

IBM Enterprise COBOL for z/OS  
6.5

*Licensed Program Specifications*



**First edition (June 2025)**

This edition applies to Version 6.5 of IBM® Enterprise COBOL for z/OS® (program number 5655-EC6) and to all subsequent releases and modifications until otherwise indicated in new editions. Make sure that you are using the correct edition for the level of the product.

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# Contents

**Chapter 1. IBM Enterprise COBOL for z/OS 6.5 Licensed Program Specifications .....1**

- Overview.....1
  - Features of Enterprise COBOL for z/OS made available through continuous delivery.....2
- Specified operating environment for Enterprise COBOL..... 3
- Industry standards supported by Enterprise COBOL for z/OS 6.5..... 3
- Compatibility with previous product releases.....5
- Security, auditability, and control..... 6
- Licensed program materials availability .....6
- Supplemental terms .....6
- Notices.....7
- Warranty and trademarks..... 8



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# Chapter 1. IBM Enterprise COBOL for z/OS 6.5 Licensed Program Specifications

## Overview

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IBM Enterprise COBOL for z/OS is an advanced optimizing compiler that helps you create, modernize, and maintain mission-critical COBOL applications that execute on IBM z/OS and take advantage of the latest IBM z17 hardware features. The applications that are created using Enterprise COBOL for z/OS can interoperate with transactional and data systems such as IBM CICS®, IBM Db2®, and IBM IMS. The COBOL compiler helps your existing COBOL applications work with modern infrastructure technologies, such as mobile, web, and cloud, with native support for JSON, XML, and Java™.

Over the course of multiple releases, Enterprise COBOL for z/OS has offered new functions to provide the tools to help maximize your IBM Z® hardware ROI and improve the performance of your business-critical applications.

New capabilities in Enterprise COBOL for z/OS 6.5 include the following:

### Support for the latest IBM z17 architecture

- Enterprise COBOL for z/OS 6.5 introduces the ARCH(15) option allowing you to generate application code to leverage the latest IBM z17 hardware architecture. Obtain immediate support for the features in the IBM z17 architecture without the need for any source code changes.
- Enterprise COBOL for z/OS 6.5 is designed to use the IBM z17 **vector packed-decimal enhancement facility 3** to help reduce CPU resources for applications that use the **NUMCHECK** compiler option.
  - When you upgrade to Enterprise COBOL for z/OS 6 from Enterprise COBOL for z/OS 4 or earlier, IBM recommends that you use the **NUMCHECK** compiler option to identify invalid data for packed and zoned decimal data items. Because this option has performance impacts, IBM recommends a second compile with **NONUMCHECK** before deploying to production. If an additional recompile with **NONUMCHECK** is not feasible, Enterprise COBOL for z/OS 6.5 is designed to take advantage of IBM z17 hardware to help reduce CPU usage of programs compiled with **NUMCHECK** compared to Enterprise COBOL for z/OS 6.4.
- Enterprise COBOL for z/OS 6.5 is designed to use the IBM z17 **vector enhancement facility 3** to help reduce C®PU and speed up binary computations for applications that use the following binary data items that are equivalent for all BINARY data and commonly used in inter-language applications as this is the closest COBOL type to the integers found in languages like Java, C, and PL/I:
  - COMP-5 data items
  - COMP, BINARY, or COMP-4 data items when the TRUNC(BIN) compiler option is set

### VSAMDB (NoSQL database) support

- Enterprise COBOL for z/OS 6.5 has historically supported relational databases such as IBM Db2 and IBM IMS. Enterprise COBOL for z/OS 6.5 introduces support for a modern, unstructured NoSQL database (VSAMDB). Until now, NoSQL databases have not been easily accessible in COBOL. NoSQL databases enable the storage and querying of data outside the traditional structures found in relational databases. They are designed to store data in a flexible manner, allowing for easier adaptation to evolving data structures and rapid application development. NoSQL databases are well-suited for storing and managing diverse data formats.
- Enterprise COBOL for z/OS 6.5 supports reading, writing, updating, and deleting of JSON documents in a VSAMDB file using COBOL's file processing statements. This function is compatible with IBM EzNoSQL for z/OS data.

- You can connect to a flexible and easily maintainable EzNoSQL database (VSAMDB) directly from COBOL. You can access the same data through both [IBM EzNoSQL for z/OS](#) (which provides modern Python, Java, C, assembler APIs to VSAMDB) and IBM Enterprise COBOL for z/OS 6.5 through support for VSAMDB. Applications can share a NoSQL database (VSAMDB) between Python, Java, C, assembler, and COBOL programs. These programs can all read, write, update, and delete the same JSON document in a VSAMDB file.
- The VSAMDB feature helps you modernize your mission-critical COBOL applications.

### **User-defined types**

- User-defined types, which are common in other programming languages are now available in Enterprise COBOL for z/OS 6.5. These user-defined type definitions act like templates that can then be reused, using the TYPE clause, to define new data items. The new data item acquires all the characteristics of the user-defined type. User-defined types are elementary or group items defined in the WORKING-STORAGE, LOCAL-STORAGE, LINKAGE, or FILE section of a program, using the TYPEDEF clause.
- User-defined types can help save you time and minimize source code because you don't have to redefine complex data structures that occur as part of the definition of two or more data items within your program. All you need to do is create one definition, and apply it to any subsequent definitions of the same type that you might need.
- User-defined types extend the functionality of existing business-critical applications and improve code modularity.

### **Binary metadata (SMARTBIN)**

- For applications that are not in active development and do not get recompiled regularly, you can avoid the need to recompile to get performance gains. Enterprise COBOL for z/OS 6.5 produces binary metadata by default so that code recompiled today can be optimized by IBM Automatic Binary Optimizer for z/OS in the future.
- The creation of binary metadata (SMARTBIN files) helps to improve integration with IBM Automatic Binary Optimizer for z/OS. You can invest in your future so that modules you compile today can take advantage of future IBM Z hardware enhancements, without having to be recompiled.

## **Features of Enterprise COBOL for z/OS made available through continuous delivery**

IBM Enterprise COBOL for z/OS 6.5 supports the continuous delivery (CD) model. Through continuous delivery, new features and enhancements are included in Program Temporary Fixes (PTFs) along with corrective and preventative service. You receive new features and enhanced capabilities as soon as the code is ready. You benefit in receiving enhancements in a faster and more continuous way without waiting for the next release.

Enterprise COBOL for z/OS 6.5 includes all of the Enterprise COBOL for z/OS 6.4 features delivered through continuous delivery.

For a list and description of these features, refer to [What is new in Enterprise COBOL for z/OS 6.4 and COBOL 6.4 with PTFs installed](#)

Enterprise COBOL for z/OS 6.5 continues the IBM commitment to the COBOL programming language on IBM Z through investment in new compiler technology and the continuous delivery of new features. With Enterprise COBOL for z/OS 6.5, you gain the benefit of new investment that is combined with more than 60 years of IBM experience in compiler development.

## Specified operating environment for Enterprise COBOL

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This section lists the hardware and software requirements for IBM Enterprise COBOL for z/OS 6.5

### Hardware requirements

At the time of general availability, the minimum required hardware prerequisite for Enterprise COBOL for z/OS 6.5 is IBM z13<sup>®</sup> or subsequent 64-bit IBM z/Architecture<sup>®</sup> processors. The basic requirement is a processor that supports the prerequisite operating system and has sufficient processor storage to meet the requirements of the operating system, Enterprise COBOL for z/OS 6.5, and all other relevant software.

Further information on the machine requirements for Enterprise COBOL for z/OS 6.5 are available on the [Software Product Compatibility Reports](#) website.

### Software requirements

The minimum required level of operating system for Enterprise COBOL for z/OS 6.5 is IBM z/OS 2.5 (5650-ZOS).

Further information on the software requirements for Enterprise COBOL for z/OS 6.5 are available on the [Software Product Compatibility Reports](#) website.

## Industry standards supported by Enterprise COBOL for z/OS 6.5

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IBM Enterprise COBOL for z/OS 6.5 supports the following industry standards.

### ISO Standards

- ISO1989:1985, Programming Languages - COBOL
- ISO/IEC1989/AMD1:1992, Programming Languages - COBOL: Intrinsic function module
- ISO/IEC1989/AMD2:1994, Programming Languages - Correction and clarification amendment for COBOL
- ISO/IEC 1989:2002, Information technology - Programming languages - COBOL (partial support)
- ISO1989:1985 is identical to ANSI INCITS 23-1985 (R2001), Programming Languages - COBOL
- ISO/IEC1989/AMD1:1992 is identical to ANSI INCITS 23a-1989 (R2001), Programming Languages - Intrinsic Function Module for COBOL
- ISO/IEC1989/AMD2:1994 is identical to ANSI INCITS 23b-1993, Programming Language - Correction Amendment for COBOL
- ISO/IEC1989:2002 is identical to ANSI INCITS 1989-2002 (R2013), Information technology - Programming languages COBOL (partial support)
- ISO/IEC 1989:2014 is identical to ANSI INCITS 1989-2014, Information technology - Programming languages, their environments and system software interfaces - Programming language COBOL (partial support)

For supported modules, see American National Standards below.

- International Reference Version of the ISO 7-bit code defined in *International Standard 646, 7-Bit Coded Character Set for Information Interchange*

### American National Standards

- ANSI INCITS 23-1985 (R2001), Programming Languages - COBOL
- ANSI INCITS 23a-1989 (R2001), Programming Languages - Intrinsic Function Module for COBOL
- ANSI INCITS 23b-1993 (R2001), Programming Language - Correction Amendment for COBOL
- ANSI INCITS 1989-2002 (R2013), Information technology - Programming languages COBOL (partial support)

- ANSIINCITS 1989-2014, Information technology - Programming languages, their environments and system software interfaces - Programming language COBOL (partial support)

The 7-bit coded character set defined in American National Standard X3.4-1977, Code for Information Interchange.

All required modules are supported at the highest level defined by the 85 COBOL Standard. In the following list, the shorthand notation for describing module levels is shown in parentheses. For example, to summarize module information for sequential input and output, the shorthand notation is (2 SEQ 1,2). The first digit indicates the level of language elements within the module supported by Enterprise COBOL. Next is the three-character abbreviation of the module name as used in the standard. Finally, the two digits separated by a comma indicate the minimum and maximum levels of the module. For example, (2 SEQ 1,2) means that Enterprise COBOL supports the sequential I-O module at level 2, while the range of levels in the module is from 1 (minimum) to 2 (maximum).

- Nucleus (2 NUC 1,2)

Provides internal processing of data within the four basic divisions of a program and the capability for defining and accessing tables.

- Sequential I-O (2 SEQ 1,2)

Provides access to records of a file in established sequence. The sequence is established as a result of writing the records to the file.

- Relative I-O (2 REL 0,2)

Provides access to records in either a random or sequential manner. Each record is uniquely identified by an integer specifying the record's logical position in a file.

- Indexed I-O (2 INX 0,2)

Provides access to records in either a random or sequential manner. Each record in an indexed file is uniquely identified by the value of a key within that record.

- Sort-Merge (1 SRT 0,1)

Orders one or more files of records, or combines two or more identically ordered files of records, according to a set of user-specified keys.

- Inter-Program Communication (2 IPC 1,2)

Allows a COBOL program to communicate with other programs through transfers of control and access to common data items.

- Source Text Manipulation (2 STM 0,2)

Allows the insertion of source program text as part of the compilation of the source program. COBOL libraries contain texts which are available to the compiler at compile time and which can be treated by the compiler as part of the source program.

In addition, the following optional modules of the standard are supported:

- Intrinsic Functions (1 ITR 0,1)

Provides the capability to reference a data item whose value is derived automatically at the time of reference during the execution of the object program.

- Debug (1 DEB 0,2)

Monitors object program execution through declarative procedures, special debugging lines, and a special register, DEBUG-ITEM, which gives specific information about execution status.

- Segmentation (2 SEG 0,2)

Refreshes independent segments when required.

The following optional module of the standard is supported with the optional IBM COBOL Report Writer Precompiler (5798-DYR):

- ReportWriter



The following optional modules of the standard are not supported:

- Communications
- Debug (2 DEB 0,2)

**Restrictions:** Enterprise COBOL for z/OS has the following restrictions related to industry standards:

- OPENEXTEND is not supported for ASCII encoded tapes (CODESET STANDARD-1 or STANDARD-2).
- File status 97 is an informational file status value that represents successful completion of an OPEN statement, rather than an unsuccessful completion as is normally the case for 9x file status values in the 85 COBOL Standard.

## Compatibility with previous product releases

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IBM Enterprise COBOL for z/OS 6.5 provides a high level of source compatibility, object compatibility, and runtime environment compatibility with prior versions of IBM COBOL.

### Compatibility, coexistence, and migration

Enterprise COBOL for z/OS 6.5 is source compatible with earlier versions of IBM COBOL. This means that the compiler will compile correct COBOL source programs that were developed using Enterprise COBOL for z/OS 6.4 or earlier, with the exception of obsolete functions that were removed and the addition of new reserved words. The removed functions include obsolete COBOL language syntax and obsolete compiler options. Complete details on removed obsolete functions are documented in the *IBM Enterprise COBOL for z/OS Migration Guide*. IBM does not expect that many applications will be affected by the removed functions, which in practice are no longer heavily used. To assist in migration, a new compiler option FLAGMIG4 was added to Enterprise COBOL 4.2 through the service stream. This option delivers warning diagnostics to flag use of obsolete syntax and options in existing COBOL programs.

Enterprise COBOL for z/OS 6.5 is object compatible with earlier versions of IBM COBOL, in that applications can be constructed by using a mixture of object modules that are compiled with 6.5 and those compiled with earlier versions. All three types of calls can be used: static calls (within a link-edited module), dynamic calls (between programs link-edited as separate modules), and DLL calls. The following are exceptions:

- Interoperation with object modules that are compiled with OS/VS COBOL (5740-CB1) is no longer supported.
- Interoperation with object modules that are compiled with VS COBOL II (5688-958) is limited to programs compiled with the RES compiler option. Interoperation with VS COBOL II programs that are compiled with the NORES option is no longer supported.

Enterprise COBOL for z/OS 6.5 is runtime compatible with earlier versions of IBM COBOL. This means that COBOL programs using valid data will continue to produce the same runtime results after being recompiled with Enterprise COBOL for z/OS 6.5. A small number of exception cases are documented in the *IBM Enterprise COBOL for z/OS Migration Guide*.

Visit the [COBOL Upgrade Portal](#) for all Enterprise COBOL for z/OS 6.5 migration-related information, including case studies, COBOL experts interview videos, COBOL Migration and Performance Tuning Webinars, FAQs, other IBM products to support your migration, and many other resources, which help ease your migration efforts from COBOL 4 or earlier to COBOL 6 compiler.

## Security, auditability, and control

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The announced program uses the security and auditability features of the host operating system software. The customer is responsible for evaluation, selection and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

## Licensed program materials availability

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Restricted materials - No. This licensed program is available without source licensed program materials. It is available in object code only.

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Designated Machine identification required: Yes.

### Testing period

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- DSLO License: Not applicable.

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## **Notices**

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