



Licensed Program Specifications

IBM Information Management Software Licensed Program Specifications Release: Version 12 Product Number 5635-A03

Information Management System (IMS[™]) Version 12 is a licensed program that operates under the IBM[®] z/OS[®] operating system. IMS includes an enterprise database server that provides hierarchical database management services and a strategic enterprise transaction server that provides data communications and transaction management services.

The IMS Version 12 Database Manager (IMS DB) provides database management for transaction managers such as IMS Version 12 Transaction Manager and Customer Information Control System (CICS[®]). The IMS Version 12 Database Manager processes concurrent database calls for a wide variety of applications.

Application programs access IMS databases through IMS DB by using the IMS Universal drivers or Data Language/I (DL/I).

The IMS Version 12 Transaction Manager (IMS TM) provides a database-independent, transaction processing environment for database managers such as IMS Version 12 Database Manager and DB2[®] for z/OS.

The IMS Version 12 Transaction Manager:

- Manages an IMS TM terminal network.
- Stores and shares IMS message queues among multiple IMS TM systems, and routes messages between terminals and applications.
- Provides connectivity to other IMS TM subsystems and non-IMS TM subsystems.
- Provides connectivity and web solutions by working with the IBM WebSphere[®] family of products.
- Schedules application programs to access IMS DB databases and DB2 for z/OS databases, and non-database files through the Generalized Sequential Access Method (GSAM).
- Provides system control facilities for system definition, restart, recovery, performance, and tuning.

- Runs continuously through the year, with no required shutdown for daylight saving time.

The IMS Version 12 Database Manager:

- Allows access to the data for multiple users from a single instance of the data.
- Controls concurrent access to the data to maintain integrity for all updates.
- Maintains only one instance of data while providing concurrent access to the data.
- Manages the physical location of the data. Application programs that access and manipulate the data do not need to know where the data resides.

Highlights of new functions

The following sections describe the new major functions of IMS Version 12.

IMS system (IMS Database Manager and IMS Transaction Manager) enhancements

This section describes the major enhancements for the overall IMS Version 12 system, including both the Database Manager (IMS DB) and the Transaction Manager (IMS TM).

Control area reclaim enhancement

When IMS Version 12 is run on z/OS Version 1 Release 12, as empty control areas (groups of VSAM control intervals) become available, they are automatically reused without needing to be reorganized.

CQS trace

Two new trace event tables are automatically generated by IMS to contain structure event trace entries and structure overflow trace entries. These new tables retain critical trace entries for a longer time than in previous versions of IMS.

The existing CQS structure trace table (STR) now contains only client activity trace entries.

/DIAGNOSE SNAP command

The /DIAGNOSE SNAP command is enhanced in IMS Version 12 to improve the diagnostic information and to streamline the problem determination process.

Dynamic resource definition (DRD)

DRD is enhanced for IMS Version 12 in the following areas: the IMPORT command has a new UPDATE option, the Manage Resources ISPF panels are enhanced, and DRD can use the IMS resource definition (IMSRSC) repository as an alternative to an RDDS.

Extended Address Volume (EAV)

z/OS Version 1 Release 12 supports non-VSAM data sets residing in the extended addressing space (EAS). IMS Version 12 takes advantage of that enhancement and provides support for OSAM data sets to be allocated in the EAS of an EAV.

The following types of data sets can be allocated in the EAS of an EAV:

- BPE external trace data sets
- OSAM database data sets
- Online log data sets (OLDSs)
- Write ahead data sets (WADSs)
- Restart data sets (RDSs)
- Message queue blocks data sets
- Long and short message data sets
- Spool data sets

Non-VSAM EAV support requires:

- z/OS Version 1 Release 12 or later
- IBM System Storage® DS8000® devices or DS8700 devices configured as 3390 Model A devices

Fast Path 64-bit buffer manager

The Fast Path 64-bit buffer manager is enhanced to:

- Provide information in the output of the QUERY POOL TYPE(FPBP64) SHOW(ALL) command that indicates which subpools or extents are being quiesced in preparation to delete the subpool or extent, and also displays EPVT storage usage
- Provide a subset of the output of the QUERY POOL TYPE(FPBP64) SHOW(ALL) command by using the new SHOW(STATISTICS) keyword

- Perform compression, expansion, and resizing of buffer subpools
- Improve performance by removing internal code paths that supported earlier operating systems

IMS Connect enhancements

In IMS Version 12, IMS Connect is enhanced as follows:

- IMS Connect can be controlled by using type-2 commands instead of WTOR commands or IMS Connect z/OS MODIFY commands.
- IMS-to-IMS TCP/IP communications is available for Multiple Systems Coupling (MSC) and Open Transaction Manager Access (OTMA), without needing a third-party application to relay the TCP/IP messages between two instances of IMS.
- Several small enhancements improve usability, performance, and diagnostics.

IMS Dump Formatter enhancements

The IMS Dump Formatter ISPF panels are enhanced to support the Repository Server (RS) address space, RS clients, and OTMA Callable Interface clients.

IMS logger enhancements

Several enhancements improve the overall performance of IMS logging and free ECSA for other uses.

In IMS Version 12, IMS logging is improved in the following ways:

- The IMS support for log data sets is enhanced to:
 - Use DFSMS striping to increase logging bandwidth. The OLDS and SLDS can use extended-format data sets that can optionally be striped. Use parameters on the DD statements for the data sets to specify the DFSMS options.
 - Better tolerate DFSMS compression. This enhancement might reduce backout failures.
- The IMS log buffers can be moved into 64-bit virtual storage to free ECSA storage space for other uses. Log buffers are obtained in 64-bit storage when all the following conditions are true:
 - The new BUFSTOR parameter of the DFSVSMxx PROCLIB member specifies BUFSTOR=64.
 - The OLDS block size is a multiple of 4096.

- The OLDSs are on extended format data sets.

To support this enhancement, message DFS3254I is added.

- The Log Filter exit routine (DFSFTFX0) is enhanced for IMS Version 12 to include a new function code that indicates a log buffer send call where the data resides above the 2 GB boundary, and three new fields on the exit routine parameter list.
- The Logger exit routine (DFSFLGX0) is changed for IMS Version 12 to include:
 - A new version of the parameter list and a new field that indicates the version number. The version number for IMS Version 12 is 2.
 - A new field in the parameter list that contains the 64-bit address of the log buffer storage, if 64-bit addressing is being used.

The sample exit routine shipped with IMS is modified to use the updated parameter list.
- The write-ahead data set (WADS) channel program is rewritten and replaced for IMS Version 12.
- IMS logger dump formatting is unchanged. However, this function is moved to the SYS section of the IMS Enhanced Dump Analysis panels within the IMS Dump Formatter.

IMS repository function enhancements

The IMS repository function enables multiple IMS systems in an IMSplex to manage, store, share, and retrieve resource definitions in a centralized manner. This function helps simplify the dynamic resource definition (DRD) function by eliminating the need to manually coordinate individual resource definition data sets (RDDSs) across the IMSplex.

The IMS repository function is an alternative to DRD RDDSs. IMS Version 12 continues to support RDDSs.

The initial type of repository supported is the IMS resource definition (IMSRSC) repository. The CSLRIxxx and DFSDFxxx members of the IMS PROCLIB data set can be used to define the specifications of the IMSRSC repository.

The IMSRSC repository is managed by the IMS Repository Server (RS), a new address space for IMS Version 12. The RS is managed by the Common Service Layer (CSL) Resource Manager (RM). Resource and descriptor definitions can be

added, queried, modified, or deleted from the IMSRSC repository by making requests to RM using type-2 commands.

Installation Verification Program (IVP) enhancements

The IVP is enhanced to demonstrate how to set up and configure the IMS repository function and an IMS resource definition (IMSRSC) repository.

Syntax Checker enhancements

The IMS Version 12 Syntax Checker supports the new and changed IMS PROCLIB members, and delivers other enhancements and changes.

The Syntax Checker is updated for IMS Version 12 in the following ways:

- Support is added for the new IMS PROCLIB member for the Repository Server address space.
- The ability to display and save keywords in custom order-of-input is added.
- The IMS PROCLIB members parameters that were supported in IMS Version 11 are updated to reflect the changes in IMS Version 12.
- IMS Version 9 PROCLIB members cannot be used as input to the IMS Version 12 Syntax Checker. IMS Version 10, IMS Version 11, and IMS Version 12 PROCLIB members are supported.

TSO SPOC enhancements

The TSO single point of control (SPOC) application is enhanced in IMS Version 12 to support the use of the IMS repository function and the UPDATE option of the IMPORT DEFN command.

Command enhancements

IMS Version 12 includes enhancements to existing commands, as well as new commands. Most of the enhancements are provided in type-2 commands, to support the IMS strategy of enhancing the capability of single point of control (SPOC) applications that issue type-2 commands through the Operations Manager (OM) API or the REXX SPOC API.

The following commands are new or changed for IMS Version 12:

- CQS trace commands
- DBRC commands
- IMS commands
- IMS Connect commands

- DRD commands

IMS Database Manager enhancements

This section describes additional enhancements for the IMS Version 12 Database Manager (IMS DB).

Database pool storage enhancements

In IMS Version 12, the storage for certain database pools is now obtained in 31-bit virtual storage backed by 64-bit real storage. If you page fix any of these pools and have 64-bit real storage on your processor, you might see a reduction in the use of 31-bit fixed real frames.

DBRC enhancements

The DBRC enhancements for IMS Version 12 improve the usability and consistency of DBRC and the RECON data sets through command enhancements, new user data fields, and other changes.

The DBRC enhancements for IMS Version 12 are:

- LIST command enhancements
When recovery-related information is not required, the output from LIST commands can be reduced by using the new NORCVINF parameter. Also, the output from /RMLIST commands that are issued through the OM API is no longer limited to 32 KB.
The output from the LIST.HISTORY and LIST.RECON commands is enhanced.
- New user data fields are added in the change accumulation (CA), IMAGE, RECOV, and REORG records in the RECON data set. Also, DBRC commands and API requests are enhanced to support the user data fields.
- Obsolete CA records can be deleted from the RECON data set.
- The number of user keys that can be defined for GENJCL functions is increased from 32 to 64.
- A new %DBTYPE keyword is added to the GENJCL %SELECT control keyword for gathering information about ALLOC records.
- The VOLLIST parameter is now optional for many commands if the RECON status record indicates that these data sets are to be treated as cataloged.
- A retention period for CA groups can be specified.
- A "BPE" indicator is added to the RECON data set if the instance of DBRC is BPE-based.

- The DELETE.LOG command is enhanced to tolerate the absence of a LOGALL record.

New output data has been added to the DBRC API. Therefore, the output block version number is increased to 4.0.

Dynamic full-function database buffer pool enhancements

In IMS Version 12, you can dynamically reconfigure the OSAM subpools and VSAM shared resource pools for full-function databases while IMS is online. You can now add, delete, and update subpools and the database buffers associated with these subpools dynamically by using type-2 commands to tune the pools according to workload, without affecting system availability. In addition, the VSAM buffer pool ID limit is increased from 16 to 255.

Requirement: To support defining more than 16 VSAM pool IDs, z/OS 1.11 APAR OA32318 must be installed.

The QUERY POOL command and the Syntax Checker are also enhanced to support the dynamic buffer function.

Even if new pools are added using type-2 commands, the new pools are displayed in the output of the type-1 /DISPLAY POOL command.

Fast Path enhancements

The Fast Path function in IMS Version 12 is enhanced with support for secondary indexes, as well as usability and performance improvements.

Fast Path secondary index enhancements

IMS Version 12 provides support for Fast Path secondary indexes for DEDB databases. A secondary index database provides an alternate path to access its corresponding primary DEDB database and can be processed as a separate database.

IMS supports only two database structures for Fast Path secondary indexes: hierarchical indexed sequential access method (HISAM) and simple hierarchical indexed sequential access method (SHISAM). Both secondary index databases offer sequential key secondary indexing support for primary DEDB databases.

Fast Path secondary indexes support sparse indexing (suppressing the automatic maintaining of the pointer segment in the index) for BMPs.

Fast Path secondary index support has the following capabilities that are not available with full-function secondary indexes:

User data partitioning

You can spread a Fast Path secondary index across multiple physical databases. Each index database can contain a range of keys. Index keys are assigned to an index database by a user partition selection exit routine. The index databases can be accessed individually or as one logical separate database.

Multiple secondary index segments

You can create multiple index entries from different fields in the same source segment by defining two or more LCHILD/XDFLD statement pairs under the SEGM statement of a target segment. Search fields must be in the same source segment and the search fields must be the same size.

IMS does not provide a utility to build a Fast Path secondary index database for existing DEDBs. You can use a user-written application or a vendor tool to build a Fast Path secondary index database, such as the IBM Fast Path Solution Pack for z/OS.

Fast Path usability and serviceability enhancements

The Fast Path usability and serviceability enhancements address various customer requirements to improve the Fast Path function.

- When no response comes from a failing IMS data-sharing partner during a type-3 notify, message DFS3770W is issued. This message does not supply the name of the IMS that is failing. IMS Version 12 provides new message DFS0066I, which supplies the IMS IDs of the IMS subsystems that successfully returned responses so that the failing IMS data-sharing partner can be identified.
- In IMS Version 11 and earlier, only the updated portion of a DEDB segment is logged. IMS Version 12 provides a new option, FULLSEG, to specify that the full-segment image is logged.
- The EXIT parameter on the DBD and SEGM statements for DEDBs is enhanced so that you can specify whether information about DLET calls or before-image data for REPL calls is logged in X'99' log records.

- The Fast Path 64-bit buffer manager is enhanced to improve usability and performance.

Full-function usability enhancements

The full-function usability enhancements in IMS Version 12 include displaying the status of randomizer and exit routines when a full-function database is started or stopped, better diagnostic information about abends 0080, 3303, and 3310, and logging the user RACF® user ID in data capture log type X'99' for both online transactions and batch jobs.

High Availability Large Database (HALDB) enhancements

In IMS Version 12, HALDB partition names can be reused as non-HALDB database names; a new option releases the ownership of an online reorganization (OLR) process when IMS terminates; the reorganization number in a HALDB partition is never regressed after a time-stamp recovery; and new options can suppress message DFS2500I.

IMS DRA enhancement

The IMS IMS Version 12 DRA thread enhancement provides the option for DRA clients to direct the DRA not to attach dedicated DRA thread task control blocks (TCBs). By not doing so, the overhead of TCB switching is avoided and parallel processing can be improved.

CICS Transaction Server for z/OS Version 4.2 takes advantage of the IMS Version 12 DRA thread enhancement.

IMS Universal drivers enhancements

The IMS Universal drivers are enhanced for IMS Version 12 in the following ways:

- The IMS Universal drivers support two new data types: arrays and structs. This support increases the range of data types that the drivers can manage.
- The IMS Universal drivers add richer support for field redefines.
- The IMS Universal drivers add support for segments maps. A segment map consists of different cases (sets of fields) within a segment where each case is valid only for a unique value of the map control field.
- The IMS Universal drivers add support for variable-length database segments

IMS Transaction Manager enhancements

This section describes additional enhancements for the IMS Version 12 Transaction Manager (IMS TM).

IMS processing that may execute on an IBM System z Integrated Information Processor

Request response processing for authorized Common Queue Server (CQS) clients in IMS Version 12 is executed under enclave service request blocks (SRBs). In IMS Version 12 and later, IMS will request z/OS to process such work on an available System z® Integrated Information Processor (zIIP).

Request response processing is the processing of the return of data from the CQS address space to an authorized CQS client address space in response to a request that the client directed to the CQS. Authorized CQS clients are clients that register to IMS IMS Version 12 CQS while executing in supervisor state and with a system program status word (PSW) key (keys 0 through 7).

Examples of IMS IMS Version 12 operations that involve such authorized CQS clients include:

- When the IMS control region is running with IMS shared message queues or shared IMS Fast Path message queues enabled
- When the IMS Resource Manager (RM) address space is using a resource structure

LU 6.2 Edit exit routine (DFSLUEE0) enhancement

The LU 6.2 Edit exit routine (DFSLUEE0) can discard an asynchronous output message when the message is not deliverable.

MSC TCP/IP enhancement

IMS Version 12 users can define a new type of MSC physical link that uses TCP/IP to connect two IMS systems in an IMS MSC network. MSC uses IMS Connect to manage the TCP/IP connection.

TCP/IP connections can be used as backup connections to existing VTAM® connections, or can be used as the primary connection method for MSC physical links.

OTMA enhancements

The OTMA enhancements reduce system storage, improve security, reduce timeouts for commit

mode 0 (commit-then-send) transactions, and enable message routing to remote instances of IMS.

OTMA ACEE reduction enhancement overview

In IMS Version 12, OTMA is designed to allow one accessor environment element (ACEE) per user ID to be created and cached for OTMA messages, even when the messages come from multiple OTMA clients. The ACEE for each user is independent of OTMA client instances.

OTMA commit mode 0 (commit-then-send) transaction enhancement overview

When an OTMA IMS application does not reply to the IOPCB and does not switch the message to another transaction, IMS issues message DFS2082 for both RESPONSE and NONRESPONSE modes of OTMA send-then-commit (CM1) transactions. In IMS Version 11 and earlier, IMS never issued message DFS2082 for OTMA commit-then-send (CM0) transaction timeouts, regardless of transaction response mode.

In IMS Version 12, IMS can issue a DFS2082 message for CM0 transaction timeouts. To enable this function, set the new optional TMAMHRSP flag in the OTMA state data prefix.

Restriction: DFS2082 messages are issued only for CM0 original input transaction timeouts and are not issued for program-to-program switches. IMS does not issue a DFS2082 message for a switched-to transaction, even when both the switched-to transaction and the original transaction fail to reply.

OTMA message routing to remote IMS enhancement

OTMA is enhanced to support sending ALT-IOPCB output messages to a remote IMS by using a local IMS Connect and a remote IMS Connect. The OTMA destination descriptor or the OTMA destination routing exits (DFSYPX0 and DFSYDRU0) can be used to define the remote IMS and IMS Connect destinations. The IMS super member can also be defined to route the messages to the remote IMS Connect and IMS.

Shared queues enhancements

IMS Version 12 adds support for using z/OS cross-system coupling facility (XCF) for communicating between a front-end IMS and a back-end IMS in a shared-queue group for APPC synchronous conversations or OTMA send-then-commit (CM1) transactions with a synchronization level of NONE or CONFIRM. In

these situations, IMS is the synchronization point manager instead of z/OS Resource Recovery Services (RRS).

This enhancement does not change how IMS processes synchronous transactions with a synchronization level of SYNCPT. RRS is still required for SYNCLVL=SYNCPT.

Highlights of existing IMS functions

The following sections describe the major existing functions of both IMS DB and IMS TM in IMS Version 11.

Abend search and notification

The IMS abend search and notification function enables IMS to send an email or text message to a designated email address to:

- Notify a group of contacts about an abnormal termination (abend)
- Provide additional information about the abend

The IMS abend search and notification function can also be used to research and retrieve links to information about abends, including IMS product documentation, technical notes in an IBM technical support database, and information in the preventive service planning (PSP) database.

ACB library

Users can load the ACB members into 64-bit storage and, separately, create DFSMDA members for the dynamic allocation of the ACBLIB data sets.

Advanced Program-to-Program Communications for IMS (APPC/IMS)

APPC/IMS provides the ability to develop distributed and cooperative (client/server) IMS TM applications to communicate with programmable workstations and other systems by using APPC/MVS and the LU 6.2 protocol. IMS TM allows you to use the Common Programming Interface for Communications (CPI-C) or the IMS DL/I programming interface to communicate with logical unit (LU) 6.2 systems.

IMS TM supports network-qualified names for APPC/IMS environments. IMS MSC supports transactions from APPC/IMS subsystems. You can include IMS MFS message formats with APPC/IMS transactions.

Commands allowed from Logical Unit 6.2 devices and Open Transaction Manager Access

The /LOCK and /UNLOCK commands are supported with the DB, PGM, SYSTEM, and TRAN keywords from LU 6.2 devices and OTMA. The /LOCK and /UNLOCK commands with the LTERM and NODE keywords are not allowed from LU 6.2 devices and OTMA.

APPC local LU

An IMS system can include several Advanced Program-to-Program Communications (APPC) LUs, one of which is defined as the base LU. IMS associates the actual LU (also known as the *local LU*) that the inbound resources use for RACF security validation, whether it is the base LU or another LU.

IMS users can use the same LU for asynchronous outbound response messages. If an asynchronous inbound message comes into IMS from an LU other than the base LU, and the response is sent using the IOPCB (I/O program control block), the same LU that is used for the inbound message is used for the outbound message.

LU 6.2 device descriptor

LU 6.2 device descriptors, which are built during IMS initialization, reside in the DFS62DTx member of the IMS.PROCLIB data set. The DFS62DTx OUTBND keyword identifies a local LU that can be used for outbound message processing.

Application control block generation

Both the Application Control Block (ACB) Maintenance utility and the block builder use storage above the 16 MB line when they generate their control blocks. The block builder dynamically builds the control blocks for programs that run in regions that are generated from the DLIBATCH procedure.

APPC/OTMA

Implicit APPC/OTMA messages can use shared queues for both asynchronous and synchronous transactions and you can input a message on any of the external interfaces to have that message distributed and executed on any IMS system within the sysplex.

Base Primitive Environment external trace

IMS provides the ability to write Base Primitive Environment (BPE) trace entries to an external data set, in addition to writing them to memory.

Common Queue Server

Common Queue Server (CQS) manages shared queues in a sysplex for multiple IMS™ subsystems. CQS receives, maintains, and distributes data objects from a shared queue on behalf of these IMS™ subsystems or clients.

Command recognition character registration

During initialization of the IMS control region, IMS uses the CRC execution parameter to register the IMS Command Recognition Character (CRC) with the sysplex (if IMS is running in a sysplex) or with the z/OS system. If the CRC is not unique, IMS issues message DFS1946W and continues with initialization.

Therefore, all IMS systems in the sysplex must have a unique CRC. With a unique CRC, a console operator can issue IMS commands from any system in the sysplex and z/OS routes the command to the appropriate system for execution.

Control Center for IMS

The Control Center for IMS provides a graphical interface for the Operations Manager through IMS Connect, which eases IMS operations. The Control Center for IMS provides a single user interface from which you can control both IMS and DB2 for z/OS.

The Control Center for IMS capability is integrated with the DB2 for z/OS administrative tools. The administrative tools include a Control Center for navigating IMSplex systems, wizards for creating the IMS IMSplex commands, and a results window for sorting and filtering single-image command results. The tools also include a Command Center for typing and executing both IMS type-1 and type-2 commands.

Data Communications Control

Data Communications Control (DCCTL) is an IMS™ operating environment that can connect to a database management subsystem other than the IMS Database Manager. With DCCTL, database management subsystems such as DB2 for z/OS can access IMS transaction management without a prerequisite for the IMS DB. DCCTL provides a

database-independent, transaction processing environment for DB2 for z/OS.

Data compression

IMS DB supports eServer™ zSeries® data compression hardware. This support provides storage (DASD) savings and improved transaction response time because hardware data compression uses fewer processor resources than software data compression, and because I/O operations are reduced for compressed data.

Data sharing

IMS DB can concurrently access and share databases with other IMS DB subsystems in IMS™, DBCTL, or batch environments.

In a sysplex that includes a coupling facility and the IBM Internal Resource Lock Manager (IRLM) Version 2.2 or later, IMS can share data at the block level among as many as 32 systems.

Lock management and serialization for multisystem data sharing is handled by IRLM using a coupling facility.

You can use IMS multisystem data sharing regardless of whether IMS™ or CICS is your transaction manager.

Database Control

Database Control (DBCTL) is an IMS DB operating environment that consists of the IMS DB product connected to a transaction management subsystem other than the IMS Transaction Manager. With DBCTL, transaction management subsystems such as CICS can have online access to full-function databases and Fast Path DEDBs.

Database quiesce

Database quiesce enables users to create a coordinated recovery point across an IMSplex without taking resources offline. Applications are given concurrent access to the resources instead of encountering an unavailable database. The resources that can use database quiesce are IMS Fast Path data entry databases (DEDBs), Fast Path areas, full-function databases, High Availability Large Databases (HALDBs), HALDB partitions, and database groups.

Users can use database quiesce to establish a *point of consistency* for a DEDB or a full-function

database. The point of consistency is a time when no updates are pending for the database and the information that is stored on a direct access storage device (DASD) accurately reflects the current information that is stored in the database. When this point is reached, an image copy can be taken that can later be used to provide a quick method of recovering the database, database group, or area to that point.

Database Recovery Control

Database Recovery Control (DBRC) helps automate the recovery of databases by tracking the database image copies and logs that are needed for recovery. DBRC also helps ensure database integrity in a data-sharing or Remote Site Recovery (RSR) environment.

Additionally, DBRC commands are provided to aid in database administration with the RECON data set for high availability large databases (HALDBs). By creating both a master template in a single editable file and the definitions that can be executed in batch.

The DBRC API is a release-independent, assembler macro interface to DBRC that user-written application programs use to obtain services from DBRC. The application programs obtain these services by issuing DBRC API requests to IMS. IMS passes these requests to DBRC and returns the results to an area in storage where the application can retrieve them.

Batch and utility regions that do not use DBRC are required to use the DFSIDEF0 module because it contains the batch and utility region installation default for DBRC. In regions that already use DBRC, the DFSIDEF0 module is optional. IMS provides a sample module for DFSIDEF0.

Users can enable DBRC interactions with a RECON data set to be processed in parallel. DBRC uses the Transactional VSAM (Virtual Storage Access Method) function of DFSMS to provide parallel processing of the RECON data set. Parallel processing of a RECON data set is available only in an IMSplex environment.

An online DBRC address space can run as a Base Primitive Environment (BPE)-based address space, so that DBRC can take advantage of some BPE services.

/DIAGNOSE command for serviceability

IMS provides a SNAP function for the /DIAGNOSE command. Using this function, you can take a snapshot of system resources at any time without impacting IMS operations. This function provides a non-intrusive alternative to a console dump.

Distributed syncpoint

Distributed Syncpoint support allows APPC and DCE/RPC (distributed computing environment/remote procedure call) application programs and DCE/RPC remote application programs to participate with IMS in protected conversations with coordinated resource updates. z/OS Resource Recovery Services (RRS) manages the syncpoint process on behalf of the conversation participants: the application program and IMS acting as resource manager. Application programs can access and update resources of multiple participating resource managers.

Dynamic abend dump formatting exit routine

IMS dynamically installs its abend dump formatting exit routine. The DFSAFMD0 module does not need to be installed as part of the IMS installation process. Registration of the abend dump formatting exit routine with the operating system is done automatically during IMS startup.

The abend dump formatting exit routine is registered dynamically.

Dynamic resource definition

Dynamic resource definition (DRD) enables you to dynamically create, update, query, and delete certain runtime resource definitions (databases, application programs, transactions, and Fast Path routing codes), without using the system definition or online change processes.

XML database support

You can store and retrieve XML data in IMS databases by using a predefined mapping between the elements and attributes of an XML document and the hierarchic structure of the IMS database. Using the XML database support, you can:

- Compose XML documents from data in existing IMS databases, including HDAM, HIDAM, HISAM, PHDAM, and PHIDAM databases.
- Store XML documents into new or existing IMS databases.

You can use the IMS Enterprise Suite Explorer or the IMS Enterprise Suite DLIModel utility plug-in to generate XML schemas from IMS database definitions (DBDs) and program specification blocks (PSBs).

You can also use the Java API for IMS DB to compose and receive XML documents in all the environments that are supported by Java class libraries for IMS DB, including: JMP or JBP application programs, CICS application programs, DB2 for z/OS stored procedures, or enterprise applications that run on WebSphere Application Server or WebSphere Application Server for z/OS.

XML transaction support

IBM WebSphere Studio Enterprise Edition Version 5 can generate XML converters that allow IMS COBOL applications to transform and generate XML documents. The IBM Enterprise COBOL and PL/I Compilers provide a PARSE keyword that allows new or modified COBOL or PL/I application programs to parse incoming XML documents. Application programs that use the Java API for IMS DB can use the XML Toolkit for z/OS to parse XML documents.

You can send and receive XML documents in IMS transactions and process these XML documents in IMS COBOL or PL/I application programs. An XML transaction for IMS must have an EBCDIC transaction code.

Expedited Message Handler

The Expedited Message Handler (EMH) enables users to reset a static node or an ETO (Extended Terminal Option) dynamic user that is hung in Fast Path input response mode by using only a combination of the /STOP and /START commands. The EMH also differentiates the output of the /DISPLAY command between the Fast Path input response mode status and the full-function input response mode status for static nodes and ETO dynamic users.

Extended Recovery Facility

Extended Recovery Facility (XRF) provides a local alternate IMS subsystem that monitors the status of an active IMS subsystem so that the alternate subsystem can take over the active subsystem's workload in the event of an outage. XRF can be used to minimize the impact to users of planned and unplanned IMS subsystem or z/OS system outages.

IMS no longer uses the DFSMS MULTACC parameter when opening an OLDS for an XRF-capable IMS subsystem.

Extended Terminal Option

Extended Terminal Option (ETO) is a separately priced feature of IMS TM. ETO provides continuous availability by allowing changes to the IMS VTAM terminal network to be made online, without the need for a planned outage for IMS system generation. ETO provides improved network and system security by controlling system access and message delivery for each user ID (which can be shared by multiple users) rather than for each terminal.

External Subsystem Attach Facility

External Subsystem Attach Facility (ESAF) allows other products to attach to IMS. ESAF allows IMS application programs that are running in IMS dependent regions to access resources owned by the attached products, for example, DB2 for z/OS resources and IMS resources.

Fast Database Recovery

Using the Fast Database Recovery (FDBR) function, you can restore database resources from a failed subsystem in a sysplex data-sharing environment more quickly. This function monitors another IMS DBCTL or IMS DB/DC subsystem in the sysplex and, in the event of a problem, restores the databases that are locked by the failed system. Other IMS subsystems release the locks that are held by the failed system and allow processing to continue, which increases availability.

Fast Path features

Fast Path is a functional extension of IMS DB that shares the IMS TM facilities. Within a given application program, the user can select Fast Path to improve performance for simply structured databases, or the full function of IMS DB for complex databases.

Fast Path provides these facilities:

- Database management services that provide improved processing rates:
 - Data entry database (DEDB): a database organization consisting of root segments with as many as seven types of dependent segments, and using VSAM improved control interval processing

- Main storage database (MSDB): a root-segment-only database residing in main storage
- Data communication management services providing an Expedited Message Handler (EMH) for selected transactions and communication to IMS transactions and terminals from Fast Path application programs.
- Database management services allowing access to both Fast Path and IMS databases from both Fast Path and IMS online application programs.
- The Fast Path 64-bit buffer manager, which autonomically controls the number and size of Fast Path buffer pools, and eliminates the need for system programmers to manually set buffer pool specifications during system definition. It also places the buffer pools for DEDB databases above the bar in 64-bit storage, potentially reducing the usage of extended common storage area (ESCA).

Front-end switching

IMS TM can be a front-end network manager connected to a back-end application processing subsystem, which can be either another IMS TM subsystem or a non-IMS TM subsystem. ISC (LU 6.1), LU 0, and LU 2 communications protocols are supported between the front-end and back-end subsystems.

Full-function databases

IMS full-function databases support complex data structures such as logical relationships and secondary indexes.

Global online change

Global online change allows nondisruptive changes to IMSplexes. Resources such as database definitions, transaction definitions, application definitions, MFS formats, and security definitions can be added, deleted, or changed without bringing down the IMSplex.

High Availability Large Databases

The High Availability Large Database (HALDB) function delivers enhancements to capacity, availability, manageability, and usability by enabling partitioning for IMS full-function databases. HALDB supports as many as 1001 partitions (each partition having a maximum capacity of 40 GB). Users can have over 40 terabytes of Overflow Sequential Access Method (OSAM) and Virtual Storage Access Method (VSAM) data sets.

HALDB support also allows a partition to be taken offline, changed, and brought back online independently. This support means that each partition can be individually unloaded and reloaded, and while offline, have a batch reorganization done to it. Or, the entire database can be taken offline and each partition can be reorganized in parallel, which speeds up the offline reorganization process.

HALDB partitions can be processed in parallel to reduce the total time required for batch workload or utility processing. Reorganized HALDBs are available for use after image copies are created. A series of ISPF panels, with embedded help screens, provide an interface for creating and migrating databases.

HALDB Online Reorganization function support

The HALDB Online Reorganization (OLR) function enables non-disruptive reorganizations of HALDB PHDAM and PHIDAM partitions. OLR addresses the planned data outage time, which has been the greatest amount of time that data was unavailable.

IMS Application menu

The IMS Application menu provides a common interface to IBM-supplied IMS applications that run on TSO and ISPF, such as the TSO SPOC, the HALDB Partition Definition utility, the IMS Syntax Checker, the Manage Resources ISPF panels, the IVP, and the IVP Export utility.

IMS callout

IMS callout enables IMS applications that run in IMS dependent regions to interact with business logic that resides outside of the IMS environment by making callout requests to external applications and servers. IMS applications can invoke the callout function either synchronously or asynchronously:

IMS OTMA type-2 commands can be used to create, update, query, and delete OTMA descriptors dynamically. These OTMA descriptors can be used for both synchronous and asynchronous callout messages.

IMS Connect

IMS Connect provides TCP/IP and local z/OS communications between one or more IMS Connect clients and one or more IMS systems. IMS Connect connects to IMS TM for transaction

processing support through Open Transaction Manager Access (OTMA).

IMS Connect is the TCP/IP path to both IMS DB and IMS TM. IMS Connect clients can access IMS DB by using the open standard Distributed Relational Database Architecture™ (DRDA®) specification, which supports distributed data management (DDM) Architecture commands.

The IMS Universal drivers can be used to access data stored in IMS. IMS Connect supports the IMS Universal drivers by using the DRDA protocol. The IMS Universal drivers enable independent software vendors to build packages that access IMS data.

IMS Database Service Data Objects support

IMS Database Service Data Objects (SDO) support enables the service-oriented architecture (SOA) integration of IMS data so that language and database are independent of one another. IMS SDO support enables the distributed use of IMS data in a disconnected mode (holding no locks in the database).

IMS enhanced command environment

The IMS enhanced command environment (also known as a single-IMS IMSplex) provides a simplified IMS configuration that does not require the Resource Manager (RM). If you want to use the IMS type-2 command format, but do not need the RM, you can group your systems into a generic IMSplex and use the IMS enhanced command environment. Examples of environments that can benefit from the IMS enhanced command environment include:

- Stand-alone IMS subsystems
- IMS DBCTL subsystems that are involved in data sharing, but that do not use online change

IMS Interactive Dump Formatter

The IMS Interactive Dump Formatter allows the user to re-create the final part of an IMS log from the information that is available in an IMS dump, thus eliminating the need to request the final system log data set (SLDS) for diagnostic purposes. A log data set can be built from the log records that reside in the log buffers of an IMS dump, potentially streamlining maintenance efforts.

IMS logger

While IMS is running, all information that is necessary to restart the system after a hardware or software failure is recorded in a system log data set. Users can change the number of log records that are produced between system checkpoints without needing to perform a system generation.

In an online environment, log records are stored on DASD, instead of being written to tape. Logging to DASD simplifies recovery of the IMS subsystem, reduces operator involvement, and improves system availability.

IMSplex

An IMS sysplex (or *IMSplex*) helps reduce the complexity of managing multiple IMS subsystems in a sysplex environment. An IMSplex is one or more IMS address spaces (control, manager, or server) that work together as a unit. Typically (but not always), these address spaces:

- Share either databases or resources or message queues (or any combination)
- Run in an S/390® sysplex environment
- Include an IMS Common Service Layer (CSL)

The address spaces that can participate in the IMSplex are:

- Control region address spaces
- IMS manager address spaces: Operations Manager (OM), Resource Manager (RM), Structured Call Interface (SCI)
- IMS server address spaces (Common Queue Server - CQS)

Examples of IMSplexes are:

- A set of IMS control regions at the IMS Version 10 or IMS Version 11 or IMS Version 12 level, with or without a CSL, which are sharing data or sharing message queues
- A single IMS control region at the IMS Version 10 or IMS Version 11 or IMS Version 12 level with a CSL. For example, you might want to use type-2 commands that can be issued only through the OM API. This example still qualifies as an IMSplex because it is a set of IMS address spaces (IMS control, OM, RM, SCI, CQS) that work together.

The following sections describe the IMS functions that support IMSplexes.

Common Service Layer: The CSLs components (the OM, RM, and SCI) provide the infrastructure for an IMSplex. Each OM, RM, and SCI runs in a separate address space.

Operations Manager: The OM provides a single system image for system operations in an IMSplex. OM performs the following functions:

- Routes IMS commands to IMSplex members that are registered to process those commands
- Consolidates command responses from individual IMSplex members into a single response for presentation to the command originator
- Provides an API for the automated control of commands to the IMSplex
- Provides user exits for command and response edit and command security reasons

Resource Manager: The RM helps manage resources that are shared by multiple IMS systems in an IMSplex. RM provides an infrastructure for managing global resources and coordinating processes across the IMSplex. RM maintains resource information by using a resource structure on a coupling facility.

Structured Call Interface: The SCI is the part of the CSL that provides the communications infrastructure of the IMSplex. Using SCI, IMSplex components can communicate with each other within a single z/OS image or from multiple z/OS images. Individual IMSplex members do not need to know where the other members are running. SCI is responsible for routing requests and messages between the IMS control regions, OMs, RMs, CQs, and other IMSplex members in the IMSplex.

Coordinated Online Change: One of the complexities of running multiple IMS systems in an IMSplex is managing online change processing for all those IMS systems. An important part of managing an IMSplex from a single point of control is to be able to coordinate global online change processing among all the IMS systems in the IMSplex.

TSO Single Point of Control Application: One of the functions delivered with IMS is the ability to manage an IMSplex from a SPOC application. IMS delivers a TSO SPOC application. Using the ISPF-based TSO SPOC application, you can:

- Issue commands to all the IMSplex components

- Display consolidated responses from those commands
- Send a message (using the /BROADCAST command) to an IMS terminal that is connected to any IMS in the IMSplex

Sysplex terminal management

IMS TM uses the Resource Manager (RM) to maintain IMS resource information in a sysplex environment. By having the resource information available to other IMS subsystems in the sysplex, the following is achievable:

- Resume work for VTAM terminals and users if their local IMS fails
- Eliminate VTAM Generic Resources terminal affinities
- Provide resource type consistency
- Provide name uniqueness
- Provide global callable services for node, LTERM, and user resources

IMS SOA composite business application support

IMS SOA composite business application support provides the business integration process of integrating J2EE resources, services, and activities (for example, user interventions), based on Web services with the Business Process Execution Language (BPEL).

IMS Connect provides a conversational option that the user can specify by setting the new conversational flag option flag that is defined in the input message.

IMS solutions for Java development

You can write Java applications to access IMS databases and process IMS transactions by using the drivers and resource adapters of the IMS solutions for Java development. The IMS solutions for Java development include the IMS Universal drivers, the IMS Java dependent region resource adapter, and the classic Java APIs for IMS.

The IMS solutions for Java development enable users and business partners the ability to provide integrated application development for IMS.

IMS Universal drivers

The IMS Universal drivers are a set of SMP/E-installable Java drivers and resource adapters that enable access to IMS from z/OS and

distributed (non-z/OS) platforms. The IMS Universal drivers are built on industry standards and open specifications, and enable access to IMS from multiple environments, including:

- WebSphere Application Server for z/OS
- DB2 for z/OS stored procedures
- CICS Transaction Server for z/OS
- IMS on the host in JMP and JBP regions (also supported by the IMS Java dependent region resource adapter)

IMS Universal DB resource adapter

A Java EE Connector Architecture (JCA) 1.5-compliant resource adapter

IMS Universal JDBC driver

A Java Database Connectivity (JDBC) driver that implements the JDBC 3.0 API

IMS Universal DL/I driver

A Java API for making calls with traditional DL/I programming semantics

IMS Java dependent region resource adapter

The IMS Java dependent region resource adapter is a set of Java classes and interfaces that support IMS database access and IMS message queue processing within Java batch processing (JBP) and Java message processing (JMP) regions. The IMS Java dependent region resource adapter provides Java application programs running in JMP or JBP regions with similar DL/I functionality to that provided in message processing program (MPP) and non-message driven BMP regions.

Classic Java APIs for IMS

The classic Java APIs for IMS are a set of SMP/E-installable Java classes and interfaces to access IMS from multiple runtime environments.

The classic Java APIs for IMS are delivered with IMS Version 10 and earlier, but are still supported in IMS Version 12.

Resource Recovery Services Access for Java Message Processing or Java Batch Processing

A Java Message Processing (JMP) region or a Java Batch Processing (JBP) region can access DB2 for z/OS tables using the DB2 Resource Recovery Services (RRS) attachment facility.

IMS support for XQuery

IMS support for XQuery is the implementation of an XQuery evaluation engine that can be run against standard IMS databases. IMS support for XQuery enhances XML visualizations that were

established in IMS Version 9 and provides additional means by which to navigate through an IMS database by using an XML data model.

IMS Web services support

IMS provides Web services support that enables you to publish existing IMS transactions, including MFS-based IMS transactions, to the Internet as Web services, and to connect to IMS using SOAP and Enterprise JavaBeans (EJB) bindings.

Web services are language- and platform-independent network-accessible programs that provide application-to-application communication using the Internet. In a WebSphere or Rational-family development environment, you can transform existing IMS application programs into Web services. These application programs can be written in C, COBOL, Java, PL/I, or they can be MFS-based. You can deploy IMS Web services to a WebSphere Application Server.

Installation Verification Program

The Installation Verification Program (IVP) is an ISPF dialog that is used to initially verify (test) the installation of IMS by using a sample IMS system. The IVP dialogs are replaced when a new release of IMS is installed.

Intersystem communication

Intersystem communication (ISC) enables communication between IMS TM and another subsystem (such as CICS), a user-written subsystem, or another IMS TM subsystem by using the LU 6.1 protocol.

JBP symbolic checkpoint and restart feature

Java batch processing (JBP) programs can use symbolic checkpoint and restart calls to restart the program after an abend. The JBP symbolic checkpoint and restart calls provide the same function as the IMS system service calls, CHKP (symbolic) and XRST.

Local online change

Local online change allows non-disruptive changes to the IMS subsystem. Resources such as database definitions, transaction definitions, application definitions, MFS formats, and security definitions can be added, deleted, or changed without bringing down the IMS subsystem.

Message Format Service

Message Format Service (MFS) allows application programs to handle logical messages, so they do not need to handle device-specific characteristics of input or output messages. MFS distributed presentation management (DPM) supports ISC and secondary logical units type P (SLU P) for a user-written program in a SLU P controller or in another subsystem connected with ISC. MFS DPM enables device-independent data streams to be transmitted between IMS and a remote program. MFS DPM also enables the application program to use a single data structure, regardless of the data source or destination.

Multiple Systems Coupling

Multiple Systems Coupling (MSC) permits message and transaction routing between two or more IMS TM subsystems in one or more z/OS systems or processors. Whether a transaction is processed on a local IMS TM subsystem or on a remote one is transparent to the user entering the transaction. So, MSC provides a single-system image to the user. MSC supports transactions (messages), responses, program-to-program switches, and fixed-length conversational scratch pad areas on two or more IMS systems.

Notify CQS outage to terminal users

If the CQS address space is unavailable, a static non-set-and-test-sequence-numbers (STSN) terminal that requires signon, receives the message DFS3649A with return code of 436, and then the terminal session is terminated.

ODBA

Open Database Access (ODBA) provides a callable interface that enables any z/OS recoverable, resource-managed z/OS address space to issue DL/I database calls to an IMS DB subsystem. The ODBA interface CIMS CONNECT command can initialize the ODBA interface and enable connection to multiple IMS DB systems.

Open Database

Distributed Java application programs in TCP/IP environments can use the IMS Universal drivers in IMS to access any database that is managed by IMS DB on any logical partition (LPAR) in an IMSplex. Open Database Access (ODBA) application programs, user-written IMS Connect client application programs, and user-written

Open Database Manager (ODBM) client application programs can also access such databases.

Open Transaction Manager Access (OTMA)

IMS Open Transaction Manager Access (OTMA) is a client/server protocol for IMS transactions. In a client/server environment, the IMS Transaction Manager is the high-performance server, and with the OTMA feature you can attach many different z/OS client subsystems. An OTMA client acts as a gateway between IMS TM and a heterogeneous network. TCP/IP, RPC, WebSphere MQ, and IMS TM systems can be used across their appropriate platforms with each other, to take advantage of existing applications, data, and programmer skills. IMS also provides a callable interface for OTMA that allows access to IMS applications from other z/OS subsystems.

RACF mixed-case password support

IMS and IMS Connect handle mixed-case passwords in the same manner as the Resource Access Control Facility (RACF) specification for mixed-case passwords.

IMS Version 10 can process mixed-case passwords, but to enable this function, users must specify PSWDC=M for IMS and PSWDMC=Y for IMS Connect. The default values for IMS Version 10 are PSWDC=U (uppercase) and PSWDMC=N (not mixed-case).

The default R specification on the PSWDC and PSWDMC parameters in IMS Version 11 and later specifies that IMS and IMS Connect will handle passwords in the same manner as RACF.

Rapid Network Reconnect

Rapid Network Reconnect (RNR) utilizes the facilities of VTAM Multinode Persistent Session Services to improve system availability by allowing IMS TM to automatically reconnect terminal sessions following any IMS failure and subsequent restart. RNR reduces network reconnect time after an IMS, z/OS, or VTAM, or CPC failure in a sysplex environment.

Remote Site Recovery

The Remote Site Recovery (RSR) feature lets you recover quickly from an interruption of computer services at an active site. The RSR feature allows you to maintain a geographically remote secondary IMS site that tracks the activity of the

primary site and that can take over the active workload in the event of an outage. RSR maintains copies of all active resources at the remote site and shadows databases and remote logs.

RSR also provides coordinated disaster recovery for IMS and DB2 for z/OS.

Replacement of XRF USERVAR

If you used the 3745 Controller for IMS XRF tracking of VTAM terminals before migrating to IMS Version 9 or IMS Version 10, you can continue to use this controller. However, after VTAM discontinues support for the 3745 Controller, you must migrate from the traditional XRF tracking with the 3745 Controller to use one of the following options:

- The Communication Controller for Linux (CCL).
- VTAM Generic Resources (VGR). This option requires a Parallel Sysplex® environment.

Shared message queues and shared EMH queues

Using a z/OS coupling facility, IMS can store and share IMS message queues among multiple IMS TM systems. Incoming messages from one IMS TM in a sysplex can be placed on the shared queue by CQS for processing by any other IMS TM that has access to the shared queue. Using shared queues enables automatic workload balancing across all IMS subsystems in the sysplex, thus providing increased capacity and availability for the IMS system. Shared queues also provide an alternative to using MSC to transfer messages across a sysplex.

Asynchronous APPC/OTMA input messages can run on any IMS system in the shared queues group that is available for processing.

Coupling Facility duplexing support

IMS provides support for z/OS Coupling Facility (CF) duplexing function for IMS shared message queue structures and IMS Fast Path EMH structures. When CF Duplexing is enabled, z/OS creates a duplex copy of the structure for failure recovery. If the IMS shared queues structure or the EMH structure fails or if a connection to the structure is lost, z/OS switches to the unaffected structure instance without the overhead of a structure rebuild.

CF duplexing also enables system-managed rebuild. z/OS does the structure rebuild for a planned reconfiguration (that does the structure copy) even if no CQS is currently running. CQS-managed rebuild is still needed to address CF failure, structure failure, or loss of connectivity.

Optional EMHQ structure for shared queues

Using IMS shared queues with IMS Fast Path installed, you are no longer required to allocate an Expedited Message Handler Queue (EMHQ) structure and its associated log structure data set, checkpoint data set, and structure recovery data set. Users who use only Fast Path DEDBs or local EMH processing in a shared queues environment do not use these resources and are no longer required to create and manage them.

64-bit real support

For IMS I/O operations, above-the-bar 64-bit real storage is used for IMS page-fixed storage to free below-the-bar real storage.

Support for Data Facility Storage Management Subsystem constructs

Support for Data Facility Storage Management Subsystem (DFSMS) constructs makes installation easier for sites that use SMS-managed volumes. HALDB sample applications are also provided.

Sysplex serialized program management

Sysplex serialized program management allows users in a shared queues environment to prevent application programs that are defined as serial from being scheduled in parallel on another IMS system in an IMSplex.

Syntax Checker

The Syntax Checker is an IMS ISPF application that helps you define, verify, maintain, and validate parameters and their values in certain IMS PROCLIB members. The Syntax Checker validates parameters and their values based on the version of IMS that you run it on. In addition, it provides detailed help text at the parameter level, identifies new and obsolete parameters, and helps determine that parameter information is valid before either the initial IMS startup or an IMS restart.

Tracing features

DL/I trace and lock trace are both on by default. To deactivate either trace, use the /TRACE command.

Type-2 commands

The IMS strategy for commands is to move toward using a single point of control (SPOC) application that issues type-2 commands through the Operations Manager (OM) API.

Virtual storage constraint relief features

When IMS dynamically allocates full-function or Fast Path databases, z/OS creates the Data Set Association Blocks (DSABs) above the 16 MB line. Thus, if you allocate many data sets, you can gain a substantial amount of low storage in the low private storage area.

The IMS internal storage managing service, IMODULE, uses 64-bit private storage, instead of 24-bit authorized private storage, for certain IMS functions.

VTAM generic resource support

Virtual Telecommunications Access Method (VTAM) can be used instead of IMS to manage the generic resource affinity. If VTAM is used, when any session outage occurs, whether a CPC, z/OS, VTAM, or IMS failure, a new terminal session can be immediately established with any available IMS system.

z/OS Automatic Restart Manager

The z/OS Automatic Restart Manager (ARM) restarts a subsystem or job, after a z/OS hardware or software failure. You can also use ARM to define restart groups. In addition, in the event of a z/OS hardware or software failure that requires you to move a subsystem from one z/OS system to another, ARM moves all the subsystems defined in the same restart group as a group to a remaining z/OS system. In IMS, the IMS control region is the only region restarted by ARM. IMS supports ARM in these environments: DB/DC, DCCTL, DBCTL, XRF, and FDBR.

DL/I, DBB, and IMS utilities are not supported.

z/OS UNIX System Services

IMS supports z/OS UNIX System Services and the support services it provides. These services, when used with other select products, conform to approved standards or provide an implementation for appropriate draft standards.

For open access to IBM and non-IBM networks

Using z/OS UNIX System Services, current data and logic can be made available to heterogeneous clients by using a single set of standardized interfaces.

z/OS Workload Management

IMS supports z/OS Workload Management (WLM) which enables you to define the performance goals for transactions and the relative importance of transactions and address spaces. Using your definitions, WLM decides how the resources that are controlled by z/OS are allocated.

After a transaction is scheduled by IMS, the z/OS WLM uses the performance goals that you define for each transaction to decide how much resources, such as processor cycles and storage, it should allocate to meet your goals. When contention for system resources occurs, the z/OS WLM uses the business importance assigned to the transaction to help decide which transactions get priority for the resources that are under the control of the z/OS WLM.

Support discontinuances

Support is discontinued for various utilities, macros, resource adapters, and functions. The BookManager[®] format for product documentation is no longer supported.

IMS Version 11 is the last version of IMS that supports the Knowledge-Based Log Analysis (KBLA) facility. Customers using this function should migrate to use other IBM analysis utilities and reports.

IMS Version 11 is the last version of IMS that supports the SMU-to-RACF utilities. Customers need to migrate to RACF or an equivalent product with an earlier version of IMS.

IMS Version 10 is the last version of IMS that supports the z/OS-based batch DLIModel utility.

Customers using this function should migrate to the IMS Enterprise Suite V2.1 DLIModel utility plug-in.

IMS Version 10 is the last version of IMS that supports the DLIModel utility plug-in as part of IMS. Customers using this function should migrate to the IMS Enterprise Suite V2.1 DLIModel utility plug-in.

IMS Version 10 is the last version of IMS in which the IMS product information is delivered in BookManager format. IMS Version 12 product documentation is provided only in PDF and XHTML (information center) formats.

The JCA 1.0 resource adapter, one of the Java connectors in the IMS DB distributed resource adapter, is stabilized and is no longer being enhanced. Users may switch to using the IMS Universal DB resource adapter.

IMS Version 12 is the last version of IMS that supports the SECURITY macro. You can use initialization parameters to specify most of the SECURITY macro keyword values. Initialization parameters for the RCLASS and SECCNT keywords will be delivered through the IMS service process.

IBM has discontinued support for Enterprise Workload Manager™ (EWLM), so IMS can no longer offer this support. Users may consider using the IBM Tivoli® Workload Automation family of products, including Tivoli Dynamic Workload Broker and Tivoli Workload Scheduler, Tivoli Workload Scheduler for z/OS, and Tivoli Composite Application Manager for Response Time Tracking.

Softcopy publications

All IMS Version 12 publications are available in softcopy format (PDF) on the IMS Product Kit CD (SK5T-7394-00) and (PDF and XHTML) in the Information Management Software for z/OS Solutions Information Center, available at <http://publib.boulder.ibm.com/infocenter/imzic>.

The PDF books can be read online by using the Adobe Reader.

Specified Operating Environment

Hardware requirements

The processor that IMS Version 12 runs on must meet the following requirements:

- An IBM z/Series machine running in z/Architecture® mode (ESA mode is not supported by IMS Version 12)
- Capable of running z/OS Version 1 Release 11 or later
- A 64-bit processor
- A processor that supports the Long Displacement Facility of the z/Architecture

For more information about these processors, see System z Hardware at ibm.com/systems/z/hardware/.

System console requirements

The console requirements of z/OS Version 1 Release 11 or later apply.

Tape unit requirements

IMS supports IBM 3590 and later tape units (or equivalent products) for installation and maintenance. IMS supports the tape block sizes greater than 32,760 bytes for the output of the Database Image Copy utility (DFSUDMP0) and Online Database Image Copy utility (DFSUICP0).

Coupling facility requirements

Sysplex data sharing (including data caching and VSO data sharing) with IRLM V2.2 or V2.3 requires a coupling facility level 9 or later. Shared queues, shared-EMH support, and the OM Audit trail also require a coupling facility level 9 or later. System-Managed Duplexing requires a coupling facility level 12 or later, and bidirectional CF-to-CF links (such as HiperLink, ICB link, or IC link).

DASD requirements

During the binding of the IMS control blocks load modules (specifically, during the bind of the IMS VTAM control blocks load monitoring module), both the binder work data set SYSUT1 and IMS.SDFSRESL library must reside on a device that supports a record size of 18 KB or greater. For all other system libraries and working storage space, any device that is supported by the operating system is allowed.

For IMS database storage, any device that is supported by the operating system is allowed

within the capabilities and restrictions of Basic Sequential Access Method (BSAM), Queued Sequential Access Method (QSAM), Overflow Sequential Access Method (OSAM), and Virtual Storage Access Method (VSAM).

Restriction: IMS does not support VSAM Extended Addressability (EA).

Non-VSAM data sets that reside in the extended addressing space (EAS) of extended address volumes (EAVs) require IBM System Storage DS8000 devices or DS8700 devices configured as 3390 Model A devices.

You must preallocate and format the write-ahead data set (WADS) on a DASD device that supports Extended Count-Key-Data (ECKD™) architecture.

The fast replication function of the Database Image Copy 2 utility (DFSUDMT0) requires DASD controllers that support one of the following features:

- The concurrent-copy feature of DFSMS
- The FlashCopy® feature of the IBM Enterprise Storage Server® (ESS)
- The SnapShot feature of the IBM RAMAC Virtual Array (RVA) storage system

FlashCopy and SnapShot might require microcode from IBM to activate their functionality. Also, the source and target data sets (databases and image copies) must reside on the same ESS or RVA hardware.

The DASD storage requirements for the following items are described in the *Program Directory for Information Management System Transaction and Database Servers V12.0*:

- SMP/E system entries
- SMP/E data sets
- Target libraries
- Distribution libraries
- Install process
- Optional machine-readable material

Large sequential data set support hardware requirements

No specific hardware is required for the large sequential data set support that was introduced in IMS Version 10. However, to take advantage of this support, hardware that has more than 65,535 tracks must be used.

Multiple Systems Coupling hardware requirements

When the physical link is channel-to-channel (CTC) and is dedicated to IMS, Multiple Systems Coupling (MSC) requires the System/370 CTC adapter or a logical channel on the IBM 3088, ESCON®, or Fibre channel connection (FICON®). MSC FICON CTC support requires that at least one IMS system is installed on an IBM zSeries machine with the FICON channel and FICON CTC microcode. The other side (IMS) can be any processor with a FICON channel.

Parallel RECON access hardware requirements

The parallel RECON access function requires a Parallel Sysplex environment and DFSMS Transactional VSAM Services (DFSMTvs). Therefore, parallel RECON access requires Coupling Facility (CF) hardware in the System z sysplex.

Remote Site Recovery hardware requirements

Remote Site Recovery (RSR) requires:

- A Sysplex Timer® (if data sharing or if workload is spread across multiple CPCs)
- A high-bandwidth control unit (such as a 3172)
- At least one tape unit at the tracking site

Coordinated Disaster Recovery support for IMS and DB2 requires that the DB2 logs reside on devices that support Extended Remote Copy (XRC).

Software requirements

IMS Version 12 has base software requirements. Some major enhancements have additional software requirements.

Operating system requirements

IMS Version 12 and its various functions have specific operating software requirements.

Before you install IMS Version 12, check with your IBM Support Center or check either Information/Access or Service Link for additional preventive service planning (PSP) information. The PSP upgrade name for IMS Version 12 is IMS1200.

The z/OS service levels that are required for installation and execution are described in the *Program Directory for Information Management System Transaction and Database Servers V12.0*.

IMS Version 12 base software requirements

The base IMS Version 12 system runs on z/OS Version 1 Release 11 or later. Certain features and functions have additional software requirements.

IMS Version 12 requires the following minimum version, release, or modification levels:

- z/OS Version 1 Release 11 (5694-A01) or later
 - IBM High-Level Assembler Toolkit (5696-234) Version 1 Release 5, a separately orderable feature of z/OS.
 - z/OS V1R11.0 Security Server RACF V1R11.0 or later, or an equivalent product, if security is used. RACF is available with the IBM SecureWay™ Security Server for z/OS (a separately orderable feature of z/OS).
 - DFSMS APAR/PTF OA33409/UA55338 is required to run IMS Version 12 on z/OS V1R11.
- IRLM Version 2.2 or later (5635-DB2), if data sharing is used. IRLM Version 2.2 and IRLM Version 2.3 are delivered with IMS Version 12.

When using multiple IMS systems:

- On the same z/OS system, you need only one IRLM.
- Of different release levels on the same z/OS system, you can use one IRLM or you can use two or more IRLM address spaces. If two or more IMS systems share data and are running on the same z/OS system, they should use the same IRLM.
- On different z/OS systems for inter-processor block-level data sharing, you must have one IRLM on each z/OS system.

IMS Version 12 also operates in a virtual machine (VM) under control of z/OS. This environment is intended for use in a program development, testing, and non-XRF production environment.

The VM environment has the following restrictions:

- The Log Analysis utilities might yield inaccurate time-stamp results.
- If you run the IMS Version 12 Transaction Manager under VM for production purposes and have specific throughput or terminal response-time requirements, plan to benchmark under VM to ensure that the proposed configuration meets your performance needs.

System-Managed CF Structure Duplexing is recommended, though not required, for the Resource Manager resource structure.

Coordinated Disaster Recovery support for IMS and DB2 requires the IMS Version 12 Remote Site Recovery (RSR) Recovery Level Tracking (RLT) feature.

Database quiesce software requirements

The software and hardware requirements for the database quiesce function are the same as for IMS Version 12. In addition, IMS must be configured as an IMSplex (with at least a minimal Common Service Layer), the MINVERS field in the RECON data sets must be set to '11.1' or higher, and image copy JCL must specify DISP=SHR, if the image copy job runs while the database is quiesced.

The database quiesce function requires an IMSplex environment that includes a Common Service Layer, with at least one Operations Manager (OM) and one Structured Call Interface (SCI). A Resource Manager (RM) is required when using the database quiesce function in an IMSplex that contains multiple IMS systems. An RM resource structure is recommended, but not required. RM is not required (RMENV=N) when using the database quiesce function in an IMSplex that contains one IMS system (also known as the enhanced command environment).

The JCL that is generated for image copy or hardcoded by the user must specify DISP=SHR because the online IMS subsystems can have the database data sets allocated during a quiesce operation.

Data sharing software requirements

For block-level data sharing, IRLM Version 2.2 or later is required. The IRLM is an independent component that is shipped with IMS Version 12. The IRLM must be defined as a z/OS subsystem. Block-level data sharing of databases is supported between all in-service versions of IMS.

DBRC software requirements

To use the parallel RECON access function of Database Recovery Control (DBRC), you must configure IMS as an IMSplex and install z/OS DFSMS Transactional VSAM Services (DFSMTsvs), a feature of z/OS that can be ordered separately.

Extended address volume (EAV) software requirements

For IMS non-VSAM data sets to reside in the extended addressing space (EAS) of an extended address volume (EAV), z/OS Version 1 Release 12 is required.

Fast Path software requirements

The Fast Path 64-bit buffer manager requires a minimum of 2.1 GB of 64-bit storage. Also, if the FP 64-bit buffer manager is used on systems that are being tracked by a Fast Database Recovery (FDBR) address space, the DFSDF keyword must be specified on the FDR procedure.

The Fast Path 64-bit buffer manager uses 64-bit common storage.

HALDB Index/ILDS Rebuild utility free space function software requirements

The HALDB Index/ILDS Rebuild utility (DFSPREC0) requires four 2 GB data spaces to store and sort the rebuilt indirect list entries (ILEs) before reloading them into the ILDS.

IMS callout function software requirements

To support the IMS callout function, one of the following components is required: IMS Enterprise Suite V2.1 SOAP Gateway, IMS TM Resource Adapter Version 10.3 or later, or user-written IMS Connect clients (TCP/IP applications).

IMS Connect software requirements

The software requirements for IMS Connect include:

- z/OS V1R11.0 Communications Server IP Version 6 or later (TCP/IP).
- To implement security, z/OS Security Server RACF or an equivalent product.
- To use the local option for client communications, there are additional software requirements. See IMS TM Resource Adapter in the Information Management Software for z/OS Solutions Information Center at <http://publib.boulder.ibm.com/infocenter/imzic>.
- To use Secure Sockets Layer (SSL), z/OS System SSL, a subcomponent of z/OS Cryptographic System Services, is required. For information about z/OS encryption support available with the z/OS Cryptographic System Services SSL module, see *z/OS System Secure Sockets Layer Programming*, SC24-5901.

- To support the IMS Universal drivers or a user-written DRDA source server, an IMS Common Service Layer is required, including the Open Database Manager, the Operations Manager, and the Structured Call Interface.
- IMS Connect must have z/OS UNIX System Services superuser privileges.

IMS Connect XML Adapter support software requirements

The IMS Connect XML Adapter support in IMS Version 12, used with the IMS Enterprise Suite V2.1 SOAP Gateway, requires IBM Rational® Application Developer for System z V7.6. Certain functions of the IMS Enterprise Suite SOAP Gateway might have additional software requirements.

Java application program support in IMS Version 12

Applications that run in or access IMS Version 12 must meet specific software requirements.

Software requirements for Java applications that access IMS databases

IMS Version 12 requires software to support Java application programs that access IMS databases.

IMS Version 12 requires the following software:

- z/OS UNIX System Services available at run time.
- Hierarchic File System (HFS) or zFS. For information about preparing HFS, see *z/OS UNIX System Services File System Interface Reference*.

The support for XML documents in IMS Version 12 requires IBM 31-bit SDK for z/OS, Java 2 Technology Edition, Version 6 (JDK 6.0).

IMS provides two generations of Java drivers and resource adapters: the IMS Universal drivers, which are the most recent generation (delivered with IMS Version 12), and the drivers and resource adapters provided by the classic Java APIs for IMS (delivered with IMS Version 11 and earlier, but also delivered with and supported in IMS Version 12).

Software requirements for Java application programs that use the IMS Universal drivers:

The IMS Universal drivers that Java application programs can use to access IMS data have runtime software requirements.

The IMS Universal drivers have the following runtime software requirements:

- Java Development Kit 6 (JDK 6.0) or later
- One or more of the following conditional requirements:
 - For CICS applications, IBM CICS Transaction Server for z/OS Version 4.1 (5655-S97) or later
 - For DB2 stored procedures:
 - DB2 for z/OS Version 10.1 (5605-DB2) or later
 - DB2 for z/OS Version 9.1 (5635-DB2) or later
 - DB2 UDB for z/OS Version 8 (5625-DB2) or laterTo access DB2 UDB for z/OS Version 8 subsystems from JMP or JBP regions, you must install APAR/PTF PQ74629/UQ77540 to the DB2 subsystem.
 - For WebSphere applications, WebSphere Application Server for z/OS or WebSphere Application Server for distributed platforms, Version 7.0.1 (program number 5655-R36) or later
- RACF or an equivalent product
- The software requirements for the JDR resource adapter are the same as for the IMS Universal drivers, except that:
 - Java programs that run in JMP and JBP regions must use Java Development Kit (JDK) 6.0 or later.
 - WebSphere Application Server for z/OS V6.1 or V7.0.1 must have the fix pack that contains WebSphere Application Server APAR PK89274 installed.

Java application programs that use the IMS Universal drivers also require a way to generate the IMS database metadata, such as using the IMS Enterprise Suite Explorer or the IMS Enterprise Suite DLIModel utility plug-in. The default segment encoding of the database metadata class produced by the DLIModel utility plug-in is cp1047.

Software requirements for Java applications that use the classic Java APIs for IMS: Java applications that access IMS databases by using the classic Java APIs for IMS have specific software requirements, depending on the environment in which the application runs.

JMP and JBP address spaces: Java application programs that run in JMP or JBP regions require

the IBM 31-bit SDK for z/OS, Java 2 Technology Edition, Version 6 or later.

Support for interoperation between Java and COBOL or PL/I when running in a JMP or JBP region requires the object-oriented syntax for Java interoperability that is in IBM Enterprise COBOL for z/OS (program number 5655-G53) or later, or IBM Enterprise PL/I for z/OS (program number 5655-H31) or later.

Java application programs that access DB2 for z/OS subsystems from JMP or JBP regions require that APAR/PTF PQ74629/UQ77540 is installed on the DB2 for z/OS subsystem.

WebSphere Application Server environment: Java application programs that provide JDBC access to IMS DB from WebSphere Application Server for z/OS require the following software:

- WebSphere Application Server for z/OS Version 7.0.1 (program number 5655-R36) or later
- z/OS Resource Recovery Services (RRS)
- RACF or an equivalent security product
- The IMS Open Database Access (ODBA) component
- The IMS Database Resource Adapter (DRA) component

To access IMS databases from WebSphere Application Server from a non-z/OS environment, use the IMS Universal DB resource adapter.

CICS environment: Java application programs that provide JDBC access to IMS DB from a CICS environment require the following software:

- One of the following versions of CICS Transaction Server for z/OS:
 - CICS Transaction Server for z/OS Version 3.1 (5655-M15) or later and JDK 1.4.2 or later
 - CICS Transaction Server for z/OS Version 3.2 (5655-M15) or later and JDK 1.4.2 or later
 - CICS Transaction Server for z/OS Version 3.2 (5655-M15) or later (with APAR PK59577 installed) and JDK 5.0 or later
- The IMS DRA component installed in the CICS environment

DB2 for z/OS environment: Java application programs that provide JDBC access from IMS DB for DB2 for z/OS stored procedures require the following software:

- One of the following versions of DB2:

- DB2 for z/OS Version 10.1 (5605-DB2) or later, with the DB2 SQLJ/JDBC driver
- DB2 for z/OS Version 9.1 (5635-DB2) or later, with the DB2 SQLJ/JDBC driver
- DB2 UDB for z/OS Version 8 (5625-DB2) or later, with the DB2 SQLJ/JDBC driver

To support Java application programs that access DB2 UDB for z/OS Version 8 subsystems from JMP or JBP regions, you must apply APAR/PTF PQ74629/UQ77540 to the DB2 subsystem.

- JDK 6.0 or later for DB2 UDB for z/OS Version 8 (5625-DB2), after applying APARPTF PK14609/UK10979
- The IMS Open Database Access (ODBA) component installed in the DB2 for z/OS environment
- The IMS DRA component installed in the DB2 for z/OS environment

Software requirements for Java applications that access IMS transactions

Java applications that access IMS transactions must meet specific software requirements.

- Java programs that run in JMP and JBP regions require Java Development Kit (JDK) 6.0 or later.
- For programs that access transactions using the IMS TM Resource Adapter, see the list of software requirements at www.ibm.com/software/data/ims/ims/components/tm-resource-adapter.html.

Open Database software requirements

To use the Open Database enhancements, IMS™ must be configured as an IMSplex and IMS Connect is required.

The Open Database enhancements require IMS Connect, as well as the following Common Service Layer (CSL) components:

- Operations Manager (OM)
- Structured Call Interface (SCI)
- Open Database Manager (ODBM)

Sysplex serialized program management

The sysplex serialized program management function requires an active Resource Manager with a resource structure defined. This requirement in turn means that you need a Common Service Layer installed.

The sysplex serialized program management function has the following software requirements:

- The following Common Service Layer components: Operations Manager, Structured Call Interface, and Resource Manager
- A resource structure defined in a coupling facility
- Shared message queues

Sysplex data sharing

IMS sysplex data sharing (including data caching, shared SDEPs, and shared VSO DEDB areas) requires IRLM Version 2.2 or later.

Type-2 command software requirements

To issue type-2 commands to IMS, you must configure IMS with a Common Service Layer (CSL) that contains at least the following two CSL components: an OM and a Structured Call Interface (SCI). Some type-2 commands (such as the type-2 commands associated with the Open Database function) have additional requirements.

Type-2 commands must be issued from an automated operator application program, such as the TSO single point of control (SPOC) application that is shipped with IMS. IMS provides two interfaces that such application programs can use to communicate with IMS: the Operations Manager (OM) application programming interface (API) and the REXX SPOC API.

By definition, one or more IMS systems with a CSL is an IMSplex. Therefore, to issue type-2 commands, IMS must be configured as an IMSplex, even if only a single IMS is involved. A single IMS that is configured as an IMSplex is also called an enhanced command environment.

CICS subsystems supported

CICS Transaction Server for z/OS Version 3.1 (5655-M15) or later can connect to either the IMS Version 12 Database Manager (DB) or, using the appropriate TM interface, the IMS Version 12 Transaction Manager.

DB2 for z/OS subsystems supported

The IMS Version 12 Transaction Manager can be connected to any of the following DB2 for z/OS products:

- DB2 for z/OS Version 10.1 (5605-DB2) or later
- DB2 for z/OS Version 9.1 (5635-DB2)
- DB2 UDB for z/OS Version 8 (5625-DB2) or later

To support Java application programs that access DB2 UDB for z/OS Version 8 subsystems from JMP or JBP regions, APAR/PTF PQ74629/UQ77540 must be installed on the DB2 subsystem.

IMS/DB2 Coordinated Disaster Recovery Support requires the IMS Version 12 Remote Site Recovery (RSR) feature, and requires the databases to be registered with Recovery Level Tracking (RLT).

Intersystem communications subsystems supported

The IMS Version 12 Transaction Manager can be connected to the following products by using intersystem communication (ISC):

- IMS Version 12 (5635-A03)
- IMS Version 11 (5635-A02)
- IMS Version 10 (5635-A01)
- CICS Transaction Server for z/OS Version 3.1 (5655-M15) or later
- User-written software

Multiple Systems Coupling subsystems supported

The IMS Version 12 Transaction Manager can be connected to the following versions of IMS by using MSC:

- IMS Version 12 (5635-A03)
- IMS Version 11 (5635-A02)
- IMS Version 10 (5635-A01)

Programming languages

IMS Version 12 is written in High Level Assembler Release 5, PL/X, C, C++, and JDK Version 6.

Programming languages supported

You can write IMS applications in the supported versions of the following languages:

- Ada
- COBOL for OS/390® & VM
- Enterprise COBOL for z/OS
- Enterprise PL/I for z/OS
- IBM High Level Assembler for z/OS & Java & z/VSE®
- Java, using the IBM 31-bit SDK for z/OS, Java Technology Edition, V6
- PL/I for z/OS and OS/390
- TSO/E REXX
- VS Pascal

- IBM Rational Application Developer
- z/OS C/C++

Requirement: The following languages require the IBM Language Environment® for z/OS:

COBOL for OS/390 & VM

PL/I for z/OS and OS/390

There is no change in IMS Version 12 that affects your ability to run OS/VS COBOL programs. OS/VS COBOL programs will not run under CICS Transaction Server for z/OS Version 3.1. This restriction is specific to that version of CICS; it does not apply to IMS.

The following restrictions pertain to OS/VS COBOL II:

- The OS/VS COBOL runtime library is no longer supported. Therefore, use the Language Environment for z/OS runtime instead. This includes code that will run in IMS dependent regions.
- The OS/VS COBOL compiler is no longer supported. If you must alter and recompile any OS/VS COBOL programs, you must use a supported COBOL compiler and make the appropriate changes to conform to the COBOL 74 standard. This includes IMS programs.

These restrictions do not pertain to IMS. They reflect the fact that technical support for the OS/VS COBOL compiler and runtimes is no longer available, so you should no longer use them. Existing OS/VS COBOL programs can run in z/OS regions (including IMS regions) that are using the new Language Environment COBOL runtime.

For information about running OS/VS COBOL programs with the Language Environment COBOL runtimes, see the *COBOL for OS/390 & VM V2R2 Compiler and Run-Time Migration Guide*, GC26-4764.

Application programs supported

All application programs that are supported under IMS Version 10 and IMS Version 11 are still supported under IMS Version 12.

Compatibility

IMS Version 12 can coexist with previous versions, so existing applications and data can be used without change. Migration and coexistence support is provided for IMS Version 10 and IMS Version 11.

Some general coexistence considerations are:

- Certain functions of IMS Version 12 can coexist with IMS Version 10 and IMS Version 11, with the appropriate coexistence APARs applied.
- You must build new application control blocks (ACBs) for all existing program specification blocks (PSBs) and database definitions (DBDs).
- An all-system generation and a cold start are required for online systems (DBCTL, DB/DC, DCCTL). All data sets must be formatted when IMS is initialized the first time.
- If you are installing multiple copies of IMS systems at different release levels in the same processor, the latest version of the IMS SVCs must be used by all the IMS systems.
- The IMS dump formatting module (DFSAMD0) installed in the host z/OS system must be from the most recent IMS release. The Offline Dump Formatter from IMS Version 12, IMS Version 11, or IMS Version 10 works without modification, if the appropriate formatter libraries are used.
- IMS Version 8 uses the IMS module DFSMRCL0 in the host z/OS system as a static resource cleanup module.

All versions later than IMS Version 8 use a dynamic resource cleanup module (DFSARC20). You do not need to install the static resource cleanup module (DFSMRCL0) on the host z/OS system for any IMS Version 9 or later system.

The DFSMRCL0 module is still shipped with IMS Version 9 and later as a precaution (in case you still have the DFSMRCL0 zap installed in IEAVTRML and the LPA pointing to the IMS SDFSRESL data set directly). The DFSMRCL0 module is available to ensure that z/OS can find it at IPL. DFSMRCL0 is not used by IMS Version 9 and later systems. DFSMRCL0 is needed only when running earlier versions of IMS.

Recommendation: Do not uninstall DFSMRCL0 from releases of IMS earlier than IMS Version 9 until both of the following conditions are true:

- Your migration to IMS Version 9 or later is complete.

- There is no possibility that you will run an earlier version of IMS.

DFSARC20 and the dynamic resource cleanup module (DFSARC20) can coexist on the same system.

- For DB/DC and DCCTL online systems, the MFS format library data set is a required data set, regardless of whether MFS is used. DBCTL systems do not require an MFS format library.
- Utilities and logs
You might need to change programs that process the log because some log records that are created by database changes have been modified.
- **Extended Checkpoint restriction:**
You cannot use extended checkpoint to restart applications across different releases of IMS.

Licensed program materials availability

This licensed program is available with source licensed program materials for some modules designated as “RESTRICTED MATERIALS OF IBM”. In addition, some modules are available without source licensed program materials. The modules are available in object code. The remaining modules are available with source licensed program materials.

The source licensed program materials are available as optional materials. They are written in Assembler and PL/I.

Supplemental terms

Designated machine identification

Designated Machine Identification Required: Yes.

Testing period

- Basic License: Two months
- DSLO License: Not applicable.

Installation/location license

- Not applicable. A separate license is required for each designated machine on which the licensed program materials will be used.

Usage restriction

- Not applicable.

Type/duration of program services

- IBM will provide Central Service, including the IBM Support Center, only through the customer location designated for the basic license until discontinued by IBM upon six months written notice.
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