

Enterprise COBOL for z/OS  
6.4

*What's New*



**Note**

Before using this information and the product it supports, be sure to read the general information under [“Notices” on page 7](#).

**First edition (31 August 2022 update)**

This edition applies to Version 6.4 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.

You can view or download softcopy publications free of charge in the [Enterprise COBOL for z/OS library](#). Because Enterprise COBOL for z/OS supports the continuous delivery (CD) model and publications are updated to document the features delivered under the CD model, it is a good idea to check for updates once every two months.

It is our intention to update the product documentation for this release periodically, without updating the order number. If you need to uniquely refer to the version of your product documentation, refer to the order number with the date of update.

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## About this information

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This information provides an executive overview of new and improved features in Enterprise COBOL for z/OS 6.4.

Throughout this information, "COBOL" or "Enterprise COBOL" refers to "IBM Enterprise COBOL for z/OS" or "IBM Enterprise COBOL Value Unit Edition for z/OS".



## How to send your comments

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Your feedback is important in helping us to provide accurate, high-quality information. If you have comments about this information or any other Enterprise COBOL documentation, send your comments to: [compinfo@cn.ibm.com](mailto:compinfo@cn.ibm.com).

Be sure to include the name of the document, the publication number, the version of Enterprise COBOL, and, if applicable, the specific location (for example, the page number or section heading) of the text that you are commenting on.

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# Chapter 1. Video: What is new in Enterprise COBOL for z/OS 6.4

Watch the [video](#) to get a quick overview of the major new features and enhancements in Enterprise COBOL for z/OS 6.4.

To discover all the new features and enhancements, refer to the complete list in [Chapter 2, “What is new in Enterprise COBOL for z/OS 6.4,”](#) on page 3.

To watch more Enterprise COBOL for z/OS videos, visit the [COBOL video gallery](#).



# Chapter 2. What is new in Enterprise COBOL for z/OS 6.4

This section lists new and improved features in Enterprise COBOL for z/OS 6.4.

The enhancements that are described in this section also have an associated cross-reference to the COBOL publications for your convenience.

The changes mainly fall into the following categories:

- [“Improved COBOL/Java interoperability” on page 4](#)
  - Non-OO COBOL/Java interoperability support
  - New JAVAIOP option
  - New JAVA-CALLABLE directive
  - New JAVA-SHAREABLE directive
  - Enhanced CALL statement
- [“Interoperability between AMODE 31 \(31-bit\) and AMODE 64 \(64-bit\) COBOL programs” on page 4](#)
- [“User-defined functions support” on page 4](#)
  - Function IDENTIFICATION DIVISION
  - User-defined function configuration section
  - Function procedure division
  - New CONTENT-OF intrinsic function
  - Using user-defined functions
- [“Enhanced UTF-8 support” on page 5](#)
- [“Improved integration with IBM Automatic Binary Optimizer for z/OS \(ABO\)” on page 5](#)
- [“Compiler option changes” on page 5](#)

New	Changed
SMARTBIN	ARCH
JAVAIOP	RULES
	TUNE

- [PERFORM ... UNTIL EXIT support](#)
- [“Debugging enhancement” on page 6](#)
- [Compiler message changes](#)

New	Changed
IGYCB7035-S	IGYCB7314-E
IGYCB7155-U	
IGYCB7301-W	
IGYCB7302-W	
IGYCB7305-U	
IGYCB7319-S	

## Improved COBOL/Java interoperability

The COBOL/Java™ interoperability is enhanced to extend the capabilities of your COBOL applications with Java and removes the need to write object-oriented (OO) COBOL. The following changes are introduced to facilitate COBOL applications interoperating with Java:

### Non-OO COBOL/Java interoperability support

Enterprise COBOL supports a more comprehensive and flexible form of Java interoperability than that provided by the object-oriented (OO) COBOL framework. ([COBOL/Java interoperability outside of the object-oriented \(OO\) COBOL framework](#))

### New JAVAIOP option

The JAVAIOP option controls the behavior of COBOL programs that interoperate with Java through the JAVA-CALLABLE or JAVA-SHAREABLE directives or by calling Java static methods using the CALL statement. ([JAVAIOP](#))

### New JAVA-CALLABLE directive

The JAVA-CALLABLE directive instructs the compiler to make the COBOL program automatically callable from Java. The directive must appear before the PROCEDURE DIVISION header for the outermost program of a compilation unit. ([JAVA-CALLABLE](#))

### New JAVA-SHAREABLE directive

You can use the JAVA-SHAREABLE ON and JAVA-SHAREABLE OFF directives to bracket one or more WORKING-STORAGE data items to indicate that they are to be made read/write accessible from Java applications interoperating with this COBOL program. ([JAVA-SHAREABLE](#))

### Enhanced CALL statement

The CALL statement is enhanced to enable the compiler to call a static Java method. A Java call stub program that is automatically generated and serves as an interface between the COBOL calling program and the static Java method. ([CALL statement](#))

PH48453: New sample files demonstrating a COBOL/Java interoperable application and how to build it are provided in the demo subdirectory of the zFS install path. ([Example: COBPROD application](#))

## Interoperability between AMODE 31 (31-bit) and AMODE 64 (64-bit) COBOL programs

AMODE 64 (64-bit) COBOL applications can interoperate with your existing AMODE 31 (31-bit) COBOL applications. Dynamic call is supported in a mixed AMODE 31/AMODE 64 environment. ([COBOL applications with mixed AMODE 31 and AMODE 64 programs](#))

## User-defined functions support

You can define your own functions by specifying a FUNCTION-ID paragraph in the IDENTIFICATION DIVISION and invoke them by using a reference to a function identifier. This is part of the 2002 COBOL Standard.

The following language elements are enhanced to provide the user-defined functions support:

### Function IDENTIFICATION DIVISION

For a user-defined function, the first paragraph of the IDENTIFICATION DIVISION must be the FUNCTION-ID paragraph.

- [IDENTIFICATION DIVISION](#)
- [FUNCTION-ID paragraph](#)

### User-defined function configuration section

Specify the configuration section in the ENVIRONMENT DIVISION of a user-defined function definition. ([REPOSITORY paragraph](#))

## Function procedure division

The function procedure division consists of optional declaratives, and procedures that contain sections, paragraphs, sentences, and statements.

- [Procedure division structure](#)
- [Format: function procedure division header](#)
- [USING phrase](#)
- [RETURNING phrase](#)

## CONTENT-OF intrinsic function

The CONTENT-OF intrinsic function returns the content of the argument. The CONTENT-OF intrinsic function is useful when you want to pass an argument to a user-defined function that is effectively BY CONTENT. ([CONTENT-OF](#))

## Using user-defined functions

You can write your own function definitions that may be invoked by using the FUNCTION keyword. ([Using user-defined functions](#))

## Enhanced UTF-8 support

PH48667: When you use the figurative constant HIGH-VALUE in a context that requires UTF-8 characters, its value is UTF-8 character UX'F48FBFBF' corresponding to Unicode code point U+10FFFF, except when HIGH-VALUE is used in a move or compare operation with a fixed byte-length UTF-8 data item that has a length that is not a multiple of 4 bytes. ([Using UTF-8-character figurative constants](#))

## Improved integration with IBM Automatic Binary Optimizer for z/OS (ABO)

COBOL modules that you compile today can be easily optimized in the future by ABO to utilize future IBM Z<sup>®</sup> hardware enhancements, without having to be recompiled.

- ABO (sold separately) improves the performance of already-compiled COBOL program modules without recompiling, source code migration, or performance tuning.
- With the new SMARTBIN compiler option in effect, COBOL compiler generates modules containing additional binary metadata that enables them to be optimized by ABO 2.2. ([SMARTBIN](#))
- Use the latest version of Enterprise COBOL for new development, modernization, and maintenance. Use ABO to improve the performance of COBOL modules that are stable and do not need any source changes.

For details about ABO, visit the [ABO product page](#).

## Compiler option changes

### New compiler options

#### SMARTBIN

Use SMARTBIN to instruct the compiler to generate modules containing additional binary metadata that enables them to be optimized by IBM Automatic Binary Optimizer (ABO) for z/OS 2.2. ([SMARTBIN](#))

#### JAVAIOP

Use JAVAIOP to control the behavior of COBOL programs that interoperate with Java through the JAVA-CALLABLE or JAVA-SHAREABLE directives or by calling Java static methods using the CALL statement. ([JAVAIOP](#))

### Modified compiler options

#### ARCH

ARCH(8) and ARCH(9) are no longer accepted. A new higher level of ARCH(14) is accepted. ARCH(10) is the default. ([ARCH](#))

## RULES

If there are multiple RULES specifications for a compilation, the suboptions are additive, which means they are accumulated. ([RULES](#))

## TUNE

TUNE (8) and TUNE (9) are no longer accepted. A new higher level of TUNE (14) is accepted. TUNE (10) is the default if ARCH is not specified. ([TUNE](#))

## PERFORM ... UNTIL EXIT support

You can specify EXIT in place of a condition in a PERFORM statement. If the UNTIL phrase with the EXIT reserved word is specified, execution proceeds exactly as if the same PERFORM statement were coded with *condition-1* specified, except that *condition-1* never evaluates as true. ([PERFORM with UNTIL phrase](#))

## Debugging enhancement

You can use ddname IGZPROUT at the run step of your JCL to generate a report of all dynamically called programs that are compiled with Enterprise COBOL 5 or later. ([Generating a report of dynamically called COBOL programs](#))

## Compiler message changes

### New messages

- IGYCB7035-S: FPR save area offset limit(4095) exceeded (FASTLINK limitation). Offset is &1. Reduce incoming parameter size in function &2. ([IGYCB7035-S](#))
- IGYCB7155-U: Register \"&1\" is reserved by the compiler and cannot be used in the code. ([IGYCB7155-U](#))
- IGYCB7301-W: A zero base was raised to a zero power in a numeric literal exponentiation. The result was set to 1. ([IGYCB7301-W](#))
- IGYCB7302-W: A zero base was raised to a negative power in a numeric literal exponentiation. The result was set to 0. ([IGYCB7302-W](#))
- IGYCB7305-U: The COBOL-specific run time library was not available at compile time. Please add SCEERUN to the concatenation for the compile step. ([IGYCB7305-U](#))
- IGYCB7319-S: The target FUNCTION-POINTER or PROCEDURE-POINTER in the CALL statement on line &1 is NULL. ([IGYCB7319-S](#))

### Changed messages

- IGYCB7314-E: The value of data item &1 at statement number &2 on line &3 was invalid. The value exceeded the number of digits in the data definition, and failed the SIZE ERROR test generated by the NUMCHECK(BIN) compiler option. ([IGYCB7314-E](#))

## Prefer video?

To get a quick overview of the major new features and enhancements in Enterprise COBOL for z/OS 6.4, watch the [Chapter 1, “Video: What is new in Enterprise COBOL for z/OS 6.4,” on page 1.](#)

## Notices

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# Enterprise COBOL for z/OS publications

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## COBOL for z/OS publications

You can find the following publications in the [Enterprise COBOL for z/OS library](#):

- *What's New*, SC31-5708-00
- *Customization Guide*, SC27-8712-03
- *Language Reference*, SC27-8713-03
- *Programming Guide*, SC27-8714-03
- *Migration Guide*, GC27-8715-03
- *Performance Tuning Guide*, SC27-9202-02
- *Messages and Codes*, SC27-4648-02
- *Program Directory*, GI13-4526-03
- *Licensed Program Specifications*, GI13-4532-03

## Softcopy publications

The following collection kits contain Enterprise COBOL and other product publications. You can find them at <https://www.ibm.com/resources/publications>.

- *z/OS Software Products Collection*
- *z/OS and Software Products DVD Collection*

## Support

If you have a problem using Enterprise COBOL for z/OS, see the following site that provides up-to-date support information: <https://www.ibm.com/support/pages/node/6560933>.



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