Akraino Overview

Edge Computing Blueprints

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Akraino Overview - Contents

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Akraino Executive Summary

- **Akraino is an LF Edge open source community focusing on edge computing**
- **Covers a very broad range of use cases and technologies**
- **Publishes blueprints – combinations of software, architecture, and data flow diagrams, working code, and documentation**
- **Provides technical and organizational support for blueprint users**
- **Following slides organize blueprints by key areas in edge computing**
  - this way of organizing Akraino is an approximation
  - there is overlap between some blueprints

Cloud Native

- **NFV stack**
  - SDWAN, customer edge, edge clouds – deploy VNFs and CNFs as micro-services
  - key organization: Intel
- **Multi-tenant security**
  - deploy secure and trusted workloads and bare-metal containers
  - key organization: Intel

Cloud / Edge Border

- **Public cloud / edge interface**
  - set of open APIs for edge applications (primarily telco) to expose towards public cloud providers
  - key organization: Equinix
- **Network cloud**
  - network cloud architecture allowing single SDN controller for containers, VMs, and bare metal servers. Incorporates Tungsten Fabric
  - key organization: Juniper Networks

Integrated Edge Cloud

- **Edge stack**
  - Integrated Edge Cloud (IEC) family of blueprints
  - deployment of edge VR/AR streaming
  - key organization: Tencent
- **Smart NIC**
  - accelerate performance of VPCs and 5G UPFs
  - key organizations: ByteDance, SocNoc, Arm
- **Edge Arm Servers**
  - run Android cloud native apps at the edge
  - key organizations: ByteDance, Arm

Telco

- **Lightweight 5G**
  - enable enterprise applications at the telco edge
  - key organization: Huawei
- **Private 5G**
  - end-to-end LTE/5G connectivity using CBRS band
  - key organizations: Cohere Technologies, Verizon
- **5G MEC slicing**
  - high performance cloud gaming, HD video, and live broadcasting edge applications
  - key organizations: Tencent, China Mobile

AI

- **Federated machine learning**
  - machine learning across mobile and IoT devices
  - key organizations: WeBank, inwinStack
- **School monitoring**
  - school safety, security, and surveillance
  - key organizations: Baidu, Arm, Intel, Penn State Univ
- **Intelligent vehicle cooperation**
  - AVs – current focus is on autonomous taxis
  - key organizations: Baidu, Intel, Arm

IoT

- **Robotics**
  - current focus is industrial and enterprise robots (e.g. food preparation and production)
  - areas of emphasis:
    - technical challenges: tactile/touch, speech recognition, real-time operation
    - robot safety (cloud independence as needed)
    - privacy of user data
  - key organizations: Fujitsu, Signalogic
- **Cloud gateway for IoT apps**
  - enable industrial IoT use cases
  - key organization: Huawei
- **SD-WAN**
  - networking for edge and micro CPE use cases
  - key organization: Huawei

Connected Edge Nodes

- **Cities**
  - smart cities – AVs, utilities management, smart buildings, safety and emergency services
  - key organizations: Arm, Microsoft, Nexcom
- **Vehicles**
  - connected vehicles – vehicle communication of route, action, safety information. Key org: Tencent
  - MEC-based topology prediction – AV path prediction, communication. Key org: Jeju Nat Univ

Areas of Common Work

- **Whitepapers**
  - collaborative publications between different blueprint teams
  - Akraino Edge Stack APIs
  - Cloud interfacing the telco edge, Jul 2020
- **Security**
  - security subcommittee oversees cert process for blueprints prior to release
  - automated checks include Lynis scam, vulnerabilities, Kubernetes (“kube hunter”)
- **APIs**
  - API subcommittee oversees gathering of organization-wide API info
  - standardized API form
  - API map (https://apiportal.akraino.org/apimap.html)
- **Documentation**
  - documentation subcommittee
- **TSC planning, review, and approval process**
  - technical steering committee
  - review and voting approval for all BPs
  - discussion and planning of organization wide issues

Summary / Q&A

- **Akraino is an LF Edge open source community focusing on edge computing, covering a very broad range of use cases and technologies**
- **Akraino publishes blueprints – a high level combination of software, architecture, and data flow diagrams, working code, and documentation**
- **Ask me for any follow-up info**
  - specific blueprints
  - blueprint project team leader (PTL) contact info
- **Top level Wiki page**
  - https://wiki.akraino.org
- **Q&A**
  - fire away !