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 x86 servers.
- This blueprint family will leverage various infrastructures. Arm servers support is the next case. This blueprint family is infrastructure neutral.
KubeEdge 1.6 release

- https://github.com/kubeedge/kubeedge/blob/master/CHANGELOG/CHANGELOG-1.6.md

- Add support of Autonomic Kube-API Endpoint on edge in Release 1.6. Both vanilla Kubernetes APIs and CRDs are supported.

- Support Remote Exec to Pods on Edge From Cloud in Release 1.5 (K8s exec api or kubectl exec).

- Metrics-Server Support for metrics collection across cloud and edge in Release 1.4
- **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: Device App ML model inference offloading workflow

1. Camera App
2. Convert to Pixel Array
3. gRPC Server/Senion Bundle
4. AI Service Engine manager
5. Tensor-RT AI Framework
6. Model Source

- Image pre-process
- Image resize
- Convert image to pixel array
- Inference engine
- Emotion recognize
- ML service offloading API
- Application registration
- Emotion recognize model training
- Model deployment

• Emotion recognition
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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