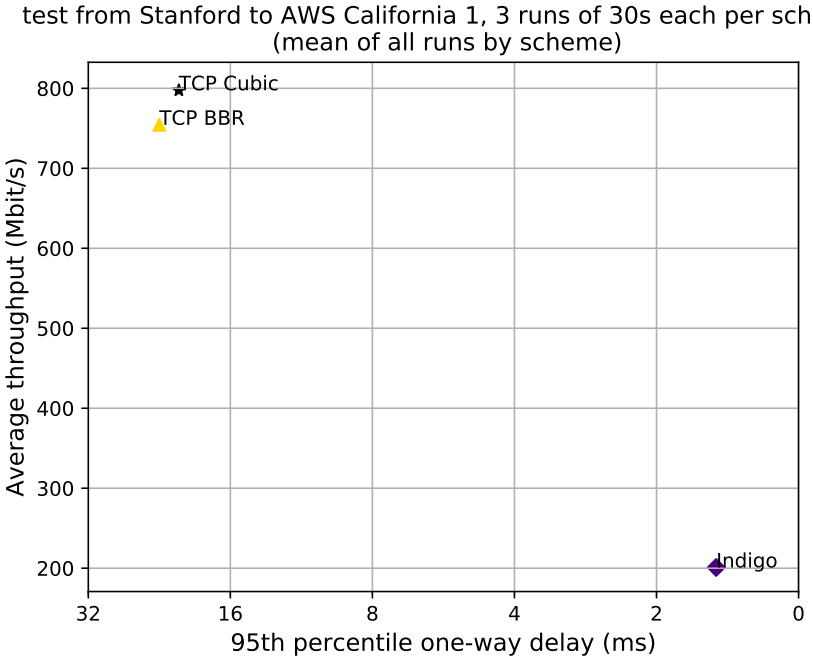
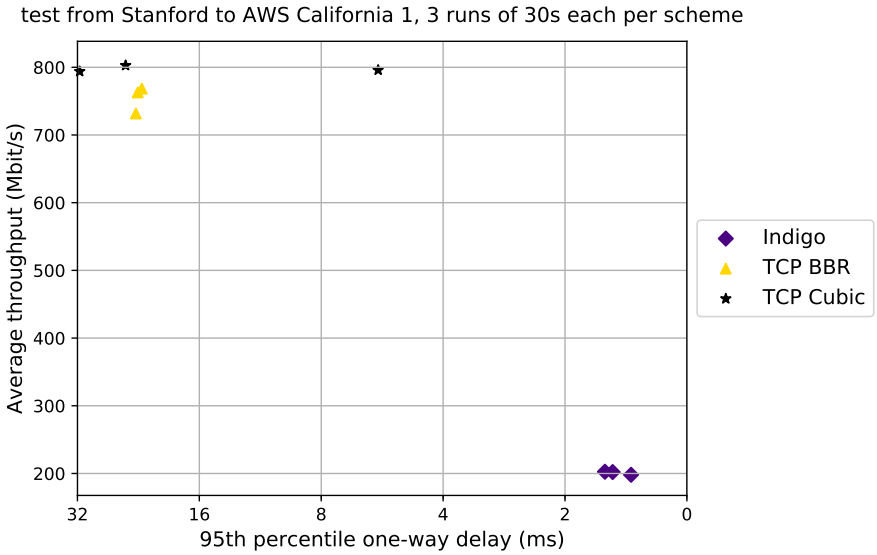
Pantheon Report

Generated at 2018-08-31 05:36:20 (UTC).
Data path: Stanford on `eno1` (*remote*) →AWS California 1 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 `time.stanford.edu` 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 @ 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 Stanford to AWS California 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)
TCP Cubic
TCP BBR
Indigo
Average throughput (Mbit/s)
800
700
600
500
400
300
200
32
16
8
4
2
0
95th percentile one-way delay (ms)


test from Stanford to AWS California 1, 3 runs of 30s each per scheme
Average throughput (Mbit/s)
800
700
600
500
400
300
200
32
16
8
4
2
0
95th percentile one-way delay (ms)
Indigo
TCP BBR
TCP Cubic

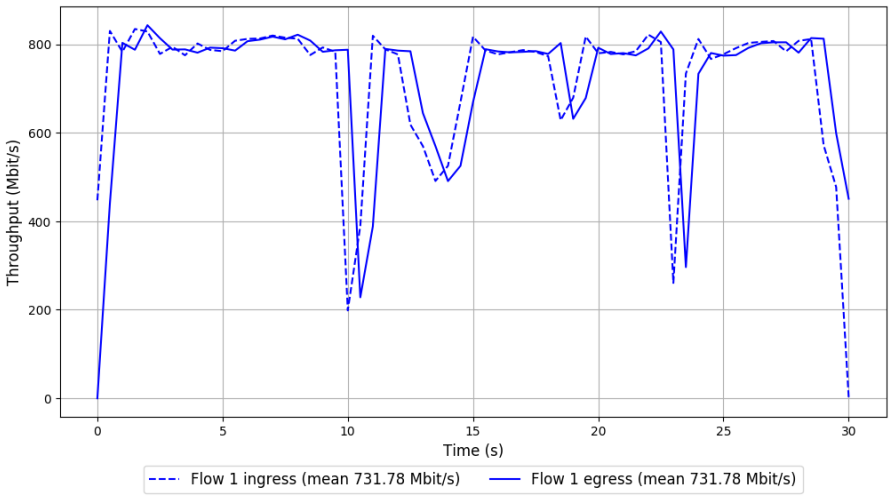
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	754.35	22.62	0.11
TCP Cubic	3	797.54	20.57	0.09
Indigo	3	200.90	1.16	0.07
Muses-25	0	N/A	N/A	N/A

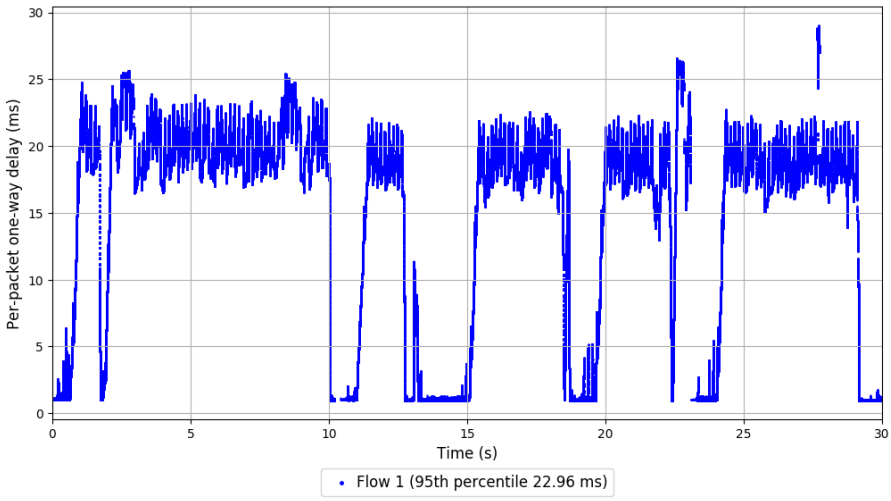
```
Run 1: Statistics of TCP BBR

Start at: 2018-08-31 05:12:42
End at: 2018-08-31 05:13:12
Local clock offset: 3.688 ms
Remote clock offset: 3.498 ms

# Below is generated by plot.py at 2018-08-31 05:35:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 731.78 Mbit/s
95th percentile per-packet one-way delay: 22.959 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 731.78 Mbit/s
95th percentile per-packet one-way delay: 22.959 ms
Loss rate: 0.07%
```

Run 1: Report of TCP BBR — Data Link



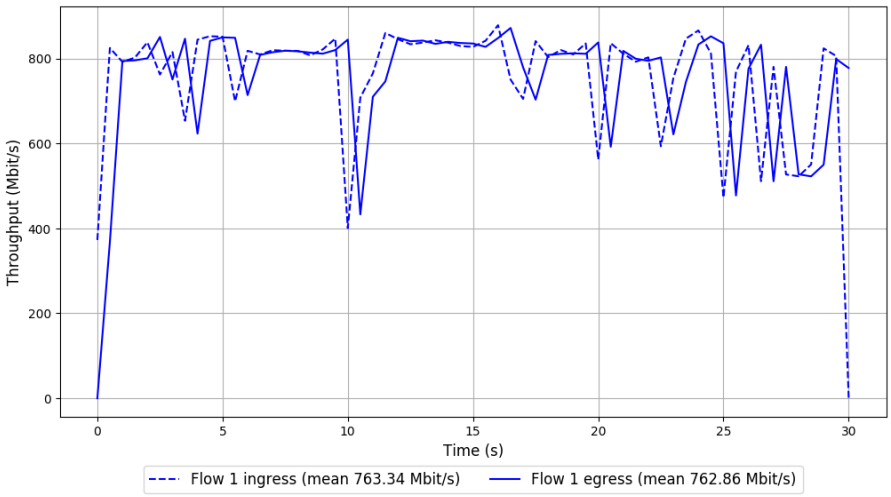


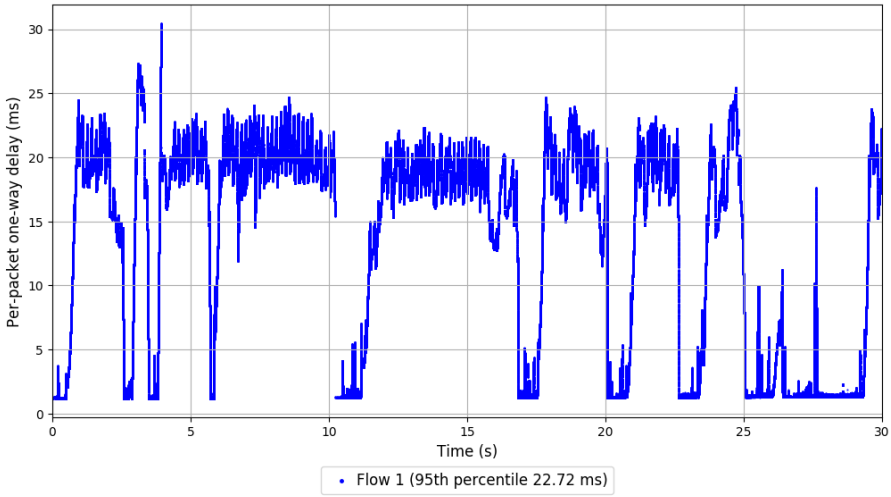
```
Run 2: Statistics of TCP BBR

Start at: 2018-08-31 05:18:48
End at: 2018-08-31 05:19:18
Local clock offset: 3.447 ms
Remote clock offset: 3.591 ms

# Below is generated by plot.py at 2018-08-31 05:36:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 762.86 Mbit/s
95th percentile per-packet one-way delay: 22.718 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 762.86 Mbit/s
95th percentile per-packet one-way delay: 22.718 ms
Loss rate: 0.12%
```

Run 2: Report of TCP BBR — Data Link



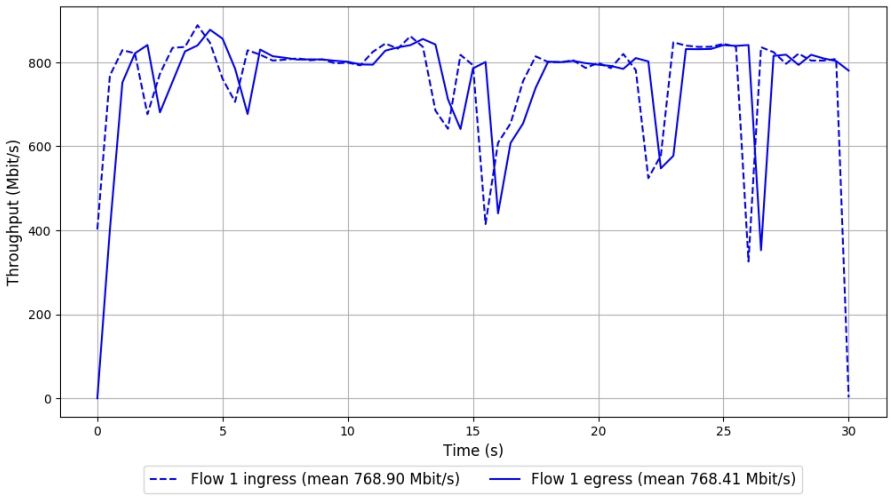


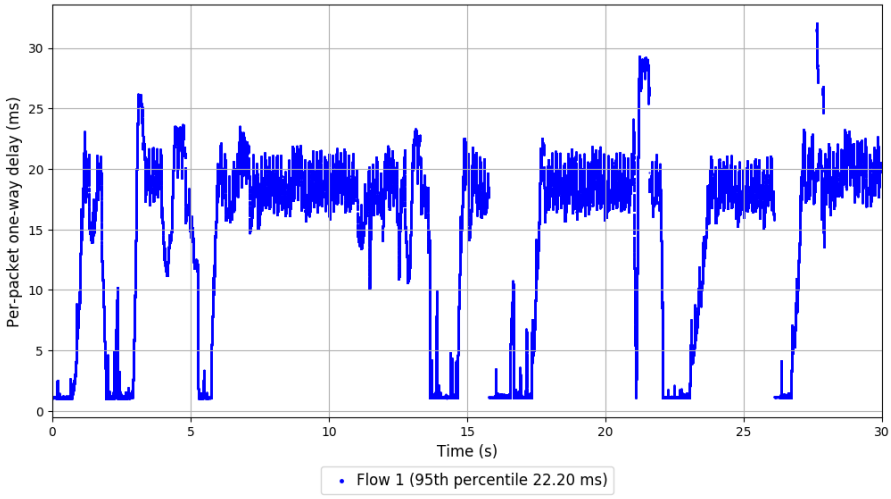
```
Run 3: Statistics of TCP BBR

Start at: 2018-08-31 05:24:55
End at: 2018-08-31 05:25:25
Local clock offset: 2.462 ms
Remote clock offset: 3.808 ms

# Below is generated by plot.py at 2018-08-31 05:36:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 768.41 Mbit/s
95th percentile per-packet one-way delay: 22.195 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 768.41 Mbit/s
95th percentile per-packet one-way delay: 22.195 ms
Loss rate: 0.13%
```

Run 3: Report of TCP BBR — Data Link



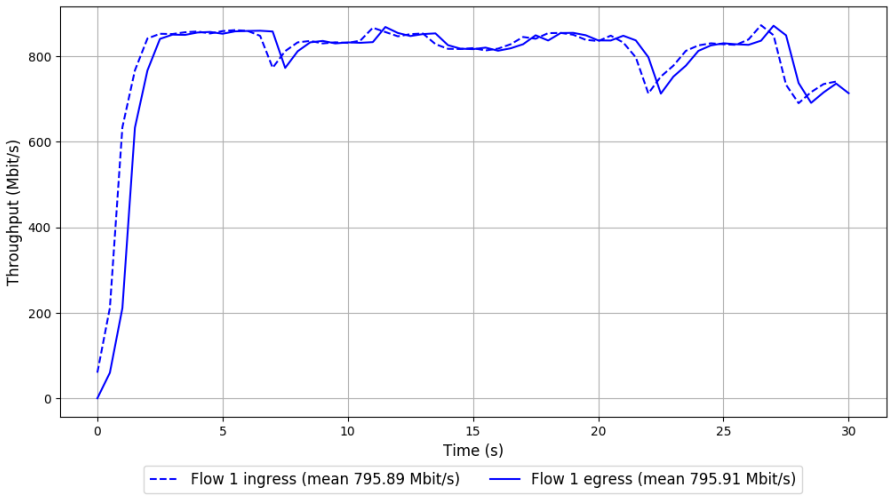


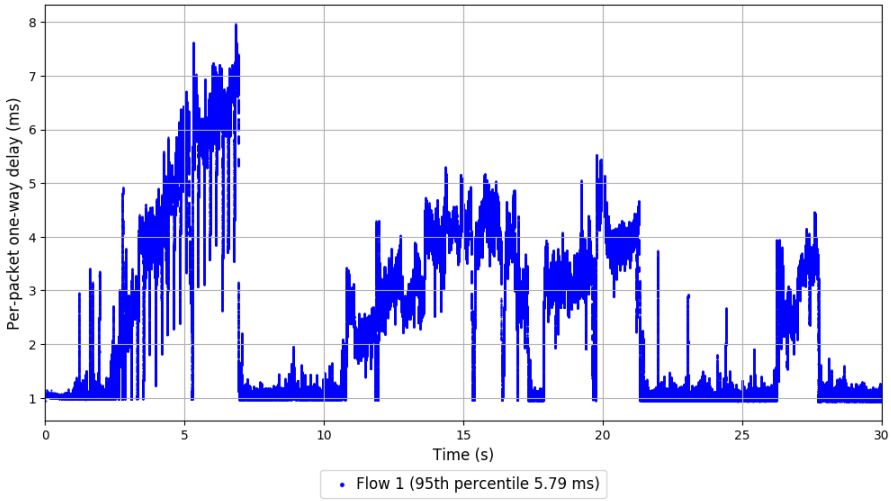
```
Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 05:14:23
End at: 2018-08-31 05:14:53
Local clock offset: 3.864 ms
Remote clock offset: 3.525 ms

# Below is generated by plot.py at 2018-08-31 05:36:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 795.91 Mbit/s
95th percentile per-packet one-way delay: 5.787 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 795.91 Mbit/s
95th percentile per-packet one-way delay: 5.787 ms
Loss rate: 0.06%
```

Run 1: Report of TCP Cubic — Data Link



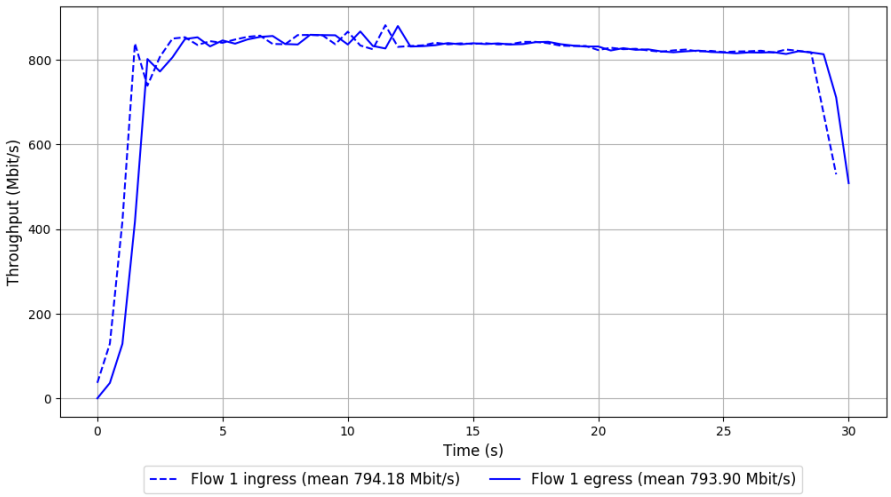


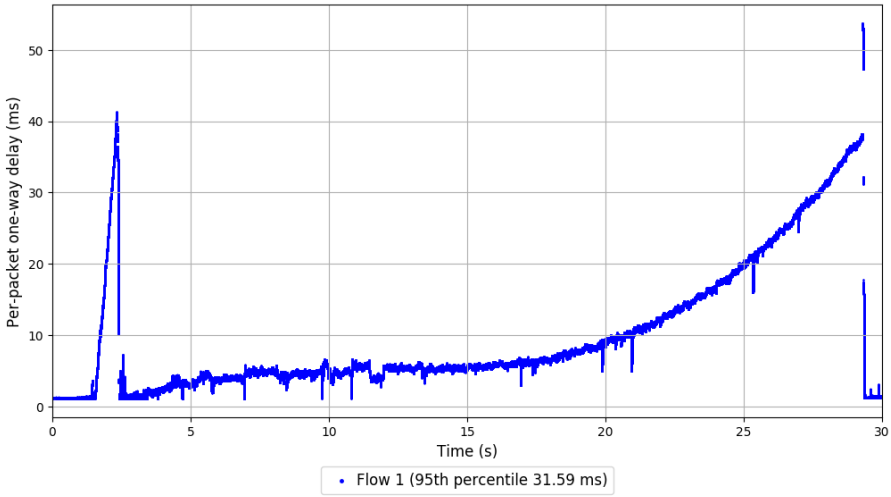
```
Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 05:20:30
End at: 2018-08-31 05:21:00
Local clock offset: 3.07 ms
Remote clock offset: 3.658 ms

# Below is generated by plot.py at 2018-08-31 05:36:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 793.90 Mbit/s
95th percentile per-packet one-way delay: 31.595 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 793.90 Mbit/s
95th percentile per-packet one-way delay: 31.595 ms
Loss rate: 0.10%
```

Run 2: Report of TCP Cubic — Data Link



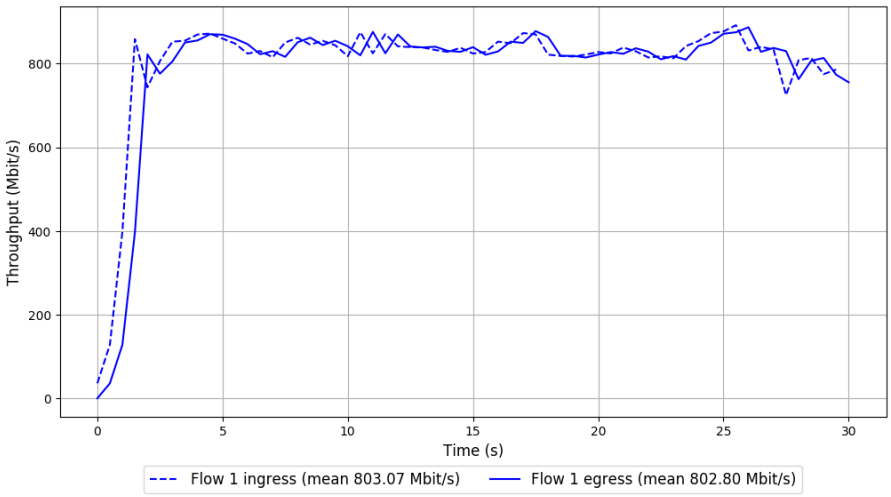


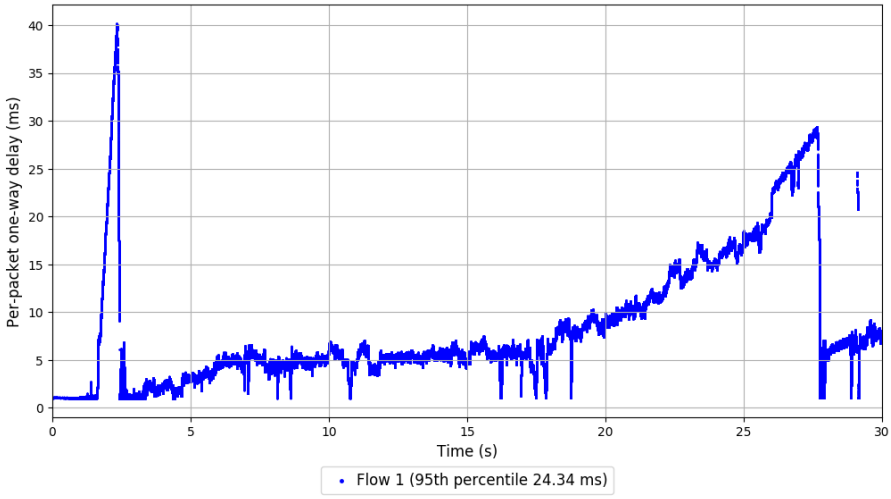
```
Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 05:26:37
End at: 2018-08-31 05:27:07
Local clock offset: 2.238 ms
Remote clock offset: 3.807 ms

# Below is generated by plot.py at 2018-08-31 05:36:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 802.80 Mbit/s
95th percentile per-packet one-way delay: 24.335 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 802.80 Mbit/s
95th percentile per-packet one-way delay: 24.335 ms
Loss rate: 0.10%
```

Run 3: Report of TCP Cubic — Data Link



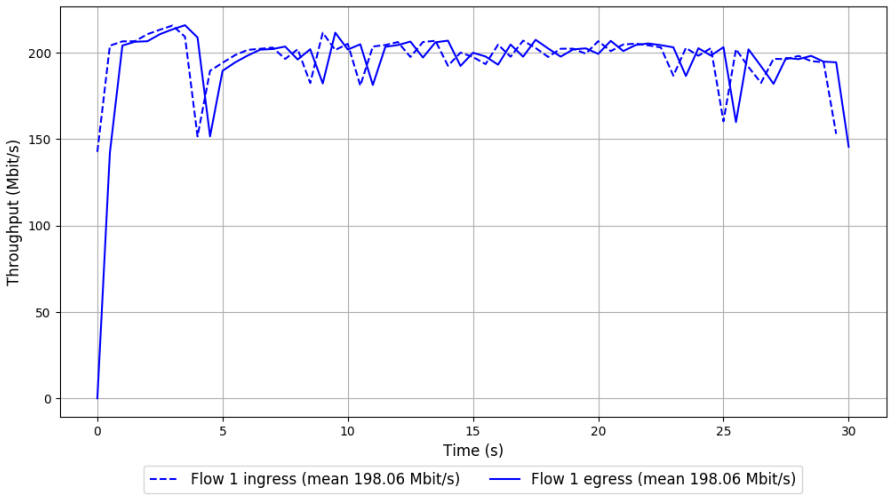


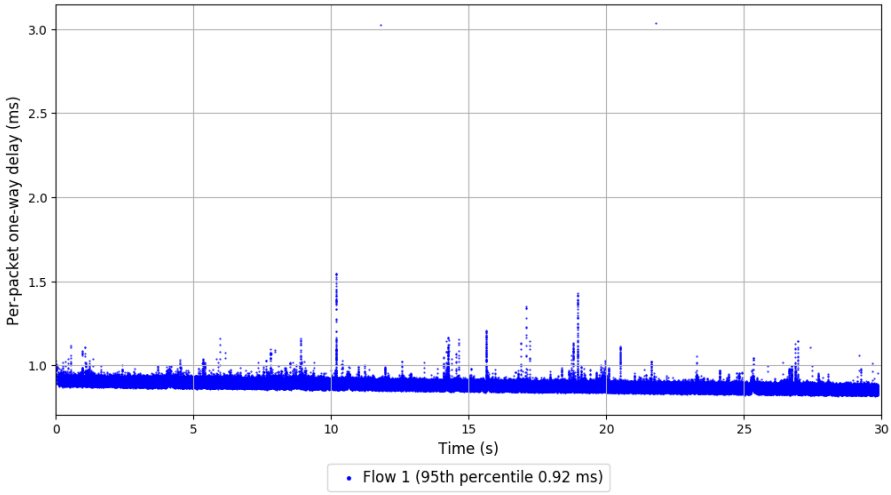
```
Run 1: Statistics of Indigo

Start at: 2018-08-31 05:11:17
End at: 2018-08-31 05:11:47
Local clock offset: 3.408 ms
Remote clock offset: 3.474 ms

# Below is generated by plot.py at 2018-08-31 05:36:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 198.06 Mbit/s
95th percentile per-packet one-way delay: 0.916 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 198.06 Mbit/s
95th percentile per-packet one-way delay: 0.916 ms
Loss rate: 0.07%
```

Run 1: Report of Indigo — Data Link



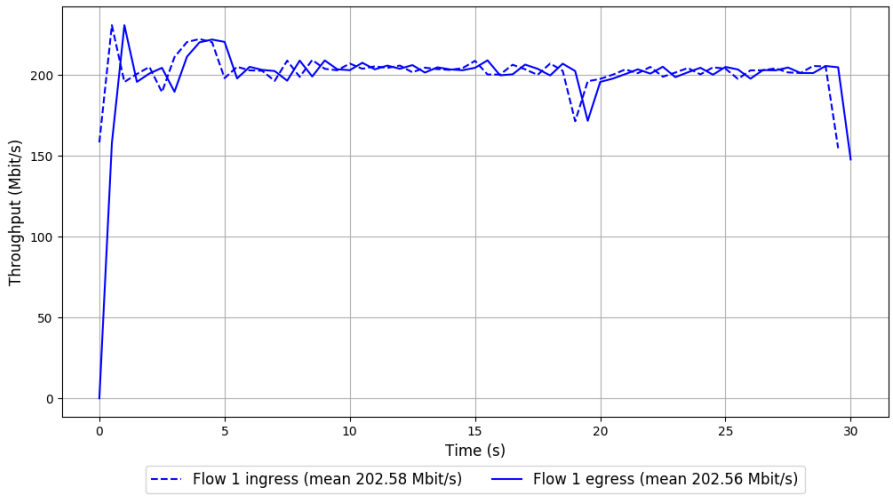


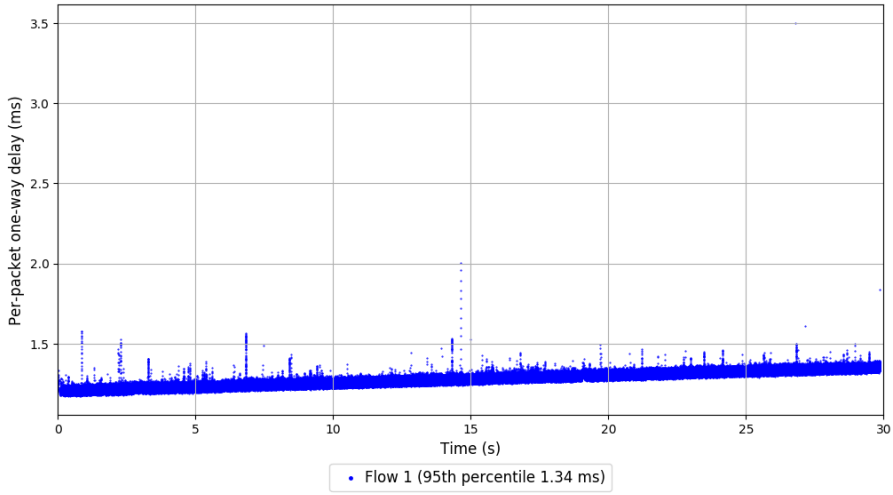
```
Run 2: Statistics of Indigo

Start at: 2018-08-31 05:17:23
End at: 2018-08-31 05:17:53
Local clock offset: 3.898 ms
Remote clock offset: 3.649 ms

# Below is generated by plot.py at 2018-08-31 05:36:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 202.56 Mbit/s
95th percentile per-packet one-way delay: 1.345 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 202.56 Mbit/s
95th percentile per-packet one-way delay: 1.345 ms
Loss rate: 0.06%
```

Run 2: Report of Indigo — Data Link



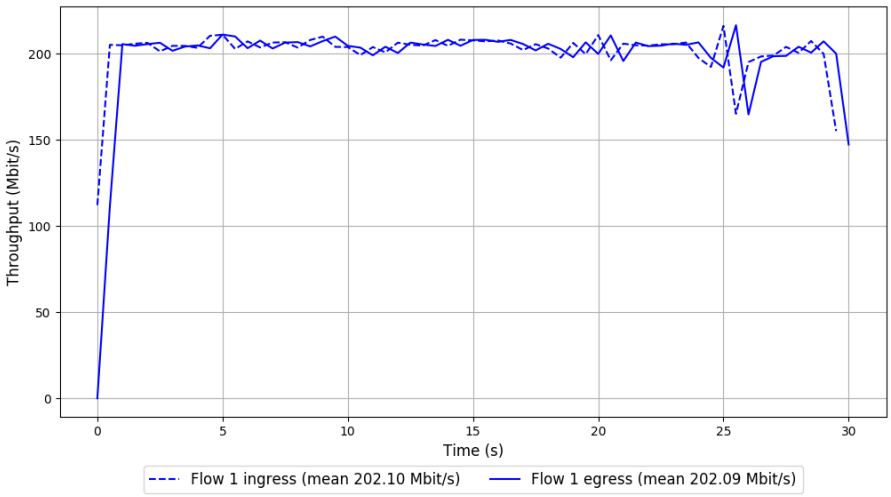


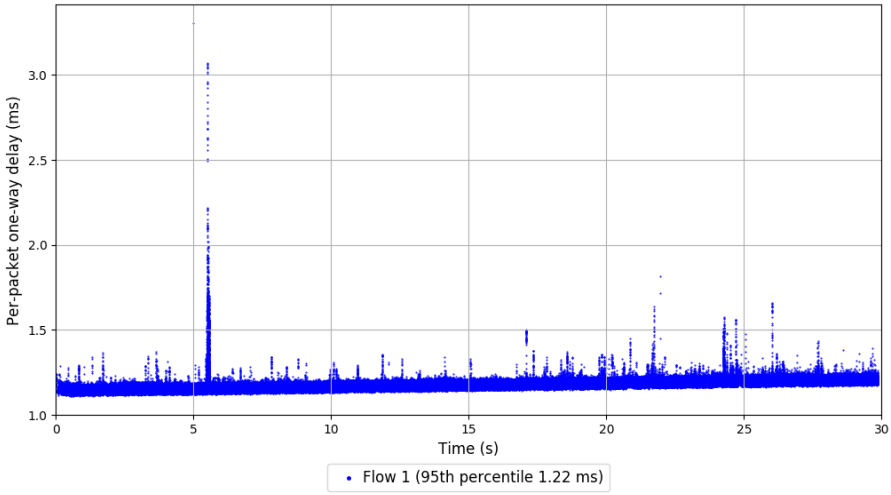
```
Run 3: Statistics of Indigo

Start at: 2018-08-31 05:23:29
End at: 2018-08-31 05:24:00
Local clock offset: 2.605 ms
Remote clock offset: 3.714 ms

# Below is generated by plot.py at 2018-08-31 05:36:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 202.09 Mbit/s
95th percentile per-packet one-way delay: 1.218 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 202.09 Mbit/s
95th percentile per-packet one-way delay: 1.218 ms
Loss rate: 0.07%
```

Run 3: Report of Indigo — Data Link

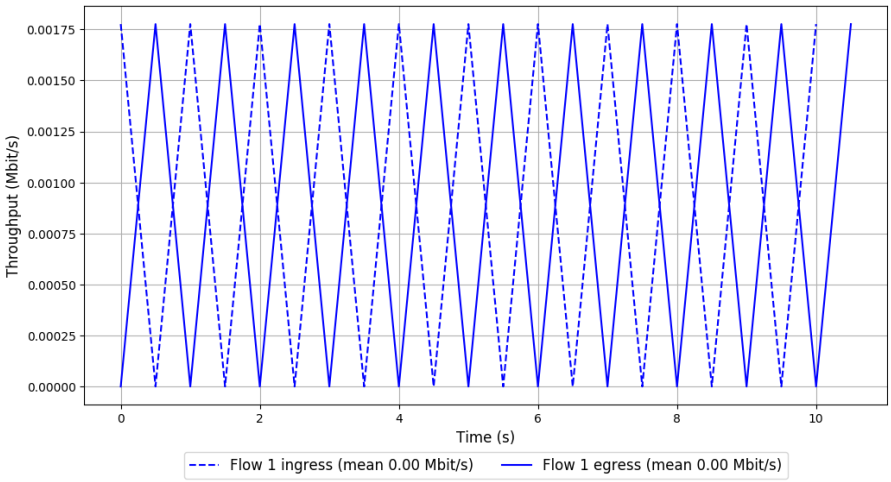


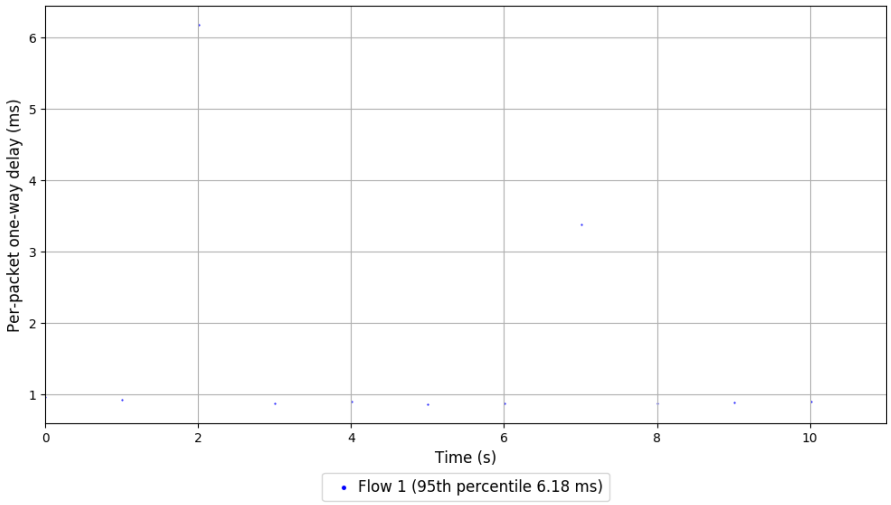


```
Run 1: Statistics of Muses-25

Start at: 2018-08-31 05:10:00
End at: 2018-08-31 05:10:30
Local clock offset: 3.28 ms
Remote clock offset: 3.482 ms
```

Run 1: Report of Muses-25 — Data Link

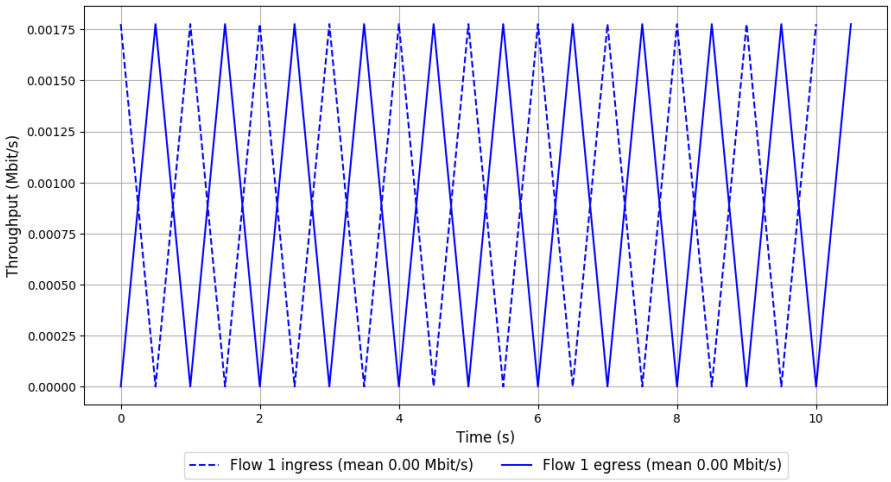


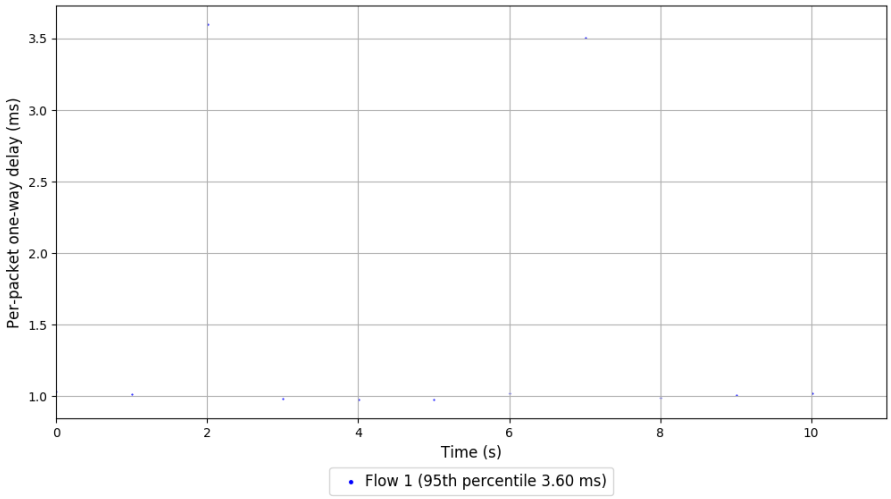


```
Run 2: Statistics of Muses-25

Start at: 2018-08-31 05:16:05
End at: 2018-08-31 05:16:35
Local clock offset: 4.012 ms
Remote clock offset: 3.567 ms
```

Run 2: Report of Muses-25 — Data Link





```
Run 3: Statistics of Muses-25

Start at: 2018-08-31 05:22:12
End at: 2018-08-31 05:22:42
Local clock offset: 2.765 ms
Remote clock offset: 3.651 ms
```

Run 3: Report of Muses-25 — Data Link