Pantheon Report

Generated at 2017-12-05 07:57:09 (UTC).

Data path: AWS Brazil 2 Ethernet (*local*) →Colombia ppp0 (*remote*).

Repeated the test of 14 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

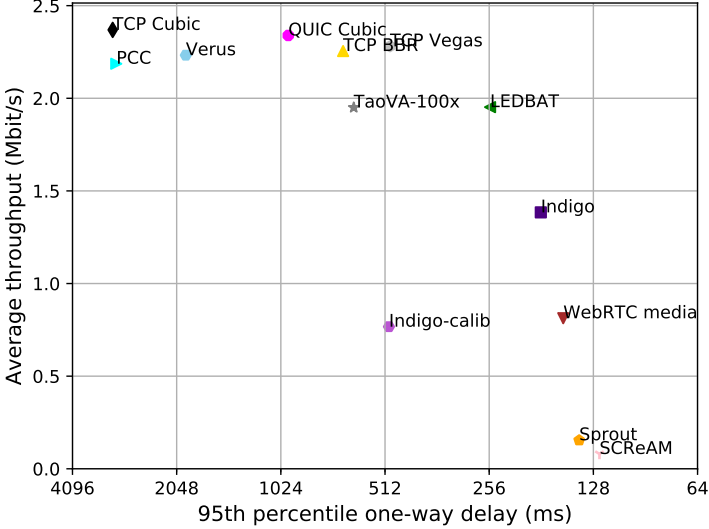Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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

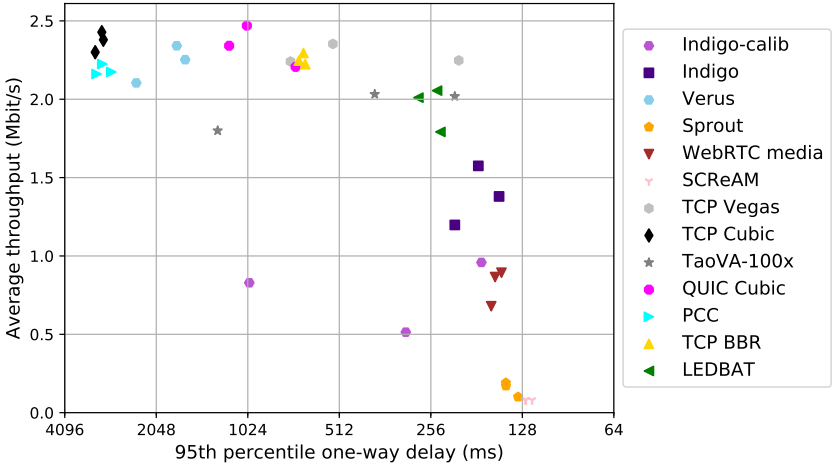NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

```
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 Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme (mean of all runs by scheme)

test from AWS Brazil 2 Ethernet to Colombia 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	2.26	676.73	1.30
TCP Cubic	3	2.37	3134.61	13.15
LEDBAT	3	1.95	254.55	0.64
PCC	3	2.18	3060.24	52.36
QUIC Cubic	3	2.34	974.53	3.21
SCReAM	3	0.08	122.92	0.00
WebRTC media	3	0.81	156.41	0.32
Sprout	3	0.15	140.69	0.01
TaoVA-100x	3	1.95	630.49	1.37
TCP Vegas	3	2.28	495.33	0.94
Verus	3	2.23	1927.12	5.25
Copa	0	N/A	N/A	N/A
Indigo	3	1.38	181.59	0.16
Indigo-calib	3	0.77	498.78	0.14

```
Run 1: Statistics of TCP BBR

Start at: 2017-12-05 07:17:49
End at: 2017-12-05 07:18:19
Local clock offset: 1.9 ms
Remote clock offset: -0.665 ms

# Below is generated by plot.py at 2017-12-05 07:56:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 695.803 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 695.803 ms
Loss rate: 1.50%
```
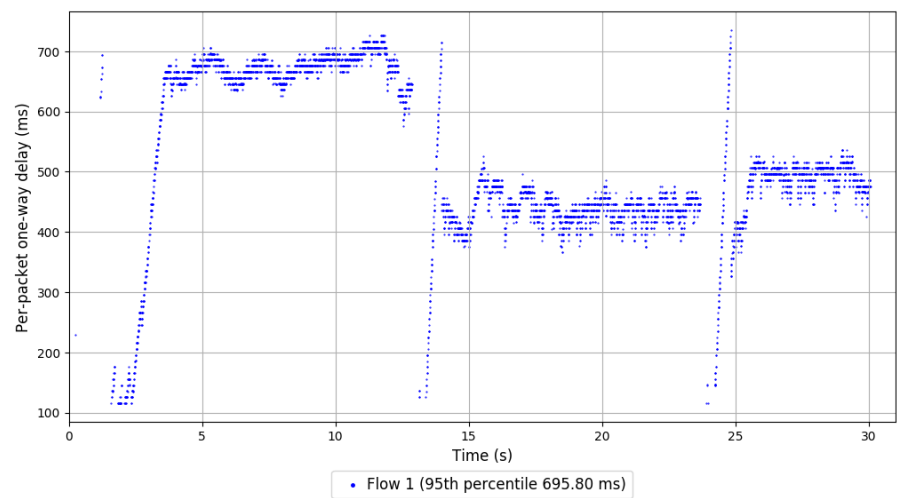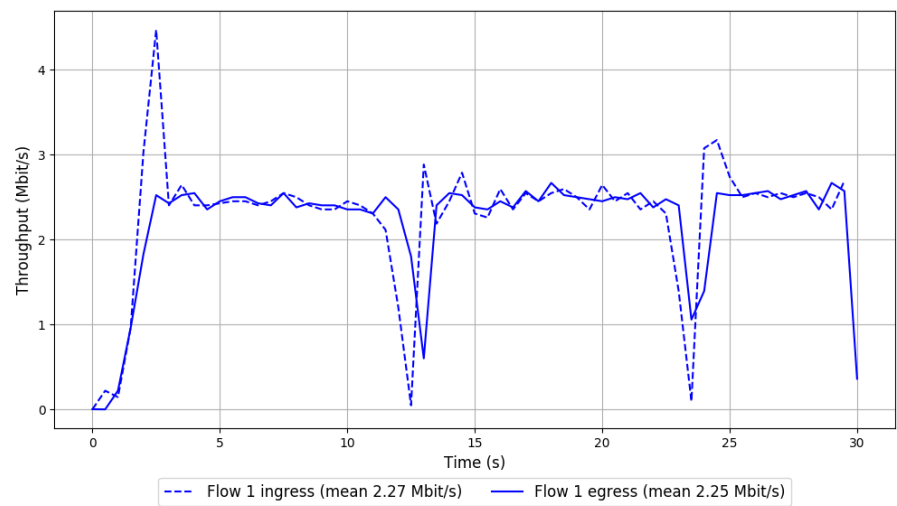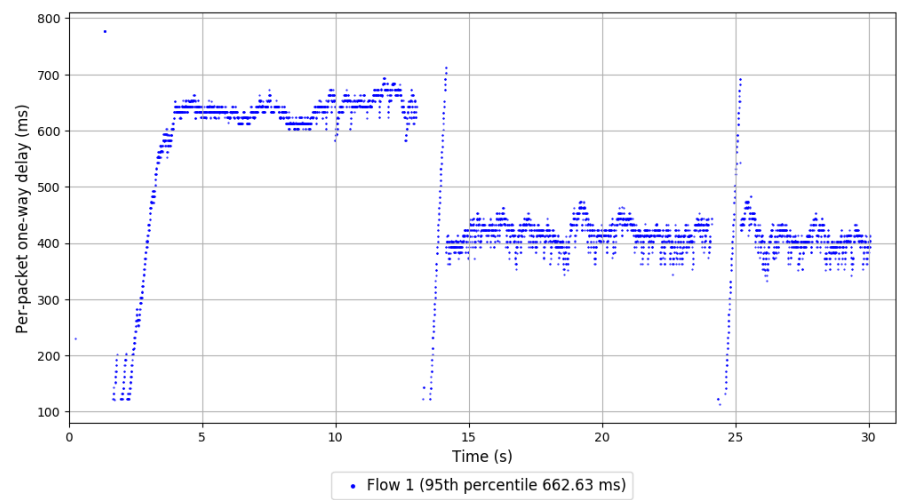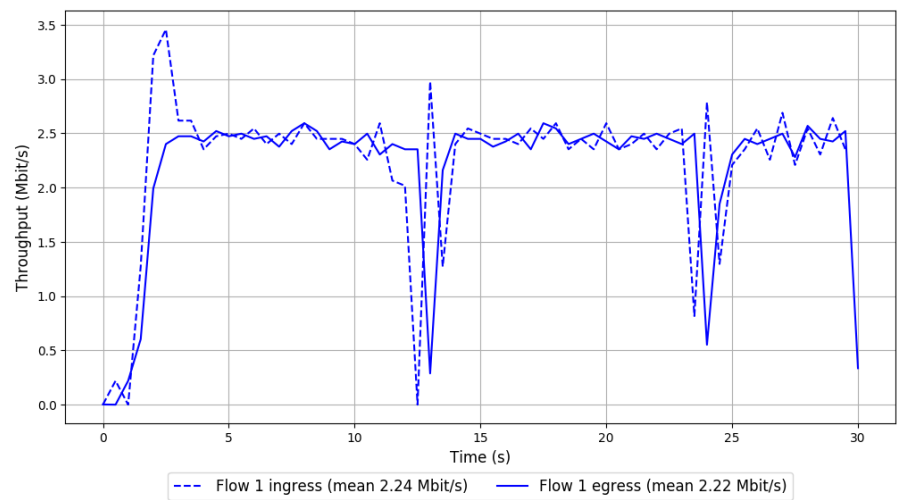
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2017-12-05 07:34:13
End at: 2017-12-05 07:34:43
Local clock offset: 1.163 ms
Remote clock offset: 1.278 ms


# Below is generated by plot.py at 2017-12-05 07:56:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 662.635 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 662.635 ms
Loss rate: 1.16%
```

Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-12-05 07:50:37
End at: 2017-12-05 07:51:07
Local clock offset: 1.772 ms
Remote clock offset: 1.169 ms


# Below is generated by plot.py at 2017-12-05 07:56:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 671.750 ms
Loss rate: 1.23%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 671.750 ms
Loss rate: 1.23%
```
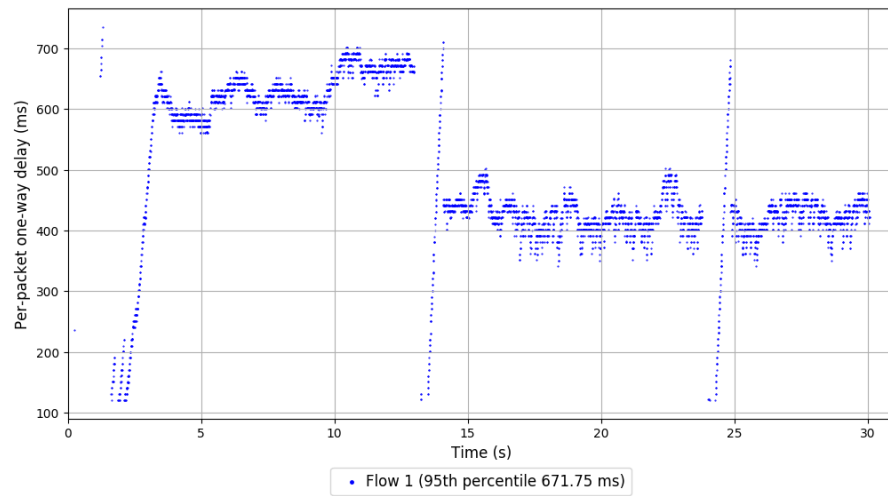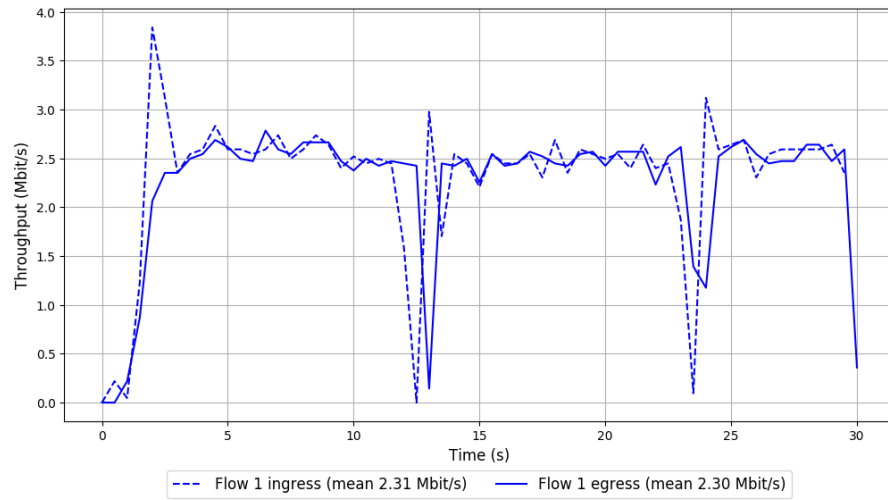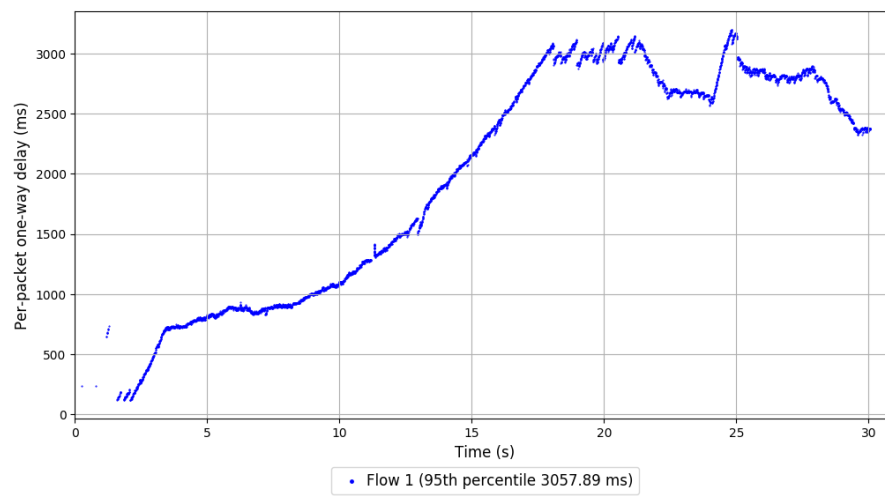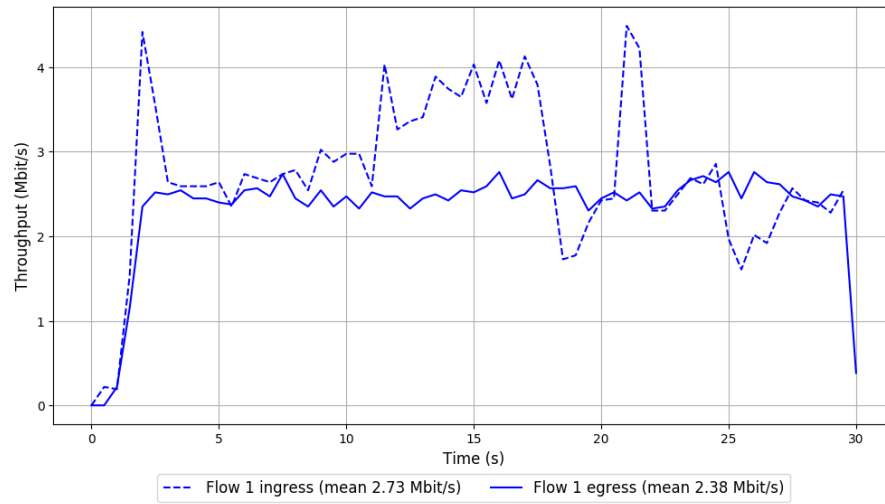
Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 2.31 Mbit/s) —— Flow 1 egress (mean 2.30 Mbit/s)
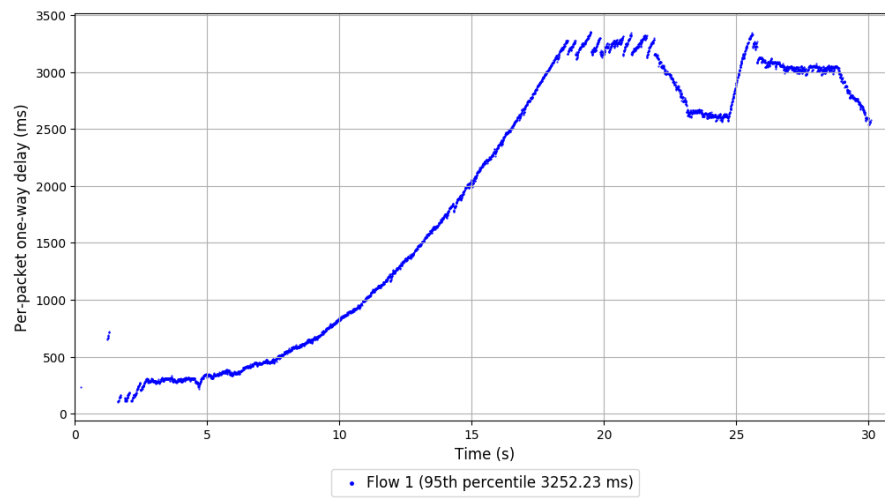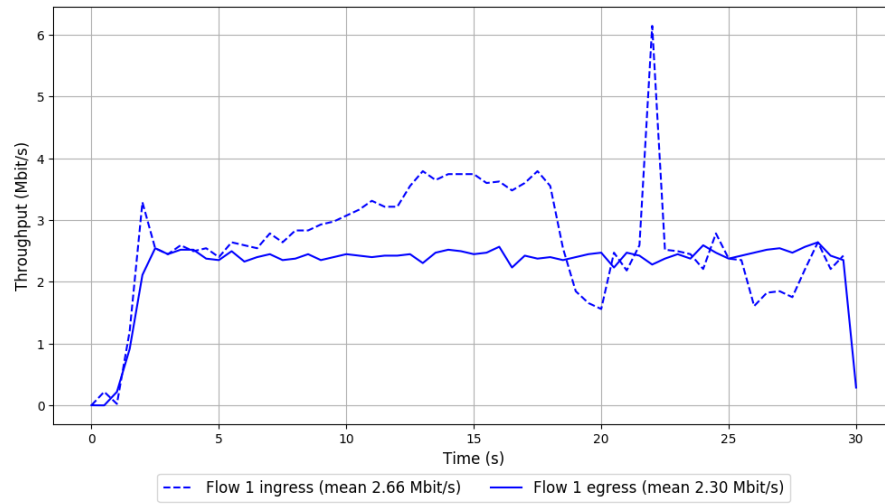

• Flow 1 (95th percentile 671.75 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2017-12-05 07:21:20
End at: 2017-12-05 07:21:50
Local clock offset: 1.695 ms
Remote clock offset: 0.607 ms


# Below is generated by plot.py at 2017-12-05 07:56:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 3057.894 ms
Loss rate: 13.35%
-- Flow 1:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 3057.894 ms
Loss rate: 13.35%
```

Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2017-12-05 07:37:44
End at: 2017-12-05 07:38:14
Local clock offset: 1.239 ms
Remote clock offset: -4.271 ms


# Below is generated by plot.py at 2017-12-05 07:56:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 3252.233 ms
Loss rate: 13.68%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 3252.233 ms
Loss rate: 13.68%
```
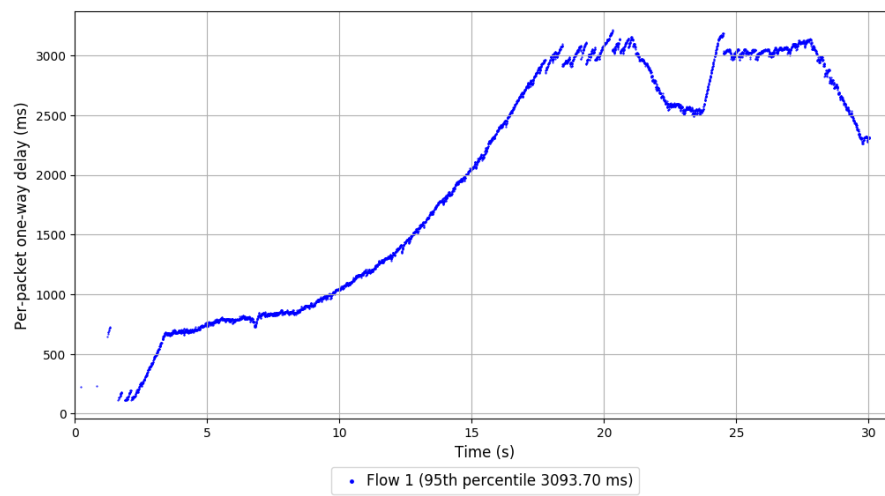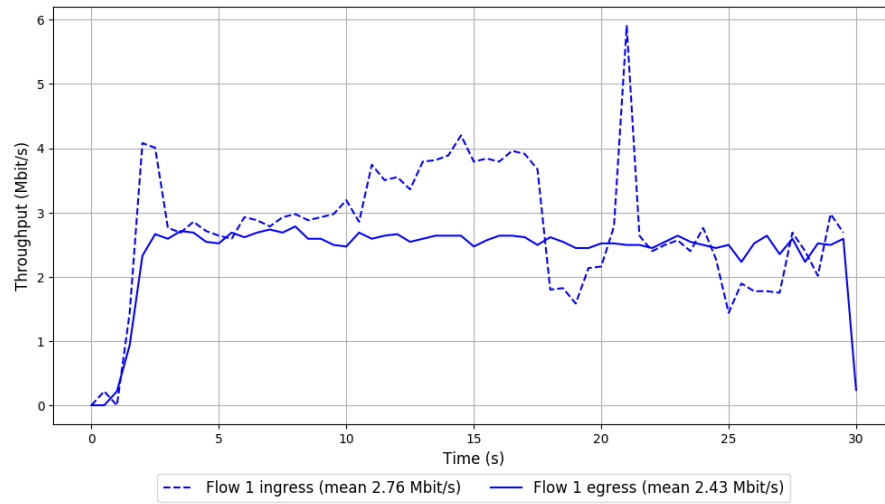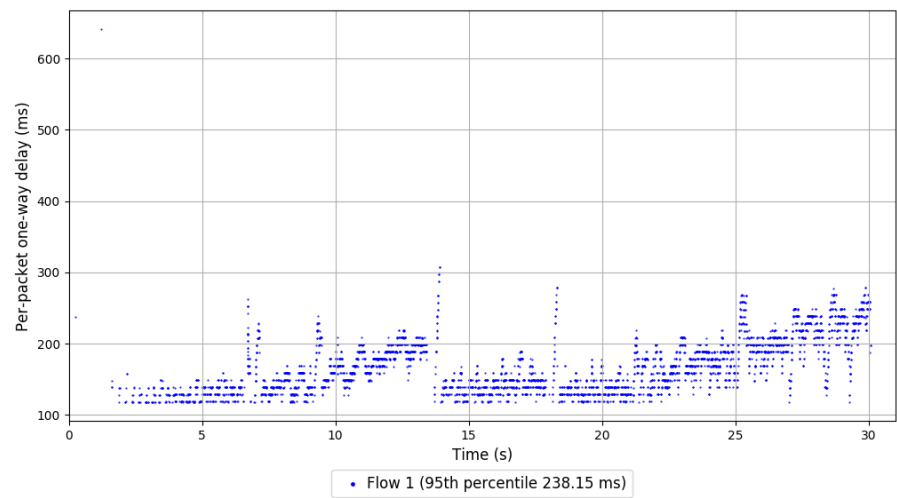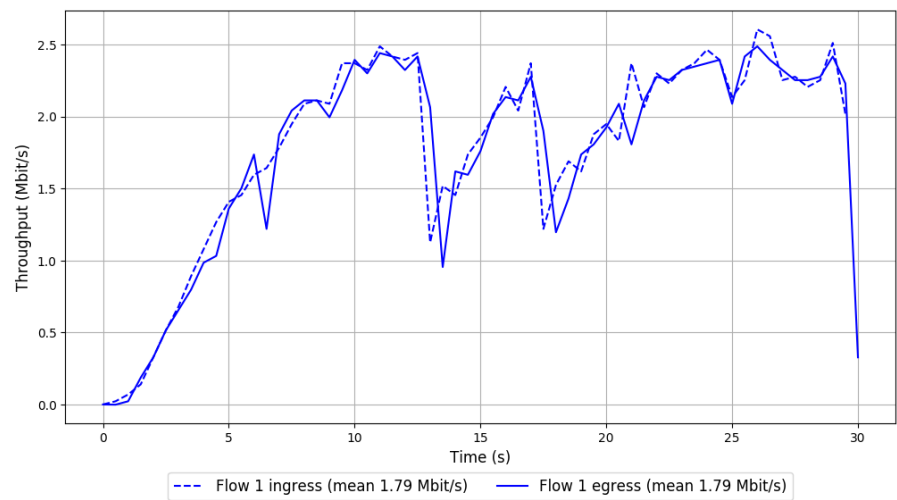
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 2.66 Mbit/s)   Flow 1 egress (mean 2.30 Mbit/s)

Flow 1 (95th percentile 3252.23 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2017-12-05 07:54:08
End at: 2017-12-05 07:54:38
Local clock offset: 2.052 ms
Remote clock offset: -4.32 ms


# Below is generated by plot.py at 2017-12-05 07:56:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.43 Mbit/s
95th percentile per-packet one-way delay: 3093.696 ms
Loss rate: 12.43%
-- Flow 1:
Average throughput: 2.43 Mbit/s
95th percentile per-packet one-way delay: 3093.696 ms
Loss rate: 12.43%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 2.76 Mbit/s) --- Flow 1 egress (mean 2.43 Mbit/s)

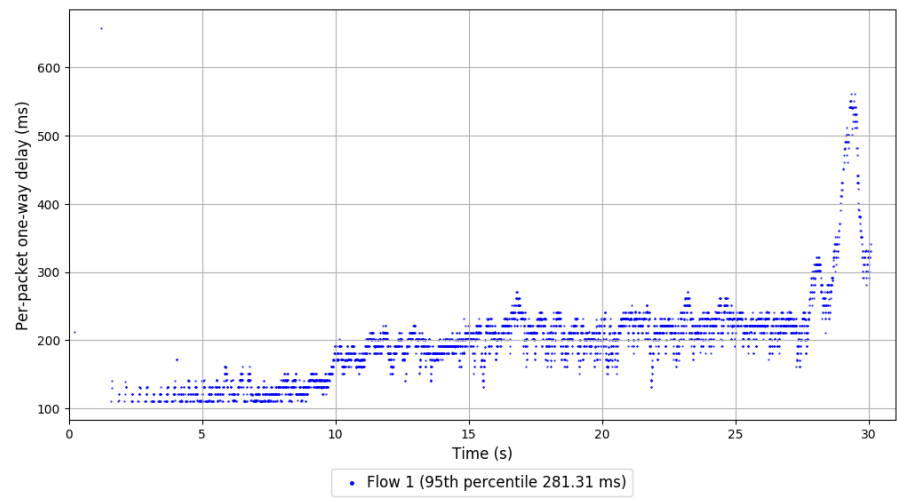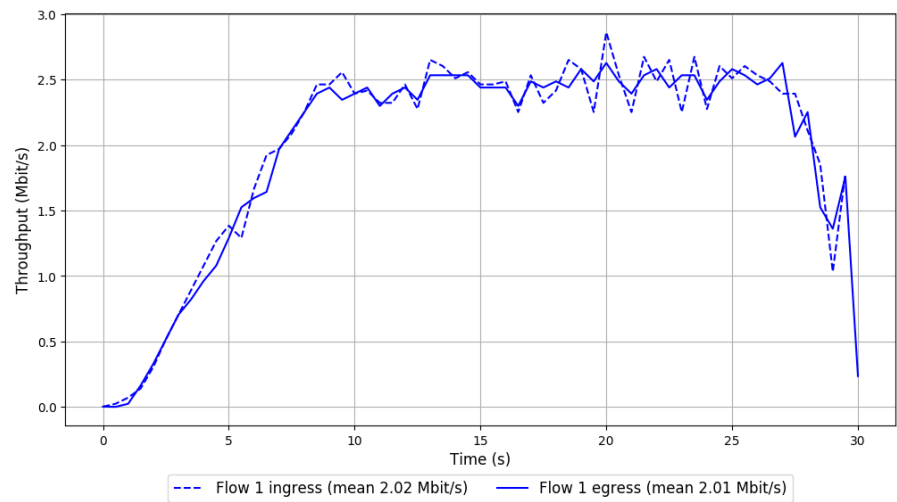
• Flow 1 (95th percentile 3093.70 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2017-12-05 07:13:08
End at: 2017-12-05 07:13:38
Local clock offset: 1.79 ms
Remote clock offset: 0.295 ms

# Below is generated by plot.py at 2017-12-05 07:56:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 238.148 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 238.148 ms
Loss rate: 0.55%
```

Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2017-12-05 07:29:32
End at: 2017-12-05 07:30:02
Local clock offset: 1.141 ms
Remote clock offset: -4.426 ms


# Below is generated by plot.py at 2017-12-05 07:56:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 281.309 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 281.309 ms
Loss rate: 0.78%
```

Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2017-12-05 07:45:56
End at: 2017-12-05 07:46:26
Local clock offset: 1.607 ms
Remote clock offset: 1.488 ms


# Below is generated by plot.py at 2017-12-05 07:56:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 244.208 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 244.208 ms
Loss rate: 0.59%
```
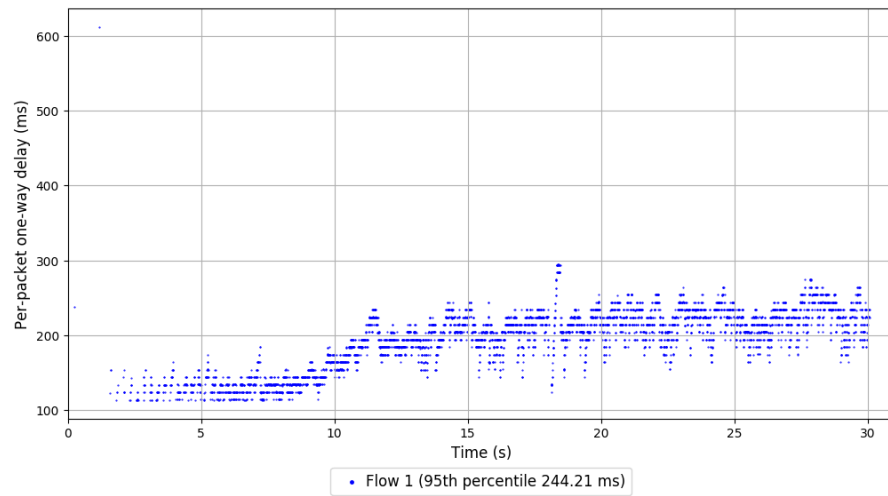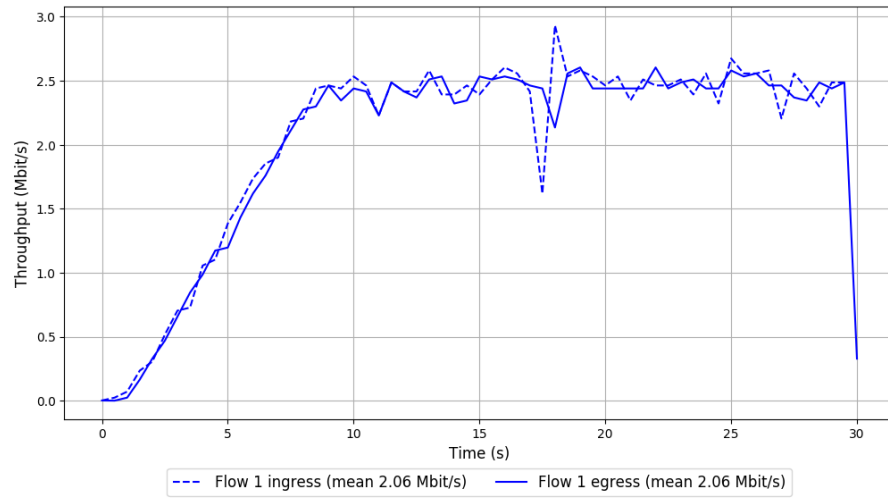
Run 3: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2017-12-05 07:22:30
End at: 2017-12-05 07:23:00
Local clock offset: 1.6 ms
Remote clock offset: -4.318 ms


# Below is generated by plot.py at 2017-12-05 07:56:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 3219.174 ms
Loss rate: 48.29%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 3219.174 ms
Loss rate: 48.29%
```
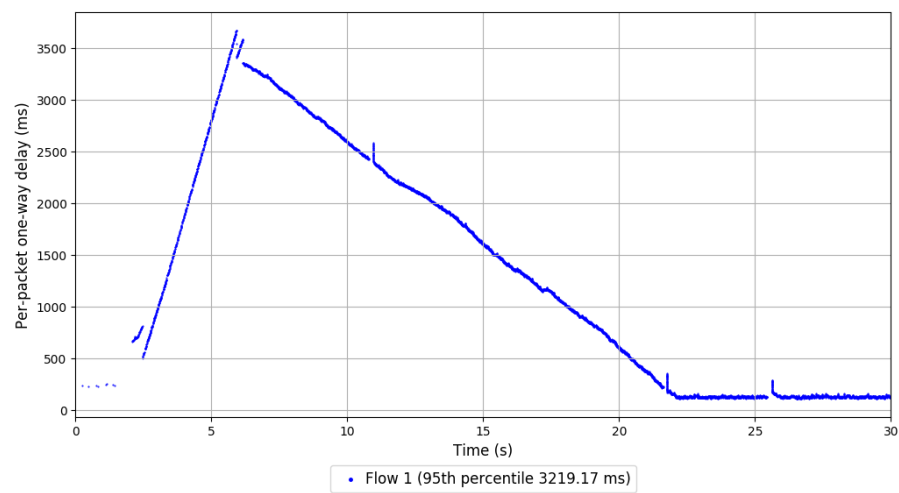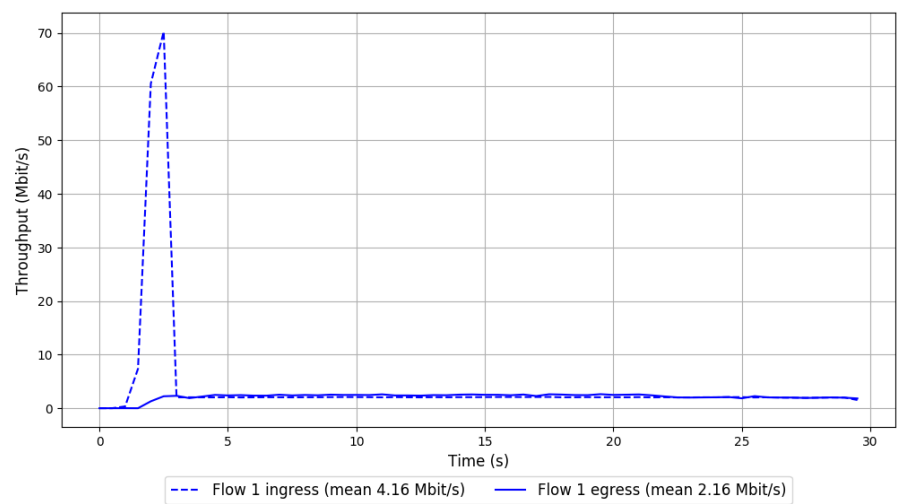
Run 1: Report of PCC — Data Link

```
Run 2: Statistics of PCC

Start at: 2017-12-05 07:38:54
End at: 2017-12-05 07:39:24
Local clock offset: 1.271 ms
Remote clock offset: 0.598 ms


# Below is generated by plot.py at 2017-12-05 07:56:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 3082.813 ms
Loss rate: 50.27%
-- Flow 1:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 3082.813 ms
Loss rate: 50.27%
```
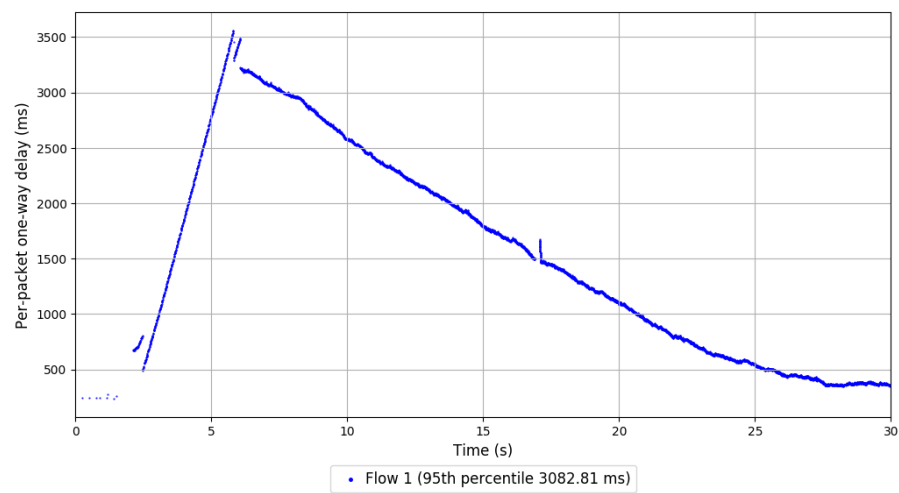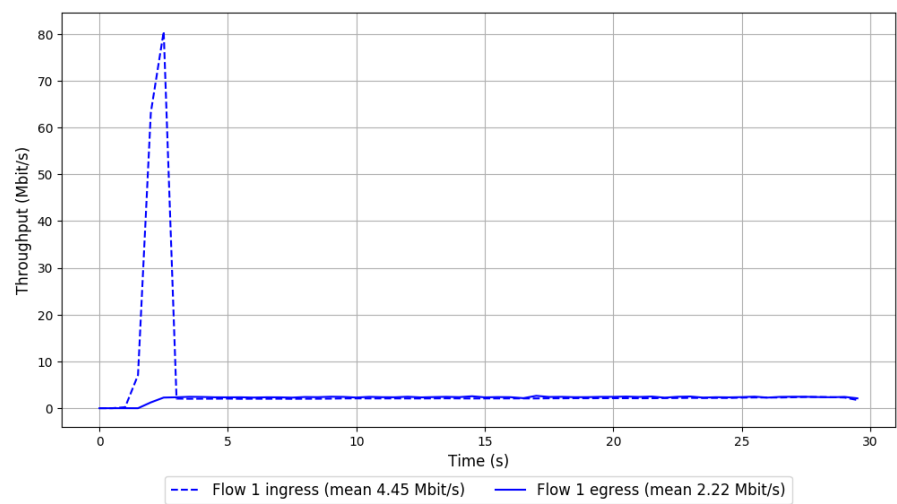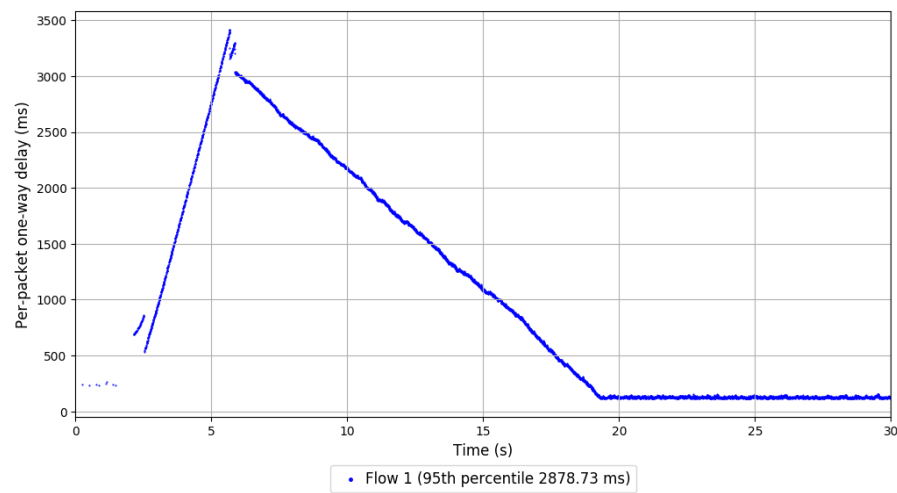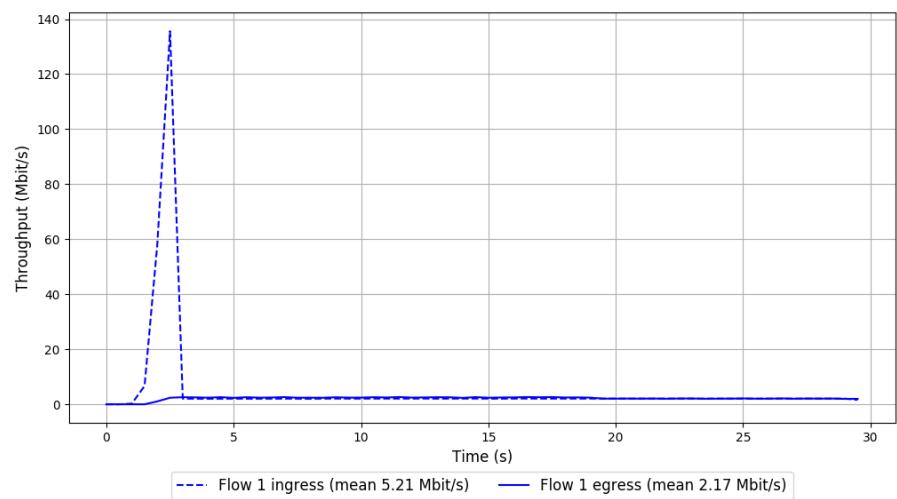
Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 4.45 Mbit/s) --- Flow 1 egress (mean 2.22 Mbit/s)

• Flow 1 (95th percentile 3082.81 ms)

```
Run 3: Statistics of PCC

Start at: 2017-12-05 07:55:18
End at: 2017-12-05 07:55:48
Local clock offset: 2.121 ms
Remote clock offset: 1.321 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.17 Mbit/s
95th percentile per-packet one-way delay: 2878.726 ms
Loss rate: 58.52%
-- Flow 1:
Average throughput: 2.17 Mbit/s
95th percentile per-packet one-way delay: 2878.726 ms
Loss rate: 58.52%
```
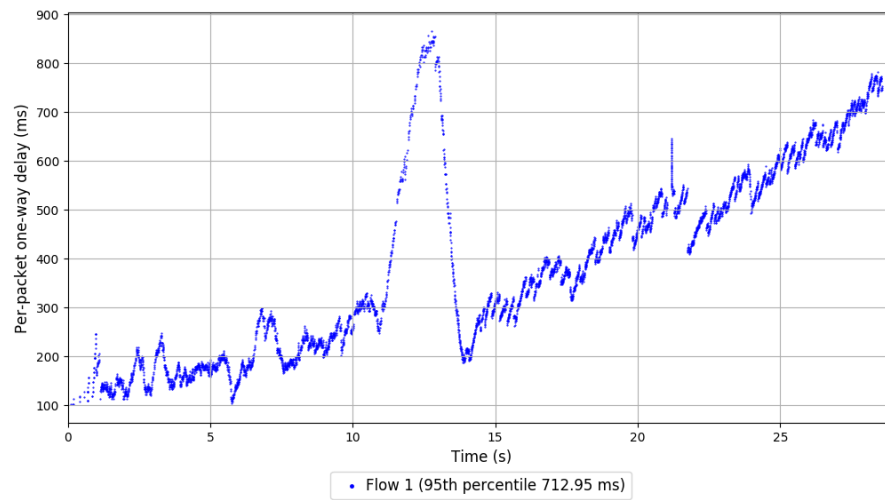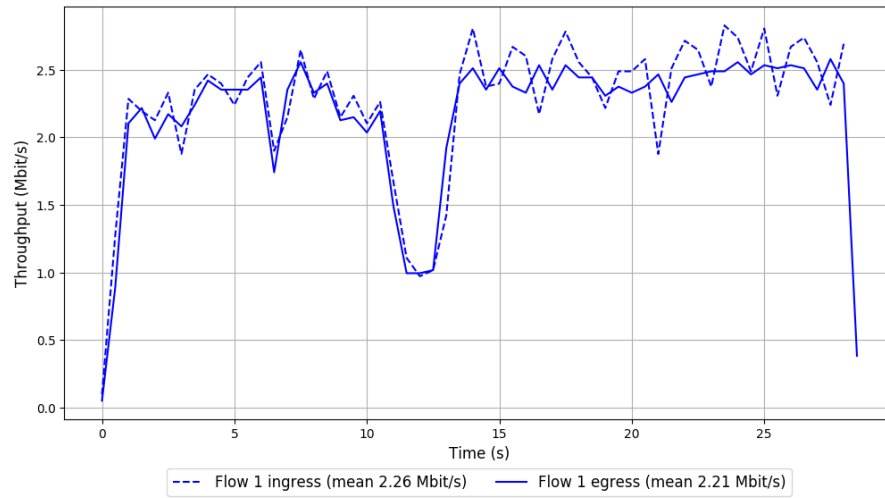
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 5.21 Mbit/s)   Flow 1 egress (mean 2.17 Mbit/s)

Flow 1 (95th percentile 2878.73 ms)

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-12-05 07:15:29
End at: 2017-12-05 07:15:59
Local clock offset: 1.938 ms
Remote clock offset: -5.292 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 712.945 ms
Loss rate: 2.60%
-- Flow 1:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 712.945 ms
Loss rate: 2.60%
```
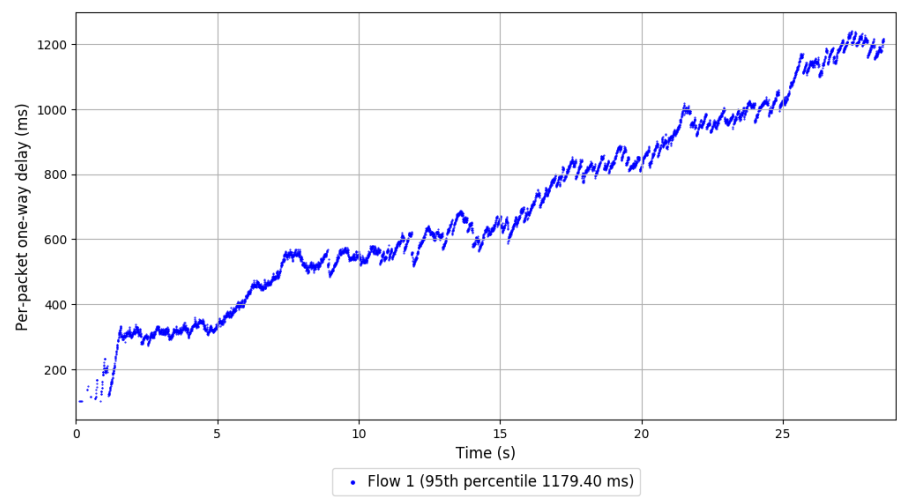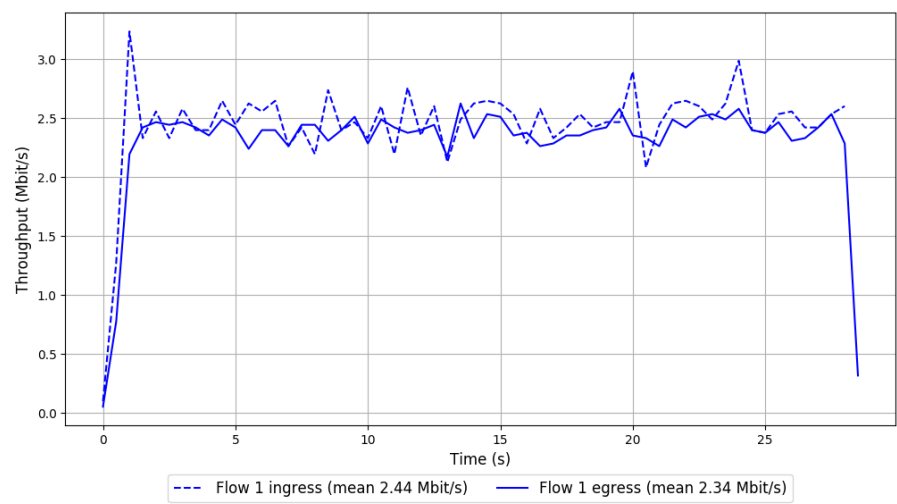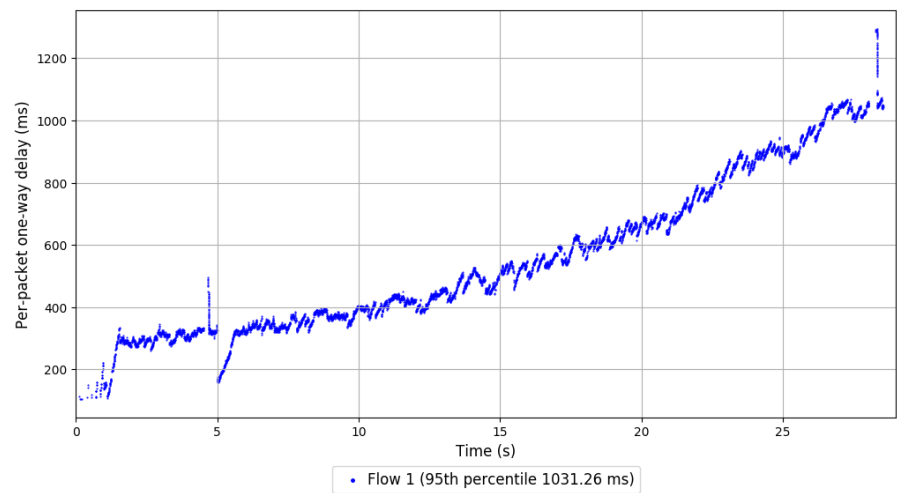
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 2.26 Mbit/s)   Flow 1 egress (mean 2.21 Mbit/s)

• Flow 1 (95th percentile 712.95 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-12-05 07:31:53
End at: 2017-12-05 07:32:23
Local clock offset: 1.119 ms
Remote clock offset: -5.273 ms

# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 1179.398 ms
Loss rate: 4.27%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 1179.398 ms
Loss rate: 4.27%
```

Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 2.44 Mbit/s) ——— Flow 1 egress (mean 2.34 Mbit/s)

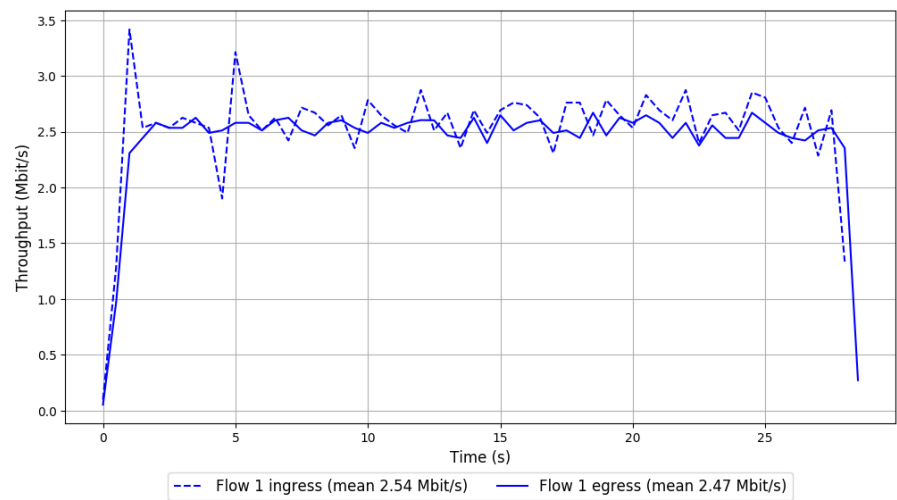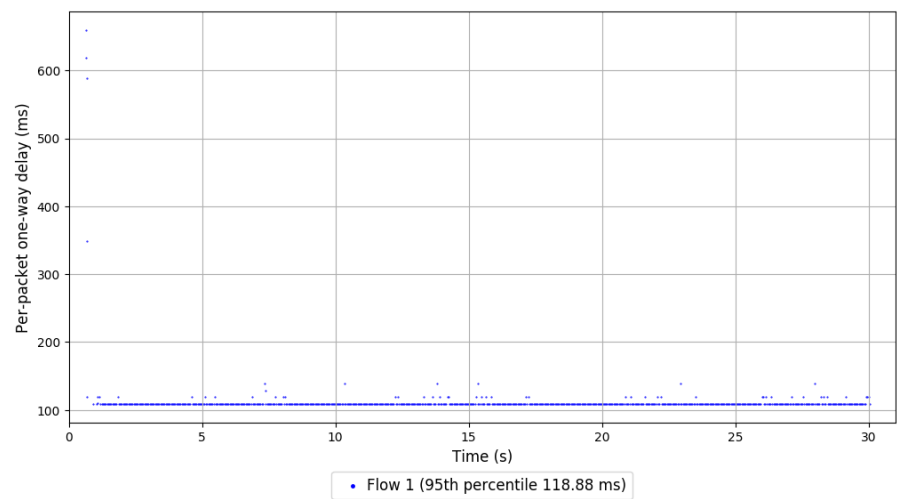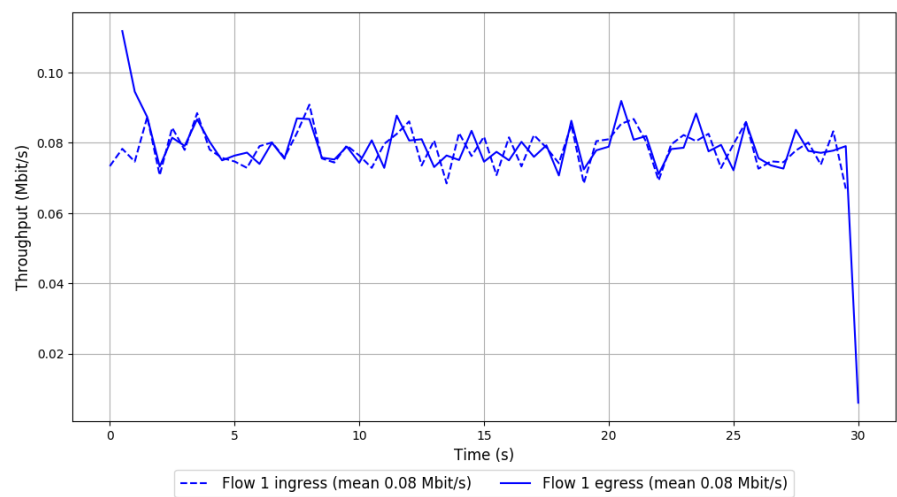
• Flow 1 (95th percentile 1179.40 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-12-05 07:48:17
End at: 2017-12-05 07:48:47
Local clock offset: 1.708 ms
Remote clock offset: -4.121 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 1031.262 ms
Loss rate: 2.77%
-- Flow 1:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 1031.262 ms
Loss rate: 2.77%
```

Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 2.54 Mbit/s)   Flow 1 egress (mean 2.47 Mbit/s)

Flow 1 (95th percentile 1031.26 ms)

```
Run 1: Statistics of SCReAM

Start at: 2017-12-05 07:19:00
End at: 2017-12-05 07:19:30
Local clock offset: 1.823 ms
Remote clock offset: -4.718 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 118.880 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 118.880 ms
Loss rate: 0.00%
```
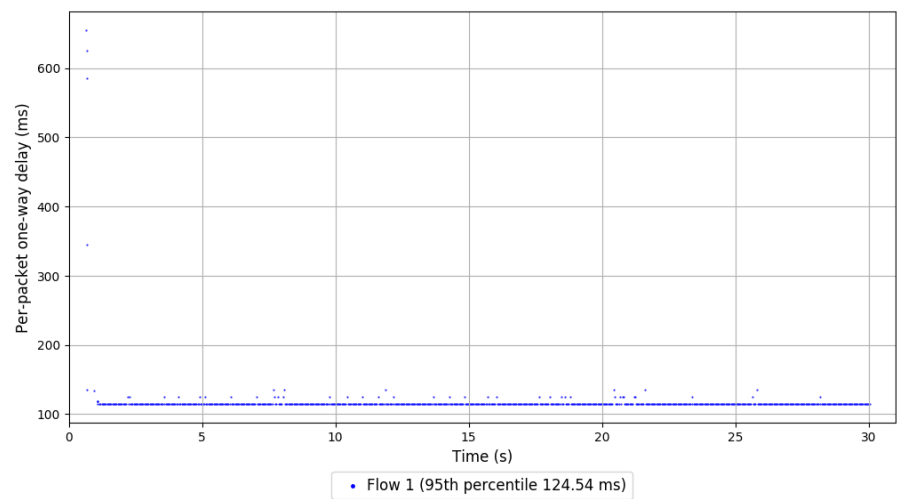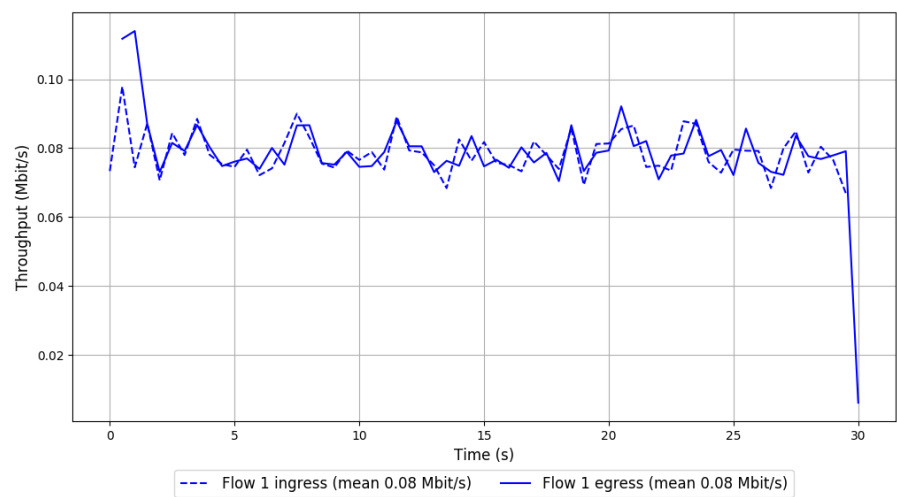
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2017-12-05 07:35:23
End at: 2017-12-05 07:35:54
Local clock offset: 1.146 ms
Remote clock offset: 0.511 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.539 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.539 ms
Loss rate: 0.00%
```
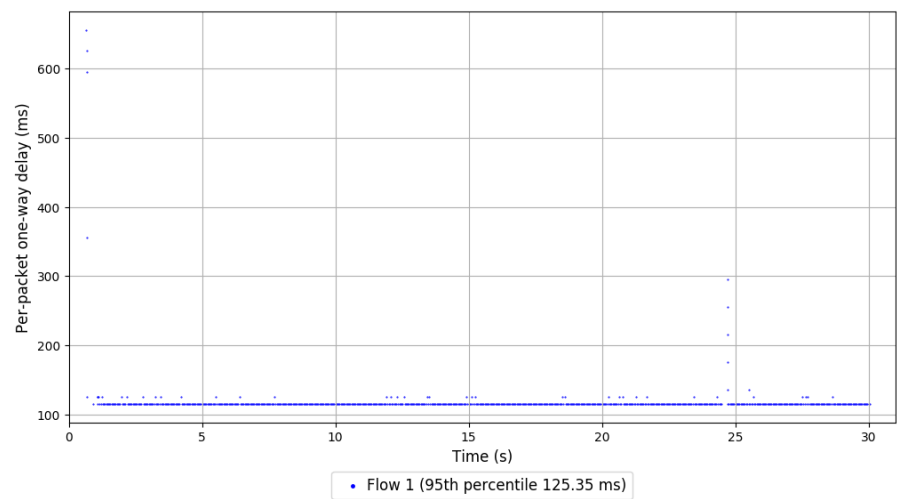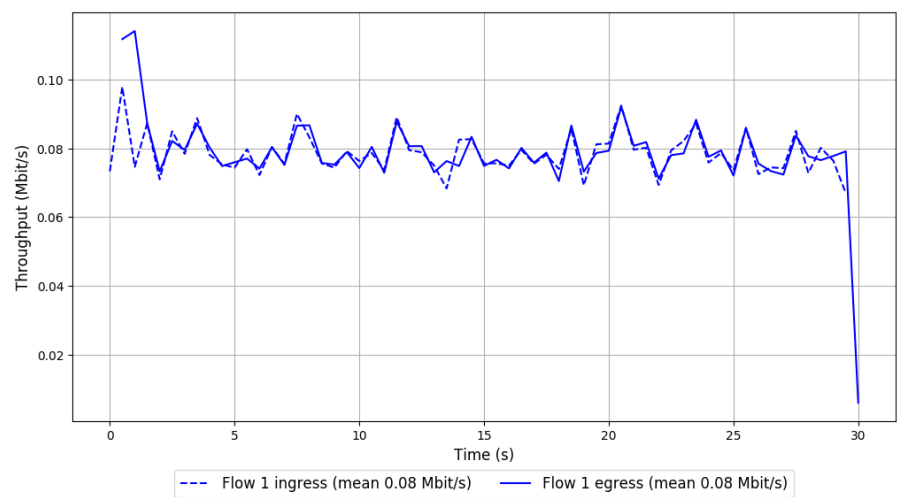
Run 2: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.08 Mbit/s)   Flow 1 egress (mean 0.08 Mbit/s)

Flow 1 (95th percentile 124.54 ms)

```
Run 3: Statistics of SCReAM

Start at: 2017-12-05 07:51:48
End at: 2017-12-05 07:52:18
Local clock offset: 1.921 ms
Remote clock offset: 0.413 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 125.353 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 125.353 ms
Loss rate: 0.00%
```
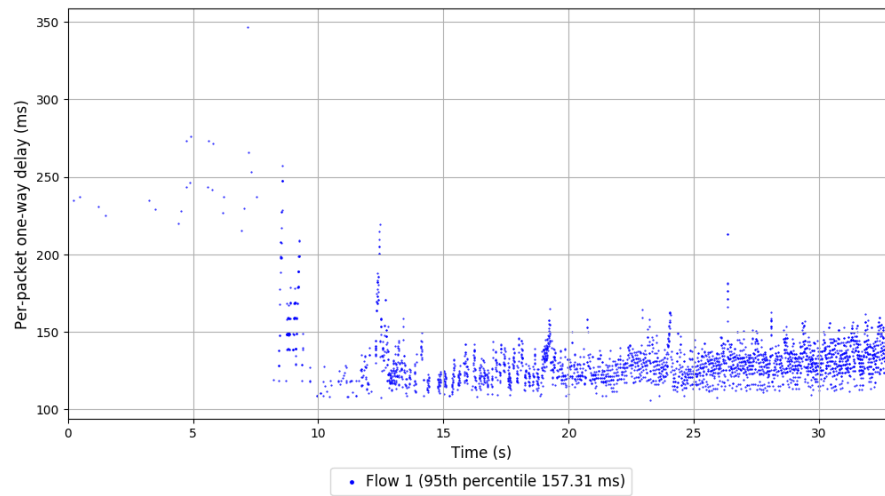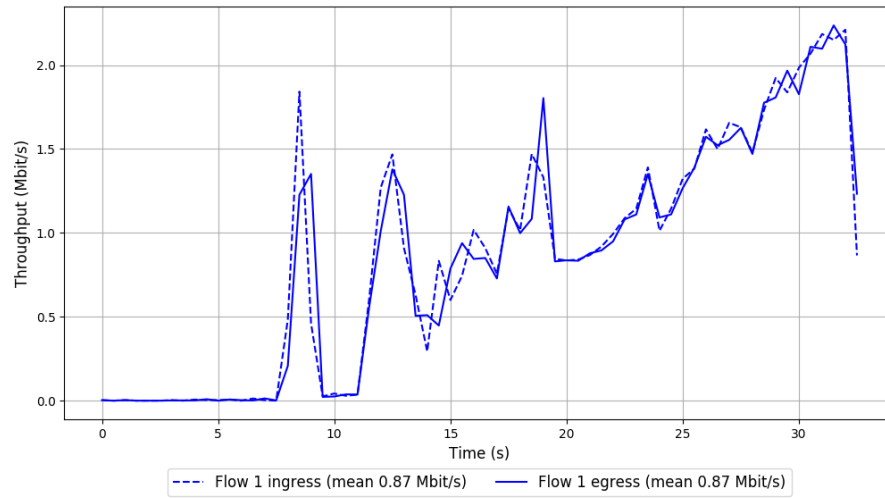
Run 3: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.08 Mbit/s)   Flow 1 egress (mean 0.08 Mbit/s)

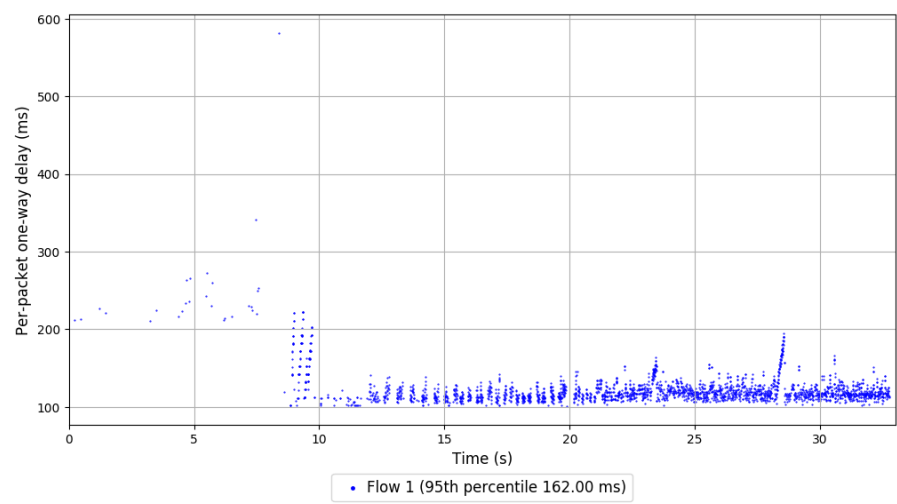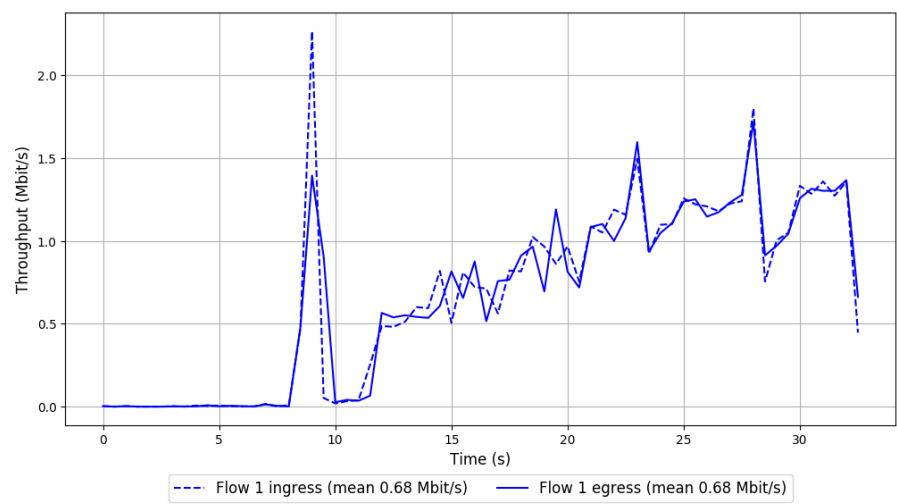Flow 1 (95th percentile 125.35 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2017-12-05 07:07:16
End at: 2017-12-05 07:07:46
Local clock offset: 1.454 ms
Remote clock offset: -5.594 ms


# Below is generated by plot.py at 2017-12-05 07:56:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 157.306 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 157.306 ms
Loss rate: 0.47%
```
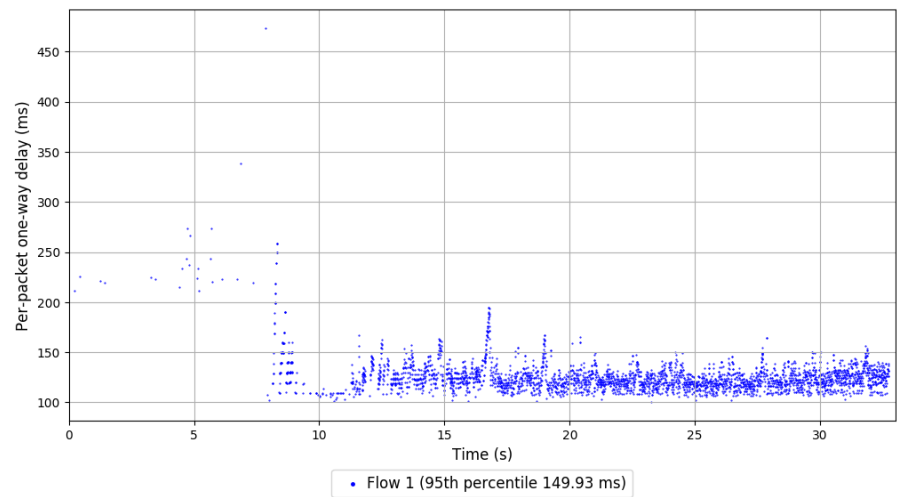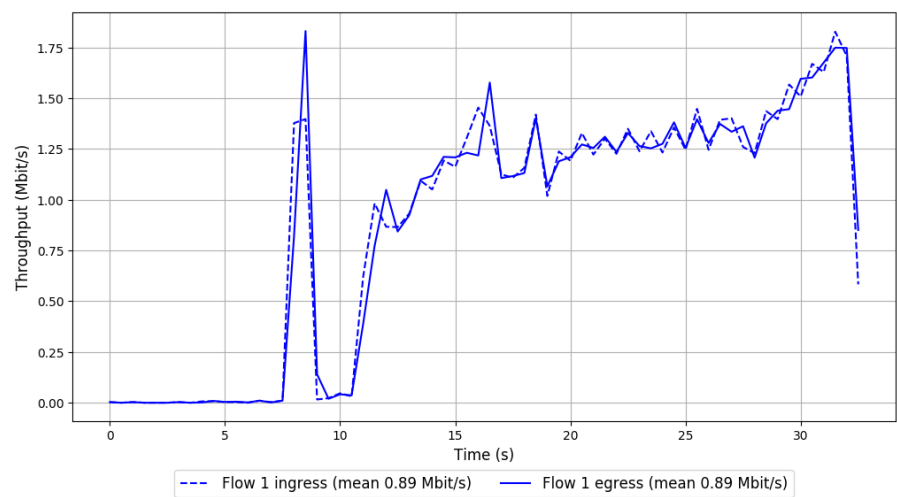
Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2017-12-05 07:23:41
End at: 2017-12-05 07:24:11
Local clock offset: 1.495 ms
Remote clock offset: -4.493 ms

# Below is generated by plot.py at 2017-12-05 07:56:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 161.999 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 161.999 ms
Loss rate: 0.22%
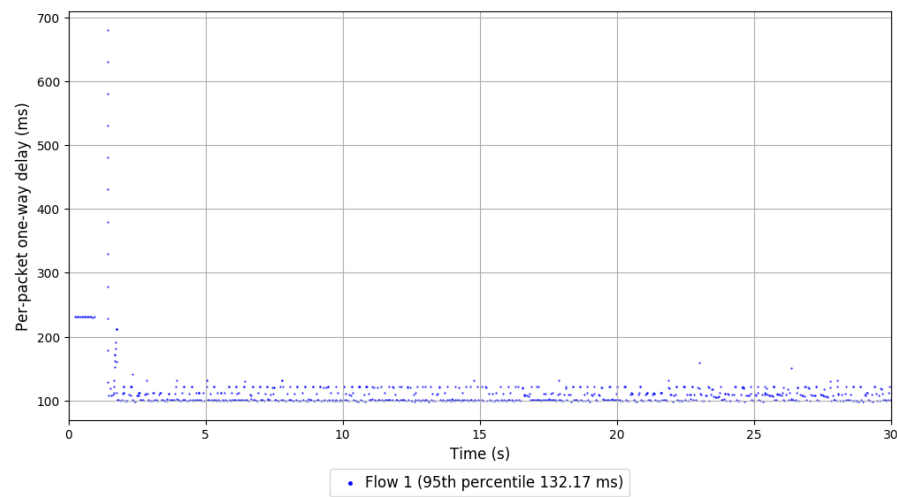```

Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2017-12-05 07:40:05
End at: 2017-12-05 07:40:35
Local clock offset: 1.299 ms
Remote clock offset: -5.099 ms

Below is generated by plot.py at 2017-12-05 07:56:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.89 Mbit/s
95th percentile per-packet one-way delay: 149.929 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.89 Mbit/s
95th percentile per-packet one-way delay: 149.929 ms
Loss rate: 0.28%
```
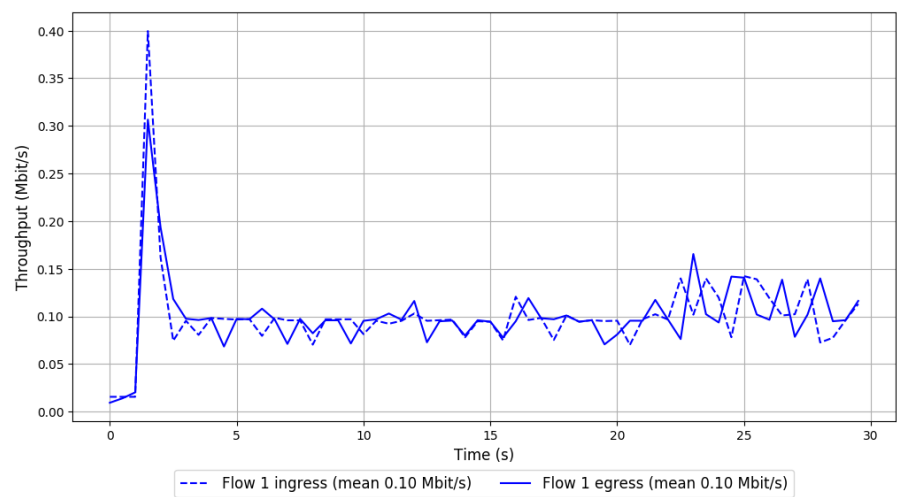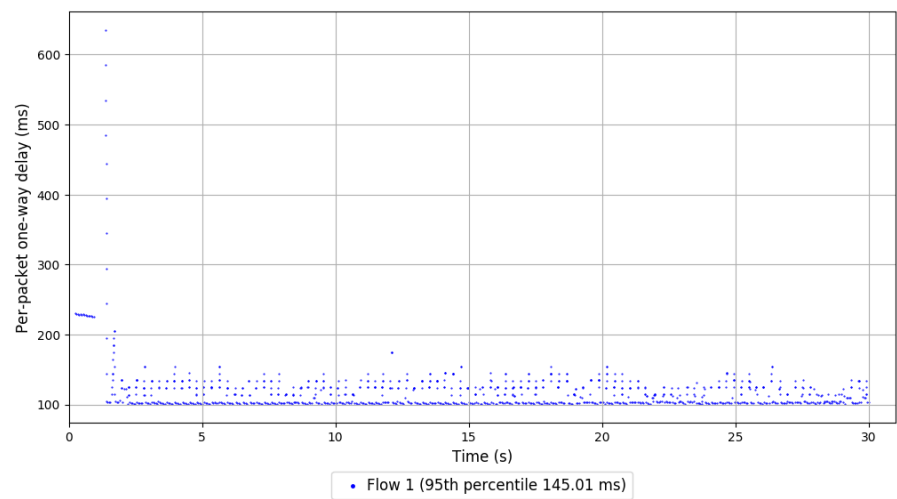
Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2017-12-05 07:20:09
End at: 2017-12-05 07:20:40
Local clock offset: 1.77 ms
Remote clock offset: -5.522 ms


# Below is generated by plot.py at 2017-12-05 07:56:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 132.167 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 132.167 ms
Loss rate: 0.00%
```

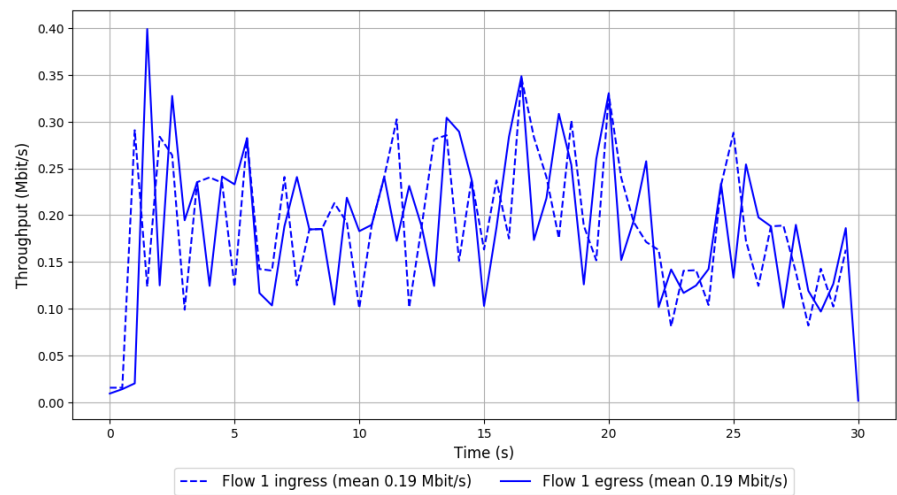Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-12-05 07:36:33
End at: 2017-12-05 07:37:03
Local clock offset: 1.196 ms
Remote clock offset: -5.104 ms


# Below is generated by plot.py at 2017-12-05 07:56:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 145.015 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 145.015 ms
Loss rate: 0.00%
```

Run 2: Report of Sprout — Data Link

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

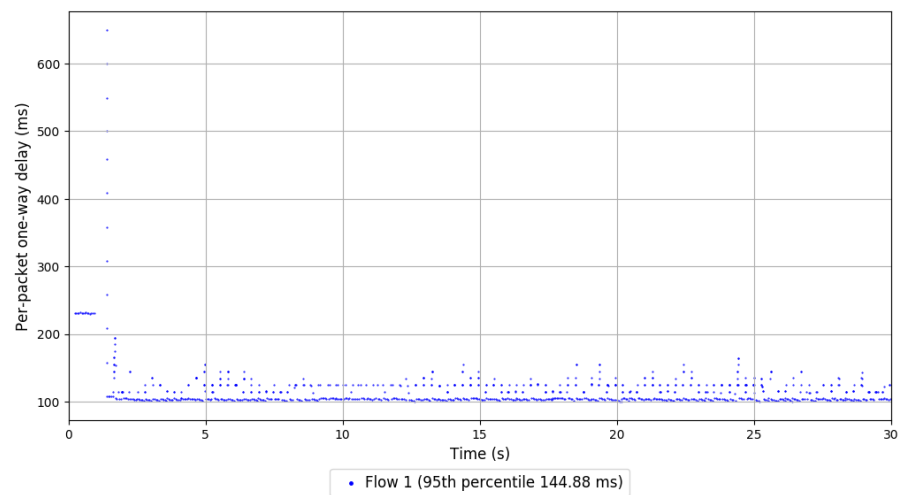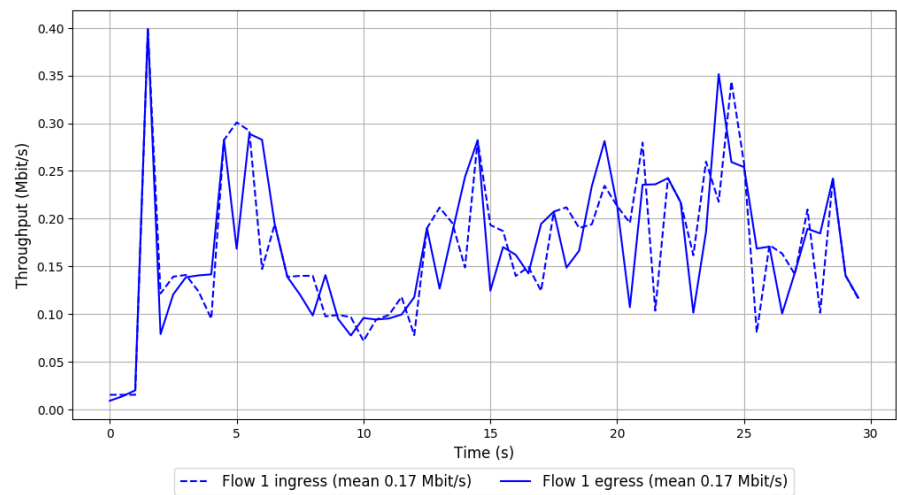Flow 1 (95th percentile 145.01 ms)

```
Run 3: Statistics of Sprout

Start at: 2017-12-05 07:52:58
End at: 2017-12-05 07:53:28
Local clock offset: 1.99 ms
Remote clock offset: -4.409 ms


# Below is generated by plot.py at 2017-12-05 07:56:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 144.879 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 144.879 ms
Loss rate: 0.02%
```
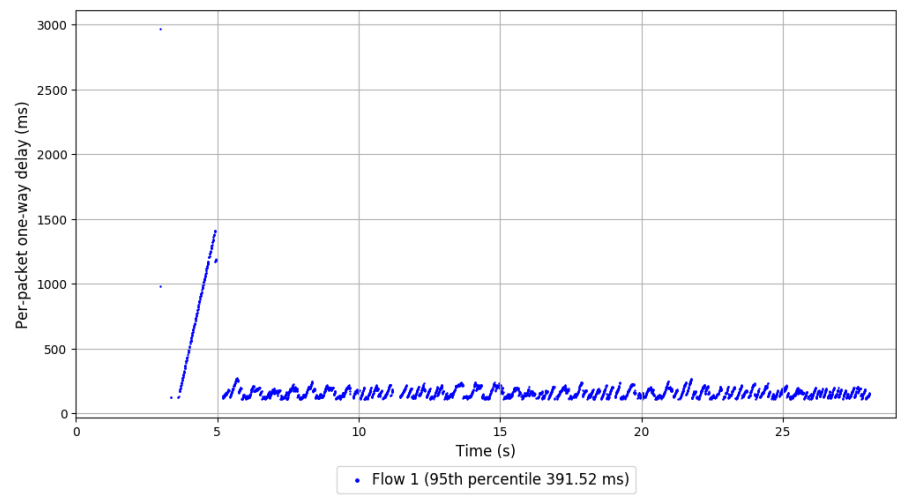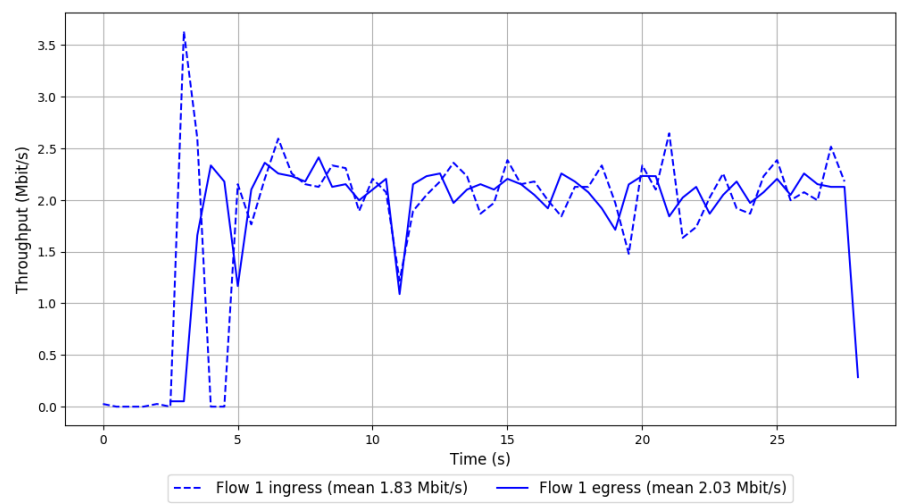
Run 3: Report of Sprout — Data Link

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

• Flow 1 (95th percentile 144.88 ms)

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

Start at: 2017-12-05 07:11:57
End at: 2017-12-05 07:12:27
Local clock offset: 1.633 ms
Remote clock offset: -0.987 ms


# Below is generated by plot.py at 2017-12-05 07:56:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 391.520 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 391.520 ms
Loss rate: 0.56%
```

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

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

Start at: 2017-12-05 07:28:21
End at: 2017-12-05 07:28:51
Local clock offset: 1.171 ms
Remote clock offset: -4.553 ms


# Below is generated by plot.py at 2017-12-05 07:57:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 213.500 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 213.500 ms
Loss rate: 0.13%
```
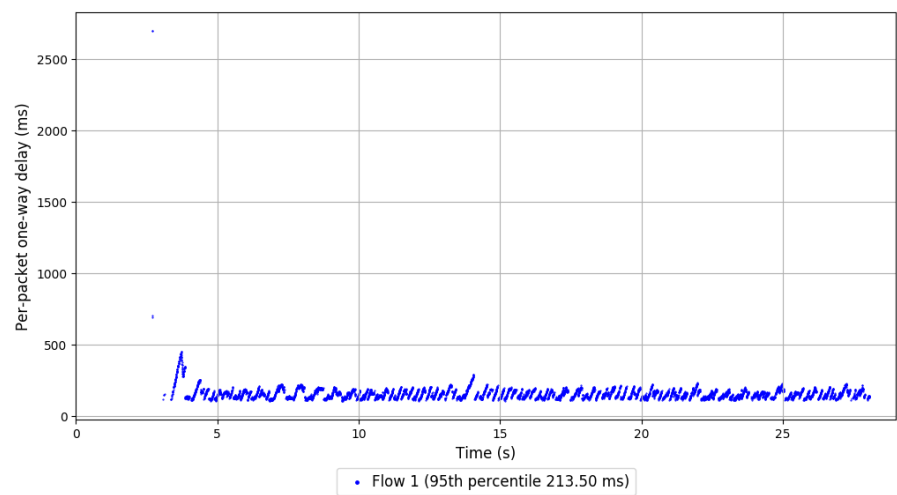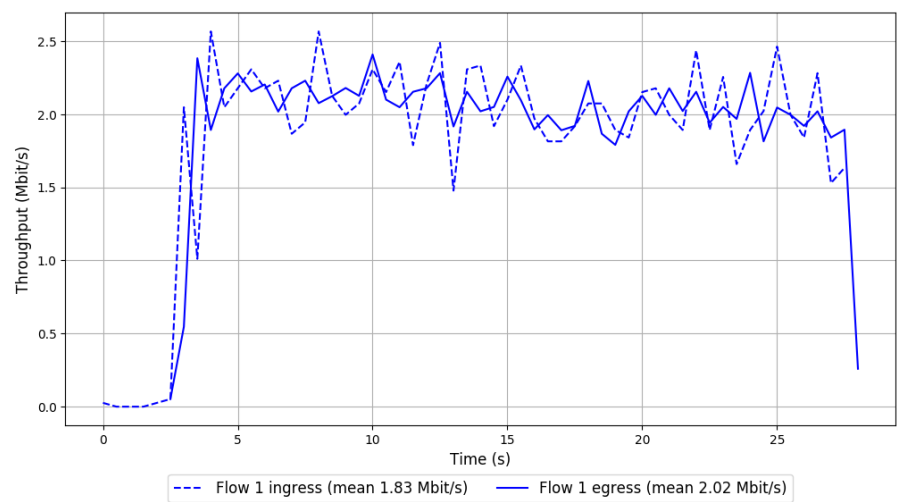
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2017-12-05 07:44:45
End at: 2017-12-05 07:45:16
Local clock offset: 1.524 ms
Remote clock offset: -0.081 ms


# Below is generated by plot.py at 2017-12-05 07:57:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.80 Mbit/s
95th percentile per-packet one-way delay: 1286.442 ms
Loss rate: 3.42%
-- Flow 1:
Average throughput: 1.80 Mbit/s
95th percentile per-packet one-way delay: 1286.442 ms
Loss rate: 3.42%
```
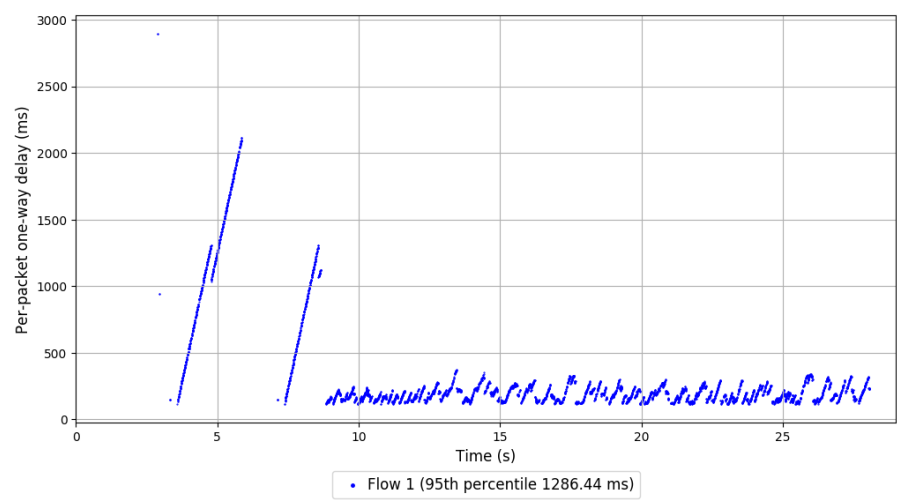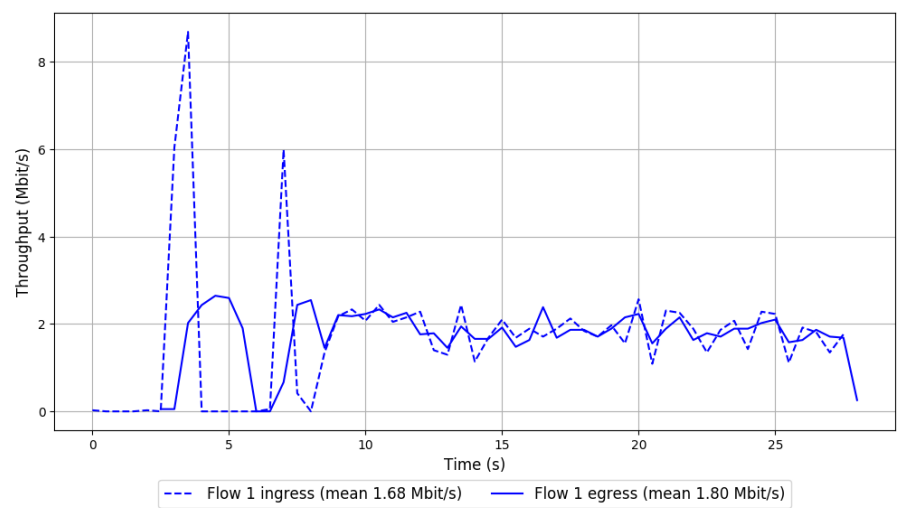
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 1.68 Mbit/s)   Flow 1 egress (mean 1.80 Mbit/s)
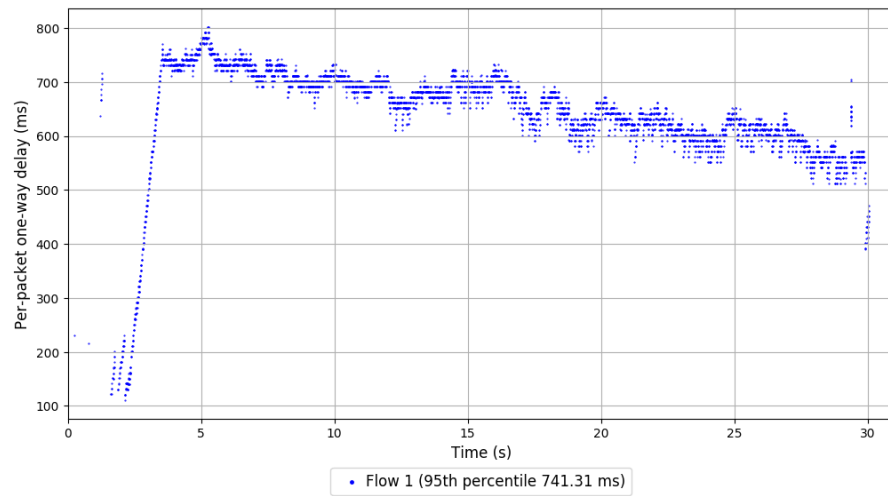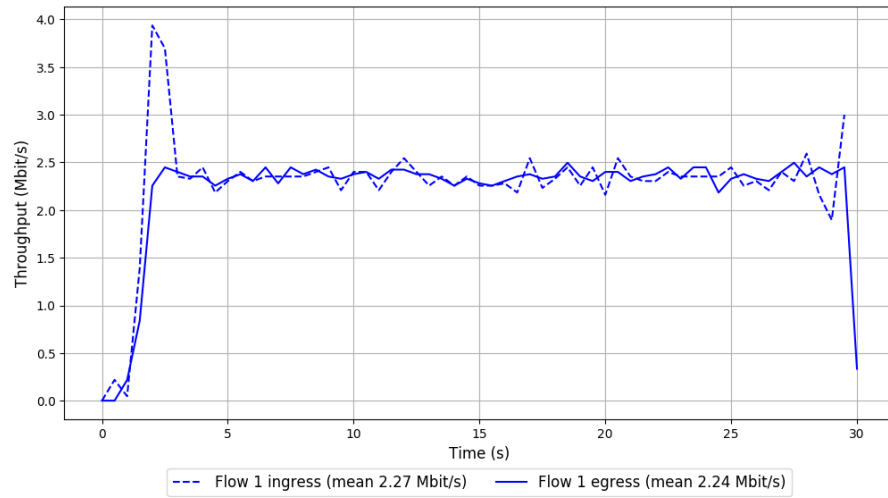

• Flow 1 (95th percentile 1286.44 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2017-12-05 07:10:47
End at: 2017-12-05 07:11:17
Local clock offset: 1.637 ms
Remote clock offset: -5.449 ms


# Below is generated by plot.py at 2017-12-05 07:57:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 741.306 ms
Loss rate: 1.64%
-- Flow 1:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 741.306 ms
Loss rate: 1.64%
```

Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2017-12-05 07:27:11
End at: 2017-12-05 07:27:41
Local clock offset: 1.255 ms
Remote clock offset: 0.36 ms


# Below is generated by plot.py at 2017-12-05 07:57:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 537.494 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 537.494 ms
Loss rate: 0.81%
```
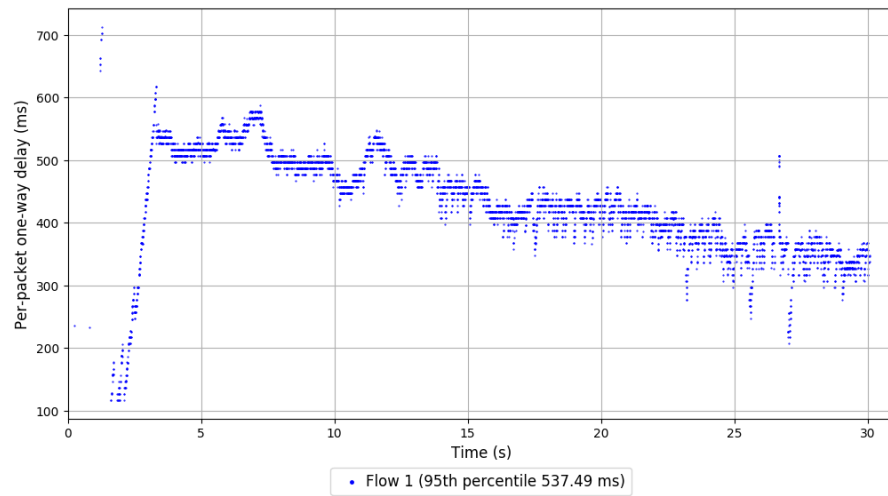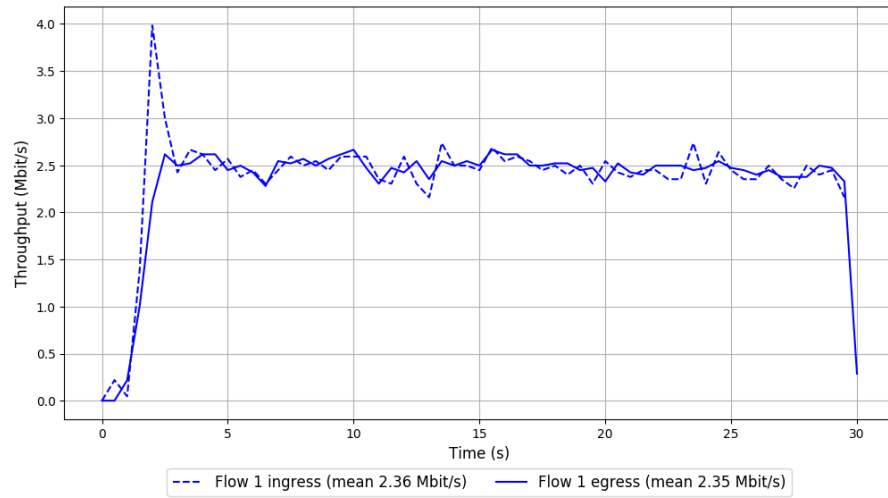
Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 2.36 Mbit/s) --- Flow 1 egress (mean 2.35 Mbit/s)

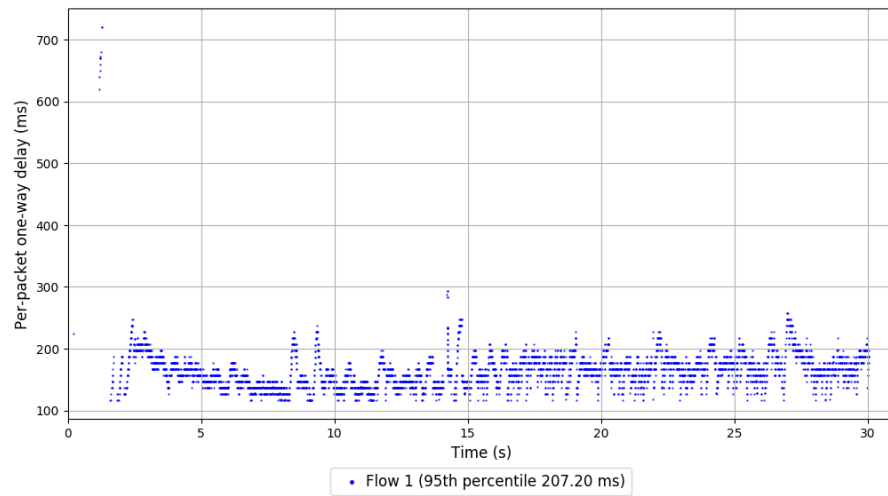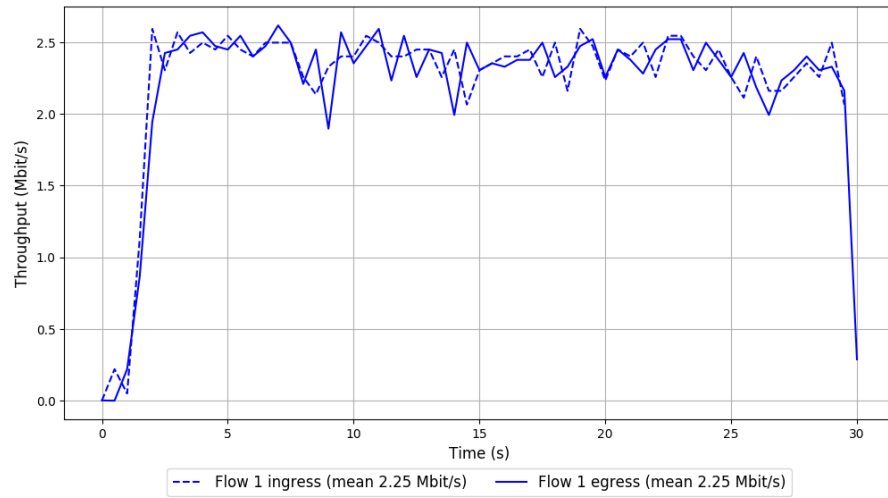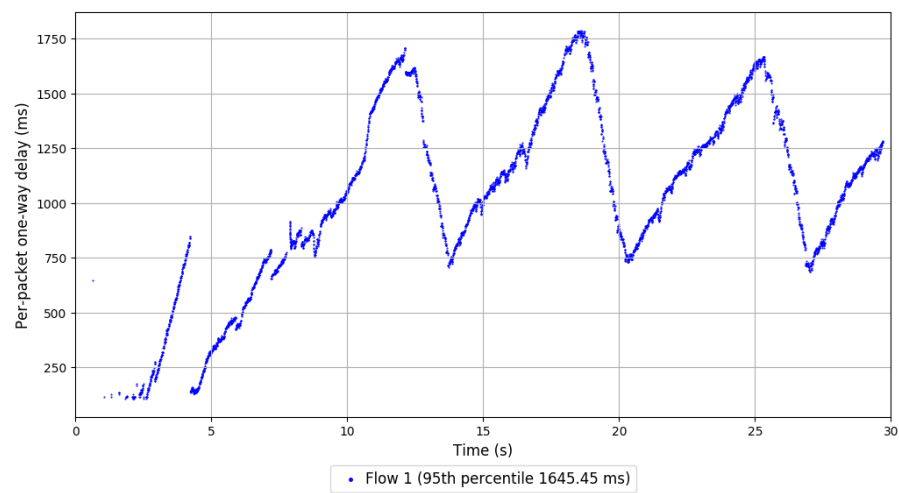Flow 1 (95th percentile 537.49 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2017-12-05 07:43:35
End at: 2017-12-05 07:44:05
Local clock offset: 1.466 ms
Remote clock offset: -5.035 ms


# Below is generated by plot.py at 2017-12-05 07:57:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 207.197 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 207.197 ms
Loss rate: 0.37%
```
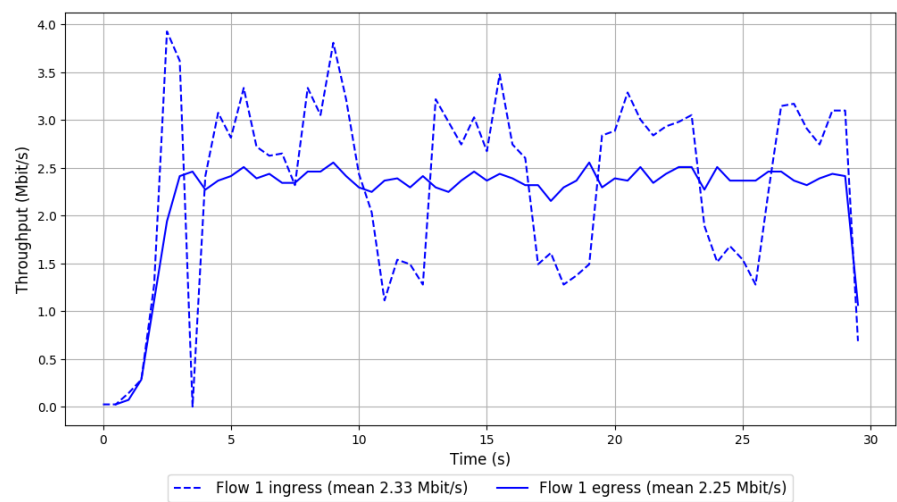
Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2017-12-05 07:14:18
End at: 2017-12-05 07:14:48
Local clock offset: 1.834 ms
Remote clock offset: -4.922 ms


# Below is generated by plot.py at 2017-12-05 07:57:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 1645.448 ms
Loss rate: 5.16%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 1645.448 ms
Loss rate: 5.16%
```

Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-12-05 07:30:42
End at: 2017-12-05 07:31:12
Local clock offset: 1.056 ms
Remote clock offset: 0.381 ms


# Below is generated by plot.py at 2017-12-05 07:57:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 2382.153 ms
Loss rate: 5.48%
-- Flow 1:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 2382.153 ms
Loss rate: 5.48%
```
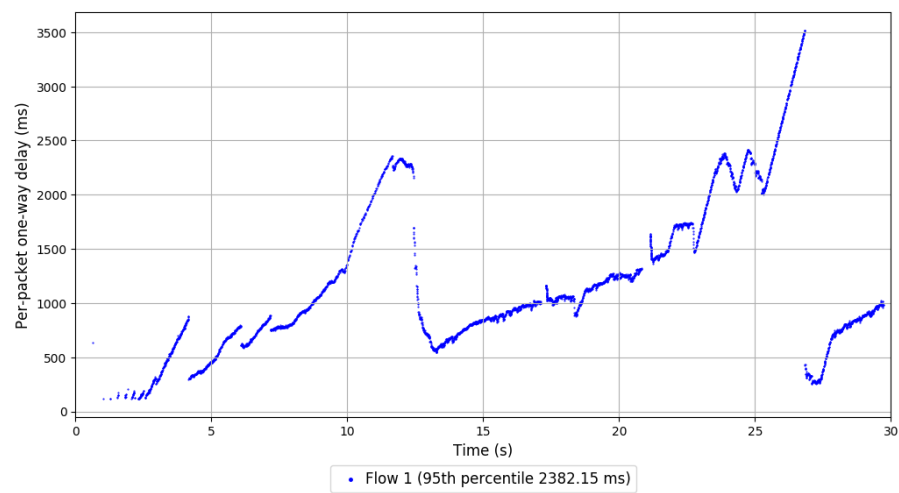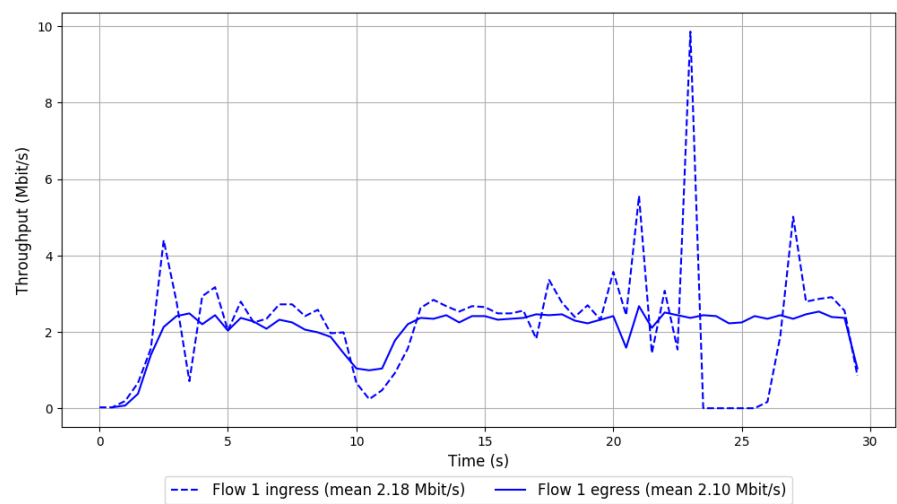
Run 2: Report of Verus — Data Link

Flow 1 ingress (mean 2.18 Mbit/s)   Flow 1 egress (mean 2.10 Mbit/s)

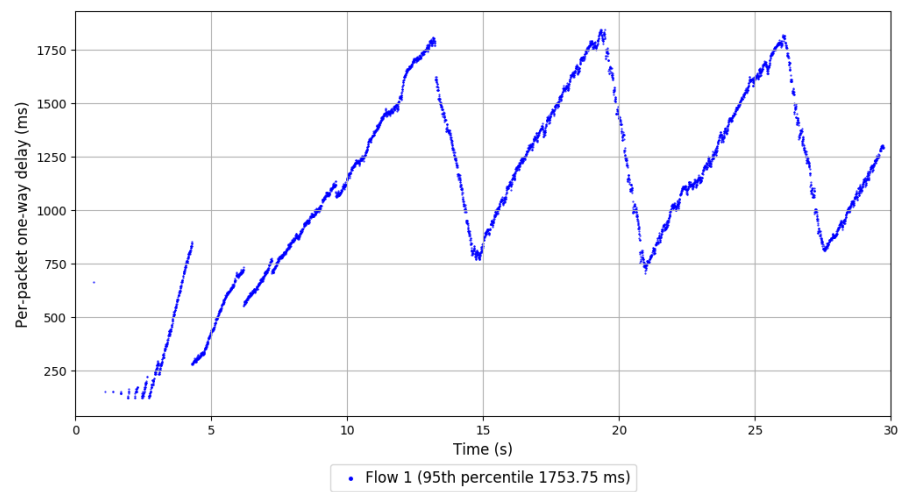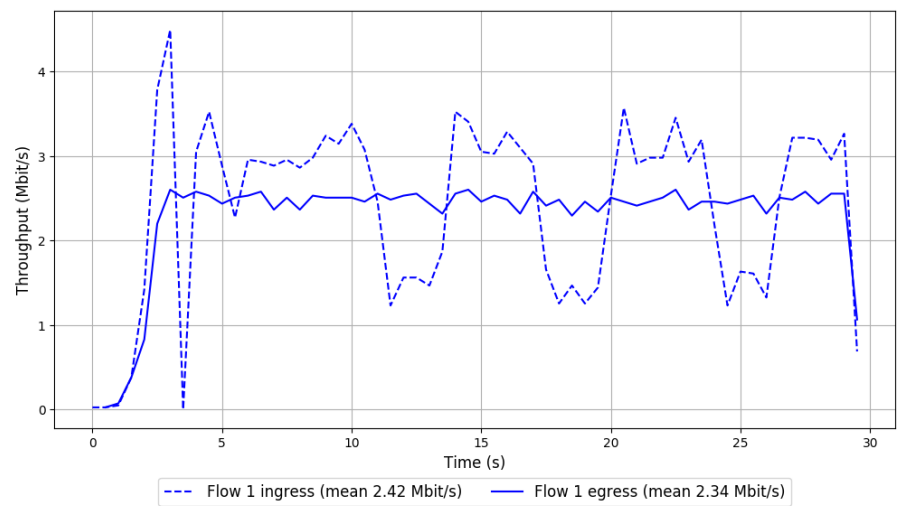Flow 1 (95th percentile 2382.15 ms)

```
Run 3: Statistics of Verus

Start at: 2017-12-05 07:47:06
End at: 2017-12-05 07:47:36
Local clock offset: 1.638 ms
Remote clock offset: -0.178 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 1753.753 ms
Loss rate: 5.10%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 1753.753 ms
Loss rate: 5.10%
```

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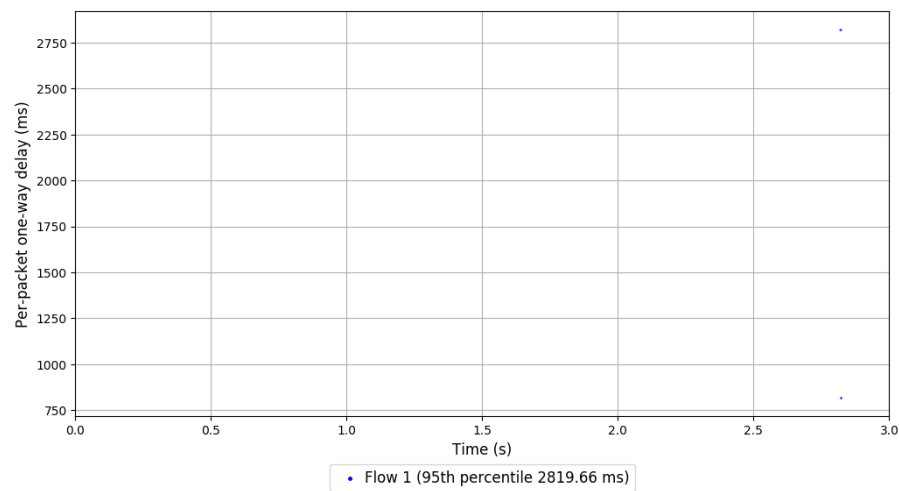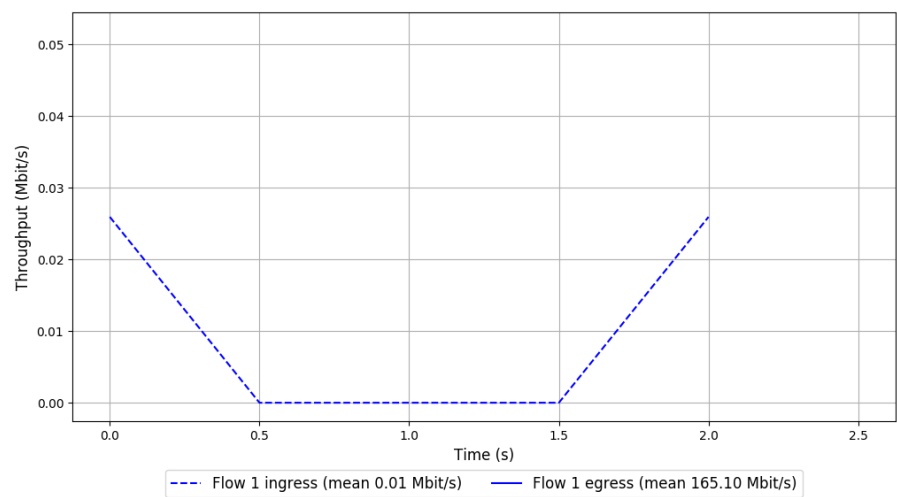
```
Run 1: Statistics of Copa

Start at: 2017-12-05 07:16:39
End at: 2017-12-05 07:17:09
Local clock offset: 1.918 ms
Remote clock offset: -5.58 ms
```

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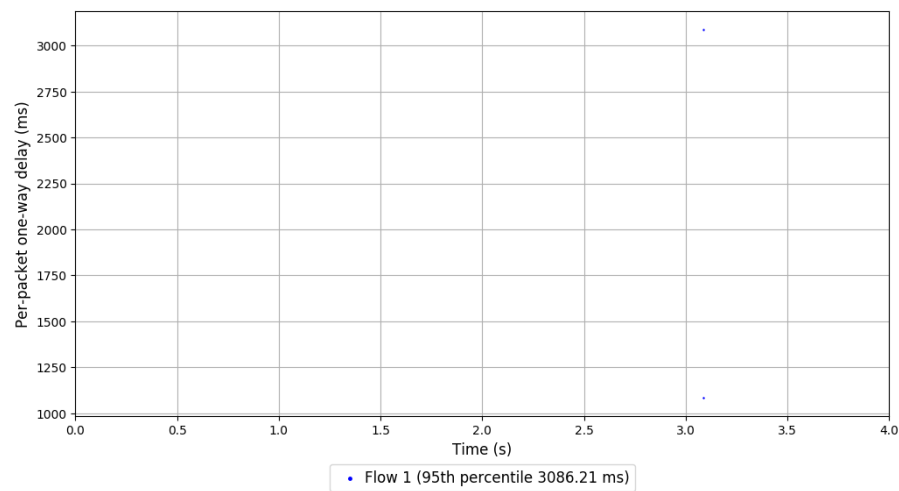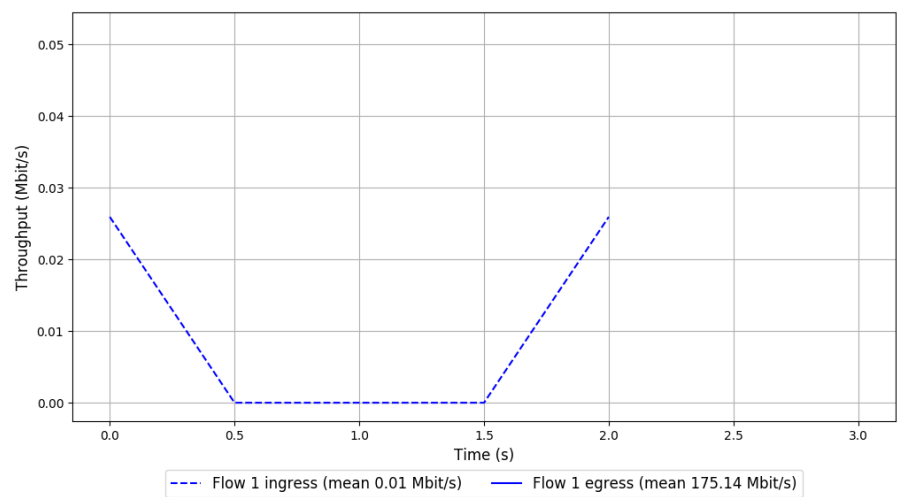
```
Run 2: Statistics of Copa

Start at: 2017-12-05 07:33:03
End at: 2017-12-05 07:33:33
Local clock offset: 1.142 ms
Remote clock offset: -3.934 ms
```

Run 2: Report of Copa — Data Link
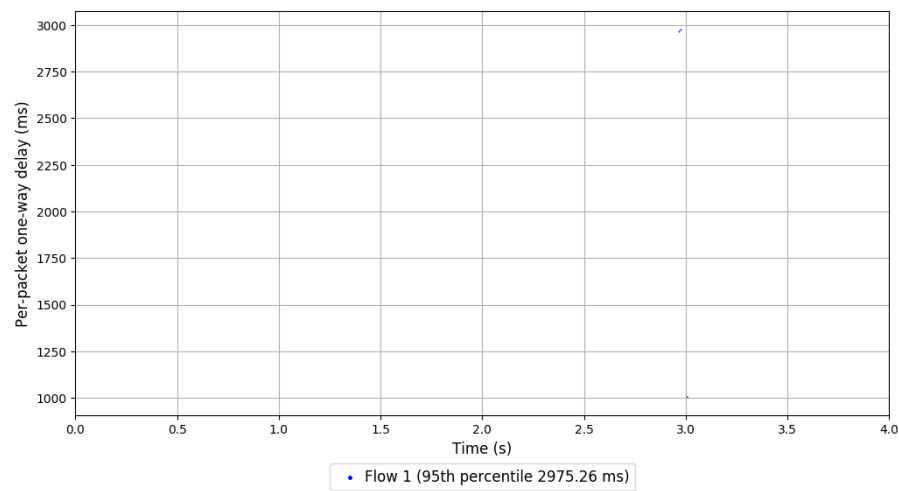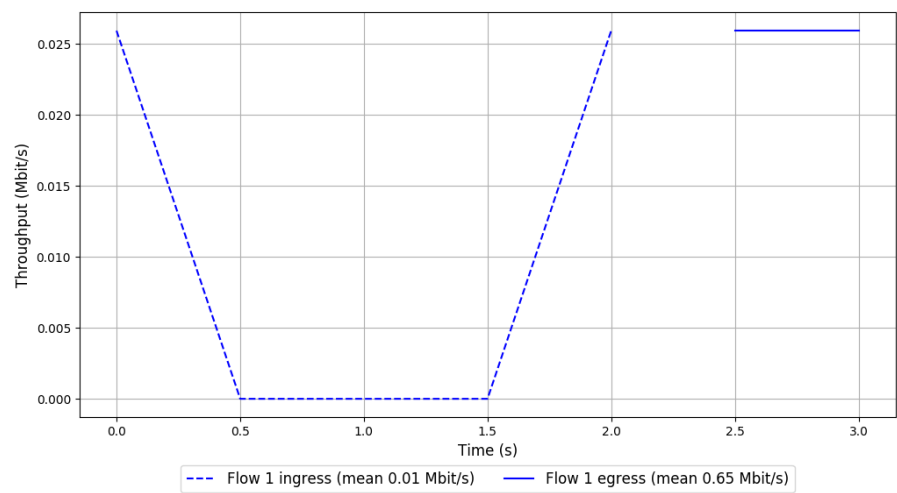
Run 3: Statistics of Copa

Start at: 2017-12-05 07:49:27
End at: 2017-12-05 07:49:57
Local clock offset: 1.727 ms
Remote clock offset: -4.883 ms

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 0.01 Mbit/s)   Flow 1 egress (mean 0.65 Mbit/s)
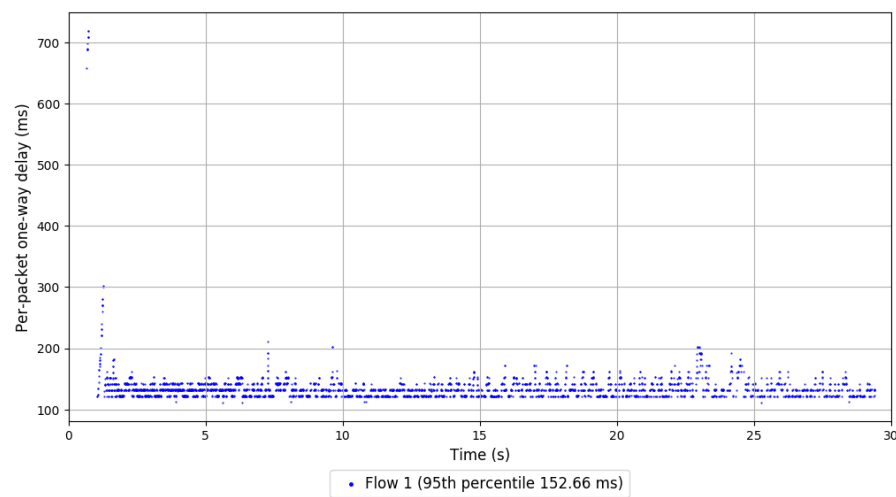

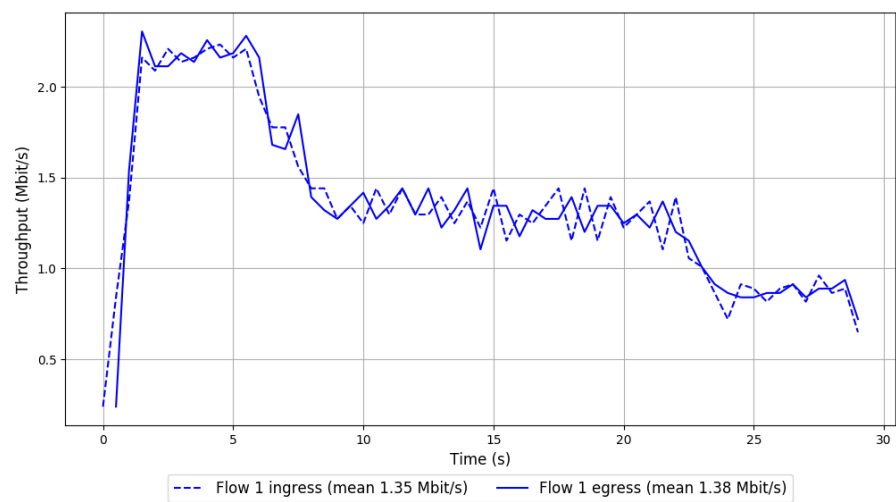• Flow 1 (95th percentile 2975.26 ms)

```
Run 1: Statistics of Indigo

Start at: 2017-12-05 07:09:37
End at: 2017-12-05 07:10:07
Local clock offset: 1.618 ms
Remote clock offset: 0.176 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 152.660 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 152.660 ms
Loss rate: 0.18%
```

Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-12-05 07:26:01
End at: 2017-12-05 07:26:31
Local clock offset: 1.325 ms
Remote clock offset: 0.373 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 213.466 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 213.466 ms
Loss rate: 0.31%
```
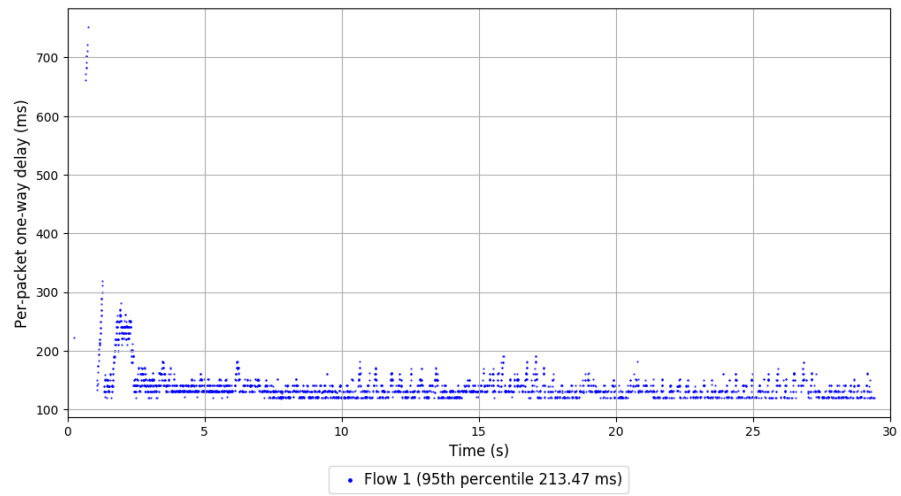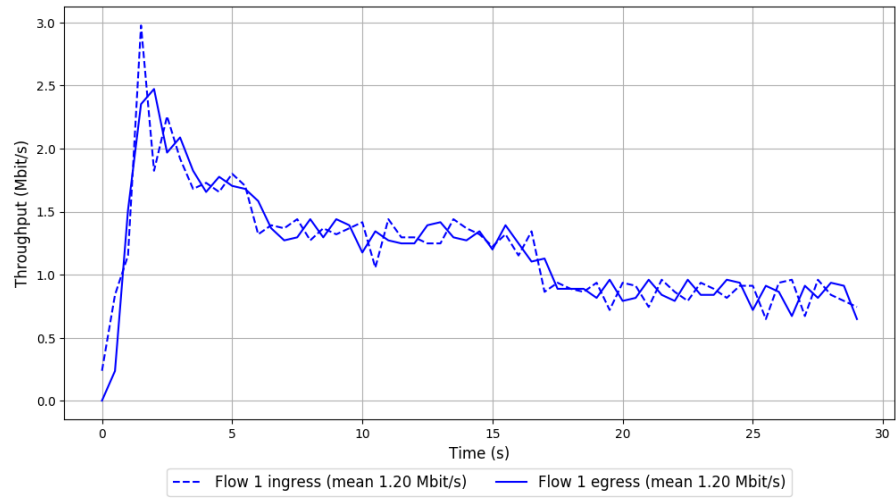
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2017-12-05 07:42:25
End at: 2017-12-05 07:42:55
Local clock offset: 1.435 ms
Remote clock offset: 0.657 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 178.650 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 178.650 ms
Loss rate: 0.00%
```
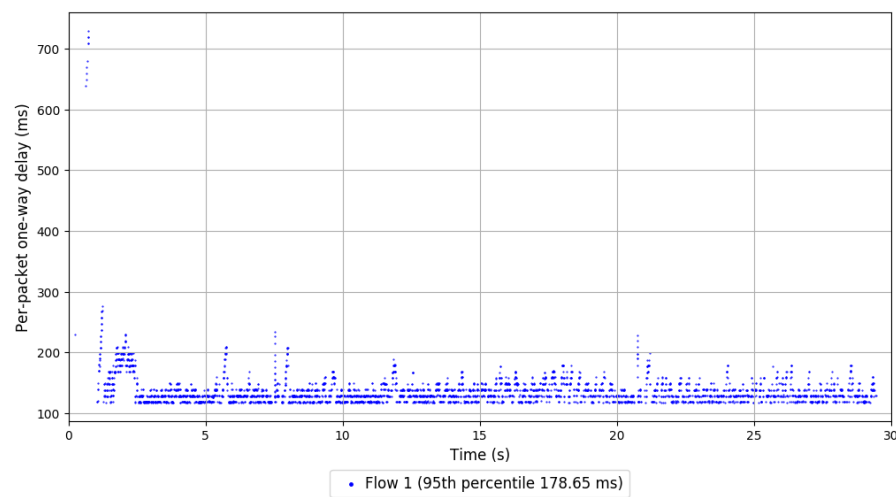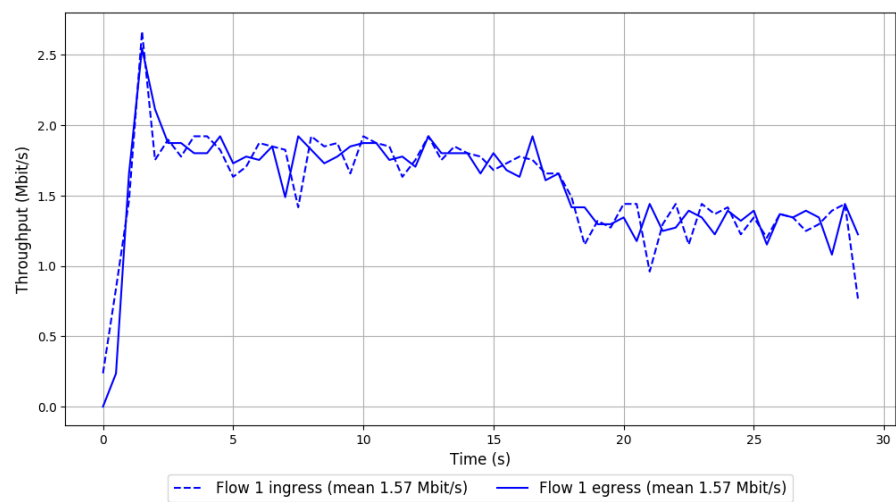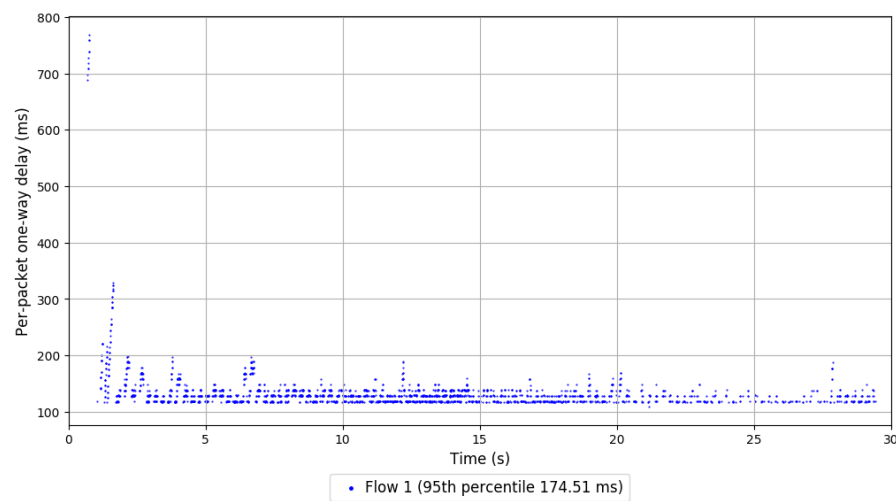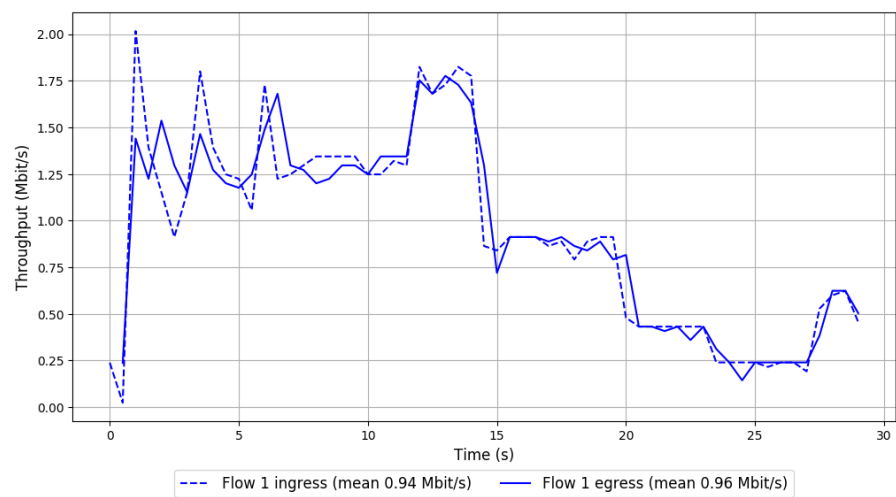
Run 3: Report of Indigo — Data Link

```
Run 1: Statistics of Indigo-calib

Start at: 2017-12-05 07:08:27
End at: 2017-12-05 07:08:57
Local clock offset: 1.563 ms
Remote clock offset: -0.789 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 174.509 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 174.509 ms
Loss rate: 0.22%
```

Run 1: Report of Indigo-calib — Data Link

```
Run 2: Statistics of Indigo-calib

Start at: 2017-12-05 07:24:51
End at: 2017-12-05 07:25:21
Local clock offset: 1.382 ms
Remote clock offset: 1.552 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 309.447 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 309.447 ms
Loss rate: 0.00%
```
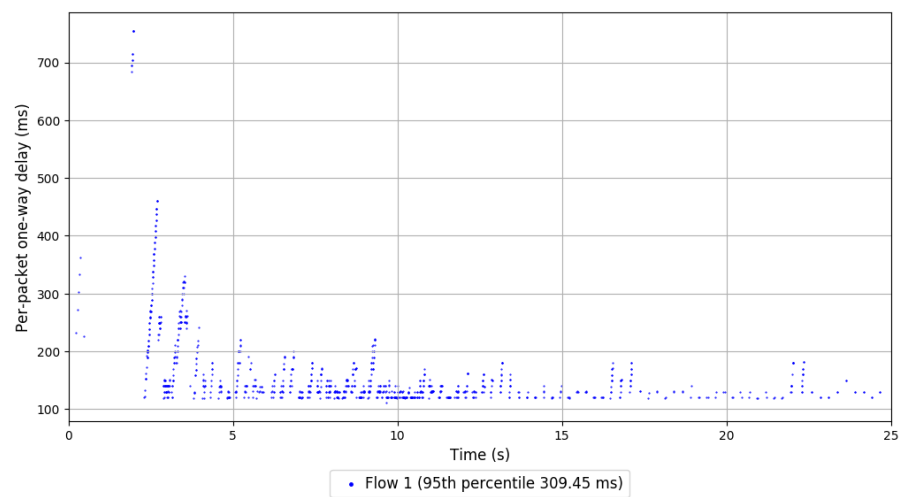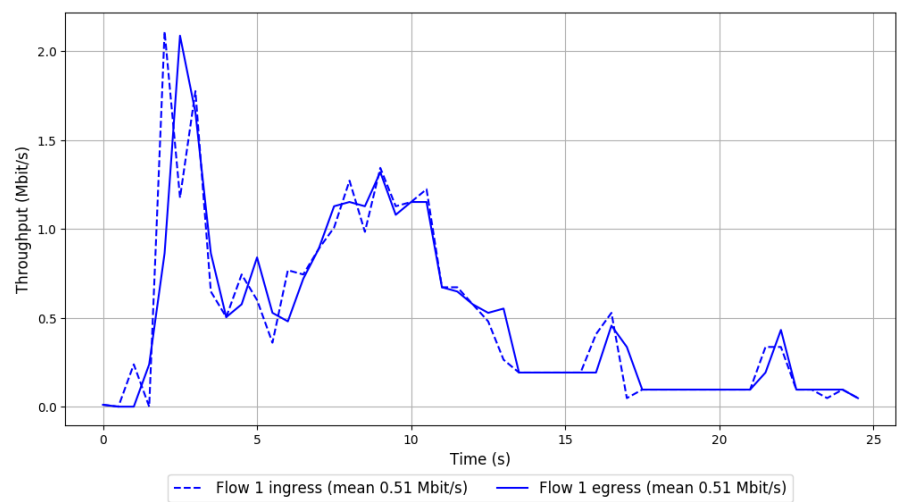
Run 2: Report of Indigo-calib — Data Link

```
Run 3: Statistics of Indigo-calib

Start at: 2017-12-05 07:41:15
End at: 2017-12-05 07:41:45
Local clock offset: 1.291 ms
Remote clock offset: -5.073 ms


# Below is generated by plot.py at 2017-12-05 07:57:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 1012.382 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 1012.382 ms
Loss rate: 0.20%
```

Run 3: Report of Indigo-calib — Data Link

Flow 1 ingress (mean 0.83 Mbit/s)   Flow 1 egress (mean 0.83 Mbit/s)

• Flow 1 (95th percentile 1012.38 ms)