

Systems and Automotive WG

WG SIG Annual Updates 2026

Feb 11th, 15:40-16:05 UTC

Philipp Ahmann, ETAS GmbH



ELISA

Enabling **Linux** in
Safety Applications

Aerospace · Automotive · Linux Features

OS Engineering Process · Safety Architecture · Systems · Tools

Lighthouse · Space Grade Linux

Presentation is split in two parts

Systems WG



Automotive Update



Light on Automotive WG

Automotive is currently operated as part of Systems WG *(due to capacity reasons)*

Automotive topics within Systems WG:

- HPC, ECU centralization & mixed-criticality
- Regular AGL exchange and participation
- Progressing towards AGL SoDeV from SDV EG





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Systems WG



Systems WG Definition

- The Systems WG aims to enable other working groups within ELISA
- Put the other WGs safety claims towards Linux in a wider system context.
- Build a reproducible example system based on real-world architectures,
- Implemented fully based on open source technologies.

**The Systems WG encourages interactions with other projects,
which either also help enable safety use cases with OSS
or plan to make use of mixed-criticality system elements
as a base for their product lines.**



Linux in Safety Critical Systems

***“Assessing whether a system is safe,
requires understanding the system sufficiently.”***

- Understand Linux within that system context and how Linux is used in that system.
- Select Linux components and features that can be evaluated for safety.
- Identify gaps that exist where more work is needed to evaluate safety sufficiently.



Achievements 2025



What we have done in Systems WG

- Started Lighthouse-SIG (session tomorrow) on “Open Source Best practices standard”
- Promoted “Railways WG”.
Not yet formed, but story continues
- Worked on “Continuous Compliance” with ARM and InfoMagnus
Use GitHub to have a trace from test to code on updates using SBOMs
- CVE Report and SBOM from Yocto added to CI (medial WG)
- Presented initial OSS safety-critical landscape and certification pathways

Leave ELISA towards broader ecosystem

- Evaluated “Standards Atlas” and how it ties to Systems and can help people not able to access all standards
- Alignment with Eclipse Automotive Process WG
- AGL SoDeV started taking over the Systems WG architectural concept





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Plans 2026



Cross WG activities examples

ELISA:

- What is quality actually? → Work together on this with OSEP
- How does safety monitoring work? → LFSCS & Architecture
- CI improvements → Tools

OSS community:

- Bring in the safety config from Xen into the ELISA example system
- Update Zephyr domain to latest (LTS) release into ELISA example system



Started and ongoing activities

- Create a safety critical Open Source landscape page
- Railways SIG formation
- Automotive: SoDeV collaboration
 - Update the meta-elisa for IC demo to latest state
 - Integrate meta-elisa into SoDeV for IC part
 - Include telltale monitoring in Zephyr.
 - Goal: Implement safety-monitoring for the Instrument Cluster in AGL SoDeV
- AI in safety systems?

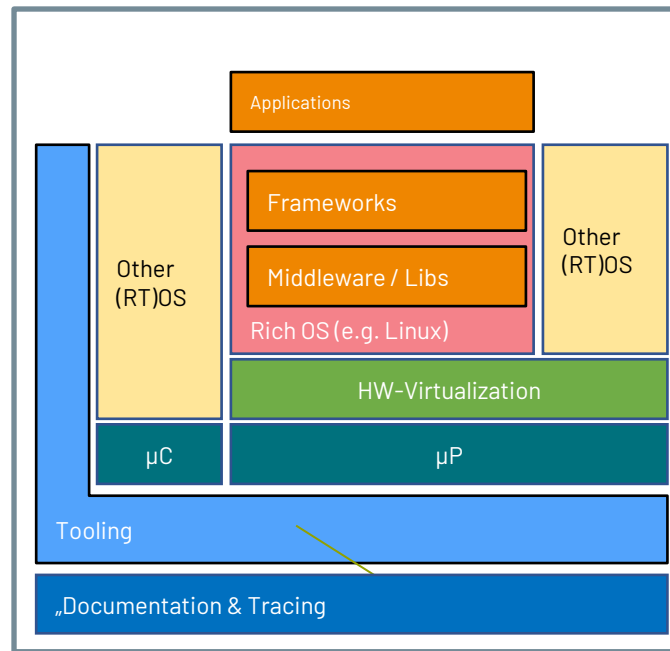


Safety Critical Open Source Landscape

Motivated by the Systems WG activities

- Requirement tools
- Documentation frameworks
- Traceability tools
- Testing frameworks
- Build tooling
- Compiler
- Hypervisor
- (RT)OS
- Container
- Middleware
- Frameworks
- IDEs
- ...

Projects
&
Foundations



Exemplary safety-critical open source project & initiative selection ... spot check



Open Source Safety Critical Landscape

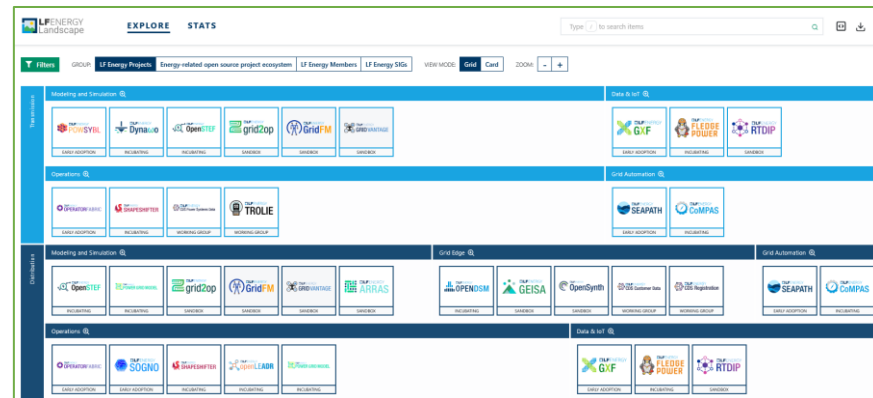
Middleware	Iceoryx	Eclipse S-CORE	Open AD Kit	
RTOS & OS	Zephyr	Eclipse ThreadX	AutoSD	
Virtualization	Xen	L4Re	seL4	
Compiler/language	Ferrocene		LLVM Qualification WG	
Req. Tools	BASIL	StrictDoc	Sphinx-needs	OpenFastTrace
Frameworks	Eclipse Trustable		SPDX Safety Profile WG	
Initiatives	ELISA	Safety Critical Rust Consortium		SOAFEE

Exemplary safety-critical open source project & initiative selection

Note: Mapping may have some (smaller) inconsistencies

Idea: <https://landscape.elisa.tech>

Bring a collection of notes and examples in a web based landscape



<https://github.com/lf-energy/lfenergy-landscape>

Railways

Railways: Approaching an additional industry...

- Several meetings to discuss working group formation
- Started at FOSDEM 2025
- Continued at FOSDEM 2026
- Proposal is to start a SIG as part of Systems WG
- Next meeting considered for e/o Feb or b/o March 2026
- Meeting will be shared via LinkedIn once date is confirmed



Automotive

meta-elisa on its way to 2026 and AGL SoDeV

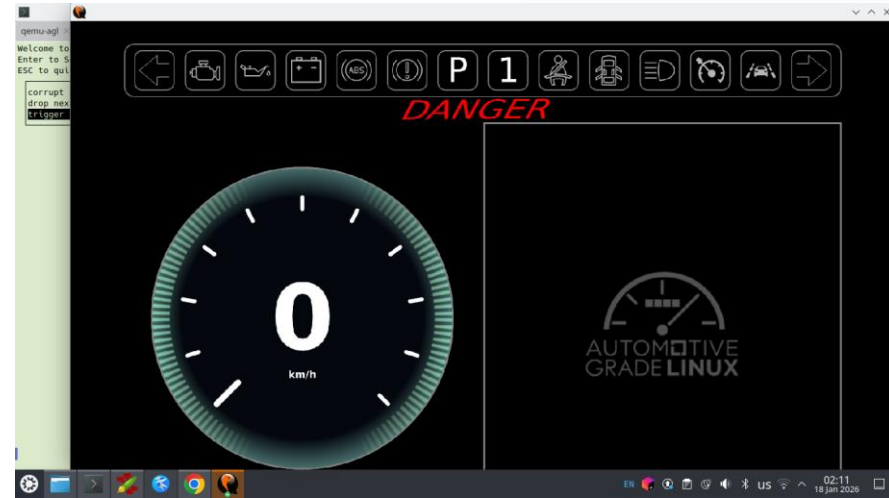
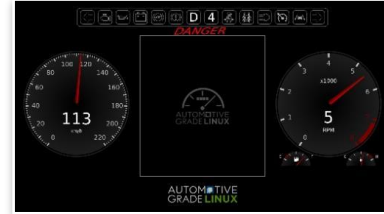
What is happening:

- Currently under update to latest AGL release
- Update docker container for better system compatability
- Rework for closer match to AGL flow using repo tooling
- Planned to be merged within next 2 weeks.

<https://github.com/elisa-tech/meta-elisa>

<https://github.com/elisa-tech/wg-automotive>

🚗 Update in progress... 🤖



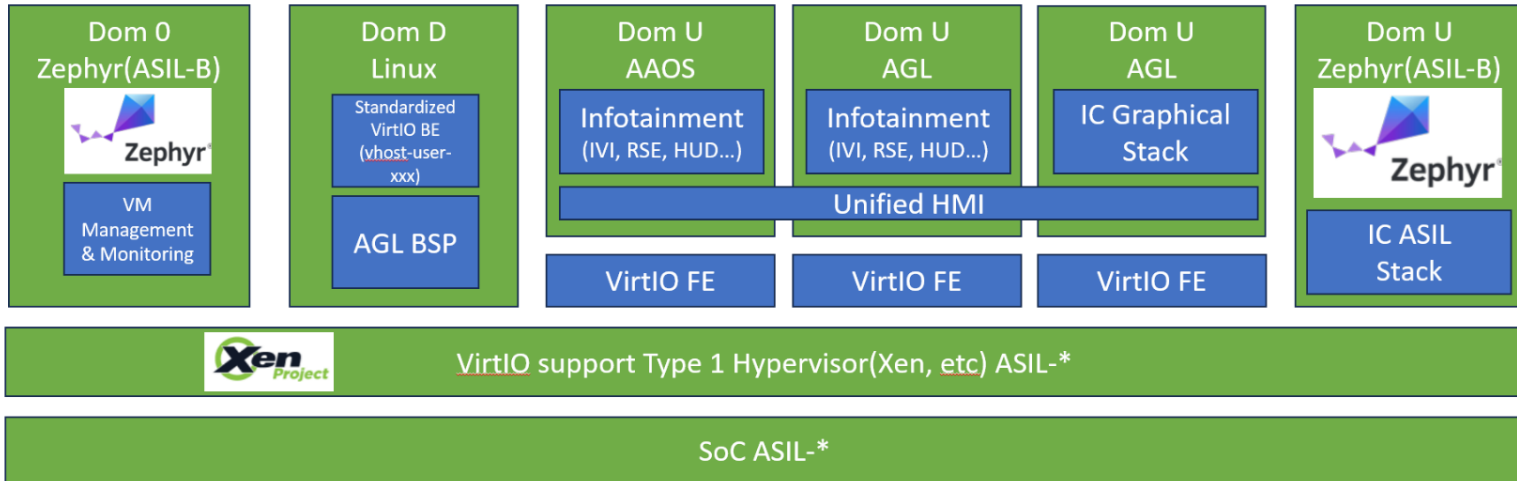


AGL SoDeV – Architectural overview

Control Domain
Monitoring,
Start/Stop VM,
Reboot PF

Driver Domain
HW Access

Guest Domains



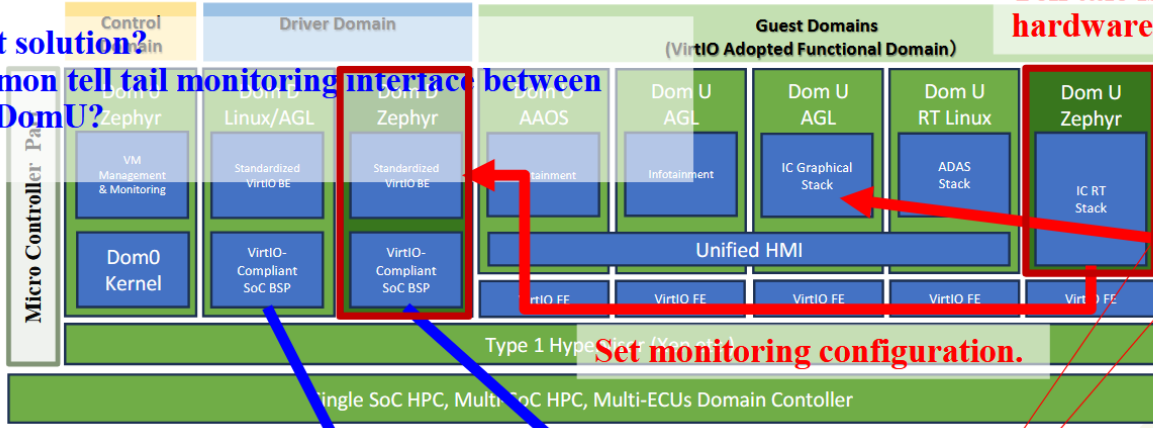
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Meta-elisa to find its way into SoDeV?!

- How to achieve safety?
 - Example use case: Tell tale for instrument cluster.

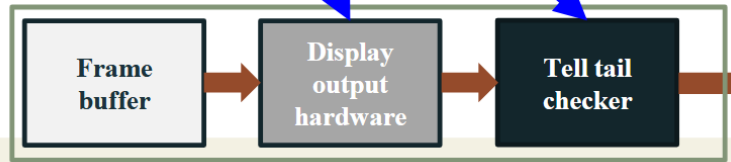


What is best solution?
Create common tell tail monitoring interface between DomD and DomU?
Others?



Tell tale is drawn by the hardware decoupled domain.

Set monitoring configuration.



Systems WG in the wild

Presentations 2025

- **Embedded World Germany**
Open Source Software in Safety-Critical Applications: Challenges and Collaborative Solutions
- **OSS North America**
[Developing a Community-Driven Standard for Open Source Software Quality](#)
- **COSCUP Taiwan**
[The Way for Safe Systems Constructed by Open Source Software](#)
- **eLSA Symposium Germany**
Open Source in safety critical Products
- **OSS Japan**
[Decoding Safe\(ty\) Linux Architectural Approaches for Critical Systems](#)



Meet us in the wild 2026

Get in touch for example at:

- FOSDEM (already over)
- embedded world
- Eclipse OCX
- ELISA Workshop
- OSS Europe/Japan/...

More to be added after confirmation by organizers.



Photo by [Paul Hanaoka](#) on [Unsplash](#)



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Call to action

Get Involved

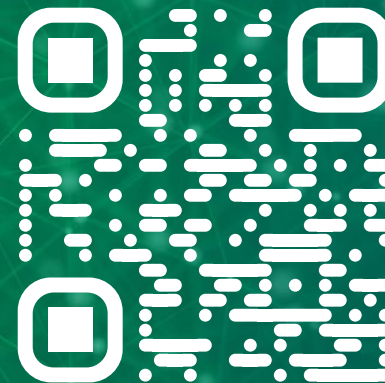
- System WG meets every other Tuesday 16:00 UTC
(15:00 UTC during DST)
<https://elisa.tech/community/meetings/>
- Mailing list(s)
<https://lists.elisa.tech/g/systems/>
<https://lists.elisa.tech/g/automotive/>
<https://lists.elisa.tech/g/lighthouse>
- Discord
<https://discord.gg/C4DDjNHS>
- Issues (or even better PRs) welcome!
<https://github.com/elisa-tech/wg-systems/>
<https://github.com/elisa-tech/meta-elisa>
<https://github.com/elisa-tech/wg-automotive>



Photo by Hannah Busing on Unsplash



Thank you!



<https://elisa.tech>

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Our infrastructure and tools are open by default, so jump in and introduce yourself, ask questions and share ideas. Please consider this your invitation to participate.



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