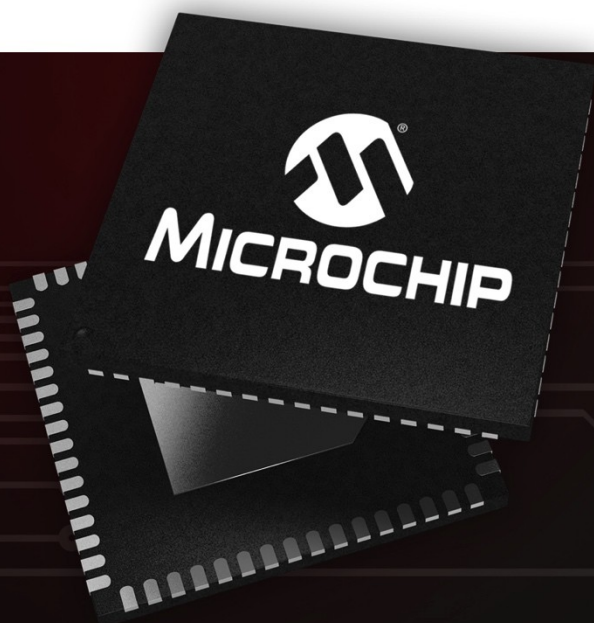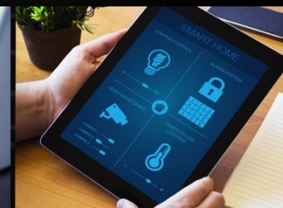# MICROCHIP

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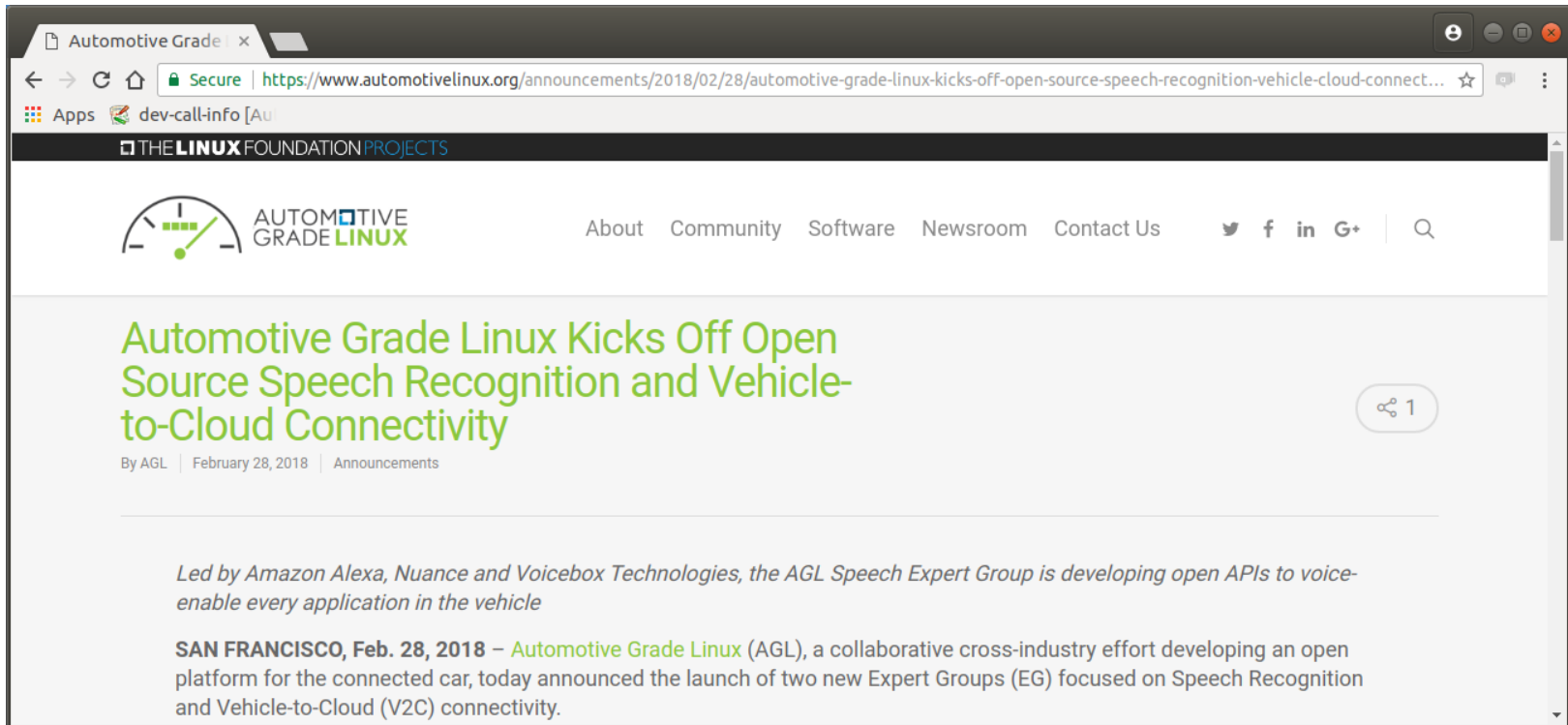
- Active Noise Cancellation
- Hands-free communication
- Speech recognition
- Cloud-based services (e.g. Amazon Alexa)

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 annouced two new ExpertGroups:
- Open Source Speech Recognition
- Vehicle-To-Cloud 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
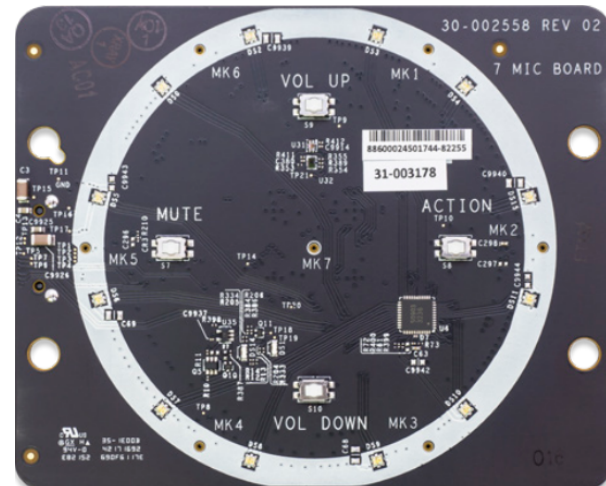- Working out-of-the-box with all AGL applications

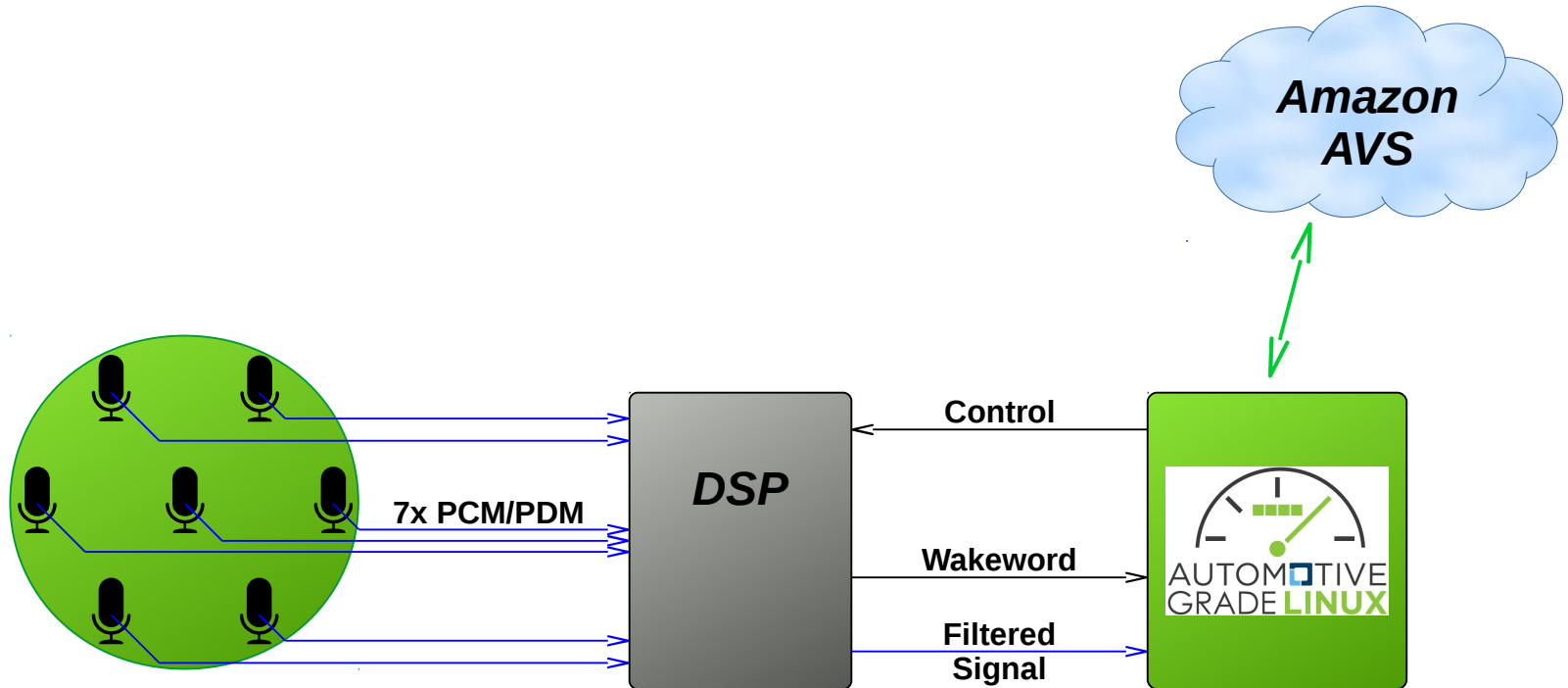Empty Spot ;)

'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)
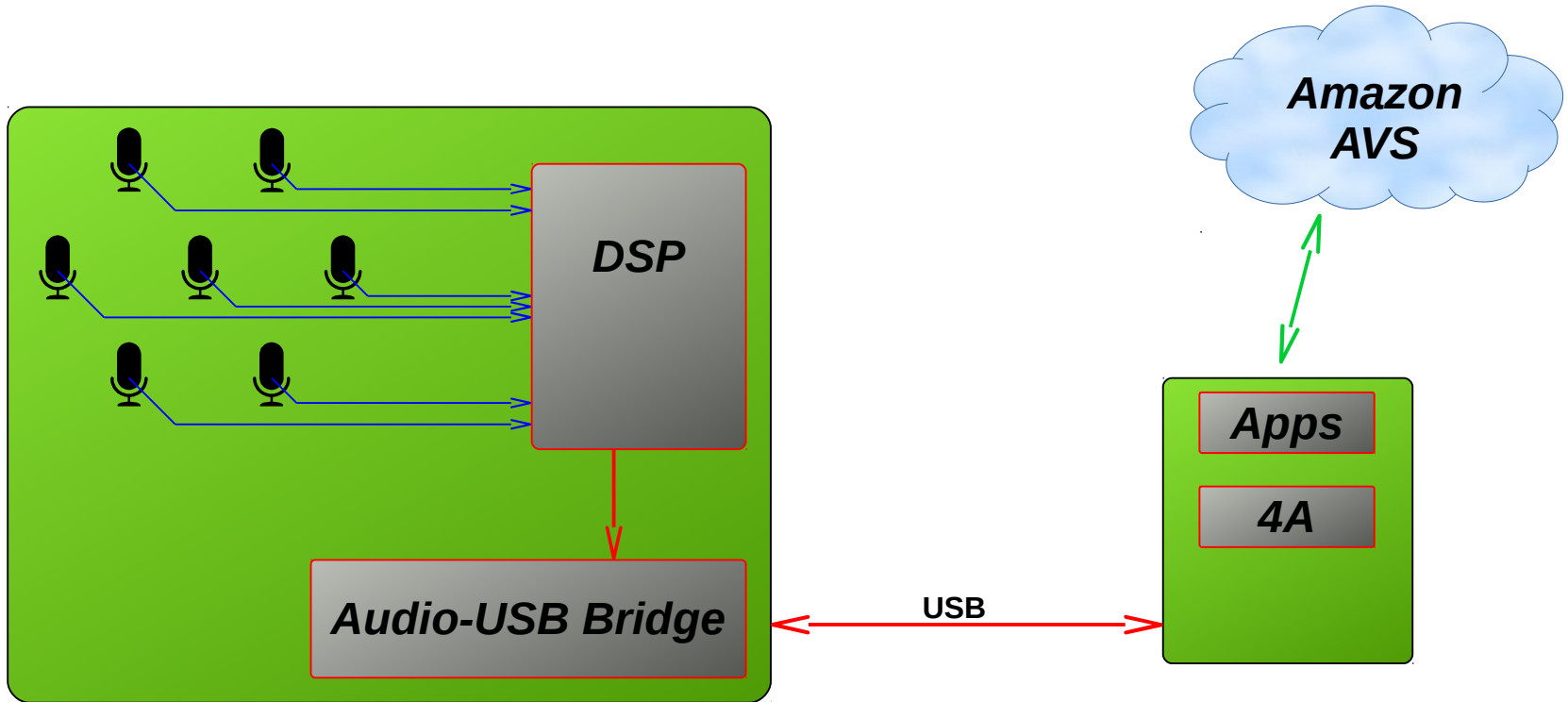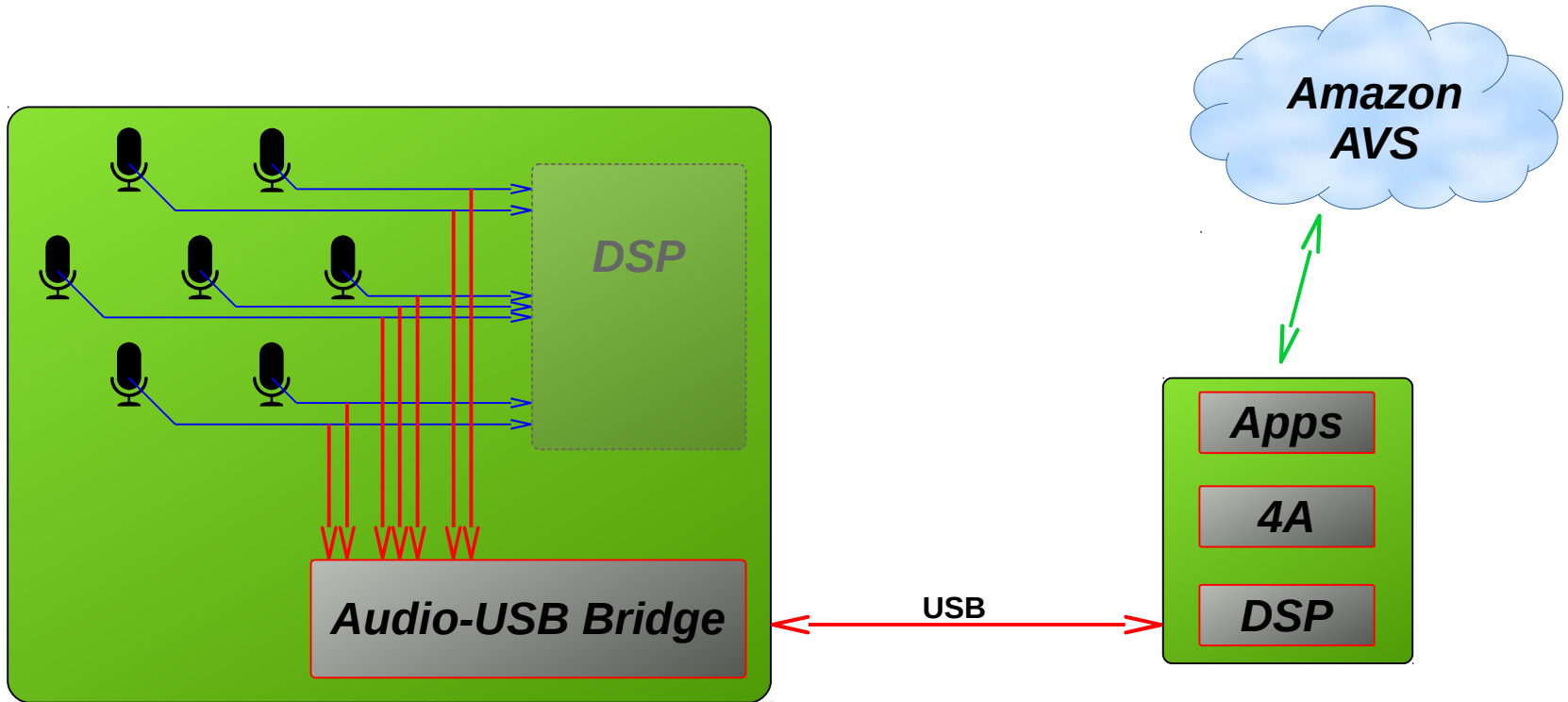
Basic Audio Processing

Amazon AVS

DSP

7x PCM/PDM

Control

Wakeword

Filtered Signal

AUTOMOTIVE GRADE LINUX

AGL Microphone Developer Kit
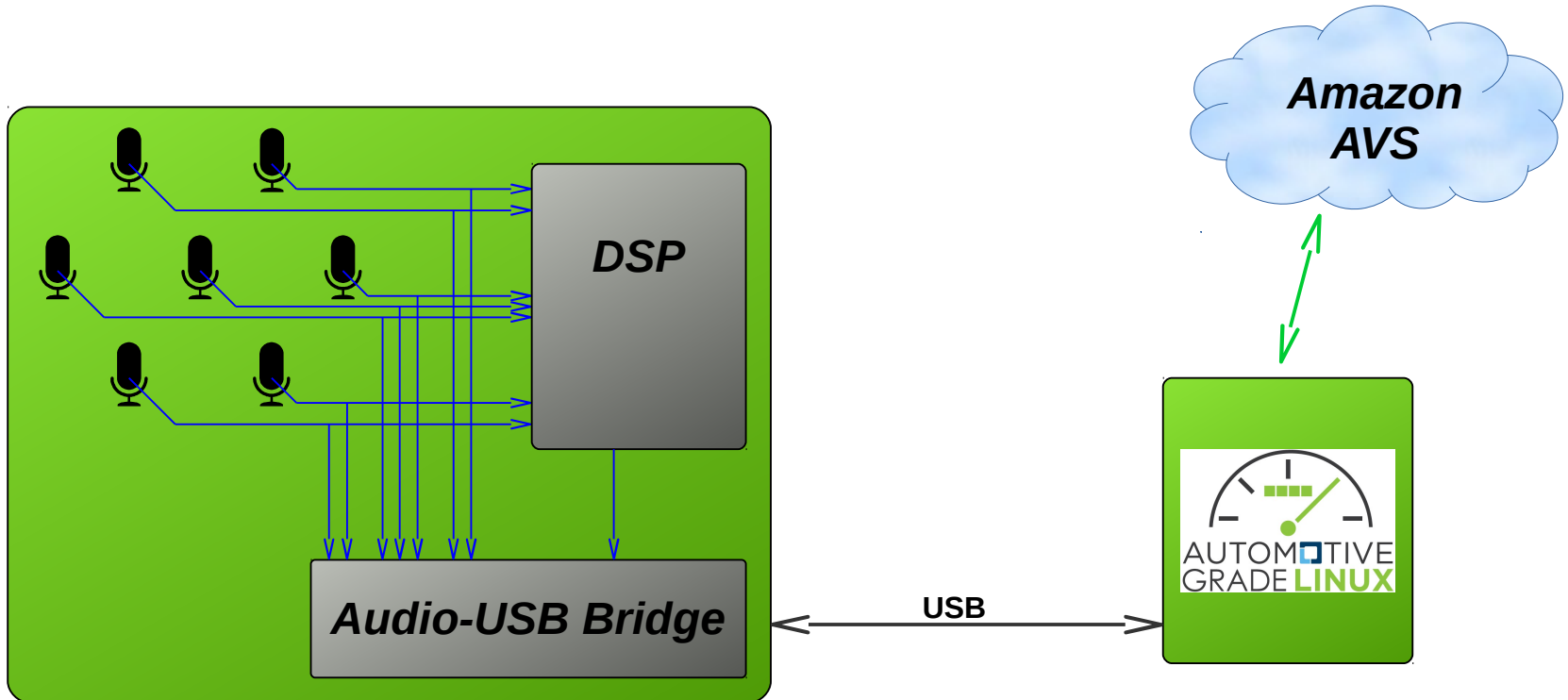
Main Usecase:
App Development

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!