

Pantheon Report

Generated at 2018-09-03 12:38:49 (UTC).

Data path: GCE London on *ens4 (local)* → GCE Iowa 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.

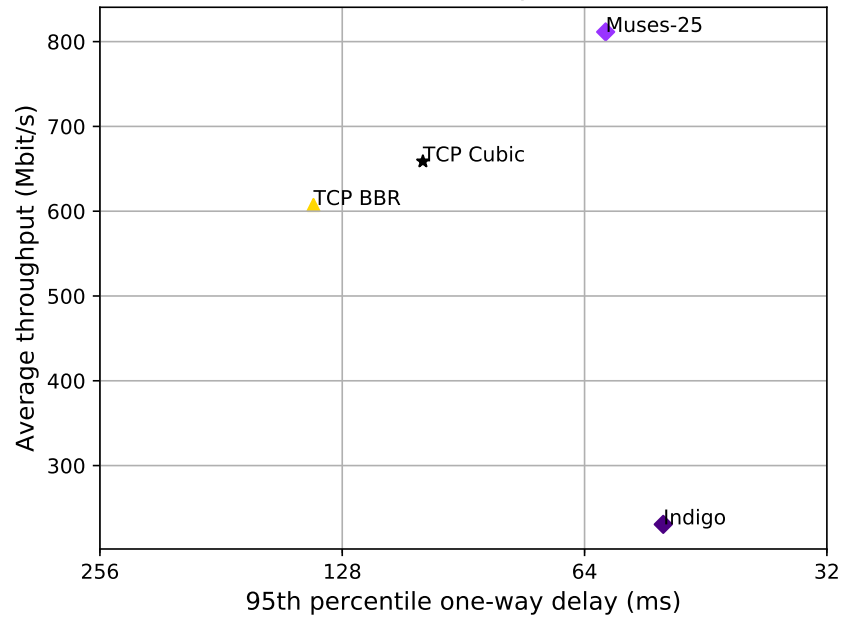
System info:

```
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
```

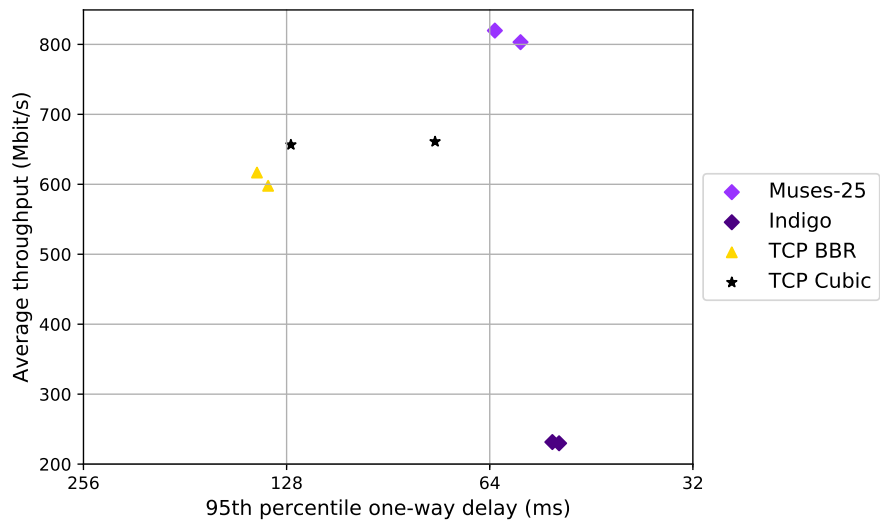
Git summary:

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



test from GCE London to GCE Iowa, 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	607.34	138.98	0.73
TCP Cubic	2	658.72	101.63	0.12
Indigo	2	230.66	51.10	0.00
Muses-25	2	811.45	60.26	0.01

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 12:15:53

End at: 2018-09-03 12:16:23

Local clock offset: 0.172 ms

Remote clock offset: 0.08 ms

Below is generated by plot.py at 2018-09-03 12:38:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 616.80 Mbit/s

95th percentile per-packet one-way delay: 141.619 ms

Loss rate: 0.63%

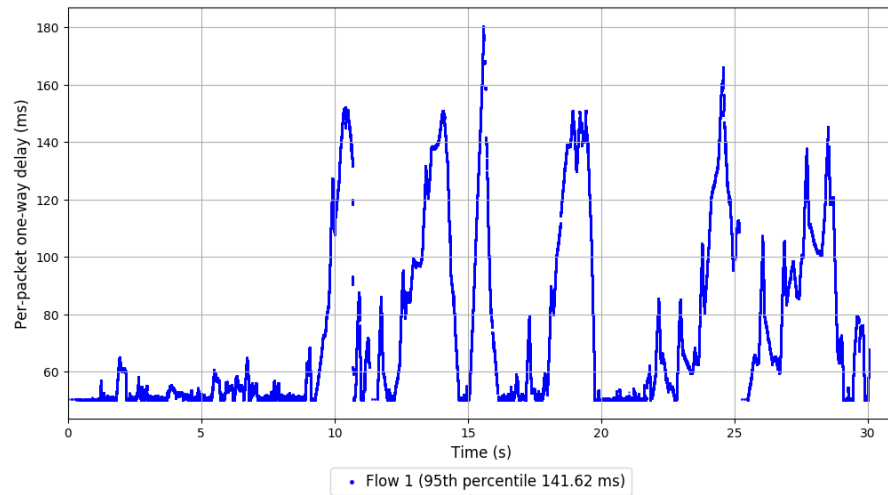
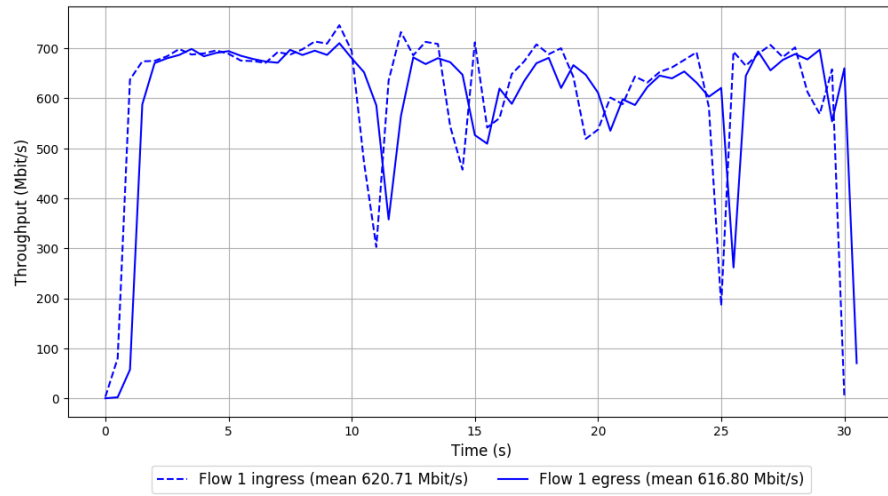
-- Flow 1:

Average throughput: 616.80 Mbit/s

95th percentile per-packet one-way delay: 141.619 ms

Loss rate: 0.63%

Run 1: Report of TCP BBR — Data Link

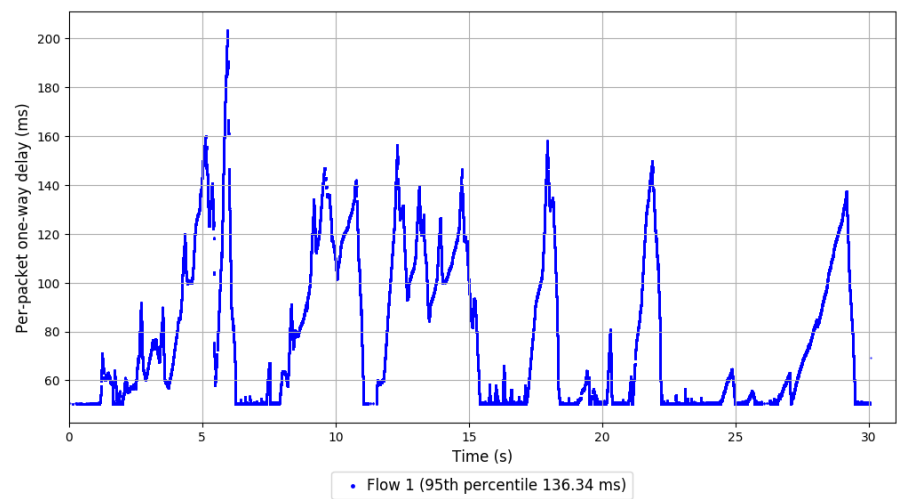
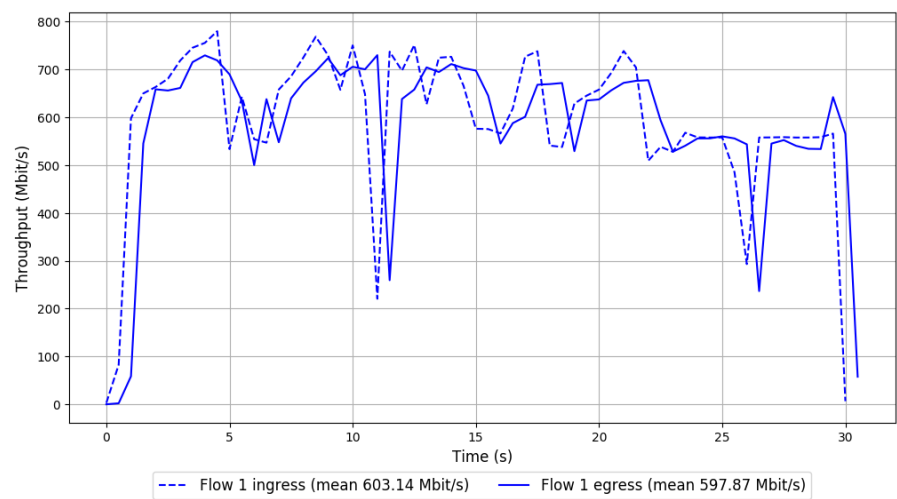


Run 2: Statistics of TCP BBR

Start at: 2018-09-03 12:22:06
End at: 2018-09-03 12:22:36
Local clock offset: -0.364 ms
Remote clock offset: -0.078 ms

Below is generated by plot.py at 2018-09-03 12:38:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 597.87 Mbit/s
95th percentile per-packet one-way delay: 136.338 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 597.87 Mbit/s
95th percentile per-packet one-way delay: 136.338 ms
Loss rate: 0.83%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 12:20:31

End at: 2018-09-03 12:21:01

Local clock offset: -0.233 ms

Remote clock offset: -0.04 ms

Below is generated by plot.py at 2018-09-03 12:38:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 660.95 Mbit/s

95th percentile per-packet one-way delay: 77.124 ms

Loss rate: 0.07%

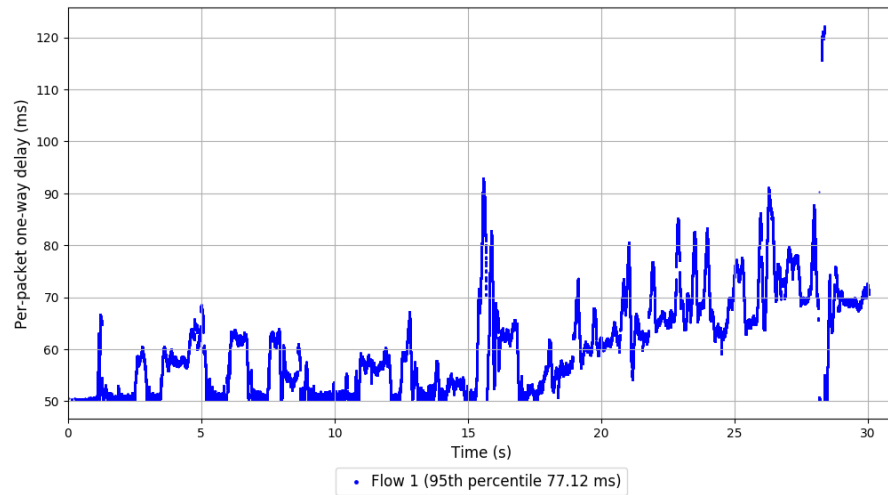
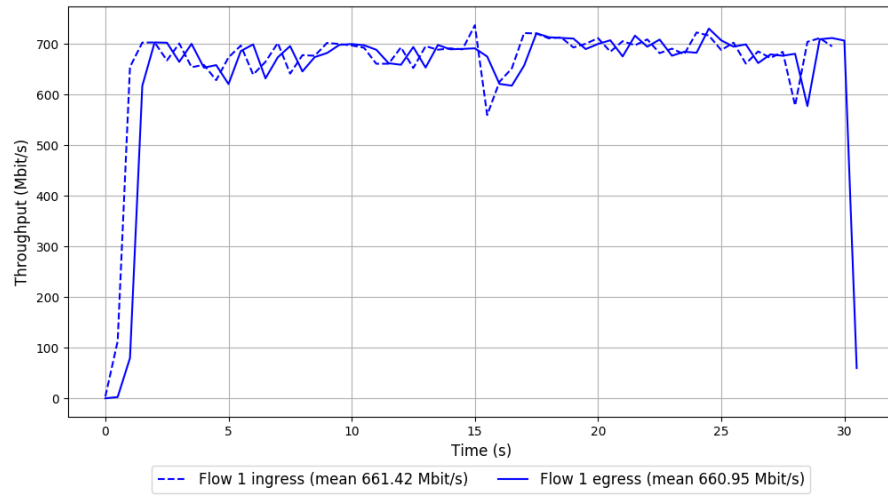
-- Flow 1:

Average throughput: 660.95 Mbit/s

95th percentile per-packet one-way delay: 77.124 ms

Loss rate: 0.07%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 12:26:42

End at: 2018-09-03 12:27:12

Local clock offset: 0.315 ms

Remote clock offset: -0.07 ms

Below is generated by plot.py at 2018-09-03 12:38:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 656.49 Mbit/s

95th percentile per-packet one-way delay: 126.140 ms

Loss rate: 0.18%

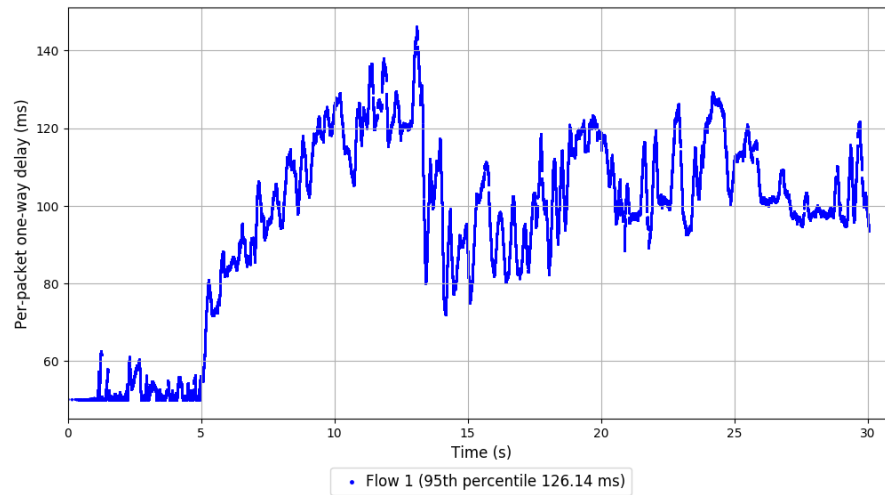
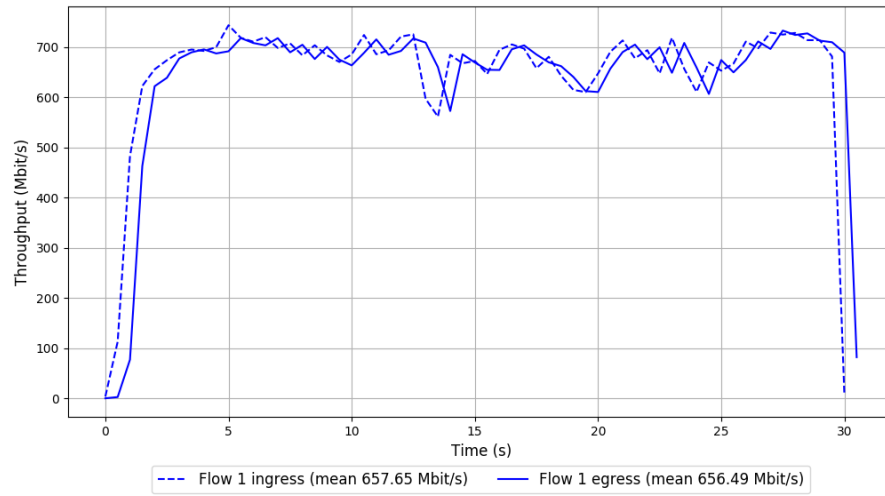
-- Flow 1:

Average throughput: 656.49 Mbit/s

95th percentile per-packet one-way delay: 126.140 ms

Loss rate: 0.18%

Run 2: Report of TCP Cubic — Data Link

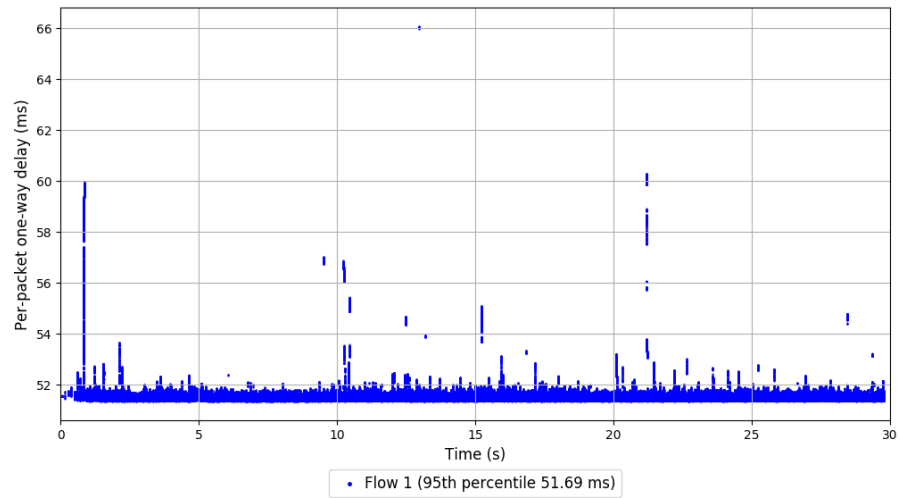
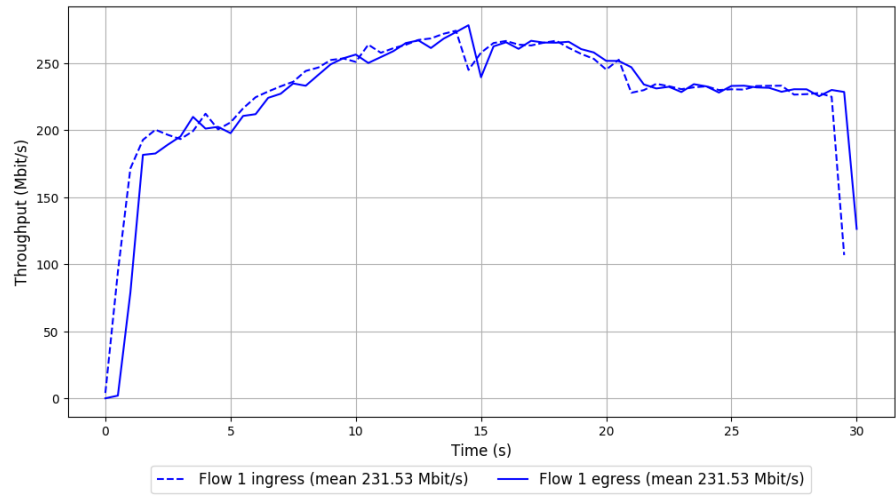


```
Run 1: Statistics of Indigo

Start at: 2018-09-03 12:17:30
End at: 2018-09-03 12:18:00
Local clock offset: -0.849 ms
Remote clock offset: 0.034 ms

# Below is generated by plot.py at 2018-09-03 12:38:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 231.53 Mbit/s
95th percentile per-packet one-way delay: 51.689 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 231.53 Mbit/s
95th percentile per-packet one-way delay: 51.689 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

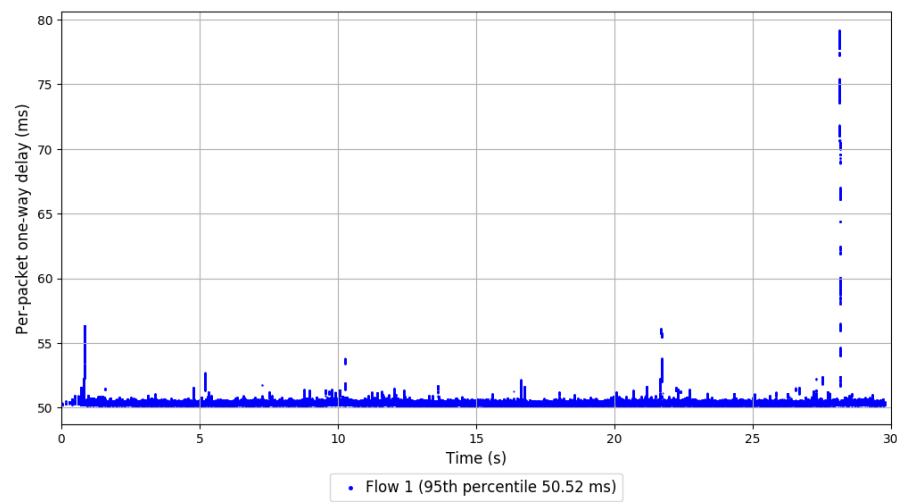
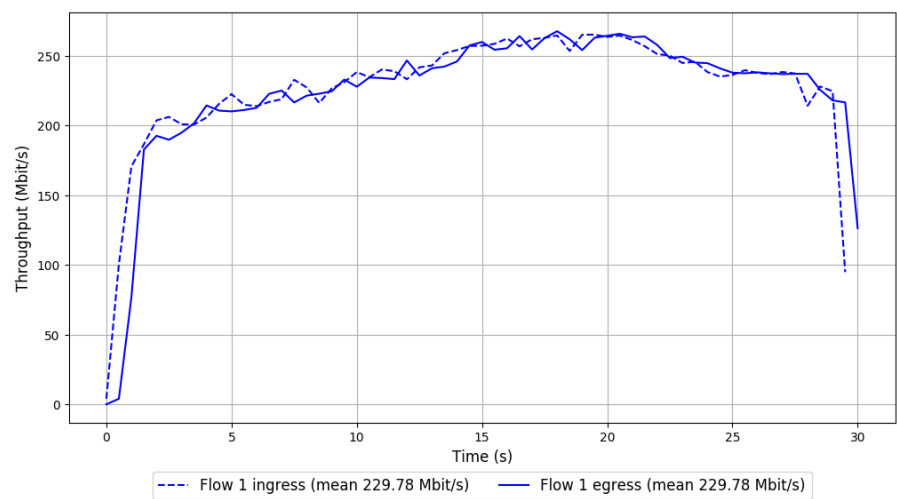


Run 2: Statistics of Indigo

Start at: 2018-09-03 12:23:41
End at: 2018-09-03 12:24:11
Local clock offset: -0.105 ms
Remote clock offset: -0.047 ms

Below is generated by plot.py at 2018-09-03 12:38:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 229.78 Mbit/s
95th percentile per-packet one-way delay: 50.516 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 229.78 Mbit/s
95th percentile per-packet one-way delay: 50.516 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link

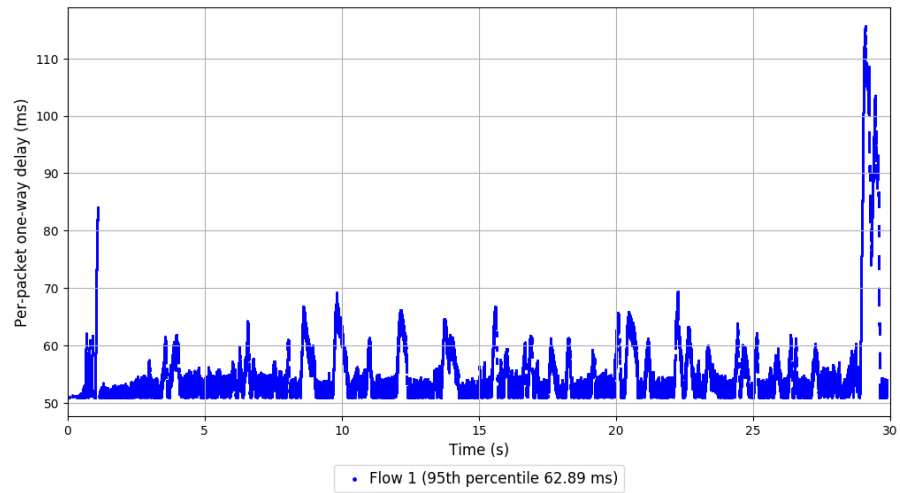
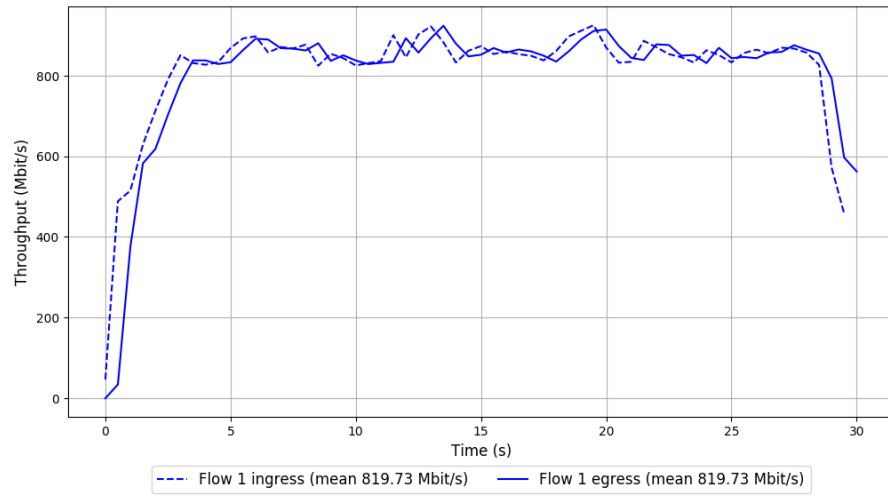


Run 1: Statistics of Muses-25

Start at: 2018-09-03 12:18:55
End at: 2018-09-03 12:19:25
Local clock offset: -0.721 ms
Remote clock offset: -0.001 ms

Below is generated by plot.py at 2018-09-03 12:38:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 819.73 Mbit/s
95th percentile per-packet one-way delay: 62.892 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 819.73 Mbit/s
95th percentile per-packet one-way delay: 62.892 ms
Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 12:25:06

End at: 2018-09-03 12:25:36

Local clock offset: -0.481 ms

Remote clock offset: -0.07 ms

Below is generated by plot.py at 2018-09-03 12:38:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 803.17 Mbit/s

95th percentile per-packet one-way delay: 57.618 ms

Loss rate: 0.01%

-- Flow 1:

Average throughput: 803.17 Mbit/s

95th percentile per-packet one-way delay: 57.618 ms

Loss rate: 0.01%

Run 2: Report of Muses-25 — Data Link

