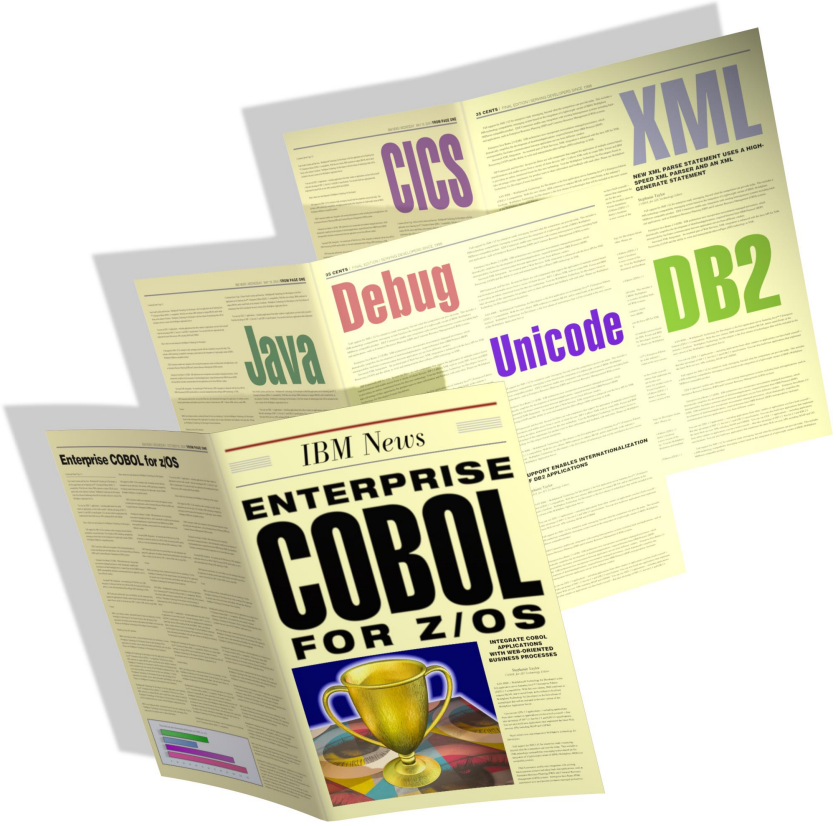
Application development for today's changing marketplace

IBM® Enterprise COBOL for z/OS® Version 3 Release 4 (5655-G53)



Highlights

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 targeted to execute on your z/OS systems and provides access to IBM DB2®, IBM CICS®, and IBM IMS® systems, as well as other data and transaction systems.

Enterprise COBOL provides the COBOL functions that you need to integrate COBOL applications with Web-oriented business processes. Enterprise COBOL retains all the function of earlier releases, such as:

- Java™ interoperability, supported by object-oriented syntax, provides access to, and the reuse of, Java business and data objects from z/OS UNIX® System Services, batch, and IMS environments.
- Enhanced XML capabilities, for generation of outbound XML from a COBOL data structure.
- Unicode™ support enables the internationalization of applications (including DB2® COBOL applications), the processing of international data, and the sharing of string data with Java.
- WebSphere® interoperability provides access from batch and z/OS UNIX System Services environments to Java processing in WebSphere.
- Compatibility with WebSphere tools, including WebSphere Studio Enterprise Developer, supports remote development, compiling, error identification, debugging, and enhanced COBOL XML processing tools. The XML tools include automatic generation of high-speed adapter modules for parsing inbound XML documents and populating a COBOL data structure.
- Enhanced support for Debug Tool Utilities and Advanced Functions including playback, which allows you to record and replay application execution paths and data values; and automonitor, which automatically displays current statement variables in the monitor window.
- Support for DB2 Universal Database for z/OS Version 8.

Enterprise COBOL for z/OS, Version 3 Release 4, delivers the following new features:

- Significant increases in maximum allowable data-item size
- Enhanced Unicode support
- Debug Tool for z/OS, Version 5 Release 1, included in Full Function offering

With the capabilities of Version 3, developers can do the following tasks:

- Simplify the componentization of COBOL programs and enable interoperability with Java components across distributed applications.
- Promote the exchange and use of

data in standardized formats, including XML and Unicode.

- Facilitate the reuse of existing applications in WebSphere and in traditional z/OS and OS/390 environments.
- Utilize new debugging functions in Debug Tool and Debug Tool Utilities and Advanced Functions.

With Enterprise COBOL, COBOL and Java applications can interoperate smoothly in the e-business world. As a result of such interoperation, software developers can leverage existing COBOL applications in new endeavors, capitalizing on existing investments.

New in Version 3 Release 4

Increased maximum data sizes

Several limits on COBOL data-item size have been significantly raised, for example:

- The maximum data-item size has been raised from 16 MB to 128 MB.
- The maximum PICTURE symbol replication has been raised to 134,217,727.
- The maximum OCCURS integer has been raised to 134,217,727.

These increases allow developers to create applications that use large amounts of data, for instance:

- DB2/COBOL applications that use DB2 CLOB and BLOB data types.
- COBOL XML applications that parse or generate large XML documents.

Enhanced Unicode support

This release provides enhanced Unicode support that enables the internationalization of applications and the processing of international data.

V3R4 builds on existing compiler Unicode capabilities and adds support to help enable much broader use of Unicode data for COBOL applications, including data of the following types encoded in Unicode:

- External decimal (national decimal)
- External floating-point (national floating point)
- Numeric-edited of USAGE NATIONAL
- National-edited

Support has been added for data encoded in Unicode (USAGE NATIONAL) that is analogous to the COBOL language and semantics for data encoded in a traditional EBCDIC code page (USAGE DISPLAY). This added support makes it possible to update existing EBCDIC applications (with any copybooks) by replacing the picture symbol X or A with the PICTURE symbol N, and USAGE DISPLAY with USAGE NATIONAL (explicitly or implicitly), and by adding the GROUP-USAGE NATIONAL clause to some declarations of groups that contain only USAGE NATIONAL data, thus minimizing changes required to procedural code.

Debug Tool for z/OS, Version 5 Release 1

This release supports new features of IBM Debug Tool, included in the Enterprise COBOL Version 3 Release 4 Full Function offering or as the separate product IBM Debug Tool for z/OS, Version 5.

This debug tool is a common facility that supports:

- Enterprise COBOL for z/OS
- Enterprise PL/I for z/OS
- COBOL for OS/390 & VM
- COBOL for MVS & VM
- PL/I for MVS & VM
- z/OS C/C++ optional feature
- OS/390 C/C++ optional feature

Only one Full Function offering is required for debugging applications written using any of these programming products. An Alternate Function offering is available if you prefer to receive the Enterprise COBOL for z/OS compiler but not the debug tool.

Major COBOL features

XML support

Enterprise COBOL XML support includes a high-speed parser that enables your COBOL programs to:

- Process XML documents in the principal run-time environments, such as CICS, IMS, and MQSeries®.
- Populate COBOL data structures with the content of XML documents.

For example, in a business-to-business environment, XML support enhances your existing high-performance IMS transactions written in COBOL, by accepting XML data as input. XML data can be placed in, and retrieved from, the IMS messages queue.

- Besides handling input XML messages (through XML PARSE), you can also handle output XML messages. The XML GENERATE statement generates XML from a group data item directly, eliminating the need to use MOVE CORRESPONDING and STRING statements to build XML messages.

WebSphere interoperability

You can use the Java interoperability capabilities of COBOL to access enterprise beans that run on a J2EE-compliant EJB server, such as WebSphere Application Server. To do this, the client environment must support a Java-based Object Request Broker (ORB). The client COBOL application can use COBOL INVOKE statements to access the following programming interfaces:

- Java Naming and Directory Interface (JNDI) to locate EJB services and components
- Java ORB to invoke methods on enterprise beans

Improved application development

Enterprise COBOL for z/OS provides a set of intrinsic functions including string handling, financial capabilities, statistical functions, and mathematical functions. 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 error handling is done in a separate routine that is loaded only when needed. You do not have to write the error-handling routines in assembler; with Language Environment you can write them in COBOL.

Enterprise COBOL for z/OS offers support for recursive calls in COBOL, structured programming, improved interoperability with other languages, and dynamic link library support. The

Enterprise COBOL for z/OS run-time library, Language Environment, 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. Except for OS/VS COBOL programs and any programs previously compiled with the CMPR2 compiler option, your current programs will continue to compile and to run without modification, while you selectively update existing applications to take advantage of the new functions. For OS/VS COBOL programs and any programs previously compiled with the CMPR2 compiler option, convert them into 1985 Standard programs that can be compiled with Enterprise COBOL. Use either the optional product COBOL and CICS Command-level Conversion Aid, or use the COBOL conversion option included in Debug Tool Utilities and Advanced Functions. The CICS Command-level Conversion capability is also part of the Debug Tool Utilities and Advanced Functions.

COBOL across platforms

Enterprise COBOL for z/OS is part of a large family of compatible compilers, application development tools, and maintenance tools. In addition to Enterprise COBOL, IBM offers IBM COBOL compilers for Windows®, AIX®, VSE®, and AS/400®. Host-based development products include ISPF, File Manager, Fault Analyzer, and Debug Tool. You can also take advantage of IBM's extensive suite of COBOL maintenance tools to improve your existing applications. These tools assist you with source code conversion from former ANSI standards to ANSI 85 COBOL syntax; code analysis, and reporting; CICS source conversion; Report Writer code support; and regression testing of interactive applications.

Software requirements

Enterprise COBOL and its generated object programs run under the following z/OS and S/390® operating systems:

- z/OS, Version 1 Release 4 (5694-A01) or later

VM/CMS is not supported.

The following Language Environment® elements provide the execution environment and library of COBOL run-time services that are required to compile and run COBOL applications using Enterprise COBOL:

- On z/OS, Version 1 Release 4, 5 or 6: z/OS Language Environment element plus PTFs for APAR PQ95214

Support for object-oriented COBOL syntax (Java interoperability) requires:

- IBM Developer Kit for OS/390, Java 2 Technology Edition, SDK 1.3.1 or later, when executing in an IMS Java environment.
- IBM Developer Kit for OS/390, Java 2 Technology Edition, SDK 1.3.0 or later, in other environments.

For installation on z/OS:

- z/OS SMP/E element

The following assembler is required for customization:

- z/OS High Level Assembler

Support for Unicode requires:

- For z/OS Release 4 or later: FMID HUN7707 must be installed and configured on your target system. Unicode Conversion Services (HUN7707) is an optional feature for z/OS.

Support for DB2® integrated coprocessor requires:

- DB2 Universal Database for z/OS, Version 8 (5625-DB2)
- DB2 Universal Database for OS/390 and z/OS, Version 7 (5675-DB2)
- Use of Unicode in DB2 COBOL applications running with DB2 Version 7 requires DB2 APAR PQ61320

Support for use of national decimal host variables in EXEC SQL statements requires DB2 Version 8 with APAR PQ93857.

To debug Enterprise COBOL code, you must use:

- Debug Tool for z/OS, Version 5 Release 1 (5655-M18) (included in the Full Function offering)
- Debug Tool for z/OS, Version 4 Release 1 (5655-L24)
- Debug Tool for z/OS and OS/390, Version 3 Release 1 (5655-H32)

One of the following prerequisites is needed for advanced interactive debugging, depending on the level of Debug Tool:

- Debug Tool Utilities and Advanced Functions for z/OS, Version 5 Release 1 (5655-M19)
- Debug Tool Utilities and Advanced Functions for z/OS, Version 4 Release 1 (5655-L23)
- Debug Tool Utilities and Advanced Functions for z/OS and OS/390, Version 3 Release 1 (5655-J18)

For sorting and merging, you must use the following feature of z/OS or an equivalent product:

- DFSORT element of z/OS (5694-A01) or OS/390 (5647-A01)

Support for integrated CICS translator requires:

- CICS Transaction Server for z/OS, Version 2 (5697-E93) or Version 3 (5655-M15)
- CICS Transaction Server for OS/390, Version 1 (5655-147)

Programs with Report Writer statements require:

- COBOL Report Writer, Release 4 (5798-DYR, 5798-DZX)

One of the following prerequisites is needed for interlanguage communication with PL/I:

- PL/I for MVS & VM, Version 1 Release 1 (5688-235)
- Enterprise PL/I for z/OS and OS/390, Version 3 Release 1 (5655-H31)

The following prerequisite is needed for interlanguage communication with FORTRAN:

- VS FORTRAN, Version 2 Release 6 (5668-806, 5688-087)

For more information

See your client representative or call IBM DIRECT at 1-800-IBM-CALL in the US and Canada. To learn more about these tools, visit the COBOL Web site at www.ibm.com/software/awdtools/cobol.

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