

Kazakhtelecom Resolves IPv4 Address Exhaustion and Scales Telco Cloud for Fast-Growing Demand



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Industry | Telecom

Introduction

Kazakhstan has one of the most advanced telecoms sectors in Central Asia, and Kazakhtelecom, the national telecom company, is an innovation leader. Kazakhtelecom was the first in the country to implement 5G New Radio (NR) technology. As Kazakhtelecom meets the growing demand for digital services, Kazakhtelecom has embraced the telco cloud approach to enable more dynamic and efficient service delivery.



Kazakhtelecom appreciates A10 Networks' industry leadership in CGNAT for telco cloud, as the company works with providers around the world to realize their vision.

— Nurlan Meirmanov, Chief Innovation Officer



Network Solution

A10 Thunder CGN



Critical Issues

Overcome IPv4 address exhaustion with carrier-grade network address translation (CGNAT) to meet rapid growing customer growth



Results

- Solve IPv4 address exhaustion to meet fast-growing demand for 5G mobile and other services
- Virtualize carrier-grade NAT to ensure critical applications and services are always available and reliable
- Enable dynamic and efficient service delivery with CGNAT integrated into its telco cloud

Kazakhtelecom's Challenge? An Unmanageable Load with User Sessions and Network Traffic

A telco cloud allows Kazakhtelecom to lay a flexible and programmable foundation for the next generation of services such as 5G and IoT, as well as to meet the rapidly increasing demands for business-to-business (B2B) connectivity as the population grows and the nation digitizes.

Kazakhtelecom needed to deliver new services efficiently, but rapid customer growth was compounding a shortage of IPv4 addresses, which were already a scarce commodity.

"Kazakhtelecom had worked for two years to obtain new IPv4 addresses, but it was impossible – our IPv4 address pools were exhausted."

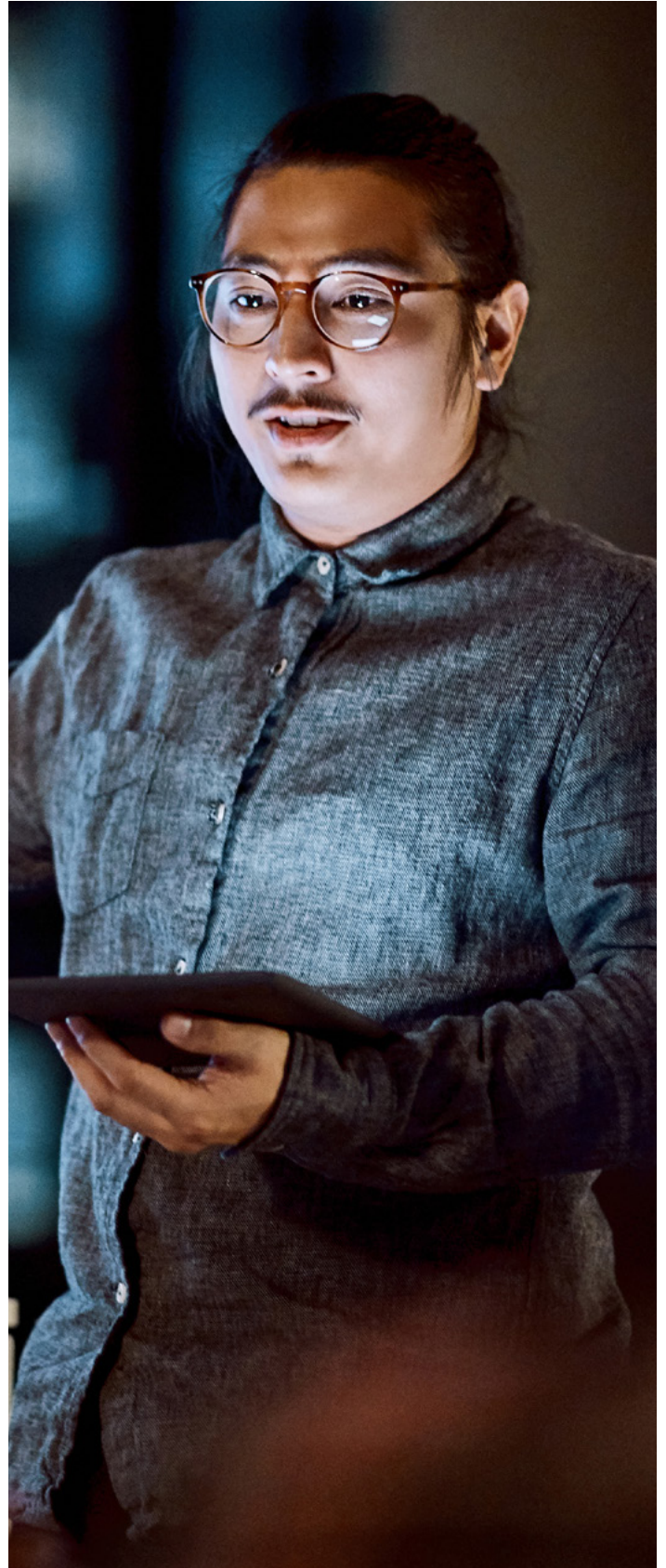
– Nurlan Meirmanov, Chief Innovation Officer

The rapid increase in subscribers was putting a significant load on its existing carrier-grade network address translation (NAT) solution both in terms of user sessions and network traffic.

Selection Criteria

Kazakhtelecom wanted a virtualized carrier-grade NAT solution to solve IPv4 address exhaustion in its telco cloud. It needed a network address translation solution that would integrate easily with its open-source cloud. It required a virtualized CGNAT solution that would grow gracefully as the provider introduced new services to meet future customer needs. And it wanted a scale-out solution for a simpler and affordable way to expand carrier-grade NAT services.

After a thorough evaluation and proof-of-concept testing, Kazakhtelecom chose A10 Networks Thunder® CGN. Thunder CGN is a high-performance CGNAT solution that enables the provider to overcome IPv4 address exhaustion with NAT44 to support network growth and seamless user experiences. Built on A10's market-proven Advanced Core Operating Systems (ACOS®), Thunder CGN ensures that critical applications and services are always available and reliable.



The Solution: A10 Networks' Technology

With the A10 Networks solution, Kazakhtelecom virtualized its carrier-grade NAT functions for its cloud network node (CloNN) as traffic is transferred from its physical network elements to its virtual network elements.

Thunder CGN integrated easily into Kazakhtelecom's telco cloud, enabling the company to choose the best-fit solution for virtualized network address translation while lowering costs.

In the initial phase, Kazakhtelecom maximized its investment in previous technologies by transferring the network load to the new cloud communications nodes, replacing closed solutions with open, disaggregated, and virtualized solutions for new services. This approach allowed Kazakhtelecom to reap the cost efficiencies of open-source and white-box products.

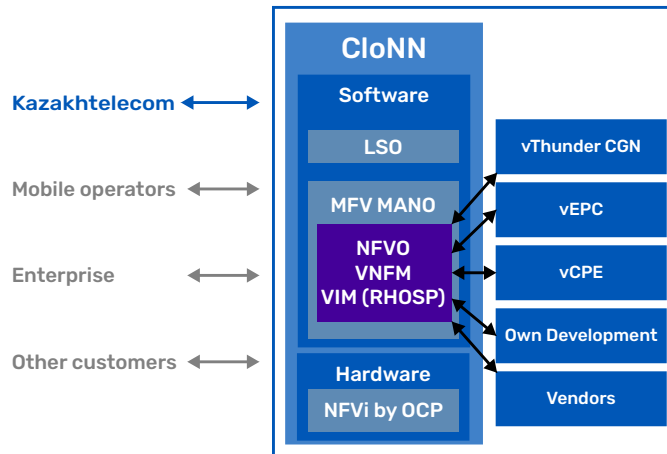
For its CGNAT function, Kazakhtelecom implemented a scale-out cluster of eight Thunder CGN VNFs. Each VNF provides NAT44 streaming at 20 Gbps, for a total of 160 Gbps of performance. Thunder CGN virtual instances in the cluster are deployed automatically using the management and orchestration (MANO) components of Kazakhtelecom's CloNN, including NFV orchestrator, VNF manager, and virtualized infrastructure manager (VIM). If an issue with the Thunder CGN VNF arises, the instance is automatically restarted on the same or a different server, thus ensuring service continuity.

With a scale-out approach to CGNAT, specialized external load balancing tools between the Thunder CGN virtual elements of the cluster are not needed, which significantly reduces the consumption of the CloNN infrastructure resources and reduces the broadcast costs.



Network Configuration

Customers Kazakhtelecom's Cloud Node



Vastly Improved Security and Availability

Leveraging A10 Networks' network address translation solution empowered Kazakhtelecom to advance infrastructure security and availability as it continues to satisfy rising customer demand. With Thunder CGN, Kazakhtelecom can overcome IPv4 address exhaustion without having to make investments in new IPv4 addresses, saving both time and money. It's far more practical to efficiently use the IPv4 address resources it already owns.

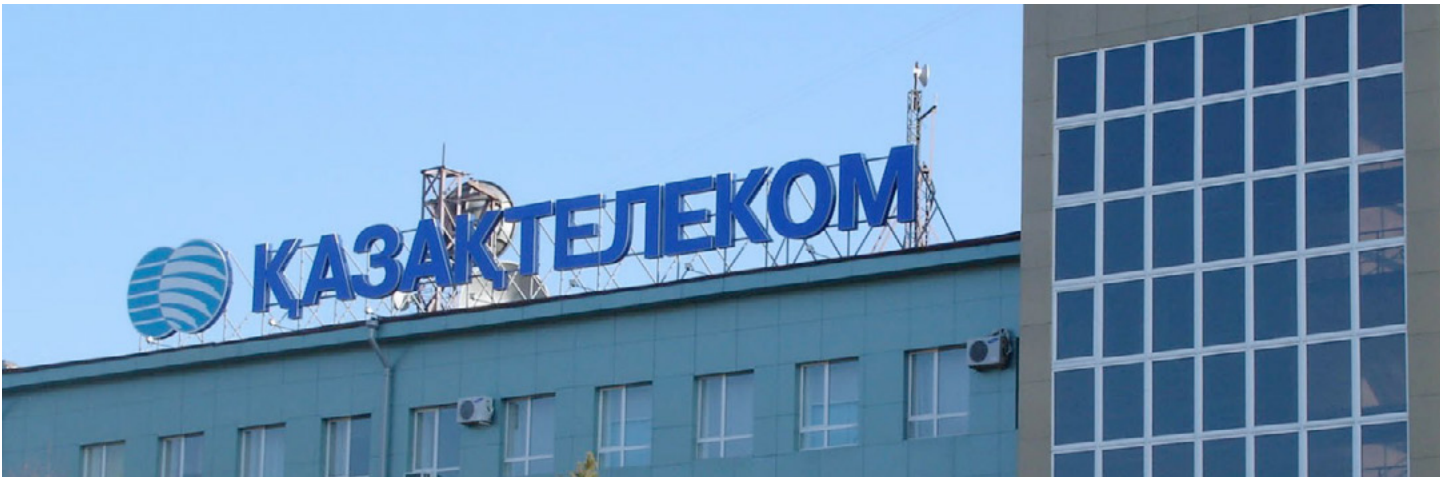
In addition to the planned launch of 5G and more B2B communications services, the provider saw increased traffic and subscriber growth as more people required fast, reliable connectivity during the COVID-19 pandemic.

Thunder CGN ensures that applications remain addressable and operate transparently through network address translations through integrated DDoS protection for NAT pools, as well as application-layer gateways.

A "scale-out" approach for carrier-grade NAT helps Kazakhtelecom prepare for the future of 5G, enterprise connectivity, and edge computing services. With the A10 Networks CGN solution, Kazakhtelecom has a more flexible foundation from which to offer virtualized network services to business customers. As new business services are launched and more customer mobile and IoT devices are connected, it can simply add compute to the Thunder CGN cluster to continue to ensure applications are always available and reliable and the infrastructure is secure.

Success and Next Steps

Kazakhtelecom is a leader in mobile, broadband, pay TV and also offers ICT services including cloud services and data centers. The company's continued growth is fueled by innovation and the introduction of new services. With its advanced telco cloud and virtual CGN solution from A10 Networks, Kazakhtelecom is able to launch innovative services to businesses and individuals and drive revenue growth.



About JSC Kazakhtelecom

Established in 1994, JSC Kazakhtelecom is the largest telecommunications company in Kazakhstan and has the status of a national telecommunications operator. Corporate offices are in Astana and Almaty with additional offices throughout Kazakhstan.

Since the mid 2000s, JSC Kazakhtelecom has consistently held high positions in the rating of the most profitable enterprises of the country with an annual turnover of tens of billions of tenge, its national currency

JSC Kazakhtelecom owns the National Information Superhighway, which is a transport fiber-optic ring that connects large cities of Kazakhstan with digital streams with high data transmission speed.



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IPv4 exhaustion using CGNAT
IPv6 – Are We There Yet?

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About A10 Networks

A10 Networks (NYSE: ATEN) provides secure application services for on-premises, multi-cloud and edge-cloud environments at hyperscale. Our mission is to enable service providers and enterprises to deliver business-critical applications that are secure, available and efficient for multi-cloud transformation and 5G readiness. We deliver better business outcomes that support investment protection, new business models and help future-proof infrastructures, empowering our customers to provide the most secure and available digital experience. Founded in 2004, A10 Networks is based in San Jose, Calif. and serves customers globally.

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