



Enable your COBOL applications to exploit the latest z/Architecture®

Enterprise COBOL is a premier enterprise class COBOL compiler for IBM® z/OS®. It delivers innovation for modernizing business-critical applications, programming features to increase programmer productivity, and bolsters the overall benefits of transactional and data systems such as IBM CICS®, IMS™, and DB2®.

Enterprise COBOL for z/OS, V6.1 delivers advanced compiler support to allow you to fully benefit from hardware advancements. The Enterprise COBOL for z/OS compiler is capable of unleashing the full power of IBM processors delivered in the various models of z Systems™ 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 z Systems hardware on which the application will run.

With its enhanced capabilities, simplified programming, and increased programmer productivity features, you can use Enterprise COBOL for z/OS to modernize existing business-critical applications. You can deliver new enhancements quicker, with less cost and with lower risks. You can add modern graphical user interfaces to business-critical COBOL applications or extend them to work with web, cloud, or mobile infrastructures. With the investment in new compiler technology and the continued delivery of new features, Enterprise COBOL for z/OS, V6.1 reaffirms IBM's commitment to COBOL on z/OS. You gain the benefit of new investments combined with more than 50 years of IBM experience in compiler innovation and development.

Highlights

Enterprise COBOL for z/OS, V6.1 delivers the following new and improved features:

- Increased compiler capacity
- New features added from the ISO 2002 COBOL Standard
- New and enhanced compiler options for ease of migration and programmer productivity
- Runtime and product-related enhancements

Increased compiler capacity

The capacity of the compiler has been expanded to allow for the compilation and optimization of large programs. With Enterprise COBOL for z/OS, V6.1, you can now compile much larger programs including those COBOL programs that are created by code generators.

New features added from the ISO 2002 COBOL Standard

In Enterprise COBOL, V6.1, the following features are added for ISO 2002 COBOL Standard conformance:

The ALLOCATE statement

The ALLOCATE statement obtains dynamic storage.

The FREE statement

The FREE statement releases dynamic storage previously obtained with an ALLOCATE statement.

The INITIALIZE statement

The INITIALIZE statement sets selected categories of data fields to predetermined values. The

INITIALIZE statement is functionally equivalent to one or more MOVE statements. The following new clauses from the 2002 and 2014 COBOL Standards are added in V6.1:

- WITH FILLER
- TO VALUE
- THEN TO DEFAULT

New IBM extension features

The JSON GENERATE statement

The new JSON GENERATE statement converts data to JSON format.

New, replaced, and enhanced compiler options for ease of migration and programmer productivity

- The new VSAMOPENFS(COMPAT|SUCC) option allows you to change File Status=97 into File Status=00 for certain VSAM OPEN statements.
- The new SUPPRESS|NOSUPPRESS option enables or disables the SUPPRESS phrase of COPY statements.
- The new SSRANGE(ZLEN|NOZLEN) suboption allows a 0-length reference modification.
- The diagnostic message for the ZONECHECK(MSG) compiler option (and also the newer NUMCHECK(MSG) compiler option) is improved by adding the data item contents for the offending data item and also adding the program name of the program that contained the offending data item.
- The LVLINFO installation option has been removed and replaced by a 7-character build-level identifier, of the format PYYMMDD, that is added to the compiler listing header. The build-level identifier is placed in locations that previously held the following LVLINFO data:
 - Listing header
 - Signature information bytes
 - ADATA field called PTF Level
- The following compiler options or suboptions are added to Enterprise COBOL V6.1 via the service stream:
 - INITCHECK (available with PTF for APAR PI68226 installed). The new INITCHECK option tells the compiler to check for uninitialized data items and issue warning messages when they are used without being initialized.
 - NUMCHECK (available with PTF for APAR PI71625 installed). The new NUMCHECK option tells the compiler whether to generate extra code to validate data items when they are used as sending data items.

Note: The ZONECHECK option is deprecated but is tolerated for compatibility, and it is replaced by NUMCHECK(ZON).

- SSRANGE(MSG|ABD) (available with PTF for APAR PI74933 installed). The new SSRANGE(MSG|ABD) suboptions control the runtime behavior of the COBOL program when a range check fails.
- INLINE option and directive (available with PTF for APAR PI77981 installed). The new INLINE option and compiler directive can be used to guide the inlining of performed sections and paragraphs at OPTIMIZE(1) or OPTIMIZE(2).
- PARMCHECK (available with PTF for APAR PI78089 installed). The new PARMCHECK option can be used to discover parameter mismatches, that is, if programs pass arguments to subprograms that are then misused as parameters. It tells the compiler to generate an extra data item following the last item in WORKING-STORAGE that is then used at run time to check whether the called subroutine corrupted data beyond the end of WORKING-STORAGE.

Product-related enhancements

Enterprise COBOL for z/OS, V6.1 delivers the following runtime and performance-related enhancements:

- The WORKING-STORAGE section will be acquired from HEAP storage, and is managed more efficiently by initializing it when the corresponding COBOL program is being called. The STORAGE runtime option will affect the WORKING-STORAGE section. In previous versions, the WORKING-STORAGE section was initialized when the program object is being loaded, regardless of whether the COBOL program will actually be called later. Also, sometimes WORKING-STORAGE was not acquired from HEAP, and in those cases the STORAGE option did not affect WORKING-STORAGE.
- Reduced storage requirements and performance tuning is implemented in Table SORT. Performance improvements are implemented in INSPECT, UNSTRING, and SEARCH ALL.

Other Enterprise COBOL for z/OS features

Improved application development

Enterprise COBOL for z/OS provides a set of intrinsic functions including string handling, financial capabilities, statistical functions, and mathematical formulas. You can also use the COBOL CALL statement to take advantage of Language Environment[®] services for everything from storage management to condition handling. The condition handling support enables you to write programs in which exception handling is done in a separate routine that is loaded only when needed. Using Language Environment condition handling, you do not have to write the exception-handling routines in assembler - you can write them in COBOL! Enterprise COBOL for z/OS offers support for recursive calls, structured programming, improved interoperability with other languages, and dynamic link library (DLL) support. The Enterprise COBOL for z/OS runtime library, Language Environment (a base element of z/OS), also supports PL/I, C/C++, and Fortran programs.

Ease into migration

Enterprise COBOL for z/OS gives you a migration path from OS/VS COBOL, VS COBOL II, IBM COBOL for MVS[™] & VM, and IBM COBOL for OS/390[®] & VM. With the exception of OS/VS COBOL programs, VS COBOL II NORES programs, and any programs that were previously compiled with the CMPR2 compiler option, your current programs can continue to compile and run without modification, while you selectively update existing applications to take advantage of new functions.

You can convert OS/VS COBOL programs and programs compiled with the CMPR2 compiler option into 1985 COBOL Standard programs, which can then be compiled using Enterprise COBOL for z/OS. Use the COBOL conversion tool (CCCA) included in Debug Tool for this purpose. Debug Tool also includes a load module analyzer that can help identify which of your programs were compiled with the OS/VS compiler.

Support for modern development tools

Rational[®] Developer for z Systems supports Enterprise COBOL and helps improve the productivity of COBOL developers. Rational Developer for z Systems provides an interactive, workstation-based environment to help you create, maintain, and reuse applications. Rational Developer for z Systems includes support for traditional development using COBOL, but also has the ability to generate web services interfaces from COBOL constructs to ease creation of web services from existing COBOL applications.

Rational Developer for z Systems provides a workstation interface to Debug Tool, and is also integrated with IBM File Manager and Fault Analyzer. File Manager integration enables you to access Keyed Sequence Data Set (KSDS) files from the Rational Developer for z Systems workbench, and gives you the

ability to browse and update data sets. By integrating with Fault Analyzer, Rational Developer for z Systems enables you to browse Fault Analyzer ABEND reports on CICS, IMS, batch, Java™, WebSphere®, and other run times.

COBOL across platforms

Enterprise COBOL for z/OS is part of a family of compatible compilers, application development tools, and maintenance tools.

System requirements

The following table presents the system requirements for Enterprise COBOL for z/OS V6.1.

Software	Hardware
<p>Enterprise COBOL for z/OS, V6.1 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.</p> <ul style="list-style-type: none"> z/OS V2.1 (5650-ZOS), or later 	<p>Enterprise COBOL for z/OS, V6.1 will run on the following IBM servers:</p> <ul style="list-style-type: none"> z13™ or z13s zEnterprise® EC12 and zEnterprise BC12 zEnterprise 196 or zEnterprise 114 z10™ Enterprise Class and z10 Business Class z9® Enterprise Class or z9 Business Class

Depending on the functions used, one or more of the following programs might be required:

- IBM CICS Transaction Server for z/OS V5 (5655-Y04)
- IBM CICS Transaction Server for z/OS Value Unit Edition V5 (5722-DFJ)
- IBM CICS Transaction Server for z/OS V4 (5655-S97)
- IBM DB2 11 for z/OS (5615-DB2)
- IBM DB2 11 for z/OS Value Unit Edition (5697-P43)
- IBM DB2 10 for z/OS (5605-DB2)
- IBM DB2 10 for z/OS Value Unit Edition (5697-P31)
- IBM IMS V13 (5635-A04)
- IBM IMS Transaction Manager Value Unit Edition V13 (5655-TM2)
- IBM IMS Database Value Unit Edition V13 (5655-DSM)
- IBM IMS V12 (5635-A03)
- IBM IMS Transaction Manager Value Unit Edition V12 (5655-TM1)
- IBM IMS Database Value Unit Edition V12 (5655-DSQ)
- IBM DFSORT optional feature of z/OS V2 (5650-ZOS)
- IBM High Level Assembler/MVS and VM and VSE (5696-234)
- IBM 31-bit SDK for z/OS, Java Technology Edition V8.0 (5655-DGG)
- IBM 31-bit SDK for z/OS, Java Technology Edition V7.0 (5655-W43)
- IBM 31-bit SDK for z/OS, Java Technology Edition V6.0 (5655-R31)
- z/OS V2.1 Client Web Enablement Toolkit (5650-ZOS - APAR Number OA46575)
- IBM Debug Tool for z/OS V13.1 (5655-Q10)
- IBM Fault Analyzer for z/OS V13.1 (5655-Q11)
- IBM File Manager for z/OS V13.1 (5655-Q12)
- IBM Application Performance Analyzer for z/OS, V13.1 (5655-Q09)
- IBM Rational Developer for z Systems, V9.5 (5724-T07)

- COBOL Report Writer Release 4 (5798-DYR, 5798-DZX)
- Enterprise COBOL for z/OS, V5 (5655-W32)
- Enterprise COBOL for z/OS, V4 (5655-S71)
- Enterprise PL/I for z/OS, V4 (5655-W67)
- Enterprise PL/I for z/OS, V3 (5655-H31)
- For XL C/C++ with Enterprise COBOL -- You must use the XL C/C++ feature of z/OS V2.1 (5650-ZOS)
- IBM VS FORTRAN V2 (5668-806, 5688-087)

Upgrade to Enterprise COBOL for z/OS V6.1

Upgrade to the latest Enterprise COBOL compiler and get more out of your zEnterprise investment and stay ahead of competitors on the technology curve.

For more information

To learn more about IBM Enterprise COBOL for z/OS V6.1, contact your IBM representative or IBM Business Partner, or visit Enterprise COBOL for z/OS at www.ibm.com/software/products/us/en/entecoboforzos/.

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