Akraino Edge Stack Overview

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Why Edge Computing?

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

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

- **Central Cloud**
  - Highly centralized computing resources of cloud service providers
  - High-Latency ~25-200 ms
  - Not Optimal

- **NFV Edge Infrastructure**
- **Autonomous Devices**
- **Immersive Experiences**
- **Industrial IOT**
Emerging Technologies in IOT and Networks are demanding lower latency and accelerated processing at the edge

<table>
<thead>
<tr>
<th>NFV Edge Infrastructure</th>
<th>Wireless (vRAN,vEPC)</th>
<th>Wireline (PON)</th>
<th>uCPE (SD-WAN)</th>
<th>IP Enterprise Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous Devices</td>
<td>Drones</td>
<td>Autonomous Vehicles</td>
<td>Industry Robots</td>
<td>Medical</td>
</tr>
<tr>
<td>Immersive Experiences</td>
<td>Virtual Reality</td>
<td>Augmented Reality</td>
<td>360 Video</td>
<td>Wearable Cognitive Assistance</td>
</tr>
<tr>
<td>IoT &amp; Analytics</td>
<td>Industrial Sensors</td>
<td>Home Devices</td>
<td>Retail</td>
<td>Healthcare</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>On-Demand NFV</th>
<th>Hardware Acceleration</th>
<th>A.I.</th>
<th>Microservices</th>
<th>5G</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Different Industries (examples)</th>
<th>Customer Devices</th>
<th>Far Edge</th>
<th>Access Methods</th>
<th>Telco Network Edge</th>
<th>Internet</th>
<th>Provider Edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>IoT</td>
<td>IoT</td>
<td>Home</td>
<td>5G</td>
<td>Tower</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td>Mobile</td>
<td>Stadiums</td>
<td>LTE</td>
<td>Central Offices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR/VR</td>
<td>AR/VR</td>
<td>Small Enterprises</td>
<td>WiFi</td>
<td>Other Telco Real Estates (Wire Centers, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End User</td>
<td>End User</td>
<td>Public buildings</td>
<td>Wireline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous Vehicles...</td>
<td>Autonomous Vehicles...</td>
<td>Enterprises</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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<tr>
<th>Company</th>
<th>Use Case</th>
<th>Target Industry</th>
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<tr>
<td><strong>Micro MEC</strong></td>
<td>Can be installed on light poles, vehicles, etc…</td>
<td>Smart City, Far Edge Cloud</td>
</tr>
<tr>
<td><strong>Edge Light &amp; IoT</strong></td>
<td>uCPE use cases, IoT appliances</td>
<td>Manufacturing &amp; Customer Premise</td>
</tr>
<tr>
<td><strong>Time Critical Edge Compute</strong></td>
<td>IoT use cases, appliances</td>
<td>Manufacturing, IoT &amp; Safety</td>
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<tr>
<td><strong>Integrated Edge Cloud</strong></td>
<td>IoT use cases, appliances</td>
<td>Remote Edge Locations</td>
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<tr>
<td><strong>Radio Edge Cloud</strong></td>
<td>Cloud appliance to address ORAN RIC requirements</td>
<td>Telco – Radio Edge</td>
</tr>
<tr>
<td><strong>SDN Enabled Broadband Access</strong></td>
<td>Virtual broadband access – higher bandwidth, symmetric version of GPON</td>
<td>Telco – Access</td>
</tr>
<tr>
<td><strong>Network Cloud</strong></td>
<td>Telco 5G use cases and beyond</td>
<td>Telco – 5G and generic use cases. Airship Based</td>
</tr>
<tr>
<td><strong>Tungsten Fabric Integration</strong></td>
<td>Enhancement to NC blueprint to support Contrail Tungsten Fabric</td>
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### Other Use Cases

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

Lab Collaboration

• Akraino blueprints are validated in the dedicated validation labs

• Akraino hosts community lab for additional validation of blueprints

• Automated testing of blueprints
Akraino Technical Community Calls take place once a week as a platform to discuss:

- New Project Proposals
- Collaborate with other communities
- Discussion on several Edge Technical topics

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:
https://wiki.akraino.org/display/AK/Approved+blueprints

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