# Faucet : Openflow SDN Made Easy

## Richard Nelson

### RIPE78
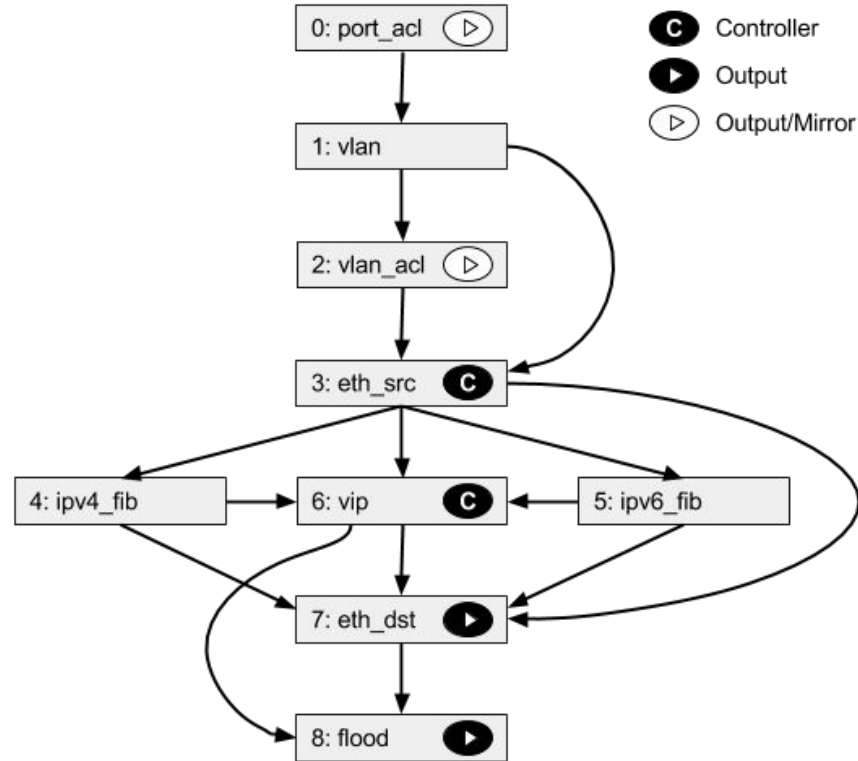
Faucet
Foundation

Faucet

# Faucet is an Enterprise SDN Controller
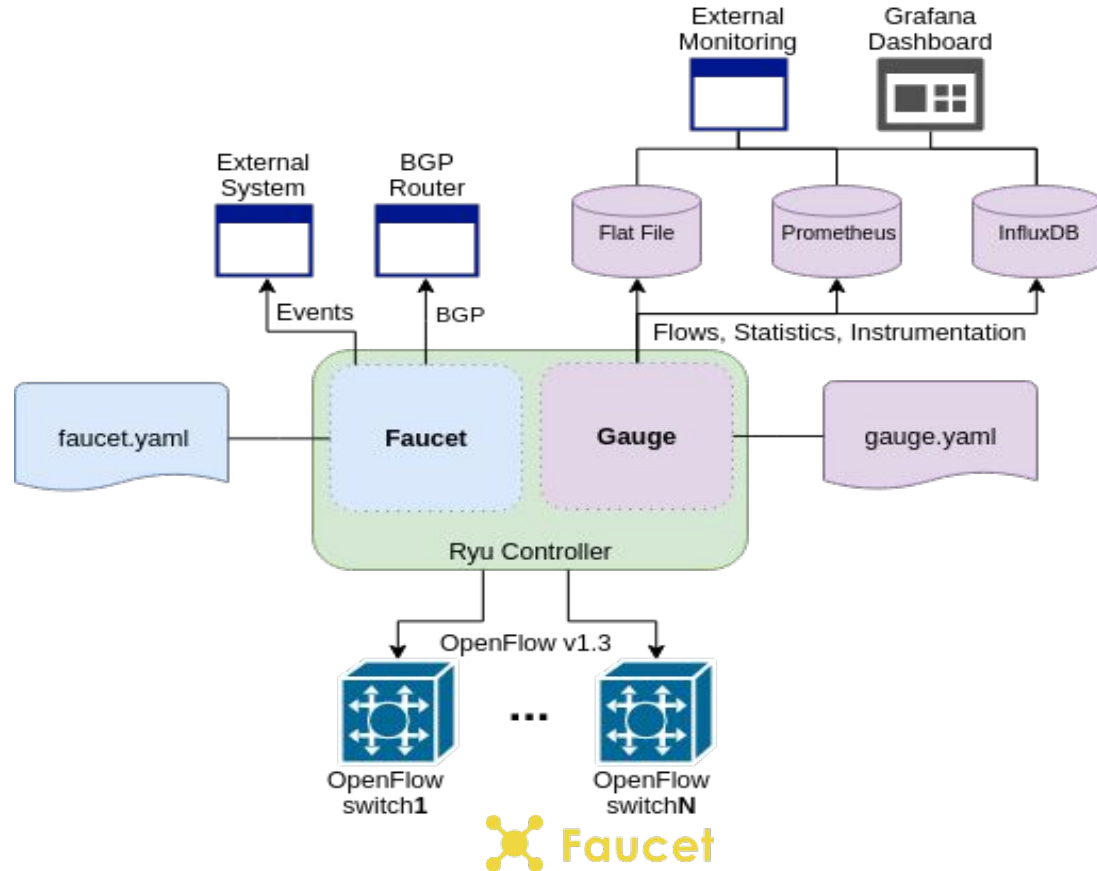
# Faucet Pipeline

# Integration Test Suite

- Boot up many different network scenarios in parallel
  - 30 - 60 minutes to complete
  - More code than the controller
- Ensure features work and checks performance
- Open vSwitch reference
- Real hardware
  - Lets us prequalify devices for FAUCET support
  - Cyber RFP

Faucet

# Switch Support

# As simple as possible (but no simpler)

- Easy to Install
  - pip, apt, docker etc
- Easy to Configure
  - YAML
- Easy to Automate
  - Test, deploy on green
- Easy to Upgrade
  - Weekly releases
- Well Documented
  - https://docs.faucet.nz



Faucet

# Network visibility

- Gauge fetches metrics from OpenFlow v1.3 dataplanes
  - MAC learning information
  - Port state
  - Port counters (bytes in/out, packets in/out, errors)

- Faucet controller also exports metrics
  - Learning capacity
  - CPU/Memory usage
  - Inventory

Grafana

Prometheus

influxdb

Faucet

# Policy and Security

DAQ - Google
- Flexible IoT Device Automated Qualification (DAQ) framework
- Extends Faucet test framework to test IoT device behaviour

Poseidon - Cyber Reboot
- Machine learning classification of node behaviour
- Uses Faucet events and traffic samples

Nozzle - UNSW
- AI inference engine(s) identify attacks
- Uses Faucet to block attacks

# Deployments

NZNOG
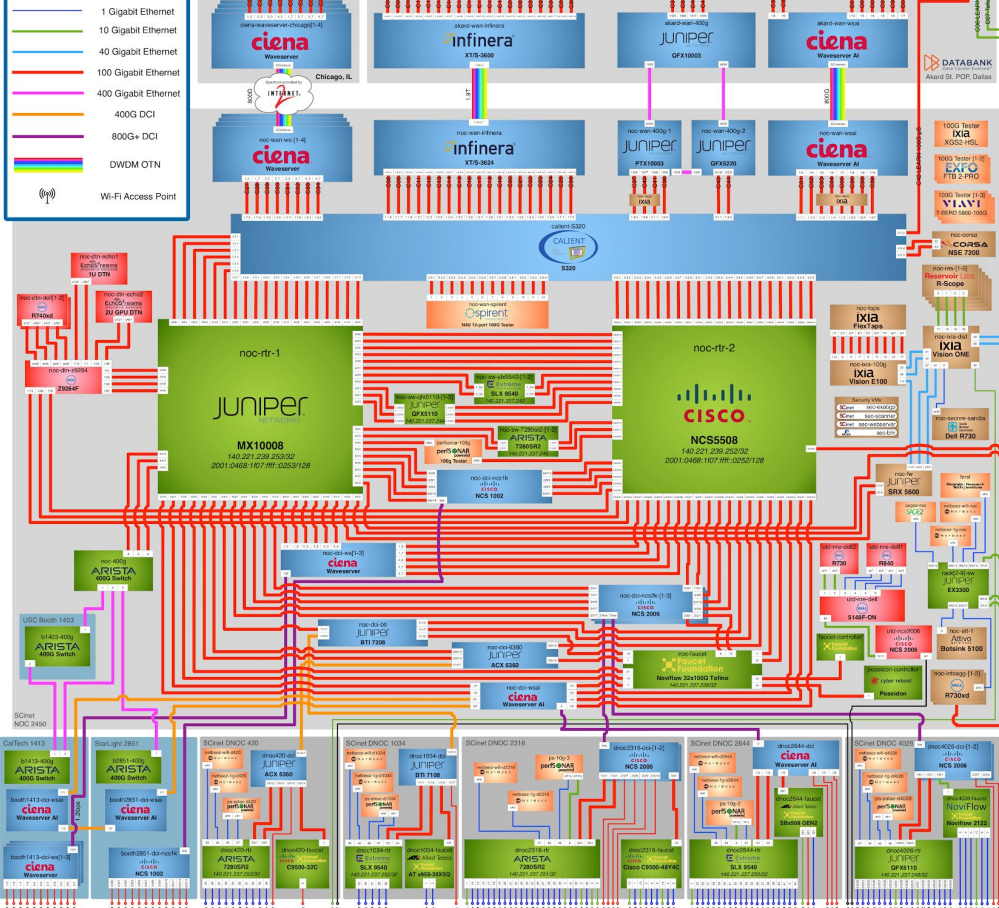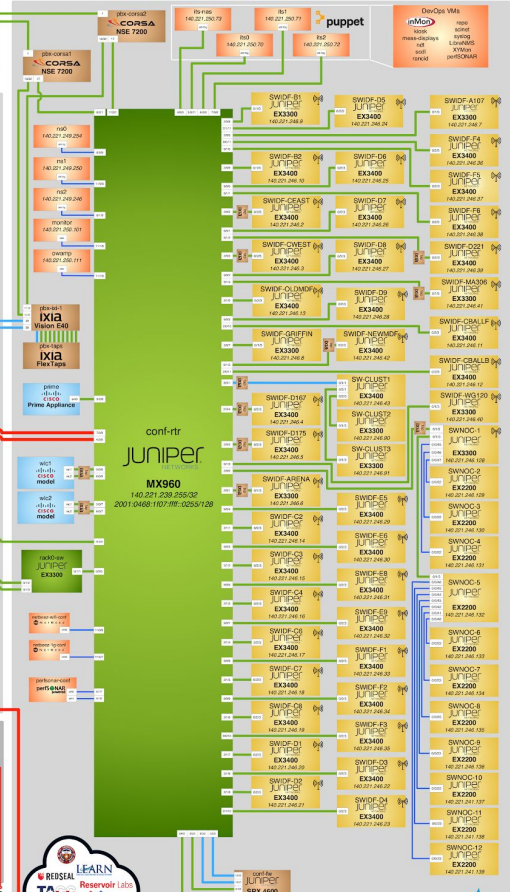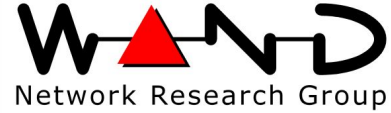New Zealand Network Operators Group

2017, 18, 19

WAND
Network Research Group

https://redcables.wand.nz/

SC18
Dallas, TX | hpc inspires.

Faucet

SCinet Network Architecture v20 - November 11, 2018, Lance Hutchinson. SC18 Dallas, TX — hpc inspires.

noc-rtr-1 — Juniper MX10008
noc-rtr-2 — Cisco NCS5500
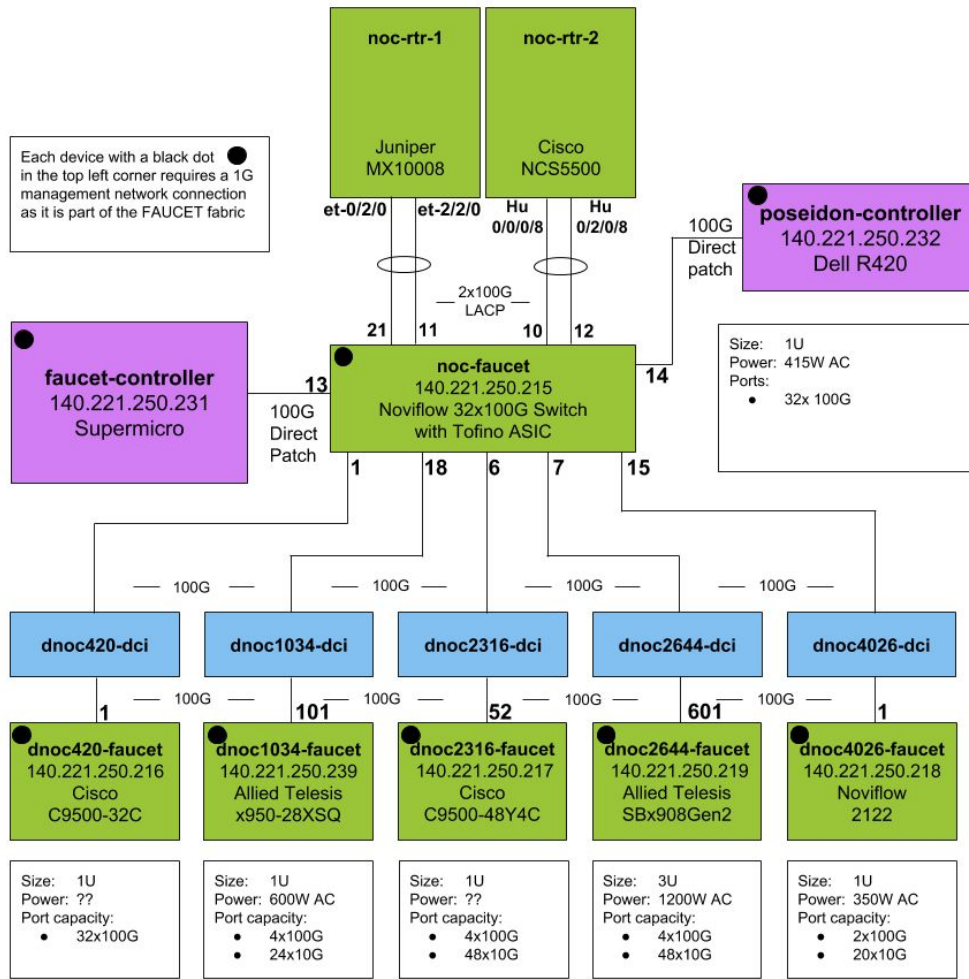
Each device with a black dot in the top left corner requires a 1G management network connection as it is part of the FAUCET fabric

poseidon-controller
140.221.250.232
Dell R420

Size: 1U
Power: 415W AC
Ports:
- 32x 100G

et-0/2/0  et-2/2/0  Hu 0/0/0/8  Hu 0/2/0/8

100G Direct patch

2x100G LACP

21  11  10  12

faucet-controller
140.221.250.231
Supermicro

13

noc-faucet
140.221.250.215
Noviflow 32x100G Switch
with Tofino ASIC

14

100G Direct Patch

1  18  6  7  15

100G  100G  100G  100G

dnoc420-dci  dnoc1034-dci  dnoc2316-dci  dnoc2644-dci  dnoc4026-dci

1  100G  101  100G  52  100G  601  100G  1

dnoc420-faucet
140.221.250.216
Cisco
C9500-32C

dnoc1034-faucet
140.221.250.239
Allied Telesis
x950-28XSQ

dnoc2316-faucet
140.221.250.217
Cisco
C9500-48Y4C

dnoc2644-faucet
140.221.250.219
Allied Telesis
SBx908Gen2

dnoc4026-faucet
140.221.250.218
Noviflow
2122

Size: 1U
Power: ??
Port capacity:
- 32x100G

Size: 1U
Power: 600W AC
Port capacity:
- 4x100G
- 24x10G

Size: 1U
Power: ??
Port capacity:
- 4x100G
- 48x10G

Size: 3U
Power: 1200W AC
Port capacity:
- 4x100G
- 48x10G

Size: 1U
Power: 350W AC
Port capacity:
- 2x100G
- 20x10G

https://github.com/wandsdn/sc18-ansible

# Staging and Testing

# Show Setup

# Complete NOC

# Team

# Faucet, Multivendor 100G SDN Made (fairly) Easy

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