

IBM Enterprise COBOL for z/OS, V6.3 delivers additional performance, functional, and modernization features to COBOL

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At a glance

The IBM^(R) Enterprise COBOL compiler supports the latest z/Architecture^(R) to maximize hardware utilization, reduce CPU usage, and improve performance of critical applications.

The COBOL compiler helps your existing COBOL applications work with modern infrastructure technologies - mobile, web, and cloud - with native support for JSON, XML, and JavaTM®.

IBM Enterprise COBOL for z/OS^(R), V6.3 supports the following features and enhancements:

- Improved efficiency in processing of UTF-8 data by supporting the UTF-8 data type
- Support for creating 64-bit (AMODE 64) batch applications
- Compiler and runtime support for the IBM z/OS V2.4 operating system so applications can take advantage of the latest operating system features and capabilities
- Support for the latest middleware, including IBM CICS^(R), IBM Db2^(R), and IBM IMS
- Numerous additional features and enhancements

Overview

IBM Enterprise COBOL for z/OS is a leading-edge, z/OS-based compiler that helps you create and maintain mission-critical, line-of-business COBOL applications to execute on your z/OS operating systems. The applications that are created by using Enterprise COBOL for z/OS can interoperate with transactional and data systems such as IBM CICS, IBM Db2, IBM IMS.

A key strength of the IBM Enterprise COBOL compiler is the continual support of the latest IBM Z^(R) hardware architectures. The ARCH level option instructs the compiler to generate optimize code that can exploit a particular IBM Z hardware architecture. Application developers can recompile using the ARCH level compiler option of their choice to instruct the compiler to generate code for their application that exploits instructions available on a particular architecture level. This translates into immediate support for that architecture level and improved computational performance without any source code changes.

Over the course of multiple releases, Enterprise COBOL for z/OS has offered new and enhanced functions to provide the tools needed to modernize and maintain

applications to meet your critical business needs. The following are the new and improved features delivered with Version 6.3:

- Improved efficiency in processing of UTF-8 data by supporting the UTF-8 data type. This enhancement improves efficiency for native language support.
- Support for creating 64-bit (AMODE 64) batch applications. 64-bit (AMODE 64) support in this compiler enables users to process large data tables that require up to 2 GB of addressing space.
- From the COBOL 2002 and 2014 programming standards, addition of the Dynamic Length elementary items.
- From the COBOL 2002 and 2014 programming standards, support for the FUNCTION keyword specifier in the REPOSITORY paragraph to make the use of the keyword FUNCTION optional.
- Compiler and runtime support for the IBM z/OS V2.4 operating system so applications can take advantage of the latest operating system features and capabilities.
- A number of additional enhancements.

Enterprise COBOL for z/OS, V6.3 continues the IBM commitment to the COBOL programming language on IBM Z through investment in new compiler technology and the continued delivery of new features. With Version 6.3, you gain the benefit of new investment that is combined with more than 50 years of IBM experience in compiler development.

Key requirements

Enterprise COBOL for z/OS, V6.3 requires z/OS V2.2 (5650-ZOS), or later.

Note: To run 64-bit applications, z/OS V2.3 (5650-ZOS), or later, is required.

For additional details, refer to the [Software requirements](#) section.

Planned availability date

September 6, 2019

Description

Enterprise COBOL for z/OS, V6.3 incorporates leading-edge code generation and optimization technology to maximize hardware utilization, and to help improve application performance.

Enterprise COBOL for z/OS, V6.3 includes the following new and enhanced features:

Improved processing of UTF-8 data with the introduction of the UTF-8 data type

- Enterprise COBOL for z/OS, V6.3 provides increased efficiency and support for Unicode data encoded in the UTF-8 format. You can now store UTF-8 data in data items that natively understand UTF-8. Correct UTF-8 padding and truncation are performed on these data items during MOVE and other operations.
- Native support for UTF-8 data items is provided through the new picture symbol 'U', which defines a new class, category, and USAGE of data in Enterprise COBOL called UTF-8.
- UTF-8 data items can be declared as having either a fixed character length (where a UTF-8 character corresponds to one Unicode codepoint) or a fixed byte length, with the latter being provided for ease of interoperability with Db2 CHAR columns in Unicode tables.

- USAGE UTF-8 data items can be optionally declared to have a dynamic length so that the actual length of the UTF-8 data is carried around automatically with the item and memory for the item is acquired dynamically.
- COBOL statements that will directly support UTF-8 include MOVE, INITIALIZE, SORT, MERGE, IF, EVALUATE, ALLOCATE, and FREE.
- UTF-8 data items are supported in conditions such as those found in IF, WHEN, and SEARCH statements.
- UTF-8 data will be a new class and category of argument and return type for intrinsic functions. Supported functions in this release are BIT-OF, BYTE-LENGTH, DISPLAY-OF, HEX-OF, LENGTH, LOWER-CASE, NATIONAL-OF, TRIM, ULENGTH, UPPER-CASE, UPOS, USUBSTR, USUPPLEMENTARY, and UVALID.

The introduction of native support for UTF-8 data items means that you can now work directly with UTF-8 data without having to waste CPU resources converting from UTF-8 to UTF-16 and back again. This results in more maintainable programs and is especially useful when modernizing your COBOL application to work with web services or to interoperate with Db2 databases that store data in UTF-8 format. In cases where it is more efficient to perform processing in UTF-16, conversion is handled automatically, where necessary.

AMODE 64 support

With this release, Enterprise COBOL for z/OS, V6.3 provides support for creating COBOL AMODE 64 batch applications. Application developers do not need to do any redesign or source code changes on their applications to obtain 64-bit support.

COBOL AMODE 64 applications can now access data items greater than the existing AMODE 31 data size limits without changes to the program logic:

- A new LP(32|64) compiler option indicates whether an AMODE 31 (31-bit) or AMODE 64 (64-bit) program should be generated with the related language features enabled.
- Files created by AMODE 31-bit programs can be accessed (read, write, and rewrite) by AMODE 64 programs and vice-versa. Data files are compatible between AMODE 64 and AMODE 31 programs.
- AMODE 64 COBOL programs can call other AMODE 64 LE conforming programs using either static or DLL calls.
- AMODE 64 COBOL programs cannot be called by non-LE conforming programs. Assembler programs using LOAD and then branch to the entry point of the subprogram will not work. Instead, the LE macro CEEFETCH should be used to fetch and call AMODE 64 COBOL programs.
- Parameter passing convention is XPLINK.
- All AMODE 64 COBOL programs are reentrant (that is, LP(64) implies RENT).
- The following functions are not available:
 - No support for building AMODE 64 applications to run under CICS or IMS.
 - No support for building AMODE 64 applications containing OO COBOL, XML, or JSON statements or using the THREAD compiler option.
 - No support for mixing AMODE 64 and AMODE 31 object files in the same COBOL program, or mixing 64/31 in the same COBOL run unit; if one COBOL source file is compiled with LP(64), all COBOL source files compiled and linked into the same program must be compiled with LP(64).

COBOL 2002 and 2014 standards

Support of programming language standards provides you with additional functionality so that you can modernize your application. It also allows for maximum portability of your source code among a variety of compiler implementations.

The following COBOL 2002 and 2014 features are provided by the V6.3 compiler:

- Dynamic-length elementary items (COBOL 2014 language feature)

- Addition of the DYNAMIC LENGTH clause provides the ability to describe a data item of varying size.
- FUNCTION keyword optional for intrinsic functions (COBOL 2002 language feature)
- The REPOSITORY paragraph FUNCTION specifier INTRINSIC allows for the declaration of intrinsic function names that may be used without specifying the word FUNCTION.

Additional enhancements

- Default ARCH changed to ARCH(8) [z10] and removed support for ARCH(7) [z9]
- Expanded signature information area for future option byte definitions
- Compiler listing enhancements for 64-bit and COBOL terminology
- Predefined compilation variables available with IGY- prefixes to keep all variables in the IGY-xxxx namespace

Features of Enterprise COBOL for z/OS, V6.3 made available through continuous delivery

In V6.1 and V6.2, Enterprise COBOL for z/OS was enhanced to support 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, V6.3 includes all of the V6.2 features delivered through continuous delivery. These features include:

- Support for mixed HFS and MVS™ files in SYSLIB for COPY phase
- Segmented parsing of national strings in COBOL XMLSS
- LOC phrase for ALLOCATE statement
- COBOL 2014 language features including various intrinsic functions such as E, PI, TRIM, ABS, BYTE-LENGTH, EXP, EXP10, NUMVAL-F, SIGN, TEST-NUMVAL, TEST-NUMVAL-C, and TEST-NUMVAL-F
- IBM extensions to intrinsic functions that include BIT-OF, HEX-OF, BIT-TO-CHAR, HEX-TO-CHAR
- Support for processing national data items with intrinsic functions REVERSE, ULENGTH, UPOS, USUBSTR, and UWIDTH
- Support for COBOL 2002 language features WHEN SET TO FALSE and SET TO FALSE
- JSON PARSE - NAME IS OMITTED phrase
- TEST(DSNAME) to indicate debug dataset name
- INITIAL compiler option to treat all COBOL programs as having the Program ID "Is Initial" designation
- Migration enhancements:
 - Additional RULES suboption (NO)UNREF to flag unreferenced variable
 - NUMCHECK(ZON(NOALPHNUM)) suboption that excludes checking display numerics against character item
 - Improved NUMCHECK performance
 - Support for the INITCHECK compiler when the OPT(0) compiler option is in effect
 - Update to the ZONEDATA option to affect the behavior of MOVE statements, comparisons, and computations for USAGEDISLAY or PACKED-DECIMAL data items that could contain invalid digits, an invalid sign code, or invalid zone bits
- Warning message when commarea is bigger than 32kb
- Improved IPCS dump formatting

Compiler and runtime support for z/OS V2.4

Enterprise COBOL for z/OS, V6.3 adds support for building and running COBOL applications for the z/OS V2.4 operating system.

Section 508 of the US Rehabilitation Act

Enterprise COBOL for z/OS, V6.3 is capable as of September 6, 2019, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be found on the [IBM Accessibility](#) website.

Product positioning

Enterprise COBOL is a premier, enterprise-class COBOL compiler for the z/OS system. It is a proven and reliable program that:

- Delivers innovation for modernizing business-critical applications and programming features to increase programmer productivity
- Bolsters the overall benefits of transactional and data systems, such as CICS, IMS, and Db2

New IBM Z hardware has increasing complexity. Enterprise COBOL for z/OS, V6.3 delivers advanced compiler support to allow you to fully benefit from hardware advancements. The ARCH and OPTIMIZE compiler options of Enterprise COBOL for z/OS can be used to unleash the full power of IBM processors that are delivered in the various IBM Z hardware models. COBOL programmers no longer need a deep understanding of z/Architecture to exploit leading-edge performance of new IBM Z hardware. Developers only need to focus on the logic of the applications and let the compiler determine the best way to transform and optimize the code generation for the IBM Z hardware on which the application will run.

With Enterprise COBOL for z/OS, V6.3, the return on your hardware and middleware investments is increased. With the implementation of advanced code generation and optimization technology, Enterprise COBOL for z/OS, V6.3 establishes a foundation for delivery of additional optimization features and exploitation of z/Architecture.

With its enhanced capabilities, simplified programming, and increased programmer productivity, you can continue to use Enterprise COBOL for z/OS to modernize existing business-critical applications. Modernization enables the reuse of your proven business logic and allows you to:

- Deliver new enhancements quicker, with less cost and lower risk
- Add modern GUIs to business-critical COBOL applications or extend them to work with web, cloud, or mobile infrastructures
- Build on proven applications in which you do not need to write original code

Enterprise COBOL for z/OS, V6.3 continues the IBM commitment to COBOL on z/OS and with this release, you gain the benefit of new investment combined with more than 50 years of IBM experience in compiler development.

Hardware and software support services

SmoothStart/installation services

IBM SmoothStart Services and Installation Services are not provided.

Program number

Program number	VRM	Program name
5655-EC6	6.3.0	IBM Enterprise COBOL for z/OS, V6

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBMid).

[BP Attachment for Announcement Letter 219-404](#)

Technical information

Specified operating environment

Hardware requirements

Enterprise COBOL for z/OS, V6.3 runs and generates code that runs on the following IBM Z servers:

- z14
- z14 ZR1
- z13^(R)
- z13s^(R)
- zEnterprise^(R) EC12 (zEC12)
- zEnterprise BC12 (zBC12)
- zEnterprise 196 (z196)
- zEnterprise 114 (z114)
- z10 Enterprise Class (z10 EC)
- z10 Business Class (z10 BC)

Software requirements

Enterprise COBOL for z/OS, V6.3 runs under the control of, or in conjunction with, the currently supported releases of the following programs and their subsequent releases or their equivalents. For more information on the following programs listed that require program temporary fixes (PTFs), refer to the *Program Directory* and the preventive service planning (PSP) bucket.

- z/OS V2.2 (5650-ZOS), or later is required. Note: To run 64-bit applications, z/OS V2.3 (5650-ZOS), or later, is required.
- For installation on z/OS, z/OS SMP/E is required.
- For customization during or after installation, z/OS High Level Assembler is required.
- Enterprise COBOL XML PARSE statements in programs, which are compiled with the XMLPARSE(XMLSS) compiler option, require z/OS XML System Services V2.2 (5650-ZOS), or later.

Optional licensed programs

Depending on the functions used you may require other software products such as CICS, Db2, or IMS. For a list of compatible software, see the [Software Products Compatibility Reports \(SPCR\)](#) site. From the SPCR site, click Create a Report under in-depth reports, search for Enterprise COBOL for z/OS, choose Version 6.3, and then click submit.

User group requirements

The functions described in this announcement may address requirements from one or more of the worldwide user group communities. Groups include SHARE Inc., Guide SHARE Europe (GSE), Japan Guide Share (JGS), InterAction (Australia/New Zealand), COMMON, and COMMON Europe.

Planning information

Packaging

The Enterprise COBOL for z/OS, V6.3 package includes:

- Basic machine-readable material on the customer-selected distribution medium
- Program Directory (GI13-4526-02)
- Licensed Program Specifications (GI13-4532-02)

Security, auditability, and control

The announced program uses the security and auditability features of the host operating system software.

The client is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

Ordering z/OS through the internet

Shopz provides an easy way to plan and order your z/OS packaged offering. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS. Additional products can also be added to your order (including determination of whether all product requisites are satisfied). Shopz is available in many countries. In countries where Shopz is not available yet, contact your IBM representative (or IBM Business Partner) to handle your order through the traditional IBM ordering process. For more details and availability, go to the [Shopz](#) website.

Publications

Unlicensed documentation

A *Program Directory* (GI13-4526-02) and *Licensed Program Specification* (GI13-4532-02) are supplied automatically with the basic machine-readable material. No other hardcopy publications are shipped with the product.

Subsequent updates (technical newsletters or revisions between releases) to the publications shipped with the product will be distributed to the user of record for as long as a license for this software remains in effect. A separate publication order or subscription is not needed.

Customized Offerings

Product deliverables are shipped only through CBPDO and ServerPac. These customized offerings are offered for internet delivery from Shopz. For more details on internet delivery, go to the Help section on the [Shopz](#) website.

IBM recommends internet delivery. However, if you still require physical media, you can choose DVD.

Many products can be ordered in ServerPac the month following their availability in CBPDO. z/OS can be ordered through CBPDO and ServerPac at general availability. Many products will also be orderable in a Product ServerPac without also having to order the z/OS operating system or subsystem.

Shopz and CFSW will determine the eligibility based on product requisite checking. For more details on the product ServerPac, go to the Help section on the [Shopz](#) website.

Production of software product orders will begin on the planned general availability date.

- CBPDO shipments will begin one week after general availability.
- ServerPac shipments will begin two weeks after general availability.

Terms and conditions

The terms for Enterprise COBOL for z/OS, V6.3, as previously announced and licensed under the IBM Customer Agreement are unaffected by this announcement. For more information on Enterprise COBOL for z/OS, V6.1 refer to Software Announcement [216-059](#), dated February 16, 2016.

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a lawful, comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective.

Important: IBM does not warrant that any systems, products, or services are immune from, or will make your enterprise immune from, the malicious or illegal conduct of any party.

Prices

For additional information and current prices, contact your local IBM representative or IBM Business Partner.

For additional product information on Enterprise COBOL for z/OS V6, refer to Software Announcement [216-059](#), dated February 16, 2016.

Variable charges

The applicable processor based one-time charge will be based on the group of the designated machine on which the program is licensed for use. If the program is designated to a processor in a group for which no charge is listed, the charge of the next higher group listed applies. For movement to a machine in a higher group, an upgrade charge equal to the difference in the then-current charges between the two groups will apply. For movement to a machine in a lower group, there will be no adjustment or refund of charges paid.

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