

Pantheon Report

Generated at 2018-08-28 12:41:31 (UTC).

Data path: GCE Tokyo 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.

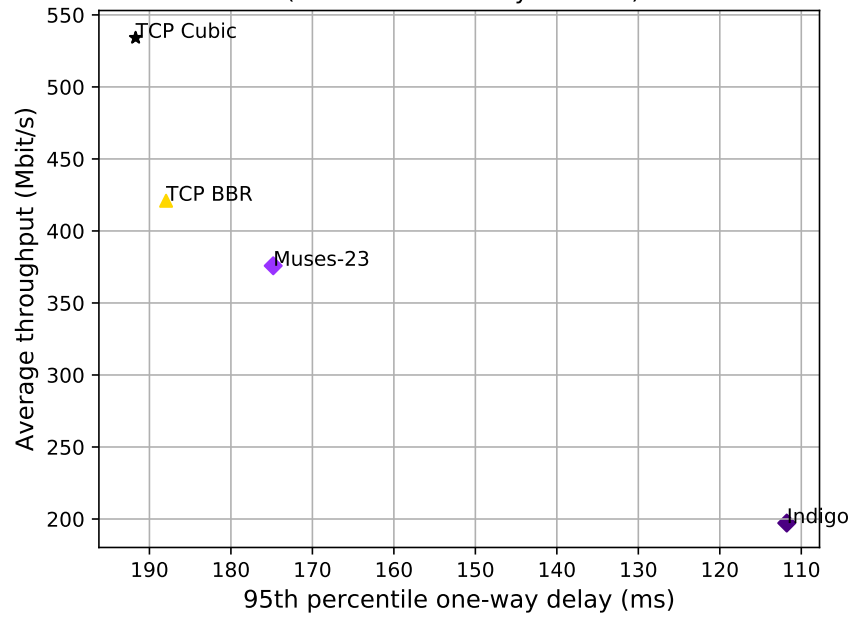
System info:

```
Linux 4.15.0-1015-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
```

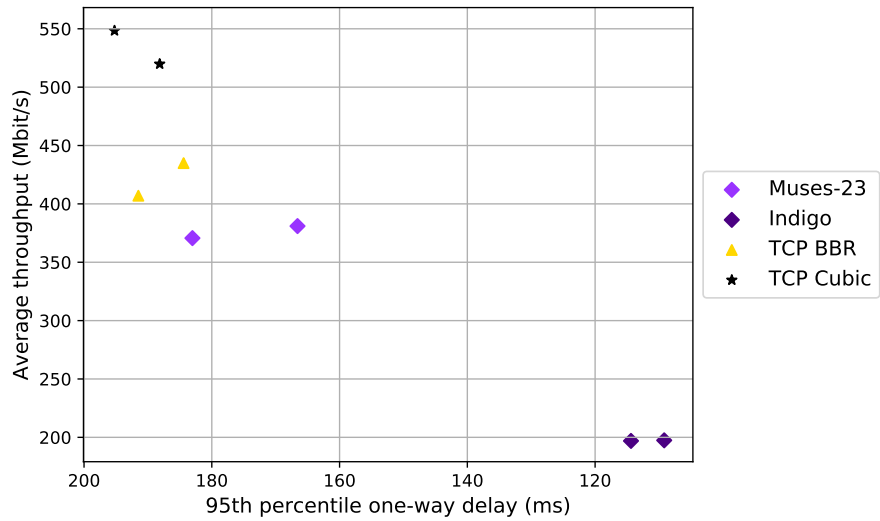
Git summary:

```
branch: muses-23 @ 88af05c5b0b7531637ca401951507a2fde628df6
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b261c9e99c63be452bc16f94ce0caa99a4c9d39a
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 Tokyo to GCE London, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Tokyo 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	420.98	187.96	0.23
TCP Cubic	2	534.09	191.70	0.02
Indigo	2	197.19	111.78	0.00
Muses-23	2	375.82	174.81	1.66

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 12:24:00

End at: 2018-08-28 12:24:30

Local clock offset: -0.056 ms

Remote clock offset: 0.033 ms

Below is generated by plot.py at 2018-08-28 12:40:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 407.01 Mbit/s

95th percentile per-packet one-way delay: 191.497 ms

Loss rate: 0.35%

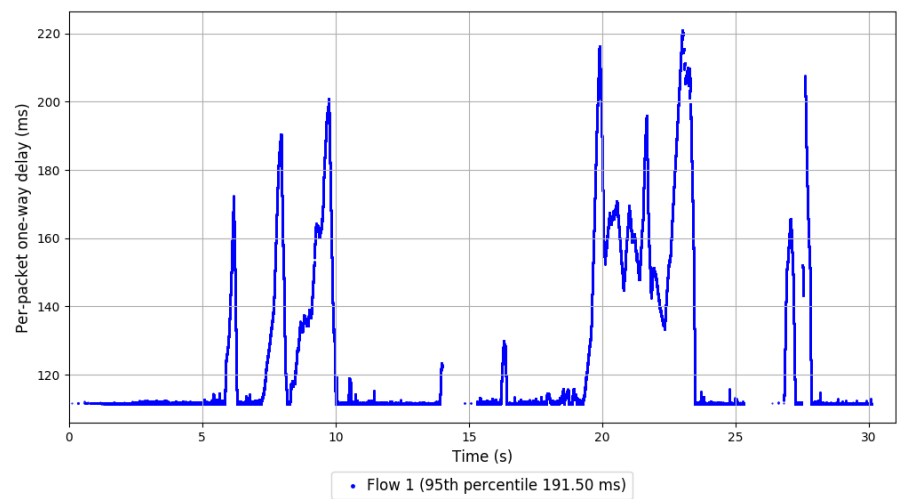
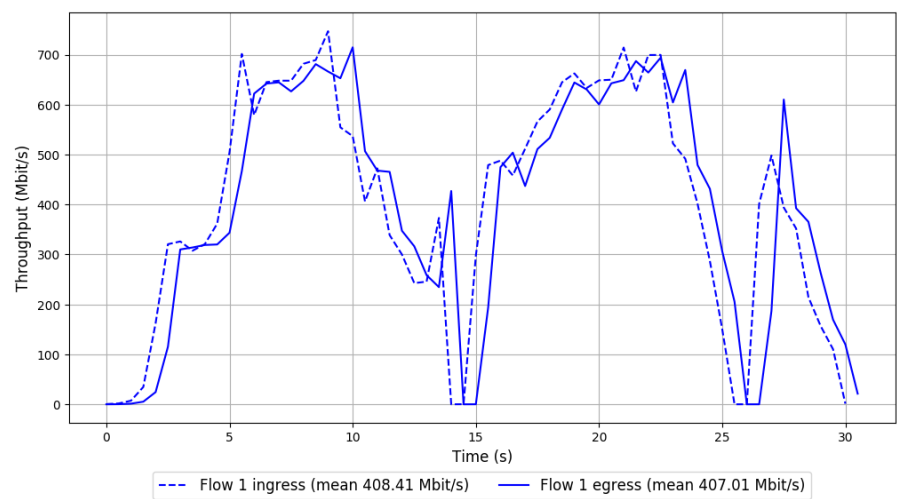
-- Flow 1:

Average throughput: 407.01 Mbit/s

95th percentile per-packet one-way delay: 191.497 ms

Loss rate: 0.35%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 12:30:06

End at: 2018-08-28 12:30:36

Local clock offset: -0.26 ms

Remote clock offset: -0.24 ms

Below is generated by plot.py at 2018-08-28 12:41:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 434.94 Mbit/s

95th percentile per-packet one-way delay: 184.417 ms

Loss rate: 0.12%

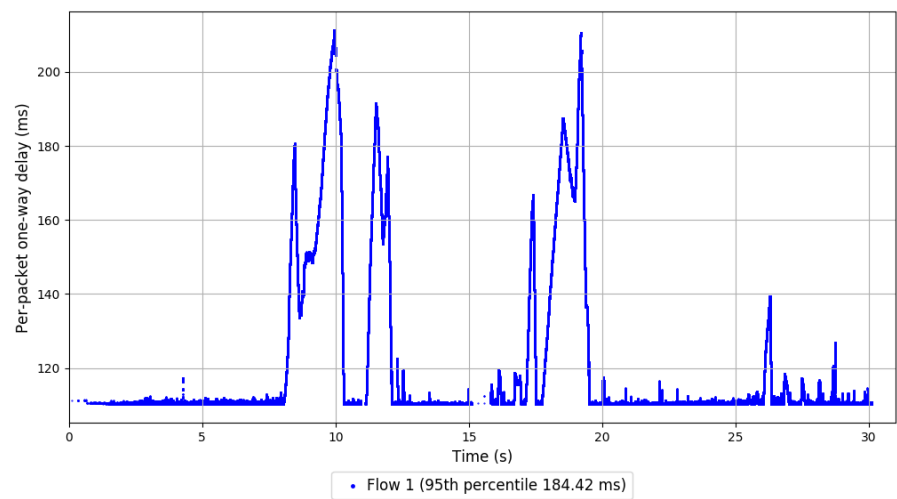
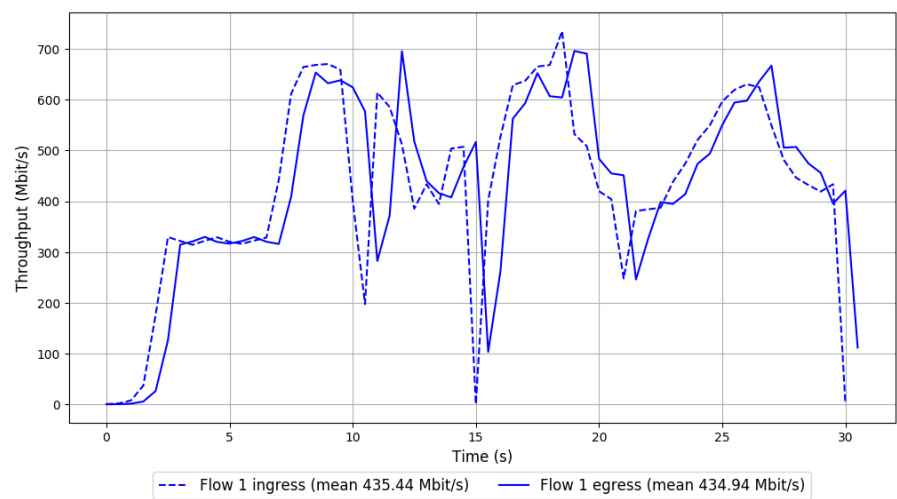
-- Flow 1:

Average throughput: 434.94 Mbit/s

95th percentile per-packet one-way delay: 184.417 ms

Loss rate: 0.12%

Run 2: Report of TCP BBR — Data Link

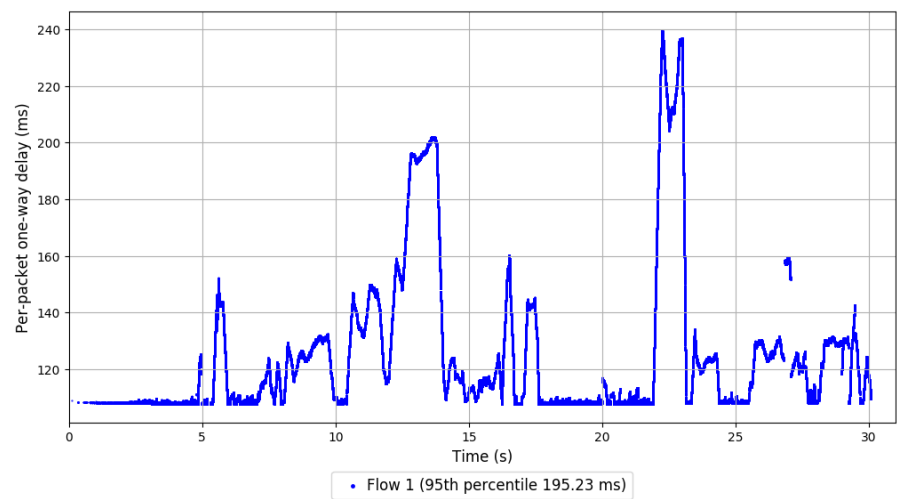
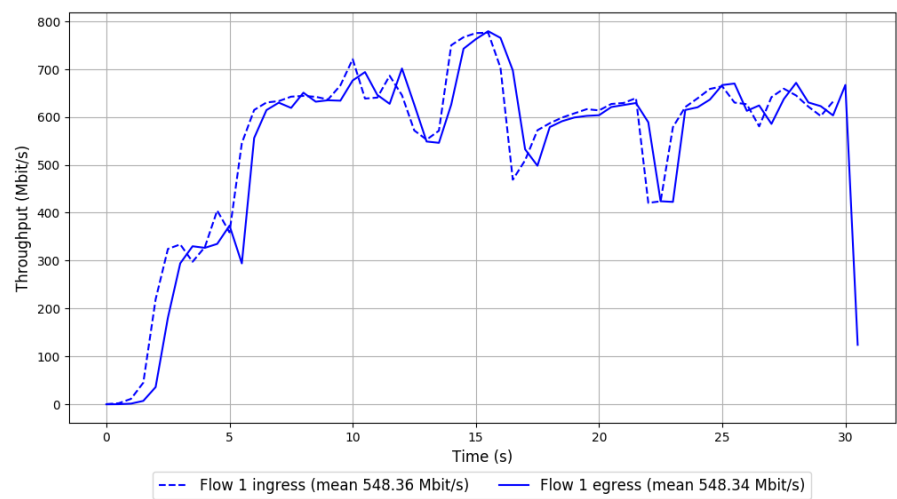


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 12:22:23
End at: 2018-08-28 12:22:53
Local clock offset: 2.722 ms
Remote clock offset: -0.059 ms

Below is generated by plot.py at 2018-08-28 12:41:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 548.34 Mbit/s
95th percentile per-packet one-way delay: 195.230 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 548.34 Mbit/s
95th percentile per-packet one-way delay: 195.230 ms
Loss rate: 0.00%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 12:28:30

End at: 2018-08-28 12:29:00

Local clock offset: -0.194 ms

Remote clock offset: 0.07 ms

Below is generated by plot.py at 2018-08-28 12:41:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 519.84 Mbit/s

95th percentile per-packet one-way delay: 188.162 ms

Loss rate: 0.04%

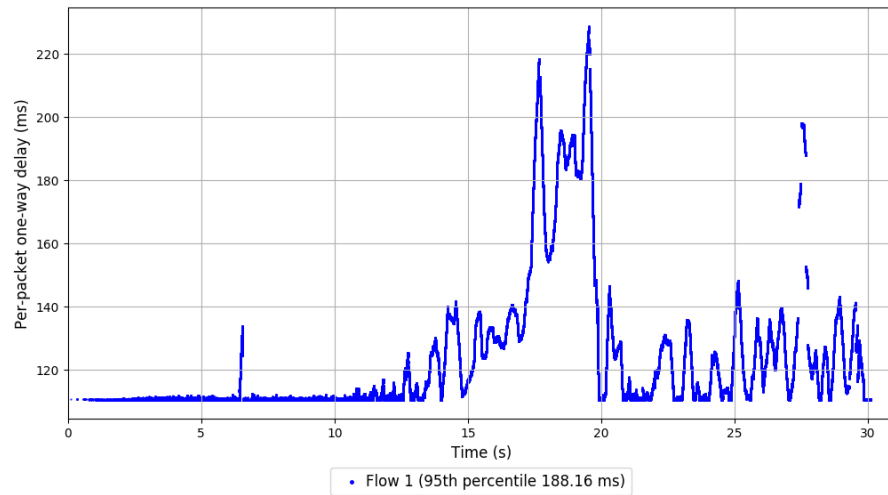
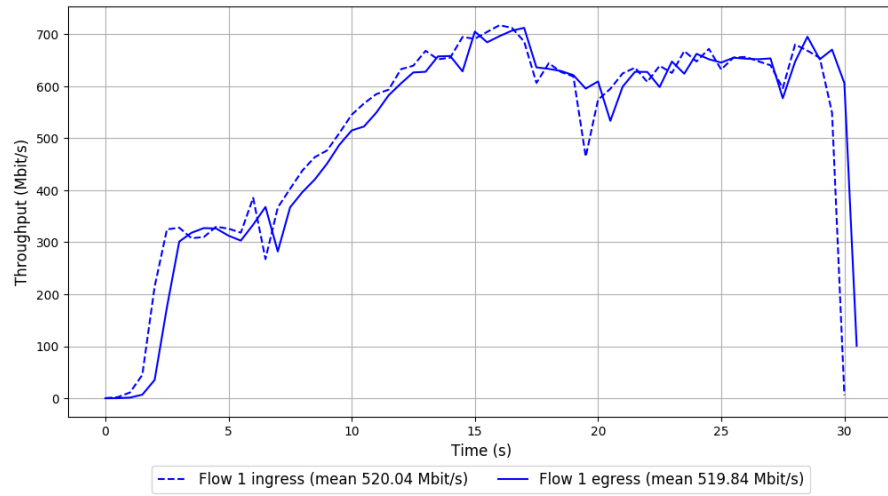
-- Flow 1:

Average throughput: 519.84 Mbit/s

95th percentile per-packet one-way delay: 188.162 ms

Loss rate: 0.04%

Run 2: Report of TCP Cubic — Data Link

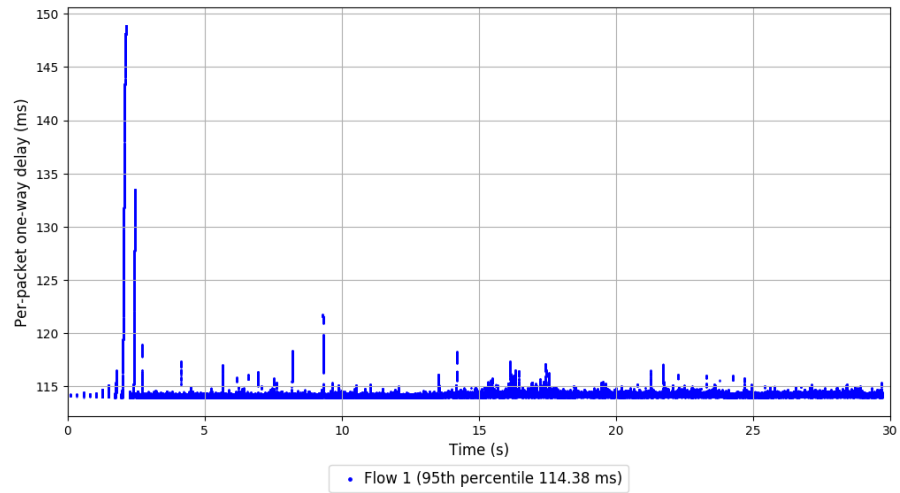
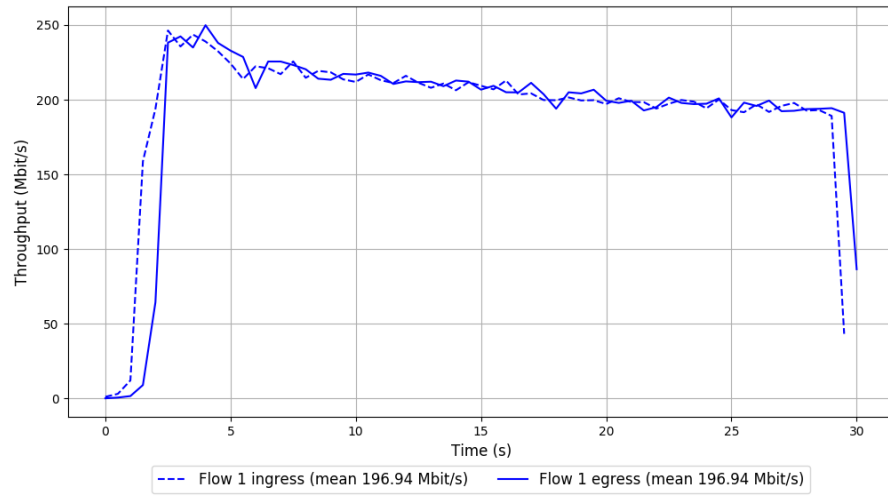


```
Run 1: Statistics of Indigo

Start at: 2018-08-28 12:25:33
End at: 2018-08-28 12:26:03
Local clock offset: -2.955 ms
Remote clock offset: -0.4 ms

# Below is generated by plot.py at 2018-08-28 12:41:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 196.94 Mbit/s
95th percentile per-packet one-way delay: 114.384 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 196.94 Mbit/s
95th percentile per-packet one-way delay: 114.384 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-28 12:31:40

End at: 2018-08-28 12:32:10

Local clock offset: 2.606 ms

Remote clock offset: 0.213 ms

Below is generated by plot.py at 2018-08-28 12:41:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 197.43 Mbit/s

95th percentile per-packet one-way delay: 109.184 ms

Loss rate: 0.00%

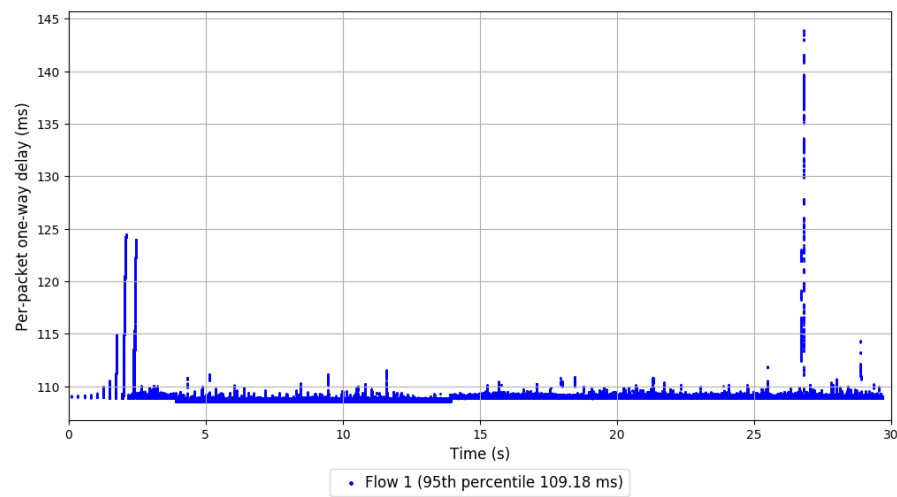
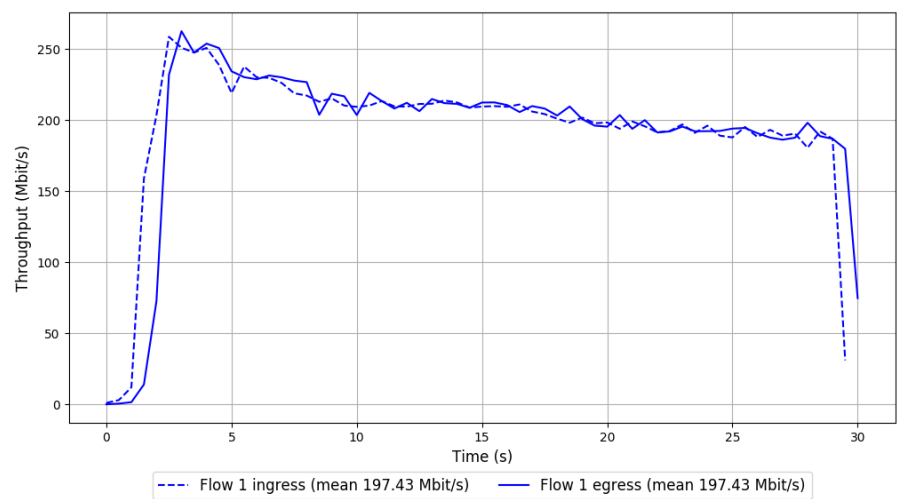
-- Flow 1:

Average throughput: 197.43 Mbit/s

95th percentile per-packet one-way delay: 109.184 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-23

Start at: 2018-08-28 12:20:54

End at: 2018-08-28 12:21:24

Local clock offset: -0.103 ms

Remote clock offset: -1.128 ms

Below is generated by plot.py at 2018-08-28 12:41:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 370.66 Mbit/s

95th percentile per-packet one-way delay: 183.033 ms

Loss rate: 2.52%

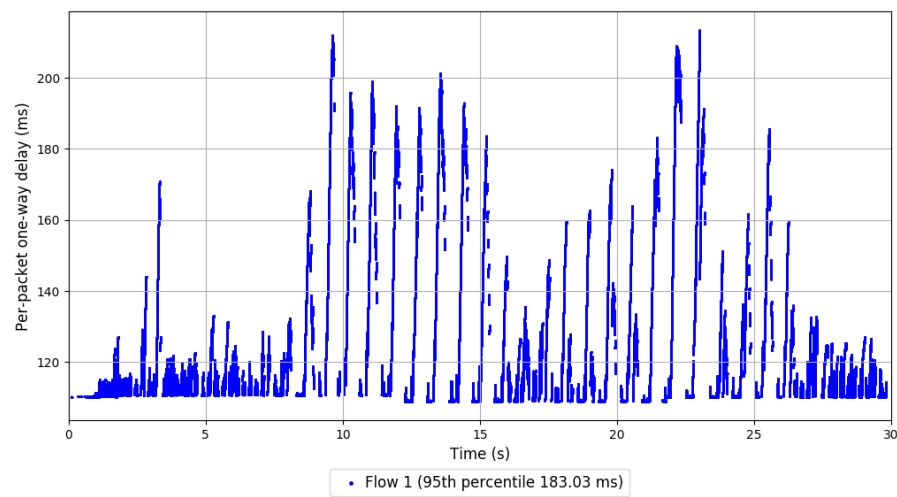
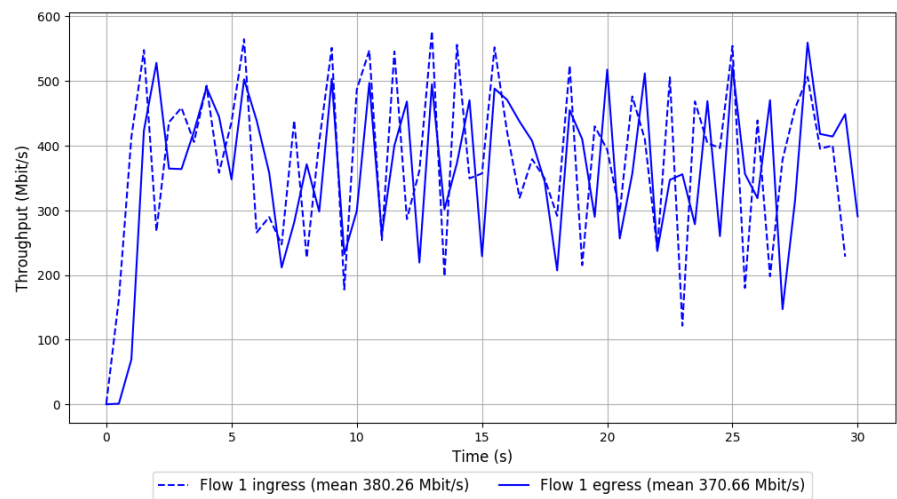
-- Flow 1:

Average throughput: 370.66 Mbit/s

95th percentile per-packet one-way delay: 183.033 ms

Loss rate: 2.52%

Run 1: Report of Muses-23 — Data Link



Run 2: Statistics of Muses-23

Start at: 2018-08-28 12:27:00
End at: 2018-08-28 12:27:30
Local clock offset: -0.048 ms
Remote clock offset: -0.466 ms

Below is generated by plot.py at 2018-08-28 12:41:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 380.98 Mbit/s
95th percentile per-packet one-way delay: 166.583 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 380.98 Mbit/s
95th percentile per-packet one-way delay: 166.583 ms
Loss rate: 0.80%

Run 2: Report of Muses-23 — Data Link

