Radio Access Networks (RAN) and RIC
The DU (Distributed Unit) / CU (Centralized Unit) split enables running the CU in an edge cloud.
O-RAN RAN architecture

The O-RAN architecture adds new elements
• RAN Intelligent Controller (RIC) near-RT
• RAN Intelligent Controller non-RT

And new interfaces:
• E1 between CU-CP and CU-UP
• E2 between RIC near-RT and CU-CP
• A1 between RIC non-RT and RIC near-RT
Infrastructure
Key installation components

- Leverage Akraino portal as much as possible
- Container based
- Airship installation
Use cases
As an operator, I want to

- **Deploy** an LTE/5G **network** as the components RRH, DU, CU, and RIC to leverage the benefits of standard hardware and software infrastructures at the edge of the network
- **Promote an ecosystem** of interchangeable components in the RAN
- Enable new **machine-learning based algorithms** for optimizing radio access
- Sample Channel Quality Indicators to get a better understanding of the **radio network quality** in different locations
- Collect and analyze detailed **event logs** for troubleshooting and performance optimization
- Fast-speed **beamforming** to use intelligent algorithms to guide beamforming with different parameters
- Optimize radio network **capacity allocation** and **power saving**

All of these allow for more optimal resource allocation which will benefit the end users with better quality of service.
Key targets

- Platform for RIC
- Robust, real-time Kubernetes platform
- Small and fast
Reference architecture
Reference architectures for release 1 and release 2

Upstream features in Akraino Rel1
- CPU management
- NUMA management
- Network management (DANM)
- Low-latency kernel options
- CentOS and Ironic

Release 1
- Kubernetes
- Akraino portal
- K8s containers
  - Ovs-dpdk
  - RT OS
  - OCP OpenEdge HW

Release 2
- K8s containers
- DANM
- RT OS
- OCP OpenEdge HW
- Other HW