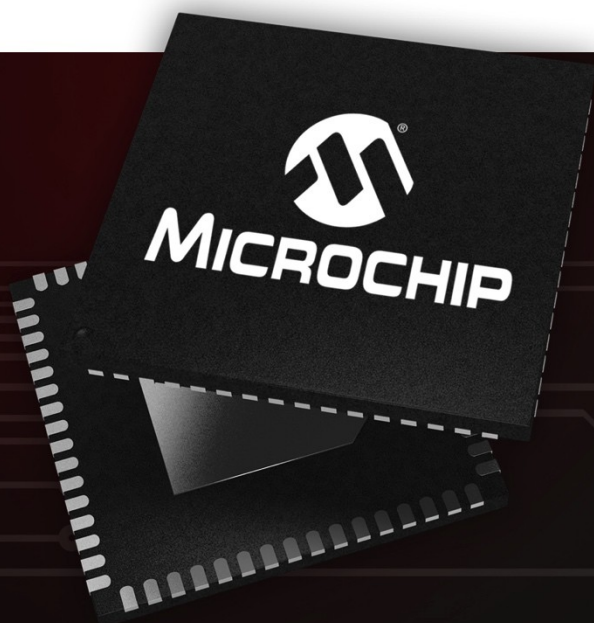
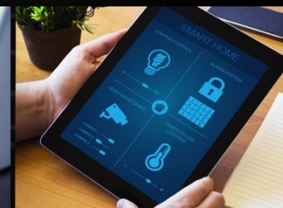




MICROCHIP



A Leading Provider of Microcontroller,
Mixed-Signal, Analog & Flash-IP Solutions



BoF: Microphone Frontend
Michael Fabry
2018/04

- Birds of a Feather (BoF) -

USB Microphone Frontend for AGL

Car Microphones

Sophisticated microphone solutions for cars are gaining popularity in the following fields:

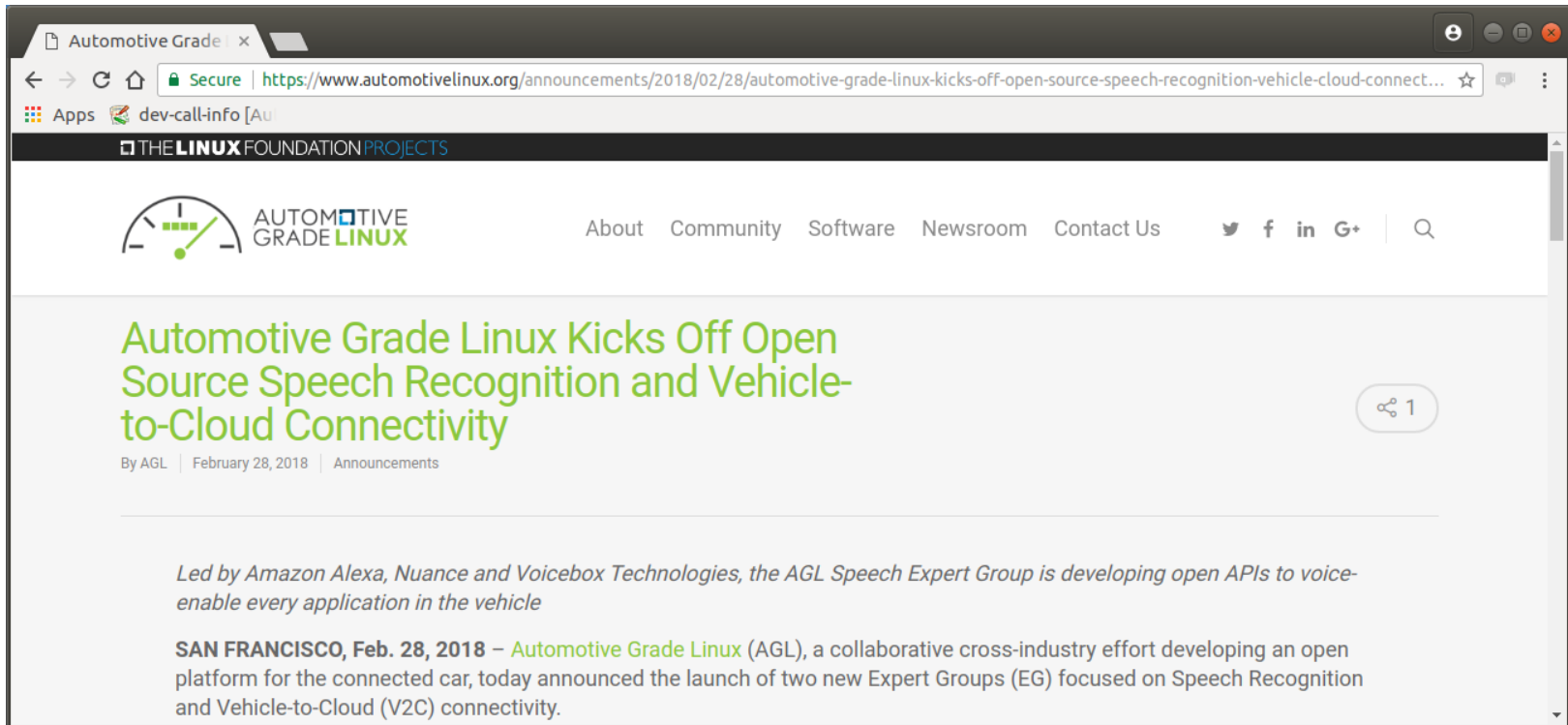
- Active Noise Cancellation
- Hands-free communication
- Speech recognition
- Cloud-based services (e.g. Amazon Alexa)

To avoid fragmentation while developing these high-level applications, AGL should be in hold of a common and harmonized hardware/driver solution

Open Source Speech Services

AGL announced two new ExpertGroups:

- Open Source Speech Recognition
- Vehicle-To-Cloud Connectivity



The screenshot shows a web browser window with the URL <https://www.automotivelinux.org/announcements/2018/02/28/automotive-grade-linux-kicks-off-open-source-speech-recognition-vehicle-cloud-connect...>. The page header includes the Automotive Grade Linux logo and navigation links: About, Community, Software, Newsroom, Contact Us, and social media icons for Twitter, Facebook, LinkedIn, and Google+. The main content area features the headline "Automotive Grade Linux Kicks Off Open Source Speech Recognition and Vehicle-to-Cloud Connectivity" in green text, with a share button showing 1 share. Below the headline, it says "By AGL | February 28, 2018 | Announcements". The body text reads: "Led by Amazon Alexa, Nuance and Voicebox Technologies, the AGL Speech Expert Group is developing open APIs to voice-enable every application in the vehicle". A sub-headline states: "SAN FRANCISCO, Feb. 28, 2018 – Automotive Grade Linux (AGL), a collaborative cross-industry effort developing an open platform for the connected car, today announced the launch of two new Expert Groups (EG) focused on Speech Recognition and Vehicle-to-Cloud (V2C) connectivity."



Open Source Speech Services

The ExpertGroup's target is defined as follows:

“Led by Amazon Alexa, Nuance and Voicebox Technologies, the AGL Speech Expert Group is developing open APIs to voice-enable every application in the vehicle”

These new and open APIs are going to be integrated in AGL as bindings to the 4A Soundmanager

So, we like to propose an AGL Microphone DevKit:

- USB connected
- ALSA-based Kernel driver
- Seamless 4A Soundmanager support
- Working out-of-the-box with all AGL applications

Development Kits | x

Secure | <https://developer.amazon.com/alexa-voice-service/dev-kits/>

Apps dev-call-info [AU]

amazon alexa Your Alexa Consoles Sign In ?

Alexa Skills Kit Alexa Voice Service Connected Devices Alexa Programs Docs Alexa Blog

Audio Front End Dev Kits

Reference solutions with flexibility to select a preferred production-ready SoC for the final product

Far-Field

Amazon Alexa Premium Far-Field Voice Development Kit

"Far-field in a chip" architecture offers premium-level voice technology on a single DSP.
Limited Availability

[Learn More >](#)

Far-Field

XMOS VocalFusion Stereo Development Kit for Amazon AVS

Linear mic array combined with full-duplex stereo Acoustic Echo Cancellation, for slim profile and wall-mounted devices.
\$499.00

[Learn More >](#)

Far-Field

Intel Speech Enabling Developer Kit for Amazon AVS

Powered by Intel's audio algorithms and dual DSP with inference engine, optimized for smart home applications.
\$499.00

[Learn More >](#)

Far-Field

XMOS VocalFusion 4-Mic Dev Kit for Amazon AVS

A linear array that brings far-field voice capture to new device types and form factors.
\$499.00

[Learn More >](#)

Far-Field

Synaptics AudioSmart™ 4-Mic Development Kit for Amazon AVS

Features four mic far-field voice interaction and is designed for omni-directional Alexa-enabled products.
\$349.00

[Learn More >](#)

Hands-Free

Cirrus Logic Voice Capture Development Kit for Amazon AVS

For portable speakers and compact audio device; uses Cirrus Logic audio algorithms.
\$400.00

[Learn More >](#)

Hands-Free

Microsemi AcuEdge™ Development Kit for Amazon AVS

Hands-Free

Synaptics AudioSmart™ 2-Mic Dev Kit for Amazon AVS

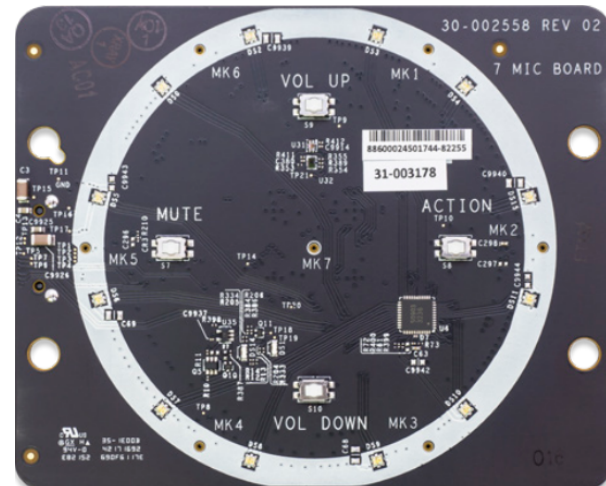


Empty Spot ;)

‘The Technical Details’

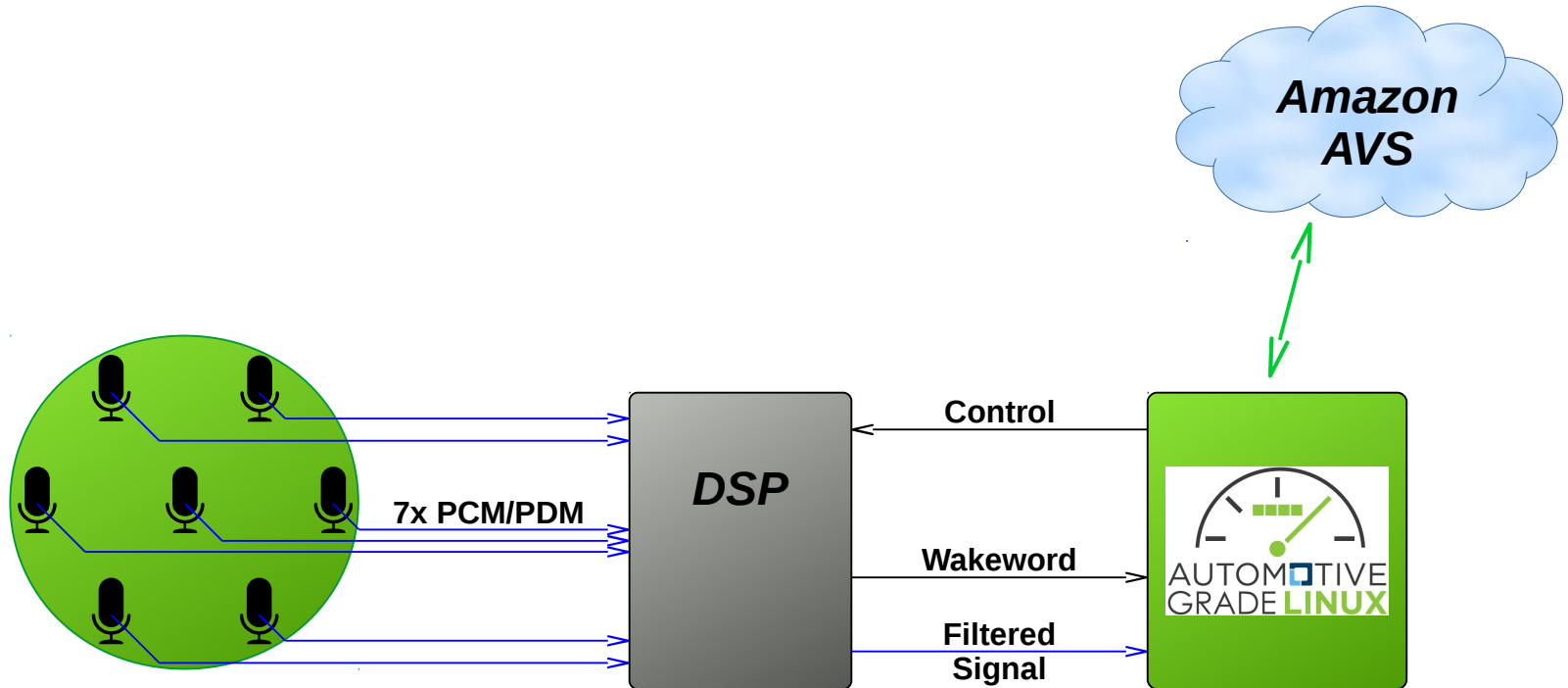
“AGL Developer Kit for Amazon AVS”

- USB-powered, simple dual-layer PCB
- 7x MEMS Microphones
- 4x Switches
- 12x LEDs
- DSP (with pre-programmed Alexa algorithms)
- USB Audio-Bridge

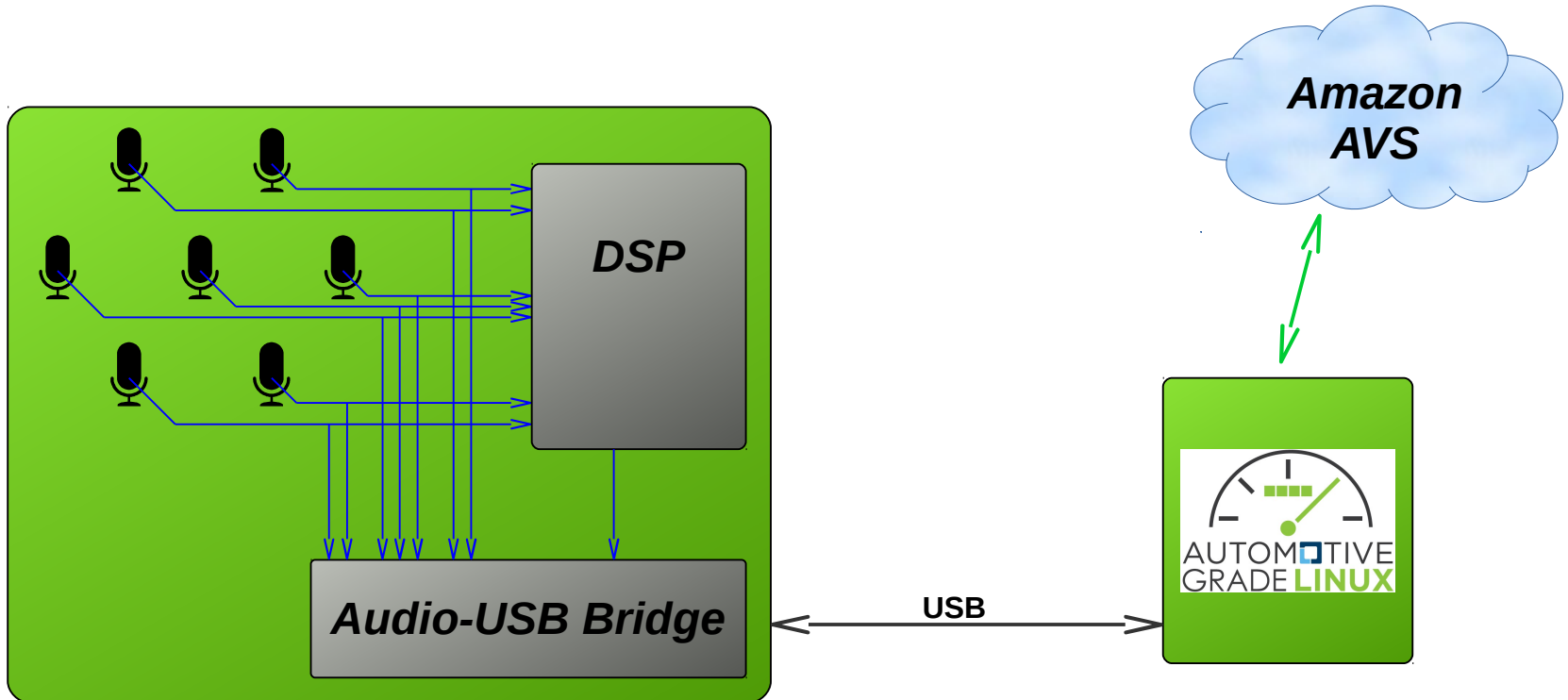


(Symbolic picture, AMAZON Alexa Premium Kit)

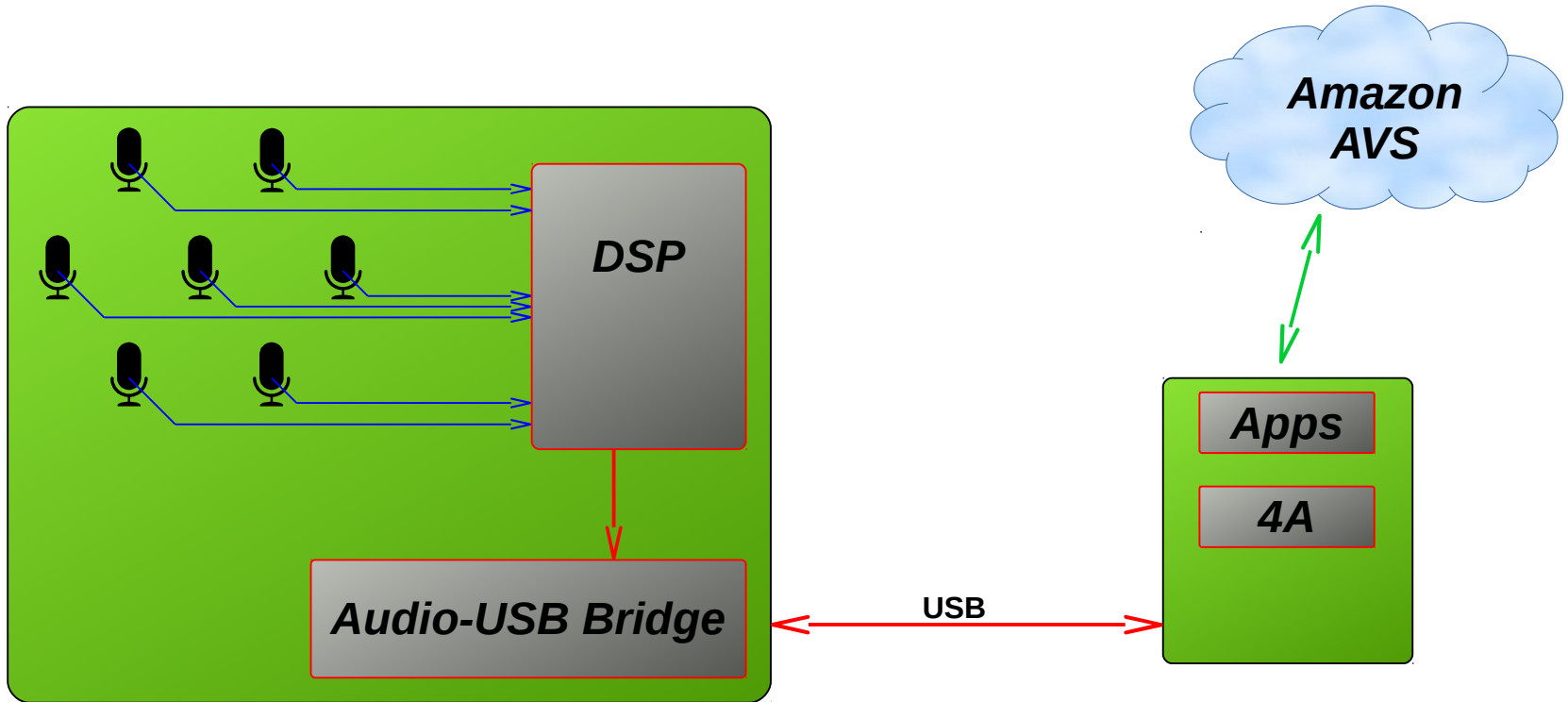
Basic Audio Processing



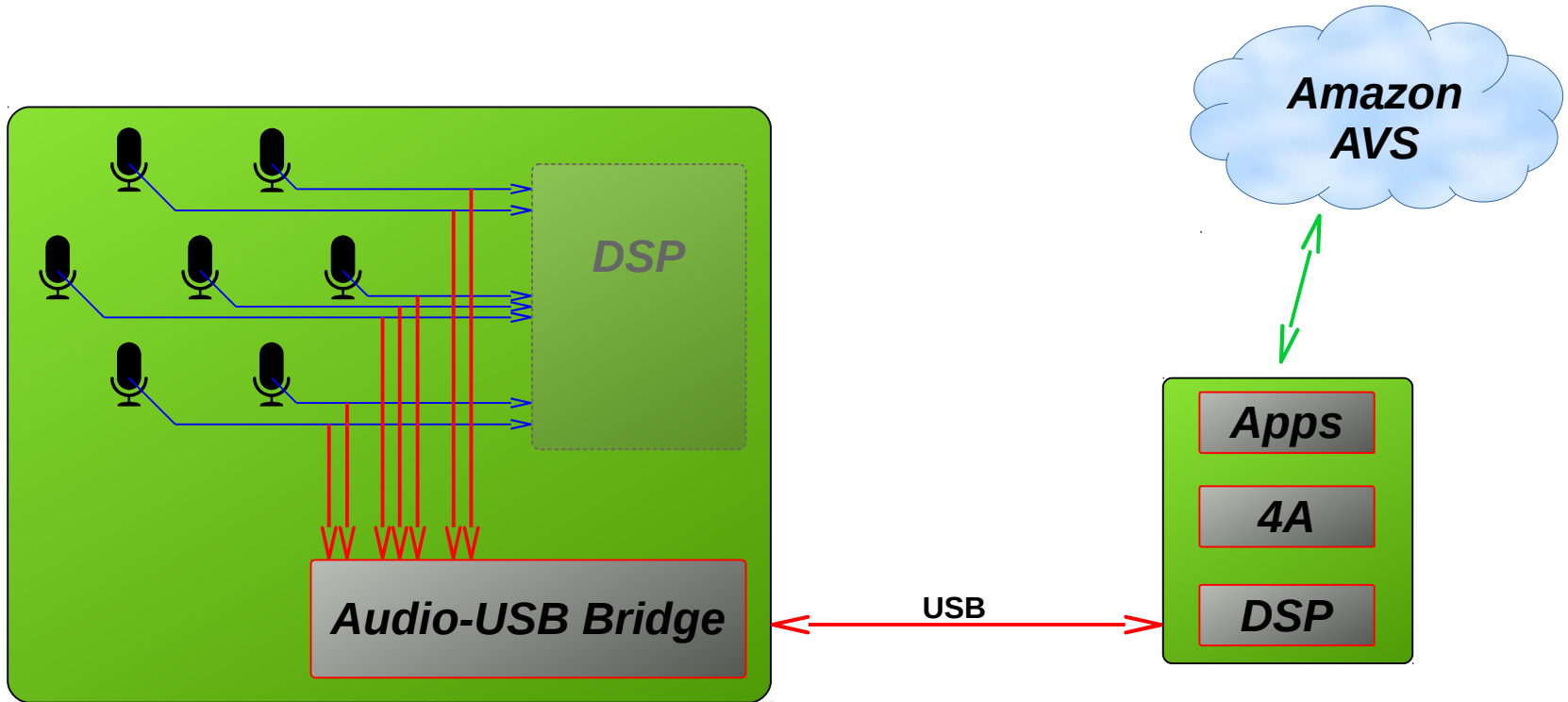
AGL Microphone Developer Kit



Main Usecase: App Development



Usecase: Internal DSP of SoC





Looking for Collaboration

Microchip likes to offer the following:

- Design and manufacture of the PCB
- Audio-USB Bridge
- ALSA-based Kernel driver

Looking for Collaboration on:

- Seamless 4A integration
- MEMS Microphones (PCM/PDM)
- DSP (Wakeword, Near/Far-field, Echo)
- Open Source Algorithms (e.g. Noise Cancelling, Beam-Forming)

Thank you!