

TeraFlow
SDN
by ETSI

2nd TeraFlowSDN Hackfest - Results

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Setup

Two Ubuntu 20 VM hosted at the University of Bologna, one running the emulated data plane with ContainerLab and the other the TeraFlowSDN controller.

Each VM is equipped with 8G of RAM, 80G of Memory and 4 vCPU.

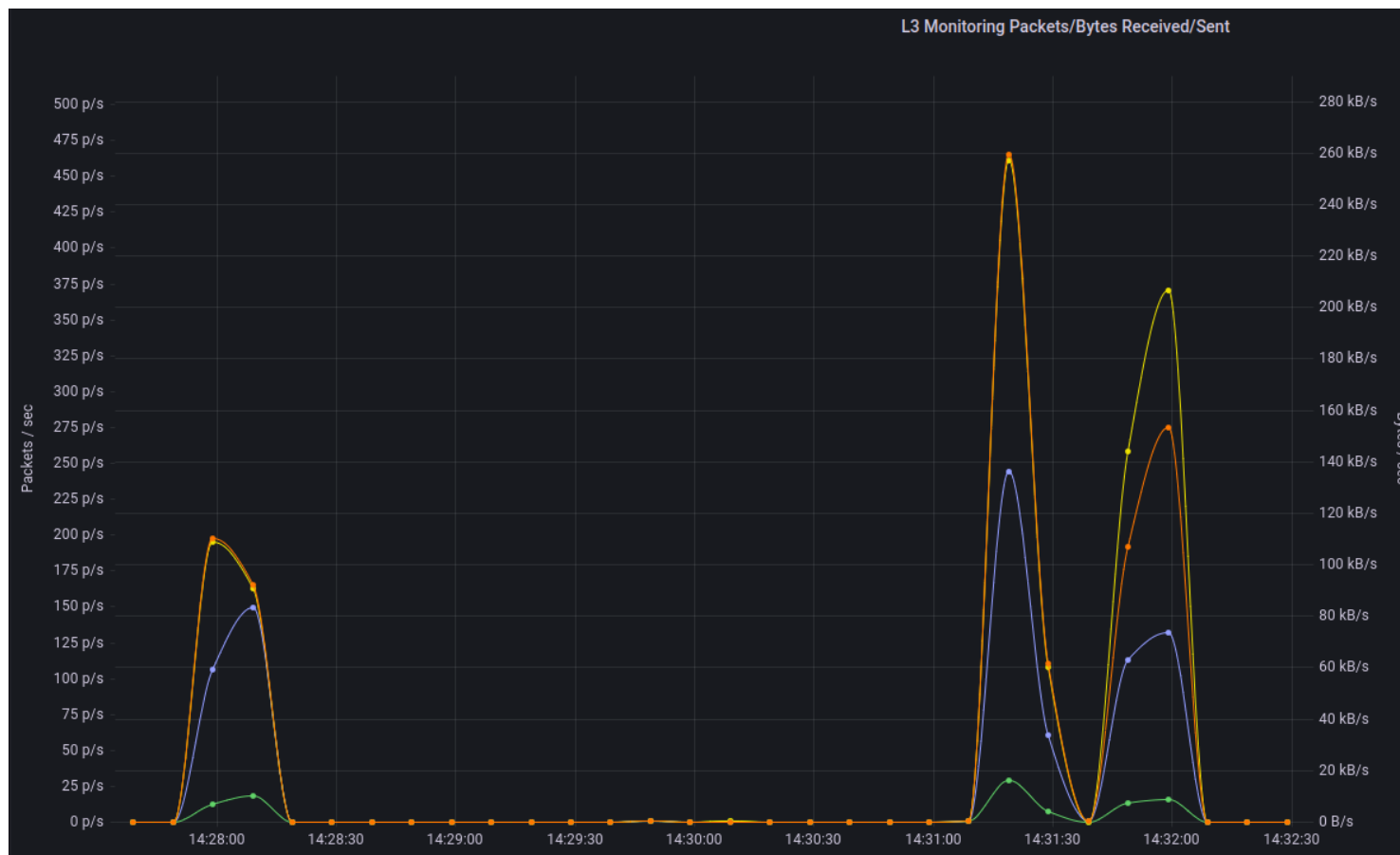
TeraFlow and ContainerLab were installed following the “Deployment Guide” available in the wiki.

First Challenge: Completed



The traffic between the two clients flows correctly, and the metrics are captured and displayed in the Grafana dashboard. The image here shows one of the interfaces of SRL2. The spike in terms of packets/sec was generated with a ping with the flood key enabled.

Second Challenge: iperf results



The iperf between the two clients works but presents some issues, probably due to the use of the emulated routers. Furthermore, by varying the packet size used in tests, the results improve a bit.

Maybe the routers perform better with smaller packets? Or they might need more computational resources.

Second Challenge: iperf results

```

bash-5.0# iperf3 -c 172.16.2.10
Connecting to host 172.16.2.10, port 5201
[ 5] local 172.16.1.10 port 56878 connected to 172.16.2.10 port 5201
[ ID] Interval           Transfer     Bitrate      Retr  Cwnd
[ 5]  0.00-1.00   sec    332 KBytes  2.72 Mbits/sec    3   9.23 KBytes
[ 5]  1.00-2.00   sec     0.00 Bytes  0.00 bits/sec    1   9.23 KBytes
[ 5]  2.00-3.00   sec     0.00 Bytes  0.00 bits/sec    0   9.23 KBytes
[ 5]  3.00-4.00   sec     0.00 Bytes  0.00 bits/sec    1   9.23 KBytes
[ 5]  4.00-5.00   sec     0.00 Bytes  0.00 bits/sec    0   9.23 KBytes
[ 5]  5.00-6.00   sec     0.00 Bytes  0.00 bits/sec    0   9.23 KBytes
[ 5]  6.00-7.00   sec     0.00 Bytes  0.00 bits/sec    1   9.23 KBytes
[ 5]  7.00-8.00   sec     0.00 Bytes  0.00 bits/sec    0   9.23 KBytes
[ 5]  8.00-9.00   sec     0.00 Bytes  0.00 bits/sec    0   9.23 KBytes
[ 5]  9.00-10.00  sec     0.00 Bytes  0.00 bits/sec    0   9.23 KBytes
-----
[ ID] Interval           Transfer     Bitrate      Retr
[ 5]  0.00-10.00  sec    332 KBytes  272 Kbits/sec    6          sender
[ 5]  0.00-10.01  sec     0.00 Bytes  0.00 bits/sec              receiver

```

```

bash-5.0# iperf3 -c 172.16.2.10 -M 700
Connecting to host 172.16.2.10, port 5201
[ 5] local 172.16.1.10 port 56882 connected to 172.16.2.10 port 5201
[ ID] Interval           Transfer     Bitrate      Retr  Cwnd
[ 5]  0.00-1.00   sec    629 KBytes  5.15 Mbits/sec    2   688 Bytes
[ 5]  1.00-2.00   sec    379 KBytes  3.11 Mbits/sec    5   688 Bytes
[ 5]  2.00-3.00   sec     0.00 Bytes  0.00 bits/sec    1   688 Bytes
[ 5]  3.00-4.00   sec    505 KBytes  4.14 Mbits/sec   22   688 Bytes
[ 5]  4.00-5.00   sec    379 KBytes  3.11 Mbits/sec   14  26.2 KBytes
[ 5]  5.00-6.00   sec     0.00 Bytes  0.00 bits/sec    2   688 Bytes
[ 5]  6.00-7.00   sec    505 KBytes  4.14 Mbits/sec   24   688 Bytes
[ 5]  7.00-8.00   sec     0.00 Bytes  0.00 bits/sec    1   688 Bytes
[ 5]  8.00-9.00   sec    379 KBytes  3.10 Mbits/sec   20   688 Bytes
[ 5]  9.00-10.00  sec    505 KBytes  4.14 Mbits/sec   37   688 Bytes
-----
[ ID] Interval           Transfer     Bitrate      Retr
[ 5]  0.00-10.00  sec   3.20 MBytes  2.69 Mbits/sec  128          sender
[ 5]  0.00-10.85  sec   3.04 MBytes  2.35 Mbits/sec              receiver

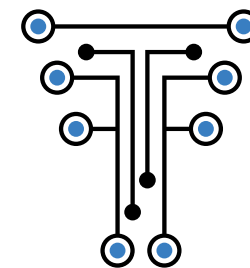
```

Third Challenge: Modified topology

Unfortunately, it seems there aren't other container-based license-free emulated devices supported by ContainerLab that can be controlled with gNMI.

Potential other candidates:

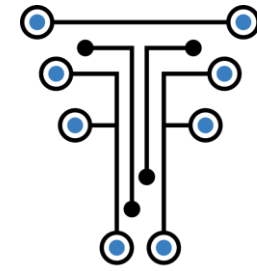
- **FRR**: seems to support gRPC. However, it's unclear which YANG format it is using. gRPC needs to be activated for each desired router service (e.g., OSPF, RIP, BGP, etc.) by adding the option `-M grpc:PORT` in the daemon config file (<https://docs.frrouting.org/en/latest/grpc.html>).
- **IPInfusion OcNOS**: the docker image must be compiled manually from a qcow2 image. This image should support gNMI calls (TO BE TESTED).



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Thank You!

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