

Pantheon Report

Generated at 2018-09-05 23:18:54 (UTC).

Data path: GCE Sydney 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.

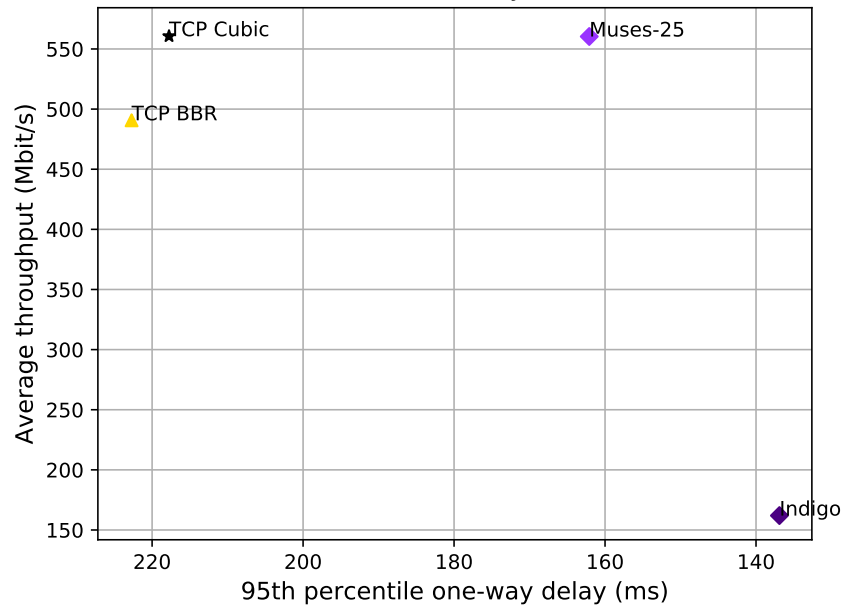
System info:

```
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
```

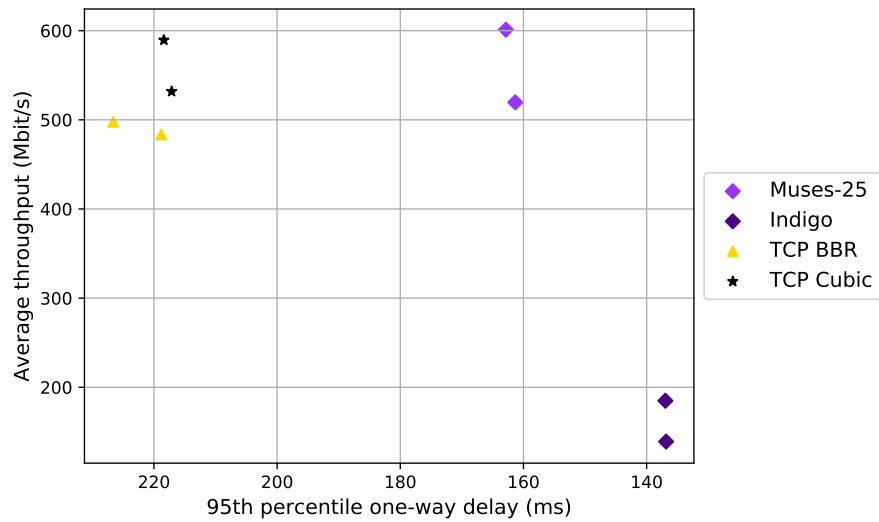
Git summary:

```
branch: muses @ 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 Sydney to GCE London, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Sydney 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	490.69	222.72	0.81
TCP Cubic	2	560.63	217.76	0.17
Indigo	2	161.98	136.90	0.00
Muses-25	2	560.37	162.09	0.06

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 23:00:49

End at: 2018-09-05 23:01:19

Local clock offset: 7.765 ms

Remote clock offset: 0.858 ms

Below is generated by plot.py at 2018-09-05 23:18:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 497.74 Mbit/s

95th percentile per-packet one-way delay: 226.610 ms

Loss rate: 1.10%

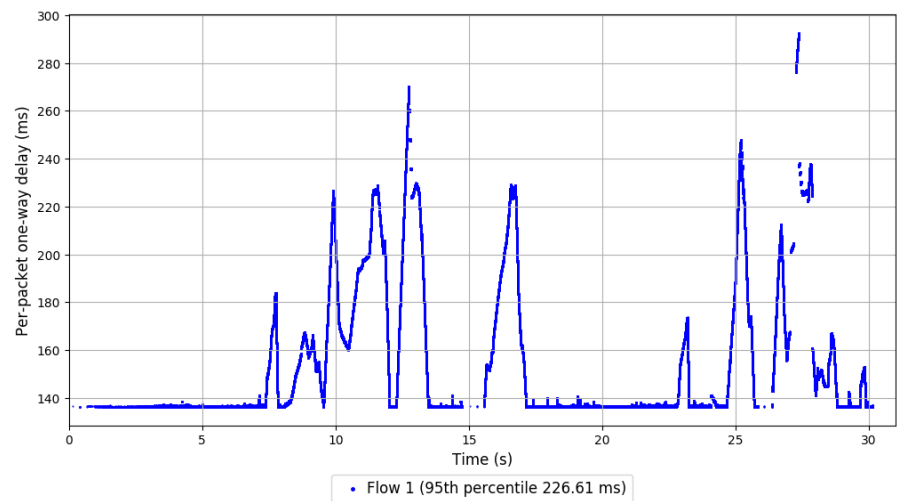
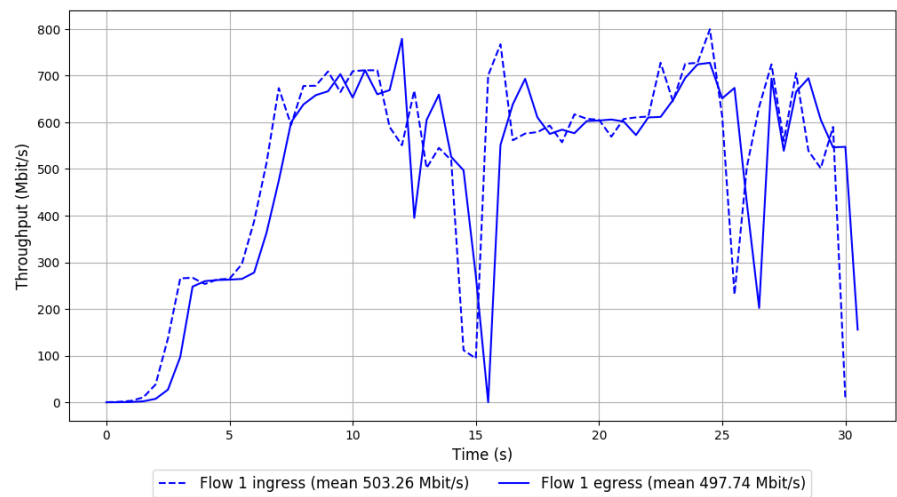
-- Flow 1:

Average throughput: 497.74 Mbit/s

95th percentile per-packet one-way delay: 226.610 ms

Loss rate: 1.10%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 23:07:21

End at: 2018-09-05 23:07:51

Local clock offset: 7.859 ms

Remote clock offset: 0.185 ms

Below is generated by plot.py at 2018-09-05 23:18:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 483.64 Mbit/s

95th percentile per-packet one-way delay: 218.822 ms

Loss rate: 0.52%

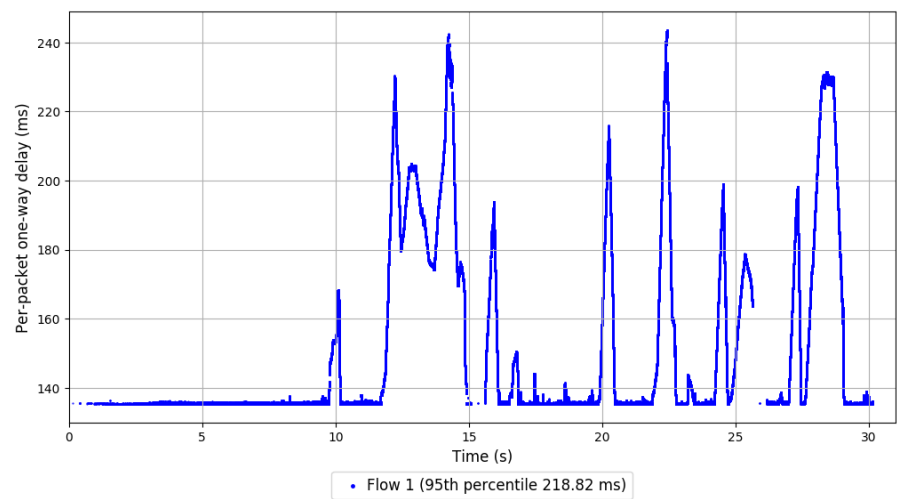
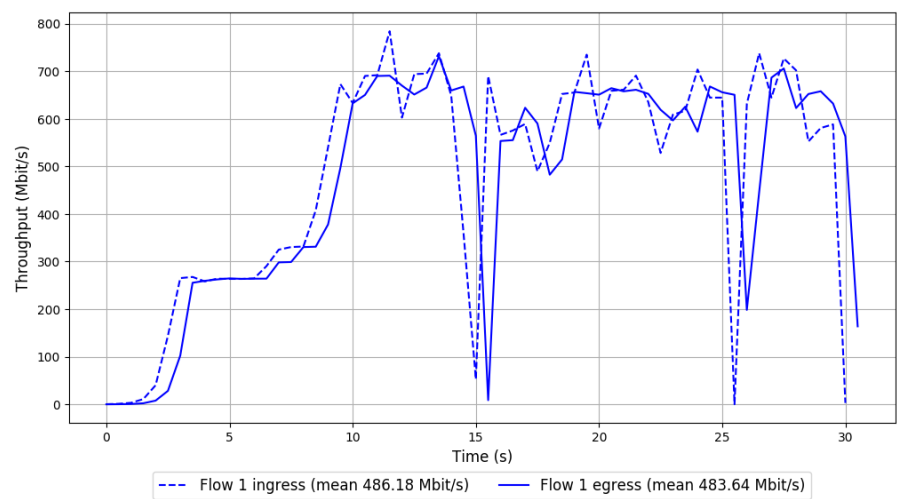
-- Flow 1:

Average throughput: 483.64 Mbit/s

95th percentile per-packet one-way delay: 218.822 ms

Loss rate: 0.52%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 23:02:29

End at: 2018-09-05 23:02:59

Local clock offset: 7.604 ms

Remote clock offset: 0.834 ms

Below is generated by plot.py at 2018-09-05 23:18:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 531.82 Mbit/s

95th percentile per-packet one-way delay: 217.129 ms

Loss rate: 0.20%

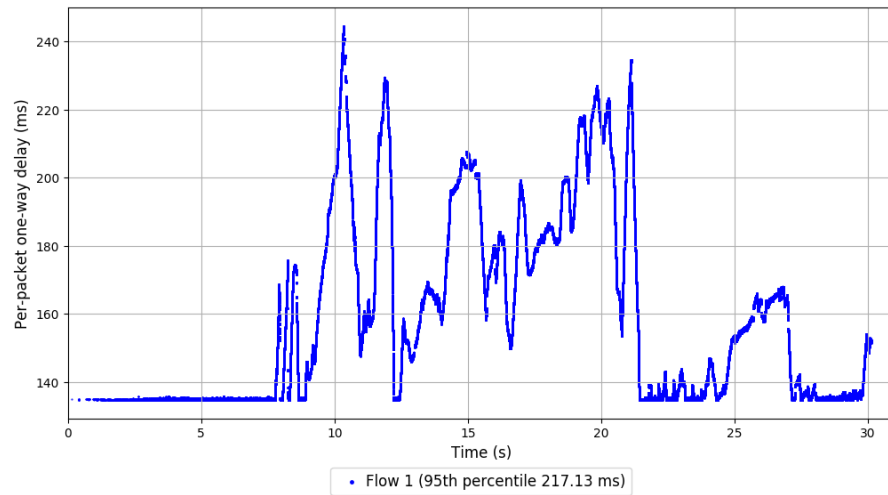
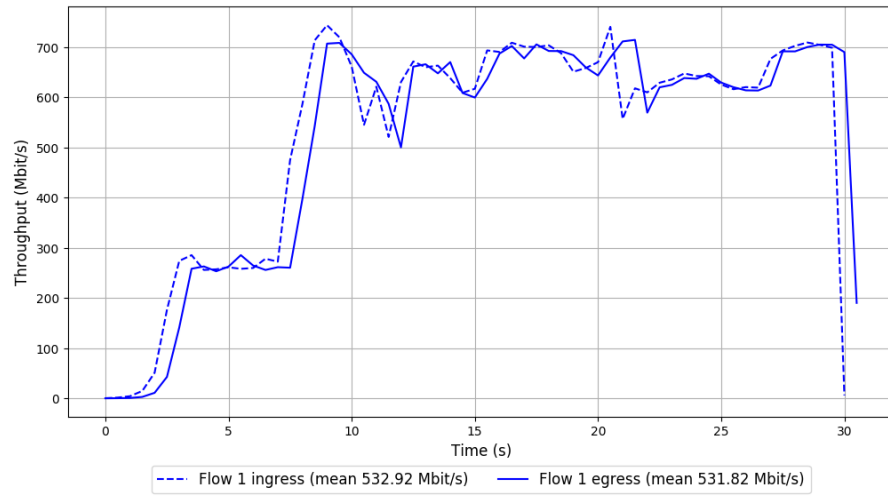
-- Flow 1:

Average throughput: 531.82 Mbit/s

95th percentile per-packet one-way delay: 217.129 ms

Loss rate: 0.20%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 23:08:59

End at: 2018-09-05 23:09:29

Local clock offset: 8.173 ms

Remote clock offset: 0.536 ms

Below is generated by plot.py at 2018-09-05 23:18:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 589.44 Mbit/s

95th percentile per-packet one-way delay: 218.390 ms

Loss rate: 0.14%

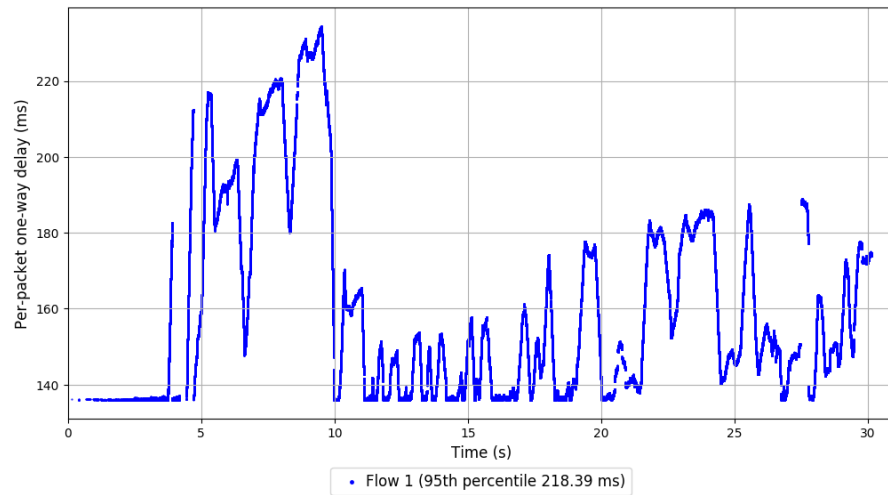
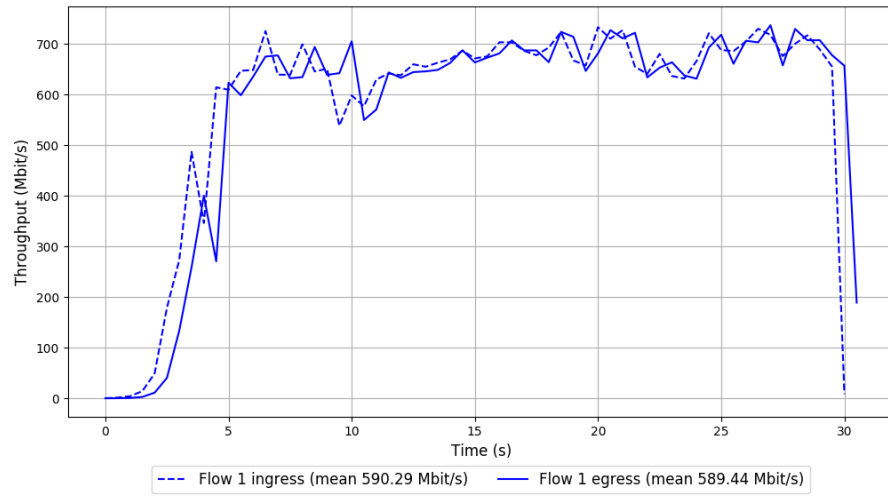
-- Flow 1:

Average throughput: 589.44 Mbit/s

95th percentile per-packet one-way delay: 218.390 ms

Loss rate: 0.14%

Run 2: Report of TCP Cubic — Data Link

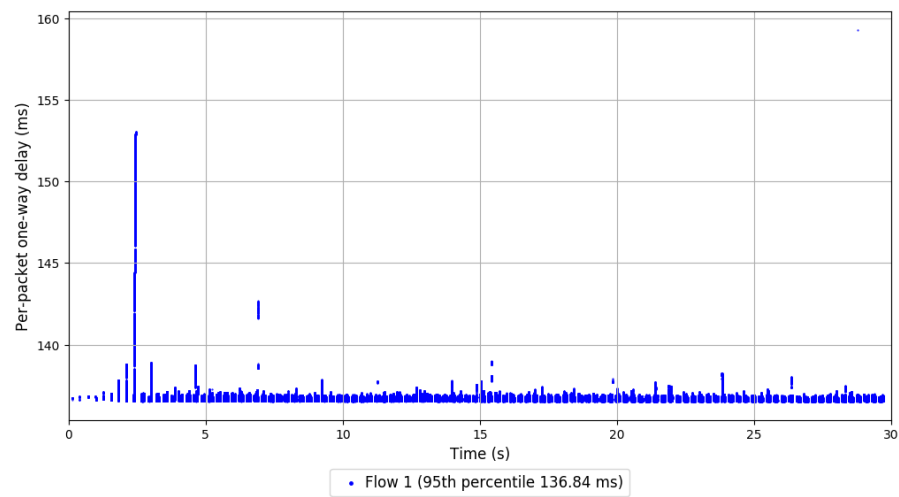
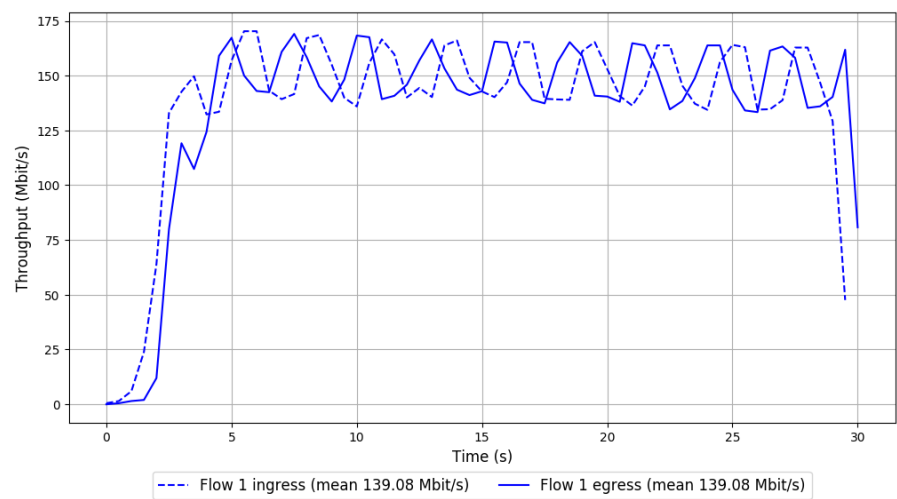


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 22:59:25
End at: 2018-09-05 22:59:55
Local clock offset: 7.488 ms
Remote clock offset: 1.176 ms

# Below is generated by plot.py at 2018-09-05 23:18:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 139.08 Mbit/s
95th percentile per-packet one-way delay: 136.841 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 139.08 Mbit/s
95th percentile per-packet one-way delay: 136.841 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 23:05:51

End at: 2018-09-05 23:06:22

Local clock offset: 7.866 ms

Remote clock offset: 0.629 ms

Below is generated by plot.py at 2018-09-05 23:18:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 184.88 Mbit/s

95th percentile per-packet one-way delay: 136.960 ms

Loss rate: 0.00%

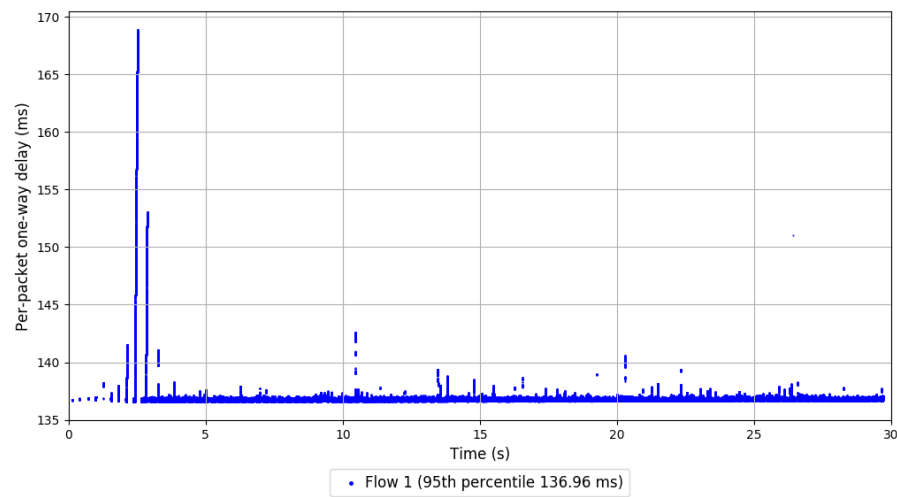
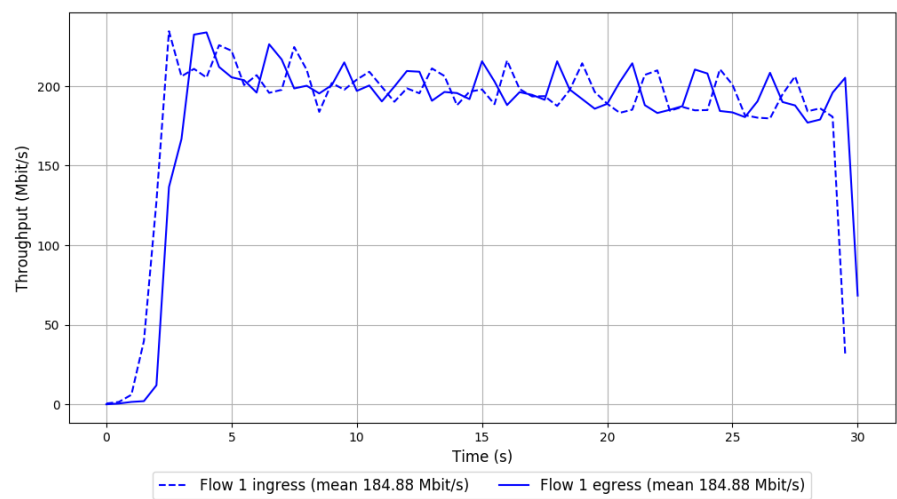
-- Flow 1:

Average throughput: 184.88 Mbit/s

95th percentile per-packet one-way delay: 136.960 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 22:57:47

End at: 2018-09-05 22:58:17

Local clock offset: 7.787 ms

Remote clock offset: 0.798 ms

Below is generated by plot.py at 2018-09-05 23:18:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 519.61 Mbit/s

95th percentile per-packet one-way delay: 161.331 ms

Loss rate: 0.00%

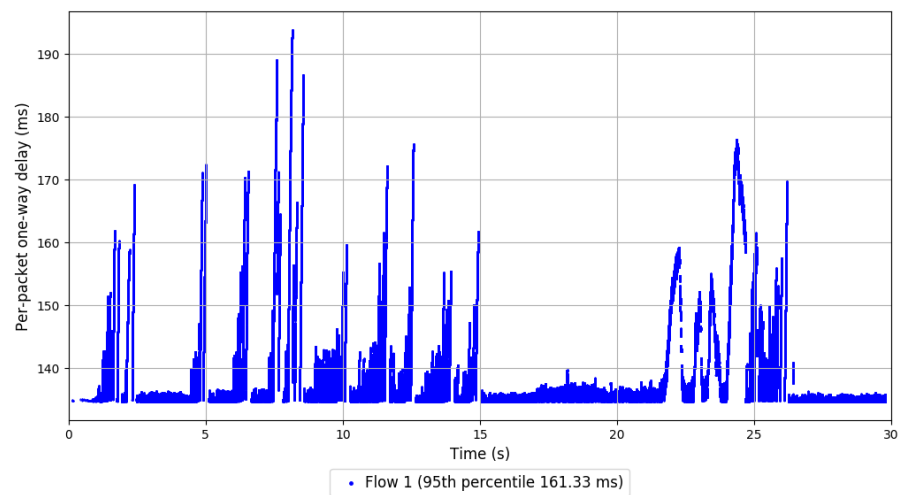
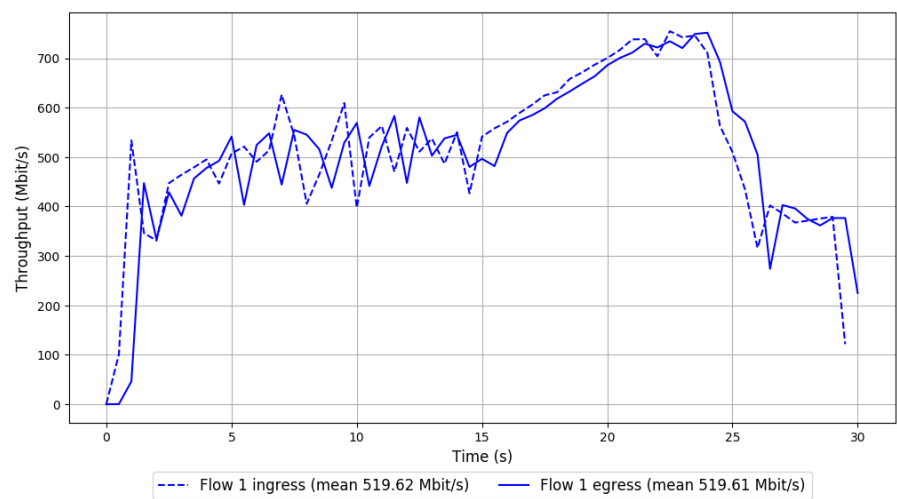
-- Flow 1:

Average throughput: 519.61 Mbit/s

95th percentile per-packet one-way delay: 161.331 ms

Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 23:04:09

End at: 2018-09-05 23:04:39

Local clock offset: 7.545 ms

Remote clock offset: 1.091 ms

Below is generated by plot.py at 2018-09-05 23:18:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 601.12 Mbit/s

95th percentile per-packet one-way delay: 162.852 ms

Loss rate: 0.11%

-- Flow 1:

Average throughput: 601.12 Mbit/s

95th percentile per-packet one-way delay: 162.852 ms

Loss rate: 0.11%

Run 2: Report of Muses-25 — Data Link

