SOAFEE

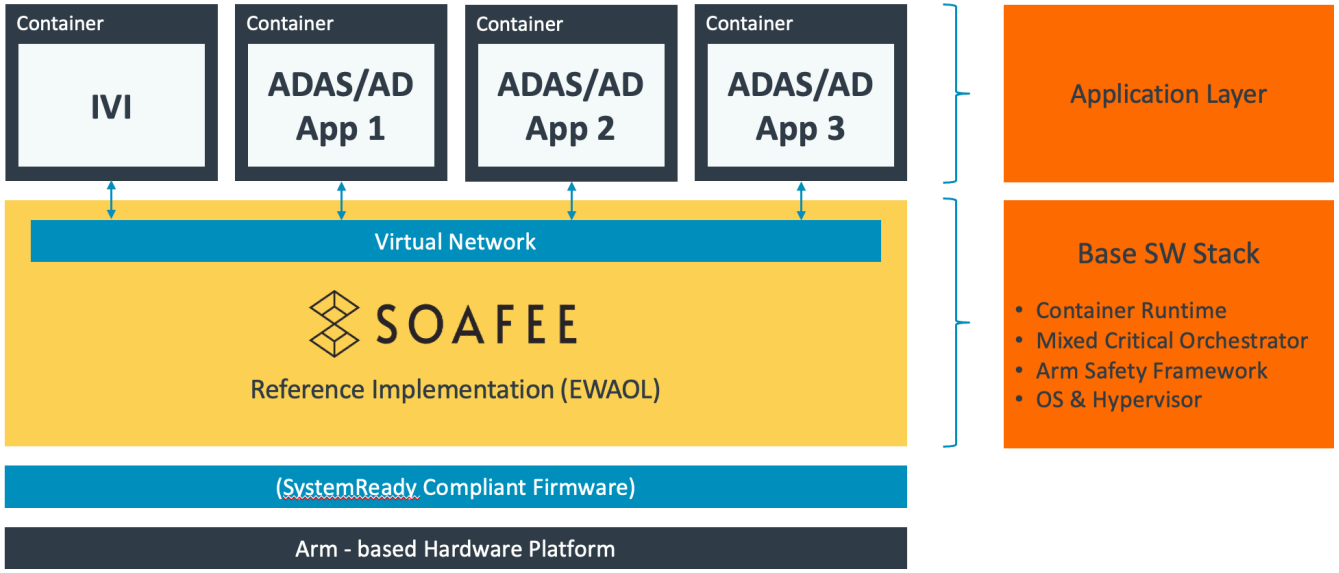
SOAFEE Update

SOAFEE Seminar in China

Robert Day and Matt Spencer

April 2024

SOAFEE Community



arm

aws BOSCH CARIAD A VOLKSWAGEN GROUP COMPANY Continental

gm LG Electronics Red Hat SUSE

Working Group Members

accelerat Acsia ACTEVIA ADLINK altia
AMD AMPERE. ANCIT Apex.AI ASTC
AutoCore AVIN SYSTEMS BlackBerry QNX
BLUEBINARIES bos C2A security cadence Canonical
CHALMERS CoAsia NEXELL Codelink cognizant
CoreAVI CORELLIUM CYIENT Deloitte. DENSO
driveblocks DSP Concepts dSPACE Elektrobit
epam eSOL ETAS FEV FOUNDRIES.IO
FUJISOFT Green Hills SOFTWARE HARMAN Astemo
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LeddarTech Lenovo Lightfleet Linaro Luxoft
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mobileye MOTER TECHNOLOGIES NETFOUNDRY Neusoft
NXP OPENSYNERGY Panasonic AUTOMOTIVE PERCEPTIVE Qualcomm
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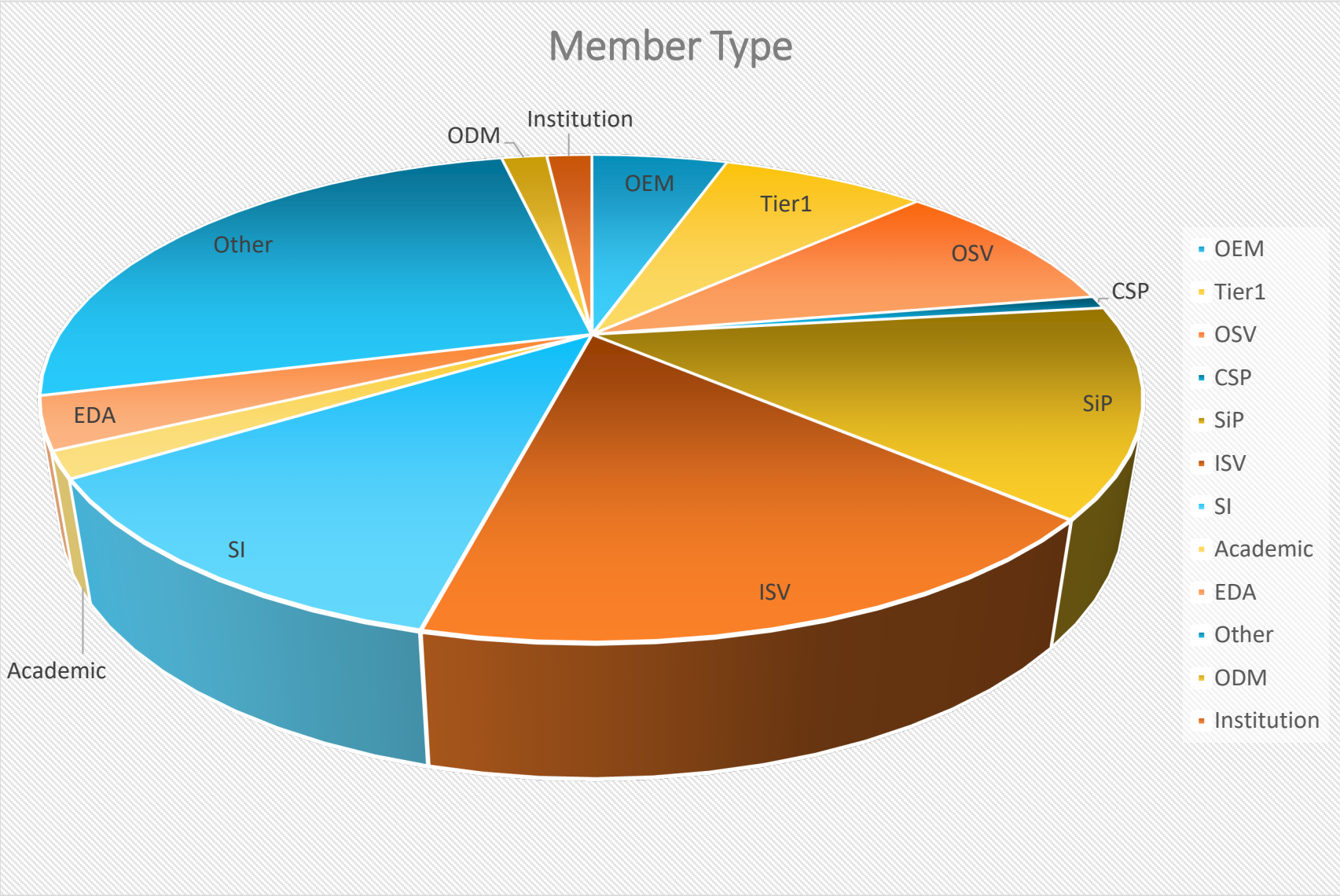
TUM UST Vayavya Labs VECTOR wanDISCO
wipro mobility zetta scale 7STARLAKE

SOAFEE Membership – April 2024



- 118 Members
- 19 Memberships in progress
- 42 companies expressed interest
- 6 New OEMs in discussion

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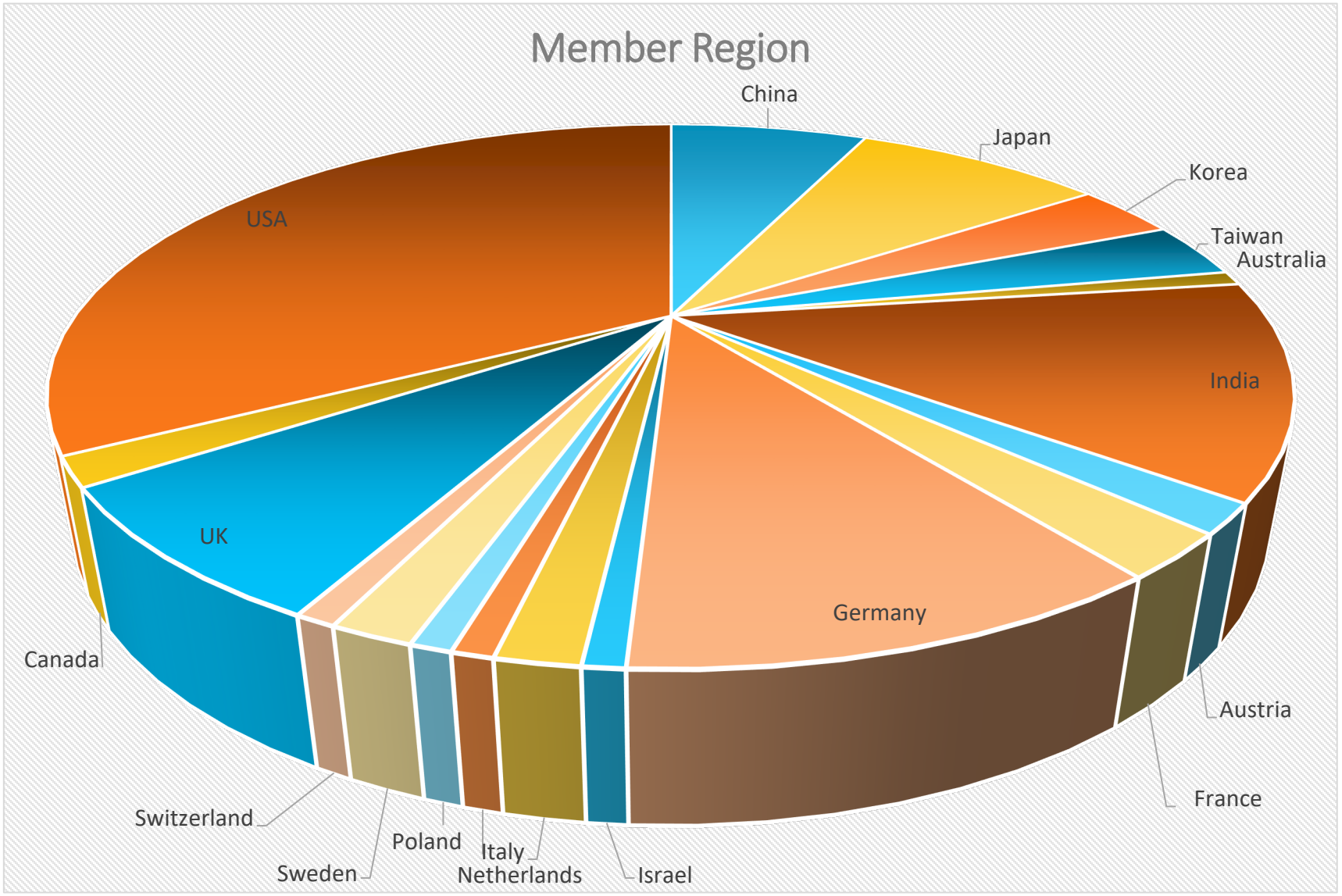
SOAFEE Membership – April 2024



- Global representation
- Major automotive regions well represented
- Looking at more members from China (in progress)

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SOAFEE – the journey so far

~120 members across the automotive and software ecosystem

- OEMs and Tier 1s
- Silicon partners
- OSVs, ISVs and CSPs
- System Integrators
- Technology providers
- Academic institutions
- Automotive consortiums

>30 ongoing SOAFEE projects, PoCs & demonstrators

- Different workloads including :
  - ADAS /AD
  - IVI/ Cockpit
  - Connected car
- Based on both EWAOL and commercial software
- Some demonstrators running on vehicle chassis

Roadmap to mixed critical compute (2025)

- Utilizing member and community projects
- Active workgroup participation
- Demonstration based on existing SOAFEE blueprint

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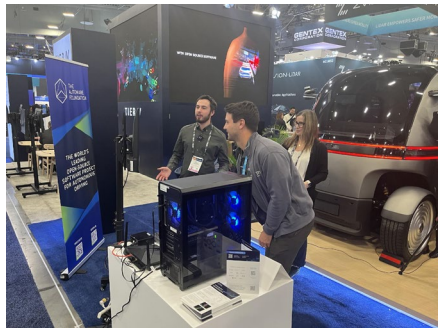
SOAFEE marketing – 2024 so far

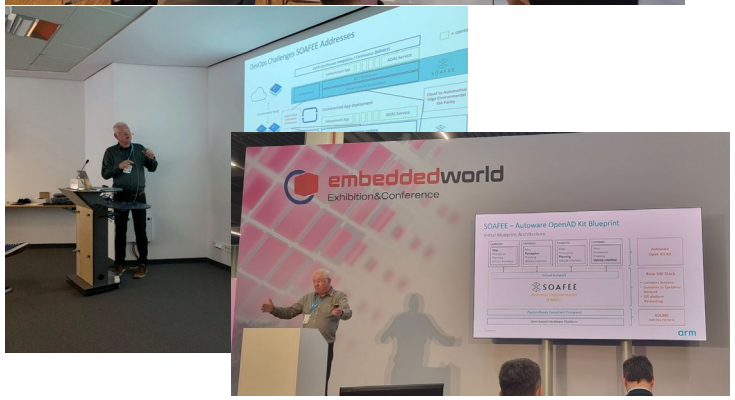
Huge presence at key automotive events

CES 2024 – January – Las Vegas



ACC USA – March - Detroit

Embedded World 2024 – April - Germany



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A new alliance

- Initial collaboration between 4 SDV organizations
- Bringing over 500 automotive and software ecosystem companies to meet the needs of the software-defined vehicle
- Combines cloud to edge, connected car, open source, open standards, safety, and real time

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SOAFEE Blueprints

SOAFEE Blueprints

- A SOAFEE Blueprint is a reference application full-stack software solution that is guided by an automotive software defined use-case used to validate SOAFEE architectural concepts. The Blueprint application can be open source and would be provided as part of the Blueprint referenced source repository. Blueprint applications may also be delivered in binary form in an application container.

- SOAFEE Blueprint examples include:
  - IVI Blueprint
  - Connected car and security Blueprint
  - ADAS Software Blueprint

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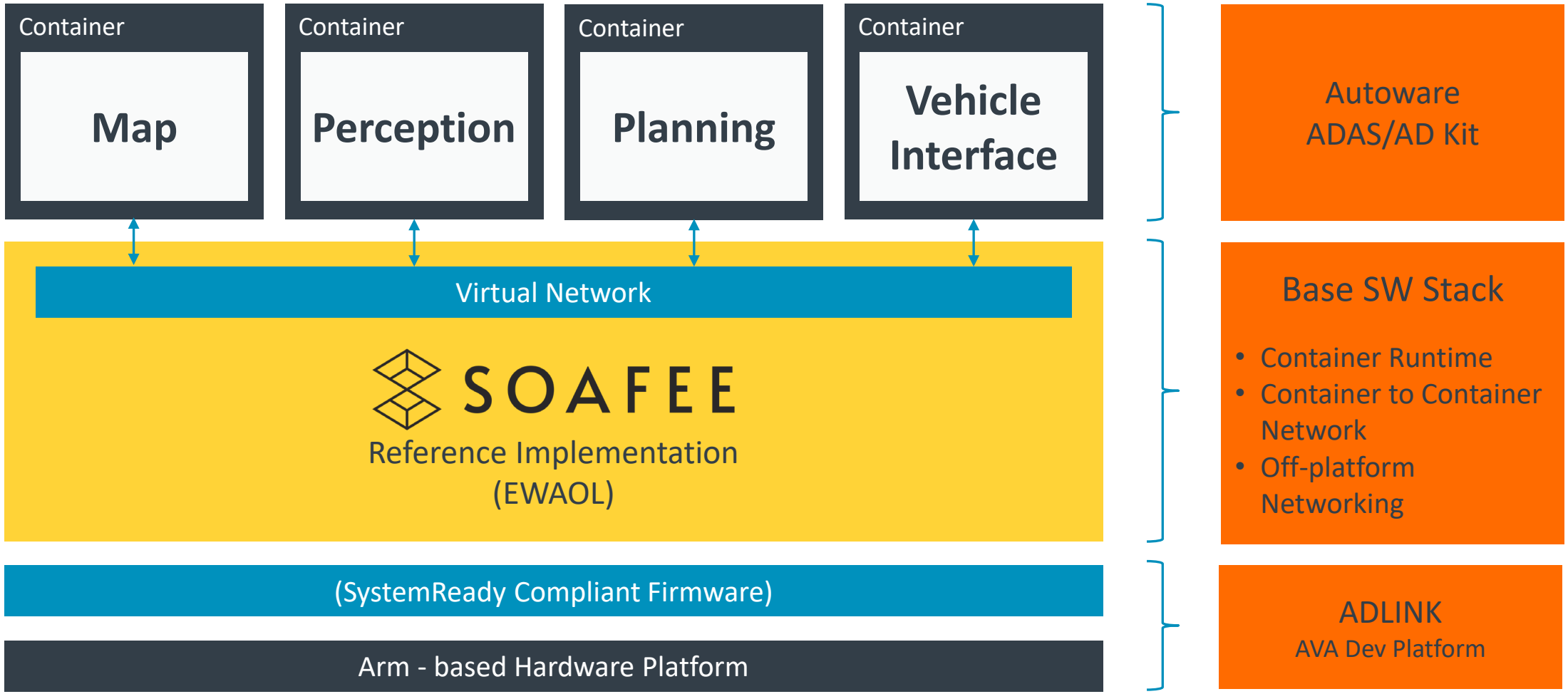
SOAFEE Blueprints – example : Autoware ADAS/AD Kit Blueprint

V2 architecture



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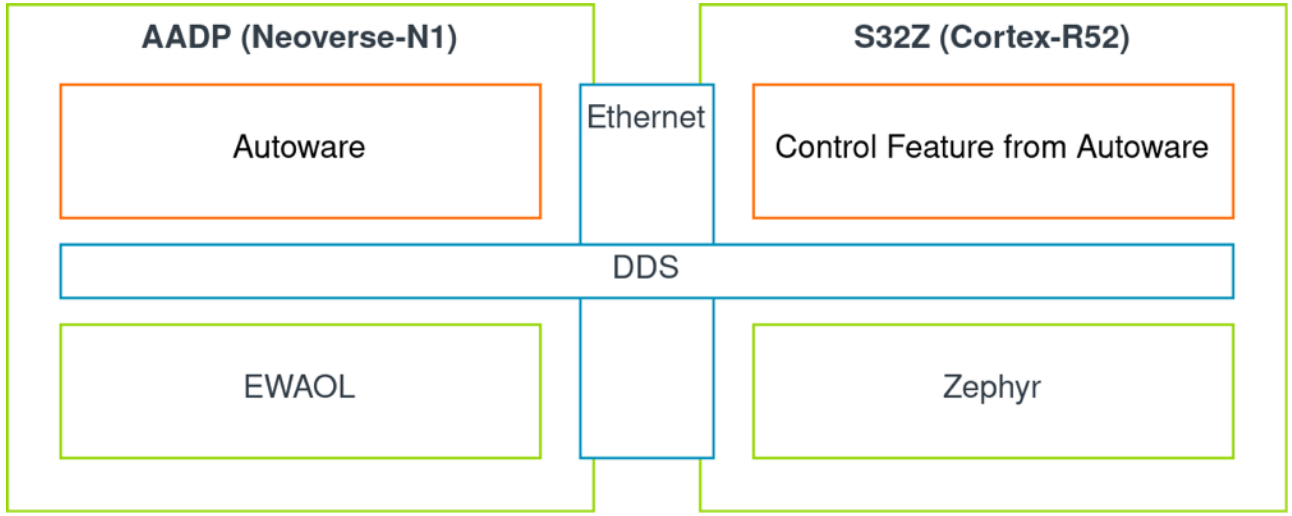
Open AD Kit – Mixed Criticality and Physical Hardware

Embedded World 2023



- The software stack is deployed on the AADP (main compute) and the S32Z (critical compute)

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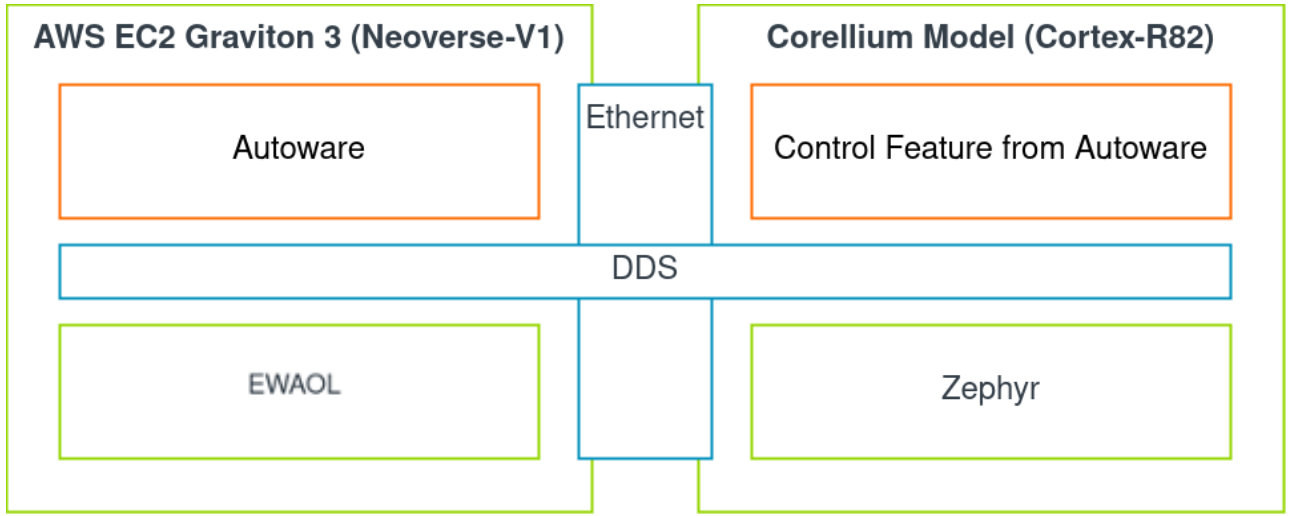
Open AD Kit – Mixed Criticality and Virtual Hardware

Embedded World 2024



- The software stack is deployed in the cloud using EC2 Graviton (main compute) and Corellium virtual hardware (critical compute)

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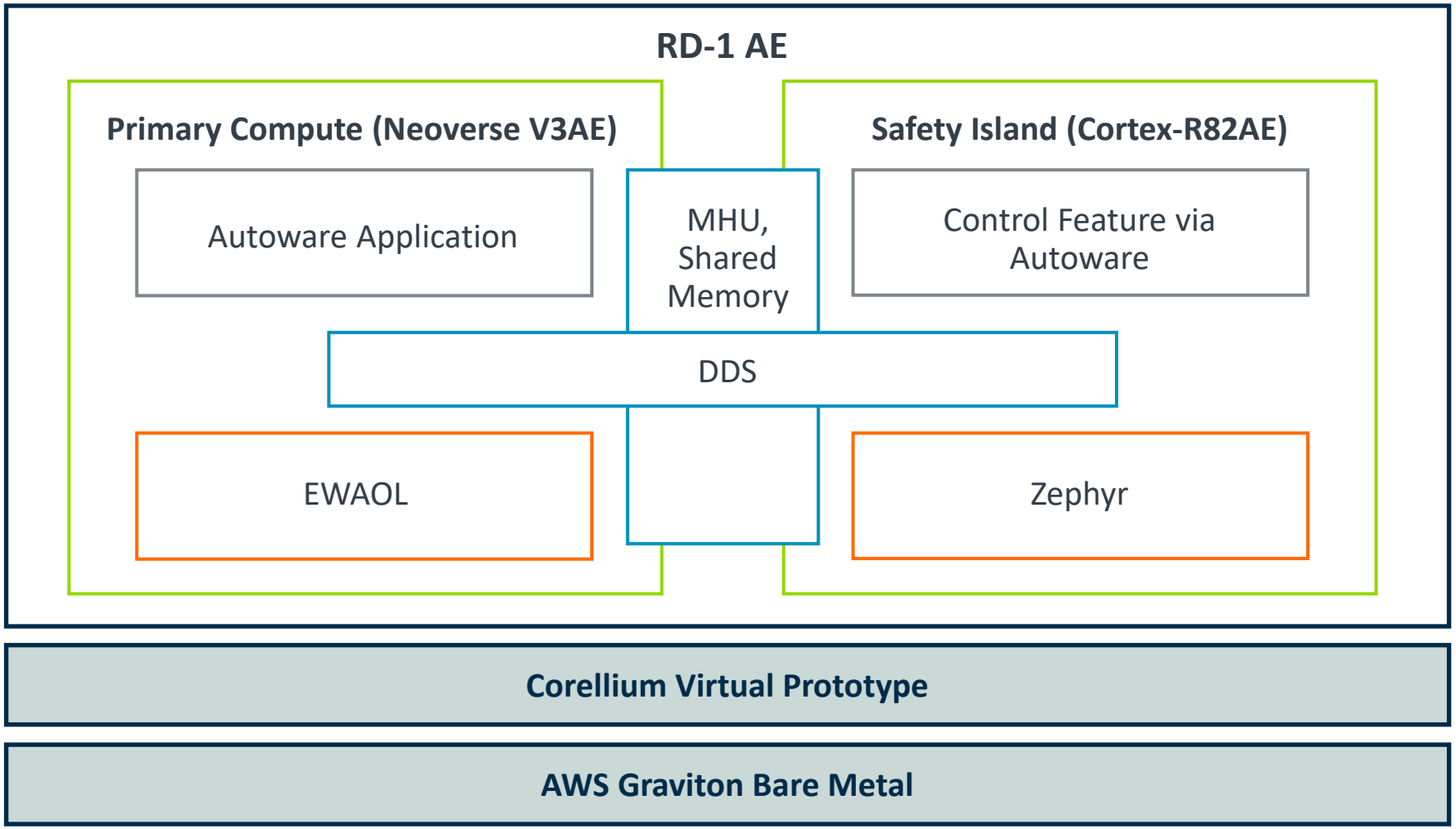
Open AD Kit – Mixed Criticality and Virtual Hardware

2024 : Full cloud-hosted virtual environment – Arm RD-1 AE enablement on virtual hardware



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Year 3 – execution
The road to Mixed Critical Orchestration (MCO)

The route towards Minimal Viable Product for MCO

Heterogeneous Containers

- OCI compliant delivery to Real Time and MCU environments
- Enable us to deploy to Cortex-A, R and M

TSN into Containers

- Realtime networking through CNI interface
- How to mitigate non-deterministic behavior through veth and bridge

Orchestrator Namespace

- Define parts of the k8s namespace that are mandatory for automotive
- Enables commercial orchestrators to focus on key functions

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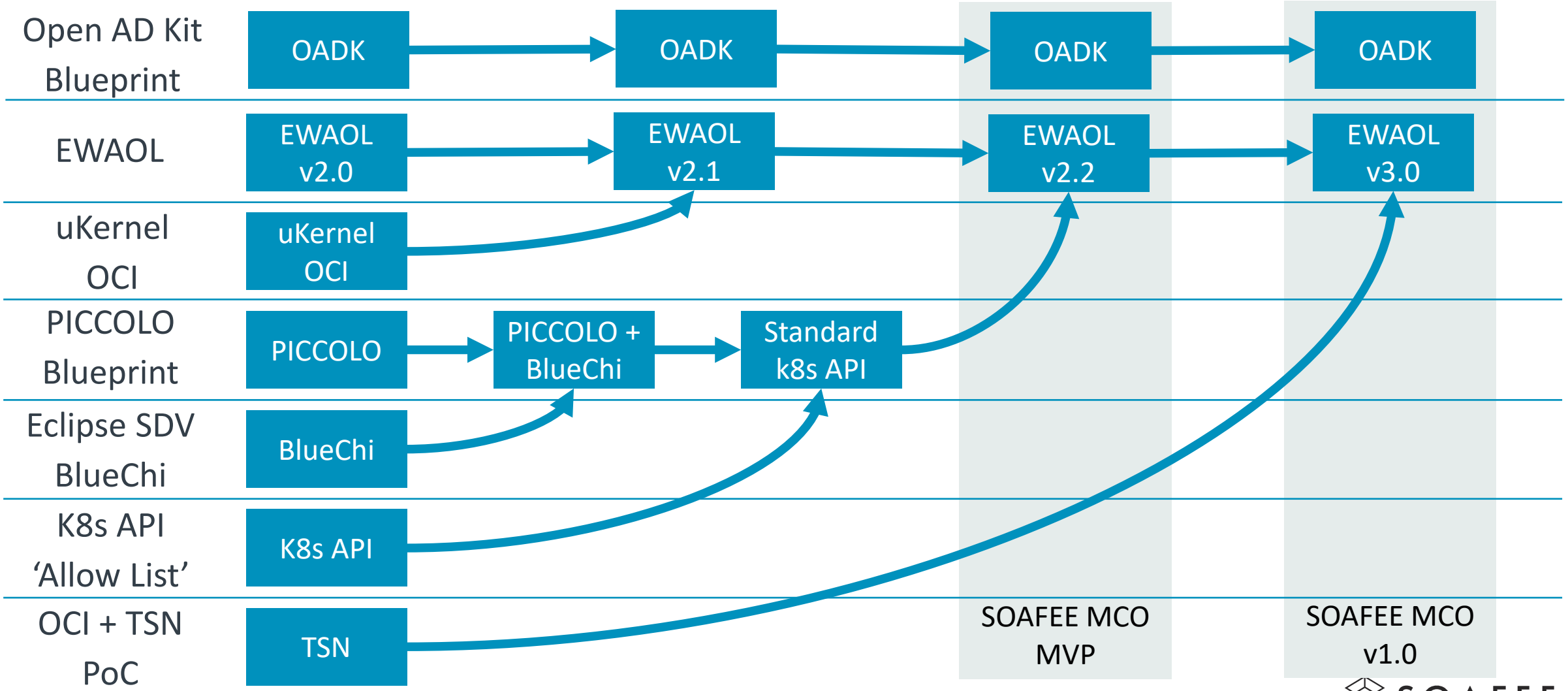
Collaboration is key – using blueprints to bring MCO to life

The road to the MCO goal of SOAFEE SIG



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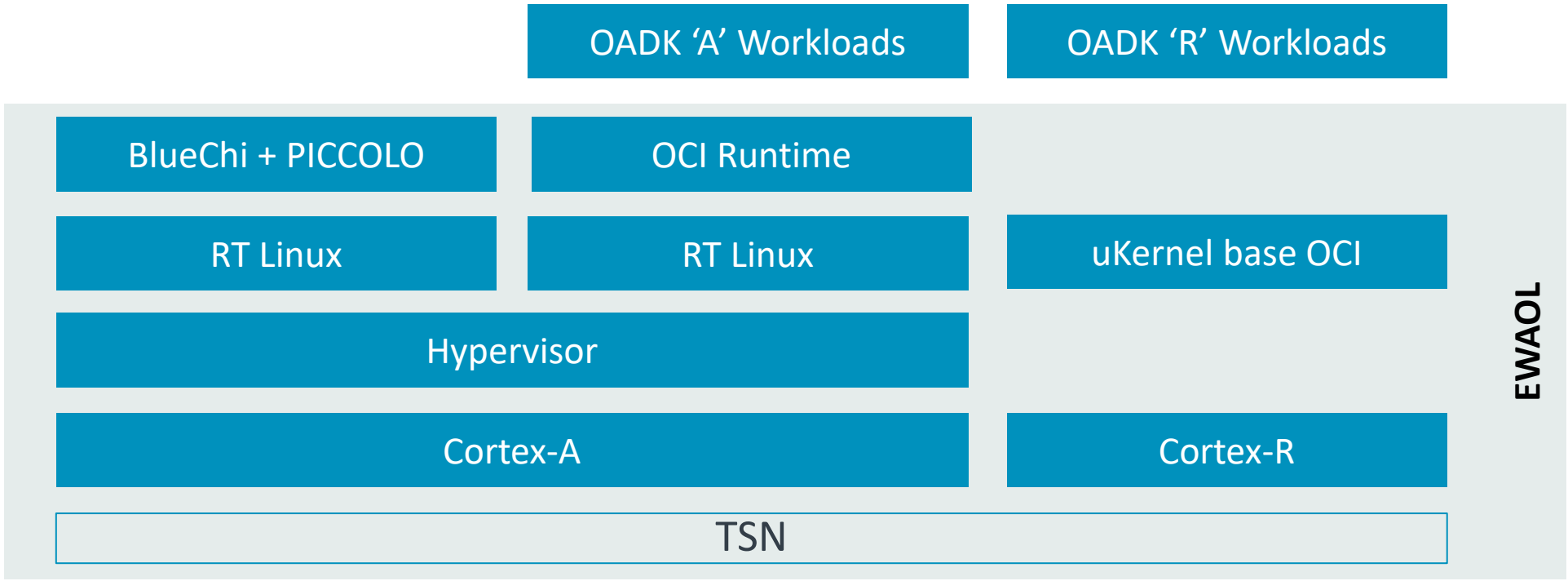
Delivering a mixed critical environment



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Enabling SOAFEE @scale
SOAFEE Special Interest Group

SOAFEE : The Foundation

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- The development community organization which promotes standards for SDV.
- This includes the Architecture, Working Groups and GTM activities.

EWAOL

- **E**dge **W**orkload **A**bstraction and **O**rchestration **L**ayer is a reference OS stack that conforms to SOAFEE defined standards.
- It is best described as the "OS/Hypervisor layer and above".

Arm RD-1 AE

- Arm's new Automotive focused Reference Design 1 hardware standard for automotive.
- Software layers are considered as "Firmware and below" for all compute cores.
- Strong alignment through firmware abstraction (RD-1 AE) APIs to the EWAOL ("OS and above") layers moving forward.

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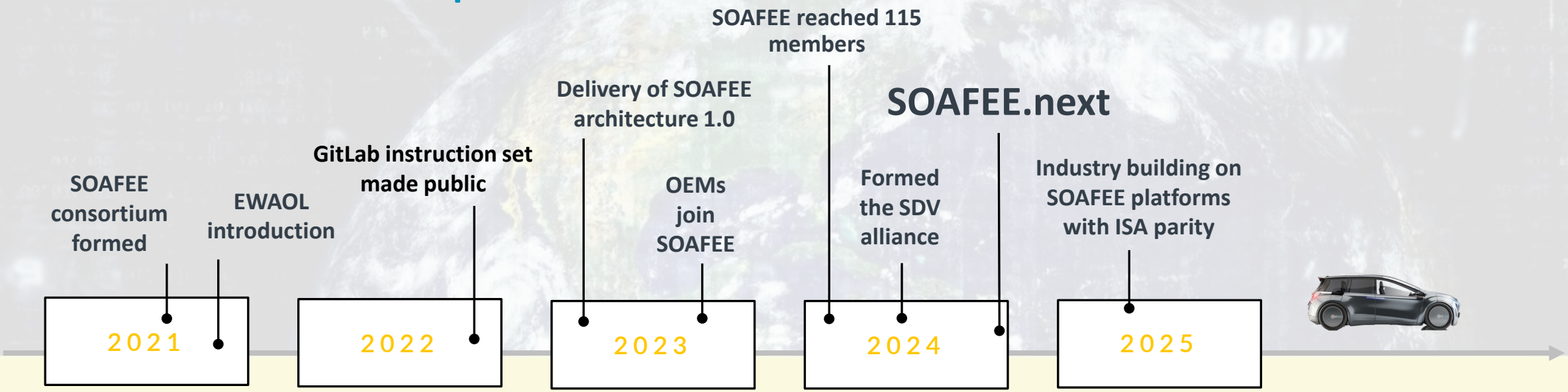
SOAFEE Roadmap



SOAFEE is an industry-led collaboration between companies across the automotive and technology sectors...

Working together to build open-source architecture for software-defined vehicles. Together we have one single goal - to create a shared platform for vehicles using cloud-native architecture that accommodates multiple hardware configurations. By making SOAFEE hardware agnostic, we plan to simplify vehicle software solutions radically.

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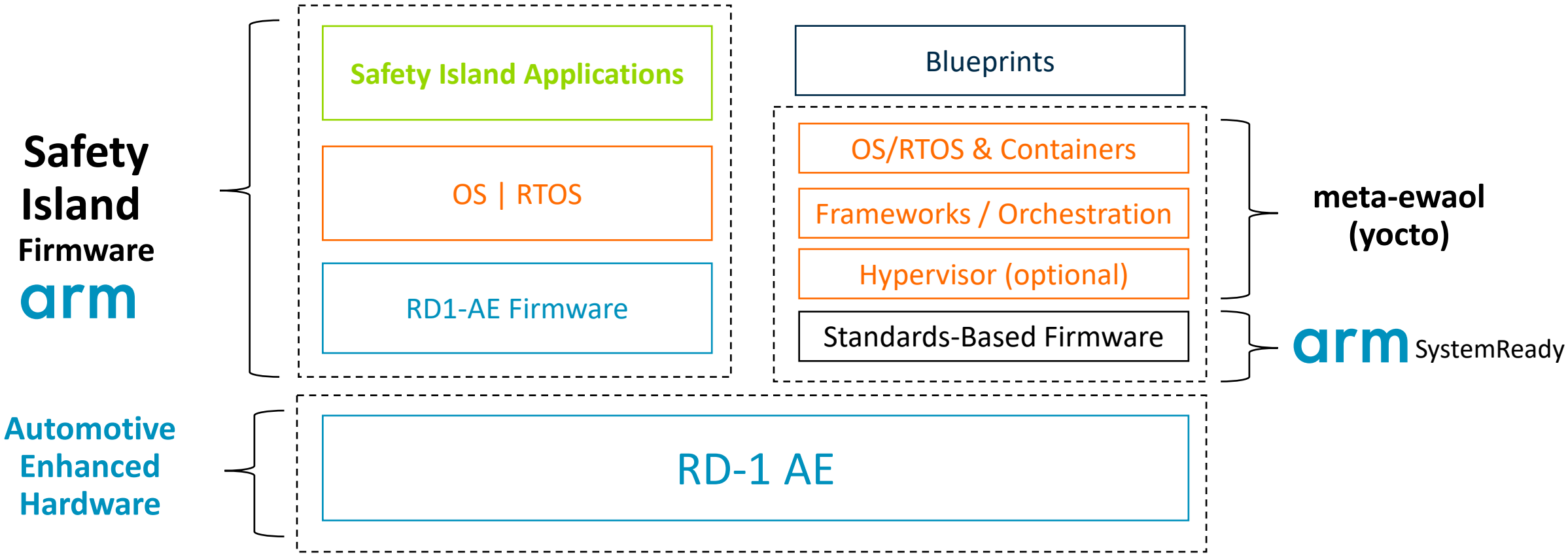
EWAOL 2.0

- Safety Island FW + “meta-ewaol” SW



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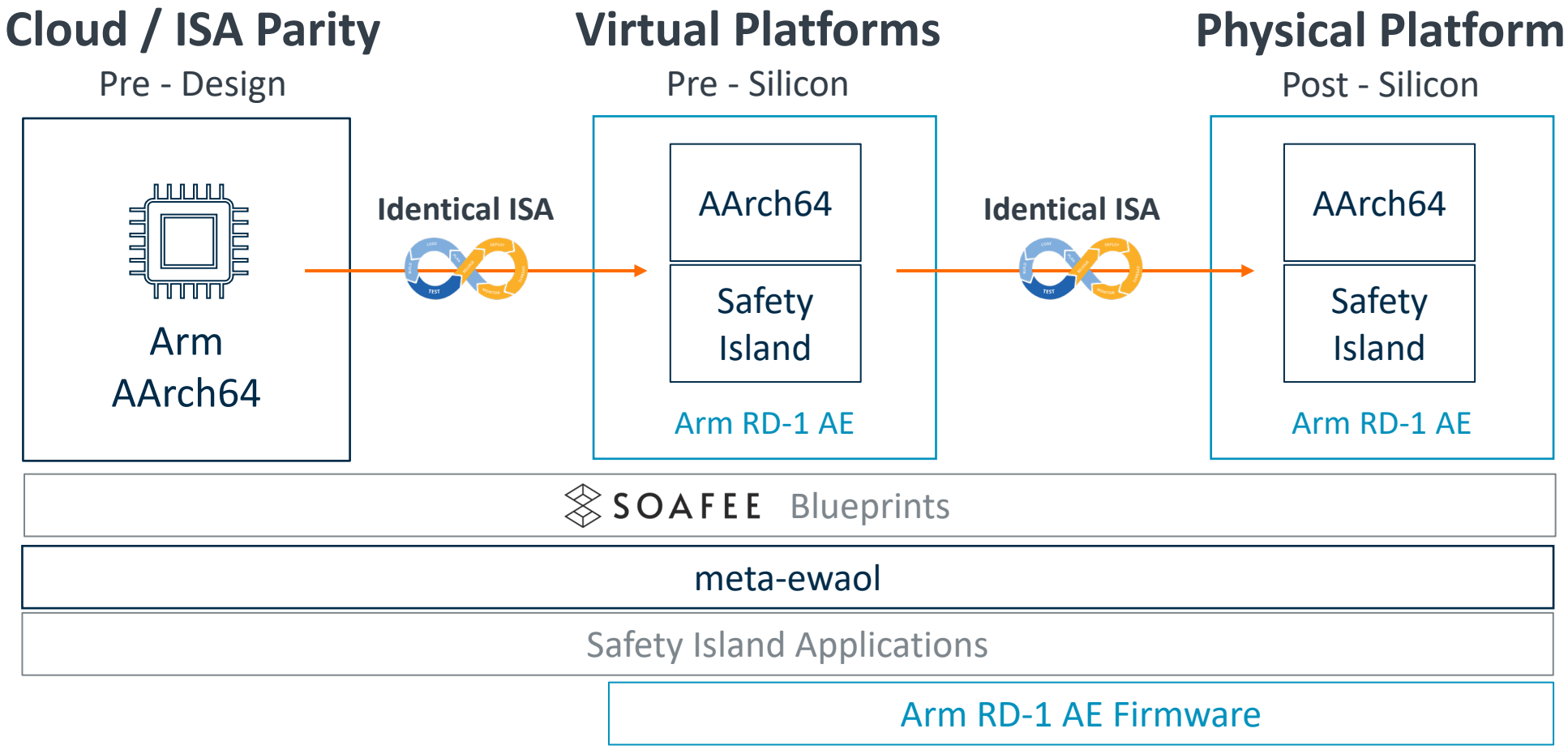
Virtual prototyping enables “shift left” development



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Thank You
Danke
Gracias
谢谢
ありがとう
Asante
Merci
감사합니다
धन्यवाद
Kiitos
شكرًا
· ĂĕąĿ
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