

Pantheon Report

Generated at 2018-09-05 22:21:39 (UTC).

Data path: Stanford on `eno1` (*remote*) → AWS California 1 on `ens5` (*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.stanford.edu` and have been applied to correct the timestamps in logs.

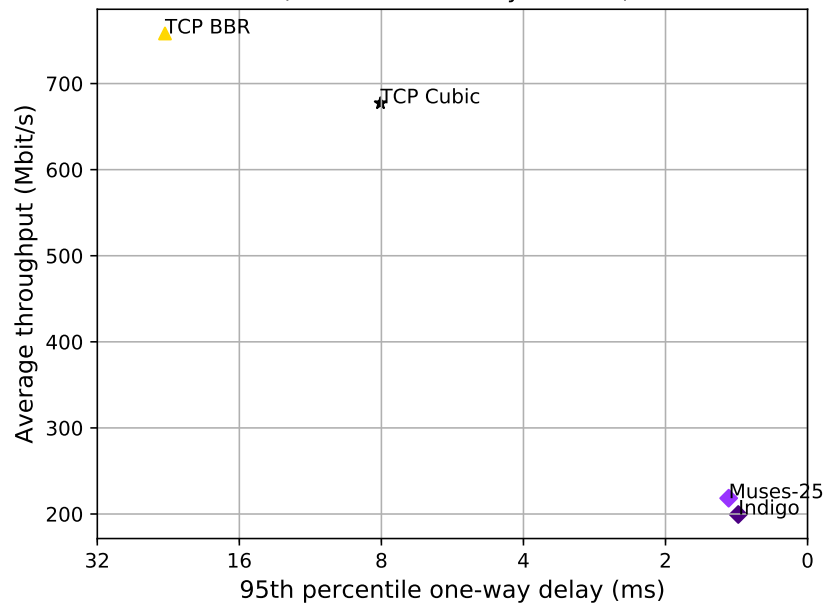
System info:

```
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
net.ipv4.tcp_mem = 536870912 536870912 536870912
```

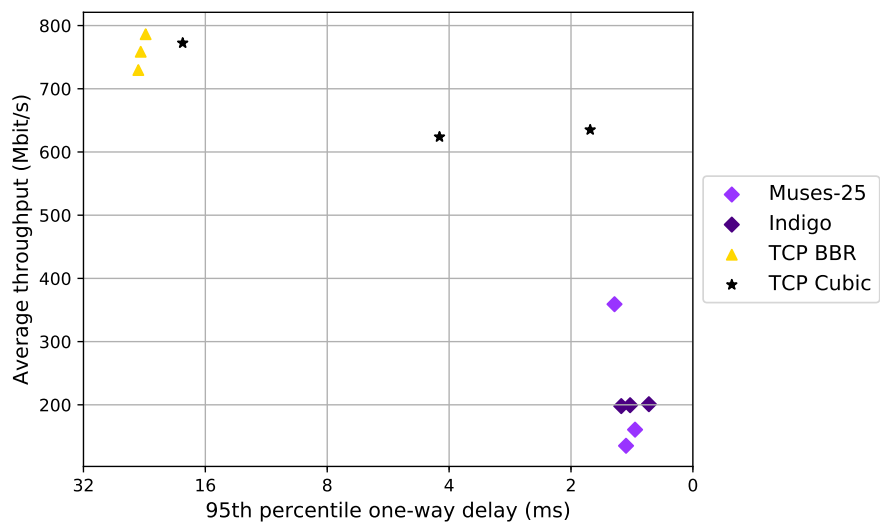
Git summary:

```
branch: muses @ 18b9165265c8ba2915c862e8713fd9ad82c1ac21
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ a28d20fb82a95a965a3da65fd1eb71b8994e9b84
third_party/pantheon-tunnel @ cbfce6db5ff5740d4fe1771f813cd646339e1952
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 Stanford to AWS California 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Stanford to AWS California 1, 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	758.17	23.00	0.12
TCP Cubic	3	677.11	8.04	0.11
Indigo	3	199.44	0.98	0.06
Muses-25	3	218.35	1.11	0.07

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 21:59:14

End at: 2018-09-05 21:59:44

Local clock offset: -4.407 ms

Remote clock offset: -0.64 ms

Below is generated by plot.py at 2018-09-05 22:21:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 758.56 Mbit/s

95th percentile per-packet one-way delay: 23.106 ms

Loss rate: 0.15%

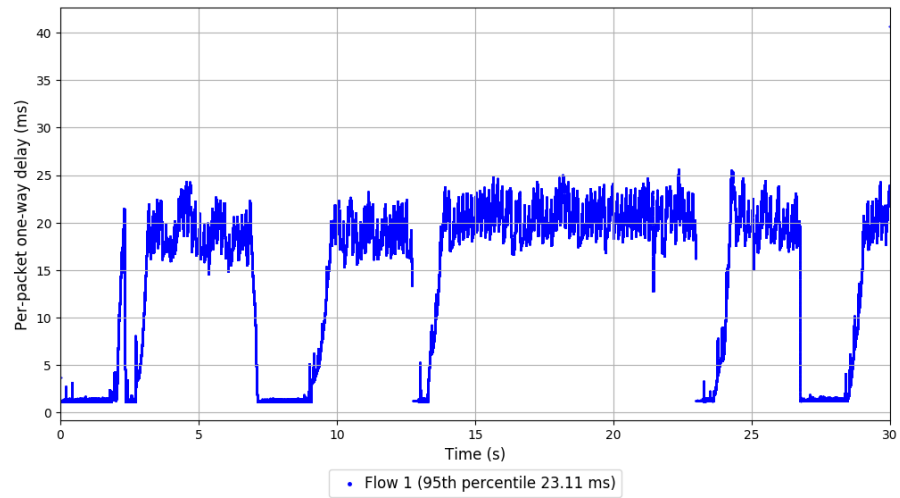
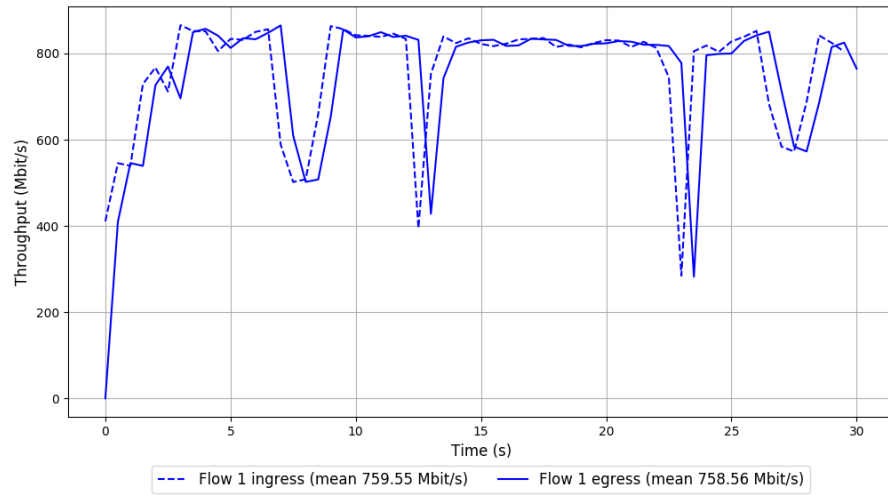
-- Flow 1:

Average throughput: 758.56 Mbit/s

95th percentile per-packet one-way delay: 23.106 ms

Loss rate: 0.15%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 22:05:30

End at: 2018-09-05 22:06:00

Local clock offset: -3.097 ms

Remote clock offset: 0.908 ms

Below is generated by plot.py at 2018-09-05 22:21:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 786.32 Mbit/s

95th percentile per-packet one-way delay: 22.466 ms

Loss rate: 0.08%

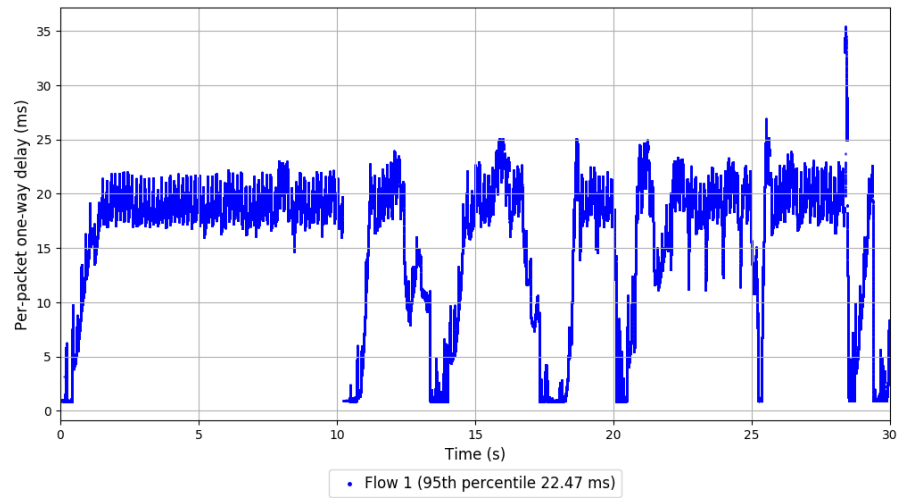
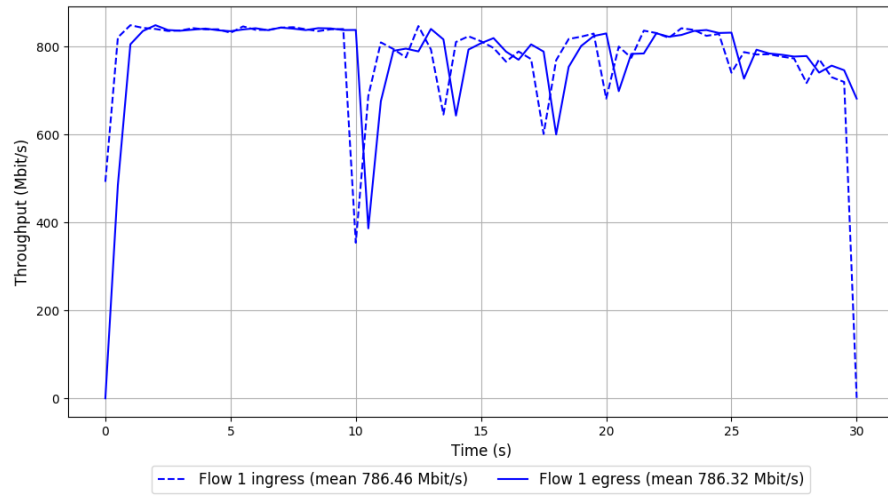
-- Flow 1:

Average throughput: 786.32 Mbit/s

95th percentile per-packet one-way delay: 22.466 ms

Loss rate: 0.08%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-05 22:11:42

End at: 2018-09-05 22:12:12

Local clock offset: -2.273 ms

Remote clock offset: 2.255 ms

Below is generated by plot.py at 2018-09-05 22:21:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 729.64 Mbit/s

95th percentile per-packet one-way delay: 23.421 ms

Loss rate: 0.14%

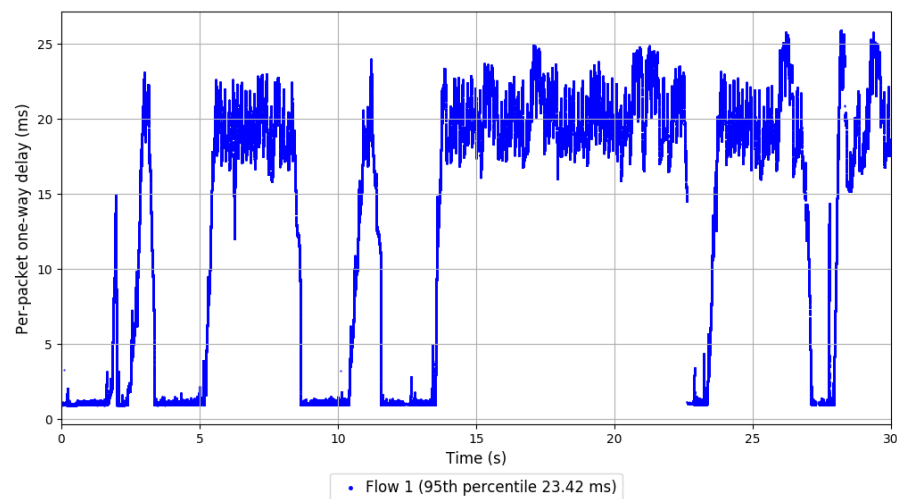
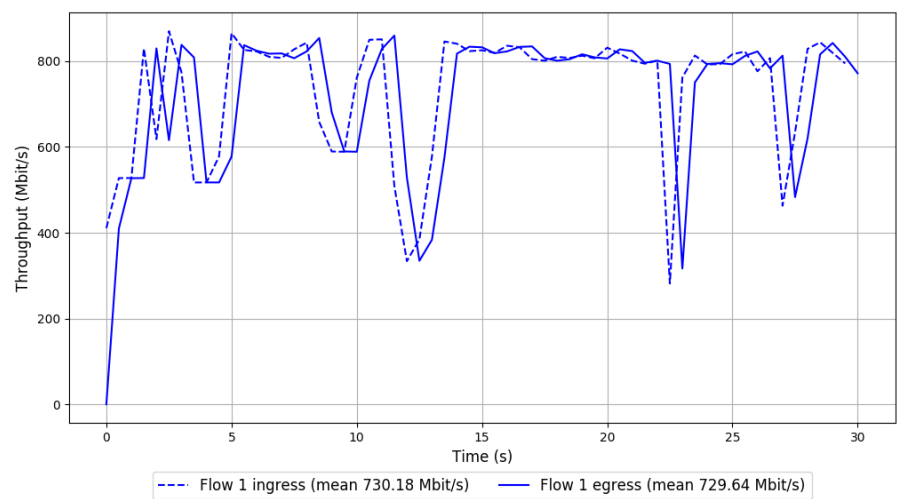
-- Flow 1:

Average throughput: 729.64 Mbit/s

95th percentile per-packet one-way delay: 23.421 ms

Loss rate: 0.14%

Run 3: Report of TCP BBR — Data Link

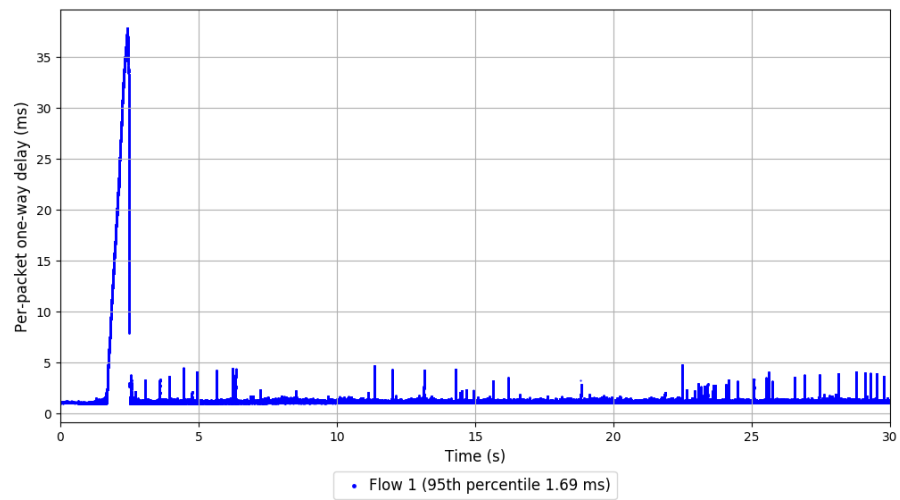
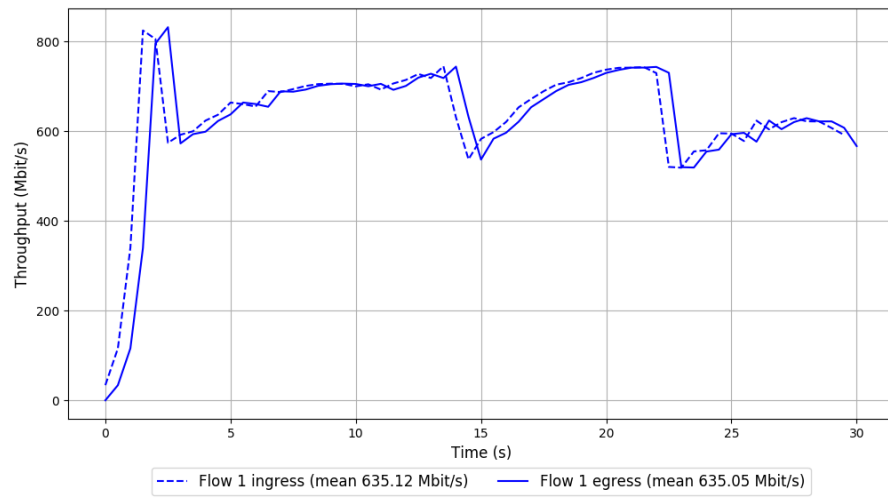


Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 21:57:35
End at: 2018-09-05 21:58:05
Local clock offset: -4.222 ms
Remote clock offset: -0.532 ms

Below is generated by plot.py at 2018-09-05 22:21:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 635.05 Mbit/s
95th percentile per-packet one-way delay: 1.685 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 635.05 Mbit/s
95th percentile per-packet one-way delay: 1.685 ms
Loss rate: 0.08%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 22:03:47

End at: 2018-09-05 22:04:17

Local clock offset: -3.595 ms

Remote clock offset: 0.345 ms

Below is generated by plot.py at 2018-09-05 22:21:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 772.41 Mbit/s

95th percentile per-packet one-way delay: 18.201 ms

Loss rate: 0.16%

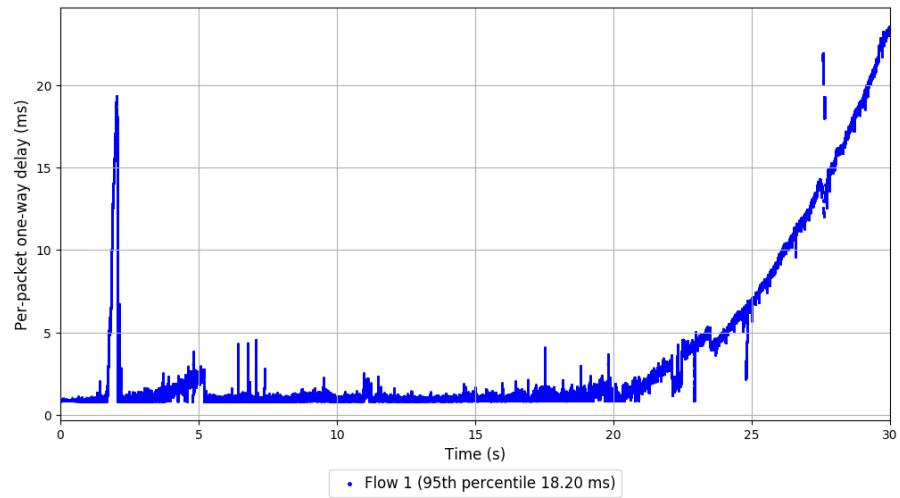
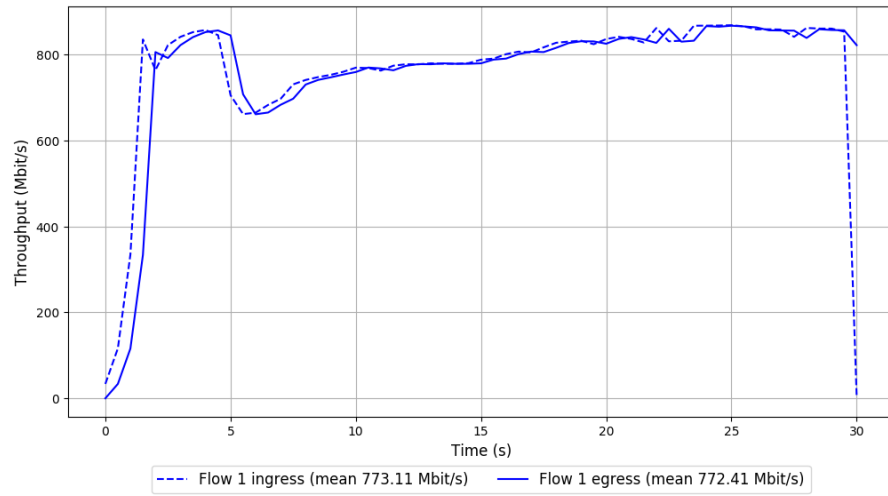
-- Flow 1:

Average throughput: 772.41 Mbit/s

95th percentile per-packet one-way delay: 18.201 ms

Loss rate: 0.16%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 22:10:04

End at: 2018-09-05 22:10:34

Local clock offset: -2.402 ms

Remote clock offset: 1.966 ms

Below is generated by plot.py at 2018-09-05 22:21:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 623.87 Mbit/s

95th percentile per-packet one-way delay: 4.225 ms

Loss rate: 0.08%

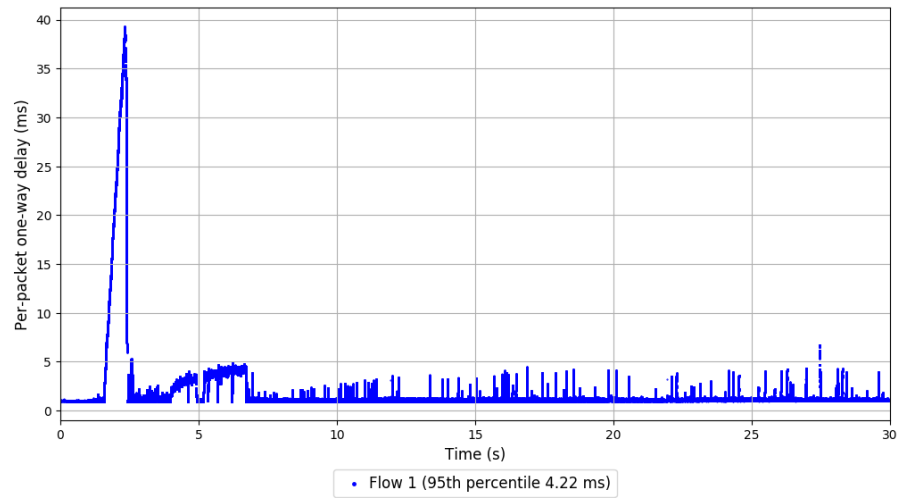
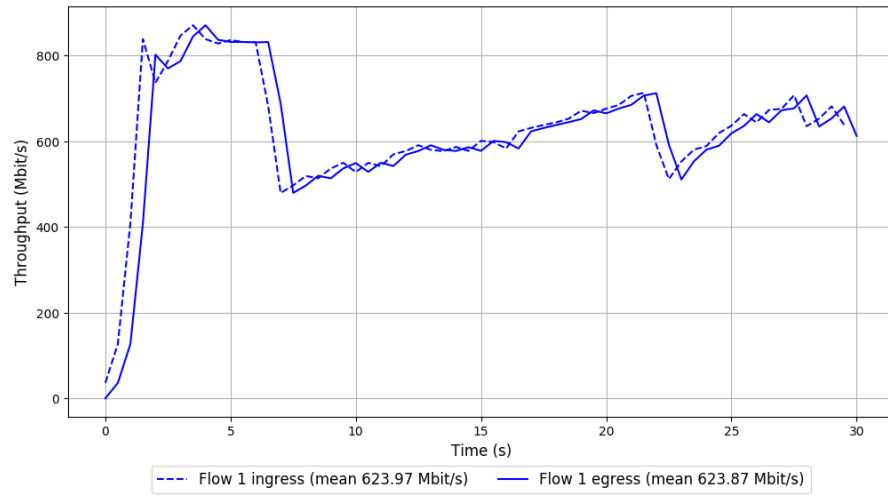
-- Flow 1:

Average throughput: 623.87 Mbit/s

95th percentile per-packet one-way delay: 4.225 ms

Loss rate: 0.08%

Run 3: Report of TCP Cubic — Data Link

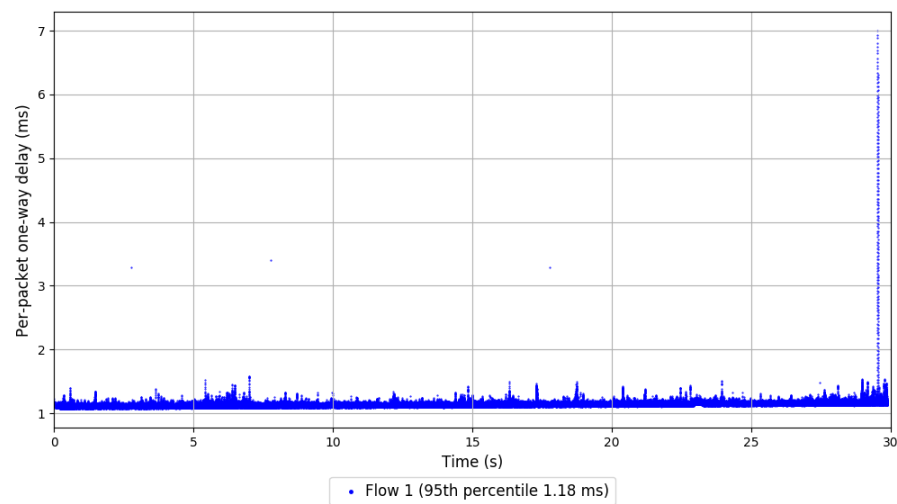
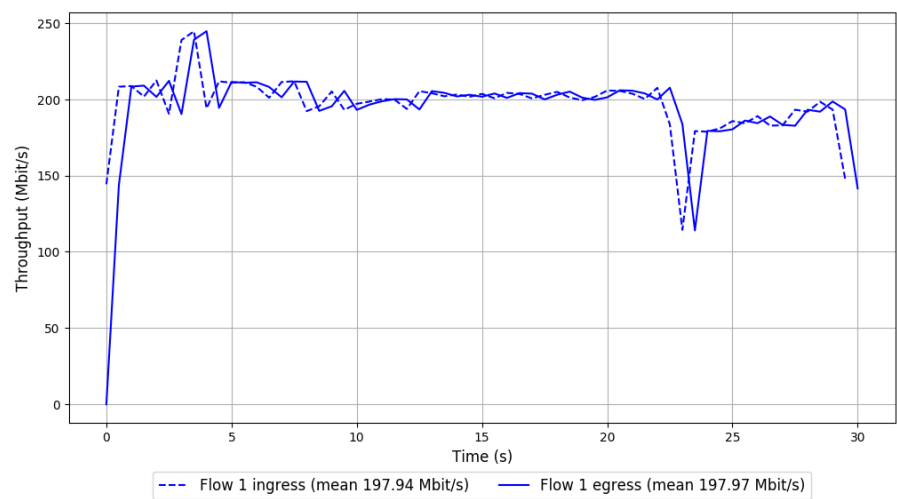


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 21:54:38
End at: 2018-09-05 21:55:08
Local clock offset: -3.689 ms
Remote clock offset: -0.414 ms

# Below is generated by plot.py at 2018-09-05 22:21:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 197.97 Mbit/s
95th percentile per-packet one-way delay: 1.175 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 197.97 Mbit/s
95th percentile per-packet one-way delay: 1.175 ms
Loss rate: 0.05%
```

Run 1: Report of Indigo — Data Link

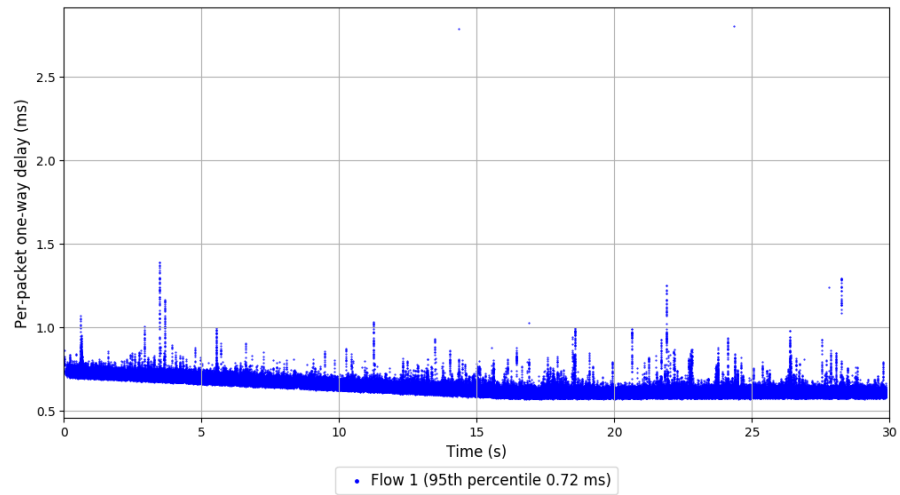
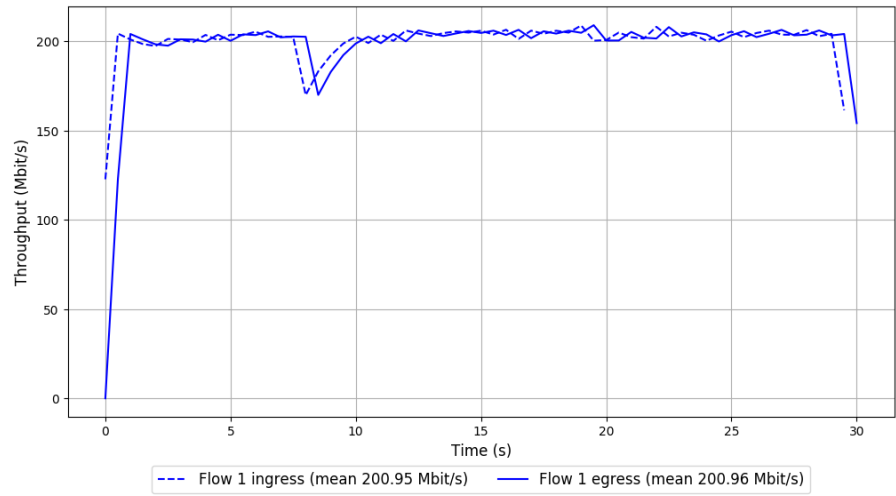


Run 2: Statistics of Indigo

Start at: 2018-09-05 22:00:57
End at: 2018-09-05 22:01:27
Local clock offset: -4.675 ms
Remote clock offset: -0.579 ms

Below is generated by plot.py at 2018-09-05 22:21:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 200.96 Mbit/s
95th percentile per-packet one-way delay: 0.722 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 200.96 Mbit/s
95th percentile per-packet one-way delay: 0.722 ms
Loss rate: 0.06%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-05 22:07:14

End at: 2018-09-05 22:07:44

Local clock offset: -2.723 ms

Remote clock offset: 1.337 ms

Below is generated by plot.py at 2018-09-05 22:21:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 199.39 Mbit/s

95th percentile per-packet one-way delay: 1.030 ms

Loss rate: 0.07%

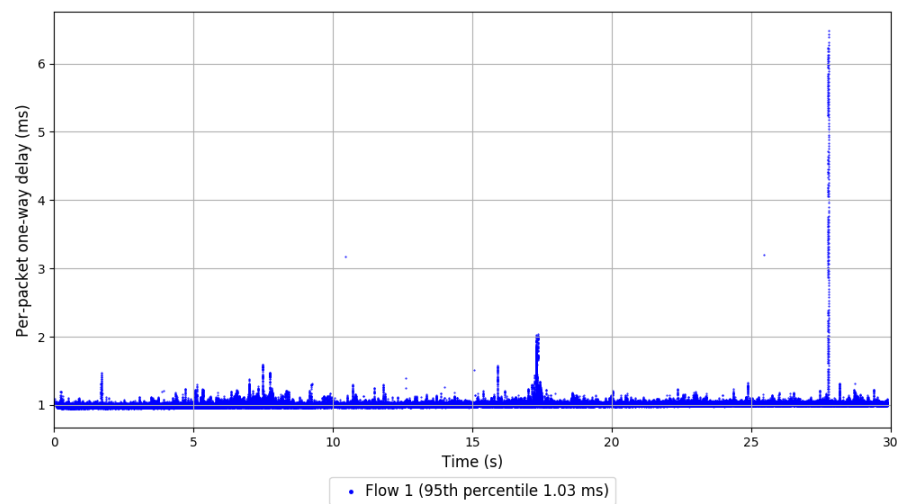
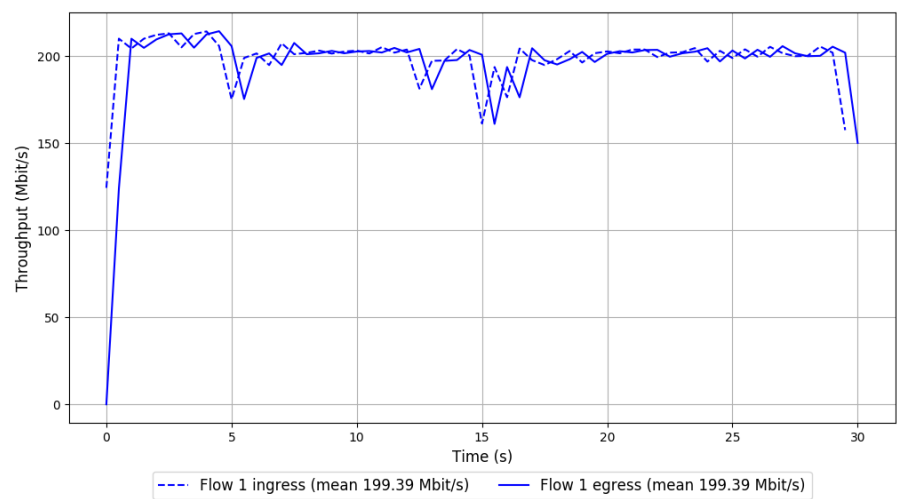
-- Flow 1:

Average throughput: 199.39 Mbit/s

95th percentile per-packet one-way delay: 1.030 ms

Loss rate: 0.07%

Run 3: Report of Indigo — Data Link

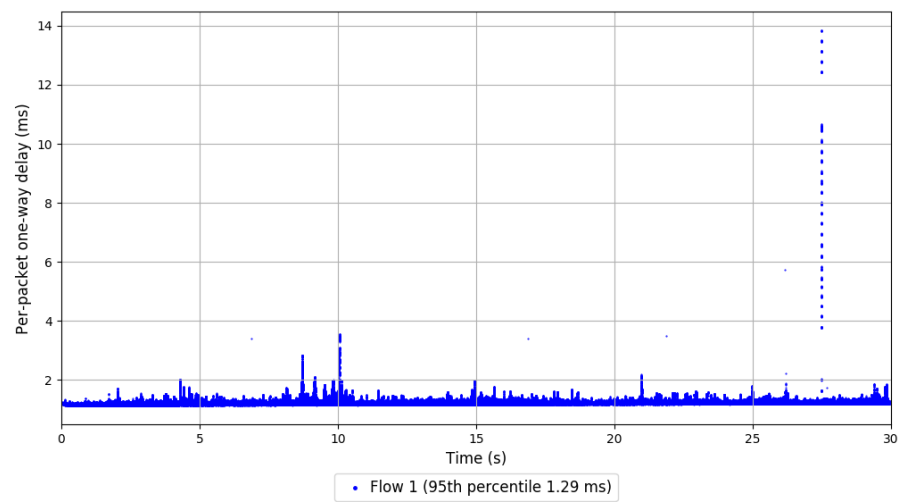
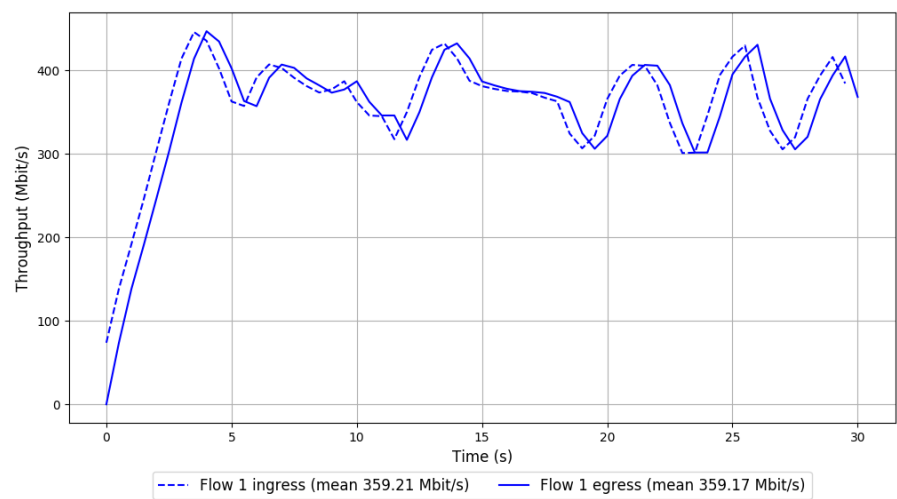


Run 1: Statistics of Muses-25

Start at: 2018-09-05 21:56:05
End at: 2018-09-05 21:56:35
Local clock offset: -3.911 ms
Remote clock offset: -0.549 ms

Below is generated by plot.py at 2018-09-05 22:21:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 359.17 Mbit/s
95th percentile per-packet one-way delay: 1.286 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 359.17 Mbit/s
95th percentile per-packet one-way delay: 1.286 ms
Loss rate: 0.08%

Run 1: Report of Muses-25 — Data Link

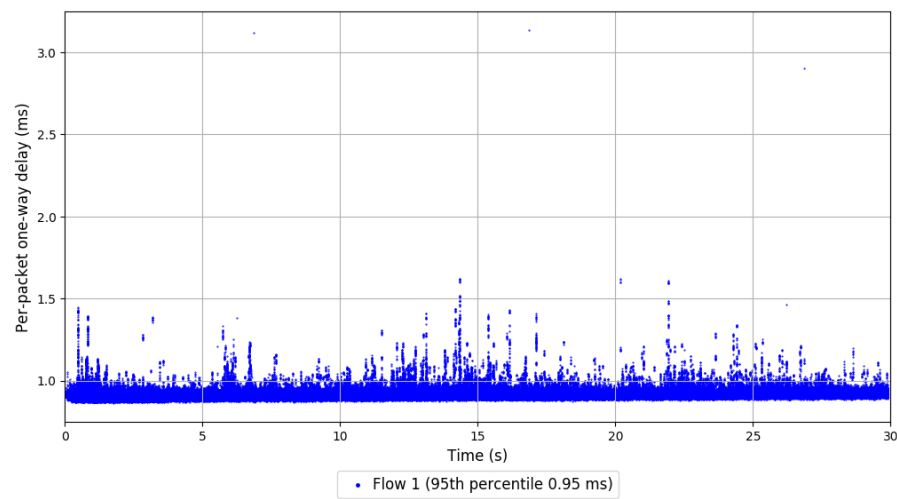
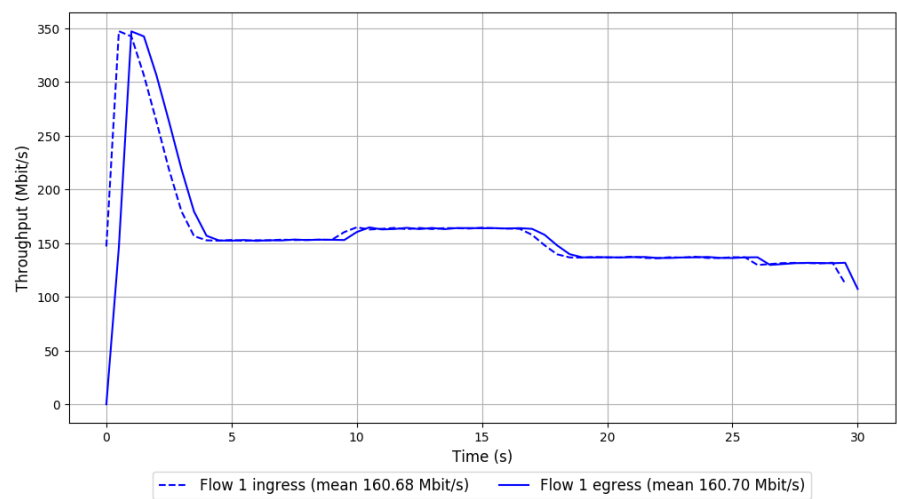


Run 2: Statistics of Muses-25

Start at: 2018-09-05 22:02:24
End at: 2018-09-05 22:02:54
Local clock offset: -4.078 ms
Remote clock offset: -0.253 ms

Below is generated by plot.py at 2018-09-05 22:21:38
Datalink statistics
-- Total of 1 flow:
Average throughput: 160.70 Mbit/s
95th percentile per-packet one-way delay: 0.949 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 160.70 Mbit/s
95th percentile per-packet one-way delay: 0.949 ms
Loss rate: 0.05%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 22:08:41

End at: 2018-09-05 22:09:11

Local clock offset: -2.464 ms

Remote clock offset: 1.666 ms

Below is generated by plot.py at 2018-09-05 22:21:38

Datalink statistics

-- Total of 1 flow:

Average throughput: 135.19 Mbit/s

95th percentile per-packet one-way delay: 1.097 ms

Loss rate: 0.07%

-- Flow 1:

Average throughput: 135.19 Mbit/s

95th percentile per-packet one-way delay: 1.097 ms

Loss rate: 0.07%

Run 3: Report of Muses-25 — Data Link

