

Pantheon Report

Generated at 2018-09-05 21:16:52 (UTC).

Data path: AWS Korea on `ens5` (*local*) → China on `eno1` (*remote*).

Repeated the test of 4 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

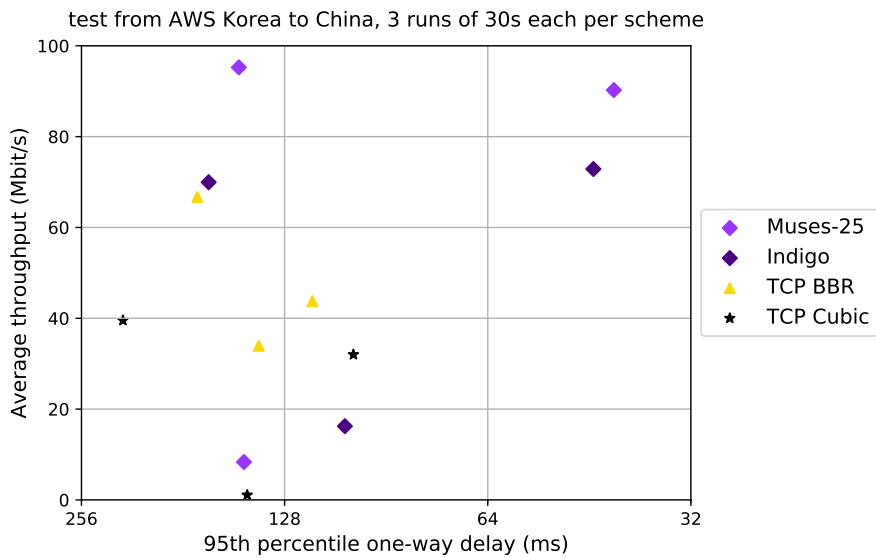
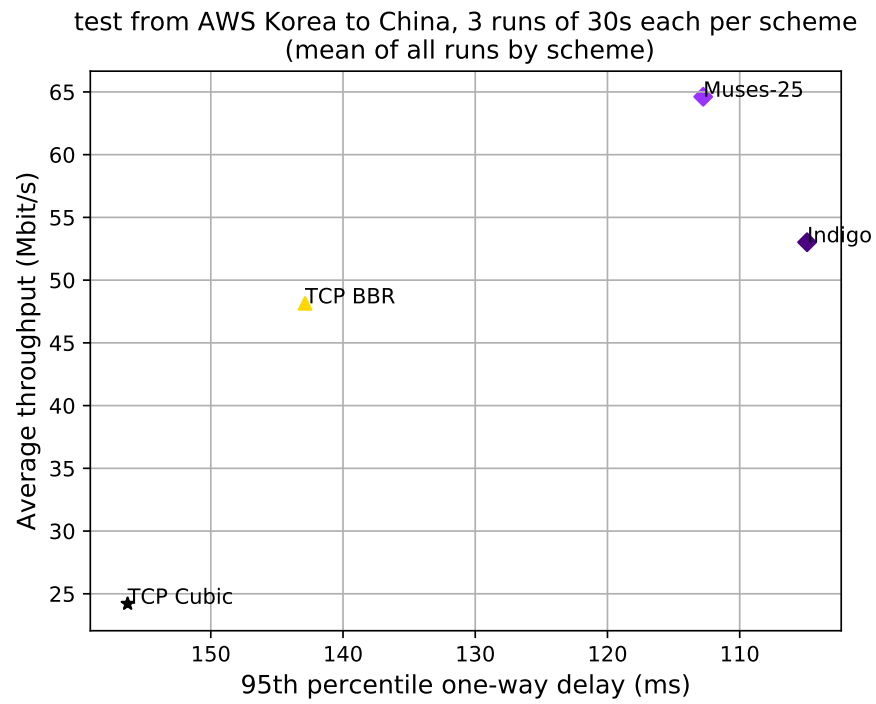
NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.

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
```



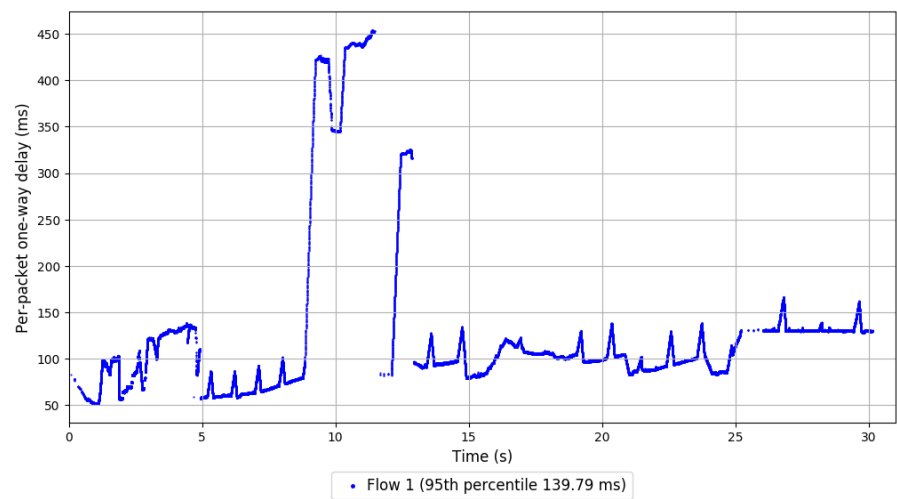
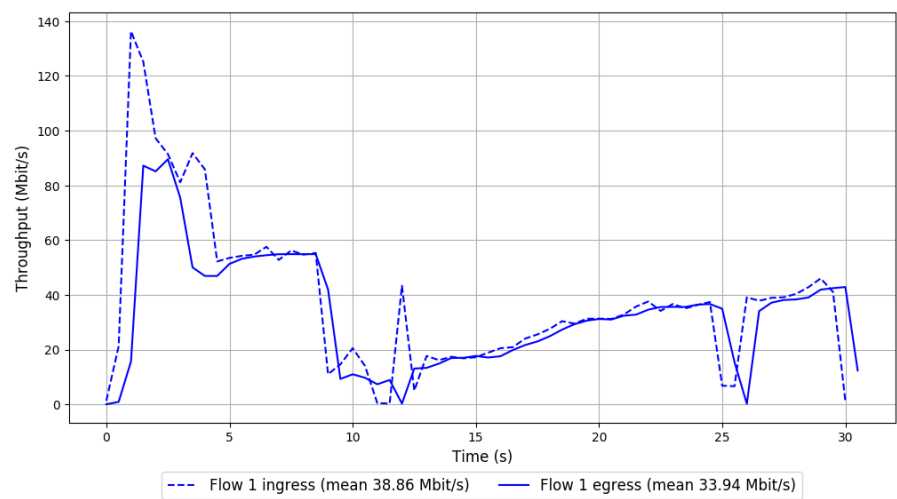
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	48.15	142.87	9.23
TCP Cubic	3	24.21	156.29	1.76
Indigo	3	53.02	104.90	8.94
Muses-25	3	64.62	112.76	2.11

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 21:01:40
End at: 2018-09-05 21:02:10
Local clock offset: 11.719 ms
Remote clock offset: -15.243 ms

Below is generated by plot.py at 2018-09-05 21:16:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 33.94 Mbit/s
95th percentile per-packet one-way delay: 139.793 ms
Loss rate: 12.53%
-- Flow 1:
Average throughput: 33.94 Mbit/s
95th percentile per-packet one-way delay: 139.793 ms
Loss rate: 12.53%

Run 1: Report of TCP BBR — Data Link

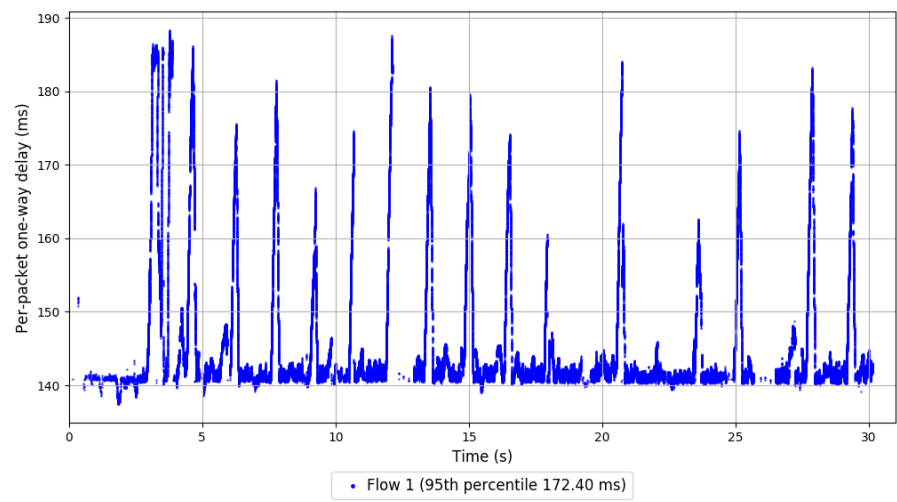
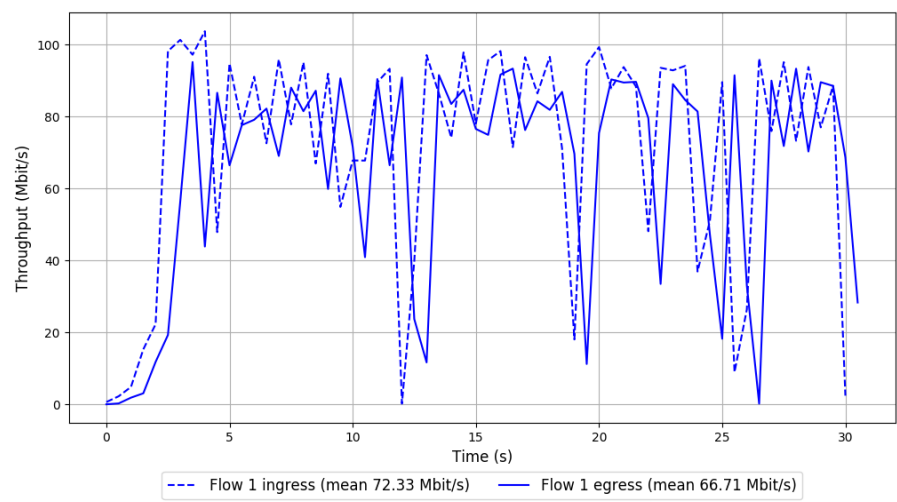


Run 2: Statistics of TCP BBR

Start at: 2018-09-05 21:06:47
End at: 2018-09-05 21:07:17
Local clock offset: -2.859 ms
Remote clock offset: -21.646 ms

Below is generated by plot.py at 2018-09-05 21:16:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 66.71 Mbit/s
95th percentile per-packet one-way delay: 172.395 ms
Loss rate: 7.77%
-- Flow 1:
Average throughput: 66.71 Mbit/s
95th percentile per-packet one-way delay: 172.395 ms
Loss rate: 7.77%

Run 2: Report of TCP BBR — Data Link

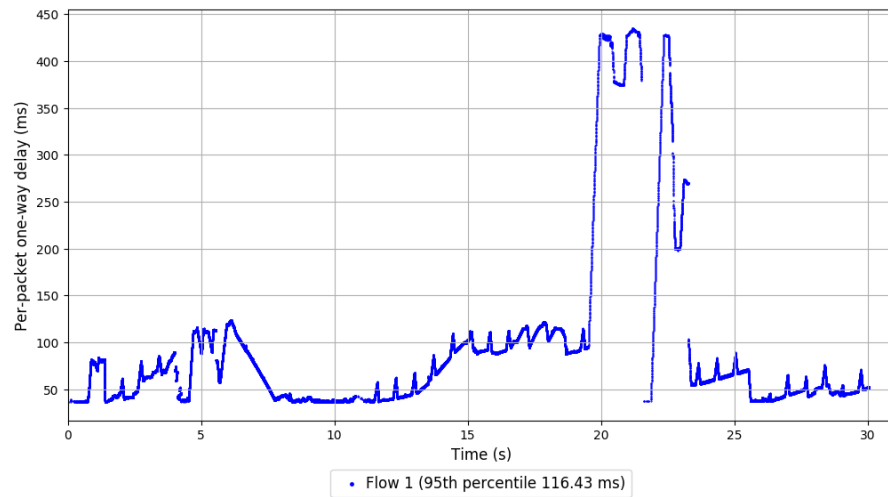
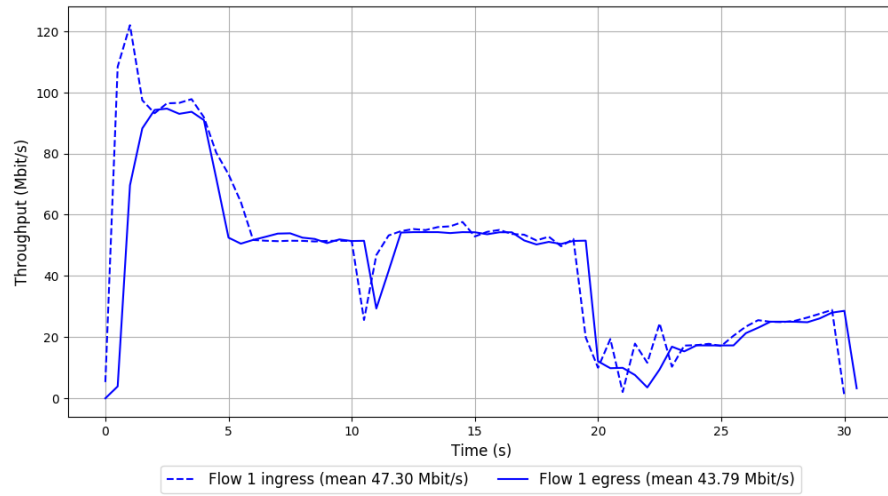


Run 3: Statistics of TCP BBR

Start at: 2018-09-05 21:11:44
End at: 2018-09-05 21:12:14
Local clock offset: -0.513 ms
Remote clock offset: -28.359 ms

Below is generated by plot.py at 2018-09-05 21:16:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 43.79 Mbit/s
95th percentile per-packet one-way delay: 116.429 ms
Loss rate: 7.40%
-- Flow 1:
Average throughput: 43.79 Mbit/s
95th percentile per-packet one-way delay: 116.429 ms
Loss rate: 7.40%

Run 3: Report of TCP BBR — Data Link

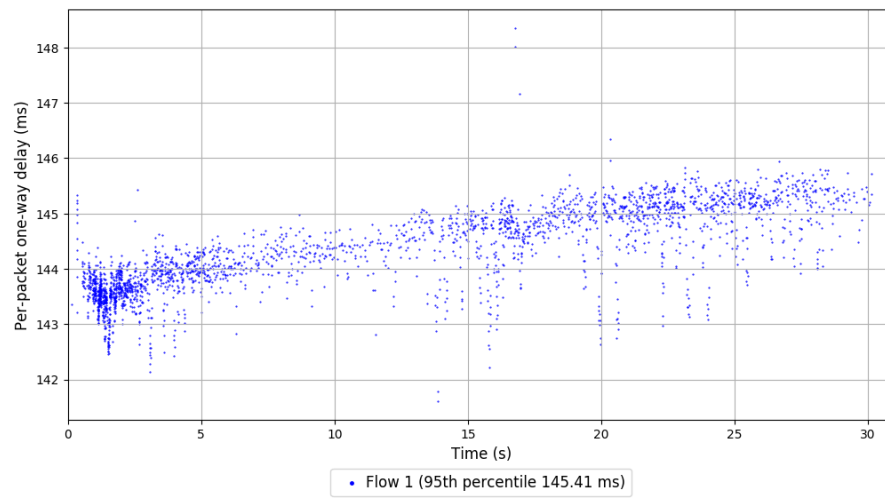
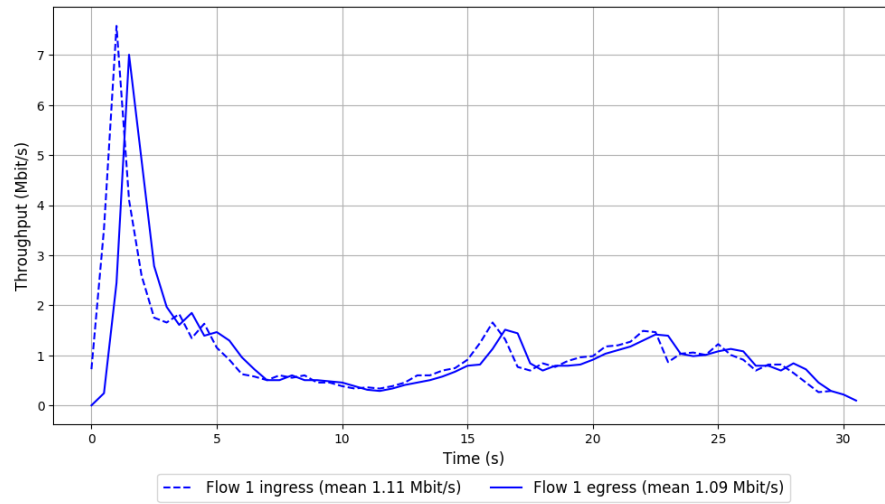


Run 1: Statistics of TCP Cubic

Start at: 2018-09-05 21:02:58
End at: 2018-09-05 21:03:28
Local clock offset: -0.93 ms
Remote clock offset: -17.245 ms

Below is generated by plot.py at 2018-09-05 21:16:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 145.412 ms
Loss rate: 2.26%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 145.412 ms
Loss rate: 2.26%

Run 1: Report of TCP Cubic — Data Link

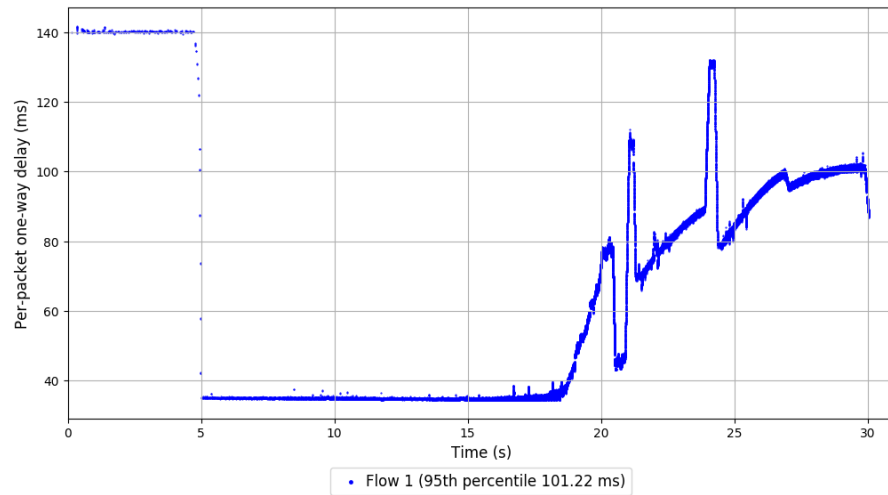
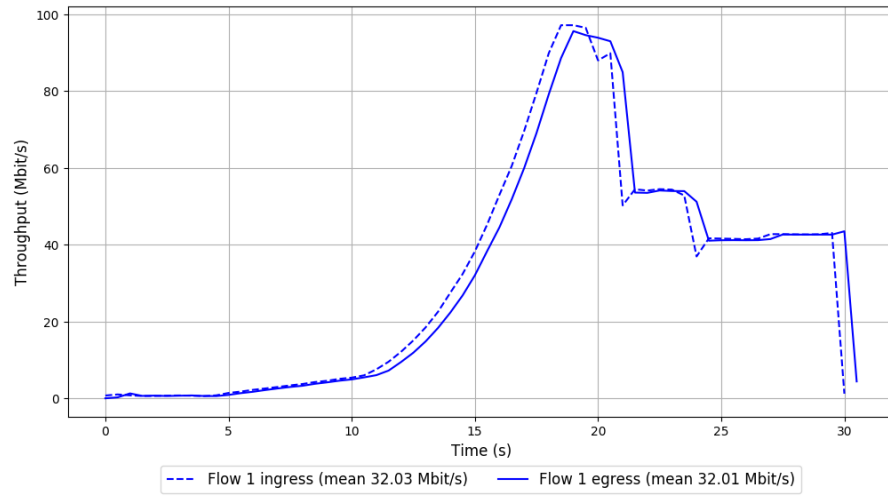


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 21:08:07
End at: 2018-09-05 21:08:37
Local clock offset: -5.58 ms
Remote clock offset: -24.443 ms

Below is generated by plot.py at 2018-09-05 21:16:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 32.01 Mbit/s
95th percentile per-packet one-way delay: 101.222 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 32.01 Mbit/s
95th percentile per-packet one-way delay: 101.222 ms
Loss rate: 0.43%

Run 2: Report of TCP Cubic — Data Link

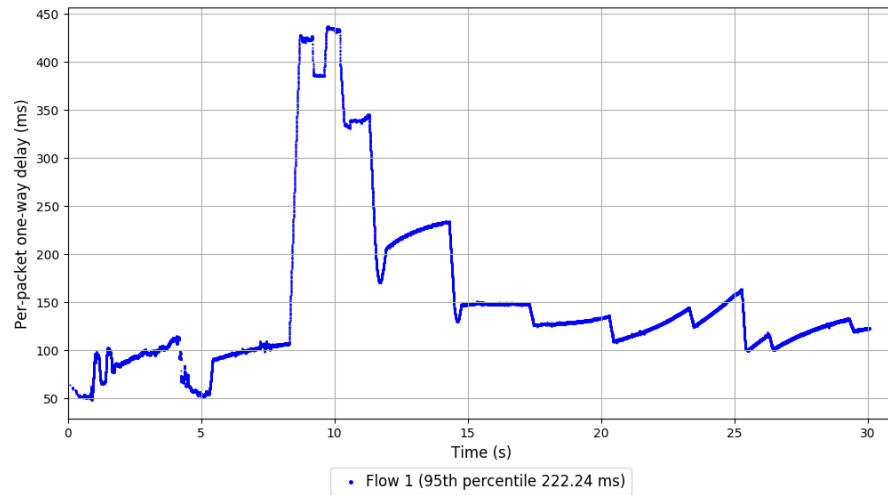
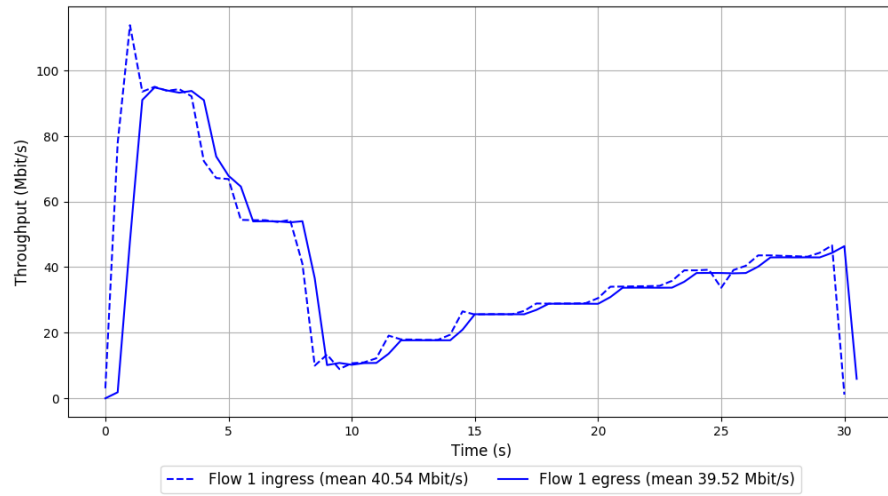


Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 21:12:55
End at: 2018-09-05 21:13:26
Local clock offset: 0.57 ms
Remote clock offset: -29.605 ms

Below is generated by plot.py at 2018-09-05 21:16:42
Datalink statistics
-- Total of 1 flow:
Average throughput: 39.52 Mbit/s
95th percentile per-packet one-way delay: 222.235 ms
Loss rate: 2.58%
-- Flow 1:
Average throughput: 39.52 Mbit/s
95th percentile per-packet one-way delay: 222.235 ms
Loss rate: 2.58%

Run 3: Report of TCP Cubic — Data Link

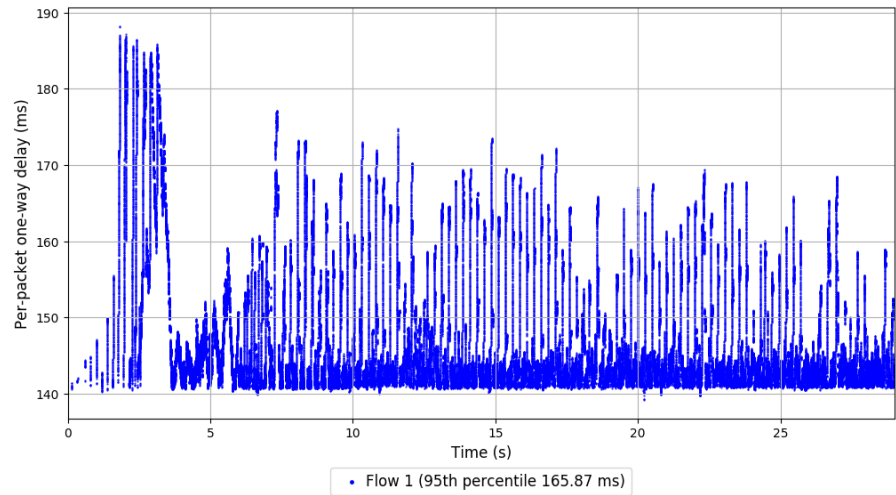
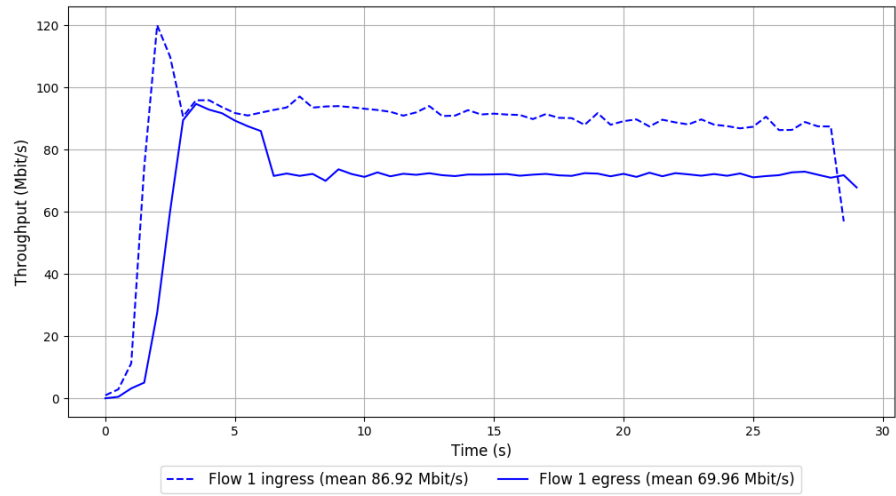


Run 1: Statistics of Indigo

Start at: 2018-09-05 21:04:09
End at: 2018-09-05 21:04:39
Local clock offset: 2.952 ms
Remote clock offset: -18.338 ms

Below is generated by plot.py at 2018-09-05 21:16:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 69.96 Mbit/s
95th percentile per-packet one-way delay: 165.871 ms
Loss rate: 19.50%
-- Flow 1:
Average throughput: 69.96 Mbit/s
95th percentile per-packet one-way delay: 165.871 ms
Loss rate: 19.50%

Run 1: Report of Indigo — Data Link

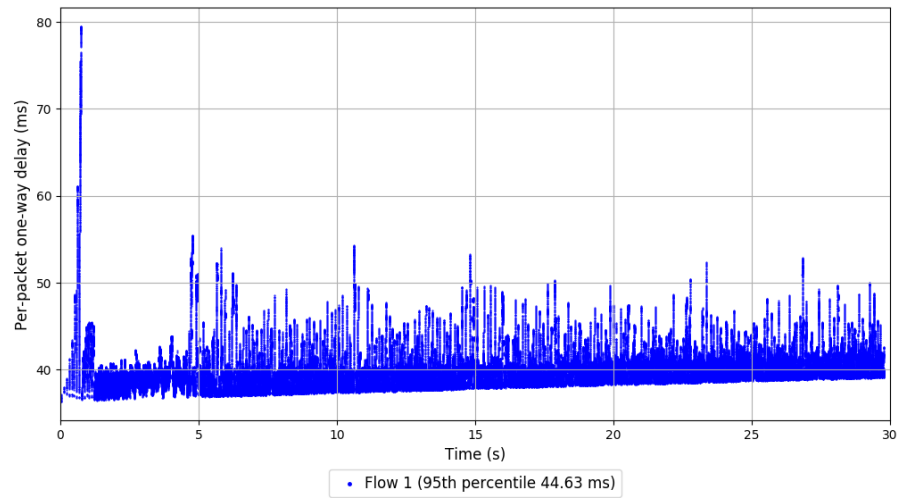
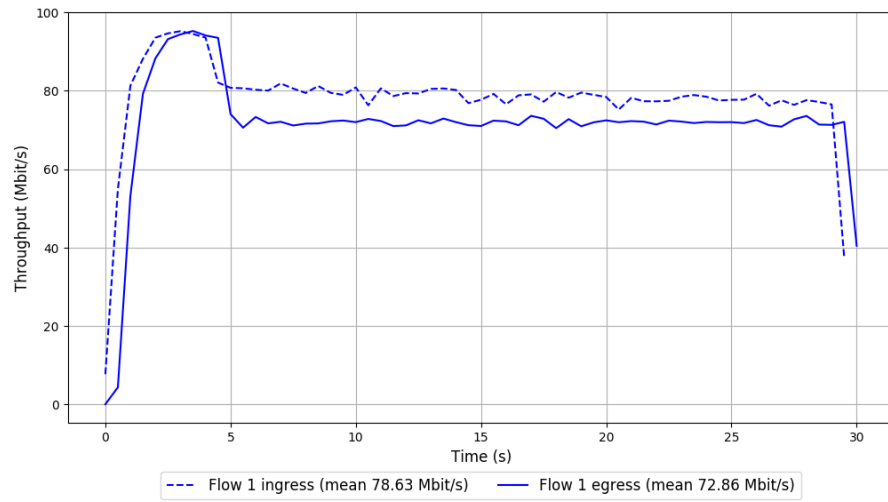


Run 2: Statistics of Indigo

Start at: 2018-09-05 21:09:17
End at: 2018-09-05 21:09:47
Local clock offset: -7.307 ms
Remote clock offset: -25.674 ms

Below is generated by plot.py at 2018-09-05 21:16:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 72.86 Mbit/s
95th percentile per-packet one-way delay: 44.630 ms
Loss rate: 7.32%
-- Flow 1:
Average throughput: 72.86 Mbit/s
95th percentile per-packet one-way delay: 44.630 ms
Loss rate: 7.32%

Run 2: Report of Indigo — Data Link

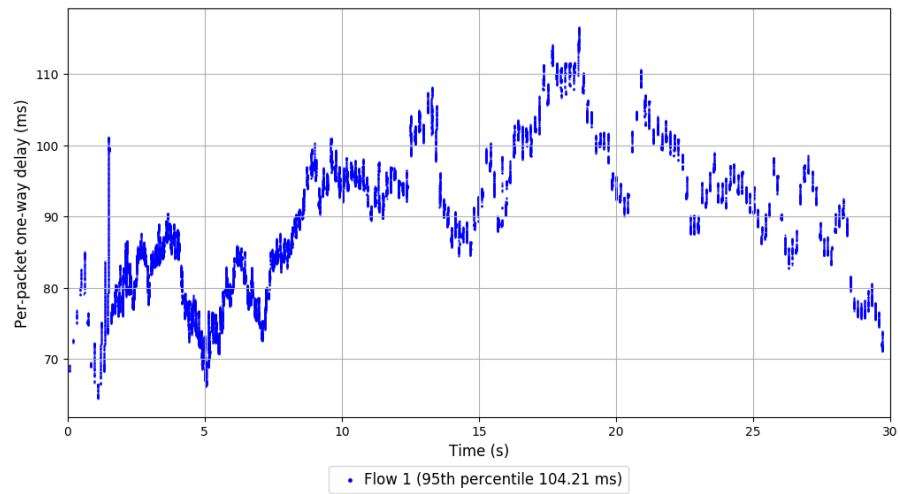
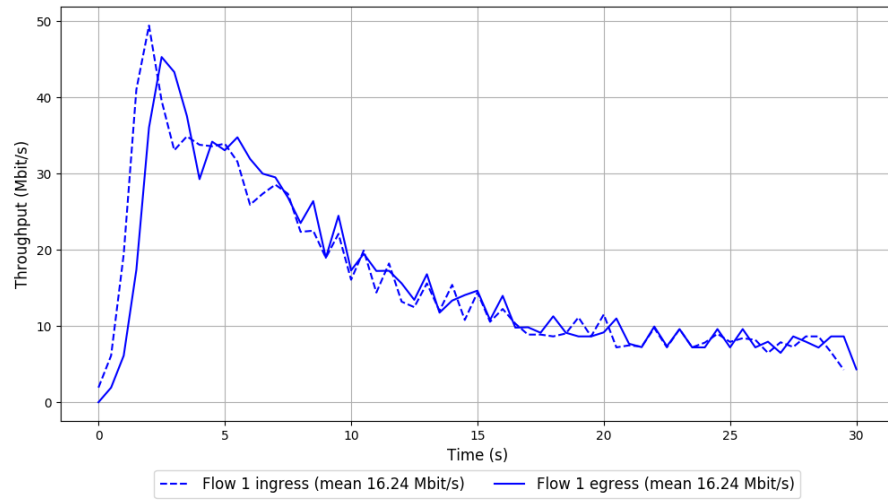


Run 3: Statistics of Indigo

Start at: 2018-09-05 21:14:07
End at: 2018-09-05 21:14:37
Local clock offset: 0.93 ms
Remote clock offset: -30.957 ms

Below is generated by plot.py at 2018-09-05 21:16:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 16.24 Mbit/s
95th percentile per-packet one-way delay: 104.210 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 16.24 Mbit/s
95th percentile per-packet one-way delay: 104.210 ms
Loss rate: 0.00%

Run 3: Report of Indigo — Data Link

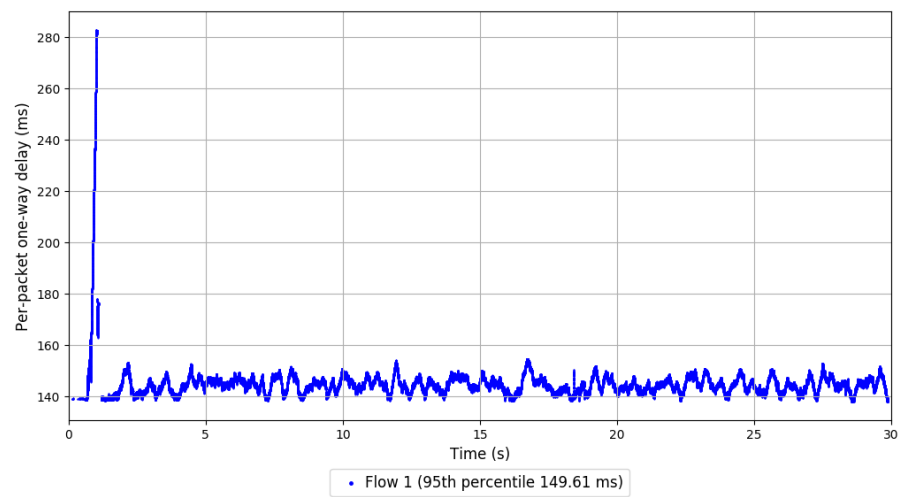
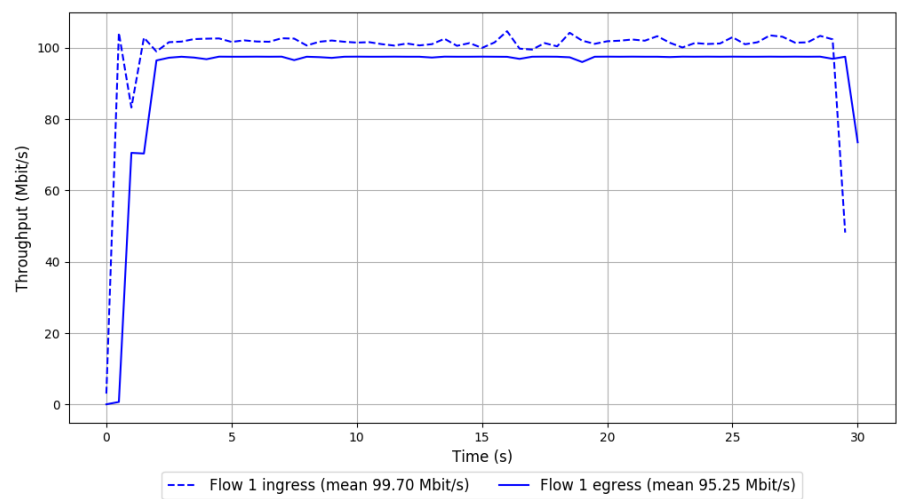


Run 1: Statistics of Muses-25

Start at: 2018-09-05 21:05:27
End at: 2018-09-05 21:05:57
Local clock offset: 1.168 ms
Remote clock offset: -21.075 ms

Below is generated by plot.py at 2018-09-05 21:16:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 95.25 Mbit/s
95th percentile per-packet one-way delay: 149.607 ms
Loss rate: 4.47%
-- Flow 1:
Average throughput: 95.25 Mbit/s
95th percentile per-packet one-way delay: 149.607 ms
Loss rate: 4.47%

Run 1: Report of Muses-25 — Data Link

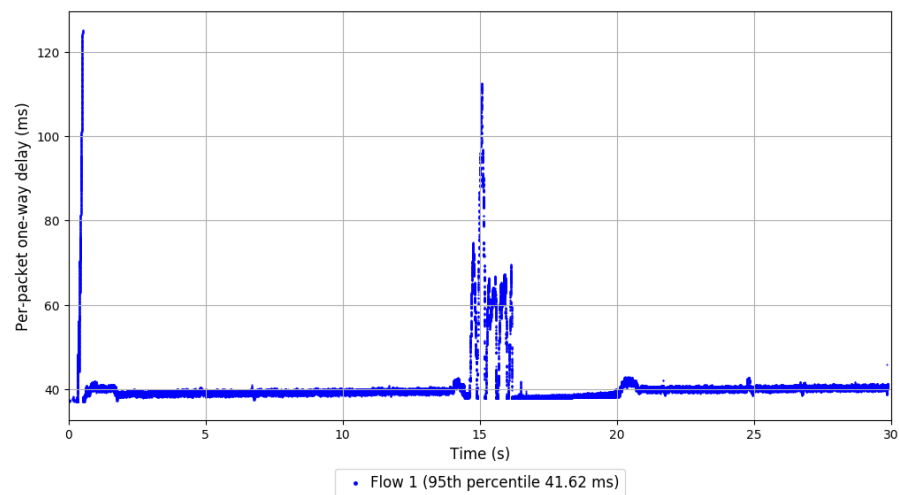
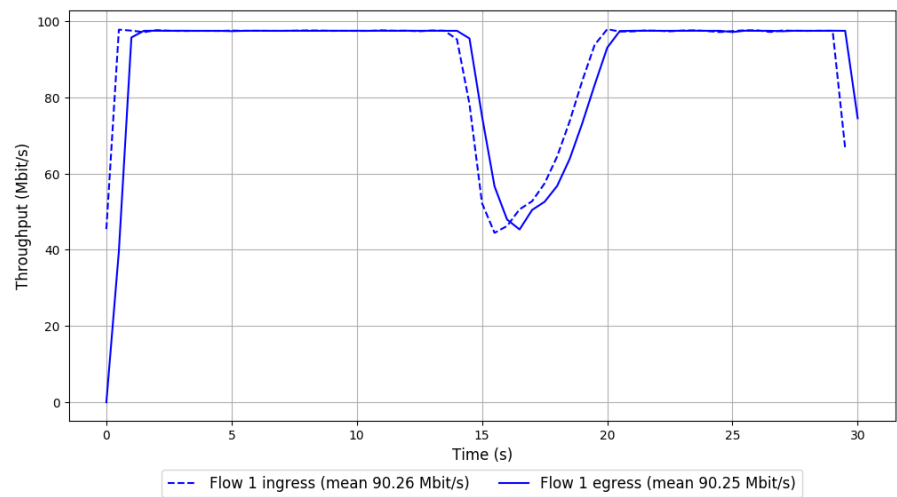


Run 2: Statistics of Muses-25

Start at: 2018-09-05 21:10:31
End at: 2018-09-05 21:11:01
Local clock offset: -2.995 ms
Remote clock offset: -26.883 ms

Below is generated by plot.py at 2018-09-05 21:16:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 90.25 Mbit/s
95th percentile per-packet one-way delay: 41.620 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 90.25 Mbit/s
95th percentile per-packet one-way delay: 41.620 ms
Loss rate: 0.00%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 21:15:17
End at: 2018-09-05 21:15:47
Local clock offset: 0.535 ms
Remote clock offset: -32.163 ms

Below is generated by plot.py at 2018-09-05 21:16:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.35 Mbit/s
95th percentile per-packet one-way delay: 147.052 ms
Loss rate: 1.87%
-- Flow 1:
Average throughput: 8.35 Mbit/s
95th percentile per-packet one-way delay: 147.052 ms
Loss rate: 1.87%

Run 3: Report of Muses-25 — Data Link

