Pantheon Report

Generated at 2018-02-01 13:42:12 (UTC).

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

Repeated the test of 17 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).
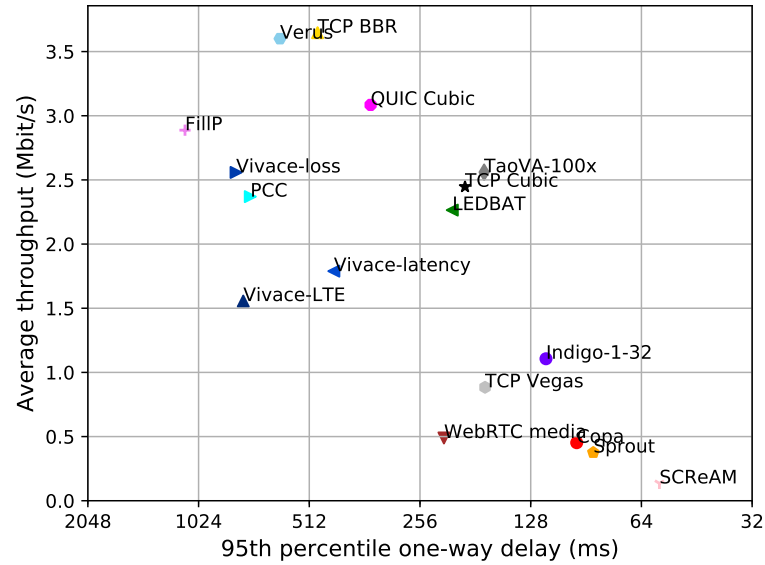
Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

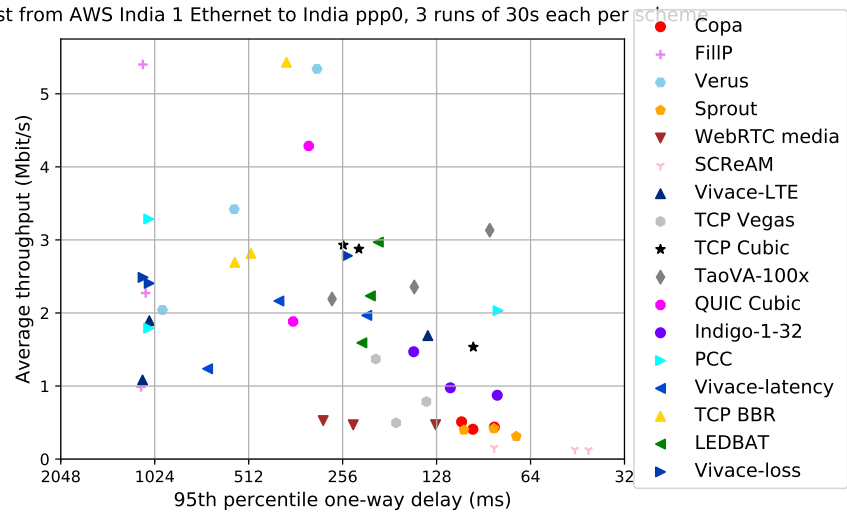NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

```
Git summary:
branch: master @ 70217998b3c9a7166a95460a70c0854d1326e100
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/fillp @ fb9c9ab842e5614ad52911a76fb9bd1c1b0dca86
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
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/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 @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)

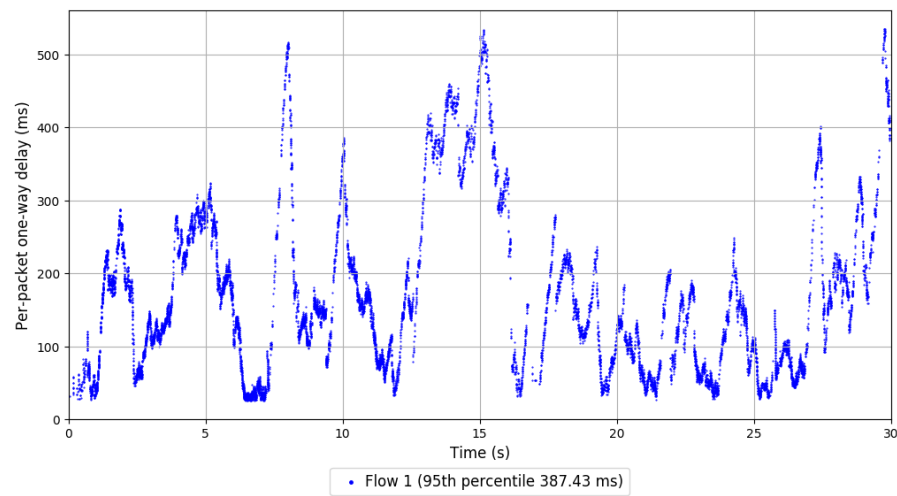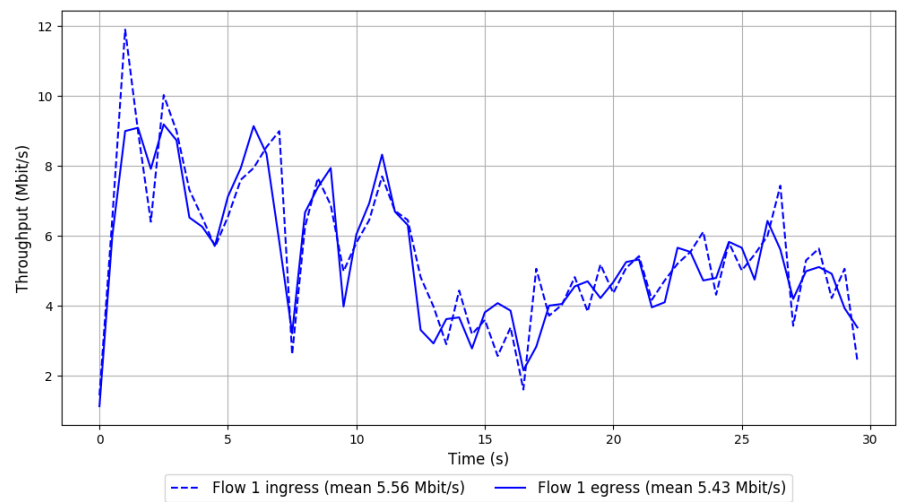test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme

scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	3.65	486.17	1.87
TCP Cubic	3	2.45	193.12	0.96
LEDBAT	3	2.26	209.19	0.47
PCC	3	2.37	740.70	12.15
QUIC Cubic	2	3.08	348.79	1.10
SCReAM	3	0.13	57.18	0.57
WebRTC media	3	0.49	220.36	0.21
Sprout	3	0.38	86.51	0.22
TaoVA-100x	3	2.56	171.36	2.67
TCP Vegas	3	0.89	170.36	3.15
Verus	3	3.60	615.20	10.27
Copa	3	0.45	95.98	0.17
FillP	3	2.89	1114.80	46.80
Indigo-1-32	3	1.11	116.33	0.18
Vivace-latency	3	1.79	439.07	1.74
Vivace-loss	3	2.56	809.66	18.37
Vivace-LTE	3	1.55	774.06	14.86

```
Run 1: Statistics of TCP BBR

Start at: 2018-02-01 12:54:58
End at: 2018-02-01 12:55:28
Local clock offset: 5.631 ms
Remote clock offset: -17.836 ms

# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.43 Mbit/s
95th percentile per-packet one-way delay: 387.431 ms
Loss rate: 2.39%
-- Flow 1:
Average throughput: 5.43 Mbit/s
95th percentile per-packet one-way delay: 387.431 ms
Loss rate: 2.39%
```
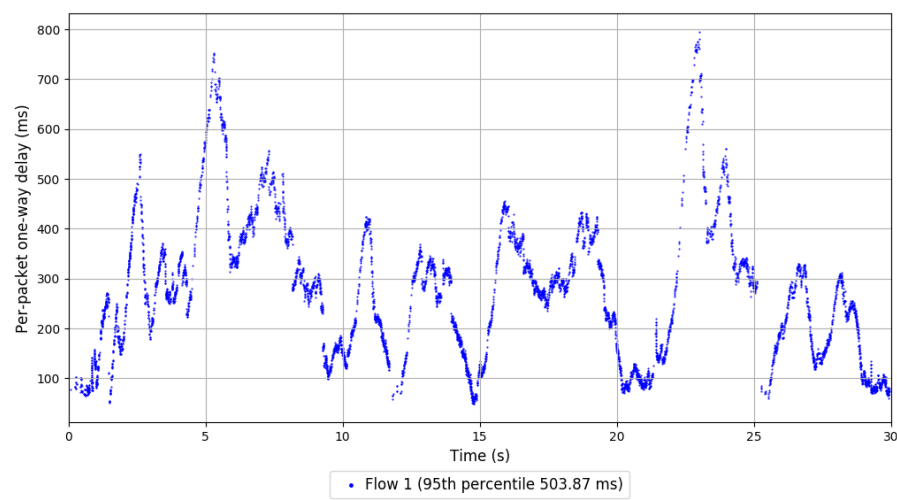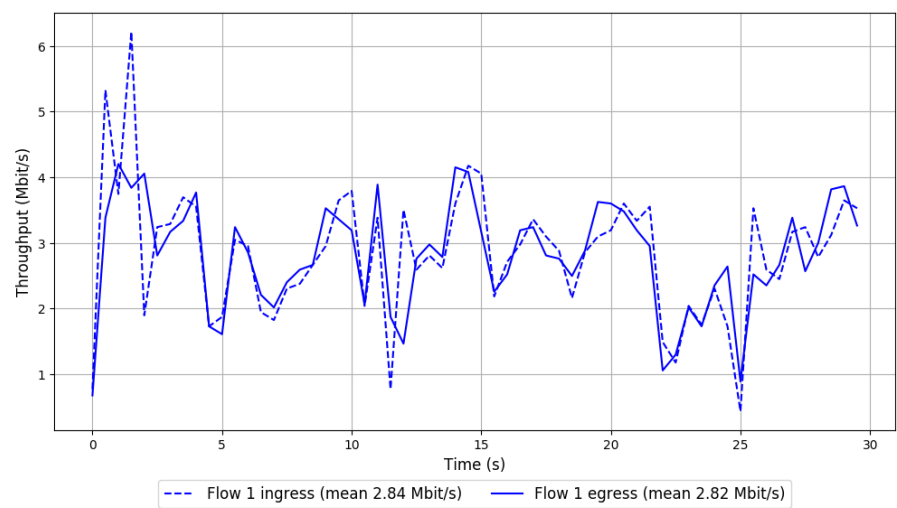
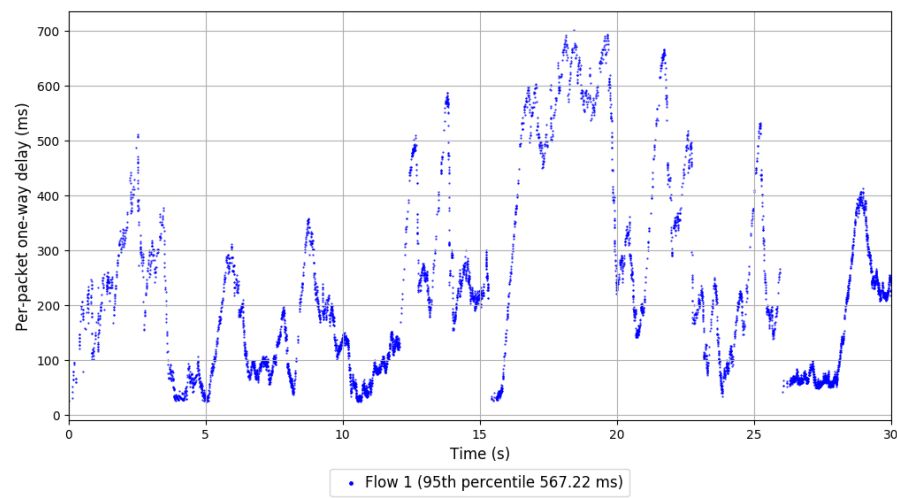Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 5.56 Mbit/s) Flow 1 egress (mean 5.43 Mbit/s)
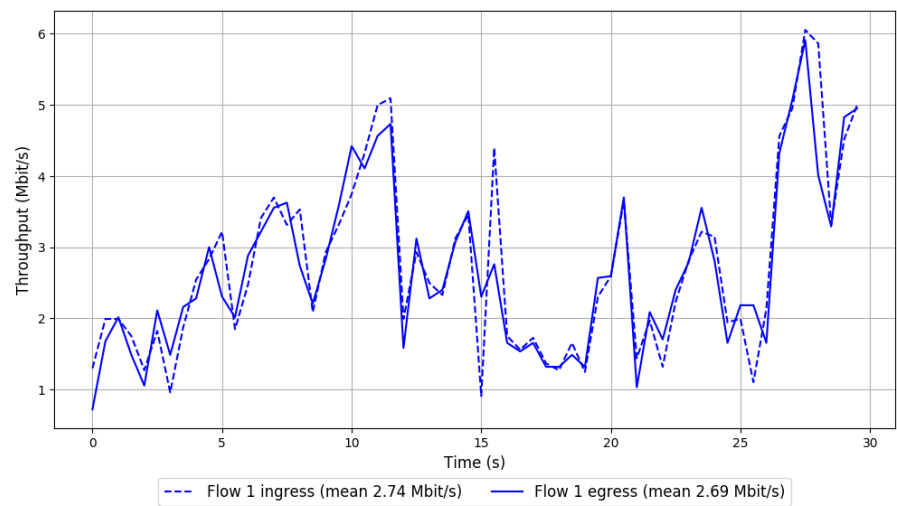

Flow 1 (95th percentile 387.43 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2018-02-01 13:15:55
End at: 2018-02-01 13:16:25
Local clock offset: 6.555 ms
Remote clock offset: -18.011 ms


# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 503.868 ms
Loss rate: 1.24%
-- Flow 1:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 503.868 ms
Loss rate: 1.24%
```
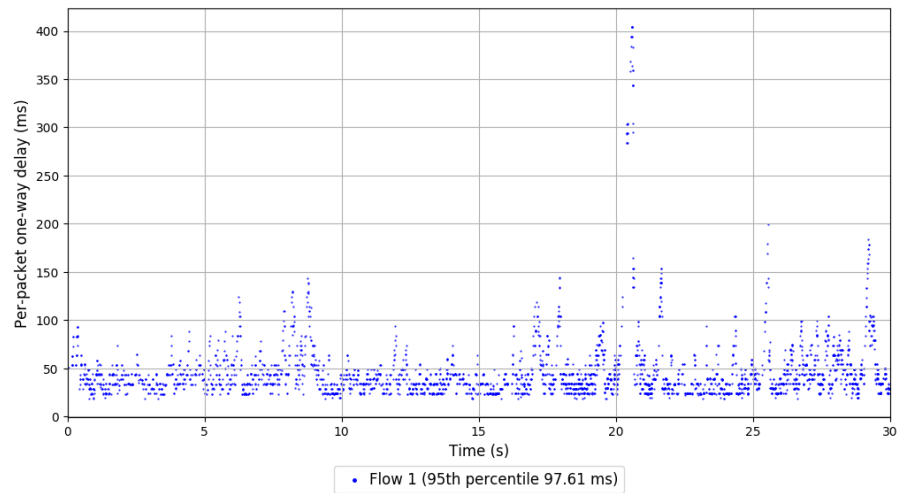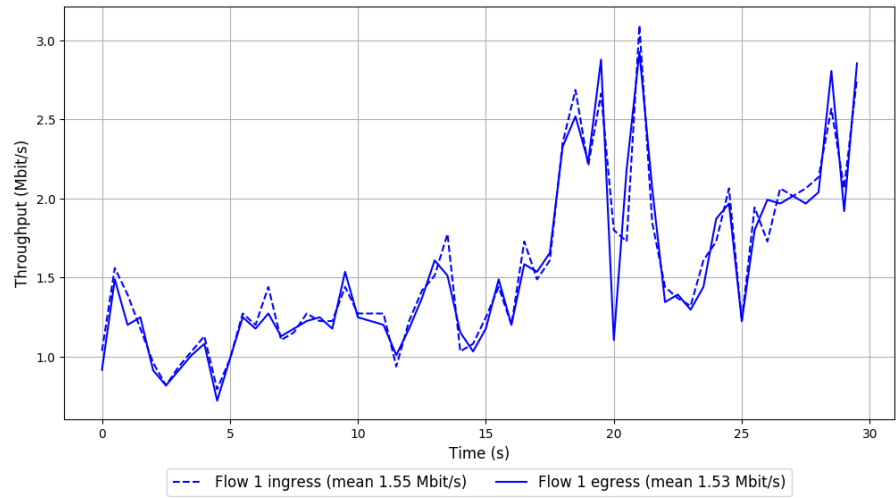
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2018-02-01 13:36:52
End at: 2018-02-01 13:37:22
Local clock offset: 3.249 ms
Remote clock offset: -14.818 ms


# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.69 Mbit/s
95th percentile per-packet one-way delay: 567.218 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 2.69 Mbit/s
95th percentile per-packet one-way delay: 567.218 ms
Loss rate: 1.97%
```
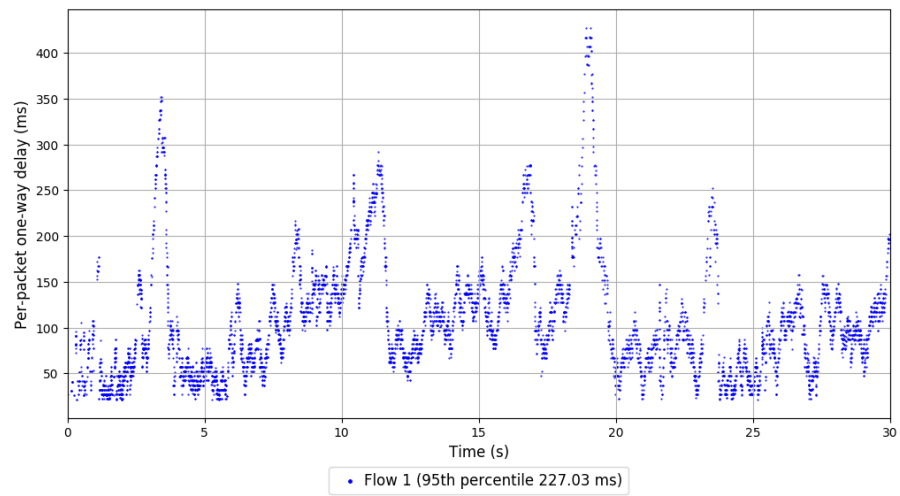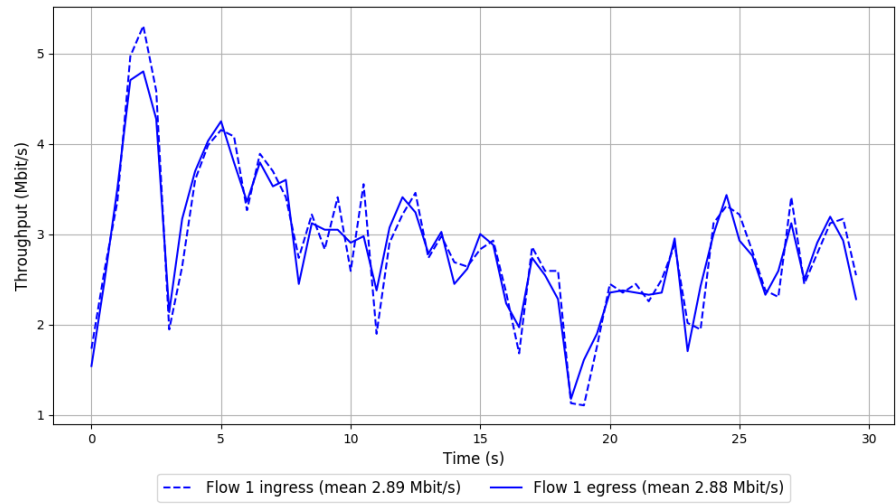
Run 3: Report of TCP BBR — Data Link

```
Run 1: Statistics of TCP Cubic

Start at: 2018-02-01 12:56:05
End at: 2018-02-01 12:56:35
Local clock offset: 3.437 ms
Remote clock offset: -20.564 ms


# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 97.610 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 97.610 ms
Loss rate: 1.44%
```
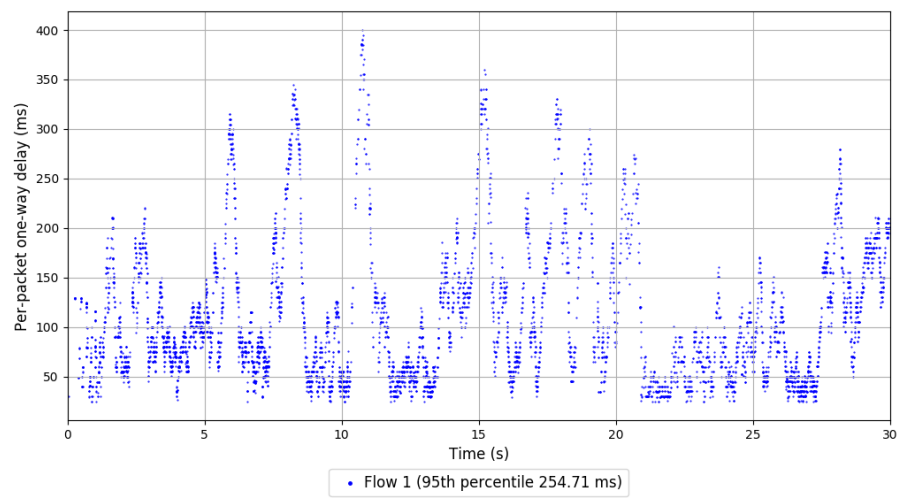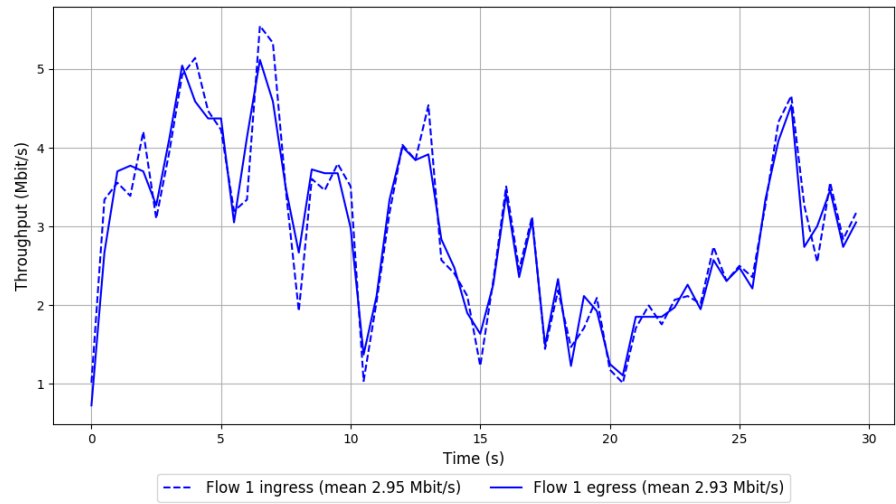
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2018-02-01 13:17:02
End at: 2018-02-01 13:17:32
Local clock offset: 6.068 ms
Remote clock offset: -17.401 ms


# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.88 Mbit/s
95th percentile per-packet one-way delay: 227.035 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 2.88 Mbit/s
95th percentile per-packet one-way delay: 227.035 ms
Loss rate: 0.60%
```
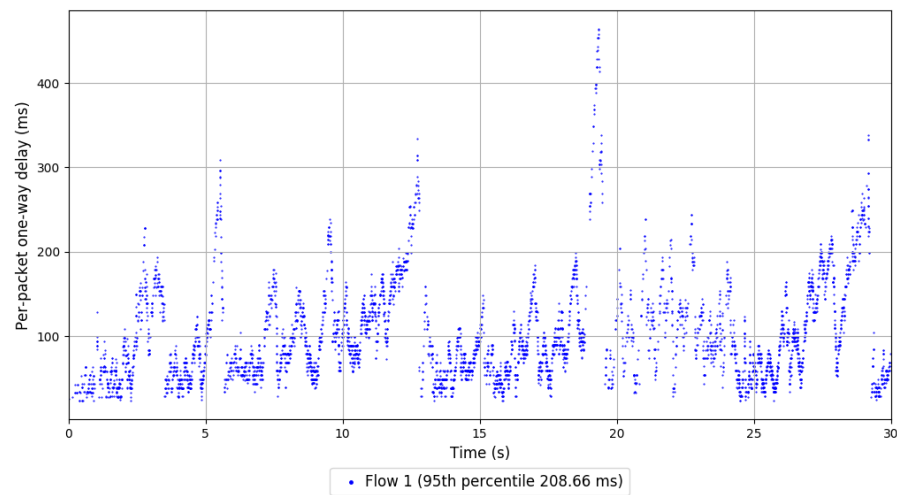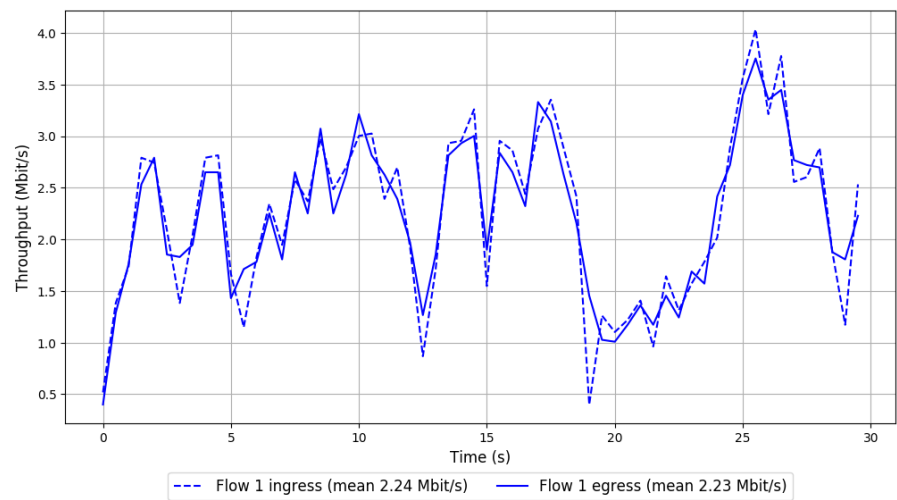
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 2.89 Mbit/s) — — — Flow 1 egress (mean 2.88 Mbit/s)

• Flow 1 (95th percentile 227.03 ms)

```
Run 3: Statistics of TCP Cubic

Start at: 2018-02-01 13:37:58
End at: 2018-02-01 13:38:28
Local clock offset: 3.344 ms
Remote clock offset: -16.12 ms


# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.93 Mbit/s
95th percentile per-packet one-way delay: 254.705 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 2.93 Mbit/s
95th percentile per-packet one-way delay: 254.705 ms
Loss rate: 0.83%
```
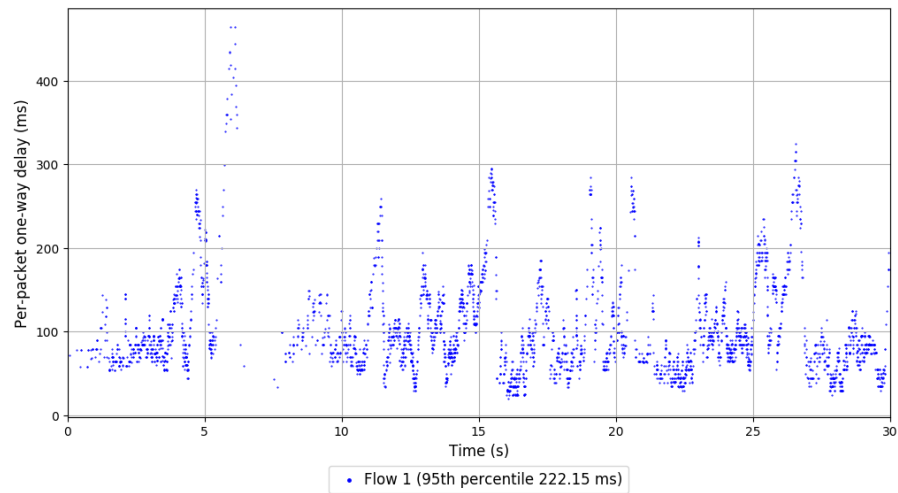
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 2.95 Mbit/s) ----   Flow 1 egress (mean 2.93 Mbit/s) ——
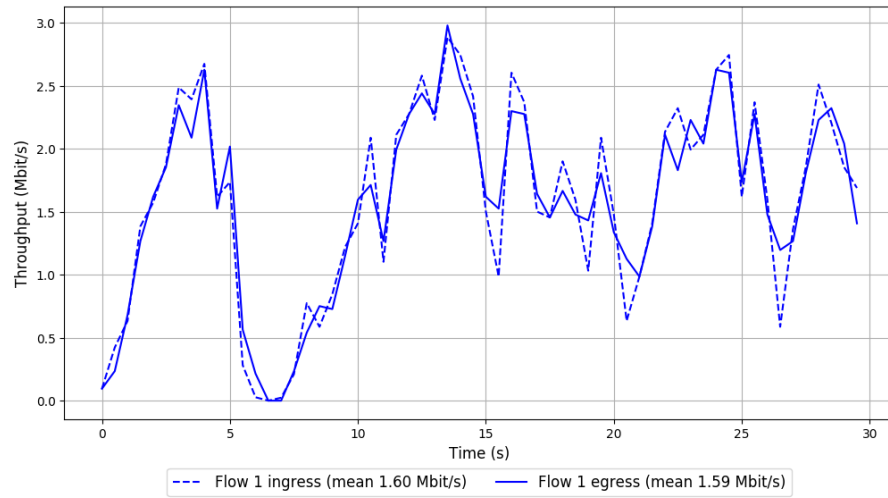

• Flow 1 (95th percentile 254.71 ms)

```
Run 1: Statistics of LEDBAT

Start at: 2018-02-01 12:52:45
End at: 2018-02-01 12:53:15
Local clock offset: 2.648 ms
Remote clock offset: -17.149 ms

# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 208.663 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 208.663 ms
Loss rate: 0.51%
```

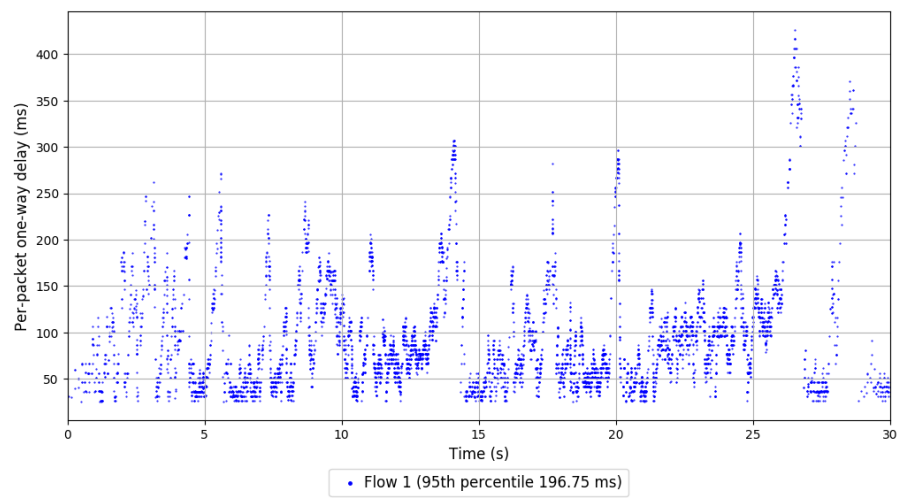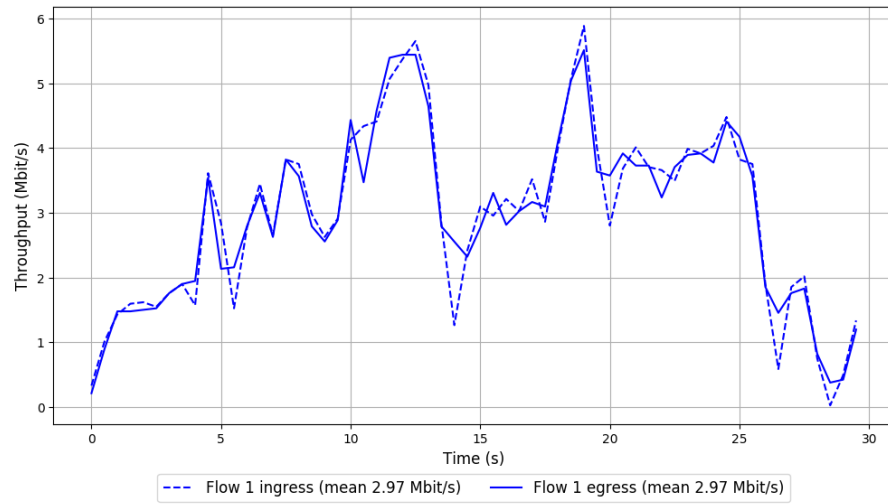Run 1: Report of LEDBAT — Data Link

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```
Run 2: Statistics of LEDBAT

Start at: 2018-02-01 13:13:43
End at: 2018-02-01 13:14:13
Local clock offset: 3.766 ms
Remote clock offset: -20.197 ms


# Below is generated by plot.py at 2018-02-01 13:41:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 222.152 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 222.152 ms
Loss rate: 0.71%
```

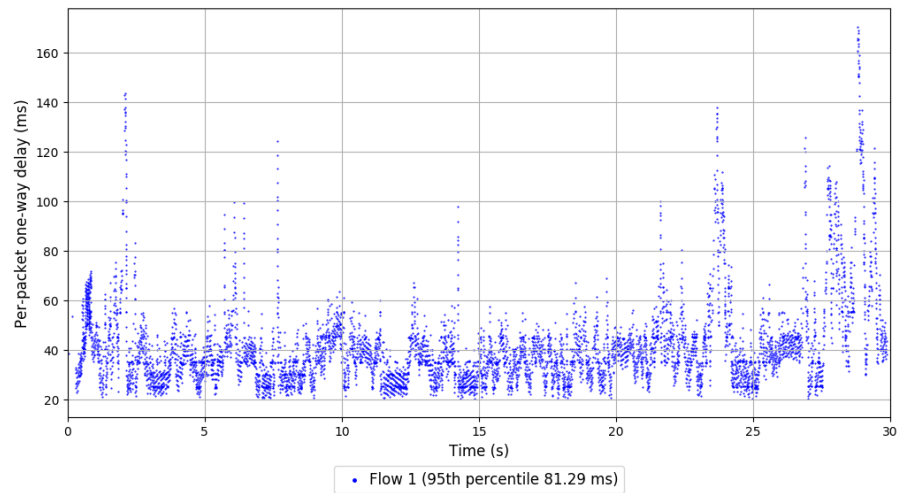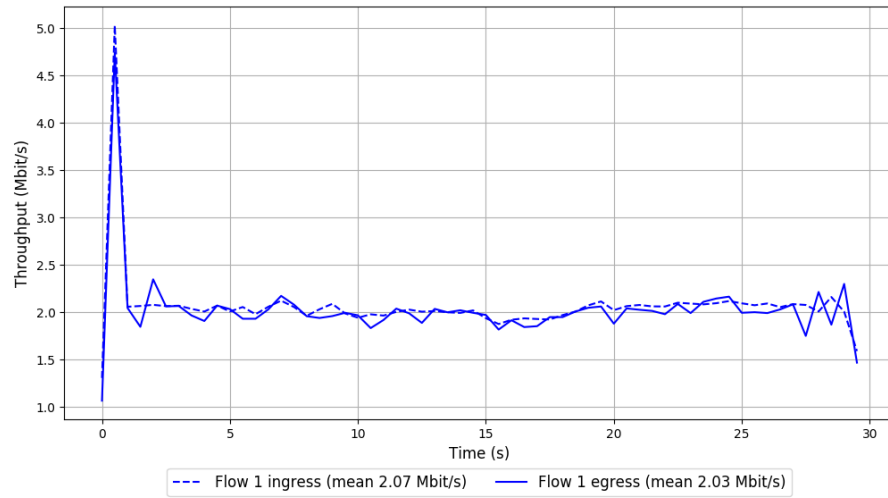Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 1.60 Mbit/s)   Flow 1 egress (mean 1.59 Mbit/s)

Flow 1 (95th percentile 222.15 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2018-02-01 13:34:40
End at: 2018-02-01 13:35:10
Local clock offset: 4.559 ms
Remote clock offset: -17.27 ms


# Below is generated by plot.py at 2018-02-01 13:41:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.97 Mbit/s
95th percentile per-packet one-way delay: 196.753 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.97 Mbit/s
95th percentile per-packet one-way delay: 196.753 ms
Loss rate: 0.20%
```

Run 3: Report of LEDBAT — Data Link

Flow 1 ingress (mean 2.97 Mbit/s)   Flow 1 egress (mean 2.97 Mbit/s)

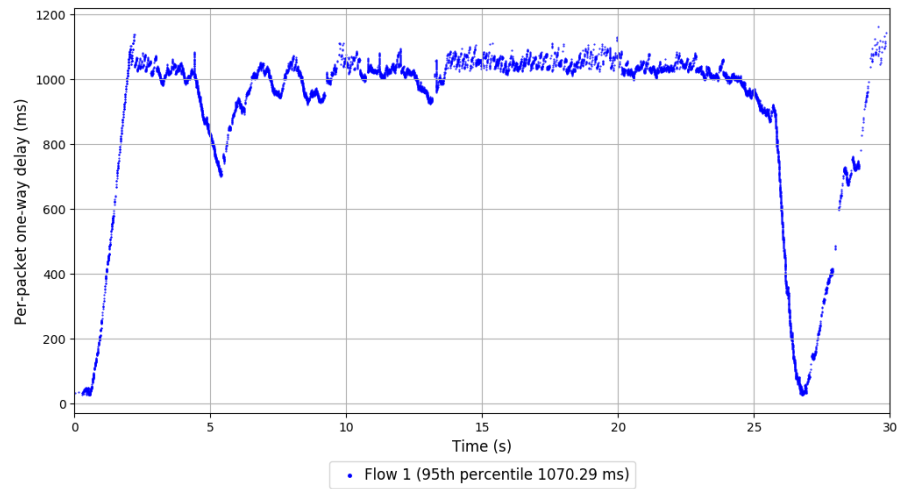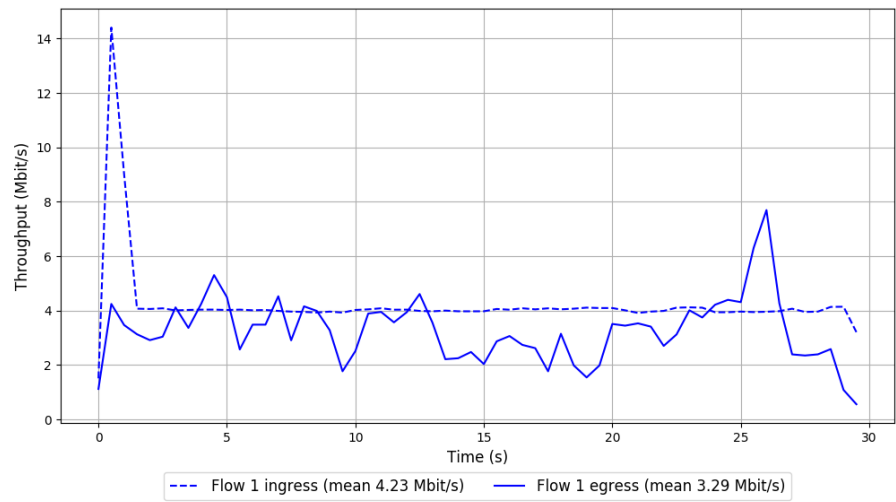• Flow 1 (95th percentile 196.75 ms)

```
Run 1: Statistics of PCC

Start at: 2018-02-01 12:40:39
End at: 2018-02-01 12:41:09
Local clock offset: 3.66 ms
Remote clock offset: -17.158 ms

# Below is generated by plot.py at 2018-02-01 13:41:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 81.292 ms
Loss rate: 1.94%
-- Flow 1:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 81.292 ms
Loss rate: 1.94%
```

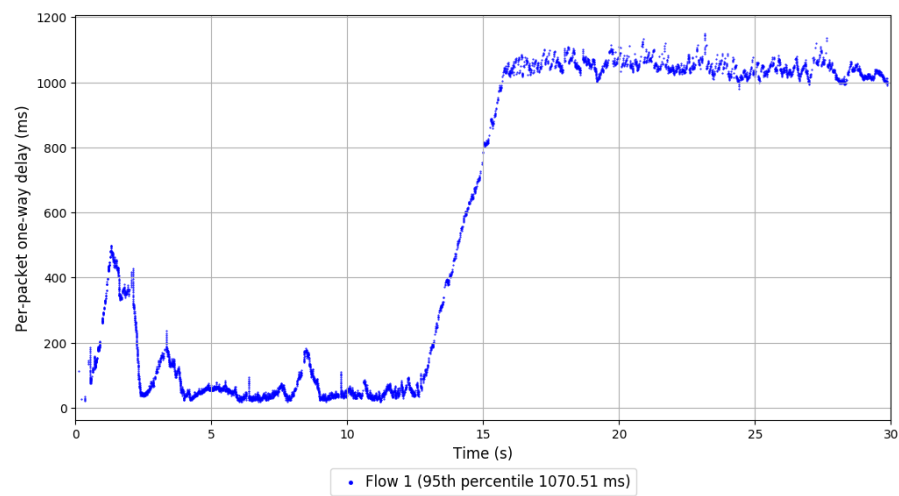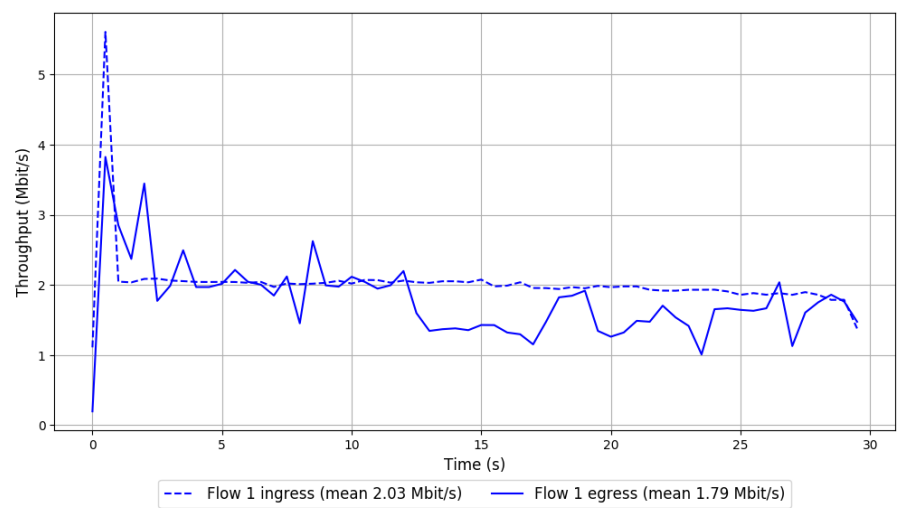Run 1: Report of PCC — Data Link

```
Run 2: Statistics of PCC

Start at: 2018-02-01 13:01:37
End at: 2018-02-01 13:02:07
Local clock offset: 5.602 ms
Remote clock offset: -18.973 ms


# Below is generated by plot.py at 2018-02-01 13:41:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 1070.289 ms
Loss rate: 22.50%
-- Flow 1:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 1070.289 ms
Loss rate: 22.50%
```

Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 4.23 Mbit/s)   Flow 1 egress (mean 3.29 Mbit/s)
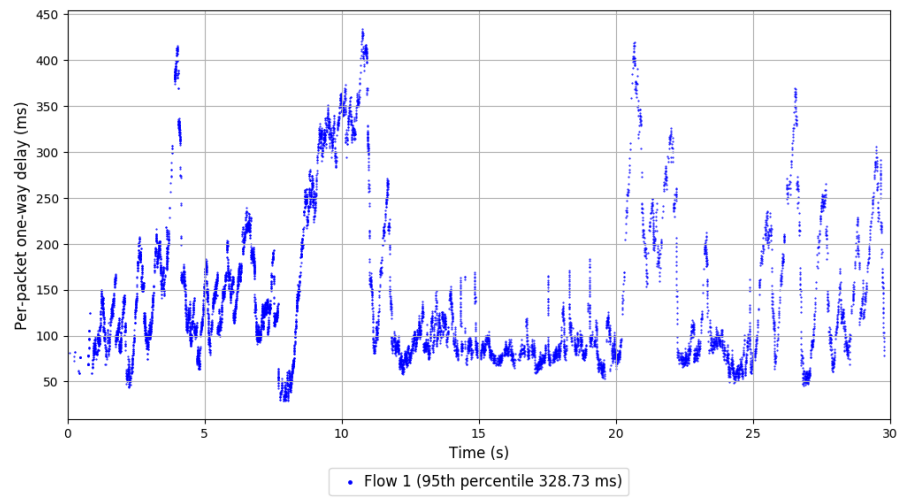

Flow 1 (95th percentile 1070.29 ms)

25

```
Run 3: Statistics of PCC

Start at: 2018-02-01 13:22:34
End at: 2018-02-01 13:23:04
Local clock offset: 5.057 ms
Remote clock offset: -16.903 ms


# Below is generated by plot.py at 2018-02-01 13:41:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 1070.508 ms
Loss rate: 12.01%
-- Flow 1:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 1070.508 ms
Loss rate: 12.01%
```

Run 3: Report of PCC — Data Link

```
Run 1: Statistics of QUIC Cubic

Start at: 2018-02-01 12:46:10
End at: 2018-02-01 12:46:40
Local clock offset: 3.552 ms
Remote clock offset: -18.55 ms
```

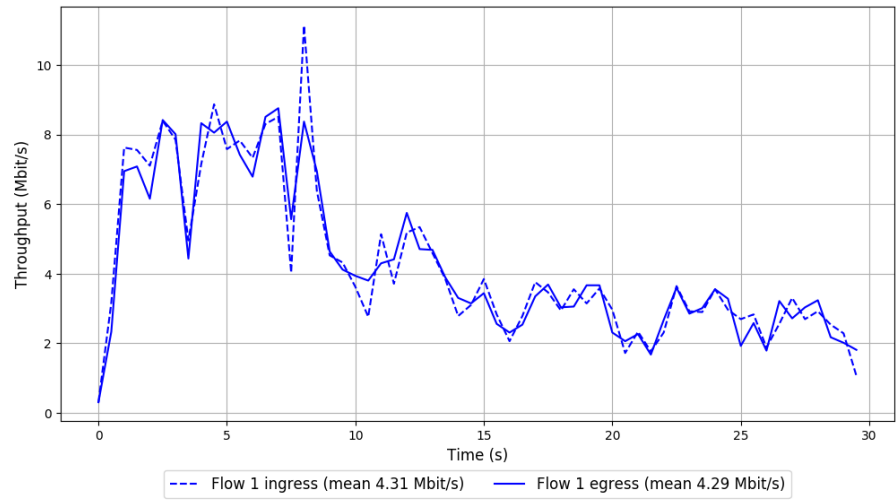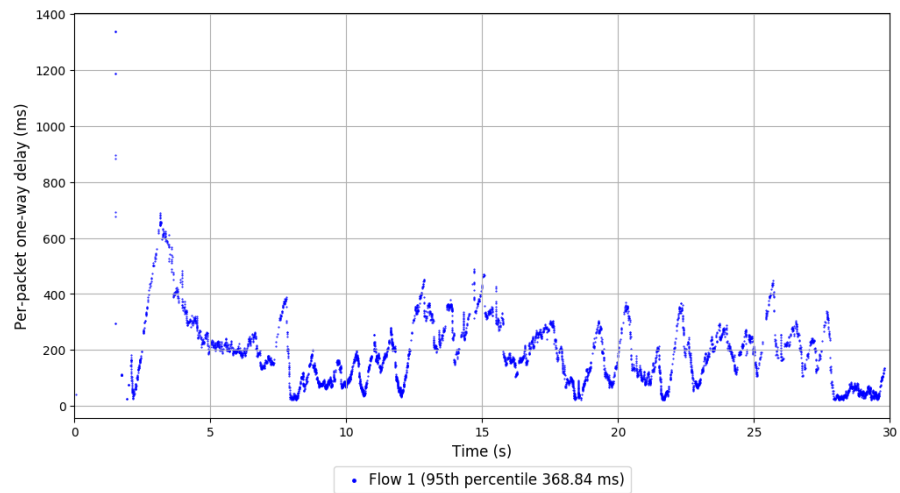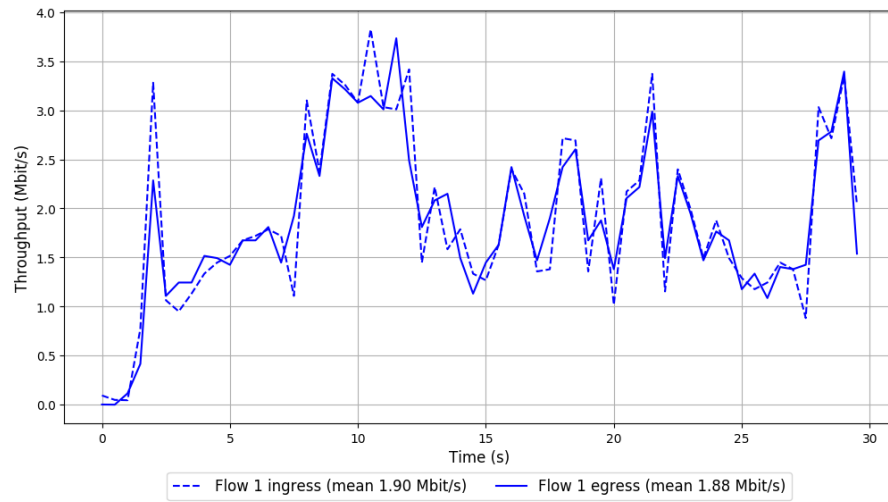Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2018-02-01 13:07:08
End at: 2018-02-01 13:07:38
Local clock offset: 3.889 ms
Remote clock offset: -18.665 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.29 Mbit/s
95th percentile per-packet one-way delay: 328.732 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 4.29 Mbit/s
95th percentile per-packet one-way delay: 328.732 ms
Loss rate: 0.87%
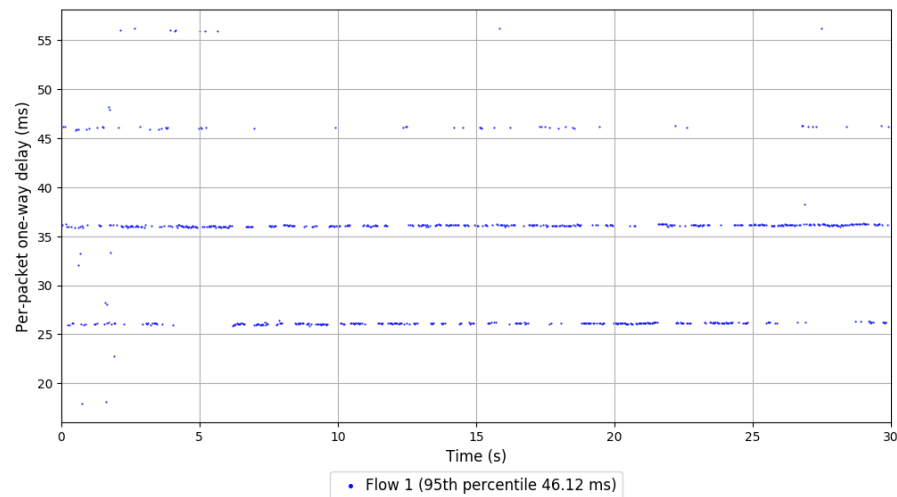```
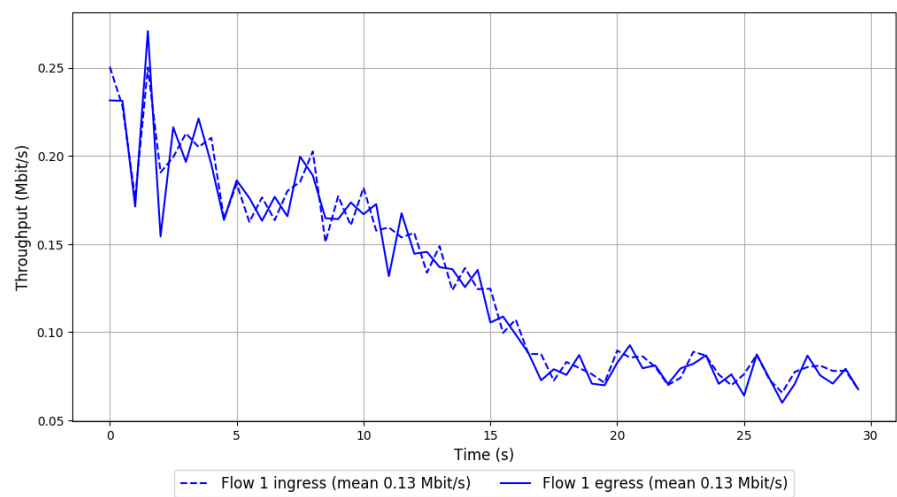
Run 2: Report of QUIC Cubic — Data Link



Flow 1 ingress (mean 4.31 Mbit/s)     Flow 1 egress (mean 4.29 Mbit/s)



Flow 1 (95th percentile 328.73 ms)

```
Run 3: Statistics of QUIC Cubic

Start at: 2018-02-01 13:28:05
End at: 2018-02-01 13:28:35
Local clock offset: 3.037 ms
Remote clock offset: -16.171 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 368.838 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 368.838 ms
Loss rate: 1.33%
```

Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 1.90 Mbit/s) --- Flow 1 egress (mean 1.88 Mbit/s)

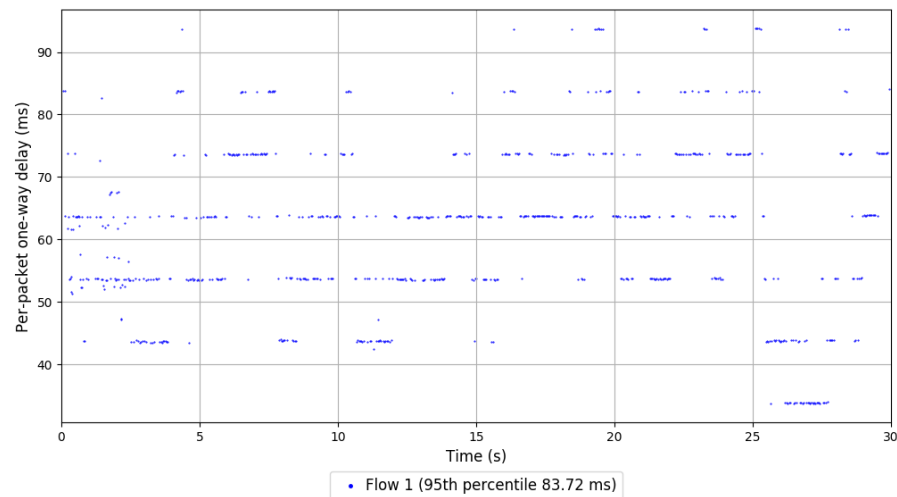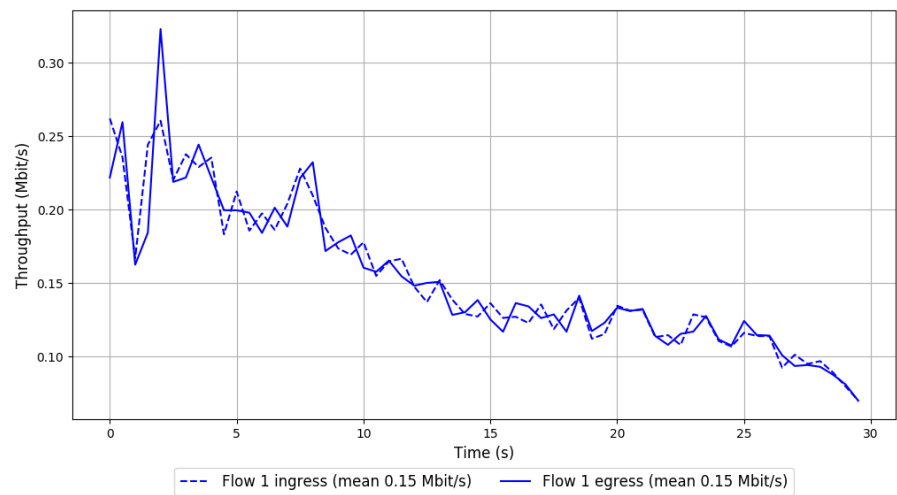
• Flow 1 (95th percentile 368.84 ms)

```
Run 1: Statistics of SCReAM

Start at: 2018-02-01 12:39:33
End at: 2018-02-01 12:40:03
Local clock offset: 2.074 ms
Remote clock offset: -20.406 ms

# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 46.118 ms
Loss rate: 1.30%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 46.118 ms
Loss rate: 1.30%
```
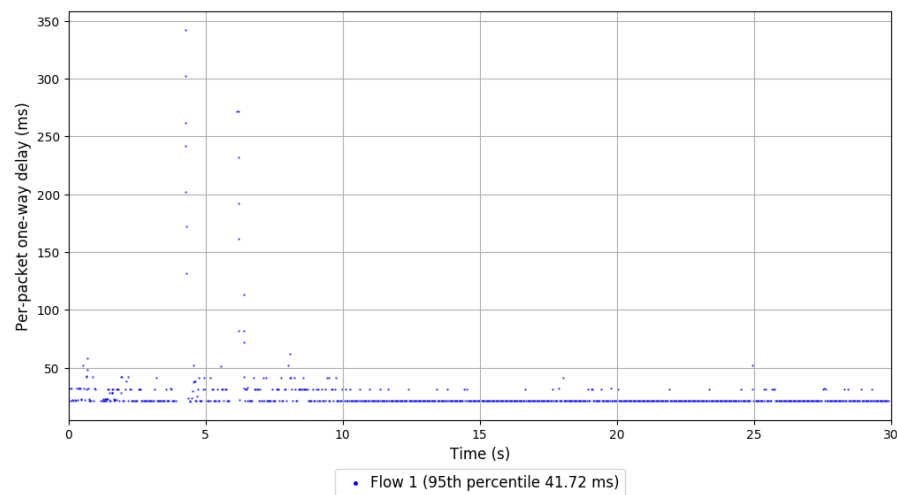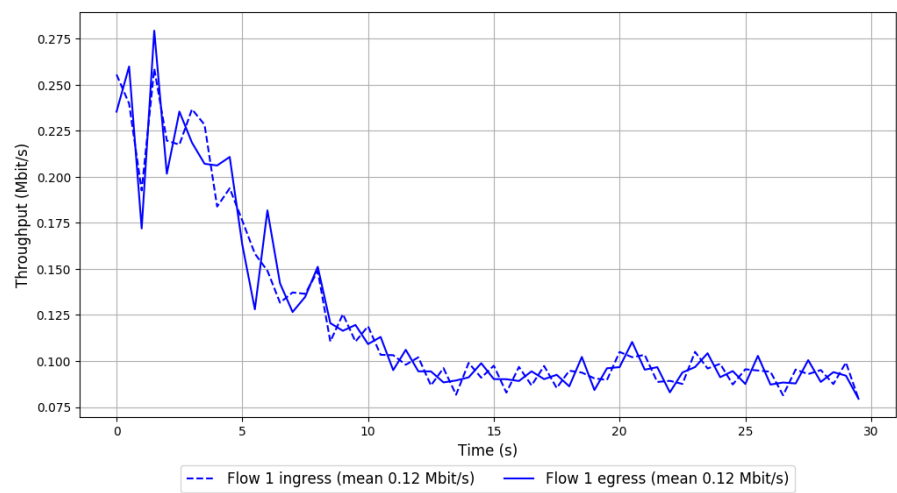
Run 1: Report of SCReAM — Data Link

```
Run 2: Statistics of SCReAM

Start at: 2018-02-01 13:00:32
End at: 2018-02-01 13:01:02
Local clock offset: 3.222 ms
Remote clock offset: -19.02 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 83.718 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 83.718 ms
Loss rate: 0.30%
```
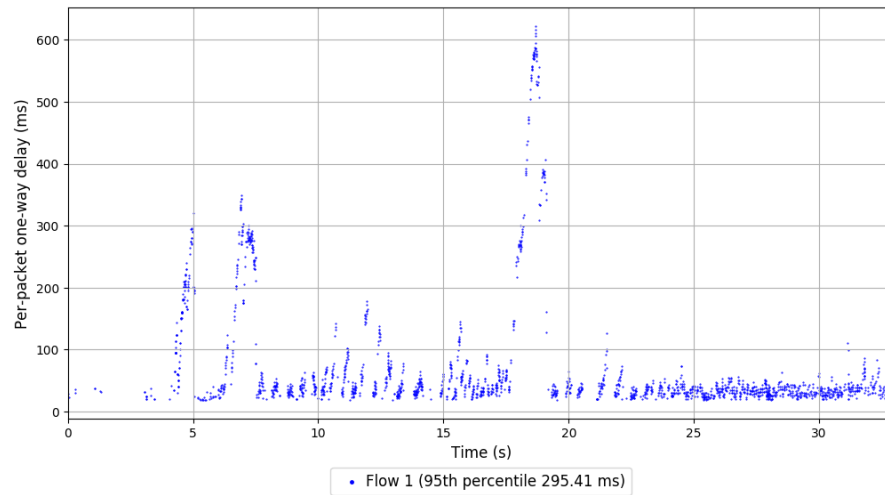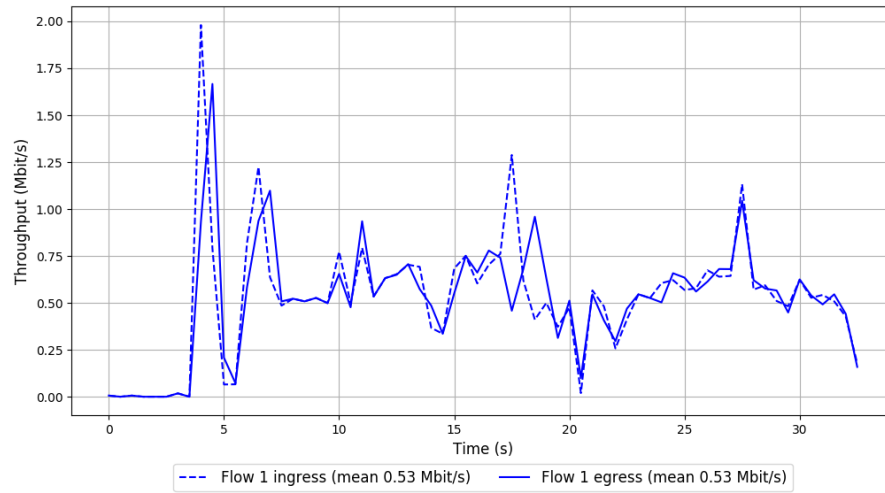
Run 2: Report of SCReAM — Data Link

```
Run 3: Statistics of SCReAM

Start at: 2018-02-01 13:21:28
End at: 2018-02-01 13:21:59
Local clock offset: 5.307 ms
Remote clock offset: -16.402 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 41.716 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 41.716 ms
Loss rate: 0.10%
```
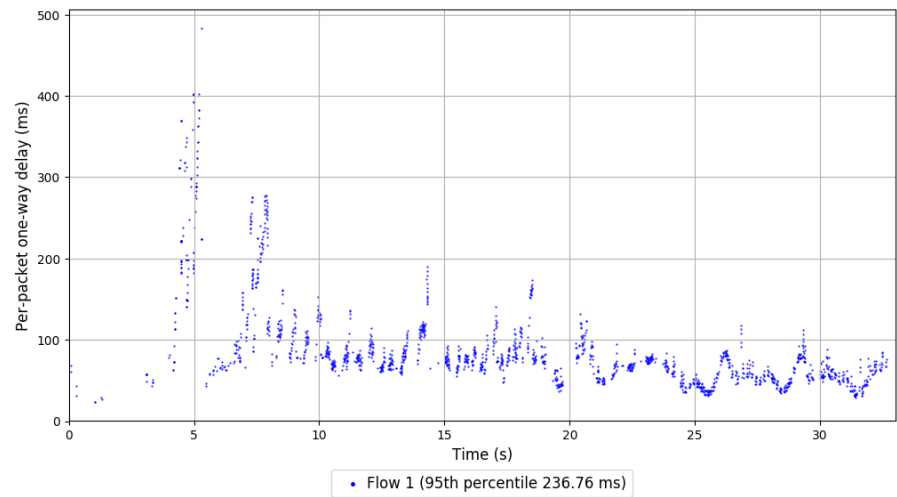
Run 3: Report of SCReAM — Data Link

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```
Run 1: Statistics of WebRTC media

Start at: 2018-02-01 12:53:51
End at: 2018-02-01 12:54:21
Local clock offset: 3.259 ms
Remote clock offset: -18.81 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 295.409 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 295.409 ms
Loss rate: 0.44%
```
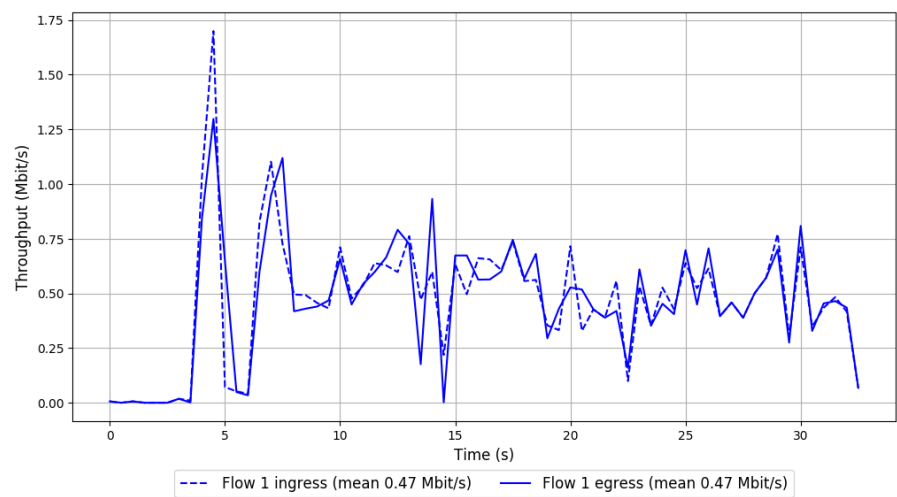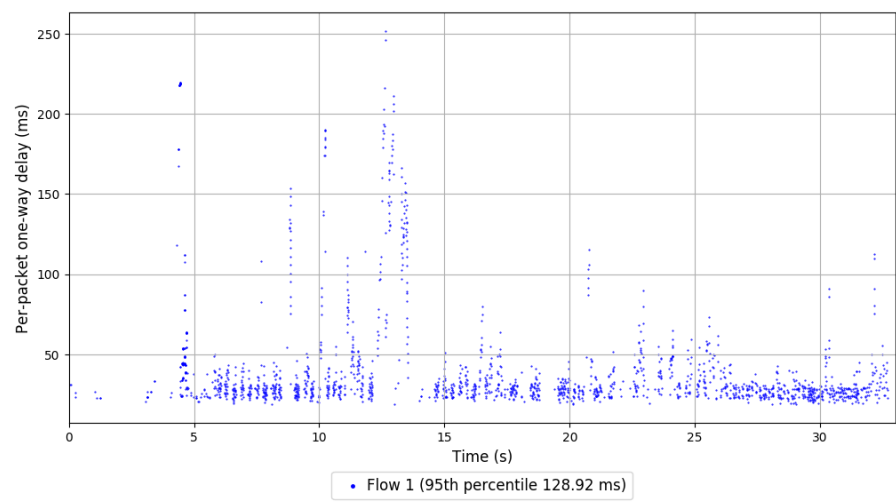
Run 1: Report of WebRTC media — Data Link

```
Run 2: Statistics of WebRTC media

Start at: 2018-02-01 13:14:49
End at: 2018-02-01 13:15:19
Local clock offset: 6.383 ms
Remote clock offset: -18.927 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 236.760 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 236.760 ms
Loss rate: 0.20%
```
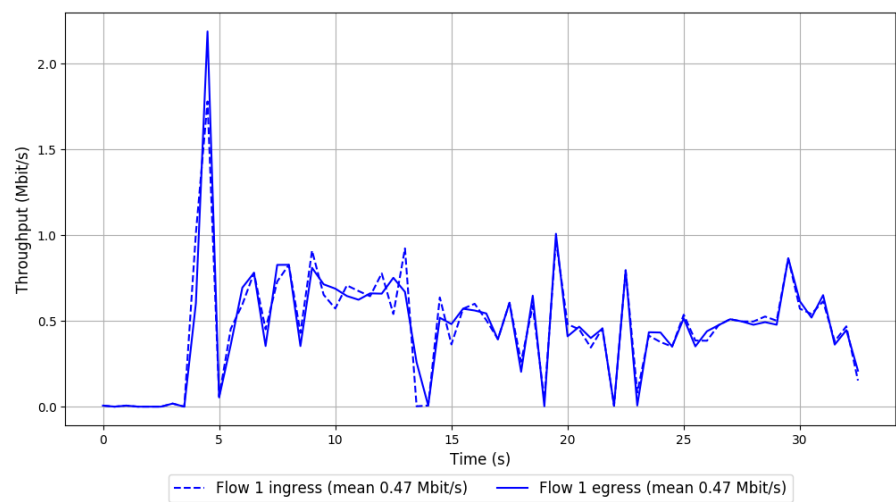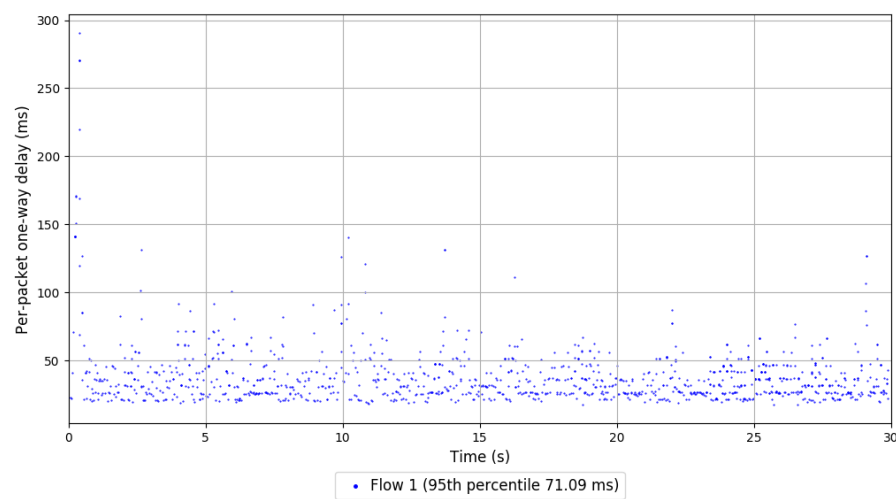
Run 2: Report of WebRTC media — Data Link

```
Run 3: Statistics of WebRTC media

Start at: 2018-02-01 13:35:47
End at: 2018-02-01 13:36:17
Local clock offset: 2.689 ms
Remote clock offset: -16.992 ms


# Below is generated by plot.py at 2018-02-01 13:41:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 128.924 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 128.924 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

Flow 1 ingress (mean 0.47 Mbit/s)   Flow 1 egress (mean 0.47 Mbit/s)
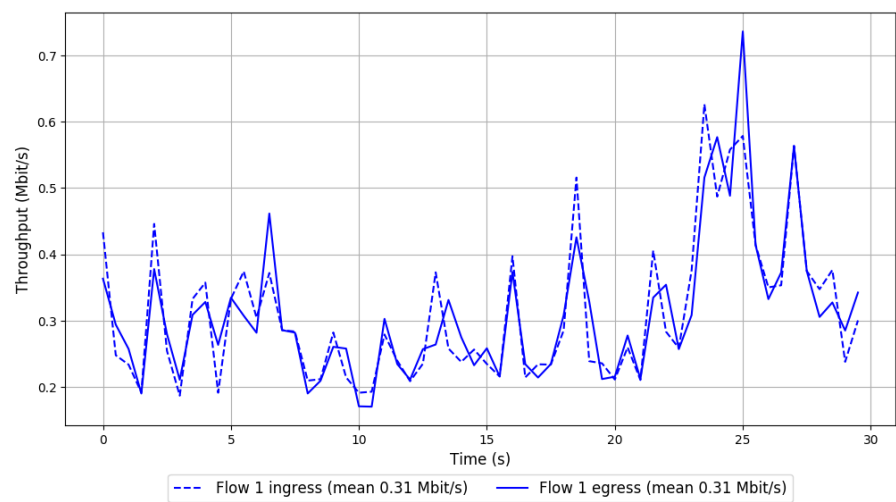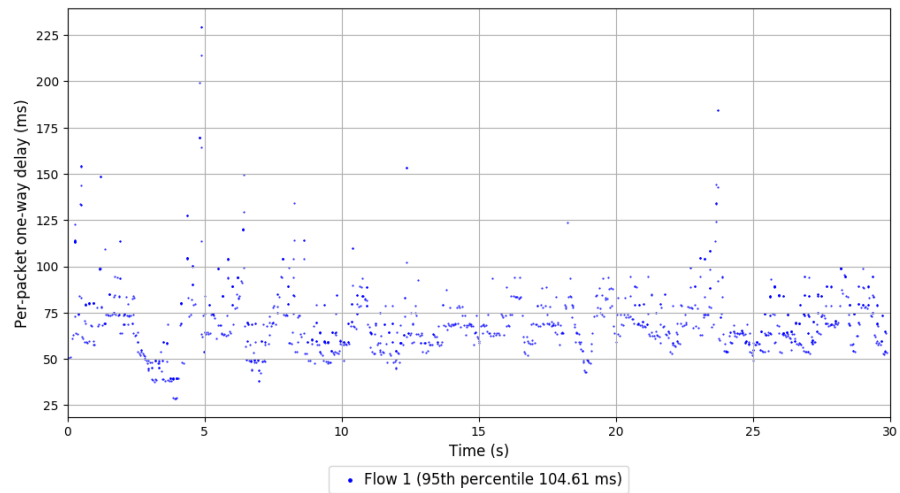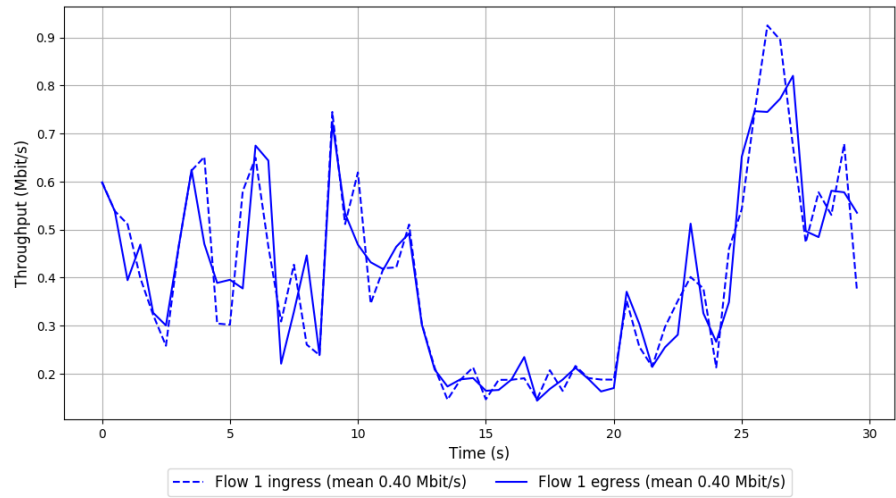

Flow 1 (95th percentile 128.92 ms)

```
Run 1: Statistics of Sprout

Start at: 2018-02-01 12:48:22
End at: 2018-02-01 12:48:52
Local clock offset: 3.221 ms
Remote clock offset: -19.476 ms


# Below is generated by plot.py at 2018-02-01 13:41:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 71.091 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 71.091 ms
Loss rate: 0.01%
```

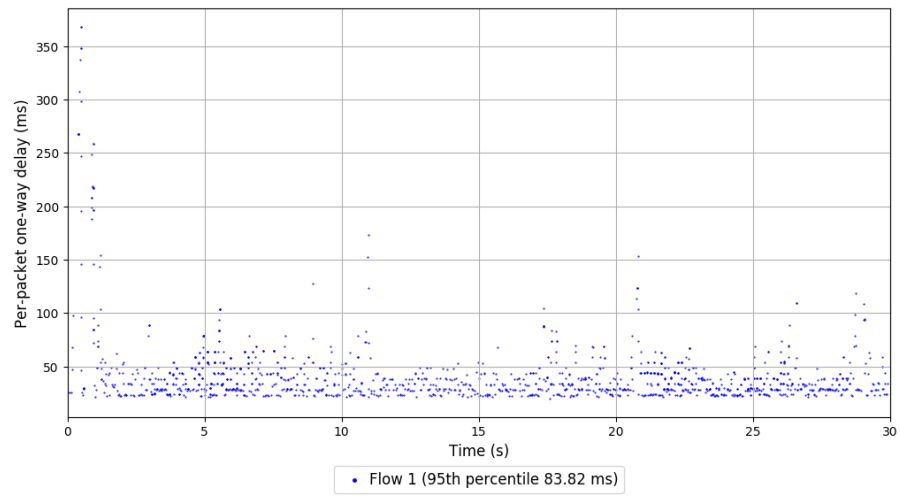Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2018-02-01 13:09:20
End at: 2018-02-01 13:09:50
Local clock offset: 4.013 ms
Remote clock offset: -19.068 ms


# Below is generated by plot.py at 2018-02-01 13:41:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 104.608 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 104.608 ms
Loss rate: 0.49%
```

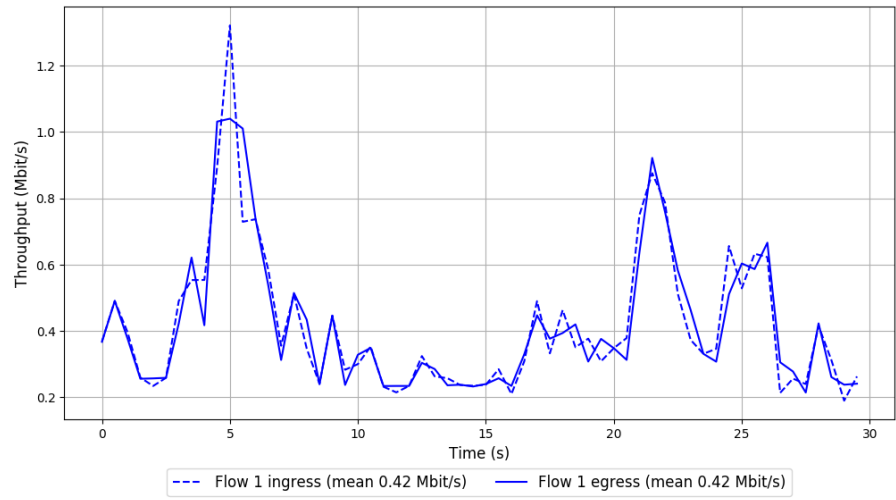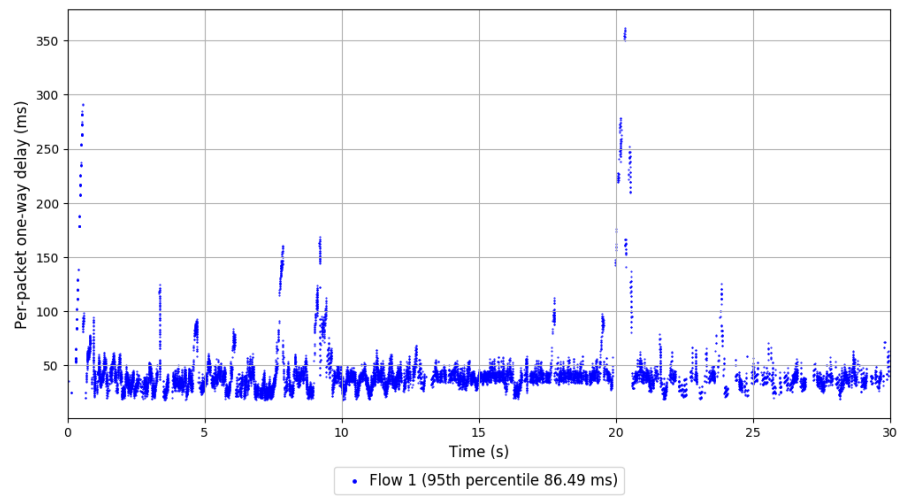Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2018-02-01 13:30:17
End at: 2018-02-01 13:30:47
Local clock offset: 2.902 ms
Remote clock offset: -16.07 ms


# Below is generated by plot.py at 2018-02-01 13:41:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 83.824 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 83.824 ms
Loss rate: 0.17%
```

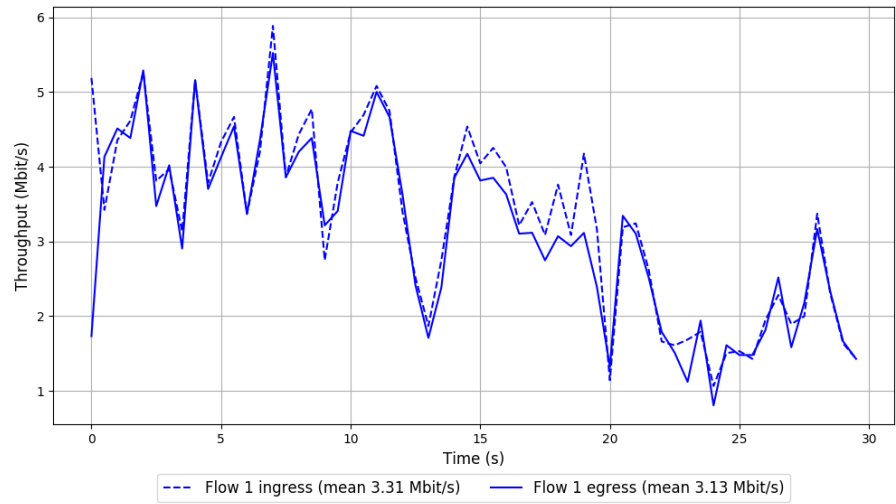Run 3: Report of Sprout — Data Link

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

Start at: 2018-02-01 12:42:51
End at: 2018-02-01 12:43:21
Local clock offset: 2.671 ms
Remote clock offset: -19.133 ms


# Below is generated by plot.py at 2018-02-01 13:41:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 86.494 ms
Loss rate: 5.46%
-- Flow 1:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 86.494 ms
Loss rate: 5.46%
```
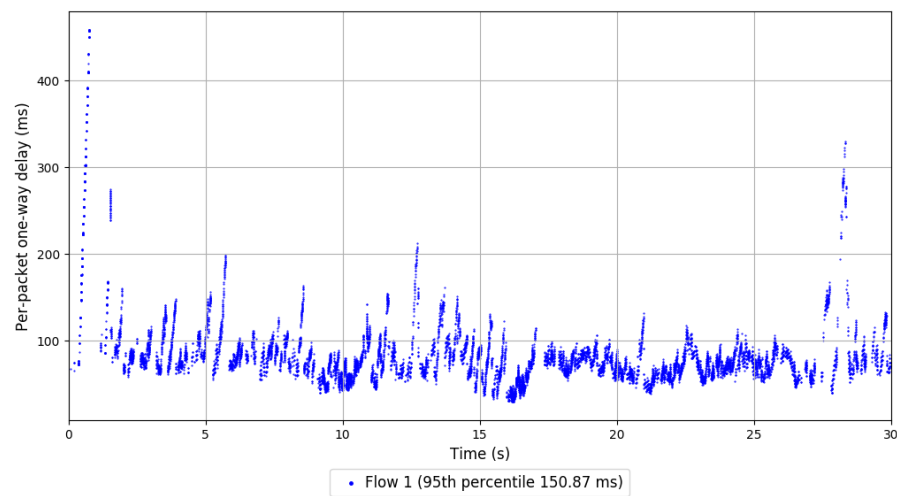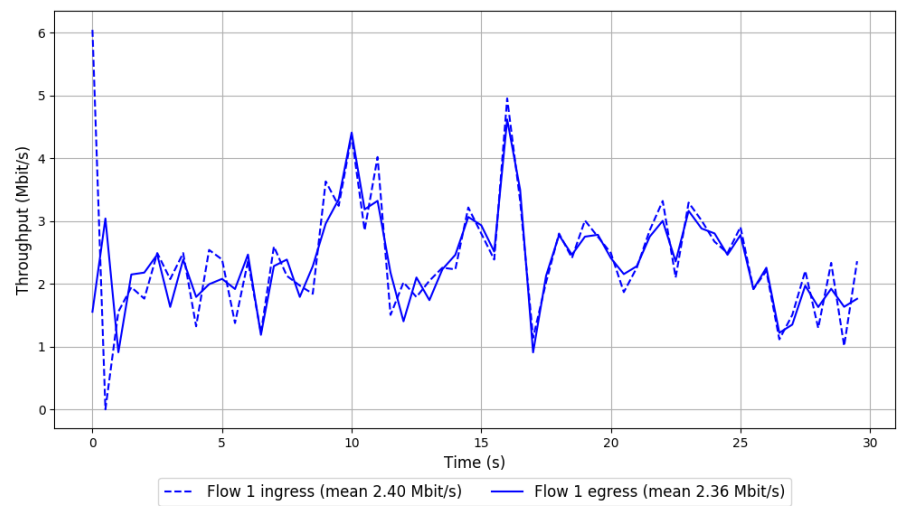
Run 1: Report of TaoVA-100x — Data Link

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

Start at: 2018-02-01 13:03:49
End at: 2018-02-01 13:04:19
Local clock offset: 5.529 ms
Remote clock offset: -20.944 ms


# Below is generated by plot.py at 2018-02-01 13:41:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 150.866 ms
Loss rate: 2.16%
-- Flow 1:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 150.866 ms
Loss rate: 2.16%
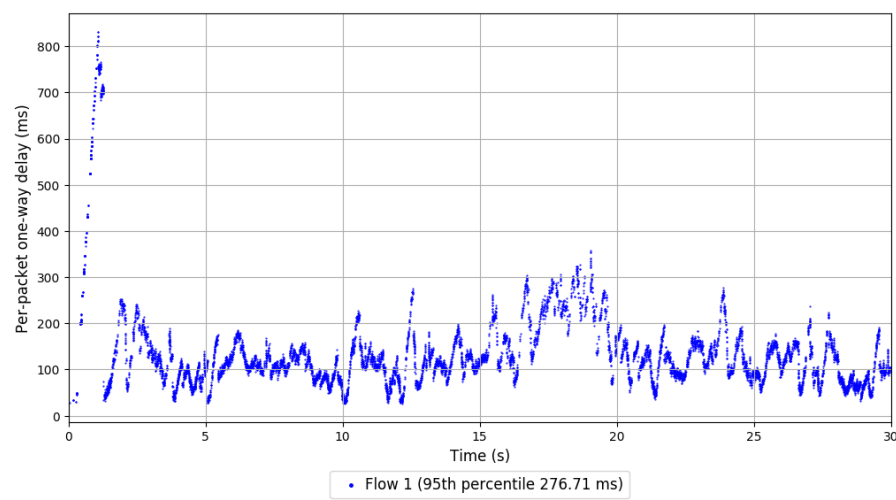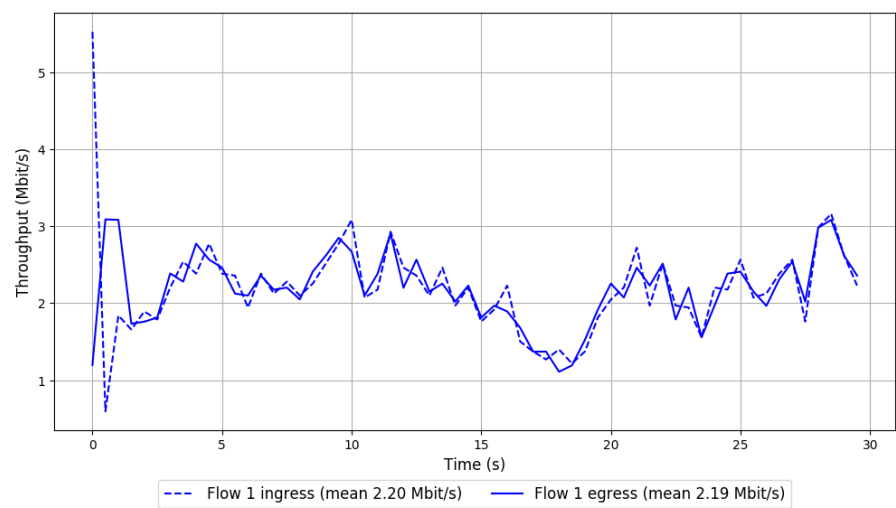```

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

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

Start at: 2018-02-01 13:24:46
End at: 2018-02-01 13:25:16
Local clock offset: 4.108 ms
Remote clock offset: -16.767 ms

Below is generated by plot.py at 2018-02-01 13:41:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.19 Mbit/s
95th percentile per-packet one-way delay: 276.708 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 2.19 Mbit/s
95th percentile per-packet one-way delay: 276.708 ms
Loss rate: 0.40%
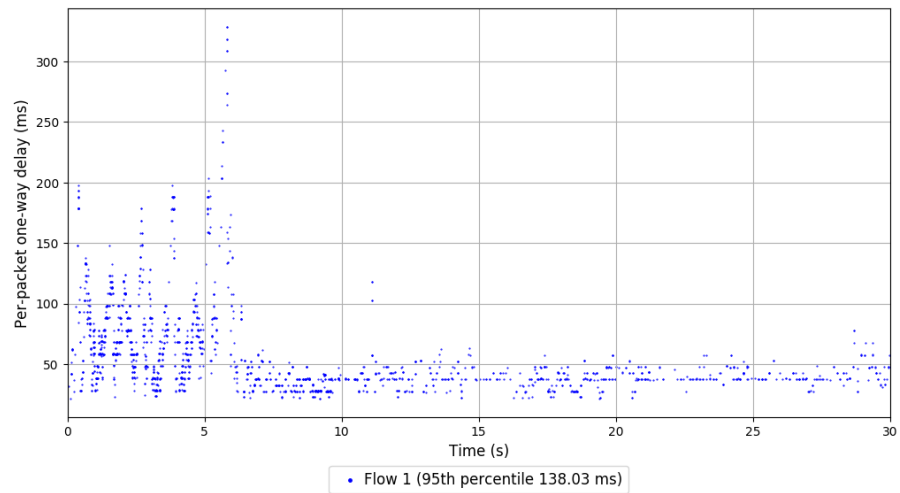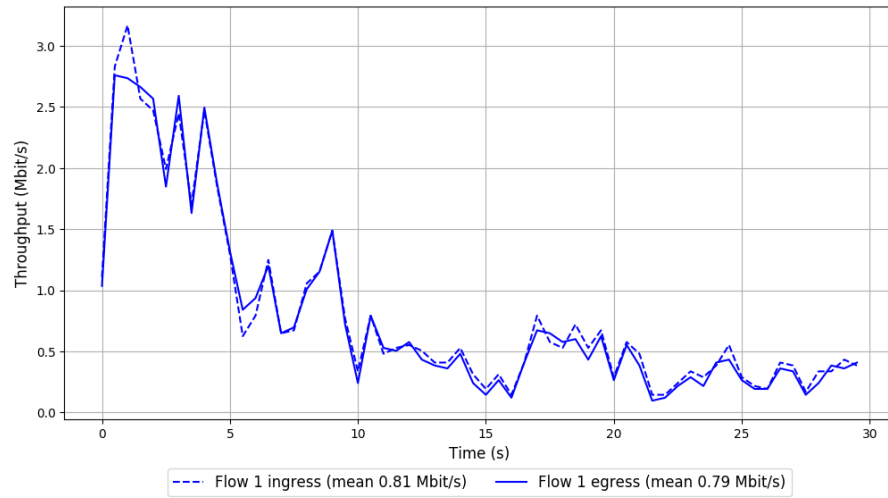```

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

```
Run 1: Statistics of TCP Vegas

Start at: 2018-02-01 12:45:04
End at: 2018-02-01 12:45:34
Local clock offset: 1.828 ms
Remote clock offset: -19.387 ms


# Below is generated by plot.py at 2018-02-01 13:41:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 138.030 ms
Loss rate: 3.21%
-- Flow 1:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 138.030 ms
Loss rate: 3.21%
```
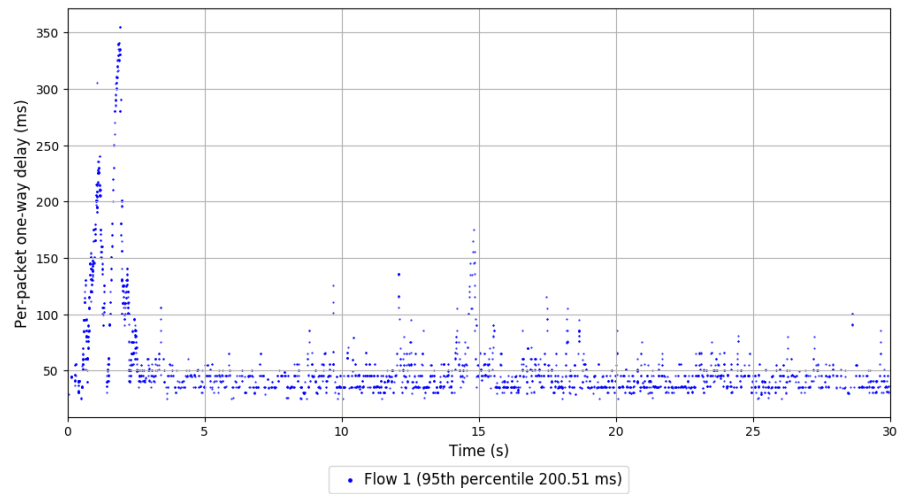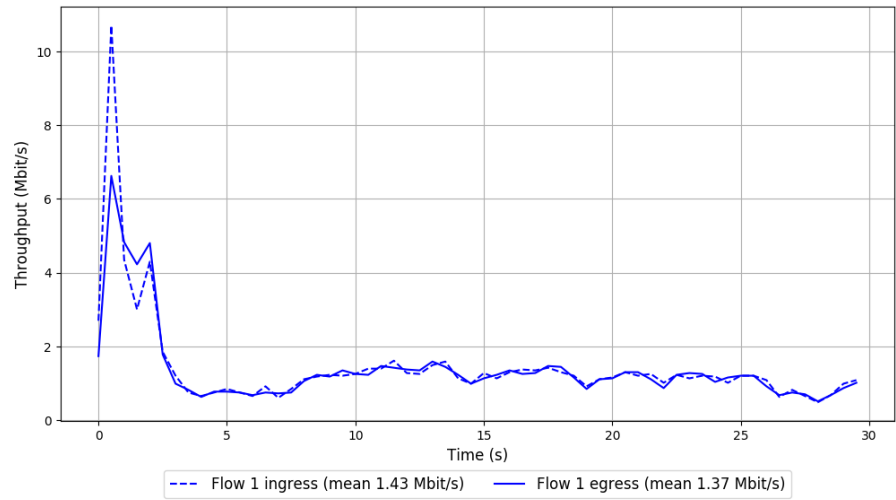
Run 1: Report of TCP Vegas — Data Link

```
Run 2: Statistics of TCP Vegas

Start at: 2018-02-01 13:06:02
End at: 2018-02-01 13:06:32
Local clock offset: 6.59 ms
Remote clock offset: -19.864 ms


# Below is generated by plot.py at 2018-02-01 13:41:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 200.509 ms
Loss rate: 4.26%
-- Flow 1:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 200.509 ms
Loss rate: 4.26%
```
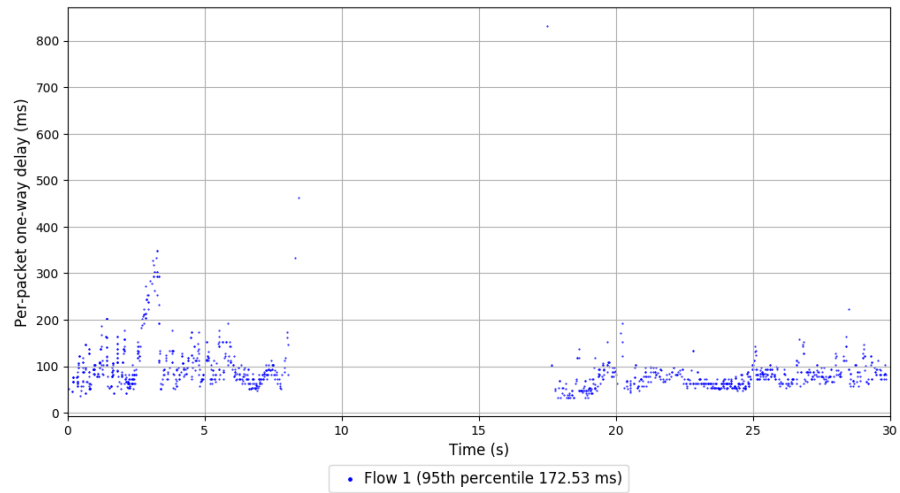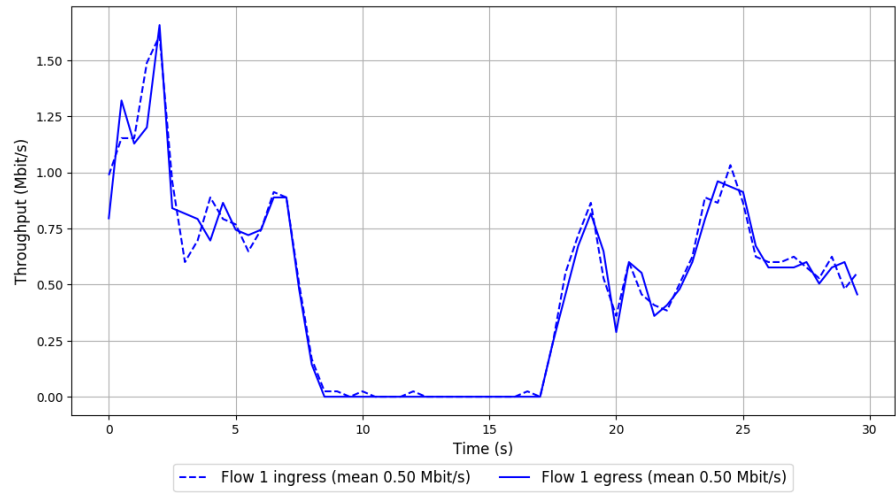
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2018-02-01 13:26:59
End at: 2018-02-01 13:27:29
Local clock offset: 6.115 ms
Remote clock offset: -18.68 ms


# Below is generated by plot.py at 2018-02-01 13:41:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 172.528 ms
Loss rate: 1.99%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 172.528 ms
Loss rate: 1.99%
```

Run 3: Report of TCP Vegas — Data Link

```
Run 1: Statistics of Verus

Start at: 2018-02-01 12:57:11
End at: 2018-02-01 12:57:41
Local clock offset: 4.923 ms
Remote clock offset: -17.6 ms


# Below is generated by plot.py at 2018-02-01 13:42:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 309.304 ms
Loss rate: 12.08%
-- Flow 1:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 309.304 ms
Loss rate: 12.08%
```
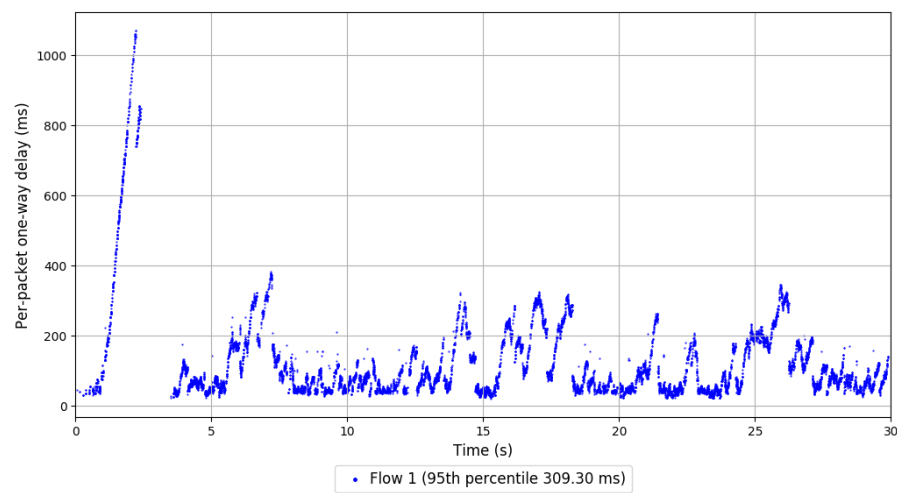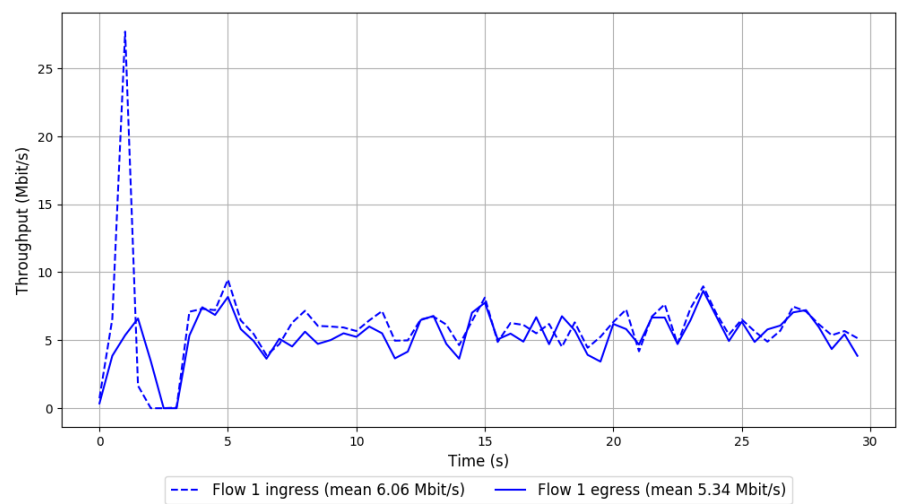
Run 1: Report of Verus — Data Link

Flow 1 ingress (mean 6.06 Mbit/s) --- Flow 1 egress (mean 5.34 Mbit/s)

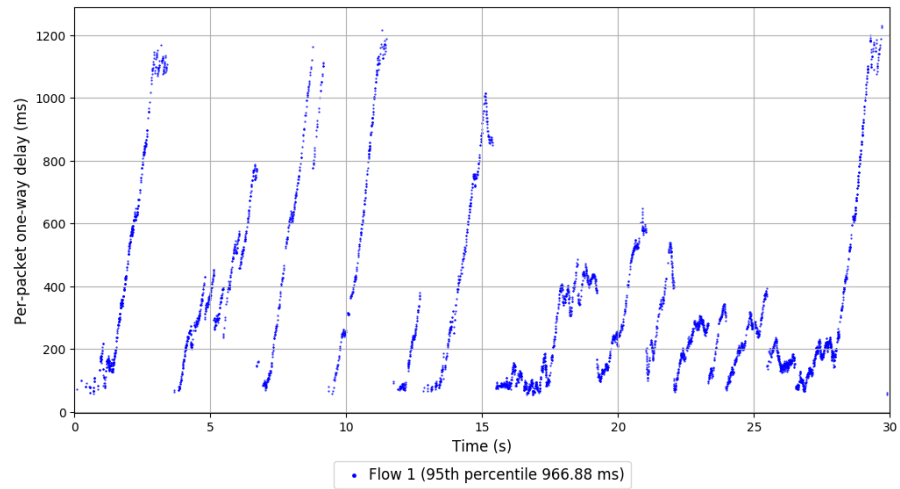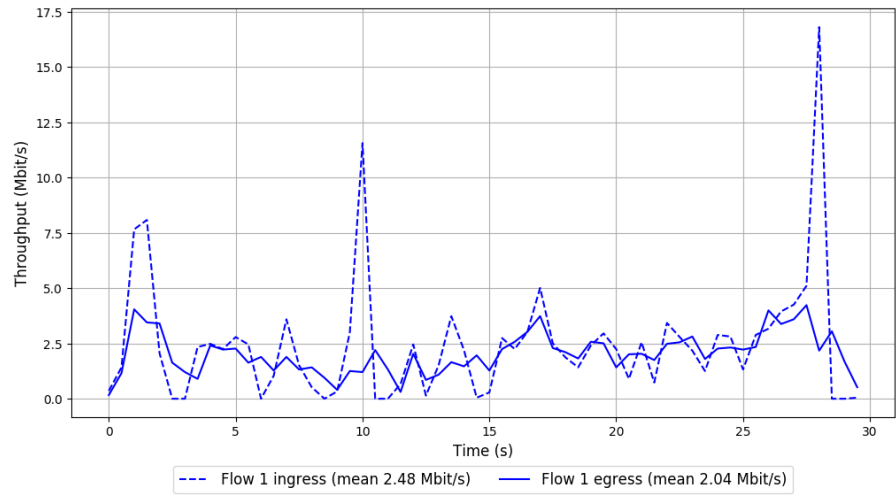Flow 1 (95th percentile 309.30 ms)

```
Run 2: Statistics of Verus

Start at: 2018-02-01 13:18:09
End at: 2018-02-01 13:18:39
Local clock offset: 4.739 ms
Remote clock offset: -17.467 ms


# Below is generated by plot.py at 2018-02-01 13:42:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 966.881 ms
Loss rate: 17.72%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 966.881 ms
Loss rate: 17.72%
```

Run 2: Report of Verus — Data Link

Flow 1 ingress (mean 2.48 Mbit/s)   Flow 1 egress (mean 2.04 Mbit/s)

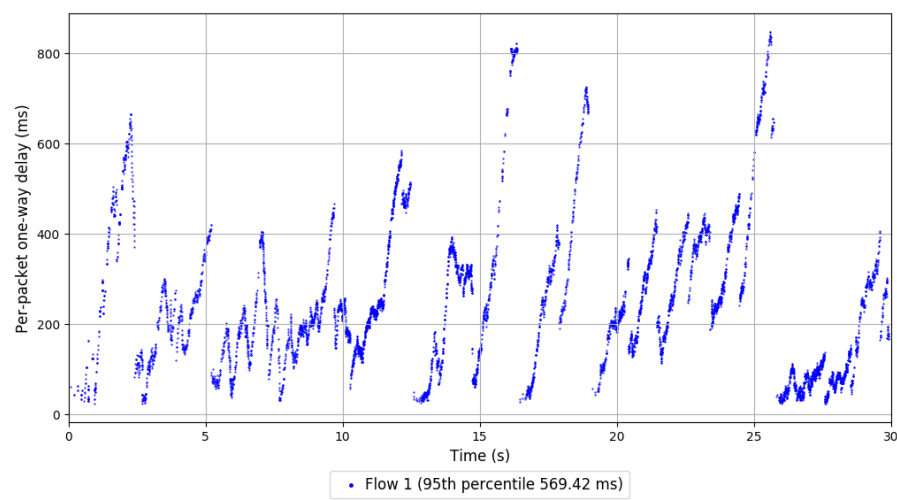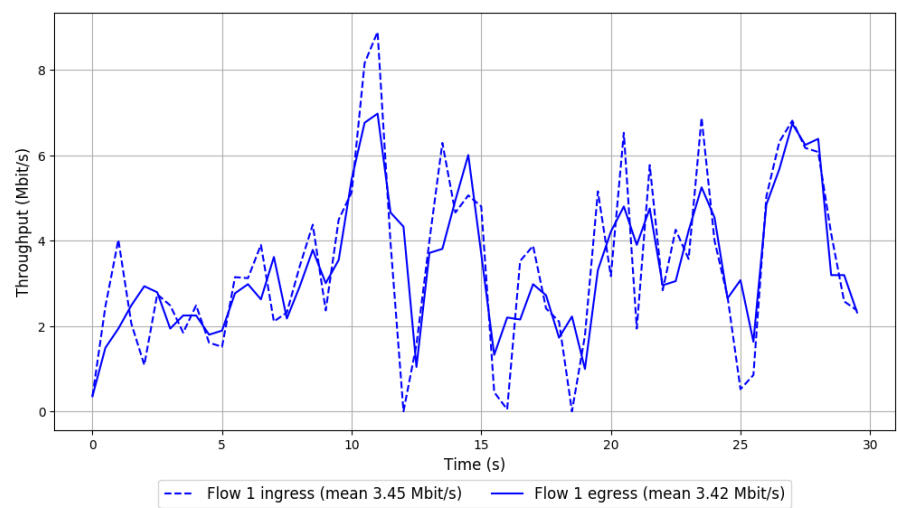Flow 1 (95th percentile 966.88 ms)

```
Run 3: Statistics of Verus

Start at: 2018-02-01 13:39:05
End at: 2018-02-01 13:39:35
Local clock offset: 5.07 ms
Remote clock offset: -16.495 ms


# Below is generated by plot.py at 2018-02-01 13:42:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 569.425 ms
Loss rate: 1.01%
-- Flow 1:
Average throughput: 3.42 Mbit/s
95th percentile per-packet one-way delay: 569.425 ms
Loss rate: 1.01%
```

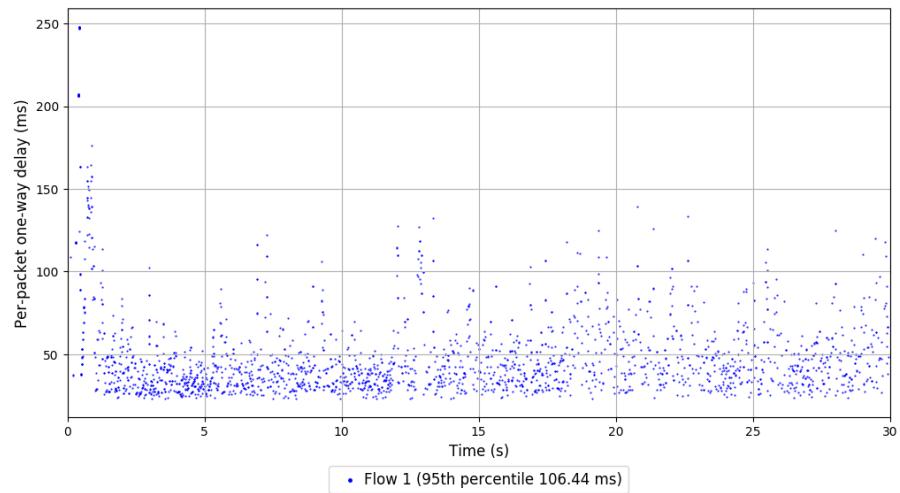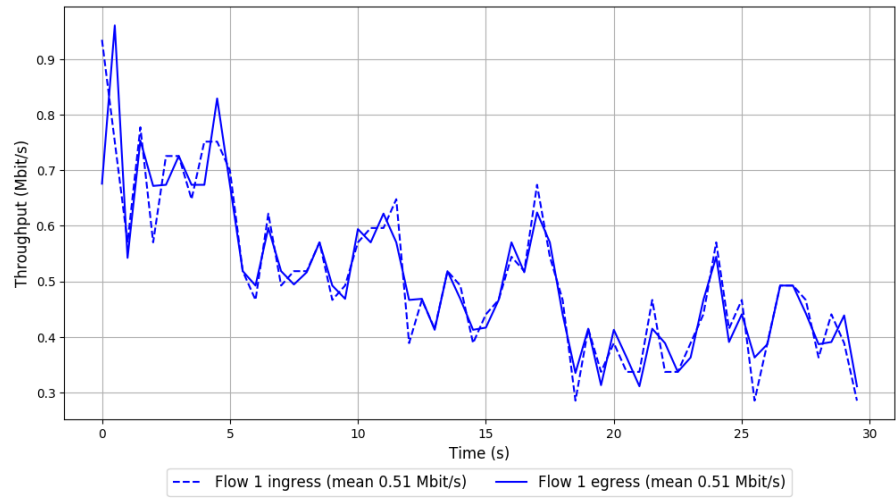Run 3: Report of Verus — Data Link

```
Run 1: Statistics of Copa

Start at: 2018-02-01 12:49:28
End at: 2018-02-01 12:49:58
Local clock offset: 2.323 ms
Remote clock offset: -20.593 ms


# Below is generated by plot.py at 2018-02-01 13:42:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 106.442 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 106.442 ms
Loss rate: 0.00%
```

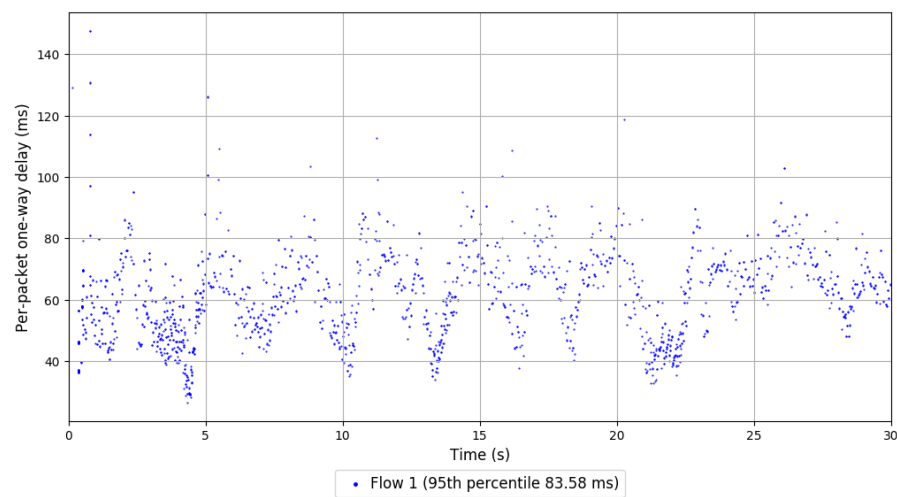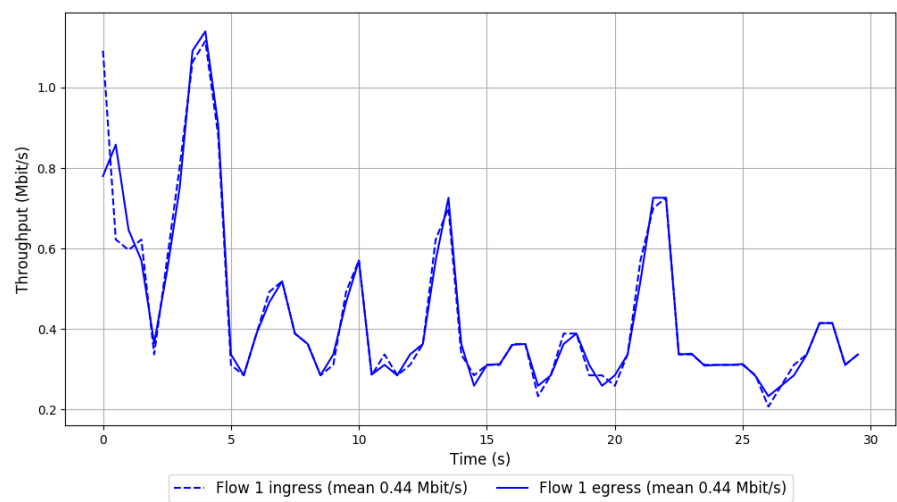Run 1: Report of Copa — Data Link

```
Run 2: Statistics of Copa

Start at: 2018-02-01 13:10:25
End at: 2018-02-01 13:10:55
Local clock offset: 6.132 ms
Remote clock offset: -18.507 ms

# Below is generated by plot.py at 2018-02-01 13:42:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 83.579 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 83.579 ms
Loss rate: 0.29%
```

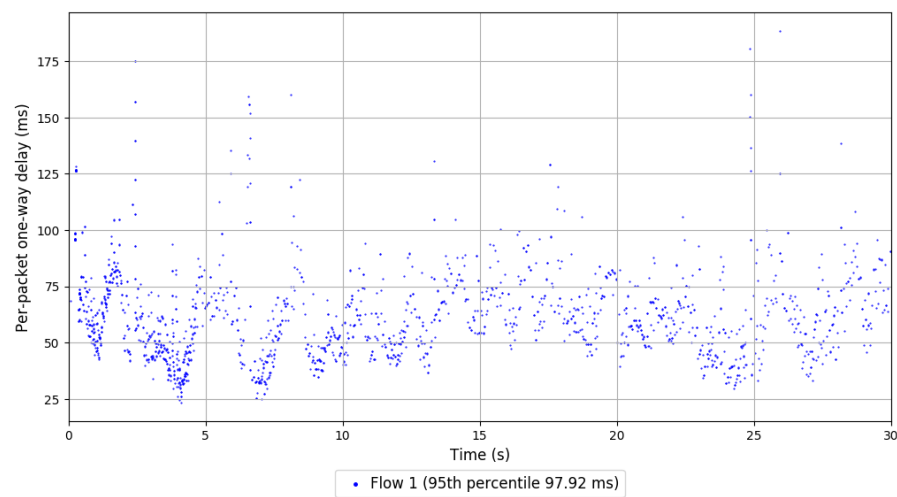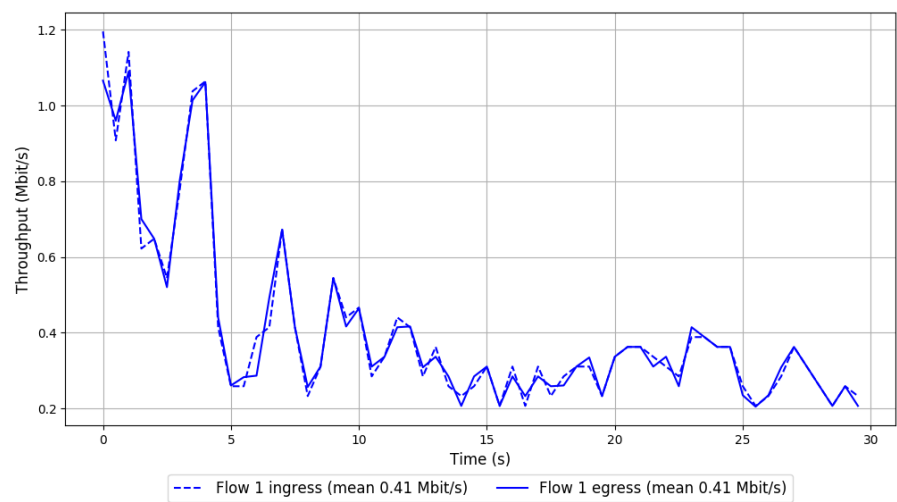Run 2: Report of Copa — Data Link

```
Run 3: Statistics of Copa

Start at: 2018-02-01 13:31:23
End at: 2018-02-01 13:31:53
Local clock offset: 4.562 ms
Remote clock offset: -18.136 ms


# Below is generated by plot.py at 2018-02-01 13:42:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 97.915 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 97.915 ms
Loss rate: 0.22%
```

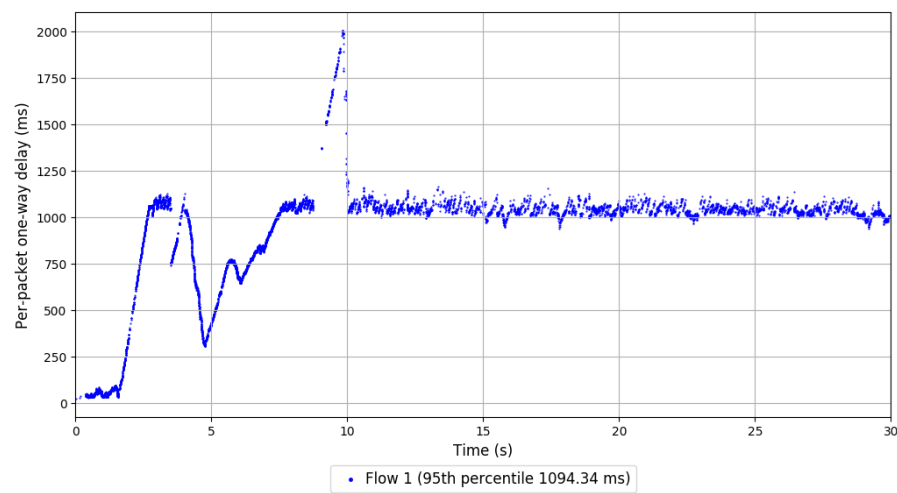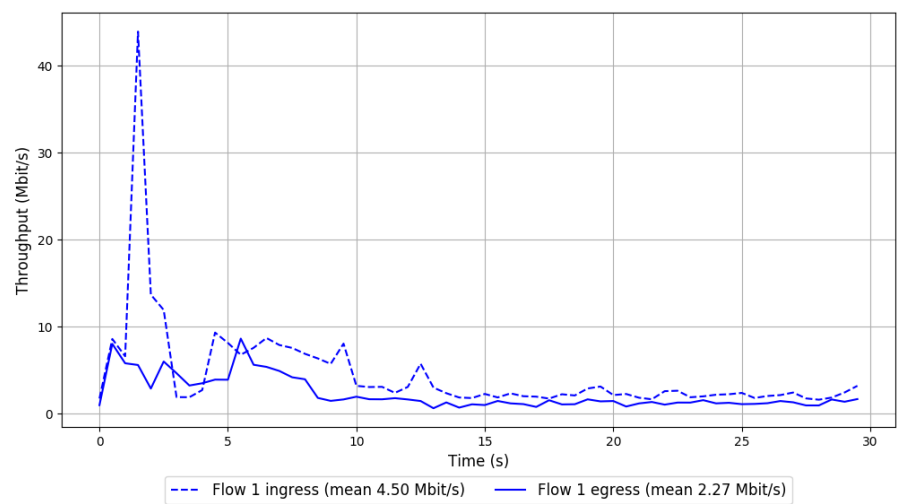Run 3: Report of Copa — Data Link

```
Run 1: Statistics of FillP

Start at: 2018-02-01 12:43:58
End at: 2018-02-01 12:44:28
Local clock offset: 4.079 ms
Remote clock offset: -19.157 ms


# Below is generated by plot.py at 2018-02-01 13:42:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 1094.342 ms
Loss rate: 49.56%
-- Flow 1:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 1094.342 ms
Loss rate: 49.56%
```

Run 1: Report of FillP — Data Link

Flow 1 ingress (mean 4.50 Mbit/s) Flow 1 egress (mean 2.27 Mbit/s)

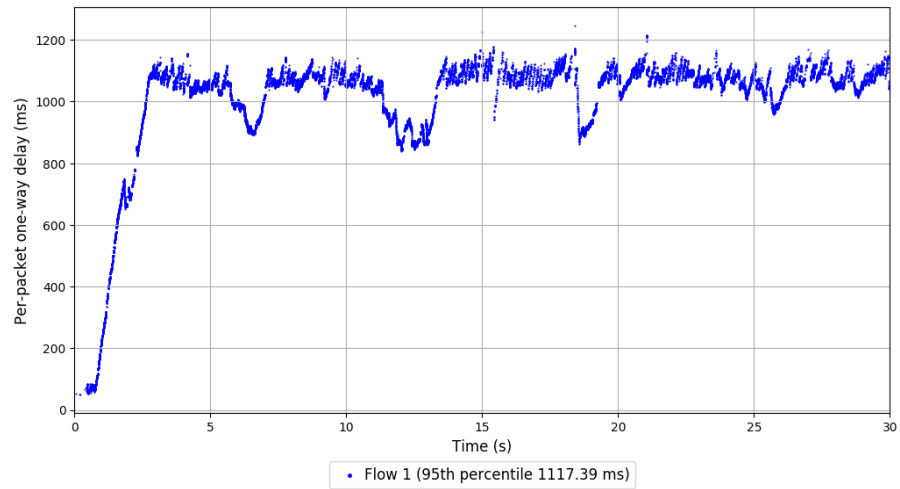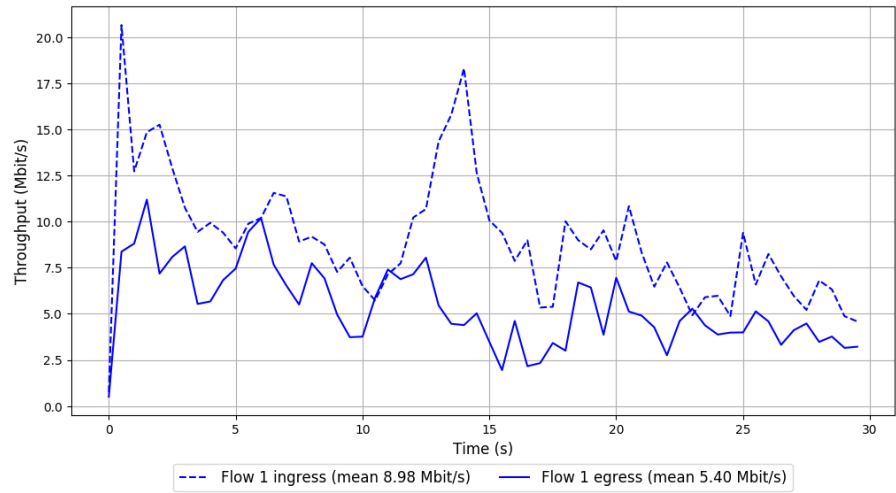Flow 1 (95th percentile 1094.34 ms)

```
Run 2: Statistics of FillP

Start at: 2018-02-01 13:04:56
End at: 2018-02-01 13:05:26
Local clock offset: -0.515 ms
Remote clock offset: -25.703 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.40 Mbit/s
95th percentile per-packet one-way delay: 1117.391 ms
Loss rate: 39.98%
-- Flow 1:
Average throughput: 5.40 Mbit/s
95th percentile per-packet one-way delay: 1117.391 ms
Loss rate: 39.98%
```

Run 2: Report of FillP — Data Link

Flow 1 ingress (mean 8.98 Mbit/s)   Flow 1 egress (mean 5.40 Mbit/s)

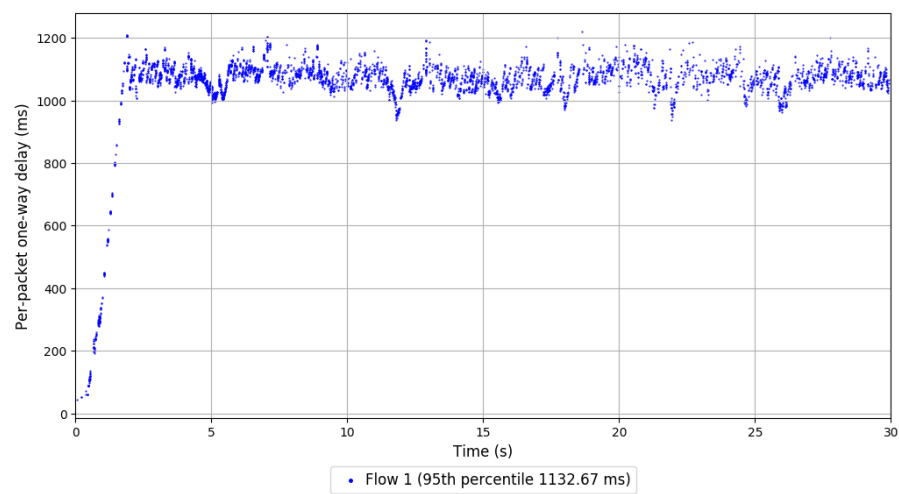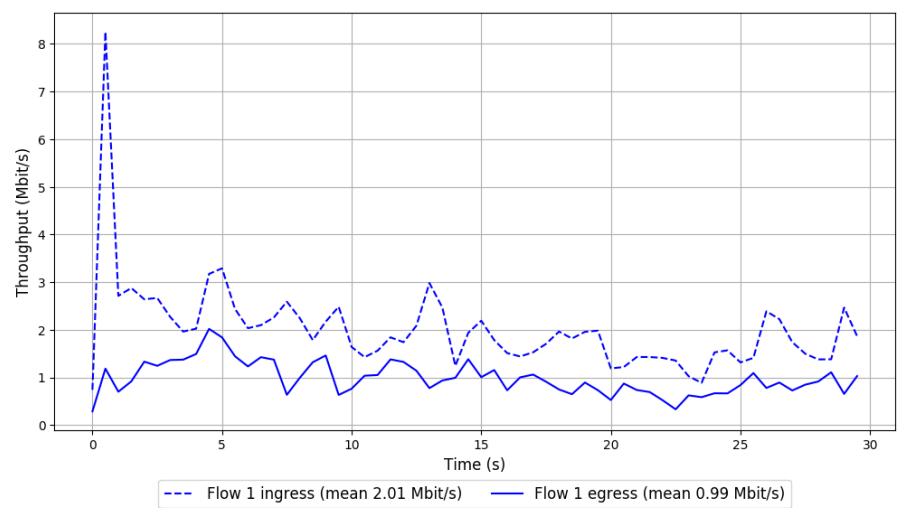Flow 1 (95th percentile 1117.39 ms)

```
Run 3: Statistics of FillP

Start at: 2018-02-01 13:25:53
End at: 2018-02-01 13:26:23
Local clock offset: 4.68 ms
Remote clock offset: -18.014 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 1132.670 ms
Loss rate: 50.86%
-- Flow 1:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 1132.670 ms
Loss rate: 50.86%
```

Run 3: Report of FillP — Data Link

Flow 1 ingress (mean 2.01 Mbit/s)   Flow 1 egress (mean 0.99 Mbit/s)

Flow 1 (95th percentile 1132.67 ms)

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

Start at: 2018-02-01 12:51:39
End at: 2018-02-01 12:52:09
Local clock offset: 3.965 ms
Remote clock offset: -20.858 ms

# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 81.814 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 81.814 ms
Loss rate: 0.14%
```
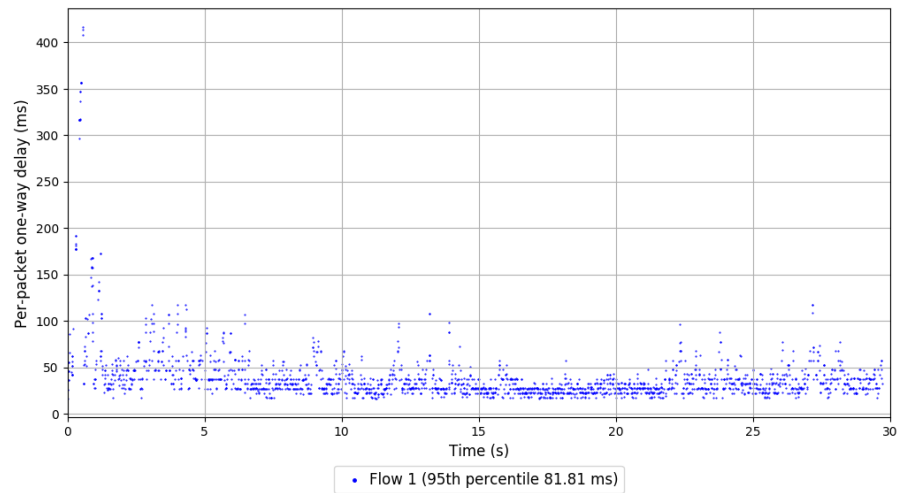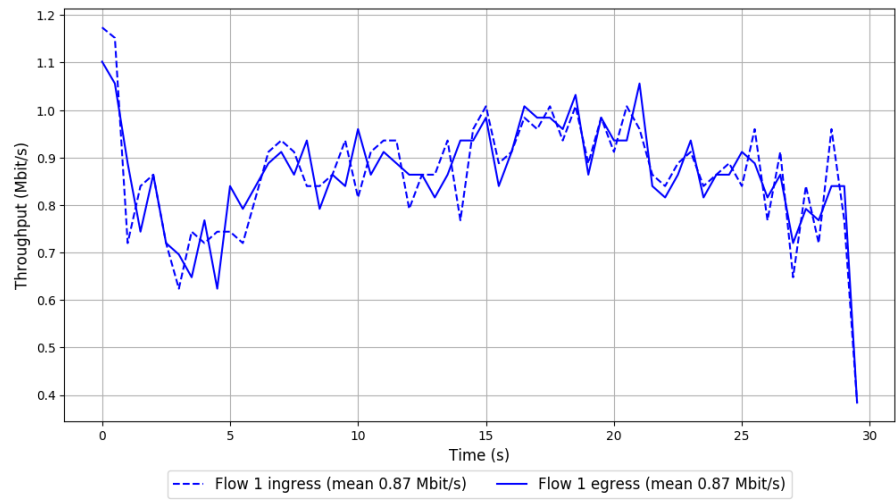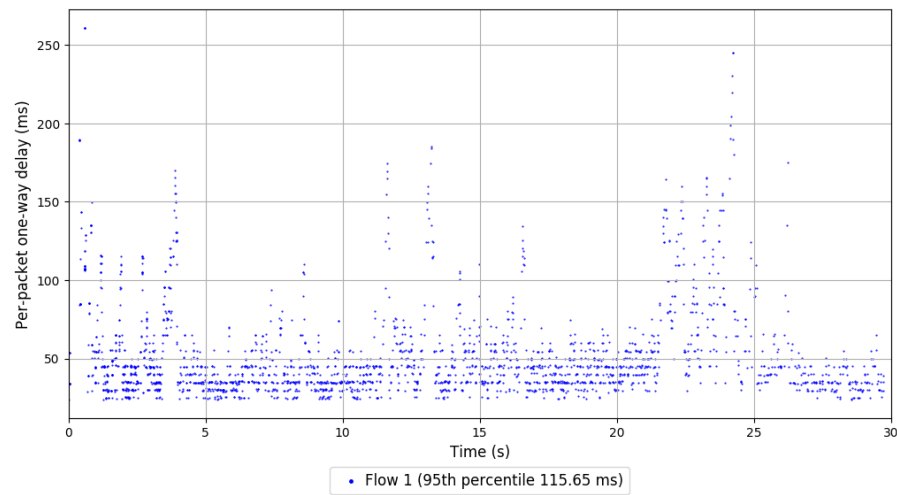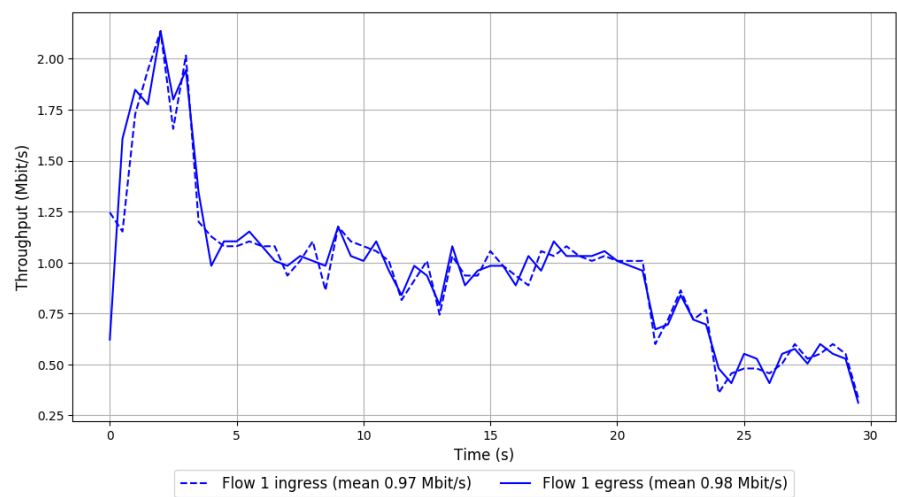
Run 1: Report of Indigo-1-32 — Data Link

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

Start at: 2018-02-01 13:12:37
End at: 2018-02-01 13:13:07
Local clock offset: 4.606 ms
Remote clock offset: -18.338 ms

# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 115.647 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 115.647 ms
Loss rate: 0.17%
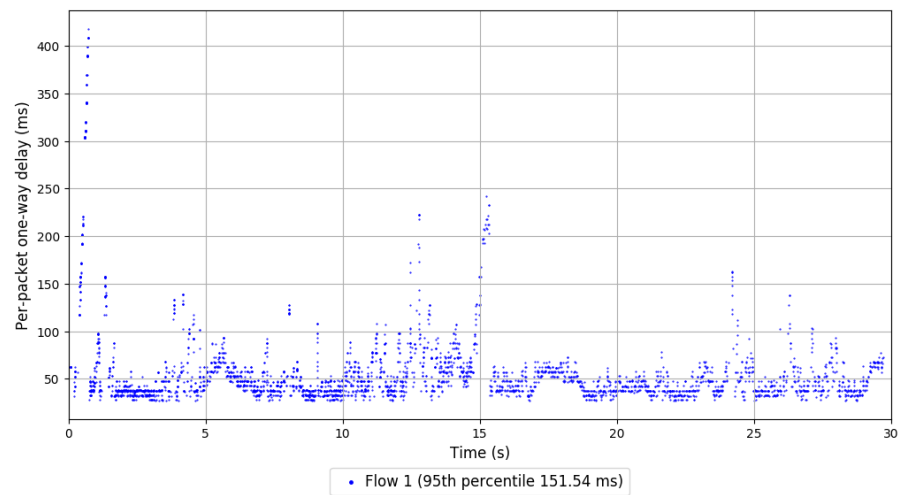```

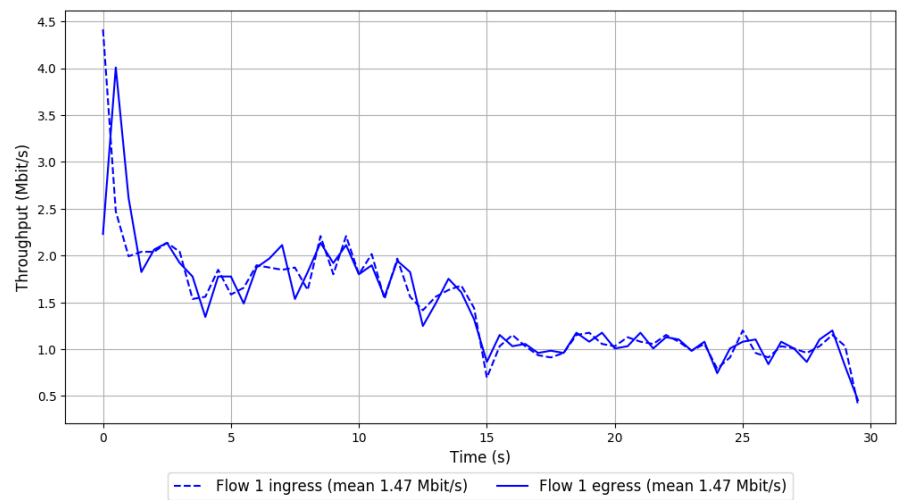Run 2: Report of Indigo-1-32 — Data Link

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

Start at: 2018-02-01 13:33:34
End at: 2018-02-01 13:34:04
Local clock offset: 3.311 ms
Remote clock offset: -16.631 ms

Below is generated by plot.py at 2018-02-01 13:42:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 151.538 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 151.538 ms
Loss rate: 0.22%
```
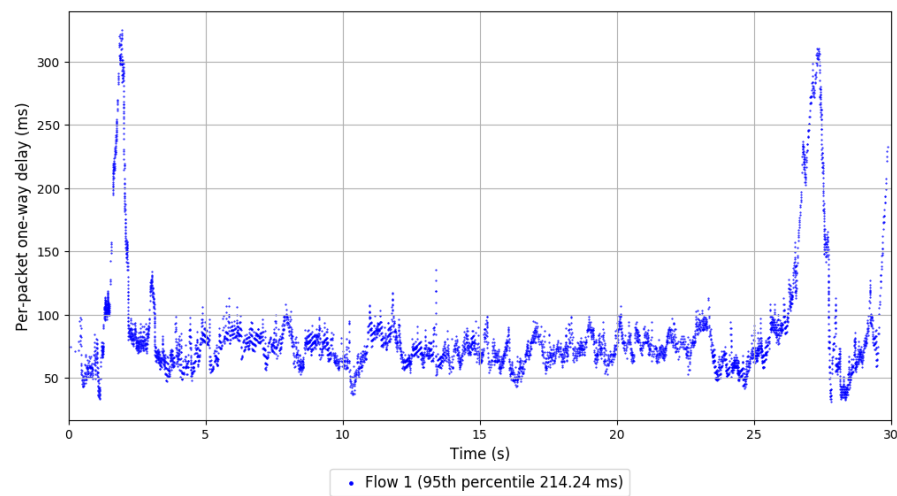
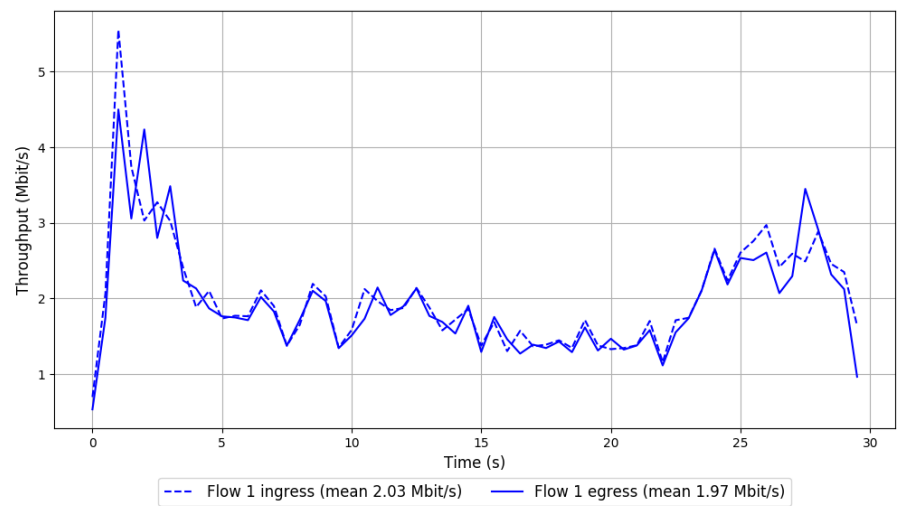Run 3: Report of Indigo-1-32 — Data Link

```
Run 1: Statistics of Vivace-latency

Start at: 2018-02-01 12:58:19
End at: 2018-02-01 12:58:49
Local clock offset: 2.728 ms
Remote clock offset: -18.055 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.97 Mbit/s
95th percentile per-packet one-way delay: 214.239 ms
Loss rate: 3.34%
-- Flow 1:
Average throughput: 1.97 Mbit/s
95th percentile per-packet one-way delay: 214.239 ms
Loss rate: 3.34%
```

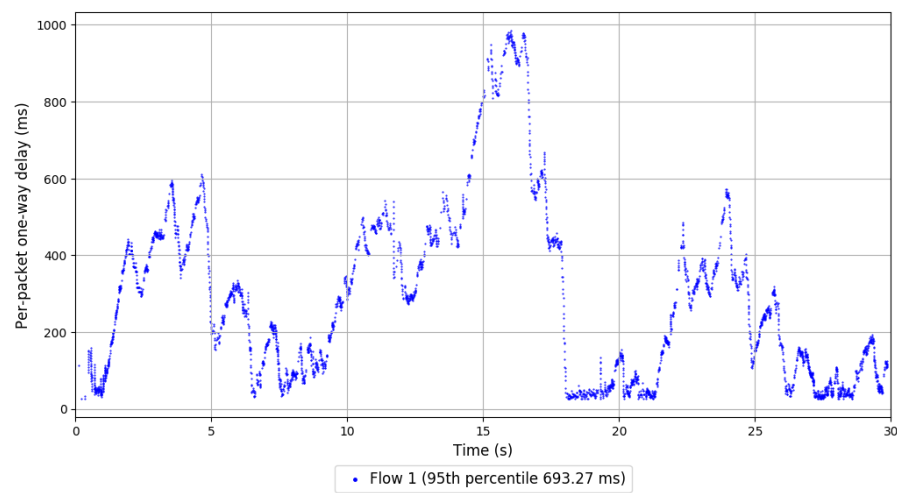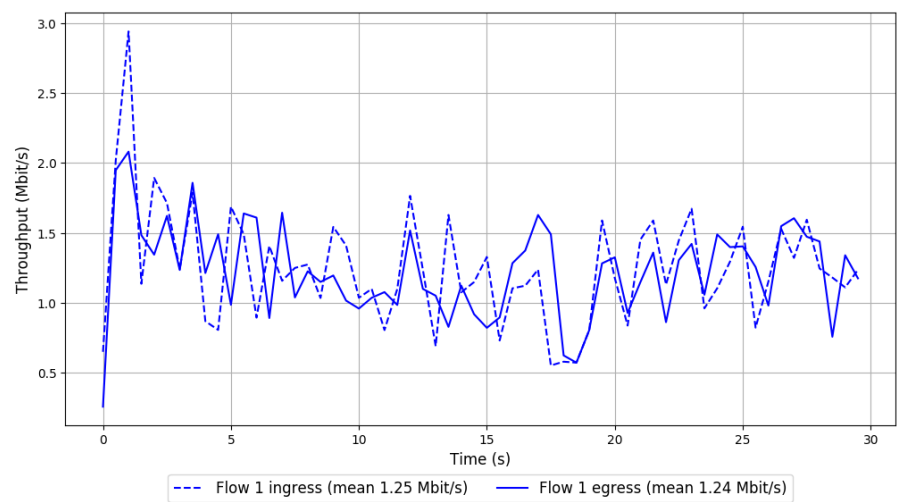Run 1: Report of Vivace-latency — Data Link

```
Run 2: Statistics of Vivace-latency

Start at: 2018-02-01 13:19:15
End at: 2018-02-01 13:19:45
Local clock offset: 5.621 ms
Remote clock offset: -16.905 ms

# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 693.274 ms
Loss rate: 1.65%
-- Flow 1:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 693.274 ms
Loss rate: 1.65%
```

Run 2: Report of Vivace-latency — Data Link

Flow 1 ingress (mean 1.25 Mbit/s)   Flow 1 egress (mean 1.24 Mbit/s)
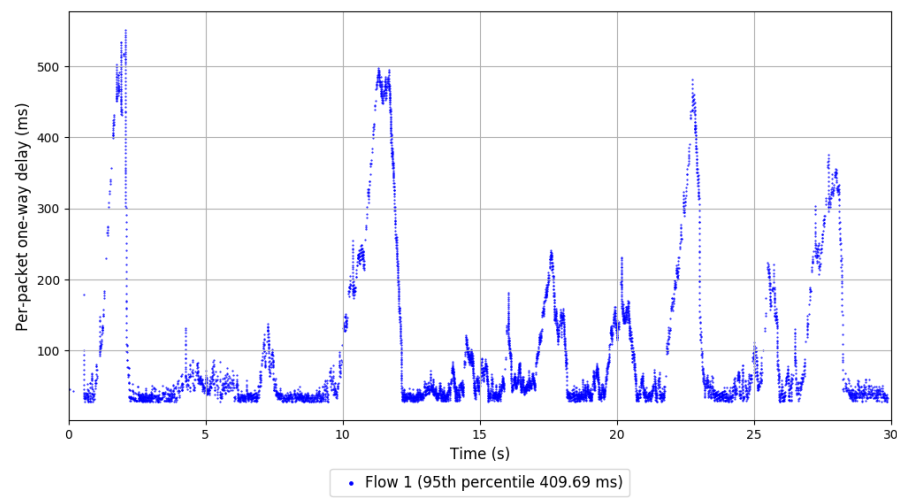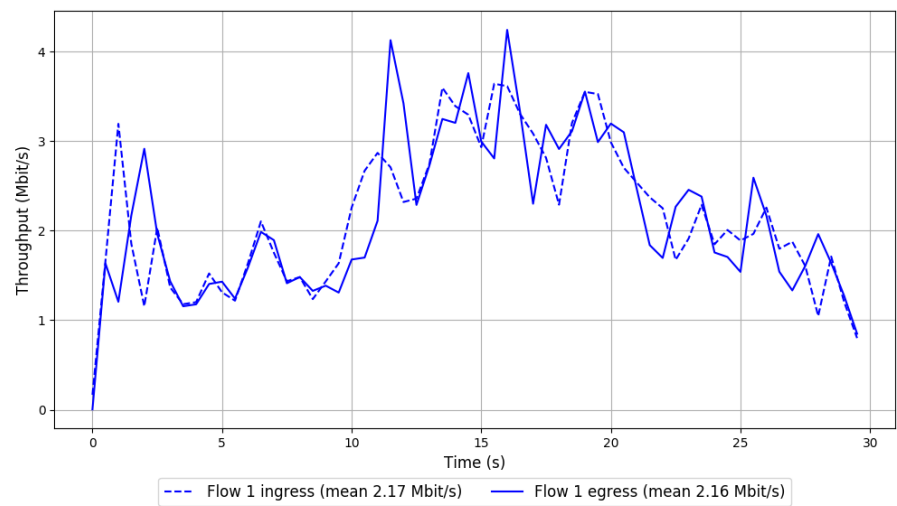

Flow 1 (95th percentile 693.27 ms)

```
Run 3: Statistics of Vivace-latency

Start at: 2018-02-01 13:40:11
End at: 2018-02-01 13:40:41
Local clock offset: 2.307 ms
Remote clock offset: -15.991 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 409.695 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 409.695 ms
Loss rate: 0.23%
```

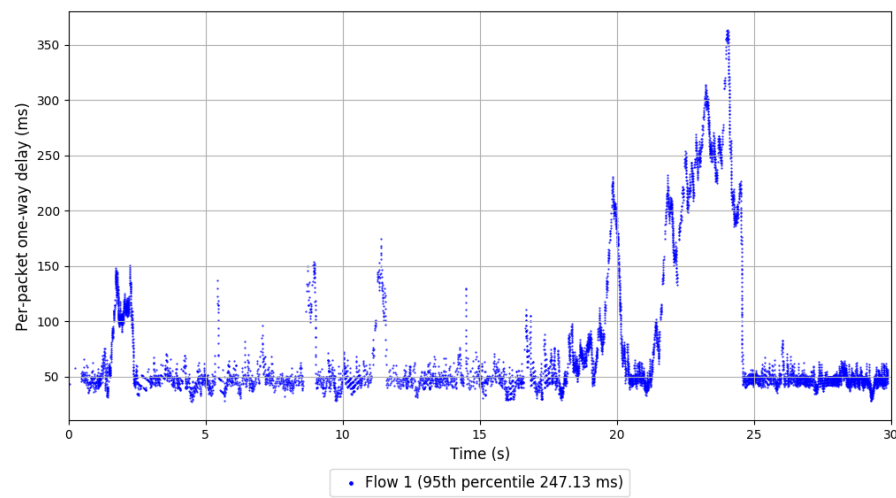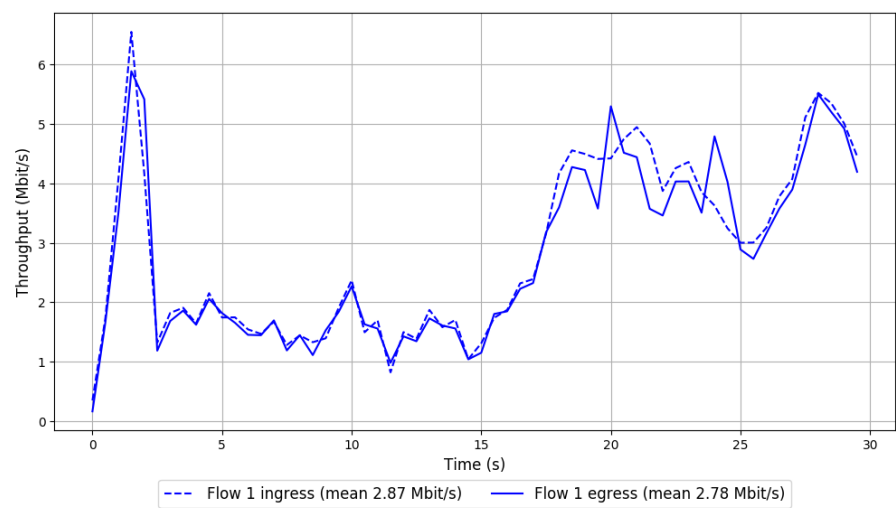# Run 3: Report of Vivace-latency — Data Link

```
Run 1: Statistics of Vivace-loss

Start at: 2018-02-01 12:38:26
End at: 2018-02-01 12:38:57
Local clock offset: 1.418 ms
Remote clock offset: -19.294 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.78 Mbit/s
95th percentile per-packet one-way delay: 247.134 ms
Loss rate: 3.33%
-- Flow 1:
Average throughput: 2.78 Mbit/s
95th percentile per-packet one-way delay: 247.134 ms
Loss rate: 3.33%
```

Run 1: Report of Vivace-loss — Data Link

Flow 1 ingress (mean 2.87 Mbit/s)   Flow 1 egress (mean 2.78 Mbit/s)

Flow 1 (95th percentile 247.13 ms)

```
Run 2: Statistics of Vivace-loss

Start at: 2018-02-01 12:59:25
End at: 2018-02-01 12:59:55
Local clock offset: 6.058 ms
Remote clock offset: -19.064 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 1115.370 ms
Loss rate: 28.83%
-- Flow 1:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 1115.370 ms
Loss rate: 28.83%
```
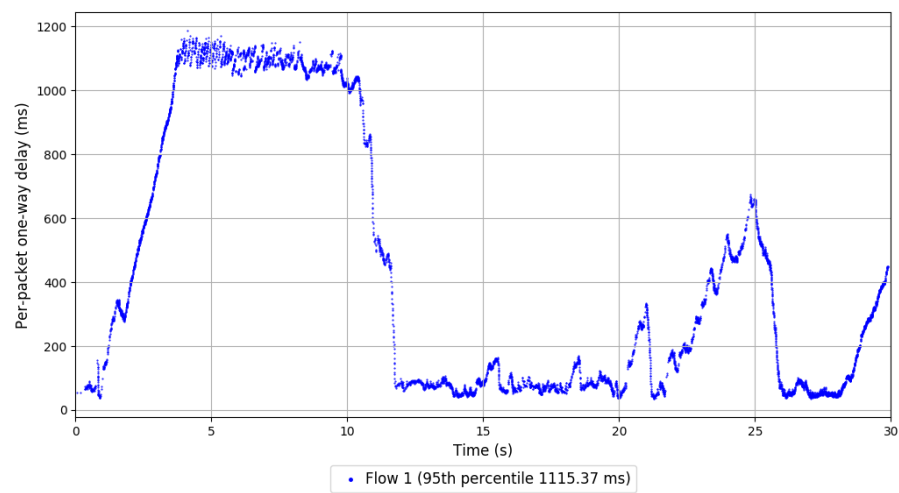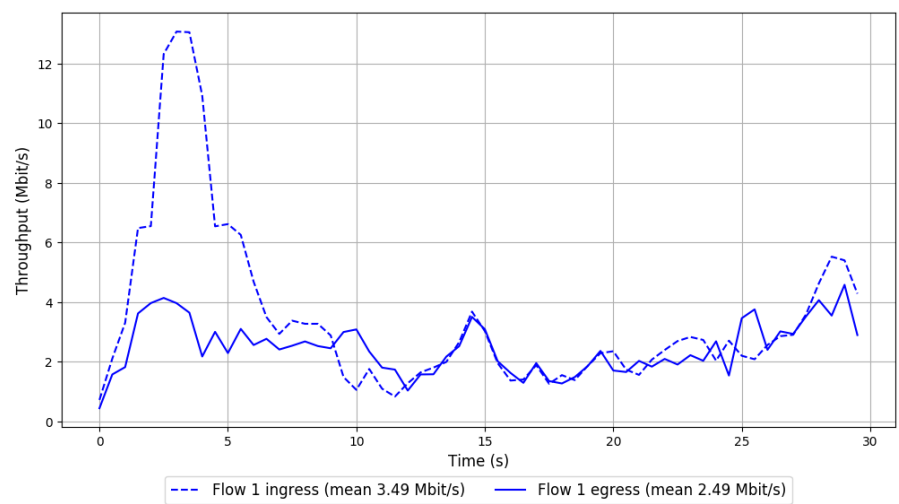
Run 2: Report of Vivace-loss — Data Link

```
Run 3: Statistics of Vivace-loss

Start at: 2018-02-01 13:20:21
End at: 2018-02-01 13:20:52
Local clock offset: 4.461 ms
Remote clock offset: -16.596 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 1066.484 ms
Loss rate: 22.96%
-- Flow 1:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 1066.484 ms
Loss rate: 22.96%
```
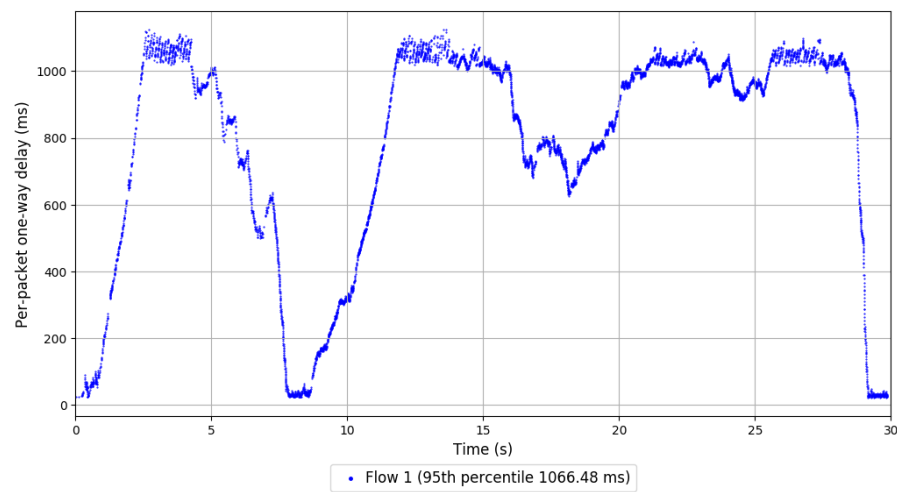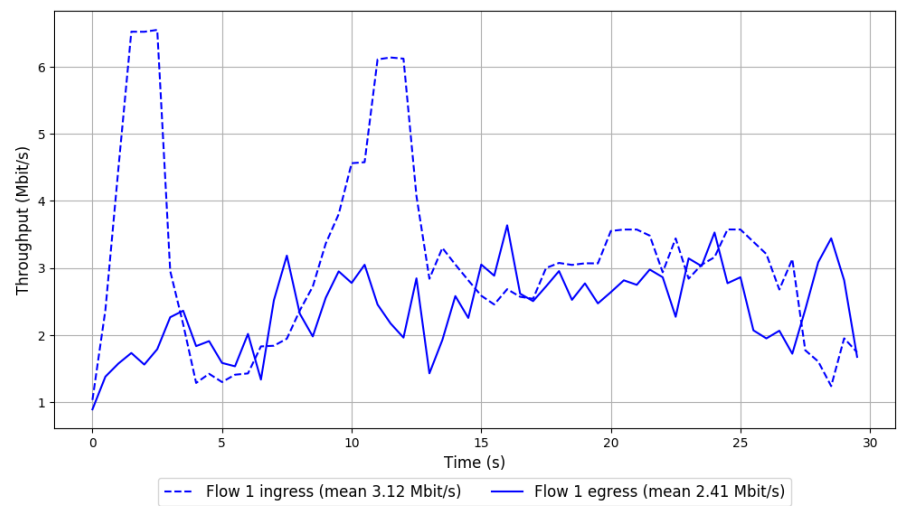
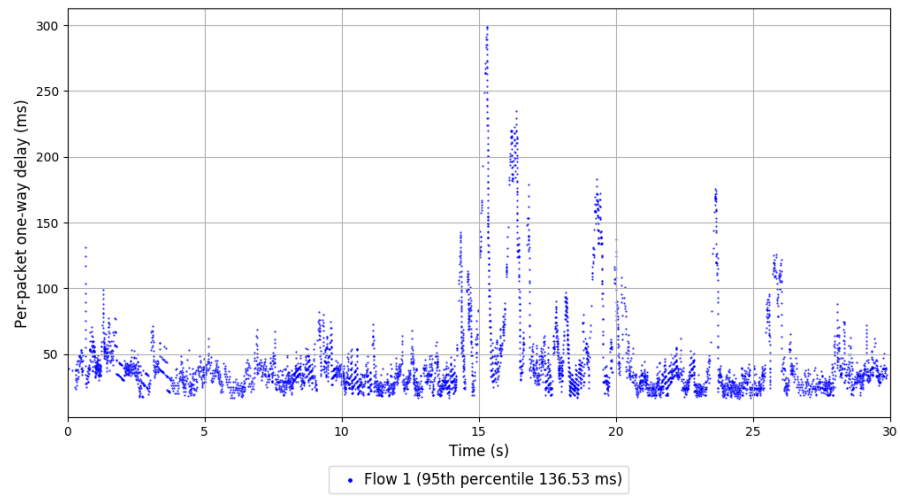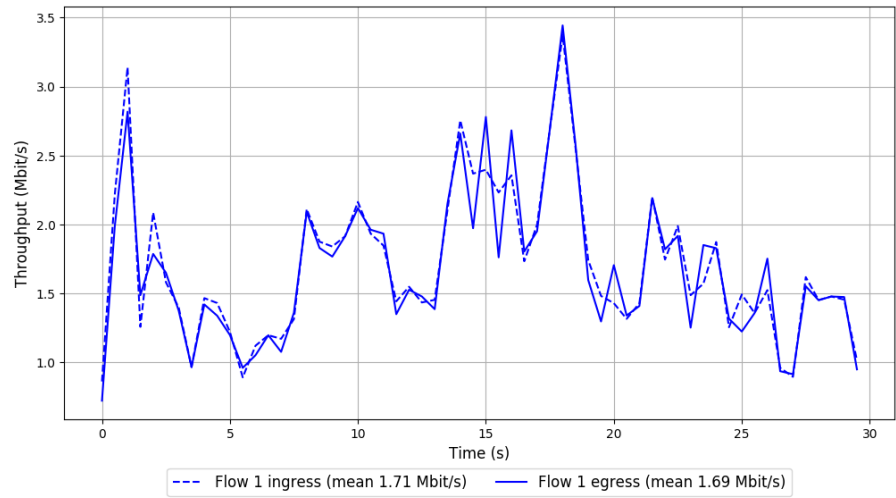Run 3: Report of Vivace-loss — Data Link

```
Run 1: Statistics of Vivace-LTE

Start at: 2018-02-01 12:41:45
End at: 2018-02-01 12:42:15
Local clock offset: 4.244 ms
Remote clock offset: -19.647 ms

# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 136.526 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 136.526 ms
Loss rate: 1.35%
```

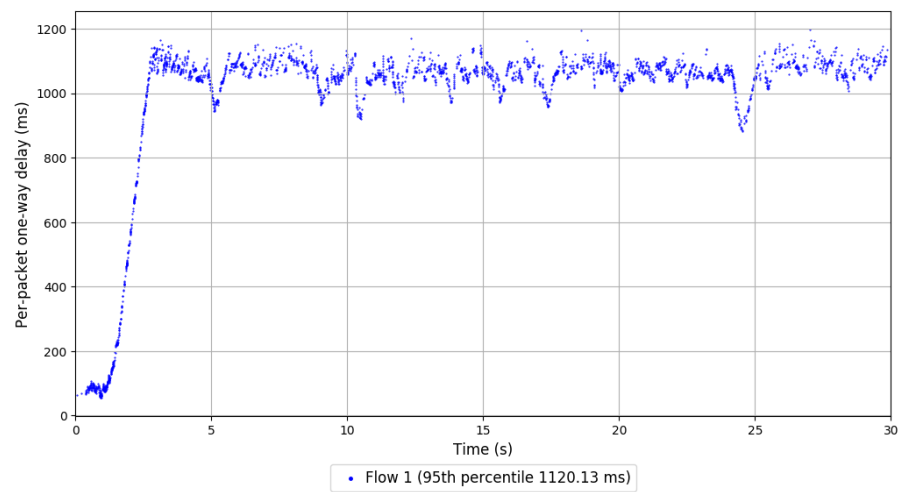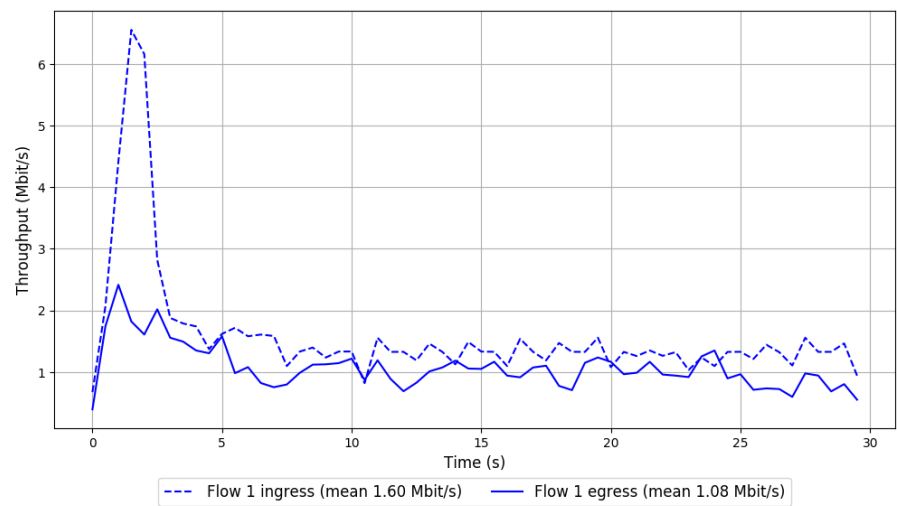Run 1: Report of Vivace-LTE — Data Link

```
Run 2: Statistics of Vivace-LTE

Start at: 2018-02-01 13:02:43
End at: 2018-02-01 13:03:13
Local clock offset: 3.167 ms
Remote clock offset: -18.976 ms


# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 1120.135 ms
Loss rate: 32.60%
-- Flow 1:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 1120.135 ms
Loss rate: 32.60%
```

Run 2: Report of Vivace-LTE — Data Link

```
Run 3: Statistics of Vivace-LTE

Start at: 2018-02-01 13:23:40
End at: 2018-02-01 13:24:10
Local clock offset: 3.535 ms
Remote clock offset: -18.387 ms

# Below is generated by plot.py at 2018-02-01 13:42:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 1065.505 ms
Loss rate: 10.62%
-- Flow 1:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 1065.505 ms
Loss rate: 10.62%
```

Run 3: Report of Vivace-LTE — Data Link