

Pantheon Report

Generated at 2018-08-28 13:35:45 (UTC).

Data path: GCE London on `ens4` (*remote*) → GCE Tokyo 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.

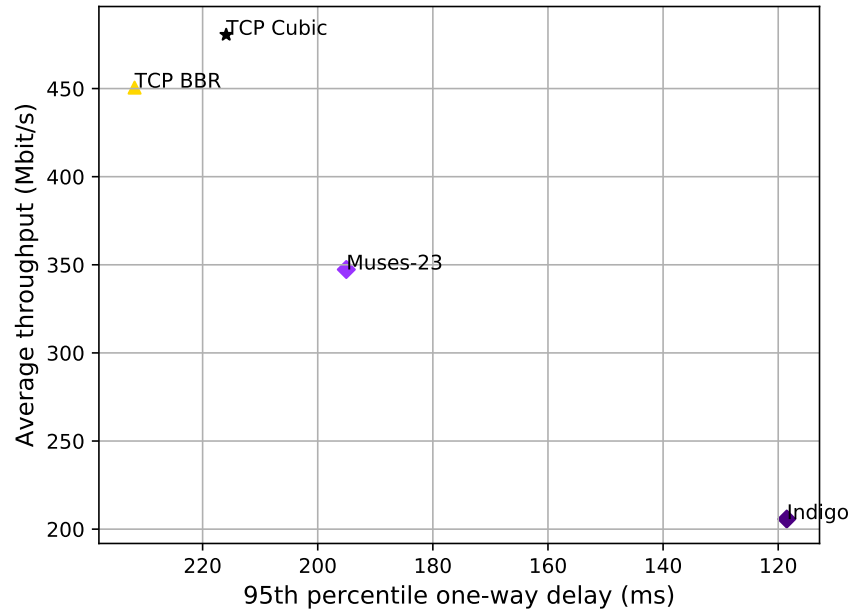
System info:

```
Linux 4.15.0-1015-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
```

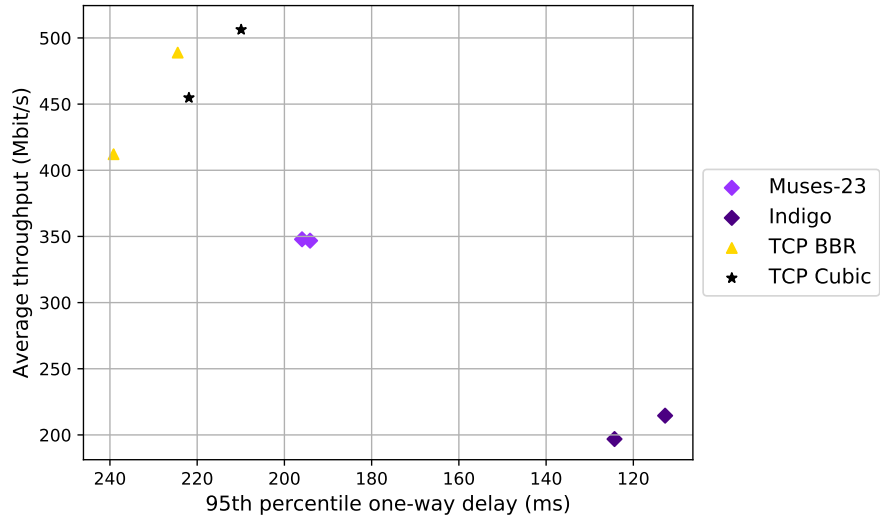
Git summary:

```
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 @ cbf6e6db5ff5740dfe1771f813cd646339e1952
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 London to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE London 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	450.53	231.81	3.11
TCP Cubic	2	480.51	215.90	1.00
Indigo	2	205.72	118.52	0.72
Muses-23	2	347.32	195.03	4.20

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 13:16:45

End at: 2018-08-28 13:17:15

Local clock offset: -3.126 ms

Remote clock offset: -0.207 ms

Below is generated by plot.py at 2018-08-28 13:35:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 488.92 Mbit/s

95th percentile per-packet one-way delay: 224.463 ms

Loss rate: 3.20%

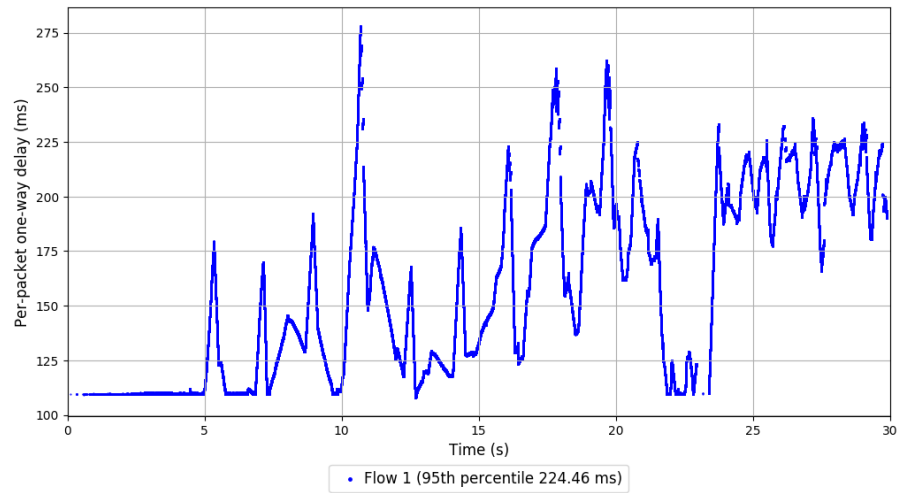
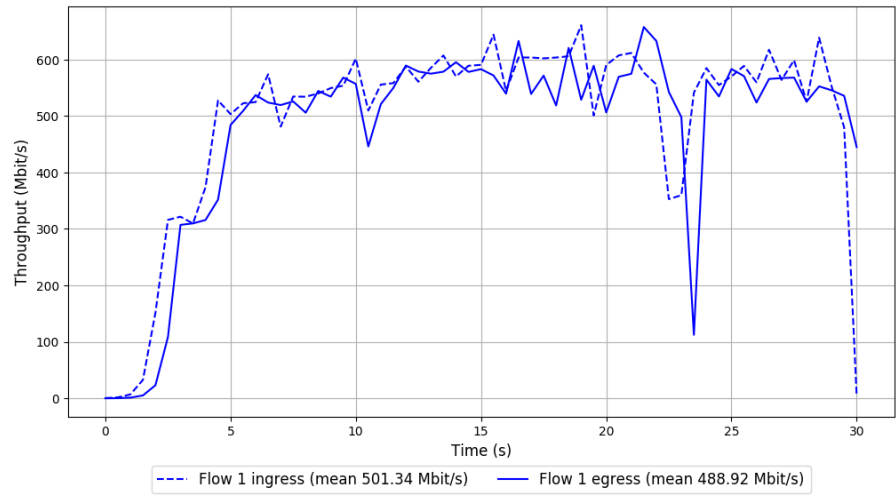
-- Flow 1:

Average throughput: 488.92 Mbit/s

95th percentile per-packet one-way delay: 224.463 ms

Loss rate: 3.20%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 13:22:52

End at: 2018-08-28 13:23:22

Local clock offset: 2.65 ms

Remote clock offset: -1.199 ms

Below is generated by plot.py at 2018-08-28 13:35:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 412.15 Mbit/s

95th percentile per-packet one-way delay: 239.167 ms

Loss rate: 3.02%

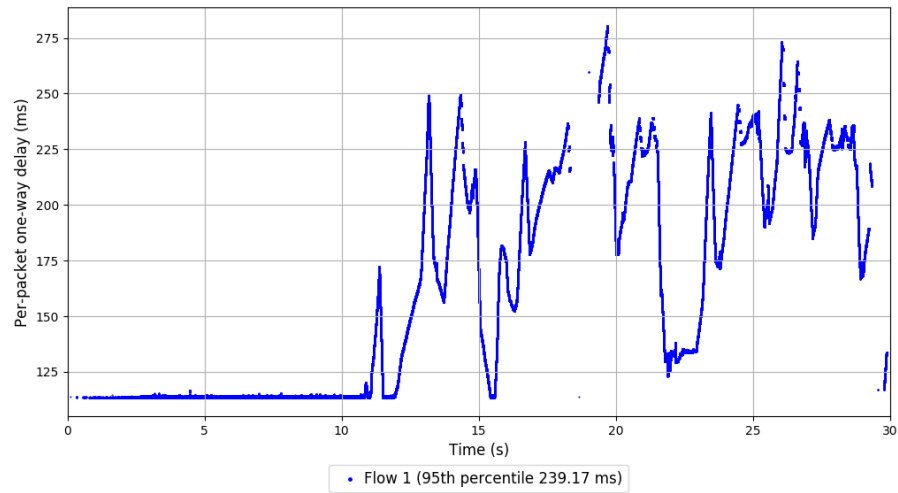
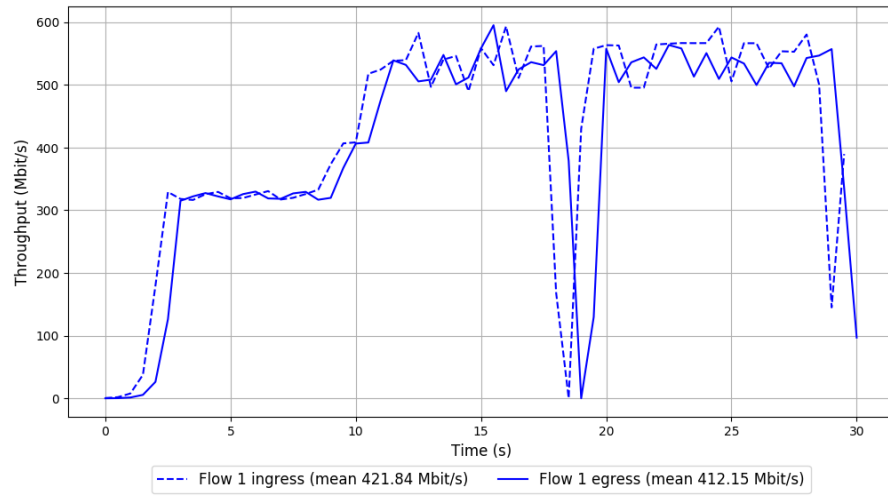
-- Flow 1:

Average throughput: 412.15 Mbit/s

95th percentile per-packet one-way delay: 239.167 ms

Loss rate: 3.02%

Run 2: Report of TCP BBR — Data Link

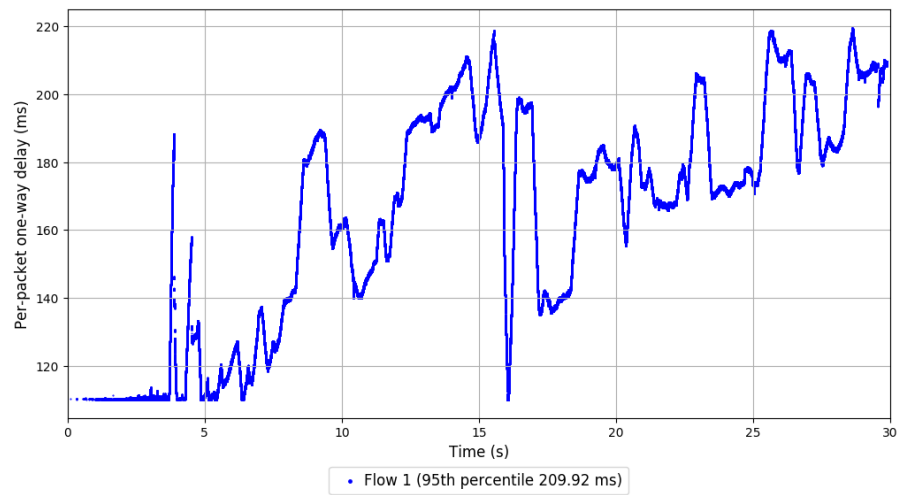
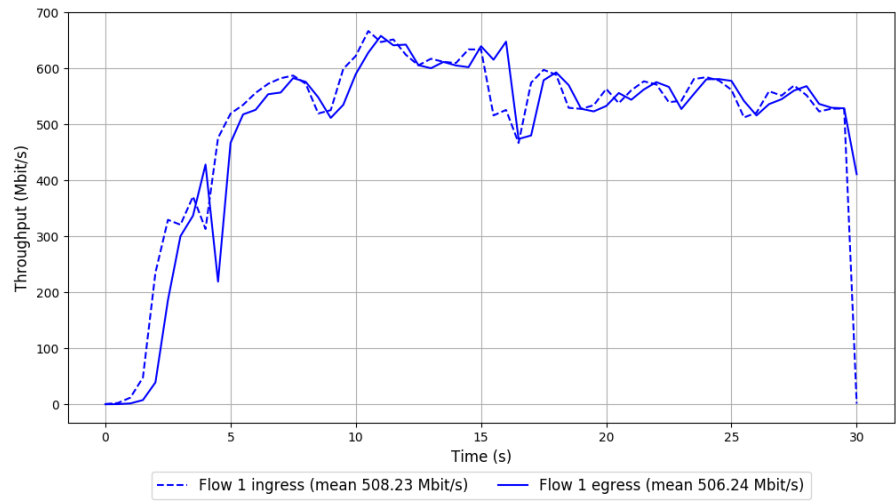


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 13:19:49
End at: 2018-08-28 13:20:19
Local clock offset: -0.106 ms
Remote clock offset: -0.739 ms

Below is generated by plot.py at 2018-08-28 13:35:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 506.24 Mbit/s
95th percentile per-packet one-way delay: 209.918 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 506.24 Mbit/s
95th percentile per-packet one-way delay: 209.918 ms
Loss rate: 1.12%

Run 1: Report of TCP Cubic — Data Link

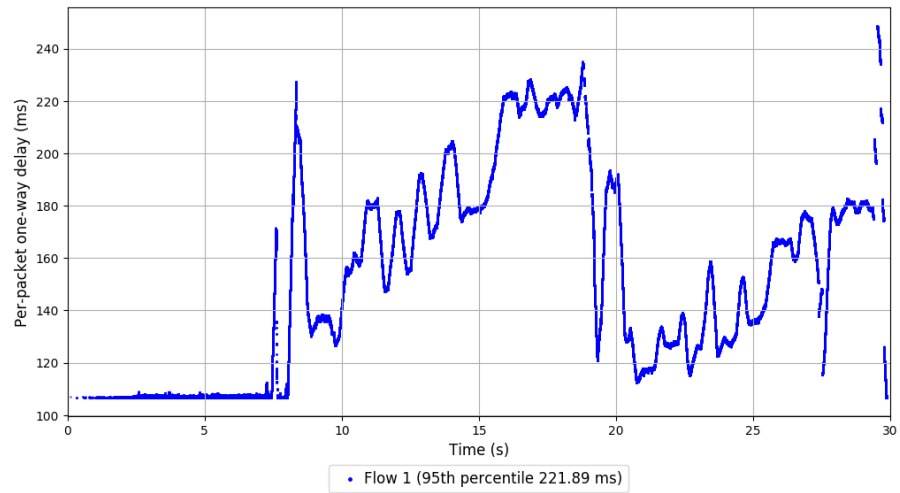
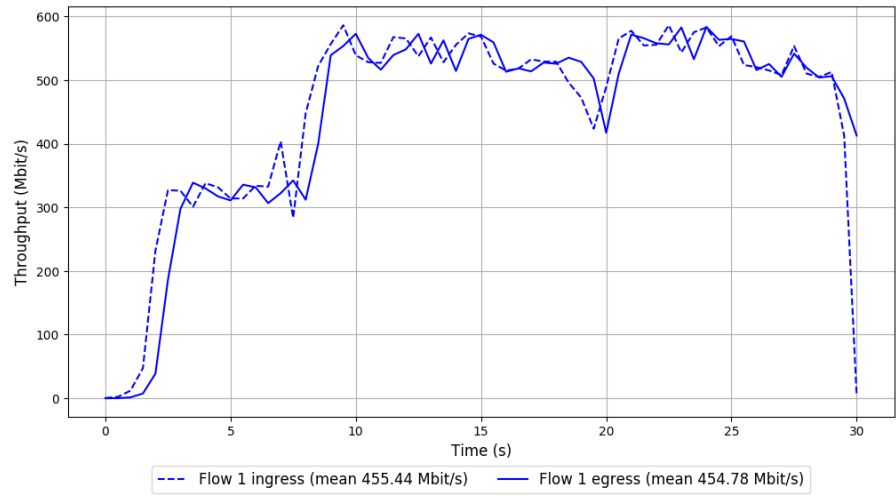


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 13:25:54
End at: 2018-08-28 13:26:24
Local clock offset: -2.958 ms
Remote clock offset: -0.209 ms

Below is generated by plot.py at 2018-08-28 13:35:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 454.78 Mbit/s
95th percentile per-packet one-way delay: 221.888 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 454.78 Mbit/s
95th percentile per-packet one-way delay: 221.888 ms
Loss rate: 0.88%

Run 2: Report of TCP Cubic — Data Link

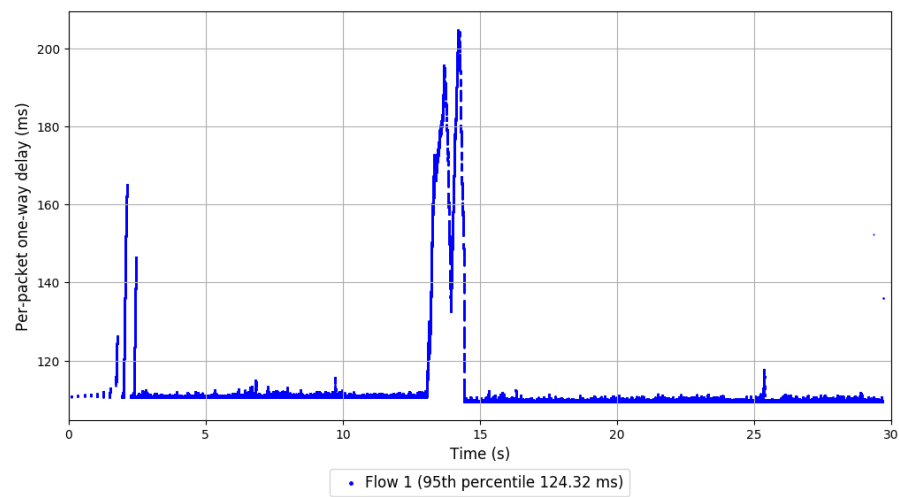
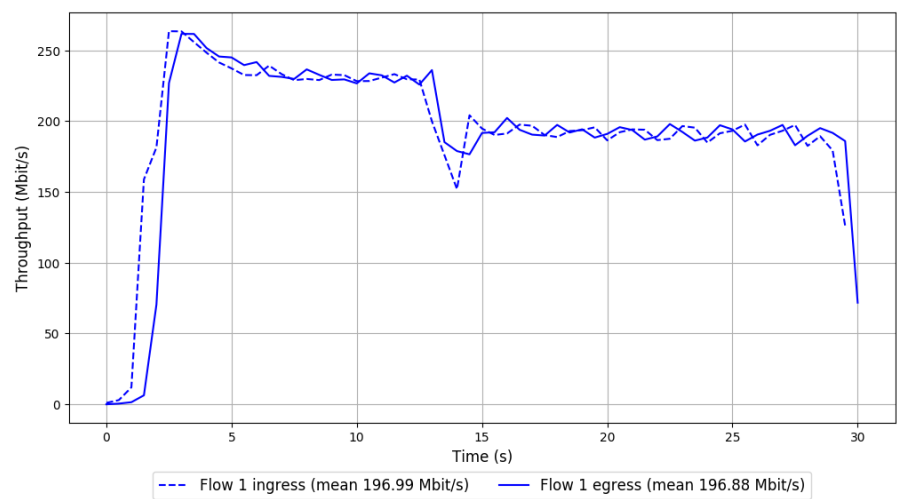


Run 1: Statistics of Indigo

Start at: 2018-08-28 13:18:22
End at: 2018-08-28 13:18:52
Local clock offset: -0.178 ms
Remote clock offset: -0.476 ms

Below is generated by plot.py at 2018-08-28 13:35:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 196.88 Mbit/s
95th percentile per-packet one-way delay: 124.316 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 196.88 Mbit/s
95th percentile per-packet one-way delay: 124.316 ms
Loss rate: 0.71%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-28 13:24:25

End at: 2018-08-28 13:24:55

Local clock offset: -0.144 ms

Remote clock offset: 0.203 ms

Below is generated by plot.py at 2018-08-28 13:35:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 214.55 Mbit/s

95th percentile per-packet one-way delay: 112.716 ms

Loss rate: 0.73%

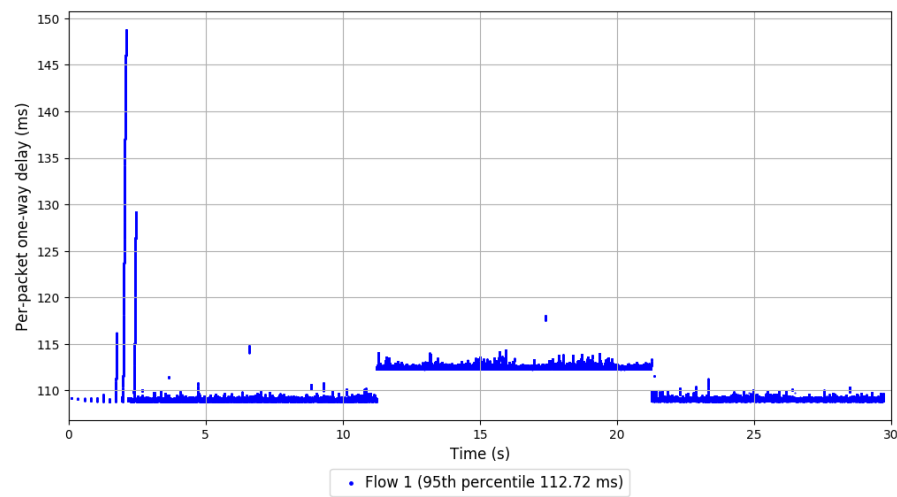
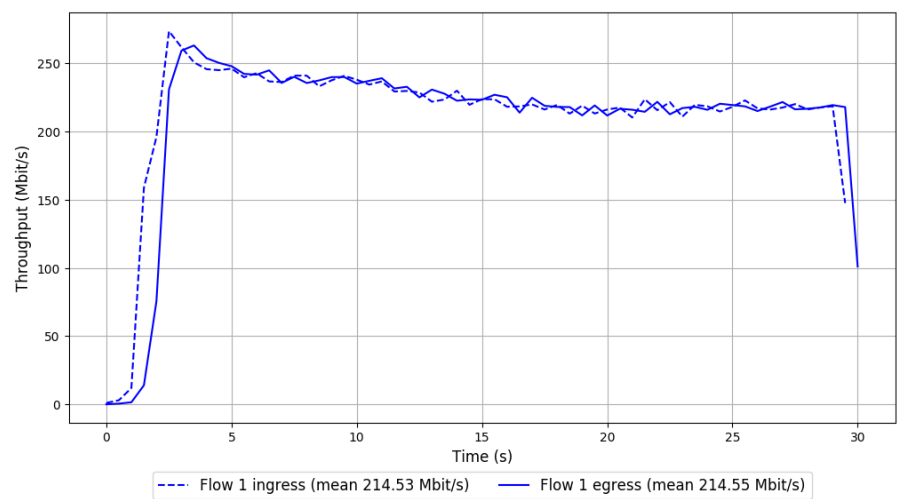
-- Flow 1:

Average throughput: 214.55 Mbit/s

95th percentile per-packet one-way delay: 112.716 ms

Loss rate: 0.73%

Run 2: Report of Indigo — Data Link

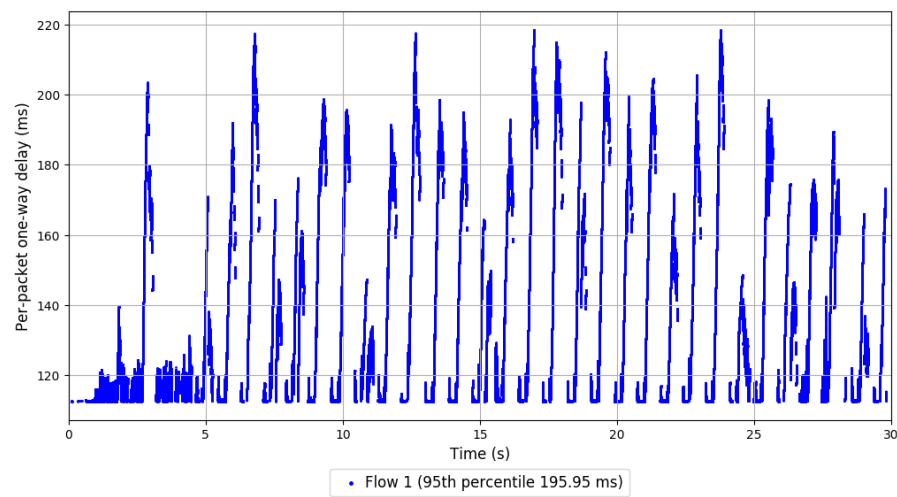
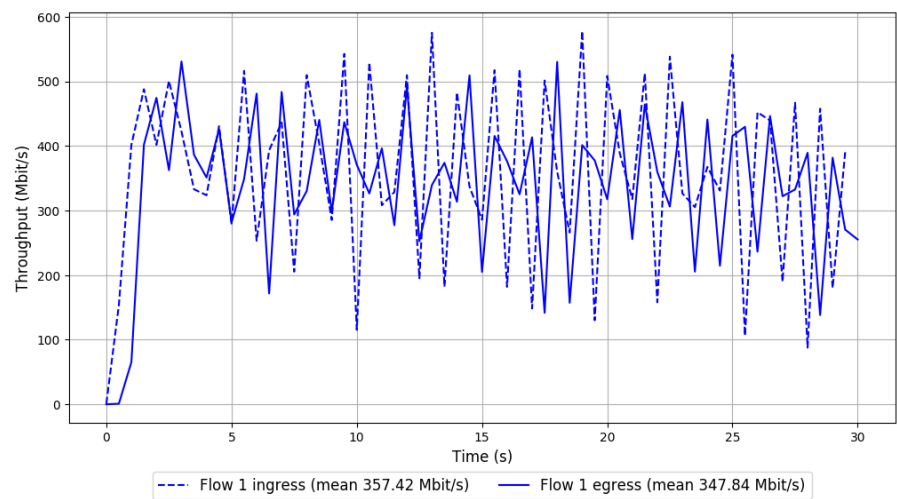


Run 1: Statistics of Muses-23

Start at: 2018-08-28 13:15:17
End at: 2018-08-28 13:15:47
Local clock offset: -0.235 ms
Remote clock offset: -0.571 ms

Below is generated by plot.py at 2018-08-28 13:35:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 347.84 Mbit/s
95th percentile per-packet one-way delay: 195.954 ms
Loss rate: 3.41%
-- Flow 1:
Average throughput: 347.84 Mbit/s
95th percentile per-packet one-way delay: 195.954 ms
Loss rate: 3.41%

Run 1: Report of Muses-23 — Data Link



Run 2: Statistics of Muses-23

Start at: 2018-08-28 13:21:24

End at: 2018-08-28 13:21:54

Local clock offset: 0.06 ms

Remote clock offset: 0.225 ms

Below is generated by plot.py at 2018-08-28 13:35:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 346.80 Mbit/s

95th percentile per-packet one-way delay: 194.115 ms

Loss rate: 4.99%

-- Flow 1:

Average throughput: 346.80 Mbit/s

95th percentile per-packet one-way delay: 194.115 ms

Loss rate: 4.99%

Run 2: Report of Muses-23 — Data Link

