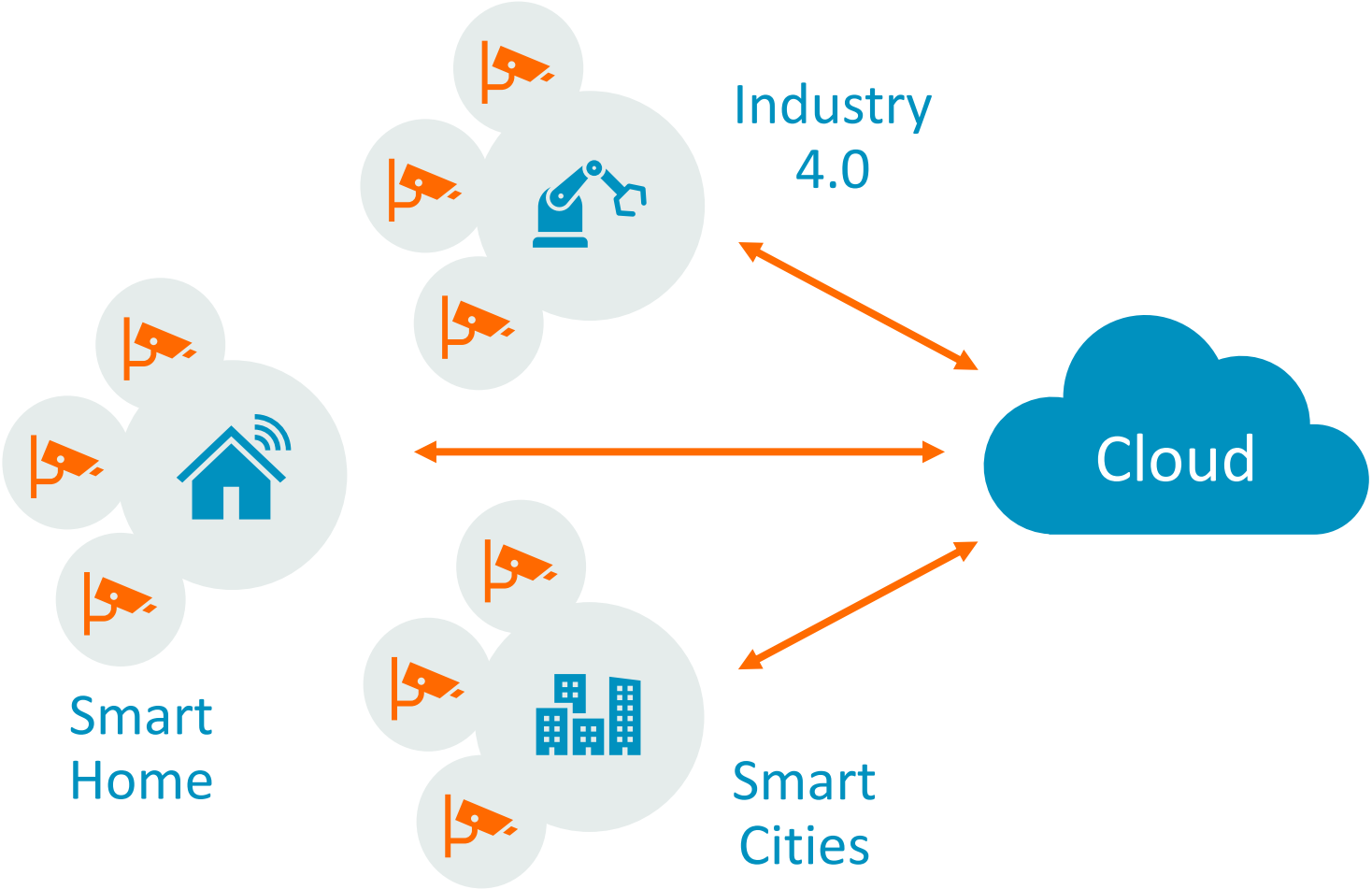




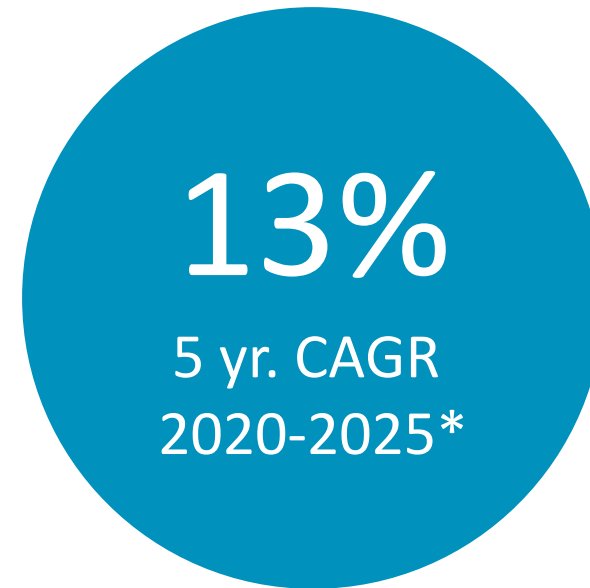
arm

Software Defined Cameras

Smart Camera Deployments are Already Everywhere



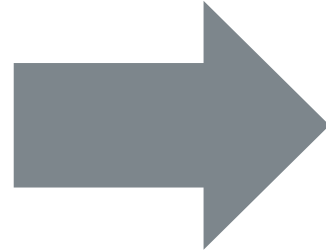
Smart Camera Market Bound for Large Growth Ahead



A Trend Pushing For a Large Increase of Functionalities

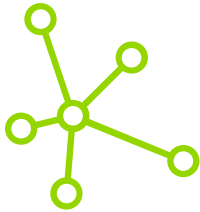


- ✓ Record video



- ✓ Record video
- ✓ Automated track/monitoring
- ✓ Person/object/activity Identification
- ✓ Cloud connectivity
- ✓ Many other services

Smart Camera Transformation Underpinned by 3 Key Trends



Shift to Edge Compute

AI-enabled
intelligent cameras



Increased Security Focus

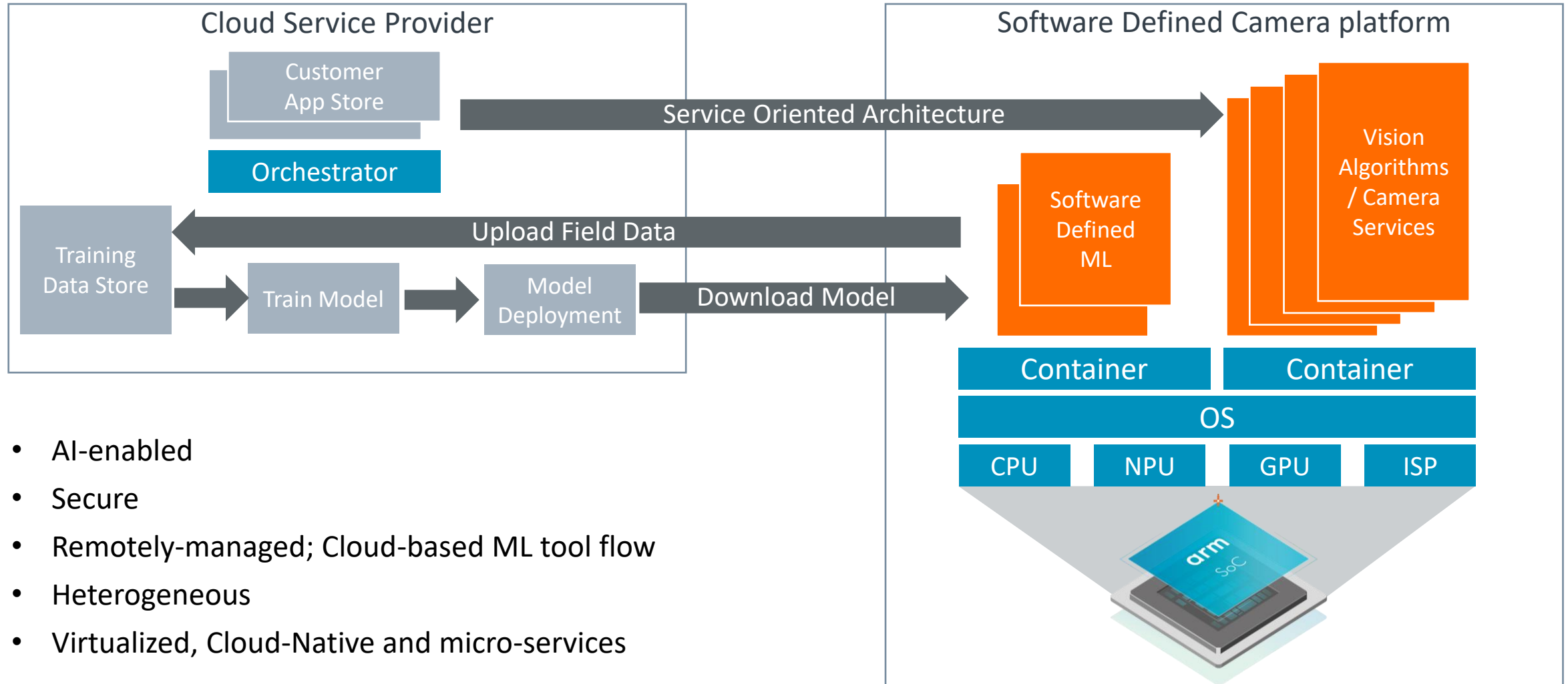
Resilient and secure
deployments



Cloud Native

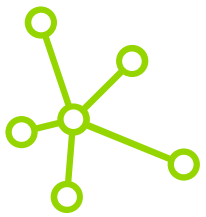
Run cloud-native applications
and deploy services over time

Edge Computing is Driving Architecture Evolution of Camera



- AI-enabled
- Secure
- Remotely-managed; Cloud-based ML tool flow
- Heterogeneous
- Virtualized, Cloud-Native and micro-services

New Applications Are Enabled by ML and AI



Location and Tracking

- Identify people and other objects
- Track direction and motion to predict location
- Enable hotspot detection



Smart and Secure

- Grant access onto property
- Privacy preserving with secure local inference
- Third party model/IP protection



Automatic Boundaries

- Create boundary conditions quickly with Image Segmentation



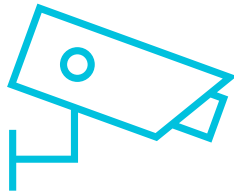
Increasing Intelligence

- Estimate actions with pose estimation and understanding
- Ability to interact verbally with security system



Why Security Matters for Smart Cameras

Camera



Data Transmission



Cloud



Hardware attacks

Software attacks

Theft of footage

Denial of Service

Modification of footage

Theft of ML models

Unauthorized user access

Theft of data

Ensuring Secure Deployments of Smart Cameras with PSA



1

Analyze



Methodically
developed

2

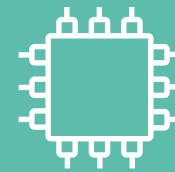
Architect



Open
architecture

3

Implement



Open Source
(TF-M, TF-A, OP-TEE)

4

Certify



Enabling
trust

PSA Certified is an independent collaborative effort using open-source threat models and government best practices



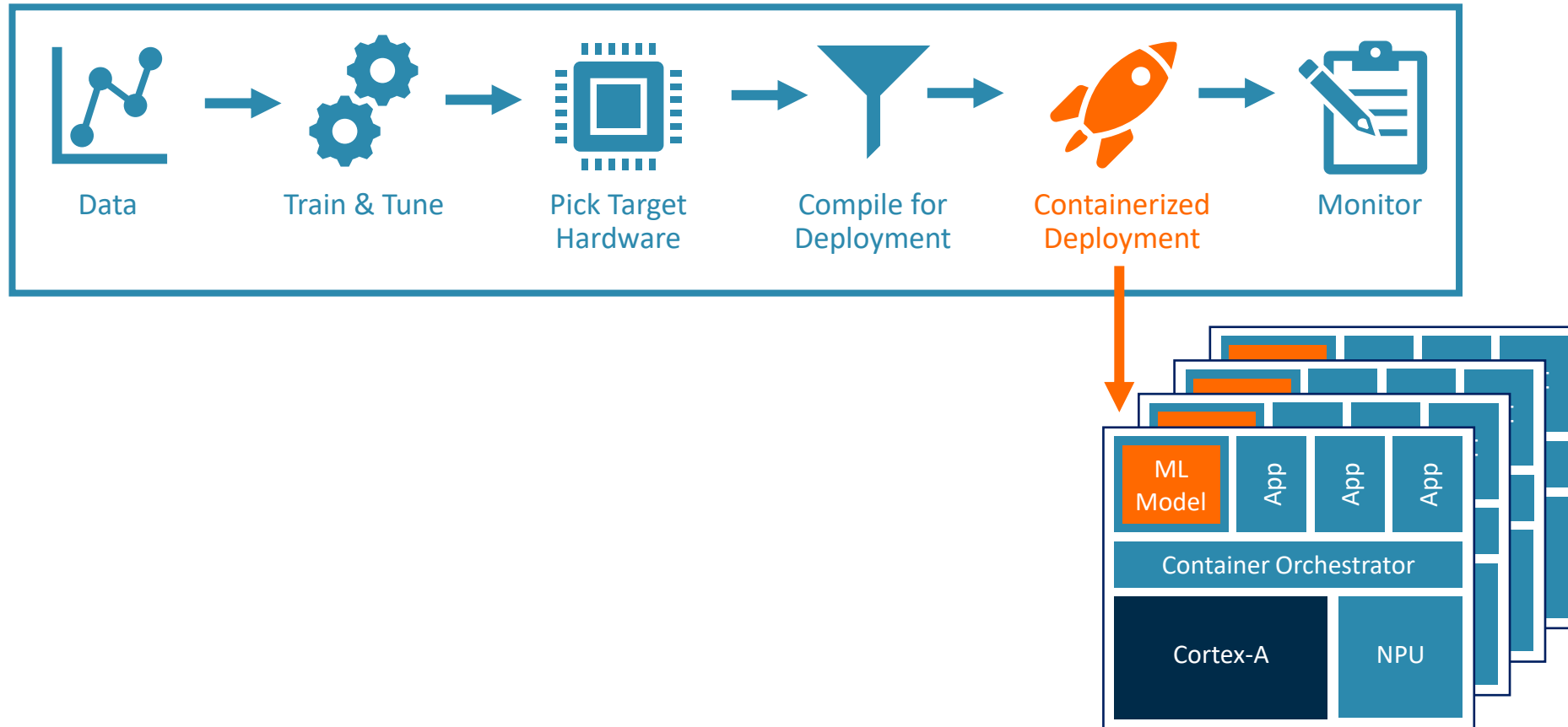
psacertified™

arm

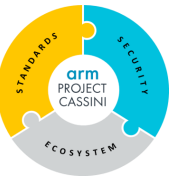
Cloud-Native and Over-The-Air Update to Deploy Services



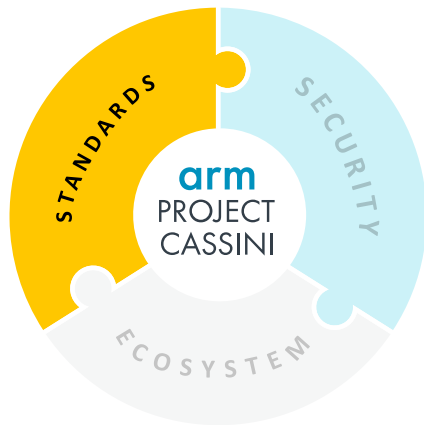
Cloud computing platform



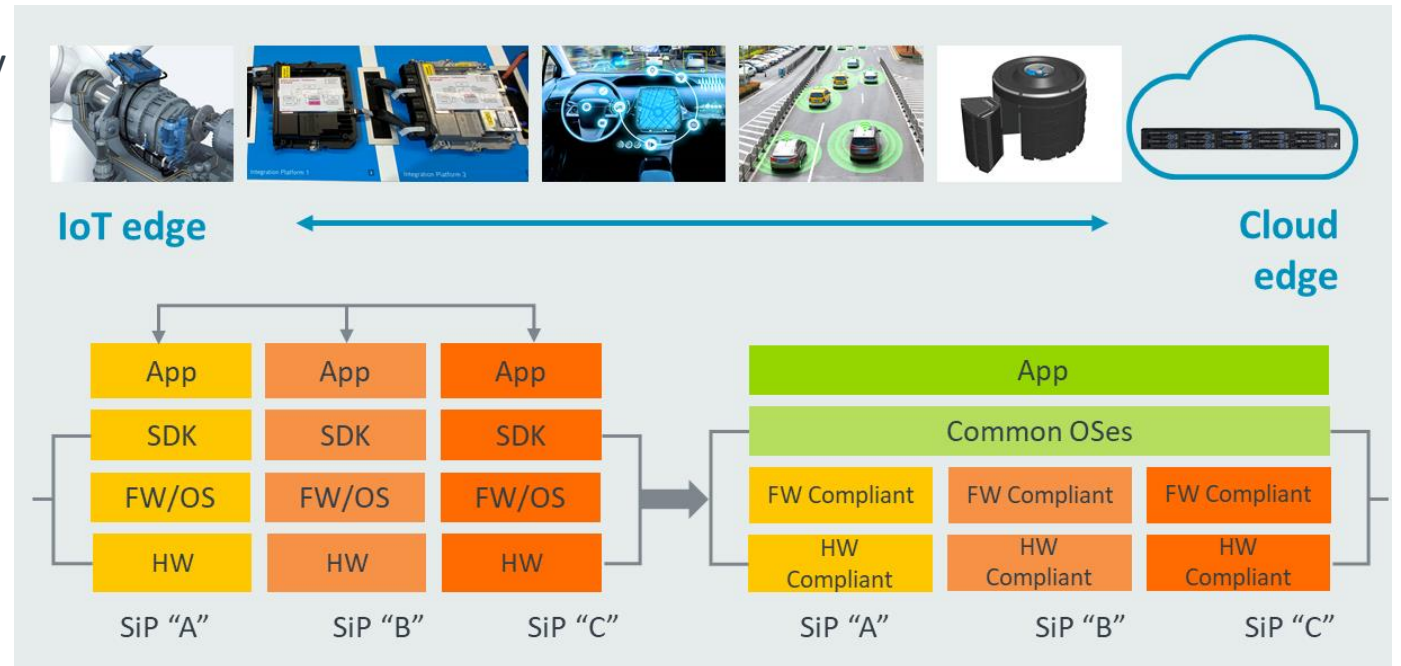
SystemReady: Foundation to Enable Cloud-Native Software



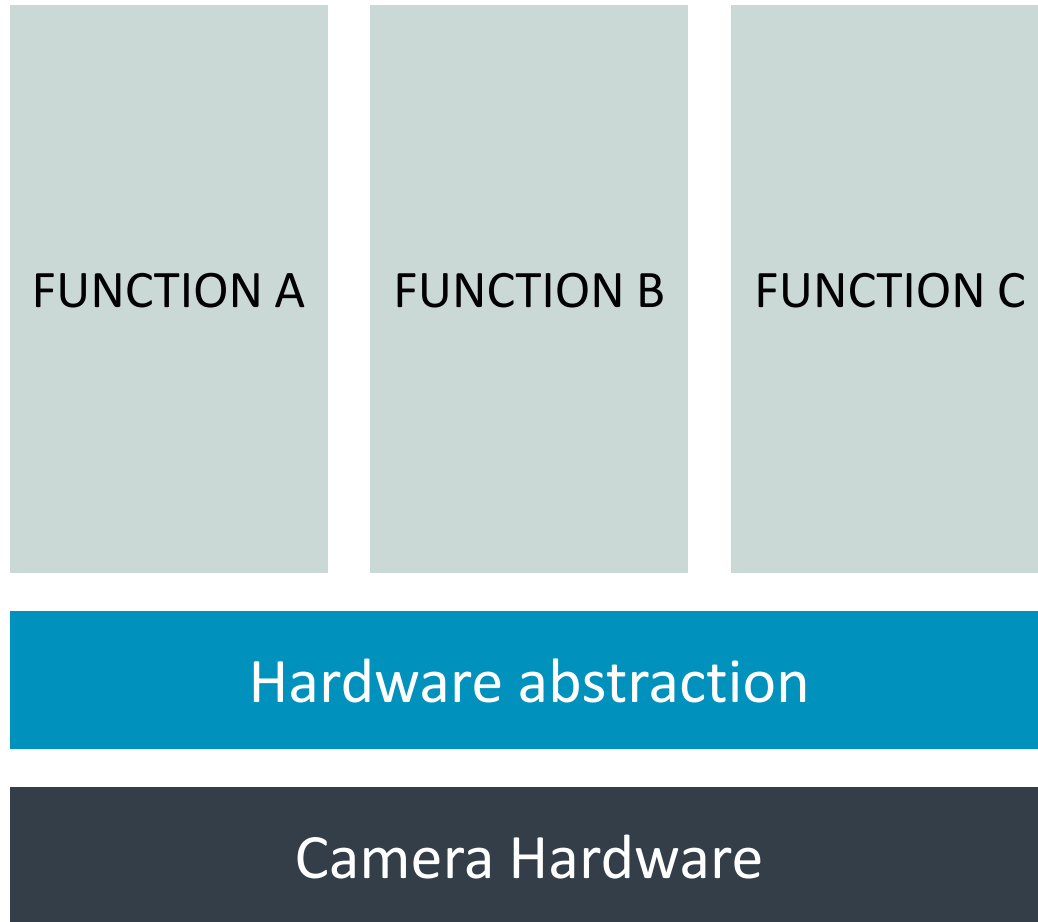
- Implementation standards around the Arm architecture: HW & FW
- Standard, “off the shelf” community or commercial OS, containers and Hypervisors simply ‘work’ on Arm MPUs
- Wider choice of SoCs vendors for multiple camera platforms with frictionless SW portability and CD/CI development principles
- Opens access to the cloud native SW ecosystem



arm SystemReady ✓



Smart Cameras Are Becoming “Software Defined”



- ❑ Functions enabled by software are abstracted from hardware
- ❑ Functions enabled using cloud-native Service-Oriented Architecture (SOA) software development model:
 - ✓ Functions delivered as services are self-contained units of software
 - ✓ System for publishing available services to the camera
 - ✓ Centralized management of these services

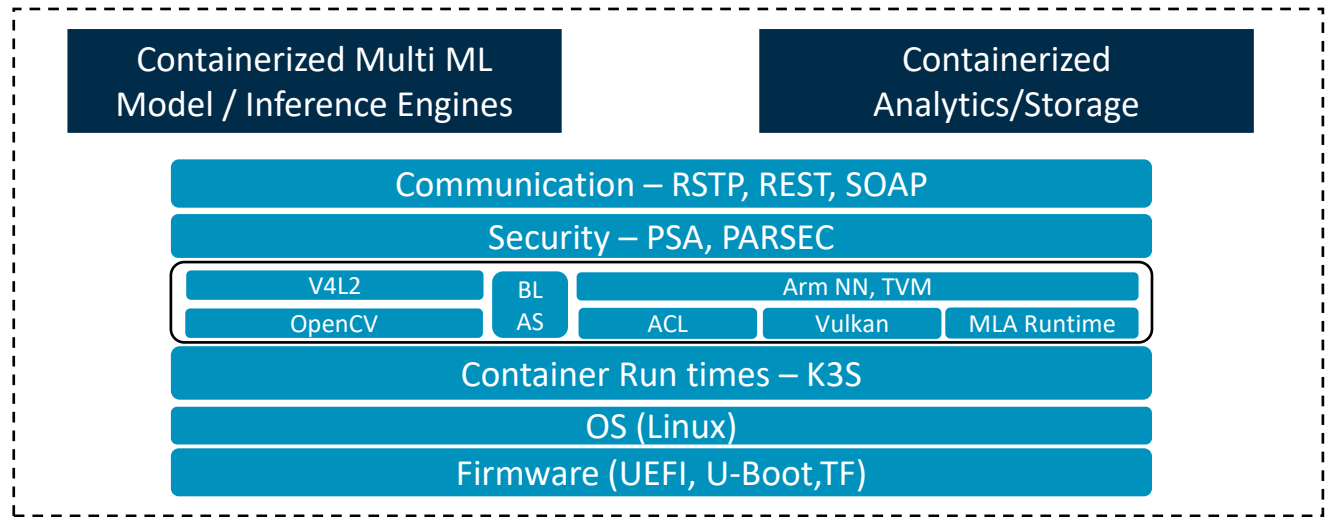
Software Defined Camera Software Architecture Proposal



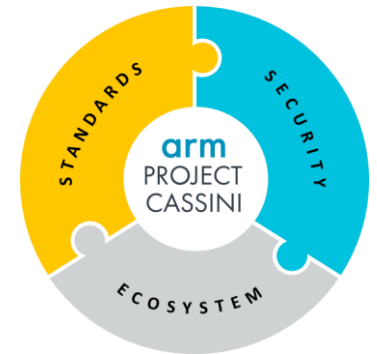
Camera and Vision Software Applications



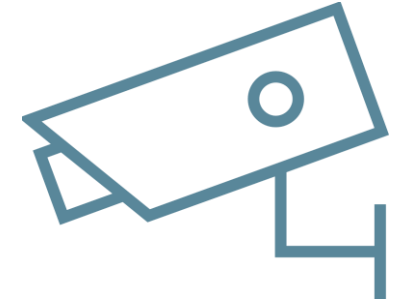
Cloud Service Providers



arm Platforms



Software Defined Cameras Accelerate Deployments



- Camera deployments are growing rapidly, with the market set to reach \$44B by 2025
- Smart cameras are becoming edge computing devices, with ML workloads redefining their functionality
- Software Defined Cameras abstract hardware from software, enabling future-proofed device deployments with OTA updatable services

arm

Thank You

Danke

Merci

谢谢

ありがとう

Gracias

Kiitos

감사합니다

धन्यवाद

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