# Introduction to Intel® Fortran Compiler Documentation

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# Introduction to the Intel Fortran Compiler

Welcome to the Intel® Fortran Compiler.
Intel® Fortran Compiler 9.1 compiles code on the following systems:

- Linux* operating systems listed in the online Release Notes that run on Intel IA-32, Intel® Extended Memory 64 Technology (Intel® EM64T), and Intel® Itanium® processors.
- Mac OS* operating systems listed in the online Release Notes that run on Intel IA-32 processors.

The Intel® Fortran Compiler product includes the following major components for the development environment:

- Intel® Fortran Compiler for IA-32 Based Applications
- Intel® Fortran Compiler for Intel® EM64T-Based Applications
- Intel® Fortran Compiler for Itanium-Based Applications
- Intel® Debugger (idb)

The command for each of the three compilers above is `ifort`.

For further information on components, see your Release Notes.

For details on installing and getting started, see:

- "Invoking the Intel® Fortran Compiler" in *Building Applications*.
- The HTML document *Getting Started with the Intel® Fortran Compiler 9.1 for Linux**
- The HTML document *Getting Started with the Intel® Fortran Compiler 9.1 for Mac OS**

This documentation assumes that you are familiar with the Fortran programming language and with the Intel® processor architecture. You should also be familiar with the host computer's operating system.

Intel® Fortran Compiler 9.1 includes the following online documentation:

- Building Applications
- Compiler Options
- Optimizing Applications

# What's New in This Release

This release contains a number of changes, improvements, and new features. The following list describes the major enhancements in this release:

- New and updated compiler options are available, including those to support Intel® Core™2 Duo processors, Intel® Core™2 Extreme processors, and the

Dual-Core Intel® Xeon® processor 5100 series.  These are detailed in New Options in the Intel® Fortran Compiler Options reference.
- New language features have been added, including support for several intrinsic functions and subroutines from the Fortran 2003 standard. For more information on new and changed language features, see New Language Features in the Overview of the Intel Fortran Language Reference (PDF file).
- The Intel Fortran Compiler now runs on Intel®-based systems running Mac OS*.
- Support for floating-point semantics has been expanded, allowing you to enable more aggressive optimizations on floating-point data and round intermediate results to source-defined precision. For more information, see the fp-model, fp compiler option.
- Man pages are available for the Code Coverage tool (codecov) and the Test prioritization tool (tselect).

**Note**

Please refer to the Release Notes for the most current information about features implemented in this release.

# Product Website and Support

For the latest product information, visit the Intel web site http://developer.intel.com/software/products/.

At this site, you will find comprehensive product information, including:

- Links to each product, where you will find technical information such as white papers and articles
- Links to user forums
- Links to news and events

To find technical support information, to register your product, or to contact Intel, please visit: http://www.intel.com/software/products/support.

# System Requirements

For detailed information on system requirements, see the Release Notes.

# FLEXlm* Electronic Licensing

The Intel® Fortran Compiler uses Macrovision*'s FLEXlm* electronic licensing technology. The compiler requires a valid license file in the `licenses` directory in the installation path. The default directory is `/opt/intel/licenses`. The license files have a `.lic` file extension.

For information on how to install and use the Intel® License Manager for FLEXlm to configure a license server for systems using counted licenses, see *Using the Intel® License Manager for FLEXlm** (flex_ug.pdf).

# Related Publications

## Tutorial information on Fortran 95 and Fortran 90

The following commercially published documents provide reference or tutorial information on Fortran 95 and Fortran 90:

- *Compaq Visual Fortran* by N. Lawrence; published by Digital Press* (Butterworth-Heinemann), ISBN: 1-55558-249-4.
- *Digital Visual Fortran Programmer's Guide* by M. Etzel and K. Dickinson; published by Digital Press (Butterworth-Heinemann), ISBN: 1-55558-218-4
- *Fortran 90 Explained* by M. Metcalf and J. Reid; published by Oxford University Press, ISBN 0-19-853772-7.
- *Fortran 90/95 Explained* by M. Metcalf and J. Reid; published by Oxford University Press, ISBN 0-19-851888-9.
- *Fortran 90/95 for Scientists and Engineers* by S. Chapman; published by McGraw-Hill, ISBN 0-07-011938-4.
- *Fortran 90 Handbook* by J. Adams, W. Brainerd, J. Martin, B. Smith, and J. Wagener; published by Intertext Publications (McGraw-Hill), ISBN 0-07-000406-4.
- *Fortran 90 Programming* by T. Ellis, I. Philips, and T. Lahey; published by Addison-Wesley, ISBN 0201-54446-6.
- *Introduction to Fortran 90/95* by Stephen J. Chapman; published by McGraw-Hill, ISBN 0-07-011969-4.
- User's guide to Fortran 90, Second Edition by W. Brainerd, C. Goldberg, and J. Adams; published by Unicomp, ISBN 0-07-000248-7.

Intel does not endorse these books or recommend them over other books on the same subjects.

## Standard and Specification Documents

The following copyrighted standard and specification documents provide descriptions of many of the features found in Intel® Fortran:

- American National Standard Programming Language FORTRAN, ANSI X3.9-1978
- American National Standard Programming Language Fortran 90, ANSI X3.198-1992
  This Standard is equivalent to: International Standards Organization Programming Language Fortran, ISO/IEC 1539:1991 (E).
- American National Standard Programming Language Fortran 95, ANSI X3J3/96-007
  This Standard is equivalent to: International Standards Organization Programming Language Fortran, ISO/IEC 1539-1:1997 (E).
- High Performance Fortran Language Specification, Version 1.1, Technical Report CRPC-TR-92225
- OpenMP Fortran Application Program Interface, Version 1.1, November 1999
- OpenMP Fortran Application Program Interface, Version 2.0, November 2000

## Associated Intel Documents

The following Intel documents provide additional information about the Intel® Fortran Compiler, Intel® architecture, Intel® processors, or tools:

- *Intel® Fortran Language Reference*
- *Intel® Fortran Libraries Reference*
- *Intel® Visual Fortran Compiler for Windows\* Systems Installing and Getting Started*
- *Using the Intel® License Manager for FLEXlm\**
- *Intel® C++ Compiler User's Guide*
- VTune™ Performance Analyzer online help
- Enhanced Debugger online help
- *Intel® Architecture Software Developer's Manual, Volume 1: Basic Architecture*, Intel Corporation, doc. number 243190
- *Intel® Architecture Software Developer's Manual, Volume 2: Instruction Set Reference Manual*, Intel Corporation, doc. number 243191
- *Intel® Architecture Software Developer's Manual, Volume 3: System Programming*, Intel Corporation, doc. number 243192
- *Pentium® Processor Family Developer's Manual*
- *Intel® Processor Identification with the CPUID Instruction*, Intel Corporation, doc. number 241618
- *Intel® Itanium® Architecture* Manuals
- *Intel® Itanium® Architecture Software Conventions & Runtime Architecture Guide*
- *Intel® Itanium® Assembler User's Guide*
- *Intel® Itanium® Architecture Assembly Language Reference Guide*

Most Intel documents can be found at the Intel web site http://developer.intel.com/software/products/.

## Optimization and Vectorization Terminology and Technology

The following documents provide details on basic optimization and vectorization terminology and technology:

- Intel® Architecture Optimization Reference Manual
- Dependence Analysis , Utpal Banerjee (A Book Series on Loop Transformations for Restructuring Compilers). Kluwer Academic Publishers. 1997.
- The Structure of Computers and Computation: Volume I , David J. Kuck. John Wiley and Sons, New York, 1978.
- Loop Transformations for Restructuring Compilers: The Foundations , Utpal Banerjee (A Book Series on Loop Transformations for Restructuring Compilers). Kluwer Academic Publishers. 1993.
- Loop parallelization , Utpal Banerjee (A Book Series on Loop Transformations for Restructuring Compilers). Kluwer Academic Publishers. 1994.
- High Performance Compilers for Parallel Computers , Michael J. Wolfe. Addison-Wesley, Redwood City. 1996.
- Supercompilers for Parallel and Vector Computers , H. Zima. ACM Press, New York, 1990.

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- An Auto-vectorizing Compiler for the Intel® Architecture , Aart Bik, Paul Grey, Milind Girkar, and Xinmin Tian. Submitted for publication
- Efficient Exploitation of Parallelism on Pentium® III and Pentium® 4 Processor-Based Systems , Aart Bik, Milind Girkar, Paul Grey, and Xinmin Tian.
- The Software Vectorization Handbook. Applying Multimedia Extensions for Maximum Performance , A.J.C. Bik. Intel Press, June, 2004.

## Tutorial information on the Intel Fortran Compiler

For additional training on the Intel Fortran Compiler, choose a course in the Intel® Software College - Course Catalog.

For additional technical product information including white papers about Intel compilers, open the page associated with your product at http://developer.intel.com/software/products.