

Pantheon Report

Generated at 2018-08-31 10:46:08 (UTC).

Data path: GCE Iowa 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.

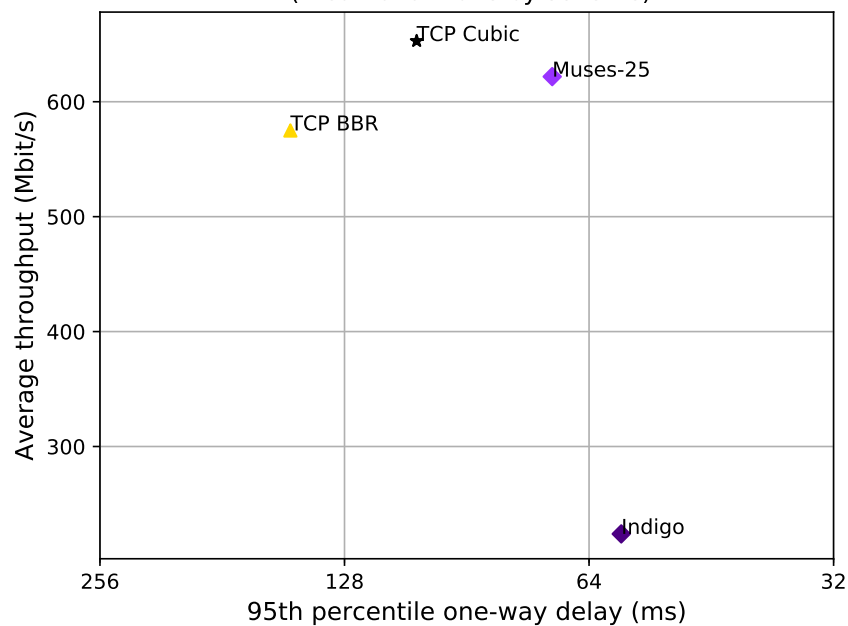
System info:

```
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
```

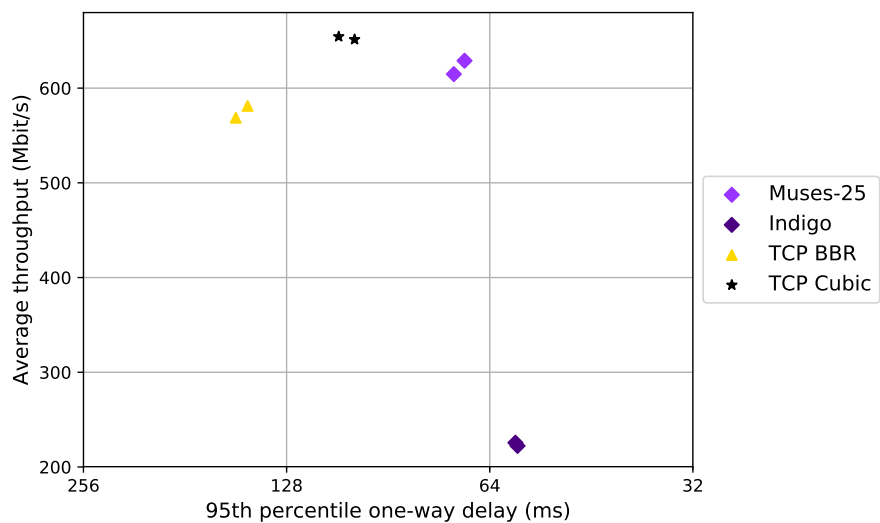
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
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 Iowa to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Iowa 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	575.00	149.22	0.67
TCP Cubic	2	652.84	104.33	0.12
Indigo	2	223.94	58.42	0.00
Muses-25	2	621.87	71.04	0.01

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 10:23:01

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

Local clock offset: 3.809 ms

Remote clock offset: 6.553 ms

Below is generated by plot.py at 2018-08-31 10:44:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 581.27 Mbit/s

95th percentile per-packet one-way delay: 146.190 ms

Loss rate: 0.41%

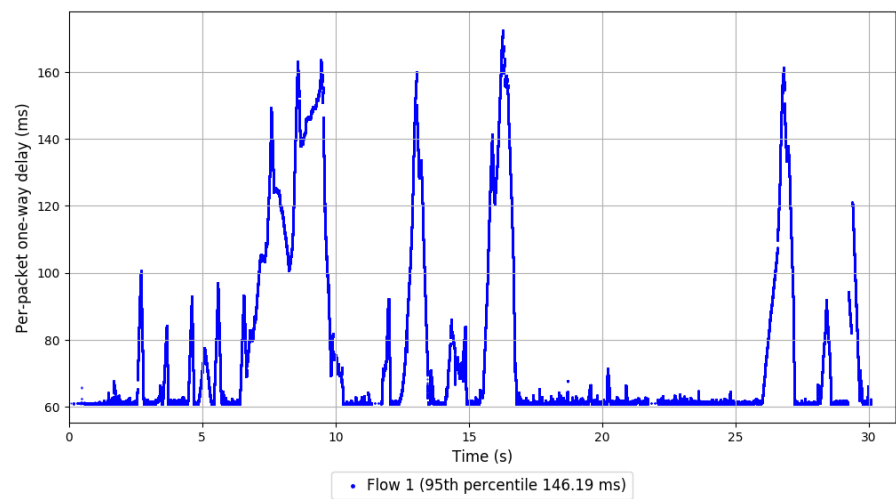
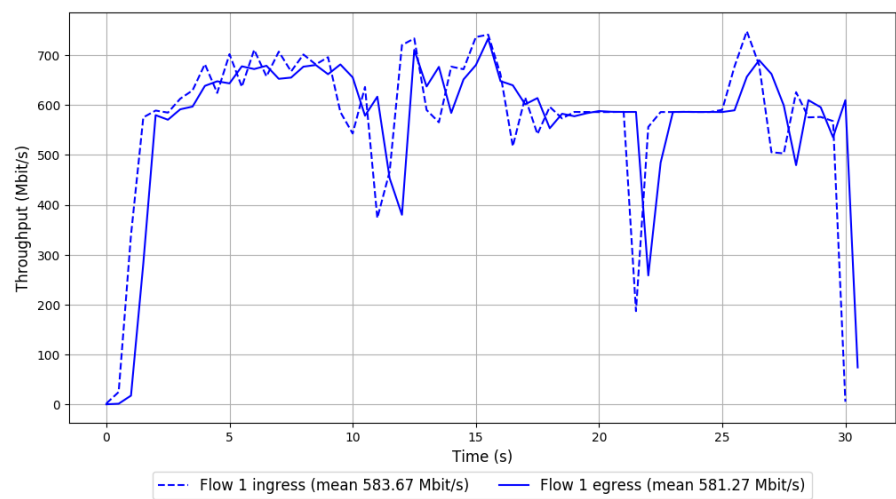
-- Flow 1:

Average throughput: 581.27 Mbit/s

95th percentile per-packet one-way delay: 146.190 ms

Loss rate: 0.41%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 10:29:17

End at: 2018-08-31 10:29:47

Local clock offset: 3.86 ms

Remote clock offset: 3.979 ms

Below is generated by plot.py at 2018-08-31 10:44:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 568.74 Mbit/s

95th percentile per-packet one-way delay: 152.259 ms

Loss rate: 0.93%

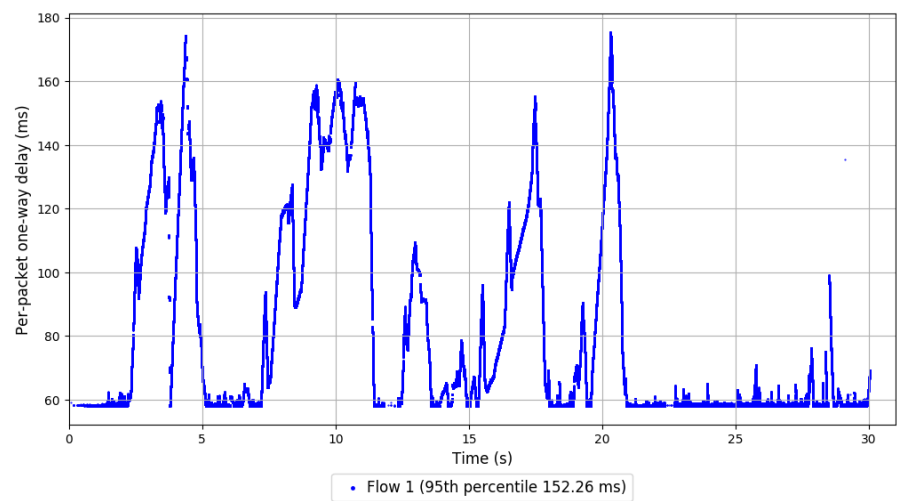
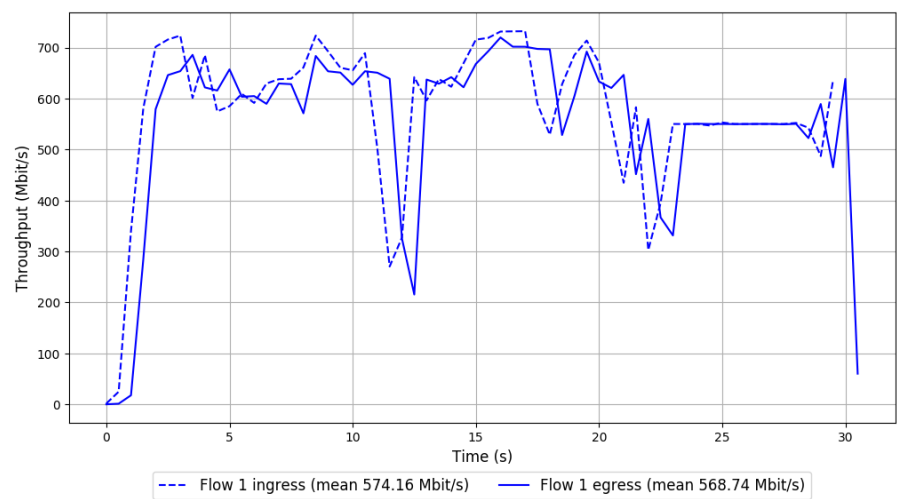
-- Flow 1:

Average throughput: 568.74 Mbit/s

95th percentile per-packet one-way delay: 152.259 ms

Loss rate: 0.93%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 10:26:15

End at: 2018-08-31 10:26:45

Local clock offset: 3.768 ms

Remote clock offset: 6.561 ms

Below is generated by plot.py at 2018-08-31 10:45:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 651.34 Mbit/s

95th percentile per-packet one-way delay: 101.501 ms

Loss rate: 0.14%

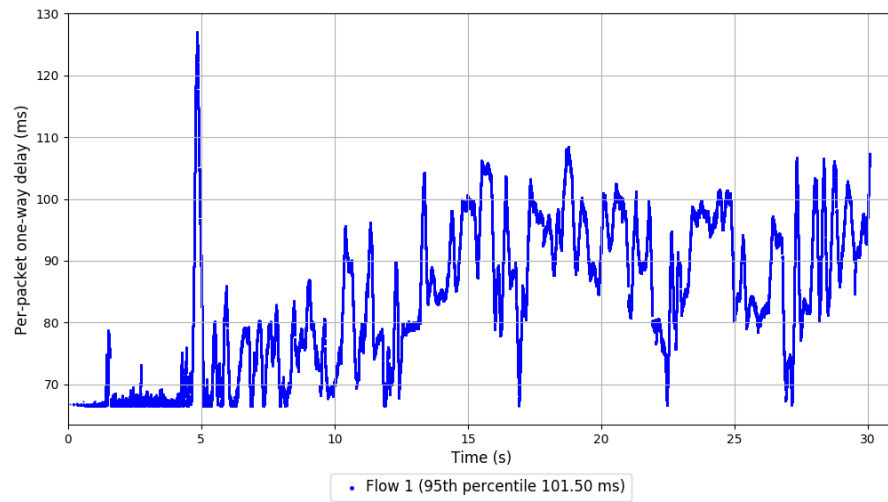
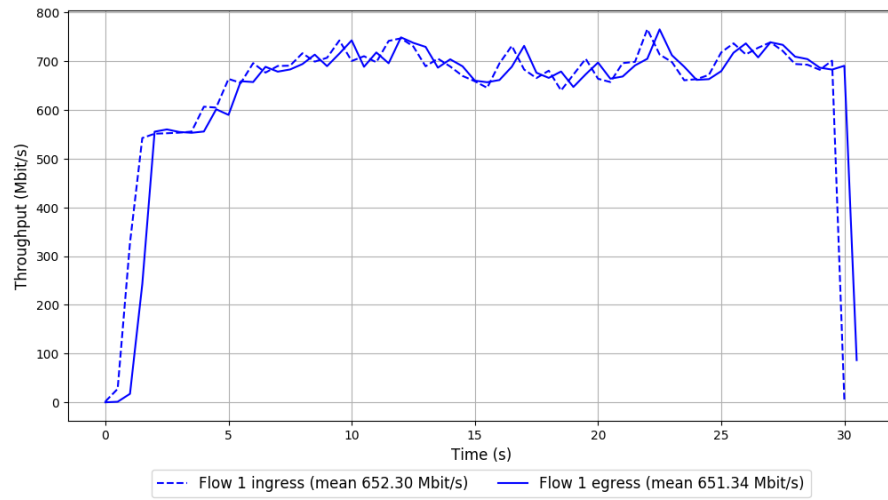
-- Flow 1:

Average throughput: 651.34 Mbit/s

95th percentile per-packet one-way delay: 101.501 ms

Loss rate: 0.14%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

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

End at: 2018-08-31 10:33:02

Local clock offset: 4.082 ms

Remote clock offset: 7.261 ms

Below is generated by plot.py at 2018-08-31 10:45:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 654.34 Mbit/s

95th percentile per-packet one-way delay: 107.154 ms

Loss rate: 0.10%

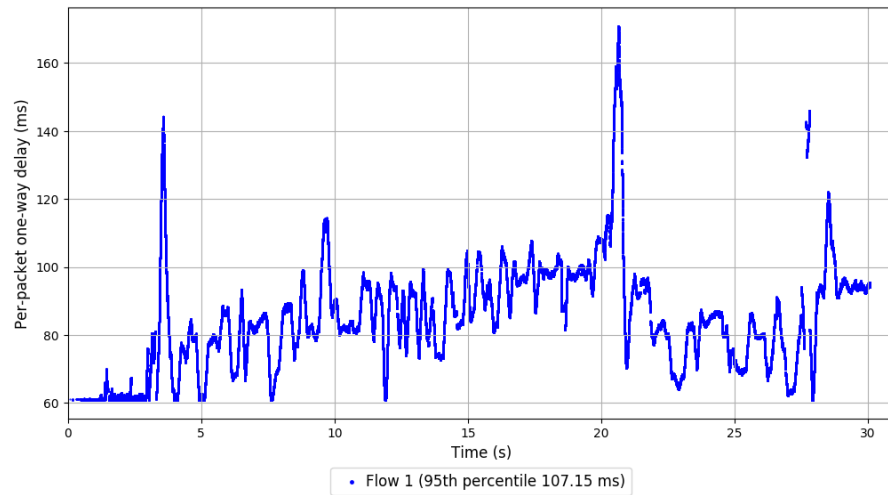
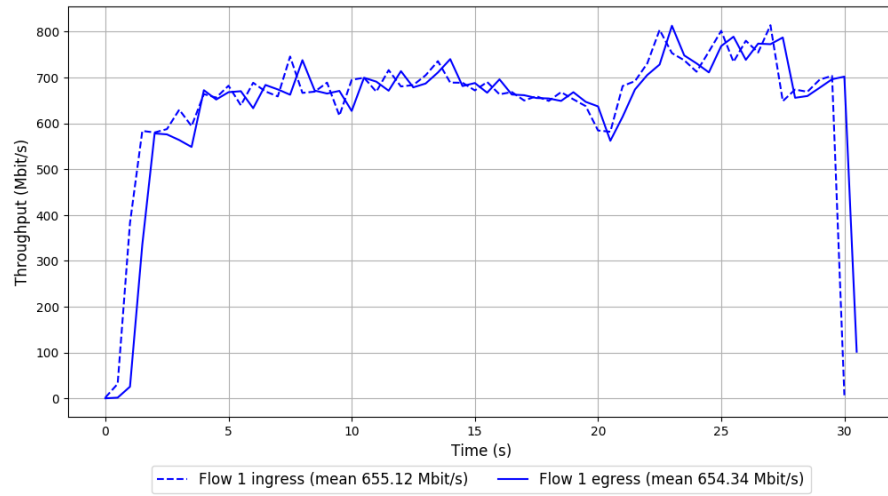
-- Flow 1:

Average throughput: 654.34 Mbit/s

95th percentile per-packet one-way delay: 107.154 ms

Loss rate: 0.10%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-31 10:27:52

End at: 2018-08-31 10:28:22

Local clock offset: 3.797 ms

Remote clock offset: 3.867 ms

Below is generated by plot.py at 2018-08-31 10:45:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 225.63 Mbit/s

95th percentile per-packet one-way delay: 58.627 ms

Loss rate: 0.00%

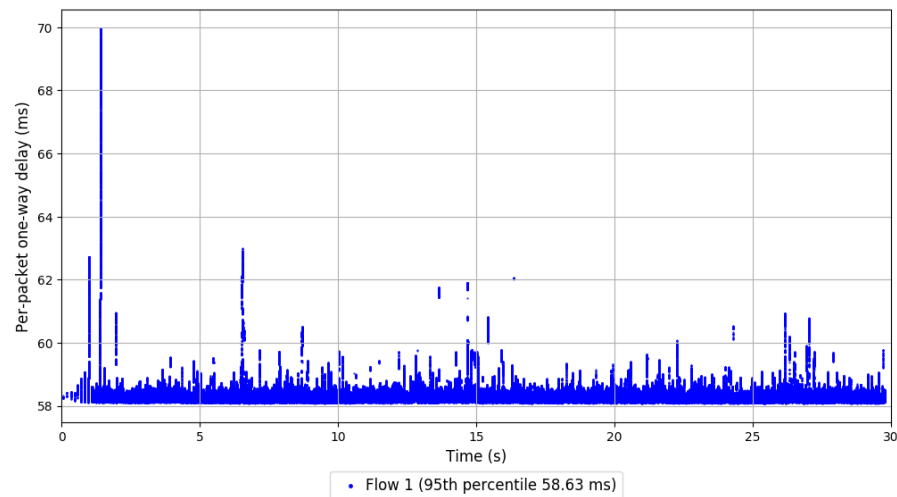
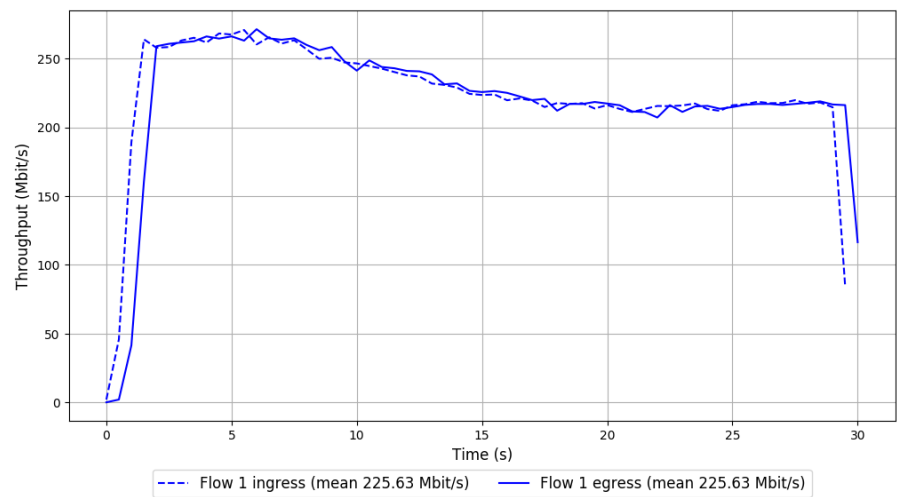
-- Flow 1:

Average throughput: 225.63 Mbit/s

95th percentile per-packet one-way delay: 58.627 ms

Loss rate: 0.00%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 10:34:09

End at: 2018-08-31 10:34:39

Local clock offset: 4.23 ms

Remote clock offset: 4.455 ms

Below is generated by plot.py at 2018-08-31 10:45:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 222.26 Mbit/s

95th percentile per-packet one-way delay: 58.209 ms

Loss rate: 0.00%

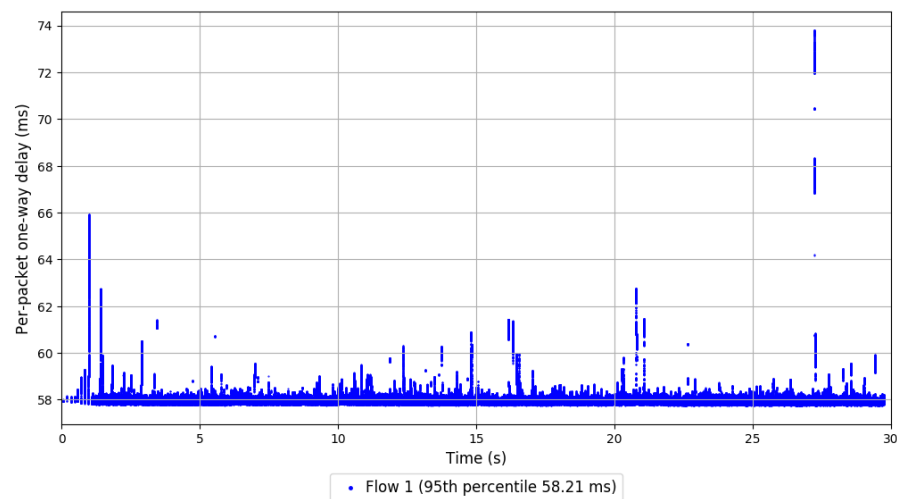
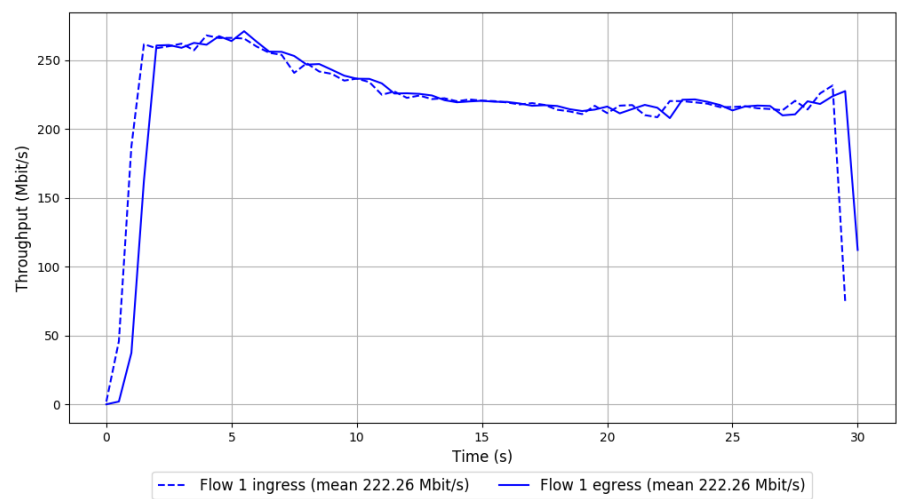
-- Flow 1:

Average throughput: 222.26 Mbit/s

95th percentile per-packet one-way delay: 58.209 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-08-31 10:24:37

End at: 2018-08-31 10:25:07

Local clock offset: 3.766 ms

Remote clock offset: 6.415 ms

Below is generated by plot.py at 2018-08-31 10:46:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 614.79 Mbit/s

95th percentile per-packet one-way delay: 72.339 ms

Loss rate: 0.00%

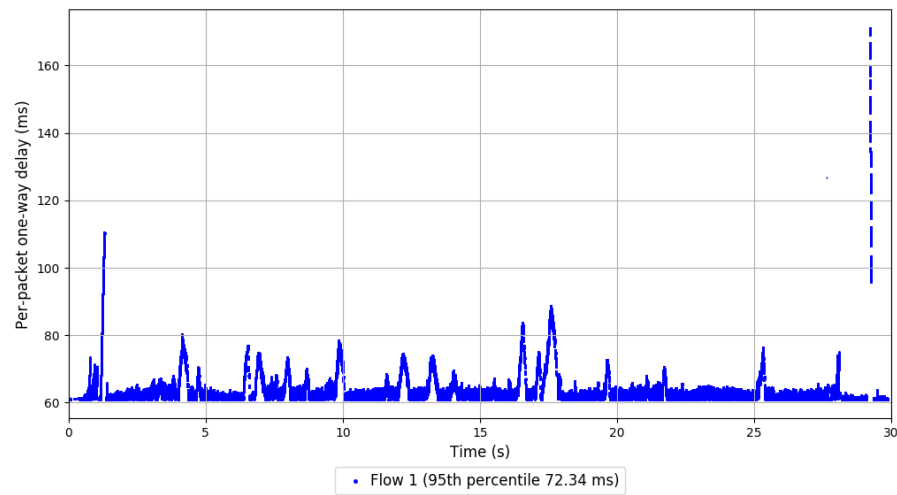
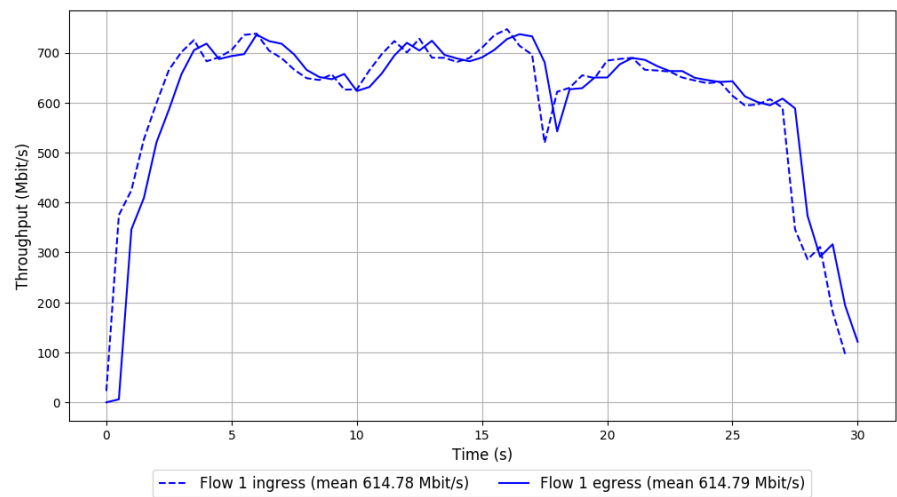
-- Flow 1:

Average throughput: 614.79 Mbit/s

95th percentile per-packet one-way delay: 72.339 ms

Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 10:30:54

End at: 2018-08-31 10:31:24

Local clock offset: 3.948 ms

Remote clock offset: 6.917 ms

Below is generated by plot.py at 2018-08-31 10:46:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 628.94 Mbit/s

95th percentile per-packet one-way delay: 69.747 ms

Loss rate: 0.03%

-- Flow 1:

Average throughput: 628.94 Mbit/s

95th percentile per-packet one-way delay: 69.747 ms

Loss rate: 0.03%

Run 2: Report of Muses-25 — Data Link

