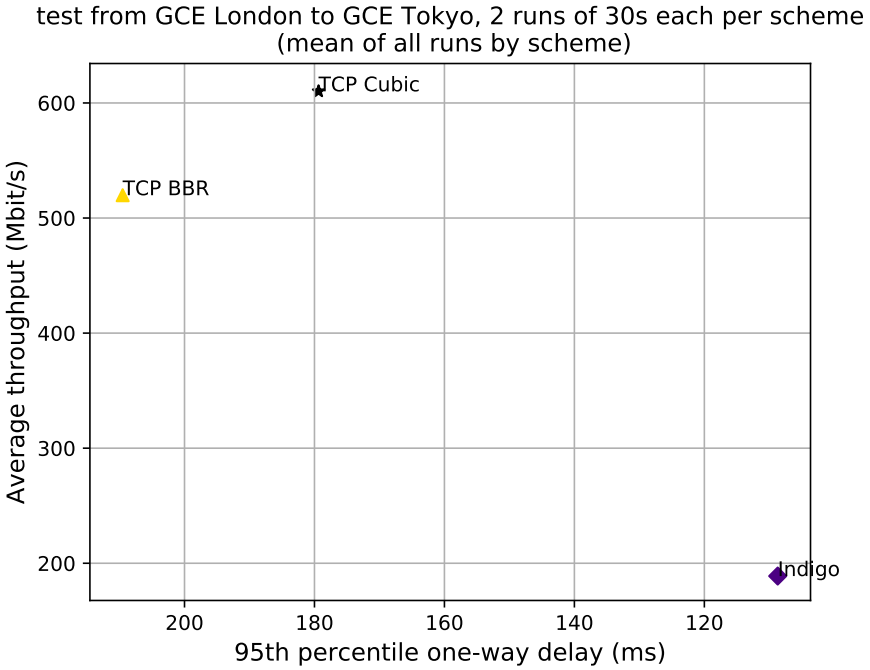
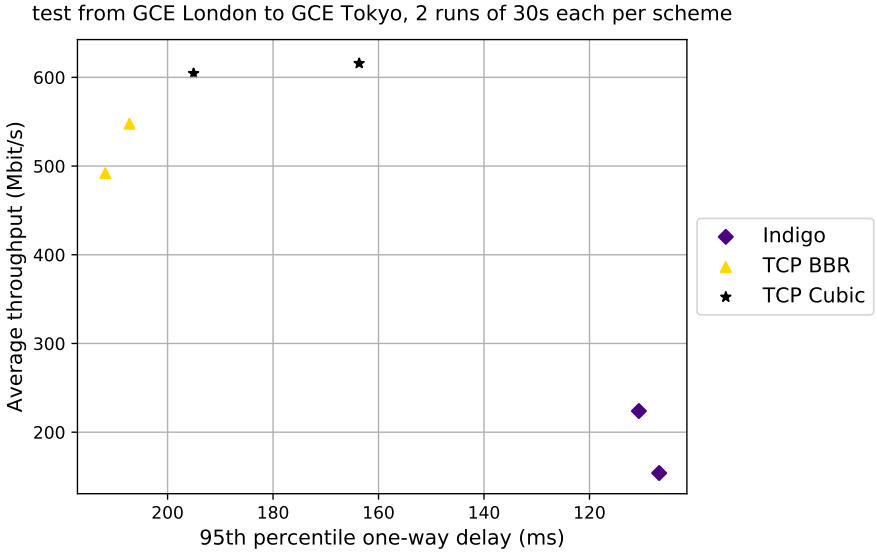
Pantheon Report

Generated at 2018-08-31 05:20:38 (UTC).
Data path: GCE London on `ens4` (*remote*) →GCE Tokyo on `ens4` (*local*).
Repeated the test of 4 congestion control schemes twice.
Each test lasted for 30 seconds running 1 flow.
NTP offsets were measured against `time.google.com` and have been applied to correct the timestamps in logs.

```
System info:
Linux 4.15.0-1018-gcp
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 @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
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 GCE London to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)
TCP Cubic
TCP BBR
Indigo
Average throughput (Mbit/s)
600
500
400
300
200
200
180
160
140
120
95th percentile one-way delay (ms)


test from GCE London to GCE Tokyo, 2 runs of 30s each per scheme
Average throughput (Mbit/s)
600
500
400
300
200
200
180
160
140
120
95th percentile one-way delay (ms)
Indigo
TCP BBR
TCP Cubic

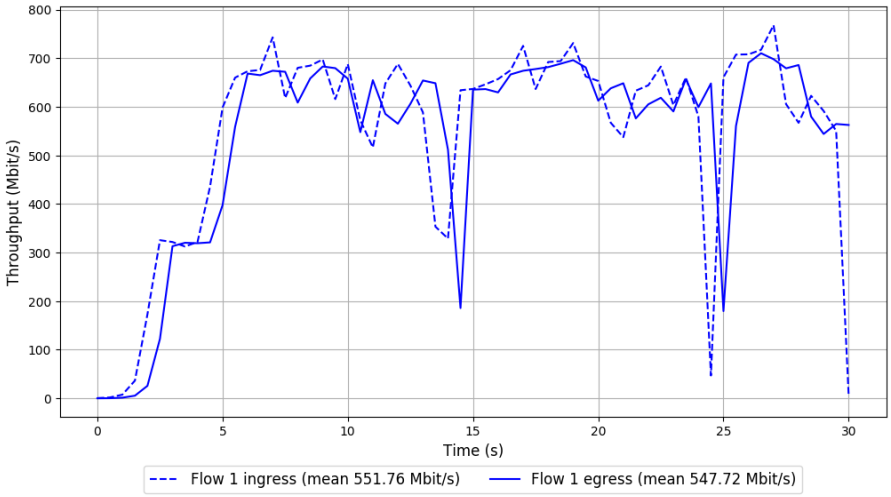
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	519.84	209.52	2.31
TCP Cubic	2	610.11	179.37	1.04
Indigo	2	188.88	108.71	0.81
Muses-25	0	N/A	N/A	N/A

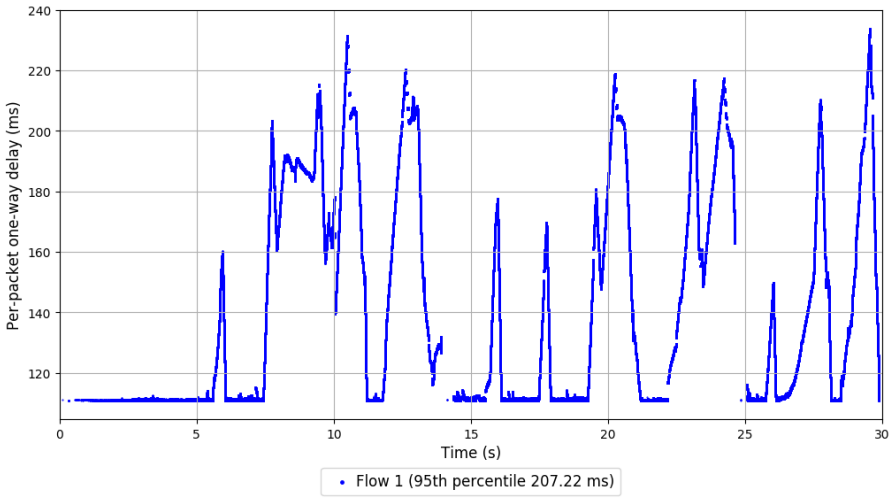
```
Run 1: Statistics of TCP BBR

Start at: 2018-08-31 05:05:44
End at: 2018-08-31 05:06:14
Local clock offset: 21.114 ms
Remote clock offset: 20.151 ms

# Below is generated by plot.py at 2018-08-31 05:20:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 547.72 Mbit/s
95th percentile per-packet one-way delay: 207.222 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 547.72 Mbit/s
95th percentile per-packet one-way delay: 207.222 ms
Loss rate: 1.47%
```

Run 1: Report of TCP BBR — Data Link



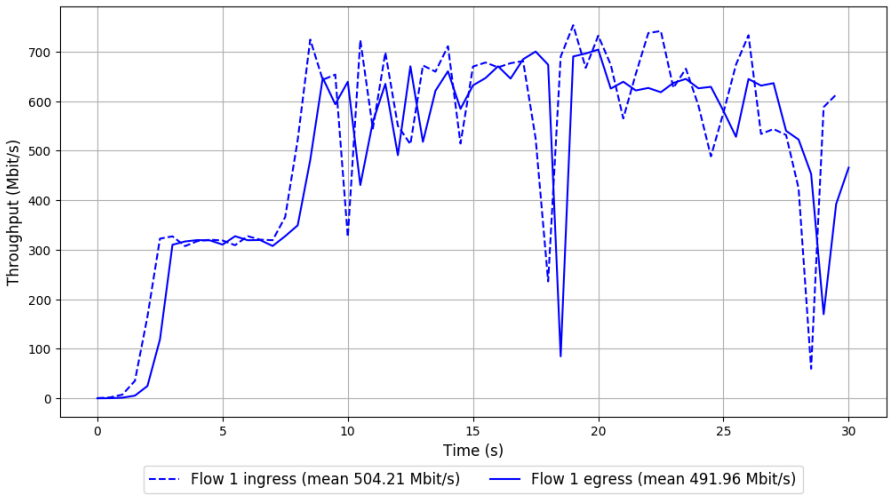


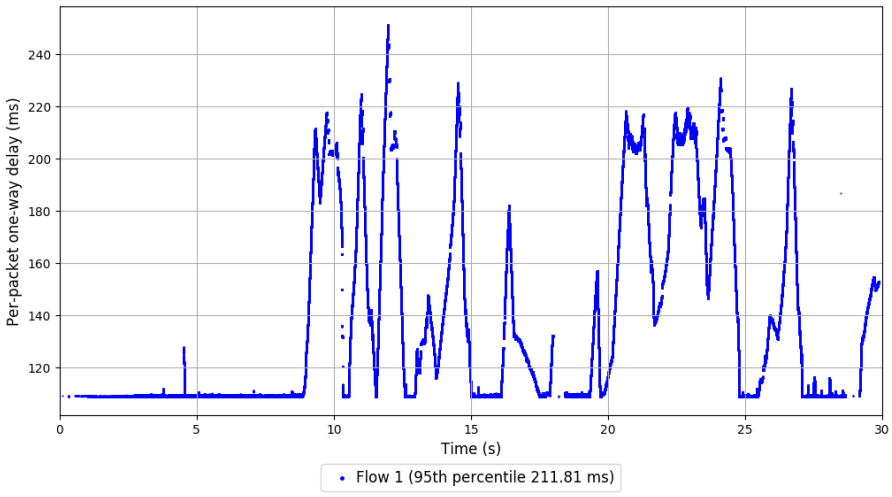
```
Run 2: Statistics of TCP BBR

Start at: 2018-08-31 05:11:40
End at: 2018-08-31 05:12:10
Local clock offset: 22.78 ms
Remote clock offset: 24.927 ms

# Below is generated by plot.py at 2018-08-31 05:20:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 491.96 Mbit/s
95th percentile per-packet one-way delay: 211.810 ms
Loss rate: 3.16%
-- Flow 1:
Average throughput: 491.96 Mbit/s
95th percentile per-packet one-way delay: 211.810 ms
Loss rate: 3.16%
```

Run 2: Report of TCP BBR — Data Link



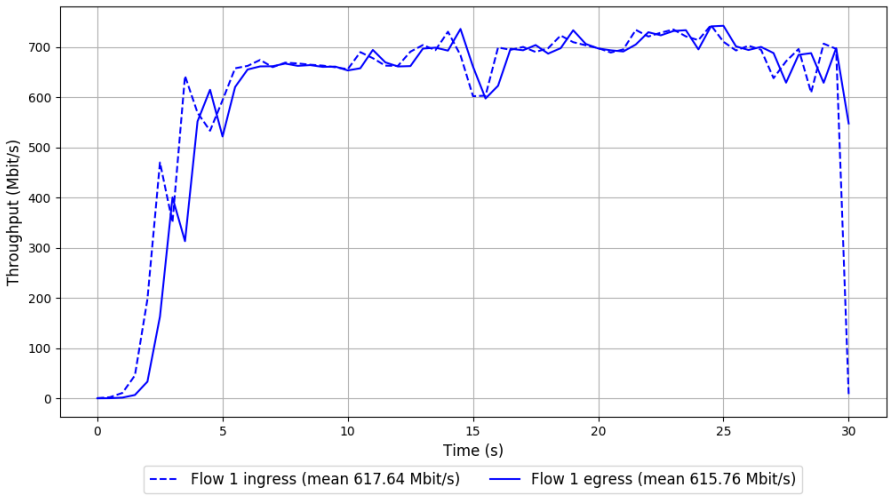


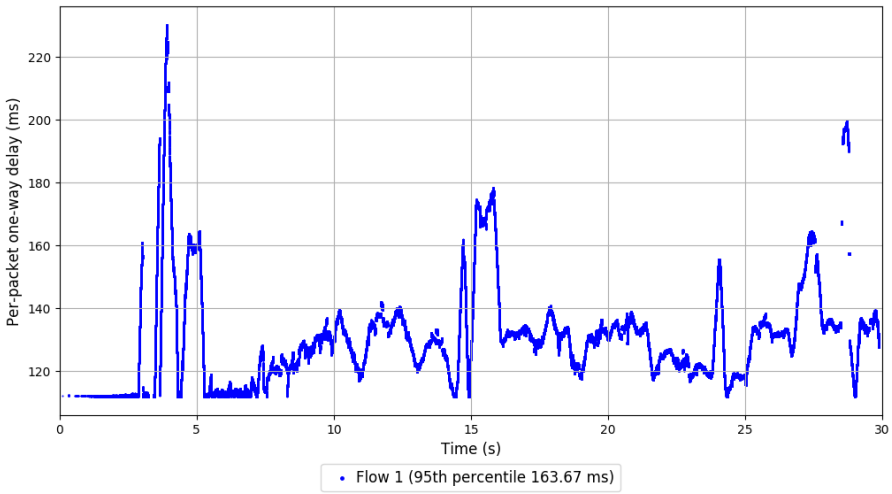
```
Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 05:07:22
End at: 2018-08-31 05:07:52
Local clock offset: 22.365 ms
Remote clock offset: 22.117 ms

# Below is generated by plot.py at 2018-08-31 05:20:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 615.76 Mbit/s
95th percentile per-packet one-way delay: 163.671 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 615.76 Mbit/s
95th percentile per-packet one-way delay: 163.671 ms
Loss rate: 1.05%
```

Run 1: Report of TCP Cubic — Data Link



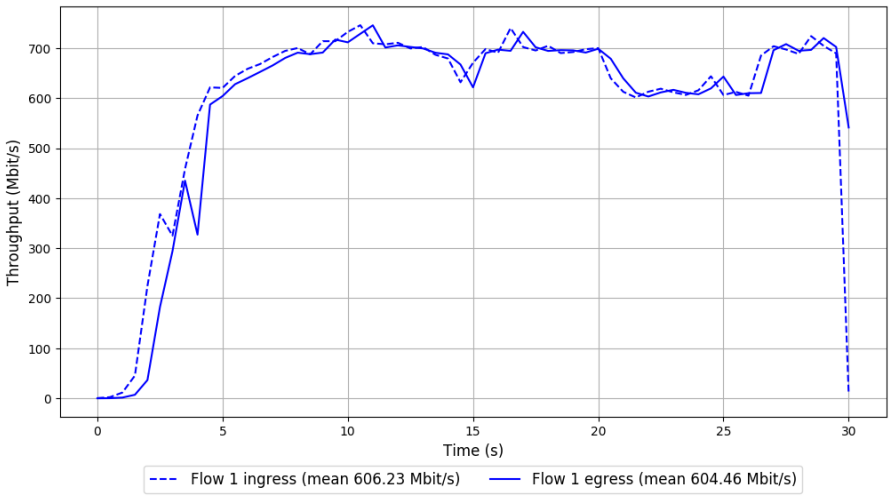


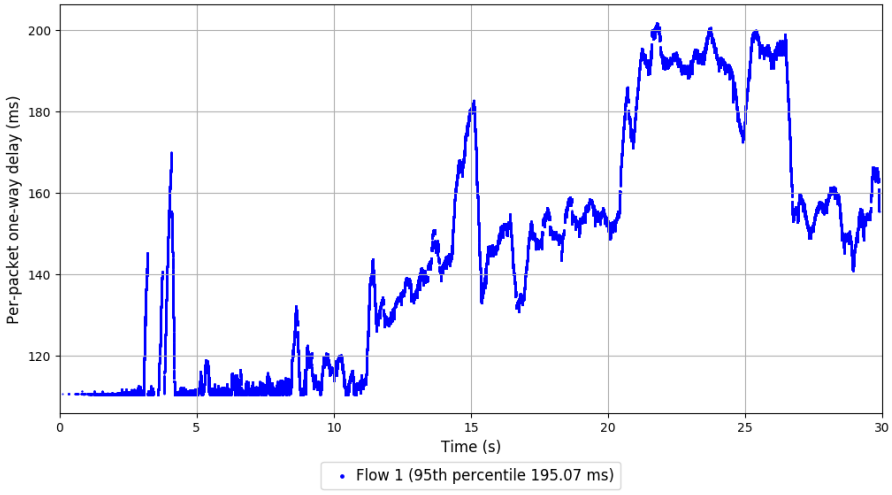
```
Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 05:13:18
End at: 2018-08-31 05:13:48
Local clock offset: 27.037 ms
Remote clock offset: 26.517 ms

# Below is generated by plot.py at 2018-08-31 05:20:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 604.46 Mbit/s
95th percentile per-packet one-way delay: 195.069 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 604.46 Mbit/s
95th percentile per-packet one-way delay: 195.069 ms
Loss rate: 1.03%
```

Run 2: Report of TCP Cubic — Data Link



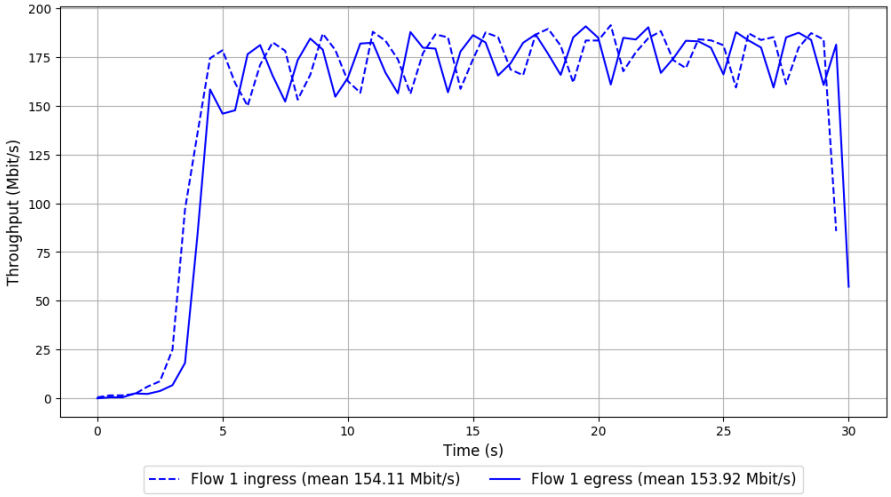


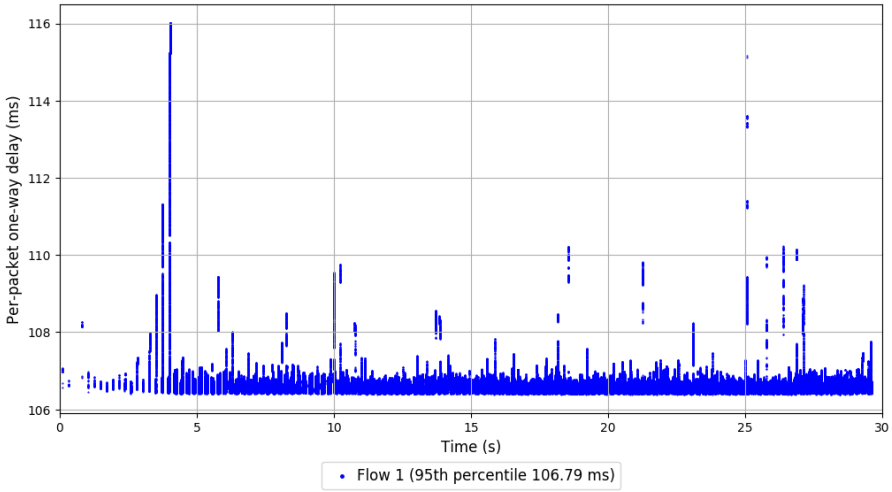
```
Run 1: Statistics of Indigo

Start at: 2018-08-31 05:04:20
End at: 2018-08-31 05:04:50
Local clock offset: 17.563 ms
Remote clock offset: 20.444 ms

# Below is generated by plot.py at 2018-08-31 05:20:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 153.92 Mbit/s
95th percentile per-packet one-way delay: 106.792 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 153.92 Mbit/s
95th percentile per-packet one-way delay: 106.792 ms
Loss rate: 0.87%
```

Run 1: Report of Indigo — Data Link



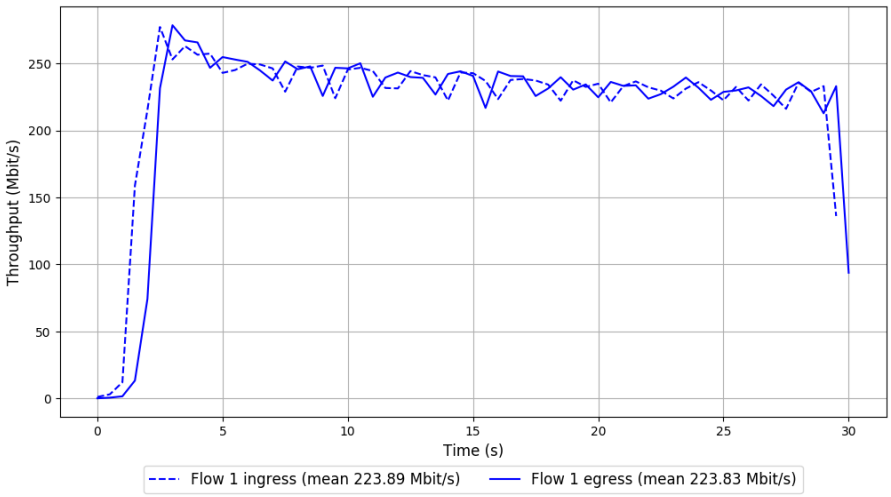


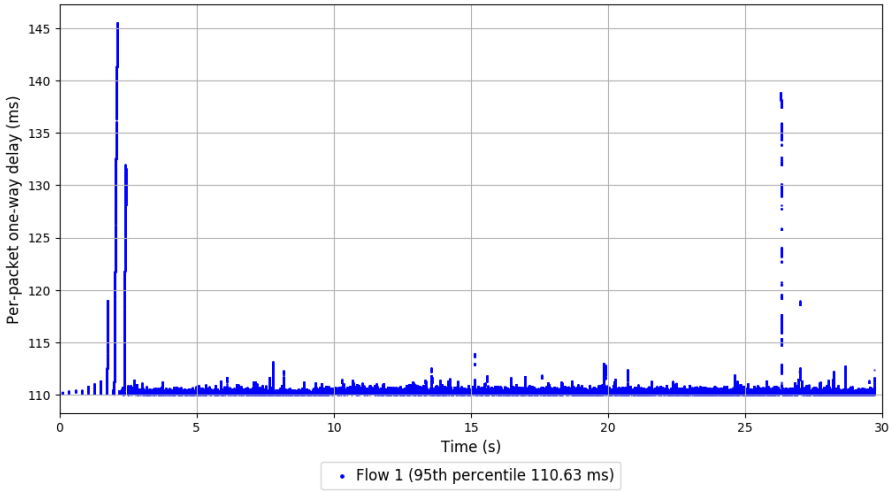
```
Run 2: Statistics of Indigo

Start at: 2018-08-31 05:10:10
End at: 2018-08-31 05:10:40
Local clock offset: 24.455 ms
Remote clock offset: 23.496 ms

# Below is generated by plot.py at 2018-08-31 05:20:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 223.83 Mbit/s
95th percentile per-packet one-way delay: 110.633 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 223.83 Mbit/s
95th percentile per-packet one-way delay: 110.633 ms
Loss rate: 0.76%
```

Run 2: Report of Indigo — Data Link

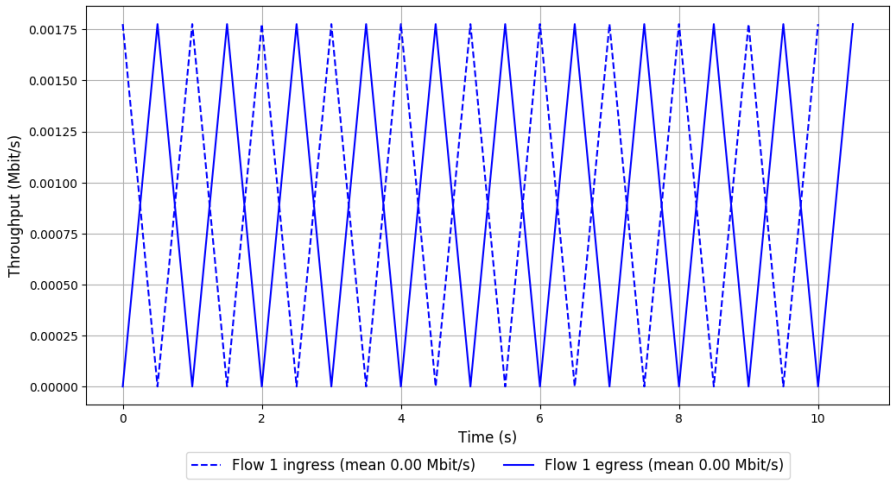


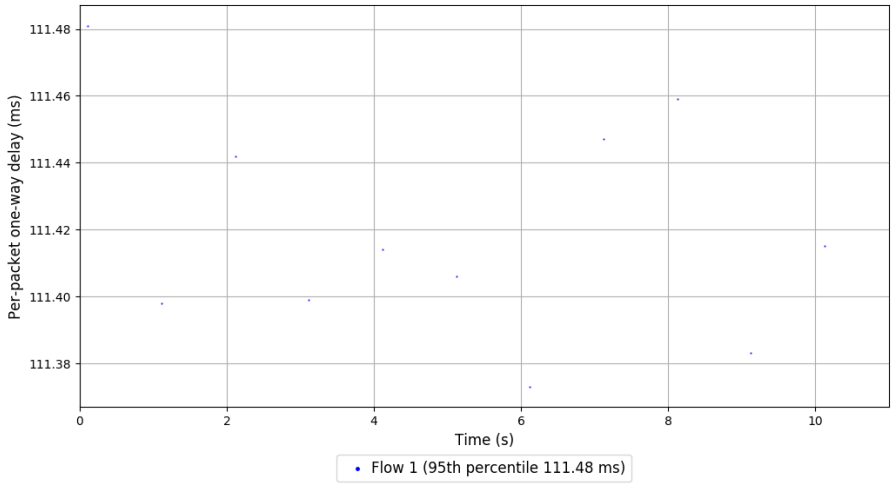


```
Run 1: Statistics of Muses-25

Start at: 2018-08-31 05:03:13
End at: 2018-08-31 05:03:43
Local clock offset: 19.944 ms
Remote clock offset: 19.153 ms
```

Run 1: Report of Muses-25 — Data Link





```
Run 2: Statistics of Muses-25

Start at: 2018-08-31 05:09:03
End at: 2018-08-31 05:09:33
Local clock offset: 23.74 ms
Remote clock offset: 22.806 ms
```

Run 2: Report of Muses-25 — Data Link