SDV
Eclipse Software Defined Vehicle

Elektrobit

Eclipse ANKAIOS

Holger Dormann, Kaloyan Rusev

July 06, 2023

Automotive HPCs vs. cloud native

Why existing cloud-native tools do not fit to automotive HPCs

Containerized applications provide advantages like

- Increased portability allowing separate updates and better reuse
- Increased security through better encapsulation
- Development and test in the cloud

But

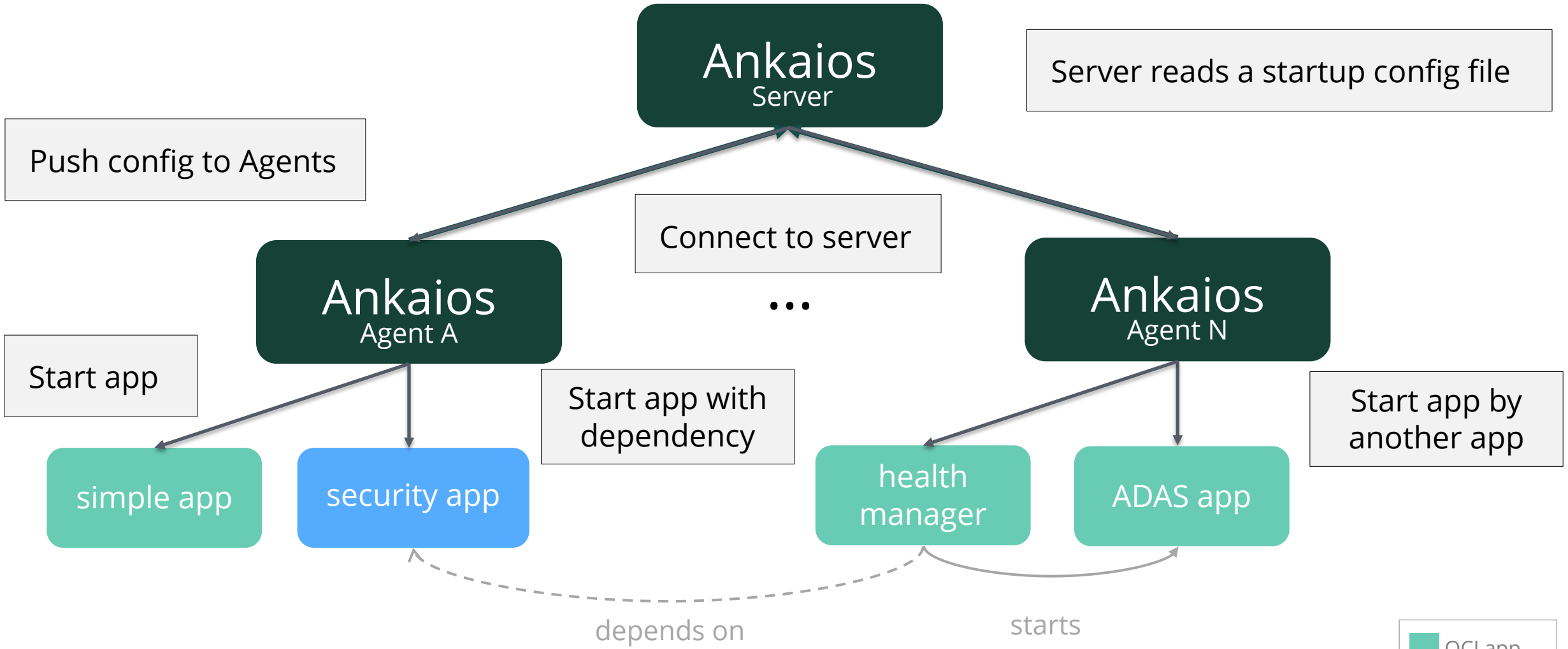
- Existing tools like Kubernetes cannot be used in automotive HPCs
- Designed for huge distributed data centers
- Eventual consistency vs. real-time and safety
- Neither programming languages like Go nor development process are suited for embedded automotive requirements
- Performance and resource usage not suited for in-vehicle platforms
- Big share of functionality not required in automotive

Image: https://unsplash.com/de/fotos/jOqJbvo1P9g

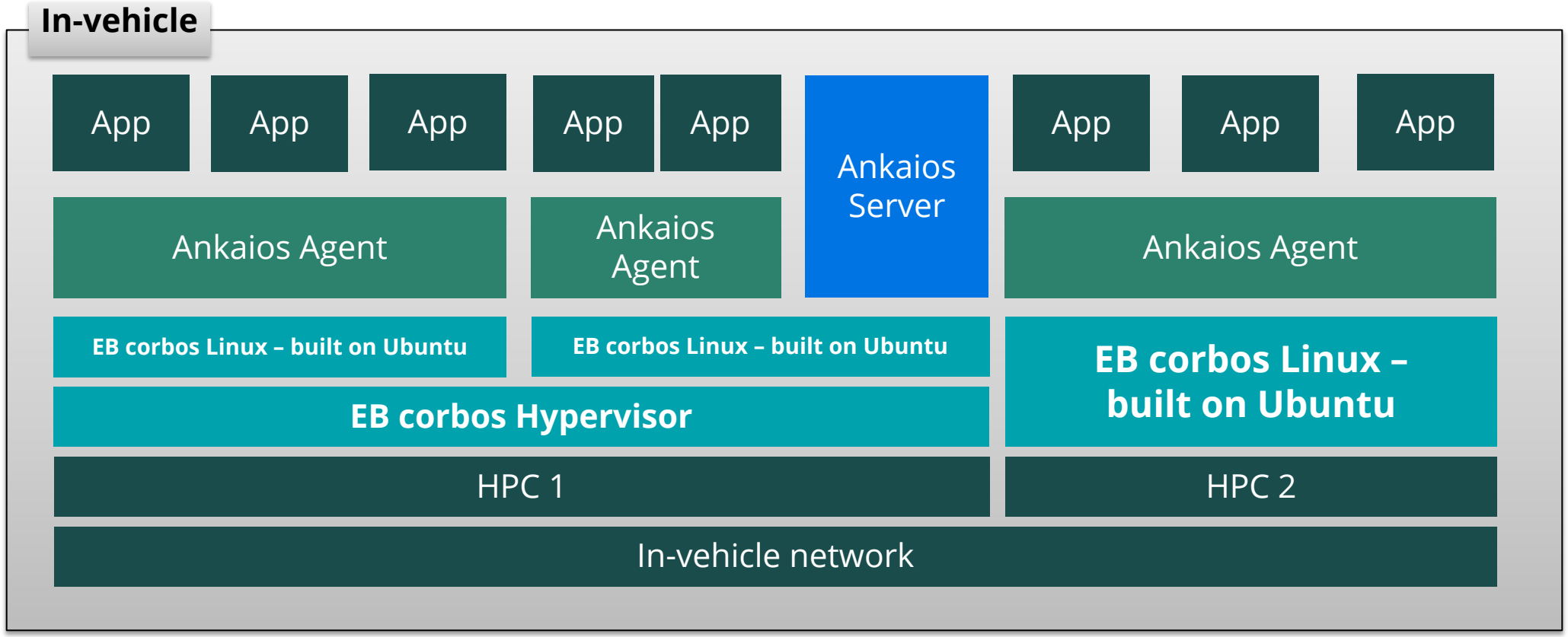
Eclipse Ankaios

- Developed from ground up for automotive HPCs in Rust
- Slim yet powerful solution to manage containerized applications
- Supports various container runtimes like Podman and also native applications
- Supports Automotive SPICE process with requirement tracing
- Multiple nodes and VMs are managed by Ankaios with a single unique API
- Provides a central place to manage automotive applications
- Existing communication frameworks like SOME/IP, DDS or REST API can be used with Ankaios workloads as well
- Supports Kubernetes pod resources

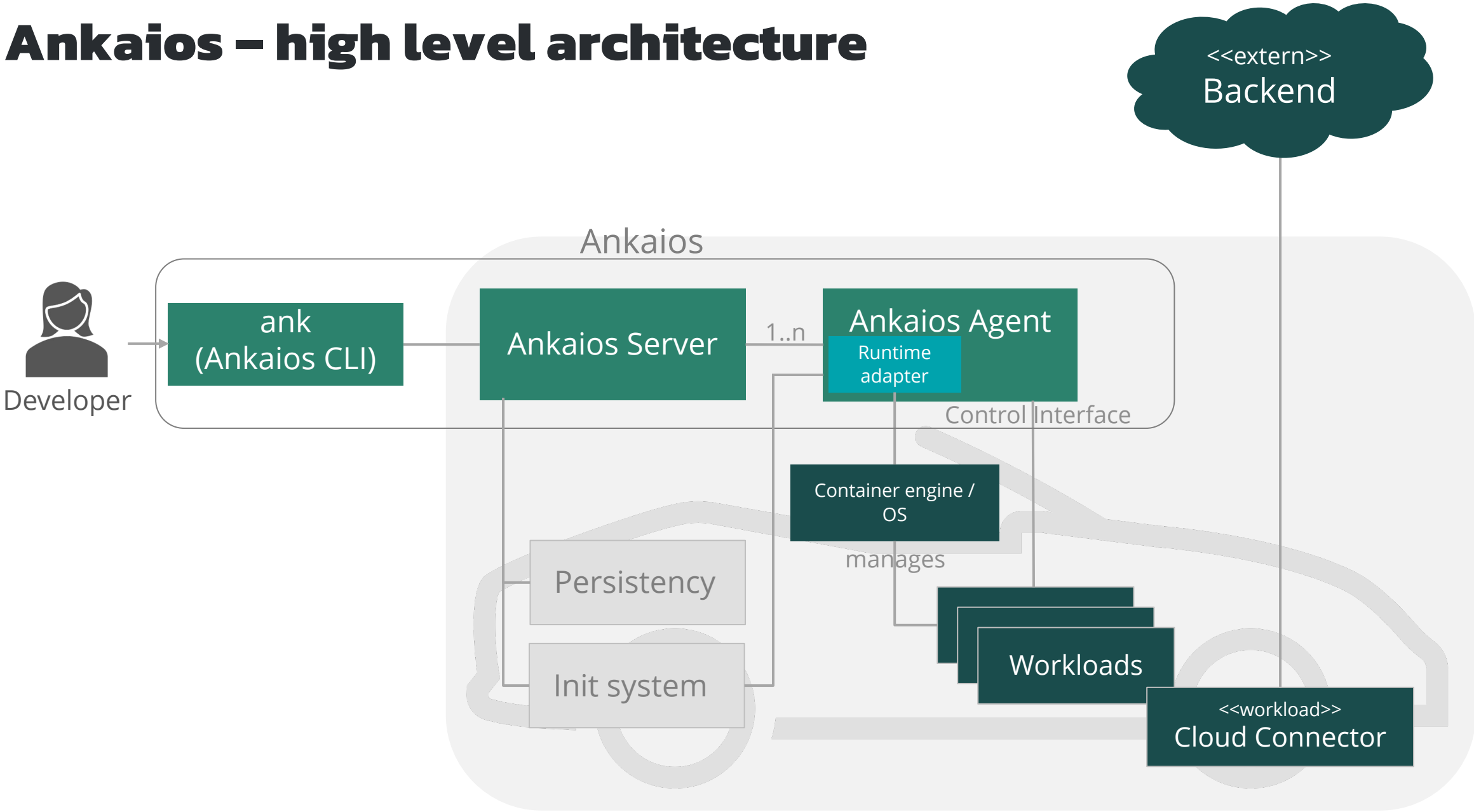
Ankaios – high level overview



Ankaios – deployment (example)



Ankaios – high level architecture



Demo

File Edit View Terminal Tabs Help

~/work/conoa/ankaios-demo

~/work/conoa/ankaios-demo

~/work/conoa/ankaios-demo

[0] 0:zsh* "mjr" 17:25 29-Jun-23

Holger Dormann

Senior project manager

holger.dormann@elektrobit.com

Kaloyan Rusev

Architect

kaloyan.rusev@elektrobit.com