




What's new in Apertis, a Debian derivative tailored for industrial embedded devices

DebConf25






- Debian Developer
- Software Engineer @ **Collabora** 
 - Apertis
 - Debian
 - Pipewire & Wireplumber
 - Wayland & Vulkan related packages
 - Machine learning packages: ONNX Runtime and TensorFlow Lite (soon?)
 - etc

- **Why another Debian derivative?**
- **What is Apertis?**
- **What's new?**
- **What's next?**








Why another Debian derivative?

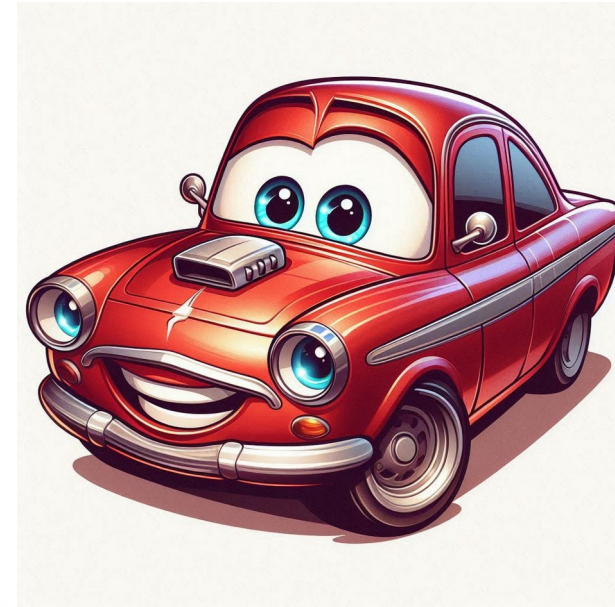
Why another Debian derivative?

- Debian is everywhere
 - Laptop 
 - Server 
 - Mobile phone 
 - International Space Station 
 - ...on the Moon (CADRE project¹) 

¹ <https://www.jpl.nasa.gov/missions/cadre/>

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 - but, it wasn't in your car!



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 - 🚗 COVESA's license policy rejects GPL-3 because anti-tivoization clause*
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 - EU's Cyber Resilience Act 🇪🇺
 - SBOM requirements
 - Licenses & Copyright used ⚖️
 - Security issues 🛡️

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 - Strict schedule
 - Released when it's ready...
 - Predictable schedule! ⌚

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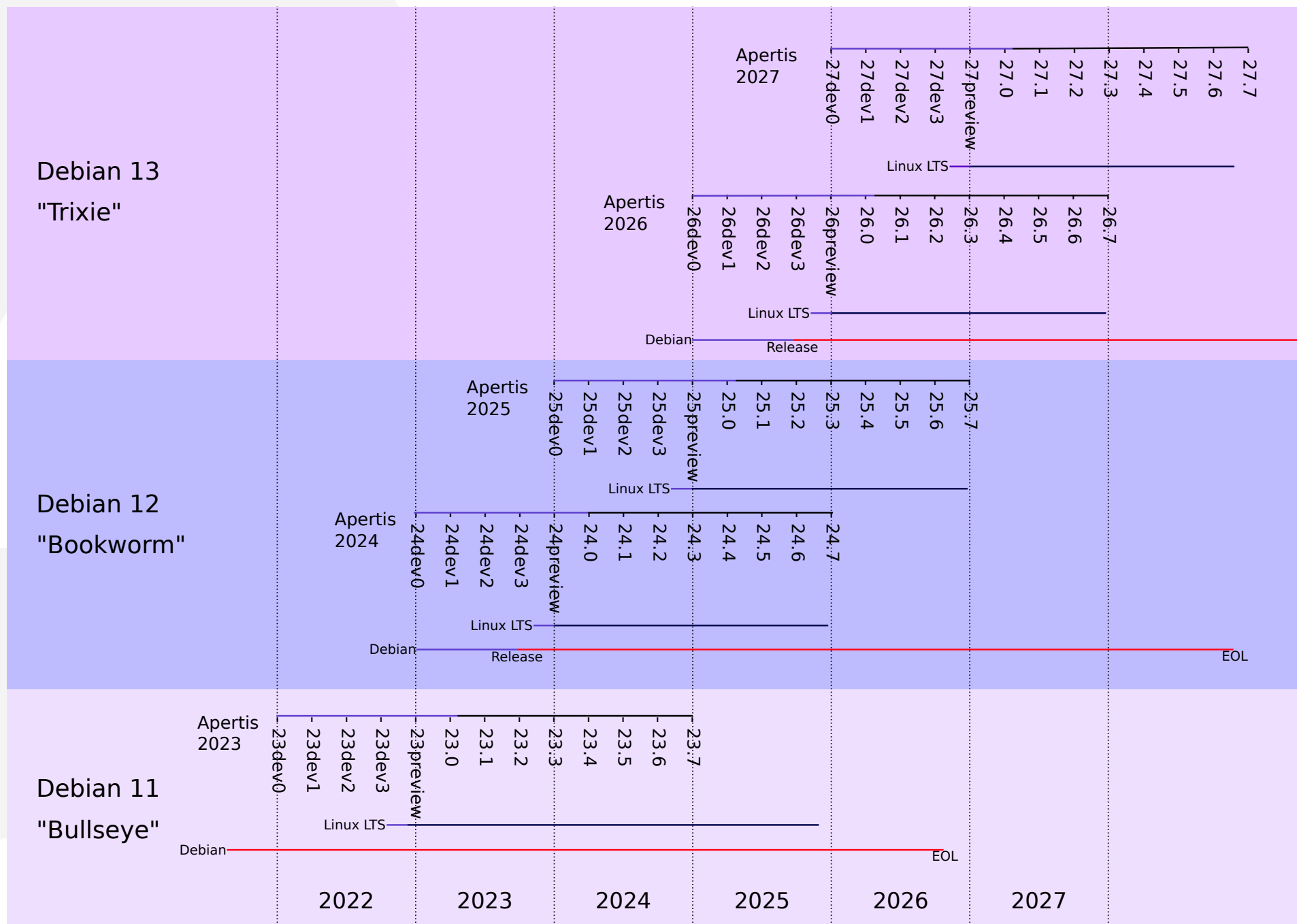
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- ...a **Debian derivative**
 - Based on Debian stable + Linux LTS
 - Yearly release:
 - v2024: 🐛 Bookworm + 🐧 Linux 6.6.X
 - v2025: 🐛 Bookworm + 🐧 Linux 6.12.X
 - v2026: 🦖 Trixie + 🐧 Linux 6.??X
 - Quarterly point release: v2024.0 → v2024.7
 - Supported for 2 years



What is Apertis?

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 - ~ 5.900  VS ~ 35.500 
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 - Subset of packages 
 - ~ 5.900  VS ~ 35.500 
 - Packages/Features not required disabled
 - No *GPL-3
 - Replaced by modern alternative  (since v2022)
 - coreutils → rust-coreutils
 - findutils → rust-findutils
 - GnuPG → Sequoia-PGP

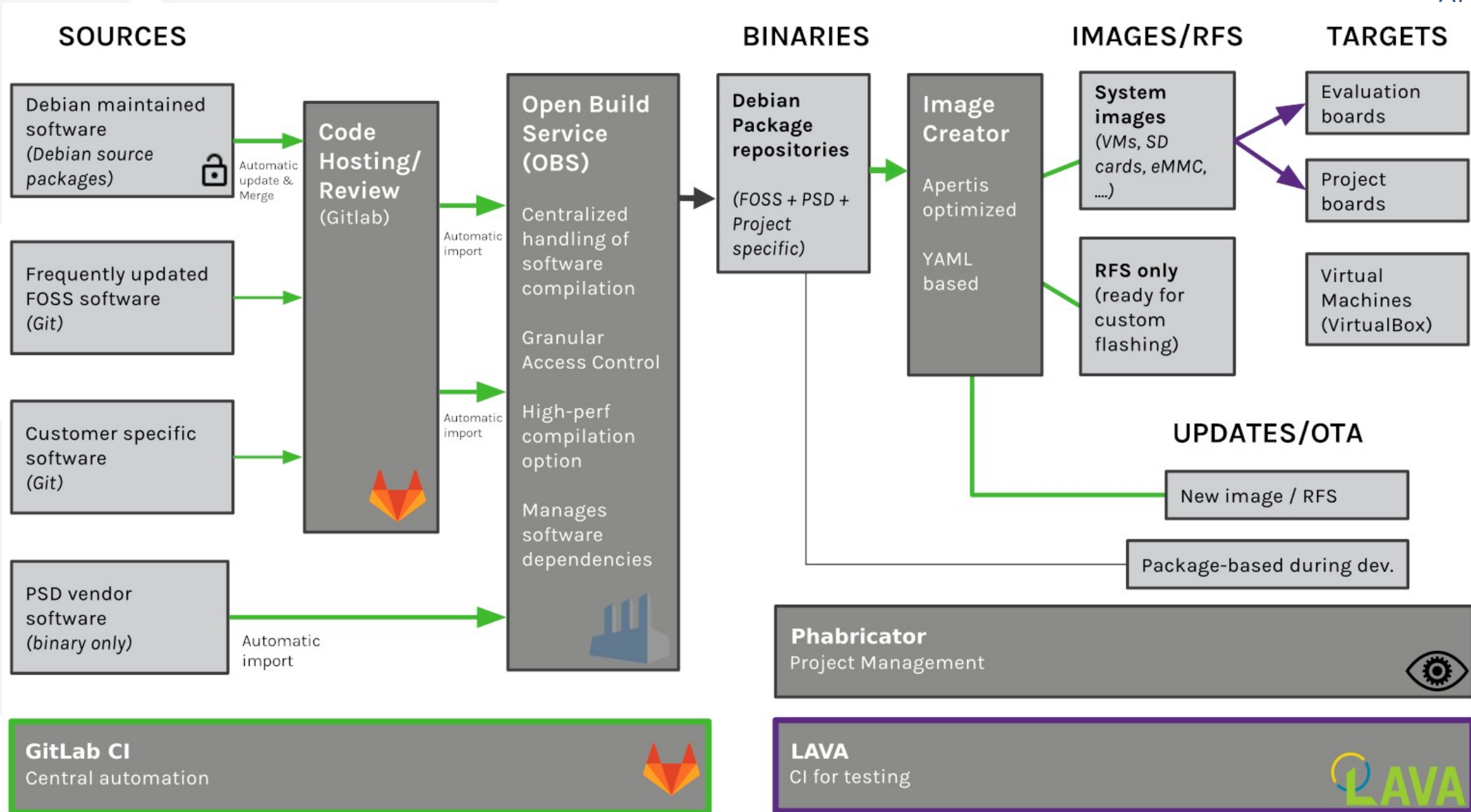
What is Apertis?

- ...but also a **development platform**:
 - FOSS-based reliable services ☁
 - Lot of automation via GitLab pipeline ⚙
 - Allow users (developers) to focus on their work ⚡
 - Instead of wasting time with building processes
 - Extensive documentation and guides 📖 → www.apertis.org
 - Smooth onboarding

Apertis' Infrastructure

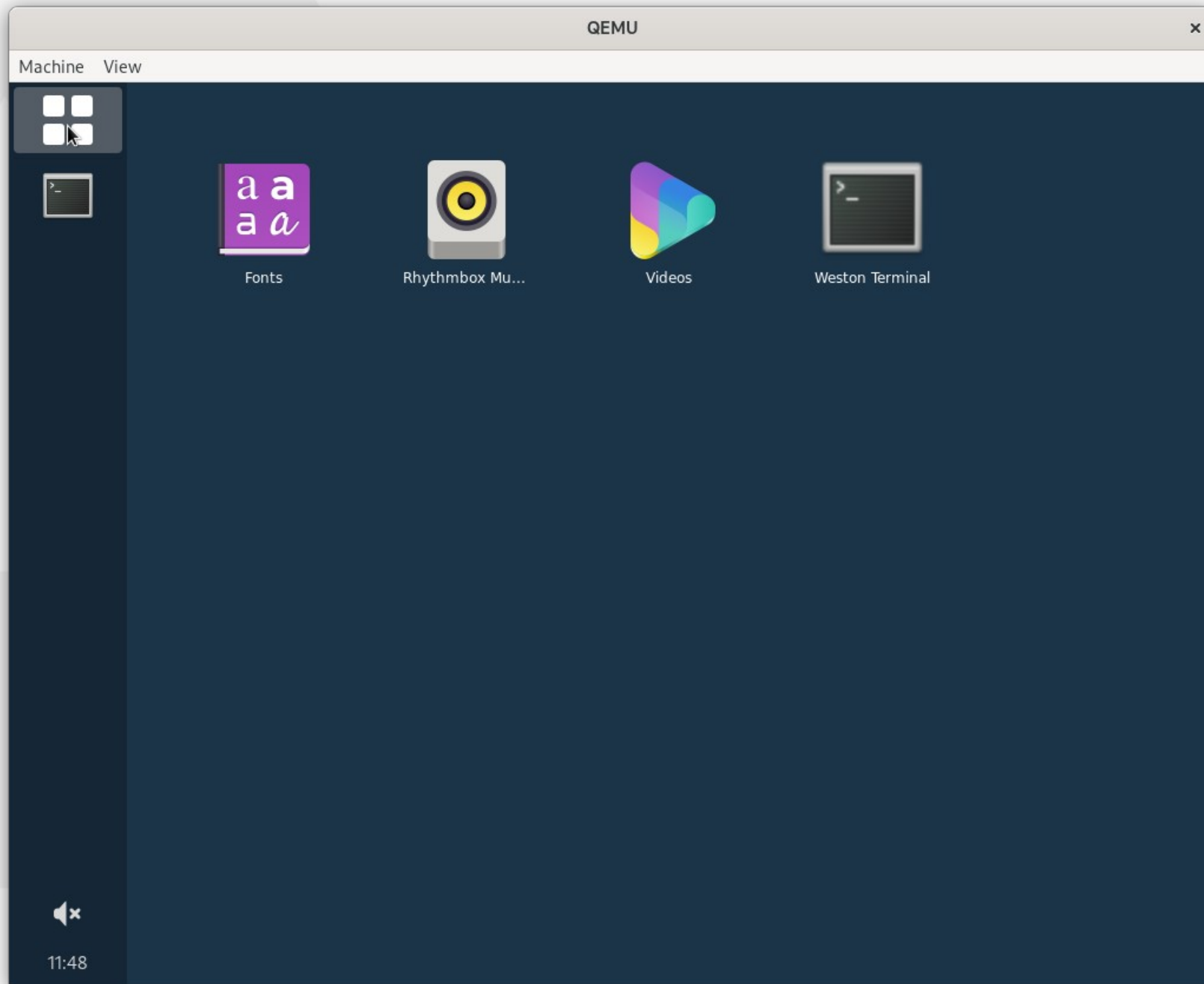
- **Gitlab**
 - Packages (DEP14 compatible)
 - **debos** images recipes
- **OBS**
 - For binary package building
- **aptly**
 - To manage APT repositories
- **LAVA**
 - Continuous automated testing of images on supported hardware

Apertis' Infrastructure



Apertis' images

- **Several types:**
 - **FixedFunction:** headless system
 - **HMI:** FixedFunction + graphics support + multimedia capabilities 🎮
 - **SDK:** ready-to-use environment for developers (Virtualbox VM) 🛠️





File System




Home



Devhelp





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 - Preventing damage during drilling ✨
 - Measuring concrete coverage



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-  **Bosch Wallscanner D-test 200**
 - Scan walls and detect objects inside them
 - Preventing damage during drilling 💣
 - Measuring concrete coverage
- And **many others products**





What's new?

v2024 & v2025

What's new?

Packages





- **Podman** 🐳
 - Integrates nicer than Docker 🐳
 - Doesn't require root privileges
 - Nor orchestrating daemon 😊

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- **ONNX runtime** 

- Cross-platform inference and training machine-learning accelerator
- Supports models from PyTorch, TensorFlow, Keras, scikit-learn, LightGBM, XGBoost, etc.



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- **OP-TEE** (Open Portable Trusted Execution Environment) 🛡️

- Mini OS running in the ARM TrustZone
 - optee-os: K3-AM62x and QEMU
 - optee-test: sanity testsuite



What's new?

Delta reports




Packages

2025-06-30T09:11:18.564883+00:00 

Packages  • Storage Usage 


8598 packages  15 updates  501 license issues  401 packaging deltas   per-release indices

Filter 

Run gitlab-rulez

Update all


Update security

 **errors:** 1799 total → 520 apt 0 ftbfs 672 git 0 licensing 607 obs 0 update 0 delta




accountsservice

   Packaging delta for 23.13.9-7+apertis0: 3 files changed, 31 insertions(+) 





adduser

   Packaging delta for 3.152+apertis1: 1 file changed, 1 insertion(+), 1 deletion(-) 

afdko

   Packaging delta for 4.0.1+dfsg1-2+apertis1: 4 files changed, 459 insertions(+), 4 deletions(-) 

alsa-plugins

   Packaging delta for 1.2.12-2+apertis1: 2 files changed, 5 insertions(+), 5 deletions(-) 

What's new?

Boards



- **TI SK-AM62**
 - Upstreamed to Debian: optee-os, arm-trusted-firmware, u-boot and linux
 - Still waiting TI to push missing firmware to linux-firmware (from their fork)
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- **NXP Layerscape LS1028A RDB**
 - Not yet upstreamed: arm-trusted-firmware, u-boot and linux
 - Specific Apertis images
- **MYIR Remi Pi**
 - Initial support
 - Upstreamed to linux mainline
 - Apertis images: WIP

What's new?

- ⚖ SBOM reports: licenses and build-dependencies
- Package level
 - Source package:
 - **ci-license-scan**: wrapper around **scan-copyrights** relying on debian/copyright (DEP5)
 - debian/apertis/copyright
 - Binary package:
 - debhelper program: **dh_setup_copyright**
 - /usr/share/doc/\${PKG}/\${BIN}_bin2sources_\${ARCH}.json
 - /usr/share/doc/\${PKG}/\${BIN}_metadata_\${ARCH}.json

What's new?

- ⚖ SBOM reports: licenses and build-dependencies
- Image level
 - **generate*_bom.py**
 - **SBOM** of build-dependencies
 - **SBOM** of licenses
 - **OSS Review Toolkit**: human friendly reports
 - PDF, WebApp, CycloneDX & SPDX

What's new?

Infrastructure


- Automatic testing of images and packages
 - LAVA (Linaro Automated Validation Architecture)
 - Farm of devices
 - Automatic flash of OS images
 - Automatic testing
- Package centric
 - Packages are tested via their CI pipeline builder (in MR context)
 - 1) Build new image or reuse the last daily
 - 2) Flash image on devices (LAVA)
 - 3) Run predefined tests (similar to autopkgtest)
- Image centric
 - Daily images are tested on target devices each night
 - Automatic tests cases





What's next?
 \geq v2026

What's next for v2026?

-  **Trixie**-based
 - Components replacement:
 - AGL-compositor/Maynard → Weston
 - connman → networkd
 - xfce → gnome
 - New packages?
 - TensorFlow Lite (aka LiteRT)
 - ready!
 - license issue with a dependency (src: *oourafft*)
 - TODO: autopkgtest: dataset?


What's next for v2026?

- **New reference hardware**

- UP Squared 6000 (*amd64*)
- i.MX6Q SABRE lite (*armhf*)
- Renesas R-Car M3 Starter Kit (*arm64*)

→ ???

What's next for v2026?

-  **QA report revamp**
 - <https://qa.apertis.org/>
 - Aggregate results of tests (automatic and manual)
 - Summary for each image by type (fixedfunction, hmi, sdk), architecture (armhf, arm64, amd64)



Test Reports

Filter ▾

Submit Manual Test Report

Releases

^

v2025

v2025dev0.0		v2025dev0 / 20231129.1807				
	Passed	Skipped	Incomplete	Failed	Total	
apt automated	201	0	2	4	207	<div></div>
apt manual	67	0	0	14	81	<div></div>
lxc automated	12	0	20	4	36	<div></div>
nfs automated	3	0	0	0	3	<div></div>
ostree automated	139	0	9	4	152	<div></div>
ostree manual	34	0	0	19	53	<div></div>

v2024

v2024.0rc1		v2024 / 20240221.0115				
	Passed	Skipped	Incomplete	Failed	Total	
apt automated	203	0	4	8	215	<div></div>
lxc automated	31	0	0	5	36	<div></div>
nfs automated	3	0	0	0	3	<div></div>
ostree automated	148	0	2	2	152	<div></div>

v2024pre.0		v2024pre / 20231122.0315				
	Passed	Skipped	Incomplete	Failed	Total	
apt automated	197	0	2	8	207	<div></div>
apt manual	142	0	0	3	145	<div></div>
lxc automated	18	0	12	6	36	<div></div>
nfs automated	3	0	0	0	3	<div></div>



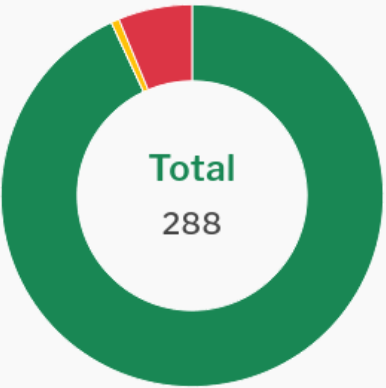
Test Report

Release v2025dev0, Build 20231129.1807 (apt)

Untag v2025dev0.0

Tag weekly

Summary



● Passed ● Skipped ● Incomplete ● Failed

Runs

- 288 total tests from 67 testcases
- 201 of 207 automated tests passed

0 skipped and 2 incomplete
- 67 of 81 manual tests passed

0 skipped and 0 incomplete

Images

BaseSDK AMD64, Fixed function AMD64, Fixed function ARM64 (rpi64), Fixed function ARM64 (uboot), Fixed function ARMhf (uboot), HMI AMD64, HMI ARMhf (uboot), SDK AMD64

This report omits test cases that have not been executed. Please check the full version of the [report page](#) for the complete list of test cases.

Results

ID	Fixed function ARMhf (uboot) (edit)	Fixed function ARM64 (uboot) (edit)	Fixed function ARM64 (rpi64) (edit)	Fixed function AMD64 (edit)	HMI ARMhf (uboot) (edit)	HMI AMD64 (edit)	BaseSDK AMD64 (edit)	SDK AMD64 (edit)	Notes
ade-commands automated	N/A	N/A	N/A	N/A	N/A	N/A	Pass	Pass	
agl-compositor manual	N/A	N/A	N/A	N/A	Pass	Pass	N/A	Pass	
annarmor									

What's next for v2026?

- **A/B partitioning**
 - OSTree
 - Storage constraints
 - Not work well with trusted boot
 - Alternative?
- Even more **automation** with GitLab pipeline!
 - Release process
 - Folding + Branching
 - Rebase process
 - Improve tooling
 - Require manual work



COLLABORA

Question?

www.apertis.org

www.collabora.com



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Thank you!

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