Reference Hardware, System Architecture deals with various requirements from OEMs.

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SEIJ I GOTO
Mazda Motor Corporation
MAZDA and LINUX, 2013-

Automotive-specific requirement:
- Reliability
- High-speed start/shutdown
- Power supply management
- Long life cycle

... All of this will be a lot for one company to take on.
We sympathized with the goals of AGL, and became one of AGL’s members.

What Mazda wants:

- Improve quality and avoid failures
- Continuous innovation/renovation
- Improve Time-to-market speed
- Reduce the cost

The goals of the Automotive Grade Linux Workgroup are to provide:

- An automotive-focused core Linux operating system stack that meets common and shared requirements of the automotive ecosystem with a broad community of support that includes individual developers, academic organizations and companies.
- A transparent, collaborative, and open environment for Automotive OEMs, Tier One suppliers, and their semiconductor and software vendors to create amazing in-vehicle software.
- A collective voice for working with other open source projects and developing new open source solutions.
- An embedded Linux distribution that enables rapid prototyping for developers new to Linux or teams with prior open source experience.

Source: https://www.automotivelinux.org/
Some IVI projects are going up in flames
“New” Expert Group together with OEMs

Multiple IVI (In-Vehicle Infotainment) projects with the scale of 10 million steps are running all over the world. Because each OEM requirement differs, a Reference Hardware System Architecture (RHSA EG) was developed by the Expert Group (EG) for HONDA, MAZDA, SUBARU, SUZUKI, and TOYOTA.
Multiple OEMs and Types of Cars

AGL OEMs
DAIMLER, FORD
HONDA, JLR, MAZDA
MITSUBISHI MOTORS
NISSAN, SUBARU
SUZUKI, TOYOTA

Types of Cars
Compact · Sports · Luxury
Sedans · SUVs · Crossovers
Electric Cars, Hybrid Cars
If AGL can work on both systems, (just like laptop and desktop) it will solve the problem of the current IVI development workload.
To be compatible with various IVI system configurations, AGL UCB needs to be able to operate on various IVI system configurations. For this, what we need is:

- A system architecture compatible with various combinations of peripherals.
- Common reference hardware.
- AGL platform independent from IVI system configurations.
Collect hardware requirements from OEMs

Design system architecture compatible with various requirements

Define reference hardware deal with various requirements

OEM A  OEM B  OEM C
Collect hardware requirements from OEMs

Input
- Camera, Media, Tuner, Microphone
- Navi Sensor, Input device

Output
- Display, Amp/Speaker

Input/Output
- Vehicle External Network (ex. WiFi Bluetooth®, DCM/TCU)
- Vehicle Internal Network (ex. CAN)
Design system architecture “Selector”

Selector:
- Make AGL PF compatible with Audio/Visual hardware configurations

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In SoCdecode

Decode in Main SoC

AGL PF

Different Media Browsers are required
Example of System Architecture

Common requirements

Various hardware requirements

This document is used only for internal discussion in the AGL Reference Hardware System Architecture ECO.
Define Reference Hardware

Reference Hardware
(for AGLPF)

Reference Hardware
(for luxury spec)

Reference Hardware
(for compact spec)

Community Board

Main Board

Ext Board

Ethernet Tuner USB

Deck BT/Wi-Fi

Display AV control

Ext Display RSE

GPS Display

Deck CAN

Camera CAN controller

BT/Wi-Fi Tuner CAN

…
Reference Hardware

It is important to reduce this GAP!
In the near future

Current scope of EG Communication with other In-vehicle system.
THANK YOU.