



EVIDENCE[®]
EMBEDDING TECHNOLOGY

Evidence

Company description ...and future challenges

Paolo Gai, pj@evidence.eu.com

IWES Workshop

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The company

Founded in 2002 as spin-off company of the
Real-Time Systems Lab at Scuola Superiore S.Anna



~20 qualified people with an average age of 34 years

10+ years of experience in academic and industrial projects

One third of the company has a PhD degree

Our Mission:

design and development software for small electronic devices



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The company



Partner in several European and Italian research projects (FP6, FP7, Ind.2015, Reg. Tuscany, H2020)

Founded SSG Srl in November 2011

<http://www.ssginnovation.com/> - [\(link to SSG slides\)](#)



Evidence won the first prize at Start Cup Pisa 2005



March 12, 2007 - selected by "*Corriere della Sera*" as one of the most innovative Italian young entrepreneurs



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(some) customers

OSEK, microcontrollers,
schedulability analysis,
code generation



Linux,
SW devel.



Listed as 3rd party



products and services

RTOS , Firmware, Embedded Linux

- OSEK/VDX, AUTOSAR, device drivers
- Embedded Linux: 8 Yrs experience custom BSPs, GCC, U-Boot, Kernel drivers
- Initial developers of the SCHED_DEADLINE patch
- QEMU and emulators



Application Development



Model-based design

- Matlab/Simulink/Stateflow



- National Instruments LabView



- E4Coder toolset for code generation



- UML/SYSML/Ecore/
Eclipse/Accelerator



Something about ERIKA Enterprise



<http://erika.tuxfamily.org>

- ERIKA Enterprise is an RTOS **OSEK/VDX certified**
- ERIKA Enterprise implements an API inspired to a subset of the **AUTOSAR API**
- **open-source license** allowing **static linking** of closed src code
- Typical footprint around 2-4KB Flash
- Used by various industries and research projects



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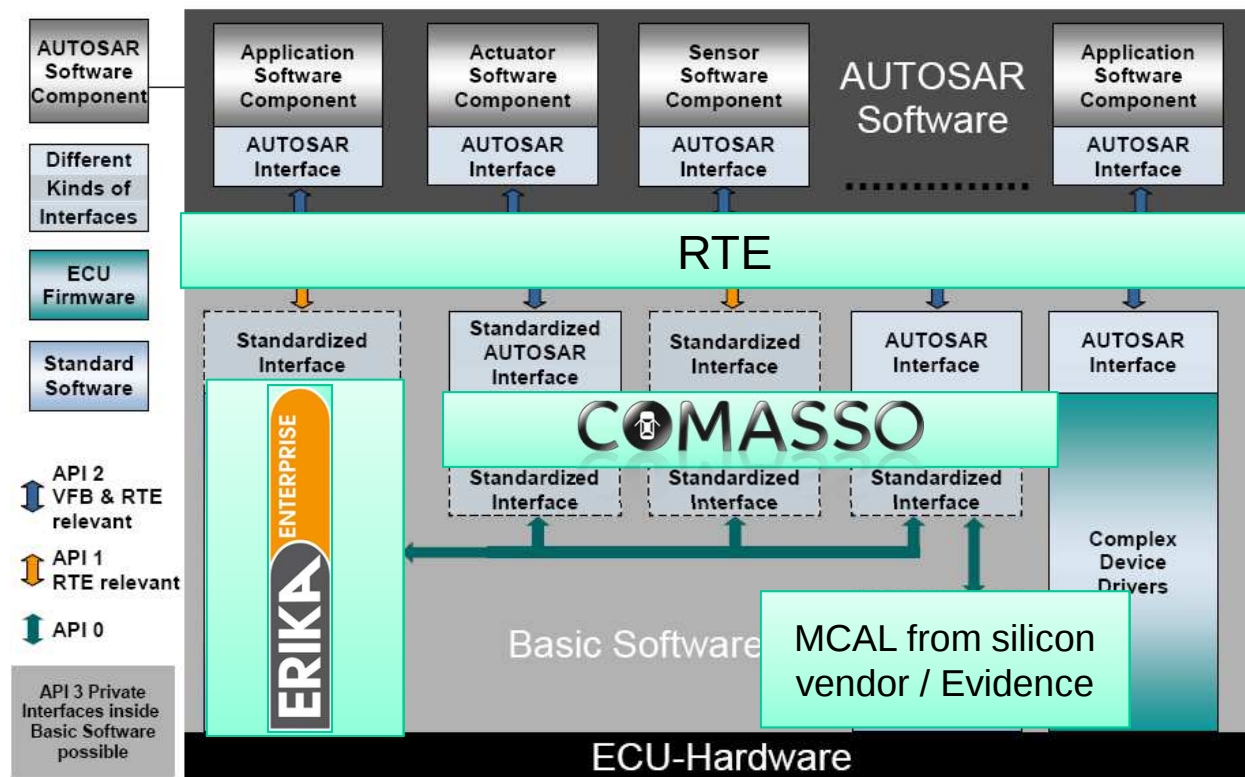
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Challenge 1: safety and security

What is the best way to provide safety (ISO26262) and security certification for ERIKA Enterprise?

Challenge 2: AUTOSAR

Are we able to fill the gap on Automotive SW providing a fully open-source (italian?) AUTOSAR system?



Challenge 3: Multicore and Hypervisors

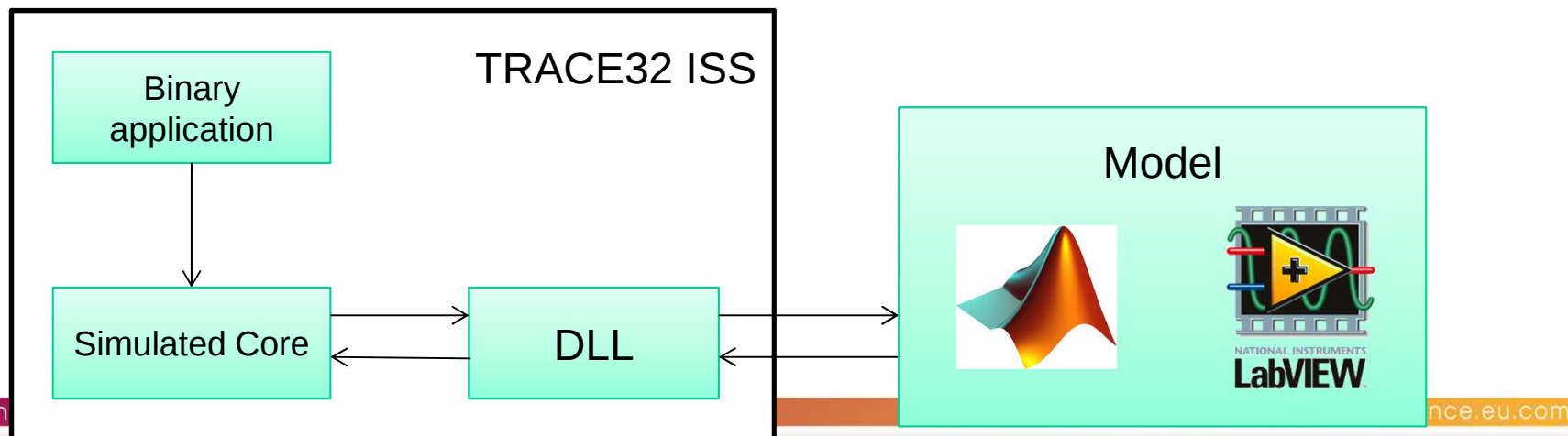
Efficient integration of small RTOS with Linux or legacy OS (VxWorks) on multicore systems

- Hypervisors? Which one?
- How to provide predictability?
- How to efficiently integrate the system for future applications?

Evidence is trying to address this challenge with the HERCULES (H2020), and RETINA (Eurostars) projects

Challenge 4: Emulators

- Use Trace32 Instruction Set Simulator to have a debugger-rich environment to test production code on specific microcontrollers
 - We could emulate the environment and the peripherals
 - To be used to perform regression tests and fault injection
 - To distribute a replicable environment for tests...and papers!
 - Simulated makers boards for students with top class debugger!



E4Coder - facts



is a toolset which is able to:

- simulate continuous time and discrete time designs
- simulate finite state machines
- GUI panel generation
- generate code without changing the design
- with and without RTOS
 - with support for microcontrollers without RTOS
 - with support for OSEK/VDX RTOS
- support for multi-rate designs

<http://www.e4coder.com>

Building Blocks



- ScicosLab / Scilab
 - Simulation engine
- E4Coder Code Generator
 - Code generation for embedded targets
- SMCube
 - Simulation / code generation of Finite State Machines
- E4Coder GUI
 - Simulation / code generation of GUI Panels
- E4Box

Challenge 5: modeling framework

What about using...  python™ ?

- It has most of the math libraries needed
- It can be embedded in a C++/Qt frontend

The missing part is...

- A good solver
- A good editor
-  / FMI integration

Interest of Evidence: building an integrated tool with simulation and code generation features, state machines, GUI editing...

Contacts



Evidence Srl
Via Carducci 56
56010 S.Giuliano Terme
Pisa - Italy

Web: <http://www.evidence.eu.com>

E-mail: info@evidence.eu.com

Phone: +39 050 99 11 224