

ptc® apexada™ *v5.2 Embedded for Linux/Armv8 64-bit is now Available!*

PTC releases a new Linux/Intel64-hosted embedded Ada compiler targeting Linux on Armv8 64-bit (aarch64) processors

Boston, MA – May 19, 2020 — PTC (NASDAQ: PTC) today announced its latest release of full 64-bit code generation capability for embedded applications in the PTC® ApexAda product line. With this release of PTC ApexAda v5.2 for Linux host-based development targeting embedded Linux on Armv8 64-bit (aarch64) processors, PTC adds another new capability to its extensive line of native and cross compilers for Ada application development. Included with the 64-bit embedded compiler is the PTC® ApexAda v5.2 64-bit compiler for Linux native application development. Also included is the integrated ApexAda 64-bit C/C++ compiler which facilitates seamless development of mixed-language applications written in Ada, C, and C++. ApexAda V5.2 Embedded compilers provide a complete cross-development toolchain hosted from Linux distributions including RedHat Enterprise Edition, CentOS, and SUSE.

PTC ApexAda V5.2 Embedded for Linux/Intel64 to Linux/Arm 64-bit is the initial product offering based on a new 64-bit code generator for ApexAda for the Armv8 64-bit (aarch64) architecture. The host operating system for this product is Intel x64 Red Hat Enterprise Linux v7.x/v8.x (or CentOS equivalent distribution). Using the Linaro GNU cross-development toolchain for 64-bit Armv8 Cortex-A processors on the Linux/Intel64 host, PTC ApexAda supports the generation of Ada 95 / Ada 2005 application images that execute on ARMv8-A 64-bit (aarch64) processors (for example Arm Cortex A53, A57, A72) running 64-bit embedded Linux distributions. Examples of embedded Linux distributions which can be supported are openSUSE Leap v15.1, SUSE Linux Enterprise Server for Arm v15.1, Ubuntu Server 20.04, Wind River Linux and other Yocto-derived Linux distributions with a 64-bit kernel. Reference hardware used for the development and test of ApexAda was the Raspberry Pi 3 Model B/B+. (Raspberry Pi 4 Model B with its larger 4GB RAM configuration and other boards such as the VPX-1703 from Curtiss-Wright Defense Solutions can also be supported by ApexAda.)

“The addition of the new code generation capability for 64-bit Armv8 processors to ApexAda opens up a whole new landscape for embedded application development using ApexAda.” stated Shawn Fanning, Software Development Director at PTC. “PowerPC processors have for a long time been a design choice for our aerospace and defense customers due to their balance of performance, cost, and power characteristics. Intel processors have offered many of our customers increased performance at a cost of additional complexity and power requirements. Driven by the mobile consumer market, Arm processors provide high performance and low power advantages over Intel processors. We think these advantages combined with the flexibility provided by embedded Linux distributions and the availability of low-cost and high-performance consumer-grade development boards as well as ruggedized 64-bit Arm boards will provide substantial benefits to our customers looking to modernize existing deployed applications while mitigating risks through continued use of the same time-proven and industrial-strength ApexAda compiler technology. The 64-bit Armv8 (aarch64) processors are now well-known and proven processors with a long life cycle and there are multiple 64-bit Linux distributions available which run on these processors. This latest ApexAda v5.2 embedded product is our initial product offering for Arm 64-bit processors and follow-on products for other real-time operating systems are under consideration for future product releases with prioritization based on customer interest and requirements.”

About the PTC Family of Ada Products

PTC ApexAda together with PTC ObjectAda product lines of native and cross development tools and runtime environments provide host development and execution support for the most popular environments including Windows, Linux and various UNIX operating systems. PTC cross development tools hosted on Windows, Linux or UNIX systems target PowerPC and Intel target processors in support of “bare” hardware execution or in conjunction with popular RTOSs.

Availability

PTC ApexAda V5.2 Embedded for Linux/Intel64 to Linux/Armv8 64-bit is immediately available. License pricing is available on request.

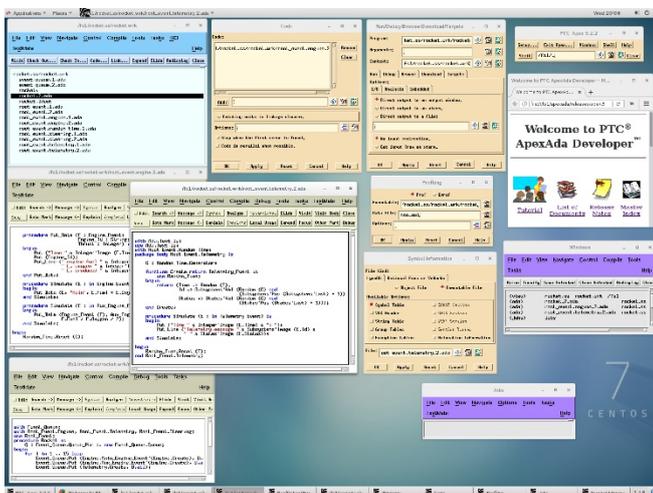
Full Product Details

PTC ApexAda®

PTC ApexAda provides a single, scalable host development environment that integrates design, implementation, testing, configuration management, and process management for native or cross development projects.

More than just a set of loosely integrated development tools, PTC ApexAda Developer products are designed specifically for large-scale team development of long lifecycle applications. Such applications can survive only when they are developed using sound software engineering best practices, and PTC ApexAda Developer is built on the fundamental principles that govern large-scale modern software engineering.

The software also provides architectural control features that are essential for developing and managing large-scale applications. These applications are already difficult to design, but when they are improperly architected they are even more difficult to maintain. PTC ApexAda Developer helps protect the architectural integrity of application design throughout the software development lifecycle.



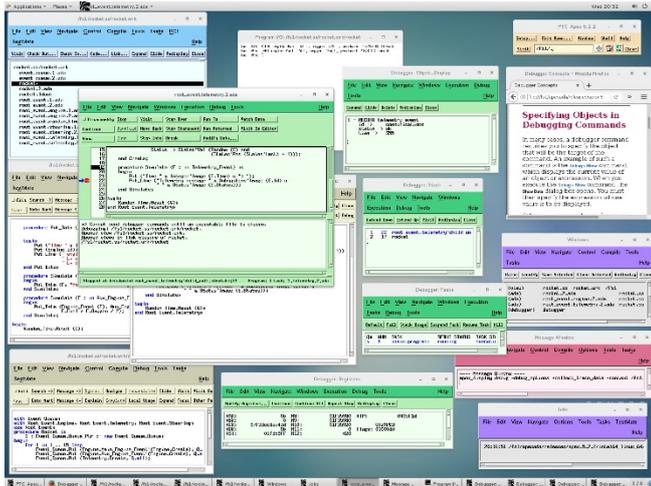
Large applications typically have special needs for configuration management. Managing change becomes extremely complex with the addition of

more development staff. PTC ApexAda Developer includes technology for controlling versions and configurations in such an environment, leveraging architectural subsystems that reside above the programming language constructs.

Key Benefits

- Leverages best practices for large-scale application development
- Supports a controlled iterative development so that smaller increments of change can be edited, built, tested and deployed
 - Reduces risk and improves time-to-market
- Delivers encapsulation restricting access and manipulation to only meaningful operations
 - Simplifies communication about real-world constructs and improves the reliability of accessing and changing data
- Includes facilities for creating software architectures (subsystems) larger than that provided by the programming language itself
 - Fosters large-scale software reuse and creates software that is adaptable in response to changing operational conditions.
- Provides testing tools directly within the development environment to facilitate frequent developer-led testing
 - Allows bugs to be found sooner and corrected more cost-efficiently
- Manages parallel development simply and without high overhead due to configuration management commands and facilities being built into the development environment
 - CM is more transparent to developers and less intrusive to work activities

- Supports embedded cross-compilation as well as native compilation
 - Seamlessly extends the host-based development tools to allow software to work directly on the target execution platform
- Results in less redundancy in development tools, higher productivity, and less rework from modification



Capabilities and specifications

- Full development lifecycle in one common IDE with integrated coding and debugging tools
- Architectural control for developing and managing large-scale applications
- Version control and configuration management
- Automated tooling that goes beyond compilers and debuggers and supports all lifecycle of development needs, from conception to testing
- PTC ApexAda Developer Enterprise Edition contains:
 - PTC ApexAda (IDE for host-based Ada05, Ada95 and mixed Ada/C/C++ development)
 - Integrated coding and debugging tools (language-based editor, program browser, incremental compiler, and comprehensive, integrated debugging facility)
 - Configuration Management and Version Control (CMVC)
 - Test Mate (test management system for native and cross development including unit, integration, system test, and coverage analysis, including modified condition/decision coverage)

- PTC ApexAda Developer Base Edition contains:
 - PTC ApexAda (IDE for host-based Ada95, Ada83, and mixed Ada/C/C++ development)
 - Configuration Management and Version Control (CMVC)
- PTC ApexAda Embedded Developer Enterprise Edition further extends the PTC ApexAda Developer Enterprise Edition tool chain with Instruction Set Simulation (ISSIM), Ethernet Support (ENet), and Patching Linker. *(Features vary depending on the target architecture and RTOS.)*

Platforms and system requirements

- PTC ApexAda Developer Enterprise Edition runs on the following host platforms:
 - Solaris®/SPARC
 - Solaris/x86
 - Linux®/x86
- PTC ApexAda Embedded Developer Enterprise Edition runs on the following host platforms:
 - Solaris/SPARC
 - Linux/x86
- PTC ApexAda Embedded Developer Enterprise Edition targets Power PC processors with the following real-time operating systems:
 - PTC ApexAda Exec
 - Wind River® VxWorks®
 - Lynx Software Technologies LynxOS®
- PTC ApexAda Embedded Developer Enterprise Edition targets x86 with the following real-time operating systems:
 - PTC ApexAda Exec
 - Wind River® VxWorks®
- PTC ApexAda Embedded Developer Enterprise Edition targets Armv8 64-bit (aarch64) with the following operating systems:
 - Linux

For more information, visit: [PTC.com/Developer-Tools/ApexAda](https://www.ptc.com/Developer-Tools/ApexAda)

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