IMS Version 9

Highlights

IBM® Information Management System (IMS™) is unsurpassed in availability and speed for database and transaction processing. With the demands of the evolving on demand business environment and a marketplace that works in Web time, IMS continues to deliver the integrity, capability, and performance that customers have come to expect from IBM.

IBM is focused on strengthening IMS leadership, helping you in on demand business enablement, growth, availability, and systems management that newer environments and cost measures require. With IMS Version 9, IBM is enhancing the IMS Database Manager (IMS DB) and the IMS Transaction Manager (IMS TM), to help you:

- Transform the way you do business with integrated information
- Build on demand business applications that can tolerate the rigors of doing business on the Internet
- Run a scalable, available, safe, and easily-manageable environment
- Leverage your business experiences to help you make more informed decisions

IMS Version 9 is evolving for on demand business by providing product integration openness with tools for application development and connectivity. IMS Version 9 offers manageability with autonomic computing to ease use, eliminate or reduce outages, and minimize the education curve for users. IMS scalability enhancements provide flexibility for growth and expansion. In IMS Version 9, new hardware and software facilities, combined with many data and application sources, optimize IMS performance, capacity, availability, and recovery.

IMS Version 9 can be used with all IBM processors that are capable of running IBM z/OS® Version 1 Release 4 (5694-A01), or later.

IBM also provides a robust portfolio of tools and utilities to help you manage IMS efficiently and gain the best possible performance. To learn more about IBM's IMS products and tools, visit the Web site at www.ibm.com/ims.

IMS DB Version 9 offers:

Integration/Openness

- Broadened access with Java and XML enhancements and storage of XML data in IMS databases
- Integrated IMS Connect function

Manageability

- Expanded, autonomic, user-friendly commands and interfaces that are accessible across environments
- Eased installation and system generation, as well as enhanced security and serviceability

Scalability

- Improved availability and recovery, with fully-integrated online reorganization for High Availability Large Databases (HALDBs), which provide concurrent online update and availability of data
- Improved performance and capacity for Virtual Storage Constraint Relief (VSCR), Database Recovery Control (DBRC), and Fast Path.

IMS TM Version 9 offers:

Integration/Openness

- Integrated IMS Connect function
- Broadened application development and execution with XML and Java enhancements

Manageability

- Extended autonomic network switchover capability
- Eased installation and system generation, as well as enhanced security and serviceability

Scalability

- Improved system availability, performance, and capacity for VSCR, DBRC and Fast Path message handling

IMS Version 9 Database Manager Enhancements

Integration and Open Access with New Application Development and Connectivity

XML Storage in IMS Databases

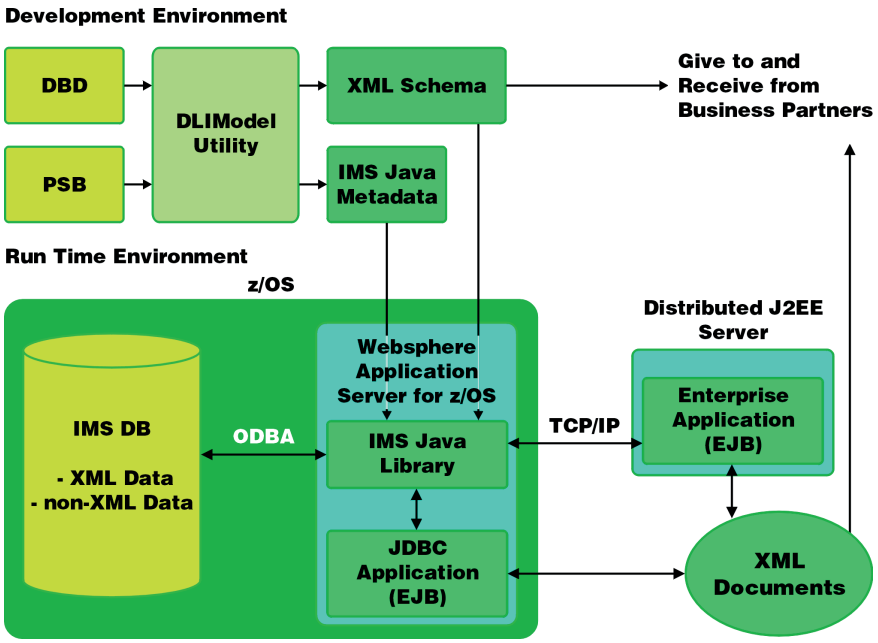
XML enablement provides support for storage and retrieval of XML documents into and from IMS databases. XML enablement extends the IMS Java JDBC interface to allow the composition of XML documents from pre-existing non-XML IMS data. Additionally, IMS can store XML documents into IMS either wholly intact or decompose them into standard IMS segments and fields that can be used by existing or new non-XML enabled applications.

Tooling for XML Storage

The DLIModel utility enhancement generates XML schemas from database definitions (DBDs) and program specification blocks (PSBs). The DLIModel utility supports XML storage and retrieval at run time. This enhancement automates schema generation to accelerate IMS application development.

Distributed Database Access

The IMS distributed JDBC resource adapter enables IMS DB access from WebSphere Application Server for z/OS distributed platforms. This includes all XML DB support.



Additional Enhancements

- Symbolic checkpoint/restart support from JBP applications
- SQL enhancements for new SQL keywords and aggregate functions
- Access to DB2® UDB for z/OS data from JBP and JMP dependent regions is provided using the DB2 Recoverable Resource Manager Services attachment facility (RRSAF)
- DLIModel utility graphical user interface (GUI) provides a graphical version of the DLIModel utility built as an Eclipse plug-in
- GSAM database support from Java applications
- The IMS JDBC driver provides the ability to use non-searchable fields in an SQL WHERE clause if those fields are a subset of a searchable field
- JDK 1.4 support
- The installation verification programs (IVPs) for IMS Java are easier to run and provide more troubleshooting information
- Integrated IMS Connect function for distributed operations allows access to new and existing IMS applications and supports communication between one or more TCP/IP clients, as well as one or more IMS systems.

IMS Version 9 Database Manager Enhancements

Scalability in High Performance, Capacity, Availability, and Recovery

HALDB Online Reorganization Enablement

Integrated HALDB Online Reorganization (OLR) is designed to address customer requirements for enhanced IMS data availability. OLR provides online reorganization by partition with concurrent online update and availability during reorganization. OLR is designed to be totally non-disruptive – there is no outage. You can adjust the pace of OLR to further minimize online impact. Multiple partitions can be reorganized in parallel. Coordination is provided through IMS Database Recovery Control (DBRC).

HALDB Enhancements

- HALDB eases partition initialization without requiring DBRC commands and provides flexibility for running a single program in different environments by allowing a batch program that references a HALDB to run without DBRC
- HALDB Processing Control Statement enhancement allows applications to specify up to 20 DB PCBs to perform single partition processing in a HALDB
- HALDB Partition Selection Exit DSECT enhancement makes HALDB with a user-written partition selection exit easier to use since customers may use the DFSPSEIB macro instead of creating their own DSECT
- HALDB Partition Selection Exit Customization enhancement enables variable partition selection exits based on the application running and by IMS, thereby enhancing usability

Database Recovery Control (DBRC) Enhancements

The new DBRC Application Programming Interface (API) enables customer-written application programs to obtain services from DBRC. The application obtains these services by issuing DBRC API requests; DBRC returns results to an area in storage where the application can retrieve them.

Command authorization support, initially provided in IMS Version 8 for DBRC batch commands, is now also provided in IMS Version 9 for the online DBRC/RM commands.

DBRC modules have been moved above the 16 MB line for enhanced capacity.

DBRC can reassign and reuse currently unused database management block (DMB) numbers to reduce the potential for outages.

Fast Path Enhancements

Enhancements provide improved performance of Fast Path data entry database (DEDB) area open/close processing. Increased parallelism is obtained by exploiting multiple task control blocks (TCBs) to process multiple area open/close requests simultaneously. This can provide a performance advantage when many areas are opened. Additional usability enhancements improve the handling of DEDB area open/close processing during IMS emergency restarts and other system error recovery scenarios.

Fast Path Shared Virtual Storage Option (SVSO) multi-area structure support provides for housing multiple DEDB areas in a single coupling facility structure. Instead of having one coupling facility structure per area, multiple areas can reside in a single coupling facility structure. This reduces the total number of coupling facility structures that must be defined in a system.

A number of additional enhancements increase the serviceability and usability of Fast Path. These enhancements include, among other items, additional log record information for sequential dependent (SDEP) segments that can be exploited by the IMS Performance Analyzer.

Database Utilities and Other Scalability Enhancements

Support for tape block size greater than 32 KB provides a performance advantage in the image copy and recovery utilities.

Enhanced recoverability of external-subsystem indoubt units of work enables you to resolve indoubt units of work before IMS restart.

IMS dynamic allocation of Virtual Storage Constraint Relief (VSCR) ensures that generated Data Set Association Blocks (DSABs) are allocated above the 16 MB line. For example, a customer with 20,000 full-function or Fast Path data sets that are dynamically allocated could have more than a megabyte of storage allocated above the 16 MB line.

Logger enhancements improve the availability of online log data sets (OLDSs) for restart and the integrity of log data that is obtained for write-ahead data sets (WADSs).

IMS Version 9 Transaction Manager Enhancements

Integration and Open Access with New Application Development and Connectivity

Integrated IMS Connect Function

Integrated IMS Connect function provides advanced security and transactional integrity in TCP/IP and local/390 access to IMS applications, operations, and the internet.

OTMA and APPC Enhancements

Open Transaction Manager Access (OTMA) and Advanced Program-to-Program Communications (APPC) security and serviceability enhancements provide the following performance advantages:

- OTMA clients can now set the ACEE security aging value for user IDs in the OTMA message prefix without requiring the client to reconnect to OTMA
- The OTMA trace table entries for the OTMA user exit routines (DFSYIOE0, DFSYPRX0, and DFSYDRU0) are standardized so that you can view the return code set by the exit routines. The DFSYPRX0 user exit routine for OTMA can set the OTMA destination TPIPE name
- The Z2 field of IMS application data can now be set or changed for OTMA translation input and output
- IMS Connect and IMS Connector for Java applications now have the ability to inform OTMA to purge Commit Mode 0 (CM0) IOPCB Output when IMS Connect is disconnected from MVS Cross-Coupling Facility group
- The /DISPLAY TMEMBER TPIPE command enhancement shows the wait status for an expected Acknowledgement or Negative Acknowledgement
- IMS response time reduction for MQSeries CM0 non-persistent output messages
- The /EXIT enhancement allows for termination of APPC/OTMA IMS Conversational transactions
- Extended command support allows /EXIT to be entered from an APPC/OTMA device/subsystem to end an IMS conversation
- Ability to allow a second timeout for APPC
- Used with WebSphere® tooling and the IMS Connector for Java, it can ease the development of On Demand business solutions. It allows the use of web applications for generating dynamic web content thereby improving marketing effectiveness.

Additional Enhancements

Enhancements to support RACF® (or an equivalent product) replace Security Maintenance utility (SMU) security. IMS now consolidates implementation of all security under RACF. SMU security is available in IMS Version 9 to enable migration to RACF.

The allowable number of named classes of transactions is increased from 255 to 999 to enhance usability and customization of the system.

The VTAM® Multi-Node Persistent Sessions (MNPS) enhancement provides a replacement for USERVAR for IMS Extended Recovery Facility (XRF). IMS XRF provides hot standby capacity for IMS, but is no longer dependent on the 3745 hardware controllers.

An added option allows a type 3 logical unit device to log on as an Extended Terminal Option (ETO) type 1 secondary logical unit (SLU1) or 3270P device, making IMS available for these devices.

Scalability in High Performance, Capacity, Availability, and Recovery

Fast Path Enhancements

The Fast Path optional expedited message handler queue (EMHQ) structure eases manageability, enabling you to bypass allocating an EMHQ structure and its associated data sets when the shared EMH is not being used.

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Manageability Ease Towards Autonomic Computing

With IMS Version 9, IMS systems manageability continues to evolve. New enhancements for IMS TM and IMS DB enable you to manage operations more effectively, while reducing system generation time and effort.

Operations Management Enhancements

The Enhanced Command Environment simplifies the Common Service Layer (CSL), enabling you to use IMS enhanced format commands and the IMS single point of control (SPOC) without requiring the Resource Manager.

Sysplex-wide database commands expand operations management single point of control to include database commands. In IMS Version 8, an Operations Manager (OM) Application Programming Interface (API) was provided to enable you to issue IMS commands from the OM. In IMS Version 9, commands for database and area resources are added to provide you with the ability to better manage the IMS sysplex and to provide a single-system image.

Command recognition character registration eases operations management by providing unique subsystem registration so that an operator can enter a command from any system in a sysplex and have it routed to the correct subsystem. With unique subsystem registration, the operating system can detect collisions between subsystems, and can inform operators or system programmers which prefixes are currently in use.

A new Write-To-Operator (WTO) message replaces the WTO-Reply (WTOR) message for Fast Database Recovery (FDBR). The new message notifies the operator when FDBR is started before the active IMS, without having to wait for a reply. FDBR waits for the active IMS to start up. This eases operations usability in this environment.

Enhancements to the Online Change Copy utility support the IEBCOPY utility dataset parameters WORK, SIZE, and LIST. The Online Change Copy utility passes the values for these parameters to the IEBCOPY utility. These enhancements reduce outages because they enable you to override default values.

Serviceability Enhancements

- The new /DIAGNOSE command eases IMS serviceability.
- Knowledge Based Log Analysis (KBLA) eases IMS serviceability by providing a set of programs that extract and analyze information from IMS log and trace records; an interface to the selection and management of IMS log data sets for analysis; a set of panels that provide an interface to the KBLA programs and to other pre-existing IMS log analysis utilities

System Generation Time and Effort Enhancements

System generation enhancements stage the removal of conditional binds currently done by system generation. This removes the restriction of requiring separate execution libraries for IMS environments. These enhancements eliminate the conditional bind of composite modules, thus eliminating a step and reducing the impact of the system generation process.

Online change module enhancements remove most online change modules from the nucleus bind step and place them in their own load module. The value to the customer is saving space below the 16 MB line private storage. This is another step toward limiting the impact of IMS system generation, easing the process for defining IMS resources.

Extended Terminal Option (ETO) feature checking has been moved to the initialization phase, eliminating the need for an IMS system generation to add this feature.

DBRC Type 4 SVC module enhancements enable you to apply maintenance to the module without having to restart IBM z/OS.

Dynamic add of resource cleanup module enhances availability and serviceability.

Enhancements to the Syntax Checker, which provides detailed assistance with the tailoring of IMS, include support for the definition and maintenance of additional IMS PROCLIB members, and the addition of usability features.

Installation verification program (IVP) enhancements provide new sample applications that support the Common Queue Server (CQS) and the Enhanced Command Environment. A number of usability improvements are provided, including the ability to import IVP variables from previous versions of IMS. Also, the IMS Java IVPs are now easier to use and provide troubleshooting information.

IMS Scales to Ultra-High Performance under Stress

IBM Leads the Industry in the 21st Century for e-business and All of Your Business Needs

Industries worldwide rely on IMS to run their businesses. IMS is a part of everyday life. Chances are you use 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 a corporate database, run a government agency, conduct international business or banking, and many more tasks.

- More than 95% of the Fortune 1000 companies use IMS.
- IMS serves 200 million end users, managing over 15 million gigabytes of production data.
- IMS processes over 50 billion transactions every day.

IMS still owns the high-volume online transaction and database management environment. IMS customers have been driving their own growth with IMS.

IMS customers report:

- More than 100 million transactions were handled by one customer in a single day on a single sysplex system.
- 7 million transactions per hour and 120 million transactions per day were handled by another customer.
- One large customer has reached over 3000 days without an outage and is still going strong.
- Another large customer has transferred more than $2.5 trillion through IMS in a single day.

IMS, IBM's premier hierarchical transaction and database management system, is the product of choice for critical online operational applications and data where support for high availability, performance, capacity, integrity, and low cost are key factors. Today, IMS manages the world's mission-critical data and has been at the forefront of the swing back to mainframe usage.

IMS Runs Over 21,000 Transactions per Second on a Sysplex (Nearly Two Billion Transactions per Day)

IBM's performance group has been achieving extremely high transaction rates with IMS Version 9 running in a high stress sysplex environment using four IMSs on a single IBM eServer™ zSeries® 990 model B16 processor. IMS demonstrated 21,396 transactions per second at 99.65% CPU usage and a DASD rate of 27,448 I/Os per second with all database updates using the IMS Fast Path Shared expedited message handler queue capability, 4-way data sharing, Shared Virtual Storage Option areas, and new IMS Version 9 capabilities.

Using the new processor and the IBM TotalStorage® Enterprise Storage Server® model 800, IMS was able to reach 28.5 MB per second logging bandwidth. This shows that IMS scales up to large logging requirements for high stress IMS activity, such as Multiple Systems Coupling, and shared queues.

These performance tests demonstrate that nothing can match the performance of IMS and the IBM zSeries in transaction and database access, making IMS the industry leader for On Demand Business and all of your business needs.

For More Information

For more information about IMS, including education schedules and consulting options, contact your IBM authorized software reseller or IBM marketing representative.

Learn more about IMS on the World Wide Web. Visit the IMS home page at www.ibm.com/ims.

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