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.
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.

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.

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.

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?

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.

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?

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.
Partner's Corner

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/escs/vs/

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.adaanswers.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 Giaca 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. Aldrea-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.” ada2007egh.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.cs.ncl.ac.uk/calendar/cseEventView.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/

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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