IBM XL C/C++ for Linux, V13.1.1 adds an additional compiler for little endian Linux distributions

Table of contents

At a glance

IBM® XL C/C++ for Linux™ now contains two C/C++ compilers that support:

- Big endian Linux distributions and IBM Power® servers configured for big endian mode
- Little endian Linux distributions and IBM Power servers configured for little endian mode.

These two compilers give you the flexibility to install the correct compiler to create applications for the architecture that you require while providing you with following features and benefits:

- Support for the latest POWER8™ servers that allows you to drive modern workloads such as big data, cloud, mobile, and social.
- Generation of optimized code that uses mature compiler technology from IBM.
- The latest programming language standards for C and C++ that gives increased function and easier portability of your source code.
- Inclusion of the optimized IBM Mathematical Acceleration Subsystem (MASS) libraries which give you frequently used mathematical procedures.
- Inclusion of the Basic Linear Algebra Subprograms (BLAS) which give you high-performance algebraic functions.
- gcc compatibility for easier porting and integration of your code.
- Provision for compiler service and support which differentiates IBM in the marketplace.

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: RE001).

Overview

A new XL C/C++ compiler is delivered to support application development on the IBM POWER8 servers that run the little endian Linux distributions.

A key strength of XL C/C++ for Linux is its ability to generate highly optimized code for execution on IBM Power Systems. The performance gain from years of IBM compiler optimization experience on XL C/C++ for Linux can be seen in the release-to-release compiler improvements from the development of the IBM POWER4 processors through to the IBM POWER5, IBM POWER5+, IBM POWER6, IBM POWER6+, IBM POWER7, IBM POWER7+, and IBM POWER8 processors. With XL C/C++ for Linux, V13.1.1, compiler support on the Linux distributions, such as Ubuntu

14.04 for IBM POWER8, Ubuntu 14.10 for IBM POWER8 and SUSE Linux Enterprise Server 12 (SLES 12) for Power, includes exploitation of the little endian architecture on the latest IBM Power Systems that are built with the POWER8 architecture and processor.

With the new XL C/C++ compiler, you can create and port applications for execution on the next generation of IBM systems supporting little endian architectures and built on POWER8 technology designed to handle big data and to drive modern workloads for cloud, mobile, and social.

Based on mature IBM compiler technology, XL C/C++ for Linux 13.1.1:

- Supports generation of highly optimized code fully exploiting the IBM POWER8 processors.
- Supports programming language standards including support for the latest C11 and C++11 standards (partial support).
- Provides a higher level of source compatibility with gcc while providing binary coexistence.
- Helps improve programmer productivity through compile time performance improvements and new error detection features.
- Includes Mathematical Acceleration Subsystem (MASS) libraries.
- Includes Basic Linear Algebraic Subprograms (BLAS).
- Allows for superior IBM service and support.

All of the expertise and heritage serving enterprise business over the years is now unleashed to programmers of the latest Linux distributions for POWER8, allowing them to take advantage of proven IBM compiler technology.

Key prerequisites

XL C/C++ for Linux for big endian distributions:

IBM Power System servers that support the following:

- Red Hat Enterprise Linux 6.4 (RHEL 6.4)
- Red Hat Enterprise Linux 7.0 (RHEL 7.0)
- SUSE Linux Enterprise Server 11 Service Pack 2 (SLES 11 SP2)

Required hard disk space: 250 MB

XL C/C++ for Linux for little endian distributions:

IBM Power System servers that support one of the following:

- Ubuntu 14.04 for IBM POWER8
- Ubuntu 14.10 for IBM POWER8
- SUSE Linux Enterprise Server 12 (SLES 12) for Power

Required hard disk space: 122 MB

Planned availability date

December 12, 2014

Description

Two XL C/C++ compilers

The new XL C/C++ compiler for Linux distributions, which support Power Systems running Linux distributions configured for the little endian architecture, is now included in the same product as the current XL C/C++ Linux compiler from IBM, which supports Power Systems running Linux distributions configured for the big endian architecture. You have the flexibility to use either or both compilers on the appropriate Power server and with the appropriate Linux distribution. This description highlights the features of the new XL C/C++ compiler, which supports the little endian architecture and Ubuntu 14.04 for IBM POWER8, Ubuntu 14.10 for IBM POWER8, and SUSE Linux Enterprise Server 12 for Power. The description of the XL C/C++ compiler supporting the big endian architecture is found in previous announcements.

Clang infrastructure

The new XL C/C++ Linux compiler for the little endian architecture leverages the Clang infrastructure from the open source community for a portion of its compiler front end. Clang is a component of the LLVM open source compiler and toolchain project and provides the C and C++ language family front end for LLVM. The new compiler combines the Clang front-end infrastructure with the advanced optimization technology from IBM in the compiler back-end.

New architecture and tune compiler options for POWER8 technology

The new XL C/C++ compiler V13.1.1 is released to support the POWER8 Systems that run little endian Linux distributions

The **-qarch** compiler option specifies the processor architecture for which code is generated. The **-qtune** compiler option tunes instruction selection, scheduling, and other architecture-dependent performance enhancements to run best on a specific hardware architecture. With the release of XL C/C++ for Linux, V13.1.1, architecture and tune compiler suboptions are added to specify code generation for the little endian architecture onthe POWER8 processor. In the new XL C/C++ for Linux compiler, **-qarch=pwr8** instructs the compiler to produce code that can exploit the little endian architecture on POWER8. **-qtune=pwr8** enables optimizations specifically for the little endian archtecture on POWER8.

Compiler built-in functions for POWER8 with the little endian architecture

New built-in functions unlock POWER8 architecture instructions to enable you to have direct access to POWER8 features at the application level.

New built-in functions are added to support the following POWER8 features:

- POWER8 built-in functions for vector processing
- POWER8 binary-coded decimal functions
- POWER8 cryptography functions
- POWER8 quad-word arithmetic functions
- POWER8 load-and-reserve and store condition instructions
- POWER8 cache and data prefetch control functions
- POWER8 transactional memory functions
- POWER8 prefetch functions

Optimization capabilities

One of the key strengths of the XL C/C++ for Linux is optimization. This compiler offers the benefit of optimization technology, which evolved at IBM since the late 1980's combining extensive knowledge of the hardware with a comprehensive understanding of compiler technology and what users look for in a compiler when building end-user applications, especially for new workloads, such as big data, cloud, mobile, and social. The optimizations can decrease execution time and make your applications run faster, producing code that is highly tuned for execution on POWER8 systems.

The optimizer includes five base optimization levels which allow you to choose from minimal optimization to intense program analysis that range from local basic block to subprogram unit scopes, file-level, and whole-program analysis. The higher the optimization level, the more intense the program analysis becomes as increasingly sophisticated optimization techniques such as interprocedural analysis and profile-directed feedback, are applied to your code.

The five levels of optimization are (-O1 level is not supported):

- -O0, minimal optimization, best for debugging
- -O2, strong low-level optimization that benefits most programs
- -O3, intense low-level optimization analysis and base-level loop analysis
- -O4, all of -O3 plus detailed loop analysis and basic, whole-program analysis at link time
- -O5, all of -O4 and detailed whole-program analysis at link time.

Programming language standards and industry specifications

Programming language standards

XL C/C++ for Linux V13.1.1 strives to maximize performance and functionality of your scientific, technical, and commercial applications through standards compliance. With representation from the IBM compiler development team on the ISO/ANSI C and C++ committees, IBM is in a position to understand and influence the latest updates, clarifications, and recommendations to the C and C++ standards.

XL C/C++ for Linux V13.1.1 conforms with:

- Information Technology - Programming Languages - C, ISO/IEC 9899:1990 (also known as C90)
- Information Technology - Programming Languages - C, ISO/IEC 9899:1999 (also known as C99)
- Information Technology - Programming Languages - C++, ISO/IEC 14882:1998 (also known as C++98)
- Information Technology - Programming Languages - C++, ISO/IEC 14882:2003(E) also known as C++2003)
- Information Technology - Programming Languages - Extensions for the programming language C to support new character types, ISO/IEC RT 19769
- Draft Technical Report on C++ Library Extensions, ISO/IEC TR 19768:2007
- Information Technology - Programming Languages - C, ISO/IEC 9899:2011 (partial support for C11)
- Information Technology - Programming Languages - C++, ISO/IEC 14882:2011 (partial support for C++11)

IBM is a member of the Standard Performance Evaluation Corporation (SPEC). The mission of SPEC is to identify and maintain standardized benchmarks that will drive high performance computing for many years. SPEC released SPEC CPU2006 in 2006. CPU2006 is a benchmark focused on a system's processor, memory subsystem, and compiler.

Support of programming language standards allows for portability of your source code among a variety of compiler implementations.

Single instruction multiple data (SIMD)

XL C/C++ exposes hardware level capabilities directly to you through source-level intrinsic functions. Under the **-qaltivec** option, XL C/C++ for Linux support a vector data type and access to the vector multimedia extension (VMX) and vector scalar extension (VSX) instructions that support VMX processors on POWER8. VMX, also known as SIMD (Single Instruction Multiple Data). Vector capabilities, allow your program to calculate arithmetic results on up to sixteen data items simultaneously. You can also instruct the compiler to automatically perform SIMD vectorization at higher levels of optimization. The most common opportunity for this transformation is with loops that iterate over contiguous array data performing calculations on each element.

IBM MASS libraries

XL C/C++ for Linux include the IBM MASS libraries, which consist of mathematical intrinsic functions, that are specifically tuned for optimum performance on the Power architecture, that include the POWER8 server. MASS includes scalar, vector, and SIMD libraries and can be used by C, C++, and Fortran applications. The SIMD libraries provide an accelerated set of frequently used math intrinsic functions that can provide improved performance over the standard mathematical library functions. Both scalar and vector libraries are automatically called at certain levels of optimization, but you can also call them explicitly in your programs.

Basic Linear Algebra Subprograms (BLAS)

BLAS is included in XL C/C++ for Linux and provides high-performance, algebraic functions that are used to perform combined matrix multiplication and addition on general matrices or their transposes, as well as to compute the matrix-vector product for a general matrix or its transpose.

GNU compatibility

The XL C/C++ for Linux compiler for little endian Linux distributions provides for a much greater level of GNU source compatibility. With the higher level of GNU source compatibility, porting of applications originally developed with gcc and g++ compilers is easier than ever before. There is also binary compatibility with GNU-built objects, archives, and shared objects. You now have the versatility to use the IBM compiler to build parts of your application that will benefit from the higher performance that can be offered and still bind the IBM and GNU compiled parts together in a single application.

IBM Service and Support

The XL C/C++ for Linux V13.1.1 compiler for little endian Linux distributions brings with it IBM Service and Support. The IBM Service and Support organization is made up of teams of individuals who work together to provide you with the responsive platform and cross-platform software support that you require. For complex or code-related problems, IBM has specialized, skilled service teams with access to the experts in our development laboratories, as required. Therefore, you have access to the right level of IBM expertise when you need it -- no matter where they are located. The vision of IBM Service and Support is to achieve a level of support excellence that exceeds customer expectations and differentiates IBM in the marketplace.

Documentation

XL C/C++ for Linux compiler product documentation is available in the fully searchable IBM Knowledge Center. The documentation can be accessed online from the product library page. Also included with the XL C/C++ for Linux compiler are man pages for all utilities and compiler invocation commands.

Accessibility by people with disabilities

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

Section 508 of the US Rehabilitation Act

XL C/C++ for Linux, V13.1.1 is capable as of December 12, 2014 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

Product positioning

Flexibility to obtain two linux compilers in a same offering

XL C/C++ now packages two linux compilers in a single product. With XL C/C++ for Linux V13.1.1 you get the existing XL C/C++ for Linux for big endian systems and the latest XL C/C++ for Linux for little endian systems. When you order XL C/C++ for Linux 13.1.1 you will always get the right Linux compiler that you need for your Power system.

Unleash the full power of IBM processors

At a basic level, compilers are a bridge between your applications and the hardware architectures on which you run your business. IBM compilers are designed to unleash the full power of IBM processors that include those for the different architectures shipped in the popular Power Systems™.

IBM compilers are designed to improve programmer productivity. The state-of-the-art compilation technology enables programmers to exploit leading-edge performance of the new hardware without source code changes. Developers need to focus only on the logic of the applications and let the compiler figure out the best way to transform and optimize the code generation for the system the application will run.

Powerful, no-hassle performance optimization

Well-written and thoroughly debugged code that is fully conformant to its language standard can take maximum advantage of the optimizing technology in XL C/C++ and may provide an increase in performance. The optimization and hardware features in XL C/C++ help improve developer productivity. The compiler is able to generate code that exploits the leading-edge performance in existing and new hardware, often with minimal source code changes.

XL C/C++ supports several levels of increasingly aggressive code transformations. Advanced optimization techniques such as inter-procedural analysis (IPA) and profile-directed feedback (PDF) are available only at high levels of optimization but can result in increased performance improvements. IPA analyzes and optimizes your

application as a whole, rather than on a file-by-file basis. PDF generates information that instructs the optimizer to focus on trade-offs that favor code that executes more frequently.

Get more performance from the POWER® platform with minimal or no source code changes. Upgrade to the latest XL C/C++ compiler, which incorporates the latest advances in optimization and hardware technology support.

Multiple-Platform XL C/C++ and Fortran

XL C/C++ for Linux, V13.1.1 is part of a larger family of IBM C, C++, and Fortran compilers which supports multiple platforms such as AIX®, z/OS® (C/C++), z/VM® (C/C++), IBM Power Systems, Linux on Power, and Blue Gene/Q™.

The modular structure of these compilers delivers optimizations and functionality on multiple platforms and languages. Further, each product derives from a good portion of common code, so features and optimizations are tested in multiple languages and on multiple platforms. Common code, along with compliance with international standards, make source-level portability of applications between IBM platforms easier.

Built on a common architecture XL C, XL C/C++, and XL Fortran compilers promote consistency and reliability on many IBM platforms and now non-IBM platforms.

Programming language standards, industry specifications, and other language influences

Programming language standards

The XL C compiler supports the C standard ISO/IEC 9899:1999, also known as C99. With V13.1, XL C/C++ for Linux continues to deliver support for additional features of the latest C standard ISO/IEC 9899:2011, also known as C11.

The XL C++ compiler supports the C++ standard ISO/IEC 14882: 2003, the C++ 2003 programming standard. With V13.1, XL C/C++ for Linux continues to deliver support for additional features of the latest C++ standard ISO/IEC 14882:2011, also known as C++11.

Infrastructure matters

The XL family of compilers in conjunction with Power Systems continues to serve the high performance computing (HPC) sector. This makes the high performance XL C/C++ for Linux compilers an optimal fit for the requirements of big data and data analytics.

One of the most discussed topics in the IT world is the migration of applications to a cloud environment. With an infrastructure that includes the POWER8, the latest Linux distributions such as Ubuntu Server, and the XL C/C++ for Linux compiler, implementing a cloud environment is easier than ever before.

Organizations that look to invest in open standards and open source-based architectures should consider the new XL C/C++ for Linux compiler.

Make XL C/C++ the backbone of your IT application development environment to drive competitive differentiation.

Rational® Developer for AIX and Linux C/C++ Edition V9.1.1

Rational Developer for AIX and Linux C/C++ Edition offers the capabilities of file management, searching, intelligent editing, refactoring, application analysis, build, debug, migration assistance, and performance analysis and management. This product can help XL C/C++ developers to realize the productivity and initial code

quality gains of moving from older, text-based, command line development tools to a rich integrated development environment.

If you license the IBM XL C/C++ for Linux compiler, you might also be interested in acquiring licenses for IBM Rational Developer for AIX and Linux V9.1.1.

Program number

```
Program                Program
number      VRM        name

5765-J08    13.1.1   IBM XL C/C++ for Linux        AAS
5725-C73    13.1.1   IBM XL C/C++ for Linux        PA
```

Product identification number

```
Program                           Program
name                              number

XL C/C++ for Linux, V13.1.1       5765-J08

XL C/C++ for Linux                5648-F62
 SW S&S 1-year After License
    - per Authorized User
    - per Concurrent User

XL C/C++ for Linux                5648-F60
 SW S&S No Charge Registration/
 1-year Renewal
    - per Authorized User
    - per Concurrent User

XL C/C++ for Linux                5648-F64
 SW S&S 3-year Registration
    - per Authorized User
    - per Concurrent User

XL C/C++ for Linux                5648-F61
 SW S&S 3-year Renewal
   - per Authorized User
   - per Concurrent User

XL C/C++ for Linux                5648-F63
 SW S&S 3-year After License
    - per Authorized User
    - per Concurrent User
```

Offering Information

Product information is available via the Offering Information website

http://www.ibm.com/common/ssi

Also, visit the Passport Advantage® website

http://www.ibm.com/software/passportadvantage

Business Partner information

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=214-411

Publications

No hardcopy publications are shipped with this program.

The IBM Publications Center

http://www.ibm.com/shop/publications/order

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. A large number of publications are available online in various file formats, and they can all be downloaded by all countries.

Technical information

Specified operating environment

Hardware requirements

For XL C/C++ for Linux, V13.1.1 for big endian distributions:

- System: Power Systems servers configured for the big endian architecture and supported by SLES 11 SP2, RHEL 6.4, and RHEL 7.0
- Disk space: 250 MB

For XL C/C++ for Linux, V13.1.1 for little endian distributions:

- System: Power Systems servers configured for the little endian architecture and supported by Ubuntu 14.04 for IBM POWER8, Ubuntu 14.10 for IBM POWER8, or SUSE Linux Enterprise Server 12 for Power
- Disk space: 122 MB

Software requirements

For XL C/C++ for Linux, V13.1.1 for big endian distributions:

- One of the following operating systems:
  - Ubuntu 14.04 for IBM POWER8
  - Ubuntu 14.10 for IBM POWER8
  - SUSE Linux Enterprise Server 12 for Power
- Required software for documentation:
  - HTML browser to access HTML documentation
  - Portable Document Format (PDF) viewer to view PDF files

For XL C/C++ for Linux, V13.1.1 for little endian distributions:

- Ubuntu 14.04 for IBM POWER8
- Ubuntu 14.10 for IBM POWER8
- SUSE Linux Enterprise Server 12 for Power
- Required software for documentation:
  - HTML browser to access HTML documentation
  - Portable Document Format (PDF) viewer to view any PDF files

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter.

Documentation and other program content may be supplied only in the English language.

Planning information

Web information

For information regarding XL C/C++, visit

   http://www-03.ibm.com/software/products/en/ccompfami

For information regarding IBM Application Development, visit

   http://www-03.ibm.com/software/products/en/category

Packaging

The XL C/C++ for Linux, V13.1.1 package contains:

- One DVD-ROM containing the XL C/C++ for Linux, V13.1.1 product
- XL C/C++ for Linux, V13.1.1 Quickstart Guide
- Passport Advantage customer letter
- Passport Advantage media pack pointer sheet

This program, when downloaded from a website, contains the applicable IBM license agreement and License Information, if appropriate, and will be presented for acceptance at the time of installation of the program. For future reference, the license and License Information will be stored in a directory such as LICENSE.TXT.

Security, auditability, and control

XL C/C++ for Linux, V13.1.1 uses the security and auditability features of the host hardware or software. The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Software Services

IBM Software Services has the breadth, depth, and reach to manage your services needs. You can leverage the deep technical skills of our lab-based, software services team and the business consulting, project management, and infrastructure expertise of our IBM Global Services team. Also, we extend our IBM Software Services reach through IBM Business Partners to provide an extensive portfolio of capabilities. Together, we provide the global reach, intellectual capital, industry insight, and technology leadership to support a wide range of critical business needs.

To learn more about IBM Software Services or to contact a Software Services sales specialist, visit

   http://www.ibm.com/software/sw-services/

Ordering information

```
Product group: IBM XL C/C++

Product Identifier Description: IBM XL C/C++ for Linux

PID: 5765-J08, 5725-C73

Product category: XL C/C++
```

Ordering through Passport Advantage part numbers

Only the media pack part number is updated. The remaining ordering information is the same as previously announced. For ordering information on XL C/C++ for Linux, V13.1, refer to Software Announcement 214-160, dated April 28, 2014.

```
                                            Part
Program name/Description                    number

XL C/C++ for Linux, V13.1.1
    Media Package Multilingual              BT0MGML
```

Ordering through Product Identifier and feature numbers, basic license, electronic delivery, Maintenance, and trade-ups

The ordering information for basic license, electronic delivery, maintenance offering media supply details, and trade-up remains the same as previously announced.

For ordering information on XL C/C++ for Linux, V13.1, refer to Software Announcement 214-160, dated April 28, 2014.

Maintenance Offering Customer: Media Supply Entitlement Details

Customers with active Software Maintenance for XL C/C++ for Linux or XL C/C++ Enterprise Edition for Linux are entitled to receive the media supply that correspond to XL C/C++ for Linux, V13.1.1 or a previous level of the program as long as the level of the program continues to be active.

Media supply for versions before Version 13.1.1 only contain the XL C/C++ compiler for big endian distributions.

This software license includes Software Subscription and Technical Support, previously referred to as Software Maintenance.

Extending coverage for a total of three years from date of acquisition may be elected. Order the program number, feature number, and quantity to extend coverage for your software licenses. If maintenance has expired, specify the after license feature number.

For ordering details for software maintenance for XL C/C++ for Linux, V13.1, refer to Software Announcement 214-160, dated April 28, 2014.

Charge metric

```
                           Part number or
Program name               PID number       Charge metric

For build to order
XL C/C++ for Linux, V13.1.1  5765-J08         Authorized User
                                              Concurrent User

For build to plan
XL C/C++ for Linux, V13.1.1  5725-C73         Authorized User
                                              Concurrent User

For build to plan
XL C/C++ for Linux, V13.1.1  BT0MGML          Authorized User
                                              Concurrent User
```

This program is licensed and charged based upon either the Authorized User or Concurrent User charge metric.

Authorized User

Authorized User is a unit of measure by which the program can be licensed. An Authorized User is a unique person who is given access to the program. The

program may be installed on any number of computers or servers and each Authorized User may have simultaneous access to any number of instances of the program at one time. Licensee must obtain separate, dedicated entitlements for each Authorized User given access to the program in any manner directly or indirectly (for example, via a multiplexing program, device, or application server) through any means. An entitlement for an Authorized User is unique to that Authorized User and may not be shared, nor may it be reassigned other than for the permanent transfer of the Authorized User entitlement to another person.

Note: Some programs may be licensed where devices are considered users. In that case, the following applies. Any computing device that requests the execution of or receives for execution a set of commands, procedures, or applications from the program or that is otherwise managed by the program is considered a separate user of the program and requires an entitlement as if that device were a person.

Concurrent User

Concurrent User is a unit of measure by which the program can be licensed. A Concurrent User is a person who is accessing the program at any particular point in time. Regardless of whether the person is simultaneously accessing the program multiple times, the person counts only as a single Concurrent User. The program may be installed on any number of computers or servers, but licensee must obtain entitlements for the maximum number of Concurrent Users simultaneously accessing the program. Licensee must obtain an entitlement for each simultaneous Concurrent User accessing the program in any manner directly or indirectly (for example, via a multiplexing program, device, or application server) through any means.

Note: Some programs may be licensed where devices are considered users. In that case, the following applies. Any computing device that requests the execution of or receives for execution a set of commands, procedures, or applications from the program or that is otherwise managed by the program is considered a separate user of the program and requires an entitlement as if that device were a person.

Withdrawal of previous Passport Advantage part numbers

The following IPLA software media pack part numbers are being replaced or are obsolete as a result of this announcement. The effective withdrawal date is March 12, 2015.

Orders for these part numbers will not be accepted after the stated effective date of withdrawal, nor will normal marketing activities or educational support be available unless previous agreement exists between the customer and IBM.

```
Withdrawn from marketing information
```

Program name/Description	Part number
XL C/C++ for Linux, V13.1.0	
Media Package Multilingual	BA180ML

```
New release information
```

Program name/Description	Part number
XL C/C++ for Linux, V13.1.1	
Media Package Multilingual	BT0MGML

Terms and conditions

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

Licensing

IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use. Part number products only, offered outside of Passport Advantage, where applicable, are license only and do not include Software Maintenance.

This software license includes Software Subscription and Support (also referred to as Software Maintenance).

Agreement for Acquisition of Software Maintenance

The IBM Agreement for Acquisition of Software Maintenance (Z125-6011) applies for Subscription and Support (also referred to as Software Maintenance) and does not require customer signatures.

These programs are licensed under the IBM Program License Agreement (IPLA) and the associated Agreement for Acquisition of Software Maintenance, which provide for support with ongoing access to releases and versions of the program. IBM includes one year of Software Subscription and Support (also referred to as Software Maintenance) with the initial license acquisition of each program acquired. The initial period of Software Subscription and Support (also referred to as Software Maintenance) can be extended by the purchase of a renewal option, if available. These programs have a one-time license charge for use of the program and an annual renewable charge for the enhanced support that includes telephone assistance (voice support for defects during normal business hours), as well as access to updates, releases, and versions of the program as long as support is in effect.

License Information number

L-JYIP-9NKLQP

The program's License Information will be available for review on the IBM Software License Agreement website

  http://www.ibm.com/software/sla/sladb.nsf

Limited warranty applies

Yes

Limited warranty

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

IBM provides you with access to IBM databases containing information on known program defects, defect corrections, restrictions, and bypasses at no additional charge.

For further information, consult the *IBM Software Support Handbook* found at

   http://www.ibm.com/support/handbook

IBM will maintain this information for at least one year after the original licensee acquires the program (warranty period).

Money-back guarantee

If for any reason you are dissatisfied with the program and you are the original licensee, you may obtain a refund of the amount you paid for it, if within 30 days of your invoice date you return the program and its PoE to the party from whom you obtained it. If you downloaded the program, you may contact the party from whom you acquired it for instructions on how to obtain the refund.

For clarification, note that (1) for programs acquired under the IBM International Passport Advantage offering, this term applies only to your first acquisition of the program and (2) for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

Volume orders (IVO)

Yes. Contact your IBM representative.

Passport Advantage applies

Yes, and through the Passport Advantage website at

   http://www.ibm.com/software/passportadvantage

Usage restriction

Yes. For additional information, refer to the License Information document that is available on the IBM Software License Agreement website

   http://www.ibm.com/software/sla/sladb.nsf

Software Subscription and Support applies

Yes. Software Subscription and Support (also referred to as Software Maintenance), is now included in the Passport Advantage Agreement. Installation and technical support for the products announced in this announcement is provided by the Software Subscription and Support offering of the IBM International Passport Advantage Agreement. This fee service enhances customer productivity by providing voice or electronic access into the IBM support organizations.

IBM includes one year of Software Subscription and Support with the initial license acquisition of each program acquired. The initial period of Software Subscription and Support can be extended by the purchase of a renewal option.

While your Software Subscription and Support is in effect, IBM provides you assistance for your routine, short duration installation and usage (how-to) questions, and code-related questions. IBM provides assistance via telephone and, if available, electronic access, only to your information systems (IS) technical support personnel during the normal business hours (published prime shift hours) of your IBM support center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For additional details, consult your *IBM Software Support Handbook* at

   http://www.ibm.com/support/handbook

Software Subscription and Support does not include assistance for the design and development of applications, your use of programs in other than their specified operating environment, or failures caused by products for which IBM is not responsible under this agreement.

For additional information about the Passport Advantage Agreement, visit the Passport Advantage website at

http://www.ibm.com/software/passportadvantage

All distributed software licenses include Software Subscription and Support for a period of 12 months from the date of acquisition, providing a streamlined way to acquire IBM software and assure technical support coverage for all licenses. Extending coverage, for a total of three years from date of acquisition, may be elected.

Variable charges apply

No

Educational allowance available

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

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective. IBM does not warrant that systems and products are immune from the malicious or illegal conduct of any party.

Prices

Business Partner information

If you are an IBM Business Partner -- Distributor for Workstation Software acquiring products from IBM, you may link to Passport Advantage Online for resellers where you can obtain Business Partner pricing information. An IBM ID and password are required.

https://www.ibm.com/software/howtobuy/passportadvantage/paoreseller

Information on charges is available at

http://www.ibm.com/support

Choose the option entitled Purchase/upgrade tools.

```
                                  Program      One-time charge
      Description                 number       feature number

      XL C/C++ for Linux, V13.1.1
      with 1-year SW  S&S
      - per Authorized User       5765-J08     0001
      - per Concurrent User       5765-J08     0002
      - trade up from single
        Authorized User entitlement
        to single Concurrent User
        entitlement               5765-J08     0003
```

```
XL C/C++ for Linux, V12.1
with 1-year SW  S&S
- per Authorized User          5765-J03    0001
- per Concurrent User          5765-J03    0002
- trade up from single
  Authorized User entitlement
  to single Concurrent User
  entitlement                  5765-J03    0003

XL C/C++ for Linux, V11.1
with 1-year SW  S&S
- per Authorized User          5724-X14    0227
- per Concurrent User          5724-X14    0228
- trade up from single
  Authorized User entitlement
  to single Concurrent User
  entitlement                  5724-X14    0229

XL C/C++ for Linux,
SW S&S No Charge Registration
 - per Authorized User         5648-F60    0001
 - per Concurrent User         5648-F60    0003
SW S&S 1-year Renewal
 - per Authorized User         5648-F60    0002
 - per Concurrent User         5648-F60    0004

XL C/C++ for Linux,
SW S&S 1-year After License
 - per Authorized User         5648-F62    0001
 - per Concurrent User         5648-F62    0002

XL C/C++ for Linux,
SW S&S 3-year Registration
 - per Authorized User         5648-F64    0001
 - per Concurrent User         5648-F64    0002

XL C/C++ for Linux,
SW S&S 3 Year Renewal
 - per Authorized User         5648-F61    0001
 - per Concurrent User         5648-F61    0002

XL C/C++ for Linux,
SW S&S 3 Year After License
 - per Authorized User         5648-F63    0001
 - per Concurrent User         5648-F63    0002
```

Order now

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).

```
Phone:     800-IBM-CALL (426-2255)
Fax:       800-2IBM-FAX (242-6329)
Email:     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: RE001

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.

Terms of use

IBM products and services which are announced and available in your country can be ordered under the applicable standard agreements, terms, conditions, and prices in effect at the time. IBM reserves the right to modify or withdraw this announcement at any time without notice. This announcement is provided for your information only. Additional terms of use are located at:

http://www.ibm.com/legal/us/en/

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

http://www.ibm.com/planetwide/us/