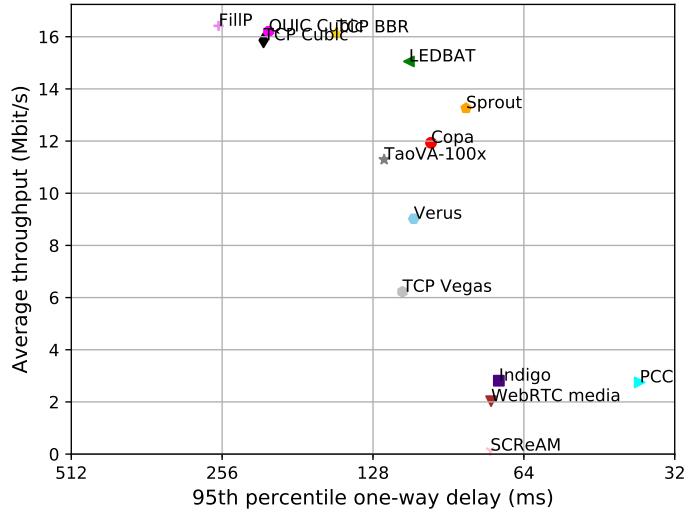


Pantheon Report

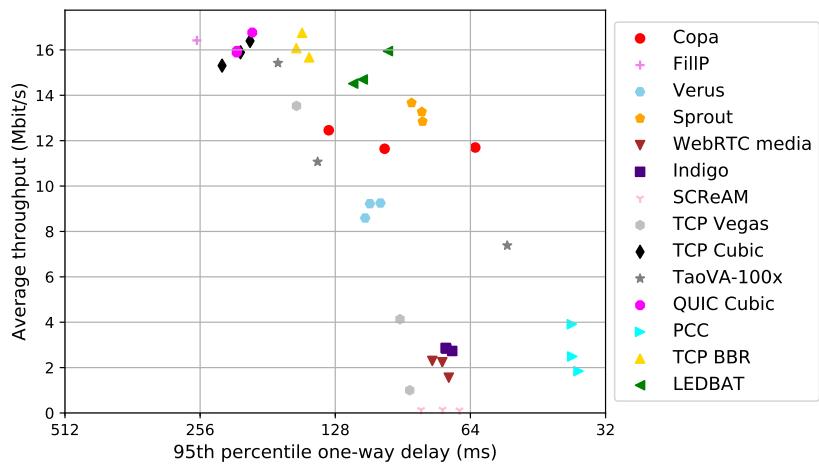
Generated at 2018-01-10 14:41:44 (UTC).
Data path: Stanford ppp0 (*remote*) → AWS California 1 Ethernet (*local*).
Repeated the test of 14 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).
NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

Git summary:
branch: master @ 56d1792c316a5efca3f2d21342905405fedffb48
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
M datagrump/sender.cc
third_party/fillp @ ec9585325218d5048c4d4152fa42240af54c6e67
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
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 @ f1a14bfe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efef6e088d91066a9f023df375eee2665089ce
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42

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



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



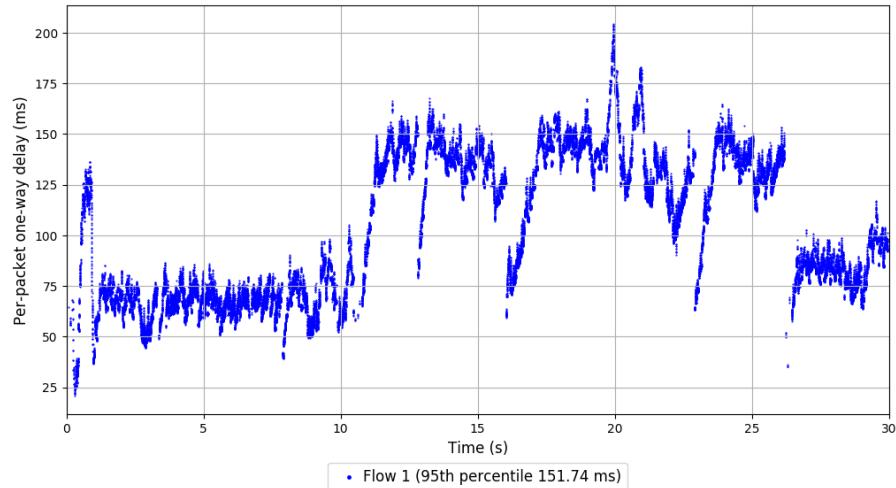
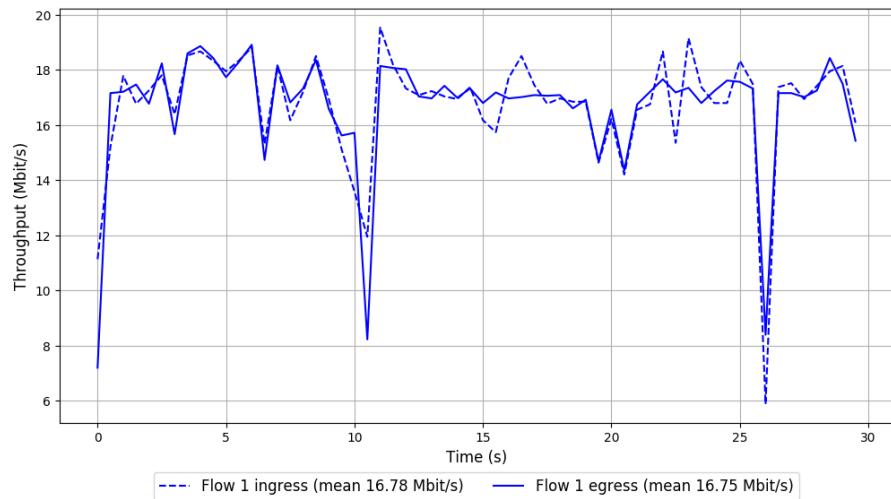
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	16.17	151.44	0.40
TCP Cubic	3	15.86	211.66	0.78
LEDBAT	3	15.05	108.54	0.48
PCC	3	2.75	37.59	0.19
QUIC Cubic	3	16.20	206.71	1.05
SCReAM	3	0.14	74.65	0.47
WebRTC media	3	2.03	74.41	0.13
Sprout	3	13.26	83.48	1.30
TaoVA-100x	3	11.29	121.62	0.72
TCP Vegas	3	6.22	111.79	0.06
Verus	3	9.02	106.16	41.88
Copa	3	11.93	98.05	0.32
FillP	1	16.42	260.26	46.50
Indigo	3	2.81	71.80	0.10

Run 1: Statistics of TCP BBR

```
Start at: 2018-01-10 12:54:41
End at: 2018-01-10 12:55:11
Local clock offset: -0.986 ms
Remote clock offset: -5.295 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.75 Mbit/s
95th percentile per-packet one-way delay: 151.735 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 16.75 Mbit/s
95th percentile per-packet one-way delay: 151.735 ms
Loss rate: 0.39%
```

Run 1: Report of TCP BBR — Data Link

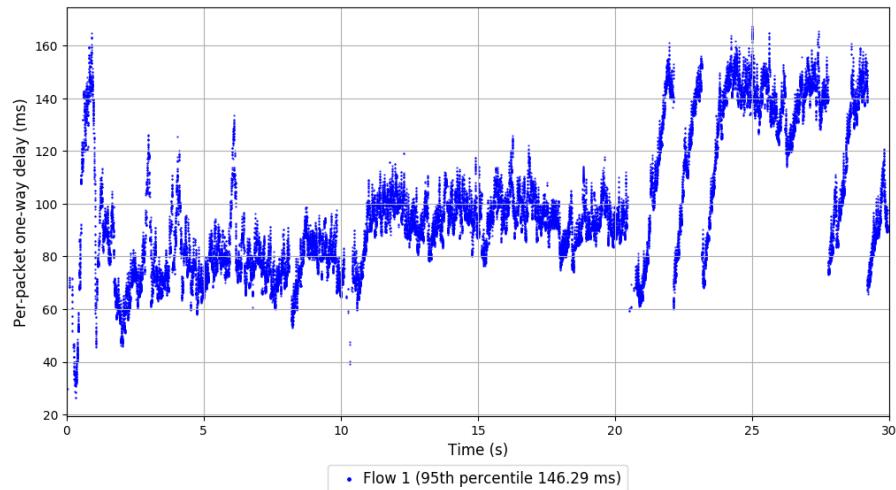
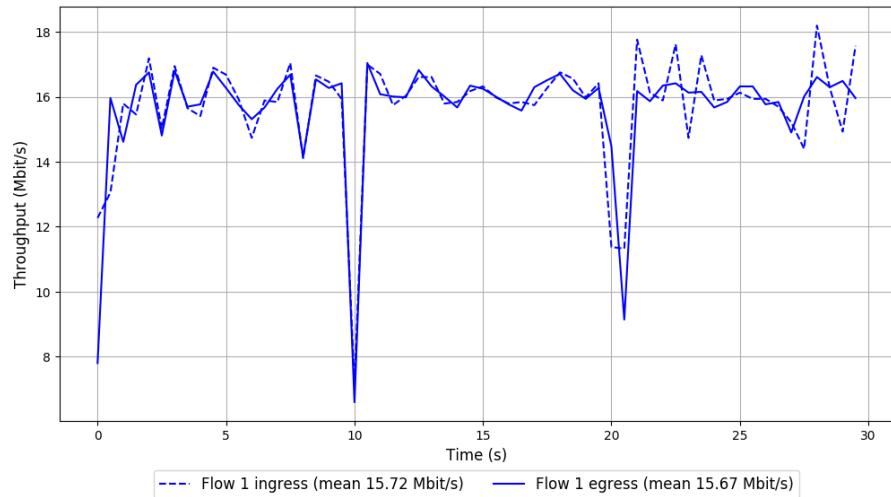


Run 2: Statistics of TCP BBR

```
Start at: 2018-01-10 13:12:23
End at: 2018-01-10 13:12:53
Local clock offset: -1.285 ms
Remote clock offset: -4.82 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.67 Mbit/s
95th percentile per-packet one-way delay: 146.294 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 15.67 Mbit/s
95th percentile per-packet one-way delay: 146.294 ms
Loss rate: 0.50%
```

Run 2: Report of TCP BBR — Data Link

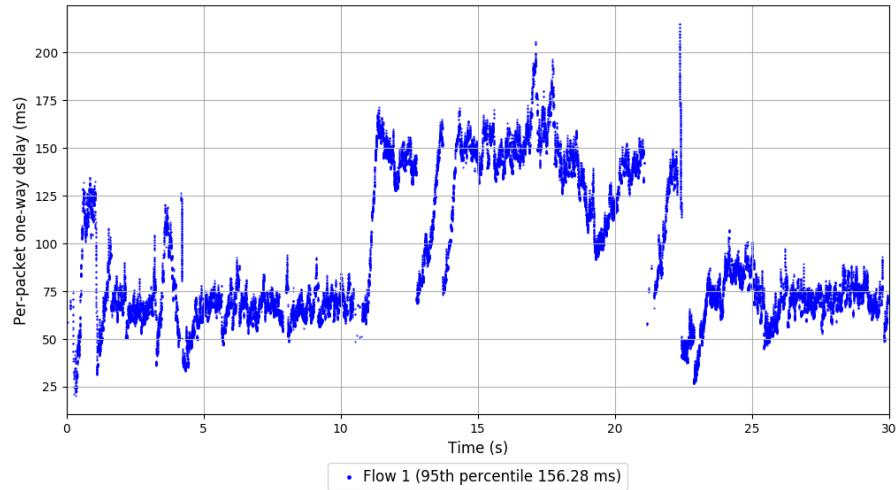
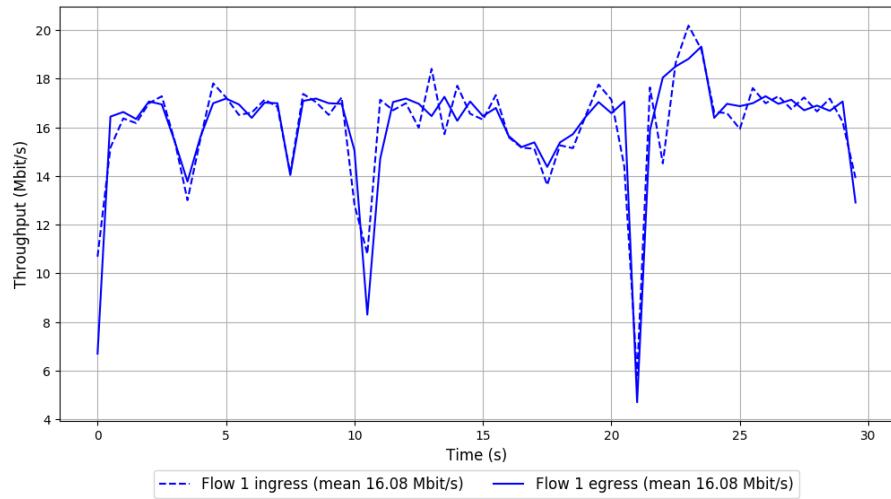


Run 3: Statistics of TCP BBR

```
Start at: 2018-01-10 13:30:06
End at: 2018-01-10 13:30:36
Local clock offset: -1.424 ms
Remote clock offset: -4.678 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.08 Mbit/s
95th percentile per-packet one-way delay: 156.277 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 16.08 Mbit/s
95th percentile per-packet one-way delay: 156.277 ms
Loss rate: 0.31%
```

Run 3: Report of TCP BBR — Data Link

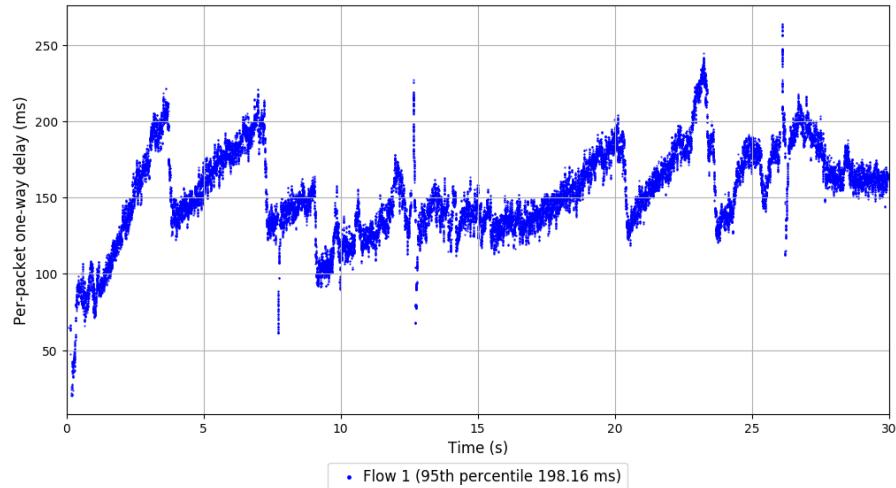
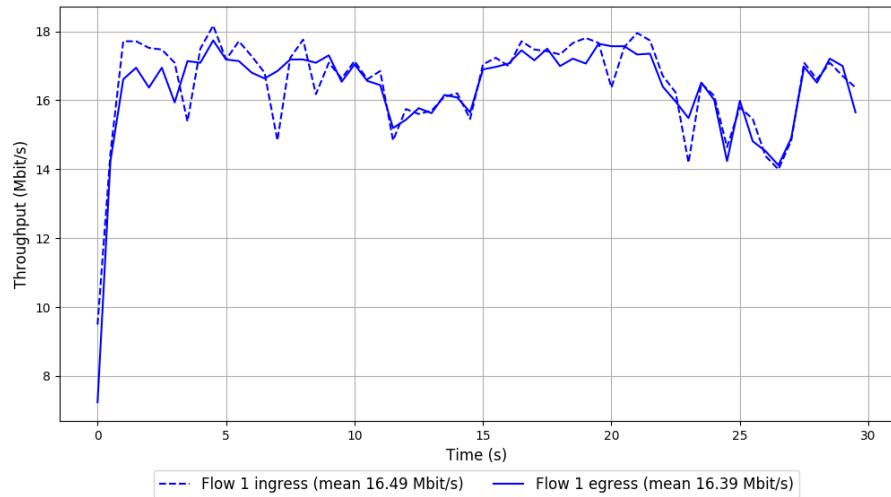


Run 1: Statistics of TCP Cubic

```
Start at: 2018-01-10 12:59:23
End at: 2018-01-10 12:59:53
Local clock offset: -0.953 ms
Remote clock offset: -5.065 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.39 Mbit/s
95th percentile per-packet one-way delay: 198.162 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 16.39 Mbit/s
95th percentile per-packet one-way delay: 198.162 ms
Loss rate: 0.81%
```

Run 1: Report of TCP Cubic — Data Link

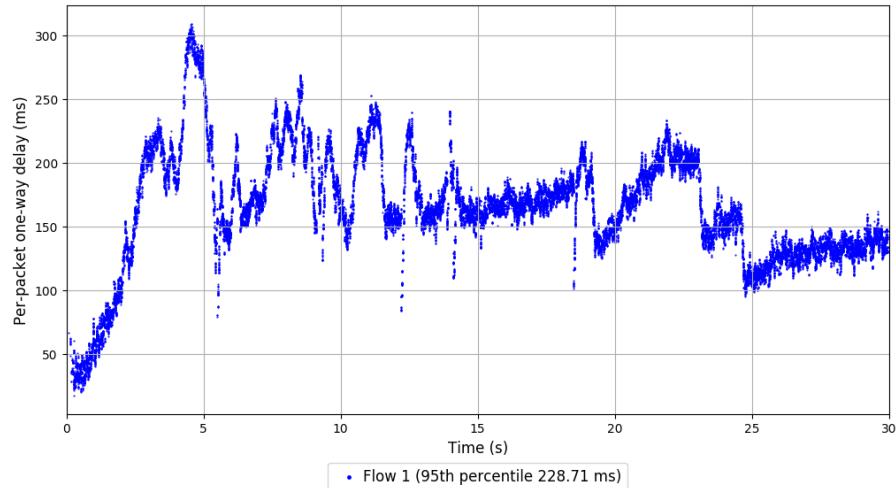
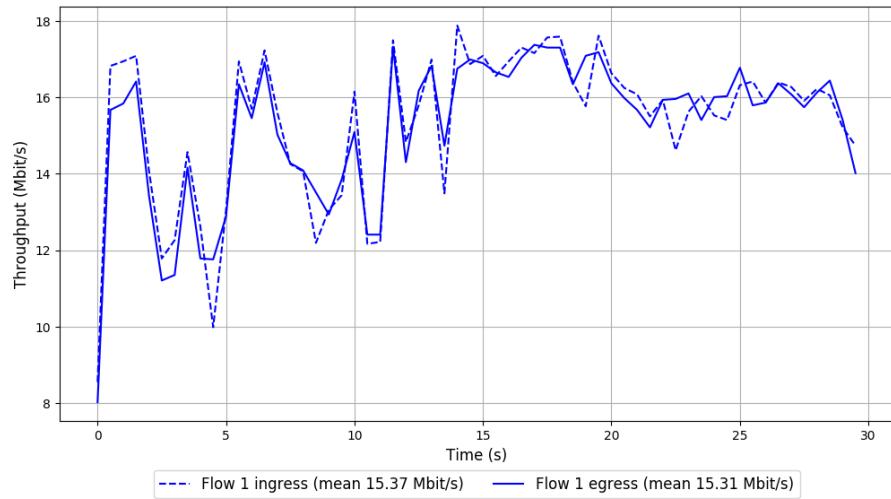


Run 2: Statistics of TCP Cubic

```
Start at: 2018-01-10 13:17:06
End at: 2018-01-10 13:17:36
Local clock offset: -1.216 ms
Remote clock offset: -4.76 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.31 Mbit/s
95th percentile per-packet one-way delay: 228.712 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 15.31 Mbit/s
95th percentile per-packet one-way delay: 228.712 ms
Loss rate: 0.67%
```

Run 2: Report of TCP Cubic — Data Link

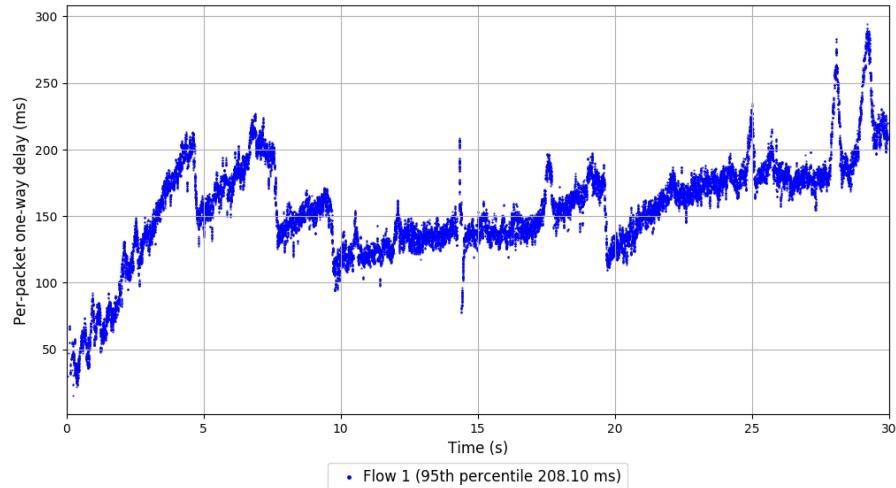
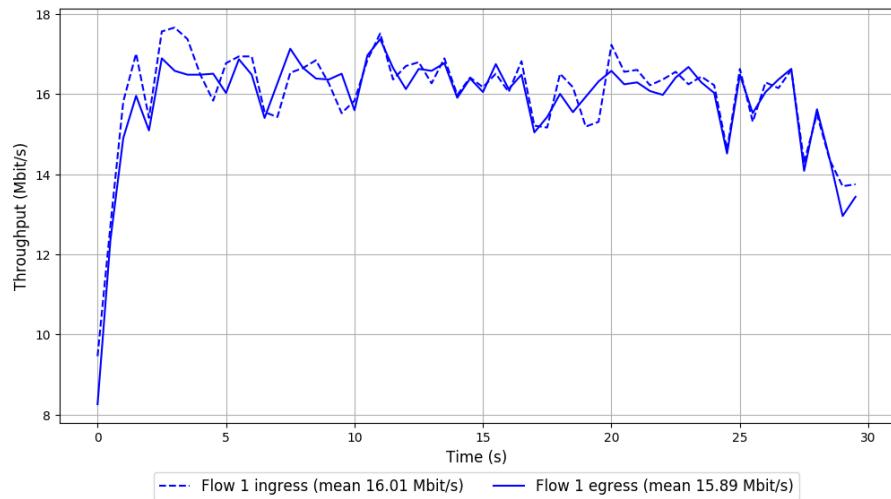


Run 3: Statistics of TCP Cubic

```
Start at: 2018-01-10 13:34:48
End at: 2018-01-10 13:35:18
Local clock offset: -1.431 ms
Remote clock offset: -4.915 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.89 Mbit/s
95th percentile per-packet one-way delay: 208.101 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 15.89 Mbit/s
95th percentile per-packet one-way delay: 208.101 ms
Loss rate: 0.86%
```

Run 3: Report of TCP Cubic — Data Link

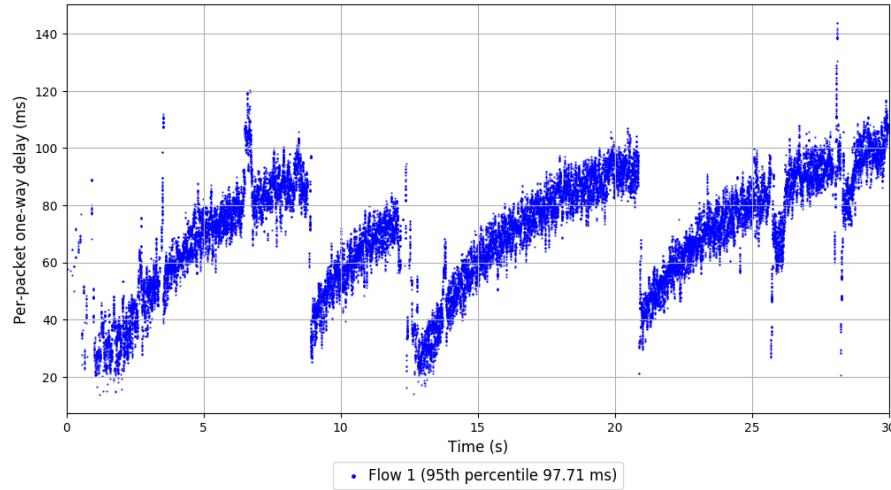
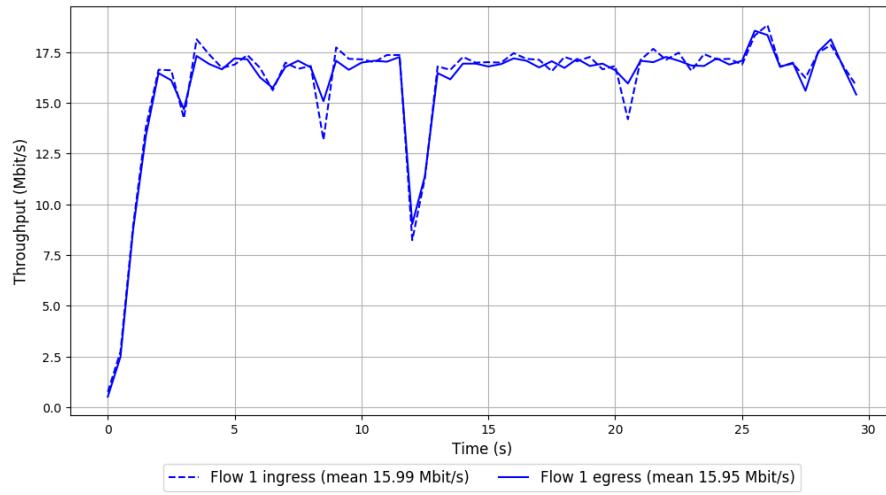


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-01-10 13:08:50
End at: 2018-01-10 13:09:20
Local clock offset: -1.147 ms
Remote clock offset: -4.882 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.95 Mbit/s
95th percentile per-packet one-way delay: 97.712 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 15.95 Mbit/s
95th percentile per-packet one-way delay: 97.712 ms
Loss rate: 0.51%
```

Run 1: Report of LEDBAT — Data Link

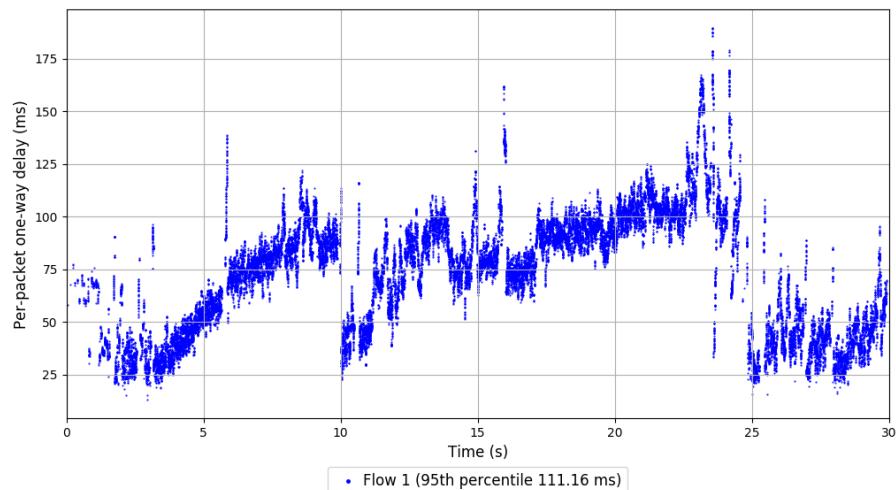
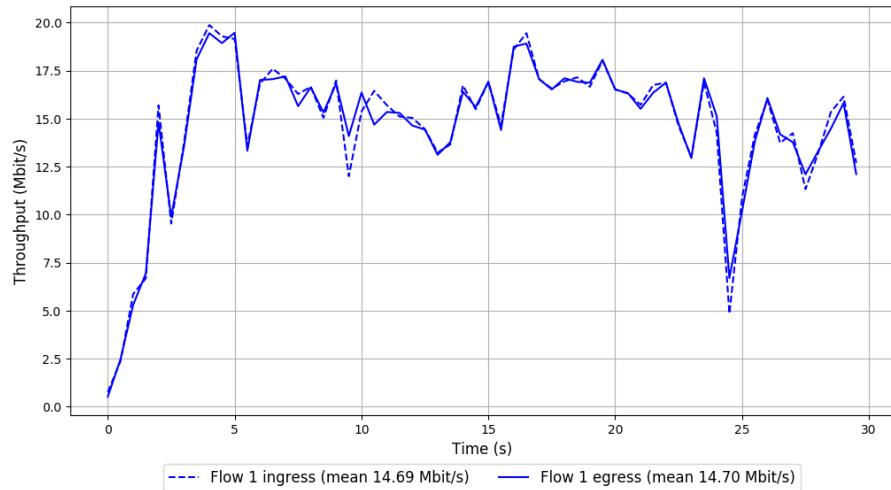


Run 2: Statistics of LEDBAT

```
Start at: 2018-01-10 13:26:33
End at: 2018-01-10 13:27:03
Local clock offset: -1.305 ms
Remote clock offset: -4.641 ms

# Below is generated by plot.py at 2018-01-10 14:40:06
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.70 Mbit/s
95th percentile per-packet one-way delay: 111.159 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 14.70 Mbit/s
95th percentile per-packet one-way delay: 111.159 ms
Loss rate: 0.30%
```

Run 2: Report of LEDBAT — Data Link

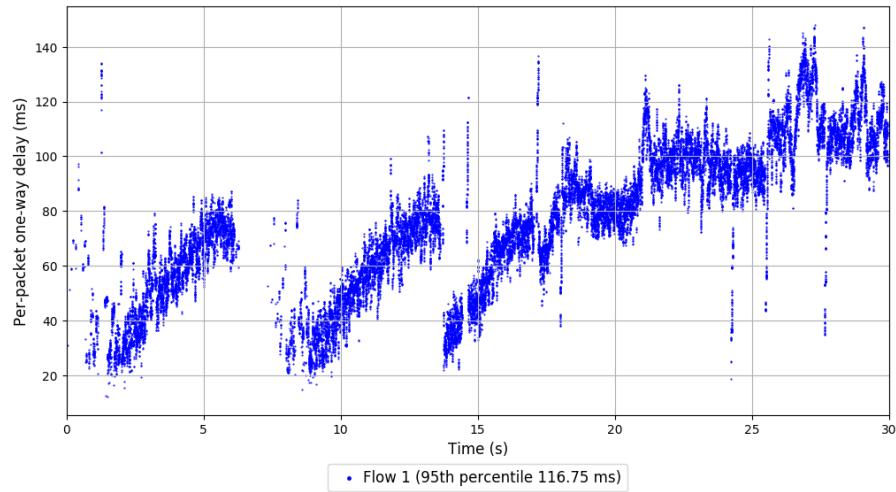
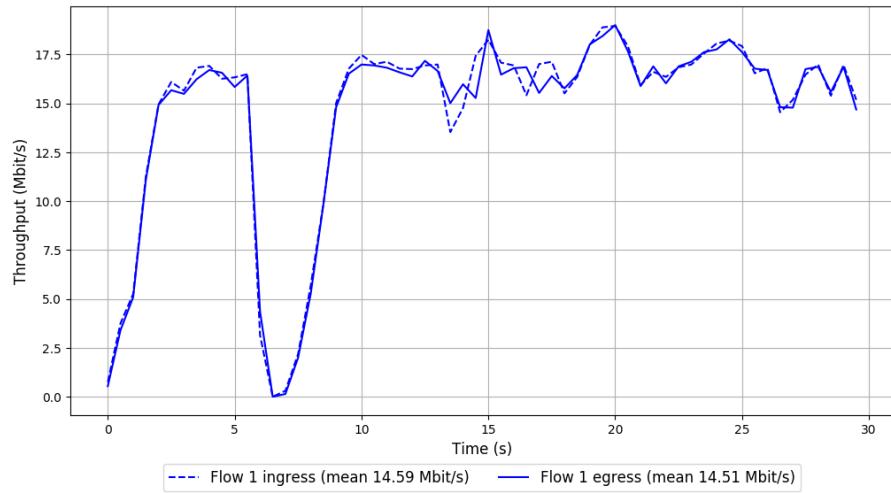


Run 3: Statistics of LEDBAT

```
Start at: 2018-01-10 13:44:13
End at: 2018-01-10 13:44:43
Local clock offset: -1.444 ms
Remote clock offset: -5.15 ms

# Below is generated by plot.py at 2018-01-10 14:40:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 14.51 Mbit/s
95th percentile per-packet one-way delay: 116.747 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 14.51 Mbit/s
95th percentile per-packet one-way delay: 116.747 ms
Loss rate: 0.63%
```

Run 3: Report of LEDBAT — Data Link

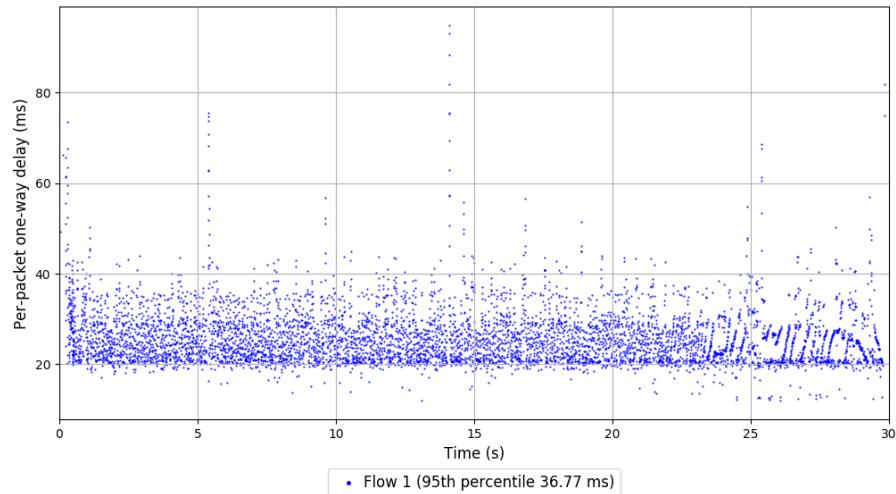
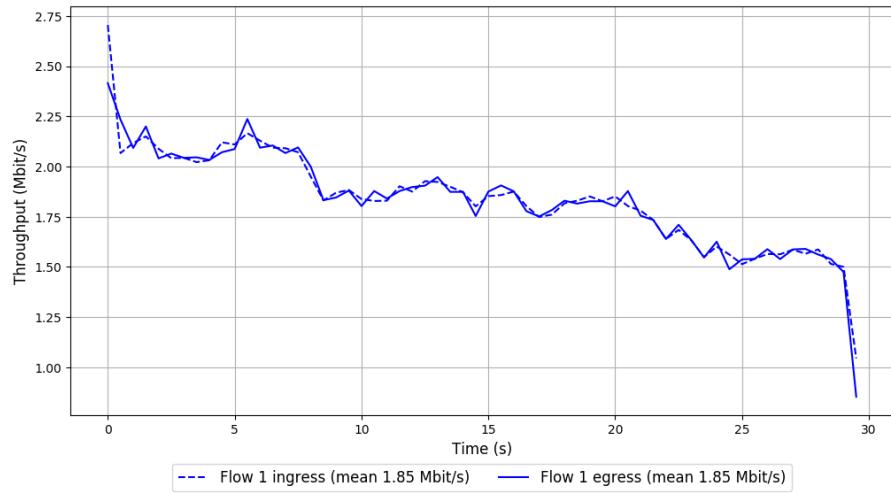


Run 1: Statistics of PCC

```
Start at: 2018-01-10 12:55:51
End at: 2018-01-10 12:56:21
Local clock offset: -0.913 ms
Remote clock offset: -5.221 ms

# Below is generated by plot.py at 2018-01-10 14:40:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 36.769 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 36.769 ms
Loss rate: 0.26%
```

Run 1: Report of PCC — Data Link

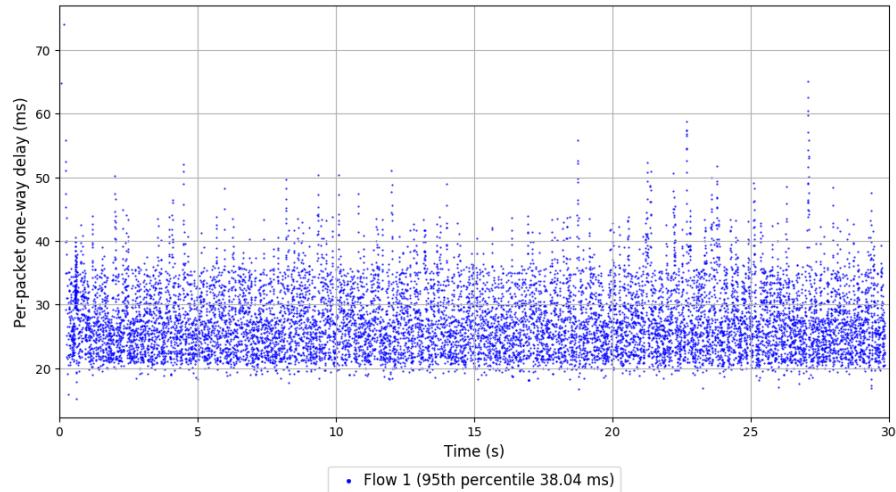
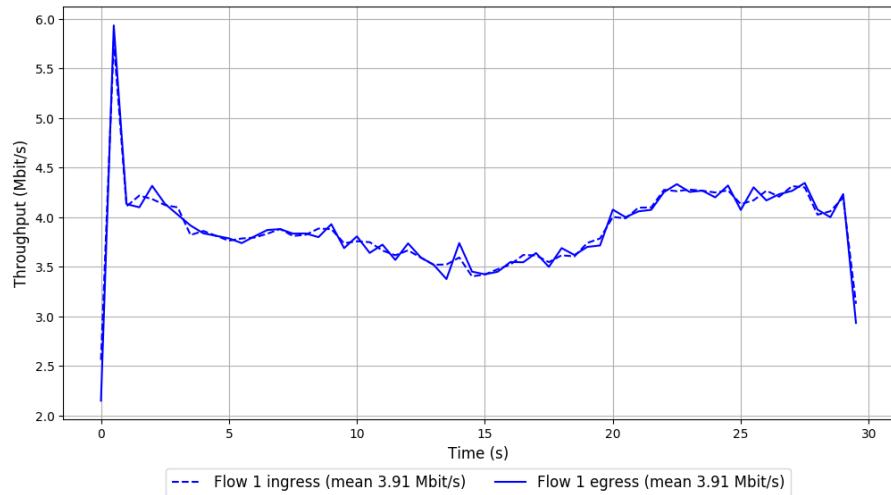


Run 2: Statistics of PCC

```
Start at: 2018-01-10 13:13:34
End at: 2018-01-10 13:14:04
Local clock offset: -1.263 ms
Remote clock offset: -4.812 ms

# Below is generated by plot.py at 2018-01-10 14:40:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.91 Mbit/s
95th percentile per-packet one-way delay: 38.043 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 3.91 Mbit/s
95th percentile per-packet one-way delay: 38.043 ms
Loss rate: 0.17%
```

Run 2: Report of PCC — Data Link

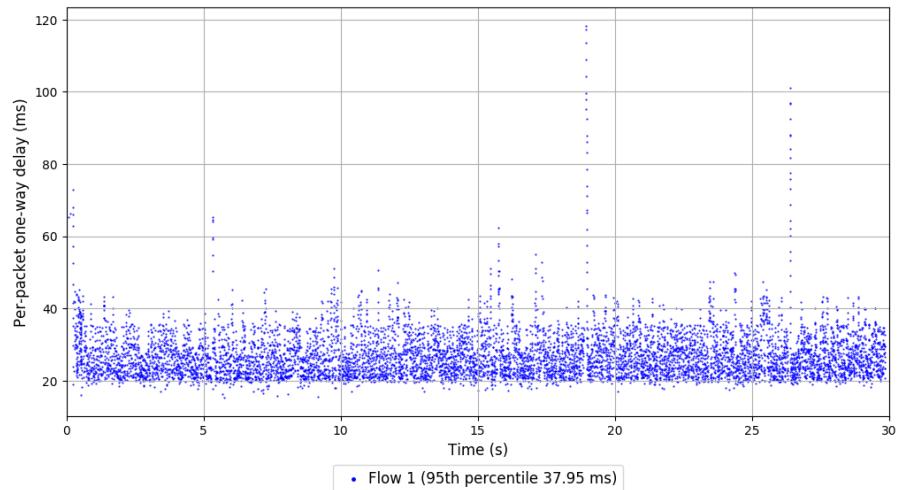
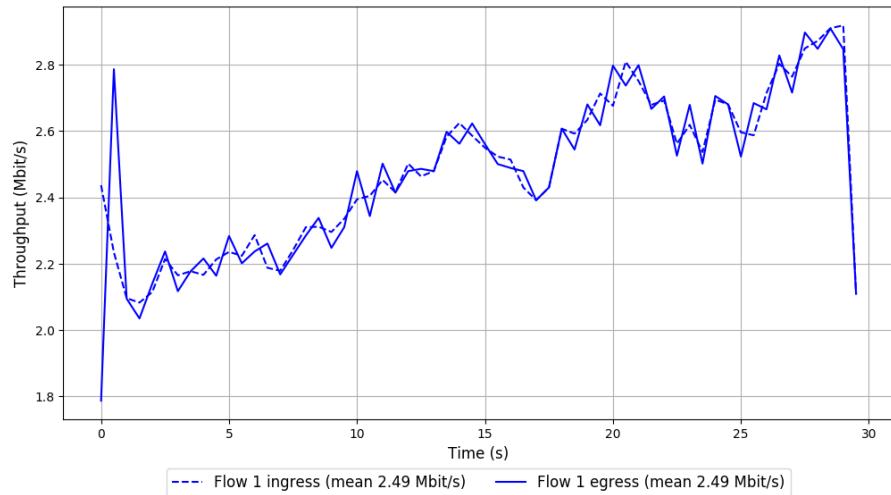


Run 3: Statistics of PCC

```
Start at: 2018-01-10 13:31:16
End at: 2018-01-10 13:31:46
Local clock offset: -1.447 ms
Remote clock offset: -4.826 ms

# Below is generated by plot.py at 2018-01-10 14:40:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 37.955 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 37.955 ms
Loss rate: 0.15%
```

Run 3: Report of PCC — Data Link

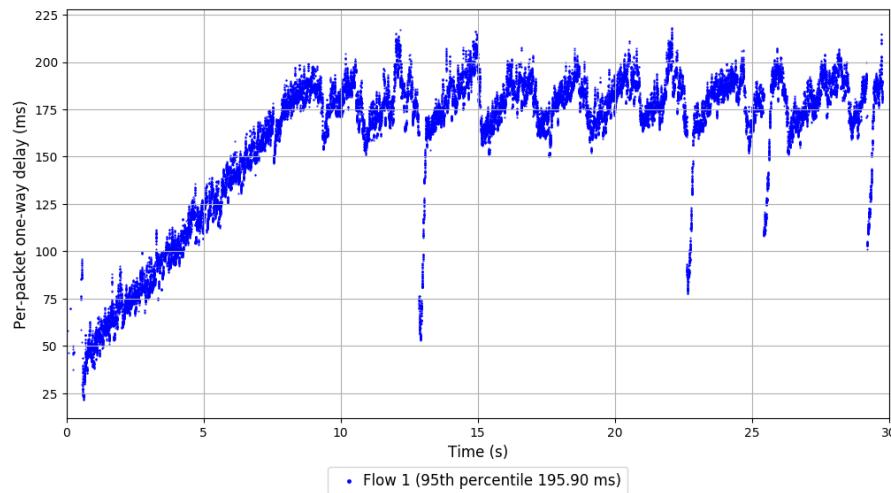
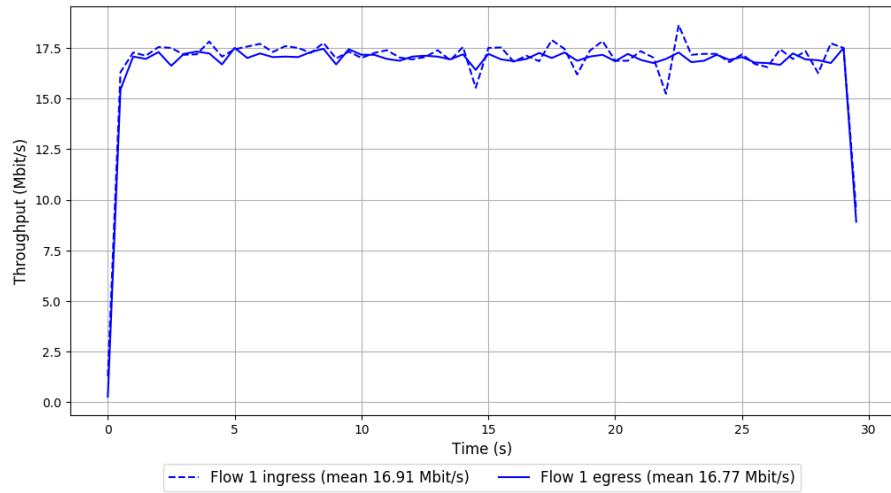


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-01-10 13:05:18
End at: 2018-01-10 13:05:48
Local clock offset: -1.059 ms
Remote clock offset: -4.934 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.77 Mbit/s
95th percentile per-packet one-way delay: 195.899 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 16.77 Mbit/s
95th percentile per-packet one-way delay: 195.899 ms
Loss rate: 1.11%
```

Run 1: Report of QUIC Cubic — Data Link

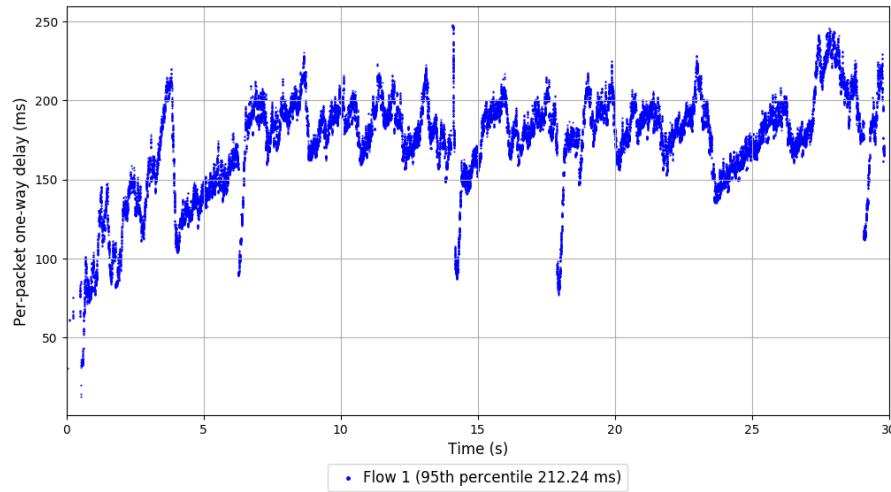
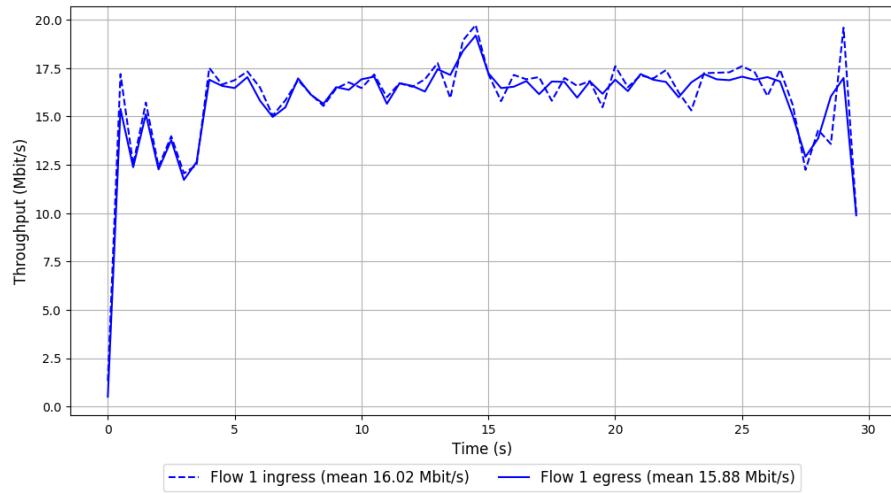


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-01-10 13:23:00
End at: 2018-01-10 13:23:30
Local clock offset: -1.358 ms
Remote clock offset: -4.622 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.88 Mbit/s
95th percentile per-packet one-way delay: 212.241 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 15.88 Mbit/s
95th percentile per-packet one-way delay: 212.241 ms
Loss rate: 1.00%
```

Run 2: Report of QUIC Cubic — Data Link

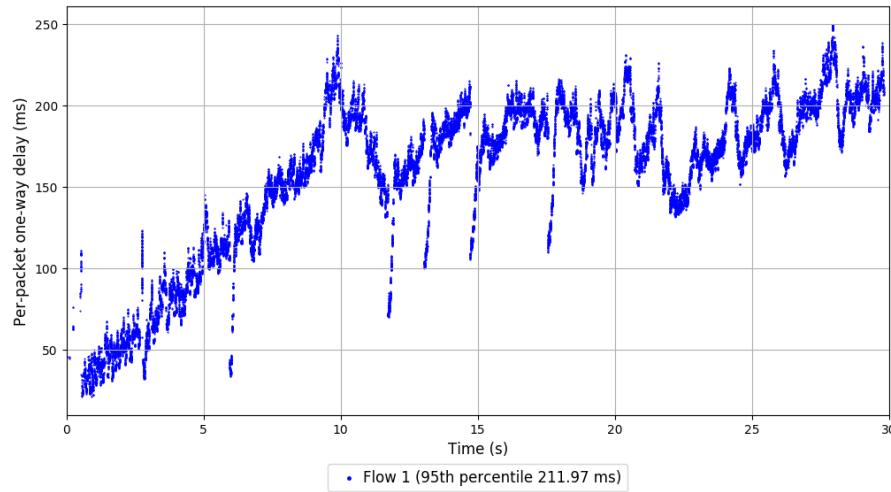
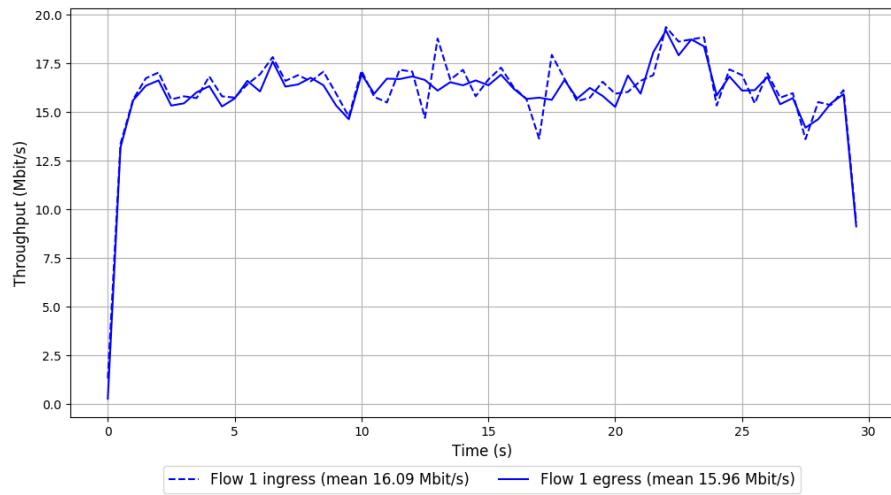


```
Run 3: Statistics of QUIC Cubic
```

```
Start at: 2018-01-10 13:40:41
End at: 2018-01-10 13:41:11
Local clock offset: -1.339 ms
Remote clock offset: -4.987 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.96 Mbit/s
95th percentile per-packet one-way delay: 211.975 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 15.96 Mbit/s
95th percentile per-packet one-way delay: 211.975 ms
Loss rate: 1.03%
```

Run 3: Report of QUIC Cubic — Data Link

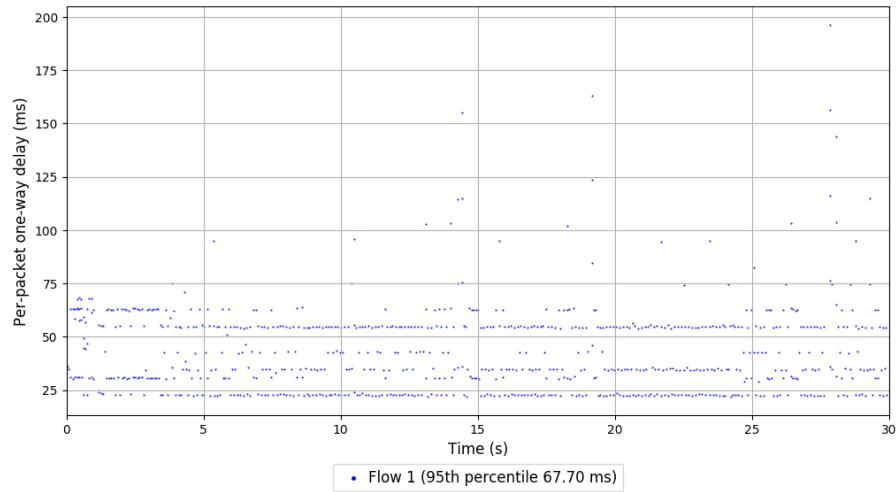
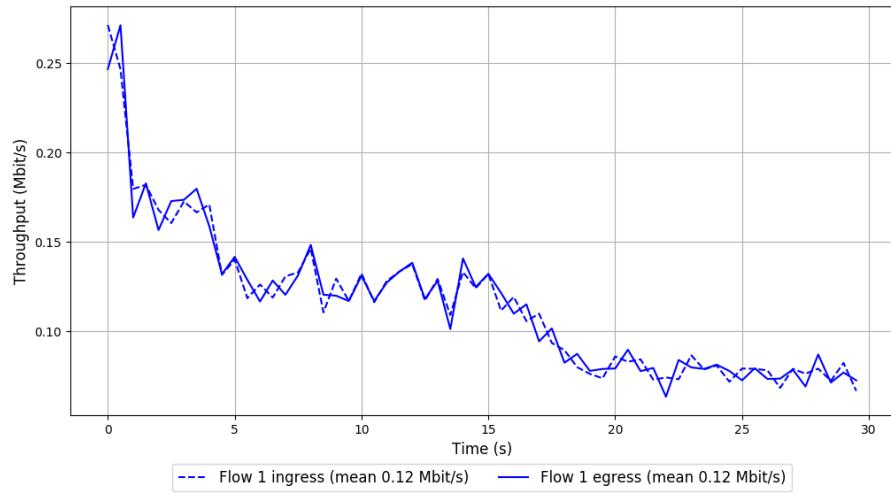


```
Run 1: Statistics of SCReAM

Start at: 2018-01-10 12:57:02
End at: 2018-01-10 12:57:32
Local clock offset: -0.911 ms
Remote clock offset: -5.231 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 67.704 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 67.704 ms
Loss rate: 0.09%
```

Run 1: Report of SCReAM — Data Link

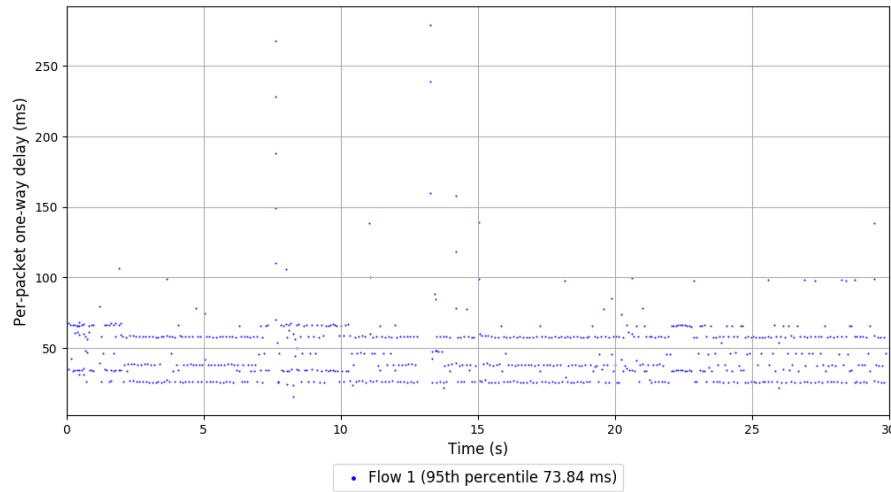
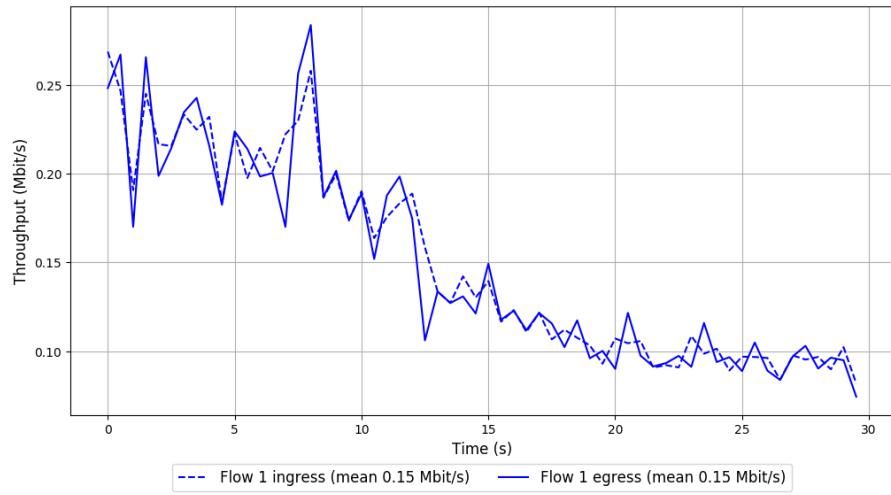


Run 2: Statistics of SCReAM

```
Start at: 2018-01-10 13:14:45
End at: 2018-01-10 13:15:15
Local clock offset: -1.318 ms
Remote clock offset: -4.801 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 73.839 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 73.839 ms
Loss rate: 0.90%
```

Run 2: Report of SCReAM — Data Link

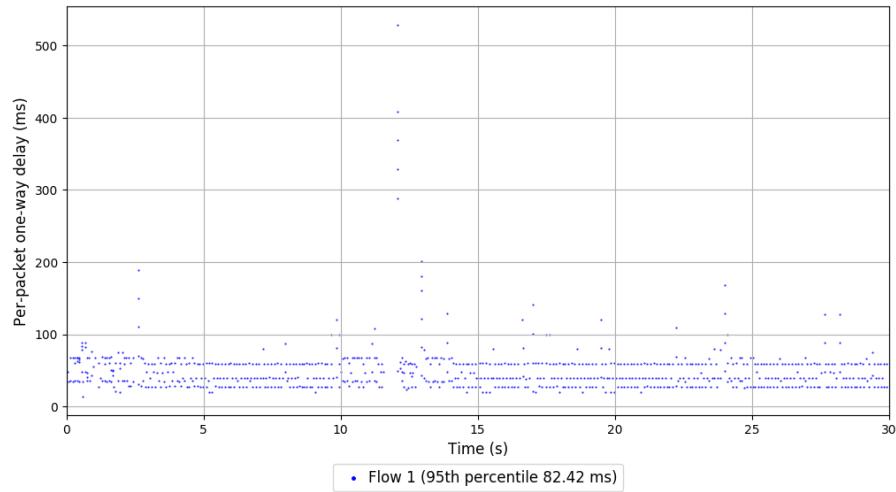
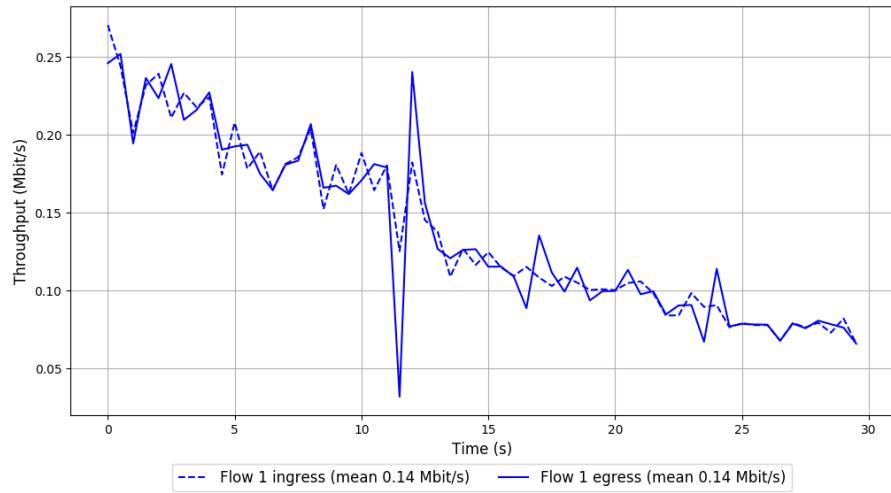


Run 3: Statistics of SCReAM

```
Start at: 2018-01-10 13:32:27
End at: 2018-01-10 13:32:57
Local clock offset: -1.416 ms
Remote clock offset: -4.863 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 82.421 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 82.421 ms
Loss rate: 0.43%
```

Run 3: Report of SCReAM — Data Link

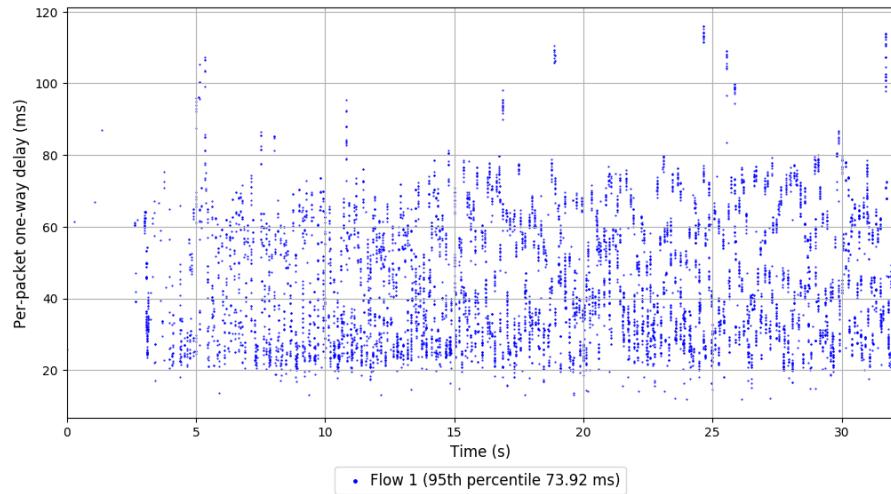
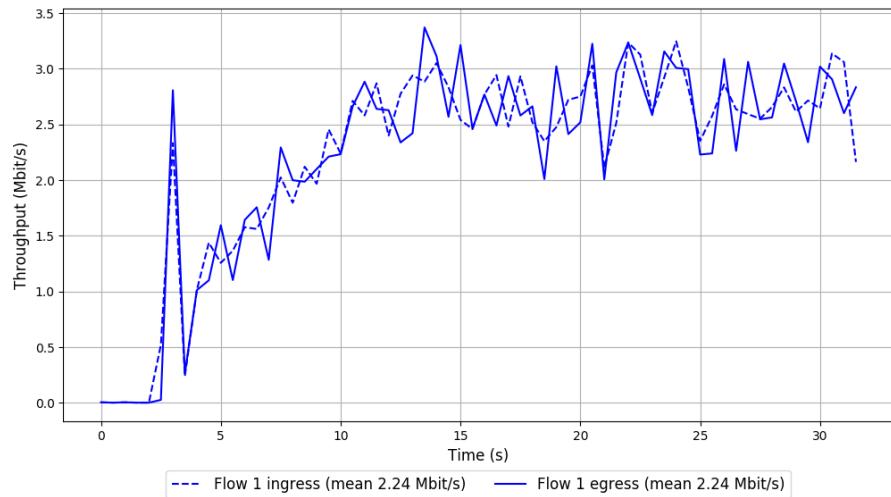


```
Run 1: Statistics of WebRTC media

Start at: 2018-01-10 13:06:28
End at: 2018-01-10 13:06:59
Local clock offset: -1.054 ms
Remote clock offset: -4.967 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 73.919 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 73.919 ms
Loss rate: 0.01%
```

Run 1: Report of WebRTC media — Data Link

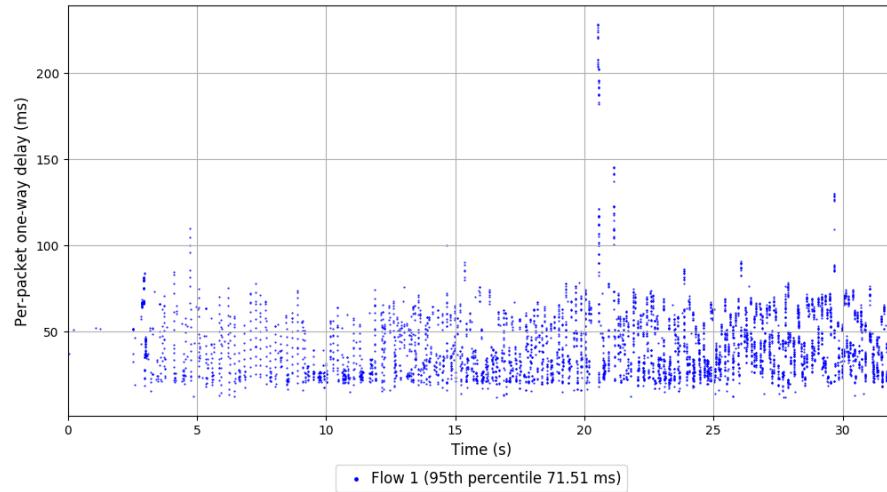
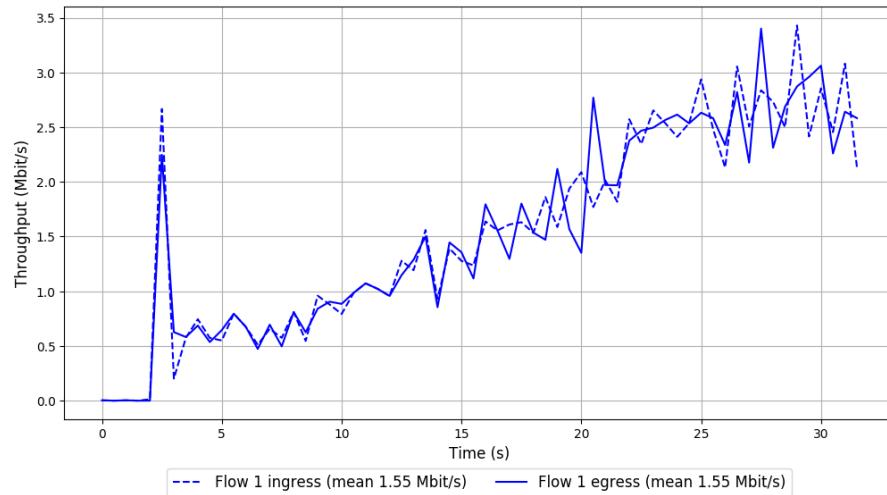


Run 2: Statistics of WebRTC media

```
Start at: 2018-01-10 13:24:11
End at: 2018-01-10 13:24:41
Local clock offset: -1.374 ms
Remote clock offset: -4.574 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 71.513 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 71.513 ms
Loss rate: 0.23%
```

Run 2: Report of WebRTC media — Data Link

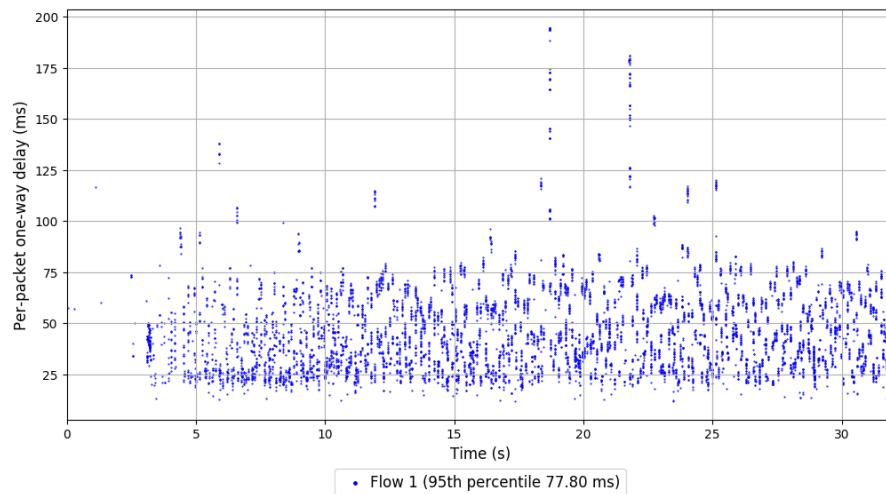
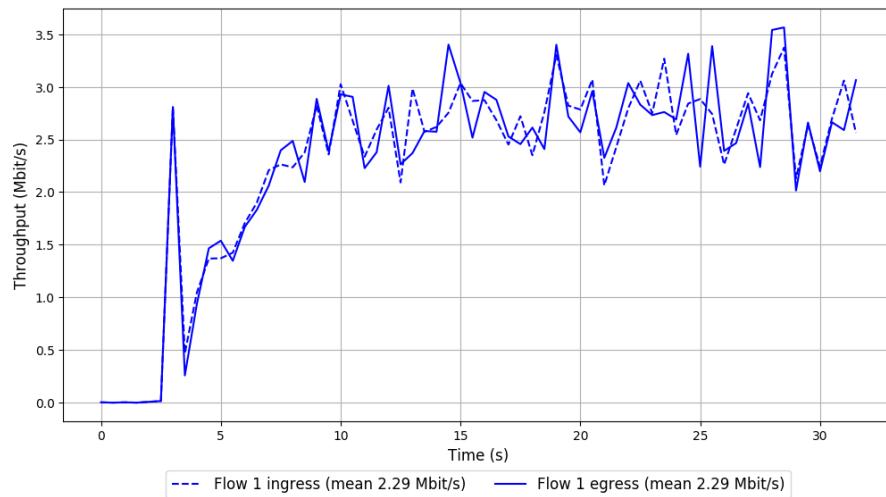


```
Run 3: Statistics of WebRTC media

Start at: 2018-01-10 13:41:52
End at: 2018-01-10 13:42:22
Local clock offset: -1.329 ms
Remote clock offset: -5.024 ms

# Below is generated by plot.py at 2018-01-10 14:40:45
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 77.803 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 77.803 ms
Loss rate: 0.14%
```

Run 3: Report of WebRTC media — Data Link

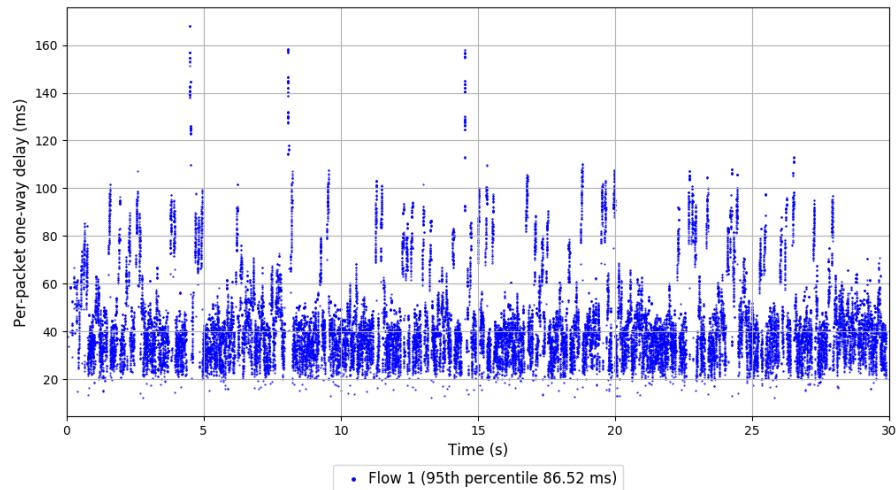
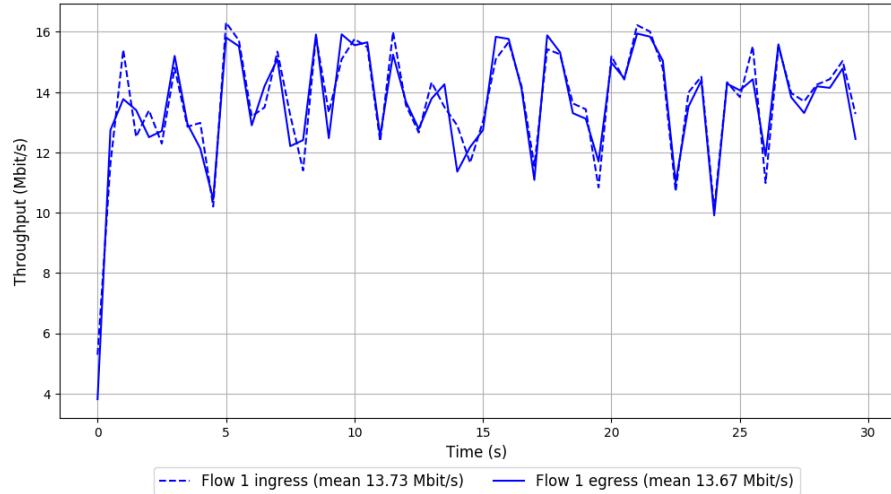


Run 1: Statistics of Sprout

```
Start at: 2018-01-10 13:01:45
End at: 2018-01-10 13:02:15
Local clock offset: -0.998 ms
Remote clock offset: -5.019 ms

# Below is generated by plot.py at 2018-01-10 14:40:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.67 Mbit/s
95th percentile per-packet one-way delay: 86.522 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 13.67 Mbit/s
95th percentile per-packet one-way delay: 86.522 ms
Loss rate: 0.66%
```

Run 1: Report of Sprout — Data Link

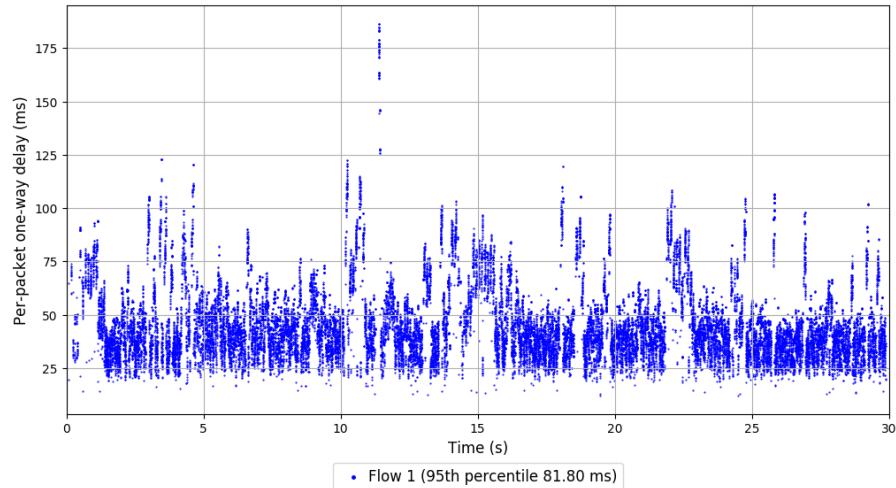
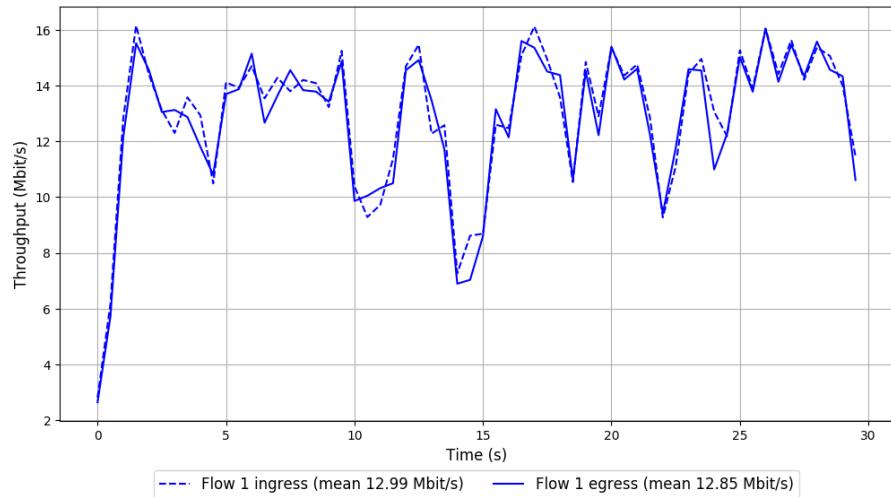


Run 2: Statistics of Sprout

```
Start at: 2018-01-10 13:19:28
End at: 2018-01-10 13:19:58
Local clock offset: -1.241 ms
Remote clock offset: -4.689 ms

# Below is generated by plot.py at 2018-01-10 14:40:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 81.796 ms
Loss rate: 1.42%
-- Flow 1:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 81.796 ms
Loss rate: 1.42%
```

Run 2: Report of Sprout — Data Link

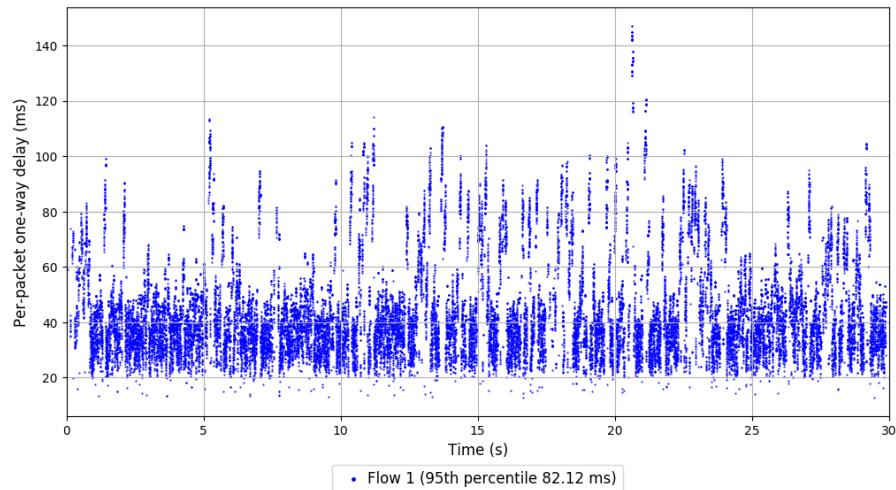
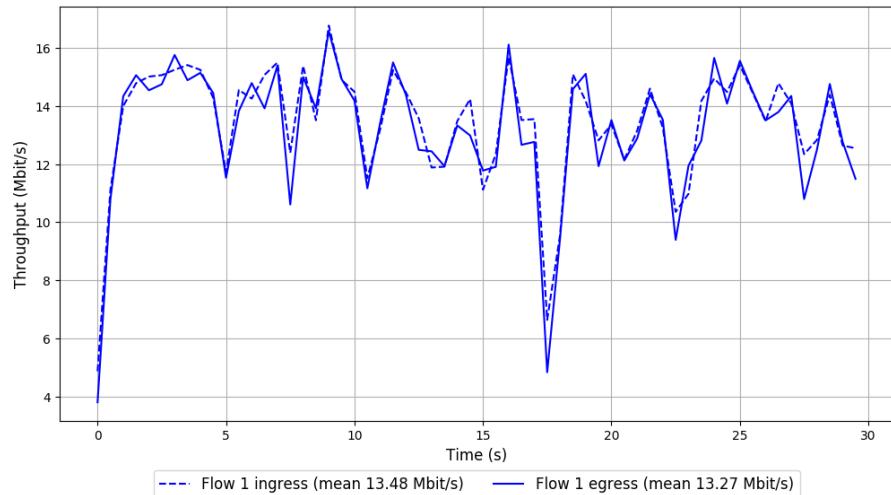


Run 3: Statistics of Sprout

```
Start at: 2018-01-10 13:37:09
End at: 2018-01-10 13:37:39
Local clock offset: -1.334 ms
Remote clock offset: -4.985 ms

# Below is generated by plot.py at 2018-01-10 14:40:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.27 Mbit/s
95th percentile per-packet one-way delay: 82.117 ms
Loss rate: 1.82%
-- Flow 1:
Average throughput: 13.27 Mbit/s
95th percentile per-packet one-way delay: 82.117 ms
Loss rate: 1.82%
```

Run 3: Report of Sprout — Data Link

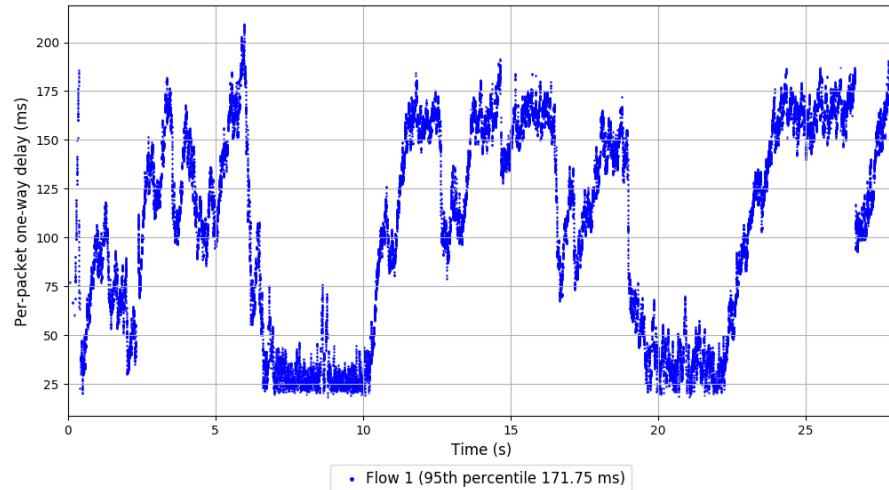
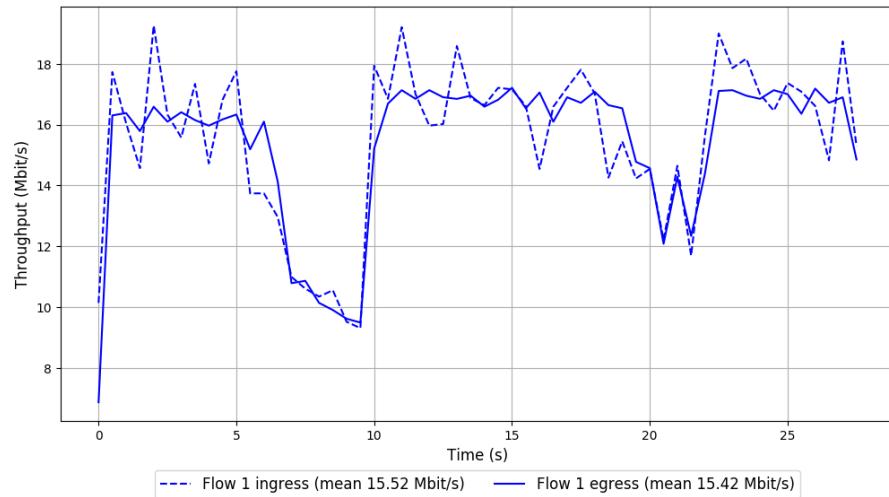


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-01-10 13:10:01
End at: 2018-01-10 13:10:31
Local clock offset: -1.139 ms
Remote clock offset: -4.733 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 15.42 Mbit/s
95th percentile per-packet one-way delay: 171.745 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 15.42 Mbit/s
95th percentile per-packet one-way delay: 171.745 ms
Loss rate: 0.99%
```

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

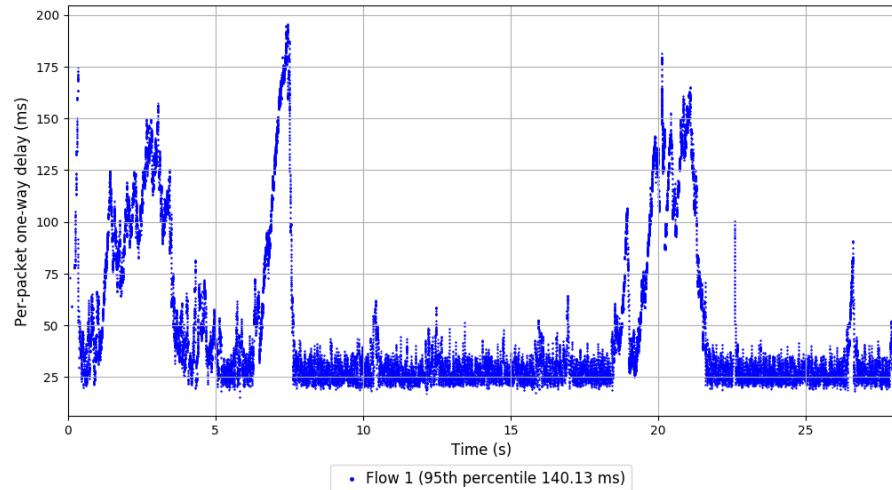
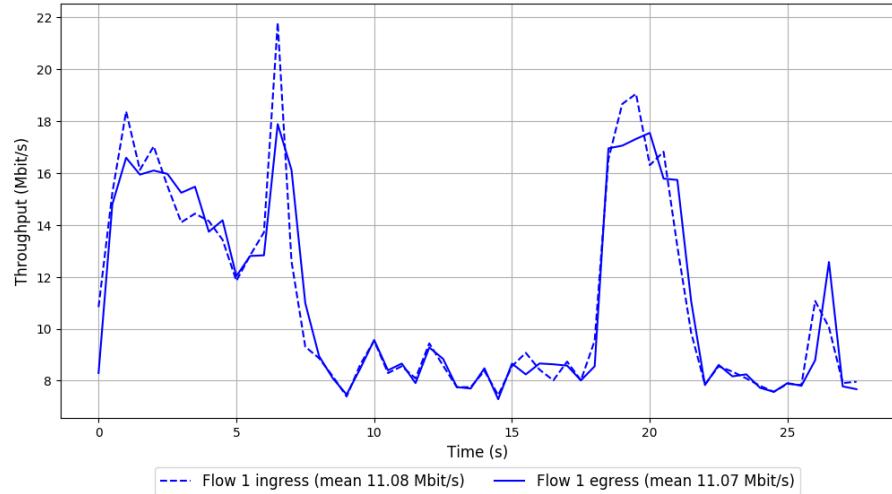


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-01-10 13:27:44
End at: 2018-01-10 13:28:14
Local clock offset: -1.406 ms
Remote clock offset: -4.642 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.07 Mbit/s
95th percentile per-packet one-way delay: 140.133 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 11.07 Mbit/s
95th percentile per-packet one-way delay: 140.133 ms
Loss rate: 0.41%
```

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

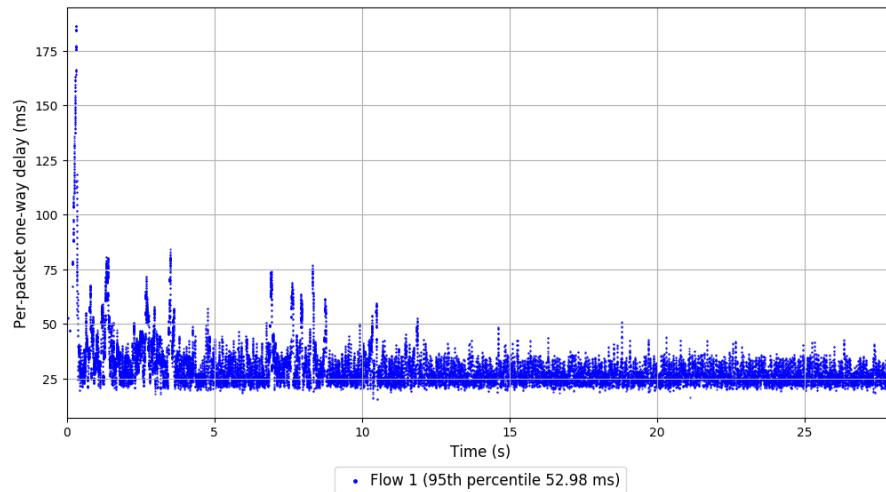
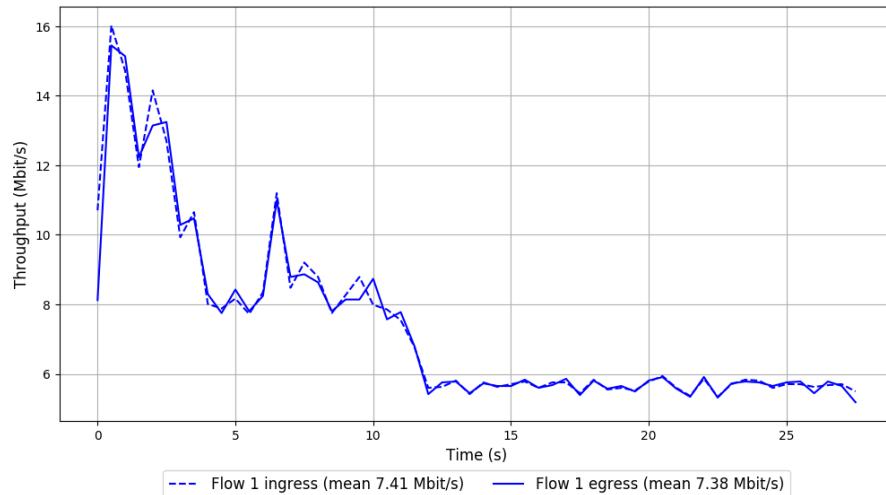


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-01-10 13:45:24
End at: 2018-01-10 13:45:54
Local clock offset: -1.317 ms
Remote clock offset: -5.172 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.38 Mbit/s
95th percentile per-packet one-way delay: 52.975 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 7.38 Mbit/s
95th percentile per-packet one-way delay: 52.975 ms
Loss rate: 0.76%
```

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

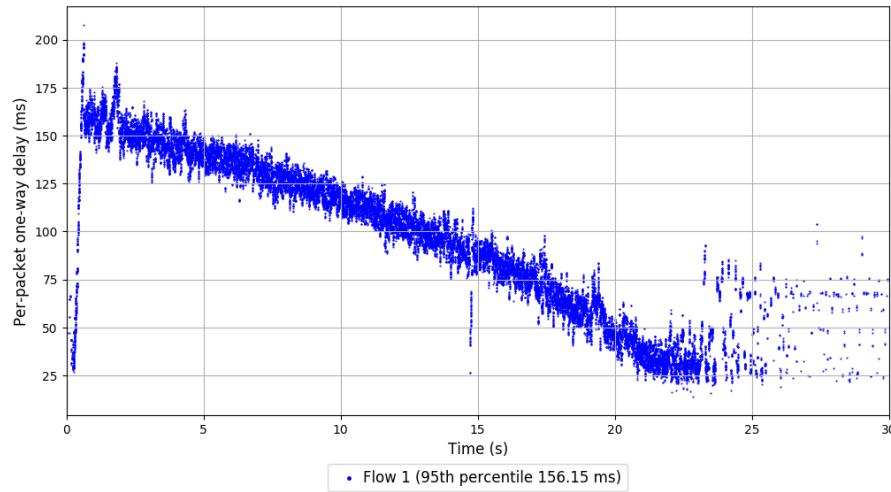
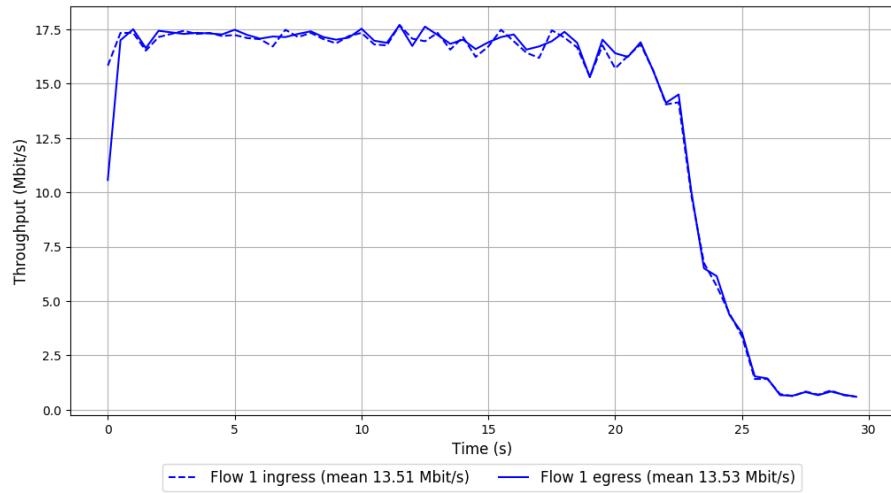


Run 1: Statistics of TCP Vegas

```
Start at: 2018-01-10 13:02:55
End at: 2018-01-10 13:03:26
Local clock offset: -0.982 ms
Remote clock offset: -5.075 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.53 Mbit/s
95th percentile per-packet one-way delay: 156.147 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 13.53 Mbit/s
95th percentile per-packet one-way delay: 156.147 ms
Loss rate: 0.01%
```

Run 1: Report of TCP Vegas — Data Link

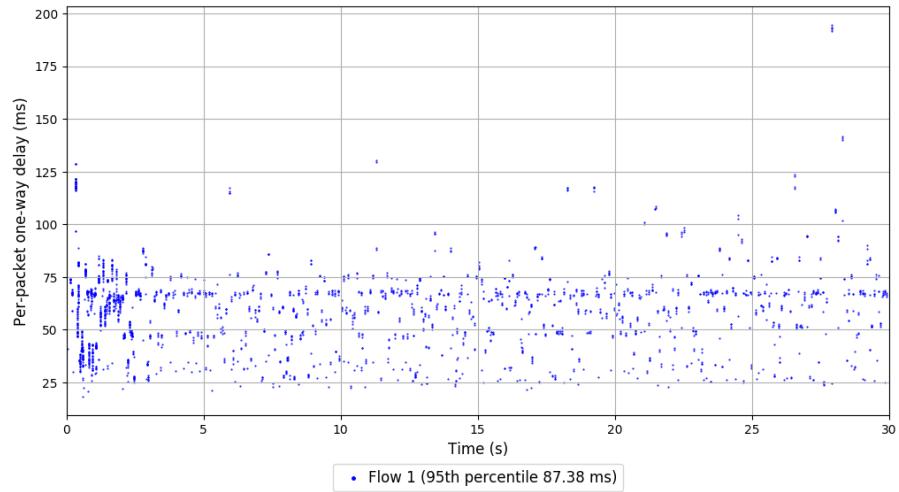
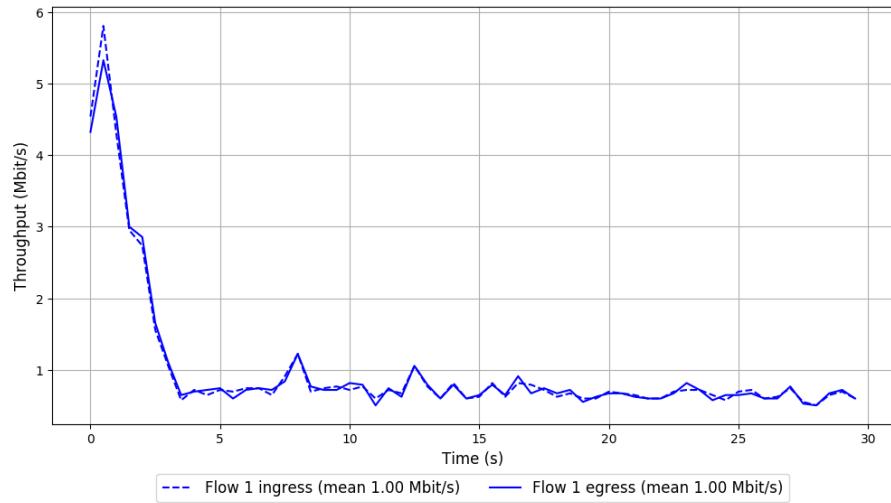


Run 2: Statistics of TCP Vegas

```
Start at: 2018-01-10 13:20:39
End at: 2018-01-10 13:21:09
Local clock offset: -1.349 ms
Remote clock offset: -4.745 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 87.376 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 87.376 ms
Loss rate: 0.12%
```

Run 2: Report of TCP Vegas — Data Link

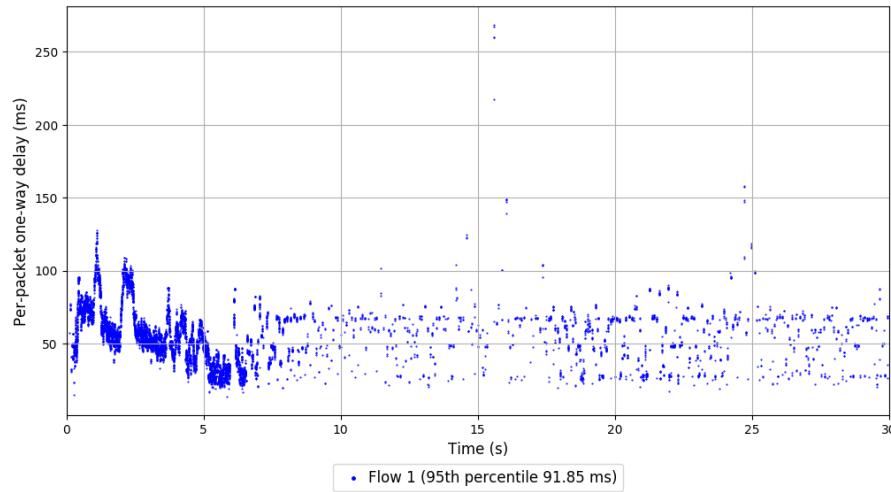
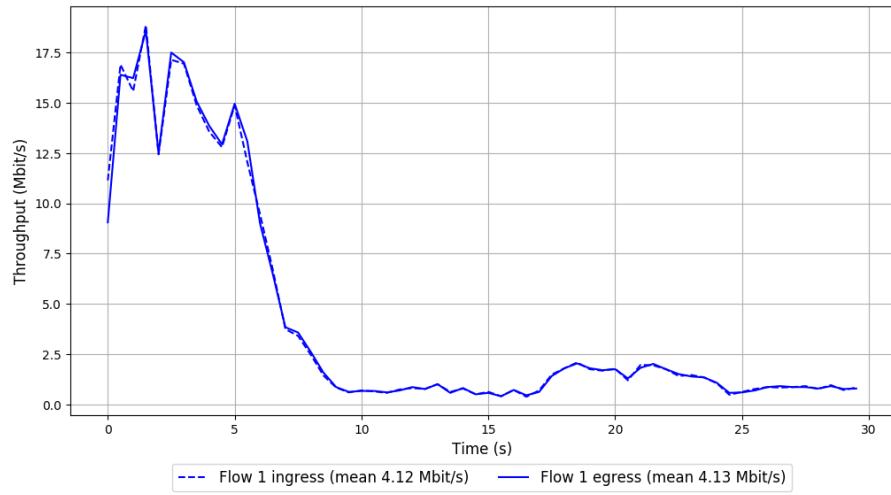


Run 3: Statistics of TCP Vegas

```
Start at: 2018-01-10 13:38:20
End at: 2018-01-10 13:38:50
Local clock offset: -1.355 ms
Remote clock offset: -4.917 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 91.846 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 4.13 Mbit/s
95th percentile per-packet one-way delay: 91.846 ms
Loss rate: 0.05%
```

Run 3: Report of TCP Vegas — Data Link

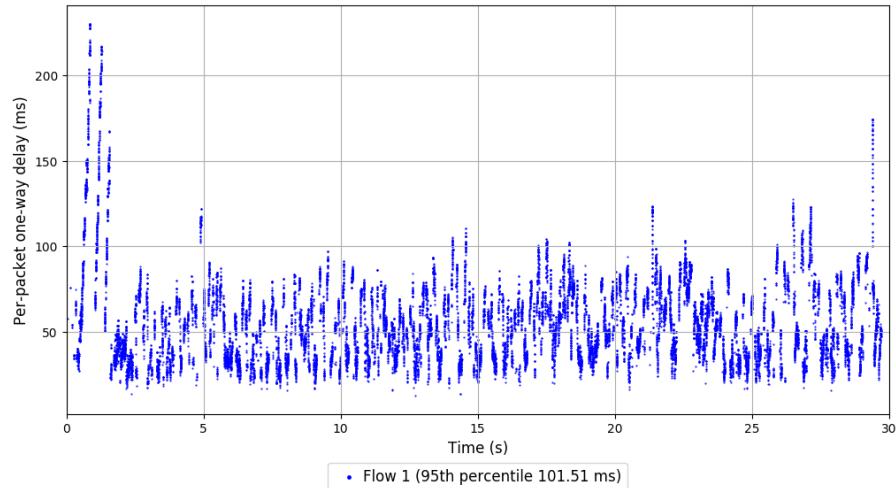
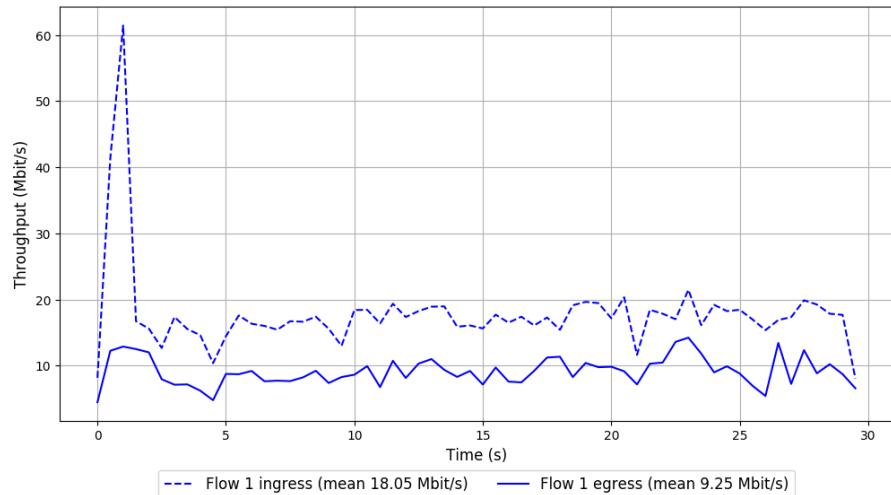


Run 1: Statistics of Verus

```
Start at: 2018-01-10 13:04:07
End at: 2018-01-10 13:04:37
Local clock offset: -1.102 ms
Remote clock offset: -4.995 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.25 Mbit/s
95th percentile per-packet one-way delay: 101.507 ms
Loss rate: 48.75%
-- Flow 1:
Average throughput: 9.25 Mbit/s
95th percentile per-packet one-way delay: 101.507 ms
Loss rate: 48.75%
```

Run 1: Report of Verus — Data Link

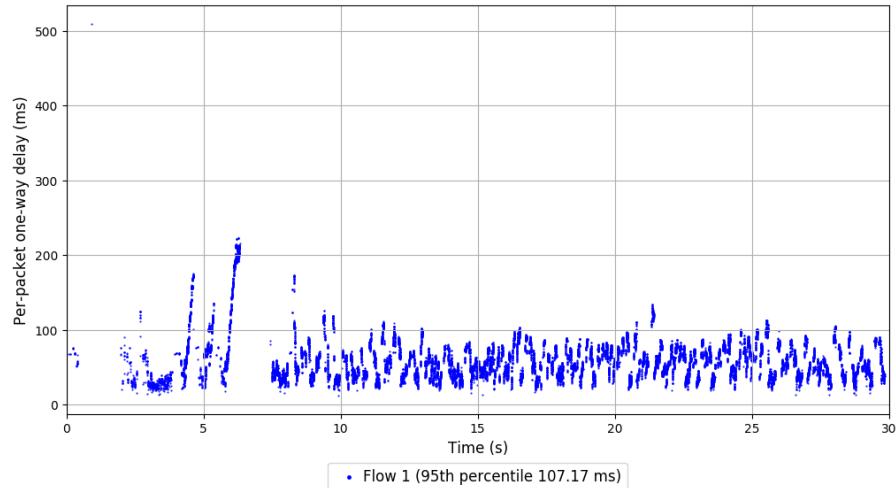
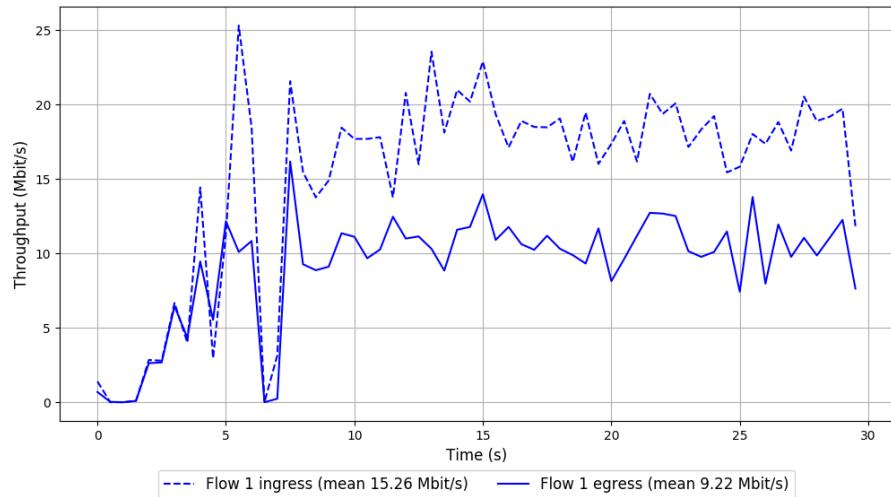


Run 2: Statistics of Verus

```
Start at: 2018-01-10 13:21:49
End at: 2018-01-10 13:22:19
Local clock offset: -1.358 ms
Remote clock offset: -4.684 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.22 Mbit/s
95th percentile per-packet one-way delay: 107.165 ms
Loss rate: 39.65%
-- Flow 1:
Average throughput: 9.22 Mbit/s
95th percentile per-packet one-way delay: 107.165 ms
Loss rate: 39.65%
```

Run 2: Report of Verus — Data Link

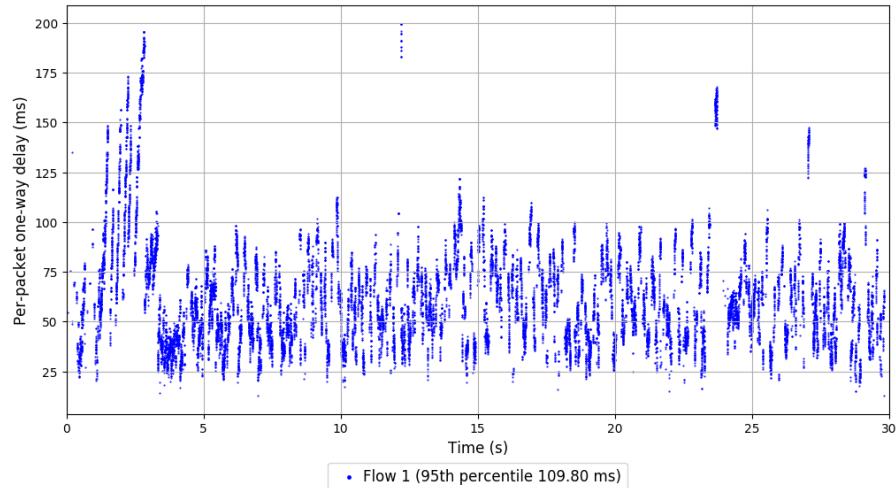
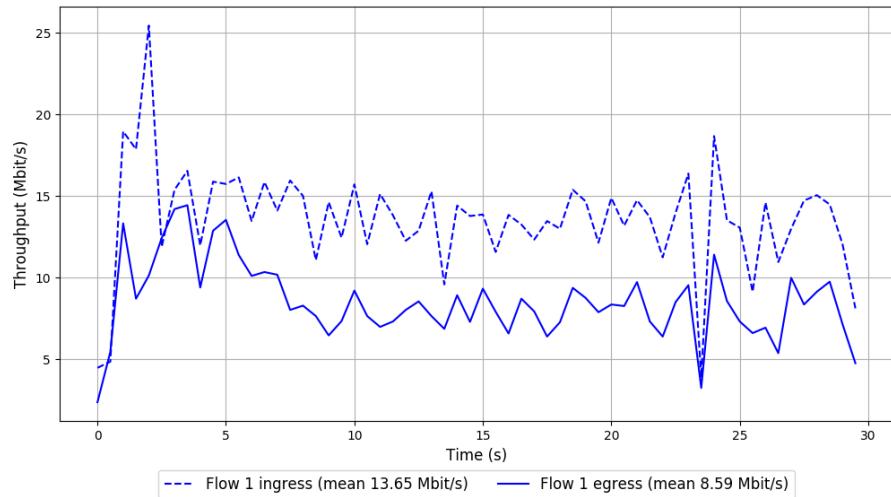


Run 3: Statistics of Verus

```
Start at: 2018-01-10 13:39:30
End at: 2018-01-10 13:40:00
Local clock offset: -1.442 ms
Remote clock offset: -5.03 ms

# Below is generated by plot.py at 2018-01-10 14:41:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.59 Mbit/s
95th percentile per-packet one-way delay: 109.796 ms
Loss rate: 37.24%
-- Flow 1:
Average throughput: 8.59 Mbit/s
95th percentile per-packet one-way delay: 109.796 ms
Loss rate: 37.24%
```

Run 3: Report of Verus — Data Link

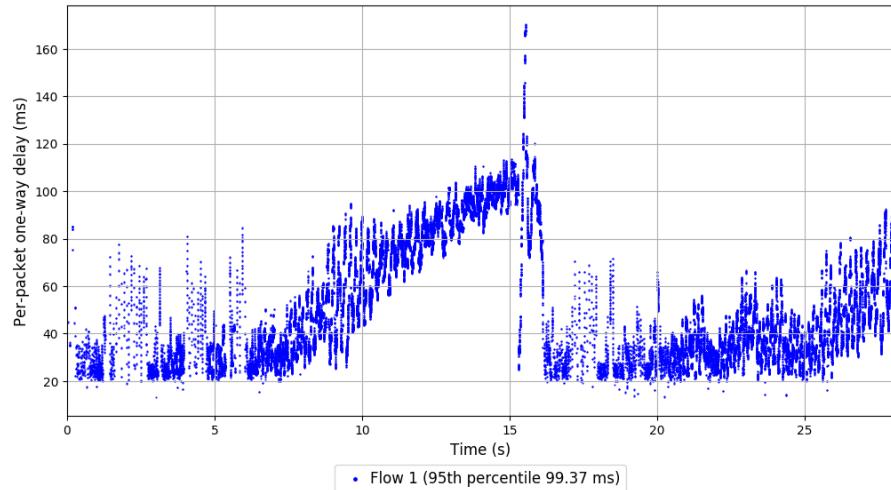
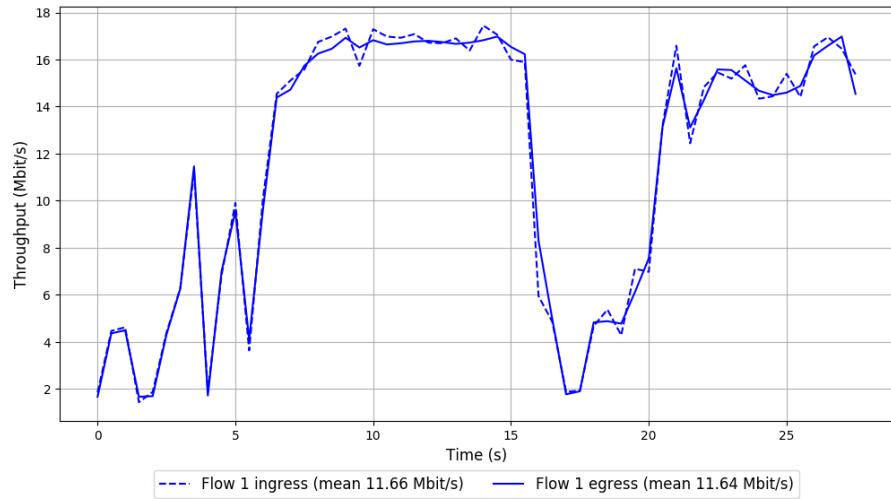


Run 1: Statistics of Copa

```
Start at: 2018-01-10 13:07:39
End at: 2018-01-10 13:08:09
Local clock offset: -1.178 ms
Remote clock offset: -4.914 ms

# Below is generated by plot.py at 2018-01-10 14:41:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.64 Mbit/s
95th percentile per-packet one-way delay: 99.370 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 11.64 Mbit/s
95th percentile per-packet one-way delay: 99.370 ms
Loss rate: 0.39%
```

Run 1: Report of Copa — Data Link

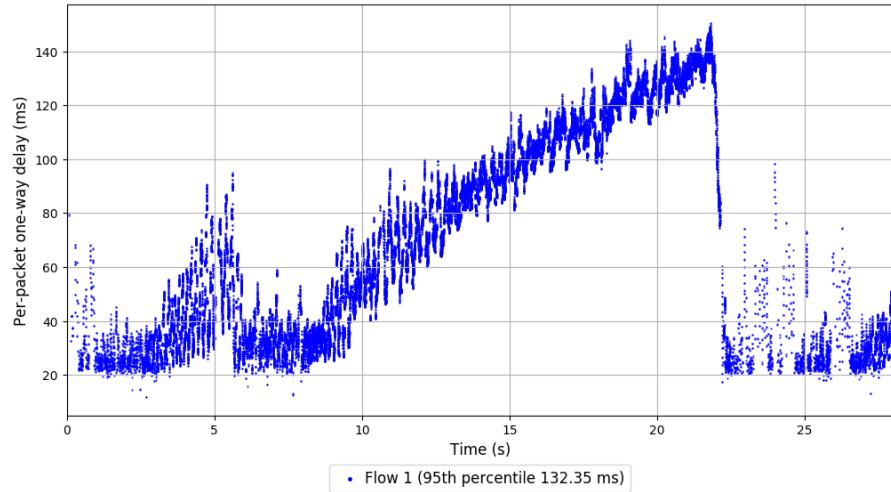
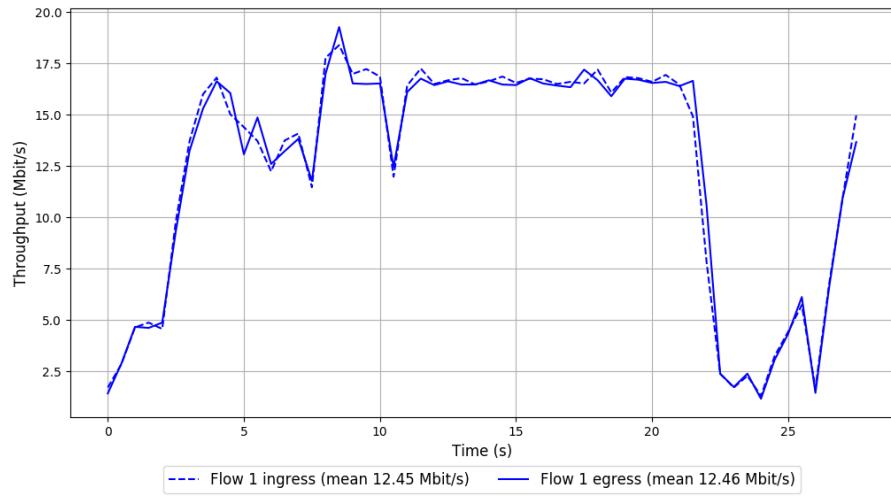


Run 2: Statistics of Copa

```
Start at: 2018-01-10 13:25:22
End at: 2018-01-10 13:25:52
Local clock offset: -1.298 ms
Remote clock offset: -4.57 ms

# Below is generated by plot.py at 2018-01-10 14:41:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.46 Mbit/s
95th percentile per-packet one-way delay: 132.350 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 12.46 Mbit/s
95th percentile per-packet one-way delay: 132.350 ms
Loss rate: 0.30%
```

Run 2: Report of Copa — Data Link

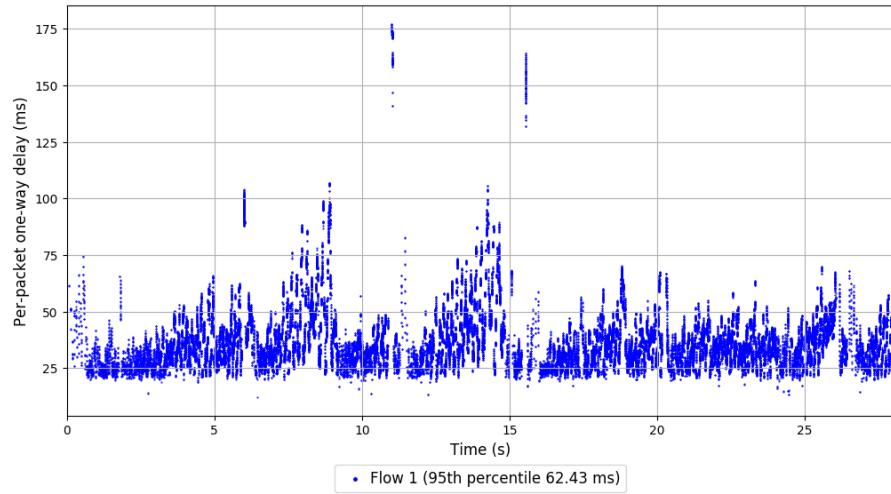
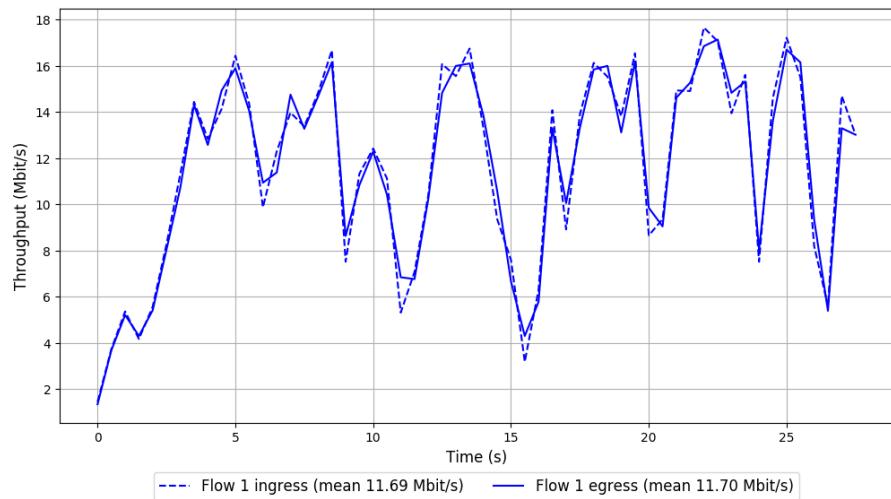


Run 3: Statistics of Copa

```
Start at: 2018-01-10 13:43:02
End at: 2018-01-10 13:43:32
Local clock offset: -1.352 ms
Remote clock offset: -5.066 ms

# Below is generated by plot.py at 2018-01-10 14:41:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.70 Mbit/s
95th percentile per-packet one-way delay: 62.426 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 11.70 Mbit/s
95th percentile per-packet one-way delay: 62.426 ms
Loss rate: 0.26%
```

Run 3: Report of Copa — Data Link

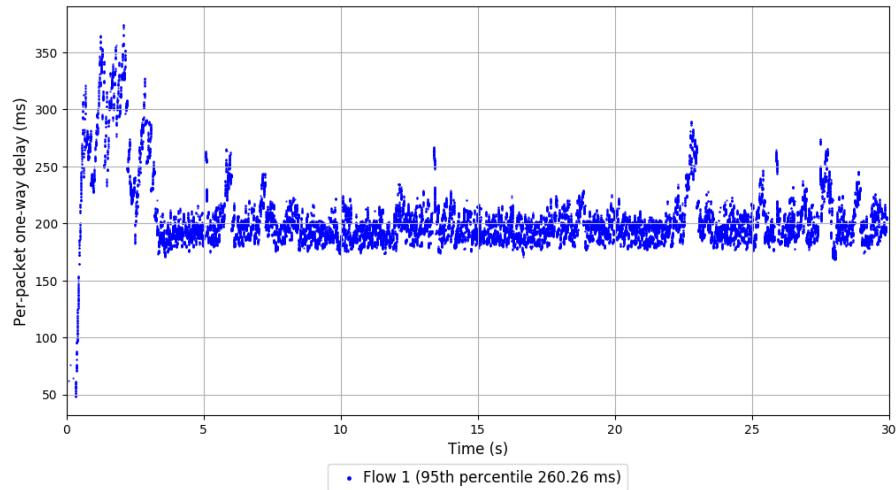
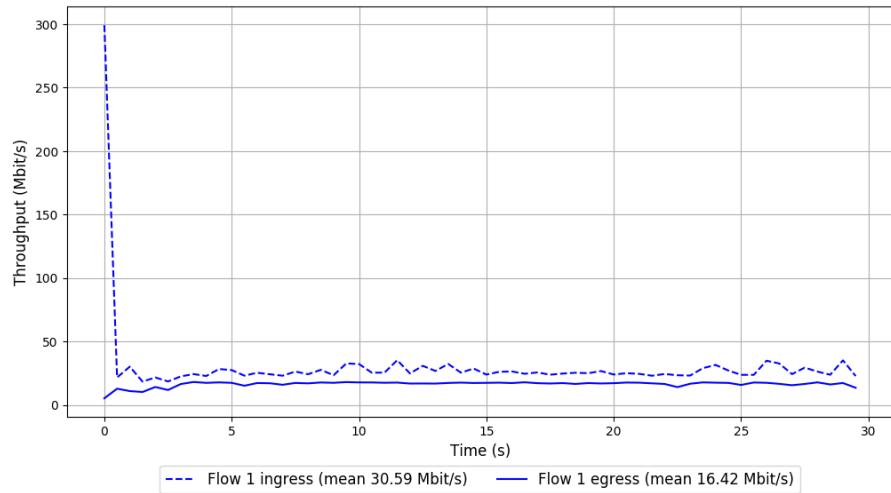


Run 1: Statistics of FillP

```
Start at: 2018-01-10 12:58:12
End at: 2018-01-10 12:58:42
Local clock offset: -0.943 ms
Remote clock offset: -5.222 ms

# Below is generated by plot.py at 2018-01-10 14:41:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.42 Mbit/s
95th percentile per-packet one-way delay: 260.256 ms
Loss rate: 46.50%
-- Flow 1:
Average throughput: 16.42 Mbit/s
95th percentile per-packet one-way delay: 260.256 ms
Loss rate: 46.50%
```

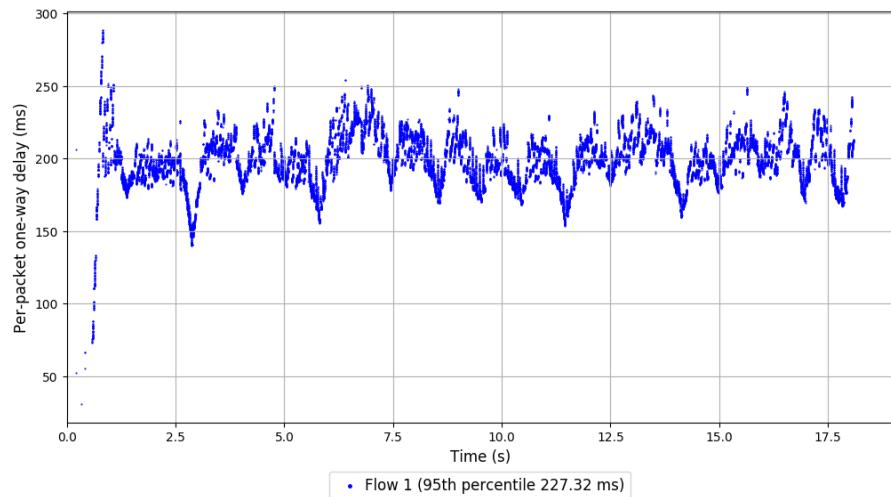
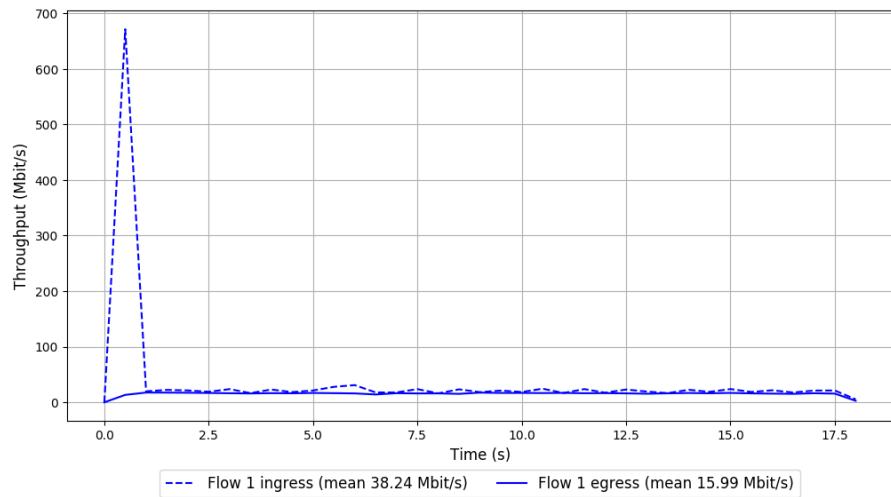
Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-01-10 13:15:55
End at: 2018-01-10 13:16:25
Local clock offset: -1.238 ms
Remote clock offset: -4.774 ms

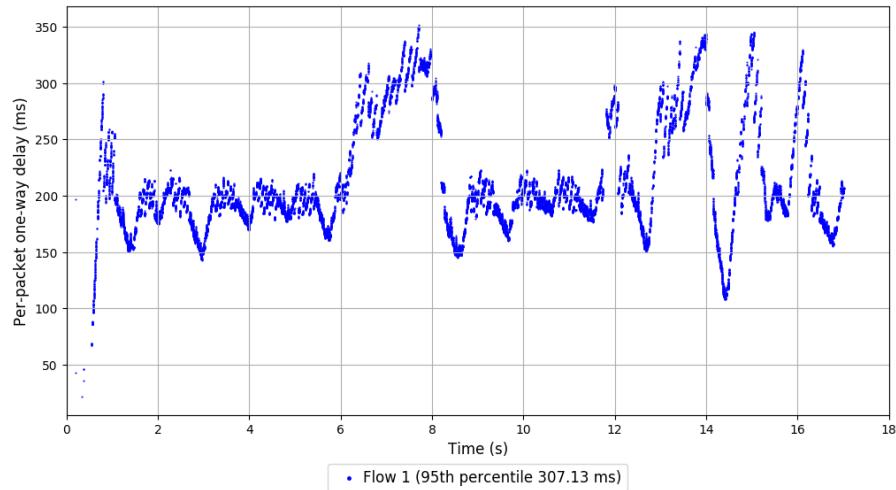
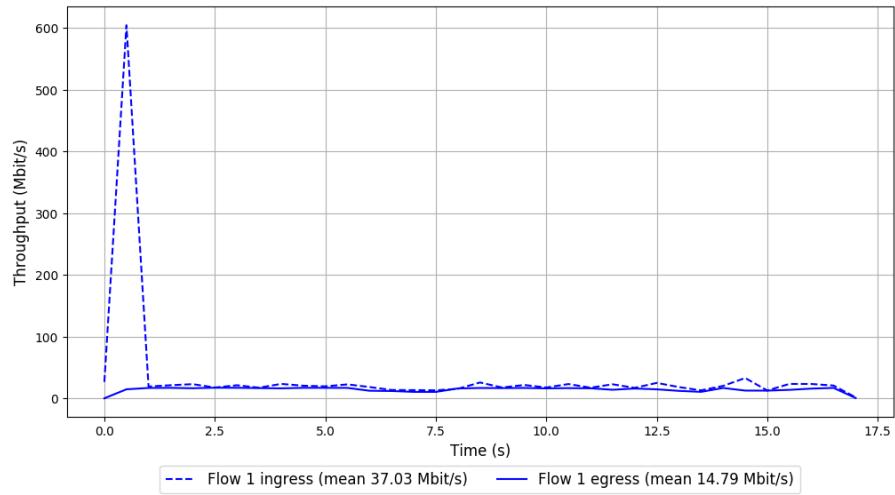
Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-01-10 13:33:37
End at: 2018-01-10 13:34:07
Local clock offset: -1.446 ms
Remote clock offset: -4.884 ms

Run 3: Report of FillP — Data Link

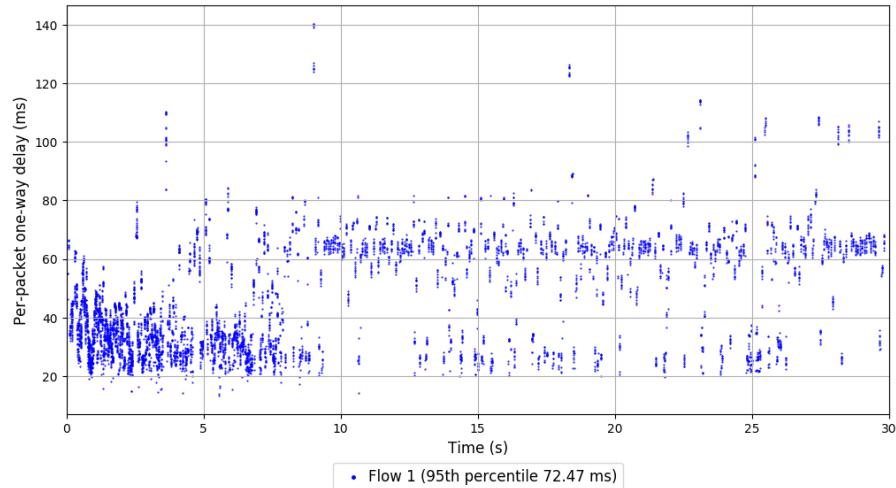
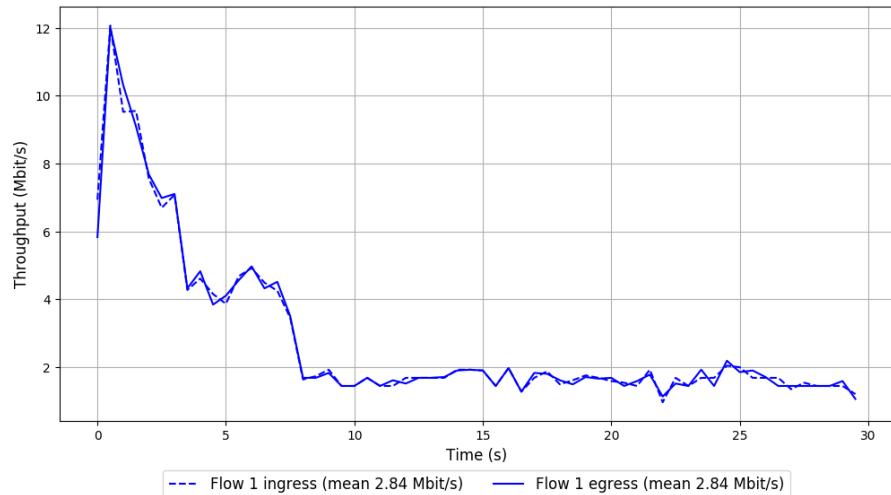


Run 1: Statistics of Indigo

```
Start at: 2018-01-10 13:00:34
End at: 2018-01-10 13:01:04
Local clock offset: -0.971 ms
Remote clock offset: -5.121 ms

# Below is generated by plot.py at 2018-01-10 14:41:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 72.467 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 72.467 ms
Loss rate: 0.14%
```

Run 1: Report of Indigo — Data Link

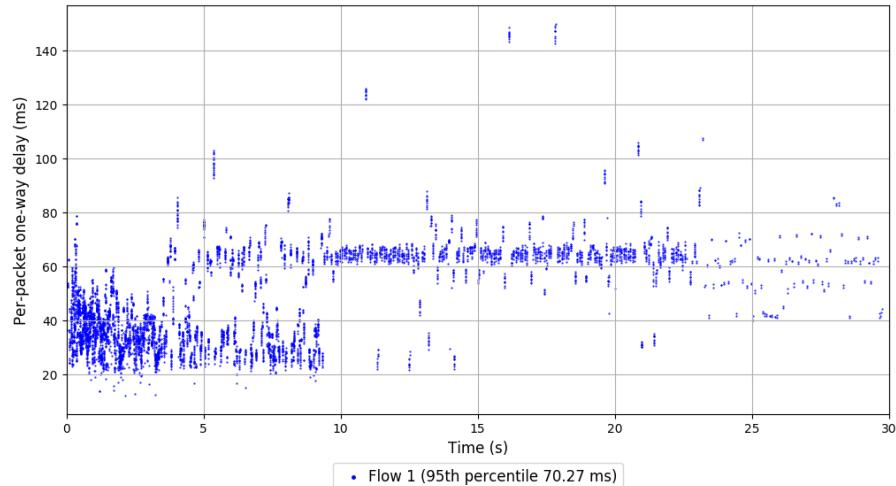
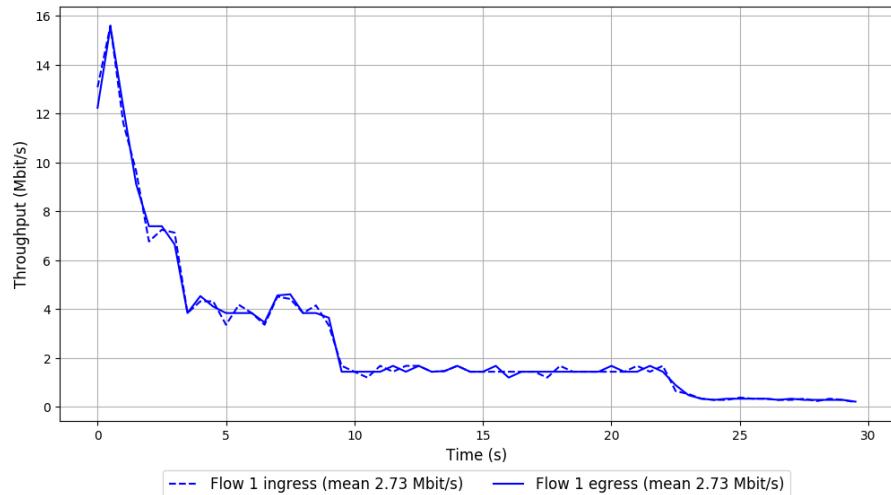


Run 2: Statistics of Indigo

```
Start at: 2018-01-10 13:18:17
End at: 2018-01-10 13:18:47
Local clock offset: -1.241 ms
Remote clock offset: -4.725 ms

# Below is generated by plot.py at 2018-01-10 14:41:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.73 Mbit/s
95th percentile per-packet one-way delay: 70.273 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 2.73 Mbit/s
95th percentile per-packet one-way delay: 70.273 ms
Loss rate: 0.01%
```

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2018-01-10 13:35:59
End at: 2018-01-10 13:36:29
Local clock offset: -1.424 ms
Remote clock offset: -4.952 ms

# Below is generated by plot.py at 2018-01-10 14:41:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 72.657 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 72.657 ms
Loss rate: 0.14%
```

Run 3: Report of Indigo — Data Link

