

WIND RIVER

Wind River ICE 2

Meet the challenge of global competitive economic pressures to introduce new products in shorter time frames with more features and higher quality. Wind River ICE 2 is a high-performance JTAG debugging product that provides industry-leading debug capabilities, taking developers quickly from initial hardware bring-up through kernel and driver development to building and integrating the application on a broad range of the industry's 32- and 64-bit single core and multicore system-on-chip (SoC) solutions.

Freedom to Innovate

Built on a high-performance hardware and software platform, Wind River ICE 2 answers the challenge of working with increasingly complex architectures incorporating multiple cores, threads, and operating systems in a myriad of device configurations, delivering a highly responsive debug experience, support for a broad range of processors, and integration with Wind River Workbench, an award-winning Eclipse-based development environment. It supports the debugging of complex multicore designs and provides advanced hardware and software diagnostic and analysis capabilities for a broad range of 32- and 64-bit JTAG- and EJTAG-enabled devices.

Embrace the Future

Wind River ICE 2 provides a scalable and cost-effective platform to any size development team, including internal software trace support for industry-leading SoCs, enabling developers to access advanced SoC debug capabilities for monitoring and debugging traffic on SoC internal system bus fabrics. Wind River ICE 2 works across a broad range of processor families, shortening the ramp-up time for new developers or those migrating to new projects that make use of new devices or architectures. Wind River's demonstrable commitment to supporting new processor innovations as they arise means your investment in one elegant solution stays with you as your company grows.

Release Products with Greater Confidence

Developers can quickly connect to and take control of their target with Wind River ICE 2's advanced hardware diagnostics, preconfigured target register files, bit-level register details, and run-control support that leverages the broad range of debug capabilities provided by today's leading SoCs. With these capabilities they can move quickly from hardware design and layout to platform and application development and integration by simplifying the verification and debugging processes related to early hardware bring-up, firmware, boot loader, and board support package (BSP)



Figure 1: Wind River ICE 2

development. By adding the optional Wind River Trace 2 real-time external trace unit for supported processors, the developer can debug, analyze, and resolve the most complex system issues, such as target crashes where the root cause is not easily found by postmortem debugging via register and memory access.

Complex 64-Bit and Multicore Debugging Support

Wind River ICE 2's ability to simultaneously debug up to 16 homogenous or heterogeneous cores supports the most complex multicore and multiprocessor environments in the industry today. Wind River ICE 2 is built on a high-performance hardware platform that will be able to scale to meet the needs of advanced multicore systems and SoC well into the future.

Wind River ICE 2 features Wind River's JTAG Server and JTAG Accelerator technology, which enables developers to do the following:

- Access a single device on the scan chain, or multiple devices simultaneously, to provide synchronous start and stop.
- Set breakpoints within a single microprocessor to halt the execution of multiple microprocessors.
- Make JTAG debugging connections to many microprocessors spanning the leading processor architectures.
- Establish and remove connections without affecting any microprocessor or device on the scan chain.

Support of Distributed Development Organizations

Wind River ICE 2 supports a Gigabit Ethernet network interface, enabling it to be located on your desk next to your target device or anywhere on your network. With this level of flexibility, developers are able to access target devices, run diagnostic tests, verify software execution and performance, and debug any issues that occur, regardless of their proximity to their device under test. As the trends toward outsourcing and decentralized and distributed engineering teams grow, Wind River ICE 2 enables enterprise development groups to work in the most efficient synergies possible.

Full Integration with Industry-Leading Technologies

Wind River ICE 2 is fully integrated with Wind River Workbench, the industry's award-winning Eclipse-based development environment that brings together hardware and software development debugging and analysis tools into a standards-based Eclipse framework. ICE 2 also supports other leading debugging tool options provided by Wind River, including Wind River On-Chip Debugging API and the optional Wind River Trace 2 external real-time trace unit for supported processors.

Features

Wind River ICE 2 lets you control a target by using the on-chip debugging services embedded in the microprocessor of that target. It operates effectively as a standalone system, communicating with the on-chip debugging services resident in the microcode of the chip. Wind River ICE 2 includes the following features:

- Simultaneous debug, synchronized run-control, and cross-correlated breakpoints for up to 16 cores and 32 threads
- 10/100/1000 Ethernet interface for network-based remote debugging
- JTAG clock speeds up to 100MHz with JTAG Accelerator technology for fast image downloads (up to 2.5MB/sec. with certain processors)*
- Full control of target: start/stop/reset, data- and expression-based hardware and software conditional breakpoints, single step through code
- Access to core and peripheral registers and bit-level detail including up to 32 user-defined register groups
- Access to L1 and L2 instruction and data cache (for supported processors)*
- Target board initialization files provided for common semiconductor vendor reference platforms
- Hardware diagnostics scripts that enable validation of address/data bus configurations and memory read/write verification
- Flash programming capability simplifying board bring-up; turnkey algorithms provided for commonly used flash devices
- Support of OS virtual addressing via memory management unit (MMU) support for translation lookaside buffer (TLB)



Figure 2: Wind River Trace 2 (optional)

- Extensible host PC interface via the following:
 - Wind River Workbench On-Chip Debugging Eclipse-based development suite (Eclipse version 3.5)
 - Wind River On-Chip Debugging API for automated test and manufacturing environments
 - Workbench On-Chip Debugging command shell and host shell
- Operating system awareness that provides access to kernel objects to simplify OS and device driver stabilization for the following:
 - VxWorks 5.5, 6.3, and higher (for supported processors)*
 - Wind River Linux (for supported processors)*
 - Wind River Real-Time Core for Linux (for supported processors)*
 - Linux kernels based on open source version 2.4.26 and higher; version 2.6 (for supported processors)*
 - Express Logic's ThreadX 4.0, 5.0 (for supported processors)*
- Internal trace buffer for visibility of code execution and system bus (for supported processors)*
- External trace buffer via optional Wind River Trace 2 unit for visibility of code execution (for supported processors)*
- Static and dynamic boot capability to improve ease-of-use through automatic loading of target drivers
- User-selectable signal drive strength that assists with heavily loaded JTAG scan chains
- Upgradeable firmware to support Wind River-provided enhancements and support for the newest processors
- LCD display panel that eases in-lab monitoring by showing Internet Protocol (IP) address and status information
- USB port for host connection and firmware update flexibility
- Extensible support for a wide range of processors based on ARM, Intel, MIPS, and PowerPC architectures*

* Consult your Wind River sales representative for details on current and future supported devices and features.

Technical Specifications

Host Operating System Requirements

Specific host OS system requirements depend on the host software connected to Wind River ICE 2. Refer to product information for Wind River Workbench and Wind River On-Chip Debugging API for more details.

Target OS Support

Wind River ICE 2 provides support for the following target operating systems:

- VxWorks 6.3 and higher
- VxWorks 5.5
- VxWorks 653
- Wind River Linux, Wind River Real-Time Core for Linux
- Open source Linux kernels version 2.4.26 and above, and version 2.6.x.
- Express Logic's ThreadX 4.0 and 5.0

Customizable target OS awareness capability for Wind River Workbench On-Chip Debugging enables support for other target operating systems.

Wind River Services and Support

Wind River provides outsourced engineering services specifically designed to help you meet strict market deadlines while keeping development costs down. Our technical experts have in-depth knowledge of Wind River products and experience assisting customers with Wind River on-chip debugging customization and product realization across a broad set of vertical industries. We can help you with device design, BSP and driver optimization, software system and middleware integration, legacy application and infrastructure migration, and real-time best practices.

Wind River Support works when you do with person-to-person help lines, a broad and deep knowledge base, and Web-based support to solve problems as they arise. Our Online Support site also provides details on Wind River products and services to help you overcome obstacles or find innovative ways to resolve debugging issues quickly and get you out of the lab sooner.

Wind River ICE 2 supports a wide range of processors. Visit www.windriver.com/products/OCD/PAM/processor-support for a current list. Other commercial operating systems and in-house proprietary operating systems can be integrated by Wind River Professional Services.

How to Purchase Wind River Solutions

Visit www.windriver.com/company/contact/index.html to find your local Wind River sales contact. To have a sales representative contact you, call 800-545-9463 or write to inquiries@windriver.com.