



**ROAMING**  
Networks

# **OPEN RAN TRENDS**



# About Us

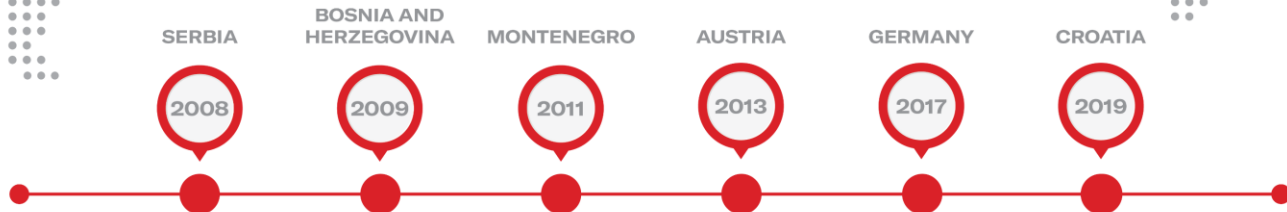
**Roaming Networks** is a system integrator company, a Digital General Contractor delivering high-end services in telecommunications and beyond across global markets. An 800-people-strong organization caters for design, build, integration, and other services, allowing clients to place their focus on what is important to them. We developed our capabilities over generations of sophisticated technologies and continue to do so by following customers' needs and expectations. Our own software development enables us to digitalize our work and through automation and standardization, efficiency and performance are continuously pushed ahead.

Forward is the only way for Roaming Networks, growing through state-of-the-art technology, aiming at a simpler and smarter future in an ever more connected world.

Come, roam with us!



-  BALKAN REGION
-  EUROPEAN UNION





# SERVICES

# Radio Communications

Comprehensive portfolio of services covering all steps from design and build to live on-air radio networks in a multiple-vendor environment. Deep-rooted in technology expertise, we are delivering 5G and Open RAN in scaled-up, demanding, and complex radio projects, supporting the client's vision and end-customer's experience.



# Passive Optical Networks and Access Systems

Extensive experience in designing and building fibre networks across international FTTx projects, from dense urban to rural networks. Turnkey solutions for connected homes and businesses and backhaul and backbone networks alike. Providing custom-made designs for the conduit and fibre infrastructure while planning for capacity and connectivity.





# ICT Infrastructure, Data Center and NOC

Turnkey solutions and services for transmission systems (IP, DWDM) in a multi-vendor environment, as well as data centre infrastructure design, build, and maintenance for Enterprise, ISP, Mobile, and SOHO. NOC Front Office and Back Office, 24/7/365 days, monitoring, ticketing, troubleshooting, dispatching, planning, and configuration services.



# Life Safety, Security, Building Automation and Management Systems

End-to-end solutions in Life Safety, Security, Building Automation, and Management Systems. Providing risk assessment, planning, design, implementation, and maintenance, as well as management and optimization of energy efficiency. The world of state-of-the-art sensors and IoT by global-leading partner network, resulting in smart solutions for smart living and businesses.



BUILDING MANAGEMENT SYSTEMS



VIDEO SURVEILLANCE SYSTEMS



VIDEO AND AUDIO INTERCOM SYSTEMS



FIRE SYSTEMS



ALARM SYSTEMS AND PERIMETER PROTECTION



ACCESS CONTROL AND TIME ATTENDANCE SYSTEMS



SECURITY SOLUTIONS INTEGRATION IN CENTRAL SECURITY MANAGEMENT SYSTEM



PUBLIC ADDRESS SYSTEM



# Industrial Automation

Managing the complexity of production processes through systems for Industrial automation and the Internet of Things. The in-house expertise in Industrial Automation over years of successfully delivered projects, ranging from preliminary studies and initial designs towards engineering, project implementation, and final commissioning with systems in full operation.



CONNECTIVITY



DEVELOPMENT  
PLC



IIOT



MOTOR



DRIVE  
CONTROL



FACTORY 4.0



PERFORMANCE



ROBOTIC

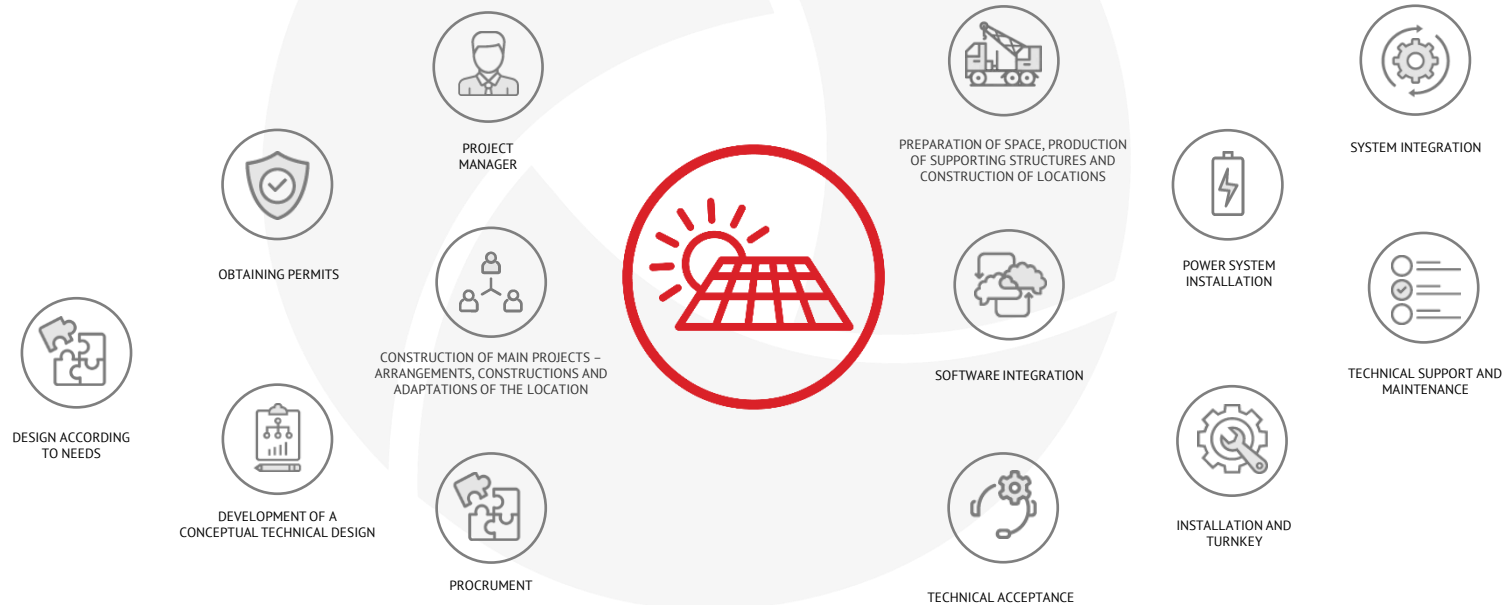
# Roaming Towers

Through in-house synergies in design and build, powered by international experience, newest technology, and applications as well as solar power systems, implementing digital towers and rooftops by the latest telecommunications standards. Custom-designed locations for mobile and Wi-Fi networks, smart city solutions, and other connectivity-providing clients.



# Solar Power Plants

Portfolio of design and construction of solar power plant services, reducing customers' carbon footprint. Innovative plug-and-play solutions and dedicated solar engineering consultancy. The quality of the service meets all market demands.



A red-tinted background image showing a person's hands working at a desk. The left hand is on a keyboard, and the right hand is on a mouse. In the center, there is a small notebook with a pen resting on it. The overall scene is a workspace or office environment.

**WE EMPHASIZE**

# Employee Skills & Tools Development

Every one of us strives towards a common goal of achieving what matters most – connecting and growing together.

## Employee



- More than 800 good people
- More than 321 engineers
- More than 460 technicians

## Digital Business



- Close Out

## Education & Training

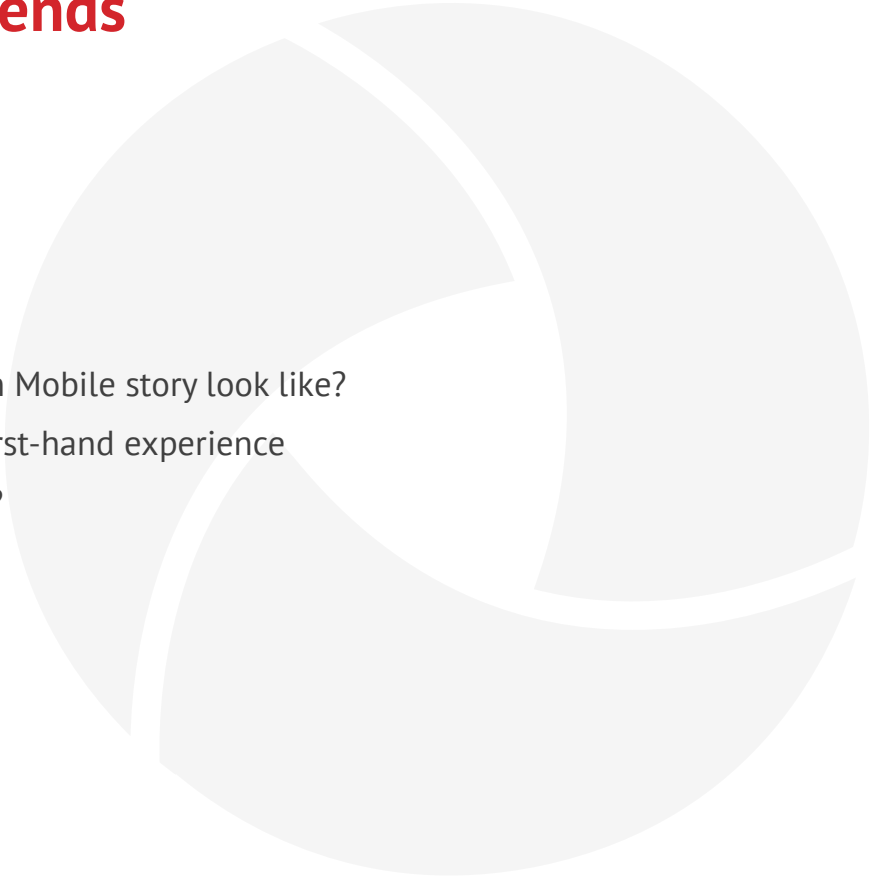


- Accredited training center
- Engineer of the future
- Practice program

A red-tinted background image showing a person's hands working at a desk. The person is wearing a watch on their left wrist. They are using a keyboard and a mouse. A notebook with a pen is open in front of them. The text "OPEN RAN TRENDS" is overlaid in the center.

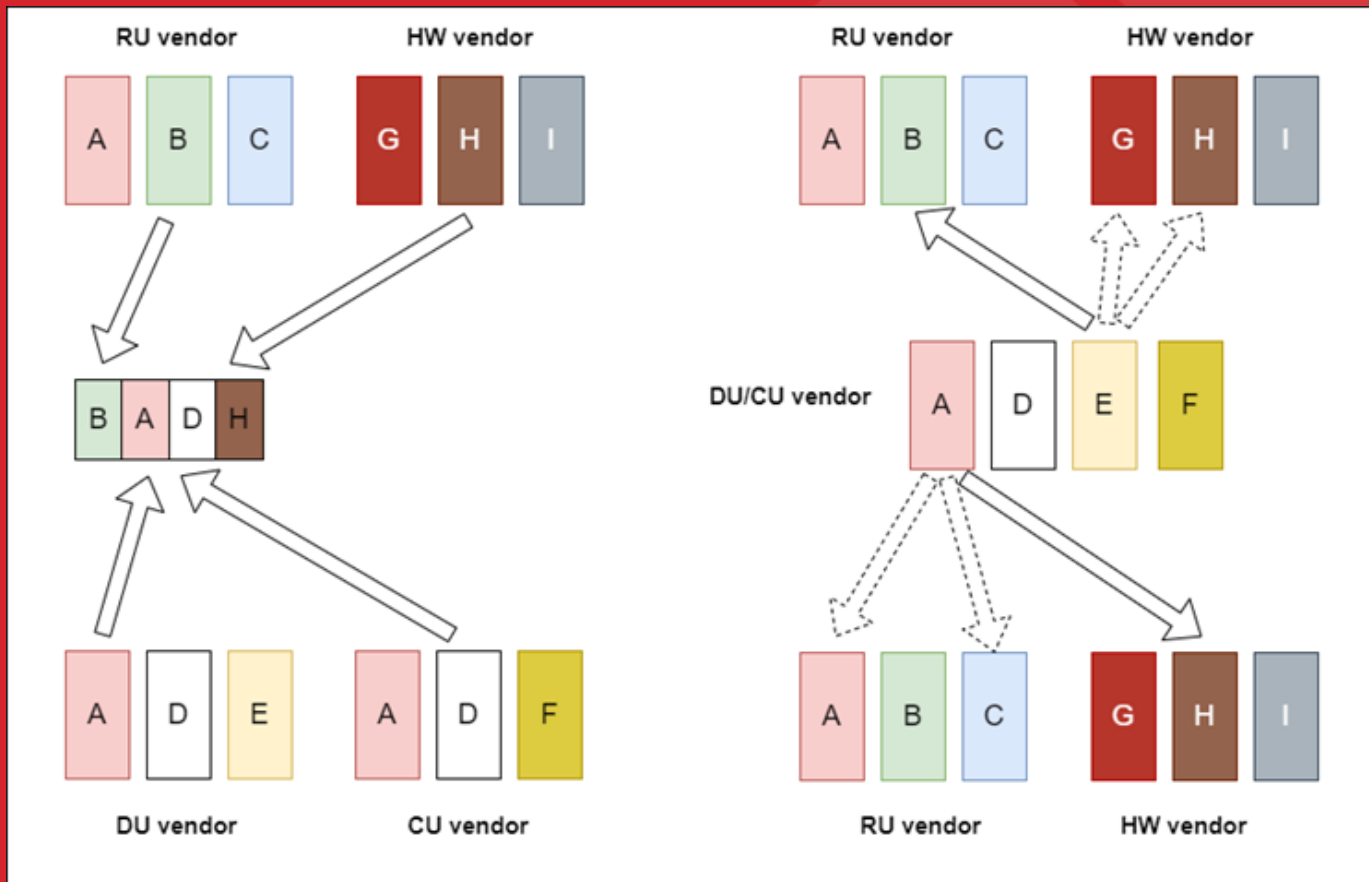
# OPEN RAN TRENDS

# Open RAN trends

- Theory and practice
  - Where are we now?
  - What does a Rakuten Mobile story look like?
  - Deutsche Telekom first-hand experience
  - Where are we going?
- 



# Theory vs Practice



# Where are we now?

5G MAGAZINE BY TECKNEXUS

## CURRENT STATE OF OPEN RAN DEPLOYMENTS | AS OF JUNE 2022

**50** ONGOING OPEN RAN DEPLOYMENTS/TRIALS

**1** Rakuten, Japan and DISH Networks in the US are the only two large-scale deployments of Open RAN network.

**2** All other CSPs noted here have either very limited deployment or are still in the trial phase

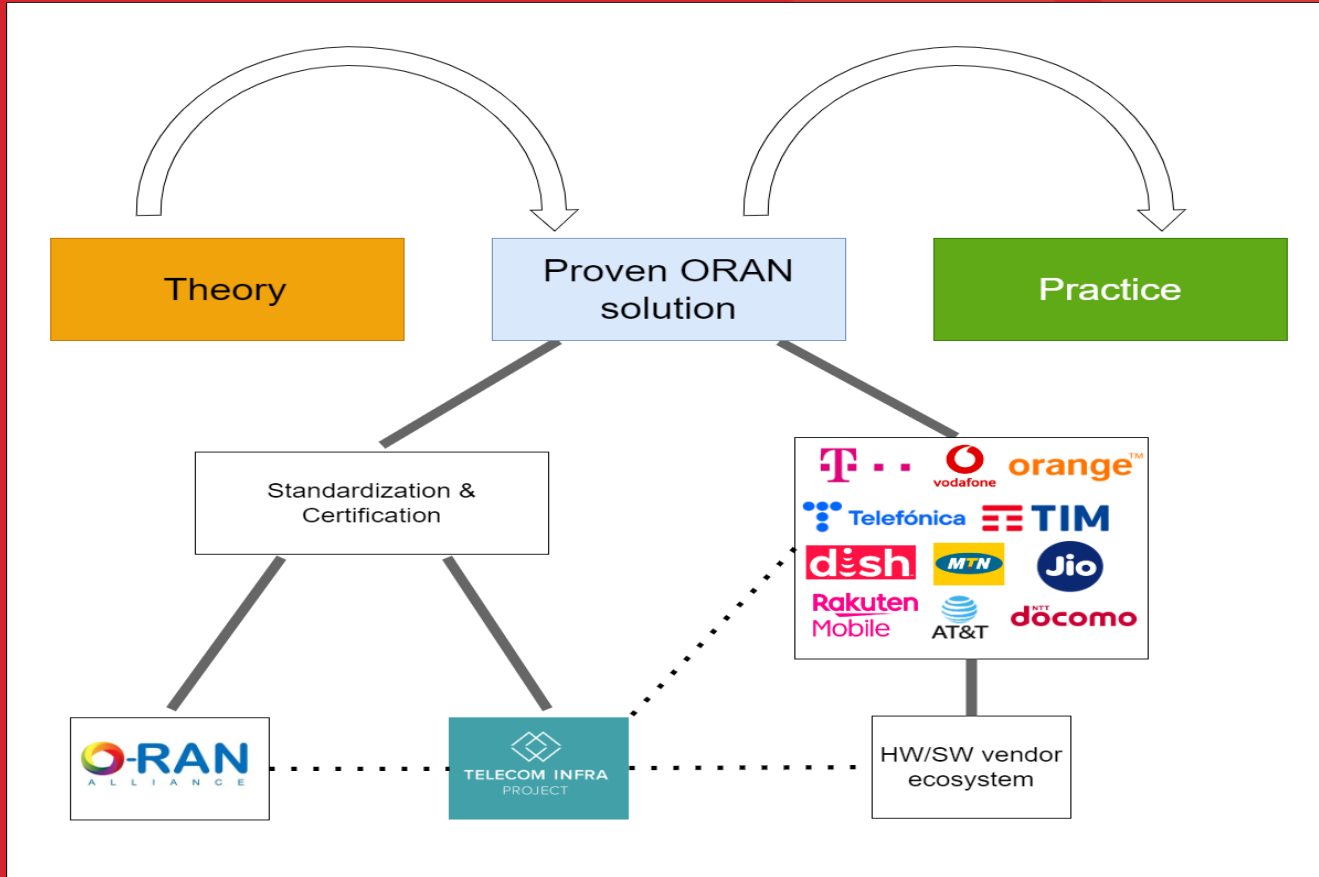


Source: TECKNEXUS,  
as of June 2022

Brisanet, Claro, TIM and Vivo are planning Open RAN trials in Brazil and Latin America with Parallel Wireless

MTN is planning Open RAN trials in South Africa, Nigeria and Liberia with Rakuten Symphony

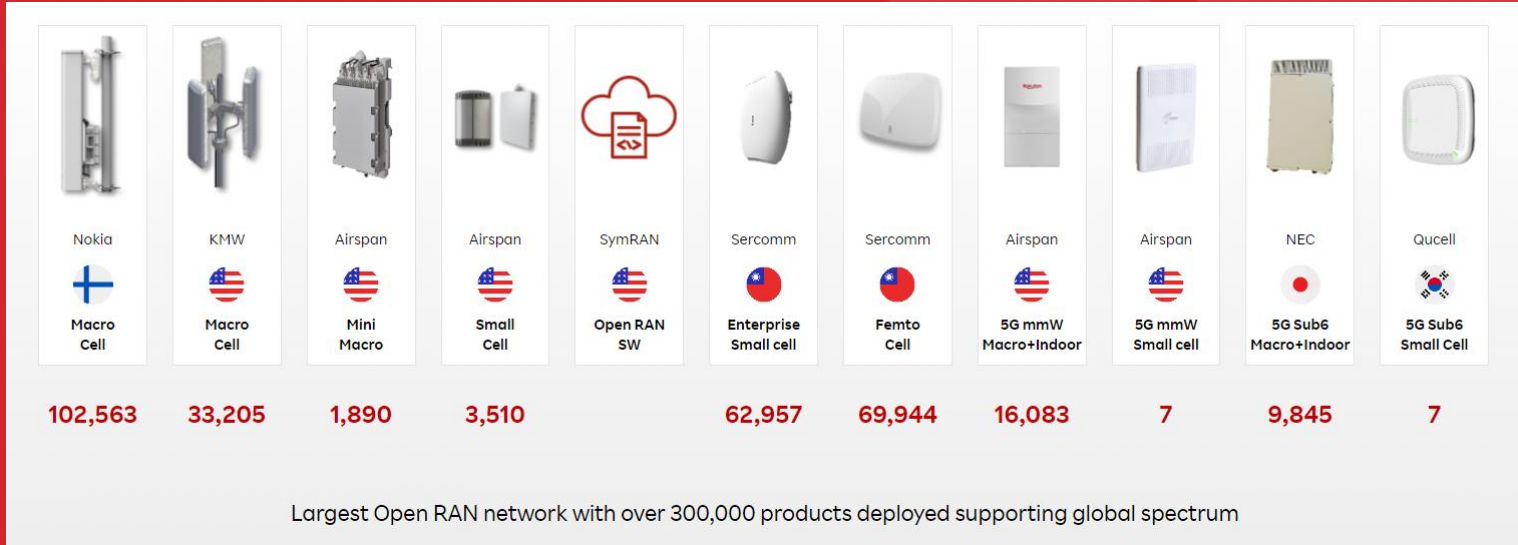
# Bridge the gap



# TIP release framework



# Rakuten Mobile story

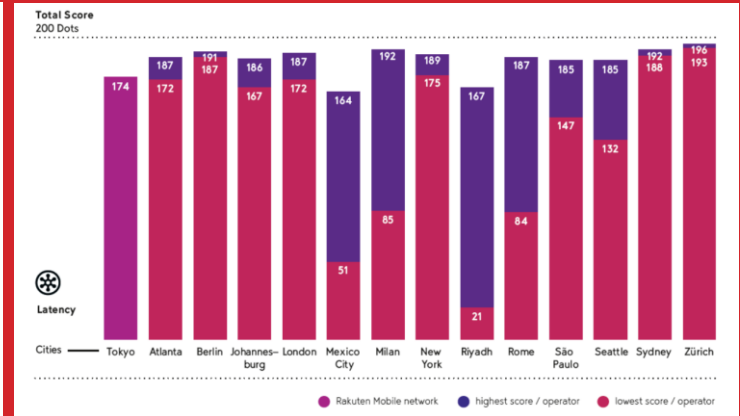
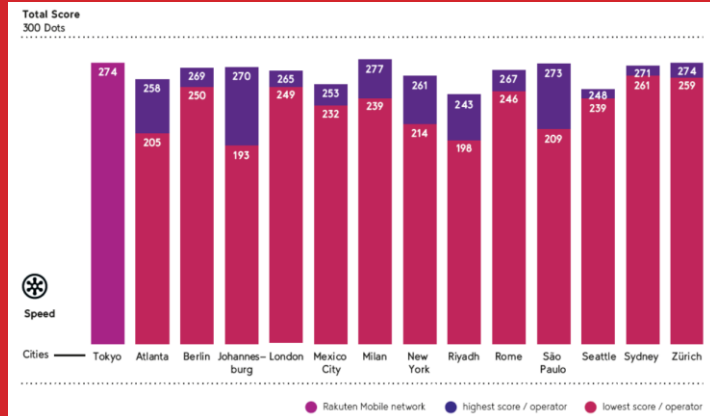
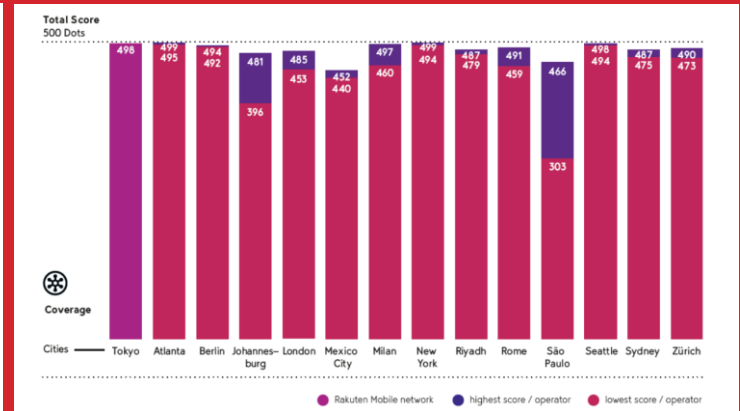
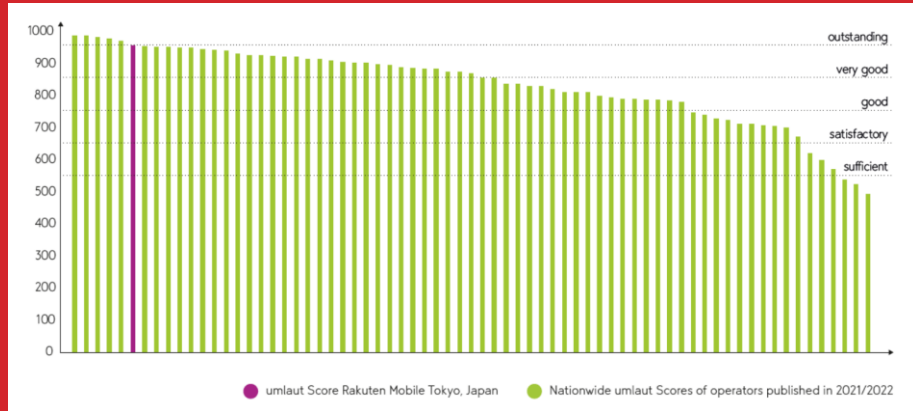


# Proven at Scale

Speed of Deployment	Agility of Provisioning	Operating Efficiency	New Feature Introduction	Automation & AI/ML
<b>4 MINS</b>	<b>3 MINS</b>	<b>1:20K</b>	<b>10-15</b>	<b>5</b>
for 5G site deployment instead of days/months	mobile service provisioning instead of 3 hours	engineer to subscriber ratio instead of 1:1k	network features and services per month	automation feature sets per day are released to the network

Source: <https://symphony.rakuten.com/open-ran>

# Rakuten Mobile score



Source: 2022 Umlaut Open RAN Network Japan in international comparison 2022

# Rakuten Mobile key takeaway

- ✓ Very good overall performances
- ✓ Reduced CapEx/OpEx
- ! Greenfield operator
- ! Not fully disaggregated solution
- ✗ Around 5 millions customers



# Deutsche Telekom experience

TECHNOLOGY PARTNERS:

 MAVENIR



intel®

NEC

FUJITSU

- ✓ RAN infrastructure solution
- ✓ SMO integration and network operation
- ✗ Installation and integration into the live network environment
- ✗ Deployment and operational experience

# Where are we going?

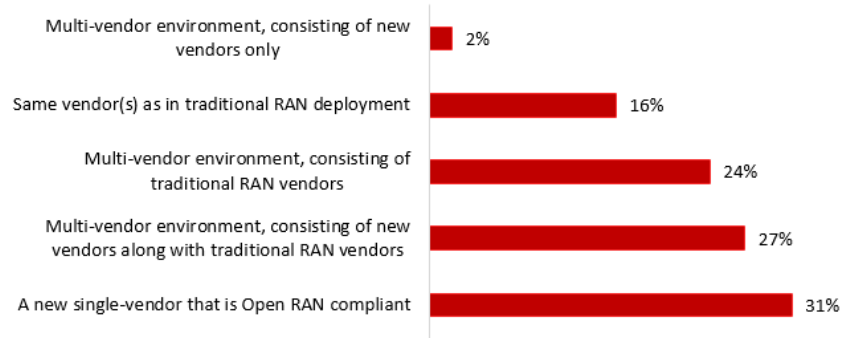
## Main blockers:

- Vendor interoperability
- System integration
- SMO readiness
- Security robustness

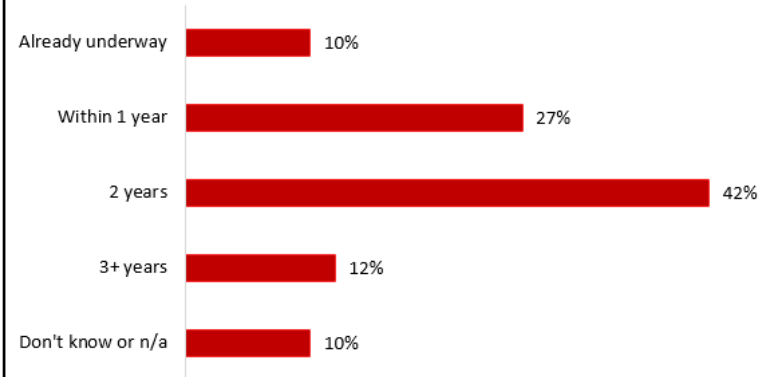
## Expected key benefits:


- Improved RAN performance
- Supply chain diversity
- Simplified management and operations

### Preferred type of vendor for Open RAN implementation



### Planned RIC implementation in a live network





**WORK IN  
PROGRESS**

**NOKIA**



**ABB**

**NUTANIX.**



**ERICSSON** 



**vmware**



**Honeywell**



**SIEMENS**



**MAVENIR**



[www.roamingnetworks.com](http://www.roamingnetworks.com)





**ROAMING**  
Networks

**DISCOVER THE POWER  
OF OUR KNOWLEDGE**

