



IBM XL C/C++ for Linux , V11.1 delivers support for the IBM POWER7 processor architecture

Table of contents

1 Overview	9 Publications
2 Key prerequisites	10 Technical information
2 Planned availability date	11 Ordering information
2 Description	16 Terms and conditions
7 Product positioning	19 Prices
9 Program number	20 Order now

At a glance

XL C/C++ for Linux® is a standards-based, high-performance C and C++ compiler with advanced optimization, debugging and performance-tuning features. XL C/C++ for Linux, V11.1 delivers the following new features and enhancements:

- Support for the latest POWER7™ processor architecture to deliver improved application performance and capability through exploitation of the architectural enhancements made available through the advancement of the Power® technology
- Wide range of optimizing features to generate highly optimized 32- and 64-bit application code to run efficiently on a variety of processors and processor families
- New diagnostic reports that can help identify opportunities to improve the performance of applications
- New and enhanced compiler options and directives for more flexibility and increased performance tuning and optimizations

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Overview

XL C/C++ for Linux is designed to:

- Optimize and tune your applications for execution on IBM Power platforms
- Help you unleash the full power of your IT investment
- Create and maintain critical business and scientific applications
- Maximize application performance
- Improve developer productivity

The performance gain from years of compiler optimization experience is realized in the continuous release-to-release compiler improvements including full exploitation of the latest IBM POWER7 processor. XL C/C++ for Linux, V11.1 includes the following enhancements for exploitation of the latest POWER7 architecture:

- Support for the vector unit and vector scalar extension (VSX) instruction set in the POWER7 processors to help parallelize applications
- Specific POWER7 processor tuning for the highly-tuned vector functions within the Mathematical Acceleration Subsystem (MASS) libraries

- New built-in functions to support POWER7 processor instructions giving you direct control of the Power instructions at the application level
- New arch and tune compiler options that allow you to specify full exploitation of the POWER7 processor architecture

With the support of the latest POWER7 processor chip, IBM advances a more than 20-year investment in the XL compilers for Power and PowerPC® series architectures. IBM has a long history of delivering innovative, high-quality compiler products to the marketplace. Over the course of multiple releases, the XL family of compilers offers new functions, enhancements, and standards conformance to provide you with the tools needed to develop and maintain smarter applications to meet critical business needs.

Additional enhancements in this release of XL C/C++ for Linux, V11.1 include:

- Further support for the draft C++0x programming language standard to deliver more functionality and to allow maximum portability of your source code
- Additional features to increase performance tuning and optimization of your C and C++ applications
- New and enhanced compiler options, directives, and built-in functions to deliver even more flexibility

Key prerequisites

Systems -- IBM Power System servers supported by

- Red Hat Enterprise Linux 5.5 (RHEL 5.5)
- SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP1)
- SUSE Linux Enterprise Server 10 Service Pack 2 (SLES 10 SP2)

Required hard disk space -- 200 MB

Planned availability date

August 20, 2010

Description

XL C/C++ for Linux continues to deliver additional functionality and enhancements including support for the latest POWER7 processor architecture to help improve application performance and capability.

Exploitation of the new POWER7 processor architecture

A key strength of XL C/C++ for Linux is performance and its ability to optimize and tune generated code for execution on Power platforms. The performance gain from years of IBM compiler optimization experience can be seen in the release-to-release compiler improvements from the development of the POWER4™ processors through to the POWER4+™, POWER5™, POWER5+™, and POWER6™ processors. With XL C/C++ for Linux, V11.1, compiler support now includes full exploitation of the latest POWER7 processor.

XL C/C++ for Linux, V11.1 supports the VSX instruction set in the POWER7 processors. New data types and built-in functions are introduced to support the VSX instruction, allowing you to efficiently manipulate vector operations in your applications. The advanced compiler optimizer can also automatically take advantage of these vector facilities to help automatically parallelize your application.

The highly-tuned MASS libraries are enhanced to support the POWER7 processors:

- The vector functions within the vector MASS library are tuned for the POWER7 architecture. The functions can be used in either 32- or 64-bit mode.
- New functions such as `exp2`, `exp2m1`, `log21p`, and `log2` are added in both single-precision and double-precision functional groups. In addition, functions supporting previous POWER processors are enhanced to support POWER7 processors.
- A new MASS SIMD library tuned for the POWER7 processor is provided, containing an accelerated set of frequently used mathematical functions.

New built-in functions to unlock POWER7 processor instructions, let you take direct control at the application level:

- POWER7 prefetch extensions and cache control instructions
- POWER7 hardware instructions

New arch and tune compiler options are added to specify code generation for the POWER7 processor architecture. `-qarch=pwr7` instructs the compiler to produce code that can fully exploit the POWER7 hardware architecture. `-qtune=pwr7` enables optimizations specifically tuned for the POWER7 hardware platforms.

With the support of the latest POWER7 processor chip, IBM advances a more than 20-year investment in compilers for Power and PowerPC series architectures.

New diagnostics reports to help improve performance of your code Compiler reports in XML format

With this release, reports containing key compiler optimization information, are now available. These reports identify areas in your code where the compiler was able to apply optimization. Equally important, the reports also identify areas where optimizations could not be applied along with the reasons why they were not applied. This information was not readily obvious or available in earlier versions of the compiler. Use this information to change your code so the compiler can take advantage of additional optimizations for improving performance.

These new compiler reports are produced in XML format (XML 1.0) and are easily consumable by tools that you can create, to read and analyze the results. A stylesheet, `xlstyle.xsl`, is provided to render the report in a human-readable format that can be read by anyone with a browser, which supports XSLT.

In this release, reports for four optimization categories are provided:

- Inlining
- Loop transformations
- Data reorganizations
- Profile-directed feedback information

The new `-qlistfmt` option and its associated suboptions are used to generate the XML 1.0 report. This new feature allows the compiler to report, in XML format, on the results of more detailed optimization transformation analysis that were previously available only with limited information and only in text format. These new reports can help you do a higher level of performance tuning in less time.

Enhanced profiling reports

When using `-qreport` with the `-qpdf` option, there is additional information on the loop iteration count, the block and call count, and a report on the number of cache misses for certain functions.

Reports of data reorganizations

The compiler can now generate reports on data reorganizations in the listing files. The data reorganization section provides a summary how program variable data is reorganized by the compiler. Information on data reorganization includes:

- Array splitting
- Array transposing
- Memory allocation merging
- Array interleaving
- Array coalescing

Also available in the listing files are the locations of data prefetch instructions, which are inserted by the compiler.

Additional loop analysis reports

A new suboption is added to `-qhot` to allow for more aggressive loop analysis. This new option, `-qhot=level=2`, together with `-qsmp` and `-qreport` provide information about loop nests on which the aggressive loop analysis was performed. This report can be found in the Loop Transformation section of the listing file and in the new XML listing file.

Utilization tracking and reporting tool to understand compiler usage

This release introduces a new feature that helps you understand the compiler utilization within your enterprise. This feature helps determine whether your organization's use of the compiler matches your compiler license entitlements. When enabled, each invocation of the compiler is recorded in a compiler utilization file. The utilization reporting tool can then be used to generate a report of the overall usage of the compiler within your organization. In particular, the report indicates the number of concurrent users using the compiler.

Additional support for C++0x

C++0x is the working draft of the next C++ programming language standard.

The following C++ 0x features are introduced in XL C/C++ for Linux, V11.1:

- Auto type deduction
- C99 long long
- C99 preprocessor features adopted in C++0x
- Decltype
- Delegating constructors
- Explicit instantiation declarations
- Inline namespace definitions
- Static assertion
- Variadic templates

Support of programming language standards not only provides you with significant functionality but also allows for maximum portability of your source code among a variety of compiler implementations.

New and enhanced compiler options and directives for more flexibility

Compiler options can be specified on the command line or through directives embedded in your application source files. The following additional new or changed compiler options are available with this release of the compiler:

- `-qarch` includes a new suboption, `-qarch=pwr7`, allowing you to instruct the compiler to produce code that can fully exploit the POWER7 hardware platforms.
- `-qassert` is a new option and is used to provide information about the characteristics of the files to help you to fine-tune optimizations.
- `-qconcurrentupdate` must be used to enable hot patching when building kernel extensions.
- `-qfuncsect` is improved in this release to help reduce the size of your C/C++ programs.
- `-qfunctrace` inserts calls to user-defined tracing procedures at procedure entry and exit, giving you powerful user-customizable debugging and profiling capabilities.
- The `-qhot` compiler option is a powerful alternative to tuning by hand. `-qhot` provides opportunities to optimize loops and array language. A new suboption is added for `-qhot`. The `-qhot=fastmath` option enables the replacement of math routines with available math routines from the XLOPT library only if `-qstrict=nolibrary` is enabled. `-qhot=nofastmath` disables this replacement.
- For improved performance, `-qinline` attempts to inline functions instead of generating calls to those functions, providing you with new control over this powerful optimization.
- Specifying `-r -qipa=relink` is used to generate relinkable objects while preserving IPA information.
- `-qkeepinlines` includes the new `exports` suboption. You can use `-qkeepinlines=exports` to ensure that the compiler keeps the list of symbols and their definitions from the shared object file compiled with an earlier version of the compiler.
- `-qlanglvl` includes new suboptions:
 - `-qlanglvl=autotypededuction` controls whether the auto type deduction feature is enabled. This feature is used to delegate the task of type deduction of an auto variable to the compiler from the type of its initializer expression.
 - `-qlanglvl=c99longlong` controls whether the C99 long long feature is enabled. This feature improves source compatibility between the C and C++ languages.
 - `-qlanglvl=c99preprocessor` controls whether the C99 preprocessor features adopted in C++0x are enabled. This feature is used to provide a more common preprocessor interface for C and C++ compilers.
 - `-qlanglvl=dectype` controls whether the `dectype` feature is enabled. This feature is used to get a type that is based on the resultant type of a possibly type-dependent expression.
 - `-qlanglvl=delegatingctors` controls whether the delegating constructors feature is enabled. This feature is used to concentrate common initializations in one constructor.
 - `-qlanglvl=extendedfriend` controls whether the extended friend declarations feature is enabled. This feature is used to accept additional forms of non-function friend declarations.
 - `-qlanglvl=extendedintegersafe` controls whether or not unsigned long long int can be used as the type for decimal integer literals that do not have a suffix containing `u` or `U` and cannot be represented by the long long int type. This option takes effect only when the `-qlanglvl=c99longlong` option is specified.
 - `-qlanglvl=externtemplate` controls whether the explicit instantiation declarations feature is enabled. This feature is used to suppress the implicit instantiation of a template specialization or its members
 - `-qlanglvl=inlinenamespace` controls whether the inline namespace definitions feature is enabled. This feature is used to define and specialize members of an inline namespace as if they were also members of the enclosing namespace.

- `-qlanglvl=static_assert` controls whether the static assertions feature is enabled. This feature is used to produce compile-time assertions for which a severe error message is issued on failure.
- `-qlanglvl=variadic(templates)` controls whether the the variadic templates feature is enabled. This feature is used to define class or function templates that have any number (including zero) of parameters.
- `-qlibmpi` is used to tune code based on the known behavior of the Message Passing Interface (MPI) functions.
- `-qlistfmt` generates the XML report containing information about optimizations performed and not performed for loop transformations, data reorganization and profile-directed feedback.
- `-qnamemangling` implements a new name mangling scheme for this release.
- New suboptions are added to `-qpdf1` and `-qpdf2`. These options tune optimizations through profile-directed feedback (PDF).
- `-qprefetch` includes a new suboption. When working with applications that generate a high cache-miss rate, `-qprefetch=assistthread` can be used to exploit assist threads for data prefetching.
- `-qsaveopt` is enhanced to include the user's configuration file name and the options specified in these configuration files.
- `-qsimd` controls whether the compiler can automatically take advantage of vector instructions for processors that support them.
- When a listing file is generated using `-qsource` option, you can use `-qskipsrc` to control whether the source statements skipped by the compiler are shown in the source section of the listing file. Alternatively the `-qskipsrc=hide` option can be used to hide the source statements skipped by the compiler.
- `-qstackprotect` is used to protect your applications against malicious code or programming errors that overwrite or corrupt the stack.
- `-qstrict` includes a new suboption to allow more control over optimizations and transformations that violate strict program semantics. `-qstrict=vectorprecision` disables vectorization in loops where it might product different results in vectorized iterations than in nonvectorized ones.
- The `-qtune=pwr7` suboption is added to `-qtune` to enable tuning for the POWER7 hardware platforms.

Additional built-in functions to help improve performance

As an alternative to managing hardware registers through assembly language, XL C/C++ built-in functions provide access to the optimized Power instruction set and allow the compiler to optimize the instruction scheduling, to help improve the performance of your code. New built-in functions in XL C/C++ for Linux, V11.1, include:

- New VSX built-in functions and vector data types are added to enable direct access to the powerful vector capabilities of the POWER7 processors.
- The POWER7 processor has cache control and stream prefetch extensions that support store stream prefetch and prefetch depth control. New built-in functions provide direct programmer access to these functions.
- New built-in functions are added corresponding to each new POWER7 hardware instruction. Using these functions you can improve performance by directly manipulating specific hardware instructions in your code.
- New built-in functions are also added for the following:
 - Conversion function to convert between decllets and binary coded decimal
 - Comparison functions to compare bytes
 - Generation of sixes

Accessibility by people with disabilities

A U.S. 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 U.S. Rehabilitation Act

XL C/C++ for Linux, V11.1 is capable as of August 20, 2010, 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 Web site

http://www.ibm.com/able/product_accessibility/index.html

Product positioning

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, including those for the different architectures shipped in the popular IBM 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 only need to focus on the logic of the applications and let the compiler figure out the best way to transform and optimize the code generation for the systems the application will run on.

Harness the power of parallel computing

Parallel programming with XL C/C++ exploits the advantages of multiprocessor systems, while maintaining full binary compatibility with existing single processor systems. With the XL C/C++ compiler's support of OpenMP 3.0 and improved OpenMP and auto-parallel performance, you can use XL C/C++ to develop high-performance, parallelized applications.

For high-bandwidth data processing and algorithmic-intensive applications, XL C/C++ can leverage VMX and VSX instructions and automatic SIMDization to improve program performance. By processing multiple pieces of data at once, the speed of executed code can increase, with the added benefit that the source code may not need to be rewritten.

Powerful, no-hassle performance optimization

Well-written and thoroughly debugged code, fully conformant to its language standard, can take maximum advantage of the optimizing technology in XL C/C++ and may enjoy 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 no source code changes.

XL C/C++ supports several levels of increasingly aggressive code transformations. Advanced optimization techniques such as inter-procedural analysis (IPA) and 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 IBM Power platform with 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, V11.1 is part of a larger family of XL C, C++, and Fortran compilers, which supports multiple platforms such as AIX®, IBM Power Systems, z/OS®, z/VM®, Linux, Blue Gene/L™, Blue Gene/P™, and Cell Broadband Engine™ architecture. The modular structure of these compilers delivers optimizations and functionality on all platforms and to all languages. Further, each product derives from a common code base, so features and optimizations are tested in multiple languages on multiple platforms. A common code base, 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.

Programming language standards, industry specifications and other

Programming language standards

XL C/C++ supports the latest revised ISO C++ 2003 standard (ISO/IEC 14882:2003)

XL C/C++ also supports the latest C standard revision ISO/IEC 9899:1999, also known as C99, a major update to the previous C standard. C99 introduces a number of new language features to the C language, such as:

- Complex data type
- Support for variable length arrays
- Compound literals
- Flexible array members

The main changes to the C++ standard are the Technical Corrigendum 1, which details ongoing work in defect reports collected worldwide. These items combine to form the 2003 C++ standards. These changes are available beginning with the XL C/C++ V7.0 compiler. Additional updates come in the form of the C++ Library Extensions Technical Report (TR1) in 2001. These reports proposed extensions to the C++ library. Support includes the hash and traits libraries from C++ Library Extensions Technical Report in the XL C/C++ V8.0 compiler. Other additions include smart pointers, template metaprogramming utilities, and special math functions useful for research.

XL C/C++ for Linux, V10.1 introduces support for the C++0x standard which is the working draft of the next C++ programming language standard. XL C/C++ for Linux, V11.1 continues to build on the support for the C++ 0x standard. This standard has not yet been officially adopted, but the XL C/C++ compiler supports some of its features. However, these features might change or be removed in the future according to the final ratification of this standard.

Industry specifications and other language influences

The XL family of compilers is deeply involved in parallel computing and high-performance computing. The XL compilers implement both the AltiVec/VMX programming interface and the OpenMP 3.0 specification for shared memory programming model. With XL C/C++ for Linux, V11.1 release, the VSX instruction set within the POWER7 architecture is also supported.

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. IBM continues to participate in the SPEC COMP suite, which measures the performance of parallel benchmarks using OpenMP.

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

Program number

Program number	VRM	Program name
5724-X14	11.1	IBM XL C/C++ for Linux

Product identification number - PID number

Program name	Program number
XL C/C++ for Linux, V11.1	5724-X14
XL C/C++ for Linux SW S&S 1 Year After License - per Authorized User - per Concurrent User	5648-F62
XL C/C++ for Linux SW S&S No Charge Registration/ 1 Year Renewal - per Authorized User - per Concurrent User	5648-F60
XL C/C++ for Linux SW S&S 3 Year Registration - per Authorized User - per Concurrent User	5648-F64
XL C/C++ for Linux SW S&S 3 Year Renewal - per Authorized User - per Concurrent User	5648-F61
XL C/C++ for Linux SW S&S 3 Year After License - per Authorized User - per Concurrent User	5648-F63

Offering Information

Product information is available via the Offering Information Web site

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

Also, visit the Passport Advantage® Web site

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

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. Payment options for orders are via credit card (in

the U.S.) or customer number for 20 countries. A large number of publications are available online in various file formats, and they can all be downloaded by all countries, free of charge.

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=210-250>

Technical information

Specified operating environment

Hardware requirements

For XL C/C++ for Linux, V11.1:

- System: IBM Power Systems servers supported by:
 - Red Hat Enterprise Linux 5.5 (RHEL 5.5)
 - SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP1)
 - SUSE Linux Enterprise Server 10 Service Pack 2 (SLES 10 SP2)
- Required hard disk space: 200 MB

Software requirements

For XL C/C++ for Linux, V11.1:

- Supported operating systems
 - Red Hat Enterprise Linux 5.5 (RHEL 5.5)
 - SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP1)
 - SUSE Linux Enterprise Server 10 Service Pack 2 (SLES 10 SP2)
- Instance of GNU Compiler Collection (GCC)
Refer to *XL C/C++ for Linux Installation Guide* for required packages.
- Perl 5.0 or later, to run the installation utility
- Required software for documentation
 - A graphical desktop environment (such as K Desktop Environment or GNOME) that supports web browsers and PDF viewers
 - A frames-capable HTML browser (to access help and other Web pages)
 - PDF viewer (to access PDF documentation)

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.ibm.com/software/awdtools/ccompilers/>

For information regarding IBM Application Development, visit

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

Packaging

The XL C/C++ for Linux, V11.1 package contains:

- One CD-ROM containing the XL C/C++ for Linux, V11.1 product
- XL C/C++ for Linux, V11.1 Quickstart Guide
- Passport Advantage customer letter
- Passport Advantage media pack pointer sheet

This program, when downloaded from a Web site, 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

IBM XL C/C++ for Linux, V11.1 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

This product is only available via Passport Advantage. It is not available as shrinkwrap.

Product Group: IBM XL C/C++

Product Identifier Description: IBM XL C/C++

PID: 5724-X14

Product Category: XL C/C++

Charge metric

Program name	Part number or PID number	Charge metric
XL C/C++ for Linux, v11.1	5724-X14	Authorized User Concurrent User
XL C/C++ for Linux, v11.1	BA0ZEML	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 accessing 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.

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.

Passport Advantage

Program name/Description	Part number
XL C/C++ for Linux, v11.1 Media Package Multilingual	BA0ZEML
XL C/C++ for Linux Authorized User License + SW S&S 12 Months	D54KXLL
XL C/C++ for Linux Authorized User Annual SW S&S Renewal	E01M2LL
XL C/C++ for Linux Authorized User SW S&S Reinstatement 12 Months	D54KYLL
XL C/C++ for Linux Concurrent User License + SW S&S 12 Months	D043RLL
XL C/C++ for Linux Concurrent User Annual SW S&S Renewal	E04U8LL
XL C/C++ for Linux Concurrent User SW S&S Reinstatement 12 Months	D043SLL

Passport Advantage trade-up

Customers who have originally acquired licenses for Authorized User can trade-up their Authorized User licenses to an equivalent or appropriate number of Concurrent User licenses (previously known as Floating User).

Below is a list of precursor products and their associated Authorized User part numbers for which you must have already acquired a license, in order to be eligible to acquire the equivalent Concurrent User licenses using the trade-up part number.

Precursor product	Trade-up product	Trade-up part number
XL C/C++ for Linux Authorized User single entitlement	XL C/C++ for Linux Concurrent User single entitlement	D0DEXLL to trade-up from single Authorized User to single Concurrent User

Consult your IBM representative if you have any questions.

Passport Advantage customer: Media pack entitlement details

Customers with active maintenance or subscription for the products listed are entitled to receive the corresponding media pack.

Entitled maintenance offerings description

XL C/C++ for Linux

Media Pack Description	Part number
XL C/C++ for Linux, v11.1 Media Pk Multilingual	BA0ZEML

Basic License: To order the programs described in this announcement for 5724-X14, specify the type-model number and the applicable features from the tables below. The medium feature (CD-ROM) need only be specified as required. To request the Media package (CD-ROM), specify media supply feature 5809 and 3410.

When placing an ESD order in econfig, specify a billing feature, the media feature 5809 and 3410, and the ESD only feature 3450.

Description	Program Number	One-time charge feature number	Medium	Medium feature number
XL C/C++ for Linux, v11.1 OTC with 1 Year SW S&S	5724-x14			
- per Authorized User		0227		
- per Concurrent User		0228		
Media Package			CD-ROM	5809
			CD-ROM	3410
Expedite Fee charge to Branch				3445
Customization features:				
ESD for upgrades only				3450
Do not ship pubs				3470
Do not ship media				3471

Electronic Software Update Orders

Entitled Software Update (ESU) is a way for customers to self order their Power software release upgrades via the Entitled Software Support (ESS) Web site without the need to go to their seller to place the upgrade order. Entitled Software Update (ESU) orders for Electronic Software Delivery (ESD), will now be available in all countries. ESU orders for Power software including IBM XL C/C++ for Linux, V11.1 will be placed on the Entitled Software Support (ESS) Web site

<https://www-05.ibm.com/servers/eserver/ess/OpenServlet.wss>

Customers should generally select electronic delivery when ordering via ESU, but do have the ability to select physical delivery. Programs ordered for ESD will have the same download images provided as on the CD media shipped for physical orders.

ESU customers placing ESD software orders will receive an e-mail with software order information. The ESU customer will be able to immediately proceed to the "Downloads" Web site support for program access, instead of waiting for delivery of a physical package shipped from IBM.

Customers choosing physical delivery will also have the electronic images available for ESD download.

ESD help (instructions on how to use)

http://www.ibm.com/systems/support/software/delivery/en_US/downloadinfo.html

ESD sign-in (must have Customer number & Power software entitlements to get in)

<http://www.ibm.com/servers/eserver/ess/OpenServlet.wss>

List of Power software products that are available for electronic download

http://www.ibm.com/systems/support/software/delivery/en_US/supportedproducts.html

Maintenance Offering customer: Media Supply Entitlement details

Customers with active Software Maintenance for XL C/C++ for Linux or XL C/C++ Advanced Edition for Linux are entitled to receive the media pack corresponding to XL C/C++ for Linux, V11.1 or a previous level of the program as long as the level of the program continues to be active.

Eligible customers should add the applicable PID and CD-ROM media supply feature number from the following table to their existing maintenance record. To request the media package (CD-ROM), specify the media feature 5809 and 3410.

When placing an ESD order in econfig, specify a billing feature, the media feature 5809 and 3410, and the ESD only feature 3450. Note that these ESD features are also applicable to the compiler products:

- XL C/C++ for Linux, V10.1 (5724-U83)
- XL C/C++ Advanced Edition for Linux, V9.0 (5724-S73)
- XL C/C++ Advanced Edition V8.0 for Linux (5724-M16)

Entitled maintenance offerings description

XL C/C++ for Linux

Description		Medium feature number
XL C/C++ for Linux V11.1 for PID 5724-X14	CD-ROM Media Supply	5809
	CD-ROM Media Supply	3410
	Expedite Fee Charge to Branch	3445
	Customization features:	
	ESD for upgrades only	3450
	Do not ship pubs	3470
	Do not ship media	3471

XL C/C++ for Linux v10.1	CD-ROM Media Supply	6036
for PID 5724-U83	CD-ROM Media Supply	3410
	Expedite Fee Charge to Branch	3445
	Customization features:	
	ESD for upgrades only	3450
	Do not ship pubs	3470
	Do not ship media	3471
XL C/C++ Adv Ed for Linux, v9.0	CD-ROM Media Supply	5809
for PID 5724-S73	CD-ROM Media Supply	3410
	Expedite Fee Charge to Branch	3445
	Customization features:	
	ESD for upgrades only	3450
	Do not ship pubs	3470
	Do not ship media	3471
XL C/C++ Adv Ed v8.0 Linux	CD-ROM Media Supply	5809
for PID 5724-M16	CD-ROM Media Supply	3410
	Expedite Fee Charge to Branch	3445
	Customization features:	
	ESD for upgrades only	3450
	Do not ship pubs	3470
	Do not ship media	3471

Trade-up from Authorized User to Concurrent User

Customers who have originally acquired licenses for Authorized User can trade-up their Authorized User licenses to an equivalent or appropriate number of Concurrent User licenses.

The following is a list of precursor products for which you must have already acquired a license, in order to be eligible to acquire the equivalent Concurrent User licenses using the trade-up feature number.

Precursor product	Trade-up product	Trade-up feature number
XL C/C++ for Linux Authorized User single entitlement	XL C/C++ for Linux Concurrent User single entitlement	Is used to trade-up from single Authorized User to single Concurrent User

Consult your IBM representative if you have any questions.

Description	One-time charge program number	Feature number
XL C/C++ for Linux, v11.1 - trade up from single Authorized User entitlement to single Concurrent User entitlement	5724-x14	0229

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.

Feature description	Feature number
Per Authorized User with 1 Year SW S&S	0227
Per Concurrent User with 1 Year SW S&S	0228
5724-X14 - IBM XL C/C++ for Linux, V11.1	5809
Multilingual, CD ROM	3410
5648-F60 - IBM XL C/C++ for Linux	
Per Authorized User SW S&S	
- NoCharge Registration	0001
- 1 Year Renewal	0002
Per Concurrent User SW S&S	
- NoCharge Registration	0003
- 1 Year Renewal	0004
5648-F62 - IBM XL C/C++ for Linux	
Per Authorized User SW S&S 1 Year After License	0001
Per Concurrent User SW S&S 1 Year After License	0002
5648-F64 - IBM XL C/C++ for Linux	
Per Authorized User SW S&S 3 Year Registration	0001
Per Concurrent User SW S&S 3 Year Registration	0002
5648-F61 - IBM XL C/C++ for Linux	
Per Authorized User SW S&S 3 Year Renewal	0001
Per Concurrent User SW S&S 3 Year Renewal	0002
5648-F63 - IBM XL C/C++ for Linux	
Per Authorized User SW S&S 3 Year After License	0001
Per Concurrent User SW S&S 3 Year After License	0002

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License Information form number

L-MCHN-85CRTN. The program's License Information will be available for review on the IBM Software License Agreement Web site

<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.

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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.

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Authorization for use on home/portable computer

The program may be stored on the primary machine and another machine, provided that the program is not in active use on both machines at the same time.

Volume orders (IVO)

Yes. Contact your IBM representative.

Passport Advantage applies

Yes, and through the Passport Advantage Web site 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 Web site

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

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Variable charges apply

No

Educational allowance available

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

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>

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<http://www.ibm.com/support>

Select "United States" and then click on "IBMLink™ 2000"

Description	Program number	One-time charge feature number
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 NoCharge 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

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