

Pantheon Report

Generated at 2018-08-28 14:29:03 (UTC).

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

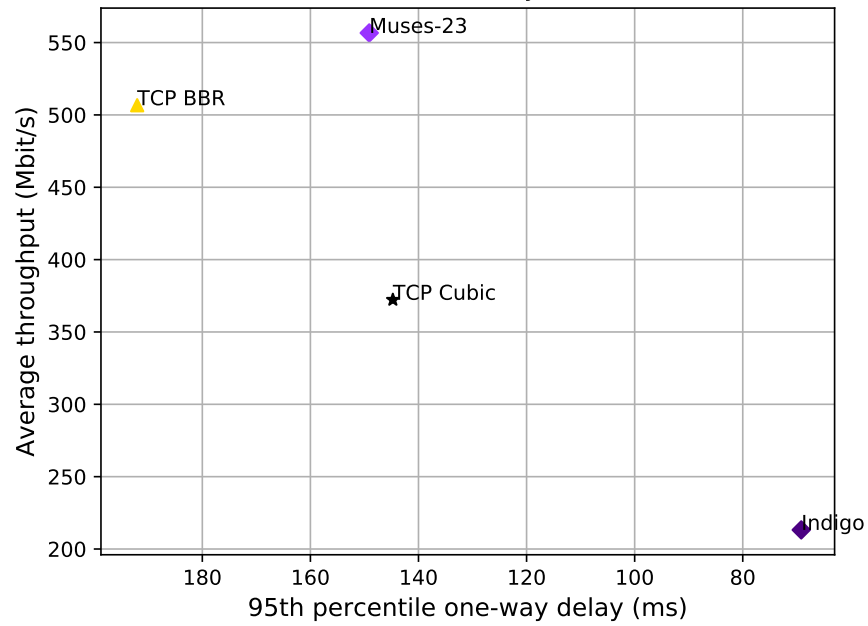
System info:

```
Linux 4.15.0-1017-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
```

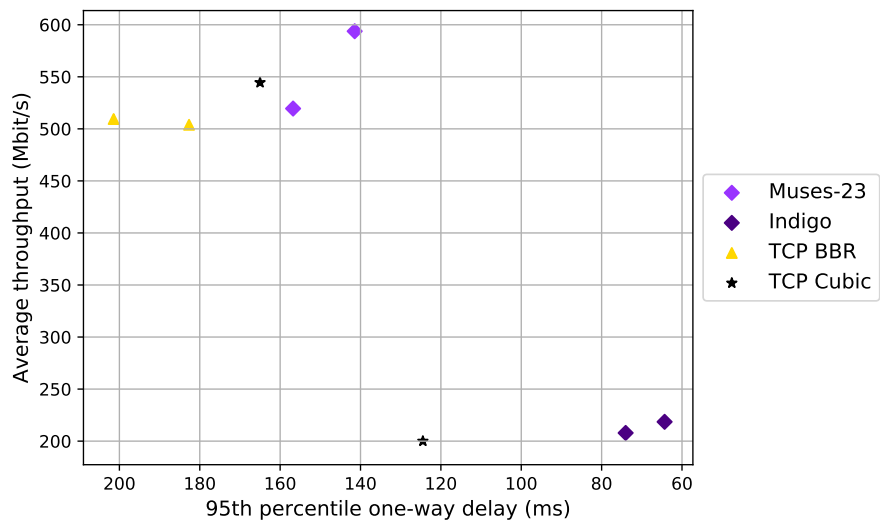
Git summary:

```
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 @ cbfce6db5ff5740dafe1771f813cd646339e1952
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 Iowa to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE Iowa to GCE Tokyo, 2 runs of 30s each per scheme



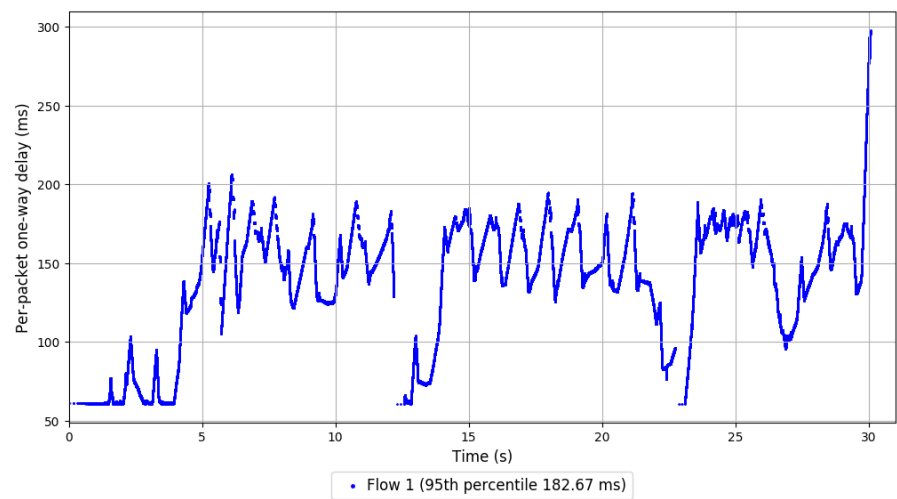
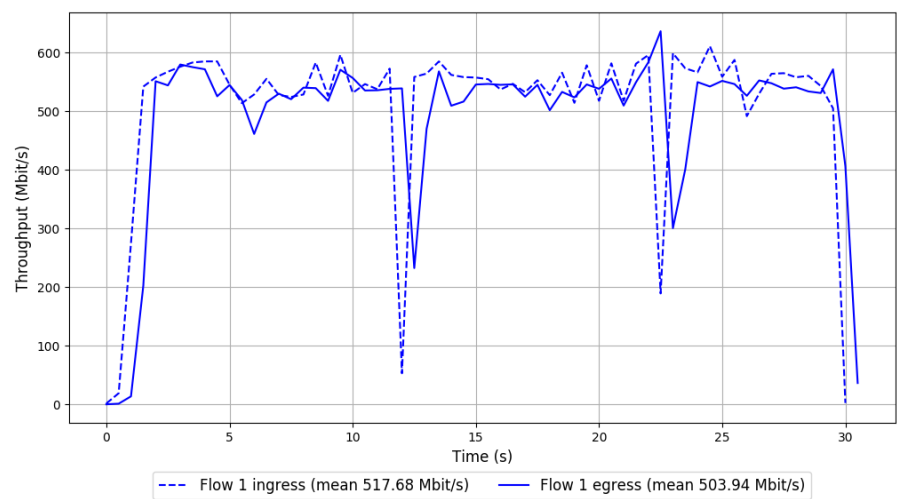
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	506.70	192.05	2.65
TCP Cubic	2	372.23	144.74	0.10
Indigo	2	213.20	69.18	0.01
Muses-23	2	556.65	149.11	7.49

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 14:10:12
End at: 2018-08-28 14:10:42
Local clock offset: -0.068 ms
Remote clock offset: -0.144 ms

Below is generated by plot.py at 2018-08-28 14:27:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 503.94 Mbit/s
95th percentile per-packet one-way delay: 182.669 ms
Loss rate: 2.65%
-- Flow 1:
Average throughput: 503.94 Mbit/s
95th percentile per-packet one-way delay: 182.669 ms
Loss rate: 2.65%

Run 1: Report of TCP BBR — Data Link

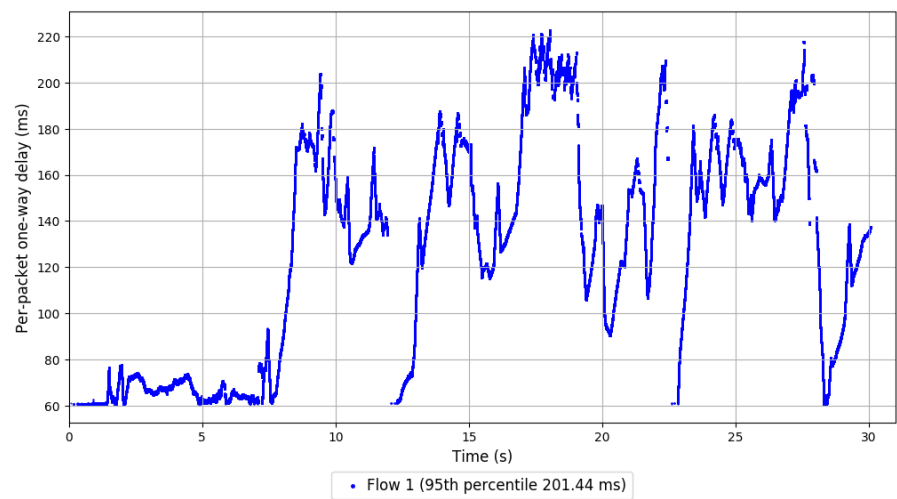
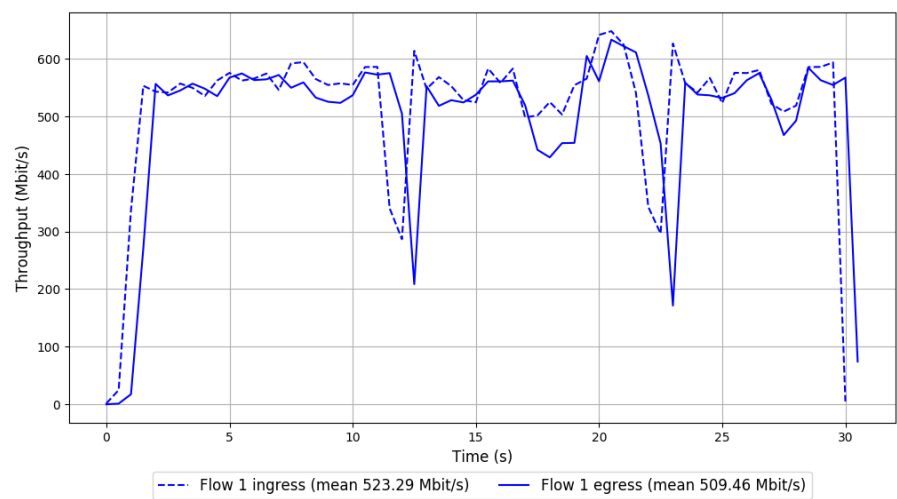


Run 2: Statistics of TCP BBR

Start at: 2018-08-28 14:16:00
End at: 2018-08-28 14:16:30
Local clock offset: -0.142 ms
Remote clock offset: -0.249 ms

Below is generated by plot.py at 2018-08-28 14:27:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 509.46 Mbit/s
95th percentile per-packet one-way delay: 201.435 ms
Loss rate: 2.64%
-- Flow 1:
Average throughput: 509.46 Mbit/s
95th percentile per-packet one-way delay: 201.435 ms
Loss rate: 2.64%

Run 2: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 14:11:44

End at: 2018-08-28 14:12:14

Local clock offset: -0.109 ms

Remote clock offset: -0.22 ms

Below is generated by plot.py at 2018-08-28 14:27:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 199.99 Mbit/s

95th percentile per-packet one-way delay: 124.484 ms

Loss rate: 0.01%

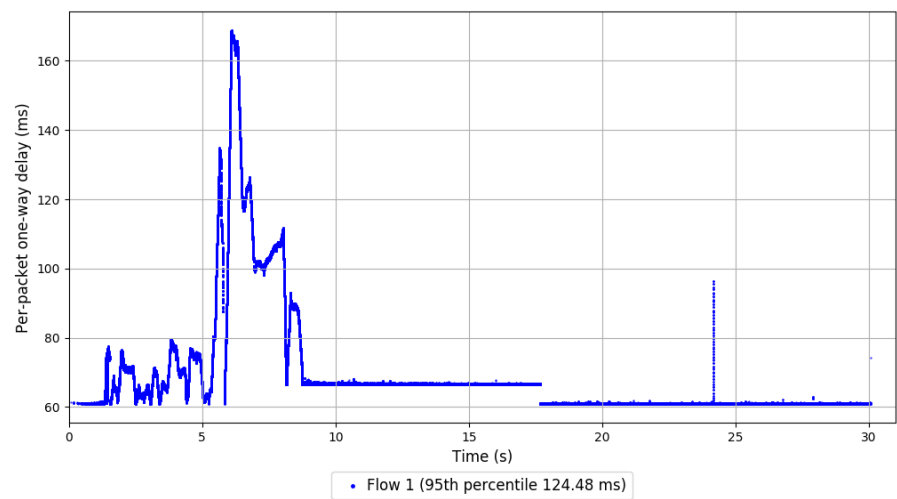
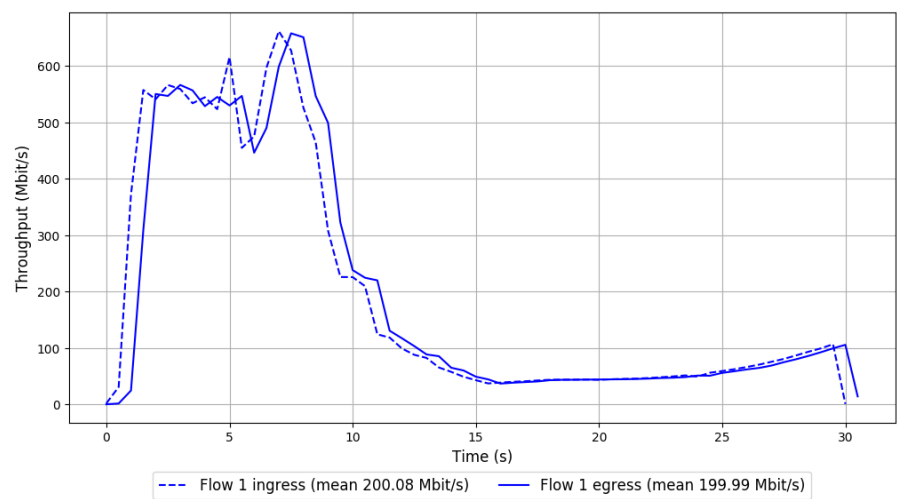
-- Flow 1:

Average throughput: 199.99 Mbit/s

95th percentile per-packet one-way delay: 124.484 ms

Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link

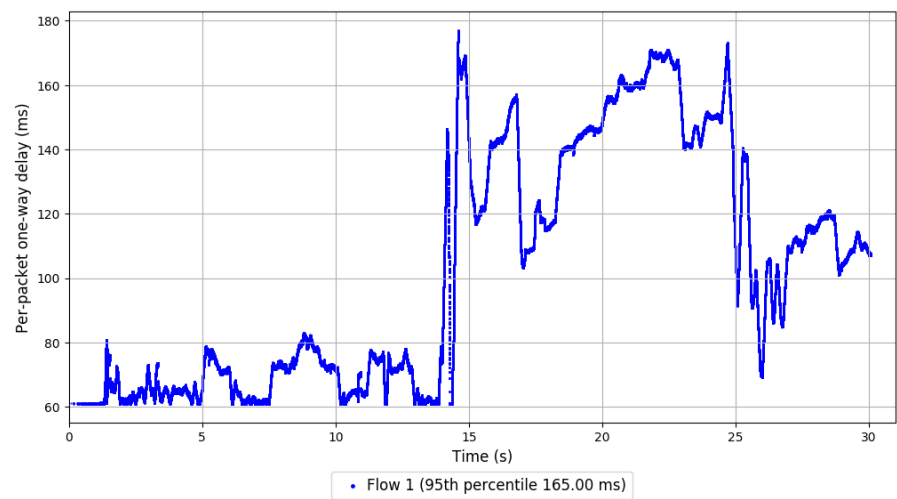
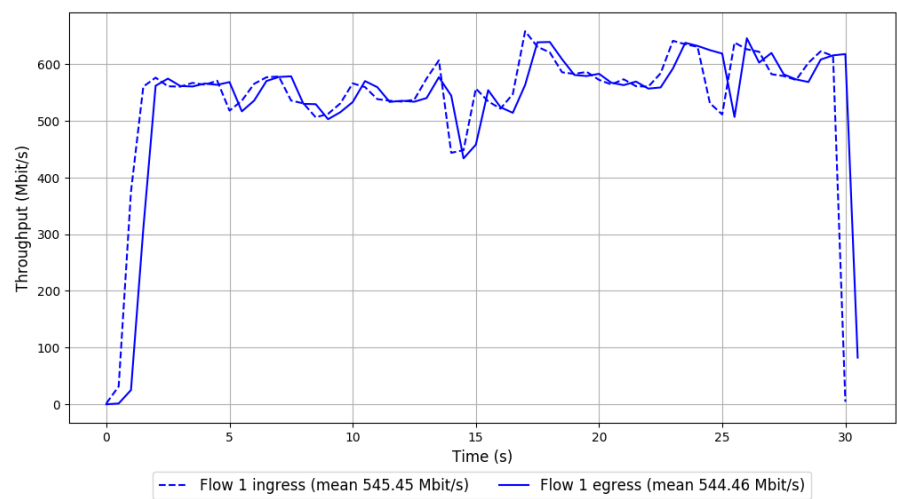


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 14:17:33
End at: 2018-08-28 14:18:03
Local clock offset: -0.117 ms
Remote clock offset: -0.235 ms

Below is generated by plot.py at 2018-08-28 14:27:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 544.46 Mbit/s
95th percentile per-packet one-way delay: 165.005 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 544.46 Mbit/s
95th percentile per-packet one-way delay: 165.005 ms
Loss rate: 0.18%

Run 2: Report of TCP Cubic — Data Link

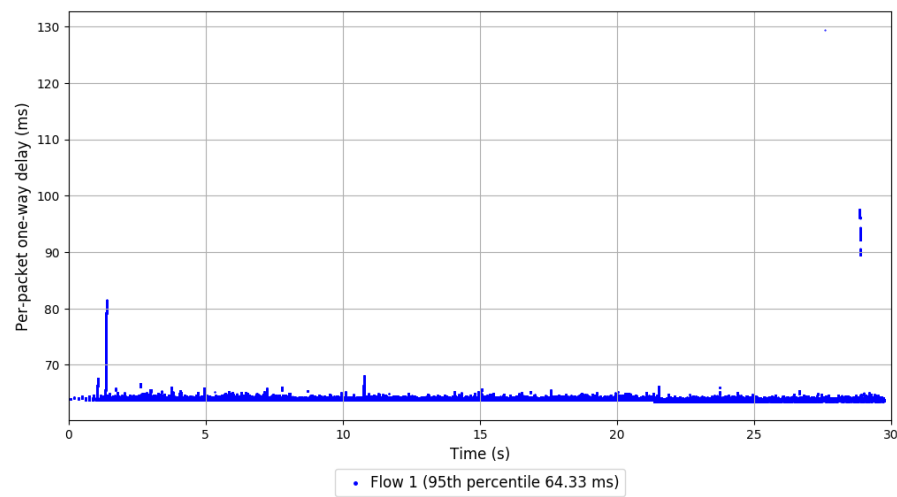
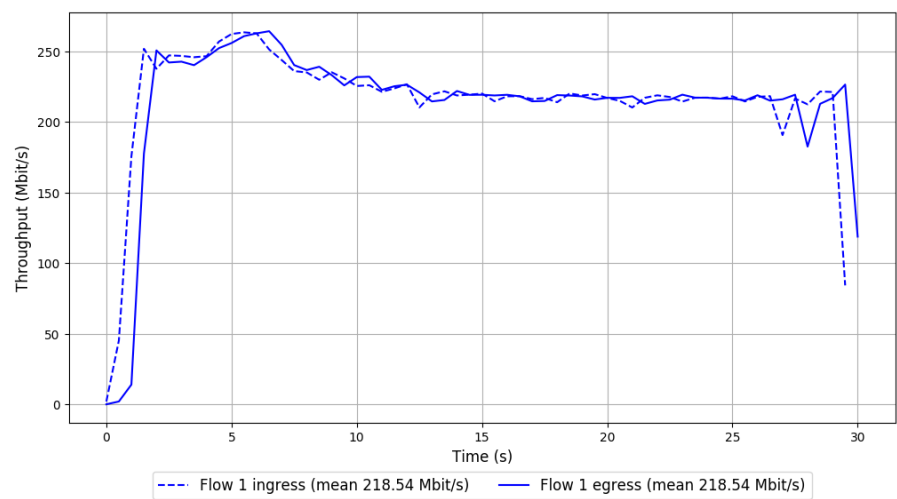


```
Run 1: Statistics of Indigo

Start at: 2018-08-28 14:13:00
End at: 2018-08-28 14:13:30
Local clock offset: -0.127 ms
Remote clock offset: 2.689 ms

# Below is generated by plot.py at 2018-08-28 14:27:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 218.54 Mbit/s
95th percentile per-packet one-way delay: 64.328 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 218.54 Mbit/s
95th percentile per-packet one-way delay: 64.328 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-28 14:19:05

End at: 2018-08-28 14:19:35

Local clock offset: -0.148 ms

Remote clock offset: -0.06 ms

Below is generated by plot.py at 2018-08-28 14:27:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 207.87 Mbit/s

95th percentile per-packet one-way delay: 74.023 ms

Loss rate: 0.03%

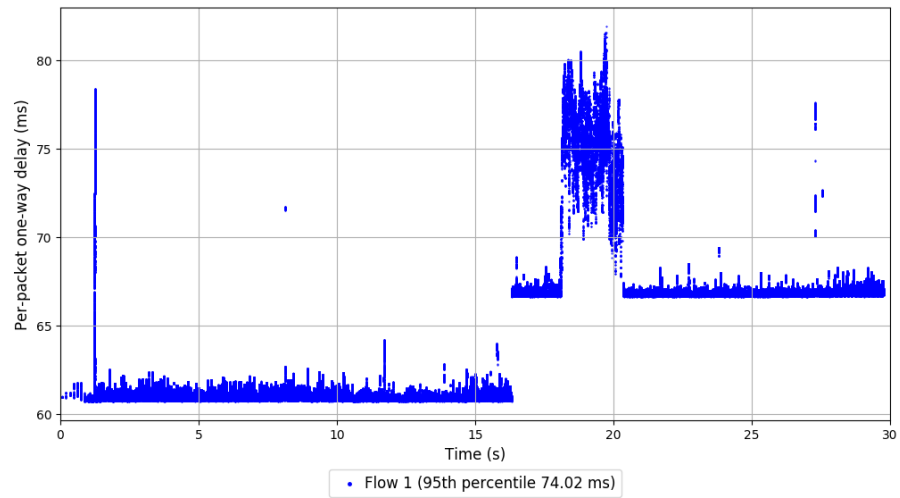
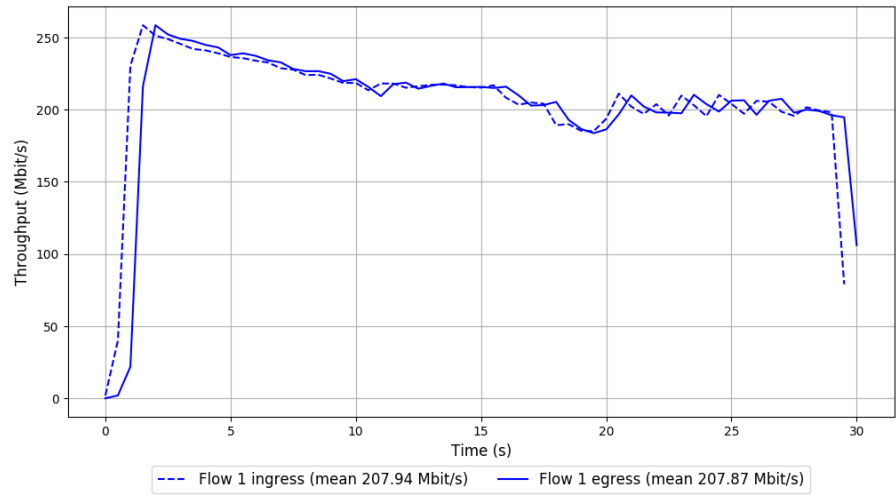
-- Flow 1:

Average throughput: 207.87 Mbit/s

95th percentile per-packet one-way delay: 74.023 ms

Loss rate: 0.03%

Run 2: Report of Indigo — Data Link

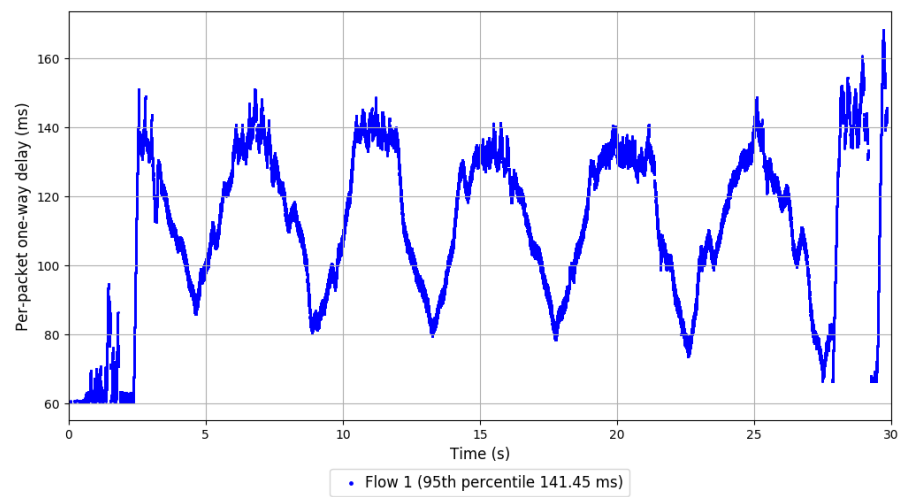
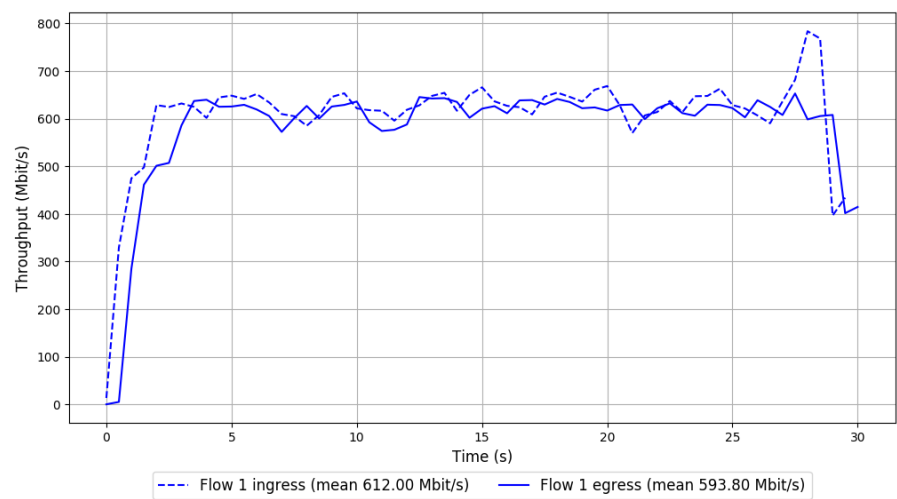


Run 1: Statistics of Muses-23

Start at: 2018-08-28 14:08:35
End at: 2018-08-28 14:09:05
Local clock offset: -0.078 ms
Remote clock offset: -0.305 ms

Below is generated by plot.py at 2018-08-28 14:29:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 593.80 Mbit/s
95th percentile per-packet one-way delay: 141.448 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 593.80 Mbit/s
95th percentile per-packet one-way delay: 141.448 ms
Loss rate: 2.97%

Run 1: Report of Muses-23 — Data Link



Run 2: Statistics of Muses-23

Start at: 2018-08-28 14:14:26
End at: 2018-08-28 14:14:56
Local clock offset: -0.165 ms
Remote clock offset: -0.238 ms

Below is generated by plot.py at 2018-08-28 14:29:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 519.50 Mbit/s
95th percentile per-packet one-way delay: 156.778 ms
Loss rate: 12.00%
-- Flow 1:
Average throughput: 519.50 Mbit/s
95th percentile per-packet one-way delay: 156.778 ms
Loss rate: 12.00%

Run 2: Report of Muses-23 — Data Link

