

Pantheon Report

Generated at 2018-09-05 22:08:18 (UTC).

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

Repeated the test of 4 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

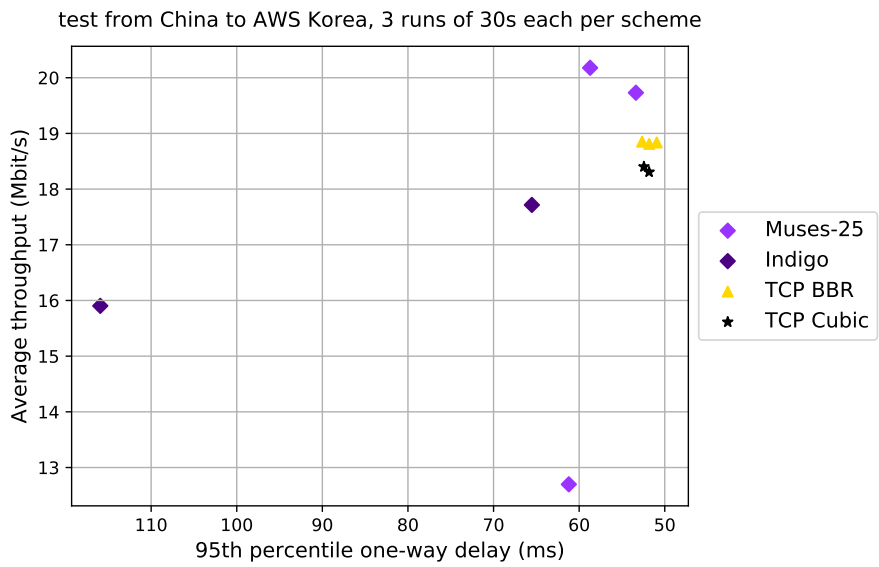
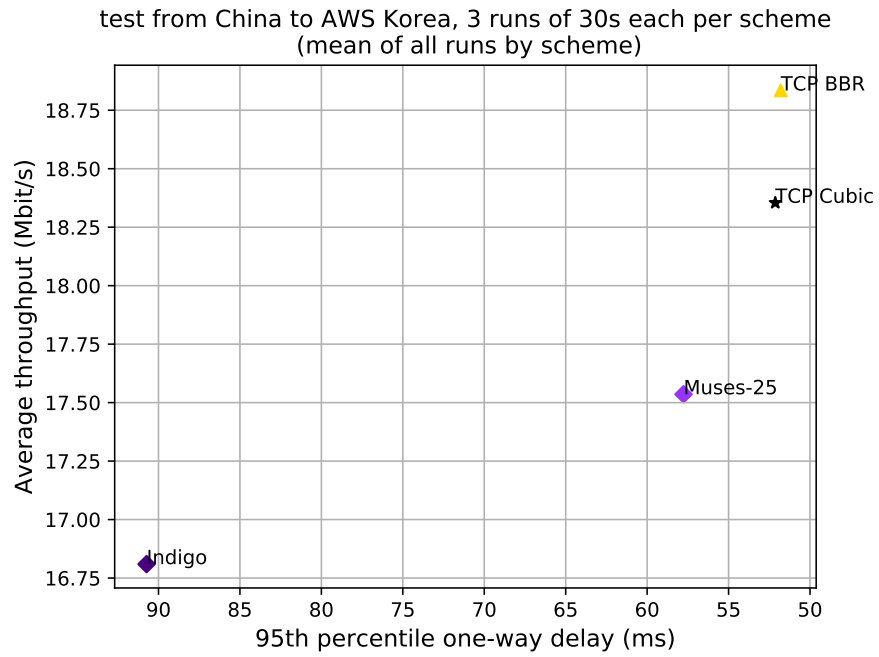
NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.

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
```



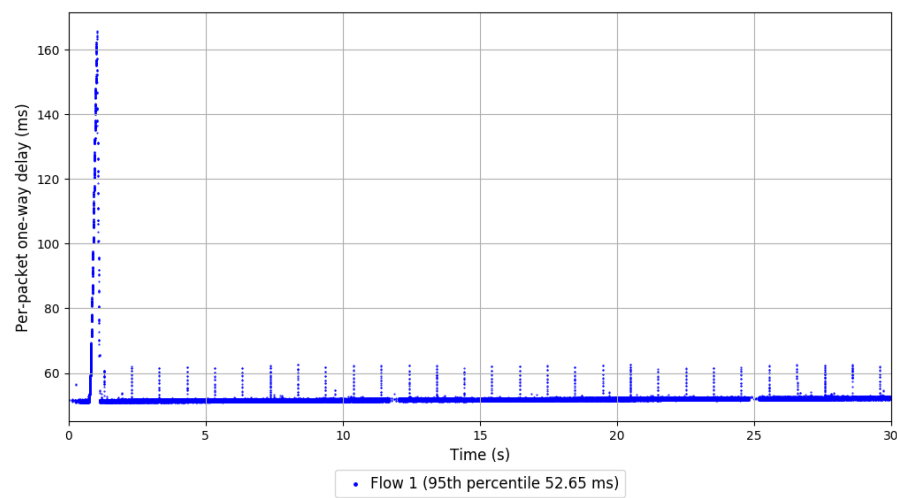
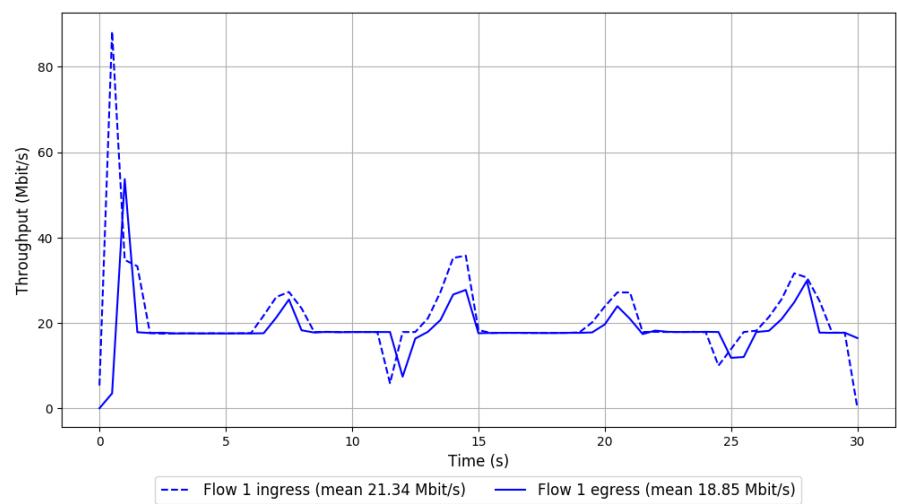
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	18.83	51.80	11.48
TCP Cubic	2	18.35	52.13	6.78
Indigo	2	16.81	90.73	63.20
Muses-25	3	17.54	57.76	37.98

Run 1: Statistics of TCP BBR

Start at: 2018-09-05 21:56:49
End at: 2018-09-05 21:57:19
Local clock offset: -11.119 ms
Remote clock offset: -23.65 ms

Below is generated by plot.py at 2018-09-05 22:08:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.85 Mbit/s
95th percentile per-packet one-way delay: 52.647 ms
Loss rate: 11.93%
-- Flow 1:
Average throughput: 18.85 Mbit/s
95th percentile per-packet one-way delay: 52.647 ms
Loss rate: 11.93%

Run 1: Report of TCP BBR — Data Link

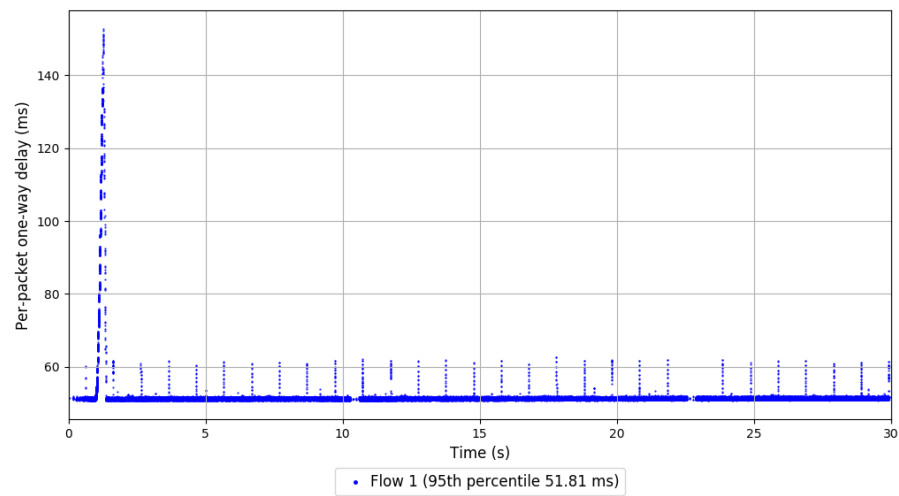
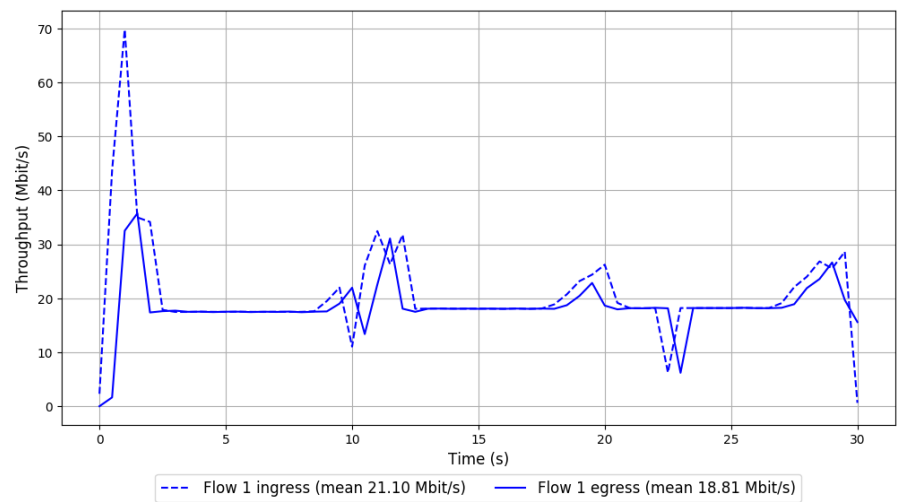


Run 2: Statistics of TCP BBR

Start at: 2018-09-05 22:01:29
End at: 2018-09-05 22:01:59
Local clock offset: -13.103 ms
Remote clock offset: -19.061 ms

Below is generated by plot.py at 2018-09-05 22:08:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.81 Mbit/s
95th percentile per-packet one-way delay: 51.813 ms
Loss rate: 11.22%
-- Flow 1:
Average throughput: 18.81 Mbit/s
95th percentile per-packet one-way delay: 51.813 ms
Loss rate: 11.22%

Run 2: Report of TCP BBR — Data Link

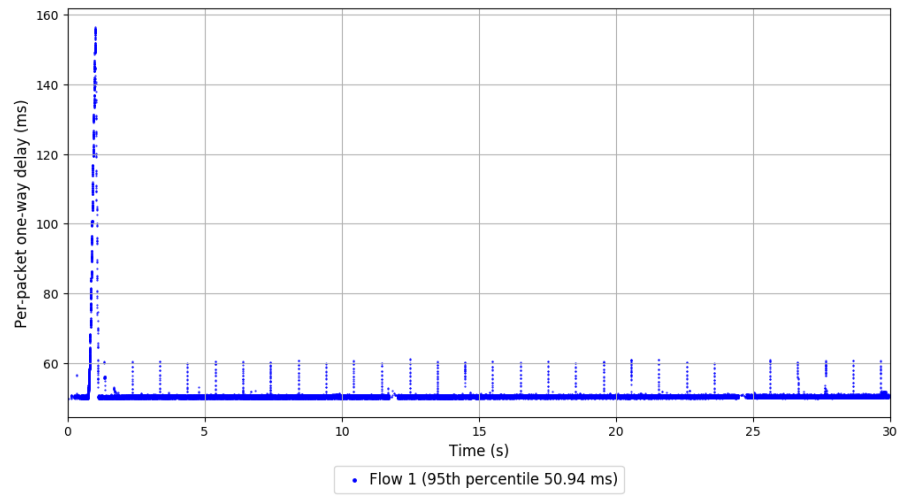
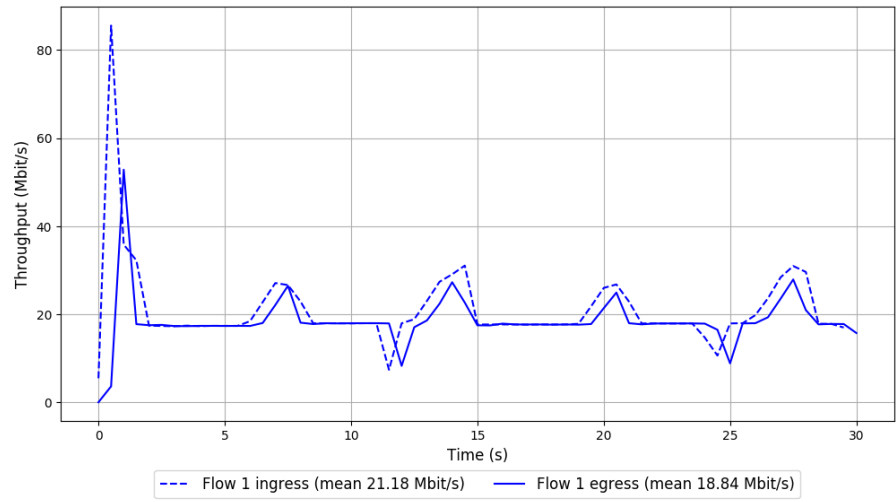


Run 3: Statistics of TCP BBR

Start at: 2018-09-05 22:06:07
End at: 2018-09-05 22:06:37
Local clock offset: -11.801 ms
Remote clock offset: -15.271 ms

Below is generated by plot.py at 2018-09-05 22:08:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.84 Mbit/s
95th percentile per-packet one-way delay: 50.935 ms
Loss rate: 11.30%
-- Flow 1:
Average throughput: 18.84 Mbit/s
95th percentile per-packet one-way delay: 50.935 ms
Loss rate: 11.30%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

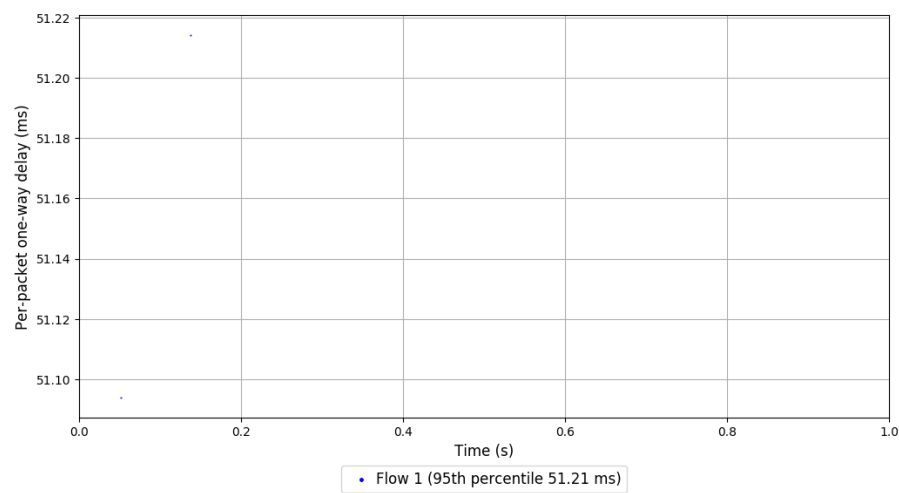
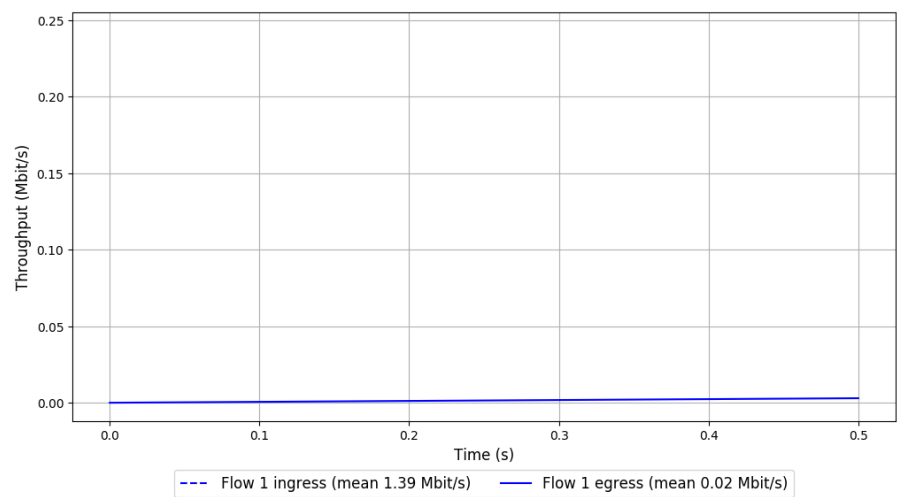
Start at: 2018-09-05 21:54:27

End at: 2018-09-05 21:54:58

Local clock offset: -9.985 ms

Remote clock offset: -26.332 ms

Run 1: Report of TCP Cubic — Data Link

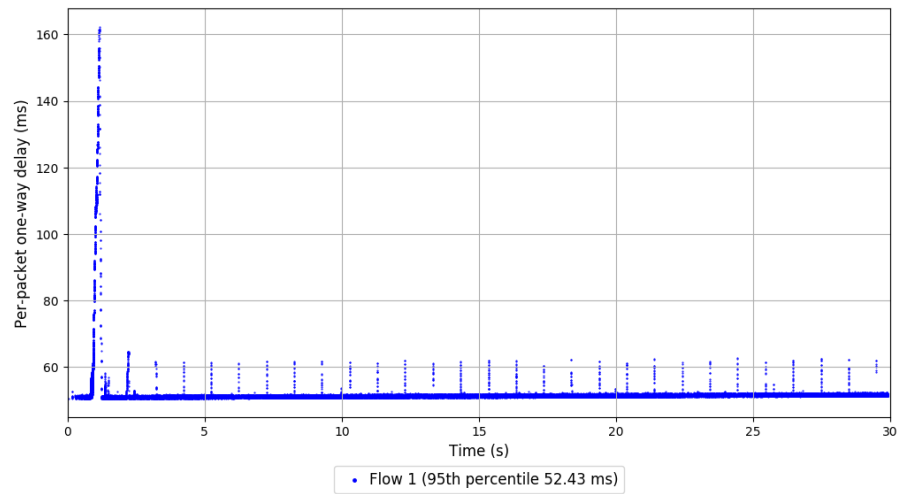
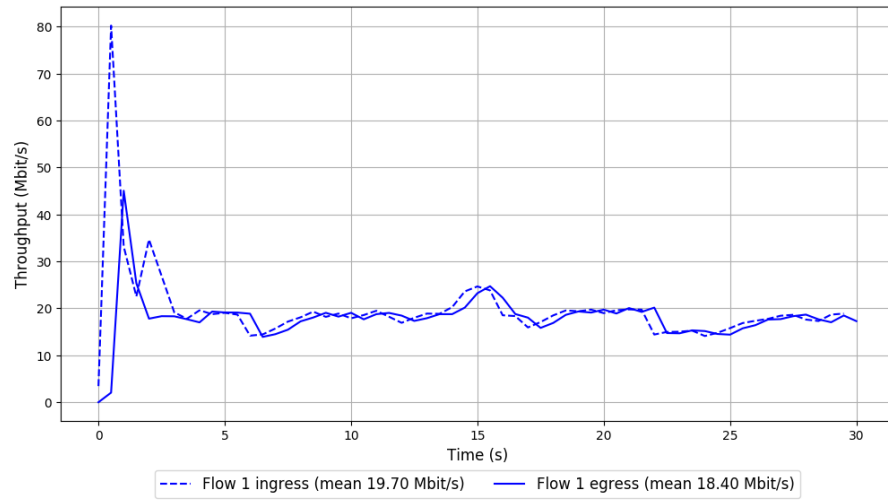


Run 2: Statistics of TCP Cubic

Start at: 2018-09-05 21:59:09
End at: 2018-09-05 21:59:39
Local clock offset: -12.577 ms
Remote clock offset: -20.517 ms

Below is generated by plot.py at 2018-09-05 22:08:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.40 Mbit/s
95th percentile per-packet one-way delay: 52.433 ms
Loss rate: 6.87%
-- Flow 1:
Average throughput: 18.40 Mbit/s
95th percentile per-packet one-way delay: 52.433 ms
Loss rate: 6.87%

Run 2: Report of TCP Cubic — Data Link

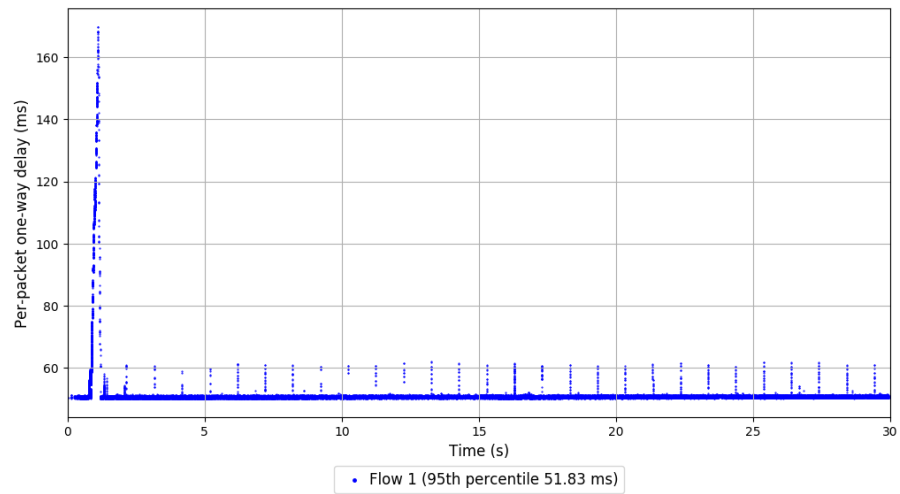
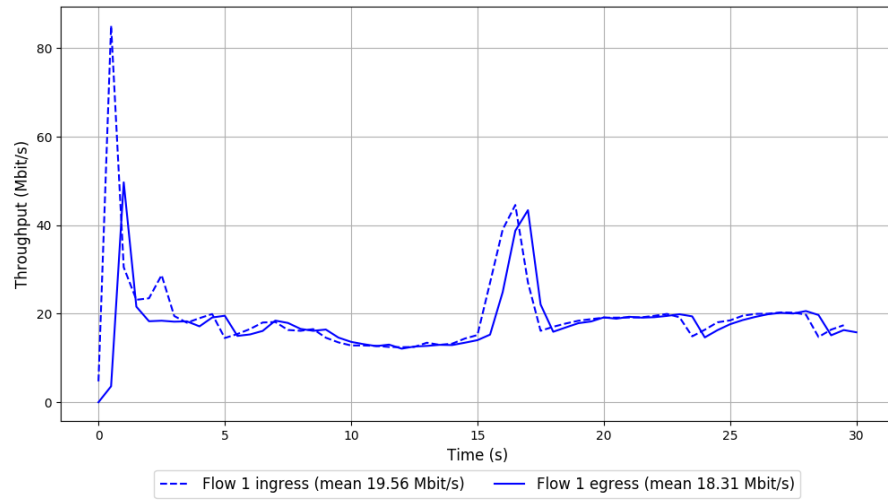


Run 3: Statistics of TCP Cubic

Start at: 2018-09-05 22:03:50
End at: 2018-09-05 22:04:20
Local clock offset: -12.06 ms
Remote clock offset: -16.759 ms

Below is generated by plot.py at 2018-09-05 22:08:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.31 Mbit/s
95th percentile per-packet one-way delay: 51.830 ms
Loss rate: 6.68%
-- Flow 1:
Average throughput: 18.31 Mbit/s
95th percentile per-packet one-way delay: 51.830 ms
Loss rate: 6.68%

Run 3: Report of TCP Cubic — Data Link

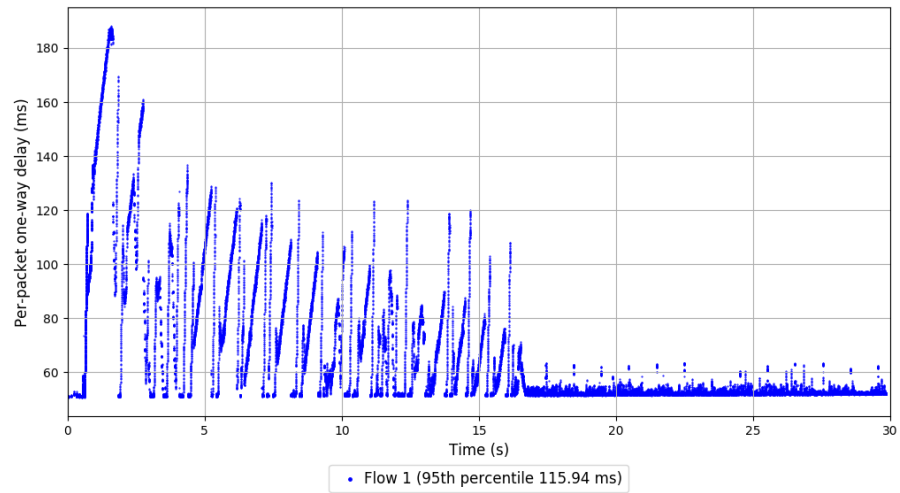
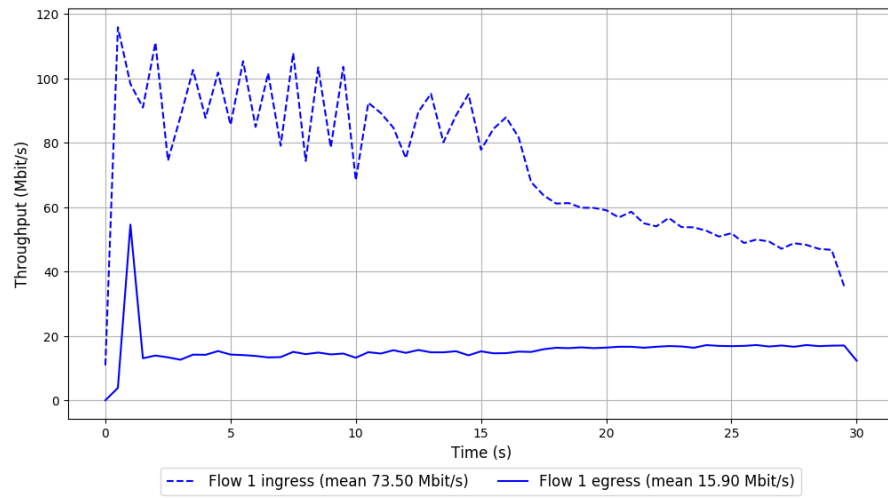


```
Run 1: Statistics of Indigo

Start at: 2018-09-05 21:55:35
End at: 2018-09-05 21:56:05
Local clock offset: -10.44 ms
Remote clock offset: -25.438 ms

# Below is generated by plot.py at 2018-09-05 22:08:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.90 Mbit/s
95th percentile per-packet one-way delay: 115.942 ms
Loss rate: 78.42%
-- Flow 1:
Average throughput: 15.90 Mbit/s
95th percentile per-packet one-way delay: 115.942 ms
Loss rate: 78.42%
```

Run 1: Report of Indigo — Data Link

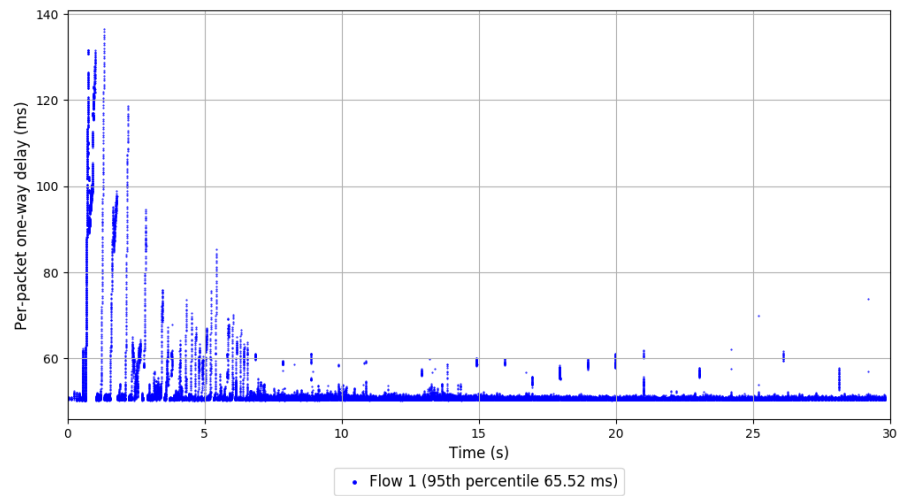
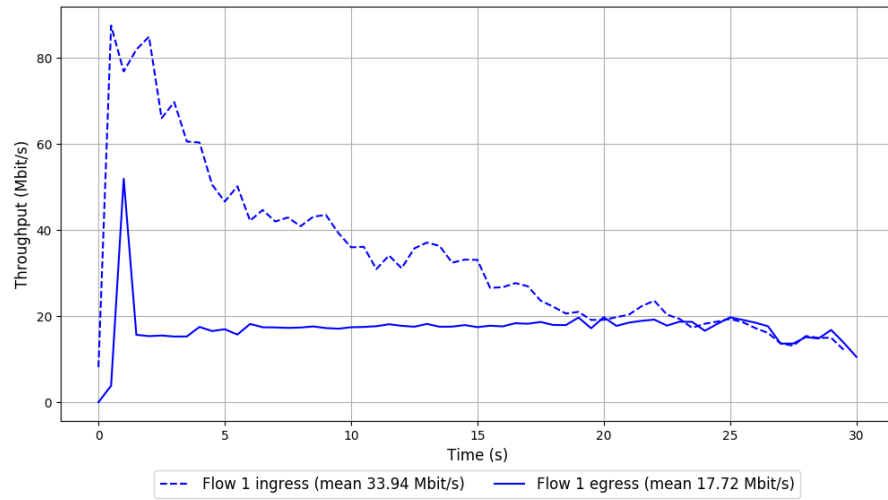


Run 2: Statistics of Indigo

Start at: 2018-09-05 22:00:18
End at: 2018-09-05 22:00:48
Local clock offset: -13.325 ms
Remote clock offset: -19.078 ms

Below is generated by plot.py at 2018-09-05 22:08:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 17.72 Mbit/s
95th percentile per-packet one-way delay: 65.524 ms
Loss rate: 47.98%
-- Flow 1:
Average throughput: 17.72 Mbit/s
95th percentile per-packet one-way delay: 65.524 ms
Loss rate: 47.98%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

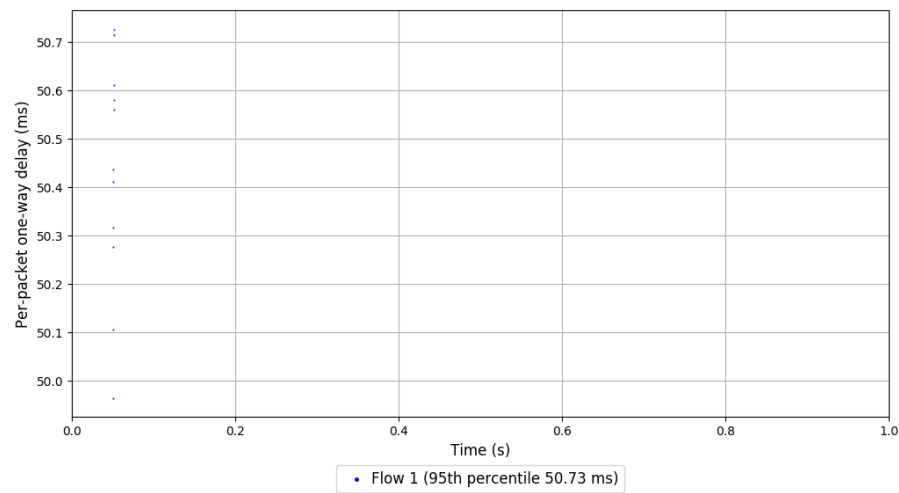
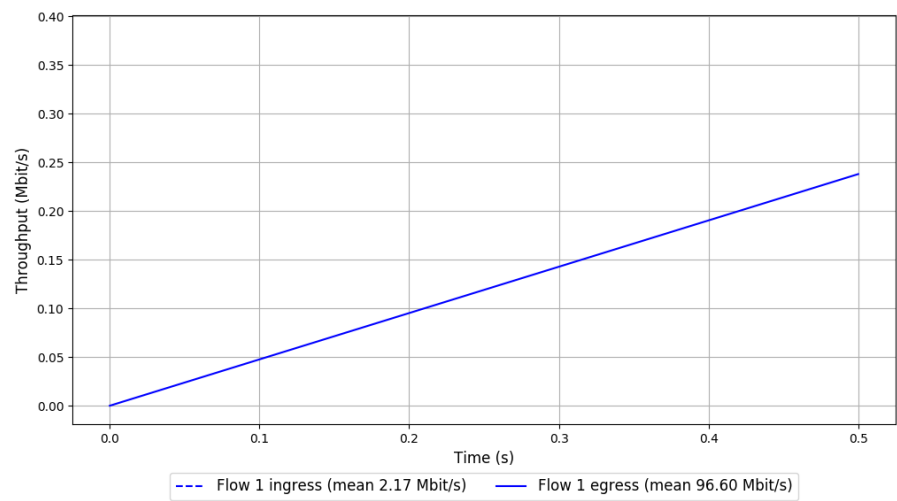
Start at: 2018-09-05 22:04:59

End at: 2018-09-05 22:05:29

Local clock offset: -11.855 ms

Remote clock offset: -16.094 ms

Run 3: Report of Indigo — Data Link

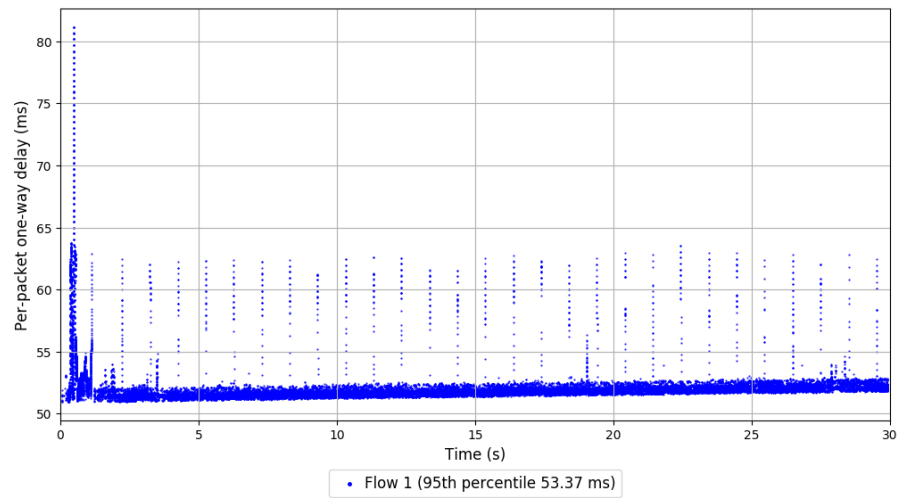
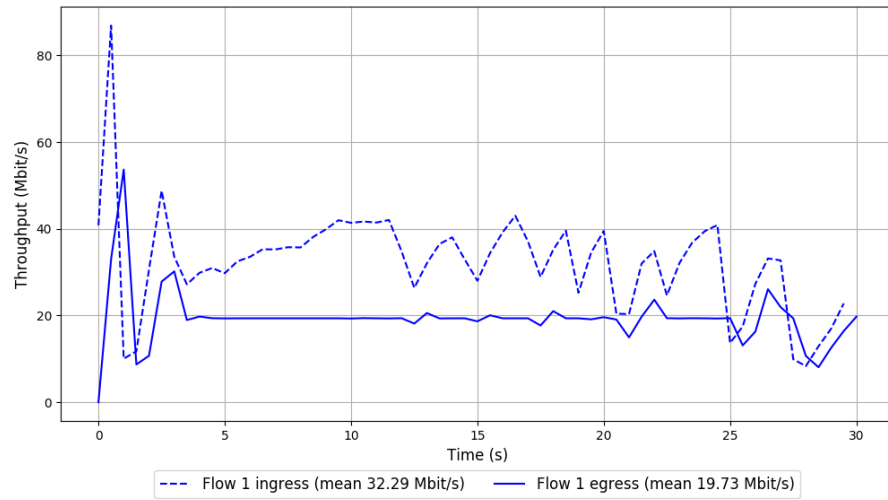


Run 1: Statistics of Muses-25

Start at: 2018-09-05 21:57:58
End at: 2018-09-05 21:58:28
Local clock offset: -11.945 ms
Remote clock offset: -22.301 ms

Below is generated by plot.py at 2018-09-05 22:08:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 19.73 Mbit/s
95th percentile per-packet one-way delay: 53.370 ms
Loss rate: 39.07%
-- Flow 1:
Average throughput: 19.73 Mbit/s
95th percentile per-packet one-way delay: 53.370 ms
Loss rate: 39.07%

Run 1: Report of Muses-25 — Data Link

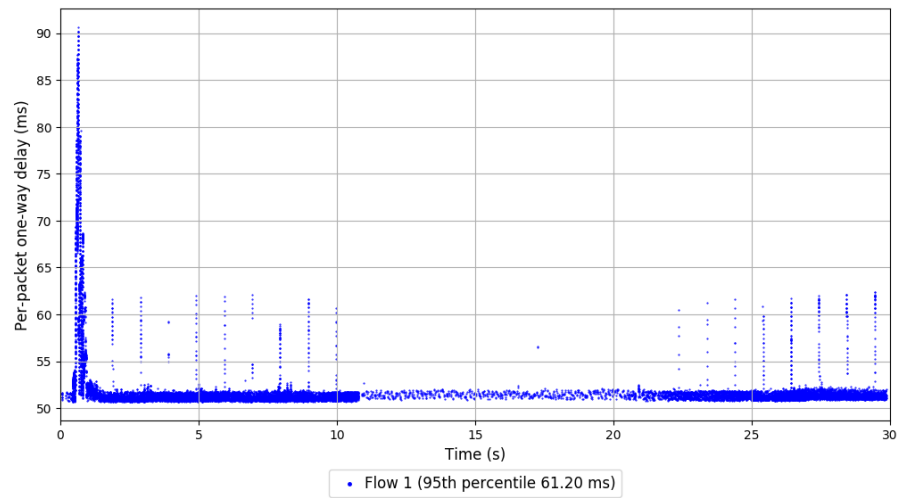
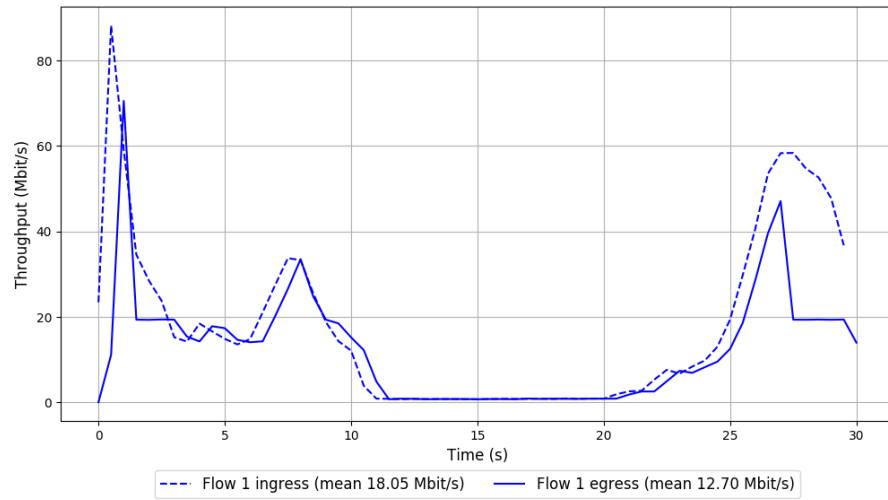


Run 2: Statistics of Muses-25

Start at: 2018-09-05 22:02:41
End at: 2018-09-05 22:03:11
Local clock offset: -12.564 ms
Remote clock offset: -18.091 ms

Below is generated by plot.py at 2018-09-05 22:08:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.70 Mbit/s
95th percentile per-packet one-way delay: 61.204 ms
Loss rate: 29.87%
-- Flow 1:
Average throughput: 12.70 Mbit/s
95th percentile per-packet one-way delay: 61.204 ms
Loss rate: 29.87%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-09-05 22:07:16
End at: 2018-09-05 22:07:46
Local clock offset: -11.575 ms
Remote clock offset: -15.733 ms

Below is generated by plot.py at 2018-09-05 22:08:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 20.18 Mbit/s
95th percentile per-packet one-way delay: 58.720 ms
Loss rate: 45.01%
-- Flow 1:
Average throughput: 20.18 Mbit/s
95th percentile per-packet one-way delay: 58.720 ms
Loss rate: 45.01%

Run 3: Report of Muses-25 — Data Link

