The bridge to possible

Rakuten Mobile Shakes Up Telco Market

The customer summary

Customer name
Rakuten Mobile

Industry
Telecommunications

Location
Tokyo, Japan

Challenges

- Build the world's first cloud-native, software-defined mobile network
- Orchestrate a highly distributed infrastructure with a lean IT staff
- Leverage automation to accelerate innovation and service delivery

Solution

- Software-defined network spanning two central data centers, one disaster recovery site, more than 50 regional data centers, and more than 1000 far edge sites

Results

- Established a single, highly-automated network for all 4G and 5G services
- Managing 48 network fabrics with just 15 engineers
- Grew year-over-year revenue by 38.6 percent
- Received two prominent Global Mobile (GLOMO) Awards for innovation

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Innovation and differentiation

As the newest entrant in a mature and highly competitive Japanese telecommunications market, Rakuten Mobile had to do things differently. And its leaders set their sights on innovation, speed, and operational efficiency as the keys to success.

"I had this crazy idea in 2018 to build the world's first fully virtualized mobile network. I loved the idea of simplicity and flatness, and I adored the concept of having an end-to-end IPv6 architecture," says Tareq Amin, CTO of Rakuten Mobile. "I presented a blueprint architecture, and people thought I was nuts."

Despite the dubious reaction, his idea was simple: Use software-defined automation to reduce the dependency on vendor-specific hardware. Roughly 70 percent of mobile operators' CapEx is spent on proprietary appliances, Amin says, which need to be fully replaced with every new generation of the equipment.

"Disaggregating all of the components and using software to make them interchangeable and interoperable has massive cost implications and gives us much more control," he explains. "So we set out to build a cloud-native, 5G-ready network architecture that is fully virtualized and highly automated."

To do so, Rakuten Mobile needed to make open and virtualized radio access networks (Open vRANs) a reality. It needed to build the most elastic, scalable, and flat IPv6 network in Japan. And it needed to automate the network fabric to enable agility and innovation at a speed the industry had not yet seen.

Rakuten Mobile built its groundbreaking 400G architecture on the proverbial shoulders of Cisco Nexus® 9000 Series switches and Cisco® Application Centric Infrastructure (Cisco ACI®), the world's leading software-defined networking solution.

Automation at scale

While other mobile operators have dedicated infrastructure for each service they provide — an approach that comes with significant cost, complexity, and rigidity — Rakuten Mobile wanted a single infrastructure to support all of its 4G and 5G services. The company's Cisco ACI network has fulfilled such ambitions, providing connectivity, visibility, automation, and operational simplicity for a diversity of workloads on a massive scale.

"Our Cisco ACI network is one of the largest data center fabrics in the world," says Ryota Mibu, vice division manager of the cloud platform at Rakuten Mobile. "It's the 'nerve center' that provides connectivity between our subscribers and mobile services."

Delivering policy-based automation, multitenancy, and carrier-grade performance, the network can accommodate any application and any hardware infrastructure. And it connects two primary data centers, a disaster recovery site, more than 50 regional data centers, and more than 1000 unmanaged, far edge sites in Japan.

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Ryota Mibu
Vice Division Manager, Cloud Platform,
Rakuten Mobile

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It can take hundreds or even thousands of specialists to keep a large-scale mobile network up and running. Rakuten Mobile is orchestrating its distributed network with a remarkably lean staff.

"We are managing 48 fabrics with just 15 engineers," says Shinsaku Shimizu, software-defined network section manager for the cloud platform at Rakuten Mobile, noting the use of Ansible playbooks. "This would be impossible without the automation and centralized management of Cisco ACI and Cisco Crosswork®. It's a huge time and cost advantage for us."

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Shinsaku Shimizu
Software-Defined Network Section Manager,
Cloud Platform, Rakuten Mobile

"Many thought a massively distributed, cloud-native architecture would increase complexity and reduce quality, but it's been quite the opposite," Amin adds. "The network has been audited four times and received exceptional performance ratings."

Cisco CX helped design, configure, and deploy the network, and has also assisted Rakuten Mobile with network automation and optimization.

"The right partner is just as important as the technology," says Amin. "We have the same mentality and vision as Cisco, and both companies are determined to improve the cost and economics of mission-critical infrastructure. It's been a very rewarding partnership."

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Award-winning success

While the desire to develop the world's first cloud-native, Open vRAN mobile network was met with skepticism, the gamble is proving the naysayers wrong. As of August 2021, Rakuten Mobile had more than five million subscribers. Its revenue had climbed 38.6 percent over the previous year. And the company received two prominent 2021 Global Mobile (GLOMO) Awards, which are widely recognized as the most prestigious in the mobile industry.

"Pulling baseband services from a custom ASIC and putting them onto commodity, off-the-shelf appliances was like a science fiction project when we started," Amin says. "But we've achieved it, and this is now the North Star for every telco."

There is a ton of opportunity for Rakuten Mobile as its competitors play catch-up. The company plans to slice its 5G network to offer dedicated cloud, gaming, network hyperscaling, and other services. And it has its sights set on the enterprise market for the first time.

"We've always been a consumer company, but with this amazingly advanced platform architecture, we can approach enterprise customers with an elegant solution and unparalleled cost advantages," Amin says. "I don't have to worry about the things other telcos worry about. My technology foundation is strong enough to build the vision we have for today and the dreams we have for tomorrow."

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Learn more about Cisco data center computing and networking customer deployments as well as Cisco software-defined 5G.

Product list

- Cisco ACI
- Cisco Nexus 9000
- Cisco Crosswork