

Pantheon Report

Generated at 2018-08-31 04:40:44 (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.

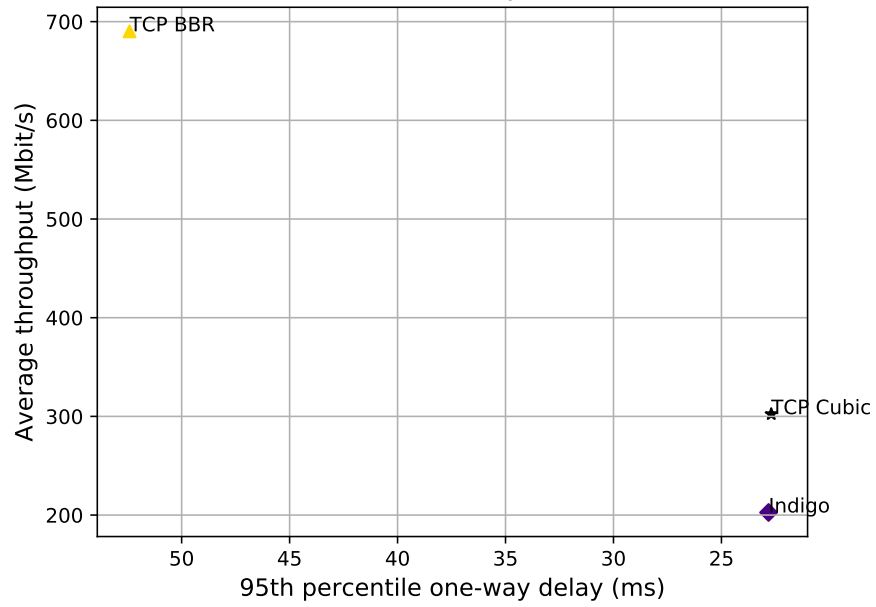
System info:

```
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
```

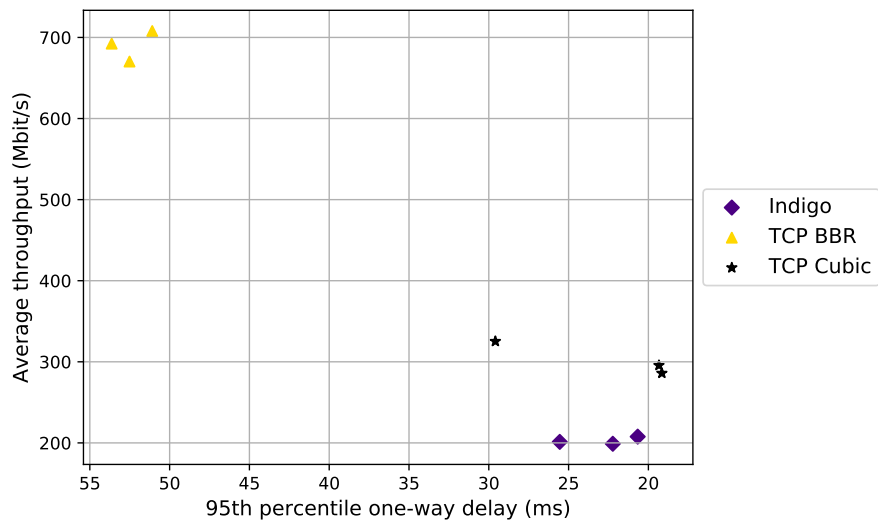
Git summary:

```
branch: muses @ 2de97ca91a065473c29a25fffe63fb137c97a67c
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
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	690.19	52.41	0.26
TCP Cubic	3	302.27	22.69	0.03
Indigo	3	202.63	22.82	0.00
Muses-25	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 04:18:03

End at: 2018-08-31 04:18:33

Local clock offset: 0.064 ms

Remote clock offset: -0.011 ms

Below is generated by plot.py at 2018-08-31 04:40:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 692.35 Mbit/s

95th percentile per-packet one-way delay: 53.631 ms

Loss rate: 0.24%

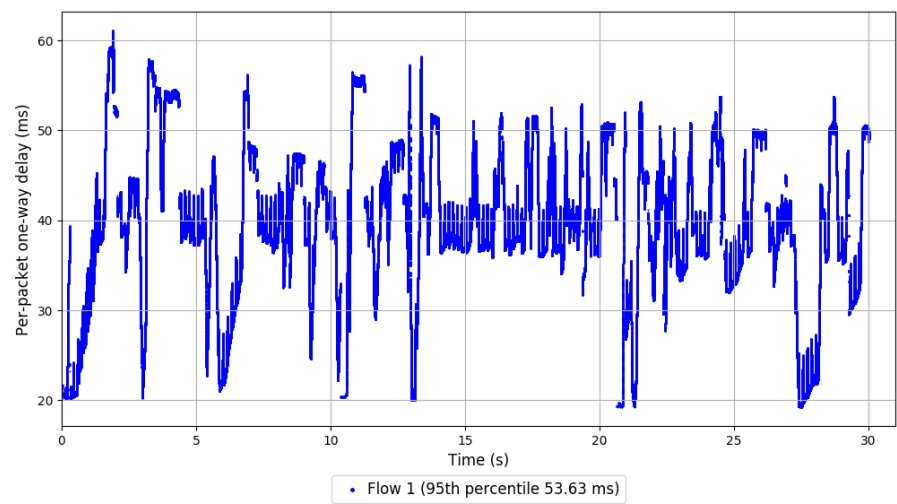
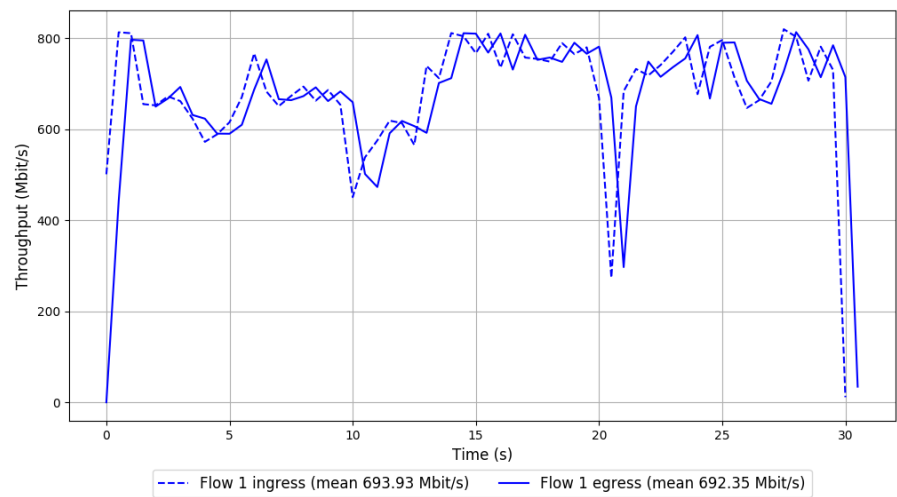
-- Flow 1:

Average throughput: 692.35 Mbit/s

95th percentile per-packet one-way delay: 53.631 ms

Loss rate: 0.24%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 04:23:55

End at: 2018-08-31 04:24:25

Local clock offset: 0.927 ms

Remote clock offset: 1.31 ms

Below is generated by plot.py at 2018-08-31 04:40:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 670.29 Mbit/s

95th percentile per-packet one-way delay: 52.513 ms

Loss rate: 0.26%

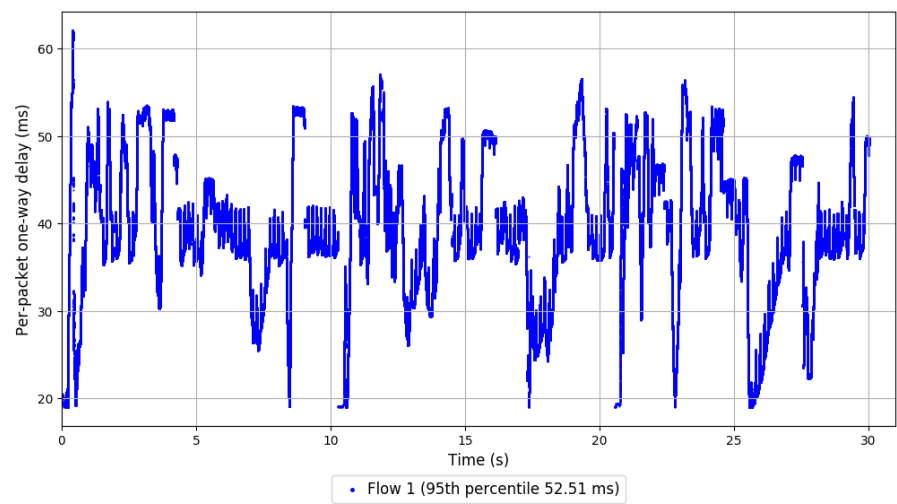
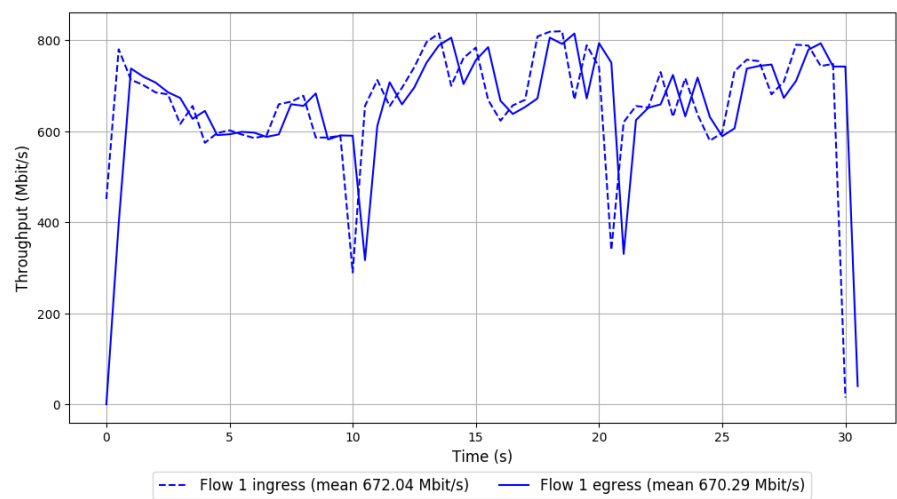
-- Flow 1:

Average throughput: 670.29 Mbit/s

95th percentile per-packet one-way delay: 52.513 ms

Loss rate: 0.26%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-31 04:29:44

End at: 2018-08-31 04:30:15

Local clock offset: 1.373 ms

Remote clock offset: 2.435 ms

Below is generated by plot.py at 2018-08-31 04:40:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 707.92 Mbit/s

95th percentile per-packet one-way delay: 51.090 ms

Loss rate: 0.29%

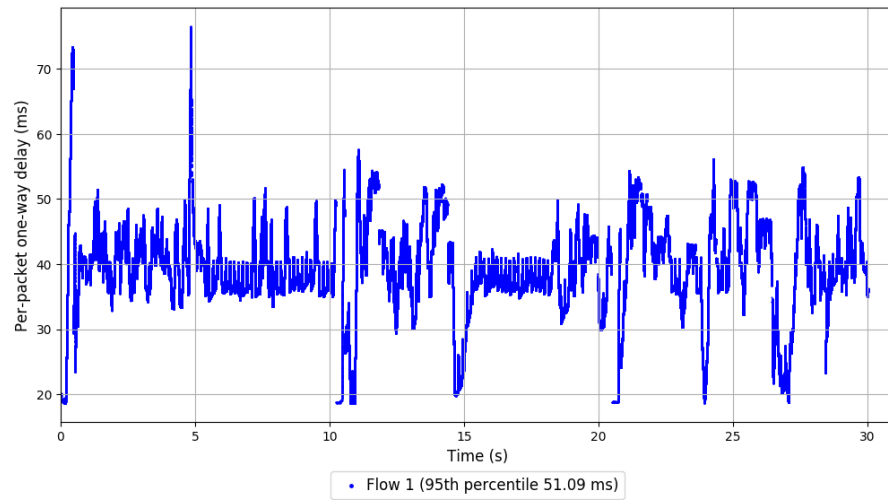
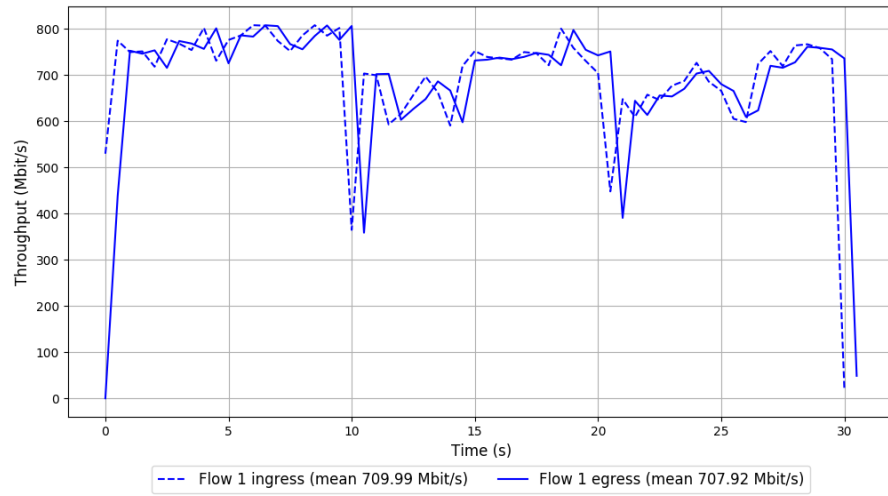
-- Flow 1:

Average throughput: 707.92 Mbit/s

95th percentile per-packet one-way delay: 51.090 ms

Loss rate: 0.29%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 04:22:27

End at: 2018-08-31 04:22:57

Local clock offset: 0.023 ms

Remote clock offset: 0.976 ms

Below is generated by plot.py at 2018-08-31 04:40:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 325.26 Mbit/s

95th percentile per-packet one-way delay: 29.588 ms

Loss rate: 0.06%

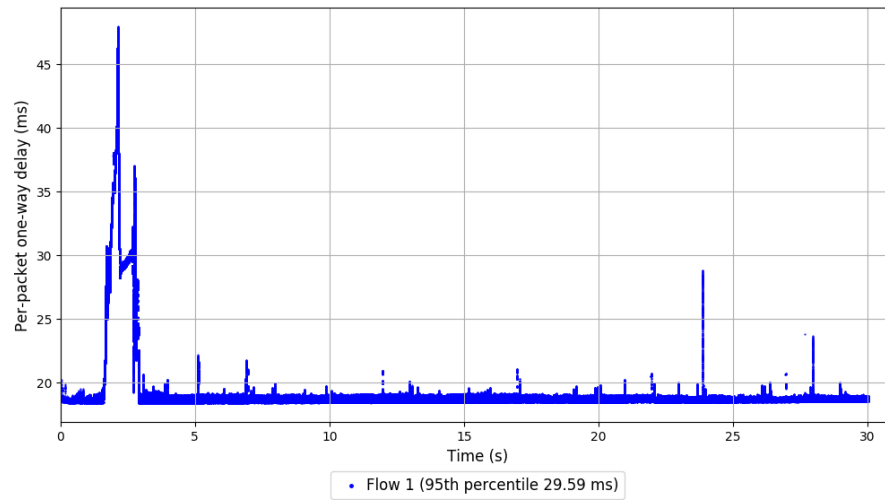
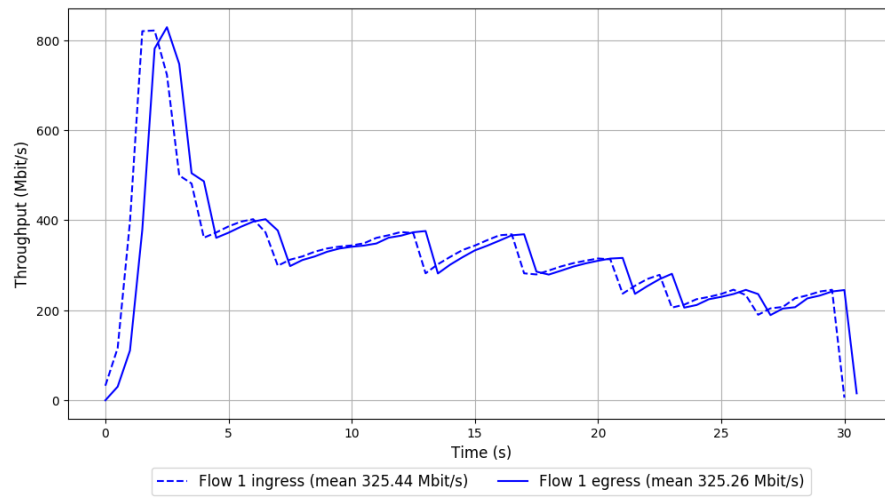
-- Flow 1:

Average throughput: 325.26 Mbit/s

95th percentile per-packet one-way delay: 29.588 ms

Loss rate: 0.06%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 04:28:18

End at: 2018-08-31 04:28:48

Local clock offset: 1.139 ms

Remote clock offset: 2.262 ms

Below is generated by plot.py at 2018-08-31 04:40:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 295.60 Mbit/s

95th percentile per-packet one-way delay: 19.338 ms

Loss rate: 0.01%

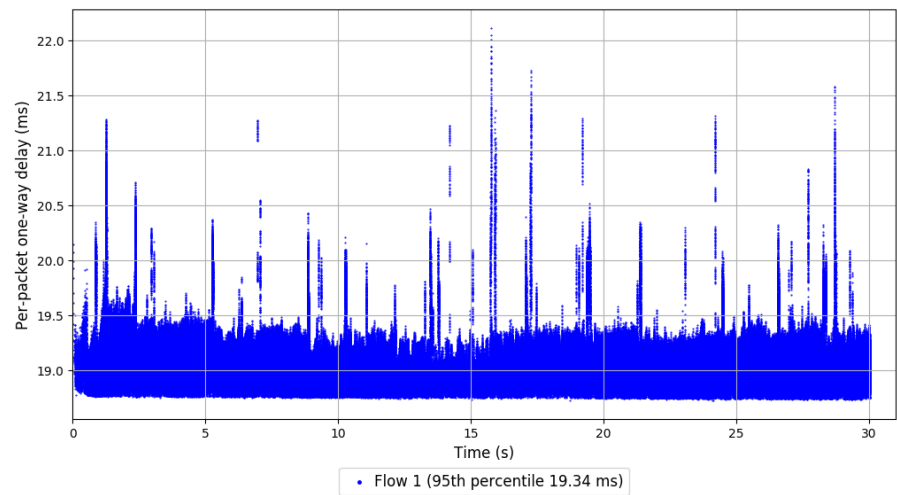
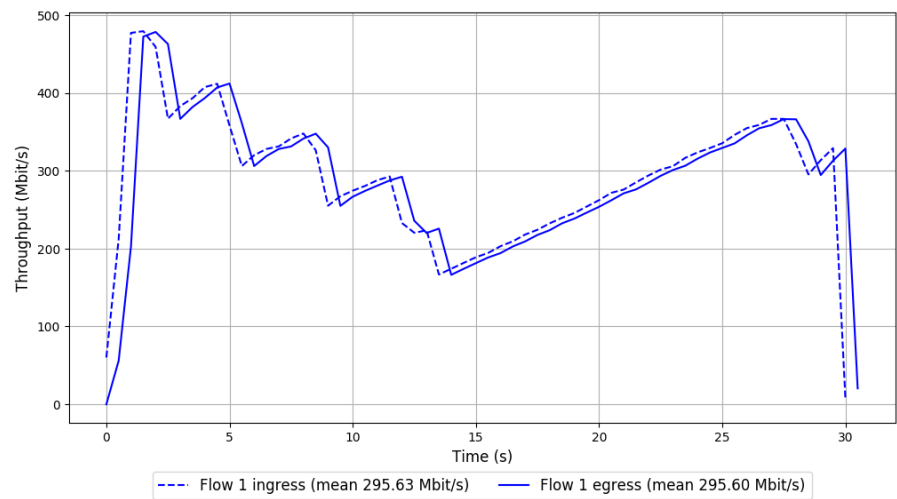
-- Flow 1:

Average throughput: 295.60 Mbit/s

95th percentile per-packet one-way delay: 19.338 ms

Loss rate: 0.01%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 04:34:09

End at: 2018-08-31 04:34:39

Local clock offset: 1.894 ms

Remote clock offset: 3.147 ms

Below is generated by plot.py at 2018-08-31 04:40:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 285.96 Mbit/s

95th percentile per-packet one-way delay: 19.156 ms

Loss rate: 0.01%

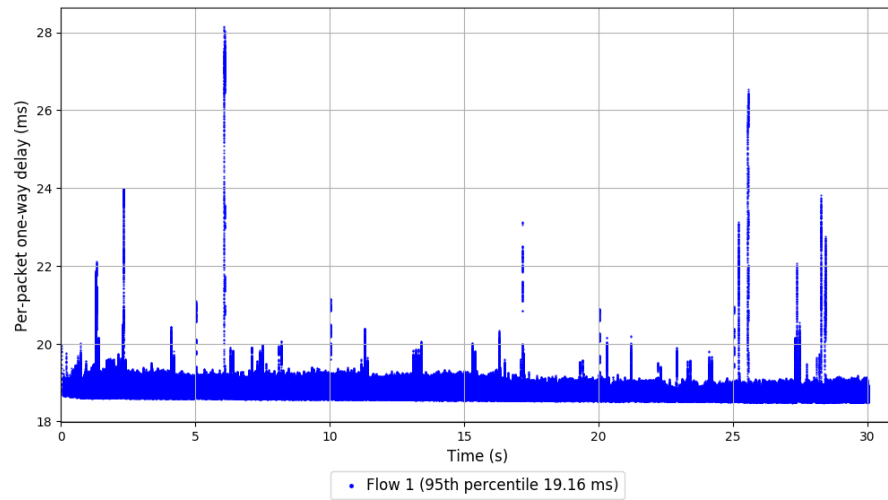
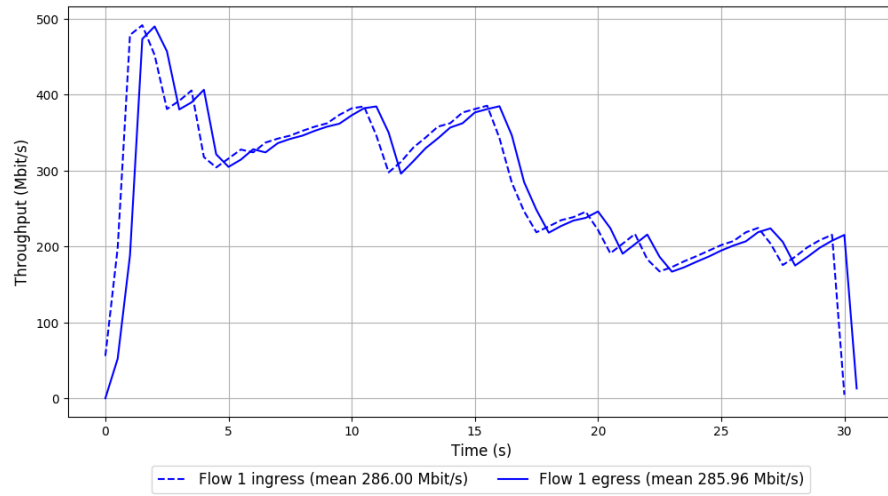
-- Flow 1:

Average throughput: 285.96 Mbit/s

95th percentile per-packet one-way delay: 19.156 ms

Loss rate: 0.01%

Run 3: Report of TCP Cubic — Data Link

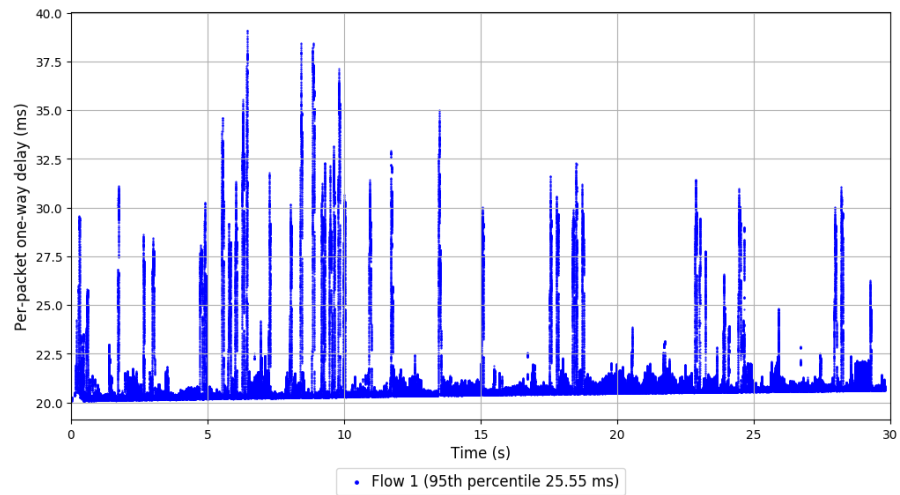
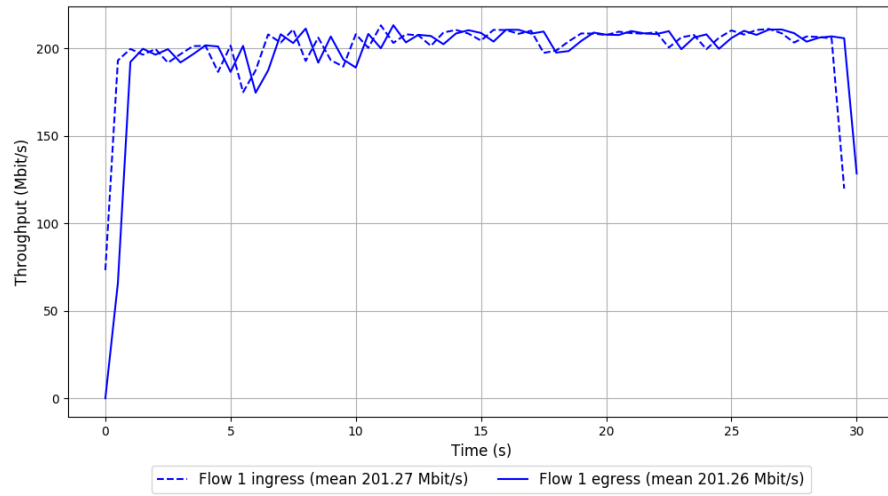


```
Run 1: Statistics of Indigo

Start at: 2018-08-31 04:21:01
End at: 2018-08-31 04:21:31
Local clock offset: -2.224 ms
Remote clock offset: 0.577 ms

# Below is generated by plot.py at 2018-08-31 04:40:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 201.26 Mbit/s
95th percentile per-packet one-way delay: 25.554 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 201.26 Mbit/s
95th percentile per-packet one-way delay: 25.554 ms
Loss rate: 0.01%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-08-31 04:26:51

End at: 2018-08-31 04:27:21

Local clock offset: 1.183 ms

Remote clock offset: 2.063 ms

Below is generated by plot.py at 2018-08-31 04:40:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 207.72 Mbit/s

95th percentile per-packet one-way delay: 20.670 ms

Loss rate: 0.00%

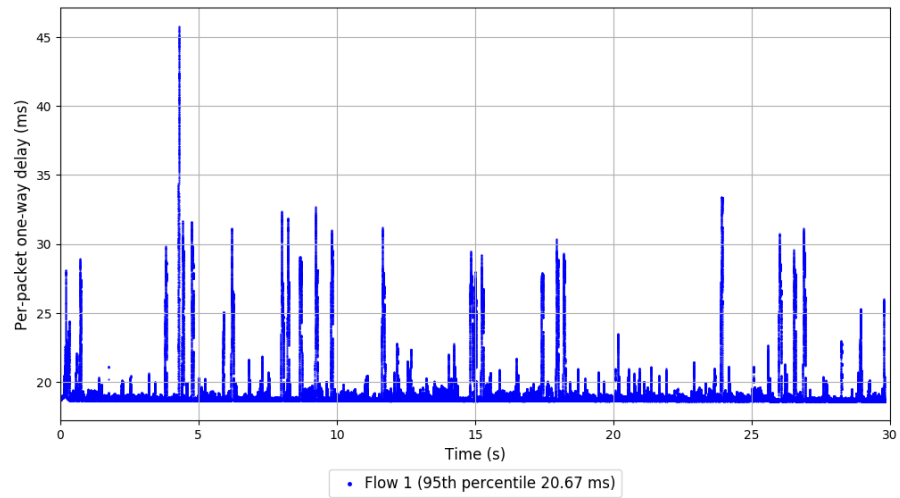
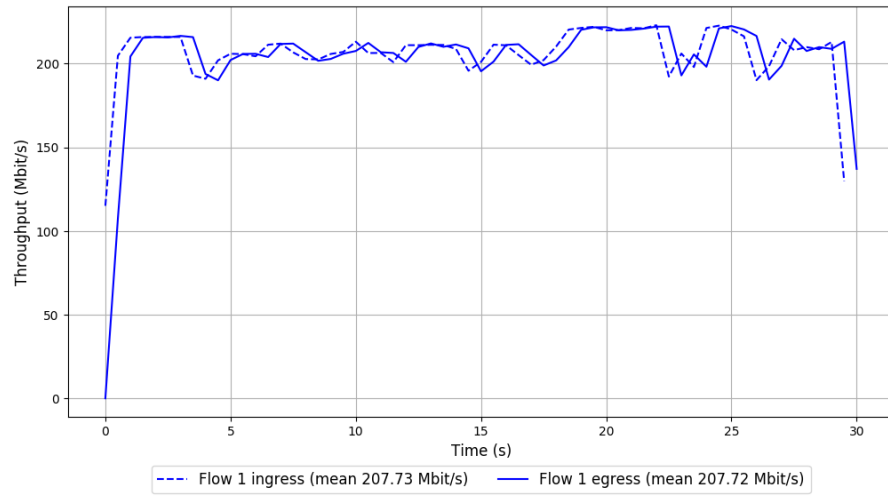
-- Flow 1:

Average throughput: 207.72 Mbit/s

95th percentile per-packet one-way delay: 20.670 ms

Loss rate: 0.00%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-08-31 04:32:43

End at: 2018-08-31 04:33:13

Local clock offset: 1.823 ms

Remote clock offset: 2.951 ms

Below is generated by plot.py at 2018-08-31 04:40:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 198.91 Mbit/s

95th percentile per-packet one-way delay: 22.230 ms

Loss rate: 0.00%

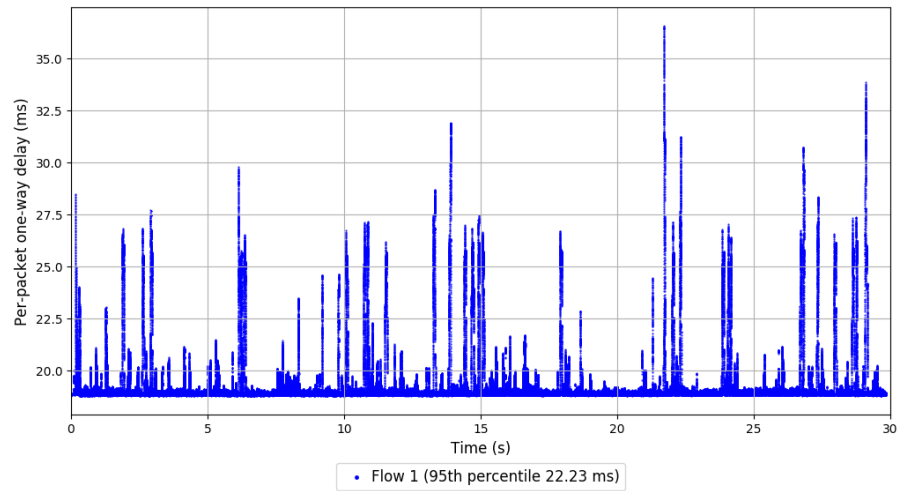
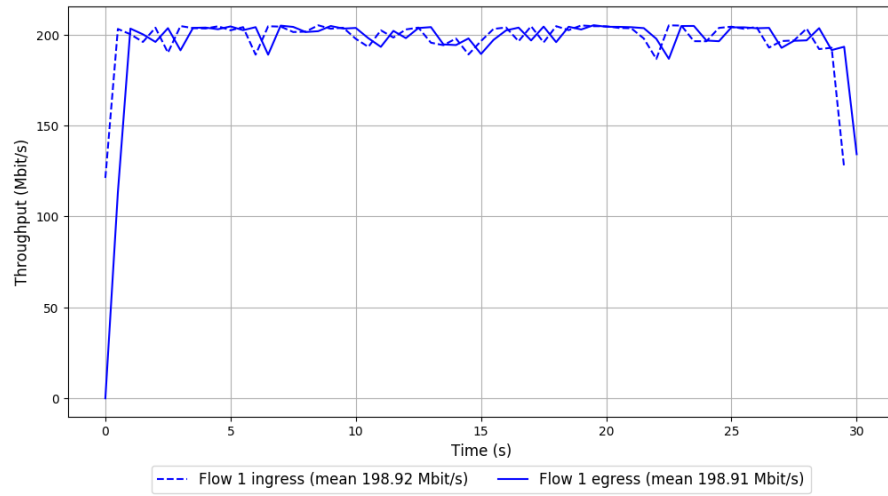
-- Flow 1:

Average throughput: 198.91 Mbit/s

95th percentile per-packet one-way delay: 22.230 ms

Loss rate: 0.00%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

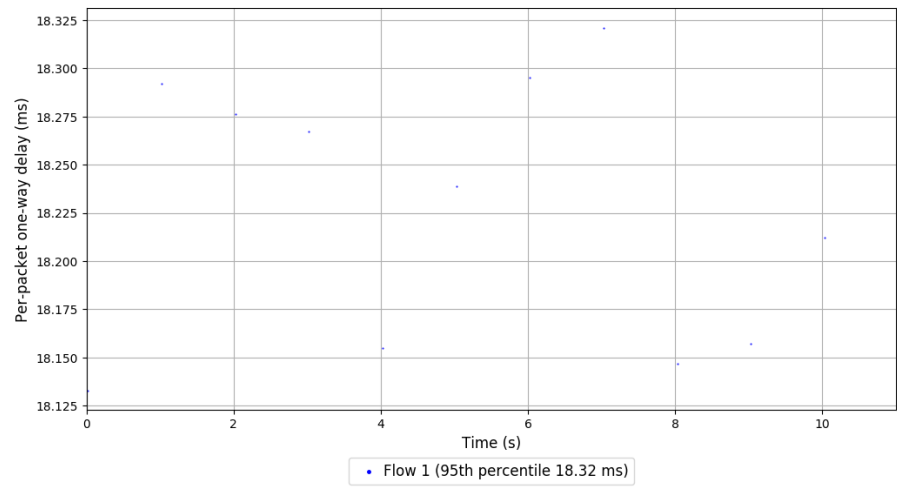
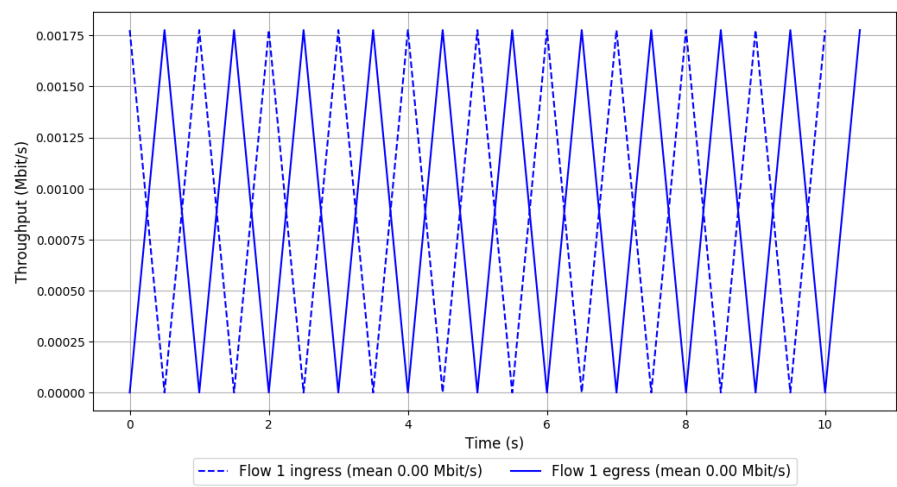
Start at: 2018-08-31 04:19:43

End at: 2018-08-31 04:20:13

Local clock offset: -1.649 ms

Remote clock offset: 0.045 ms

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

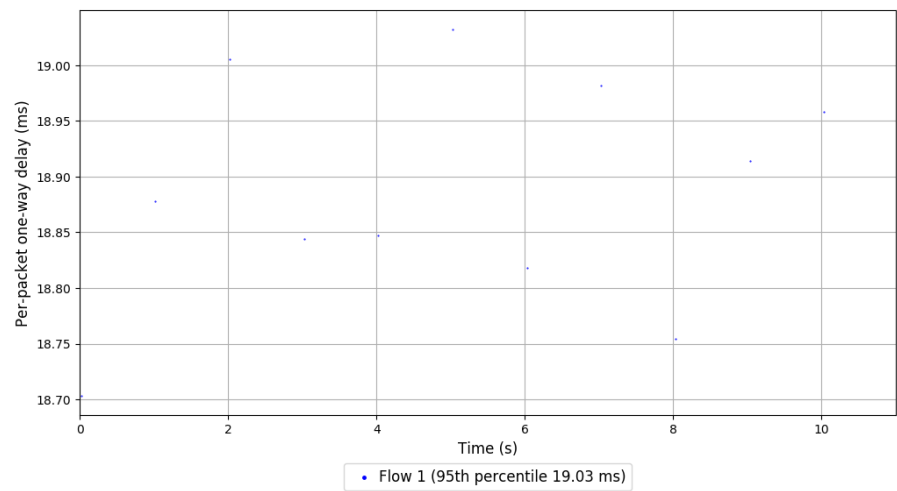
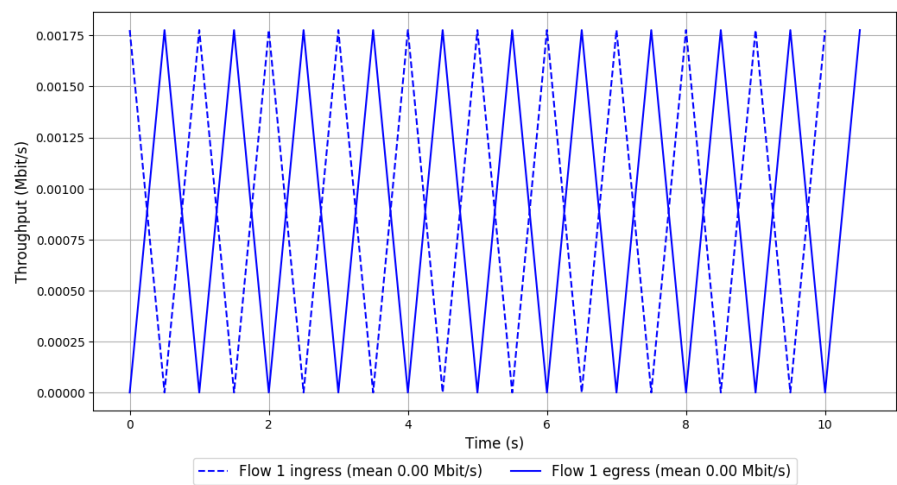
Start at: 2018-08-31 04:25:34

End at: 2018-08-31 04:26:04

Local clock offset: 1.324 ms

Remote clock offset: 1.761 ms

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-08-31 04:31:25

End at: 2018-08-31 04:31:55

Local clock offset: 1.532 ms

Remote clock offset: 2.778 ms

Run 3: Report of Muses-25 — Data Link

