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Accelerating SDV Through Open-Source Based Virtualization

May. 13, 2026

Panasonic Automotive Systems Co., Ltd.
EVP, CTO

Masashige Mizuyama

The Future of Automotive Is Driven by Software

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The Speed of Product Discovery Matters

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Product Develop-ment

Measures for software that expands exponentially due to shifting to SDVs

Time To Market, resource limit, explosion of development cost

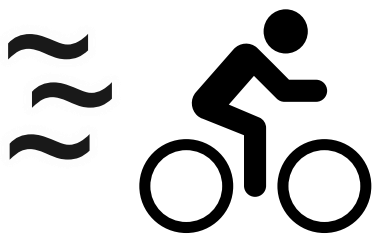
Product Discovery

Competition to "discover the right products to develop"

How fast can you reach the right product through repeated try-fail-improve?

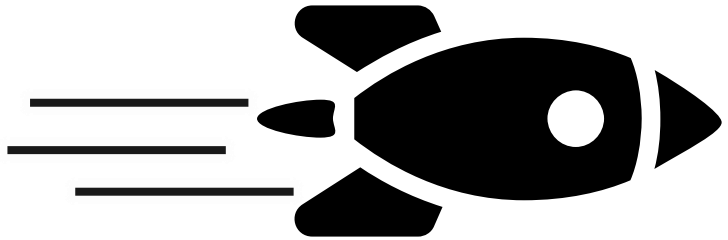
Competitiveness in product discovery will significantly influence the advantage.

Conventional-type hardware company



Copy machine, car navigation, automotive parts
Development period: 1-3 years
(surveyed by iTiD Consulting)

IT industry



Release in approximately two-week cycles with agile development on the cloud
Amazon: Frequency of once every 11.6 seconds on average

From “Hardware First” to “Software First”

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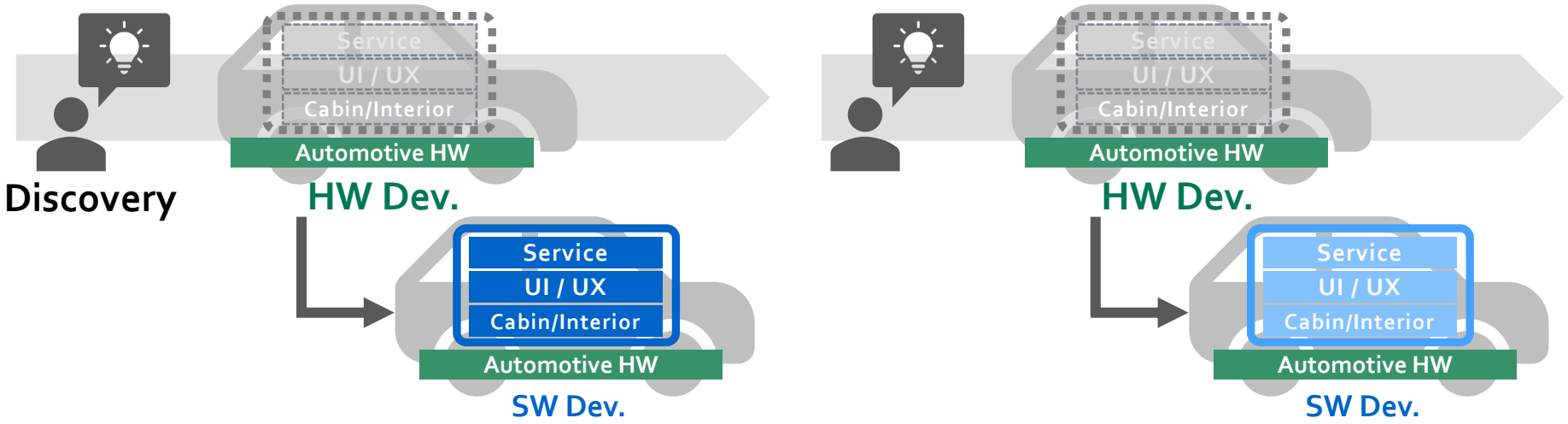
Evolve Software Continuously to Increase *Value*, Develop Optimal Hardware to Run it.

Legacy

Hardware First

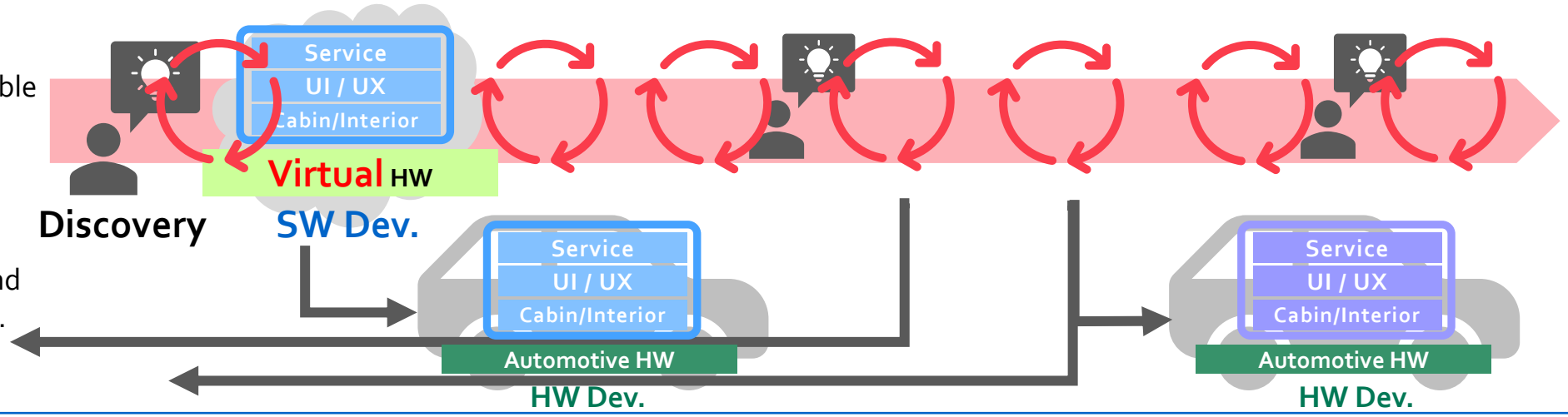
- Realizing limited value within hardware constraints.
- Long lead time to realize new value.



To Be

Software First

- Selecting the most suitable and latest hardware for realizing value through software.
- Faster value discovery and introduction into market.



Agenda

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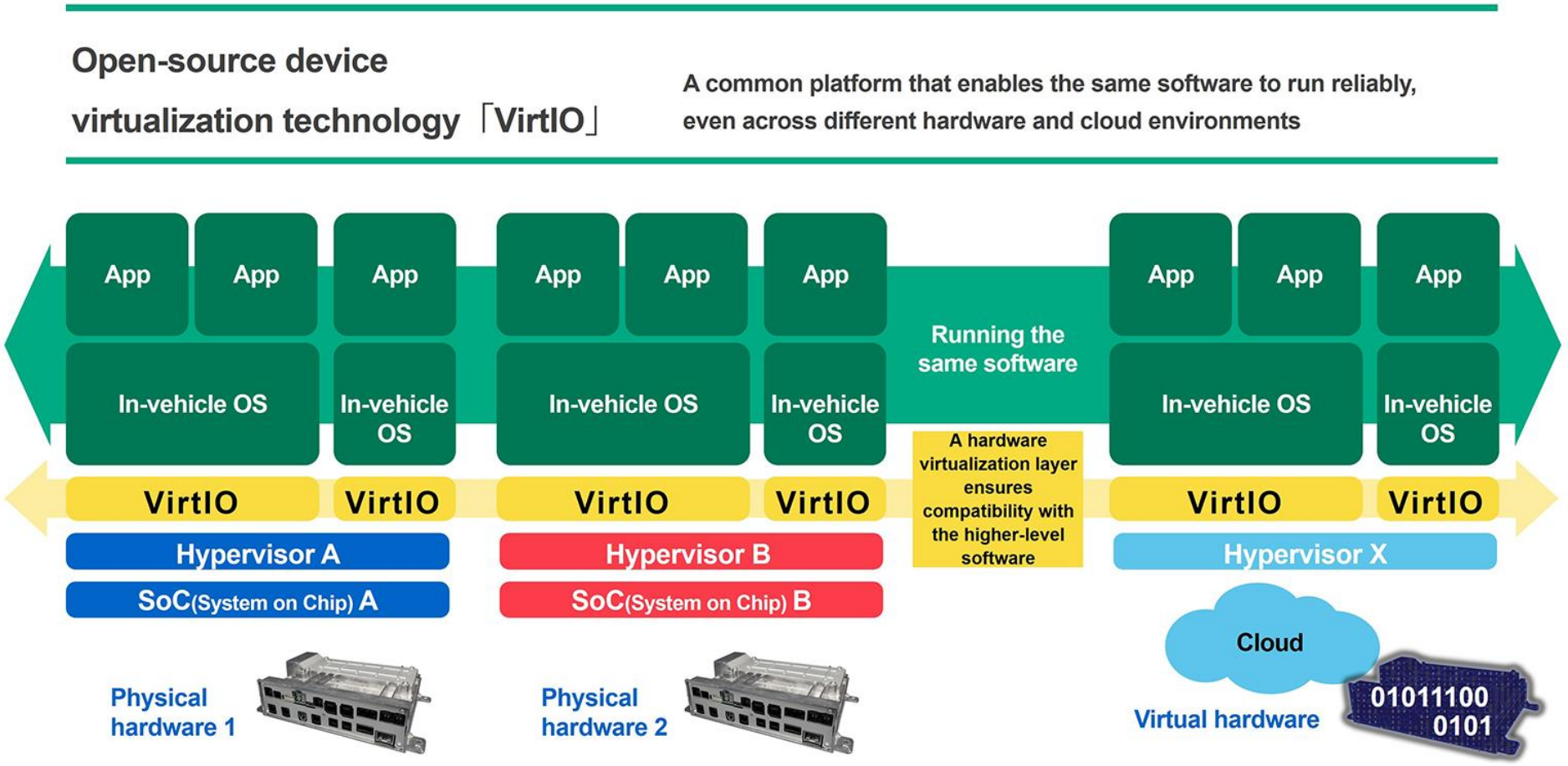
- **A**chievements *du jour* on VirtIO ecosystem
- **G**rowth of Existing VirtIO Initiatives
- **L**aunch of New Incubation & Innovation

Industry-wide support gained for standardizing VirtIO as a de-facto industry standard, led by Panasonic Automotive w/AGL



Various World-class Companies and Organizations Aligned around VirtIO in our Press Release

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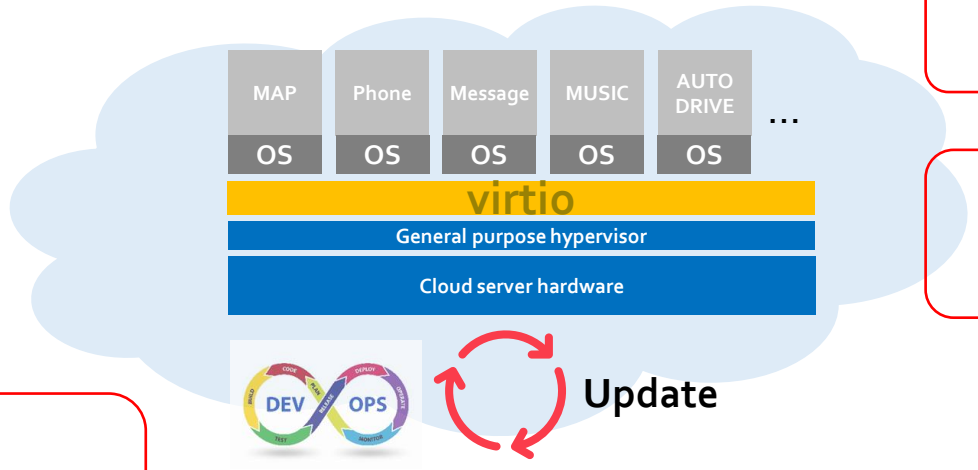


Cloud

AWS Google

Virtual Hardware

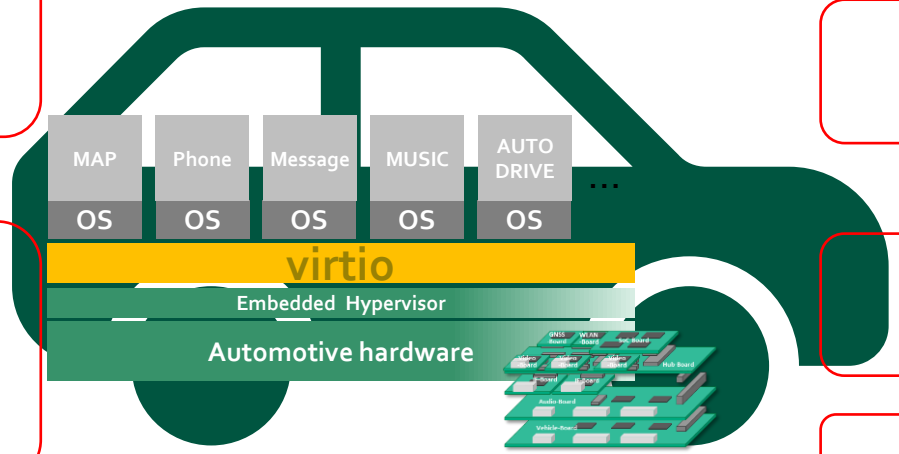
Panasonic Automotive

OEM

Honda Mazda
Mitsubishi
Nissan Toyota

OS/Platform/Hypervisor

AGL Google Eclipse Xen



Tier1/SDV Enabler

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SoC

AMD MediaTek Qualcomm
Renesas Telechips

Core IP

Arm

Panasonic Automotive Systems Co., Ltd. visualizes the key contents of the press release in https://news.panasonic.com/jp/press/jn260224-1

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Enthusiastic Endorsements Gathering around VirtIO

Honda: Specifically, it is critical to treat software as a continuous asset, necessitating a hardware-agnostic architecture that remains resilient to underlying hardware evolution. We recognize VirtIO as a key technology for hardware virtualization, offering the potential to overcome these challenges and accelerate SDV development. Furthermore, we believe that the adoption of VirtIO will go beyond Honda's own advancements **to fortify the entire industry's technological foundation, driving sustainable value creation across the mobility ecosystem**.

Mazda: **Mazda views VirtIO as a common interface that helps maintain architectural consistency in line with the evolution of future system configurations. Recognizing its potential early on, Mazda has been actively evaluating and promoting the adoption of VirtIO as an effective technology to underpin this common foundation**. Mazda expects VirtIO to further mature as a technology that contributes to value creation and remains committed to contributing to its continued advancement.

Google: At Google, **we have officially adopted VirtIO as the standard I/O interface for many years, both in Android Automotive OS and our cloud-native development environments**. It supports extensions for a wide range of devices and ensures stable operation and high versatility across multiple hypervisors and hardware configurations. **We appreciate Panasonic Automotive's continuous contributions to VirtIO standardization and Android development**.

AGL: **PAS is playing a critical role in defining the future of the software-defined vehicle. Their significant technical contributions, most notably their extensive work on VirtIO, have become an integral part of the AGL SoDeV platform,** providing the essential device and hardware abstraction required for modern, scalable architectures. We deeply value their continued collaboration and leadership as we work together to accelerate automotive innovation.

Renesas: As a leading provider of automotive semiconductor solutions, Renesas is strengthening hardware virtualization in our SoCs and actively driving software-based virtualization technologies. As part of these efforts, **we are expanding VirtIO capabilities in our SoC software**. **We fully support Panasonic Automotive's initiative to promote the standardization of VirtIO across the industry**.

Qualcomm: Virtualization is a foundational pillar of the software defined vehicle, playing an increasingly important role in decoupling the inherent complexity of the automotive domain, where diverse platforms and fragmented architectures demand scalable solutions. By enabling portability across devices and cloud environments, it accelerates development, testing, and rapid prototyping. **Qualcomm Technologies remains committed to advancing VirtIO as it evolves to meet growing automotive requirements**.

AGL is always in the frontier of Automotive VirtIO

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Achievements *du jour* on VirtIO ecosystem

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VirtIO devices (HV-frontend) coverage expands.

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AGL has been equipped most of fundamental VirtIO devices for CDC, as a frontier of VirtIO implementation.

Panasonic Automotive will continue to contribute more ready-to-user VirtIO to evolve AGL implementation.

2020~2021: AGL11~12

- Block Device
- Network
- GPU
- Sound
- Console, Socket, Random Generator

2022~2023: AGL13~15

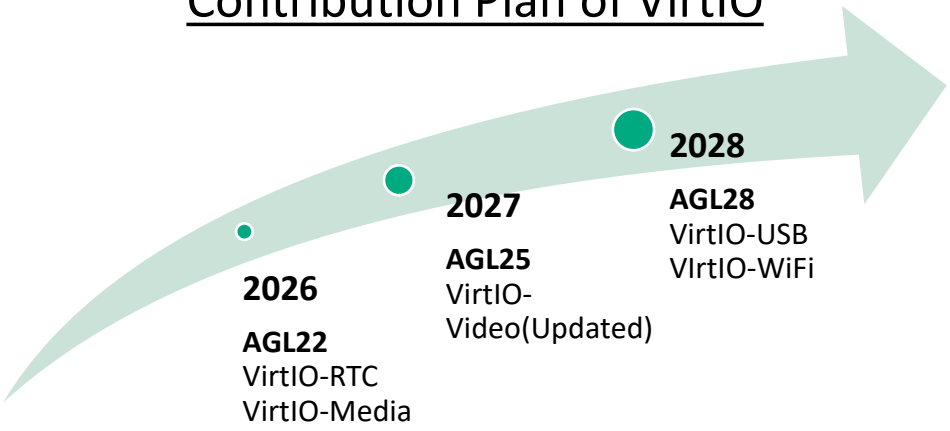
- SCMI (Sensor)
- Video
- Bluetooth
- CAN
- Camera (virtio-video based)

2026~2028: AGL22~28

- Real Time Clock (RTC)
- Media
- Video (Updated)
- USB
- WiFi

AUTOMOTIVE GRADE LINUX

Contribution Plan of VirtIO



[**Problem**] May take 2~3-year progress to reflect latest VirtIO

VirtIO	Kernel Upstream	Yocto	AGL
virtio-rtc	6.16 (2025/5)	Not yet in latest 5.0.16 (6.6 kernel) → Later than 2026	AGL 22 (in-progress)
virtio-media	Patch v3 under review (2025/4)	Later than 2026	AGL 22 (in-progress)
virtio-video	Patch v10 under review (2026/2)	Later than 2027	AGL 25 (plan)
virtio-usb	draft commit in 2027 (TBD)	Later than 2028	AGL 28 (plan)
virtio-wifi	draft commit in 2027 (TBD)	Later than 2027	AGL 28 (plan)

Solution
AGL to be the first OS code base of the latest automotive VirtIO to lead SDV evolution

Unified HMI: VirtIO based Display System Virtualization

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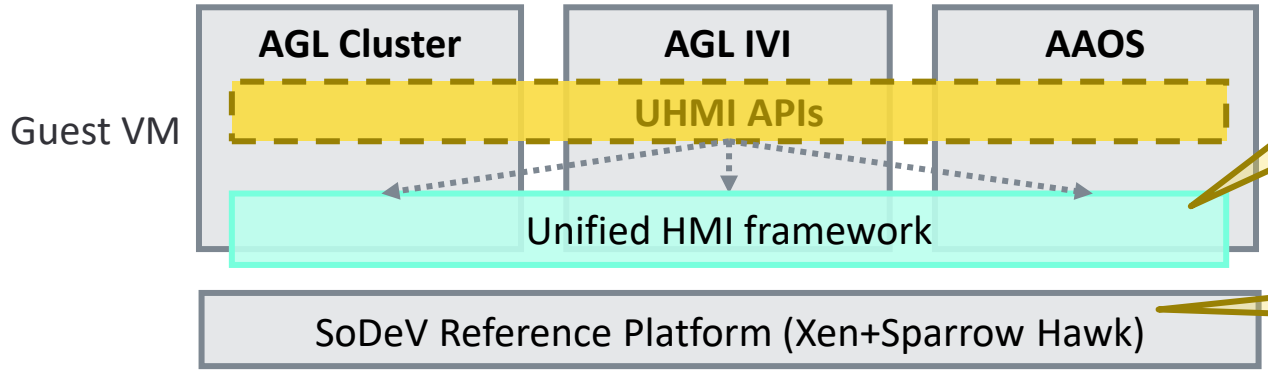
Updates for Unified HMI

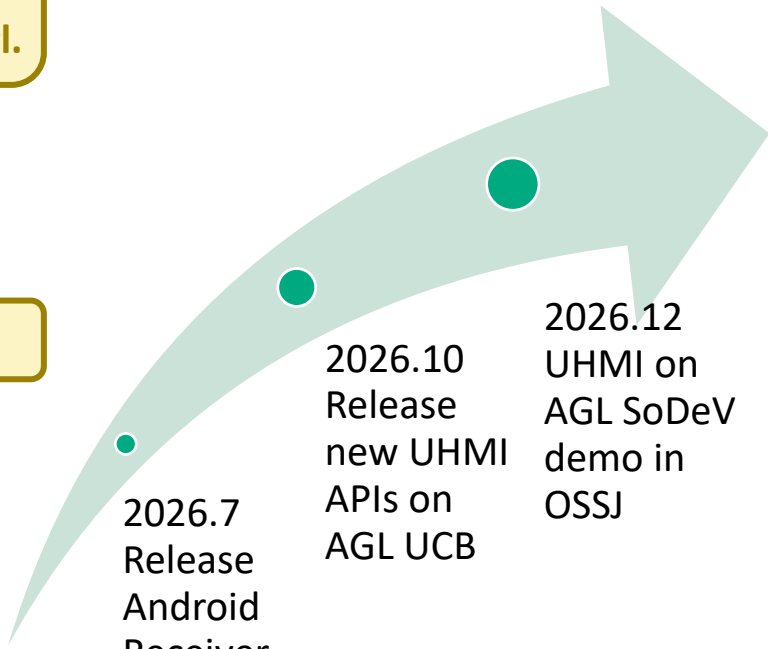


1. API enhancement for simplified window management/layout ctrl.

2. SoDeV support

3. New SoDeV use cases: AGL apps to render on the Android-side screen w/layout control

Contribution Plan



Map data from OpenStreetMap

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Coupling of Cloud-native with MBD Models or Other Simulated External Systems

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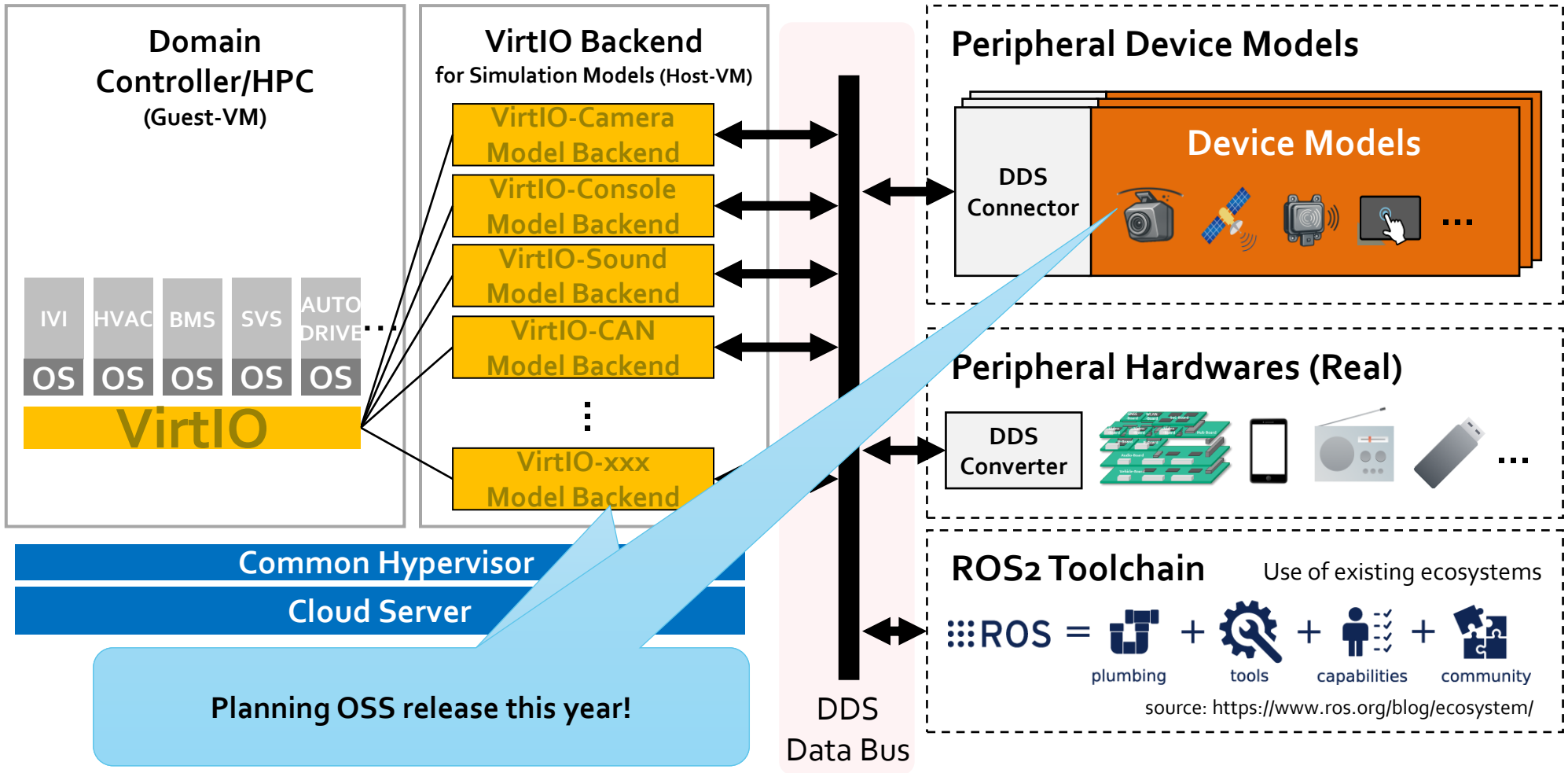
Accelerate model standardization and reuse through a VirtIO-compliant Model interface backend



Open Source Release Plan

2026.12
- VirtIO Backends for Simulation Models
- Reference Peripheral Device Models (behavioral level, e.g., GNSS, HVAC)

DDS: Data Distribution Service

AGL SoDeV Overview - Collective Community Work

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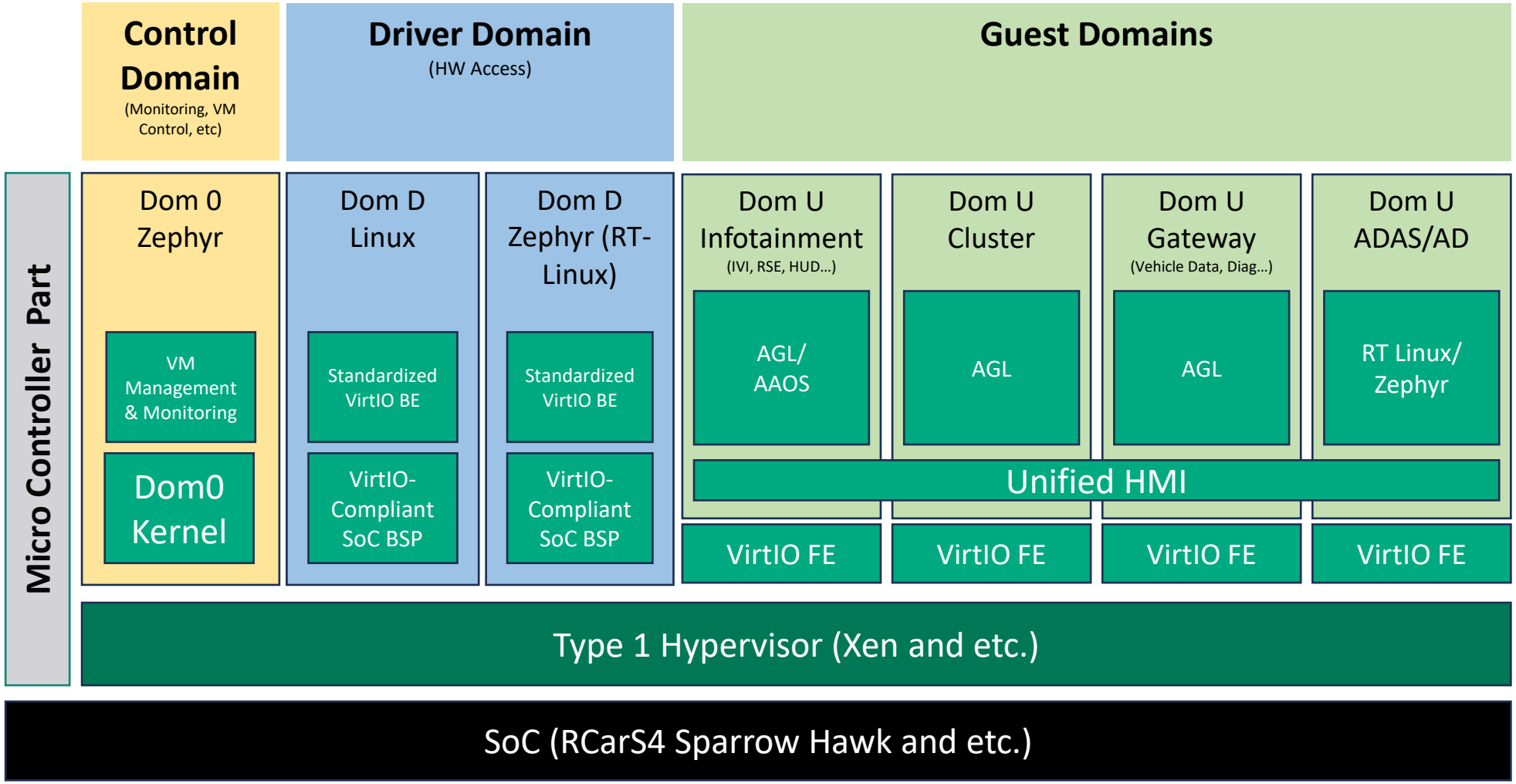

AGL SoDeV Overview – PAS Major Future Contribution Area

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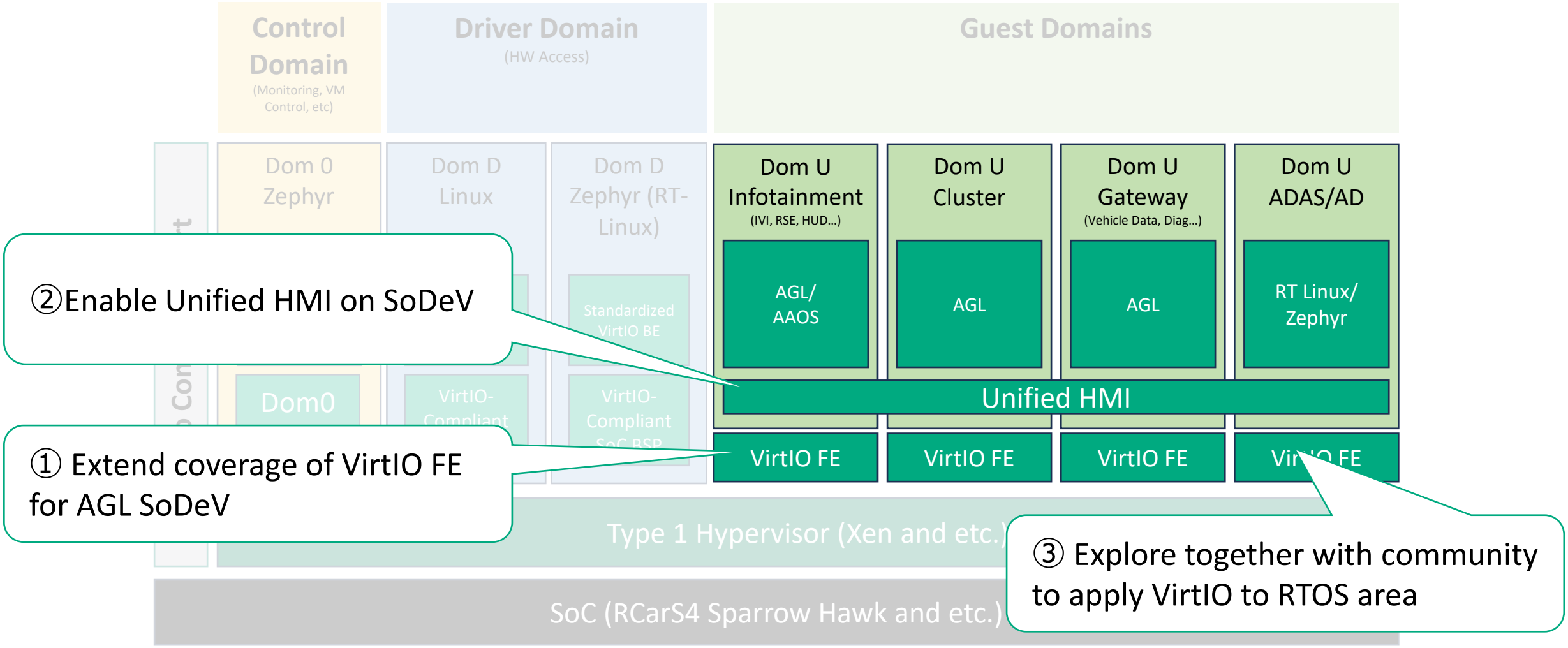

Explore more about PAS Presentations & Demo in AMM

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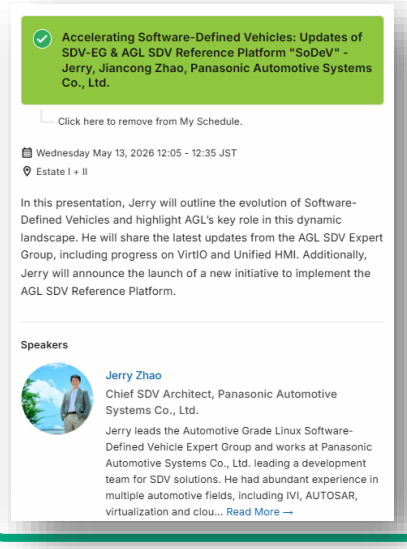
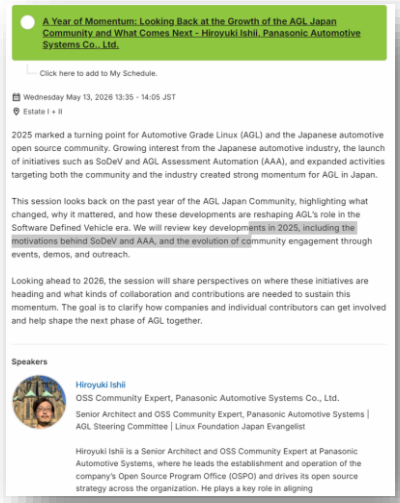
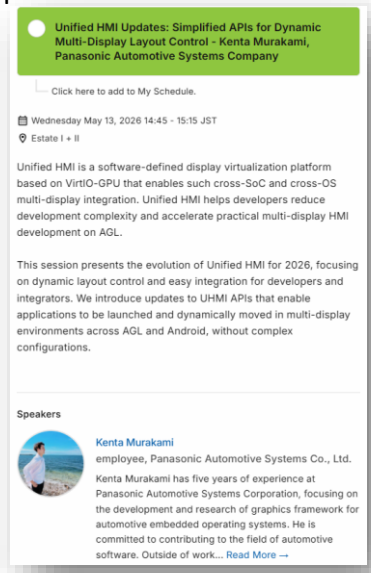
May 13 (WED) 12:05pm~12:35pm
Speaker: Jerry, PAS
Title: Accelerating Software-Defined Vehicles: Updates of SDV-EG & AGL SDV Reference Platform "SoDeV"
Topic: SDV-EG



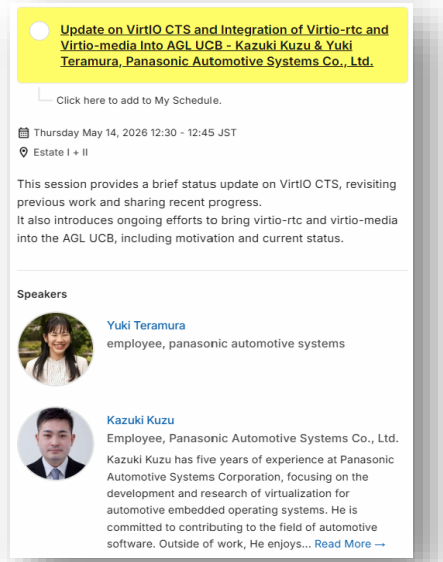
May 13 (WED) 13:35pm~14:05pm
Speaker: Ishii-san, PAS
Title: A Year of Momentum: Looking Back at the Growth of the AGL Japan Community and What Comes Next
Topic: AGL Japan Community



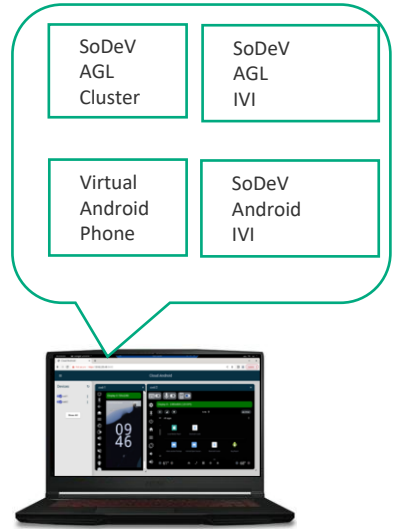
May 13 (WED) 14:45pm~15:15pm
Speaker: Murakami-san, PAS
Title: Unified HMI Updates: Simplified APIs for Dynamic Multi-Display Layout Control
Topic: Unified HMI



May 14 (THU) 12:30pm~12:45pm
Speaker: Teramura-san & Kuzu-san, PAS
Title: Update on VirtIO CTS and Integration of Virtio-rtc and Virtio-media Into AGL UCB
Topic: VirtIO



May 13~14
Sponsor Booth Demo: vSkipGen as Virtual Reference Hardware of SoDeV



vSkipGen

Heartmotive

Connecting our hearts to the Journey