

Pantheon Report

Generated at 2018-08-31 12:42:49 (UTC).

Data path: GCE Sydney on **ens4** (*local*) → GCE Tokyo on **ens4** (*remote*).

Repeated the test of 4 congestion control schemes twice.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

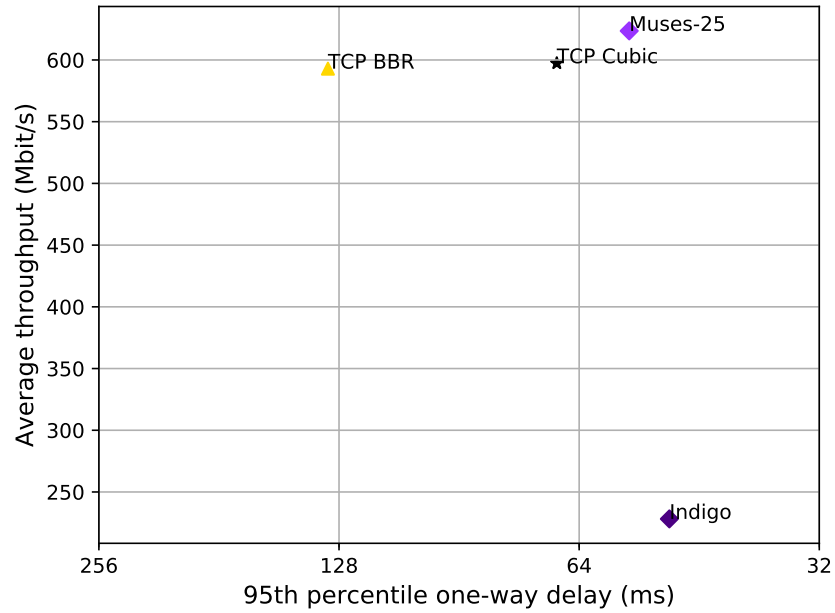
System info:

```
Linux 4.15.0-1018-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
net.ipv4.tcp_mem = 536870912 536870912 536870912
```

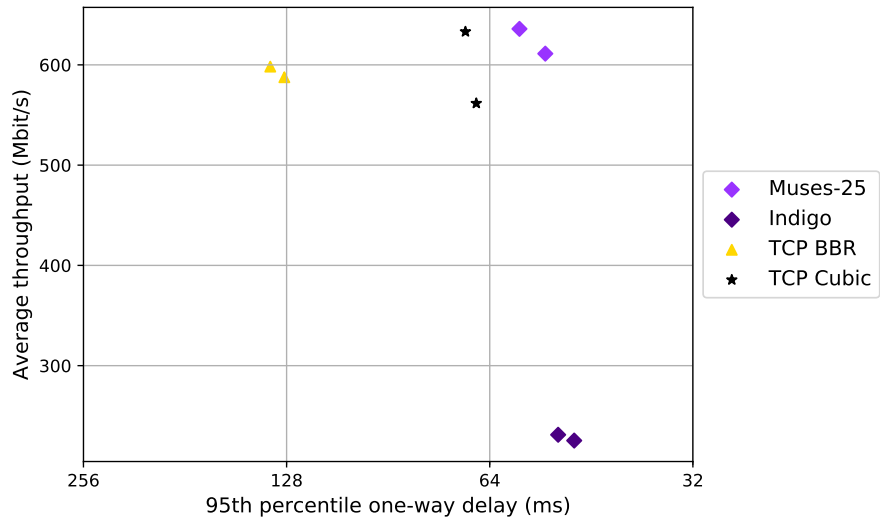
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
third_party/pantheon-tunnel @ cbfce6db5ff5740dafa1771f813cd646339e1952
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from GCE Sydney to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Sydney to GCE Tokyo, 2 runs of 30s each per scheme



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	592.98	132.16	0.62
TCP Cubic	2	597.36	68.27	0.01
Indigo	2	228.19	49.33	0.00
Muses-25	2	623.55	55.39	0.00

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 12:21:38

End at: 2018-08-31 12:22:08

Local clock offset: 0.386 ms

Remote clock offset: -2.456 ms

Below is generated by plot.py at 2018-08-31 12:41:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 598.28 Mbit/s

95th percentile per-packet one-way delay: 135.337 ms

Loss rate: 0.67%

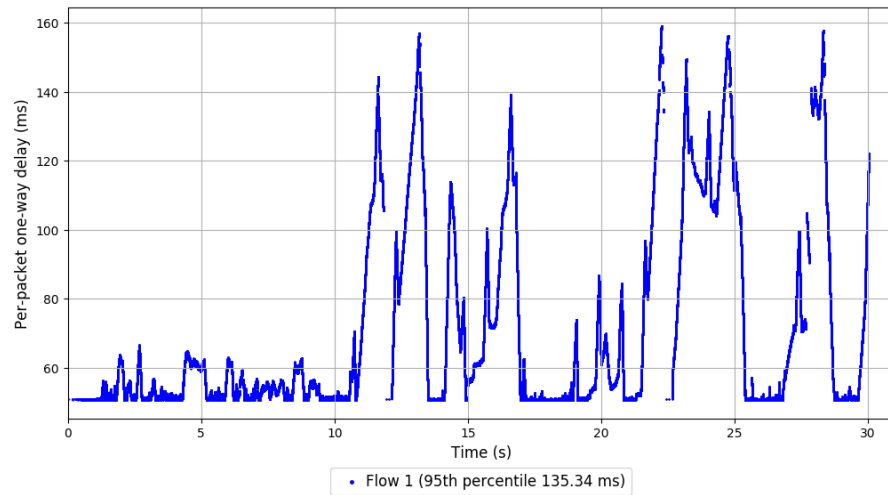
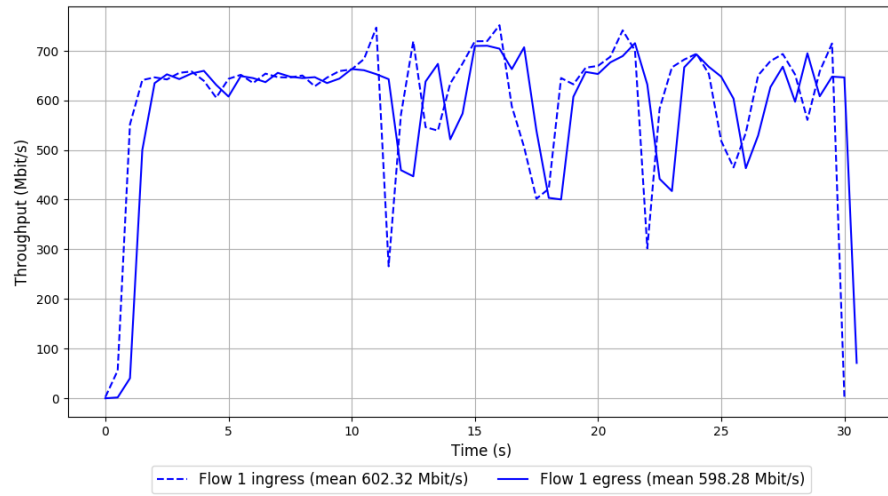
-- Flow 1:

Average throughput: 598.28 Mbit/s

95th percentile per-packet one-way delay: 135.337 ms

Loss rate: 0.67%

Run 1: Report of TCP BBR — Data Link

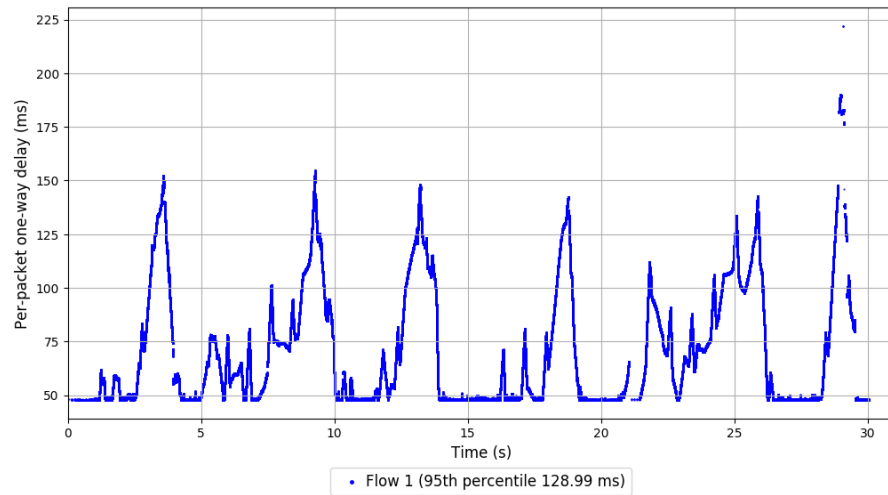
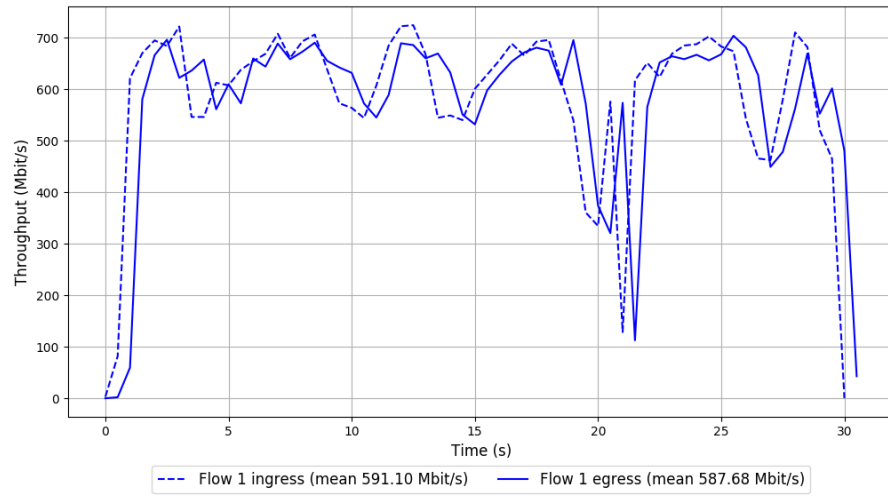


Run 2: Statistics of TCP BBR

Start at: 2018-08-31 12:27:45
End at: 2018-08-31 12:28:15
Local clock offset: 0.317 ms
Remote clock offset: -2.399 ms

Below is generated by plot.py at 2018-08-31 12:41:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 587.68 Mbit/s
95th percentile per-packet one-way delay: 128.988 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 587.68 Mbit/s
95th percentile per-packet one-way delay: 128.988 ms
Loss rate: 0.58%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 12:20:02

End at: 2018-08-31 12:20:32

Local clock offset: 0.31 ms

Remote clock offset: 3.343 ms

Below is generated by plot.py at 2018-08-31 12:42:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 633.07 Mbit/s

95th percentile per-packet one-way delay: 69.533 ms

Loss rate: 0.02%

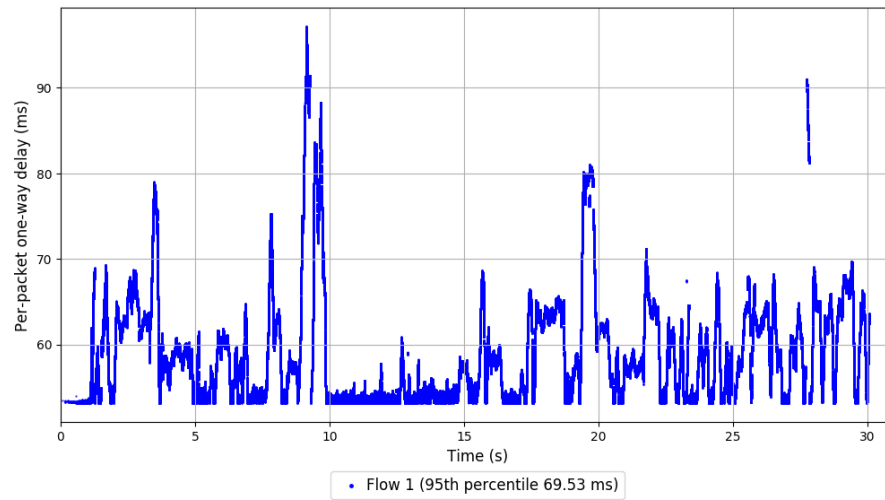
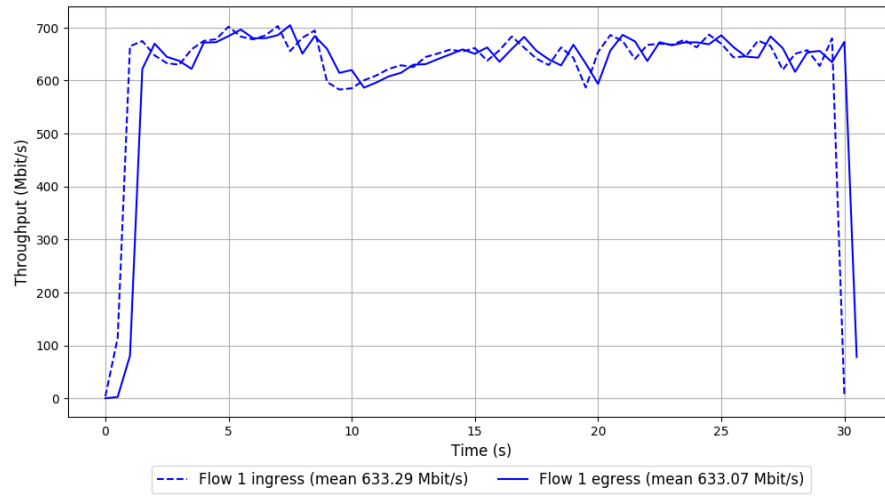
-- Flow 1:

Average throughput: 633.07 Mbit/s

95th percentile per-packet one-way delay: 69.533 ms

Loss rate: 0.02%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 12:26:14

End at: 2018-08-31 12:26:44

Local clock offset: 0.422 ms

Remote clock offset: 0.372 ms

Below is generated by plot.py at 2018-08-31 12:42:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 561.65 Mbit/s

95th percentile per-packet one-way delay: 67.002 ms

Loss rate: 0.00%

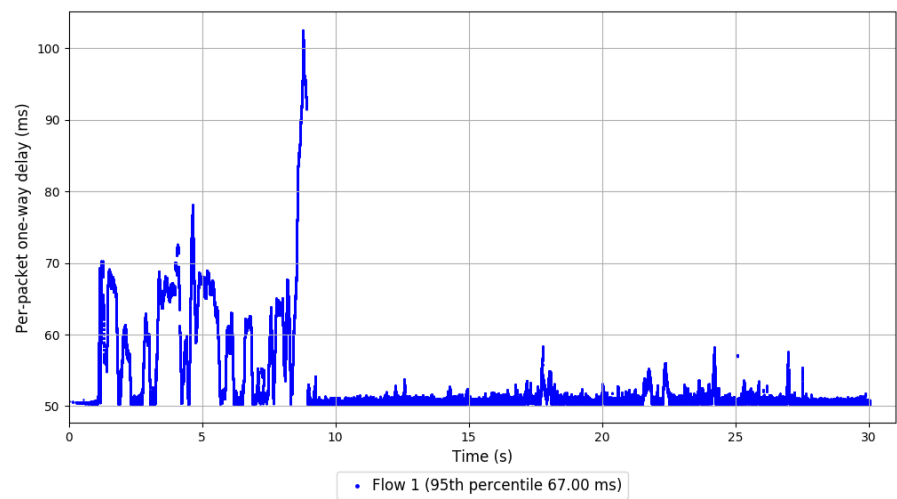
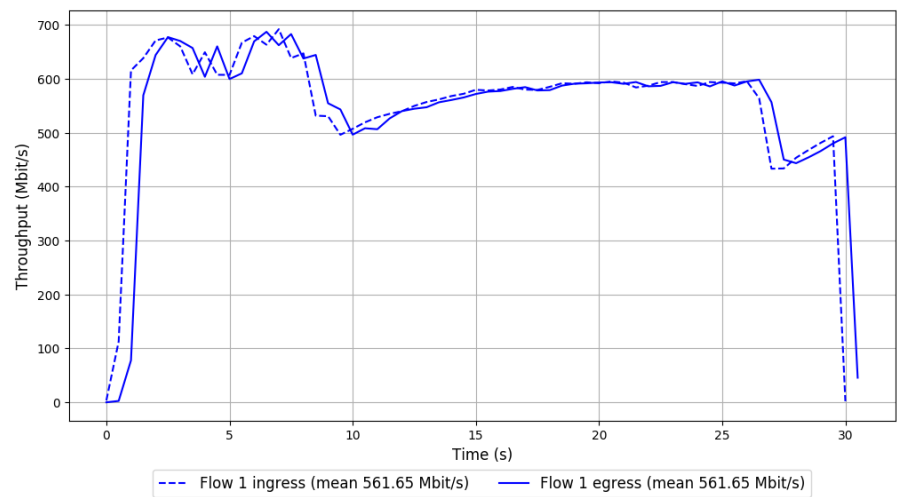
-- Flow 1:

Average throughput: 561.65 Mbit/s

95th percentile per-packet one-way delay: 67.002 ms

Loss rate: 0.00%

Run 2: Report of TCP Cubic — Data Link

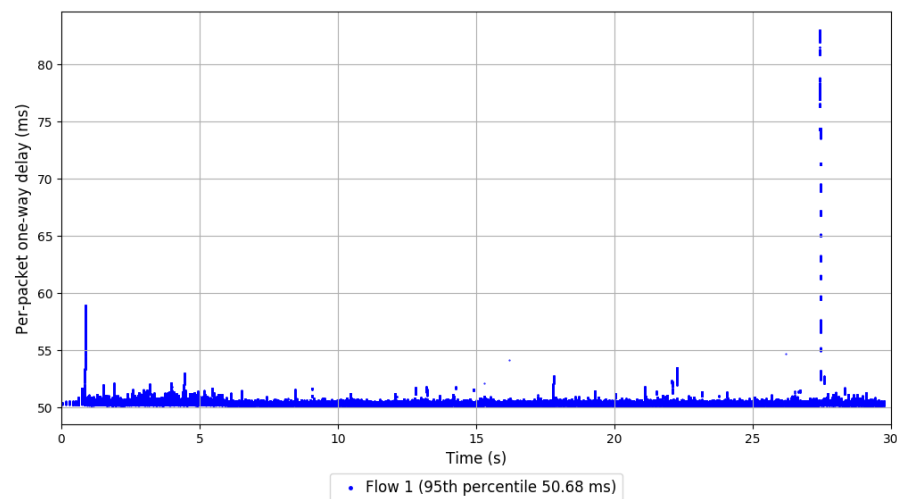
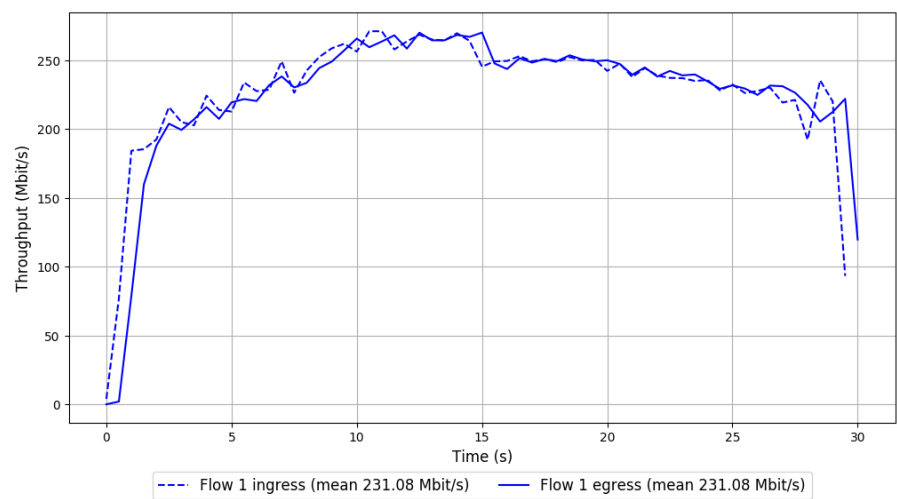


```
Run 1: Statistics of Indigo

Start at: 2018-08-31 12:24:48
End at: 2018-08-31 12:25:19
Local clock offset: 0.427 ms
Remote clock offset: 0.256 ms

# Below is generated by plot.py at 2018-08-31 12:42:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 231.08 Mbit/s
95th percentile per-packet one-way delay: 50.679 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 231.08 Mbit/s
95th percentile per-packet one-way delay: 50.679 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

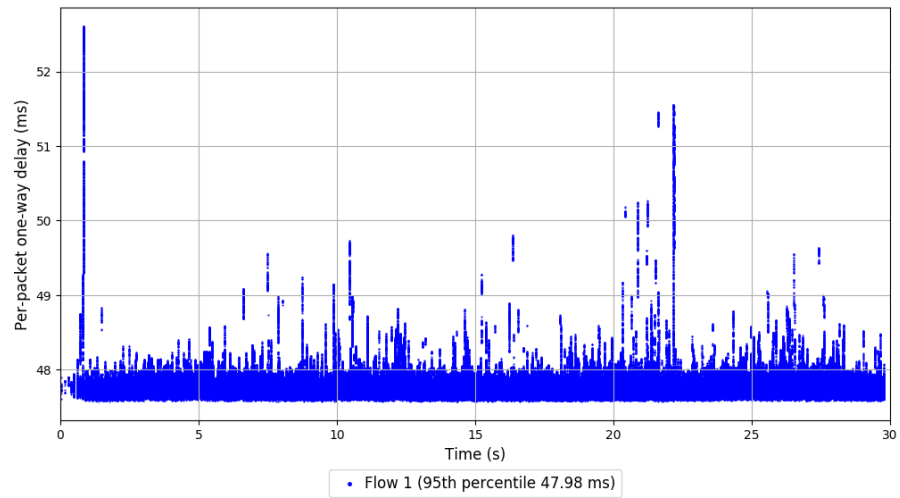
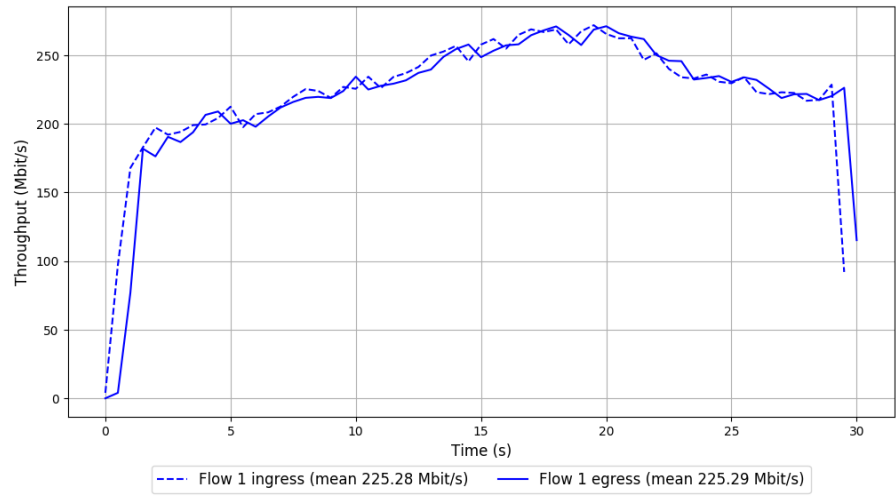


Run 2: Statistics of Indigo

Start at: 2018-08-31 12:30:59
End at: 2018-08-31 12:31:29
Local clock offset: 0.529 ms
Remote clock offset: -2.274 ms

Below is generated by plot.py at 2018-08-31 12:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 225.29 Mbit/s
95th percentile per-packet one-way delay: 47.976 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 225.29 Mbit/s
95th percentile per-packet one-way delay: 47.976 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link

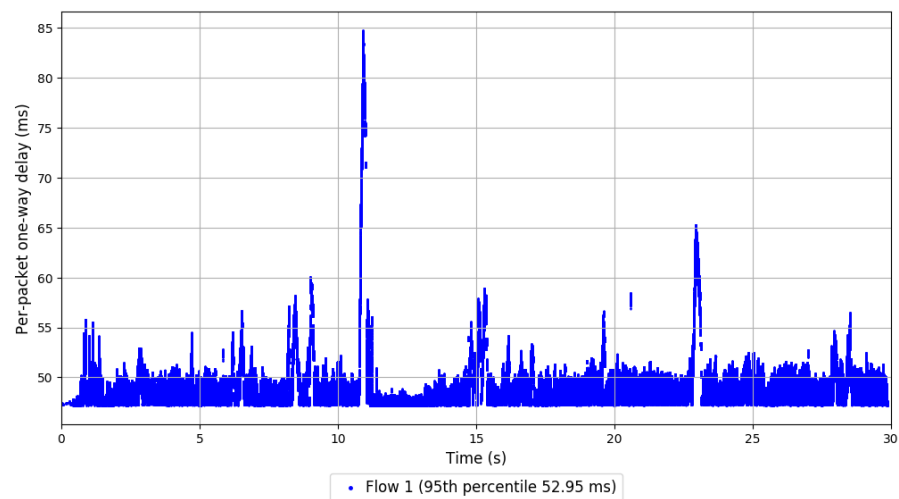
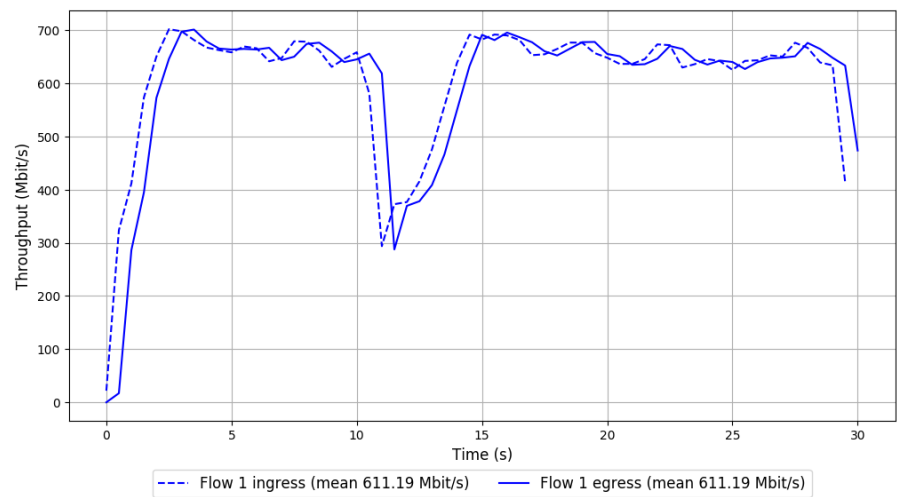


Run 1: Statistics of Muses-25

Start at: 2018-08-31 12:23:13
End at: 2018-08-31 12:23:43
Local clock offset: 0.573 ms
Remote clock offset: -2.388 ms

Below is generated by plot.py at 2018-08-31 12:42:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 611.19 Mbit/s
95th percentile per-packet one-way delay: 52.949 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 611.19 Mbit/s
95th percentile per-packet one-way delay: 52.949 ms
Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 12:29:21

End at: 2018-08-31 12:29:51

Local clock offset: 0.519 ms

Remote clock offset: 0.622 ms

Below is generated by plot.py at 2018-08-31 12:42:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 635.91 Mbit/s

95th percentile per-packet one-way delay: 57.829 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 635.91 Mbit/s

95th percentile per-packet one-way delay: 57.829 ms

Loss rate: 0.00%

Run 2: Report of Muses-25 — Data Link

