

Pantheon Report

Generated at 2018-08-31 04:35:17 (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.

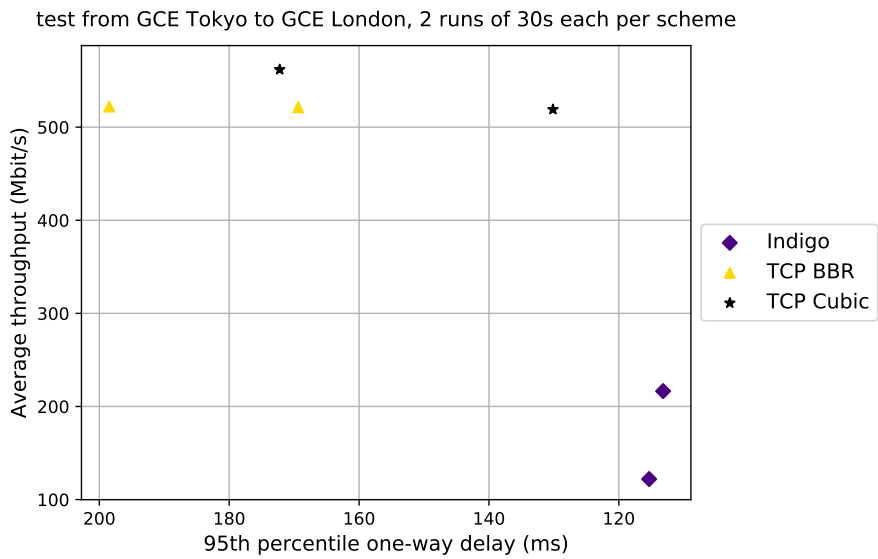
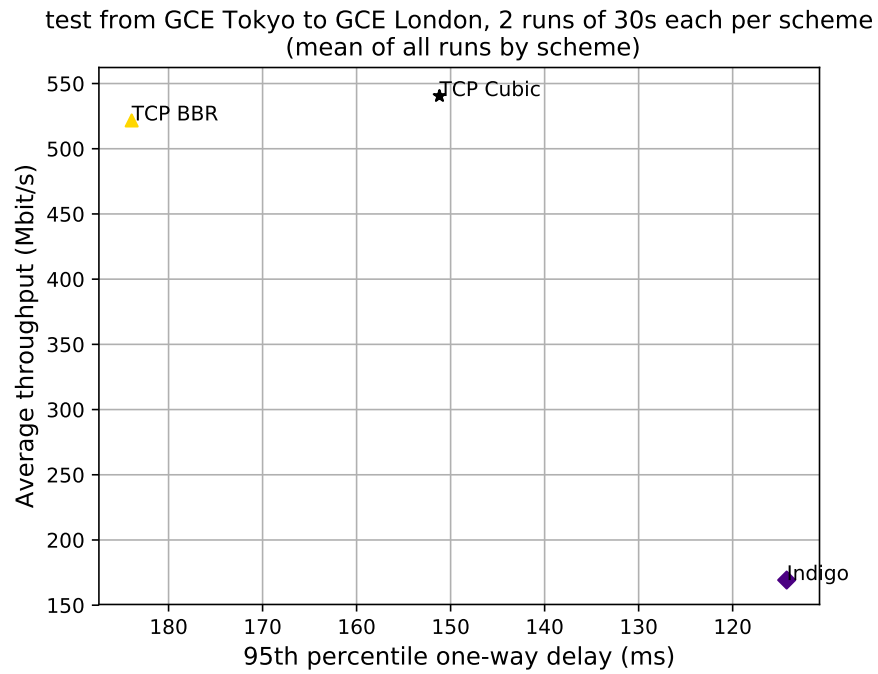
NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

System info:

```
Linux 4.15.0-1018-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 @ 2de97ca91a065473c29a25fffe63fb137c97a67c
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
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
```



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	521.69	183.92	0.37
TCP Cubic	2	540.42	151.19	0.11
Indigo	2	169.28	114.25	0.00
Muses-25	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 04:18:41

End at: 2018-08-31 04:19:11

Local clock offset: 0.793 ms

Remote clock offset: 4.238 ms

Below is generated by plot.py at 2018-08-31 04:35:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 522.04 Mbit/s

95th percentile per-packet one-way delay: 198.473 ms

Loss rate: 0.53%

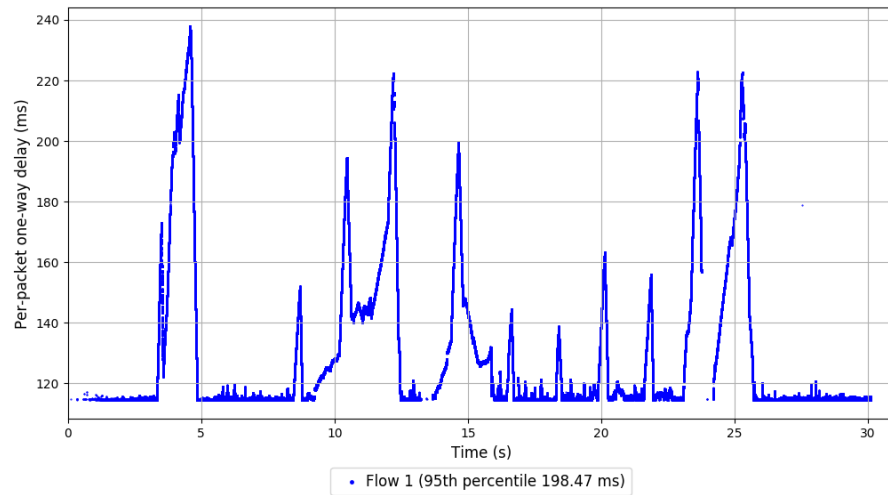
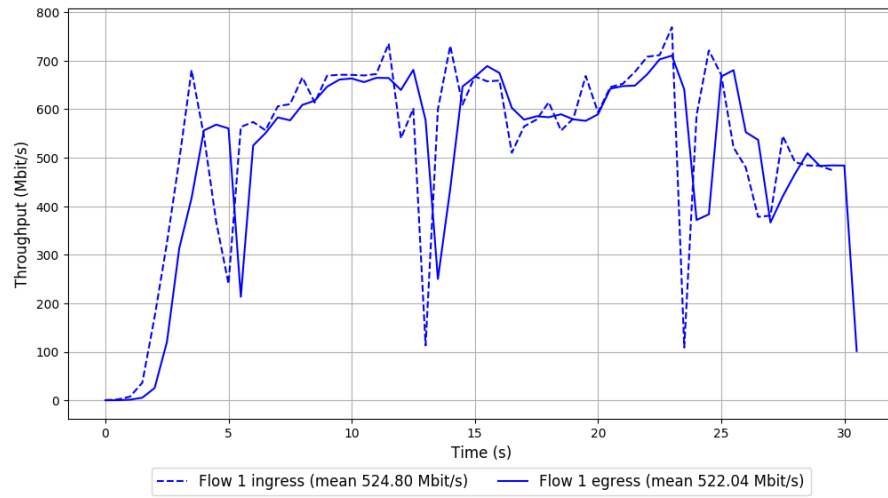
-- Flow 1:

Average throughput: 522.04 Mbit/s

95th percentile per-packet one-way delay: 198.473 ms

Loss rate: 0.53%

Run 1: Report of TCP BBR — Data Link

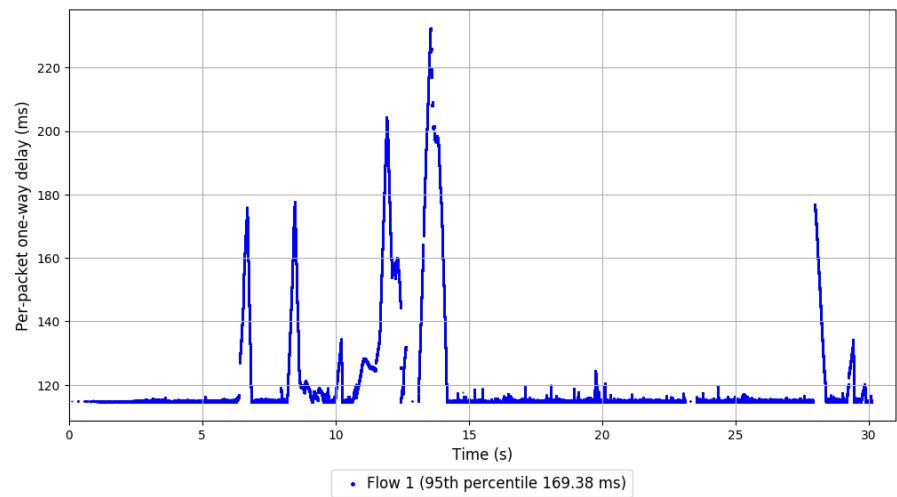
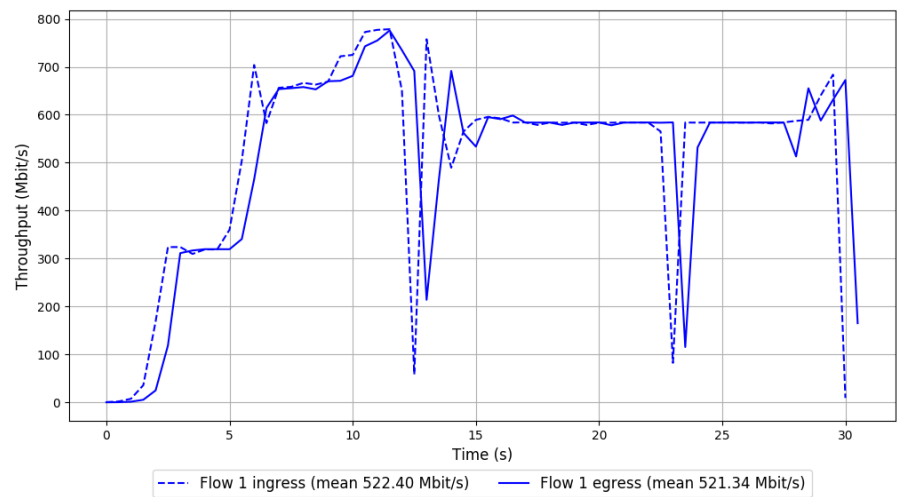


Run 2: Statistics of TCP BBR

Start at: 2018-08-31 04:24:23
End at: 2018-08-31 04:24:53
Local clock offset: 7.715 ms
Remote clock offset: 10.612 ms

Below is generated by plot.py at 2018-08-31 04:35:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 521.34 Mbit/s
95th percentile per-packet one-way delay: 169.376 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 521.34 Mbit/s
95th percentile per-packet one-way delay: 169.376 ms
Loss rate: 0.21%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 04:21:38

End at: 2018-08-31 04:22:08

Local clock offset: 5.691 ms

Remote clock offset: 6.059 ms

Below is generated by plot.py at 2018-08-31 04:35:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 561.85 Mbit/s

95th percentile per-packet one-way delay: 172.229 ms

Loss rate: 0.21%

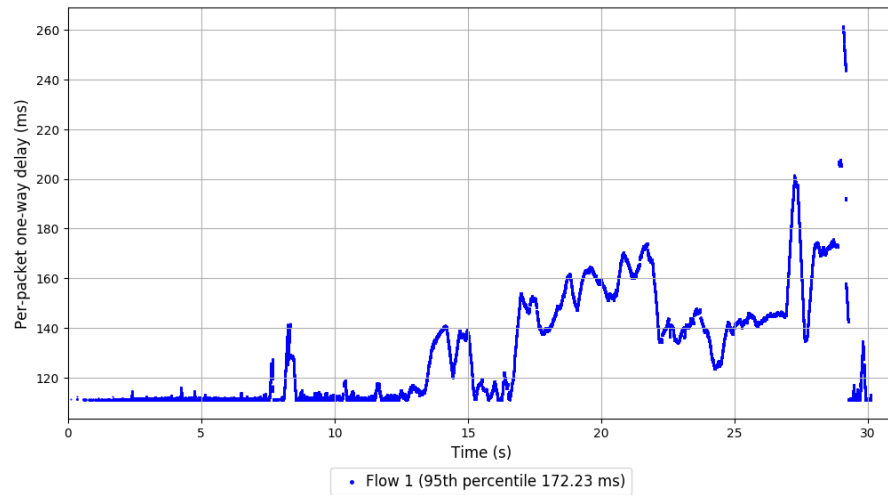
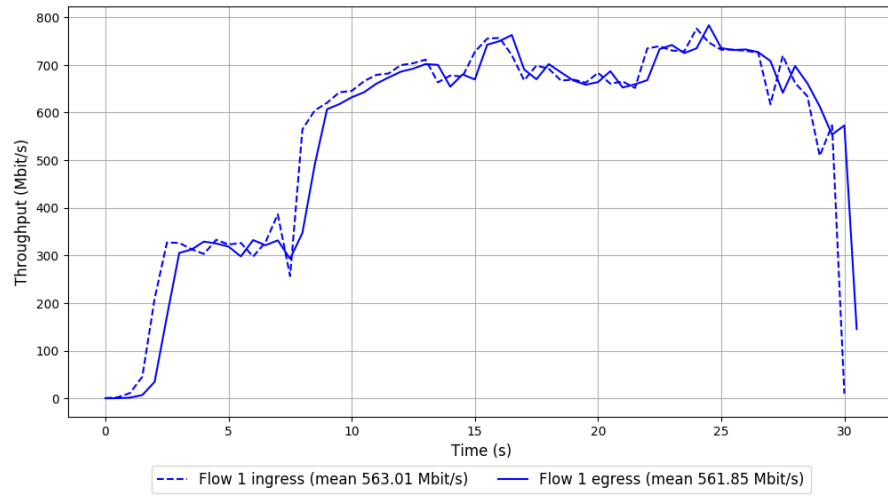
-- Flow 1:

Average throughput: 561.85 Mbit/s

95th percentile per-packet one-way delay: 172.229 ms

Loss rate: 0.21%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 04:27:28

End at: 2018-08-31 04:27:58

Local clock offset: 5.861 ms

Remote clock offset: 9.015 ms

Below is generated by plot.py at 2018-08-31 04:35:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 518.99 Mbit/s

95th percentile per-packet one-way delay: 130.145 ms

Loss rate: 0.02%

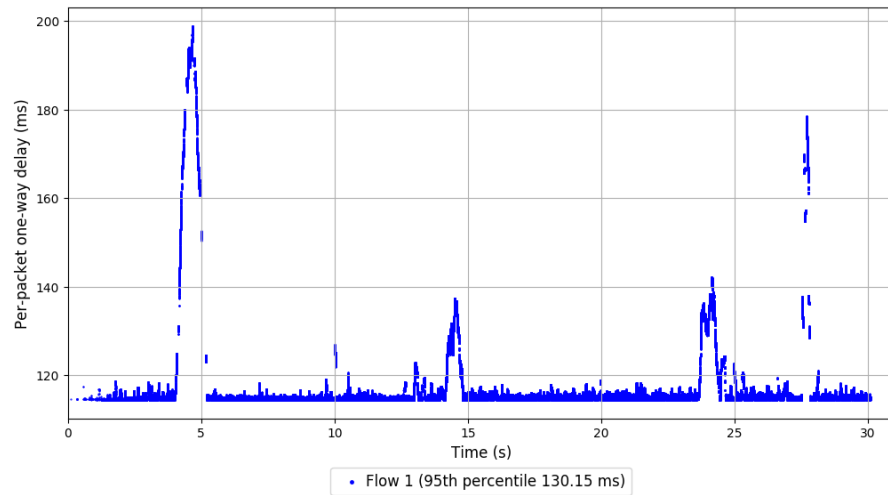
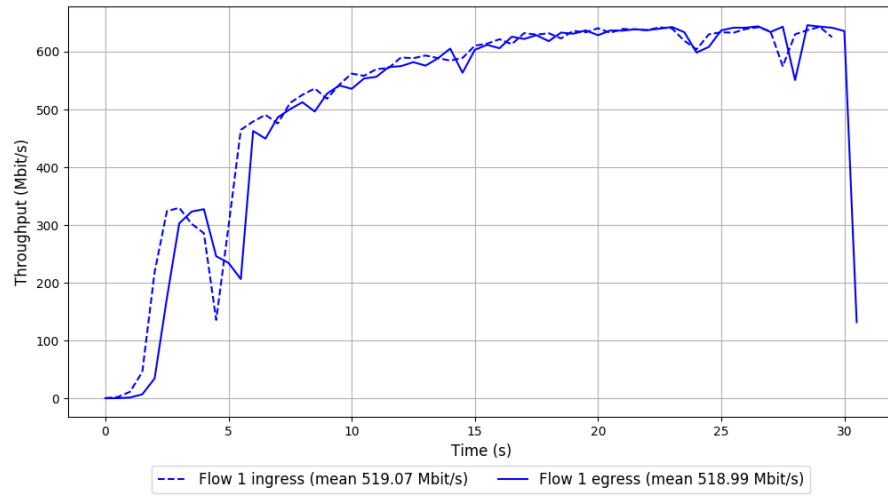
-- Flow 1:

Average throughput: 518.99 Mbit/s

95th percentile per-packet one-way delay: 130.145 ms

Loss rate: 0.02%

Run 2: Report of TCP Cubic — Data Link

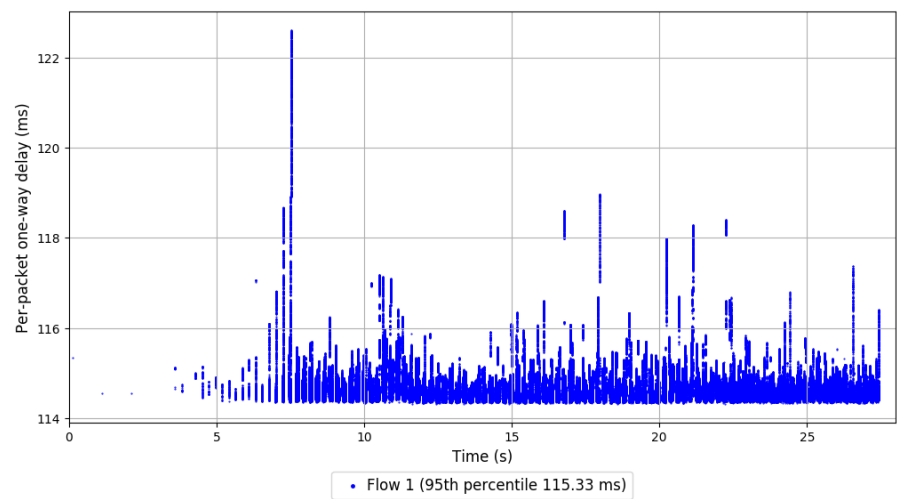
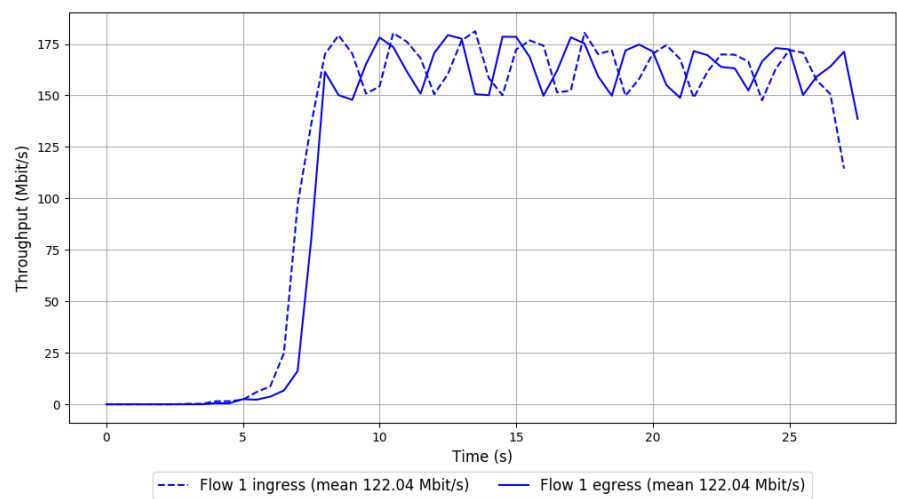


```
Run 1: Statistics of Indigo

Start at: 2018-08-31 04:20:18
End at: 2018-08-31 04:20:49
Local clock offset: 4.424 ms
Remote clock offset: 7.201 ms

# Below is generated by plot.py at 2018-08-31 04:35:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 122.04 Mbit/s
95th percentile per-packet one-way delay: 115.331 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 122.04 Mbit/s
95th percentile per-packet one-way delay: 115.331 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 04:25:59

End at: 2018-08-31 04:26:29

Local clock offset: 5.842 ms

Remote clock offset: 7.341 ms

Below is generated by plot.py at 2018-08-31 04:35:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 216.51 Mbit/s

95th percentile per-packet one-way delay: 113.177 ms

Loss rate: 0.00%

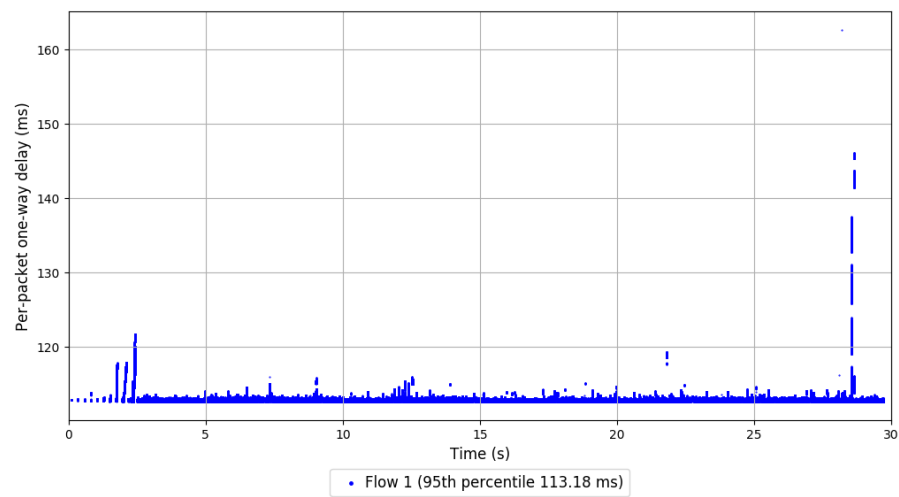
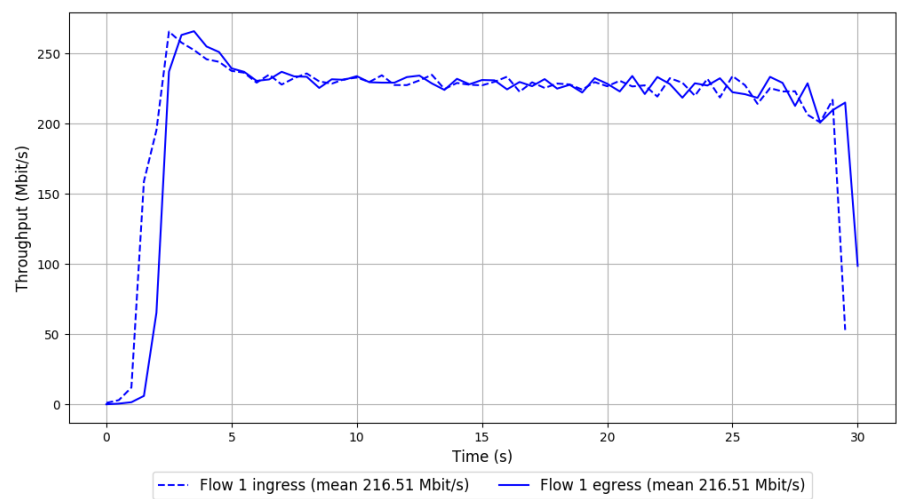
-- Flow 1:

Average throughput: 216.51 Mbit/s

95th percentile per-packet one-way delay: 113.177 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

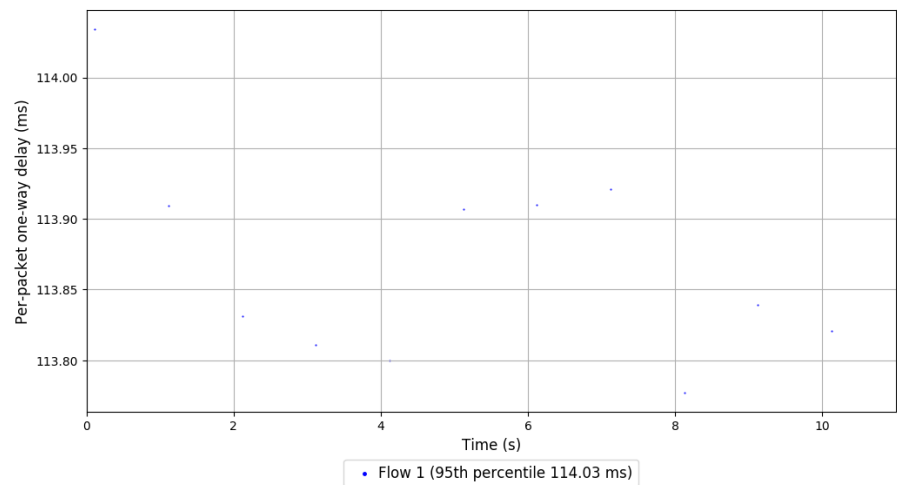
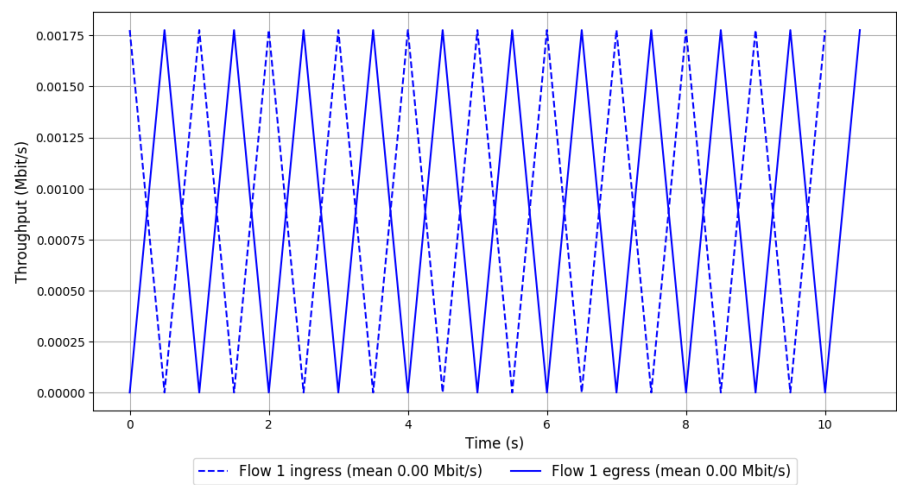
Start at: 2018-08-31 04:23:15

End at: 2018-08-31 04:23:45

Local clock offset: 5.128 ms

Remote clock offset: 8.094 ms

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-08-31 04:29:02

End at: 2018-08-31 04:29:33

Local clock offset: 10.337 ms

Remote clock offset: 10.252 ms

Run 2: Report of Muses-25 — Data Link

