

Pantheon Report

Generated at 2018-08-28 05:10:49 (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.

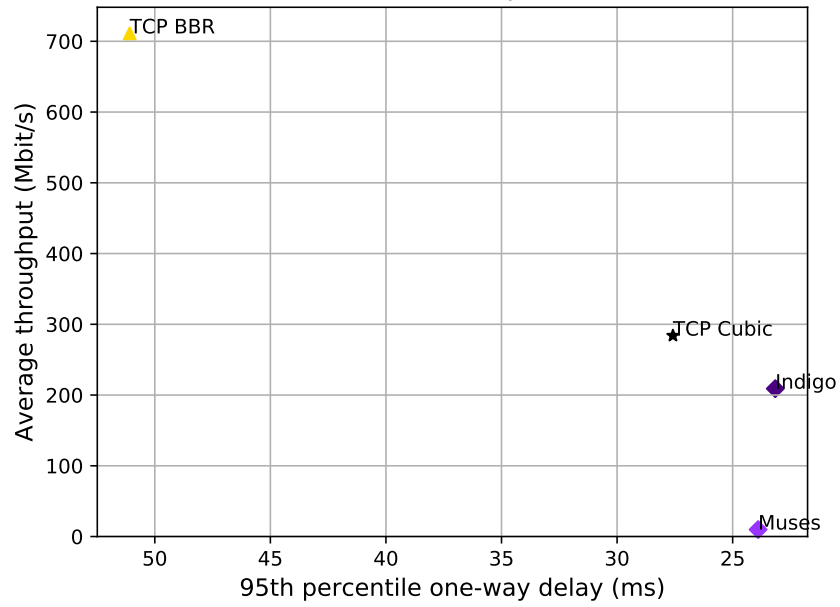
System info:

```
Linux 4.15.0-1019-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
```

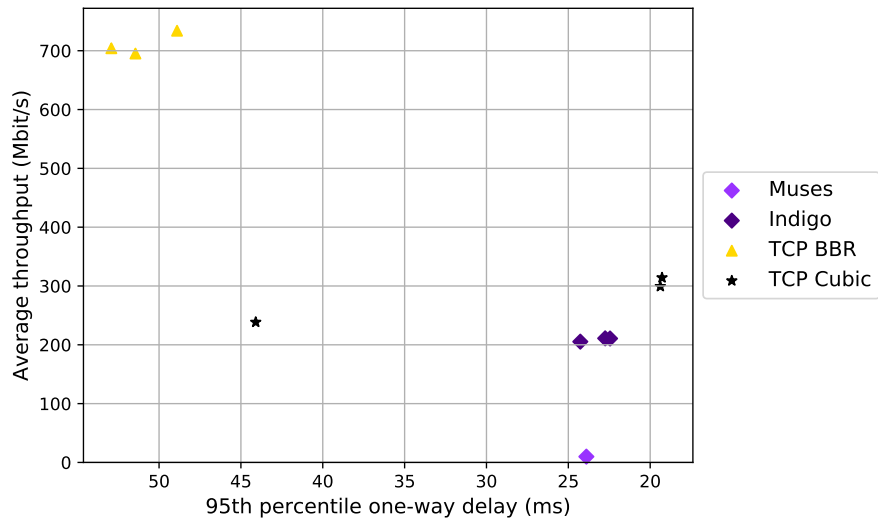
Git summary:

```
branch: muses @ 86ef433b09b2f4ecae1186d6940af93bcf0969cd
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 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	711.16	51.09	0.39
TCP Cubic	3	283.94	27.58	0.06
Indigo	3	209.03	23.16	0.01
Muses	1	9.87	23.90	32.82

Run 1: Statistics of TCP BBR

Start at: 2018-08-28 04:49:50

End at: 2018-08-28 04:50:20

Local clock offset: 0.593 ms

Remote clock offset: -0.502 ms

Below is generated by plot.py at 2018-08-28 05:10:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 695.24 Mbit/s

95th percentile per-packet one-way delay: 51.443 ms

Loss rate: 0.32%

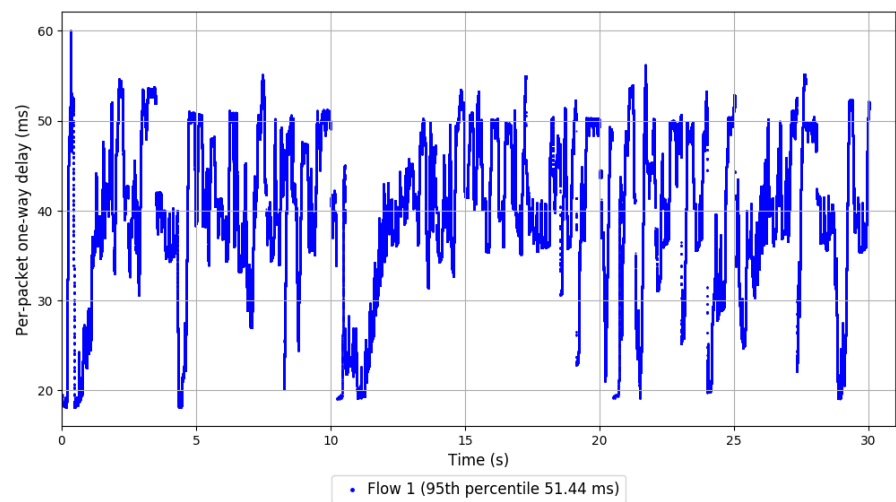
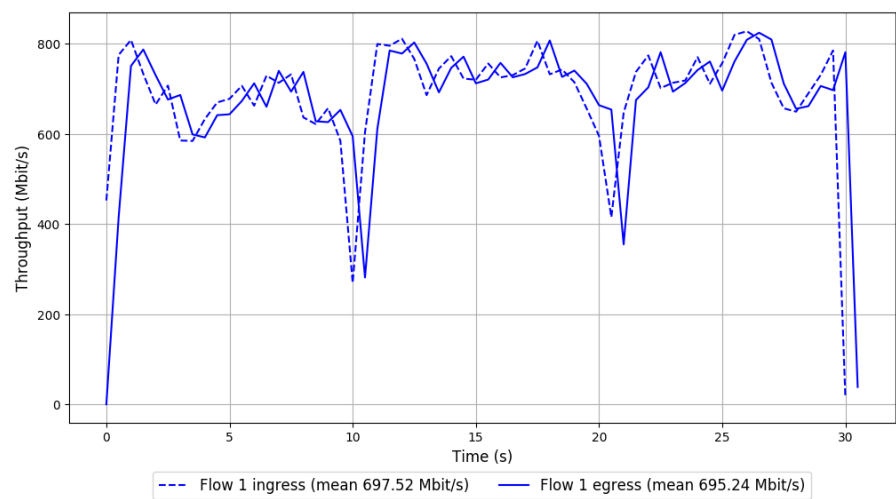
-- Flow 1:

Average throughput: 695.24 Mbit/s

95th percentile per-packet one-way delay: 51.443 ms

Loss rate: 0.32%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-28 04:55:40

End at: 2018-08-28 04:56:10

Local clock offset: 1.059 ms

Remote clock offset: -0.41 ms

Below is generated by plot.py at 2018-08-28 05:10:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 704.21 Mbit/s

95th percentile per-packet one-way delay: 52.914 ms

Loss rate: 0.42%

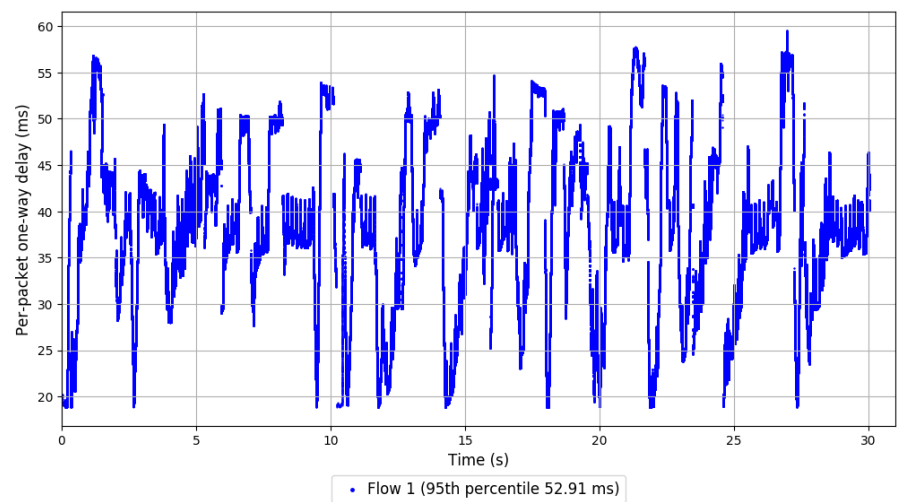
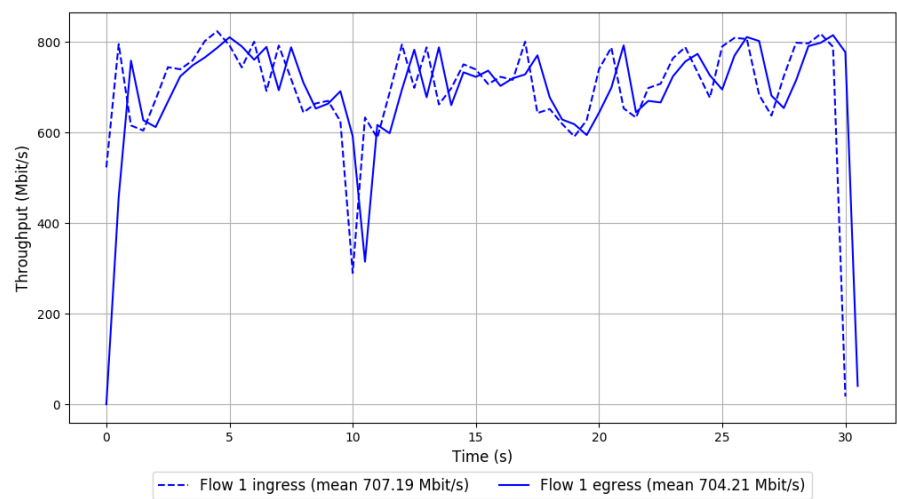
-- Flow 1:

Average throughput: 704.21 Mbit/s

95th percentile per-packet one-way delay: 52.914 ms

Loss rate: 0.42%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-28 05:01:29

End at: 2018-08-28 05:01:59

Local clock offset: 1.366 ms

Remote clock offset: -0.306 ms

Below is generated by plot.py at 2018-08-28 05:10:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 734.04 Mbit/s

95th percentile per-packet one-way delay: 48.901 ms

Loss rate: 0.44%

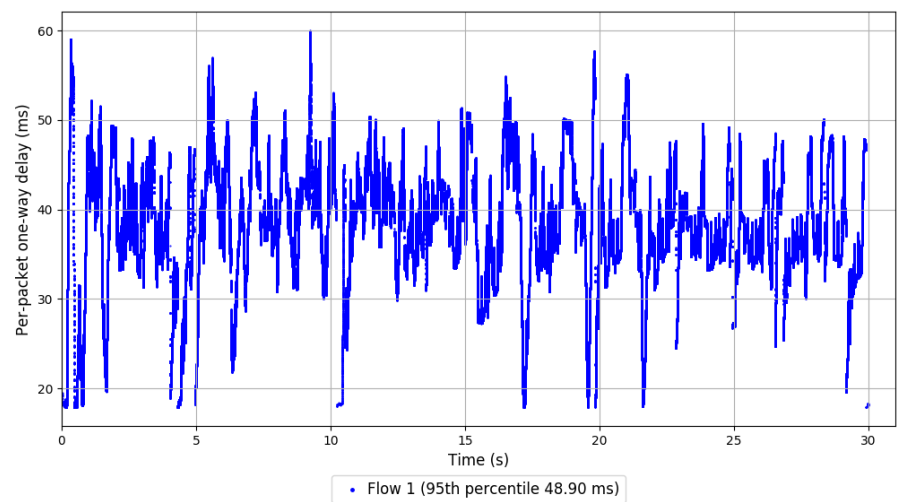
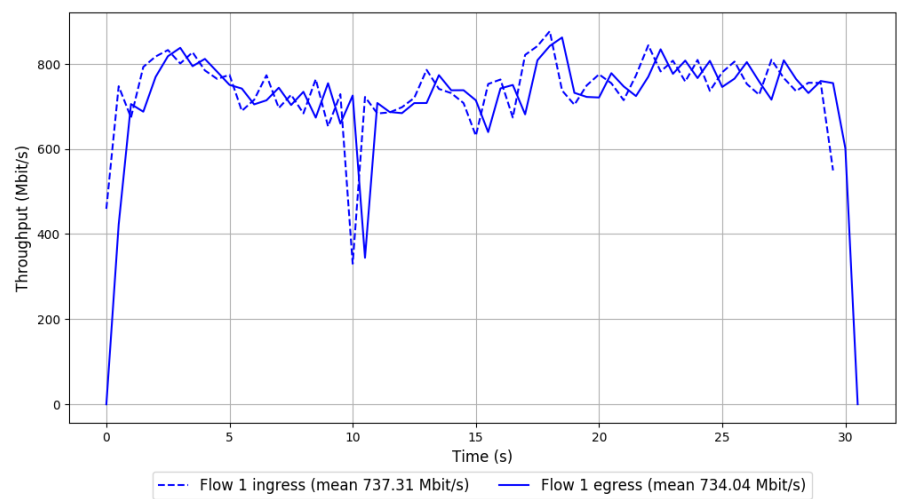
-- Flow 1:

Average throughput: 734.04 Mbit/s

95th percentile per-packet one-way delay: 48.901 ms

Loss rate: 0.44%

Run 3: Report of TCP BBR — Data Link

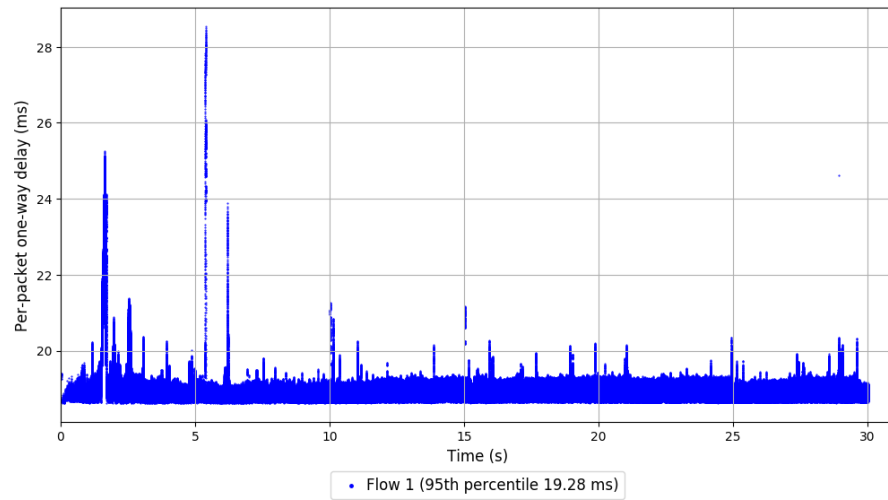
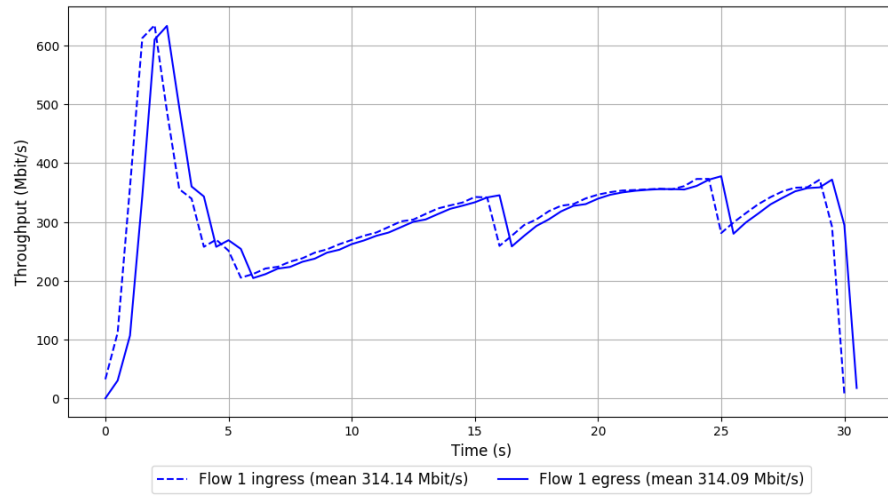


Run 1: Statistics of TCP Cubic

Start at: 2018-08-28 04:51:30
End at: 2018-08-28 04:52:00
Local clock offset: 0.793 ms
Remote clock offset: -0.532 ms

Below is generated by plot.py at 2018-08-28 05:10:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 314.09 Mbit/s
95th percentile per-packet one-way delay: 19.276 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 314.09 Mbit/s
95th percentile per-packet one-way delay: 19.276 ms
Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link

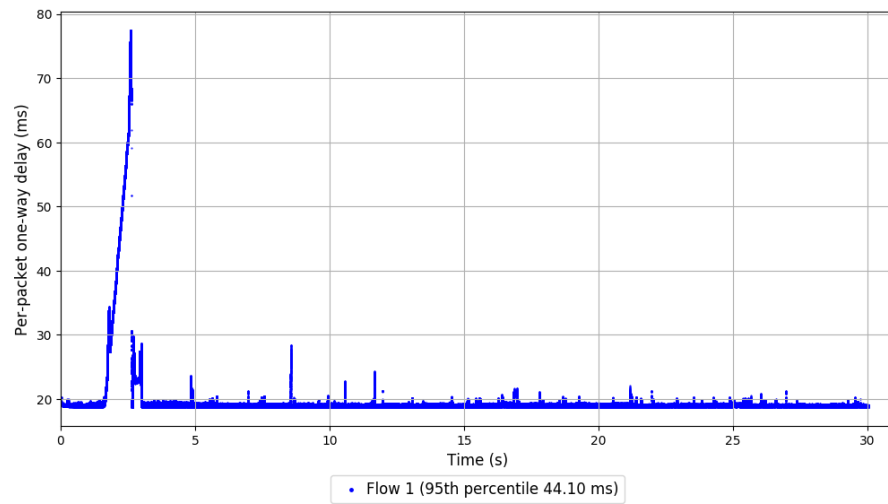
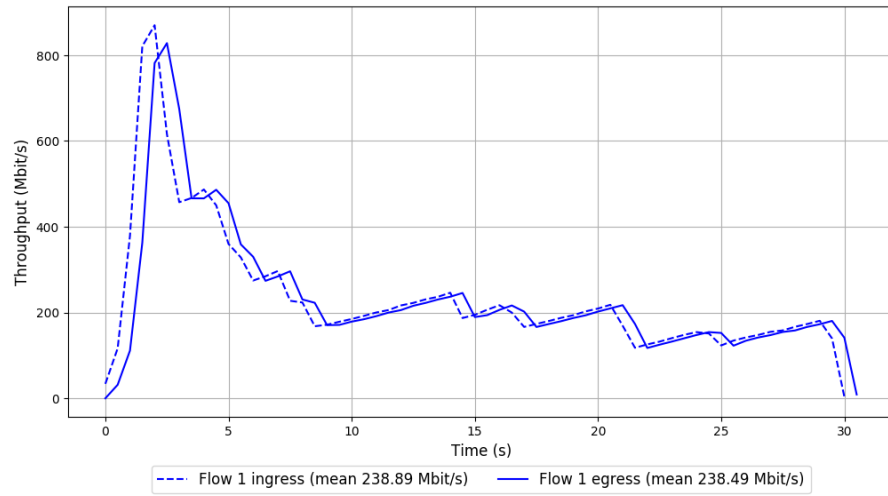


Run 2: Statistics of TCP Cubic

Start at: 2018-08-28 04:57:20
End at: 2018-08-28 04:57:51
Local clock offset: 1.165 ms
Remote clock offset: -0.278 ms

Below is generated by plot.py at 2018-08-28 05:10:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 238.49 Mbit/s
95th percentile per-packet one-way delay: 44.096 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 238.49 Mbit/s
95th percentile per-packet one-way delay: 44.096 ms
Loss rate: 0.17%

Run 2: Report of TCP Cubic — Data Link

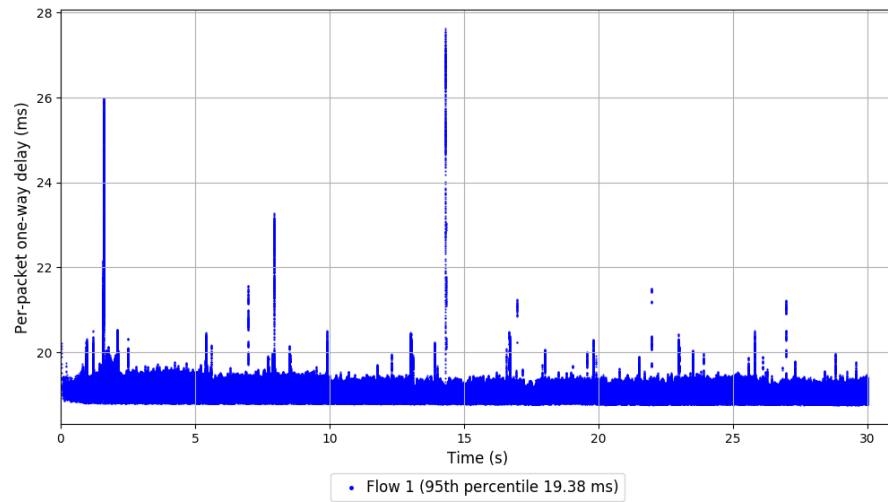
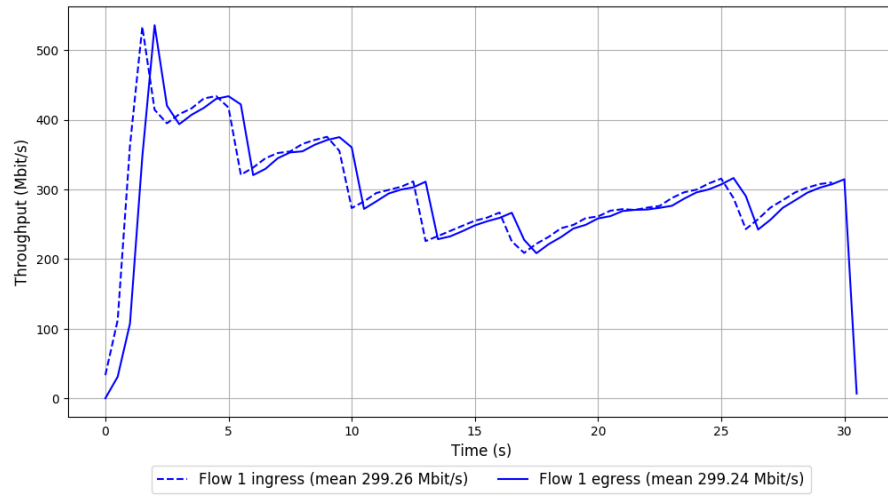


Run 3: Statistics of TCP Cubic

Start at: 2018-08-28 05:03:10
End at: 2018-08-28 05:03:40
Local clock offset: 1.324 ms
Remote clock offset: -0.226 ms

Below is generated by plot.py at 2018-08-28 05:10:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 299.24 Mbit/s
95th percentile per-packet one-way delay: 19.379 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 299.24 Mbit/s
95th percentile per-packet one-way delay: 19.379 ms
Loss rate: 0.01%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of Indigo

Start at: 2018-08-28 04:48:24

End at: 2018-08-28 04:48:54

Local clock offset: 0.58 ms

Remote clock offset: -0.636 ms

Below is generated by plot.py at 2018-08-28 05:10:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 210.72 Mbit/s

95th percentile per-packet one-way delay: 22.451 ms

Loss rate: 0.00%

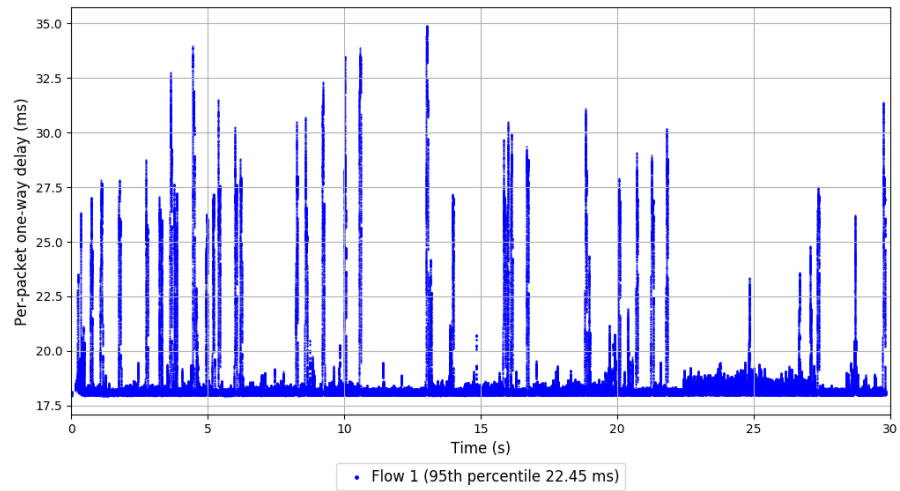
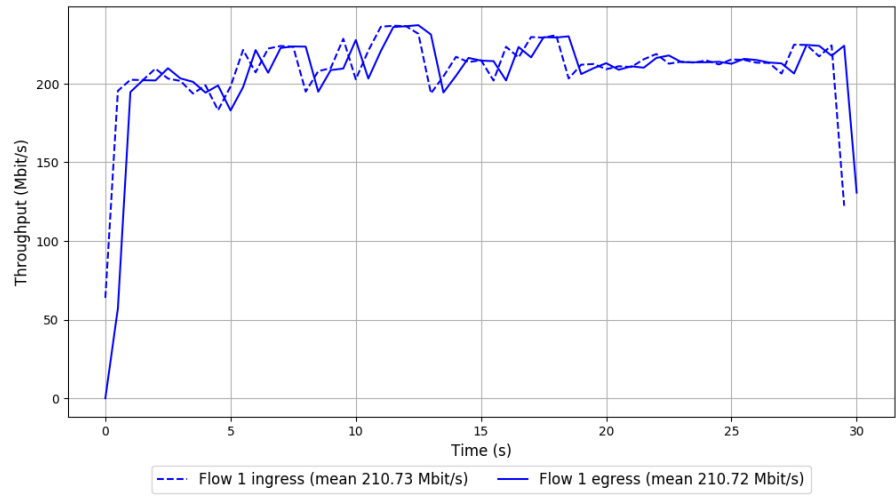
-- Flow 1:

Average throughput: 210.72 Mbit/s

95th percentile per-packet one-way delay: 22.451 ms

Loss rate: 0.00%

Run 1: Report of Indigo — Data Link

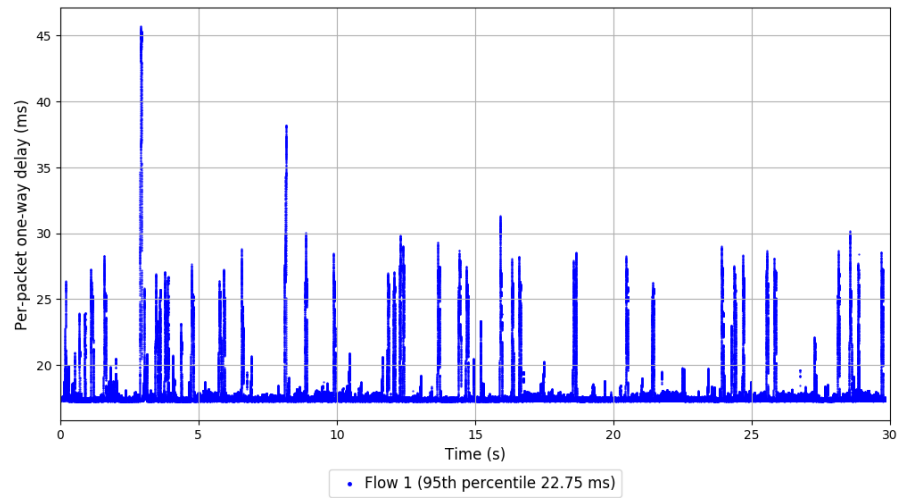
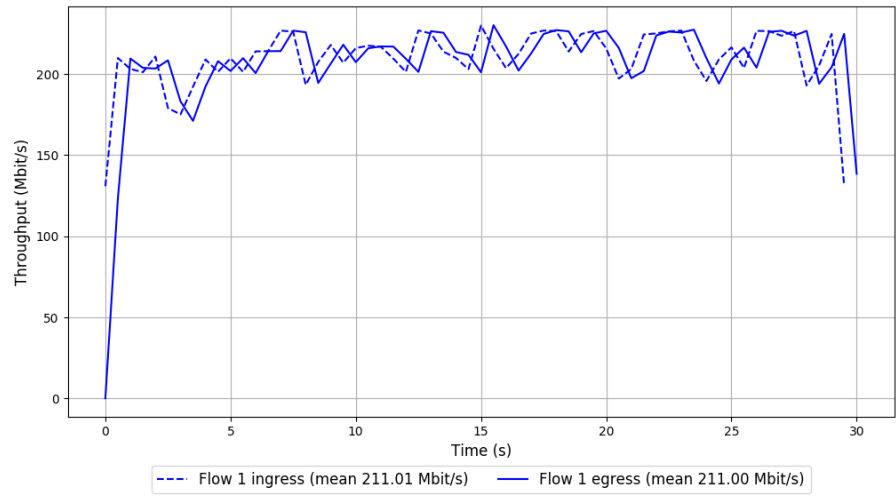


Run 2: Statistics of Indigo

Start at: 2018-08-28 04:54:14
End at: 2018-08-28 04:54:44
Local clock offset: 0.991 ms
Remote clock offset: -0.375 ms

Below is generated by plot.py at 2018-08-28 05:10:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 211.00 Mbit/s
95th percentile per-packet one-way delay: 22.749 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 211.00 Mbit/s
95th percentile per-packet one-way delay: 22.749 ms
Loss rate: 0.01%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-28 05:00:03

End at: 2018-08-28 05:00:33

Local clock offset: 1.281 ms

Remote clock offset: -0.266 ms

Below is generated by plot.py at 2018-08-28 05:10:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 205.36 Mbit/s

95th percentile per-packet one-way delay: 24.268 ms

Loss rate: 0.01%

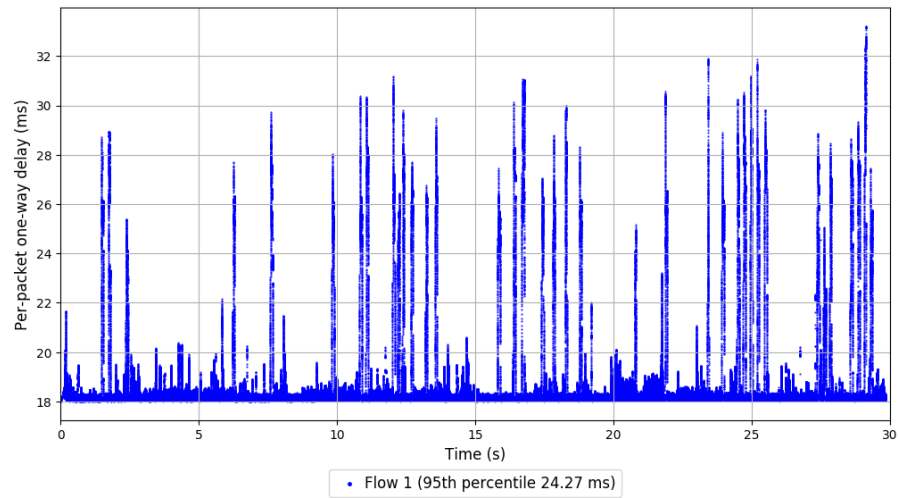
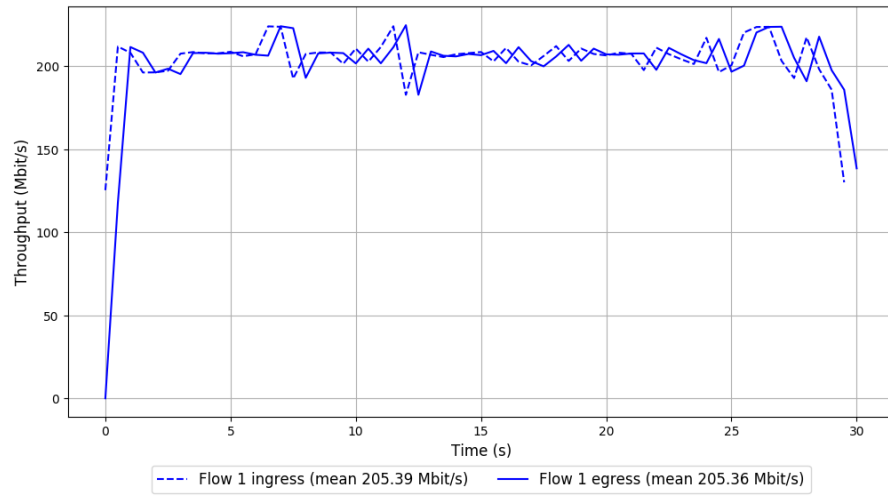
-- Flow 1:

Average throughput: 205.36 Mbit/s

95th percentile per-packet one-way delay: 24.268 ms

Loss rate: 0.01%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses

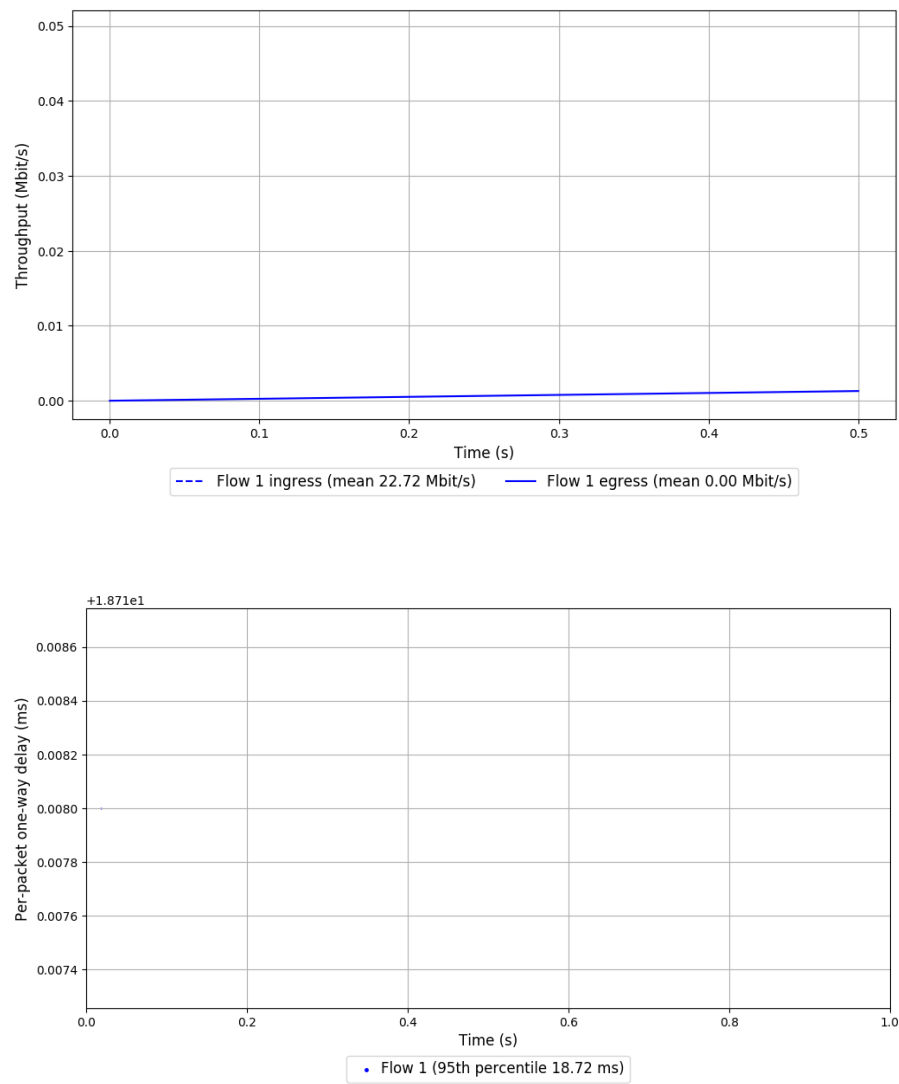
Start at: 2018-08-28 04:52:57

End at: 2018-08-28 04:53:27

Local clock offset: 0.909 ms

Remote clock offset: -0.475 ms

Run 1: Report of Muses — Data Link

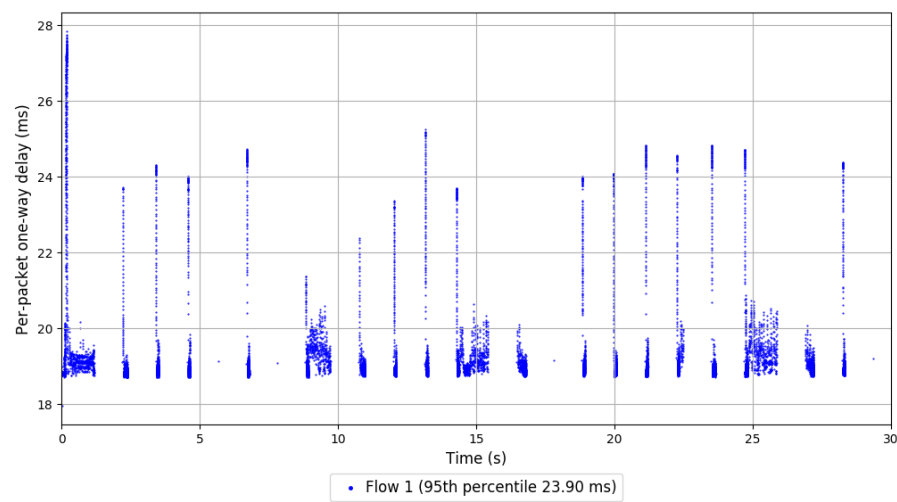
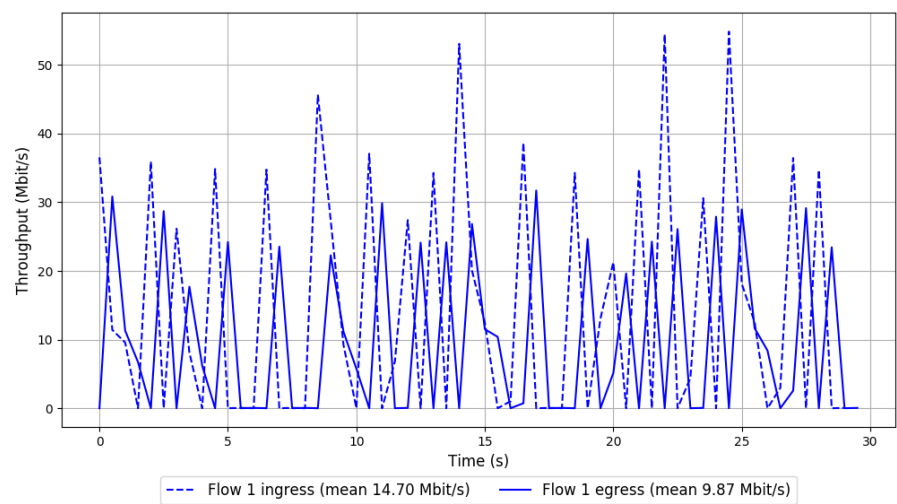


Run 2: Statistics of Muses

Start at: 2018-08-28 04:58:45
End at: 2018-08-28 04:59:15
Local clock offset: 1.241 ms
Remote clock offset: -0.276 ms

Below is generated by plot.py at 2018-08-28 05:10:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.87 Mbit/s
95th percentile per-packet one-way delay: 23.898 ms
Loss rate: 32.82%
-- Flow 1:
Average throughput: 9.87 Mbit/s
95th percentile per-packet one-way delay: 23.898 ms
Loss rate: 32.82%

Run 2: Report of Muses — Data Link



Run 3: Statistics of Muses

Start at: 2018-08-28 05:04:36

End at: 2018-08-28 05:05:06

Local clock offset: 1.226 ms

Remote clock offset: -0.218 ms

Run 3: Report of Muses — Data Link

