

Pantheon Report

Generated at 2018-09-05 03:20:58 (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.

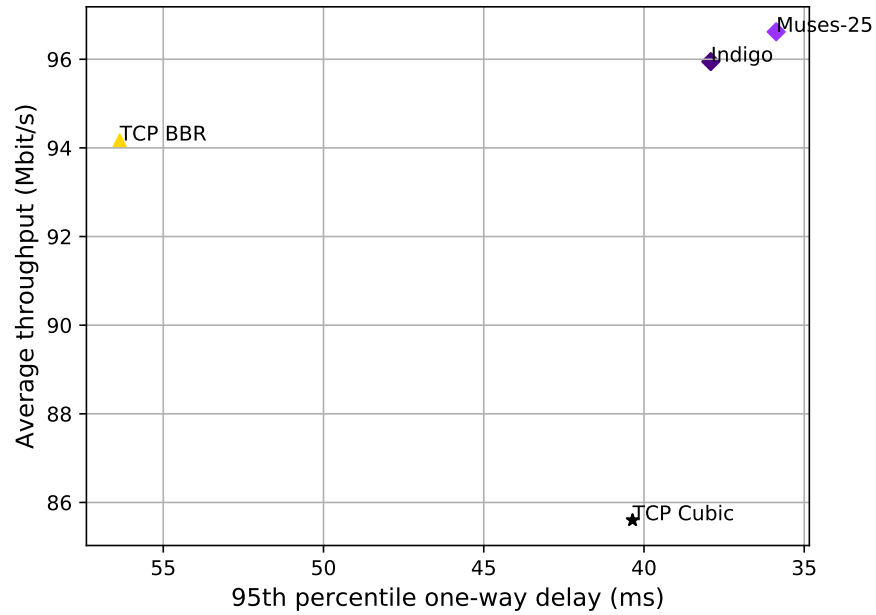
System info:

```
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
```

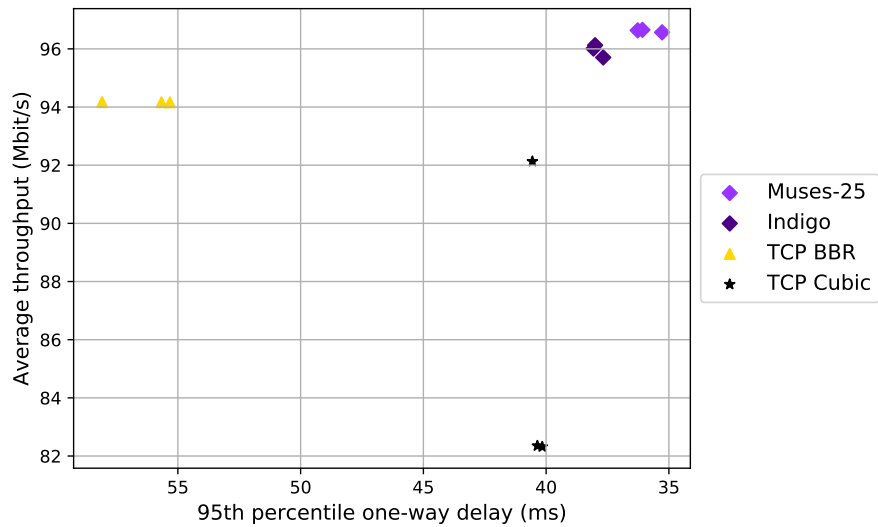
Git summary:

```
branch: muses @ 71e71e9a55b945431a7dea72180c1c9381097db9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd9c077e64d
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 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	56.36	0.52
TCP Cubic	3	85.60	40.36	0.26
Indigo	3	95.95	37.92	0.23
Muses-25	3	96.62	35.88	0.22

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 03:03:33

End at: 2018-09-05 03:04:03

Local clock offset: 2.683 ms

Remote clock offset: -5.698 ms

Below is generated by plot.py at 2018-09-05 03:20:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 58.086 ms

Loss rate: 0.61%

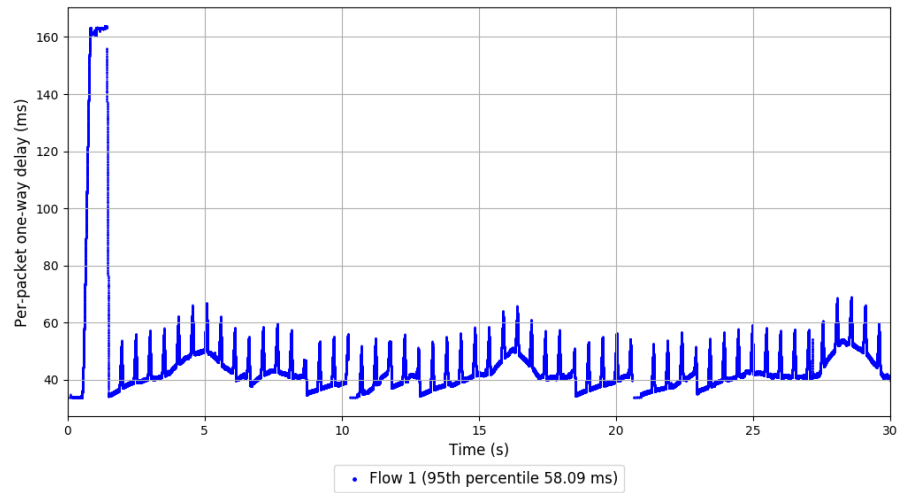
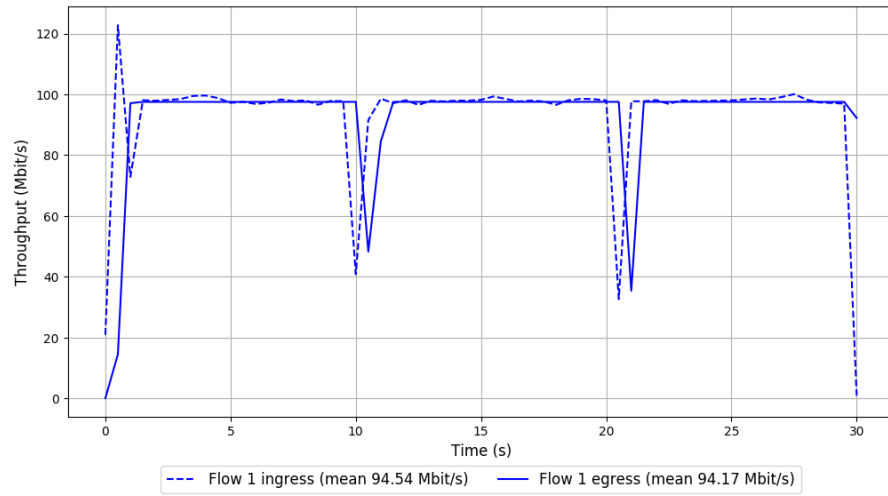
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 58.086 ms

Loss rate: 0.61%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-05 03:08:56

End at: 2018-09-05 03:09:26

Local clock offset: 2.901 ms

Remote clock offset: -5.426 ms

Below is generated by plot.py at 2018-09-05 03:20:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 55.667 ms

Loss rate: 0.46%

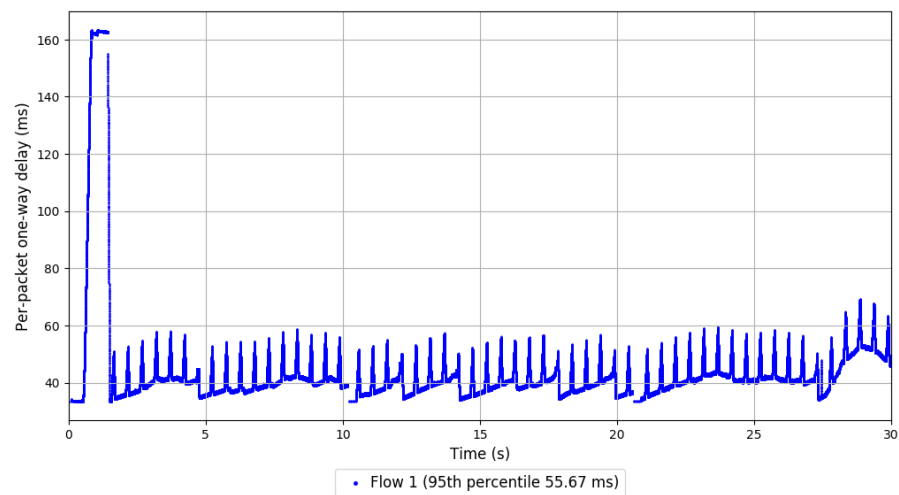
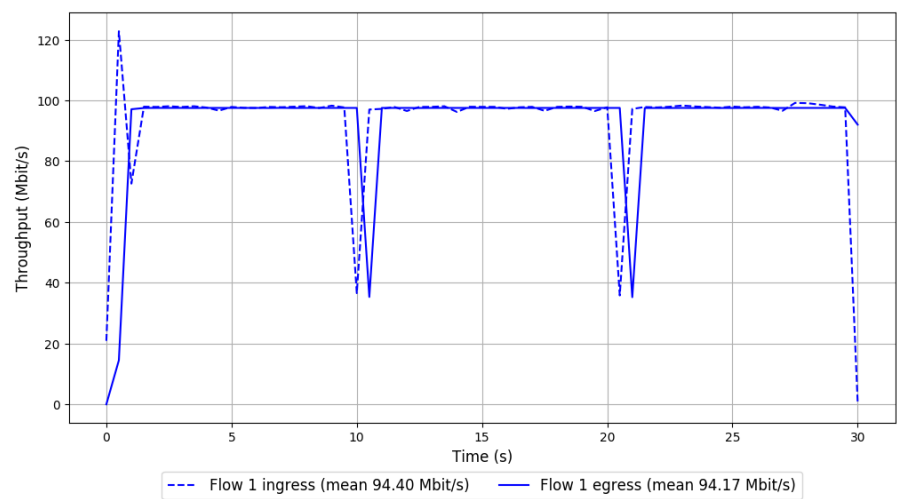
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 55.667 ms

Loss rate: 0.46%

Run 2: Report of TCP BBR — Data Link

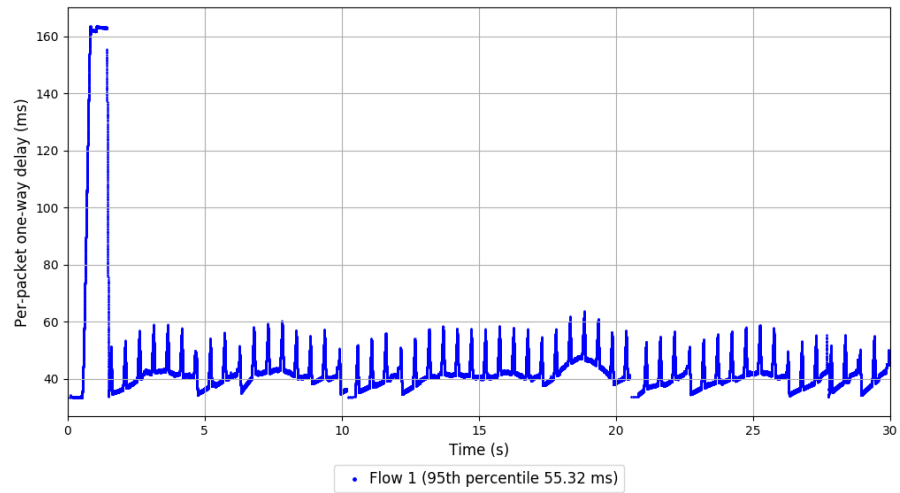
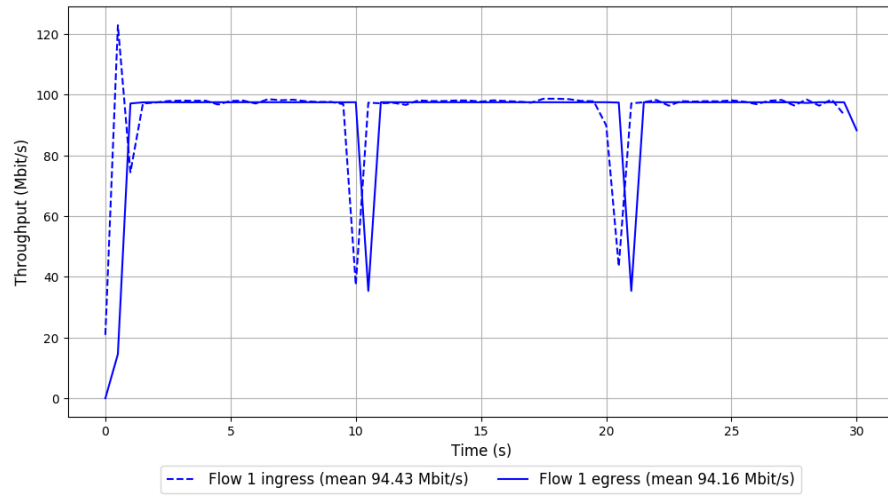


Run 3: Statistics of TCP BBR

Start at: 2018-09-05 03:14:19
End at: 2018-09-05 03:14:49
Local clock offset: 3.262 ms
Remote clock offset: -5.345 ms

Below is generated by plot.py at 2018-09-05 03:20:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 94.16 Mbit/s
95th percentile per-packet one-way delay: 55.324 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 94.16 Mbit/s
95th percentile per-packet one-way delay: 55.324 ms
Loss rate: 0.50%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 03:04:54

End at: 2018-09-05 03:05:24

Local clock offset: 2.718 ms

Remote clock offset: -5.523 ms

Below is generated by plot.py at 2018-09-05 03:20:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 82.35 Mbit/s

95th percentile per-packet one-way delay: 40.356 ms

Loss rate: 0.27%

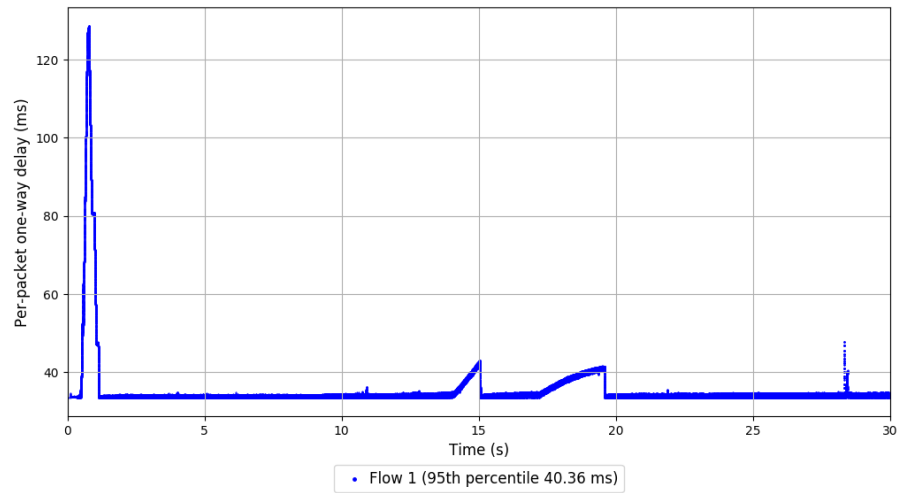
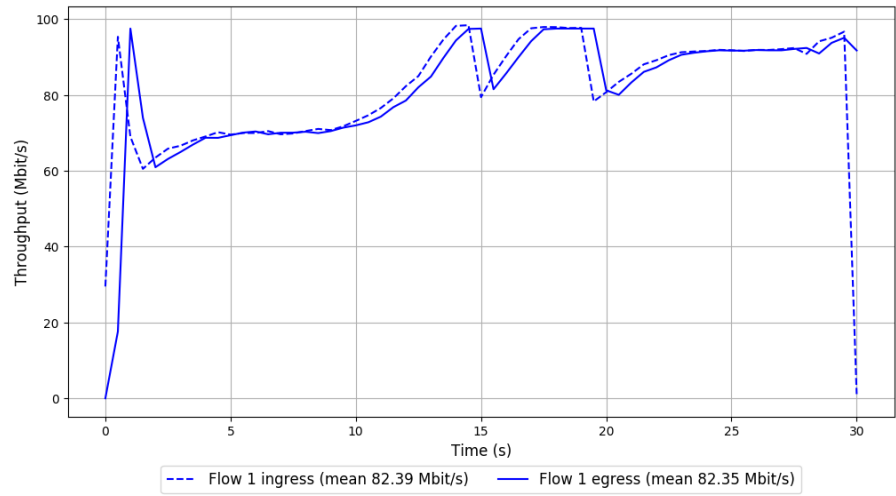
-- Flow 1:

Average throughput: 82.35 Mbit/s

95th percentile per-packet one-way delay: 40.356 ms

Loss rate: 0.27%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 03:10:17

End at: 2018-09-05 03:10:47

Local clock offset: 2.986 ms

Remote clock offset: -5.28 ms

Below is generated by plot.py at 2018-09-05 03:20:23

Datalink statistics

-- Total of 1 flow:

Average throughput: 82.32 Mbit/s

95th percentile per-packet one-way delay: 40.157 ms

Loss rate: 0.26%

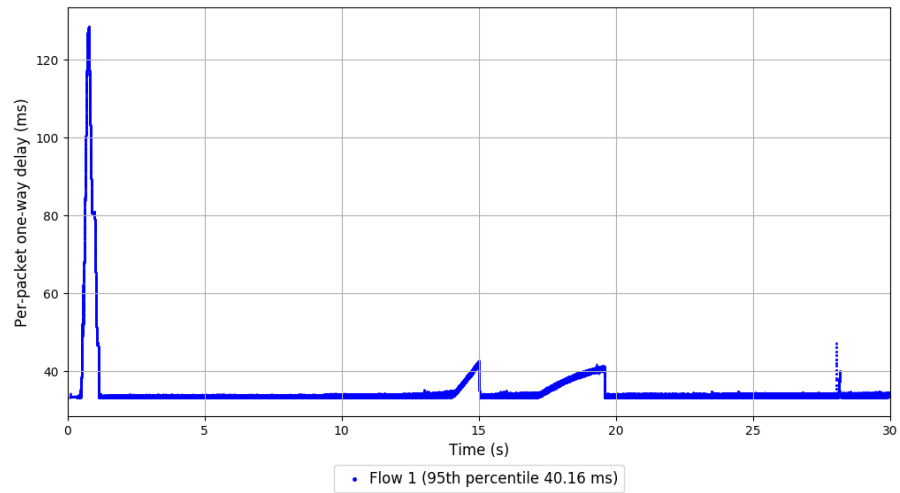
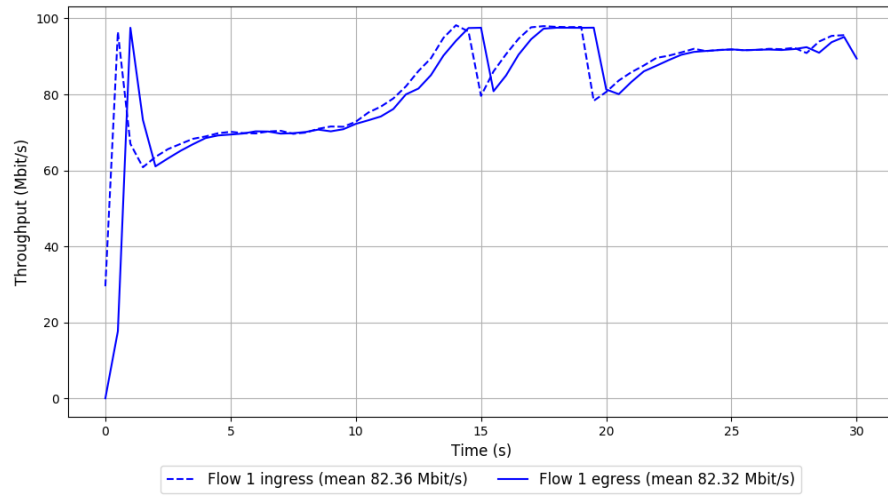
-- Flow 1:

Average throughput: 82.32 Mbit/s

95th percentile per-packet one-way delay: 40.157 ms

Loss rate: 0.26%

Run 2: Report of TCP Cubic — Data Link

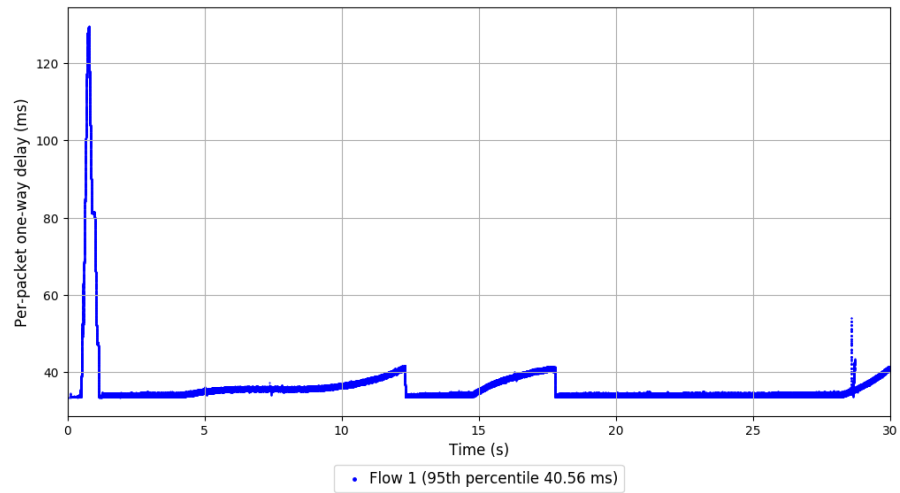
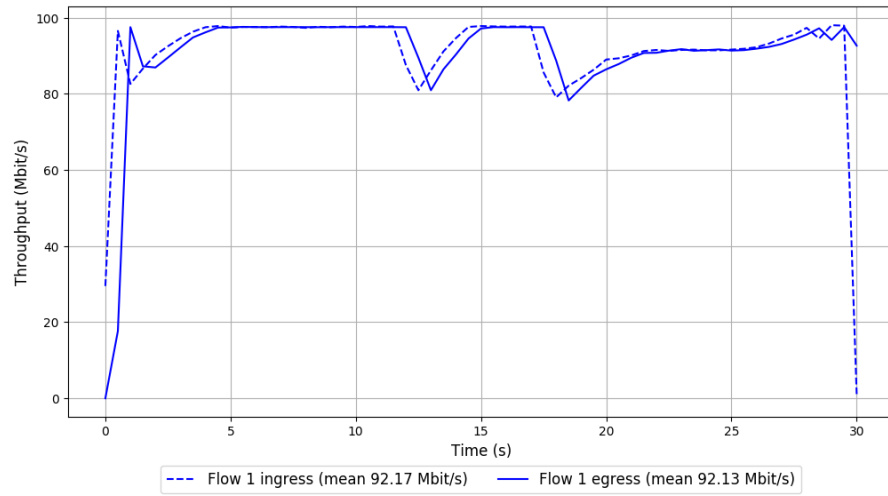


Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 03:15:40
End at: 2018-09-05 03:16:10
Local clock offset: 2.962 ms
Remote clock offset: -5.307 ms

Below is generated by plot.py at 2018-09-05 03:20:23
Datalink statistics
-- Total of 1 flow:
Average throughput: 92.13 Mbit/s
95th percentile per-packet one-way delay: 40.559 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 92.13 Mbit/s
95th percentile per-packet one-way delay: 40.559 ms
Loss rate: 0.26%

Run 3: Report of TCP Cubic — Data Link

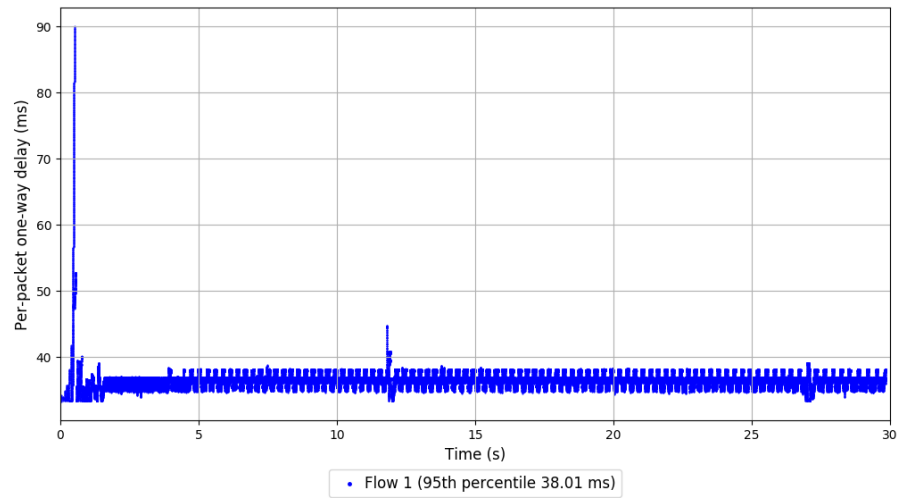
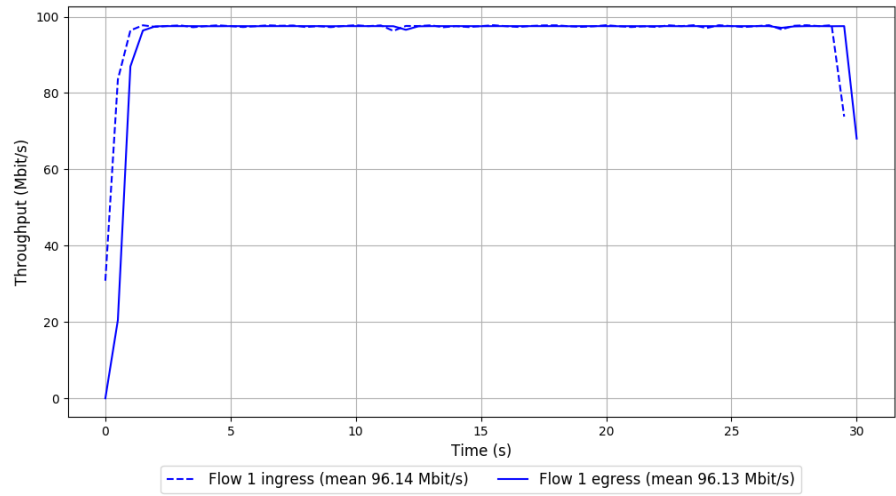


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 03:07:34
End at: 2018-09-05 03:08:04
Local clock offset: 2.715 ms
Remote clock offset: -5.522 ms

# Below is generated by plot.py at 2018-09-05 03:20:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.13 Mbit/s
95th percentile per-packet one-way delay: 38.006 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 96.13 Mbit/s
95th percentile per-packet one-way delay: 38.006 ms
Loss rate: 0.23%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-05 03:12:58

End at: 2018-09-05 03:13:28

Local clock offset: 3.159 ms

Remote clock offset: -5.37 ms

Below is generated by plot.py at 2018-09-05 03:20:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.01 Mbit/s

95th percentile per-packet one-way delay: 38.071 ms

Loss rate: 0.23%

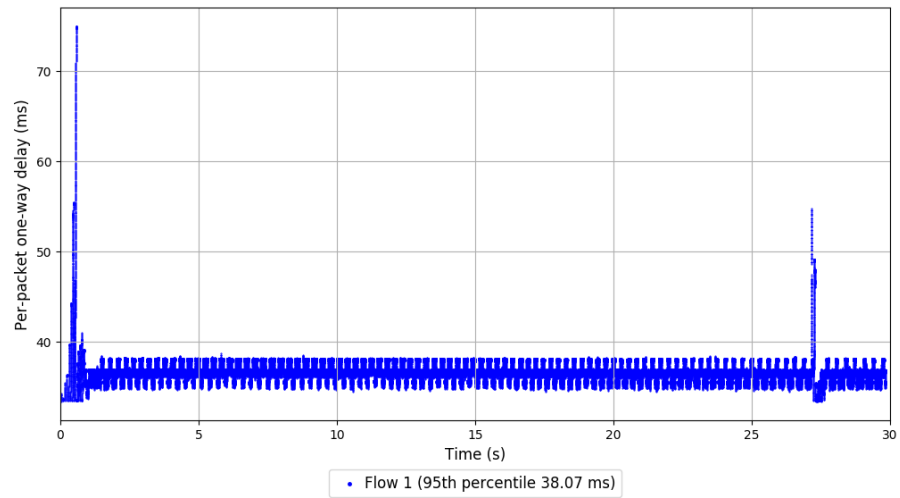
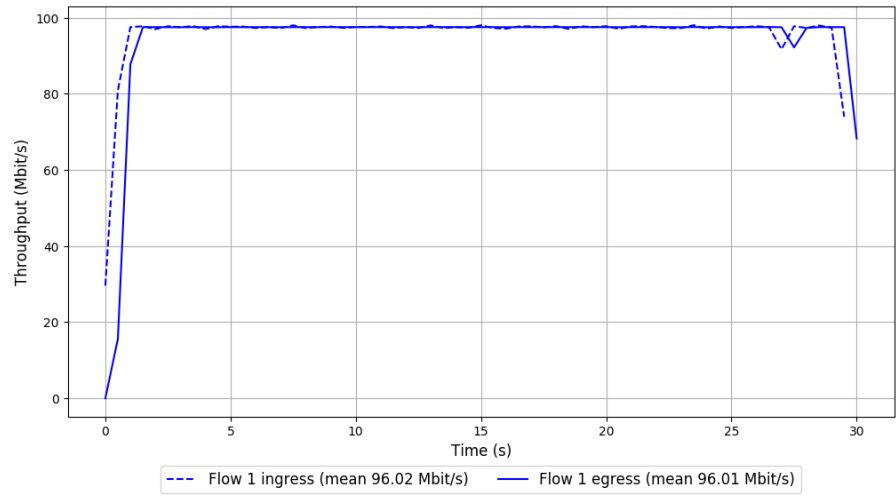
-- Flow 1:

Average throughput: 96.01 Mbit/s

95th percentile per-packet one-way delay: 38.071 ms

Loss rate: 0.23%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-05 03:18:22

End at: 2018-09-05 03:18:52

Local clock offset: 2.357 ms

Remote clock offset: -5.212 ms

Below is generated by plot.py at 2018-09-05 03:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.71 Mbit/s

95th percentile per-packet one-way delay: 37.675 ms

Loss rate: 0.23%

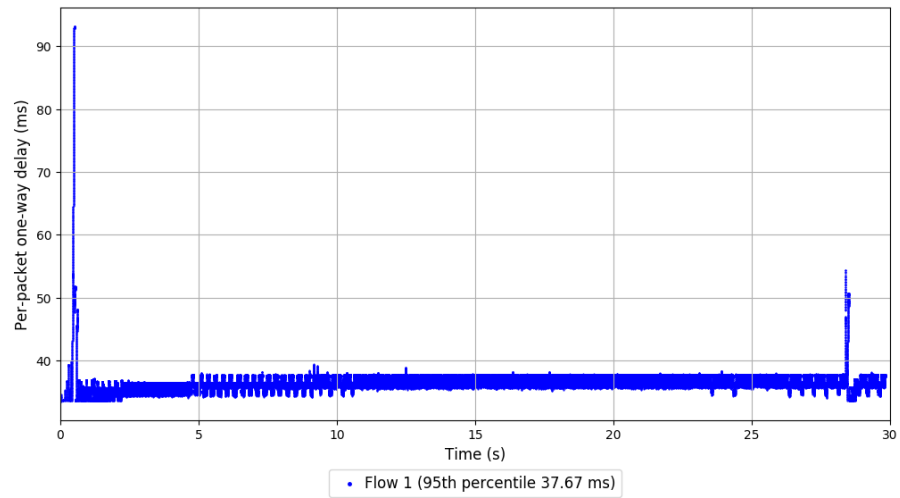
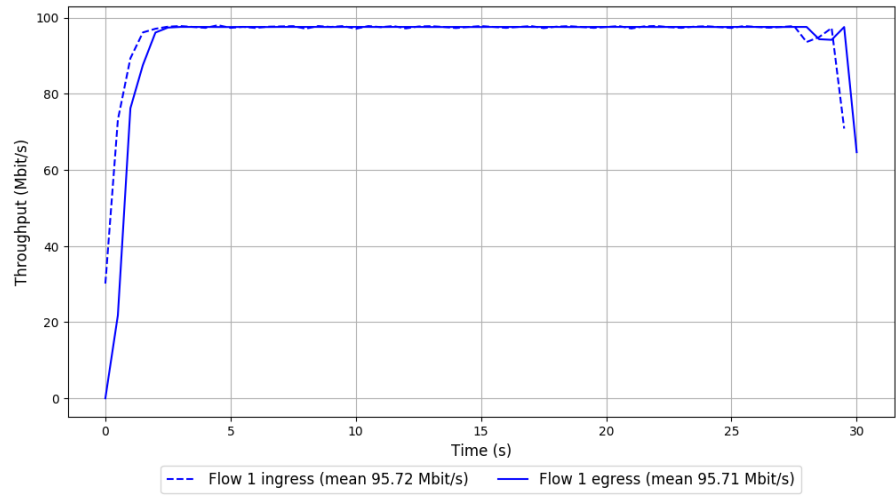
-- Flow 1:

Average throughput: 95.71 Mbit/s

95th percentile per-packet one-way delay: 37.675 ms

Loss rate: 0.23%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-05 03:06:14

End at: 2018-09-05 03:06:44

Local clock offset: 2.761 ms

Remote clock offset: -5.743 ms

Below is generated by plot.py at 2018-09-05 03:20:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.64 Mbit/s

95th percentile per-packet one-way delay: 36.271 ms

Loss rate: 0.22%

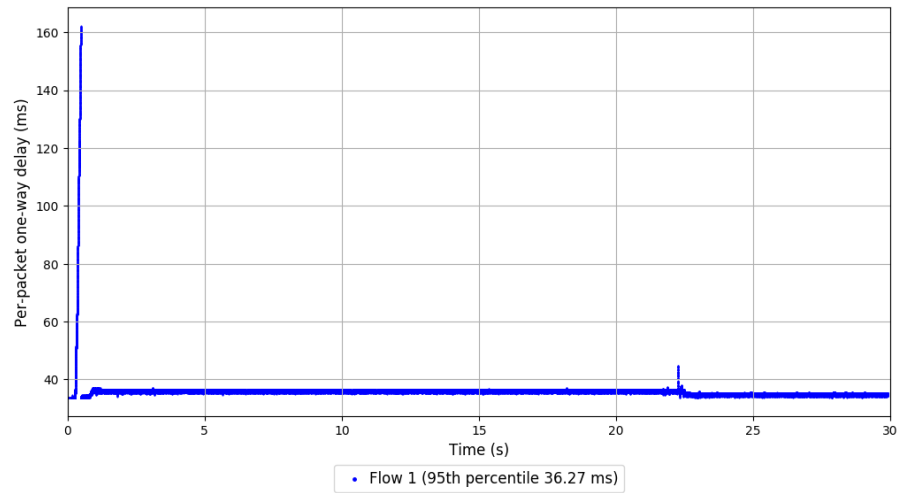
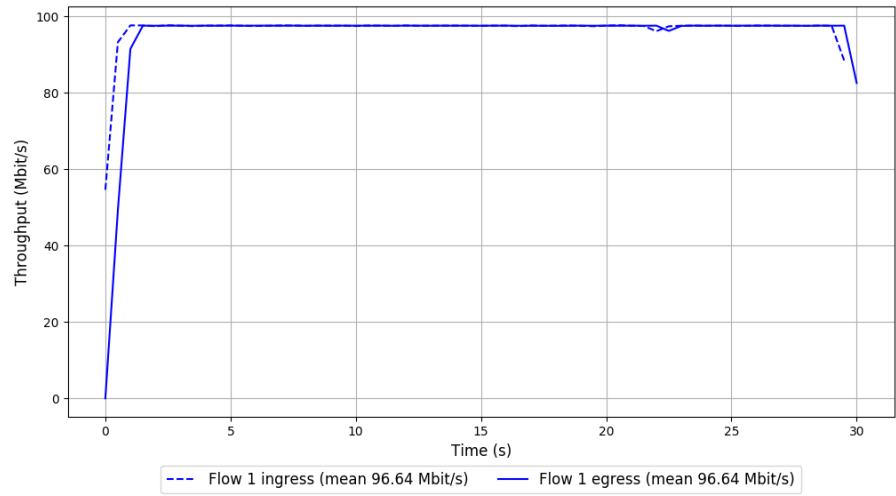
-- Flow 1:

Average throughput: 96.64 Mbit/s

95th percentile per-packet one-way delay: 36.271 ms

Loss rate: 0.22%

Run 1: Report of Muses-25 — Data Link

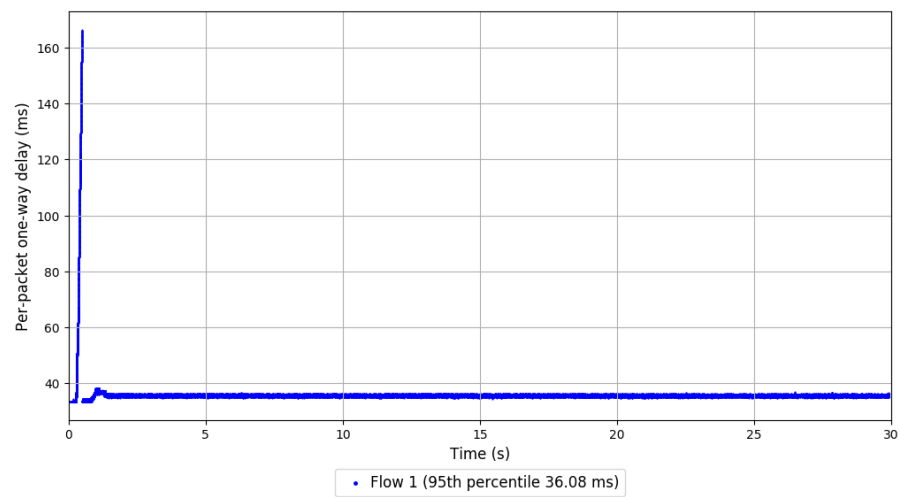
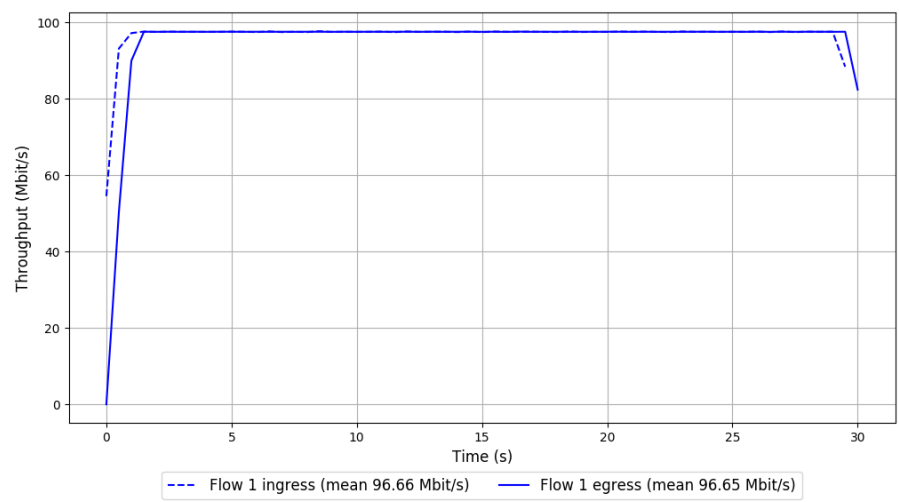


Run 2: Statistics of Muses-25

Start at: 2018-09-05 03:11:37
End at: 2018-09-05 03:12:07
Local clock offset: 3.09 ms
Remote clock offset: -5.381 ms

Below is generated by plot.py at 2018-09-05 03:20:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.65 Mbit/s
95th percentile per-packet one-way delay: 36.078 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.65 Mbit/s
95th percentile per-packet one-way delay: 36.078 ms
Loss rate: 0.22%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 03:17:01
End at: 2018-09-05 03:17:31
Local clock offset: 2.651 ms
Remote clock offset: -5.363 ms

Below is generated by plot.py at 2018-09-05 03:20:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.57 Mbit/s
95th percentile per-packet one-way delay: 35.276 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.57 Mbit/s
95th percentile per-packet one-way delay: 35.276 ms
Loss rate: 0.22%

Run 3: Report of Muses-25 — Data Link

