

Pantheon Report

Generated at 2018-08-31 11:44:10 (UTC).

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

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.

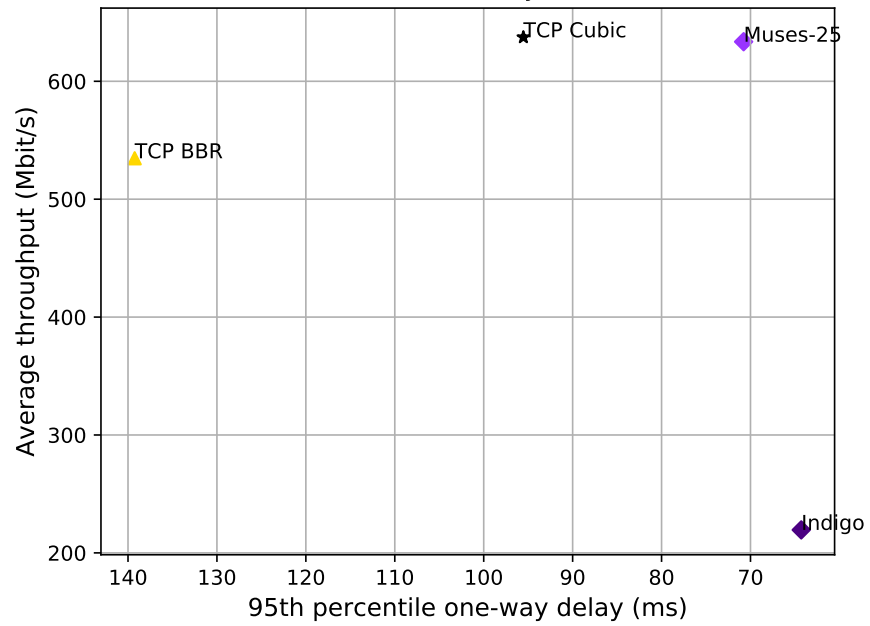
System info:

```
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
```

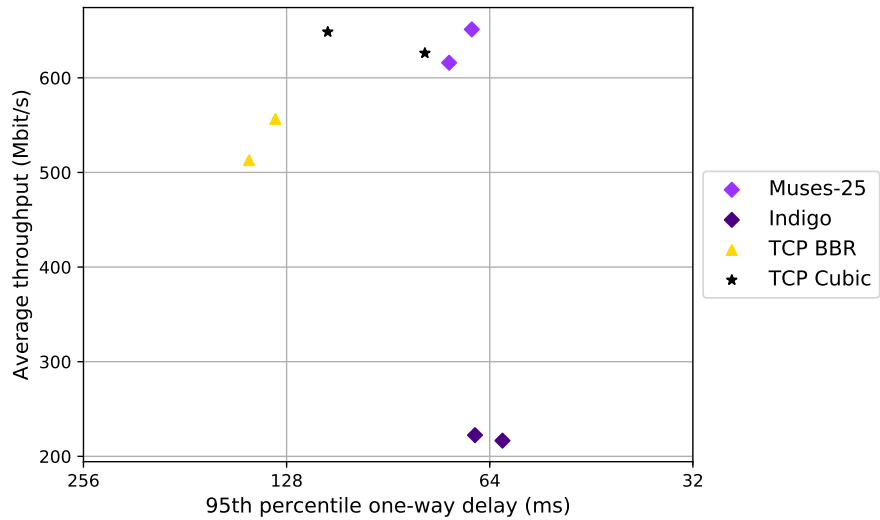
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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 Tokyo to GCE Iowa, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Tokyo to GCE Iowa, 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	534.71	139.25	0.62
TCP Cubic	2	637.32	95.54	0.45
Indigo	2	219.49	64.29	0.42
Muses-25	2	633.56	70.77	0.45

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 11:26:18

End at: 2018-08-31 11:26:48

Local clock offset: -1.356 ms

Remote clock offset: 0.602 ms

Below is generated by plot.py at 2018-08-31 11:42:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 512.92 Mbit/s

95th percentile per-packet one-way delay: 145.505 ms

Loss rate: 0.55%

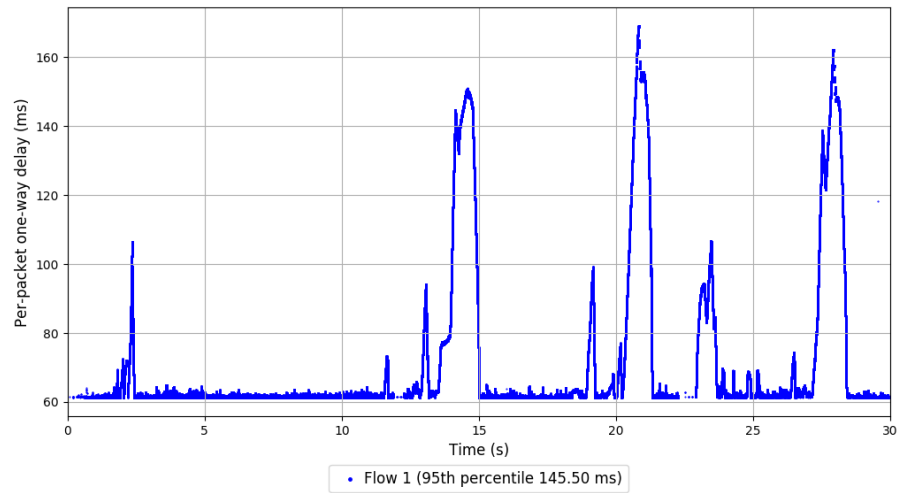
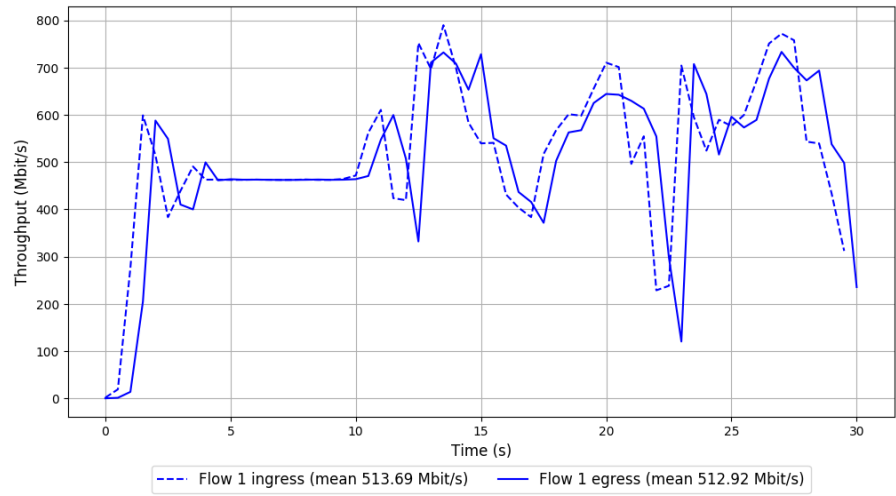
-- Flow 1:

Average throughput: 512.92 Mbit/s

95th percentile per-packet one-way delay: 145.505 ms

Loss rate: 0.55%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 11:32:31

End at: 2018-08-31 11:33:01

Local clock offset: -3.163 ms

Remote clock offset: 0.471 ms

Below is generated by plot.py at 2018-08-31 11:42:32

Datalink statistics

-- Total of 1 flow:

Average throughput: 556.51 Mbit/s

95th percentile per-packet one-way delay: 132.991 ms

Loss rate: 0.69%

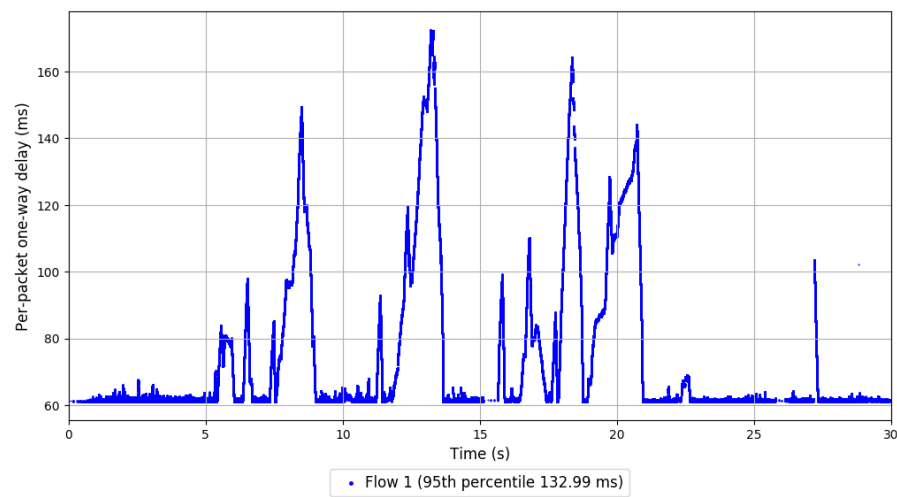
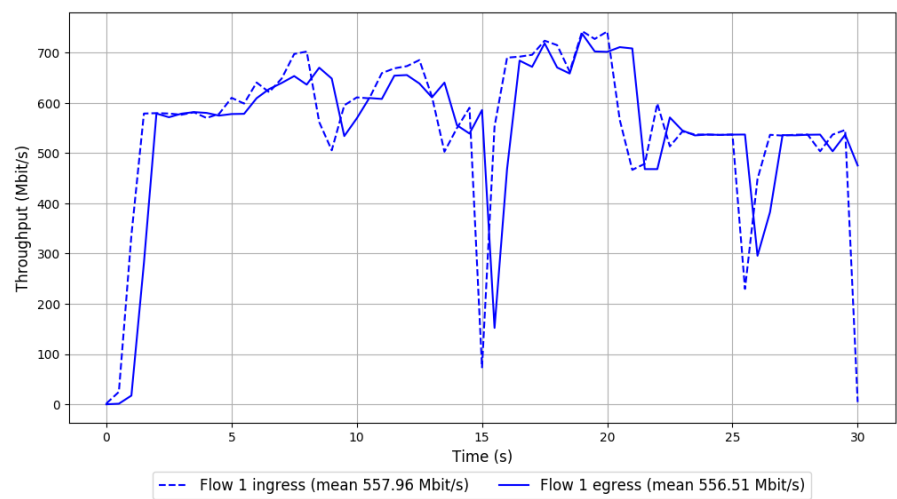
-- Flow 1:

Average throughput: 556.51 Mbit/s

95th percentile per-packet one-way delay: 132.991 ms

Loss rate: 0.69%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 11:23:03

End at: 2018-08-31 11:23:33

Local clock offset: -0.302 ms

Remote clock offset: 0.88 ms

Below is generated by plot.py at 2018-08-31 11:42:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 626.11 Mbit/s

95th percentile per-packet one-way delay: 79.853 ms

Loss rate: 0.49%

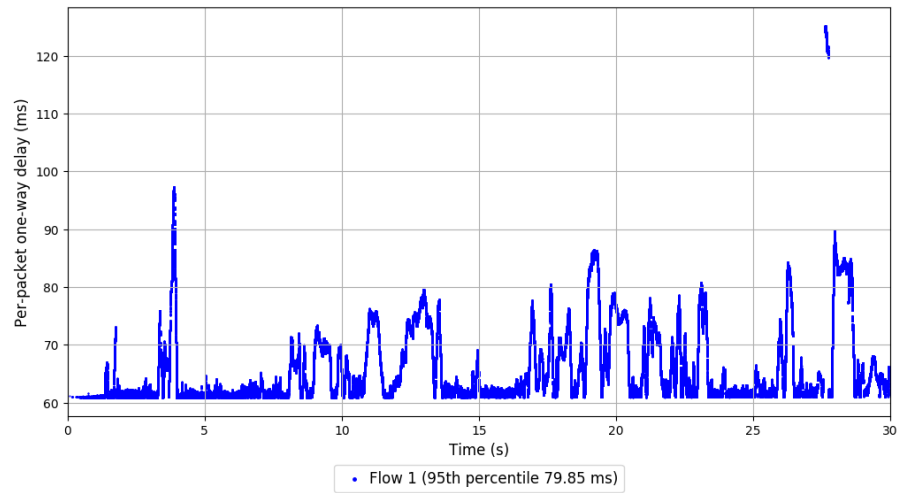
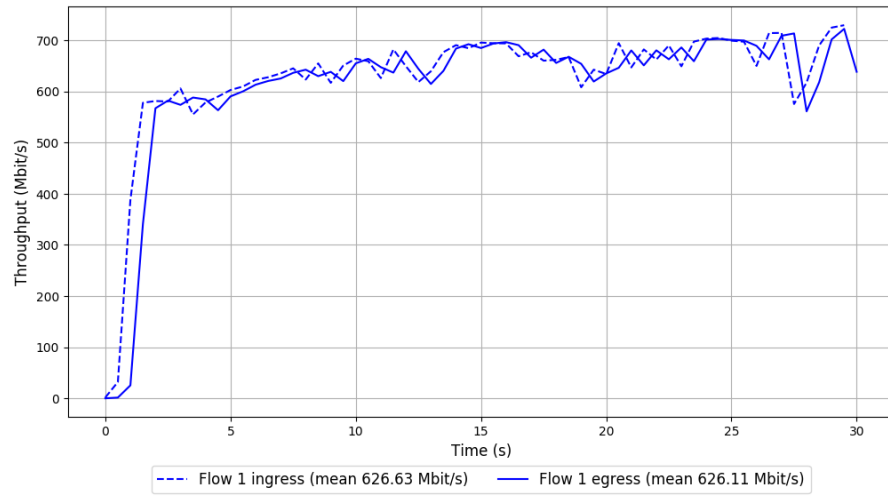
-- Flow 1:

Average throughput: 626.11 Mbit/s

95th percentile per-packet one-way delay: 79.853 ms

Loss rate: 0.49%

Run 1: Report of TCP Cubic — Data Link

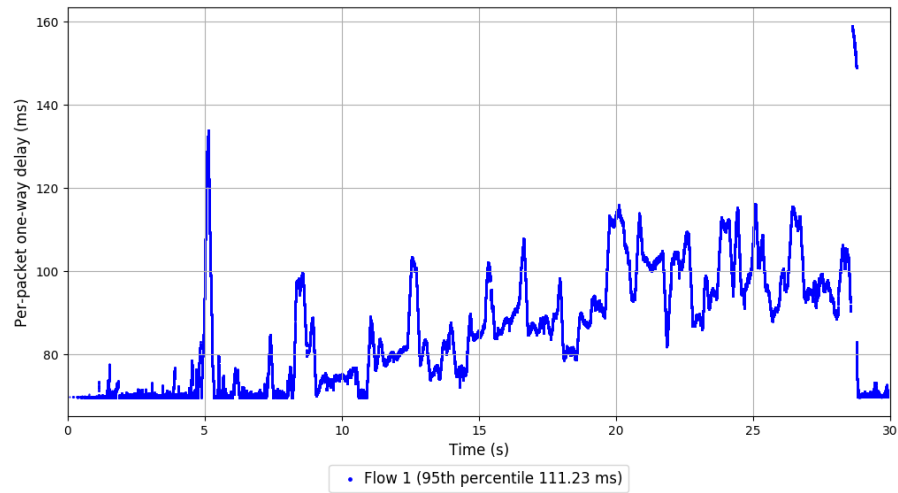
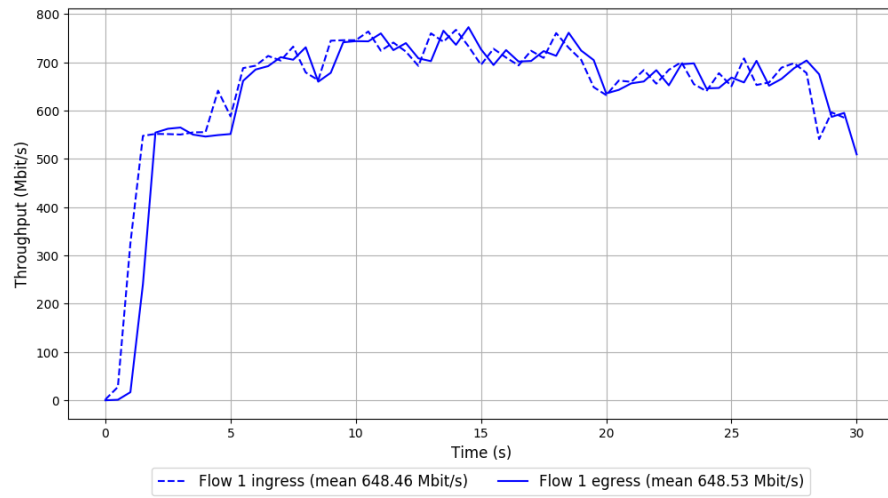


Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 11:29:16
End at: 2018-08-31 11:29:46
Local clock offset: -2.195 ms
Remote clock offset: -2.335 ms

Below is generated by plot.py at 2018-08-31 11:43:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 648.53 Mbit/s
95th percentile per-packet one-way delay: 111.228 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 648.53 Mbit/s
95th percentile per-packet one-way delay: 111.228 ms
Loss rate: 0.41%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-31 11:21:37

End at: 2018-08-31 11:22:07

Local clock offset: 0.272 ms

Remote clock offset: 0.977 ms

Below is generated by plot.py at 2018-08-31 11:43:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 216.59 Mbit/s

95th percentile per-packet one-way delay: 61.279 ms

Loss rate: 0.43%

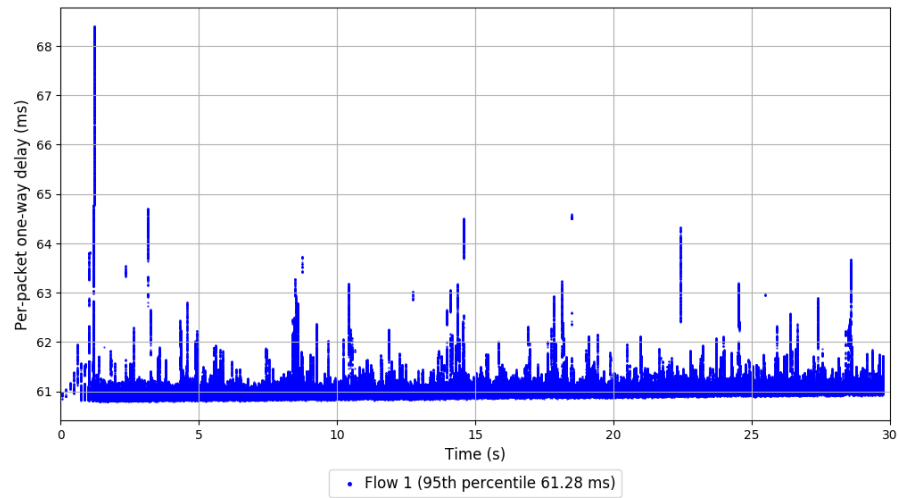
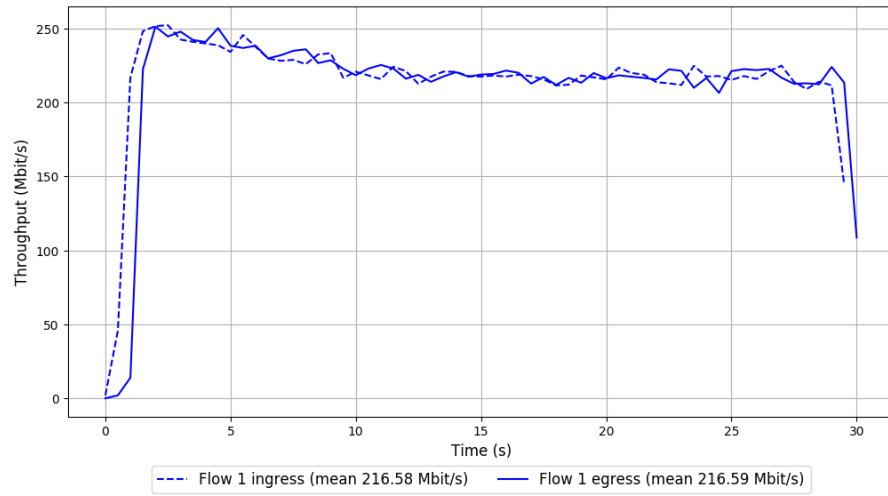
-- Flow 1:

Average throughput: 216.59 Mbit/s

95th percentile per-packet one-way delay: 61.279 ms

Loss rate: 0.43%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 11:27:51

End at: 2018-08-31 11:28:21

Local clock offset: -1.811 ms

Remote clock offset: 0.55 ms

Below is generated by plot.py at 2018-08-31 11:43:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 222.39 Mbit/s

95th percentile per-packet one-way delay: 67.305 ms

Loss rate: 0.42%

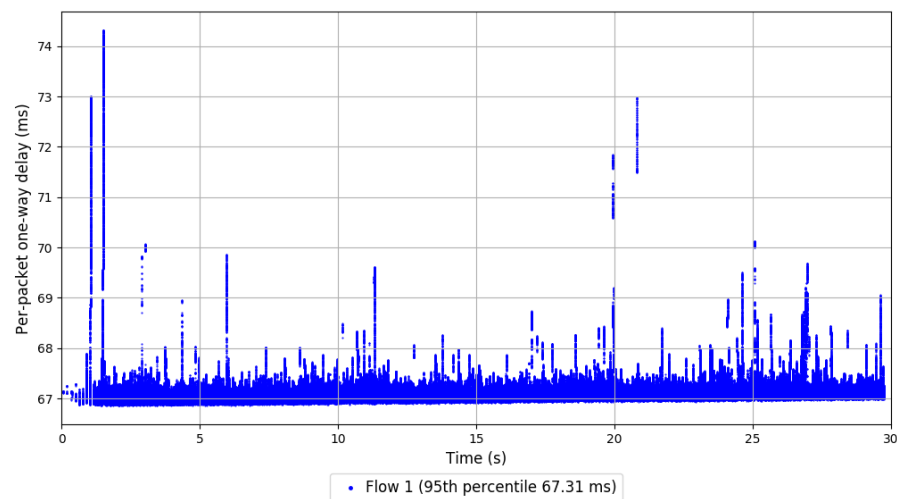
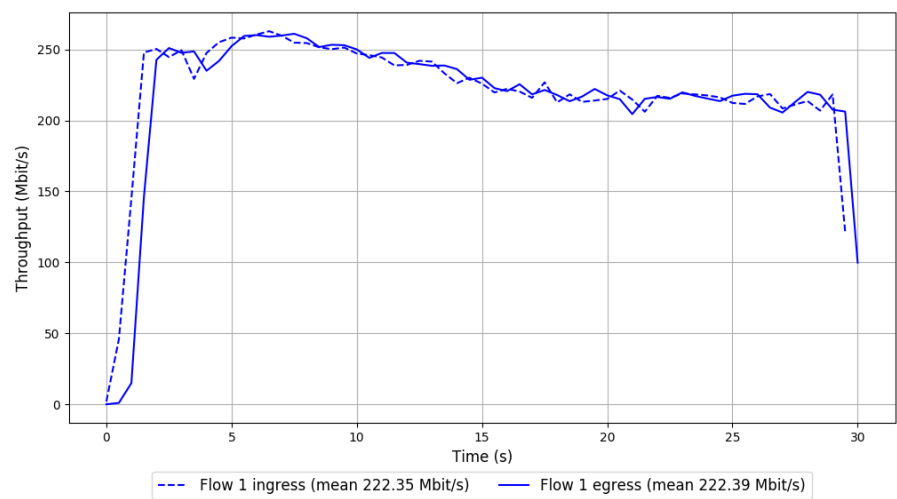
-- Flow 1:

Average throughput: 222.39 Mbit/s

95th percentile per-packet one-way delay: 67.305 ms

Loss rate: 0.42%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-08-31 11:24:39

End at: 2018-08-31 11:25:09

Local clock offset: -0.733 ms

Remote clock offset: 0.764 ms

Below is generated by plot.py at 2018-08-31 11:44:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 651.18 Mbit/s

95th percentile per-packet one-way delay: 68.035 ms

Loss rate: 0.44%

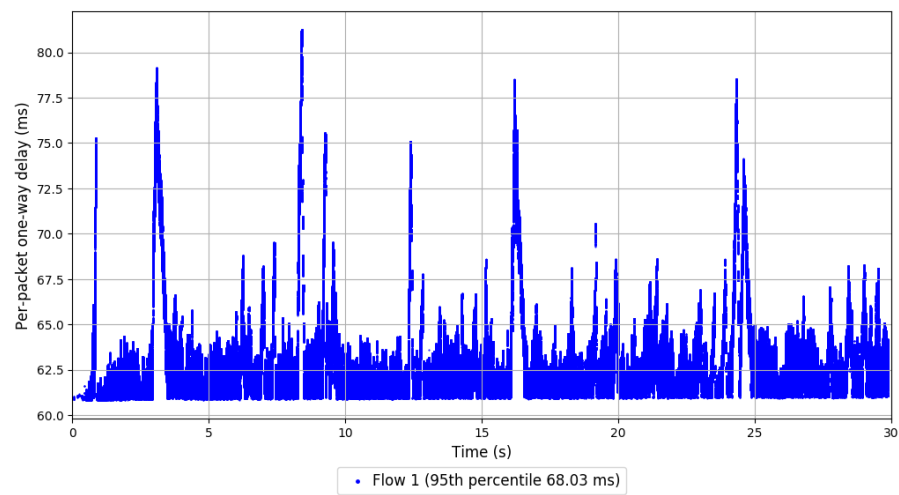
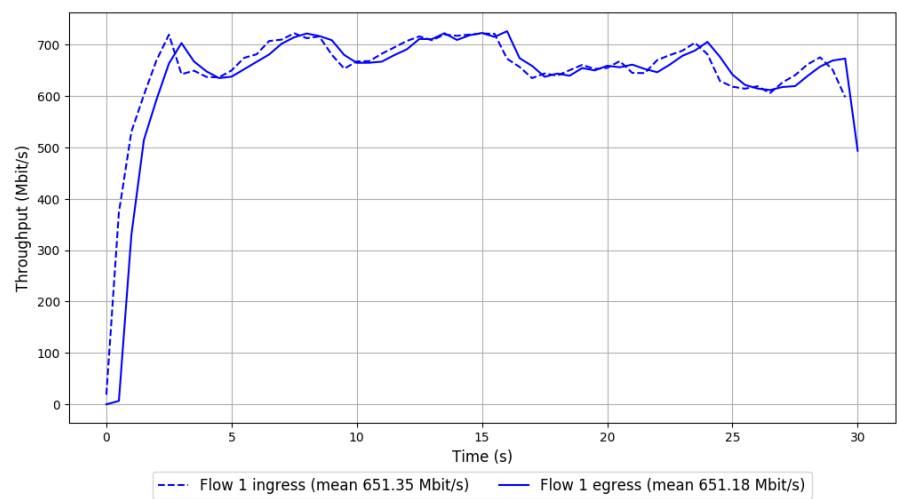
-- Flow 1:

Average throughput: 651.18 Mbit/s

95th percentile per-packet one-way delay: 68.035 ms

Loss rate: 0.44%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 11:30:53

End at: 2018-08-31 11:31:23

Local clock offset: -2.65 ms

Remote clock offset: 0.544 ms

Below is generated by plot.py at 2018-08-31 11:44:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 615.94 Mbit/s

95th percentile per-packet one-way delay: 73.509 ms

Loss rate: 0.46%

-- Flow 1:

Average throughput: 615.94 Mbit/s

95th percentile per-packet one-way delay: 73.509 ms

Loss rate: 0.46%

Run 2: Report of Muses-25 — Data Link

