

Pantheon Report

Generated at 2018-09-05 02:32:00 (UTC).
Data path: AWS India 2 on `ens5` (*local*) → Saudi Arabia on `enp2s0` (*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.

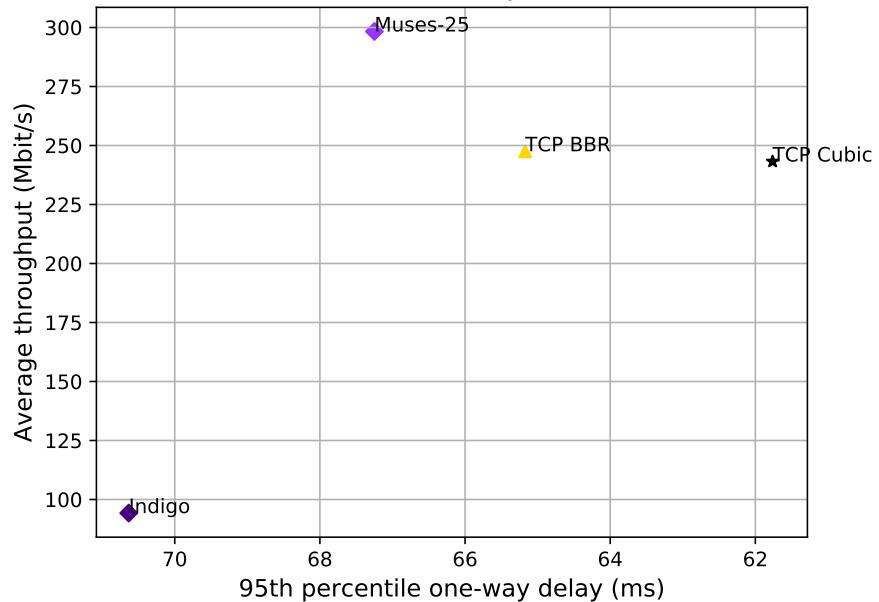
System info:

```
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
```

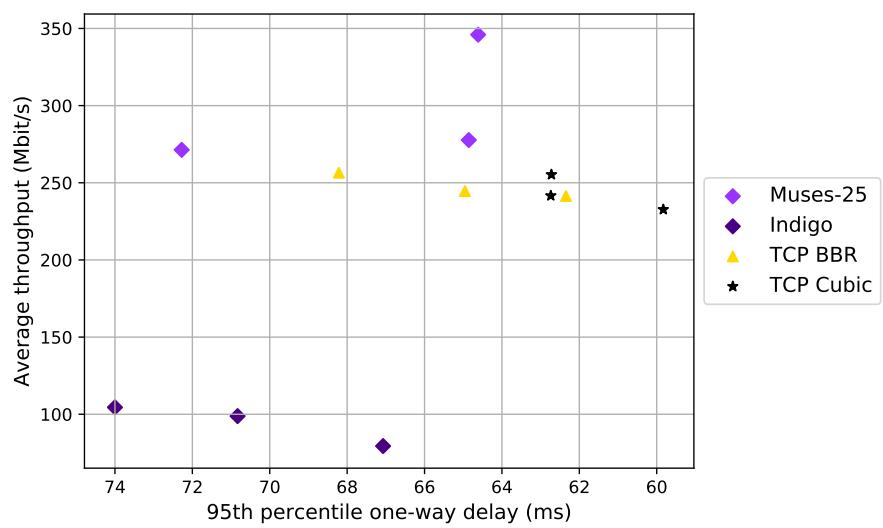
Git summary:

```
branch: muses @ 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 India 2 to Saudi Arabia, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS India 2 to Saudi Arabia, 3 runs of 30s each per scheme



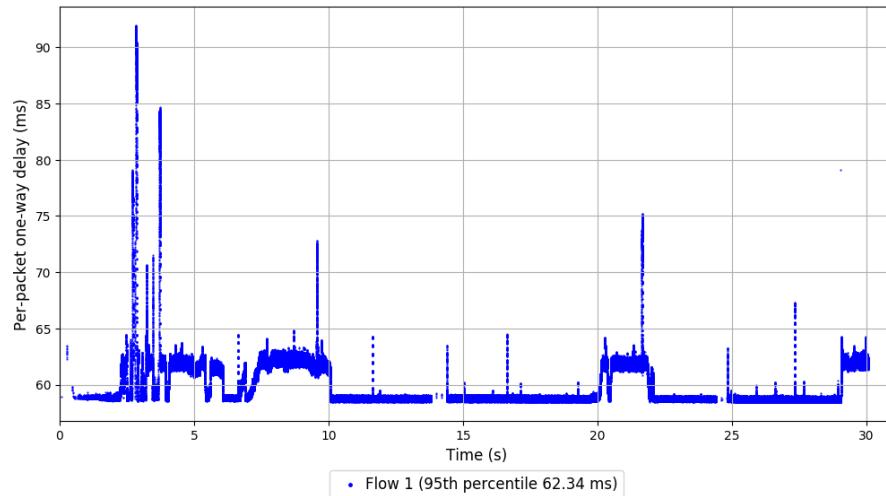
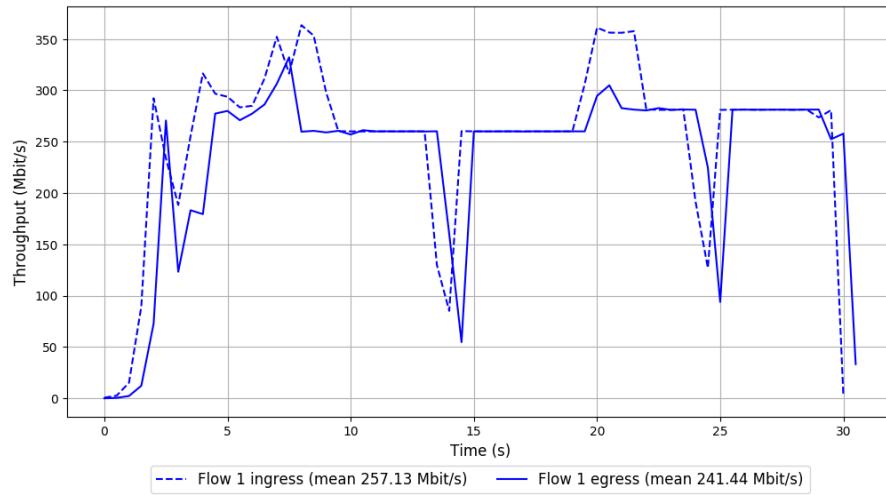
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	247.54	65.17	5.96
TCP Cubic	3	243.20	61.76	0.54
Indigo	3	94.23	70.63	0.19
Muses-25	3	298.32	67.25	3.28

Run 1: Statistics of TCP BBR

```
Start at: 2018-09-05 02:07:34
End at: 2018-09-05 02:08:04
Local clock offset: -4.364 ms
Remote clock offset: -36.918 ms

# Below is generated by plot.py at 2018-09-05 02:31:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 241.44 Mbit/s
95th percentile per-packet one-way delay: 62.345 ms
Loss rate: 6.10%
-- Flow 1:
Average throughput: 241.44 Mbit/s
95th percentile per-packet one-way delay: 62.345 ms
Loss rate: 6.10%
```

Run 1: Report of TCP BBR — Data Link

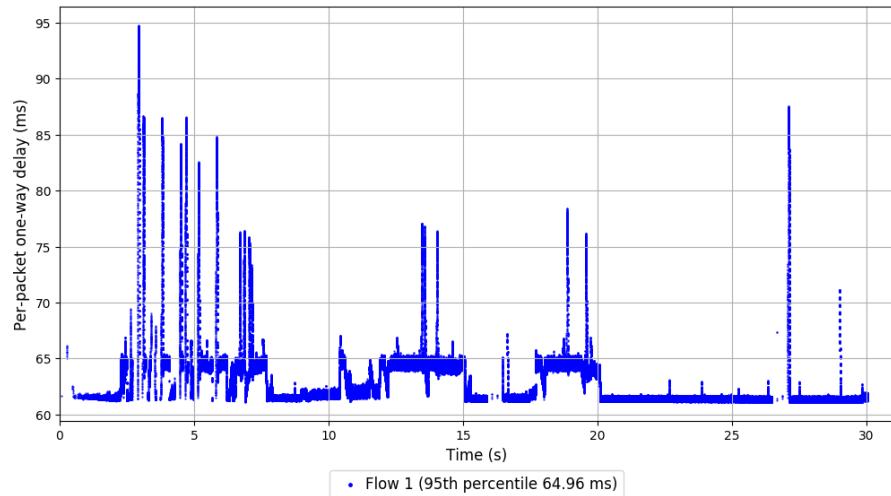
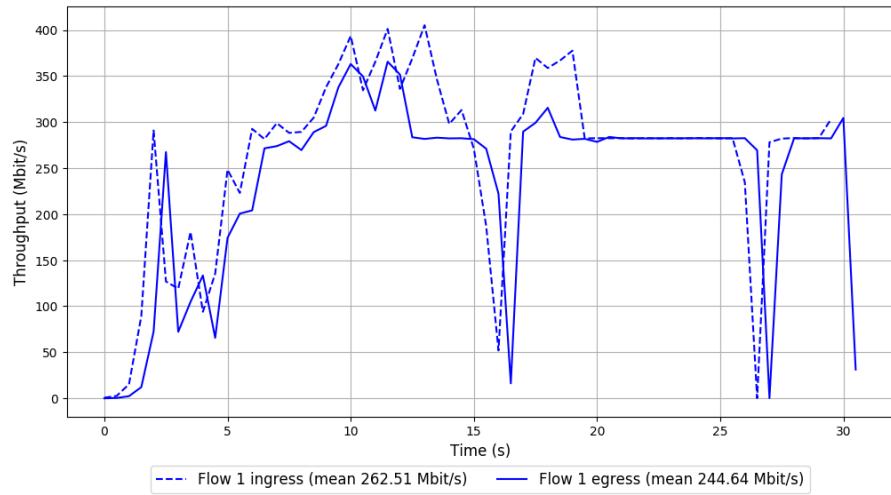


Run 2: Statistics of TCP BBR

```
Start at: 2018-09-05 02:13:00
End at: 2018-09-05 02:13:30
Local clock offset: -7.941 ms
Remote clock offset: -35.952 ms

# Below is generated by plot.py at 2018-09-05 02:31:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 244.64 Mbit/s
95th percentile per-packet one-way delay: 64.956 ms
Loss rate: 6.81%
-- Flow 1:
Average throughput: 244.64 Mbit/s
95th percentile per-packet one-way delay: 64.956 ms
Loss rate: 6.81%
```

Run 2: Report of TCP BBR — Data Link

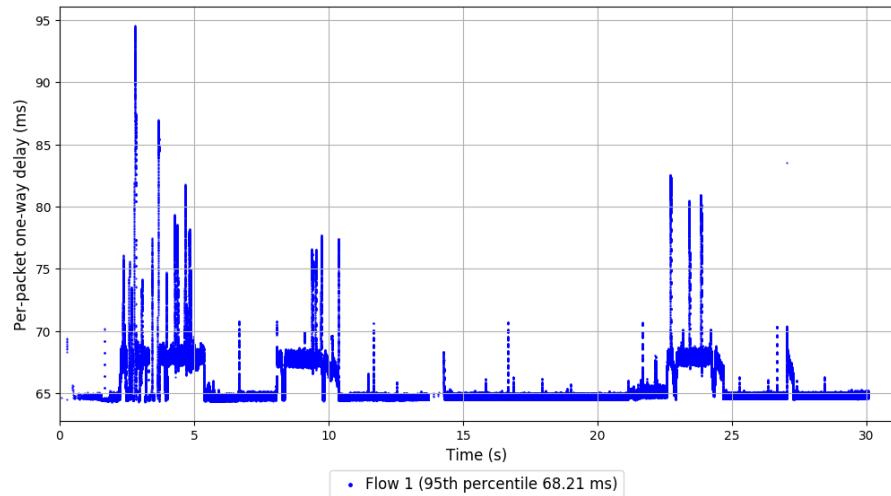
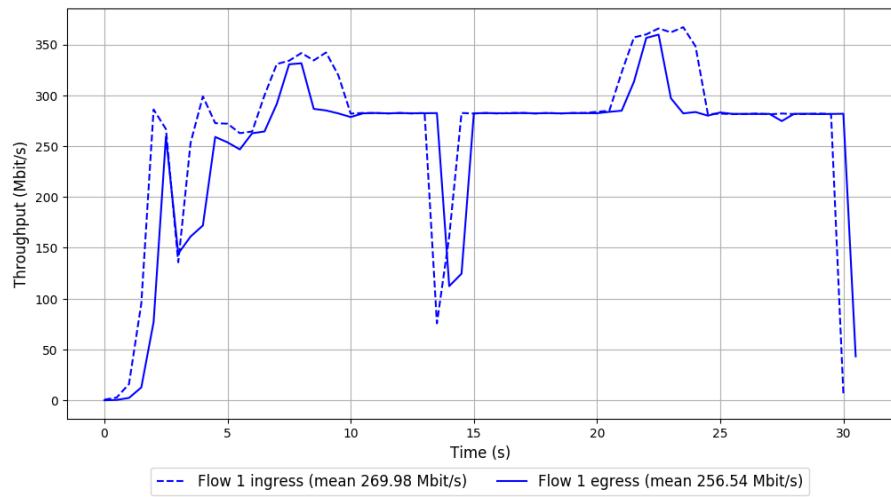


Run 3: Statistics of TCP BBR

```
Start at: 2018-09-05 02:18:23
End at: 2018-09-05 02:18:53
Local clock offset: -6.258 ms
Remote clock offset: -31.329 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 256.54 Mbit/s
95th percentile per-packet one-way delay: 68.213 ms
Loss rate: 4.98%
-- Flow 1:
Average throughput: 256.54 Mbit/s
95th percentile per-packet one-way delay: 68.213 ms
Loss rate: 4.98%
```

Run 3: Report of TCP BBR — Data Link

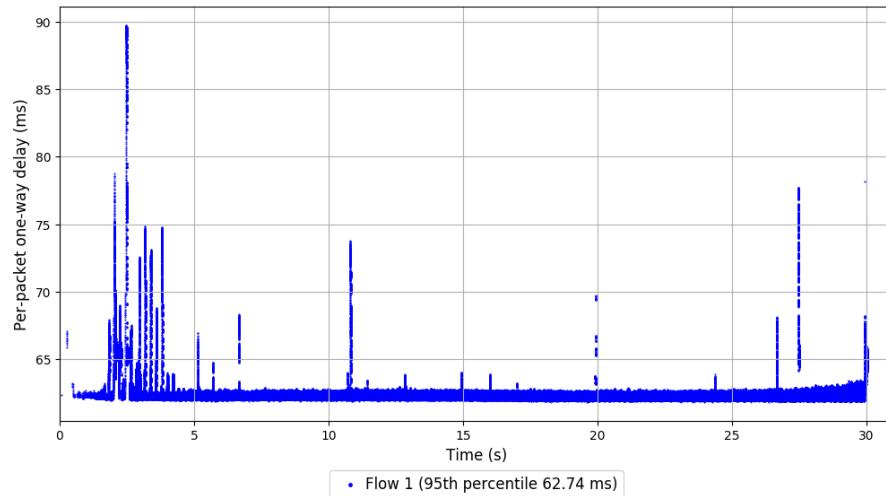
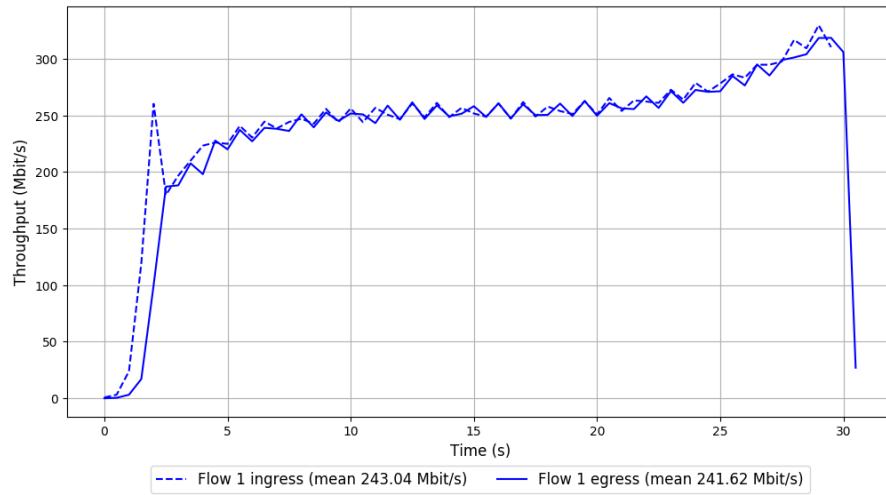


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-09-05 02:10:12
End at: 2018-09-05 02:10:42
Local clock offset: -5.517 ms
Remote clock offset: -31.38 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 241.62 Mbit/s
95th percentile per-packet one-way delay: 62.737 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 241.62 Mbit/s
95th percentile per-packet one-way delay: 62.737 ms
Loss rate: 0.57%
```

Run 1: Report of TCP Cubic — Data Link

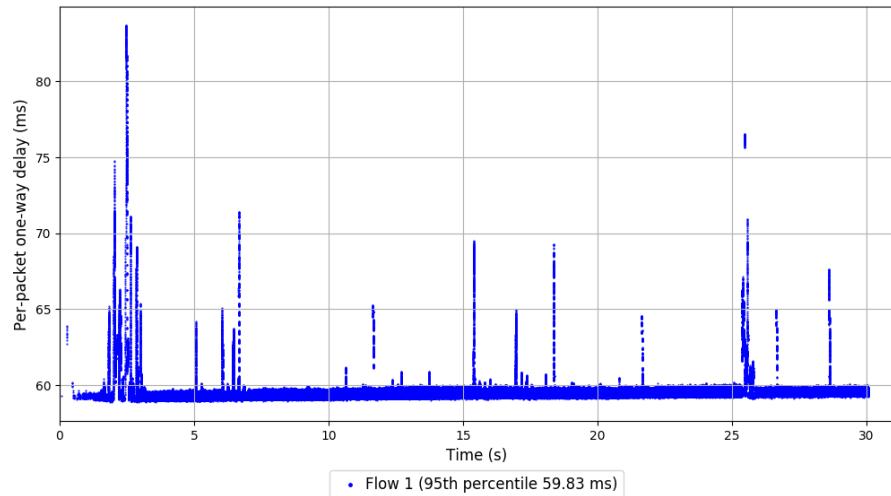
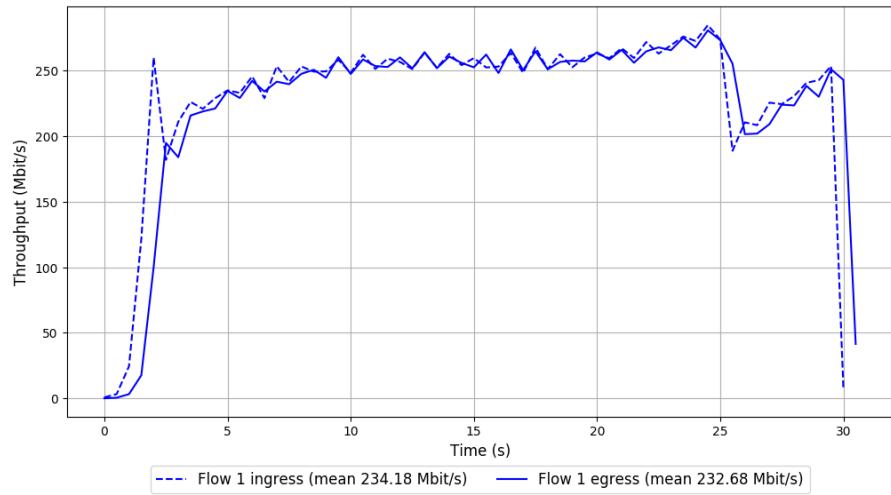


Run 2: Statistics of TCP Cubic

```
Start at: 2018-09-05 02:15:39
End at: 2018-09-05 02:16:09
Local clock offset: -7.464 ms
Remote clock offset: -36.03 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 232.68 Mbit/s
95th percentile per-packet one-way delay: 59.830 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 232.68 Mbit/s
95th percentile per-packet one-way delay: 59.830 ms
Loss rate: 0.64%
```

Run 2: Report of TCP Cubic — Data Link

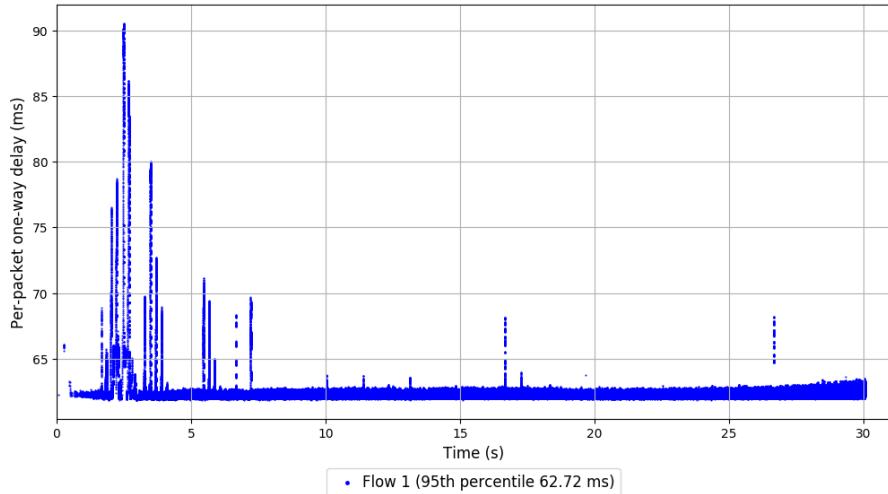
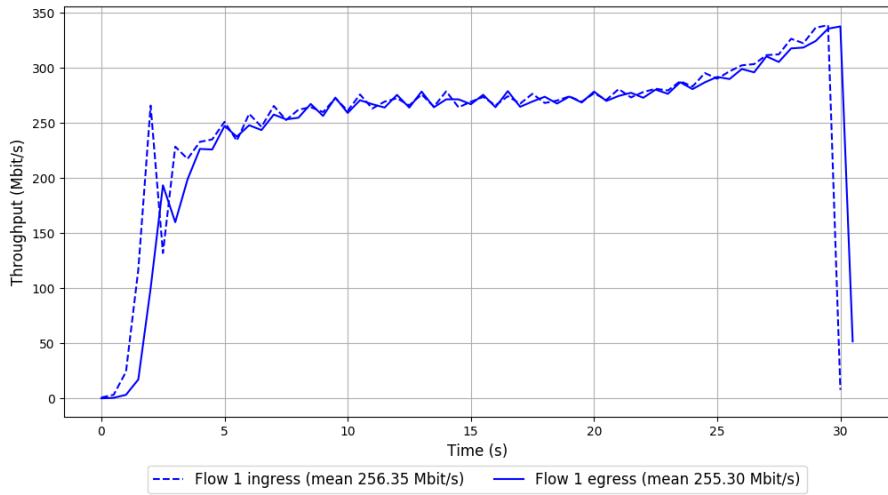


Run 3: Statistics of TCP Cubic

```
Start at: 2018-09-05 02:26:49
End at: 2018-09-05 02:27:19
Local clock offset: -1.128 ms
Remote clock offset: -30.107 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 255.30 Mbit/s
95th percentile per-packet one-way delay: 62.721 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 255.30 Mbit/s
95th percentile per-packet one-way delay: 62.721 ms
Loss rate: 0.41%
```

Run 3: Report of TCP Cubic — Data Link

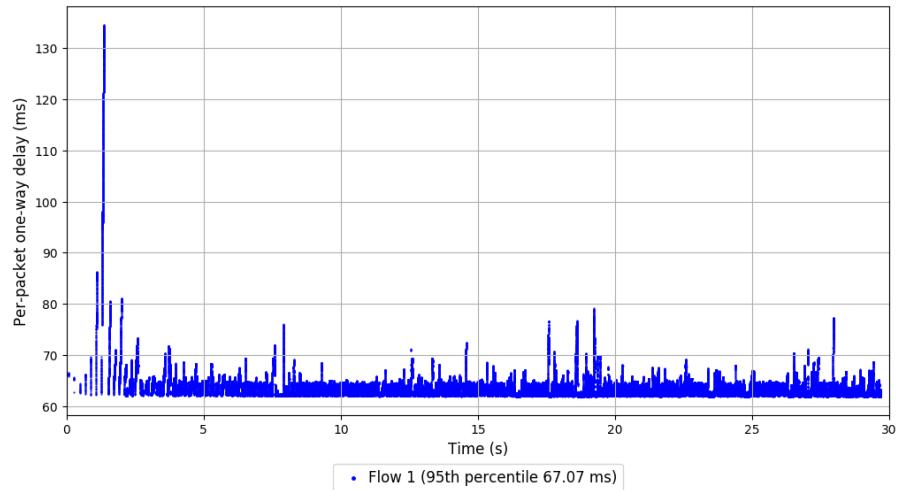
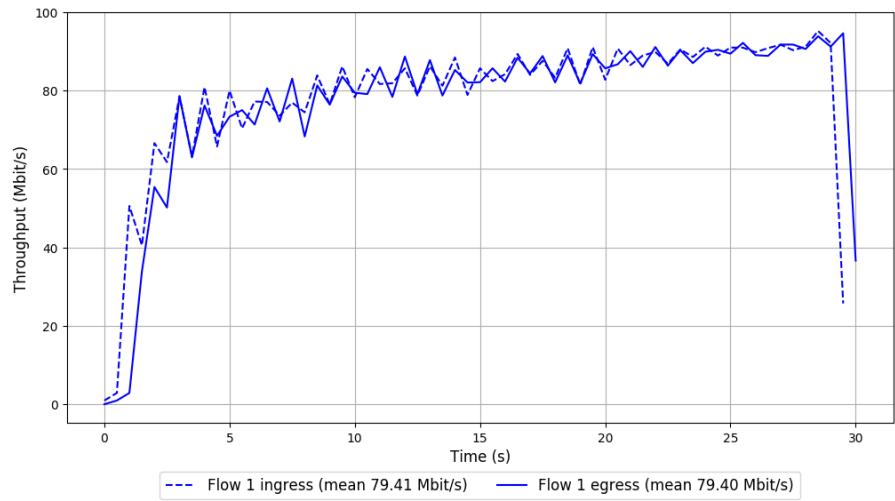


Run 1: Statistics of Indigo

```
Start at: 2018-09-05 02:08:57
End at: 2018-09-05 02:09:27
Local clock offset: -6.155 ms
Remote clock offset: -32.452 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 79.40 Mbit/s
95th percentile per-packet one-way delay: 67.071 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 79.40 Mbit/s
95th percentile per-packet one-way delay: 67.071 ms
Loss rate: 0.03%
```

Run 1: Report of Indigo — Data Link

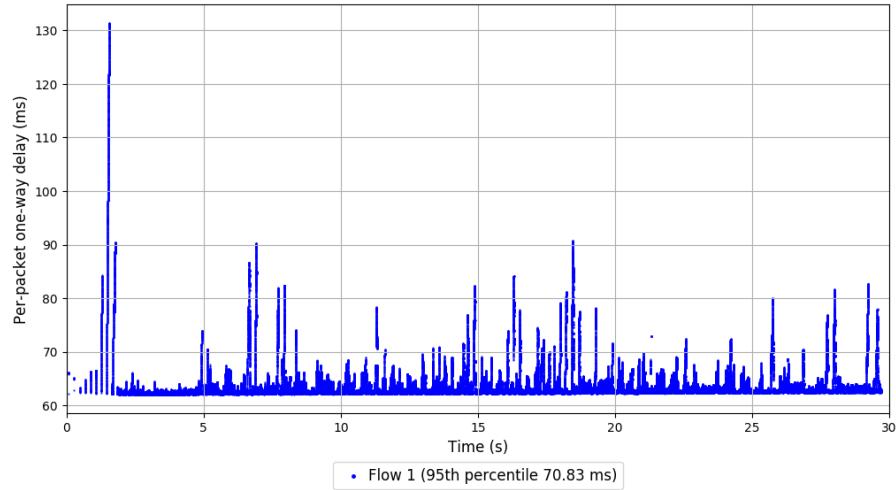
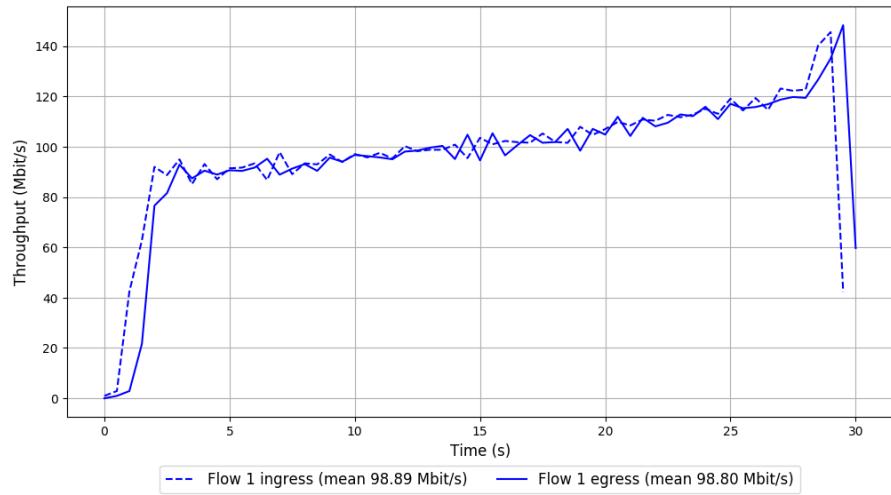


Run 2: Statistics of Indigo

```
Start at: 2018-09-05 02:14:23
End at: 2018-09-05 02:14:53
Local clock offset: -7.948 ms
Remote clock offset: -32.397 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 98.80 Mbit/s
95th percentile per-packet one-way delay: 70.831 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 98.80 Mbit/s
95th percentile per-packet one-way delay: 70.831 ms
Loss rate: 0.09%
```

Run 2: Report of Indigo — Data Link

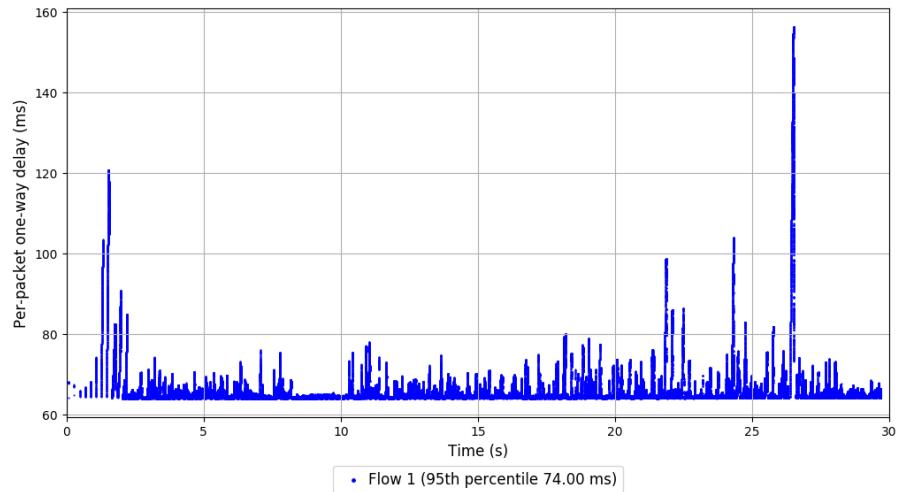
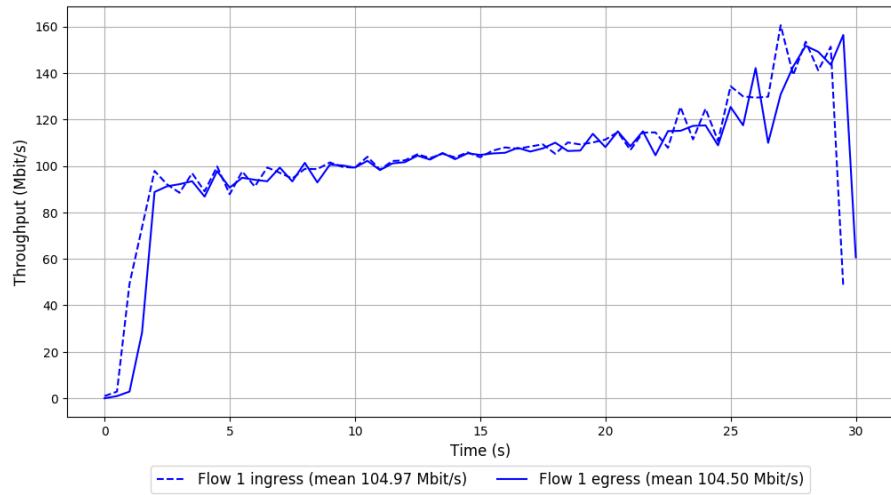


Run 3: Statistics of Indigo

```
Start at: 2018-09-05 02:19:46
End at: 2018-09-05 02:20:16
Local clock offset: -5.653 ms
Remote clock offset: -31.152 ms

# Below is generated by plot.py at 2018-09-05 02:31:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 104.50 Mbit/s
95th percentile per-packet one-way delay: 74.000 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 104.50 Mbit/s
95th percentile per-packet one-way delay: 74.000 ms
Loss rate: 0.44%
```

Run 3: Report of Indigo — Data Link

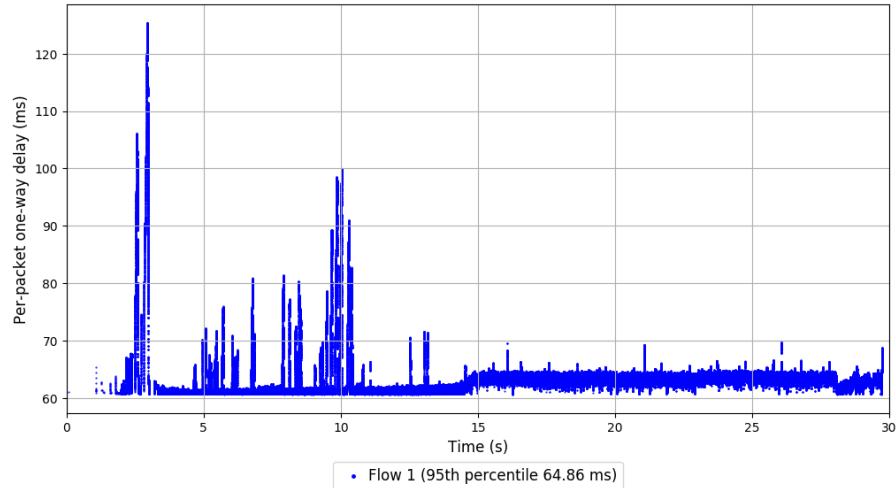
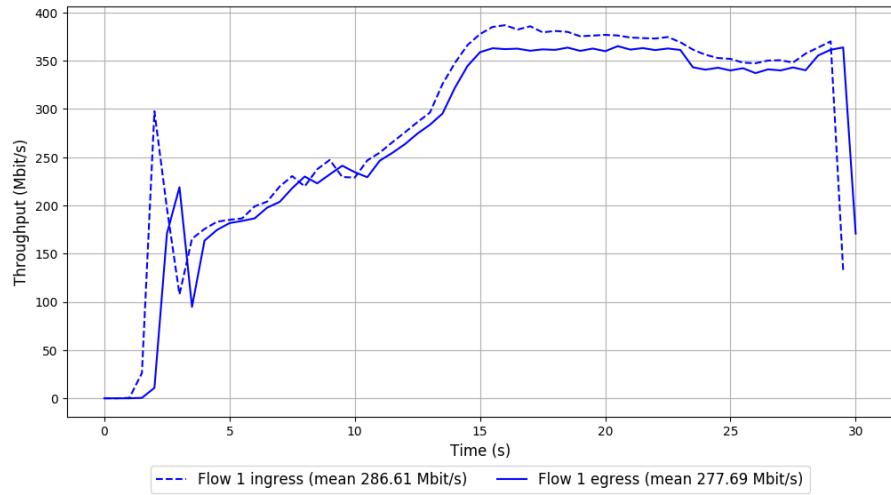


```
Run 1: Statistics of Muses-25
```

```
Start at: 2018-09-05 02:06:11
End at: 2018-09-05 02:06:41
Local clock offset: -5.871 ms
Remote clock offset: -36.891 ms

# Below is generated by plot.py at 2018-09-05 02:31:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 277.69 Mbit/s
95th percentile per-packet one-way delay: 64.857 ms
Loss rate: 3.11%
-- Flow 1:
Average throughput: 277.69 Mbit/s
95th percentile per-packet one-way delay: 64.857 ms
Loss rate: 3.11%
```

Run 1: Report of Muses-25 — Data Link

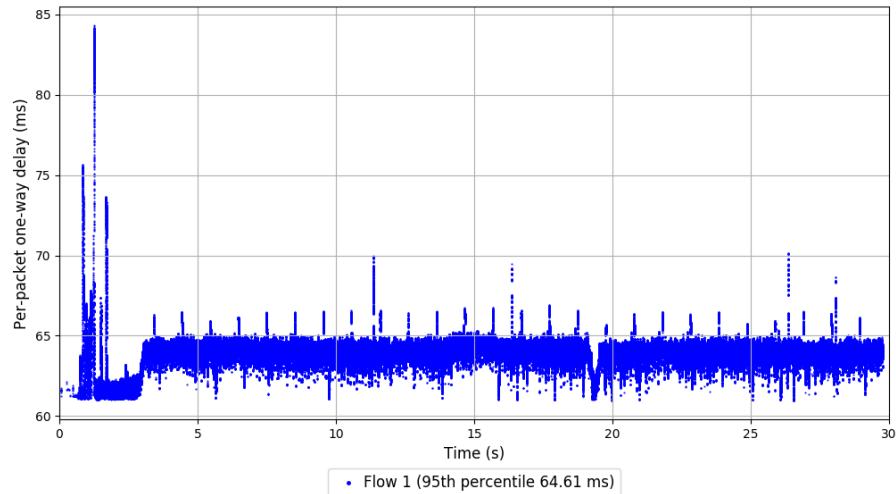
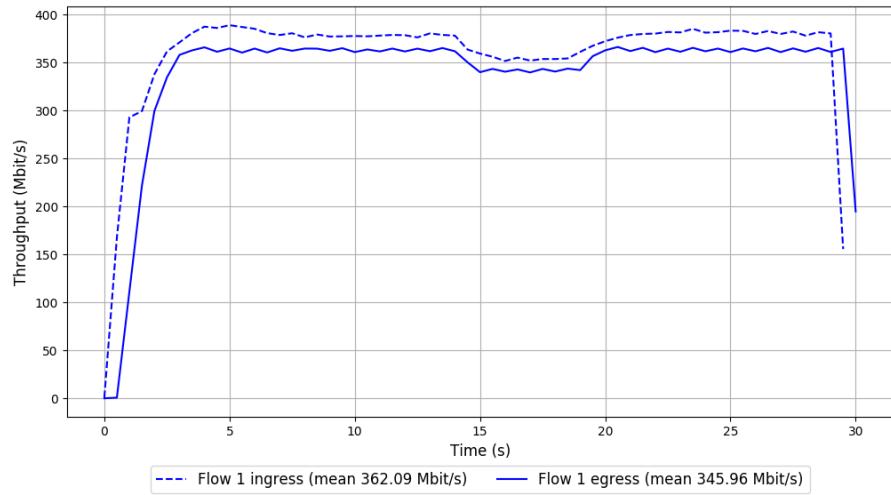


Run 2: Statistics of Muses-25

```
Start at: 2018-09-05 02:11:34
End at: 2018-09-05 02:12:04
Local clock offset: -5.43 ms
Remote clock offset: -31.753 ms

# Below is generated by plot.py at 2018-09-05 02:31:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 345.96 Mbit/s
95th percentile per-packet one-way delay: 64.614 ms
Loss rate: 4.45%
-- Flow 1:
Average throughput: 345.96 Mbit/s
95th percentile per-packet one-way delay: 64.614 ms
Loss rate: 4.45%
```

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

```
Start at: 2018-09-05 02:17:01
End at: 2018-09-05 02:17:31
Local clock offset: -6.304 ms
Remote clock offset: -29.243 ms

# Below is generated by plot.py at 2018-09-05 02:31:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 271.31 Mbit/s
95th percentile per-packet one-way delay: 72.275 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 271.31 Mbit/s
95th percentile per-packet one-way delay: 72.275 ms
Loss rate: 2.29%
```

Run 3: Report of Muses-25 — Data Link

