

Fast Facts: Intel® Software Development Products

OVERVIEW

Leap Ahead and Expand the World's Horizons

Intel is helping to shape the future with a comprehensive line of Software Development Products. These tools enable developers to achieve maximum performance on Intel® processors, so their software can push the envelope for what's possible, today and tomorrow:

- **Intel® Compilers:** Deliver outstanding application performance, add threading to software, and improve developer productivity
- **Intel® VTune™ Performance Analyzers:** Quickly identify and resolve performance bottlenecks
- **Intel® Performance Libraries:** Benefit from highly optimized, threaded, ready-to-use building-block functions
- **Intel® Threading Tools:** Find threading errors and optimize threaded applications for maximum performance
- **Intel® Cluster Tools:** Create, analyze, optimize, and deploy cluster-based applications

These products are available for software that runs on servers, workstations, laptops, and mobile devices such as PDAs and cell phones. Intel® Software Development Products are highly standards-compliant, and they integrate with other popular development tools and environments, particularly for C++ or Fortran developers working with Windows*, Linux*, or Mac OS*.

- Maximize performance of software on Intel® architecture.
- Get the most out of threading.
- Increase development speed and accuracy, especially for threaded applications.
- Get early support for new hardware technologies.

To get the most out of multi-core technology as it replaces single-core processors, developers must thread their software to enable the operating system to divide work among multiple processor cores. Intel software development products are a key means of simplifying the introduction of threads into software and improving threaded application performance.

HISTORY & TRENDS

In the past, developers could rely on better application performance as processor clock rates increased. Moving forward, multi-core processors are the means for increased performance while maintaining acceptable power levels. Developers need to create optimized, threaded applications to deliver competitive performance. Developing multi-threaded applications is a complex undertaking, and poorly executed threading can dramatically decrease performance, instead of increasing it. In order to thread software properly, developers should make use of Intel Software Development Products.



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INTEL'S STRATEGY IN SOFTWARE DEVELOPMENT PRODUCTS

Core Infrastructure Building Blocks

Intel has a solid roadmap of continued releases that will support upcoming processor improvements. Whether developing for digital home, digital health, enterprise, or mobile devices, Intel tools deliver performance, compatibility and support:

- **Performance** – Intel Software Development Products help you to create highly optimized applications for Intel processors, putting Intel's unique hardware expertise to work in your software.
- **Compatibility** – Intel Software Development Products provide standards-based support across Intel architectures and compatibility with industry-leading development environments.
- **Support** – Intel backs its Software Development Products with outstanding technical support, and all product purchases include one year of Intel Premier Support, including all product updates during that term.

Strategic Alliances

Intel is committed to working with fellow travelers in the industry to maximize added value to the developer with its Software Development Products:

- **Collaboration with operating-system makers and other tool vendors** helps to ensure that Intel Software Developer Products work optimally with the rest of the developer environment.
- **Cooperation with major ISVs** optimizes their code for Intel architecture, with Intel Software Development Products playing a key role in this optimization.

Technology

Intel software development teams benefit from their proximity to hardware technology development, bringing optimizations for new hardware advances to market rapidly. Those development teams also benefit from Intel's position as an industry leader in driving industry standards and new technologies.

Services

World-class service offerings augment the hardware and software products that Intel offers:

- Extensive training courses, both on-line and on-site, are available through the Intel® Software College: <http://www.intel.com/software/college>.
- Intel Solution Services (ISS) provides highly trained technical consultants on-site at customer locations. These consultants are experts in Intel architecture and Intel Software Development Tools.
- Less intensive, off-site assistance can be provided by the Intel Software Products Division. Application Engineers can help resolve software issues and drive feature requests into the product development cycle.
- All customers of the Intel software development products receive an account at the Intel Premier Support Site (<http://premier.intel.com>). This site contains a knowledge base, file downloads, and a tool for issue submission and resolution.

Research Programs

Intel has focused R&D groups working on several software technology areas, including managed runtime environments, advanced software optimization, advanced computer architecture, etc. One particularly interesting research program is called Speculative Threading: Creating New Methods of Thread-Level Parallelization. More information can be found at <http://www.intel.com/technology/magazine/research/speculative-threading-1205.htm>.



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MARKET OVERVIEW

Intel has provided software development products for more than 10 years. More than one thousand Intel engineers work on tools to support existing and future platforms. Because new hardware capabilities released often require software support, new Intel Software Development Products and upgrades are closely linked to processor launches.

FREQUENTLY ASKED QUESTIONS (FAQS)

1) How do I determine if Intel Software Development Products can help me?

You can quickly determine whether Intel Software Development Products can help by asking a simple question: "Are you developing software using C, C++ or Fortran programming languages on Windows, Linux, or Mac OS?". If the answer is yes, then Intel software development products can help you extract the best performance, as well as help with taking full advantage of new technologies like multi-core processing and Intel® EM64T. For other developers, the .NET Common Language Runtime and Java* Virtual Machines such as BEA JRockit are highly optimized for Intel architecture.

2) How do Intel Software Development Products help support multi-core processors?

Intel Software Development Products are thread-safe, that is they work and generate code that work in a threaded environment. The tools, with the exception of the cluster tools, help develop threaded applications:

- Intel Threading Tools, consisting of Intel® Thread Checker and Intel® Thread Profiler, vastly simplify the debugging and performance optimization of threaded code.
- Intel VTune Performance Analyzer identifies sections of code that are good candidates for parallelization.
- Intel Compilers can automatically introduce threading into software using auto-parallelization and OpenMP*.
- Intel Performance Libraries provide pre-threaded software functions that can easily add parallelism to applications.
- Intel Cluster Tools help identify areas for better performance in applications that run across clusters.

3) Why should a developer use an Intel Compiler?

Performance. Intel compilers generate extremely high-performing code on Intel architecture, through advanced compiler techniques such as Interprocedural and Profile-Guided Optimization. Intel compilers provide very early support for Intel architectural innovations, and they are complimentary to and compatible with other popular compilers, such as GCC and the Microsoft compilers.

4) How do the Intel Software Development Products help support developers using .NET and Java?

Rather than developing .NET or Java compilers, Intel's focus for the managed runtime market is in working with third-party vendors to optimize the .NET CLR and Java Virtual Machines such as BEA JRockit for Intel architecture. Still, Intel software development products can be useful in mixed manage runtime/native (C, C++, Fortran) development environments - a unique product feature. Intel VTune Performance Analyzer supports optimization of applications running in .NET and Java on IA-32, Intel EM64T, and Itanium® architectures.

5) What about support for non-Intel hardware in Intel Software Development Products?

Intel understands that developers want the freedom to choose the hardware platform that meets their needs. Intel compilers, Intel IPP, and the Intel MPI Library offer leadership application performance on systems using Intel processors while providing competitive application performance on systems using third-party processors. Note, however, that Intel VTune Performance Analyzer and Intel Threading Tools are not supported on non-Intel hardware because of architectural differences beyond our control.



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BUZZWORDS

<ul style="list-style-type: none"> • Win32 threads • Pthreads (POSIX threads) • OpenMP 	<p>Methods of introducing threading into applications.</p> <p>Win32 Threads are for Windows, Pthreads (POSIX threads) are for UNIX/Linux, and OpenMP is for cross-platform threading. All are supported by Intel Software Development Products, including Intel Threading Tools.</p>	Debugger	<p>A tool used to diagnose problems in software applications. Intel offers a variety of tools to help debug applications including Intel® Debugger, Intel VTune analyzer, and Intel Threading Tools. Third-party debuggers including Microsoft, GDB, and Totalview are compatible with the Intel software development products.</p>
C/C++ and Fortran Compiler	<p>A software program that translates other programs written in a high level language (C, C++, Fortran, etc...) into machine language so they can be executed. The Intel® compilers translate C, C++, or Fortran into optimized machine language for Intel and third-party processors.</p>	MRTes	<p>Managed Runtime Environments. These include .NET and Java, which abstract common low-level tasks such as garbage collection and some security functionality away from the developer. These environments represent a different philosophy than compiled code languages, with potential benefits in the areas of portability, security and faster code development.</p>
IDE	<p>Integrated Development Environment. The programming environment that programmers use to develop code. Popular environments include Visual Studio* on Windows, Eclipse* on Linux, and Xcode for Mac OS.</p>	JVM	<p>Java Virtual Machine. This is the managed runtime that executes Java code. JVMs are available for all modern operating systems, from several vendors including Sun, IBM, and BEA. Intel has invested heavily in the optimization of the BEA JRockit JVM* for Intel® architecture.</p>

USEFUL WEBSITES & TRAINING RESOURCES

Intel Software Products Home (North America)	http://www.intel.com/cd/software/products/asm-na/eng/index.htm	Intel Premier Support	http://premier.intel.com
Speculative Threading: Creating New Methods of Thread-Level Parallelization	http://www.intel.com/technology/magazine/research/speculative-threading-1205.htm	Intel Software College	http://www.intel.com/software/college
		Intel Solution Services	http://www.intel.com/go/intelsolutionservices

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