

Pantheon Report

Generated at 2018-09-05 02:29:16 (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.

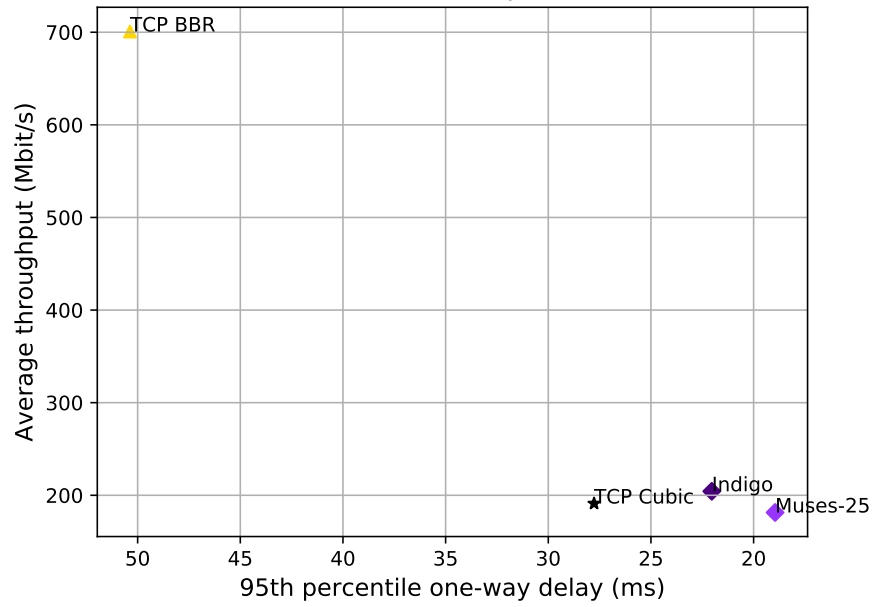
System info:

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

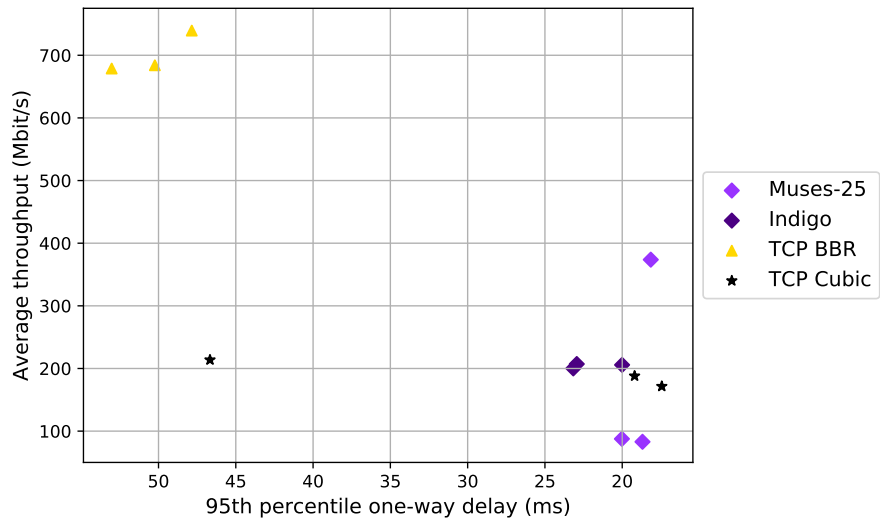
Git summary:

```
branch: muses @ 71e71e9a55b945431a7dea72180c1c9381097db9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 96fbc95fb38373d71fbc80c5a105e62e7636623b
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



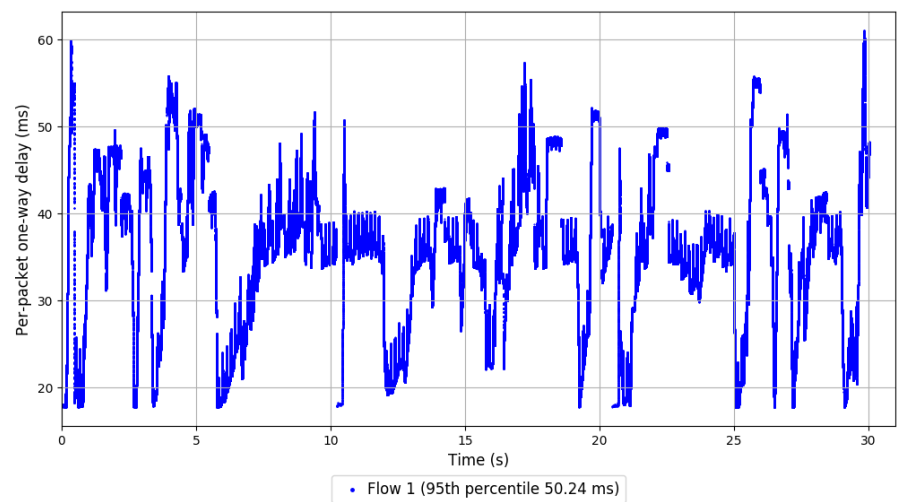
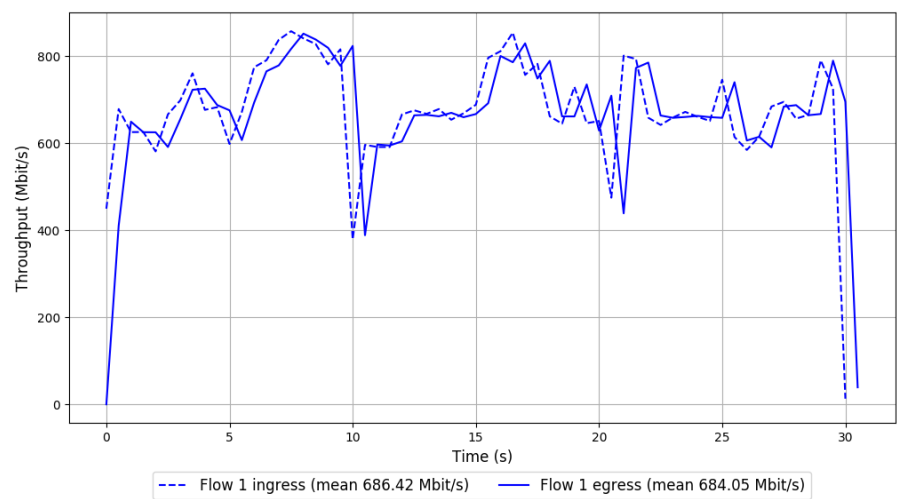
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	700.77	50.37	0.44
TCP Cubic	3	191.11	27.77	0.01
Indigo	3	204.33	22.04	0.01
Muses-25	3	181.45	18.95	0.01

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 02:07:19
End at: 2018-09-05 02:07:49
Local clock offset: -12.671 ms
Remote clock offset: 2.819 ms

Below is generated by plot.py at 2018-09-05 02:29:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 684.05 Mbit/s
95th percentile per-packet one-way delay: 50.236 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 684.05 Mbit/s
95th percentile per-packet one-way delay: 50.236 ms
Loss rate: 0.34%

Run 1: Report of TCP BBR — Data Link

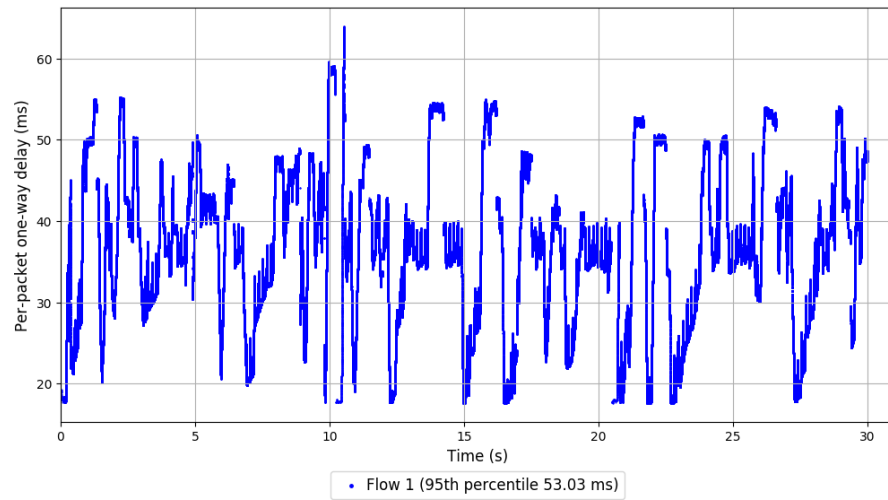
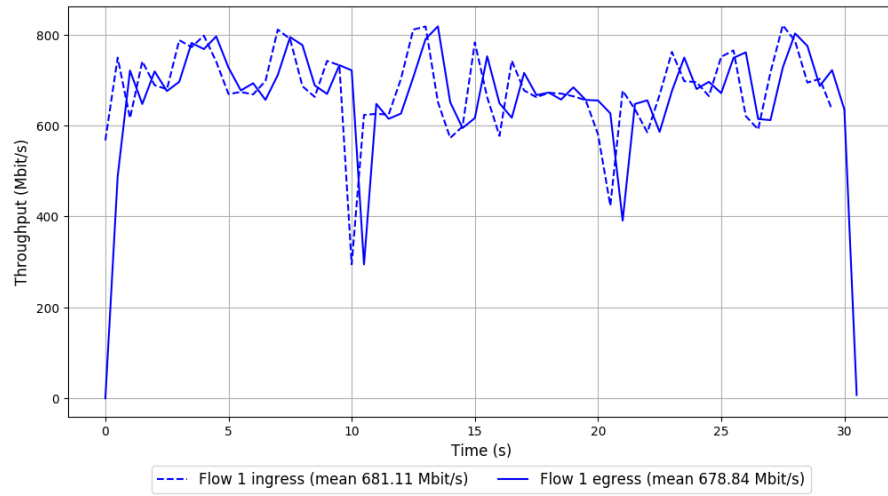


Run 2: Statistics of TCP BBR

Start at: 2018-09-05 02:13:22
End at: 2018-09-05 02:13:52
Local clock offset: -15.749 ms
Remote clock offset: 0.983 ms

Below is generated by plot.py at 2018-09-05 02:29:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 678.84 Mbit/s
95th percentile per-packet one-way delay: 53.030 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 678.84 Mbit/s
95th percentile per-packet one-way delay: 53.030 ms
Loss rate: 0.33%

Run 2: Report of TCP BBR — Data Link

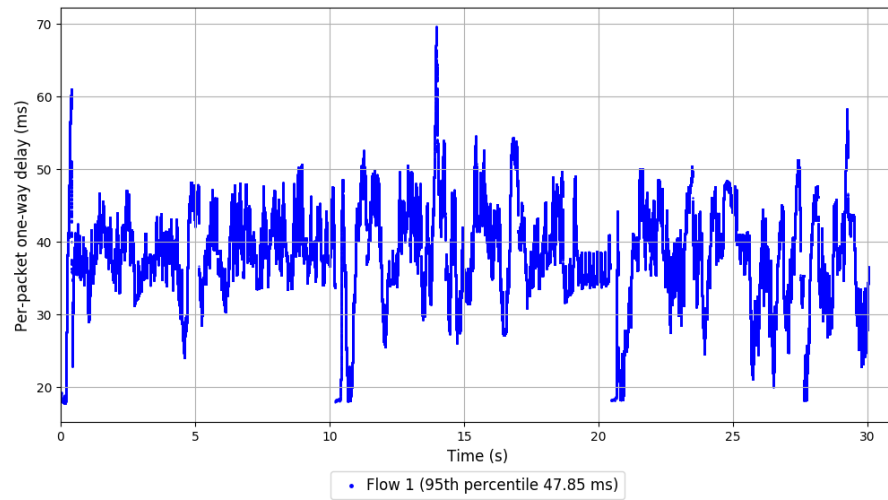
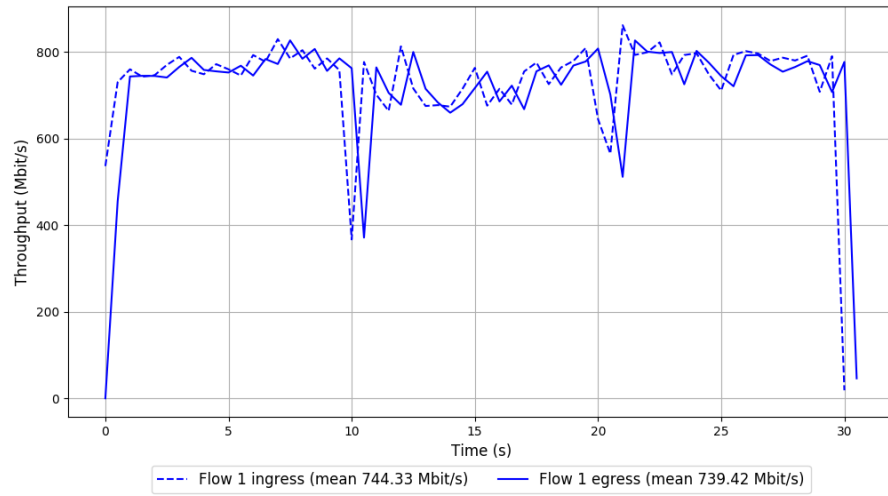


Run 3: Statistics of TCP BBR

Start at: 2018-09-05 02:19:16
End at: 2018-09-05 02:19:46
Local clock offset: -11.165 ms
Remote clock offset: 0.068 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 739.42 Mbit/s
95th percentile per-packet one-way delay: 47.849 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 739.42 Mbit/s
95th percentile per-packet one-way delay: 47.849 ms
Loss rate: 0.66%

Run 3: Report of TCP BBR — Data Link

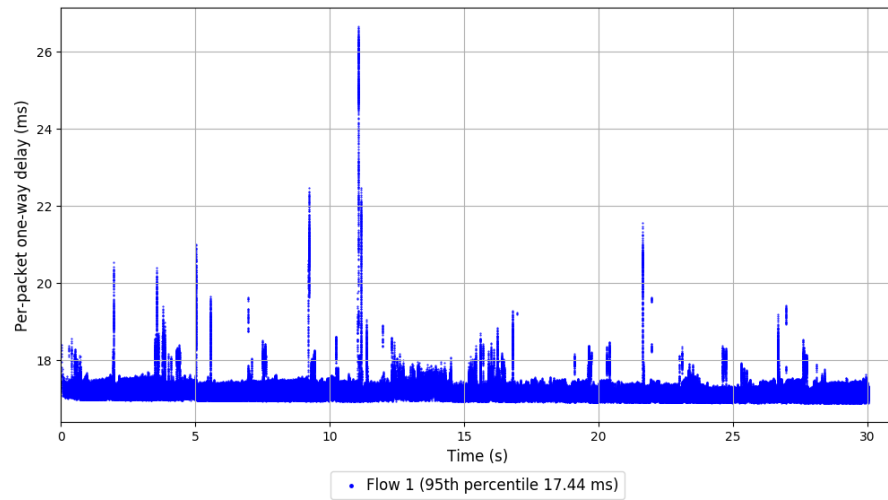
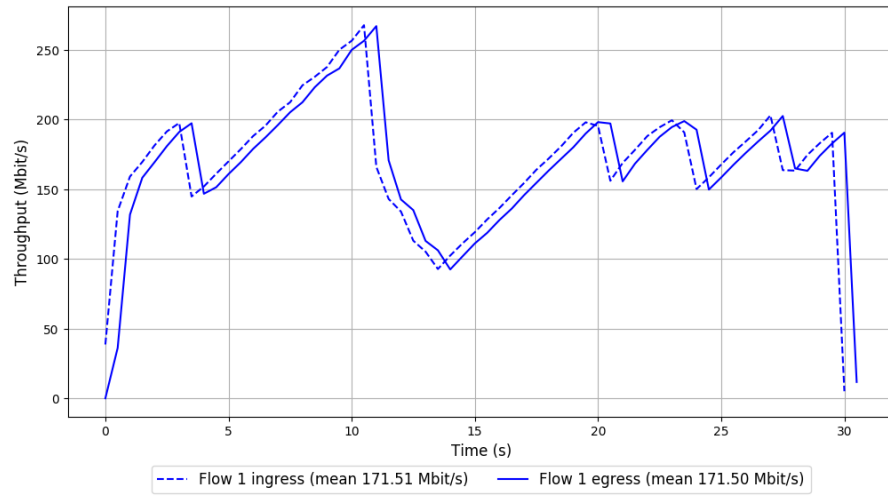


Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 02:09:00
End at: 2018-09-05 02:09:30
Local clock offset: -13.392 ms
Remote clock offset: 2.281 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 171.50 Mbit/s
95th percentile per-packet one-way delay: 17.441 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 171.50 Mbit/s
95th percentile per-packet one-way delay: 17.441 ms
Loss rate: 0.01%

Run 1: Report of TCP Cubic — Data Link

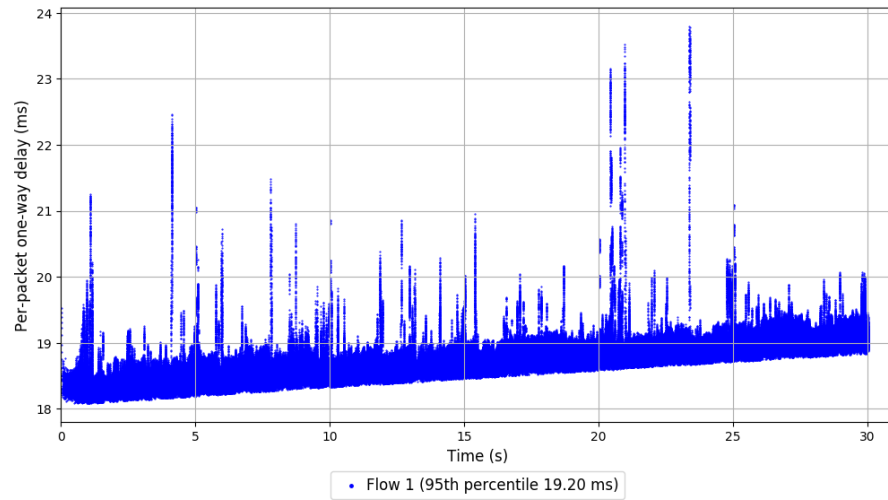
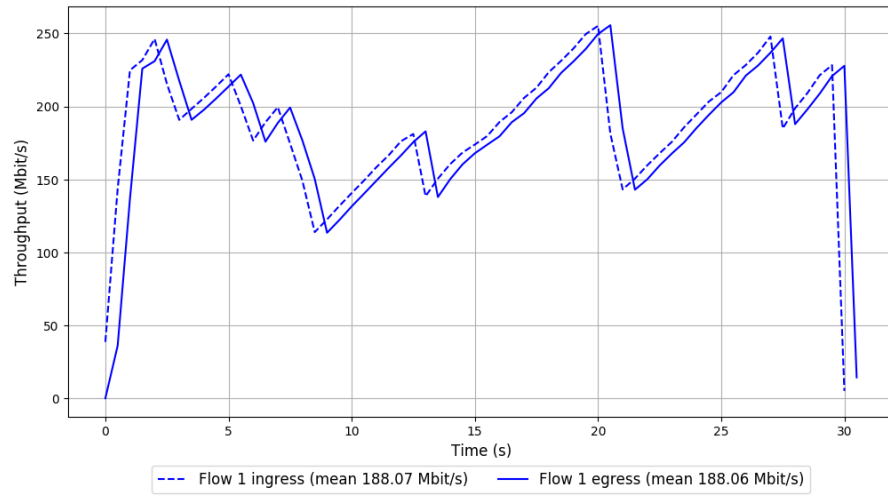


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 02:15:03
End at: 2018-09-05 02:15:33
Local clock offset: -15.905 ms
Remote clock offset: 0.757 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 188.06 Mbit/s
95th percentile per-packet one-way delay: 19.200 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 188.06 Mbit/s
95th percentile per-packet one-way delay: 19.200 ms
Loss rate: 0.01%

Run 2: Report of TCP Cubic — Data Link

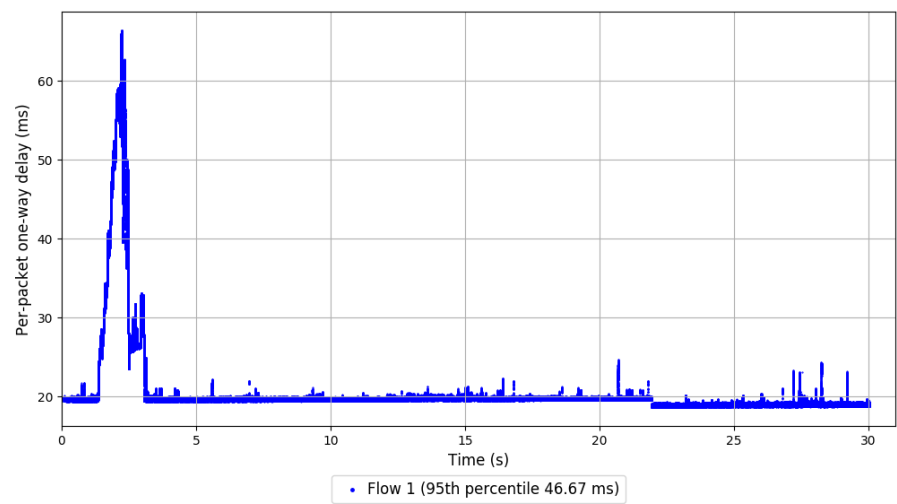
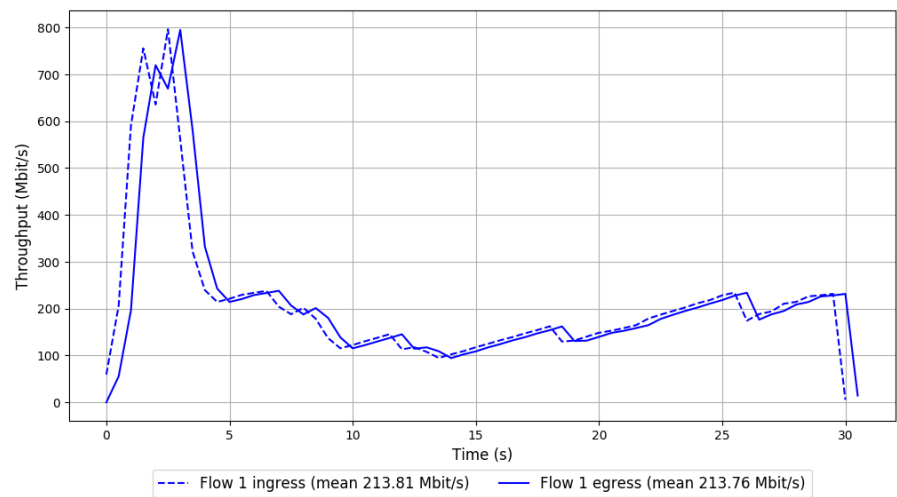


Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 02:20:59
End at: 2018-09-05 02:21:29
Local clock offset: -9.854 ms
Remote clock offset: -0.095 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 213.76 Mbit/s
95th percentile per-packet one-way delay: 46.670 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 213.76 Mbit/s
95th percentile per-packet one-way delay: 46.670 ms
Loss rate: 0.02%

Run 3: Report of TCP Cubic — Data Link

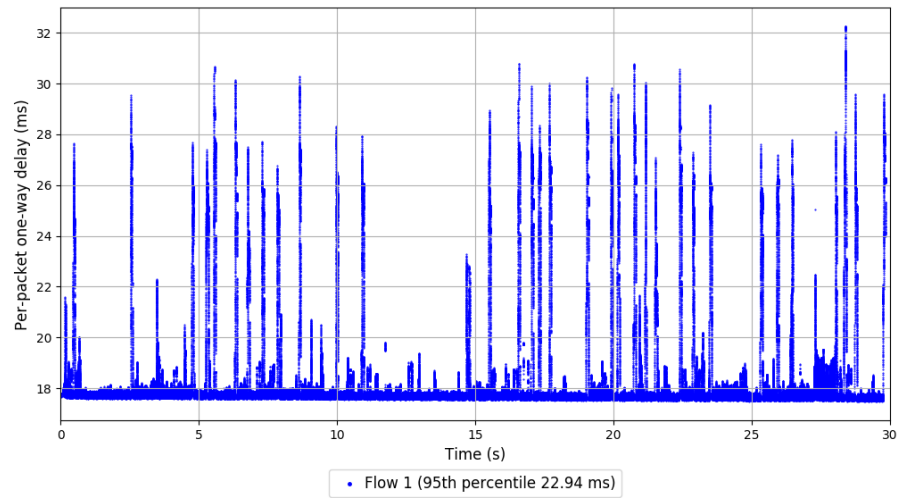
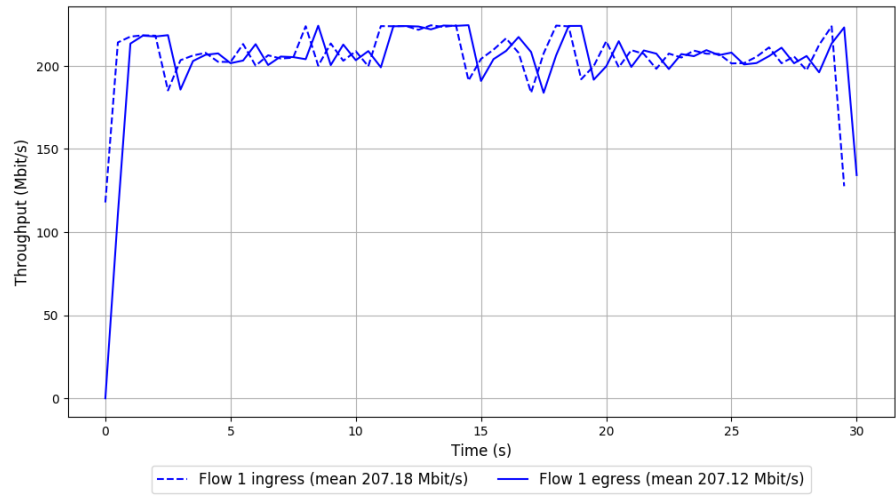


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 02:10:24
End at: 2018-09-05 02:10:54
Local clock offset: -14.083 ms
Remote clock offset: 1.759 ms

# Below is generated by plot.py at 2018-09-05 02:29:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 207.12 Mbit/s
95th percentile per-packet one-way delay: 22.940 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 207.12 Mbit/s
95th percentile per-packet one-way delay: 22.940 ms
Loss rate: 0.02%
```

Run 1: Report of Indigo — Data Link

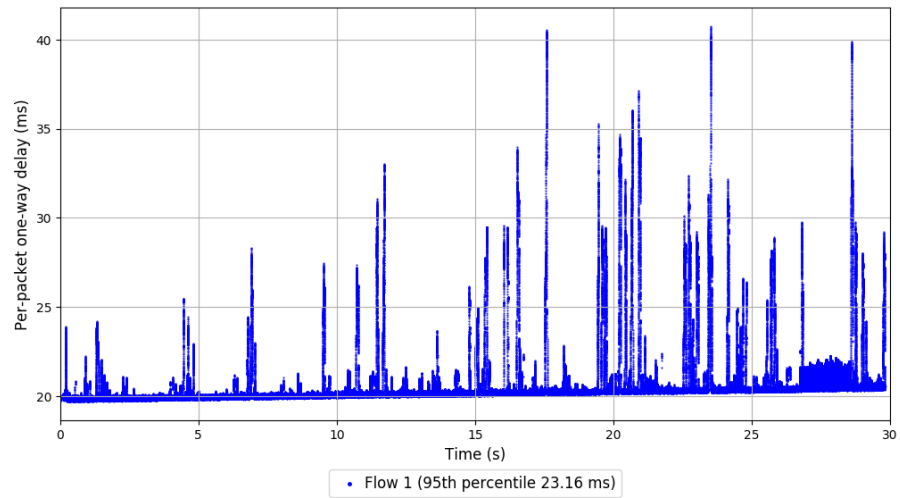
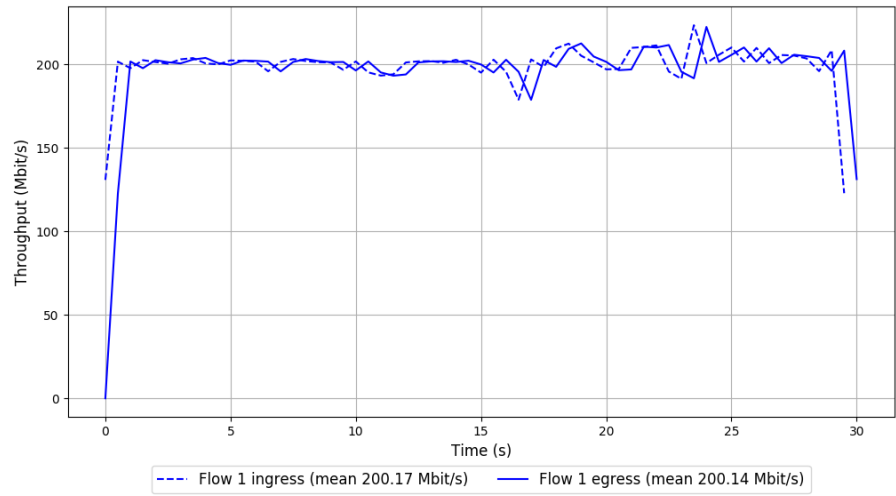


Run 2: Statistics of Indigo

Start at: 2018-09-05 02:16:27
End at: 2018-09-05 02:16:57
Local clock offset: -14.038 ms
Remote clock offset: 0.55 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 200.14 Mbit/s
95th percentile per-packet one-way delay: 23.165 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 200.14 Mbit/s
95th percentile per-packet one-way delay: 23.165 ms
Loss rate: 0.01%

Run 2: Report of Indigo — Data Link

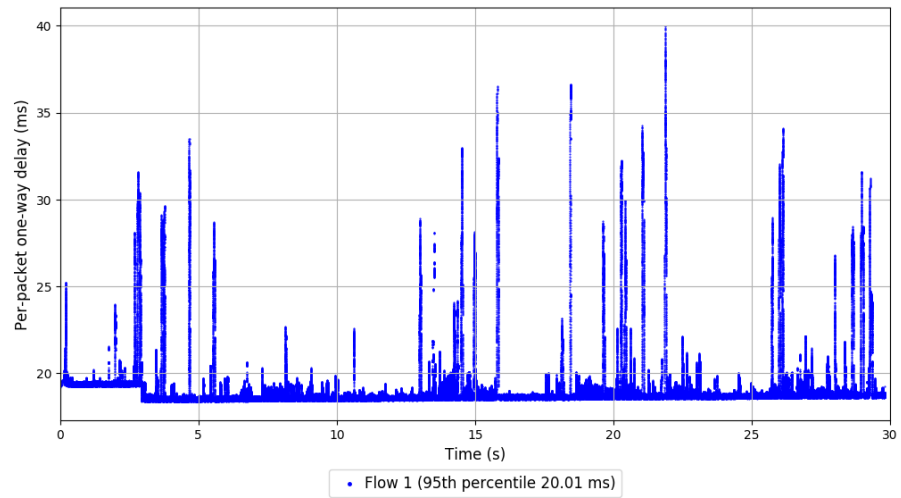
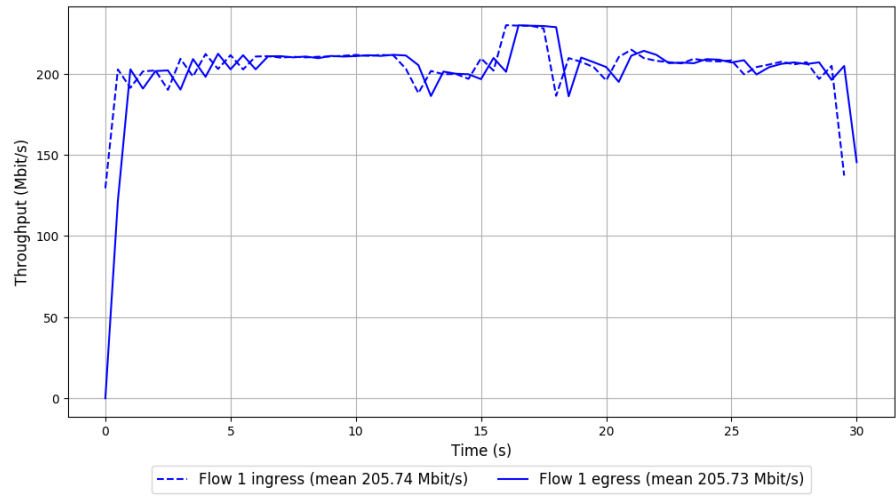


Run 3: Statistics of Indigo

Start at: 2018-09-05 02:22:24
End at: 2018-09-05 02:22:54
Local clock offset: -9.057 ms
Remote clock offset: -0.254 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 205.73 Mbit/s
95th percentile per-packet one-way delay: 20.008 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 205.73 Mbit/s
95th percentile per-packet one-way delay: 20.008 ms
Loss rate: 0.01%

Run 3: Report of Indigo — Data Link

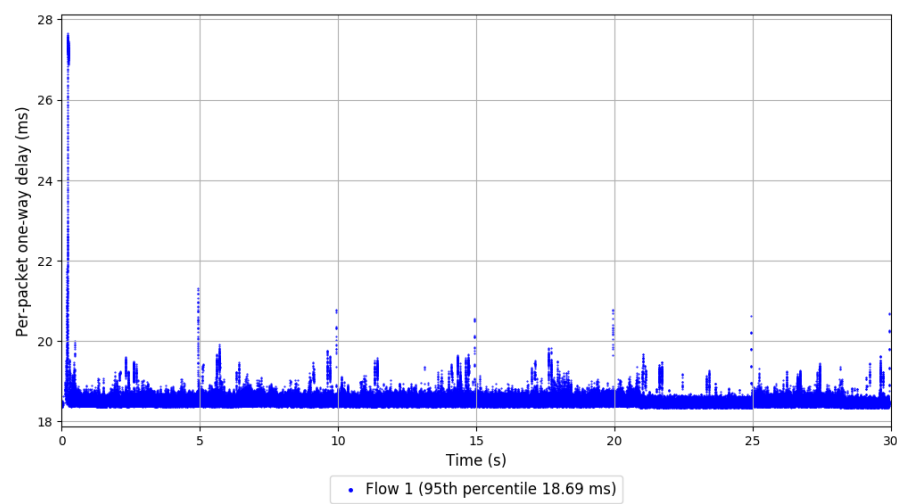
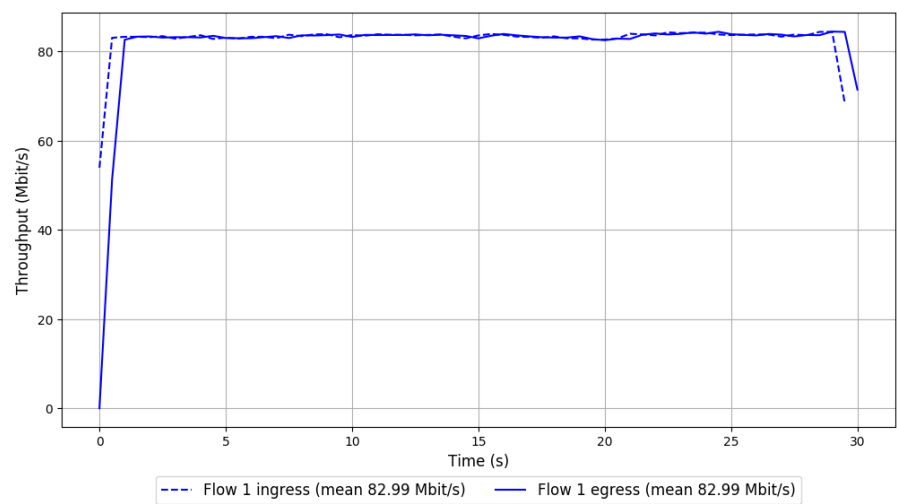


Run 1: Statistics of Muses-25

Start at: 2018-09-05 02:05:58
End at: 2018-09-05 02:06:28
Local clock offset: -11.969 ms
Remote clock offset: 3.379 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 82.99 Mbit/s
95th percentile per-packet one-way delay: 18.688 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 82.99 Mbit/s
95th percentile per-packet one-way delay: 18.688 ms
Loss rate: 0.00%

Run 1: Report of Muses-25 — Data Link

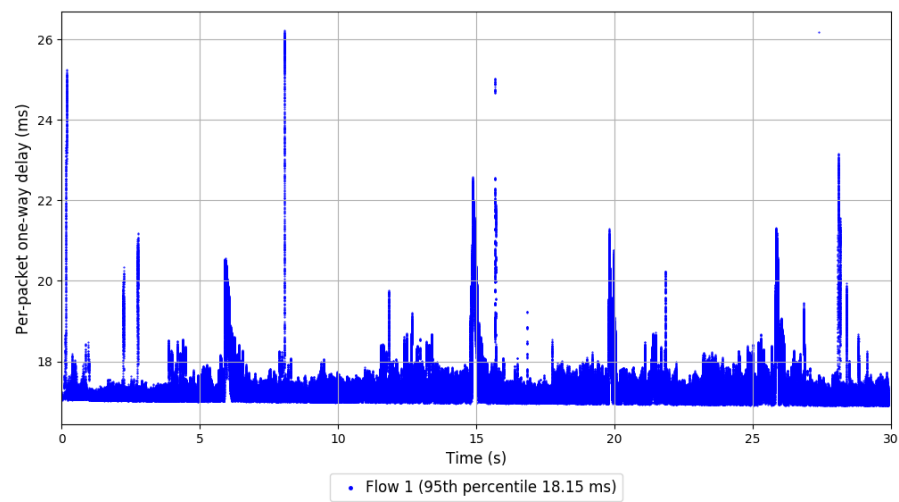
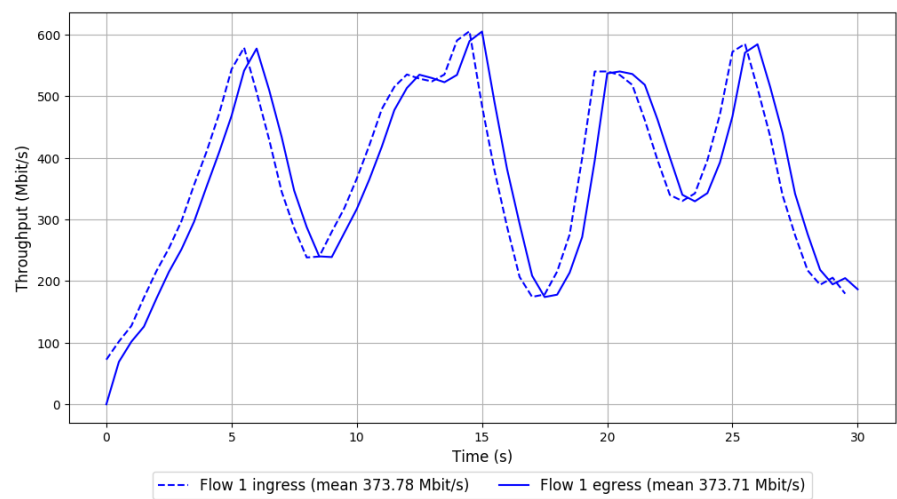


Run 2: Statistics of Muses-25

Start at: 2018-09-05 02:11:52
End at: 2018-09-05 02:12:22
Local clock offset: -14.981 ms
Remote clock offset: 1.374 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 373.71 Mbit/s
95th percentile per-packet one-way delay: 18.152 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 373.71 Mbit/s
95th percentile per-packet one-way delay: 18.152 ms
Loss rate: 0.02%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 02:17:54
End at: 2018-09-05 02:18:24
Local clock offset: -12.352 ms
Remote clock offset: 0.27 ms

Below is generated by plot.py at 2018-09-05 02:29:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 87.64 Mbit/s
95th percentile per-packet one-way delay: 20.020 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 87.64 Mbit/s
95th percentile per-packet one-way delay: 20.020 ms
Loss rate: 0.00%

Run 3: Report of Muses-25 — Data Link

