Your Path to Edge Computing – Akraino Edge Stack

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Tapio Tallgren – Technical leader, Nokia. Community sub-committee Chair, Akraino
Why Edge Computing?

Emerging technologies are demanding lower latency and accelerated processing at the edge.

- **Edge Cloud**
  - Low-Latency < 20 ms
  - Performs data processing at the edge of the network, near data sources

- **Central Cloud**
  - High-Latency ~25-200 ms
  - Highly centralized computing resources of cloud service providers

- **NFV Edge Infrastructure**
- **Autonomous Devices**
- **Immersive Experiences**
- **Industrial IOT**

**Optimal**

**Not Optimal**
Emerging Technologies in IOT and Networks are demanding lower latency and accelerated processing at the edge.

- NFV Edge Infrastructure
- Autonomous Devices
- Immersive Experiences
- IoT & Analytics
- On-Demand NFV
- Hardware Acceleration
- A.I.
- Microservices
- 5G

- Wireless (vRAN, vEPC)
- Drones
- Virtual Reality
- Industrial Sensors
- Hardware Acceleration
- A.I.
- Microservices
- 5G

- Wireline (PON)
- Autonomous Vehicles
- Augmented Reality
- Home Devices
- Microservices
- 5G

- uCPE (SD-WAN)
- Industry Robots
- 360 Video
- Retail
- 5G

- IP Enterprise Services
- Medical
- Wearable Cognitive Assistance
- Healthcare

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- IoT & Analytics
- Industrial Sensors
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- Healthcare

- On-Demand NFV
- Hardware Acceleration
- A.I.
- Microservices
- 5G

- Edge Computing
Akraino Supports Telco, Enterprise, IOT, … use cases & variety of edge deployment types

Different Industries (examples)

- IoT
- Hospitality
- Healthcare
- Manufacturing
- Transportation

Access Methods

- 5G
- LTE
- WiFi
- Wireline

Telco Network Edge

- Tower
- Central Offices
- Other Telco Real Estates (Wire Centers, etc.)

Customer Devices

- IoT
- Mobile
- AR/VR
- End User
- Autonomous Vehicles

Far Edge

- Home
- Stadiums
- Small Enterprises
- Public buildings
- Enterprises

Internet

Provider Edge

- Millions
- Thousands
- Tens

Source: AT&T
Why Akraino Edge Stack?

Before Akraino

- User integrates multiple opensource
- Multiple gaps
- No integrated solution for Edge use cases
- Complex CI
- No guaranteed working of the solution

Akraino Model

- Akraino Community Integrates multiple opensource for edge use cases.
- Bridge gaps (development of code in upstream and at Akraino)
- Fully integrated solution
- Simple CI
- Validated with multiple testing
Akraino Blueprints
The Akraino Edge Stack community delivers fully integrated, “ready and proven” Edge Stacks

Real use case driven & Architecture Agnostic

Akraino Blueprints

Edge Use Case Driven
Development of features to support fully functional Edge Solution.

Integration of Multiple Opensource Software
Fully Integrated Edge Stack

Production Readiness
Multiple Validations with declarative stack

Bridge gaps & Standardize Edge Features and APIs
Compliant and Secure

Vendor Support Eco-system
Suppliers and Users upfront collaboration
How Akraino fits in the opensource eco-system?

Facts

› Akraino is complimentary to many opensource projects
› Akraino uses many of the upstream opensources within its blueprints
› Many opensources could use Akraino blueprints
› Users gets fully integrated, “ready and proven” Edge Stacks
LF Edge - Founding projects
Bringing several Edge verticals and domains under one umbrella

Platinum Members:
60 + Members already
# Akraino Blueprints - Incubation Projects

**IOT & Far Edge Use Cases**

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nokia</td>
<td>Micro MEC: Can be installed on light poles, vehicles, etc… Target Industry: Smart City, Far Edge Cloud</td>
</tr>
<tr>
<td>Huawei</td>
<td>Edge Light &amp; IoT uCPE use cases, IoT appliances Target Industry: Manufacturing &amp; Customer Premise</td>
</tr>
<tr>
<td>Intel</td>
<td>Time Critical Edge Compute IoT use cases, appliances Target Industry: Manufacturing, IoT &amp; Safety</td>
</tr>
<tr>
<td>Arm</td>
<td>Integrated Edge Cloud IoT use cases, appliances Target Industry: Remote Edge Locations</td>
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**Telco Use Cases**

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<th>Company</th>
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<tr>
<td>AT&amp;T</td>
<td>Radio Edge Cloud Cloud appliance to address ORAN RIC requirements Target Industry: Telco – Radio Edge</td>
</tr>
<tr>
<td>Nokia</td>
<td>SDN Enabled Broadband Access Virtual broadband access – higher bandwidth, symmetric version of GPON Target Industry: Telco – Access</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>Network Cloud Telco 5G use cases and beyond Target Industry: Telco – 5G and generic use cases. Airship Based</td>
</tr>
<tr>
<td>Juniper Networks</td>
<td>Tungsten Fabric Integration Enhancement to NC blueprint to support Contrail Tungsten Fabric</td>
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**Other Use Cases**

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<tbody>
<tr>
<td>Ericsson</td>
<td>OVS-DPDK Integration Enhancement to NC blueprint to support OVS-DPDK</td>
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<tr>
<td>Arm</td>
<td>ARM Servers/Appliance Enhancement to NC blueprint to support ARM Servers &amp; Appliances</td>
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<tr>
<td>Red Hat</td>
<td>Kubernetes Native Infrastructure Focused on Native Container workloads Target Industry: Industrial Automation</td>
</tr>
<tr>
<td>Wind River</td>
<td>StarlingX Edge Cloud Addresses Industrial Edge Use cases Target Industry: Far Edge Automation</td>
</tr>
</tbody>
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**Note:** Companies listed and blueprint listed are not an exhaustive list.
Akraino Community Progress

Akraino Release 1 Highlights

• 8+ Blueprint Families with 19+ Blueprints under development to support variety of Edge use cases.

• Community Development started in Jan’19 and 1st release targeted in 2Q2019
Lab Collaboration

- Akraino blueprints are validated in the dedicated validation labs
- Akraino hosts community lab for additional validation of blueprints
- Automated testing of blueprints
Technical Community Collaboration

• Akraiino Technical Community Calls take place once a week as a platform to discuss:
  • New Project Proposals
  • Collaborate with other communities

• Community Calls Occur weekly on Thursdays’ at 11:00am-12:00pm ET
How to get involved..

› Join Akraino Community Events and calls
› Join the projects’ mailing lists and participate in the discussions

Key Links:

Website:
https://www.lfedge.org/projects/akraino

Wiki:
https://wiki.akraino.org

Gerrit:
https://wiki.akraino.org/display/AK/documentation

Mail Lists:
https://lists.akraino.org/g/main

Blueprints:

Calendar:
https://wiki.akraino.org/display/AK/Akraino+TSC+Group+Calendar