Edge Use Cases to address

• Telco/enterprise Edge cloud – for example, MEC or branch office data center...
• Telco/enterprise remote edge locations – edge platform with limited resources, for example, SD-WAN, IoT gateway...
Integrated Edge Cloud Overview

Remote Edge End

Edge End Device
- IoT Box
- Sensor Box
- ML Box
- SD-WAN Box

Application Orchestration Client
Container Orchestration Engine
Networking Support

Edge Cloud Server Cluster
- Server
- Server
- Server

Edge Cloud
- User Management
- User Interface
- Deployment Facility
- Application Management
- Platform Orchestration
- Data Storage

Application Orchestration Server
Container Orchestration Engine
Networking Support
Containerized Integrated Edge Cloud Environment

- The edge applications run as containers with container orchestration engine and high performance networking support;
- The integrated edge cloud platform provides management interface and programming interface to deploy/manage edge applications quickly and conveniently.
- The platform supports the applications of IoT gateway, SD-WAN, edge AI and etc.
Arm Edge Cloud Reference Stack

- Heterogeneous Architecture
  - VM, container, bare metal
  - Servers and customized Edge platforms
  - Virtualized NFs and Physical NFs
  - Accelerator interface

- Resource constraints
  - Kubernetes
  - SDN Controller for K8s

- HW Accelerations
  - Integrated accelerators
  - PCIe/CCIX attached accelerator (Smart NICs...)

- Infra Orchestration and Installer
  - Kubernetes
  - Containerized Compass

- Networking Software
  - Linux System Networking
  - VPP, OVS

- Controller
  - Calico
  - Contiv/VPP
  - OVN-K8s

- SR-IOV, DPDK
- Real Time Linux distribution

- Edge Servers or Networking Edge Platform
  - Acceleration
    - Integrated Accelerators
      - Smart NICs
      - FPGA/GPU

- Network Equipment
  - Switch/GW
An Edge Use Case Scenario

Remote Edge

Smart Home (IoT Gateway)

Secure Network Connection

Edge Cloud Server Center

Service Provider’s Edge Data Center using standard ARM Servers

Cloud
## Edge Reference Stack Components

<table>
<thead>
<tr>
<th>Categories</th>
<th>Components</th>
<th>Descriptions</th>
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<tr>
<td><strong>Edge HW platforms</strong></td>
<td>Networking edge platforms</td>
<td>Arm Cortex 8.x-A cores&lt;br&gt;Integrated HW accelerators&lt;br&gt;Next gen Arm CPUs and custom CPUs</td>
</tr>
<tr>
<td></td>
<td>Cloud edge servers</td>
<td>Arm cloud edge servers&lt;br&gt;Accelerator expansion via CCIX/PCIe (Smart NICs)&lt;br&gt;Next gen Arm CPUs and custom CPUs</td>
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<tr>
<td><strong>Linux Distribution</strong></td>
<td>Real time Linux distro</td>
<td>Linux distribution with real-time open source kernel&lt;br&gt;Tiny Linux distro in resource constraint edge environment</td>
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<tr>
<td></td>
<td>Tiny Linux distro</td>
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<tr>
<td><strong>Data Plane Solutions</strong></td>
<td>DPDK</td>
<td>A set of open source libraries to accelerate packet processing workloads running on Arm SoCs</td>
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<tr>
<td></td>
<td>Open vSwitch</td>
<td>An open-source implementation of a virtual switch accelerated by HW offloading</td>
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<tr>
<td></td>
<td>VPP</td>
<td>A high performance, open source virtual switching/routing solutions</td>
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## Edge Reference Stack Components – Cont’d

<table>
<thead>
<tr>
<th>Categories</th>
<th>Components</th>
<th>Descriptions</th>
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<tr>
<td><strong>SDN controllers and CNI</strong></td>
<td>CNIs and Container Networking Solutions</td>
<td>Calico, Contiv/VPP, OVN(OVS)-Kubernetes</td>
</tr>
<tr>
<td><strong>Infrastructure Orchestration</strong></td>
<td>Kubernetes</td>
<td>An open source container orchestration system with NFD</td>
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<td></td>
<td>Kubevirt/Virtlet</td>
<td>Deployment VMs on Kubernetes</td>
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<tr>
<td><strong>Installer</strong></td>
<td>Containerized Compass</td>
<td>Automatic deployment and management of Kubernetes</td>
</tr>
<tr>
<td><strong>Apps Orchestration</strong></td>
<td>Lightweight App orchestration</td>
<td>Orchestration and automation of physical and virtual network functions</td>
</tr>
<tr>
<td><strong>Test framework &amp; CI/CD</strong></td>
<td>Edge application and reference stack test suites</td>
<td>Testing methodology, test suites and test cases to test and verify platform functionality</td>
</tr>
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</table>