

Pantheon Report

Generated at 2018-09-03 08:43:23 (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.

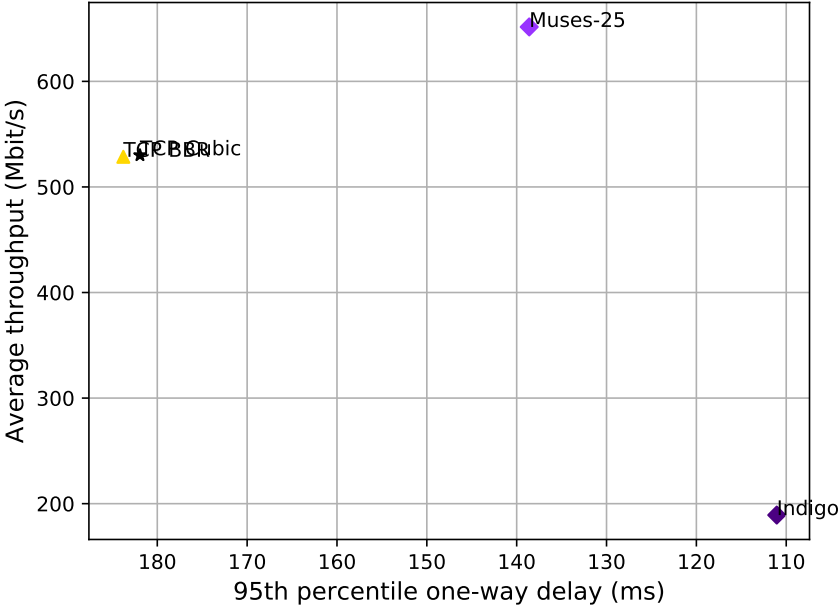
System info:

```
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
```

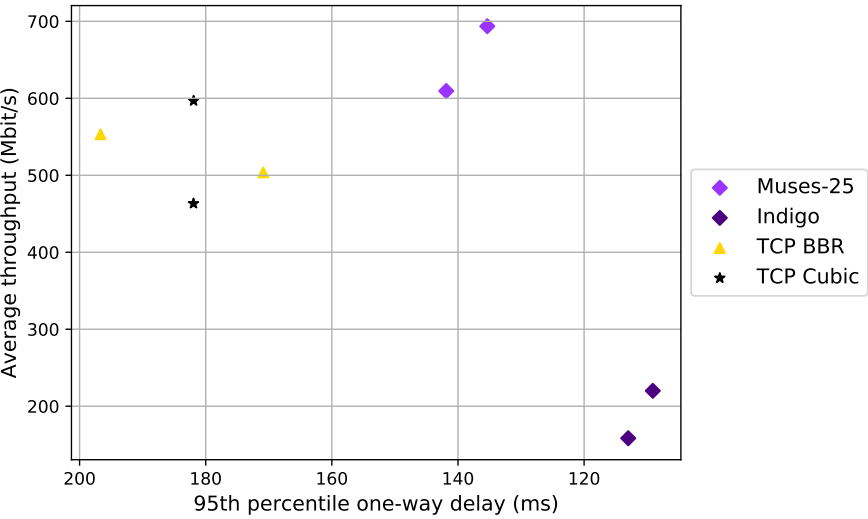
Git summary:

```
branch: muses @ f309f5459e2c5237279a184e52ece7a2b47ef1c9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b8d5019b83a3a678804d830fcfe1da7b3a63421b
third_party/pantheon-tunnel @ cbfce6db5ff5740dfe1771f813cd646339e1952
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	528.57	183.78	0.60
TCP Cubic	2	530.03	181.93	0.01
Indigo	2	189.20	111.05	0.00
Muses-25	2	651.57	138.60	0.04

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 08:22:27

End at: 2018-09-03 08:22:57

Local clock offset: 2.546 ms

Remote clock offset: 26.287 ms

Below is generated by plot.py at 2018-09-03 08:42:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 503.82 Mbit/s

95th percentile per-packet one-way delay: 170.882 ms

Loss rate: 0.44%

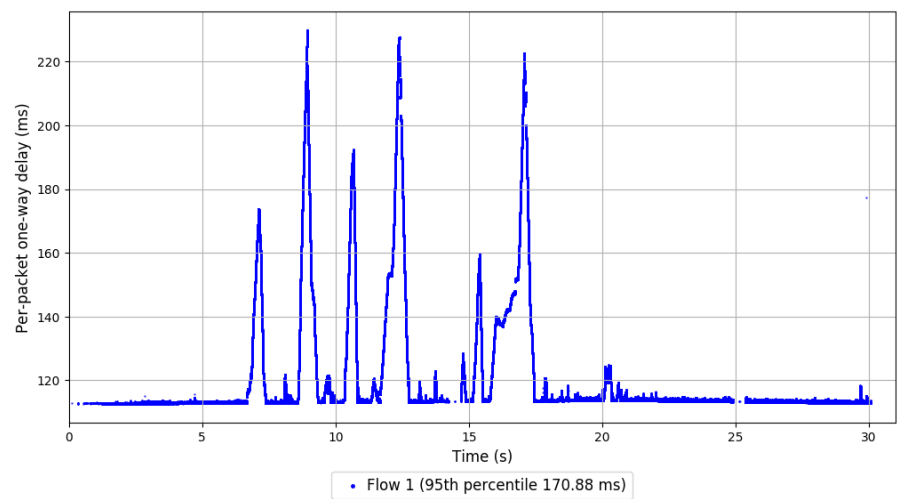
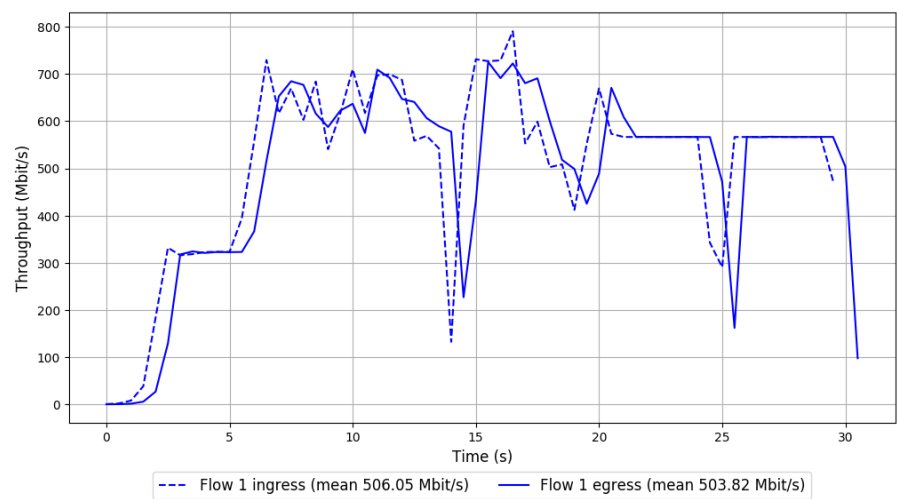
-- Flow 1:

Average throughput: 503.82 Mbit/s

95th percentile per-packet one-way delay: 170.882 ms

Loss rate: 0.44%

Run 1: Report of TCP BBR — Data Link

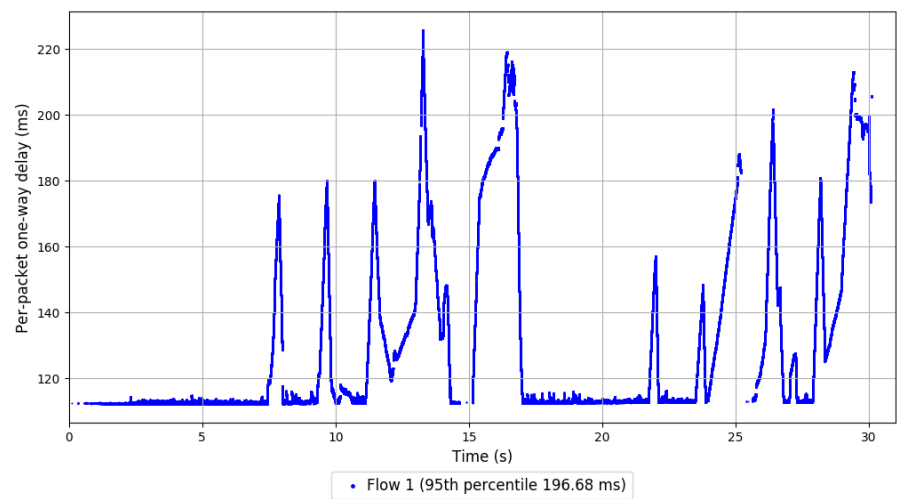
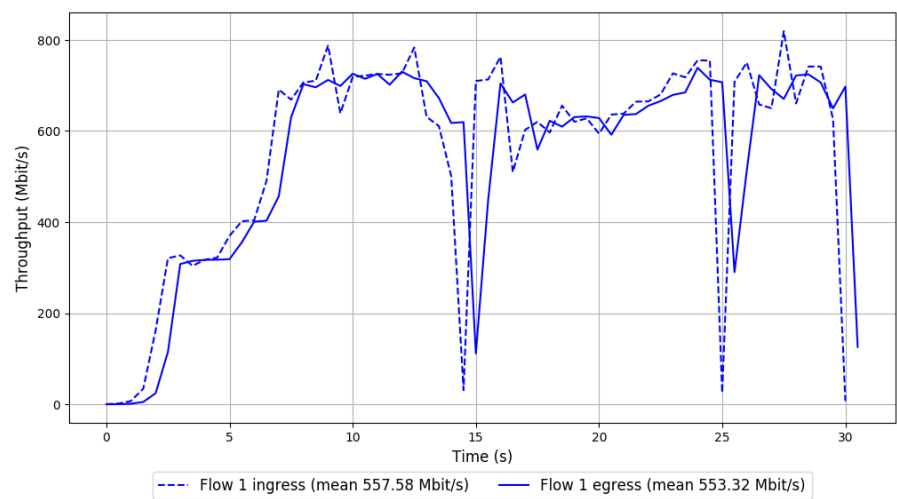


Run 2: Statistics of TCP BBR

Start at: 2018-09-03 08:28:40
End at: 2018-09-03 08:29:10
Local clock offset: 8.953 ms
Remote clock offset: 31.191 ms

Below is generated by plot.py at 2018-09-03 08:43:08
Datalink statistics
-- Total of 1 flow:
Average throughput: 553.32 Mbit/s
95th percentile per-packet one-way delay: 196.679 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 553.32 Mbit/s
95th percentile per-packet one-way delay: 196.679 ms
Loss rate: 0.76%

Run 2: Report of TCP BBR — Data Link

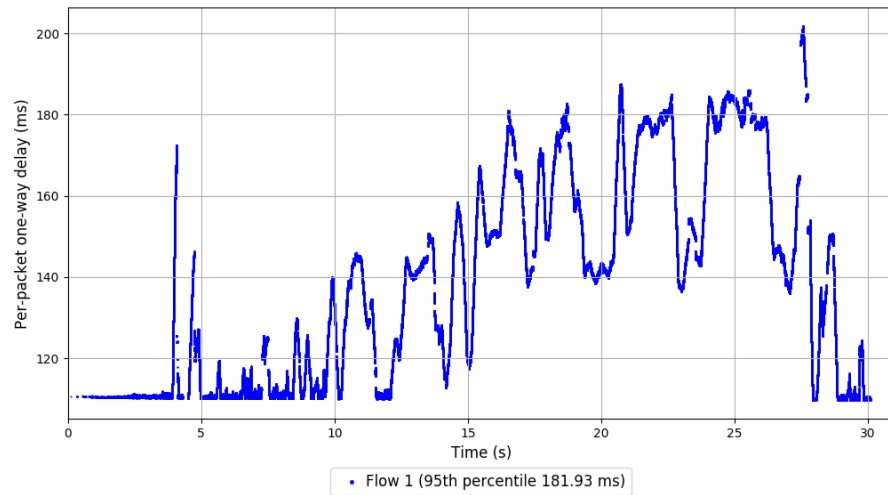
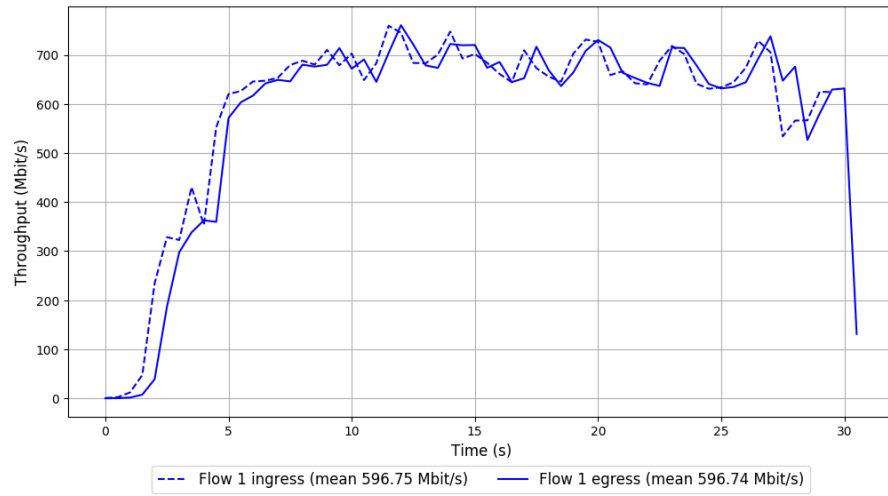


Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 08:25:38
End at: 2018-09-03 08:26:08
Local clock offset: 6.353 ms
Remote clock offset: 28.718 ms

Below is generated by plot.py at 2018-09-03 08:43:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 596.74 Mbit/s
95th percentile per-packet one-way delay: 181.925 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 596.74 Mbit/s
95th percentile per-packet one-way delay: 181.925 ms
Loss rate: 0.00%

Run 1: Report of TCP Cubic — Data Link

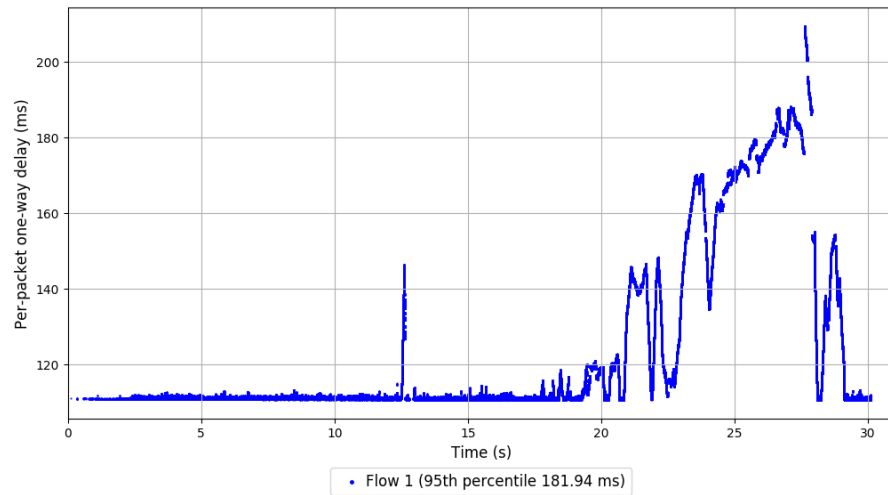
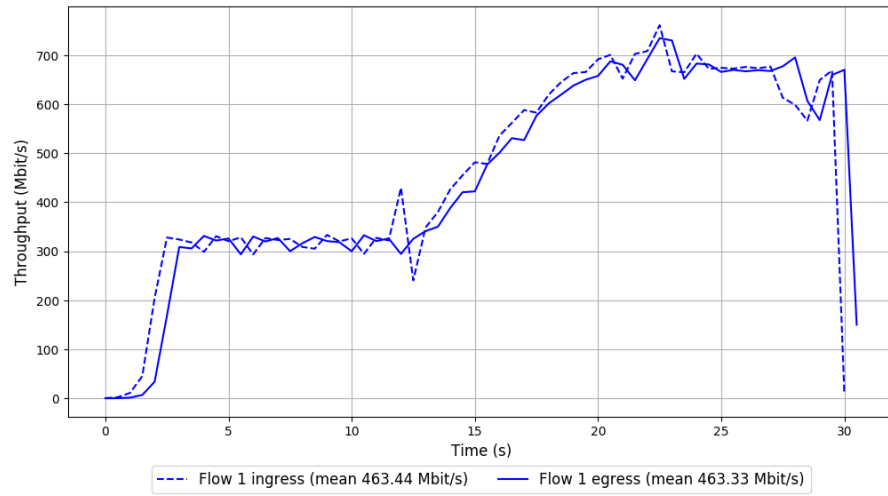


Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 08:31:57
End at: 2018-09-03 08:32:27
Local clock offset: 8.388 ms
Remote clock offset: 34.681 ms

Below is generated by plot.py at 2018-09-03 08:43:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 463.33 Mbit/s
95th percentile per-packet one-way delay: 181.937 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 463.33 Mbit/s
95th percentile per-packet one-way delay: 181.937 ms
Loss rate: 0.02%

Run 2: Report of TCP Cubic — Data Link

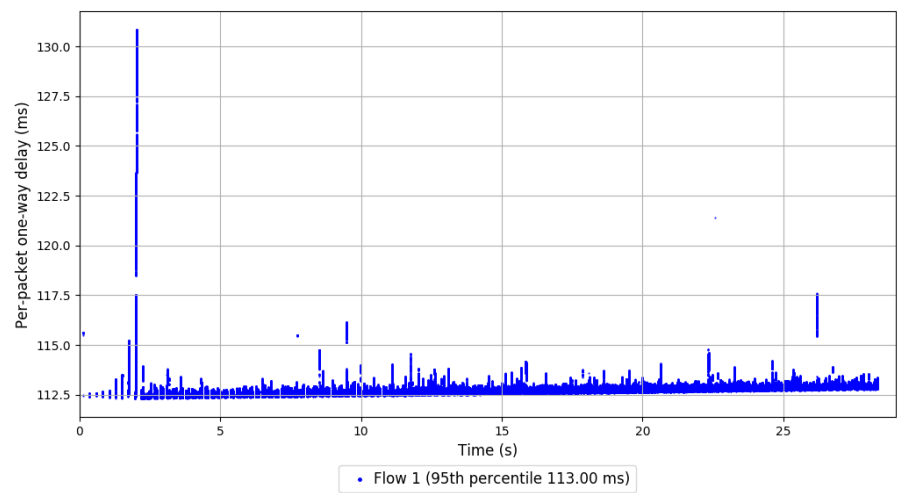
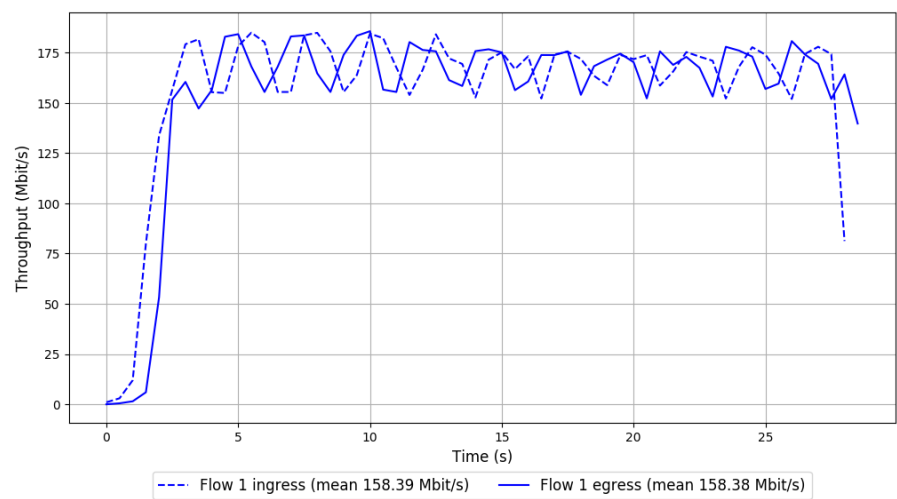


Run 1: Statistics of Indigo

Start at: 2018-09-03 08:27:17
End at: 2018-09-03 08:27:47
Local clock offset: 6.205 ms
Remote clock offset: 30.999 ms

Below is generated by plot.py at 2018-09-03 08:43:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 158.38 Mbit/s
95th percentile per-packet one-way delay: 113.002 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 158.38 Mbit/s
95th percentile per-packet one-way delay: 113.002 ms
Loss rate: 0.00%

Run 1: Report of Indigo — Data Link

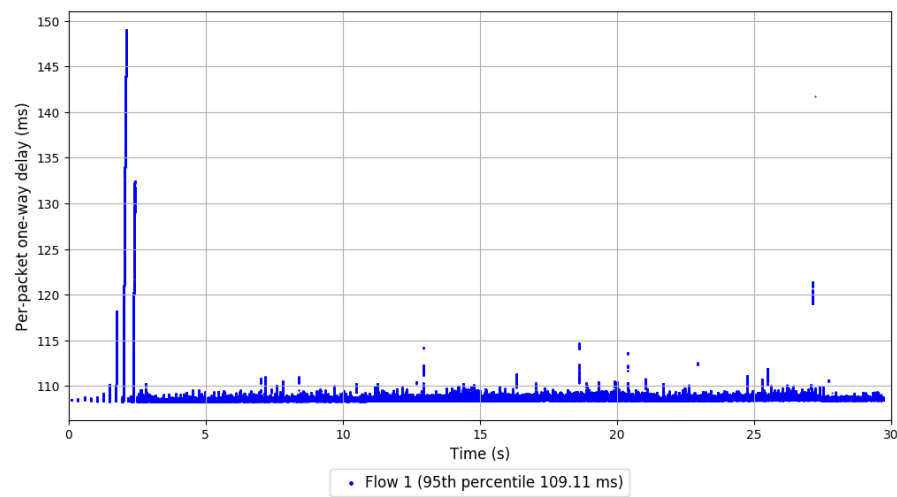
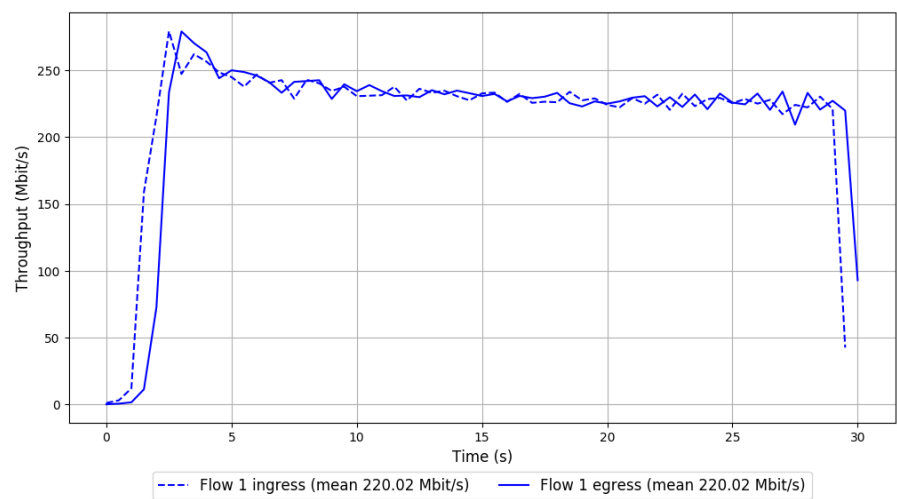


Run 2: Statistics of Indigo

Start at: 2018-09-03 08:33:29
End at: 2018-09-03 08:33:59
Local clock offset: 12.195 ms
Remote clock offset: 36.388 ms

Below is generated by plot.py at 2018-09-03 08:43:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 220.02 Mbit/s
95th percentile per-packet one-way delay: 109.106 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 220.02 Mbit/s
95th percentile per-packet one-way delay: 109.106 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-03 08:24:04

End at: 2018-09-03 08:24:34

Local clock offset: 1.088 ms

Remote clock offset: 26.863 ms

Below is generated by plot.py at 2018-09-03 08:43:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 609.50 Mbit/s

95th percentile per-packet one-way delay: 141.859 ms

Loss rate: 0.01%

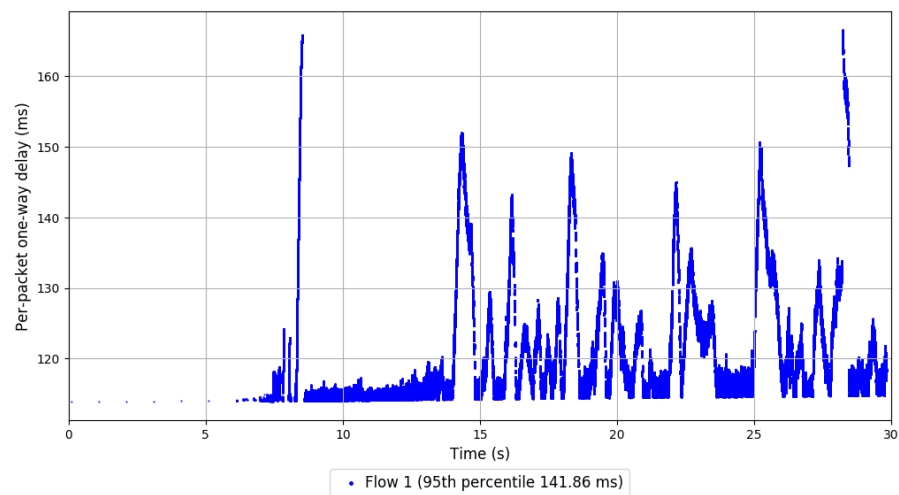
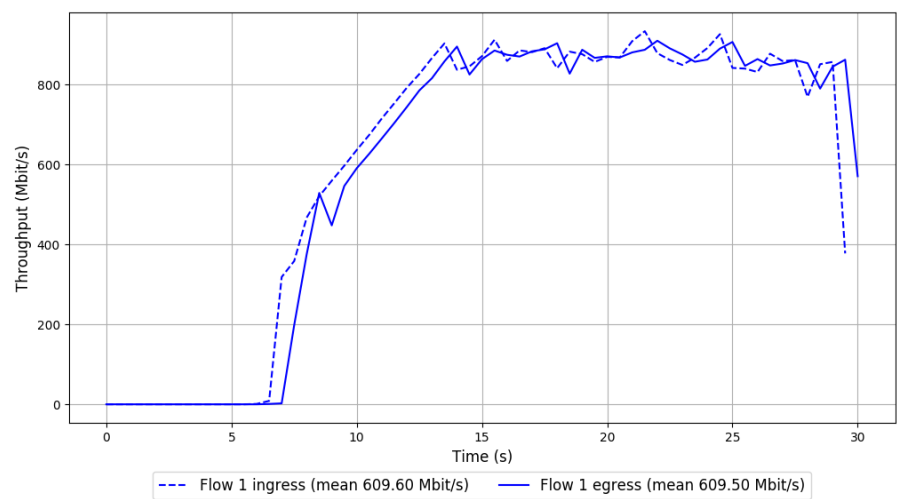
-- Flow 1:

Average throughput: 609.50 Mbit/s

95th percentile per-packet one-way delay: 141.859 ms

Loss rate: 0.01%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 08:30:19
End at: 2018-09-03 08:30:49
Local clock offset: 12.396 ms
Remote clock offset: 33.101 ms

Below is generated by plot.py at 2018-09-03 08:43:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 693.63 Mbit/s
95th percentile per-packet one-way delay: 135.349 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 693.63 Mbit/s
95th percentile per-packet one-way delay: 135.349 ms
Loss rate: 0.07%

Run 2: Report of Muses-25 — Data Link

