



# Top Features

## Code snippet before #pragma SIMD

```
for(int i = 2; i < n ;i++)  
    y[i] = y[i-2] + 1;
```

## Code snippet with #pragma SIMD

```
#pragma simd vectorlength(2)  
for(int i = 2; i < n ;i++)  
    y[i] = y[i-2] + 1;
```

## Intel® Cilk™ Plus #pragma SIMD - Powerful Vectorization

Intel Cilk Plus #pragma SIMD is a powerful vectorization tool that extends the C/C++ language serial semantics to explicitly express data parallelism using relevant SIMD clauses. Developers can use this pragma to tell the compiler to generate accurate vectorized code. For instance, the vectorlength clause explicitly tells the compiler to use a specific vectorlength. Other supported clauses are reduction, private, linear, assert, firstprivate, lastprivate and vectorlengthfor. This Intel C++ capability makes it easier to take advantage of vectorization, get that vectorization right, and deliver improved application performance.

## Serial code (left) made parallel with Intel Cilk Plus Keywords. No changes to original code.

|   |   |
|---|---|
| <pre>int fib (int n)<br/>{<br/>    if (n &lt;= 2)<br/>        return n;<br/>    else {<br/>        int x,y;<br/>        x = fib(n-1);<br/>        y = fib(n-2);<br/>        return x+y;<br/>    }<br/>}</pre> | <pre>int fib (int n)<br/>{<br/>    if (n &lt;= 2)<br/>        return n;<br/>    else {<br/>        int x,y;<br/>        x = <b>_Cilk_spawn</b> fib(n-1);<br/>        y = fib(n-2);<br/>        <b>_Cilk_sync</b>;<br/>        return x+y;<br/>    }<br/>}</pre> |
|---|---|

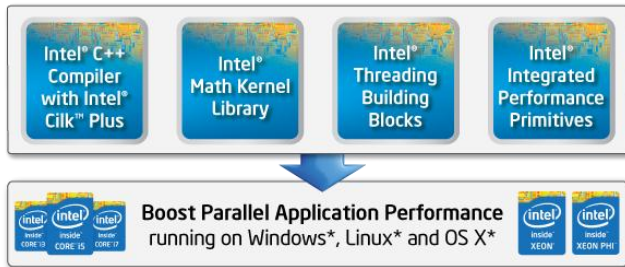
## Intel Cilk Plus Keywords - Easier Task & Data Parallelism

Intel Cilk Plus supports task and data parallelism, making it easier to take advantage of more processing power in multicore systems. The benefit is improved application performance that scales.

Inserting keywords into existing code offers a simple, fast, readable, and maintainable way to take advantage of multi-core systems. For task parallelism, two keywords, as shown in the code sample to the left, tell the application where to start and end parallel functionality. For data parallelism, such as for loops, just one keyword is needed - `_Cilk_for`.

## Intel® C++ Composer XE Components

Industry leading C and C++ compilers, libraries and programming models



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

One of the easiest ways to take advantage of systems with wider-vectors and multiple cores is to use pre-optimized functions from Intel® Performance Libraries. Industry-leading Intel® MKL and Intel® IPP include a wealth of routines to improve performance and cut development time. These functions automatically scale across 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.

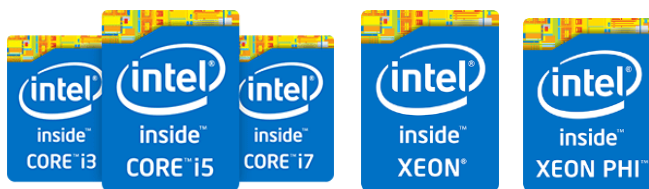
The Rogue Wave\* IMSL\* Numerical Library for Intel Visual Fortran (Windows only) is also available. This leading library offers the largest collection of commercially-available math and statistical functions for science, technical, and business environments.

## Intel® C++ compiler supports Intel® Core® & Xeon® Processors and Intel® Xeon Phi™ Coprocessors

## Offloading and Co-Processor Support, Linux & Windows

Intel compilers support Linux-based systems using Intel Xeon Phi coprocessors. With the SP1 release, support is extended to Xeon Phi coprocessors hosted on Xeon-based systems using Windows.

Whether developing for Intel Xeon Phi co-processors, Intel Xeon processors, or Intel Core processors, developers use Intel Cilk Plus in the Intel C++ compiler, to tell the application which parts of the application to offload. Whether you are creating new applications or extending existing code, you use Intel C++ and the Intel Cilk Plus programming model to deliver outstanding application performance.



The Intel C++ compiler supports Intel and compatible processors, including application offloading to Intel Xeon Phi coprocessors.

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

Intel C++ Composer XE integrates into Microsoft\* Visual Studio\* 2008, 2010 and 2012 on Windows\*, supports the gnu tool chain on Linux\* and integrates into the Xcode\* IDE on OS X\*. And the compiler produces code that is binary compatible with Visual C++ and gcc. This means the investment you have in your code, and how you work, is productively preserved. Intel C++ Composer XE supports all IA-32 and Intel 64 architectures, including Intel® Xeon Phi™ coprocessor, and includes one year of support. In addition, there's an active community of developers out there sharing their experiences on our Forums.

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

The Intel C++ Compiler is focused on delivering great application performance with support for multiple parallel programming models. Intel Cilk Plus, part of Intel C++, helps streamline development of vectorized code with its #pragma SIMD and array notation capabilities and parallelism with easy-to-use keywords. The compiler also continues to enhance proven Intel C++ features such as the High-Performance Parallel Optimizer (HPO), a powerful capability combines vectorization, parallelization, and loop transformations in a single pass that is faster, more effective, and more reliable than individual, discrete phases. The compiler also supports vectorization of code used on systems with conventional Intel® Xeon, Intel® Core and compatible processors and includes vectorization tools for applications targeting Intel® MIC Architecture. 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. Performance is #1 at Intel.

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

Intel C++ Composer XE is a lot more than a compiler. It includes Intel® Threading Building Blocks, the 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. Intel C++ Composer XE includes lots of sample code and tutorials to simplify development with examples and code snippets.

## Take a Test Drive – See for yourself how Intel C++ Composer XE can help deliver application performance

Intel C++ Composer XE 30-day evaluations are available for download from our web site (<http://intel.ly/sw-tools-eval>). You'll need a system with Visual Studio 2008, 2010 or 2012 for a Windows eval. For Linux or OS X, you'll need a system capable of running the gnu tool chain. Check out the link above for more details. 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 C++ Composer XE developers, visit the Intel Software Network Forums (<http://software.intel.com/en-us/forums/>) or go to the Intel C++ Composer XE web site (<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 performance not provided by other compilers and libraries  |
| Parallelism Tools and Methods | New with the SP1 release: enhanced support for OpenMP* 4.0 and enhanced support for C++ 11 and C++ 03 standards. Enhanced Linux-based application debugging for Intel Xeon Phi coprocessors.                     |
| Compatibility                 | Preserve the investment in your code, the knowledge you have in using the development environments and tools, and deliver 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 <sup>3</sup> | ●                        | ●                         | ●                    |                          | ●                  | ●                      |                            |
|            | Intel® Math Kernel Library <sup>3</sup>               | ●                        | ●                         | ●                    | ●                        | ●                  | ●                      | ●                          |
|            | 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 <sup>2</sup>                 |                          |                           |                      |                          |                    |                        | ●                          |
|            | Operating System <sup>1</sup>                         | W, L                     | W, L                      | W, L                 | W, L                     | W, L               | W, L, O                | W, L, O                    |

Note: <sup>1</sup> Operating System: W=Windows\*, L= Linux\*, O= OS X\*. <sup>2</sup> Available in Intel® Visual Fortran Composer XE for Windows with IMSL\*

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

## Technical Specifications

| Technical Specifications               |  |
|--|--|
| Processor Support                      | Supports both genuine Intel® processors and compatible processors.   |
| Operating Systems                      | Windows*, Linux* and OS X*   |
| Programming Languages                  | C, C++   |
| Compatibility                          | Designed to work with Microsoft development products and GNU C/C++ compilers. It provides expanded 32-bit and 64-bit multicore processor support, including enhanced Intel® AVX support. The Intel C++ Compiler supports the latest C and C++ standards, including selected parts of C99, C++ 03, and C++11. |
| 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: <a href="http://www.intel.com/software/products/systemrequirements/">www.intel.com/software/products/systemrequirements/</a>               |
| Documentation, including Release Notes | [Current link: <a href="http://software.intel.com/en-us/articles/intel-c-composer-xe-documentation/">http://software.intel.com/en-us/articles/intel-c-composer-xe-documentation/</a> ]   |



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.