



Akraino Overview

Edge Computing Blueprints

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Akraino Overview - Contents



- **Wide range of edge computing blueprints**

- **Cloud native**
 - NFV stack
 - multi-tenant security
- **Cloud / edge border**
 - public cloud edge interface
 - network cloud (with Tungsten Fabric)
- **Integrated edge cloud**
 - edge stack (AR/VR focus)
 - smart NIC
 - Arm servers
- **Telco**
 - lightweight / private 5G
 - 5G MEC slicing (gaming, video, broadcasting)
- **AI**
 - federated deep learning
 - school monitoring
 - intelligent vehicle cooperation
- **IoT**
 - robotics (industrial / enterprise)
 - cloud gateway for IoT apps
 - lightweight edge and IoT application management
- **Connected edge nodes**
 - cities
 - vehicles

- **Areas of common work between blueprints**

- Whitepapers
- Security
- APIs
- Documentation
- Technical steering committee

- **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

- **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

- **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

- **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

- **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

- **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

- **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 scan, 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 about edge computing**
- **Blueprints cover a very broad range of use cases and technologies**
- **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 !