Licensed Program Specifications

Enterprise COBOL for z/OS, Version 3 Release 4 – Program Number 5655-G53

IBM Enterprise COBOL for z/OS provides COBOL functions that integrate COBOL applications with Web-oriented business processes. The capabilities in this release:

- Facilitate programming with large amounts of data through increases in maximum data-item sizes.
- Offer enhanced Unicode support that helps enable the internationalization of applications and the processing of international data. Several additional types of data items and group items can now be described as USAGE NATIONAL.
- Include Debug Tool for z/OS, Version 5 in the Full Function offering.
- Allow developers to create and maintain mission-critical, line-of-business COBOL applications targeted to execute on your z/OS systems.
- Provide access to IBM DB2, IBM CICS, and IBM IMS systems, as well as other data and transaction systems.

With Enterprise COBOL, COBOL and Java applications can interoperate in the e-business world.

Specified operating environment for Enterprise COBOL

This section lists the hardware and software requirements for IBM Enterprise COBOL for z/OS, Version 3 Release 4.

Hardware requirements

Enterprise COBOL and its compiled object programs can run on any IBM zSeries processor supported by the operating systems listed under "Programming Requirements."

Applications using the enhanced Unicode support provided by this release must be developed and executed on a z/Architecture processor model that has the extended-translation facility 2 available.

IBM devices supported by VSAM and QSAM on the above systems can be used with object programs produced by Enterprise COBOL.

When the ARITH(EXTEND) compiler option is in effect, the ESA/390 HFP-extensions package is required for application execution. This package includes support for additional hexadecimal floating-point instructions and provides 16 (rather than four) floating-point registers. Support for this capability is available in G5 or later processors, or through the software emulation provided in z/OS. The software emulation is not recommended for a production environment.

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 4 (5694-A01) or later

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

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

Support for changing the name of the separate file that is produced when compiling with the SEPARATE suboption of the TEST compiler option requires the debug file exit provided with Language Environment APAR PQ93395.

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, the following is required:

- z/OS SMP/E element

The following is required for customization during or after installation:

- z/OS High Level Assembler

Support for Unicode requires:

- Unicode Conversion Services (HUN7707) 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, 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.

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

- DFSORT element of z/OS (5694-A01)

Support for the integrated CICS translator requires:

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

Programs with Report Writer statements require:

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

Support for the execution of mixed Java and COBOL applications in IMS Java-dependent regions requires one of the following:

- IMS, Version 9 (5655-J38)
- IMS, Version 8 (5655-C56)
- IMS, Version 7 (5655-B01) with PTFs for APARs PQ53944 and PQ54039

For C/C++ with Enterprise COBOL, you must use the C/C++ feature of z/OS.

Optional licensed programs for z/OS

Enterprise COBOL Version 3 Release 4 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)
- CICS Transaction Server for OS/390, Version 1 (5655-147)
- DB2 Universal Database for OS/390, Version 6 (5645-DB2)
- DB2 Universal Database for OS/390 and z/OS, Version 7 (5675-DB2)
- DB2 Universal Database for z/OS, Version 8 (5625-DB2)
- Debug Tool for z/OS, Version 5 (5655-M18) (Included in the Full Function Enterprise COBOL offering.)
- Debug Tool Utilities and Advanced Functions for z/OS, Version 5 (5655-M19) for use with Debug Tool for z/OS, Version 5
- Debug Tool for z/OS, Version 4 (5655-L24)
- Debug Tool Utilities and Advanced Functions for z/OS, Version 4 (5655-L23) for use with Debug Tool for z/OS, Version 4
- Debug Tool for z/OS and OS/390, Version 3 (5655-H32)
- Debug Tool Utilities and Advanced Functions for z/OS and OS/390, Version 3 (5655-J18) for use with Debug Tool for z/OS, Version 3

- High Level Assembler MVS & VM & VSE (5696-234)
- COBOL Report Writer R4 (5798-DYR, 5798-DZX)
- IMS, Version 9 (5655-J38))
- IMS, Version 8 (5655-C56)
- IMS, Version 7 (5655-B01)
- PL/I for MVS & VM, Version 1 (5688-235)
- Enterprise PL/I for z/OS and OS/390, Version 3 (5655-H31)
- VS FORTRAN, Version 2 (5668-806, 5668-087)

Industry standards supported by Enterprise COBOL V3.4

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 features with previous product releases

Compatibility with Enterprise COBOL for z/OS, Version 3

Enterprise COBOL is fully source and object compatible with Enterprise COBOL for z/OS, Version 3 Releases 1, Release 2, or Release 3 except in the following case:

- There are new reserved words: GROUP-USAGE and NATIONAL-EDITED.
- CMPR2 compiler option has been removed.
- There are new reserved words: EXECUTE, FACTORY, FUNCTION-POINTER, GROUP-USAGE, JNIENVPTR, NATIONAL-EDITED, XML, END-XML, XML-EVENT, XML-CODE, XML-TEXT, and XML-NTEXT.
- SOM-based object-oriented COBOL is no longer supported.

Compatibility with COBOL for OS/390 & VM, Version 2 Release 2

Enterprise COBOL is fully source and object compatible with COBOL for OS/390 & VM Version 2 except in the following cases:

Link-editing requirements for Enterprise COBOL

If any part of a load module is compiled with Enterprise COBOL, the load module must be linked with z/OS Language Environment. With Enterprise COBOL, relinked load modules are not self-contained.

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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