

GNAT Pro

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www.adacore.com



newsflash

► AdaCore Awarded MCTS Naval Trainer Contract

BAE Systems in the UK has chosen Ada and GNAT Pro for x86 Windows as the development environment for the Maritime Composite Training System (MCTS). The MCTS Phase 1 program will deliver to the Royal Navy a new shore-based Warfare Operator Training Capability. This latest contract continues the long relationship between AdaCore and BAE Systems and the use of Ada in developing critical defense applications.

► AdaCore Joins Eclipse Foundation

AdaCore has joined the Eclipse Foundation as an Add-In-Provider. At this membership level AdaCore will be continuing its commitment to develop and extend the development framework known as the Eclipse ecosystem. AdaCore has already produced an Eclipse-based tool—the GNATbench plug-in—and the company sees the Eclipse Foundation's objectives and open-source approach as completely aligned with AdaCore's corporate goals.

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What's New in GNATbench 2.0

AdaCore's latest version of GNATbench, the plug-in for Eclipse and for Wind River Systems' Workbench environment, provides new functionality, improved robustness, and higher performance. In addition, GNATbench now supports the most recent releases of Eclipse (3.2) and Workbench (2.6).

GNATbench's Ada-sensitive editor has new capabilities, especially in its support for Code Assist for identifier completion. GNATbench implements Code Assist for Ada 83, Ada 95, and Ada 2005.

GNATbench for Eclipse has a new builder that supports cross-compiling as well as native-system development. Both the Workbench and Eclipse versions of GNATbench define an Ada perspective,

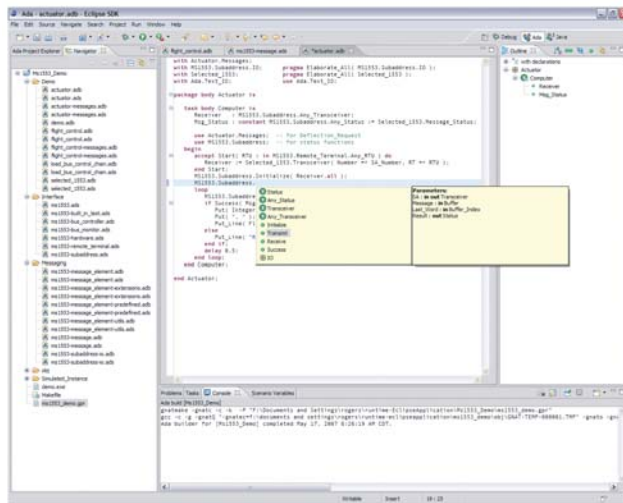
including Ada-specific views, toolbars, menus, and wizards for creating new projects. The Import wizard in GNATbench for Workbench

allows users to configure a new project with the Workbench *New Project* wizard as part of the importing process.

GNATbench now loads much more quickly and has better performance and robustness overall.

The GNATbench on-line Help files have been significantly revised and extended and now include detailed instructions for building, debugging,

and editing, among other topics. A complete step-by-step tutorial describes creating a project from scratch and using it to build an executable system.



Major New Air Traffic Control System Using GNAT Pro

Praxis High Integrity Systems has selected AdaCore's GNAT Pro technology for use on the iFACTS project (interim Future Area Control Tools Support) in the UK. Praxis was appointed by NATS, the UK's leading air traffic services provider, to write the specification and develop the software for iFACTS, a system that has been described as triggering "the biggest change in ATC since the introduction of radar." Details on the technology selection were just being announced as this newsletter was going to press. **Further information will be available on the AdaCore website www.adacore.com**

GNAT Pro 6.0.1

This major technology release provides full support for Ada 2005, easier interfacing with C++, better warning messages, friendlier elaboration order, and many other improvements.

It is available on a number of new platforms:

- UltraSparc Solaris (64 bits)
- LEON ELF format (hosted on GNU Linux and Solaris)
- PowerPC VxWorks 6.x (hosted on GNU Linux)
- x86 VxWorks 6.x (hosted on GNU Linux)
- PowerPC 55xx ELF format (hosted on Windows)

The Zero Footprint Profile (ZFP) runtime is now available for the host system in High Integrity Edition configurations.

GPS 4.1.1

This minor upgrade of GPS 4.1.0 can be downloaded in GNAT Tracker along with GNAT Pro 6.0.1. As usual, this new version of GPS is compatible with older versions of GNAT Pro. GPS 4.1.1 offers a variety of enhancements including an advanced Outline View, implementation of Python and pygtk scripting capabilities on all platforms, a wider range of plug-ins, and an improved "smart completion" engine and error repair mechanism. The overall result is a smoother and more productive development process.

GNAT Tracker 2

The secure web-based customer interface to GNAT Pro's support services has been enhanced significantly. Among the improvements are a new, more intuitive look and feel, easier access to account information, better navigational capabilities, and access to the AdaCore Developer Center for the latest news on GNAT Pro technology.

▶ Ada-Java Interfacing Technology

During Q3 2007 AdaCore will release a preliminary beta version of its Ada/Java binding technology, which allows a developer to combine Ada and Java code through low level calls to the Java Native Interface (JNI) in either direction.

A subsequent release will include an automatic binding generator, which will provide type-safe object oriented interfaces between the two languages using the new features of Ada 2005. A beta version of the binding generator is planned for release during Q4 2007.

▶ GPRbuild

The beta test program for GNAT Project Builder (GPRbuild), AdaCore's multi-language build tool that will replace the current gprmake, is scheduled for Q3 2007. GPRbuild extends GNAT project files to handle applications written in several languages including Ada, assembler, C, C++, and Fortran, for both native and embedded platforms. GPRbuild's generic framework makes it easy to extend support to new toolchains and new languages and to express compatibility requirements between toolchains. Support for Java is also on the roadmap.

▶ GNAT Pro 6.0.2

Following our standard annual schedule, a minor release for GNAT Pro will be available on most platforms during Q3 2007. This new version, GNAT Pro 6.0.2, will be a maintenance release; the next version to incorporate significant new functionality will be GNAT Pro 6.1.1 during Q1 2008.

Spotlighting a GAP Member: Kean University (New Jersey, USA)

A longstanding participant in the ACM International Collegiate Programming Contest, Professor Lee Wittenberg decided to enroll Kean University in AdaCore's GNAT Academic Program (GAP) last year when the school hosted the 30th annual regional competition.

Ada was already in use at the university, with the GNAT environment, and Prof. Wittenberg wanted to have the latest toolset available not only for the contest, but also for the Comparative Programming Languages Course in which Ada is currently taught.

When asked what he felt students gained from learning Ada, Prof. Wittenberg responded, "Ada is a well-designed, readable language, whose syntax corresponds directly to its semantics rather than obscuring them. Although this may appear a small point, students seem to have no difficulty whatsoever indenting their Ada programs properly but have major problems indenting C++ and Java code. The larger issues are whether the language supports the software engineering principles we are trying to teach, and how easily students can achieve the necessary literacy. Here Ada excels. It avoids the traps and pitfalls of C and C++, and its methodology neutral design makes it much easier to learn than the strict object-oriented approach imposed by Java."

Ada 2005 is an Official ISO Standard!

The Ada 95 language revision process has come to a successful conclusion with the March 2007 publication of the new Ada standard by ISO (the International Organization for Standardization).

Ada 2005 offers significant enhancements in several areas, including object-oriented programming, real-time systems support, and interfacing with other languages, and its many improvements promise to strengthen Ada's role as a language of choice for systems with stringent safety and/or security requirements.

Ada 2005, as well as the earlier versions of the Ada standard (Ada 83 and Ada 95), are implemented in GNAT Pro 6.0.1 on all platforms.

Copies of the new Ada Reference Manual and the supporting Rationale are available on the Ada Information Clearinghouse website: www.adaic.org/standards/ada05.html



Interview with Arnaud Charlet GPS Project Director, AdaCore Europe

GNAT Pro Insider Tell us a bit about your background, how you came to be involved with Ada and AdaCore, and what your current role is.

► **Arnaud Charlet** I learned computer science with Ada as my first language in the early 1990s, at the Institut Universitaire de Technologie (IUT) d'Aix-en-Provence. While completing my studies at Telecom (ENST) Bretagne, I started with AdaCore in New York as an intern in 1997 and then joined as an employee in Paris in 1998. I'm currently managing our GNAT Programming Studio and GtkAda implementations as well as the GNAT Pro port to .NET, and I also contribute to other projects, especially on issues surrounding run-time tasking support.

GNAT Pro Insider You have had a major role in the design and implementation of many key components of the GNAT technology, and you are a recognized expert on tasking. Can you describe some of your most memorable experiences?

► **Arnaud Charlet** One of the most exciting projects was the prototype of a new graphical debugger fully written in Ada using GtkAda. This started as an "on the side" effort done mainly as a feasibility study and ended up as a successful graphical debugger (GVD) and the core of our next generation IDE, the GNAT Programming Studio.

Another notable experience was the design of a portable, efficient mechanism for Ada tasking support. This is a major technical challenge, which we have addressed through a tasking kernel that is adaptable to systems ranging from bare boards to full operating systems, including support for multiple processors.

GNAT Pro Insider AdaCore produces GNAT Pro releases each year with significant enhancements, on dozens of platforms ranging from cross environments with embedded targets to native systems on multicore processors. As someone central to the development process, how would you explain the company's success?

► **Arnaud Charlet** Technologically, the key is to make the correct decisions at the start, since the marketplace does not usually give companies "second chances." At AdaCore this meant choosing an open source approach aligned with the Free Software Foundation's GCC development, allowing us to reuse and contribute to an extensive set of code generators. An open source approach by itself is not enough; it needs to be backed by a rigorous development process to ensure quality. At AdaCore we have fine tuned such a process over the years, running an extensive battery of tests nightly on each GNAT Pro platform, and also whenever an engineer attempts to check in a file. Good technology and a sound process are necessary but still not sufficient; success requires good people, and here again AdaCore stands out. On our staff are some of the world's leading Ada and compiler experts, and we are unique in having virtually no turnover. Since it is the developers who respond to customer queries directly—in effect the entire engineering staff is the support group—GNAT Pro users see the benefits of our expertise both in our products and in our services.

GNAT Pro Insider You are one of the architects of GNAT Programming Studio (GPS), the GNAT Pro IDE. How do you see GPS evolving over the next few years?

► **Arnaud Charlet** Firstly, many of the enhancements made in GPS are based on user feedback, so the evolution of the product will be shaped in part by suggestions from our customers and also from the experience of our own engineers.

As far as specific new functionality is concerned, a major focus will be on GPS's Remote Programming capability, which allows programmers to take advantage of the processing power and video capabilities of their local workstation while using tools and files on their remote server. We plan to implement Remote Programming on additional platforms and to allow access to additional remote tools.

Other enhancements planned in GPS include improved customization, better automatic documentation generation, new plug-ins, a more powerful/customizable multi-language build capability, and new tools such as an elaboration dependency graph generator, an instantiation browser, and a code coverage analyzer.

As part of our future plans, we expect GPS to evolve in new forms, for example as a set of capabilities that are accessible from any web browser.

All of this is consistent with our overall strategy of providing the highest quality tools and services for the Ada community.

Technology Webinars

AdaCore is conducting a number of webinars

in 2007. Thirty minutes long each, these webinars offer practical information on how to optimize use of key GNAT Pro technologies. The first webinar takes place on **June 5** and features **GNATbench**, the Eclipse-based plug-in described on page 1 of this issue. Other GNAT Pro topics to be covered include the High Integrity Edition and GPS (GNAT Programming Studio).

For more details please check the AdaCore website.

AdaCore Partner Vector Software Helps Certification Effort for DO-178B

AdaCore maintains an association with several best-in-class partners who offer valuable technologies to our joint customers. One such partner is Vector Software, a leading test harness and capabilities vendor.

Their VectorCAST tool suite has been selected by Nord-Micro, Hamilton Sundstrand's business unit in Frankfurt, Germany, for the testing of the A380 Cabin Pressure Control System project currently undergoing certification. VectorCAST is being used for module and integration testing, a requirement for DO-178B levels B and C. The software tested with VectorCAST was written in Ada utilizing AdaCore's GNAT Pro High-Integrity Edition, the JTAG interface, and debugging capability from another AdaCore partner Abatron.

Nord-Micro is a leading designer and manufacturer of cabin pressure control systems (CPCS) and ventilation system components for commercial aircraft. Nord-Micro supplies CPCS software for the majority of the Airbus fleet, including all models of the A320 and A330/340 family.

AdaCore at Conferences ■ April 2007 - November 2007

ESC 2007 - Silicon Valley

Embedded Systems Conference

1-5 April 2007 / San Jose, California, US

AdaCore is an exhibitor at this conference, and Robert Dewar is delivering a tutorial, "Safety-Critical Design Techniques for Secure and Reliable Systems."

www.embedded.com/esc/07/

IRTAW 2007

13th International Real-Time Ada Workshop

17-19 April 2007 / Woodstock, Vermont, US

AdaCore is a sponsor for this workshop, which serves as a focal point for discussion of Ada language features for real-time systems. Ben Brosgol and José Ruiz are participating.

www.adaresource.org/irtaw13/

ICSE 2007

29th International Conference
on Software Engineering

20-26 May 2007 / Minneapolis, Minnesota, US

Ben Brosgol is presenting a tutorial, "Languages for Safety-Critical Software: Issues and Assessment." web4.cs.ucl.ac.uk/icse07/

SSTC 2007

Systems and Software Technology Conference

18-21 June 2007 / Tampa, Florida, US

AdaCore is an exhibitor at this conference, and Ben Brosgol and Greg Gicca are delivering a presentation "Designing High-Security Systems: A Comparison of Programming Languages."

www.sstc-online.org

Ada-Europe 2007

12th International Conference
on Reliable Software Technologies

25-29 June 2007 / Geneva, Switzerland

AdaCore is an exhibitor at this conference. Matthew Heaney is conducting a tutorial "Object-Oriented Programming in Ada 2005," and Thomas Quinot and Jérôme Hugues are conducting a tutorial "Building Interoperable Applications with PolyORB." José Ruiz is presenting a paper (with M. Aldea-Rivas from University of Cantabria) "Implementation of New Ada 2005 Real-Time Services in MaRTE OS and GNAT," and Javier Miranda is presenting a paper "Towards Certification of Object-Oriented Code with the GNAT Compiler." adae2007.eig.ch/

Ada UK Conference 2007

25 September 2007 / Manchester, UK

AdaCore is lead sponsor and advocate for this conference, which is being organized by the UK's Centre for Software Reliability in cooperation with the Safety-Critical Systems Club. The intent of this conference is to promote awareness of the Ada language and to highlight the increased relevance of Ada in safety-critical programming.

www.csr.ncl.ac.uk/calendar/csrEventView.php?targetId=372

SIGAda 2007

4-8 November 2007 / Fairfax, VA, US

AdaCore is a platinum sponsor of this conference, the annual international conference sponsored by ACM's Special Interest Group on Ada.

www.acm.org/sigada/conf/sigada2007/

newsflash

► **XML/Ada Added to GNAT Pro Subscription**
Support for XML/Ada, the Ada library for processing XML streams, is now included as part of the general GNAT Pro subscription package. Customers interested in adding support for XML/Ada to their accounts should contact sales@adacore.com. The XML/Ada parser fully supports XML 1.0, including DTDs, entity resolution, external entities, attribute normalization, and conditional sections. XML/Ada also supports the SAX 2.0 standard, a framework defining a set of callbacks that are automatically invoked when special events are detected in the XML stream.

► Ada Gems

During Q2 2007 AdaCore is initiating a weekly series explaining, through examples, how to best use Ada's features. Each "Ada Gem" will be published in the Developer's Log on the AdaCore website. The emphasis is on the new features of Ada 2005, especially those whose usage might not be immediately apparent, but topics will also be drawn from Ada 95. The gems' documentation includes compilable source code, explanations of language semantics, and suggestions about programming style.

www.adacore.com/home/ada_answers/gems

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