



# Intel® Fortran Compiler Professional Edition 11.1 for Linux\*

In-Depth

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## Intel® Fortran Compiler Professional Edition 11.1 for Linux\*

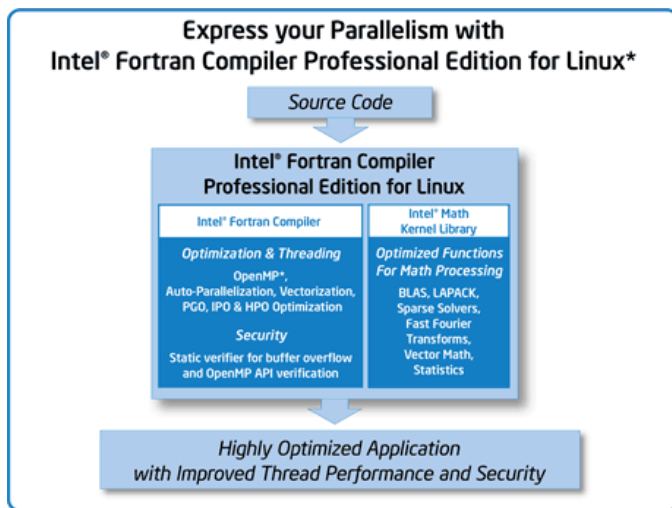
The features you need to create high-performance multithreaded apps for multicore systems. The product includes:

- Intel® Fortran Compiler for Linux for IA-32, Intel® 64, and IA-64 architectures
- Intel® Debugger for IA-32 and Intel® 64 architectures
- Intel® Math Kernel Library

The Professional Edition offers a great price compared to the individual components.

**Attention Fortran developers**—Intel® Compiler Suite Professional Edition for Linux includes everything listed above plus the Intel® C++ Compiler, Intel® Threading Building Blocks, and Intel® Integrated Performance Primitives. Take advantage of a significant price savings over individual components.

### Intel Fortran Compiler Professional Edition— At A Glance



#### Intel® Fortran Compiler Professional Edition 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

- **Compatibility with the GNU tool chain** protects your investment in the way you develop software on and for Linux-based systems.
- **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 Math Kernel Library** includes optimized and scalable math routines for maximizing performance and seamlessly provides forward scaling from current to future manycore platforms.
- **Optimized-Code Debugging** with the Intel® Debugger for IA-32 and Intel® 64 architecture-based applications that improves the efficiency of the debugging process on code that has been optimized for Intel® architecture. Includes new threaded code debugging features and a new GUI.
- **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
<b>Compiler and Debugger</b>	
More Fortran 2003 Support	Additional support includes object-oriented features such as CLASS declaration, SELECT TYPE constant, inheritance association, and more. Other additions support deferred-length character entities, PUBLIC types with PRIVATE components (and vice versa), ENUMERATOR, IEEE Floating Point Exception Handling, ALLOCATE extensions, array constructor changes, and more to bring your Fortran apps closer to the standard. These join C interoperability features introduced in the last release to make it easier to develop mixed-language applications.
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.
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.
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.
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.
New Debugger GUI	Eclipse rich-client-platform based GUI makes it easier to see your application parallelism. Also offers command-line support.

### 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).

Feature	Benefit
<b>New Linux Support</b>	Fedora* 9, Ubuntu* 8.04, SLES 11, GNU tool chain 4.2 and 4.3. See the Release Notes for a complete list.
<b>Simplified installation</b>	Streamlined, simplified complete installation for a seamless one-step installation of all components.
<b>New Online Support Community</b>	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 Web site for more information.
<b>Processor Support</b>	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 will receive one year of technical support and product updates from Intel® Premier Support, our interactive and password-protected issue management and communication website. 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 Fortran Compiler fully supports the Fortran 95 language standard, as well as the previous standards Fortran 90, Fortran 77, and Fortran IV. It also includes many features from the Fortran 2003 language standard, as well as numerous popular language extensions. For additional details about what’s new in this release, please see the *Release Notes*.

## System Requirements at a Glance

More specific information on installation requirements is available in the Release Notes but, at a glance, Intel Fortran Compiler Professional Edition for Linux can be used on, and develop code for, Intel® processors since the Intel® Pentium® 4 processor.

We support the use of Intel Fortran Compiler Professional Edition on recent releases of Asianux\*, Debian\*, Red Hat Enterprise Linux\*, SUSE LINUX Enterprise Server\* and TurboLinux\*.

Installation of all components in the product requires 1.5 GB free disk space.

Microsoft Visual Studio 2005\* or 2008\* is not required but recommended. For more detailed information on system requirements, go to [www.intel.com/software/products/systemrequirements/](http://www.intel.com/software/products/systemrequirements/)

