

Open RAN推進分科会

-Background and Status of Open RAN-

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Rakuten Mobile, Inc.

Agenda

1 : Rakuten Open RAN Status

2 : Open RAN Challenges

Status of current RAN and Rakuten in 2018

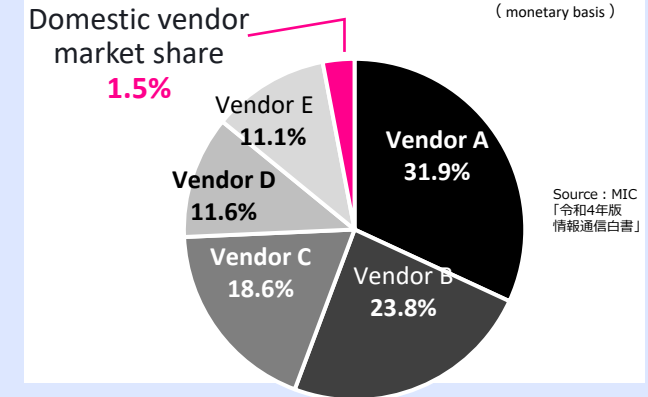
Current RAN Status in the world

Many operators want to change to a low-cost, high-quality RAN. However, current market is oligopolistic, making it difficult to change from their existing products to another vendor's.

<Challenges for telecom company>

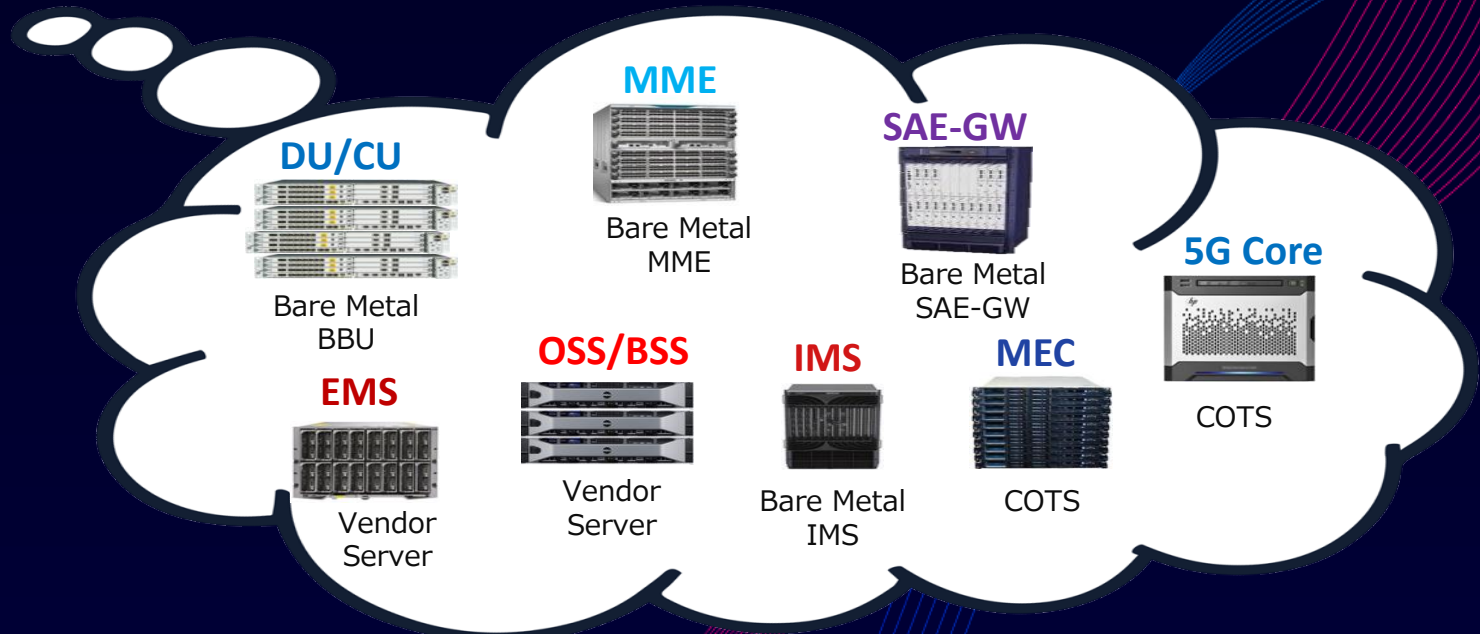
- ① Dependence on dedicated hardware from major vendors (see right)
 - ↳ High costs and risks due to wars
- ② Enormous capital investment/operating costs for base station construction
- ③ Transition to 5G/6G will take time

Reference: 5G base station market share



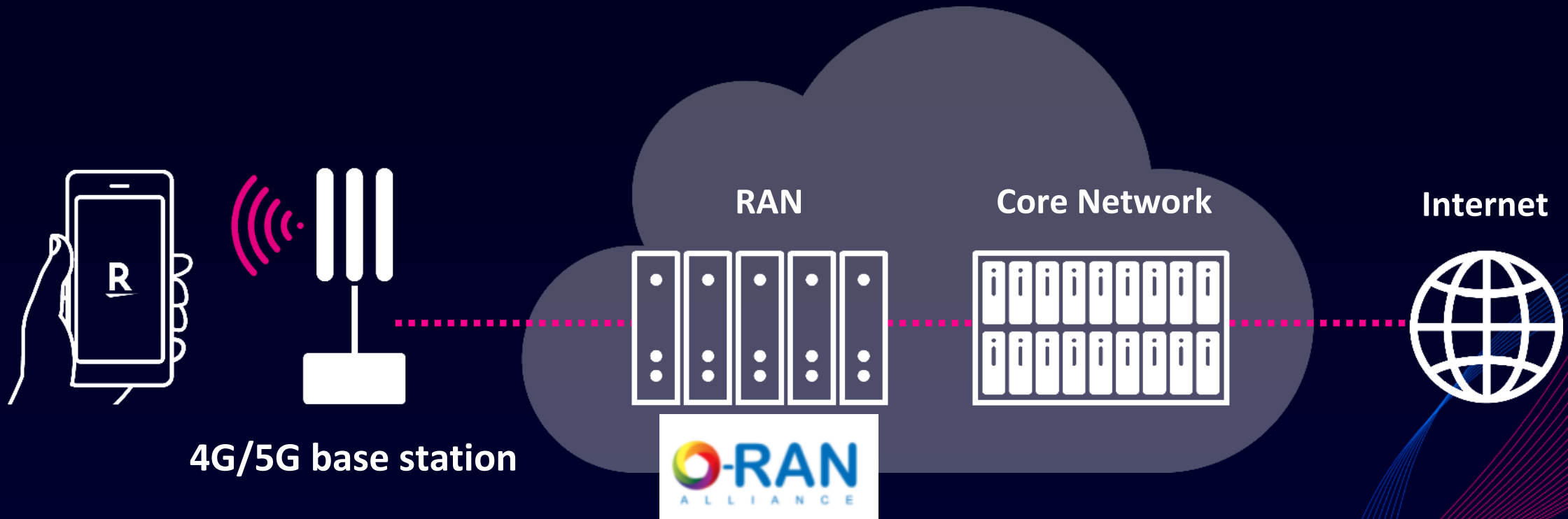
Rakuten Status in 2018

We needed to start up completely new telecommunications facilities as soon as possible, and to consider not only 4G but also the transition to 5G at the same time. New method needed to be taken into consideration.



World's First Fully Virtualized Cloud-Native Mobile Network

In October 2019, Rakuten Mobile became one of the first to commercialize



4G/5G base station

RAN

Core Network

Internet

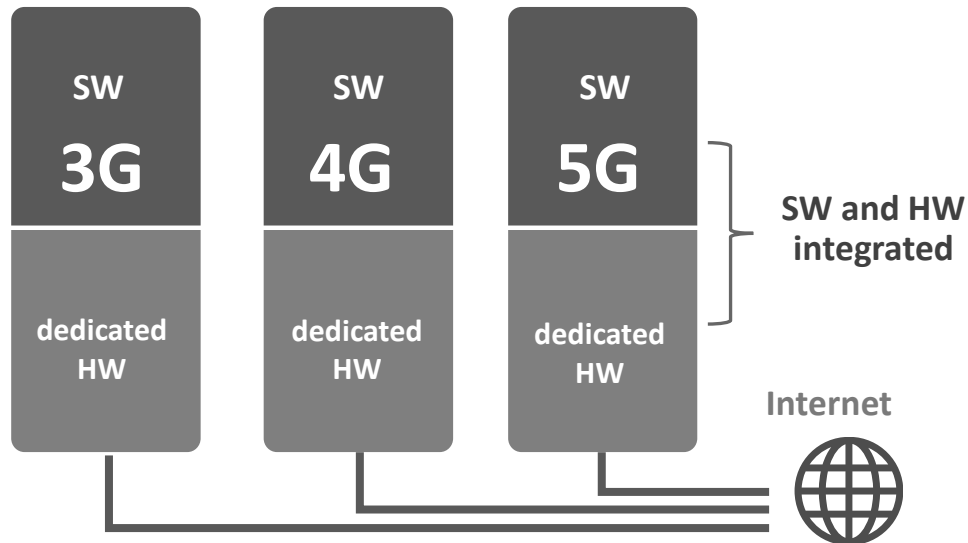
Fully Virtualized • Cloud-Native

Advantages of a fully virtualized cloud

A mechanism which is running software on generic hardware through virtualization technology

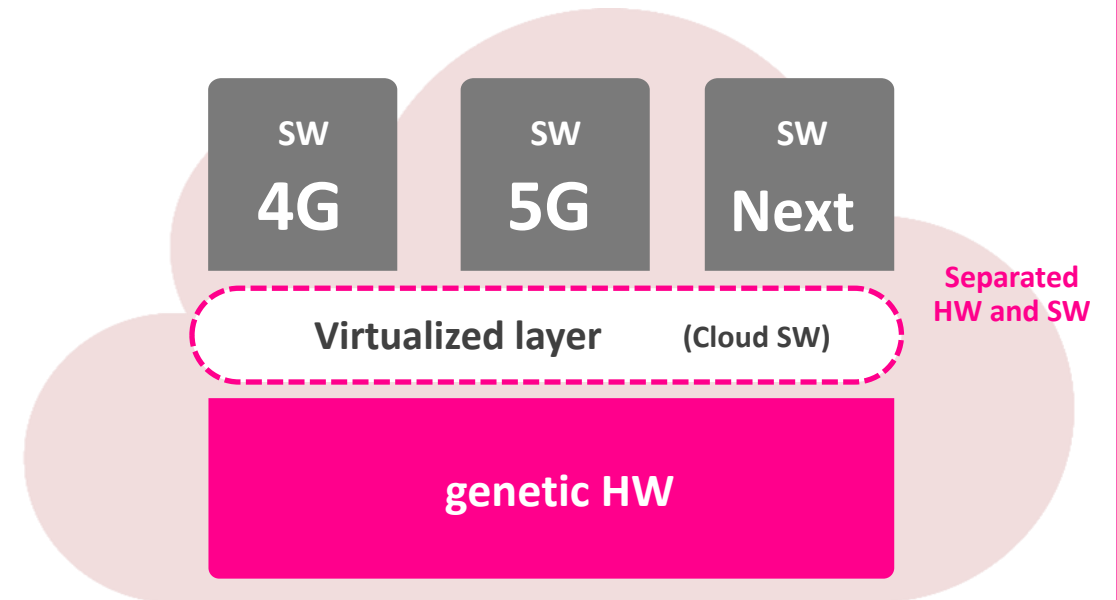
Conventional Vertically Integrated Telecom Network

Ex)



- Dependence on dedicated HW (fixed vendor)
- Transition to next-generation can take time
- Enormous capital investment/operating costs for base station construction

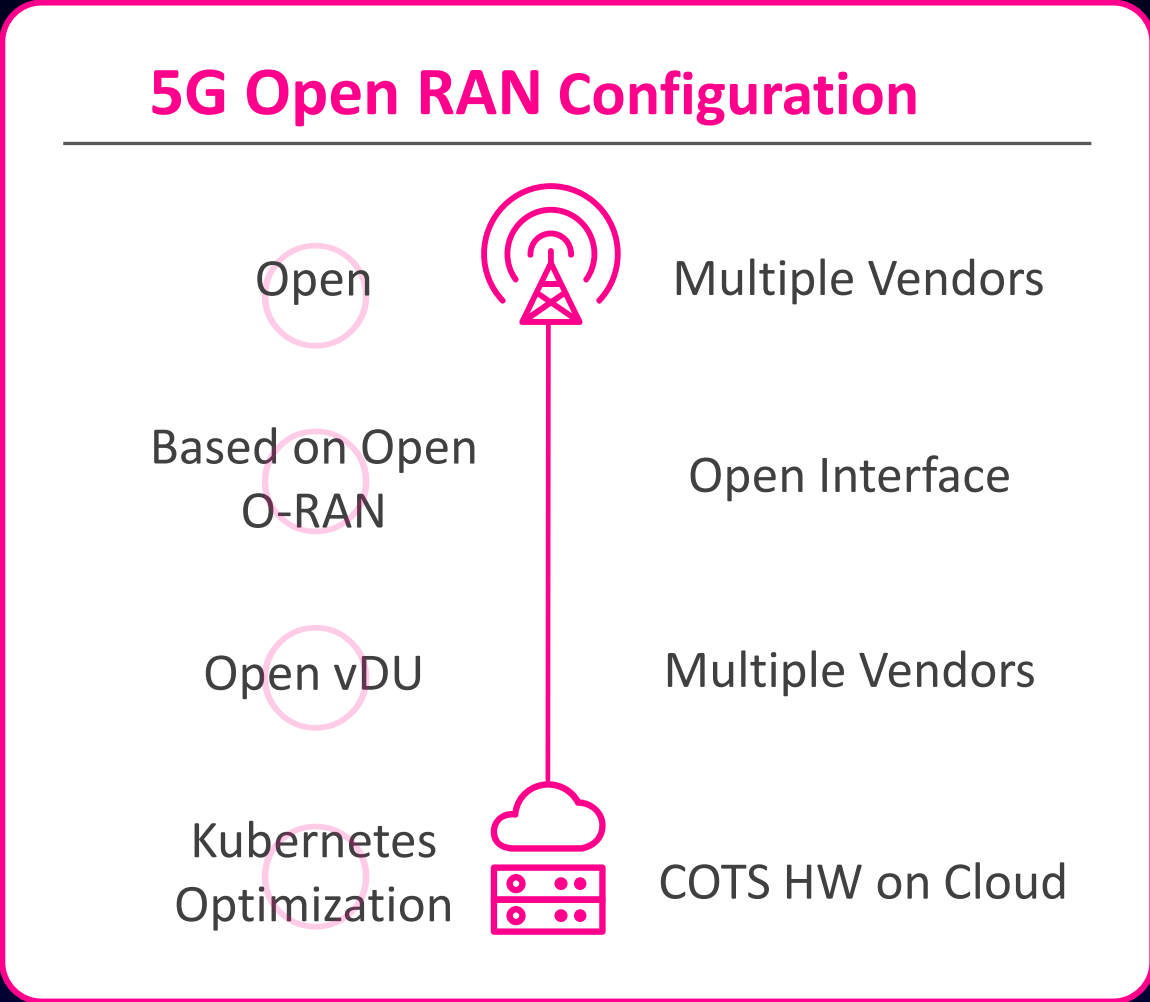
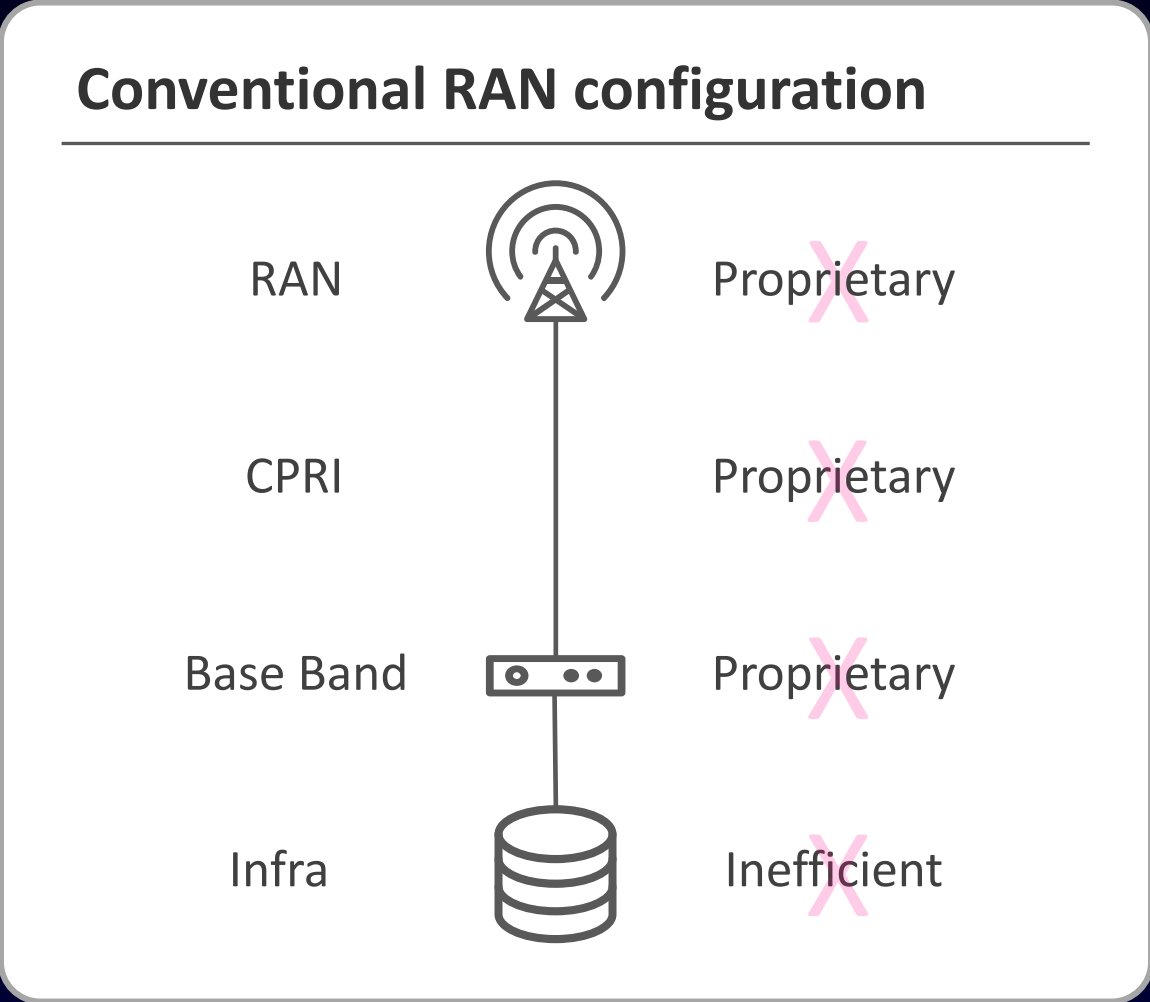
Fully Virtualized Cloud-Native Network



- **Generic HW is available (multiple vendor)**
- **Speedy transition to next-generation**
- **Significantly reduced capital investment/operating costs**

Advantages of Open RAN

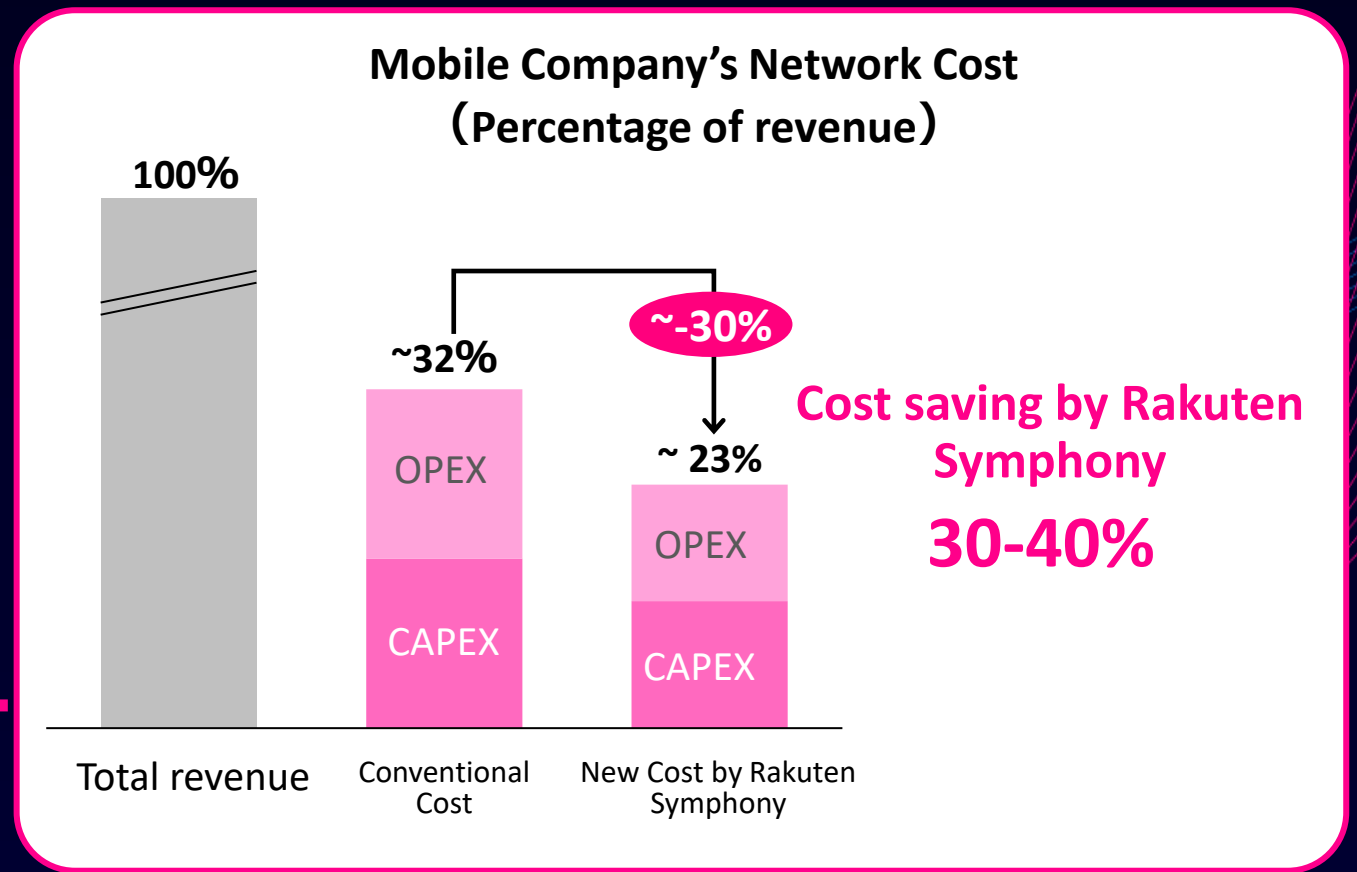
Enables to build RAN with multiple vendors



Cost Advantages of Fully Virtualized Cloud-Native Network

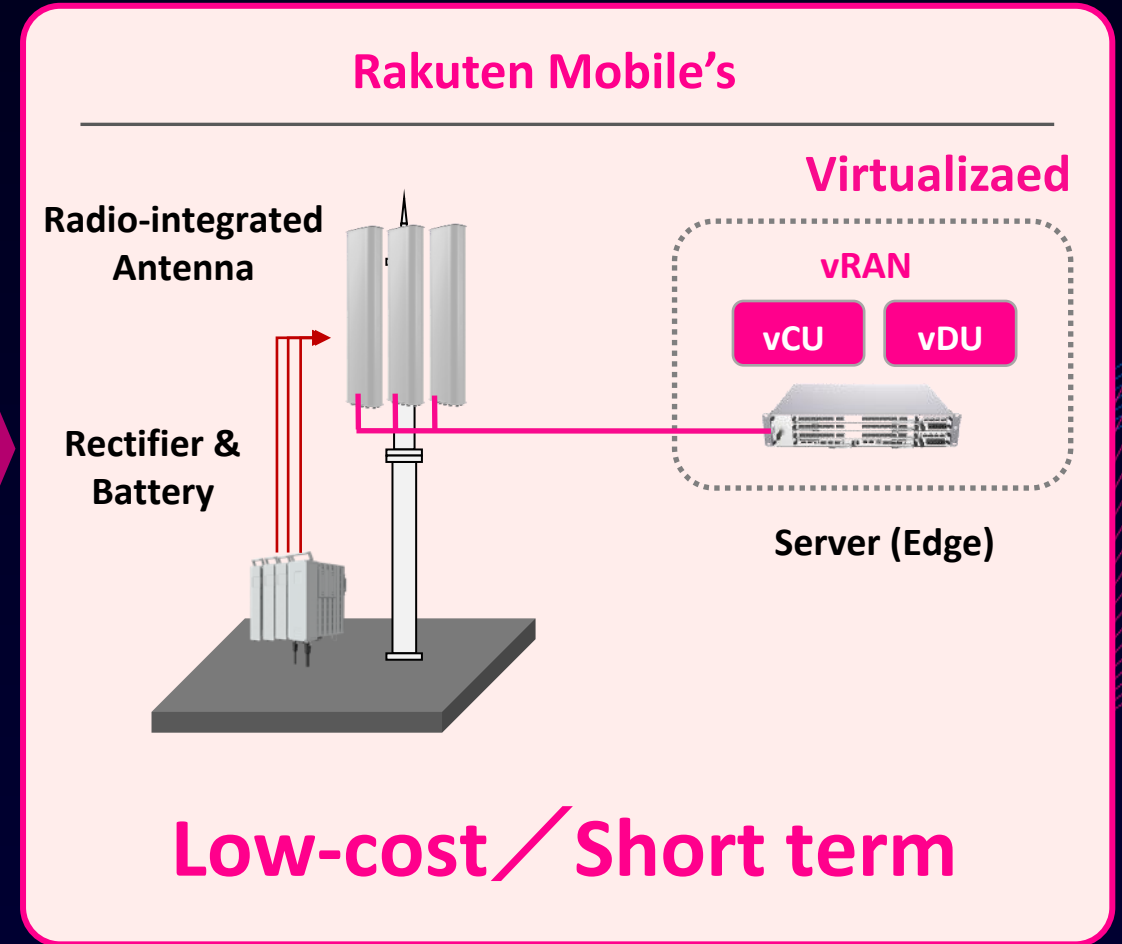
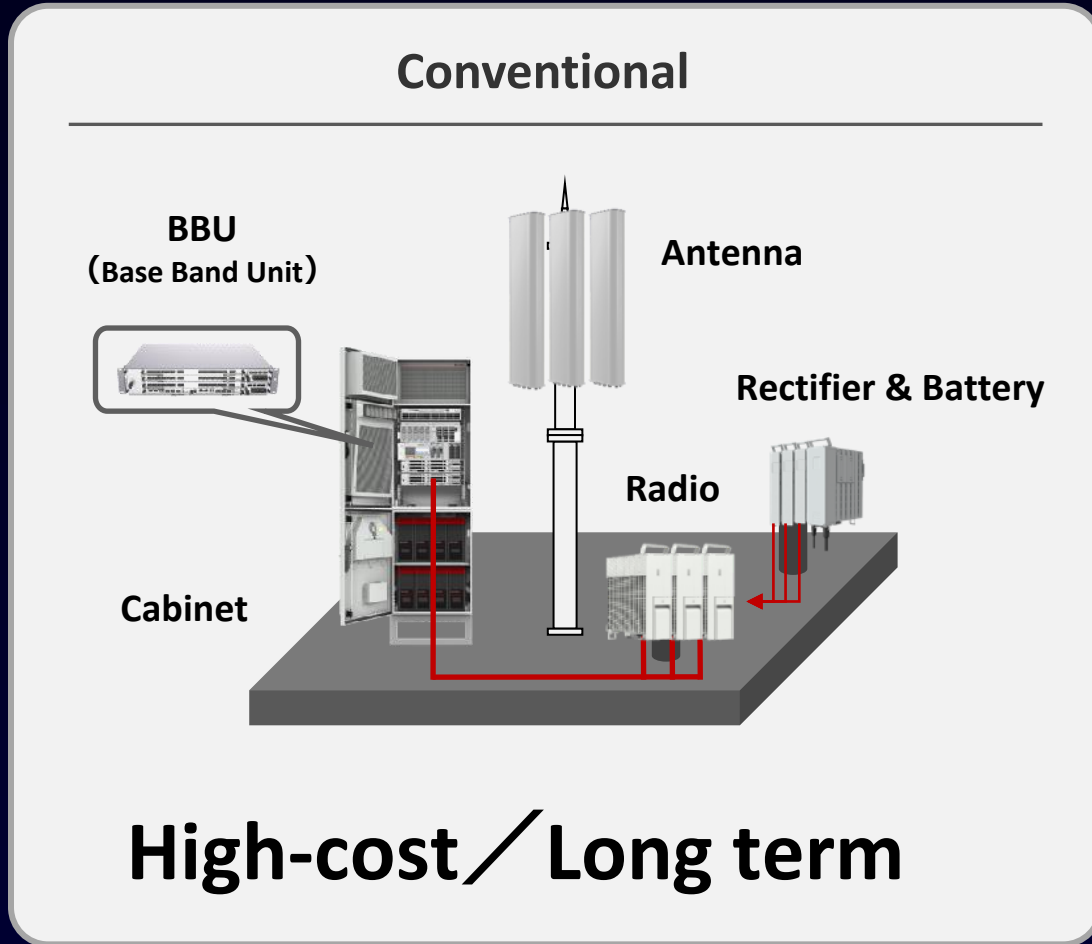
Advantages

- ✓ Avoiding specific vendor lock-in
- ✓ Additional services for network operation
- ✓ Network optimization by AI
- ✓ Cost-effective solutions
- ✓ Secure network



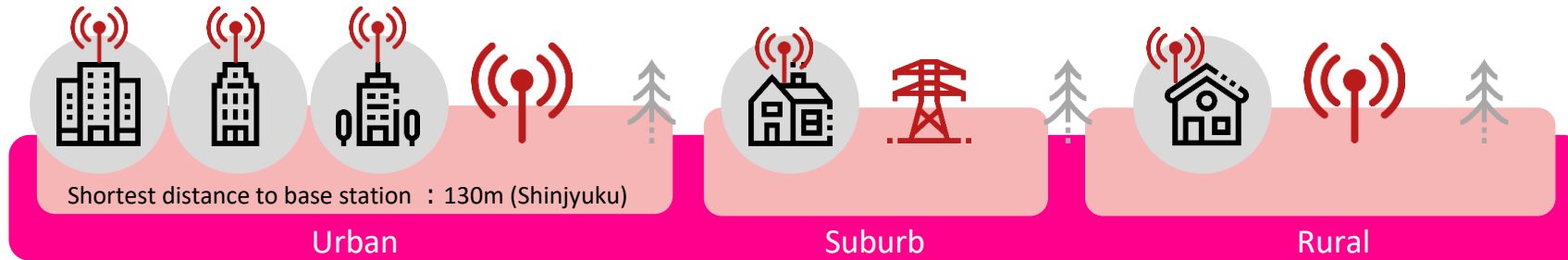
Simple Configuration of Base Station

Virtualization technology enables "simple" and "compact" base station configuration

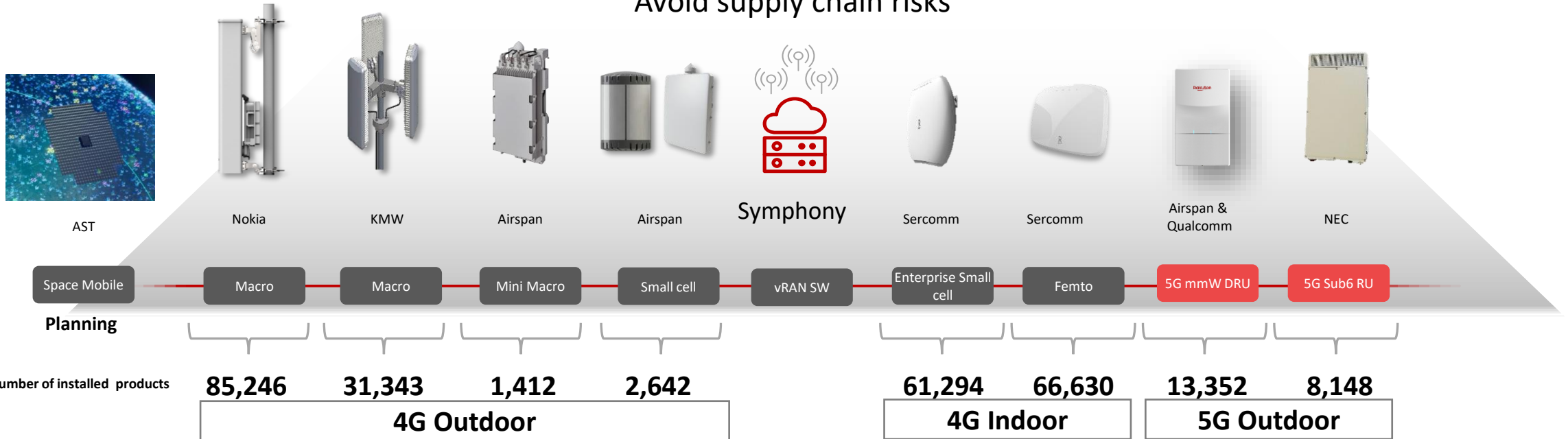


Virtualized Open RAN allows for early deployment

(as of Apr 2022)



Open RAN products for a variety of deployment use cases
Avoid supply chain risks

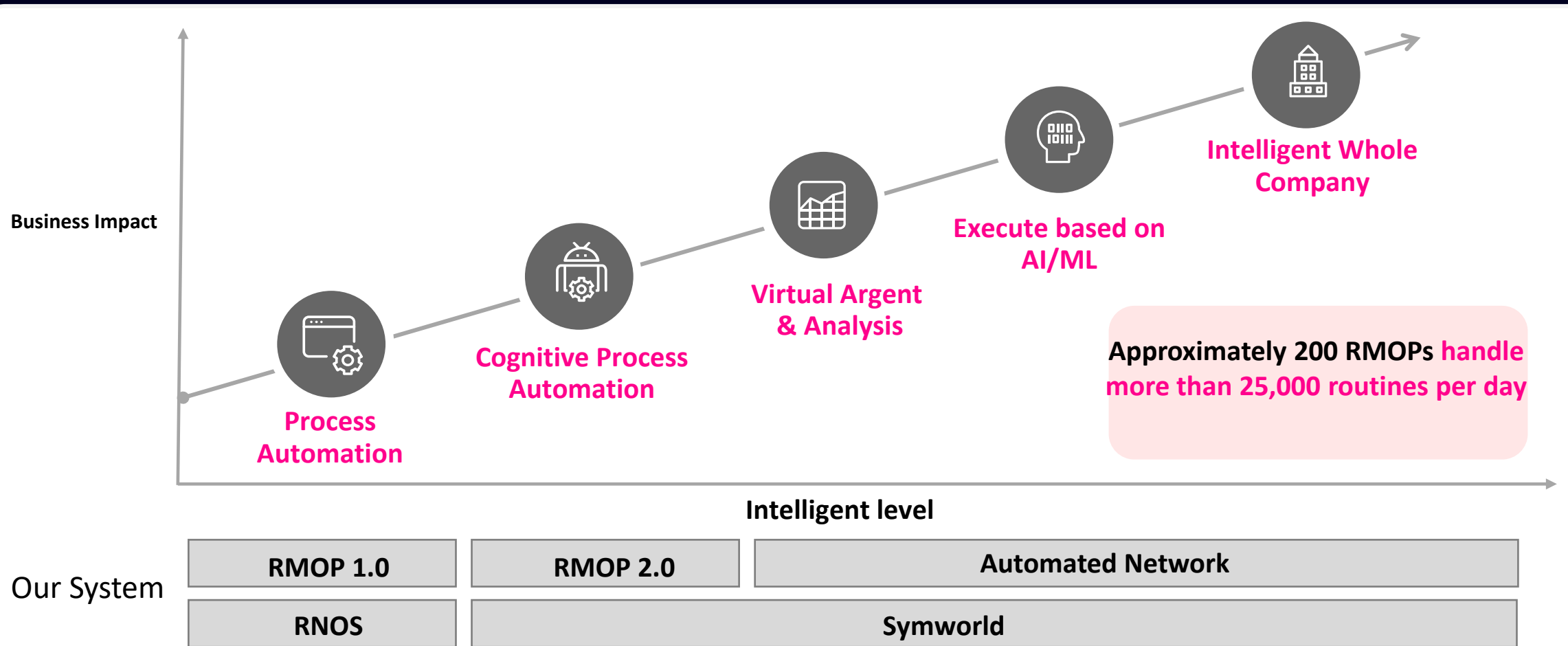


Symcloud

Symworld (Autocommissioning)

Operational Reduction through Automation

Developed world-leading "Automation Framework"



※RMOP: Proprietary business automation platform ※RNOS: Proprietary E2E network operation and management system

96% population coverage with Open RAN

4G Coverage Percentage ※1

※1

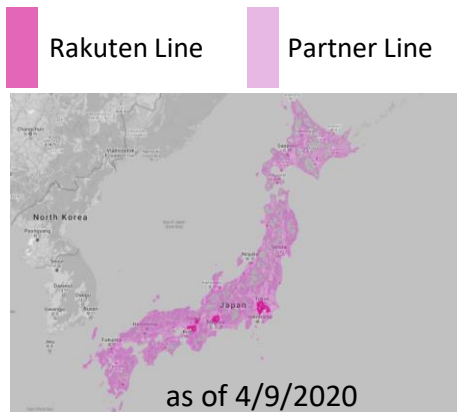
Mar. 2021
80.1%

Feb. 2022

96.0%

Apr.

97.2%



Mar. 2020
23.4%

Achieved "96% population coverage" of the opening plan **4 years ahead of schedule.**

Mar. 2020

Mar. 2021

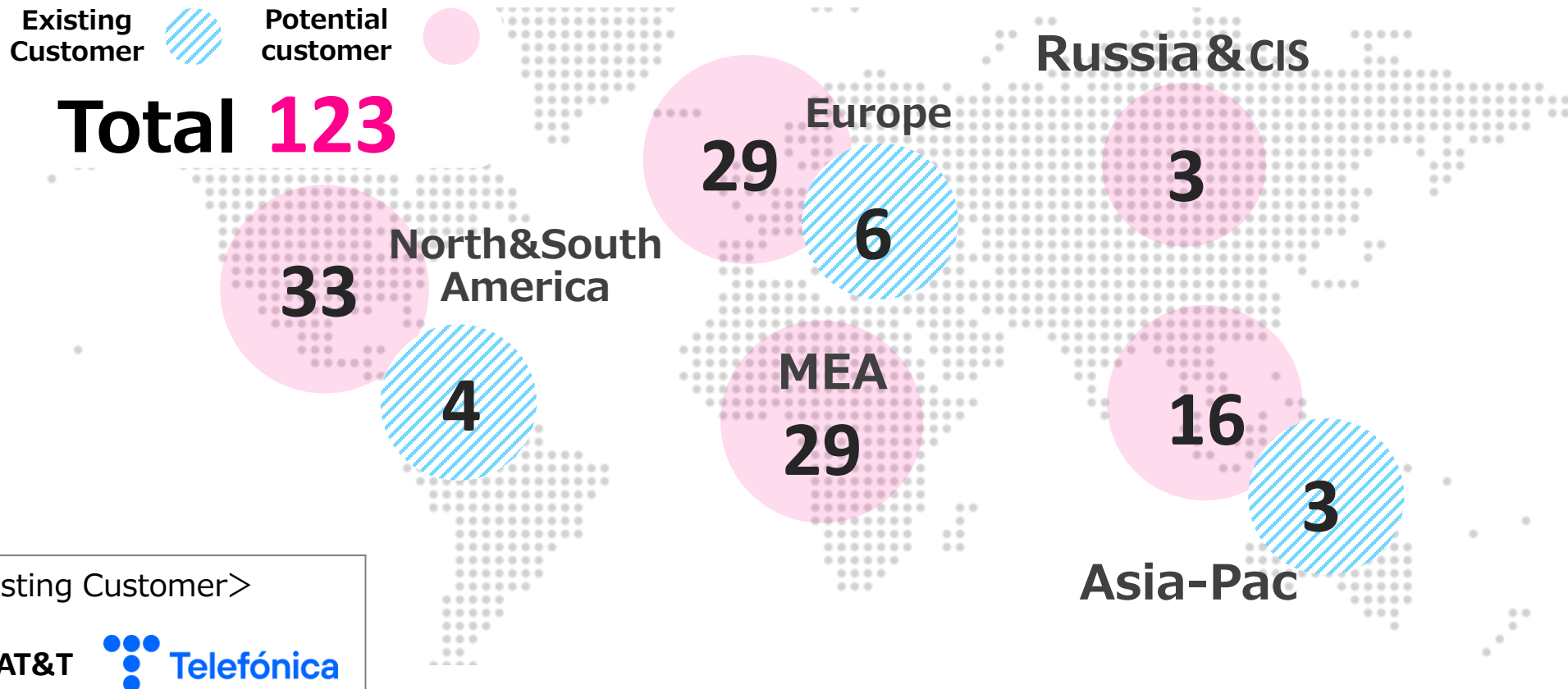
Feb. 2022

Apr.

※1: Population coverage as a percentage of nighttime population

Global Interest in Open RAN

Overseas offices established in 8 countries, conducting business negotiations with telecommunications carriers, governments, etc.



Agenda

1 : Rakuten Open RAN Status

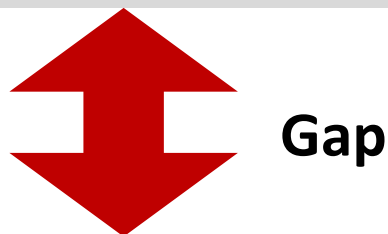
2 : Open RAN Challenges

What Customers Are Saying About Open RAN

<これまでの通信事業者の課題>

Issues (Customer's review)

- ✓ Are the quality of existing RANs and ORANs really equivalent?
- ✓ Concerns about security because of Open **Interface**
- ✓ Unsure of integration in multi-vendor configurations
- ✓ Unsure how to deploy multi-vendor commercial **network**



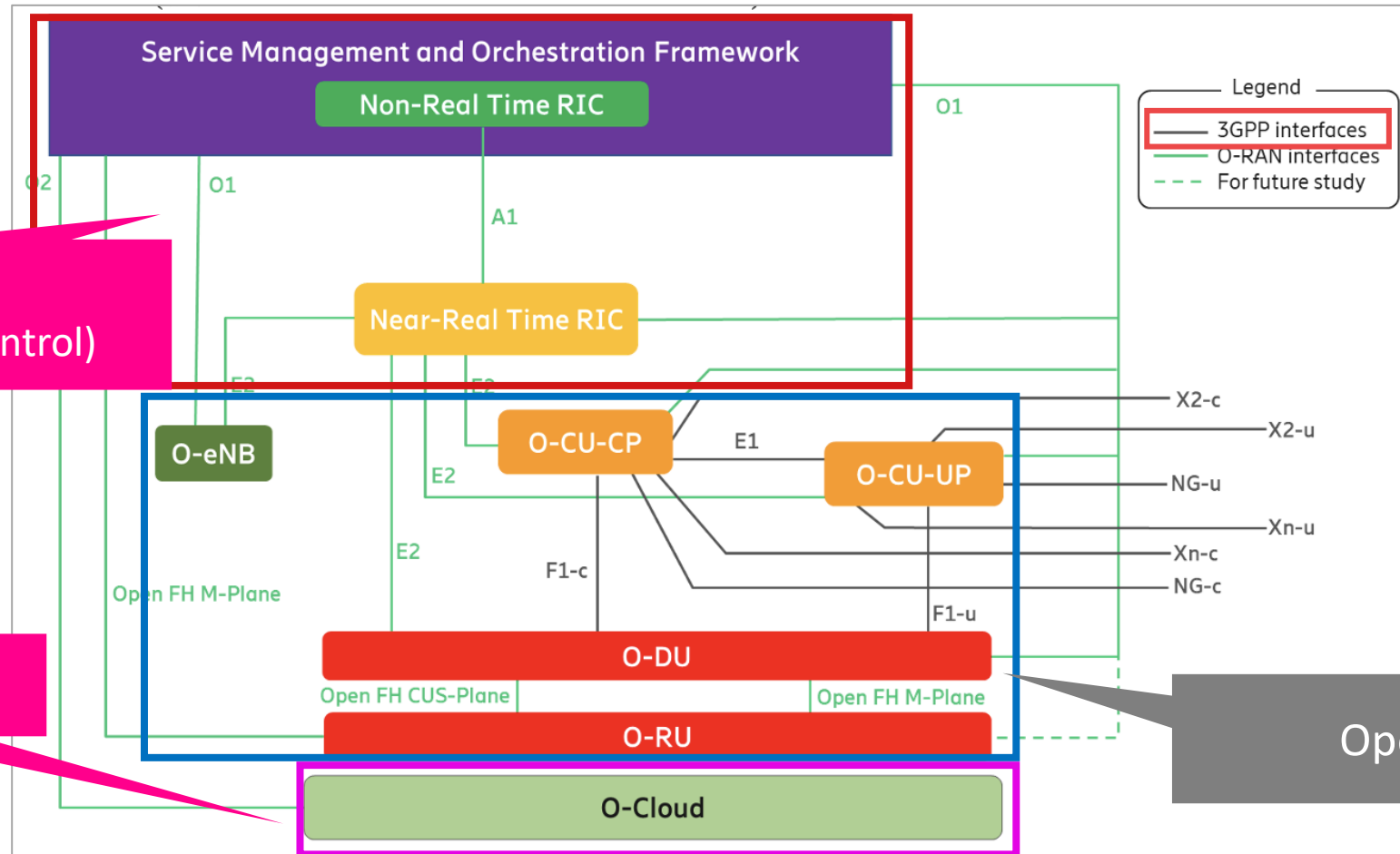
Gap

ORAN Operator's review

- ✓ Quality of existing RANs and ORANs are equivalent.
- ✓ Security standards with O-RAN Alliance SFG(Security Focus Group)
- ✓ Integration in multi-vendor configurations has already been streamlined
- ✓ Streamlined multi-vendor commercial deployment methods

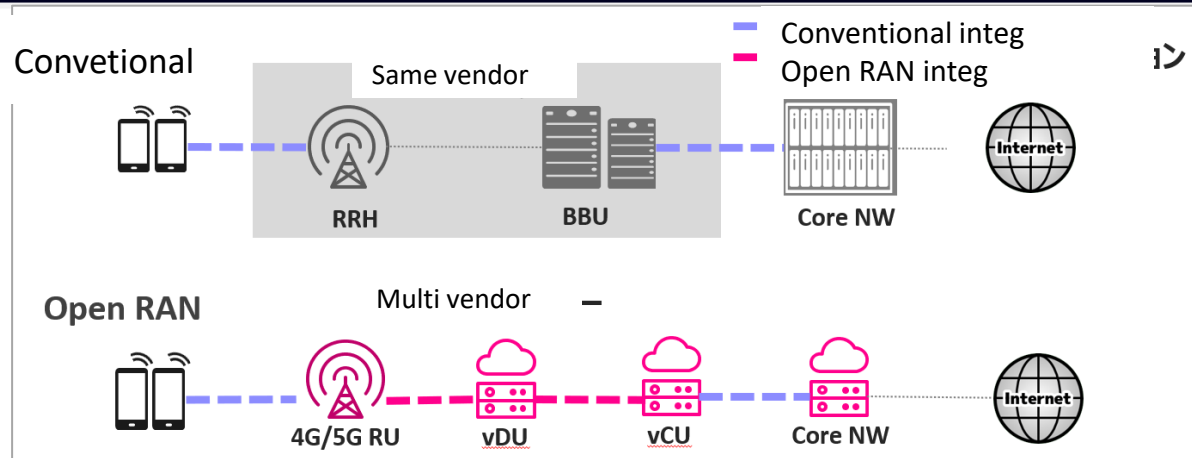
About Open RAN

- ✓ Even if it is ORAN, it is basically 3GPP compliant except for RIC and Cloud
- ✓ Technically, there is no difference between conventional RAN and ORAN, only that they are "open".

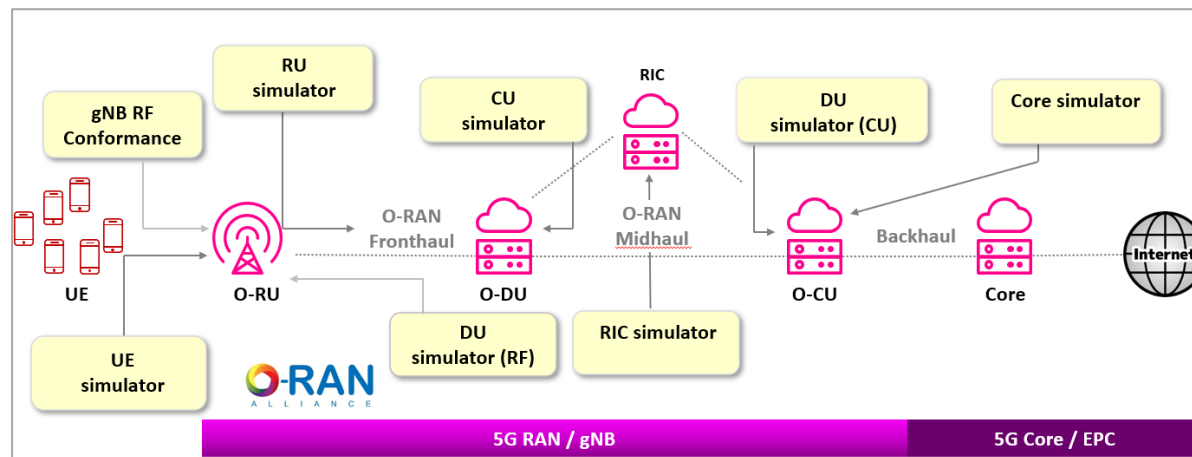


Open RAN Integration Complexity and Support

High quality and low cost, but integration has become more complex
Integration support programs are important to reassure customers



Integration previously not considered by operators



Non-experienced operator cannot handle the quality assurance, which requires various types of simulators

Rakuten Mobile