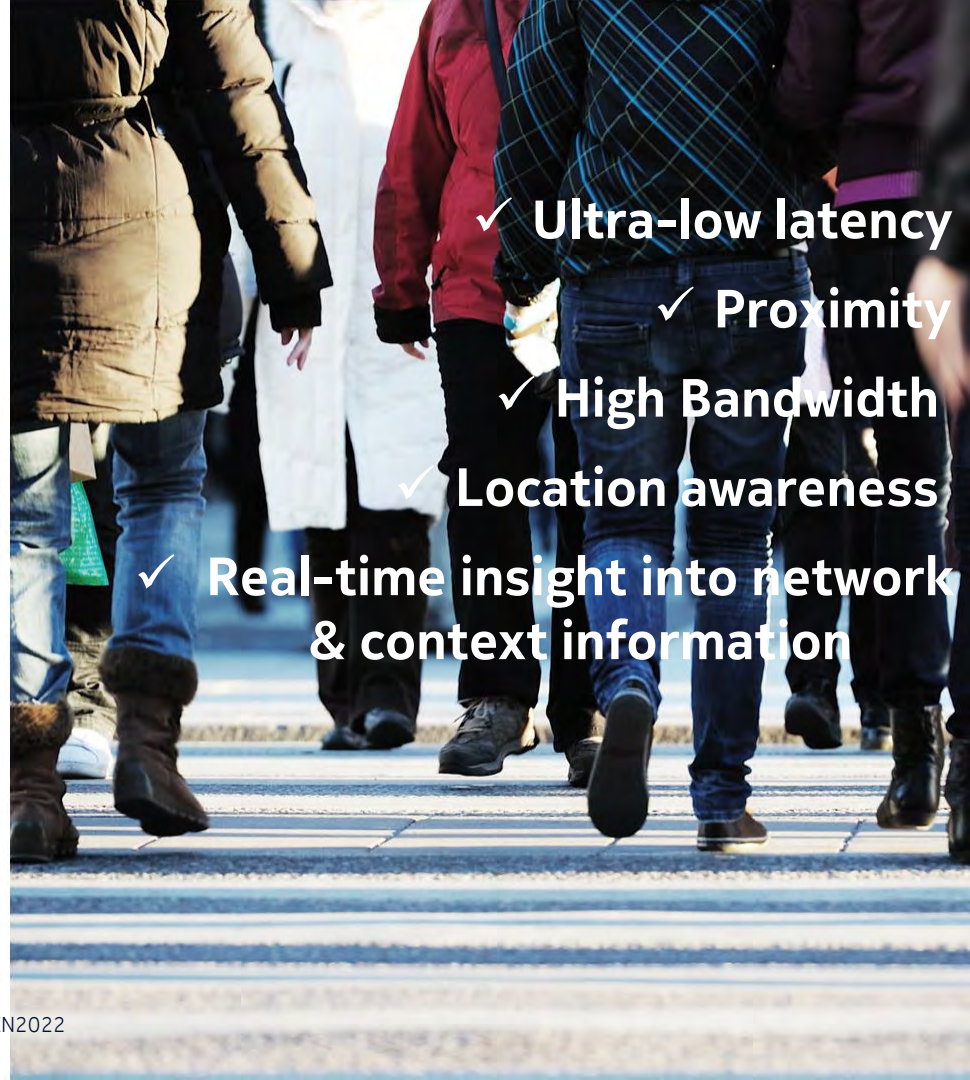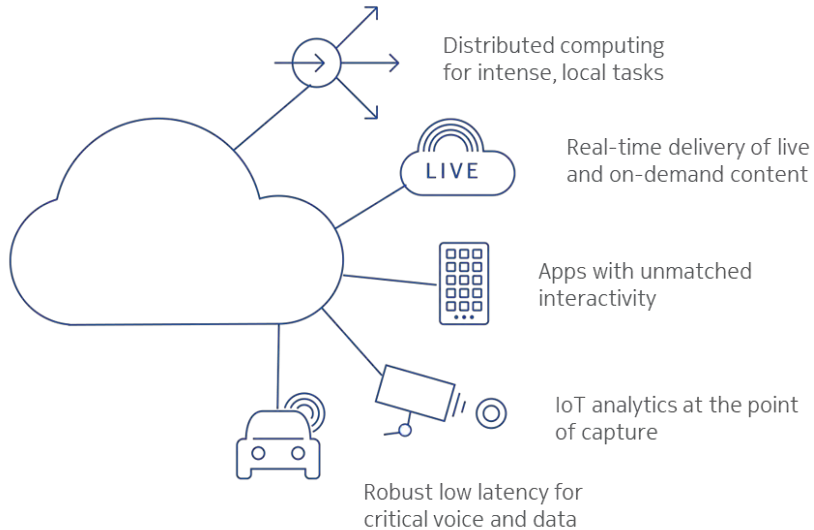# Unlocking innovation at the 5G/6G edge with MEC and RIC

Common application enabling platform for new business opportunities

Tuomas Niemelä
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# MEC: Getting closer to people and connected objects



Distributed computing for intense, local tasks

Real-time delivery of live and on-demand content

Apps with unmatched interactivity

IoT analytics at the point of capture

Robust low latency for critical voice and data

✓ **Ultra-low latency**
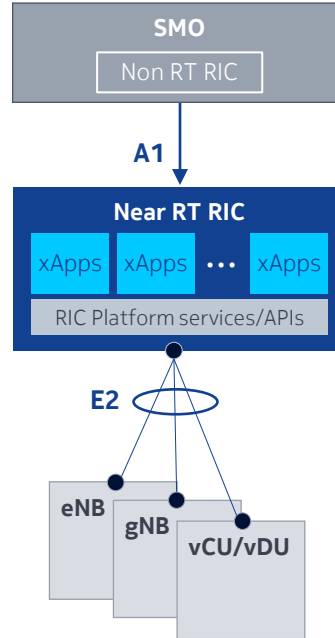
✓ **Proximity**

✓ **High Bandwidth**

✓ **Location awareness**

✓ **Real-time insight into network & context information**

# Near real-time RAN Intelligent Controller (RIC)
## O-RAN component for RAN Programmability

- Near RT RIC is a **control plane element** in the RAN defined in O-RAN WG3

- RIC enables **RAN Programmability** via **3rd pty** application-logic as xApps

- RIC is deployed on Edge Datacenters in mobile networks, supporting **both classical and cloudified RAN**

- **E2** exposes BTS data via RIC Platform and xApps control RAN via imperative E2 policies in a near real-time control loop

- **xApps complement native BTS logic** by implementing sophisticated, typically **AI/ML based algorithms**

- **RIC use-case range** from CSP specific RAN optimization to deployment specific customization supporting Enterprise use-cases

- RIC xApp have a **span of control** over range of BTS-es (nx100) and multiple RAN technologies (4G, 5G, Small Cell, cloud etc.)
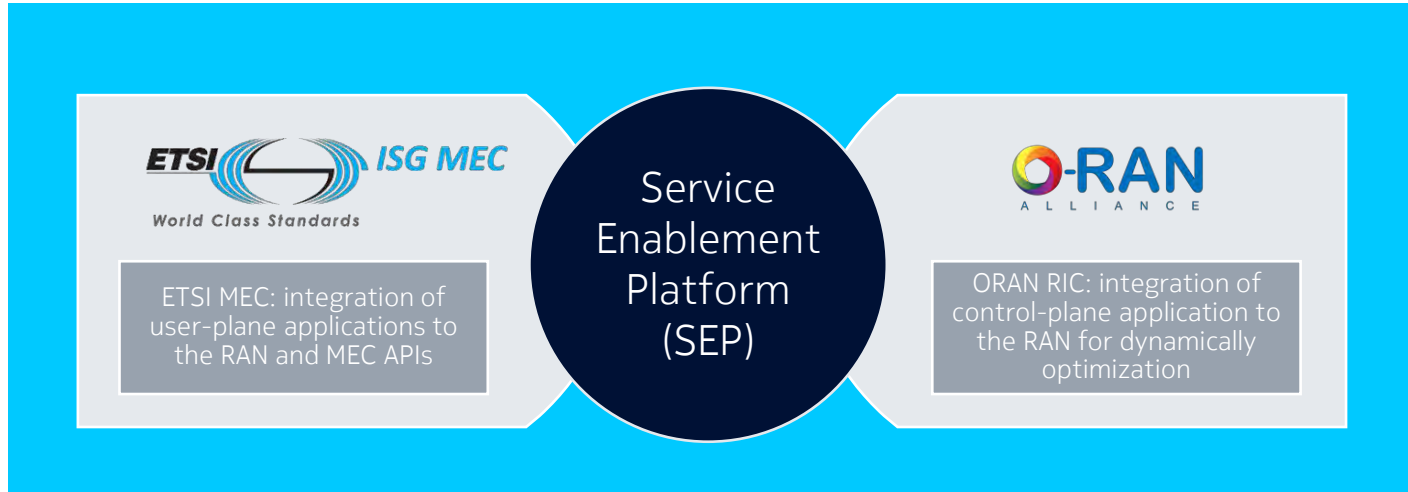
**SMO**
Non RT RIC

**A1**

**Near RT RIC**
xApps | xApps | ... | xApps
RIC Platform services/APIs

**E2**

eNB
gNB
vCU/vDU

RAN Intelligent Controller

### Use cases

| Network Intelligence | Policy Enforcement |
| --- | --- |
| | Mobility Optimization |
| Resource Assurance | Radio-Link Management |
| | Advanced SON |
| Resource Control | Load Balancing |
| | Slicing Policy |

- RAN Programmability
- App logic implemented in xApps
- AI/ML training and inference support on RIC
- Policy based control of BTS using E2 service models

Near real-time RIC is a new network element defined in O-RAN standardization (https://www.o-ran.org/)

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# Service Enablement Platform (SEP)

## ETSI MEC and O-RAN RIC



**ETSI ISG MEC** — World Class Standards

Service Enablement Platform (SEP)

**O-RAN ALLIANCE**

ETSI MEC: integration of user-plane applications to the RAN and MEC APIs

ORAN RIC: integration of control-plane application to the RAN for dynamically optimization

ETSI MEC and O-RAN RIC two complementary standards

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# Nokia Service Enablement Platform
## Enables user-plane and control-plane application at the edge

| Applications at the edge | Platform for AI/ML use-cases | RAN programmability | Operator specific optimization | Service QoE differentiation |
|---|---|---|---|---|

**Service Enablement Platform:**

- Infrastructure independent, containerized platform services

- Standard APIs for applications to interact with the RAN
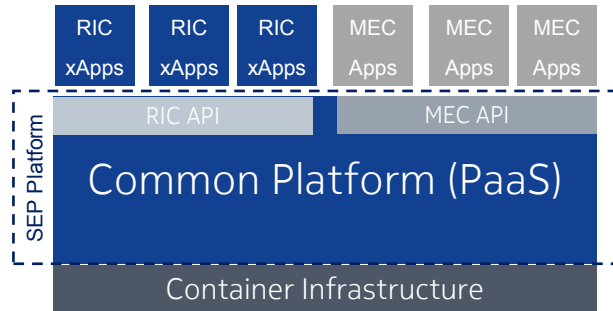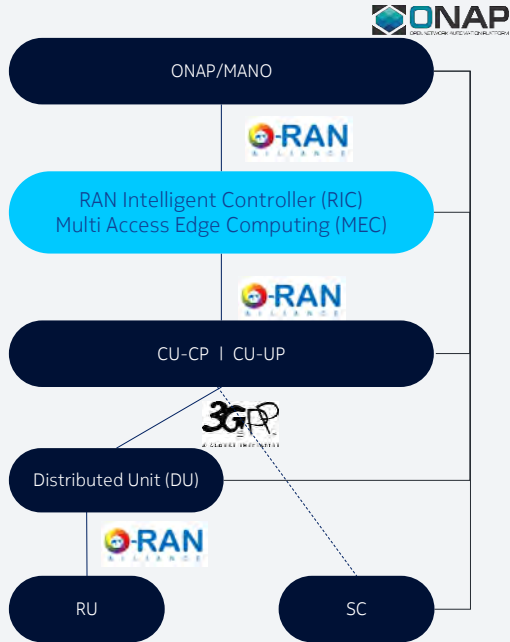


**Single Edge Platform for:**

- MEC platform services based on ETSI MEC standard

- RIC services based on O-RAN standardized RAN Intelligence Controller

- Open platform for 3rd party Apps / xApps

**Application awareness of MEC combined with RAN awareness of the RIC**
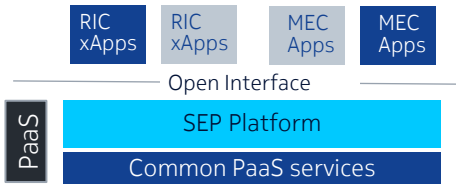
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# Service Enablement Platform (SEP)
## Innovation platform for the Edge

### O-RAN brings openness and programmability to the Cloud RAN



ONAP/MANO

RAN Intelligent Controller (RIC)
Multi Access Edge Computing (MEC)

CU-CP | CU-UP
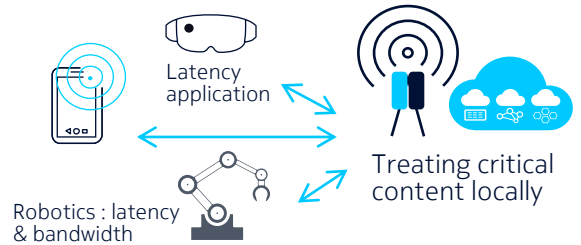
Distributed Unit (DU)

RU

SC

### RAN Openness for 3rd party applications with RIC and MEC

**RAN Programmability for Customization, Slice management, Service optimization and Artificial intelligence**

| RIC xApps | RIC xApps | MEC Apps | MEC Apps |

Open Interface

**PaaS**

SEP Platform

Common PaaS services

Innovative Mobile Service and Application Award 2019 for MEC Application

**MEC Application @ Edge**

Latency application

Treating critical content locally

Robotics : latency & bandwidth

**O-RAN/RIC based xAPP @ Edge**

Dedicated Slices

Diverse and extreme use case requirements

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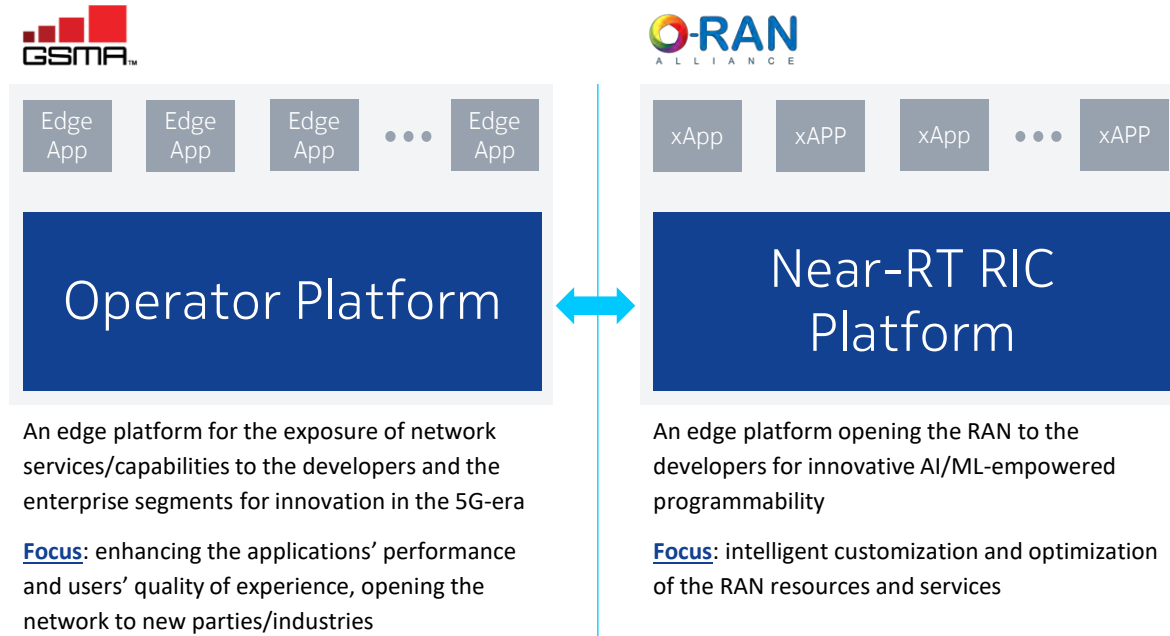NOKIA

# Bringing together the Telco Edge Cloud and the Near-RT RAN Intelligent Controller (RIC)

Two separate operator-driven edge initiatives: Operator Platform and Near-RT RIC

**GSMA™**

| Edge App | Edge App | Edge App | • • • | Edge App |
|---|---|---|---|---|

## Operator Platform

An edge platform for the exposure of network services/capabilities to the developers and the enterprise segments for innovation in the 5G-era

**Focus**: enhancing the applications' performance and users' quality of experience, opening the network to new parties/industries

**O-RAN ALLIANCE**

| xApp | xAPP | xApp | • • • | xAPP |
|---|---|---|---|---|

## Near-RT RIC Platform

An edge platform opening the RAN to the developers for innovative AI/ML-empowered programmability

**Focus**: intelligent customization and optimization of the RAN resources and services

Consider a single platform to support:

- Common OP and Near-RT RIC deployment options
- Value creation, enabling enhanced customization and optimization powered by RAN-aware applications and application-aware RAN
- Flexible applicability

Enablers:

- Common platform and services
- Infrastructure independent
- Zero-touch automation for dynamic resources, service and application orchestration
- Trustworthiness

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# Bringing together the Telco Edge Cloud and the Near-RT RAN Intelligent Controller (RIC): discussion points

How do these two operator-driven initiatives relate to each other?

What will be the common OP and Near-RT RIC deployment options?

Will operators invest in two distinct platforms (in common deployment options)?

What would be the value in having a single platform to host both Edge Apps and xApps?

What are the required considerations when running both kinds of applications on a single platform?

Can such a common platform be used to run also network functions?

What are the implications of having a common platform from the standardization and implementation perspectives?

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# Summary

There are vast opportunities at the edge

- MEC is coherent with the openness ambition for innovation and growth. It provides a common API framework for third-party plug-ins and open APIs for data exposure and programmability.

- Integration of near-RT RIC and MEC in common platform provides additional value, enabling enhanced customization and optimization powered by RAN-aware applications and application-aware RAN

- Edge platforms integrating various use cases are a focal point for collaboration between Operators and Enterprises.

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