E2E Network Services Automation

Tigo Guatemala and Aarna Networks leverage an open source cloud-based solution to automate E2E services discovery and testing

Summary

TIGO Guatemala with the help of Aarna Networks automated the discovery and testing of end-to-end services and devices for customers using their MPLS network through a cloud-based solution utilizing key ONAP components deployed onto Kubernetes clusters. This automation improved efficiency and reduced their Mean Time to Response (MTTR) to incidents—a key performance metric.

The Challenge

TIGO is a major mobile service provider company in Latin America servicing many countries in the region. TIGO Guatemala started working with Aarna Networks in 2020, initially requesting installation and training support for the (Open Networking Automation Platform) **ONAP** project platform to help automate their physical network functions.

The most significant challenge Tigo faced was standardization of their network configurations. Tigo offers their business customers point-to-point data connectivity (over Layer 3) based on Multiprotocol Label Switching (MPLS). The network is more than 15 years old and contains a mix of old and new devices. This non-standard set up makes communication between physical devices difficult and requires new configuration templates and projects to correct issues. To configure these templates manually was time consuming for the Tigo technical staff.

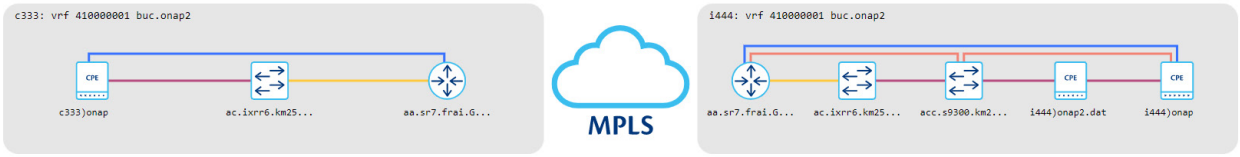
> "We were surprised by all the things that are possible with ONAP! Aarna networks helped us take advantage of using open source projects and achieve tangible improvements in our key performance metrics like MTTR. We expect to leverage more platform capabilities in the future and use ONAP to help us migrate towards a virtual network."
>
> ***– Michel Ramirez, Tigo Guatemala (Millicom)***

The Solution

As part of their strategy towards network automation, Tigo needed a flexible platform to develop automation use cases for physical network functions today (and VNFs in the future). This needed to include diagnosing E2E circuits with pings to track packet loss, jitter, and more. They considered many platforms before settling on the Linux Foundation ONAP project. ONAP proved able to discern network problems in real time and alert the ticket issuing platform (formerly a manual task done by Support Engineers).

Enlisting the help of Aarna Networks, Tigo Guatemala set out to automate the discovery and testing of end-to-end services and devices over their MPLS network. Working together, they developed a cloud-

based solution utilizing key ONAP components deployed onto Kubernetes clusters. Tigo developed a custom model that fit their network architecture for the A&AI database, creating custom libraries in the CDS module to discover the devices' relationships, store them inside the A&AI, and communicate with the network's devices. They created custom workflows in Camunda to discover and diagnose the devices.



Circuit with ONAP relationships

They have also successfully implemented the discovery of various MPLS network relationships such as LLDP, MAC, ARP, and LSP on the network for particular subscribers. Using the workflow engine in ONAP, they implemented Ping, Traceroute, and Route table tests where an outside portal calls for the tests which are executed by CDS and then returned to the portal.

The Benefits

The E2E discovery and testing automation now provides a centralized platform to manage MPLS network inventory. Using ONAP, Tigo can configure and communicate with 10-12 different models of devices on their MPLS network, avoiding the need for manual configuration templates.

The automation is helping Tigo to detect, diagnose, and start remediating incidents, oftentimes before the customer can detect and report it. Importantly, this is helping TIGO reduce a key performance metric: Mean Time To Response (MTTR) after an incident. This means more network uptime, the freeing of support staff from manual work, higher customer satisfaction, and higher customer retention.

Tigo Guatemala is moving forward with complete automation QA towards production and is looking to share their learnings with other TIGO subsidiaries. In the future, Tigo expects to migrate their physical network functions to virtual ones, where ONAP again will be instrumental.

"Tigo's MPLS automation was the perfect use case for select ONAP components. The modular nature of ONAP allows users to choose the most relevant components and integrate with other open source projects to meet customer requirements. It's great to see the results we've achieved with Tigo and we look forward to more automation breakthroughs in the future."

– Amar Kapadia, Aarna Networks

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