Pantheon Report

Generated at 2017-11-30 06:58:13 (UTC).

Data path: AWS California 1 Ethernet (*local*) →Stanford ppp0 (*remote*).

Repeated the test of 14 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: indigos @ e3a57ad5ac5cfcaca0e3f983c8dd4cc3509e0262
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/genericCC @ b5b7c38e8391001927dc41c6cfa2627d03dde737
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-cellular @ aee99e8eb842cb053f8c9a80e28cd256a930bbc2
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/indigo-no-cwnd @ 3e58442c04028a11d7b02456e137604633ba2d6c
third_party/indigo-no-delivery-rate @ 57caa40858b964906edff4876d5a7e5bfff666c5
third_party/indigo-no-queuing-delay @ 03455460fd1a8ffbdad86fabb936fdca204b80db
third_party/indigo-no-send-rate @ b39dfa6b2c5f19cb7cd89626cb4f5bb81f9fecda
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
 M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
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/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
 M src/examples/cellsim.cc
 M src/examples/sproutbt2.cc
 M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
 M src/verus.hpp
 M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS California 1 Ethernet to Stanford ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)
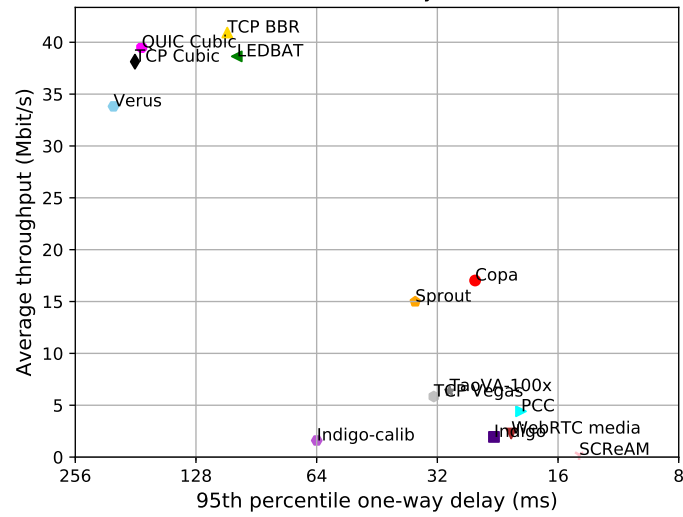
test from AWS California 1 Ethernet to Stanford ppp0, 3 runs of 30s each per scheme
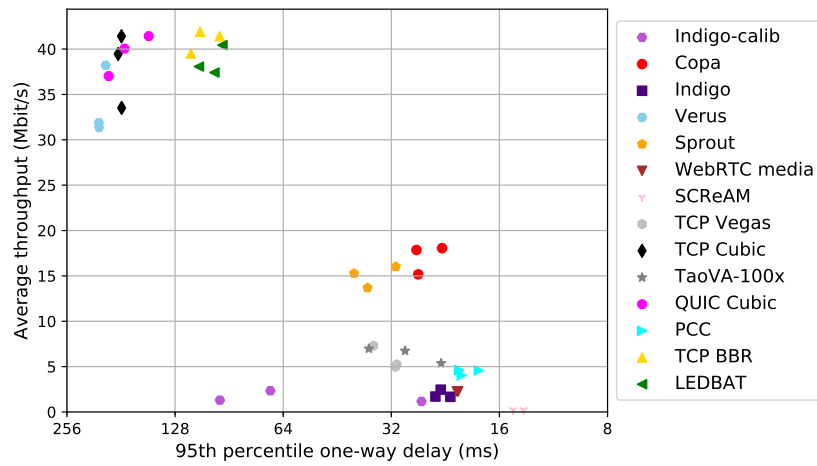
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	40.94	106.94	0.11
TCP Cubic	3	38.13	181.72	0.52
LEDBAT	3	38.64	101.27	0.16
PCC	3	4.41	19.79	0.00
QUIC Cubic	3	39.50	174.82	0.36
SCReAM	2	0.22	14.18	0.00
WebRTC media	3	2.27	20.94	0.00
Sprout	3	14.99	36.34	0.03
TaoVA-100x	3	6.37	29.83	0.10
TCP Vegas	3	5.84	32.66	0.00
Verus	3	33.82	205.58	10.35
Copa	3	17.03	25.76	0.01
Indigo	3	1.94	23.12	0.00
Indigo-calib	3	1.60	63.97	0.00

```
Run 1: Statistics of TCP BBR

Start at: 2017-11-30 06:08:18
End at: 2017-11-30 06:08:48
Local clock offset: -0.599 ms
Remote clock offset: -3.734 ms

# Below is generated by plot.py at 2017-11-30 06:56:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 39.50 Mbit/s
95th percentile per-packet one-way delay: 115.620 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 39.50 Mbit/s
95th percentile per-packet one-way delay: 115.620 ms
Loss rate: 0.13%
```

Run 1: Report of TCP BBR — Data Link
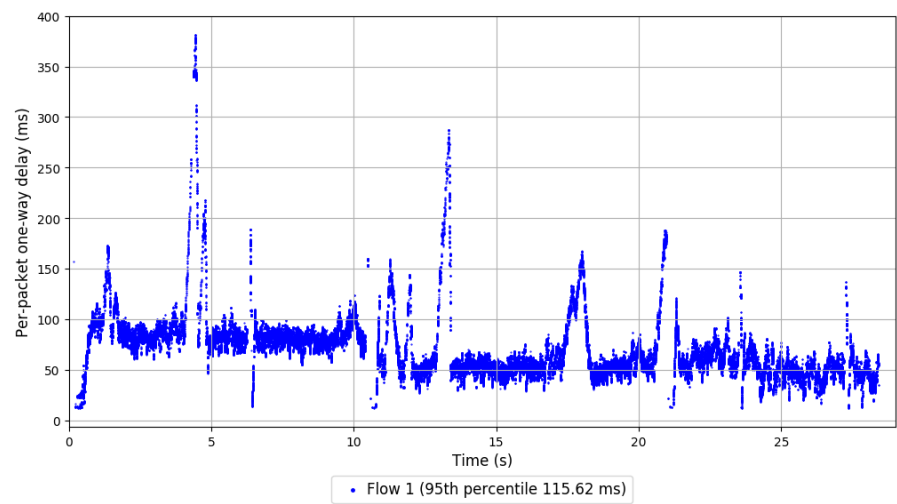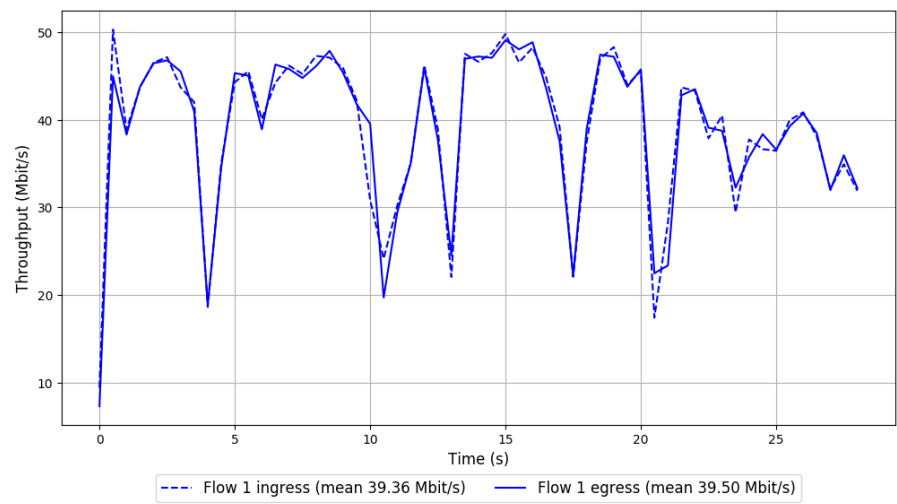
```
Run 2: Statistics of TCP BBR

Start at: 2017-11-30 06:24:54
End at: 2017-11-30 06:25:24
Local clock offset: -0.177 ms
Remote clock offset: -3.355 ms


# Below is generated by plot.py at 2017-11-30 06:57:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.41 Mbit/s
95th percentile per-packet one-way delay: 96.205 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 41.41 Mbit/s
95th percentile per-packet one-way delay: 96.205 ms
Loss rate: 0.08%
```
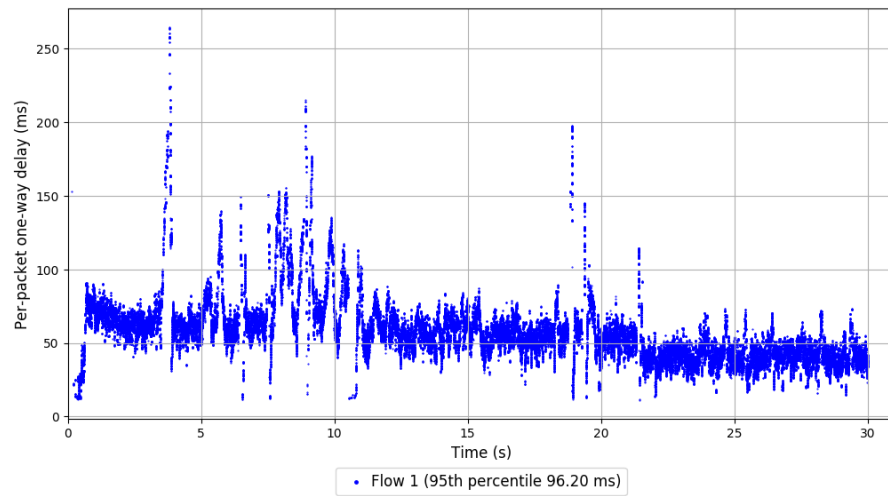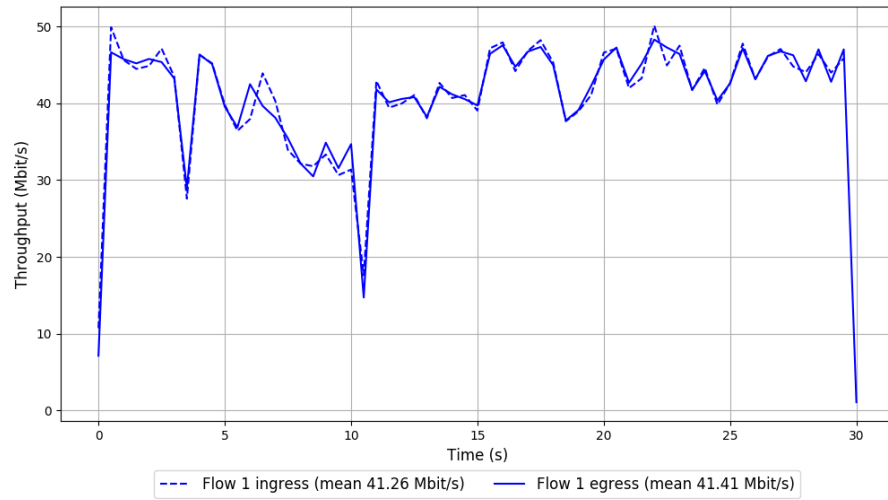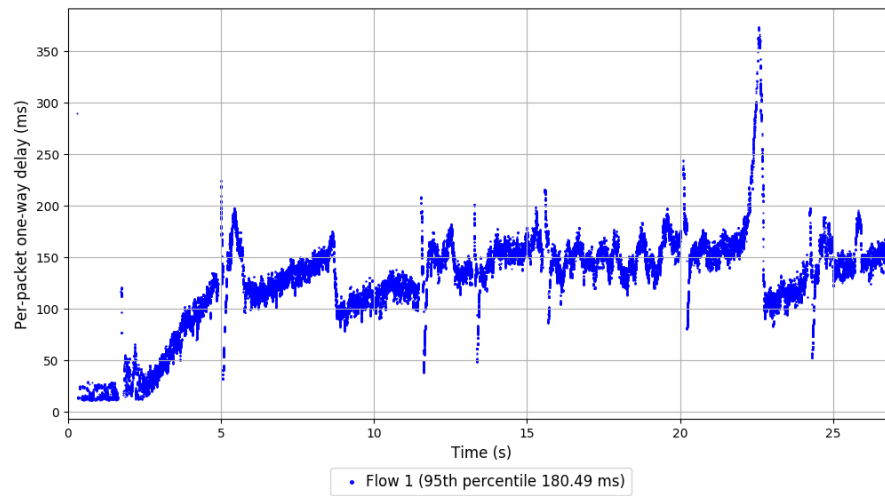
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-11-30 06:41:29
End at: 2017-11-30 06:41:59
Local clock offset: -0.633 ms
Remote clock offset: -3.509 ms


# Below is generated by plot.py at 2017-11-30 06:57:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.90 Mbit/s
95th percentile per-packet one-way delay: 108.981 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 41.90 Mbit/s
95th percentile per-packet one-way delay: 108.981 ms
Loss rate: 0.13%
```
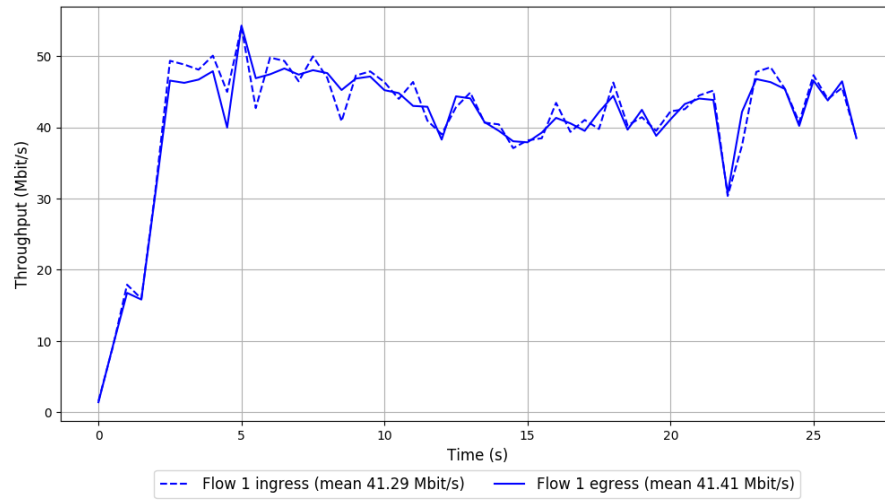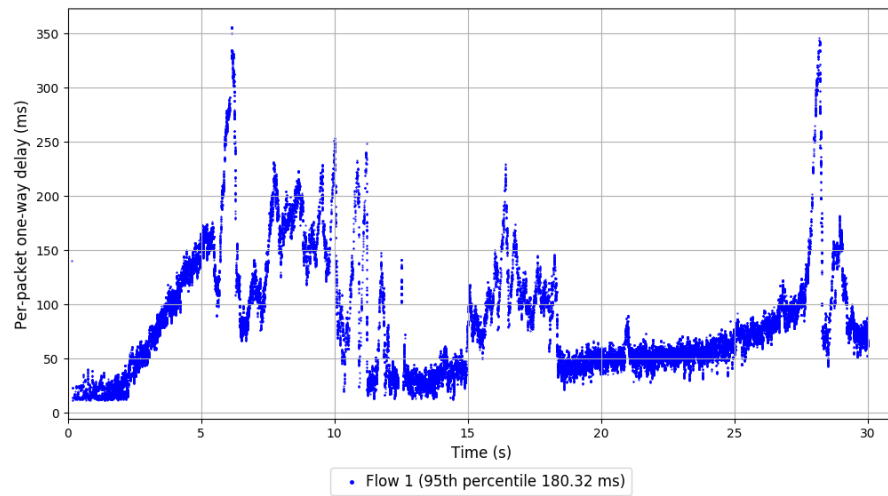
Run 3: Report of TCP BBR — Data Link
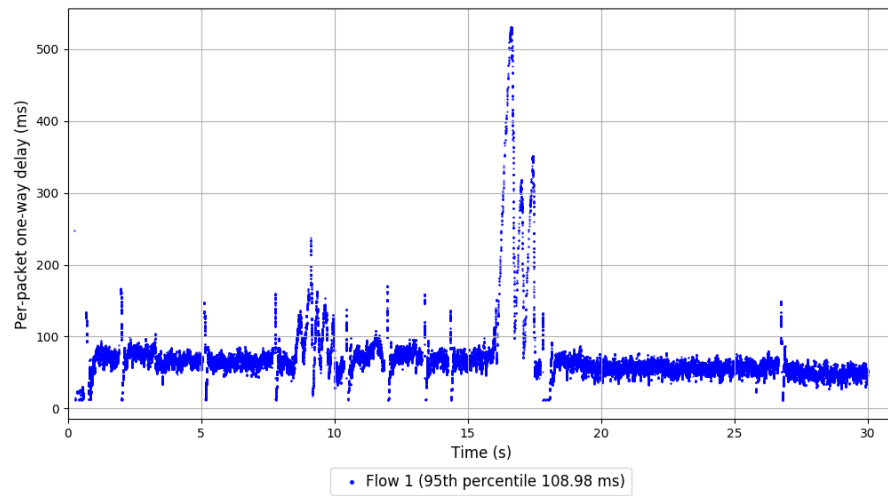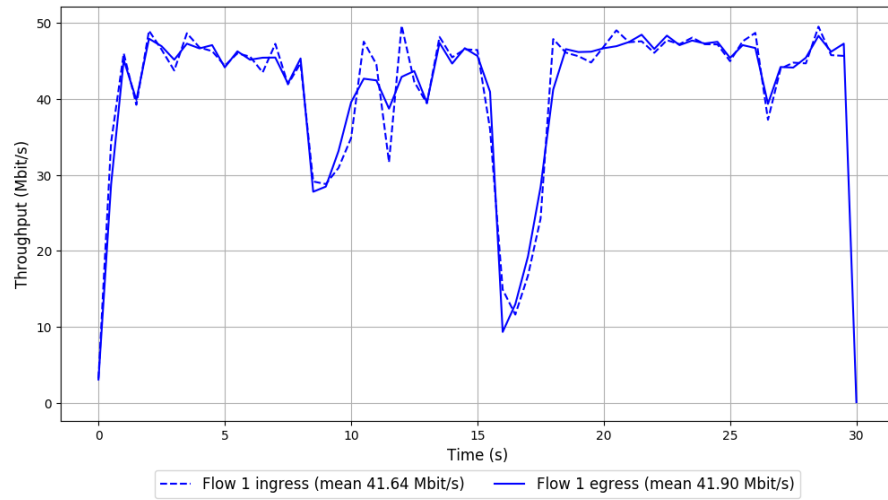
```
Run 1: Statistics of TCP Cubic

Start at: 2017-11-30 06:05:55
End at: 2017-11-30 06:06:25
Local clock offset: -0.569 ms
Remote clock offset: -3.837 ms


# Below is generated by plot.py at 2017-11-30 06:57:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.41 Mbit/s
95th percentile per-packet one-way delay: 180.487 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 41.41 Mbit/s
95th percentile per-packet one-way delay: 180.487 ms
Loss rate: 0.72%
```

Run 1: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 41.29 Mbit/s) --- Flow 1 egress (mean 41.41 Mbit/s)
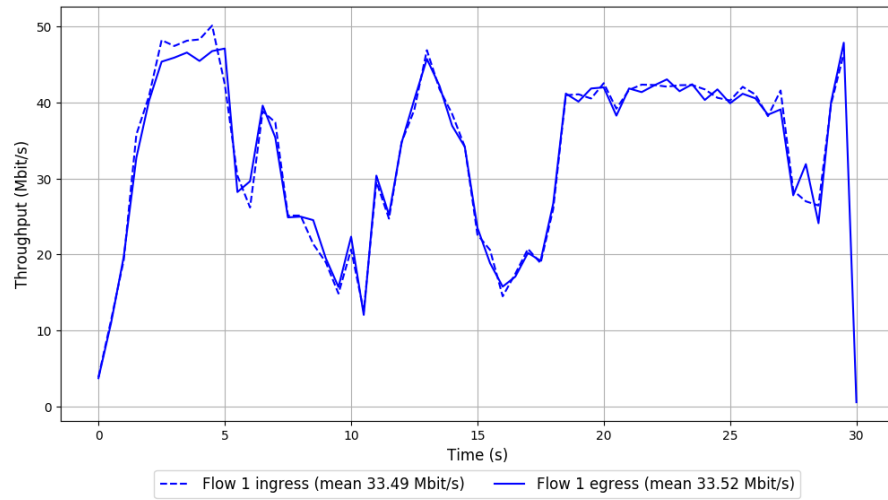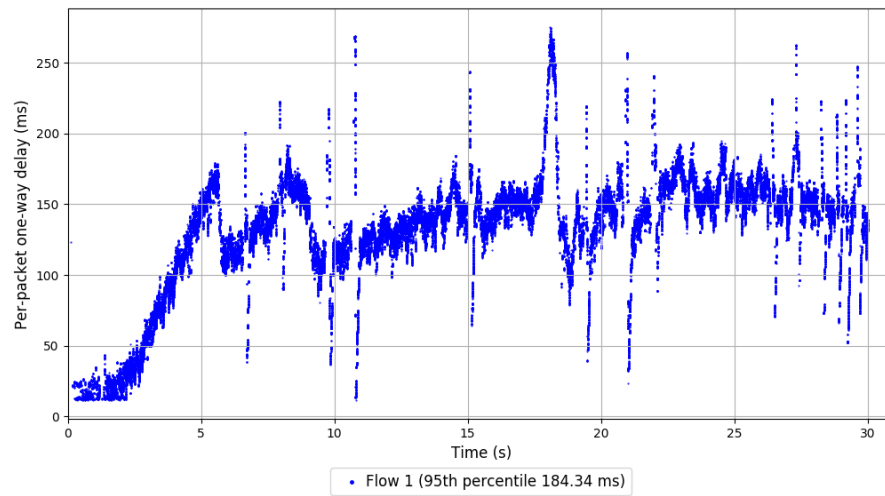

• Flow 1 (95th percentile 180.49 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-11-30 06:22:30
End at: 2017-11-30 06:23:00
Local clock offset: -0.146 ms
Remote clock offset: -3.428 ms


# Below is generated by plot.py at 2017-11-30 06:57:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 33.52 Mbit/s
95th percentile per-packet one-way delay: 180.319 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 33.52 Mbit/s
95th percentile per-packet one-way delay: 180.319 ms
Loss rate: 0.32%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 33.49 Mbit/s)   —— Flow 1 egress (mean 33.52 Mbit/s)
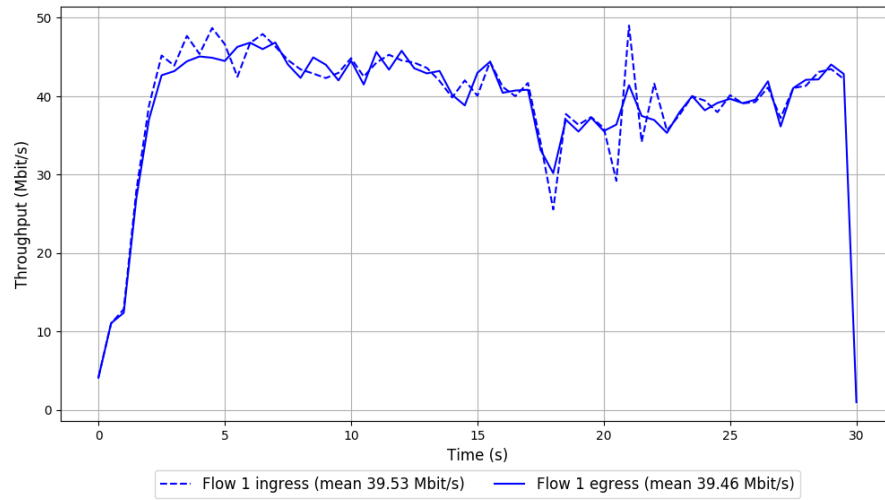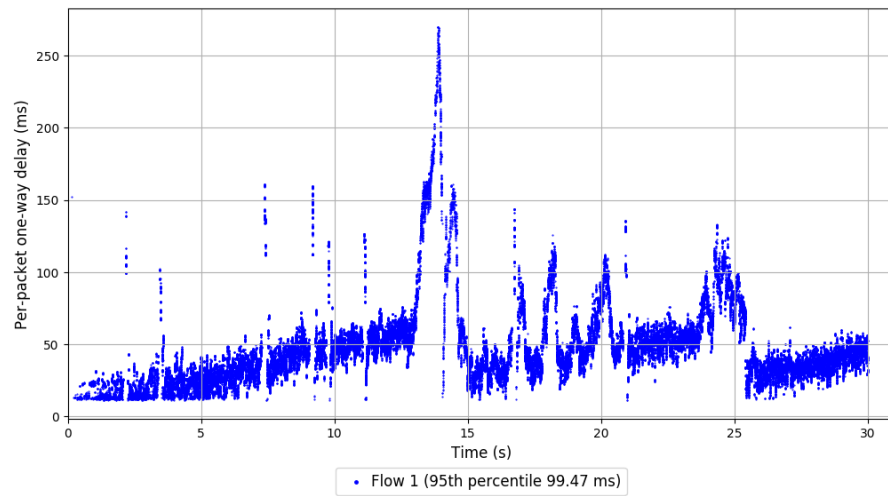

• Flow 1 (95th percentile 180.32 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-11-30 06:39:05
End at: 2017-11-30 06:39:35
Local clock offset: -0.553 ms
Remote clock offset: -3.521 ms


# Below is generated by plot.py at 2017-11-30 06:57:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 39.46 Mbit/s
95th percentile per-packet one-way delay: 184.345 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 39.46 Mbit/s
95th percentile per-packet one-way delay: 184.345 ms
Loss rate: 0.53%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 39.53 Mbit/s) ----   Flow 1 egress (mean 39.46 Mbit/s) ——
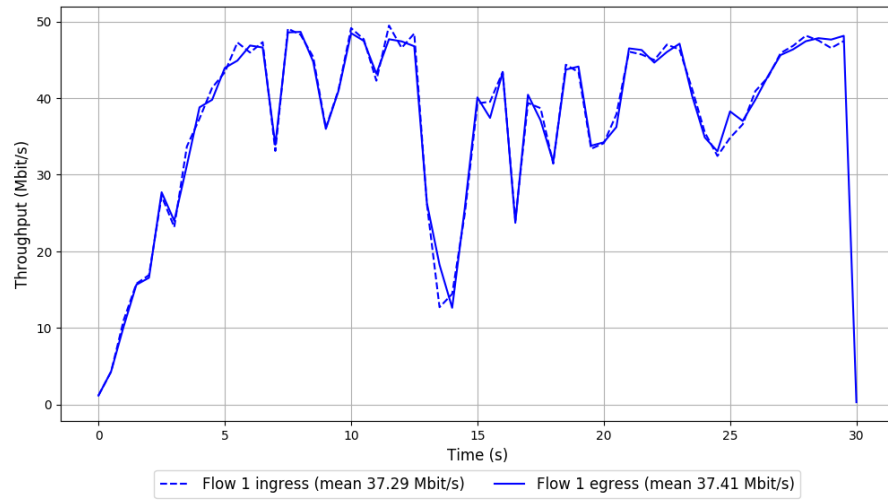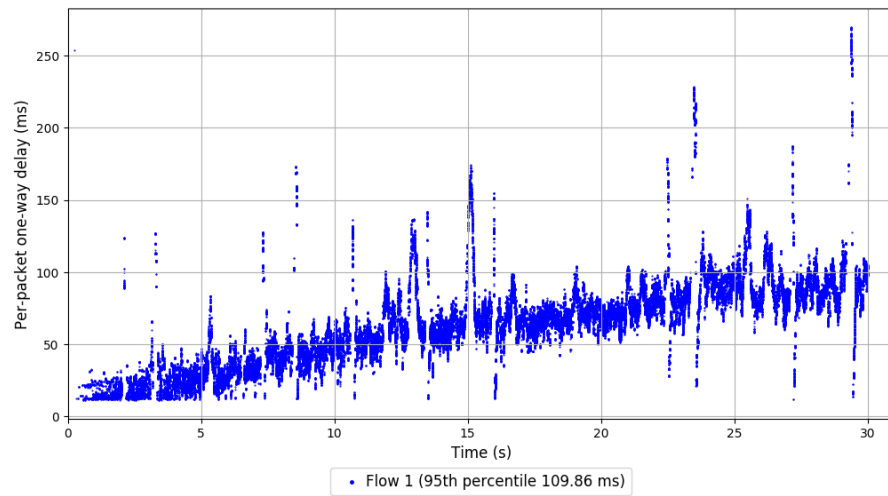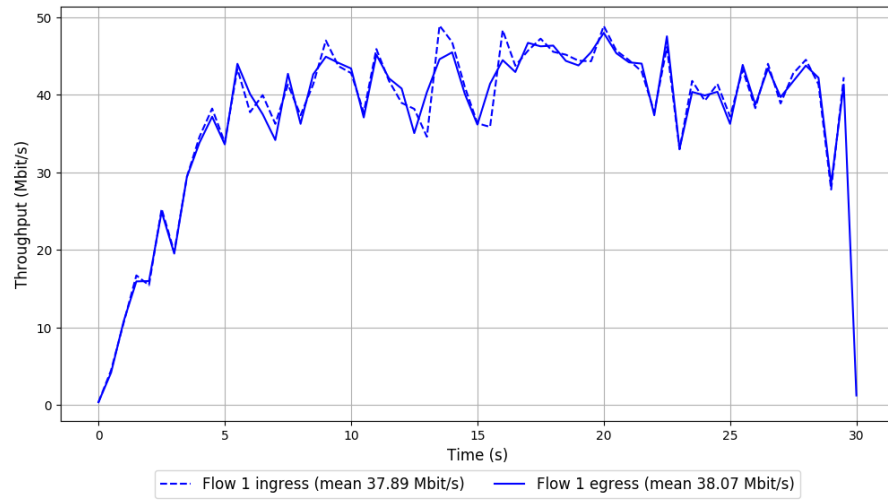

Flow 1 (95th percentile 184.34 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2017-11-30 06:07:06
End at: 2017-11-30 06:07:36
Local clock offset: -0.504 ms
Remote clock offset: -3.852 ms

# Below is generated by plot.py at 2017-11-30 06:57:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 37.41 Mbit/s
95th percentile per-packet one-way delay: 99.466 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 37.41 Mbit/s
95th percentile per-packet one-way delay: 99.466 ms
Loss rate: 0.08%
```

Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 37.29 Mbit/s) --- Flow 1 egress (mean 37.41 Mbit/s)

Flow 1 (95th percentile 99.47 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2017-11-30 06:23:42
End at: 2017-11-30 06:24:12
Local clock offset: -0.145 ms
Remote clock offset: -3.305 ms

# Below is generated by plot.py at 2017-11-30 06:57:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 38.07 Mbit/s
95th percentile per-packet one-way delay: 109.856 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 38.07 Mbit/s
95th percentile per-packet one-way delay: 109.856 ms
Loss rate: 0.29%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 37.89 Mbit/s)   Flow 1 egress (mean 38.07 Mbit/s)

• Flow 1 (95th percentile 109.86 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2017-11-30 06:40:17
End at: 2017-11-30 06:40:47
Local clock offset: -0.591 ms
Remote clock offset: -3.417 ms

# Below is generated by plot.py at 2017-11-30 06:57:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 40.43 Mbit/s
95th percentile per-packet one-way delay: 94.493 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 40.43 Mbit/s
95th percentile per-packet one-way delay: 94.493 ms
Loss rate: 0.12%
```

Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 40.30 Mbit/s)   Flow 1 egress (mean 40.43 Mbit/s)

Flow 1 (95th percentile 94.49 ms)
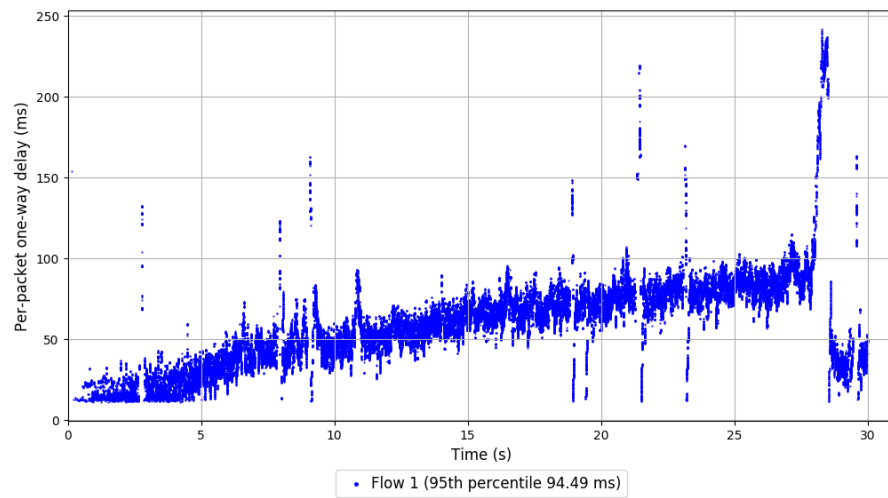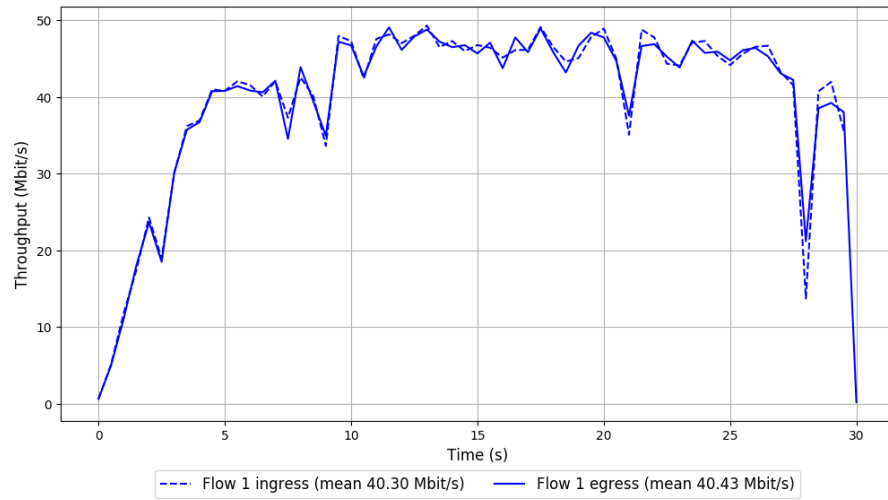
```
Run 1: Statistics of PCC

Start at: 2017-11-30 06:18:57
End at: 2017-11-30 06:19:27
Local clock offset: -0.197 ms
Remote clock offset: -3.39 ms


# Below is generated by plot.py at 2017-11-30 06:57:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 20.725 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 20.725 ms
Loss rate: 0.00%
```

Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 4.62 Mbit/s)   Flow 1 egress (mean 4.63 Mbit/s)

Flow 1 (95th percentile 20.73 ms)
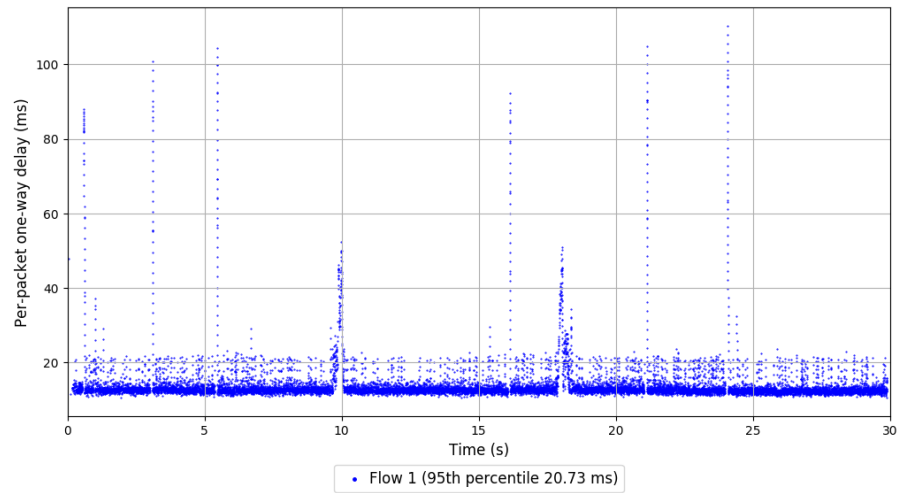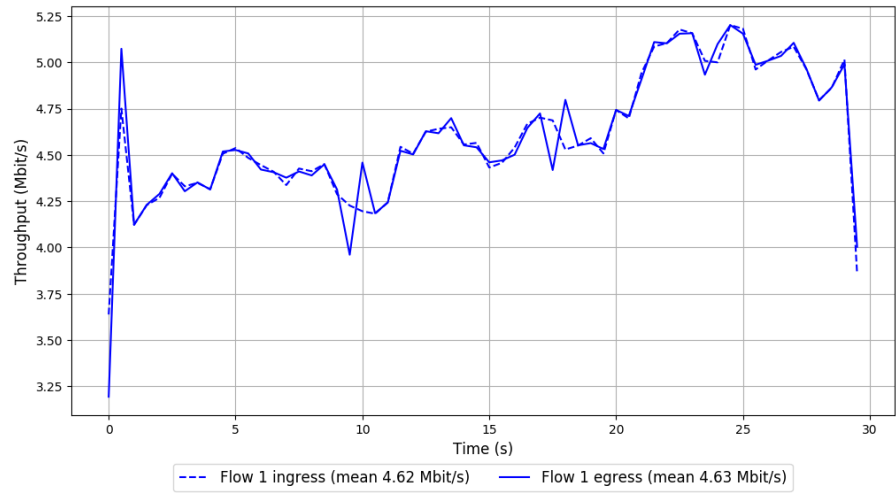
```
Run 2: Statistics of PCC

Start at: 2017-11-30 06:35:33
End at: 2017-11-30 06:36:03
Local clock offset: -0.371 ms
Remote clock offset: -3.42 ms

# Below is generated by plot.py at 2017-11-30 06:57:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.03 Mbit/s
95th percentile per-packet one-way delay: 20.377 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.03 Mbit/s
95th percentile per-packet one-way delay: 20.377 ms
Loss rate: 0.00%
```

Run 2: Report of PCC — Data Link
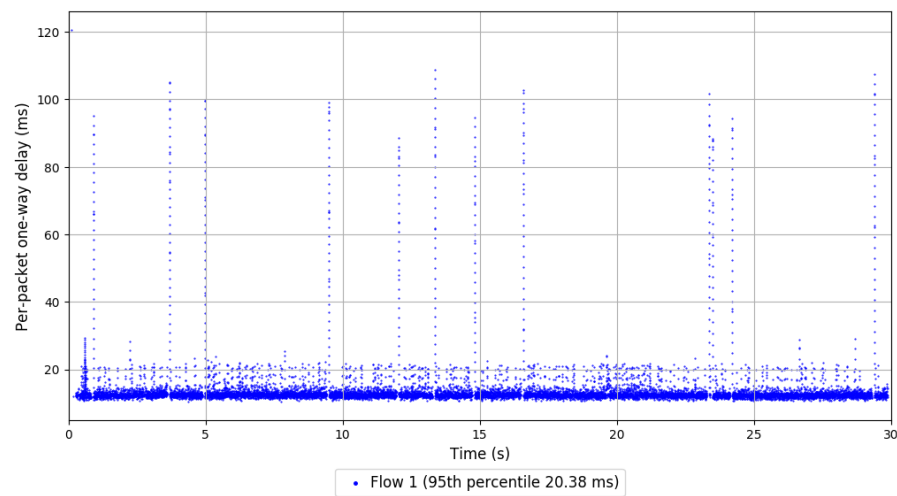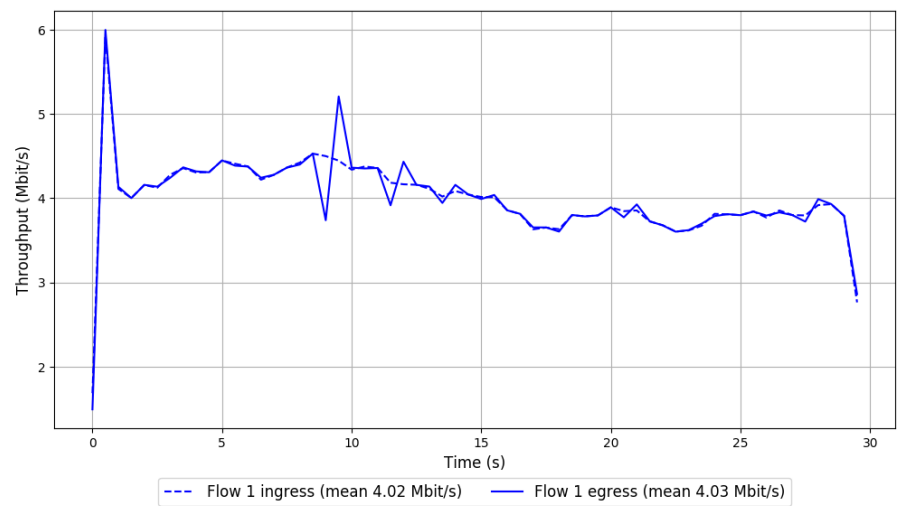
```
Run 3: Statistics of PCC

Start at: 2017-11-30 06:52:06
End at: 2017-11-30 06:52:36
Local clock offset: -0.853 ms
Remote clock offset: -3.496 ms


# Below is generated by plot.py at 2017-11-30 06:57:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.58 Mbit/s
95th percentile per-packet one-way delay: 18.264 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.58 Mbit/s
95th percentile per-packet one-way delay: 18.264 ms
Loss rate: 0.00%
```
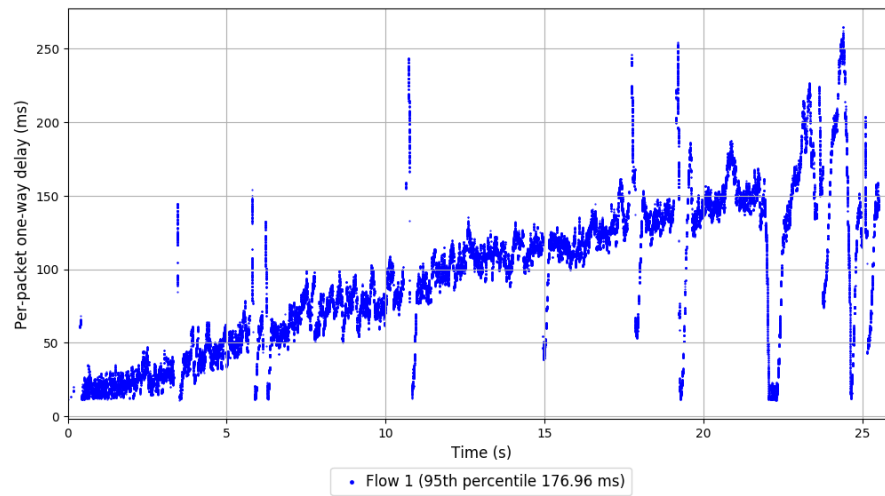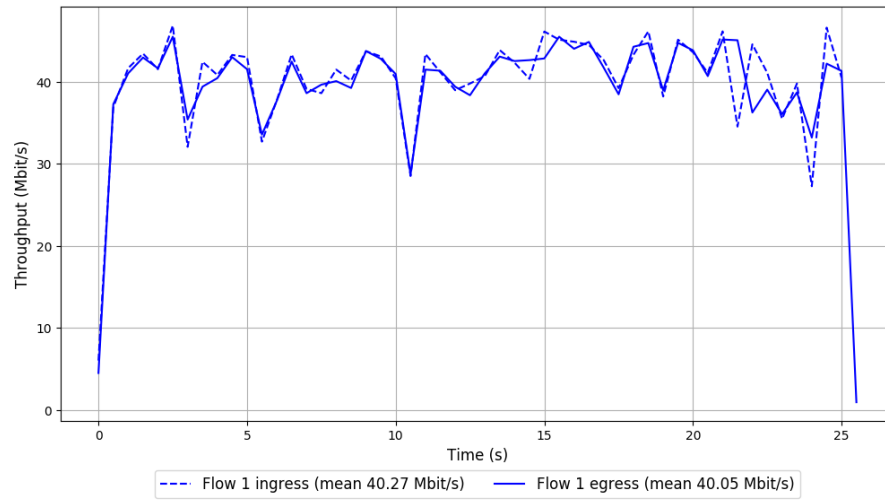
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 4.57 Mbit/s)   Flow 1 egress (mean 4.58 Mbit/s)

Flow 1 (95th percentile 18.26 ms)
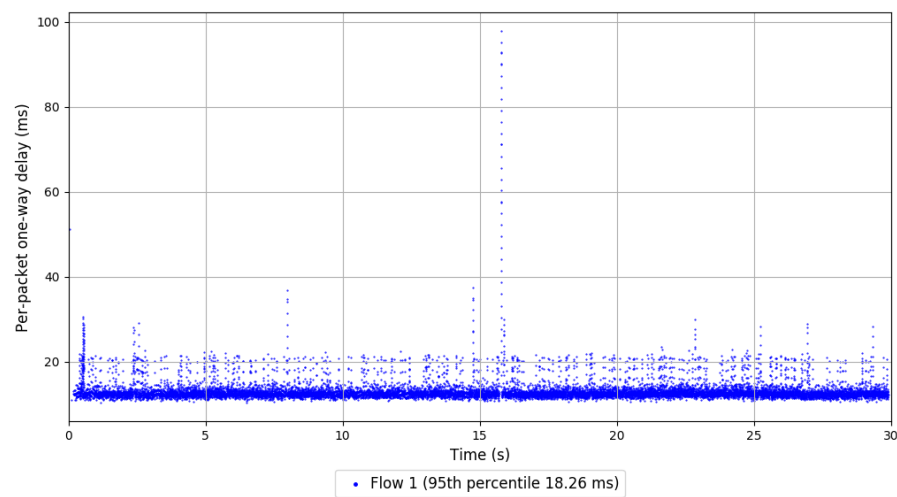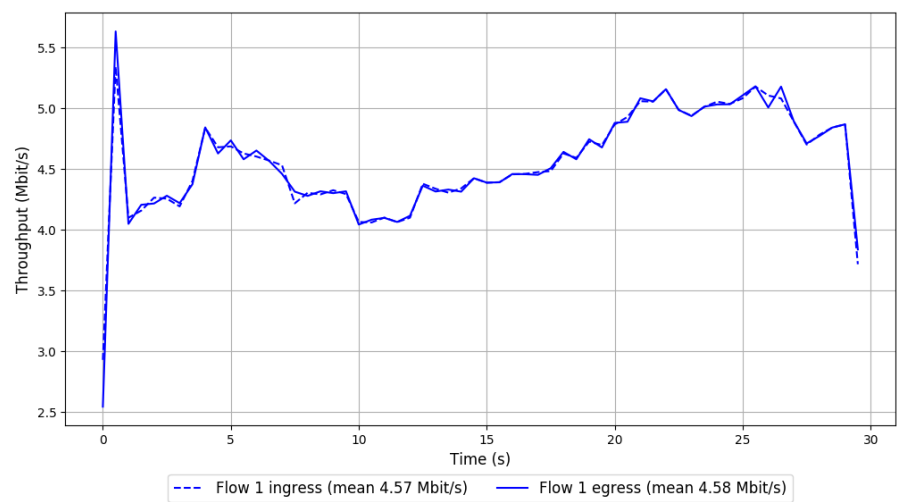
```
Run 1: Statistics of QUIC Cubic

Start at: 2017-11-30 06:21:18
End at: 2017-11-30 06:21:48
Local clock offset: -0.134 ms
Remote clock offset: -3.448 ms

# Below is generated by plot.py at 2017-11-30 06:57:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 40.05 Mbit/s
95th percentile per-packet one-way delay: 176.958 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 40.05 Mbit/s
95th percentile per-packet one-way delay: 176.958 ms
Loss rate: 0.53%
```
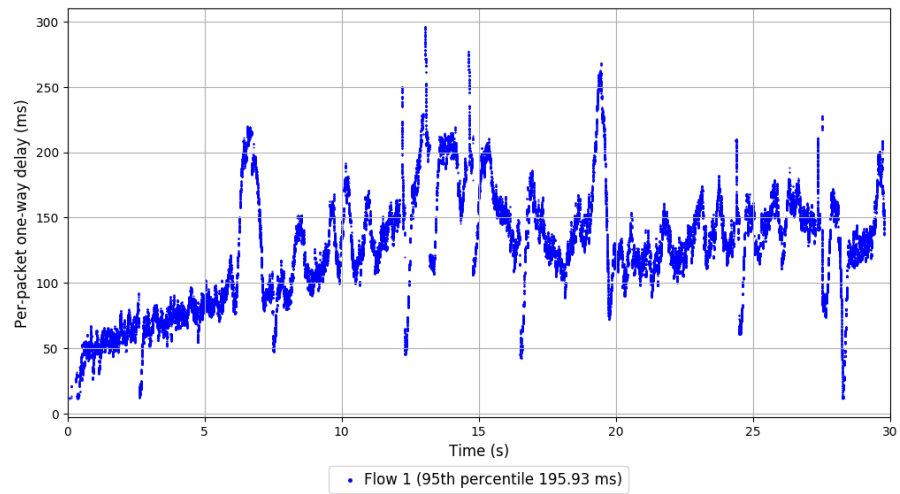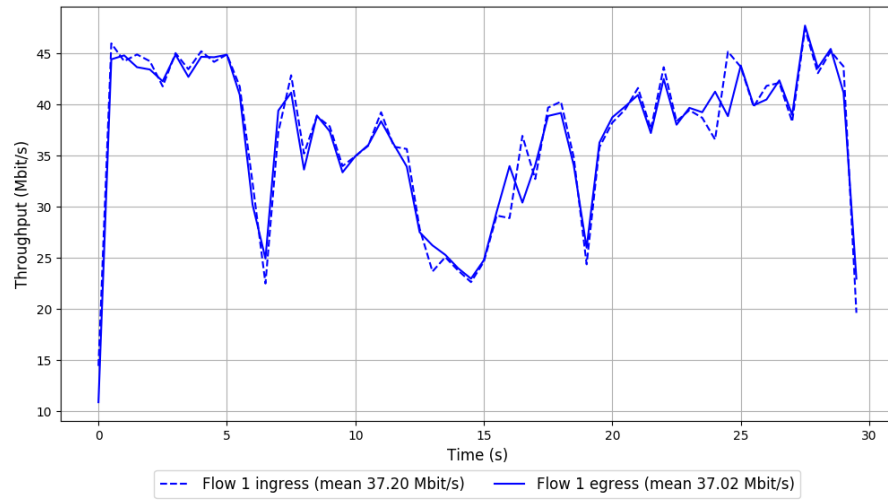
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 40.27 Mbit/s)   ——— Flow 1 egress (mean 40.05 Mbit/s)

• Flow 1 (95th percentile 176.96 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-11-30 06:37:53
End at: 2017-11-30 06:38:23
Local clock offset: -0.444 ms
Remote clock offset: -3.497 ms


# Below is generated by plot.py at 2017-11-30 06:57:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 37.02 Mbit/s
95th percentile per-packet one-way delay: 195.930 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 37.02 Mbit/s
95th percentile per-packet one-way delay: 195.930 ms
Loss rate: 0.46%
```

Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 37.20 Mbit/s)   Flow 1 egress (mean 37.02 Mbit/s)

• Flow 1 (95th percentile 195.93 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-11-30 06:54:27
End at: 2017-11-30 06:54:57
Local clock offset: -1.01 ms
Remote clock offset: -3.459 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 41.43 Mbit/s
95th percentile per-packet one-way delay: 151.567 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 41.43 Mbit/s
95th percentile per-packet one-way delay: 151.567 ms
Loss rate: 0.08%
```
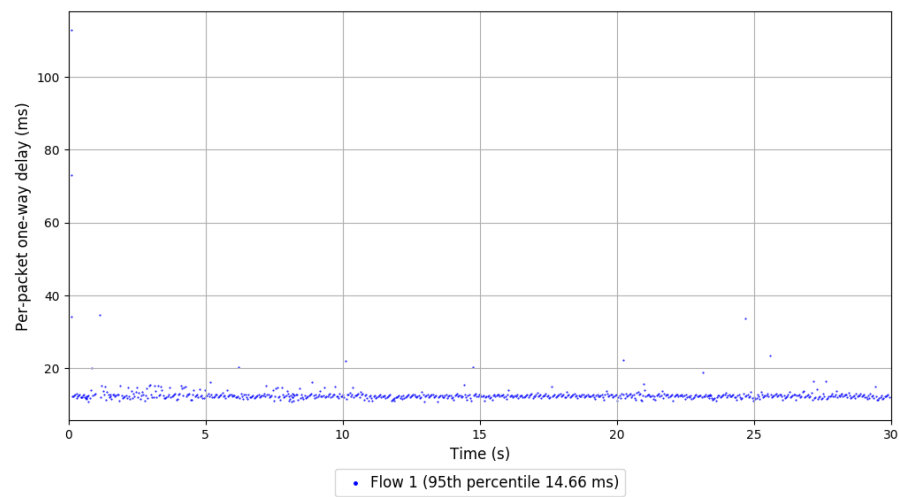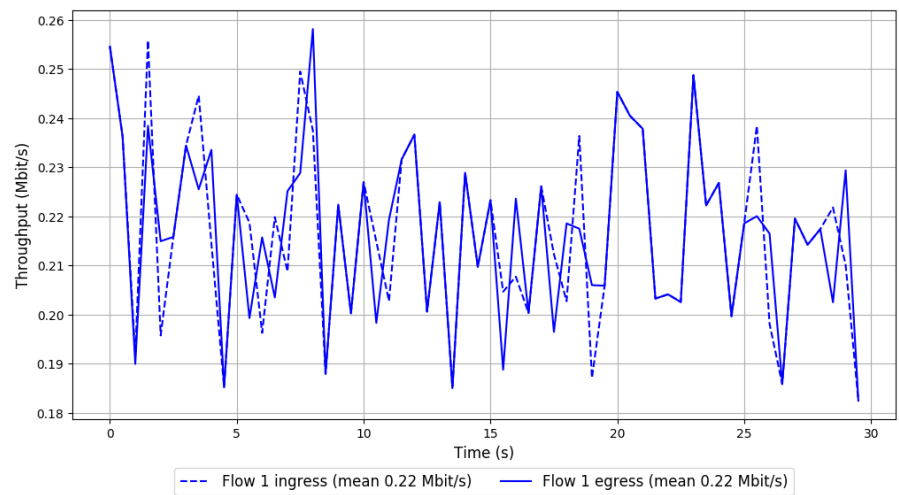
Run 3: Report of QUIC Cubic — Data Link
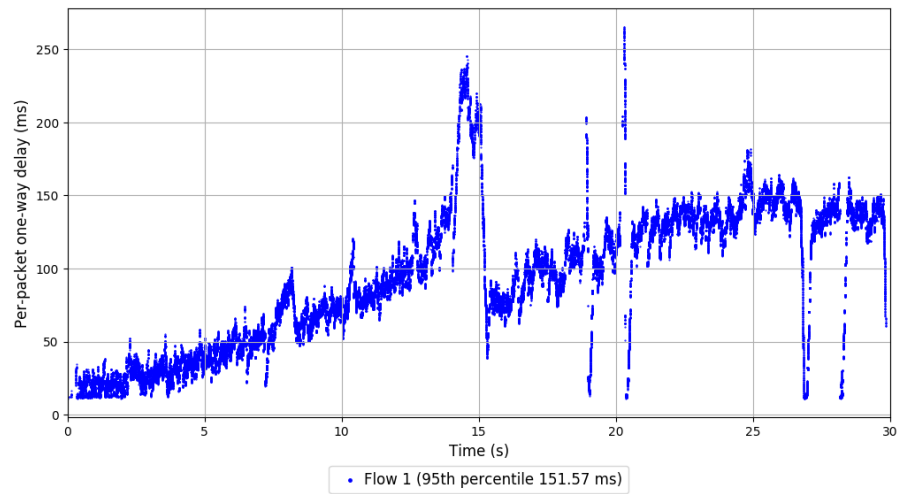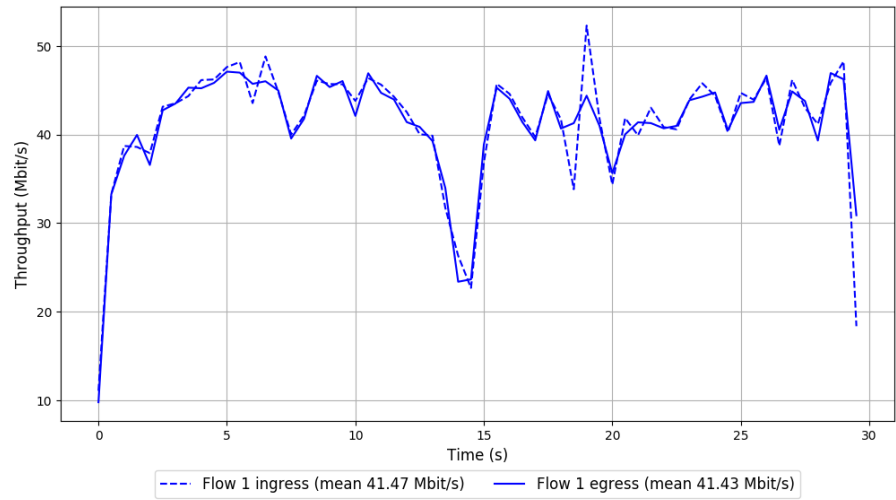
```
Run 1: Statistics of SCReAM

Start at: 2017-11-30 06:13:04
End at: 2017-11-30 06:13:34
Local clock offset: -0.434 ms
Remote clock offset: -3.721 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 13.698 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 13.698 ms
Loss rate: 0.00%
```

Run 1: Report of SCReAM — Data Link
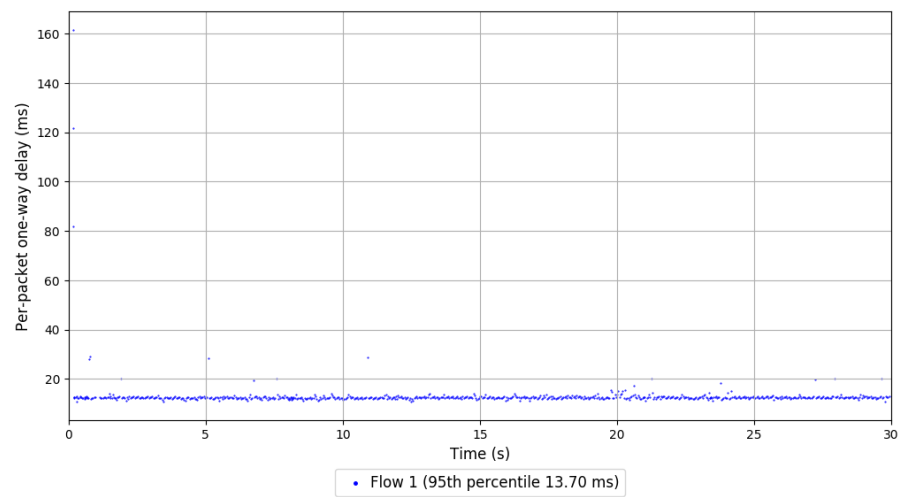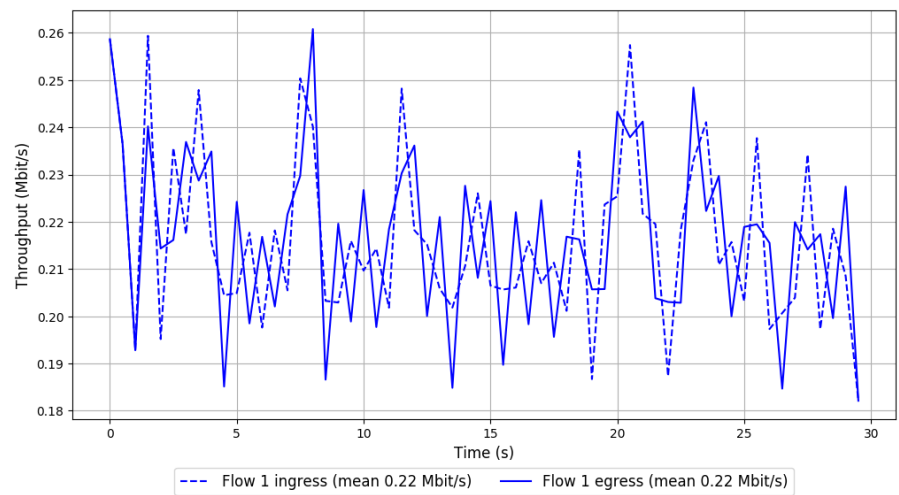
```
Run 2: Statistics of SCReAM

Start at: 2017-11-30 06:29:40
End at: 2017-11-30 06:30:10
Local clock offset: -0.209 ms
Remote clock offset: -3.437 ms

# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.656 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.656 ms
Loss rate: 0.00%
```

Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2017-11-30 06:46:14
End at: 2017-11-30 06:46:44
Local clock offset: -0.77 ms
Remote clock offset: -3.487 ms
```

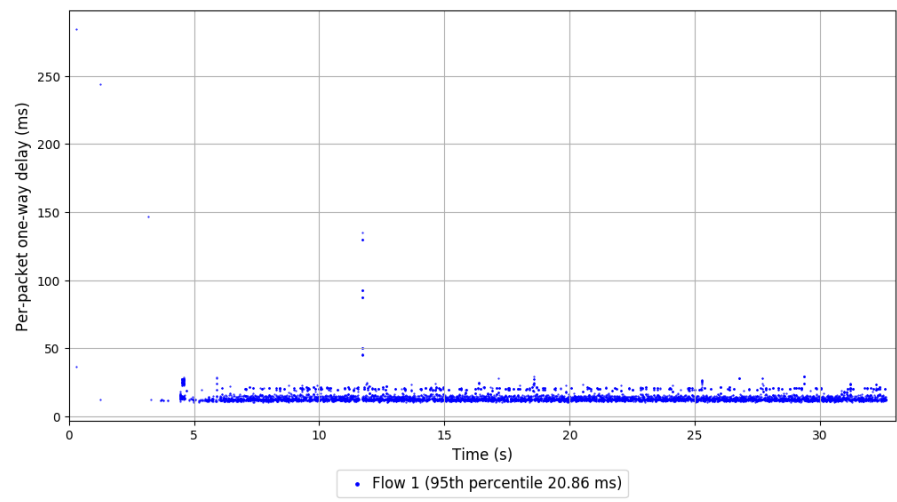## Run 3: Report of SCReAM — Data Link
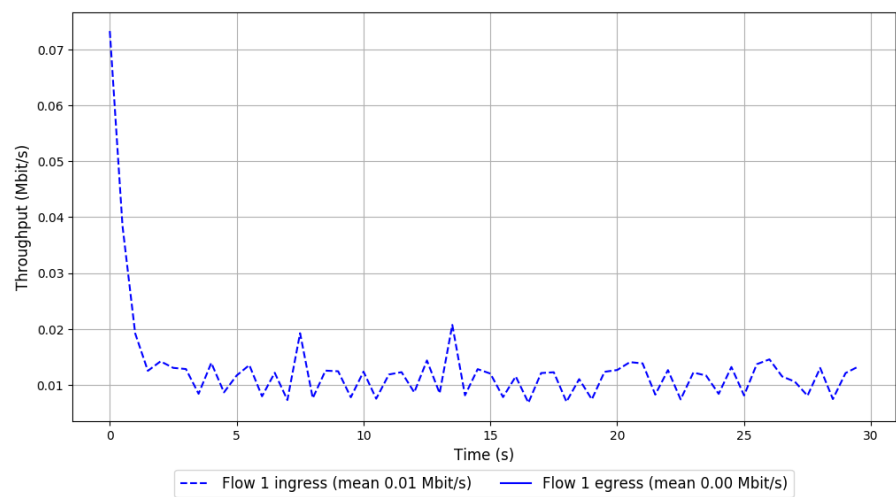
Figure is missing

```
Run 1: Statistics of WebRTC media

Start at: 2017-11-30 06:15:25
End at: 2017-11-30 06:15:55
Local clock offset: -0.26 ms
Remote clock offset: -3.632 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 21.017 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 21.017 ms
Loss rate: 0.00%
```
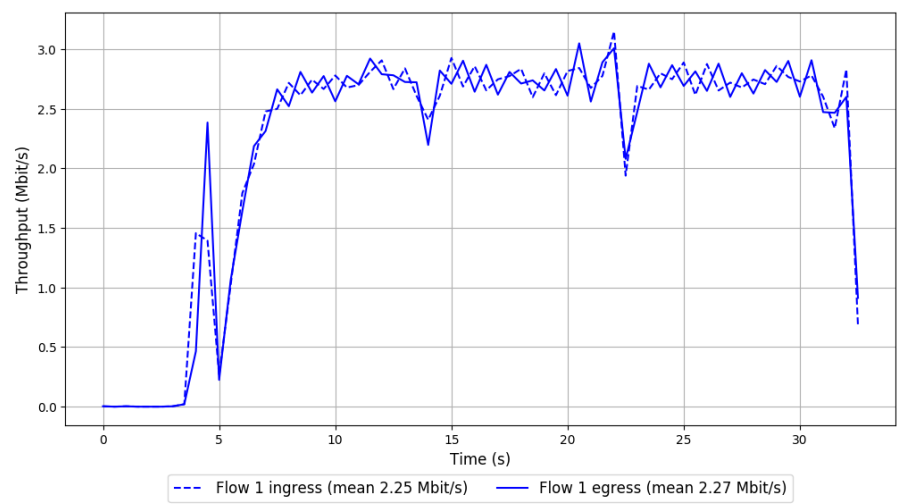
Run 1: Report of WebRTC media — Data Link
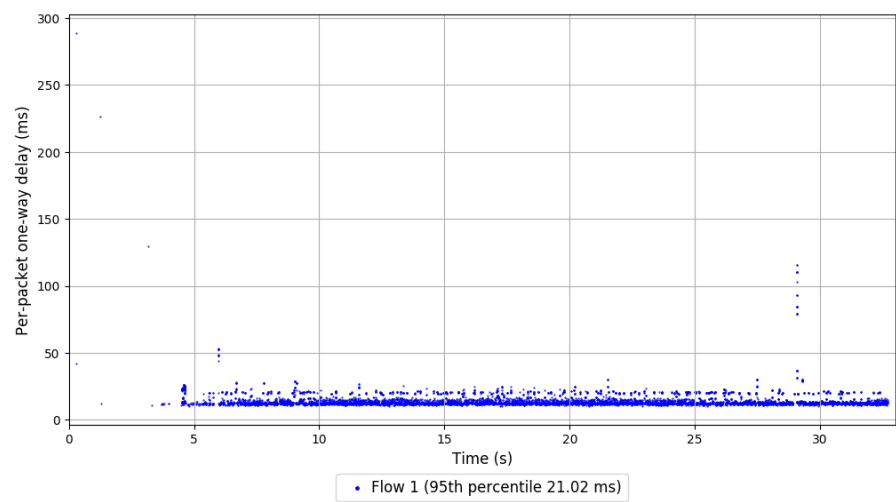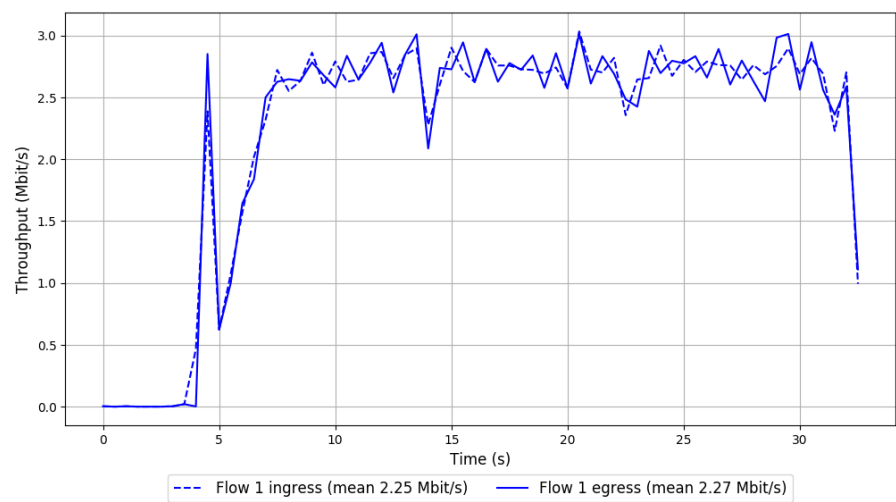
```
Run 2: Statistics of WebRTC media

Start at: 2017-11-30 06:32:00
End at: 2017-11-30 06:32:30
Local clock offset: -0.272 ms
Remote clock offset: -3.454 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 20.861 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 20.861 ms
Loss rate: 0.00%
```

Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-11-30 06:48:35
End at: 2017-11-30 06:49:05
Local clock offset: -0.744 ms
Remote clock offset: -3.596 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 20.934 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 20.934 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 2.27 Mbit/s) --- Flow 1 egress (mean 2.27 Mbit/s)
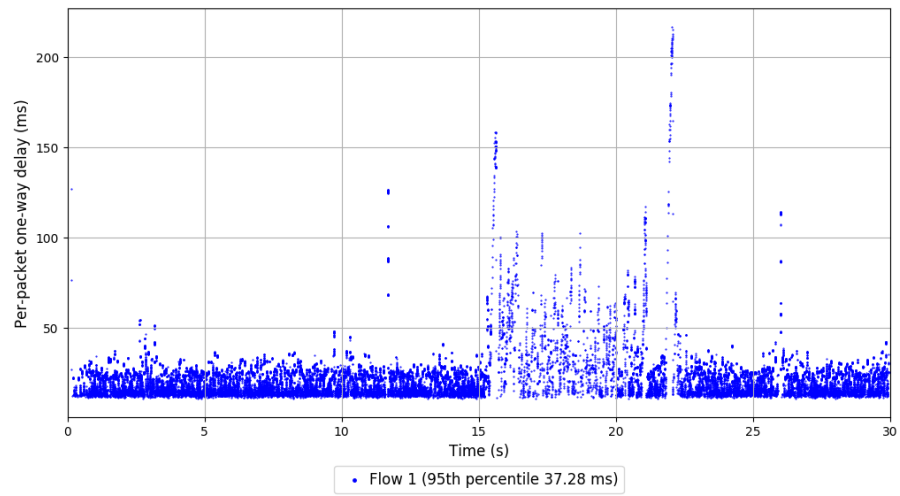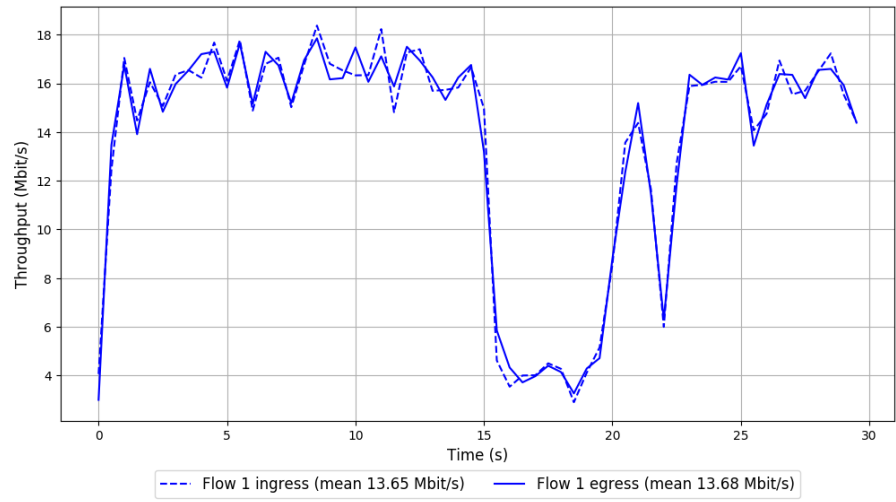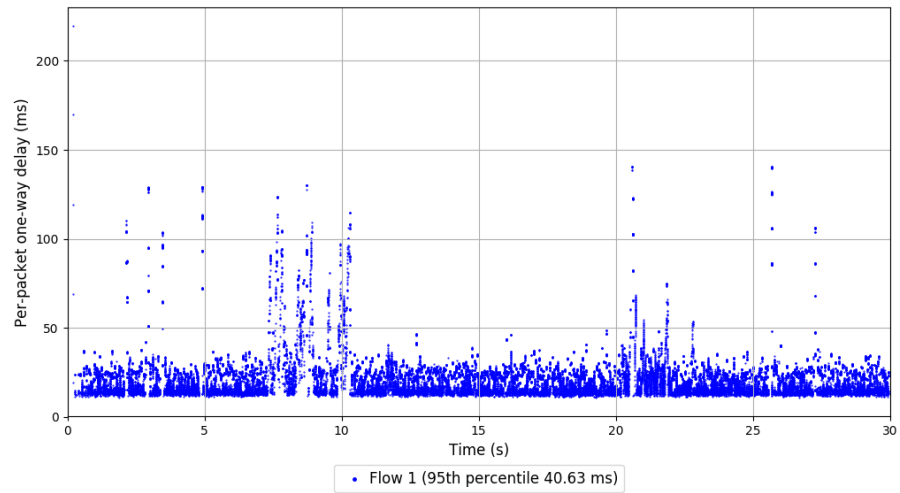

Flow 1 (95th percentile 20.93 ms)
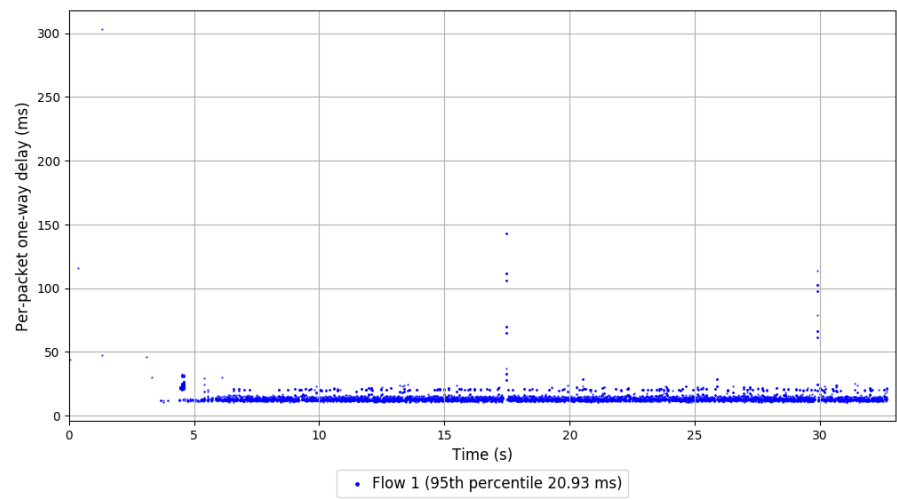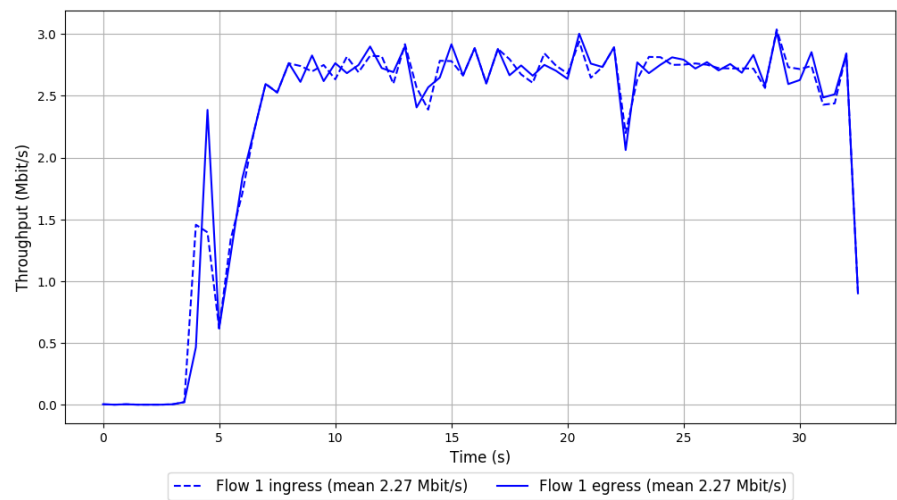
```
Run 1: Statistics of Sprout

Start at: 2017-11-30 06:17:46
End at: 2017-11-30 06:18:16
Local clock offset: -0.135 ms
Remote clock offset: -3.533 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.68 Mbit/s
95th percentile per-packet one-way delay: 37.285 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 13.68 Mbit/s
95th percentile per-packet one-way delay: 37.285 ms
Loss rate: 0.08%
```

Run 1: Report of Sprout — Data Link

Flow 1 ingress (mean 13.65 Mbit/s)   Flow 1 egress (mean 13.68 Mbit/s)

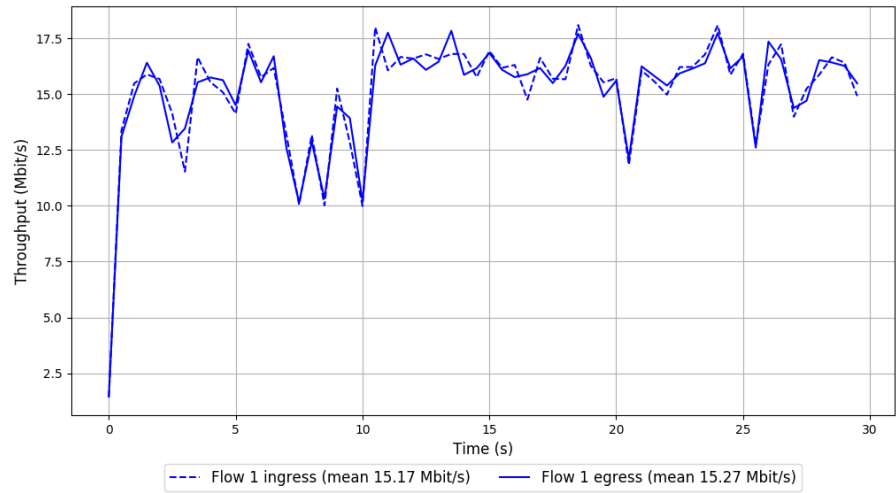Flow 1 (95th percentile 37.28 ms)

```
Run 2: Statistics of Sprout

Start at: 2017-11-30 06:34:22
End at: 2017-11-30 06:34:52
Local clock offset: -0.337 ms
Remote clock offset: -3.459 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.27 Mbit/s
95th percentile per-packet one-way delay: 40.631 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.27 Mbit/s
95th percentile per-packet one-way delay: 40.631 ms
Loss rate: 0.00%
```

Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-11-30 06:50:55
End at: 2017-11-30 06:51:25
Local clock offset: -0.82 ms
Remote clock offset: -3.59 ms

# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.02 Mbit/s
95th percentile per-packet one-way delay: 31.096 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 16.02 Mbit/s
95th percentile per-packet one-way delay: 31.096 ms
Loss rate: 0.01%
```

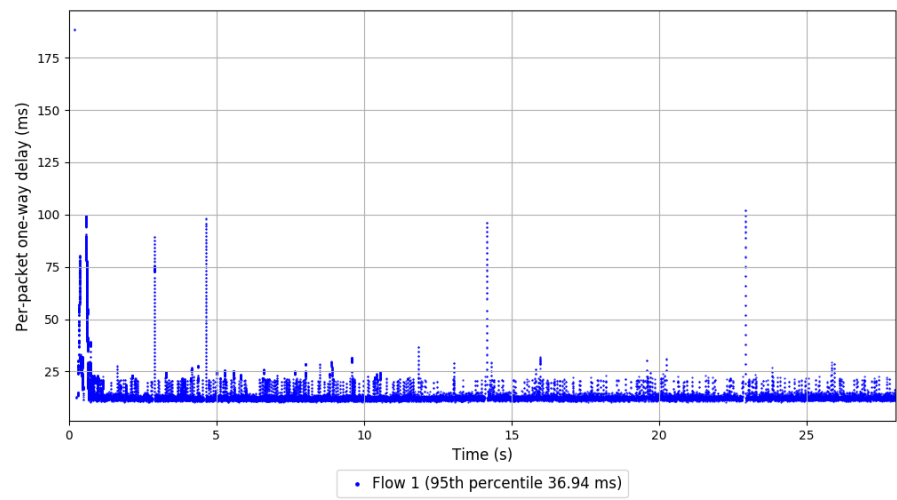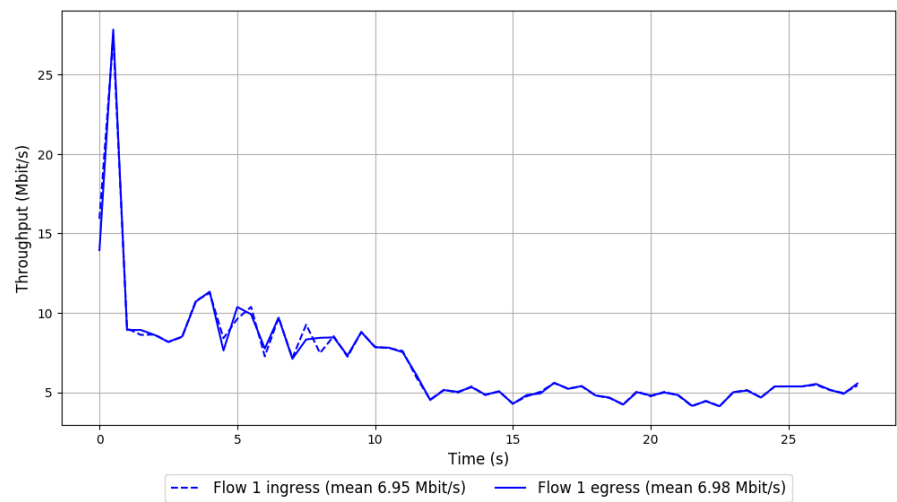Run 3: Report of Sprout — Data Link
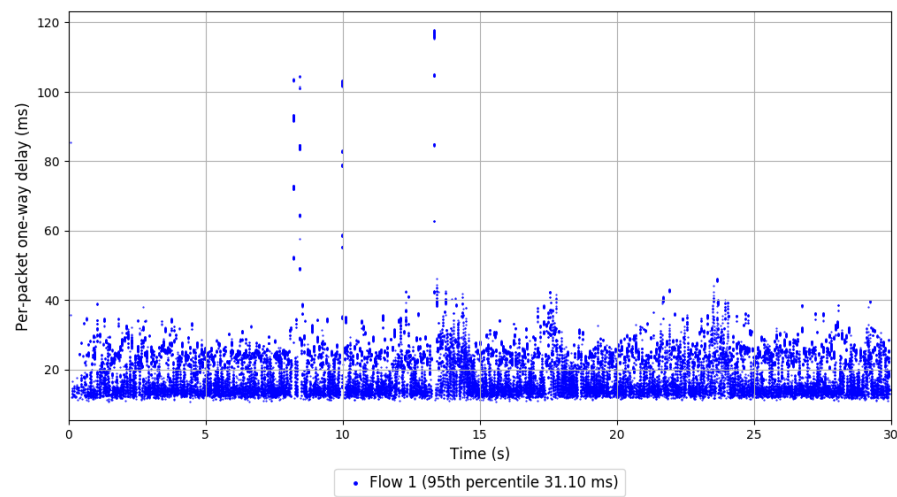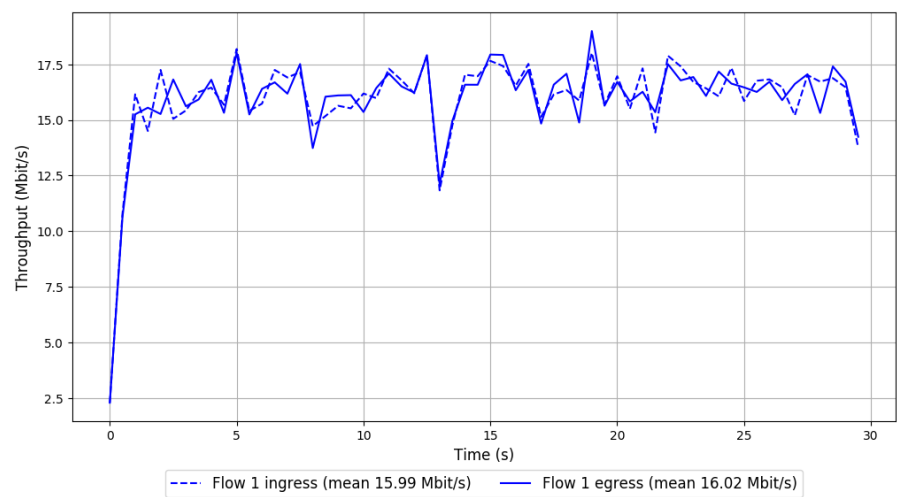
```
Run 1: Statistics of TaoVA-100x

Start at: 2017-11-30 06:20:07
End at: 2017-11-30 06:20:37
Local clock offset: -0.185 ms
Remote clock offset: -3.474 ms

# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.98 Mbit/s
95th percentile per-packet one-way delay: 36.941 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 6.98 Mbit/s
95th percentile per-packet one-way delay: 36.941 ms
Loss rate: 0.29%
```

Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 6.95 Mbit/s) ----   Flow 1 egress (mean 6.98 Mbit/s) ——
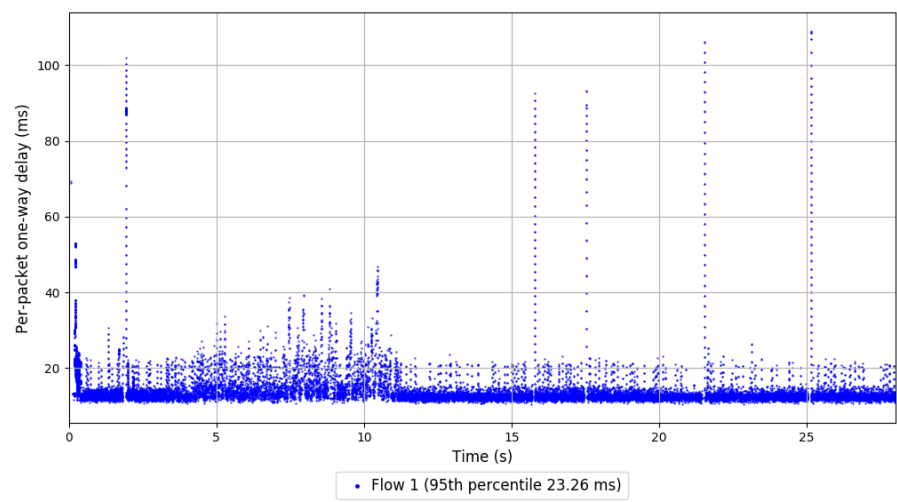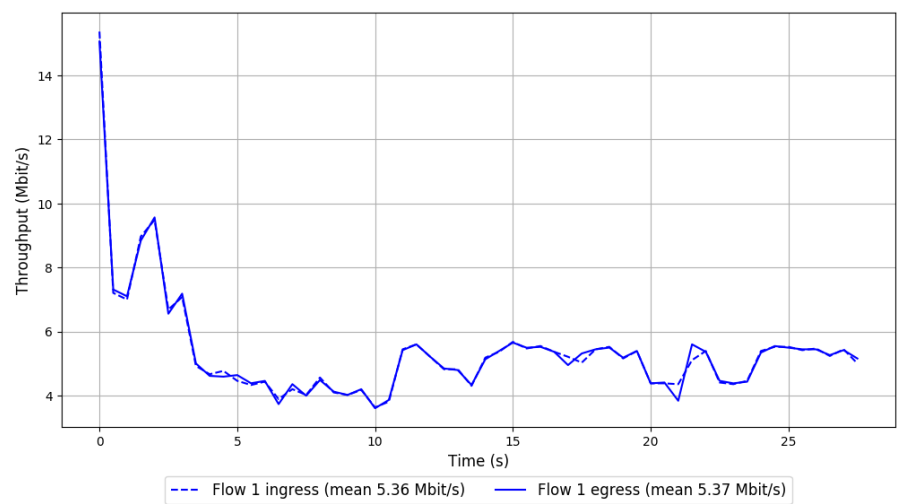

Flow 1 (95th percentile 36.94 ms)

```
Run 2: Statistics of TaoVA-100x

Start at: 2017-11-30 06:36:43
End at: 2017-11-30 06:37:13
Local clock offset: -0.483 ms
Remote clock offset: -3.509 ms

# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.37 Mbit/s
95th percentile per-packet one-way delay: 23.258 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 5.37 Mbit/s
95th percentile per-packet one-way delay: 23.258 ms
Loss rate: 0.00%
```

Run 2: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 5.36 Mbit/s)   Flow 1 egress (mean 5.37 Mbit/s)

Flow 1 (95th percentile 23.26 ms)

```
Run 3: Statistics of TaoVA-100x

Start at: 2017-11-30 06:53:17
End at: 2017-11-30 06:53:47
Local clock offset: -0.878 ms
Remote clock offset: -3.55 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.75 Mbit/s
95th percentile per-packet one-way delay: 29.305 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.75 Mbit/s
95th percentile per-packet one-way delay: 29.305 ms
Loss rate: 0.00%
```
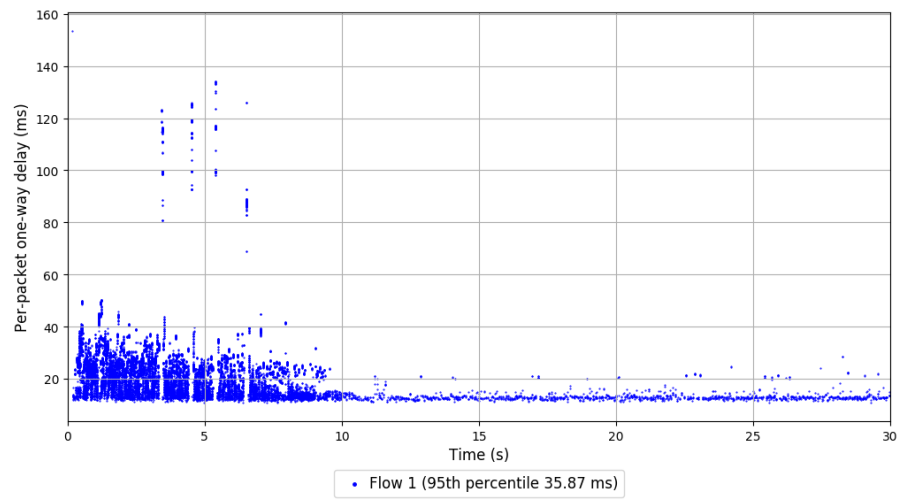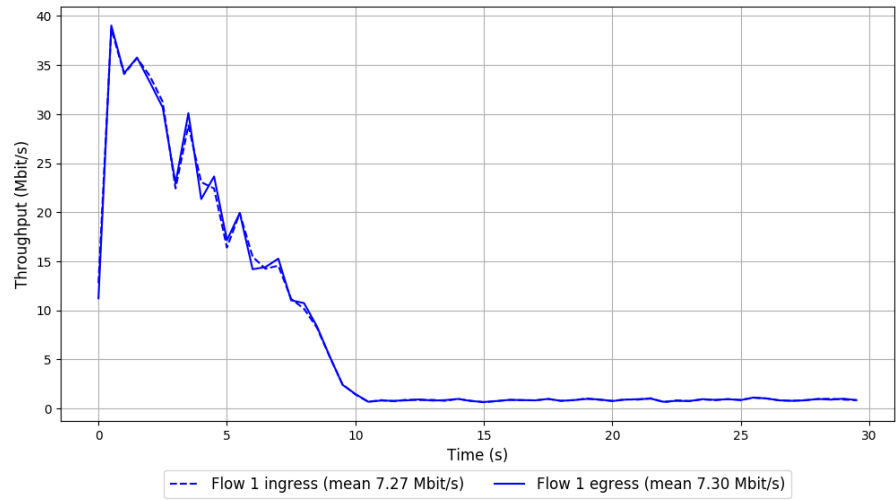
Run 3: Report of TaoVA-100x — Data Link
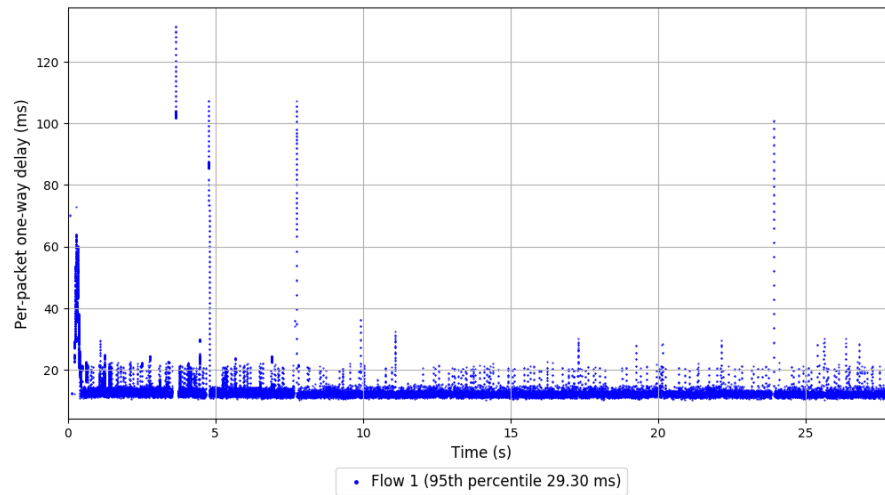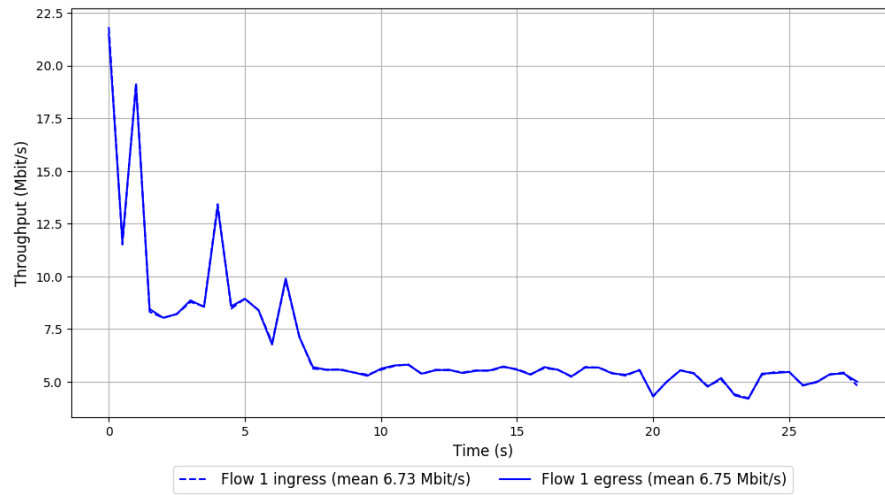
```
Run 1: Statistics of TCP Vegas

Start at: 2017-11-30 06:16:36
End at: 2017-11-30 06:17:06
Local clock offset: -0.283 ms
Remote clock offset: -3.592 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.30 Mbit/s
95th percentile per-packet one-way delay: 35.870 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 7.30 Mbit/s
95th percentile per-packet one-way delay: 35.870 ms
Loss rate: 0.00%
```
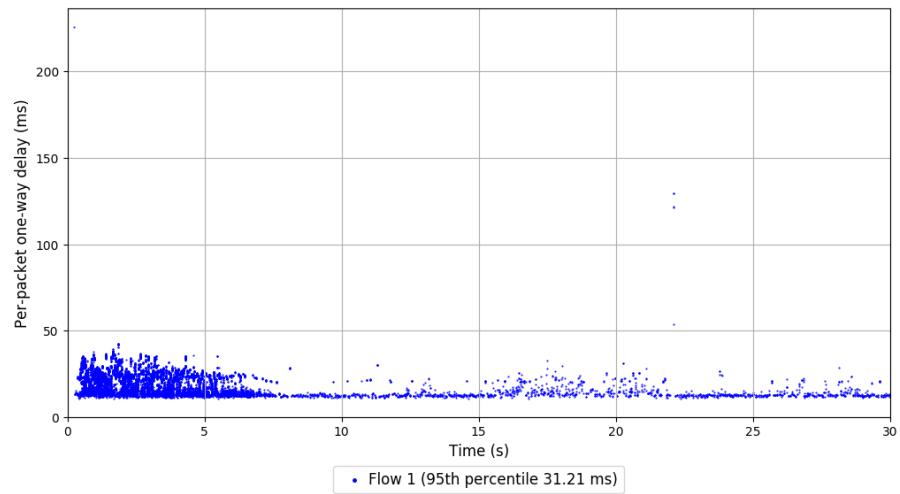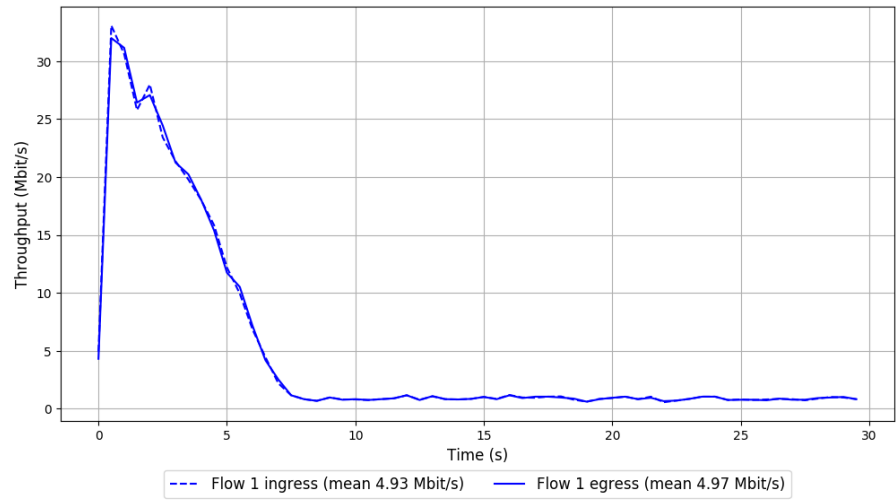
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-11-30 06:33:11
End at: 2017-11-30 06:33:41
Local clock offset: -0.393 ms
Remote clock offset: -3.465 ms

# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.97 Mbit/s
95th percentile per-packet one-way delay: 31.206 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.97 Mbit/s
95th percentile per-packet one-way delay: 31.206 ms
Loss rate: 0.00%
```

Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2017-11-30 06:49:45
End at: 2017-11-30 06:50:15
Local clock offset: -0.772 ms
Remote clock offset: -3.596 ms


# Below is generated by plot.py at 2017-11-30 06:57:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.25 Mbit/s
95th percentile per-packet one-way delay: 30.916 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 5.25 Mbit/s
95th percentile per-packet one-way delay: 30.916 ms
Loss rate: 0.00%
```

Run 3: Report of TCP Vegas — Data Link
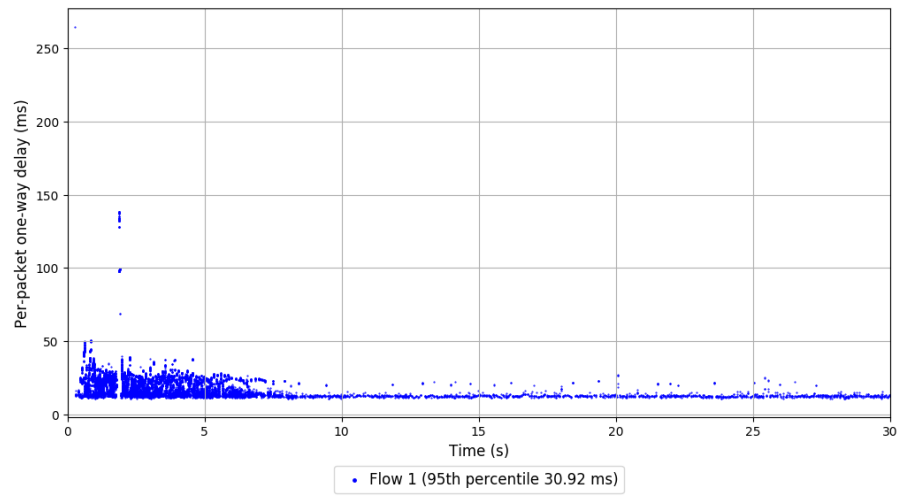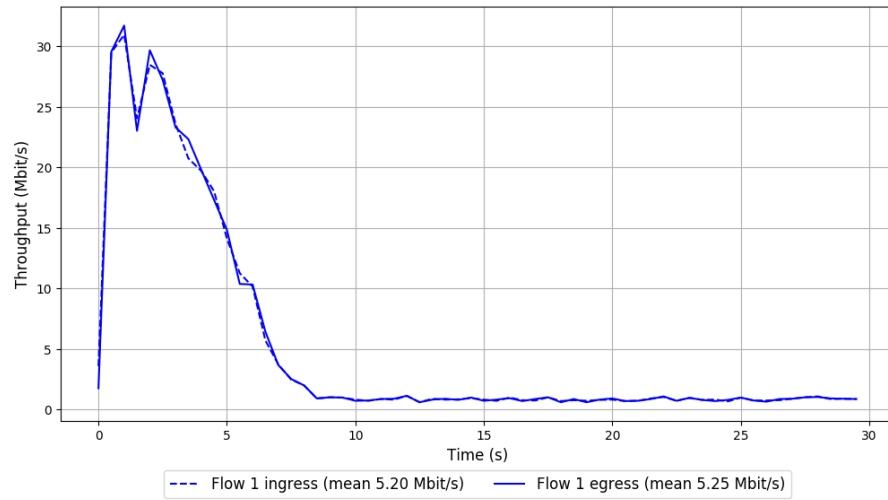
```
Run 1: Statistics of Verus

Start at: 2017-11-30 06:09:30
End at: 2017-11-30 06:10:00
Local clock offset: -0.525 ms
Remote clock offset: -3.815 ms


# Below is generated by plot.py at 2017-11-30 06:58:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 31.87 Mbit/s
95th percentile per-packet one-way delay: 208.615 ms
Loss rate: 11.77%
-- Flow 1:
Average throughput: 31.87 Mbit/s
95th percentile per-packet one-way delay: 208.615 ms
Loss rate: 11.77%
```
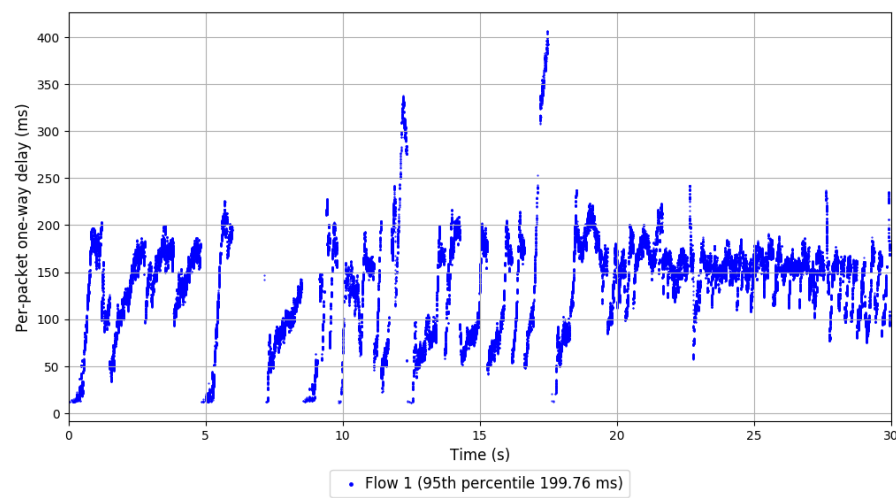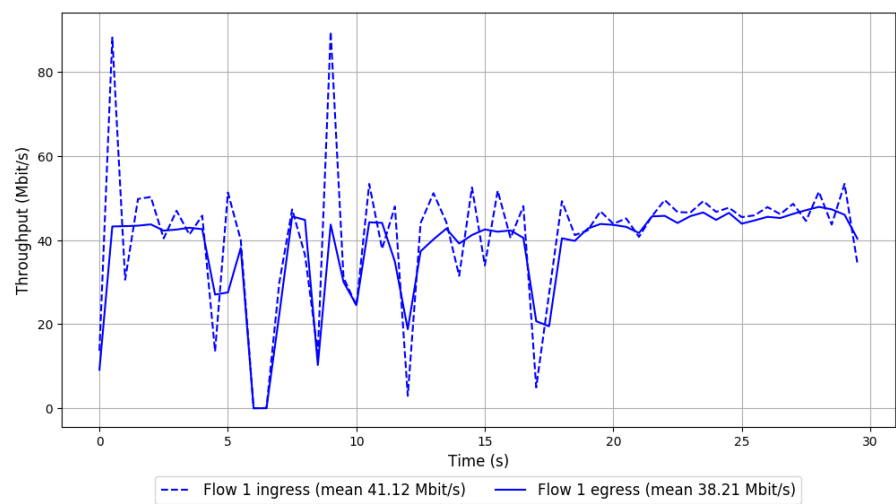
Run 1: Report of Verus — Data Link
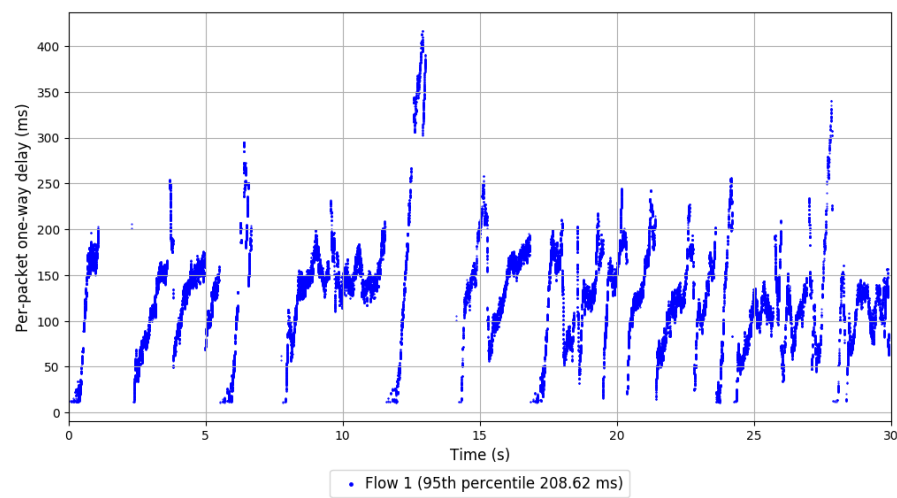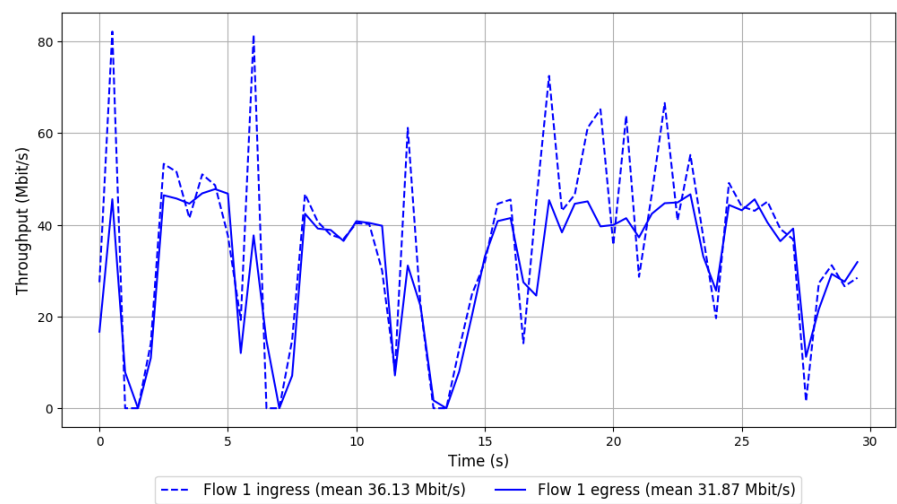
```
Run 2: Statistics of Verus

Start at: 2017-11-30 06:26:06
End at: 2017-11-30 06:26:36
Local clock offset: -0.221 ms
Remote clock offset: -3.385 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 38.21 Mbit/s
95th percentile per-packet one-way delay: 199.757 ms
Loss rate: 7.05%
-- Flow 1:
Average throughput: 38.21 Mbit/s
95th percentile per-packet one-way delay: 199.757 ms
Loss rate: 7.05%
```

Run 2: Report of Verus — Data Link

Flow 1 ingress (mean 41.12 Mbit/s) --- Flow 1 egress (mean 38.21 Mbit/s)

Flow 1 (95th percentile 199.76 ms)

```
Run 3: Statistics of Verus

Start at: 2017-11-30 06:42:41
End at: 2017-11-30 06:43:11
Local clock offset: -0.556 ms
Remote clock offset: -3.488 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 31.37 Mbit/s
95th percentile per-packet one-way delay: 208.361 ms
Loss rate: 12.23%
-- Flow 1:
Average throughput: 31.37 Mbit/s
95th percentile per-packet one-way delay: 208.361 ms
Loss rate: 12.23%
```
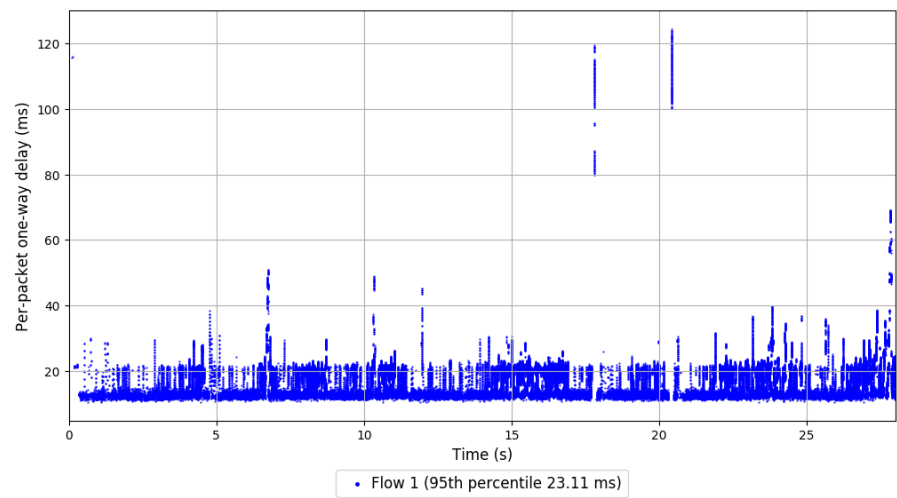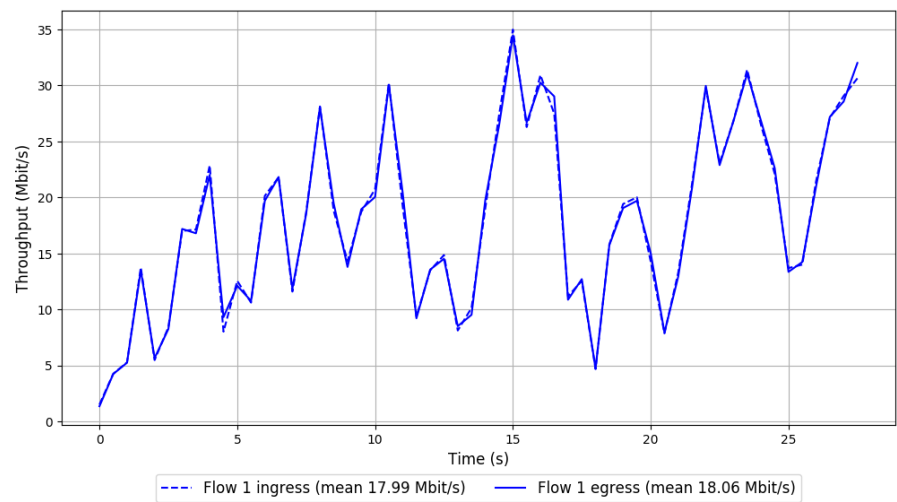
Run 3: Report of Verus — Data Link
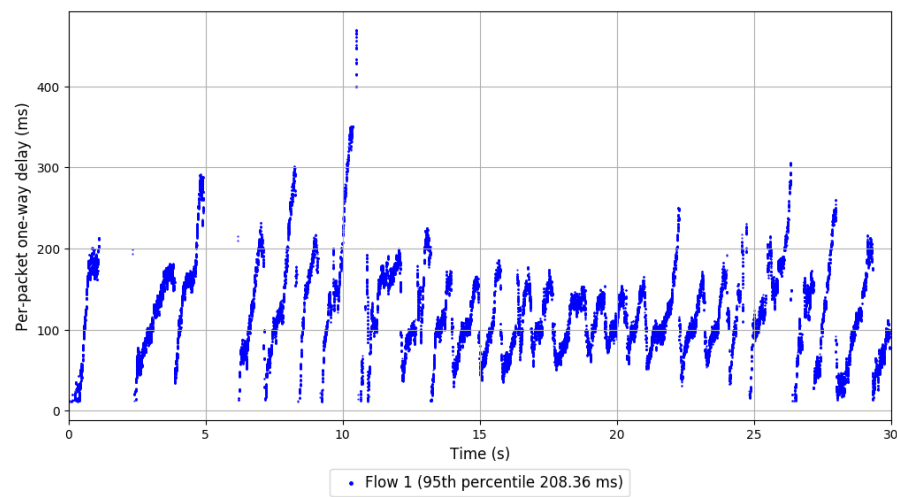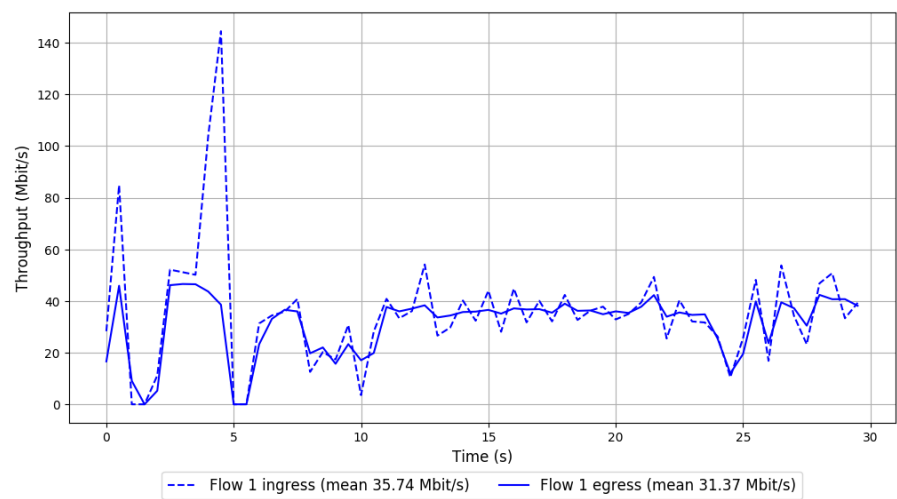
```
Run 1: Statistics of Copa

Start at: 2017-11-30 06:11:53
End at: 2017-11-30 06:12:23
Local clock offset: -0.551 ms
Remote clock offset: -3.753 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 18.06 Mbit/s
95th percentile per-packet one-way delay: 23.115 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 18.06 Mbit/s
95th percentile per-packet one-way delay: 23.115 ms
Loss rate: 0.00%
```

Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 17.99 Mbit/s) — Flow 1 egress (mean 18.06 Mbit/s)

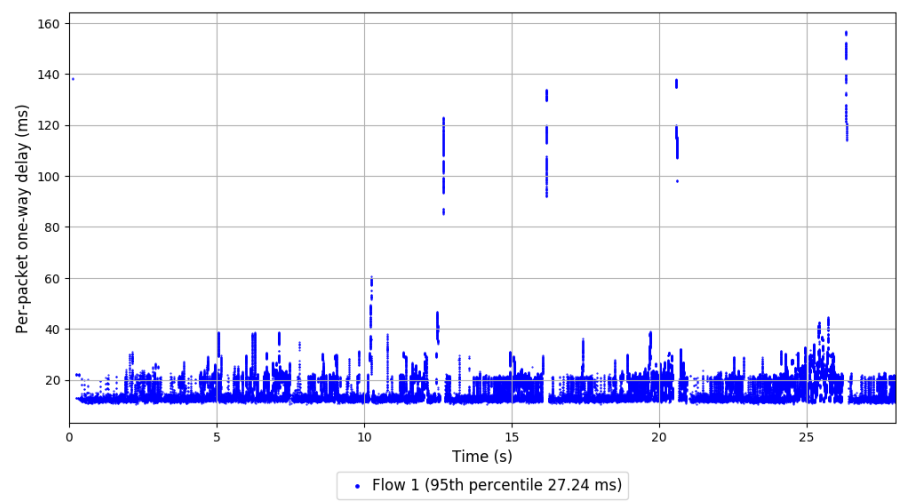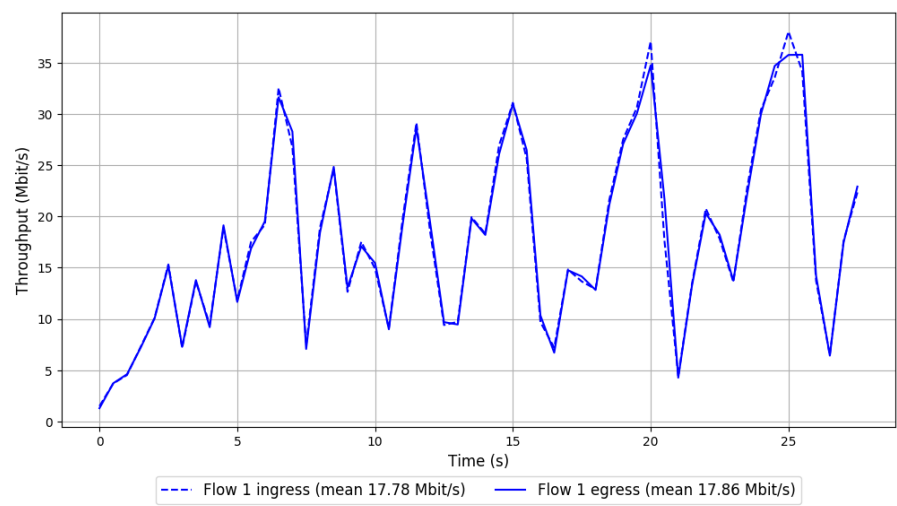Flow 1 (95th percentile 23.11 ms)

```
Run 2: Statistics of Copa

Start at: 2017-11-30 06:28:29
End at: 2017-11-30 06:28:59
Local clock offset: -0.198 ms
Remote clock offset: -3.349 ms

# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.86 Mbit/s
95th percentile per-packet one-way delay: 27.237 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 17.86 Mbit/s
95th percentile per-packet one-way delay: 27.237 ms
Loss rate: 0.00%
```

Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2017-11-30 06:45:03
End at: 2017-11-30 06:45:33
Local clock offset: -0.738 ms
Remote clock offset: -3.545 ms

# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.17 Mbit/s
95th percentile per-packet one-way delay: 26.924 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 15.17 Mbit/s
95th percentile per-packet one-way delay: 26.924 ms
Loss rate: 0.02%
```

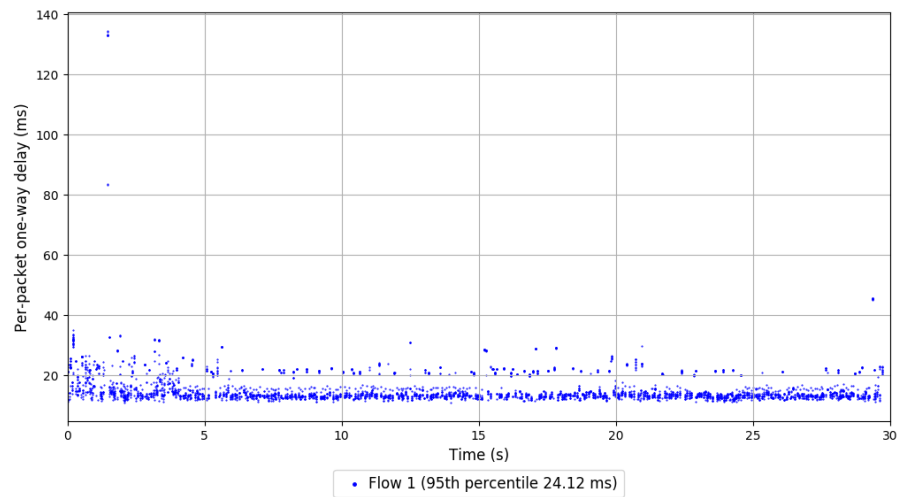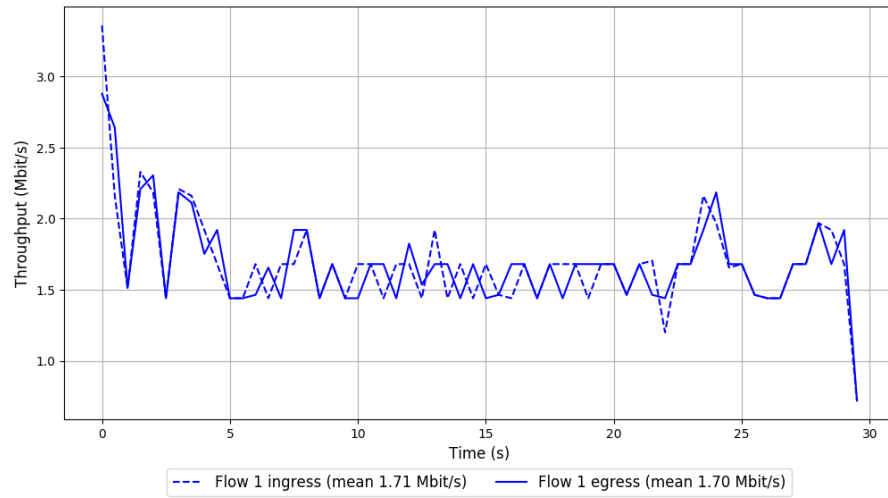Run 3: Report of Copa — Data Link
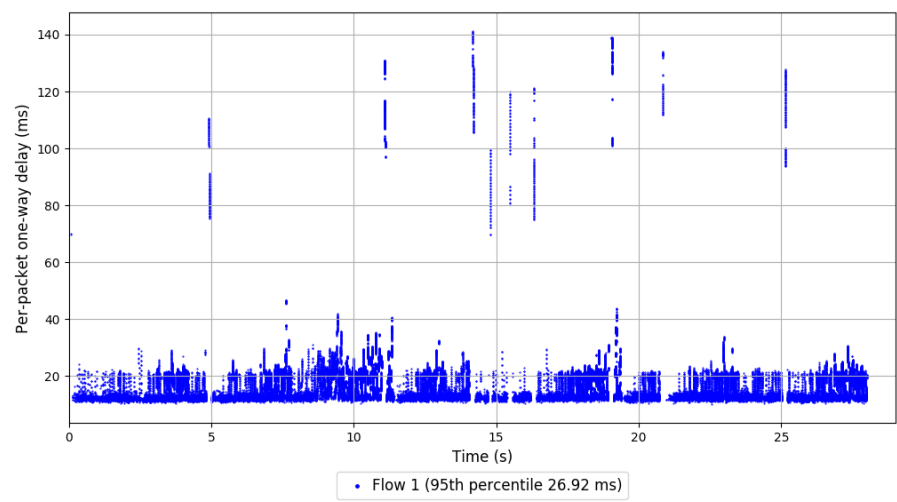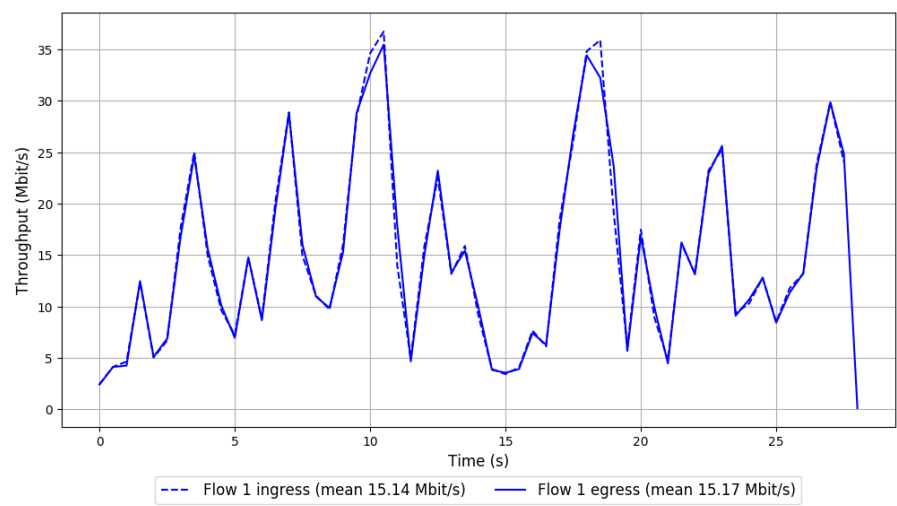
Run 1: Statistics of Indigo

Start at: 2017-11-30 06:14:15
End at: 2017-11-30 06:14:45
Local clock offset: -0.322 ms
Remote clock offset: -3.678 ms

Below is generated by plot.py at 2017-11-30 06:58:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 24.121 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 24.121 ms
Loss rate: 0.00%
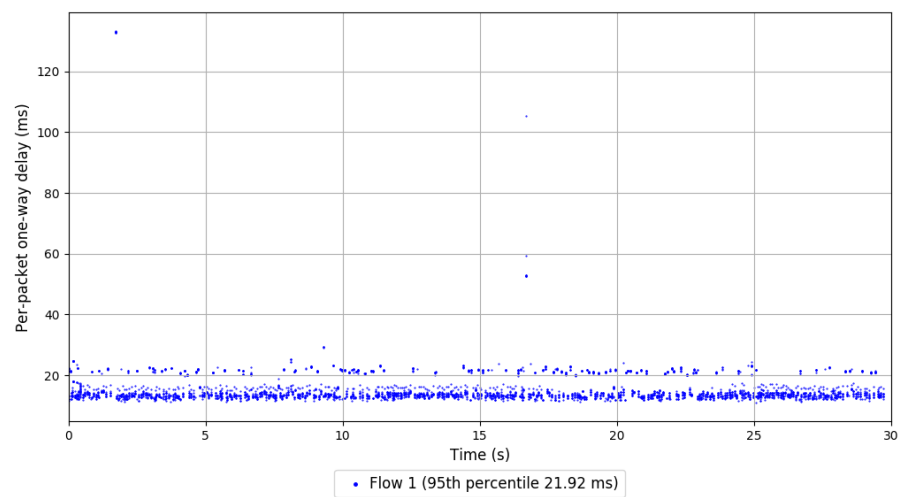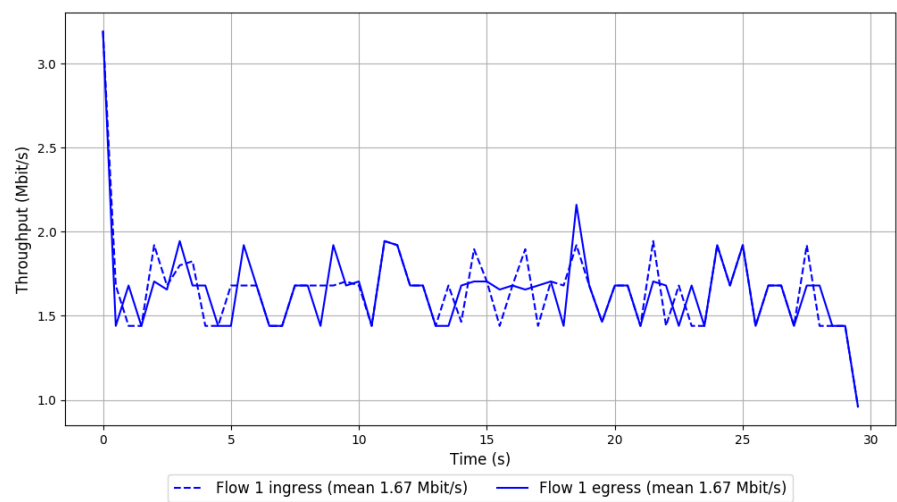
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-11-30 06:30:50
End at: 2017-11-30 06:31:20
Local clock offset: -0.344 ms
Remote clock offset: -3.439 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 21.919 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 21.919 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo — Data Link

Flow 1 ingress (mean 1.67 Mbit/s)   Flow 1 egress (mean 1.67 Mbit/s)

Flow 1 (95th percentile 21.92 ms)

```
Run 3: Statistics of Indigo

Start at: 2017-11-30 06:47:24
End at: 2017-11-30 06:47:55
Local clock offset: -0.703 ms
Remote clock offset: -3.554 ms

# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 23.310 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 23.310 ms
Loss rate: 0.00%
```
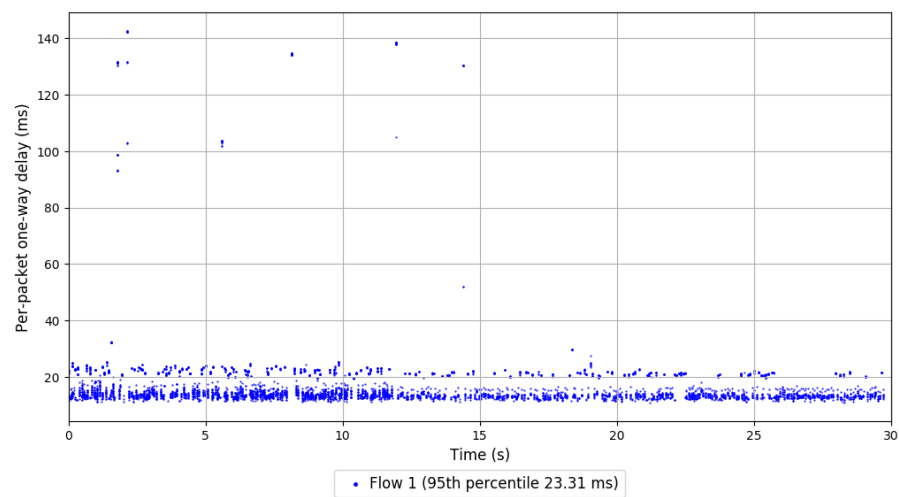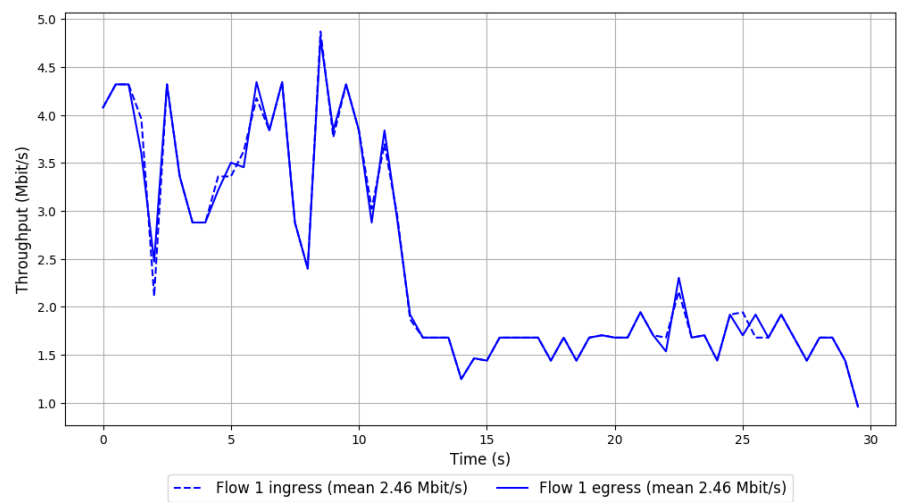
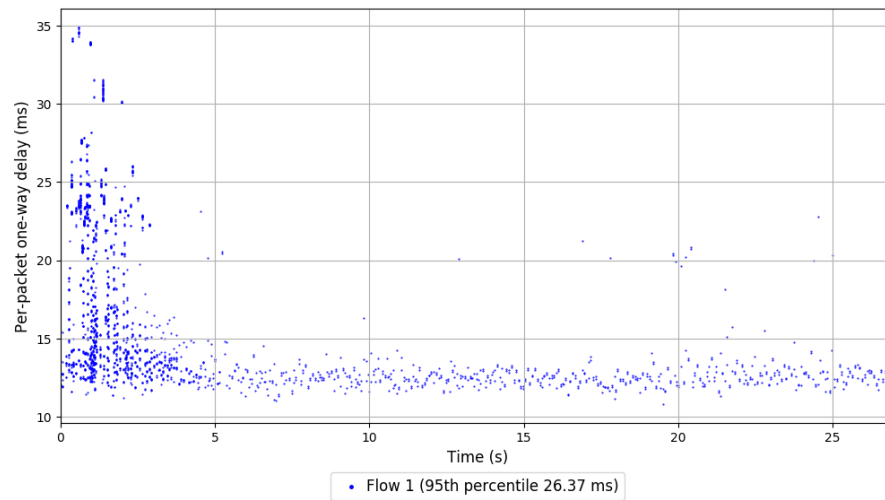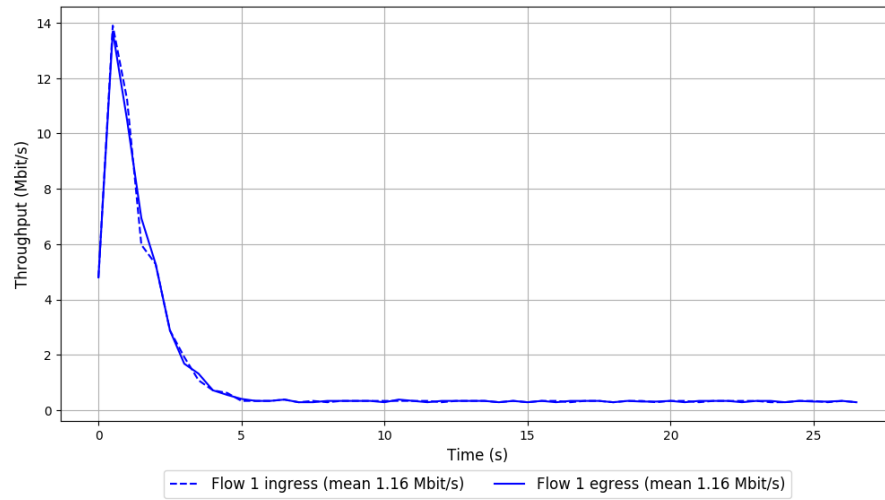## Run 3: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-calib

Start at: 2017-11-30 06:10:43
End at: 2017-11-30 06:11:13
Local clock offset: -0.549 ms
Remote clock offset: -3.806 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 26.366 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 26.366 ms
Loss rate: 0.00%
```

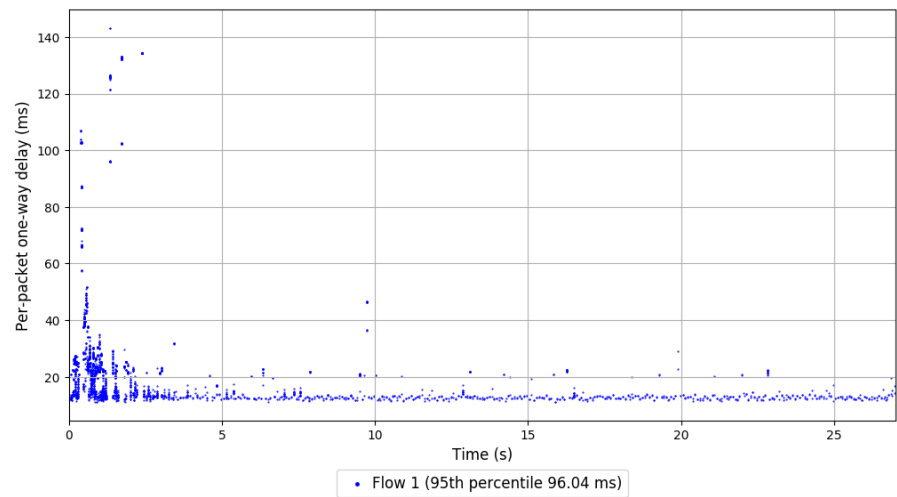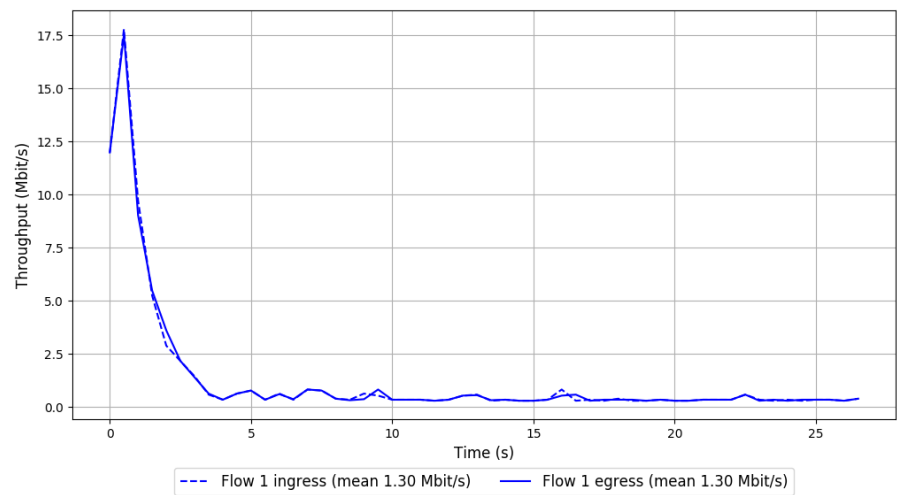# Run 1: Report of Indigo-calib — Data Link

```
Run 2: Statistics of Indigo-calib

Start at: 2017-11-30 06:27:18
End at: 2017-11-30 06:27:48
Local clock offset: -0.246 ms
Remote clock offset: -3.435 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 96.043 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 96.043 ms
Loss rate: 0.00%
```

Run 2: Report of Indigo-calib — Data Link

```
Run 3: Statistics of Indigo-calib

Start at: 2017-11-30 06:43:53
End at: 2017-11-30 06:44:23
Local clock offset: -0.599 ms
Remote clock offset: -3.532 ms


# Below is generated by plot.py at 2017-11-30 06:58:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 69.506 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 69.506 ms
Loss rate: 0.00%
```

Run 3: Report of Indigo-calib — Data Link