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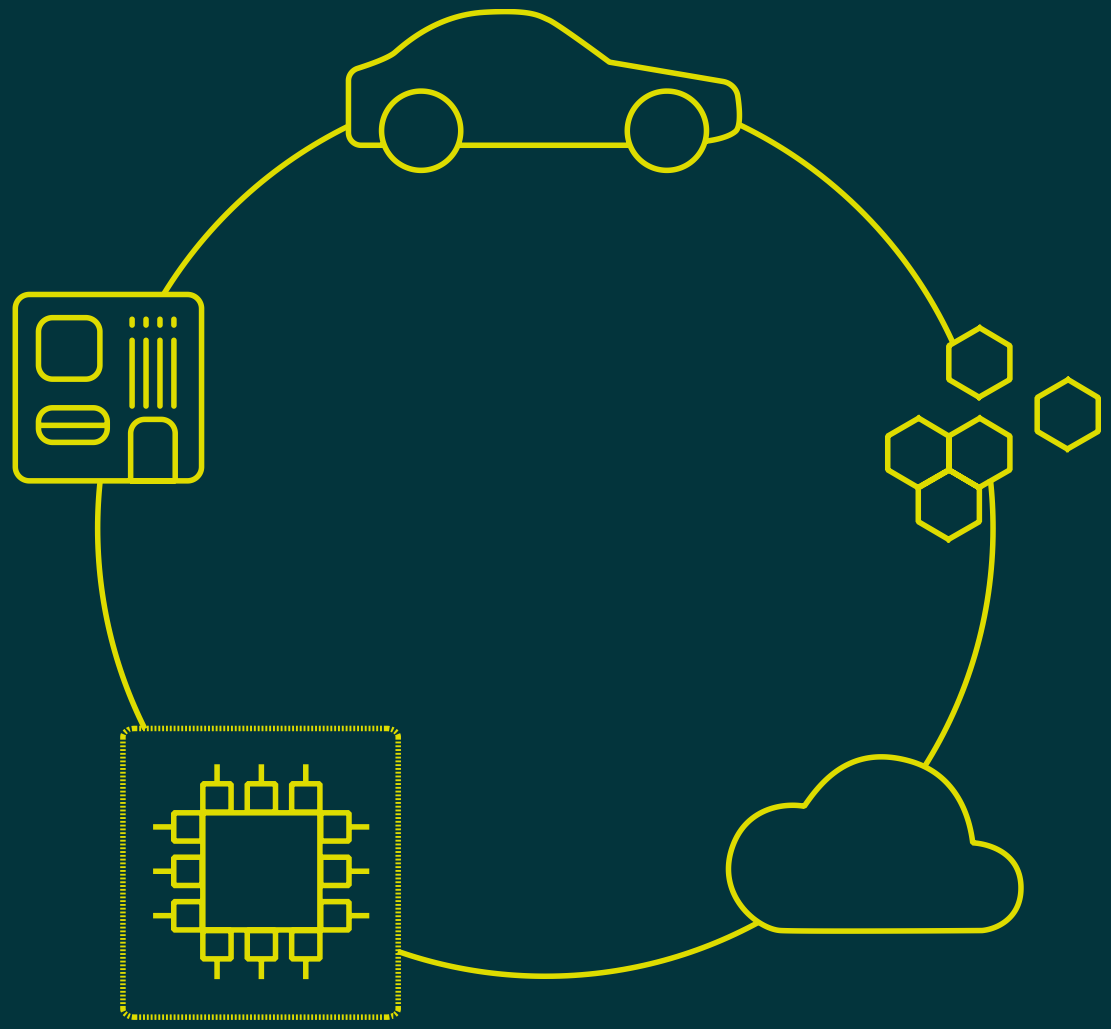
Vehicle Service Orchestration and Introduction of PICCOLO



Taesuk Yoon, LG Electronics

2023-09-21

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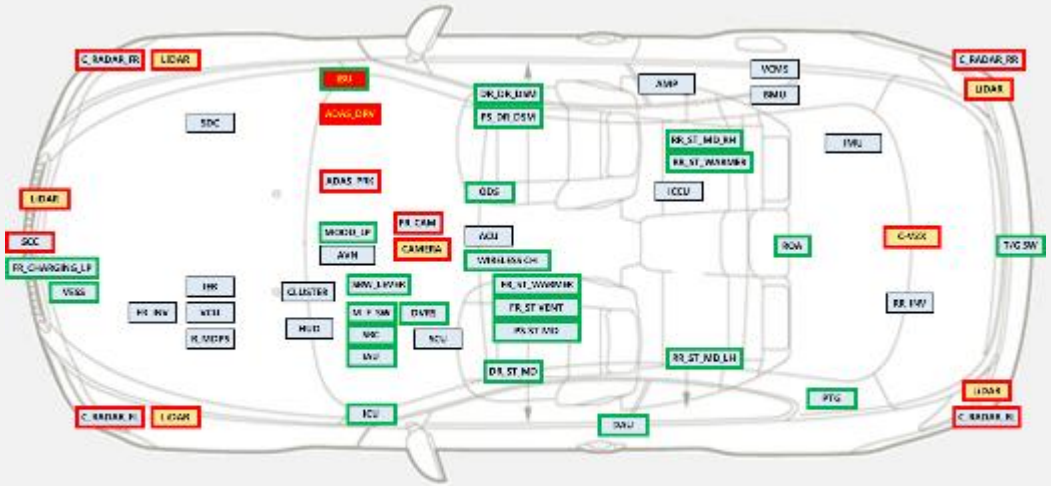
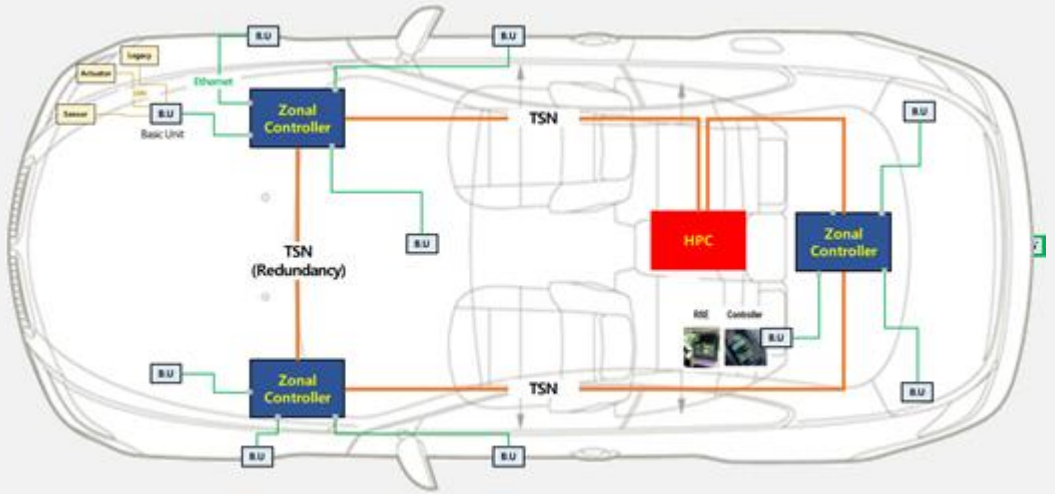
Shift of Complexity



- Over 100 ECUs
- HW Complexity
  (Isolated SW Blocks)



- 10 ~ 20 ECUs
- Numbers of SW consolidated in one box

Problem

- **Increase of SW complexity**
  (Priority, Permission, Isolation, Maintenance, Collaboration)

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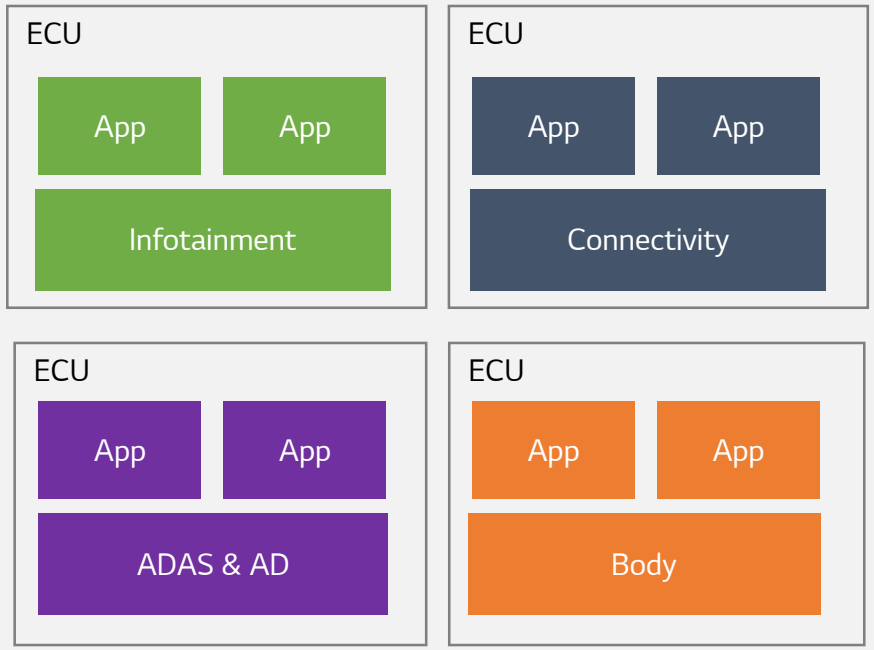
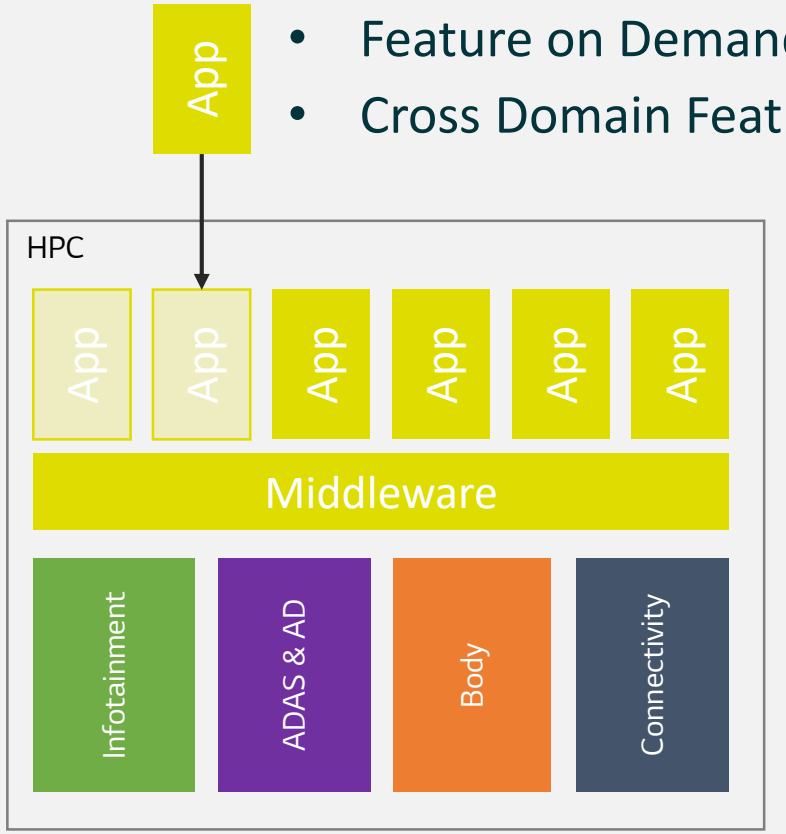
Invention of Cross Domain User Scenario





- Feature on Demand
- Cross Domain Features

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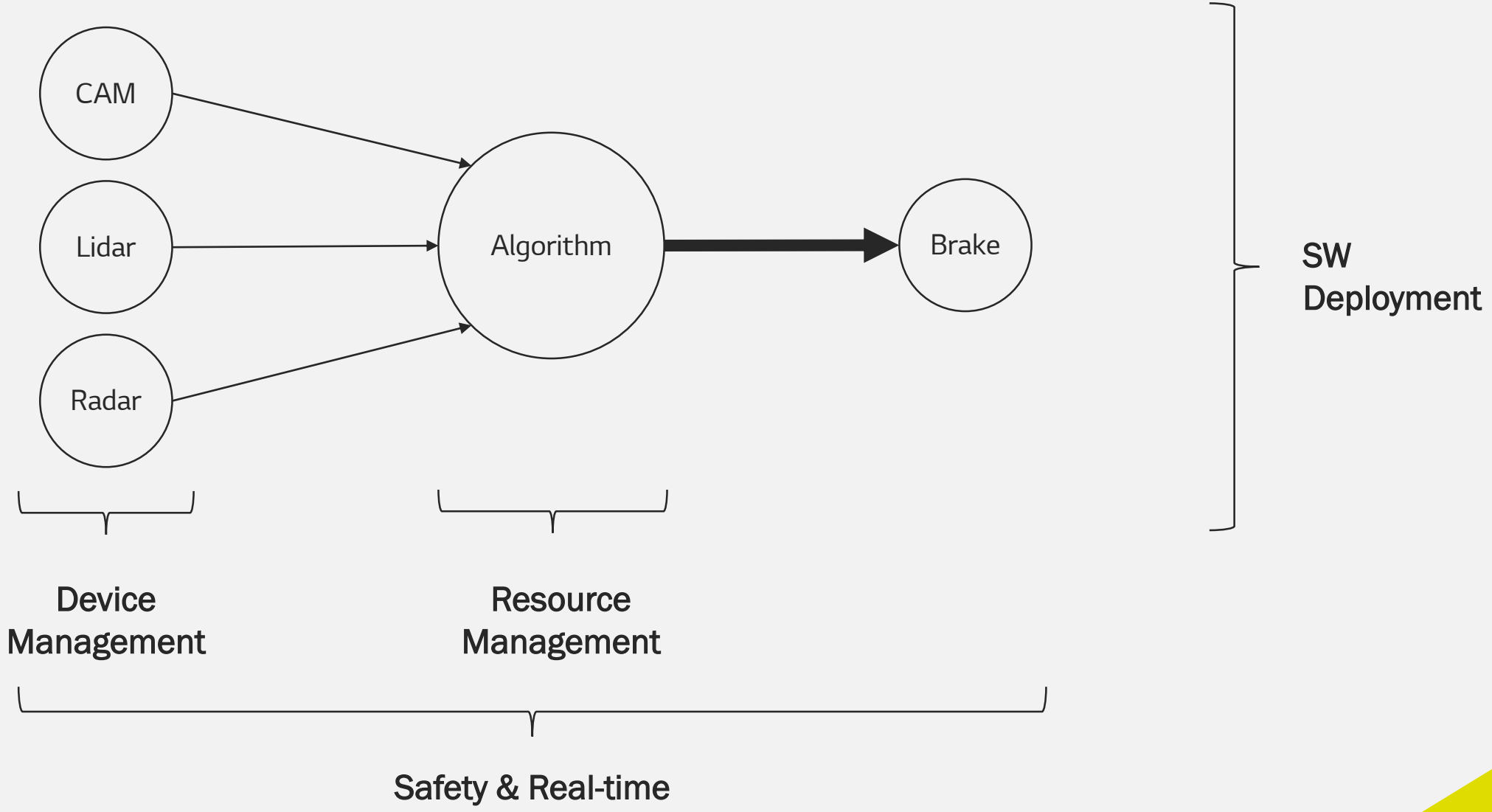
Mixed Critical Orchestration



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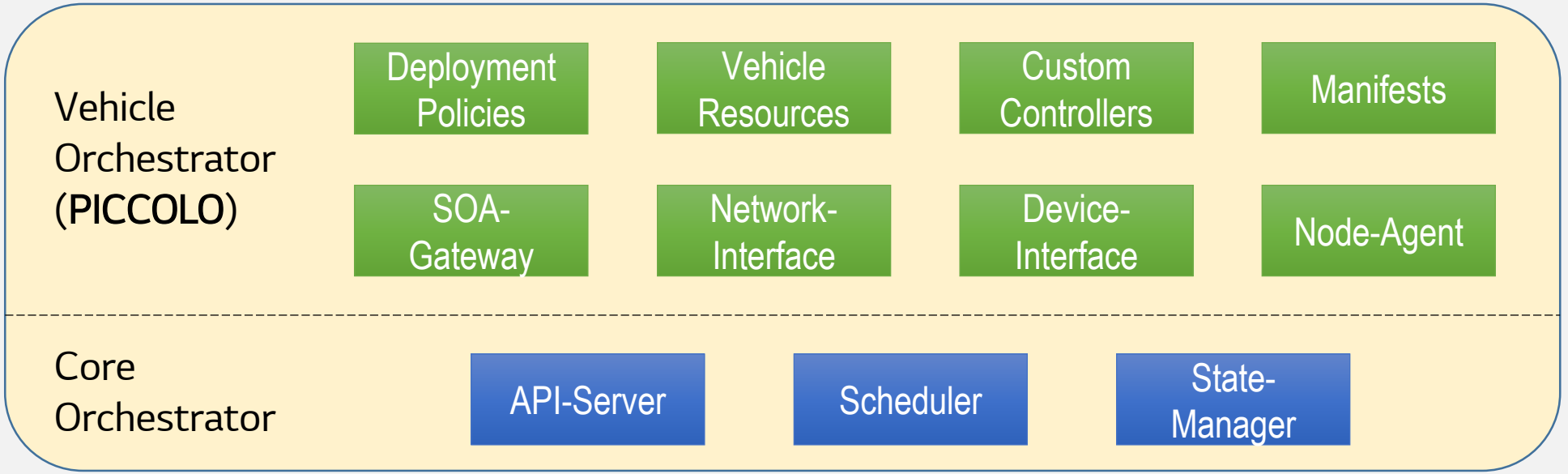
Embedded Edge Orchestrator



① Core Orchestrator: Fixed components for embedded edge orchestration
(Key Feature: Real-Time element: Fast launch, immediate response, Etc.)

② Vehicle Orchestrator: Variable components based on applied industry.
Vehicle Orchestrator handles functional safety (Fail-Safe, Monitoring, Authentication, Etc.).

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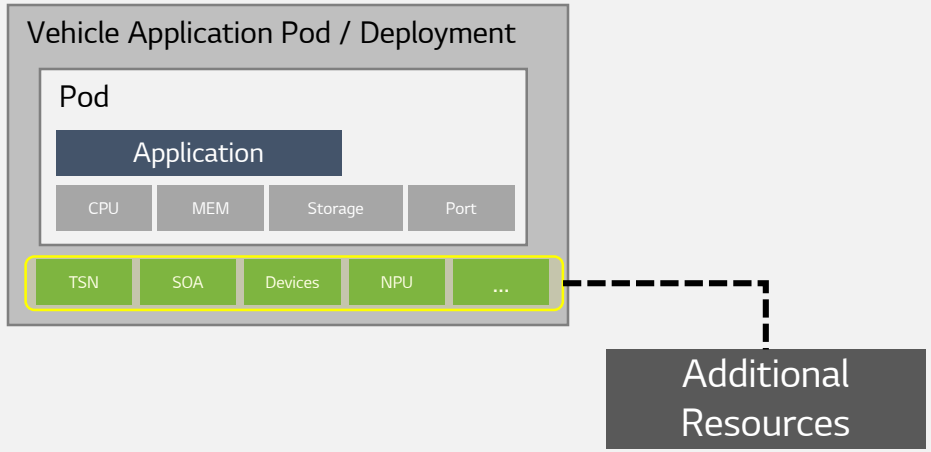
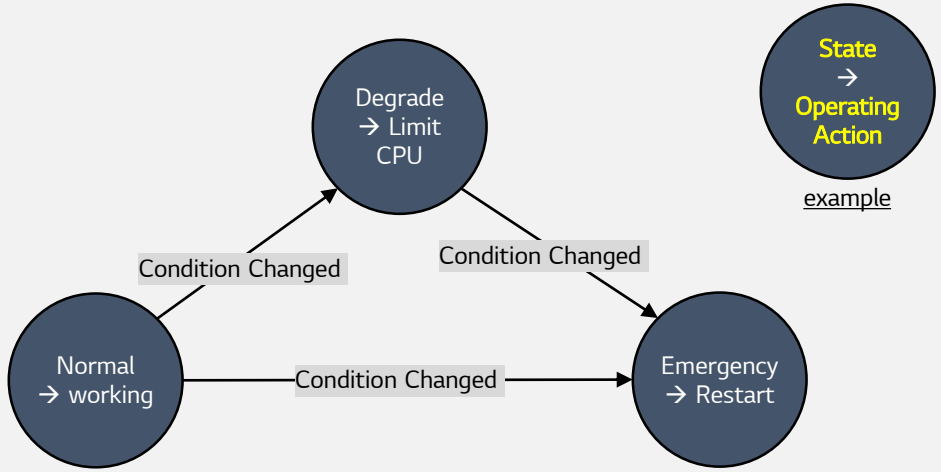
Key Approach





❑ **Provisioning Vehicle Application Pod / Deployment**

- Resources on Vehicles can become Pod resources (CPU, Memory, Network, I/O Device, Vehicle Status)

❑ **Declarative Structure according to manifest files**

- Pre-Define State and Operating Action
- Deployment Policy and Orchestration become Operating Action

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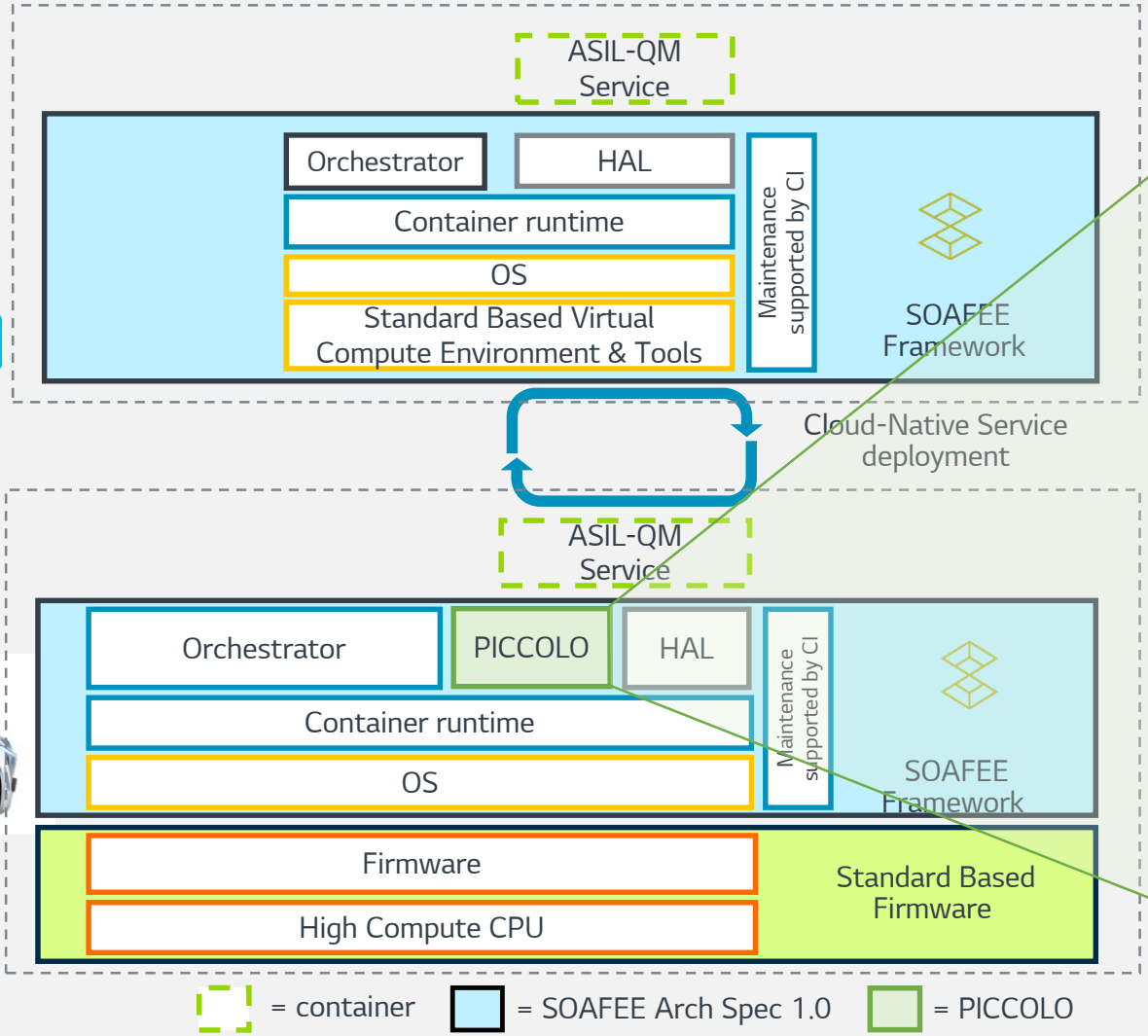
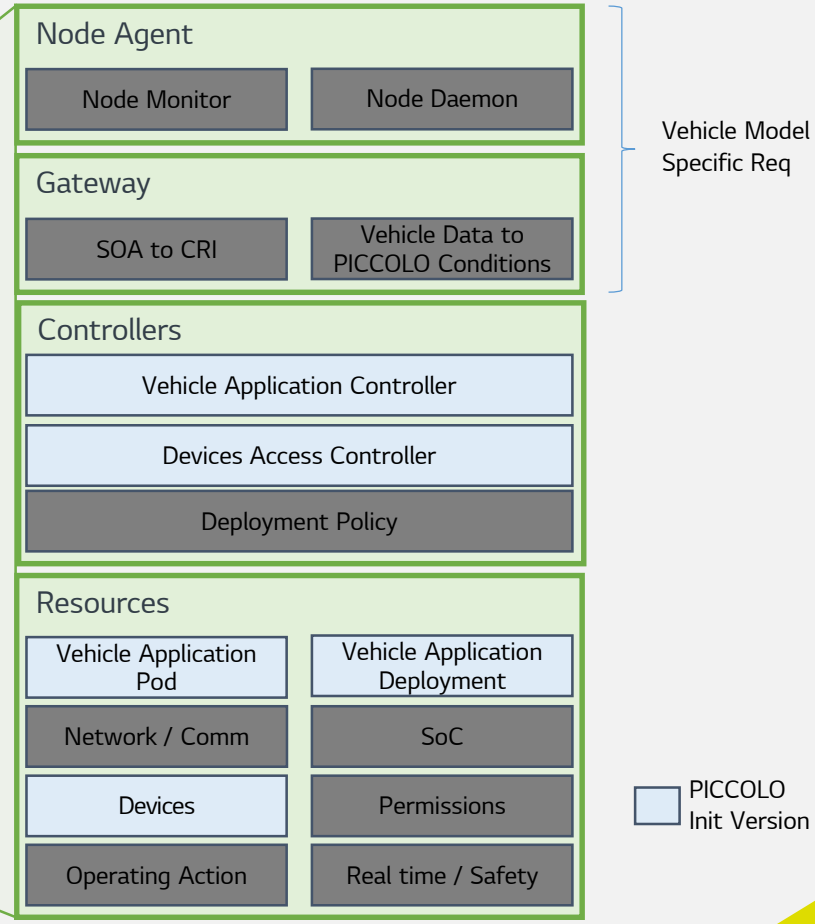
PICCOLO in SOAFEE (Blueprint)





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Next & Roadmap

Today

1. PICCOLO on SOAFEE blueprint

Target - October

1. Show PoC about USECASE used PICCOLO
2. Contribute PICCOLO source code & specification to SOAFEE (compatible K8S)

To Do

1. Discussion with SOAFEE members to build PICCOLO specification

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Thank You
Danke
Gracias
Grazie
谢谢
ありがとう
Asante
Merci
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