

Pantheon Report

Generated at 2018-08-31 08:50:02 (UTC).

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

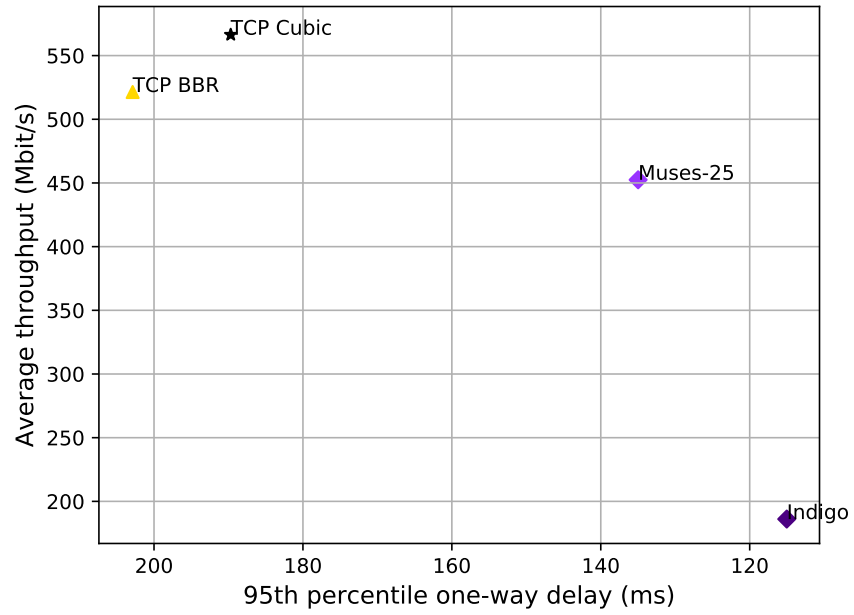
System info:

```
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
```

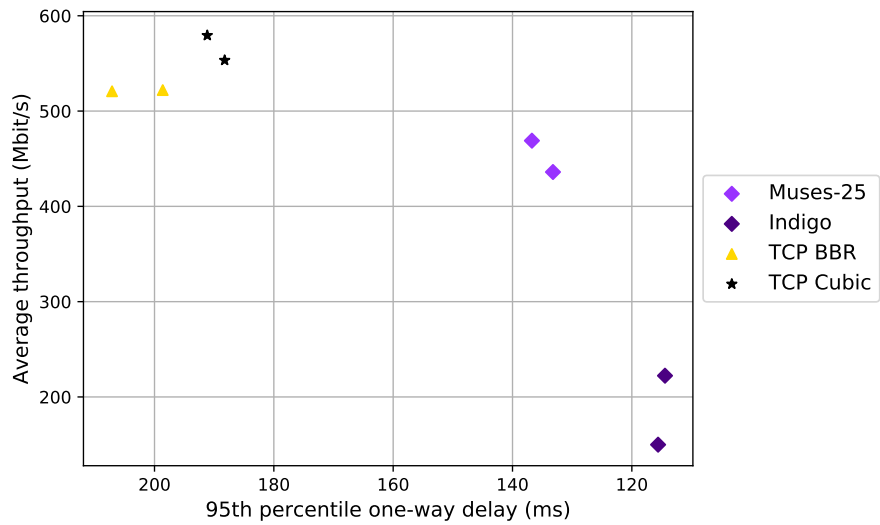
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
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 London, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Tokyo to GCE London, 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	521.41	202.87	0.98
TCP Cubic	2	566.36	189.70	0.14
Indigo	2	186.10	115.02	0.00
Muses-25	2	452.49	134.98	0.01

Run 1: Statistics of TCP BBR

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

End at: 2018-08-31 08:31:00

Local clock offset: 6.417 ms

Remote clock offset: 7.867 ms

Below is generated by plot.py at 2018-08-31 08:49:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 520.78 Mbit/s

95th percentile per-packet one-way delay: 207.117 ms

Loss rate: 1.29%

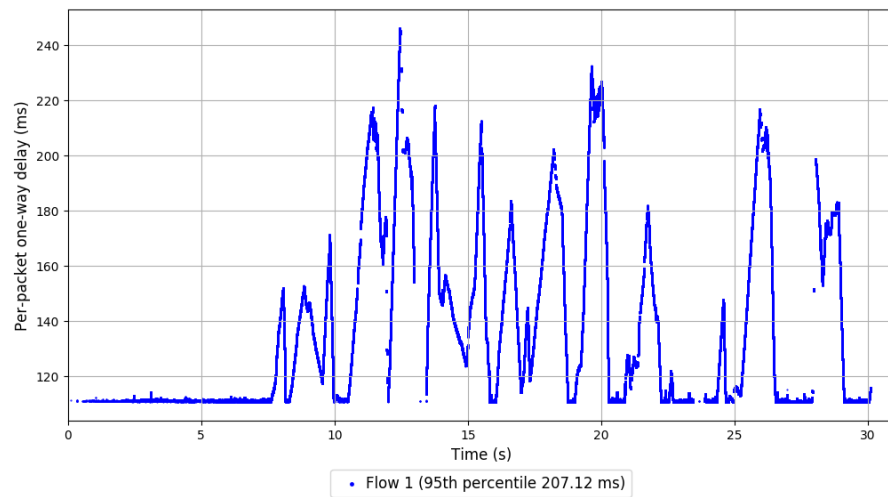
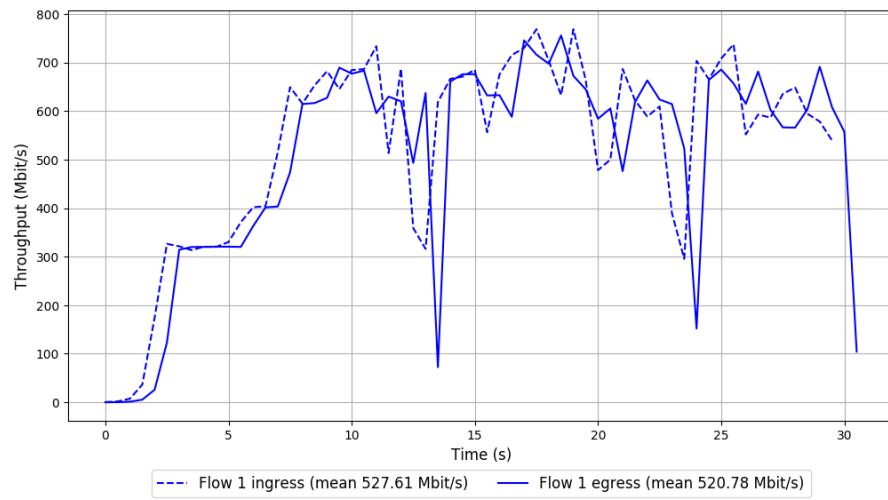
-- Flow 1:

Average throughput: 520.78 Mbit/s

95th percentile per-packet one-way delay: 207.117 ms

Loss rate: 1.29%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 08:36:45

End at: 2018-08-31 08:37:15

Local clock offset: 9.283 ms

Remote clock offset: 10.973 ms

Below is generated by plot.py at 2018-08-31 08:49:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 522.04 Mbit/s

95th percentile per-packet one-way delay: 198.620 ms

Loss rate: 0.66%

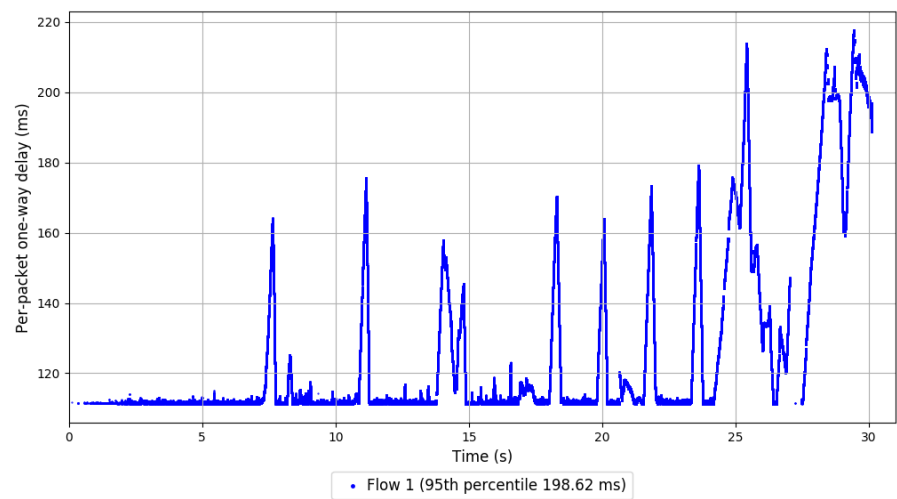
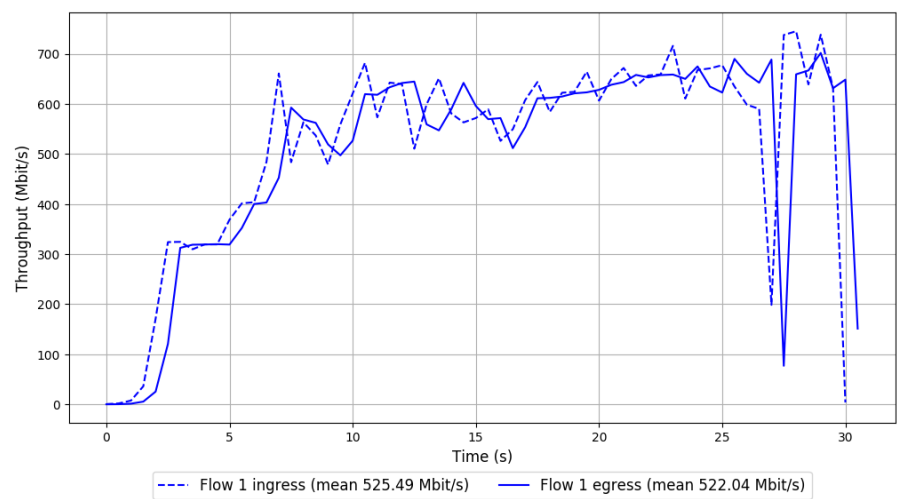
-- Flow 1:

Average throughput: 522.04 Mbit/s

95th percentile per-packet one-way delay: 198.620 ms

Loss rate: 0.66%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 08:33:31

End at: 2018-08-31 08:34:02

Local clock offset: 8.403 ms

Remote clock offset: 9.332 ms

Below is generated by plot.py at 2018-08-31 08:49:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 579.39 Mbit/s

95th percentile per-packet one-way delay: 191.155 ms

Loss rate: 0.19%

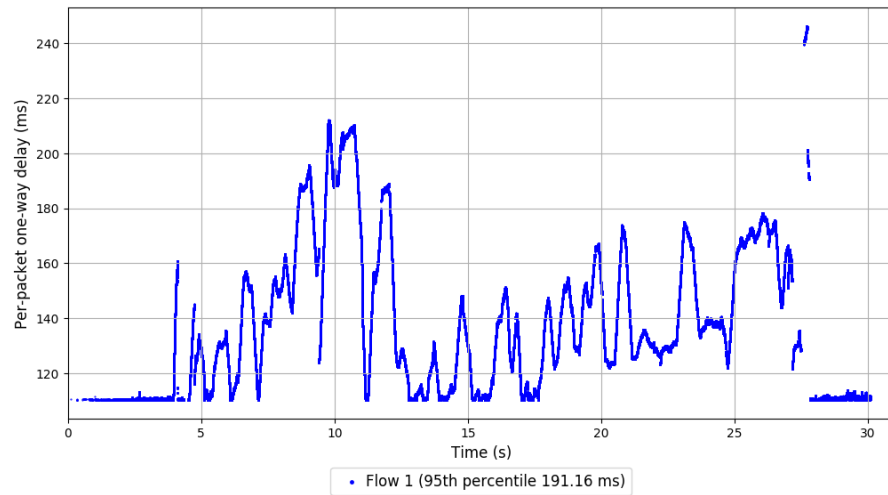
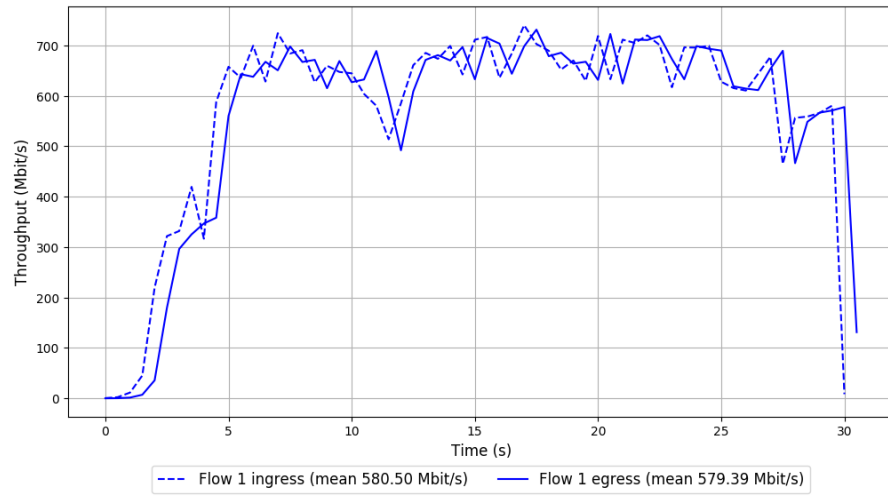
-- Flow 1:

Average throughput: 579.39 Mbit/s

95th percentile per-packet one-way delay: 191.155 ms

Loss rate: 0.19%

Run 1: Report of TCP Cubic — Data Link

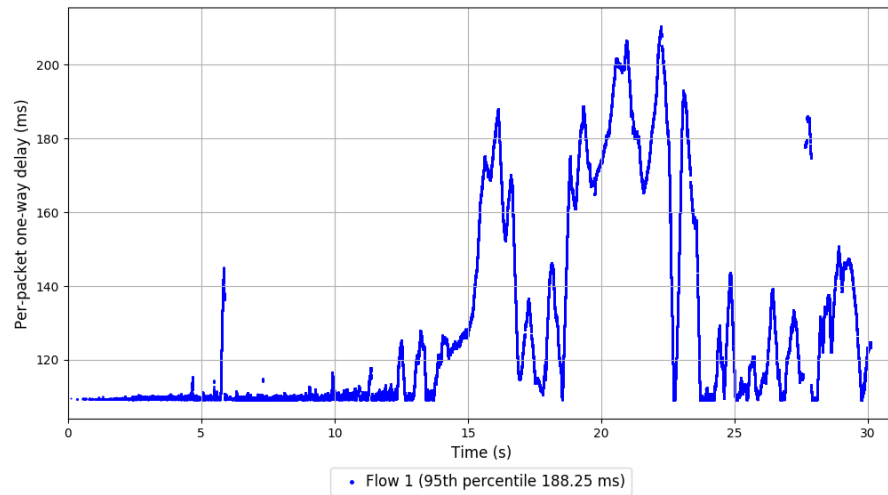
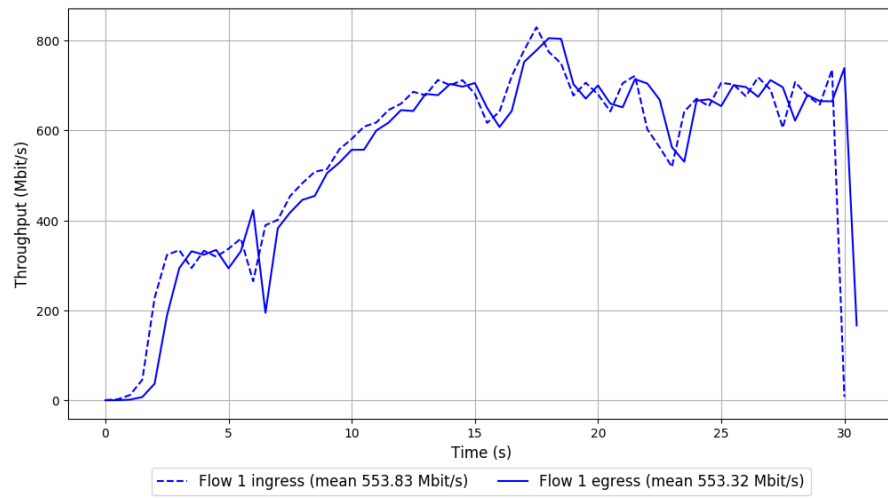


Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 08:39:52
End at: 2018-08-31 08:40:22
Local clock offset: 16.692 ms
Remote clock offset: 16.954 ms

Below is generated by plot.py at 2018-08-31 08:49:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 553.32 Mbit/s
95th percentile per-packet one-way delay: 188.245 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 553.32 Mbit/s
95th percentile per-packet one-way delay: 188.245 ms
Loss rate: 0.09%

Run 2: Report of TCP Cubic — Data Link

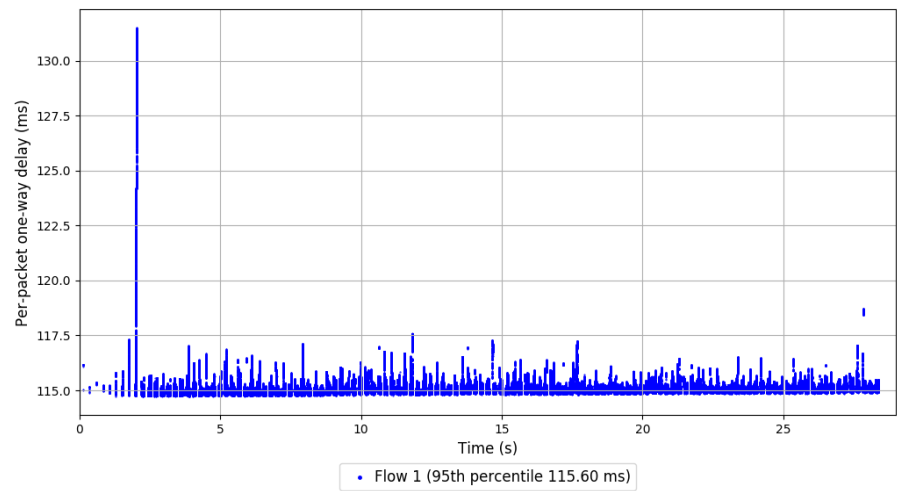
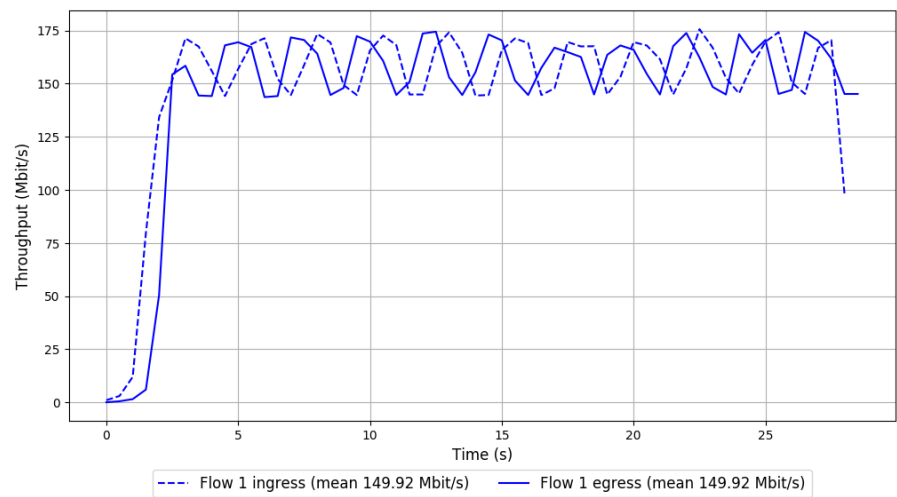


Run 1: Statistics of Indigo

Start at: 2018-08-31 08:32:10
End at: 2018-08-31 08:32:40
Local clock offset: 7.268 ms
Remote clock offset: 12.252 ms

Below is generated by plot.py at 2018-08-31 08:49:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 149.92 Mbit/s
95th percentile per-packet one-way delay: 115.602 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 149.92 Mbit/s
95th percentile per-packet one-way delay: 115.602 ms
Loss rate: 0.00%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 08:38:23

End at: 2018-08-31 08:38:53

Local clock offset: 8.449 ms

Remote clock offset: 14.07 ms

Below is generated by plot.py at 2018-08-31 08:49:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 222.29 Mbit/s

95th percentile per-packet one-way delay: 114.444 ms

Loss rate: 0.00%

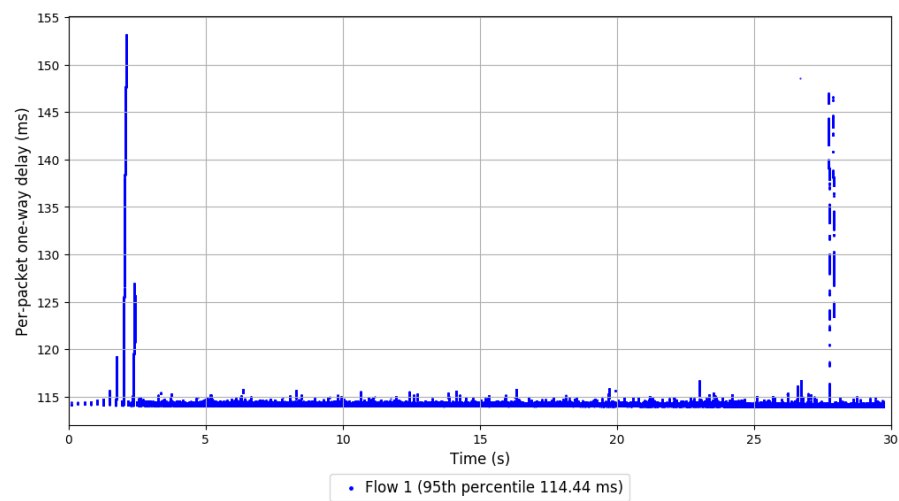
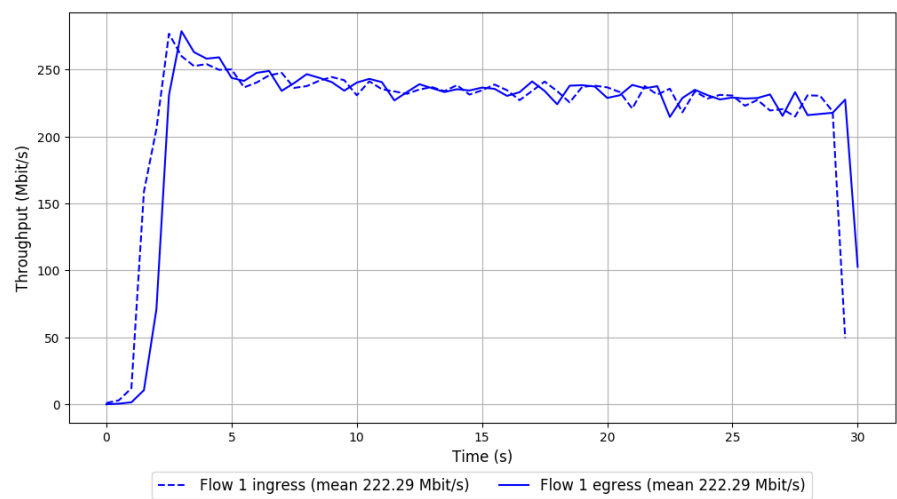
-- Flow 1:

Average throughput: 222.29 Mbit/s

95th percentile per-packet one-way delay: 114.444 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-08-31 08:28:59

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

Local clock offset: 8.017 ms

Remote clock offset: 5.864 ms

Below is generated by plot.py at 2018-08-31 08:49:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 436.04 Mbit/s

95th percentile per-packet one-way delay: 133.218 ms

Loss rate: 0.01%

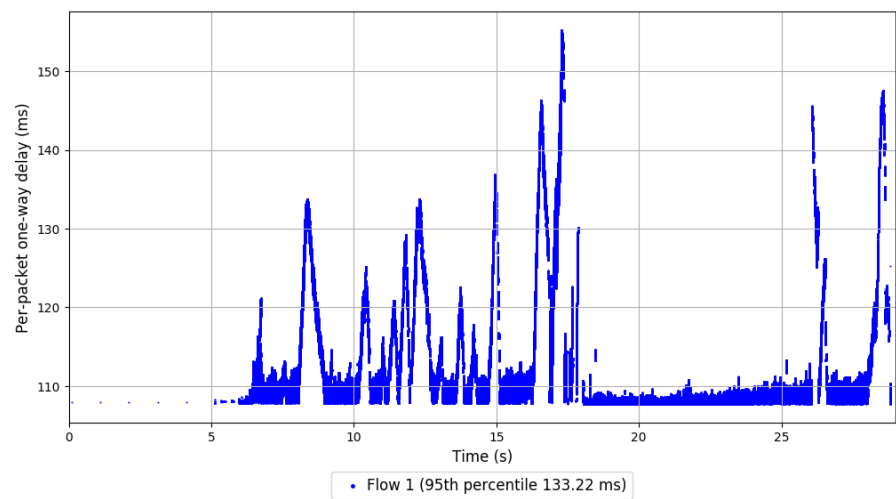
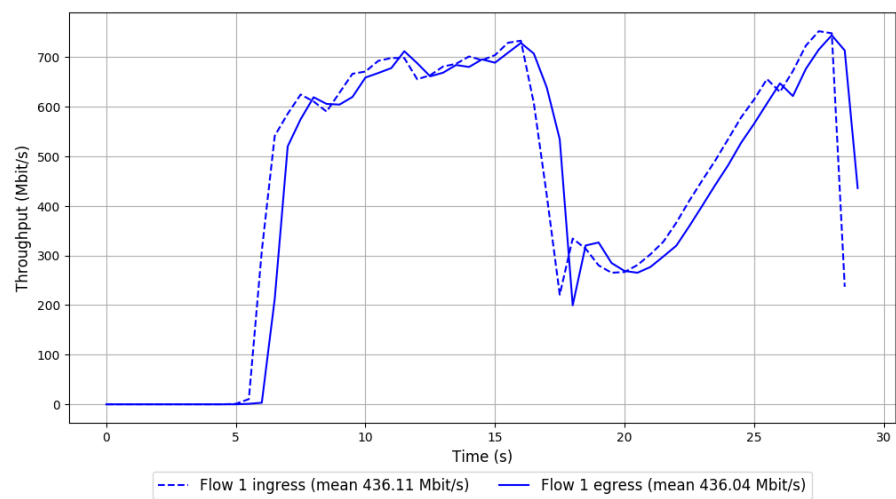
-- Flow 1:

Average throughput: 436.04 Mbit/s

95th percentile per-packet one-way delay: 133.218 ms

Loss rate: 0.01%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 08:35:11

End at: 2018-08-31 08:35:41

Local clock offset: 7.754 ms

Remote clock offset: 9.212 ms

Below is generated by plot.py at 2018-08-31 08:50:01

Datalink statistics

-- Total of 1 flow:

Average throughput: 468.93 Mbit/s

95th percentile per-packet one-way delay: 136.747 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 468.93 Mbit/s

95th percentile per-packet one-way delay: 136.747 ms

Loss rate: 0.00%

Run 2: Report of Muses-25 — Data Link

