

Pantheon Report

Generated at 2018-09-03 09:36:00 (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.

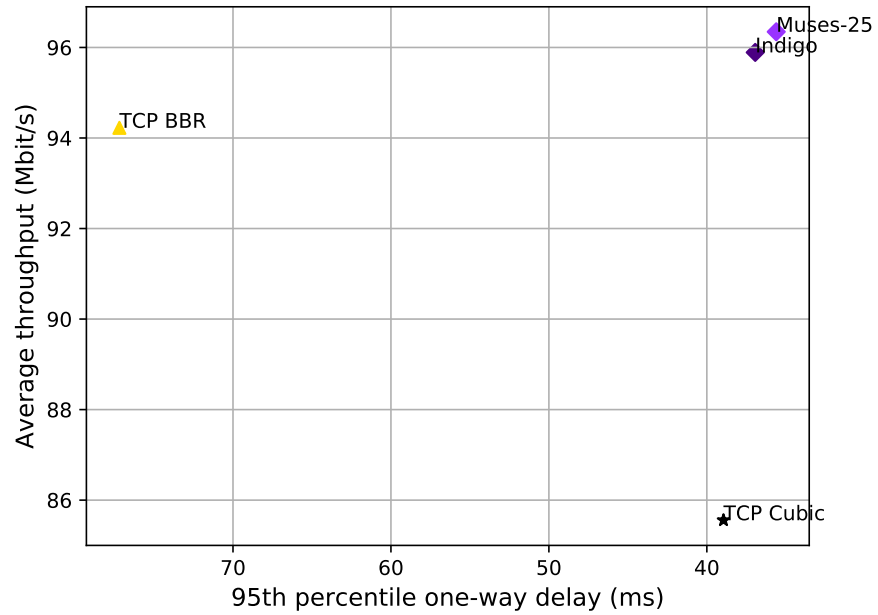
System info:

```
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
```

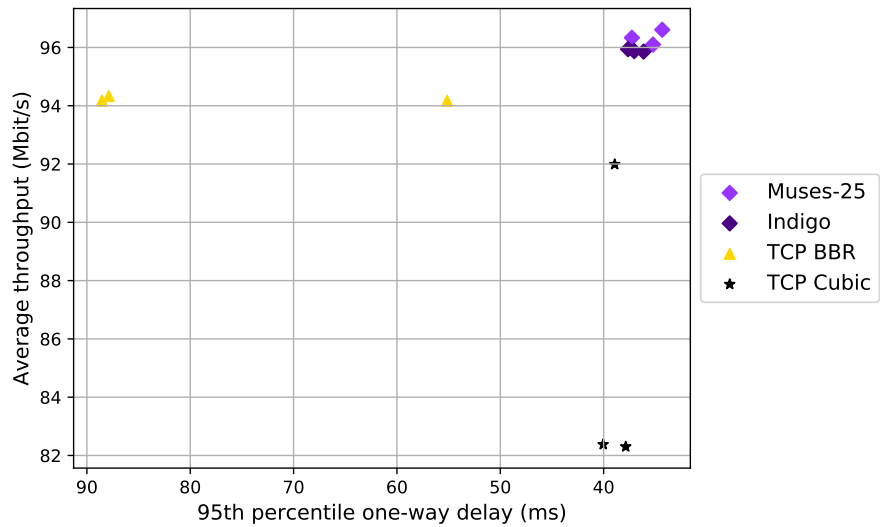
Git summary:

```
branch: muses @ f309f5459e2c5237279a184e52ece7a2b47ef1c9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b8d5019b83a3a678804d830fcfe1da7b3a63421b
third_party/pantheon-tunnel @ cbfce6db5ff5740dfe1771f813cd646339e1952
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	94.22	77.19	0.57
TCP Cubic	3	85.56	38.95	0.24
Indigo	3	95.89	36.94	0.23
Muses-25	3	96.35	35.61	0.22

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 09:20:13

End at: 2018-09-03 09:20:43

Local clock offset: -30.67 ms

Remote clock offset: 5.296 ms

Below is generated by plot.py at 2018-09-03 09:35:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 55.142 ms

Loss rate: 0.38%

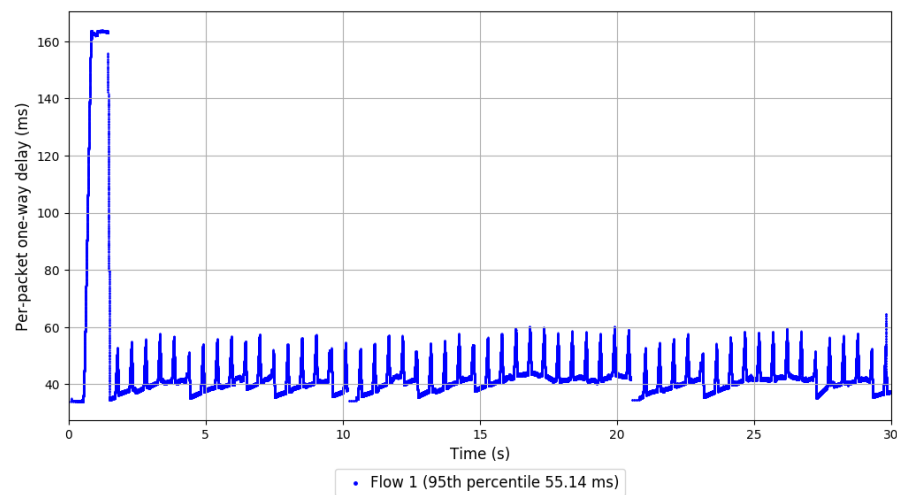
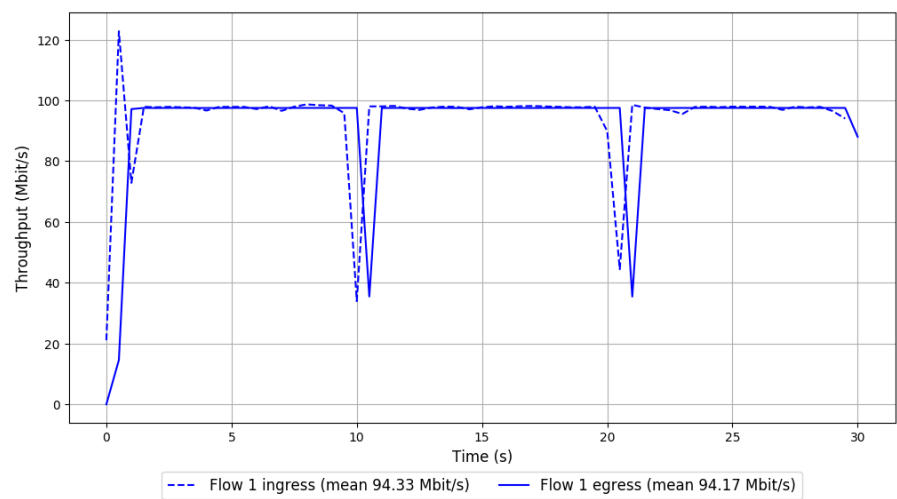
-- Flow 1:

Average throughput: 94.17 Mbit/s

95th percentile per-packet one-way delay: 55.142 ms

Loss rate: 0.38%

Run 1: Report of TCP BBR — Data Link

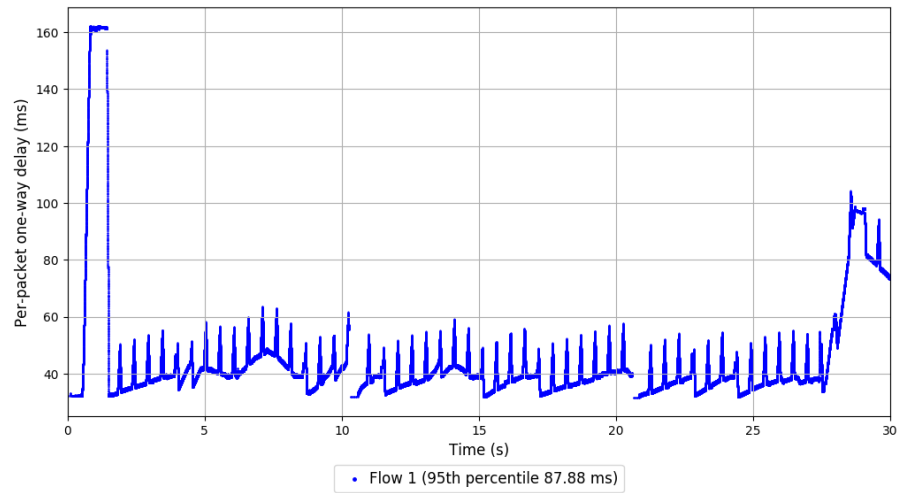
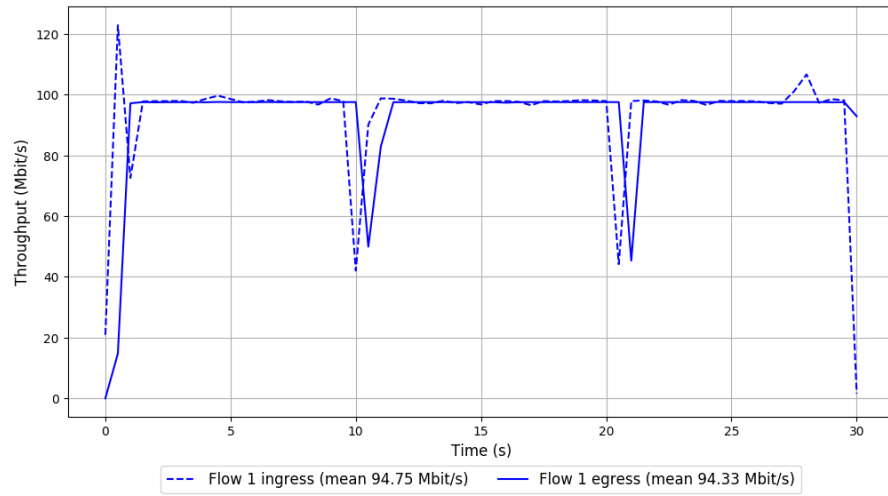


Run 2: Statistics of TCP BBR

Start at: 2018-09-03 09:25:29
End at: 2018-09-03 09:26:00
Local clock offset: -21.507 ms
Remote clock offset: 5.138 ms

Below is generated by plot.py at 2018-09-03 09:35:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 94.33 Mbit/s
95th percentile per-packet one-way delay: 87.884 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 94.33 Mbit/s
95th percentile per-packet one-way delay: 87.884 ms
Loss rate: 0.66%

Run 2: Report of TCP BBR — Data Link

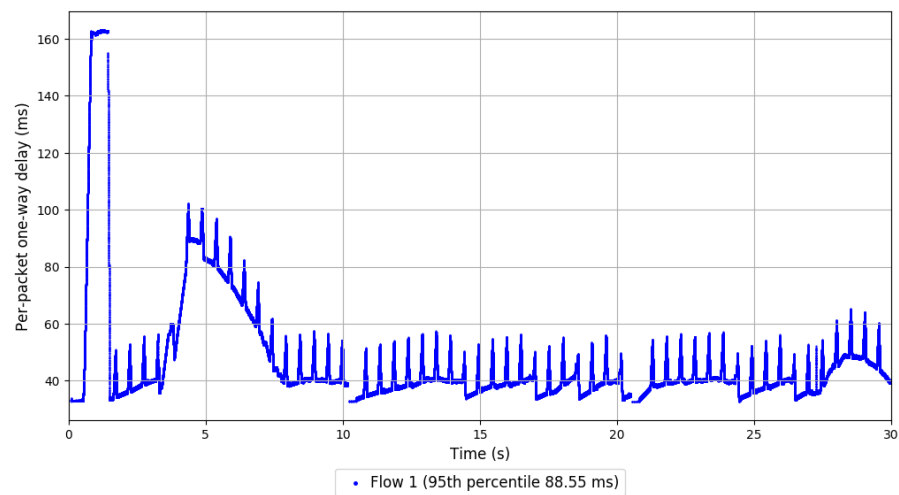
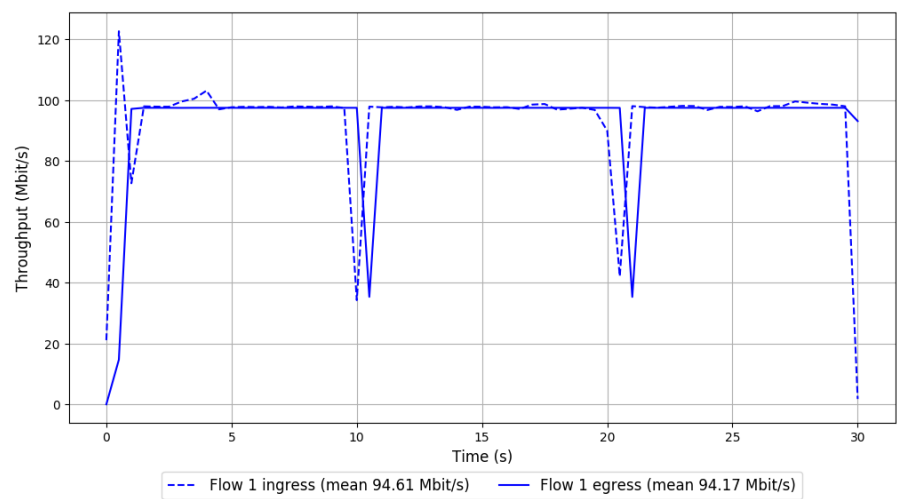


Run 3: Statistics of TCP BBR

Start at: 2018-09-03 09:30:47
End at: 2018-09-03 09:31:17
Local clock offset: -13.367 ms
Remote clock offset: 5.501 ms

Below is generated by plot.py at 2018-09-03 09:35:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 94.17 Mbit/s
95th percentile per-packet one-way delay: 88.550 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 94.17 Mbit/s
95th percentile per-packet one-way delay: 88.550 ms
Loss rate: 0.67%

Run 3: Report of TCP BBR — Data Link

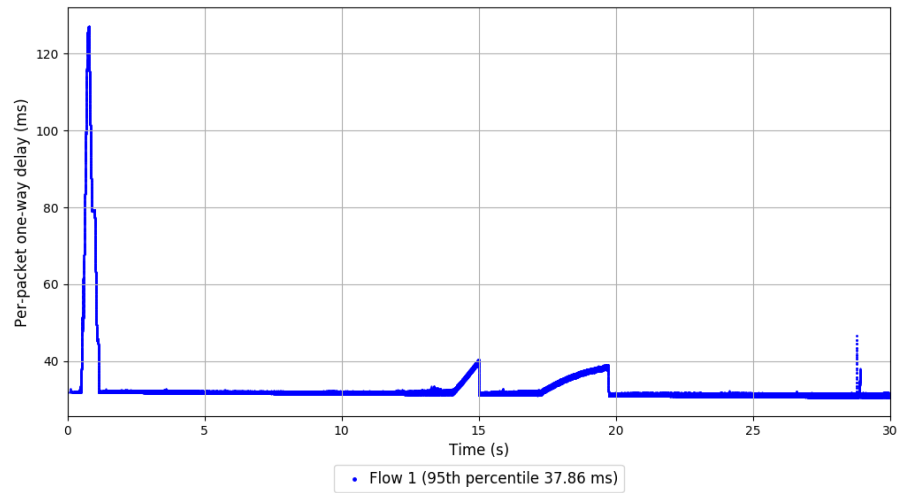
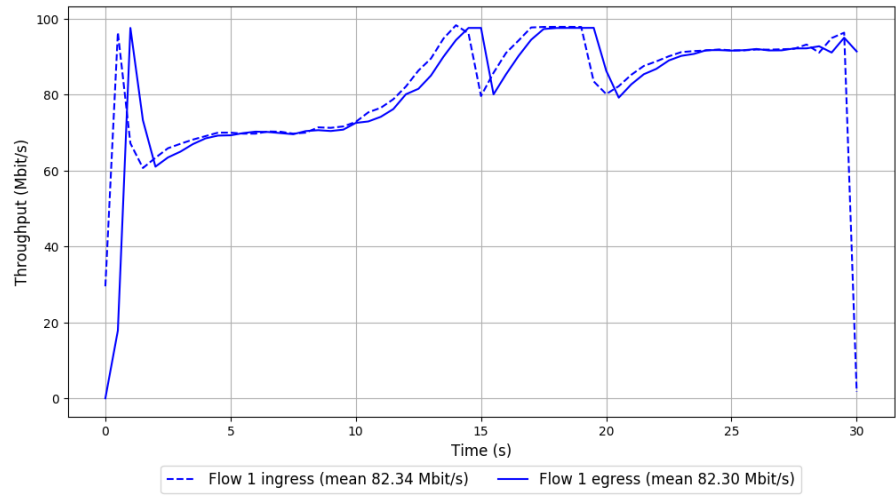


Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 09:22:52
End at: 2018-09-03 09:23:23
Local clock offset: -28.119 ms
Remote clock offset: 5.346 ms

Below is generated by plot.py at 2018-09-03 09:35:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 82.30 Mbit/s
95th percentile per-packet one-way delay: 37.864 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 82.30 Mbit/s
95th percentile per-packet one-way delay: 37.864 ms
Loss rate: 0.26%

Run 1: Report of TCP Cubic — Data Link

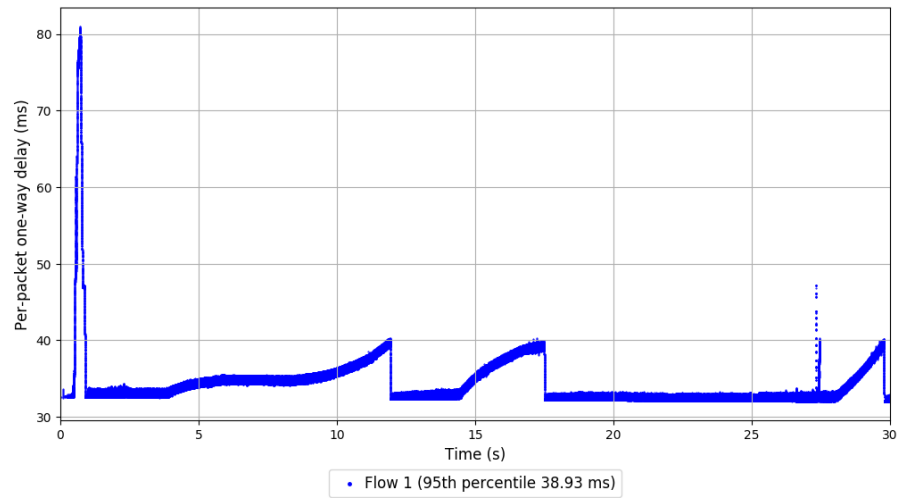
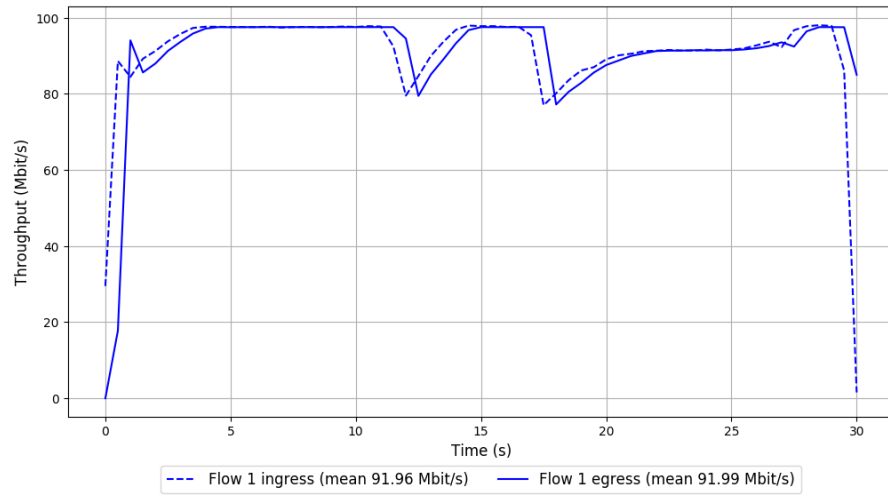


Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 09:28:10
End at: 2018-09-03 09:28:40
Local clock offset: -16.505 ms
Remote clock offset: 5.417 ms

Below is generated by plot.py at 2018-09-03 09:35:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 91.99 Mbit/s
95th percentile per-packet one-way delay: 38.931 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 91.99 Mbit/s
95th percentile per-packet one-way delay: 38.931 ms
Loss rate: 0.19%

Run 2: Report of TCP Cubic — Data Link

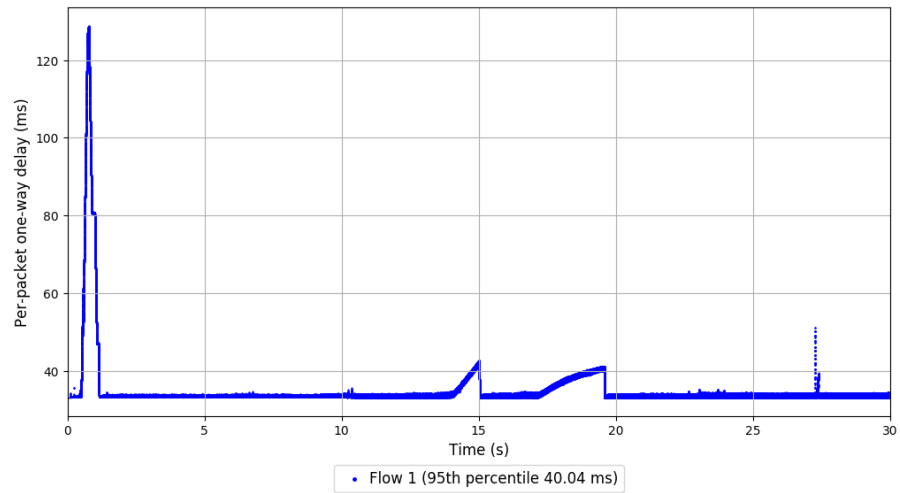
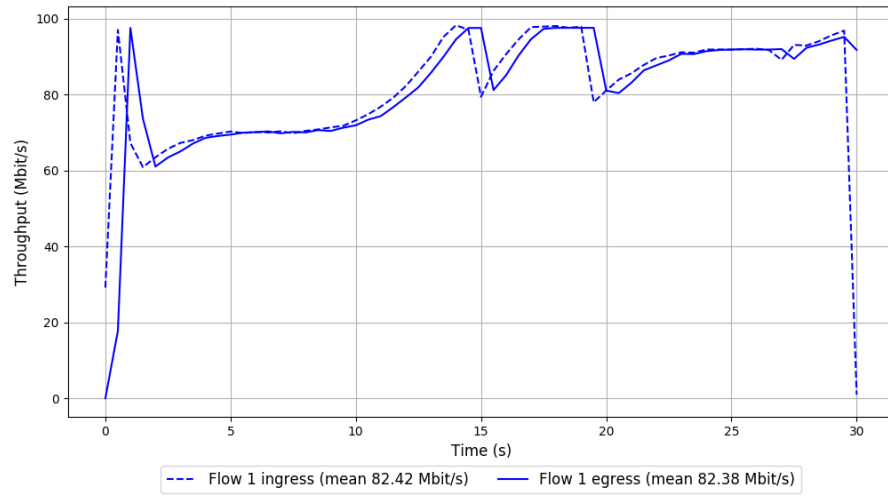


Run 3: Statistics of TCP Cubic

Start at: 2018-09-03 09:33:27
End at: 2018-09-03 09:33:57
Local clock offset: -11.463 ms
Remote clock offset: 5.32 ms

Below is generated by plot.py at 2018-09-03 09:35:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 82.38 Mbit/s
95th percentile per-packet one-way delay: 40.044 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 82.38 Mbit/s
95th percentile per-packet one-way delay: 40.044 ms
Loss rate: 0.26%

Run 3: Report of TCP Cubic — Data Link

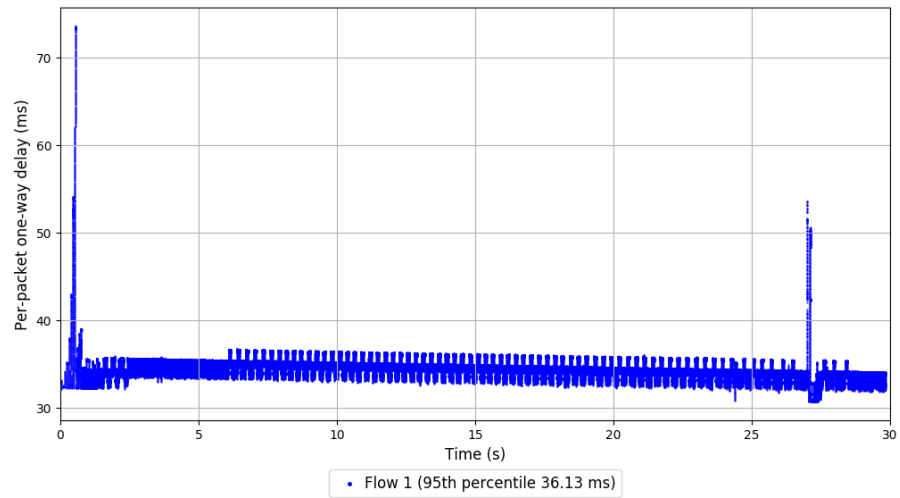
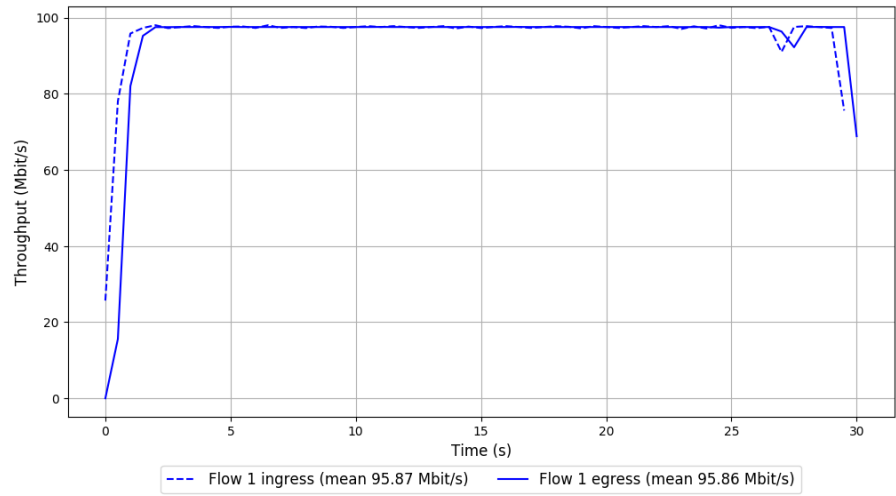


```
Run 1: Statistics of Indigo

Start at: 2018-09-03 09:21:32
End at: 2018-09-03 09:22:02
Local clock offset: -32.189 ms
Remote clock offset: 5.142 ms

# Below is generated by plot.py at 2018-09-03 09:35:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.86 Mbit/s
95th percentile per-packet one-way delay: 36.133 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 95.86 Mbit/s
95th percentile per-packet one-way delay: 36.133 ms
Loss rate: 0.23%
```

Run 1: Report of Indigo — Data Link

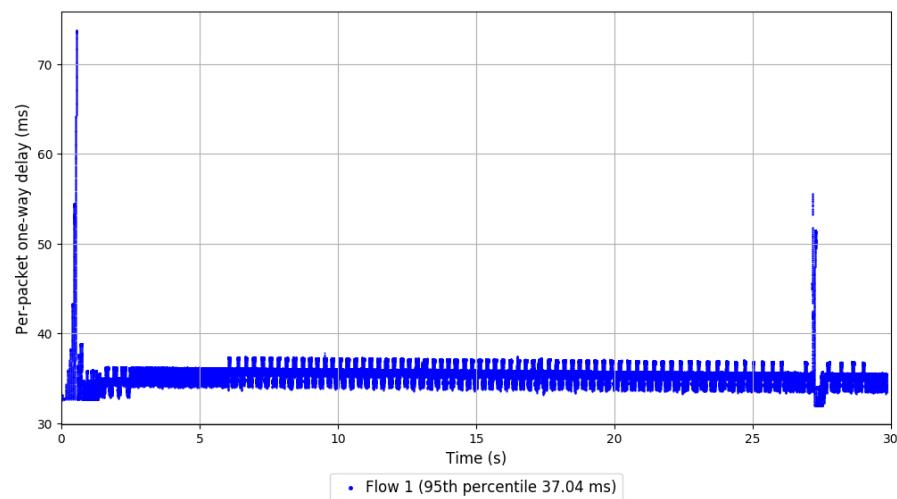
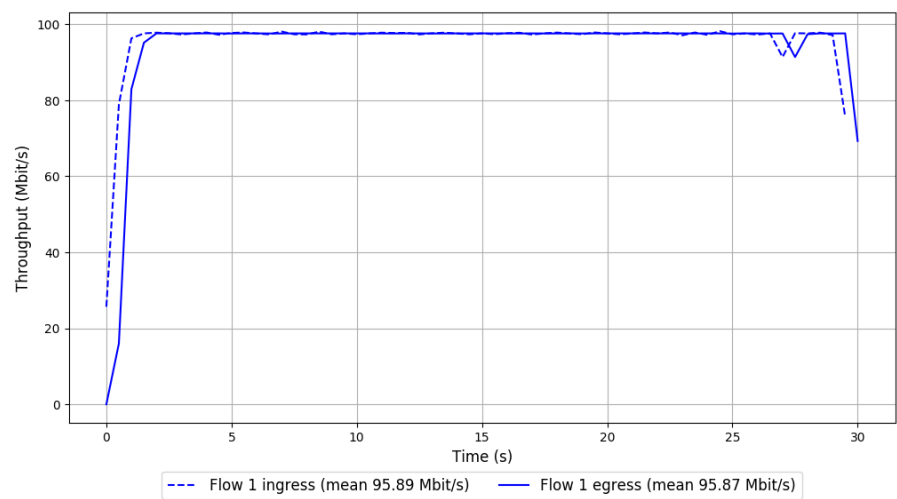


Run 2: Statistics of Indigo

Start at: 2018-09-03 09:26:49
End at: 2018-09-03 09:27:19
Local clock offset: -18.412 ms
Remote clock offset: 5.335 ms

Below is generated by plot.py at 2018-09-03 09:35:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 95.87 Mbit/s
95th percentile per-packet one-way delay: 37.039 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 95.87 Mbit/s
95th percentile per-packet one-way delay: 37.039 ms
Loss rate: 0.23%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-03 09:32:07

End at: 2018-09-03 09:32:37

Local clock offset: -12.16 ms

Remote clock offset: 5.454 ms

Below is generated by plot.py at 2018-09-03 09:35:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.94 Mbit/s

95th percentile per-packet one-way delay: 37.638 ms

Loss rate: 0.23%

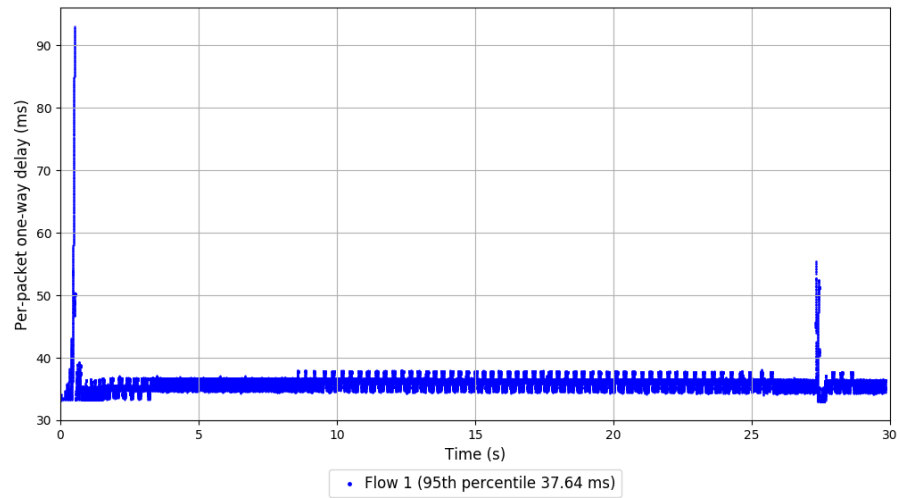
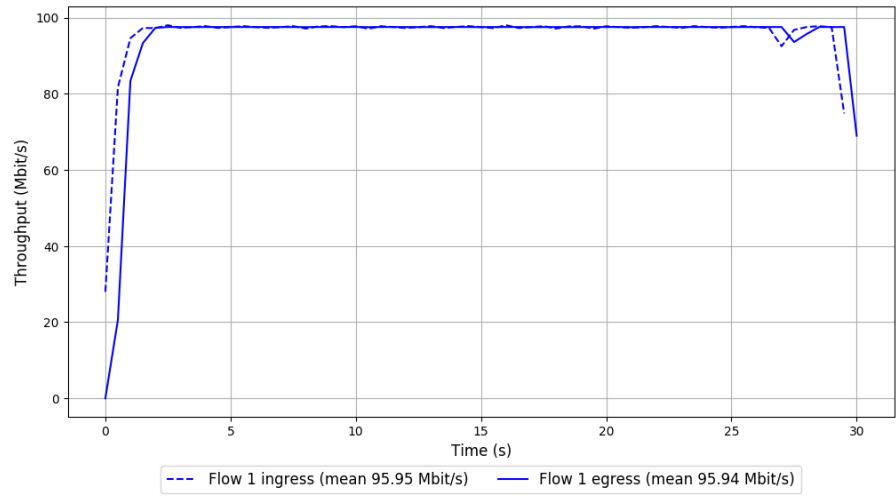
-- Flow 1:

Average throughput: 95.94 Mbit/s

95th percentile per-packet one-way delay: 37.638 ms

Loss rate: 0.23%

Run 3: Report of Indigo — Data Link

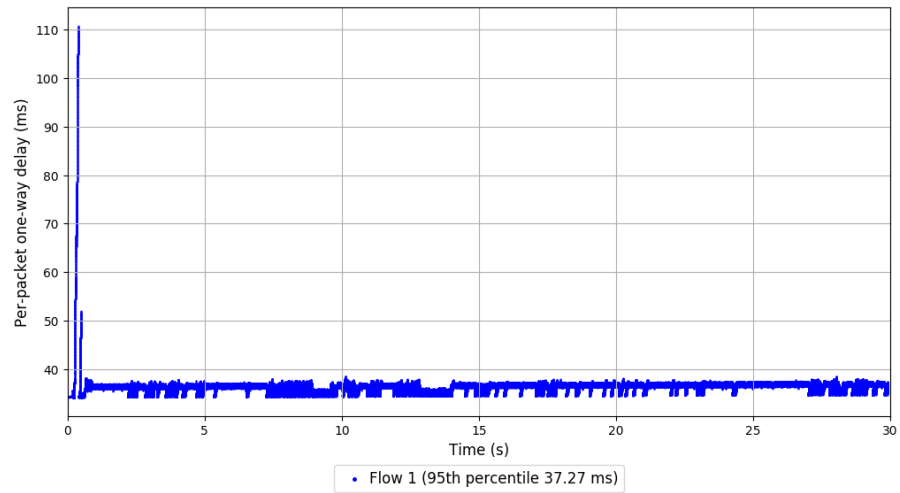
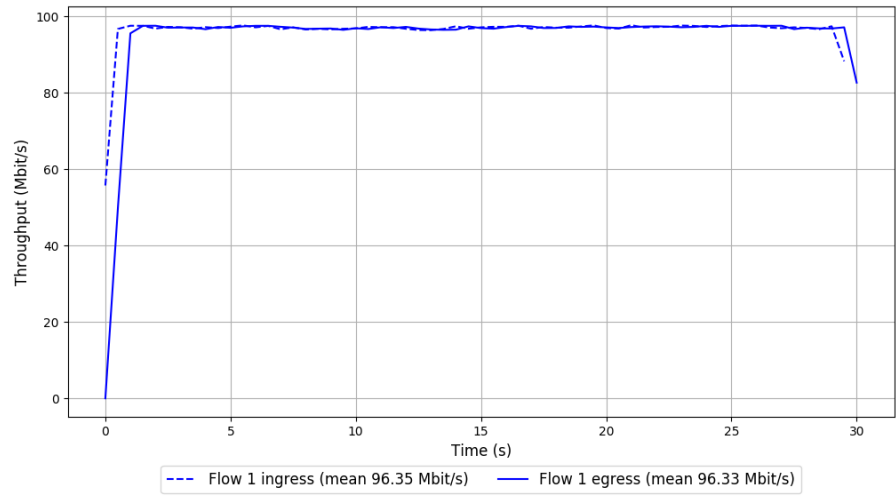


Run 1: Statistics of Muses-25

Start at: 2018-09-03 09:18:54
End at: 2018-09-03 09:19:24
Local clock offset: -29.392 ms
Remote clock offset: 4.896 ms

Below is generated by plot.py at 2018-09-03 09:35:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.33 Mbit/s
95th percentile per-packet one-way delay: 37.265 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.33 Mbit/s
95th percentile per-packet one-way delay: 37.265 ms
Loss rate: 0.22%

Run 1: Report of Muses-25 — Data Link

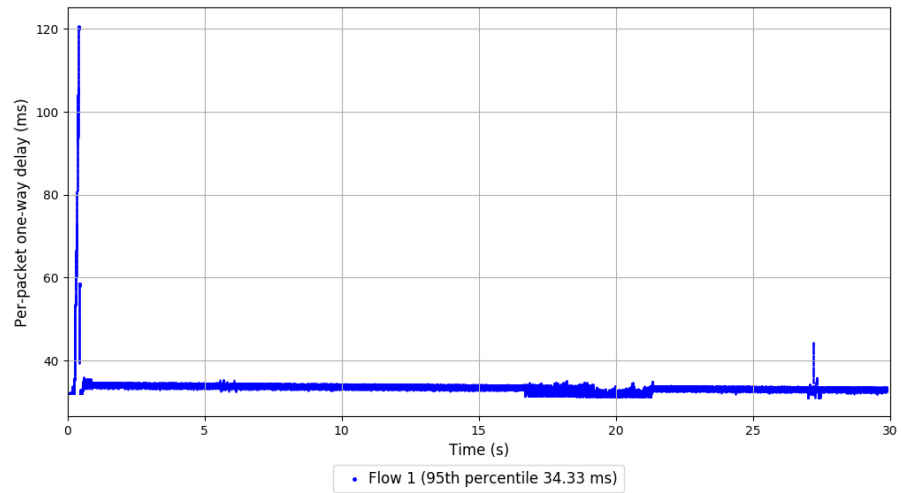
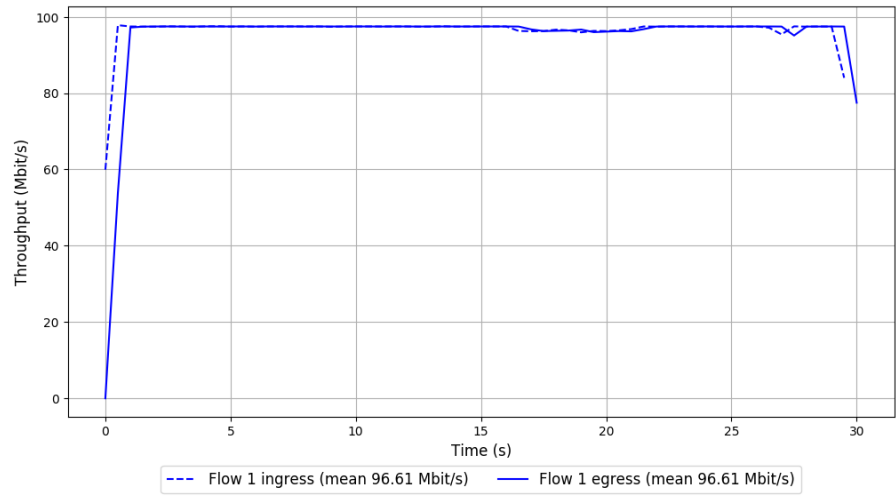


Run 2: Statistics of Muses-25

Start at: 2018-09-03 09:24:11
End at: 2018-09-03 09:24:41
Local clock offset: -24.448 ms
Remote clock offset: 5.227 ms

Below is generated by plot.py at 2018-09-03 09:35:59
Datalink statistics
-- Total of 1 flow:
Average throughput: 96.61 Mbit/s
95th percentile per-packet one-way delay: 34.331 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 96.61 Mbit/s
95th percentile per-packet one-way delay: 34.331 ms
Loss rate: 0.22%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-03 09:29:28

End at: 2018-09-03 09:29:58

Local clock offset: -14.65 ms

Remote clock offset: 5.484 ms

Below is generated by plot.py at 2018-09-03 09:35:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.10 Mbit/s

95th percentile per-packet one-way delay: 35.224 ms

Loss rate: 0.22%

-- Flow 1:

Average throughput: 96.10 Mbit/s

95th percentile per-packet one-way delay: 35.224 ms

Loss rate: 0.22%

Run 3: Report of Muses-25 — Data Link

