.AMPERE

A Model-driven development framework for highly Parallel and
EneRgy-Efficient computation supporting multi-criteria optimisation

OpenERIKA as the beginning of an
AUTOSAR Classic system open to AUTOSAR Members

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June 27th 2023 – Final dissemination event

About ERIKA3

http://www.erika-enterprise.com

- AUTOSAR OS developed for automotive Electronic Control Units (ECUs)
- Reference standards: MISRA-C, AUTOSAR OS, OIL conf. file
- Support for various ECUs (8 – 16 – 32 bit), AUTOSAR OS SC1
- Complete rewrite compared to (older version now not maintained) ERIKA2
- Development funded by European research projects since 2006
- A (closed source) fork made by Huawei reached AUTOSAR OS SC4 ASIL-D compliance … and is part of the Huawei VOS product

Community of Evidence and ERIKA OS (2019)

- R&D purposes
- in production directly

OEM

- Training courses
- Research projects
- Research papers
- Example: more than 30 universities around the world, more than 10 research projects in Germany only using ERIKA as the base

Universities R&D

Tier 1, 2 Supplier

Production OS for
- Powertrain
- Alarms
- IOT
- BMS
- Body applications

- Library integration
- Test platform for new chips
- Integration with silicon vendor libraries

Silicon Vendors

Tool Vendors

Demos: the only open source OS allowing Tier 2 to show their technology in an automotive context

- Using ERIKA, customizing it and providing it to third companies
- other companies in India/Russia

Engineering companies

27/06/2023

The Vision

- **Create a modular platform**
  … that over time can grow towards a complete AUTOSAR CP Platform

- **… as a project run in AUTOSAR**

- **… initially based on production code (i.e., ERIKA3 AUTOSAR OS)**

- **… which is vendor-neutral**

- **… with full source code provided**

- **… open to all chipsets**

- **… simple to "prune" (silicon vendors love customized integrated releases…)**

- **… with permissive licensing compatible with AUTOSAR rules**

- **… with community support.**
  Committed community support
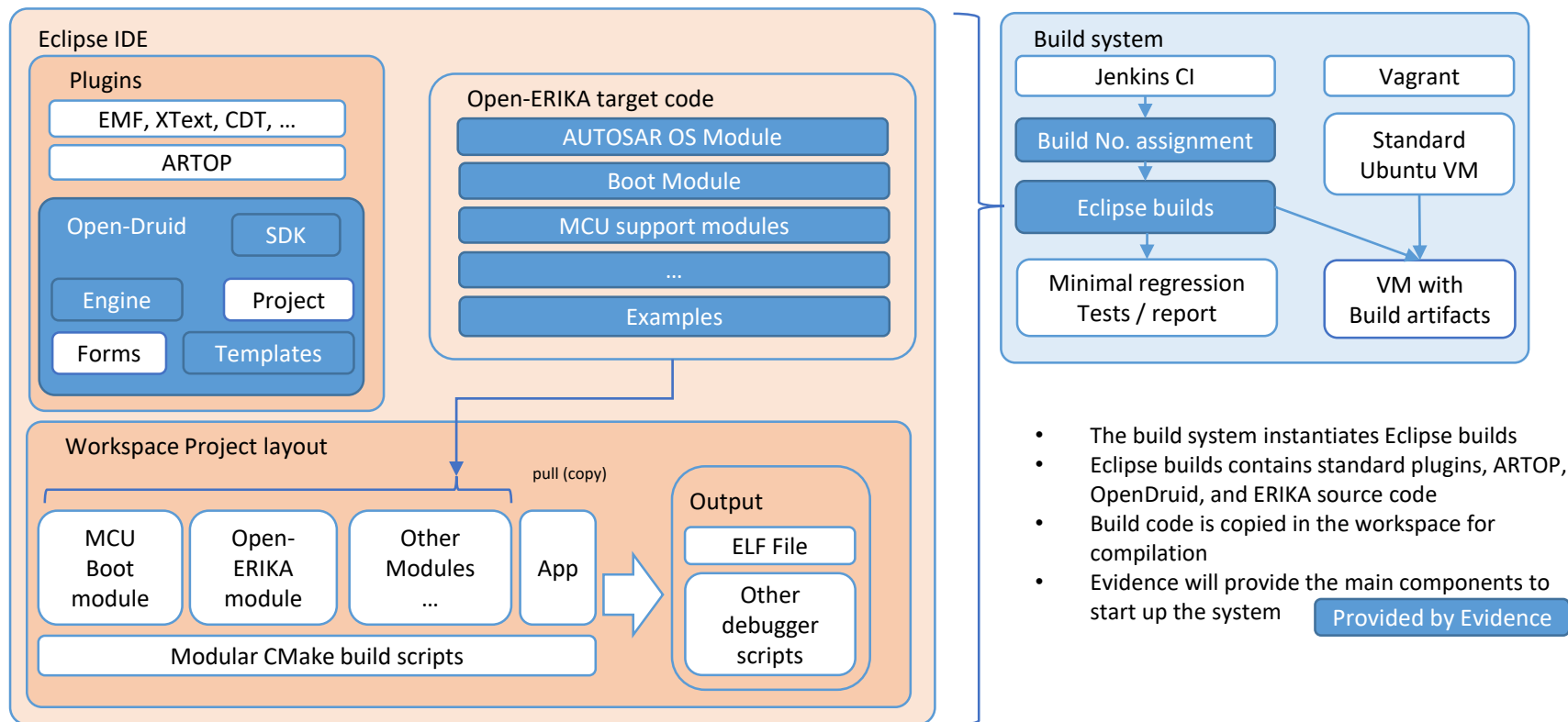 **from at least one AUTOSAR member (Evidence)**

The "platform concept"

The platform will start with the following components:

- **Application build scripts**
  - A modular set of build scripts based on CMake, which enable building the code (optionally removable)

- **"Open-ERIKA" Target code**
  - Initially OS Code and examples, then other modules will come from the community

- **Tooling for the configuration of Open-ERIKA**
  - Currently being written / will be committed in AUTOSAR

- **Build system**
  - Jenkins CI with build numbers
    - Each build has a number (e.g., "CP57")
    - "good" versions periodically tagged
    - "yearly versions" part of the releases aligned with AUTOSAR timings (e.g., 2021-11)
  - Vagrant tool for creation of prebuilt Virtual Machines → to make it easy to deploy

Shape of how the system will work

Eclipse IDE

Plugins
- EMF, XText, CDT, …
- ARTOP

Open-Druid
- SDK
- Engine
- Project
- Forms
- Templates

Open-ERIKA target code
- AUTOSAR OS Module
- Boot Module
- MCU support modules
- …
- Examples

Workspace Project layout

pull (copy)

- MCU Boot module
- Open-ERIKA module
- Other Modules …
- App

Output
- ELF File
- Other debugger scripts

Modular CMake build scripts

Build system
- Jenkins CI
- Vagrant
- Build No. assignment
- Standard Ubuntu VM
- Eclipse builds
- Minimal regression Tests / report
- VM with Build artifacts

- The build system instantiates Eclipse builds
- Eclipse builds contains standard plugins, ARTOP, OpenDruid, and ERIKA source code
- Build code is copied in the workspace for compilation
- Evidence will provide the main components to start up the system   Provided by Evidence

Licensing of ERIKA Enterprise

The AUTOSAR OS which is typically known as «ERIKA»
is in reality composed by two components:

- **ERIKA** – the RTOS, which is the source code that once compiled goes into the embedded device
- **RT-Druid** – A set of Eclipse-based plugins that provides a configurator able to generate ERIKA configuration code from a OIL language specification. The nice feature is that in general it can be seen as a generic engine generating configuration code for this specific instance

ERIKA2 License

- GPLv2 (no later clause) + linking exception
- License cannot be changed because we accepted contributions from outside

RT-Druid2 License

- EPL Licensed

To be changed into OSEK-VDX only, or to be removed

ERIKA3 License (up to GH65)

- GPLv2 (with later clause)
- + Third party linking exception
- + Linking exception for a fee
- + Contribution agreement

RT-Druid3 License

- Closed source (demo license)

To be removed once Open-ERIKA available

OpenERIKA / Open-Druid

- Starting point: code of ERIKA3 on GitHub contributed to AUTOSAR Consortium in March 2023
  - Using APD Licensing (for now available for AUTOSAR Members only)
  - https://code.autosar.org/open-erika
- OpenDruid development started
  - Based on ARTOP+Xtext
  - First release on s32K148 by 1Q 2024
- First interests:
  - Alten working on COMASSO support
  - Universities, companies, AUTOSAR WGs

Available for AUTOSAR Members Free membership for Universities

R&D development roadmap

- **Evidence is going to support enhancements of Open-ERIKA in the future**
  - R&D topics and innovation related to ERIKA3
  - Support for community development (training, documentation, …)
  - Open-Druid customizations
  - Support for new chipsets

- **Evidence is seeking for cooperation with external partners (association, companies and universities) for fostering common innovation**
  - Integration with ARTOP (to provide the Eclipse EMF import of AUTOSAR models)
  - Integration with COMASSO (currently Alten is looking at it)
  - Integration with silicon vendor MCALs
  - Example projects, additional AUTOSAR Classic modules…

- **Evidence is committed in creating a community**
  - Evidence is seeking **collaborations with SMEs** for the community/commercial support of Open-ERIKA for various customers currently using the tool
  - Evidence is interested in **creating a community of users and developers**

Join us* on   https://code.autosar.org/open-erika   … and stay tuned for the next releases!

27/06/2023

* AUTOSAR Membership required

Thanks for listening

www.ampere-euproject.eu