O-RAN and ONAP
How the OSNL is supporting truly open networking
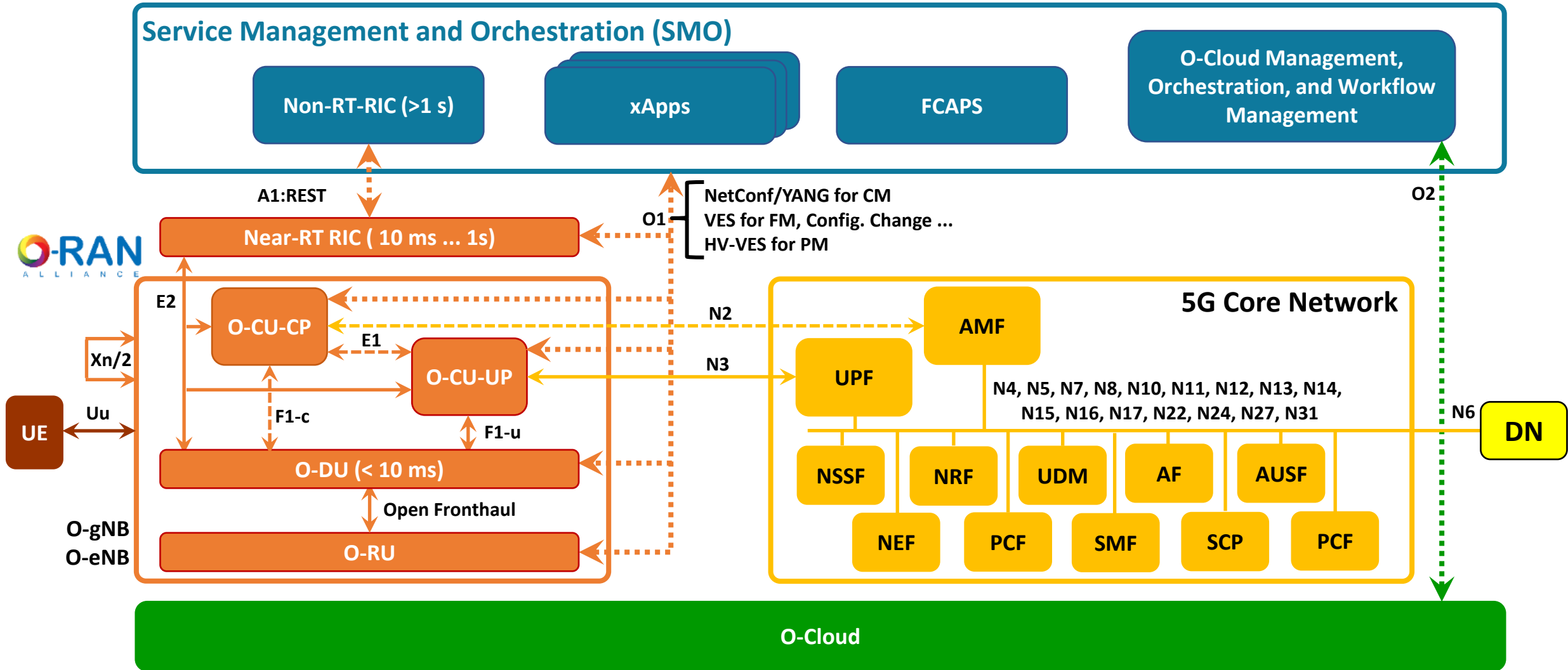
3 December 2020

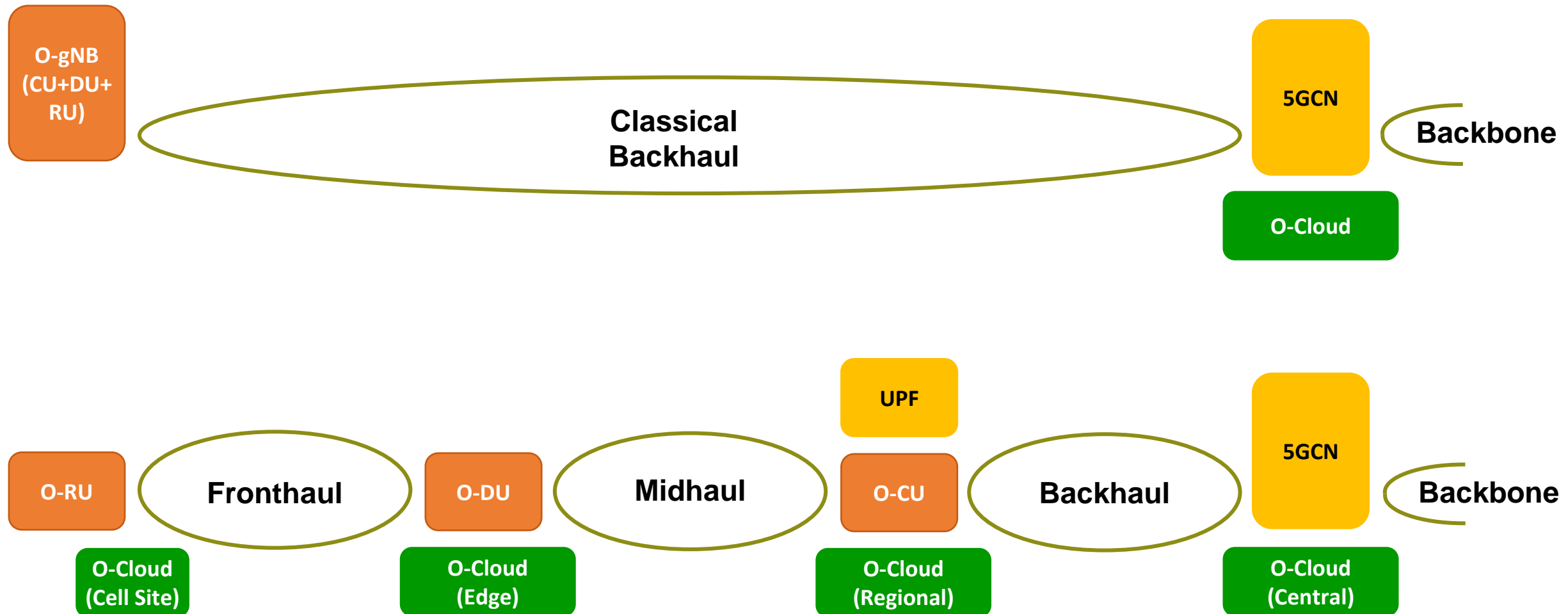OSNL OPEN SDN & NFV LAB

O-RAN and ONAP
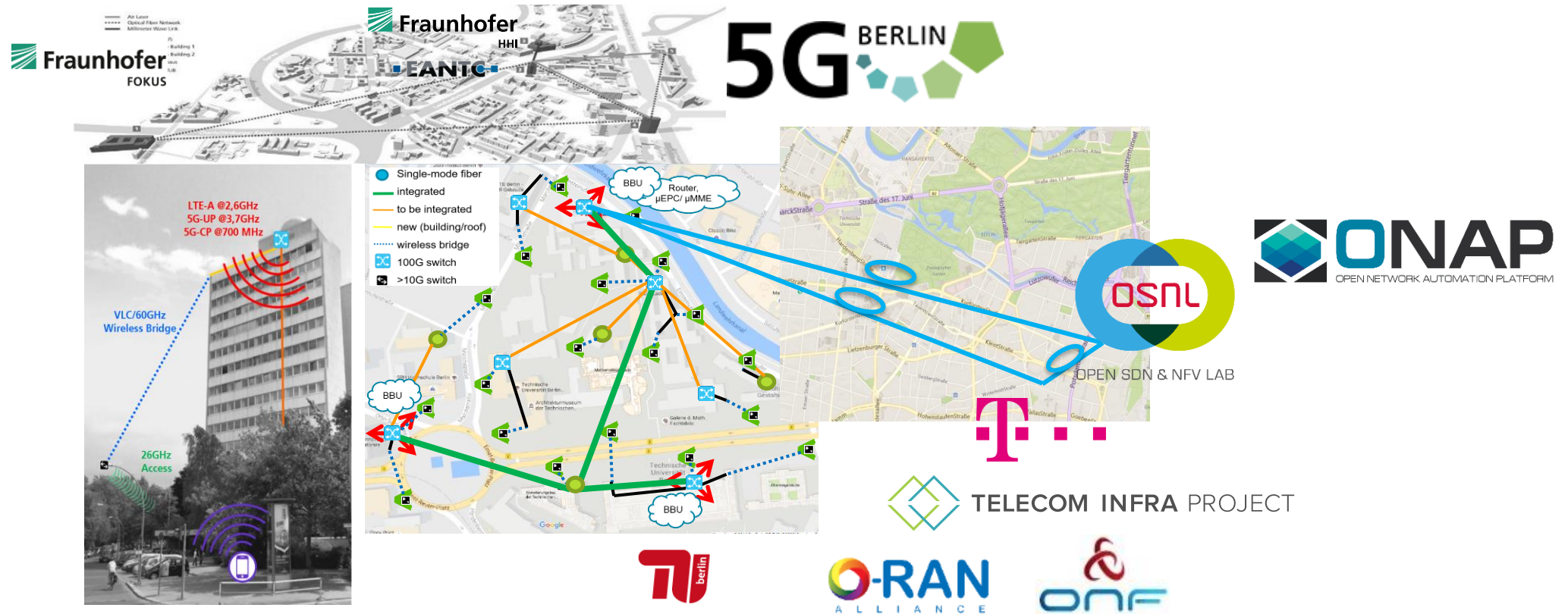## *O-RAN Architecture*

OSNL OPEN SDN & NFV LAB

Service Management and Orchestration (SMO)

| Non-RT-RIC (>1 s) | xApps | FCAPS | O-Cloud Management, Orchestration, and Workflow Management |

A1:REST

O1 — NetConf/YANG for CM
VES for FM, Config. Change ...
HV-VES for PM

O2

O-RAN ALLIANCE

Near-RT RIC (10 ms ... 1s)

E2

O-CU-CP

E1

Xn/2

O-CU-UP

Uu

UE

F1-c

F1-u

O-DU (< 10 ms)

Open Fronthaul

**O-gNB
O-eNB**

O-RU

5G Core Network

N2

AMF

N3

UPF

N4, N5, N7, N8, N10, N11, N12, N13, N14, N15, N16, N17, N22, N24, N27, N31

N6

DN

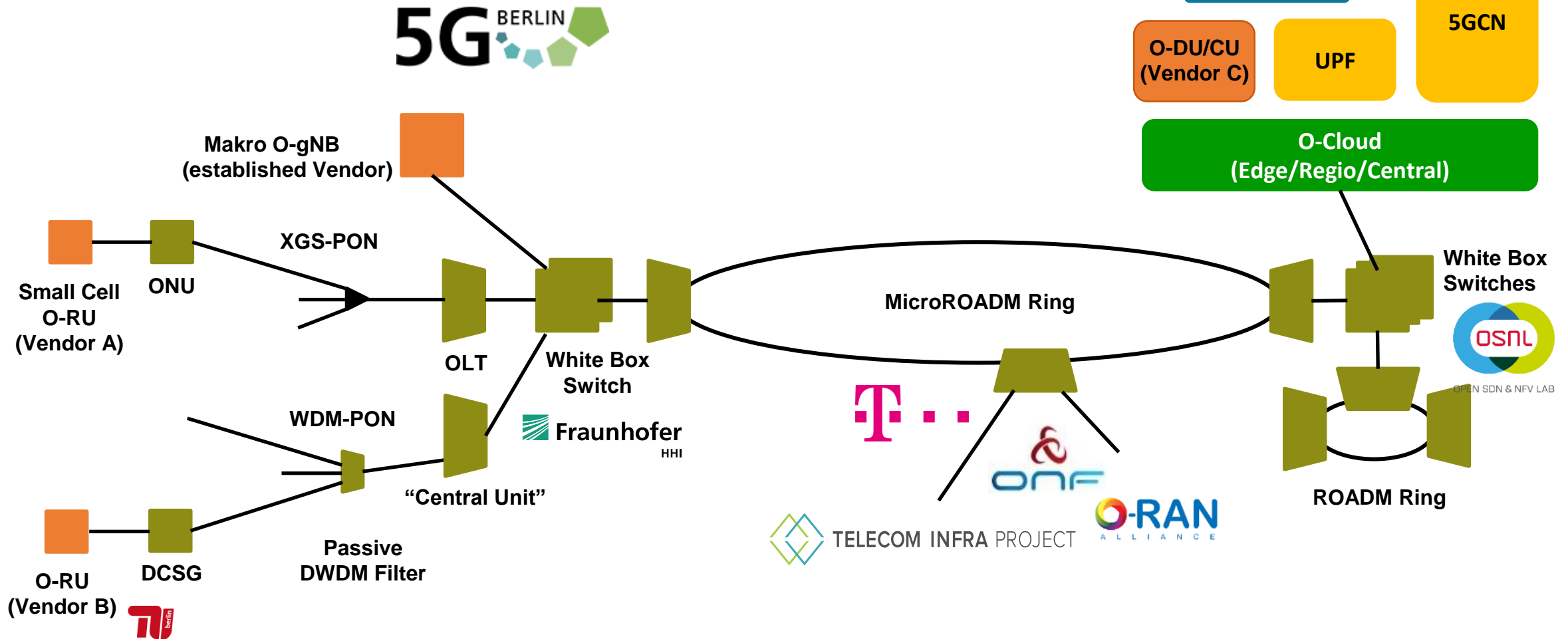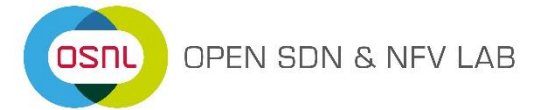| NSSF | NRF | UDM | AF | AUSF |
| NEF | PCF | SMF | SCP | PCF |

O-Cloud

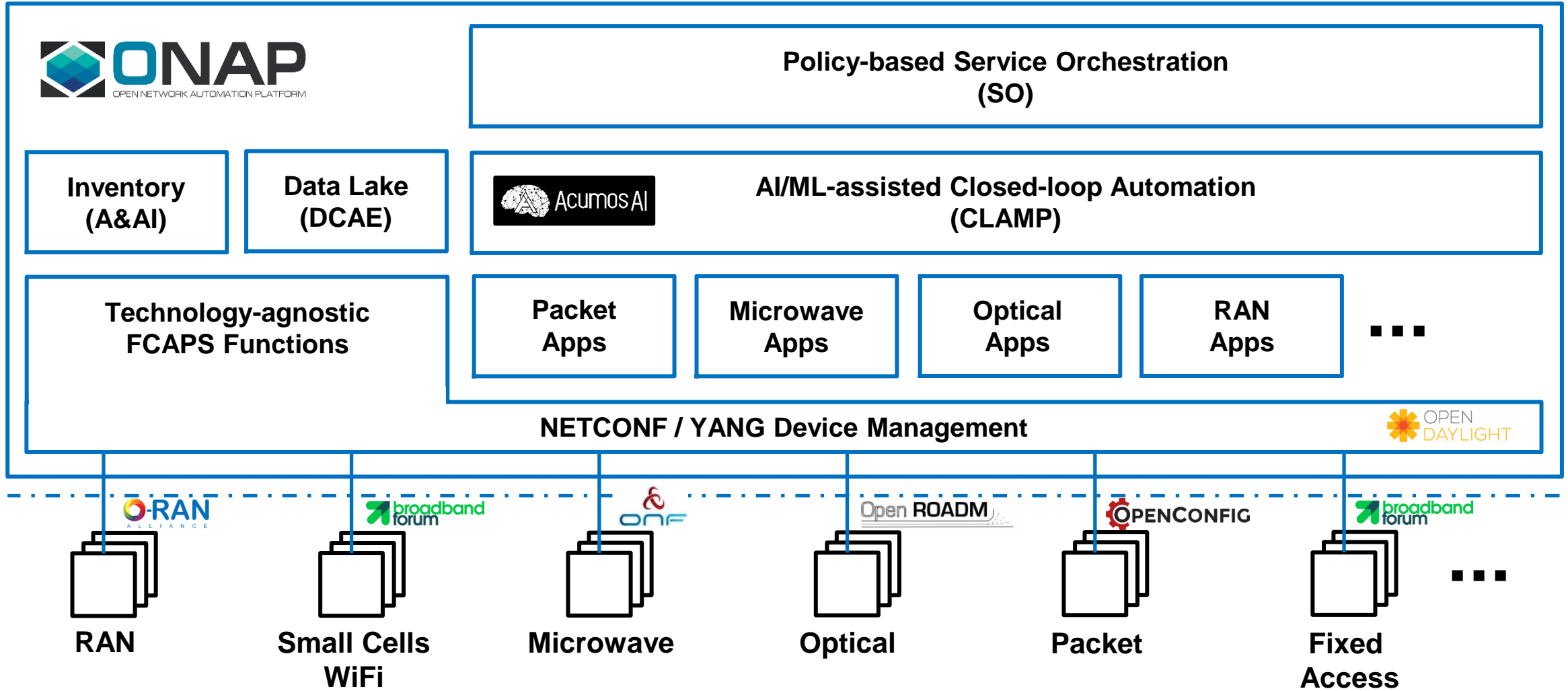## Integration of 5G Berlin, TIP / OTIC / ONF and the OSNL

O-RAN and ONAP
Connecting 5G Berlin, OTIC / TIP / ONF, and the OSNL

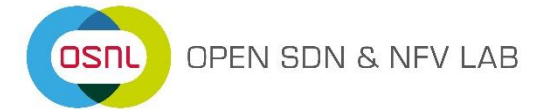# Open Network Automation Platform (ONAP)
ONAP-based Service Management and Orchestration

ONAP OPEN NETWORK AUTOMATION PLATFORM

Policy-based Service Orchestration (SO)

Inventory (A&AI)

Data Lake (DCAE)

Acumos AI

AI/ML-assisted Closed-loop Automation (CLAMP)

Technology-agnostic FCAPS Functions

Packet Apps

Microwave Apps

Optical Apps

RAN Apps

. . .

NETCONF / YANG Device Management

OPEN DAYLIGHT

O-RAN ALLIANCE

broadband forum

ONF

Open ROADM

OPENCONFIG

broadband forum

RAN

Small Cells WiFi

Microwave

Optical

Packet

Fixed Access

. . .

O-RAN and ONAP
5G Berlin Members and OSNL Partners

O-RAN and ONAP
Outlook to 2021

Q1 2020

- Fully O-RAN compliant 5G network in urban environment
    - O-gNB
    - O-RU / O-DU / O-CU from different vendors
    - Fronthaul / Midhaul / Backhaul transport: Optical, wireless and packet
    - Latency-optimized UPF separated from 5G Core
- Network slicing
    - "emergency" network slice for first responder application

Q2 2020

- Private 5G network in hospital
- Drone surveillance of critical infrastructure (railway)

Q3 2020

- Fully O-RAN compliant 5G network in rural environment
- 5G integrated in street lamps (invisible 5G)

Q4 2020

- Sharing of public RAN infrastructure
- Private 5G network in factory

Thank you!