

IBM COBOL for Linux on x86  
1.2

*Data Sheet*



**June 2023**

This edition applies to Version 1.2 of IBM® COBOL for Linux® on x86 (program number 5737-L11) and to all subsequent releases and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

You can view or download softcopy publications at no charge in the [COBOL for Linux on x86 documentation library](#).

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# Chapter 1. IBM COBOL for Linux on x86 1.2 highlights

IBM COBOL for Linux on x86 1.2 is a productive and powerful development environment for building and modernizing COBOL applications. It includes an optimizing COBOL compiler, a COBOL runtime library, and a debugger that lets you visually debug programs from your workstation. COBOL for Linux on x86 offers high performance and functionality, enabling you to develop COBOL applications for Linux on x86 systems, and is designed to support your journey to the cloud. It enables you to strategically deploy business critical applications written in COBOL to a hybrid cloud environment or best-fit platforms that include IBM Z® (z/OS®), IBM Power® Systems (AIX®), and x86 (Linux) platforms.

Highlights of COBOL for Linux on x86 1.2 are as follows:

- IBM COBOL compiler and runtime library for the Linux on x86 environment
- Support for creating 64-bit COBOL applications to provide access to a larger address space
- Support for incremental builds designed to improve developer productivity for iterative and incremental builds
- Support for MongoDB as a VSAM data store by specifying a file system type of MONGO in COBOL applications
- Interoperability with IBM TXSeries® for Multiplatforms
- Interoperability with IBM Db2® Advanced Enterprise Server Edition for Linux, UNIX, and Windows
- Unicode support to enable COBOL applications to directly process Unicode data
- Native support for XML, which allows COBOL applications to parse incoming and generate outgoing XML messages
- A debugger that enables you to conveniently debug programs
- Compatibility with IBM Enterprise COBOL for z/OS and IBM COBOL for AIX
- Source conversion utility (scu) to aid in migrating COBOL source code developed with non-IBM COBOL compilers

To remain competitive, a complete business strategy can help you modernize, integrate, and manage existing applications, data, and skill sets to ease your organization's transformation into a more flexible business. You need to be able to connect your business components end to end with your suppliers, partners, employees, and customers, and position your organization to quickly take advantage of opportunities and respond to challenges in real time. COBOL for Linux on x86 helps you to meet these challenges and lets you use your existing COBOL code while upgrading your applications with the newest technologies.

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## Chapter 2. Features

COBOL for Linux on x86 1.2 provides features that you can use to upgrade your existing COBOL applications with the newest technologies.

### Improved application performance

The performance of COBOL for Linux on x86 applications is improved by means of world-class optimization technology shared with IBM Enterprise COBOL for z/OS. The common optimization technology from Enterprise COBOL for z/OS is integrated into the COBOL for Linux on x86 compiler to deliver many COBOL-specific optimizations designed to improve application performance.

### A performance enhanced COBOL runtime library

The COBOL for Linux on x86 high-performance runtime, which is shared with IBM COBOL for AIX, is designed for applications for the Linux on x86 environment.

### 64-bit application development support

COBOL for Linux on x86 provides support for creating 64-bit COBOL applications. This provides you access to a larger address space for code and application data, more efficient use of memory layout, and improved performance.

You can control whether 64-bit or 32-bit COBOL programs are created through use of the ADDR compiler option. By default, the compiler will create 64-bit applications.

In 64-bit mode, storage allocation for data items that contain addresses or indexes (POINTER, FUNCTION-POINTER, PROCEDURE- POINTER, and INDEX) is increased to 8 bytes, affecting data items that have any of these usages.

Additional benefits include the ability to link COBOL applications with 64-bit C/C++ and other compiled language applications, and to interoperate with 64-bit Java™ applications through JNI. COBOL programs that make use of IBM Db2 might see improved performance as the program no longer needs to spend cycles transitioning data between a 64-bit Db2 server and a 32-bit Db2 client.

The debugger included with COBOL for Linux on x86 provides the capability to debug 64-bit COBOL applications.

### Incremental build support

Incremental build support is provided through the -M compiler option. When the -M compiler option is specified, the compiler will generate dependency information that can be used in a makefile. GNUmake makes use of the dependency information and will automatically recompile a COBOL program if its source or any of the copybooks it uses are modified. This may help improve developer productivity by allowing iterative, incremental builds, while also ensuring that programs are always built with the latest version of any copybooks that are used.

### MongoDB as a VSAM data store

Support for MongoDB as a VSAM data store is provided by specifying a file system type of MONGO in COBOL applications.

### SLES 15 support

SLES 15 support is available for building and deploying 64-bit COBOL applications. SLES 15 only supports building and deploying of 64-bit COBOL applications. For building and deploying 32-bit COBOL

applications, use either RHEL 8 or 9 or Ubuntu 20.04 or 22.04, as these platforms provide the ability to build and deploy both 32-bit and 64-bit COBOL applications.

## **Compatibility with Enterprise COBOL of z/OS and COBOL for AIX**

COBOL for Linux on x86 provides many compiler options and COBOL language features that are compatible with COBOL for AIX and Enterprise COBOL for z/OS to allow strategic deployment of business-critical applications written in COBOL to best-fit platforms or a hybrid cloud environment. COBOL for Linux on x86 provides compiler options to control the endian representation of binary, floating point, and national data items.

## **Source conversion utility (scu)**

The scu aids in migrating COBOL applications to COBOL for Linux on x86. The scu is a stand-alone program that assists in the conversion of COBOL source programs from non-IBM or free-format source formats to a format that can be compiled by COBOL for Linux on x86.

## **Unicode support**

COBOL for Linux on x86 supports Unicode UTF-16 as national character data at run time. UTF-16 is a fixed-width Unicode encoding that provides a consistent and efficient way to encode plain text. National (UTF-16) data items, national literals, intrinsic functions, figurative constants, and national groups provide the support for developing COBOL programs that will work with various national languages. The Chinese character standard GB18030 is also supported.

## **Developing COBOL programs with CICS or Db2**

COBOL for Linux on x86 supports interoperability with IBM TXSeries for Multiplatforms and with IBM Db2 Advanced Enterprise Server Edition for Linux, UNIX, and Windows, which enables you to develop COBOL programs to run in a CICS® or Db2 environment.

The Db2 file system supports sequential, indexed, and relative files. Db2 provides enhanced interoperation with CICS, enabling batch COBOL programs to access CICS ESDS, KSDS, and RRDS files that are stored in Db2, and to use the Db2 data management facilities, such as backup, compression, encryption, and utility functions, along with a familiar maintenance and administration protocol.

## **Extensible Markup Language (XML) support**

XML makes it easier to write COBOL applications to handle document types, author and manage structured information, and transmit and share structured information across computing systems. COBOL for Linux on x86 provides XML support to enable COBOL programs to parse incoming and to generate outgoing XML messages.

The XML GENERATE statement provides flexibility and control over the form of the XML documents that are generated. You can use the XML GENERATE statement to do the following tasks:

- Specify a namespace by using the NAMESPACE phrase, and a namespace prefix to be applied to each element by using the NAMESPACE-PREFIX phrase.
- Specify the encoding of the generated document by using the ENCODING phrase.
- Generate XML documents in UTF-8, in UTF-16, or in various ASCII or EBCDIC code pages.
- Use the WITH ATTRIBUTES phrase to specify that eligible items in the XML document will be generated as XML attributes instead of as elements.
- Use the WITH XML-DECLARATION phrase to include the XML version and the encoding information in the generated document.

You can use the XML PARSE statement to parse documents that are encoded in UTF-8, in UTF-16, or in various ASCII or EBCDIC code pages.

## Robust file systems

COBOL for Linux on x86 provides robust file system support to work with record-oriented files that have sequential, relative, indexed, or line-sequential organization. The following file systems are supported by COBOL for Linux on x86:

- Db2 relational database
- CICS Structured File Server (SFS)
- Line Sequential (LSQ)
- MongoDB database (MONGO)
- Queued Sequential Access Method (QSAM)
- Record Sequential Delimited (RSD)
- Standard Language (STL)
- Virtual Storage Access Method (VSAM)

## Simplified processing of multiple versions of data

Have you ever wanted to simplify the processing of multiple versions of related data? You can do so because all COBOL for Linux on x86 file systems support generation data groups (GDGs). A generation data group (GDG) is a chronological collection of related files.

There are advantages to grouping related files. For example:

- Files in the group can be referred to by a common name.
- Files in the group are kept in generation order.
- Outdated files can be automatically discarded.

Using the `gdgmgr` utility program, you can easily manage GDG catalogs and generation files.

GDGs facilitate cross-platform compatibility between Enterprise COBOL for z/OS and COBOL for Linux on x86.

## IBM Debug for Linux on x86: a source-level debugger

IBM Debug for Linux on x86 is included in COBOL for Linux on x86. Debug for Linux on x86 works with Eclipse p2 plug-ins that can be installed into the Eclipse IDE. It supports COBOL and CICS debugging, and comes with core debugging and program navigation capabilities including setting breakpoints, monitoring variables, memory, registers and call stacks.

## Interlanguage communication between COBOL and C/C++

COBOL for Linux on x86 supports interlanguage communication between COBOL and C/C++. The interlanguage communication support enables building COBOL applications from component routines written in C/C++.

## An extended source format

COBOL for Linux on x86 supports fixed source format and extended source format. Fixed source format consists of text that varies in length up to 72 bytes per line. Extended source format consists of text that varies in length up to 252 bytes per line.

The extended source format is supported by:

- The `SRCFORMAT` compiler option that allows you to indicate whether source files have the new extended format or the fixed format that is compatible with earlier versions
- The `scu` source conversion utility that helps you normalize non-IBM COBOL source and free-format COBOL source so that it can be compiled



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## Chapter 3. Other features

COBOL for Linux on x86 also provides these other features.

### Integration of COBOL applications with web services

Using COBOL for Linux on x86, you can integrate your COBOL applications with web services and XML. Such interoperability enables you to capitalize on existing IT investments while smoothly incorporating new, web-based applications into your organization's infrastructure.

### Increased programmer productivity

Boost your programming productivity with these features in COBOL for Linux on x86:

- Compiler listings cross-reference copybooks to the library names and file names from which the copybooks are obtained.
- Usability enhancements to Db2/COBOL applications are available when you use the integrated Db2 coprocessor; for example, an explicitly coded LOCAL-STORAGE or WORKING-STORAGE section is no longer required.
- Specification of CICS options, and integrated compilation of programs and copybooks that contain CICS statements, are enabled by means of a compiler option (CICS).
- A compiler option, MDECK, causes the updated input source (after processing of statements such as COPY) to be written to a file.
- A callable service, iwzGetSortErrno, makes it possible to obtain the sort or merge error number after each sort or merge operation.
- When you use the REDEFINES clause for data items that are not level 01, the subject of an entry can be larger than the data item being redefined.

### Improved application development

COBOL for Linux on x86 is a productive and powerful development environment for building and modernizing COBOL applications. It provides a set of intrinsic functions that includes string handling, financial functions, statistical functions, and mathematical formulas. COBOL for Linux on x86 offers support for recursive calls, structured programming, improved interoperability with other languages, and shared libraries.

### Supports concatenation of multiple input files

In COBOL for Linux on x86, you can concatenate input files by separating the individual file identifiers with a colon (:), which simplifies processing multiple files as one.

File concatenation facilitates cross-platform compatibility between Enterprise COBOL for z/OS and COBOL for Linux on x86.

### Enables compiler message severity customization

Have you ever wanted to change the severity of a compiler diagnostic message, or completely suppress a compiler message? In COBOL for Linux on x86, you can do both. For example, you can now get return code zero from a compilation that used to return warning messages.

The MSGEXIT suboption of the EXIT compiler option lets you specify a module that is called for each compiler message. Using the MSGEXIT module, you can change the severity of diagnostic messages, suppress diagnostic messages, and convert FIPS (FLAGSTD) messages into diagnostic messages.

## **Allows the underscore character in user-defined words**

In COBOL for Linux on x86, COBOL user-defined words such as data names and program names can include underscore characters (\_). Underscores are also supported in the literal form of program names.

By being able to use underscores in data names and program names, your COBOL code can more easily interoperate with XML, DB2<sup>®</sup>/SQL, and other programming languages.

## **COBOL across platforms**

COBOL for Linux on x86 is part of a family of compatible compilers, application development tools, and maintenance tools. The IBM COBOL family consists of COBOL for Linux on x86, COBOL for AIX, Enterprise COBOL for z/OS, and Automatic Binary Optimizer for z/OS.

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## Chapter 4. System requirements

COBOL for Linux on x86 runs on an x86-64 server that supports one of the following operating systems:

- Red Hat® Enterprise Linux (RHEL) 8 or 9
- Ubuntu Server (Ubuntu) 20.04 or 22.04
- SUSE Linux Enterprise Server (SLES) 15

It is also recommended that you meet the following requirements:

- Minimum 250 MB for product packages
- Minimum 2 GB of hard drive space for paging
- Minimum 512 MB for temporary files
- Minimum 2 GB RAM, with 4 GB more optimal

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## Chapter 5. For more information

To learn more about COBOL for Linux on x86, contact your IBM representative or IBM Business Partner, or visit the [COBOL for Linux on x86 product page](#).

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## Chapter 6. Notices

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Produced in the United States of America  
June 2023

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Product Number: 5737-L11