



THE LINUX FOUNDATION

NORTH AMERICA



# State of Embedded Linux

May 17, 2026

Walt Miner  
Senior Director – Automotive Grade Linux  
The Linux Foundation



# Where's Tim?



# Who is This Guy?

- AGL Development and Community Manager since 2014
- Over 30 years embedded software experience
- Involved with Linux for 20 years
- Previously at MontaVista and Mentor Graphics
- Continental AG
- Motorola Mobile Devices
- Motorola Telematics Communications Group
- Defense Electronics at ITT Avionics and Northrop Grumman



## Nature of this talk...

- Periodically take a look at the status of embedded Linux
  - Not comprehensive – just a few things we saw
- No way to cover everything
  - Sorry if we missed something you're interested in
- 2 parts:
  - The firehose/shotgun part
  - The "themes" part



## Outline

Linux Kernel  
Technology Areas  
Industry News  
Community  
Conclusions



## Outline

# Linux Kernel

Technology Areas

Industry News

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Conclusions



# Kernel Versions since ELC Europe

- Linux v6.17 - 28 Sep 2025 – 63 days
- [Linux v6.18](#) - 30 Nov 2025 – 63 days
- [Linux v6.19](#) - 08 Feb 2026 – 70 days
- [Linux 7.0](#) - 12 Apr 2026 – 63 days

Update

# Linux 6.17 Release (28 Sep 2025)

- 2038 developers, 13089 non-merge changesets [1]
- Support for uniprocessor configuration removed [2]
  - Even single-processor machine will run SMP kernels
- Initial support for proxy execution
- USB audio offload
  - Allows audio to flow while much of system is sleeping
  - Provides good power savings
- More Ext4 filesystem speedups
  - Reduced block allocation contention
- BPF programs now have std out and error streams
- New 'rtapp' monitor for finding realtime app problems

Sources:

[1] <https://lwn.net/ksdb/releases/>

[2] <https://lwn.net/Articles/1031713/>

[3] <https://lwn.net/Articles/1032095/>

# Linux 6.18 release (30 Nov 2025)

- 2134 developers, 13710 non-merge changesets [1]
- bcachefs removed from kernel
- Scope based resource management [added to audio subsystem](#)
- Kernel namespaces can now be referred to using file handles
- Audit subsystem can now handle multiple LSMs being enabled
- Many Rust binding updates
- New VirtIO SPI driver using VirtIO spec 1.4

Sources:

- [1] <https://lwn.net/ksdb/releases/>
- [2] <https://lwn.net/Articles/1040203/>
- [3] <https://lwn.net/Articles/1041004/>

# Linux 6.19 release (8 Feb 2026)

- 2137 developers, 14344 non-merge changesets [1]
- **Live Update Orchestrator** – kernel reboot via kexec while VMs keep running
- **DRM Color Pipeline API** – hardware-accelerated HDR (backed by Valve)
- **PCIe Link Encryption** – encrypted traffic between devices and confidential VMs
- **AMD GCN 1.0/1.1** → **amdgpu** – legacy Radeon GPUs get native Vulkan
- **ext4 large block size** – block size > page size; up to 50% write boost

Sources:

- [1] <https://lwn.net/ksdb/releases/>
- [2] <https://lwn.net/Articles/1048869/>
- [3] <https://lwn.net/Articles/1049424/>
- [4] [https://kernelnewbies.org/Linux\\_6.19](https://kernelnewbies.org/Linux_6.19)

# Linux 7.0 release (12 Apr 2026)

- 2362 developers, 14251 non-merge changesets [1]
- **Rust for Linux goes stable** – experimental label dropped; Rust modules are first-class
- **XFS self-healing** – auto-detects and repairs metadata corruption while mounted
- **Preemption simplification** – modern arches reduced to two models (full + lazy)
- **AccECN enabled by default** – better TCP congestion handling via Accurate ECN
- **Faster containers** – OPEN\_TREE\_NAMESPACE copies only needed mounts (~40% speedup)

Sources:

- [1] <https://lwn.net/ksdb/releases/>
- [2] <https://lwn.net/Articles/1057769/>
- [3] <https://lwn.net/Articles/1058664/>
- [4] [https://kernelnewbies.org/Linux\\_7.0](https://kernelnewbies.org/Linux_7.0)

# Linux 7.1

- Merge window closed
- Currently at RC4
- Final details next time!

# Kernel Releases (as of 17 May 2026)

Protocol	Location
HTTP	<a href="https://www.kernel.org/pub/">https://www.kernel.org/pub/</a>
GIT	<a href="https://git.kernel.org/">https://git.kernel.org/</a>
RSYNC	<a href="rsync://rsync.kernel.org/pub/">rsync://rsync.kernel.org/pub/</a>



mainline:	<b>7.1-rc3</b>	2026-05-10	<a href="#">[tarball]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	
stable:	<b>7.0.9</b>	2026-05-17	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
stable:	<b>6.19.14 [EOL]</b>	2026-04-22	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm:	<b>6.18.32</b>	2026-05-17	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm:	<b>6.12.90</b>	2026-05-17	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm:	<b>6.6.140</b>	2026-05-17	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm:	<b>6.1.173</b>	2026-05-15	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm:	<b>5.15.207</b>	2026-05-15	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm:	<b>5.10.256</b>	2026-05-15	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
linux-next:	<b>next-20260508</b>	2026-05-08						<a href="#">[browse]</a>

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Linux Kernel  
Technology Areas  
Industry News  
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# Event Slides and videos resources

- For sessions from ELC Europe 2025 (August)
  - Use [https://elinux.org/ELC\\_Europe\\_2025\\_Presentations](https://elinux.org/ELC_Europe_2025_Presentations) to find the slides and video links
- For sessions from ELC 2025 (June)
  - Use [https://elinux.org/ELC\\_2025\\_Presentations](https://elinux.org/ELC_2025_Presentations) to find the slides and video links
- For sessions from Embedded Recipes (May)
  - Use <https://embedded-recipes.org/2025/schedule/> for slides and video links
- Search by title and/or presenter name



# Wayland and Weston

- **Weston 15 released**
- **Lua shell** – new meta-shell with fully scriptable window management via Lua scripts; full control over placement, focus, and events
- **Experimental Vulkan renderer** – targets Vulkan 1.0; works with DRM, Wayland, and X11 backends without Zink translation layer
- **Post-blend color transform offload** – offloads color transformations to KMS display hardware; pre-blend offload via new per-plane color pipeline uAPI in progress
- **Color-vision accessibility** – GL-renderer color effects for deuteranopia, protanopia, and tritanopia on marked outputs
- **Perfetto profiler support** – out-of-process tracing for performance analysis; focus on low-end device efficiency
- **Looking ahead** – Weston 16 targeting June/July with full color management & HDR, DRM state caching, and legacy cleanup

# systemd 260 (17 Mar 2026)

- **SysV scripts removed** – systemd-sysv-generator, rc-local.service and systemd-sysv-install dropped; native unit files required
- **mstack** – new OverlayFS + bind-mount arrangement defined by an .mstack/ directory; systemd-mstack CLI for interactive use
- **Kernel baseline raised** – minimum 5.4→5.10, recommended 5.14, full functionality requires 6.6; legacy compat code removed
- **FANCY\_NAME=** – new os-release field supporting ANSI sequences and Unicode glyphs; shown by hostnamectl
- **networkd + ModemManager** – mobile broadband via “simple connect” protocol; xaccess concept delegates device access per session
- **AI policy** – AI-agents documentation added; contributions require co-developed-by disclosure tag in commit messages



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# Build Tools and Distros

- Yocto Project
- Buildroot



# Yocto Project

- Latest release - 6.0 (wrynose), released May 14, 2026
  - New Yocto LTS version with four years of support
  - See <https://downloads.yoctoproject.org/releases/yocto/yocto-6.0/RELEASENOTES>
- New Features for Wrynose include
  - RISC-V support
  - SPDX v3 now supported with SPDX v2 support removed
  - CVE checker substantially improved
  - Systemd now default in openembedded core
  - Bitbake-setup layer configuration tool
  - [Scott Murray presentation](#) at the AGL AMM last week (YouTube coming soon)

# Yocto Project

- New Ecosystem Engineering and Operations Lead hired
- New LTS maintainer hired – Steve Sokoman retired
- Release 6.0 (wynose) new LTS – released last week
- Scarthgap LTS (5.0.x) supported until March 2028
- Kirkstone LTS (4.0.x) support EOL in March 2026

# Buildroot

- 2026.05 is in the rc stage
- [Longterm support release](#) = 2025.02.13 [released April 21](#)
- Build LTS now have three years of support!
- Latest stable release = [2026.02](#)
  
- See <https://buildroot.org/news.html>

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# Linux Foundation Embedded Projects

- Linux Foundation
  - Automotive Grade Linux (AGL) –automotive vertical
  - Civil Infrastructure Platform (CIP) – 5 supported linux kernels
  - Dronecode Foundation– drone vertical
  - ELISA –safety certification and standards
    - Space Grade Linux
  - KernelCI –automated testing (for upstream)
  - Open Chain –issues with entities in the supply chain
  - OpenSSF – working on security throughout OSS ecosystem
  - Yocto Project – build system for embedded OSS (not just Linux)

# Automotive Grade Linux (AGL)

- SDV Reference Platform “SoDeV” [officially announced December 5](#)
- Ultimate Unagi (21.0.1) released April 27. Next AGL LTS based on Scarthgap
- LTS “Quirky Quillback” 17.1.16 to be released this week. Final Quillback release based on Yocto Project kirkstone
- Vibrant Vimba switch to Wrynose. Releasing in September





# ELISA Project

Enabling **Linux** in  
**Safety** Applications



- Enabling **Safety-critical applications** with **Linux** (beyond Security)
- Increase **dependability & reliability** for whole Linux ecosystem
- **Various use cases**: Aerospace, Automotive, Medical, Railways & Industrial
- Supported by major **industrial grade Linux distributors** known for mission critical operation and various industries representatives
- Close community collaboration with **Xen, Zephyr, SPDX, Yocto & AGL** projects
- **Reproducible system** creation from specification to testing
- SW **elements**, engineering **processes**, development **tools**

**Join the next ELISA workshop, June 9<sup>th</sup>-11<sup>th</sup>**



**<https://elisa.tech/event/elisa-workshop-london-2026/>**

*(virtual and in-person participation possible)*





# Open Chain Project

- Mary Wang new Executive Director at Open Chain Project



**Mary Meixia Wang** ✓ She/Her · 1st  
Executive Director @ Open Chain Project, The Linux Foundation  
Gothenburg, Västra Götaland County, Sweden · [Contact info](#)

 Open Chain Project @ The Linux Foundation  
 University of Science and Technology of China

# Space Grade Linux



- New Linux Foundation project formed under ELISA project
- Graduating from ELISA in Q3 2026 – Founding Member Enrollment Open
- 30+ organizations already engaged, including 4 NASA centers (Ames, Goddard, JPL, Langley)
- Yocto-based Linux distribution purpose-built for space systems
- MIT + DCO licensed
- See <https://elisa.tech/space-grade-linux-sig/>

# Dronecode Foundation



- Live from ELC: UVify, a Dronecode board member, flew a 600-drone light show at last night's reception under challenging weather.
- PX4 Autopilot is the flagship firmware and autonomy stack: One codebase, every vehicle class: multicopter, fixed-wing, VTOL, rover, sub-surface (UUV), surface (USV), balloons, satellites, and jetpacks.
- Hiring project maintainers to sustain the continuous growth of the project. Reach out to Ramón Roche [roche@linuxfoundation.org](mailto:roche@linuxfoundation.org)
- See Dronecode Foundation - <https://dronecode.org/>

# Miscellaneous

- Amazon VegaOS
- AI World Domination?



# Amazon Vega OS

- Amazon switching from Android to its own Vega OS
- First product (Amazon Fire Stick 4K Select released in November)
- Linux based OS built with React Native
  - MediaTek Quad Core ARM
  - 1 GB RAM
  - Mali GPU
- Claimed performance is quite impressive
- Eliminate sideloading Android apps on Amazon devices going forward

# AI World Domination

- Gemini 3 released – the best ever?
- Google TPUs to compete with NVIDIA
- OpenAI declares “Code Red”
- ChatGPT 5.1
- Anthropic Claude

Update



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# LLM Landscape — May 2026

- **GPT-5.5** (Apr 23) — OpenAI's flagship; Intelligence Index 60; GPT-5.5 Instant now default in ChatGPT
- **Claude Opus 4.7** (Apr 16) — leads SWE-bench Pro 64.3%; 128K output; Agent Teams orchestration
- **Gemini 3.1 Pro** (Feb) — 1M context; GPQA Diamond 94.3%; 2× reasoning jump; Wi-Fi 8 groundwork
- **DeepSeek V4** (Apr 24) — 1.6T MoE open-weight on Huawei Ascend; \$0.14/M tok (Flash); MIT license
- **Open-source surge** — GLM-5.1 first open model to top SWE-bench Pro; Llama 4 Scout 10M context; cost collapse continues
- **Musk v. Altman dismissed** (May 18) — jury tossed \$150B suit on statute of limitations; Musk vows appeal

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# Upcoming Events

- Embedded Recipes – Nice, France – May 27-28
- OSS and ELC Europe – Prague – Oct 7-9
- OSS Japan and ELC Asia - Dec 7-9, 2026



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# Conclusions

- The embedded Linux ecosystem is strong. 2026 will be a great year!
- AI will continue to transform how we work, but...
- Higher costs will be passed along for frontier models





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# Thank you!

# Questions?

