

# State of the AGL

Linux Foundation AGL Advisory Board

DENSO TEN Linux PF Project Leader

Yuichi Kusakabe

**掲載および発言内容は各個人の見解であり、必ずしも所属する  
企業や組織の立場、戦略、意見を代表するものではありません。**

# What is AGL?

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- Non-profit
- Open source Linux-based collaborative project
- Hosted at Linux Foundation
- Focused on rapid innovation of vehicle software

# Goals of AGL

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- Build a single software platform for the entire industry
- Develop 70-80% of the starting point for a production project
- Reduce fragmentation by combining the best of open source
- Develop an ecosystem of developers, suppliers, expertise all using a single platform



AUTOMOTIVE  
GRADE **LINUX**

the only  
organization  
addressing  
all software in  
the car



**Infotainment**



**Instrument  
Cluster**



**Heads-up  
Display (HUD)**



**Telematics/  
Connectivity**



**Functional  
Safety**



**Advanced Driver  
Assistance Systems  
(ADAS)**



**Autonomous Driving**

# AGL Members - Total of 127 companies!

## Platinum



## Gold



## Silver



## Bronze



# Just announced:

## Automotive Grade Linux Platform Debuts on the 2018 Camry

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# Automotive Linux Wiki

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[AGL Projects](#)  
[2018 CES Demonstrator](#)

## AGL Software

[Schedule and Milestones](#)  
[AGL Software Distribution](#)  
[Subteam Pages](#)  
[Demo Apps](#)  
[AGL Developer Web Site](#)  
[Contributing to the AGL Code](#)  
[Tips and tricks](#)  
[Release Notes](#)

## Expert Groups

[System Architecture Team](#)  
[App Framework and Security](#)  
[Connectivity](#)  
[Continuous Integration and Test](#)  
[UI and Graphics](#)  
[Virtualization](#)  
[Navigation](#)  
[Reference Hardware System](#)  
[Architecture](#)  
[Vehicle to Cloud](#)

The [Automotive Grade Linux \(AGL\) initiative](#) is

- driven by the Automotive Grade Linux Collaborative Project of the Linux Foundation
- about improving open source components for automotive use cases
- follows an upstream-first policy in publishing the improvements
- using a common reference platform for test and integration purposes

The overall direction of the Automotive Grade Linux Collaborative Project is set by the AGL Advisory Board and Steering Committee. All work is carried out by the Expert Groups.

You are cordially invited to join and contribute to AGL and this Wiki. See [Getting Started with AGL](#) to register for accounts to contribute to the requirements, source code, or documentation of AGL.

**Weekly Developer Meeting held on Tuesdays at 14:00 UTC (6 am Pacific Standard Time)**

[Conference Info and Meeting Notes](#)

## News

You can find the latest AGL News [here](#).

## Table of Contents

- ♦ [News](#)
- ♦ [Face To Face Meetings](#)
- ♦ [Important Links](#)
- ♦ [Getting started with DokuWiki](#)

start







Automotive Apps with HTML5, Qt OpenGL

Multiple platforms on a common code base

Free and open source

[GET STARTED](#)

[CONTRIBUTE](#)



Reusable code  
across platforms



Support for  
Connected  
Vehicles



Security Built In



# 2018ALS@お台場



2018年6月20日～22日  
東京コンファレンスセンター・有明  
東京 – 有明  
#autolinux

[スケジュールを見る](#)

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## ご来場、ありがとうございました

おかげさまで Automotive Linux Summit 2018 は無事終了いたしました。ご来場いただきました皆様、ならびにスポンサー企業の方々に、深く御礼申し上げます。イベント会場の写真は[こちら](#)、講演者提供のセッションスライドは[こちらのスケジュールサイト](#)でご覧いただけます。

[2017年のイベントWEBサイトを見る](#)

## 2019年の開催予定について

Open Source Summit Japan & Automotive Linux Summit 2019 は、2019年7月17日から7月19日、虎ノ門ヒルズフォーラムにおいて開催される予定です。

2018ALS@お台場

# Welcome to ALS + OSSJ - Tokyo 2018

***900+ people across 289 companies and 43 countries!***



Slide 2

# 2018ALS@お台場

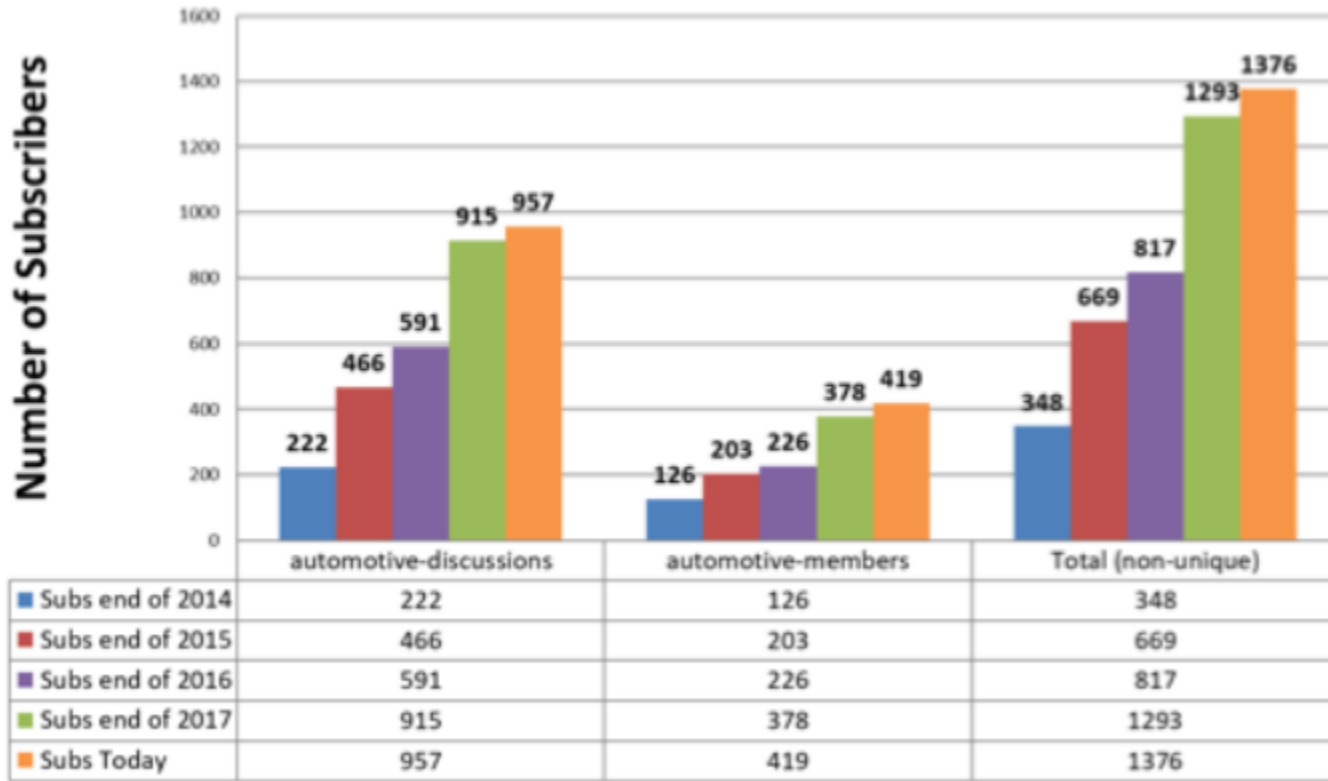
## 19 New AGL Members in 2018



*\*One stealth startup not shown*

## Community: Mailing List Subscribers

AGL Mailing List Subscriber Growth



- Healthy community!
- 950+ developers on Automotive-Discussions list
- 106% growth since 2015



## Top 25 Git Committers in 2018

Commits	Name	Company
141	Jose Bollo	IoT.bzh
76	Matt Ranostay	Konsulko
71	Changhyeok Bae	LG
68	Romain Forlot	IoT.bzh
67	Khang Nguyen	Renesas
51	Ronan Le Martret	IoT.bzh
39	Thuy Tran	Renesas
31	Jan-Simon Moeller	Linux Foundation
31	Kazumasa Mitsunari	Witz
28	Jonathan Aillet	IoT.bzh
18	Thao Nguyen	Renesas
15	Kevin Hilman	BayLibre
15	Loic Collignon	IoT.bzh

Commits	Name	Company
13	Sebastien Douheret	IoT.bzh
11	Martin Kelly	Xevo
11	Matt Porter	Konsulko
9	Harunobu Kurokawa	Renesas
9	Kotaro Hashimoto	Mitsubishi Electric
7	Loys Ollivier	BayLibre
7	Stephane Desneux	IoT.bzh
7	Tadao Tanikawa	Panasonic
7	Tobias Jahnke	Microchip
7	Tom Rini	Konsulko
5	Christian Gromm	Microchip
5	Scott Murray	Konsulko
5	Thierry Bultel	IoT.bzh

796 Total Commits  
47 Committers  
19 Companies

- 01 Jan 2018 – 14 June 2018
- Commits to master



## Commits by Company in 2018

Company	Commits
IoT.bzh	329
Renesas	140
Konsulko	106
LG	71
Witz	33
Linux Foundation	31
BayLibre	25
Microchip	12
Mitsubishi Electric	11

Company	Commits
Xevo	11
Panasonic	7
Intel	5
FiberDyne	4
Individual	3
Qt Company	3
Nexty	2
AisinAW	1
Cogent Embedded	1
Virtual Open Systems	1

796 Total Commits  
47 Committers  
19 Companies

- 01 Jan 2018 – 14 June 2018
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## Grumpy Guppy



- Strong focus on hardening, stability and “production ready”
- Speech Services
  - Speech API
  - Speech enabled app framework
  - Speech enabled apps for CES 2019
- Vehicle-to-Cloud features



2018ALS@お台場

# Speech Recognition Expert Group

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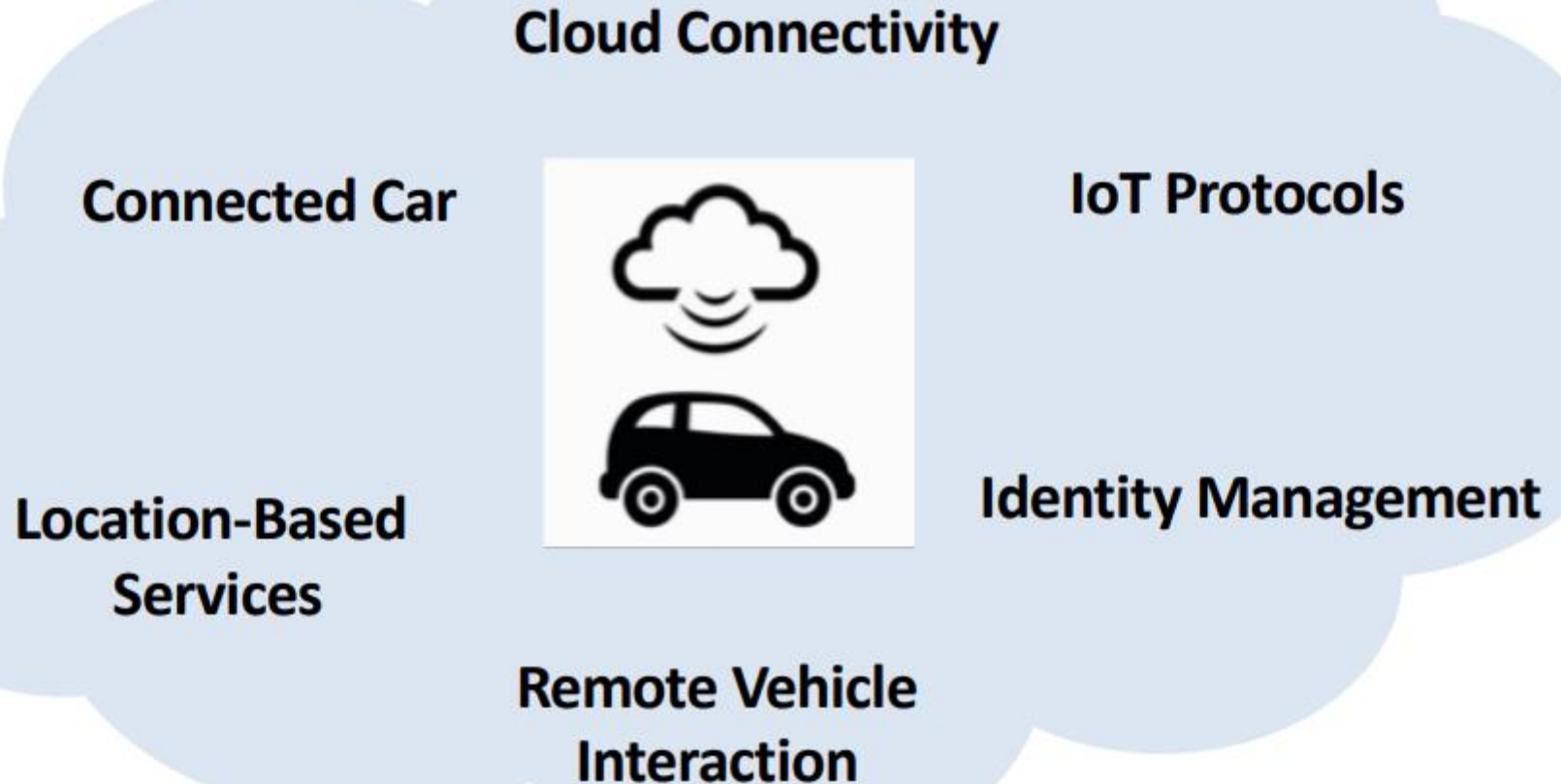


- New Expert Group formed at CES
- Vision:
  - We want to speech-enable every app in the vehicle!
- Goals:
  - Define industry standard APIs
  - Independent of the underlying technology
  - Simplify Speech Rec integration for app developers



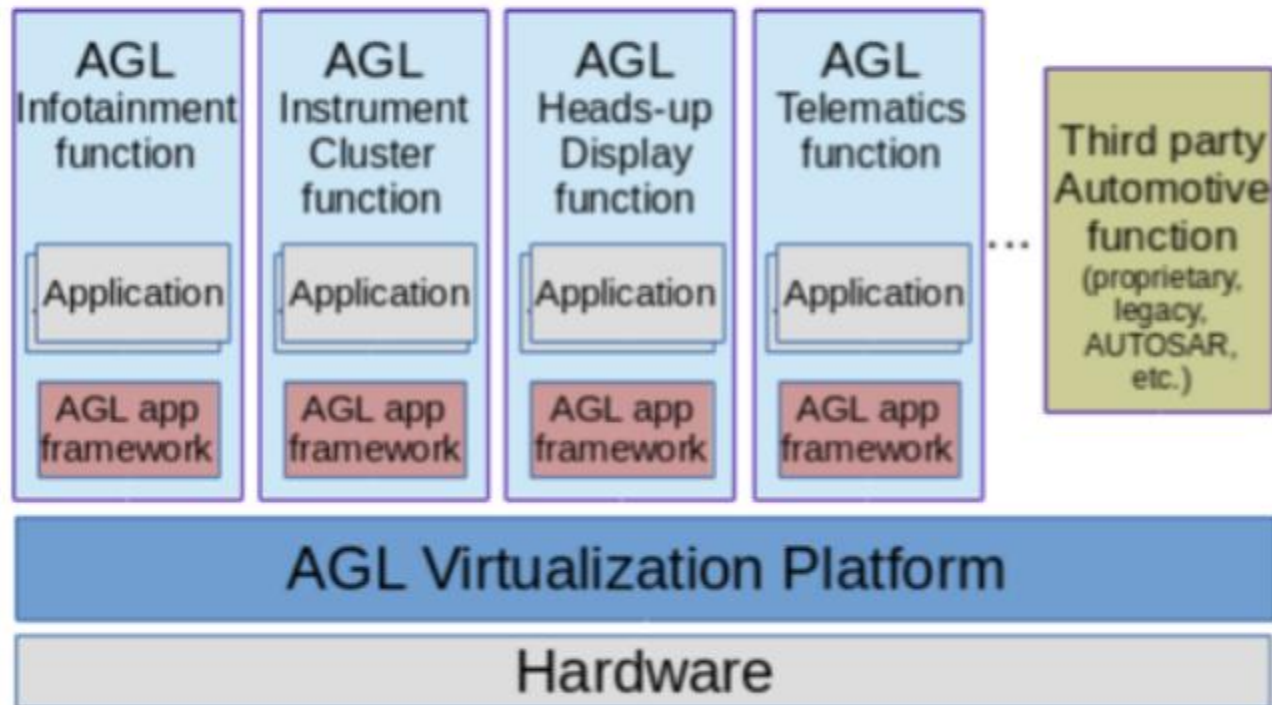
2018ALS@お台場

# Vehicle-to-Cloud Expert Group



# Virtualization Expert Group

*Announcing: Publication of the Virtualization whitepaper*





# Mercedes-Benz Vans Transforms the Future of Commercial Vehicles

## AGL Continues to Roll out to New Toyota Vehicles across Japan and the United States

### Mercedes-Benz Vans Transforms the Future of Commercial Vehicles

With its future-oriented “adVANce” initiative, Mercedes-Benz Vans is evolving from a manufacturer of globally successful vans into a provider of holistic transport solutions. The adVANce initiative focuses on several fields of innovation: connectivity and IoT applications, innovative hardware solutions, new on-demand mobility and rental concepts and fleet management solutions for the transport of goods and passengers.

In order to bring these new commercial solutions to life, Mercedes-Benz Vans is developing a next-generation onboard operating system using Automotive Grade Linux (AGL). The open source AGL platform provides Mercedes-Benz Vans with the flexibility to rapidly create tailored solutions for customers, including adding and connecting any kind of IoT components to the vehicle, such as sensors, automation controls and actuators. The new AGL-based operating system will debut on various Mercedes-Benz Vans prototype projects later this year.

“It has become clear that fast innovation cycles and flexible software architecture are key for the successful development of business applications, which is why we are using AGL as a foundation for our new onboard operating system,” said Thomas Wurdig, Head of Onboard-System Architecture and IoT, Mercedes-Benz Vans. “Using a standardized, open operating system like AGL enables us to rapidly develop new commercial vehicle use cases such as robotic delivery, data analytics and prediction and automation technologies.”

### AGL Continues to Roll out to New Toyota Vehicles across Japan and the United States

The first AGL-based infotainment system on the road was **announced last year** on the 2018 Toyota Camry in the United States. The system is now in vehicles globally including the 2018 Prius PHV in Japan and many of the updated vehicle models following the Camry in the United States.

“Adopting open source software and being actively involved in projects like AGL represents a significant part of our technology strategy,” said Keiji Yamamoto, Executive Vice President, Connected Company of Toyota Motor Corporation. “The flexibility of the AGL platform has allowed us to quickly roll-out our new infotainment system to multiple vehicle models across the world.”

# Toyota's "Open Strategy" of Connected Vehicle

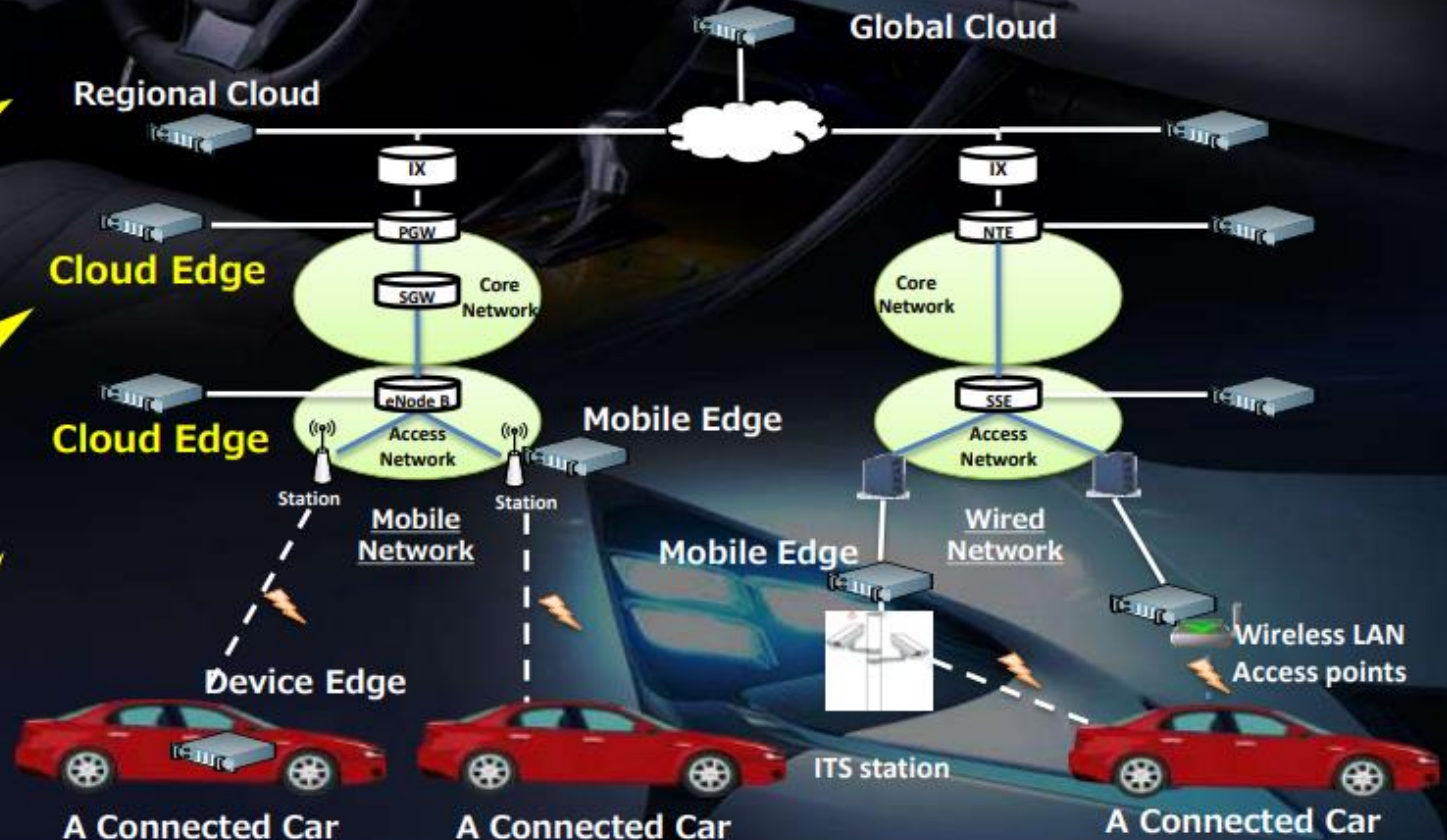
## AECC: Automotive Edge Computing Consortium



Contributing to  
establish the  
consortium

Contributing  
requirements  
from Car OEM  
viewpoint

Contributing  
system  
requirements  
and  
standardization





# Toyota's "Open Strategy" of Connected Vehicle

## Issues on Non-Technologies

To reduce OSS copyright risks

To reduce OSS patent risks



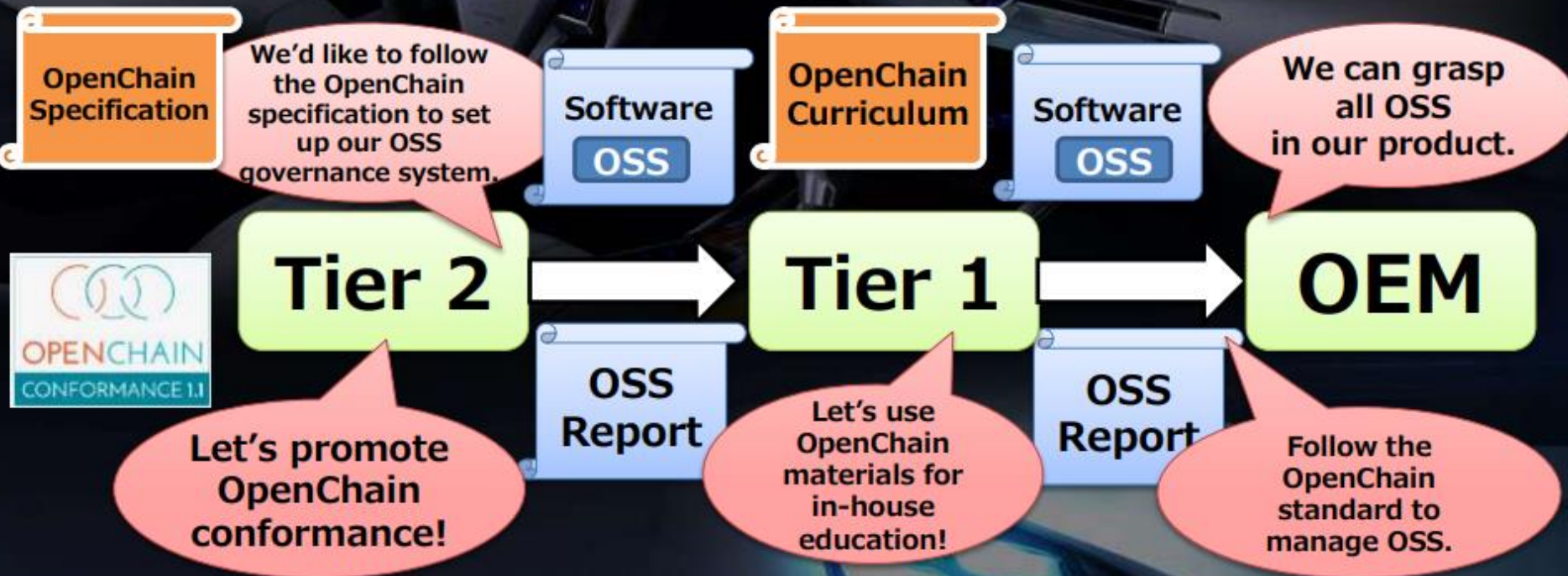
openinventionnetwork®

**Hybrid  
strategy!**

- We are working together with the communities to reduce OSS legal risks for customers and developers.
- TOYOTA is the first corporation to become a top level member in both OpenChain Project and OIN.

# Toyota's "Open Strategy" of Connected Vehicle

## Pros of applying OpenChain to the Supply Chain



**OpenChain materials will provide strong OSS governance throughout the whole supply chain!**



# Toyota's "Open Strategy" of Connected Vehicle

## OpenChain Japan Work Group

### <Members>

Over **25** companies

TOYOTA/HITACHI/Sony/Panasonic/TOSHIBA/NEC/FUJITSU/RICOH/  
MITSUBISHI ELECTRIC/DENSO/DENSO TEN/AISIN AW/Pioneer/RENESAS...

### <Mission>

To help Japanese and Asian engineers so engineers can use OSS safely

### <Activities>

- Promoting OSS compliance in Japan and Asia
- Solving issues which are unique to Japan
- Sharing information



**TOYOTA, HITACHI and Sony formed the Japanese Work Group last December and have already initiated OSS compliance activities in Japan and elsewhere in Asia.**



# トヨタのオープンソース活用戦略、コネクテッドカーは「協力」でできている

Automotive Linux Summit 2018レポート：

## トヨタのオープンソース活用戦略、コネクテッドカーは「協力」でできている (1/2)

🕒 2018年06月22日 06時00分 公開

[齊藤由希, MONOist]



印刷



通知



20



177



3



コネクテッドカーにオープンソースソフトウェアが必要なのは、コストダウンではなく「一貫性」のため——。Linuxベースの車載情報機器関連のオープンソースプロジェクト Automotive Grade Linux (AGL) が開発者向けイベント「Automotive Linux Summit」(2018年6月20～22日、東京コンファレンスセンター・有明)を開催した。

その基調講演にトヨタ自動車 コネクティッドカンパニー コネクティッド戦略企画グループ プロジェクトゼネラルマネージャーの村田賢一氏と、トヨタ自動車 知的財産部 コネクティッドビークルグループ プログラムマネージャーの遠藤雅人氏が登壇。コネクテッドカーにおけるオープンソース活用の重要性や、特許リスクへの取り組みを紹介した。

### インフォテインメントシステム、ネットワーク基盤、スマホ連携の取り組み

自動車が通信機を搭載することにより、車両の状態やセンサーから得た車内外の情報をクラウドに集めて分析することが可能になる。こうしたデータを分析した結果は、研究開発や製品企画、品質改善、マーケティング、販売後のメンテナンス、故障の診断や予知など幅広く活用できる。また、ドライバーに情報を提供するテレマティクスサービスや、運転の仕方に応じた自動車保険、車両の再販価格の査定など、新しいサービスも生み出す。



トヨタ自動車の村田賢一氏

# Open Hardware in In-Vehicle Infotainment System

## Reference Hardware System Architecture Expert Group in AGL

- Expert Group members



**TOYOTA**

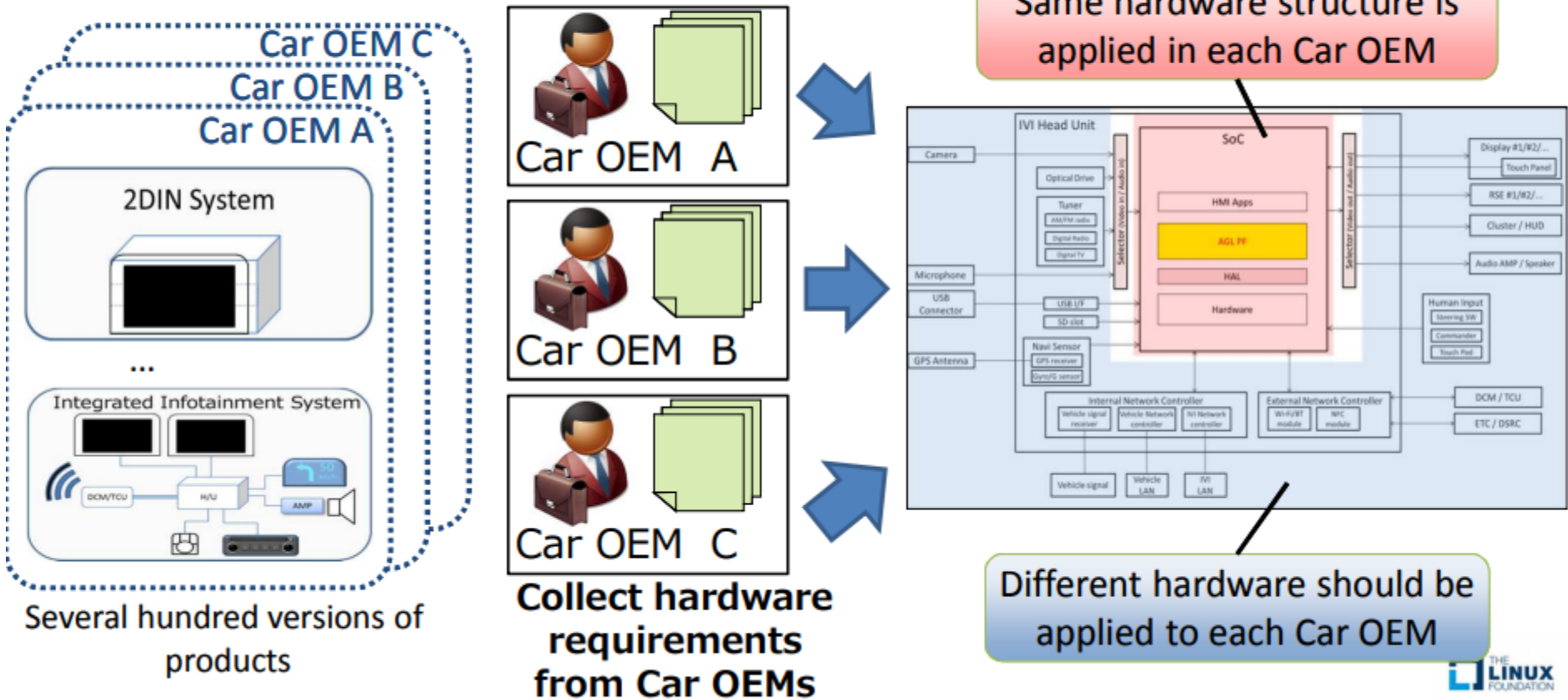
- Today's speakers

- |                    |                            |
|--------------------|----------------------------|
| – Seiji Goto       | – Mazda Motor Corporation  |
| – Shinji Tsunoda   | – SUBARU CORPORATION       |
| – Toshihisa Haraki | – SUZUKI MOTOR CORPORATION |



# Open Hardware in In-Vehicle Infotainment System

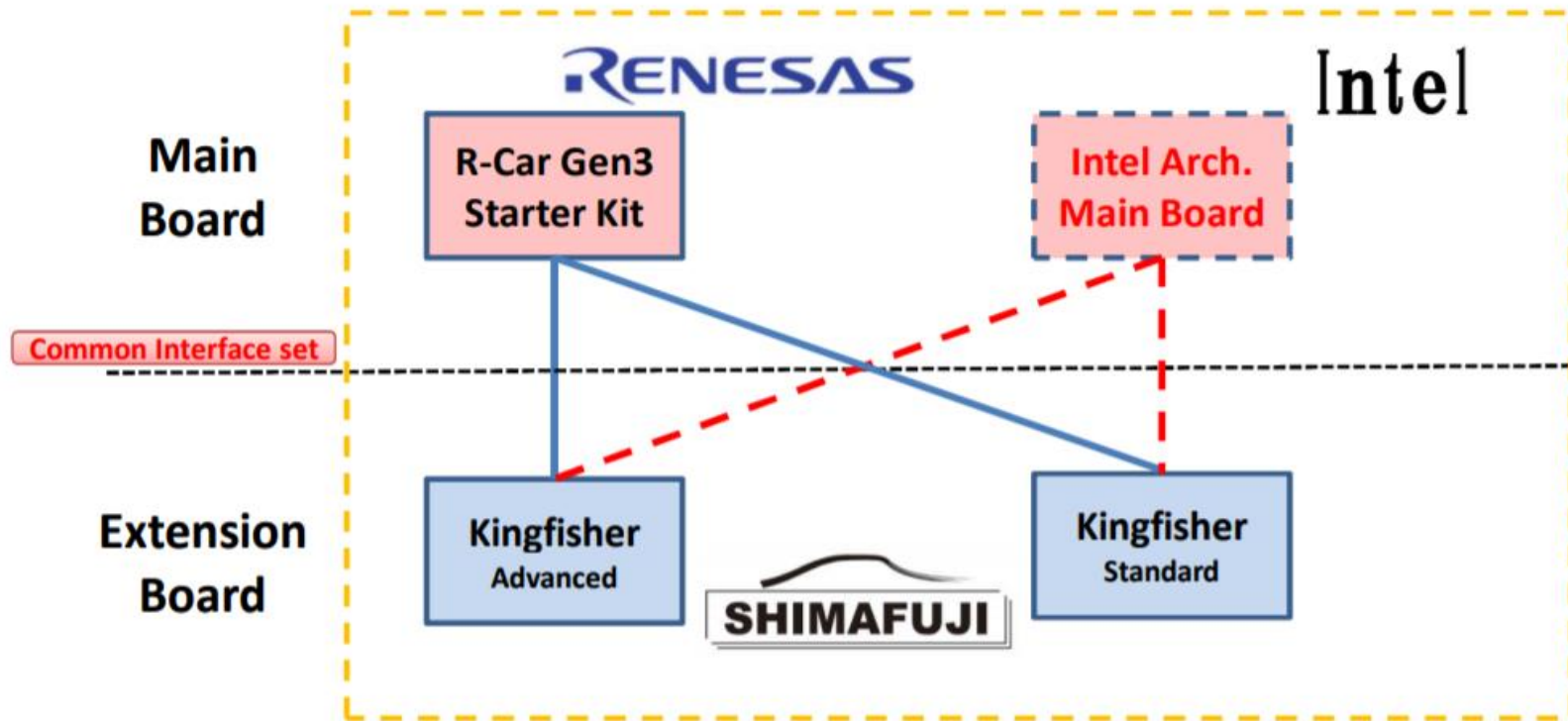
## Analysis of Variation



# Open Hardware in In-Vehicle Infotainment System

## [1<sup>st</sup> step] Scorp and Cooperative system of the 1st step

Collaboration between RHSA-EG and SoC / Board vendors





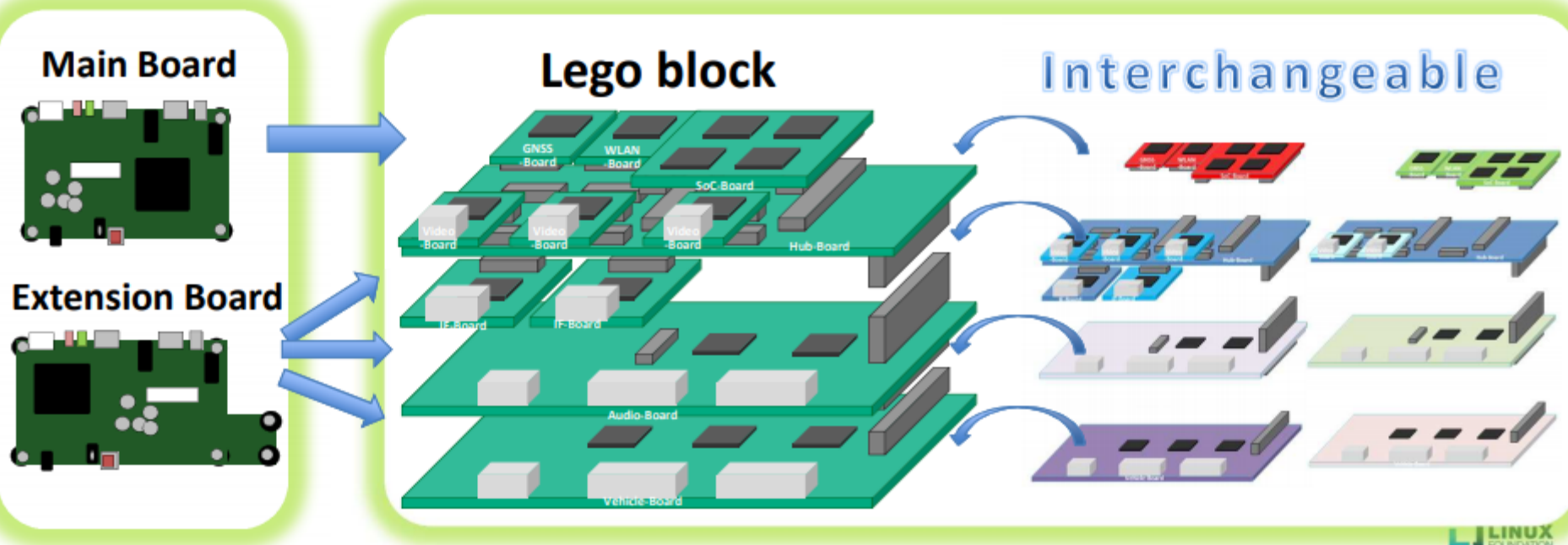
# Open Hardware in In-Vehicle Infotainment System

## Next Reference Hardware Concept : Lego block

Two Board  
constitution

Mountable on a real vehicle:  
“2DIN Target”

Tentative





# Open Hardware in In-Vehicle Infotainment System



# オープンソースと量産の間にあるギャップ、自動車メーカー5社が協力して埋める

## オープンソースと量産の間にあるギャップ、自動車メーカー5社が協力して埋める (1/2)

© 2018年06月29日 06時00分 公開

[齊藤由希, MONOist]



車載インフォテインメントシステム (IVI) をレゴブロックのように組み合わせながら開発できたら——。Linuxベースの車載情報機器関連のオープンソースプロジェクト Automotive Grade Linux (AGL) が開発者向けイベント「Automotive Linux Summit」(2018年6月20～22日、東京コンファレンスセンター・有明)を開催した。

3日目の基調講演では、マツダ IVI Advanced Development マネージャーの後藤誠二氏が、自動車メーカー5社で共同開発している“IVIのためのオープンハードウェア”について紹介。スズキの原本俊壽氏やスバルの角田信次氏も登壇し、自動車メーカー、ティア1サプライヤー、半導体メーカーが協力する重要性を語った。

### 開発コストは増加するが決して譲れない、「IVIのバリエーション」

IVIは、スマートフォンとの連携や車外との通信などさまざまな新機能を取り入れることが求められており、車種ごとにさまざまなシステムのバリエーションが必要になる。そのため、自動車メーカーだけでなくティア1サプライヤーにとっても開発コストが増大している。

「自動車メーカーには独自の仕様がおり、各社ともバラバラだ。ティア1サプライヤーは、複数の異なる仕様を受けてIVIを開発しなければならない。しかし、最近は開発コストの増加が著しく、ほとんどのプロジェクトが炎上している。AGLでは、IVIの非競争領域で協力して、このコスト増加を抑えたいと考えている」とマツダの後藤氏は活動の背景に触れた。これを受け、自動車メーカーが集まってコラボレーションする組織として、AGLでは「レファレンスハードシステムアーキテクチャエキスパートグループ」を結成。マツダ、スズキ、スバルの他、トヨタ自動車とホンダの5社で活動している。



マツダの後藤誠二氏 (クリックして拡大)

# AGL wiki page



## Automotive Linux Wiki

[Recent changes](#) [Media Manager](#) [Sitemap](#)

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[Subteam Pages](#)  
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[System Architecture Team](#)  
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[Connectivity](#)  
[Continuous Integration and Test](#)  
[UI and Graphics](#)  
[Virtualization](#)  
[Navigation](#)  
[Reference Hardware System](#)  
[Architecture](#)  
[Vehicle to Cloud](#)  
[Speech](#)

### About Us

[Getting Started with AGL](#)  
[AGL Meeting Calendar](#)

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[Conference Info and Meeting Notes](#)

### News

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### Face To Face Meetings

#### 2018

Sep 11 - 13 - [Face to Face Meeting](#) to be held at the LG Silicon Valley Lab in Santa Clara, California.

### Table of Contents

- ♦ [News](#)
- ♦ [Face To Face Meetings](#)
- ♦ [Important Links](#)
- ♦ [Getting started with DokuWiki](#)

start



# OpenChain Japan Work Group (JWG) Wiki

openchain:openchain-japanese-working-group

## OpenChain Japan Work Group (JWG) Wiki

### Table of Contents

- ◆ OpenChain Japan Work Group (JWG) Wiki
  - ◆ 会合 / Meetings
  - ◆ ケーススタディ / Case Study
  - ◆ メーリングリスト / Mailing List
  - ◆ リーフレット / Leaflet
  - ◆ 日本語翻訳資料 / Japanese Translation
  - ◆ その他資料 / other documents

OpenChain Japan Work Group (JWG) のWikiです。日本語でJWGの情報を発信します。

- OpenChainプロジェクトのウェブサイト <http://openchainproject.org/>
- OpenChainプロジェクトのWiki <https://wiki.linuxfoundation.org/openchain/start>

— English —

This is the Wiki for the OpenChain Japan Work Group (JWG). This Wiki provides information about JWG in Japanese language.

- The OpenChain project website can be found at <http://openchainproject.org/>
- The OpenChain project wiki can be found at <https://wiki.linuxfoundation.org/openchain/start>

## 会合 / Meetings

会合：

[開催予定]

- **2018/8/31** 第5回会合（計画中） 2018年8月31日（金）
  - 場所：富士通（神奈川県川崎市）





# Job Board

Put your contact here!

OPEN SOURCE SUMMIT

ALPHA CENTRE LINUX SUMMIT

Need good engineer?

Put your contact here!

募集中の方

募集要項URLや連絡先など  
お貼り下さい

CHINA SOURCE SUMMIT

AUTONUMERUS EXHIBIT Center

Looking for a new place?

Put your LinkedIn URL or contact address on board!

求職中の方

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Location	Location
Software Engineer - Open Source	Software Engineer - Open Source
Software Engineer - Open Source	Software Engineer - Open Source
UX Designer, Data Science	UX Designer, Data Science
Manager, Site Reliability Engineering	Manager, Site Reliability Engineering
UX Engineering Manager	UX Engineering Manager

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**indeed**

indeed

**Thank you!!!**

**[yuichi.kusakabe@denso-ten.com](mailto:yuichi.kusakabe@denso-ten.com)**