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White Paper

Open RAN fundamentals

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About Open RAN

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Open RAN evolution

vRAN

Decouples software from hardware and virtualize part/full baseband units (BBUs) for cloud deployment, interfaces remain in the proprietary domain

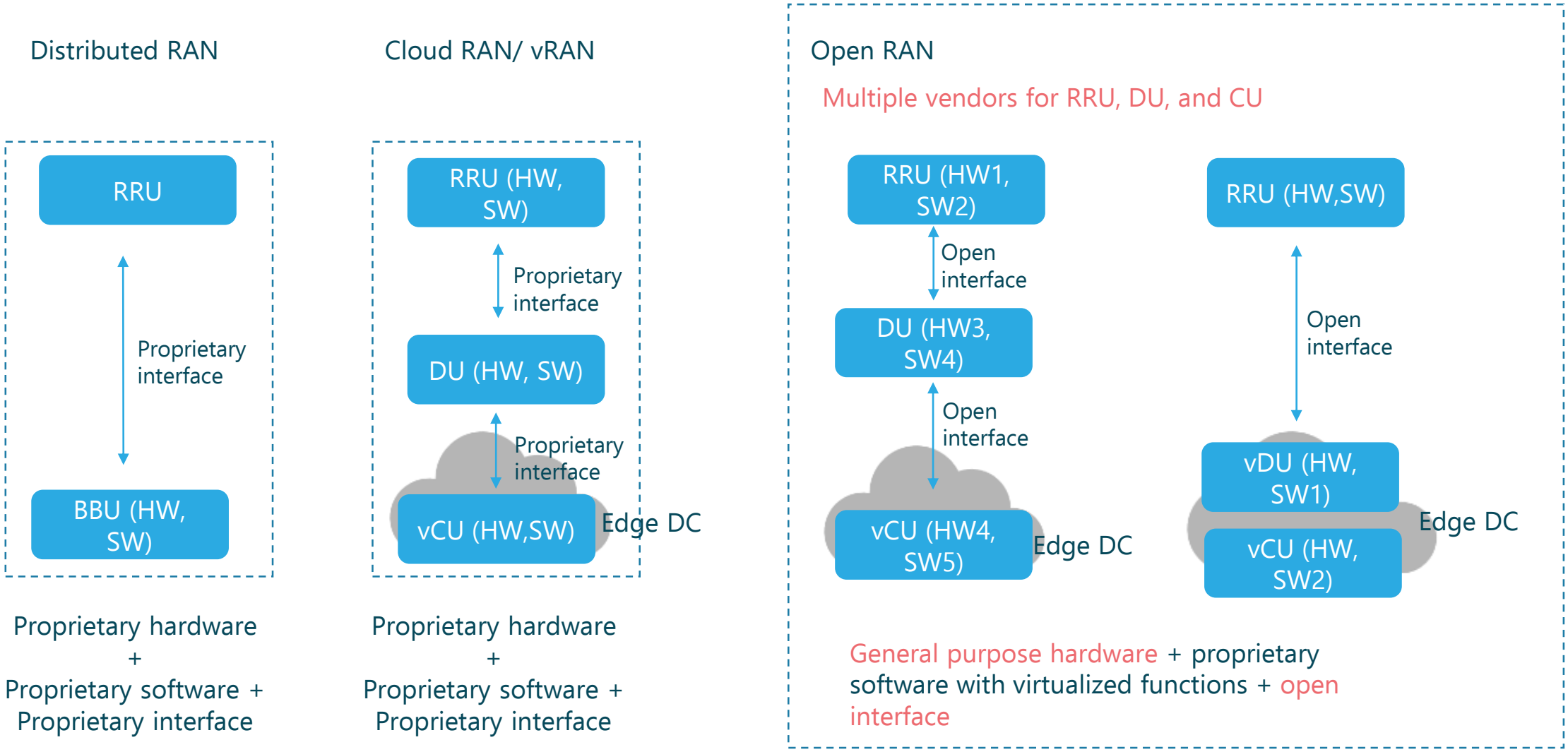
Open RAN

Open the transport interfaces between the different baseband processing functions and remote radio units (RRUs), network operators and equipment vendors can mix and match between units theoretically

Open vRAN

Combines of the two options (vRAN and Open RAN) for both open and virtualized baseband processing functions to maximize deployment flexibility and reduce time to market

Open RAN architecture



Open RAN benefits

Vendor flexibility

- No vendor lock-in
- Increased competition
- Best of breed solutions for operators

Total cost of Ownership (TCO)

- Lower TCO
- Use of general-purpose hardware and commoditization of radio
- Network automation

Innovation

- Enabling robust applications
- Faster time to market
- New services and products

Current status of Open RAN

01 Deployments

02 Greenfield vs brownfield

03 Growth drivers

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Open RAN deployments

Comparing greenfield and brownfield operators

Rakuten

Built fully virtualised, cloud native 5G RAN and core network functions on COTS

dish

Hosted an end-to-end, open & cloud-based 5G network on public infrastructure

VS

Telefónica

Engage in partnerships to launch pre-commercial trials in four core global markets

Has a target of reaching 50% radio network growth based on Open RAN by 2025

axiata

Conducted open RAN field pilots on legacy (2G & 3G) networks at rural sites

Open RAN growth drivers

Reasons	
Disaggregated and virtualised networks	• Split or distributed architecture is a pre-requisite for 5G networks • Open RAN will benefit from fast virtualisation of RAN
TCO optimisation & vendor flexibility	• Use of general purpose hardware and commoditization of radio • Vendor diversity to break market monopolies
Rural deployment	• Bridging the digital divide by extending network coverage in rural areas is much easier for operators with the lower deployment cost of Open RAN
Government incentivisation	• **US:** Injected US$ 750 million in funding over 10 years to accelerate the development of Open • RAN solutions • **UK**: Multiple grants released through OFCOM for open RAN lab, R&D, trials and deployment incentives • **India**: The Indian government has encouraged local vendors to develop local telecom equipment supply chains under its "Make in India" incentives

Vendor landscape

01 Radio hardware

02 Radio software

03 System integrator

04 Semiconductor chips & components

Open RAN radio hardware

Radio units are built to common specifications that include common and open interfaces to other RAN elements

Open RAN radio software

Software is disaggregated to run on hardware from any supplier

More number of elements to be controlled and managed, making RIC and orchestration important

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Leading Network Transformation

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Netcracker
An NEC Company

NOKIA

ERICSSON

Aelleran

vmware

Parallel
WIRELESS

JMA

Radisys

SAMSUNG

Open RAN system integrator

Interoperability and performance are key factors

Traditionally integration was usually done by the RAN vendor, but in Open RAN the role of integrator is greatly enhanced

accenture

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Leading Network Transformation

Tech Mahindra

World Wide Technology

NEC

Airspan

IBM

MAVENIR

FUJITSU

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Open RAN semiconductor chips & components

Chip providers have a much greater opportunity to support equipment from multiple vendors

Concerns over integration and performance stand in the way of open RAN merits

Complex integration and interoperability challenge

Performance and feature parity

Legacy and backward compatibility

Secure, consistent network performance

Maintenance capabilities

Twimbit analysis

01 Analyst prediction

02 Key takeaways

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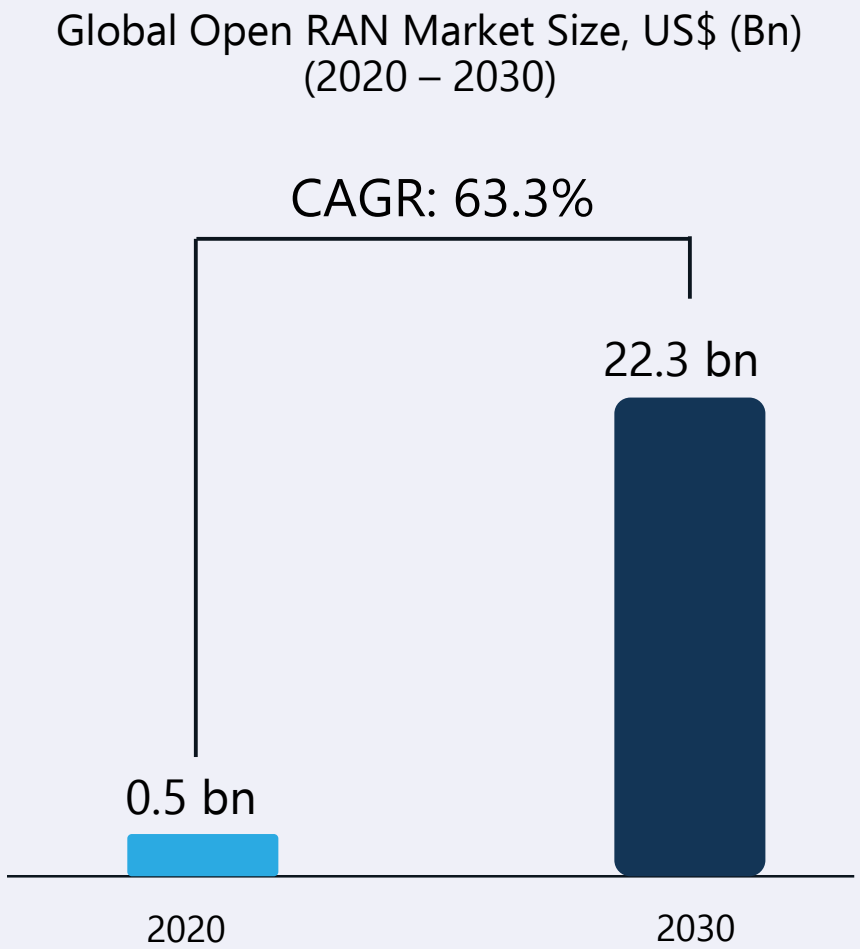
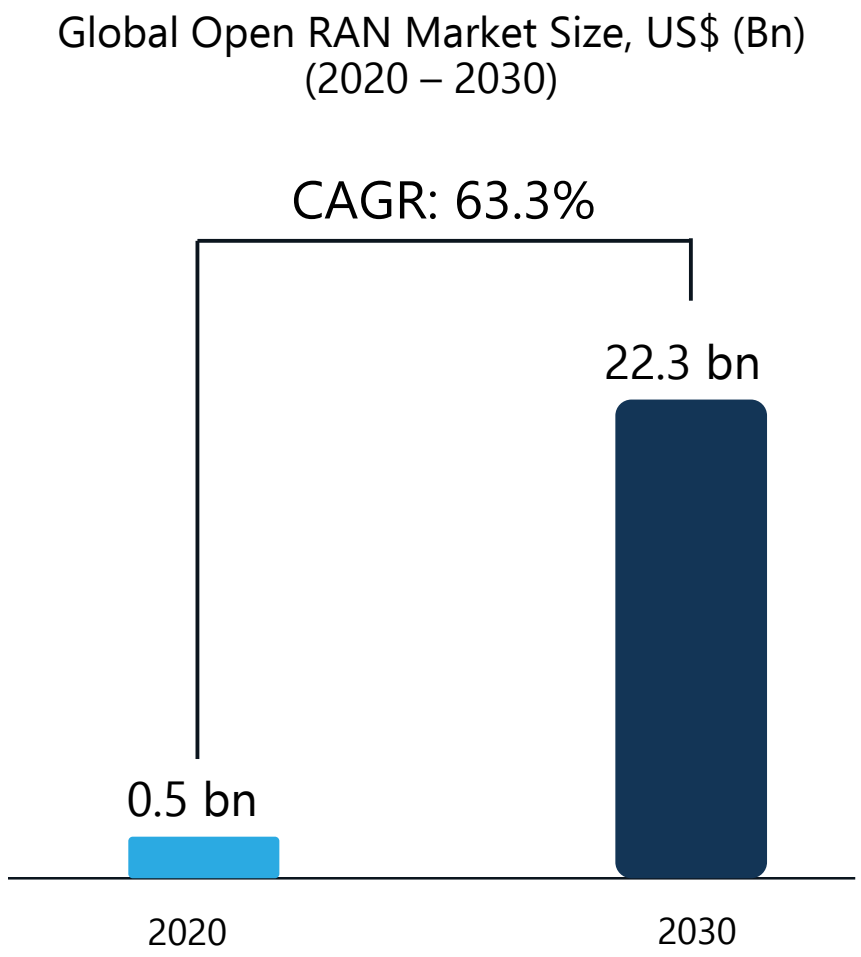
Open RAN market size



60%

RAN market share by 2030

Open RAN market size



Inception growth of the Open RAN market is driven by early adopters and deployment trials

Market share remains low in the early stage. Mobile industry sceptical of multiple complications arising from multi-vendor structure

The penetration forecasted to grow up to 3X from 2023 – 2027. Momentum continues towards to end of the decade, where more than half of the total RAN market dominated by Open RAN

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