Introduction to Smart data transaction for CPS Blueprint

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Why akraino?

- **Sustainable development Goals**
  - IoT/edge computing power is necessary to achieve.
  - “Akraino” has wide variety of blueprint which is end to end stack in IoT/edge.
    - ✓Integrated
    - ✓Proven and Tested
    - ✓Deployable
    - ✓Low Cost
    - ✓Use case based　etc…

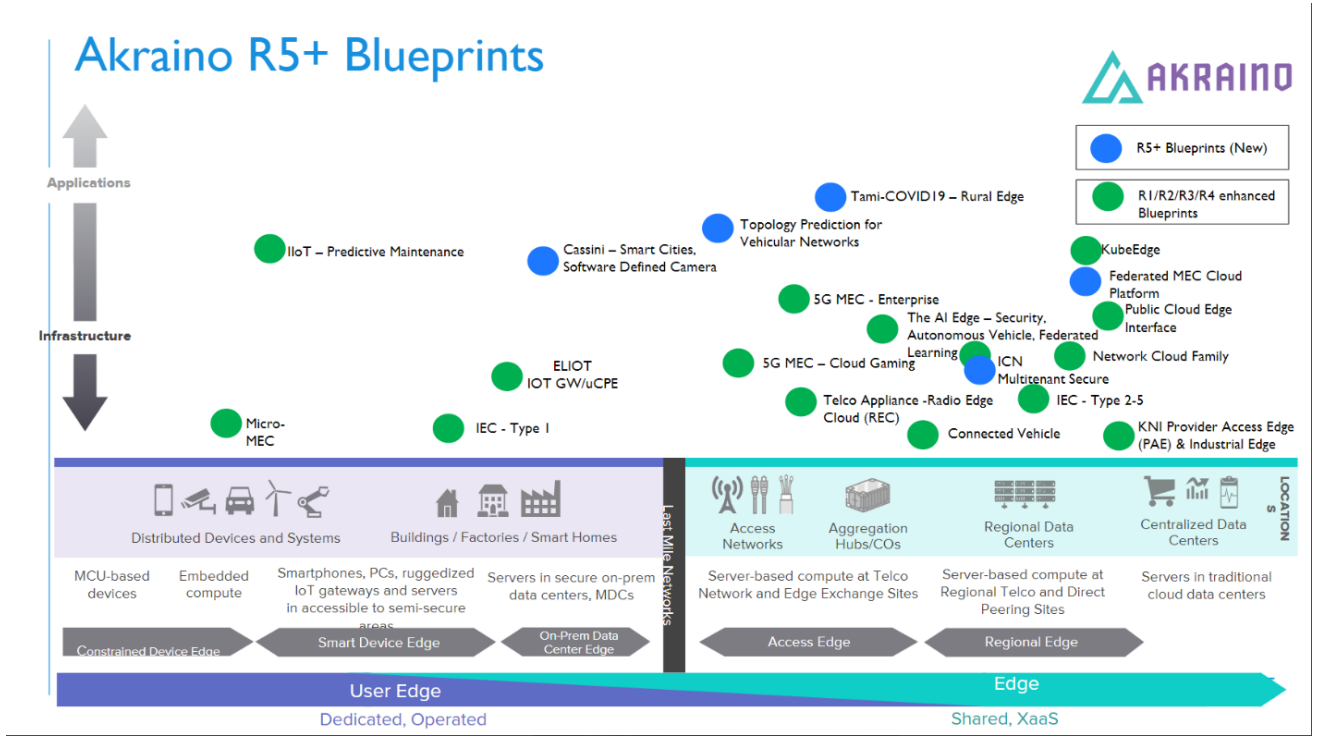

Figure: Akraino release5

09/28/2021 Akraino R5 Webinar: Expanding the Edge - Akraino - Akraino Confluence

Fujitsu agrees with concept of akraino and will contribute based on our IoT/edge social implementation achievements.

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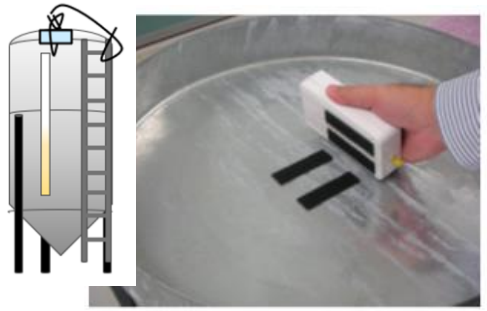
Fujitsu contribution to solve social issues

› Social implementation achievements using ICT in wide range of fields

IoT

Monitoring sewerage water level

Monitoring frost FAN for Tea plantation

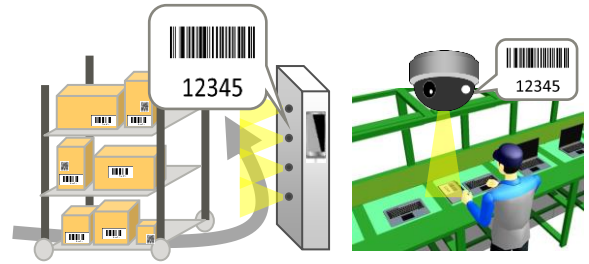


Monitoring amount of feed tank for livestock

AI

Birdsong detection

Individual identification of cattle by image recognition



Batch recognizing Bar code/QR code

Started “Smart data transaction for CPS Blueprint” based on challenges and solutions for these social implementation.

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Motivation for “Smart data transaction for CPS Blueprint”

Challenges in social implementation

- The bandwidth of the sensor network depends on use cases.
- Big data from many sensor nodes will pressure the NW bandwidth between edge and clouds.

Need to have a means to optimize each NW bandwidth according to use cases.

This blueprint propose a solution for NW bandwidth optimization.

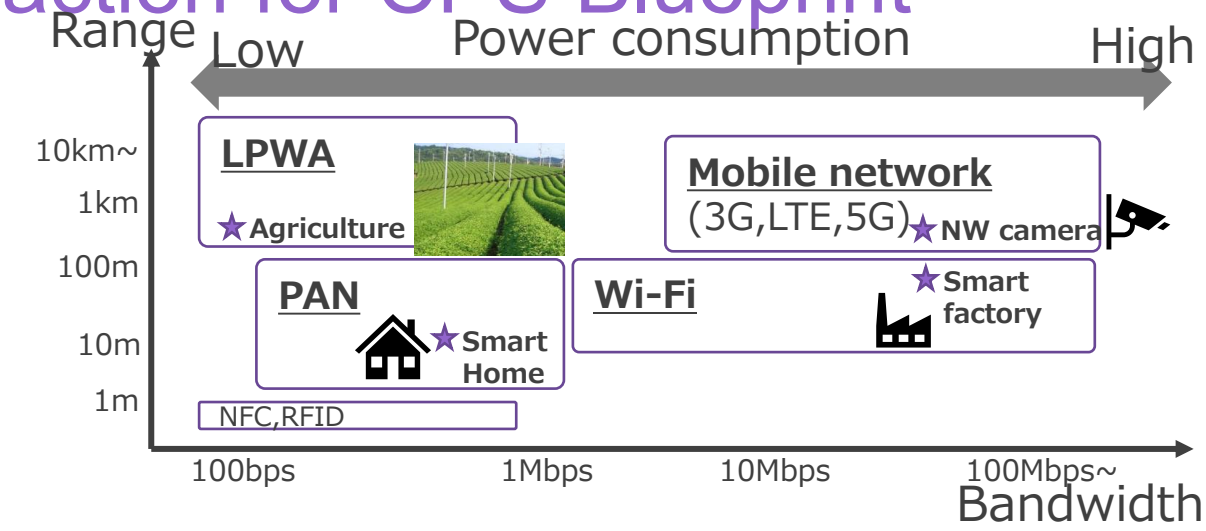

Figure1:Sensor network bandwidth and range

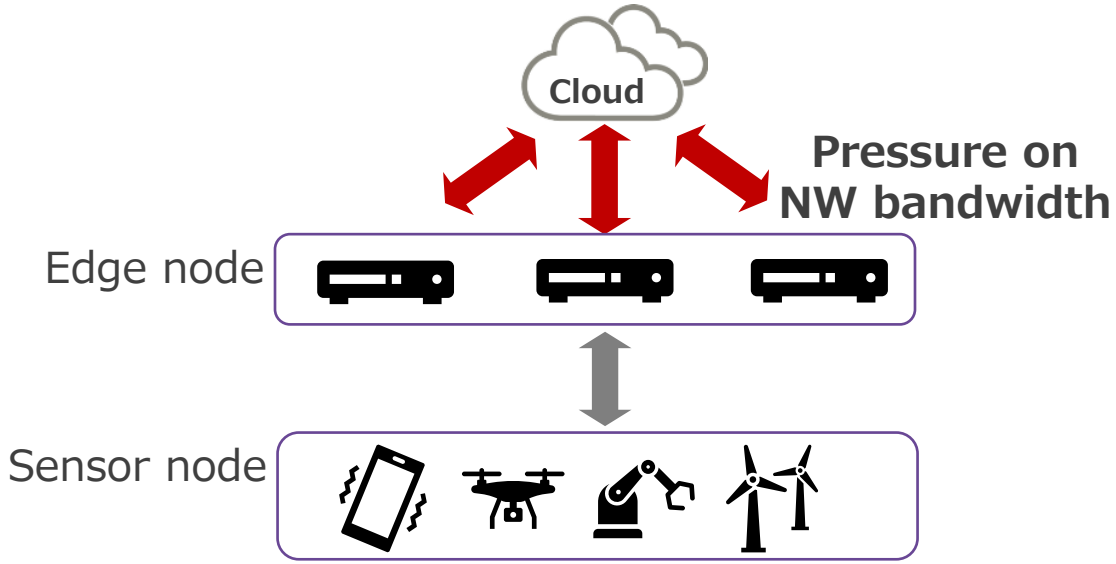

Figure2:Pressure on network bandwidth

Architecture Overview

Solution for NW bandwidth optimization

- **Increase types of Sensor NW supported by akraino** (E.g. LoRa)
  →Can meet various demands about sensor NW bandwidth, distance and power consumption which comes from various use cases.

- **Data synchronization**
  Share process data b/w edge node
  →Can reduce
  - ・NW bandwidth b/w edge and cloud
  - ・Processing latency

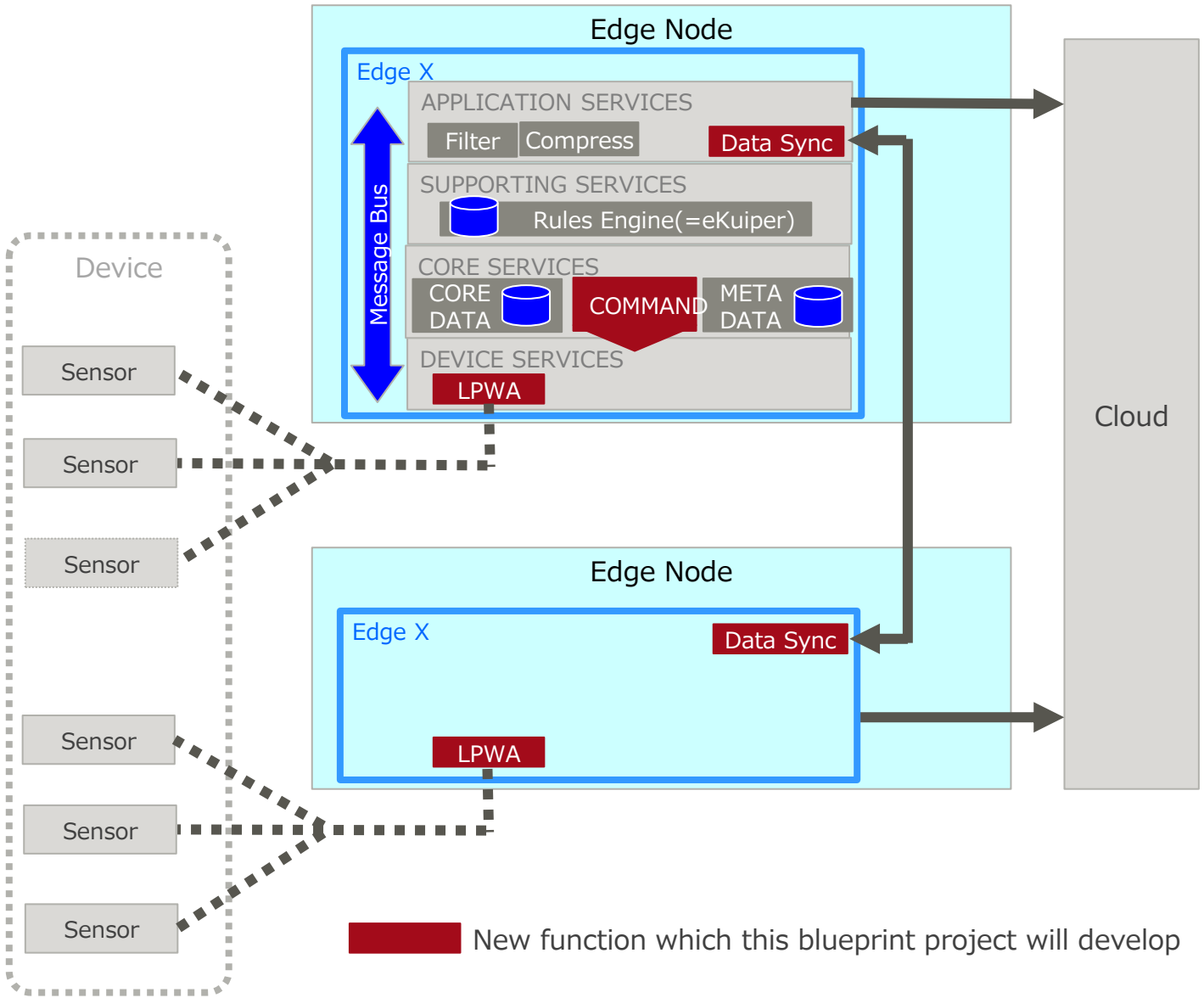

Figure: Architecture of Smart data transaction for CPS

Use case: Monitoring sewerage water level

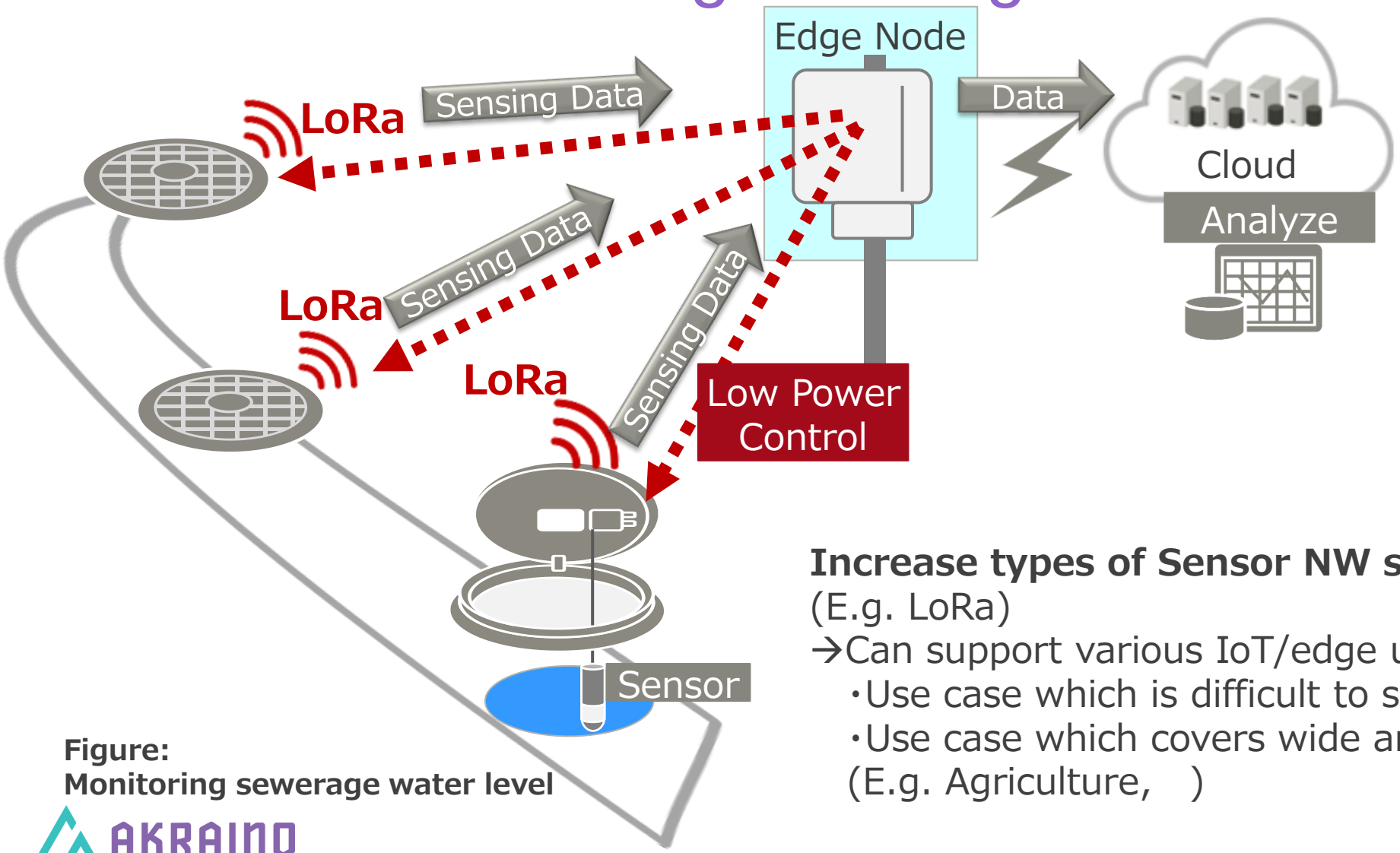

Figure:
Monitoring sewerage water level

Increase types of Sensor NW supported by akraino
(E.g. LoRa)
→Can support various IoT/edge use case
・Use case which is difficult to supply power to sensor
・Use case which covers wide area
(E.g. Agriculture,　)

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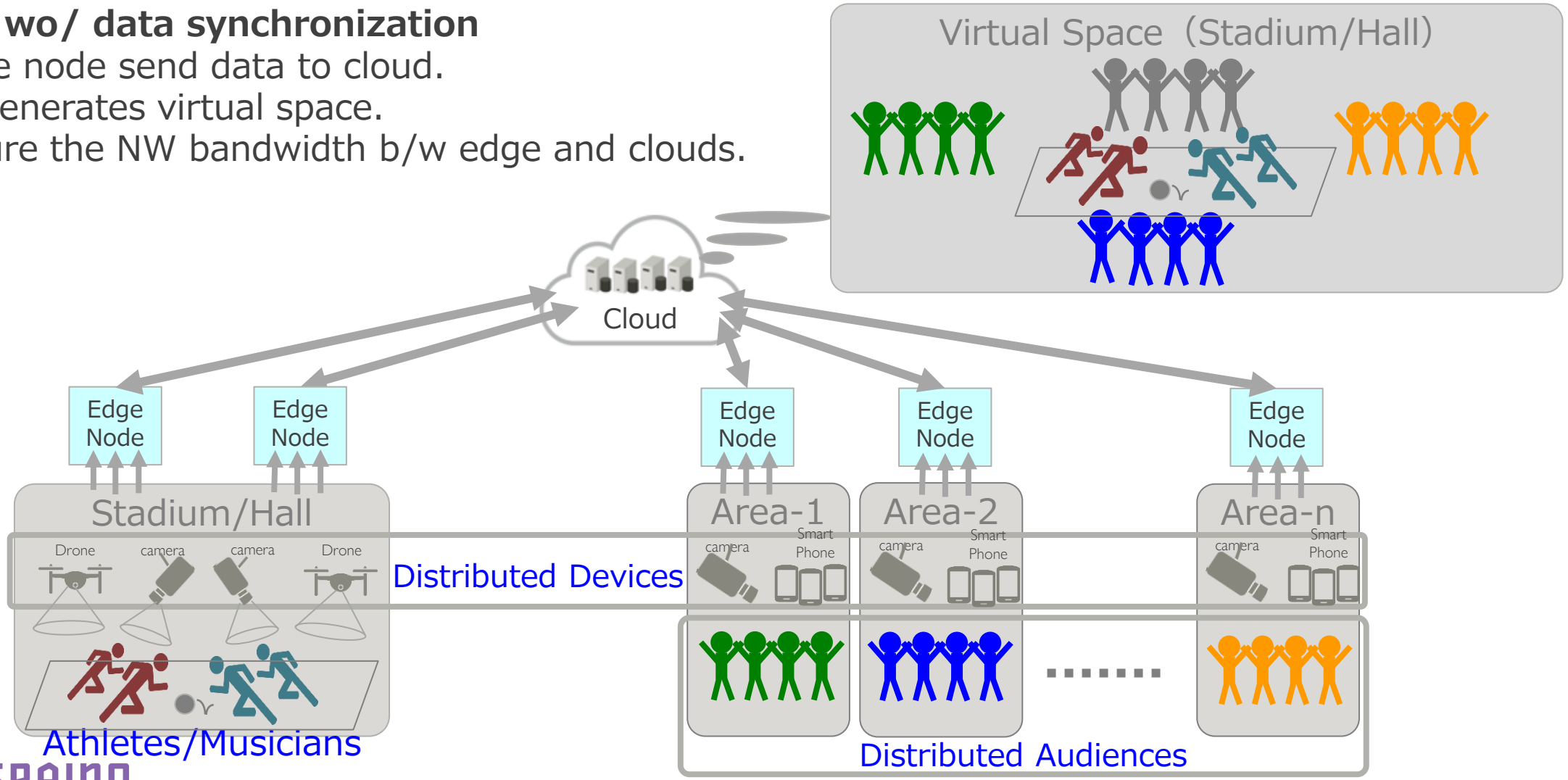
Use case: Interactive live sports/music

Before: wo/ data synchronization

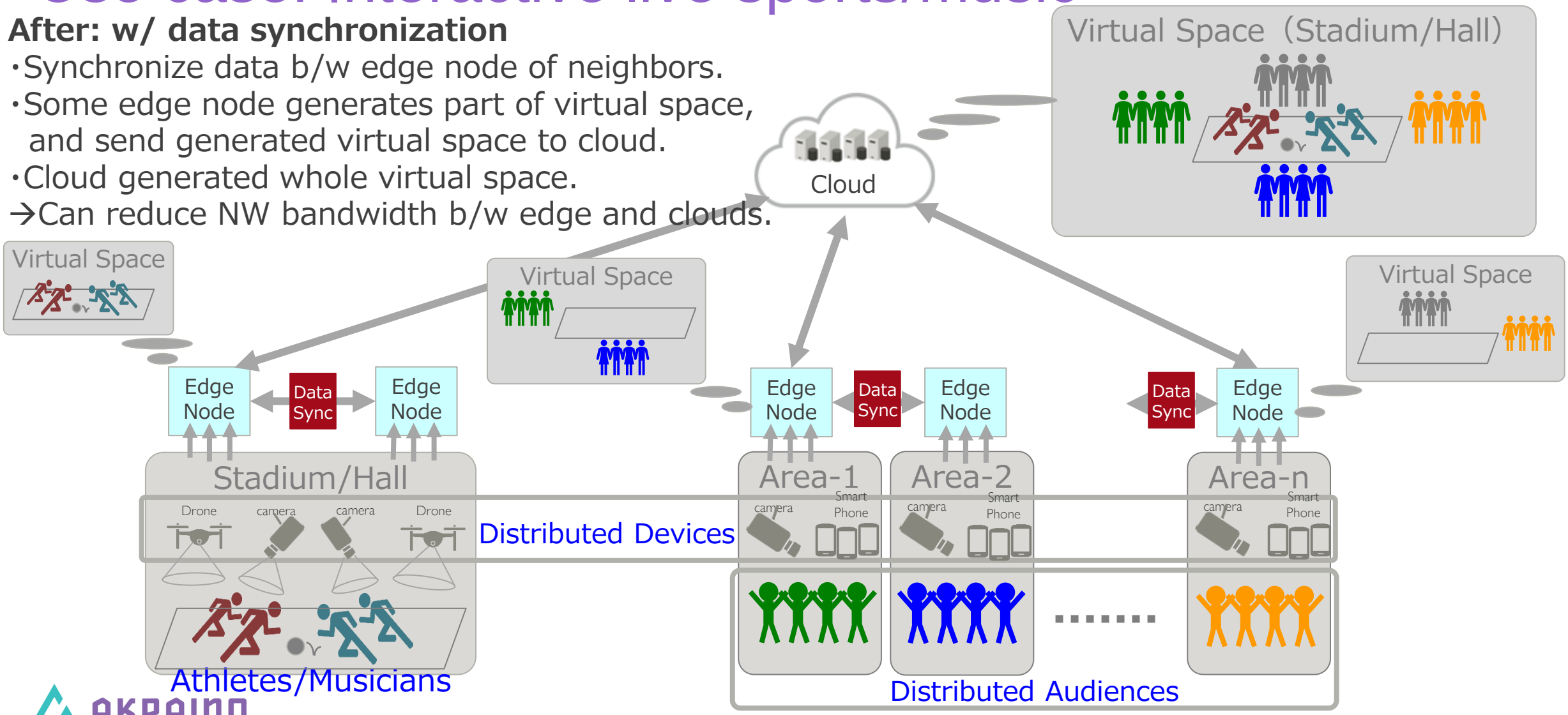
・All edge node send data to cloud.
Cloud generates virtual space.
→Pressure the NW bandwidth b/w edge and clouds.



Use case: Interactive live sports/music

After: w/ data synchronization

・Synchronize data b/w edge node of neighbors.
・Some edge node generates part of virtual space, and send generated virtual space to cloud.
・Cloud generated whole virtual space.
→Can reduce NW bandwidth b/w edge and clouds.



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Status of Smart data transaction for CPS Blueprint

- Passed all test and reviewing by community for release6
- All Documents are available on wiki [Smart Data Transaction for CPS - Akraino - Akraino Confluence]
  - Architecture document
  - Installation document
  - Test document

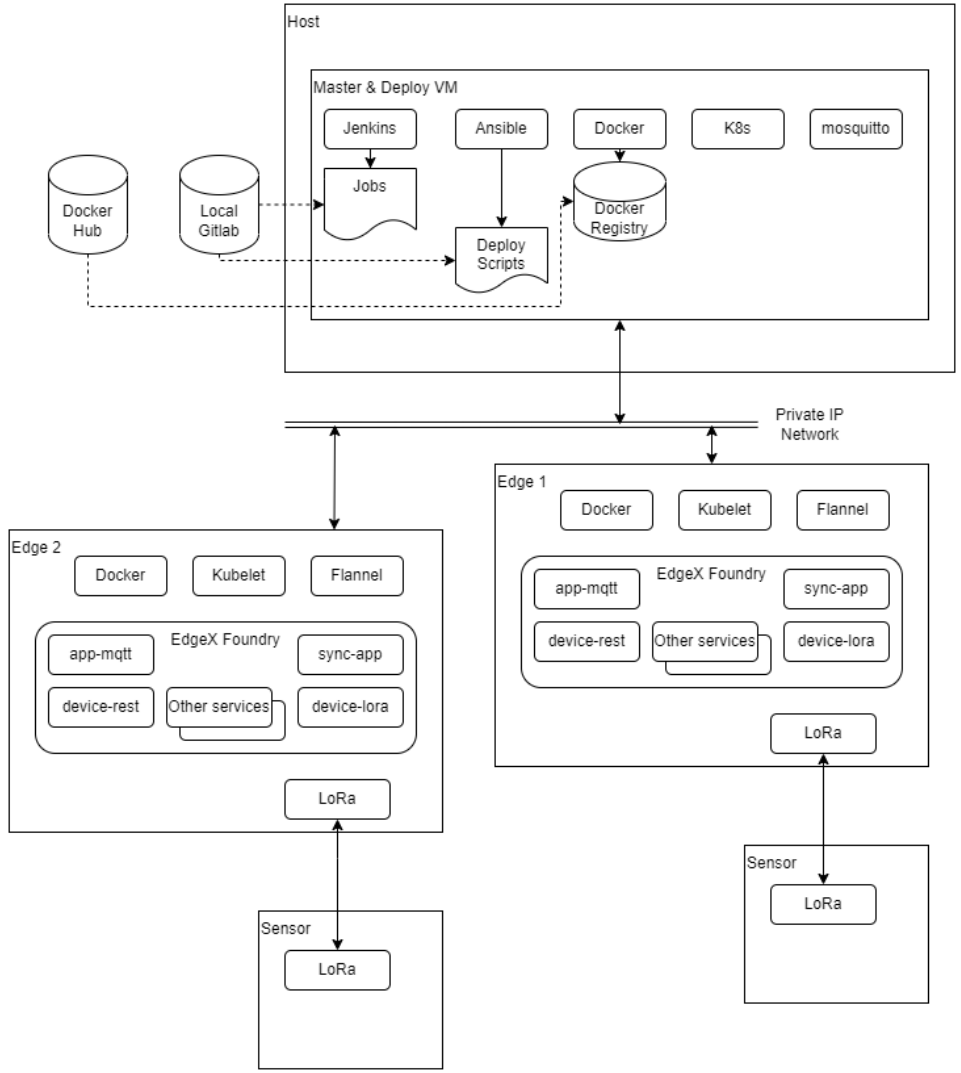

Figure: Architecture and test bed

Conclusion

- Will release Smart data transaction for CPS Blueprint in akraino release6
- Will enhance functionality for akraino release7
  E.g. Support synchronizing streaming data such as camera

Welcome participants

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Thanks