologies for the Internet and Java. With the industry standard, open interfaces of Java, users can transparently download and seamlessly run applications. It is becoming widely used and is platform independent. IMS applications and data can use and be accessible using the latest in standard architectures and interfaces, include the J2EE Connector Architecture (JCA) and standard application programming interfaces, for example, Java Database Connectivity (JDBC) interface, across platforms.

IMS Java support provides for the development/enablement of Java applications running under the IMS Transaction Manager and also for accessing IMS Databases with JDBC from applications running under other environments, such as WebSphere, CICS, and DB2 Stored procedures, as well. The IMS V9 Java DB utility can help distributed as well as z/OS WebSphere environments access IMS data. Interoperability is also being provided between Java, Cobol and PL/I applications, and between DB2 and IMS databases. And new support for DB2 Stored procedures can access IMS TM applications as well as IMS DB data. IBM also provides JDBC access to IMS Databases with the DB2 Information Integrator Classic Federation product.

IMS V9 provided for the storage/retrieval of decomposed or intact XML data in IMS DB databases. IMS 10 is providing support for IMS Databases with XQuery, the new standard XML interface.

IMS 9 introduced a way to view your IMS data as collections of XML documents -- aligning the stored IMS records with the valid XML documents for retrieval and automated conversion between these. The emerging XQuery standard is a powerful query language to search, aggregate, evaluate, pick and choose parts of the XML collection and then convert the resulting data into XML. IBM development and research have teamed up to build a fully functional, performance-oriented XQuery implementation atop IMS. Prior to V10 an IMS XQuery Technology Preview is available on alphaworks through the www.ibm.com/IMS website.

In conjunction with WebSphere and Rational development tools and servers, the IMS V9 Integrated Connect/Connector for Java function can be used for new J2EE application development/enablement to access IMS applications. IMS provides Web services for IMS applications using the WebSphere Application Server, IMS Connector for Java, and IMS Connect. You can transform existing IMS transactions into Web services by using WebSphere Studio tools to create service definitions for IMS transactions. You then deploy these service definitions to WebSphere Application Server (WAS) to make the IMS services available as Enterprise Java Bean (EJB) services or Simple Object Access Protocol (SOAP) services. In this way, customers can enable IMS applications as Web Services to support IMS COBOL, C and MFS-based applications. This Web services support integrates IMS into the Services Oriented Architecture (SOA). SOA is key to interoperability and flexibility for on demand business. SOA supports end-to-end integration across the enterprise and among business partners. This provides a flexible business process model that allows customers to respond quickly to new customer requirements, new business opportunities, and competitive threats.

IMS is also providing an XML Adapter for use with the IMS SOAP gateway code. The IMS SOAP Gateway is an XML based connectivity solution that enables existing or new IMS applications to communicate outside of the IMS environment using SOAP to provide and request services independently of platform, environment, application language, or programming model. The IMS SOAP Gateway enables the seamless exposure of IMS application assets as Web Services. The IMS SOAP Gateway, providing a relatively simple but extensible option, will provide the ability for non-WebSphere customers to re-use existing and to create new IMS-based business logic. One typical usage scenario of providing Web services with the IMS SOAP Gateway is to enable Microsoft .NET client applications or intermediary servers that submit SOAP requests into IMS to drive business logic transactions. This SOAP function can assist organizations with Enterprise modernization, Application development, Business integration, and Web Services implementation. Generated IMS service definitions (that is, Web Services Description Language (WSDL) files) can be published or exposed to a Universal Description, Discovery, Integration (UDDI) directory for businesses to publish their offerings, and for users to discover their needs. You can retrieve IMS WSDL files out of the UDDI directory and fit them into a tool (such as Microsoft .Net tools or Apache Axis server tools) to generate SOAP messages to be sent to the host to run existing IMS applications. You can also use the standard APIs, such as Java API for XML-based RPC (JAX-RPC), to create both client and server code out of the generated WSDL files. This gateway can also provide the ability to preserve and enhance IMS value to SAP and other customer applications, as well as to applications running in WebSphere and other Web Server environments.

IMS 10 Integration for Application Development and Connectivity Enhancements
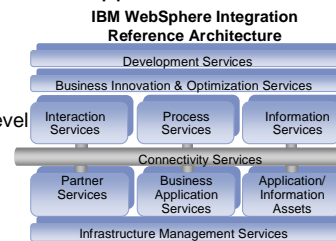
Integrating IMS Data

➢ XQuery and additional standards support to ease IMS Database access
➢ DL/I Model Utility GUI and XML Enhancements to ease development
➢ Java Library support enhancements for DB2 Java Stored Procedures
➢ GSAM Database support expanded to Java Batch Processing Regions
➢ XML Database Mapping enhanced for emerging standards and usability

Integrating IMS Transactions

➢ SOA Composite Business Applications Conversational enhancements
➢ Enhanced Callout for WebSphere and IMS SOAP Gateway environments
➢ Multiple Systems Coupling (MSC) VTAM Generic Resources support
➢ OTMA Descriptor enhancement to ease usability
➢ APPC Local-LU and timeout granularity
➢ Security enhancements
  • Member-level security with each member having its own security level
  • Security refresh by userid using the /SECURE OTMA command
  • Resume TPIPE enhanced with security to protect operations

Easing Development with Java/XML/SOA tools

IBM WebSphere Integration Reference Architecture

Development Services
Business Innovation & Optimization Services

| Interaction Services | Process Services | Information Services |

Connectivity Services

| Partner Services | Business Application Services | Application/ Information Assets |

Infrastructure Management Services

Key Message: IMS Application Development and Connectivity enhancements are being delivered with IMS V10

A number of additional application development and connectivity enhancements have been provided with IMS V10 and are being enhanced.

IMS XQuery support provides access using standard XQuery expressions to IMS full function data, including new IMS XML data. This opens up IMS to the emerging market of off-the-shelf third party tools (e.g. query generation tools for application development, business reporting, data sharing , etc.) and offers a standard shareable integration point between IMS and other industry databases.

IMS Java library support enhances DB2 result sets. This offers the ability to return IMS data to the stored procedure client encapsulated within a DB2 result set, with the conversion to the DB2 result set handled by the Java libraries. This provides for query of an IMS database and conversion of the IMS data into a DB2 result set. This support enhances the interaction between a DB2 stored procedure and IMS data.

The Java libraries are also enhanced to support GSAM databases consistent with other IMS database types. This allows all of the supported data types to be stored into and read from a GSAM database record and fully leverages the existing Java library built-in data conversion routines.

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. These enhancements provide support for the latest standards and ease use.

IMS SOA Composite Business application support provides for the next generation business process tooling and servers that integrate J2EE resources, services and activities (like user interventions), based on Web Services with the Business Process Execution Language (BPEL). This extends existing transactions to include conversational transactions as SOA-based composite business applications using the IMS Connector for Java and WebSphere tooling and runtime, maximizing re-use of IMS assets in new applications for rapid business innovation and reduced costs.
Additional enhancements for IMS interaction with other environments includes Callout support, where an IMS application could call out to another application across the IMS Connector for Java to WebSphere server applications or to SOAP application environments.

Multiple Systems Coupling (MSC) VTAM Generic Resources (VGR) support provides a remote IMS the ability to use a generic resource node name to communicate to any IMS within an IMS Sysplex through the MSC facility. A remote IMS could use a single MSC link definition to connect to the partner link in any of the IMSs in the IMS Sysplex and cloned MSC links can be used across IMSs for connection to remote IMSs.

These also include enhancements for OTMA and APPC, Security, Automation, and more.

IMS 10 Security/Usability Enhancements for Connectivity

IMS benefits from transaction security through RACF

- **Client Password Change Request**
  - Allow user to change security password by submitting a password change request message to the IMS Connect message exit routine
- **ACEE Aging Value**
  - Allow user to set aging value of the cached ACEE for the OTMA security checking for better performance throughput.
- **RACF Mixed Case Password**
  - Allow user to specify the mixed case password for RACF or the equivalent product
- **CM1 Timeout**
  - Allow user to specify timeout value for dependent region wait-syncpoint condition when acknowledgement message is not received for an OTMA CM1 output response
- **Message Flood Control (partial support provided as V9 SPE)**
  - Allow user to specify a threshold value to detect the OTMA message flood condition
- **Alternate Client ID (also provided as V9 SPE)**
  - Allow user to retrieve IMS asynchronous output using an alternate Tpipe name or client ID
- **RACF error message reduction**
- **Faster RACF auditing**
- **Conversational Security enrichment items**
- **Command enhancements**
  - /SIGN ON enforcing conversations be held or user authorized to use transaction for active conversations
  - /DISPLAY SHUTDOWN STATUS showing active or indoubt ODBA threads that could prevent IMS from shutting down completely if IMS not shutting down as expected
  - /LOCL, /OPNDST, /SET,/SIGN, /UNLOCK enhanced to support mixed-case passwords

Note: IMS V9 is last release for SMU support - users must migrate to RACF or equivalent

Key Message: IMS Continues to enhance serviceability and usability for connectivity
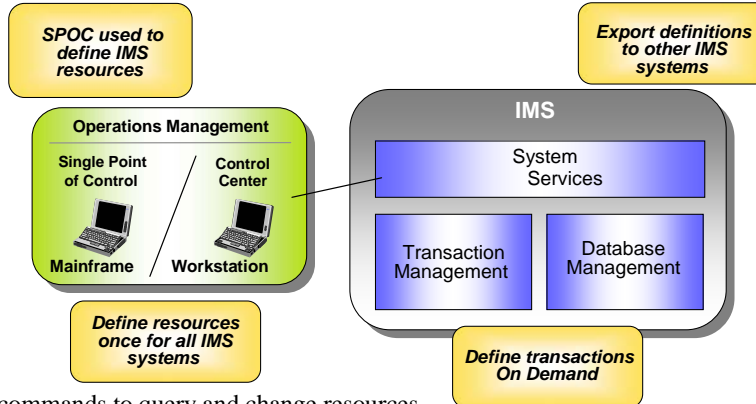
Security enhancements include RACF error message reduction, support for z/OS mixed case passwords, Faster RACF Auditing, and Conversational Security enrichment items. A mechanism on client input to the integrated IMS Connect function to change the password associated with the client ID is provided. Customer-written applications will have the ability to change the client RACF password. The user will be able to define to Connect the aging value used by OTMA within IMS for the aging value of the ACEE's used by RACF, where the current default value is 'forever.' RACF Mixed Case Passwords are supported with Connect preserving the original password value rather than attempting to translate the password to upper case. A new Startup parameter is added to the DBC, DCC and IMS procedures and commands are enhanced to support mixed case passwords.

These items enhance security and reduce unnecessary error messages.

Message Flood Control was partially support earlier with IMS V9 SPE

Easing IMS Manageability:
   IMS 10 Dynamic Resource Definition Support

Simplifies definition of IMS resources

SPOC used to define IMS resources

Export definitions to other IMS systems

Operations Management

Single Point of Control — Control Center

Mainframe / Workstation

IMS

System Services

Transaction Management

Database Management

Define resources once for all IMS systems

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 V10 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.

IMS 10 Systems and Operations Management (OM) Enhancements

Maintain Global Sysplex Status for Databases and Transactions

Single Point of Control for Commands and Automation

Sysplex Audit Trail

New Commands and Wizards

SPOC to Initiate IMS Transactions

Commands routed to all IMS systems

Single Consolidated Command Response

IMS V8

IMS

System Services

Operations Management

Single Point of Control

Control Center

Mainframe / Workstation

Transaction Management

Database Management

IMS Msgs

IMS DB

- 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.

Additional IMS 10 Manageability Enhancements

- **Program Serialization across the Sysplex**
  - Eases application flow management
- **Transaction Level Statistics**
  - Offers more application granularity to ease operations
- **Selective Display of System Parameters**
  - Offers more parameter granularity and reduced usermods to ease operations
- **Enterprise Workload Manager**
  - Enhanced workload balancing to ease operations
  - EWLM function portion can use zIIP processors to reduce costs
- **Serviceability Enhancements**
  - Ease problem determination and increase awareness of problems/resolution

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Key Message: IMS provides and continues to enhanced additional items for manageability

Serialized programs has been a requirement since Shared Queues was implemented. This uses the resource structure to keep track of serialized programs so only one program is running at a time in the IMSplex.

Transaction Level Statistics would provide a more granular layer of information related to transactions that are processed. Currently a record is written at the start and end of a scheduling cycle. This would add additional log records to reflect the messages that are processed within a commit scope. This is an option and could be used in a mode=sngl environment to write statistics for every transaction that is processed.

And many more enhancements for IMS are being provided for workload management and serviceability.

Increasing IMS Scalability:
IMS 10 Parallel RECON Access

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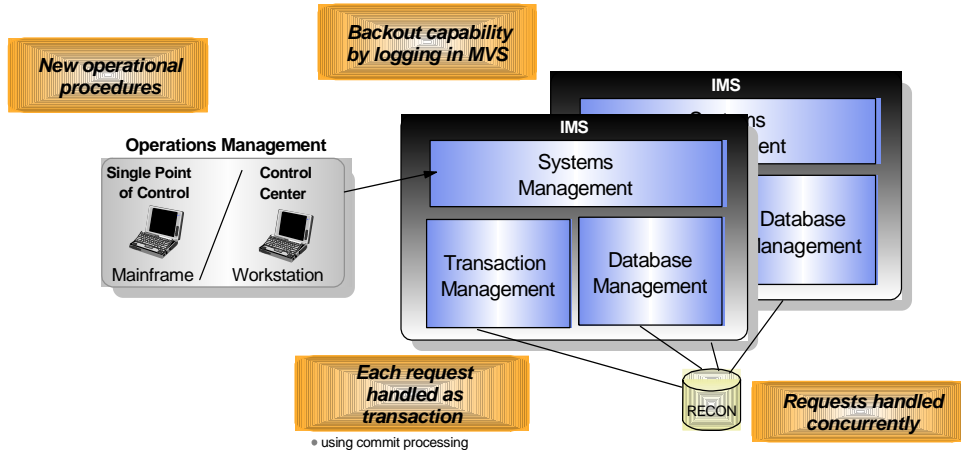
- Eliminate performance bottlenecks caused by contention for the RECON
- Utilizes DFSMStvs to provide record level locking and logging for the RECON data set
- Eliminates transaction response time issues, unplanned IMS system quiesces for OLDS switches

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Key Message: IMS V10 provides improved RECON performance by reducing contention

IMS V10 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.

Additional IMS 10 Database Recovery Control (DBRC) and Utility enhancements

- Provides Recon Update function for users and programs with the standard, release independent Application Program Interface (API) to the RECON – easing Tool workload and V2V migration
- Adds READONLY access to the RECON Data set
- Increases DBRC Time stamp precision
- Image Copy 2 (IC2) Fast Replication support of Data Set Flash Copy
- Changes SORT core size and defaults
- Improves performance of Indirect List Data Set (ILDS) Rebuild Utility
- Statistics Utilities Shared Queues support

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Key Message: IMS provides and continues to enhance the DBRC and Utilities to ease recovery, performance and usability

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

IMS 10 Multiple Systems Coupling (MSC) Bandwidth Enhancements
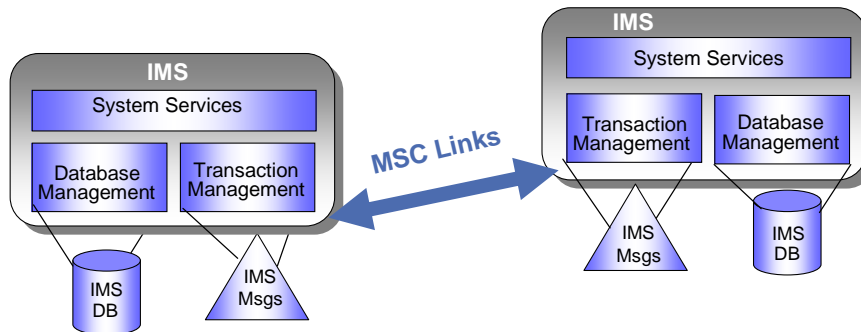
- Relieves bandwidth problems across the MSC network
- Makes Link Protocols more efficient/dynamic
- Improves blocking technology for greater bandwidth across MSC links
- Enables dynamic display/query/change or link buffer size
- Improves efficiency, transaction performance, output message response times, easing use and reducing links required
- Provides statistics to fine tune/analyze/improve link performance

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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.

Additional IMS 10 Scalability Enhancements

- Fast Path
  - Data Entry Database (DEDB) buffer pool, command, options, and Virtual Storage Option (VSO) enhanced
  - Expedited Message Handler (EMH) increase buffers, usability/availability items
  - Sequential Dependent (SDEP) Segment (SDEP) Utilities function QUITCI enabled as system default
- VSCR moving blocks from CSA to 31 bit storage for capacity relief
- Large sequential dataset size limit increased for capacity relief
- Application Control Block Library (ACBLIB) Online Change (OLC) enhancements for enhanced availability
- ACBGen 31 bit support for capacity relief
- Display Active enhancements improves availability

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Key Message: IMS provides and continues to enhance scalability

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

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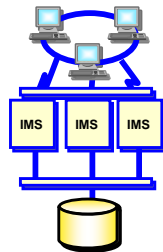
Application Control Block Library (ACBLIB) online change (OLC) commit and /DISPLAY MODIFY ALL are changed to no longer treat messages on the local queues in a non-shared queue environment as work in progress for transactions indirectly affected by online change. This improves the usability of online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

ACBLIB Member Online Change (OLC) provides for individual ACBLIB members to be added or changed (though not deleted) without a library switch, which earlier was required for a full OLC. Only the resources associated with the change will be quiesced. This function coexists with existing full library switch OLC capability. This ACBLIB function makes online change for ACBLIB more usable and enhances availability.

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

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

IMS **IMS** **IMS**

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

Strategic Open Access z/OS Enterprise Servers

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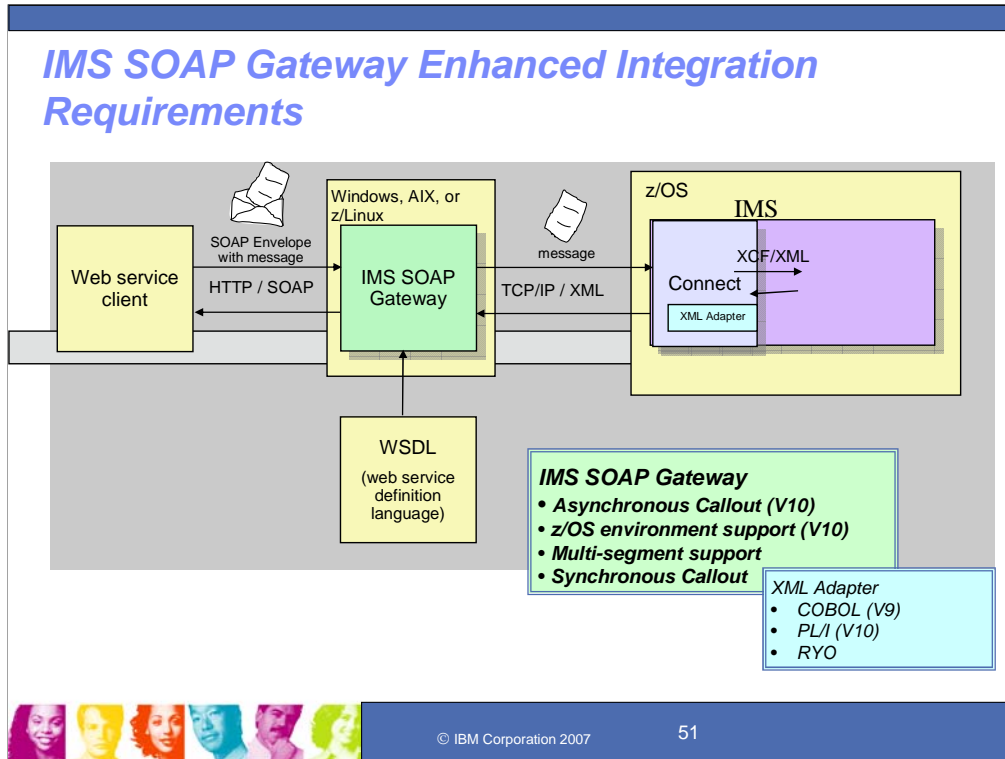
IMS has been providing Sysplex support to ensure the highest in availability/performance for Systems growth. IMS would continue to enhance support for this environment and provide support for new capabilities in it.

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.

IMS SOAP Gateway Enhanced Integration Requirements

Windows, AIX, or z/Linux

z/OS

IMS

SOAP Envelope with message

Web service client

HTTP / SOAP

IMS SOAP Gateway

message

TCP/IP / XML

XCF/XML

Connect

XML Adapter

WSDL
(web service definition language)

IMS SOAP Gateway
- **Asynchronous Callout (V10)**
- **z/OS environment support (V10)**
- **Multi-segment support**
- **Synchronous Callout**

XML Adapter
- *COBOL (V9)*
- *PL/I (V10)*
- *RYO*

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Key Message: IBM plans to enhance the IMS SOAP Gateway and the IMS XML Adapter support

IMS could also use the WebSphere Developer for z XML Adapter for COBOL with its IMS SOAP gateway code. The IMS SOAP Gateway is Generally Available (GA), downloadable at www.ibm.com/ims. The IMS Connect XML adapter is currently being Beta tested with customers.

The XML Adapter, for this release supports COBOL and SOAP Client; in the future it could support COBOL and RYO Clients, as well as PL/1 and MFS for SOAP and RYO clients.

Enhanced IMS SOA Composite Business Application Requirements

Objective:

- Enhance integration of IMS transactions as SOA based composite applications while reducing existing complexity, proprietary nature and resource requirements

Solution:

- Invoke and Integrate IMS Message Format Services (MFS) conversational transactions as SOA-based composite applications
- Ease integration using the latest tooling support though IMS Connector for Java, WebSphere Integration Developer (WID) tool set and the WebSphere Process Server (WPS)

Value:

- Enhanced application integration and ease of use

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Key Message: IMS plans to enhance its SOA composite business application support

IMS would continue to enhance integration of IMS transactions with other transactions/applications, including in composite business application environments. This would be needed to help reduce the existing complexity, the proprietary nature of existing environments, and the resources and skills required.

Representing IMS data with Web Services Standards Requirements

- **Service Component Architecture (SCA) is a universal model for "business services" that publish or operate on "business data".**
- **Service Data Objects (SDO) provides the universal model for "business data".**
  - SDO defines a single uniform way to access and manipulate data from heterogeneous data sources including relational databases, hierarchical databases, XML data sources, Web services, and Enterprise Information System (e.g. IMS & CICS)
  - Provides a common unifying format for exchanging data and messages among services and interacting with existing data sources without having to learn the intricacies of countless data access conventions
- **Enhance IMS DLIModel utility to generate SDOs for IMS data**

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

Service Component Architecture (SCA) is a universal model for "business services" that publish or operate on "business data".
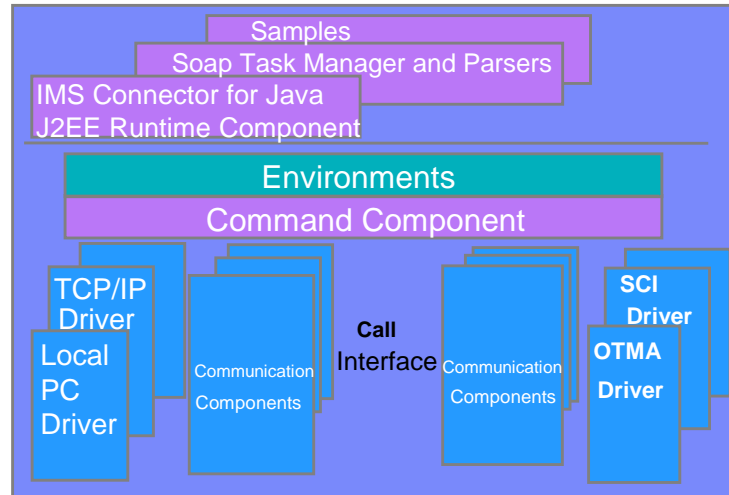
Service Data Objects (SDO) provides the universal model for "business data".

SDO defines a single uniform way to access and manipulate data from heterogeneous data sources including relational databases, hierarchical databases, XML data sources, Web services, and Enterprise Information System (e.g. IMS & CICS)

Provides a common unifying format for exchanging data and messages among services and interacting with existing data sources without having to learn the intricacies of countless data access conventions

Enhance IMS DLIModel utility to generate SDOs for IMS data

Integrated IMS Connect Internal Structure Provides Connectivity Base for Future

Samples

Soap Task Manager and Parsers

IMS Connector for Java
J2EE Runtime Component

Environments

Command Component

TCP/IP Driver

Local PC Driver

Communication Components

Call Interface

Communication Components

SCI Driver

OTMA Driver

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 Veriions so you can start to take advantage of it before migrating your networks/applications/databases to IMS V9. The structure of IMS Connect is designed such that drivers can be interchangeable. That is, alternatives for the TCP/IP front end or OTMA back end interfaces are already being provided. These are allowing IMS to exploit newer, additional, and enhanced protocols and/or interfaces. Along with IMS Connect is provided the IMS Connector for Java for access from Java applications, SOAP Gateway and parsers, and samples for other language access as well.

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

 With IMS Version 9 this function was integrated in.

 With this structure IMS Connect could evolve to address other connectivity requirements, such as distributed database access to IMS DB.

Distributed IMS Database Access Requirements
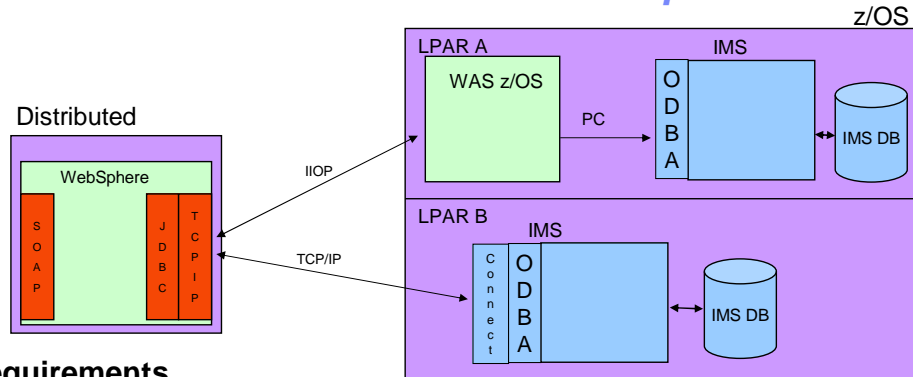
Requirements

- **Businesses that rely on data storage in IMS want:**
  - Extended, distributed access to IMS DB with language independent interfaces
  - Improved availability through better isolation of open IMS DB access components
  - Enhanced integration, eased development using standard, state of the art tooling
    - Supporting Service Component Architecture/Service Data Object (SCA/SDO) programming models along with XQuery

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

In the top box on the right labeled LPAR A you'll see our current solution. Once again, we leverage WebSphere z/OS as the TCP/IP endpoint on the mainframe and our libraries use the ODBA API to access IMS databases. The requirement we have is to leverage IMS Connect as the TCP/IP endpoint on the mainframe. This nicely positions IMS Connect as the complete gateway to IMS resources…both TM and DB related. This is shown in LPAR B.

Enhanced IMS Distributed Database Access Requirements

Objective:

- Extend distributed access to IMS DB while reducing existing complexity, proprietary nature and resource requirements

Solution:

- Offer direct distributed access to IMS database resources through industry standard interfaces
- Enhance distributed JDBC connectivity through integrated IMS Connect function utilizing TCP/IP
- Allow cross-LPAR access to any IMS database in the IMSplex
- Provide simplified access to IMS data wrappered in a separate address space with a callable interface for Open DB Access
- Extend Web Services Data Language (WSDL) interface for IMS Data, mapping to the DLIModel Utility and IMS Database Definitions (DBDs)

Value:

- Reduce complex infrastructure and additional products/resources required for distributed and cross-LPAR access to IMS Data
- Enhance integration by easing and extending distributed access to IMS DB data using the latest technologically advanced standards
- Allow industry standard Distributed Relational Database Adapter (DRDA) access to IMS, reducing DL/I knowledge needed for IMS DB access
- Increase availability with improved isolation of IMS DB access components

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Key Message: IMS plans to enhance its distributed database access

Customers also have wanted extended IMS distributed data base access. Today we leverage WebSphere z/OS as the TCP/IP endpoint on the mainframe and our libraries use the ODBA API to access IMS databases. The requirement we have is to leverage IMS Connect as the TCP/IP endpoint on the mainframe. This nicely positions IMS Connect as the complete gateway to IMS resources…both TM and DB related. This would enhance integration by easing/extending distributed access to IMS Data and it would also improve the availability through better isolation of open IMS data.

Today we also use Web Services Data Language to map to applications though COBOL copybooks. IMS would also extend this for database mapping to the DLIModel Utility and IMS Database Definitions (DBDs) using JDBC connectors..

Additional IMS Connectivity Requirements

Objective:

- Extend distributed access to IMS applications/data, reducing existing complexity, proprietary nature and resource requirements

Solution:

- Offer recorder trace enhancements to reduce abend occurrences, eliminate dataset full, and minimize amount of data recorded.
- Provide reconnect capability to TCP/IP relieving operator interaction to manually reestablish connection.
- Provide security restrictions to relieve customer errors tying up systems.
- Maintain socket connection with user exit to remove client burden of reestablishing the connection
- Provide granularity of Super member data store instances
- Add storage address to message to better expedite diagnostics
- Transaction expiration support for flood control
- Degraded system checking to avoid wasting cpu cycles and to provide for improved workload balancing

Value:

- Improve reliability and serviceability
- Enhance resilience, performance and availability
- Eased IMS application connectivity usability

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Key Message: IMS plans to continue to enhance its application connectivity

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

Enhanced IMS Manageability Requirements

Objective:
- Reduce resource/skill requirements for managing IMS

Solution:
- Database Quiesce Type 2 command to create point of consistence to reduce time the databases are offline
- Data Communication Type 2 commands QUERY and UPDATE for nodes/users/lterms.
- Standardized user exits enhancements
- RAS Enhancements to minimize library maintenance mistakes and enhance log analysis

Value:
- Reduce skills required for IMS operations, plan outages, and updates to user exits
- Standardize user interface, replacing manual process.
- Eliminate need for user to provide customized programs to communicate with user exits
- Ease migration to new function/versions

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Key Message: IBM plans to enhance IMS for easing manageability

IMS Manageability enhancements could 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 could reduce skill requirements, reduce manual efforts, and improve business application availability.

Enhanced IMS Scalability Requirements

Objective:

- Increase availability, recovery, capacity and performance of the IMS environment

Solution:

- Multithreaded Database Recovery Control (DBRC), allowing requests to a single DBRC instance to be processed in parallel
- DBRC Security override for non-production Recovery Control (RECON) data set copies to allow user to optionally set data set high level qualifier attribute for test or debug
- Providing for unconditional deletion of PRILOG by specifying max time to keep recovery information, thus reducing amount/size of information kept
- Reduce CPU/elapsed time and log volume of Integrated HALDB Online Reorganization
- Allows access to the inactive ACBLIB when IMS is active to enable inactive ACBLIB to be taken offline for maintenance without an IMS outage.
- Reduce ACB Data 31-bit storage needs, utilizing 64-bit virtual storage as cache for ACB data
- Enhance usability, flexibility and ease ECSA usage in Fast Path Buffer Management by providing more granular method of defining buffer pool storage and move FP buffers into 64-bit storage

Value:

- Improve database availability/performance through more parallelism and reduced resource consumption
- Improve business application availability
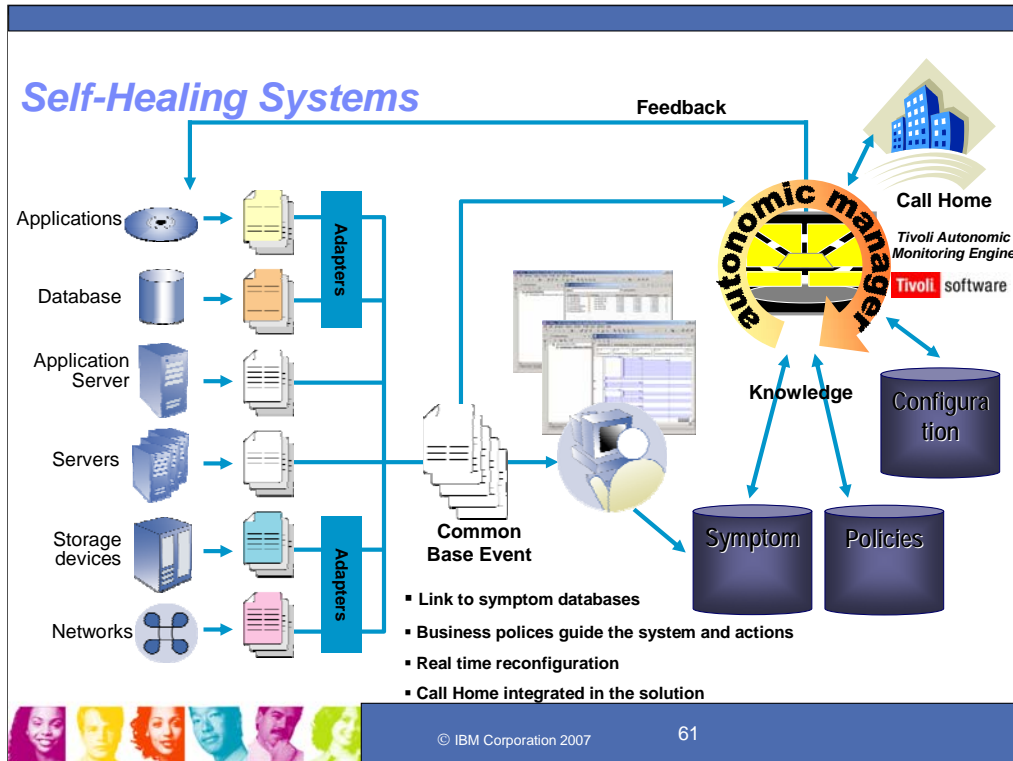- Reduce capacity constraints

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Key Message: IBM plans to enhance IMS Scalability

IMS scalability enhancements 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.

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Key Message: IMS continues to move toward autonomic computing for installation and problem determination

What we would really all like to see is the workload and skill requirements for installations and problem determination greatly reduced. IBM has put in place an autonomic computing initiative to help with this across the board, focusing on self configuring, self optimizing, self healing and self protecting. And IBM is putting in place a lot of work on this to help our IMS customers achieve this. IMS today is making progress with workload manager support, single point of distributed operations control, common log/trace, Sysplex data/network/message sharing, and resource definition manageability. IMS is also planning on addressing requirements for an enterprise level workload manager, and for an enterprise level integrated systems console, as well as enhancements for improved diagnostics and service. zSeries and IMS also provide enduring value through best of breed performance/capacity, availability/recovery, and security/integrity. Future enhancements are planned in IMS and the zSeries to continue this enduring value.

Self-Healing Systems

Feedback

Applications
Database
Application Server
Servers
Storage devices
Networks

Adapters

Common Base Event

- Link to symptom databases
- Business polices guide the system and actions
- Real time reconfiguration
- Call Home integrated in the solution

Call Home

Tivoli Autonomic Monitoring Engine

Tivoli software

Knowledge

Configuration

Symptom

Policies

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Key Message: IMS in conjunction with other products is moving toward a fully self-healing system

A fully self-healing system requires a consolidated effort from a lot of products working together. Integration and open standards are key to this. The entire picture of a self-healing system also requires autonomic elements with health checking, legacy logs, Generic log adapters (AC technology) to convert logs, Log analyzer (TAME), Symptom databases, and Policy engines. Feedback ultimately will go directly to the system but in meantime, it could go to a system administrator. Once determining the symptom and required action, we would want to see if the action matches the policy. example: two actions may exist for a symptom, one may be to reboot the system, which will 'fix' the problem, the other is a workaround, like increasing swapper space, that will temporarily fix the problem. If the policy is to not reboot the system during peak business hours, the policy service would tell us to use the workaround. IBM has been making real and significant progress in the tooling, moving from vision to action. There are, however, still a lot of challenges ahead of us for this.
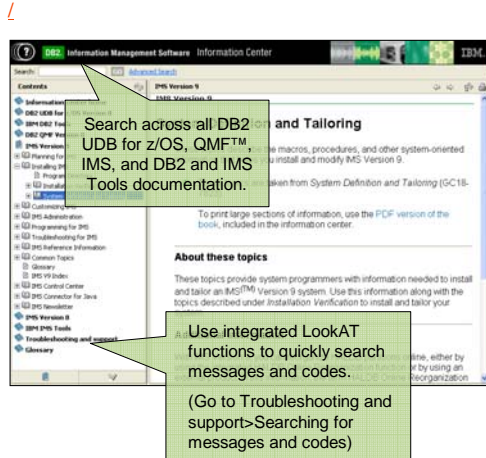
The IMS Home Page: www.ibm.com/ims

Key Message: IMS information is provided through the IMS home page on the web

IMS Information is readily available at the IMS home page at www.ibm.com/ims. Information is available for IMS V9, as well as other IMS versions and tools, and also for the IMS Integration Suite. This presentation and others as well as papers are available off the Presentations/papers page.

IMS Information Resources

IMS Information Center
/

Search across all DB2 UDB for z/OS, QMF™, IMS, and DB2 and IMS Tools documentation.

Use integrated LookAT functions to quickly search messages and codes.

(Go to Troubleshooting and support>Searching for messages and codes)

IMS Web Links
Take advantage of IBM self-help services on the Web for answers to many of your Support questions

IMS Web site

IMS Tools Web site

IBM Support Handbook

IBM MySupport
For customized Support information on the products that interest you including automatic e-mail notifications of downloads, fixes, and documentation updates.

IMS Version 8 Information Roadmap
Take advantage of an anchor site that provides links to a wide variety of useful information resources about IMS and IMS Tools

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Key Message: IMS is making information readily available along with other products though an Information center

IBM has many resources available to you online to help you find the information you are looking for quickly and easily. These resources are updated regularly and can save you time by putting the latest product information from IBM at your fingertips. When it comes to meeting your Support needs, IBM's online resources are your first line of defense. On this slide we have links to our online Information Center as well as the IMS and IMS Tools product Web sites. Here you can search for maintenance updates, fixes, Users Guides, and the latest troubleshooting information to answer your questions. For customized Support online, with automatic e-mail notification when new information becomes available, visit IBM's MySupport.

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**

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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 exiting investment in skills and applications for information access across the Internet.