



AonixPERC[®] Pico

Hard Real-Time Solutions for Java™ Developers

EXTENDING THE REACH FOR JAVA DEVELOPERS TO HARD REAL-TIME AND DEEPLY EMBEDDED SYSTEMS

RTOS Support:

- ◆ Linux
- ◆ Windows
- ◆ VxWorks*
- ◆ LynxOS*
- ◆ QNX*
- ◆ Nucleus*
- ◆ PikeOS*

Architecture Support:

- ◆ Intel x86
- ◆ Other*

*The first release of PERC Pico supports Linux and Windows for x86. The PERC Pico architecture is designed to be rapidly portable, and will be made available for any requested architecture prioritized by customer demand.

When considering the use of Java for “hard” real-time systems, many engineers assume that Java is just too big, too slow, too unpredictable, and too far removed from the hardware layer to be usable. PERC Pico has proven these assumptions to be no longer applicable.

Embedded systems developers frequently wish to exploit the high-level benefits promoted by Java, but are not able to do so because the resource requirements exceed their available budget. For example, typically optimized Java throughput is over three times slower than C for certain performance-critical components. Further, the memory required to deploy traditional Java software far exceeds the memory budgets of these kinds of systems.

PERC Pico resolves this disparity. PERC Pico offers an optimizing environment that provides the ability to create applications with very strict timing and space demands. Benchmarks have shown that PERC Pico applications can be over three times faster than traditional Java applications, and as much as 20% faster than equivalent C code and with a memory footprint comparable to that of C code.

THE PERC PICO TOOLCHAIN

The PERC Pico development environment consists of the components illustrated on the back side of this brochure. With this technology, real-time Java developers can use the powerful Eclipse platform to create real-time software components using Java source code.

When a developer saves files, the Eclipse build system coordinates with the PERC Pico builder to determine which components need to be processed by invoking the Eclipse Java compiler and running the PERC Pico verifier.

The PERC Pico verifier processes the real-time annotations and assures consistency between annotations and implementations. If either the PERC Pico verifier or the Java compiler finds problems in the Java source code, these problems are highlighted in the source code and added to the Eclipse task list.

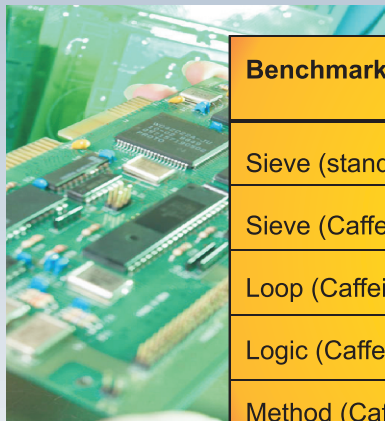
RTSJ PROFILE SUPPORT

The RTSJ specification is very broad in scope, providing a framework for many types of real-time Java implementations. Work is currently in progress toward the definition of standardized RTSJ profiles for the use of Java in mission critical and safety critical applications. Such applications have very tight constraints for execution speed, memory usage, responsiveness, and predictability. PERC Pico and its sister technology, PERC Raven, have been purposely designed to conform to these emerging standards.

COMPLEMENTARY TO PERC PRODUCT LINE

PERC Pico can be used by itself for small, standalone applications, or in conjunction with J2SE-level compatibility offered by PERC. Low level device access and high performance components may be developed with PERC Pico, while complex, fully-J2SE compliant middleware components may be executed on the full PERC VM, communicating with the PERC Pico components via well defined protocols.

PERC Pico programs can execute in standalone mode on bare hardware, or in conjunction with an off-the-shelf RTOS.

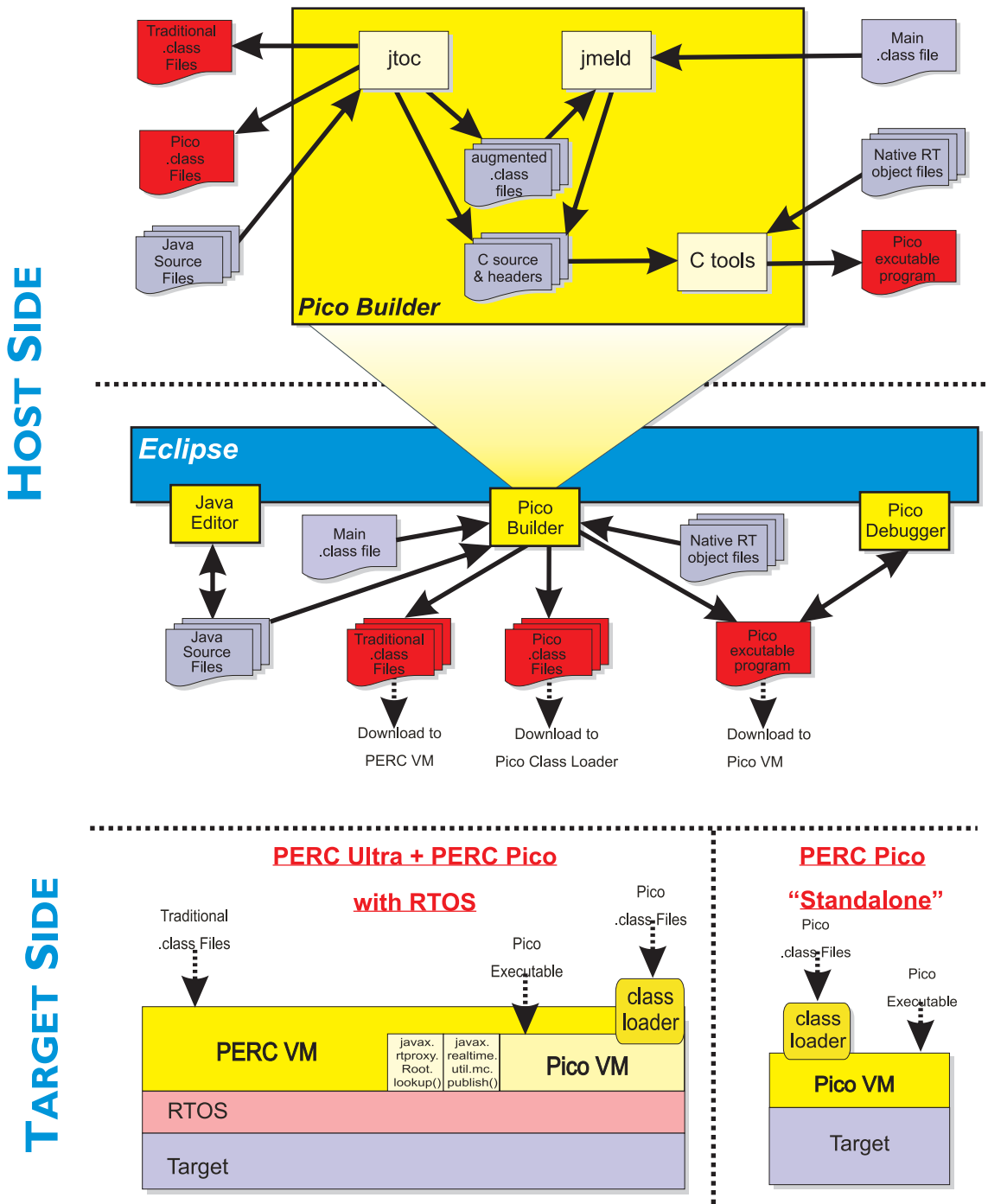


Benchmark	PERC Pico	Gnu C	Sun HotSpot
Sieve (standalone)	83	100	256
Sieve (CaffeineMark)	111	100	164
Loop (CaffeineMark)	88	100	286
Logic (CaffeineMark)	154	100	228
Method (CaffeineMark)	141	100	152

This table represents *unoptimized* PERC Pico benchmark performance compared to gcc and Hotspot.

Figures denote relative execution times, therefore lower numbers reflect faster performance.

Product Line Overview



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