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AdaCore Update

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Vendor Presentation

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Outline

- AdaCore news
- Products: GNAT Pro, GPS, tools
- New Platforms
- Language development: **Ada 2005**
- Safe programming: environment and tools
- **GAP**: The GNAT Academic Program

AdaCore
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Who we are, what we do



- **AdaCore = Ada Core Technologies + ACT Europe**
 - Separate legal entities but single organization
 - Founded in 1994 (US) and 1996 (Europe)
 - Robert Dewar, Edmond Schonberg, Richard Kenner in US
 - Cyrille Comar, Franco Gasperoni in Europe
 - Staff comprises around 52 people worldwide, 45 technical
 - *Extreme Ada*, compiler and software engineering expertise
- **Flagship product is *GNAT Pro***
 - GUI-based Integrated Development Environment
 - Full Ada (core language + all annexes)
 - Toolchain / libraries / bindings
 - On-line consulting / support
 - Documentation
 - Add-ons
 - On-site training in Ada and/or tools

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GNAT Pro basic components

- **Integrated Development Environment**
 - GPS (GNAT Programming Studio)
- **Compilation tools**
 - gcc
 - gnatbind
 - gnatlink
 - Gnatmake
 - **Next release: version 5.04, Q1 2006**
- **Project facility**
 - Management of settings used for program builds
- **Debugger**



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GPS IDE

- **Functionality**
 - Context-sensitive, language-aware, configurable editor
 - GNAT Pro Ada compilation system
 - Visual debugger
 - Source browsing / navigation facility
 - Interface to source configuration management tools
 - Control over project settings
 - Pretty printing / reformatting
 - Control over window topography
- **Attributes**
 - Intuitive, easy to use
 - On-line help includes access to source files for predefined libraries (in GPS 2.1)
 - Configurability, extensibility through scripting
 - **Eclipse plug-in under development**

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Project facility

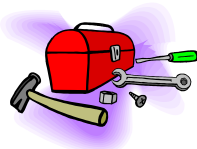
- **Introduction**
 - A *project* is a configurable set of properties for a collection of source files
 - Developer can specify
 - Directories for source files, objects, executables
 - Source file naming conventions (per-unit or global)
 - Switch settings
 - Access to command-line switches, environment variables
 - Hierarchical organization
 - Project may inherit / override source files from parent project
 - Project may import other projects containing required source files
- **Some uses**
 - Common set of sources generates object files in different directories, via different switches
 - Multiple versions of the body for a package spec
 - **New version to support multi-language builds**

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GNAT Pro tools (1)

- **Monitoring**
 - `gnatmem` (heap monitor)
 - `GNAT.Debug_Pools` (diagnose heap problems)
 - `gprof` (profiler)
 - **Stack checking tool** (under development)
- **Reducing code space**
 - `gnatelim` (minimize executables)
- **Testing**
 - `gcov` (test coverage)
 - `aunit` (test harness)
- **Browsing**
 - `gnatxref` (cross-referencer)
 - `gnatfind` (definition / use finder)
 - `gnatls` (library browser)
- **Many of the above are ASIS-based**

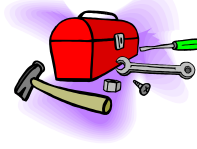


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GNAT Pro tools (2)

- **Documentation**
 - `gnathtml` (HTML generator)
- **Utilities**
 - `gnatchop` (file splitter)
 - `gnatkr` (file name "kruncher")
 - `gnatprep` (preprocessor)
 - `gnatstub` (body generator)
 - `gnatpp` (pretty printer)
 - `gnatclean` (delete intermediate files)
 - `gnatmetric` (metrics tool, coming in GNAT Pro 5.03a)
- **Distributed systems**
 - GLADE
 - PolyOrb



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GNAT Pro platforms

- **Native**
 - Alpha OpenVMS
 - Alpha Tru64
 - Mac OS X
 - MIPS IRIX
 - PA-RISC HP-UX
 - PowerPC AIX
 - SGI Altix
 - SPARC Solaris
 - x86/Pentium GNU Linux
 - x86 Windows
 - x86 Trusted Solaris
- **High-Integrity Edition**
 - DO-178B VxWorks/Cert
 - PowerPC (Solaris hosted)
 - PowerPC (x86 Windows)
 - VxWorks AE653
 - PowerPC (Solaris hosted)
 - PowerPC (x86 Windows)
- **Cross / Tornado**
 - SPARC Solaris ⇔ 68K
 - x86 Windows ⇔ 68K
 - SPARC Solaris ⇔ PowerPC
 - x86 Windows ⇔ PowerPC
 - x86 Windows ⇔ StrongARM/XScale
 - SPARC Solaris ⇔ UltraSPARC
- **LynxOS**
 - Native x86
 - SPARC Solaris ⇔ PowerPC
- **Ports in progress**
 - HP-Linux Itanium
 - IVMS
 - SPARC Solaris ⇔ x86 VxWorks
 - Vxworks 6

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GNAT 2005

- **Implementation of the new standard continues.**
- **Programming in the large**
 - Limited_With clauses
 - Private_With clauses
- **Object-Oriented features**
 - Interfaces
 - Object notation
 - Task, protected, synchronized, limited interfaces
- **Containers**
- **Generalized anonymous access types**
- **New real-time features (flexible scheduling policies, time budgets) to be provided by MarteOS (Madrid/Santander collaboration)**

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GNAT Pro High-Integrity Edition (1)

- **Enforcement of selected profile**
 - High-Integrity profiles
 - Zero Footprint
 - Cert
 - Ravenscar
 - Full-Runtime
- **Allowance of user-specified profile**
 - Run-time libraries selected *à la carte*, based on features actually used in the program
- **Platform / application**
 - Wind River Platform for Safety Critical ARINC 653
 - Boeing 7E7 Dreamliner Common Core System (Smiths Aerospace)
- **Status**
 - **Certification materials (DO-178B, Level A) for Ada libraries are being completed** (collaboration with Verocel and Wind River, for Smiths Industries)

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GNAT Pro High-Integrity Edition (2)

- **Product highlights**
 - Binding to ARINC 653 Application Executive (APEX)
 - Support for AE653 partition types
- **Compiler features relevant to High-Integrity development**
 - Generation of human-readable low-level intermediate representation (-gnatD, -gnatG)
 - Generation of human-readable data layout information (-gnatR)
 - Generation of assembly language listing
 - Restrictions identifiers for implicit loops or conditionals
 - Restrictions identifier for form of explicit conditionals
 - Style checks (-gnaty)

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User interface to AdaCore: **GNAT Tracker**


- **Secure web-based customer interface**
- **Download of GNAT Pro tool suite and components**
- **Online version of GNAT Pro documentation**
- **Submit toolset support or online consulting requests**
- **Download of GNAT Pro releases**
- **Access to up-to-date versions of known-issues and features**
- **Browse/search all request exchanges for your account**

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Additional services

- **GNAT consulting**
- **On-site courses**
 - Introduction to GNAT Pro and GPS
 - Introduction to GNAT Pro and GPS for AE653
 - Ada Programming with GNAT Pro: Fundamentals
 - Ada Programming with GNAT Pro: Advanced Topics
 - Ada Programming with GNAT Pro: Beyond Ada 83
- **Professional services**
 - GNAT Pro ports
 - Special-purpose run-time libraries
 - Tool customization and enhancements
 - Assistance with in-house specialized GCC and GNAT ports



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The GNAT Academic Program

- **GAP is an AdaCore initiative to foster the use of Ada in academia**
 - AdaCore serves as clearinghouse of resources for universities that use Ada for teaching and research
- **GNAT software freely available to faculty and students**
 - GNAT binaries for XP, Linux, Solaris
 - GPS
 - On-line GNAT and Ada technical support
- **Clearinghouse for Ada information**
 - Teaching materials
 - Textbooks in electronic form
 - Software (GNAT et al, **MarteOS**)
- **A catalyst for Ada activities**
 - Over 100 members today