Software Defined Vehicle

Our Golden Rules

- We are code first (but not code only)
- Projects are self-governing to enable community driven success.
- Aim for success by selecting robust, sustainable, well engineered projects.
- No kingmakers. Similar or competitive projects are not excluded for reasons of overlap or competition.
- Don’t reinvent the wheel. Adopt and promote useful work happening in other industry groups.
- No single stack. Encourage interoperability for the emergence of a variety of stacks and distributions to serve the community and adopters.
- Define specifications derived from open source projects which have demonstrated broad adoption and real world use.
- We want to build automotive grade software (from QM to ASIL-D) which will be used in series production.
- We are here to help our projects.

Source: SDV Charter

SDV a short history (15+ busy months)

Oct 22nd	Announced at EclipseCon 2021
Feb 1st	Charter approved
March 3rd	First Steering Committee Meeting
June 30th	1st SDV Contribution Day
Sept. 22nd	2nd SDV Contribution Day
Oct 27th	1st SDV Hackathon
Nov 7th - 9th	SDV Hackathon at BCX
March 29th - 30th	1st Community Day
June 6th	Automotive Open Source Summit

31.3.2022
16 members

ECLIPSE FOUNDATION

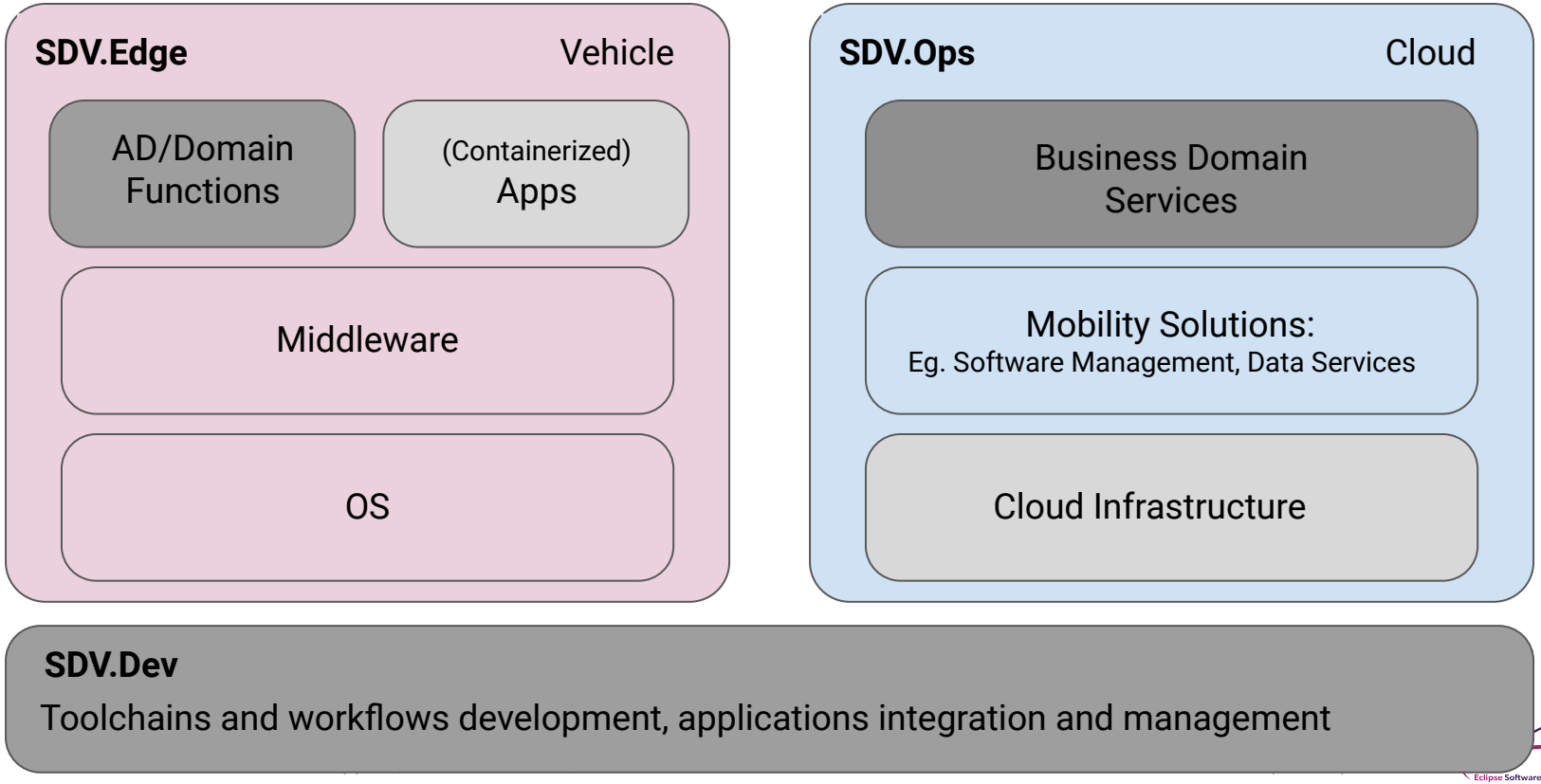
SDV Membership Commitments

38 members today

(and growing)

SDV Eclipse Software Defined Vehicle

The SDV WG Scope



The SDV project landscape (From 0 one year ago)

AUTOMOTIVE

Eclipse ADAAA (Adaptive Cruise Control Demo Application for Adaptive AUTOSAR)
ADAAA is example application for Adaptive AUTOSAR with the following goals: * Provide a tutorial with simple examples code base for getting involved with AUTOSAR methodology and each functional...

Get Started >

Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Ambient Light Services
The Eclipse Ambient Light Services showcase vizualizes possible new lighting concepts which are adaptive to different specific driving scenarios, like e.g. coming and leaving but also further...

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Latest release:

Project status: **Incubating**

OTHER TOOLS

Eclipse Ankaios
Eclipse Ankaios manages multiple nodes and virtual machines with a single unique API in order to start, stop, configure, and update containers and workloads. It provides a central place to manage...

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Latest release:

Project status: **Incubating**

OTHER TOOLS

Eclipse Heimlig
Eclipse Heimlig is a Hardware Security Module (HSM) firmware for embedded platforms written in Rust. As an HSM, Eclipse Heimlig typically runs on dedicated hardware and provides cryptographic...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Ibeji
The automotive and mobility ecosystem is facing major challenges in modernizing and streamlining in-vehicle software development as well as in software life cycle management. The Eclipse Ibeji...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Kuksa™
A modern car contains more than 200 millions lines of code. This code is distributed between low level embedded components and increasingly also high-performance Vehicle Computers running operating...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Muto
Eclipse Muto provides an adaptive framework and a runtime platform for dynamically composable model-driven ROS software stacks. Eclipse Muto can be used to introspect, monitor and manipulate the...

Get Started >

Latest release:

Project status: **Incubating**

OTHER TOOLS

Eclipse SDV Developer Console
Eclipse SDV Developer Console (DCO) integrates necessary sources for software lifecycle management and there by optimizes the complete process from development to release of software. The core of...

Get Started >

Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse SommR
Eclipse SommR provides an automotive grade implementation of the SomeIP specification for embedded Linux systems together with the required tools to support developers. Eclipse SommR fosters...

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Latest release:

Project status: **Incubating**

OTHER TOOLS

Eclipse uProtocol
Purpose Connecting Automotive Apps and Services, Everywhere The purpose of this project shall be to provide a transport agnostic, layered communication protocol that builds on top of existing...

Get Started >

Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse ArchE
Eclipse ArchE (Architecture Enabler) provides a tool for Architecture Modeling following an holistic Model-Based-Systems-Engineering (MBSE) approach instead of having a heterogeneous environment of...

Get Started >

Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Backend function Bindings (BfB)
The Eclipse BfB project provides a protocol and technology agnostic interface specification in the ecosystem of mobility and automotive applications. The Eclipse BfB specification is maintained in...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Chariott
The Eclipse Chariott project aims to simplify and enhance in-vehicle software developer productivity by providing a metadata-driven middleware/abstraction layer that allows modern application...

Get Started >

Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Leda
In the ambition to build a technology ecosystem for software-defined vehicle, one of the main challengs will be the combination of the diverse components into a coherent and useful whole: all the...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Leda Incubator
Eclipse Leda Incubator provides a place for experimental components from the software-defined vehicle ecosystem.

Get Started >

Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse MoEc
Eclipse MoEc provides an open software development kit (SDK) for infrastructure-based planning, motion, parking and charging solutions within the Software Defined Vehicle (SDV) ecosystem. The MoEc...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse Velocitas
Eclipse Velocitas™ provides an end-to-end, scalable, modular and open source development toolchain for creating containerized and non-containerized in-vehicle applications. Currently, the...

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Latest release:

Project status: **Incubating**

AUTOMOTIVE

Eclipse eCAL™ (enhanced Communication Abstraction Layer)
Eclipse eCAL™ (enhanced Communication Abstraction Layer) provides a middleware that enables scalable, high performance interprocess communication on a single computer node or between different...

Get Started >

Latest release:

Project status: **Incubating**

OTHER TOOLS

Eclipse p3com
Eclipse p3com enables arbitrary communication interfaces through a convenient and modern high level API while exploiting full HW capabilities. Eclipse "p3com" stands for: Pluggable Portable Publish...

Get Started >

Latest release:

Project status: **Incubating**

SDV
Eclipse Software Defined Vehicle

SDV Projects with Contributions & Releases

As of 26.05

SDV.Edge: Vehicle

Chariott
Metadata-driven middleware/abstraction HW layer, gRPC based framework

KUKSA
Vehicle Interfaces adaptation into a basic interfaces using simple APIs (eg VSS).

eCAL
Interprocess communication using a publish/subscribe pattern.

Ibeji
Digital twin of vehicle state representation

uProtocol
Transport agnostic, layered communication protocol from mechatronic layer to Cloud.

p3com
Enabler for arbitrary communication HW interfaces
ECLIPSE INCUBATION

Ambient Light Services
ECLIPSE INCUBATION
Application: Showcase new lighting concepts

SDV.Ops: Cloud

muto
ROS: adaptive framework and runtime platform

SDV.Dev

Leda
Quickstart linux based image for "SDV distribution"

Velocitas
Development toolchain for in-vehicle applications.

Source SDV Projects

SDV Eclipse Software Defined Vehicle

{hackathon}

Challenges overview

What use cases can you solve today?

Click on the pictures to access the specs

Driving Score

- Measure the quality of driving by calculating a score of the driving style
- Implement a vehicle app to calculate the score and visualize it

Passenger Welcome

- The goal is for a passenger to feel comfortable entering and using a vehicle
- Ideate on ideas how the vehicle should behave

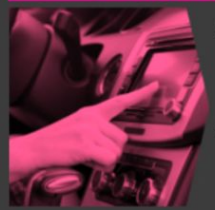
Hack the Truck

- Do you dream big? Yes?
- Have you ever hacked an actual truck? No?
- Well, here you can! We bring the truck - you bring your creative ideas

Virtual Vehicle Application

- build in-vehicle applications using telemetry data generated with simulation tools
- the two simulation tools used are Carla and AirSim

Control Vehicle Lights



- Control vehicle lights using Eclipse SommR and KUKSA.val
- Integrate lights with other hack challenges

Let's Play OSM and CARLA

- Bring real world city and street data into the simulator's virtual world
- Implement best way of driving in this world from A to B and visualize it

Source https://eclipse-sdv-hackathon-bcx.github.io/.github/

Don't reinvent the wheel The ecosystem around

AUTOSAR

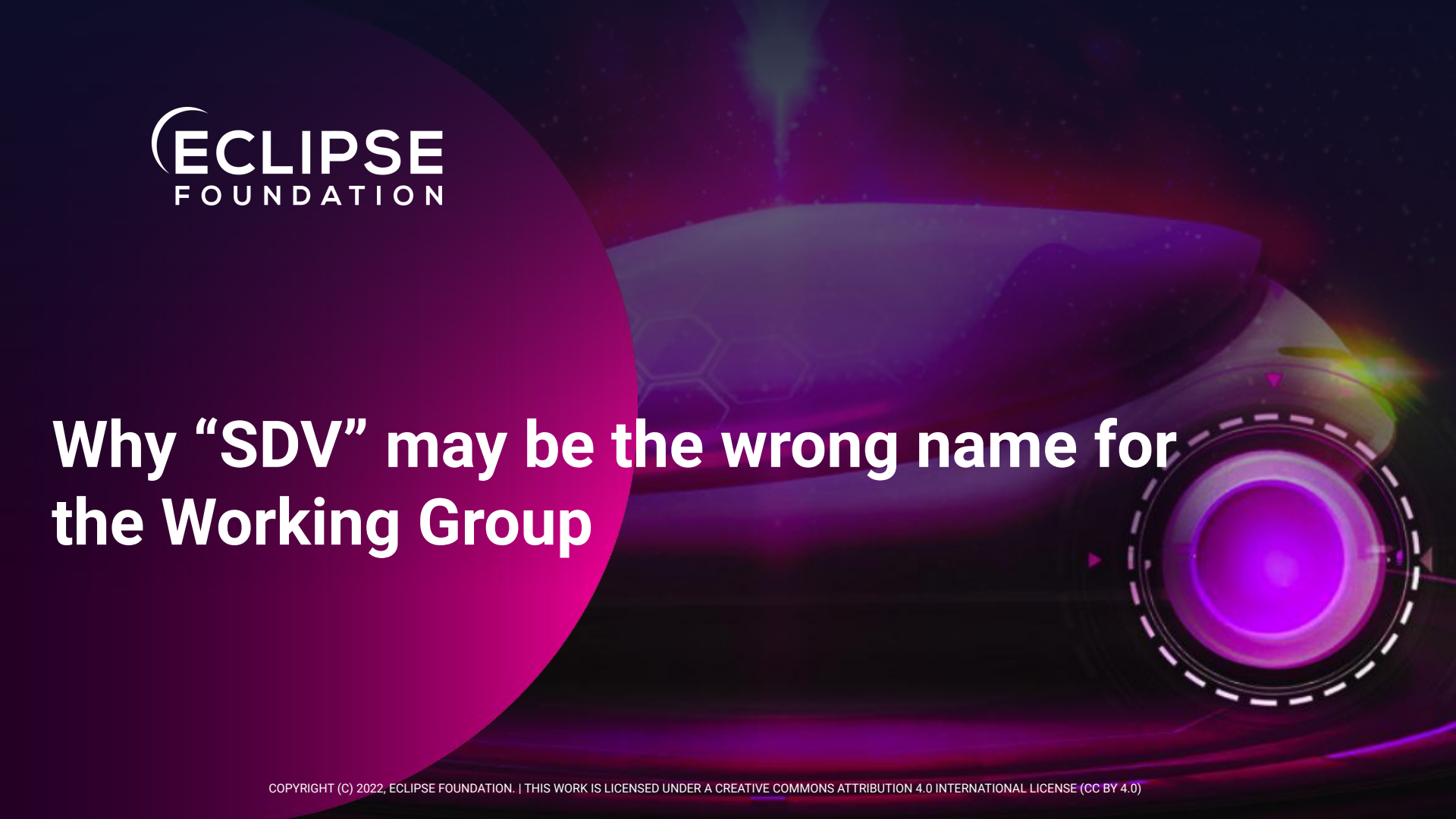
SOAFEE

COVESA

Accelerating the future of connected vehicles

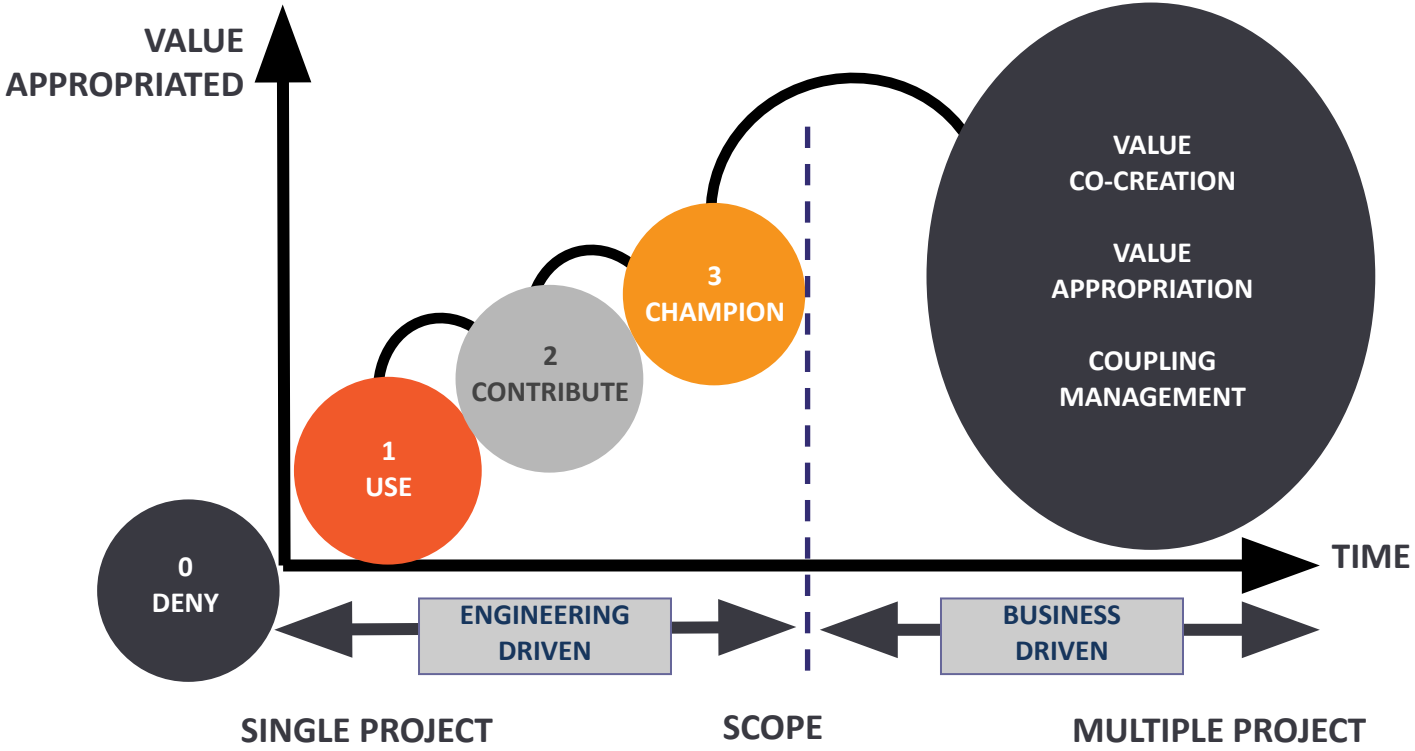
AUTOMOTIVE GRADE LINUX

…. and more



Why “SDV” may be the wrong name for the Working Group

The state of Open Source



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Why Open Source may not be enough

Open Collaboration

Contribution

- Transfer of IP rights
- Future influence

Collaboration

- Rules for collaboration (Governance)
- Predictability
- Sustainability

Open Source

Adoption

- Open Source License
- Four Freedoms

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Eclipse Software Defined Vehicle

Our Impact: Open Innovation at Industrial Scale

Competition Layer

Commercial Adopters focus resources on rapidly building differentiating features

Requirements & Use Cases

Value Line

Product-Ready Technologies

Collaboration Layer

Technology Producers jointly **define roadmap** and **build core capabilities**

Governance Layer

The Eclipse Foundation provides an **open, vendor-neutral development environment** to enable collaboration

€13+ billion

of shared investment to date

Let's talk about the Collaboration Layer (and the Value Line)

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A project is like a piece of the cake

That's what SDV looks like today

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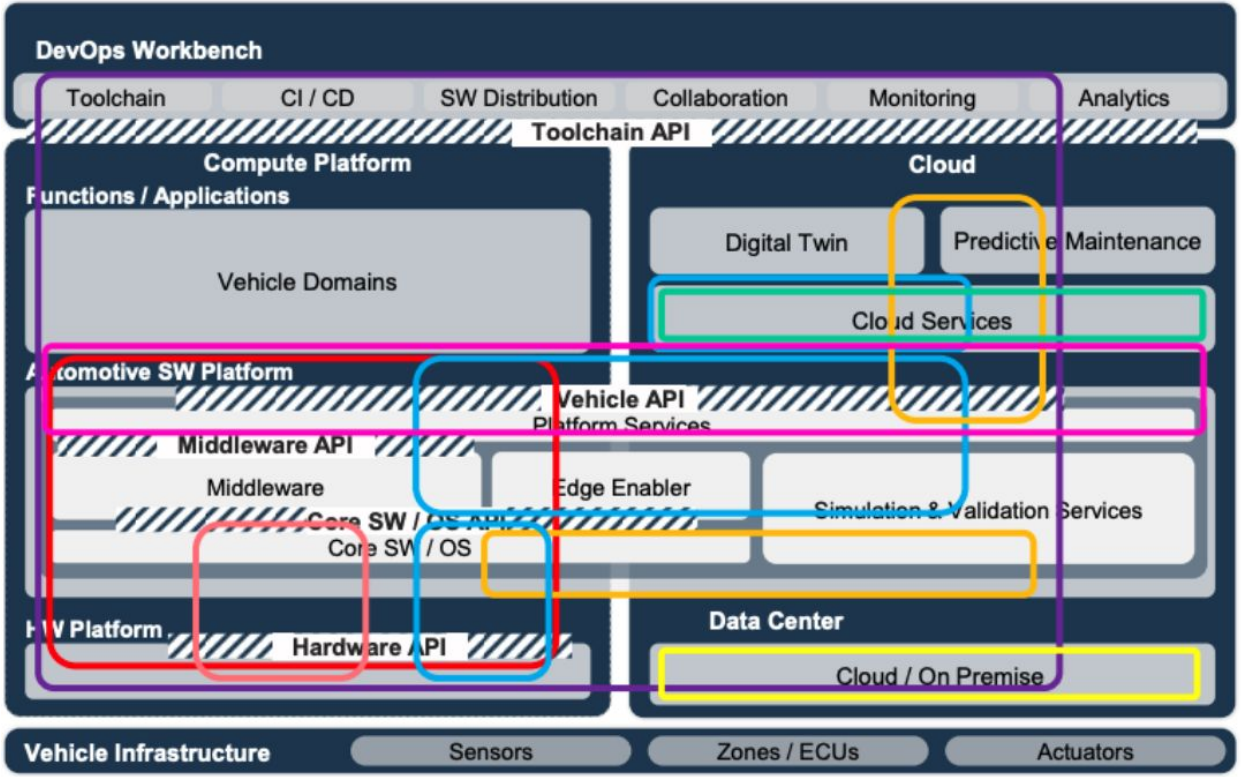
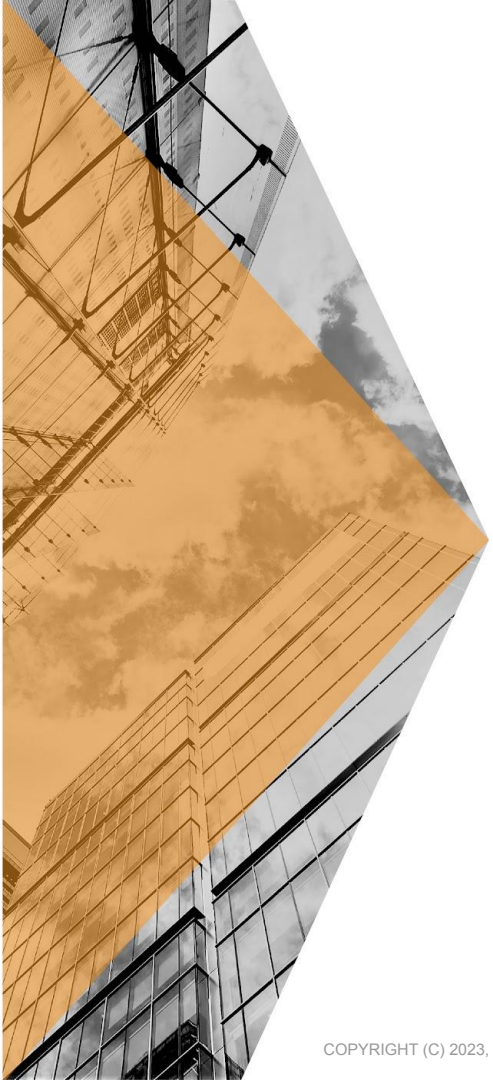
Let's talk about the Collaboration Layer (and the Value Line)

SDV as middelware reloaded?



AUTOSAR - embedded world conference 2023



SDV as middelware reloaded?

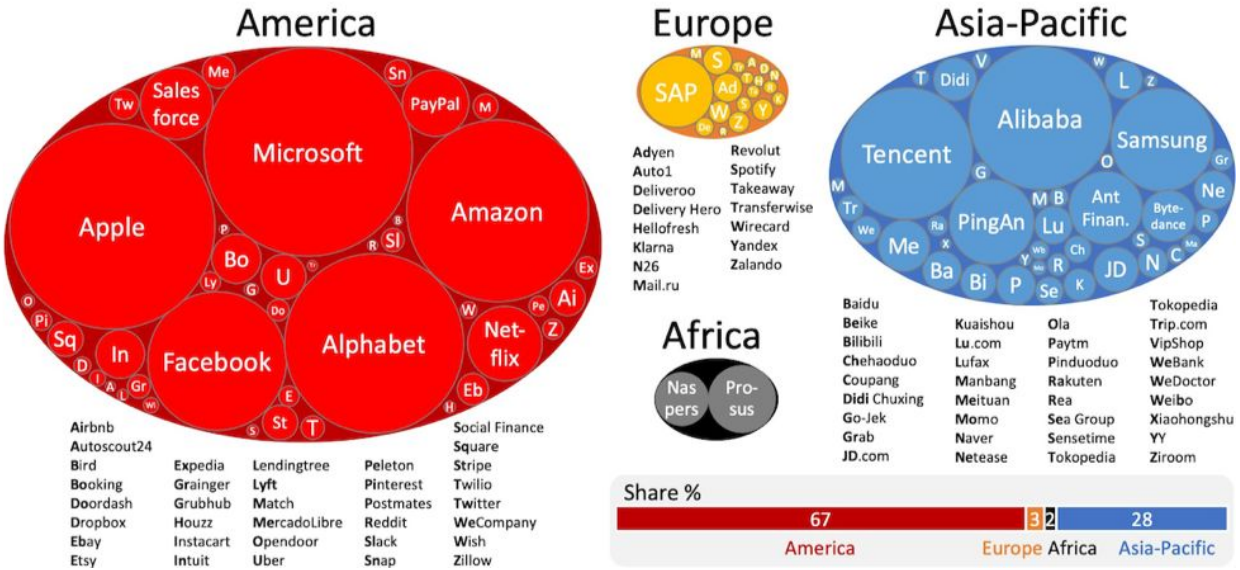
An Open Source middleware stack

- Leveraging existing technologies
- Easy and fast extensible
- Smart concepts (e.g. containers) for SW updates
- In a limited number of variants (SDV distributions)
- Includes needed tooling for configuration, testing and validation (and more)

This would need more of your cakes and developers

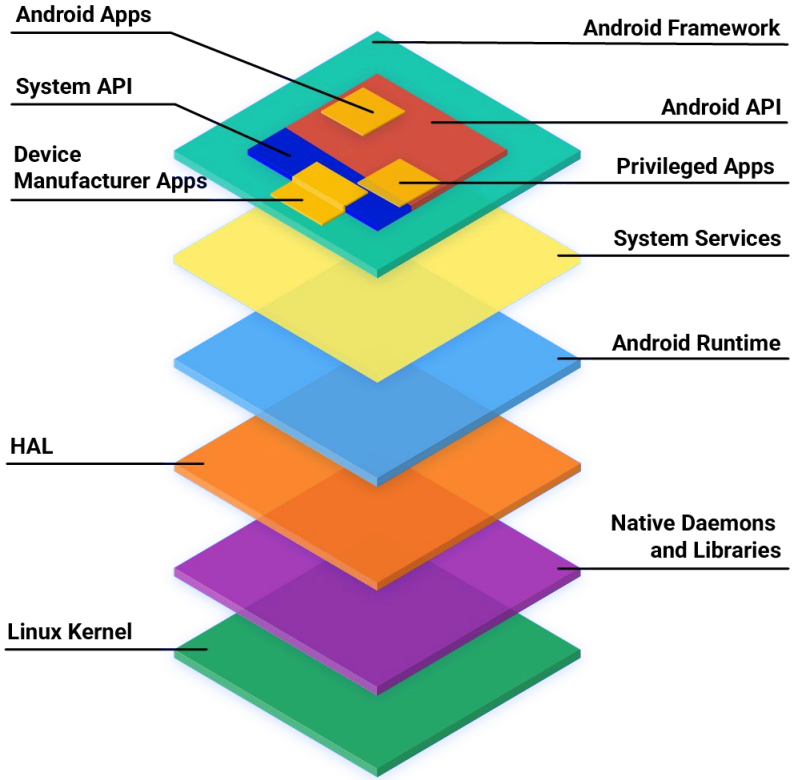
Let's talk about the Collaboration Layer (and the Value Line)

Enabling the platform economy with open source



Source: Dr. Holger Schmidt

SDV as a platform?



Google Play

Play In-app Billing Library

Provides APIs to help you implement Google Play's in-app billing and subscription features.
Reference User Guide

Play Core Library

Provides APIs to help you request, monitor, and manage on demand downloads for Play Feature Delivery, Play Asset Delivery, and offers additional APIs such as in-app updates and in-app reviews. This library is available in Java, Native code, and Unity.

Play Install Referrer library

Provides APIs to securely retrieve referral content from Google Play.
Reference

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We understand!

We, the community, need to **build trust first** (before you may want to go “all-in”)

- By showing that we **can deliver** value
- By demonstrating **thought leadership**
- By building the network with other initiatives

But keep in mind, you may be seen as part of “the community”