

Pantheon Report

Generated at 2018-09-05 02:21:17 (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.

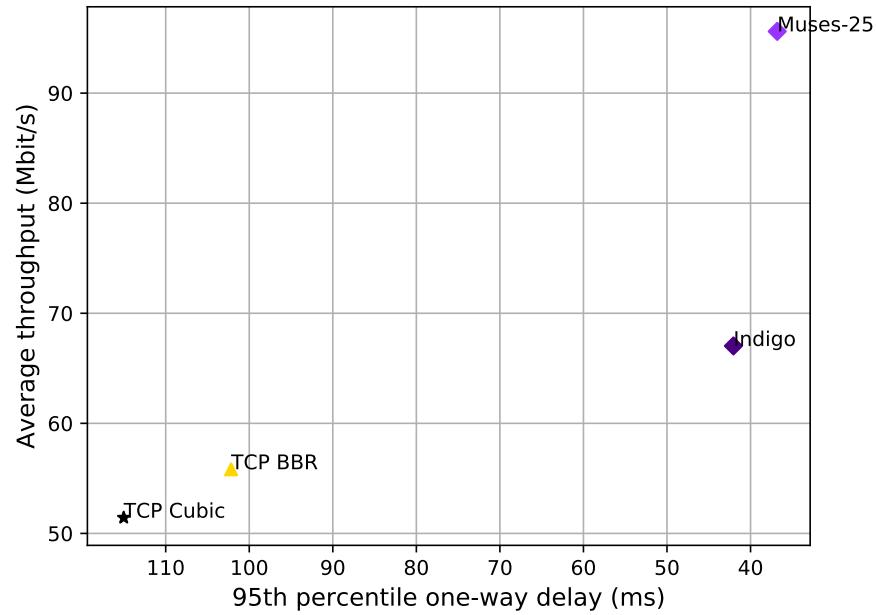
System info:

```
Linux 4.15.0-1010-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
```

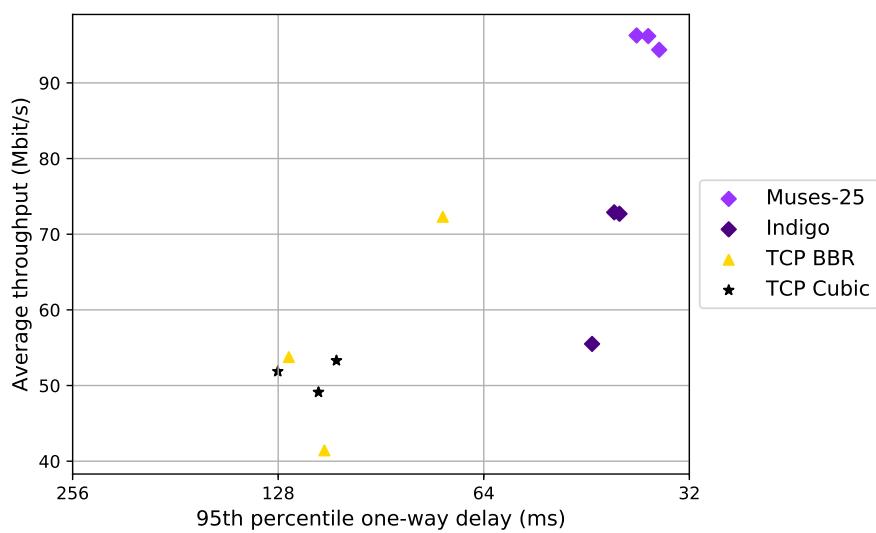
Git summary:

```
branch: muses @ 71e71e9a55b945431a7dea72180c1c9381097db9
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 96fbc95fb38373d71fbc80c5a105e62e7636623b
third_party/pantheon-tunnel @ cbfce6db5ff5740dafe1771f813cd646339e1952
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 AWS Korea to China, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS Korea to China, 3 runs of 30s each per scheme



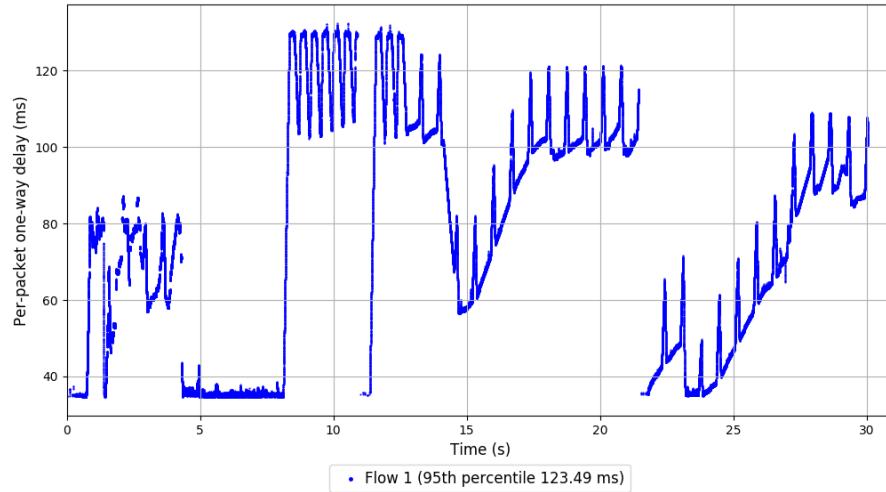
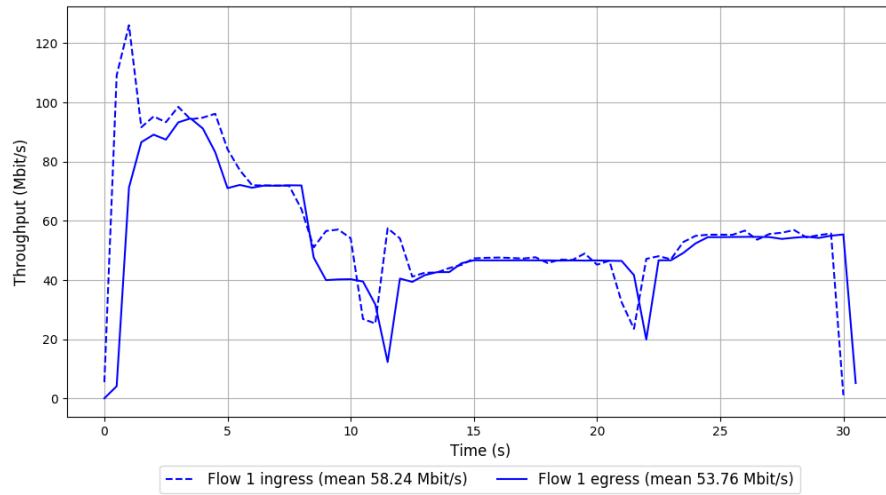
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	55.83	102.17	8.59
TCP Cubic	3	51.43	115.03	0.58
Indigo	3	67.03	42.05	5.20
Muses-25	3	95.61	36.81	0.01

Run 1: Statistics of TCP BBR

```
Start at: 2018-09-05 02:08:13
End at: 2018-09-05 02:08:43
Local clock offset: 8.35 ms
Remote clock offset: 38.266 ms

# Below is generated by plot.py at 2018-09-05 02:20:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 53.76 Mbit/s
95th percentile per-packet one-way delay: 123.490 ms
Loss rate: 7.68%
-- Flow 1:
Average throughput: 53.76 Mbit/s
95th percentile per-packet one-way delay: 123.490 ms
Loss rate: 7.68%
```

Run 1: Report of TCP BBR — Data Link

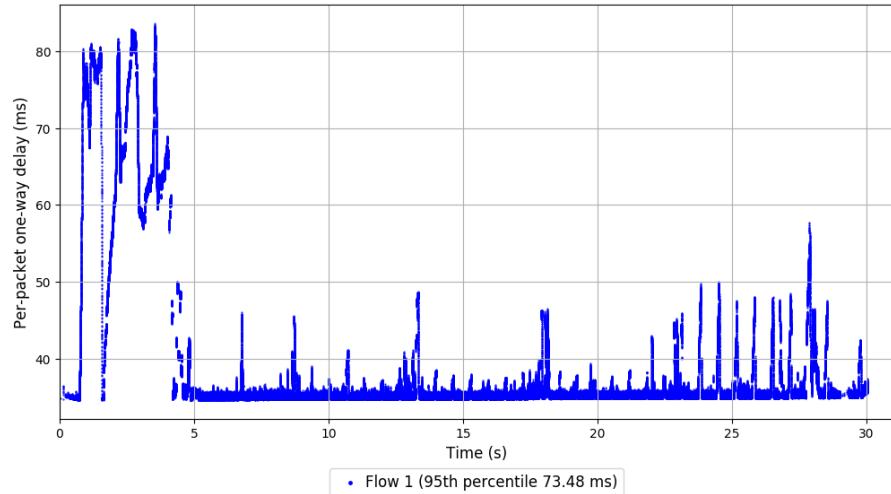
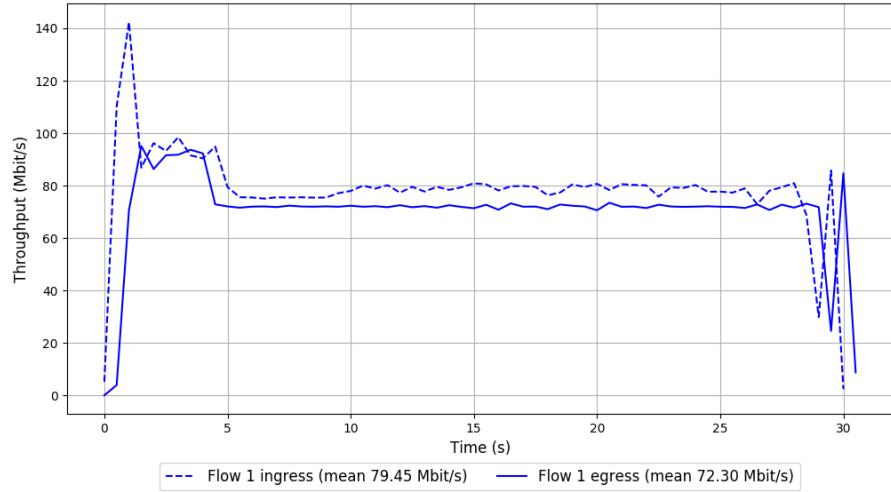


Run 2: Statistics of TCP BBR

```
Start at: 2018-09-05 02:13:06
End at: 2018-09-05 02:13:37
Local clock offset: 9.692 ms
Remote clock offset: 35.442 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.30 Mbit/s
95th percentile per-packet one-way delay: 73.479 ms
Loss rate: 8.99%
-- Flow 1:
Average throughput: 72.30 Mbit/s
95th percentile per-packet one-way delay: 73.479 ms
Loss rate: 8.99%
```

Run 2: Report of TCP BBR — Data Link

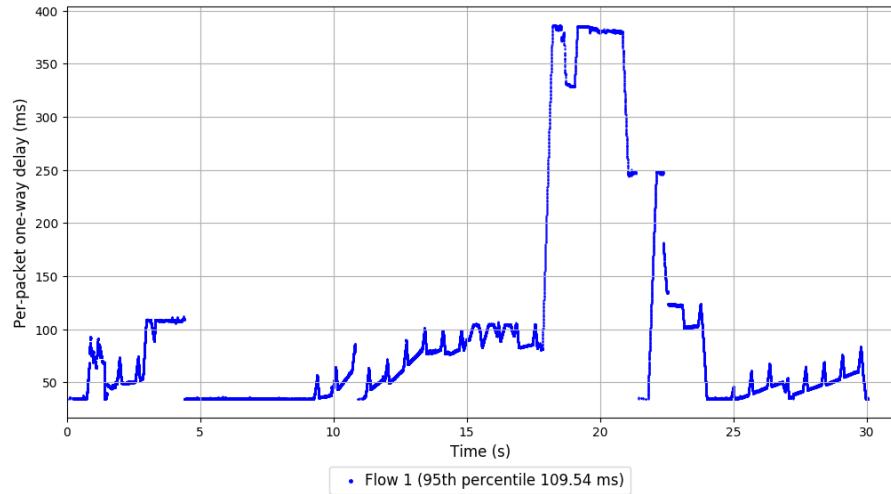
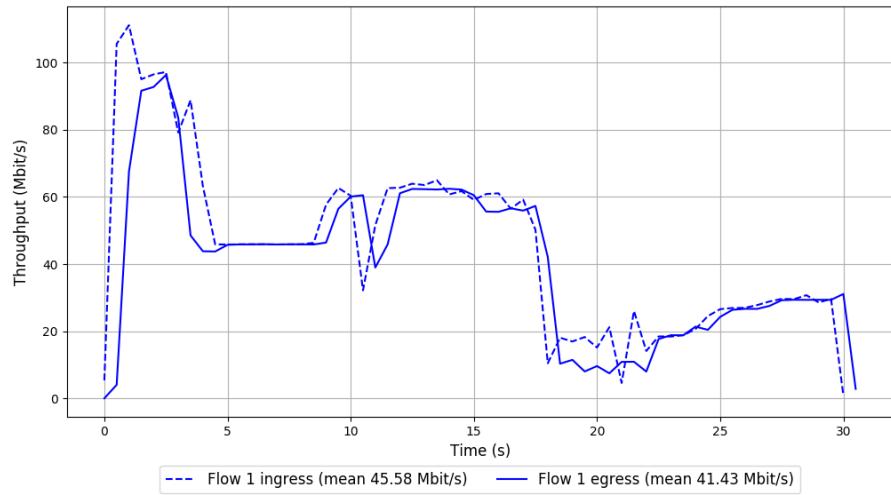


Run 3: Statistics of TCP BBR

```
Start at: 2018-09-05 02:18:03
End at: 2018-09-05 02:18:33
Local clock offset: 9.294 ms
Remote clock offset: 34.135 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.43 Mbit/s
95th percentile per-packet one-way delay: 109.538 ms
Loss rate: 9.11%
-- Flow 1:
Average throughput: 41.43 Mbit/s
95th percentile per-packet one-way delay: 109.538 ms
Loss rate: 9.11%
```

Run 3: Report of TCP BBR — Data Link

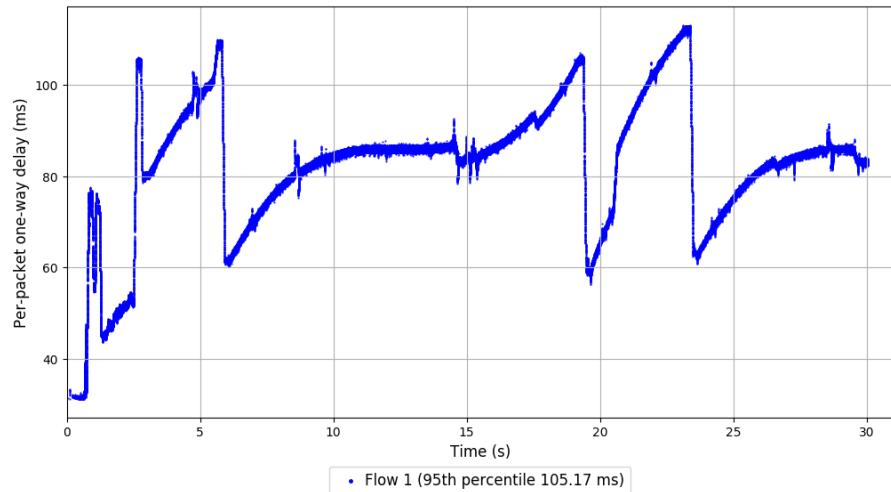
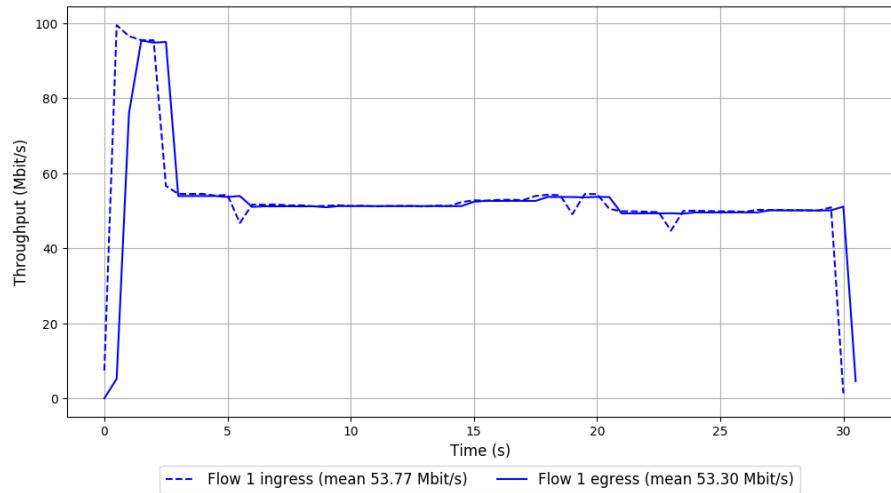


Run 1: Statistics of TCP Cubic

```
Start at: 2018-09-05 02:09:25
End at: 2018-09-05 02:09:55
Local clock offset: 8.639 ms
Remote clock offset: 33.567 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 53.30 Mbit/s
95th percentile per-packet one-way delay: 105.170 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 53.30 Mbit/s
95th percentile per-packet one-way delay: 105.170 ms
Loss rate: 0.87%
```

Run 1: Report of TCP Cubic — Data Link

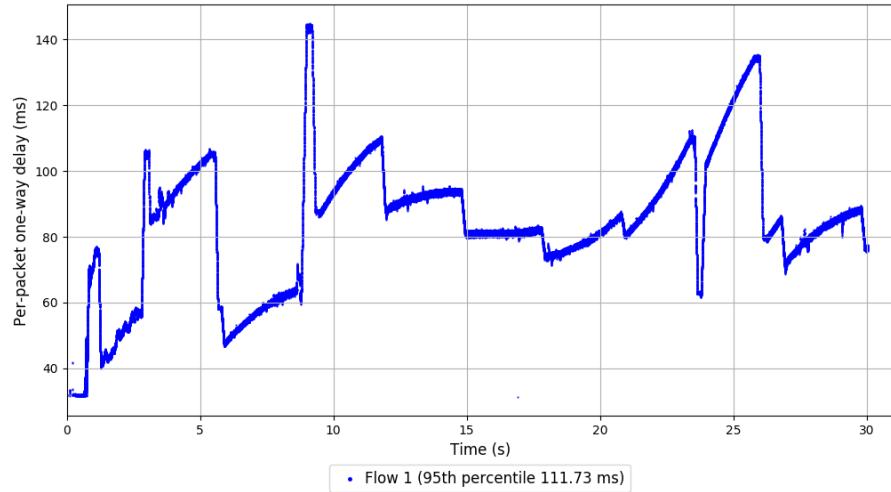
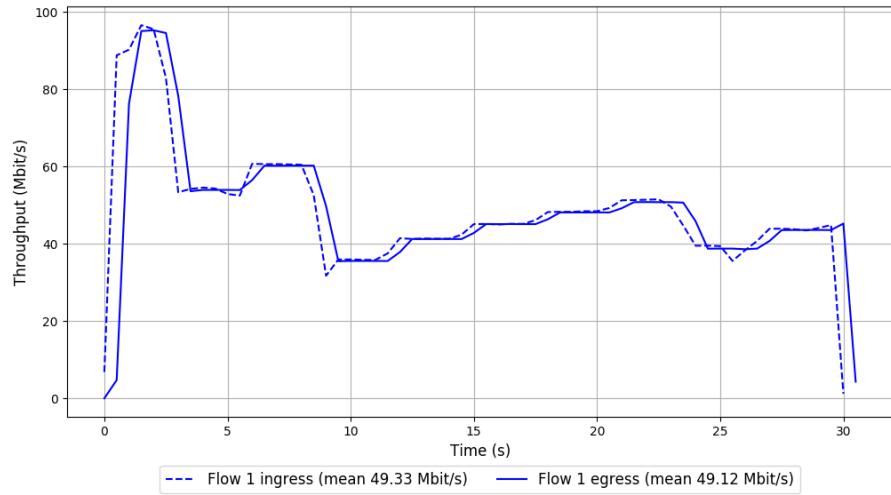


Run 2: Statistics of TCP Cubic

```
Start at: 2018-09-05 02:14:21
End at: 2018-09-05 02:14:51
Local clock offset: 10.336 ms
Remote clock offset: 31.979 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 49.12 Mbit/s
95th percentile per-packet one-way delay: 111.735 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 49.12 Mbit/s
95th percentile per-packet one-way delay: 111.735 ms
Loss rate: 0.41%
```

Run 2: Report of TCP Cubic — Data Link

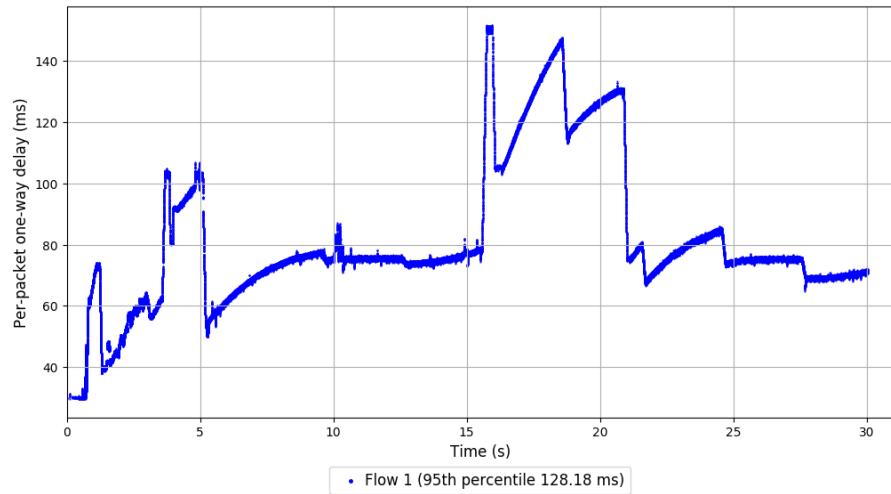
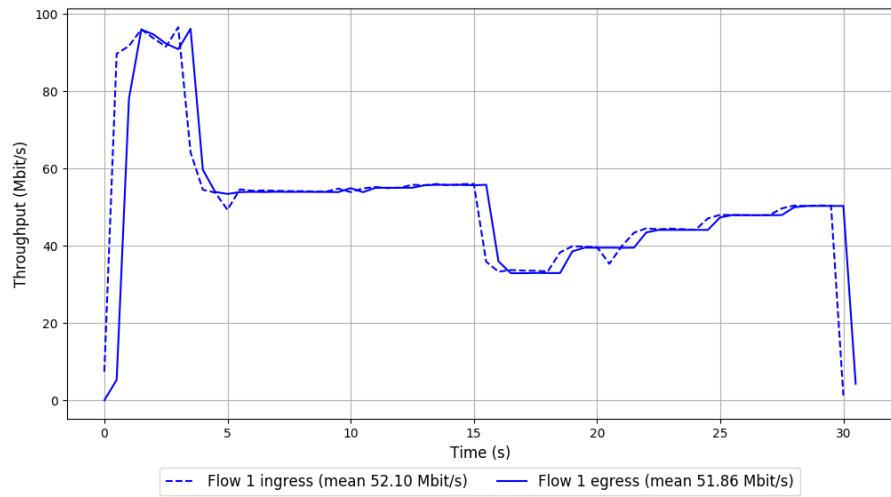


Run 3: Statistics of TCP Cubic

```
Start at: 2018-09-05 02:19:15
End at: 2018-09-05 02:19:45
Local clock offset: 9.008 ms
Remote clock offset: 28.749 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 51.86 Mbit/s
95th percentile per-packet one-way delay: 128.177 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 51.86 Mbit/s
95th percentile per-packet one-way delay: 128.177 ms
Loss rate: 0.45%
```

Run 3: Report of TCP Cubic — Data Link

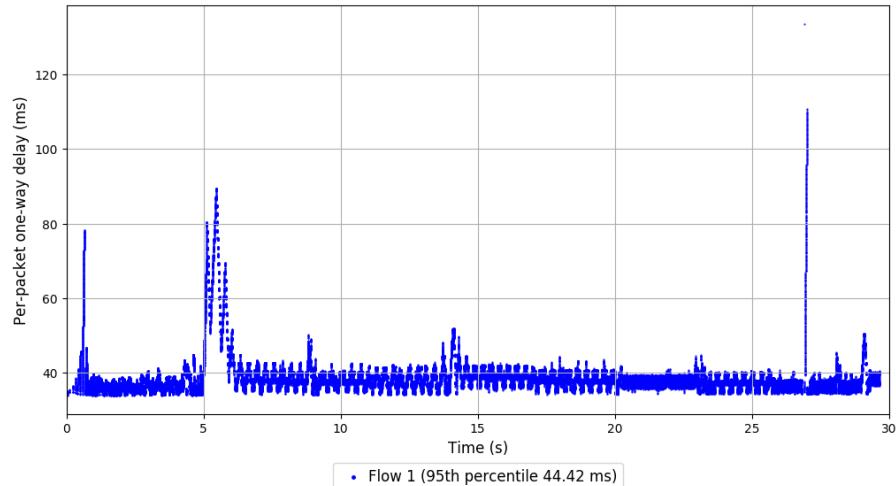
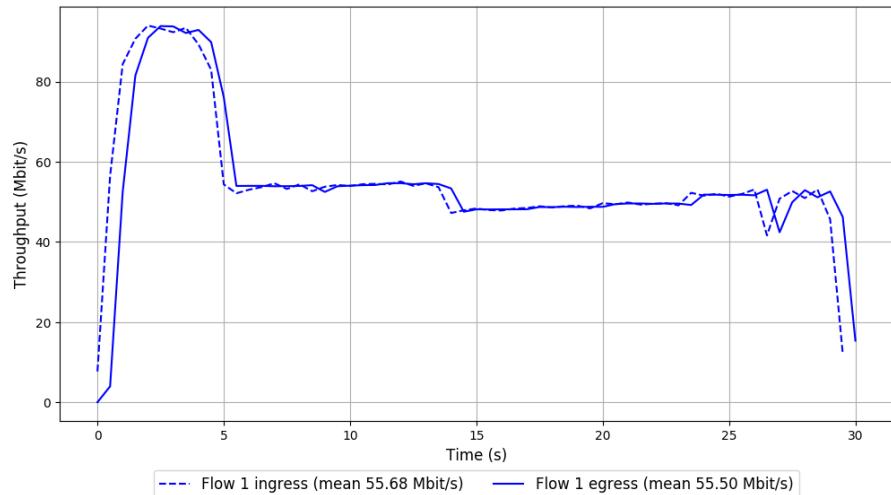


Run 1: Statistics of Indigo

```
Start at: 2018-09-05 02:07:01
End at: 2018-09-05 02:07:31
Local clock offset: 7.915 ms
Remote clock offset: 37.959 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 55.50 Mbit/s
95th percentile per-packet one-way delay: 44.420 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 55.50 Mbit/s
95th percentile per-packet one-way delay: 44.420 ms
Loss rate: 0.32%
```

Run 1: Report of Indigo — Data Link

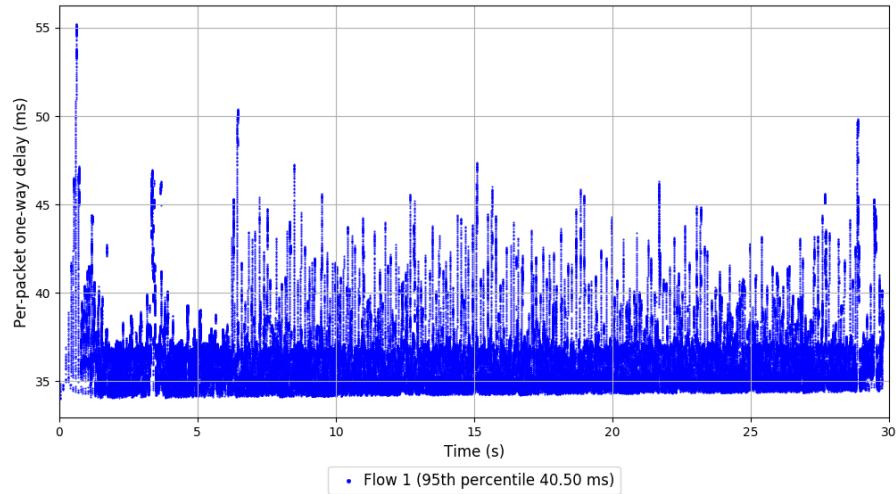
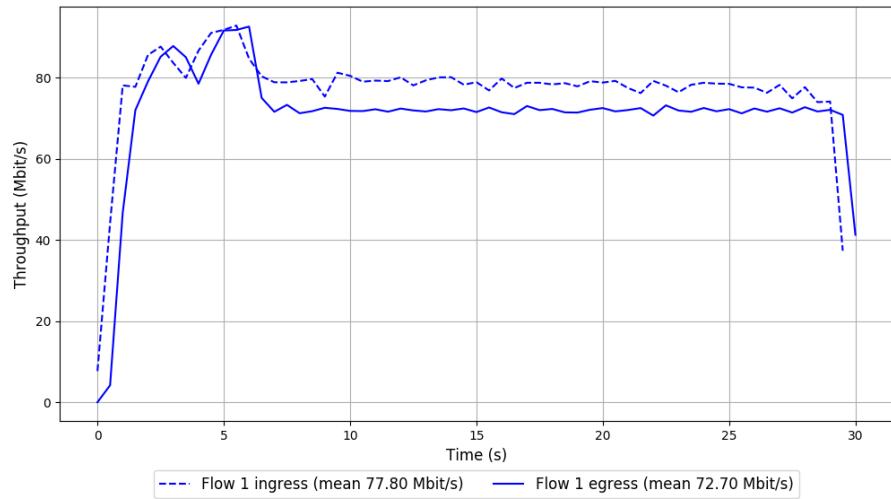


Run 2: Statistics of Indigo

```
Start at: 2018-09-05 02:11:51
End at: 2018-09-05 02:12:21
Local clock offset: 9.586 ms
Remote clock offset: 35.422 ms

# Below is generated by plot.py at 2018-09-05 02:20:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.70 Mbit/s
95th percentile per-packet one-way delay: 40.496 ms
Loss rate: 6.55%
-- Flow 1:
Average throughput: 72.70 Mbit/s
95th percentile per-packet one-way delay: 40.496 ms
Loss rate: 6.55%
```

Run 2: Report of Indigo — Data Link

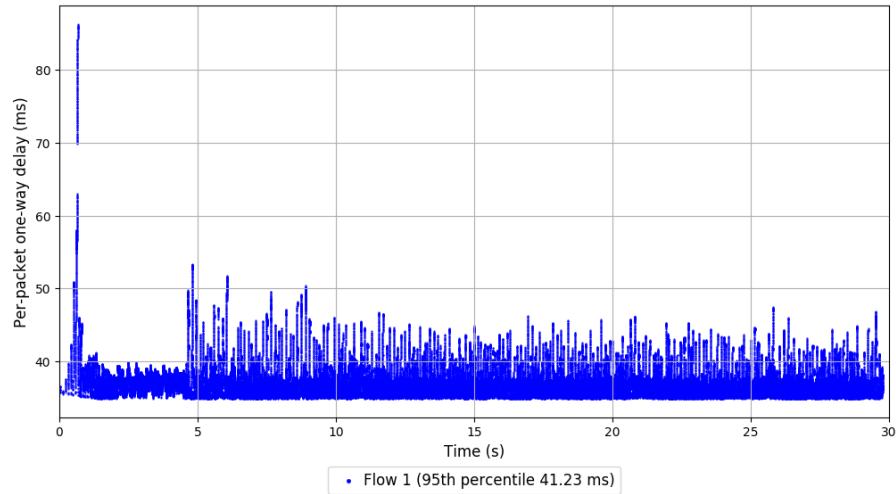
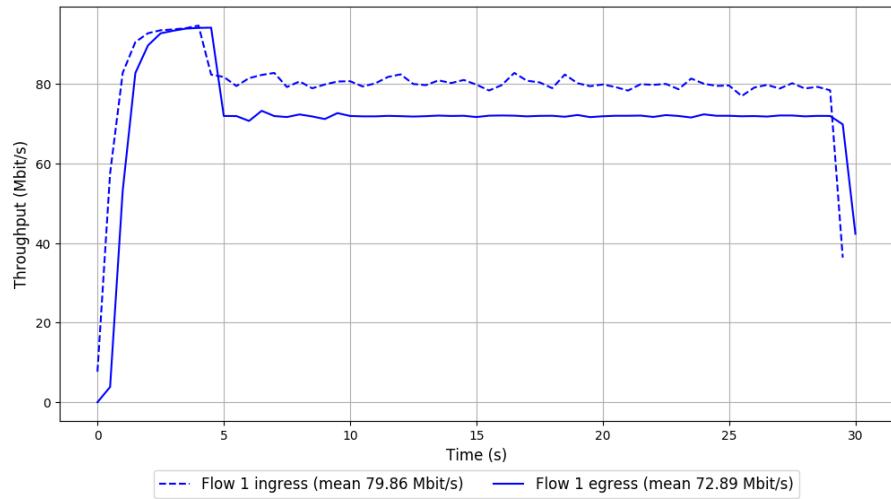


Run 3: Statistics of Indigo

```
Start at: 2018-09-05 02:16:48
End at: 2018-09-05 02:17:18
Local clock offset: 9.458 ms
Remote clock offset: 34.828 ms

# Below is generated by plot.py at 2018-09-05 02:21:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 72.89 Mbit/s
95th percentile per-packet one-way delay: 41.230 ms
Loss rate: 8.73%
-- Flow 1:
Average throughput: 72.89 Mbit/s
95th percentile per-packet one-way delay: 41.230 ms
Loss rate: 8.73%
```

Run 3: Report of Indigo — Data Link

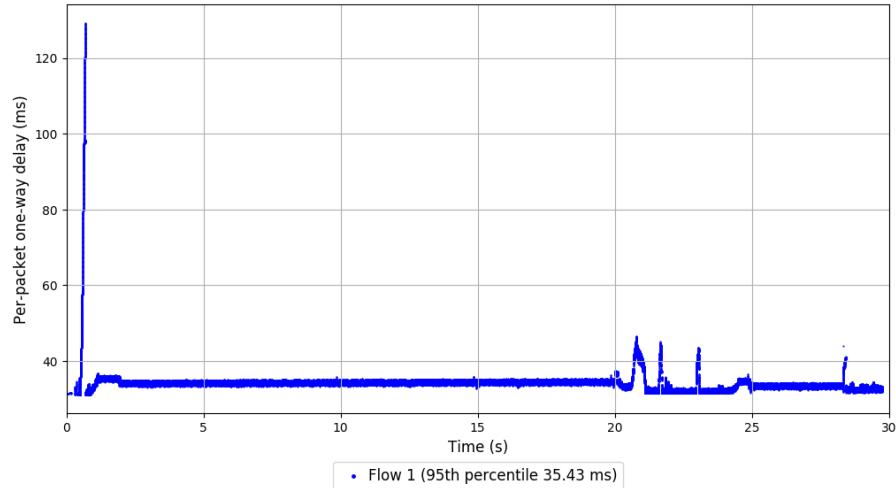
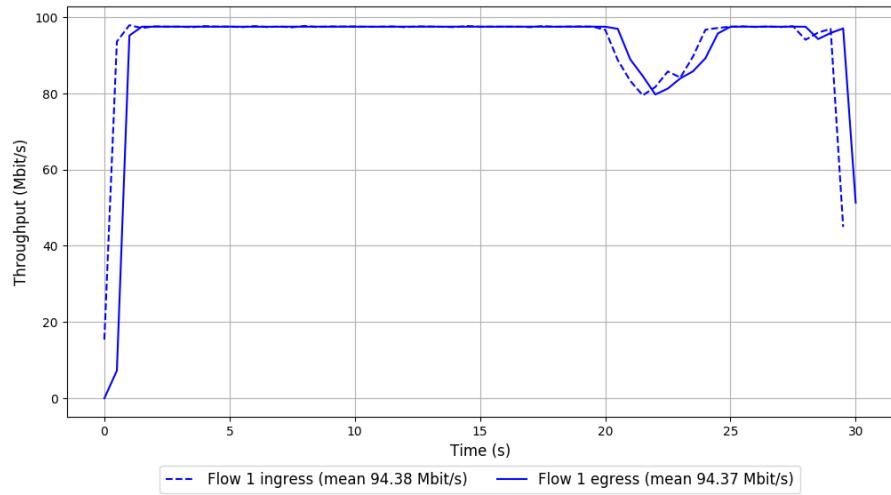


```
Run 1: Statistics of Muses-25
```

```
Start at: 2018-09-05 02:05:48
End at: 2018-09-05 02:06:18
Local clock offset: 7.572 ms
Remote clock offset: 36.722 ms

# Below is generated by plot.py at 2018-09-05 02:21:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.37 Mbit/s
95th percentile per-packet one-way delay: 35.429 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 94.37 Mbit/s
95th percentile per-packet one-way delay: 35.429 ms
Loss rate: 0.00%
```

Run 1: Report of Muses-25 — Data Link

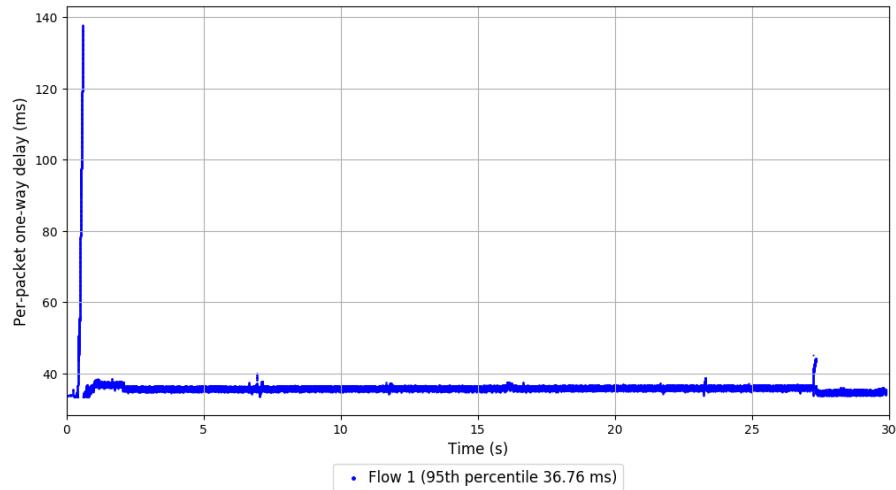
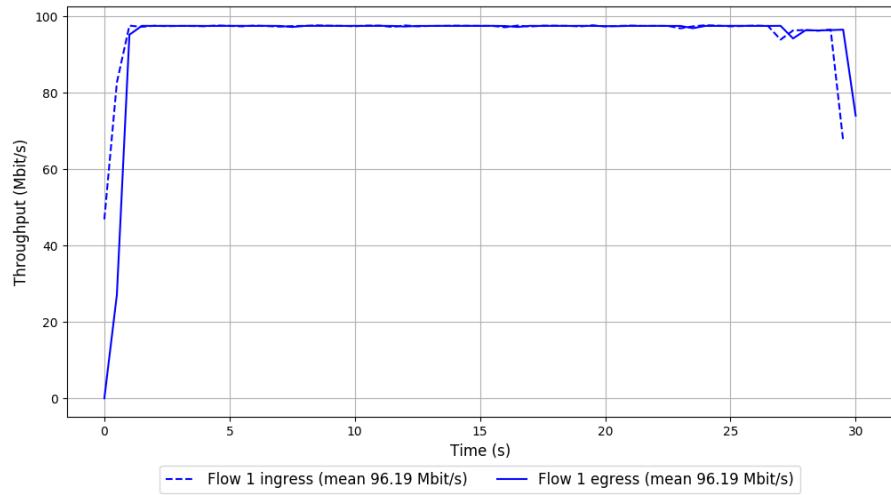


Run 2: Statistics of Muses-25

```
Start at: 2018-09-05 02:10:36
End at: 2018-09-05 02:11:06
Local clock offset: 9.27 ms
Remote clock offset: 35.633 ms

# Below is generated by plot.py at 2018-09-05 02:21:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.19 Mbit/s
95th percentile per-packet one-way delay: 36.760 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 96.19 Mbit/s
95th percentile per-packet one-way delay: 36.760 ms
Loss rate: 0.00%
```

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

```
Start at: 2018-09-05 02:15:33
End at: 2018-09-05 02:16:03
Local clock offset: 10.079 ms
Remote clock offset: 35.421 ms

# Below is generated by plot.py at 2018-09-05 02:21:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.27 Mbit/s
95th percentile per-packet one-way delay: 38.227 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 96.27 Mbit/s
95th percentile per-packet one-way delay: 38.227 ms
Loss rate: 0.03%
```

Run 3: Report of Muses-25 — Data Link

