Automotive Grade Linux Developer BoF Session

Embedded Linux Conference Europe
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What is AGL?

Collaborating to build the car of the future through rapid innovation

- Open source Linux-based collaborative project
- Hosted at Linux Foundation
- Focused on rapid innovation of vehicle software using the AGL Unified Code Base
Total of 11 OEMs supporting AGL!

Accounts for approximately 60% of worldwide annual vehicle shipments

Sources:
AGL Members - Total of 155 companies!

**Platinum**
- DENSO
- mazda
- Panasonic
- Renesas
- Suzuki
- Toyota

**Gold**
- Honda

**Silver**
- Aisin AW CO., LTD.
- Amazon
- Mercedes-Benz
- Denso Ten
- DRIMRES
- NTT DATA
- Qualcomm
- SAIC Motor
- Volkswagen
- Wind River

**Bronze**
- Abalta
- Aditi
- Airbiquity
- Aditiv
- Adobe
- BeRock Systems, Inc.
- Bosch
- Brüel & Kjær
- Cognite
- Continental
- Dell
- Dassault Systèmes
- Epam
- ETRI
- Eureka, Inc.
- Fujitsu
- German Autobahn Ventures
- GitHub
- Green Hills Software
- harman
- HERE
- Hitachi
- Hyundai
- iC
- igalia
- iMx
- Intel
- Irisys
- IVIS
- Kistler
- Kvaser
- Kollmorgen
- Konsulko
- Kepner-Tregoe
- KPMG
- LEAR
- Linaro
- LUXFOSS
- Mentor
- Neusoft
- NEXUS
- NVIDIA
- NXP
- Oracle
- PAM Software
- Pioneer
- Poseidon
- QNX
- Quasar
- Renesas
- Samsung
- SiFive
- Sony
- Spansion
- Suntech
- Synergy
- SYSCON
- Telenav
- Total
- Tuxera
- Veniam
- VOLVO
- Xevo
- Xilinx
- Xilinx
- Yahtsome
<table>
<thead>
<tr>
<th>Hardware/Software Component</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Infotainment</td>
<td>Music, Navigation, Media</td>
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<tr>
<td>Instrument Cluster</td>
<td>Speed, Engine, Climate</td>
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<tr>
<td>Heads-up Display (HUD)</td>
<td>Warning, Information</td>
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<tr>
<td>Telematics/Connectivity</td>
<td>Cloud, GPS, Signal</td>
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<tr>
<td>Functional Safety</td>
<td>Safety, Security, Monitoring</td>
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<tr>
<td>Advanced Driver Assistance Systems (ADAS)</td>
<td>Lane Assitance, Collision Avoidance</td>
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The only organization addressing all software in the car is...

**Autonomous Driving**
AGL Unified Code Base

• Develop a single open source software platform for the entire industry, reducing fragmentation
• Provide at least 70% of the base platform for production projects
• Cultivate an ecosystem of developers, suppliers, and automotive expertise all using a single platform
• Reference hardware and applications available for adaptation

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2019 AGL Schedule (Current)

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<th>Jan</th>
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<th>Dec</th>
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**Grumpy Guppy**
- RC4
- RC5
- 7.0.0
- 7.0.1
- 7.0.2
- 7.0.3
- 7.0.4

**Happy Halibut**
- Start of Development
- Release Candidates
- 8.0.0
- 8.0.1
- 8.0.2
- 8.0.3
- 8.0.4

**Itchy Icefish**
- Start of Development

See [https://wiki.automotivelinux.org/schedule#latest_schedule](https://wiki.automotivelinux.org/schedule#latest_schedule) for latest schedule information
AGL Architecture

Platform
- Base BSP
- Security
- AGL transport

Micro Services based
- Middleware and App Binding / Binder Model
- Downloaded on platform
- Multi-ECU
- Car to Cloud
- Car to Car
AGL Binder/Binding

Security Context
- SMACK based

Binder
- Secure environment for an App
- Container process
- Transport
- Security
- Standardized Async API structure

Binding
- Adds one API to the Binder
- Implements feature
- Multi thread support
- Standardized integration

http://docs.automotivelinux.org/docs/apis_services/en/dev/#application-framework-binder
AGL Binder/Binding

- Available binders include
  - Home Screen
  - Window Manager
  - Audio
  - Connectivity (Networking, Wifi, Bluetooth, Vehicle Signaling, Telephone, Phone Book, NFC)
  - Location (GPS, Geofence)
  - Media Player, Media Scanner, AM/FM Tuner
  - Signal Composer, HVAC
SDK for App Developers

• XDS Based SDK
• Docker image to eliminate host dependency issues
• Available for reference boards with published images that include graphics drivers
• Enables rapid AGL application development
• Support for Qt (HTML5 planned!)
• No Yocto knowledge is needed or assumed for SDK users

http://docs.automotivelinux.org/docs/devguides/en/dev/#development-kit-build-agl-application
DEVELOPER RESOURCES
AGL Documentation

• Getting Started
  https://wiki.automotivelinux.org/start/getting-started

• AGL documentation site
  http://docs.automotivelinux.org/

• AGL Wiki
  https://wiki.automotivelinux.org/

• AGL Jira
  https://jira.automotivelinux.org/
Get The Code

• Pre-built binaries and source tar balls available
  • [https://www.automotivelinux.org/software/download](https://www.automotivelinux.org/software/download)

• Latest Source Code and Build Instructions
  • [https://wiki.automotivelinux.org/agl-distro/source-code](https://wiki.automotivelinux.org/agl-distro/source-code)

• Release Notes
  [https://wiki.automotivelinux.org/agl-distro/release-notes](https://wiki.automotivelinux.org/agl-distro/release-notes)
• AGL gerrit

http://gerrit.automotivelinux.org/

• AGL git

https://git.automotivelinux.org/
Ask Questions

• Weekly Developer Call on Tuesdays
  https://wiki.automotivelinux.org/dev-call-info

• IRC channel #automotive on freenode.net

  Discussion about open source software for vehicles. No help for mechanical issues should be accepted from anyone on this channel.

• Weekly Newsletter
  https://wiki.automotivelinux.org/newsletter

• Dev Community Mail List
  https://lists.automotivelinux.org/g/agl-dev-community
2019 F2F Workshop Update

• Mar 5-7 – Tokyo AGL AMM
• May 7-9 – A Coruña, Spain (Igalia)
• July 16 – Tokyo - Day before Automotive Linux Summit
• Sep 24-26 – Berlin (VW/ Carmeq)
• October 21 - 24 – Monte Carlo – AGL Fall AMM
• Nov 11 – 13 – Karlsruhe and Yokohama – CES Integration Session #1
• Dec 10 – 12 – San Francisco – CES Integration Session #2
• Jan 7-10 : CES 2020
Q & A
Q & A

• This is the segment where
  • You ask intelligent, well thought out questions
  • I ramble pointlessly and unintelligently

• And/Or
  • You ask “dumb” questions
  • I respond with concise, insightful, and well-reasoned answers
THANK YOU