IBM

Licensed Program
Specifications

**IBM Information Management System
Licensed Program Specifications
Release: Version 14
Product Number 5635-A05**

Information Management System (IMS™) 14 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 14 Database Manager (IMS DB) provides database management for transaction managers such as IMS 14 Transaction Manager and Customer Information Control System (CICS®). The IMS 14 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 14 Transaction Manager (IMS TM) provides a database-independent, transaction processing environment for database managers such as IMS 14 Database Manager and DB2® for z/OS.

The IMS 14 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 14 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.

Specified Operating Environment

Machine requirements

IMS 14 runs only in z/Architecture® mode on an IBM System z9® processor or later.

System console requirements

The console requirements of z/OS Version 2 Release 1 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 32760 bytes for the output of the Database Image Copy utility (DFSUDMP0) and the Online Database Image Copy utility (DFSUICP0).

Coupling facility requirements

A coupling facility level of 14 or later is required for the following IMS 14 functions:

- Operations Manager (OM) Audit Trail, if a coupling facility log stream is used
- Repository Server Audit Log, if a coupling facility log stream is used
- Resource Manager (RM), if a resource structure is used

- Shared-EMH support
- Shared queues
- Sysplex data sharing (including data caching and VSO data sharing) with Internal Resource Lock Manager (IRLM) V2.3

DASD requirements

IMS 14 hardware requirements include several requirements for DASD.

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.

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 V14.0*:

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

The following types of data sets can be allocated in the extended addressing space (EAS) of an extended address volume (EAV):

- GSAM database data sets
- BPE external trace data sets
- OSAM database data sets
- VSAM database data sets
- Online log data sets (OLDSs), including large OLDS (for example, greater than 64 KB tracks)
- Write ahead data sets (WADSs)
- Restart data sets (RDSs)
- Message queue blocks data sets
- Long and short message data sets
- Terminal devices with UNITYPE = SPOOL or DISK
- RESLIB data sets (IMS.SDFSRESL)
- MODBLKS data sets for online change (IMS.MODBLKSA and IMS.MODBLKSB)
- Application control block library (ACBLIB) data sets
- DBRC RECON data sets (non-PRA)
- Database Image Copy utility (DFSUDMP0) data sets
- Database Image Copy 2 utility (DFSUDMT0) data sets
- Database Change Accumulation utility (DFSUCUM0) data sets
- Local online change data sets (IMS.MODSTAT)
- Global online change data sets (IMS.OLCSTAT)
- Partitioned data set extended (PDSE) data sets (IMS.SDFSJLIB, PGMLIB, SMPLTS, and External Subsystem Attach Facility (ESAF) load libraries)
- Time-controlled operations (TCO) data sets
- System log data sets (SLDSs)
- Recovery log data sets (RLDSs)
- HALDB Indirect List data sets (ILDSs)
- IMS Repository data sets
- MFS map library data sets produced by the MFS Language and Service utilities (IMS.FORMAT)
- IMS Trace facility external trace data sets
- IMS Monitor output data sets

Large sequential data set support hardware requirements

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 be 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 (DFSMStvs). 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).

zIIP utilitization hardware requirements

One or more IBM System z Integrated Information Processors (zIIPs) must be online on the machine at the time an IMS Connect or IMS ODBM address space is started in order to have any threads zIIP eligible and executed on a zIIP for that execution instance.

If no zIIPs are online when the address space is started, no work will be moved to a zIIP.

Programming requirements

IMS 14 has base software requirements. Some individual functions have additional software requirements. For software requirements for individual functions, see *IMS Version 14 Release Planning* in the IBM Knowledge Center.

Operating system requirements

IMS 14 and its various functions have specific operating software requirements.

Before you install IMS 14, check with your IBM Support Center or check either Information/Access or Service Link for additional preventive service planning (PSP) information that you need to be aware of. The PSP upgrade name for IMS 14 is IMS1400.

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 V14.0.*

Base software requirements

The base IMS 14 system runs on z/OS Version 2 Release 1 or later. Certain features and functions have additional software requirements.

IMS 14 requires the following minimum version, release, or modification levels, as long as those versions remain available and supported by IBM:

- z/OS Version 2 Release 1 (5650-ZOS) or later
  - The use of zEnterprise Data Compression services by the IMS Database Image Copy utility (DFSUDMT0) is dependent on the installation of DFSMSdss APAR OA42238 (PTF UA74782) in z/OS 2.1.
- IRLM Version 2.3 or later (5635-A04), if data sharing is used. IRLM 2.3 is delivered with IMS 14.

  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 have 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 14 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 14 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 14 Remote Site Recovery (RSR) Recovery Level Tracking (RLT) feature.

Database Resource Adapter (DRA) software requirements

The version of the IMS DRA modules that are used by a DRA client must be the same version as the IMS with which the DRA client is communicating.

Data sharing software requirements

For block-level data sharing, IRLM Version 2.3 or later is required. The IRLM is an independent component that is shipped with IMS 14. 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.

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, OTMA must be enabled in IMS and IMS Connect must be configured for callout support.

Also, one of the following components that is external to IMS is required: IMS Enterprise Suite SOAP Gateway, IMS TM Resource Adapter, an IBM WebSphere DataPower appliance, or a user-written IMS Connect client (TCP/IP application).

IMS catalog function software requirements

If the IMS management of ACBs is enabled by ACBMGMT=CATALOG in the <CATALOG> section of the DFSDFxxx PROCLIB member, z/OS 2.1 APAR OA45400 for DFSMS must be applied via PTF UA73855.

Distributed environments that use the IMS catalog function can use either the IMS Universal drivers or the IBM IMS Data Provider for Microsoft .NET to access the catalog. The IMS catalog function supports the use of the IMS Universal drivers, IMS Data Provider for Microsoft .NET, traditional IMS database query techniques, or batch processing in the z/OS environment.

IMS management of ACBs function software requirements

If you are running IMS on z/OS 2.1, the IMS management of ACBs function requires z/OS 2.1 DFSMS APAR OA45400 applied via PTF UA73855.

ISC TCP/IP software requirements

The software requirements for the IMS 14 ISC TCP/IP function are:
- IBM CICS Transaction Server for z/OS, Version 5.1 (or later) must be used.
- IMS Connect is required to provide TCP/IP socket connection support for IMS.
- The Common Service Layer (CSL) with at least the Structured Call Interface (SCI) and the Operations Manager (OM) is required. SCI is required for communications between IMS and IMS Connect and OM is required for type-2 command support.
- A single point of control (SPOC) program, such as the IMS TSO SPOC, must be used to issue type-2 commands to the OM API or REXX SPOC API.
- For each IMS subsystem that uses dynamically defined terminals with ISC TCP/IP, the IMS Extended Terminal Option (ETO) is required.

IMS Connect software requirements

The software requirements for IMS Connect include:
- z/OS V12R1.0 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 IBM Knowledge Center.
- 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 Cryptographic Services System SSL Programming*, SC14-7495.

- 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, to ensure that IMS Connect can open ports.

IMS Connect XML Adapter support software requirements

The IMS Connect XML Adapter support in IMS 14, used with the IMS Enterprise Suite SOAP Gateway, requires IBM Rational® Application Developer for System z. Certain functions of the IMS Enterprise Suite SOAP Gateway might have additional software requirements.

Java application program support in IMS 14

Applications that run in or access IMS 14 must meet specific software requirements.

Software requirements for Java applications that access IMS databases

IMS 14 requires software to support Java™ application programs that access IMS databases.

IMS 14 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*.

In IMS 14, the IMS Universal drivers provide the IMS Java drivers and resource adapters.

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:
- IBM SDK, Java Technology Edition, Version 7.0.1 or later (31-bit or 64-bit)
- One or more of the following conditional requirements:
  - For CICS applications, IBM CICS Transaction Server for z/OS Version 5.1 (5655-Y04) or later, as determined by the JDK version
  - For DB2 stored procedures:

    - DB2 11 for z/OS (5605-DB2) or later
    - DB2 10 z/OS (5605-DB2) or later
  - For WebSphere applications, WebSphere Application Server for z/OS (5655-W65) or WebSphere Application Server for distributed platforms (5724-J08), Version 8.5 or later, as determined by the supported JDK level
- RACF or an equivalent product
- The software requirements for the JDR resource adapter are the same as for the IMS Universal drivers.

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 for Development.

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) 7.0 or later.
- For programs that access transactions using the IMS TM Resource Adapter, see the topic "Supported versions and software configurations" in the IMS TM Resource Adapter information in IBM Knowledge Center.

Open Database software requirements

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

The Open Database solution requires IMS Connect, as well as the following Common Service Layer (CSL) components:
- Operations Manager (OM)
- Structured Call Interface (SCI)
- Open Database Manager (ODBM)

Parallel RECON access software requirements

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

SQL support software requirements

For IMS to process SQL calls in the native host environment, COBOL Version 5 with IMS coprocessor support is required. With COBOL

Version 5, all load modules must reside within a partitioned data set extended (PDSE).

IMS catalog must be enabled for this SQL support.

User exit enhancements software requirements

Exits to be queried or refreshed using type-2 commands must first be defined in the <USER_EXITS> section of the DFSDFxxx member of the IMS PROCLIB data set.

Some user exits are passed a standard user exit parameter list (SXPL), mapped by macro DFSSXPL. The SXPL contains a version number that can be used to identify which fields are present in the parameter list. If your user exit accesses a field that was added at a specific version of the parameter list beyond the base level for an IMS release, you should test the SXPL version number to ensure that the parameter list you were passed is at the correct version or higher before using the field.

In IMS 14, some older user exits are always passed a version 1 SXPL. All other user exits that are passed an SXPL will receive at least a version 6 SXPL.

IMS Enterprise Suite software requirements

IMS Enterprise Suite provides APIs, tools, a mobile solution, and a web service solution for facilitating application development and extending access to IMS transactions and data.

IMS 14 can be used with the following versions of IMS Enterprise Suite, although some components or functions might have specific IMS requirements: IMS Enterprise Suite V3.2 or IMS Enterprise Suite V3.1.

CICS subsystems supported

CICS Transaction Server for z/OS can connect to IMS if minimum version requirements are met. Certain IMS 14 functions might include additional version requirements for CICS.

CICS Transaction Server for z/OS Version 4.1 (5655-S97) or later can connect to either the IMS 14 Database Manager (DB) or, using the appropriate TM interface, the IMS 14 Transaction Manager.

The IMS Universal drivers require CICS Transaction Server for z/OS Version 4.1 (5655-S97) or later.

For the ISC TCP/IP function, IBM CICS Transaction Server for z/OS Version 5.1 or later, the Extended Terminal Option (ETO) feature, and IMS Connect are required.

IBM CICS Transaction Server for z/OS Version 4.2 is required to support the CICS open transaction environment (threadsafe). CICS Version 4.2 takes advantage of the DRA open thread TCB option that was added by IMS Version 12 APAR/PTF PM31420/UK70991.

DB2 for z/OS subsystems supported

The IMS 14 Transaction Manager can be connected to any of the following DB2 products:
- DB2 11 for z/OS Version 10.1 (5615-DB2) or later
- DB2 10 for z/OS (5605-DB2)

IMS/DB2 Coordinated Disaster Recovery Support requires the IMS 14 Remote Site Recovery (RSR) feature, and requires the databases to be registered with Recovery Level Tracking (RLT).

IBM MQ subsystems supported

IMS 14 supports IBM MQ.

IBM MQ for z/OS V7.0.1 introduces the MQ message expiry option to interface the IMS transaction expiration function.

IBM MQ for z/OS V7.1 enhances the support for MQ message expiry and adds support for the OTMA protocol messages for resource monitoring.

Intersystem communication (ISC) subsystems supported

The IMS 14 Transaction Manager can be connected to the following products by ISC:
- IMS Version 13 (5635-A04)
- IMS Version 12 (5635-A03)
- CICS Transaction Server for z/OS Version 3.2 (5655-M15) or later

  For the ISC TCP/IP function, IBM CICS Transaction Server for z/OS Version 5.1 or later and IMS Connect are required.
- User-written software

Programming languages used to write IMS 14

IMS 14 is written in High Level Assembler Release 6, PL/X, C, C++, and JDK Version 7.

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, V7
- PL/I for z/OS and OS/390
- TSO/E REXX
- VS Pascal
- z/OS C/C++

Application programs supported

All application programs that are supported under IMS Version 13 and IMS Version 12 are still supported under IMS 14.

Compatibility

Although IMS 14 can coexist with earlier versions of IMS, general coexistence considerations apply.

IMS 14 can coexist with earlier versions, so existing applications and data can be used without change. Migration and coexistence support is provided for IMS Version 12 and IMS Version 13.

The following general coexistence considerations apply:

- 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 versions of IMS systems in the same processor, you can continue to use the prior versions of the IMS SVCs with the prior versions of IMS. However, the IMS 14 SVCs are downward compatible with IMS Version 12 and IMS Version 13. Only IMS 14 requires the IMS 14 SVCs.
- As of IMS Version 11, IMS uses a dynamic abend dump formatting module (DFSAFMX0). If you are running only versions of IMS that are Version 11 or later, you do not need to install the static abend dump formatting module (DFSAFMD0) on the host z/OS system. If you want to have IMS online dump formatting, and your z/OS system is running any jobs (either online or batch) for IMS Version 10 or earlier, the DFSAFMD0 module must be installed on the z/OS system.
- As of IMS Version 13, the old IMS static resource cleanup module, DFSMRCL0, is no longer shipped with IMS. DFSMRCL0 was used in IMS Version 8 and earlier. All currently supported versions of IMS use a dynamic resource cleanup module (DFSMRC20). **Recommendation:** If you have not already done so, remove the DFSMRCL0 zap installed in IEAVTRML and the LPA direct pointer to the IMS SDFSRESL data set.
- For DB/DC and DCCTL online systems, the MFS format library 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. For a list of the log records that are changed for IMS 14, see the topic "New, changed, and deleted log records" in IBM Knowledge Center.
- Extended checkpoint restriction: You cannot use extended checkpoint to restart applications across different releases of IMS.

Licensed program materials availability

Restricted materials - Yes. 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

- Distributed Systems License Option (DSLO) License: Not applicable.

Location license

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

Use-based charges/usage restriction

- Not applicable.

Type/duration of program services

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