IMS
15 .4

Licensed Program Specifications

GC27-6799-03

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Chapter 1. Specified Operating Environment

Machine requirements

IMS 15.4 has base hardware requirements. Some individual functions have additional hardware requirements.

Processor requirements

IMS 15.4 runs only in z/Architecture® mode on an IBM System zEC12 processor or later. IMS 15.4 is the last IMS release that supports running on an IBM System zEC12 or zBC12 (machine type 2827 or 2828).

The following table lists the processors supported by IMS 15.4.

Table 1. Supported IBM processors for IMS 15.4

Machine name	Machine type
IBM zEnterprise® EC12 (zEC12)	2827
IBM zEnterprise BC12 (zBC12)	2828
IBM z13®	2964
IBM z13s®	2965
IBM z14	3906
IBM z14 ZR1	3907
IBM z15®	8561
IBM z15 T02	8562
IBM z16™	3931
IBM z16 A02	3932

System console requirements

The console requirements of z/OS® Version 2 Release 4 or later apply.

Tape unit requirements

IMS supports IBM 3590 and later tape units (or equivalent products) for installation and maintenance. IMS supports 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

IMS 15.4 is the last IMS release that supports coupling facility levels associated with IBM zEC12 and zBC12 processor types (CF levels 18 through 19).

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

A coupling facility level of 18 or later is required for the following functions:

- Operations Manager (OM) Audit Trail, if a coupling facility log stream is used
- Parallel RECON access support

- 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 15.4 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 data sets IMS.SDFSRESL and IMS.SDFSJLIB 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).

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 V15.04.00*:

- 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 Fiber 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.

Terminals and equipment support

IMS 15.4 supports SLU, LU, NTO, 3270, and Finance (3600) terminals, as well as other equipment such as printers and DASD devices.

The following tables list the terminals and other equipment supported by IMS 15.4.

In the table, the following abbreviations are used:

DSC
Data Stream Compatibility

ISC
Intersystem Communication

LU
Logical Unit

NTO
Network Terminal Option

PC
Personal Computer

PP
Program Product

SLU
Secondary Logical Unit

TTY
Teletypewriter equipment

VTAM
Virtual Telecommunications Access Method

Table 2. Terminals that are supported by IMS 15.4

Compatible product	SNA	Notes®
SLU 1 (for example, 3230, 3232, 3262, 3287, 3767, 3268, 3770, 3770P, 3790 (type 2 batch and bulk print), 4700, 5280, 5550, S/32, S/34, S/38, 8100)	VTAM	1, 2
SLU 2 (for example, 3179, 3180, 3276, 3278, 3279, 3290, 3790 (3270 DSC feature), 3600 Admin PP, 4700, 5280, 5520, 5550, 8100, 8775, S/34, Display writer)	VTAM	1, 2
SLU P (for example, 3600, 3630, 3650, 3680, 3770PC, 3790, 4700, 4730, 4736, 5520, 8100, S/34, Series/1)	VTAM	1, 2, 3, 4
LU 6.1 (ISC)	VTAM	1, 2
LU 6.2 (APPC)	VTAM	2
NTO (for example, 33/35, TTY, 2740, 2741, 3101, 3232, 3767, S/23)	VTAM	1, 2

Notes:

1. The IMS Message Format Service (MFS) is available for this device. MFS editing can be bypassed on a message-by-message basis.
2. IMS Fast Path supports the use of compatible terminals.
3. Although IMS provides sample code for this terminal, additional user coding is required.
4. IMS provides no device-resident code for this device. Additional user coding is required to attach it to IMS.

Table 3. Terminals that are supported by IMS 15.4, but withdrawn from IBM Marketing

IMS-supported product	Compatible product	Switched mode	Polled mode	Local mode	SNA	Notes
3270		VTAM	VTAM	VTAM	VTAM	1, 2
Finance (3600)	4700				VTAM	1, 2, 3

Notes:

1. The IMS Message Format Service (MFS) is available for this device. MFS editing can be bypassed on a message-by-message basis.
2. IMS Fast Path supports the use of compatible terminals.
3. Although IMS provides sample code for this terminal, additional user coding is required.

For the following table, refer to operating system descriptions for specific device types.

Table 4. Other equipment that is supported by IMS 15.4

IMS-supported product	Access
System console	MVS™ write-to-operator/write-to-operator-with-reply (WTO/WTOR)
Spool device	Basic Sequential Access Method (BSAM)
Card reader	BSAM
Printer	BSAM
Magnetic tape	BSAM
DASD devices	BSAM

Restriction: IMS 15.4 does not support BTAM devices (2740-1, 2740-2, 2741, 2780, System/3, and System/7).

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, IMS ODBM, or IMS CQS 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 15.4 has base software requirements. Some individual functions have additional software requirements.

Operating software requirements

IMS 15.4 and its various functions have specific operating software requirements.

Before you install IMS 15.4, 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 15.4 is IMS1540.

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 V15.04.00*.

Base software requirements

The base IMS 15.4 system runs on z/OS Version 2 Release 4 or later. Certain features and functions have additional software requirements.

IMS 15.4 requires the following minimum version, release, or modification levels:

- z/OS Version 2 Release 4 (5650-ZOS), or later
  - The following APARs must be installed:
    - If you are using z/OS 2.4, the following z/OS APARs must be installed for data privacy for diagnostics support for IMS 64-bit storage:
      - OA57570
      - OA57633

      for IBM z/OS Workload Interaction Correlator support:
      - OA57165

- For z/OS data set encryption support, one of the following DFSMS versions:
  - DFSMS 2.4 with APAR OA60688
  - DFSMS 2.5 or above

– RACF®, or an equivalent product, if security is used. RACF is available with the IBM Security Server for z/OS (a separately orderable feature of z/OS V2R4).
– IBM High-Level Assembler Toolkit, a separately orderable feature of z/OS V2R4.

- IRLM Version 2.3 (5635-A06) or later, if data sharing is used. IRLM Version 2.3 is delivered with IMS 15.4.

  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 15.4 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.

Restrictions: The VM environment has the following restrictions:

- The Log Analysis utilities might yield inaccurate time-stamp results.
- If you operate the IMS 15.4 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.

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.

Recommendations:

- Concatenate the IMS.SDFSRESL library to the DRA client step library so the correct version of the DRA Startup/Router routine (DFSPRRC0) is loaded into the DRA client load library.
- Ensure that the DRA Startup Table (DFSPZPxx) points to the correct version of IMS.SDFSRESL.

Data sharing software requirements

For block-level data sharing, IRLM Version 2.3 (5635-A06) or later is required. The IRLM is an independent component that is shipped with IMS 15. The IRLM must be defined as a z/OS subsystem. Block-level data sharing of databases is supported between all in-service levels 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 configured for callout support.

You also need one of the following external components:

- The IMS Enterprise Suite SOAP Gateway

- The IMS TM Resource Adapter
- An IBM WebSphere® DataPower® appliance
- A user-written IMS Connect client (TCP/IP application)

IMS Connect software requirements

The software requirements for IMS Connect include:

- z/OS Communications Server V2R4.0 or later (TCP/IP).
- To implement security, z/OS Security Server RACF or an equivalent product.
- 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

The IMS Connect XML Adapter support in IMS 15.4, used with the IMS Enterprise Suite SOAP Gateway, requires IBM Developer for System z . Certain functions of the IMS Enterprise Suite SOAP Gateway might have additional software requirements.

Java application program support in IMS 15.4

Applications that run in or access IMS 15.4 must meet specific software requirements.

Software requirements for Java applications that access IMS databases

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

IMS 15.4 requires the following software:

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

In IMS 15.4, the IMS Universal drivers provide the IMS Java drivers and database resource adapters.

Note: The IMS Java dependent region (JDR) resource adapter reuses some of the interfaces and classes in the IMS Universal drivers. As a result, it is packaged as part of the IMS Universal drivers and has the same software requirements as the IMS Universal drivers.

The IMS Universal drivers have the following runtime software requirements:

- IBM SDK, Java Technology Edition, Version 8.0.2.10 or later (31-bit or 64-bit), available from IBM Support Fix Central.
- One or more of the following conditional requirements:
  - For CICS® applications, IBM CICS Transaction Server for z/OS Version 5.4 (5655-Y04), or later, as determined by the JDK version
  - For Db2® stored procedures, Db2 12 for z/OS (5650-DB2®) or later
  - For WebSphere applications, WebSphere Application Server for z/OS (5655-W65) or WebSphere Application Server for distributed platforms (5724-J08), Version 8.5.5 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.

Note: Use binary-mode FTP to transfer the IMS Universal drivers JAR or RAR files to another system.

JAR and RAR files for type-4 connectivity

The following table describes the JAR and RAR files that provide type-4 connectivity for the IMS Universal drivers:

Table 5. Type-4 connectivity JAR and RAR files for Java applications that use the IMS Universal drivers

Driver	JAR or RAR file
IBM IMS Universal DL/I driver	*pathprefix*/usr/lpp/ims/ims154/imsjava/imsudb.jar
IBM IMS Universal JDBC driver	*pathprefix*/usr/lpp/ims/ims154/imsjava/imsudb.jar
IBM IMS Universal Database resource adapter	• For use within WebSphere Application Server (both z/OS and distributed platforms): • For JCA/JDBC local transaction processing only: *pathprefix*/usr/lpp/ims/ims154/imsjava/rar/imsudbJLocal.rar • For JCA/JDBC two-phase (XA) commit processing or local transaction processing: *pathprefix*/usr/lpp/ims/ims154/imsjava/rar/imsudbJXA.rar • For CCI local transaction support: *pathprefix*/usr/lpp/ims/ims154/imsjava/rar/imsudbLocal.rar • For CCI two-phase commit (XA) transaction support: *pathprefix*/usr/lpp/ims/ims154/imsjava/rar/imsudbXA.rar

JAR and RAR files for type-2 connectivity

The following table describes the JAR and RAR files that provide type-2 connectivity for the IMS Universal drivers:

Table 6. Type-2 connectivity JAR and RAR files for Java applications that use the IMS Universal drivers

Driver	JAR file
IMS Universal DL/I driver	*pathprefix*/usr/lpp/ims/ims154/imsjava/imsudb.jar
IMS Universal JDBC driver	*pathprefix*/usr/lpp/ims/ims154/imsjava/imsudb.jar

Table 6. Type-2 connectivity JAR and RAR files for Java applications that use the IMS Universal drivers (continued)

Driver	JAR file
IMS Universal Database resource adapter	For use within WebSphere Application Server (both z/OS and distributed platforms): • For CCI programming interface to perform SQL or DL/I data operations: *pathprefix*`/usr/lpp/ims/ims154/imsjava/rar/imsudbLocal.rar` • For JDBC programming interface to perform SQL data operations: *pathprefix*`/usr/lpp/ims/ims154/imsjava/rar/imsudbJLocal.rar`

When **DriverType=***2*:

- The transaction scope is local (a unit of work is scoped to a particular connection). Multiple connections can have independent units of work associated with each connection.
- Application programs can issue local commit and rollback calls through either the JDBC Connection interface or the CCI LocalTransaction interface.
- ContainerManaged beans are supported, but require the following properties to be set in the EJB Deployment Descriptor:
  - In the Bean tab, specify the following properties under the LocalTransaction heading:
    - **Boundary =** *BeanMethod*
    - **Resolver =** *ContainerAtBoundary*
    - **Unresolved action =** *Rollback*
  - In the Assembly tab, set the transaction scope to *NotSupported*.

When **DriverType=***2_CTX*:

- Specifies a global scope transaction model in which a unit of work can span multiple bean methods. RRS-managed transaction applications use this driver type. The container coordinates commit and rollback processing through RRS.
- Application programs can use the UserTransaction interface for explicit commit and rollback calls.

Software requirements for Java applications that access IMS transactions

- Java programs that run in Java message processing (JMP) and Java batch processing (JBP) regions require Java Development Kit (JDK) 8.0.2.10 or later (31-bit or 64-bit), available from IBM Support Fix Central.
- For programs that access transactions using the IMS TM Resource Adapter, see supported versions and software configurations.

The JAR file `imsudb.jar` is needed to support JMP and JBP regions.

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)

Important: Open Database Manager (ODBM) can only connect to the IMS systems that are of the same version as ODBM itself. In a mixed-version IMSplex, to limit ODBM connection to the IMS systems of the same version, list the eligible IMS systems as data stores in the CSLDC*xxx* member of the IMS PROCLIB data set.

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 separately orderable feature of z/OS.

SQL support software requirements

For IMS to process SQL calls in the native host environment, COBOL Version 6.2 (5655-EC6) or later with IMS coprocessor support is required. With COBOL Version 6.2 (5655-EC6) or later, all load modules must reside within a partitioned data set extended (PDSE). The 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 DFSDF*xxx* 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 what 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 15.4, some older user exits are always passed a version 1 SXPL. All other user exits that are passed an SXPL receive a version 6 or later SXPL.

IMS Enterprise Suite software requirements

IMS 15.4 can be used with the following versions of IMS Enterprise Suite, although some components or functions might have specific IMS requirements.

- IMS Enterprise Suite for Distributed Systems V3.3
- IMS Enterprise Suite V3.2

CICS subsystems supported

CICS Transaction Server for z/OS Version 5.4 (5655-Y04) or later can connect to either the IMS 15.4 Database Manager (DB) or, using the appropriate TM interface, the IMS 15.4 Transaction Manager.

Db2 for z/OS subsystems supported

The IMS 15.4 Transaction Manager can be connected to any of the following Db2 products:

- Db2 12 for z/OS (5650-DB2) or later

IBM MQ subsystems supported

IMS 15.4 supports IBM MQ Version 9.1 (5724-H72) or later.

Intersystem communication (ISC) subsystems supported

Using Intersystem Communication (ISC), the IMS 15 Transaction Manager can be connected to IMS 15 and earlier systems, to IBM CICS Transaction Server for z/OS, and to user-written software.

The IMS 15 Transaction Manager can be connected to the following products by using ISC:

- IMS 15 (5635-A06) at any IMS 15 release level
- IMS 14 (5635-A05)
- IMS Version 13 (5635-A04)
- IBM CICS Transaction Server for z/OS Version 5.4 (5655-Y04) or later

  For the ISC TCP/IP function, IMS Connect is required.
- User-written software

Programming languages used to write IMS 15.4

IMS 15.4 is written in High Level Assembler Release 6, PL/X, C, C++, and JDK Version 8.

Programming languages supported

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

- Ada
- COBOL for OS/390® & VM
- Enterprise COBOL for z/OS

  If you use Enterprise COBOL for z/OS Version 6.2 or later, the data set that holds the output load modules of the compiler must be a PDSE.

  For the latest version of COBOL for z/OS that is supported for a particular version of z/OS, see Product lifecycle details for Enterprise COBOL for z/OS.
- Enterprise PL/I for z/OS
- IBM High Level Assembler for z/OS & z/VM® & z/VSE®
- Java, using the IBM SDK for z/OS, Java Technology Edition, V8.0.2.10 (31-bit or 64-bit), available from IBM Support Fix Central.
- PL/I for z/OS and OS/390
- TSO/E REXX
- VS Pascal
- z/OS C/C++

Application programs supported

IMS 15.4 supports application programs that are supported by IMS Version 13 and IMS 14 and all earlier releases of IMS 15.

All application programs that are supported under IMS Version 13 and IMS 14 and all earlier releases of IMS 15 are still supported under IMS 15.4. In general, you should not have to recompile, reassemble, or rebind an IMS application program to run under IMS 15.4.

Compatibility

Although IMS 15.4 can coexist with earlier versions of IMS, general coexistence considerations apply.

Compatibility with an earlier IMS 15 release

Because all releases of IMS within the version IMS 15 use a single set of SMP/E function modification identifiers (FMIDs), you do not need to perform a full installation of IMS to migrate from an earlier release of IMS 15 to IMS 15.4. Instead, you apply APAR/PTFs to migrate to IMS 15.4 if you are already using IMS 15.

Compatibility with an earlier IMS version than IMS 15

IMS 15.4 can coexist with earlier versions, so existing applications and data can be used without change. Migration and coexistence support is provided for IMS Version 13 and IMS 14.

The following general migration and coexistence considerations apply when you migrate from IMS Version 13 or IMS 14 to IMS 15.4:

- 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. To ensure that the data sets are formatted, specify the **FORMAT ALL** keywords on the cold start command (**/NRESTART CHECKPOINT 0** or **/ERESTART COLDSYS**).
- If you are installing multiple versions of IMS 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 15 SVCs are downward compatible with IMS Version 13 and IMS 14. Only IMS 15 requires the IMS 15 SVCs. The IMS 15 routines are the same for all available IMS 15 releases.
- 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 new, deleted, or changed for IMS 15.4, see Log record changes in Log record changes in IMS 15.4.
- 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/X.

Chapter 2. Supplemental terms

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.

Redistribution of code for IMS

This document includes information about certain language interface modules that are intended to be bound or otherwise included with code and run on IMS subsystems. In connection with your authorized use of IMS, you may include these language interface modules in your modules and distribute your modules with the included language interface modules for the purposes of developing, using, marketing and distributing programs conforming to the documented programming interfaces for IMS, provided that each language interface module is included in its entirety, including any IBM copyright statements. The language interface modules referred to here are:

- DFSCDLI0
- DFSCPIR0
- DFSCSI00
- DFSLI000
- DFSREXX1
- DFSYCRET

Use-based charges/usage restriction

- Not applicable.

Type/duration of program services

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