

Pantheon Report

Generated at 2018-09-05 22:11:49 (UTC).

Data path: Mexico on **em1** (*remote*) → AWS California 2 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.

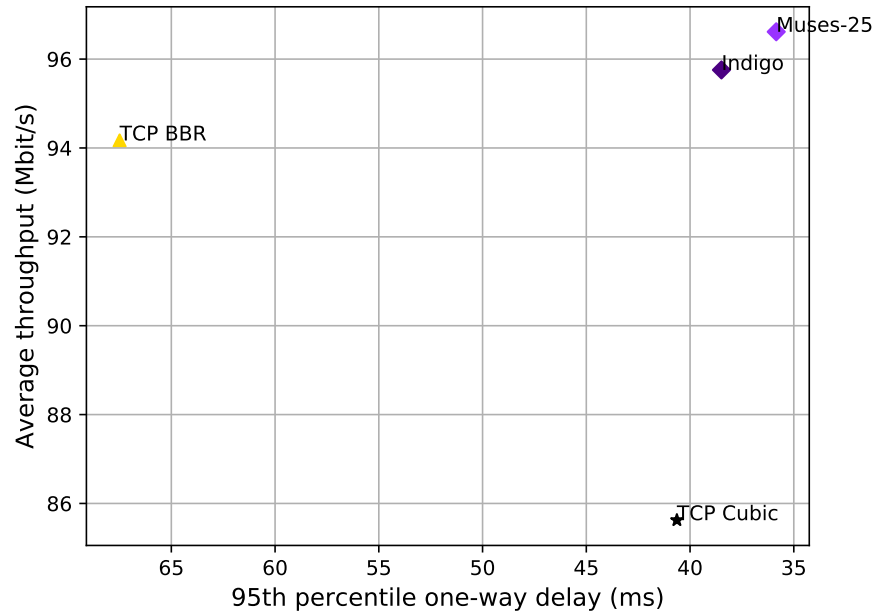
System info:

```
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
```

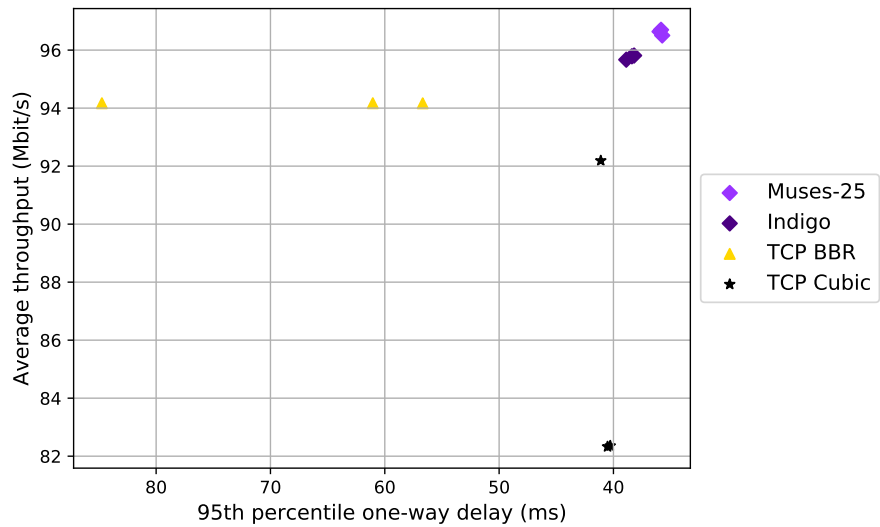
Git summary:

```
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 Mexico to AWS California 2, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Mexico to AWS California 2, 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	94.17	67.49	0.79
TCP Cubic	3	85.63	40.63	0.26
Indigo	3	95.76	38.49	0.23
Muses-25	3	96.61	35.85	0.22

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 21:54:36

End at: 2018-09-05 21:55:06

Local clock offset: 6.85 ms

Remote clock offset: -0.473 ms

Below is generated by plot.py at 2018-09-05 22:11:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 84.744 ms

Loss rate: 0.71%

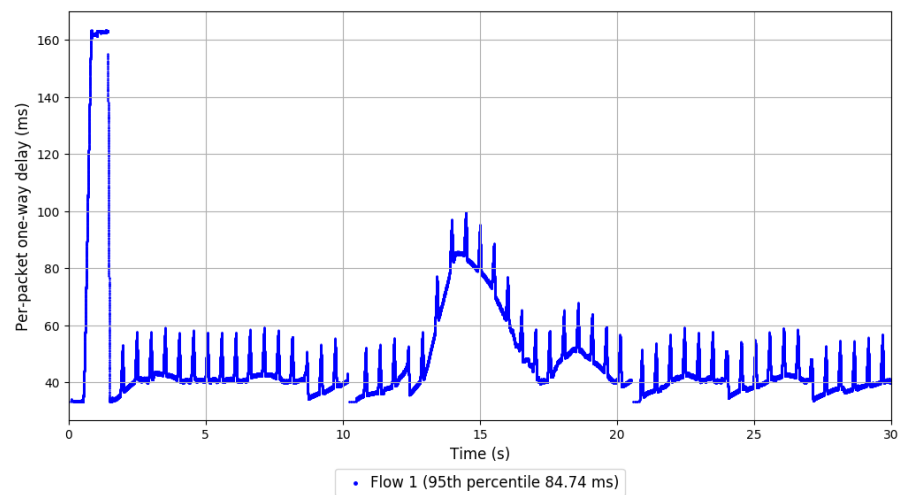
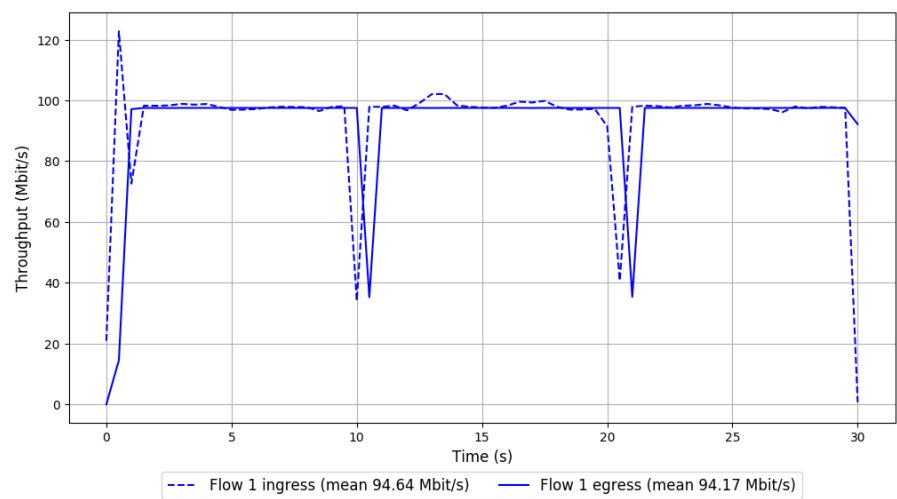
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 84.744 ms

Loss rate: 0.71%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 21:59:55

End at: 2018-09-05 22:00:25

Local clock offset: 8.048 ms

Remote clock offset: -0.832 ms

Below is generated by plot.py at 2018-09-05 22:11:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 56.683 ms

Loss rate: 0.69%

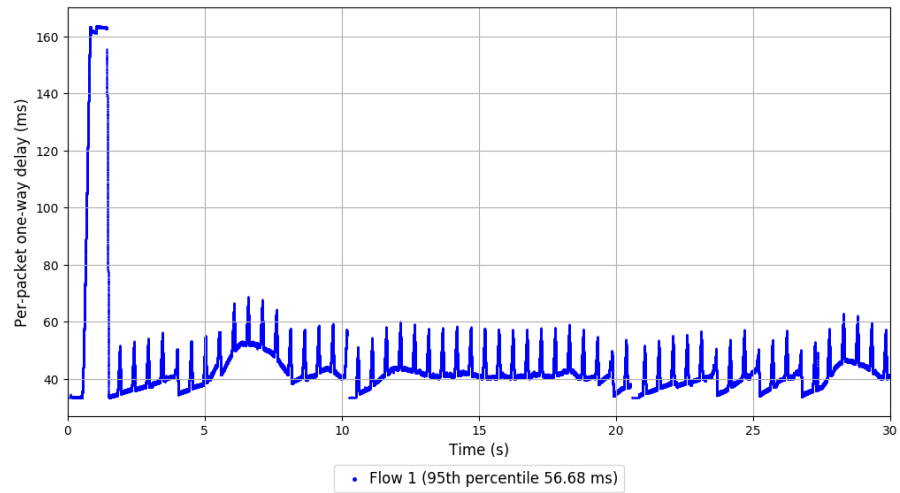
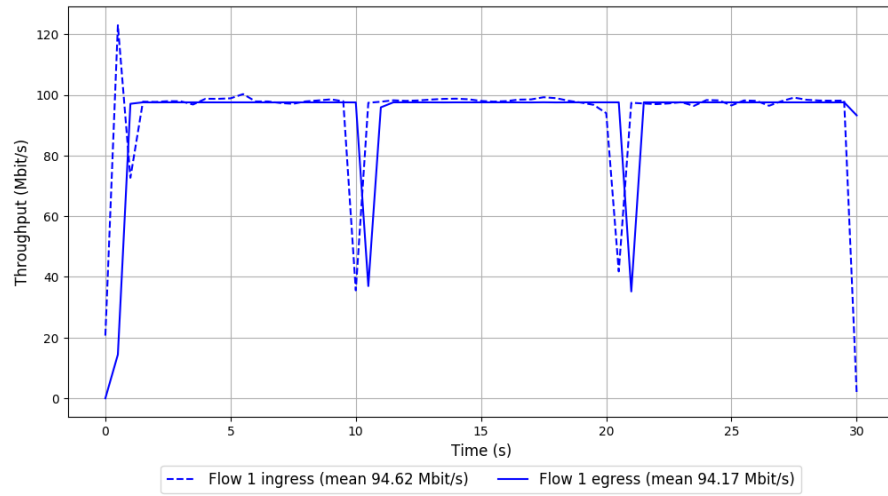
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 56.683 ms

Loss rate: 0.69%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-05 22:05:15

End at: 2018-09-05 22:05:45

Local clock offset: 5.578 ms

Remote clock offset: -0.848 ms

Below is generated by plot.py at 2018-09-05 22:11:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 61.048 ms

Loss rate: 0.98%

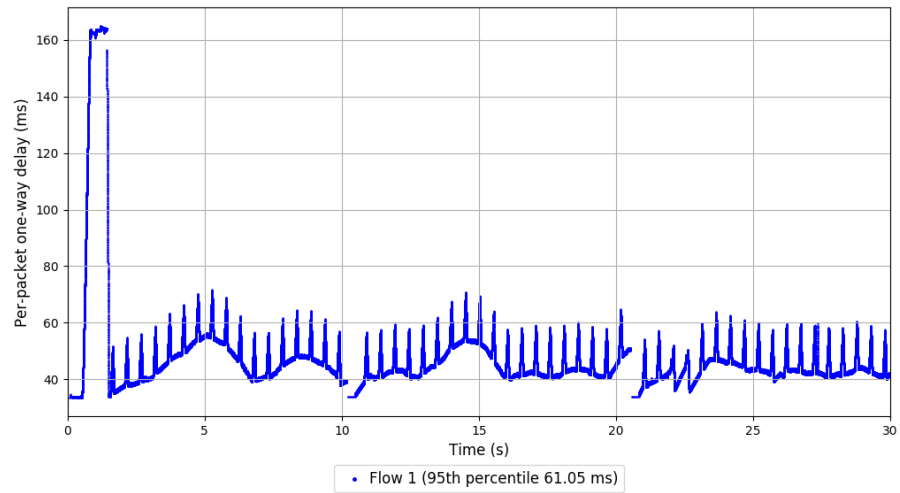
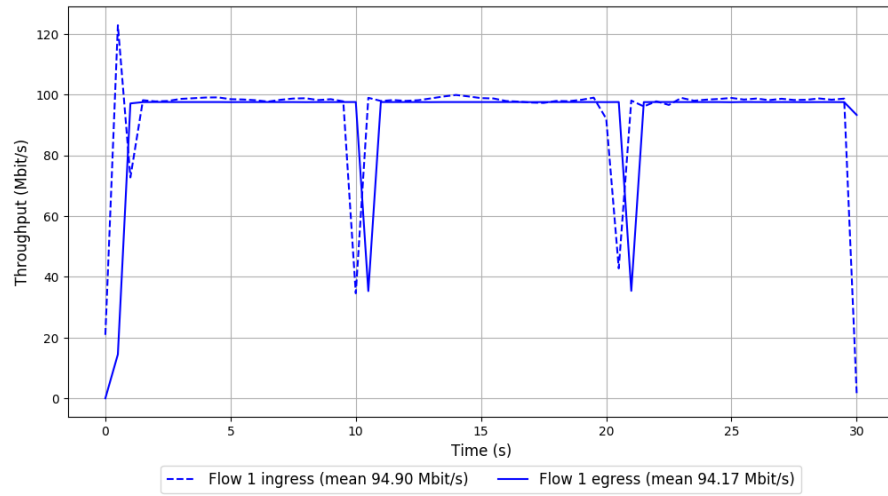
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 61.048 ms

Loss rate: 0.98%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 21:58:37

End at: 2018-09-05 21:59:07

Local clock offset: 7.849 ms

Remote clock offset: -0.63 ms

Below is generated by plot.py at 2018-09-05 22:11:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 82.36 Mbit/s

95th percentile per-packet one-way delay: 40.279 ms

Loss rate: 0.26%

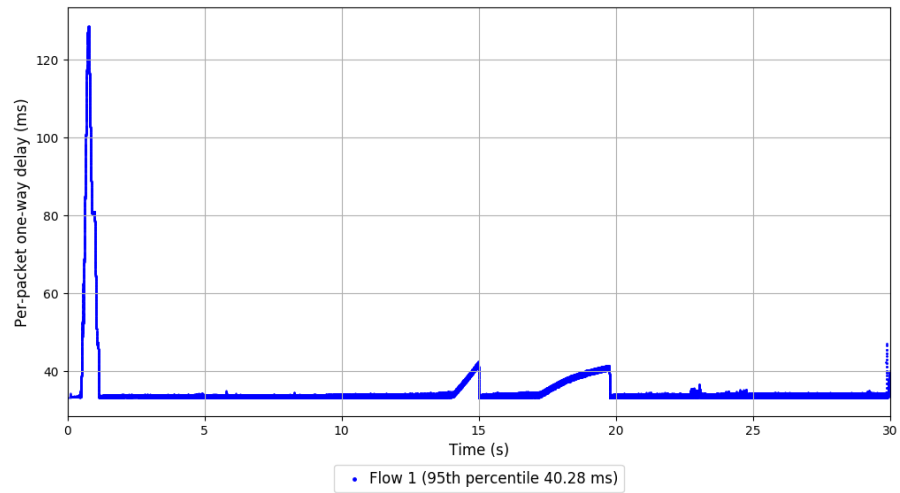
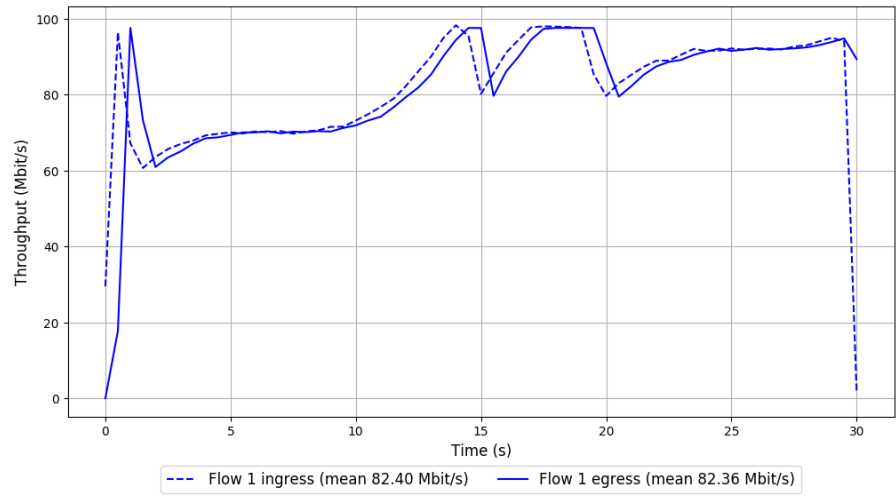
-- Flow 1:

Average throughput: 82.36 Mbit/s

95th percentile per-packet one-way delay: 40.279 ms

Loss rate: 0.26%

Run 1: Report of TCP Cubic — Data Link

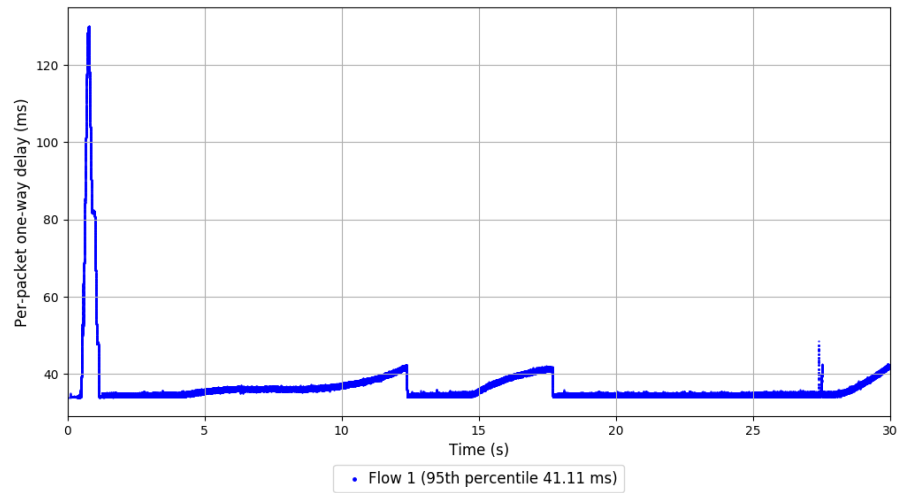
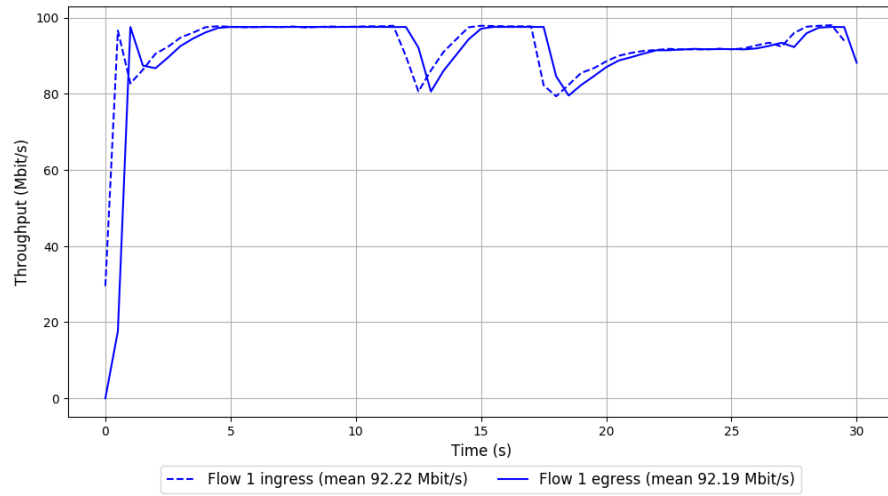


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 22:03:56
End at: 2018-09-05 22:04:26
Local clock offset: 6.268 ms
Remote clock offset: -1.007 ms

Below is generated by plot.py at 2018-09-05 22:11:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 92.19 Mbit/s
95th percentile per-packet one-way delay: 41.109 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 92.19 Mbit/s
95th percentile per-packet one-way delay: 41.109 ms
Loss rate: 0.25%

Run 2: Report of TCP Cubic — Data Link

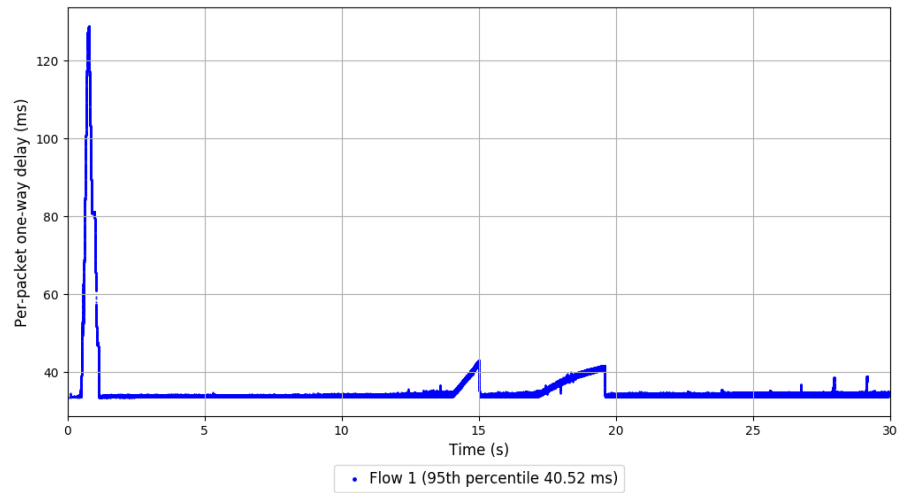
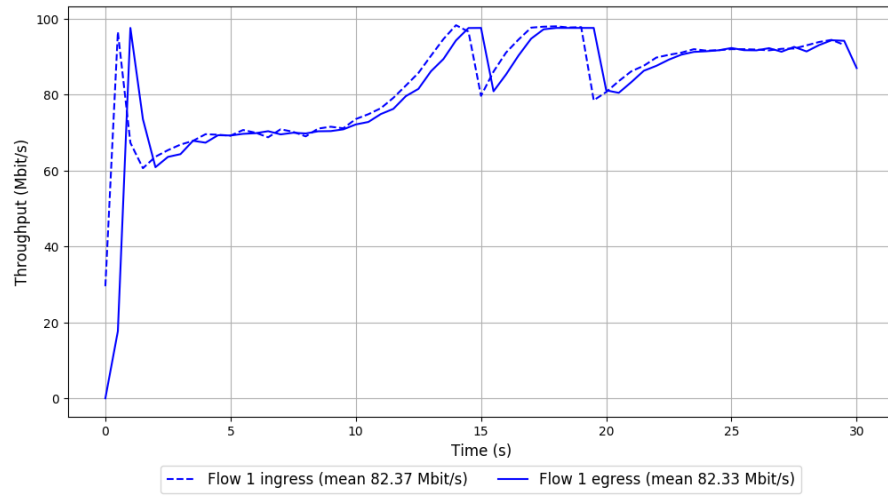


Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 22:09:17
End at: 2018-09-05 22:09:47
Local clock offset: 4.273 ms
Remote clock offset: -0.852 ms

Below is generated by plot.py at 2018-09-05 22:11:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 82.33 Mbit/s
95th percentile per-packet one-way delay: 40.516 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 82.33 Mbit/s
95th percentile per-packet one-way delay: 40.516 ms
Loss rate: 0.26%

Run 3: Report of TCP Cubic — Data Link

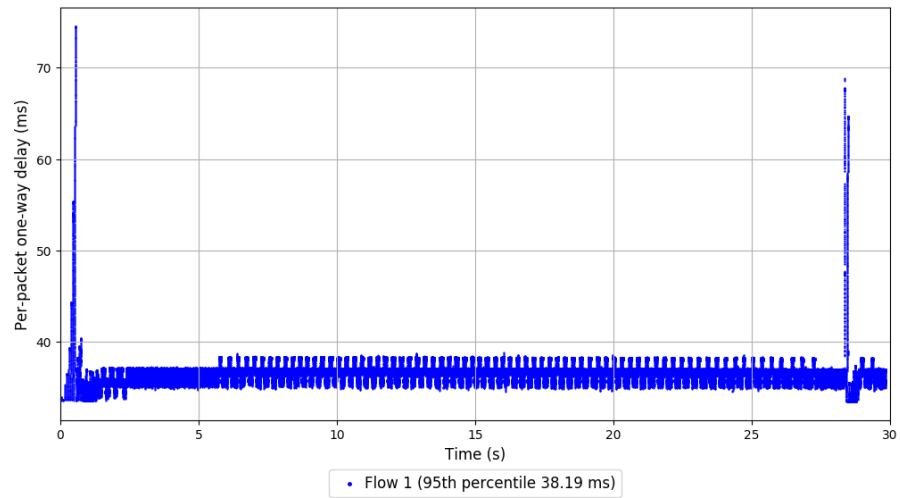
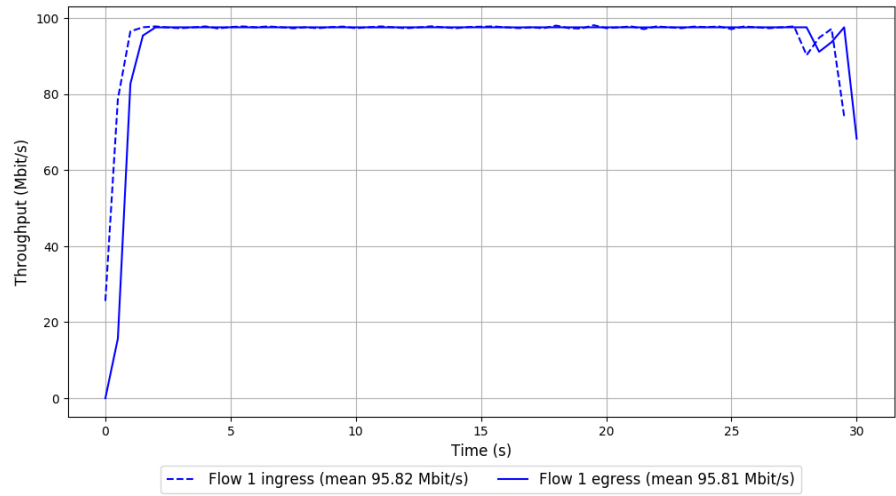


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 21:55:56
End at: 2018-09-05 21:56:26
Local clock offset: 7.244 ms
Remote clock offset: -0.738 ms

# Below is generated by plot.py at 2018-09-05 22:11:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.81 Mbit/s
95th percentile per-packet one-way delay: 38.193 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 95.81 Mbit/s
95th percentile per-packet one-way delay: 38.193 ms
Loss rate: 0.23%
```

Run 1: Report of Indigo — Data Link

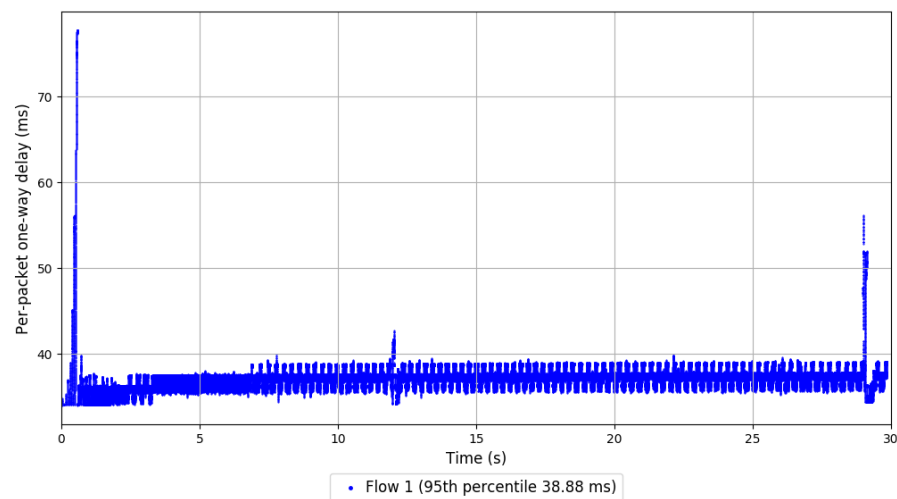
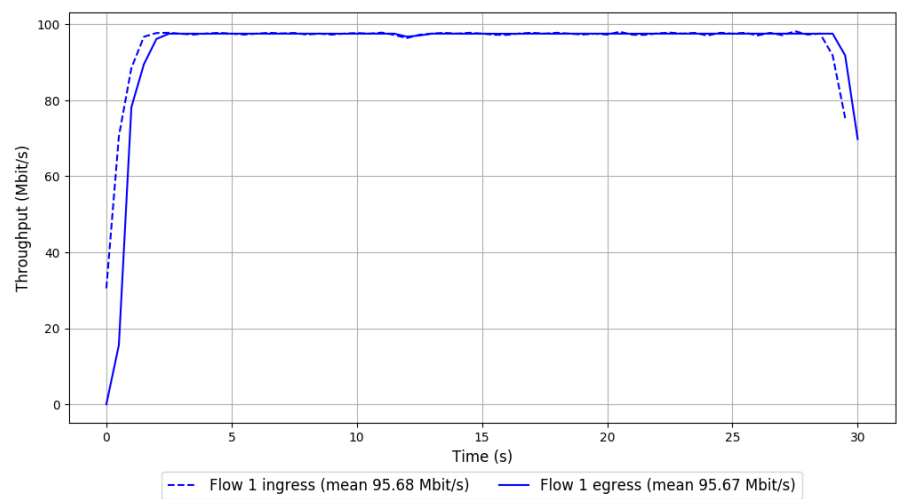


Run 2: Statistics of Indigo

Start at: 2018-09-05 22:01:15
End at: 2018-09-05 22:01:46
Local clock offset: 8.127 ms
Remote clock offset: -0.818 ms

Below is generated by plot.py at 2018-09-05 22:11:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 95.67 Mbit/s
95th percentile per-packet one-way delay: 38.879 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 95.67 Mbit/s
95th percentile per-packet one-way delay: 38.879 ms
Loss rate: 0.23%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-05 22:06:36

End at: 2018-09-05 22:07:06

Local clock offset: 5.09 ms

Remote clock offset: -0.853 ms

Below is generated by plot.py at 2018-09-05 22:11:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.79 Mbit/s

95th percentile per-packet one-way delay: 38.389 ms

Loss rate: 0.23%

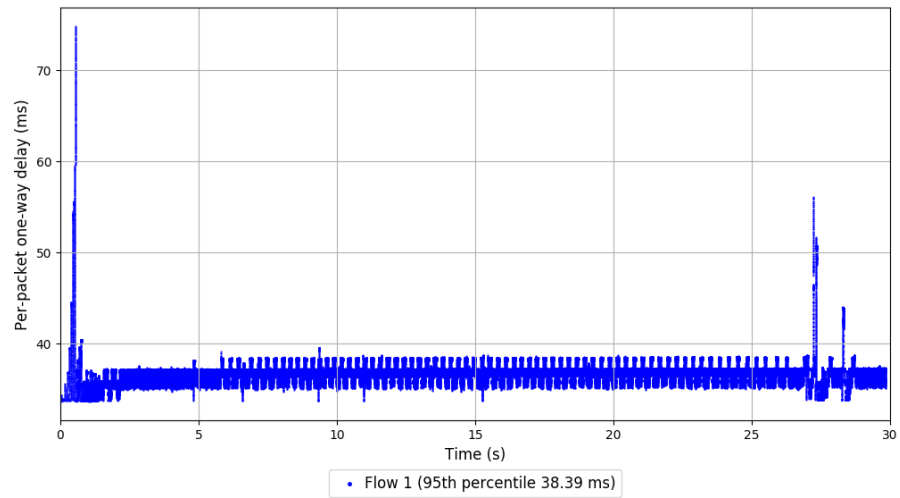
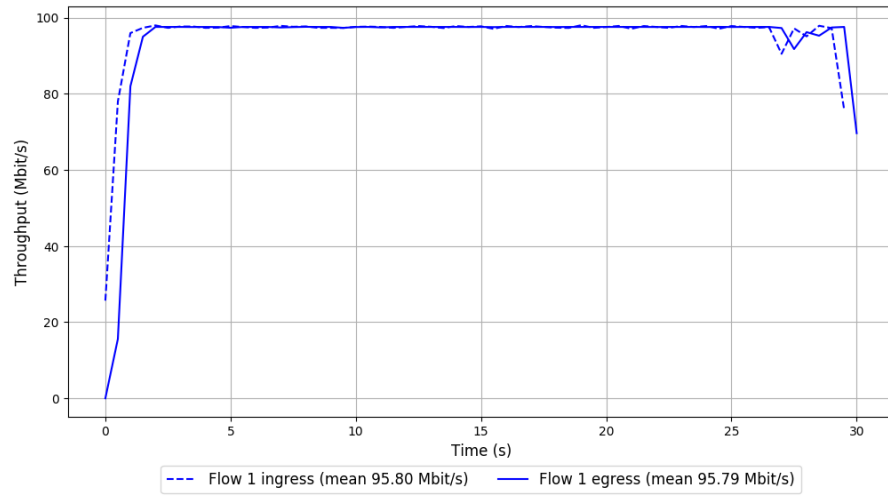
-- Flow 1:

Average throughput: 95.79 Mbit/s

95th percentile per-packet one-way delay: 38.389 ms

Loss rate: 0.23%

Run 3: Report of Indigo — Data Link

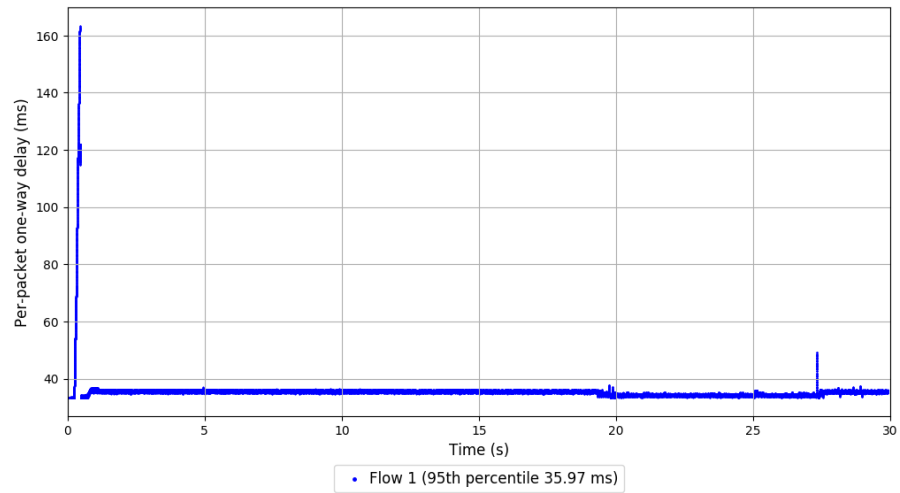
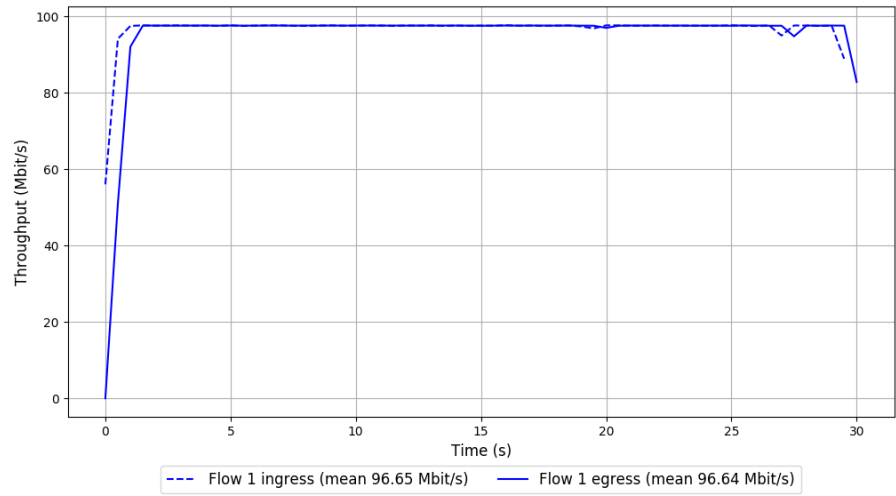


Run 1: Statistics of Muses-25

Start at: 2018-09-05 21:57:17
End at: 2018-09-05 21:57:47
Local clock offset: 7.566 ms
Remote clock offset: -0.645 ms

Below is generated by plot.py at 2018-09-05 22:11:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.64 Mbit/s
95th percentile per-packet one-way delay: 35.968 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.64 Mbit/s
95th percentile per-packet one-way delay: 35.968 ms
Loss rate: 0.22%

Run 1: Report of Muses-25 — Data Link

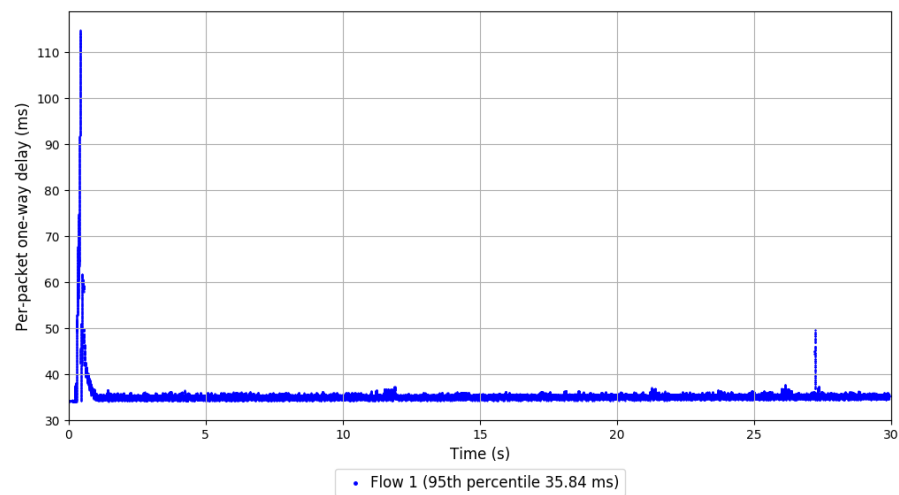
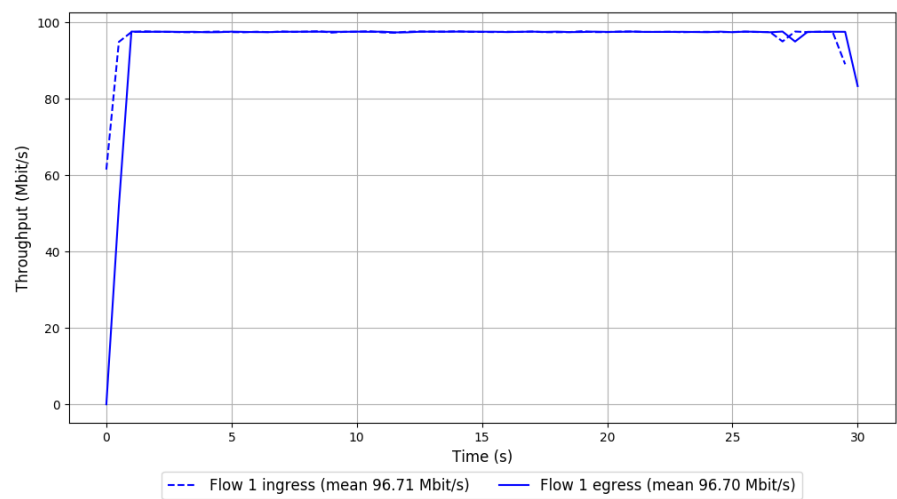


Run 2: Statistics of Muses-25

Start at: 2018-09-05 22:02:36
End at: 2018-09-05 22:03:06
Local clock offset: 7.21 ms
Remote clock offset: -0.946 ms

Below is generated by plot.py at 2018-09-05 22:11:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.70 Mbit/s
95th percentile per-packet one-way delay: 35.837 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.70 Mbit/s
95th percentile per-packet one-way delay: 35.837 ms
Loss rate: 0.22%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 22:07:57
End at: 2018-09-05 22:08:27
Local clock offset: 4.71 ms
Remote clock offset: -0.902 ms

Below is generated by plot.py at 2018-09-05 22:11:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.50 Mbit/s
95th percentile per-packet one-way delay: 35.734 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.50 Mbit/s
95th percentile per-packet one-way delay: 35.734 ms
Loss rate: 0.22%

Run 3: Report of Muses-25 — Data Link

