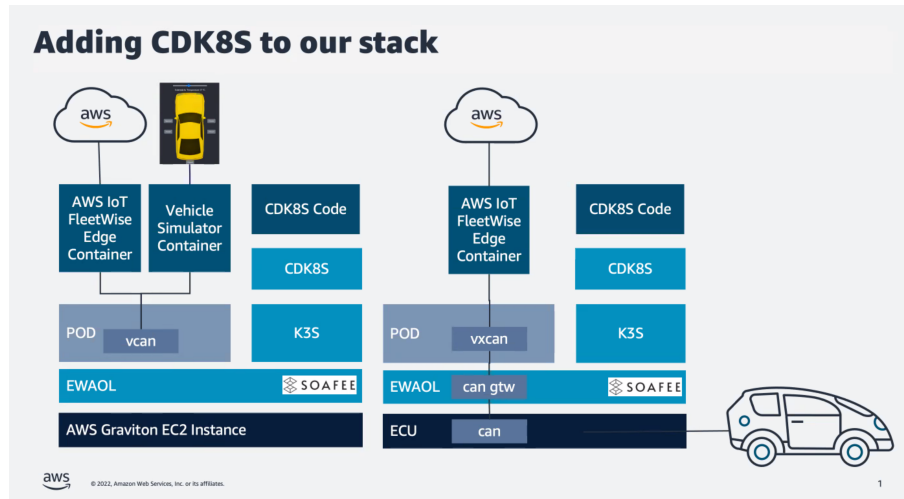


# Mar 10 F2F Meeting

## Workload Orchestration Presentation from AWS

Francesco Salamida : please kindly upload your slides to substitute the screenshots.

- CDK8S
  - CAN



- socket can

### Introducing CDK8S

<https://cdk8s.io>

cdk8s is an open-source software development framework for defining Kubernetes applications and reusable abstractions using familiar programming languages and rich object-oriented APIs. cdk8s apps synthesize into standard Kubernetes manifests which can be applied to any Kubernetes cluster.

```
cdk8s-welcome > ts main.ts > ts MyChart > @ constructor > p image
1 import { Construct } from 'constructs';
2 import { App, Chart } from 'cdk8s';
3 import { WebService } from './lib/web-service';
4
5 class MyChart extends Chart {
6   constructor(scope: Construct, name: string) {
7     super(scope, name);
8     new WebService(this, 'WebService', {
9       image: 'cdk8s-welcome:1.0.0'
10    });
11  }
12 }
```

### Abstracting K8S Manifest with CDK8S

An open-source multi-language software development framework for modeling Kubernetes resources as reusable components

**Go from code to YAML**

Define Kubernetes applications and architectures using familiar programming languages

**Cut, copy & paste**

Turn best practices into code libraries and share easily

**Run everywhere**

cdk8s runs locally and generates YAML you can deploy to any cluster, anywhere

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- Rust VMM
  - Virtualization components written in Rust
  - Build as separate libraries that can be re-used in multiple implementations

- Open Source Project with open governance
  - AWS
  - Intel
  - Alibaba
  - Google
  - Linaro
  - Red Hat

## What is rust-vmm?



Virtualization components written in Rust

Build as separate libraries that can be re-used in multiple implementations

Open Source project with open governance:

- AWS
- Intel
- Alibaba
- Google
- Linaro
- Red Hat
- Individual contributors

## Why rust-vmm?

Faster development for new custom VMMs

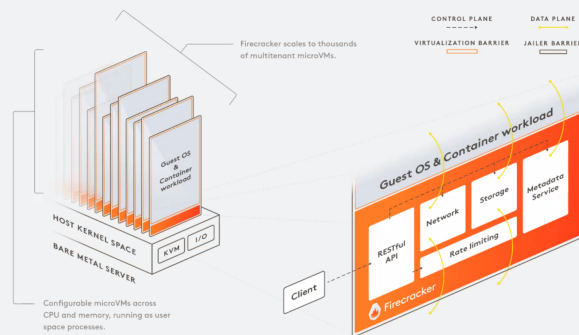
Security & Testability

Clean interface

Reduce code duplication

Supports virtio and KVM

## Firecracker is based on rust-vmm



## Example feature: Save/Restore

Firecracker Snapshot functionality

Run a microVM, pause execution, save state, stop

Start a microVM from previously saved state

[Used by AWS Lambda](#) to speed up execution of functions

VM start-up time can be reduced to 2 msec



- K3s: how heavy it is?
  - light-weight

## Brainstorm for White Paper

### Background Questions

- What is SDV?
- Why SDV is important?
  - Reduce development life-cycle
  - Increase reusability of SW components
  - Everyone can develop application softwares for automotive just like mobile phone.
    - <https://digitalauto.netlify.app/>
    - OEMs can utilize application as ecosystem to provide more end-user values
    - However, due to the automotive natures, such kind of applications need filtering to guarantee safety and security
      - Application Firewall
      - App Store only certificated apps can enter vehicle
  - Wait: Maybe SDV will be only applied to EV? Will it still be able to happen in the combustion cars?
- What is micro-service?
- Why micro-service is important?
- What does micro-service mean to AGL?
- What's the future AGL should be?
  - What kind of use case should AGL need to support?
    - How SDV can change people's life?
    - How a SDVized AGL can provide additional values to end users?

### Scope of AGL in terms of Software Defined Vehicle

- **What is scope of AGL? Some strategic discussions may be needed in SC/AB level.**
  - **Extend** More flexible for more use cases (EV, ADAS and etc.)
  - **Shrink** Bring up quality of current AGL scope (infotainment) to make it more production-close
    - production-close can have two definitions:
      - **Get ready for short-term product** SDV may have a little help here
      - **Get ready for long-term product** SDV is get ready for the future infotainment needs
- What will be the focus of AGL in domain point of view?
  - only infotainment
  - infotainment and telematics
  - or extend to EV related field (such as battery management)
  - or extend to ADAS/AD
- What will be the focus of AGL in technical point of view?
  - Environment Parity
  - Workload Orchestration
  - else?

### Technical Insights

- Workload Orchestration
  - What is the suitable container (runtime) type
  - What will be the requirement for automotive orchestrator?
    - Is k3s a good one?
    - If no, what's the gap
  - Any lightweight VMM suitable for the AGL?
    - crosvm?

- rust-vmm?
- Environment Parity
  - Device Virtualization in the Hypervisor Environment
  - Device Virtualization in the Non-Hypervisor Environment
  - Device Virtualization across ECUs
  - Device Virtualization across Cloud and Edge