RAN Transformation

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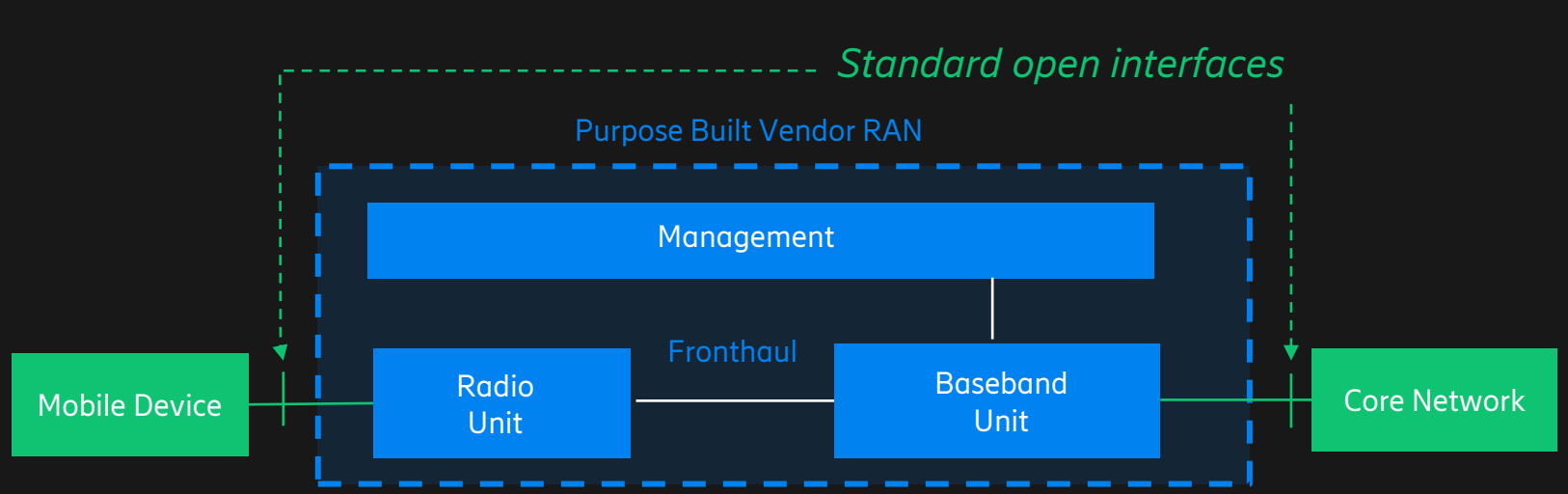
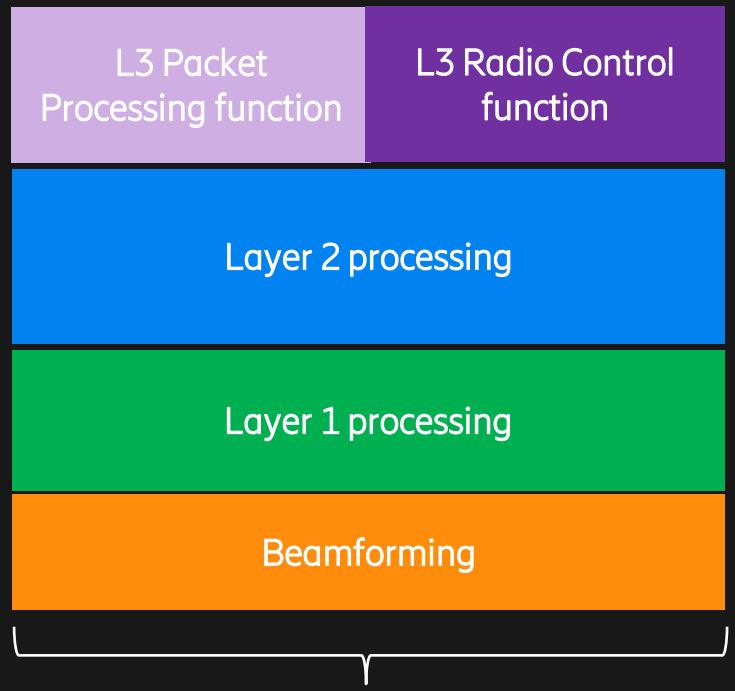
Agenda – RAN transformation Journey

- Purpose Build RAN
- RAN transformation
- O-RAN and Ericsson solution
- Ericsson Cloud RAN Architecture
- SMO
- Challenges

Existing RAN architecture



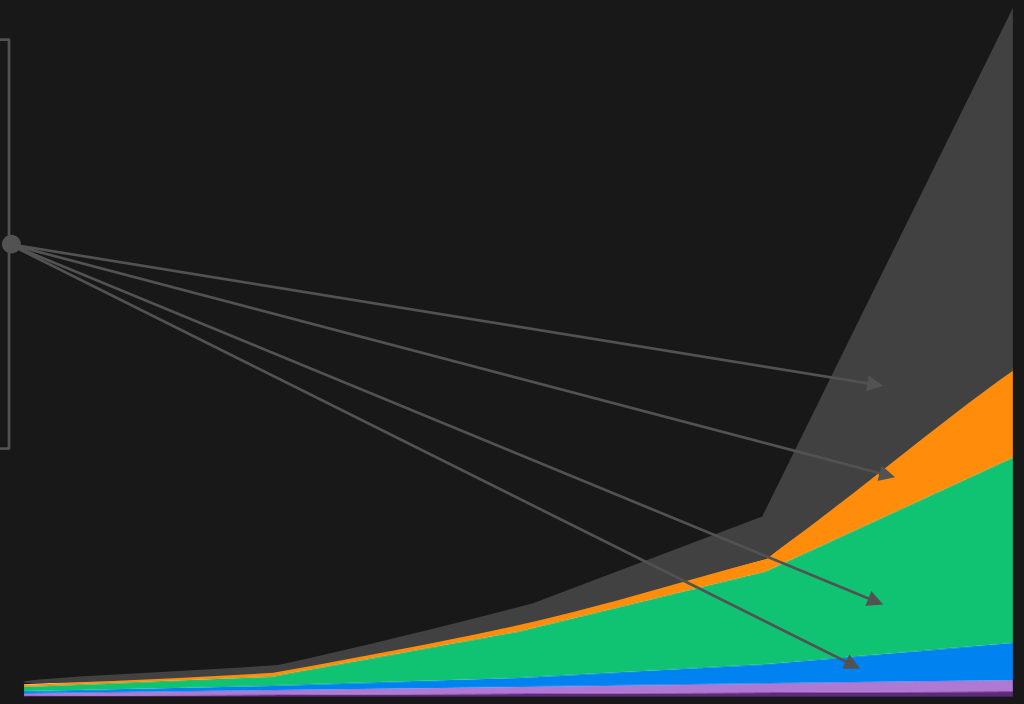


- ✓ HW and SW tightly coupled and proprietary
- ✓ Inner proprietary interfaces
- ✓ Outer open interfaces (devices, CN)
- ✓ E2E multi-RAT RAN integration & validation

Exponential increase in processing needs

Trends driving higher processing

- # Antenna branches growing with Massive MIMO
- More carrier bandwidth at higher frequencies
- Wider spectrum allocations in new bands
- Shorter transmission time interval (TTI)



Carrier bandwidth	20 MHz	20 MHz	100 MHz	100 MHz	100 MHz
Antenna branches	2T2R	4T4R	4T4R	8T8R	64T64R
Transmission time interval (TTI)	1 ms	1 ms	0.5 ms	0.5 ms	0.5 ms

	BW	DL Layers	UL Layers	Total DL BW	Total UL BW
Low-band	20 MHz	4	1	80 MHZ	20 MHz
Mid-band	100 MHz	16	8	1600 MHz	800 MHz
				-20x proc	**-40x proc**

- Digital front-end processing
- Beamforming processing
- Layer 1 processing
- Layer 2 processing
- Layer 3 Packet processing function
- Layer 3 Radio control function

Ericsson Silicon

Ericsson Many-Core Architecture (EMCA)

Hundreds of digital signaling processors (DSPs)

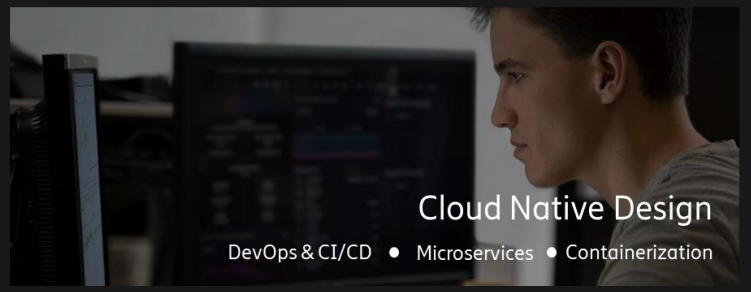
4G/5G HW Accelerators

Digital front-end

Tight SW/HW co-design

Software development kit (SDK) for designing massively parallel radio algorithms

Changes versus Ericsson Radio System

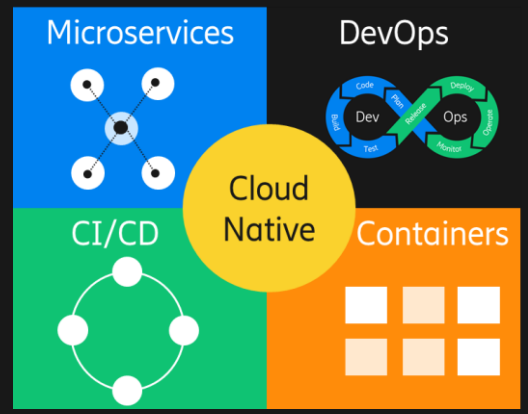


No Change

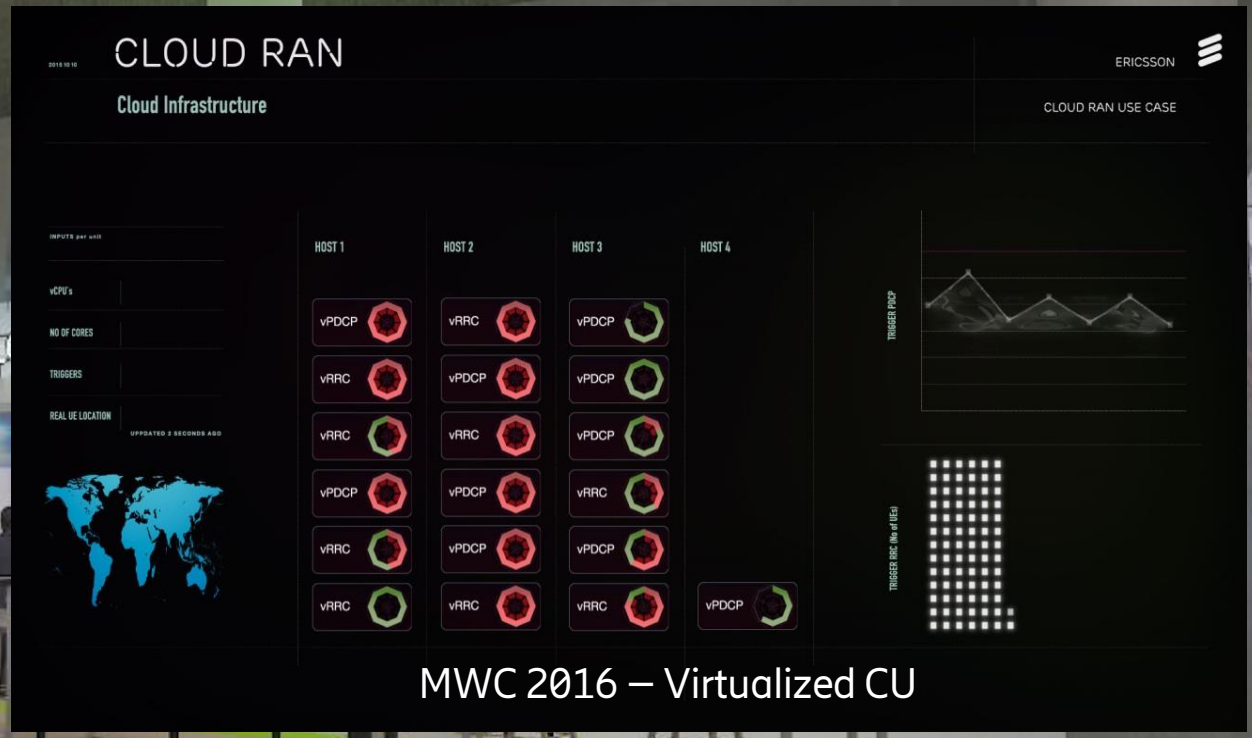
- Spectral efficiency
- Rich feature set
- Advanced radio

Change

- Ecosystem view
- Nodes vs functions
- Release management
- IT harmonization
- Design for scalability
- Operations & management automation

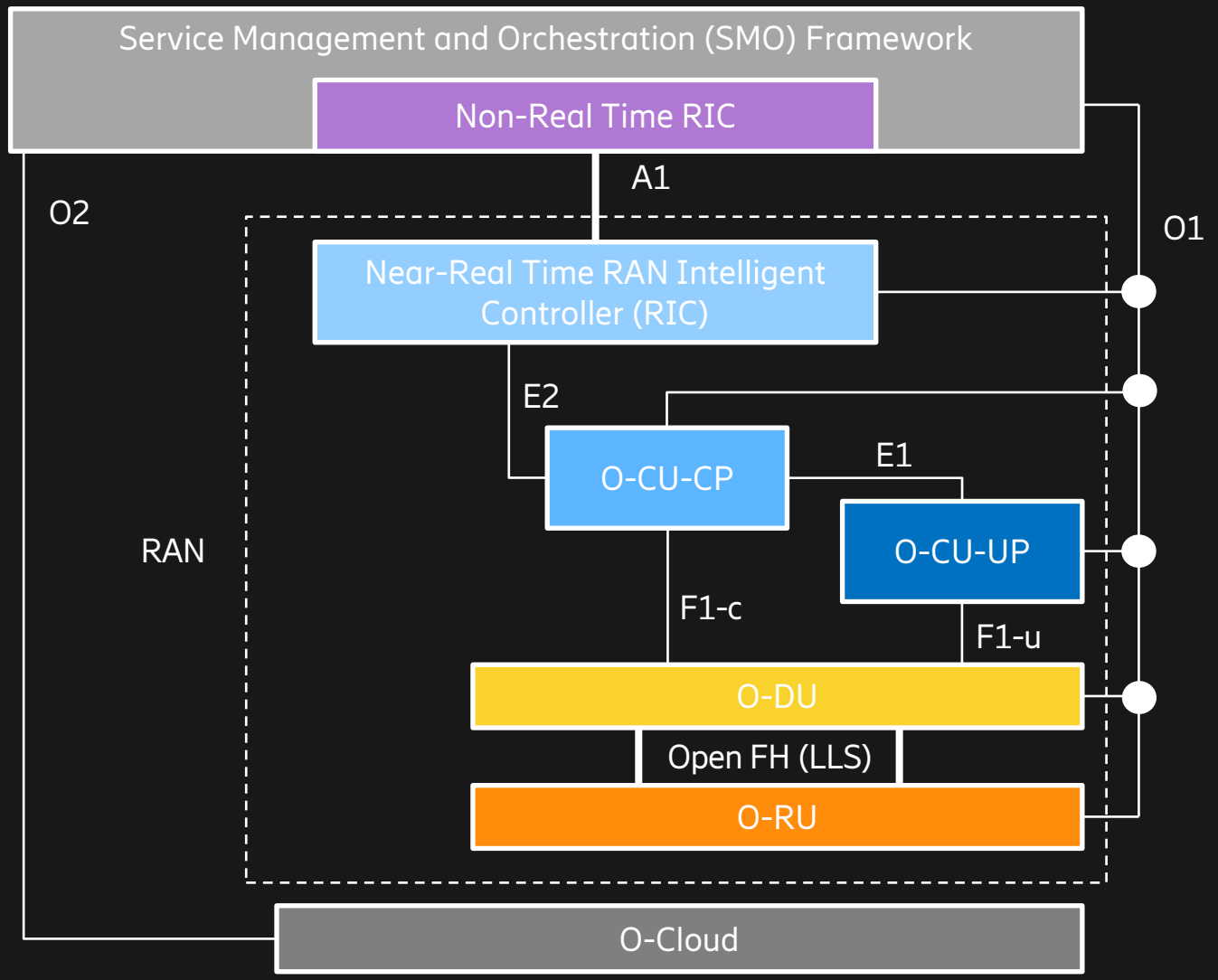


Virtualized BB Functions trialed since late 2015



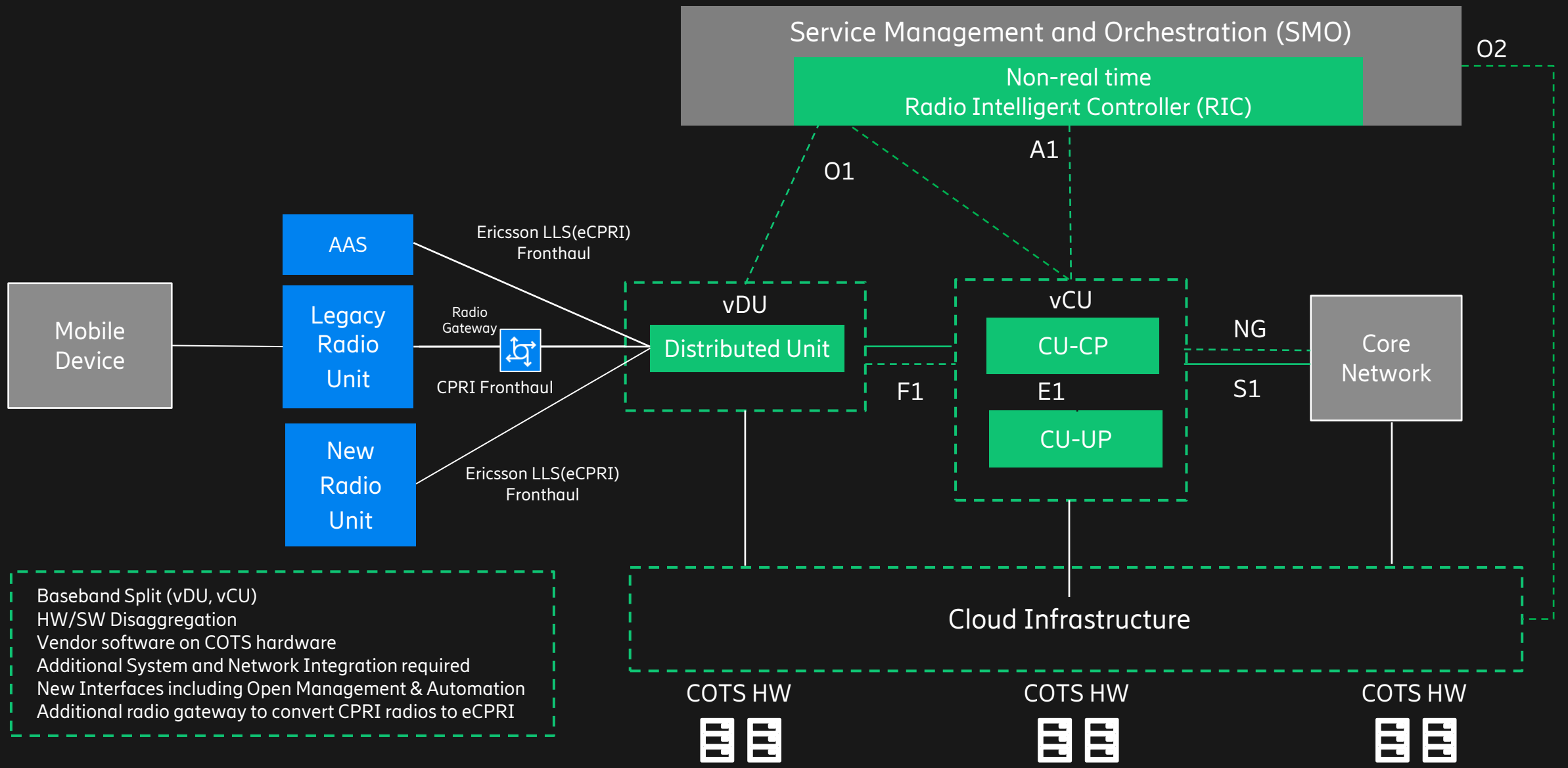
MWC 2016 – Virtualized CU

Ericsson Open Lab



Ericsson joined in Feb 2019 and holds 2 work-group chair positions

Ericsson Cloud RAN

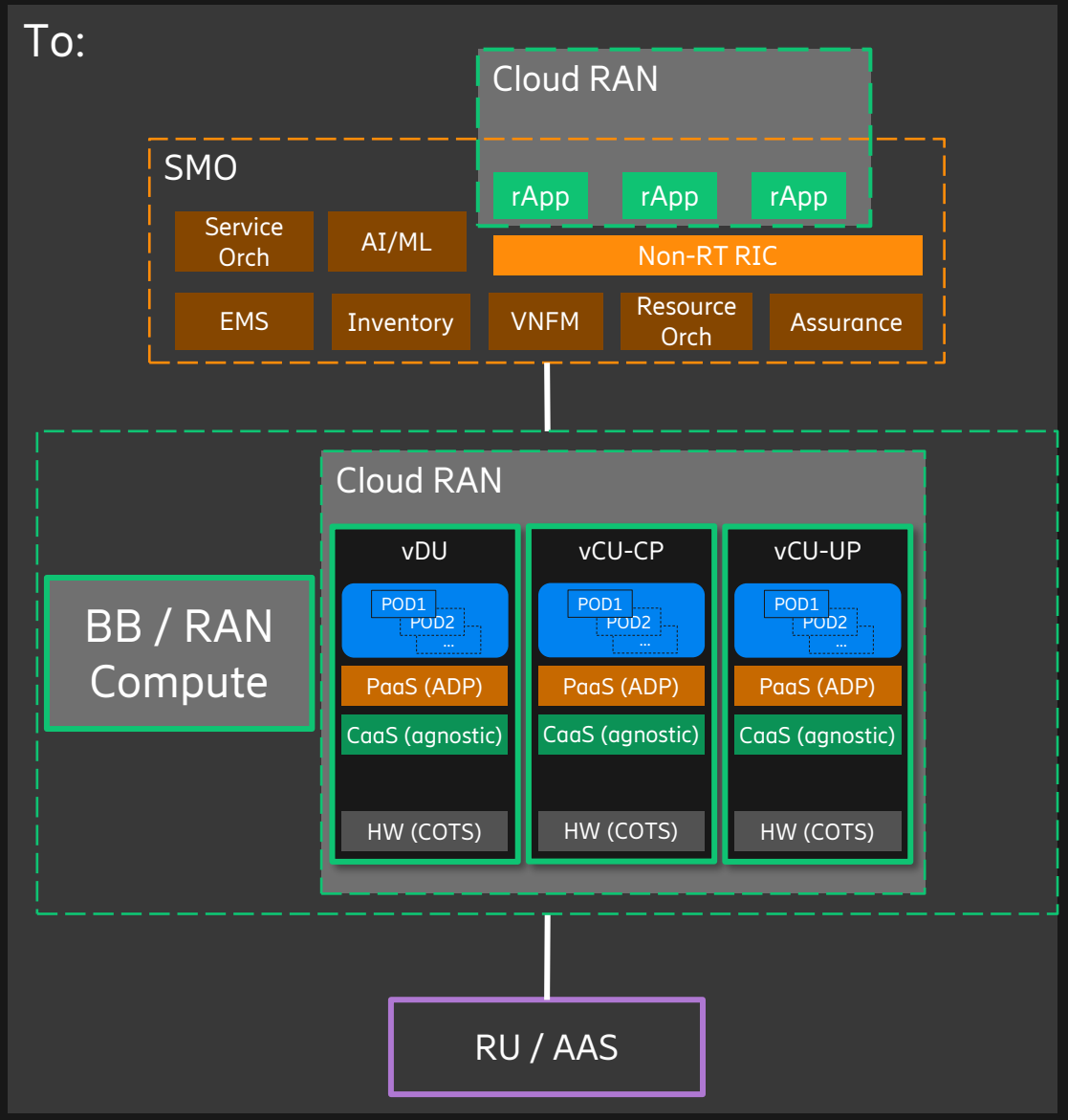


Cloud RAN Management paradigm

From … To …

From:

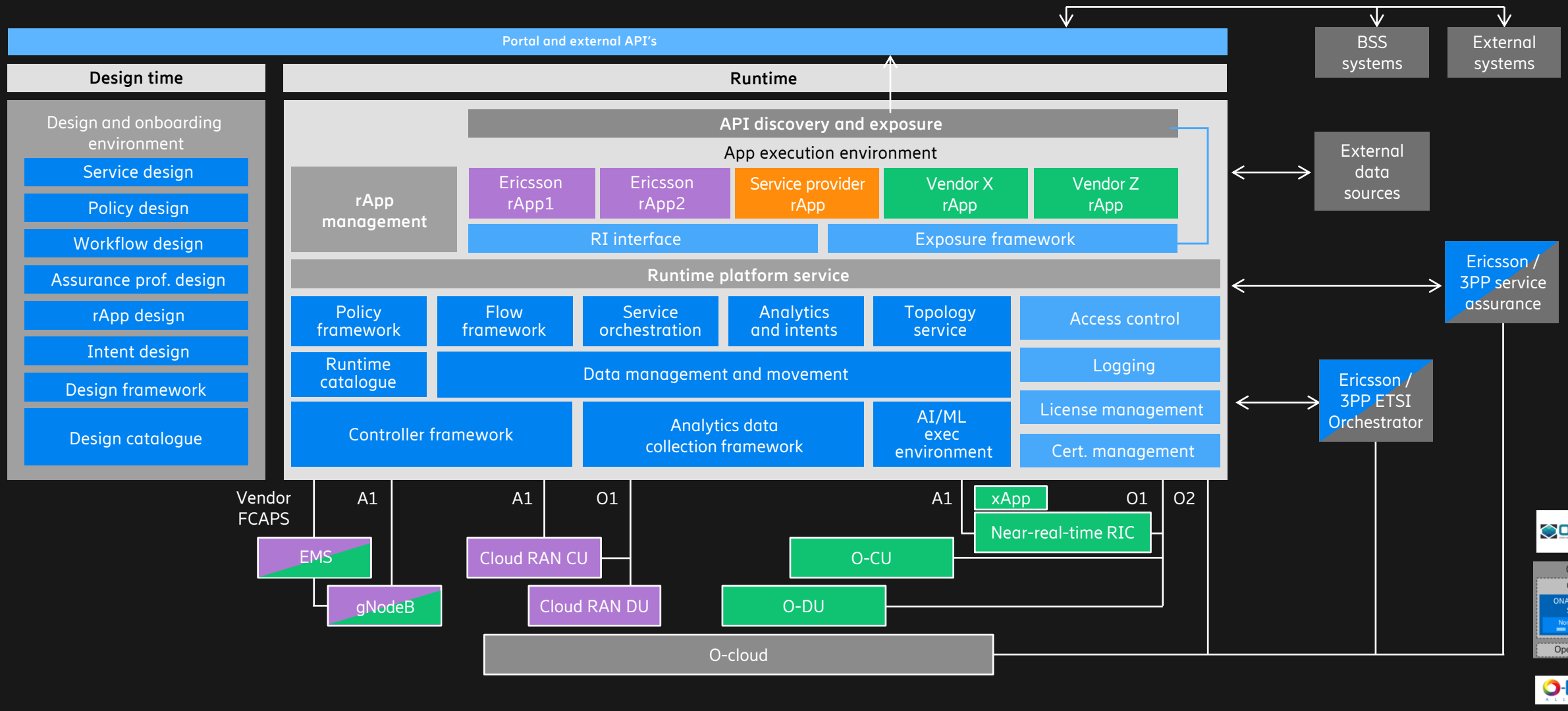
To:



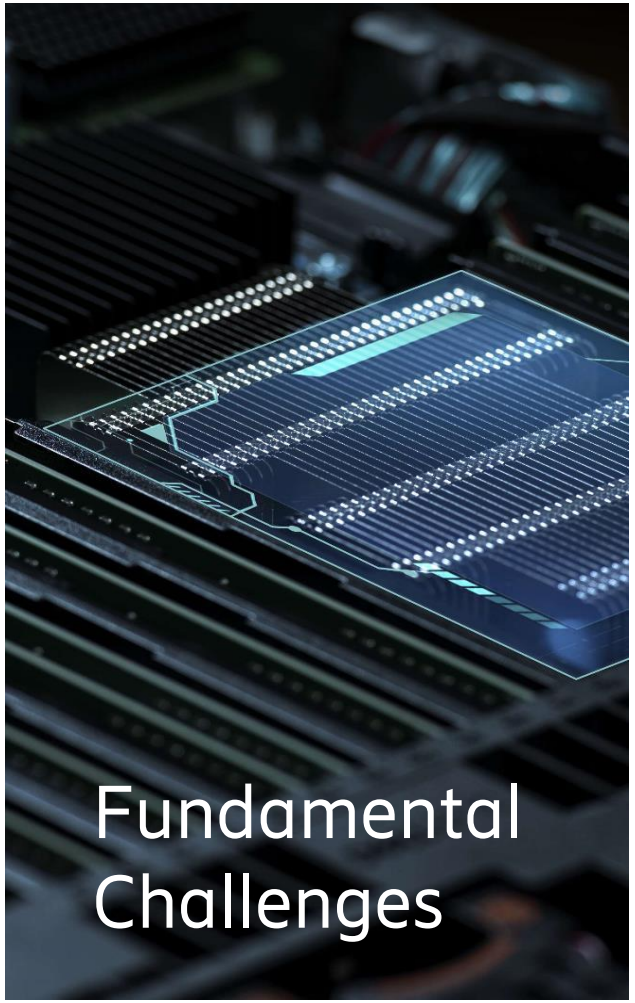
Disaggregation of RAN: vDU, vCU-CP, vCU-UP, rApps.

- Support independent scaling of Cloud RAN Functions
- Cloud native, microservice based architecture on bare metal
- Agnostic to underlaying CaaS layer and x86 HW
- rApps to enhance RAN functionalities (LCM, Dynamic Services, traffic optimization, assurance, …)
- Multi vendor orchestration

Ericsson Intelligent Automation Platform – Ericsson SMO



Challenges



System integration

Extensive integration project to verfiy an open interface between vendors adds TTM & cost to the solution

Life-cycle management

Software releases between vendors need to be coordinated, tested and verified to ensure interoperability is not broken.

System performance

Minimum common denominator dictates feature support by the vendors involved, resulting in performance limitations

Assurance of KPIs & security

Challenging root cause analysis to identify vendor at fault and who is responsible for providing fixes

One Global Standard

ericsson.com