Wind River Simics Services
A Service of the Wind River Simulation Practice

Wind River Simics Services has helped many customers achieve impressive returns on their investments through advanced integration, expert onsite coaching, modeling support, and the application of best practices. Wind River provides simulation assistance that covers the entire product development life cycle.

Wind River uses Simics in our own product development and test labs to bring to market some of the industry’s most advanced integrated software and hardware solutions. Our expertise in the setup and use of test and debugging environments allows us to help you optimize your environment to realize the full value from your investment.

Simics Installation and Quick-Start Orientation
Wind River provides customers with installation of the full Simics environment, including third-party software configured to your specific host equipment. Onsite quick-start training ensures operability and usability of the system.

Simics Environment Integration, Extension, and Customization
External tools (simulators, test fixtures, load generators, etc.) can be interfaced to Simics, tightly integrating the simulated environment into your existing hardware-based development process. Additionally, foreign instruction set simulator (ISS) frameworks can be integrated with Simics, allowing multiple simulation approaches to communicate with one another. Wind River’s extensive experience with different simulator frameworks on different abstraction levels ensures fast and effective integration and extension of Simics, enabling comprehensive complex system modeling environments. Additional optimization services include the following:

- **Simulator performance analysis:** Wind River simulator performance experts are available to assist in the optimization and fine-tuning of the simulation model as well as parameters within the simulation itself. Code hot spots can be identified and timing optimized, allowing engineers to complete more simulation in ever decreasing time cycles.
- **Customizing for end users:** Wind River experts work directly with end users to understand their personal needs and workflow requirements. Then the simulation environment can be customized to ensure both ease of use and effectiveness for the whole user community.

Wind River Simics Services
Wind River Simics Services works closely with you to assist in the realization of product development life cycle goals through the services related to the Wind River Simics product.

**The Wind River Simics Product**
Wind River Simics creates a high-performance virtual environment in which any electronic system—from a single board to complex, heterogeneous, multi-board, multiprocessor, multi-core systems—can be defined, developed, and deployed.

Wind River Simics allows product teams to adopt a development methodology where physical system hardware is replaced by Simics virtual platforms running on a workstation or a PC.

The virtual platform can run the same binary software as the physical hardware and is fast enough to be used as an alternative to physical hardware for software development and testing.

Simics virtual platforms are unique. They are fast and accurate enough to run a full software stack from hypervisor to application, and they guarantee repeatable software execution, full visibility/ control of the virtual target hardware, and true reverse execution.

The entire product development team—including hardware architects, hardware designers, software designers, software testers, system integrators, and system testers—can utilize virtual platforms.
Simics Modeling Support
Wind River modeling experts are available to consult with model developers on the design and creation and use of complex device, component, and system models as needed:

- **Model building:** When developers do not have enough time in the schedule to build models themselves or need coaching to quickly learn advanced modeling concepts, Wind River services are available to take on the effort, either onsite or in one of our development centers.

- **Multi-core emulation:** Developing, debugging, and testing complex systems, such as those that contain multiprocessor, multi-core, or multi-board elements, or those that are networked, can bring unique and challenging problems unlike those in simpler systems. Wind River simulation experts can work with your team in the area of system or system-on-chip architecture investigation, core utilization, loading, and architecture performance to determine how best to design or take advantage of multi-core and multiprocessor architectures.

Testing and Debugging Support
Wind River is available to work side by side with your testing and development teams to help in realizing the full benefit of the system:

- **Test and debug environment:** Whether your debugging environment is Wind River Workbench, Eclipse, GDB, or any others, Wind River provides consultation and integration services to assist in the fine-tuning of the optimal integrated test and debug environment.

- **Test and debug execution assistance:** Wind River provides assistance in the execution and analysis of product tests within the Simics environment.

- **Test and debug methods:** Wind River provides consultation on enabling test equipment consolidation using techniques such as the capture of hardware-specific information from the simulator for export to the tools of your choice.

- **System test framework:** Wind River Simics provides excellent functionality for creating automatic tests, not only for a single processor or board but for the entire system. Services are available to help you in creating a full system test. The test environment can be built into your software department’s nightly build process, using Simics advanced scripting and check-pointing facilities.

Simics for Multi-Core
The hardware shift to multi-core processors and multiprocessor systems calls for new software and systems development tools to help developers transform their code into parallel applications and gain performance increases.

Traditional debugging techniques and debugging tools do not work very well on an inherently nondeterministic system such as a hardware multiprocessor or multi-core processor. For these systems, virtual platforms provide repeatable deterministic replay of any execution, making it much easier to fix intermittent and “random” bugs.

Wind River Simics comes with many features for multi-core development: repeatability, debugging, OS awareness, global stop-and-step, reversibility, and error provocation.

What Simics Can Do for You

**Define System Architecture**
- Leave paper behind and create an “executable specification.”
- Make design decisions: How many CPUs? DSP or GPP? Cache size? Which software to optimize?

**Develop Software**
- Eliminate scheduling problems due to limited target hardware availability.
- Perform “impossible” debugging.
- Send a bit-exact system snapshot file to another developer for collaboration.
- Say goodbye to “nonrepeatable bugs.”
- Eliminate big-bang integration: Start early and integrate progressively.
- Improve quality by testing hardware corner cases.
- Develop software applications across heterogeneous OS environments and hardware architectures.

**Deploy Virtual Platforms**
- Support field teams.
- Demo your system on a laptop.
- Support new customer configurations easily and inexpensively.
**Architecture Consulting**

As architectures and systems software become more complex and market windows narrow, it becomes ever more critical to make the correct decision on architectural choices as early as possible in the development life cycle. Wind River simulation experts can set up standalone Simics modeling environments for ad hoc investigations and architecture trade-off studies:

- Architectural (SMP, AMP, ISS core processor selection, etc.)
- Software/OS/firmware
- System partitioning
- Software/data cache optimization

**Product Life Cycle Consulting**

Wind River Simics enables companies to dramatically change the way system development is done today, allowing hardware and software teams to work in a more agile and efficient manner, as depicted in the following figure. Wind River experts are available to consult with hardware and software teams to adopt new approaches to the product development life cycle, resulting in dramatic reduction in product risks, time-to-market, and development costs, while also improving product quality and engineering efficiency.

*Product life cycle consulting results in dramatically shortened time-to-market*