Pantheon Report

Generated at 2018-04-16 23:02:54 (UTC).

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

Repeated the test of 16 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

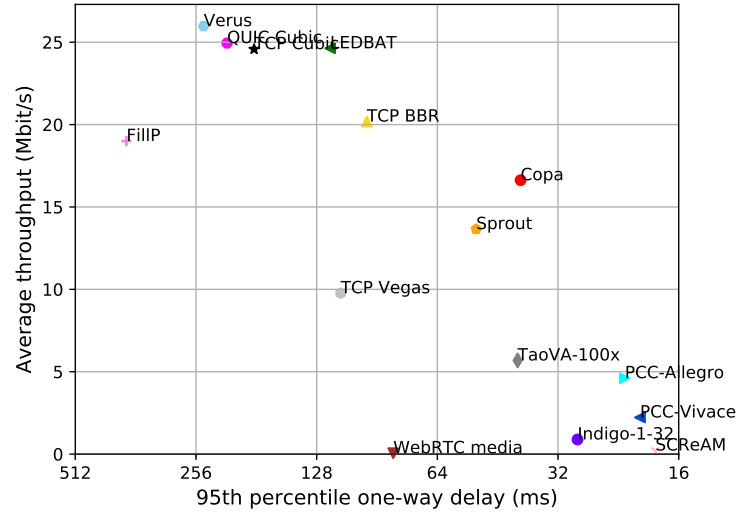Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

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.
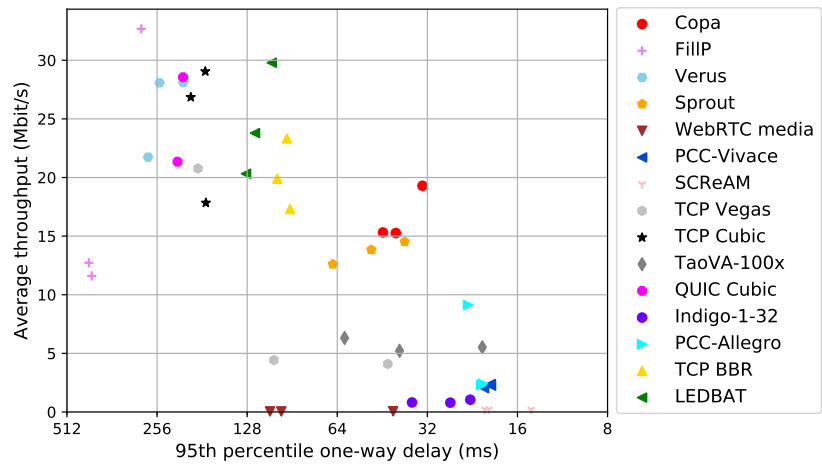
```
Git summary:
branch: master @ 4ed32c0e22b4dd733f97c1d3aaab2e5bb16f66b4
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
third_party/genericCC @ d223989828276fa83a807da6e0341dc0c7b89aec
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
 M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
 M receiver/src/buffer.h
 M receiver/src/core.cpp
 M sender/src/buffer.h
 M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ 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/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ f271183af822eee5d0031620f4bebf38aedc5581
```

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

2

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	20.18	95.94	0.03
TCP Cubic	3	24.58	183.35	0.23
LEDBAT	3	24.63	118.55	0.24
PCC-Allegro	3	4.61	21.80	0.01
QUIC Cubic	2	24.95	214.22	0.13
SCReAM	3	0.22	18.30	0.00
WebRTC media	3	0.05	82.47	0.00
Sprout	3	13.65	51.20	0.02
TaoVA-100x	3	5.68	40.36	0.00
TCP Vegas	3	9.76	111.52	0.00
Verus	3	25.97	244.94	2.99
Copa	3	16.62	39.69	0.00
FillP	3	19.00	381.66	27.66
Indigo-1-32	3	0.89	28.61	0.00
PCC-Vivace	3	2.22	19.99	0.01
PCC-Expr	0	N/A	N/A	N/A

```
Run 1: Statistics of TCP BBR

Start at: 2018-04-16 21:53:55
End at: 2018-04-16 21:54:25
Local clock offset: -1.242 ms
Remote clock offset: -4.119 ms


# Below is generated by plot.py at 2018-04-16 23:01:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.90 Mbit/s
95th percentile per-packet one-way delay: 101.526 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 19.90 Mbit/s
95th percentile per-packet one-way delay: 101.526 ms
Loss rate: 0.01%
```
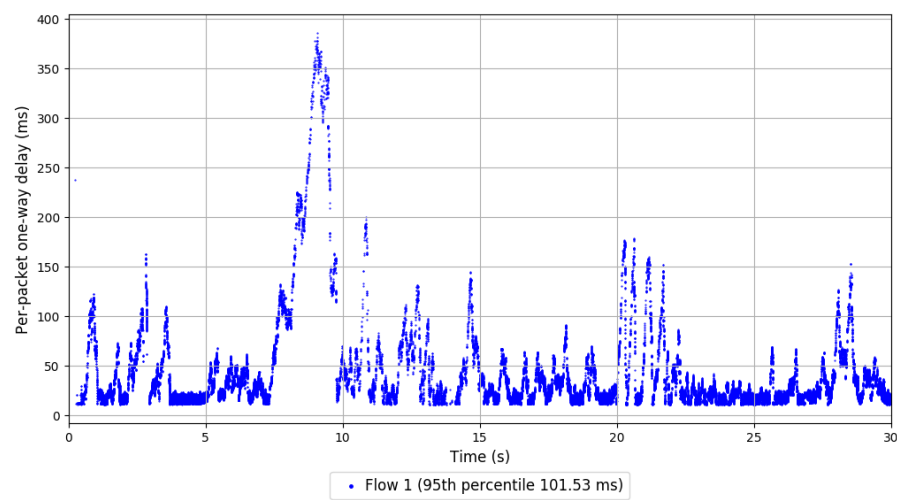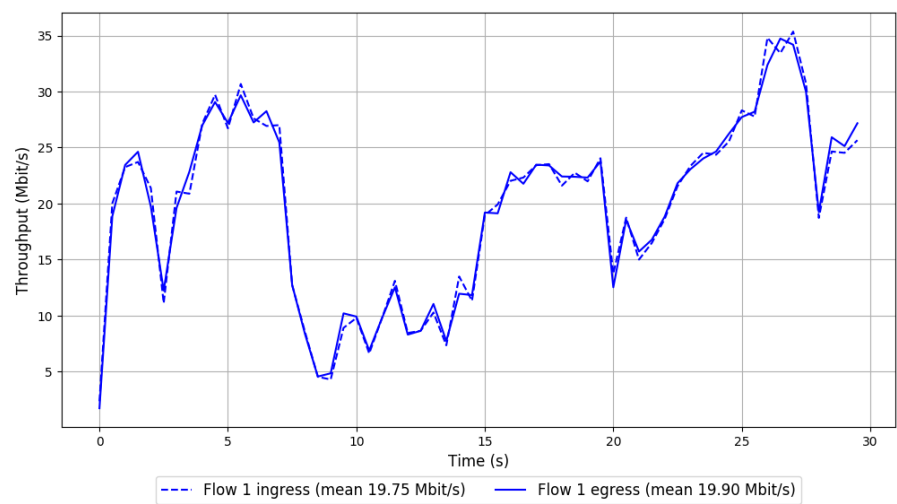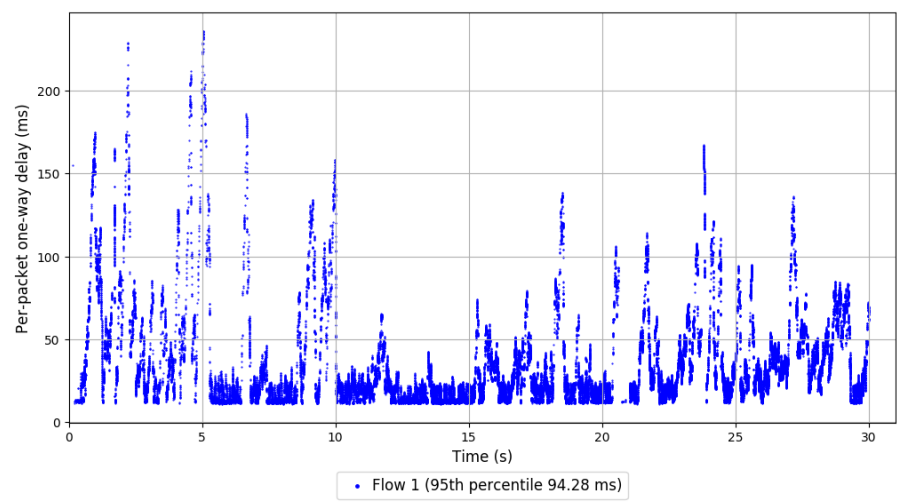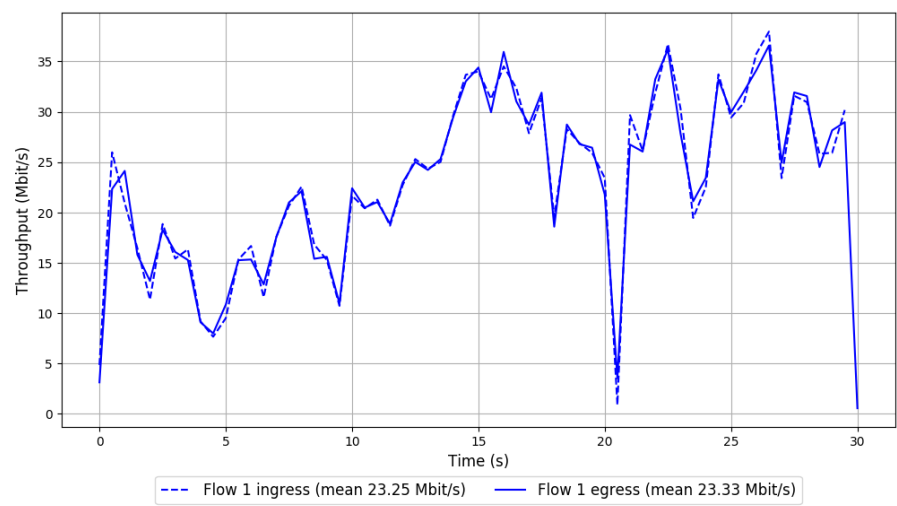
Run 1: Report of TCP BBR — Data Link

```
Run 2: Statistics of TCP BBR

Start at: 2018-04-16 22:16:13
End at: 2018-04-16 22:16:43
Local clock offset: 0.803 ms
Remote clock offset: -4.919 ms


# Below is generated by plot.py at 2018-04-16 23:01:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.33 Mbit/s
95th percentile per-packet one-way delay: 94.277 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 23.33 Mbit/s
95th percentile per-packet one-way delay: 94.277 ms
Loss rate: 0.09%
```
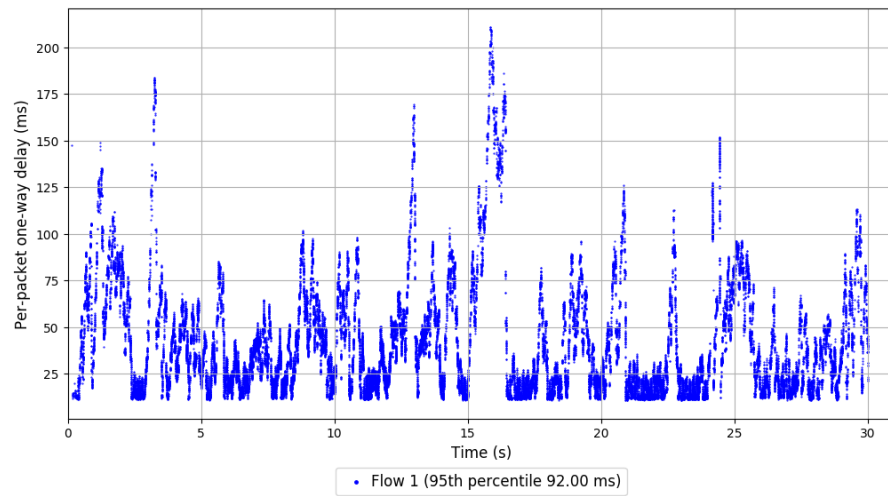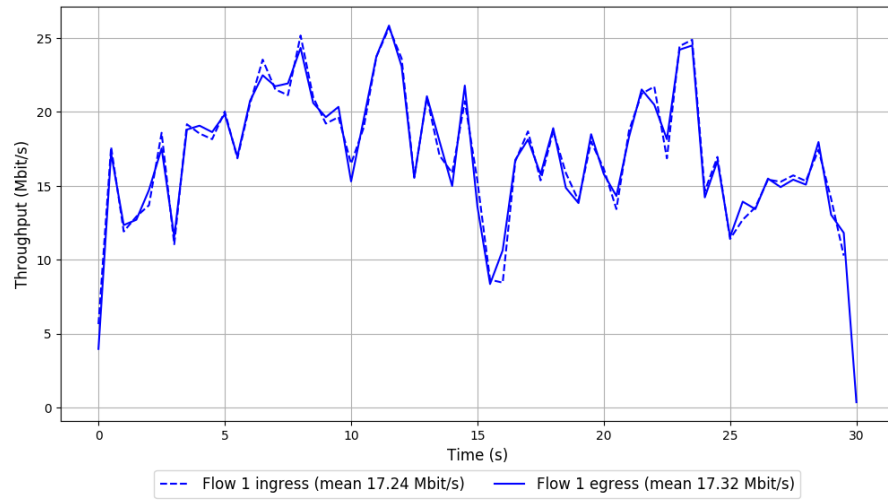
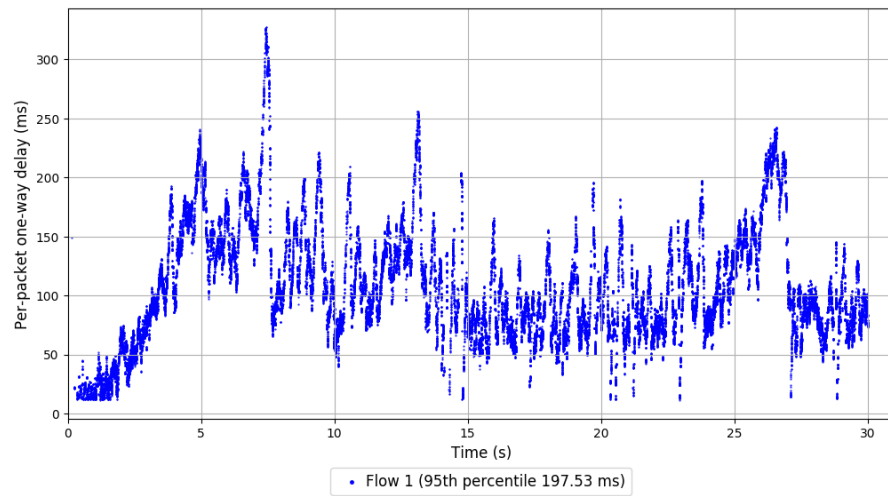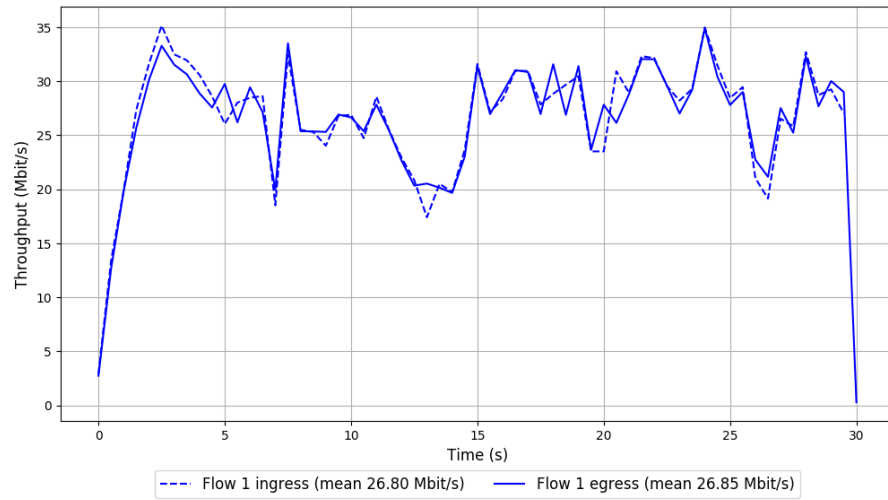Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-04-16 22:38:33
End at: 2018-04-16 22:39:03
Local clock offset: 1.215 ms
Remote clock offset: -5.046 ms


# Below is generated by plot.py at 2018-04-16 23:01:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.32 Mbit/s
95th percentile per-packet one-way delay: 92.002 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 17.32 Mbit/s
95th percentile per-packet one-way delay: 92.002 ms
Loss rate: 0.00%
```

Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 17.24 Mbit/s) --- Flow 1 egress (mean 17.32 Mbit/s)

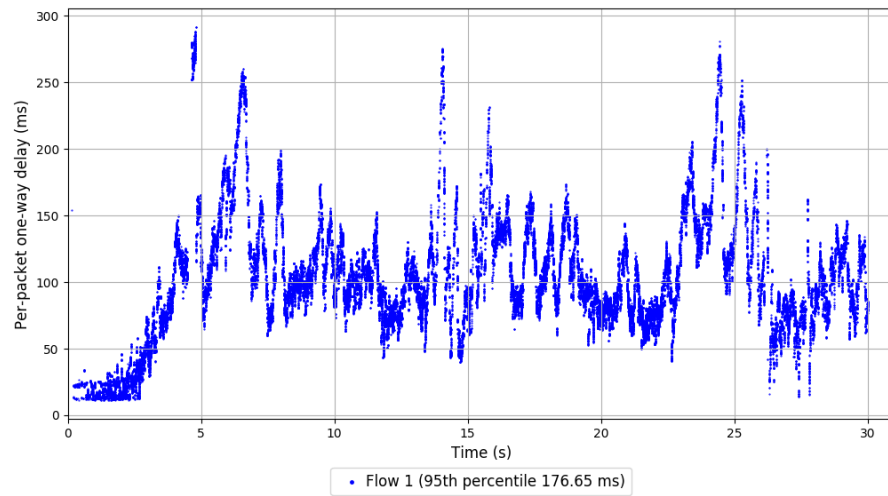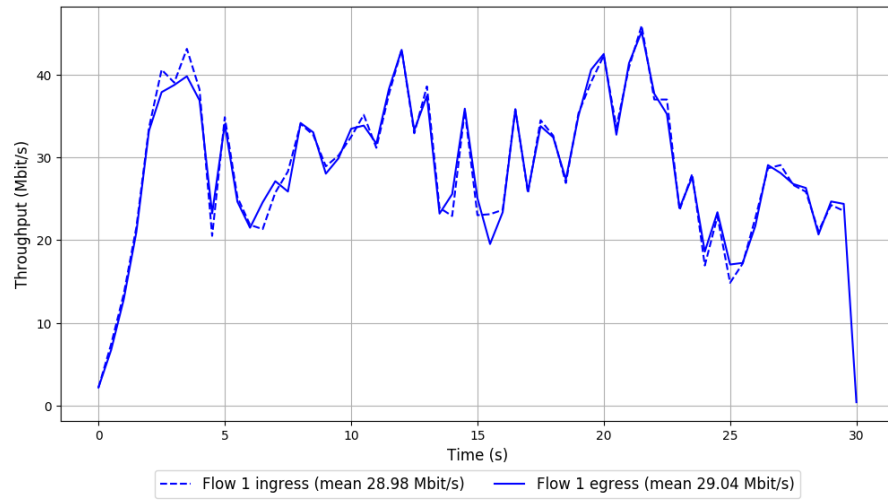Flow 1 (95th percentile 92.00 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2018-04-16 22:01:46
End at: 2018-04-16 22:02:16
Local clock offset: -0.887 ms
Remote clock offset: -3.981 ms

# Below is generated by plot.py at 2018-04-16 23:01:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 26.85 Mbit/s
95th percentile per-packet one-way delay: 197.529 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 26.85 Mbit/s
95th percentile per-packet one-way delay: 197.529 ms
Loss rate: 0.21%
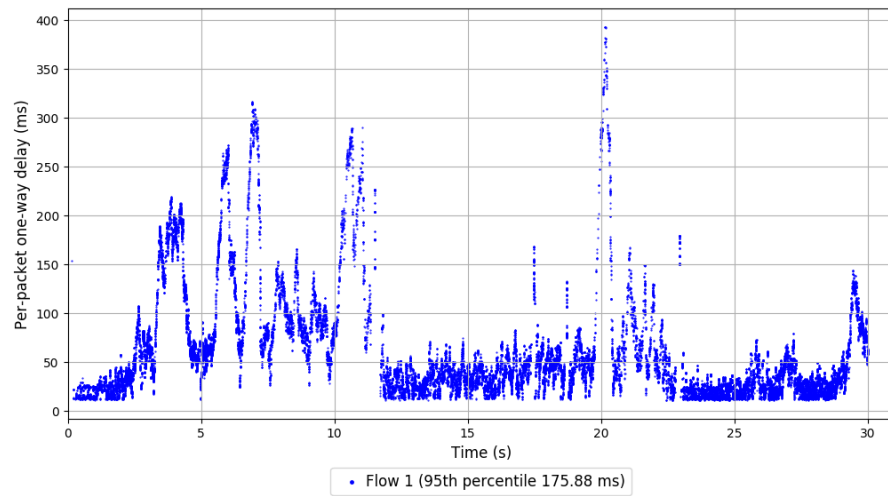```

Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-04-16 22:24:06
End at: 2018-04-16 22:24:36
Local clock offset: 1.269 ms
Remote clock offset: -5.227 ms

Below is generated by plot.py at 2018-04-16 23:01:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 29.04 Mbit/s
95th percentile per-packet one-way delay: 176.645 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 29.04 Mbit/s
95th percentile per-packet one-way delay: 176.645 ms
Loss rate: 0.21%
```
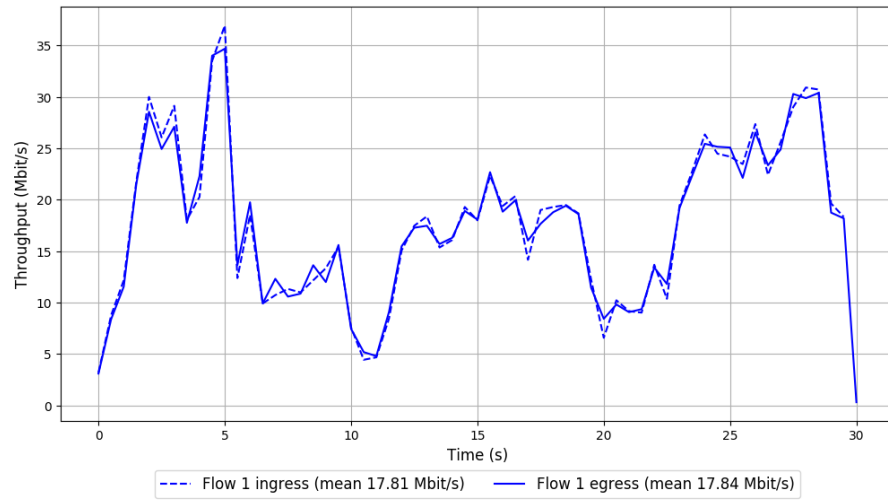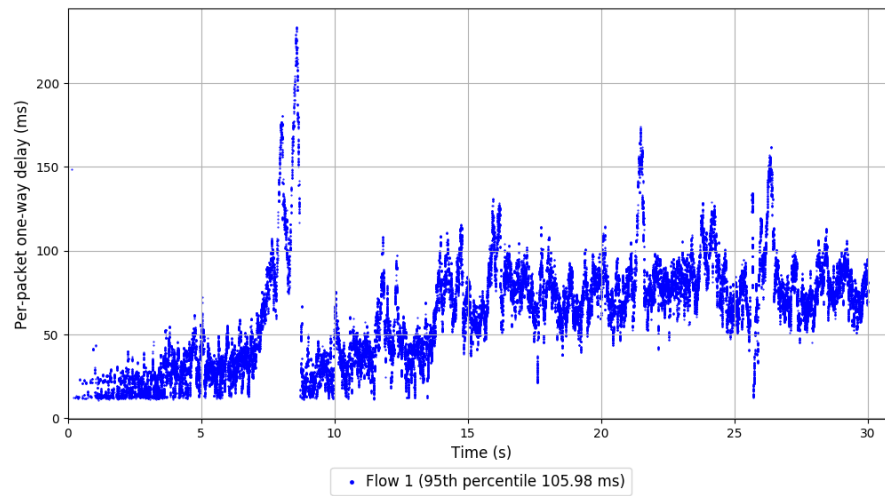
Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2018-04-16 22:46:27
End at: 2018-04-16 22:46:57
Local clock offset: 0.93 ms
Remote clock offset: -5.336 ms


# Below is generated by plot.py at 2018-04-16 23:01:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 17.84 Mbit/s
95th percentile per-packet one-way delay: 175.879 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 17.84 Mbit/s
95th percentile per-packet one-way delay: 175.879 ms
Loss rate: 0.28%
```

Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 17.81 Mbit/s) ----- Flow 1 egress (mean 17.84 Mbit/s)
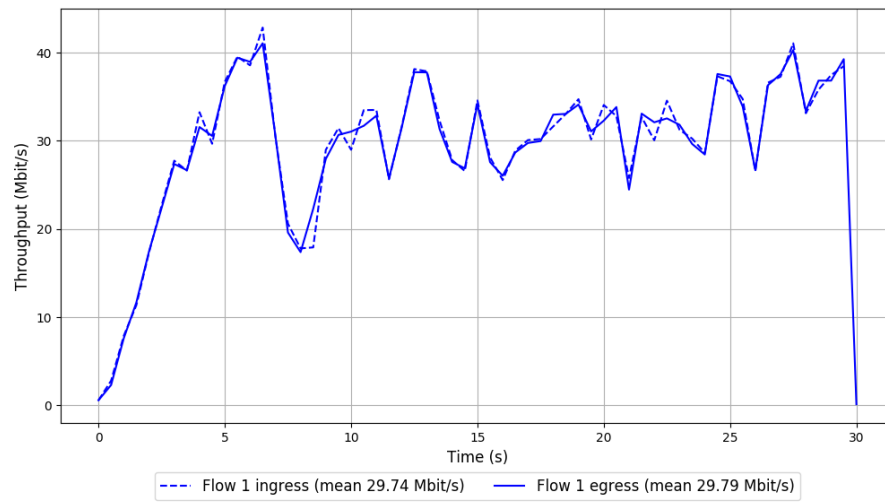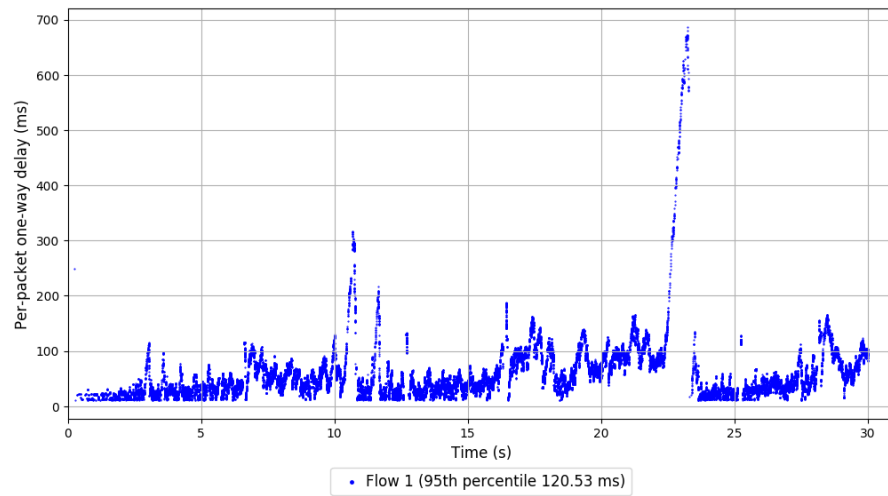

Flow 1 (95th percentile 175.88 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2018-04-16 22:10:56
End at: 2018-04-16 22:11:26
Local clock offset: 0.31 ms
Remote clock offset: -4.256 ms


# Below is generated by plot.py at 2018-04-16 23:01:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 29.79 Mbit/s
95th percentile per-packet one-way delay: 105.984 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 29.79 Mbit/s
95th percentile per-packet one-way delay: 105.984 ms
Loss rate: 0.27%
```

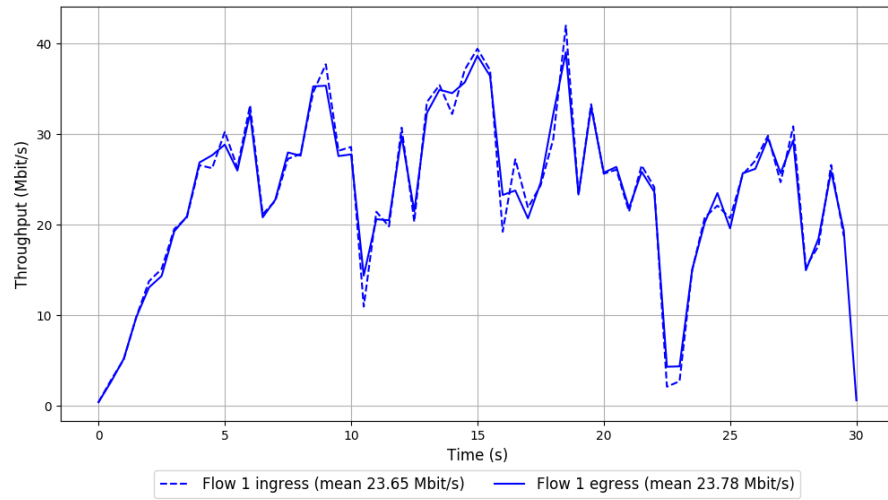Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2018-04-16 22:33:17
End at: 2018-04-16 22:33:47
Local clock offset: 1.696 ms
Remote clock offset: -5.208 ms


# Below is generated by plot.py at 2018-04-16 23:01:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 23.78 Mbit/s
95th percentile per-packet one-way delay: 120.532 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 23.78 Mbit/s
95th percentile per-packet one-way delay: 120.532 ms
Loss rate: 0.16%
```

Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 23.65 Mbit/s) ----   Flow 1 egress (mean 23.78 Mbit/s) ——
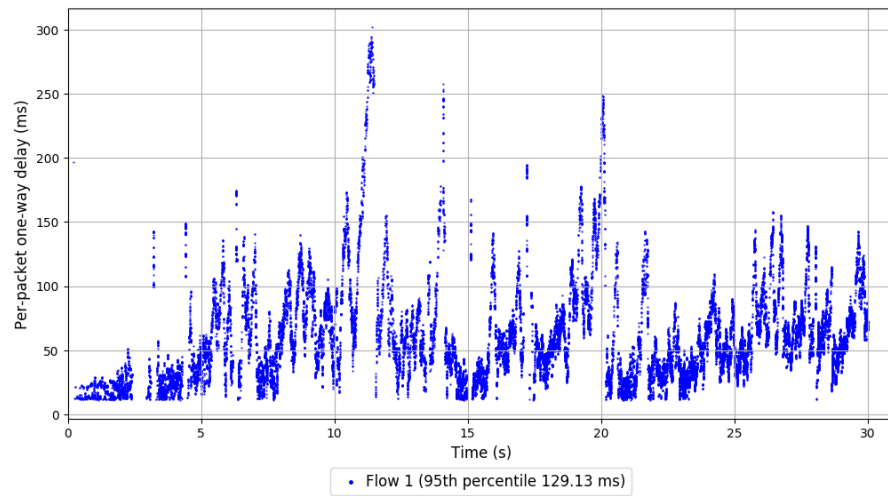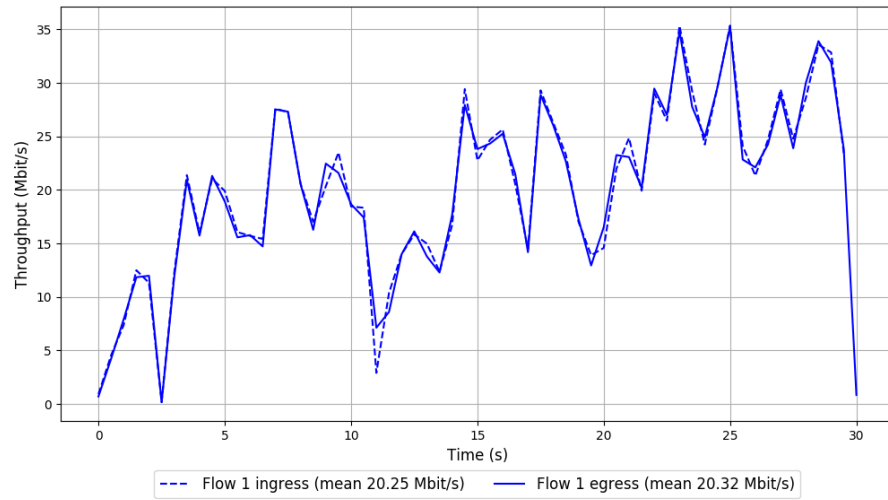

• Flow 1 (95th percentile 120.53 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2018-04-16 22:55:36
End at: 2018-04-16 22:56:06
Local clock offset: 0.95 ms
Remote clock offset: -5.538 ms

# Below is generated by plot.py at 2018-04-16 23:01:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 20.32 Mbit/s
95th percentile per-packet one-way delay: 129.129 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 20.32 Mbit/s
95th percentile per-packet one-way delay: 129.129 ms
Loss rate: 0.28%
```
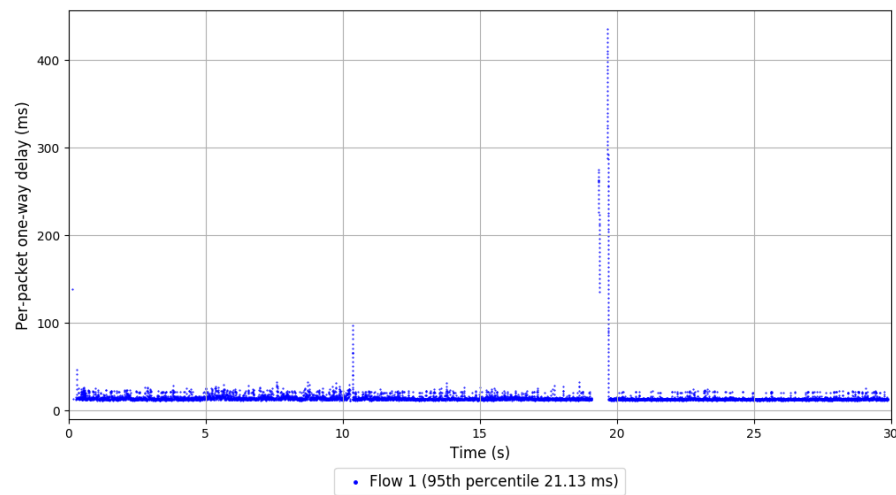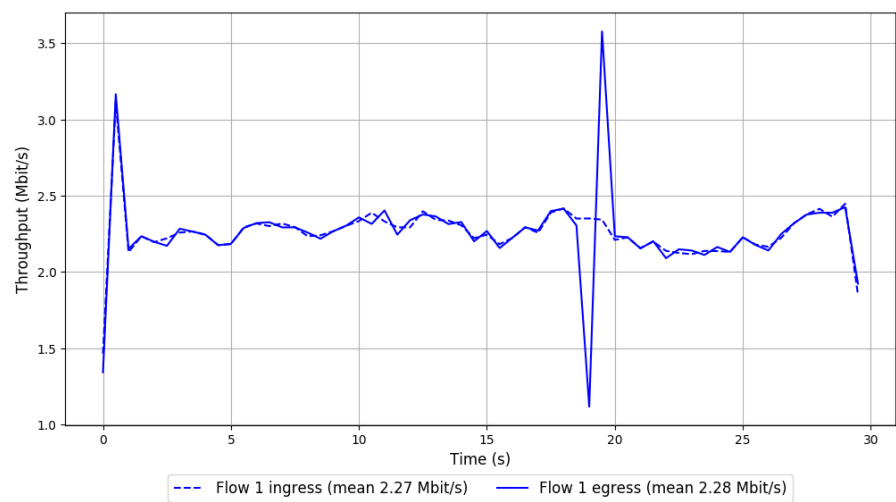
Run 3: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC-Allegro

Start at: 2018-04-16 22:00:28
End at: 2018-04-16 22:00:58
Local clock offset: -1.124 ms
Remote clock offset: -4.086 ms


# Below is generated by plot.py at 2018-04-16 23:01:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 21.128 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 21.128 ms
Loss rate: 0.02%
```
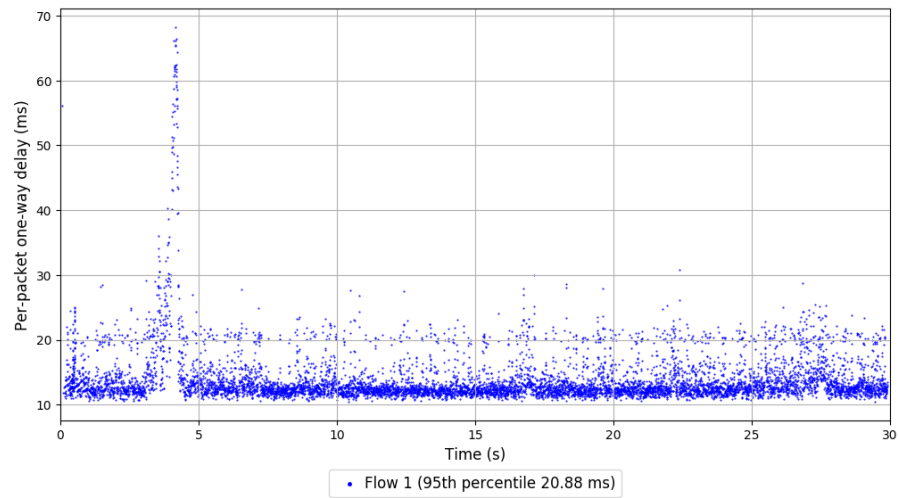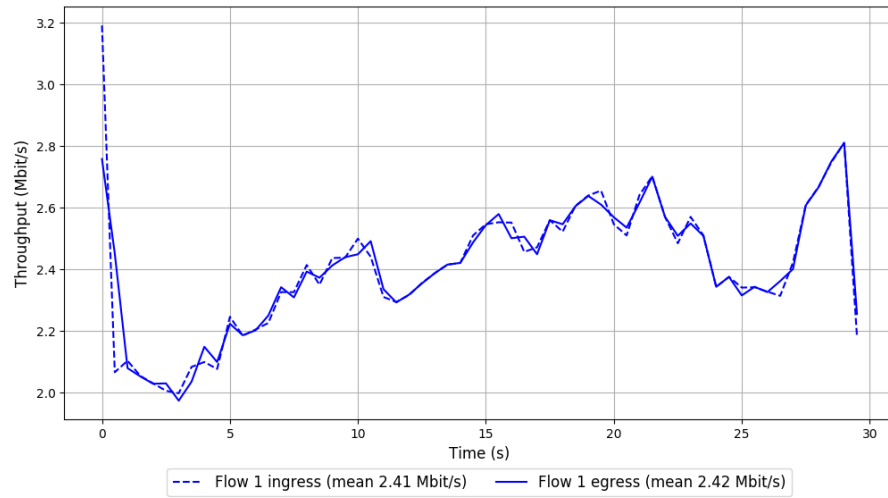
Run 1: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 2.27 Mbit/s)   Flow 1 egress (mean 2.28 Mbit/s)

Flow 1 (95th percentile 21.13 ms)

```
Run 2: Statistics of PCC-Allegro

Start at: 2018-04-16 22:22:48
End at: 2018-04-16 22:23:18
Local clock offset: 1.189 ms
Remote clock offset: -5.256 ms


# Below is generated by plot.py at 2018-04-16 23:01:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.42 Mbit/s
95th percentile per-packet one-way delay: 20.884 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.42 Mbit/s
95th percentile per-packet one-way delay: 20.884 ms
Loss rate: 0.00%
```
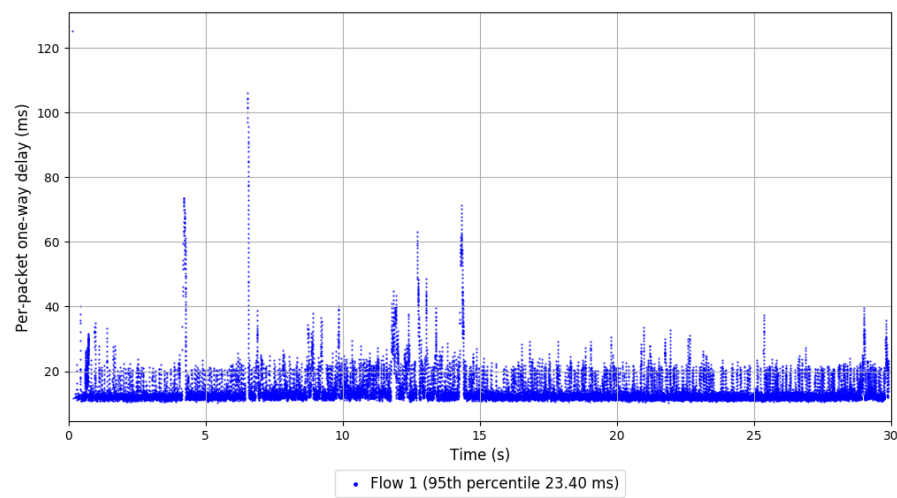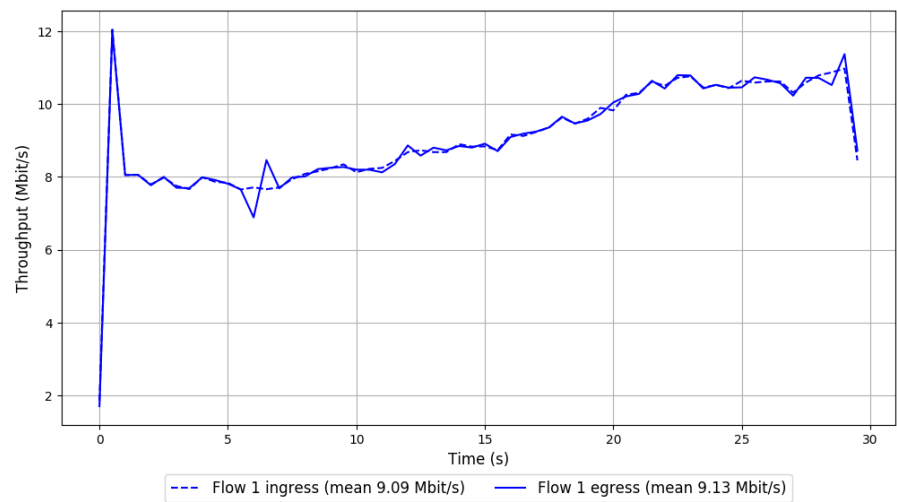
Run 2: Report of PCC-Allegro — Data Link

Flow 1 ingress (mean 2.41 Mbit/s)   Flow 1 egress (mean 2.42 Mbit/s)

• Flow 1 (95th percentile 20.88 ms)

```
Run 3: Statistics of PCC-Allegro

Start at: 2018-04-16 22:45:08
End at: 2018-04-16 22:45:38
Local clock offset: 1.034 ms
Remote clock offset: -5.209 ms


# Below is generated by plot.py at 2018-04-16 23:01:59
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.13 Mbit/s
95th percentile per-packet one-way delay: 23.399 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 9.13 Mbit/s
95th percentile per-packet one-way delay: 23.399 ms
Loss rate: 0.00%
```

Run 3: Report of PCC-Allegro — Data Link
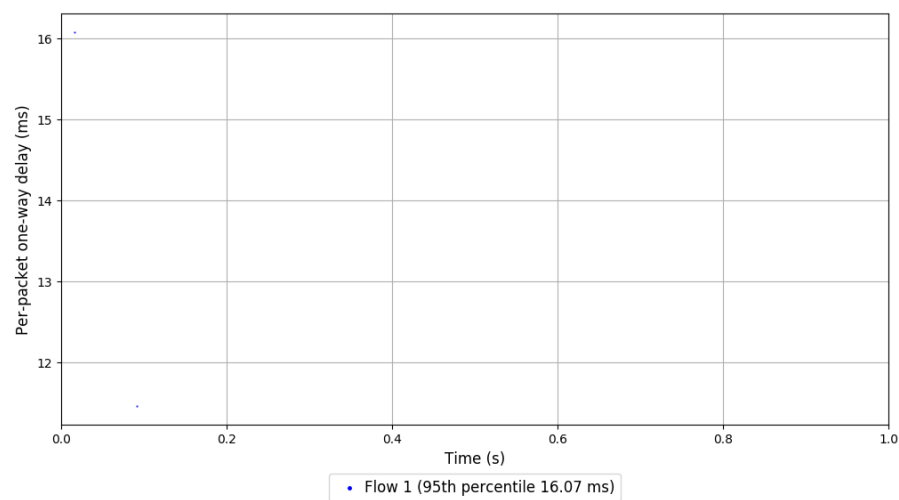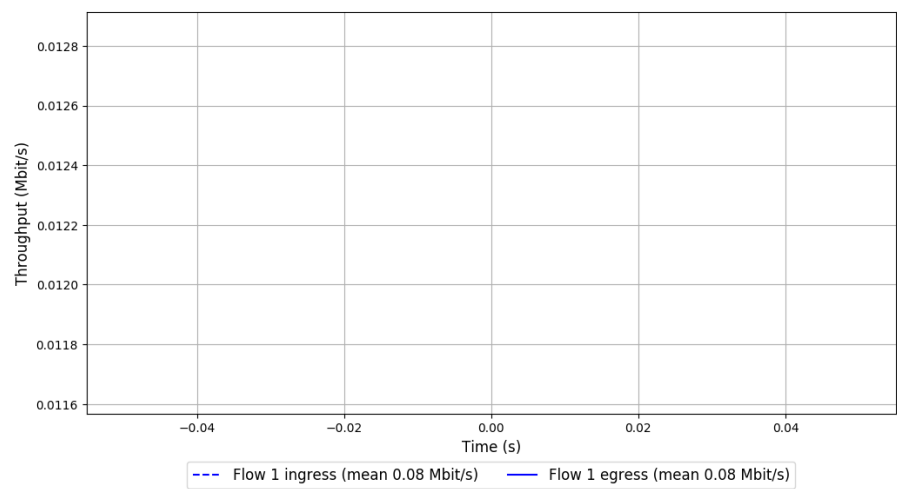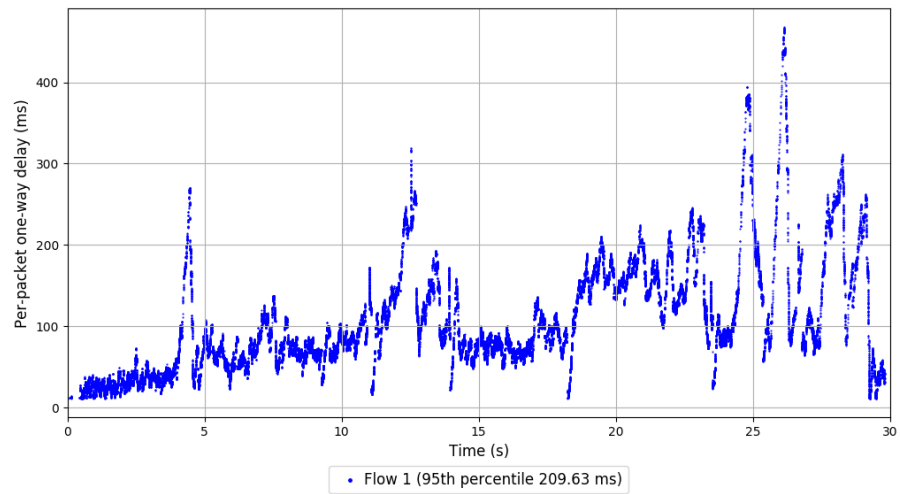
```
Run 1: Statistics of QUIC Cubic

Start at: 2018-04-16 21:56:33
End at: 2018-04-16 21:57:03
Local clock offset: -1.238 ms
Remote clock offset: -4.143 ms
```

Run 1: Report of QUIC Cubic — Data Link

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

Flow 1 (95th percentile 16.07 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-04-16 22:18:50
End at: 2018-04-16 22:19:20
Local clock offset: 1.001 ms
Remote clock offset: -5.047 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 28.55 Mbit/s
95th percentile per-packet one-way delay: 209.632 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 28.55 Mbit/s
95th percentile per-packet one-way delay: 209.632 ms
Loss rate: 0.16%
```
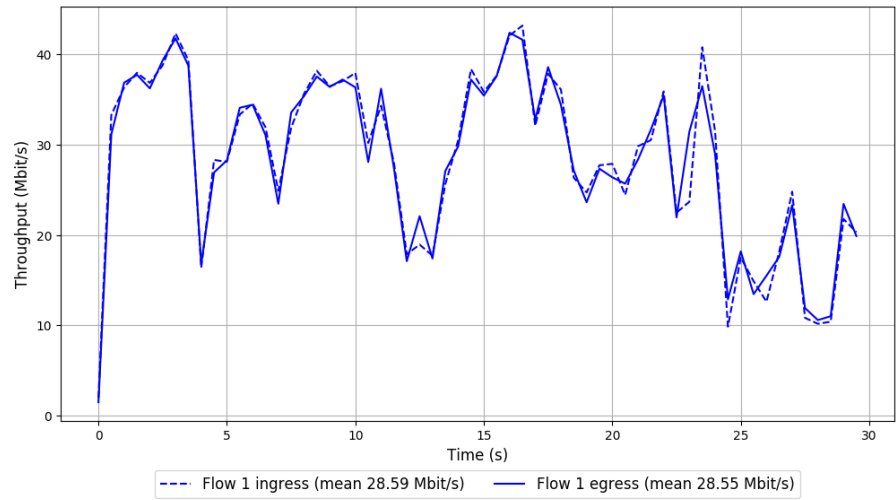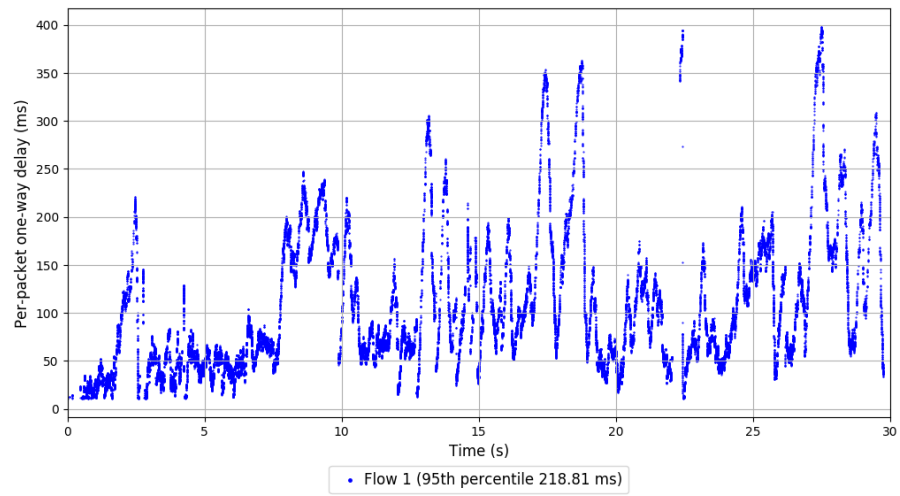
Run 2: Report of QUIC Cubic — Data Link

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-04-16 22:41:12
End at: 2018-04-16 22:41:42
Local clock offset: 1.134 ms
Remote clock offset: -5.035 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 21.35 Mbit/s
95th percentile per-packet one-way delay: 218.809 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 21.35 Mbit/s
95th percentile per-packet one-way delay: 218.809 ms
Loss rate: 0.10%
```
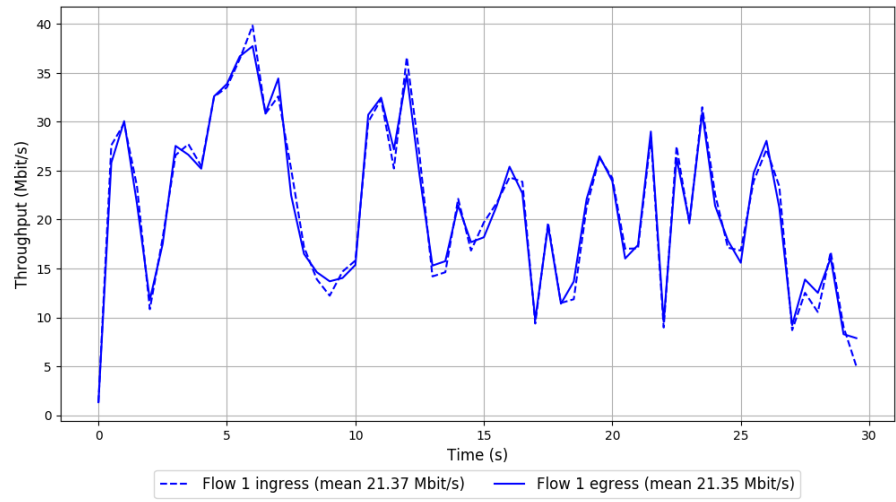
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 21.37 Mbit/s) --- Flow 1 egress (mean 21.35 Mbit/s)
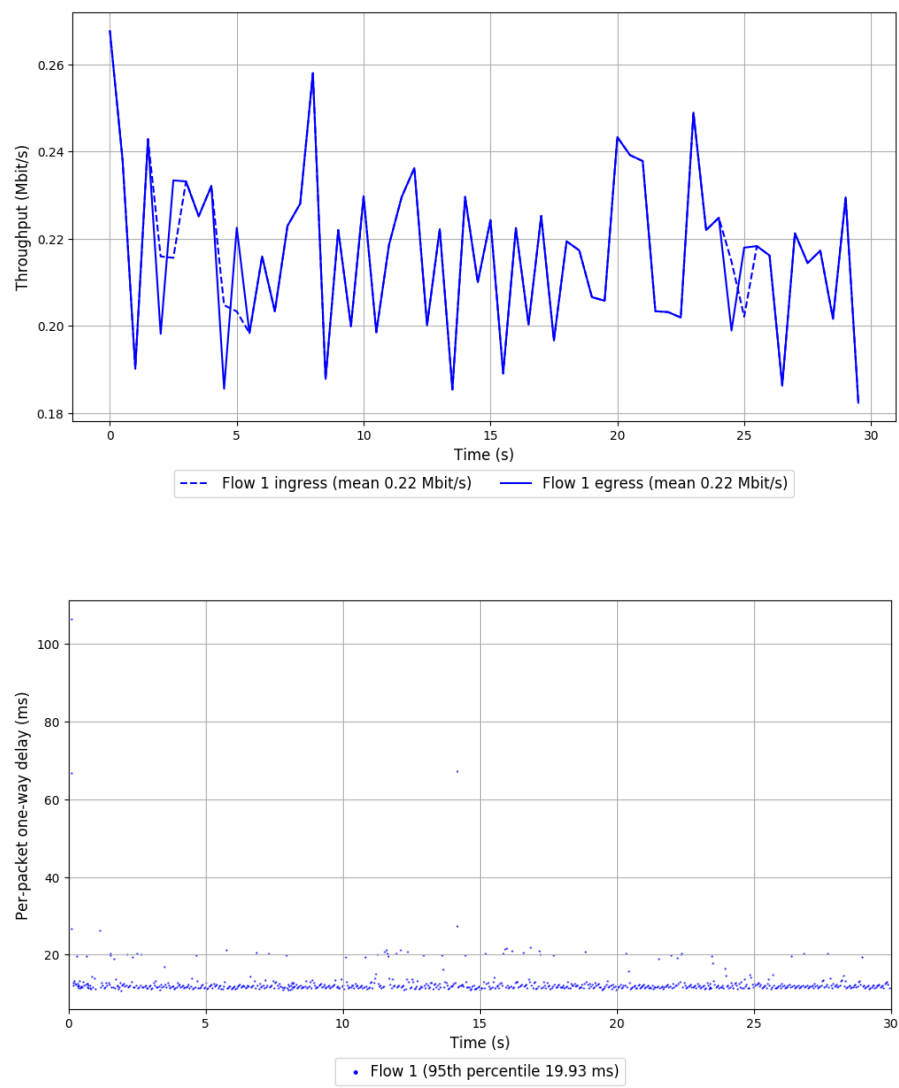

Flow 1 (95th percentile 218.81 ms)

```
Run 1: Statistics of SCReAM

Start at: 2018-04-16 21:59:10
End at: 2018-04-16 21:59:40
Local clock offset: -1.228 ms
Remote clock offset: -4.117 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 19.927 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 19.927 ms
Loss rate: 0.00%
```

Run 1: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.22 Mbit/s) --- Flow 1 egress (mean 0.22 Mbit/s)

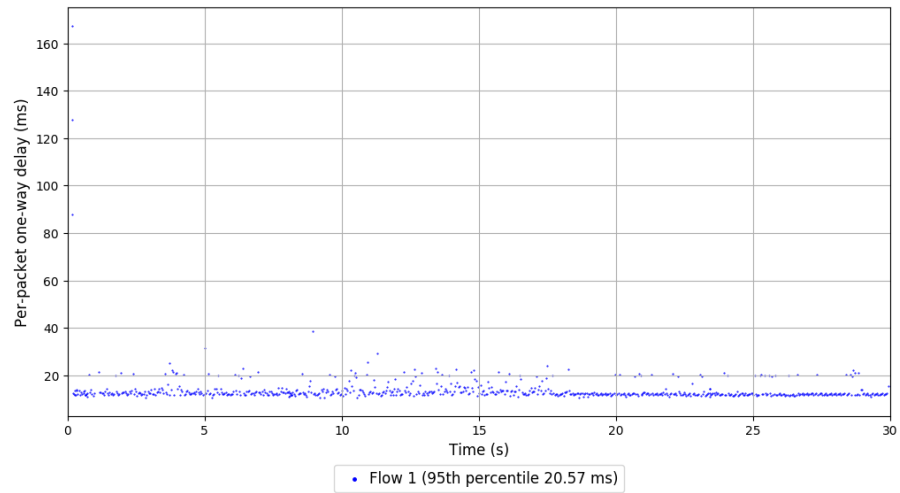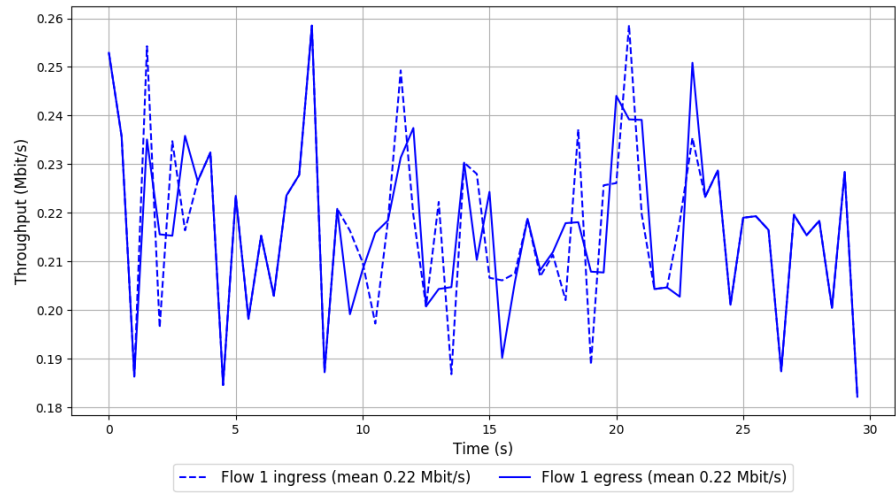Flow 1 (95th percentile 19.93 ms)

```
Run 2: Statistics of SCReAM

Start at: 2018-04-16 22:21:29
End at: 2018-04-16 22:21:59
Local clock offset: 1.144 ms
Remote clock offset: -5.209 ms

# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 20.572 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 20.572 ms
Loss rate: 0.00%
```

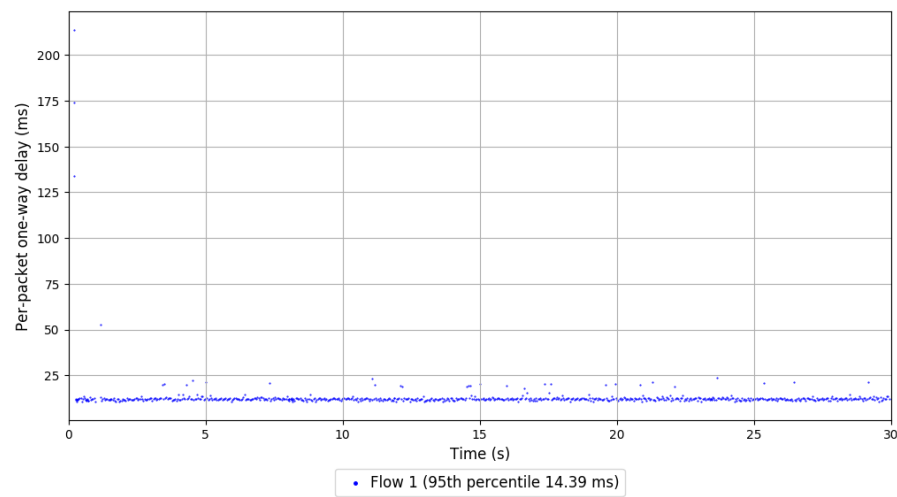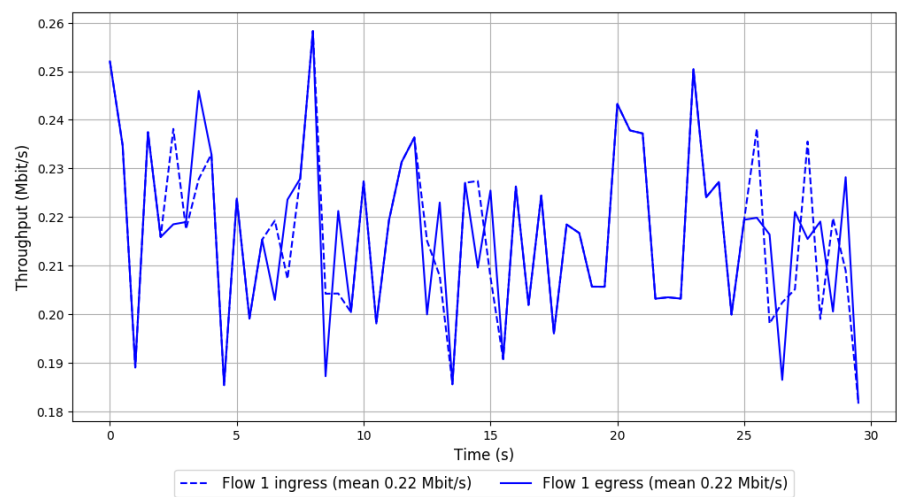# Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-04-16 22:43:49
End at: 2018-04-16 22:44:19
Local clock offset: 1.055 ms
Remote clock offset: -5.122 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.387 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 14.387 ms
Loss rate: 0.00%
```

Run 3: Report of SCReAM — Data Link

Flow 1 ingress (mean 0.22 Mbit/s) — — —   Flow 1 egress (mean 0.22 Mbit/s) ———

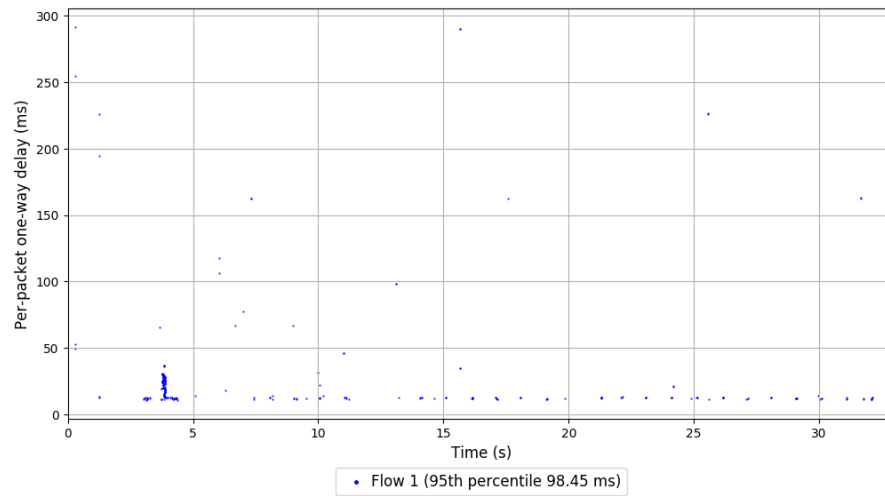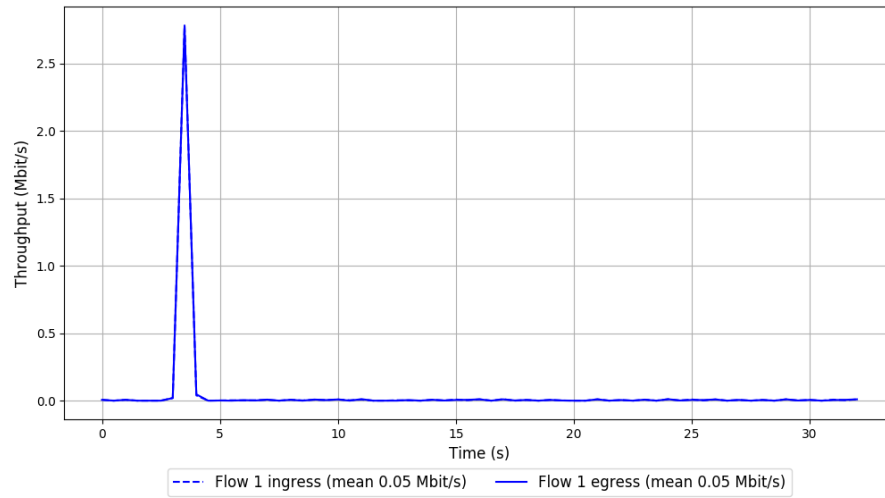Flow 1 (95th percentile 14.39 ms)

```
Run 1: Statistics of WebRTC media

Start at: 2018-04-16 22:09:38
End at: 2018-04-16 22:10:08
Local clock offset: 0.303 ms
Remote clock offset: -3.926 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 98.447 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 98.447 ms
Loss rate: 0.00%
```
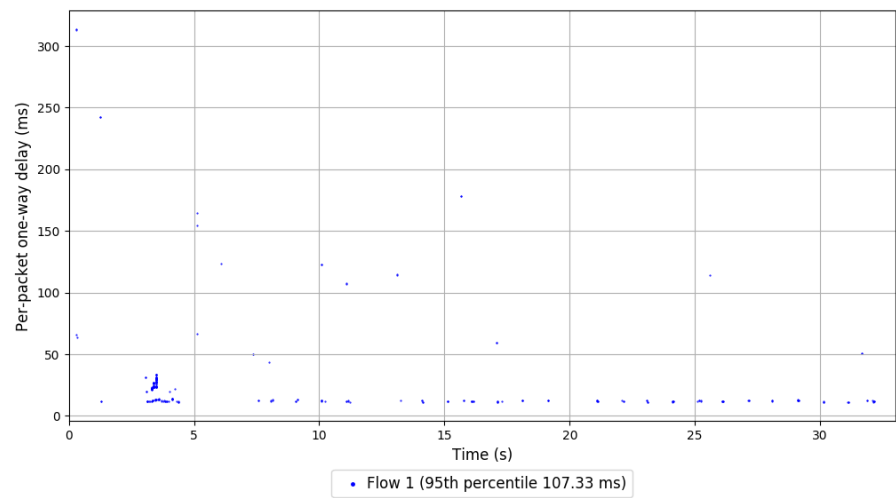
Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-04-16 22:31:59
End at: 2018-04-16 22:32:29
Local clock offset: 1.514 ms
Remote clock offset: -5.17 ms

# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 107.328 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 107.328 ms
Loss rate: 0.00%
```
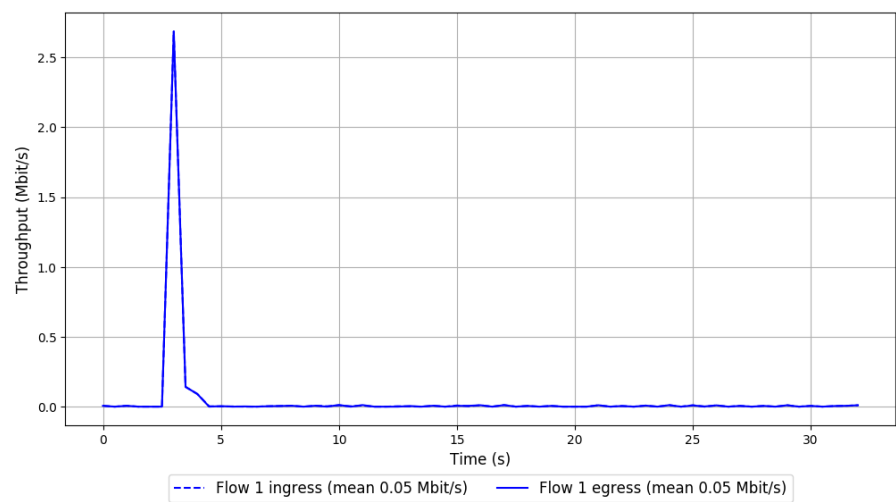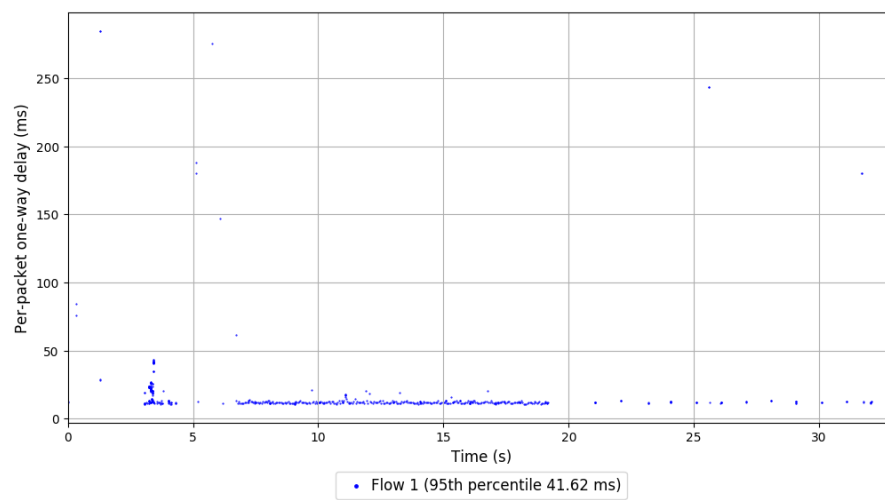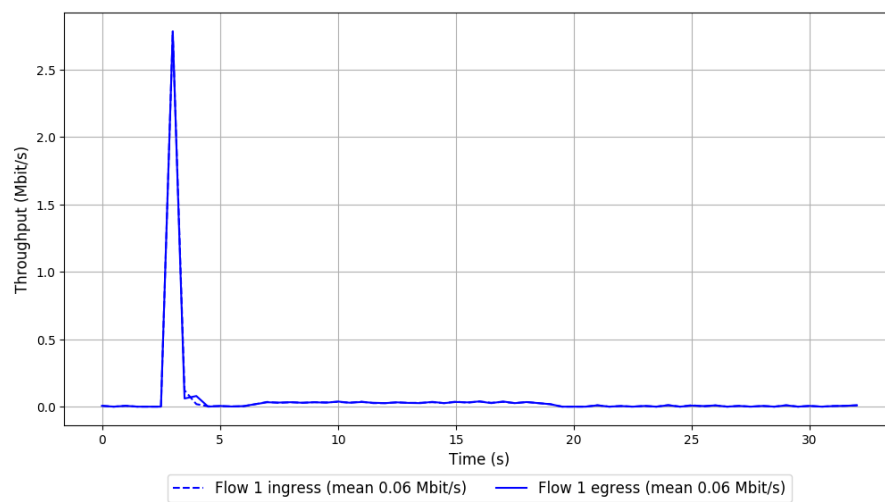
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-04-16 22:54:18
End at: 2018-04-16 22:54:48
Local clock offset: 0.887 ms
Remote clock offset: -5.544 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 41.624 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 41.624 ms
Loss rate: 0.00%
```
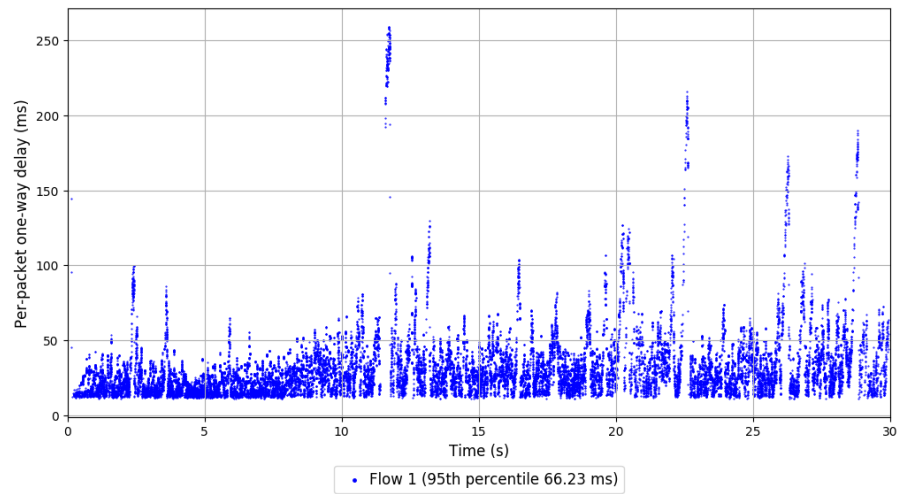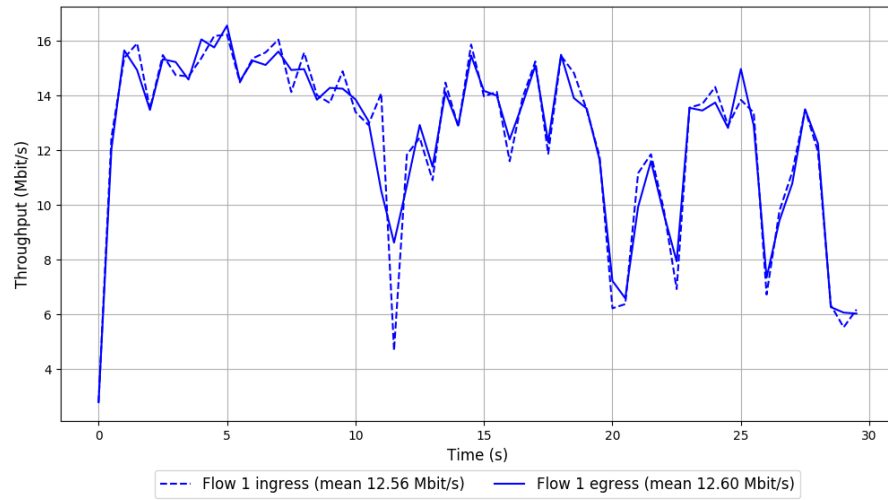
Run 3: Report of WebRTC media — Data Link

```
Run 1: Statistics of Sprout

Start at: 2018-04-16 21:57:51
End at: 2018-04-16 21:58:21
Local clock offset: -1.121 ms
Remote clock offset: -4.061 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.60 Mbit/s
95th percentile per-packet one-way delay: 66.230 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 12.60 Mbit/s
95th percentile per-packet one-way delay: 66.230 ms
Loss rate: 0.06%
```

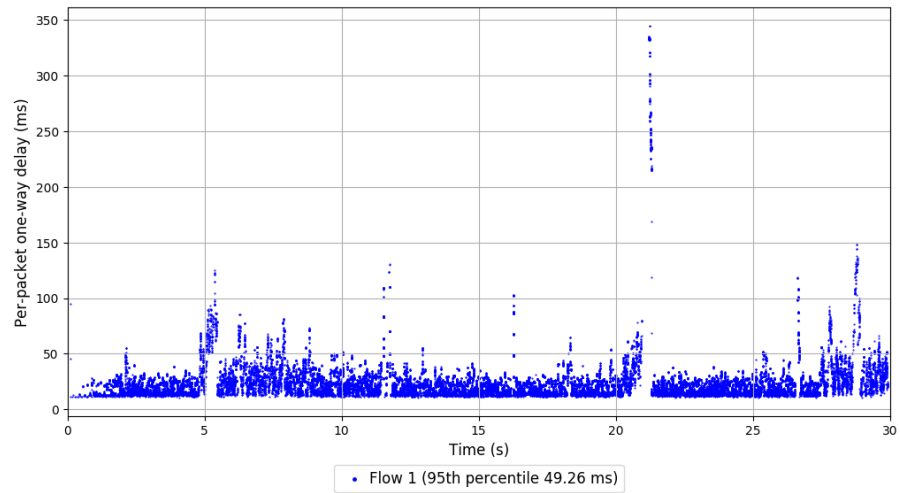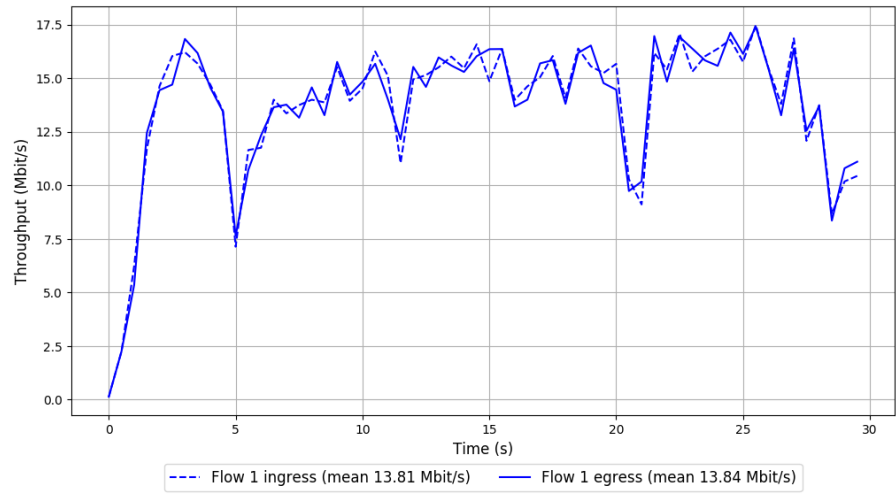Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-04-16 22:20:10
End at: 2018-04-16 22:20:40
Local clock offset: 1.04 ms
Remote clock offset: -5.126 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.84 Mbit/s
95th percentile per-packet one-way delay: 49.264 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 13.84 Mbit/s
95th percentile per-packet one-way delay: 49.264 ms
Loss rate: 0.00%
```

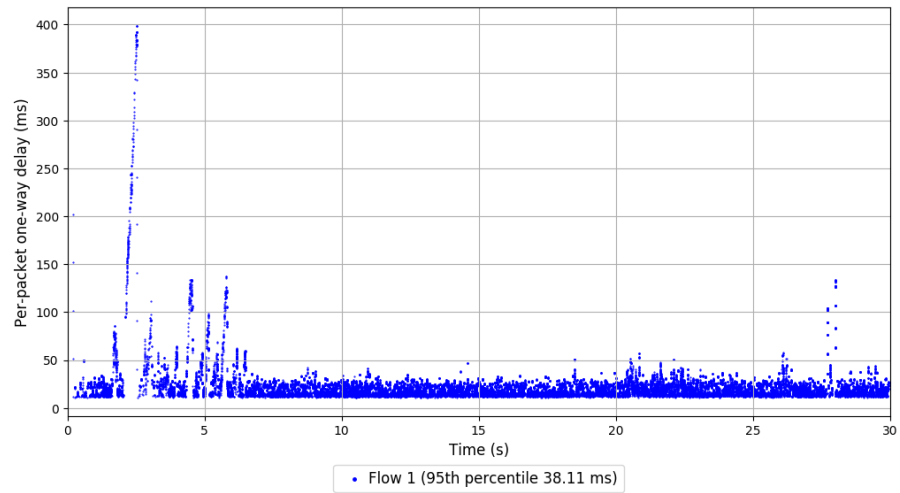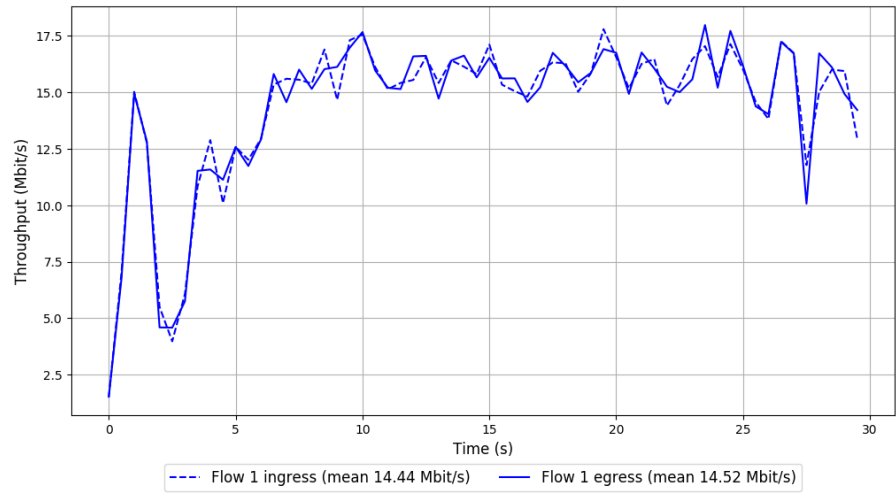Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-04-16 22:42:31
End at: 2018-04-16 22:43:01
Local clock offset: 1.111 ms
Remote clock offset: -4.878 ms

# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.52 Mbit/s
95th percentile per-packet one-way delay: 38.107 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 14.52 Mbit/s
95th percentile per-packet one-way delay: 38.107 ms
Loss rate: 0.00%
```

Run 3: Report of Sprout — Data Link

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

Start at: 2018-04-16 22:08:19
End at: 2018-04-16 22:08:49
Local clock offset: 0.16 ms
Remote clock offset: -3.648 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.51 Mbit/s
95th percentile per-packet one-way delay: 20.967 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 5.51 Mbit/s
95th percentile per-packet one-way delay: 20.967 ms
Loss rate: 0.00%
```
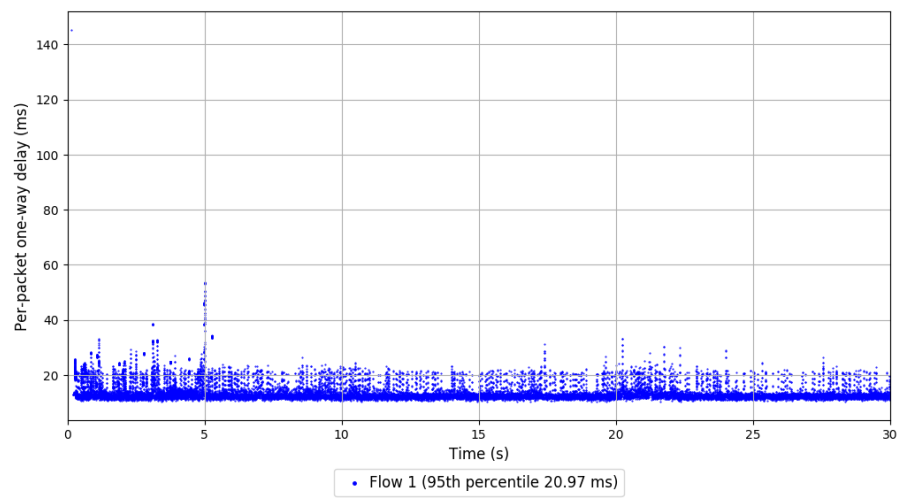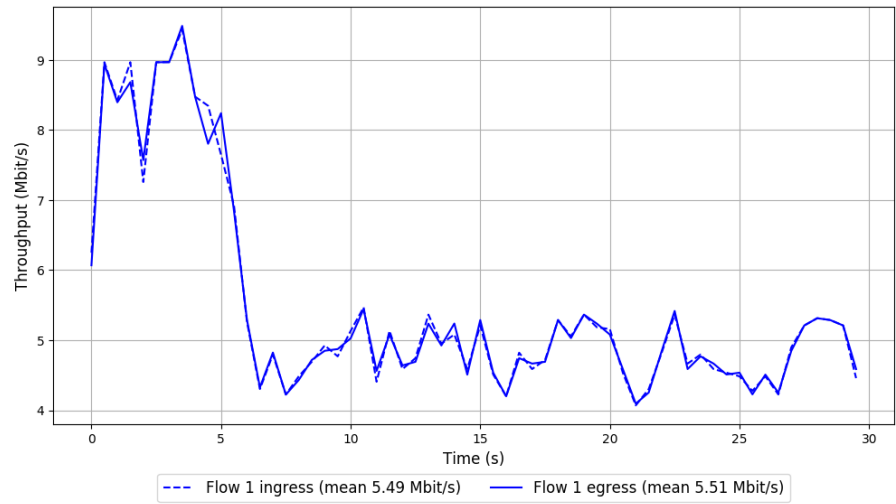
Run 1: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 5.49 Mbit/s)   Flow 1 egress (mean 5.51 Mbit/s)

Flow 1 (95th percentile 20.97 ms)

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

Start at: 2018-04-16 22:30:40
End at: 2018-04-16 22:31:10
Local clock offset: 1.574 ms
Remote clock offset: -5.169 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.22 Mbit/s
95th percentile per-packet one-way delay: 39.633 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 5.22 Mbit/s
95th percentile per-packet one-way delay: 39.633 ms
Loss rate: 0.00%
```
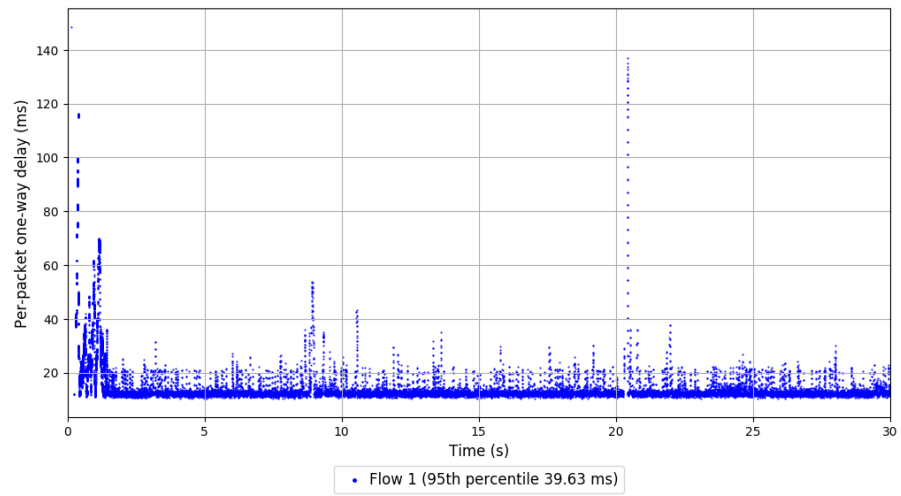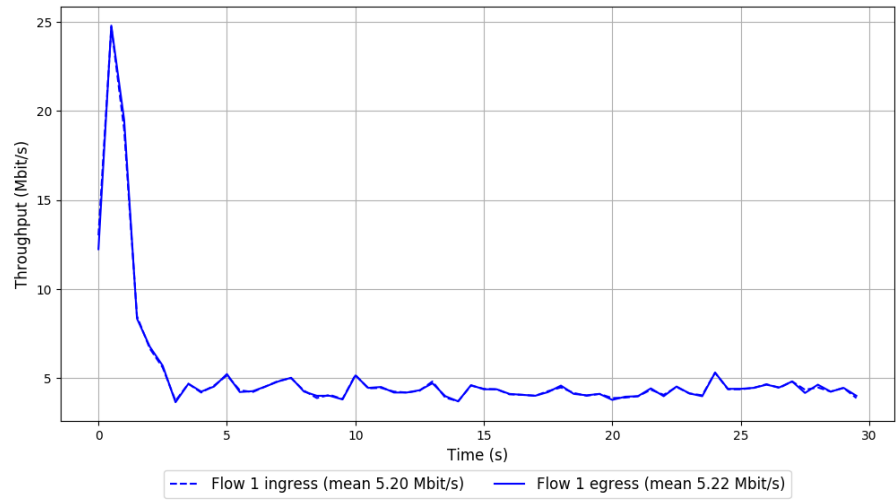
Run 2: Report of TaoVA-100x — Data Link

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

Start at: 2018-04-16 22:53:00
End at: 2018-04-16 22:53:30
Local clock offset: 0.995 ms
Remote clock offset: -5.58 ms


# Below is generated by plot.py at 2018-04-16 23:02:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.31 Mbit/s
95th percentile per-packet one-way delay: 60.494 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 6.31 Mbit/s
95th percentile per-packet one-way delay: 60.494 ms
Loss rate: 0.00%
```
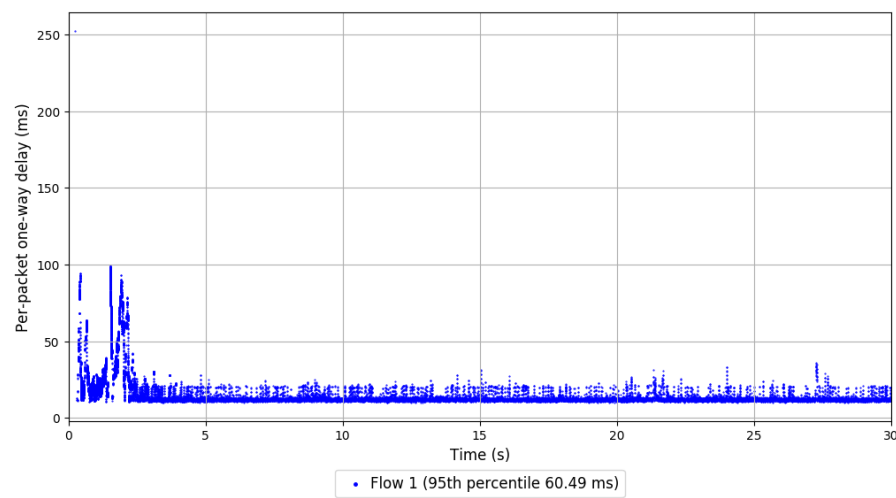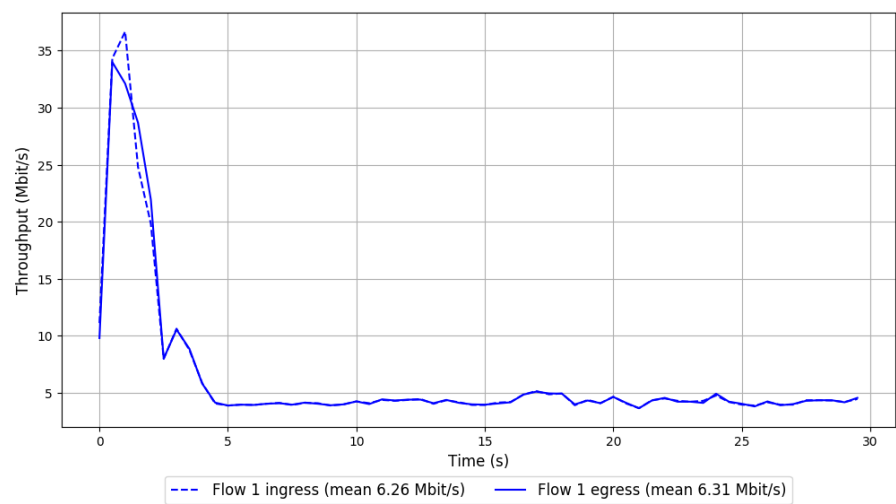
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 6.26 Mbit/s)   Flow 1 egress (mean 6.31 Mbit/s)

Flow 1 (95th percentile 60.49 ms)

```
Run 1: Statistics of TCP Vegas

Start at: 2018-04-16 22:12:16
End at: 2018-04-16 22:12:46
Local clock offset: 0.402 ms
Remote clock offset: -4.5 ms


# Below is generated by plot.py at 2018-04-16 23:02:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 20.76 Mbit/s
95th percentile per-packet one-way delay: 186.983 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 20.76 Mbit/s
95th percentile per-packet one-way delay: 186.983 ms
Loss rate: 0.00%
```
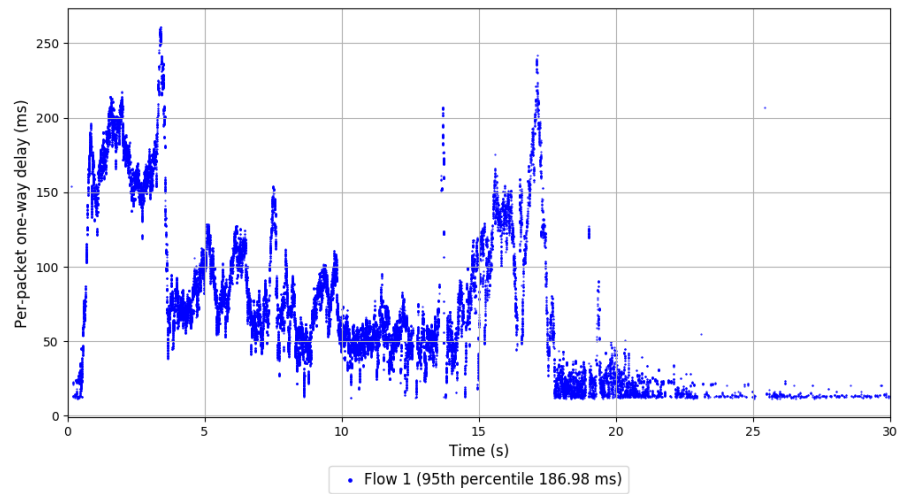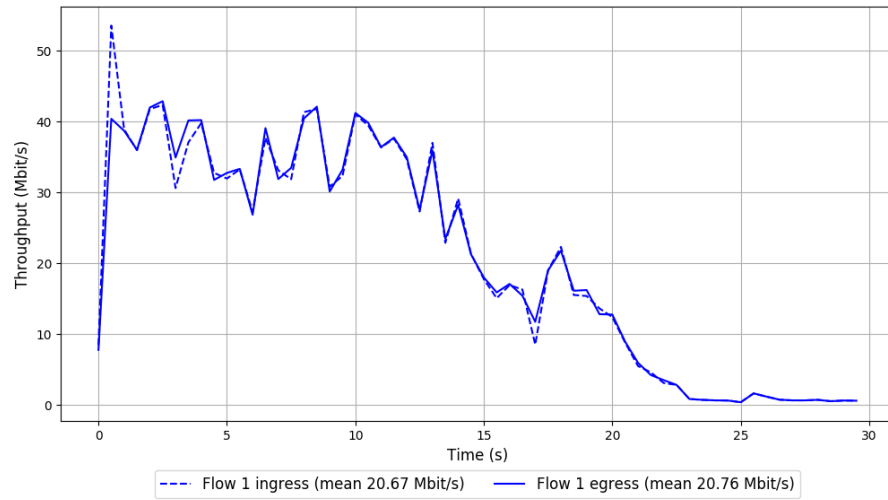
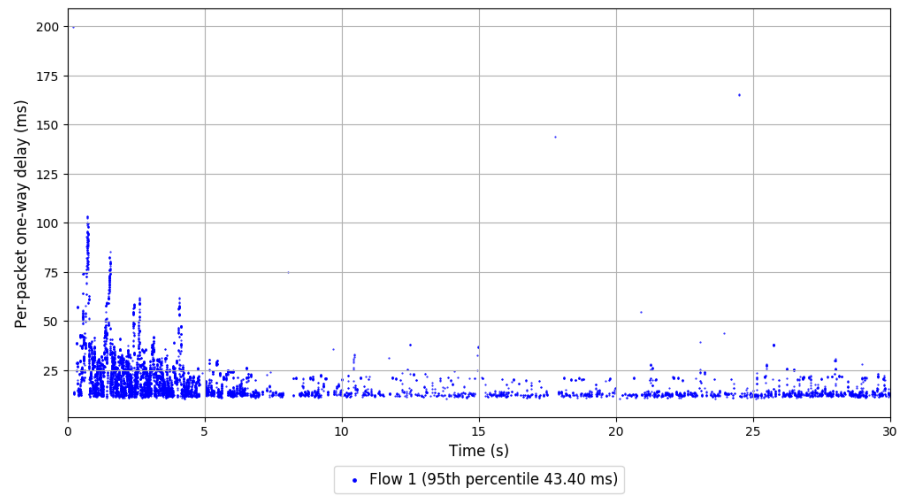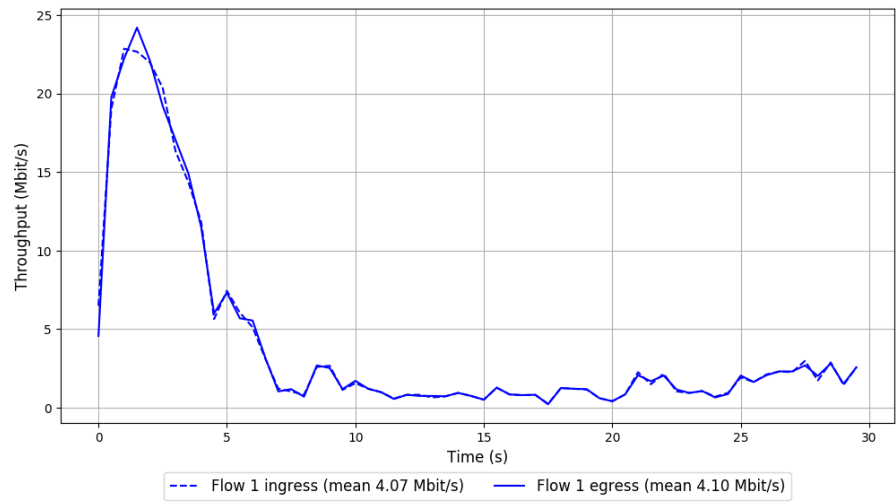Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-04-16 22:34:37
End at: 2018-04-16 22:35:07
Local clock offset: 1.661 ms
Remote clock offset: -5.211 ms


# Below is generated by plot.py at 2018-04-16 23:02:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.10 Mbit/s
95th percentile per-packet one-way delay: 43.398 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.10 Mbit/s
95th percentile per-packet one-way delay: 43.398 ms
Loss rate: 0.00%
```

Run 2: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 4.07 Mbit/s)   Flow 1 egress (mean 4.10 Mbit/s)
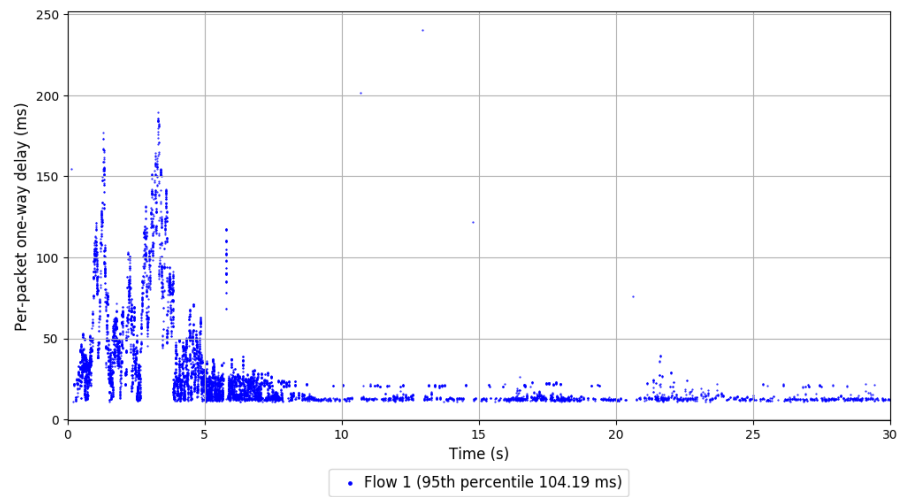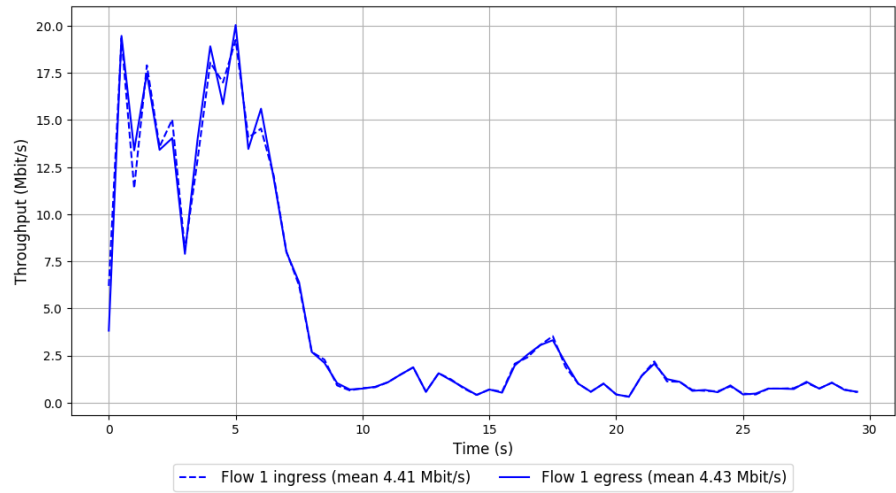

Flow 1 (95th percentile 43.40 ms)

```
Run 3: Statistics of TCP Vegas

Start at: 2018-04-16 22:56:56
End at: 2018-04-16 22:57:26
Local clock offset: 0.993 ms
Remote clock offset: -5.605 ms


# Below is generated by plot.py at 2018-04-16 23:02:26
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.43 Mbit/s
95th percentile per-packet one-way delay: 104.192 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 4.43 Mbit/s
95th percentile per-packet one-way delay: 104.192 ms
Loss rate: 0.00%
```

Run 3: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 4.41 Mbit/s)   Flow 1 egress (mean 4.43 Mbit/s)
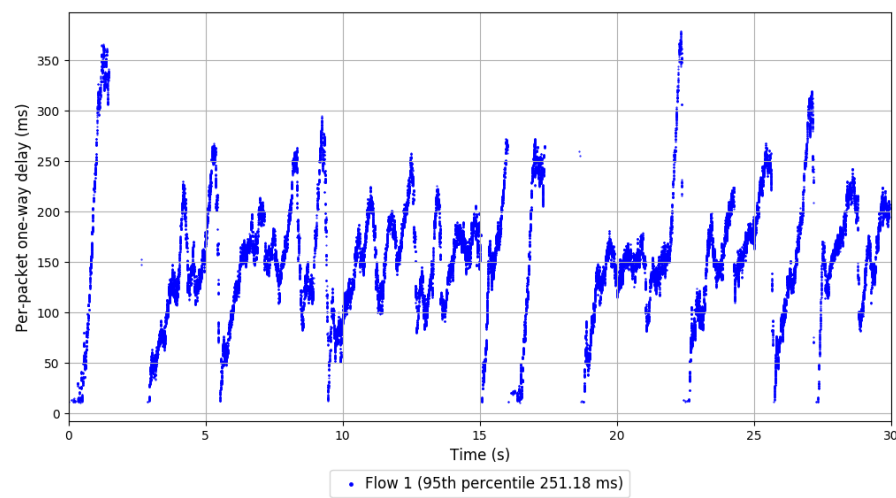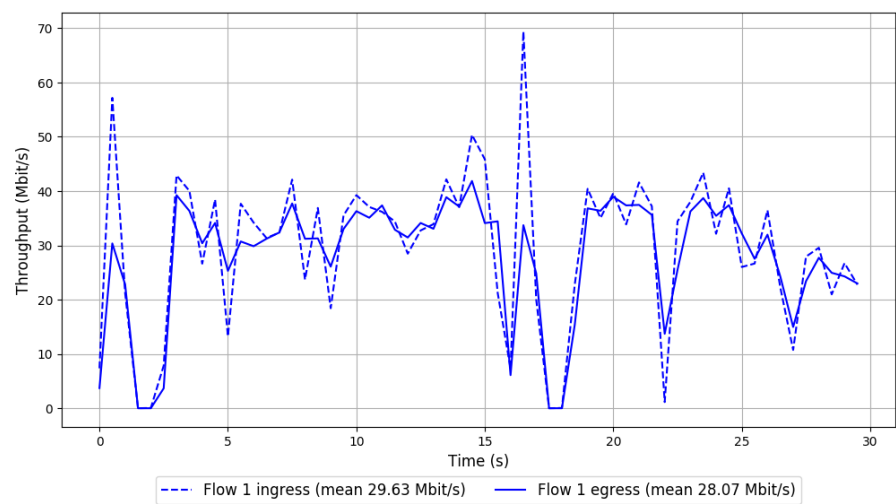

Flow 1 (95th percentile 104.19 ms)

```
Run 1: Statistics of Verus

Start at: 2018-04-16 22:13:35
End at: 2018-04-16 22:14:05
Local clock offset: 0.511 ms
Remote clock offset: -4.702 ms


# Below is generated by plot.py at 2018-04-16 23:02:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 28.07 Mbit/s
95th percentile per-packet one-way delay: 251.177 ms
Loss rate: 5.22%
-- Flow 1:
Average throughput: 28.07 Mbit/s
95th percentile per-packet one-way delay: 251.177 ms
Loss rate: 5.22%
```
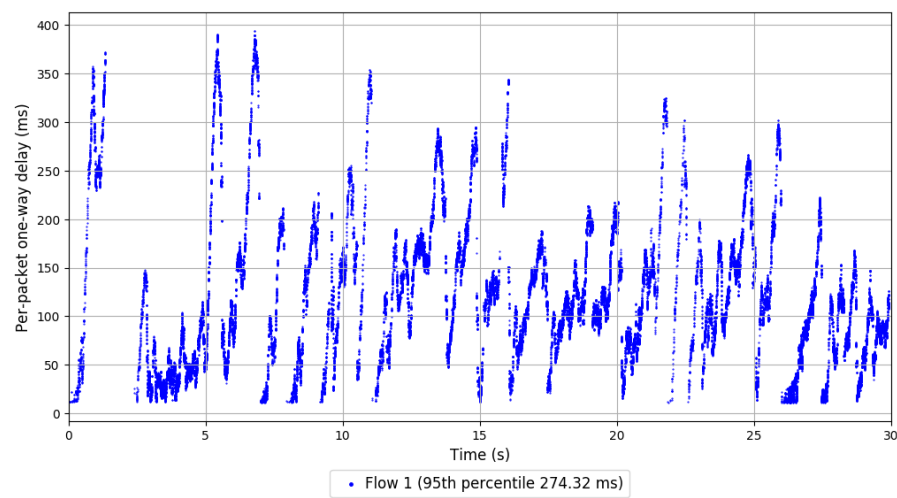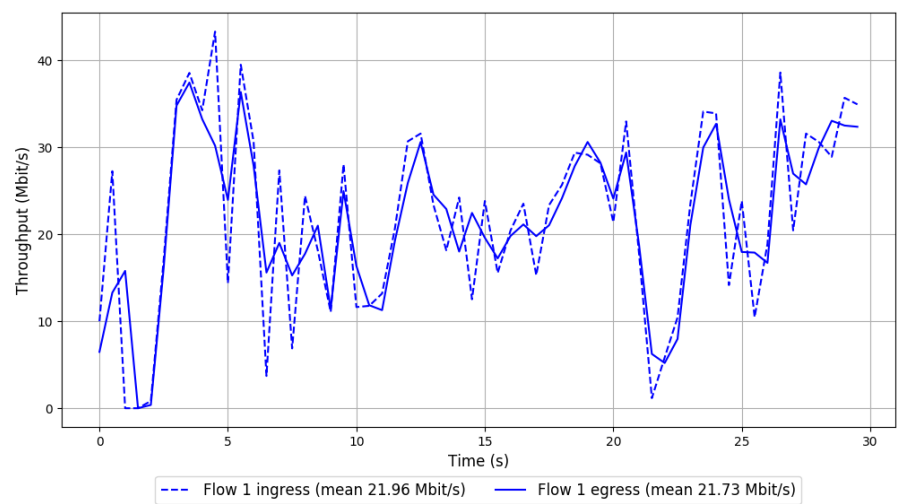
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2018-04-16 22:35:55
End at: 2018-04-16 22:36:25
Local clock offset: 1.519 ms
Remote clock offset: -5.082 ms


# Below is generated by plot.py at 2018-04-16 23:02:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 21.73 Mbit/s
95th percentile per-packet one-way delay: 274.317 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 21.73 Mbit/s
95th percentile per-packet one-way delay: 274.317 ms
Loss rate: 0.99%
```
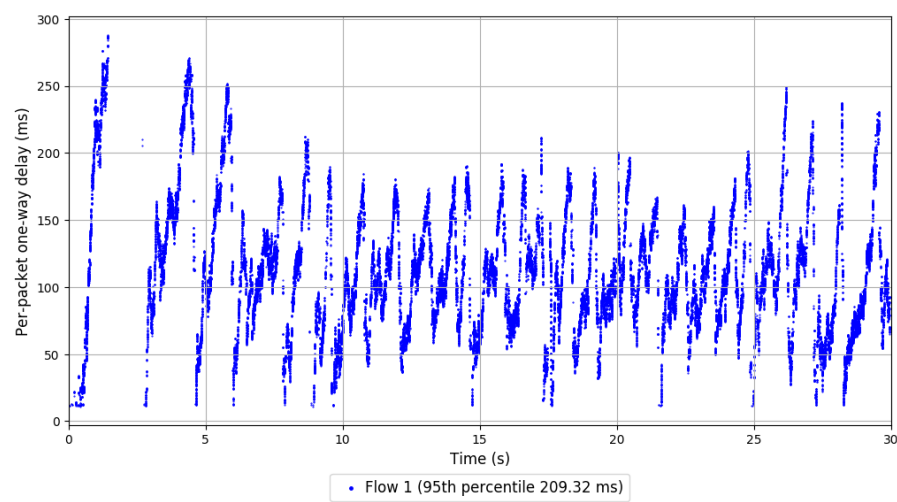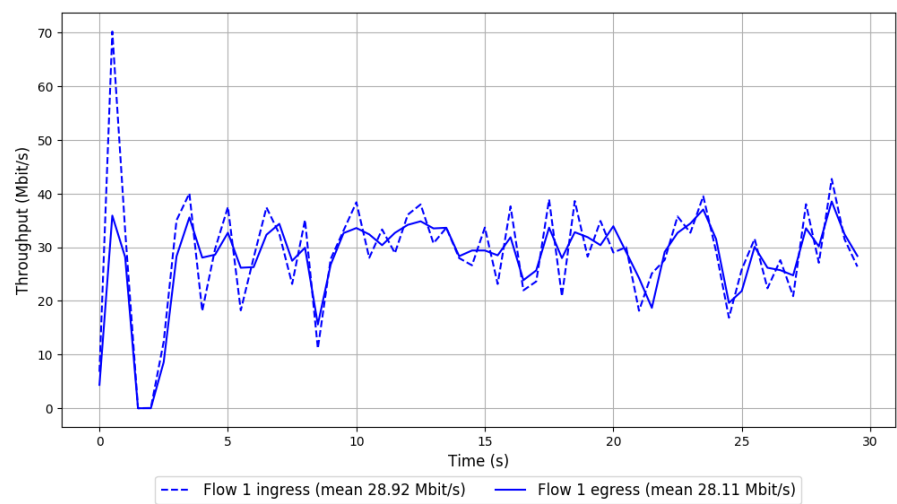
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2018-04-16 22:58:15
End at: 2018-04-16 22:58:45
Local clock offset: 0.987 ms
Remote clock offset: -5.569 ms


# Below is generated by plot.py at 2018-04-16 23:02:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 28.11 Mbit/s
95th percentile per-packet one-way delay: 209.324 ms
Loss rate: 2.77%
-- Flow 1:
Average throughput: 28.11 Mbit/s
95th percentile per-packet one-way delay: 209.324 ms
Loss rate: 2.77%
```

Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 28.92 Mbit/s) --- Flow 1 egress (mean 28.11 Mbit/s)

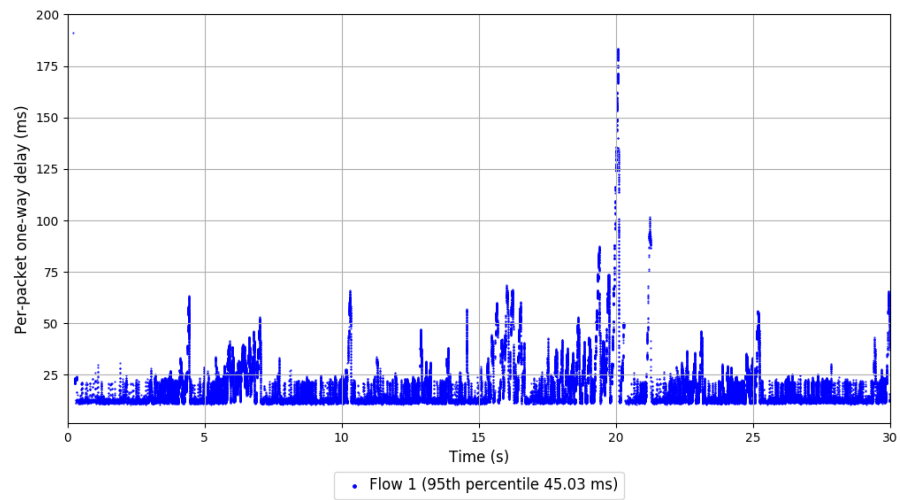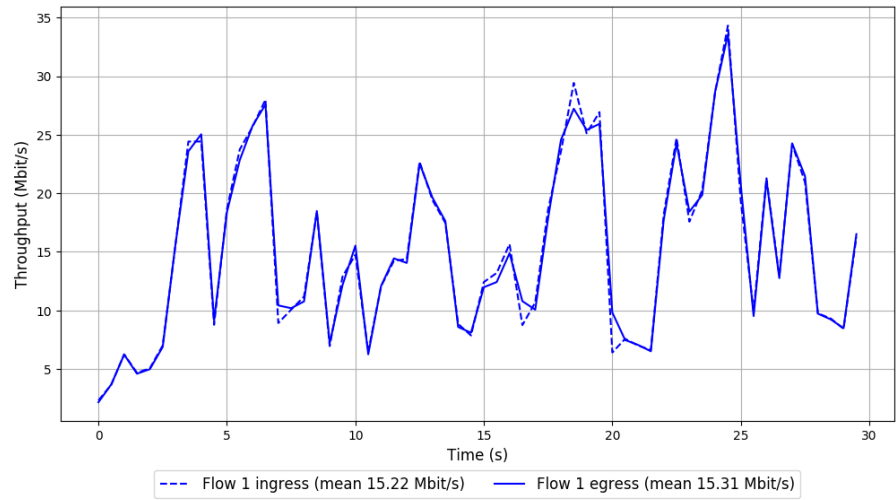
• Flow 1 (95th percentile 209.32 ms)

```
Run 1: Statistics of Copa

Start at: 2018-04-16 22:03:06
End at: 2018-04-16 22:03:36
Local clock offset: -0.635 ms
Remote clock offset: -3.914 ms


# Below is generated by plot.py at 2018-04-16 23:02:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.31 Mbit/s
95th percentile per-packet one-way delay: 45.031 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.31 Mbit/s
95th percentile per-packet one-way delay: 45.031 ms
Loss rate: 0.00%
```

Run 1: Report of Copa — Data Link

Flow 1 ingress (mean 15.22 Mbit/s)   Flow 1 egress (mean 15.31 Mbit/s)
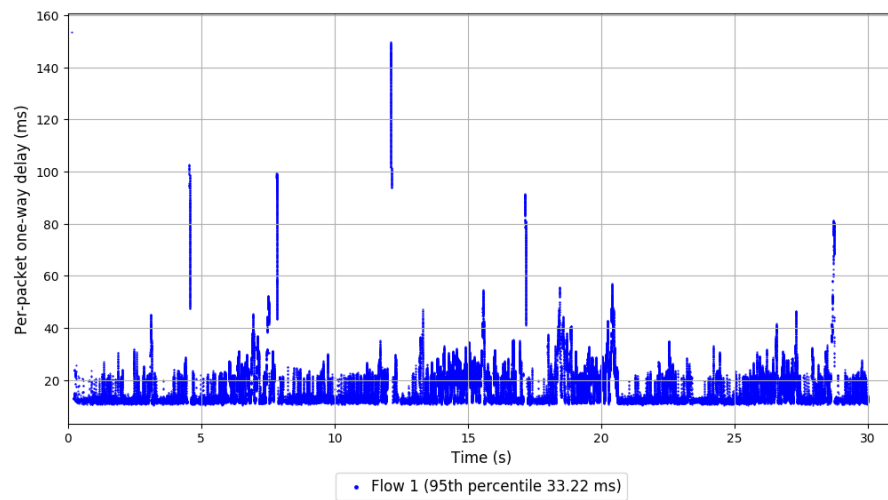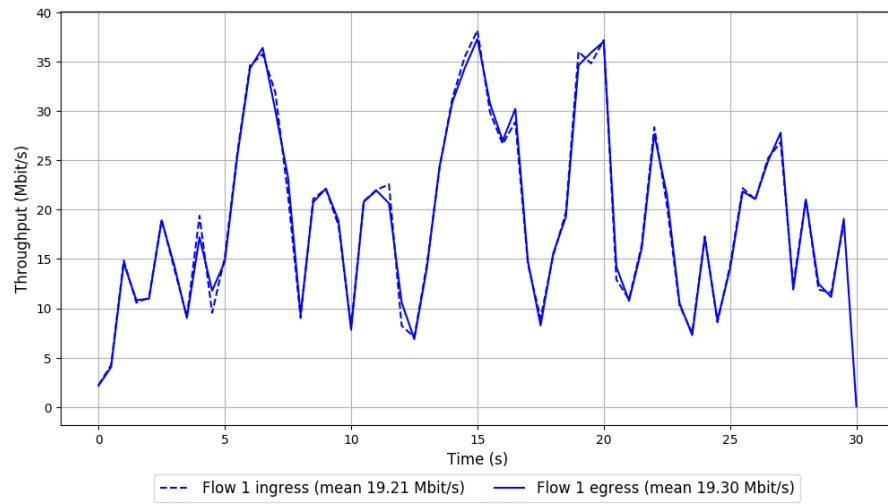

Flow 1 (95th percentile 45.03 ms)

```
Run 2: Statistics of Copa

Start at: 2018-04-16 22:25:26
End at: 2018-04-16 22:25:56
Local clock offset: 1.231 ms
Remote clock offset: -5.256 ms


# Below is generated by plot.py at 2018-04-16 23:02:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 19.30 Mbit/s
95th percentile per-packet one-way delay: 33.219 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 19.30 Mbit/s
95th percentile per-packet one-way delay: 33.219 ms
Loss rate: 0.00%
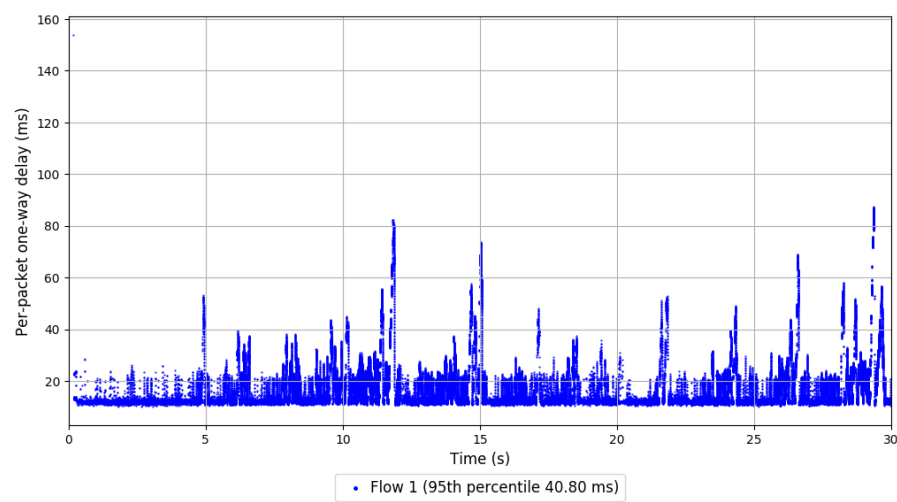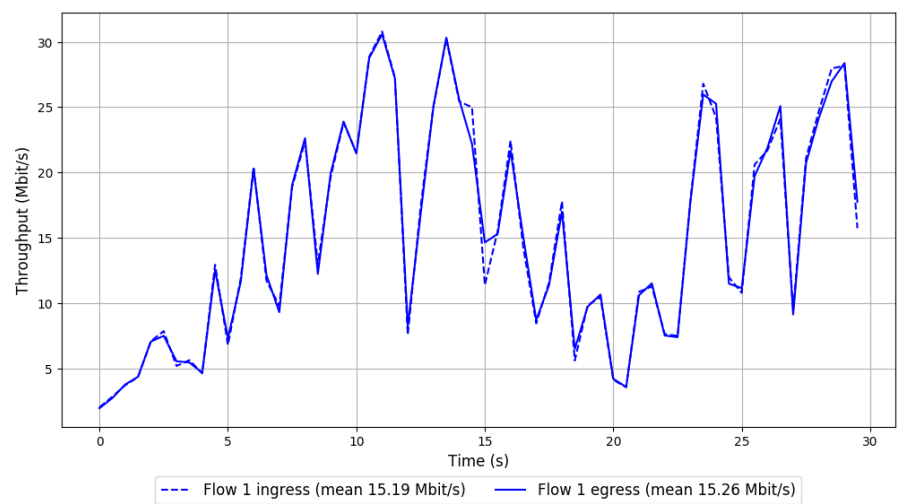```

Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-04-16 22:47:45
End at: 2018-04-16 22:48:15
Local clock offset: 0.989 ms
Remote clock offset: -5.366 ms


# Below is generated by plot.py at 2018-04-16 23:02:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.26 Mbit/s
95th percentile per-packet one-way delay: 40.805 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 15.26 Mbit/s
95th percentile per-packet one-way delay: 40.805 ms
Loss rate: 0.00%
```

Run 3: Report of Copa — Data Link

Flow 1 ingress (mean 15.19 Mbit/s)   Flow 1 egress (mean 15.26 Mbit/s)

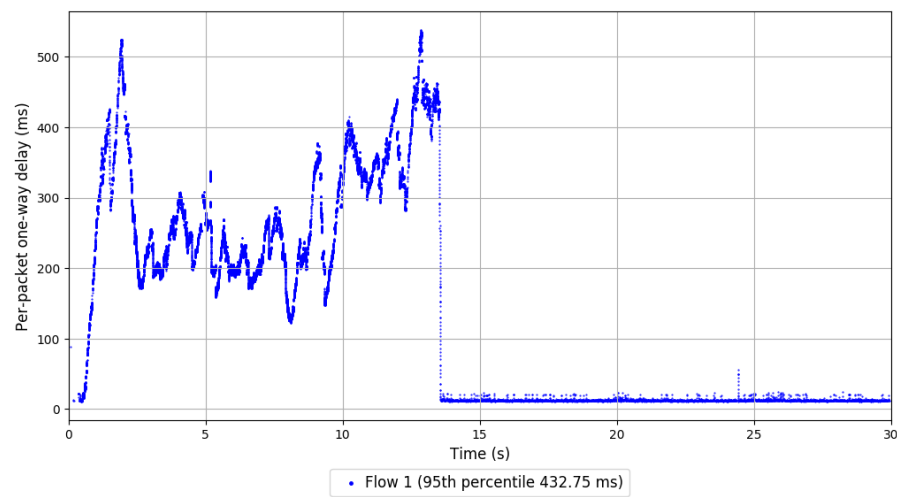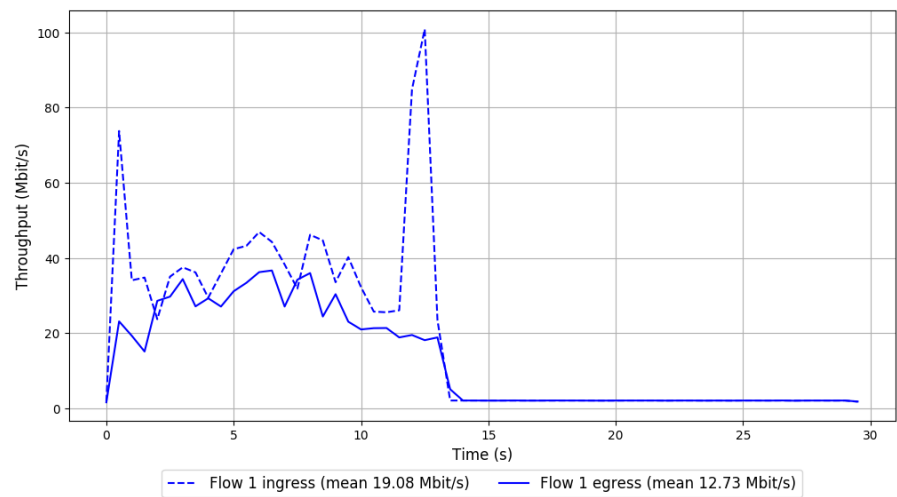

• Flow 1 (95th percentile 40.80 ms)

```
Run 1: Statistics of FillP

Start at: 2018-04-16 21:55:14
End at: 2018-04-16 21:55:44
Local clock offset: -1.133 ms
Remote clock offset: -4.155 ms


# Below is generated by plot.py at 2018-04-16 23:02:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 432.746 ms
Loss rate: 33.48%
-- Flow 1:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 432.746 ms
Loss rate: 33.48%
```
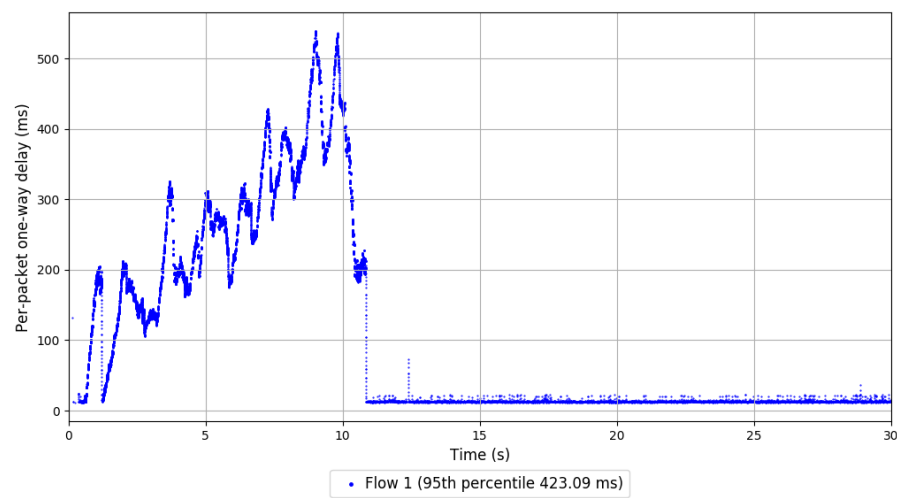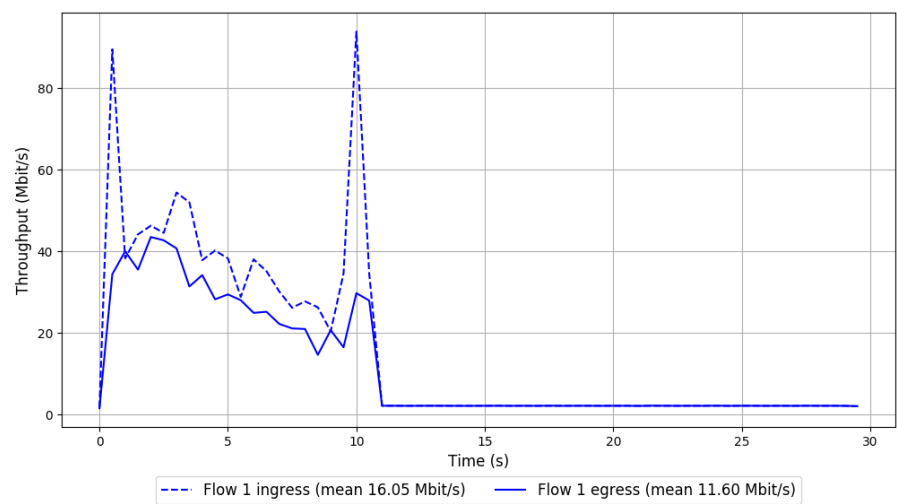
Run 1: Report of FillP — Data Link

```
Run 2: Statistics of FillP

Start at: 2018-04-16 22:17:32
End at: 2018-04-16 22:18:02
Local clock offset: 0.801 ms
Remote clock offset: -5.019 ms


# Below is generated by plot.py at 2018-04-16 23:02:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.60 Mbit/s
95th percentile per-packet one-way delay: 423.092 ms
Loss rate: 28.00%
-- Flow 1:
Average throughput: 11.60 Mbit/s
95th percentile per-packet one-way delay: 423.092 ms
Loss rate: 28.00%
```

Run 2: Report of FillP — Data Link

Flow 1 ingress (mean 16.05 Mbit/s)   Flow 1 egress (mean 11.60 Mbit/s)

Flow 1 (95th percentile 423.09 ms)

```
Run 3: Statistics of FillP

Start at: 2018-04-16 22:39:52
End at: 2018-04-16 22:40:22
Local clock offset: 1.226 ms
Remote clock offset: -5.08 ms


# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 32.68 Mbit/s
95th percentile per-packet one-way delay: 289.129 ms
Loss rate: 21.51%
-- Flow 1:
Average throughput: 32.68 Mbit/s
95th percentile per-packet one-way delay: 289.129 ms
Loss rate: 21.51%
```
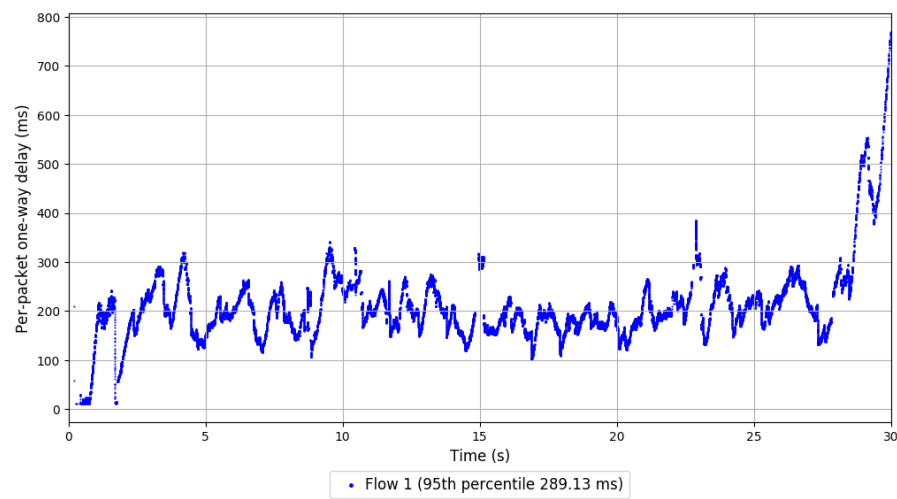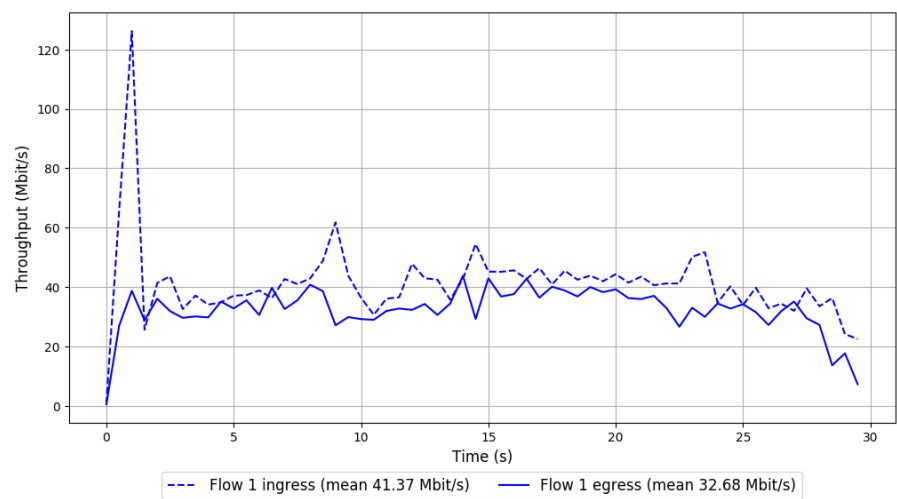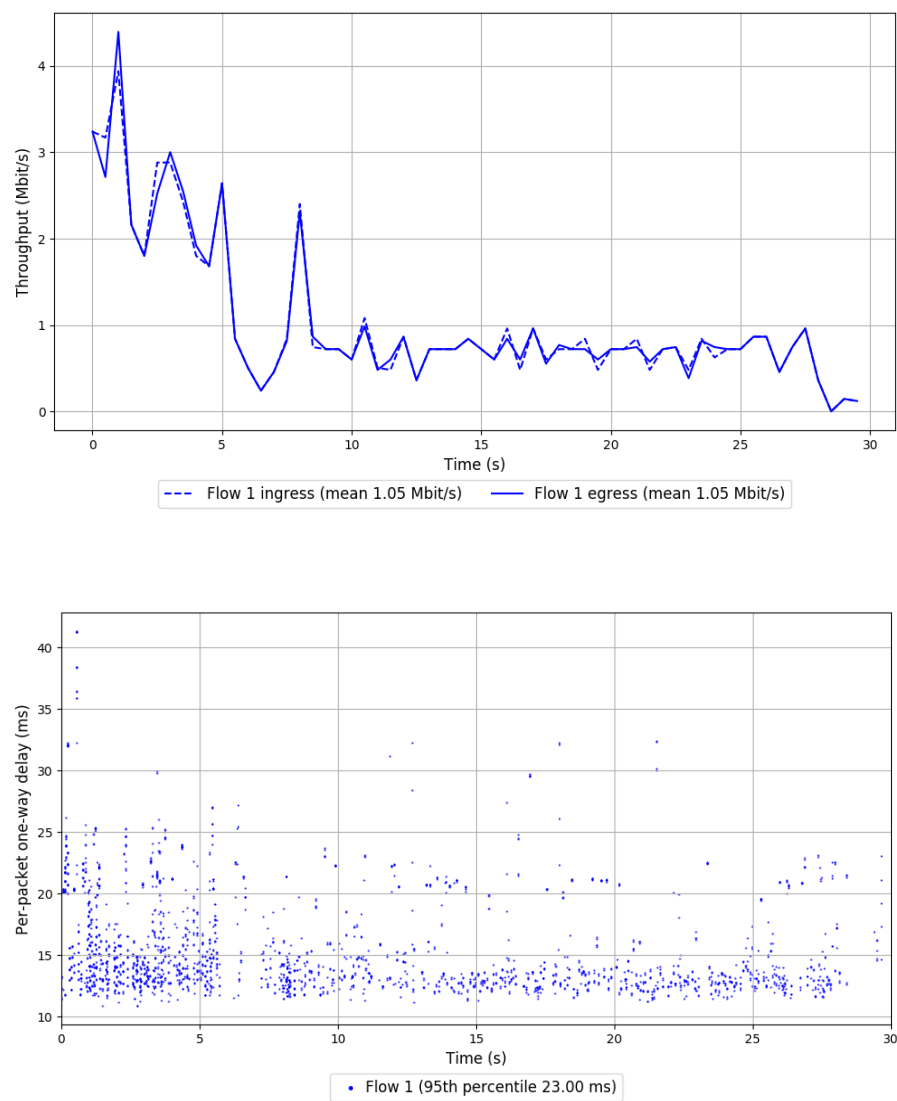
Run 3: Report of FillP — Data Link

```
Run 1: Statistics of Indigo-1-32

Start at: 2018-04-16 22:14:55
End at: 2018-04-16 22:15:25
Local clock offset: 0.708 ms
Remote clock offset: -4.841 ms

# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 23.004 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 23.004 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo-1-32 — Data Link

```
Run 2: Statistics of Indigo-1-32

Start at: 2018-04-16 22:37:14
End at: 2018-04-16 22:37:44
Local clock offset: 1.395 ms
Remote clock offset: -5.04 ms


# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 36.010 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 36.010 ms
Loss rate: 0.00%
```
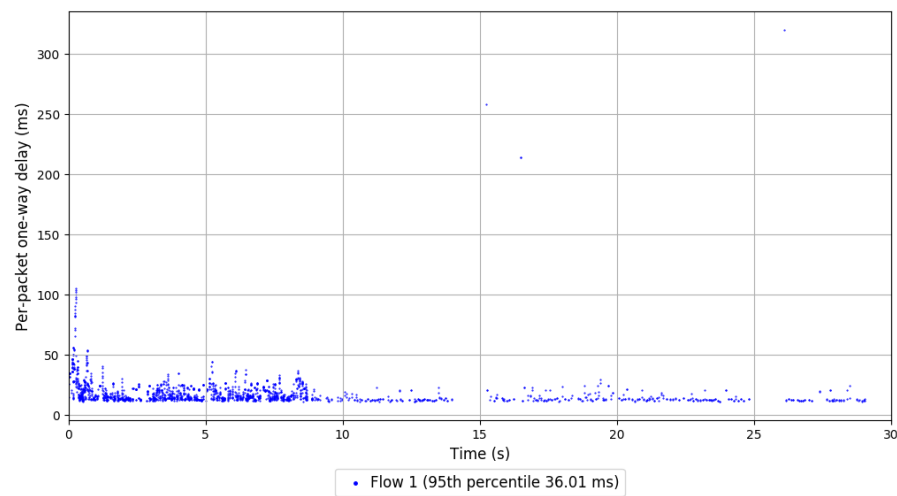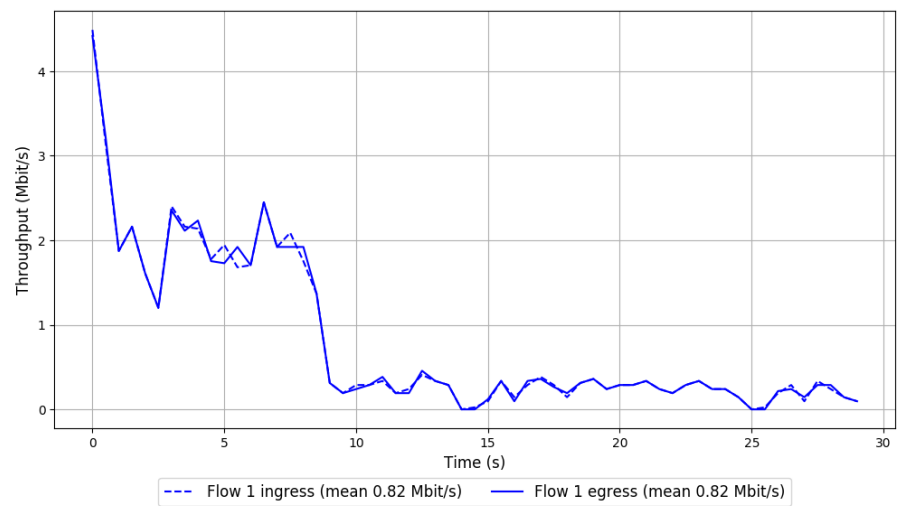
Run 2: Report of Indigo-1-32 — Data Link

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

Flow 1 (95th percentile 36.01 ms)

```
Run 3: Statistics of Indigo-1-32

Start at: 2018-04-16 22:59:34
End at: 2018-04-16 23:00:04
Local clock offset: 1.002 ms
Remote clock offset: -5.564 ms

# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 26.823 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 26.823 ms
Loss rate: 0.00%
```
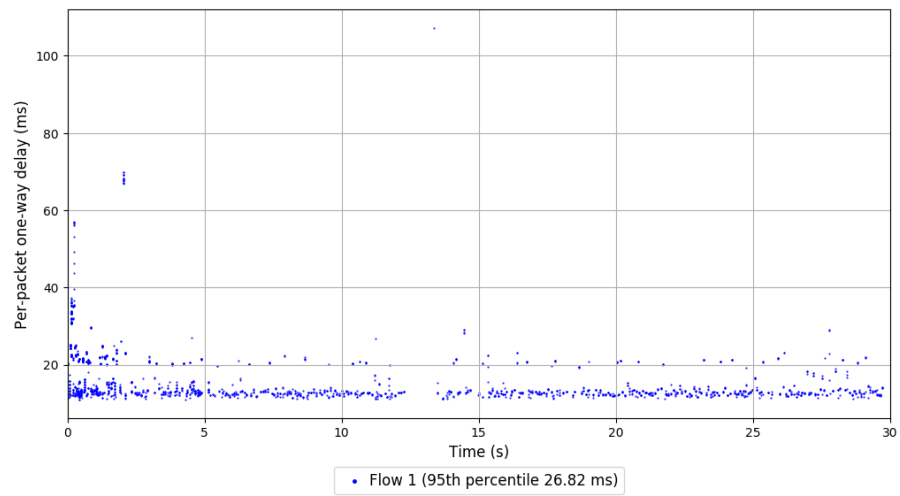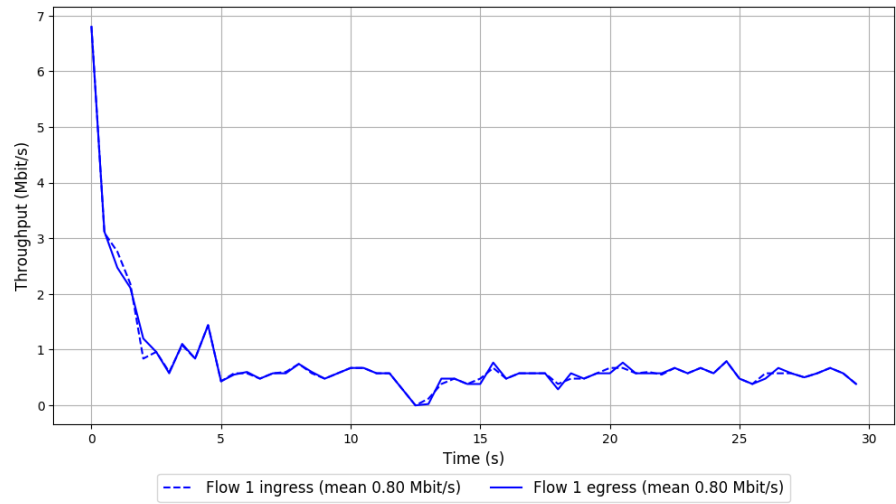
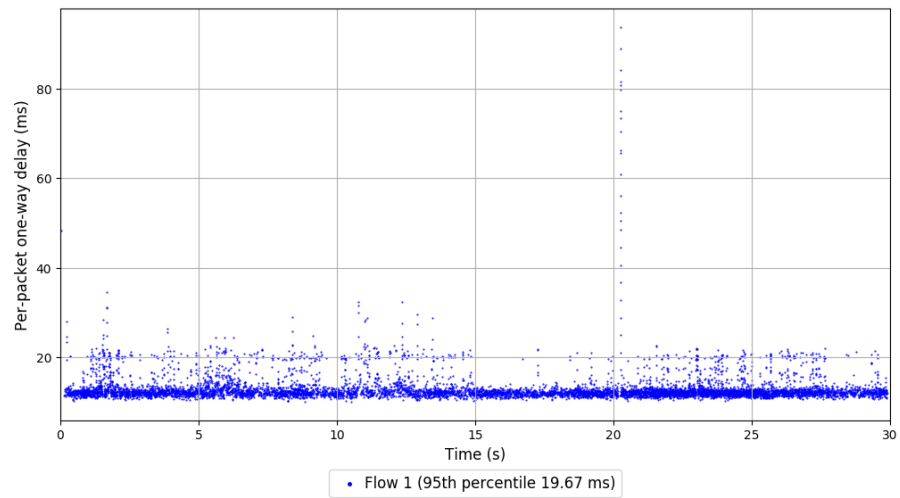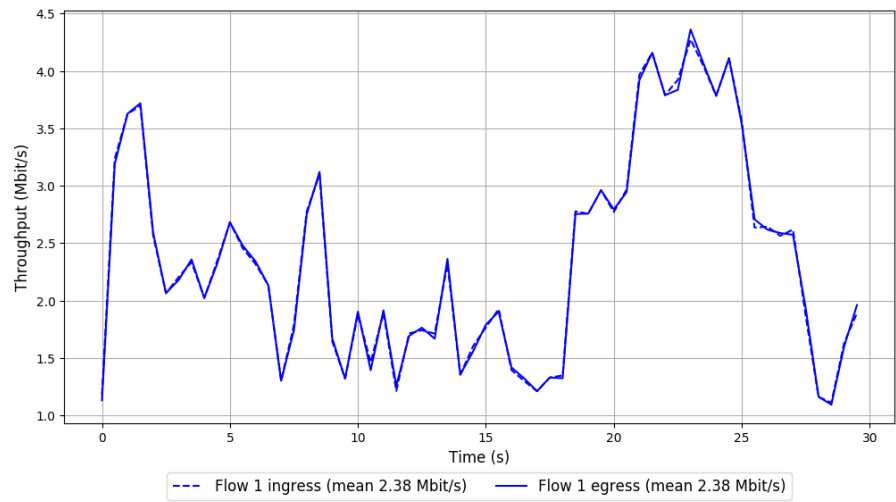Run 3: Report of Indigo-1-32 — Data Link

```
Run 1: Statistics of PCC-Vivace

Start at: 2018-04-16 22:07:01
End at: 2018-04-16 22:07:31
Local clock offset: -0.078 ms
Remote clock offset: -3.826 ms


# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 19.667 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 19.667 ms
Loss rate: 0.00%
```

Run 1: Report of PCC-Vivace — Data Link

```
Run 2: Statistics of PCC-Vivace

Start at: 2018-04-16 22:29:22
End at: 2018-04-16 22:29:52
Local clock offset: 1.397 ms
Remote clock offset: -5.194 ms


# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 19.611 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 19.611 ms
Loss rate: 0.00%
```
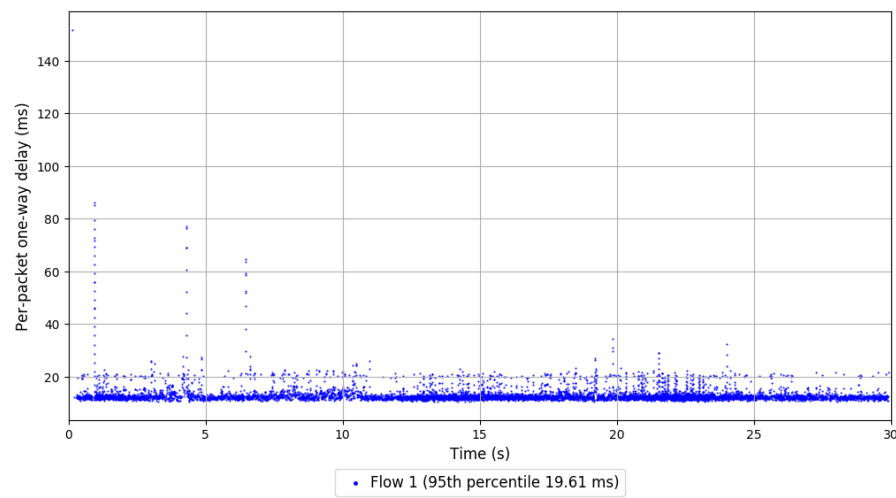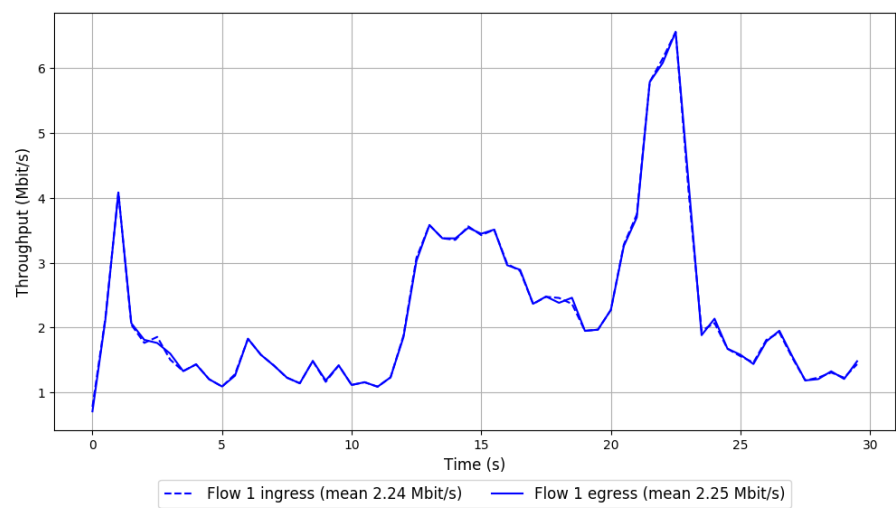
Run 2: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 2.24 Mbit/s) --- Flow 1 egress (mean 2.25 Mbit/s)

Flow 1 (95th percentile 19.61 ms)

```
Run 3: Statistics of PCC-Vivace

Start at: 2018-04-16 22:51:41
End at: 2018-04-16 22:52:11
Local clock offset: 0.981 ms
Remote clock offset: -5.53 ms


# Below is generated by plot.py at 2018-04-16 23:02:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 20.695 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 20.695 ms
Loss rate: 0.02%
```
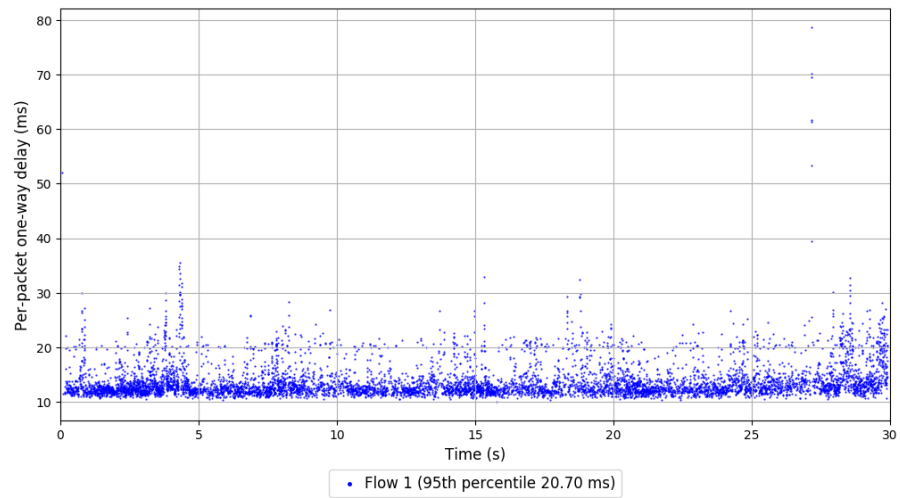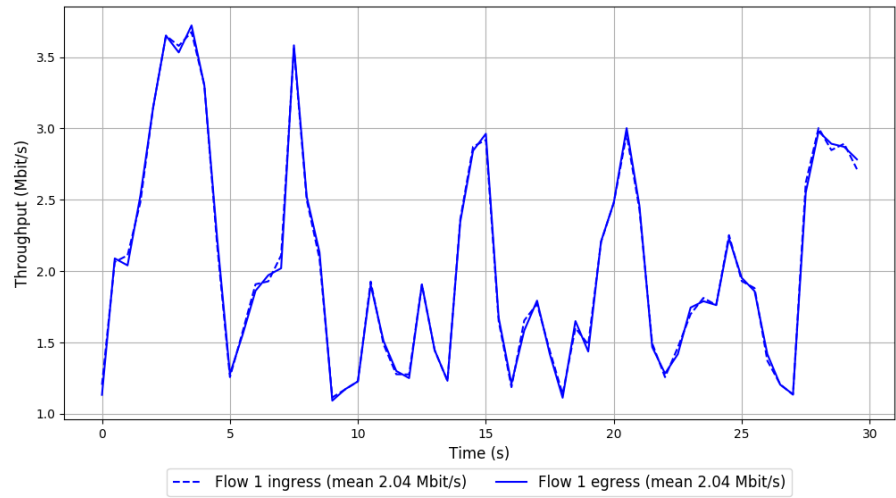
Run 3: Report of PCC-Vivace — Data Link

Flow 1 ingress (mean 2.04 Mbit/s) — — — — Flow 1 egress (mean 2.04 Mbit/s)

• Flow 1 (95th percentile 20.70 ms)

```
Run 1: Statistics of PCC-Expr

Start at: 2018-04-16 22:05:43
End at: 2018-04-16 22:06:13
Local clock offset: -0.155 ms
Remote clock offset: -3.881 ms
```

Run 1: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

```
Run 2: Statistics of PCC-Expr

Start at: 2018-04-16 22:28:04
End at: 2018-04-16 22:28:34
Local clock offset: 1.363 ms
Remote clock offset: -5.242 ms
```

Run 2: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

```
Run 3: Statistics of PCC-Expr

Start at: 2018-04-16 22:50:23
End at: 2018-04-16 22:50:53
Local clock offset: 0.964 ms
Remote clock offset: -5.486 ms
```

Run 3: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing