



Intel® C++ Compiler Professional Edition 11.1 for Mac OS* X

In-Depth

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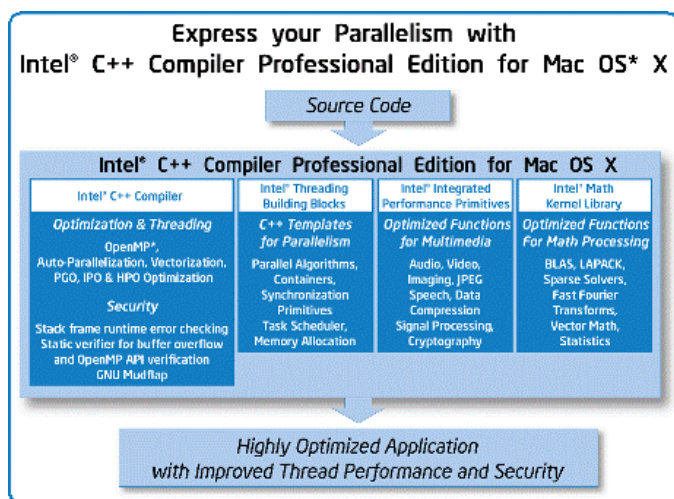
Intel® C++ Compiler Professional Edition 11.1 for Mac OS* X

The features you need to create high-performance multithreaded apps for multicore systems. The product includes:

- Intel® C++ Compiler for Mac OS X for IA-32 and Intel® 64 architectures
- Intel® Threading Building Blocks
- Intel® Integrated Performance Primitives
- Intel® Math Kernel Library

Compatible with the Mac Xcode* environment and tool chain to protect your investment in how you develop. The Professional Edition offers a great price compared to the individual components.

Intel C++ Compiler Professional Edition 11.1— at a Glance



Intel® C++ Compiler Professional Edition 11.1 Components:

The multithreading and optimization technologies in Intel® compilers and libraries give the Professional Edition its edge in helping you deliver high-performance applications for the latest multicore processors.

Features

- **Xcode* Integration** enables developers to continue working with this familiar environment while benefiting from the advanced capabilities of the Intel® compiler.
- **Includes Interoperability with GCC 4.0** offering excellent GCC source, binary, and command line compatibility.

- **Support for Apple Frameworks*** puts this powerful Apple programming model to work on Intel® Core™ microarchitecture-based platforms.
- **Multithreaded Application Support** including new in 11.0, OpenMP 3.0* (data- and now task-parallelism), and auto-parallelization for simple and efficient software threading.
- **Auto-vectorization** parallelizes code to utilize the Streaming SIMD Extensions (SSE) instruction set architectures (SSE, SSE2, SSE3, SSSE3, and SSE4) of our latest processors.
- **High-Performance Parallel Optimizer (HPO)** restructures and optimizes loops to ensure that auto-vectorization, OpenMP*, or auto-parallelization make best use of cache and memory accesses, SIMD instruction sets, and multiple cores. Compiles in a single pass, improving compile time and producing more reliable code.
- **Interprocedural Optimization (IPO)** dramatically improves performance of small- to mid-sized functions, especially in programs containing calls within loops. IPO analysis gives feedback on vulnerabilities and coding errors, such as uninitialized variables or OpenMP API issues, which cannot be detected as well by other compilers.
- **Profile-guided Optimization (PGO)** improves application performance by reducing instruction-cache thrashing, reorganizing code layout, shrinking code size, and reducing branch mispredictions.
- **Intel® Threading Building Blocks** is an award-winning C++ template library that abstracts threads to tasks to create reliable, portable, and scalable parallel applications. Intel® TBB is the most efficient way to implement parallel applications and unleash multicore platform performance.
- **Intel® Math Kernel Library** includes optimized and scalable math routines for maximizing performance, and seamlessly provides forward scaling from current to future manycore platforms.
- **Intel® Integrated Performance Primitives** is an extensive library of multicore-ready, highly optimized software functions for multimedia data processing and communications applications.
- **New integrated, simplified installation** gets you going with all capabilities quickly and easily. Simplified custom install makes it easy to identify just the components you want.
- **Ongoing Premier Support** now includes online community support forums to speed information flow, in addition to private, password-protected accounts. Technical support, interactive issues management, access to technical and application notes, product updates, and more with every commercial and academic license.

New in This Release

Feature	Benefit
New Processor Support	Intel® Atom™ Processor—Create high-performance and battery-saving applications for new Mobile Internet Devices!
Compiler and Debugger	
Intel® 64 processor support	Native Intel® 64 compiler for Mac OS® X makes it easier to take advantage of 64-bit capabilities on Intel® Xeon® Processors.
New exception handling	Same user-settable options produce better-optimized code, leading to improved application performance.
C++ lambda functions	Already part of the next C++ standard, Intel C++ Lambda functions available now to simplify templates libraries use with loop constructs like STL and Intel TBB.
OpenMP* 3.0	OpenMP raises the parallelism abstraction away from the API, simplifying threading and making code more portable. Previously limited to loop-based data-parallelism, the new 3.0 standard simplifies both data and task parallelism.
Improved valarray option	Templates of array operations that enable low-level hardware features to enhance application performance. No source code change required to use! Implicit valarray loops can either be auto-vectorized or directed to invoke optimized Intel® Integrated Performance Primitives (IPP*) library primitives for potential performance gains.
SSE2 enabled by default	Take advantage of new Intel® Streaming SIMD Extensions—automatically—through the compiler. No messy low-level coding to get the most from Intel® processors. Resettable for other hosts/targets.
Decimal floating point	IEEE 754R Standard implementation overcomes otherwise unavoidable precision issues implied by binary FP formats. Great for banking, accounting, billing, and e-Commerce.
Thread-related front-end diagnostics	Provides useful warnings about references and assignments to statically allocated variables, and address references of statically allocated variables.
Parallel compilation	Supports your build by appropriately allocating files to available processors to take advantage of multicore processors and speed you through your edit/compile/debug cycle.
64-bit Mac OS® X support	Ability to create applications that take advantage of addressing and performance capabilities enabled by the Intel® 64 architecture-based processors used in the latest Mac OS X systems.
Optimization Reports	More detailed optimization diagnostics for users who want to use our advanced optimizations to help the compiler do a better job of tuning their applications.
Static Verifier	Find and analyze source file issues. Diagnostics include issues with OpenMP* directives, boundary violations, memory corruptions, memory leak, buffer overflow, and uninitialized memory.
Parallel Lint for OpenMP*	Performs static analysis to check for OpenMP parallelization correctness. Helps diagnose deadlocks, data races, or potential data dependency—side effects from synchronization issues.
Improved Mac XCode IDE* integration	As you move it around, the Intel® compiler can relocate with the Mac XCode IDE to keep your development tools available to you through the IDE.

Feature	Benefit
Intel® Threading Building Blocks (Intel® TBB)	
Loops, containers, mutexes, atomic operations, and more	Intel® TBB provides developers with high-level, STL-like library functions to take advantage of parallelism in existing or planned code. Covering loops, containers, mutex controls, atomic operations, complex task scheduling and more, Intel TBB simplifies threading, saves time, and produces applications that scale as processors are added.
Task-oriented threading	Eliminate the tedium and inefficiencies of threading low-level, heavy constructs close to the hardware. Thread the way you think about your application and let the Intel® TBB runtime library worry about the threads.
Threaded performance	Intel® TBB focuses on the particular goal of parallelizing computationally intensive work, delivering higher-level, simpler solutions.
Scalable performance through data-parallelism	Intel® TBB emphasizes programming which scales well to larger numbers of processors by dividing the collection into smaller pieces. With data-parallel programming, program performance increases as you add processors.
Debug and release libraries	Intel® TBB functions come in debug and release forms to support extensive internal checking before building the production version of your software with the release form of the Intel TBB function. This simplifies development and delivers great performance.

Intel® Integrated Performance Primitives (Intel® IPP)

Intel® Core™ i7 and Atom™ processor support	Continued support for new processors continues to future-proof your investment with assurance of support for each successive generation of processors.
Deferred Mode Image Processing (DMIP) Layer	Introduced as a sample on top of Intel® IPP libraries, this provides solutions for pipelined image operations on larger images, utilizes in-memory optimization, and improves performance in a multi-threading environment.
Unified Image Codec (UIC) framework sample library	Standardizes plug-and-play interfaces for various image codecs (JPEG, JPEG2000, etc.) to improve ease of implementation and maintenance.
Threaded static libraries for all functional domains	Provides higher performance threading to static library users.
High-level LZ0 data compression library + improved Zlib, gzip and bzip2 algorithms	High performance implementations of most popular data compression algorithms using standard interfaces for ease of use.
Data Integrity Functional Domain	Reed-Solomon error-correcting codes to preserve integrity of data in transmission, storage, and encoding.
Variety of new functions and enhancements to Intel® IPP samples	Continued added value in response to user requests for added functionality including new signal and image processing transforms and codec enhancements.

Feature	Benefit
Intel® Math Kernel Library (Intel® MKL)	
New "layered" architecture	The new architecture provides maximum support for different development environment configurations and processors in a single package.
New threading layer	Link to the version of this layer that matches your development environment, and rest assured that Intel® MKL will not have threading incompatibilities with the threading in your application.
Discrete Fourier Transform Interface	The DftiCopyDescriptor function has been added for convenience when using the FFTs. The size of statically linked executables calling DFTI has been reduced significantly and complex storage is now available for real-to-real transforms.
LAPACK* enhancement	The capability to track and/or interrupt the progress of lengthy LAPACK computations has been added. A function called mkl_progress can be defined in a user application, which will be called regularly from a subset of the MKL LAPACK routines.
VML extensions	With performance in mind, all VML functions are now threaded. And a new "Enhance Performance" mode is offered for applications where math-function inaccuracies don't dominate parameter inaccuracies (e.g., Monte Carlo simulations and media applications).
Sparse BLAS extensions	Improvements include threaded level-3 sparse BLAS triangular solvers and support for all data types (single precision, complex and double complex).
Support for Mac OS* X 10.4.11, 10.5.4 and Xcode* 2.5 and 3.1	Provides the ability to create applications that take advantage of the latest Mac OS X features.
Simplified installation	Streamlined, simplified complete installation for a seamless one-step installation of all components.
New Online Support Community	Our enhanced online community support forums and knowledge-base search capabilities help you find answers more quickly. This is in addition to private, password-protected accounts available with Premier Support. Go to the support section of the website for more information.
Processor Support	The addition of support for Intel® Atom™ processors continues to future-proof your investment with assurance of support for each successive generation of processors. That's a key advantage in a world where new hardware platforms come to market with awesome speed. For more details, see the <i>Release Notes</i> .

Technical Support

With the purchase of the product, you receive one year of technical support and product updates from Intel® Premier Support, our interactive and password-protected issue management and communication web site. This premium support service allows you to submit questions, download product updates, and access technical notes, application notes, and other documentation. In addition, we have enhanced our user forums to provide a quick and easy first resource to help with most issues.

Compatibility

The Intel C++ Compiler Professional Edition 11.1 for Mac OS X is compatible with Xcode, enabling developers to work with this popular IDE while also taking advantage of advanced optimization features from Intel.

Intel C++ Compiler is substantially gnu C/C++ compatible and enables source- and object-code compatibility with gnu C. It also has gcc-extension support to help ease application porting, so you can recompile existing software to get improved application performance.

Intel C++ Compiler Professional Edition 11.1 supports Apple Frameworks*, which are a special type of bundle used to distribute shared resources, including library code, resource files, header files, and reference documentation. They offer flexibility that is often preferable to using dynamic shared libraries. For more information on Apple Frameworks, please visit www.apple.com.

System Requirements at a Glance

More specific information on installation requirements is available in the Release Notes but, at a glance, Intel C++ Compiler Professional Edition 11.1 for Mac OS X can be used on any Mac system that is based on an Intel® processor.

Installation of all components in the product requires 1 GB free disk space.

For more detailed information on system requirements, go to www.intel.com/software/products/systemrequirements/

