



From Closed To Collaborative: Lessons From Qualcomm's Open Development Experience

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From Closed to Collaborative

In-Depth Perspectives & Lessons from Qualcomm's Open Development Experience



Open Development Evolution

The journey to Qualcomm Linux 2.0



New Ways of Thinking

OSDO – Open Source Development Office, Identities and Branding, Policies & Mandates, Support Maintainers, Build a Community & Track Contributions



Open Development Workflow & Integrations

Investment in existing systems in an Open Workflow



Roll Out Strategy

Incremental expansion from “boot to shell” to broader enablement



Lessons & Insights

From Upstreaming & the overall transition effort

Open Development Evolution



Open Development Evolution

The Old BSP Model

- Proprietary, Android-based BSPs
- Customized per platform/customer/project
- No open collaboration or ecosystem
- Misaligned with Yocto/upstream practices
- Code dumps and fragmented efforts

meta-qcom

- Community maintained, clean layer following Yocto best practices, developed in the open
- Limited HW support, focused on open source based implementations (ex: freedreno)
- Not officially supported by Qualcomm; Reference BSP for Linaro

Qualcomm Linux 1.0

- Closer to traditional Embedded Linux
- Yocto/OE layers more aligned with upstream expectations
- Huge improvements over old “LE” targets
- meta-qcom-hwe as the Yocto hardware enablement layer for QLI supported targets
- Dependency on meta-qcom
- Closed development

Qualcomm Linux 2.0 Open Development Goals



Upstream based software distributions

- Mainline serves as the baseline for all other derivatives & is developed in the open
 - Limited forked projects, downstream patches, or other "custom" enablement
 - Pristine upstream focused software distributions
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Public open development model

- Enable the community & Qualcomm engineers to collaborate on software projects
 - Drive for transparency, trust & visibility into the software we deliver into the open
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Continuously validated baselines

Enable completely automated hardware testing to keep the baseline from introducing regressions by leveraging CI/CD systems integrated with Github



Downstream enablement on Upstream baseline

- Enable CI/CD loops for value-add technology against the latest mainline
- Work w/ tech teams to resolve issues & create a stable integration

New Ways of Thinking



OSDO – Open Source Developer Office

Qualcomm's OSPO dedicated to accelerating our open transformation

Run as an internal open source project,
inviting participation across our organization
& fostering partnerships among different
organizations & roles.

Mission

- Accelerate changes needed by our open source developers.
- Streamline processes and remove internal roadblocks.
- Provide a clear and centralized voice for engineering across the company.

Open Source Developer Office (OSDO)

👋 Welcome to the Open Source Developer Office (OSDO), an open source program office dedicated to accelerating our open transformation. As we embrace the power of open source, the OSDO will play a pivotal role in advocating for our engineering team and driving positive change across our organization.

Open Source Handbook

Comprehensive documentation and how-tos for handling various open source activities within Qualcomm.

[→ Get started](#)

Open Source Training

Training modules cover everything from contributing to open source projects to maintaining your own projects.

[→ Get started](#)

Open Source Contributions

Information on the Contribution review process, including the Contribution Portal and contributing to an Approved Project.

[→ Contribution Portal](#)
[→ Contribution Process Overview](#)

Qualcomm on GitHub.com

Guidelines for becoming a GitHub.com contributor and creating an open source project on GitHub.com.

[→ Get started](#)

Have a question, request, or improvement idea related to OSDO?

[Submit an OSDO issue](#)

New Ways of Thinking

Rethink our approach across several domains

Identities & Branding

Show up as Qualcomm

Policies & Training

Upstream-first approaches

Support Maintainers

Support & retain talent

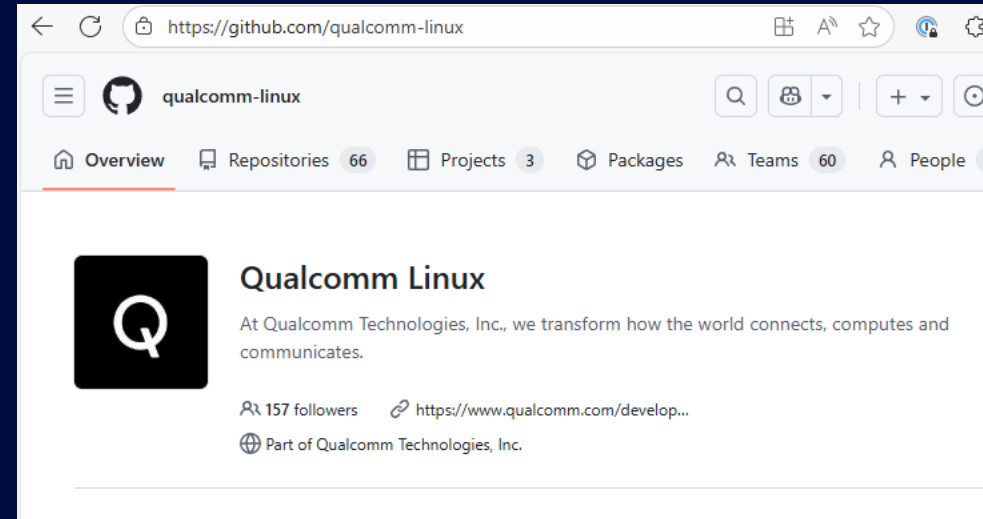
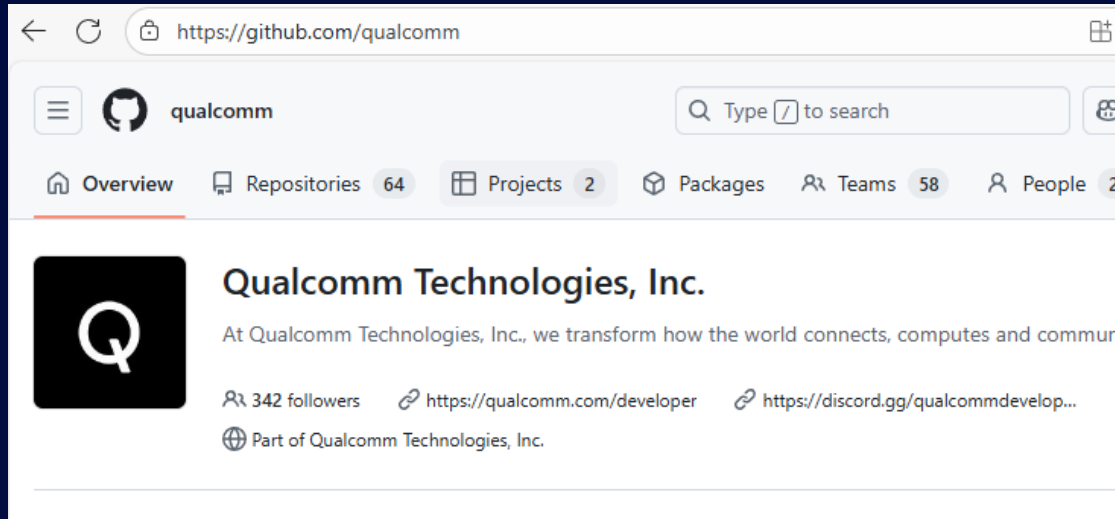
Build a Community &
Track Contributions

Insights & Analytics

Identities and Branding

Showing up in the community as Qualcomm

- Move to Qualcomm Technologies Inc. identity and branding for our Open Source presence
- New e-mail service, new domain – oss.qualcomm.com
 - Challenging and disruptive to some aspects of our development and the communities in which we participate, but necessary.
- New GitHub Organizations – github.com/qualcomm, github.com/qualcomm-linux



Policies & Mandates

New Policies

Mainline/Upstream first

Strict enforcement; exceptions require approval & must be ported to mainline unless not applicable

Semantic versioning

Transition to enable external understanding of releases

Security

New processes & tooling suited to open development & community vulnerability reporting

Training

Contributor & maintainer training covering best practices, templates & compliance checks

Key Mandates

Downstream overlays built against both **mainline** (0.0) and **LTS** (QLI 1.0/2.0) branches

Kernel tracks **linux-yocto-dev** master; Yocto tracks to active development upstream version

Upstream drivers must enable **boot** and **basic functionality** for all peripherals on supported SoCs

L1+ automated testing; no commercial support on mainline

Support Maintainers

Drive towards a more maintainer friendly development approach, support tooling and processes for developers.

OSDO unified cross-company maintainer and OSS developer input into focused **Working Groups** and drove cross-functional execution to resolution.



Efficient Processes

Progress: 32% Complete

Focuses on removing the "red tape" associated with legal and compliance workflows.

Key Themes

Compliance Automation,
Firmware workflows



Developer Experience

Progress: 64% Complete

Focuses on resolving immediate "quality of life" issues for developers.

Key Themes

Infrastructure, Tools



Community

Progress: 39% Complete

Focuses on Qualcomm's external reputation and culture.

Key Themes

Governance



Strategy

Progress: 40% Complete

Focuses on long-term health, security, and demonstrating the value of open-source work to leadership.

Key Themes

Metrics, Security

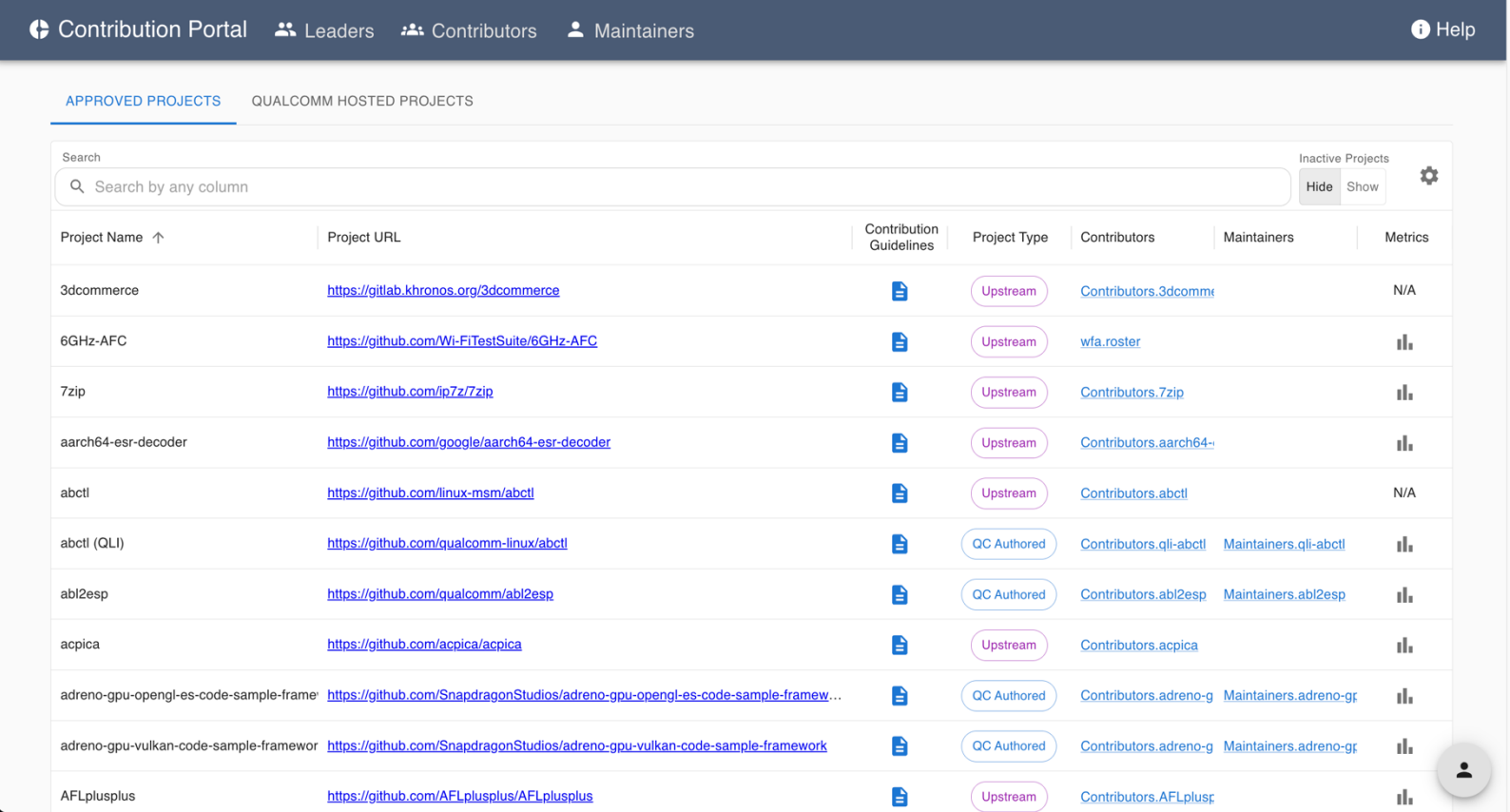
Build a Community & Track Contributions

Contribution Portal

System that tracks Open Source Projects cleared for contributions

Key highlights

- 600+ Approvals & 1200+ Projects
- Includes internal leads for each project
- View contribution guidance
- Join the contributor list
- Launchpad for Contribution Metrics



The screenshot displays the 'Contribution Portal' interface. At the top, there is a navigation bar with links for 'Contribution Portal', 'Leaders', 'Contributors', and 'Maintainers', along with a 'Help' icon. Below the navigation bar, the page is titled 'APPROVED PROJECTS' and 'QUALCOMM HOSTED PROJECTS'. A search bar is present with the placeholder text 'Search by any column'. The main content is a table listing various projects. The table has columns for 'Project Name', 'Project URL', 'Contribution Guidelines', 'Project Type', 'Contributors', 'Maintainers', and 'Metrics'. The projects listed include 3dcommerce, 6GHz-AFC, 7zip, aarch64-esr-decoder, abctl, abctl (QLI), abl2esp, acpica, adreno-gpu-opengl-es-code-sample-frame, adreno-gpu-vulkan-code-sample-framework, and AFLplusplus. Each project row includes a link to its URL, a document icon for guidelines, a 'Project Type' (either 'Upstream' or 'QC Authored'), a list of contributors, a list of maintainers, and a bar chart representing metrics.

Contribution Portal						
Leaders Contributors Maintainers Help						
APPROVED PROJECTS QUALCOMM HOSTED PROJECTS						
Search						
Q Search by any column						
Project Name ↑	Project URL	Contribution Guidelines	Project Type	Contributors	Maintainers	Metrics
3dcommerce	https://gitlab.khronos.org/3dcommerce		Upstream	Contributors.3dcomm		N/A
6GHz-AFC	https://github.com/Wi-FiTestSuite/6GHz-AFC		Upstream	wfa.roster		
7zip	https://github.com/lp7z/7zip		Upstream	Contributors.7zip		
aarch64-esr-decoder	https://github.com/google/aarch64-esr-decoder		Upstream	Contributors.aarch64-		
abctl	https://github.com/linux-msm/abctl		Upstream	Contributors.abctl		N/A
abctl (QLI)	https://github.com/qualcomm-linux/abctl		QC Authored	Contributors.qli-abctl	Maintainers.qli-abctl	
abl2esp	https://github.com/qualcomm/abl2esp		QC Authored	Contributors.abl2esp	Maintainers.abl2esp	
acpica	https://github.com/acpica/acpica		Upstream	Contributors.acpica		
adreno-gpu-opengl-es-code-sample-frame	https://github.com/SnapdragonStudios/adreno-gpu-opengl-es-code-sample-framew...		QC Authored	Contributors.adreno-g	Maintainers.adreno-gr	
adreno-gpu-vulkan-code-sample-framework	https://github.com/SnapdragonStudios/adreno-gpu-vulkan-code-sample-framework		QC Authored	Contributors.adreno-g	Maintainers.adreno-gr	
AFLplusplus	https://github.com/AFLplusplus/AFLplusplus		Upstream	Contributors.AFLplusg		

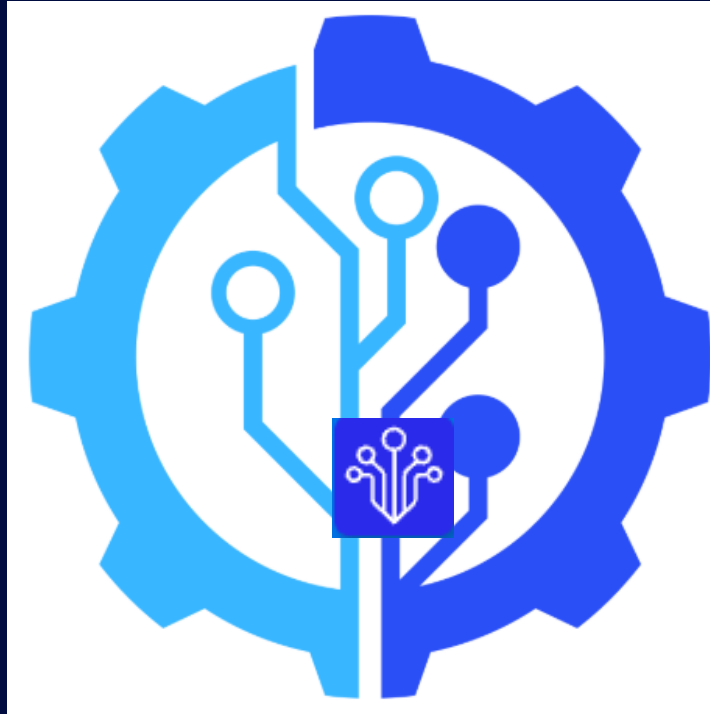
Development Workflow & Integrations



Connecting the Two Worlds

Product Delivery

- Validate against all commercialization lines
- Comprehensive device tests (external & internal)
- Change Request (bug & feature) traceability
- Qualcomm commercial deliverables must adhere to compliance requirements



Open Development

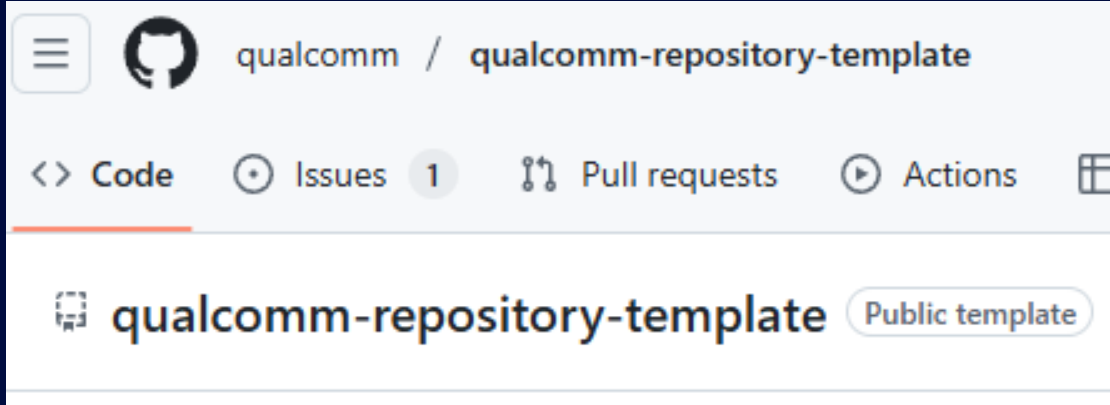
- Tech teams transitioning to develop in the open
- Encourage external contributions
- Modern CI/CD pipelines native to GitHub
- Fast transparent feedback
- Adherence to one-mainline model

Open Development Workflow & Integrations

GitHub Workflow

Qualcomm Repository Template

Starter project with required files + OSS best practices



- Includes required and sample files e.g. README.md, LICENSE.txt, CONTRIBUTING.md
- Issue and PR templates
- Workflows
 - Qualcomm Preflight Checks
 - Stale Issues: warn and then close inactive Issues/PR
- Dependabot config

Qualcomm Preflight Checks Workflow

Runs a series of preflight checks on Pull Requests

1. **Repolinter** for open source best practices
 - To be replaced with [repo-policy-action](#)
2. **Semgrep** static analysis tool and security scanner
 - Investigating alternative tools for different ecosystems - [Zizimor](#)
3. **Dependency Review Action** detects vulnerable dependencies
4. **copyright-license-checker-action** checks copyright and licenses
5. **commit-emails-check-action** validates commit email addresses
6. **Commit-msg-check** Ensures commit messages follow standards (optional)
7. **ARMOR Compatibility Checkers** - Ensures source code follows API and ABI backward compatibility (optional)

Roll Out Strategy





MVP Pilot for
Yocto
“Phase 1”

Lessons & Insights



Lessons & Insights

Strategy	Outcome
Intersect with Community Efforts	Accelerated progress
Engage tech champions & mentors	Unblock bottlenecks early, reduce rework
Dedicate tech team bandwidth & personnel	Faster mainline enablement
Decouple upstream from marketing name	Unblock base DT upstreaming
Upstream FW early	Eliminate FW upstreaming delays
Templatize SOC upstream execution	Faster, consistent upstream delivery

From Closed to Collaborative: The Results Speak

3x contributor growth. 188 unique contributors. 12+ teams.

Qualcomm Linux 2.0 Journey

- Created 170 new OSS repositories across relevant organizations
- 6,290 merged/9,105 total PRs in the qualcomm-linux organization
- 1060 issues filed — 58% *already closed*
- **377** unique contributors

Huge cross functional effort

- First phase had **126** people with meaningful contributions from **12+** different organizations:
 - Program Management, Tools, Build & CI, Configuration Management, Test, Technology Teams, Security, IT and OSDO
- And then we expanded further!

Strategic Wins

- Incremental enablement was a good strategy
- Immediate parity with existing closed development approach was not feasible
- MVP of basic functionality & adding different technologies over time worked well
- Aligning with existing community effort (meta-qcom)
- Strategically merged initiatives kickstarted momentum.

The Qualcomm Linux journey demonstrates that incremental, community-aligned open development scales

Thank You!

