

PTC ObjectAda® for Embedded, Real-Time and Safety-Critical Systems

ENTERPRISE-CLASS ADA DEVELOPMENT TOOLS FOR COMPLEX MISSION-CRITICAL SYSTEMS

PTC ObjectAda cross-compilation and execution solutions provide enterprise-class Ada development for embedded and real-time development teams needing a full Ada runtime, or a hard realtime, deterministic Ada runtime execution on bare targets or in conjunction with Real-Time Operating Systems (RTOSs) for mission-critical or safety-critical aerospace and defense, and transportation applications.

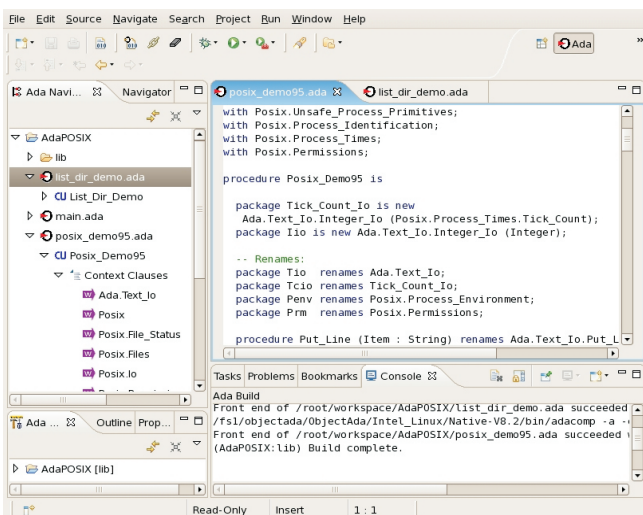
Ada real-time developers want to focus on their core competency; development of their mission-critical embedded and real-time systems. They want to work in a familiar environment and they want to know that their Ada will execute within the selected Ada runtime environment or Real-Time Operating System (RTOS) correctly. And they need the right tools to enable fast and efficient testing, debugging and deployment. They need engineer-quality tools from a proven supplier.

PTC ObjectAda provides embedded system Ada execution options, from a full Ada tasking runtime

functionality appropriate for soft real-time execution, to the PTC ObjectAda Raven runtime, a small and very fast real-time kernel that is perfectly suited for hard real-time and safety-critical applications. Either solution is applicable to execution on bare target hardware environments or in conjunction with 3rd-party RTOSs. PTC ObjectAda provides the reliable, feature-rich toolset most critical-system developers require to help them build an efficient, provable, verifiable and/or certifiable, deterministic real-time application.

PTC ObjectAda Features

- Full Integrated Development Environment (IDE)
- Ada Development Toolkit (ADT) Eclipse plug-ins
- Efficient cross compiler
- High quality code generator
- Source-level target debugger
- Ethernet and serial download and debug facilities
- Multiple host-target options for development on Unix, Linux, or Windows systems, targeting x86 or PowerPC embedded systems
- Multiple Ada runtime environments for bare hardware execution or in support of RTOSs



PTC ObjectAda Real-Time Products

PTC ObjectAda Real-Time

PTC ObjectAda Real-Time addresses the aspects of development embedded system developers are concerned with: a reliable development environment and deployment environment, tools availability, flexibility, and compliance with Ada language runtime standards.

PTC ObjectAda Real-Time solutions supply support for full Ada tasking on bare hardware targets, including board-support packages for supported processors. Optionally, the full Ada runtime can function in concert with Lynx Software Technologies' LynxOS®, or Wind River Systems' VxWorks® or VxWorks® 653.

PTC ObjectAda Real-Time Runtime Features

- Full Ada95 runtime for bare environments, LynxOS, VxWorks, or VxWorks 653
- Provides support for scheduling and timing, tasking, signal handling, memory management, and input/output
- Interrupt support using POSIX signals

PTC ObjectAda Raven Products

PTC ObjectAda Raven for Bare Environments

PTC ObjectAda Raven employs a small and very fast real-time kernel that is perfectly suited for hard realtime and safety-critical applications. It also provides the reliable, feature-rich toolset most critical-system developers require to help them build an efficient, provable, verifiable and/or certifiable, deterministic real-time application.

Industry Standards that Support Safe Applications

The Ada runtime provided with PTC ObjectAda Raven is designed based on the Ravenscar Profile as now defined in the Ada Reference manual for Ada 2005. The restricted subset, originally adopted at the Eighth International Real-Time Ada Workshop (IRTAW-8), Ravenscar, UK, accommodates certification requirements for high-integrity safety-critical, real-time systems.

Designed to Address Safety-Critical Systems

From the start, the design and implementation of Raven is focused on deterministic behavior, a requirement for safety-critical systems. PTC ObjectAda Raven satisfies the highest levels of criticality, even Level-A as defined by the FAA DO-178C software safety guidelines for airborne systems.

Flexibility

PTC ObjectAda Raven provides several libraries that may be selected to suit the application. Programs requiring no concurrent operations may use the sequential (no tasking) execution library. A preemptive tasking library supports programs requiring concurrent threads of execution. For non-safety-critical applications, additional real-time primitives can be incrementally linked in from the extended runtime library.

PTC ObjectAda Raven is rigorously tested to assure that it provides a solid development and execution environment for the toughest hard real-time applications imaginable.

PTC ObjectAda Raven Technology

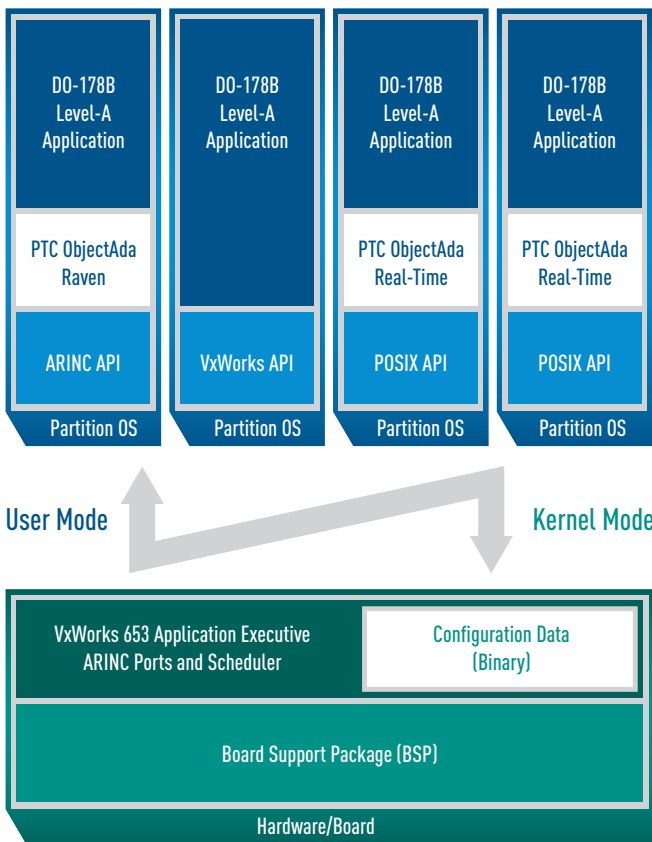
As the threshold of software engineering technology advances, PTC ObjectAda Raven meets the challenges of modern real-time development head-on with the full power of Object-Oriented Programming - without the baggage other OO languages can bring to a realtime environment. PTC ObjectAda Raven builds on a successful track record in real-time development with proven technology, compact and optimized code and new features for improved real-time support.

PTC ObjectAda Raven Runtime Features:

- Deterministic behavior
- Bounded memory usage
- Ada 95 Protected Object support
- Interrupt support
- Small size
- Fast execution
- Safety-Critical certifiability to the highest levels of criticality

PTC ObjectAda Raven for VxWorks 653

PTC ObjectAda Raven implements a runtime that is specifically designed for use in multi-partitioned RTOS products providing ARINC 653 services. PTC ObjectAda Raven also supports Ada tasks with ARINC 653 periodic process properties using new pragmas. The PTC ObjectAda Raven kernel supports tasks with periodic and aperiodic properties within the same.



PTC ObjectAda with support for VxWorks 653

Wind River Workbench Integration

The PTC ObjectAda Development Toolkit is Eclipsebased and can be integrated with Wind River’s Workbench technology. By delivering the power of the standard Eclipse IDT with Ada programming awareness, PTC provides developers with built-in support for the project manager, editor, difference capability, compiler, debugger, and command history.

PTC ObjectAda Real-Time produces DWARF debugging aggregates, allowing developers to use Workbench to debug their Ada programs including mixed language applications debug (e.g. Ada and C). Alternatively, the PTC ObjectAda debugger can provide you with a high fidelity display of complex Ada data types.

PTC ObjectAda Raven for VxWorks 653 Runtime Features

- Executes in a VxWorks 653 partition via the APEX interface
- External events access through APEX queuing ports
- Safety-Critical certifiability to the highest levels of criticality
- Deterministic behavior
- Bounded memory usage
- Ada 95 Protected Object support
- Small size and fast execution

Close Relationships

As a Wind River Strategic Software Partner and participant in the Wind River Validation Program, PTC is committed to providing the highest quality support for Wind River’s VxWorks and Workbench products. PTC Object-Ada Real-Time and PTC ObjectAda Raven products are available for embedded and real-time use with standard VxWorks and PTC ObjectAda Raven is available for safety-critical development and deployment together with VxWorks 653, Wind River’s ARINC-653 conformant multi-partition DO-178C-certifiable environment.

Platform Support and System Requirements

- Available PTC ObjectAda Host/Target configurations for soft real-time execution
 - AIX targeting LynxOS/PPC
 - Linux/Intel targeting LynxOS/PPC
 - Solaris/SPARC targeting LynxOS/PPC
 - Windows targeting PTC Raven/PPC
 - Windows targeting PTC Raven/Intel
 - Windows targeting VxWorks/PPC
 - Windows targeting VxWorks/Intel
 - Windows targeting VxWorks-653/PPC
- Available PTC ObjectAda host/target configurations for hard real-time or safety-critical execution
 - Windows targeting PTC Raven/PPC
 - Windows targeting PTC Raven/Intel
 - Solaris/SPARC targeting PTC Raven/PowerPC
 - Solaris/SPARC targeting PTC Raven/ERC32
 - Windows targeting VxWorks-653/PPC

In summary

PTC ObjectAda Real-Time and Raven products provide complete Ada software development solutions for the deployment of Ada applications with cross development, download and execution on PowerPC and x86 target systems. They combine blazing-fast compilation speed with efficient edit and debug tools that support PTC's Ada development toolchain or Wind River's Workbench environment for development of mission-critical applications.

For more information, visit:

PTC.com/developer-tools/objectada

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