

Pantheon Report

Generated at 2018-09-05 22:22:18 (UTC).

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

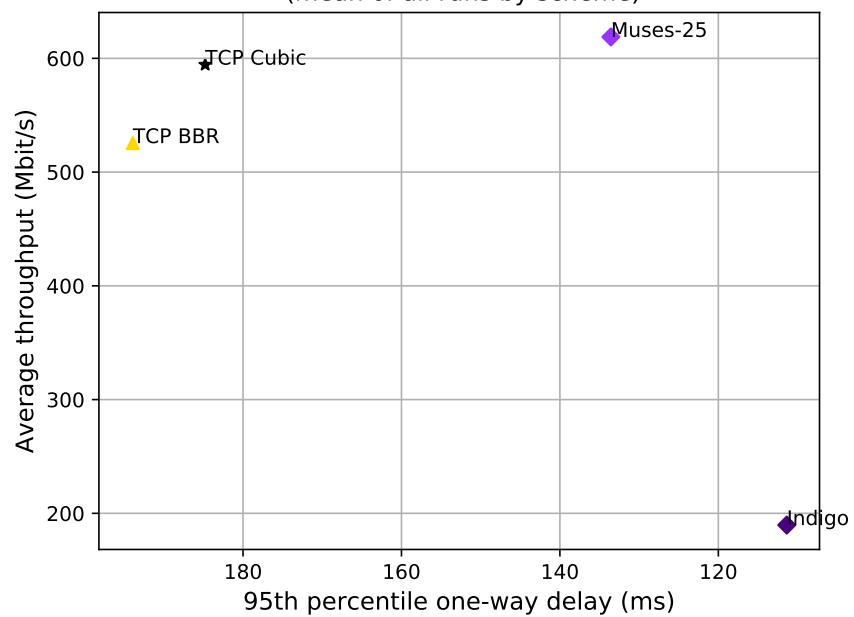
System info:

```
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
```

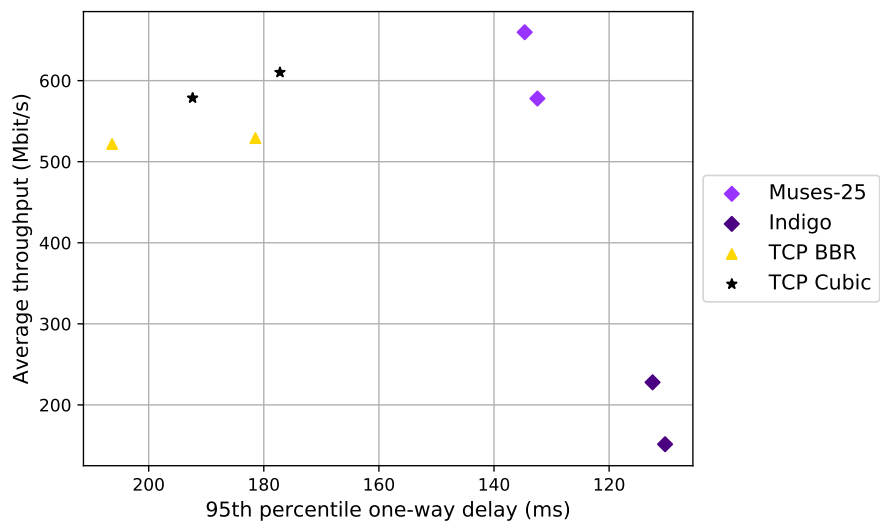
Git summary:

```
branch: muses @ 18b9165265c8ba2915c862e8713fd9ad82c1ac21
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
third_party/pantheon-tunnel @ cbfce6db5ff5740d4fe1771f813cd646339e1952
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 London to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE London 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	525.46	193.91	1.50
TCP Cubic	2	594.41	184.78	0.99
Indigo	2	189.68	111.37	0.92
Muses-25	2	618.81	133.56	0.88

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 22:03:19

End at: 2018-09-05 22:03:49

Local clock offset: 34.408 ms

Remote clock offset: 3.488 ms

Below is generated by plot.py at 2018-09-05 22:21:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 529.13 Mbit/s

95th percentile per-packet one-way delay: 181.461 ms

Loss rate: 1.19%

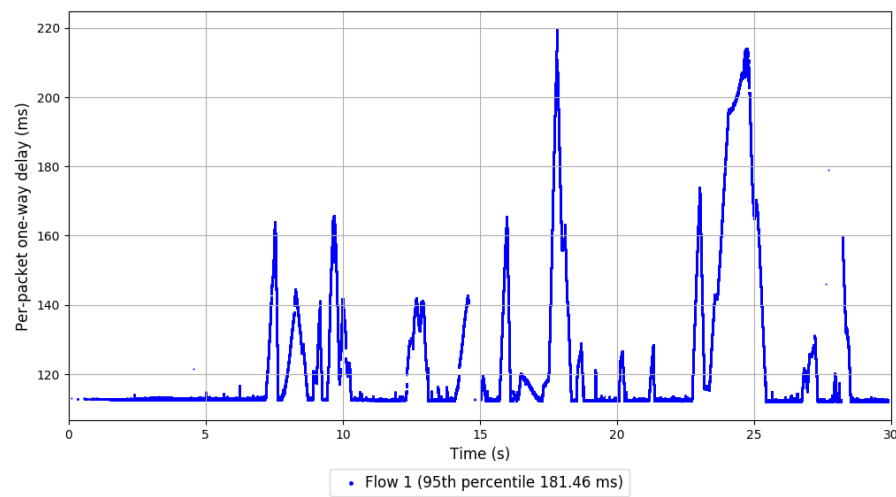
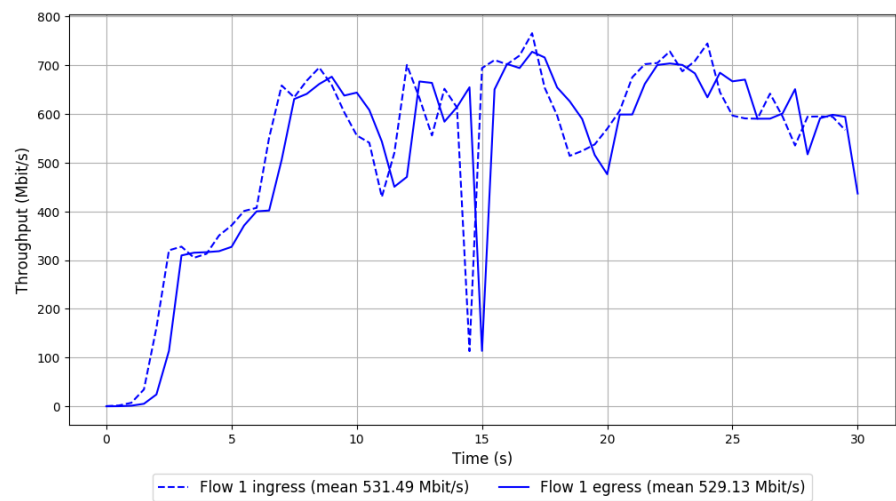
-- Flow 1:

Average throughput: 529.13 Mbit/s

95th percentile per-packet one-way delay: 181.461 ms

Loss rate: 1.19%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 22:09:49

End at: 2018-09-05 22:10:19

Local clock offset: 33.567 ms

Remote clock offset: 2.07 ms

Below is generated by plot.py at 2018-09-05 22:21:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 521.80 Mbit/s

95th percentile per-packet one-way delay: 206.356 ms

Loss rate: 1.80%

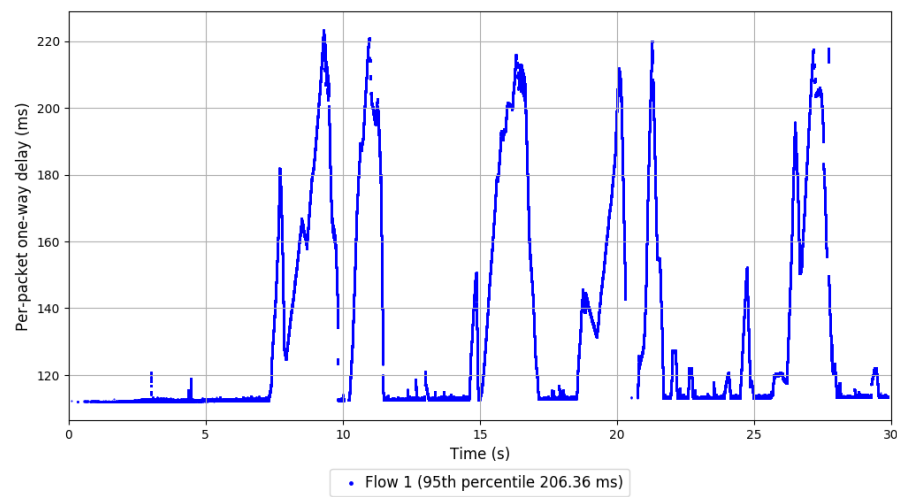
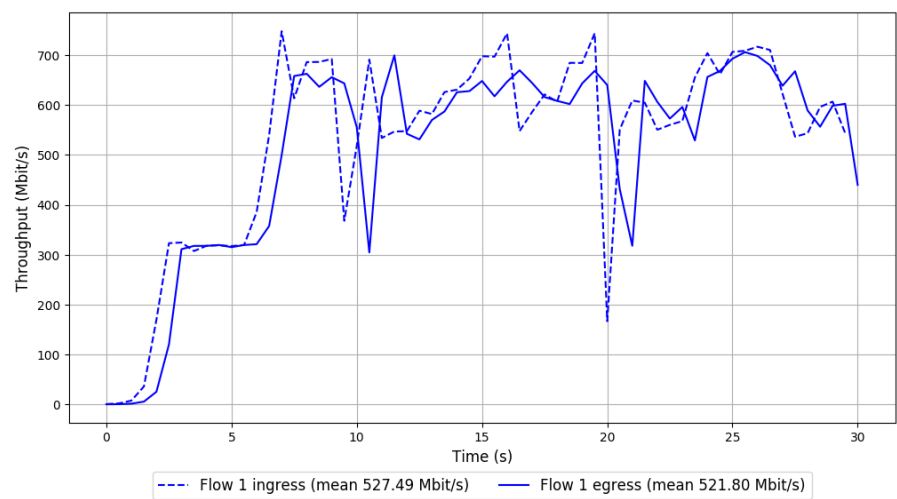
-- Flow 1:

Average throughput: 521.80 Mbit/s

95th percentile per-packet one-way delay: 206.356 ms

Loss rate: 1.80%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 22:00:14

End at: 2018-09-05 22:00:44

Local clock offset: 31.452 ms

Remote clock offset: 4.117 ms

Below is generated by plot.py at 2018-09-05 22:22:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 610.21 Mbit/s

95th percentile per-packet one-way delay: 177.186 ms

Loss rate: 1.01%

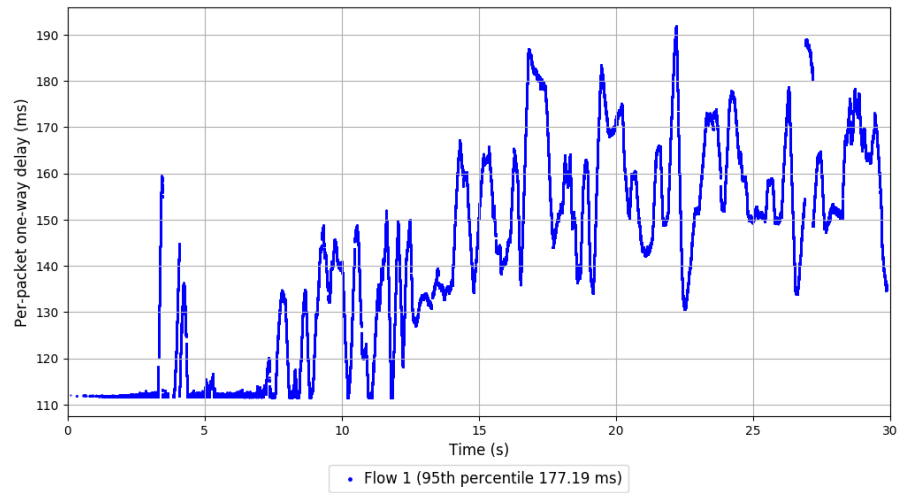
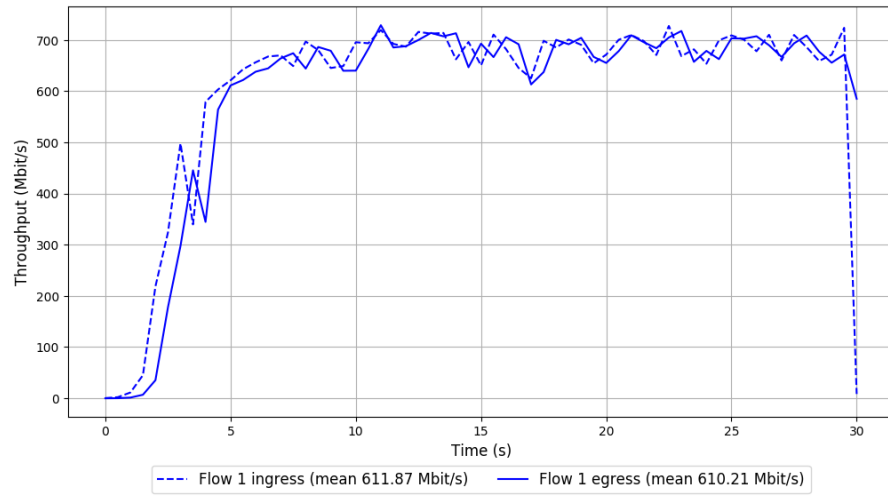
-- Flow 1:

Average throughput: 610.21 Mbit/s

95th percentile per-packet one-way delay: 177.186 ms

Loss rate: 1.01%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 22:06:38

End at: 2018-09-05 22:07:08

Local clock offset: 36.104 ms

Remote clock offset: 2.082 ms

Below is generated by plot.py at 2018-09-05 22:22:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 578.62 Mbit/s

95th percentile per-packet one-way delay: 192.371 ms

Loss rate: 0.97%

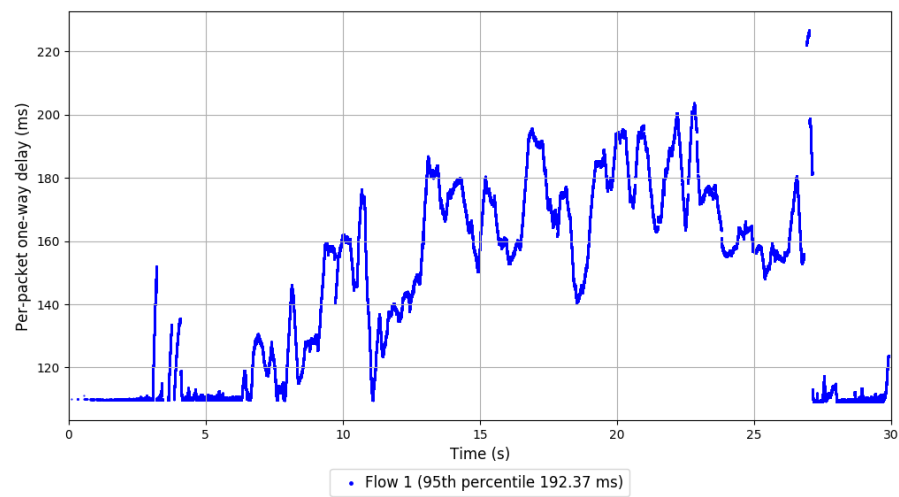
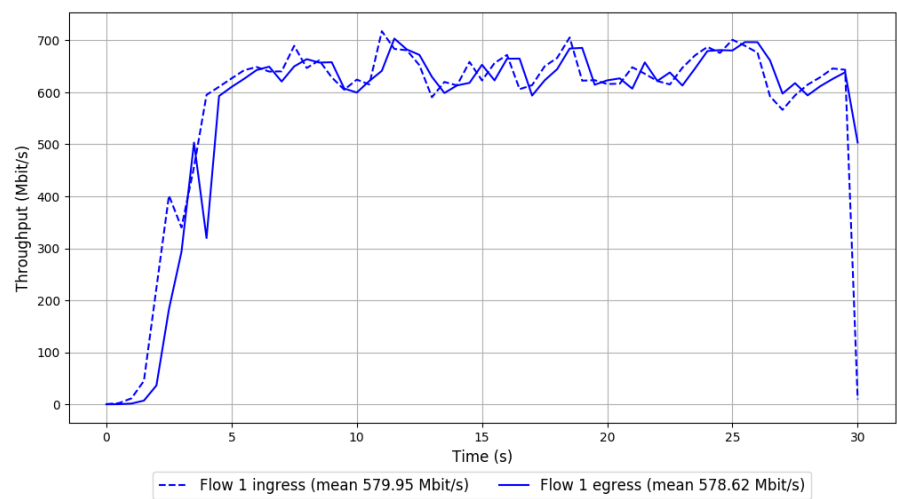
-- Flow 1:

Average throughput: 578.62 Mbit/s

95th percentile per-packet one-way delay: 192.371 ms

Loss rate: 0.97%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-09-05 22:01:55

End at: 2018-09-05 22:02:25

Local clock offset: 31.637 ms

Remote clock offset: 3.508 ms

Below is generated by plot.py at 2018-09-05 22:22:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 151.50 Mbit/s

95th percentile per-packet one-way delay: 110.279 ms

Loss rate: 1.08%

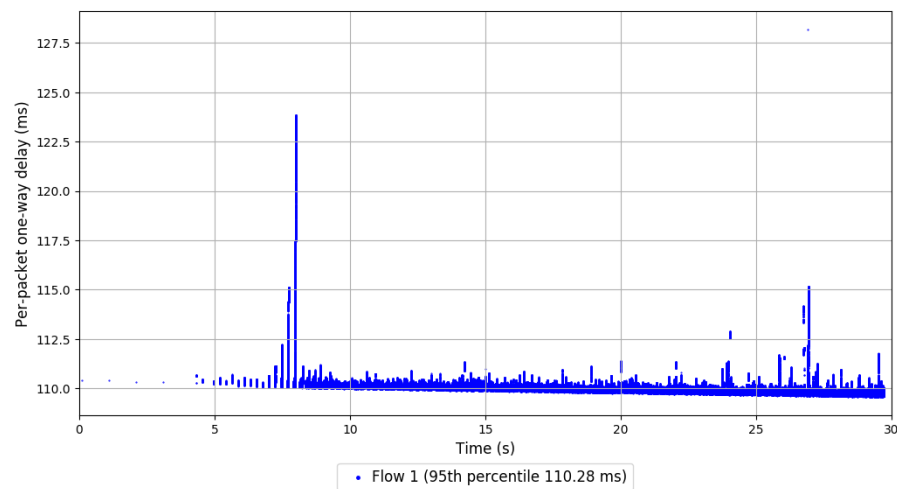
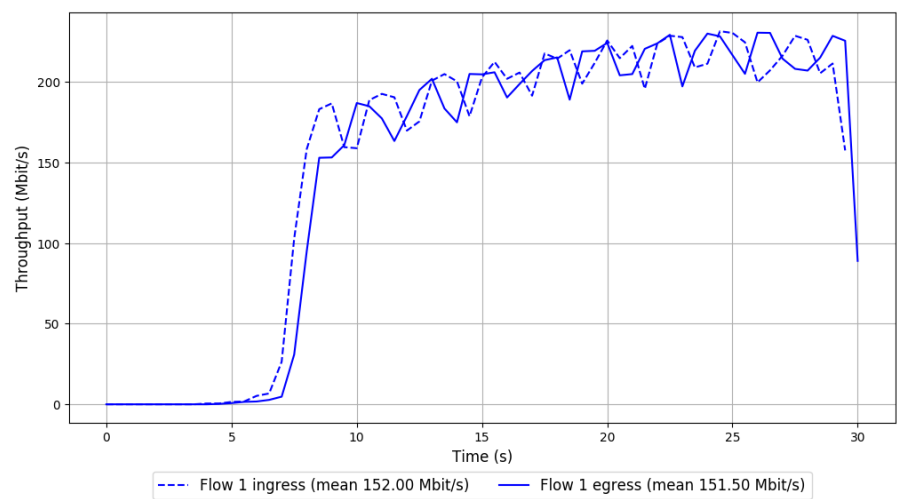
-- Flow 1:

Average throughput: 151.50 Mbit/s

95th percentile per-packet one-way delay: 110.279 ms

Loss rate: 1.08%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 22:08:17

End at: 2018-09-05 22:08:47

Local clock offset: 37.98 ms

Remote clock offset: 2.252 ms

Below is generated by plot.py at 2018-09-05 22:22:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 227.86 Mbit/s

95th percentile per-packet one-way delay: 112.452 ms

Loss rate: 0.76%

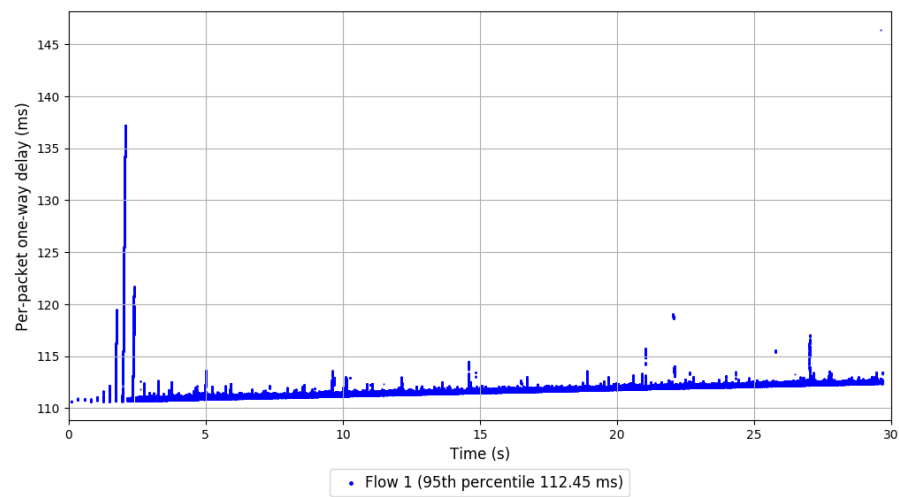
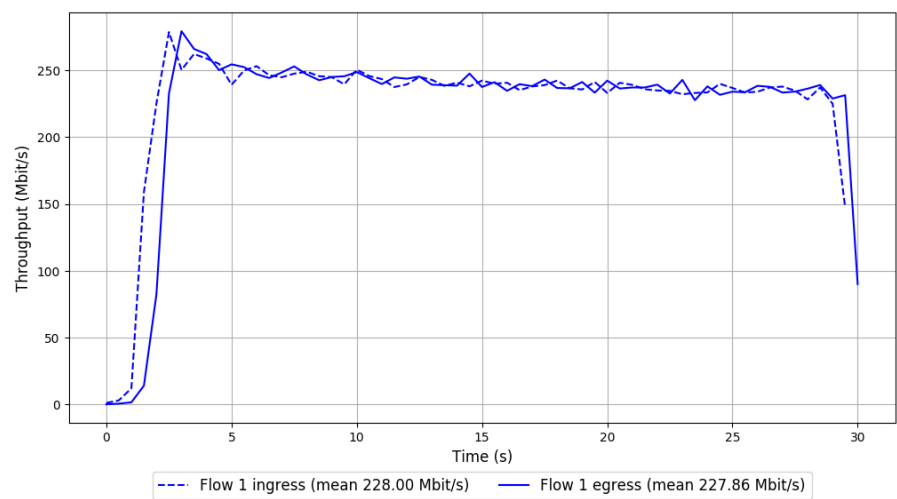
-- Flow 1:

Average throughput: 227.86 Mbit/s

95th percentile per-packet one-way delay: 112.452 ms

Loss rate: 0.76%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 22:04:59

End at: 2018-09-05 22:05:29

Local clock offset: 34.217 ms

Remote clock offset: 3.123 ms

Below is generated by plot.py at 2018-09-05 22:22:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 577.92 Mbit/s

95th percentile per-packet one-way delay: 132.460 ms

Loss rate: 0.96%

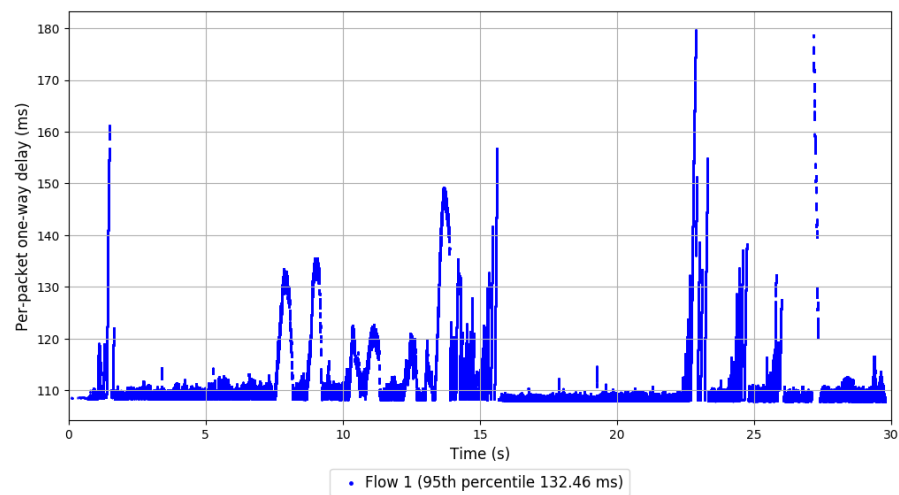
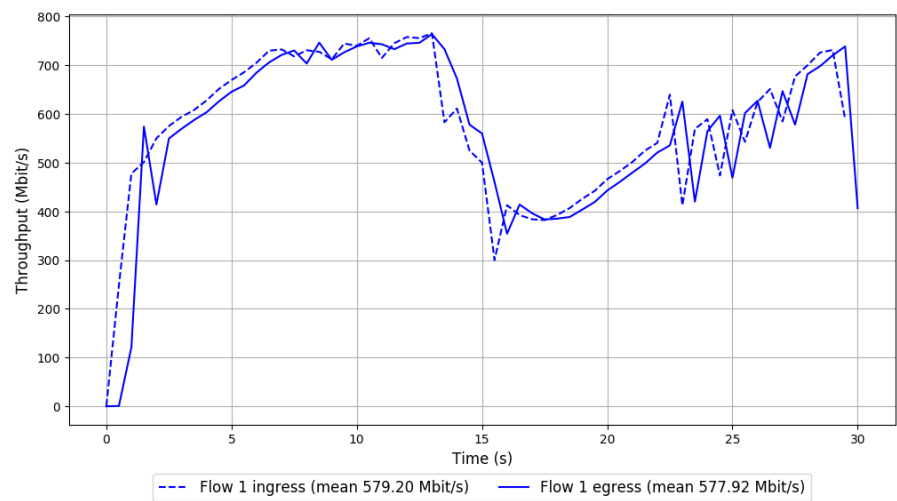
-- Flow 1:

Average throughput: 577.92 Mbit/s

95th percentile per-packet one-way delay: 132.460 ms

Loss rate: 0.96%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 22:11:28

End at: 2018-09-05 22:11:58

Local clock offset: 29.965 ms

Remote clock offset: 2.322 ms

Below is generated by plot.py at 2018-09-05 22:22:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 659.70 Mbit/s

95th percentile per-packet one-way delay: 134.667 ms

Loss rate: 0.80%

-- Flow 1:

Average throughput: 659.70 Mbit/s

95th percentile per-packet one-way delay: 134.667 ms

Loss rate: 0.80%

Run 2: Report of Muses-25 — Data Link

