

Pantheon Report

Generated at 2018-09-03 09:33:42 (UTC).

Data path: Brazil on **p4p1** (*remote*) → AWS Brazil 1 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 **gps.ntp.br** and have been applied to correct the timestamps in logs.

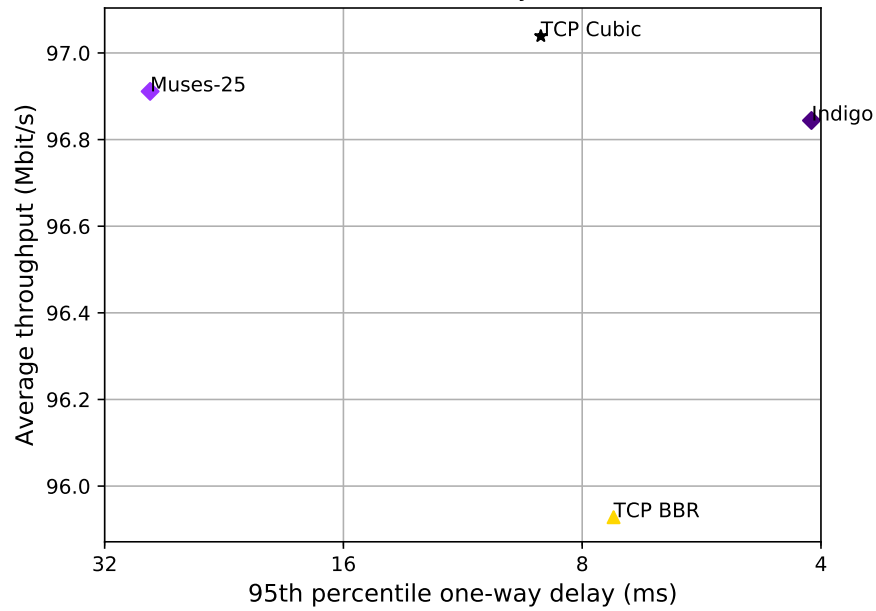
System info:

```
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
```

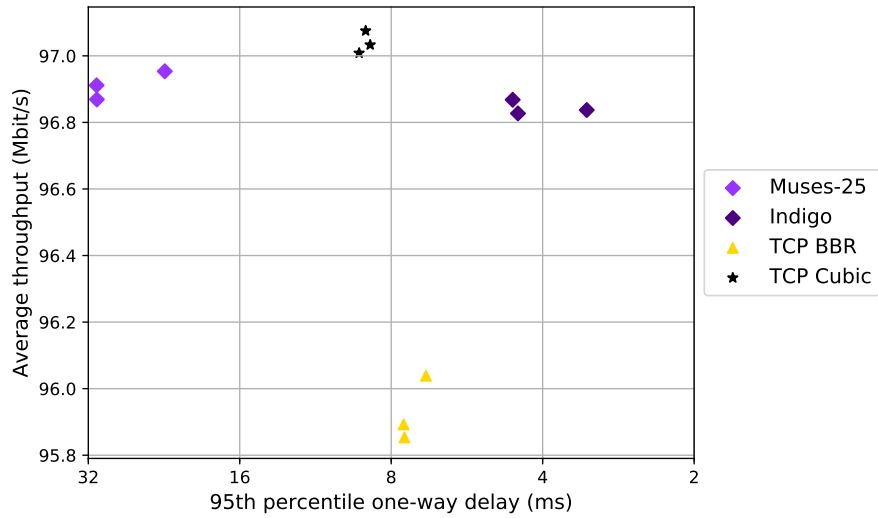
Git summary:

```
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 Brazil to AWS Brazil 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Brazil to AWS Brazil 1, 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	95.93	7.30	0.02
TCP Cubic	3	97.04	9.02	0.06
Indigo	3	96.85	4.11	0.01
Muses-25	3	96.91	28.04	6.45

Run 1: Statistics of TCP BBR

Start at: 2018-09-03 09:18:44

End at: 2018-09-03 09:19:14

Local clock offset: -1.255 ms

Remote clock offset: 0.296 ms

Below is generated by plot.py at 2018-09-03 09:33:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.04 Mbit/s

95th percentile per-packet one-way delay: 6.823 ms

Loss rate: 0.02%

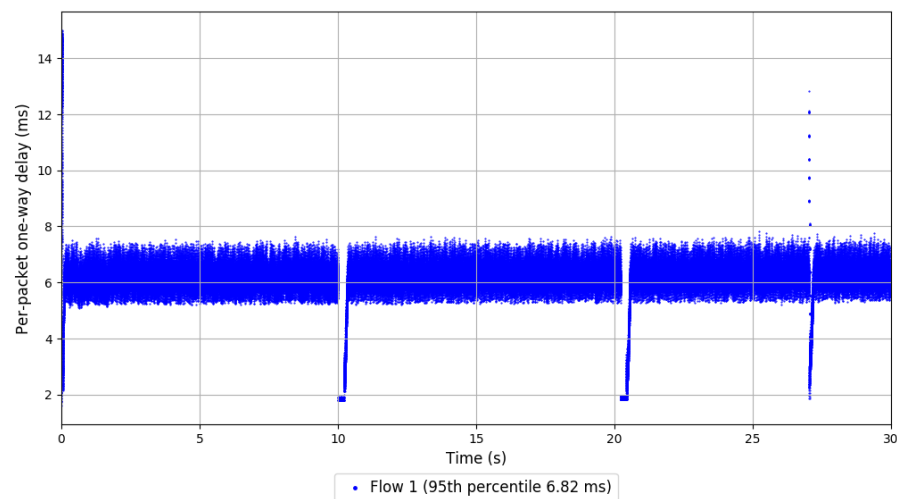
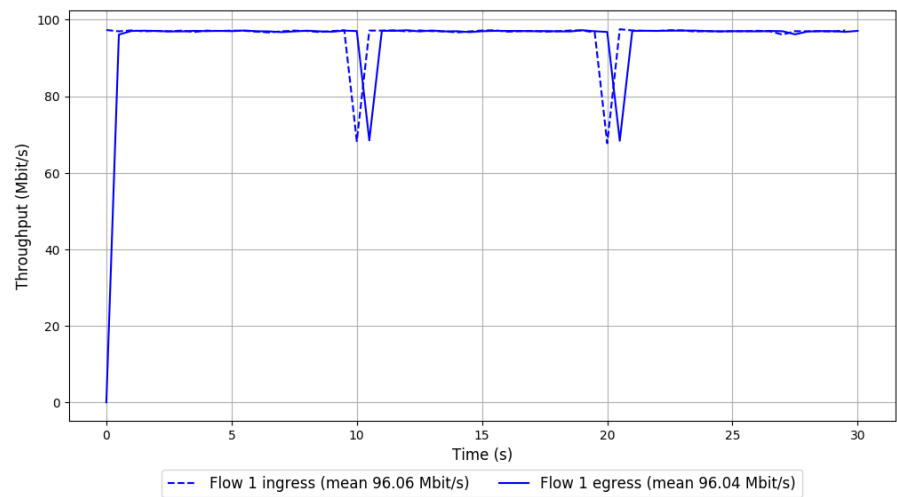
-- Flow 1:

Average throughput: 96.04 Mbit/s

95th percentile per-packet one-way delay: 6.823 ms

Loss rate: 0.02%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-09-03 09:23:13

End at: 2018-09-03 09:23:43

Local clock offset: -0.914 ms

Remote clock offset: 0.291 ms

Below is generated by plot.py at 2018-09-03 09:33:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.85 Mbit/s

95th percentile per-packet one-way delay: 7.529 ms

Loss rate: 0.02%

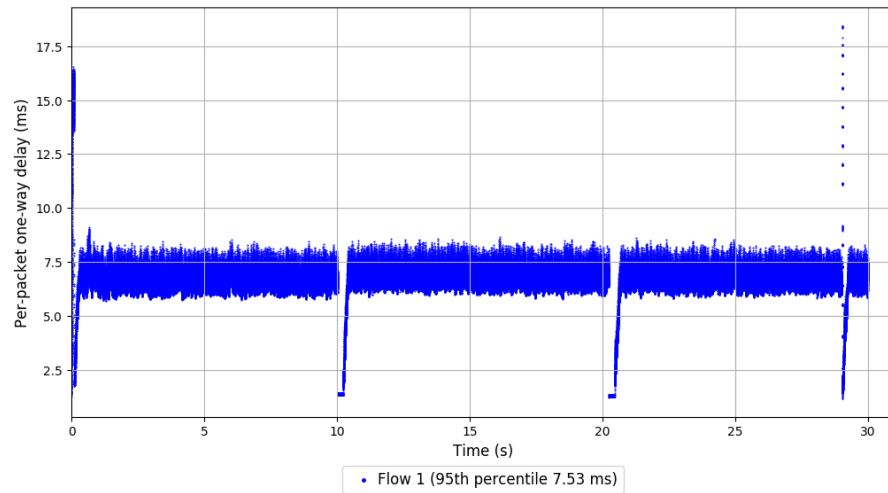
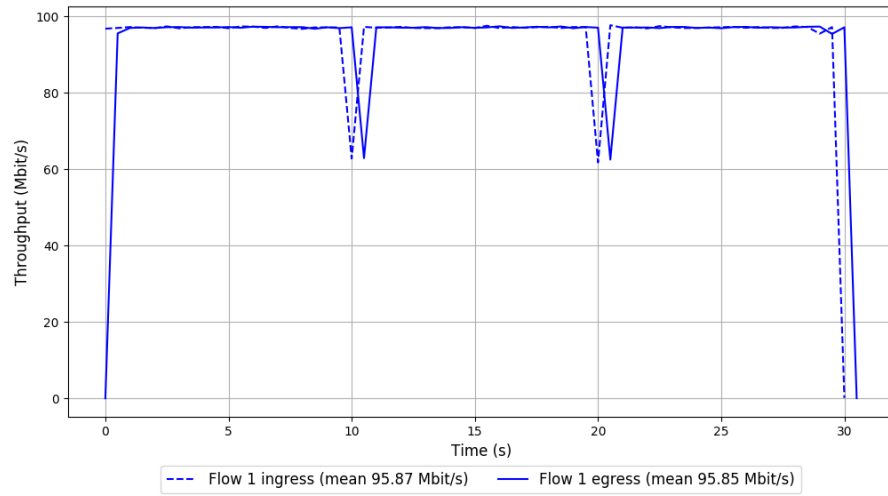
-- Flow 1:

Average throughput: 95.85 Mbit/s

95th percentile per-packet one-way delay: 7.529 ms

Loss rate: 0.02%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-09-03 09:27:43

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

Local clock offset: 0.89 ms

Remote clock offset: 0.292 ms

Below is generated by plot.py at 2018-09-03 09:33:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 95.89 Mbit/s

95th percentile per-packet one-way delay: 7.558 ms

Loss rate: 0.02%

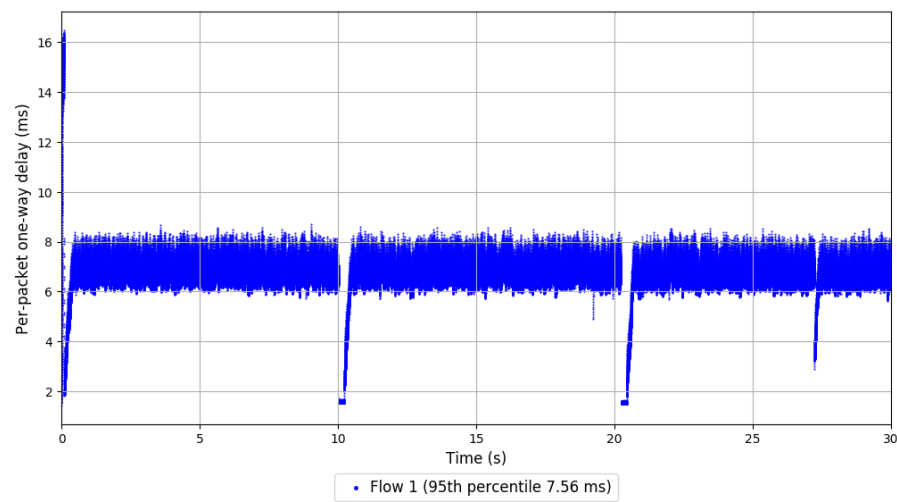
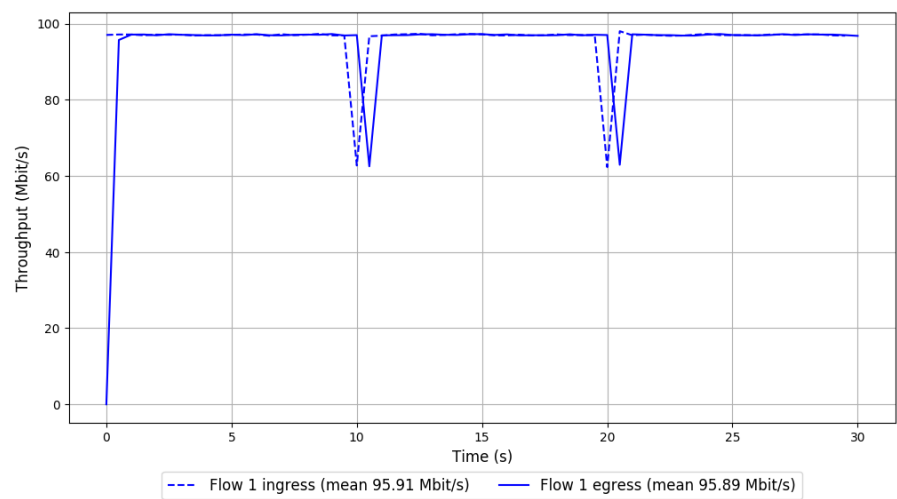
-- Flow 1:

Average throughput: 95.89 Mbit/s

95th percentile per-packet one-way delay: 7.558 ms

Loss rate: 0.02%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-09-03 09:19:51

End at: 2018-09-03 09:20:21

Local clock offset: -1.501 ms

Remote clock offset: 0.32 ms

Below is generated by plot.py at 2018-09-03 09:33:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.01 Mbit/s

95th percentile per-packet one-way delay: 9.264 ms

Loss rate: 0.06%

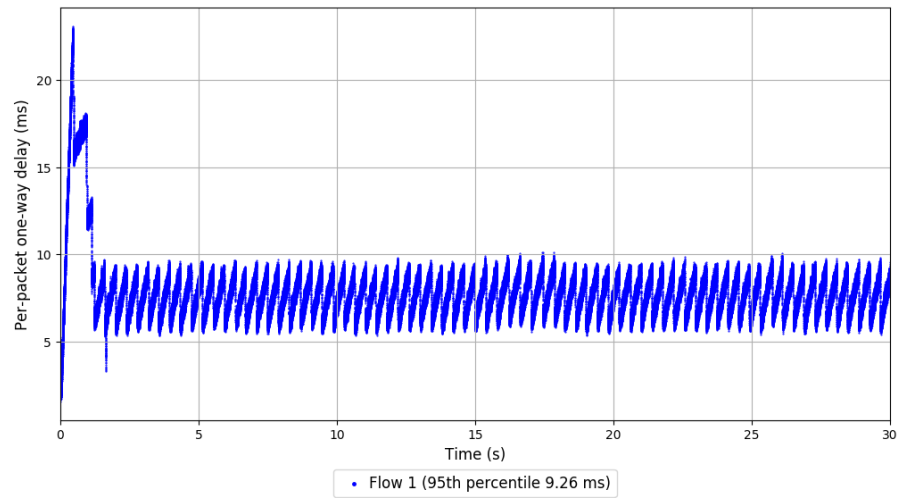
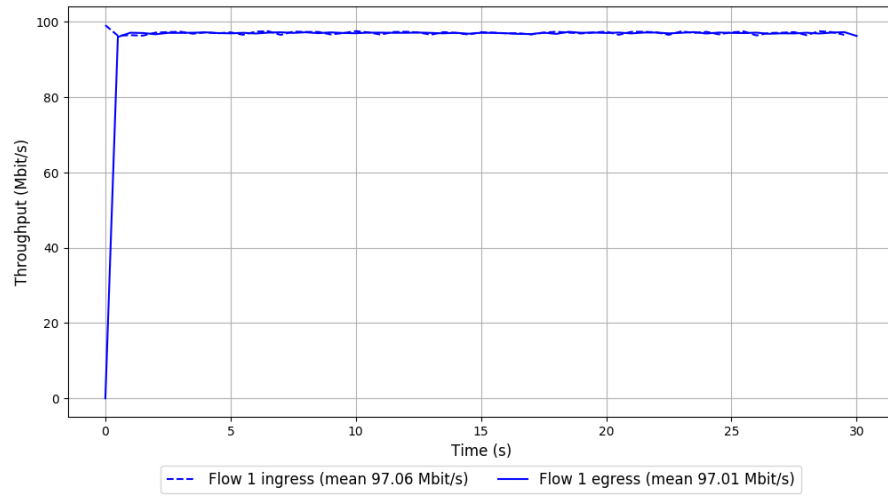
-- Flow 1:

Average throughput: 97.01 Mbit/s

95th percentile per-packet one-way delay: 9.264 ms

Loss rate: 0.06%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-09-03 09:24:20

End at: 2018-09-03 09:24:50

Local clock offset: -0.401 ms

Remote clock offset: 0.281 ms

Below is generated by plot.py at 2018-09-03 09:33:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.03 Mbit/s

95th percentile per-packet one-way delay: 8.808 ms

Loss rate: 0.06%

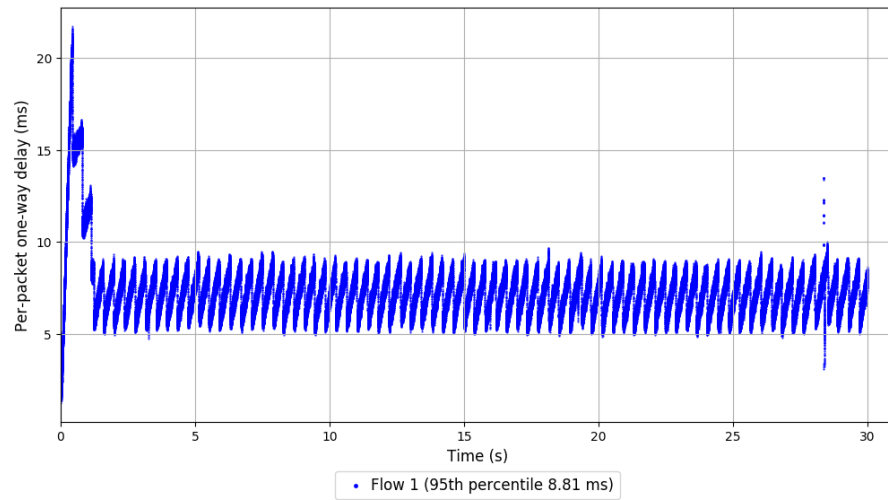
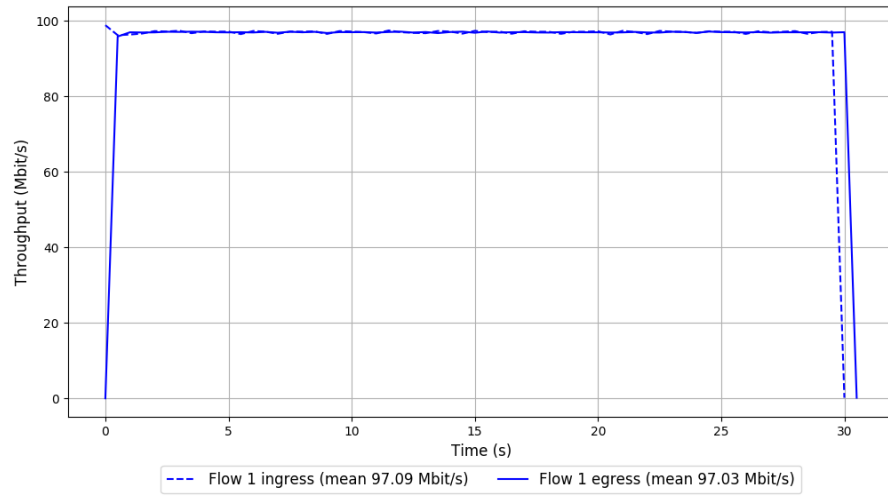
-- Flow 1:

Average throughput: 97.03 Mbit/s

95th percentile per-packet one-way delay: 8.808 ms

Loss rate: 0.06%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-09-03 09:28:50

End at: 2018-09-03 09:29:20

Local clock offset: 1.139 ms

Remote clock offset: 0.307 ms

Below is generated by plot.py at 2018-09-03 09:33:06

Datalink statistics

-- Total of 1 flow:

Average throughput: 97.08 Mbit/s

95th percentile per-packet one-way delay: 8.992 ms

Loss rate: 0.06%

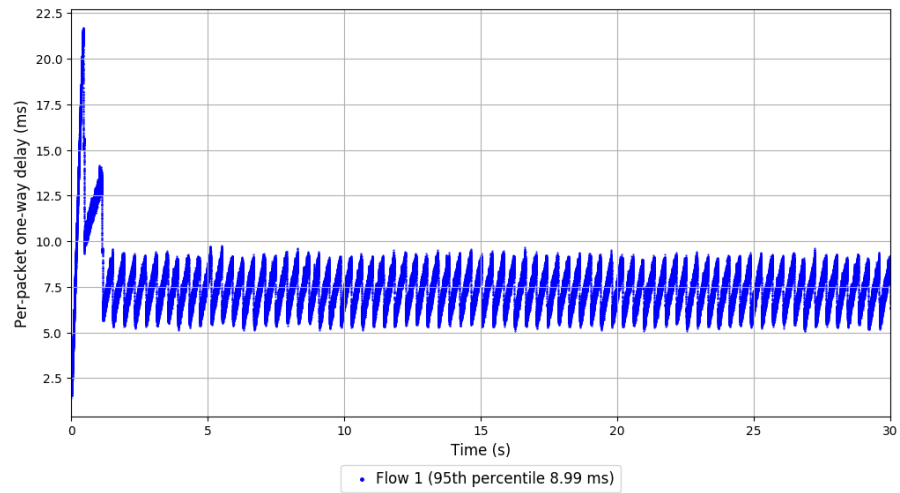
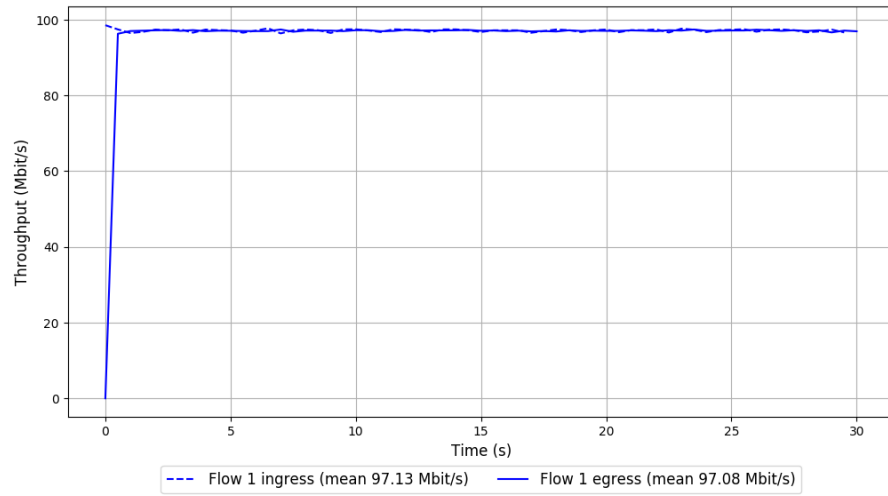
-- Flow 1:

Average throughput: 97.08 Mbit/s

95th percentile per-packet one-way delay: 8.992 ms

Loss rate: 0.06%

Run 3: Report of TCP Cubic — Data Link

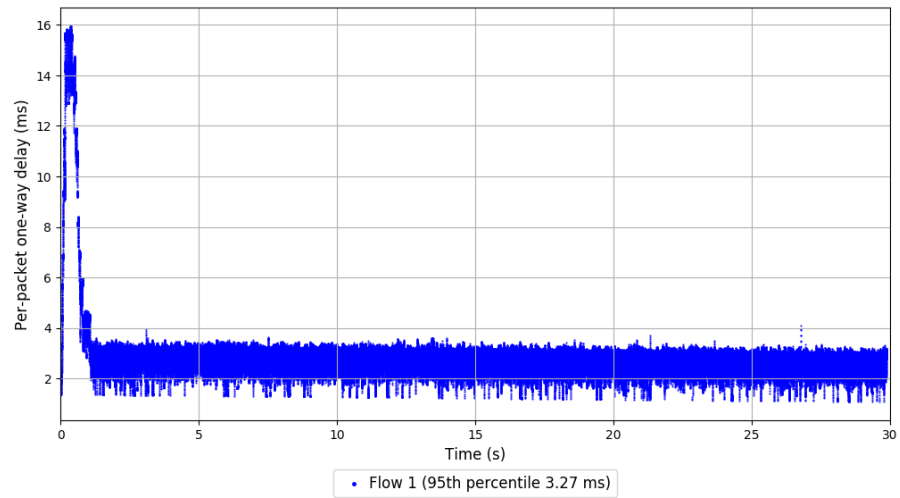
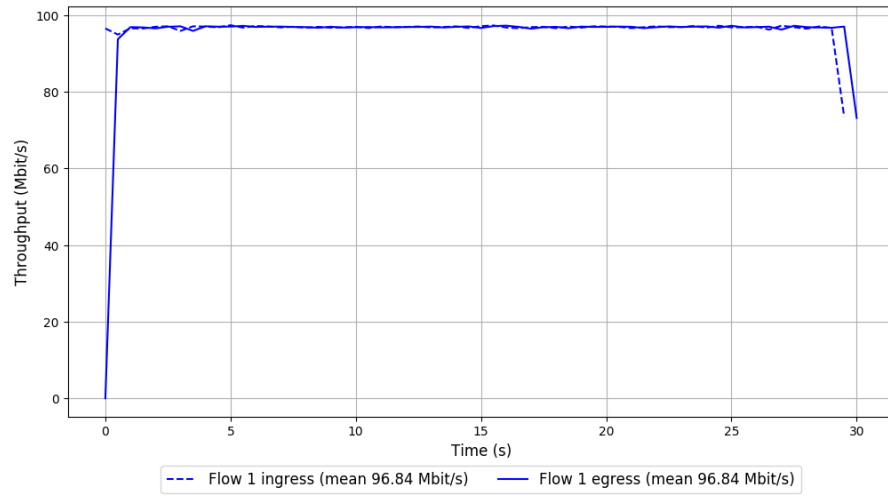


```
Run 1: Statistics of Indigo

Start at: 2018-09-03 09:22:05
End at: 2018-09-03 09:22:35
Local clock offset: -1.583 ms
Remote clock offset: 0.284 ms

# Below is generated by plot.py at 2018-09-03 09:33:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.84 Mbit/s
95th percentile per-packet one-way delay: 3.269 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 96.84 Mbit/s
95th percentile per-packet one-way delay: 3.269 ms
Loss rate: 0.01%
```

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2018-09-03 09:26:34

End at: 2018-09-03 09:27:04

Local clock offset: 0.523 ms

Remote clock offset: 0.303 ms

Below is generated by plot.py at 2018-09-03 09:33:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.83 Mbit/s

95th percentile per-packet one-way delay: 4.479 ms

Loss rate: 0.01%

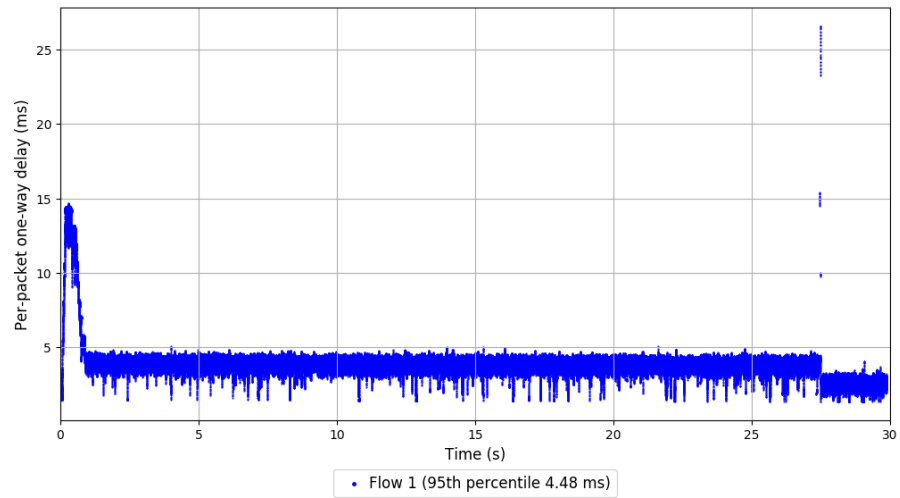
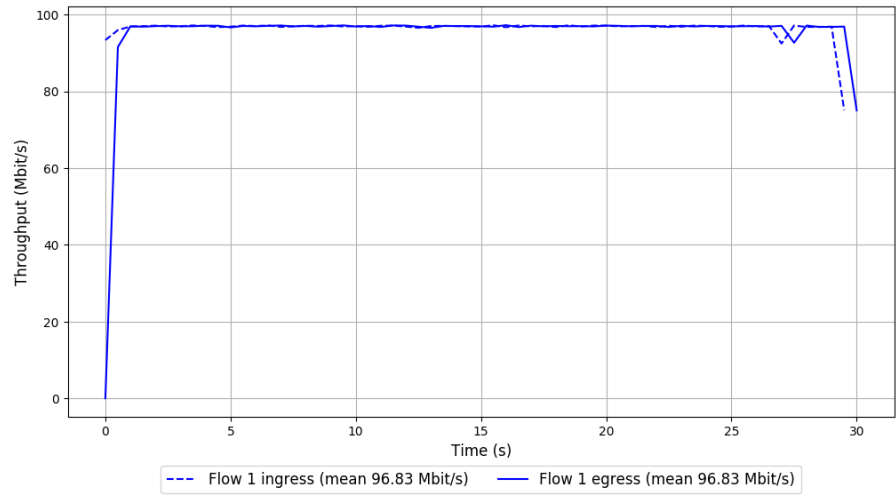
-- Flow 1:

Average throughput: 96.83 Mbit/s

95th percentile per-packet one-way delay: 4.479 ms

Loss rate: 0.01%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2018-09-03 09:31:04

End at: 2018-09-03 09:31:34

Local clock offset: 1.541 ms

Remote clock offset: 0.349 ms

Below is generated by plot.py at 2018-09-03 09:33:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.87 Mbit/s

95th percentile per-packet one-way delay: 4.588 ms

Loss rate: 0.02%

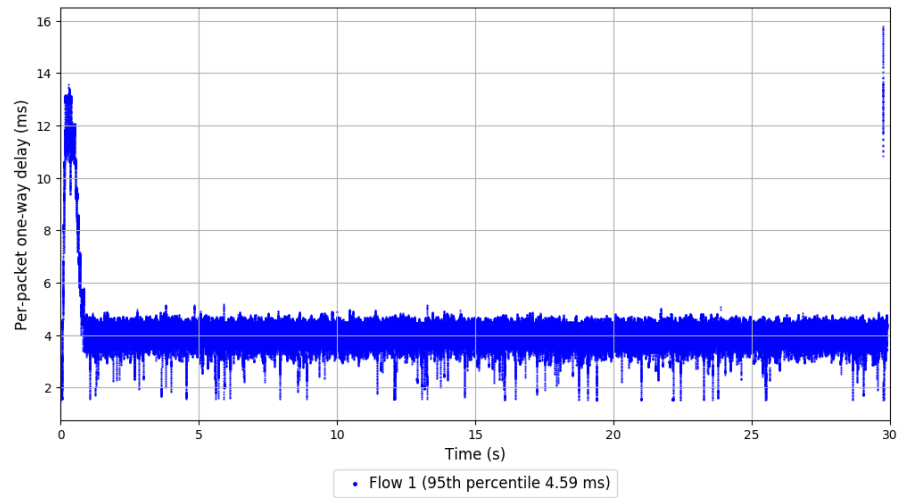
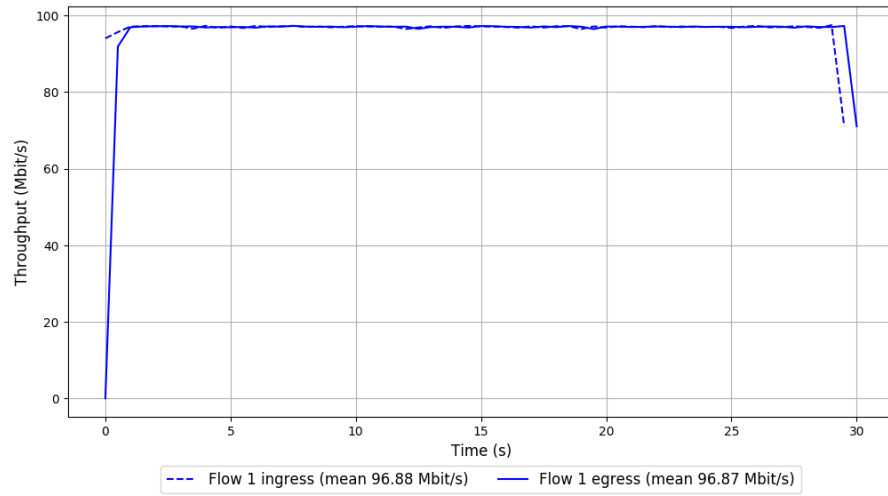
-- Flow 1:

Average throughput: 96.87 Mbit/s

95th percentile per-packet one-way delay: 4.588 ms

Loss rate: 0.02%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

Start at: 2018-09-03 09:20:58

End at: 2018-09-03 09:21:28

Local clock offset: -2.503 ms

Remote clock offset: 0.225 ms

Below is generated by plot.py at 2018-09-03 09:33:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.95 Mbit/s

95th percentile per-packet one-way delay: 22.548 ms

Loss rate: 3.42%

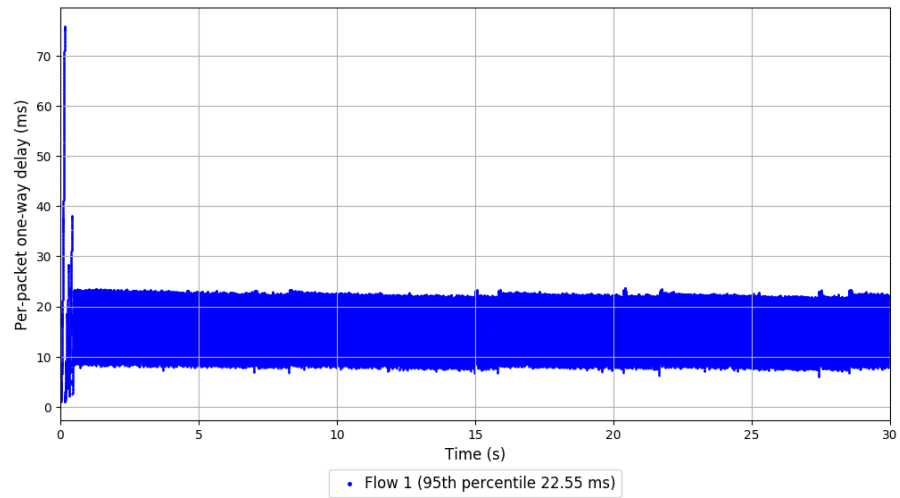
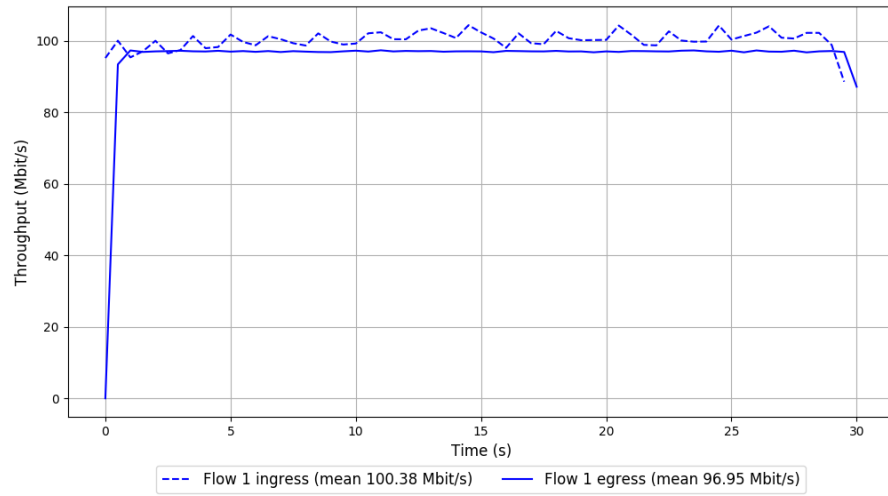
-- Flow 1:

Average throughput: 96.95 Mbit/s

95th percentile per-packet one-way delay: 22.548 ms

Loss rate: 3.42%

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

Start at: 2018-09-03 09:25:27

End at: 2018-09-03 09:25:57

Local clock offset: 0.196 ms

Remote clock offset: 0.303 ms

Below is generated by plot.py at 2018-09-03 09:33:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.87 Mbit/s

95th percentile per-packet one-way delay: 30.771 ms

Loss rate: 8.01%

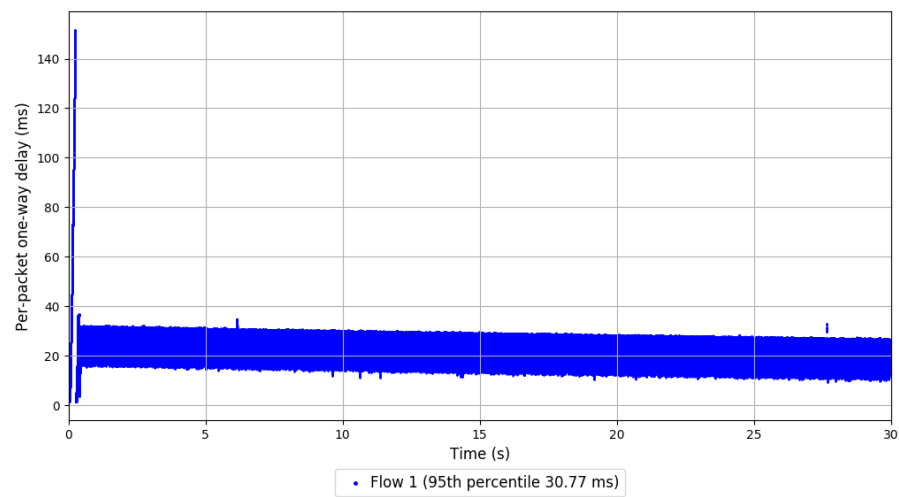
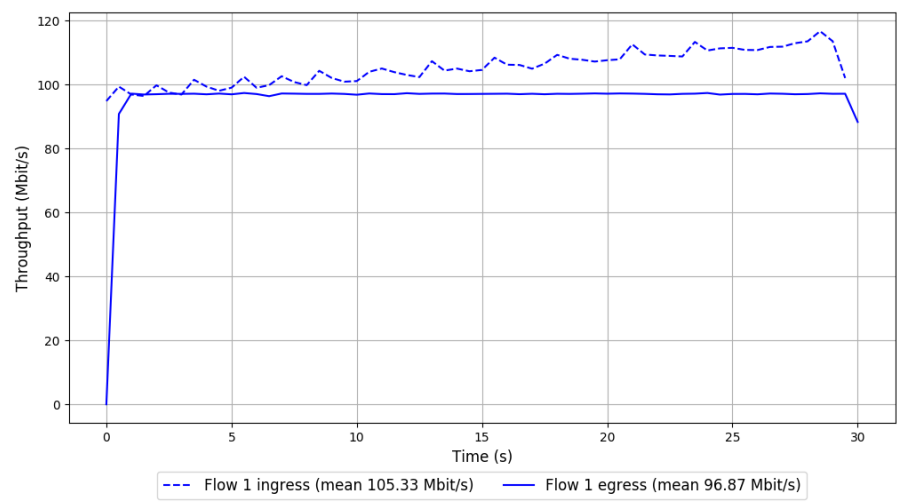
-- Flow 1:

Average throughput: 96.87 Mbit/s

95th percentile per-packet one-way delay: 30.771 ms

Loss rate: 8.01%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-03 09:29:57

End at: 2018-09-03 09:30:27

Local clock offset: 1.353 ms

Remote clock offset: 0.323 ms

Below is generated by plot.py at 2018-09-03 09:33:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 96.91 Mbit/s

95th percentile per-packet one-way delay: 30.804 ms

Loss rate: 7.92%

-- Flow 1:

Average throughput: 96.91 Mbit/s

95th percentile per-packet one-way delay: 30.804 ms

Loss rate: 7.92%

Run 3: Report of Muses-25 — Data Link

