Transition to the Intel® Fortran Compiler

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Our Fortran Compilers
2023 and Beyond
Agenda

- Intel Fortran Compiler 2023 Overview
- Getting Started and Porting From IFORT to IFX
- Q&A
Celebrating IFX Feature Completion!

Our Goal: IFX feature parity with IFORT with 2023.0.0

ACCOMPLISHED!

Full Fortran 2018
IFORT directives, options, & behaviors
Legacy DEC extensions
Microsoft* Visual Studio support

AND MORE!
Acceleration with Intel GPUs
Our Fortran Solution 2023

*Intel® Fortran Compiler (ifx)*

Our Fortran compiler tuned for 4th Gen Intel® Xeon® Scalable processors (code-named Sapphire Rapids), Intel® Xeon® CPU Max Series (code-named Sapphire Rapids HBM) and the Intel® Data Center GPU Max Series (code-named Ponte Vecchio)

Fortran Language Feature parity with IFORT
With Comparable Performance

*Intel® Fortran Compiler Classic (ifort)*

Dependable, proven features
and performance for pre-2023 Intel CPU products

Because you need advanced Fortran language features and the absolute best performance for your applications on Intel solutions

**CHOICE! Continuity! Features! Performance!**
IFX: Driving a New Era in Accelerated Computing

**IFX: ALL that you like in IFORT PLUS**

- OpenMP* 5.x Standards, offload to Intel GPUs from Fortran
  *An open, portable Standard maintains your investment*
  *Best in class OpenMP features and support*
- Fortran 2018 DO CONCURRENT supports automatic offload to Intel GPUs

**Protecting your Fortran Investment**

Same Fortran parser/analyzer you know and love from IFORT

- Supports legacy DEC extensions, **all F2018**, ifort directives and features
- The majority of IFORT compiler directives and options you have used for years. And Microsoft Visual Studio* integration for Windows*

- **Binary compatible, mix and match ifx and ifort**
Intel® Fortran Compilers Build Time Performance on Linux*

Build time performance advantage relative between Intel compilers on Intel® Core™ i7-8700K Processor

Estimated: Built time measurement of the geometric mean of the Fortran workloads from the SPECrate® 2017 Integer suite

Estimated: Built time measurement of the geometric mean of the Fortran workloads from the SPECrate® 2017 Floating Point suite

Performance varies by use, configuration, and other factors. Learn more at www.intel.com/PerformanceIndex.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See configuration disclosure for details. No product or component can be absolutely secure.

Your costs and results may vary. Intel technologies may require enabled hardware, software, or service activation.

More information on the SPEC benchmarks can be found at http://www.spec.org.

Configuration: Testing by Intel as of Mar 16, 2022. Configuration: Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz, 16G x2 DDR4 2666. Red Hat Enterprise Linux release 8.0 (Ootpa), 4.18.0-80.el8.x86_64. Software: Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316. Intel(R) Fortran Compiler Classic for applications running on Intel(R) 64, Version 2021.6.0 Build 20220226_000000. Compiler switches: Intel(R) 64 Compiler Classic: ifort -O2 -xCORE -AVX512, Intel(R) Fortran Compiler: ifx -O2 -xCORE-AVX512.
The Next Chapter for The Intel® Fortran Compiler, 2023
Compilers Roadmap and Timeline Update 2023
Intel® oneAPI Toolkits Release Schedule 2023 (Tentative)

- 2023.0.0 released 12/11/2022
- 2023.1.0 released 04/06/2023
- 2023.2.0 released 07/19/2023
- 2024.0.0 scheduled* Q4 2023

* All product updates and releases and scheduled dates are subject to change
### Intel Compilers Transition Roadmap

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<th>Compiler</th>
<th>XPU Support</th>
<th>2022</th>
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| **Intel® Fortran Compiler Classic (IFORT)** | CPU         | Production Quality | • Not recommended for new projects
|                           |             | IFORT macOS Deprecated | • Start migration now
|                           |             | Legacy Product Support | • IFORT deprecation timelines determined in 2023 |
| **Intel® Fortran Compiler (IFX)** | CPU         | Production Quality | • Use for all new projects
|                           |             | IFX supports Lin, Win | • Migrate existing projects to use IFX |
|                           | GPU         | Production Quality | • Fortran language parity and better performance achieved with 2023.0|
| **Intel® C++ Compiler Classic (ICC)** | CPU         | Production Quality | • Not recommend for new projects
|                           |             | Legacy Product Support (LPS) | • Start migration now |
| **Intel® oneAPI DPC++/C++ Compiler (ICX)** | CPU         | Production Quality | • Use for all new projects
|                           | GPU         | Production Quality | • Migrate existing projects to use ICX |
|                           | FPGA        | Production Quality | • Only ICX provides GPU offload |
|                           |             | Legacy Product Support (LPS) | • ICX supports Lin, Win |

**Use Recommendation**

- **CPU** = Intel Xeon, Core, Atom processors
- **GPU** = Intel Integrated and discrete GPU’s
- **FPGA** = Intel FPGA’s (Agilex, Stratix and Arria)

**Legacy Product Support (LPS):** Maintenance mode. Fix only critical bugs from priority customers and CVE issues.

The Next Chapter for The Intel® Fortran Compiler, 2023
Intel® Compiler Classic (ifort) macOS Deprecation

- macOS oneAPI HPC and Base Toolkits deprecation notice published with 2023.1.0 release. **NO DATES SET FOR Linux* or Windows**
  - Intel oneAPI Base and HPC Toolkits for macOS on x86 are now deprecated and will be discontinued in the 2024.0 release. Several Intel-led open source developer tool projects will continue supporting macOS on Apple Silicon including oneAPI Threading Building Blocks (oneTBB) and Intel® Implicit SPMD Program Compiler and we welcome the opportunity to work with contributors to expand support to additional tools in the future.

- For more info, [blog post](#)
Support Definitions

“Deprecation” similar to Language Standards definition:

- The act or process of marking the feature or product as obsolete, to discourage its use and warn users that it *may* be phased out in the future, but not removing the capability immediately, so as to allow for continued compatibility for a period of time.

“Legacy Product Support Support”

- Follows our support for older product versions. Older compilers provided on Intel® Registration Center downloads: