

Request for an Ada Developer Room

at

Free and Open-Source Software Developers' European Meeting
FOSDEM 2009

7-8 February 2009



Executive Summary

- Project Name: Ada Developer Room
- URL of the website of the project:
<http://www.cs.kuleuven.be/~dirk/ada-belgium/events/09/090207-fosdem.html>
- Description of the project(s) : Ada for Free and Open Source Software
- Name of **Ada at FOSDEM2009** Coordinator: Valentine Reboul
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Introduction

Ada-Belgium requests a Developer Room to hold presentations on related projects and tools.

Seven speakers from various origins (Universities, Compiler Assessment Laboratory, Companies) and countries (Belgium, France, and Spain) have confirmed their will to participate to the event, and another one might soon ensure his contribution. They propose to give talks about Ada and related Free Software technologies. Ada-Belgium coordinates their joint DevRoom request.

At FOSDEM 2006 the full-day Ada DevRoom received a warm welcome from its public (up to 65 participants at several presentations). We would be really pleased to have this opportunity again, especially considering recent afferent developments. The use of the new Ada 2005 standard which was published by ISO in 2007, starts to spread thanks to the advent of its first full implementation which is none other than the GNU Compiler Collection (GNAT).

The eleven talks we are presenting below (ordered by related themes), would be enough to fill a DevRoom for the entire duration of the FOSDEM event (i.e. Saturday 7th from 12:00 to 18:00 and Sunday 8th from 10:00 to 17:00). However, if necessary, we could try to make our program fit in a single day by reducing the number of talks or the time allocated to each of them .

- ▷ <http://www.cs.kuleuven.be/~dirk/ada-belgium>
- ▷ [http://en.wikipedia.org/wiki/Ada_\(programming_language\)](http://en.wikipedia.org/wiki/Ada_(programming_language))
- ▷ http://en.wikibooks.org/wiki/Ada_Programming
- ▷ <http://www.adaic.com>

Presentations

An Introduction to Ada for Beginning or Experienced Programmers

by [Jean-Pierre Rosen - Adalog](#)

This presentation exposes the main features of the Ada language, with special emphasis on the features that make it especially attractive for free software development.

▷ <http://www.adalog.fr/compo2.htm> (free Software from Adalog)

Object-Oriented Programming Model in Ada 2005

by [Jean-Pierre Rosen - Adalog](#)

This presentation exposes how Ada handles the object oriented paradigm, and especially how its model is different from what is commonly found in other languages. It discusses the benefits and drawbacks of this original approach.

▷ <http://adaic.org/standards/95rat/RAThtml/rat95-p2-4.html>

▷ <http://adaic.org/standards/05rat/html/Rat-2.html>

Ast2Cfg - A Framework for CFG-Based Analysis and Visualisation of Ada Programs

by [Georg Kienesberger - Vienna University of Technology](#)

The control flow graph is the basis for many code optimisation and analysis techniques. Ast2Cfg is a Free Software framework for the construction of powerful CFG-based representations of arbitrary Ada programs. The generated data holds extensive information about the original Ada source, such as visibility, package structure and type definitions and provides means for complete interprocedural analysis. Ast2Cfg was developed exclusively with Free Software like GNAT, the GNU Ada Compiler, and ASIS-for-GNAT. This presentation gives an overview on how to use the Ast2Cfg framework, and includes basics on the used data structures, an introduction to the architecture and a thorough coverage of the programming interface with numerous examples.

▷ <http://cfg.w3x.org>

Ada Annex E - Distributed Systems

by [Thomas Quinot - Adacore](#)

The Distributed Systems Annex is an optional part of the Ada language that allows writing programs that are distributed across several computers. Each "partition" of the program, running on one machine, communicates with the others by means of remote procedure calls and shared data structures. Ada provides facilities to make this communication completely transparent to the programmer. Thanks to it, writing a distributed program is no more complex than writing a monolithic one. Indeed it is possible to recompile a distributed program to make it either distributed or monolithic with no changes to the program source. There are two Free Software implementations of Annex E for GNAT,

the GNU Ada compiler : GLADE and its successor PolyORB, both licensed under terms of the GPL.

- ▷ <http://www.adaic.com/standards/05rm/html/RM-E.html>
- ▷ <https://libre.adacore.com/polyorb>

NARVAL - Distribution Data Acquisition from Particle Accelerators

by [Xavier Grave](#) - [Centre National de la Recherche Scientifique](#)

NARVAL stands for "Nouvelle Acquisition temps Reel Version 1.6 Avec Linux". It is a distributed data acquisition software system that collects and processes data from nuclear and particles physics detectors. NARVAL replaces an older system based on C, Fortran and proprietary technologies with Ada and Debian GNU/Linux and is itself Free Software. In order to ensure maximum data safety most of the code is written in Ada with heavy use of Annex E, the Distributed Systems Annex. Software engineers and physicists from several countries used this system for fundamental research.

The talk will presents NARVAL architecture in detail with some focus on the multi-tasking dataflow core and also the configuration done through Annex E.

- ▷ <http://www.in2p3.fr>

GPRBuild - A New Build Tool for Large-Scale Software Development

by [Vincent Celier](#) - [Adacore](#)

GPRBuild is a Free (GPL) modern multi-language builder from AdaCore. It is a configurable tool that is able to drive a large number of tool chains, both native and cross, of many languages, such as Ada, C, C++, Fortran, Assembler, etc... With GPRBuild, you are able to build systems written in one or several languages, with the main program in any languages. GPRBuild (re)compiles sources, (re)builds libraries and (re)links executables.

- ▷ <http://www.adacore.com/2008/11/18/gprbuild-120>

GPS - The GNAT Programming Studio

by [Vincent Celier](#) - [Adacore](#)

GPS, the GNAT Programming Studio, is a powerful and simple-to-use Integrated Development Environment that serves as portal to the GNAT toolchain. It provides customizable settings, browsing, syntax-directed editing, easy integration with third party tools such as Version Control Systems, source navigation, dependency graphs, and more. Built entirely in Ada, GPS is designed to allow programmers to get the most out of GNAT technology.

- ▷ <https://libre.adacore.com/gps>
- ▷ <http://www.adacore.com/2008/11/19/gps-43>

GNATBench - Ada programming with Eclipse

by [Vincent Celier](#) - [Adacore](#)

The GNATBench plug-in for Eclipse brings the advantages of AdaCore's GNAT toolset to Wind River's Workbench integrated development environment for embedded systems running VxWorks.

- ▷ <https://libre.adacore.com/GNATbench>
- ▷ <http://www.adacore.com/2008/10/02/gnatbench-220-211>

Ada in Debian

by [Ludovic Brenta](#) - [Debian](#)

The Debian Project is an association of individuals who have made common cause to create a free operating system. The development processes are open to the public and anyone can contribute. The strict Debian Free Software Guidelines are the basis of the Open Source Definition. The resulting operating system consists of tens of thousands of Free Software packages and is renowned for its reliability, thanks to Debian's extensive quality assurance policy. Debian GNU/Linux supports 12 hardware architectures and 4 more are in various stages of development. Debian GNU/Hurd, Debian GNU/NetBSD and Debian GNU/kFreeBSD are works in progress. Several other distributions use Debian as their foundation.

Ludovic Brenta will explain his work as the principal maintainer of Ada in Debian, and the policy that unites all Ada packages, thereby making Debian the best free Ada development platform in the world.

- ▷ <http://www.ada-france.org/debian/debian-ada-policy.html>

MaRTE-OS - A Hard Real-Time Operating System for Embedded Devices

by [Miguel Telleria de Esteban](#) - [Universidad de Cantabria](#)

MaRTE-OS is a Free (GPL) operating system developed in Ada that complies with POSIX.13 minimal real-time subset (also known as "the toaster profile") and Ada Real-Time Systems Annex D. It is thread based (no support for processes or different memory spaces and MMU's) and provides all synchronisation and timing features of POSIX Real Time standard. It can run as stand-alone (providing full Real-Time capabilities with support for drivers and real-time networks) or as a linux process (handling task scheduling itself and possibly interacting with linux shared libraries and filesystems). Applications can be developed in Ada 2005, C or C++.

The talk will present MaRTE features, choice of Ada for Real Time, development environments and a quick demo.

- ▷ <http://marte.unican.es>

Ada as an Hardware Descriptor Language

by Parnian Mokri - University of Tehran

By hardware designs getting more complex, hardware designers seek for new ways to modify the instructions to describe systems. Today RTL (Register Transaction Level, a constraint format to write HDL-source files) is used as a very common and suitable level for describing hardware, and VHDL, Verilog and other languages has been developed to meet these needs. However there is another family of languages for System level designers allowing desingners to focus on functionality of the design and to get rid of RTL details which are based on hardware/software co-design.

On the basis of Ada specifications such as strength in security-critical applications and a high-level concurrency model and since VHDL is derived from Ada, Ada is a natural choice for an emerging challenge in embedded-system programming multicore applications and therefore a very good choice to be used as a Hardware Descriptor Language.

(To be confirmed)

Speakers

Jean-Pierre Rosen

Jean-Pierre Rosen graduated from ENST (French engineering school) in 1975, and obtained PhD in 1986. He started as a software engineer at the computing center of ENST, then as Professor, where he was responsible for the teaching of Software Engineering and Ada. He has formed Adalog, a company specialized in high level training, consultancy, and software development in the fields of Ada and associated technologies (software engineering, object oriented methodologies).

Jean-Pierre Rosen is Chairman of the AFNOR (French standardization body) group for Ada, and a member of the ARG (Ada Rapporteur Group), the group of experts in charge of maintenance and evolution of the Ada language. He was a member of the expert team who controlled the development of the validation suite for Ada 95.

He is the author of "Méthodes de Génie Logiciel avec Ada 95" (Software Engineering Methods with Ada 95) and "HOOD: an industrial approach for software development".

Georg Kienesberger

Georg Kienesberger is a graduate student in Computer Science at the Vienna University of Technology, where he currently concentrates on research in the field of static control flow analysis. He is a longtime GNU/Linux enthusiast and also known as a passionate Free Software advocate. Within the Free Software Foundation Europe he serves as the Country Coordinator for Austria.

Xavier Grave

Xavier Grave got his PhD in theoretical physics in 1997 but learned programming by himself as early as 1984 and learned Ada with GNAT and the Lovelace tutorial in 1997. The following year, he joined the CNRS, where he is now developing a highly distributed acquisition system: NARVAL.

Thomas Quinot

Thomas Quinot holds an engineering degree from Telecom Paris and a PhD from Université Paris VI. The main contribution of his research work is the definition of a flexible middleware architecture aiming at interoperability across distribution models. He is now a Senior Software Engineer with AdaCore, a leading provider of tools and solutions for embedded, real-time and critical systems, where he is responsible for the distribution technologies.

Vincent Celier

Vincent Celier is a retired navy officer who spent 20 years in the French Navy, where he learned and practiced Ada starting in 1986. In 1988, he joined CR2A, where among other things he was one of the authors of ExtrA (Extension temps reel in Ada), an ISO Technical Report. In 1994, he moved to Vancouver in Canada, where he worked for 7 years in Ada on the Canadian Automated Air Traffic System. In Vancouver, he discovered Free Software and GNU/Linux. In 2001, he joined AdaCore. He is currently working mostly on the Project Manager and in particular on GPRBuild.

Ludovic Brenta

Ludovic Brenta has been programming since 1989 and using GNU/Linux since 1994. He graduated from INSA Lyon in industrial engineering in 1996 and has been a software engineer ever since. In 2002, dissatisfied with the languages he used, he started looking for safer alternatives and discovered Ada, which he taught himself with help from the Free Software community. He started giving back in 2003 when he adopted most of the Ada packages in Debian and has been an official Debian Developer since 2006.

Miguel Telleria de Esteban

Miguel Telleria de Esteban is a Free Software engineer and computer science researcher from Cantabria region in the north of Spain.

He started using Debian GNU/Linux in 2002 and keeps collaborating ever since with [Linux User Groups](#) (Brussels) and [Linuca](#) (Cantabria region, Spain). He discovered Ada in 1998 through the lectures of Prof Michael González Harbour in Cantabria and pursued it a year later with the Software Engineering course of Prof. Alfred Strohmeier's lab at the EPFL. After a 5 year period of IT consulting work in Brussels (where he discovered Free Software), he returned to the University of Cantabria to start a research career on Real-Time systems in the same lab where he was taught Ada for the first time ([CTR](#)).

Parnian Mokri

Parnian Mokri is a hardware computer engineering student at Theran Central Azad University. He learned about Free Software Foundation and Open Source project while being Robotic group manager during two years at his University. His thesis dealt with Detecting Heart Arrhythmia using CycloneII FPGA's specifications. I choosed Ada as is Programming Language specialty two years ago and now work with Professor Zain Navabi on subject such as Extending VHDL as a TLM Language, Object Oriented VHDL based on Ada, Developing Ada as a hardware descriptor language in Register Transaction Level and Transaction Level Modelling...