

Why Rakuten Mobile is Winning the Network Virtualization Race

Creating a Cloud Native 5G Network Takes the Right Mindset and Infrastructure

“The principles of success for deploying a true cloud-native network starts with a vision and mentality shift. Simply put, the way we build networks hasn’t changed in three decades, now is the time to aim for a future-proven architectural model and implement the plans to achieve that.”

— **Rabih Dabboussi, SVP-Global Sales and Marketing at Rakuten Mobile, Inc**

Key Features

- QCT and Intel® hardware geared towards virtualization and the cloud-native deployment model
- Open, disaggregated, software-defined, validated, and optimized hardware for 5G cloud-native network workloads
- RESTful APIs and Intel® Rack Scale Design (RSD) through embedded Intel® Xeon® processors
- QuantaGrid D52BQ-2U and QuantaGrid D52BE-2U edge servers
- NFVI and vRAN application optimization

5G is built around the idea of cloud — [many](#) telecommunications companies and [industry leaders](#) have argued that 5G cannot reach its full potential without a fully cloud-native core.

However, the process of cloudification isn’t a smooth or a fast one. But with the right mindset, and by using the right kind of infrastructure and software strategy, it’s possible for the telecom industry to move at the speed of cloud.

As 5G deployments continue to roll out around the globe, telecoms are pinning their hopes on the latest generation of mobile networks to enable new use cases and bring faster speeds than ever before.

Now, however, the reality is beginning to catch up. Infrastructure blockages caused by global regulations and the COVID pandemic are [preventing telecoms](#) from building the necessary components for their towers, small cells, and data centers.

As well, it’s becoming increasingly clear that many 5G use cases, such as AR/VR, [are still in their infancy](#) — feasible in labs and controlled settings, but not on a mass-deployable scale.

These issues are linked to a myriad of reasons, though one stands as a consistent issue among telecoms: building a truly virtualized, cloud-native 5G core.

This isn’t a universal issue for telecoms, however. Japan-based Rakuten Mobile launched a fully virtualized, open RAN, cloud native mobile network [in April 2020](#).

The new infrastructure costs nearly 40% less than a traditional telecom infrastructure, only two years after gaining approval from the Japanese government to launch their mobile network — and only six years after entering the mobile network sphere.

How did Rakuten Mobile make this possible on such a short timeline? The answer lies in Rakuten Mobile’s approach — its infrastructure, software, and mindset are all centered around virtualization.

Part of this lies in Rakuten Mobile’s use of QCT and Intel® hardware, which is geared towards virtualization and this cloud native deployment model. This has enabled Rakuten Mobile to build the world’s first truly cloud native mobile network and helped pave the path to a smoother, faster 5G virtualization process.

The Global 5G Struggle

The primary stopping point for many telecoms, when it comes to virtualizing their networks, is due to the fact that many are stuck in a legacy infrastructure and a legacy mindset.

“The traditional way of building a network, from base station, core network, to data center, is dominated by proprietary vendors,” said Howard Wu, VP, global head of networks, and GM USA



for QCT. “Telecoms struggle with choice, high cost, and lack of flexibility and scalability when they need to upgrade their networks.”

The established methods telecoms have typically taken in building their mobile networks simply don't work in the fast-changing environment of virtualization. The vendor-bound model is holding telecoms back.

“As the communications network has evolved over the last century, it started as a rigid tool for simply communicating over distances. In today's network, it encompasses a lot more,” Wu said.

“Ergo, 5G must have an adaptable infrastructure to mold and evolve itself over time, a software-defined and driven network [that] can provide services globally with the blink of an eye. If we are still building siloed, monolithic hardware systems like most OEMs, then we will never be able to truly converge compute and communications through cloud.”

A 5G network, and by extension a virtualized network, needs to meet three criteria, Wu said. These features include IoT support, an open system that can support the speed of innovation, and future-proofing.

“The principles of success for deploying a true cloud-native network starts with a vision and mentality shift,” said Rabih Dabboussi, SVP-Global Sales and Marketing at Rakuten Mobile, Inc.

“Simply put, the way we build networks hasn't changed in three decades, now is the time to aim for a future-proven architectural model and implement the plans to achieve that.”

Building a Better Cloud Native Platform

One of the cores of Rakuten's success is the fact that it is primarily an internet services company — while many telecoms are still stuck on the vendor and hardware-centric service network model, Rakuten Mobile built a software-centric platform from day one.

“It fundamentally comes down to mindset,” Wu said. “Most car companies in the world are engine centric, as many of them claim to build the best engine, so their focus and R&D efforts are around the engine.

“Tesla is a software-centric data company that happens to deliver that vision through a vehicle. Rakuten Mobile is similar; while most telecoms focus on radio signaling and service level, Rakuten Mobile delivers that vision through a software-based communications network.”

It is due to this mindset that Rakuten Mobile selected QCT's hardware to build their virtualized mobile network platform.

“QCT offers open, disaggregated, software-defined, validated, and optimized hardware for 5G cloud-native network workloads to easily deploy on our platform,” said Gary Lee, telco solution engineering AVP for QCT. “As 5G technology requires [us] to have high throughput, connectivity, and low latency, our servers are the top choice to fulfill this need.”

In particular, Rakuten Mobile relies on QCT's QuantaGrid D52BQ-2U and QuantaGrid D52BE-2U edge servers, which support the hyperconverged data centers and cloud applications that form the basis of a virtualized network.

QCT's servers are optimized for NFVI and vRAN applications, as well as rapid scaling, quick deployment, and low maintenance opex that monitors server health through a microSD record system, even during server power downs.

As well, each server is integrated with industry standard RESTful APIs and Intel® Rack Scale Design (RSD) through embedded Intel® Xeon® processors and enables high-performance network functions with various Intel® acceleration technologies such as Enhanced Platform Awareness (EPA) features.

“The innovation that Rakuten Mobile is driving is because of their different mindset and how they envision how to operate an efficient mobile network,” Wu said.

“As the telecom industry looks into how to deliver an open, adaptable, cloud based and secure infrastructure, QCT's decade-long experience in cloud, and our ability to bring openness at the bare metal layer... makes us a key partner in any industry that is looking at hardware infrastructure.”

5G Acceleration Through Partnership

As telecoms continue to develop, build, and adapt their 5G networks to the new reality of virtualized networking, partnership with cloud and hardware vendors will become increasingly critical in creating an ecosystem that fosters market innovation — and one where those vendors and service providers can help influence the development process.

“Any serious effort to create a comprehensive ecosystem of diverse players needs to include the diverse players,” said Chris Nicoll, senior principal analyst at independent analyst firm Omdia [in an SDxCentral article](#).

Both Rakuten Mobile and QCT have worked together to build an open, innovative, virtualized mobile platform that can adapt to and support the new use cases 5G will continue to foster.

QCT's partnerships with Intel®, Red Hat and the Open Infrastructure Foundation (formerly known as The OpenStack Foundation) have enabled QCT to build an open, innovative infrastructure offering that supports the cloud native mindset and architecture.

“The cloud is an enabler of better usage and efficiency, and a cloud architecture is the first step [towards] a modern infrastructure,” Wu said. “[This means] applying open, disaggregated, software-driven and cloud technologies in their infrastructure and a willingness to work with non-traditional telecom vendors.”

Rakuten Mobile will continue to work with QCT and its hardware to expand its 5G network – at the time of service launch the mobile network covered parts of six prefectures in Japan, including Tokyo, Kanagawa, Saitama, Hokkaido, Osaka, and Hyogo.

The mobile company [plans to expand its network](#) to all of Japan's prefectures by March 2021; their 5G standalone network is set to launch by mid-2021.

Rakuten Mobile also aims to bring the technology and expertise behind its cloud native mobile network to telcos, enterprises and governments around the world through the Rakuten Communications Platform (RCP). RCP will offer customers a way to easily build and deploy fully cloud native network services at speed and low-cost.

Despite the challenges, this journey is made all the easier by the fact

that Rakuten Mobile has built a solid foundation for a truly virtualized, cloud-native mobile network.

"Rakuten Mobile embarked on the telco network buildout in 2018 and made a conscious decision to build the world's first cloud-native mobile network realizing that this mission is the more challenging but more rewarding approach," Dabboussi said.

"Working together with QCT, Rakuten Mobile combines our expertise and experience into a ready-to-use network transformation solution, and fosters the global 5G development with cost-efficiency, economic scalability, and service agility."

For more information about QCT Cloud-Native Solutions, please visit <https://go.qct.io/telco/#telco-solutions>.

About QCT

Quanta Cloud Technology (QCT) is a global datacenter solution provider. We combine the efficiency of hyperscale hardware with infrastructure software from a diversity of industry leaders to solve next-generation datacenter design and operation challenges. QCT serves cloud service providers, telecoms and enterprises running public, hybrid and private clouds. Product lines include hyper-converged and software-defined datacenter solutions as well as servers, storage, switches, integrated racks with a diverse ecosystem of hardware component and software partners. QCT designs, manufactures, integrates and services cutting edge offerings via its own global network. The parent of QCT is Quanta Computer, Inc., a Fortune Global 500 corporation.

www.qct.io



About Intel®

Intel® (Nasdaq: INTC) is an industry leader, creating world-changing technology that enables global progress and enriches lives. Inspired by Moore's Law, we continuously work to advance the design and manufacturing of semiconductors to help address our customers' greatest challenges. By embedding intelligence in the cloud, network, edge and every kind of computing device, we unleash the potential of data to transform business and society for the better. Intel, the Intel logo, Optane, and Xeon Inside are trademarks or registered trademarks of Intel Corporation in the U.S. and/or other countries. All trademarks and logos are the properties of their respective holders.

www.intel.com