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

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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 edge servers.
- This blueprint family will leverage various infrastructures. Arm servers support is the next case. This blueprint family is infrastructure neutral.
Release 4 Status

- KubeEdge BP Architecture Documents: https://wiki.akraino.org/display/AK/KubeEdge+BP+Architecture+Documents
- KubeEdge BP API Documents: https://wiki.akraino.org/display/AK/KubeEdge+BP+Architecture+Documents
- KubeEdge BP Installation Guide: https://wiki.akraino.org/display/AK/KubeEdge+BP+Architecture+Documents
- KubeEdge BP Release Notes: https://wiki.akraino.org/display/AK/KubeEdge+BP+Release+Notes
- KubeEdge BP Test Documents: https://wiki.akraino.org/display/AK/KubeEdge+BP+Test+Documents
- KubeEdge Edge Service Blueprint Release 4 datasheet: https://wiki.akraino.org/display/AK/KubeEdge+Edge+Service+Blueprint+Release+4+datasheet
**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.
Use Case 1: Device App ML model inference offloading workflow

1. Camera App
   - Image pre-process
   - Image resize
   - Convert image to pixel array

2. Convert to Pixel Array

3. gRPC Server/Session Bundle
   - ProtoBuf

4. AI Service Engine manager
   - HTTP 8500

5. Tensor-RT AI Frame work

6. Model Source
   - Application registration
   - Emotion recognize model training
   - Model deployment

Emotion recognition
Thank you

We welcome all participants

- Wiki: [https://wiki.akraino.org/display/AK/KubeEdge+Edge+Service+Blueprint](https://wiki.akraino.org/display/AK/KubeEdge+Edge+Service+Blueprint)
- Weekly Meeting: [https://zoom.us/j/91049610205](https://zoom.us/j/91049610205), every Tuesday 19:00 PST.
- Slack Channel: [https://lfedge.slack.com/archives/C0155MP4TSB](https://lfedge.slack.com/archives/C0155MP4TSB)
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