



HIGH PERFORMANCE C++ AND FORTRAN COMPILERS WITH LIBRARIES



Intel® Composer XE 2013

Product Brief

Key Features

- Leadership Application Performance
- Powerful Parallelism Models Simplify Multicore Support
- Compatible with Leading Development Environments
- Optimized Libraries For Threading, Math, Media And Data Processing

Also available with one language:

- Intel® C++ Composer XE
- Intel® Fortran Composer XE

Interoperable Products

- Intel® VTune™ Amplifier XE Performance Analyzer
- Intel® Inspector XE Error Checker
- Intel Advisor XE Threading Assistant

Also available in:

- Intel® Parallel Studio XE
- Intel® C++ Studio XE
- Intel® Fortran Studio XE
- Intel® Cluster Studio XE

OS Support:

- Windows*
- Linux*
- † OS X*

† Available in Intel C++ Composer XE for OS X and Intel Fortran Composer XE for OS X

Fortran, C++, and Libraries in One Convenient Package

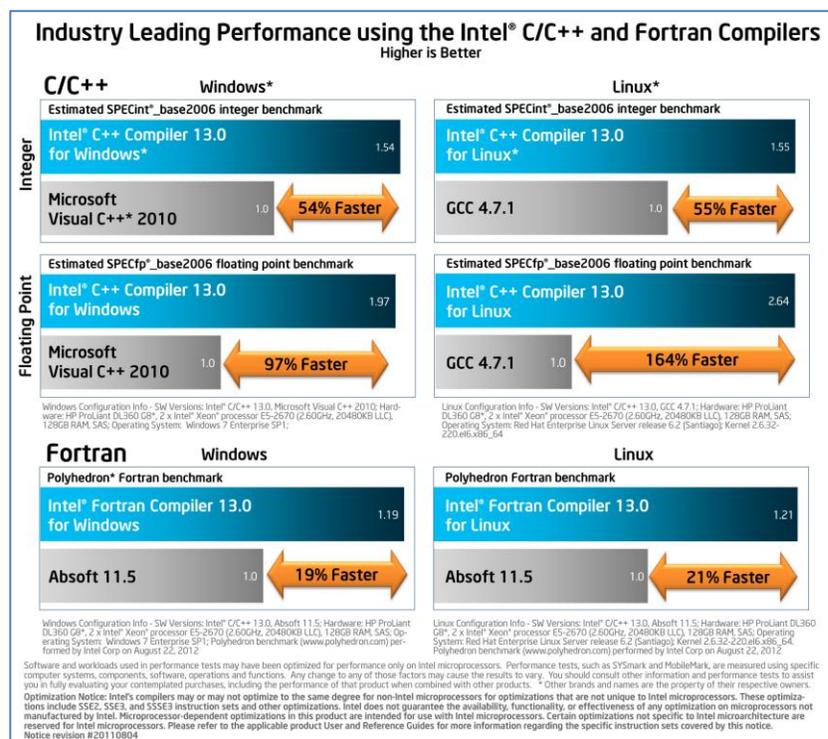
Intel Composer XE 2013 is for Fortran developers who want a matching C++ compiler. It combines all the tools from Intel® C++ Composer XE with those from Intel® Fortran Composer XE to help deliver outstanding performance for your applications as they run on systems using Intel® Core™ or Xeon® processors, compatible processors, and Intel® Xeon Phi™ coprocessor.

Take advantage of a significant price savings over purchasing individual components. It's available on Windows* and Linux*. For Windows users, use of this suite requires Microsoft Visual Studio* 2008, 2010 or 2012 to be installed on your system.

It features the acclaimed Intel® C++ and Fortran compilers, with innovations in vectorization and parallel programming to simplify development of performance-oriented application software. It's compatible with leading C++ compilers and developer environments on Windows and Linux.

Intel Performance Libraries are also included. Intel® Math Kernel Library (Intel® MKL) for advanced math processing and Intel® Integrated Performance Primitives (Intel® IPP) for multimedia, signal and data processing. These libraries offer highly optimized, threaded, specialized functions that speed development and add application performance. An added bonus for use with Intel C++, Intel® Threading Building Blocks (Intel® TBB), helps simplify general parallelism in your applications to help take advantage of Intel multicore processor capabilities.

Performance, compatibility and innovative, easy-to-use parallelism capabilities make Intel Composer XE a powerful and productive tool. Download an eval today and give it a try!



Intel compilers offer industry leading application performance
View more benchmarks at <http://intel.ly/composer-xe>.

Top Features

Array notation showing simple vector multiplication

```
a[0:N] = b[0:N] * c[0:N];
```

More sophisticated example of array notation

```
x[0:10:10] = sin(y[20:10:2]);
```

Example of Intel® Fortran Coarray Syntax

```
real, ALLOCATABLE :: grid(:, :)[:, :]  
...  
ALLOCATE (grid(0:N+1, 0:M+1) [1:P, 1:*]) ! with halo  
...  
SYNC ALL !...wait for all iterations  
  
grid( 0, 1:M) = grid( N, 1:M)[north_P, me_Q] ! north  
grid( N+1, 1:M) = grid( 1, 1:M)[south_P, me_Q] ! south  
grid( 1:N, M+1) = grid( 1:N, 1 ) [me_P, east_Q] ! east  
grid( 1:N, 0 ) = grid( 1:N, M ) [me_P, west_Q] ! west
```

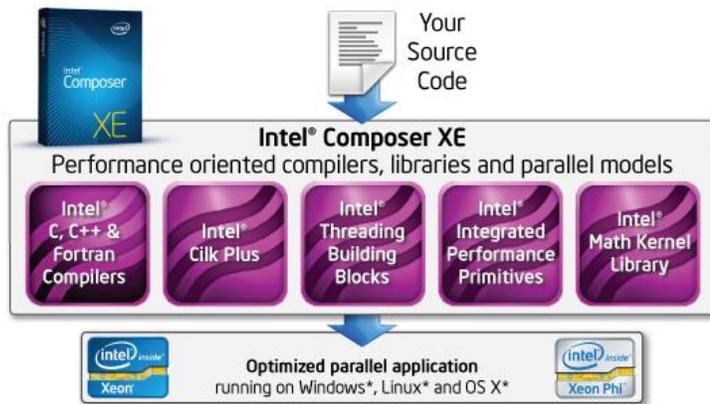
Intel® Cilk™ Plus Array Notation – Powerful Vectorization

Intel Cilk Plus is a powerful, new capability included in Intel C++. It features array notation that simplifies vectorization, saving developer time in producing readable, maintainable, scalable code that delivers impressive performance benefits by processing array elements simultaneously

Array notation syntax specifies an array section using a set of 3 numbers, either variable or literal, in an array syntax separated by colons. The first is the lower bound where the array section starts, the second is the length of the array, and the third is the stride used to select items from the array.

Intel® Fortran – Great Standards Supports

The compiler in Intel Fortran Composer XE 2011 offers great Fortran standards support and full source code compatibility with Compaq Visual Fortran. On Windows and Linux, it includes support for coarray Fortran, providing support for single multi-cpu shared-memory nodes. Cluster support is available in Intel® Cluster Studio XE package. The benefit is performance for your Fortran applications as they run on individual computers or clusters.



Intel® MKL, Intel® IPP and Intel® TBB libraries – Ready to Use Performance and Productivity

One of the easiest ways to take advantage of wider-vector and multicore systems is to use pre-optimized functions from Intel® Performance Libraries. They deliver high, scalable performance through simple function calls.

Industry-leading Intel® MKL and Intel® IPP include a wealth of routines to improve performance and cut development time. These functions automatically scale across on current and future processor architectures. Just re-link to the latest library version and your code is ready to take advantage of the latest processor features.

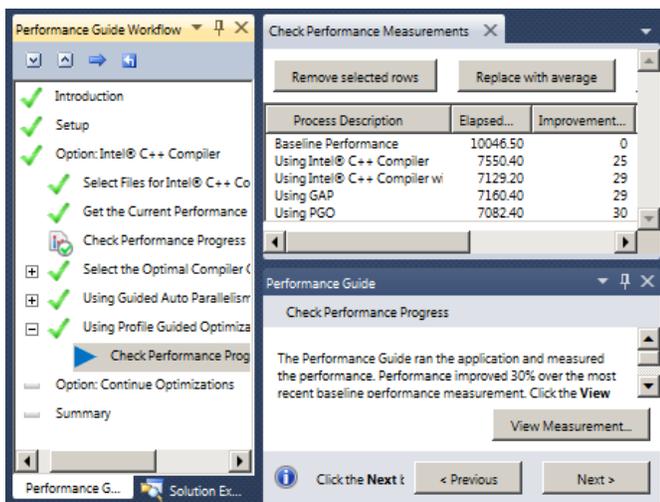
Intel® TBB offers a rich task-based approach to expressing parallelism in a C++ program. It is a library that helps you take advantage of multi-core processor performance without having to be a threading expert.

Performance Guide – Wizard Your Way to Performance

Performance Guide is a Windows-based, interactive tool that helps you improve your C++ application performance. It guides you through an easy to use workflow, telling you where you can apply Intel C++ performance techniques and quickly see the results. The two-fold benefit is great productivity in getting improved performance. It requires that you have Intel® VTune™ Amplifier XE 2013, Intel® C++ Studio XE 2013 or Intel® Parallel Studio XE 2013 also installed.

The Performance Guide workflow window (left) shows the steps in the workflow and keeps track of completed steps. The Performance Guide window (bottom right) provides instructions for the current step. The Check Performance Measurements window (top right) shows how performance has improved after applying each of the Intel C++ performance techniques.

The Performance Guide is a great way to add application performance and a very good reason to consider using Intel C++ Studio XE 2013 or Intel VTune Amplifier XE 2013.



Take Comfort – Intel Composer XE is compatible with your code and the way you work

Intel Composer XE integrates into Microsoft Visual Studio* 2008, 2010 or 2012 and supports the gnu tool chain on Linux*. And the C++ compiler produces code that is binary compatible with Visual C++ and gcc. Intel® Fortran on Windows continues to feature full source code compatibility with Compaq Visual Fortran*. This means the investment you have in how you develop, and your code itself, is productively preserved. Your license also supports all IA-32 and Intel 64 architectures, including Intel® Xeon Phi™ coprocessor, and includes one year of support. In addition, there's a great community of developers out there sharing their experiences on our Forums.

Take Advantage – Intel Composer XE delivers easy-to-use performance features

Intel continues to enhance proven Intel compiler features such as the High-Performance Parallel Optimizer (HPO). This revolutionary capability combines vectorization, parallelization, and loop transformations into a single pass that is faster, more effective, and more reliable than prior discrete phases. The compilers also automatically vectorize code for use on systems with conventional Intel® Xeon, Intel® Core and compatible processors and include vectorization tools for applications targeting Intel Xeon Phi coprocessor. When the compiler can't vectorize for use on Intel Xeon and Intel Core processors, you can use the Guided Auto-Parallelization (GAP) feature to get a report suggesting changes so your code will vectorize. Interprocedural optimization and profile-guided optimization continue to provide developers with opportunities to enhance performance by in-lining code and restructuring code based on workload, respectively. Performance is #1 at Intel.

Take it Easy – Intel Performance Libraries keep you productive and deliver application performance

Intel Composer XE is a lot more than C++ and Fortran compilers. It includes Intel® Threading Building Blocks, a widely used, award-winning C++ template library that simplifies creating reliable, portable, low-maintenance and scalable parallel applications. And Intel® Math Kernel Library is included. It's a library of highly optimized, extensively threaded math routines, including BLAS, LAPACK, ScaLAPACK, sparse solvers, fast Fourier transforms vector math and much more. Intel® Integrated Performance Primitives is also included. It offers highly optimized, extensively threaded functions for multimedia, compression, data processing, communications and more. Last but not least, Intel Composer XE includes lots of sample code and tutorials to simplify development with examples and snippets.

Take a Test Drive – See for yourself how Intel Composer XE can help you

Intel Composer XE 30-day evaluations are available for download from our web site. Click or enter this link: <http://intel.ly/sw-tools-eval>. Additional detail is presented on the next page but, in general, you'll need a system with Visual Studio 2008, 2010 or 2012 for a Windows eval. On Linux, you'll need a system with the gnu tool chain. That's basically it! The download includes tutorials and lots of code samples, or you can jump right in using your own code. To join the community of your fellow Intel Composer XE developers, visit the Intel Software Network Forums (<http://software.intel.com/en-us/forums/>) or go to the Composer XE web sites (<http://software.intel.com/en-us/articles/intel-composer-xe/>) and click support.

What's New

Feature	Benefit
Performance Leadership	Provide users of your software a level of responsiveness not provided by other development tools
Parallelism Tools and Methods	Intel Composer XE simplifies taking advantage of performance-oriented capabilities within processors and across multiple processors in computers today. Get better performance faster.
Compatibility	Preserve the investment in your code, the knowledge you have in using the development environments and tools, and delivery software with outstanding performance on systems with Intel and compatible processors.

Purchase Options: Language Specific Suites

Several suites are available combining the tools to build, verify and tune your application. The product covered in this product brief is highlighted in blue. Single or multi-user licenses along with volume, academic, and student discounts are available.

Suites >>		Intel® Cluster Studio XE	Intel® Parallel Studio XE	Intel® C++ Studio XE	Intel® Fortran Studio XE	Intel® Composer XE	Intel® C++ Composer XE	Intel® Fortran Composer XE
Components	Intel® C / C++ Compiler	●	●	●		●	●	
	Intel® Fortran Compiler	●	●		●	●		●
	Intel® Integrated Performance Primitives ³	●	●	●		●	●	
	Intel® Math Kernel Library ³	●	●	●	●	●	●	●
	Intel® Cilk™ Plus	●	●	●		●	●	
	Intel® Threading Building Blocks	●	●	●		●	●	
	Intel® Inspector XE	●	●	●	●			
	Intel® VTune™ Amplifier XE	●	●	●	●			
	Intel® Advisor XE	●	●	●	●			
	Static Analysis	●	●	●	●			
	Intel® MPI Library	●						
	Intel® Trace Analyzer & Collector	●						
	Rogue Wave IMSL* Library ²							●
Operating System ¹	W, L	W, L	W, L	W, L	W, L	W, L	W, L, O	W, L, O

Note: ¹ Operating System: W=Windows, L= Linux, M= OS X*. ² Available in Intel® Visual Fortran Composer XE for Windows with IMSL*

³ Not available individually on OS X, it is included in Intel® C++ & Fortran Composer XE suites for OS X

Technical Specifications

Specs at a Glance	
Processor Support	Supports both genuine Intel® processors and compatible processors.
Operating Systems	Windows*, Linux*, OS X*
Programming Languages	C, C++, Fortran
Compatibility	Designed to work with Microsoft development products and GNU C/C++ compilers with expanded 32-bit and 64-bit multicore processor support including Intel® AVX. The Intel C++ Compiler supports the latest C and C++ standards including key features of C++11 and C99. The Intel Fortran Compiler expands support of established standards: Fortran 90, Fortran 77, and Fortran IV, near-complete support for Fortran 2003 and significant parts of Fortran 2008.
System Requirements	Intel Composer 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/
Documentation, including Release Notes	C++: http://software.intel.com/en-us/articles/intel-c-composer-xe-documentation/ Fortran: http://software.intel.com/en-us/articles/intel-fortran-composer-xe-documentation/
Support	All product updates, Intel® Premier Support services and Intel® Support Forums are included for one year. Intel Premier Support gives you secure, web-based, engineer-to-engineer support.



Learn more about Intel Composer XE

- Click or enter the link below:
<http://intel.ly/composer-xe>
- Or scan the QR code on the left



Download a free 30-day evaluation

- Click or enter the link below:
<http://intel.ly/sw-tools-eval>
- Click on 'Compilers and Libraries' link

Optimization Notice

Notice revision #20110804

Intel's compilers 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 SSE2, SSE3, and 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. Certain optimizations not specific to Intel microarchitecture are reserved for Intel microprocessors. Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice.