Blueprint: KubeEdge Edge Service Family
(Type 1: ML Inference Offloading)

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LF EDGE

Table of Content

- Project Overview and General Introduction
- Blueprint Architecture
- Demo
- Release 4 Status

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General Blueprint Introduction

- KubeEdge Edge Service family focuses on a device/edge/cloud collaboration framework around KubeEdge. The verticals of focus have been IoT and MEC etc.
- The key component KubeEdge is a unique design from scratch of edge nodes and edge cloud, with all source code developed in the upstream CNCF KubeEdge Project.
- Type I of KubeEdge Edge Service family focuses an edge stack listed in the next slide of the use case ML Inference Offloading on x86 servers.
- This blueprint family will leverage various infrastructures. Arm servers support is the next case. This blueprint family is infrastructure neutral.

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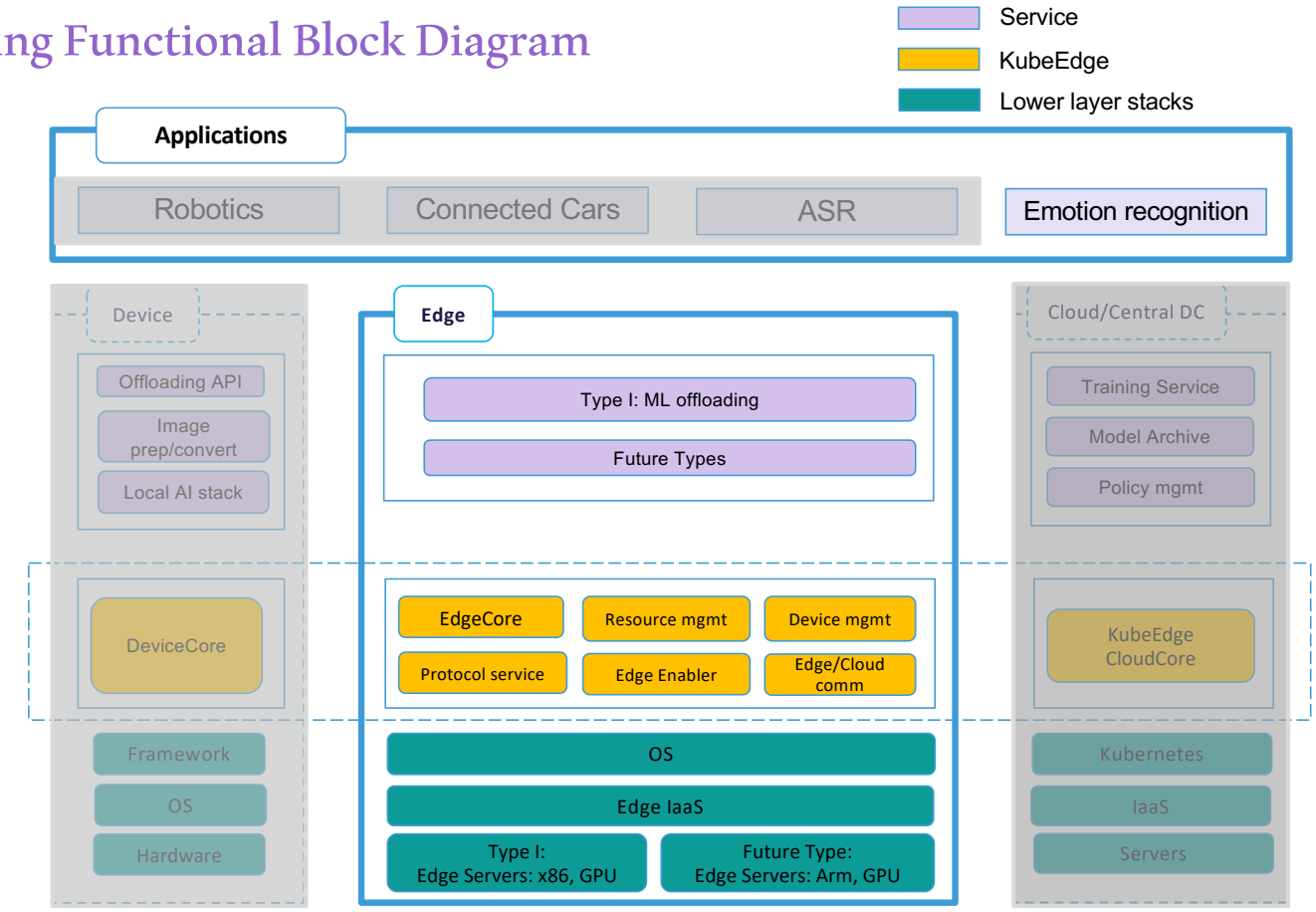
KubeEdge ML Offloading Functional Block Diagram

- **KubeEdge**: Device, Edge and Cloud Collaboration.
- **ML offloading service:**

- Resource limited device needs to offload AI processing
- Typical offloading approach is offloading inference to edge and training to central DC/Cloud
- A device/edge/cloud collaboration framework is essential to ML offloading. KubeEdge provides underline software platform.



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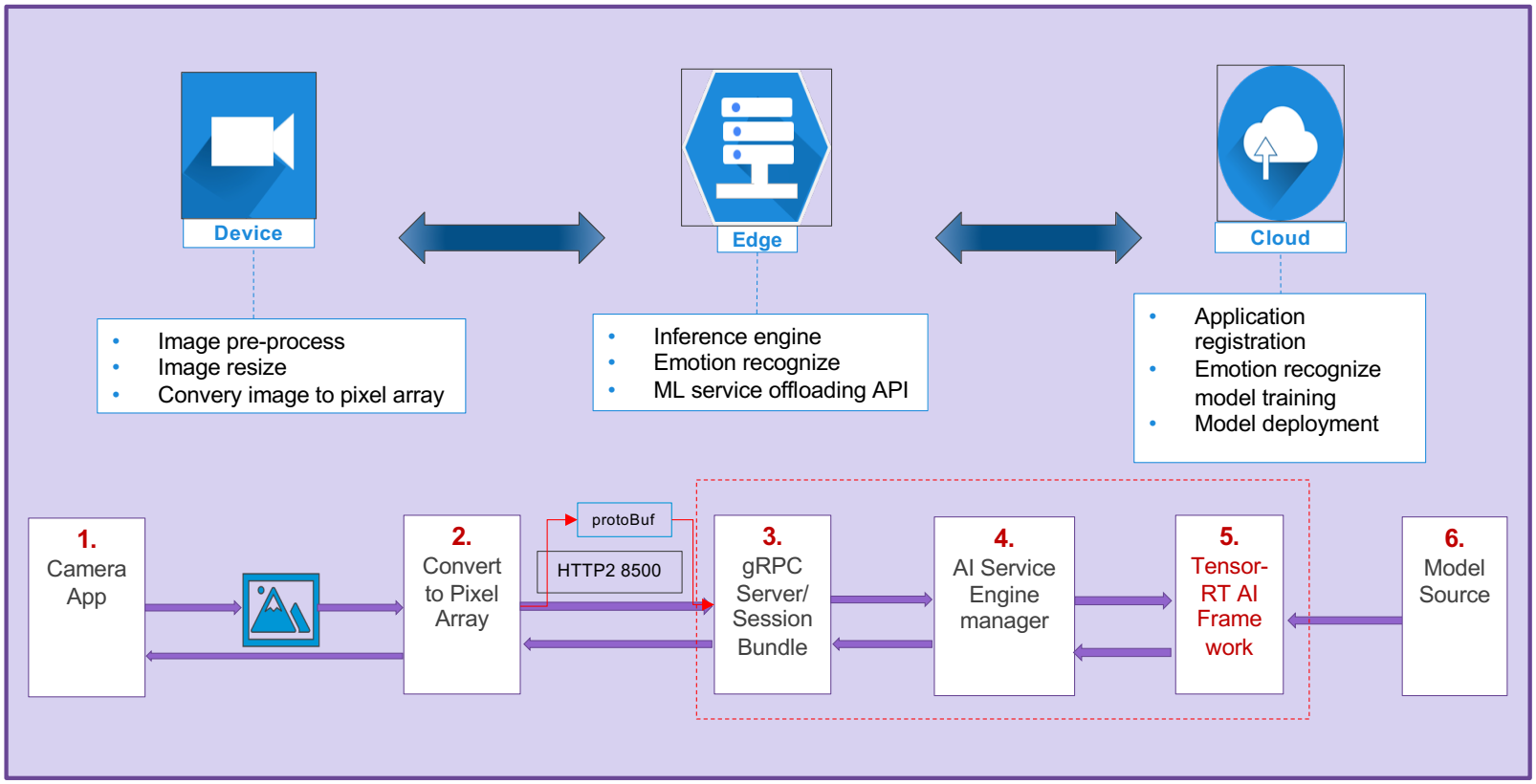
Use Case 1: Device App ML model inference offloading workflow



- Emotion recognition

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Demo

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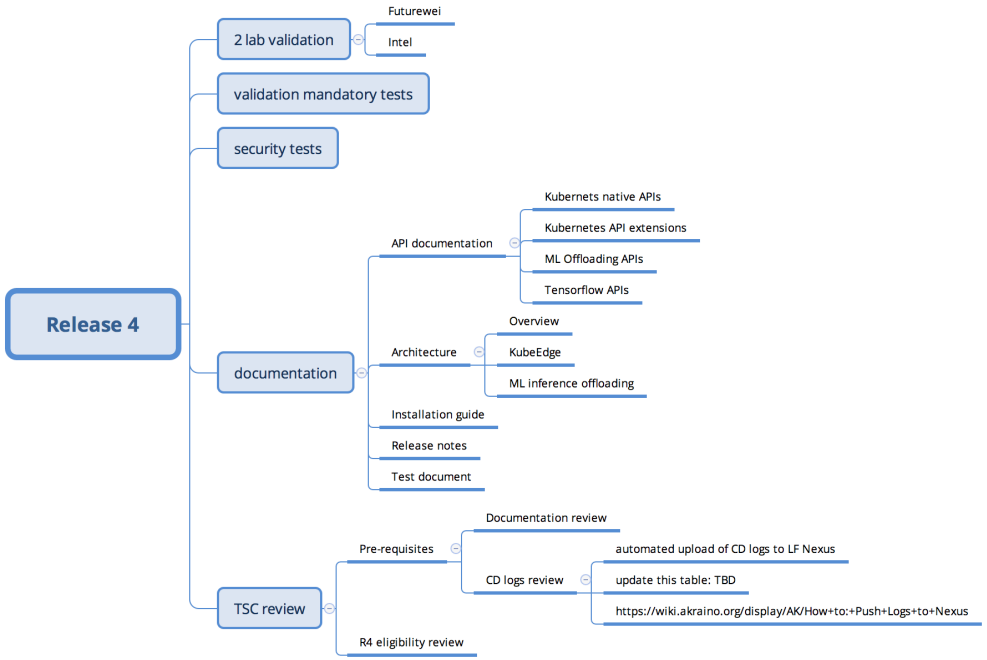
Release 4 Status

- https://wiki.akraino.org/display/AK/Release+4+planning+and+tracking



BlueVal Tests Status

1. Lynis: Pass

2. Vuls:

All the packages have been updated or upgraded to latest version in the repo. There are 4 CVEs with CVSS score > 9.0. These require upstream kernel patches, i.e.
http://nvd.nist.gov/vuln/detail/CVE-2019-19814
http://nvd.nist.gov/vuln/detail/CVE-2018-20839
http://nvd.nist.gov/vuln/detail/CVE-2017-8283
http://nvd.nist.gov/vuln/detail/CVE-2016-1585

3. Kube-Hunter:

Fixed KHV002, KHV050, and CAP_NET_RAW. No more to fix

4. Conformance:

Sonobuoy is not compatible with KubeEdge architecture.

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Bluval conformance test blockers

- The following image currently only support K8s versions up to v1.16:

  akraino/validation:kube-conformance-v1.16

- Sonobuoy assumes CNI, Kubelet, and Kube-Proxy are all installed on the worker nodes. However KubeEdge edge nodes do not have these installed. It uses a different networking model, because edge and cloud nodes do not reside within the same LAN.

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Thank you

Welcome participants

- **Wiki:** https://wiki.akraino.org/display/AK/KubeEdge+Edge+Service+Blueprint
- **Weekly Meeting:** https://zoom.us/j/91049610205, every Tuesday 20:00 PDT.
- **Slack Channel:** https://lfedge.slack.com/archives/C0155MP4TSB

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