IBM XL C/C++ V2R1M1 web deliverable for z/OS V2R1

IBM

Enable high-performing z/OS XL C/C++ programs for workload optimized business software solutions

Highlights

XL C/C++ V2R1M1 web deliverable for z/OS® V2R1 delivers the following features:

- Exploits IBM® z13 through new hardware built-in functions and options for improved application performance
- Supports inline assembler statements, runtime architecture blocks, and the Vector Facility for z/Architecture®
- Supports IBM MASS (Mathematical Accelerator Subsystem) and ATLAS (Automatically Tuned Linear Algebra Software) libraries for high-performance mathematical computing
- Integrates with IBM Rational® Developer for System z® and IBM Rational Team Concert™ providing a modern development environment and a collaborative team environment

The IBM z/OS XL C/C++ compiler helps you create and maintain critical business applications written in C or C++, maximize application performance, and improve developer productivity. z/OS XL C/C++ can transform C or C++ source code to fully exploit your existing IBM z Systems and optimize workloads through smarter computing capabilities with the new IBM z13. Built-in functions, performance-tuned libraries, and language constructs are some of the features that simplify programming and boost application runtime performance.

IBM works constantly to improve compiler components, including front-ends, high-level optimizers, and low-level optimizers. By upgrading your compiler, you can keep up with new language standards and extensions, advancements in hardware technology, usability features, and advances in optimization with minimal or no source code changes. IBM compilers offer a cost-effective way to get more out of existing technology and stay ahead of competitors on the technology curve.

z/OS XL C/C++ is a leading-edge compiler that maximizes middleware by providing interoperability with IBM DB2®, CICS®, and IMS™ systems.

XL C/C++ V2R1M1 web deliverable for z/OS V2R1 reinforces the continuing IBM commitment to the C and C++ programming languages on the z/OS platform.

Exploits IBM z13 through new built-in functions and options

In the XL C/C++ V2R1M1 web deliverable for z/OS V2R1, the ARCH(11) option is introduced, to enable functions for programs running on z13, including support for the Vector Facility for z/Architecture as well as a new TUNE(11) option to generate code that is optimized for z13 processors.

New vector types have been added to provide easy algorithmic access to the single instruction, multiple data (SIMD) registers and instructions. C and C++ operators have been enhanced to provide natural operations on vector types. New built-in functions have been added to allow use of specialized vector instructions for tuned performance.

Supports inline assembler statements, runtime architecture blocks, and the Vector Facility for z/Architecture

In the XL C/C++ V2R1M1 web deliverable for z/OS V2R1, you can use inline assembler statements to insert assembler statements inlined with XL C and XL C++ code without compiling with Metal C. You can also easily use specialized instructions with your C and C ++ objects.

With runtime architecture blocks, you can use a single source file with sections designed to take advantage of various hardware architecture levels, and select the appropriate path to be run at execution time. This function allows a single executable to have optimized paths for various hardware levels to help deliver improved performance.

Supports MASS and ATLAS libraries for high-performance computing

The XL C/C++ V2R1M1 web deliverable for z/OS V2R1 is shipped with a set of Mathematical Acceleration Subsystem (MASS) libraries, and the Runtime Library Extensions base element is shipped with a set of Automatically Tuned Linear Algebra Software (ATLAS) libraries. The MASS library can be used for accelerated execution of elementary math functions and serve as a higher performance alternative to the standard math library that is part of the z/OS XL C/C++ Runtime. The ATLAS library provides linear algebra function support for BLAS (Basic Linear Algebra Subprograms) and LAPACK (Linear Algebra PACKage) functions routinely used in Business Analytics and Optimization solutions. Together these two libraries provide a powerful

framework for development of new Business Analytics workloads, porting math intensive workloads from other platforms, and accelerating Business Analytics workloads on IBM z13. In addition, the compiler provides vector programming support for programmers to make use of the Vector Facility for z/Architecture for both of these libraries.

Integrates with IBM Rational Developer for System z and IBM Rational Team Concert providing a modern development environment and a collaborative team environment

IBM Rational Developer for System z, an Eclipse-based offering, boosts programming productivity with an integrated development environment that makes it easy to edit, compile and debug z/OS XL C and XL C++ applications right from your workstation.

IBM Rational Team Concert allows you to boost programming productivity with a collaborative team environment that makes it easy to manage your distributed software projects and teams.

License options

To help you optimize software licensing costs, IBM can assist in identifying the licenses that best suits your organization. For additional information on the types of licenses available for z/OS, see:

www.ibm.com/systems/z/resources/swprice/index.html

Ordering information

IBM z/OS XL C/C++ is an optional priced feature of z/OS. z/OS XL C/C++ is available through the Shopz website:

www.ibm.com/software/shopzseries

where it is listed as "XL C/C++".

z/OS XL C/C++ is supported on z/OS at the same level. For more information about the support lifecycle of z/OS, see:

www.ibm.com/software/support/lifecycle/index_z.html

The XL C/C++ V2R1M1 web deliverable for z/OS V2R1 can be installed on a z/OS V2R1 system after you have enabled the z/OS XL C/C++ optionally priced feature of z/OS V2R1. The XL C/C++ V2R1M1 web deliverable for z/OS V2R1 is available as a web download from http://www.ibm.com/systems/z/os/zos/downloads/ (see "XL C/C++ V2R1M1 web deliverable with z13 exploitation support for z/OS 2.1")

Note: Although the web deliverable is an optional z/OS feature, it is required for XL C/C++ z13 exploitation.

Summary of features and benefits

The following table summarizes the features and benefits for z/OS XL C/C++.

Table 1. Summary of features and benefits

Feature	Benefit
Designed for IBM platforms	• Exploits z/Architecture systems
Improved industry language standards compliance	• Facilitates porting from other platforms to z/OS • Provides compiler diagnostics to help you achieve the level of conformance to a particular programming language standard • Supports commonly used IBM and non-IBM language extensions
Improved industry-leading optimizations	• Uses technology from the industry-leading XL C/C++ family of compilers; z/OS XL C/C++ is designed to offer superior application performance on z/OS.
Enhanced middleware support	• Exploits the latest middleware (DB2, CICS, IMS) to facilitate application integration and modernization.
Improved debug information and debug APIs	• Enables tool providers (including Debug Tool, Application Performance Analyzer, z/OS dbx, as well as third-party tools) to build additional debugging capability and improve performance in their tools.
Improved low-level programming support	• Provides system programming capabilities through Metal C. With Metal C you can insert HLASM instructions into C source, specify custom function prologs and epilogs, and generate HLASM source, making it easier to integrate new code with existing HLASM programs.
Exploits hardware support for IEEE 754 decimal floating-point data	• Improves the accuracy and performance of decimal floating-point calculations for commercial applications
Additional built-in functions	• Provides access to the newest and most efficient hardware operations at the source level • Simplifies the development effort for creating and maintaining high-performance applications
Integrated development environment	• Rational Developer for System z (separate product) consists of a common development workbench and an integrated set of tools that support model-based development, runtime testing, and rapid deployment of applications.

Table 1. Summary of features and benefits (continued)

Feature	Benefit
Collaborative team environment	• Rational Team Concert (separate product) unifies development teams by making it easy to manage your distributed software projects and teams.
IBM service and support	• Provides responsive platform and cross-platform support that meets or exceeds customer expectations. • Teams with subject matter experts in compiler development for dedicated support excellence.

System requirements

The following table presents the hardware requirements for z/OS V2R1 XL C/C++.

Table 2. System requirements

Operating system	Hardware
z/OS V2R1 **Note:** z/OS XL C/C++ is an optionally priced feature of z/OS.	• IBM z13 • IBM zEnterprise® EC12 (zEC12) • IBM zEnterprise BC12 (zBC12) • IBM zEnterprise 196 (z196) • IBM zEnterprise 114 (z114) • IBM System z10™ (z10 EC, z10 BC)[1] • IBM System z9® (z9 BC, z9 EC)[1] **Notes:** 1. These products are withdrawn from marketing. 2. For a complete description of z/OS software prerequisites, see *z/OS Planning for Installation (GA22-7504)*.

Upgrade now

Upgrade to the latest z/OS operating system and get the latest XL C/C++ compiler to leverage your IBM z Systems investment and stay ahead of competitors on the technology curve. For the enhancements in z/OS V2R1 XL C/C++, see the V2R1 data sheet at http://www.ibm.com/support/docview.wss?uid=swg27038977

For more information

To learn more about the XL C/C++ V2R1M1 web deliverable for z/OS V2R1, contact your IBM representative or IBM Business Partner, or visit the z/OS XL C/C++ website:

http://www.ibm.com/software/products/us/en/czos

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