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The future of mobile networks

In an industry shift towards an open architecture for mobile networks, NTT DOCOMO delivers vendor diversity and a path to innovation.

The telecommunications industry is currently undergoing a significant shift towards an open architecture for mobile networks, known as Open RAN. This new technology promises to reduce costs and improve customer experiences by allowing mobile operators to diversify their supply chain, opening the door to healthy competition, best-in-breed components, and innovative developers of all sizes.

What is Open RAN?

Open RAN is an open and virtualized network architecture that enables the disaggregation of hardware and software components of the traditional Radio Access Network (RAN). It brings together the abilities and components of diverse vendors in a crucial segment of mobile networks and allows them to work seamlessly as one. In other words, Open RAN replaces the traditional system with standardized open interfaces, allowing each component to be developed and provided by different vendors and switched out when necessary to improve performance, add features, or reduce costs.

At the heart of Open RAN is the idea of vendor diversity, which allows mobile network operators to choose the hardware and software from various vendors that best fit their needs and priorities. This approach breaks the stranglehold of locked-in proprietary systems, where mobile operators are tied to a single vendor and its technology for components. Open RAN offers them greater flexibility and choice.

NTT DOCOMO, the largest mobile operator in Japan, is a leader in this transition and is offering a global integration solution to help other networks evolve to Open RAN. With significant experience operating mobile networks, NTT DOCOMO is helping to reduce technical obstacles through its research efforts and is building an ecosystem to explain, demonstrate, and enhance the advantages of Open RAN.

The technology is gaining momentum, and it is expected to create a healthier supplier market in which robust competition helps keep costs down, encourages innovation, and provides greater choice for network operators. Open RAN is also seen as a stepping stone or accelerator to further promote more advanced technologies, including 6G mobile systems, which are expected to roll out near the end of the decade.

The benefits of Open RAN

The history of the core network, the workhorse of mobile telecommunications, offers a look at the benefit of open systems. In the early 2010s, when 4G technology was introduced, the interface between the core network and the RAN was well-defined and open. As a result, competition among vendors for the core network was intense, delivering greater choice, lower prices, and operational efficiencies.

However, closed systems have historically been the only option available for the traditional RAN system, comprised of a Remote Radio Head (RRH) on the antenna, a Baseband Unit (BBU) that processes incoming and outgoing signals, and an interface that connects the two.

These closed systems have been supplied by the major equipment manufacturers, primarily Ericsson, Huawei, and Nokia, providing turn-key equipment, service packages, and maintenance. The components and interfaces are all proprietary, and hardware often comes with built-in software. This system is convenient for network operators but at the same time causes them to become dependent on a single vendor and offers little negotiating power or flexibility.

Open RAN will change this, enabling more competition. In addition, one of the other crucial advantages of Open RAN is that it adds a new element to the architecture, a Radio Access Network Intelligent Controller (RIC) that works with the Distributed Unit (DU) and Centralized Unit (CU) to add functions and features. These applications can use artificial intelligence and machine learning to create greater efficiency and improve performance. High-value uses include traffic steering and load balancing, which can be automated to achieve optimal capacity and energy use results.

Standards, specifications, and the O-RAN Alliance

To achieve the benefits of Open RAN, accepted standards and specifications for the interfaces must be developed. The O-RAN Alliance, founded in 2018 by NTT DOCOMO and four other mobile network operators (since expanded to include vendors and researchers), is working to create a healthy ecosystem of vendors and developers that can participate in the Open RAN market. The Alliance is focused on developing open, interoperable interfaces and RAN software that is compliant with the Open RAN specifications.

The benefits of Open RAN are clear, and the technology is gaining ground in the market. Further success will require greater collaboration across a broad ecosystem and pioneering moves by visionary business leaders. NTT DOCOMO is at the forefront of this movement, working closely with a wide range of Open RAN partners in many industries to realize the full potential of this innovative technology.

Read our whitepaper to learn more about how Open RAN will revolutionize the telecommunications industry, creating a healthier supplier market, improving customer experiences, and fostering innovation.

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