Setting Up a Telecom-Grade Temporary Conferencing Network

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- Undergraduate CS Student in Taiwan
- Expertise: Kubernetes, Networking and SDN
- Experience
  - 2022: Site Reliability Engineering Intern at LINE
  - 2024: Research Assistant at National University of Singapore (NUS)
- Fellowships & Awards
  - 2021 APAN
  - 2022 APNIC 54 Fellowship program
  - 2023 APSIG Fellowship program
  - 2025 APNIC Policy Pilot Fellowship program
- Delivered presentations at over 10 technical events in Taiwan

Introduction and Objectives

- Conference networking remains a significant challenge for event organizers, as stability and high throughput are paramount.
- Inspired by APNIC’s conference network architecture, we aim to leverage this opportunity to deploy a telecom-grade temporary network.
- Full autonomy and optimal routing.
- Obtaining a temporary AS number and announcing our own IP address space.

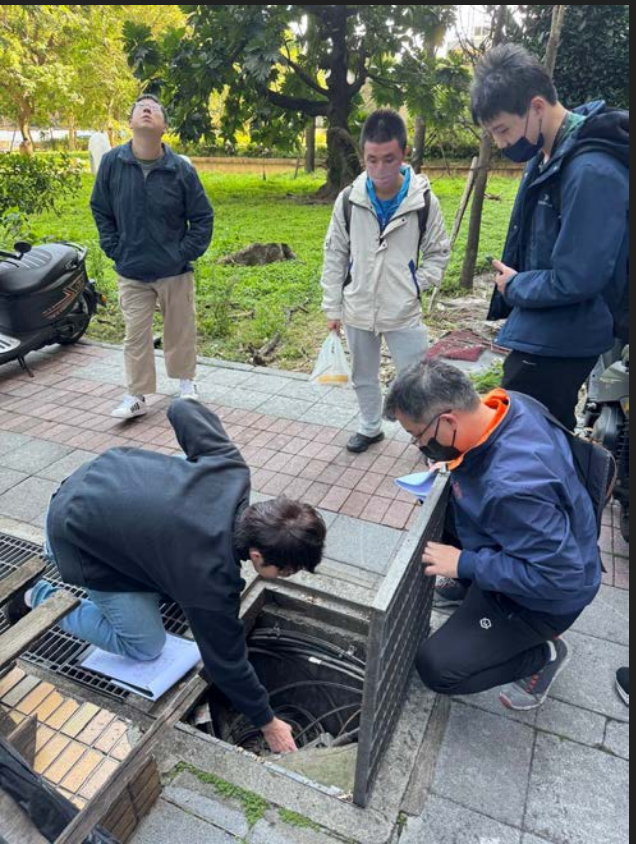
Network Topology: Connect to the Internet

- Most IXPs and NSPs Located Exclusively in Data Centers.
- Challenges of Data Center-to-Venue Connectivity.

Survey the resources: Layer 1

Obtain the fiber-optic conduit map from the Government

Building Fiber Optic Site Survey



Survey the resources: Layer 2

Requirements and Purpose

- Long-distance link requiring a connection back to the main server room.
- Must interface with multiple upstream providers and Internet Exchanges.
- Must operate as a trunk port, carrying multiple VLANs.
- Minimum port speed of 10 Gbps.

IP Transit
Layer 3 & IP Resources

Get the IP Resources

- Apply the AS and temporary IP (prop-156) from the APNIC.

prop-156: Assignment of Temporary IP Resources

Proposal text	prop-156-v002
Objective	This proposal suggests reserving the /21 IPv4 prefix from the non-103/8 pool, as well as a /29 IPv6 prefix and 8 Autonomous System numbers, for delegation to events such as conferences and any other reason that APNIC deems appropriate and for which a long-term assignment would not be feasible.
Current status	Implemented
Author	Christopher Hawker
Relevant forum	Policy SIG
Previous versions	prop-156-v001

BGP and OSPF Layer 3

How we setup the WiFi AP?

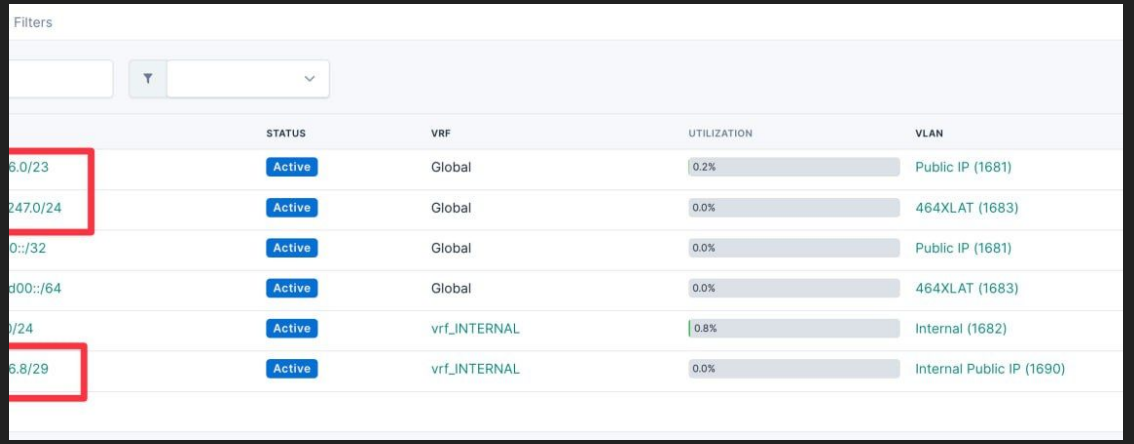
Device list

- Aruba AP535 * 10
  - Connected via 10G Ethernet port with PoE support.
  - Installed using a camera tripod with mounting bracket.

Services that we set up.

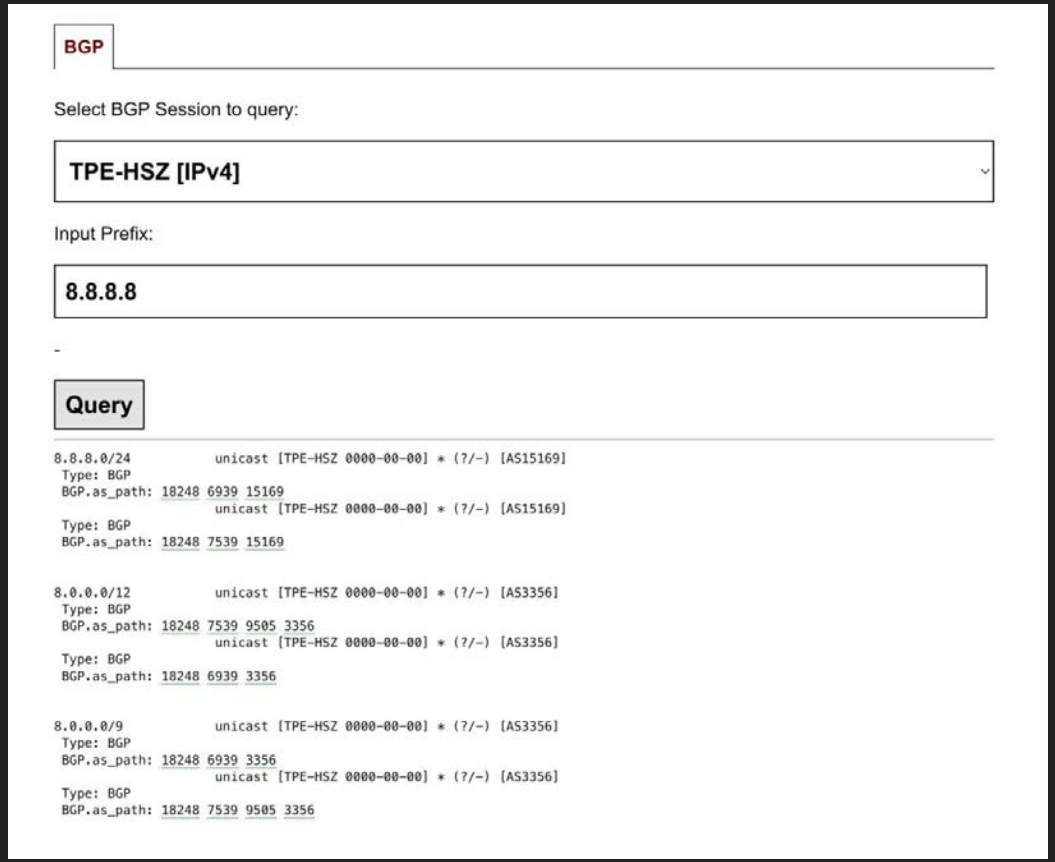
Netbox

- Integration of DCIM and IPAM
- IP address allocation
- DNS configuration
- Device management
- Highly customizable
  - Custom fields
  - Custom export templates
- Provides data sources for network automation
- REST API and GraphQL API available



BGP Tools Looking Glass

- Integration with bgp.tools.
- Allowing users to perform online BGP route lookups.



RIPE Atlas

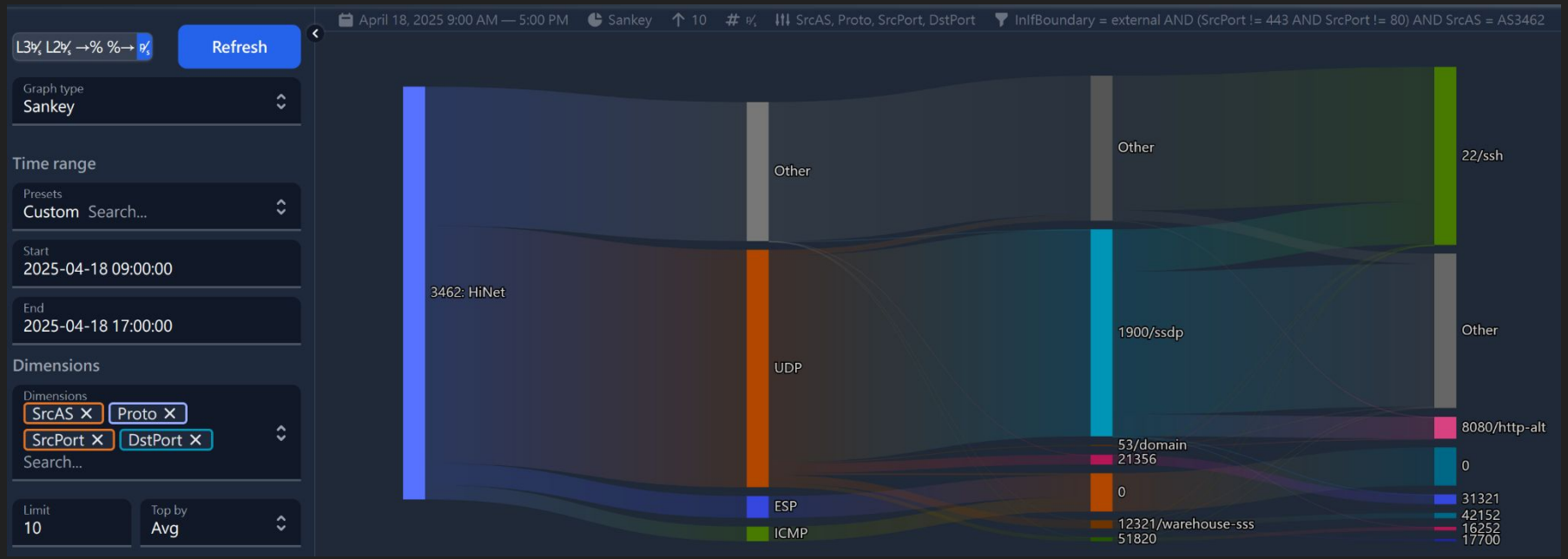
- Testing the routing

WireGuard VPN

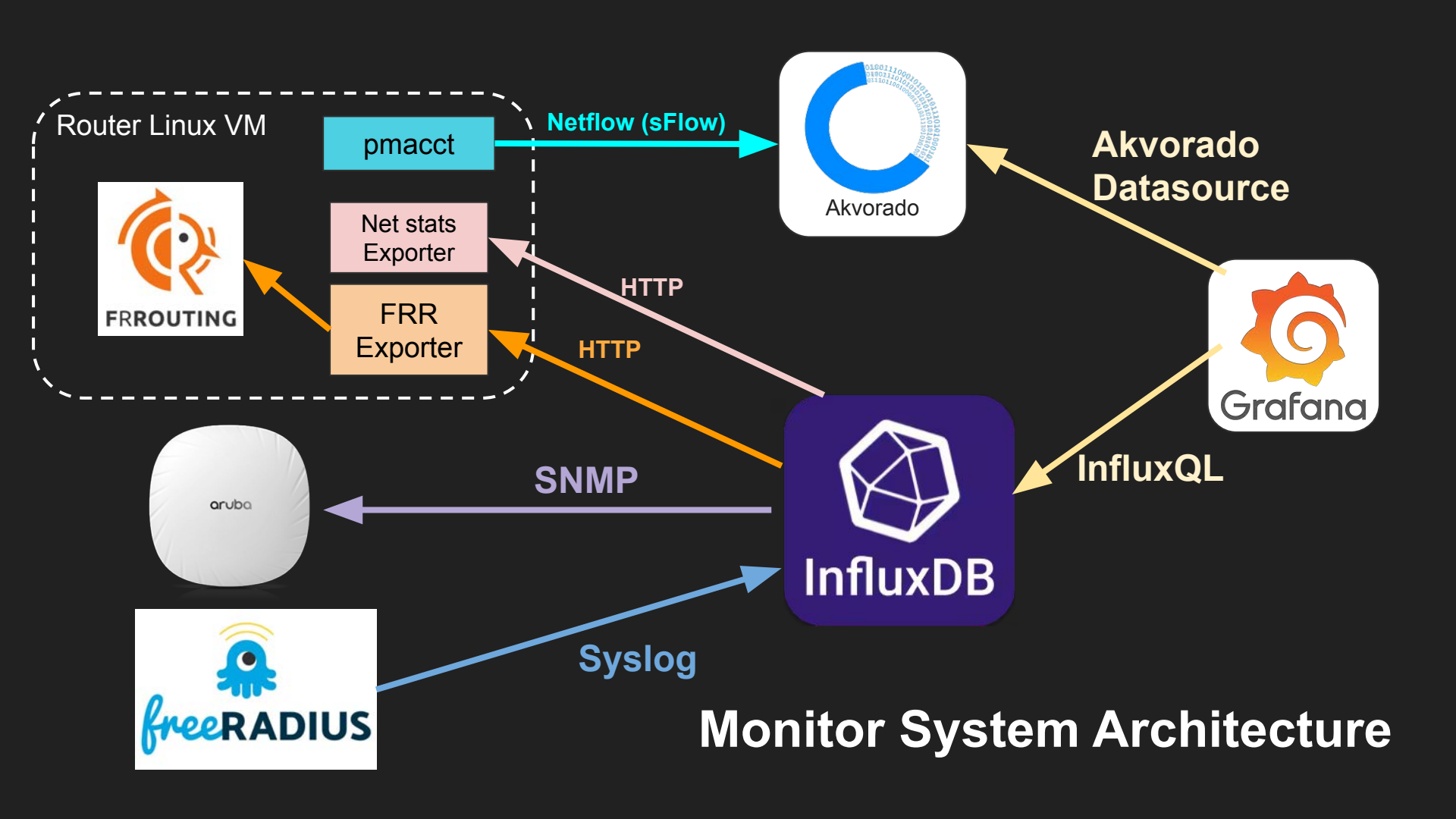
- Connects to internal networks, e.g., IPAM, Grafana, IPMI, or routers.
- SNATs traffic to the Internet using the IP address (if needed).

Akvorado Flow

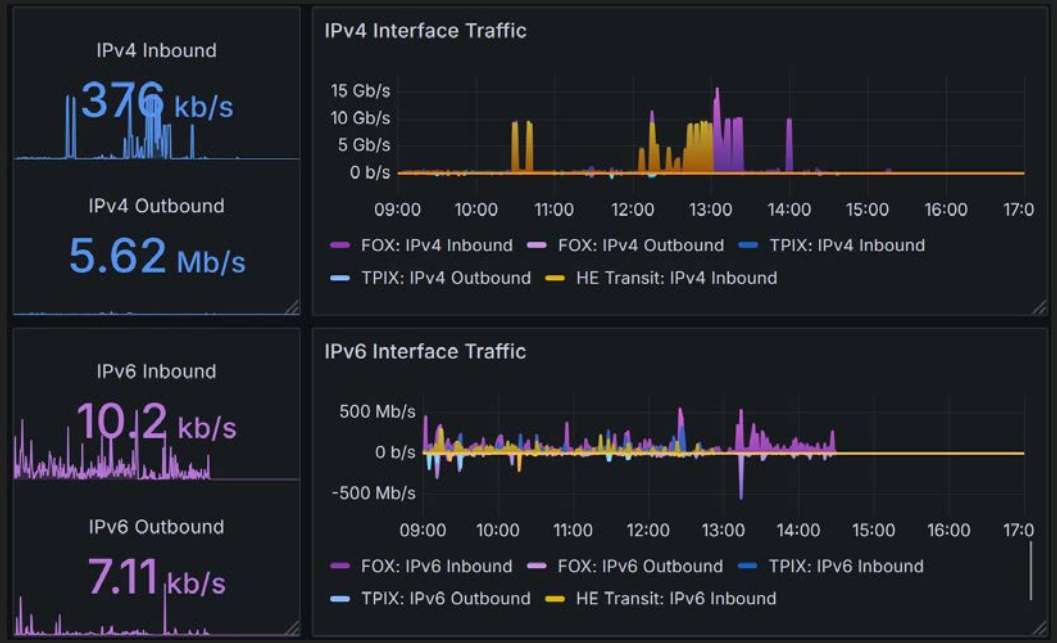
Sankey Graph



Grafana Monitor Dashboard


Router Linux VM
pmacct
Netflow (sFlow)
Akvorado
Akvorado Datasource
FRROUTING
Net stats Exporter
HTTP
FRR Exporter
HTTP
Grafana
aruba
SNMP
InfluxQL
InfluxDB
freeRADIUS
Syslog
Monitor System Architecture

Write a Net Stats Exporter to export the IPv4/IPv6 traffic



https://github.com/YiPrograms/net-stats-exporter

That’s all.

Challenges Encountered

- Time.
- Communication.
- Lots of communication.
- Still more communication.
- People can be challenging.

You won’t know the outcome unless you try, so don’t give up before you start.

This is our philosophy for success.