VyOS Networks

VYOS SUCCESS STORY

Scaling Regional Connectivity: How KCAT Modernized Its ISP Core with VyOS

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Customer Overview

KCAT Inc. is a regional fiber ISP serving Negros Island with FTTH broadband and IPTV. As KCAT scales from 5,000 to 10,000 subscribers, the team is redesigning its network end-to-end: GPON expansion, migration to IPoE, a new BNG design, and a unified NOC visibility system. VyOS powers KCAT's CGNAT layer today and supports the transition to a full IPoE BNG.

The Challenge

As subscriber growth accelerated, KCAT's CCR-based CGNAT platform began to constrain peak-hour performance. Throughput ceilings, elevated conntrack pressure, and latency spikes made evening periods harder to manage. KCAT needed a solution that delivered:

- **Stable high throughput during peak load**
- **A practical path to IPoE BNG without proprietary BRAS costs**
- **Strong operational control and automation, with a manageable TCO**

Why VyOS

KCAT evaluated commercial CGNAT boxes, MikroTik scale-out clusters, and Linux-native NAT. VyOS stood out by combining carrier-grade performance with open standards and deployment flexibility on commodity hardware. Key drivers included:

- **Performance:** High-performance NAT for carrier-grade workloads
- **Hardware Freedom:** Runs on standard commercial off-the-shelf servers and NICs
- **Feature Depth:** RADIUS and CoA capabilities required for the upcoming BNG rollout

Implementation

The transition to VyOS was executed in phases, prioritizing stability and performance tuning. The engineering team leaned heavily on internal lab testing to validate configurations before production. The deployment focused on:

- **Optimization: Tuning system interrupts, hugepages, and NIC RSS to maximize hardware efficiency**

- **Automation: Leveraging API and Ansible for fast, repeatable configuration management**
- **Integration: Validating NAT rules and NOC visibility tooling for production readiness**

After the initial discovery phase, KCAT achieved a **stable, high-performance** setup that integrated cleanly with their **converged core.**

Results

By replacing their legacy hardware platform with VyOS, KCAT improved **peak-hour stability** and **customer experience** immediately. Key metrics included:

- **Throughput:** Consistent delivery of **7 to 10 Gbps** stable traffic
- **Latency:** NAT latency reduced by **35 to 50%** compared to the previous platform
- **Efficiency: Conntrack utilization maintained under 40%** even during peak usage
- **Reliability:** Zero unplanned downtime in production

Operational and Cost Impact

VyOS lowered **hardware cost per Gbps** and reduced **operational overhead** by enabling predictable scale-out on standard servers and commodity NICs. Day-to-day wins included:

- **Transparent configurations** and easier troubleshooting
- **Native Linux tools** when needed
- Fast automation via **API plus Ansible**
- **Real-time subscriber visibility** for the NOC

Looking Ahead

CGNAT was Phase 1. Phase 2 is full IPoE BNG on VyOS. KCAT has already validated key BNG requirements, including:

- **RADIUS-based policies** and **CoA** for dynamic changes
- **DHCPv4** and **DHCPv6-PD** for IPoE delivery
- **Per-subscriber VRF** and **rate-limit assignment**
- **VLAN-per-user** and **shared VLAN architectures**
- Clean integration with their **converged core**

They are migrating subscribers gradually, and early performance is promising.

VyOS has been a strong partner, and we would recommend it to other ISPs, especially those managing growth at our scale.

— Joel Dabao, President, KCAT Inc.