

Systems WG Update

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Aerospace · Automotive · Linux Features
Medical Devices · OS Engineering Process
Safety Architecture · Systems · Tools

Topics

- Working group goal & introduction
- Milestones & achievements in 2023
- Challenges and fails
- Current focus / activities
- Plans for 2024 & collaboration opportunities

Working Group Goal & Introduction

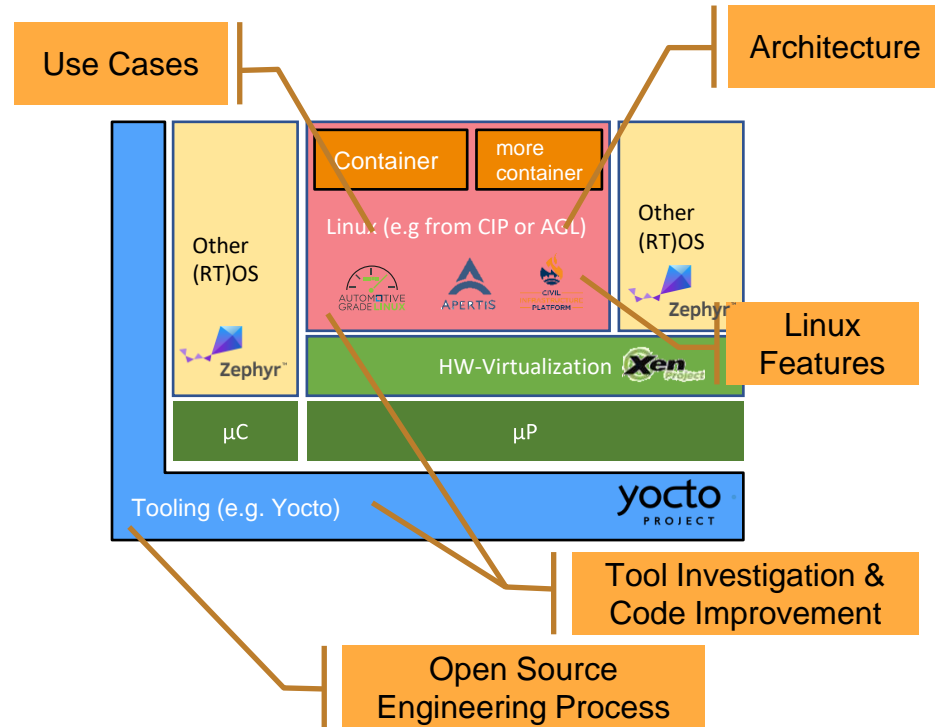


Working Group Goal

“Enable other working groups within ELISA to put their safety claims towards Linux in a wider system context.”

ELISA Working Groups - Fit in an Exemplary System

- **Linux Features, Architecture and Code Improvements** should be integrated into the reference system directly.
- **Tools and Engineering process** should serve the reproducible product creation.
- **Medical, Automotive, Aerospace** and future WG use cases should be able to strip down the reference system to their use case demands.



Interaction with Other Communities (Outside ELISA)

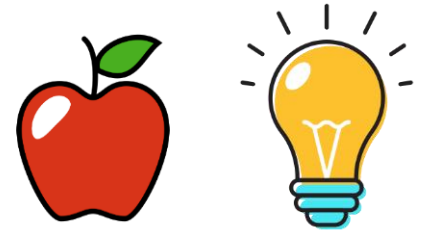
- Open source projects focusing on safety-critical analysis



- Open source projects with safety-critical relevance and comparable system architecture considerations



- Further community interactions



“If you have an apple and I have an apple and we exchange these apples then you and I will still each have **one apple**

But if you have an idea and I have an idea and we exchange these ideas, then each of us will have **two ideas**

— George Bernard Shaw



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Milestones & Achievements



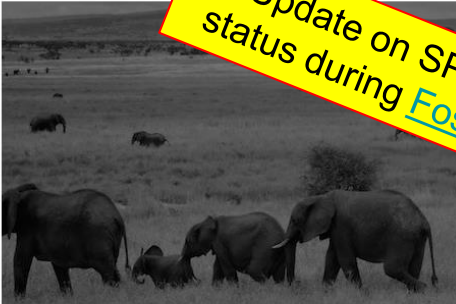
Milestones & Achievements

- SPDX-FUSA subgroup started
- Systems WG related demos at CES (e.g. by epam)
- Started with Renesas R-Car H3. Migrated towards Xilinx ZCU102
- First hardware demonstrator setup prepared and showcased
- Public events: Presentations at EOSS, Plumbers and Exida Symposium
- Continuous integration enabled for system images

SPDX Subgroup: <https://lists.spdx.org/g/spdx-fusa>

SPDX

Home
Messages
Hashtags
Subgroups



Update on SPDX-FUSA status during Fosdem 2024!

spdx-fusa@lists.spdx.org

This group is focused on extending SPDX so that the functional safety (FuSa) related information can be conveyed accurately in a bill of materials.

Group Information

- 20 Members
- 159 Topics , Last Post: Jan 12
- Started on 8/10/22
- Feed

Group Email Addresses

Post: spdx-fusa@lists.spdx.org
Subscribe: spdx-fusa+subscribe@lists.spdx.org
Unsubscribe: spdx-fusa+unsubscribe@lists.spdx.org
Group Owner: spdx-fusa+owner@lists.spdx.org
Help: spdx-fusa+help@lists.spdx.org

Hardware Demonstrator Setup - Xilinx ZCU102

- Board ZCU102 ([link](#) to description)
 - Reference manual ([link](#))
 - SD card 16GB for boot loader
 - USB Stick 16GB for demonstrator setup
 - USB-Ethernet-Adapter (DLINK)
- Environment for setup
 - Local DHCP server (VM with system networkd)
 - Putty for serial console
 - USB Keyboard (for TTY console)
 - HDMI screen

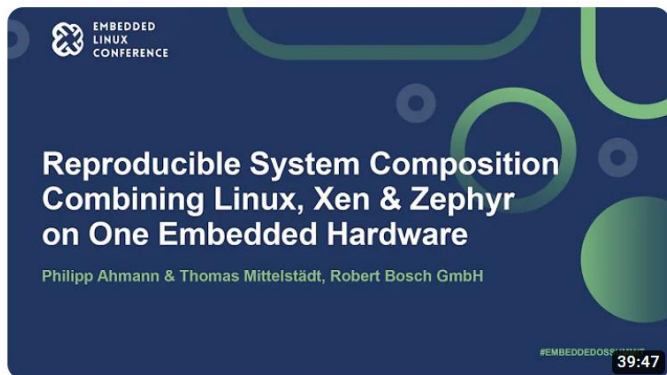


Hardware Demonstrator Setup - Packaging

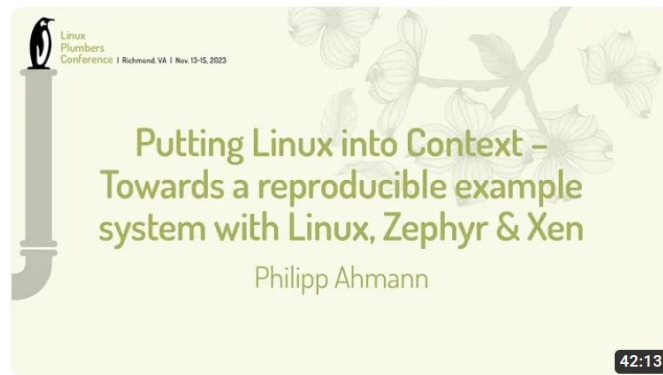
- Running example system during Embedded Linux and OSS Day at Bosch in July.
- Various use cases and setups documented (see presentations at EOSS)



Public Events: Presentation at EOSS and Plumbers



<https://youtu.be/93bFxGC7G5M>



<https://youtu.be/xUPOAUAbGwI>

Challenges & Fails



Challenges & Fails - GPU and System SBOM

- HW with good GPU virtualization support is hard to find (meaning community version without the need of NDA!)
 - AGL demo integration did not work out completely.
 - Just specific use case reproduced from an epam demo (AGL as DomU, not reproducible for others due to license restrictions for GPU binaries)
 - HW accelerated graphics with virtualized GPU is very limited to hardly possible with the ZCU102
- System SBOM not yet part of the CI.

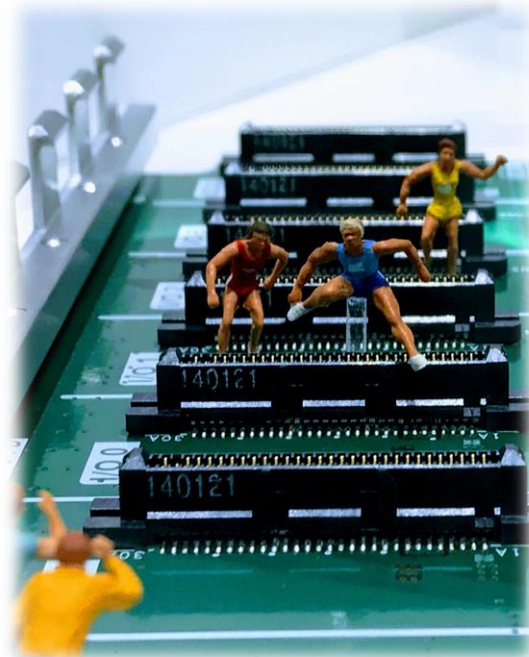


Photo by [John Cameron](#) on [Unsplash](#)



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Current Focus / Activities



Current Focus / Activities

- Enhance CI to include image boot with qemu
- System SBOM generation
- Work on example system to be showcased at exhibitions & fairs

Systems-WG-CI Enhancements

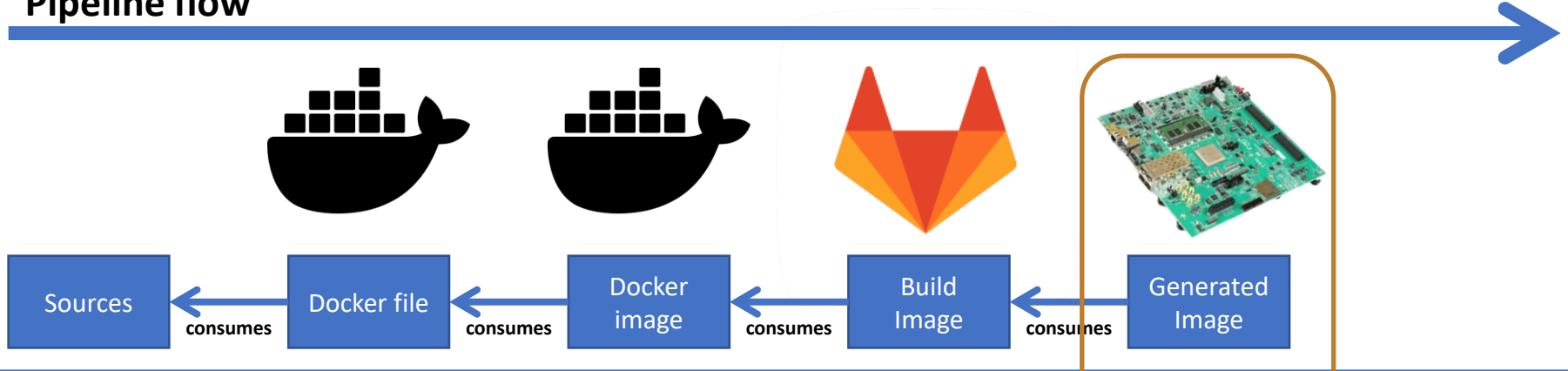
The screenshot displays the GitLab CI interface for the 'systems-wg-ci' project. The left sidebar contains navigation options: Project, Pipelines, Jobs (selected), Pipeline schedules, Artifacts, Deploy, Operate, Monitor, and Analyze. The main content area shows a list of jobs under the 'Jobs' tab, with a search filter and a table of job details.

Status	Job	Pipeline
Passed 00:00:59 9 hours ago	#5927613959: push_package main 3208c235	#1138002012 created by [user] Stage: package
Passed 00:10:12 9 hours ago	#5927613932: system-wg-build main 3208c235 elisa	#1138002012 created by [user] Stage: build
Passed 00:00:59 1 day ago	#5925337054: push_package main 3208c235	#1137500521 created by [user] Stage: package
Passed 00:12:27 1 day ago	#5925336972: system-wg-build main 3208c235 elisa	#1137500521 created by [user] Stage: build

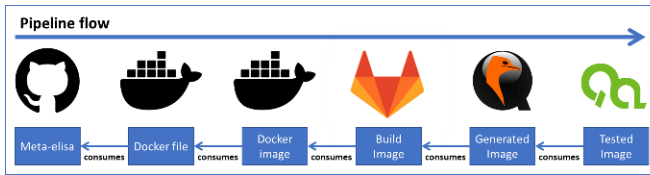
<https://gitlab.com/elisa-tech/systems-wg-ci>

Systems-WG-CI Enhancements

Pipeline flow

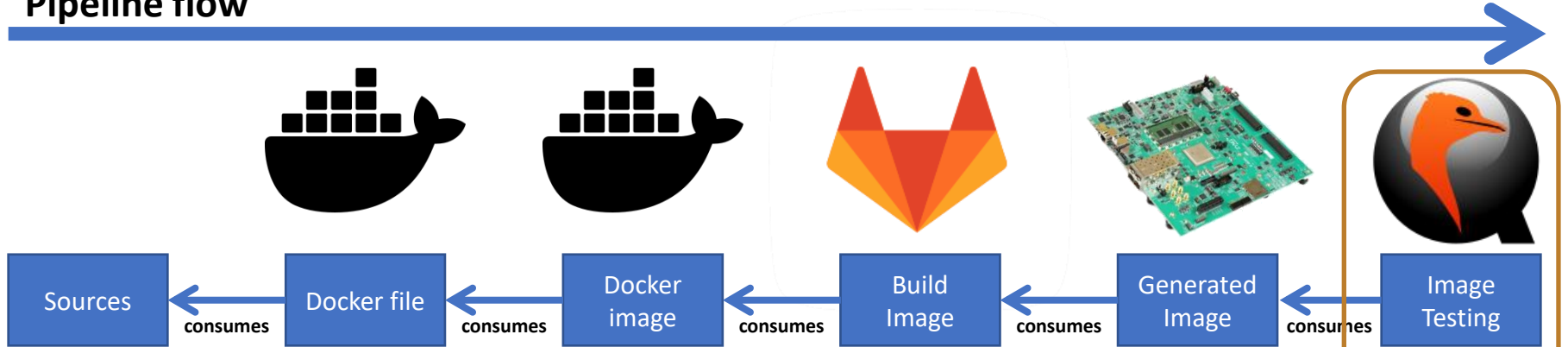


Pure Linux system "meta-elisa":



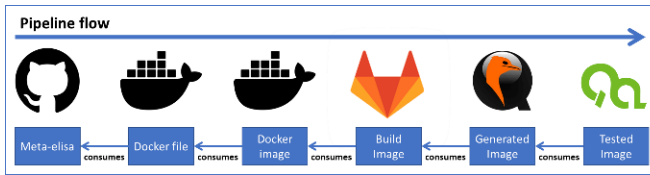
Systems-WG-CI Enhancements

Pipeline flow

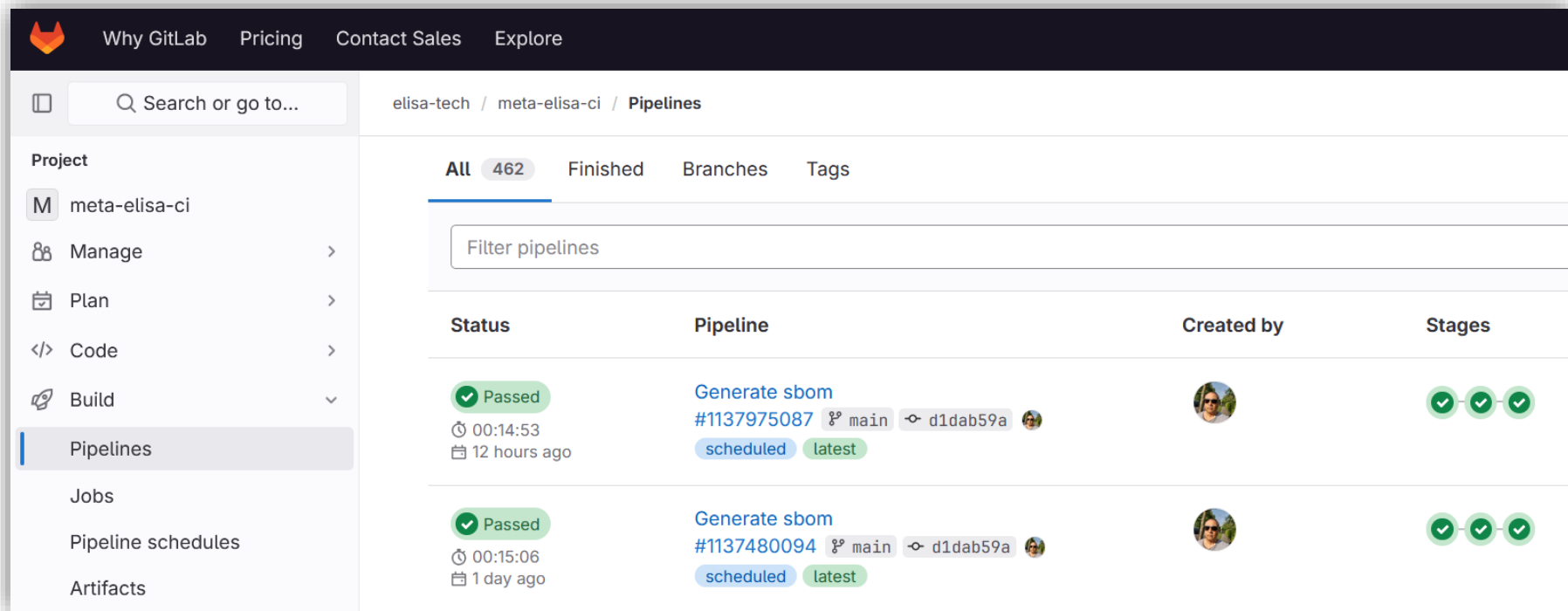


Qemu Boot test with HW images as CI job

Pure Linux system "meta-elisa":



AGL SBOM Already Available from Automotive WG



The screenshot shows the GitLab interface for the project 'elisa-tech / meta-elisa-ci / Pipelines'. The left sidebar contains navigation options: Project, meta-elisa-ci, Manage, Plan, Code, Build, Pipelines (selected), Jobs, Pipeline schedules, and Artifacts. The main content area displays a list of pipelines under the 'All' tab, which has 462 items. A search filter is present. Two pipelines are visible, both with a 'Passed' status and three green checkmarks in the 'Stages' column. The first pipeline is '#1137975087' and the second is '#1137480094'. Both are scheduled and have a 'latest' tag.

Status	Pipeline	Created by	Stages
Passed	Generate sbom #1137975087 main d1dab59a		
Passed	Generate sbom #1137480094 main d1dab59a		

<https://gitlab.com/elisa-tech/meta-elisa-ci/-/pipelines>



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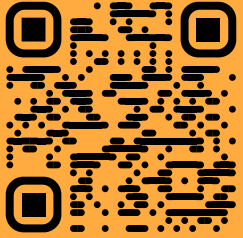
Plans for 2024 & Collaboration Opportunities



Plans for 2024 & Collaboration Opportunities

- Enablement of additional hardware (in best case with Graphics Support)
- Enhance feature set on an example use case
 - E.g. potential outreach to LFEnergy and EVerest project on EV charging?
- Closer interaction with Zephyr community
- AI as part of SBOM and its importance for safety-critical systems?

Plans for 2024 & Collaboration Opportunities



Any suggestions on good community hardware is welcome!

Volunteers to bring the porting of new hardware are needed!

Feedback needed to improve example system documentation!

Thank you!

(Interested? Join the regular [meeting](#)
and subscribe to the [mailing list!](#))

JOIN THE COMMUNITY

ELISA members are defining and maintaining a common set of elements, processes and tools that can be incorporated into specific Linux-based, safety-critical systems amenable to safety certification. ELISA is also working with certification authorities and standardization bodies in multiple industries to establish how Linux can be used as a component in safety-critical systems.

Join us to expand the use of Linux across new industries including healthcare, energy, transportation, and manufacturing. Learn more today to participate and support ELISA.



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