

## Wind River Compiler

In the face of fierce competition and rapid industry advancements, developers of modern embedded devices face challenges in terms of both functionality and system performance. Using more powerful hardware is not always an option, since it raises costs and power consumption. Developers working against aggressive deadlines are under increased pressure to create faster, more compact code. In this environment, software development tools that help generate efficient code and improve productivity have become indispensable.

Wind River Compiler (formerly known as Diab Compiler) has a proven track record generating robust, tight, compact, and fast-executing code while also delivering the control and flexibility demanded by device software development. Optimization technology builds on and extends the industry-hardened Diab compiler, providing both strong performance and reliability.

### Key Benefits

Wind River Compiler provides high-performance software development tools to expedite the development of embedded applications. Compiler enables developers to do the following:

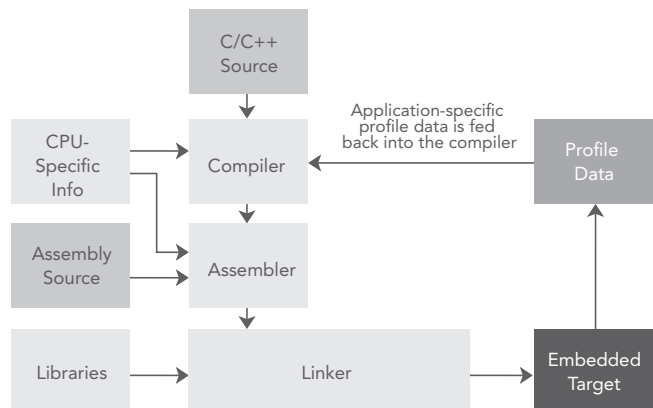
- Generate more compact code that requires less memory
- Improve productivity, speed time-to-market, and reduce schedule risks
- Reduce bill of materials (BOM) cost
- Enhance product quality and deploy mission-critical applications

### Optimized for High Performance

Wind River Compiler uses sophisticated optimization technology to generate exceptionally fast, compact, high-quality object code. This improves your competitive position by doing the following:

- **Reducing hardware costs:** Compiler uses lower-frequency devices and less memory.
- **Helping you develop competitive applications:** Compiler helps them to run faster and include more functionality and features.
- **Improving your time-to-market and reducing risk:** You won't need to tweak code at the last minute to meet aggressive performance goals.
- **Improving code portability:** Compiler automatically optimizes code for a given target, eliminating the need to include target-specific optimizations in the source code.

Wind River Compiler uses a wide range of highly refined global, local, processor-specific, and application-specific (profile-driven) optimization techniques to generate code that runs faster with a smaller footprint. Cross-module inlining significantly boosts performance by permitting Compiler to inline functions across multiple modules and source files. Profile-driven optimizations take advantage of Compiler's ability to instrument the code and collect profile information specific to the application being developed. This information is then fed back into Compiler, enabling it to make better decisions when performing function inlining, register allocation, branch prediction, and other optimizations, all of which further improve the application performance and footprint (see figure below).



*Profile-driven, application-specific optimizations*

## Flexibility

Embedded devices differ in terms of the processors and microcontrollers on the device, amount and types of memory available, interfaces and peripherals, operating systems, and other variables. This means every developer faces individual challenges and has specific requirements.

Wind River Compiler lets you control the compiler's output to match the application's requirements. For example, you can do the following:

- Select various optimizations that will balance execution speed with code size
- Use any of a number of debugging options, based on how much memory is available on the target device and on other considerations
- Generate position-independent code (PIC) or position-independent data (PID)
- Generate packed and byte-swapped data structures
- Generate PROMable code
- Use absolute addressing or the extensive memory mapping capabilities included in the Compiler solution to target devices with unique memory layouts and constraints

## Reliability

Mission-critical applications, such as those used in the automotive and aerospace and defense (A&D) industries, require absolute reliability from the code that runs on their systems—and also from the software tools that generate this code, particularly the compiler. To minimize defects, the code must be rigorously tested and compliant with such standards as POSIX PSE52.

Wind River Compiler is based on mature, hardened Diab compiler technology that has been in use for 20 years. Compiler has been thoroughly tested in Wind River's world-class test lab and in the field. Wind River Compiler has achieved certified conformance to the POSIX PSE52 standard. In addition, it is used to compile code for Wind River A&D platforms (both the OS kernel and the middleware).

## Adherence to Industry Standards

Wind River Compiler is compatible with the latest ANSI C++ specifications (ISO/IEC 14882:1998(E) C++ standard), as well as ANSI C specifications (X3.159-1989 and ISO/IEC 9899:1999(E)). It also adheres strictly to the Embedded Application Binary Interface (EABI) for maximum tool interoperability.

In addition, Wind River Compiler supports older standards (Kernighan and Ritchie, System V.3 UNIX) in order to ease porting of legacy applications.

## Target Architecture Support

Wind River Compiler supports a wide range of embedded architectures, enabling processor-specific optimization. This permits continuity if you decide to migrate from one architecture to another.

- ARM
- ColdFire
- Intel Architecture/Pentium
- Intel XScale
- M\*CORE
- MIPS
- Renesas M32R
- Renesas SuperH
- Motorola 68K
- PowerPC
- SPARC, SPARClike
- TriCore

Please visit [www.windriver.com/products/development\\_suite/wind\\_river\\_compiler](http://www.windriver.com/products/development_suite/wind_river_compiler) for a current list of supported processors.

## Long-Term Support Service

Your customers need you to support your product once it's in the field. This support window may span years—or even decades—requiring you to maintain the same software tools across your product's lifetime and make as few changes to these tools as possible.

Wind River Long-Term Support Service lengthens the support window for Wind River Compiler beyond the standard product life cycle. This service also provides custom bug-fixing and quality assurance to minimize the impact of compiler changes to your code. Contact Wind River Customer Support ([www.windriver.com/support](http://www.windriver.com/support)) or your account manager for details.