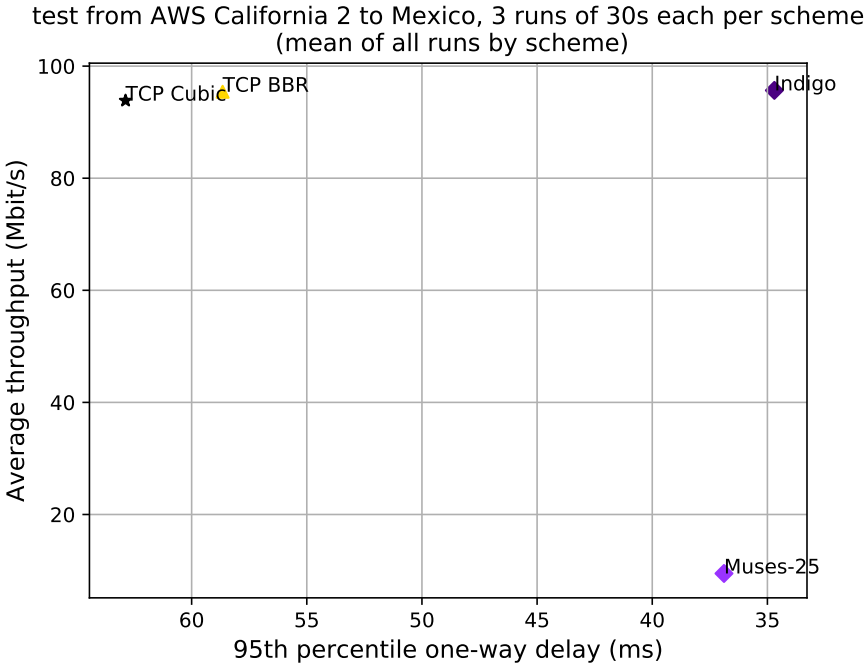
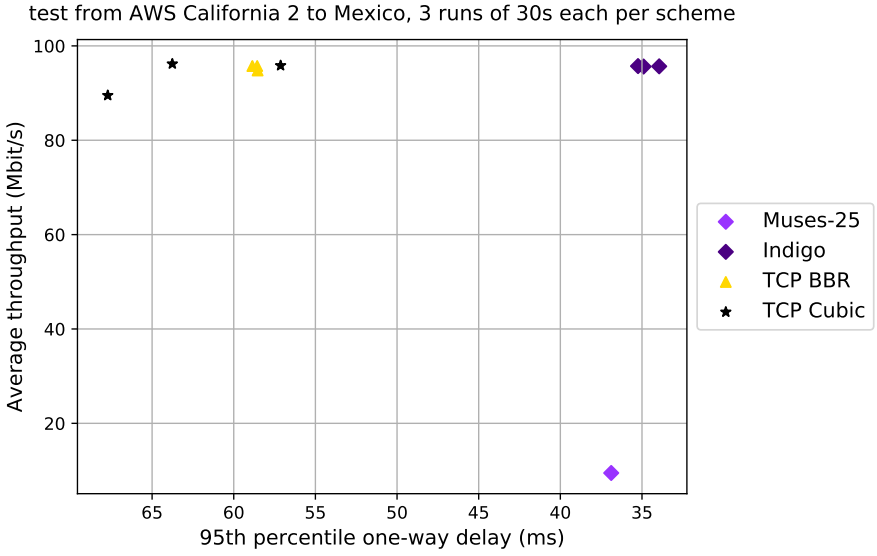
Pantheon Report

Generated at 2018-08-31 07:22:58 (UTC).
Data path: AWS California 2 on `ens5` (*local*) →Mexico on `em1` (*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 `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 @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
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 AWS California 2 to Mexico, 3 runs of 30s each per scheme
(mean of all runs by scheme)
TCP Cubic
TCP BBR
Indigo
Muses-25
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
100
80
60
40
20
60
55
50
45
40
35


test from AWS California 2 to Mexico, 3 runs of 30s each per scheme
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
Muses-25
Indigo
TCP BBR
TCP Cubic
100
80
60
40
20
65
60
55
50
45
40
35

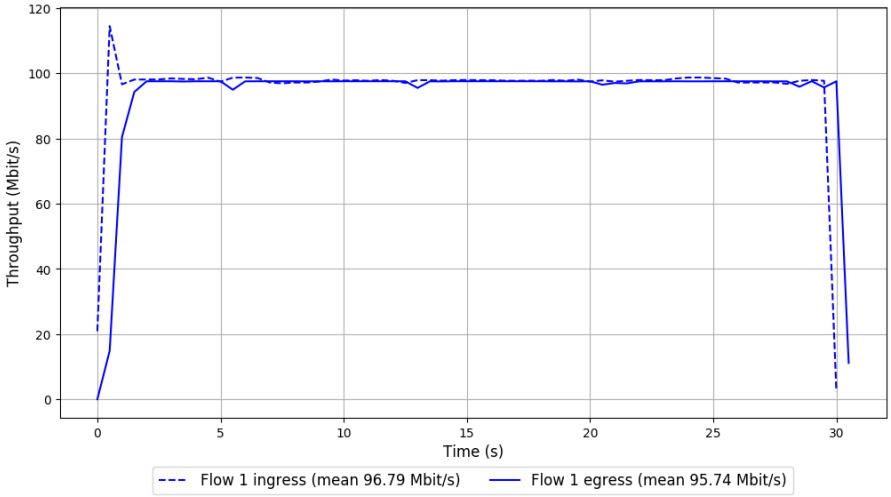
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	95.42	58.65	1.03
TCP Cubic	3	93.84	62.87	0.48
Indigo	3	95.67	34.70	0.01
Muses-25	1	9.48	36.88	52.00

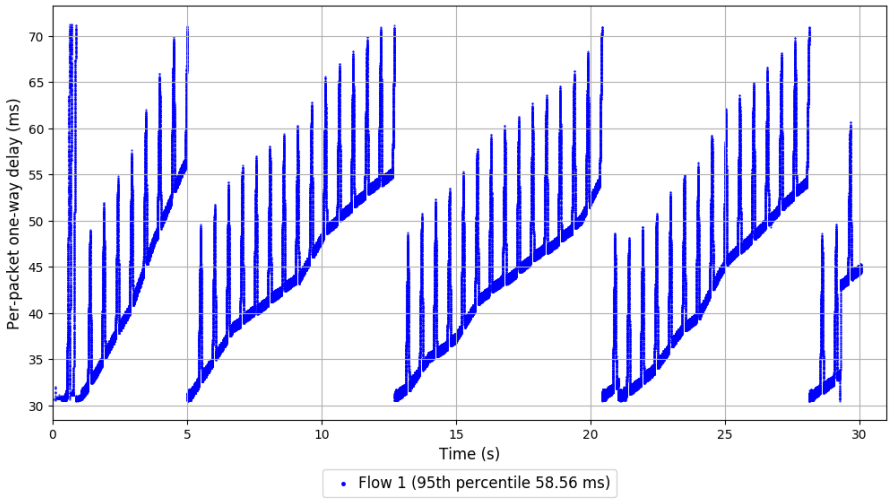
```
Run 1: Statistics of TCP BBR

Start at: 2018-08-31 07:10:32
End at: 2018-08-31 07:11:02
Local clock offset: -20.565 ms
Remote clock offset: -2.164 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.74 Mbit/s
95th percentile per-packet one-way delay: 58.564 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 95.74 Mbit/s
95th percentile per-packet one-way delay: 58.564 ms
Loss rate: 1.04%
```

Run 1: Report of TCP BBR — Data Link



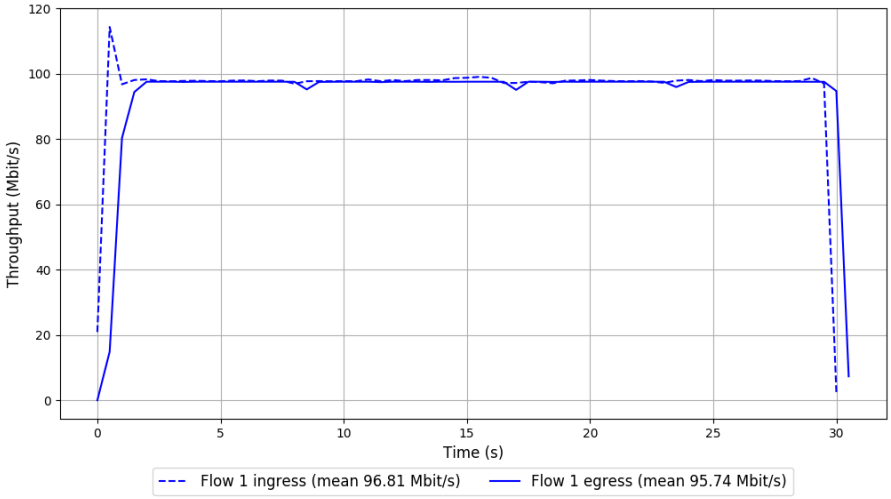


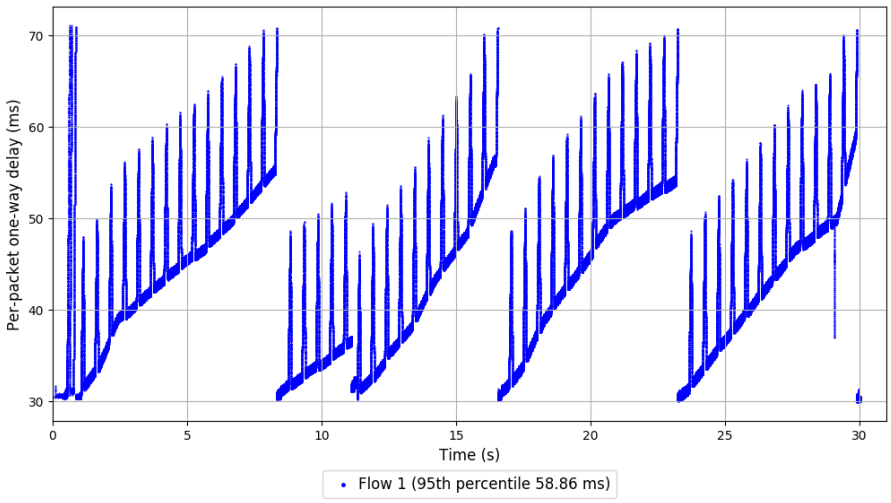
```
Run 2: Statistics of TCP BBR

Start at: 2018-08-31 07:15:44
End at: 2018-08-31 07:16:14
Local clock offset: -22.911 ms
Remote clock offset: -2.027 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.74 Mbit/s
95th percentile per-packet one-way delay: 58.860 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 95.74 Mbit/s
95th percentile per-packet one-way delay: 58.860 ms
Loss rate: 1.11%
```

Run 2: Report of TCP BBR — Data Link



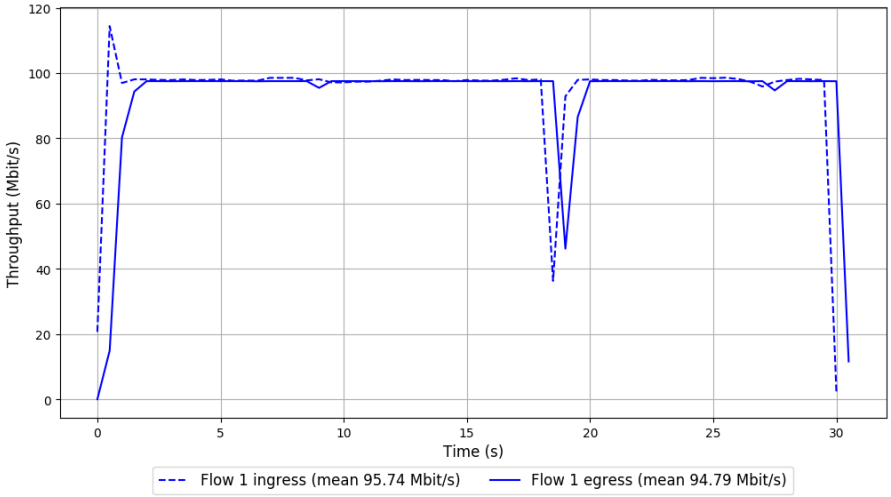


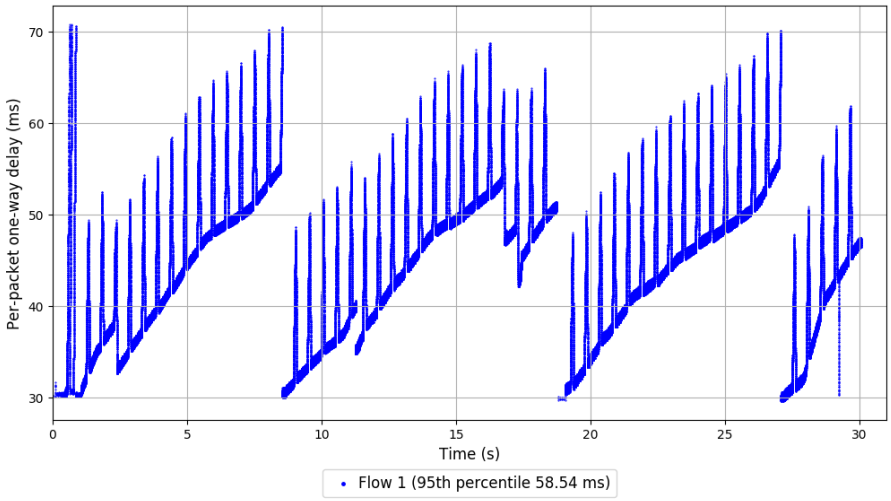
```
Run 3: Statistics of TCP BBR

Start at: 2018-08-31 07:20:57
End at: 2018-08-31 07:21:27
Local clock offset: -27.828 ms
Remote clock offset: -1.997 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 94.79 Mbit/s
95th percentile per-packet one-way delay: 58.538 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 94.79 Mbit/s
95th percentile per-packet one-way delay: 58.538 ms
Loss rate: 0.93%
```

Run 3: Report of TCP BBR — Data Link



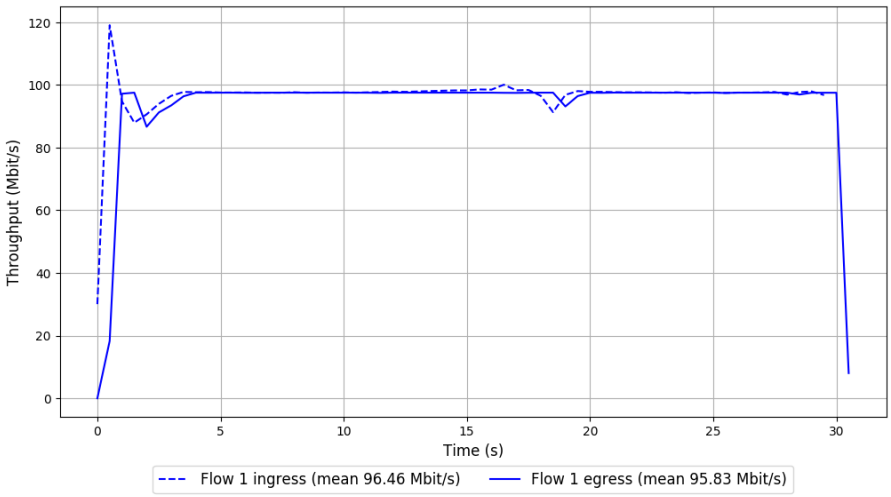


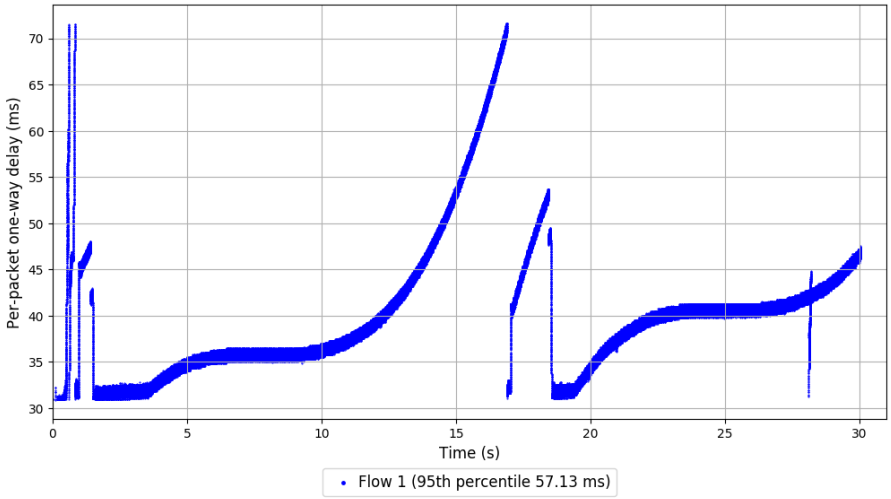
```
Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 07:07:58
End at: 2018-08-31 07:08:28
Local clock offset: -21.176 ms
Remote clock offset: -2.001 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.83 Mbit/s
95th percentile per-packet one-way delay: 57.131 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 95.83 Mbit/s
95th percentile per-packet one-way delay: 57.131 ms
Loss rate: 0.60%
```

Run 1: Report of TCP Cubic — Data Link



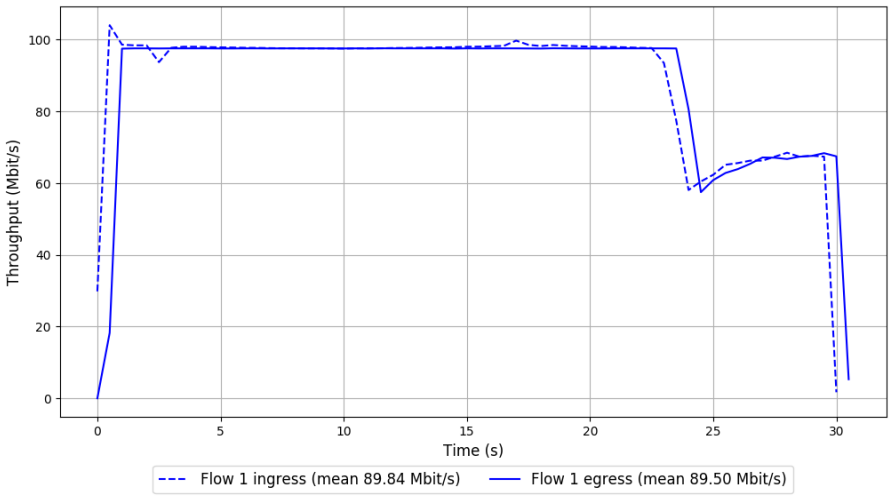


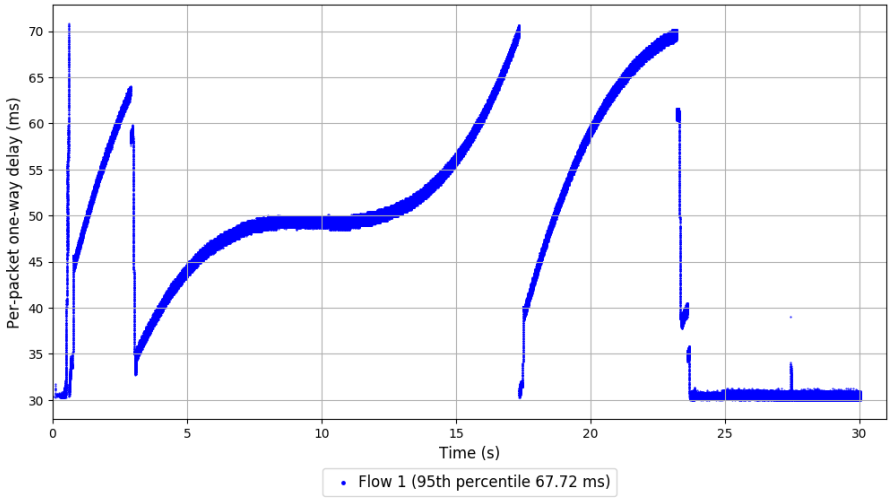
```
Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 07:13:11
End at: 2018-08-31 07:13:41
Local clock offset: -21.212 ms
Remote clock offset: -2.166 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 89.50 Mbit/s
95th percentile per-packet one-way delay: 67.717 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 89.50 Mbit/s
95th percentile per-packet one-way delay: 67.717 ms
Loss rate: 0.38%
```

Run 2: Report of TCP Cubic — Data Link



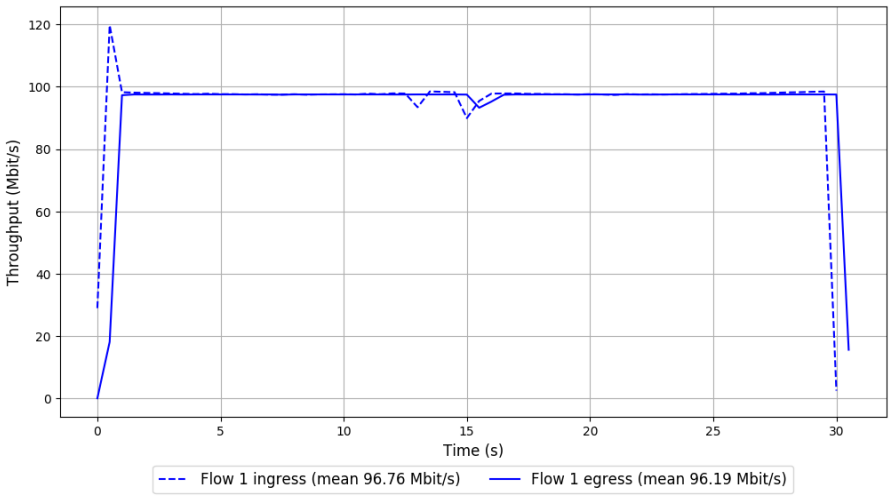


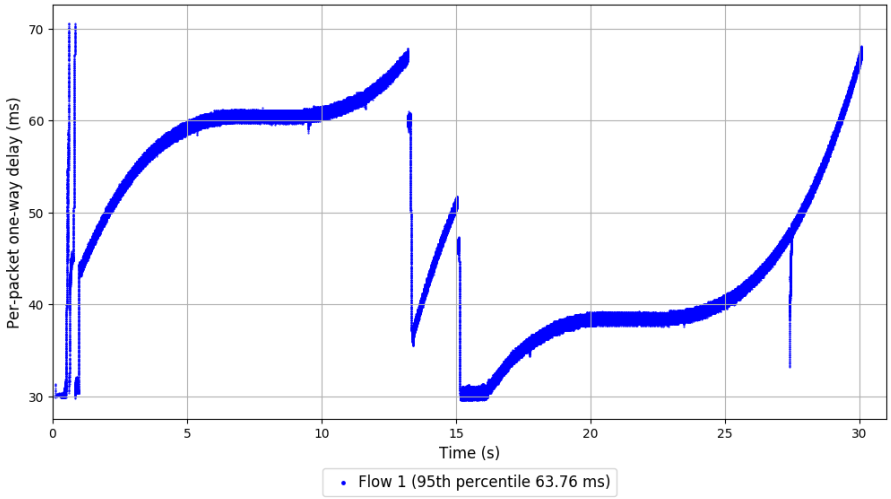
```
Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 07:18:23
End at: 2018-08-31 07:18:53
Local clock offset: -24.947 ms
Remote clock offset: -2.173 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 96.19 Mbit/s
95th percentile per-packet one-way delay: 63.761 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 96.19 Mbit/s
95th percentile per-packet one-way delay: 63.761 ms
Loss rate: 0.47%
```

Run 3: Report of TCP Cubic — Data Link



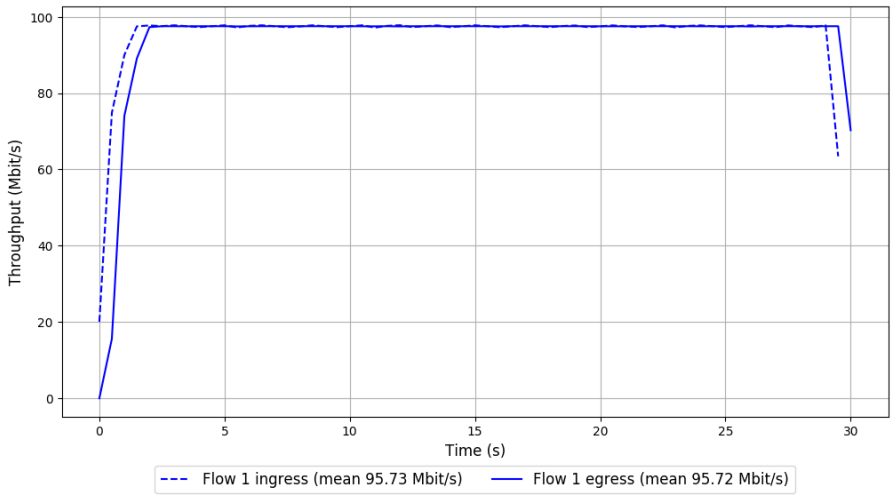


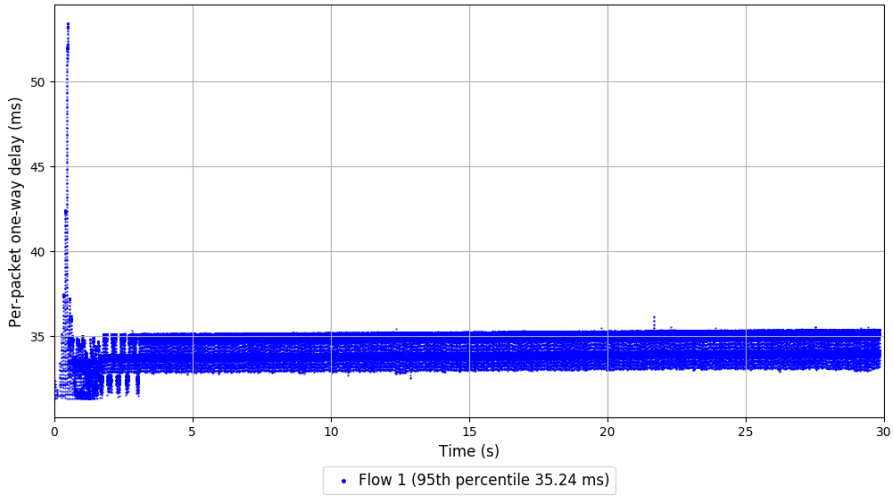
```
Run 1: Statistics of Indigo

Start at: 2018-08-31 07:06:38
End at: 2018-08-31 07:07:08
Local clock offset: -22.057 ms
Remote clock offset: -1.85 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.72 Mbit/s
95th percentile per-packet one-way delay: 35.243 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 95.72 Mbit/s
95th percentile per-packet one-way delay: 35.243 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link



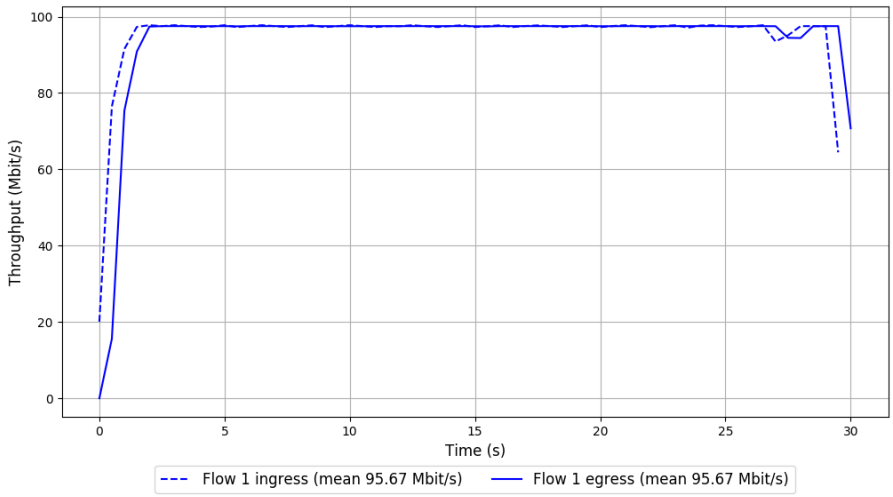


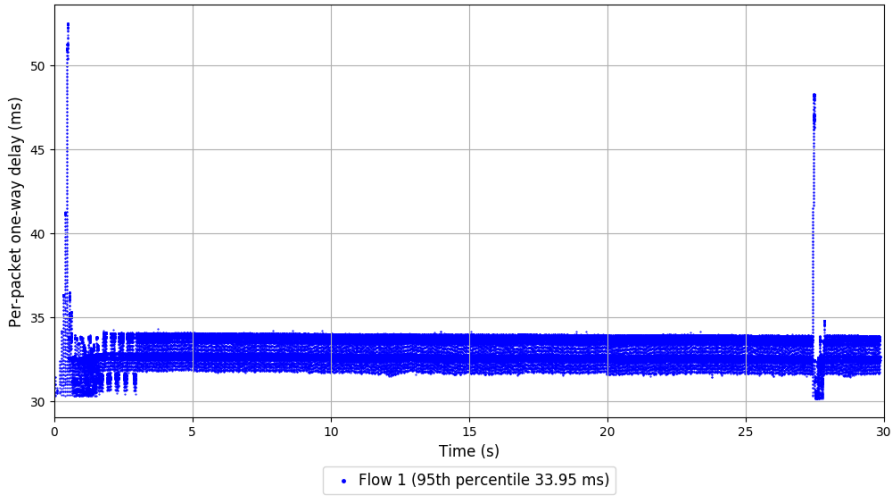
```
Run 2: Statistics of Indigo

Start at: 2018-08-31 07:11:50
End at: 2018-08-31 07:12:20
Local clock offset: -20.739 ms
Remote clock offset: -2.193 ms

# Below is generated by plot.py at 2018-08-31 07:22:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.67 Mbit/s
95th percentile per-packet one-way delay: 33.947 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 95.67 Mbit/s
95th percentile per-packet one-way delay: 33.947 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo — Data Link



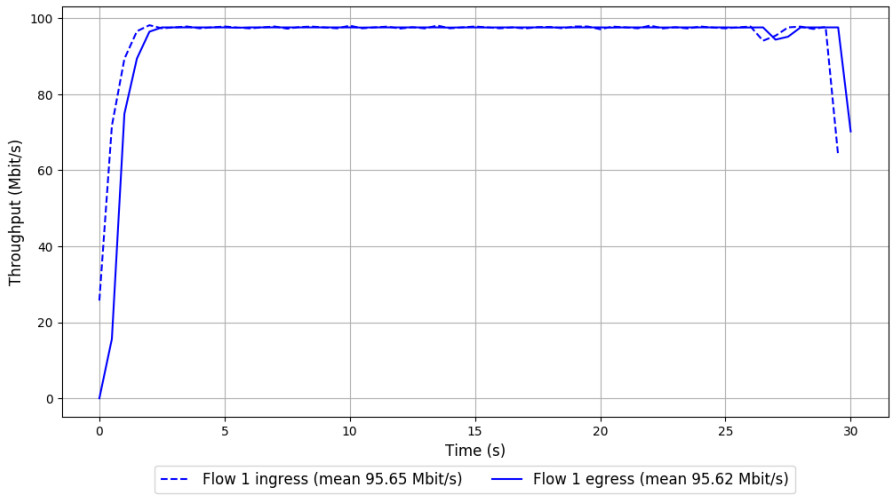


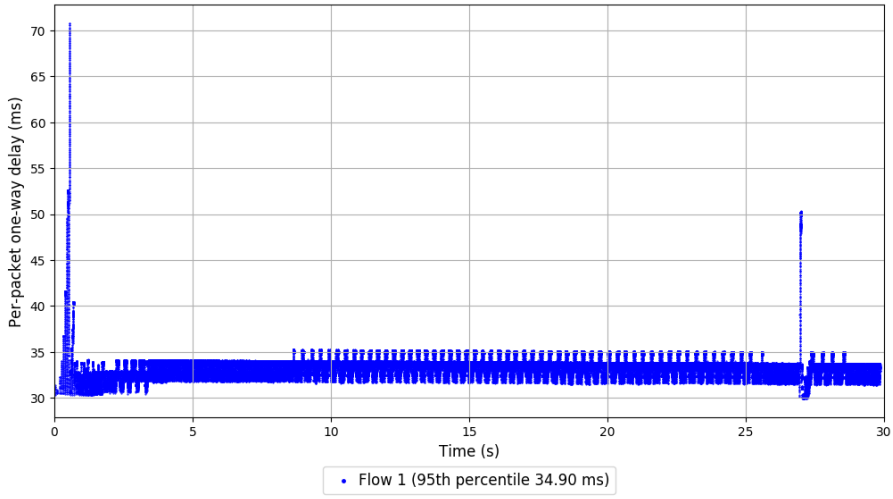
```
Run 3: Statistics of Indigo

Start at: 2018-08-31 07:17:03
End at: 2018-08-31 07:17:33
Local clock offset: -23.981 ms
Remote clock offset: -1.981 ms

# Below is generated by plot.py at 2018-08-31 07:22:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 95.62 Mbit/s
95th percentile per-packet one-way delay: 34.902 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 95.62 Mbit/s
95th percentile per-packet one-way delay: 34.902 ms
Loss rate: 0.02%
```

Run 3: Report of Indigo — Data Link

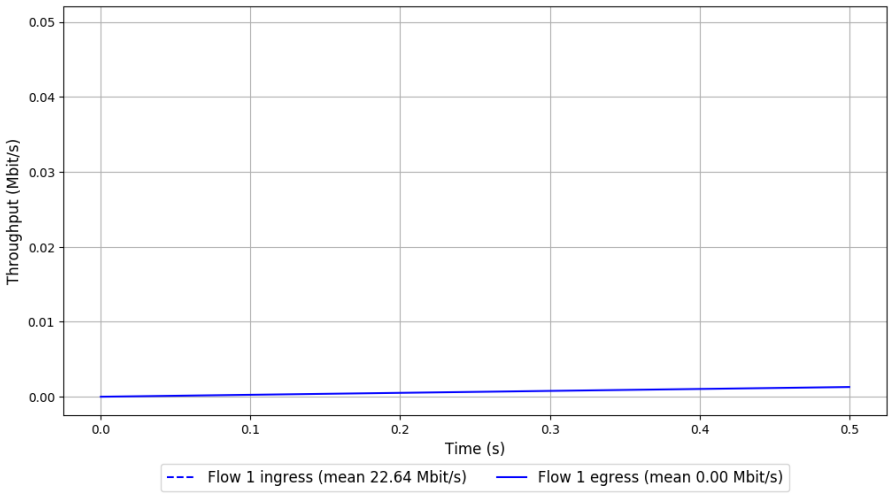


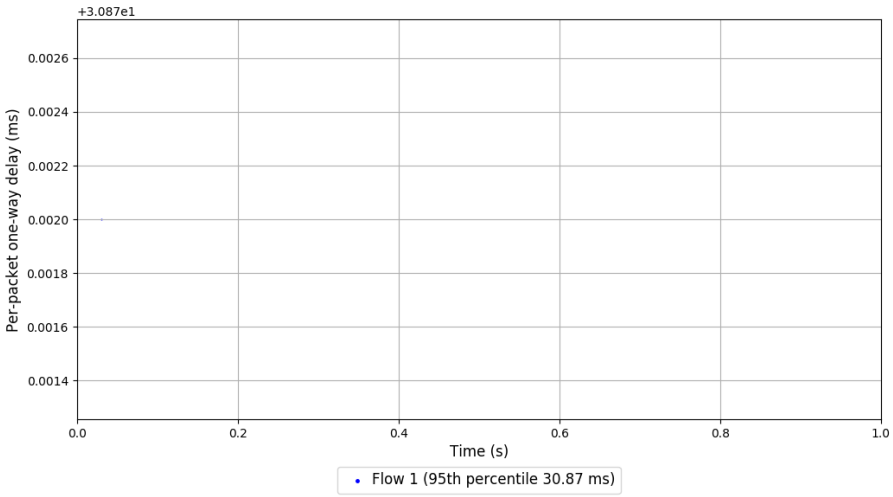


```
Run 1: Statistics of Muses-25

Start at: 2018-08-31 07:09:17
End at: 2018-08-31 07:09:47
Local clock offset: -20.739 ms
Remote clock offset: -1.988 ms
```

Run 1: Report of Muses-25 — Data Link



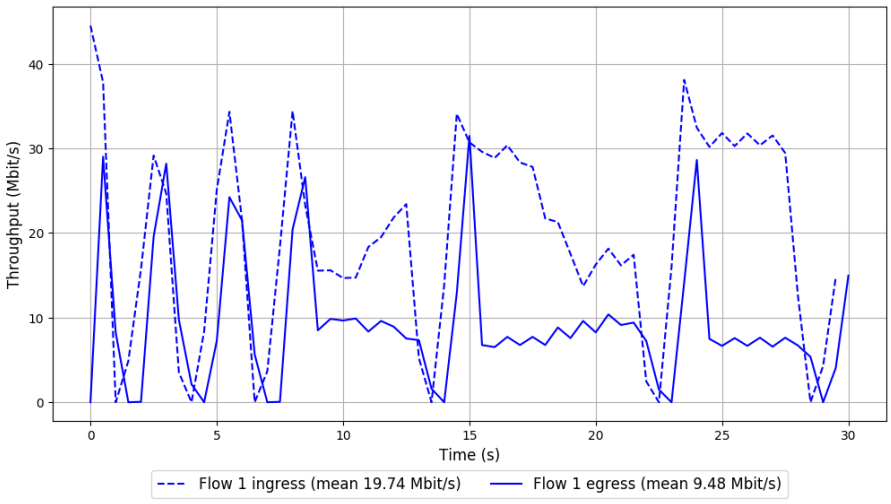


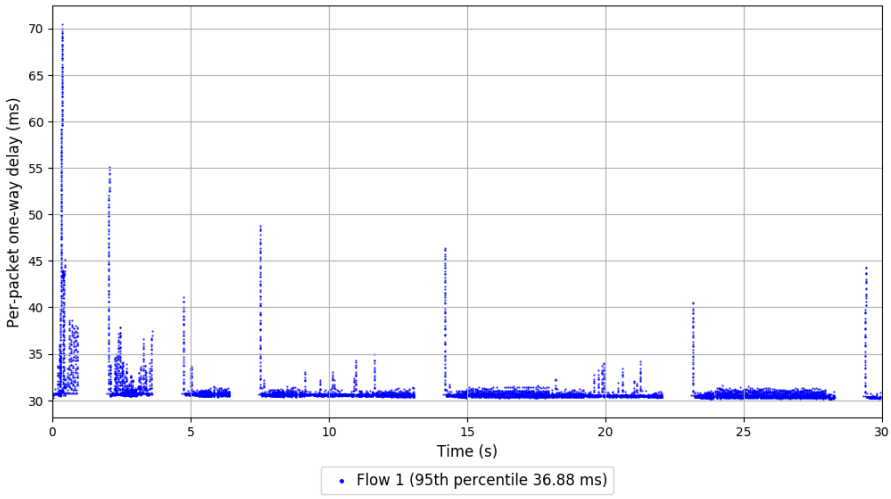
```
Run 2: Statistics of Muses-25

Start at: 2018-08-31 07:14:29
End at: 2018-08-31 07:14:59
Local clock offset: -21.855 ms
Remote clock offset: -1.986 ms

# Below is generated by plot.py at 2018-08-31 07:22:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.48 Mbit/s
95th percentile per-packet one-way delay: 36.885 ms
Loss rate: 52.00%
-- Flow 1:
Average throughput: 9.48 Mbit/s
95th percentile per-packet one-way delay: 36.885 ms
Loss rate: 52.00%
```

Run 2: Report of Muses-25 — Data Link





```
Run 3: Statistics of Muses-25

Start at: 2018-08-31 07:19:42
End at: 2018-08-31 07:20:13
Local clock offset: -26.561 ms
Remote clock offset: -1.945 ms
```

Run 3: Report of Muses-25 — Data Link