

Pantheon Report

Generated at 2018-08-31 10:43:44 (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.

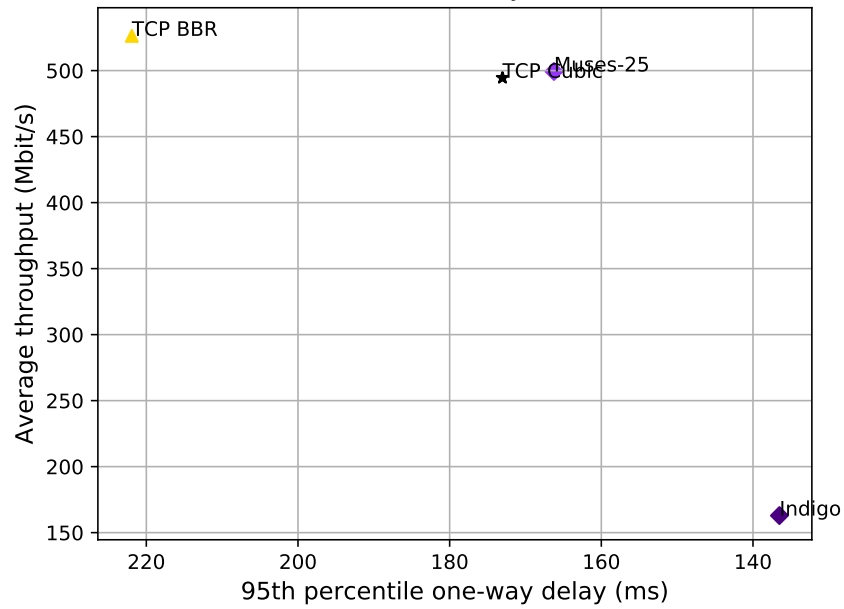
System info:

```
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
```

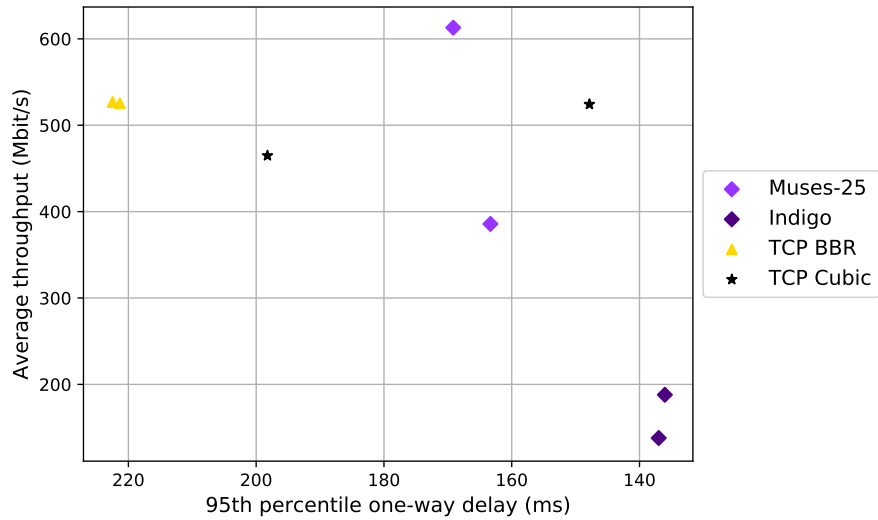
Git summary:

```
branch: muses @ 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 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	526.31	221.91	0.74
TCP Cubic	2	494.53	173.03	0.04
Indigo	2	162.92	136.51	0.01
Muses-25	2	499.35	166.24	0.01

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 10:26:26

End at: 2018-08-31 10:26:56

Local clock offset: 6.181 ms

Remote clock offset: 4.619 ms

Below is generated by plot.py at 2018-08-31 10:43:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 527.01 Mbit/s

95th percentile per-packet one-way delay: 222.478 ms

Loss rate: 1.04%

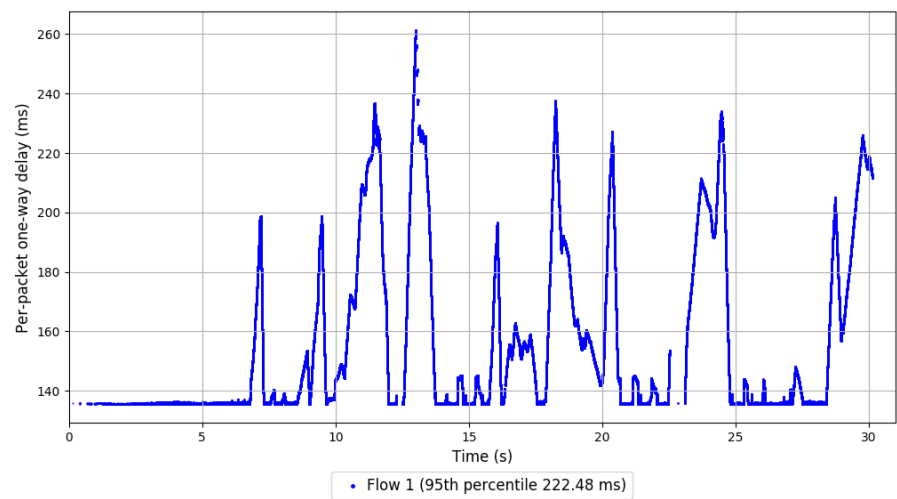
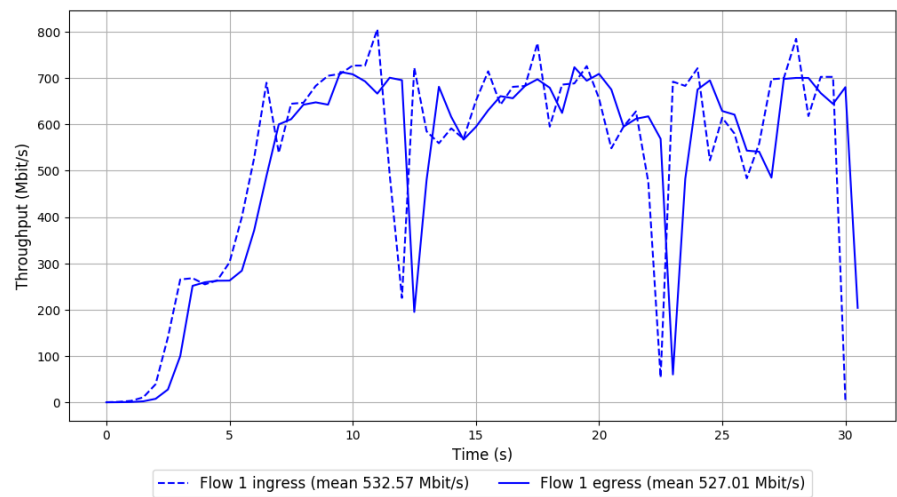
-- Flow 1:

Average throughput: 527.01 Mbit/s

95th percentile per-packet one-way delay: 222.478 ms

Loss rate: 1.04%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 10:32:41

End at: 2018-08-31 10:33:11

Local clock offset: 6.799 ms

Remote clock offset: 4.412 ms

Below is generated by plot.py at 2018-08-31 10:43:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 525.61 Mbit/s

95th percentile per-packet one-way delay: 221.343 ms

Loss rate: 0.44%

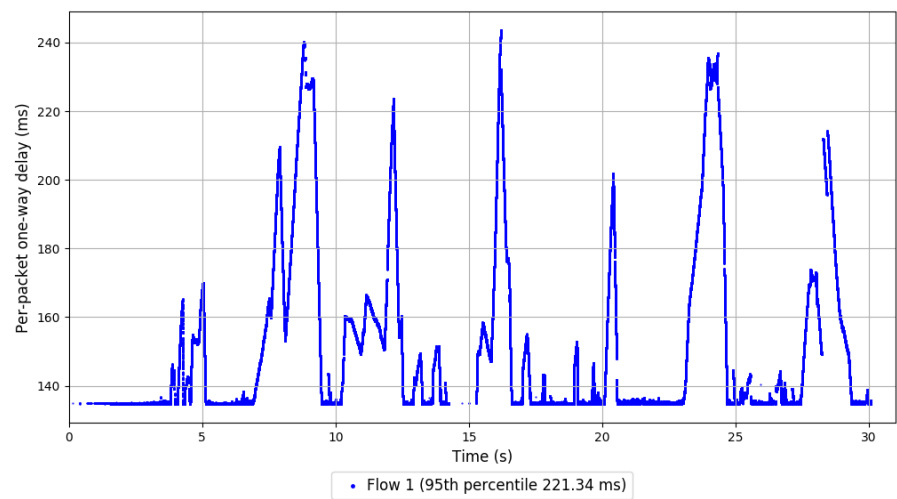
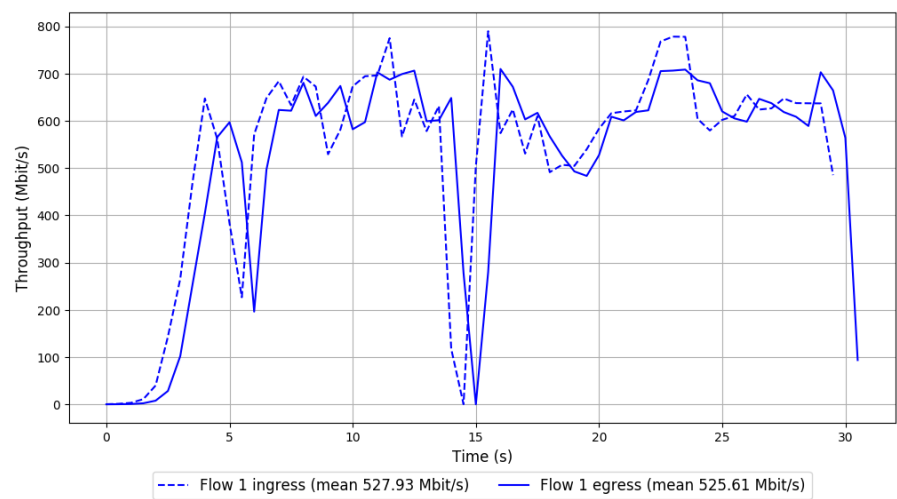
-- Flow 1:

Average throughput: 525.61 Mbit/s

95th percentile per-packet one-way delay: 221.343 ms

Loss rate: 0.44%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 10:23:04

End at: 2018-08-31 10:23:34

Local clock offset: 6.344 ms

Remote clock offset: 4.947 ms

Below is generated by plot.py at 2018-08-31 10:43:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 524.29 Mbit/s

95th percentile per-packet one-way delay: 147.837 ms

Loss rate: 0.01%

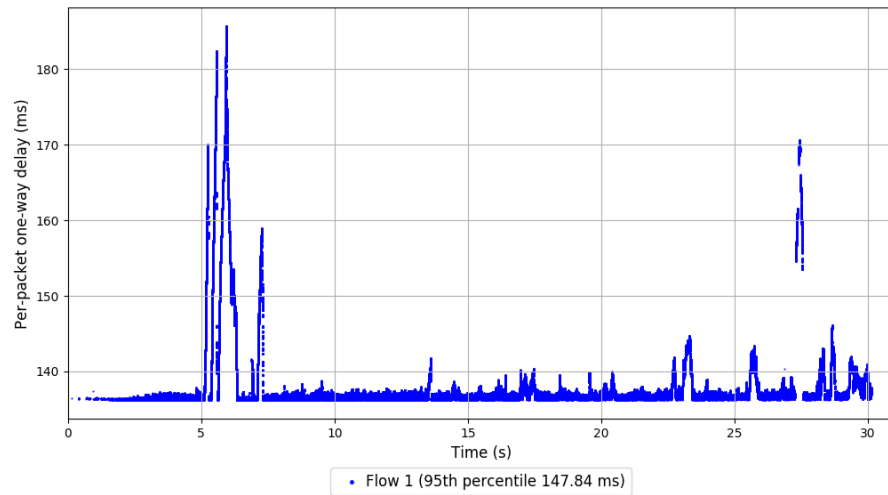
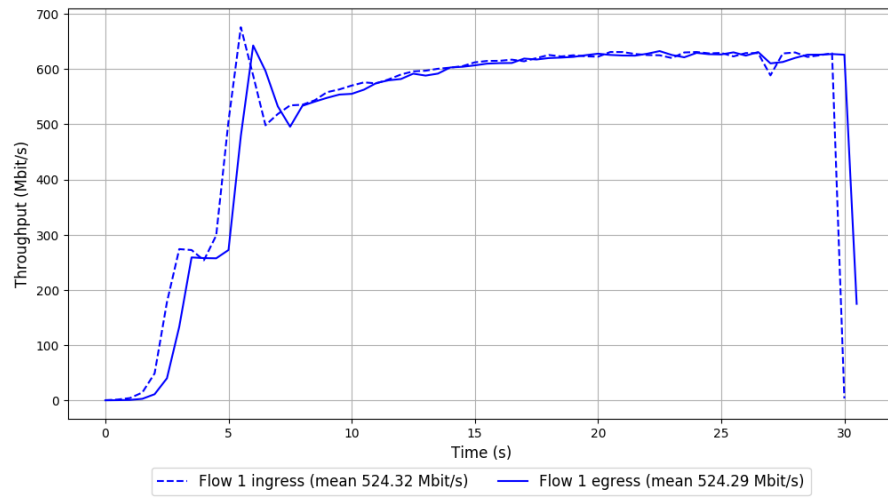
-- Flow 1:

Average throughput: 524.29 Mbit/s

95th percentile per-packet one-way delay: 147.837 ms

Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 10:29:35

End at: 2018-08-31 10:30:05

Local clock offset: 6.359 ms

Remote clock offset: 4.298 ms

Below is generated by plot.py at 2018-08-31 10:43:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 464.78 Mbit/s

95th percentile per-packet one-way delay: 198.233 ms

Loss rate: 0.07%

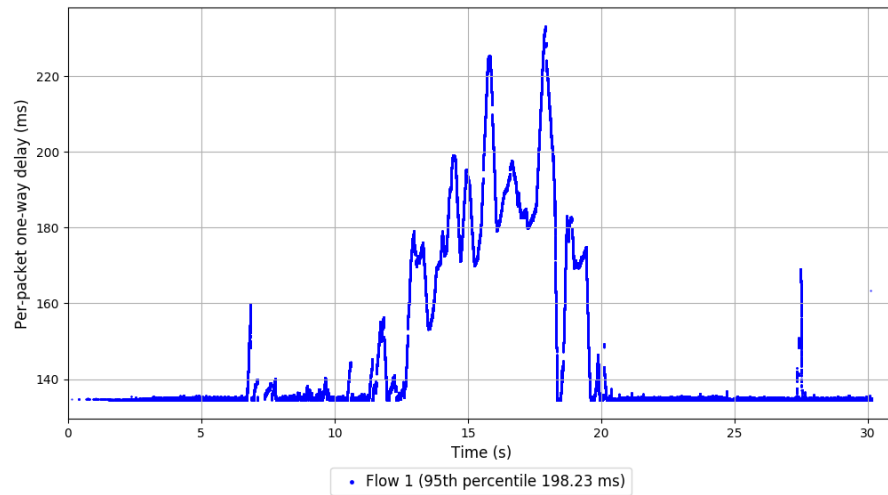
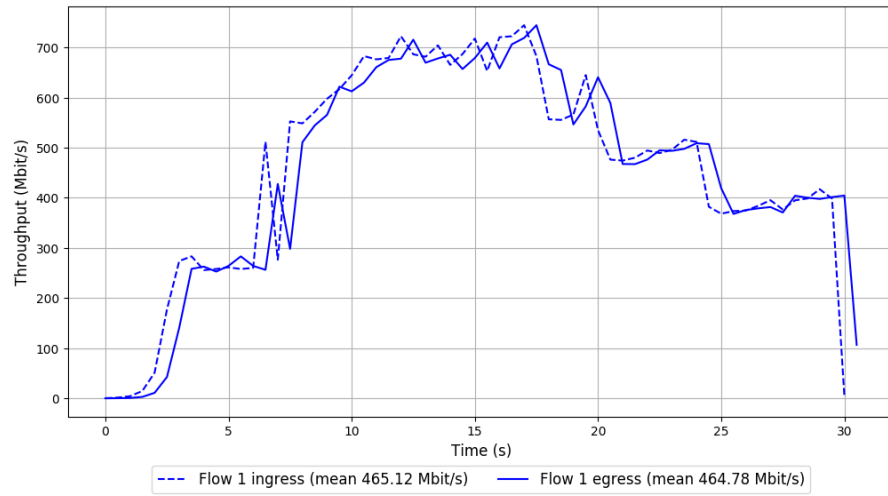
-- Flow 1:

Average throughput: 464.78 Mbit/s

95th percentile per-packet one-way delay: 198.233 ms

Loss rate: 0.07%

Run 2: Report of TCP Cubic — Data Link

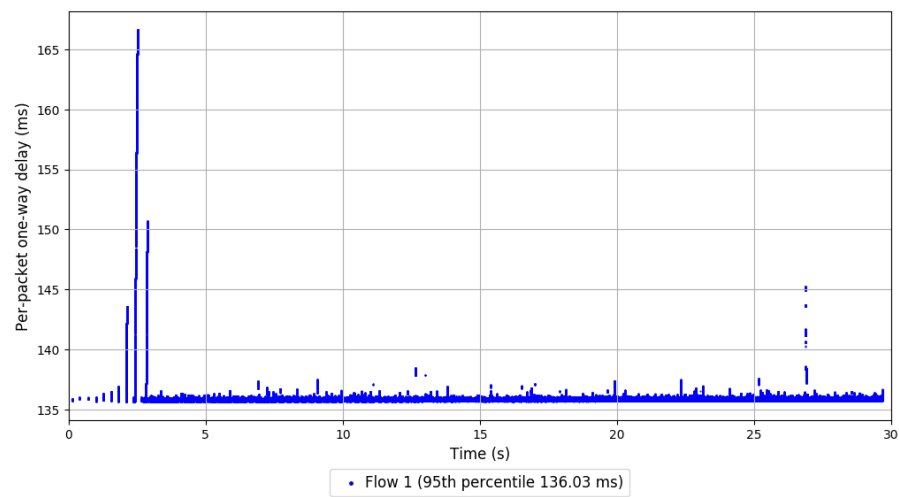
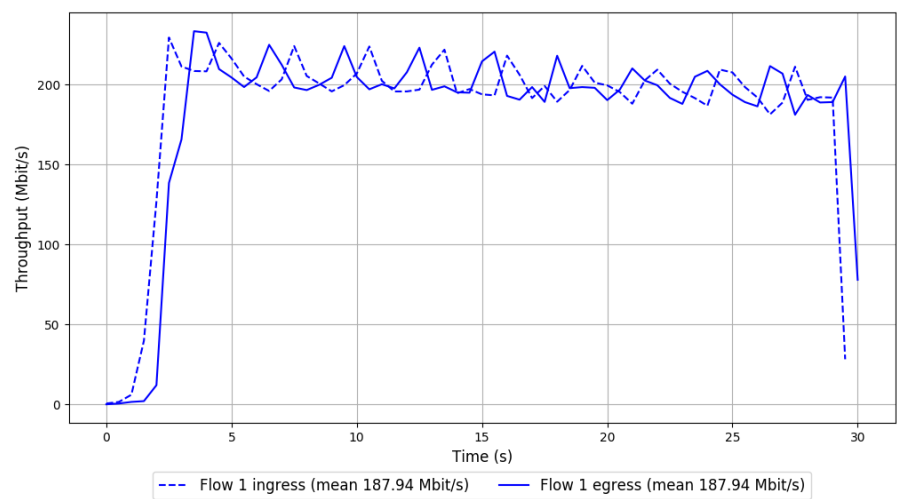


```
Run 1: Statistics of Indigo

Start at: 2018-08-31 10:28:07
End at: 2018-08-31 10:28:37
Local clock offset: 6.327 ms
Remote clock offset: 4.308 ms

# Below is generated by plot.py at 2018-08-31 10:43:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 187.94 Mbit/s
95th percentile per-packet one-way delay: 136.035 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 187.94 Mbit/s
95th percentile per-packet one-way delay: 136.035 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 10:34:23

End at: 2018-08-31 10:34:53

Local clock offset: 6.896 ms

Remote clock offset: 4.035 ms

Below is generated by plot.py at 2018-08-31 10:43:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 137.90 Mbit/s

95th percentile per-packet one-way delay: 136.993 ms

Loss rate: 0.01%

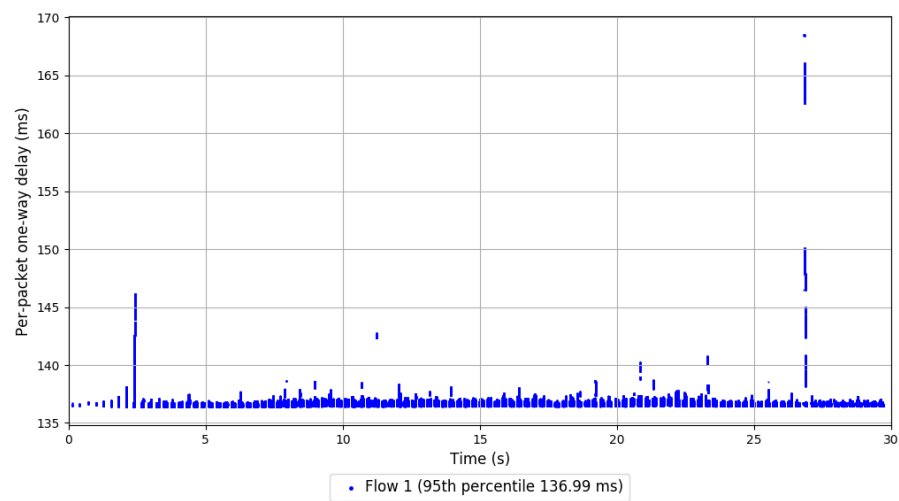
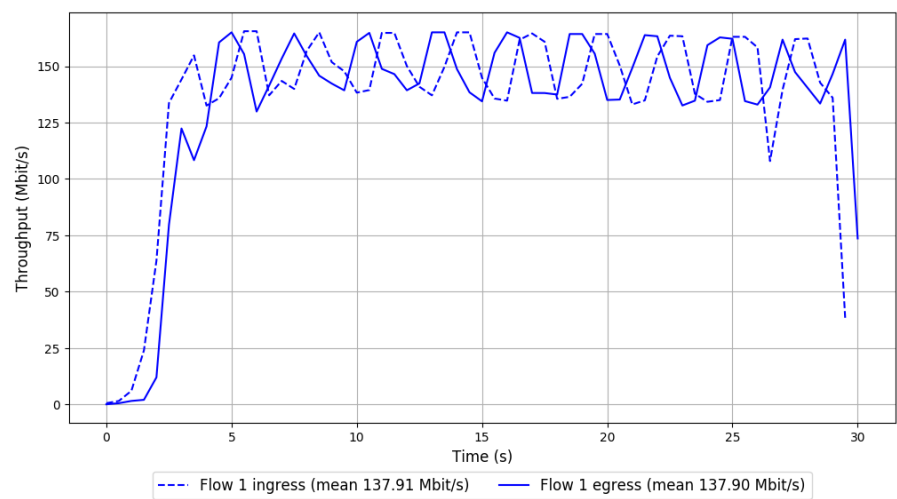
-- Flow 1:

Average throughput: 137.90 Mbit/s

95th percentile per-packet one-way delay: 136.993 ms

Loss rate: 0.01%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-08-31 10:24:42

End at: 2018-08-31 10:25:12

Local clock offset: 6.144 ms

Remote clock offset: 4.526 ms

Below is generated by plot.py at 2018-08-31 10:43:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 612.97 Mbit/s

95th percentile per-packet one-way delay: 169.152 ms

Loss rate: 0.00%

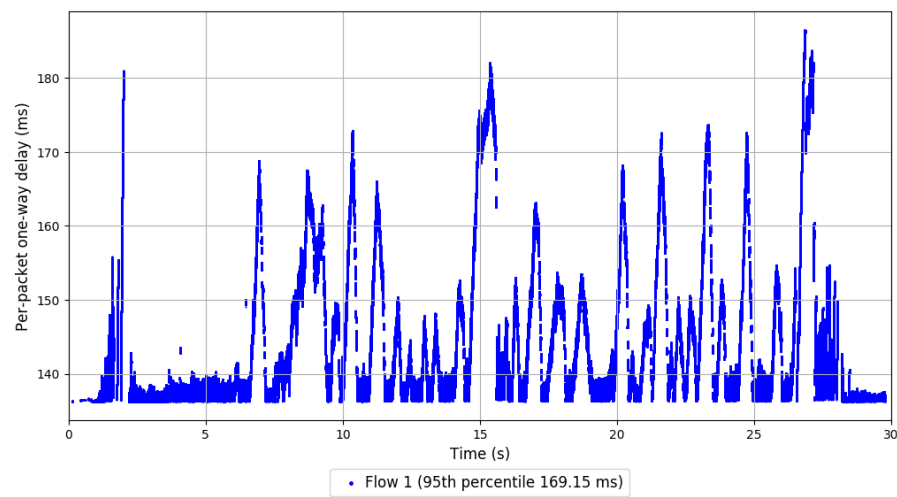
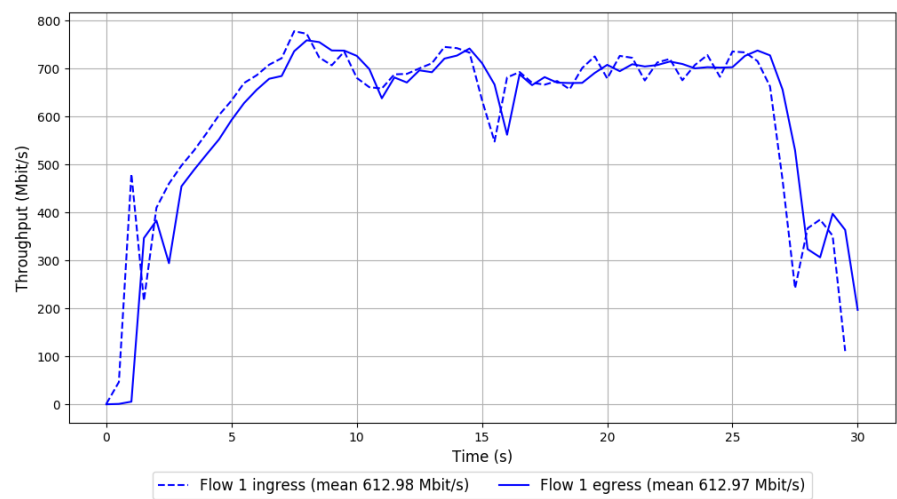
-- Flow 1:

Average throughput: 612.97 Mbit/s

95th percentile per-packet one-way delay: 169.152 ms

Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 10:31:10

End at: 2018-08-31 10:31:40

Local clock offset: 6.731 ms

Remote clock offset: 4.471 ms

Below is generated by plot.py at 2018-08-31 10:43:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 385.73 Mbit/s

95th percentile per-packet one-way delay: 163.337 ms

Loss rate: 0.02%

-- Flow 1:

Average throughput: 385.73 Mbit/s

95th percentile per-packet one-way delay: 163.337 ms

Loss rate: 0.02%

Run 2: Report of Muses-25 — Data Link

