

Pantheon Report

Generated at 2018-08-28 06:43:05 (UTC).

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

Repeated the test of 4 congestion control schemes 3 times.

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.

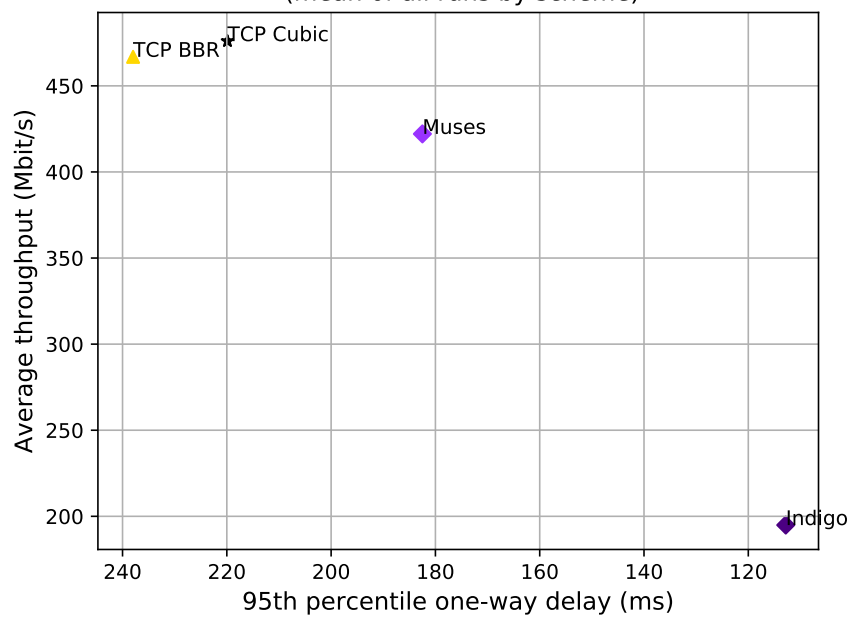
System info:

```
Linux 4.15.0-1015-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
```

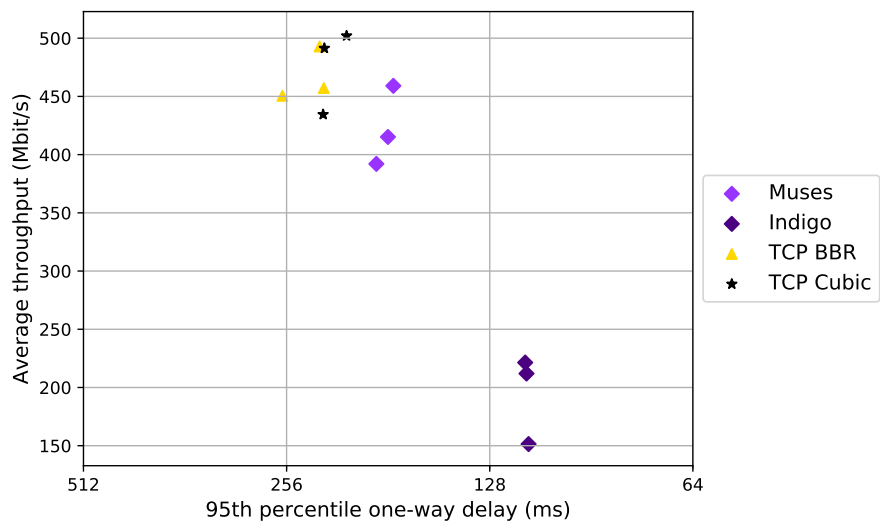
Git summary:

```
branch: muses @ 86ef433b09b2f4ecae1186d6940af93bcf0969cd
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e562f4
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 London to GCE Tokyo, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from GCE London to GCE Tokyo, 3 runs of 30s each per scheme



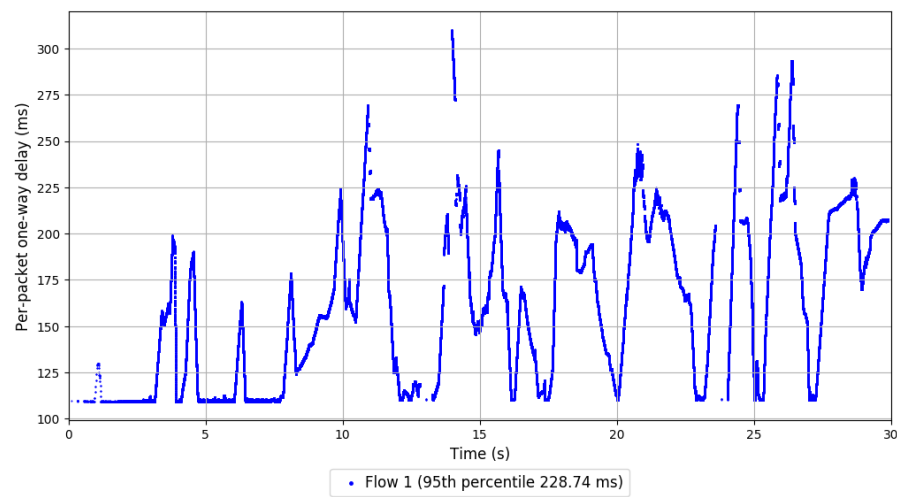
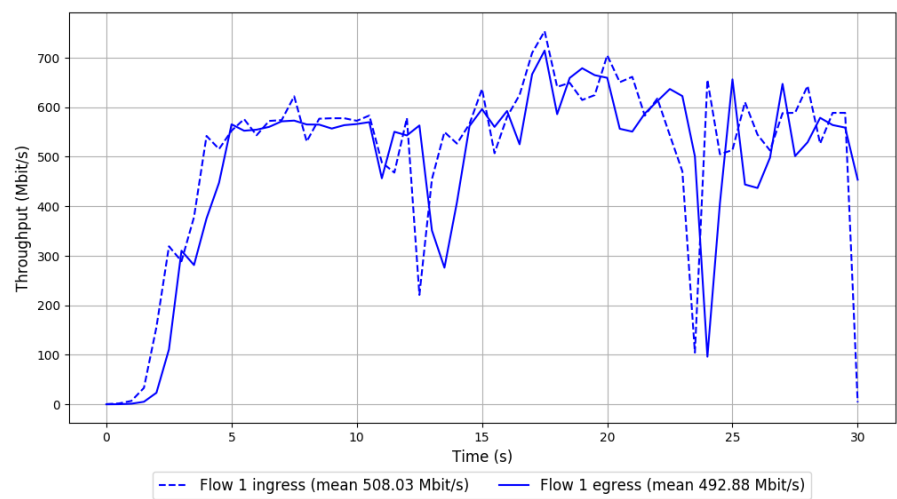
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	466.86	237.98	4.41
TCP Cubic	3	475.97	219.88	1.03
Indigo	3	194.92	112.82	0.84
Muses	3	422.09	182.50	2.85

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 06:11:55
End at: 2018-08-28 06:12:25
Local clock offset: -2.854 ms
Remote clock offset: -0.484 ms

Below is generated by plot.py at 2018-08-28 06:39:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 492.88 Mbit/s
95th percentile per-packet one-way delay: 228.740 ms
Loss rate: 3.71%
-- Flow 1:
Average throughput: 492.88 Mbit/s
95th percentile per-packet one-way delay: 228.740 ms
Loss rate: 3.71%

Run 1: Report of TCP BBR — Data Link

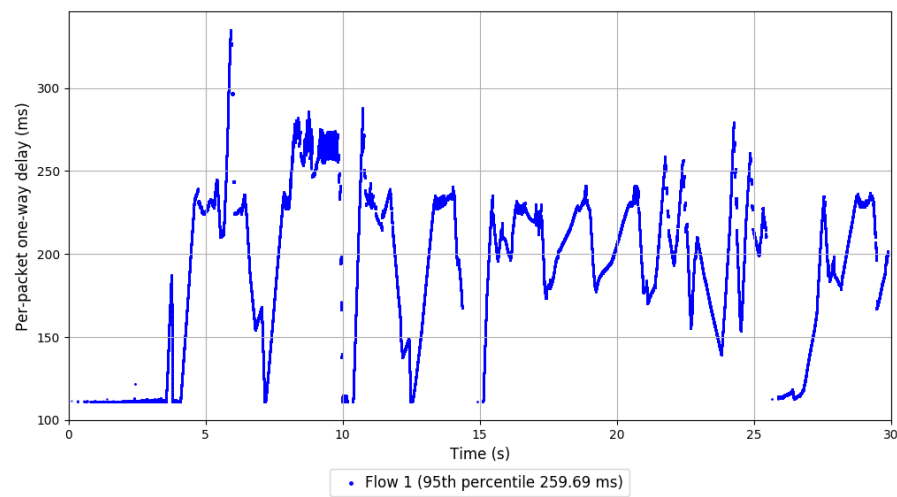
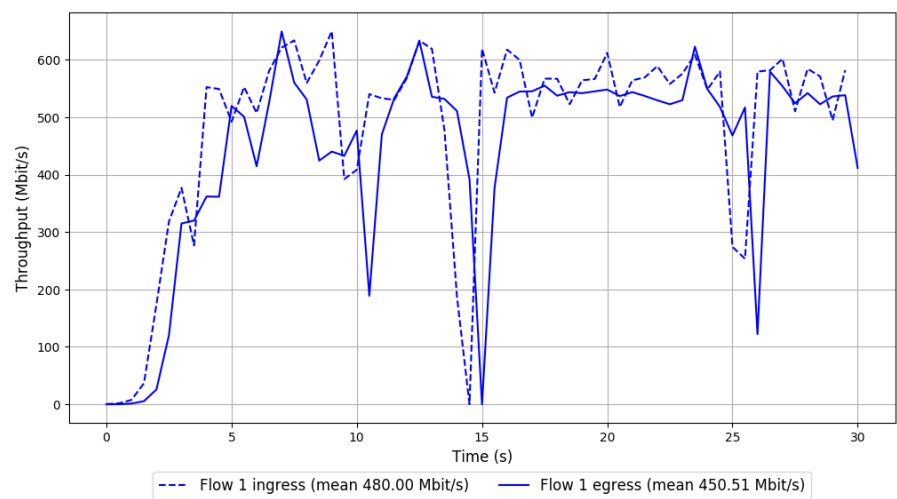


Run 2: Statistics of TCP BBR

Start at: 2018-08-28 06:18:07
End at: 2018-08-28 06:18:37
Local clock offset: -0.093 ms
Remote clock offset: -0.318 ms

Below is generated by plot.py at 2018-08-28 06:39:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 450.51 Mbit/s
95th percentile per-packet one-way delay: 259.689 ms
Loss rate: 6.84%
-- Flow 1:
Average throughput: 450.51 Mbit/s
95th percentile per-packet one-way delay: 259.689 ms
Loss rate: 6.84%

Run 2: Report of TCP BBR — Data Link

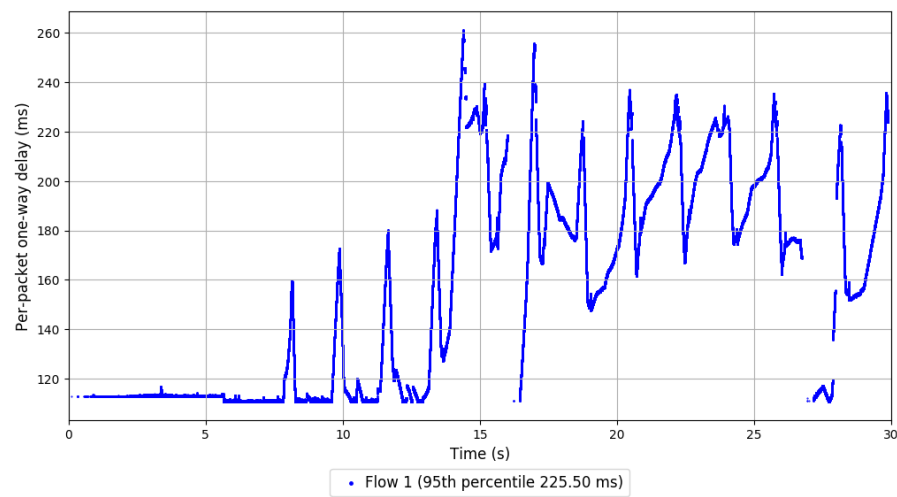
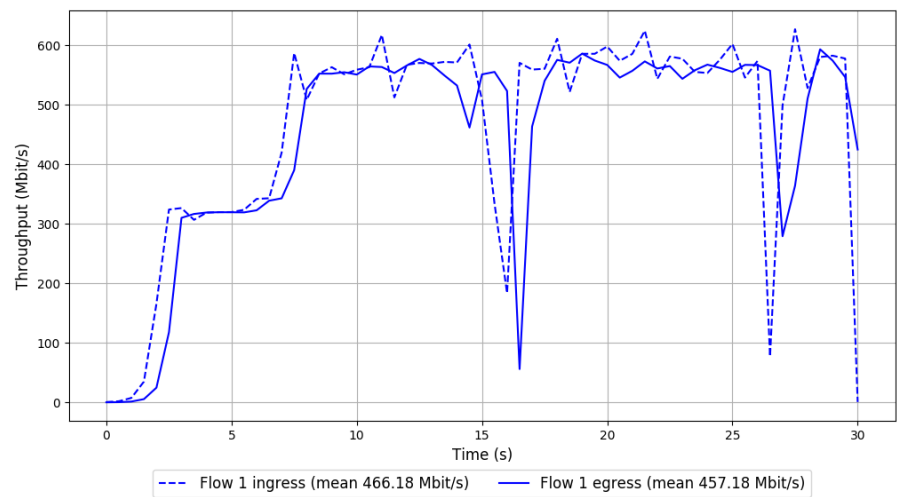


Run 3: Statistics of TCP BBR

Start at: 2018-08-28 06:24:20
End at: 2018-08-28 06:24:50
Local clock offset: -0.08 ms
Remote clock offset: -0.181 ms

Below is generated by plot.py at 2018-08-28 06:39:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 457.18 Mbit/s
95th percentile per-packet one-way delay: 225.501 ms
Loss rate: 2.67%
-- Flow 1:
Average throughput: 457.18 Mbit/s
95th percentile per-packet one-way delay: 225.501 ms
Loss rate: 2.67%

Run 3: Report of TCP BBR — Data Link

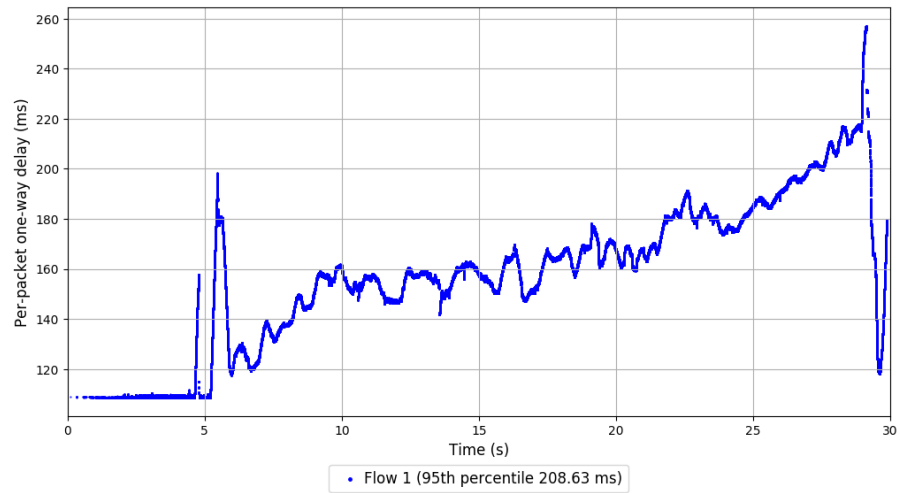
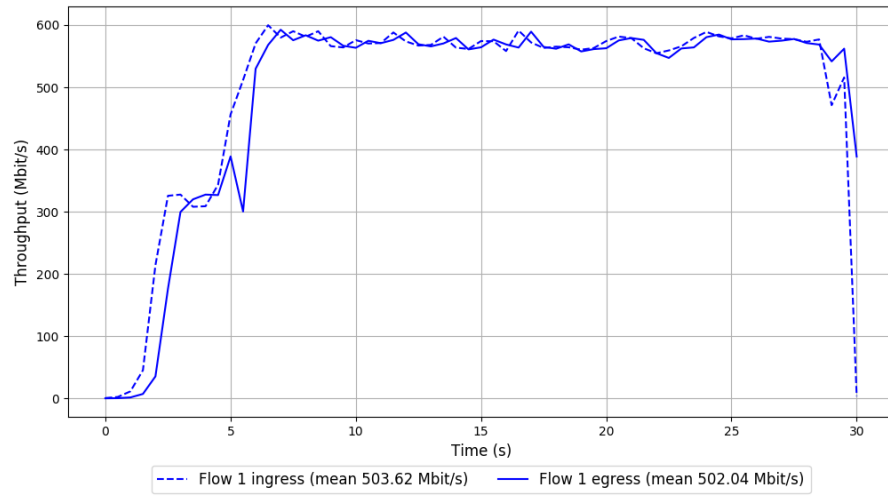


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 06:14:57
End at: 2018-08-28 06:15:27
Local clock offset: -2.92 ms
Remote clock offset: -0.328 ms

Below is generated by plot.py at 2018-08-28 06:39:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 502.04 Mbit/s
95th percentile per-packet one-way delay: 208.629 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 502.04 Mbit/s
95th percentile per-packet one-way delay: 208.629 ms
Loss rate: 1.05%

Run 1: Report of TCP Cubic — Data Link

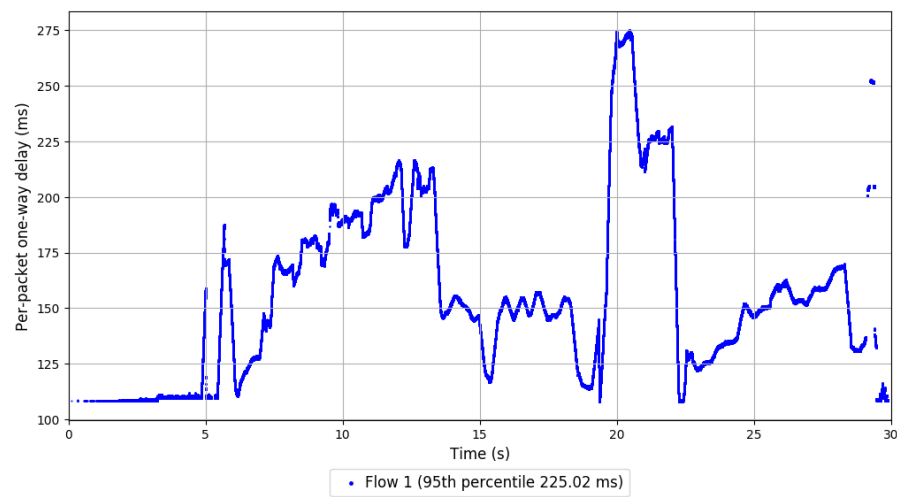
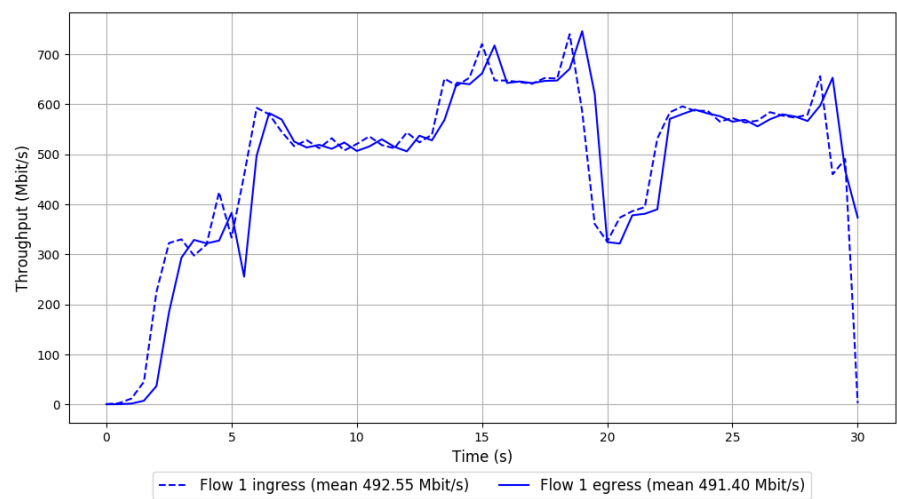


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 06:21:13
End at: 2018-08-28 06:21:43
Local clock offset: -2.926 ms
Remote clock offset: -0.203 ms

Below is generated by plot.py at 2018-08-28 06:39:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 491.40 Mbit/s
95th percentile per-packet one-way delay: 225.021 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 491.40 Mbit/s
95th percentile per-packet one-way delay: 225.021 ms
Loss rate: 0.97%

Run 2: Report of TCP Cubic — Data Link

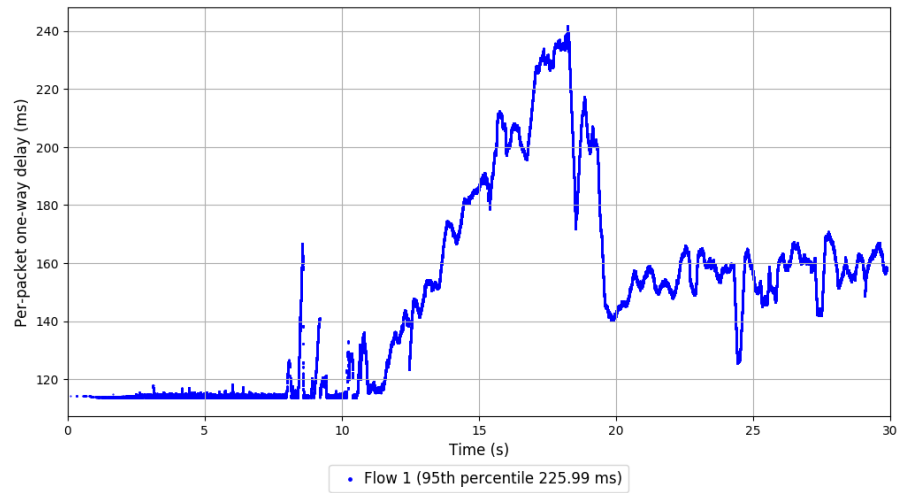
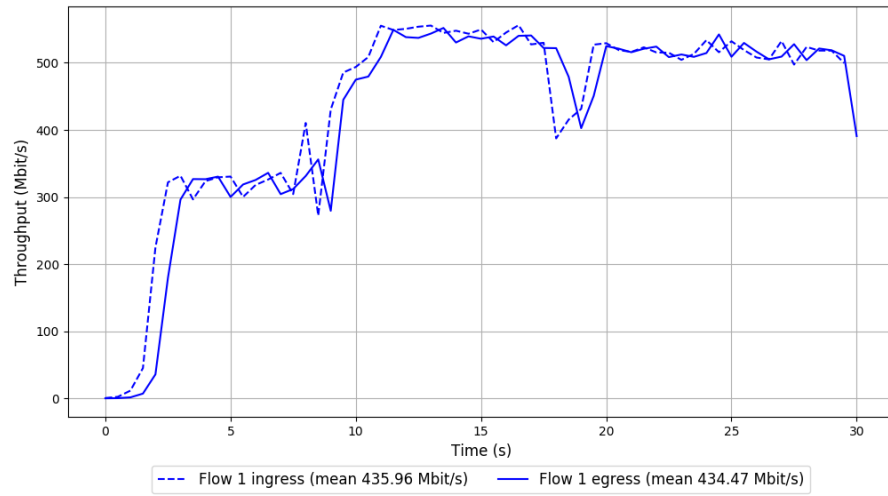


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 06:27:25
End at: 2018-08-28 06:27:55
Local clock offset: 2.693 ms
Remote clock offset: -0.431 ms

Below is generated by plot.py at 2018-08-28 06:39:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 434.47 Mbit/s
95th percentile per-packet one-way delay: 225.987 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 434.47 Mbit/s
95th percentile per-packet one-way delay: 225.987 ms
Loss rate: 1.08%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-28 06:13:34

End at: 2018-08-28 06:14:04

Local clock offset: -0.02 ms

Remote clock offset: -0.271 ms

Below is generated by plot.py at 2018-08-28 06:39:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 151.39 Mbit/s

95th percentile per-packet one-way delay: 112.120 ms

Loss rate: 1.07%

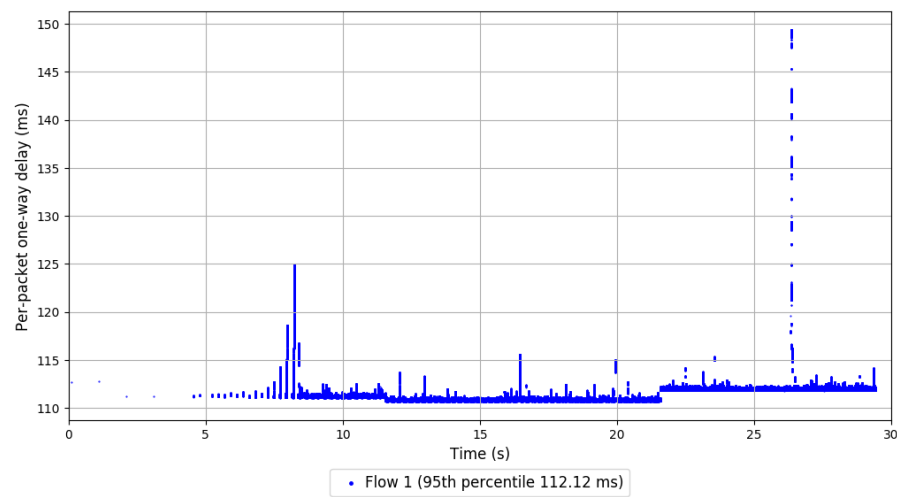
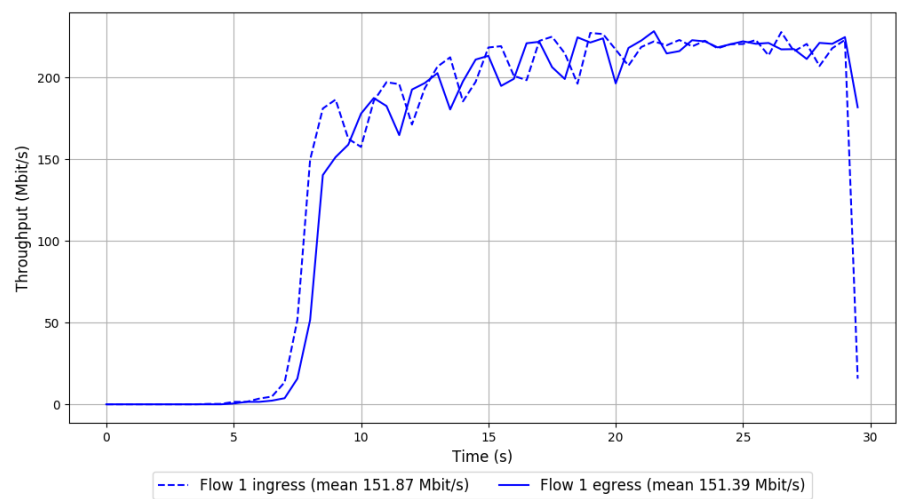
-- Flow 1:

Average throughput: 151.39 Mbit/s

95th percentile per-packet one-way delay: 112.120 ms

Loss rate: 1.07%

Run 1: Report of Indigo — Data Link

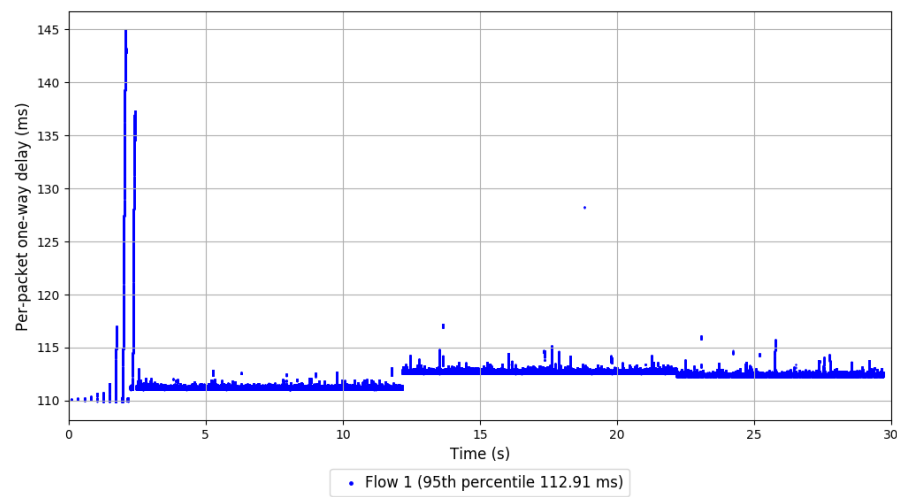
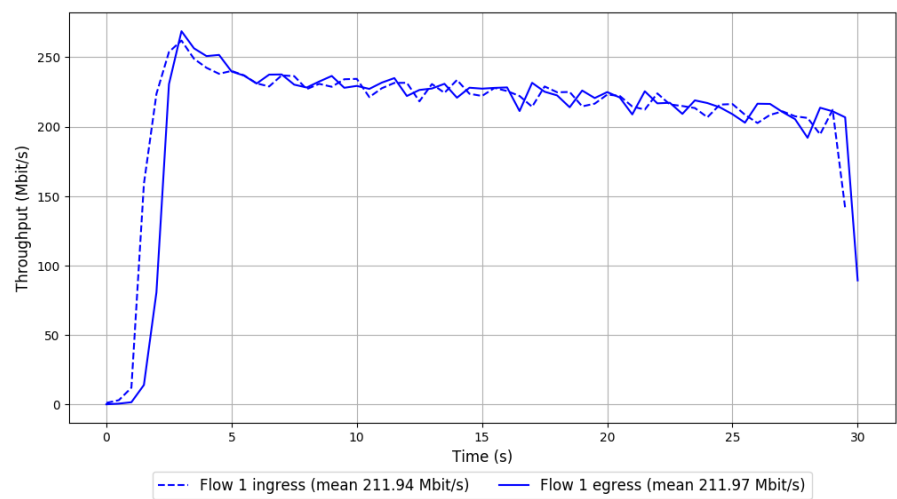


Run 2: Statistics of Indigo

Start at: 2018-08-28 06:19:43
End at: 2018-08-28 06:20:14
Local clock offset: -0.113 ms
Remote clock offset: -0.208 ms

Below is generated by plot.py at 2018-08-28 06:39:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 211.97 Mbit/s
95th percentile per-packet one-way delay: 112.910 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 211.97 Mbit/s
95th percentile per-packet one-way delay: 112.910 ms
Loss rate: 0.73%

Run 2: Report of Indigo — Data Link

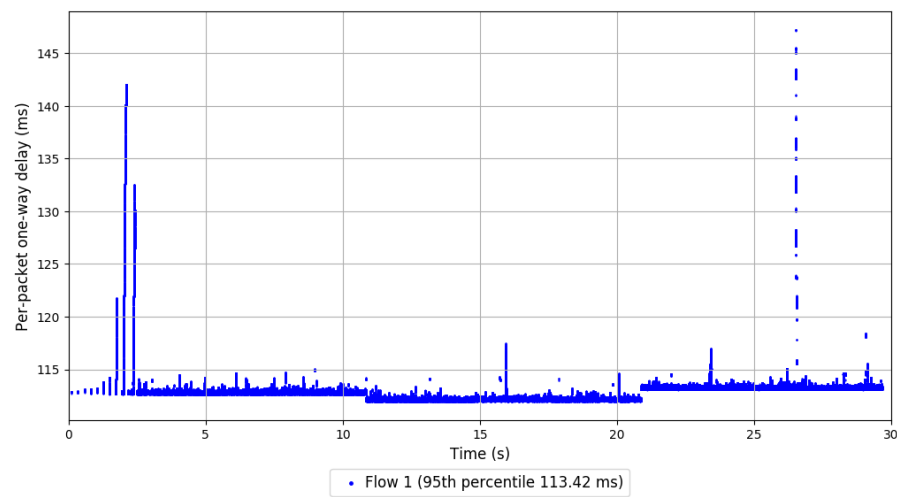
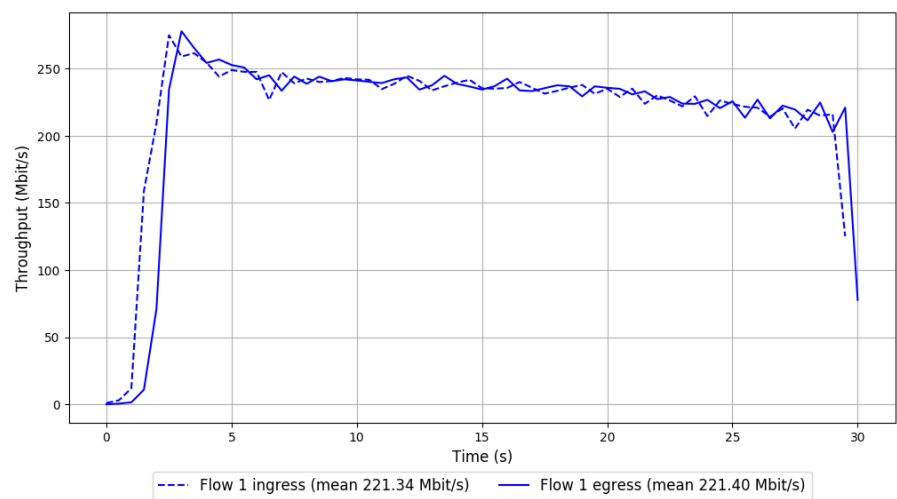


Run 3: Statistics of Indigo

Start at: 2018-08-28 06:25:55
End at: 2018-08-28 06:26:25
Local clock offset: -0.032 ms
Remote clock offset: -0.543 ms

Below is generated by plot.py at 2018-08-28 06:41:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 221.40 Mbit/s
95th percentile per-packet one-way delay: 113.421 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 221.40 Mbit/s
95th percentile per-packet one-way delay: 113.421 ms
Loss rate: 0.73%

Run 3: Report of Indigo — Data Link

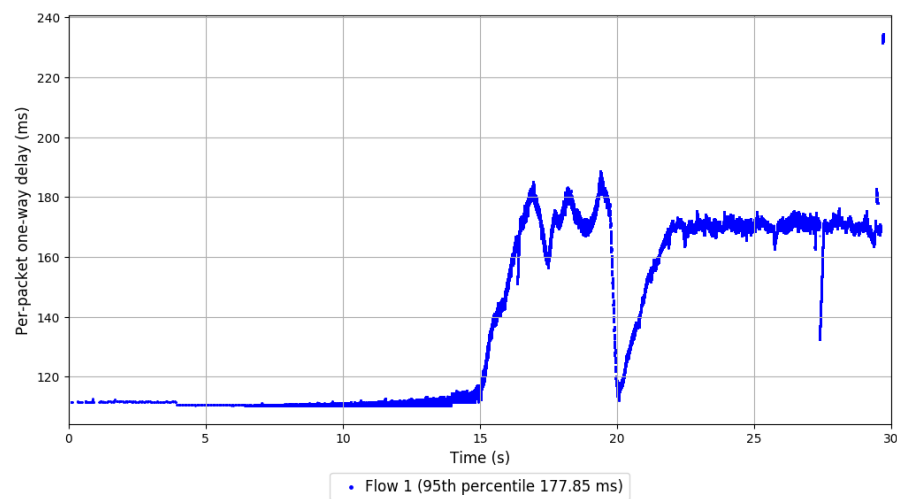
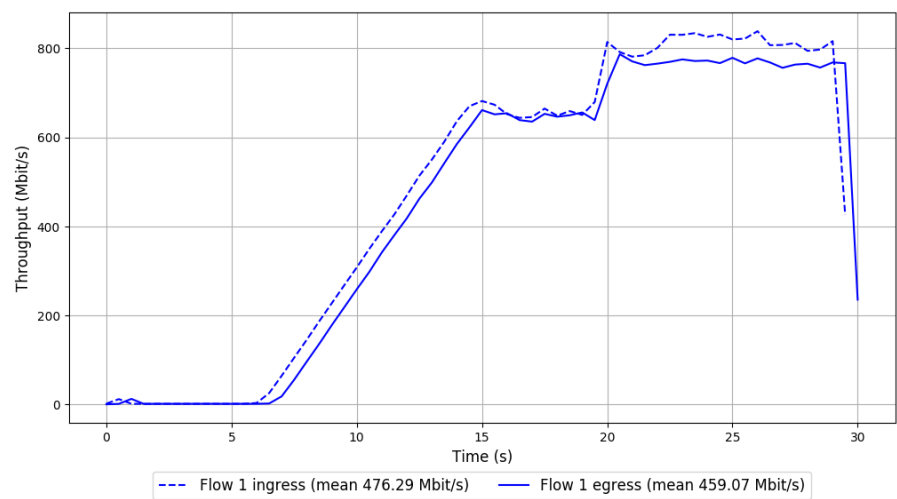


Run 1: Statistics of Muses

Start at: 2018-08-28 06:16:32
End at: 2018-08-28 06:17:02
Local clock offset: -0.063 ms
Remote clock offset: -0.286 ms

Below is generated by plot.py at 2018-08-28 06:43:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 459.07 Mbit/s
95th percentile per-packet one-way delay: 177.850 ms
Loss rate: 4.34%
-- Flow 1:
Average throughput: 459.07 Mbit/s
95th percentile per-packet one-way delay: 177.850 ms
Loss rate: 4.34%

Run 1: Report of Muses — Data Link

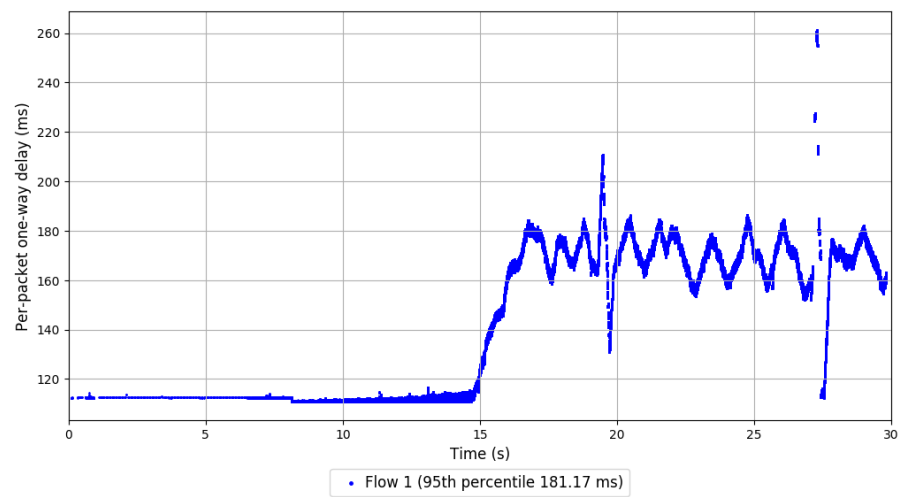
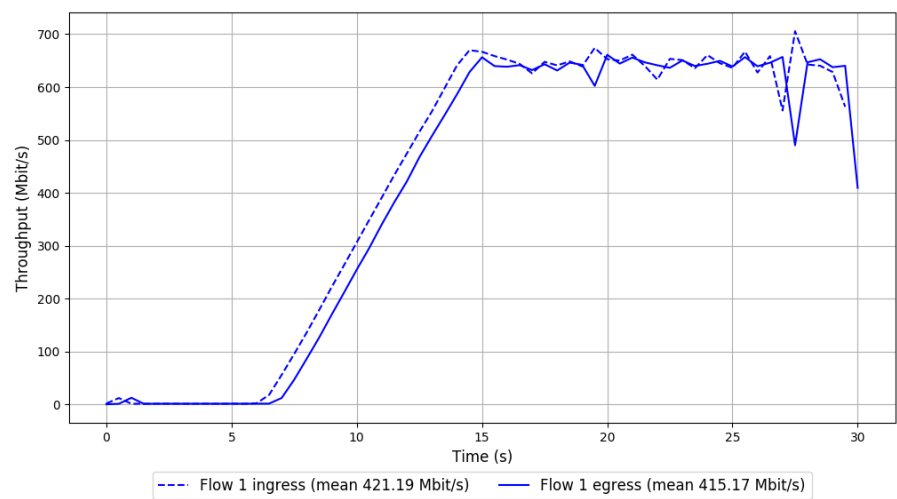


Run 2: Statistics of Muses

Start at: 2018-08-28 06:22:48
End at: 2018-08-28 06:23:18
Local clock offset: -0.122 ms
Remote clock offset: -0.275 ms

Below is generated by plot.py at 2018-08-28 06:43:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 415.17 Mbit/s
95th percentile per-packet one-way delay: 181.168 ms
Loss rate: 2.17%
-- Flow 1:
Average throughput: 415.17 Mbit/s
95th percentile per-packet one-way delay: 181.168 ms
Loss rate: 2.17%

Run 2: Report of Muses — Data Link



Run 3: Statistics of Muses

Start at: 2018-08-28 06:28:57

End at: 2018-08-28 06:29:27

Local clock offset: 2.688 ms

Remote clock offset: -0.22 ms

Below is generated by plot.py at 2018-08-28 06:43:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 392.03 Mbit/s

95th percentile per-packet one-way delay: 188.468 ms

Loss rate: 2.04%

-- Flow 1:

Average throughput: 392.03 Mbit/s

95th percentile per-packet one-way delay: 188.468 ms

Loss rate: 2.04%

Run 3: Report of Muses — Data Link

