

Pantheon Report

Generated at 2018-08-28 09:04:21 (UTC).

Data path: AWS California 1 on **ens5** (*local*) → Stanford on **eno1** (*remote*).

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.stanford.edu** and have been applied to correct the timestamps in logs.

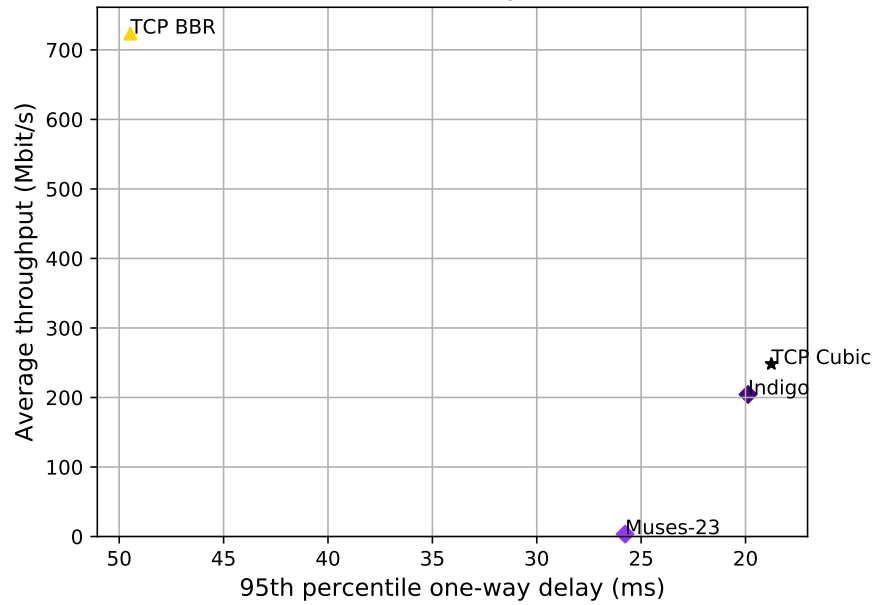
System info:

```
Linux 4.15.0-1020-aws
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
```

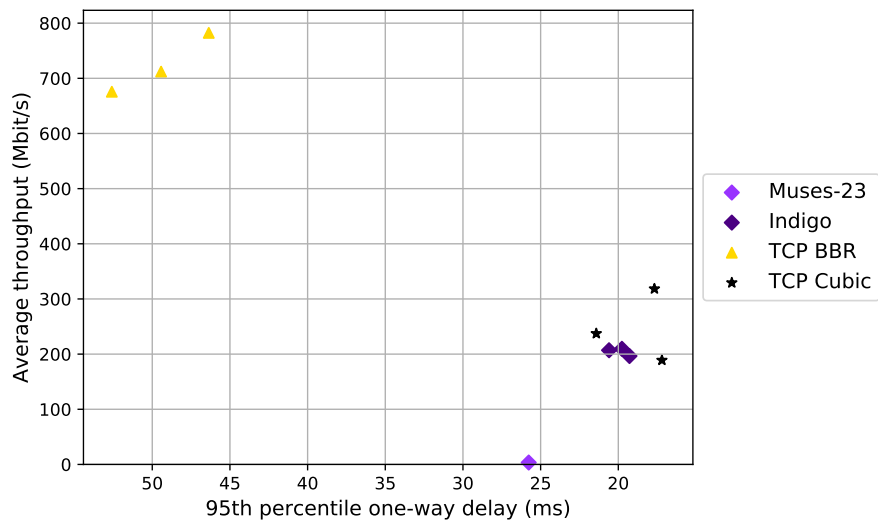
Git summary:

```
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 @ cbfce6db5ff5740dafa1771f813cd646339e1952
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 AWS California 1 to Stanford, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS California 1 to Stanford, 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	723.40	49.47	0.57
TCP Cubic	3	248.20	18.76	0.02
Indigo	3	204.38	19.88	0.01
Muses-23	1	3.43	25.77	99.28

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 08:43:04

End at: 2018-08-28 08:43:34

Local clock offset: -6.914 ms

Remote clock offset: 4.017 ms

Below is generated by plot.py at 2018-08-28 09:04:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 675.70 Mbit/s

95th percentile per-packet one-way delay: 52.603 ms

Loss rate: 0.16%

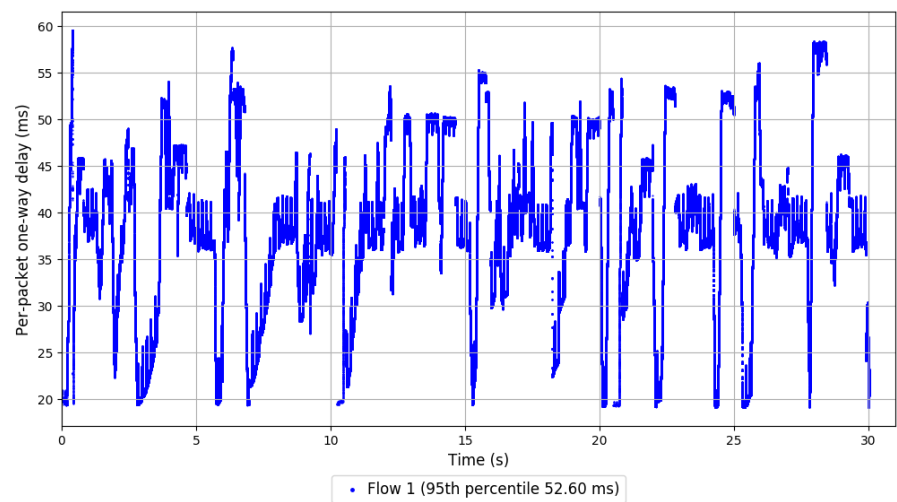
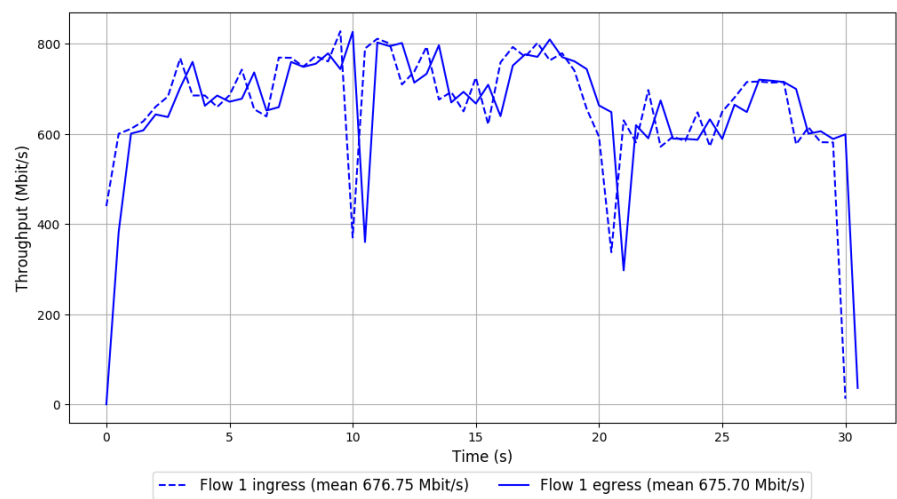
-- Flow 1:

Average throughput: 675.70 Mbit/s

95th percentile per-packet one-way delay: 52.603 ms

Loss rate: 0.16%

Run 1: Report of TCP BBR — Data Link

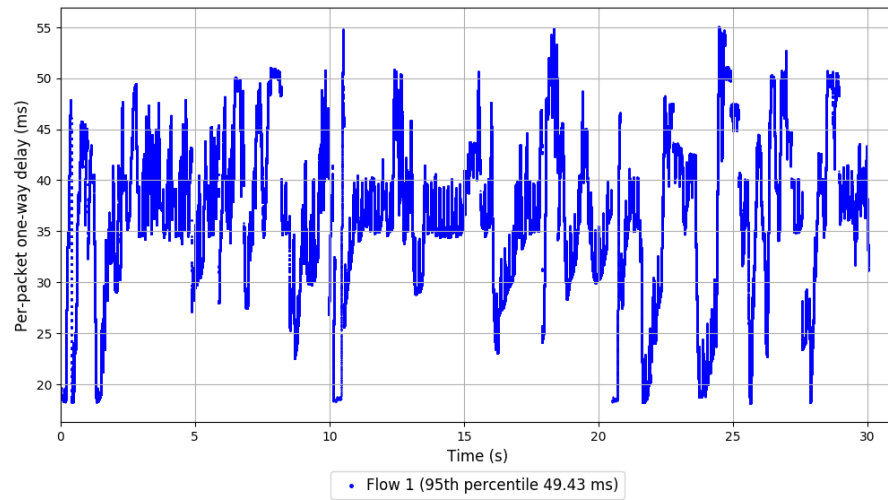
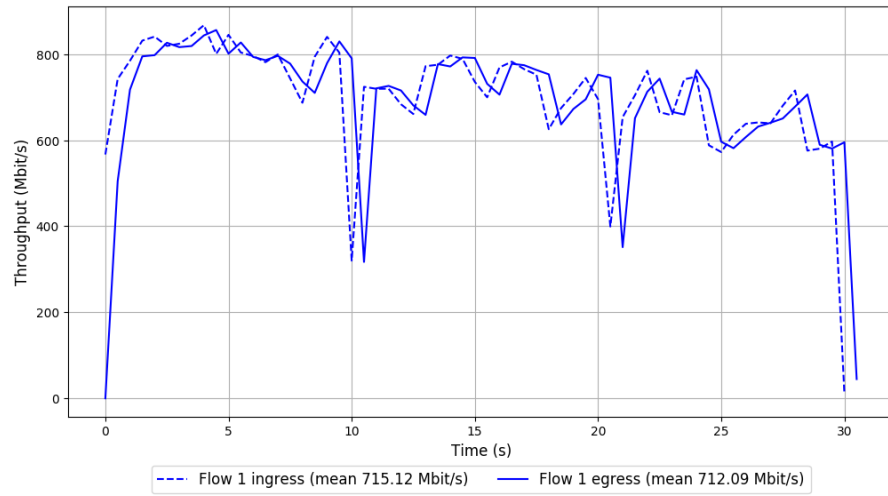


Run 2: Statistics of TCP BBR

Start at: 2018-08-28 08:48:52
End at: 2018-08-28 08:49:22
Local clock offset: -12.073 ms
Remote clock offset: 3.605 ms

Below is generated by plot.py at 2018-08-28 09:04:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 712.09 Mbit/s
95th percentile per-packet one-way delay: 49.431 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 712.09 Mbit/s
95th percentile per-packet one-way delay: 49.431 ms
Loss rate: 0.43%

Run 2: Report of TCP BBR — Data Link

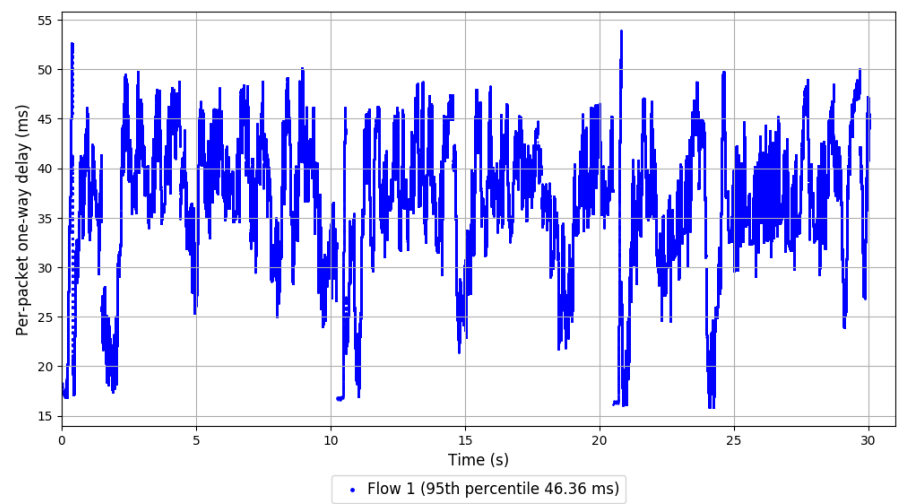
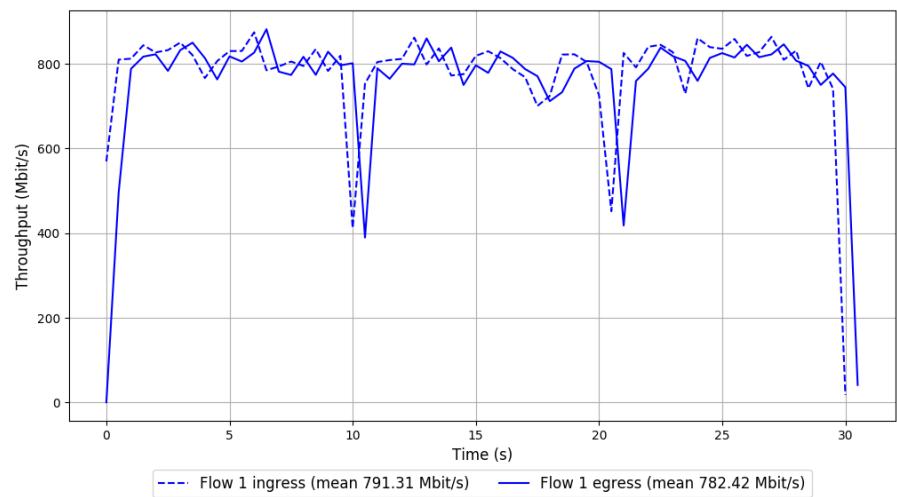


Run 3: Statistics of TCP BBR

Start at: 2018-08-28 08:54:45
End at: 2018-08-28 08:55:15
Local clock offset: -20.917 ms
Remote clock offset: 3.468 ms

Below is generated by plot.py at 2018-08-28 09:04:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 782.42 Mbit/s
95th percentile per-packet one-way delay: 46.362 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 782.42 Mbit/s
95th percentile per-packet one-way delay: 46.362 ms
Loss rate: 1.13%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 08:44:43

End at: 2018-08-28 08:45:13

Local clock offset: -7.435 ms

Remote clock offset: 3.786 ms

Below is generated by plot.py at 2018-08-28 09:04:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 188.96 Mbit/s

95th percentile per-packet one-way delay: 17.193 ms

Loss rate: 0.02%

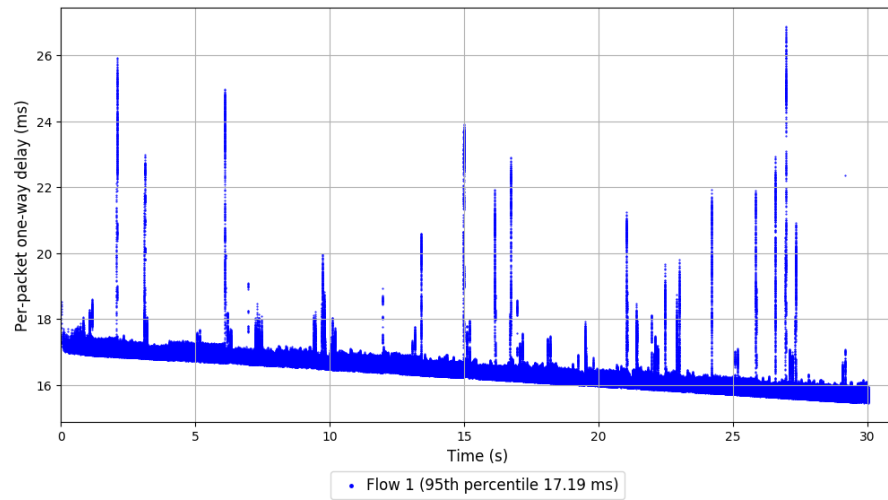
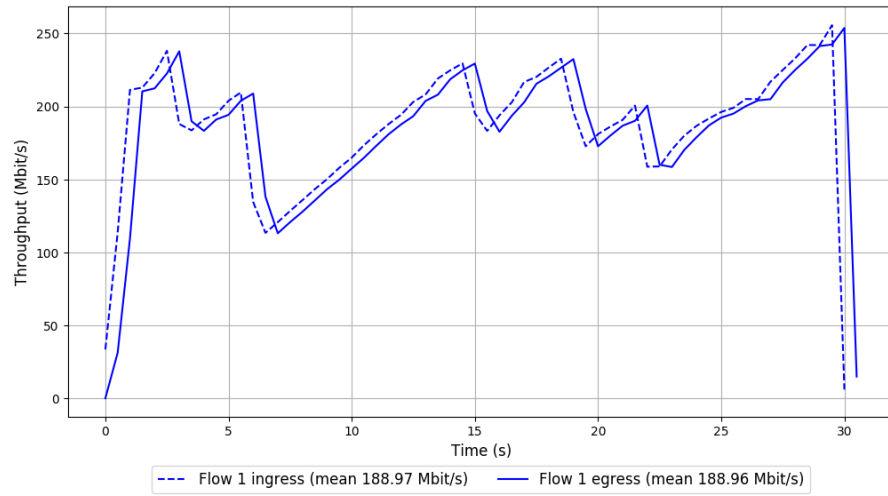
-- Flow 1:

Average throughput: 188.96 Mbit/s

95th percentile per-packet one-way delay: 17.193 ms

Loss rate: 0.02%

Run 1: Report of TCP Cubic — Data Link

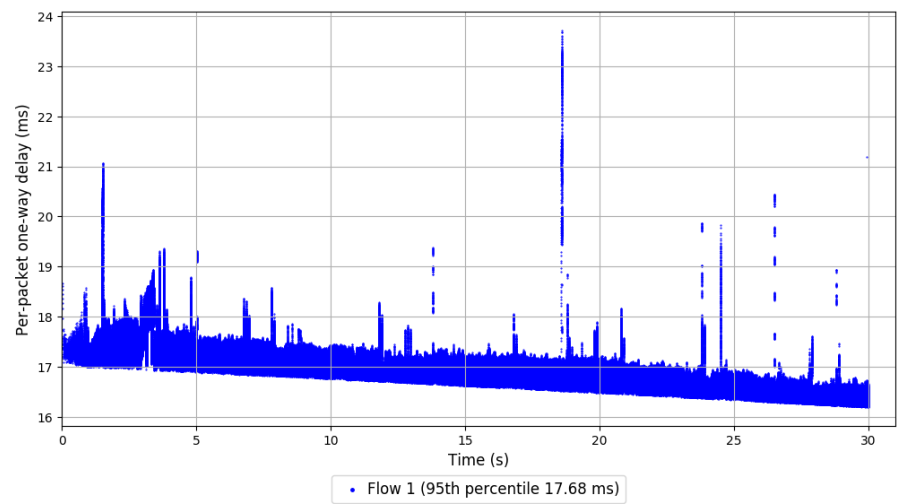
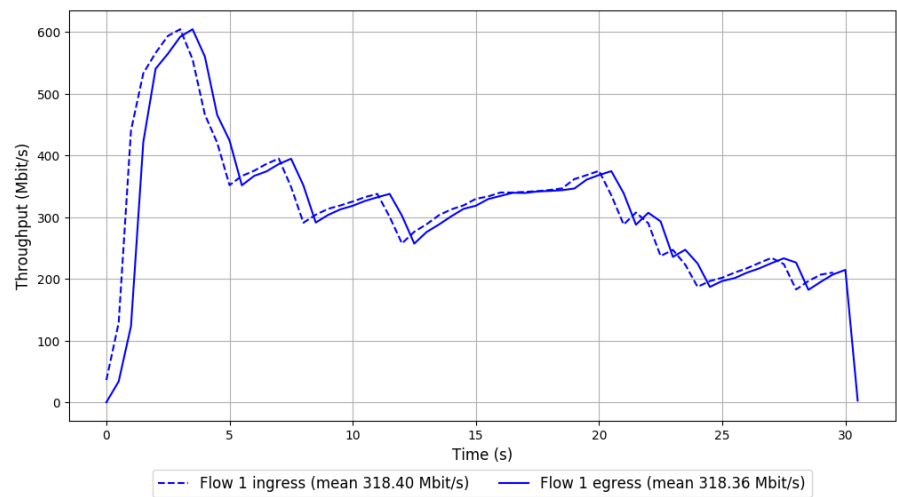


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 08:50:33
End at: 2018-08-28 08:51:03
Local clock offset: -12.344 ms
Remote clock offset: 3.564 ms

Below is generated by plot.py at 2018-08-28 09:04:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 318.36 Mbit/s
95th percentile per-packet one-way delay: 17.675 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 318.36 Mbit/s
95th percentile per-packet one-way delay: 17.675 ms
Loss rate: 0.02%

Run 2: Report of TCP Cubic — Data Link

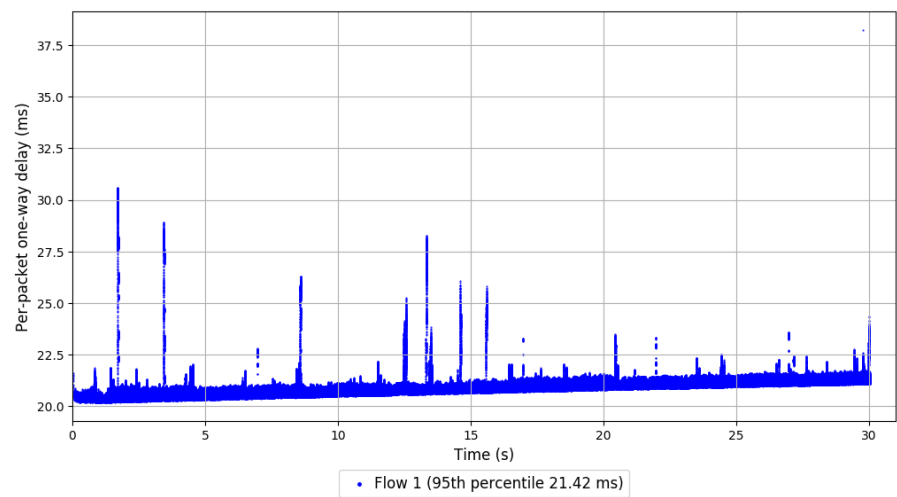
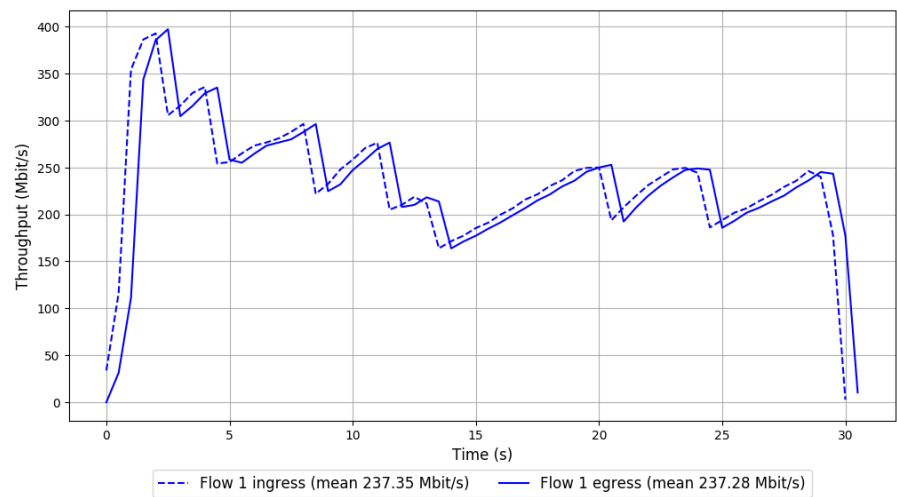


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 08:56:29
End at: 2018-08-28 08:56:59
Local clock offset: -21.964 ms
Remote clock offset: 3.545 ms

Below is generated by plot.py at 2018-08-28 09:04:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 237.28 Mbit/s
95th percentile per-packet one-way delay: 21.417 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 237.28 Mbit/s
95th percentile per-packet one-way delay: 21.417 ms
Loss rate: 0.03%

Run 3: Report of TCP Cubic — Data Link

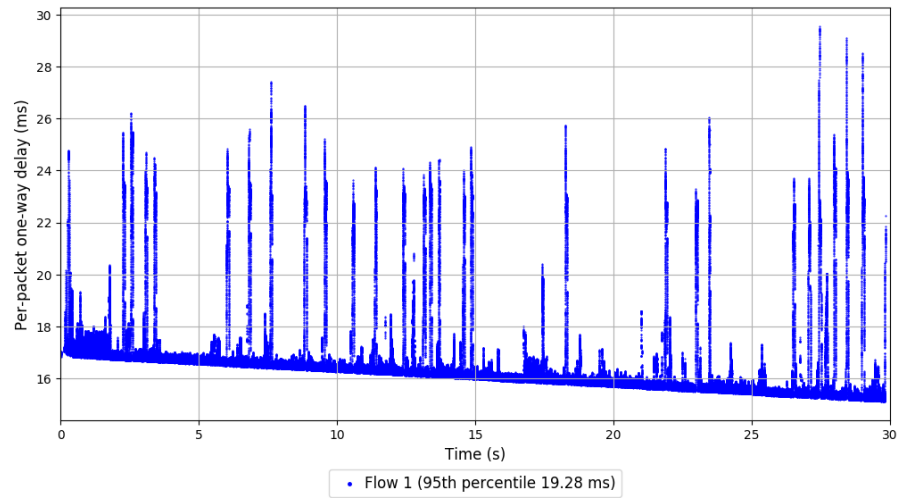
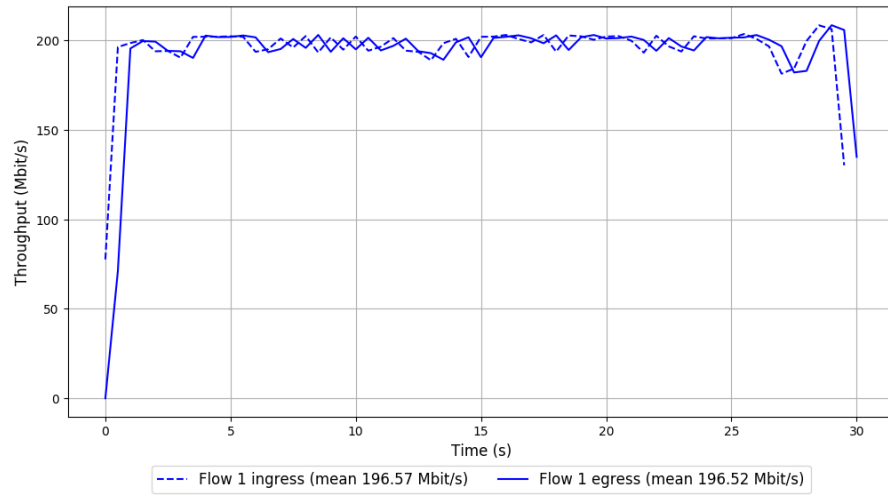


```
Run 1: Statistics of Indigo

Start at: 2018-08-28 08:46:06
End at: 2018-08-28 08:46:36
Local clock offset: -11.784 ms
Remote clock offset: 3.763 ms

# Below is generated by plot.py at 2018-08-28 09:04:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 196.52 Mbit/s
95th percentile per-packet one-way delay: 19.280 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 196.52 Mbit/s
95th percentile per-packet one-way delay: 19.280 ms
Loss rate: 0.03%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-28 08:52:01

End at: 2018-08-28 08:52:31

Local clock offset: -14.9 ms

Remote clock offset: 3.507 ms

Below is generated by plot.py at 2018-08-28 09:04:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 209.62 Mbit/s

95th percentile per-packet one-way delay: 19.767 ms

Loss rate: 0.01%

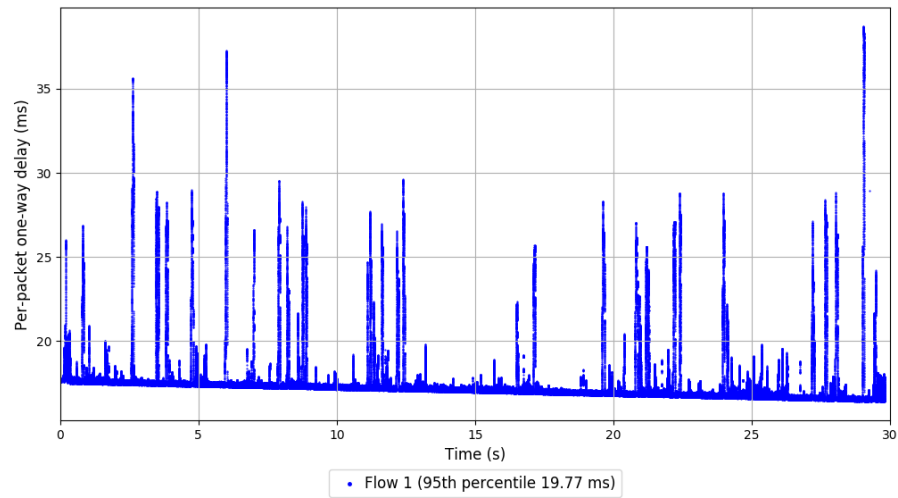
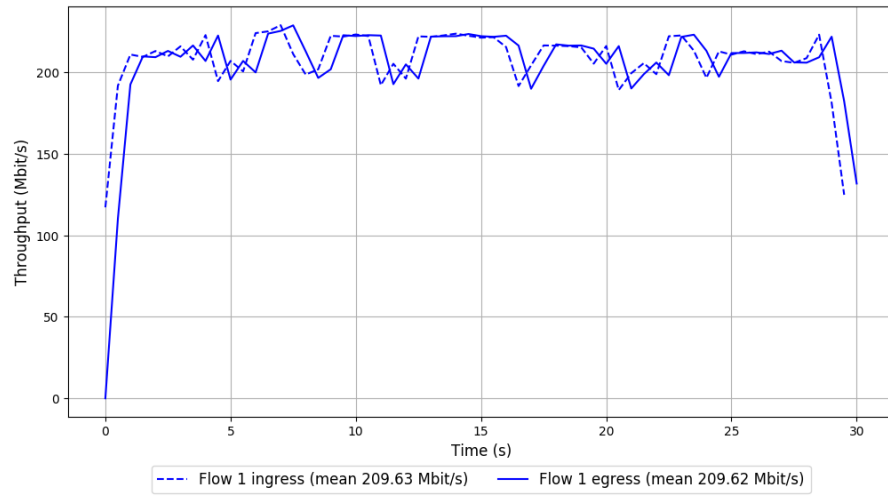
-- Flow 1:

Average throughput: 209.62 Mbit/s

95th percentile per-packet one-way delay: 19.767 ms

Loss rate: 0.01%

Run 2: Report of Indigo — Data Link

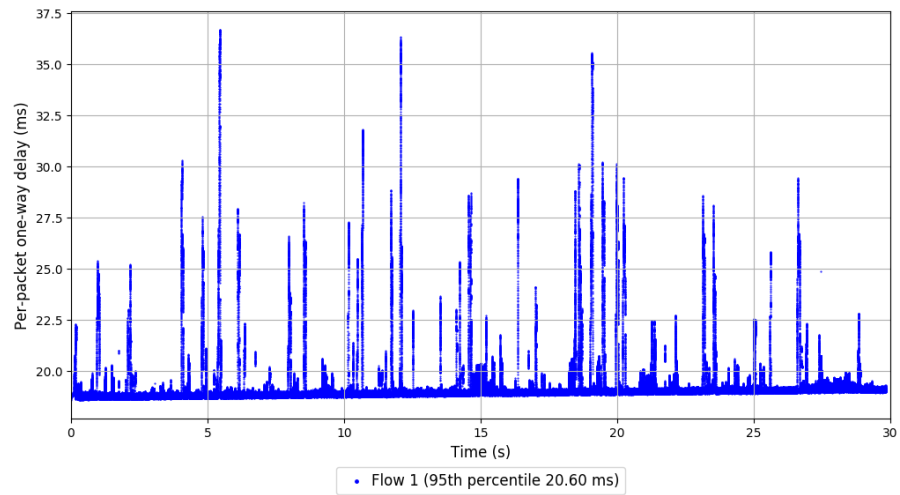
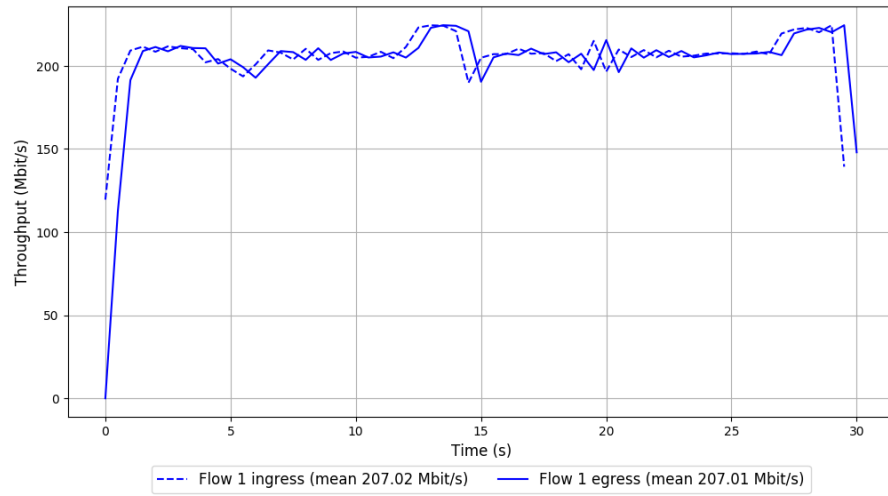


Run 3: Statistics of Indigo

Start at: 2018-08-28 08:57:54
End at: 2018-08-28 08:58:24
Local clock offset: -18.962 ms
Remote clock offset: 3.607 ms

Below is generated by plot.py at 2018-08-28 09:04:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 207.01 Mbit/s
95th percentile per-packet one-way delay: 20.596 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 207.01 Mbit/s
95th percentile per-packet one-way delay: 20.596 ms
Loss rate: 0.00%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-23

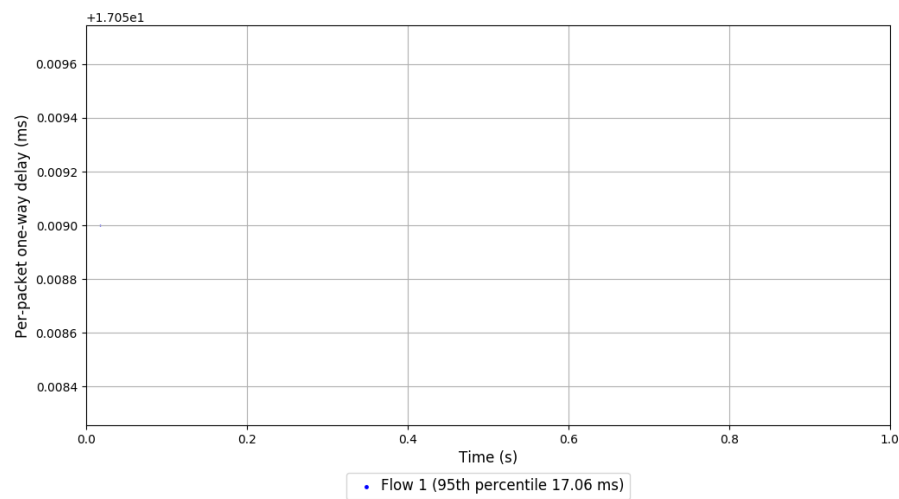
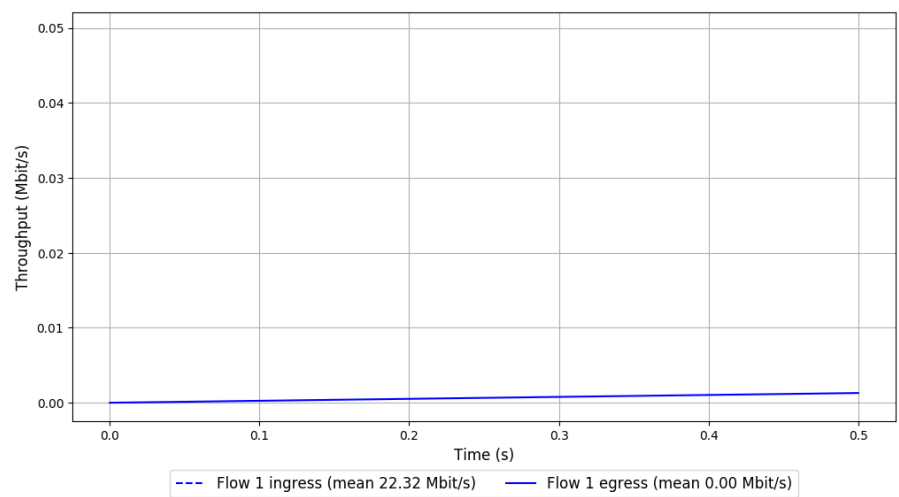
Start at: 2018-08-28 08:41:46

End at: 2018-08-28 08:42:16

Local clock offset: -2.936 ms

Remote clock offset: 4.121 ms

Run 1: Report of Muses-23 — Data Link

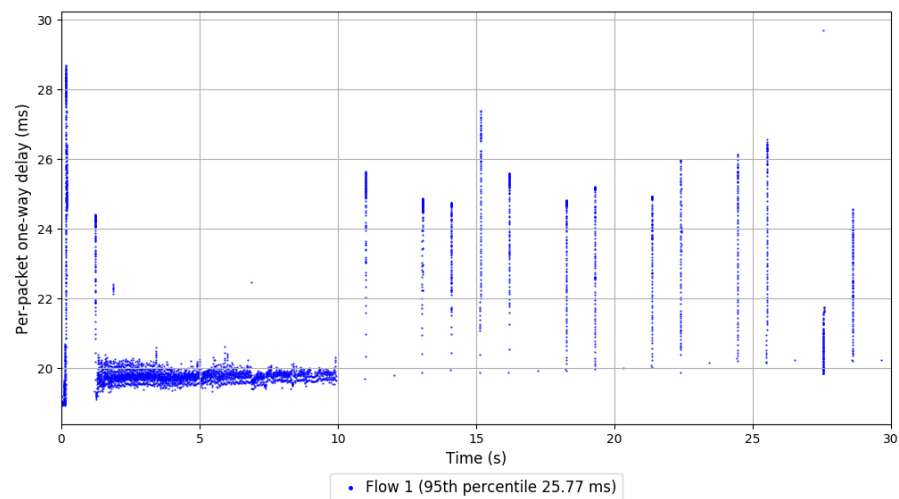
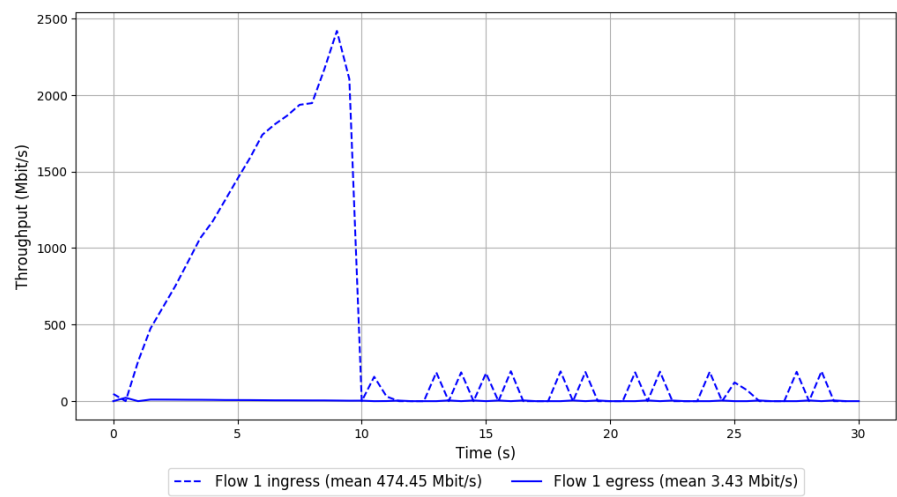


Run 2: Statistics of Muses-23

Start at: 2018-08-28 08:47:32
End at: 2018-08-28 08:48:02
Local clock offset: -14.816 ms
Remote clock offset: 3.614 ms

Below is generated by plot.py at 2018-08-28 09:04:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.43 Mbit/s
95th percentile per-packet one-way delay: 25.767 ms
Loss rate: 99.28%
-- Flow 1:
Average throughput: 3.43 Mbit/s
95th percentile per-packet one-way delay: 25.767 ms
Loss rate: 99.28%

Run 2: Report of Muses-23 — Data Link



Run 3: Statistics of Muses-23

Start at: 2018-08-28 08:53:27

End at: 2018-08-28 08:53:57

Local clock offset: -18.078 ms

Remote clock offset: 3.454 ms

Run 3: Report of Muses-23 — Data Link

