

Pantheon Report

Generated at 2018-09-03 11:40:06 (UTC).

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

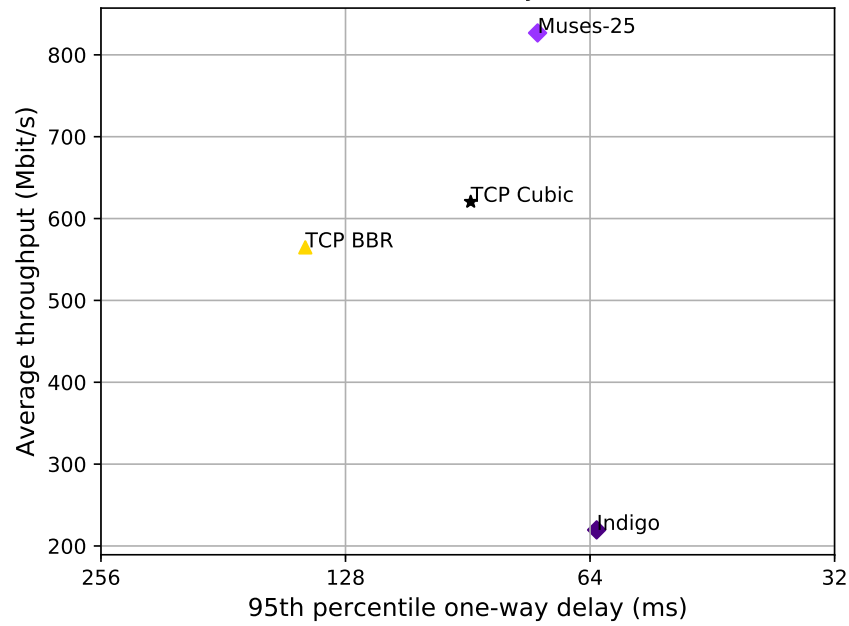
System info:

```
Linux 4.15.0-1018-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
```

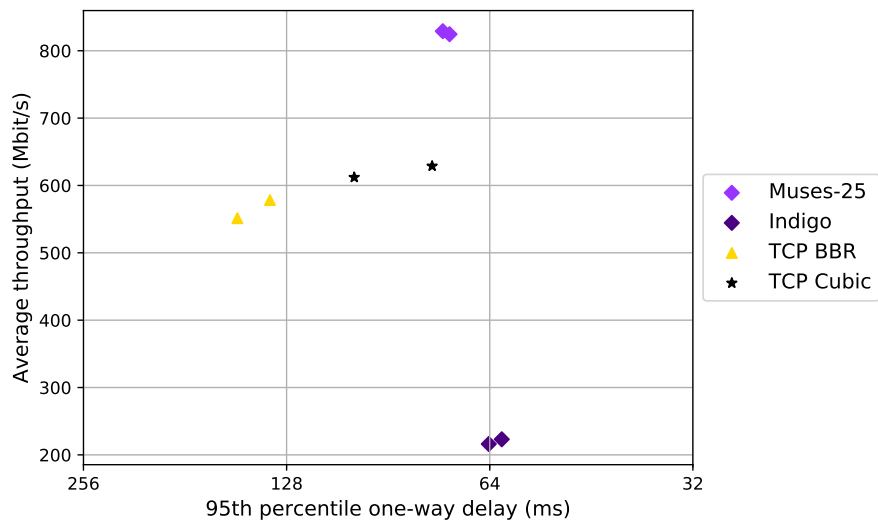
Git summary:

```
branch: muses @ f309f5459e2c5237279a184e52ece7a2b47ef1c9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
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 Iowa, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Tokyo 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	564.81	143.45	0.98
TCP Cubic	2	620.44	89.76	0.52
Indigo	2	219.63	62.82	0.44
Muses-25	2	826.77	74.26	0.46

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 11:19:05

End at: 2018-09-03 11:19:35

Local clock offset: 0.367 ms

Remote clock offset: -2.101 ms

Below is generated by plot.py at 2018-09-03 11:38:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 551.34 Mbit/s

95th percentile per-packet one-way delay: 151.414 ms

Loss rate: 0.93%

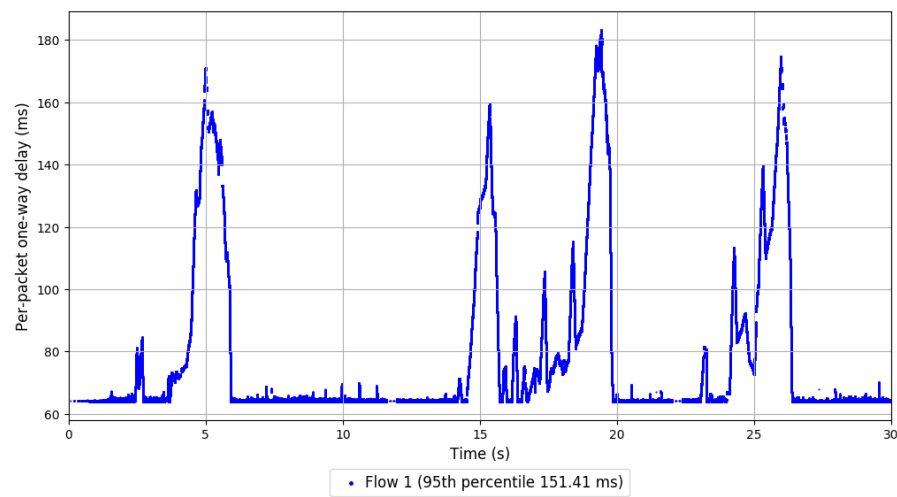
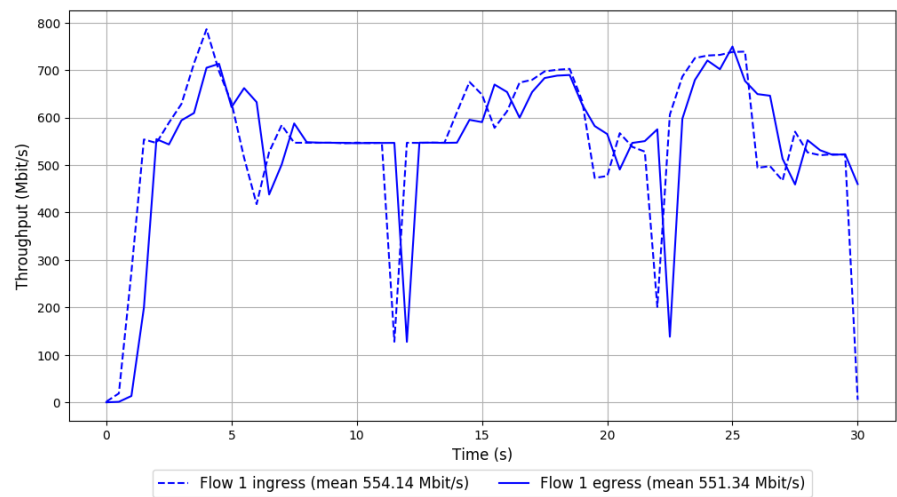
-- Flow 1:

Average throughput: 551.34 Mbit/s

95th percentile per-packet one-way delay: 151.414 ms

Loss rate: 0.93%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-03 11:25:20

End at: 2018-09-03 11:25:50

Local clock offset: 0.457 ms

Remote clock offset: 0.75 ms

Below is generated by plot.py at 2018-09-03 11:38:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 578.27 Mbit/s

95th percentile per-packet one-way delay: 135.483 ms

Loss rate: 1.02%

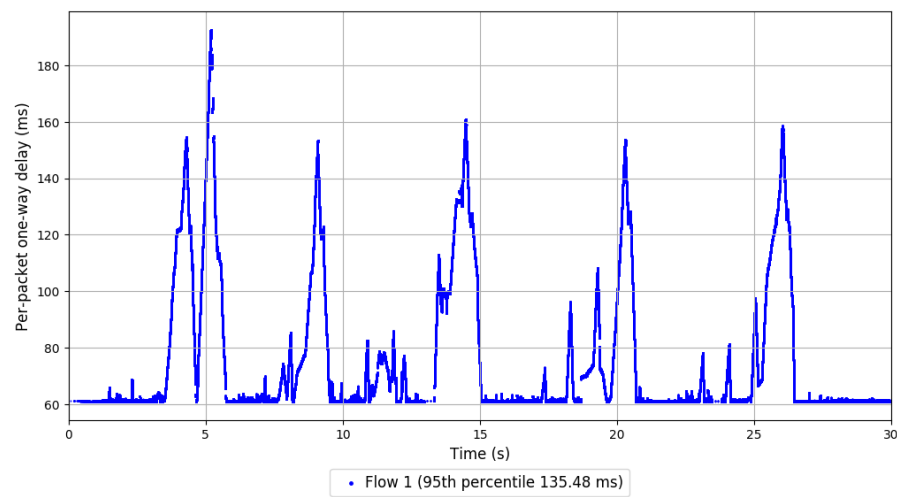
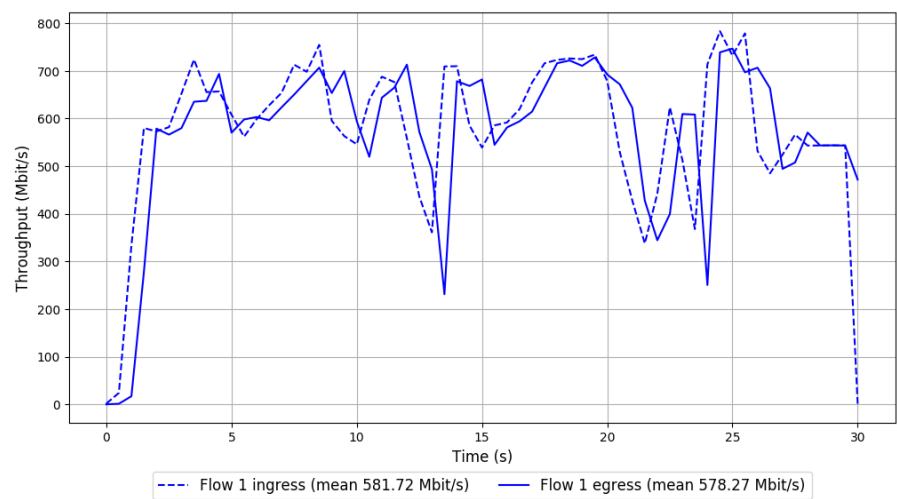
-- Flow 1:

Average throughput: 578.27 Mbit/s

95th percentile per-packet one-way delay: 135.483 ms

Loss rate: 1.02%

Run 2: Report of TCP BBR — Data Link

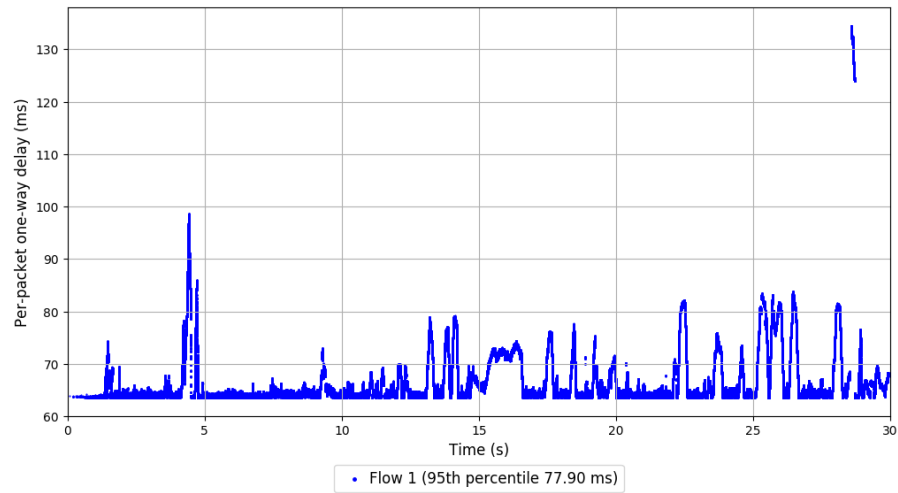
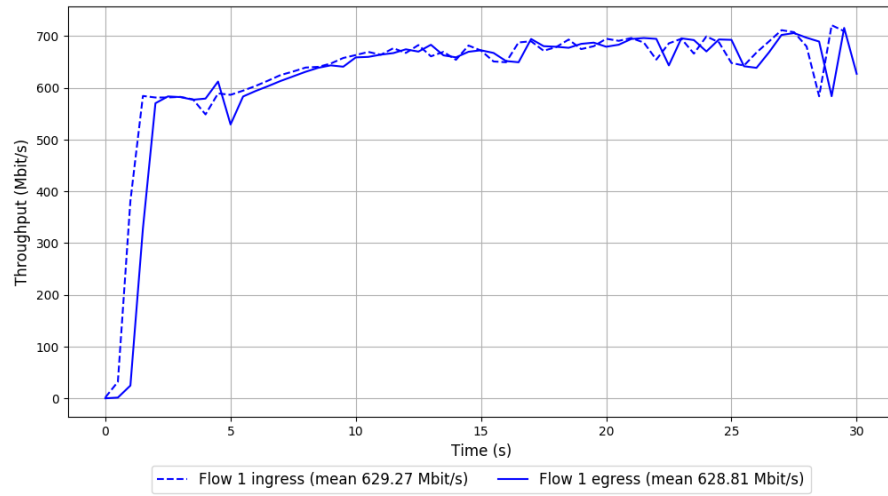


Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 11:22:04
End at: 2018-09-03 11:22:34
Local clock offset: 0.416 ms
Remote clock offset: -2.156 ms

Below is generated by plot.py at 2018-09-03 11:39:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 628.81 Mbit/s
95th percentile per-packet one-way delay: 77.899 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 628.81 Mbit/s
95th percentile per-packet one-way delay: 77.899 ms
Loss rate: 0.48%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 11:28:23

End at: 2018-09-03 11:28:53

Local clock offset: 0.51 ms

Remote clock offset: 0.626 ms

Below is generated by plot.py at 2018-09-03 11:39:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 612.08 Mbit/s

95th percentile per-packet one-way delay: 101.622 ms

Loss rate: 0.57%

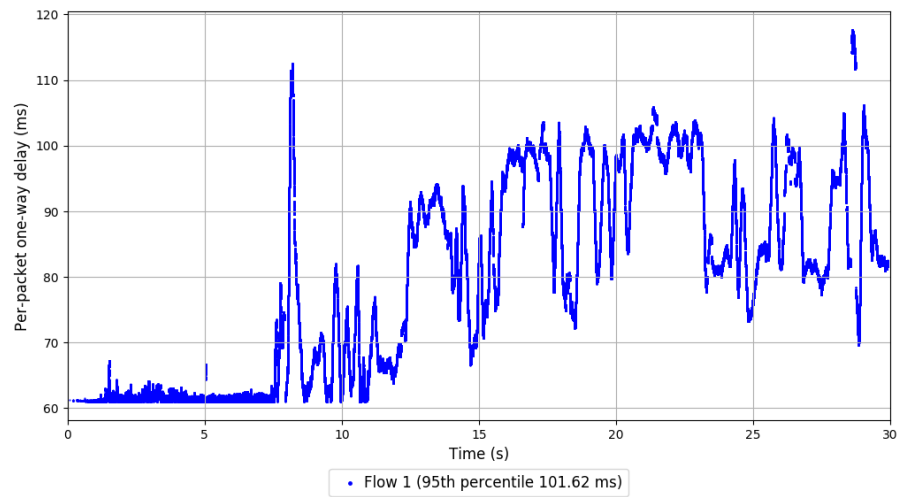
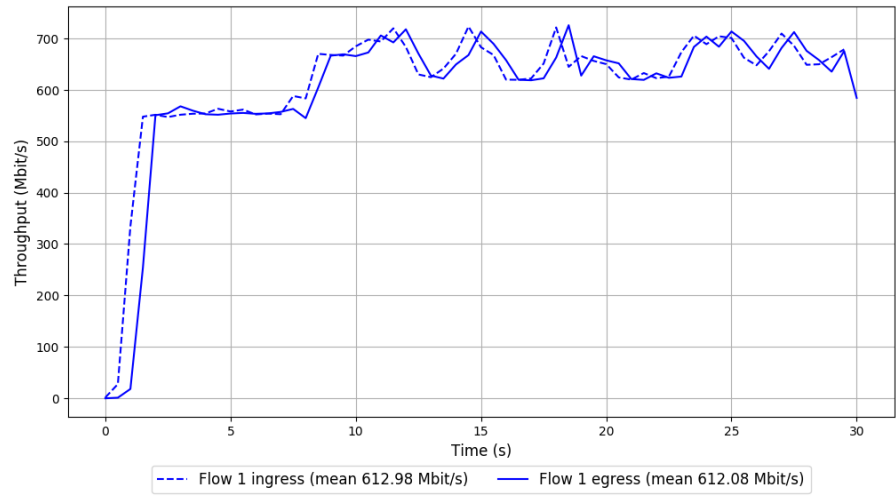
-- Flow 1:

Average throughput: 612.08 Mbit/s

95th percentile per-packet one-way delay: 101.622 ms

Loss rate: 0.57%

Run 2: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-09-03 11:20:39

End at: 2018-09-03 11:21:09

Local clock offset: 0.439 ms

Remote clock offset: 3.577 ms

Below is generated by plot.py at 2018-09-03 11:39:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 216.12 Mbit/s

95th percentile per-packet one-way delay: 64.209 ms

Loss rate: 0.47%

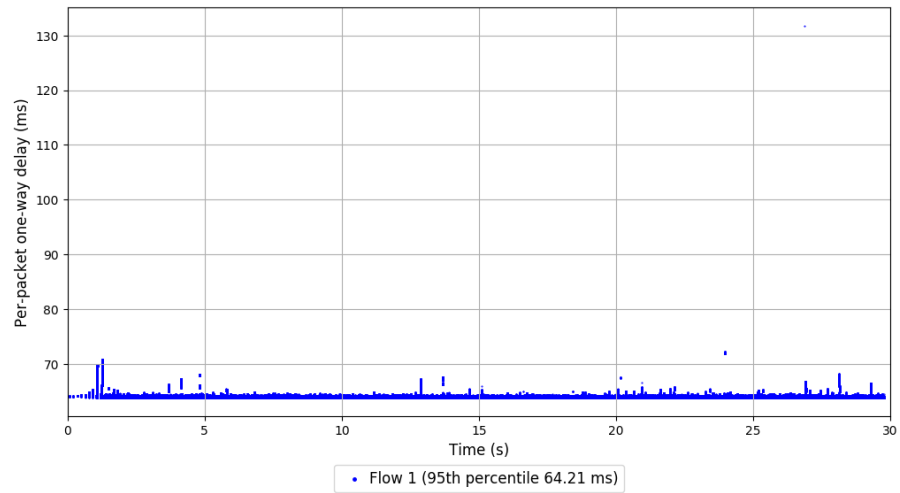
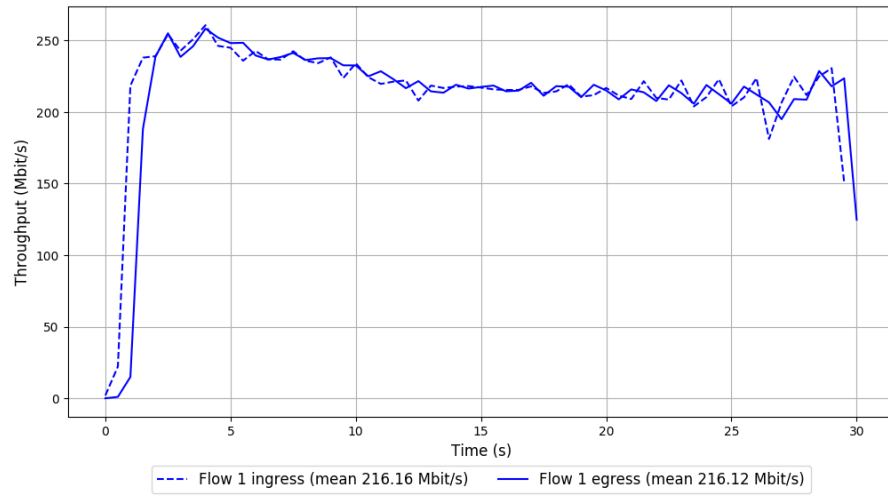
-- Flow 1:

Average throughput: 216.12 Mbit/s

95th percentile per-packet one-way delay: 64.209 ms

Loss rate: 0.47%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-03 11:26:57

End at: 2018-09-03 11:27:27

Local clock offset: 0.487 ms

Remote clock offset: 0.623 ms

Below is generated by plot.py at 2018-09-03 11:39:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 223.14 Mbit/s

95th percentile per-packet one-way delay: 61.429 ms

Loss rate: 0.41%

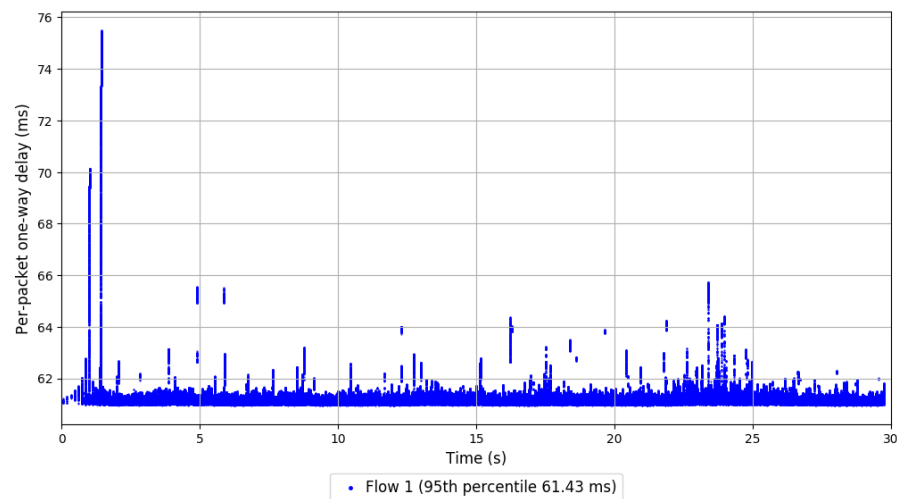
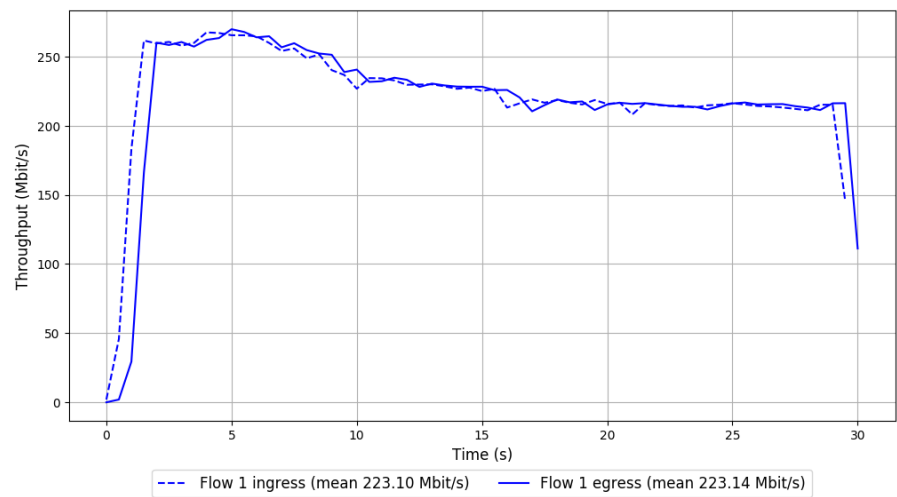
-- Flow 1:

Average throughput: 223.14 Mbit/s

95th percentile per-packet one-way delay: 61.429 ms

Loss rate: 0.41%

Run 2: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-03 11:17:26

End at: 2018-09-03 11:17:56

Local clock offset: 0.372 ms

Remote clock offset: 1.134 ms

Below is generated by plot.py at 2018-09-03 11:40:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 828.99 Mbit/s

95th percentile per-packet one-way delay: 75.116 ms

Loss rate: 0.45%

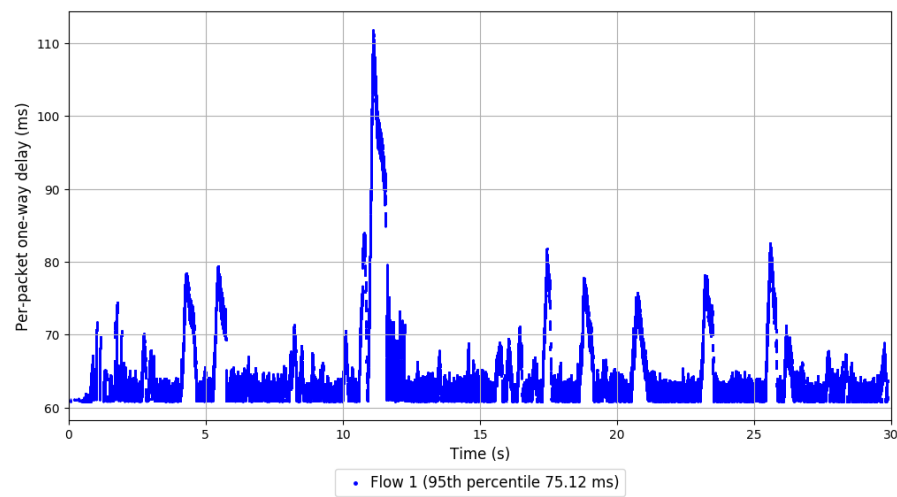
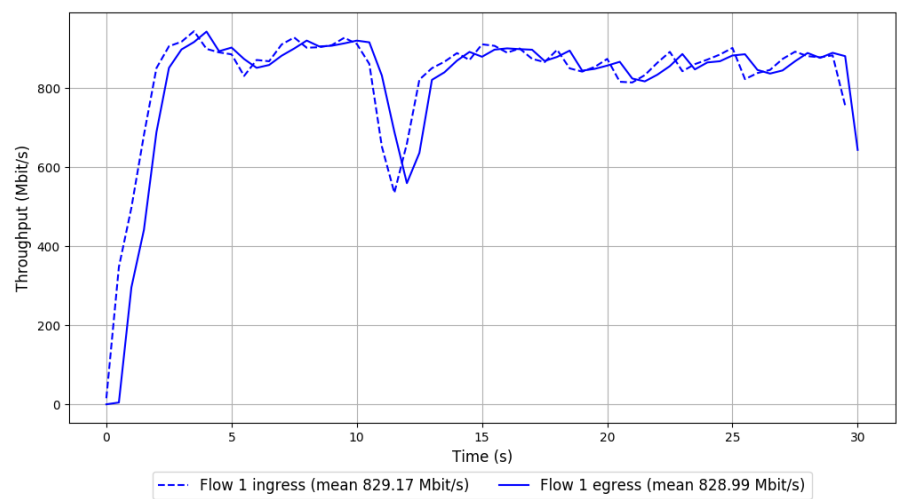
-- Flow 1:

Average throughput: 828.99 Mbit/s

95th percentile per-packet one-way delay: 75.116 ms

Loss rate: 0.45%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 11:23:40

End at: 2018-09-03 11:24:10

Local clock offset: 0.421 ms

Remote clock offset: 0.695 ms

Below is generated by plot.py at 2018-09-03 11:40:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 824.55 Mbit/s

95th percentile per-packet one-way delay: 73.408 ms

Loss rate: 0.46%

-- Flow 1:

Average throughput: 824.55 Mbit/s

95th percentile per-packet one-way delay: 73.408 ms

Loss rate: 0.46%

Run 2: Report of Muses-25 — Data Link

