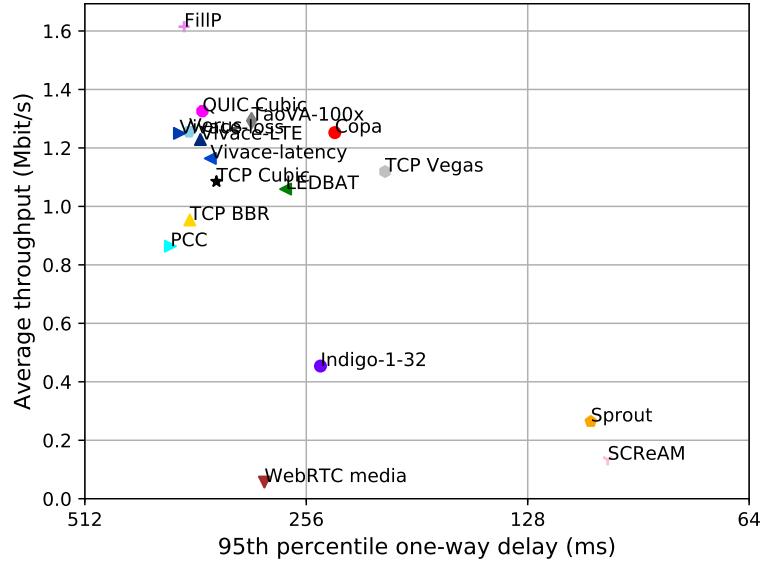


Pantheon Report

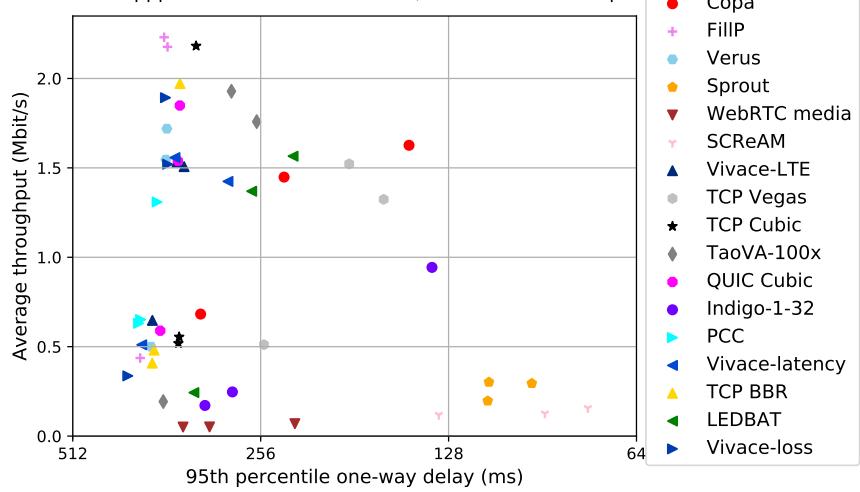
Generated at 2018-04-10 06:30:25 (UTC).
Data path: India ppp0 (*remote*) → AWS India 1 Ethernet (*local*).
Repeated the test of 17 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).
Tested BBR with qdisc 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 @ eb420b5be9bafcc22cf68b99ff5a2000462fc59
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
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 @ b3465b942e2826f2b179aab4a906ce6bb7cf3cf
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 @ f271183af822eee5d0031620f4bebf38aedc5581

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



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



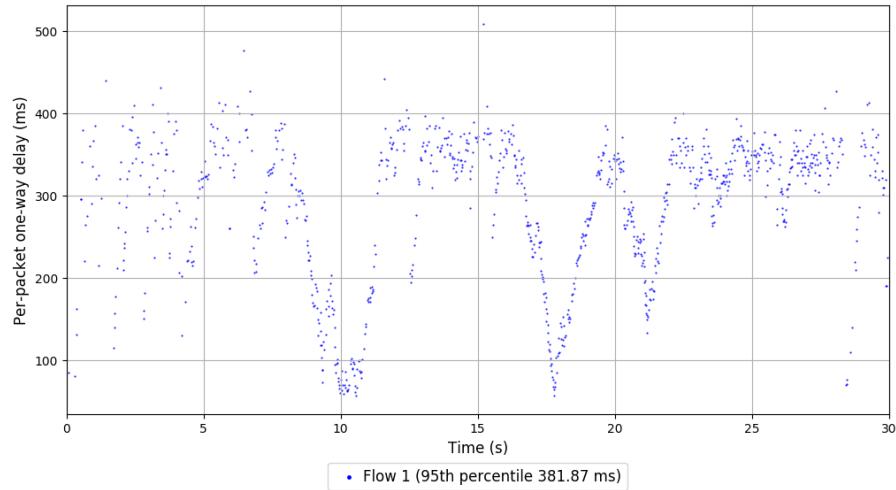
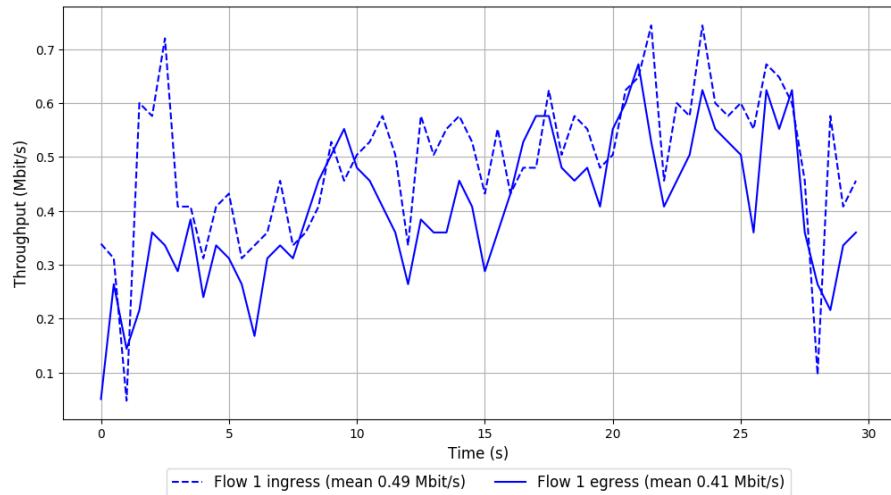
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.95	368.61	11.53
TCP Cubic	3	1.08	339.14	3.74
LEDBAT	3	1.06	273.14	1.23
PCC	3	0.86	391.73	82.00
QUIC Cubic	3	1.33	354.40	7.36
SCReAM	3	0.14	99.66	0.16
WebRTC media	3	0.06	291.86	12.72
Sprout	3	0.26	105.08	0.29
TaoVA-100x	3	1.29	303.87	25.38
TCP Vegas	3	1.12	200.06	1.06
Verus	3	1.26	369.55	31.71
Copa	3	1.25	234.13	1.52
FillP	3	1.62	375.23	31.83
Indigo-1-32	3	0.45	244.88	5.69
Vivace-latency	3	1.16	345.69	24.95
Vivace-loss	3	1.25	380.79	38.17
Vivace-LTE	3	1.23	356.61	21.33

Run 1: Statistics of TCP BBR

```
Start at: 2018-04-10 04:49:07
End at: 2018-04-10 04:49:37
Local clock offset: -5.366 ms
Remote clock offset: -0.476 ms

# Below is generated by plot.py at 2018-04-10 06:29:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 381.866 ms
Loss rate: 17.54%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 381.866 ms
Loss rate: 17.54%
```

Run 1: Report of TCP BBR — Data Link

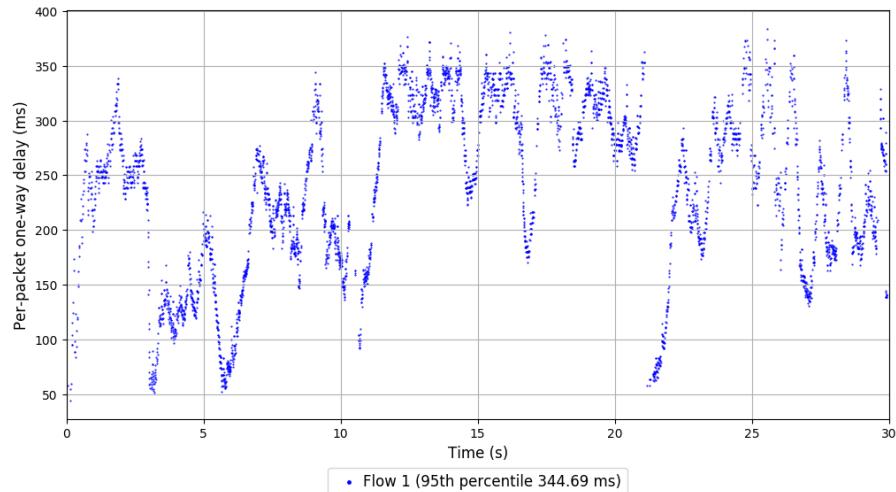
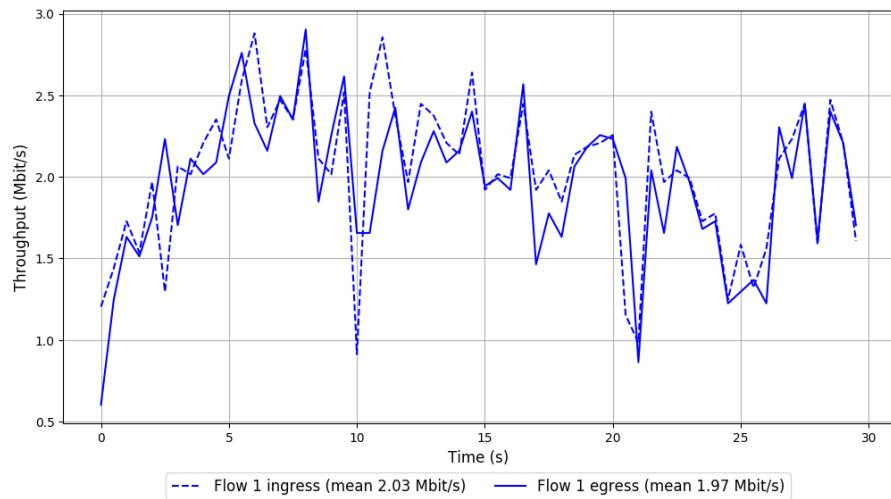


Run 2: Statistics of TCP BBR

```
Start at: 2018-04-10 05:08:46
End at: 2018-04-10 05:09:16
Local clock offset: -7.277 ms
Remote clock offset: -2.081 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.97 Mbit/s
95th percentile per-packet one-way delay: 344.687 ms
Loss rate: 3.31%
-- Flow 1:
Average throughput: 1.97 Mbit/s
95th percentile per-packet one-way delay: 344.687 ms
Loss rate: 3.31%
```

Run 2: Report of TCP BBR — Data Link

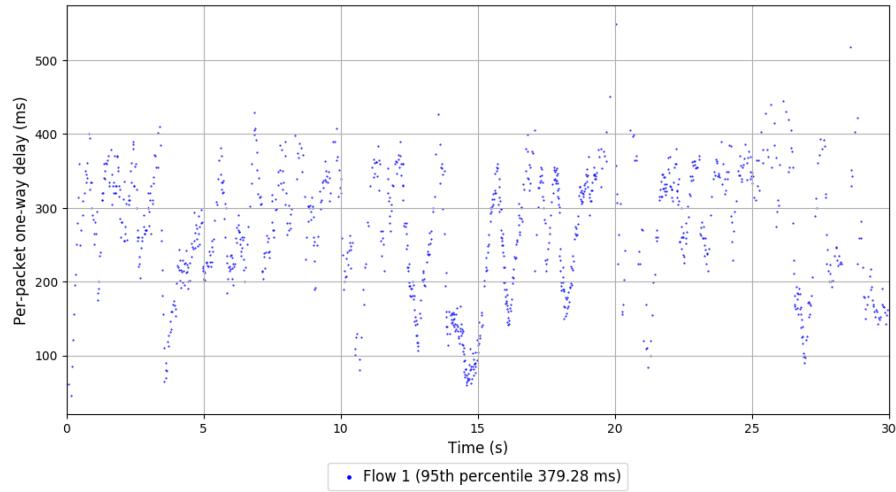
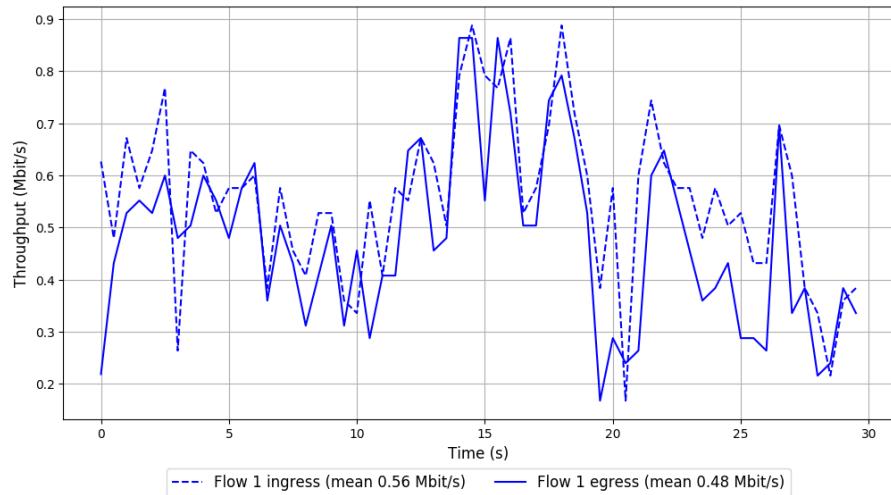


Run 3: Statistics of TCP BBR

```
Start at: 2018-04-10 05:28:14
End at: 2018-04-10 05:28:44
Local clock offset: -9.893 ms
Remote clock offset: -3.8 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 379.282 ms
Loss rate: 13.75%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 379.282 ms
Loss rate: 13.75%
```

Run 3: Report of TCP BBR — Data Link

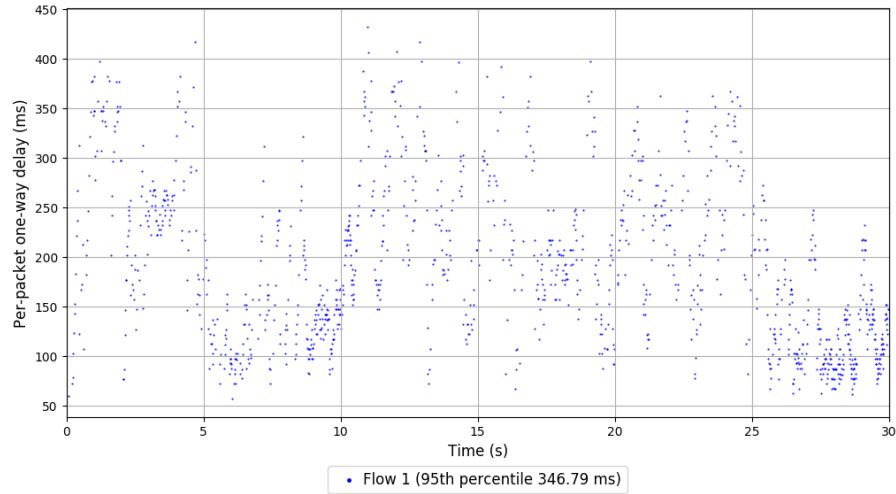
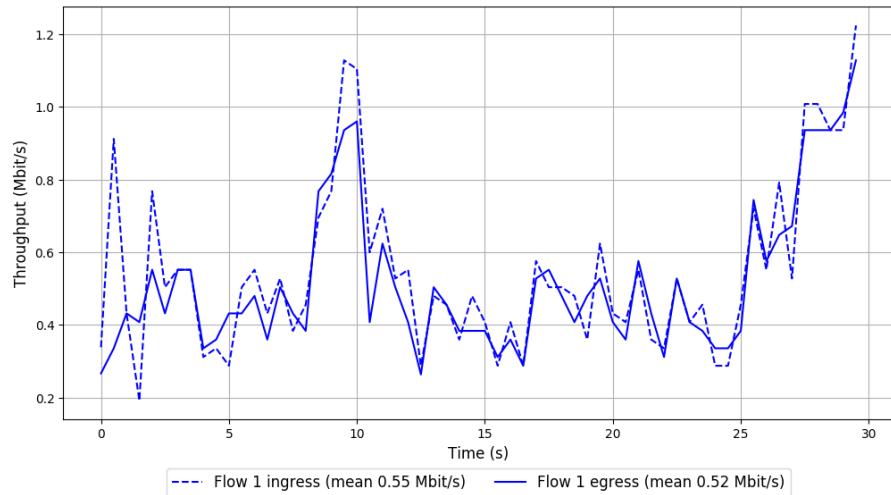


Run 1: Statistics of TCP Cubic

```
Start at: 2018-04-10 04:45:50
End at: 2018-04-10 04:46:20
Local clock offset: -5.946 ms
Remote clock offset: -0.017 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 346.793 ms
Loss rate: 5.62%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 346.793 ms
Loss rate: 5.62%
```

Run 1: Report of TCP Cubic — Data Link

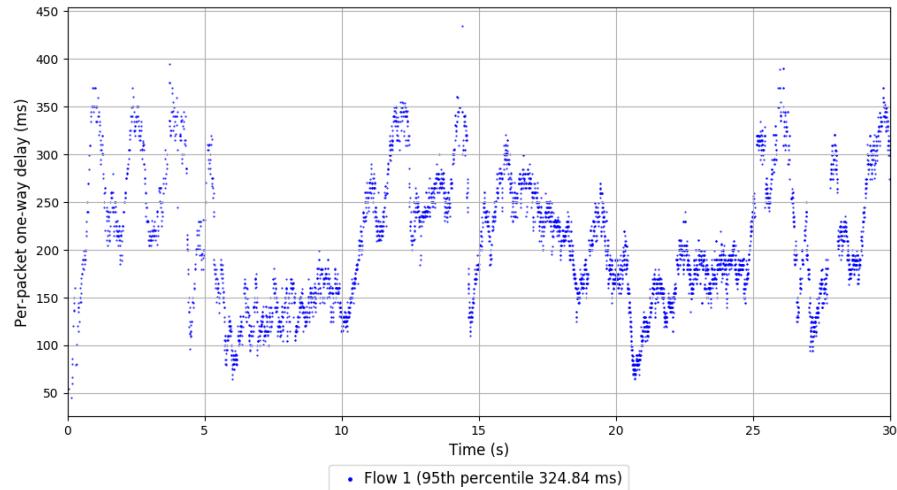
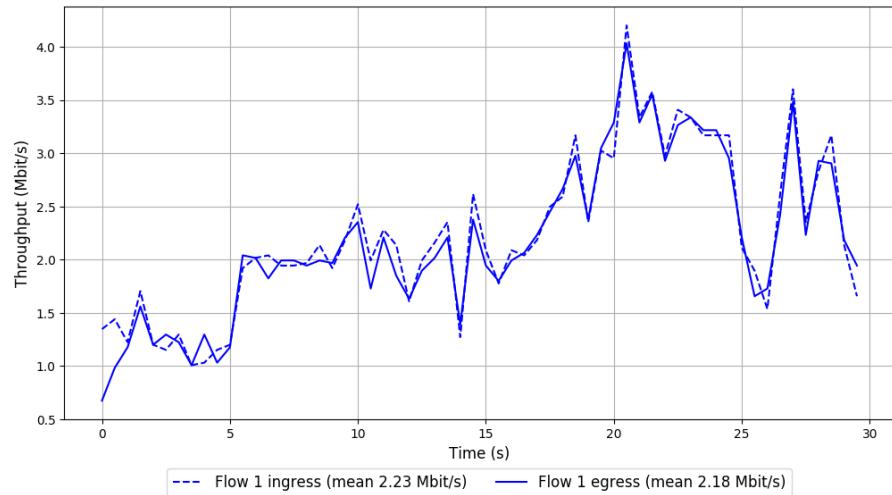


Run 2: Statistics of TCP Cubic

```
Start at: 2018-04-10 05:05:31
End at: 2018-04-10 05:06:01
Local clock offset: -8.478 ms
Remote clock offset: -2.385 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 324.839 ms
Loss rate: 2.39%
-- Flow 1:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 324.839 ms
Loss rate: 2.39%
```

Run 2: Report of TCP Cubic — Data Link

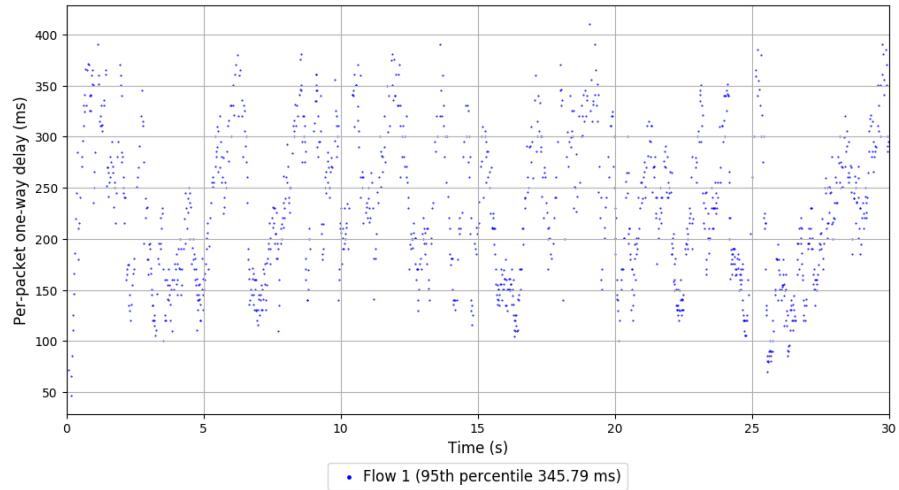
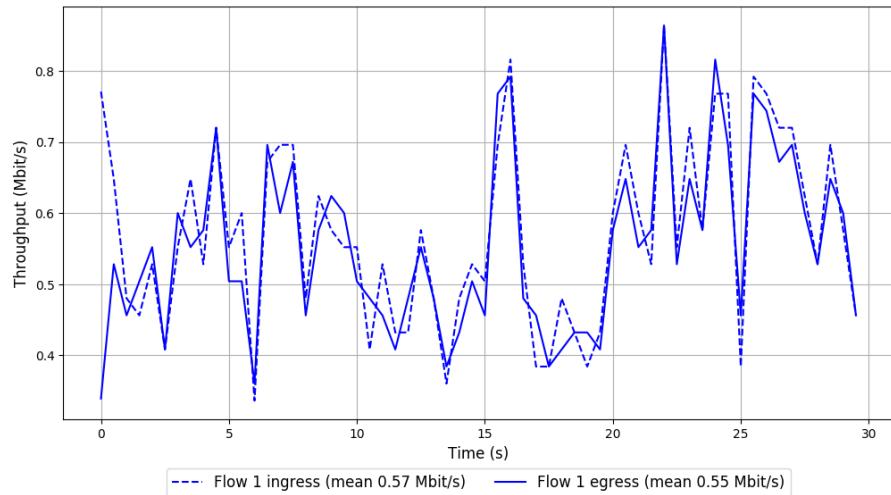


Run 3: Statistics of TCP Cubic

```
Start at: 2018-04-10 05:24:59
End at: 2018-04-10 05:25:29
Local clock offset: -8.892 ms
Remote clock offset: -3.806 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 345.792 ms
Loss rate: 3.22%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 345.792 ms
Loss rate: 3.22%
```

Run 3: Report of TCP Cubic — Data Link

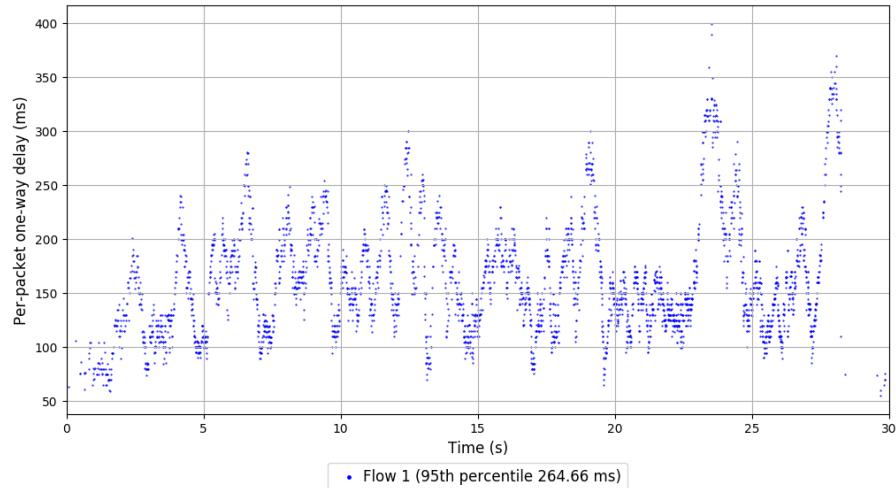
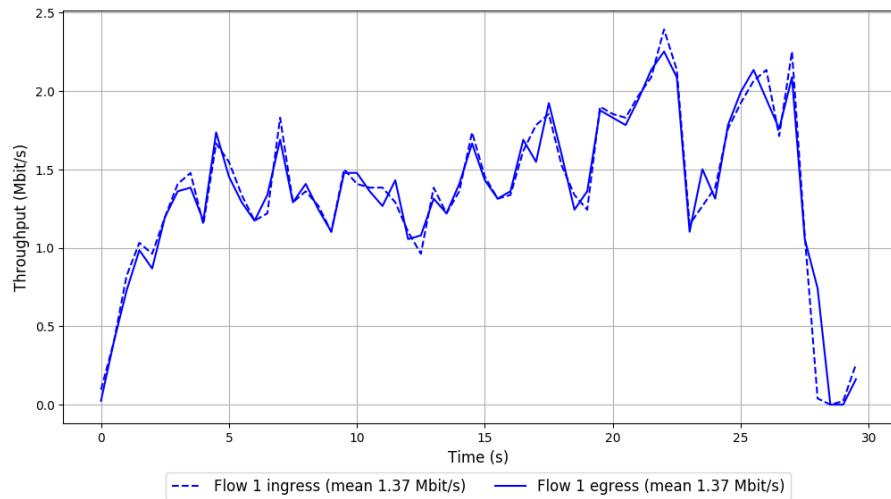


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-04-10 04:36:03
End at: 2018-04-10 04:36:33
Local clock offset: -3.587 ms
Remote clock offset: 2.113 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 264.656 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 264.656 ms
Loss rate: 0.23%
```

Run 1: Report of LEDBAT — Data Link

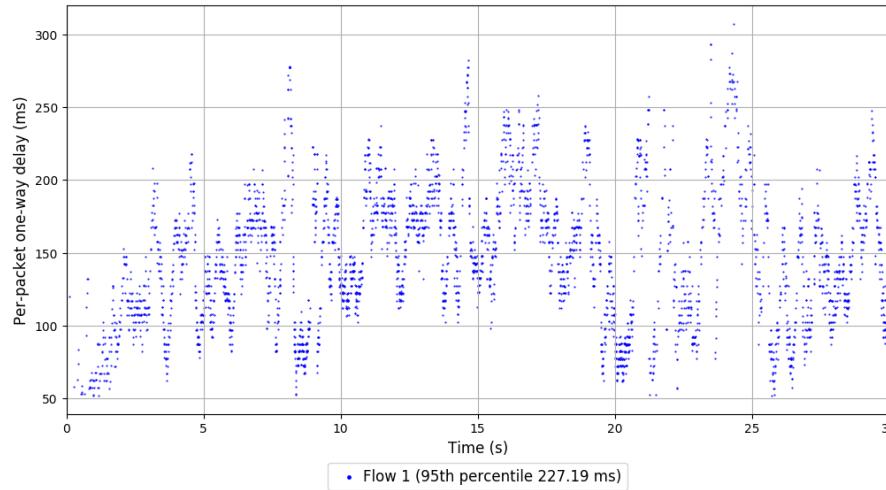
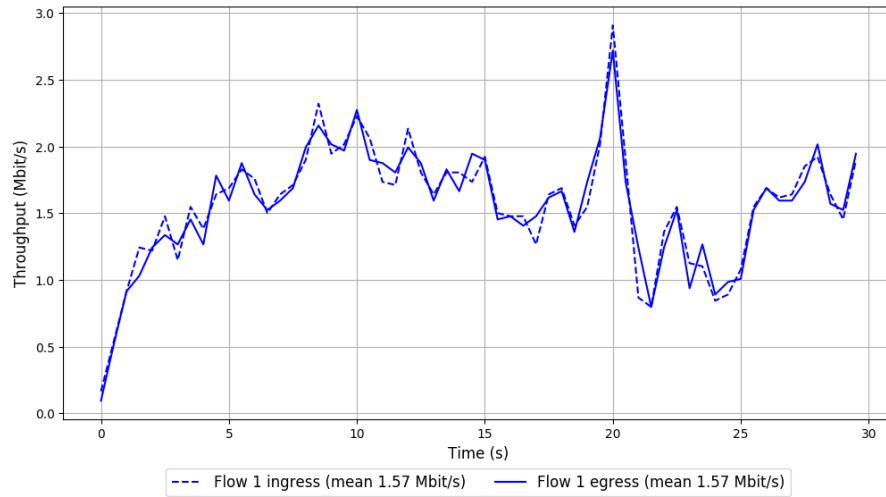


Run 2: Statistics of LEDBAT

```
Start at: 2018-04-10 04:55:45
End at: 2018-04-10 04:56:15
Local clock offset: -5.683 ms
Remote clock offset: -1.487 ms

# Below is generated by plot.py at 2018-04-10 06:29:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 227.190 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 227.190 ms
Loss rate: 0.50%
```

Run 2: Report of LEDBAT — Data Link

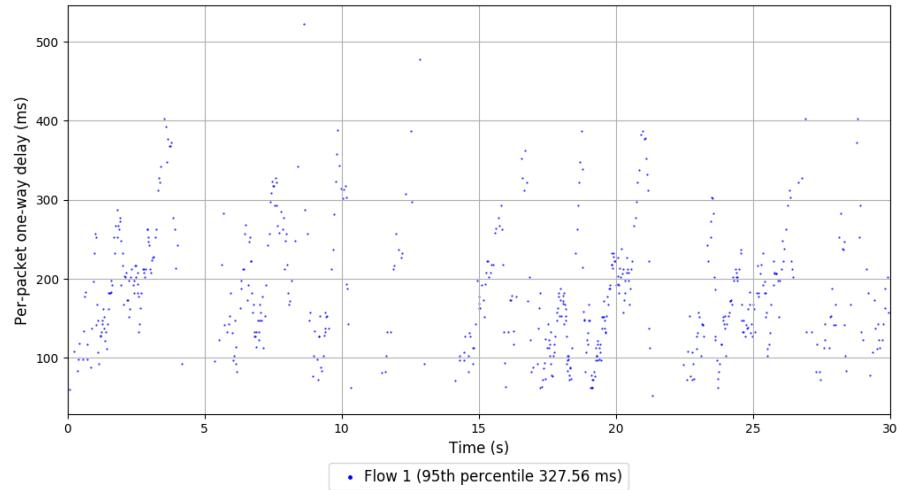
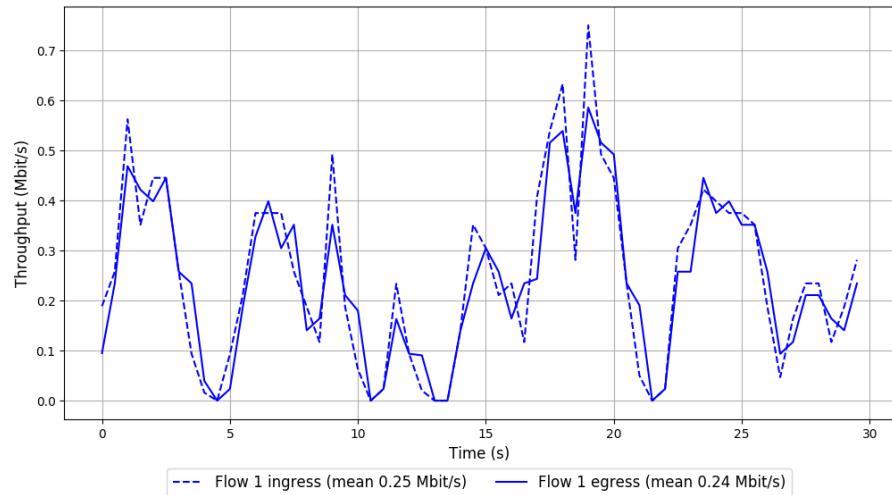


Run 3: Statistics of LEDBAT

```
Start at: 2018-04-10 05:15:15
End at: 2018-04-10 05:15:45
Local clock offset: -6.735 ms
Remote clock offset: -2.479 ms

# Below is generated by plot.py at 2018-04-10 06:29:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 327.561 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 327.561 ms
Loss rate: 2.97%
```

Run 3: Report of LEDBAT — Data Link

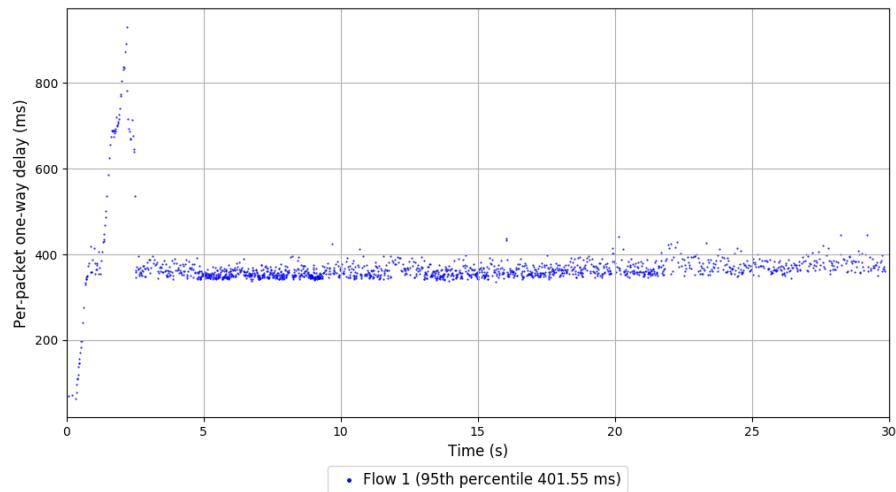
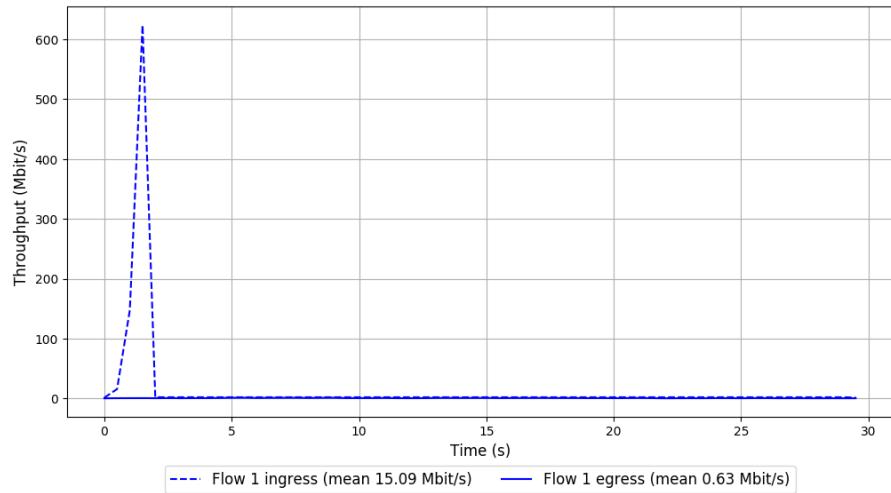


Run 1: Statistics of PCC

```
Start at: 2018-04-10 04:46:56
End at: 2018-04-10 04:47:26
Local clock offset: -7.246 ms
Remote clock offset: -1.033 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 401.554 ms
Loss rate: 95.83%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 401.554 ms
Loss rate: 95.83%
```

Run 1: Report of PCC — Data Link

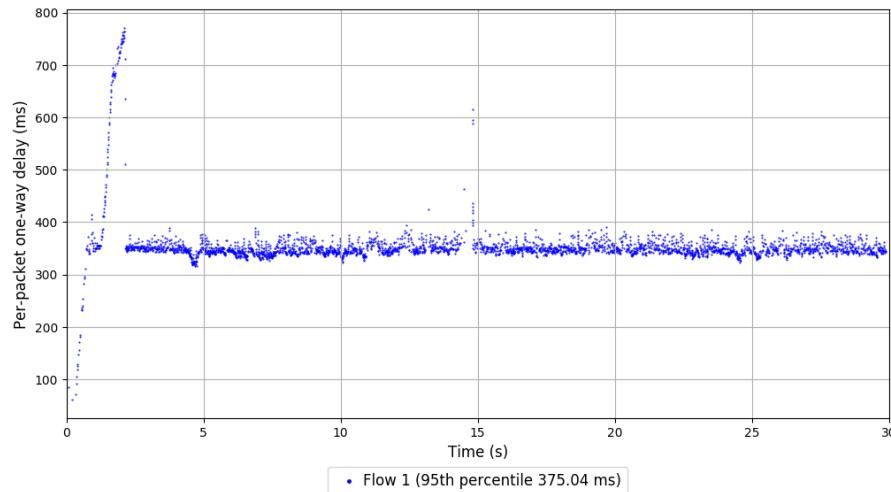
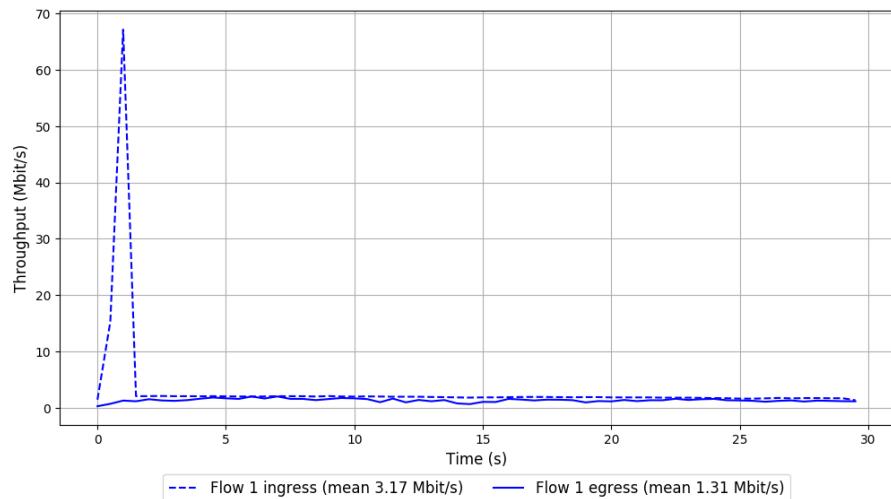


Run 2: Statistics of PCC

```
Start at: 2018-04-10 05:06:36
End at: 2018-04-10 05:07:06
Local clock offset: -8.34 ms
Remote clock offset: -2.417 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 375.037 ms
Loss rate: 58.83%
-- Flow 1:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 375.037 ms
Loss rate: 58.83%
```

Run 2: Report of PCC — Data Link

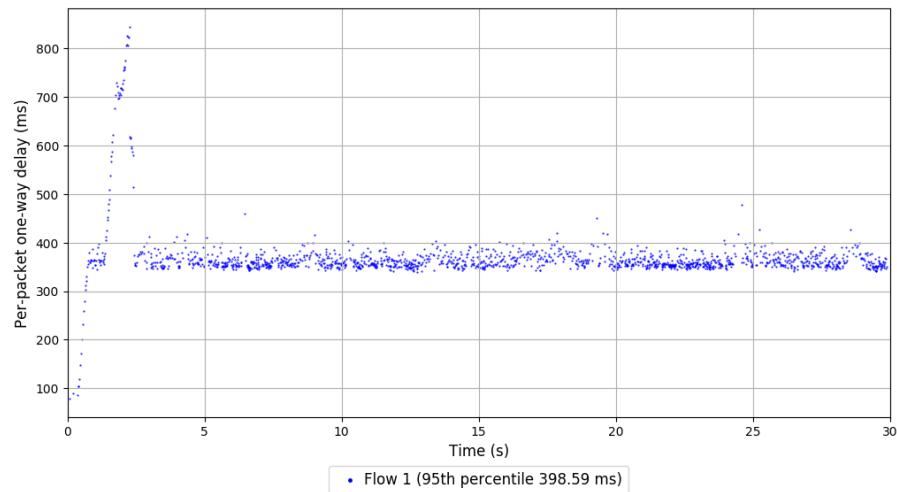
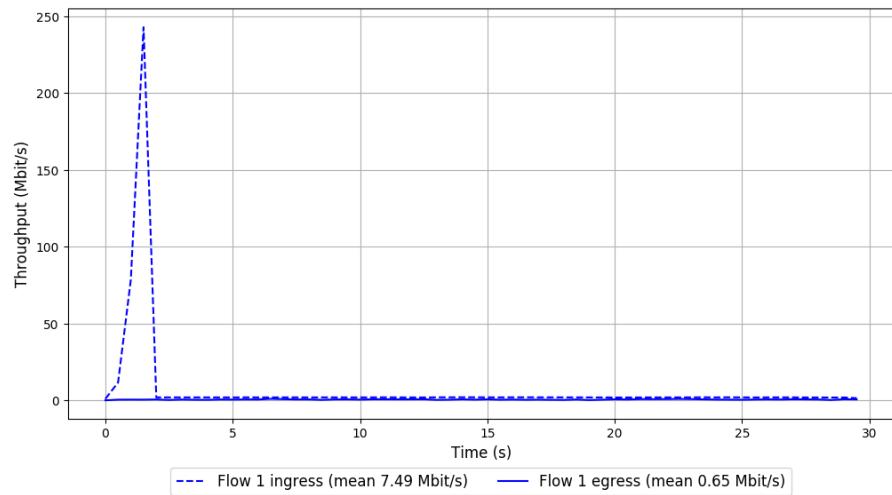


Run 3: Statistics of PCC

```
Start at: 2018-04-10 05:26:04
End at: 2018-04-10 05:26:34
Local clock offset: -10.106 ms
Remote clock offset: -4.384 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 398.589 ms
Loss rate: 91.33%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 398.589 ms
Loss rate: 91.33%
```

Run 3: Report of PCC — Data Link

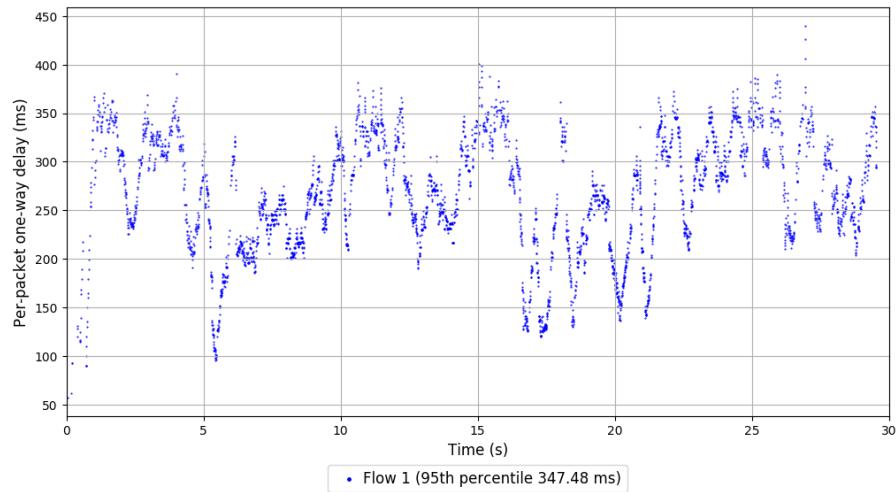
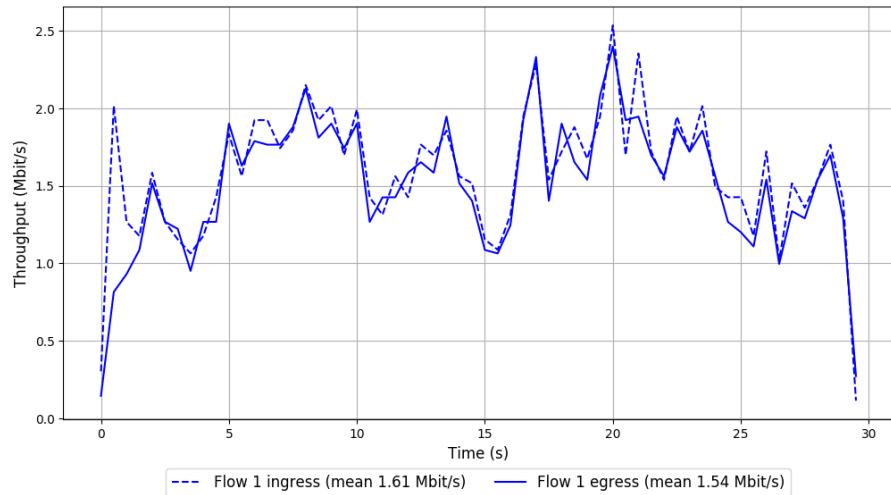


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-04-10 04:43:39
End at: 2018-04-10 04:44:09
Local clock offset: -4.597 ms
Remote clock offset: 0.281 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 347.477 ms
Loss rate: 4.64%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 347.477 ms
Loss rate: 4.64%
```

Run 1: Report of QUIC Cubic — Data Link

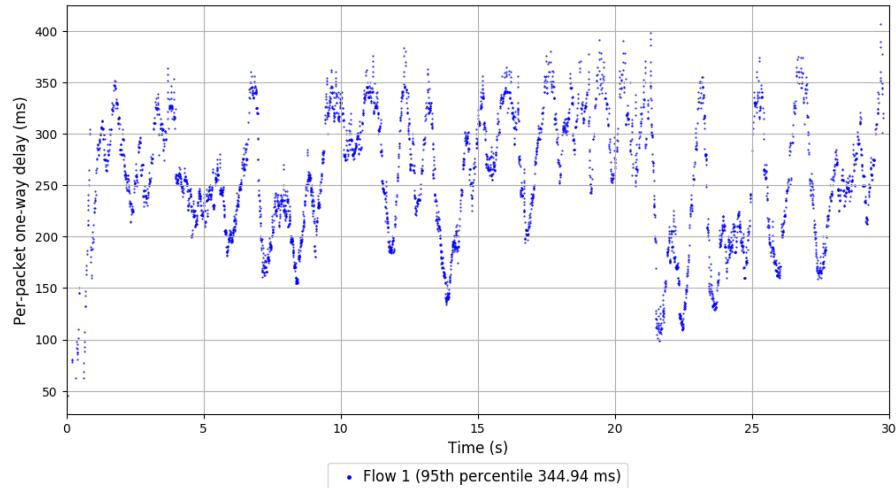
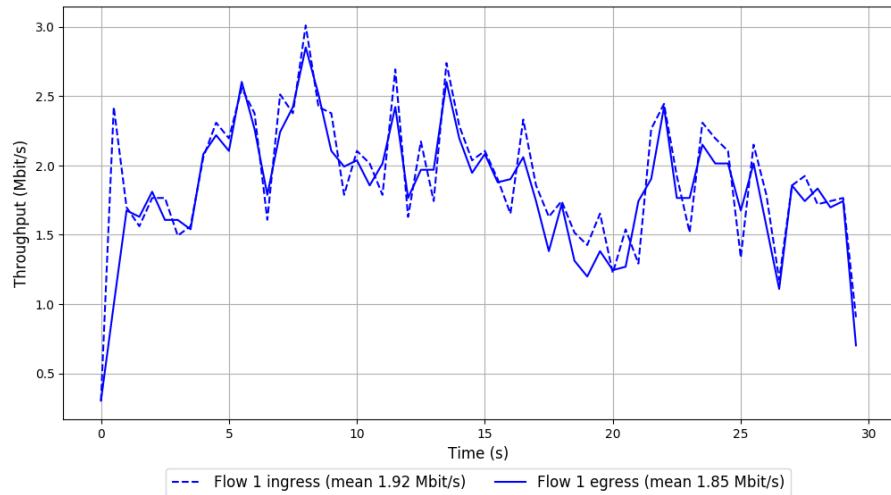


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-04-10 05:03:21
End at: 2018-04-10 05:03:51
Local clock offset: -8.991 ms
Remote clock offset: -1.901 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 344.944 ms
Loss rate: 3.80%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 344.944 ms
Loss rate: 3.80%
```

Run 2: Report of QUIC Cubic — Data Link

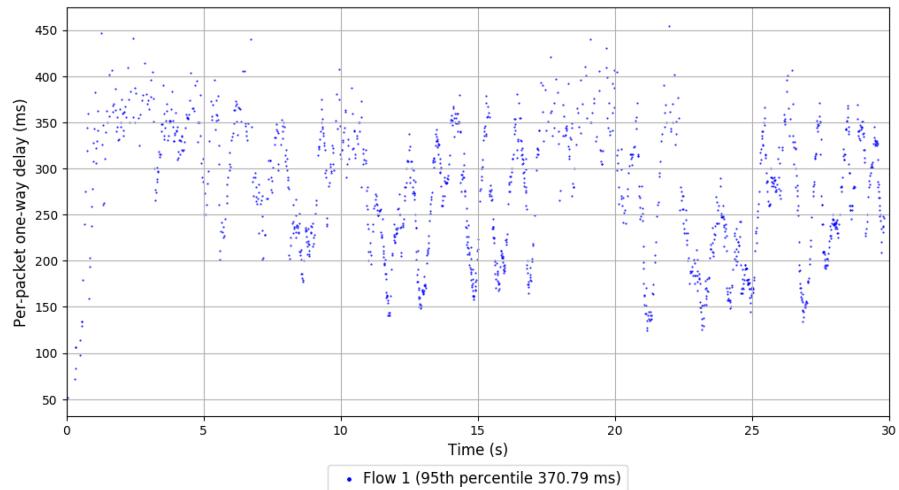
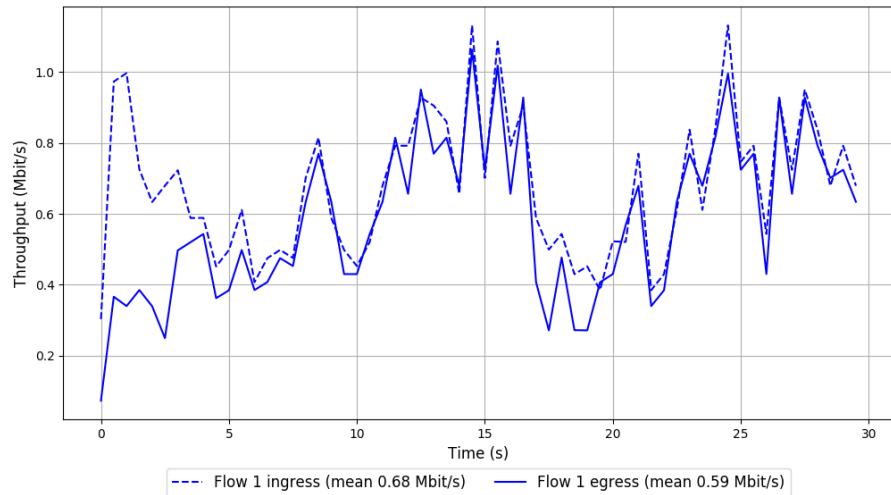


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-04-10 05:22:49
End at: 2018-04-10 05:23:19
Local clock offset: -8.688 ms
Remote clock offset: -3.806 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 370.792 ms
Loss rate: 13.65%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 370.792 ms
Loss rate: 13.65%
```

Run 3: Report of QUIC Cubic — Data Link

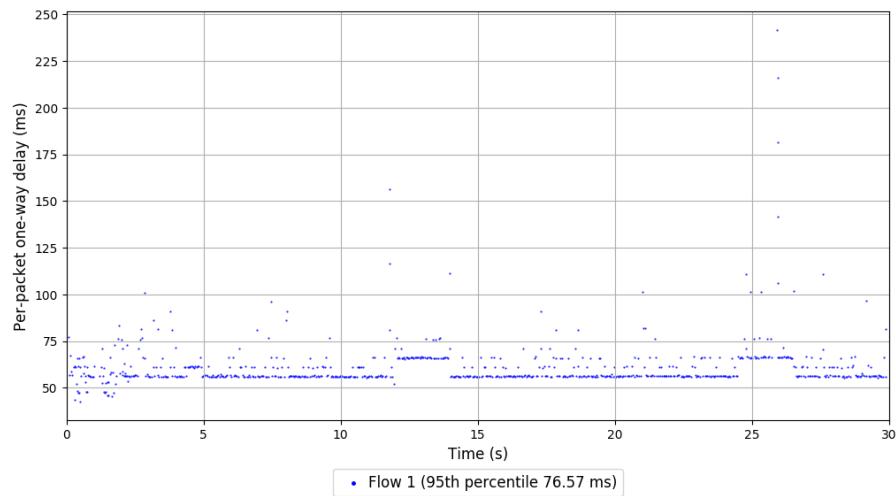
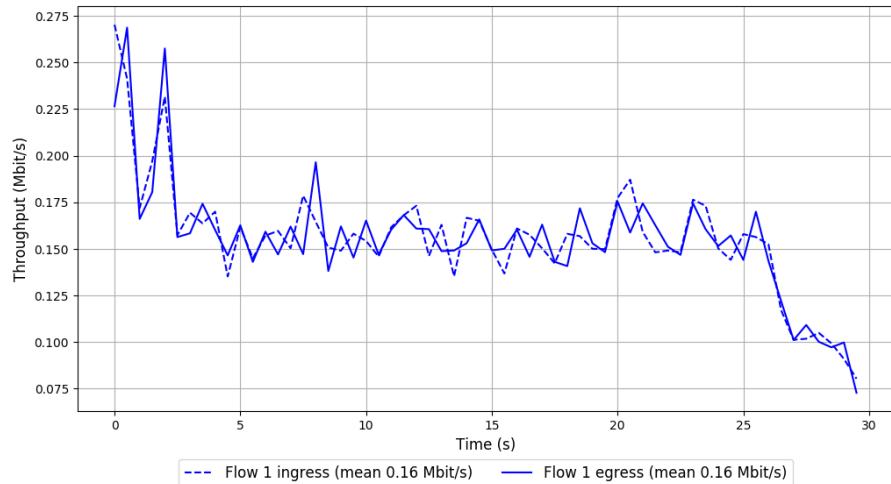


```
Run 1: Statistics of SCReAM

Start at: 2018-04-10 04:41:28
End at: 2018-04-10 04:41:58
Local clock offset: -3.515 ms
Remote clock offset: 0.497 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 76.571 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 76.571 ms
Loss rate: 0.16%
```

Run 1: Report of SCReAM — Data Link

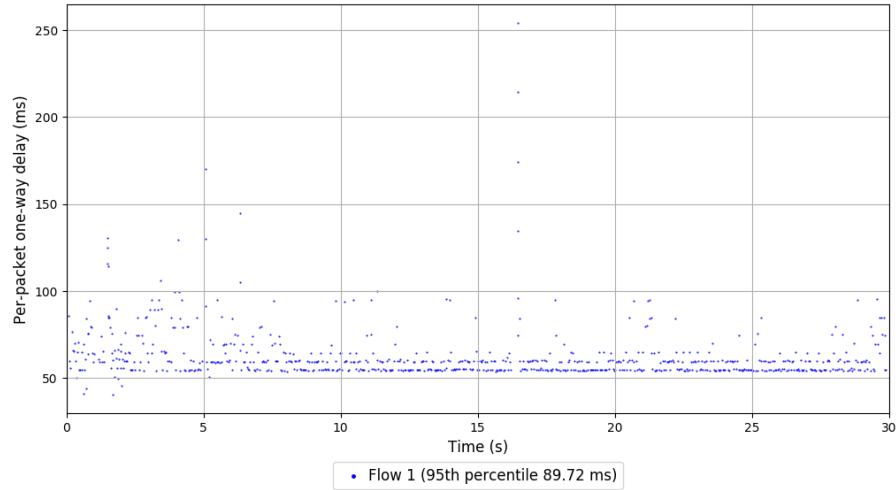
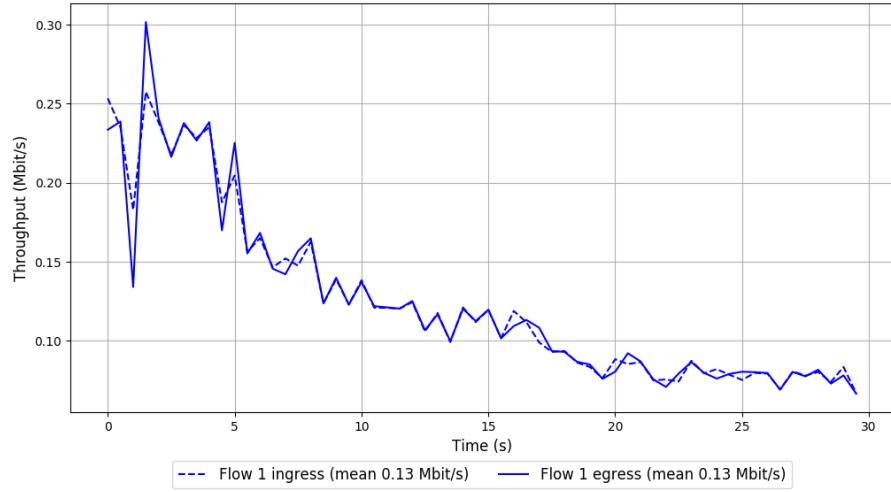


Run 2: Statistics of SCReAM

```
Start at: 2018-04-10 05:01:11
End at: 2018-04-10 05:01:41
Local clock offset: -8.116 ms
Remote clock offset: -1.987 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 89.723 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 89.723 ms
Loss rate: 0.16%
```

Run 2: Report of SCReAM — Data Link

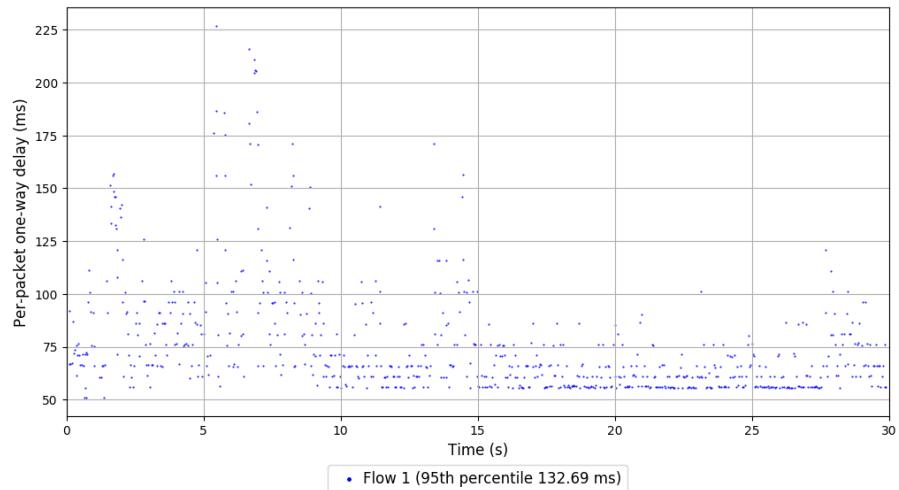
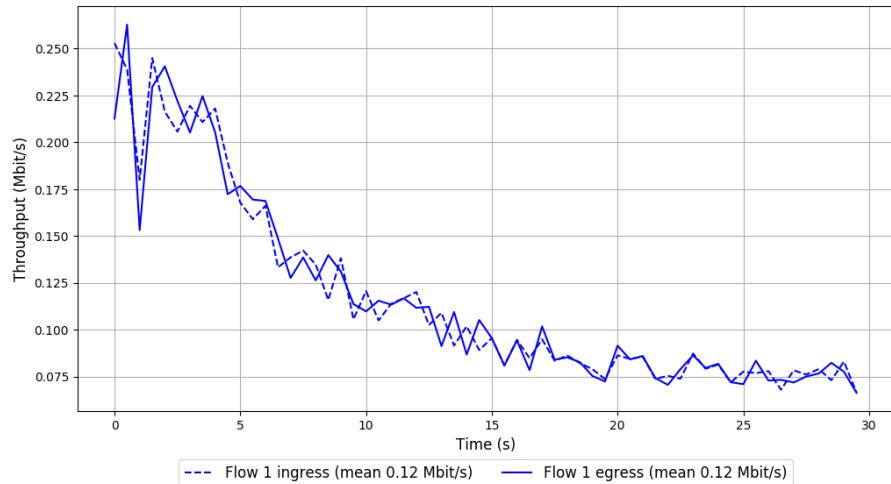


Run 3: Statistics of SCReAM

```
Start at: 2018-04-10 05:20:40
End at: 2018-04-10 05:21:10
Local clock offset: -7.723 ms
Remote clock offset: -3.455 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 132.685 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 132.685 ms
Loss rate: 0.17%
```

Run 3: Report of SCReAM — Data Link

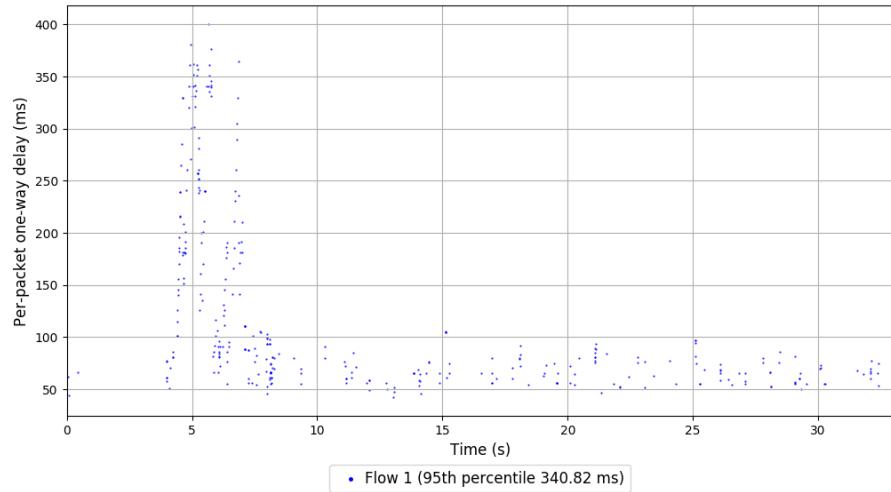
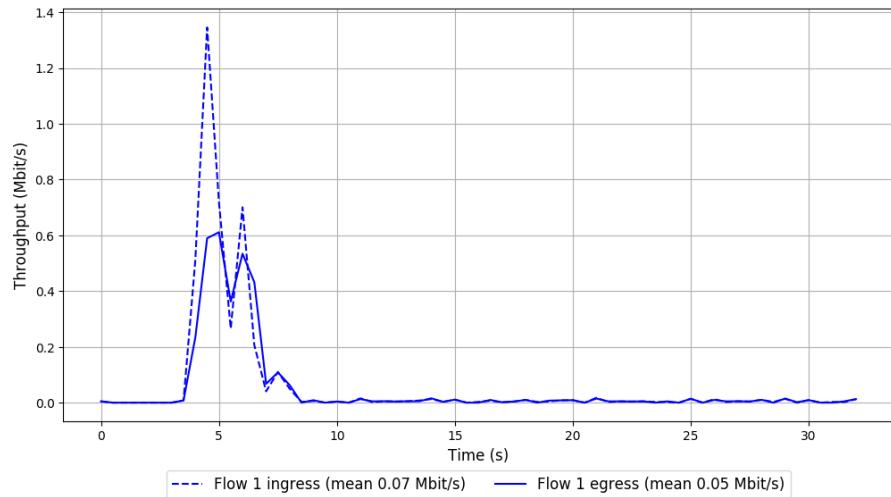


```
Run 1: Statistics of WebRTC media
```

```
Start at: 2018-04-10 04:48:02
End at: 2018-04-10 04:48:32
Local clock offset: -6.382 ms
Remote clock offset: -1.041 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 340.825 ms
Loss rate: 22.45%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 340.825 ms
Loss rate: 22.45%
```

Run 1: Report of WebRTC media — Data Link

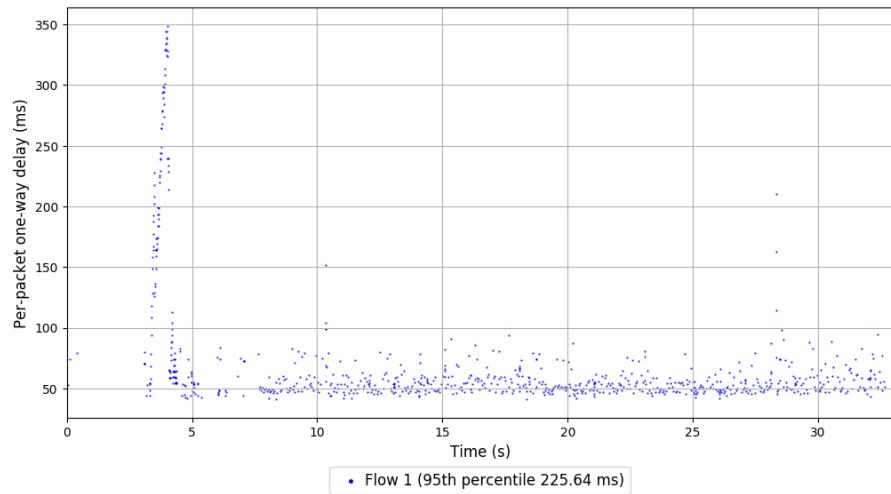
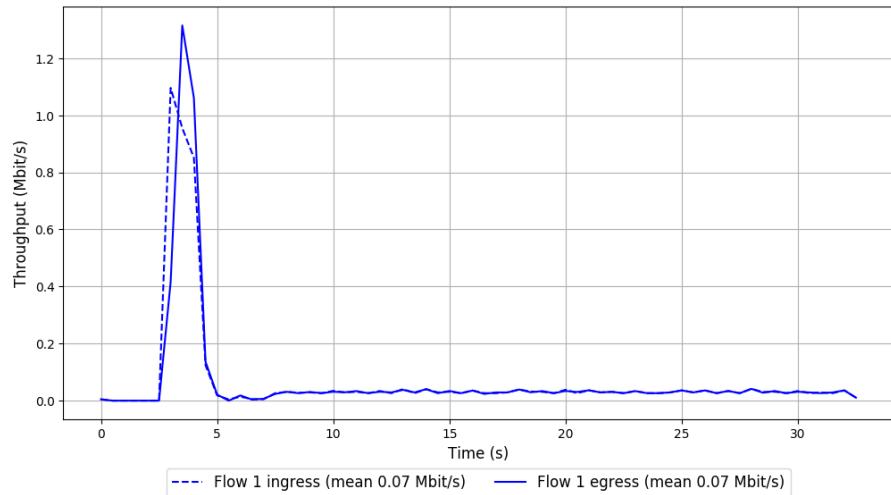


Run 2: Statistics of WebRTC media

```
Start at: 2018-04-10 05:07:41
End at: 2018-04-10 05:08:11
Local clock offset: -7.679 ms
Remote clock offset: -2.58 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 225.639 ms
Loss rate: 2.14%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 225.639 ms
Loss rate: 2.14%
```

Run 2: Report of WebRTC media — Data Link

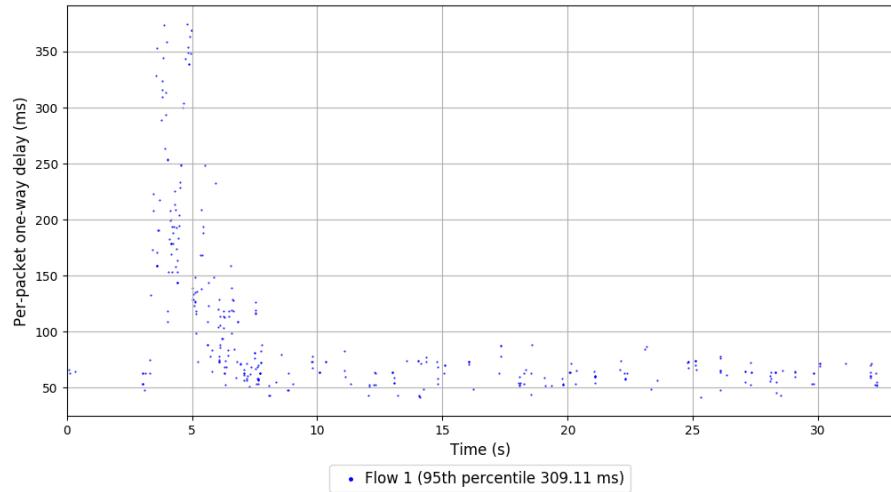
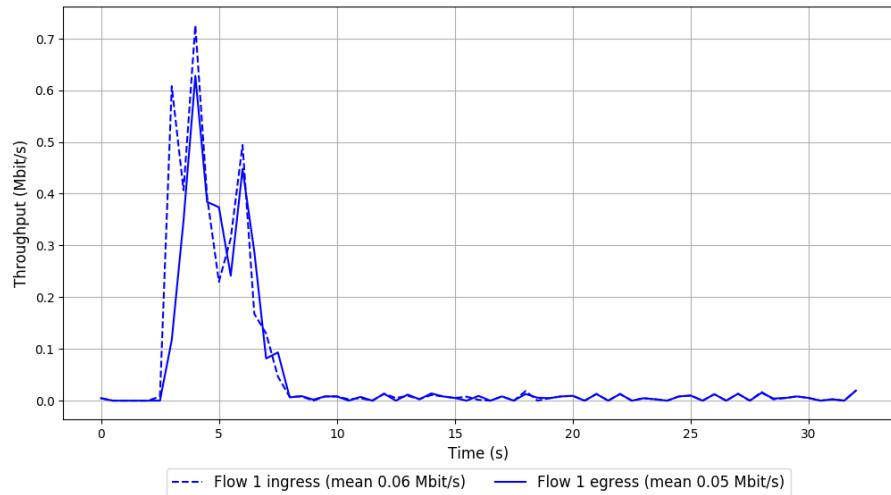


Run 3: Statistics of WebRTC media

```
Start at: 2018-04-10 05:27:09
End at: 2018-04-10 05:27:39
Local clock offset: -10.355 ms
Remote clock offset: -3.578 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 309.114 ms
Loss rate: 13.57%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 309.114 ms
Loss rate: 13.57%
```

Run 3: Report of WebRTC media — Data Link

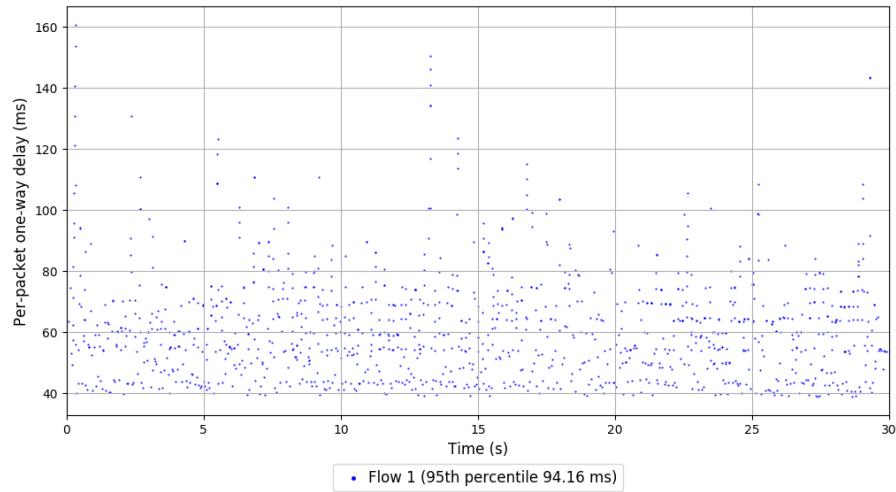
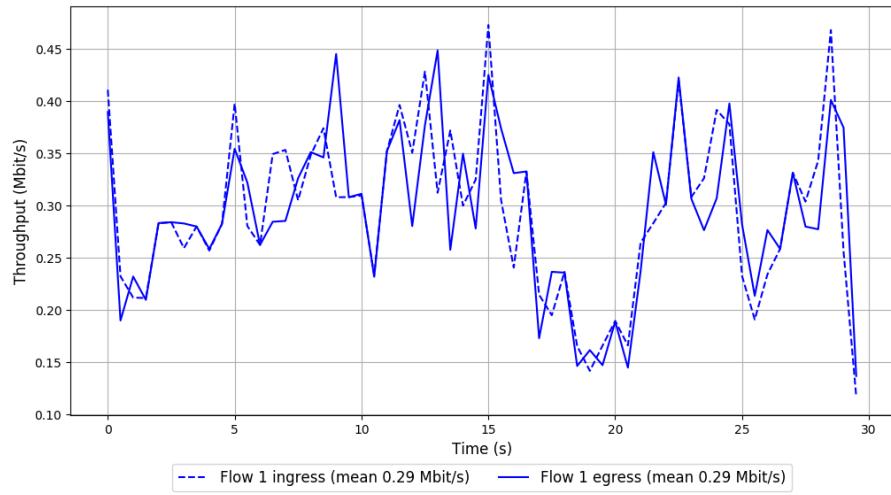


Run 1: Statistics of Sprout

```
Start at: 2018-04-10 04:40:24
End at: 2018-04-10 04:40:54
Local clock offset: -4.881 ms
Remote clock offset: 1.521 ms

# Below is generated by plot.py at 2018-04-10 06:30:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 94.160 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 94.160 ms
Loss rate: 0.22%
```

Run 1: Report of Sprout — Data Link

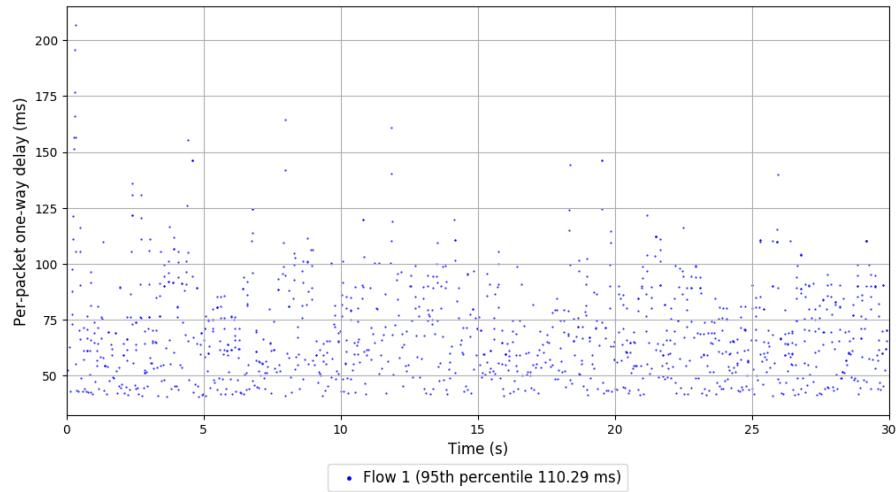
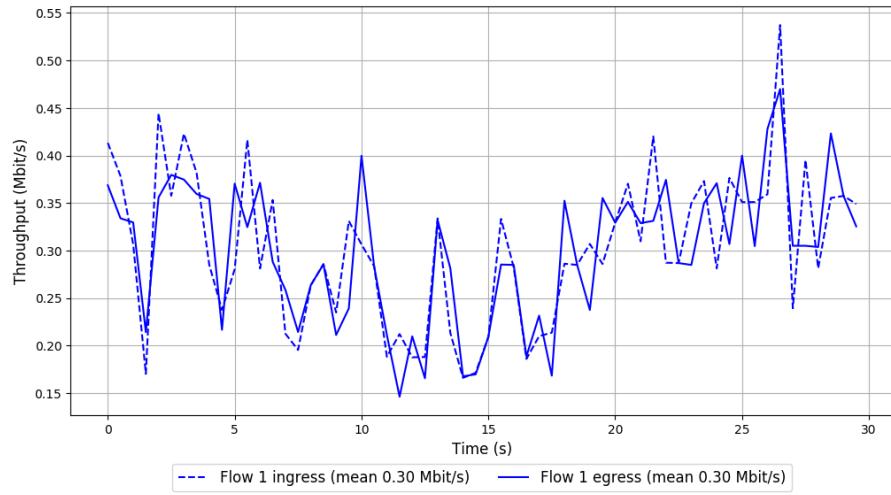


Run 2: Statistics of Sprout

```
Start at: 2018-04-10 05:00:06
End at: 2018-04-10 05:00:36
Local clock offset: -6.874 ms
Remote clock offset: -1.39 ms

# Below is generated by plot.py at 2018-04-10 06:30:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 110.287 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 110.287 ms
Loss rate: 0.25%
```

Run 2: Report of Sprout — Data Link

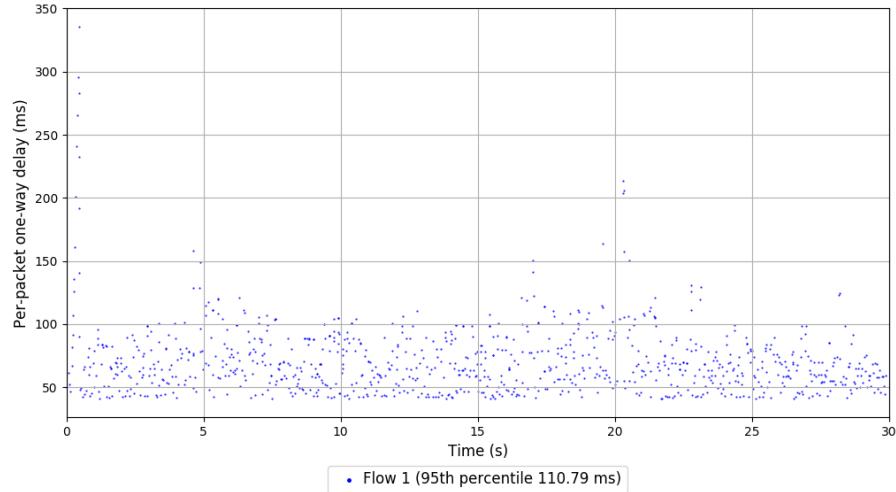
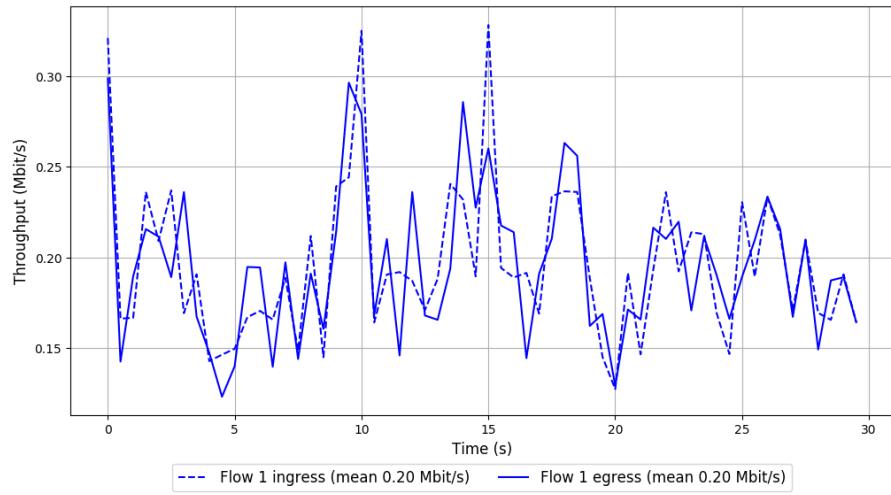


Run 3: Statistics of Sprout

```
Start at: 2018-04-10 05:19:35
End at: 2018-04-10 05:20:05
Local clock offset: -7.636 ms
Remote clock offset: -2.281 ms

# Below is generated by plot.py at 2018-04-10 06:30:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 110.786 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 110.786 ms
Loss rate: 0.39%
```

Run 3: Report of Sprout — Data Link

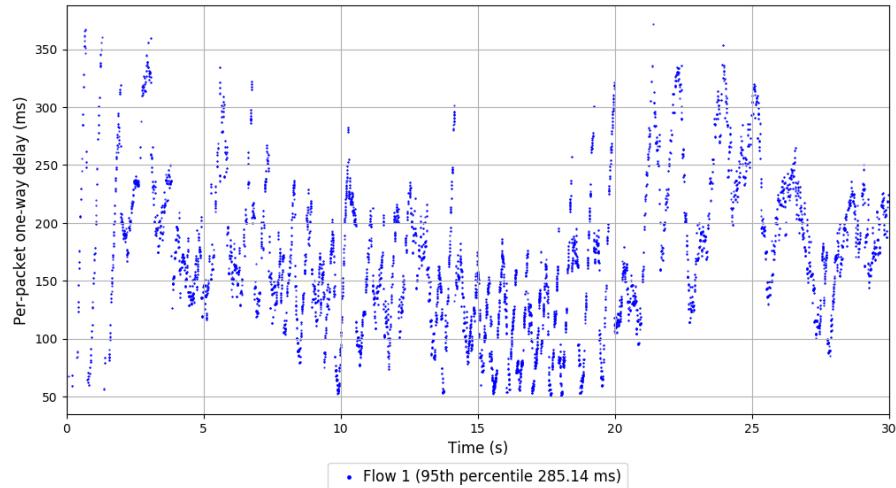
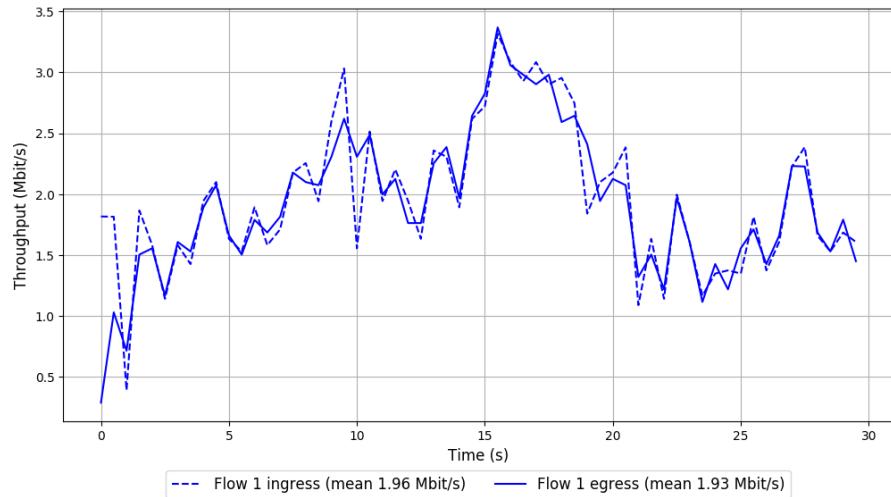


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-04-10 04:38:14
End at: 2018-04-10 04:38:44
Local clock offset: -5.808 ms
Remote clock offset: 1.937 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 285.144 ms
Loss rate: 2.11%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 285.144 ms
Loss rate: 2.11%
```

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

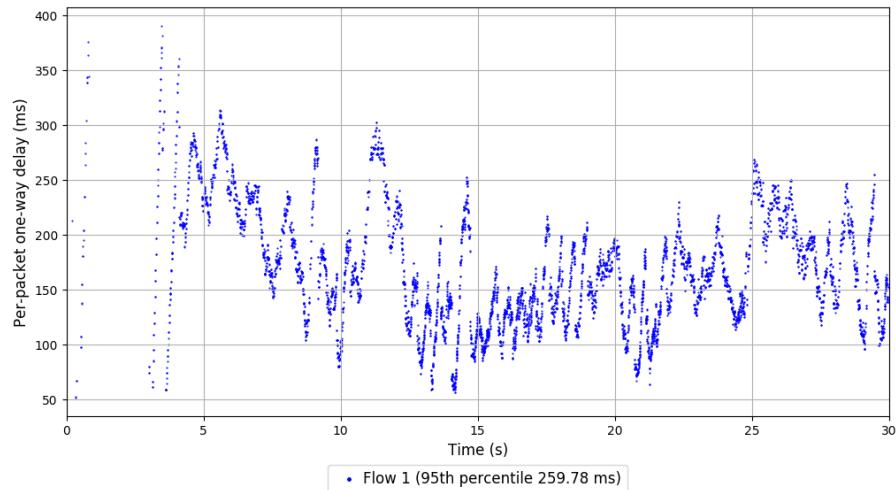
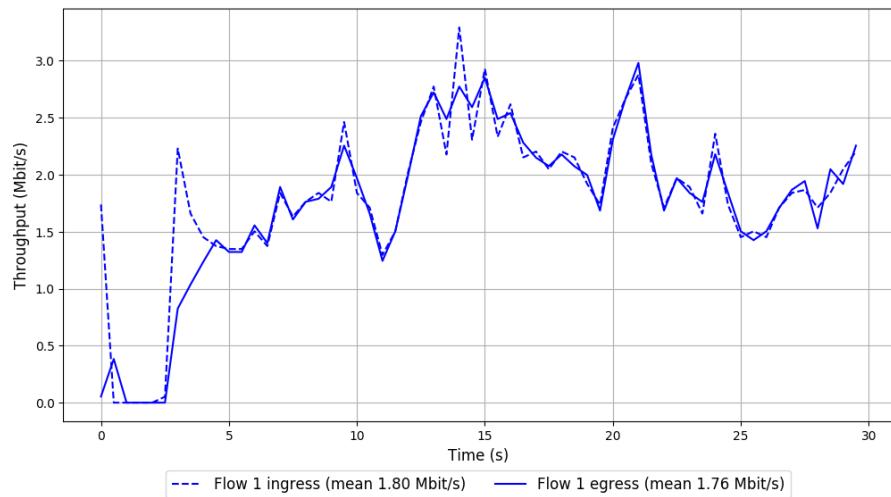


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-04-10 04:57:56
End at: 2018-04-10 04:58:26
Local clock offset: -6.897 ms
Remote clock offset: -1.562 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 259.781 ms
Loss rate: 3.16%
-- Flow 1:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 259.781 ms
Loss rate: 3.16%
```

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

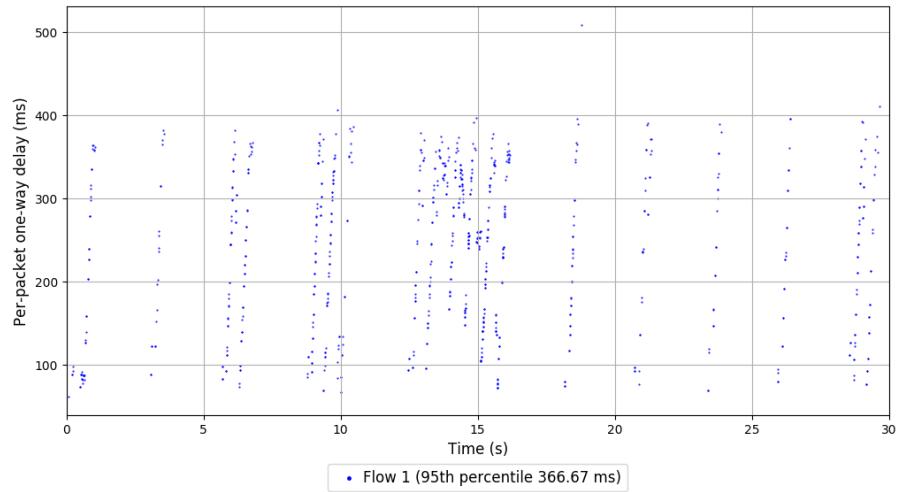
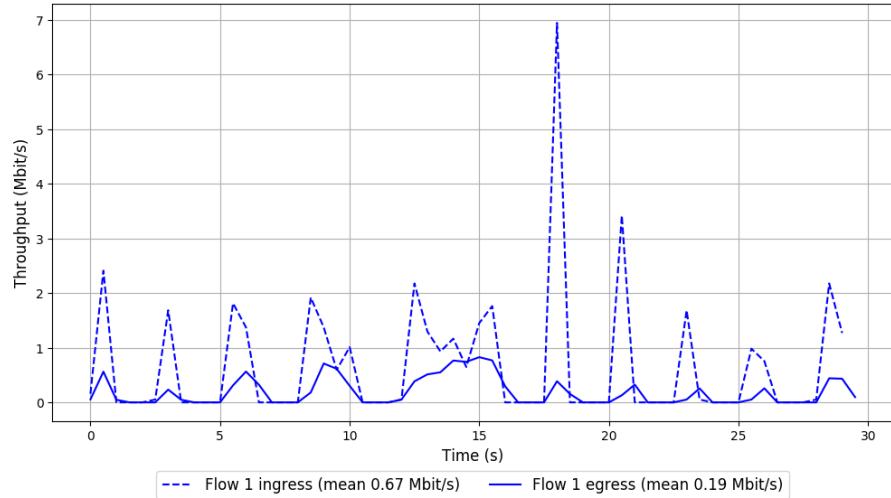


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-04-10 05:17:25
End at: 2018-04-10 05:17:55
Local clock offset: -6.867 ms
Remote clock offset: -2.409 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 366.670 ms
Loss rate: 70.86%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 366.670 ms
Loss rate: 70.86%
```

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

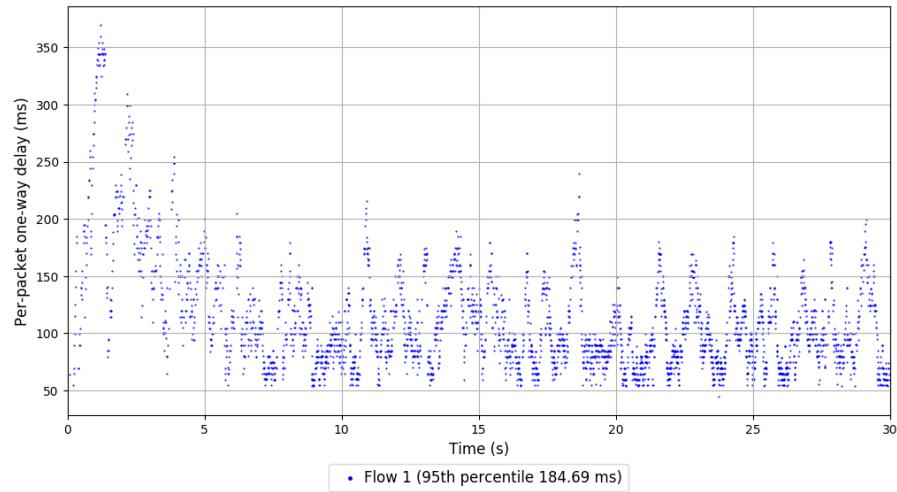
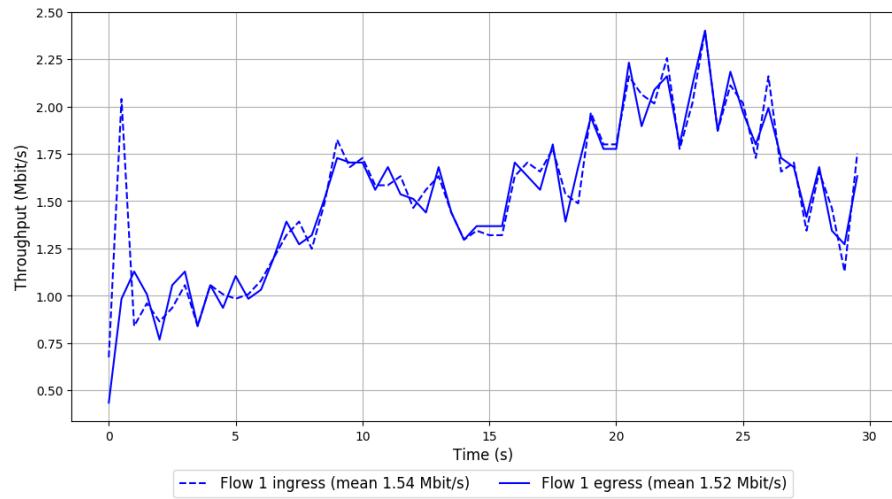


Run 1: Statistics of TCP Vegas

```
Start at: 2018-04-10 04:37:08
End at: 2018-04-10 04:37:38
Local clock offset: -4.556 ms
Remote clock offset: 1.743 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 184.689 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 184.689 ms
Loss rate: 1.07%
```

Run 1: Report of TCP Vegas — Data Link

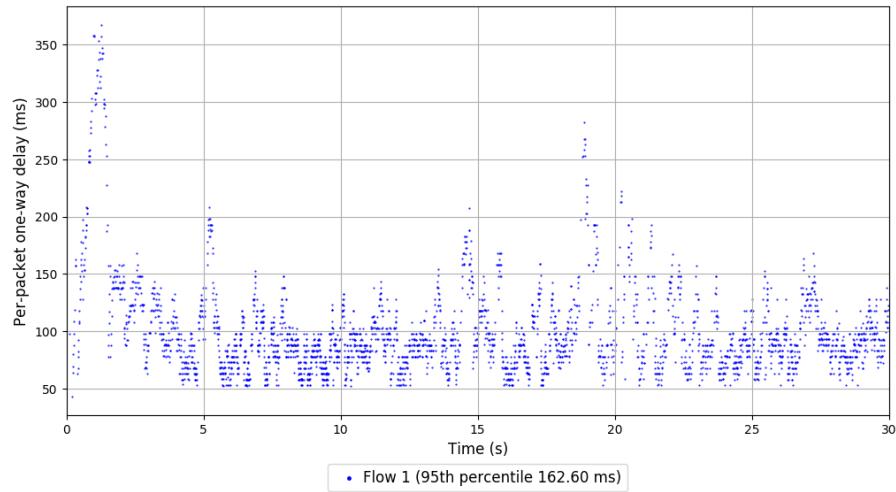
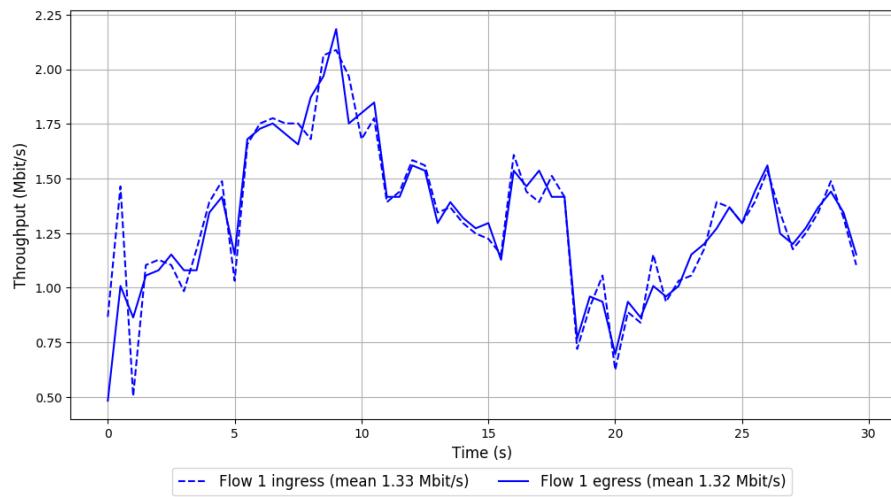


Run 2: Statistics of TCP Vegas

```
Start at: 2018-04-10 04:56:51
End at: 2018-04-10 04:57:21
Local clock offset: -5.734 ms
Remote clock offset: -1.964 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 162.604 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 162.604 ms
Loss rate: 0.57%
```

Run 2: Report of TCP Vegas — Data Link

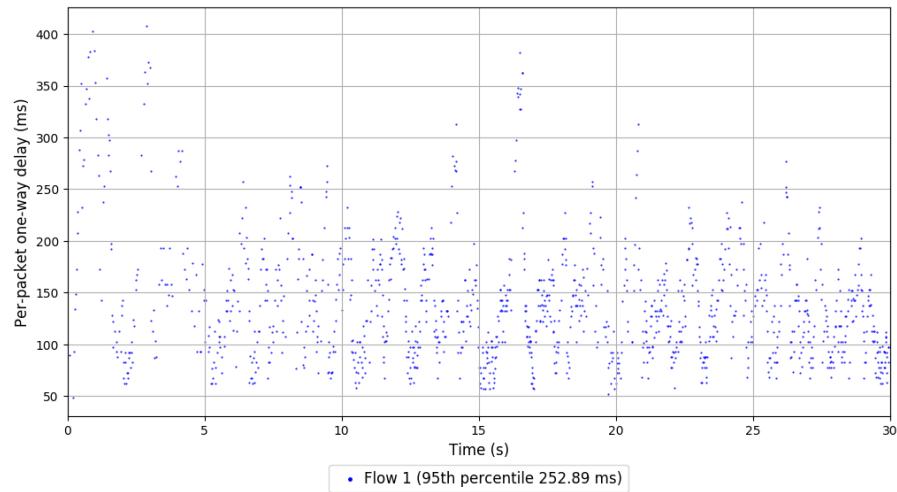
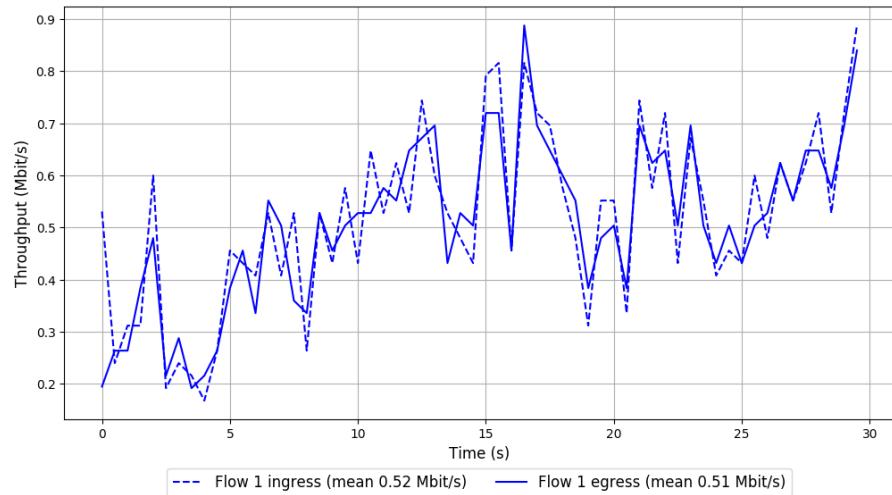


Run 3: Statistics of TCP Vegas

```
Start at: 2018-04-10 05:16:20
End at: 2018-04-10 05:16:50
Local clock offset: -6.896 ms
Remote clock offset: -3.076 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 252.893 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 252.893 ms
Loss rate: 1.55%
```

Run 3: Report of TCP Vegas — Data Link

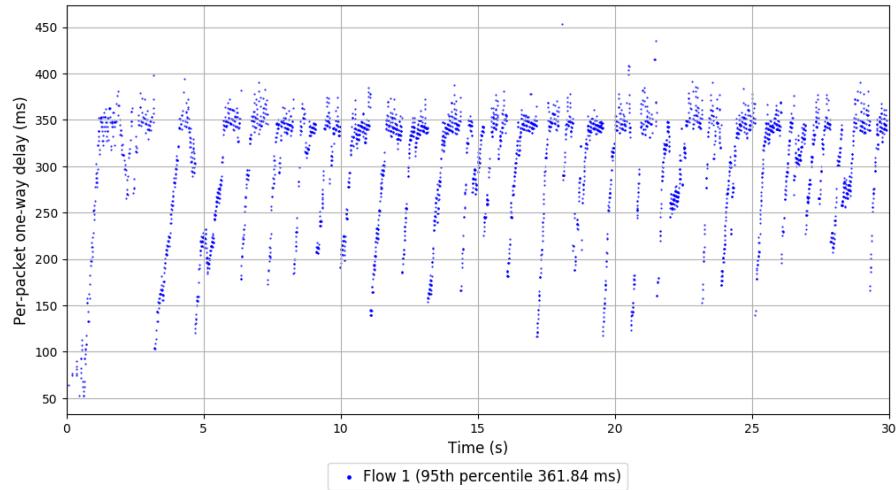
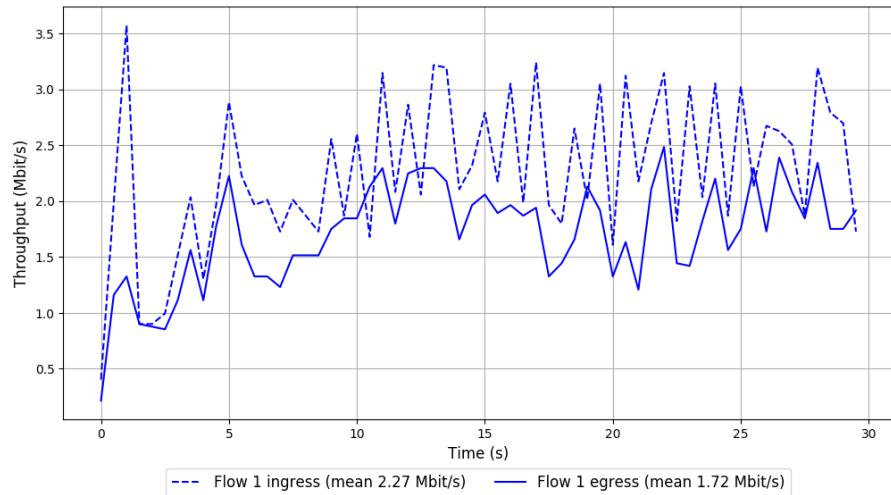


Run 1: Statistics of Verus

```
Start at: 2018-04-10 04:39:19
End at: 2018-04-10 04:39:49
Local clock offset: -4.781 ms
Remote clock offset: 1.745 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 361.843 ms
Loss rate: 24.61%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 361.843 ms
Loss rate: 24.61%
```

Run 1: Report of Verus — Data Link

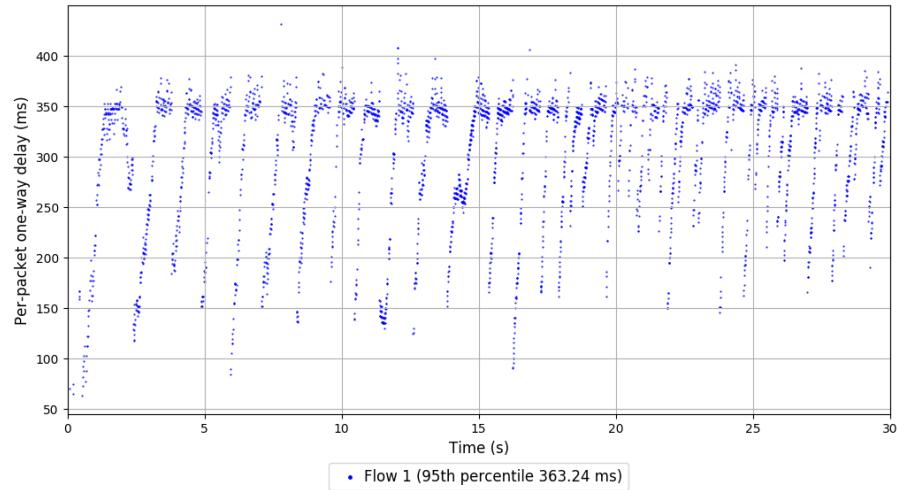
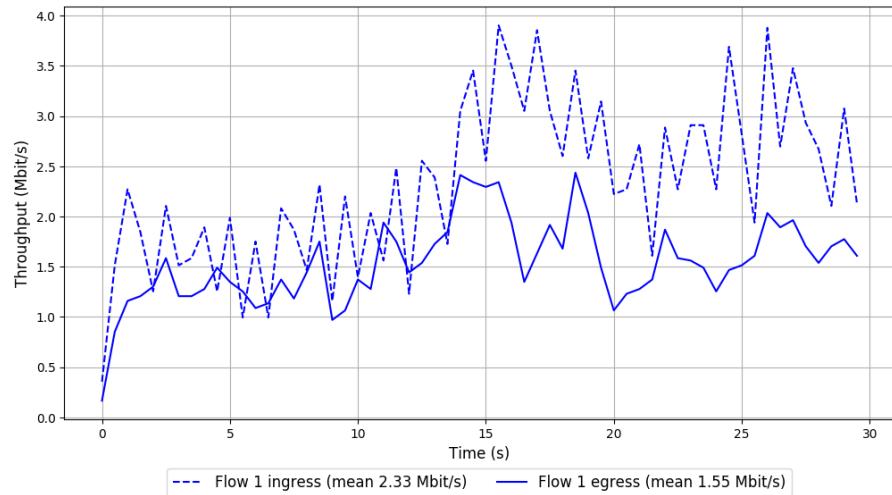


Run 2: Statistics of Verus

```
Start at: 2018-04-10 04:59:01
End at: 2018-04-10 04:59:31
Local clock offset: -6.444 ms
Remote clock offset: -1.37 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 363.240 ms
Loss rate: 33.80%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 363.240 ms
Loss rate: 33.80%
```

Run 2: Report of Verus — Data Link

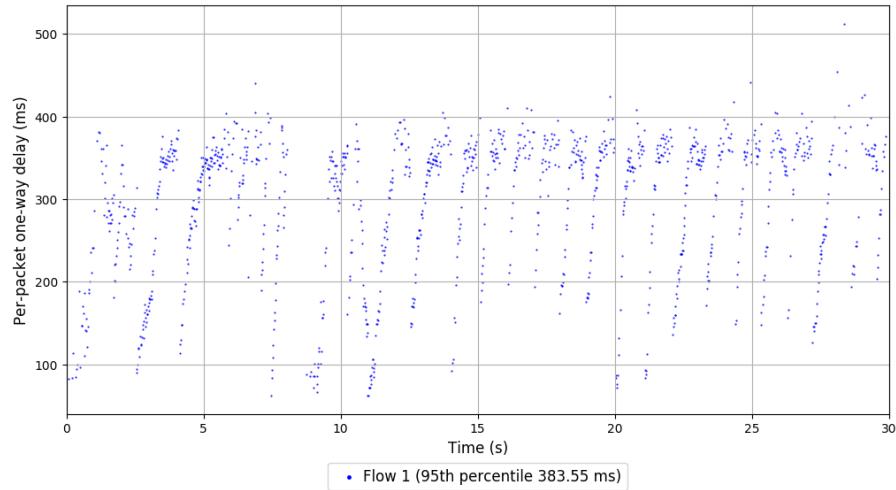
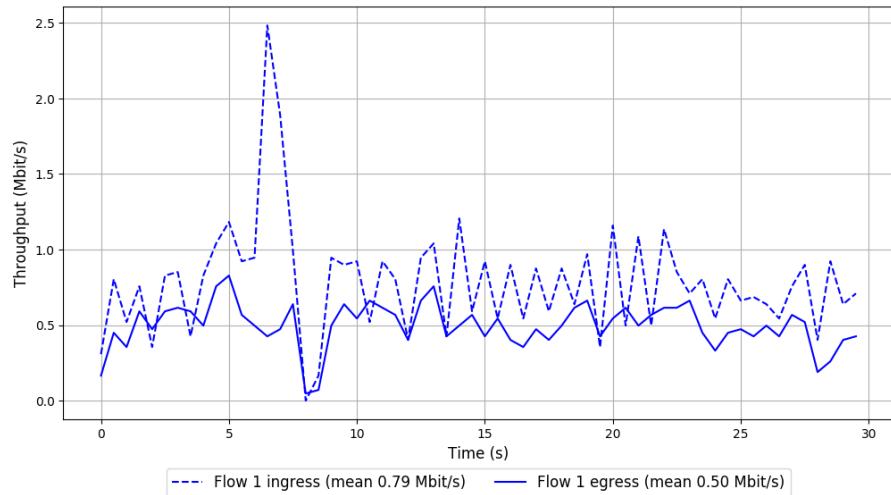


Run 3: Statistics of Verus

```
Start at: 2018-04-10 05:18:30
End at: 2018-04-10 05:19:00
Local clock offset: -7.682 ms
Remote clock offset: -2.269 ms

# Below is generated by plot.py at 2018-04-10 06:30:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 383.553 ms
Loss rate: 36.72%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 383.553 ms
Loss rate: 36.72%
```

Run 3: Report of Verus — Data Link

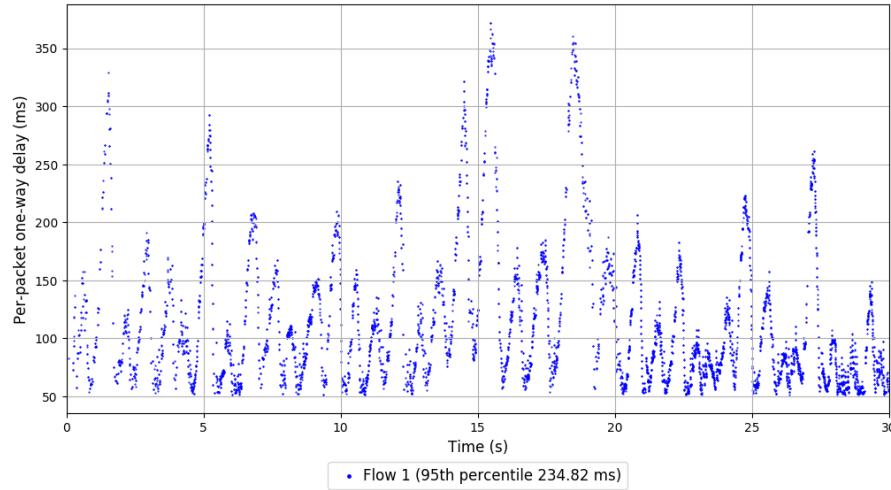
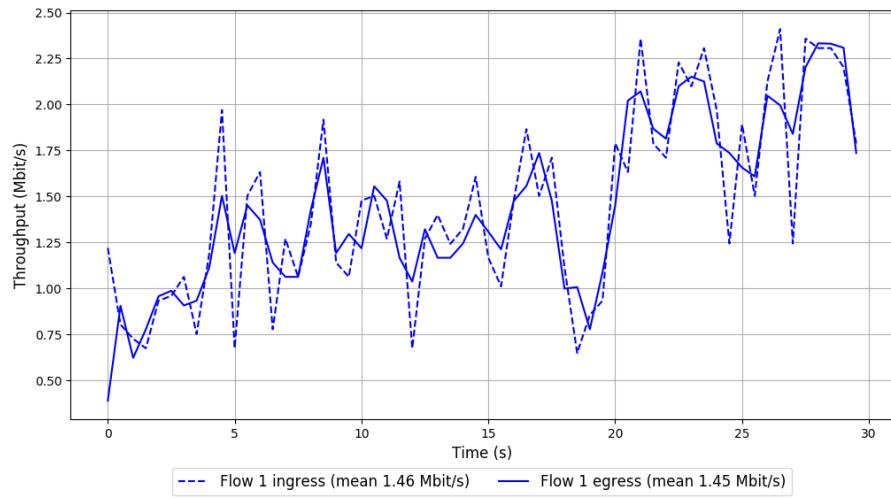


Run 1: Statistics of Copa

```
Start at: 2018-04-10 04:42:34
End at: 2018-04-10 04:43:04
Local clock offset: -4.454 ms
Remote clock offset: -0.028 ms

# Below is generated by plot.py at 2018-04-10 06:30:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 234.819 ms
Loss rate: 1.14%
-- Flow 1:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 234.819 ms
Loss rate: 1.14%
```

Run 1: Report of Copa — Data Link

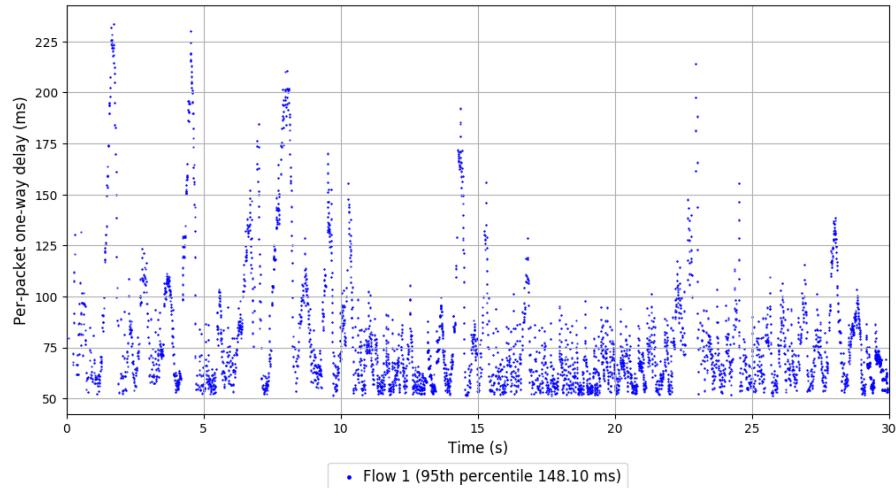
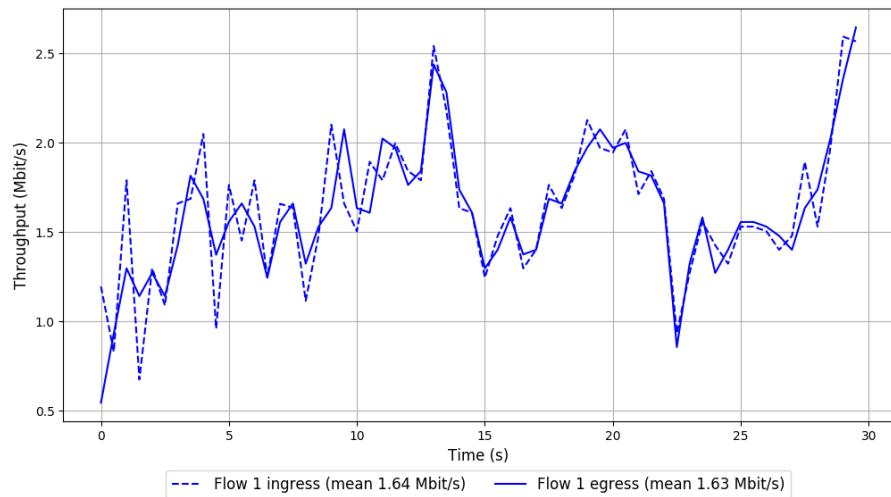


Run 2: Statistics of Copa

```
Start at: 2018-04-10 05:02:16
End at: 2018-04-10 05:02:46
Local clock offset: -7.713 ms
Remote clock offset: -1.495 ms

# Below is generated by plot.py at 2018-04-10 06:30:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 148.103 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 148.103 ms
Loss rate: 0.82%
```

Run 2: Report of Copa — Data Link

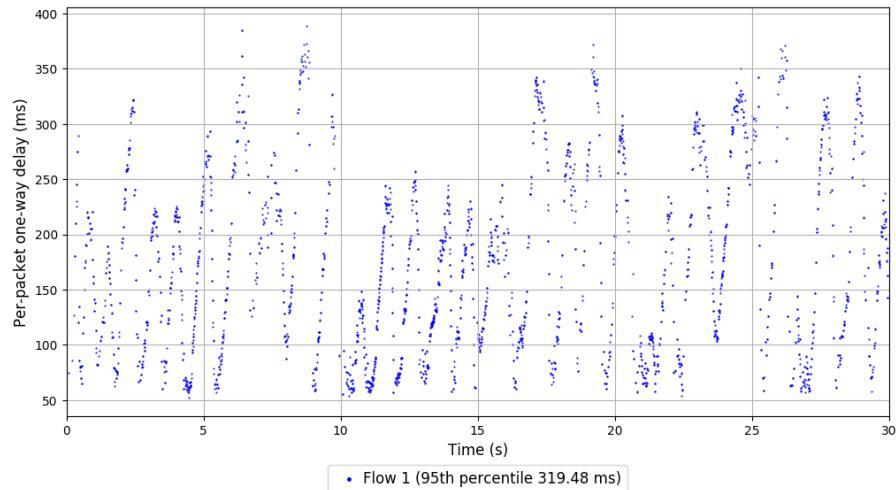
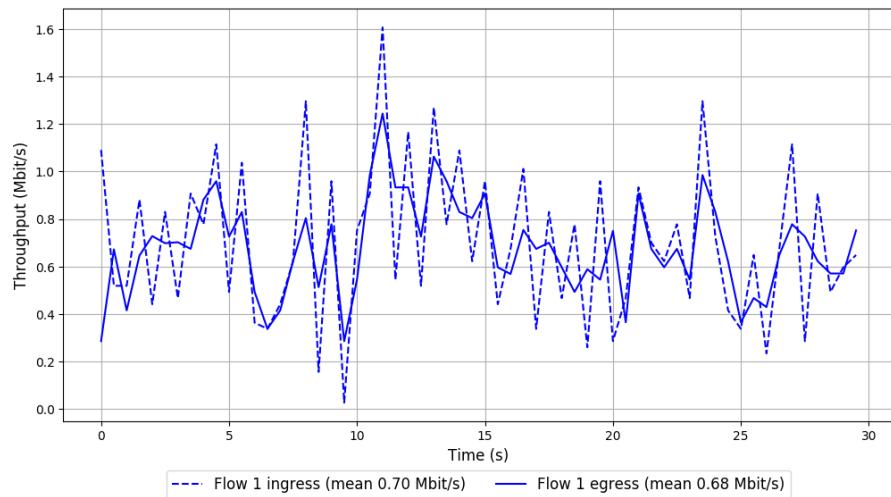


Run 3: Statistics of Copa

```
Start at: 2018-04-10 05:21:44
End at: 2018-04-10 05:22:14
Local clock offset: -8.538 ms
Remote clock offset: -2.888 ms

# Below is generated by plot.py at 2018-04-10 06:30:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 319.477 ms
Loss rate: 2.61%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 319.477 ms
Loss rate: 2.61%
```

Run 3: Report of Copa — Data Link

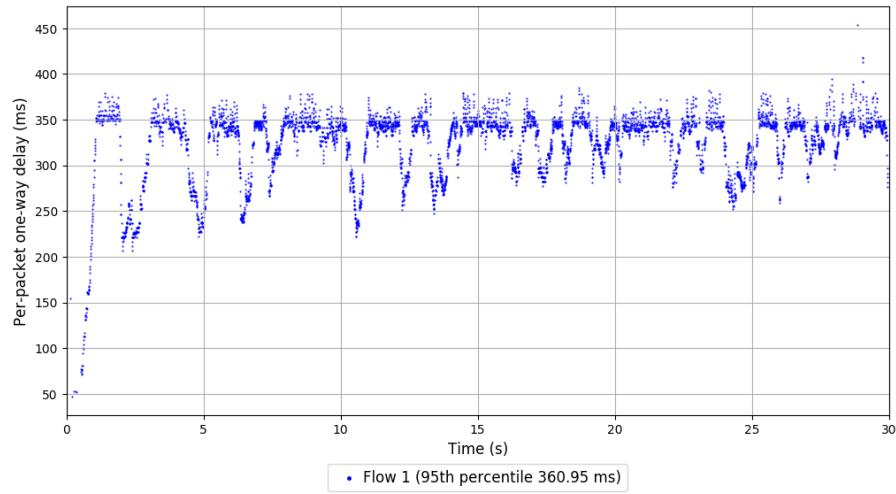
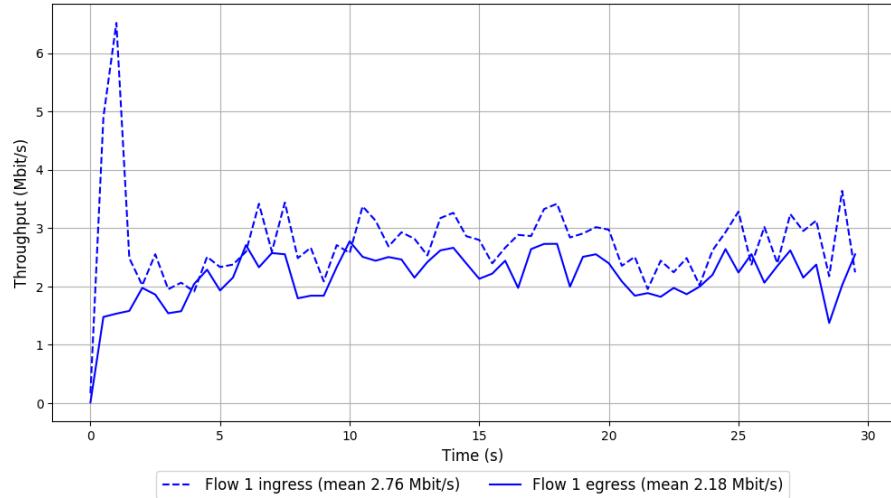


```
Run 1: Statistics of FillP

Start at: 2018-04-10 04:44:44
End at: 2018-04-10 04:45:14
Local clock offset: -5.956 ms
Remote clock offset: -1.042 ms

# Below is generated by plot.py at 2018-04-10 06:30:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 360.952 ms
Loss rate: 21.44%
-- Flow 1:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 360.952 ms
Loss rate: 21.44%
```

Run 1: Report of FillP — Data Link

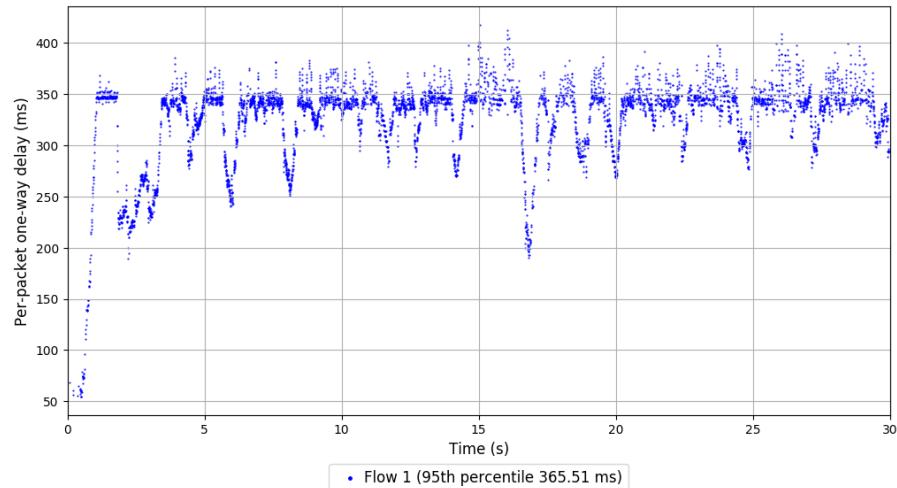
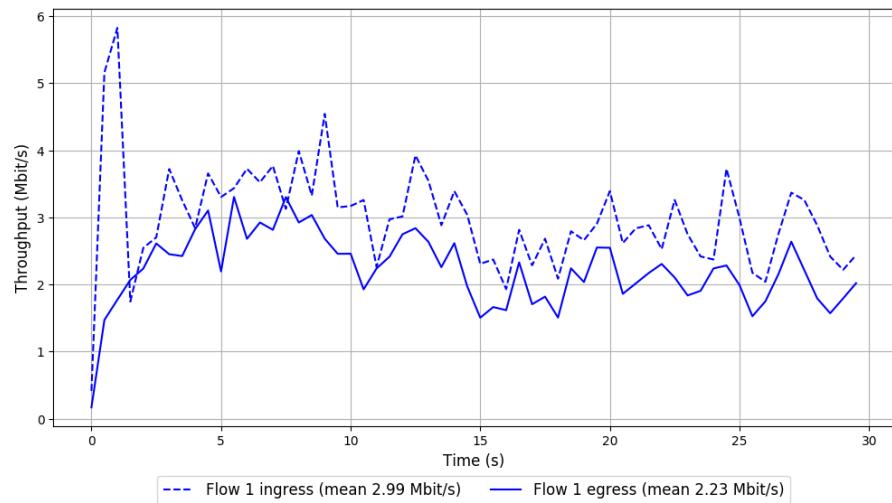


Run 2: Statistics of FillP

```
Start at: 2018-04-10 05:04:26
End at: 2018-04-10 05:04:56
Local clock offset: -9.842 ms
Remote clock offset: -2.489 ms

# Below is generated by plot.py at 2018-04-10 06:30:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 365.509 ms
Loss rate: 25.70%
-- Flow 1:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 365.509 ms
Loss rate: 25.70%
```

Run 2: Report of FillP — Data Link

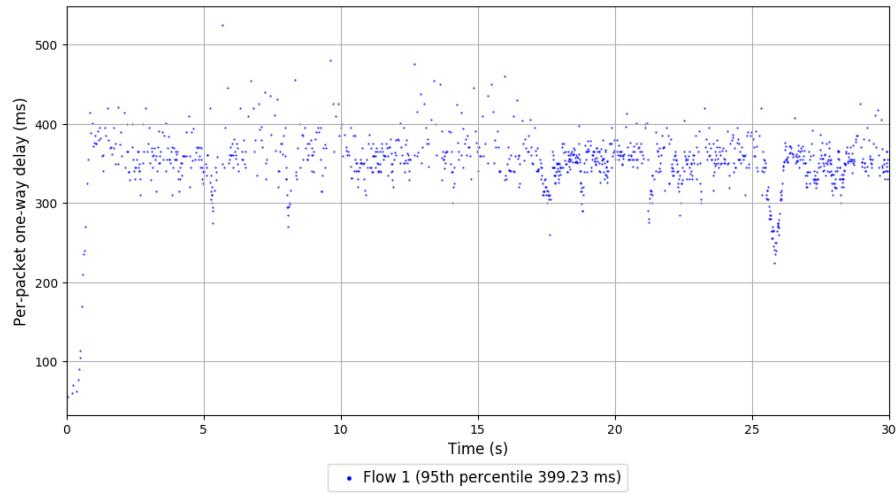
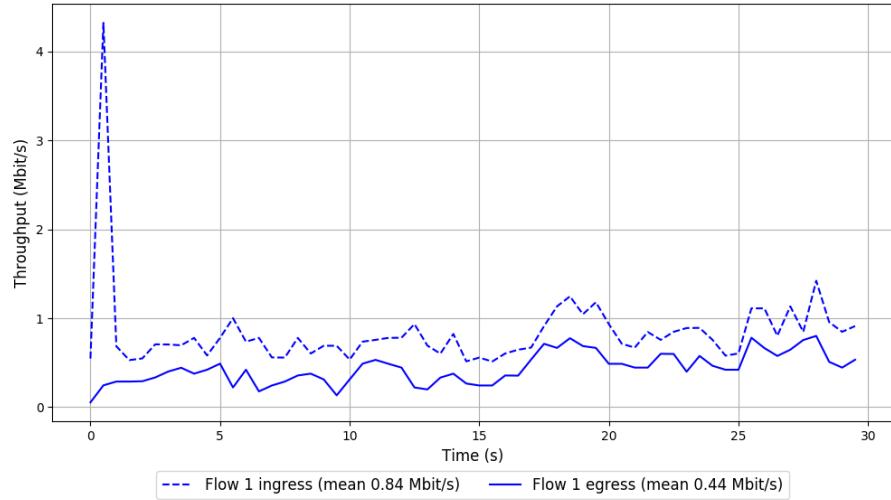


Run 3: Statistics of FillP

```
Start at: 2018-04-10 05:23:54
End at: 2018-04-10 05:24:24
Local clock offset: -8.9 ms
Remote clock offset: -3.877 ms

# Below is generated by plot.py at 2018-04-10 06:30:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 399.234 ms
Loss rate: 48.34%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 399.234 ms
Loss rate: 48.34%
```

Run 3: Report of FillP — Data Link

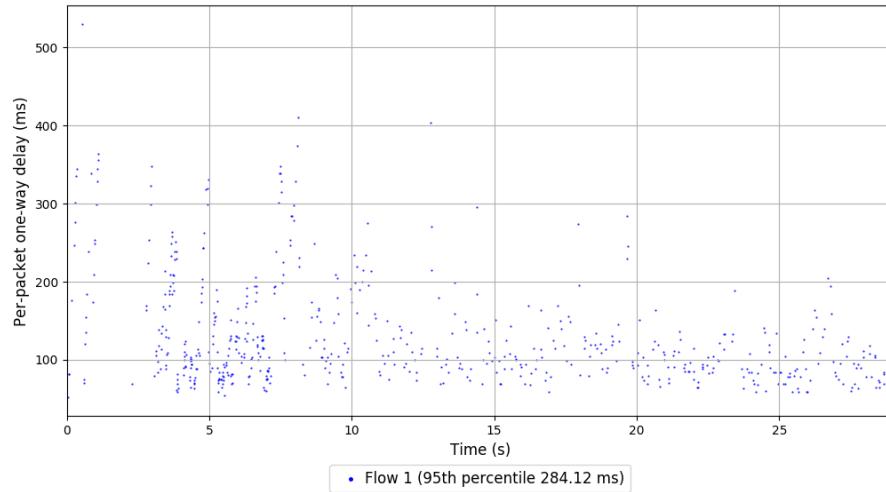
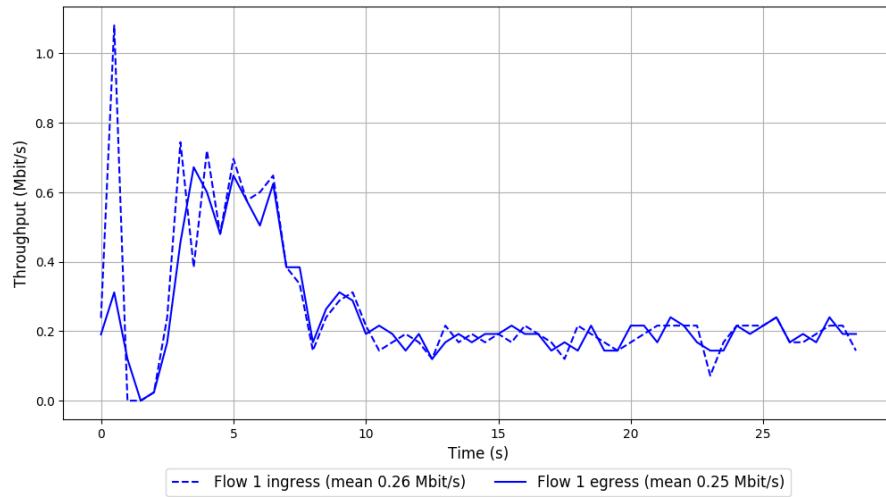


Run 1: Statistics of Indigo-1-32

```
Start at: 2018-04-10 04:50:17
End at: 2018-04-10 04:50:47
Local clock offset: -4.79 ms
Remote clock offset: -1.69 ms

# Below is generated by plot.py at 2018-04-10 06:30:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 284.123 ms
Loss rate: 5.87%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 284.123 ms
Loss rate: 5.87%
```

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

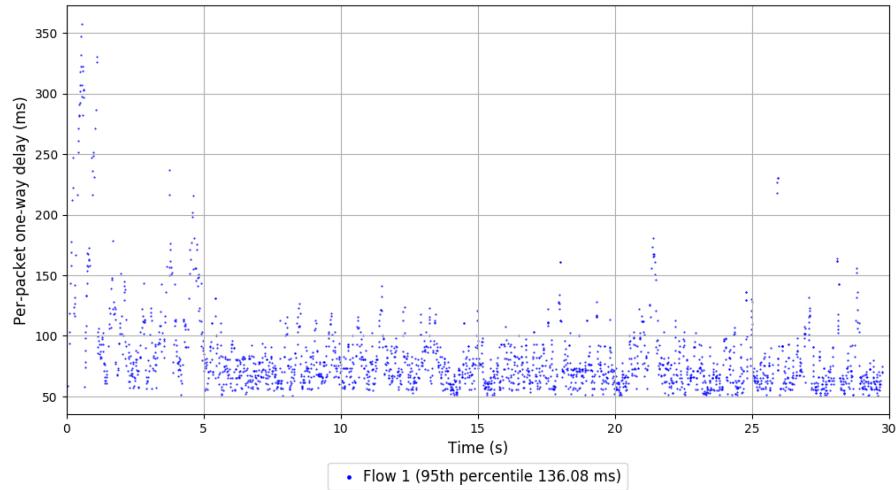
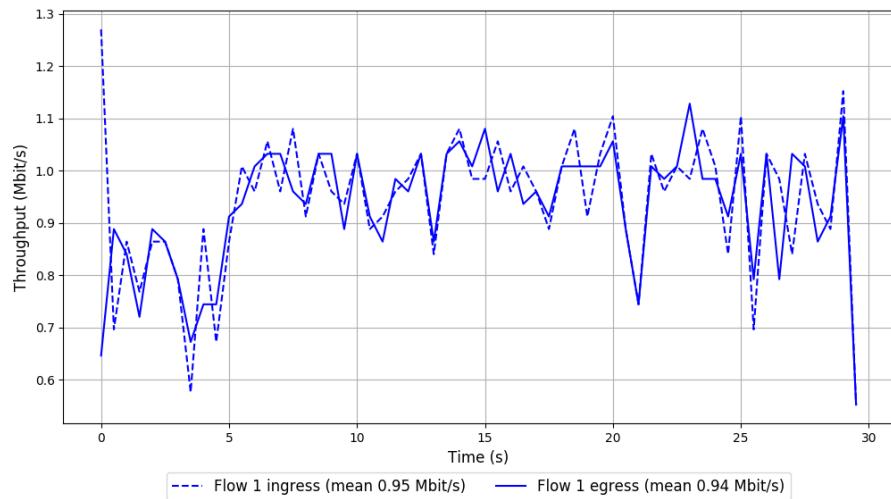


Run 2: Statistics of Indigo-1-32

```
Start at: 2018-04-10 05:09:51
End at: 2018-04-10 05:10:21
Local clock offset: -6.867 ms
Remote clock offset: -2.363 ms

# Below is generated by plot.py at 2018-04-10 06:30:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 136.082 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 136.082 ms
Loss rate: 0.85%
```

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

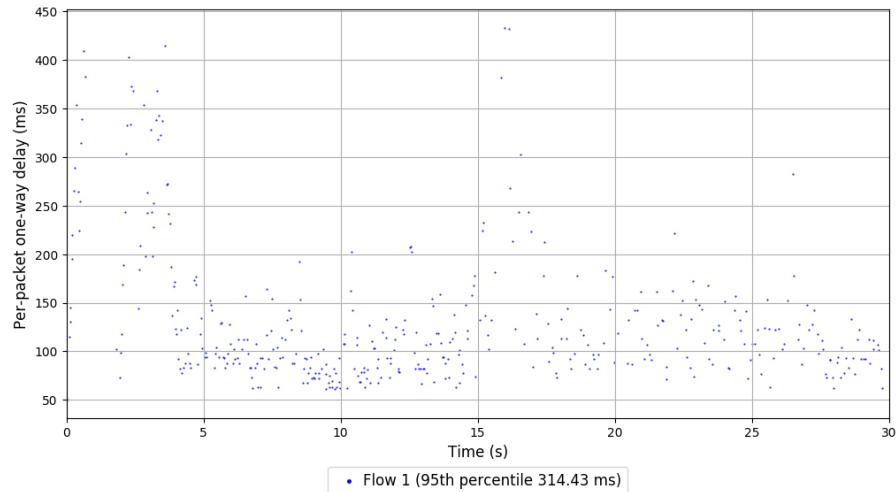
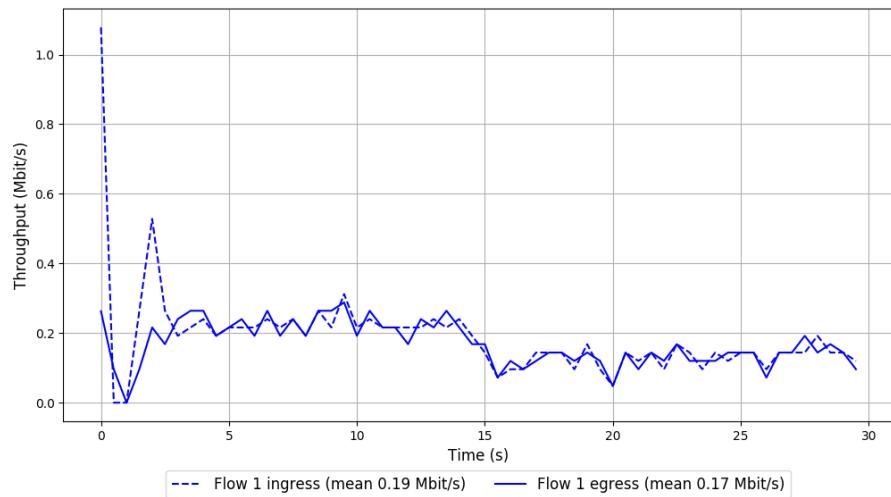


Run 3: Statistics of Indigo-1-32

```
Start at: 2018-04-10 05:29:19
End at: 2018-04-10 05:29:49
Local clock offset: -10.57 ms
Remote clock offset: -3.304 ms

# Below is generated by plot.py at 2018-04-10 06:30:19
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 314.430 ms
Loss rate: 10.36%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 314.430 ms
Loss rate: 10.36%
```

Run 3: Report of Indigo-1-32 — Data Link

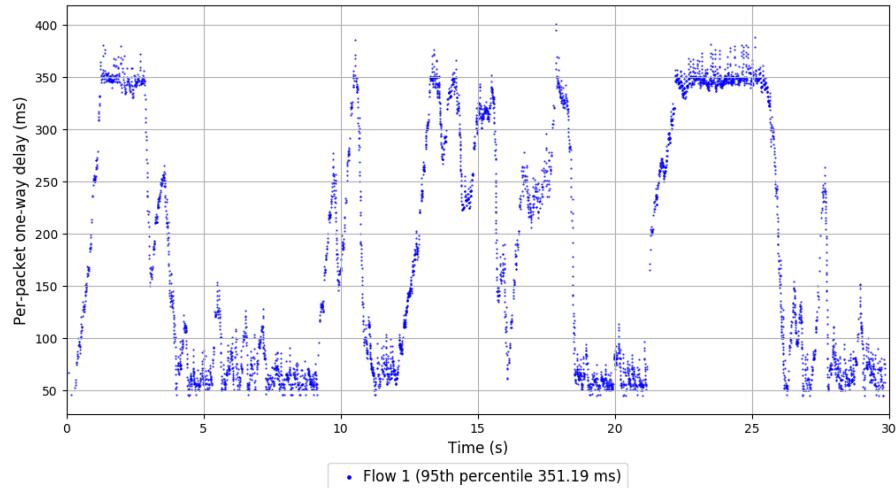
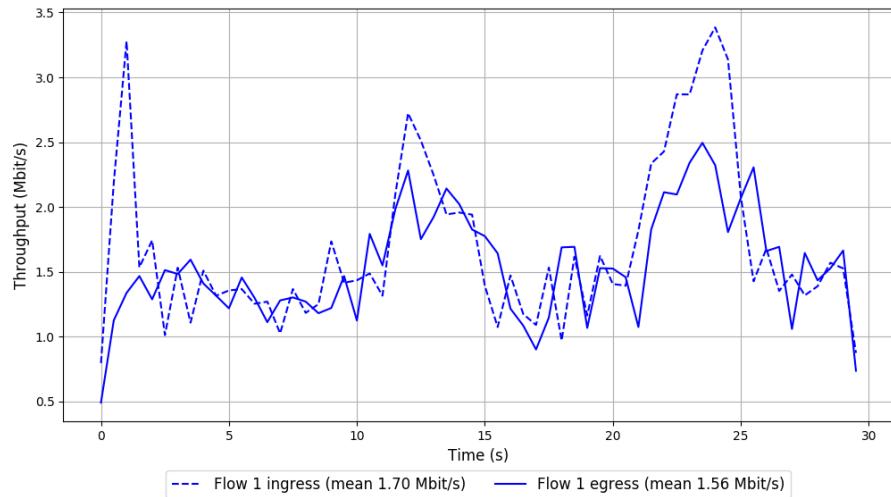


Run 1: Statistics of Vivace-latency

```
Start at: 2018-04-10 04:33:52
End at: 2018-04-10 04:34:22
Local clock offset: -2.725 ms
Remote clock offset: 3.394 ms

# Below is generated by plot.py at 2018-04-10 06:30:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 351.194 ms
Loss rate: 8.60%
-- Flow 1:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 351.194 ms
Loss rate: 8.60%
```

Run 1: Report of Vivace-latency — Data Link

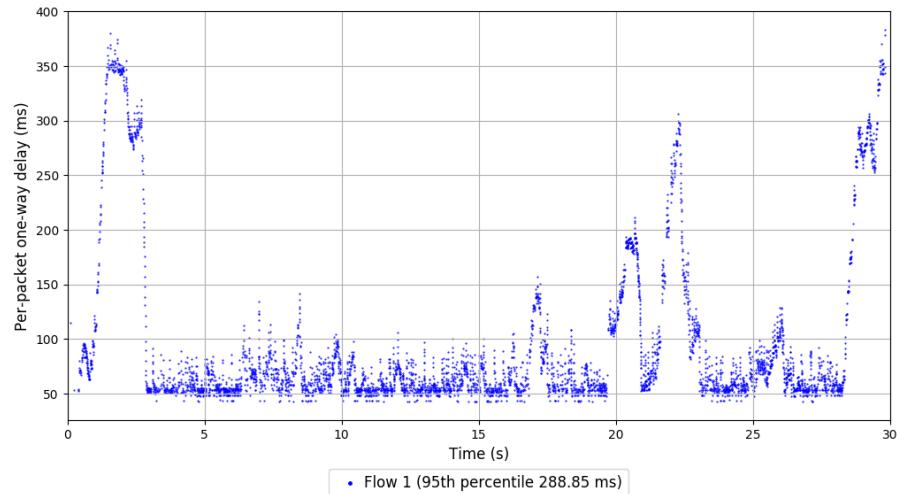
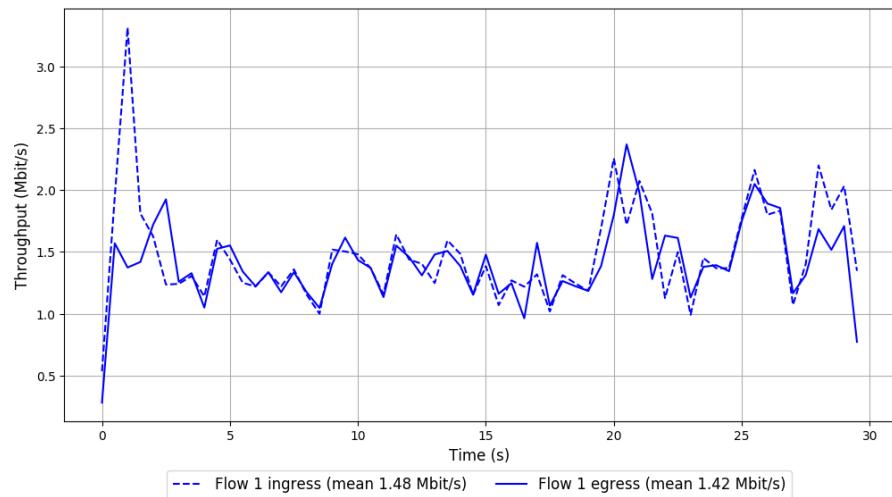


Run 2: Statistics of Vivace-latency

```
Start at: 2018-04-10 04:53:35
End at: 2018-04-10 04:54:05
Local clock offset: -5.26 ms
Remote clock offset: -1.314 ms

# Below is generated by plot.py at 2018-04-10 06:30:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 288.845 ms
Loss rate: 4.45%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 288.845 ms
Loss rate: 4.45%
```

Run 2: Report of Vivace-latency — Data Link

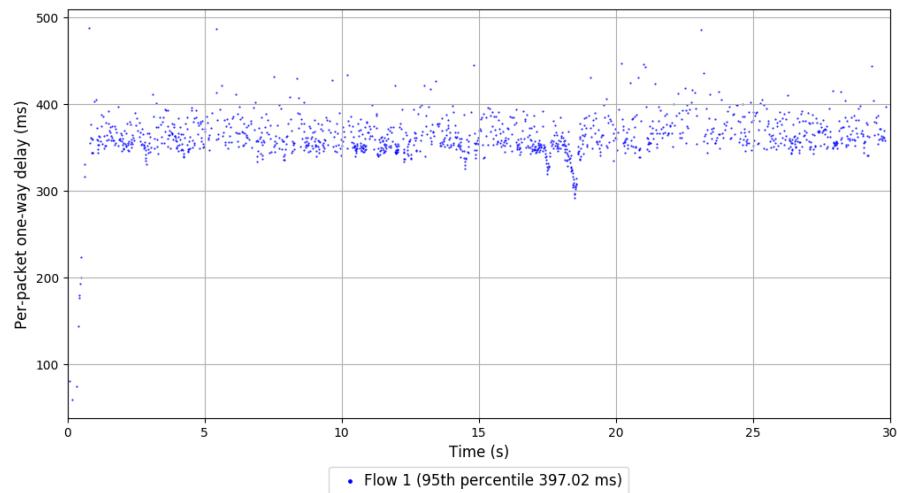
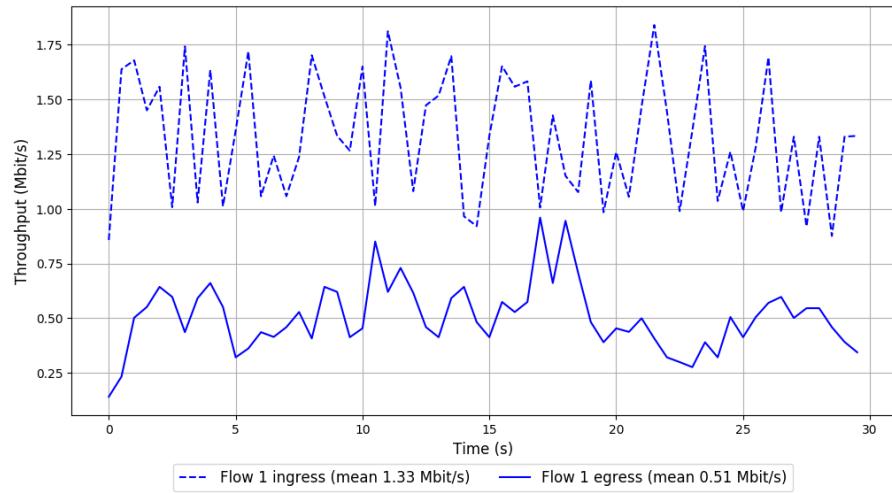


Run 3: Statistics of Vivace-latency

```
Start at: 2018-04-10 05:13:06
End at: 2018-04-10 05:13:36
Local clock offset: -6.354 ms
Remote clock offset: -2.592 ms

# Below is generated by plot.py at 2018-04-10 06:30:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 397.022 ms
Loss rate: 61.79%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 397.022 ms
Loss rate: 61.79%
```

Run 3: Report of Vivace-latency — Data Link

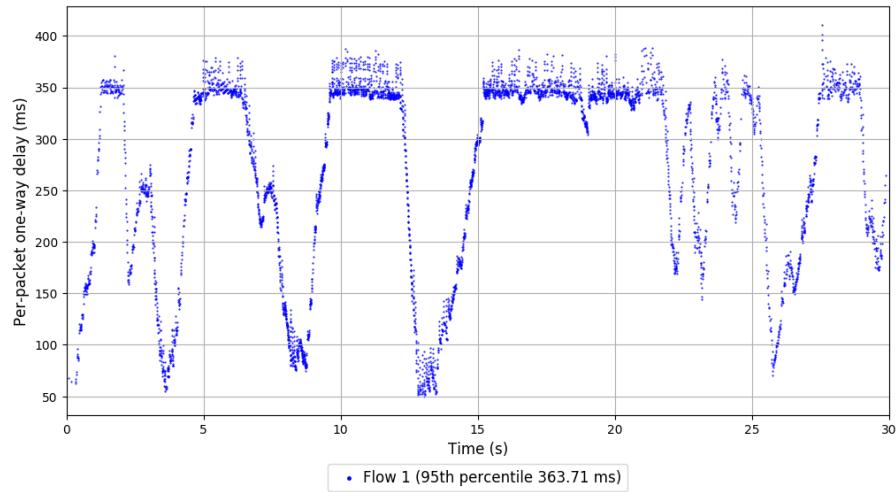
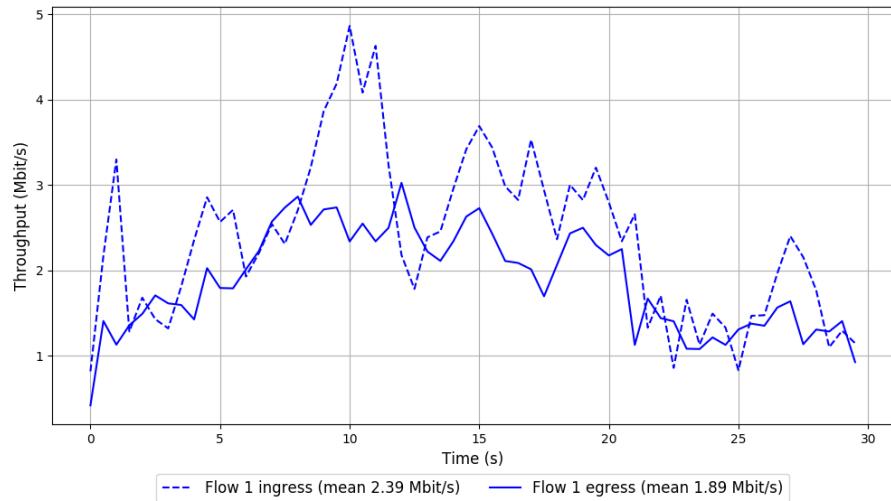


```
Run 1: Statistics of Vivace-loss
```

```
Start at: 2018-04-10 04:34:57
End at: 2018-04-10 04:35:27
Local clock offset: -2.875 ms
Remote clock offset: 3.425 ms

# Below is generated by plot.py at 2018-04-10 06:30:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 363.714 ms
Loss rate: 21.00%
-- Flow 1:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 363.714 ms
Loss rate: 21.00%
```

Run 1: Report of Vivace-loss — Data Link

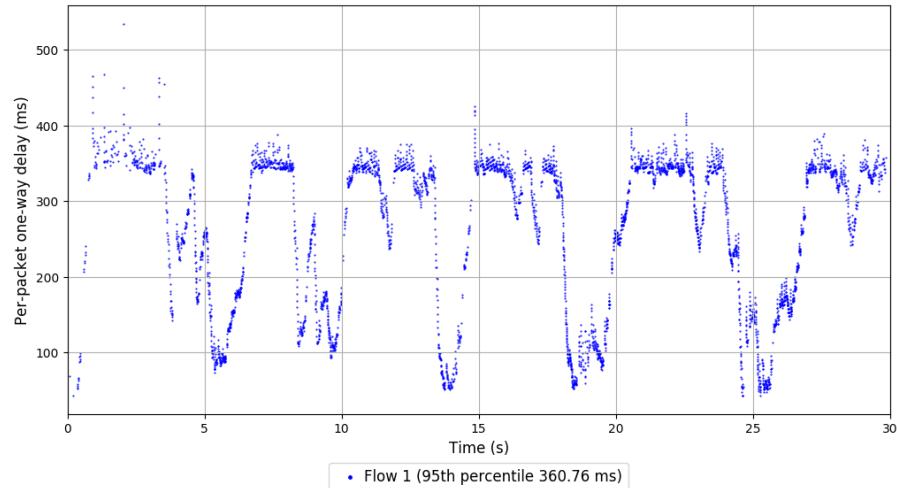
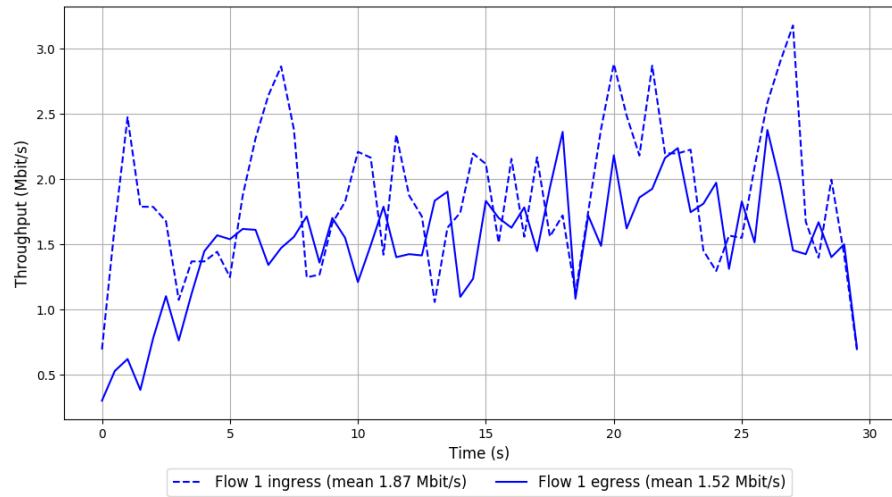


Run 2: Statistics of Vivace-loss

```
Start at: 2018-04-10 04:54:40
End at: 2018-04-10 04:55:10
Local clock offset: -5.161 ms
Remote clock offset: -1.361 ms

# Below is generated by plot.py at 2018-04-10 06:30:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 360.757 ms
Loss rate: 19.05%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 360.757 ms
Loss rate: 19.05%
```

Run 2: Report of Vivace-loss — Data Link

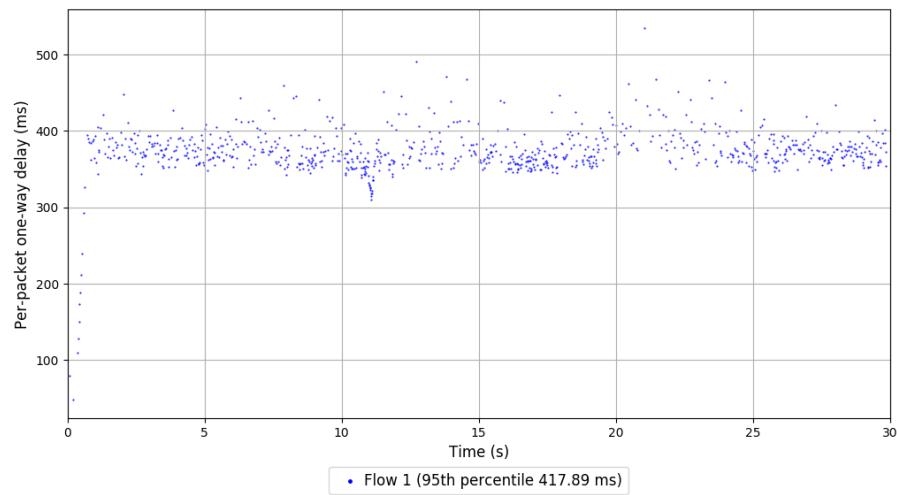
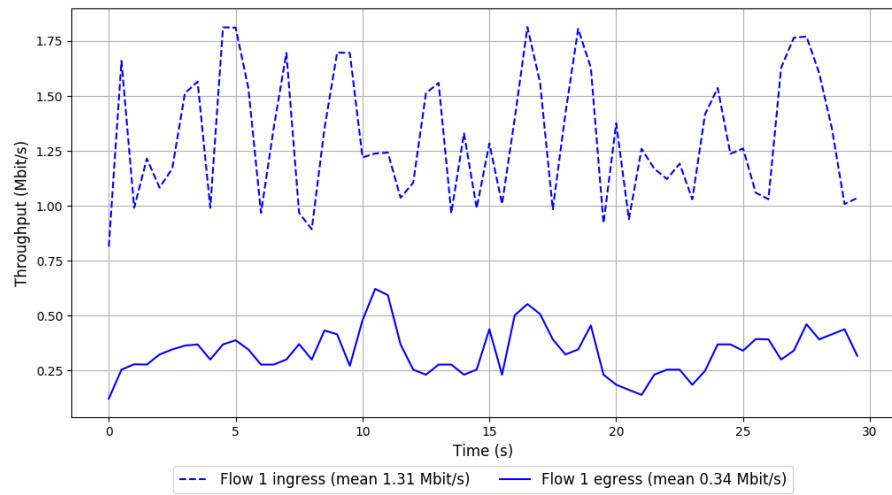


Run 3: Statistics of Vivace-loss

```
Start at: 2018-04-10 05:14:10
End at: 2018-04-10 05:14:41
Local clock offset: -6.976 ms
Remote clock offset: -2.483 ms

# Below is generated by plot.py at 2018-04-10 06:30:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 417.893 ms
Loss rate: 74.46%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 417.893 ms
Loss rate: 74.46%
```

Run 3: Report of Vivace-loss — Data Link

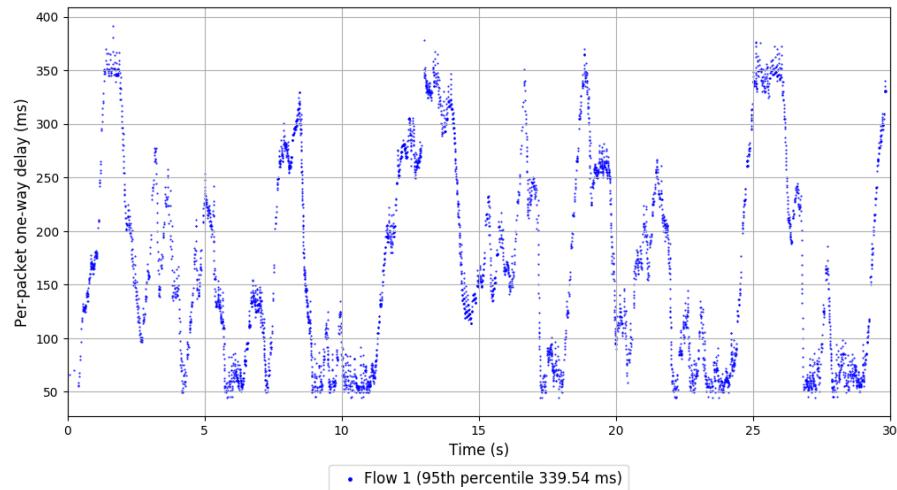
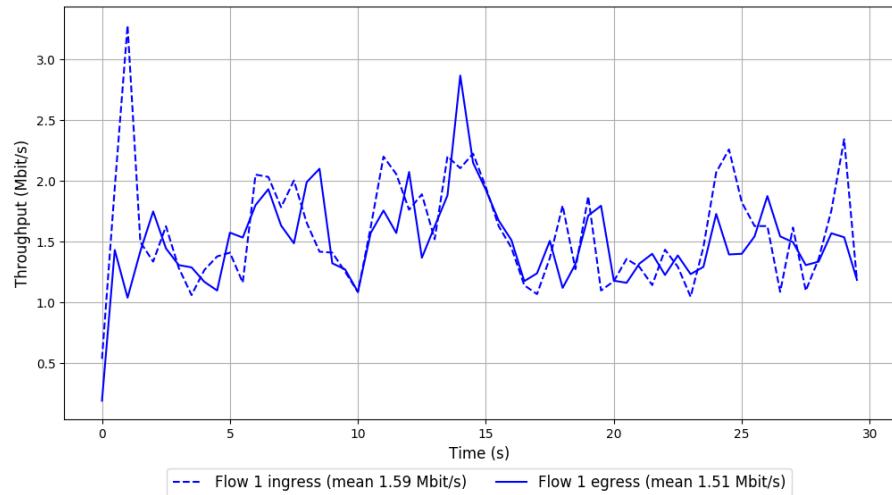


Run 1: Statistics of Vivace-LTE

```
Start at: 2018-04-10 04:32:46
End at: 2018-04-10 04:33:16
Local clock offset: -1.99 ms
Remote clock offset: 4.084 ms

# Below is generated by plot.py at 2018-04-10 06:30:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 339.539 ms
Loss rate: 5.20%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 339.539 ms
Loss rate: 5.20%
```

Run 1: Report of Vivace-LTE — Data Link

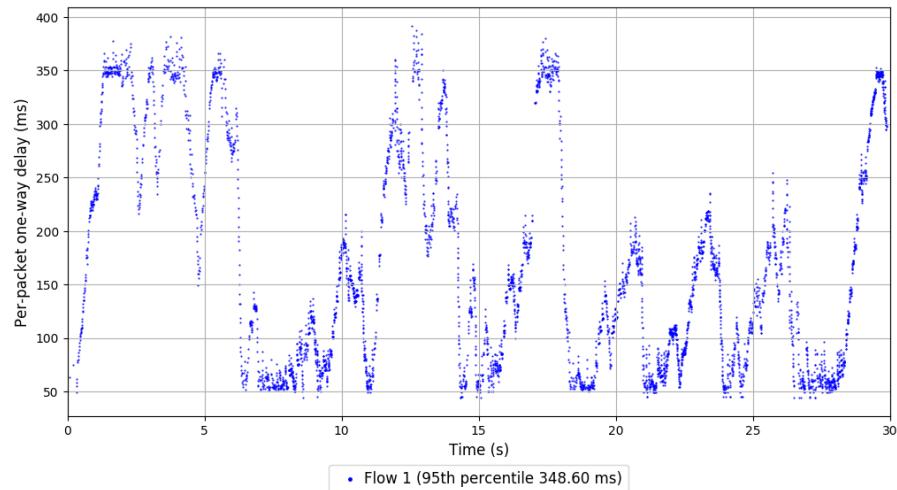
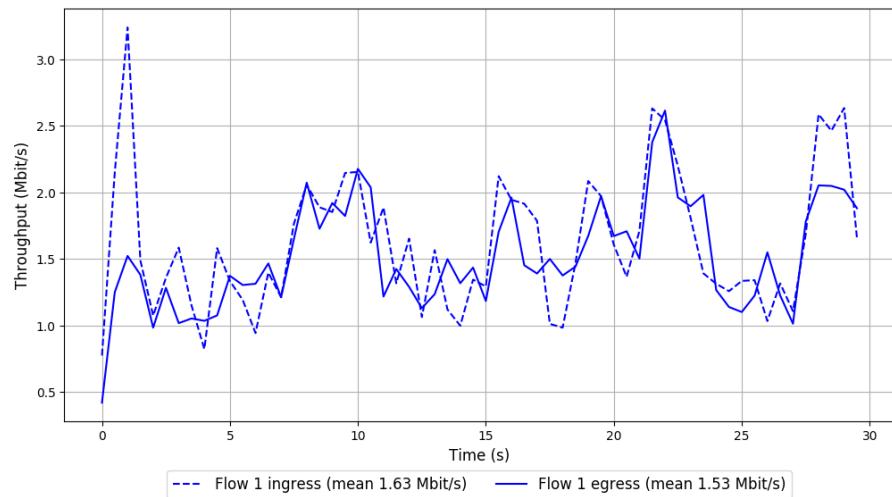


Run 2: Statistics of Vivace-LTE

```
Start at: 2018-04-10 04:52:29
End at: 2018-04-10 04:52:59
Local clock offset: -4.363 ms
Remote clock offset: -1.393 ms

# Below is generated by plot.py at 2018-04-10 06:30:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 348.600 ms
Loss rate: 6.16%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 348.600 ms
Loss rate: 6.16%
```

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

```
Start at: 2018-04-10 05:12:00
End at: 2018-04-10 05:12:30
Local clock offset: -6.324 ms
Remote clock offset: -2.829 ms

# Below is generated by plot.py at 2018-04-10 06:30:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 381.693 ms
Loss rate: 52.62%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 381.693 ms
Loss rate: 52.62%
```

Run 3: Report of Vivace-LTE — Data Link

