

Pantheon Report

Generated at 2018-09-05 22:20:05 (UTC).

Data path: GCE Iowa on `ens4` (*remote*) → GCE Sydney on `ens4` (*local*).

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.

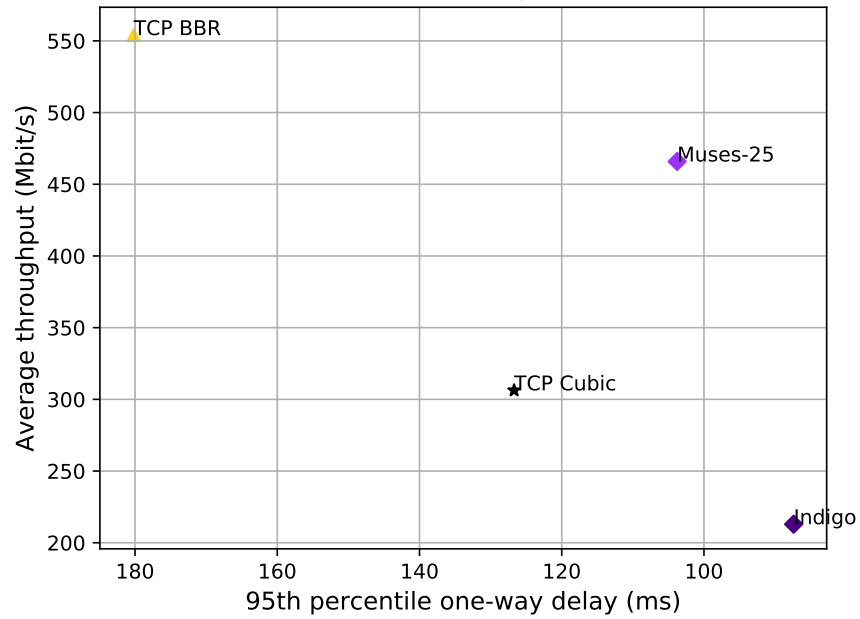
System info:

```
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
```

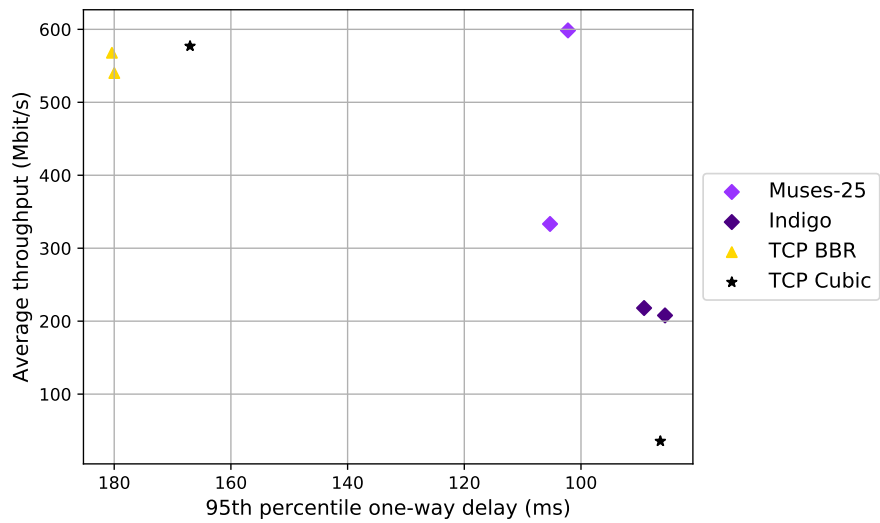
Git summary:

```
branch: muses @ 18b9165265c8ba2915c862e8713fd9ad82c1ac21
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
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 Iowa to GCE Sydney, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Iowa to GCE Sydney, 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	554.01	180.19	1.66
TCP Cubic	2	306.28	126.70	0.64
Indigo	2	212.93	87.39	0.64
Muses-25	2	465.88	103.77	0.78

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 22:03:16

End at: 2018-09-05 22:03:46

Local clock offset: 35.524 ms

Remote clock offset: 4.852 ms

Below is generated by plot.py at 2018-09-05 22:19:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 540.13 Mbit/s

95th percentile per-packet one-way delay: 179.983 ms

Loss rate: 2.06%

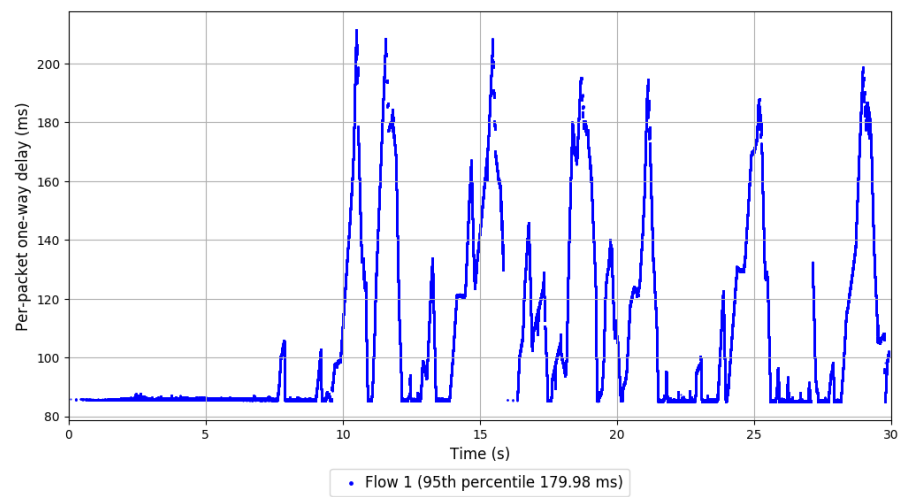
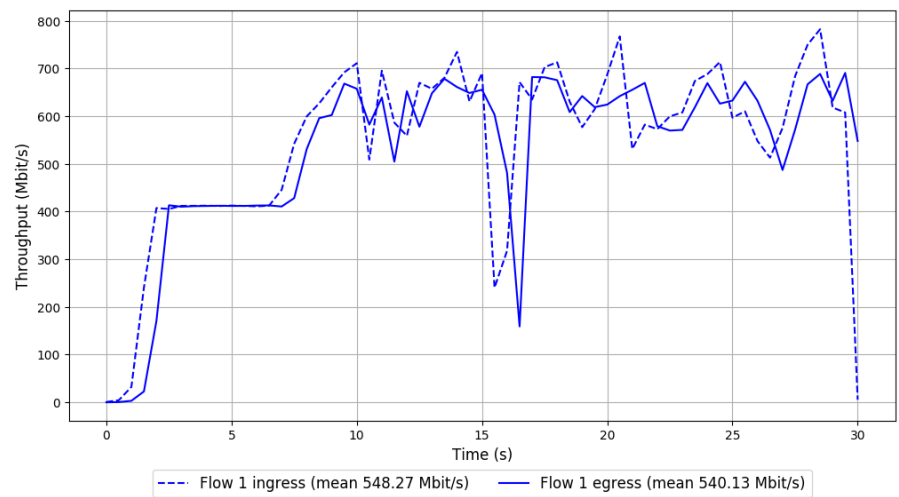
-- Flow 1:

Average throughput: 540.13 Mbit/s

95th percentile per-packet one-way delay: 179.983 ms

Loss rate: 2.06%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 22:09:10

End at: 2018-09-05 22:09:40

Local clock offset: 39.081 ms

Remote clock offset: 3.964 ms

Below is generated by plot.py at 2018-09-05 22:19:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 567.90 Mbit/s

95th percentile per-packet one-way delay: 180.392 ms

Loss rate: 1.25%

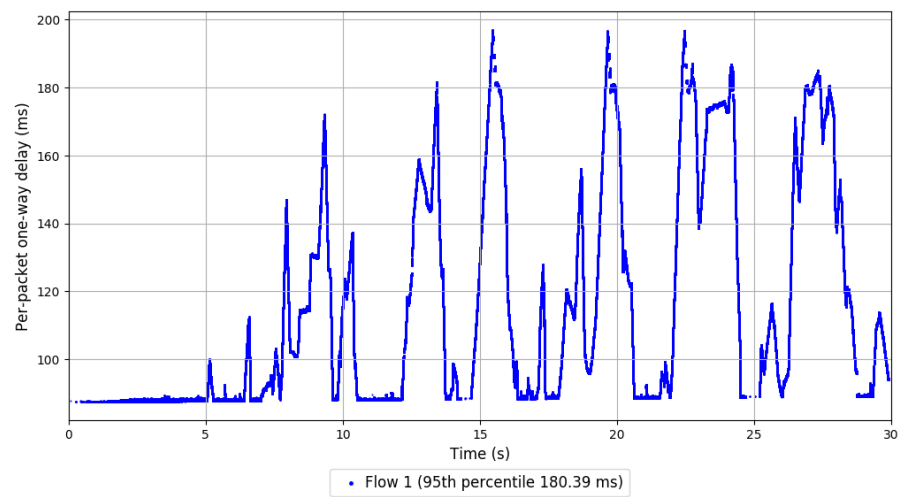
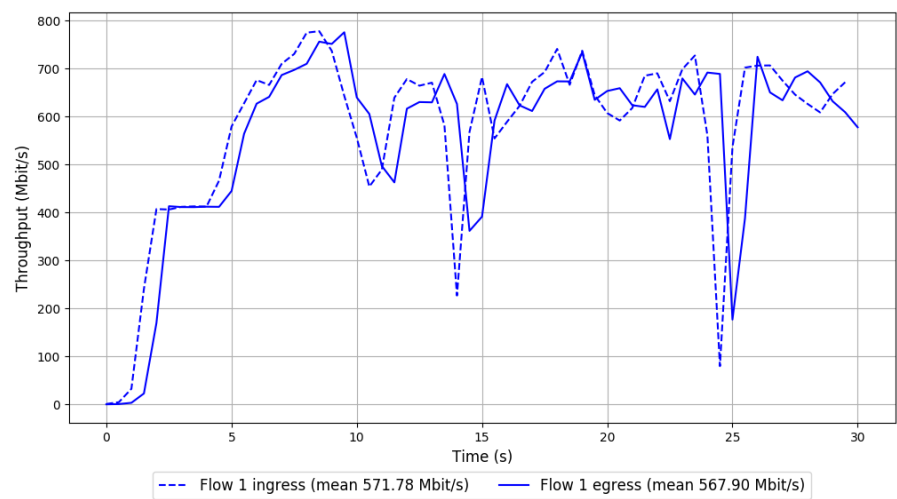
-- Flow 1:

Average throughput: 567.90 Mbit/s

95th percentile per-packet one-way delay: 180.392 ms

Loss rate: 1.25%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 22:01:39

End at: 2018-09-05 22:02:09

Local clock offset: 33.522 ms

Remote clock offset: 5.333 ms

Below is generated by plot.py at 2018-09-05 22:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 577.04 Mbit/s

95th percentile per-packet one-way delay: 167.001 ms

Loss rate: 0.88%

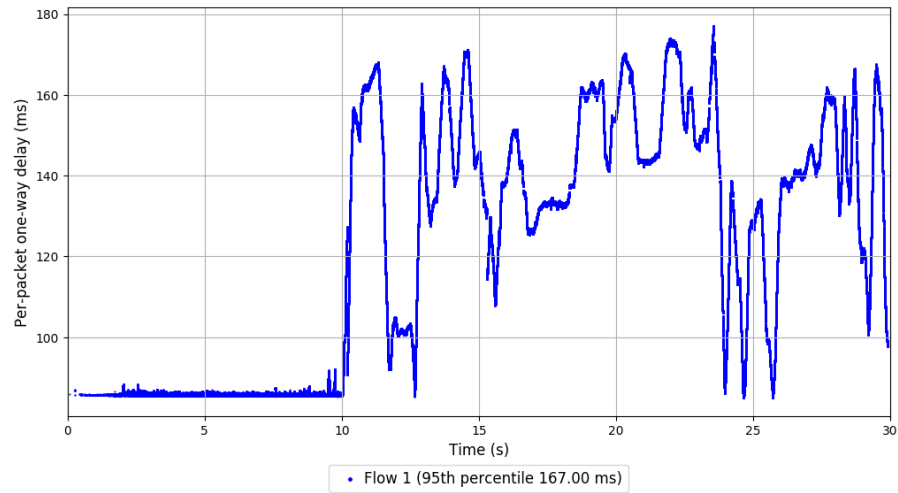
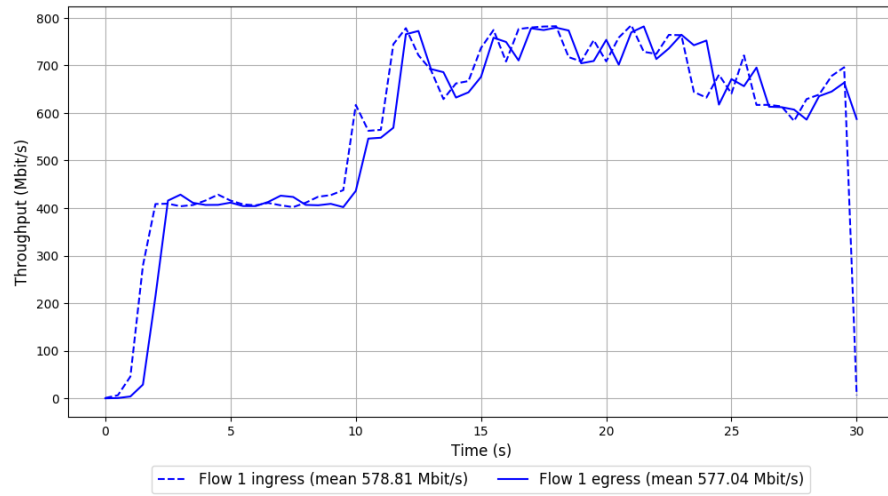
-- Flow 1:

Average throughput: 577.04 Mbit/s

95th percentile per-packet one-way delay: 167.001 ms

Loss rate: 0.88%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 22:07:59

End at: 2018-09-05 22:08:29

Local clock offset: 40.551 ms

Remote clock offset: 4.045 ms

Below is generated by plot.py at 2018-09-05 22:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 35.52 Mbit/s

95th percentile per-packet one-way delay: 86.393 ms

Loss rate: 0.40%

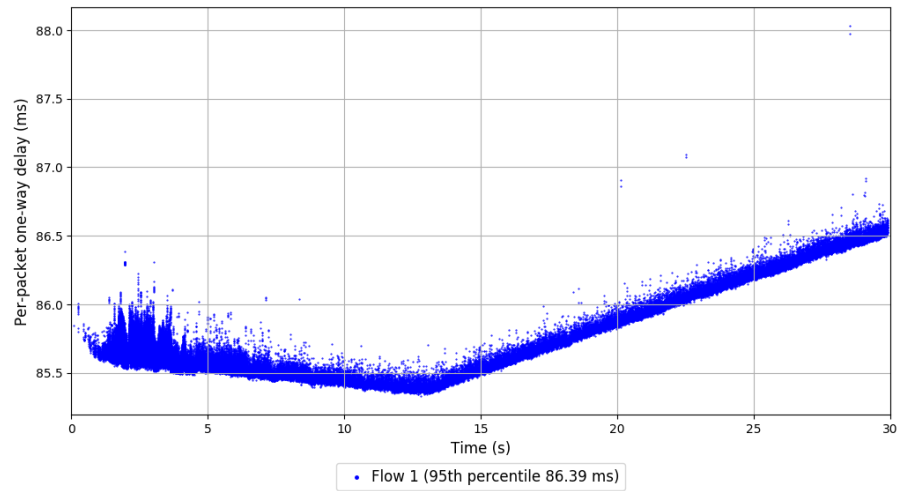
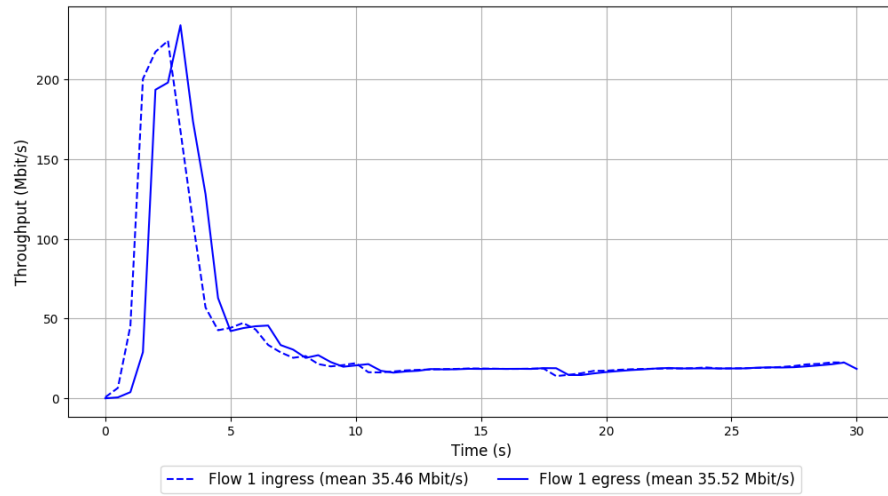
-- Flow 1:

Average throughput: 35.52 Mbit/s

95th percentile per-packet one-way delay: 86.393 ms

Loss rate: 0.40%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-09-05 22:04:54

End at: 2018-09-05 22:05:24

Local clock offset: 36.888 ms

Remote clock offset: 4.459 ms

Below is generated by plot.py at 2018-09-05 22:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 207.86 Mbit/s

95th percentile per-packet one-way delay: 85.598 ms

Loss rate: 0.62%

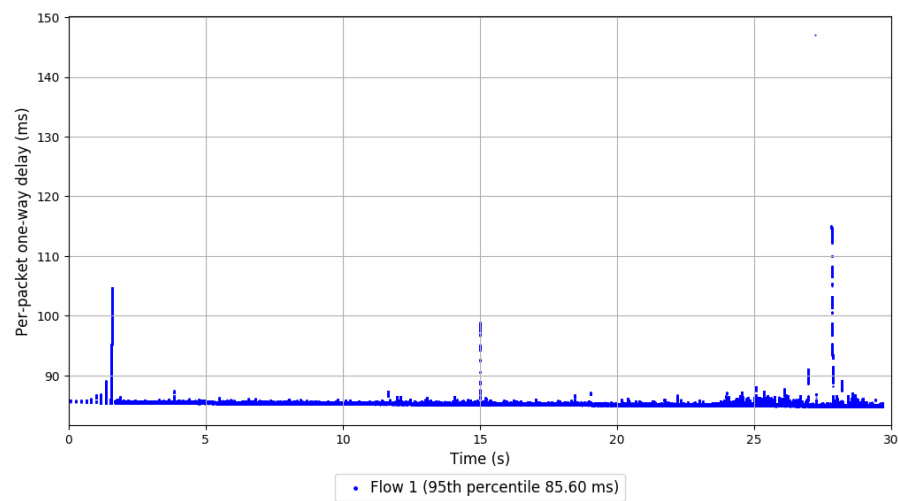
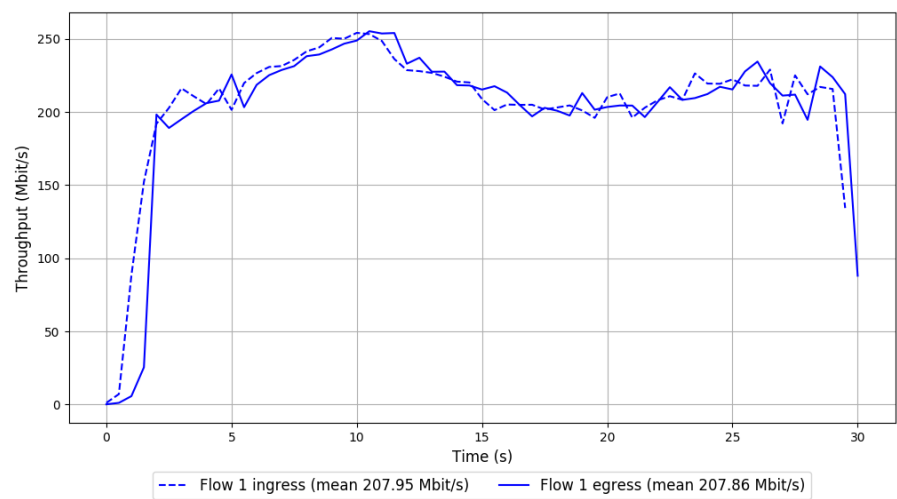
-- Flow 1:

Average throughput: 207.86 Mbit/s

95th percentile per-packet one-way delay: 85.598 ms

Loss rate: 0.62%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 22:10:49

End at: 2018-09-05 22:11:19

Local clock offset: 33.343 ms

Remote clock offset: 3.871 ms

Below is generated by plot.py at 2018-09-05 22:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 218.00 Mbit/s

95th percentile per-packet one-way delay: 89.185 ms

Loss rate: 0.66%

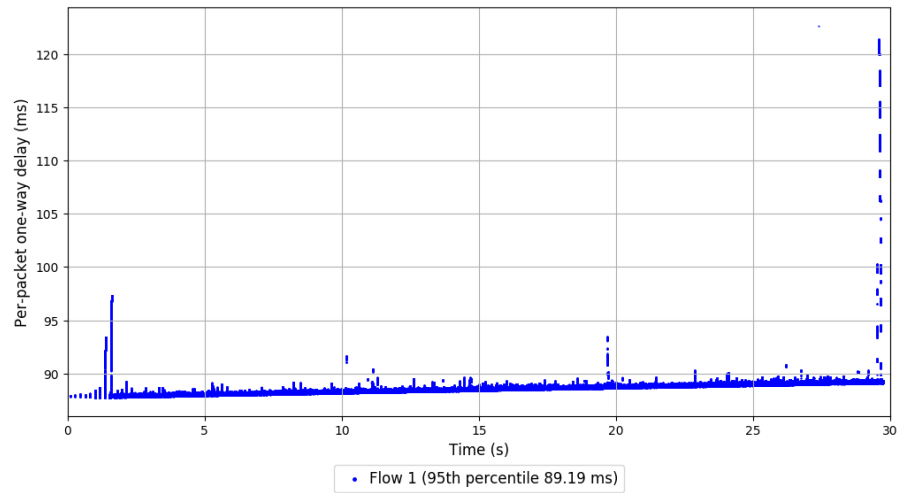
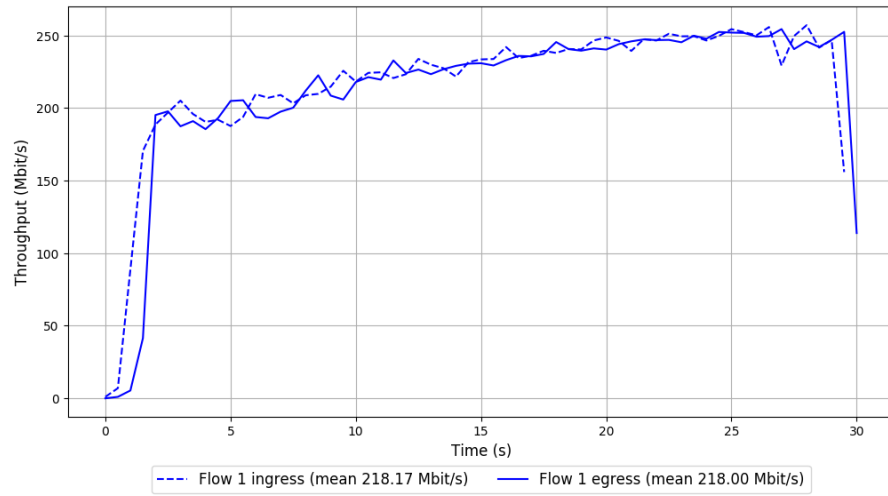
-- Flow 1:

Average throughput: 218.00 Mbit/s

95th percentile per-packet one-way delay: 89.185 ms

Loss rate: 0.66%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 22:00:14

End at: 2018-09-05 22:00:44

Local clock offset: 32.117 ms

Remote clock offset: 5.842 ms

Below is generated by plot.py at 2018-09-05 22:20:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 333.22 Mbit/s

95th percentile per-packet one-way delay: 105.305 ms

Loss rate: 0.90%

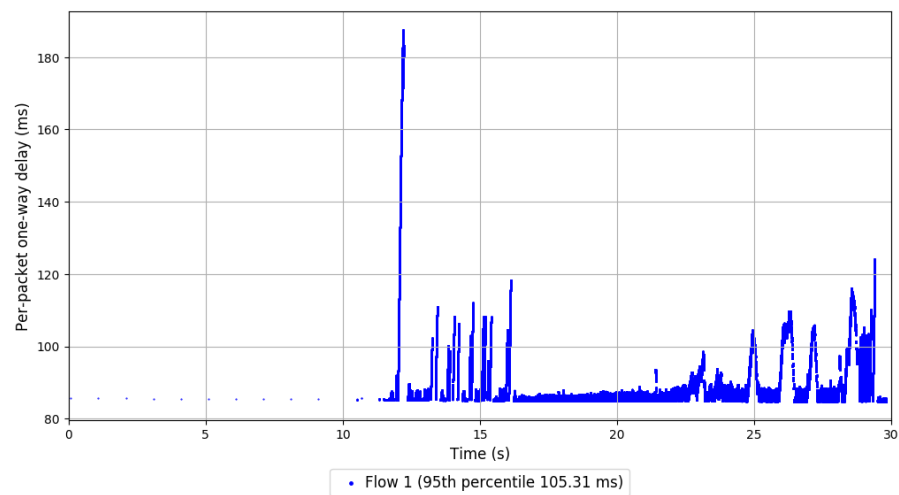
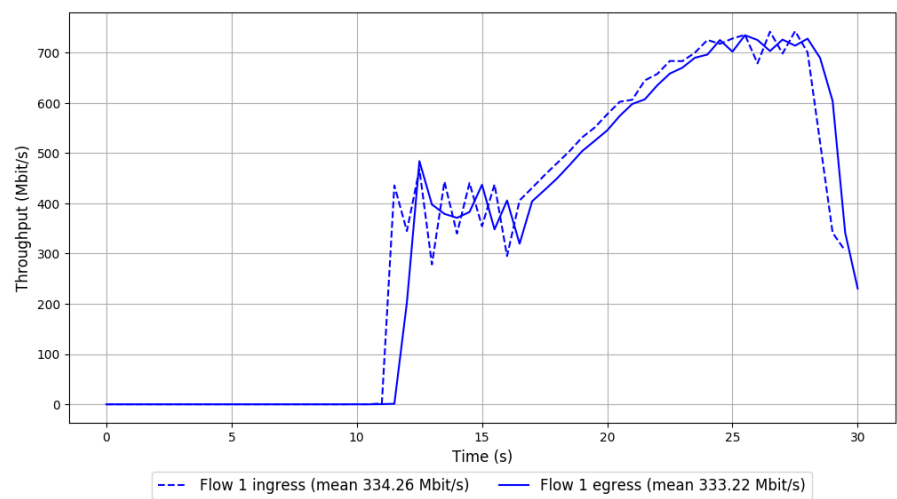
-- Flow 1:

Average throughput: 333.22 Mbit/s

95th percentile per-packet one-way delay: 105.305 ms

Loss rate: 0.90%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-05 22:06:21

End at: 2018-09-05 22:06:51

Local clock offset: 38.749 ms

Remote clock offset: 4.226 ms

Below is generated by plot.py at 2018-09-05 22:20:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 598.55 Mbit/s

95th percentile per-packet one-way delay: 102.233 ms

Loss rate: 0.65%

-- Flow 1:

Average throughput: 598.55 Mbit/s

95th percentile per-packet one-way delay: 102.233 ms

Loss rate: 0.65%

Run 2: Report of Muses-25 — Data Link

