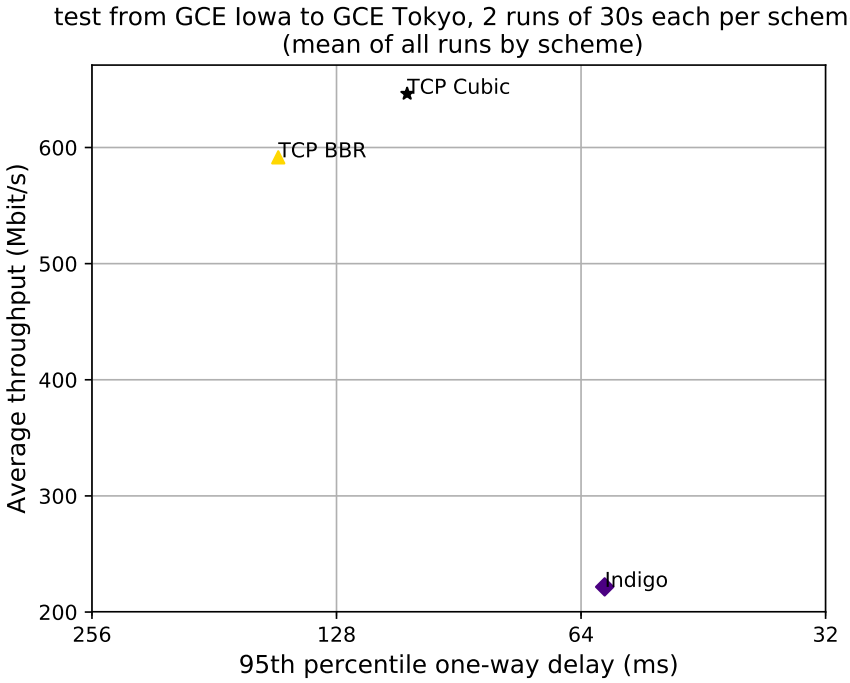
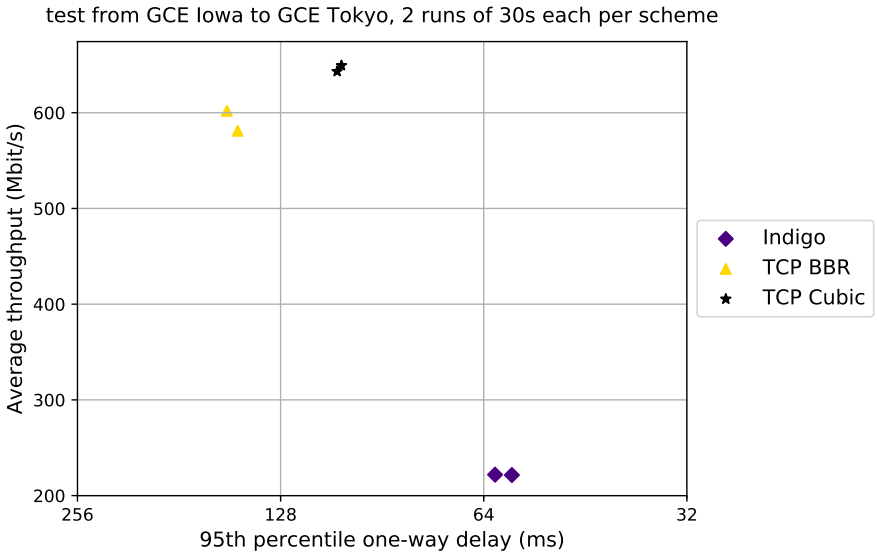
Pantheon Report

Generated at 2018-08-31 06:07:05 (UTC).
Data path: GCE Iowa on `ens4` (*local*) →GCE Tokyo on `ens4` (*remote*).
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 Iowa to GCE Tokyo, 2 runs of 30s each per scheme
(mean of all runs by scheme)
TCP Cubic
TCP BBR
Indigo
600
500
400
300
200
Average throughput (Mbit/s)
256
128
64
32
95th percentile one-way delay (ms)


test from GCE Iowa to GCE Tokyo, 2 runs of 30s each per scheme
600
500
400
300
200
Average throughput (Mbit/s)
256
128
64
32
95th percentile one-way delay (ms)
Indigo
TCP BBR
TCP Cubic

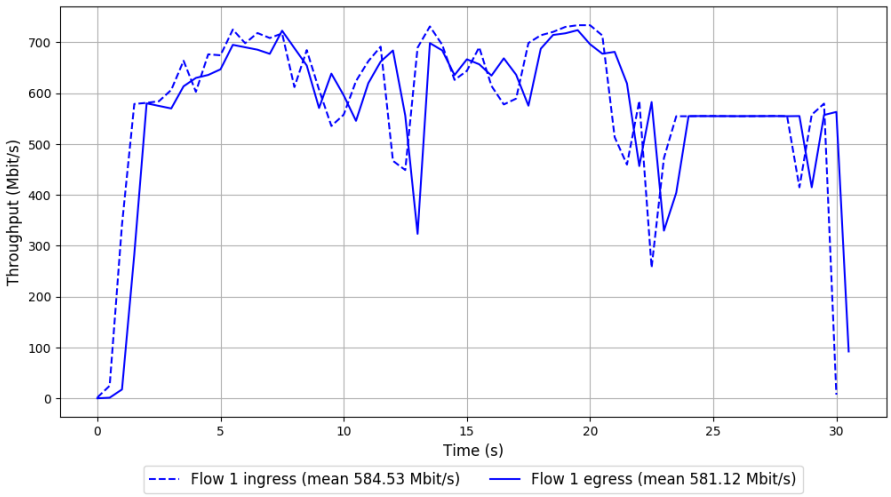
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	591.55	150.98	0.94
TCP Cubic	2	646.27	104.78	0.07
Indigo	2	221.66	59.86	0.00
Muses-25	0	N/A	N/A	N/A

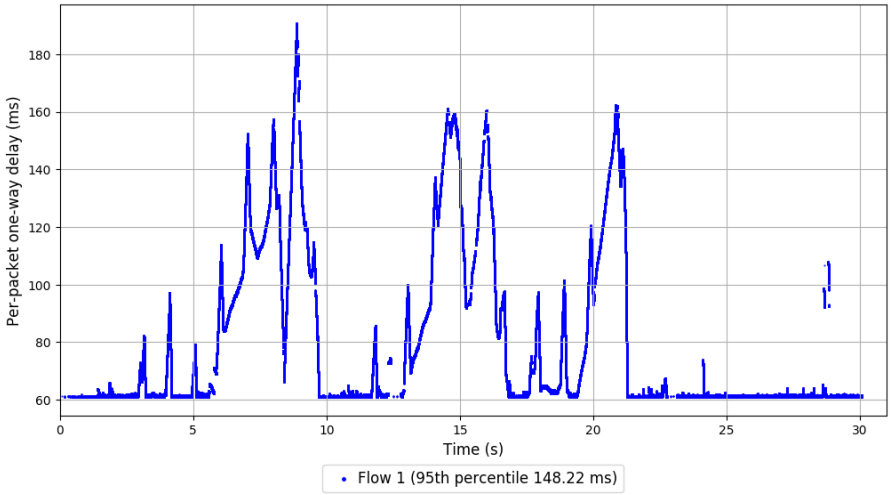
```
Run 1: Statistics of TCP BBR

Start at: 2018-08-31 05:51:39
End at: 2018-08-31 05:52:09
Local clock offset: 19.62 ms
Remote clock offset: 16.672 ms

# Below is generated by plot.py at 2018-08-31 06:06:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 581.12 Mbit/s
95th percentile per-packet one-way delay: 148.216 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 581.12 Mbit/s
95th percentile per-packet one-way delay: 148.216 ms
Loss rate: 0.58%
```

Run 1: Report of TCP BBR — Data Link



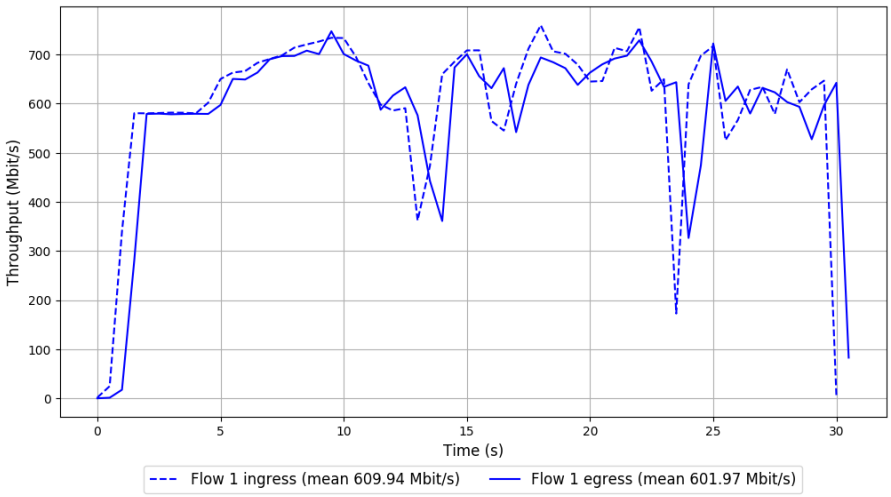


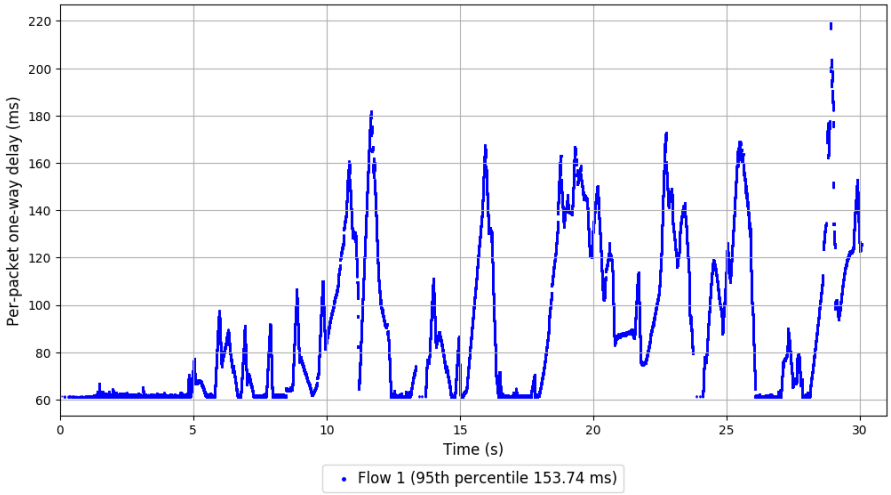
```
Run 2: Statistics of TCP BBR

Start at: 2018-08-31 05:57:22
End at: 2018-08-31 05:57:52
Local clock offset: 22.355 ms
Remote clock offset: 19.013 ms

# Below is generated by plot.py at 2018-08-31 06:06:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 601.97 Mbit/s
95th percentile per-packet one-way delay: 153.742 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 601.97 Mbit/s
95th percentile per-packet one-way delay: 153.742 ms
Loss rate: 1.30%
```

Run 2: Report of TCP BBR — Data Link



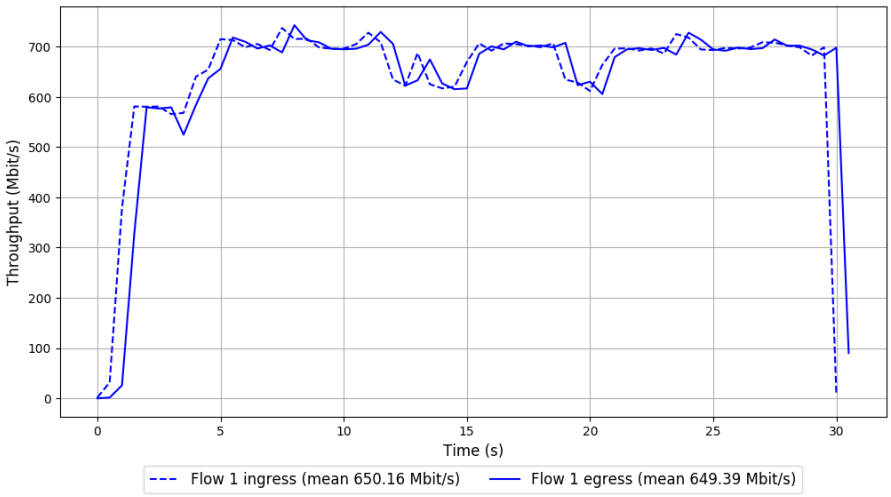


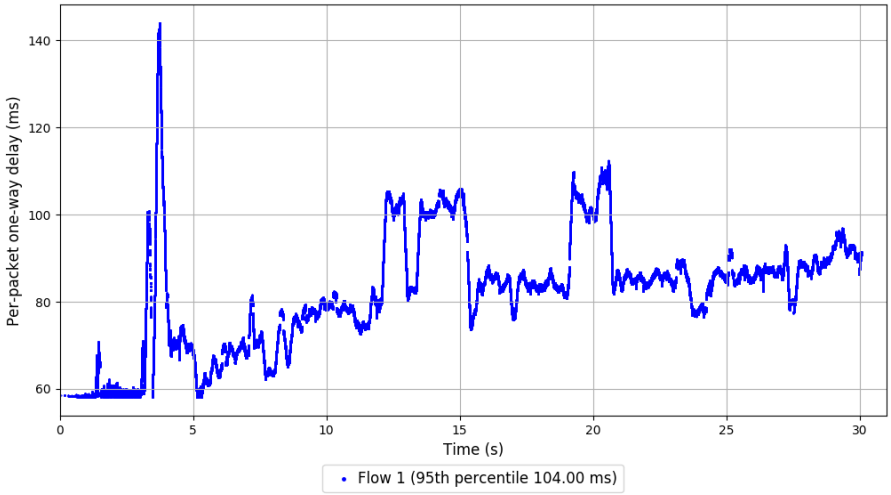
```
Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 05:48:57
End at: 2018-08-31 05:49:27
Local clock offset: 18.512 ms
Remote clock offset: 12.754 ms

# Below is generated by plot.py at 2018-08-31 06:07:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 649.39 Mbit/s
95th percentile per-packet one-way delay: 103.995 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 649.39 Mbit/s
95th percentile per-packet one-way delay: 103.995 ms
Loss rate: 0.12%
```

Run 1: Report of TCP Cubic — Data Link



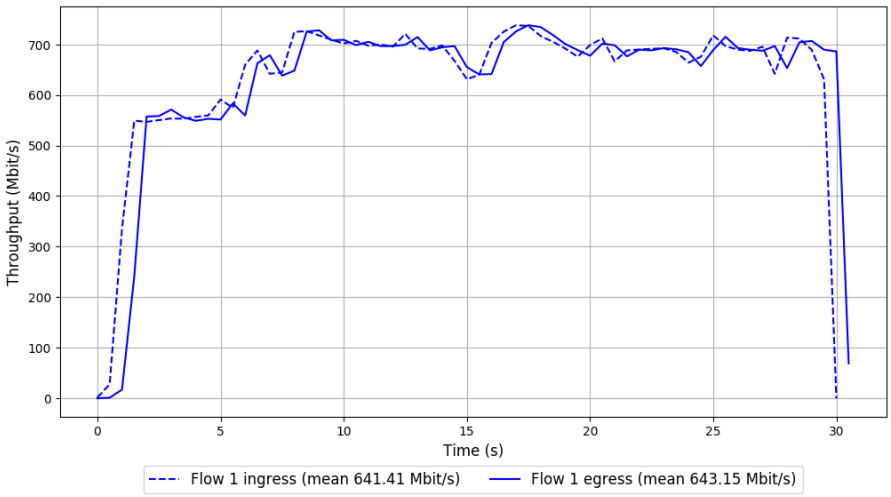


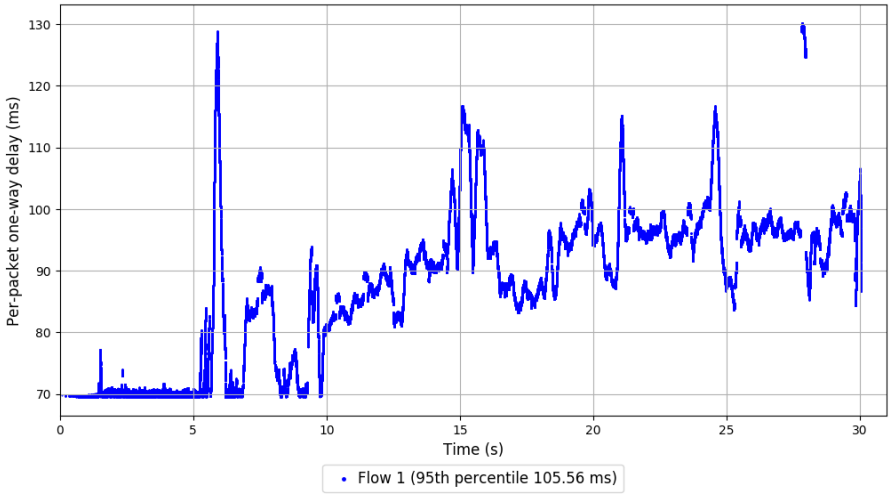
```
Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 05:54:40
End at: 2018-08-31 05:55:10
Local clock offset: 20.961 ms
Remote clock offset: 20.666 ms

# Below is generated by plot.py at 2018-08-31 06:07:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 643.15 Mbit/s
95th percentile per-packet one-way delay: 105.558 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 643.15 Mbit/s
95th percentile per-packet one-way delay: 105.558 ms
Loss rate: 0.03%
```

Run 2: Report of TCP Cubic — Data Link



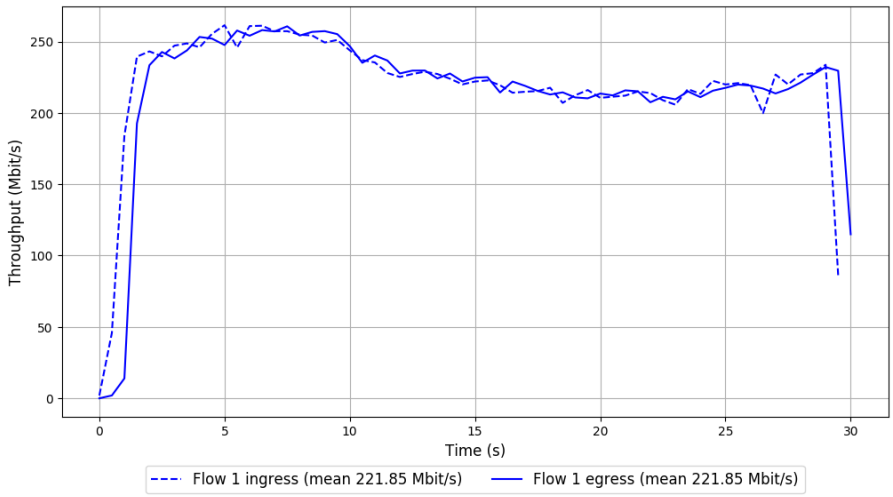


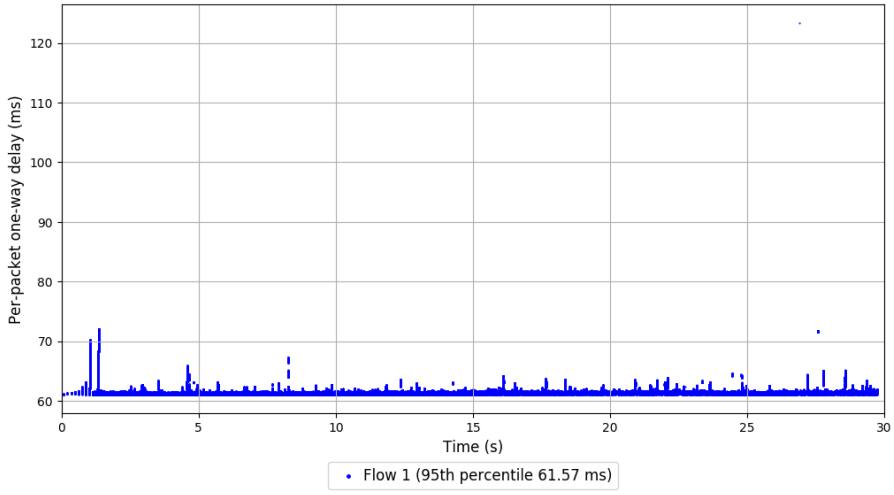
```
Run 1: Statistics of Indigo

Start at: 2018-08-31 05:53:15
End at: 2018-08-31 05:53:45
Local clock offset: 20.232 ms
Remote clock offset: 17.21 ms

# Below is generated by plot.py at 2018-08-31 06:07:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 221.85 Mbit/s
95th percentile per-packet one-way delay: 61.574 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 221.85 Mbit/s
95th percentile per-packet one-way delay: 61.574 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



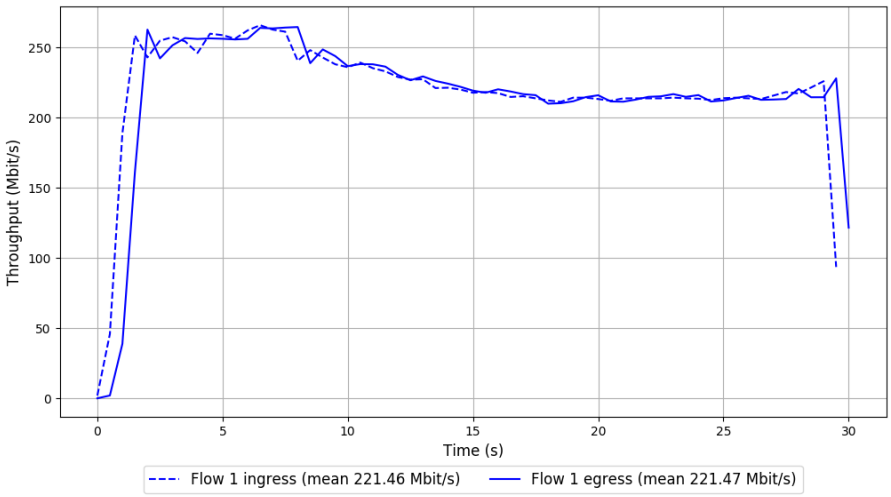


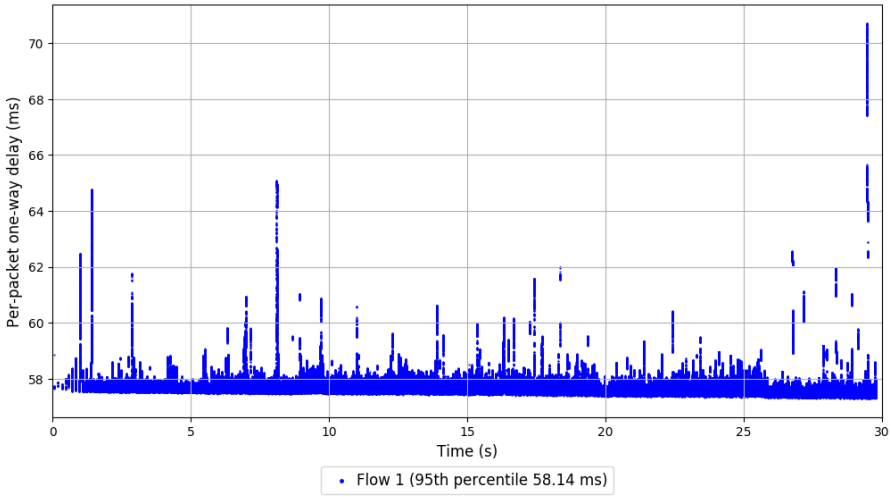
```
Run 2: Statistics of Indigo

Start at: 2018-08-31 05:58:58
End at: 2018-08-31 05:59:28
Local clock offset: 21.898 ms
Remote clock offset: 15.151 ms

# Below is generated by plot.py at 2018-08-31 06:07:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 221.47 Mbit/s
95th percentile per-packet one-way delay: 58.141 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 221.47 Mbit/s
95th percentile per-packet one-way delay: 58.141 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo — Data Link

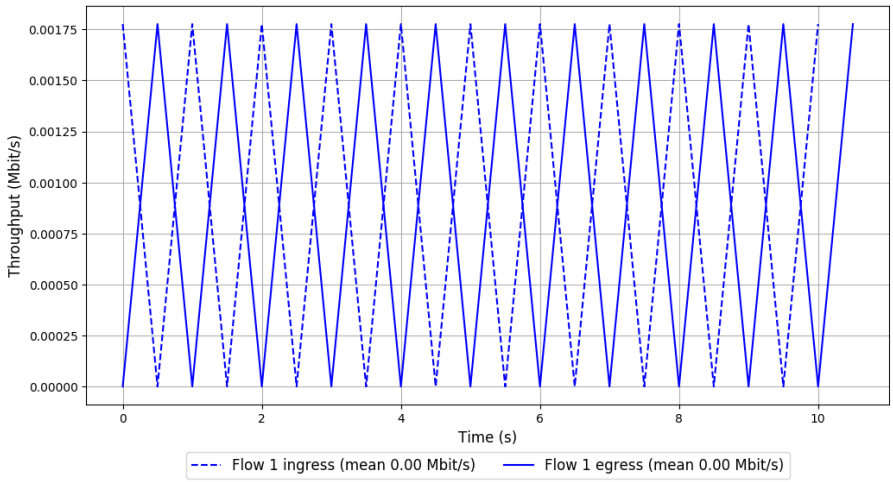


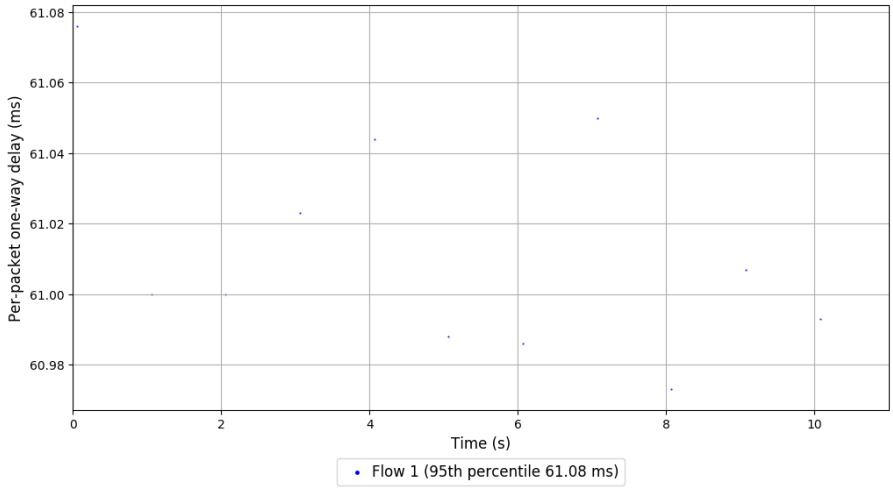


```
Run 1: Statistics of Muses-25

Start at: 2018-08-31 05:50:34
End at: 2018-08-31 05:51:04
Local clock offset: 19.12 ms
Remote clock offset: 16.133 ms
```

Run 1: Report of Muses-25 — Data Link





```
Run 2: Statistics of Muses-25

Start at: 2018-08-31 05:56:16
End at: 2018-08-31 05:56:46
Local clock offset: 21.747 ms
Remote clock offset: 18.385 ms
```

Run 2: Report of Muses-25 — Data Link