

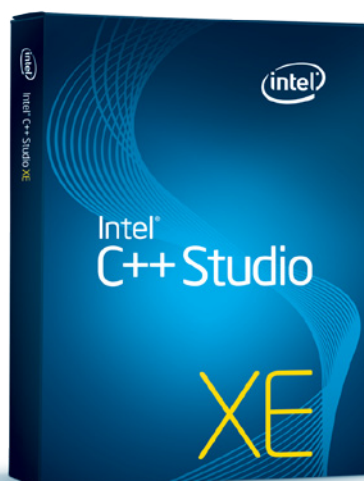
Intel® C++ Studio XE 2011

For Windows* and Linux*

Product Brief

Intel® C++ Studio XE 2011

For Windows* and Linux*



Boost Performance. Code Reliably. Scale Forward.

Intel® C++ Studio XE 2011 extends industry-leading development tools for unprecedented application performance and code robustness. Intel® C++ Studio XE combines Intel's industry-leading C/C++ compilers; performance and parallel libraries; error checking, code robustness, and Performance profiling tools into a single suite offering. This helps boost application performance and increase the code quality, security, and reliability needed by high-performance computing and enterprise applications. At the same time, the suite eases the procurement of all the necessary tools for high performance, and simplifies the transition from multicore to manycore processors in the future. Intel C++ Studio XE is a bundle of three next-generation revisions of industry-leading products – Intel® C++ Composer XE, Intel® VTune™ Amplifier XE, and Intel® Inspector XE.

Learn the New Names

Many tools in the Intel® Parallel Studio XE line are next-generation advancements of familiar industry-leading Intel® software development products. See below to learn more—and to help guide you during the upgrade process.

New Name	Old Name
Intel® Composer XE	Intel® Compiler Suite Professional Edition
Intel® C++ Composer XE	Intel® C++ Compiler Professional Edition
Intel® Visual Fortran Composer XE	Intel® Visual Fortran Compiler Professional Edition
Intel® Visual Fortran Composer XE with IMSL*	Intel® Visual Fortran Compiler Professional Edition with IMSL*
Intel® VTune™ Amplifier XE	Intel® VTune™ Performance Analyzer (including Intel® Thread Profiler)
Intel® Inspector XE	Intel® Thread Checker

Intel® C++ Studio XE 2011

Optimizing C++ Compiler & Libraries



Intel® C++ Composer XE

Memory, Thread & Security Analyzer



Intel® Inspector XE

Performance Profiler



Intel® VTune™ Amplifier XE

“Using Intel® Parallel Studio XE’s Static Security Analysis tool, we were able to quickly track down several occurrences of uninitialized data and some dubious usages of optional arguments in some of the code recently developed, this will help save us time in support and debugging in the future.”

Mark Lewy
Principal Technical Leader
MHW Soft

Highlights of Intel C++ Studio XE

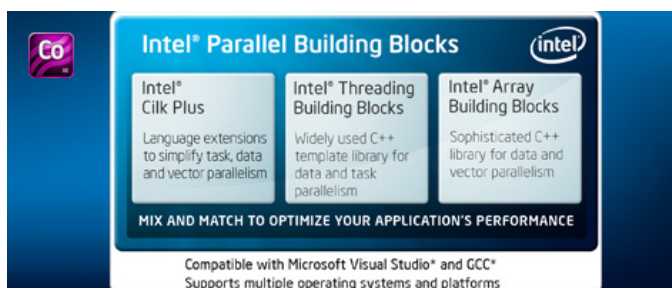
- Available for Multiple OSs—**Intel C++ Studio XE** provides the same set of tools to aid development for Windows* and Linux* platforms, available separately. C/C++ compilers and performance and parallelism libraries bring advanced optimizations to the Mac OS* X platform as well.
- Robustness—**Intel Inspector XE** memory and thread analyzer pinpoints memory and threading errors before they happen.
- Code Quality—**Intel C++ Studio XE** enables developers to effectively find software security vulnerabilities through static security analysis.
- Performance—**Intel VTune™ Amplifier XE** performance profiler finds bottlenecks in serial and parallel code that limit performance. Improvements include a more intuitive interface, fast statistical call graph, and timeline view. **Intel® Math Kernel Library (Intel® MKL)** and **Intel® Integrated Performance Primitives (Intel® IPP)** performance libraries provide robust multicore performance for commonly used math and data processing routines. A simple linking of the application with these libraries is an easy first step to multicore parallelism.
- Advanced optimizations—The compilers and libraries in **Intel® C++ Composer XE** offer advanced vectorization support, including support for Intel® AVX. The C/C++ optimizing compiler now includes Intel® Parallel Building Blocks (Intel® PBB) library, which expands the types of problems that can be solved more easily in parallel with increased scale and reliability.
- Compatibility and Support—**Intel® C++ Studio XE** offers excellent compatibility with leading development environments and compilers. Intel provides broad support with forums and Intel® Premier Support, which delivers fast answers and covers all software updates for one year.

Why Upgrade Now?

The tools introduced in Intel® C++ Studio XE are next-generation revisions of industry-leading tools for C/C++ developers seeking cross-platform capabilities for the latest x86 processors on Windows and Linux platforms.

What's New in Intel® C++ Composer XE

Intel® C++ Composer XE package contains the next-generation C/C++ compilers (v12.0) and performance and parallel libraries, Intel® Math Kernel Library (Intel® MKL) 10.3, Intel® Integrated Performance Primitives (Intel® IPP) 7.0, and Intel® Threading Building Blocks (Intel® TBB) 3.0.



The latest Intel® C/C++ compiler, Intel® G++ Compiler XE 12.0, optimizes for the latest Intel® Architecture processor, code-named Sandy Bridge, with Intel® AVX support. The package contains Intel® Parallel Building Blocks (Intel® PBB), which includes advances in mixing and matching task, vector, and data parallelism in applications to better map to the multicore optimization opportunities using Intel® Cilk Plus, Intel TBB, and Intel® Array Building Blocks (Intel® ArBB) (in beta, available separately). Support for vector optimizations with Intel AVX, with SIMD pragmas, and help in auto-parallelization for the highest performance and parallelism on the latest IA multicore CPUs are some additional capabilities.

Intel's performance libraries continue to provide an easy way to include highly optimized and automatically parallel math and scientific functions and data processing routines for high-performance users. The math library, Intel® MKL 10.3, contains several enhancements, including better Intel® AVX support, a summary statistics library, and enhanced C language support for LAPACK. The data processing library, Intel® IPP 7.0, contains improved data compression, improved codecs, and support for Intel AVX and AES instructions.

Enhanced Developer Productivity with Correctness Analyzers and Performance Profilers

Intel C++ Studio XE 2011 takes ease-of-use innovations, introduced in Intel Parallel Studio, including advanced functionality for high performance, scalability, and code robustness, and brings them to Linux, in addition to Windows. Intel has traditionally offered developer tools on both Windows and Linux, and increasingly strived to offer the same functionality across both platforms, especially important for developers creating applications to run on both Windows and Linux.



With Intel Inspector XE, the package helps the C/C++ developer with tools for static and dynamic code analysis and threading and memory analysis to develop highly robust, secure, and highly optimized applications.

Function	CPU Time	Module
algorithm_2	3.560s	matrix.exe
algorithm_1	1.412s	matrix.exe
BaseThreadInitThunk	0.000s	kernel32.dll
main	0s	matrix.exe

- Find performance bottlenecks
- Functions sorted by amount of CPU time

Function	CPU Time	Core Utilization
GenerateScanLine	1.656s	Idle
DO_BackToPrimary	0.547s	Poor
Paint	0.547s	Ok
DO_Init	0.031s	Ok
Paint	0.016s	Ok

- Color shows # of cores utilized
- Click [+] to view call stacks

Intel VTune™ Amplifier XE 2011 is the next generation of Intel® VTune™ Performance Analyzer, which is a powerful tool to quickly find, and provide greater insights into, multicore performance bottlenecks. It removes the guesswork and analyzes performance behavior in Windows* and Linux* applications, providing quick access to scalability bottlenecks for faster and improved decision making.

Source Code Security Errors

Problems

ID	Problem	Sources
P1	Null pointer dereference ... apigeom.cpp	apigeom.cpp(155); error #12172: dereference of pointer null at (file:apigeom.cpp line:141)

Improve Code Security with Static Analysis

Finds buffer overruns, unsafe library usage, uninitialized variables, bad pointers

When used with Intel® Parallel Studio XE

Software security starts very early in the development phase, and Intel® C++ Studio XE 2011 makes it faster to identify, locate, and fix software issues prior to software deployment. This helps developers identify and prevent critical software security vulnerabilities early in the development cycle, thereby minimizing the cost of finding and fixing errors.

Feature	Benefit
Support for both Linux* and Windows* platforms	Development capability with the same set of tools on both Windows* and Linux* platforms –enhanced performance, productivity, and programmability
C/C++ compilers with Intel® Parallel Building Blocks	Breakthrough in providing choices in type of parallelism—task, data, vector—for applications, with mix-and-match flexibility for optimizing application performance. C/C++ standards support.
Memory, threading, and security analysis tools in one package	Enhanced developer productivity and efficiencies by simplifying and speeding the process of detecting difficult-to-find coding errors
Updated performance libraries	Multicore performance for common math and data processing tasks via a simple linking with automatically parallel libraries
Updated performance profiler	Several ease-of-use enhancements, deeper microarchitectural insights, enhanced GUI, and quicker and more robust performance

System Requirements

Intel C++ Studio XE is available for IA-32 and Intel® 64 architecture and compatible platforms.

For details on hardware and software requirements, please refer to www.intel.com/software/products/systemrequirements/.

Support

Every purchase of Intel C++ Studio XE includes one year of support services, which provides access to Intel® Premier Support and all product updates during that time. Intel Premier Support gives you online access to technical notes, application notes, and documentation. You can also take advantage of Intel® Support Forums located at <http://software.intel.com/en-us/forums>.

Join the community—contribute, learn, or just browse!

About Intel® Software Development Products

For details about our entire line of products, visit www.intel.com/software/products.

Optimization Notice

Intel® Compiler includes compiler options that optimize for instruction sets that are available in both Intel® and non-Intel microprocessors (for example SIMD instruction sets), but do not optimize equally for non-Intel microprocessors. In addition, certain compiler options for Intel® Compiler are reserved for Intel microprocessors. For a detailed description of these compiler options, including the instruction sets they implicate, please refer to "Intel® Compiler User and Reference Guides > Compiler Options." Many library routines that are part of Intel® Compiler are more highly optimized for Intel microprocessors than for other microprocessors. While the compilers and libraries in Intel® Compiler offer optimizations for both Intel and Intel-compatible microprocessors, depending on the options you select, your code and other factors, you likely will get extra performance on Intel microprocessors.

While the paragraph above describes the basic optimization approach for Intel® Compiler, with respect to Intel's compilers and associated libraries as a whole, Intel® Compiler may or may not optimize to the same degree for non-Intel microprocessors for optimizations that are not unique to Intel microprocessors. These optimizations include Intel® Streaming SIMD Extensions 2 (Intel® SSE2), Intel® Streaming SIMD Extensions 3 (Intel® SSE3), and Supplemental Streaming SIMD Extensions 3 (Intel® SSSE3) instruction sets and other optimizations. Intel does not guarantee the availability, functionality, or effectiveness of any optimization on microprocessors not manufactured by Intel. Microprocessor-dependent optimizations in this product are intended for use with Intel microprocessors.

Intel recommends that you evaluate other compilers to determine which best meet your requirements.

Try and Buy Intel C++ Studio XE for Linux* or Windows*

<http://software.intel.com/en-us/articles/buy-or-renew>

