

Pantheon Report

Generated at 2018-08-31 06:49:52 (UTC).

Data path: AWS India 1 on `ens5` (*local*) → India on `em1` (*remote*).

Repeated the test of 4 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

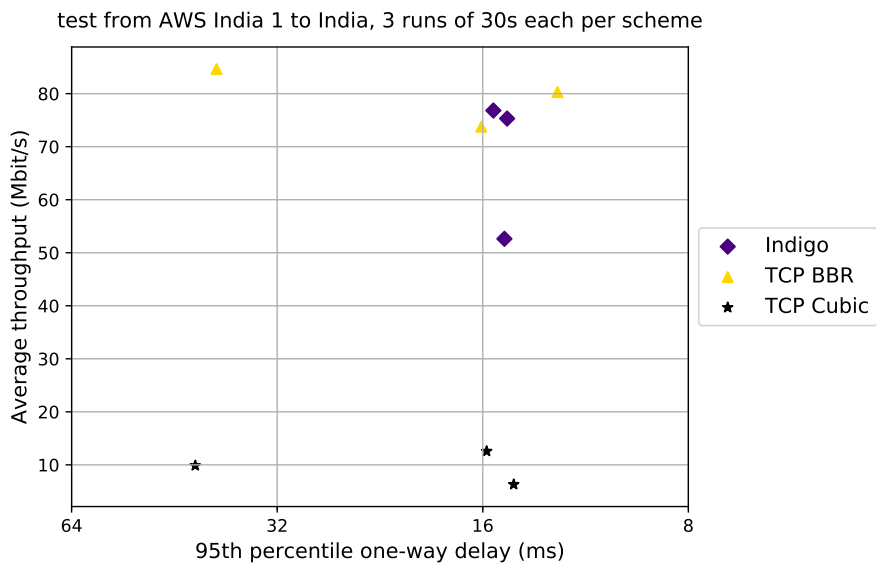
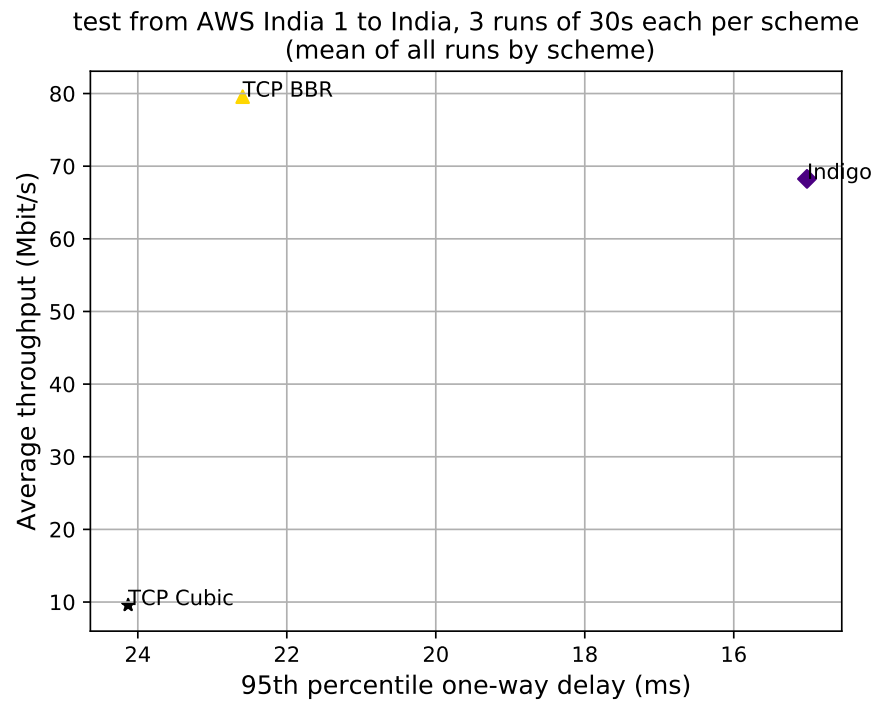
NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

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
```



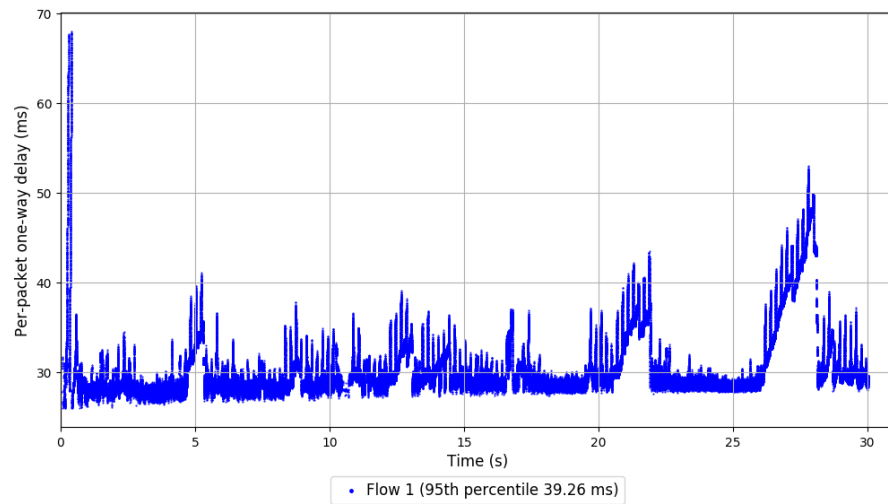
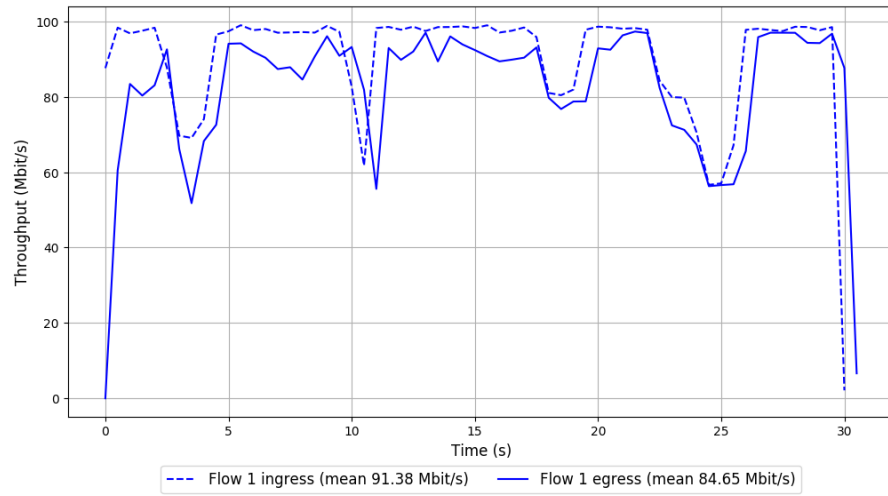
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	79.57	22.59	9.30
TCP Cubic	3	9.58	24.13	1.32
Indigo	3	68.25	15.02	8.03
Muses-25	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 06:36:02
End at: 2018-08-31 06:36:32
Local clock offset: -20.747 ms
Remote clock offset: -1.502 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 84.65 Mbit/s
95th percentile per-packet one-way delay: 39.259 ms
Loss rate: 7.36%
-- Flow 1:
Average throughput: 84.65 Mbit/s
95th percentile per-packet one-way delay: 39.259 ms
Loss rate: 7.36%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 06:40:32

End at: 2018-08-31 06:41:02

Local clock offset: -4.523 ms

Remote clock offset: -1.33 ms

Below is generated by plot.py at 2018-08-31 06:49:51

Datalink statistics

-- Total of 1 flow:

Average throughput: 73.76 Mbit/s

95th percentile per-packet one-way delay: 16.081 ms

Loss rate: 9.83%

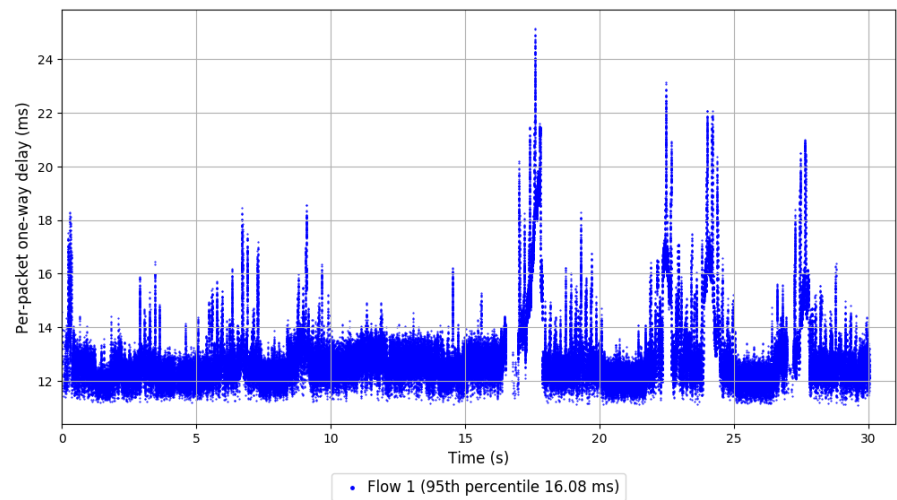
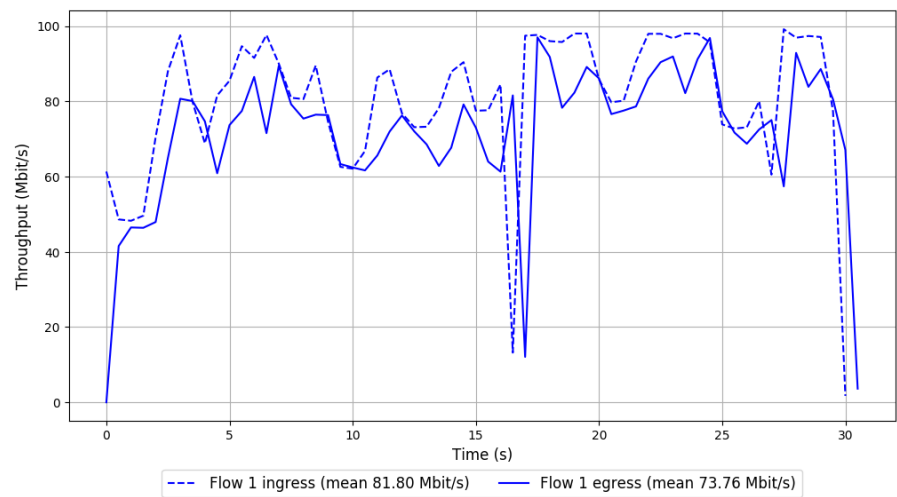
-- Flow 1:

Average throughput: 73.76 Mbit/s

95th percentile per-packet one-way delay: 16.081 ms

Loss rate: 9.83%

Run 2: Report of TCP BBR — Data Link

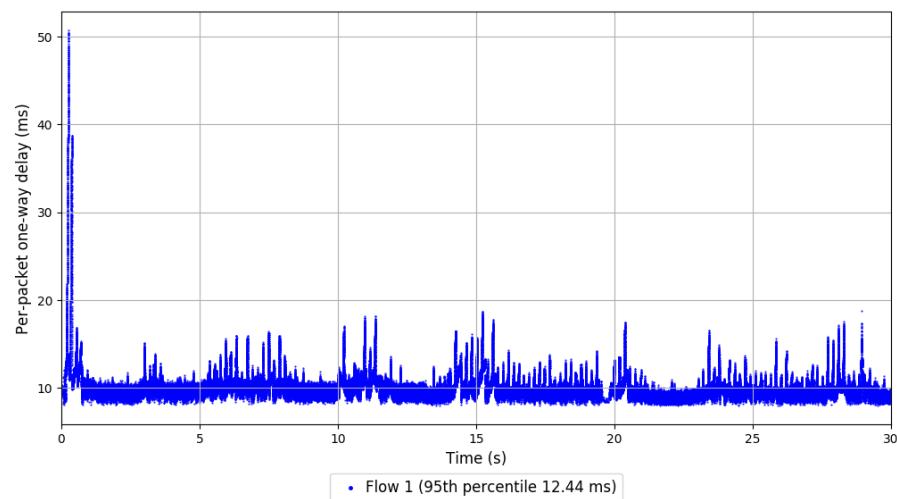
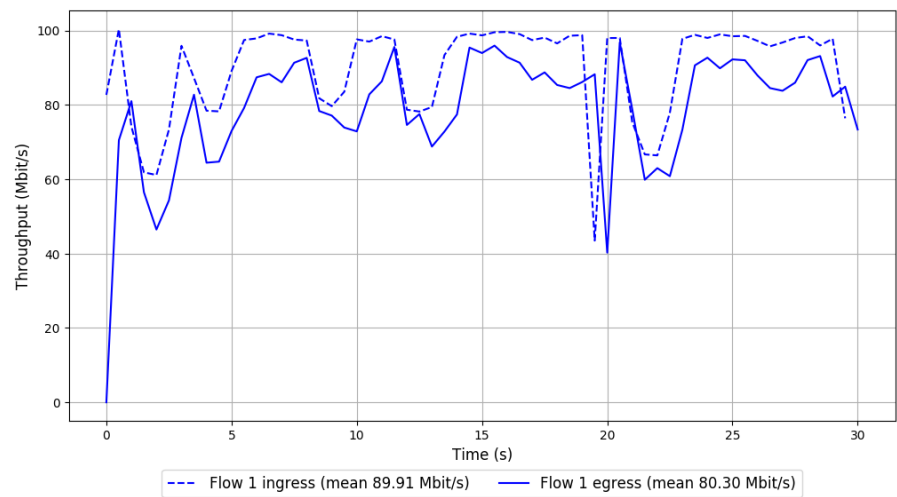


Run 3: Statistics of TCP BBR

Start at: 2018-08-31 06:45:02
End at: 2018-08-31 06:45:32
Local clock offset: -2.645 ms
Remote clock offset: -1.924 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 80.30 Mbit/s
95th percentile per-packet one-way delay: 12.438 ms
Loss rate: 10.70%
-- Flow 1:
Average throughput: 80.30 Mbit/s
95th percentile per-packet one-way delay: 12.438 ms
Loss rate: 10.70%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 06:39:27

End at: 2018-08-31 06:39:57

Local clock offset: -6.545 ms

Remote clock offset: -1.35 ms

Below is generated by plot.py at 2018-08-31 06:49:51

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.57 Mbit/s

95th percentile per-packet one-way delay: 15.794 ms

Loss rate: 0.31%

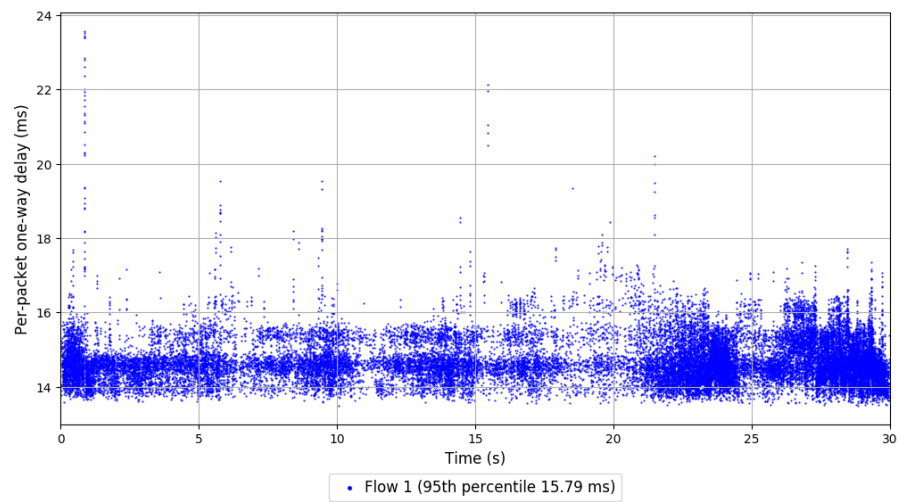
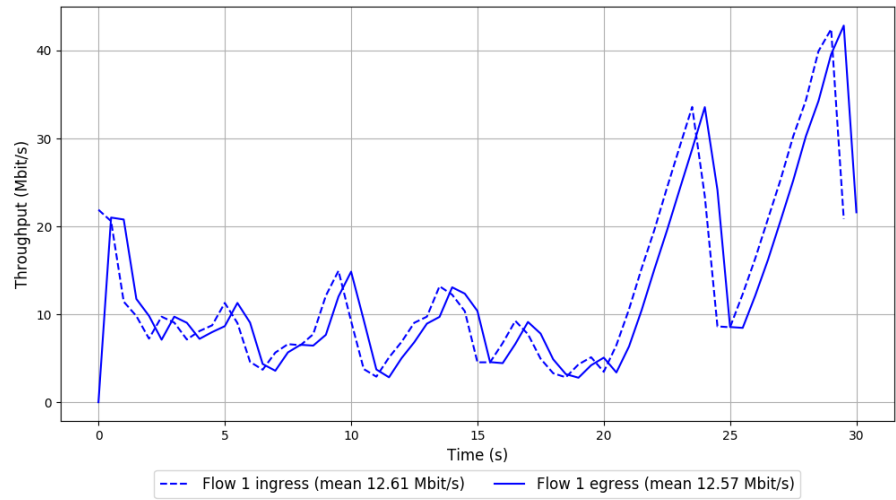
-- Flow 1:

Average throughput: 12.57 Mbit/s

95th percentile per-packet one-way delay: 15.794 ms

Loss rate: 0.31%

Run 1: Report of TCP Cubic — Data Link

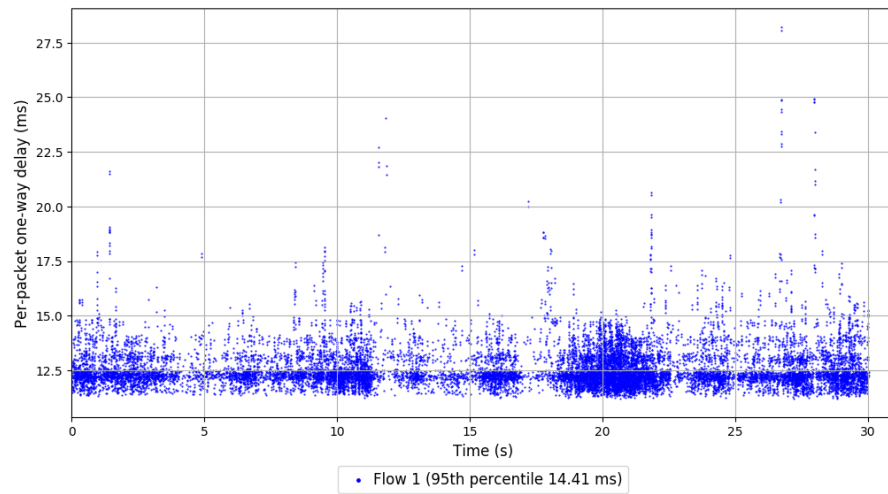
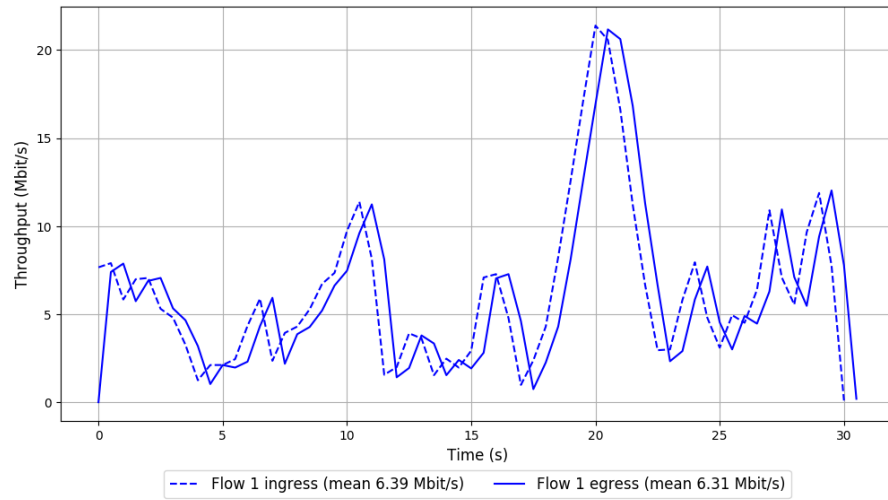


Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 06:43:58
End at: 2018-08-31 06:44:28
Local clock offset: -5.158 ms
Remote clock offset: -1.639 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.31 Mbit/s
95th percentile per-packet one-way delay: 14.415 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 6.31 Mbit/s
95th percentile per-packet one-way delay: 14.415 ms
Loss rate: 1.25%

Run 2: Report of TCP Cubic — Data Link

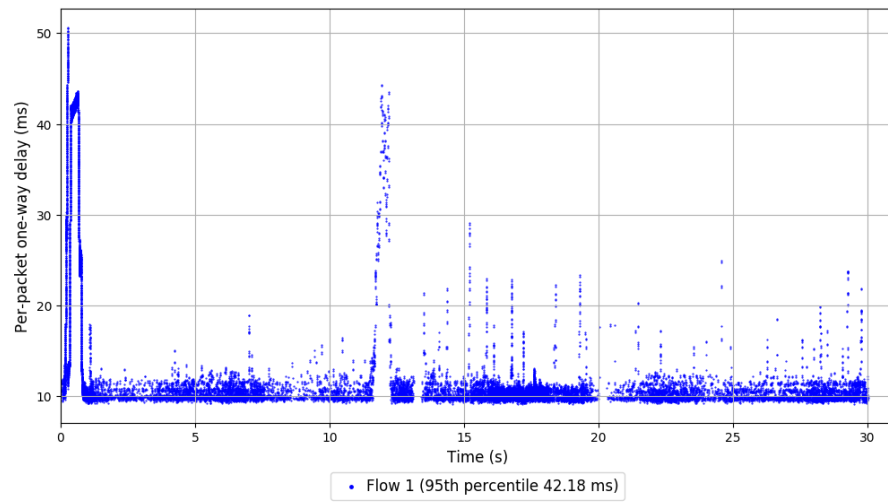
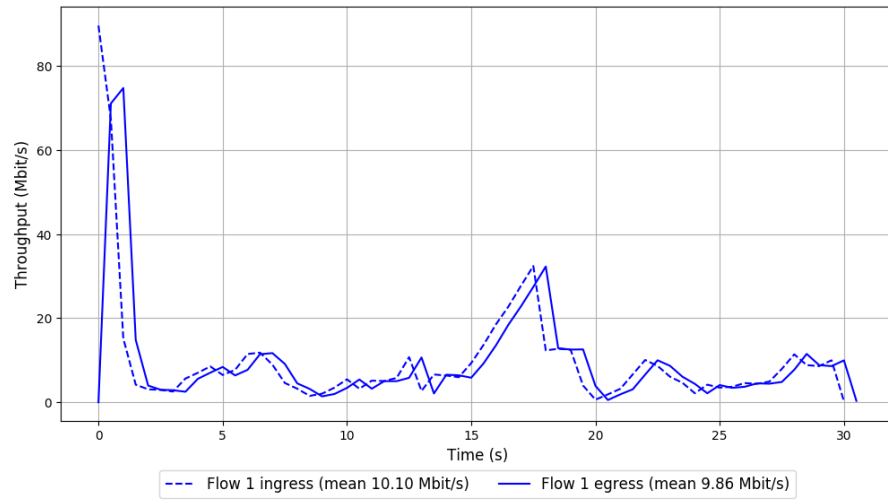


Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 06:48:23
End at: 2018-08-31 06:48:53
Local clock offset: -4.25 ms
Remote clock offset: -2.124 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.86 Mbit/s
95th percentile per-packet one-way delay: 42.182 ms
Loss rate: 2.41%
-- Flow 1:
Average throughput: 9.86 Mbit/s
95th percentile per-packet one-way delay: 42.182 ms
Loss rate: 2.41%

Run 3: Report of TCP Cubic — Data Link

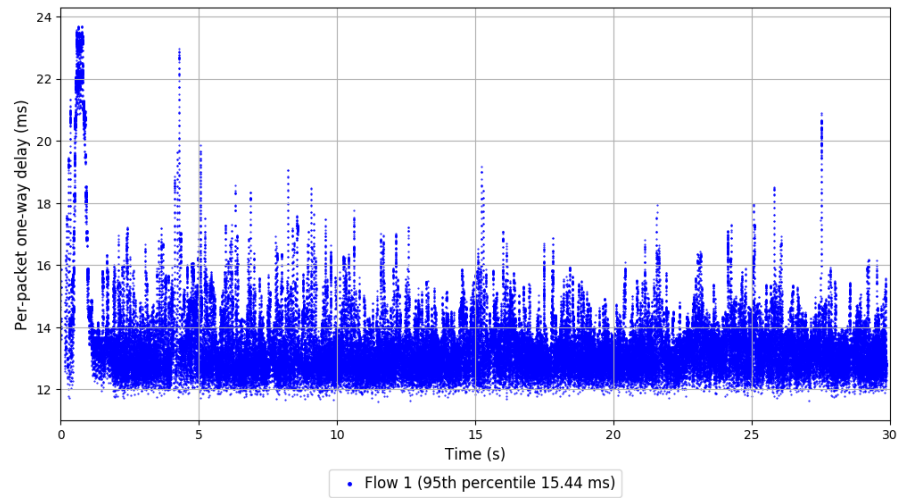
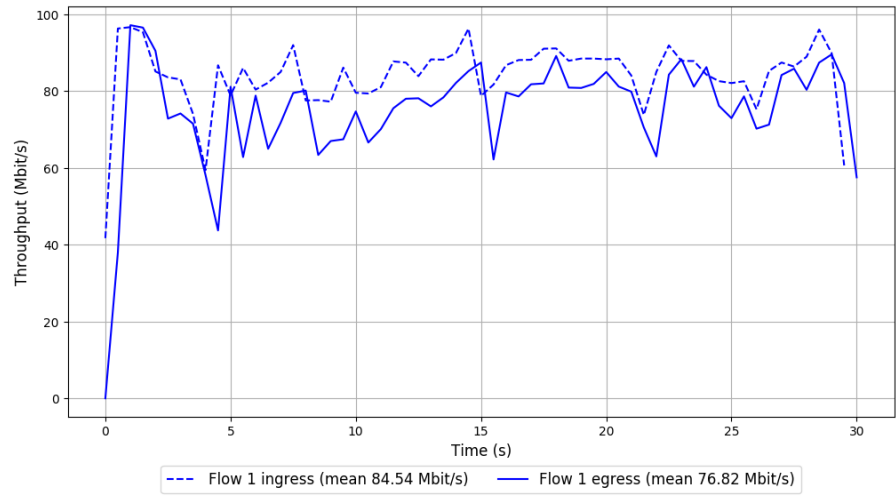


Run 1: Statistics of Indigo

Start at: 2018-08-31 06:37:14
End at: 2018-08-31 06:37:44
Local clock offset: -4.327 ms
Remote clock offset: -1.089 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 76.82 Mbit/s
95th percentile per-packet one-way delay: 15.438 ms
Loss rate: 9.14%
-- Flow 1:
Average throughput: 76.82 Mbit/s
95th percentile per-packet one-way delay: 15.438 ms
Loss rate: 9.14%

Run 1: Report of Indigo — Data Link

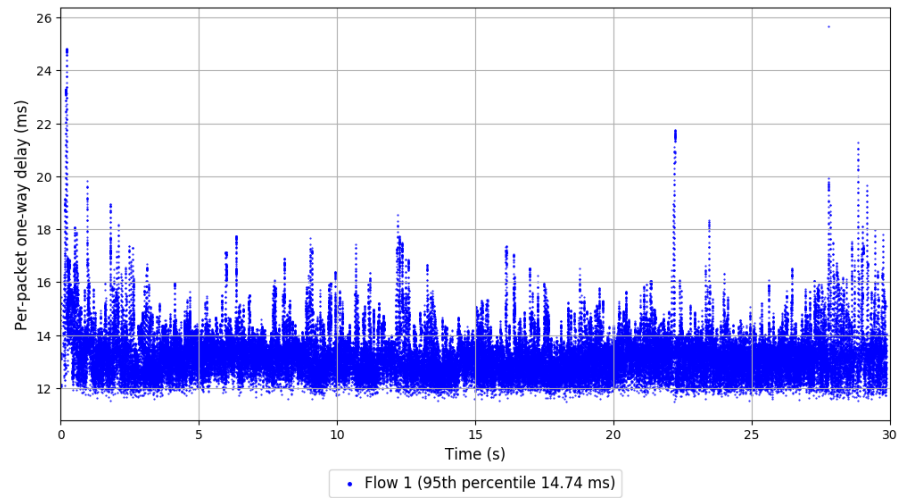
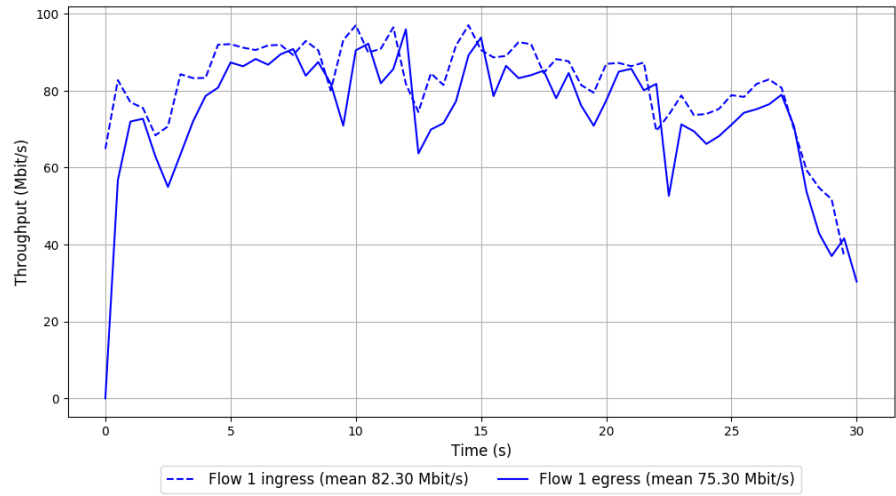


Run 2: Statistics of Indigo

Start at: 2018-08-31 06:41:44
End at: 2018-08-31 06:42:14
Local clock offset: -4.512 ms
Remote clock offset: -0.756 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 75.30 Mbit/s
95th percentile per-packet one-way delay: 14.739 ms
Loss rate: 8.50%
-- Flow 1:
Average throughput: 75.30 Mbit/s
95th percentile per-packet one-way delay: 14.739 ms
Loss rate: 8.50%

Run 2: Report of Indigo — Data Link

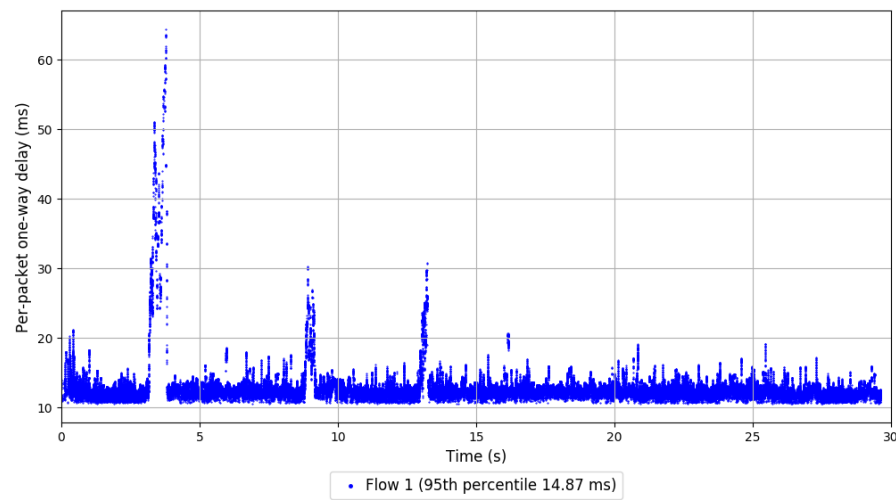
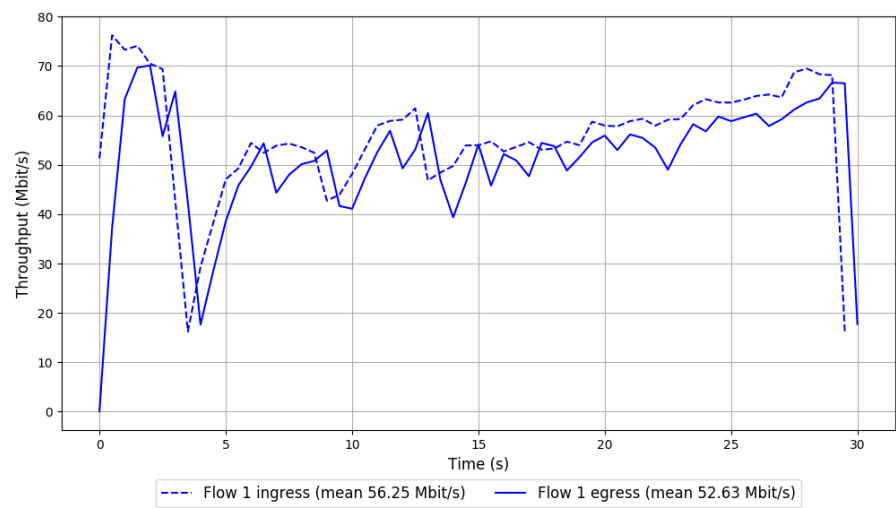


Run 3: Statistics of Indigo

Start at: 2018-08-31 06:46:12
End at: 2018-08-31 06:46:42
Local clock offset: -5.011 ms
Remote clock offset: -1.774 ms

Below is generated by plot.py at 2018-08-31 06:49:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 52.63 Mbit/s
95th percentile per-packet one-way delay: 14.874 ms
Loss rate: 6.45%
-- Flow 1:
Average throughput: 52.63 Mbit/s
95th percentile per-packet one-way delay: 14.874 ms
Loss rate: 6.45%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

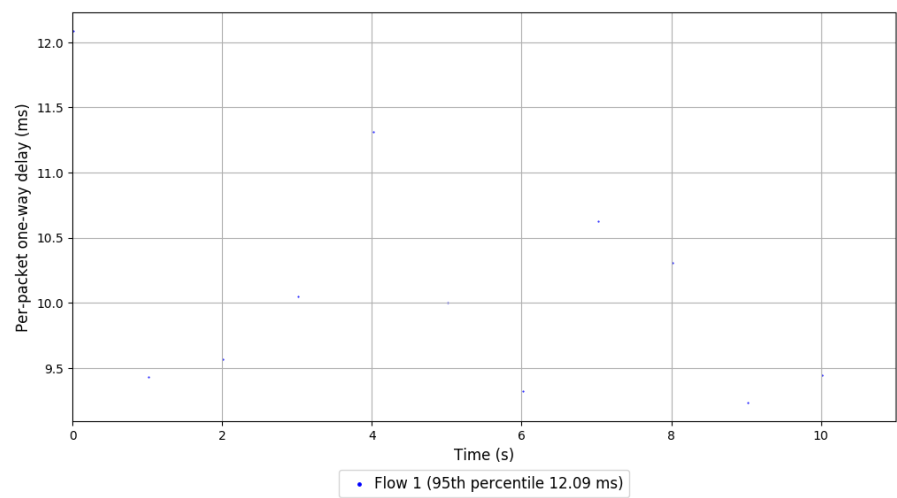
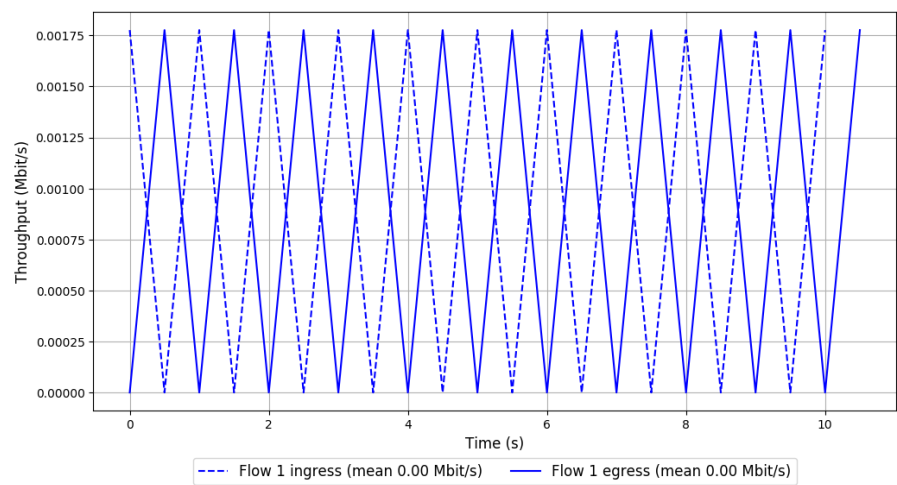
Start at: 2018-08-31 06:38:23

End at: 2018-08-31 06:38:53

Local clock offset: -1.414 ms

Remote clock offset: -0.765 ms

Run 1: Report of Muses-25 — Data Link



Run 2: Statistics of Muses-25

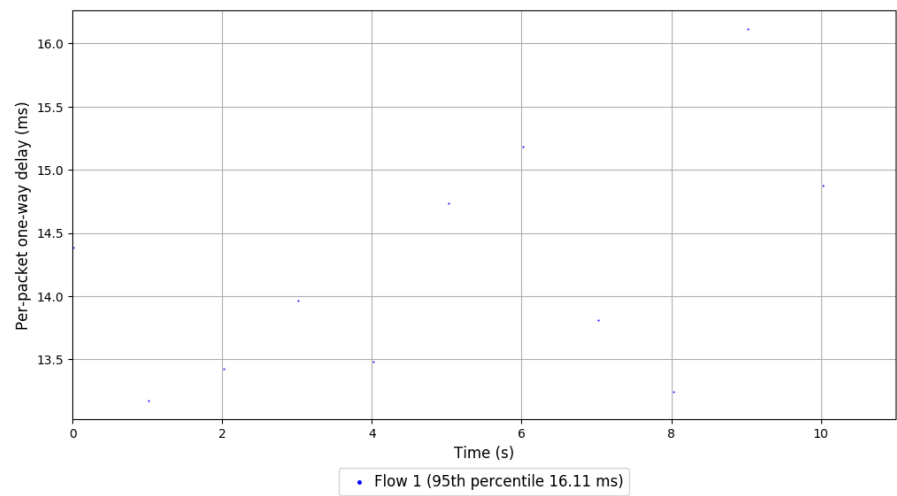
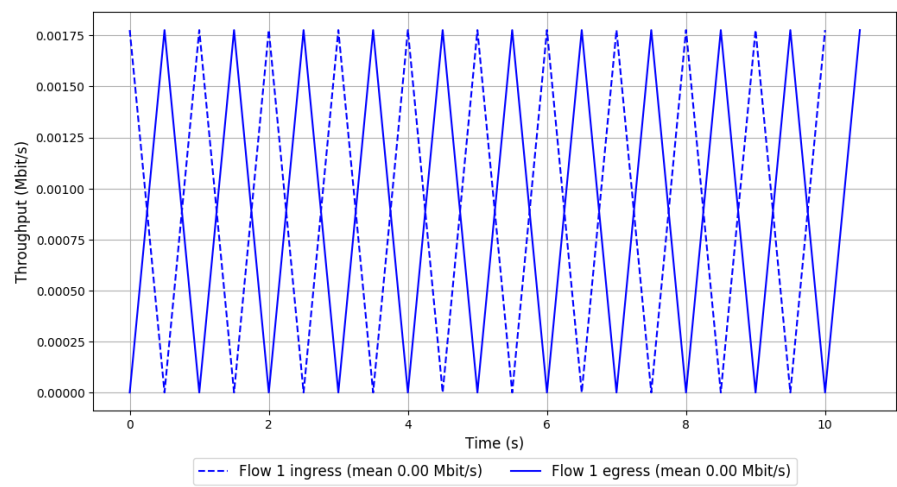
Start at: 2018-08-31 06:42:54

End at: 2018-08-31 06:43:24

Local clock offset: -6.739 ms

Remote clock offset: -1.319 ms

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-08-31 06:47:19

End at: 2018-08-31 06:47:49

Local clock offset: -5.02 ms

Remote clock offset: -1.514 ms

Run 3: Report of Muses-25 — Data Link

