

Pantheon Report

Generated at 2018-08-31 07:28:09 (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.

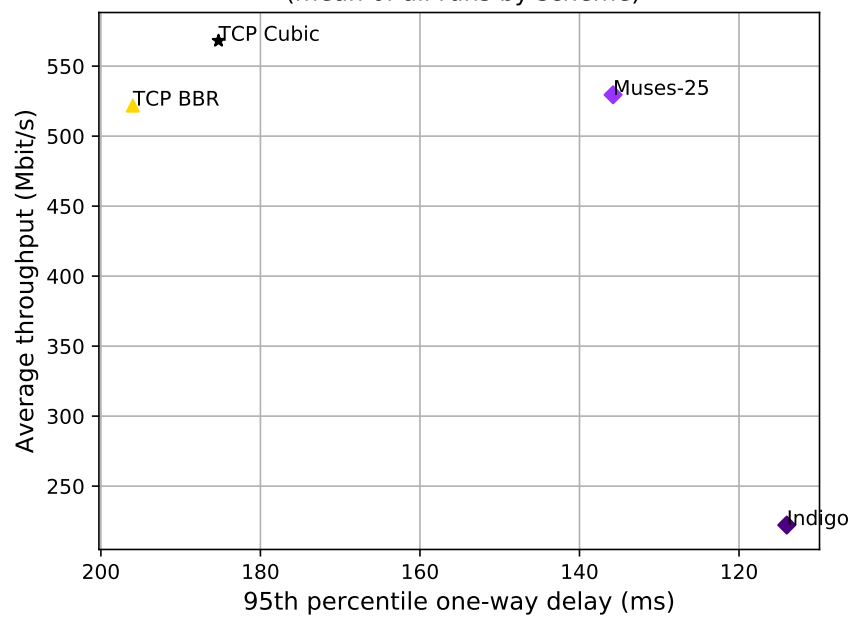
System info:

```
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
```

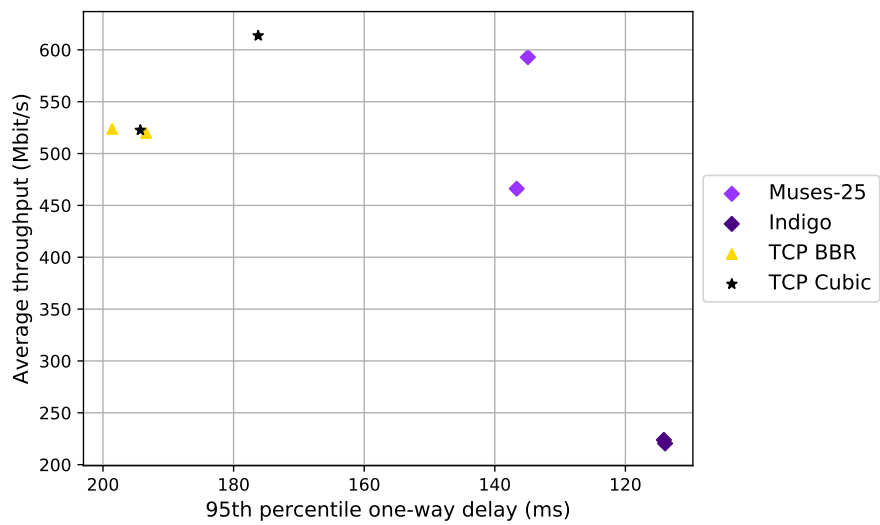
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ 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 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	521.80	196.00	0.96
TCP Cubic	2	568.12	185.25	0.13
Indigo	2	222.18	114.02	0.00
Muses-25	2	529.50	135.79	0.00

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 07:07:51

End at: 2018-08-31 07:08:21

Local clock offset: 3.986 ms

Remote clock offset: 1.588 ms

Below is generated by plot.py at 2018-08-31 07:27:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 523.72 Mbit/s

95th percentile per-packet one-way delay: 198.597 ms

Loss rate: 1.16%

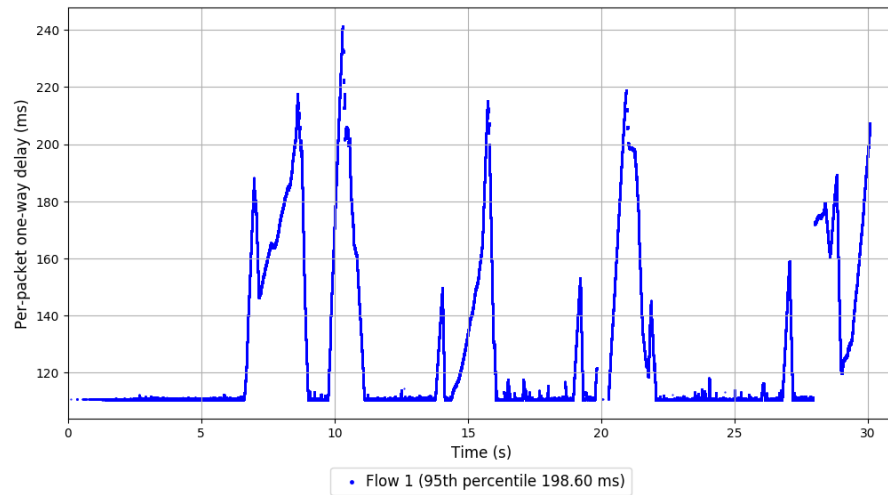
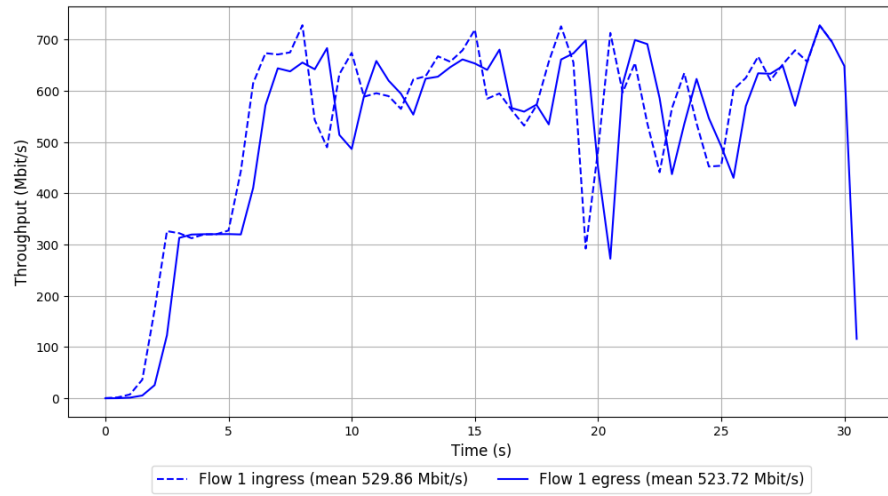
-- Flow 1:

Average throughput: 523.72 Mbit/s

95th percentile per-packet one-way delay: 198.597 ms

Loss rate: 1.16%

Run 1: Report of TCP BBR — Data Link

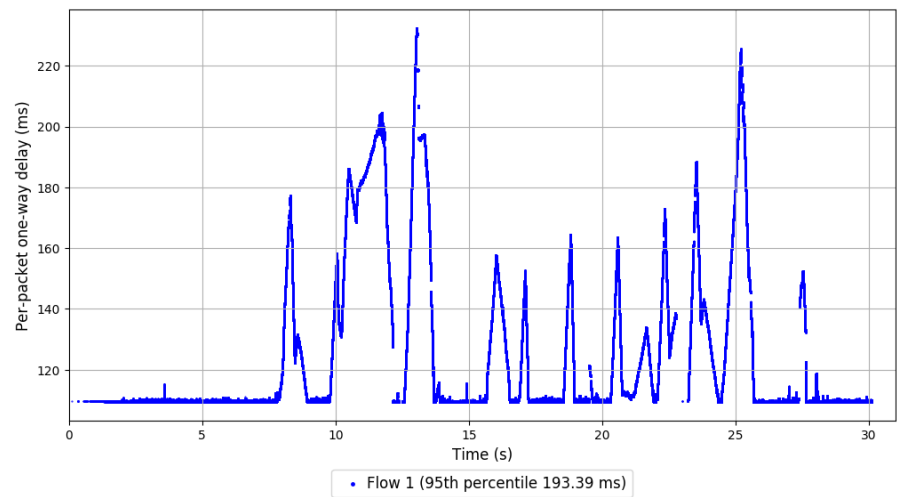
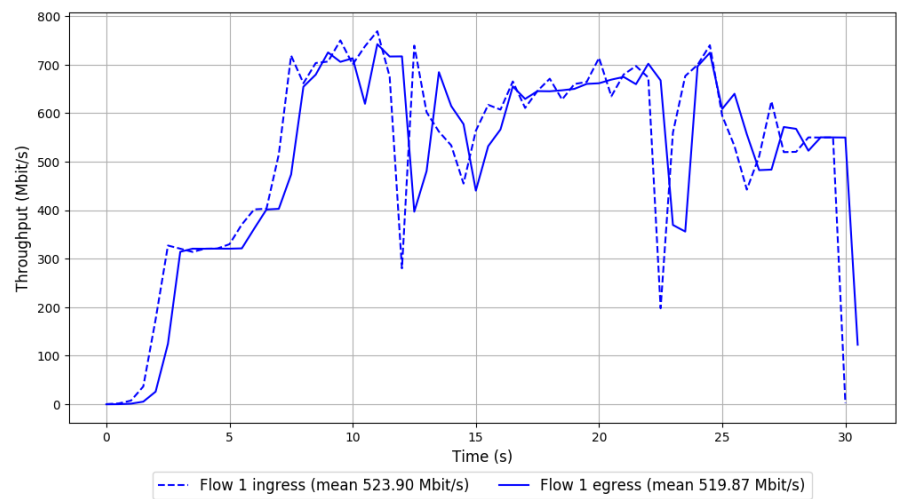


Run 2: Statistics of TCP BBR

Start at: 2018-08-31 07:14:10
End at: 2018-08-31 07:14:40
Local clock offset: 2.228 ms
Remote clock offset: -0.138 ms

Below is generated by plot.py at 2018-08-31 07:27:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 519.87 Mbit/s
95th percentile per-packet one-way delay: 193.394 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 519.87 Mbit/s
95th percentile per-packet one-way delay: 193.394 ms
Loss rate: 0.77%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 07:11:04

End at: 2018-08-31 07:11:34

Local clock offset: 5.603 ms

Remote clock offset: 0.88 ms

Below is generated by plot.py at 2018-08-31 07:27:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 522.58 Mbit/s

95th percentile per-packet one-way delay: 194.275 ms

Loss rate: 0.14%

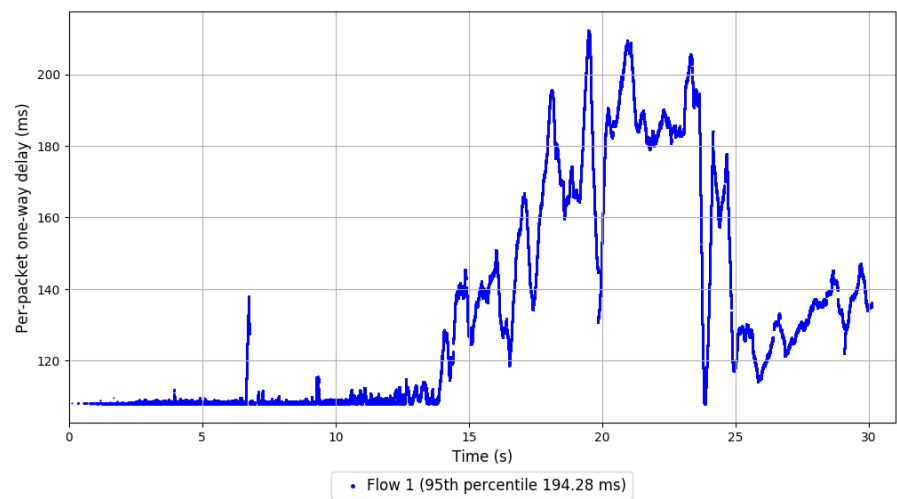
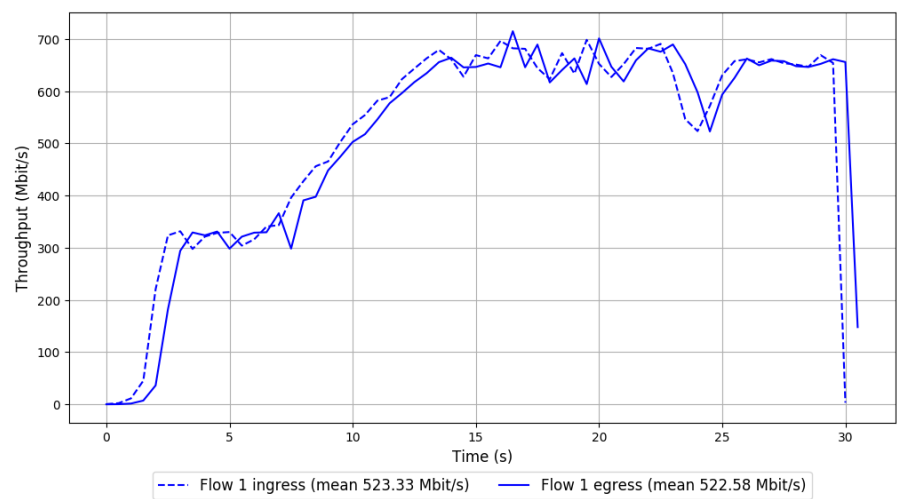
-- Flow 1:

Average throughput: 522.58 Mbit/s

95th percentile per-packet one-way delay: 194.275 ms

Loss rate: 0.14%

Run 1: Report of TCP Cubic — Data Link

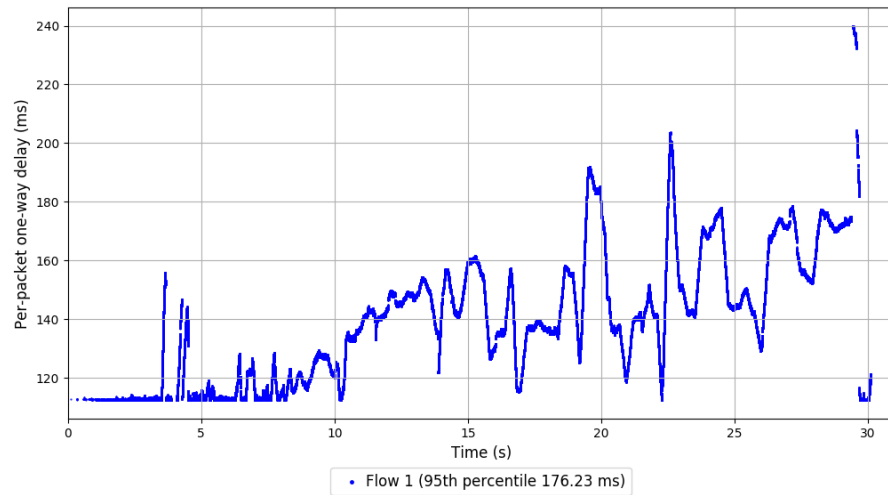
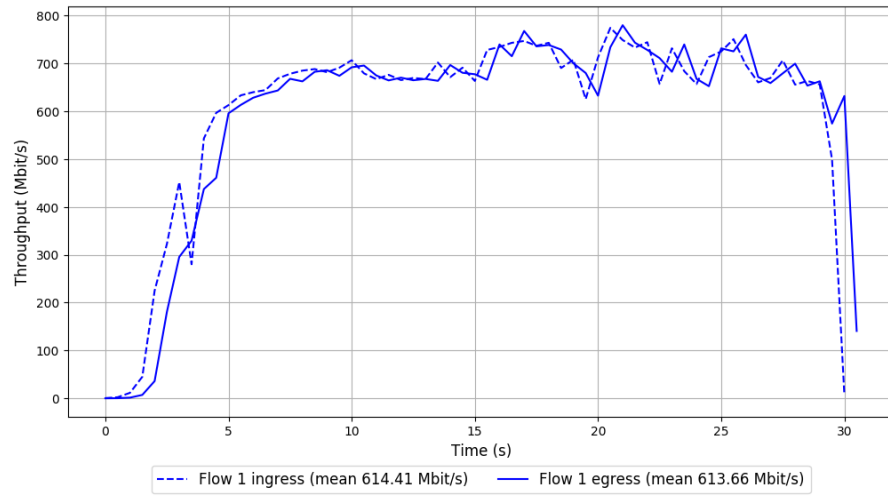


Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 07:17:28
End at: 2018-08-31 07:17:58
Local clock offset: -1.363 ms
Remote clock offset: -0.323 ms

Below is generated by plot.py at 2018-08-31 07:27:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 613.66 Mbit/s
95th percentile per-packet one-way delay: 176.232 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 613.66 Mbit/s
95th percentile per-packet one-way delay: 176.232 ms
Loss rate: 0.12%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-31 07:06:21

End at: 2018-08-31 07:06:52

Local clock offset: 1.607 ms

Remote clock offset: 1.727 ms

Below is generated by plot.py at 2018-08-31 07:27:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 220.48 Mbit/s

95th percentile per-packet one-way delay: 113.924 ms

Loss rate: 0.00%

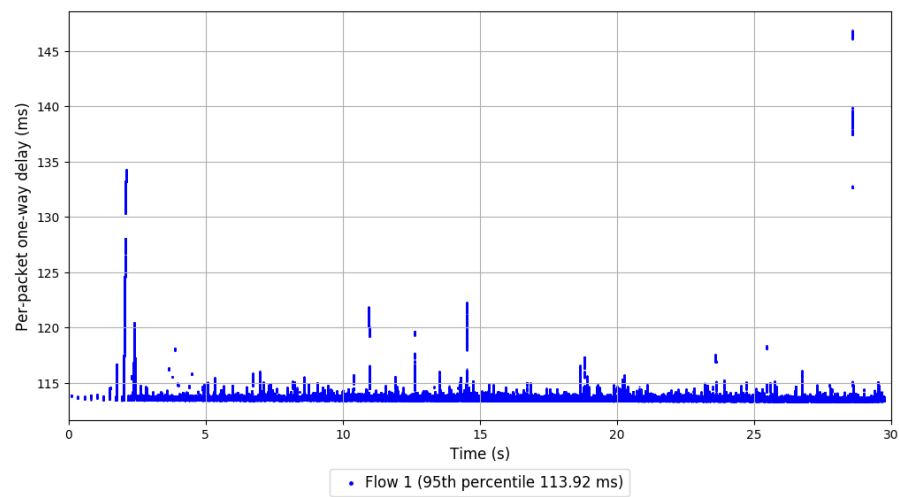
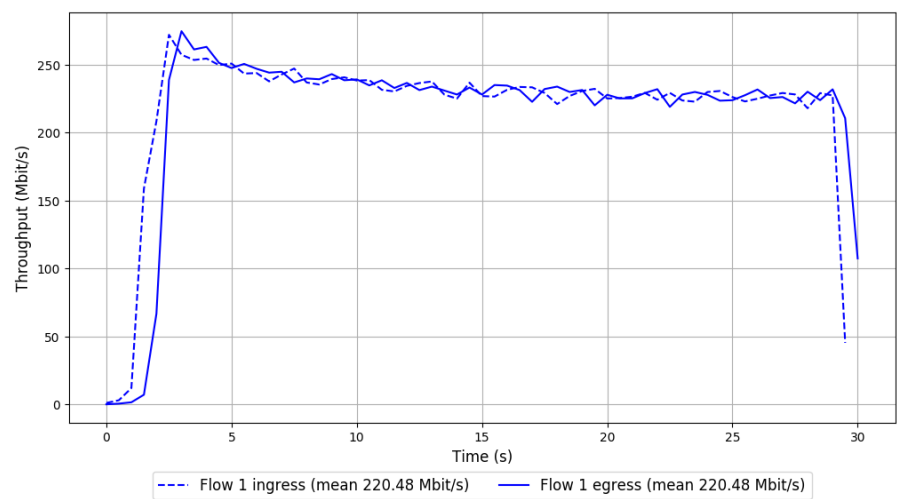
-- Flow 1:

Average throughput: 220.48 Mbit/s

95th percentile per-packet one-way delay: 113.924 ms

Loss rate: 0.00%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 07:12:40

End at: 2018-08-31 07:13:10

Local clock offset: -0.703 ms

Remote clock offset: 1.211 ms

Below is generated by plot.py at 2018-08-31 07:27:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 223.87 Mbit/s

95th percentile per-packet one-way delay: 114.108 ms

Loss rate: 0.00%

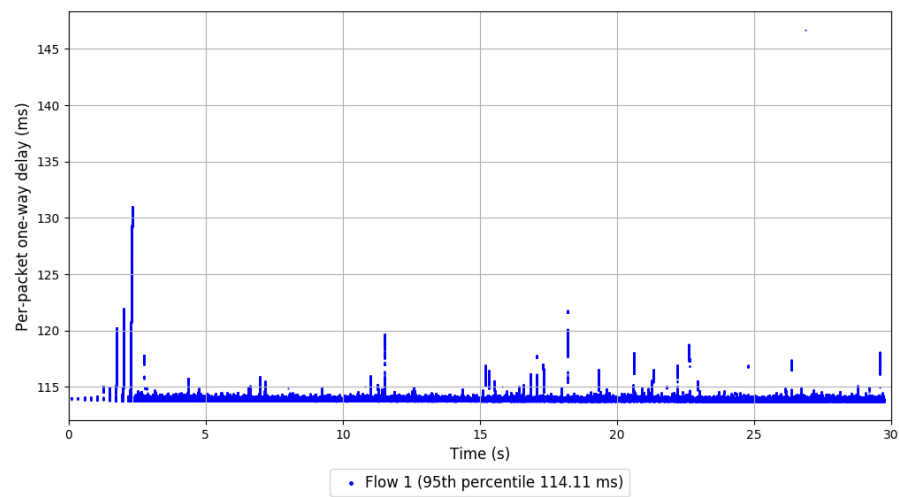
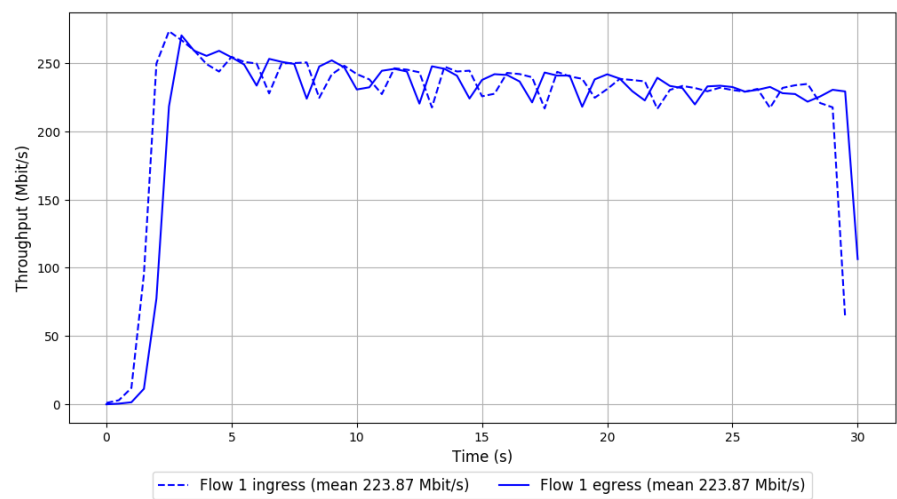
-- Flow 1:

Average throughput: 223.87 Mbit/s

95th percentile per-packet one-way delay: 114.108 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-08-31 07:09:29

End at: 2018-08-31 07:09:59

Local clock offset: 3.343 ms

Remote clock offset: 1.175 ms

Below is generated by plot.py at 2018-08-31 07:28:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 466.08 Mbit/s

95th percentile per-packet one-way delay: 136.642 ms

Loss rate: 0.00%

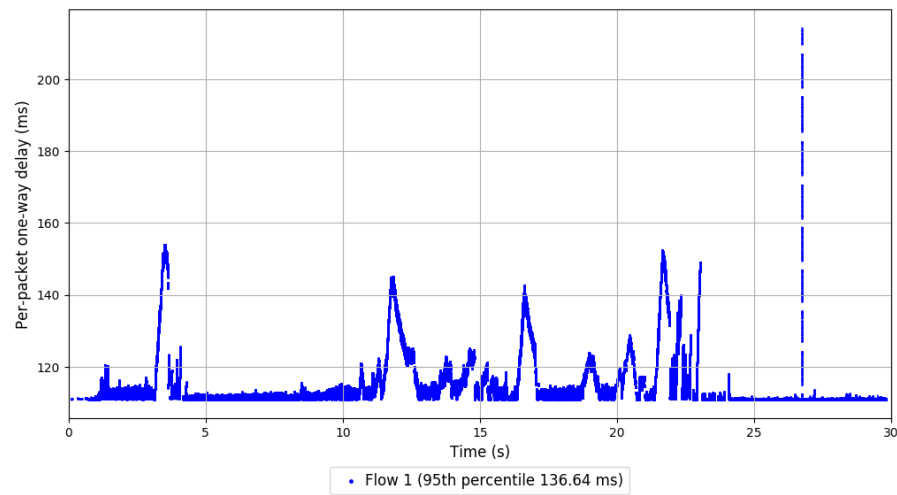
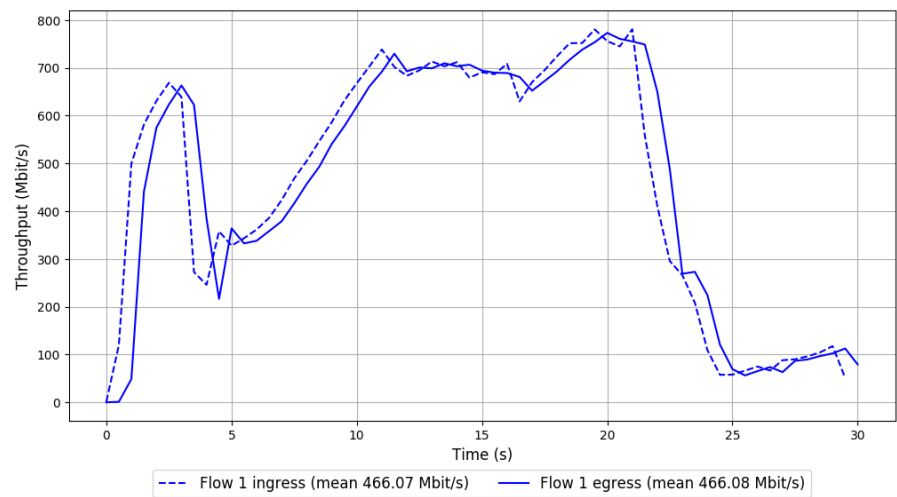
-- Flow 1:

Average throughput: 466.08 Mbit/s

95th percentile per-packet one-way delay: 136.642 ms

Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 07:15:47

End at: 2018-08-31 07:16:17

Local clock offset: 1.827 ms

Remote clock offset: 1.685 ms

Below is generated by plot.py at 2018-08-31 07:28:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 592.93 Mbit/s

95th percentile per-packet one-way delay: 134.935 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 592.93 Mbit/s

95th percentile per-packet one-way delay: 134.935 ms

Loss rate: 0.00%

Run 2: Report of Muses-25 — Data Link

