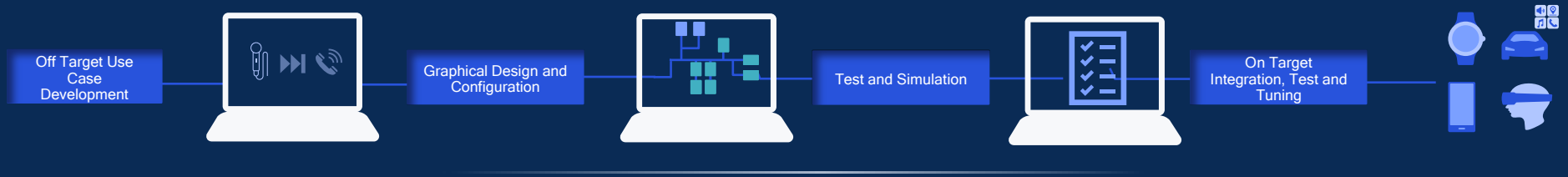
Linaro Connect
MADRID 2024 | MAY 14-17 2024

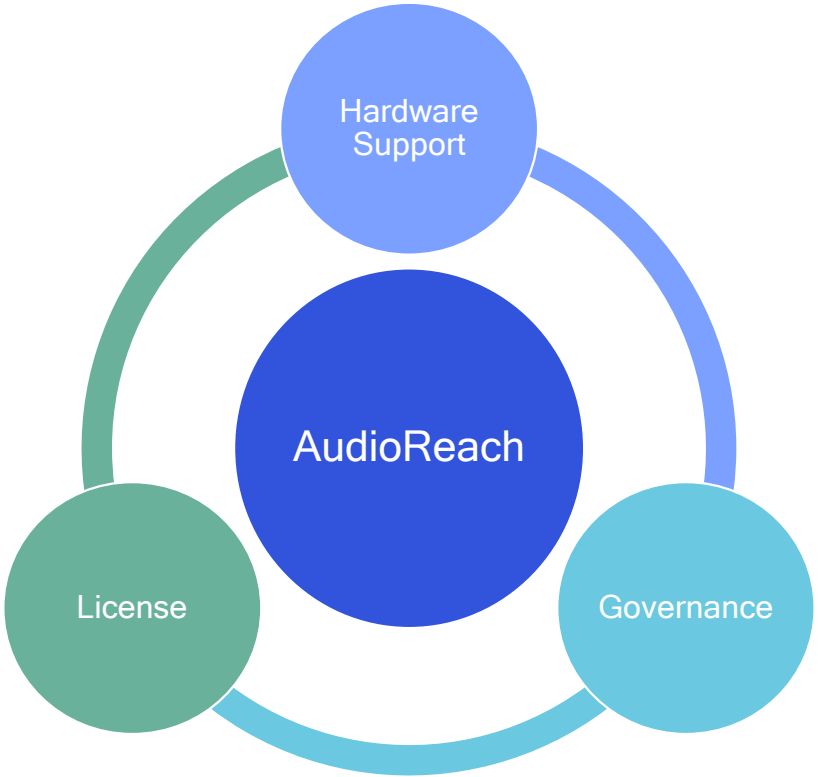
AudioReach™ Open Source Project

Qualcomm is open sourcing AudioReach !!



AudioReach Open Source Project Highlights

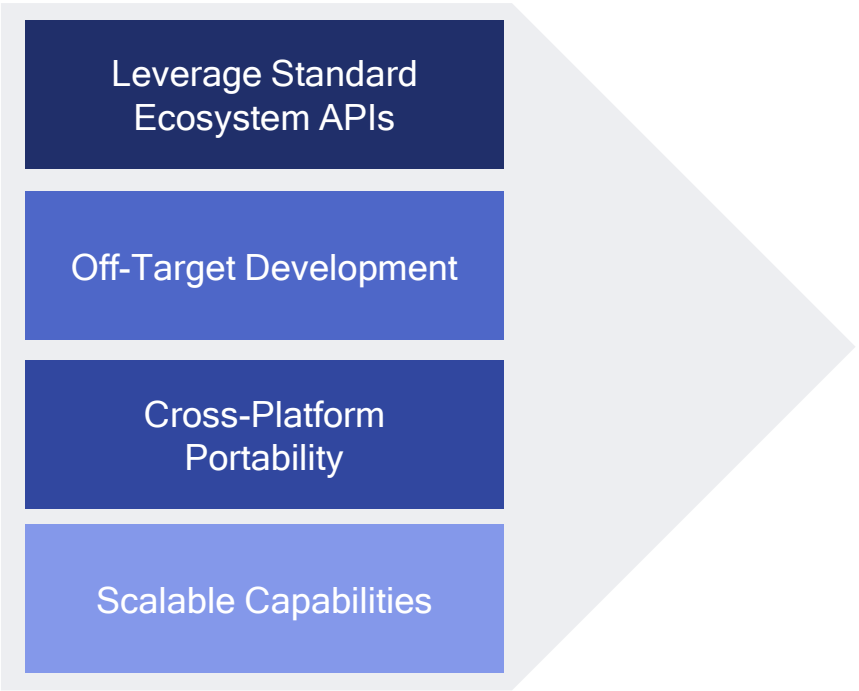
Qualcomm Hardware, Raspberry Pi, Xtensa DSP, …



BSD-3 Clause

Self-Appointing Council

AudioReach Open Source Project Benefits Ecosystem



Lowers development and maintenance cost for ecosystem

- Interoperability with ecosystem software and tools (Gstreamer, PulseAudio, specialized tuning tools, etc)
- Seamless migration from off- to on-target development
- Portability across different SoC / HW vendor platforms using same development environment and workflow
- Capability rich solution that maximizes platform performance (offloading, load balancing, low power, etc)

AudioReach SDK Highlights

Algos & use case design in algo design tool then port to AudioReach easily

IDE for software coding, debugging, and profiling

Audio calibration database (ACDB) stores use case topology (graph) and device tuning data

Same developer touch points by offering adaptations and plug-ins for de-facto audio frameworks

Cross-OS graph services support dynamic, run-time graph configuration and interface with SPFs

E2E validation in off-target environment

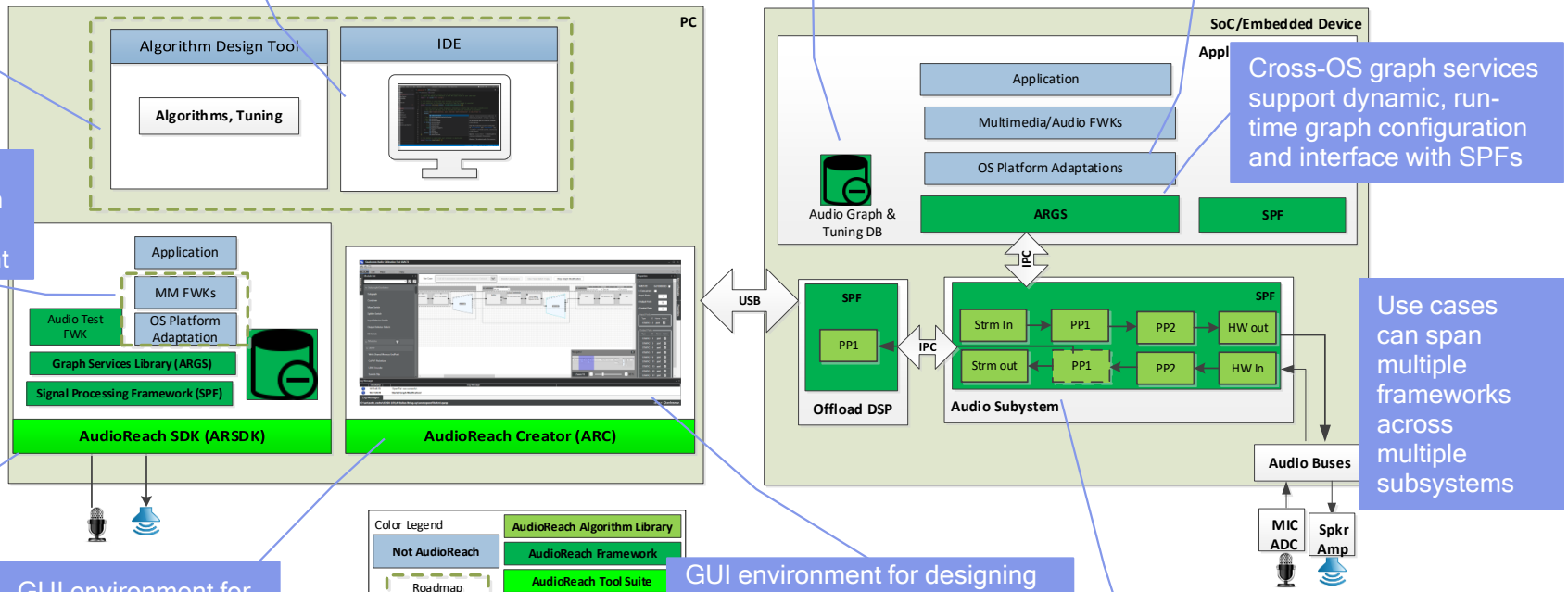
Use cases can span multiple frameworks across multiple subsystems

Off-target development and testing environment

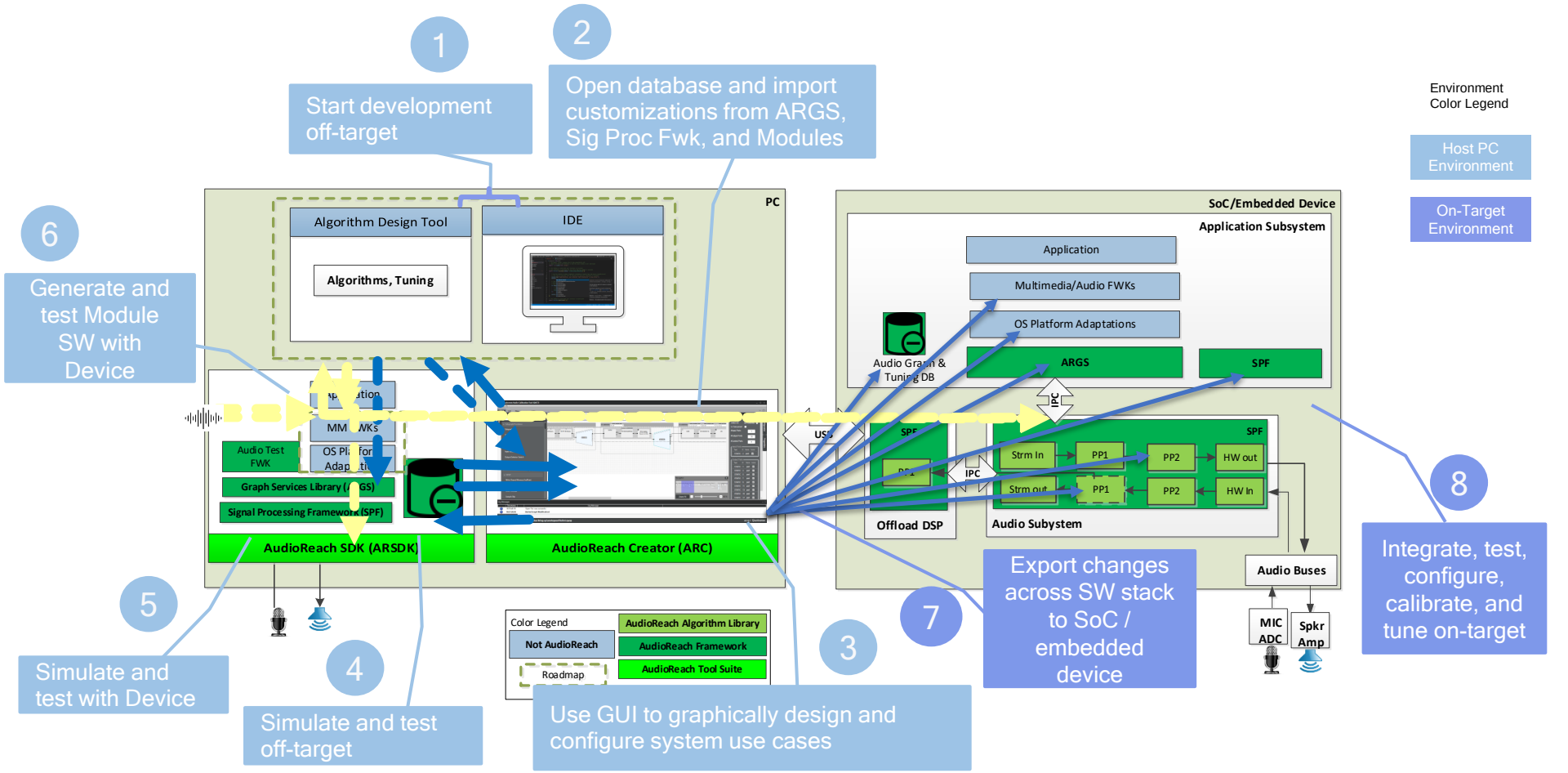
GUI environment for real-time audio graph modification, module tuning, and processor resource monitoring

GUI environment for designing and configuring audio use cases

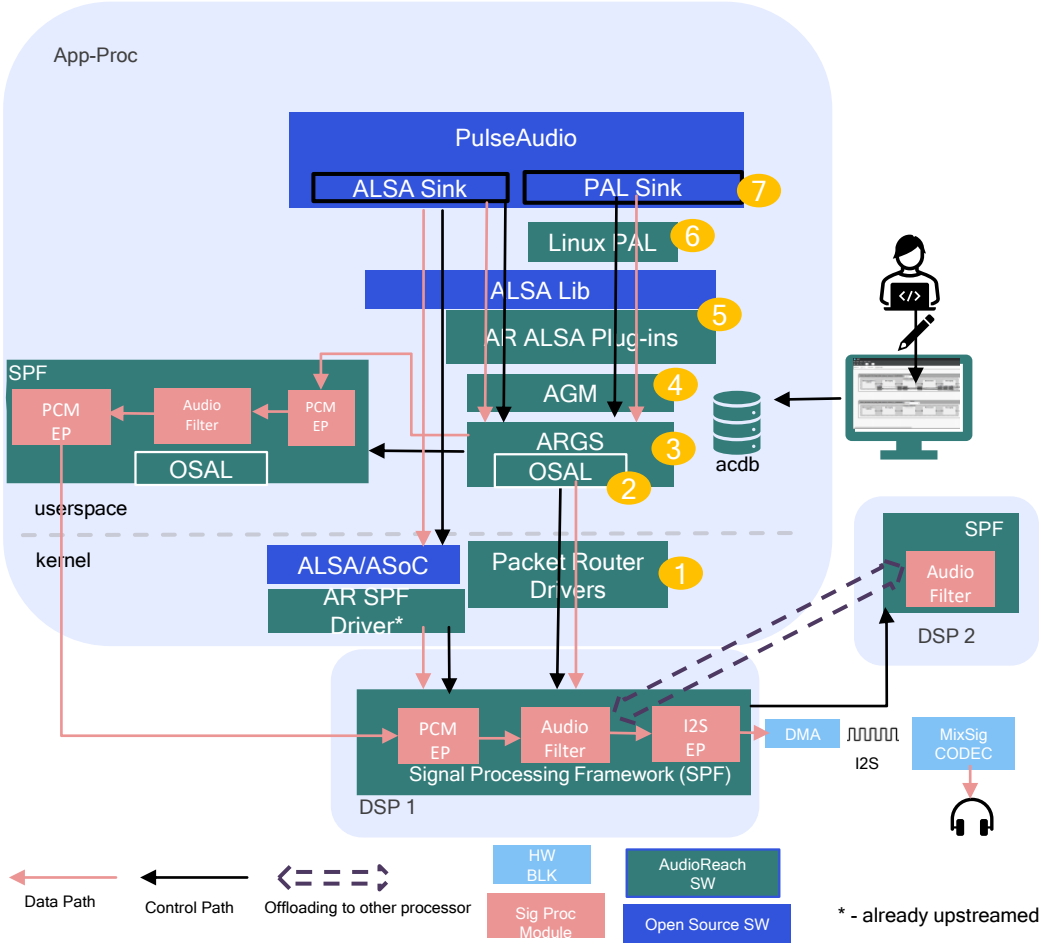
Comprehensive, flexible, and portable signal processing framework (SPF) with plug-and-play capabilities



Development Workflow Enabled by the Project



AudioReach on Linux



Native/User-Mode Solution

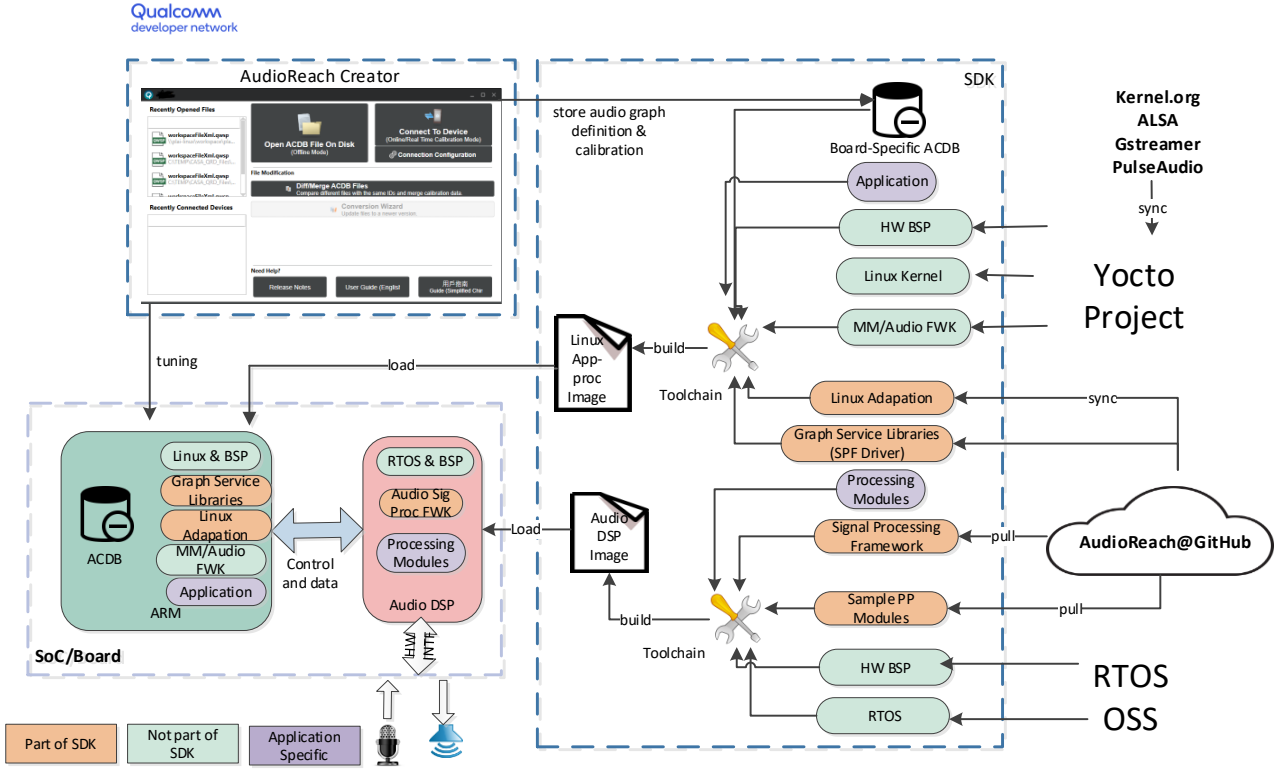
1. Packet Router Driver – Provide direct pipeline to allow ARGS and SPFs on DSPs to exchange command and data
2. LX Platform & OS abstraction layer (OSAL) – Thin layer which enable ARGS and SPF running on Linux platform
3. Cross-OS graph services support dynamic, run-time graph configuration and interface with SPFs
4. Audio Graph Manager (AGM) – Implements corresponding ALSA equivalent APIs and ASoC Dynamic PCM functionalities
5. AR ALSA Plug-ins – Developed to plug into libALSA, tinyalsa, tinycompress libraries and interface with AGM
6. Platform Adaption Layer (PAL) – Middleware like layer to provide turnkey logic to manage wide variety of use cases & sound devices (Roadmap)
7. PulseAudio PAL Sink – Enable application to utilize AudioReach framework through PulseAudio APIs (Roadmap)

ASoC Solution

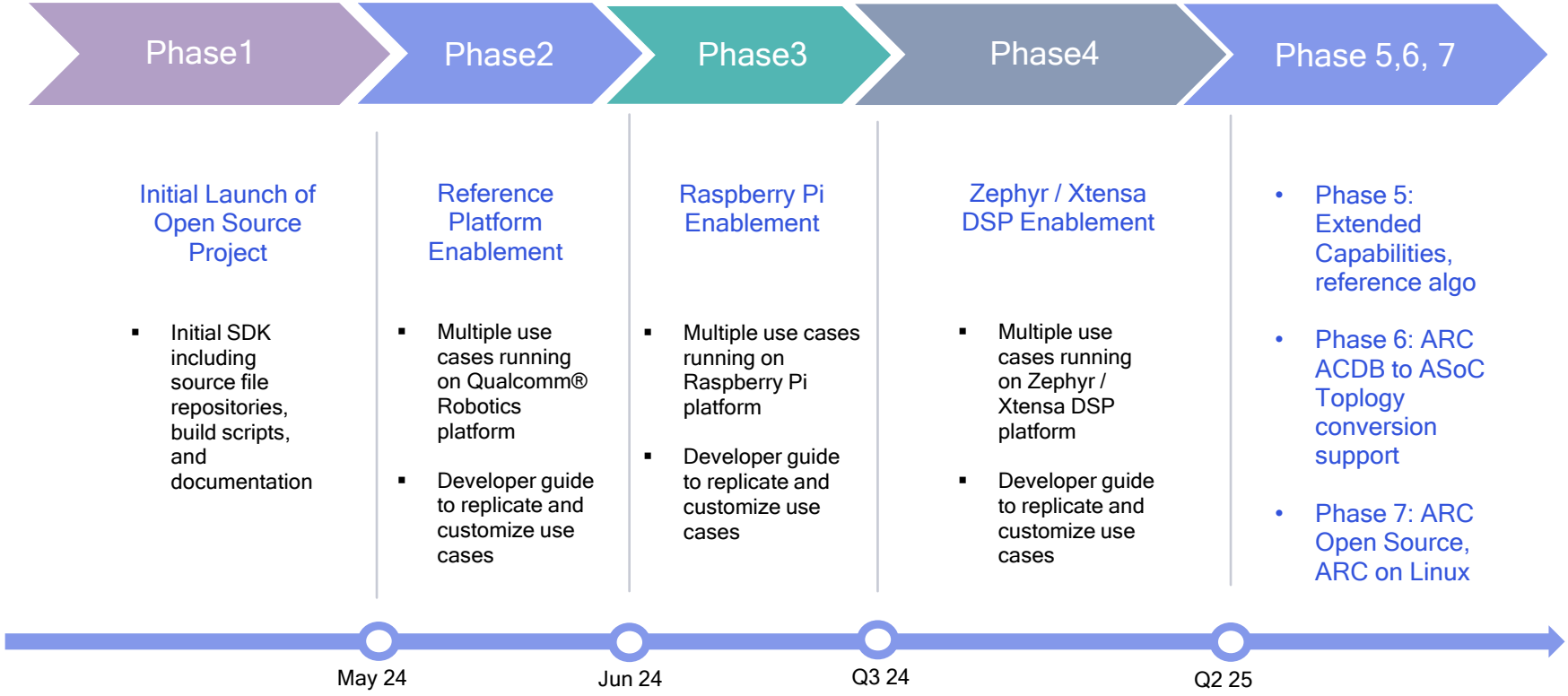
- A set of ASoC compliant drivers provide basic audio functionalities to enable class of developers who are accustomed to existing de-facto Linux audio stack

Device Deployment Vision with AudioReach (Yocto)

- Purchase reference HW supported by AudioReach OSP and Yocto
- Sync Yocto project and pull in necessary meta layers
- Build BSP & AudioReach software
- Download AudioReach Creator and design use case graphs
- Bring up board and verify audio use cases
- Tune form factor with ARC
- Deploy



AudioReach OSP Deployment Phases



Contact Us

[AudioReach Project Site]

Come to our booth to check out AudioReach demo

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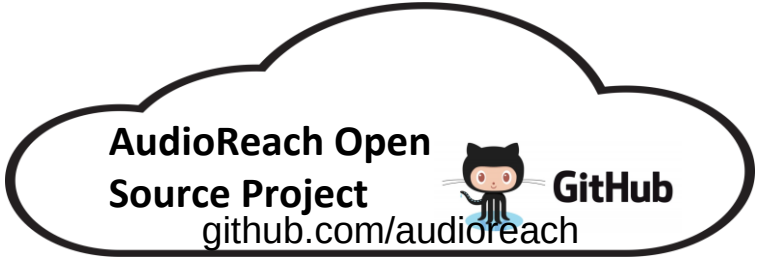
Thank you

Project Overview - Detail



SDK consists of source code, build script, and documentation

- Source Form
  - Audio signal processing framework
  - Audio graph service libraries
  - Linux adaptation
- Binary Form
  - Tuning & use case configuration tool (download through Qualcomm developer network)

HW support: Qualcomm® Robotics platform (initially)

OS: Linux, OpenEmbedded (initially)

Community project

- License – BSD-3 clause
- Community Contribution Welcomed
  - Framework enhancement
  - Processing Modules
  - SoC & Board support