



Founded by storied wireless industry veterans, Ramen (www.rameninc.com) provides cloud-managed, secure, Network-as-a-Service (NaaS) to 'Uncarpeted' enterprises with SLA-backed guarantees. The founding team has deep technology/business expertise in enterprise infrastructure, security, and wireless (4G/5G/Wi-Fi). Ramen enables reliable connectivity in uncarpeted environments like manufacturing, universities, warehouses, and fruit processing plants, unlocking the potential of AI and robotics in these sectors. It allows optimized operations, improved productivity, and increased workplace safety, ultimately contributing to the growth and advancement of the global economy. Ramen has corporate headquarters in Silicon Valley and development centers in Bangalore, India.

Ramen builds on Akka to provide Network-as-a-Service to Uncarpeted Enterprises

Executive Summary

Ramen needed to build a resilient Network-as-a-Service (NaaS) offering that was capable of delivering guaranteed connectivity for thousands of devices in the world's most challenging wireless environments. By using the Akka distributed application platform as the foundation for their AI-driven, cloud-managed, hierarchical multi-tenant portal, Ramen delivers SLA-backed NaaS across a diverse set of devices, use cases, and geographic regions.

The Challenge

The "uncarpeted" enterprise represents an underserved and much larger network footprint than traditional office space by several orders of magnitude. These "uncarpeted" areas typically involve operations that are focused on production, logistics, educational institutions, or infrastructure management. Examples include warehouses, manufacturing floors, universities, community colleges, oil rigs, wineries, railyards, shipyards, ports, stadiums, and more. Ramen faced several challenges in building a system to serve this market.

- **Resilience**

The NaaS system must deliver rugged, reliable wireless networks capable of withstanding harsh weather conditions, challenging spectrum interference, and unique physical demands. In many ways, the physical deployment of the private wireless infrastructure is the "easy" part. Once installed, the real challenge begins: providing resilient connectivity, monitoring, and management via a cloud-based service. Each transaction failure due to network unavailability puts the entire operation at risk.

“It’s difficult to understate how challenging it is to deliver SLA-backed wireless connectivity via a cloud-based model across such a diversity of global locations, challenging wireless environments, and myriad device types, all of which continue to grow and change daily. The amount of variables is mind-boggling. Akka has been critical to enabling our team to scale globally while also keeping our customers happy.”

Partho Mishra, Co-founder and CEO of Ramen, Inc.

- **Scale**

The uncarpeted enterprise generally has fewer human workers on site, who are highly skilled and require reliable network connectivity to support automation and AI-enabled workflows. The network must support many industrial IoT networks, made up primarily of devices so it must scale much faster and less predictably than a ‘carpeted enterprise’ user base.

- **Enabling Automation in a Distributed Environment**

One of the primary challenges of delivering connectivity via a NaaS model is the expectation the provider will detect and fix network issues before they impact the customer. Ramen customers are distributed worldwide - each of them a unique and challenging wireless environment. To achieve this, Ramen must have detailed telemetry data streamed directly into its Cloud Orchestrator.

The Solution

The Ramen Cloud managed portal is hosted in a secure, SOC 2-compliant Google Cloud Platform (GCP)-hosted Virtual Private Cloud (VPC) across multiple availability zones. This cloud-based management system uses advanced AI algorithms to monitor, observe, alert, and discover anomalies in operations and apply the appropriate remediation in real time. It has more than 100 microservices and end-points responsible for providing services on various aspects of the managed network – management, monitoring, telemetry, alerting, AI models, protocol stacks, inventory, partner management, dashboard, reporting, controllers for multiple wireless technologies, including 4G/LTE, 5G, Wi-Fi, and IoT.

Due to the tremendous scale and diverse elements within its global environment, Ramen chose a combination of Akka HTTP, Akka actors, and Akka Streams to build scalable and responsive applications in Scala. Akka HTTP provides a robust and efficient toolkit for building RESTful APIs, while Akka Streams enables Ramen to process and transform data with unprecedented flexibility. Akka actors are used as the basic unit of concurrency and distribution.

The Results

By leveraging Akka, Ramen is able to deliver its NaaS-based private wireless service with the strict SLAs that its customers demand. Ramen’s uncarpeted NaaS requires a tremendous amount of data to provide such a robust SLA. With every new deployment, the Ramen solution continuously learns and adds more data elements to be carried to Ramen’s backend systems for analysis. As a result, the Ramen service is continually growing and adding complexity as the dimensionality of data increases significantly over time. Moreover, the number of RESTful endpoints increases with each learning.

With the adoption of Akka, Ramen is managing tens of thousands of users and IoT devices simultaneously, providing them with SLA-backed connectivity in remote, large outdoor areas. Using Akka means that critical elements such as separation of concern, data transformation on the move, scaling the network, and network latency are no longer a concern.

Visit [Lightbend](#) to learn more about [Akka](#) and our other product and service offerings.
