

Pantheon Report

Generated at 2018-09-03 12:38:37 (UTC).

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

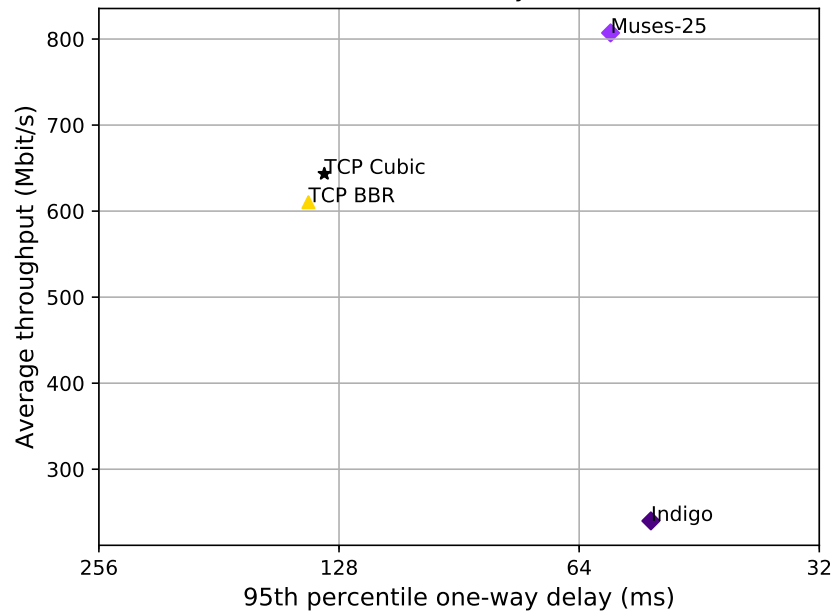
System info:

```
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
```

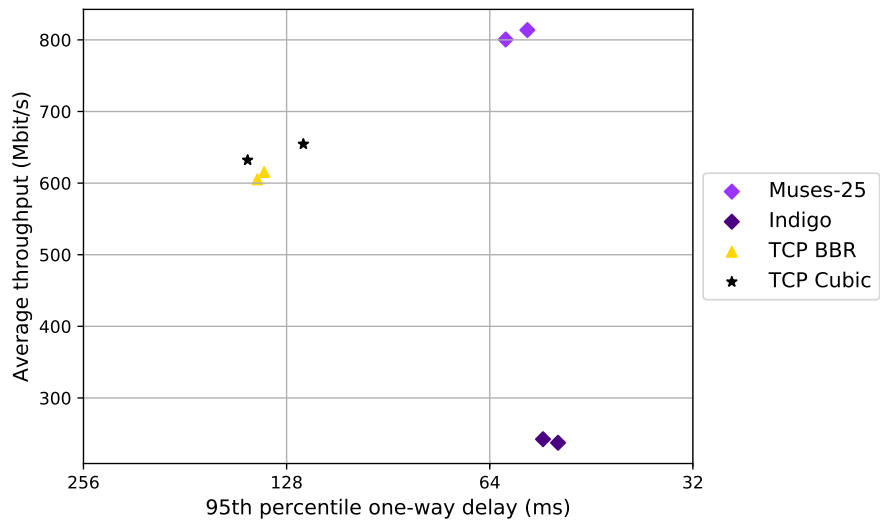
Git summary:

```
branch: muses @ f309f5459e2c5237279a184e52ece7a2b47ef1c9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b8d5019b83a3a678804d830fcfe1da7b3a63421b
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 Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Sydney 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	610.34	139.82	0.53
TCP Cubic	2	643.34	133.54	0.11
Indigo	2	239.92	52.03	0.01
Muses-25	2	807.13	58.45	0.01

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 12:17:29

End at: 2018-09-03 12:17:59

Local clock offset: 0.324 ms

Remote clock offset: 1.572 ms

Below is generated by plot.py at 2018-09-03 12:37:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 605.25 Mbit/s

95th percentile per-packet one-way delay: 141.441 ms

Loss rate: 0.51%

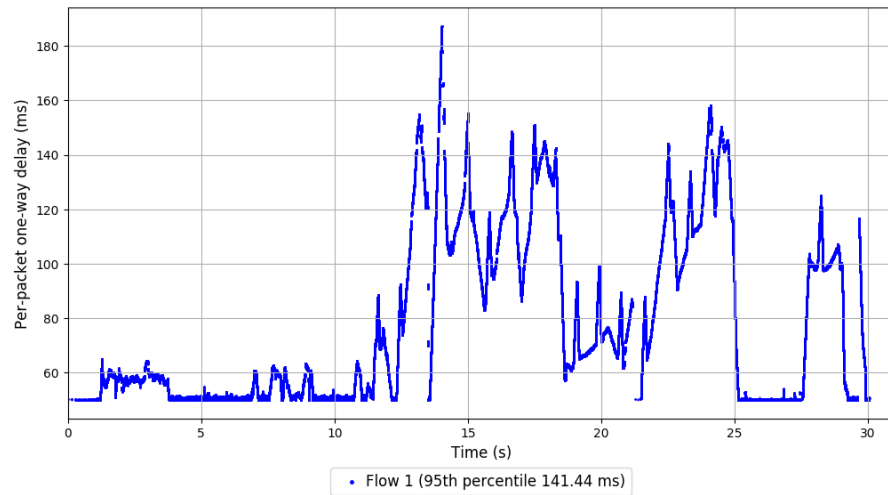
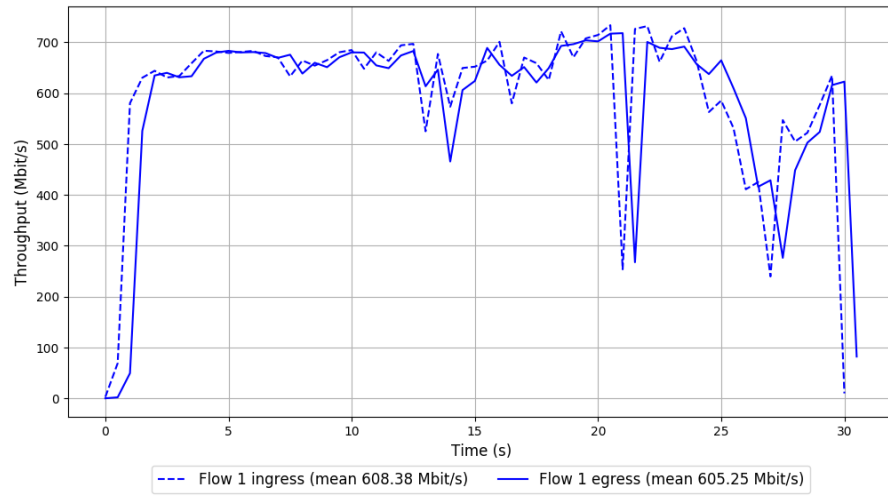
-- Flow 1:

Average throughput: 605.25 Mbit/s

95th percentile per-packet one-way delay: 141.441 ms

Loss rate: 0.51%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-03 12:23:41

End at: 2018-09-03 12:24:11

Local clock offset: 0.39 ms

Remote clock offset: 1.093 ms

Below is generated by plot.py at 2018-09-03 12:38:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 615.42 Mbit/s

95th percentile per-packet one-way delay: 138.195 ms

Loss rate: 0.54%

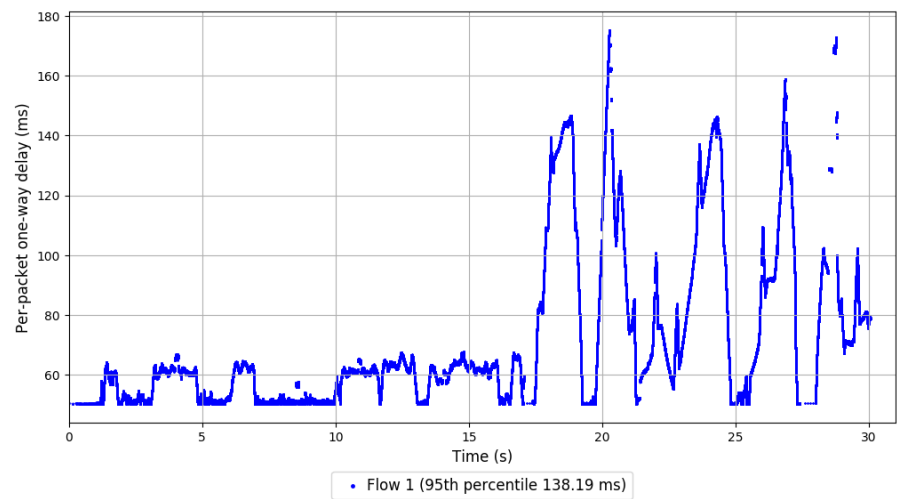
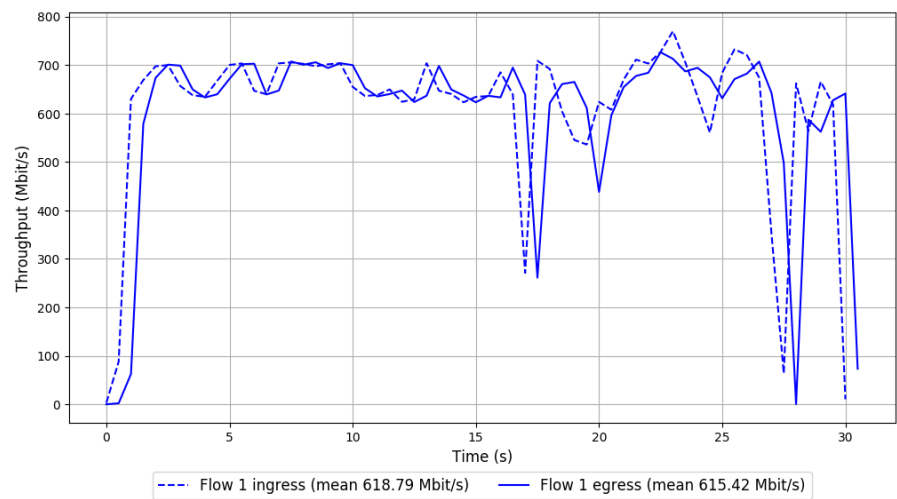
-- Flow 1:

Average throughput: 615.42 Mbit/s

95th percentile per-packet one-way delay: 138.195 ms

Loss rate: 0.54%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 12:20:30

End at: 2018-09-03 12:21:00

Local clock offset: 0.469 ms

Remote clock offset: 4.447 ms

Below is generated by plot.py at 2018-09-03 12:38:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 632.15 Mbit/s

95th percentile per-packet one-way delay: 146.209 ms

Loss rate: 0.16%

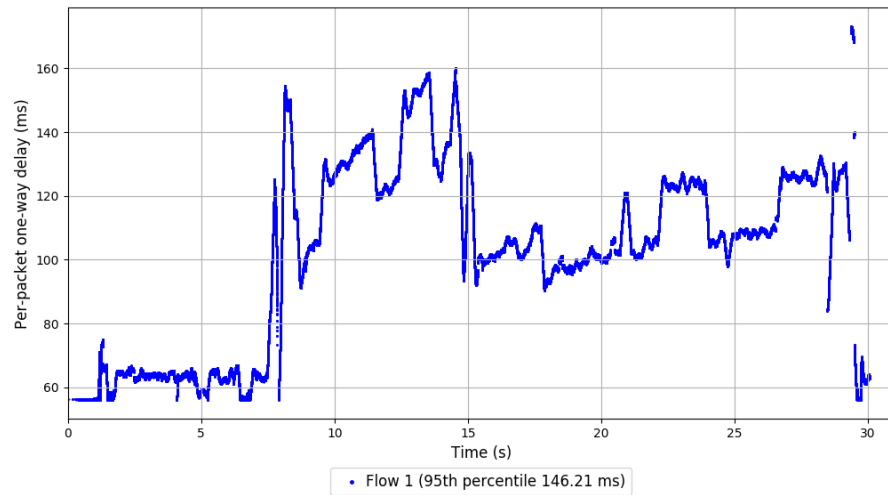
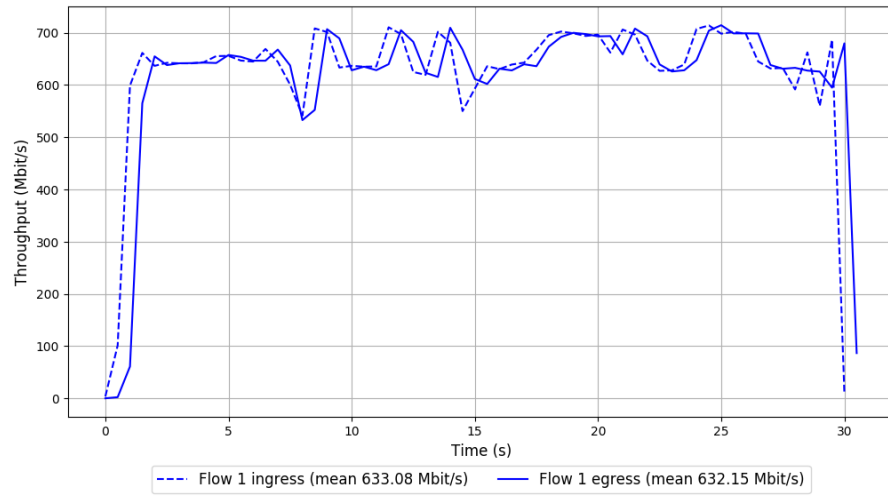
-- Flow 1:

Average throughput: 632.15 Mbit/s

95th percentile per-packet one-way delay: 146.209 ms

Loss rate: 0.16%

Run 1: Report of TCP Cubic — Data Link

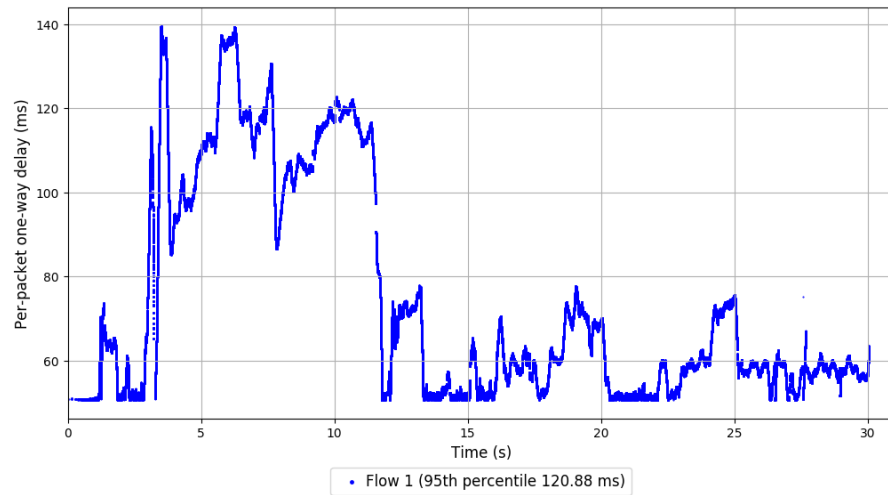
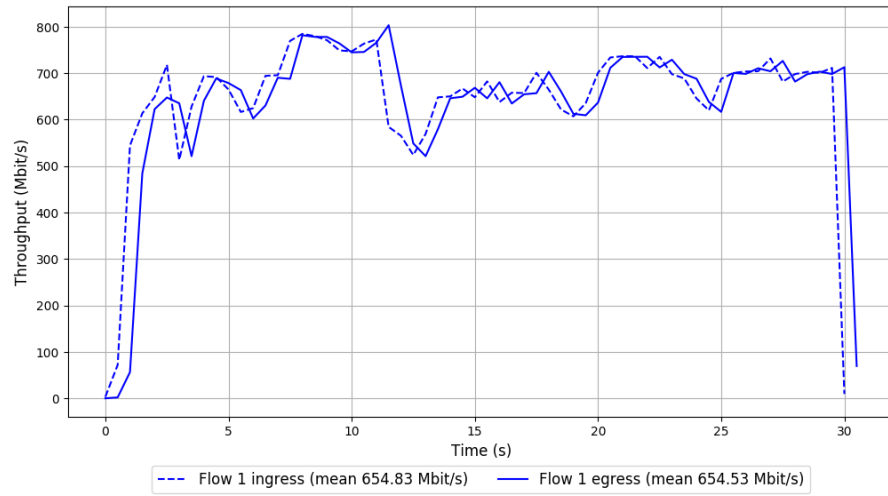


Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 12:26:42
End at: 2018-09-03 12:27:12
Local clock offset: 0.427 ms
Remote clock offset: -2.153 ms

Below is generated by plot.py at 2018-09-03 12:38:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 654.53 Mbit/s
95th percentile per-packet one-way delay: 120.876 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 654.53 Mbit/s
95th percentile per-packet one-way delay: 120.876 ms
Loss rate: 0.05%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-09-03 12:19:04

End at: 2018-09-03 12:19:34

Local clock offset: 0.197 ms

Remote clock offset: 1.745 ms

Below is generated by plot.py at 2018-09-03 12:38:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 237.43 Mbit/s

95th percentile per-packet one-way delay: 50.699 ms

Loss rate: 0.00%

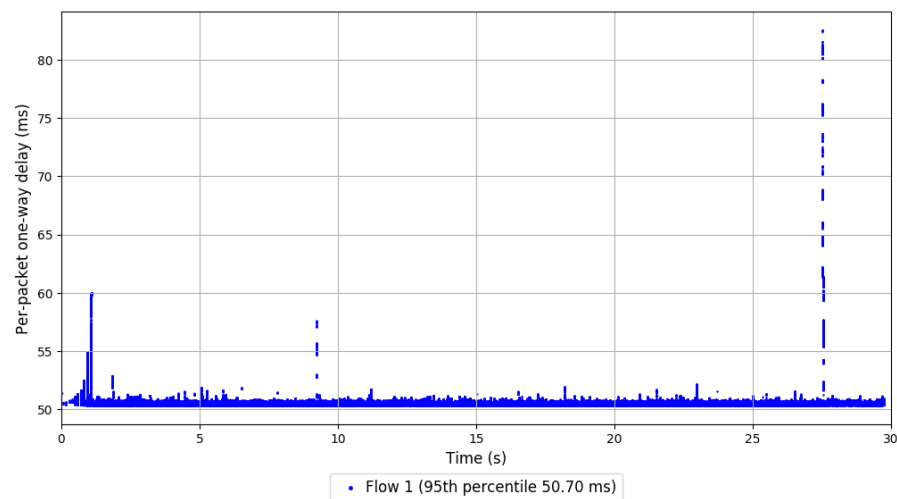
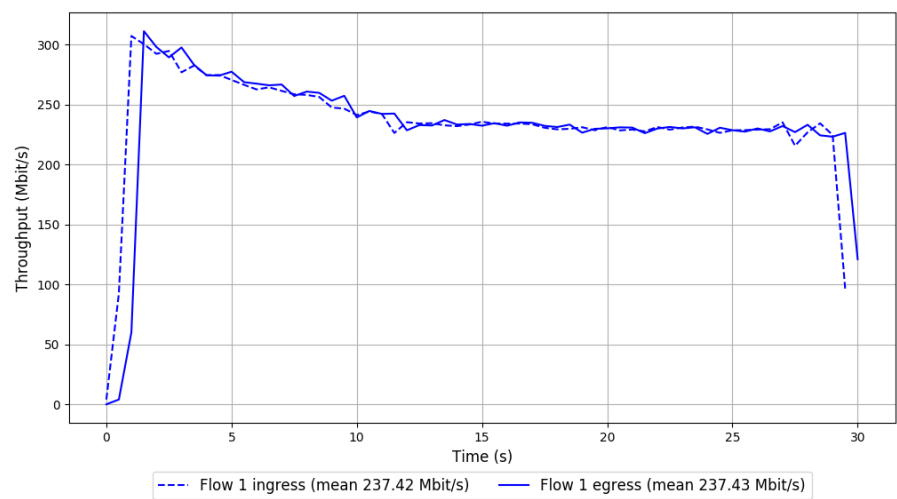
-- Flow 1:

Average throughput: 237.43 Mbit/s

95th percentile per-packet one-way delay: 50.699 ms

Loss rate: 0.00%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-03 12:25:16

End at: 2018-09-03 12:25:46

Local clock offset: 0.592 ms

Remote clock offset: 0.99 ms

Below is generated by plot.py at 2018-09-03 12:38:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 242.41 Mbit/s

95th percentile per-packet one-way delay: 53.364 ms

Loss rate: 0.01%

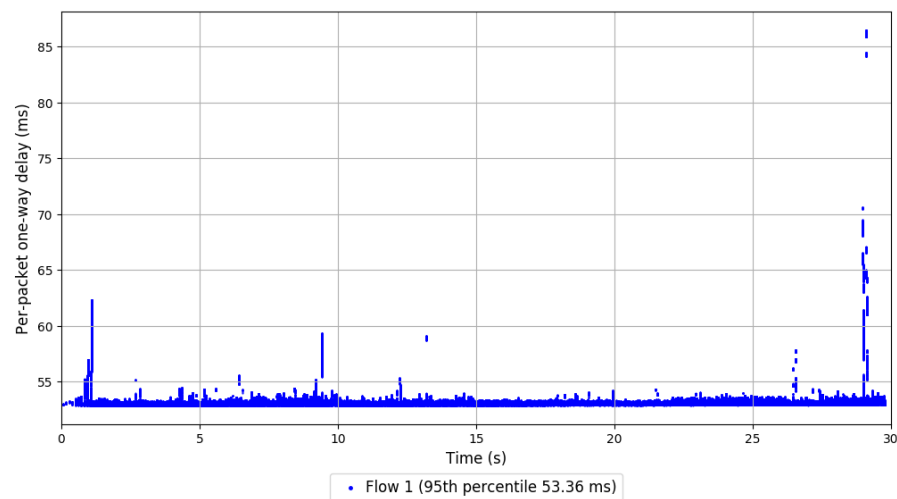
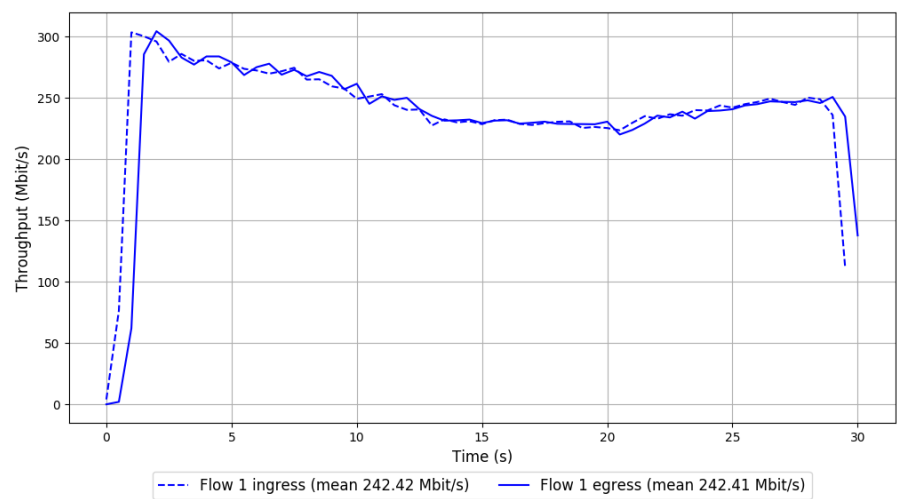
-- Flow 1:

Average throughput: 242.41 Mbit/s

95th percentile per-packet one-way delay: 53.364 ms

Loss rate: 0.01%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-03 12:15:54

End at: 2018-09-03 12:16:24

Local clock offset: 0.357 ms

Remote clock offset: 4.349 ms

Below is generated by plot.py at 2018-09-03 12:38:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 800.54 Mbit/s

95th percentile per-packet one-way delay: 60.612 ms

Loss rate: 0.02%

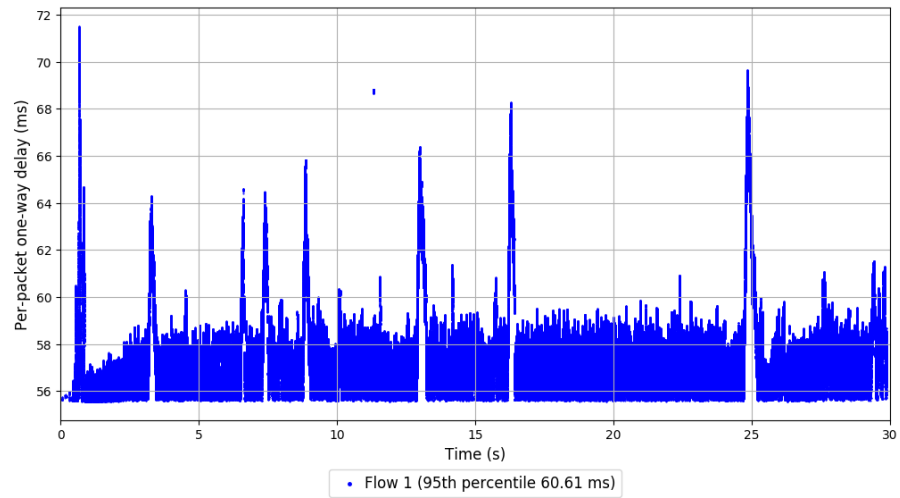
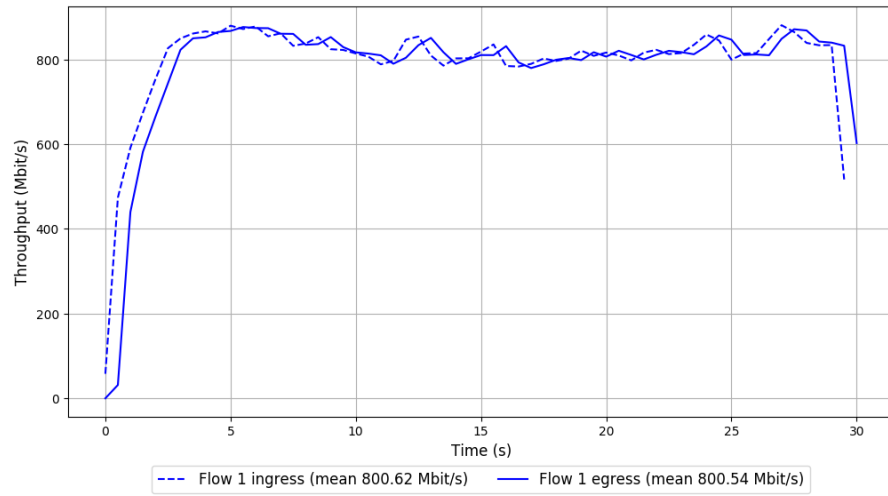
-- Flow 1:

Average throughput: 800.54 Mbit/s

95th percentile per-packet one-way delay: 60.612 ms

Loss rate: 0.02%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 12:22:05

End at: 2018-09-03 12:22:35

Local clock offset: 0.136 ms

Remote clock offset: 1.314 ms

Below is generated by plot.py at 2018-09-03 12:38:35

Datalink statistics

-- Total of 1 flow:

Average throughput: 813.73 Mbit/s

95th percentile per-packet one-way delay: 56.285 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 813.73 Mbit/s

95th percentile per-packet one-way delay: 56.285 ms

Loss rate: 0.00%

Run 2: Report of Muses-25 — Data Link

