



Reinventing IMS for a Rapidly Changing World

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IBM Data Management Team



- ▶ Key Message: IBM's Data Management team is positioned to support customer solutions for the new world.
- ▶ The IBM Data Management Team has been rapidly growing, with sites around the world for Research and development. Marketing and Sales and Business Partners too have been rapidly growing.
- ▶ We work together across locations and platforms with a lot of great teamwork.

IBM: *The Fastest Growing DM Company*

Business performance update...

Fastest Growth & Highest Customer Satisfaction

1Q 2002 Database Management

YTY WW Revenue Growth 2002

▶ IMS + DB2/390	+9%
▶ DB2 Distributed	+10%
▶ IMS + DB2/390 Tools	+17%
▶ IBM Database Overall	+10%

17 Consecutive Quarters of Growth

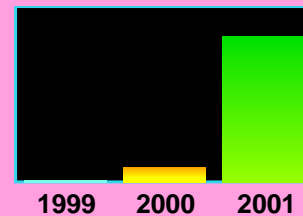
- ▶ Key Message: IBM Data Management have been shown to provide very successful solutions
- ▶ On the host our Data Management grew 13%, faster than the industry growth rate as well.
- ▶ In the 1st Half of 2001, our distributed platform DB2 grew 19%, where it continues to outpace the industry
- ▶ But our move into the Data Management Tools has resulted in significant growth of 205%
- ▶ IBM's Data Management Division has seen 15 consecutive quarters of growth.



IMS: The World Depends on it !

- **2 yr IMS Mips Growth +27%**
- **IMS Family Revenue Growth puts it in the Top 10 software companies**
- **IMS V7 install rate is 25% faster than earlier versions**

**IMS V7
License Growth**



- ▶ Key Message: IMS in particular has been providing very strategic customer solutions and continues to thrive.
- ▶ The IMS family is key to the Data Management family, offering solutions for the fastest customer growth and highest customer satisfaction.
- ▶ IMS exploitation of the S/390/z/Series platform has resulted in a 27% mips growth over the past 2 years.
- ▶ The current IBM Family revenue would put it in the Top 10 of software companies.
- ▶ This year we have been continuing to grow that revenue, ensuring a bright future at IBM.
- ▶ Version 7 with its valuable new function, ease of installation, and high quality, has been going into our customer shops at a 25% faster rate than any earlier versions.



- ▶ With a large number of customers world-wide, V7 has been growing at a rapid rate, 25% faster than any earlier version.
- ▶ IMS Version 7 has been well received. Customers are starting with IMS V7 and HALDB migrations and Java application support as a base for their future development.
- ▶ IMS customers are using V7 to provide them leading-edge advantage solutions to retain and/or become the leaders in their industry. Customers who fall behind could find themselves at a distinct disadvantage in a very competitive rapidly changing world.

IMS Runs the World...

- **Most Corporate Data is Managed by IMS**
 - Over 95% of Fortune 1000 Companies use IMS
 - IMS Manages over 15 Billion GBs of Production Data
 - \$2.5 Trillion/day transferred thru IMS by one customer
- **Over 50 Billion Transactions a Day run through IMS**
 - IMS Serves Close to 200 Million Users a Day
 - Over 79 Million IMS Trans/Day Handled by One Customer on Single Production Sysplex, 30M Trans/Day on single CEC
 - 120M IMS Trans/day, 7M per hour handled by one customer
 - 6000 Trans/sec across TCP/IP to single IMS
 - 11,200 Trans/sec (nearly 1 Billion/day) with IMS Data/Queued sharing on a 2-CEC Sysplex

■ **Gartner Group:** "A large and loyal IMS installed base. Rock-solid reputation of a transactional workhorse for very large workloads. Successfully proven in large, Web-based applications. IMS is still a viable, even unmatched, platform to implement very large OLTP systems, and, in combination with Web Application Server technology, it can be a foundation for a new generation of Web-based, high-workload applications."

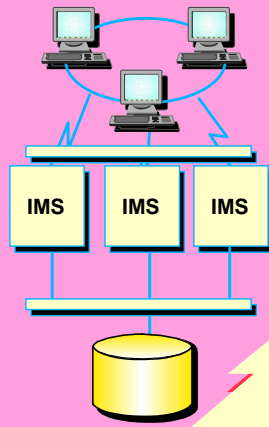
- ▶ Key Message: IMS has successfully been exceeding customer and consultant expectations
- ▶ Industries world-wide rely on IMS to run their businesses. IMS is part of everyday life. Chances are you are using IMS when you turn on a light, make a telephone call, get a business loan, process accounting records, use your ATM card, put money in a bank, rent a car, purchase insurance, travel, send a package, track in-transit packages, trade stocks, control inventories, process payroll, update personnel records, control an assembly line, control a railroad, use corporate database, run a government agency, conduct international business/banking, and many more.
- ▶ More than ninety-percent of the Fortune 1000 companies use IMS. IMS serves 200 million end users, managing over 15 billion Gigabytes of production data and processing over 50 billion transactions every day. IMS still owns the high-volume on-line transaction and database management environment. IMS customers have been driving their own growth with IMS - over 79 million transactions were handled by one customer in a single day on a single sysplex system, 30 Million Trans/Day on a single CEC. 7 million Transactions/ hour and 120 million transactions/day were handled by another customer. IMS in-house testing has reached over 4000 transactions/sec across TCP/IP to a single IMS on a single machine (G6). And we have reached 11,246 trans/sec (nearly 1 Billion trans/day) with IMS Data/Queued Sharing on a 2-CPC Sysplex..
- ▶ IMS, IBM's premier hierarchical transaction and database management system, is the product of choice for critical on-line operational applications and data where support for high availability, performance, capacity and integrity, and low cost are key factors

IMS - Version 7

2nd Year CELEBRATION

Ideal for e-business

- ✓ Continuous Availability
- ✓ Systems Management
- ✓ Performance/Capacity
- ✓ Application Development/Connectivity



Enhancements

- Extended Large DB support
- Enhanced DB recovery
- Faster Restart with Multinode Persistent Sessions
- Enhanced Systems Mgmt Tools
- Enhanced Connectivity
- IMS Java & XML

Benefits

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

Strategic Open Access
S/390 and z/OS
Enterprise Server

- ▶ Key Message: IMS V7 celebrates its one-year-since-GA anniversary, providing solutions for Integration, Manageability, and Scalability.
- ▶ To help all our customer with growth, availability, and systems management, we provided IMS Version 7 and some related tools. IMS V7 extending its database availability and capacity with large database support and extended partitioning to other database types with its High Availability Large (HAL) DB support IMS V7 also enhanced Network availability with the new Rapid Network Reconnect facility, providing faster reconnect, utilizing the facilities of VTAM's Multinode Persistent Sessions. IMS V7 also introduced IMS Java application support and JDBC access to IMS Data. This was also enhanced for XML support. IMS V7 function also offers the ability to enhance Sysplex operations, improve workload balancing, and provide enhanced backup and recovery. IBM has also been providing extended IMS capabilities through new/enhanced tools for IMS database recovery with the IMS Online Recovery Service facility and for IMS Connectivity with IMS Connect, a new Tool for enhanced access to IMS through TCP/IP These enhancements, as well as additional items, are provided to continue improvement in availability, systems management, performance/capacity, and for optimizing use of IMS in enterprise and network computing environments.

IMS Version 7 Status

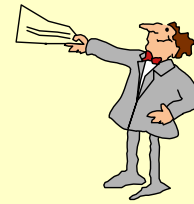
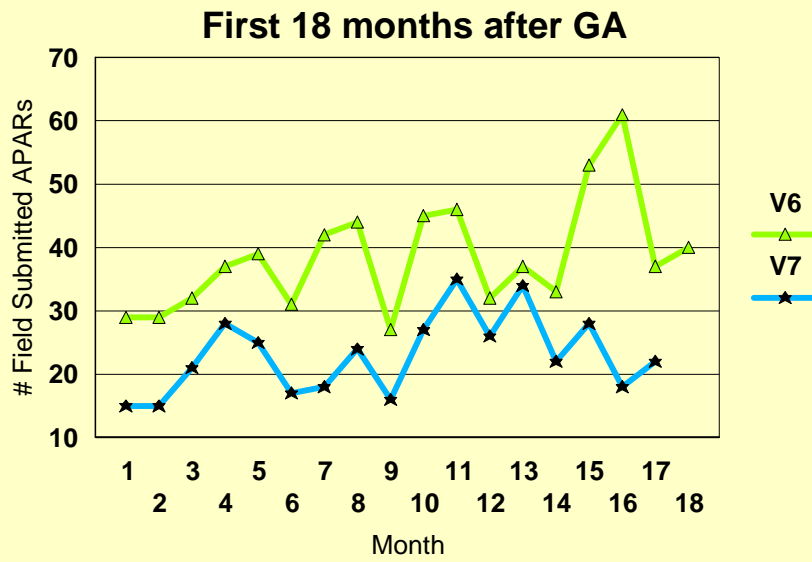
- **General Availability 10/27/00 IMS V7**
 - **Fastest New Version Install Rate**
 - **New Enhancements provided since GA**
 - **Stable base for the Future**
- **Education and Services Available**
 - **New Redbooks Available**
 - **Online Information at ibm.com/ims**
- **Customer Support available through**
 - **e-Care web based support**



- ▶ Since IMS Version 7 became Generally available on October 27, 2000, a number of new enhancements and tools have been provided.
- ▶ We have also been providing education classes and services offerings to help all our customers prepare and more readily migrate to IMS V7.
- ▶ In addition a number of redbooks are available or in final preparation, bringing in IBM field and customer personnel to provide hands on experience for installation and use of IMS V7, Java, HALDB, and ORS, and new ones are planned on performance, connectivity and management.
- ▶ Online information and timely updates are available through the web at our continually improving website at ibm.com/ims

IMS V7 Quality Measurement

First 18 Months After Availability



IMS V7 Functionality Expands

- **Information Integration 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 installation and operations efforts
 - ✓ High levels of security
 - ✓ End-to-end transaction integrity
 - ✓ Real time data currency
 - ✓ Highest code quality
- **Scalability in Performance/Capacity/Availability/Recovery**
 - ✓ Handling increasing workload
 - ✓ Handling unpredictable volumes
 - ✓ More hours for workload
 - ✓ Continuous up time for applications and user access



- ▶ IMS meets extreme IT needs for e-transaction processing with the ultimate in performance/capacity, availability and systems management and technological leadership in connectivity and new application development.
- ▶ IMS along with the S/390 and the new zSeries have been delivering on the promise of e-business and continue to do so with new enhancements for e-transaction processing bandwidths capable of supporting the largest web sites and transaction rates through GB ethernet. Fiber connection technology and industry leading webserving with IMS and the IBM WebSphere Application Server, Security and Communications Servers. A balanced system is provided for world class solutions. IMS together with the S/390 and zSeries are delivering more comprehensive security protection, featuring centralized management and a strong suite of end-to-end products. We continue to provide and enhance our leading edge end-to-end transaction integrity and real time data currency with the sharing of data, networks, and messages, utilizing the sysplex and its coupling facility. Our technology transition from bipolar to CMOS has allowed us to deliver exponentially improving price/performance to our customers. Customers are using this power to take on new e-business related applications.

IMS V7 Java for Integrated e-business Application Development/Connectivity



✓ Application programmer productivity

- Java access to IMS input/output message queues
- JDBC to access IMS DB and DB2 data
- Uses VisualAge tools for development

✓ Enhanced since IMS V7 GA

- **New Java Dependent Region support for Persistent Reusable Java Virtual Machine**
- **JDBC access to IMS DB from CICS/390 Java applications and DB2 for OS/390 and z/OS Stored Procedures**

- ▶ Java is the base for new application development and connectivity.
- ▶ In the base of IMS Version 7 is our IMS Java application support to enhance the ability of our customers and business partners to provide integrated e-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 Visual Age workstation and host tools for development and testing.
- ▶ Compiling is provided initially through the High Performance Java compiler.
- ▶ We provide access to IMS TM message queues and to IMS DB and DB2 data through JDBC.
- ▶ Enhancements are being provided to this support for IMS DB access from CICS/390 Java applications, DB2/390 Java Stored procedures and WebSphere applications, opening IMS DB up to better integration and use across platforms and across application environments. IMS would also be providing this support for Websphere application Server access to IMS.
- ▶ New Java Region Types are also being provided. IMS V7 Java support currently utilizes the High Performance Java Compiler. This support enhances the IMS V7 Java support to run with the new Scalable JVM, providing enhanced tool support for developing these Java applications to run in IMS.

IMS Connect for Broader e-business Connectivity

IMS Connect V1R1 Enhancements

- ✓ Local Support
- ✓ Unicode Support
- ✓ ACK/NAK required notification support
- ✓ Output message structure change

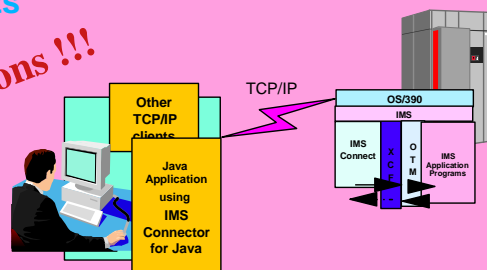
IMS Connect V1R2 Enhancements

- ✓ Incorporation of the IMS Connector for Java J2EE Runtime support
- ✓ Used with VAJava's IMS Connector for Java J2EE Development support

IMS Connect 2002 Enhancements

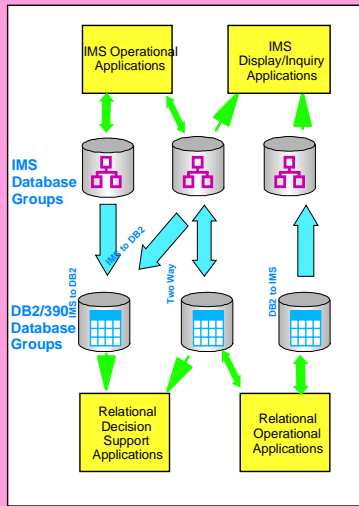
- ✓ Two-phase Commit Support
- ✓ Security enhancements

Ready for Linux Applications !!!



- ▶ IMS Connect V1R1 was provided last year as a new separately priced facility for IMS. It provides enhanced IMS TCP/IP support. New enhancements this year being provided through the service process include:
- ▶ Local support, available via APAR PQ45057 4/01, for communication using Program Calls without requiring TCP/IP from a web-serving application to IMS in a z/OS or OS/390 environment, easing the management in this environment. This support is used by the VisualAge for Java (VAJava) IMS Connector for Java for creating Java applications that can access IMS transactions from WebSphere Application Servers for zOS and OS/390.
- ▶ Unicode support, available via APAR PQ47906 5/01, for sending Unicode application data to an IMS host application capable of dealing with Unicode, such as a Java application running in IMS.
- ▶ ACK/NAK required notification support, available via APAR PQ46195 4/01, provides client notification that an ACK or NAK response is required by the client without additional testing of data received. This notification will be sent to the Client in the CSM and RSM.
- ▶ Output message structure change, available via APAR PQ48182 5/01, to include the full message length preceding the output message to the client, reducing the design and coding effort of a client application.
- ▶ In web computing the system must match capacity to business requirements on an as-needed basis and provide an easy growth path, minimize downtime and provide quick return on investment. These are available with IMS and IMS Connect along with the OS/390. Recent enhancements have included improvements to the processing of requests, yielding overall increases in throughput. Performance improvements, higher

IMS DataPropagator for Broader Application Integration



- **Decision Support - Data Warehouse**
 - ▶ Selectively Propagate data
 - ▶ Exploit relational query tools
- **Application co-existence**
 - ▶ Multiple Applications
 - ▶ Synchronized Data
- **IMS DPROP V3 enhancements**
 - ▶ Simplified Operations
 - ▶ Simplified Administration
 - ▶ Asynchronous near real-time propagation improves performance

No Change to Existing Applications

IMS has also been providing Business Intelligence solutions with data replication/propagation tools, such as the IMS DataPropagator.

The IMS DataPropagator provides synchronous and asynchronous updates passed between IMS DB and DB2 databases to enable consistency and use in a mixed database environment. The IMS Data Propagator can provide IMS customers with advanced data integration and analysis capabilities, while leveraging their existing IMS data assets.

IMS DPROP

- ▶ Propagates updates from IMS to DB2, DB2 to IMS, and both
 - ▶ Two modes of operation are Asynchronous (user controlled) and Synchronous (automated)
 - ▶ Allows users to subset operational data for informational use, create consistent copies, and maintain historical data
 - ▶ Can use a local/reomote DB2 target with asynchronous propagation of updates to a remote DB2 target copy.
 - ▶ Interfaces to Data Refereshier for initial synchronization of source and taget, and source/target mapping used both for intital load and for propagating changes
 - ▶ Provides data staging where IMS updates propagated to DB2 DPROP staging table and applied to DB2 and DataJoiner targets.
- IMS Data Propagator V2 has been enhanced to run with IMS V7. And the new DPROP V3 adds near real time asynchronous update capability through MQSeries support. Additional requirements could also address an improved user interface, and support for additional environments.

IMS Tools Portfolio

Database Administration

- ▶ **IMS High Performance Unload 5655-E06**
- ▶ **IMS High Performance Load 5655-E07**
- ▶ **IMS High Performance Prefix Resolution V2 5655-E08**
- ▶ **IMS Index Builder V2.2 5655-E24**
- ▶ **IMS Parallel Reorganization V2 5655-F74**
- ▶ **IMS High Performance Pointer Checker 5655-E09**
- ▶ **IMS Data Base Repair Facility 5655-E03**
- ▶ **IMS High Performance Sysgen Tool 5655-F43**
- ▶ **IMS Command Control Facility 5655-F40**
- ▶ **IMS ETO Support 5655-E12**
- ▶ **IMS Library Management Utilities 5655-E04**
- ▶ **IMS Advanced ACBGEN 5655-E05**
- ▶ **IMS Sequential Randomizer Generator 5655-E11**
- ▶ **IMS Compression - Extended 5655-E02**
- ▶ **IMS Data Base Control Suite 5655-F76**
- ▶ **IMS Fast Path Basic Tools 5655-E30**
 - DEDB Unload/Reload
 - DEDB Pointer Checker
 - DEDB Tuning Aid
- ▶ **IMS Fast Path Online Tools V2 5655-F78**
 - Online Pointer Checker
 - Online Data Extract
 - Online Area Extend
- ▶ **IMS HALDB Conversion Aid 5655-I01**

Performance Management

- ▶ **IMS Performance Analyzer 5655-E15**
- ▶ **IMS Network Compression Facility 5655-E41**
- ▶ **IMS Queue Control Facility V1.2 5697-E99**
- ▶ **IMS Dynamic Resource Control Facility 5697-D14**
- ▶ **IMS Workload Router 5697-B87**

Recovery / Duplication

- ▶ **IMS Image Copy Extensions 5655-E10**
- ▶ **IMS DEDB Fast Recovery 5655-E32**
- ▶ **IMS Recovery Saver 5655-E16**
- ▶ **DB2 Recovery Manager 5697-F56**
- ▶ **Online Recovery Service 5655-E50**
- ▶ **IMS Data Propagation 5655-E52**
- ▶ **IMS High Performance Change Accumulation 5655-F59**

Application Management

- ▶ **IMS Connect 5655-E51**
- ▶ **IMS Message Format Services Reversal Utilities 5655-F45**
- ▶ **IMS Program Restart Facility 5655-E14**
- ▶ **Batch Terminal Simulator 5655-A14**

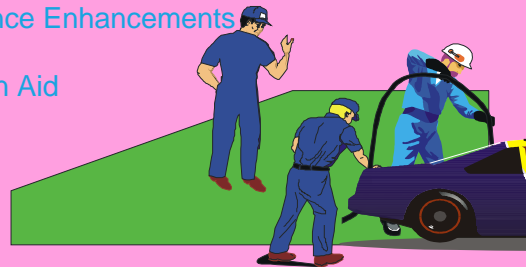


*Manage
Automate
Monitor
Tune...*

- ▶ In addition to IMS, IBM has been providing a wide range of price/performance, competitive Systems Management tools for IMS. This shows a summary of the IBM IMS tools available currently available. The tools provide support for speeding up and reporting on performance, extend the functions of and assist with testing of IMS, and provide system tools for querying, validating, managing, and tuning the IMS Database, These include for example tools necessary to maintain and repair databases Many tools serve multiple purposes. IBM offers tool functionality like IMS 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 tool can be considered the best in the industry.

IMS V7 High Availability Database HALDB for Management and Scalability

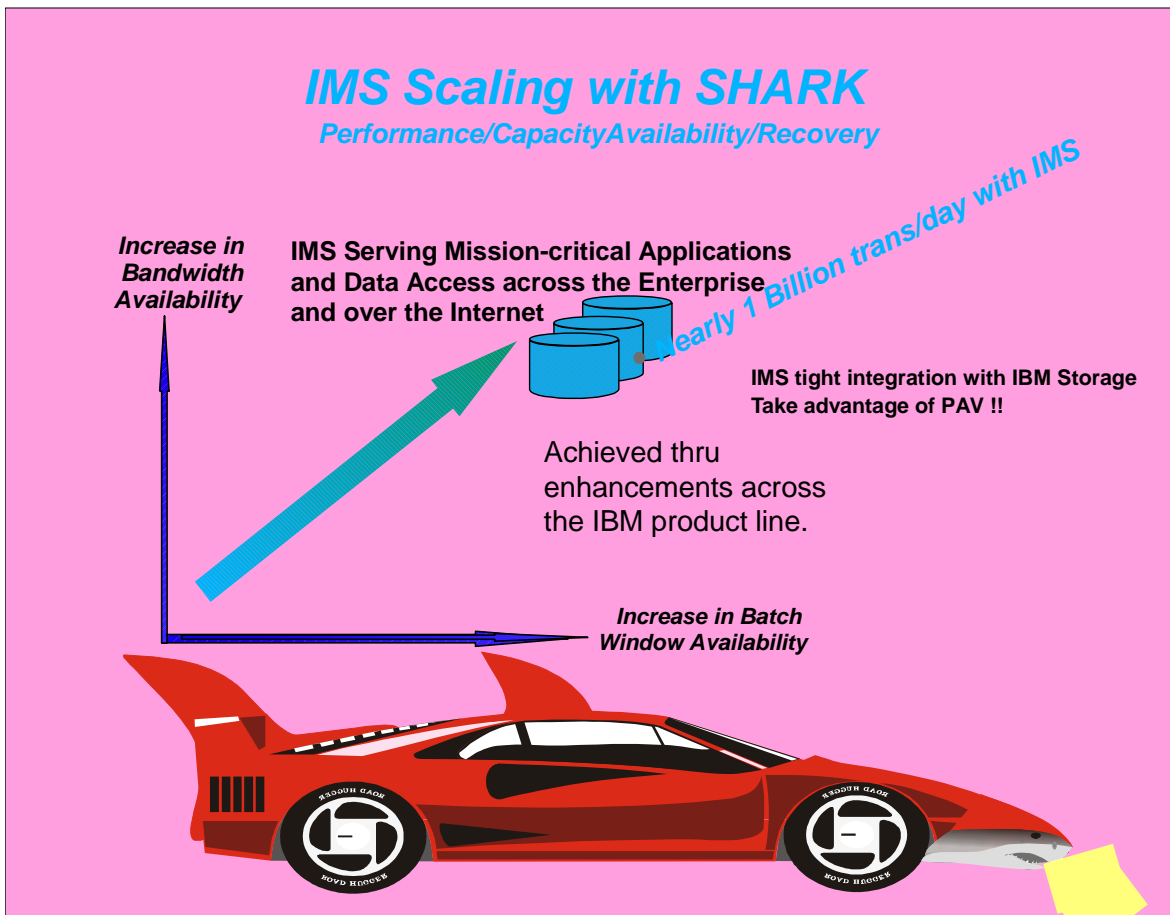
- ✓ Extend IMS Full Function database size to **40+ terabytes**
- ✓ Provides data availability through partition independence
- ✓ Provides easier manageability with smaller partitions of the database
- ✓ **Enhanced since V7 GA**
 - ✓ Management/Performance Enhancements
 - ✓ New HALDB Conversion Aid



- ▶ For increased capacity, IMS initially provided
 - a) 8 gigabyte OSAM support for V5 and followed that with
 - b) the Partition DB support for V3, 4, 5, 6 in 1997 as an interim solution to extend the capacity and availability of the database. This was done via a Neon systems product marketed as the IMS Partition Database Tool, interim to the integrated IMS V7 HALDB support.
- ▶ The Partition DB tool only allows in a database 32 datasets (2560 gigabytes), with partition control around each, and has restrictions on logical relationships and on secondary indexing.
- ▶ This code was provided as a usermod to IMS so customers had the extra work of applying it and supporting it in IMS.
- ▶ "Partitions" in the current IMS/ESA Partition DB tool have no partition independence from the online database; i.e.. the entire database would have to be taken offline to do any work on any partition.
- ▶ To do this right, we needed a fully integrated solution.
- ▶ IMS V7 High Availability Large Data Base Support was thus provided, fully integrated into and making very specific use of the IMS V7 product.
- ▶ HALDB allows for 1001 partitions to a max capacity of 40 gigabyte each. This means you can have over 40 Terabytes OSAM and VSAM databases. That would be 20,000 3390 devices. This works out to 6600 bytes for each person on earth. This compares to V5/6 when we just expanded to allow 8 gigabyte databases
- ▶ This support also allows for a partition to be taken offline, have something done to it and be independently brought back online. This means each partition could be individually unloaded and reloaded and while offline a batch reorg could be done to on it. Or the entire database could be taken offline and each partition could be reorged in parallel, greatly speeding up the offline reorg process.
- ▶ This requires a migration effort, staged over time to the new HALDB partitioned format, but provides a base for any future database growth and availability
- ▶ We have also been providing numerous enhancements since GA to continually improve upon HALDB manageability and performance. And we have also provided a new HALDB Conversion Aid to help you take advantage of HALDB by giving you utilities and aides to analyze, model and convert existing IMS Database structures to a HALDB Format.

IMS Scaling with SHARK

Performance/Capacity/Availability/Recovery

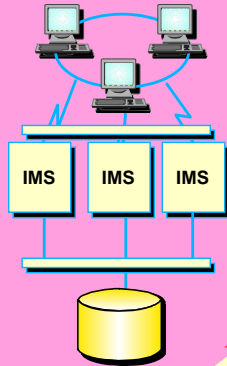


- ▶ IMS solutions also exploit IBM Enterprise Storage subsystem products to optimize performance. Testing with IMS Version 7 and the Enterprise Storage Server (ESS) have demonstrated increases in Online Log Data Set logging Bandwidth and in Batch window availability.
- ▶ Test results indicated a possible 1/3 reduction in utilities and sequential update Batch Message Programs that increase the overall batch window availability.
- ▶ They also indicated an overall improvement of 175% in bandwidth over the IBM RAMAC Virtual Array (RVA) storage subsystem and 500% over the IBM RAMAC2 storage subsystem.
- ▶ We are continuing to identify, develop, and exploit new features and advance functions together with IBM's OS/390, Network, Storage and Enterprise servers to provide continually increasing performance for our customers. And we are publishing the details of these measurements in our Newsletters and on our website.
- ▶ IMS in-house testing has reached over 4000 transactions/sec across TCP/IP to a single IMS on a single machine (G6). And we have reached 11,246 trans/sec (nearly 1 Billion trans/day) with IMS Data/Queued Sharing on a 2-CPC Sysplex.
- ▶ And one large customer indicated they have reached over 3000 days without an outage and another over 2000 days and still going strong.

Announcing IMS Version 8

Ideal for e-business

- ✓ Continuous Availability
- ✓ Systems Management
- ✓ Performance/Capacity
- ✓ Application Development/Connectivity



Enhancements

- Coordinated IMS/DB2 Recovery
- Coordinate Online Change
- Sysplex Terminal Management
- Sysplex-wide Resource Mgmt
- Sysplex-wide Operations with Single Point of Control
- Enhanced DB Recovery Ctrl
- Simplified Installation Process
- Enh Systems/Data Mgmt Tools
- Enhanced Java and XML

Benefits

- ✓ Enable Customer Growth
- ✓ Enhance Workload Balancing
- ✓ Increase Availability; Ease of Use
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Strategic Open Access
S/390 and z/OS
Enterprise Server

- ▶ Key Message: IMS V8 announcing today is enhancing IMS solutions for Integration, Manageability, and Scalability.
- ▶ Today, I am announcing our next version of IMS, Version 8. With IMS V8, IMS is focused on further strengthening its support as the e-business Server of choice. This is in support of IBM's Strategy for helping customers in their e-business enablement and the growth, availability, and systems management that the e-business environment requires. IMS focus thus is on continually improving performance/capacity, availability, systems management/usability, open access, and supporting tools for the e-business environment. The goal is to deliver the next stage of this function.
- ▶ IMS has been providing support as an e-business Server with improvements in data, workload, and network sharing. IMS provided workload management information and support of VTAM's Generic resources to help with the balancing of work across the Sysplex. IMS V8 provides more transparent Sysplex Terminal Management to enhance e-business availability.
- ▶ Systems Management too has been a key area with IMS customers in managing their e-business servers. IMS has focused traditionally on ensuring a single system image. . IMS would provide additional e-business Server management enhancements with Sysplex-wide Resource Management, Sysplex-wide Single Image Operations, Simplified System Definition and Improved Diagnostics.
- ▶ IMS is also providing continued enhancements to eliminate bottlenecks and impediments to growth.
- ▶ Java is a key area for new application development. IMS Java support and the IMS

IMS V8 - QPP Began 03/01/2002

- **Information "Integration" with New Application Development/Connectivity**
 - ✓ Support of Persistent Reuseable JVM for improved tooling
 - ✓ Support for latest JAVA and SQL Standards
 - ✓ Integration with Websphere
 - ✓ Enhanced XML Support of Messages
- **Manageability**
 - ✓ **Management View across Sysplex**
 - Single Point Of Control (SPOC)
 - DB2 Control Center Integration
 - ✓ **Enhanced Recovery**
 - ✓ **Sysplex Terminal Options**
- **Scalability in Performance/Capacity/Availability/Recovery**
 - ✓ **Increasing FastPath Area from 240 to 2048**
 - ✓ **Handling unpredictable volumes**
 - ✓ **Continuous up time for applications and user access**



- IMS meets extreme IT needs for e-transaction processing with the ultimate in performance/capacity, availability and systems management and technological leadership in connectivity and new application development.
- IMS along with the S/390 and the new zSeries have been delivering on the promise of e-business and continue to do so with new enhancements for e-transaction processing bandwidths capable of supporting the largest web sites and transaction rates through GB ethernet. Fiber connection technology and industry leading webserving with IMS and the IBM WebSphere Application Server, Security and Communications Servers. A balanced system is provided for world class solutions. IMS together with the S/390 and zSeries are delivering more comprehensive security protection, featuring centralized management and a strong suite of end-to-end products. We continue to provide and enhance our leading edge end-to-end transaction integrity and real time data currency with the sharing of data, networks, and messages, utilizing the sysplex and its coupling facility. Our technology transition from bipolar to CMOS has allowed us to deliver exponentially improving price/performance to our customers. Customers are using this power to take on new e-business related applications.

XML and IMS for Transparent Application Integration

■ Processing XML Documents in New IMS Applications Today

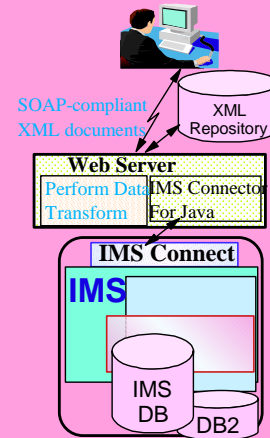
- Customers can write IMS C++ or IMS Java applications using the XML Toolkit for OS/390
- Customers can write IMS Cobol or PL/I application using XML support for COBOL and PL/I
 - Tran code still must be EBCDIC, rest of data can be XML
 - The IMS program can invoke XML parser to convert to non-tagged data

■ Bridging XML and Existing IMS Applications Today

- Using MQSeries Integrator
 - Dictionary support for messages
 - Routing and processing based on message content
 - US Utility built cost-effective e-business infrastructure to IMS
- Customers can enable existing IMS applications as Web Services via WAS

■ XML and IMS Requirements

- Generate XML doc for outputs from new COBOL and PL/I applications
- Enable MFS-based IMS application programs as web services
- Transform XML for existing IMS applications using IMS Connect
- Using XML as an IMS Data Definition language



And IMS Tools are also taking advantage of XML which is critical for future transparent application integration.

Today, IMS documents can be processed in new IMS Java and C++ Applications, through use of the XML Parser, and/or access existing IMS applications using MQSeries.

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 and C applications as Web Services by connecting SOAP and EJBs to IMS.

Future requirements also offer enhanced support for industry tooling, additional languages, transformation, and the use of XML as an IMS Data Definition language.

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

You would be able to web enable your MFS applications using XML.

You would also be able to transform your MFS based IMS applications into web services.

XML transformation processing could eventually be contained within IMS Connect.

IBM's IMS E-Commerce Connectors Team at the Silicon Valley Laboratory developed the Common Application Metamodel (CAM). CAM is an IBM open standard initiative for Enterprise Application Integration (EAI). It was submitted as a proposal to the Object Management Group (OMG). OMG is the world's largest software consortium with a membership of over 800 vendors, developers, and end users. See <http://www.omg.org>.

A good description of CAM is part of a draft document, with diagrams and illustrations, at the web site for the Instituto Tecnológico de Informatica in Spain. Sections 6 (page 13) and 9 (page 79) are of special interest to those who have labored in the Open Transaction Management Access (OTMA) vineyards.

See <http://www.iti.upv.es/iti/i+d/mirrors/ftp.omg.org/pub/docs/ad/00-08-12.pdf>.

CAM defines and publishes a metadata exchange standard for information about accessing enterprise applications such as CICS and IMS. Anyone who has written COBOL COPYBOOK to XML translators or who has tried to make IMS message contents discernable to Java code, as have I, knows there has just got to be a better way. CAM is that better way!

Because CAM provides physical representation of data types and storage mapping to support data transformation in an EAI environment, it enables Web services for enterprise applications.

IBM has indicated CAM in their statement of direction for IMS. I would expect third party software developers to also adopt CAM,

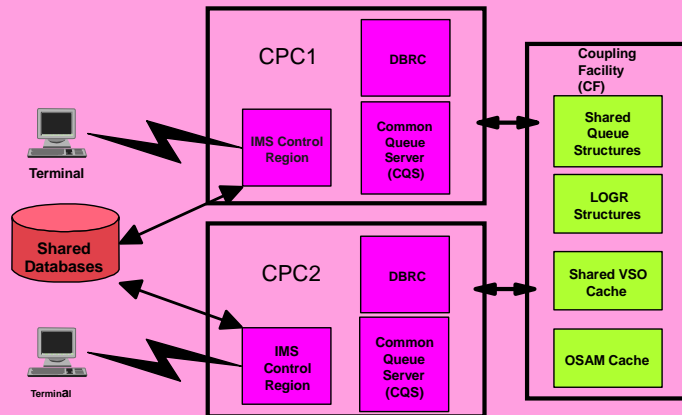
IMS V8 - QPP Began 03/01/2002

- **Information Integration with New Application Development/Connectivity**
 - ✓ Support of Persistent Reuseable JVM for improved tooling
 - ✓ Support for latest JAVA and SQL Standards
 - ✓ Integration with Websphere
 - ✓ Enhanced XML Support of Messages
- **"Manageability"**
 - ✓ **Management View across Sysplex**
 - Single Point Of Control (SPOC)
 - DB2 Control Center Integration
 - ✓ **Enhanced Recovery**
 - ✓ **Sysplex Terminal Options**
- **Scalability in Performance/Capacity/Availability/Recovery**
 - ✓ **Increasing FastPath Area from 240 to 2048**
 - ✓ **Handling unpredictable volumes**
 - ✓ **Continuous up time for applications and user access**



- IMS meets extreme IT needs for e-transaction processing with the ultimate in performance/capacity, availability and systems management and technological leadership in connectivity and new application development.
- IMS along with the S/390 and the new zSeries have been delivering on the promise of e-business and continue to do so with new enhancements for e-transaction processing bandwidths capable of supporting the largest web sites and transaction rates through GB ethernet. Fiber connection technology and industry leading webserving with IMS and the IBM WebSphere Application Server, Security and Communications Servers. A balanced system is provided for world class solutions. IMS together with the S/390 and zSeries are delivering more comprehensive security protection, featuring centralized management and a strong suite of end-to-end products. We continue to provide and enhance our leading edge end-to-end transaction integrity and real time data currency with the sharing of data, networks, and messages, utilizing the sysplex and its coupling facility. Our technology transition from bipolar to CMOS has allowed us to deliver exponentially improving price/performance to our customers. Customers are using this power to take on new e-business related applications.

IMS Sysplex Requirements



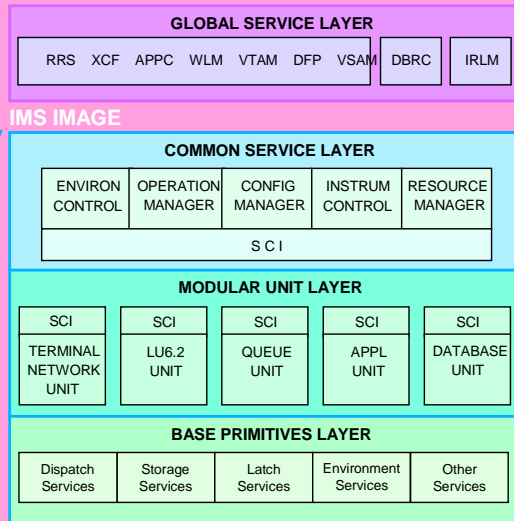
SYSTEMS MANAGEMENT REQUIREMENTS

- PRESENT A SINGLE SYSTEM IMAGE AND PROVIDE EASE OF USE THROUGH A SINGLE POINT OF CONTROL ACROSS THE SYSPLEX
- USERS NEED TO BE ABLE TO RESUME STATUS ON ANOTHER IMS IN IMSPLEX
- COORDINATE/MANAGE ONLINE CHANGE ACROSS THE IMSPLEX

Strategic IMS Architecture

■ **Goals:**

- Restructure IMS components into independent units
- Provide scalability by allowing multiples of units (mix and match different multiples of DB/TM mgrs)
- Fully exploit parallel sysplex environment



(BPE in V5, CQS in V6, ... and SCI ties it all together)

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IMS Directions

Continuous Improvement

IBM delivers at web speed...



IMS Goals

- Unlimited Growth
- 100% Accessible
- 100% Available
- GEN-Less System
- Dynamic Install
- Latest Technology

IMS V8 Enhancements

- Extend DB Connectivity
- Enhance Sysplex Operations
- Enhance Availability/Recovery
- Increase Capacity
- Simplify Install Process
- Enhance Management Tools

IMS Today

- High Availability Large DB
- Rapid Restart
- Enhanced DB Recovery
- Enhanced Connectivity
- IMS Java Applications

DB Transparent for Application Development

- Standardized Database calls
- Programming language flexibility

Easy management across the Sysplex

- coordinated change and expanded control
- integration with DB2 controls

- ▶ Key Message: IMS is fully supported in IBM to provide technological leadership with continuous improvement on a more rapid delivery schedule.
- ▶ IMS has provided and will continue to roll out solutions to reaching its goals and addressing our customers needs for e-transaction processing.
- ▶ To supplement the value in IMS V7, we are announcing today even more new function with IMS Version 8. Our focus with Version 8 is in providing Sysplex Operations Management and in simplifying the install process. We are also providing enhancements for Database Connectivity, availability, recovery, and capacity.
- ▶ Our IMS Strategy is in providing Continuous Improvements. The IMS goals are to provide our customers with
 - ▶ -- 100% accessibility
 - ▶ -- Unlimited Growth
 - ▶ -- 100% availability
 - ▶ -- a Gen-less system
 - ▶ -- Dynamic Installability, and
 - ▶ -- The latest in Technology