



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

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At a glance

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

- Support for the latest POWER7™ processor architecture, for 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

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

Overview

IBM XL C/C++ for AIX is designed to optimize and tune your applications for execution on IBM Power platforms, to help you unleash the full power of your IT investment, to create and maintain critical business and scientific applications, to maximize application performance, and to improve developer productivity. The performance gain from years of compiler optimization experience is seen in the continuous release-to-release compiler improvements including full exploitation of the latest IBM POWER7 processor.

With this release, IBM XL C/C++ for AIX, V11.1 introduces 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 added to support POWER7 processor instructions giving you direct control of the Power instructions at the application level
- New arch and tune compiler options made available to specify full exploitation of the POWER7 processor architecture

With the support of the latest POWER7 processor chip, IBM will have advanced a more than 20-year investment in the XL compilers for Power series 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 has invested in 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 AIX, V11.1 include:

- Further support for the draft C++0x programming language standards to give you more functionality and to allow for maximum portability of your source code
- Additional features for increased performance tuning and optimization of your C and C++ applications
- New and enhanced compiler options, directives, and built-ins to give you even more flexibility

Key prerequisites

Systems -- IBM Power System servers supported by:

- IBM AIX 5.3 TL 5300-07 or higher
- IBM AIX 6.1
- IBM PASE for i 6.1 with PTF SI30636 or higher

Required hard disk space -- 500 MB

Planned availability date

April 23, 2010

Description

IBM XL C/C++ for AIX 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 IBM XL C/C++ for AIX 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 AIX, V11.1, compiler support now includes full exploitation of the latest POWER7 processor.

IBM XL C/C++ for AIX, 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 have been 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 unlock POWER7 processor instructions to enable you to 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 previous versions of the compiler. You can use this information to change your code to allow the compiler to 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 allow you to render the report into a human-readable format that can be read by anyone with a browser that 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, you get additional information on the loop iteration count, and 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 of 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 has been 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 will enable you to understand the compiler utilization within your enterprise. You can use this feature to help 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 AIX, 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 has been 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=decltype controls whether the decltype 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 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 produce 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 AIX, 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 declets 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

IBM XL C/C++ for AIX, V11.1 is capable as of April 13, 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 U.S. 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 IBM XL C/C++ exploits the advantages of multiprocessor systems, while maintaining full binary compatibility with existing single-processor systems. With XL C/C++ you can use any of the following to develop your parallelized applications:

- An extensive range of OpenMP directives and non-OpenMP SMP directives
- Message passing interface (MPI)
- The POSIX threads (Pthreads) library module

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, and the compiler is able to generate code that exploits the leading-edge performance in existing and new hardware, often with minimal source code changes.

IBM 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 minimal or no source code changes. Upgrade to the latest IBM XL C/C++ compiler, which incorporates the latest advances in optimization and hardware technology support.

Multiple-platform XL C/C++ and Fortran

IBM XL C/C++ for AIX, V11.1 is part of a larger family of IBM 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 language influences

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++ for AIX, 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++ for AIX, V8.0 compiler. Other additions include smart pointers, template metaprogramming utilities, and special math functions useful for research.

XL C/C++ for AIX, 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 AIX, 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 IBM 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 the XL C/C++ for AIX, V11.1 release, the Vector Scalar Extension (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.

IBM Rational Developer for Power Systems Software

IBM Rational® Developer for Power Systems Software™ V7.6 can be purchased with this program.

IBM Rational Developer for Power Systems Software now includes a rich set of integrated development tools that support the XL C/C++ for AIX compiler. IBM Rational Developer for Power Systems Software offers the capabilities of file management, searching, editing, analysis, build, and debug, all integrated into an Eclipse workbench. XL C/C++ developers will now be able to realize the productivity gains of moving from older, text-based, command line development tools to a rich integrated development environment. IBM Rational Developer for Power Systems Software V7.6 is used with XL C/C++ for AIX, versions 8.0, 9.0, 10.1, or 11.1.

If you license the XL C/C++ for AIX compiler, you might also be interested in acquiring licenses for Rational Developer for Power Systems Software V7.6.

Program number

Program number	VRM	Program name
5724-X13	11.1	IBM XL C/C++ for AIX

Product identification number

Program name	Program number
XL C/C++ for AIX, V11.1	5724-X13
XL C/C++ for AIX SW S&S 1 Year After License - per Authorized User - per Concurrent User	5648-F53
XL C/C++ for AIX SW S&S No Charge Registration/ 1 Year Renewal - per Authorized User - per Concurrent User	5648-F49
XL C/C++ for AIX SW S&S 3 Year Registration - per Authorized User - per Concurrent User	5648-F47
XL C/C++ for AIX SW S&S 3 Year Renewal - per Authorized User - per Concurrent User	5648-F46
XL C/C++ for AIX SW S&S 3 Year After License - per Authorized User - per Concurrent User	5648-F45

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=210-095>

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.

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.

Technical information

Specified operating environment

Hardware requirements

- For XL C/C++ for AIX, V11.1:
 - System: IBM Power Systems servers supported by AIX 5.3 or AIX 6.1
 - Disk space: 500 MB
- For XL C/C++ for AIX, V11.1 using IBM Portable Application Solutions Environment for i (IBM PASE for i):
 - IBM i or AS/400® RISC model server

Software requirements

- For XL C/C++ for AIX, V11.1:
 - AIX 5.3 TL 5300-07 (or later) or AIX 6.1
 - Viewers to access and display the documentation such as:
 - Frames-capable browser to access HTML documentation
 - Portable Document Format (PDF) viewer to view PDF files
- For XL C/C++ for AIX, V11.1 using IBM PASE for i:
 - IBM PASE for i 6.1 with PTF SI30636 or later

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 and 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 IBM XL C/C++ for AIX, V11.1 package contains:

- One CD-ROM containing the XL C/C++ for AIX, V11.1 product
- XL C/C++ for AIX, 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, which 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 AIX, 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 available only via Passport Advantage. It is not available as shrinkwrap.

Product Group: IBM XL C/C++

Product Identifier Description: IBM XL C/C++

PID: 5724-X13

Product Category: XL C/C++

Charge metric

Program name	Part number or PID number	Charge metric
XL C/C++ for AIX, V11.1	5724-X13	Authorized User Concurrent User
XL C/C++ for AIX, V11.1	BA0YKML	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 AIX, V11.1 Media Package Multilingual	BA0YKML
XL C/C++ for AIX Authorized User LIC + SW S&S 12 Mo	D5AHL L L
XL C/C++ for AIX Authorized User Annual SW S&S Rnw1	E1AHN L L
XL C/C++ for AIX Authorized User SW S&S Reinstate 12Mo	D5AH P L L
XL C/C++ for AIX Concurrent User LIC + SW S&S 12 Mo	D043 P L L
XL C/C++ for AIX Concurrent User Annual SW S&S Rnw1	E04U7 L L
XL C/C++ for AIX Concurrent User SW S&S Reinstate 12Mo	D043 Q L L

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 AIX Authorized User single entitlement	XL C/C++ for AIX Concurrent User single entitlement	D0CNW L L 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 below are entitled to receive the corresponding media pack.

Entitled Maintenance Offerings description

XL C/C++ for AIX

Media Pack description	Part number
------------------------	-------------

XL C/C++ for AIX, V11.1 Media Pk Multilingual	BA0YKML
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Basic license: To order the programs described in this announcement for 5724-X13, 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 features 5809 and 3410.

When placing an ESD order in econfig, specify a billing feature, the media features 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 AIX, V11.1 OTC with 1 Year SW S&S	5724-X13			
- per Authorized User		0220		
- per Concurrent User		0221		
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. 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 AIX, V11.1, will be placed on the ESS Web site

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

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 and 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 AIX, XL C/C++ Enterprise Edition for AIX, or VisualAge® C++ for AIX are entitled to receive the media pack corresponding to XL C/C++ for AIX, 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 features 5809 and 3410.

When placing an ESD order in econfig, specify a billing feature, the media features 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 AIX, V10.1, PID 5724-U81
- XL C/C++ Enterprise Edition for AIX, V9.0, PID 5724-S71
- XL C/C++ Enterprise Edition V8.0 for AIX, PID 5724-M12

Entitled maintenance offerings description

XL C/C++ for AIX

Description		Medium feature number
XL C/C++ for AIX V11.1 for PID 5724-X13	CD-ROM Media Supply CD-ROM Media Supply	5809 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 AIX V10.1 for PID 5724-U81	CD-ROM Media Supply CD-ROM Media Supply	5809 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++ Ent Ed for AIX, V9.0 for PID 5724-S71	CD-ROM Media Supply CD-ROM Media Supply	5809 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++ Ent Ed V8.0 AIX	CD-ROM Media Supply	5809
for PID 5724-M12	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 AIX Authorized User single entitlement	XL C/C++ for AIX 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 AIX, V11.1 - trade up from single Authorized User entitlement to single Concurrent User entitlement	5724-X13	0226

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
5724-X13 - IBM XL C/C++ for AIX, V11.1	
Per Authorized User with 1 Year SW S&S	0220
Per Concurrent User with 1 Year SW S&S	0221
5724-X13 - IBM XL C/C++ for AIX, V11.1	
Multilingual, CD ROM	5809 3410
5648-F49 - IBM XL C/C++ for AIX	
Per Authorized User SW S&S	
- No Charge Registration	0001
- 1 Year Renewal	0002
Per Concurrent User SW S&S	
- No Charge Registration	0003
- 1 Year Renewal	0004
5648-F53 - IBM XL C/C++ for AIX	
Per Authorized User SW S&S 1 Year After License	0001

Per Concurrent User SW S&S 1 Year After License 0002

5648-F47 - IBM XL C/C++ for AIX
Per Authorized User SW S&S 3 Year Registration 0003
Per Concurrent User SW S&S 3 Year Registration 0004

5648-F46 - IBM XL C/C++ for AIX
Per Authorized User SW S&S 3 Year Renewal 0001
Per Concurrent User SW S&S 3 Year Renewal 0002

5648-F45 - IBM XL C/C++ for AIX
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-72VMHZ

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.

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).

Program technical support

Technical support of a program product will be available for a minimum of five years from the general availability date, as long as your Software Subscription and Support (also referred to as Software Maintenance) is in effect. This technical support allows you to obtain assistance (via telephone or electronic means) from IBM for product-specific, task-oriented questions regarding the installation and operation of the program product. Software Subscription and Support (Software Maintenance) also provides you with access to updates, releases, and versions of the program. You will be notified, via announcement letter, of discontinuance of support with 12 months' notice. If you require additional technical support from IBM, including an extension of support beyond the discontinuance date, contact your IBM representative or IBM Business Partner. This extension may be available for a fee.

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

Information on charges is available at

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

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

Description	Program number	One-time charge feature number
XL C/C++ for AIX, V11.1 with 1 Year SW S&S		
- per Authorized User	5724-X13	0220
- per Concurrent User	5724-X13	0221
- trade up from single Authorized User entitlement to single Concurrent User entitlement	5724-X13	0226
XL C/C++ for AIX, SW S&S No Charge Registration		
- per Authorized User	5648-F49	0001
- per Concurrent User	5648-F49	0002
SW S&S 1 Year Renewal		
- per Authorized User	5648-F49	0003
- per Concurrent User	5648-F49	0004
XL C/C++ for AIX, SW S&S 1 Year After License		
- per Authorized User	5648-F53	0001
- per Concurrent User	5648-F53	0002
XL C/C++ for AIX, SW S&S 3 Year Registration		
- per Authorized User	5648-F47	0003
- per Concurrent User	5648-F47	0004
XL C/C++ for AIX, SW S&S 3 Year Renewal		
- per Authorized User	5648-F46	0001
- per Concurrent User	5648-F46	0002
XL C/C++ for AIX, SW S&S 3 Year After License		
- per Authorized User	5648-F45	0001
- per Concurrent User	5648-F45	0002

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Corrections

(Corrected on September 16, 2010)

The Electronic Software Delivery for update software orders section is revised.