Pantheon Report

Generated at 2017-12-01 01:03:40 (UTC).

Data path: China ppp0 (*remote*) →AWS Korea Ethernet (*local*).

Repeated the test of 14 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

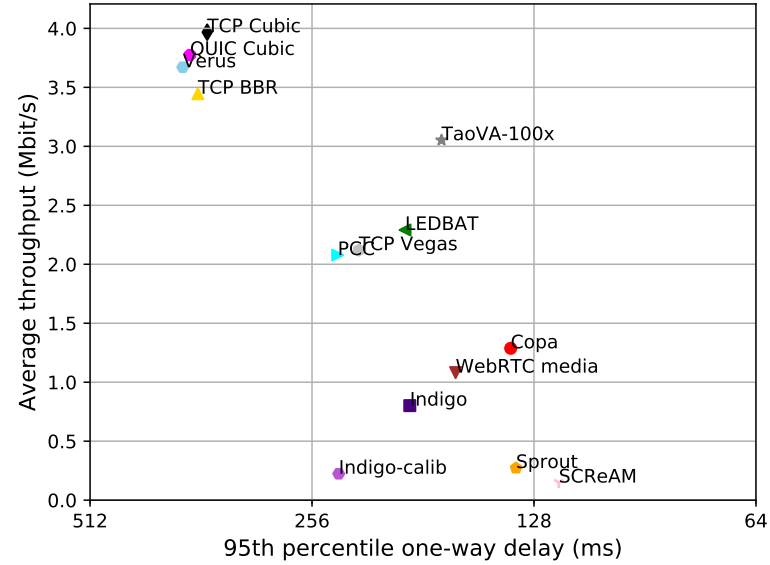Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

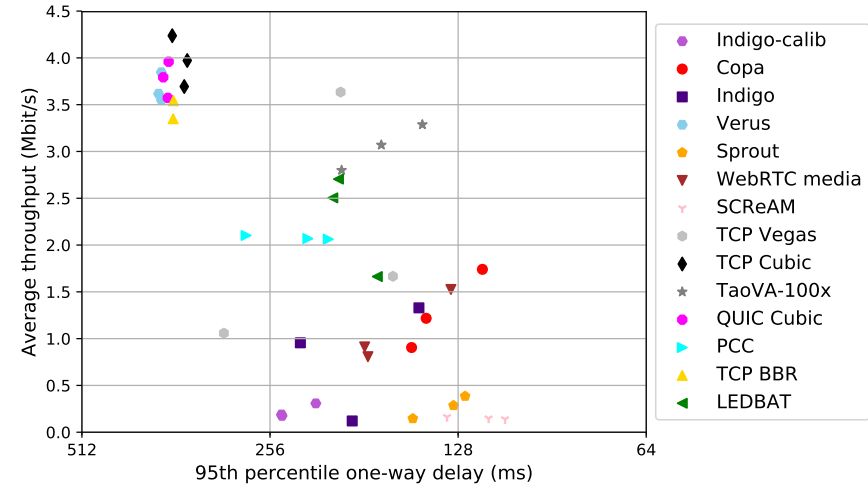NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.

```
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 China ppp0 to AWS Korea Ethernet, 3 runs of 30s each per scheme
(mean of all runs by scheme)

test from China ppp0 to AWS Korea Ethernet, 3 runs of 30s each per scheme
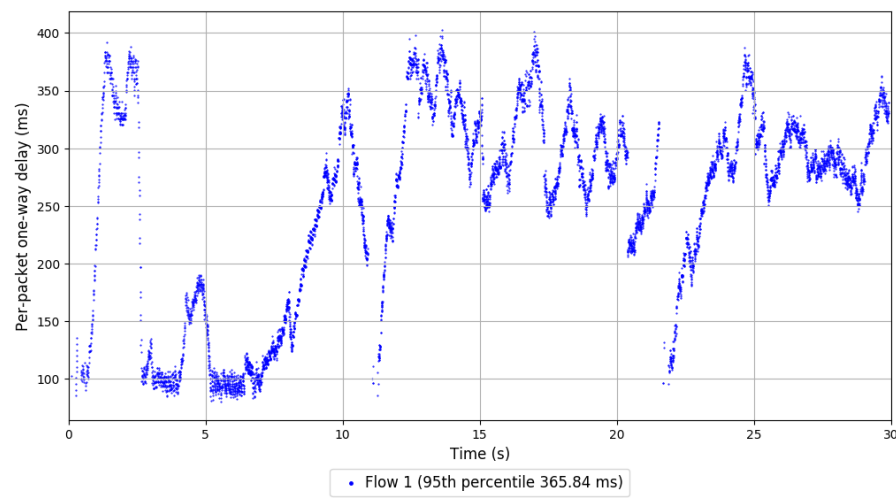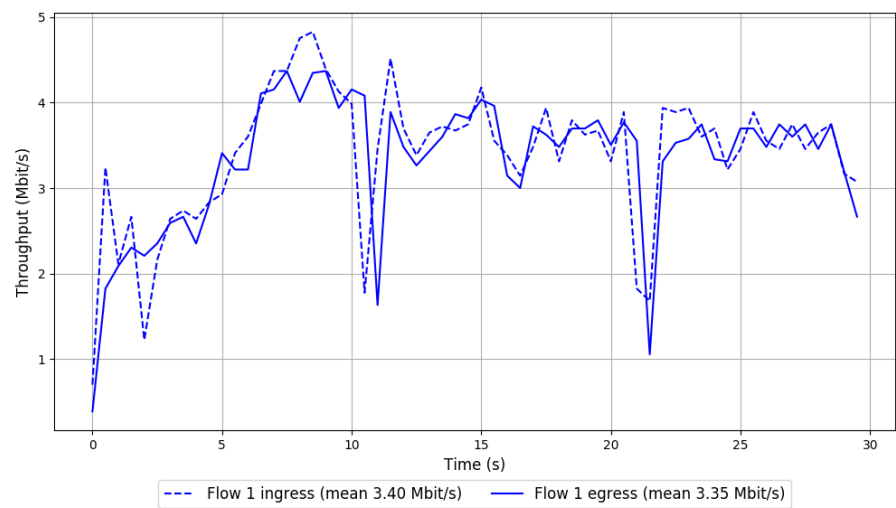
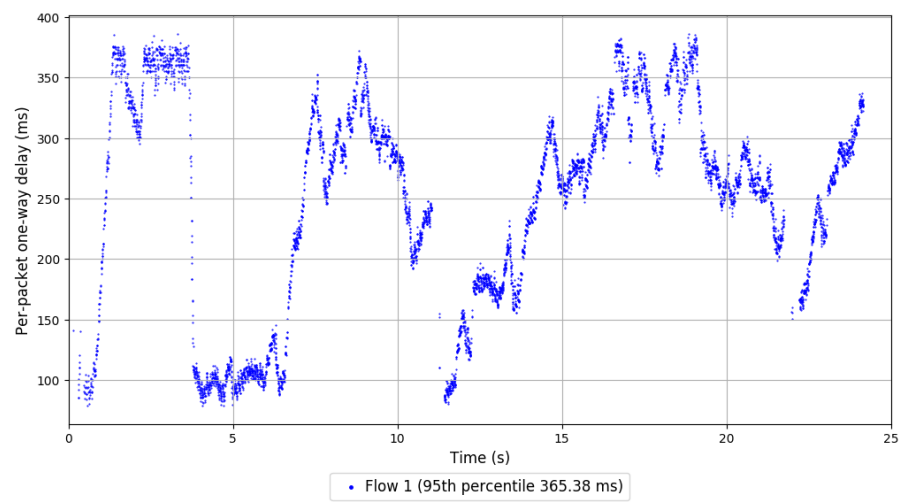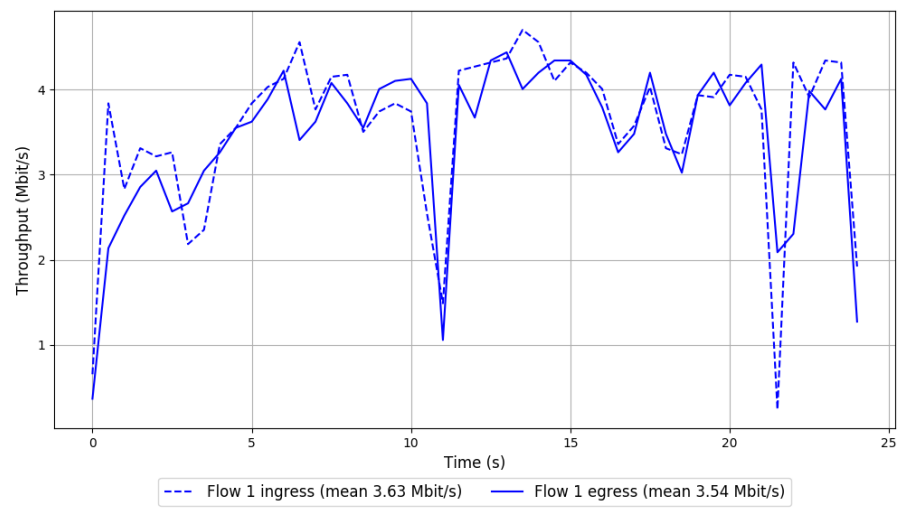| scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	3.45	365.61	2.52
TCP Cubic	3	3.97	355.16	2.09
LEDBAT	3	2.29	191.50	1.19
PCC	3	2.08	236.26	14.42
QUIC Cubic	3	3.77	374.79	3.88
SCReAM	3	0.15	118.47	0.41
WebRTC media	3	1.08	163.51	6.58
Sprout	3	0.27	135.40	0.61
TaoVA-100x	3	3.05	170.85	0.92
TCP Vegas	3	2.12	221.19	1.70
Verus	3	3.67	383.36	29.12
Copa	3	1.29	137.66	0.58
Indigo	3	0.80	188.64	1.16
Indigo-calib	3	0.22	235.52	1.50

```
Run 1: Statistics of TCP BBR

Start at: 2017-11-30 23:27:05
End at: 2017-11-30 23:27:35
Local clock offset: -2.079 ms
Remote clock offset: -6.646 ms

# Below is generated by plot.py at 2017-12-01 01:03:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.35 Mbit/s
95th percentile per-packet one-way delay: 365.841 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 3.35 Mbit/s
95th percentile per-packet one-way delay: 365.841 ms
Loss rate: 1.85%
```

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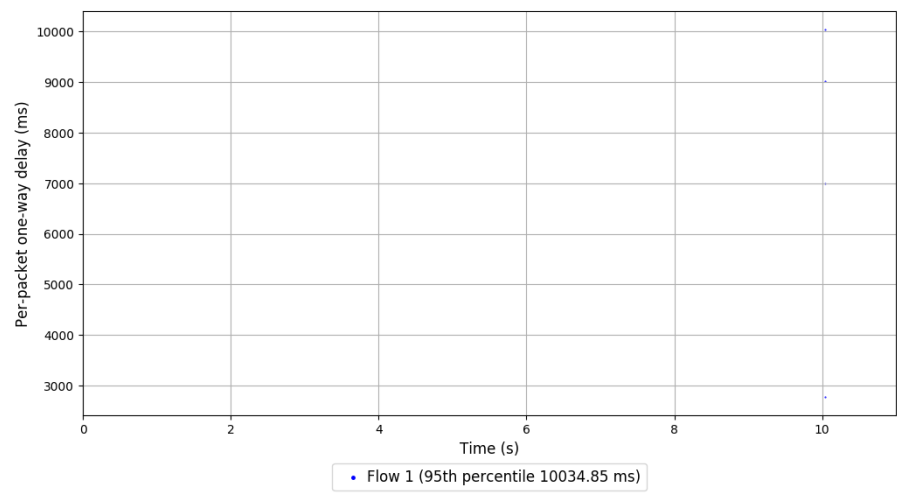
```
Run 2: Statistics of TCP BBR

Start at: 2017-11-30 23:43:08
End at: 2017-11-30 23:43:38
Local clock offset: -1.754 ms
Remote clock offset: -6.439 ms

# Below is generated by plot.py at 2017-12-01 01:03:08
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 365.376 ms
Loss rate: 3.18%
-- Flow 1:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 365.376 ms
Loss rate: 3.18%
```

Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 3.63 Mbit/s) — — — Flow 1 egress (mean 3.54 Mbit/s)

Flow 1 (95th percentile 365.38 ms)
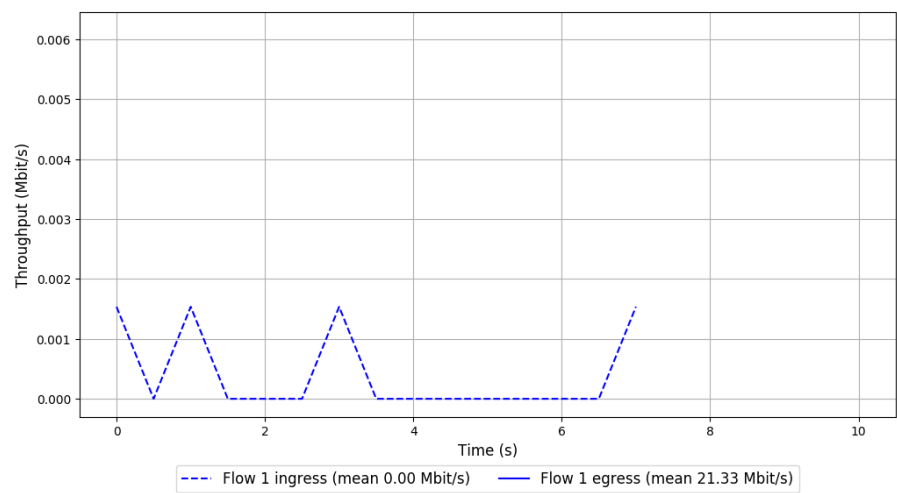
Run 3: Statistics of TCP BBR

Start at: 2017-11-30 23:59:11
End at: 2017-11-30 23:59:41
Local clock offset: -1.621 ms
Remote clock offset: -6.414 ms
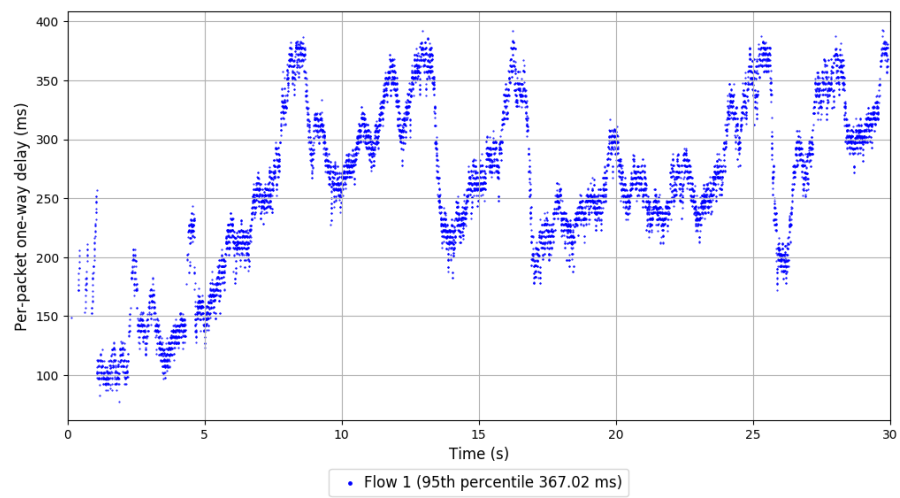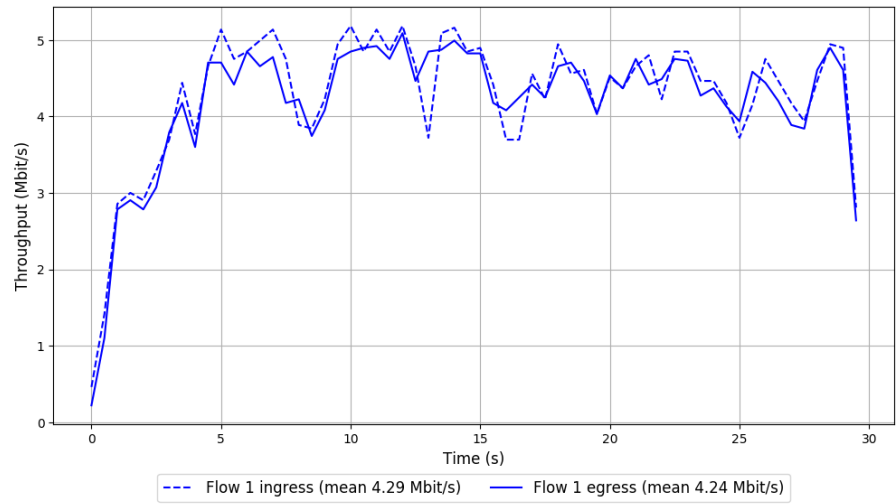
Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 0.00 Mbit/s)   Flow 1 egress (mean 21.33 Mbit/s)
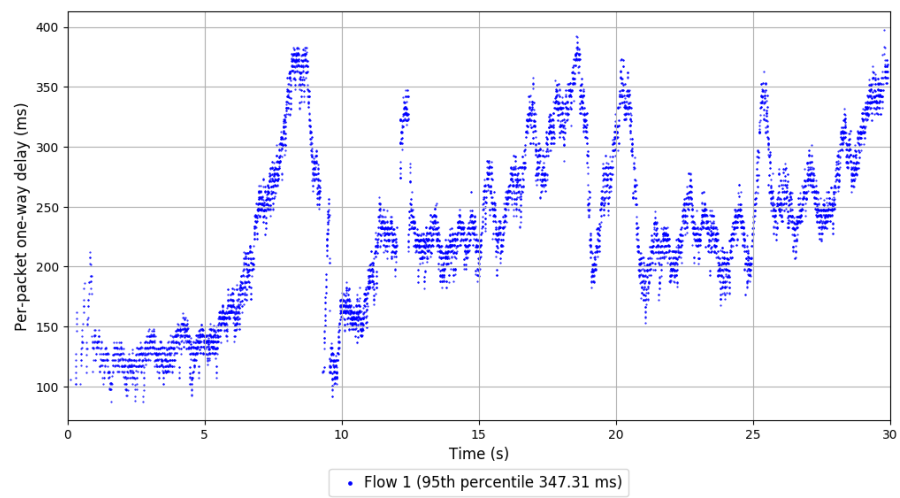

Flow 1 (95th percentile 10034.85 ms)

9

```
Run 1: Statistics of TCP Cubic

Start at: 2017-11-30 23:39:42
End at: 2017-11-30 23:40:12
Local clock offset: -2.051 ms
Remote clock offset: -6.525 ms


# Below is generated by plot.py at 2017-12-01 01:03:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.24 Mbit/s
95th percentile per-packet one-way delay: 367.017 ms
Loss rate: 1.81%
-- Flow 1:
Average throughput: 4.24 Mbit/s
95th percentile per-packet one-way delay: 367.017 ms
Loss rate: 1.81%
```
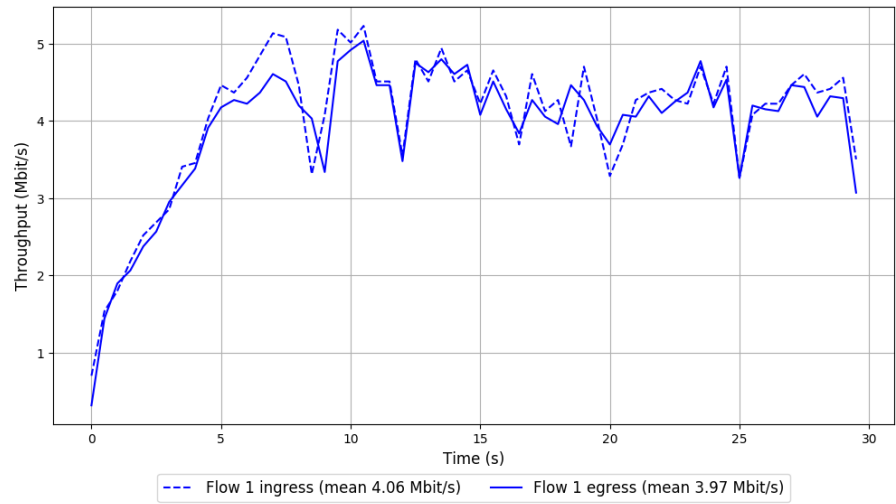
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2017-11-30 23:55:45
End at: 2017-11-30 23:56:15
Local clock offset: -1.708 ms
Remote clock offset: -6.375 ms


# Below is generated by plot.py at 2017-12-01 01:03:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.97 Mbit/s
95th percentile per-packet one-way delay: 347.315 ms
Loss rate: 2.62%
-- Flow 1:
Average throughput: 3.97 Mbit/s
95th percentile per-packet one-way delay: 347.315 ms
Loss rate: 2.62%
```

Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 4.06 Mbit/s)   Flow 1 egress (mean 3.97 Mbit/s)

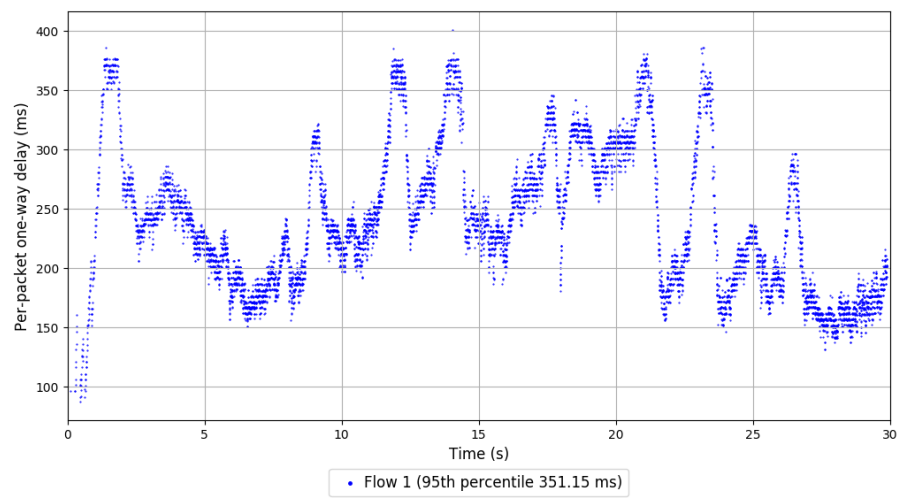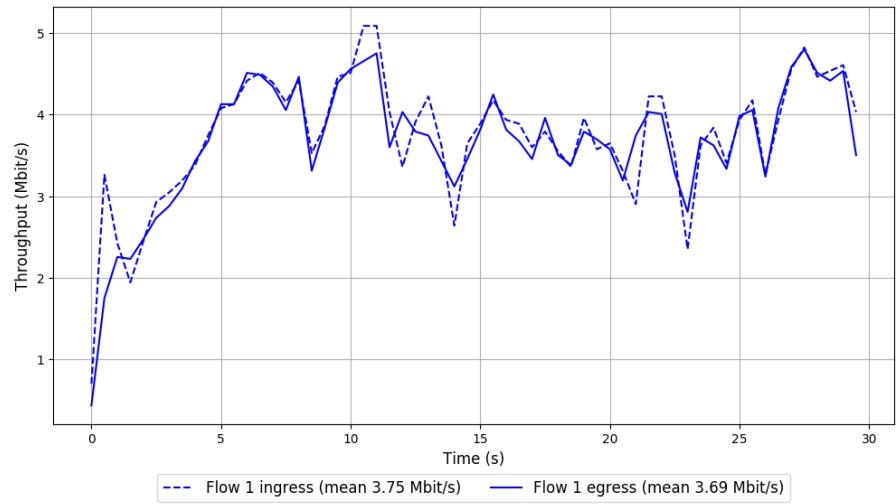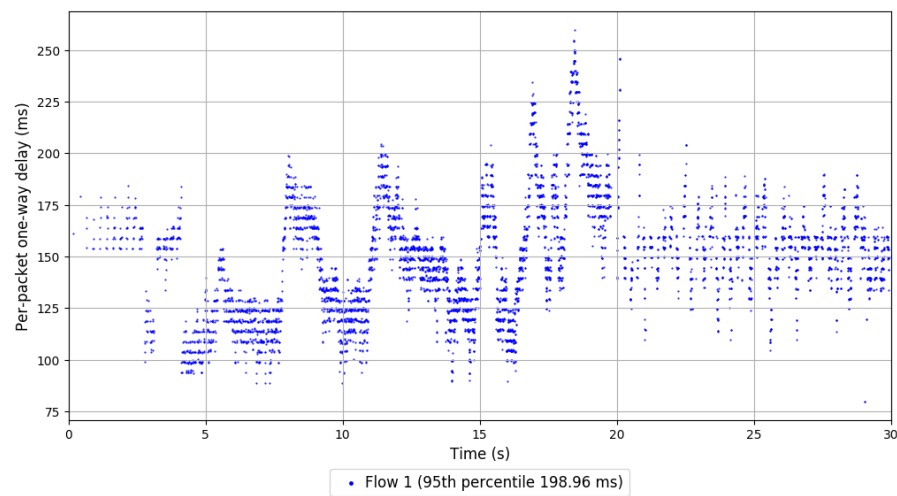

• Flow 1 (95th percentile 347.31 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-12-01 00:11:47
End at: 2017-12-01 00:12:17
Local clock offset: -1.337 ms
Remote clock offset: -6.419 ms


# Below is generated by plot.py at 2017-12-01 01:03:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.69 Mbit/s
95th percentile per-packet one-way delay: 351.152 ms
Loss rate: 1.83%
-- Flow 1:
Average throughput: 3.69 Mbit/s
95th percentile per-packet one-way delay: 351.152 ms
Loss rate: 1.83%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 3.75 Mbit/s) --- Flow 1 egress (mean 3.69 Mbit/s)

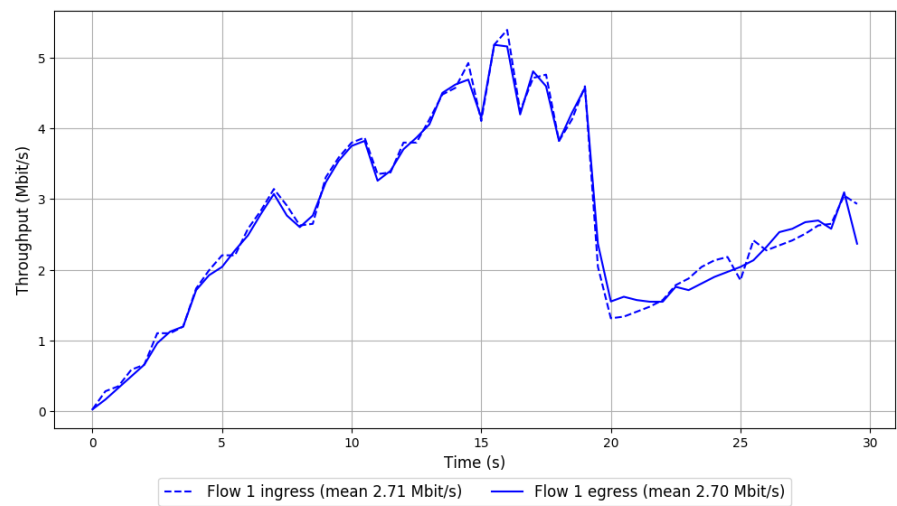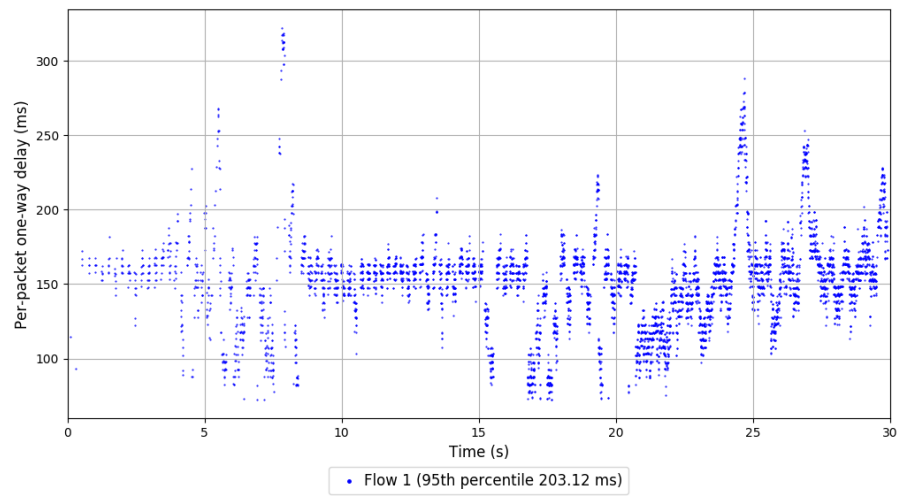• Flow 1 (95th percentile 351.15 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2017-11-30 23:35:06
End at: 2017-11-30 23:35:36
Local clock offset: -1.887 ms
Remote clock offset: -6.625 ms

# Below is generated by plot.py at 2017-12-01 01:03:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.70 Mbit/s
95th percentile per-packet one-way delay: 198.962 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 2.70 Mbit/s
95th percentile per-packet one-way delay: 198.962 ms
Loss rate: 0.88%
```

Run 1: Report of LEDBAT — Data Link

Flow 1 ingress (mean 2.71 Mbit/s) — — — Flow 1 egress (mean 2.70 Mbit/s)

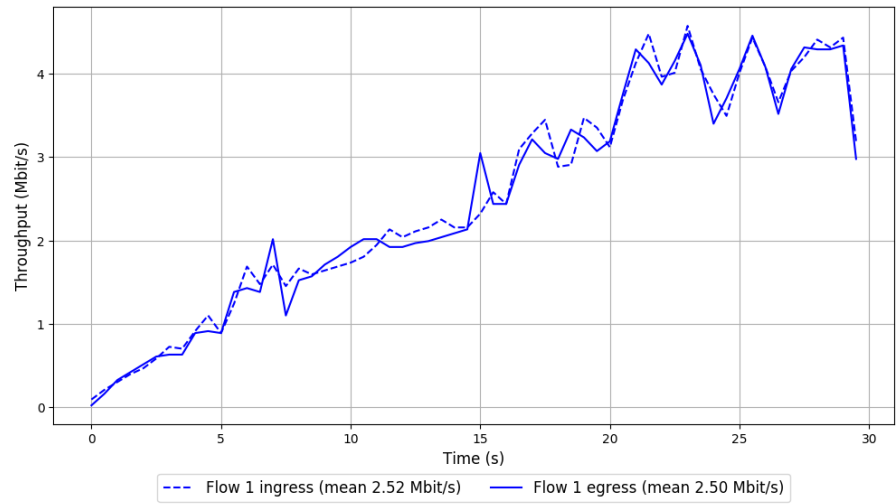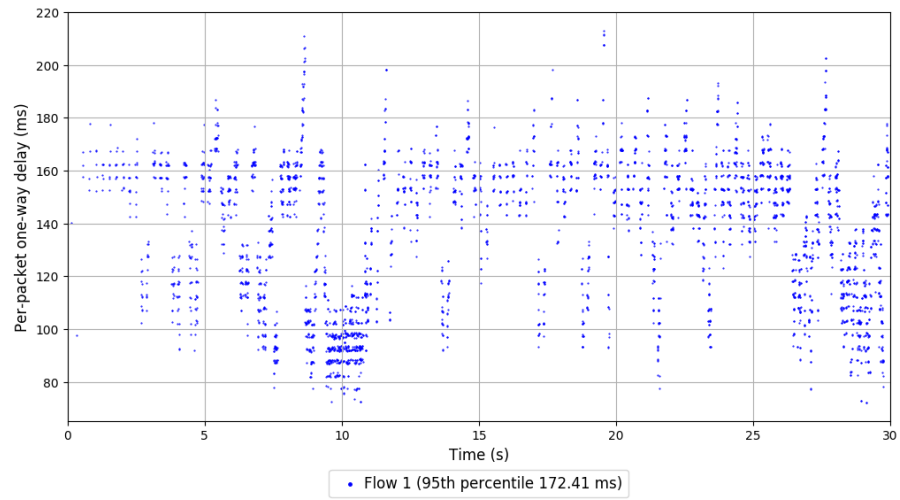Flow 1 (95th percentile 198.96 ms)

```
Run 2: Statistics of LEDBAT

Start at: 2017-11-30 23:51:10
End at: 2017-11-30 23:51:40
Local clock offset: -1.616 ms
Remote clock offset: -6.409 ms

# Below is generated by plot.py at 2017-12-01 01:03:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 203.124 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 203.124 ms
Loss rate: 1.13%
```

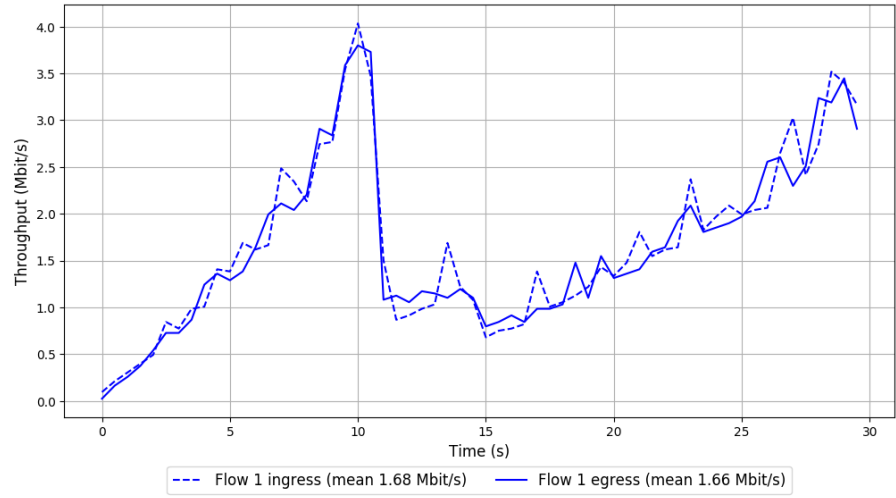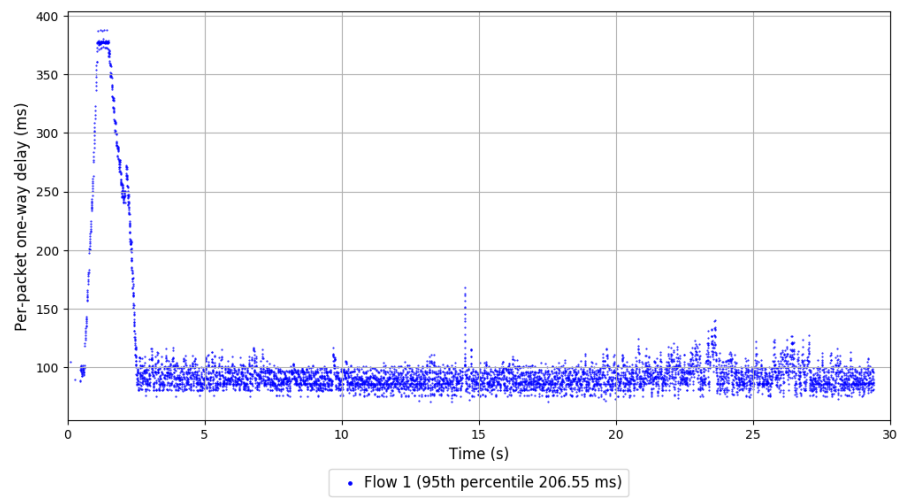Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2017-12-01 00:07:12
End at: 2017-12-01 00:07:42
Local clock offset: -1.616 ms
Remote clock offset: -6.445 ms

# Below is generated by plot.py at 2017-12-01 01:03:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 172.411 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 172.411 ms
Loss rate: 1.56%
```

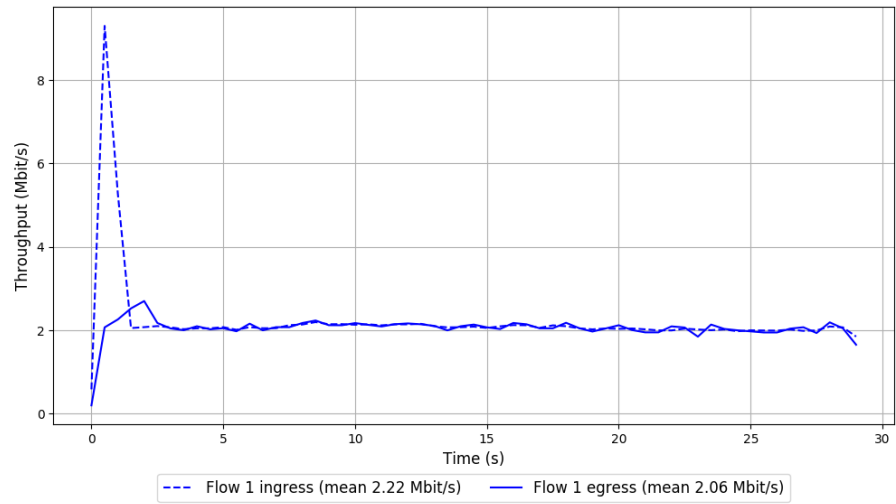Run 3: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2017-11-30 23:30:31
End at: 2017-11-30 23:31:01
Local clock offset: -2.201 ms
Remote clock offset: -6.643 ms


# Below is generated by plot.py at 2017-12-01 01:03:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 206.552 ms
Loss rate: 7.40%
-- Flow 1:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 206.552 ms
Loss rate: 7.40%
```

Run 1: Report of PCC — Data Link

Flow 1 ingress (mean 2.22 Mbit/s) --- Flow 1 egress (mean 2.06 Mbit/s)
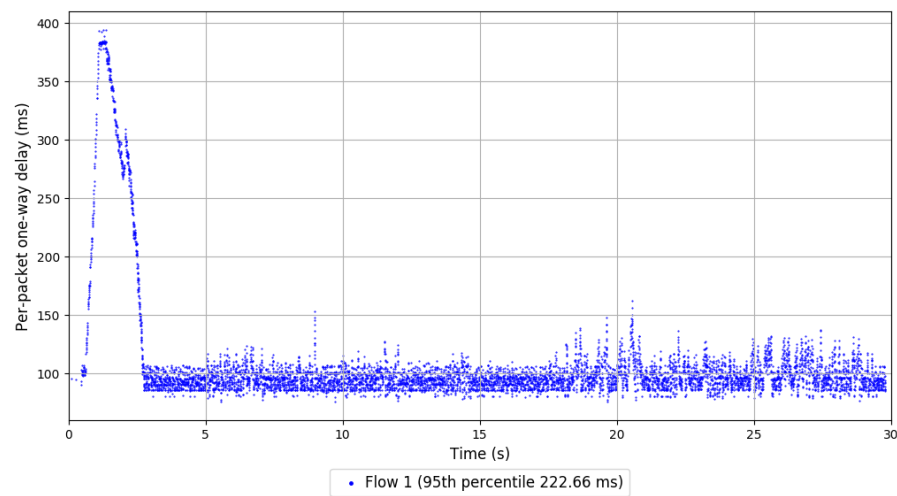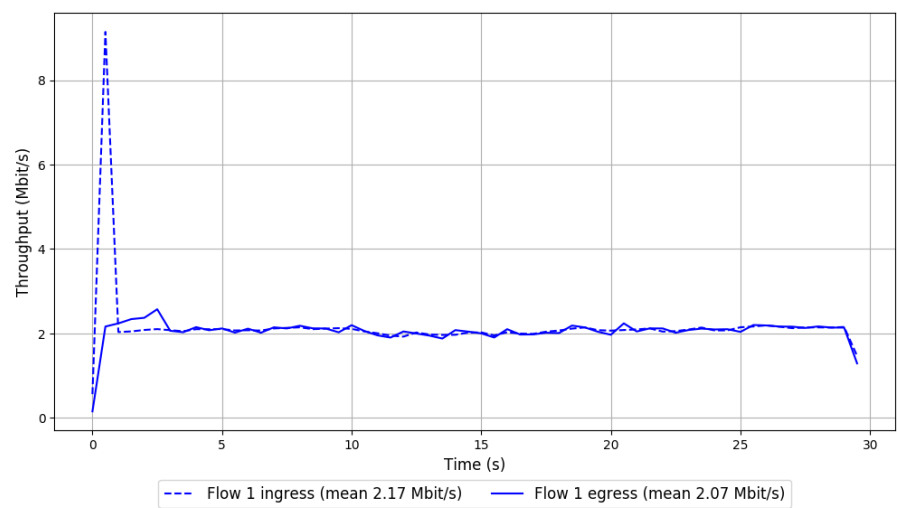

Flow 1 (95th percentile 206.55 ms)

```
Run 2: Statistics of PCC

Start at: 2017-11-30 23:46:35
End at: 2017-11-30 23:47:05
Local clock offset: -1.703 ms
Remote clock offset: -6.397 ms


# Below is generated by plot.py at 2017-12-01 01:03:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 222.665 ms
Loss rate: 4.91%
-- Flow 1:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 222.665 ms
Loss rate: 4.91%
```

Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 2.17 Mbit/s)   Flow 1 egress (mean 2.07 Mbit/s)

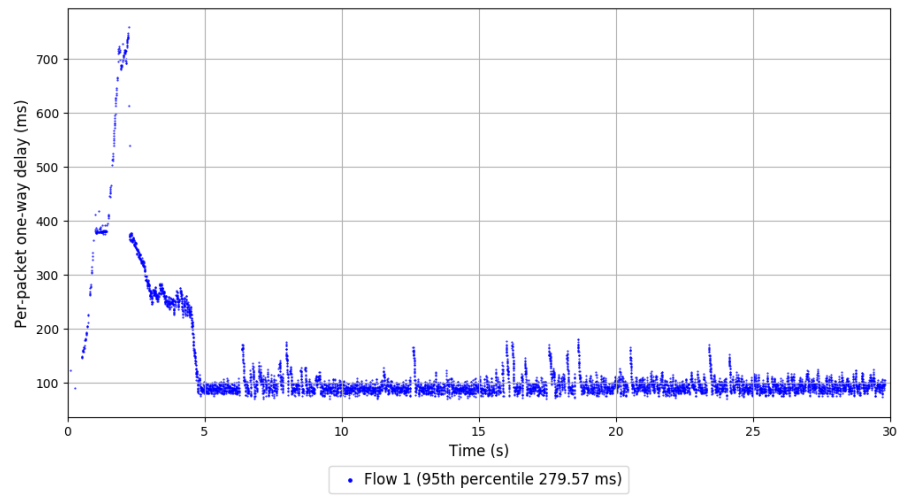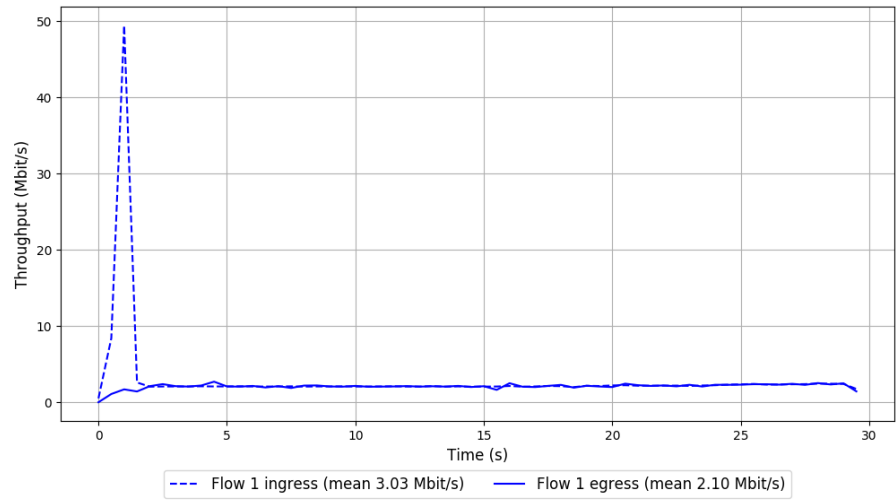Flow 1 (95th percentile 222.66 ms)

```
Run 3: Statistics of PCC

Start at: 2017-12-01 00:02:37
End at: 2017-12-01 00:03:07
Local clock offset: -1.583 ms
Remote clock offset: -6.442 ms


# Below is generated by plot.py at 2017-12-01 01:03:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 279.571 ms
Loss rate: 30.94%
-- Flow 1:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 279.571 ms
Loss rate: 30.94%
```
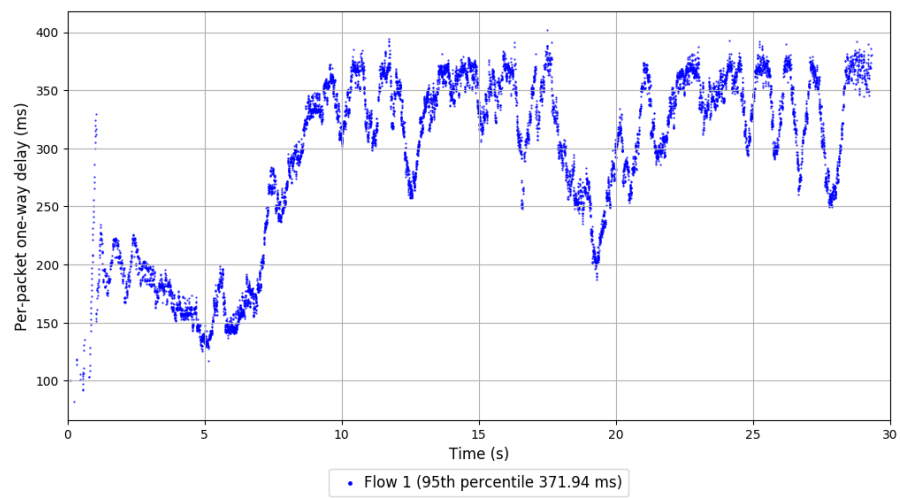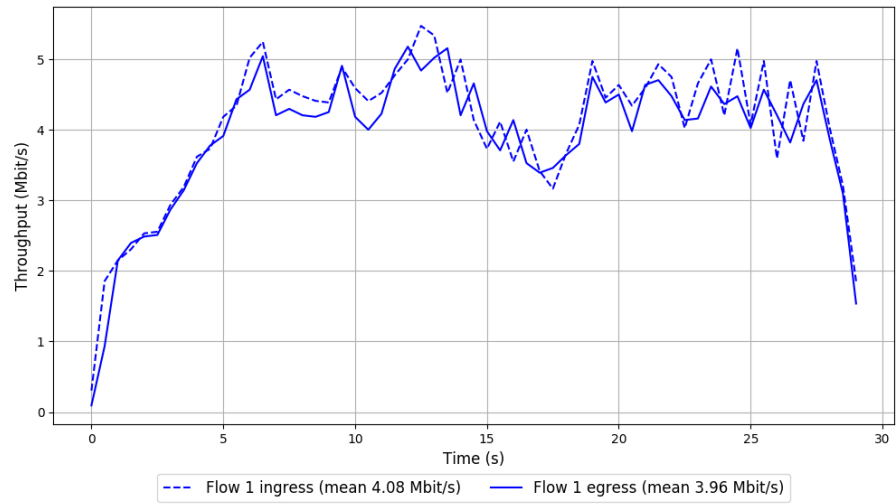
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 3.03 Mbit/s)   Flow 1 egress (mean 2.10 Mbit/s)

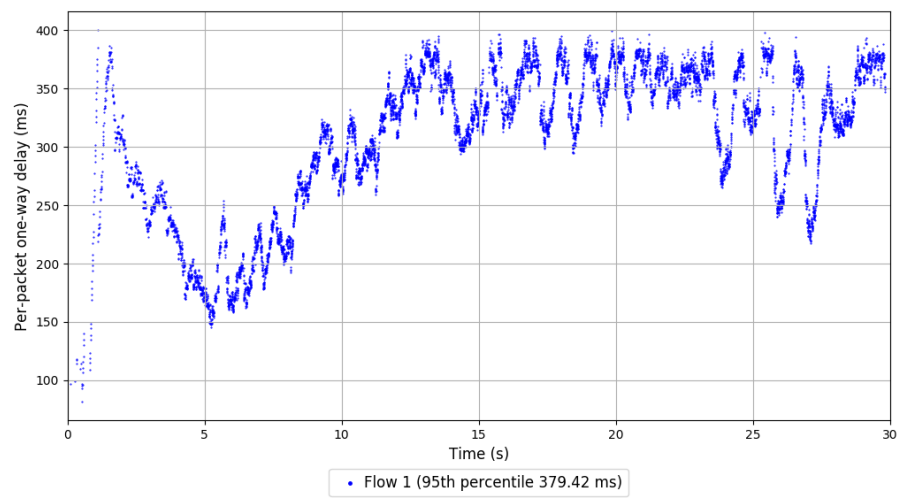
Flow 1 (95th percentile 279.57 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-11-30 23:33:57
End at: 2017-11-30 23:34:27
Local clock offset: -2.004 ms
Remote clock offset: -6.616 ms


# Below is generated by plot.py at 2017-12-01 01:03:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.96 Mbit/s
95th percentile per-packet one-way delay: 371.942 ms
Loss rate: 3.47%
-- Flow 1:
Average throughput: 3.96 Mbit/s
95th percentile per-packet one-way delay: 371.942 ms
Loss rate: 3.47%
```

Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 4.08 Mbit/s) --- Flow 1 egress (mean 3.96 Mbit/s)

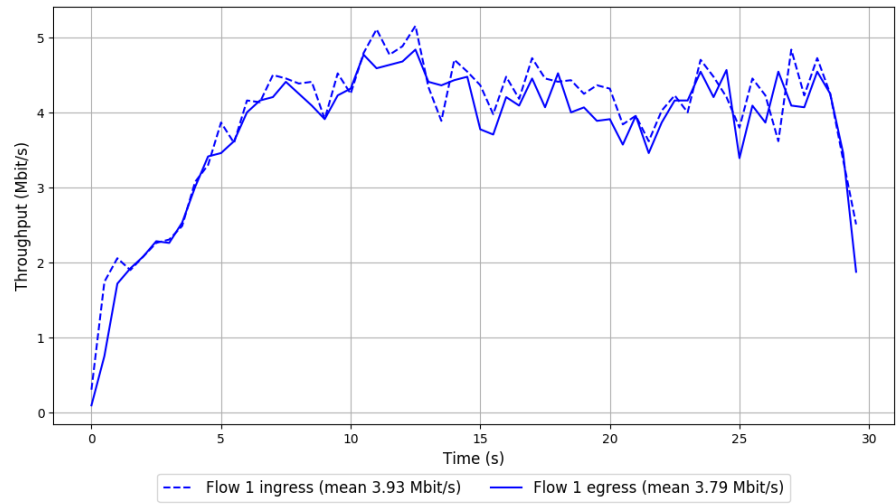
Flow 1 (95th percentile 371.94 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-11-30 23:50:01
End at: 2017-11-30 23:50:31
Local clock offset: -1.657 ms
Remote clock offset: -6.453 ms


# Below is generated by plot.py at 2017-12-01 01:03:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.79 Mbit/s
95th percentile per-packet one-way delay: 379.421 ms
Loss rate: 4.10%
-- Flow 1:
Average throughput: 3.79 Mbit/s
95th percentile per-packet one-way delay: 379.421 ms
Loss rate: 4.10%
```
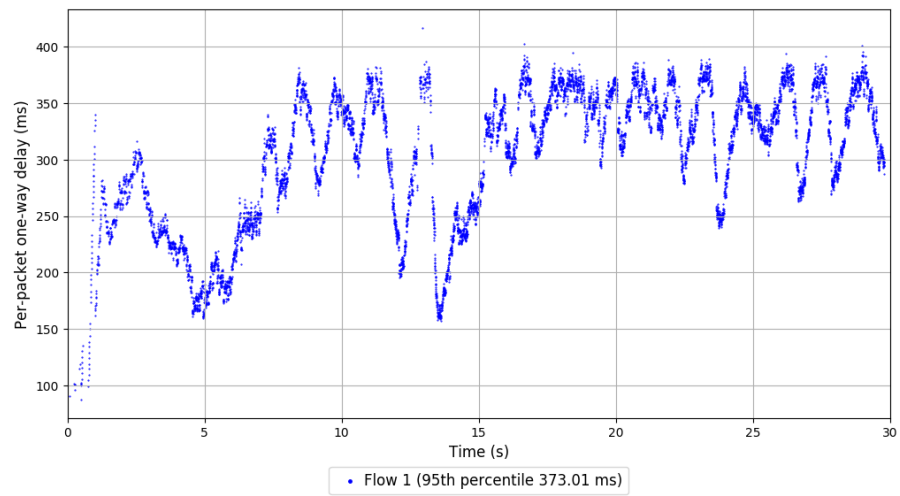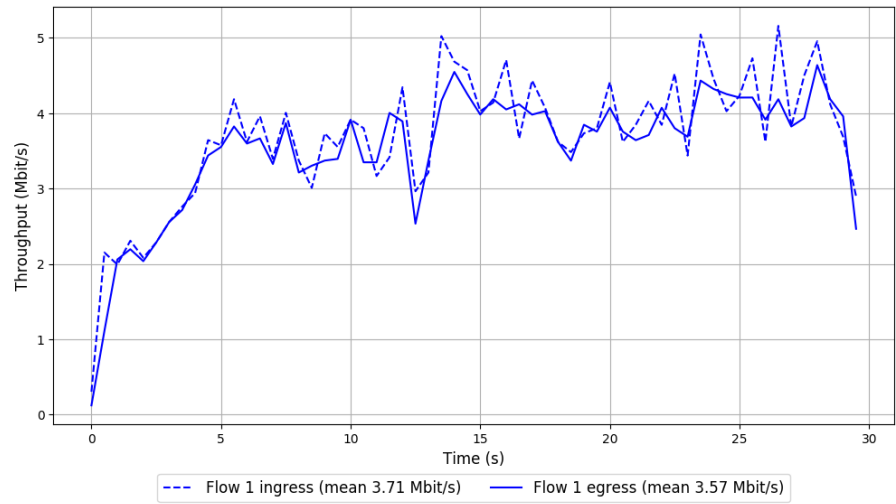
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-12-01 00:06:03
End at: 2017-12-01 00:06:33
Local clock offset: -1.57 ms
Remote clock offset: -6.429 ms

# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.57 Mbit/s
95th percentile per-packet one-way delay: 373.015 ms
Loss rate: 4.08%
-- Flow 1:
Average throughput: 3.57 Mbit/s
95th percentile per-packet one-way delay: 373.015 ms
Loss rate: 4.08%
```
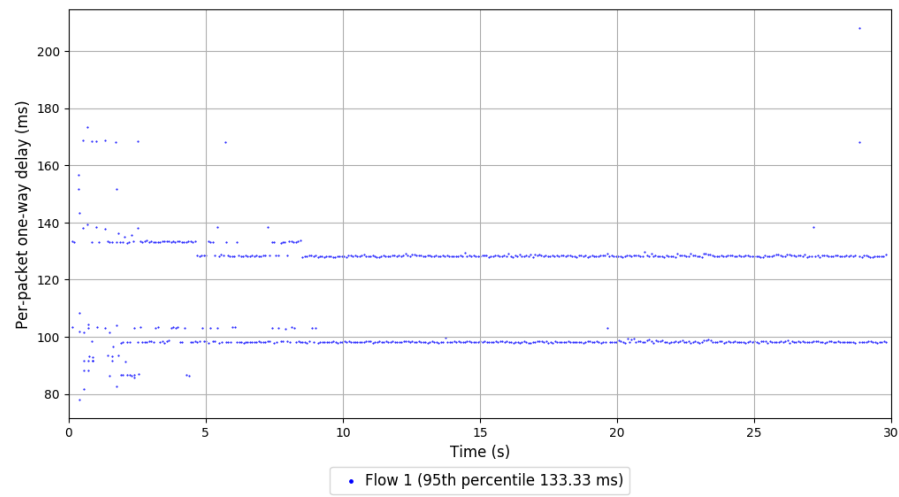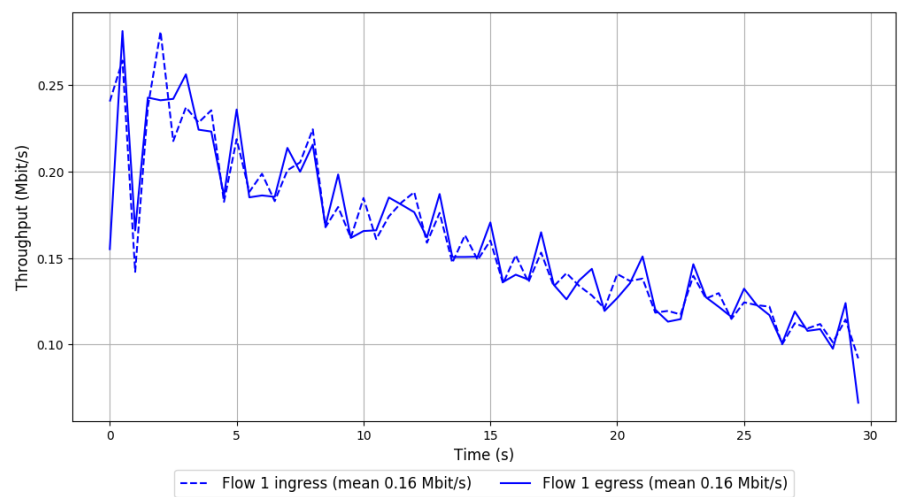
Run 3: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of SCReAM

Start at: 2017-11-30 23:40:51
End at: 2017-11-30 23:41:21
Local clock offset: -2.037 ms
Remote clock offset: -6.474 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 133.329 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 133.329 ms
Loss rate: 0.43%
```

Run 1: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.16 Mbit/s) --- Flow 1 egress (mean 0.16 Mbit/s) ——

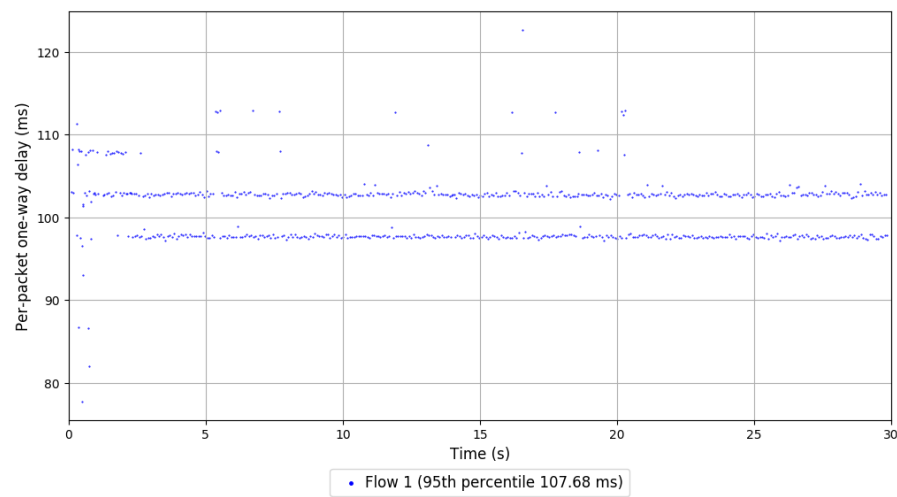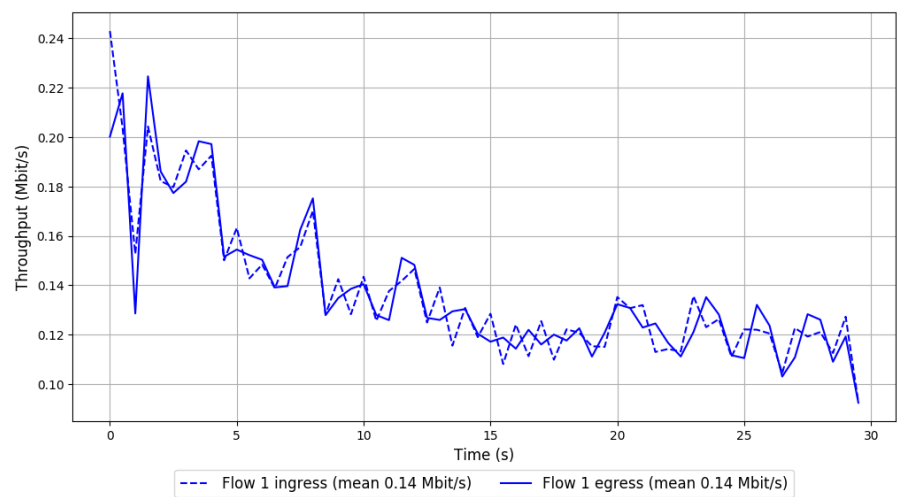Flow 1 (95th percentile 133.33 ms)

```
Run 2: Statistics of SCReAM

Start at: 2017-11-30 23:56:54
End at: 2017-11-30 23:57:24
Local clock offset: -1.547 ms
Remote clock offset: -6.403 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 107.677 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 107.677 ms
Loss rate: 0.34%
```

Run 2: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.14 Mbit/s)   Flow 1 egress (mean 0.14 Mbit/s)

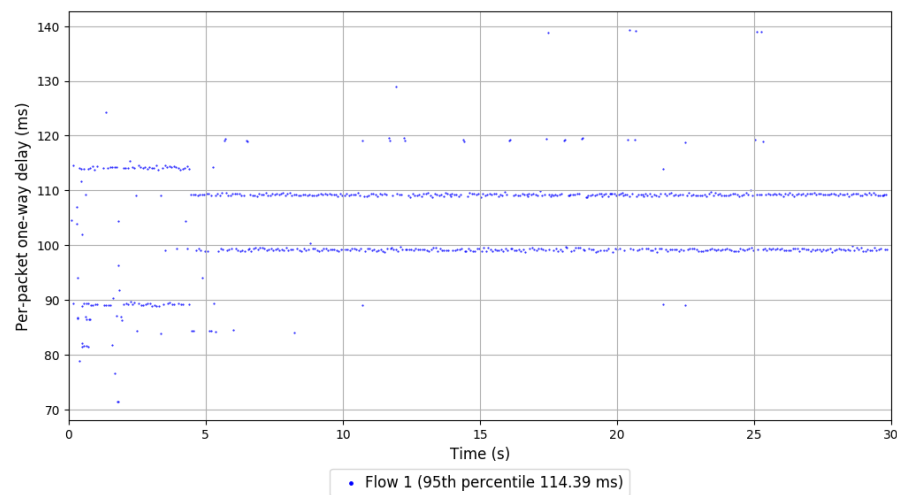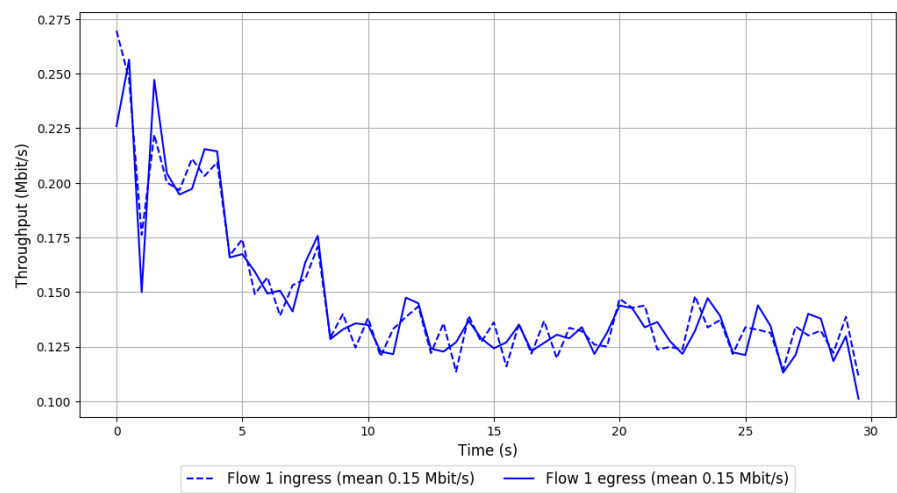Flow 1 (95th percentile 107.68 ms)

```
Run 3: Statistics of SCReAM

Start at: 2017-12-01 00:12:56
End at: 2017-12-01 00:13:26
Local clock offset: -1.453 ms
Remote clock offset: -6.501 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 114.391 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 114.391 ms
Loss rate: 0.46%
```

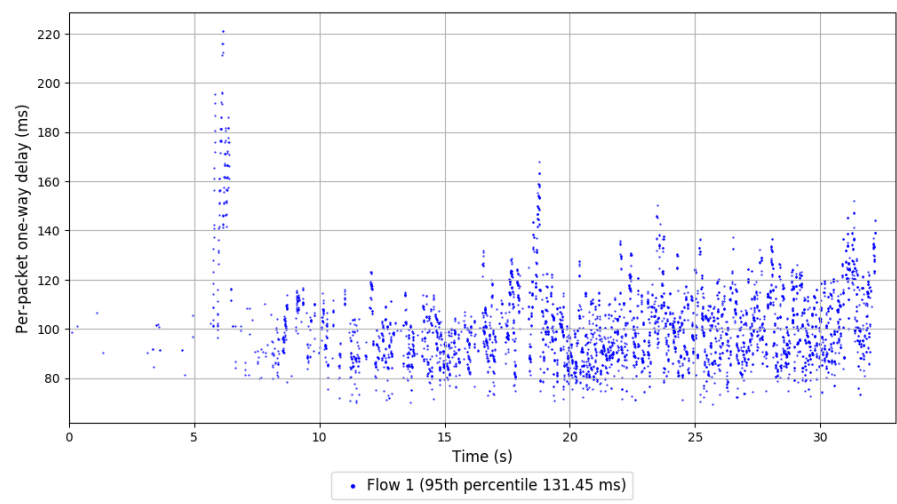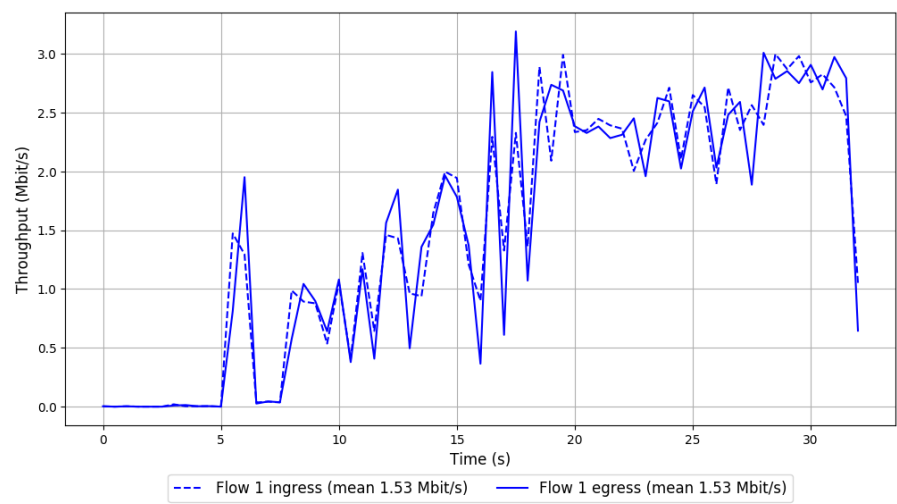Run 3: Report of SCReAM — Data Link

```
Run 1: Statistics of WebRTC media

Start at: 2017-11-30 23:38:33
End at: 2017-11-30 23:39:03
Local clock offset: -2.085 ms
Remote clock offset: -6.586 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 131.451 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 131.451 ms
Loss rate: 0.64%
```

Run 1: Report of WebRTC media — Data Link

Flow 1 ingress (mean 1.53 Mbit/s)   Flow 1 egress (mean 1.53 Mbit/s)
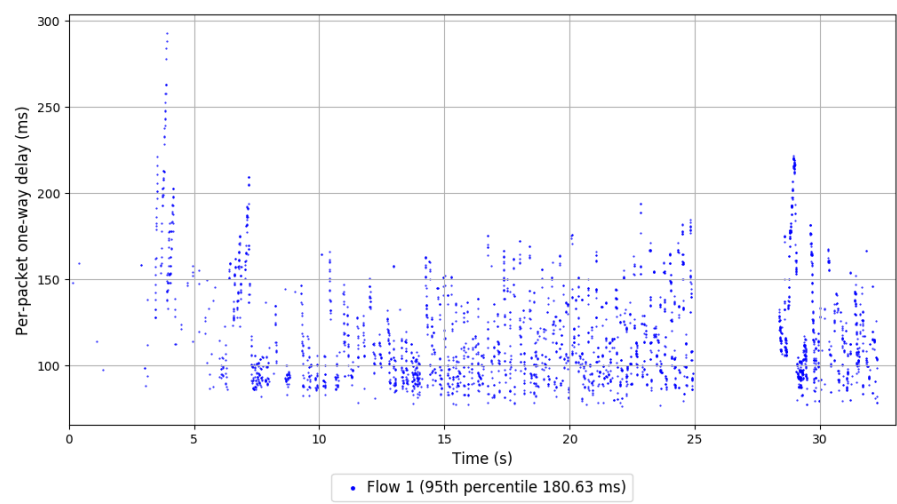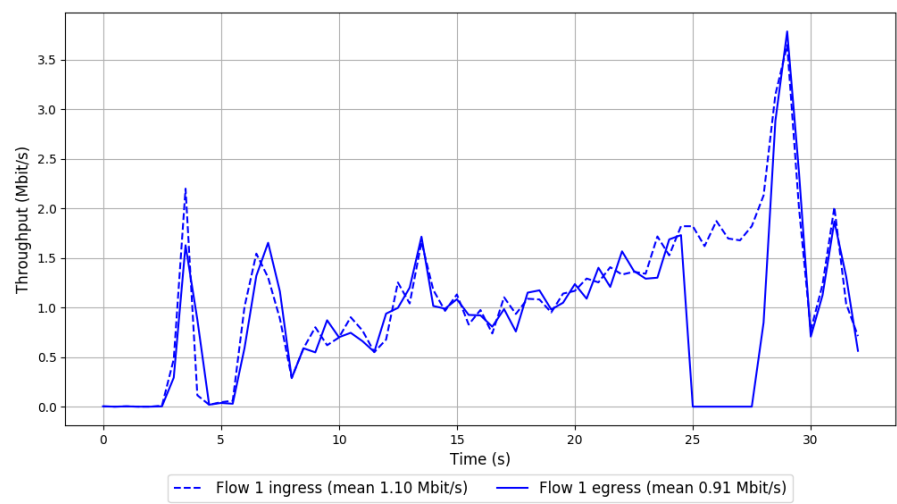

Flow 1 (95th percentile 131.45 ms)

```
Run 2: Statistics of WebRTC media

Start at: 2017-11-30 23:54:36
End at: 2017-11-30 23:55:06
Local clock offset: -1.718 ms
Remote clock offset: -6.386 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 180.632 ms
Loss rate: 17.54%
-- Flow 1:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 180.632 ms
Loss rate: 17.54%
```
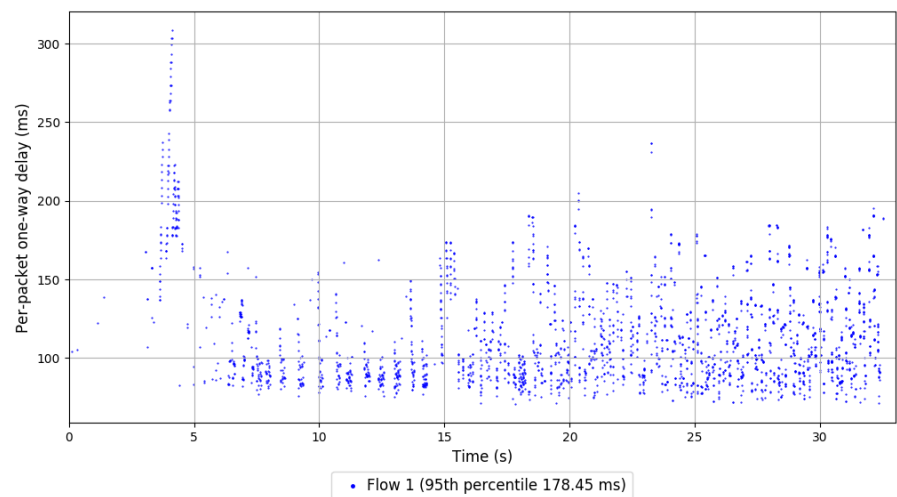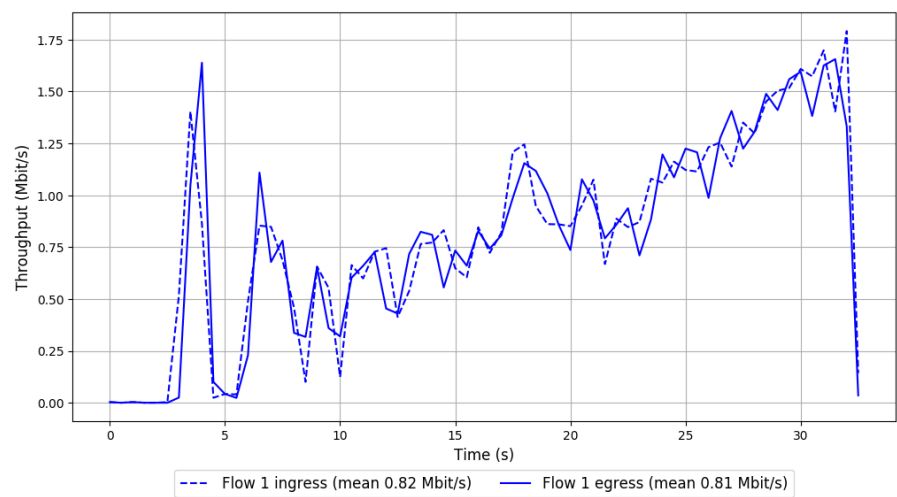
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-12-01 00:10:39
End at: 2017-12-01 00:11:09
Local clock offset: -1.453 ms
Remote clock offset: -6.445 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 178.452 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 178.452 ms
Loss rate: 1.56%
```
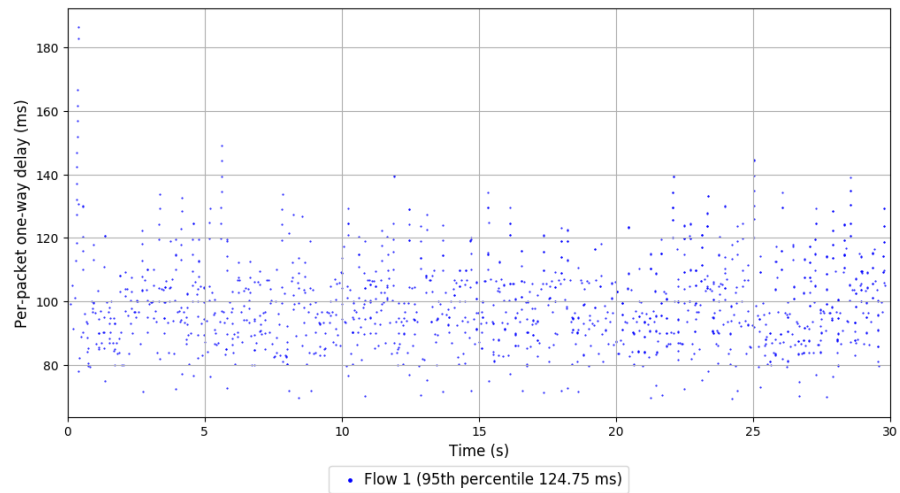
Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 0.82 Mbit/s) --- Flow 1 egress (mean 0.81 Mbit/s)

Flow 1 (95th percentile 178.45 ms)

```
Run 1: Statistics of Sprout

Start at: 2017-11-30 23:31:40
End at: 2017-11-30 23:32:10
Local clock offset: -2.087 ms
Remote clock offset: -6.63 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 124.747 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 124.747 ms
Loss rate: 1.02%
```
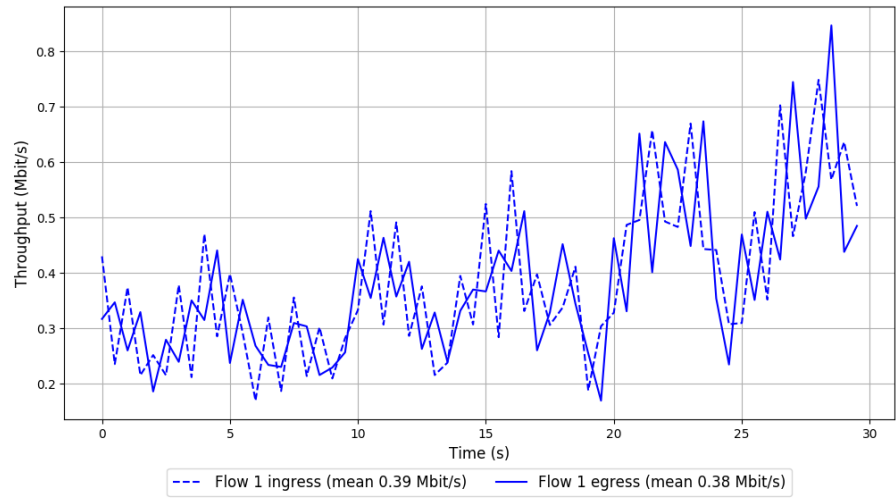
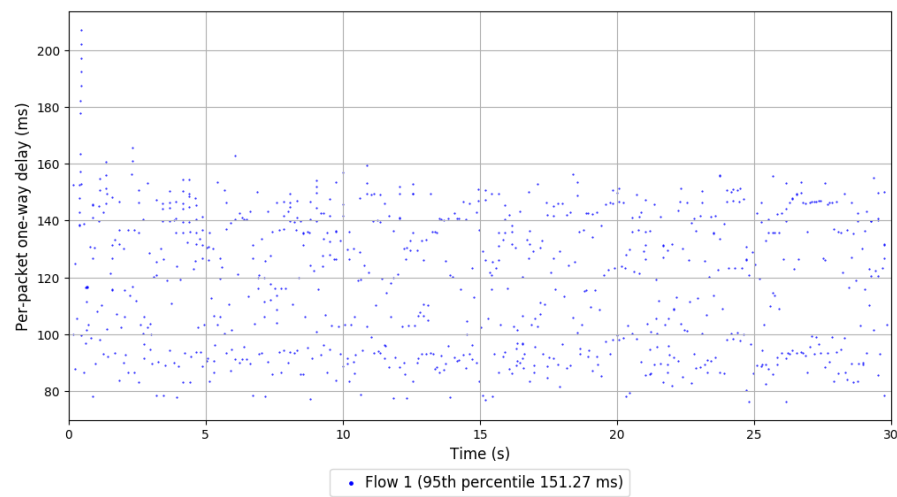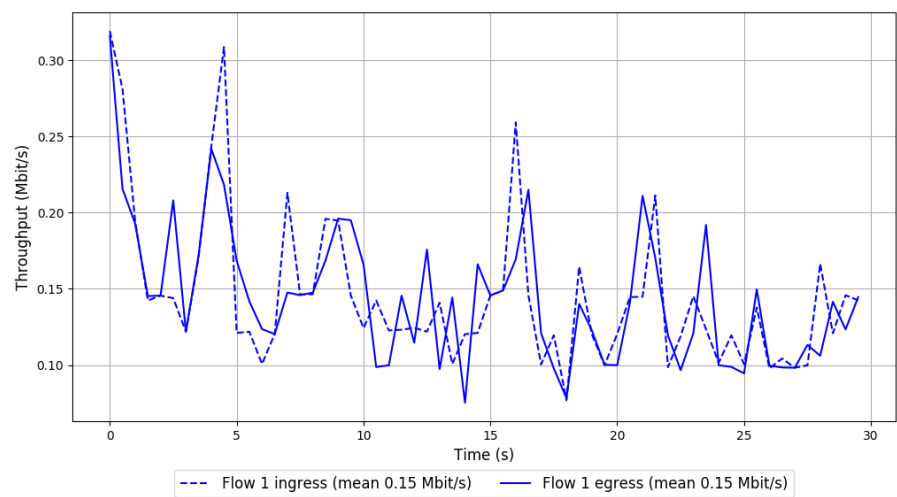Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-11-30 23:47:43
End at: 2017-11-30 23:48:13
Local clock offset: -1.805 ms
Remote clock offset: -6.385 ms


# Below is generated by plot.py at 2017-12-01 01:03:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 151.270 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 151.270 ms
Loss rate: 0.79%
```

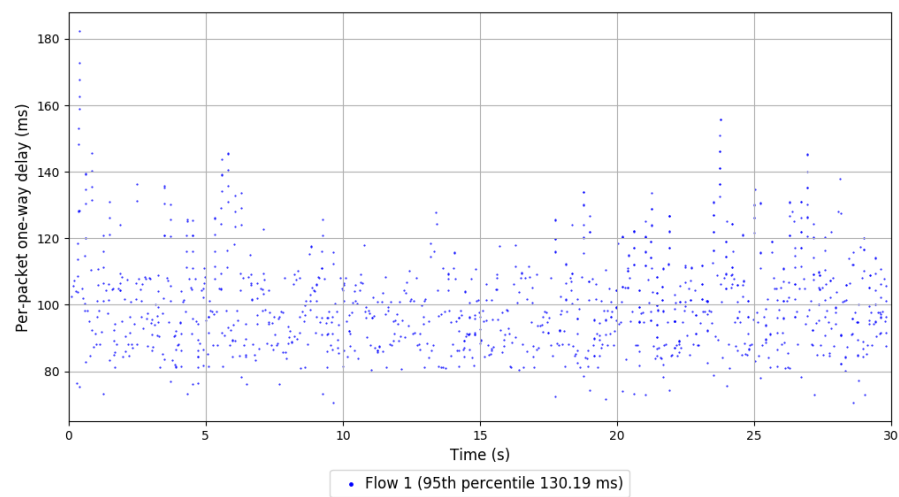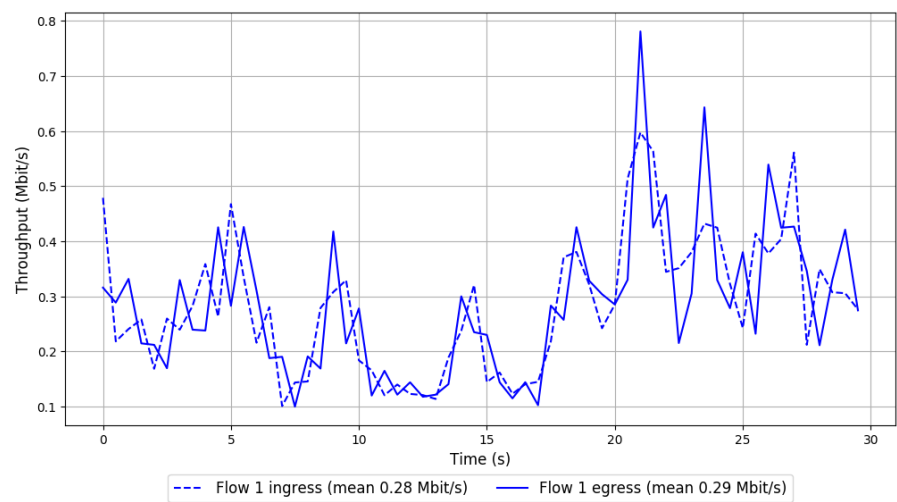Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-12-01 00:03:46
End at: 2017-12-01 00:04:16
Local clock offset: -1.693 ms
Remote clock offset: -6.415 ms


# Below is generated by plot.py at 2017-12-01 01:03:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 130.187 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 130.187 ms
Loss rate: 0.03%
```

Run 3: Report of Sprout — Data Link

Flow 1 ingress (mean 0.28 Mbit/s) — — — Flow 1 egress (mean 0.29 Mbit/s)

• Flow 1 (95th percentile 130.19 ms)

```
Run 1: Statistics of TaoVA-100x

Start at: 2017-11-30 23:28:14
End at: 2017-11-30 23:28:44
Local clock offset: -2.08 ms
Remote clock offset: -6.72 ms

# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 146.024 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 146.024 ms
Loss rate: 0.92%
```
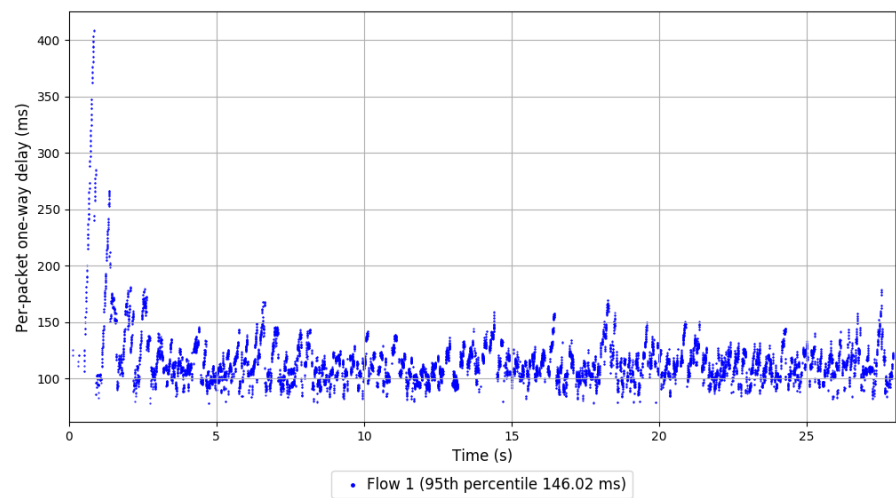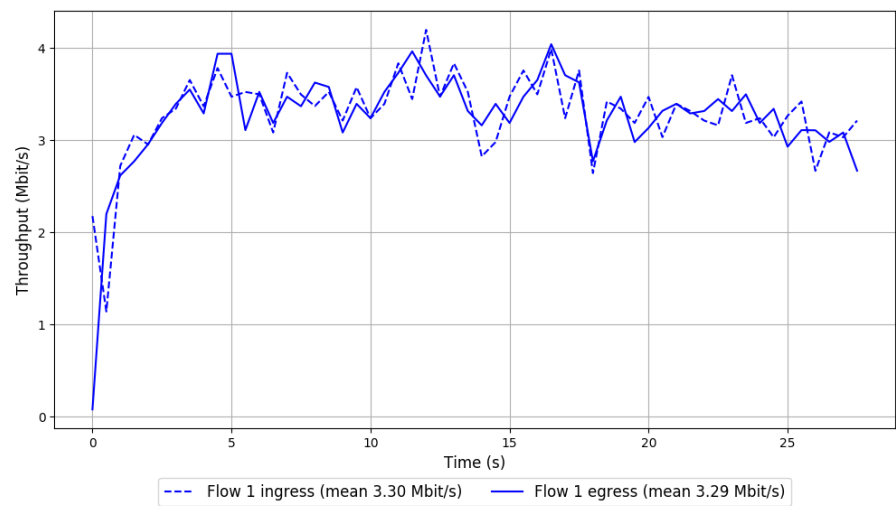
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 3.30 Mbit/s) --- Flow 1 egress (mean 3.29 Mbit/s)

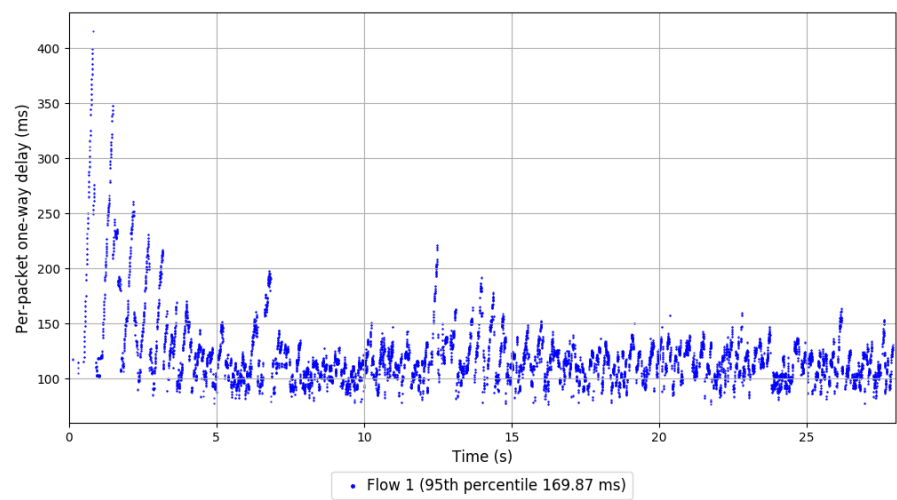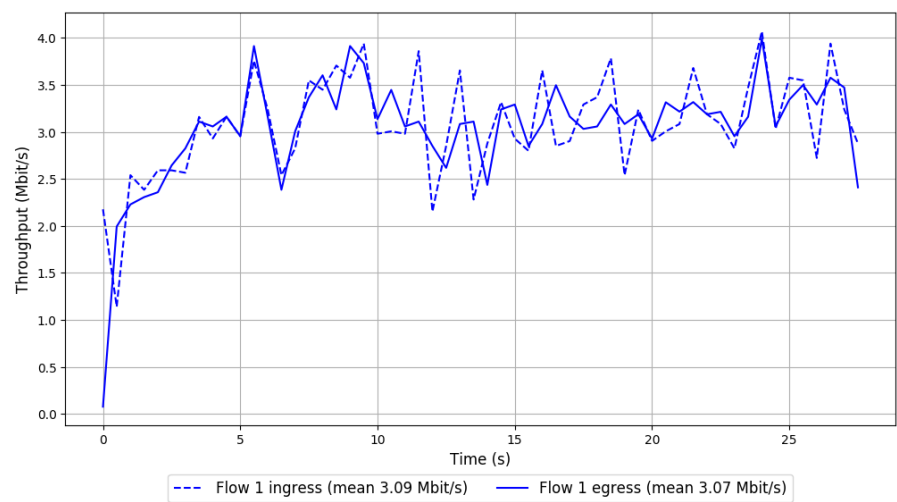• Flow 1 (95th percentile 146.02 ms)

53

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

Start at: 2017-11-30 23:44:17
End at: 2017-11-30 23:44:47
Local clock offset: -1.832 ms
Remote clock offset: -6.423 ms

# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 169.869 ms
Loss rate: 1.01%
-- Flow 1:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 169.869 ms
Loss rate: 1.01%
```

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

Flow 1 ingress (mean 3.09 Mbit/s)   Flow 1 egress (mean 3.07 Mbit/s)

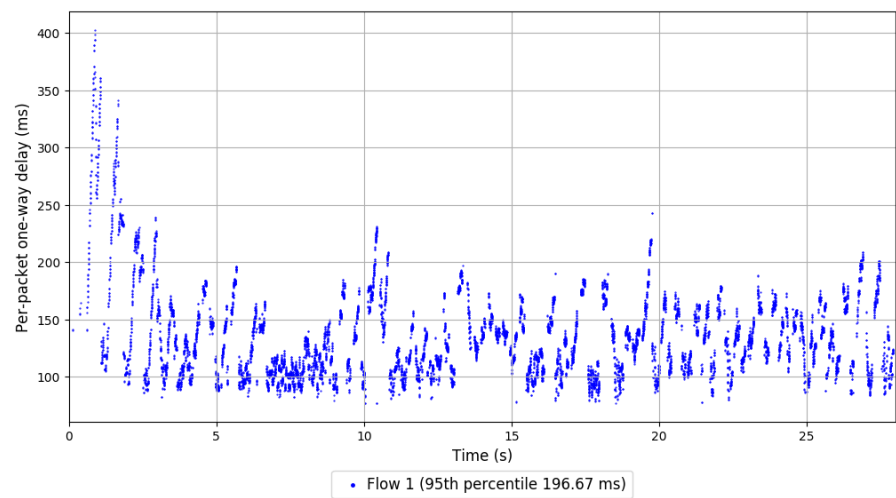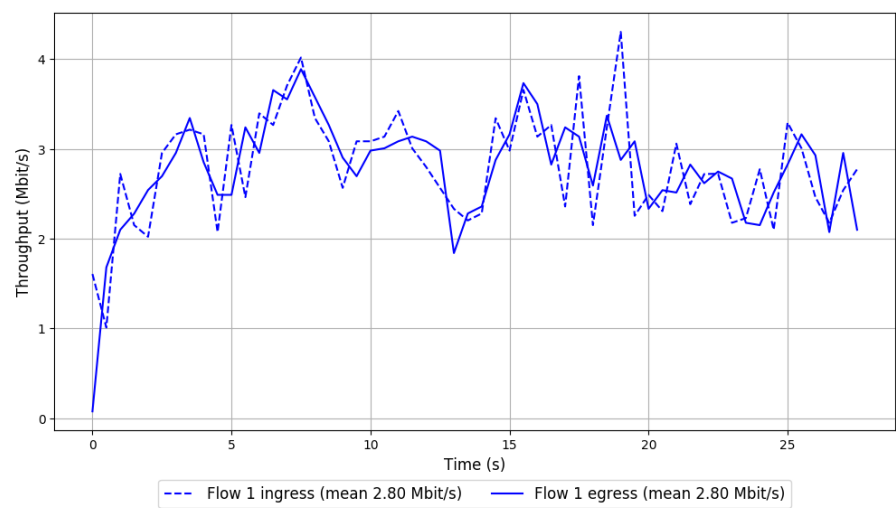Flow 1 (95th percentile 169.87 ms)

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

Start at: 2017-12-01 00:00:20
End at: 2017-12-01 00:00:50
Local clock offset: -1.612 ms
Remote clock offset: -6.465 ms


# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.80 Mbit/s
95th percentile per-packet one-way delay: 196.666 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 2.80 Mbit/s
95th percentile per-packet one-way delay: 196.666 ms
Loss rate: 0.83%
```

Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 2.80 Mbit/s) ——— Flow 1 egress (mean 2.80 Mbit/s)
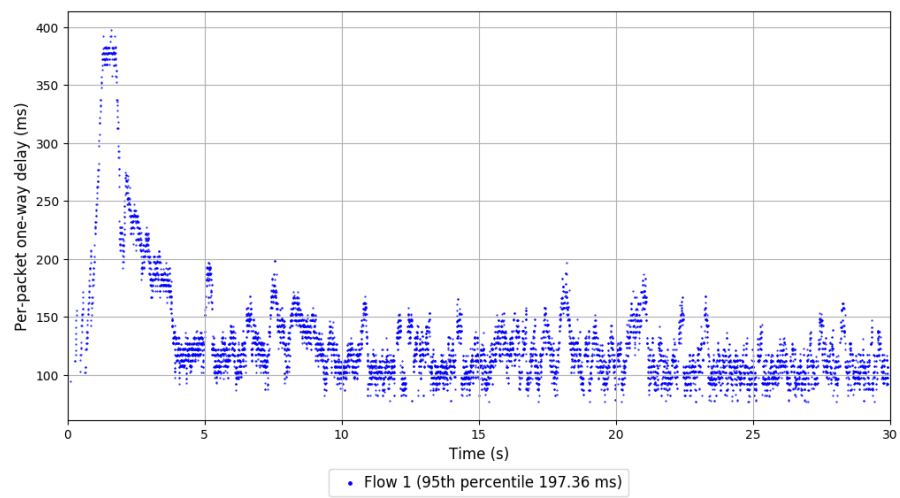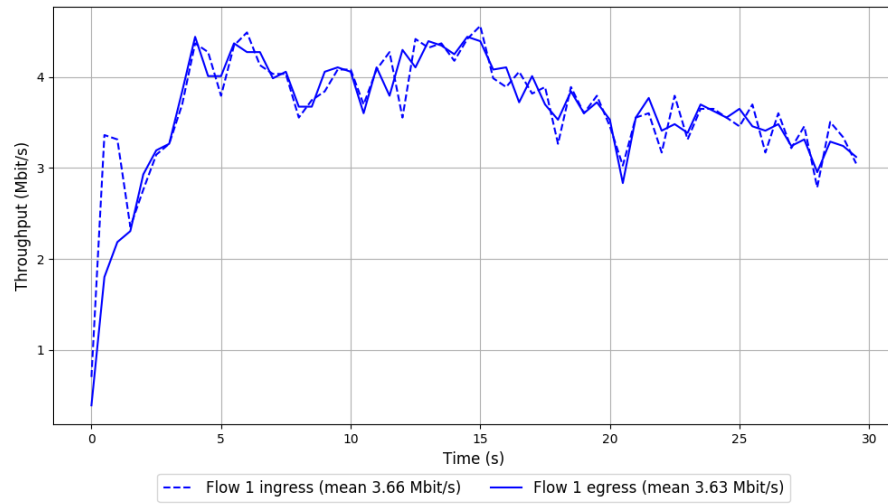

• Flow 1 (95th percentile 196.67 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2017-11-30 23:37:24
End at: 2017-11-30 23:37:54
Local clock offset: -2.111 ms
Remote clock offset: -6.536 ms


# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.63 Mbit/s
95th percentile per-packet one-way delay: 197.357 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 3.63 Mbit/s
95th percentile per-packet one-way delay: 197.357 ms
Loss rate: 1.16%
```
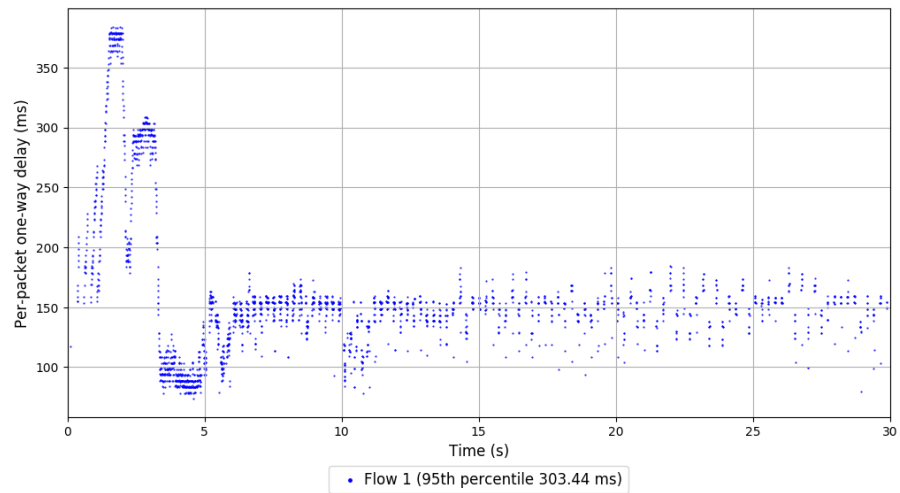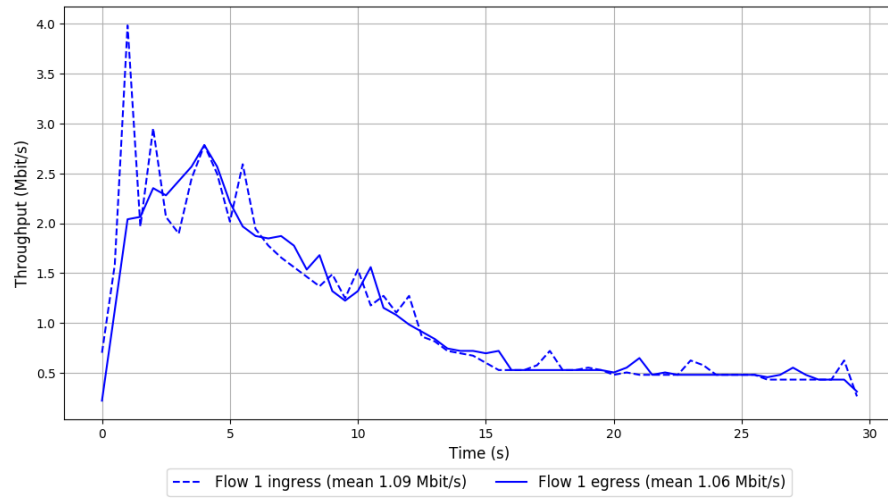
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-11-30 23:53:27
End at: 2017-11-30 23:53:58
Local clock offset: -1.72 ms
Remote clock offset: -6.383 ms


# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 303.439 ms
Loss rate: 3.38%
-- Flow 1:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 303.439 ms
Loss rate: 3.38%
```

Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 1.09 Mbit/s) —— Flow 1 egress (mean 1.06 Mbit/s)

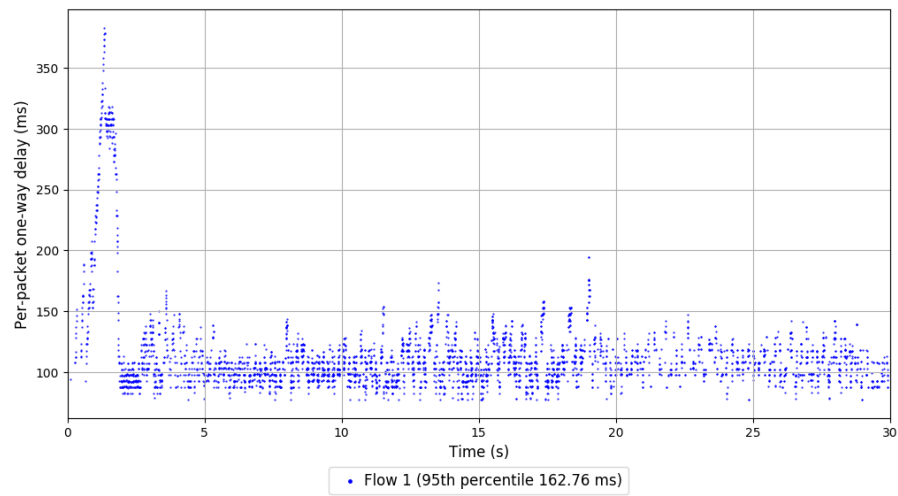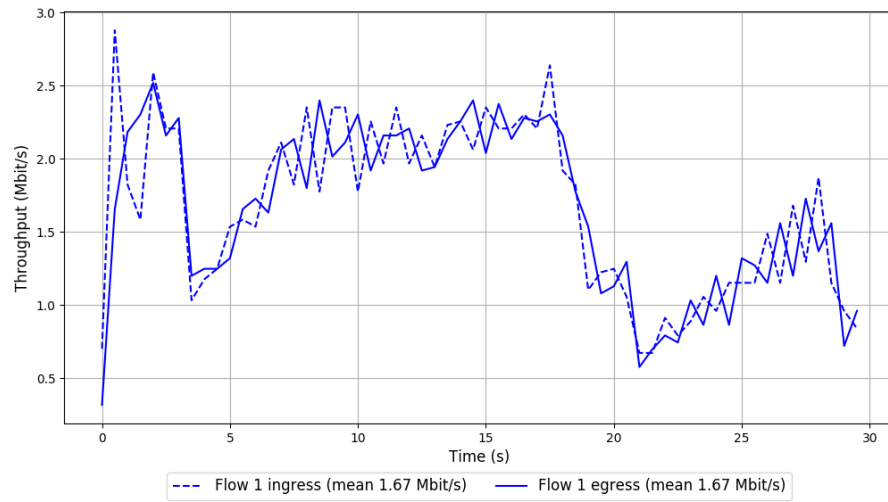• Flow 1 (95th percentile 303.44 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2017-12-01 00:09:30
End at: 2017-12-01 00:10:00
Local clock offset: -1.585 ms
Remote clock offset: -6.484 ms


# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 162.762 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 162.762 ms
Loss rate: 0.55%
```
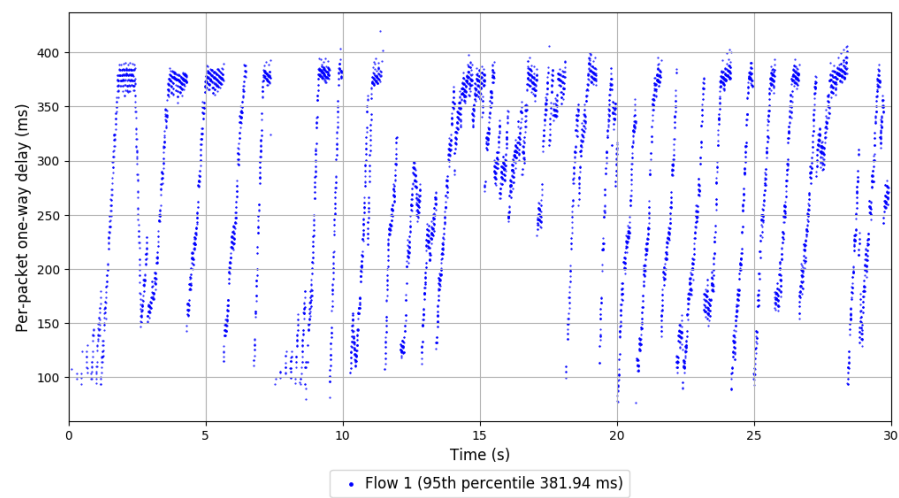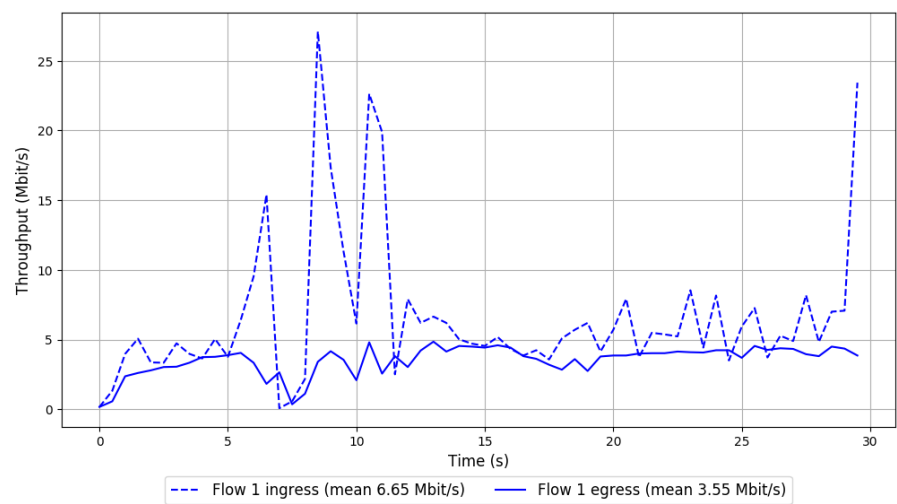
Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2017-11-30 23:36:15
End at: 2017-11-30 23:36:45
Local clock offset: -1.858 ms
Remote clock offset: -6.593 ms


# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.55 Mbit/s
95th percentile per-packet one-way delay: 381.937 ms
Loss rate: 46.97%
-- Flow 1:
Average throughput: 3.55 Mbit/s
95th percentile per-packet one-way delay: 381.937 ms
Loss rate: 46.97%
```
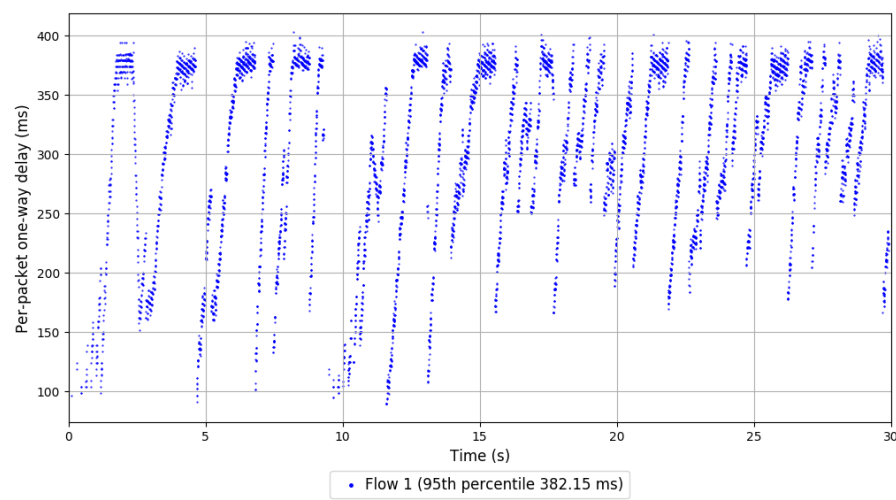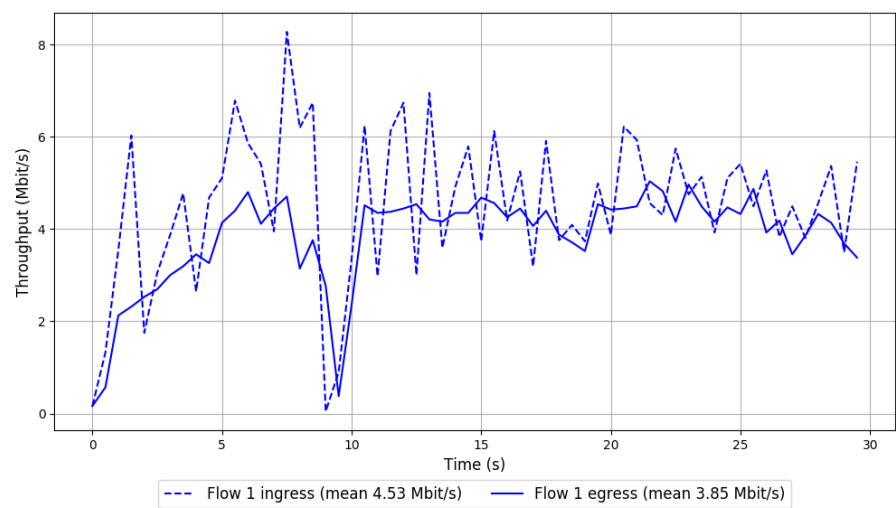
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-11-30 23:52:18
End at: 2017-11-30 23:52:48
Local clock offset: -1.732 ms
Remote clock offset: -6.432 ms


# Below is generated by plot.py at 2017-12-01 01:03:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.85 Mbit/s
95th percentile per-packet one-way delay: 382.149 ms
Loss rate: 15.56%
-- Flow 1:
Average throughput: 3.85 Mbit/s
95th percentile per-packet one-way delay: 382.149 ms
Loss rate: 15.56%
```
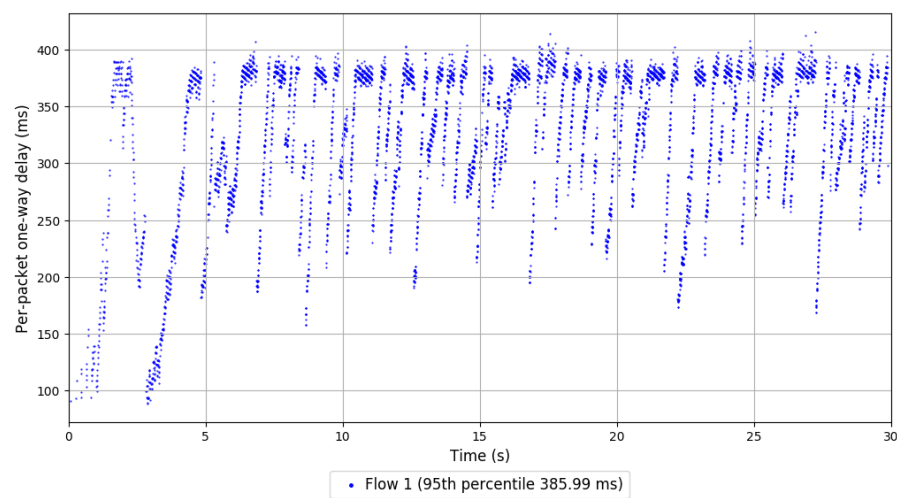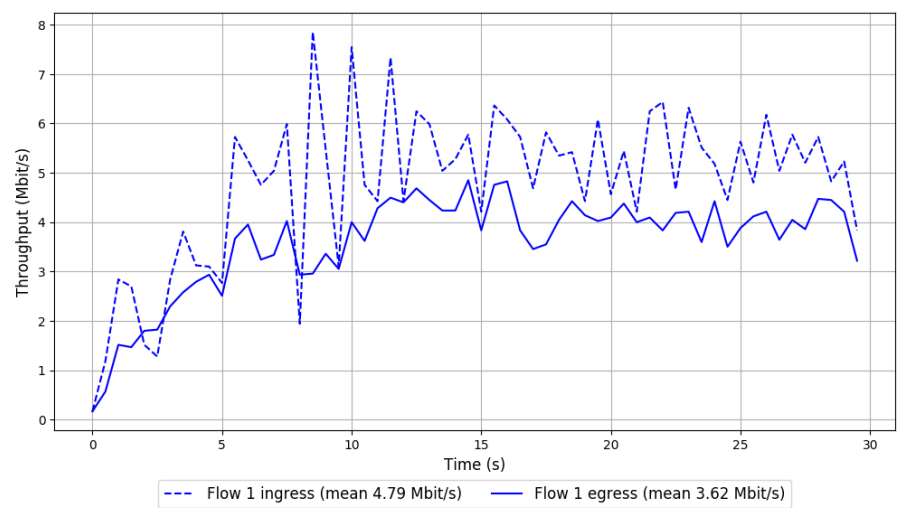
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2017-12-01 00:08:21
End at: 2017-12-01 00:08:51
Local clock offset: -1.496 ms
Remote clock offset: -6.434 ms


# Below is generated by plot.py at 2017-12-01 01:03:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.62 Mbit/s
95th percentile per-packet one-way delay: 385.991 ms
Loss rate: 24.82%
-- Flow 1:
Average throughput: 3.62 Mbit/s
95th percentile per-packet one-way delay: 385.991 ms
Loss rate: 24.82%
```

Run 3: Report of Verus — Data Link

```
Run 1: Statistics of Copa

Start at: 2017-11-30 23:32:49
End at: 2017-11-30 23:33:19
Local clock offset: -2.148 ms
Remote clock offset: -6.62 ms


# Below is generated by plot.py at 2017-12-01 01:03:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 144.008 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 144.008 ms
Loss rate: 0.76%
```
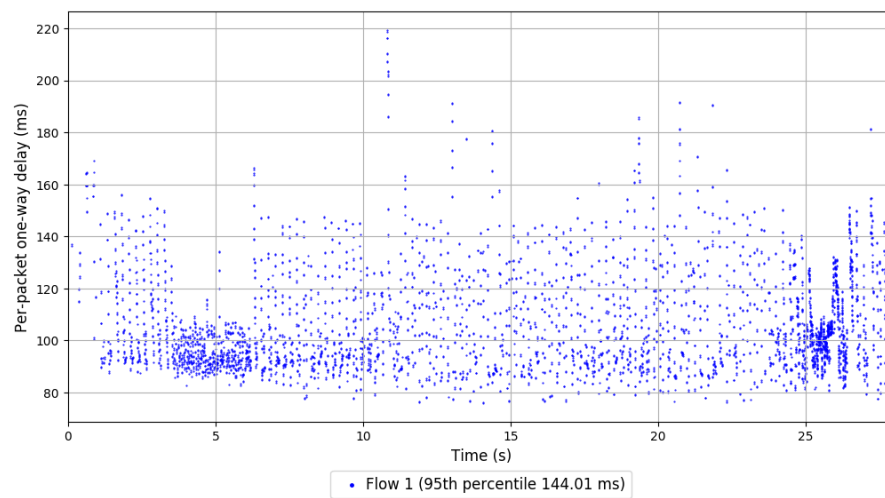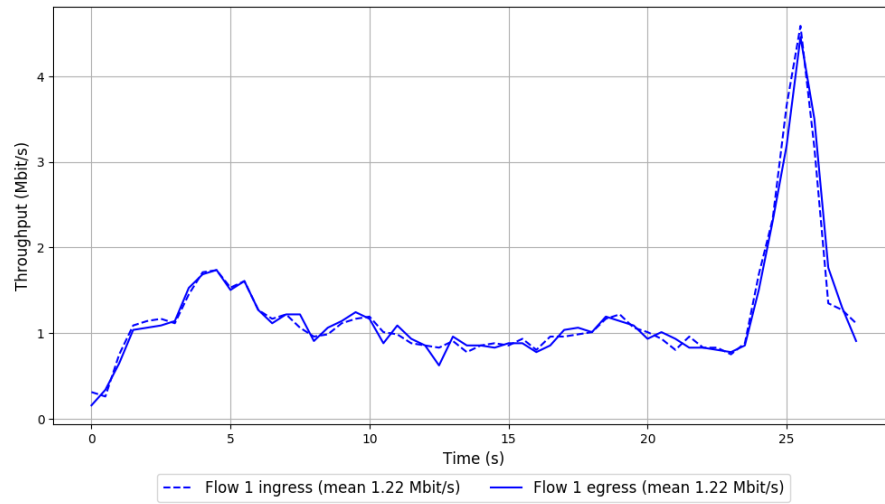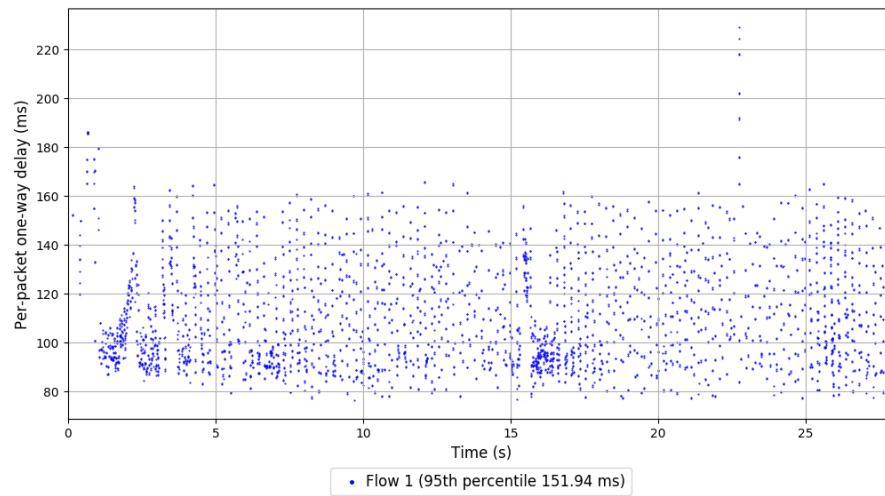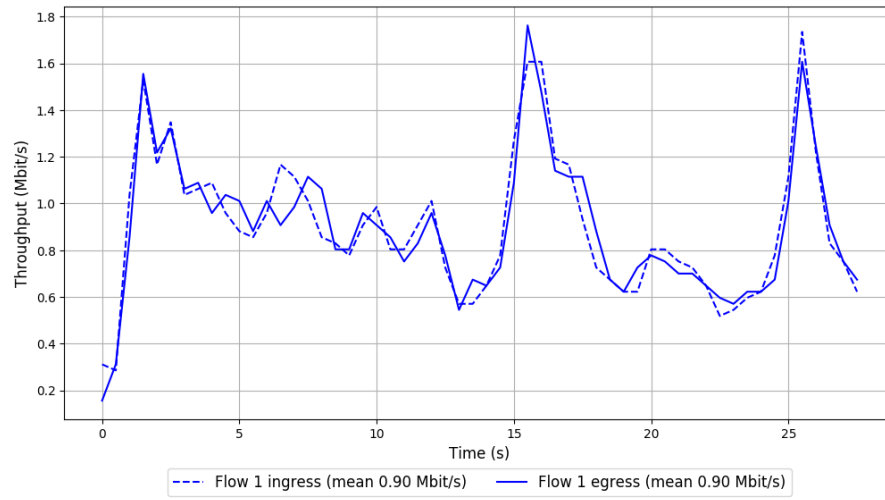
Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2017-11-30 23:48:52
End at: 2017-11-30 23:49:22
Local clock offset: -1.787 ms
Remote clock offset: -6.443 ms

# Below is generated by plot.py at 2017-12-01 01:03:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 151.939 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 151.939 ms
Loss rate: 0.46%
```

Run 2: Report of Copa — Data Link

Flow 1 ingress (mean 0.90 Mbit/s) --- Flow 1 egress (mean 0.90 Mbit/s)

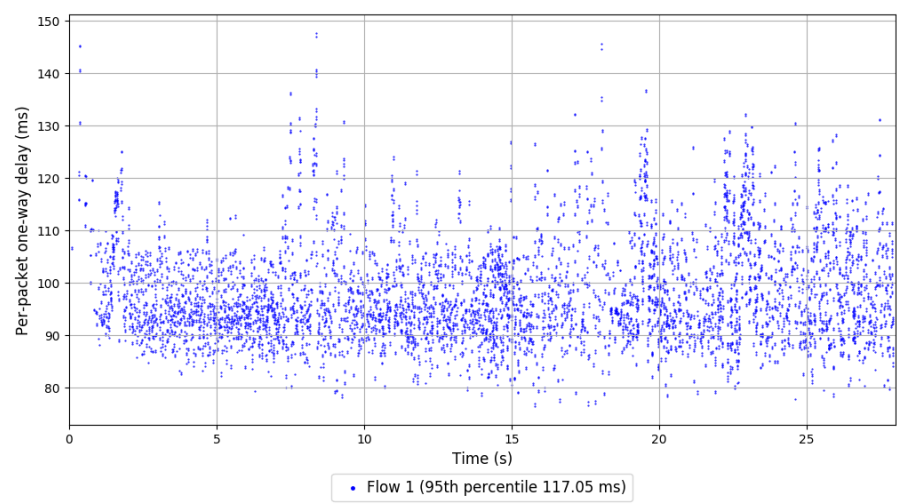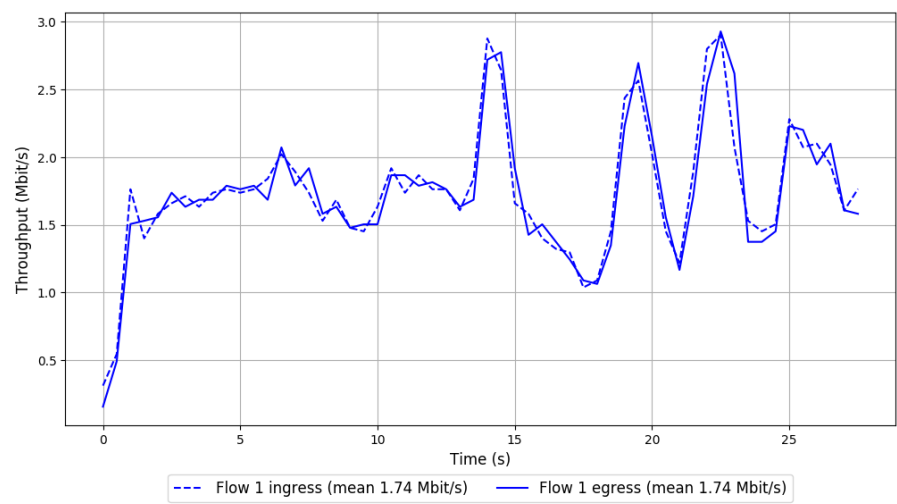Flow 1 (95th percentile 151.94 ms)

```
Run 3: Statistics of Copa

Start at: 2017-12-01 00:04:55
End at: 2017-12-01 00:05:25
Local clock offset: -1.517 ms
Remote clock offset: -6.445 ms


# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 117.045 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 117.045 ms
Loss rate: 0.53%
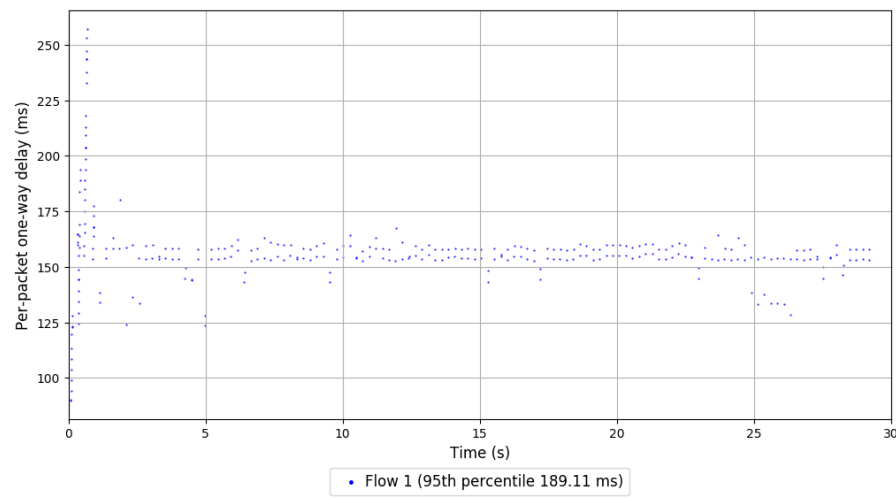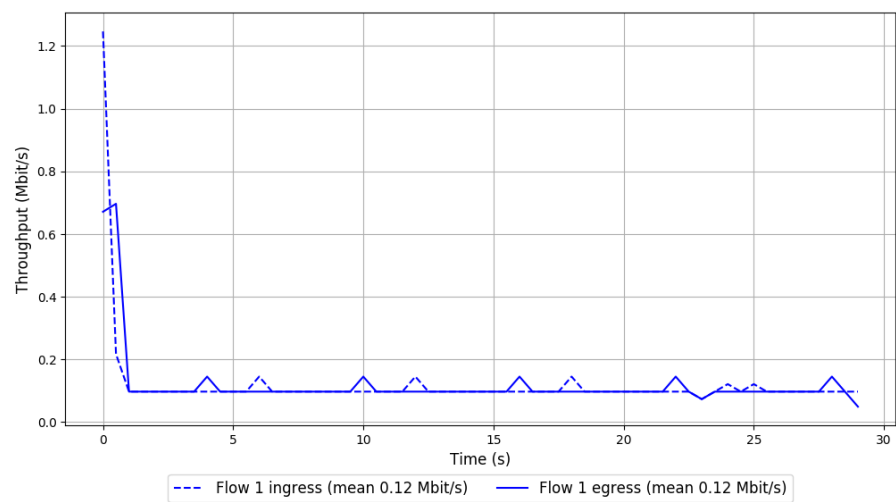```

Run 3: Report of Copa — Data Link

```
Run 1: Statistics of Indigo

Start at: 2017-11-30 23:29:23
End at: 2017-11-30 23:29:53
Local clock offset: -2.213 ms
Remote clock offset: -6.63 ms


# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 189.106 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 189.106 ms
Loss rate: 1.35%
```

Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-11-30 23:45:26
End at: 2017-11-30 23:45:56
Local clock offset: -1.727 ms
Remote clock offset: -6.42 ms


# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 228.922 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 228.922 ms
Loss rate: 1.18%
```
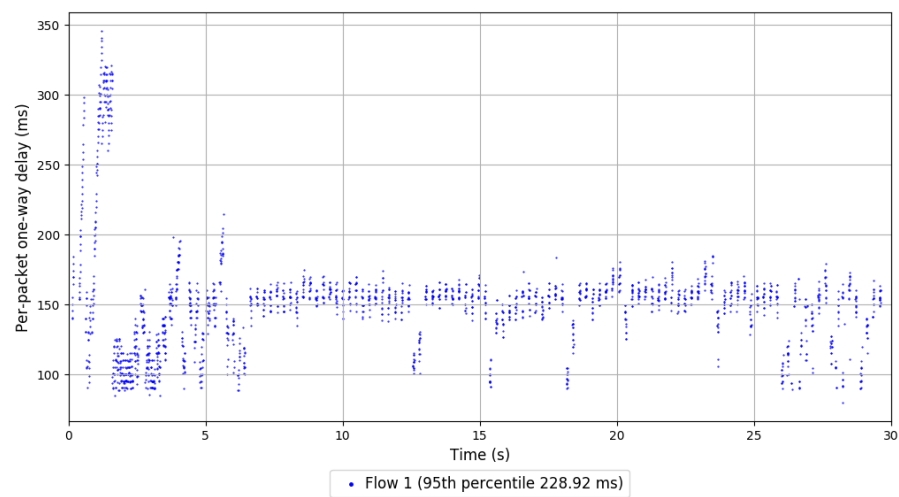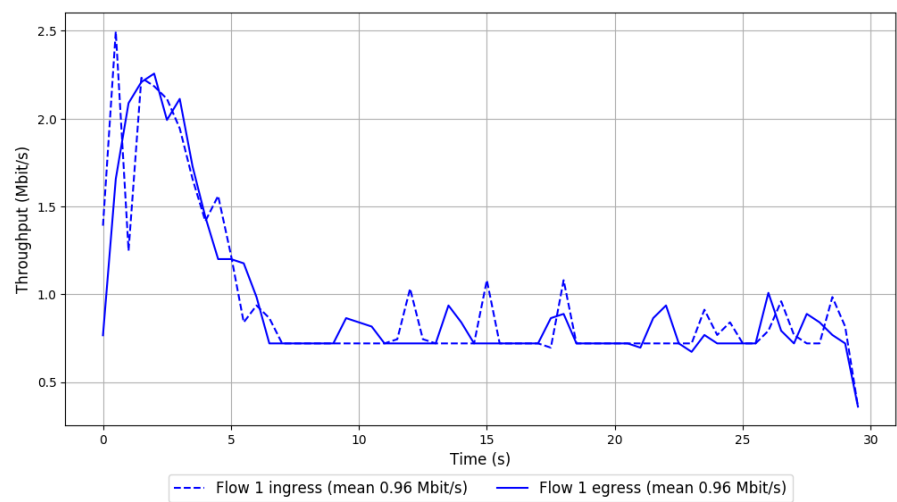
Run 2: Report of Indigo — Data Link

Flow 1 ingress (mean 0.96 Mbit/s)   Flow 1 egress (mean 0.96 Mbit/s)
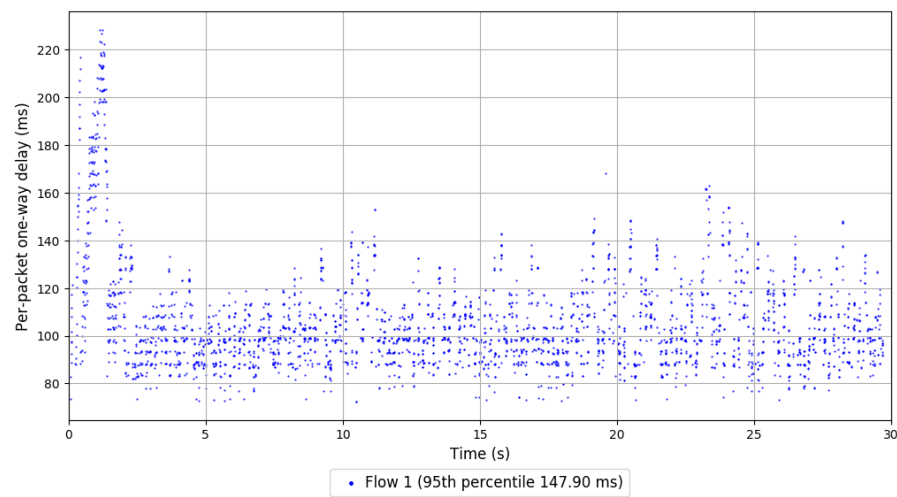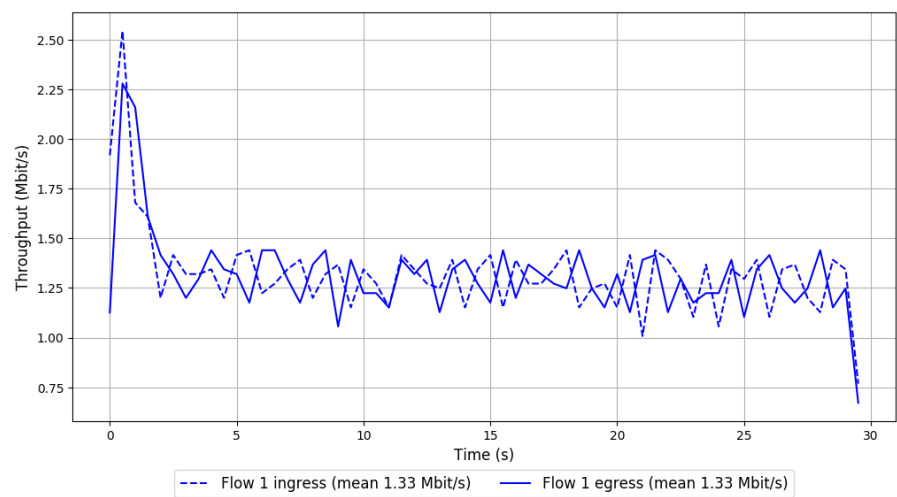

Flow 1 (95th percentile 228.92 ms)

```
Run 3: Statistics of Indigo

Start at: 2017-12-01 00:01:28
End at: 2017-12-01 00:01:58
Local clock offset: -1.599 ms
Remote clock offset: -6.431 ms

# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 147.897 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 147.897 ms
Loss rate: 0.94%
```
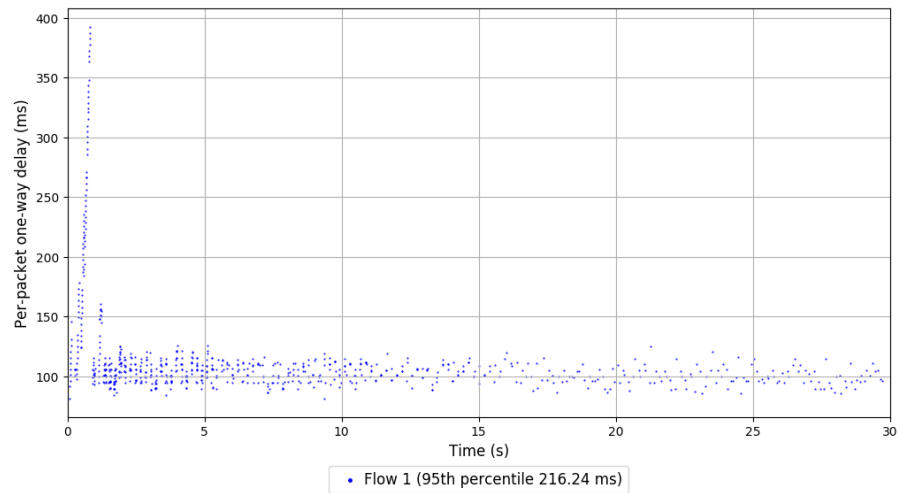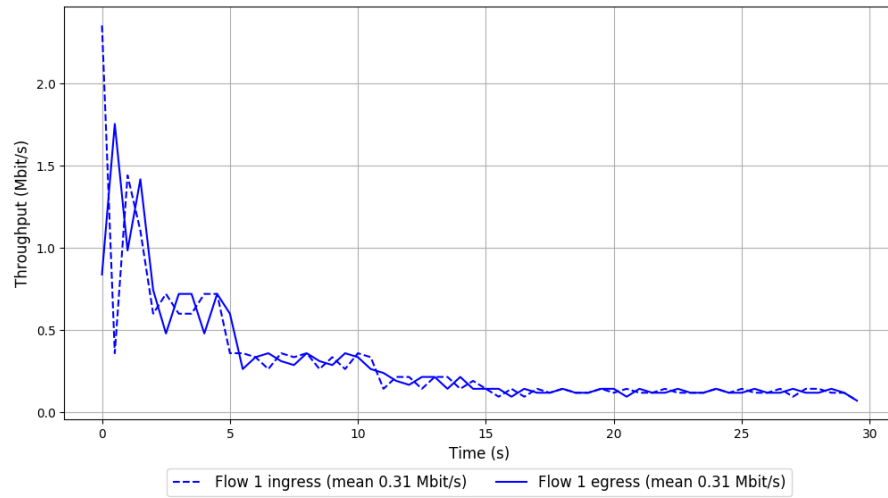
Run 3: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-calib

Start at: 2017-11-30 23:41:59
End at: 2017-11-30 23:42:29
Local clock offset: -1.905 ms
Remote clock offset: -6.447 ms

# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 216.241 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 216.241 ms
Loss rate: 0.78%
```

Run 1: Report of Indigo-calib — Data Link

```
Run 2: Statistics of Indigo-calib

Start at: 2017-11-30 23:58:02
End at: 2017-11-30 23:58:32
Local clock offset: -1.779 ms
Remote clock offset: -6.39 ms


# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 244.919 ms
Loss rate: 2.05%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 244.919 ms
Loss rate: 2.05%
```
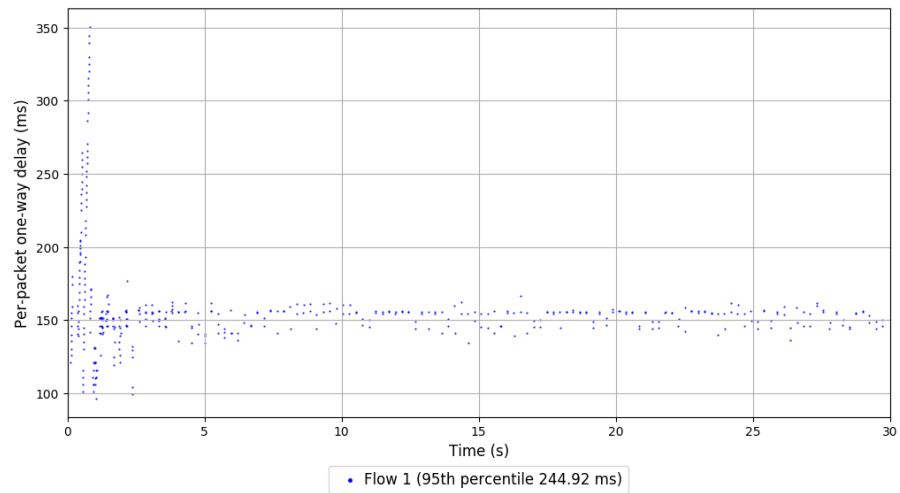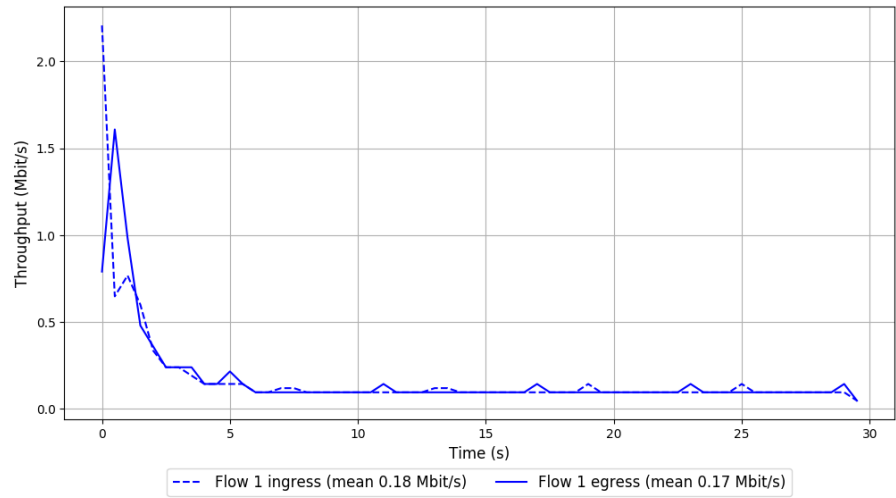
Run 2: Report of Indigo-calib — Data Link

Flow 1 ingress (mean 0.18 Mbit/s) Flow 1 egress (mean 0.17 Mbit/s)

Flow 1 (95th percentile 244.92 ms)

```
Run 3: Statistics of Indigo-calib

Start at: 2017-12-01 00:14:05
End at: 2017-12-01 00:14:35
Local clock offset: -1.3 ms
Remote clock offset: -6.437 ms


# Below is generated by plot.py at 2017-12-01 01:03:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 245.393 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 245.393 ms
Loss rate: 1.68%
```

Run 3: Report of Indigo-calib — Data Link

Flow 1 ingress (mean 0.19 Mbit/s)   Flow 1 egress (mean 0.19 Mbit/s)

Flow 1 (95th percentile 245.39 ms)