



# IBM Enterprise COBOL for z/OS , V5.1 allows you to generate your applications for higher levels of the z/Architecture and higher levels of performance optimization

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## At a glance

Enterprise COBOL for z/OS® , V5.1 exploits the capabilities of the z/Architecture® while adding a number of new features and enhancements:

- A new compiler option (ARCH) to exploit and tune your code to run on your choice of the z/Architecture levels of the z/OS platform.
- The enhanced compiler option (OPTIMIZE) to select from multiple levels of increasing optimization for your code.
- Improved capability to process large data items to the full AMODE(31) capability.
- Improved capability for modernizing business-critical applications through XML enhancements that gives you control over the form of XML documents.
- Support for the latest middleware including CICS® , DB2® , and IMS™ .
- Improved capability for programming with UTF-8 Unicode.
- New pseudo-assembly listings (output from LIST compiler option).
- Interoperability with Java™ 7 to help you incorporate web-based applications as part of your business processes.
- New DWARF/Common Debug Architecture interface to provide a consistent format for information that can be used by debuggers and program analysis tools.

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: ME001).

## Overview

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 to execute on your z/OS systems. Enterprise COBOL for z/OS continues to give you access to CICS , DB2 , IMS , and other transactional and data systems.

Enterprise COBOL for z/OS , V5.1 introduces two significant compiler options. Based on new code generation and optimization technology the new ARCH and enhanced OPTIMIZE compiler options allow you to maximize the delivery of z/Architecture exploitation and performance optimization within your applications.

The new compiler option ARCH gives you the flexibility to have the Enterprise COBOL compiler generate code for higher levels of the z/Architecture . Higher ARCH levels instruct the compiler to exploit newer processor instructions to optimize and tune your application code to the latest levels of z/Architecture .

The enhanced OPTIMIZE compiler option provides you with the flexibility to obtain multiple levels of increasing optimization that run from comprehensive low-level optimizations to more extensive optimizations that can improve the performance of your COBOL applications.

Over the course of multiple releases, Enterprise COBOL for z/OS has offered new and enhanced functions in order to provide you with the tools needed to modernize and maintain smarter applications to meet your critical business needs. The following are some of the new and improved features within this release:

- XML processing enhancements for easier web interoperability.
- Improved capability for programming with UTF-8 Unicode for better national language support in your applications.
- Increased compiler limits to help you handle larger data items and larger groups of data and to improve application exploitation of system resources.
- Support for unbounded tables and groups to improve usability in defining variable length tables and groups.
- A new floating comment indicator to create a comment anywhere in the program-text area.
- A new level of z/OS System Management Facilities (SMF) tracking support to reduce your administrative reporting overhead.
- Java interoperability to Java 7 to help you incorporate new, web-based applications as part of your business processes.
- Support for CICS , DB2 , and IMS to provide access to the latest middleware.
- A new interface called Common Debug Architecture (CDA) to provide a consistent format for accessing information that can be used by debuggers and program analysis tools.

Enterprise COBOL for z/OS , V5.1 provides source compatibility with prior versions of IBM COBOL, in that the compiler will compile correct COBOL source programs that were developed with earlier versions. V5.1 is object compatible with prior versions, in that applications can be constructed using a mixture of object modules compiled with V5.1 and those compiled with earlier versions. V5.1 is run time compatible with prior versions, in that correct COBOL programs will continue to produce the same run time results after being recompiled with V5.1. A small number of exception cases are documented in the Enterprise COBOL Version 5 Migration Guide.

Enterprise COBOL for z/OS , V5.1 advances the IBM commitment to the COBOL programming language on the z/OS platform through investment in new compiler technology and the continued delivery of new features, many of them client requested. With Enterprise COBOL for z/OS , V5.1, you gain the benefit of new investment combined with more than 40 years of IBM experience in compiler development.

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## Key prerequisites

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For details, refer to the [Software requirements](#) section.

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## Planned availability date

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June 21, 2013

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## Description

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Enterprise COBOL for z/OS , V5.1 incorporates leading-edge code generation and optimization technology to improve delivery of z/Architecture exploitation, maximize hardware utilization, and help improve application performance.

### **Harness the power of z/Architecture advancements**

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The new compiler option (ARCH) is made available to you for selecting optimization and processor architecture levels. The ARCH option supports the following architecture levels and groups of models:

- ARCH(6) produces code that uses instructions available on the 2084-xxx (z990) and 2086-xxx (z890) models in z/Architecture mode. Specifically, these ARCH(6) machines and subsequent generations add the long-displacement facility.
- ARCH(7) produces code that uses instructions available on the 2096-xxx ( IBM System z9® BC) and 2094-xxx models ( IBM System z9 EC) in z/Architecture mode. Specifically, these ARCH(7) machines and subsequent generations add instructions supported by the extended-immediate facility, which may be exploited by the compiler. Also, these machines add instructions supported by the decimal floating-point facility, which are generated if there are decimal floating-point data types in the source code.
- ARCH(8) produces code that uses instructions available on the 2098-xxx models ( IBM System z10® BC) and 2097-xxx models ( IBM System z10 EC) in z/Architecture mode. Specifically, these ARCH(8) machines and subsequent generations instructions supported by the general instruction extensions facility, which may be exploited by the compiler. Also these machines add instructions supported by the decimal floating-point facility, which are generated if there are decimal floating-point data types in the source code
- ARCH(9) produces code that uses instructions available on the 2818-xxx models ( IBM zEnterprise® 114) (z114) and 2817-xxx models ( IBM zEnterprise 196) (z196) in z/Architecture mode. Specifically, these ARCH(9) machines and subsequent generations add the following facilities:
  - High-word facility
  - Interlocked-access facility
  - Load/store-on-condition facility
  - Distinct-operands facility
  - Population-count facility
- ARCH(10) produces code that uses instructions available on the 2828-xxx models ( IBM zEnterprise BC12) (zBC12) and 2827-xxx models ( IBM zEnterprise EC12) (zEC12) in z/Architecture mode. Specifically, these ARCH(10) machines and subsequent generations add the following facilities:
  - Execution-hint facility
  - Load-and-trap facility
  - Miscellaneous-instructions-extension facility
  - Transactional-execution facility

### **Powerful performance optimization with no development effort**

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Through the enhanced OPTIMIZE compiler option, COBOL programmers are offered a number of ways to optimize their code. Using the OPTIMIZE(0), OPTIMIZE(1), and OPTIMIZE(2) options, you can obtain multiple levels of increasing optimization that run from comprehensive low-level optimizations to more extensive optimizations that can improve the performance of your COBOL applications.

- OPTIMIZE(0) indicates that only limited optimizations are to be performed. This results in the most efficient compilation time, and full debug capabilities are available when the TEST option is specified.

- OPTIMIZE(1) includes optimizations that improve application run-time performance, while preserving most debugging capabilities. Optimizations at this level include basic inlining, strength reduction and similar simplification of complex operations into equivalent simpler operations, removal of some unreachable code, and block rearrangement. Also, some intra-block optimizations such as common sub-expression elimination and value propagation are performed.
- OPTIMIZE(2) adds further optimizations including more aggressive simplifications and instruction scheduling. Also, some inter-block optimizations such as global value propagation and loop invariant code motion are performed.

## **New and improved functions are added to Enterprise COBOL for z/OS**

### ***XML processing enhancements***

Originally developed in 1996, XML is now widely used and is one of the most flexible ways to automate web transactions. In version 3, Enterprise COBOL introduced support for XML with the XML GENERATE and XML PARSE statements. Since then, Enterprise COBOL has enhanced its support for XML with every release including this new version 5.1.

- XML Parse with continued data
  - With the z/OS XML System Services parser that is used to support the XML PARSE statement, XML content may not all be delivered on a single XML event. Rather, the contents may be split across multiple events, and application program logic must concatenate the pieces of content together. This programming can be awkward using prior versions of Enterprise COBOL, because there is no mechanism available to easily determine whether delivered content is complete or is continued on the next event.

Enterprise COBOL for z/OS , V5.1 provides the new XML-INFORMATION special register to address this problem. The XML-INFORMATION special register provides a mechanism to easily determine whether an XML EVENT and its associated XML-INFORMATION value is complete or incomplete.
- XML generation enhancements
  - The XML GENERATE statement is extended with new syntax that gives the programmer more flexibility and control over the form of the XML document that is generated.
    - The NAME phrase has been added to allow user supplied element and attribute names.
    - The SUPPRESS phrase has been added to allow suppression of empty attributes and elements.
    - The TYPE phrase has been added to give the user control of attribute and element generation.

### ***Unicode support enhancements***

- New intrinsic functions provide additional Unicode capability while improving usability for programming with UTF-8 Unicode and complementing the support for UTF-16 Unicode.
  - The ULENGTH function returns an integer equal to the length, in UTF-8 characters, of a character string argument that is encoded in UTF-8.
  - The USUBSTR function returns a substring of a character string argument that is encoded in UTF-8.
  - The UNSUPPLEMENTARY function returns an integer equal to the index of the first Unicode supplementary character in a character string argument that is encoded in UTF-8 or UTF-16.
  - The UVALID function returns an integer which has the value zero if a character string contains valid Unicode UTF-8 or UTF-16 data, and which has the index of the first invalid element if the character string does not contain valid Unicode data.
  - The UWIDTH function returns an integer equal to the width in bytes of the nth UTF-8 character in a character string argument that is encoded in UTF-8.

With the improving national data capabilities, it is easier than ever before to develop COBOL programs that exclusively use Unicode for all application data.

### ***Increased compiler limits***

A number of internal compiler limits have been raised, to improve usability and enable COBOL applications to further exploit available processor storage resources. For example, in the previous Enterprise COBOL versions the limit for each data division section and the limit for an individual data item is 128 MB. In Enterprise COBOL V5.1, there is no aggregate data division limit (up to the address space capacity) and the limit for an individual data item is 999,999,999 bytes.

With the increase of limits on data item, table and table element, linkage section and data division sizes, you will be able to use Enterprise COBOL for z/OS , V5.1 to work with even larger volumes of data while employing business analytics to uncover opportunities, build efficiencies and make more informed decisions.

### ***Support for unbounded tables and groups***

A new keyword UNBOUNDED is added to the OCCURS ... DEPENDING ON clause which enables you to define variable length (unbounded) tables and groups. With this new keyword, the maximum number of occurrences (size) for a table and the containing group no longer has to be specified. Usability in defining variable length tables in COBOL is improved particularly when defining COBOL group structures that correspond to XML documents, where the XML document structure is defined by a general XML schema.

### ***Floating comment indicator (\*>)***

A new floating comment indicator (the character string '\*>') can be specified anywhere in the program-text area to indicate that the ensuing text on a line is a comment line or an inline comment. A floating comment indicator indicates a comment line if it is the first character string in the program-text area (Area A plus Area B, columns 8 - 72), or indicates an inline comment if it is after one or more character strings in the program-text area.

### **Use of System Management Facilities records to ease administration**

A new level of z/OS System Management Facilities (SMF) tracking support within Enterprise COBOL for z/OS , V5.1 allows clients, who implement sub-capacity tracking to reduce their administrative reporting overhead.

SMF collects and records system and job related information that is used by the Sub-Capacity Reporting Tool (SCRT) to report on sub-capacity products.

As of V5.1, Enterprise COBOL for z/OS is instrumented so it can be tracked by SMF89 records. If you have enabled the collection of SMF70 and SMF89 records on your machine and you are using SCRT to report the usage of the COBOL compiler, you will no longer have to tell SCRT where your COBOL compiler runs. Enterprise COBOL for z/OS , V5.1 can now automatically be tracked by SMF89 records and will be supported by SCRT V21.2.0. You must use SCRT V21.2.0, or a later release, whenever you use Enterprise COBOL for z/OS , V5.1.

In conjunction with the SMF record support, system administrators will now also be able to define a disablement policy through the SYSx.PARMLIB(IFAPRDxx) parameter library. This client requested feature can be used to disable the use of the Enterprise COBOL for z/OS , V5.1 compiler within a specific z/OS system.

You continue to gain the benefits of implementing sub-capacity for Enterprise COBOL for z/OS , V5.1 while reducing your administrative overhead.

## **A consistent and well-documented DWARF interface**

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The new DWARF/Common Debug Architecture interface provides a consistent format for information that can be used by debuggers and program analysis tools.

The Common Debug Architecture (CDA) was introduced in z/OS V1R5 and first supported by z/OS XL C/C++. CDA provides a consistent format for information that can be used by debuggers and program analysis tools. As such, CDA provides an opportunity to work towards a common debug information format across various programming languages. CDA components are based on the DWARF Debugging Information Format standard and the Executable and Linking format (ELF) ABIs. The new version of Enterprise COBOL for z/OS generates DWARF information conforming to the DWARF V4 specification. The debugging information format is open-ended, allowing for the addition of debugging information that accommodates new languages and debugger capabilities while facilitating the porting of debug and analysis tools to z/OS from other DWARF-compliant platforms. Enterprise COBOL for z/OS V5 will continue to make available ADATA and program listings which have been traditionally used by debuggers and program analysis tools.

With CDA support, when you compile your application with TEST on, Enterprise COBOL V5.1 will create and store the debug information in the program object. The debug information is stored as a NOLOAD class and is not loaded unless it is needed. In this way the debug information always matches the executable. There are no extra files to keep track of and the size of the executable that is loaded, is reduced.

With CDA, customers can continue to release debuggable applications but now these applications will not occupy as much memory when loaded at execution time.

## **Additional new and changed functions**

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In addition to the features mentioned above, Enterprise COBOL for z/OS , V5.1 delivers the following new and changed features:

- The following compiler options are new to Enterprise COBOL for z/OS :
  - AFP(VOLATILE|NOVOLITILE)
  - ARCH(n)(ARCH)
  - DISPSIGN(SEP|COMPAT)
  - HGPR(PRESERVE|NOPRESERVE)
  - MAXPCF
  - STGOPT|NOSTGOPT
- The following compiler options are enhanced:
  - The NOTEST option is enhanced to include the suboptions DWARF and NODWARF.
  - The EXIT compiler option is no longer mutually exclusive with the DUMP compiler option, and the compiler exit rules are updated.
  - The OPTIMIZE option is modified to allow several levels of optimization. The previous OPTIMIZE option format is deprecated but is tolerated for compatibility.

## **Accessibility by people with disabilities**

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A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

[http://www.ibm.com/able/product\\_accessibility/index.html](http://www.ibm.com/able/product_accessibility/index.html)

## **Section 508 of the US Rehabilitation Act**

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IBM Enterprise COBOL for z/OS , V5.1 is capable as of June 21, 2013, when used in accordance with associated IBM documentation, of satisfying the applicable

requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested on the following website

[http://www.ibm.com/able/product\\_accessibility/index.html](http://www.ibm.com/able/product_accessibility/index.html)

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## Product positioning

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Enterprise COBOL is a premier enterprise class COBOL compiler for the z/OS system. It is a proven and reliable program. 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 CICS , IMS , and DB2 .

New System z® hardware is becoming increasingly complex. Enterprise COBOL for z/OS , V5.1 delivers advanced compiler support to allow you to fully benefit from hardware advancements. With the introduction of the new ARCH and enhanced OPTIMIZE compiler options, the Enterprise COBOL for z/OS compiler is now capable of unleashing the full power of IBM processors delivered in the various models of System z hardware. COBOL programmers no longer need a deep understanding of z architecture to exploit leading edge performance of new System z 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 System z hardware on which the application will run. With Enterprise COBOL for z/OS , V5.1 you increase the return on your hardware and middleware investments. With the implementation of advanced code generation and optimization technology, Enterprise COBOL for z/OS , V5.1 establishes a foundation for delivery of additional optimization features and exploitation of future z/Architecture .

With its enhanced capabilities, simplified programming, and increased programmer productivity, you can continue to use Enterprise COBOL for z/OS to modernize existing business critical applications. Modernization enables the reuse of your proven business logic. You can deliver new enhancements quicker and with less cost and lower risk. You can add modern graphical user interfaces to business critical COBOL applications or extend them to work with web, cloud, or mobile infrastructures. Built on proven applications, there is no need for you to write from scratch.

With the investment in new compiler technology and the continued delivery of new features, many of them client requested, Enterprise COBOL for z/OS , V5.1 reaffirms IBM's commitment to COBOL on z/OS . You gain the benefit of new investment combined with more than 40 years of IBM experience in compiler development.

The future of IBM COBOL starts now.

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## Hardware and software support services

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### SmoothStart/Installation Services

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IBM SmoothStart Services and Installation Services are not provided.

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## Program number

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| Program Name                       | Program Number |
|------------------------------------|----------------|
| IBM Enterprise COBOL for z/OS V5.1 | 5655-w32       |

### Specified operating environment

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#### **Hardware requirements**

Enterprise COBOL for z/OS , V5.1 will run on the following IBM System z servers:

- zEnterprise EC12 or zEnterprise BC12
- zEnterprise 196 or zEnterprise 114
- z10™ Enterprise Class or z10 Business Class
- z9® Enterprise Class or z9 Business Class
- zSeries® z990
- zSeries z890

#### **Software requirements**

Enterprise COBOL for z/OS , V5.1 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.

- z/OS V1.13 (5694-A01), or later
- z/OS V2.1 (5650-ZOS), or later

#### **Optional licensed programs**

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

- CICS Transaction Server for z/OS , V5 (5655-Y04)
- CICS Transaction Server for z/OS , V4 (5655-S97)
- CICS Transaction Server for z/OS , V3 (5655-M15)
- IBM DB2 10 for z/OS (5605-DB2)
- IBM DB2 10 for z/OS Value Unit Edition (5697-P31)
- IBM DB2 V9 for z/OS (5635-DB2)
- IBM DB2 V9 for z/OS Value Unit Edition (5697-P12)
- IBM DFSORT element of z/OS (5694-A01)
- IBM High Level Assembler/MVS and VM and VSE (5696-234)
- IBM IMS V13 (5635-A04)
- IBM IMS V12 (5635-A03)
- IBM IMS V11 (5635-A02)
- 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)
- IBM 31-bit SDK for z/OS , Java 2 Technology Edition, V5.0 (5655-N98)
- IBM Debug Tool for z/OS , V12.1 (5655-W70)
- IBM Fault Analyzer for z/OS V12.1 (5655-W69)
- IBM File Manager for z/OS V12.1 (5655-W68)
- IBM Application Performance Analyzer for z/OS V12.1 (5655-W71)
- IBM Rational® Developer for System z , V9 (5724-T07)
- COBOL Report Writer Release 4 (5798-DYR, 5798-DZX)
- Enterprise COBOL for z/OS , V4 (5655-S71)
- Enterprise COBOL for z/OS and OS/390® , V3 (5655-G53)

- 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 V1.13 (5694-A01), or later
- IBM VS FORTRAN V2 (5668-806, 5688-087)

Enterprise COBOL for z/OS , V5.1 in this announcement is supported for use only with the announced and currently supported levels of IBM software listed above. Enterprise COBOL for z/OS , V5.1 should continue to work with certain earlier, unsupported IBM software products.

IBM will undertake to fix problems found using Enterprise COBOL for z/OS , V5.1 in this announcement with the above mentioned earlier, unsupported product levels. IBM must be able to reproduce the problem using a supported level of the same product. If the problem can be reproduced and fixed, the fix will be developed and tested using supported levels of IBM software. If a fix is made available, it is likely to work on the unsupported product level; however, IBM can not guarantee that the fix will work with the unsupported product.

### **Compatibility**

Enterprise COBOL for z/OS Version 5 provides a high level of source compatibility, object compatibility, and runtime compatibility with prior versions of IBM COBOL.

Enterprise COBOL Version 5 is source compatible with prior versions of IBM COBOL, in that the compiler will compile correct COBOL source programs that were developed using Enterprise COBOL Version 4 or earlier, with the exception of obsolete functions that have been removed and the addition of new reserved words. The removed functions include obsolete COBOL language syntax and obsolete compiler options. Complete details on removed obsolete functions are documented in the *Enterprise COBOL for z/OS Version 5 Migration Guide*. IBM does not expect that many applications will be affected by the removed functions, which in practice are no longer heavily used. To assist in migration, a new compiler option FLAGMIG will be added to Enterprise COBOL V4.2 via the service stream. This option provides warning diagnostics to flag use of obsolete syntax and options in existing COBOL programs.

Enterprise COBOL Version 5 is object compatible with prior versions of IBM COBOL, in that applications can be constructed using a mixture of object modules compiled with Version 5 and those compiled with prior versions. Both static calls (calls within a link-edited module) and dynamic calls (calls between programs link-edited as separate modules) can be used. The following are exceptions:

- Interoperation with object modules compiled with OS/VS COBOL (5740-CB1) is no longer supported.
- Interoperation with object modules compiled with VS COBOL II (5688-958) is limited to programs compiled with the RES compiler option. Interoperation with VS COBOL II programs compiled with the NORES option is no longer supported.

Enterprise COBOL Version 5 will interoperate with correctly written assembler language programs, with the exception that assembler programs link-edited with Version 5 compiled programs now must be AMODE(31) or AMODE(ANY). Static calls between Enterprise COBOL Version 5 compiled programs and programs with the AMODE(24) attribute are no longer supported.

Enterprise COBOL Version 5 is run time compatible with prior versions of IBM COBOL in that correct COBOL programs will continue to produce the same run time results after being recompiled with Version 5. A small number of exception cases are documented in the *Enterprise COBOL for z/OS Version 5 Migration Guide*.

### **User group requirements**

This announcement addresses twenty four requirements from one or more of the worldwide user group communities. Groups include COMMON, COMMON Europe,

Guide Share Europe (GSE), InterAction (Australia/New Zealand), Japan Guide Share (JGS), and SHARE Inc.

Requirements addressed include:

- MR0317083230 - SSLNGC08001 COBOL XML GENERATE attributes enhancement
- MR0317083231 - SSLNGC08002 COBOL XML GENERATE tag/attribute names enhancement
- MR0609082028 - SSLNGC08007 2002 ISO COBOL - Enhanced comment format
- MR051111144 - GGADL11015 Inline Comments
- MR00023056 - GS222187117 Print the full COBOL source statement in the LIST report
- MR0122044439 Using SYS1.PARMLIB(IFAPRDxx) ... FEATURENAME(COBOL) STATE(DISABLED) to prevent using Enterprise COBOL
- MR0209044033 - XREF, SOURCE and SQL option produce Clutter (4.2)
- MR021808285 - Exploit new proc instructions when generating code for double word binary arithmetic, EG comparing two PIC S9(18) COMP-5 items
- MR0330065842 - SYS1.PARMLIB(IFAPRD00) protection
- MR0429082141 - Add the ARCHITECTURE or ARCH compile option for COBOL
- MR0609063523 - Omit certain items during COBOL XML generation
- MR032009652 - AUTOMONITOR should show variables in EVALUATE WHEN...DEBUG TOOL V9.1
- MR081104187 - XML GENERATE using COBOL reserved words
- MR120804208 - COBOL XML Generate enhancements (NAME)
- MR1210093044 - XML GENERATE flexibility
- MR1213075315 - XML GENERATE should produce attributes and elements together
- MR1228052741 - zero-hex-items during COBOL XML generation
- MR0712043643 - LE search for symbolic information with TEST(,SYM,SEP)
- MR0727046419 - High Performance by a large PICTURE X(big)
- MR0804096333 - Add END-OF-ATTRIBUTE event (XML-INFORMATION does this)
- MR0911092218 - ATTRIBUTE-CHARACTERS and CONTENT-CHARACTERS should not be split. (XML-INFORMATION)
- MR0923076636 - Allow SEPARATE(NAME|NONAME) so SYSDEBUG name and location is NOT stored in load module
- MR00029480 - ESCOBD91005 Run-time messages should not be repeated many times.
- MR0801057047 - Debug Tool Display Level 88 items subordinately

## **Planning information**

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### ***Packaging***

The Enterprise COBOL for z/OS , V5.1 package includes:

- Basic machine-readable material on the customer-selected distribution medium
- Program Directory (GI11-9180)
- Licensed Program Specifications (GI11-9181)

### **Security, auditability, and control**

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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.

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## Ordering information

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### Ordering z/OS through the Internet

ShopzSeries provides an easy way to plan and order your z/OS ServerPac or CBPDO. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS . Additional products can also be added to your order (including determination of whether all product requisites are satisfied). ShopzSeries is available in the US, Canada, and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative (or IBM Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries website at

<http://www14.software.ibm.com/webapp/ShopzSeries/ShopzSeries.jsp>

### New licensees

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- Orders for new licenses can be placed now.
- Registered customers can access IBMLink for ordering information and charges.
- Shipment will not occur before the availability date.
- Unless a later date is specified, orders entered before the planned availability date will be assigned a schedule date of one week following availability.
- Orders entered after the planned availability date will be assigned a schedule date for the week following order entry.

Shipment will begin on the planned availability date.

New users of Enterprise COBOL for z/OS , V5.1 should specify:

- Type: 5655
- Model: W32

### ***Parallel Sysplex® license charge (PSLC) basic license***

To order a basic license, specify the program number and quantity of MSU.

If there is more than one program copy in a Parallel Sysplex , the charge for all copies is associated to one license by specifying the applicable PSLC license options and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex . For all other program copies, specify the System Usage Registration No-Charge (SYSUSGREG NC) Identifier on the licenses.

| Entitlement identifier | Description         | License option/<br>Pricing metric  |
|------------------------|---------------------|--|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, PSLC below 3 MSU<br>Basic MLC, PSLC AD<br>SYSUSGREG NC, PSLC AD |

### ***Advanced Workload License Charges (AWLC) basic license***

To order a basic license, specify the program number and quantity of MSUs. If there is more than one program copy in a Parallel Sysplex , the charge for all copies is associated to one license by specifying the applicable AWLC license options and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex . For all other program copies, specify the System Usage Registration No-Charge (SYSUSGREG NC) Identifier on the licenses.

| Entitlement identifier | Description         | License option/<br>Pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, AWLC                   |

Workload Registration  
No Charge,  
AWLC

**Advanced Entry Workload License Charges (AEWLC) basic license**

To order a basic license, specify the program number and quantity of MSUs.

| Entitlement identifier | Description         | License option/<br>Pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, AEWLC                  |

**Workload License Charge (WLC) Basic License**

If there is more than one program copy in a Parallel Sysplex , the charge for all copies is associated to one license by specifying the applicable WLC license options and quantity represented by the sum of the Service Units in Millions (MSUs) in your Parallel Sysplex . For all other program copies, specify the Workload Registration Variable WLC Identifier on the licenses.

| Entitlement identifier | Description         | License option/<br>Pricing metric  |
|------------------------|---------------------|--|
| S0177FX                | Enterprise CPBOL V5 | Basic MLC, Variable WLC<br>Workload Registration<br>No Charge,<br>Variable WLC |

**Entry Workload License Charge (EWLC) Basic License**

To order a basic license, specify the program number and the quantity of MSUs.

| Entitlement identifier | Description         | License option/<br>Pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, Entry WLC              |

**Growth opportunity license charge (GOLC)**

To order a basic license, specify the program number and the correct level.

Specify the GOLC monthly license option.

| Entitlement identifier | Description         | License option/<br>Pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, GOLC                   |

**System z entry license charge (zELC)**

To order zELC software, specify the program number and z800 model.

Specify the zELC monthly license option.

| Entitlement identifier | Description         | License option/<br>Pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, zELC                   |

### **Single version charging**

To elect single version charging, the customer must notify and identify to IBM the prior program and replacement program and the designated machine the programs are operating on.

### **Basic machine-readable material**

| Orderable<br>Supply ID: | Language   | Distribution Medium | Description             |
|-------------------------|------------|---------------------|-------------------------|
| S0177FV                 | US English | 3590 Tape Cartridge | Ent COBOL for z/OS V5.1 |
| S0177FW                 | Japanese   | 3590 Tape Cartridge | Ent COBOL for z/OS V5.1 |

### **Customization options**

Select the appropriate feature numbers to customize your order to specify the delivery options desired. These features can be specified on the initial or MES orders.

#### *Example*

If publications are not desired for the initial order, specify feature number 3470 to ship media only. For future updates, specify feature number 3480 to ship media updates only. If, in the future, publication updates are required, order an MES to remove feature number 3480; then, the publications will ship with the next release of the program.

#### Initial shipments

| Feature | Description  |
|---------|--|
| 3444    | Serial Number Only<br>(suppresses shipment of media and documentation) |
| 3470    | Ship Media Only<br>(suppresses initial shipment of documentation)      |
| 3471    | Ship Documentation Only<br>(suppresses initial shipment of media)      |

#### Update shipments

| Feature | Description   |
|---------|---|
| 3480    | Ship Media Updates Only<br>(suppresses update shipment of documentation)    |
| 3481    | Ship Documentation Only<br>(suppresses update shipment of media)            |
| 3482    | Suppress Updates<br>(suppresses update shipment of media and documentation) |

### **Business Partner information**

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If you are a Direct Reseller - System Reseller acquiring products from IBM , you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=213-144>

A *Program Directory* (GI11-9180) and *Licensed Program Specification* (GI11-9181) are supplied automatically with the basic machine-readable material. No other hardcopy publications are shipped with the product. Subsequent updates (technical newsletters or revisions between releases) to the publications shipped with the product will be distributed to the user of record for as long as a license for this software remains in effect. A separate publication order or subscription is not needed.

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## **Customized offerings**

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Product deliverables are shipped only via CBPDO, ServerPac, SystemPac® .

CBPDO and ServerPac are offered for Internet delivery in countries where ShopzSeries product ordering is available. Internet delivery reduces software delivery time and allows you to install software without the need to handle tapes. For more details on Internet delivery, refer to the ShopzSeries help information at

<http://www.software.ibm.com/ShopzSeries>

You choose the delivery method when you order the software. IBM recommends Internet delivery. In addition to Internet and DVD, the supported tape delivery options for CBPDO, ServerPac, SystemPac include:

- 3590
- 3592

Most products can be ordered in ServerPac and SystemPac the month following their availability on CBPDO. z/OS can be ordered via all three offerings at general availability. Production of software product orders will begin on the planned general availability date.

- CBPDO shipments will begin one week after general availability.
- ServerPac shipments will begin two weeks after general availability
- SystemPac shipments will begin four weeks after general availability due to additional customization, and data input verification.

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## **Terms and conditions**

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### ***Agreement***

IBM Customer Agreement

### ***Variable charges apply***

No

### ***Indexed monthly license charge (IMLC) applies***

No

### ***Location license applies***

No

### ***Use limitation applies***

No

### ***Educational allowance available***

Yes, 15% education allowance applies to qualified education institution customers.

### **Volume orders**

Not applicable.

| Replaced Program<br>Program Number | Program<br>Program Name         | Replacement Program<br>Program Number | Program<br>Program Name      |
|------------------------------------|---------------------------------|---------------------------------------|------------------------------|
| 5740-CB1                           | OS/VS COBOL                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5740-LM1                           | OS/VS COBOL                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5734-CB4                           | OS/VS COBOL                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5734-CB2                           | OS COBOL V4                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5688-022                           | VS COBOL II                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5688-023                           | VS COBOL II                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5668-958                           | VS COBOL II                     | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5688-194                           | IBM CODE/370                    | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5688-197                           | IBM COBOL for<br>MVS™ & VM V1   | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5648-A25                           | IBM COBOL for<br>OS/390 & VM V2 | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5655-G53                           | IBM Ent COBOL for<br>z/OS V3    | 5655-w32                              | IBM Ent COBOL for<br>z/OS V5 |
| 5655-S71                           | IBM Ent COBOL for<br>z/OS V4    | 5655-w32                              | IBM Ent COBOL for<br>zOS V5  |
| 5655-w32                           | IBM Ent COBOL for<br>z/OS V5    | To a follow-on if any                 |                              |

### **Warranty applies**

Yes

### **Licensed program materials availability**

Restricted Materials of IBM: None  
Non-Restricted Source Materials: None  
Object Code Only (OCO): All

### **Program services**

Support Center applies: Yes  
Access is available through the  
IBM Support Center

Available until discontinued: 12 months' written notice

APAR Mailing Address: IBM Corporation  
APAR Processing  
P.O. Box 49023

**IBM Operational Support Services - SupportLine**

Yes

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**Prices**

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For additional information and current prices, contact your local IBM representative.

| Entitlement identifier | Description         | License option/<br>pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, GOLC                   |

| Entitlement identifier | Description         | License option/<br>pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, zELC                   |

| Entitlement identifier | Description         | License option/<br>pricing metric   |
|------------------------|---------------------|---|
| S0177FX                | Enterprise COBOL V5 | Basic MLC,<br>PSLC below 3 MSU<br>Basic MLC, PSLC AD<br>SYSUSGREG NC, PSLC AD |

**Advanced Workload License Charges**

| Entitlement identifier | Description         | License option/<br>pricing metric                              |
|------------------------|---------------------|--|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, AWLC<br>Workload Registration<br>No Charge,<br>AWLC |

For more information on the Advanced Workload License Charge, refer to Software Announcement [210-238](#), dated July 22, 2010 .

| Entitlement identifier | Description         | License option/<br>Pricing metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, AEWLC                  |

**Variable Workload License Charges**

| Entitlement identifier | Description         | License option/<br>pricing metric  |
|------------------------|---------------------|--|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, Variable WLC<br>Workload Registration<br>No Charge,<br>Variable WLC |

**Sub-Capacity Charges for VWLC Products**

Sub-capacity charges for VWLC products are based on product LPAR utilization capacity. Product LPAR utilization capacity for a VWLC product is the highest number of MSUs utilized by the combined LPARs in which a VWLC product runs concurrently during a reporting period. The number of MSUs is based on the highest observed

rolling 4-hour average utilization used by the combination of the relevant LPARs during the reporting period.

Refer to Software Announcement [200-354](#), dated October 03, 2000 , and Software Announcement [202-105](#), dated April 30, 2002 , for additional details on IBM Workload License Charges.

### ***Sub-Capacity Charges Terms and Conditions***

System z software charges at less than full machine capacity for eligible VWLC products apply when z/OS is running in z/Architecture (64 bit) mode on an IBM e(logo)server System z 900, no other MVS-based operating system is licensed to that server and the required information is provided by the customer in accordance with the applicable terms.

Sub-capacity charges for a VWLC product is based on the utilization of the LPARs where/when the product executes . To obtain charges at less than full machine capacity for VWLC products the customer is required to:

- Sign and abide by the terms of the Attachment for IBM System z Workload License Charges - (Z125-6516).
- Obtain the latest version of the Sub-Capacity Reporting Tool.
- Install any VWLC product and IBM e(logo)server System z 900 Licensed Internal Code (LIC) service required for sub-capacity charging. Required service will be listed on the WLC website,

<http://www.ibm.com/zseries/swprice>

- Collect SMF data as required by the Sub-Capacity Reporting Tool. Retain the collected SMF data for a period of not less than 6 months.
- Use the IBM provided Sub-Capacity Reporting Tool to process the collected SMF data. The Sub-Capacity Report produced by the tool is used to determine required license capacity for the VWLC products. Required license capacity is determined based on the largest MSU value of a VWLC product running concurrently in all LPARs during the reporting period. IBM reserves the right to request the system data that supports these product defined capacity values for a period of up to six months after the data was collected.
- Provide an initial Sub-Capacity Report to begin to receive the benefits of less than full machine capacity charges. Sub-capacity charging will follow submission of a Sub-Capacity Report. There will be no retroactive application of sub-capacity charges.
- Submit Sub-Capacity Reports monthly.
- Submit Sub-Capacity Reports for all VWLC products with complete data for the entire reporting period to the email address and by the date, specified on the System z Software Pricing website

<http://www.ibm.com/zseries/swprice>

and in the current IBM System z Workload License Charges Exhibit (Z125-6324). Sub-Capacity Reports that reflect a changed product defined capacity will be considered to be orders placed by the customer without further action on the customer's part and IBM is authorized to make any resulting billing increase or decrease. To place an order for a new license or to discontinue licenses, move licenses between machines, report a hardware model upgrade or enable or disable product features, the customer must contact IBM or their IBM Business Partner.

- Configure machine to send weekly Transmit System Availability Data (TSAD) to IBM via the IBM e(logo)server System z 900 Remote Support Facility (RSF). if the machine cannot connect via the RSF, provide this TSAD via an alternate means documented in the z/OS publication 'Planning for Workload License Charges' at

<http://www.ibm.com/zseries/swprice>

## **Advanced Workload License Charges**

| Entitlement identifier | Description         | License option/<br>pricing metric                               |
|------------------------|---------------------|---|
| S0177FX                | Enterprise COBOL V5 | Basic AWLC, AWLC<br>workload Registration<br>No Charge,<br>AWLC |

For more information on the Advanced Workload License Charge, refer to Software Announcement [210-238](#), dated July 22, 2010 .

## **Entry Workload License Charge (EWLC)**

| Entitlement identifier | Description         | License option/<br>pricing Metric |
|------------------------|---------------------|-----------------------------------|
| S0177FX                | Enterprise COBOL V5 | Basic MLC, Entry WLC              |

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## **Order now**

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To order, contact the Americas Call Centers or your local IBM representative, or your IBM Business Partner.

To identify your local IBM representative or IBM Business Partner, call 800-IBM-4YOU (426-4968).

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Fax: 800-2IBM-FAX (242-6329)  
Internet: [callserv@ca.ibm.com](mailto:callserv@ca.ibm.com)  
Mail: IBM Teleweb Customer Support  
ibm.com® Sales Execution Center, Americas North  
3500 Steeles Ave. East, Tower 3/4  
Markham, Ontario  
Canada  
L3R 2Z1

Reference: ME001

The Americas Call Centers, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

**Note:** Shipments will begin after the planned availability date.

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## Corrections

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**(Corrected on August 2, 2013)**

Revised Description and Technical information sections.