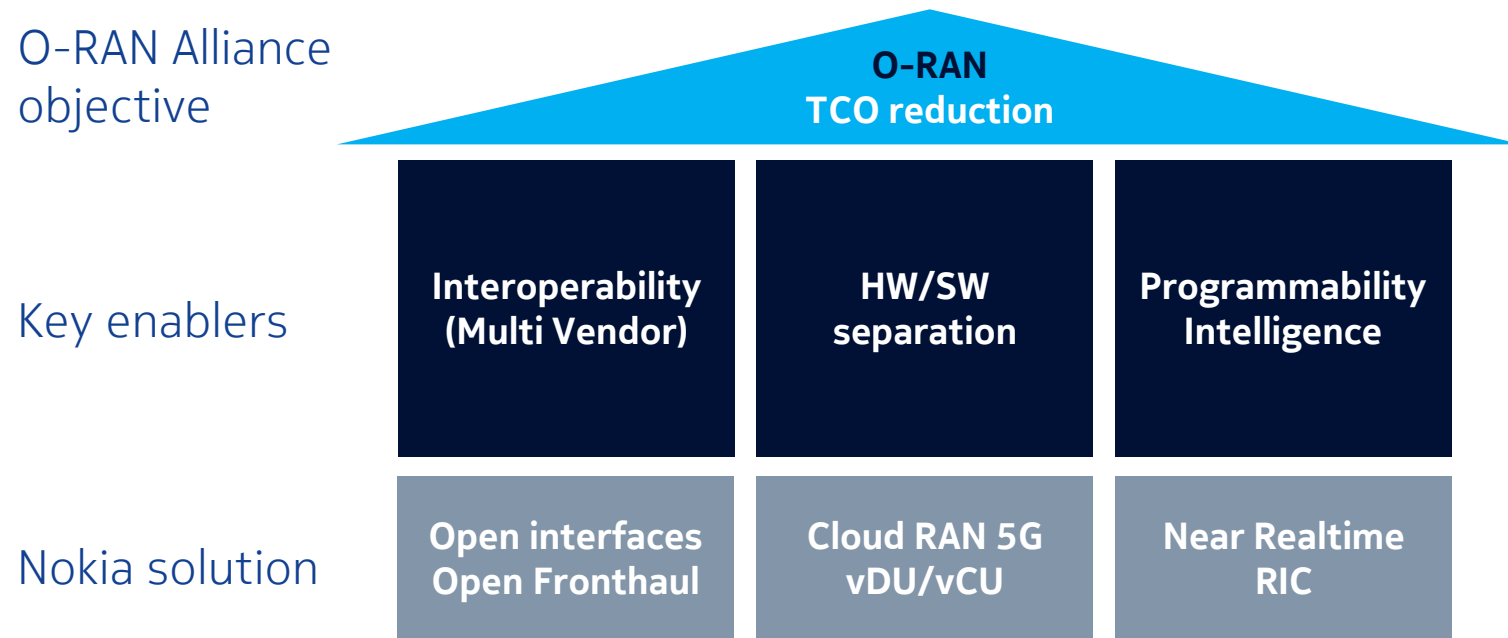# Nokia O-RAN Update

November 2021

NOKIA

Agenda

- Overview of O-RAN
- What is it?

- Nokia O-RAN contribution

- Way forward and questions to be answered

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Key areas of O-RAN
Three main pillars build on technical specification work

O-RAN Alliance objective	O-RAN TCO reduction		
Key enablers	Interoperability (Multi Vendor)	HW/SW separation	Programmability Intelligence
Nokia solution	Open interfaces Open Fronthaul	Cloud RAN 5G vDU/vCU	Near Realtime RIC

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O-RAN architecture
Functions and interfaces can be selected/deployed independently

Open RAN

Is **not clearly specified**. It can be interpreted in different ways. O-RAN can be considered as a subset.
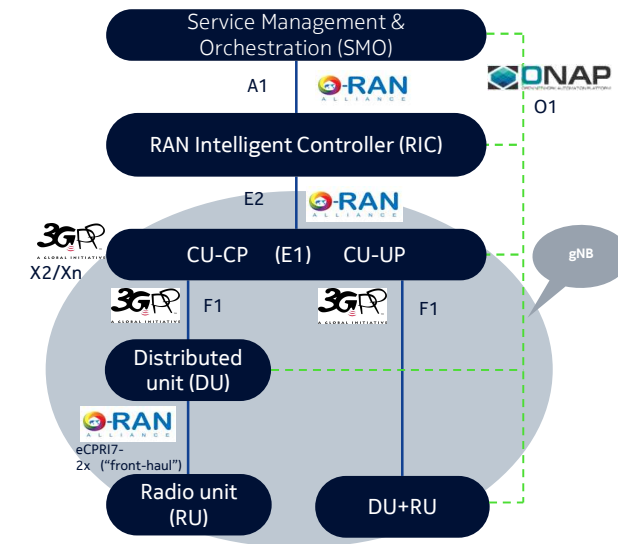
O-RAN

refers to the interfaces and architecture elements as shown, **specified** by the O-RAN Alliance

OpenRAN (w/o space)

Is a project group inside the TIP (Telecom Infra Project). Target is to "… define and build 2G, 3G, 4G, and 5G RAN solutions…"

Oran

A city at the Mediterranean sea in Algeria ☺

F1 applicable in Cloud
- vRAN 1.0: vCU + (DU + RU)
- vRAN 2.0: vCU + vDU + RU

F1 not applicable in Classic
- AirScale BBU: CU+DU

Interface	Status in O-RAN alliance
F1	Spec not completed yet
W1	Spec not completed yet
E1	Spec not completed yet
X2	X2 spec available for Non-Stand Alone (NSA) EN-DC.
Xn	Spec not completed yet
FH	eCPRI 7-2x spec available
E2	Spec available
A1	Spec available
O1	Spec available
O2	Spec not completed yet

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What about Cloud RAN? O-RAN and vRAN are inter-related

Cloudification is one of the fundamental tenants of O-RAN

vRAN / Cloud RAN

- "Vertical openness"
- Targets the separation of baseband hardware and software
- multi-vendor option
- work commenced before O-RAN

Application
vDU, vCU

Virtualization / Containerization

Hardware
DataCenter x86

Fronthaul eCPRI

Midhaul F1 (Option 2 split)

MANO / Other E2, O1, X2

O-RAN / Interfaces

- "Horizontal openness"
- Open interfaces, white box approach, Open Source
- multi-vendor option
- applicable to Classical RAN and vRAN

Example: O-RAN with Classical RAN

O-RAN eCPRI
open

open

Core Network

Example: O-RAN with vRAN2.0

O-RAN eCPRI
open

vDU

F1
open

vCU

open

Core Network

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