

A large crowd of people at a concert, with the Nokia logo overlaid in the center. The background is a bright, hazy blue, suggesting a stage or arena setting. The crowd is dense and fills the lower two-thirds of the frame. The Nokia logo is a large, semi-transparent white graphic that spans across the middle of the image, partially obscuring the crowd. Above the logo, the text "Radio Edge Cloud" is written in a clean, white, sans-serif font.

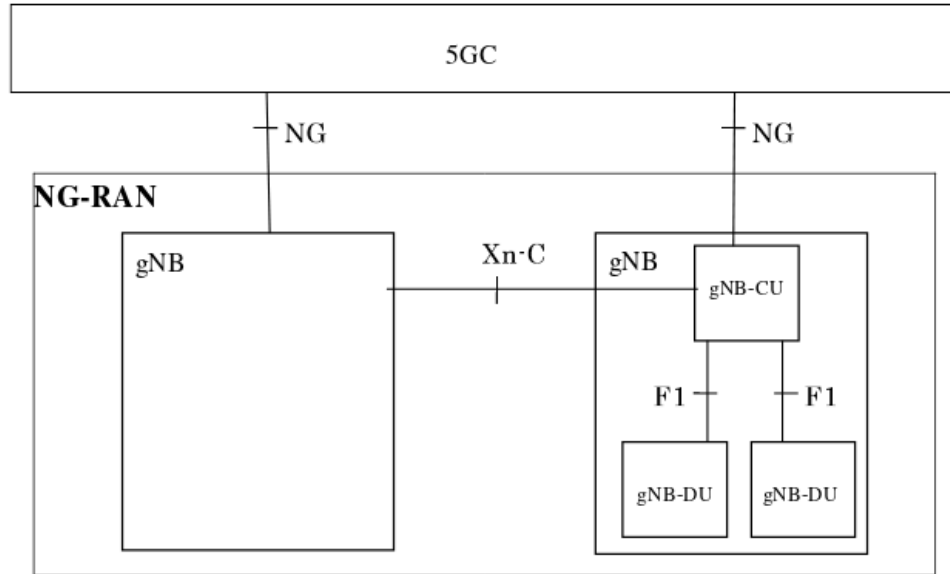
Radio Edge Cloud

NOKIA

# Radio Access Networks (RAN) and RIC



# ETSI 5G RAN architecture



The DU (Distributed Unit) / CU (Centralized Unit) split enables running the CU in an edge cloud

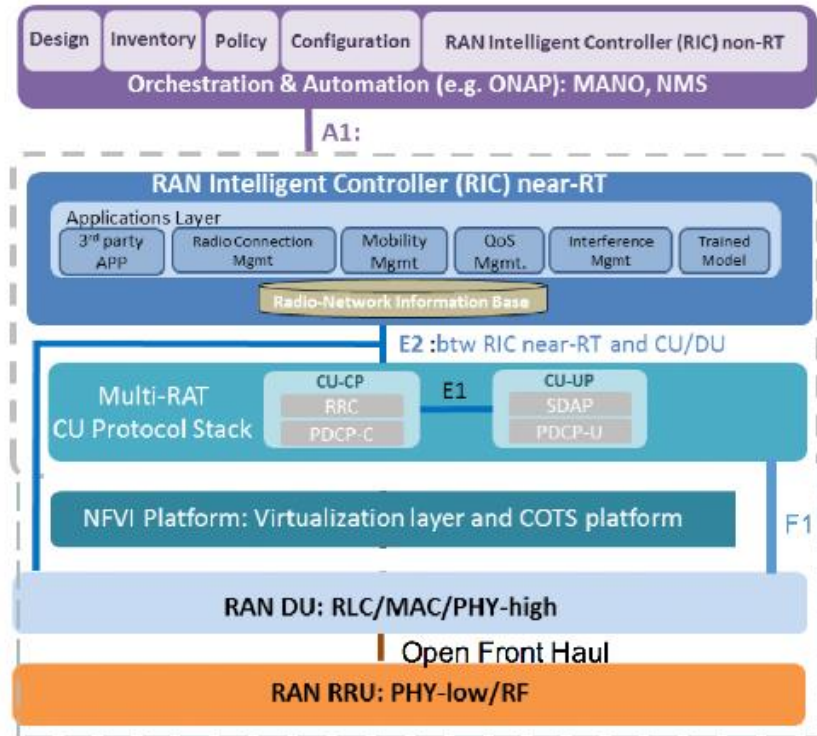
# O-RAN RAN architecture

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

A large crowd of people is gathered at a concert, with their arms raised in the air. The scene is illuminated by bright blue stage lights, creating a hazy, atmospheric effect. In the background, a stage with various equipment and structures is visible. The overall mood is energetic and vibrant.

## Key installation components

- Leverage Akraino portal as much as possible
- Container based
- Airship installation

# Use cases

A large crowd of people is seen from behind, looking towards a stage. The scene is bathed in a strong blue light, creating a hazy, atmospheric effect. The stage in the background features various pieces of equipment, including what appears to be a large screen or backdrop. The overall mood is energetic and vibrant.

## 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

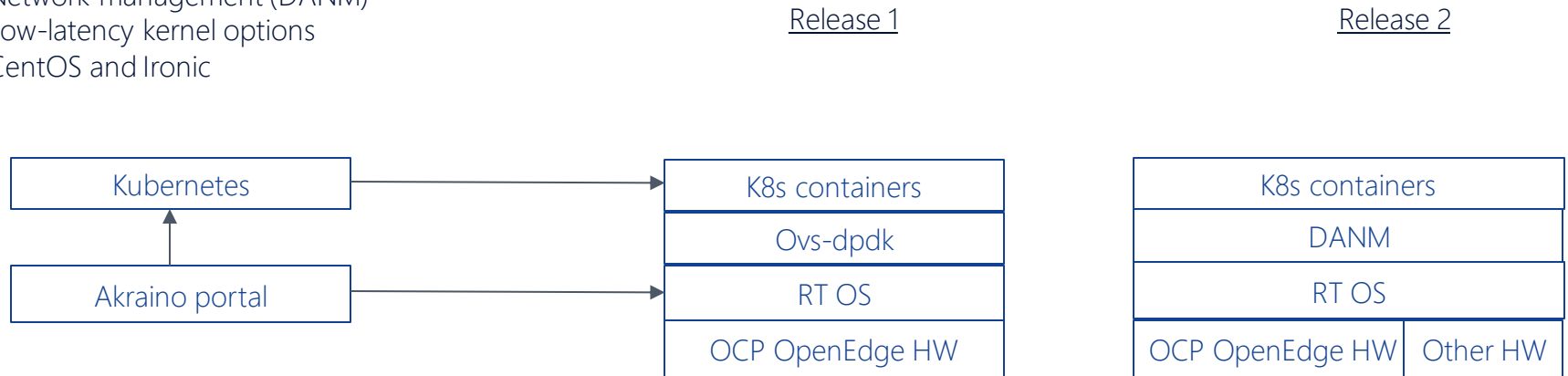
# Reference architecture

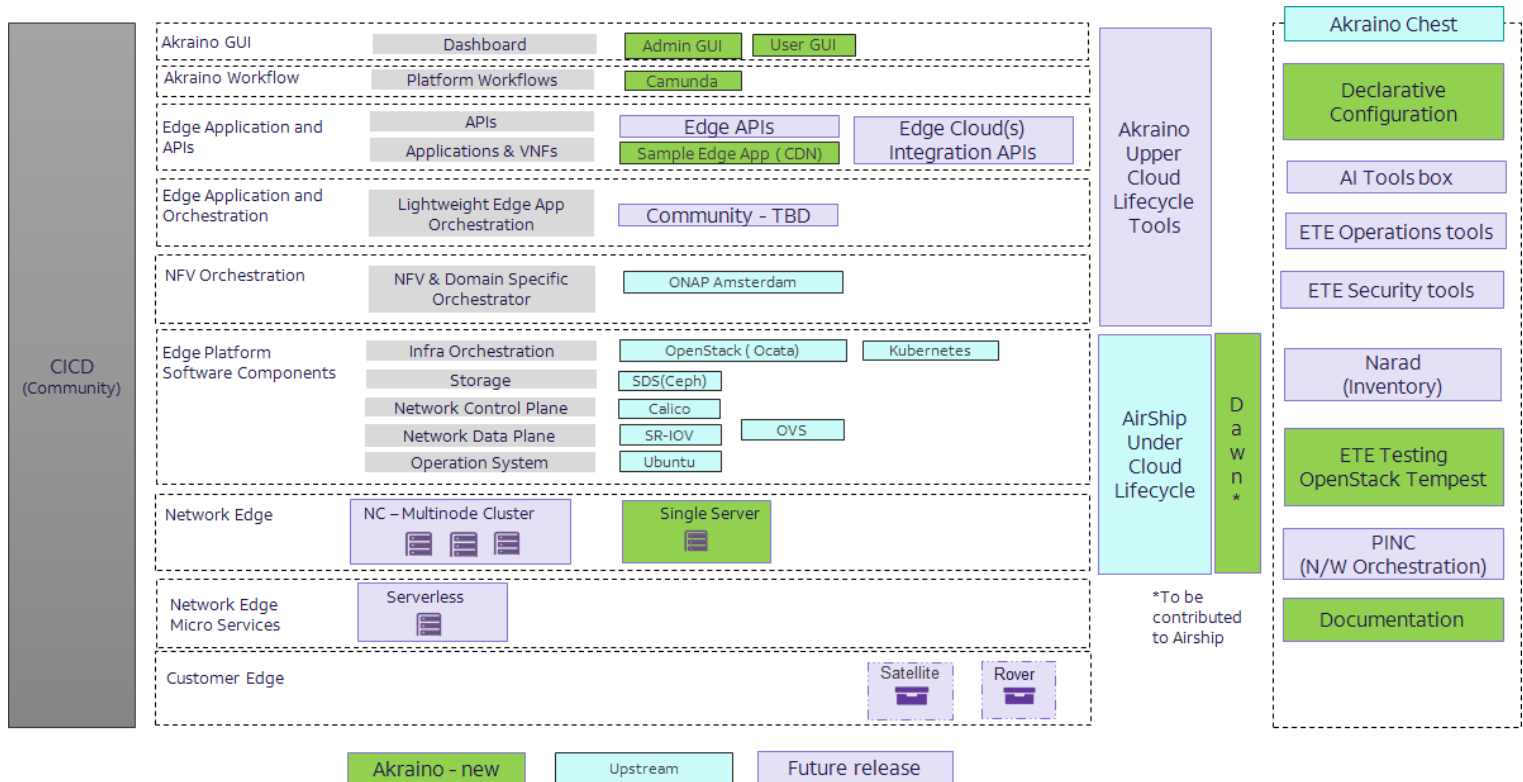
A large crowd of people is seen from behind, filling the foreground and middle ground. They are looking towards a stage area in the background. The scene is illuminated with a mix of blue and yellow light, creating a vibrant atmosphere. The stage area is somewhat obscured by haze or smoke, but some structures and equipment are visible. The overall mood is energetic and celebratory.

# 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





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