Licensed Program Specifications

IBM

Enterprise COBOL for z/OS, Version 4 Release 1 – Program Number 5655-S71

Enterprise COBOL is an IBM® z/OS-based compiler that helps you create and maintain COBOL applications targeted to execute on your z/OS® systems and provides access to DB2®, CICS®, and IMS™ systems, as well as other data and transaction systems. Enterprise COBOL for z/OS provides COBOL functions that integrate COBOL applications with Web-based business processes in Web services, XML, and Java™.

Version 4.1 enhancements

Enterprise COBOL V4.1 compiler enhancements include:

New syntax options for the XML GENERATE statement that give programmers more flexibility and control over the form of the XML documents that are generated. New syntax options:

WITH ATTRIBUTES phrase
Eligible items in the XML document are generated as XML attributes instead of elements

WITH ENCODING phrase
Allows the user to specify the encoding of the generated document

NAMESPACE phrase
Allows generation of XML documents that use XML namespaces

WITH XML-DECLARATION
Includes the version and the encoding information in the document

The XML GENERATE statement now supports generation of XML documents encoded in UTF-8 Unicode.

The following XML PARSE support enhancements:

– As an alternative to the COBOL library's existing XML parser, Enterprise COBOL now supports the z/OS System Services XML parser, which provides the following benefits:

- Improved support for parsing XML documents that use XML namespaces

- Direct support for parsing XML documents that are encoded in UTF-8 Unicode

- Support for parsing a buffer of XML at a time for very large XML documents

– Four new special registers are introduced for namespace processing during execution of XML PARSE statements

– The XML PARSE statement is extended with new syntax: WITH ENCODING and RETURNING NATIONAL phrases give the programmer control over the assumed encoding of input XML documents and facilitate parsing in Unicode

– A new compiler option, XMLPARSE, has been created to control whether the z/OS System Services parser or the existing COBOL parser is used for XML PARSE statements. With the XMLPARSE(COMPAT) option, XML parsing is compatible with Enterprise COBOL Version 3. With the XMLPARSE(XMLSS) options, the z/OS System Services parser is used and new XML parsing capabilities are enabled.

DB2 support has been enhanced in this release, including DB2 V9 exploitation and improvements in coprocessor integration and usability:

– Support for new SQL data types and new SQL syntax provided by DB2 V9

– DB2 options are shown in the compiler listing (DB2 V9 only)

– SQLCA and SQLDA control blocks are expanded in the compiler listing (all supported DB2 releases)

– A new compiler option SQLCCSID is provided to coordinate the coded character set ID (CCSID) between COBOL and DB2

Enterprise COBOL V4.1 additional function includes:

• Compiler options can now be specified in a data set

- When the XREF compiler option is used, the compiler listing includes cross references of COPY statements, libraries, and data sets
- Debug Tool V8 is supported

- A new suboption of the TEST compiler option enables support for the Debug Tool GOTO and JUMPTO commands when debugging optimized production programs

Specified operating environment for Enterprise COBOL

This section lists the hardware and software requirements for IBM Enterprise COBOL for z/OS, Version 4 Release 1.

Hardware requirements

Enterprise COBOL for z/OS V4.1 will run on any z/Architecture® processor that includes the z/Architecture Extended-Translation Facility 2.

Software requirements

Enterprise COBOL runs under the control of, or in conjunction with, the following IBM licensed programs and their subsequent releases unless otherwise announced by IBM.

For information about programs listed below that mention the need to apply program temporary fixes (PTFs), see the *Enterprise COBOL Program Directory*, the *Enterprise COBOL Customization Guide*, and the preventive support planning (PSP) bucket.

Required licensed programs

Enterprise COBOL and its generated object programs run under the following zSeries® operating systems:

- z/OS, Version 1 Release 7 (5694-A01) or later

Language Environment® provides the execution environment and library of COBOL runtime services required to compile and run COBOL applications using Enterprise COBOL:

- z/OS Language Environment Version 1, Release 7, Release 8 or Release 9 plus PTFs for APAR PK55645

For installation on z/OS, the following is required:

- z/OS SMP/E element

The following is required for customization during or after installation:

- z/OS High Level Assembler

Enterprise COBOL XML processing with the XMLPARSE(XMLSS) option requires:

- z/OS Version 1 Release 7, Release 8, or Release 9 XML Systems Services plus PTFs for APAR OA22777

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

- SDK for z/OS, Java 2 Technology Edition (5655-I56), V1.4

  Note: COBOL requires a 31-bit Java SDK, 64-bit Java technology is not currently supported. Java 2 Technology Edition V5 is not currently supported.

Support for DB2 integrated coprocessor (SQL compiler option) requires:

- DB2 Universal Database™ for z/OS, Version 9 (5635-DB2) with PTFs for APAR PK46422
- DB2 Universal Database for z/OS, Version 8 (5625-DB2) with PTFs for APAR PK46422
- DB2 Universal Database, Version 7 (5675-DB2) with PTFs for APAR PK46422
- Use of Unicode in DB2 COBOL applications with DB2 Version 7 requires PTFs for APAR PQ61320
- Support for use of national decimal host variables in EXEC SQL statements requires DB2 Version 8 with PTFs for APAR PQ93857 or DB2 Version 9
- Support for use of alternate DDNAME for DBRMLIB requires DB2 Version 8 or Version 9 with PTFs for DB2 APAR PK55937

Support for the integrated CICS translator (CICS compiler option) requires:

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

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

- DFSORT™ element of z/OS (5694-A01)

Programs with Report Writer statements require:
- COBOL Report Writer, Release 4 (5798-DYR, 5798-DZX)

Optional licensed programs for z/OS

Enterprise COBOL Version 4 Release 1 runs with the currently supported releases of the following programs:
- CICS Transaction Server for z/OS, Version 3 (5655-M15)
- CICS Transaction Server for z/OS, Version 2 (5697-E93)
- DB2 Universal Database for z/OS, Version 9 (5635-DB2)
- DB2 Universal Database for z/OS, Version 8 (5625-DB2)
- DB2 Universal Database for z/OS and OS/390®, Version 7 (5675-DB2)
- IMS, Version 10 (5635-A01)

- IMS, Version 9 (5655-J38))
- IMS, Version 8 (5655-C56)
- Debug Tool for z/OS, Version 8 (5655-S17)
- Debug Tool Utilities and Advanced Functions for z/OS, Version 8 (5655-S16) for use with Debug Tool for z/OS, Version 8
- Debug Tool for z/OS, Version 7 (5655-R44)
- Debug Tool Utilities and Advanced Functions for z/OS, Version 7 (5655-R45) for use with Debug Tool for z/OS, Version 7
- COBOL Report Writer R4 (5798-DYR, 5798-DZX)
- High Level Assembler MVS™ & VM & VSE (5696-234)
- PL/I for MVS & VM, Version 1 (5688-235)
- Enterprise PL/I for z/OS, Version 3 (5655-H31)
- VS FORTRAN, Version 2 (5668-806, 5668-087)
- For C/C++ with Enterprise COBOL, you must use the C/C++ feature of z/OS

Industry standards supported by Enterprise COBOL V4.1

Enterprise COBOL supports the following industry standards.

ISO standards

ISO 1989:1985, Programming Languages - COBOL.

ISO/IEC 1989/AMD1:1992, Programming Languages - COBOL: Intrinsic Function Module.

ISO/IEC 1989/AMD2: 1994, Programming Languages - COBOL: Correction and Clarification Amendment for COBOL.

ISO 1989:1985 is identical to ANSI INCITS 23-1985, Programming Languages - COBOL.

ISO/IEC 1989/AMD1:1992 is identical to ANSI INCITS 23b-1989, Programming Languages - Intrinsic Function Module for COBOL.

ISO/IEC 1989/AMD2:1994 is identical to ANSI INCITS 23b-1993, Programming Language - Correction Amendment for COBOL.

For supported modules, see American National Standards below.

International Reference Version of the ISO 7-bit code defined in *International Standard 646, 7-Bit Coded Character Set for Information Processing Interchange*.

American National standards

ANSI INCITS 23-1985, Programming Languages - COBOL.

ANSI INCITS 23a-1989, Programming Languages - Intrinsic Function Module for COBOL.

ANSI INCITS 23b-1993, Programming Language - Correction Amendment for COBOL.

The 7-bit coded character sets defined in American National Standard X3.4-1977, Code for Information Interchange.

All required modules are supported at the highest level defined by the standard. In the following list, the shorthand notation for describing module levels is shown in parentheses. For example, to summarize module information for sequential input and output, the shorthand notation is (2 SEQ 1,2). The first digit indicates the level of language elements within the module supported

by Enterprise COBOL. Next is the three-character abbreviation of the module name as used in the standard. Finally, the two digits separated by a comma indicate the minimum and maximum levels of the module. For example, (2 SEQ 1,2) means that Enterprise COBOL supports the sequential I-O module at level 2, while the range of levels in the module is from 1 (minimum) to 2 (maximum).

- Nucleus (2 NUC 1,2)

  Provides internal processing of data within the four basic divisions of a program and the capability for defining and accessing tables.

- Sequential I-O (2 SEQ 1,2)

  Provides access to records of a file in established sequence. The sequence is established as a result of writing the records to the file.

- Relative I-O (2 REL 0,2)

  Provides access to records in either a random or sequential manner. Each record is uniquely identified by an integer specifying the record's logical position in a file.

- Indexed I-O (2 INX 0,2)

  Provides access to records in either a random or sequential manner. Each record in an indexed file is uniquely identified by the value of a key within that record.

- Sort-Merge (1 SRT 0,1)

  Orders one or more files of records, or combines two or more identically ordered files of records, according to a set of user-specified keys.

- Inter-Program Communication (2 IPC 1,2)

  Allows a COBOL program to communicate with other programs through transfers of control and access to common data items.

- Source Text Manipulation (2 STM 0,2)

  Allows the insertion of source program text as part of the compilation of the source program. COBOL libraries contain texts which are available to the compiler at compile time and which can be treated by the compiler as part of the source program.

In addition, the following optional modules of the standard are supported:

- Intrinsic Functions (1 ITR 0,1)

  Provides the capability to reference a data item whose value is derived automatically at the time of reference during the execution of the object program.

- Debug (1 DEB 0,2)

  Monitors object program execution through declarative procedures, special debugging lines, and a special register, DEBUG-ITEM, which gives specific information about execution status.

- Segmentation (2 SEG 0,2)

  Refreshes independent segments when required.

The following optional module of the standard is supported with the optional IBM COBOL Report Writer Precompiler (5798-DYR):

- Report Writer

The following optional modules of the standard are not supported:

- Communications
- Debug (2 DEB 0,2)

Restrictions: Enterprise COBOL has the following restrictions related to industry standards:

- OPEN EXTEND is not supported for ASCII encoded tapes (CODESET STANDARD-1 or STANDARD-2).
- When division by zero occurs in an arithmetic expression and an ON SIZE ERROR phrase is not specified, processing abnormally terminates.

Compatibility with previous product releases

Compatibility with Enterprise COBOL for z/OS, Version 3

Enterprise COBOL for z/OS, Version 4.1 is fully source and object compatible with Enterprise COBOL for z/OS, Version 3, except in the following cases:

- There are new reserved words. See the *Enterprise COBOL for z/OS Compiler and Runtime Migration Guide, Version 4 Release 1* for details.
- The SIMVRD runtime option and simulated variable length relative record data sets are no longer supported.

- The suboptions of the TEST compiler option are simplified. Existing suboptions are tolerated for compatibility, and are automatically mapped to the new suboption values. Symbolic debugging information is always generated when the TEST option is in effect.
- Corrections to the SEARCH ALL statement have been made that might result in behavior incompatible with Enterprise COBOL 3 if the compiler installation is at release 3 or earlier, or at release 4 if the installation does not have current service applied. See the *Enterprise COBOL for z/OS Compiler and Runtime Migration Guide, Version 4 Release 1* for details.

For compatibility of Enterprise COBOL for z/OS, Version 4.1 with IBM COBOL products prior to Version 3, see the *Enterprise COBOL for z/OS Compiler and Runtime Migration Guide, Version 4 Release 1*.

Security, auditability, and control

The announced program uses the security and auditability features of the host operating system software. The customer is responsible for evaluation, selection and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Licensed program materials availability

Restricted materials - No. This licensed program is available without source licensed program materials. It is available in object code only.

Supplemental terms

Designated Machine Identification

Designated Machine Identification required: Yes.

Testing period

- Basic License: Not applicable.
- DSLO License: Not applicable.

Installation or location license

Not applicable. A separate license is required for each machine on which the licensed program will be used.

Usage restriction

Not applicable.

Type and duration of program services

- Central Service.
- Until discontinued by IBM with a minimum of six months' written notice.

Authorization for copy and use on home or portable computer

Not applicable.

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http://www.w3.org/2003/03/Translations/byTechnology?technology=xml.

This document is a W3C Recommendation. This fourth edition is not a new version of XML. As a convenience to readers, it incorporates the changes dictated by the accumulated errata (available at http://www.w3.org/XML/xml-V10-3e-errata) to the Third Edition of XML 1.0, dated 4 February 2004. In addition, the markup introduced in the third edition, to clarify when prescriptive keywords are used in the formal sense defined in [IETF RFC 2119], has been modified to better match the intent of [IETF RFC 2119]. This edition supersedes the previous W3C Recommendation of 4 February 2004.

Please report errors in this document to the public xml-editor@w3.org mailing list; archives are available. For the convenience of readers, an XHTML version with color-coded revision indicators is also provided; this version highlights each change due to an erratum published in the errata list, together with a link to the particular erratum in that list. Most of the errata in the list provide a rationale for the change. The errata list for this fourth edition is available at http://www.w3.org/XML/xml-V10-4e-errata.

An implementation report is available at http://www.w3.org/XML/2006/06/xml10-4e-implementation.html. A Test Suite is maintained to help assessing conformance to this specification. This document has been reviewed by W3C Members, by software developers, and by other W3C groups and interested parties, and is endorsed by the Director as a W3C Recommendation. It is a stable document and may be used as reference material or cited from another document. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability of the Web.

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