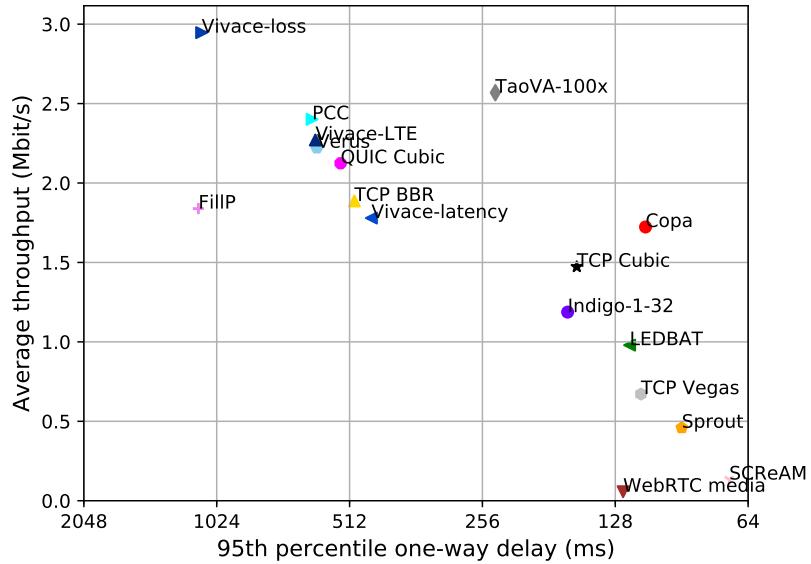


## Pantheon Report

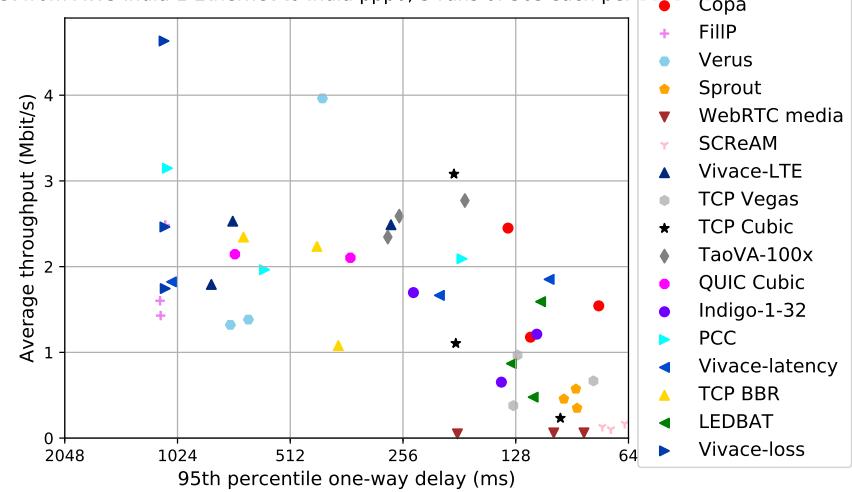
Generated at 2018-04-10 06:31:20 (UTC).  
Data path: AWS India 1 Ethernet (*local*) → India ppp0 (*remote*).  
Repeated the test of 17 congestion control schemes 3 times.  
Each test lasted for 30 seconds running 1 flow.  
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).  
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo\_fast**).  
NTP offsets were measured against **nets.org.sg** and have been applied to correct the timestamps in logs.

Git summary:  
branch: master @ 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 @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf  
third\_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993  
third\_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1  
M receiver/src/buffer.h  
M receiver/src/core.cpp  
M sender/src/buffer.h  
M sender/src/core.cpp  
third\_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42  
third\_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885  
third\_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681  
third\_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce  
M src/examples/cellsim.cc  
M src/examples/sproutbt2.cc  
M src/network/sproutconn.cc  
third\_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494  
M src/verus.hpp  
M tools/plot.py  
third\_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3  
third\_party/webrtc @ f271183af822eee5d0031620f4bebf38aedc5581

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



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



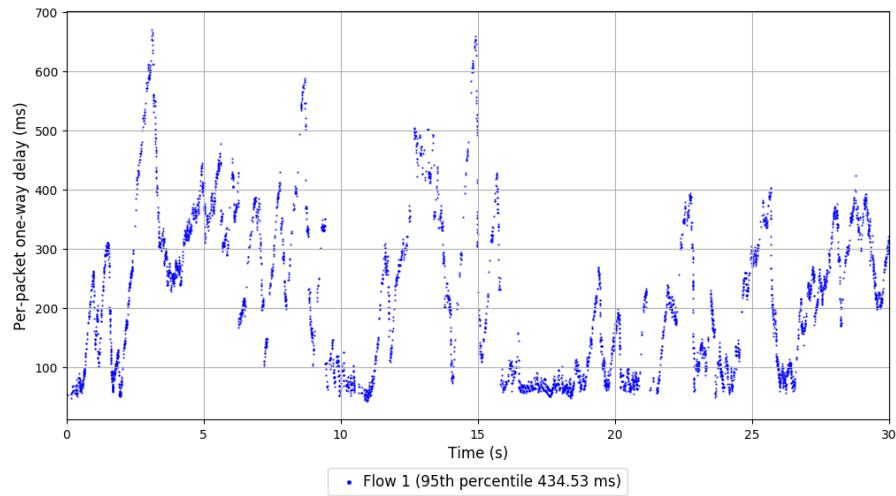
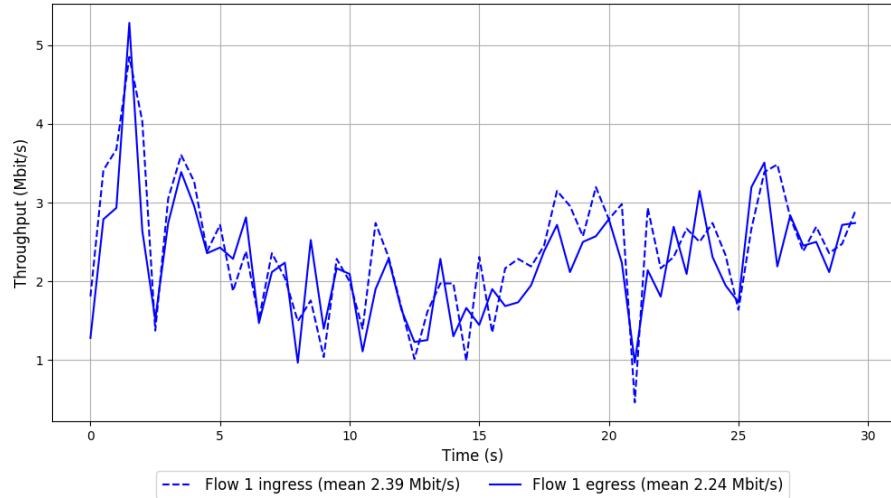
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.89	499.33	5.27
TCP Cubic	3	1.47	156.48	6.03
LEDBAT	3	0.98	118.79	6.24
PCC	3	2.40	622.48	12.99
QUIC Cubic	2	2.12	536.62	1.63
SCReAM	3	0.13	70.64	1.27
WebRTC media	3	0.06	122.90	9.66
Sprout	3	0.46	90.49	2.97
TaoVA-100x	3	2.57	239.32	4.65
TCP Vegas	3	0.67	111.98	6.14
Verus	3	2.22	607.32	7.12
Copa	3	1.72	109.32	4.63
FillP	3	1.84	1126.74	55.60
Indigo-1-32	3	1.19	164.12	10.23
Vivace-latency	3	1.78	456.98	5.83
Vivace-loss	3	2.94	1107.61	34.77
Vivace-LTE	3	2.27	612.13	4.93

Run 1: Statistics of TCP BBR

```
Start at: 2018-04-10 05:47:52
End at: 2018-04-10 05:48:22
Local clock offset: -6.989 ms
Remote clock offset: -3.723 ms

# Below is generated by plot.py at 2018-04-10 06:30:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 434.526 ms
Loss rate: 6.77%
-- Flow 1:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 434.526 ms
Loss rate: 6.77%
```

## Run 1: Report of TCP BBR — Data Link

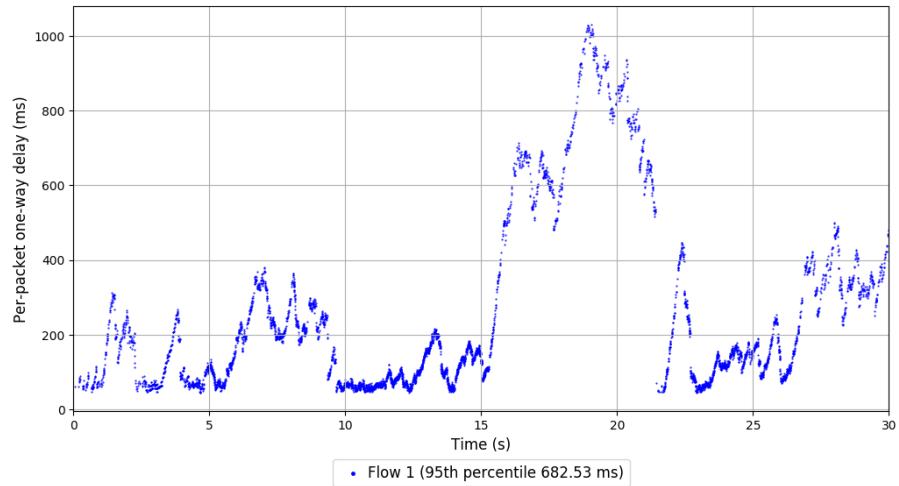
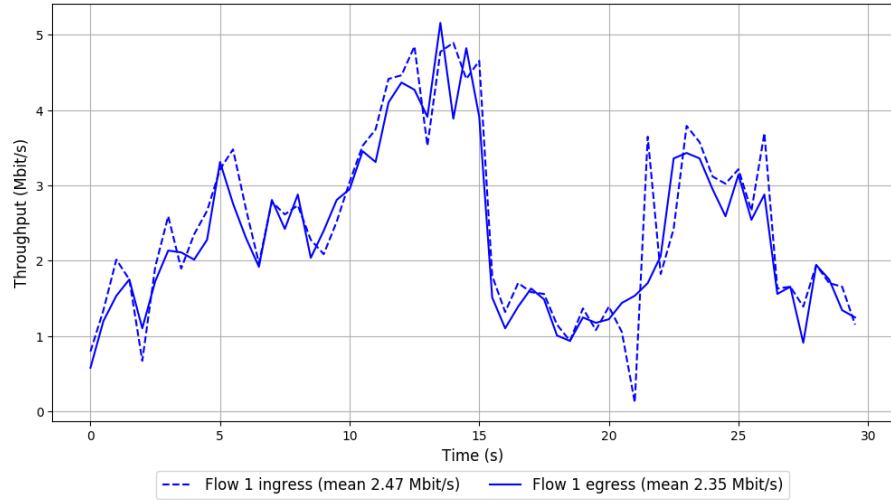


Run 2: Statistics of TCP BBR

```
Start at: 2018-04-10 06:07:25
End at: 2018-04-10 06:07:55
Local clock offset: -6.617 ms
Remote clock offset: -2.441 ms

# Below is generated by plot.py at 2018-04-10 06:30:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 682.531 ms
Loss rate: 5.06%
-- Flow 1:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 682.531 ms
Loss rate: 5.06%
```

## Run 2: Report of TCP BBR — Data Link

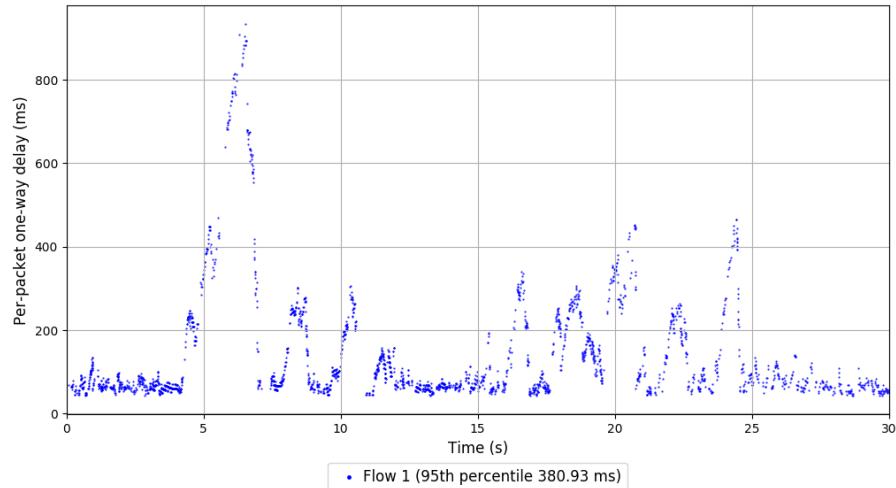
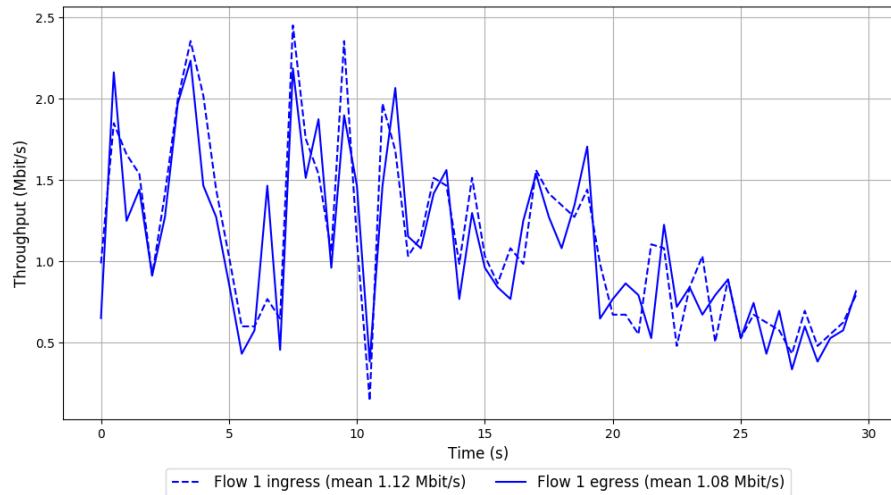


Run 3: Statistics of TCP BBR

```
Start at: 2018-04-10 06:27:01
End at: 2018-04-10 06:27:31
Local clock offset: -4.156 ms
Remote clock offset: -2.265 ms

# Below is generated by plot.py at 2018-04-10 06:30:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 380.925 ms
Loss rate: 3.99%
-- Flow 1:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 380.925 ms
Loss rate: 3.99%
```

### Run 3: Report of TCP BBR — Data Link

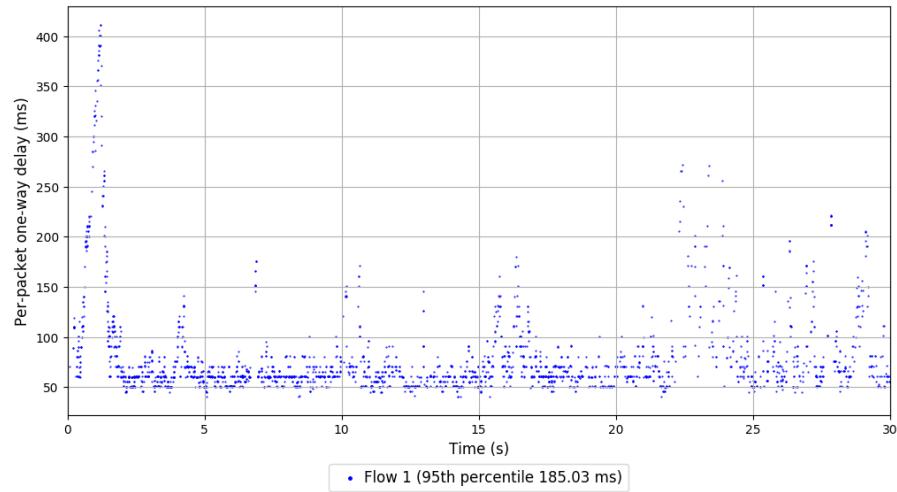
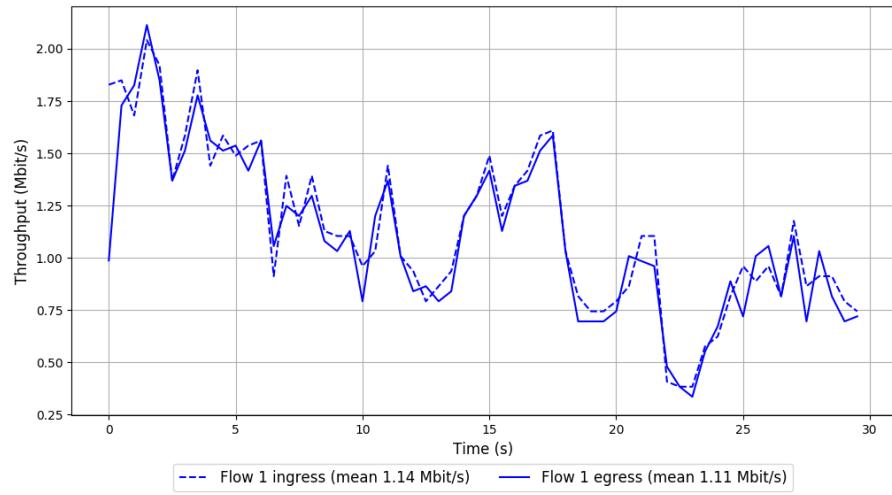


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-04-10 05:44:37
End at: 2018-04-10 05:45:07
Local clock offset: -7.805 ms
Remote clock offset: -3.313 ms

# Below is generated by plot.py at 2018-04-10 06:30:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 185.030 ms
Loss rate: 3.43%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 185.030 ms
Loss rate: 3.43%
```

## Run 1: Report of TCP Cubic — Data Link

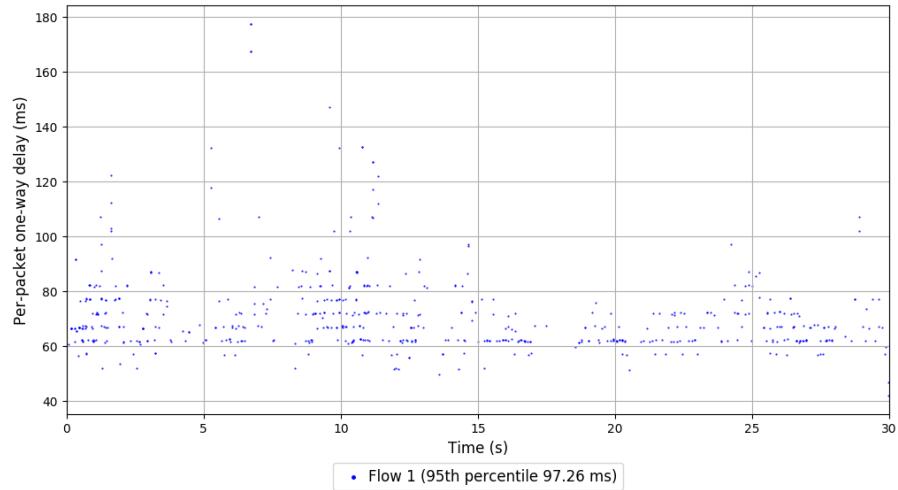
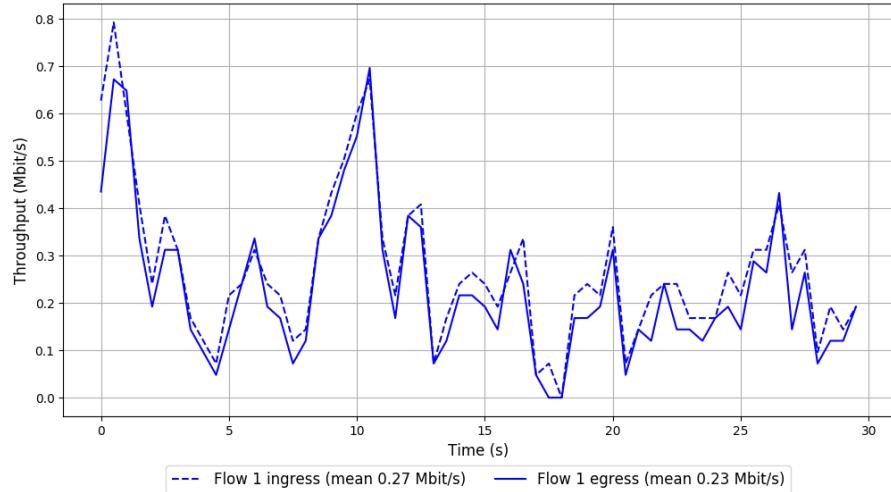


Run 2: Statistics of TCP Cubic

```
Start at: 2018-04-10 06:04:10
End at: 2018-04-10 06:04:40
Local clock offset: -6.937 ms
Remote clock offset: -2.848 ms

# Below is generated by plot.py at 2018-04-10 06:30:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 97.261 ms
Loss rate: 13.96%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 97.261 ms
Loss rate: 13.96%
```

## Run 2: Report of TCP Cubic — Data Link

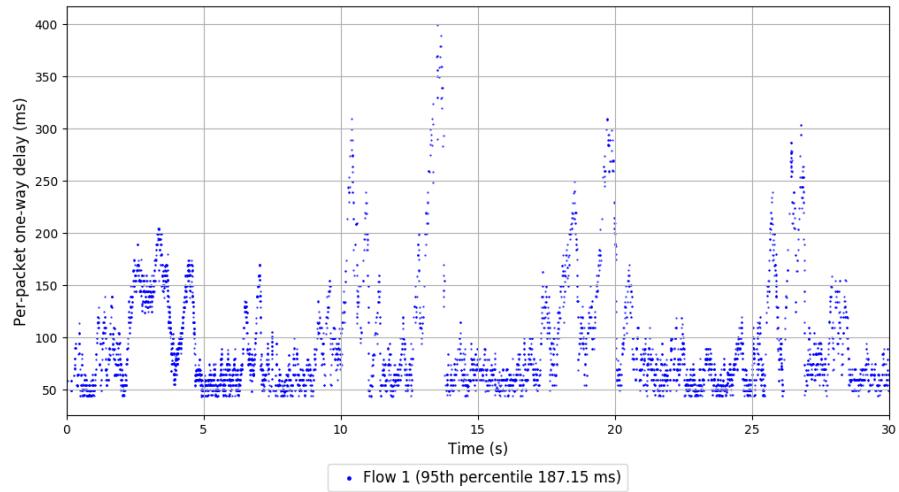
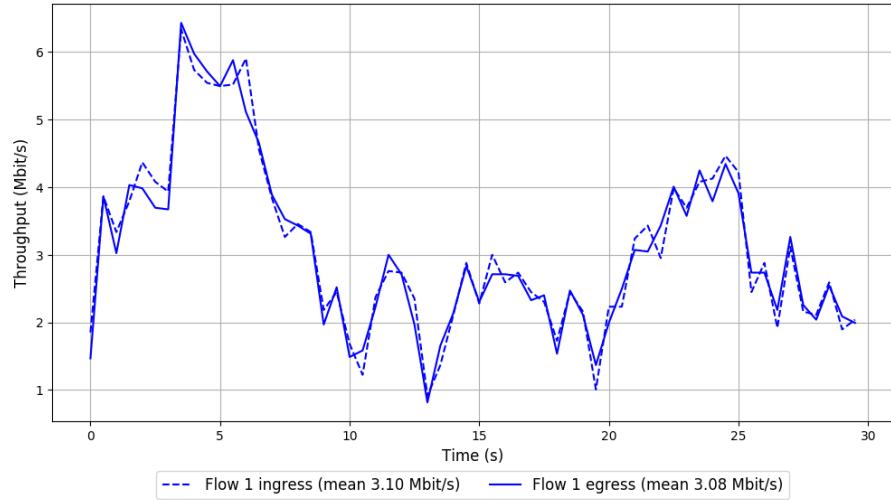


Run 3: Statistics of TCP Cubic

```
Start at: 2018-04-10 06:23:46
End at: 2018-04-10 06:24:16
Local clock offset: -3.938 ms
Remote clock offset: -1.473 ms

# Below is generated by plot.py at 2018-04-10 06:30:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 187.146 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 187.146 ms
Loss rate: 0.71%
```

### Run 3: Report of TCP Cubic — Data Link

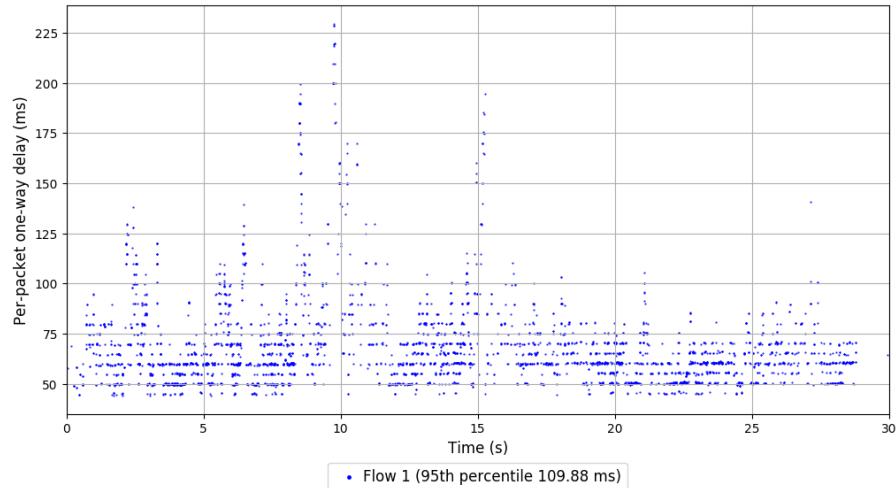
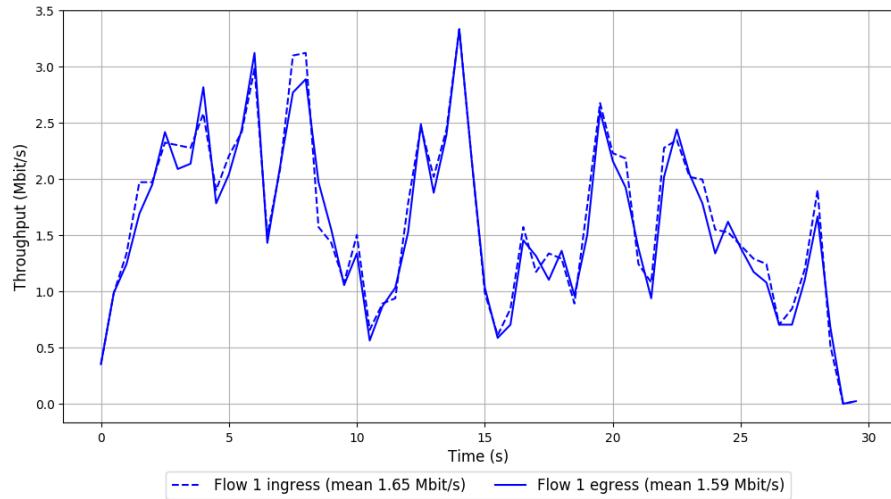


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-04-10 05:40:16
End at: 2018-04-10 05:40:46
Local clock offset: -12.129 ms
Remote clock offset: -4.209 ms

# Below is generated by plot.py at 2018-04-10 06:30:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 109.882 ms
Loss rate: 3.24%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 109.882 ms
Loss rate: 3.24%
```

## Run 1: Report of LEDBAT — Data Link

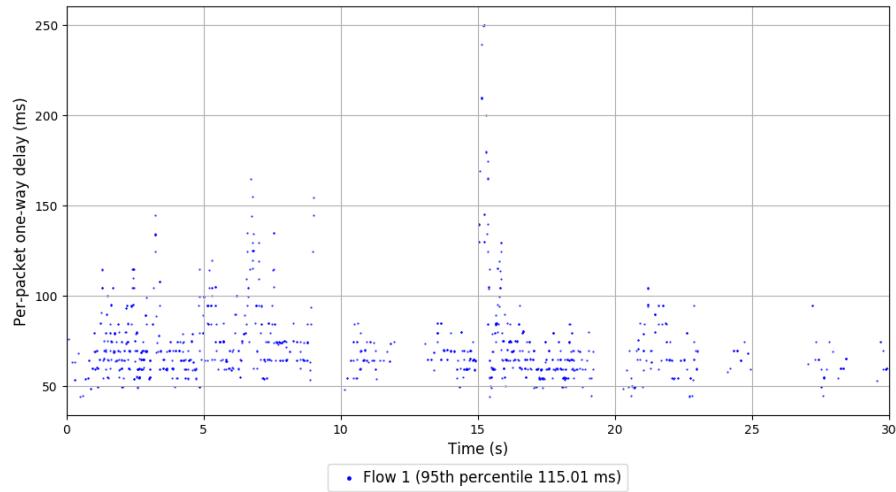
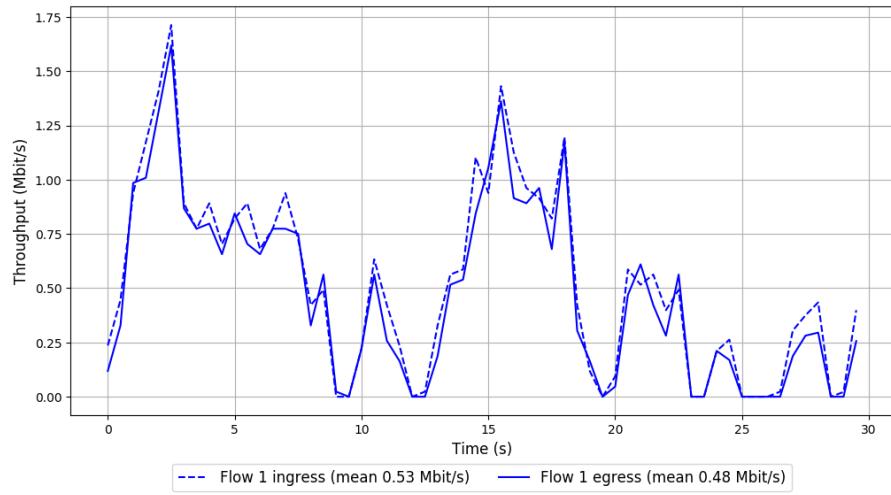


Run 2: Statistics of LEDBAT

```
Start at: 2018-04-10 05:59:49
End at: 2018-04-10 06:00:19
Local clock offset: -5.635 ms
Remote clock offset: -2.86 ms

# Below is generated by plot.py at 2018-04-10 06:30:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 115.008 ms
Loss rate: 10.00%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 115.008 ms
Loss rate: 10.00%
```

## Run 2: Report of LEDBAT — Data Link

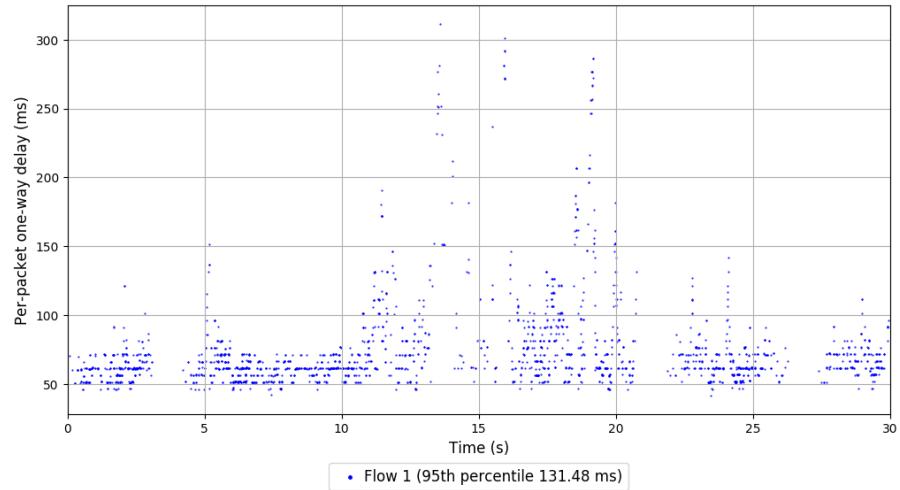
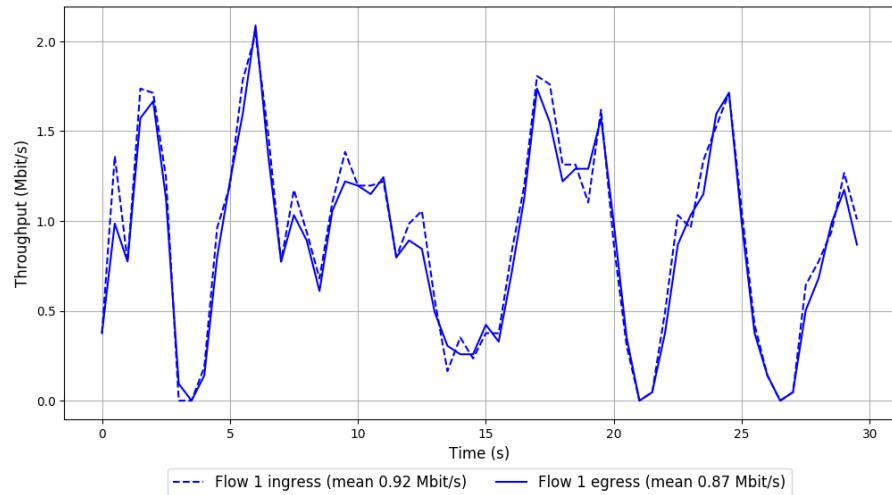


Run 3: Statistics of LEDBAT

```
Start at: 2018-04-10 06:19:20
End at: 2018-04-10 06:19:50
Local clock offset: -4.662 ms
Remote clock offset: -2.515 ms

# Below is generated by plot.py at 2018-04-10 06:30:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 131.480 ms
Loss rate: 5.47%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 131.480 ms
Loss rate: 5.47%
```

### Run 3: Report of LEDBAT — Data Link

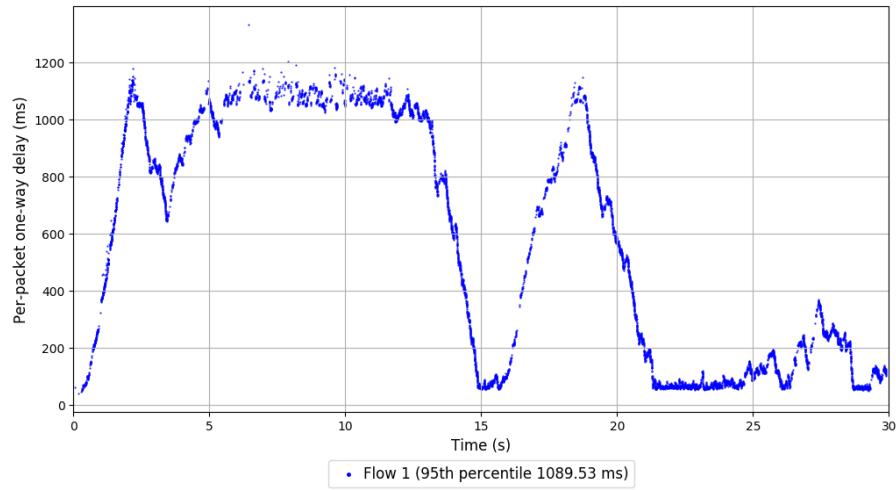
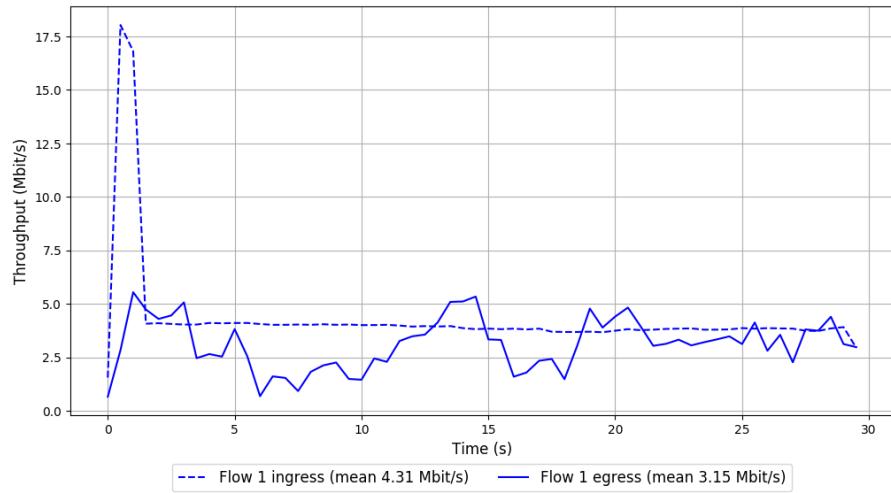


Run 1: Statistics of PCC

```
Start at: 2018-04-10 05:45:42
End at: 2018-04-10 05:46:12
Local clock offset: -7.512 ms
Remote clock offset: -4.281 ms

# Below is generated by plot.py at 2018-04-10 06:30:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 1089.529 ms
Loss rate: 27.16%
-- Flow 1:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 1089.529 ms
Loss rate: 27.16%
```

### Run 1: Report of PCC — Data Link

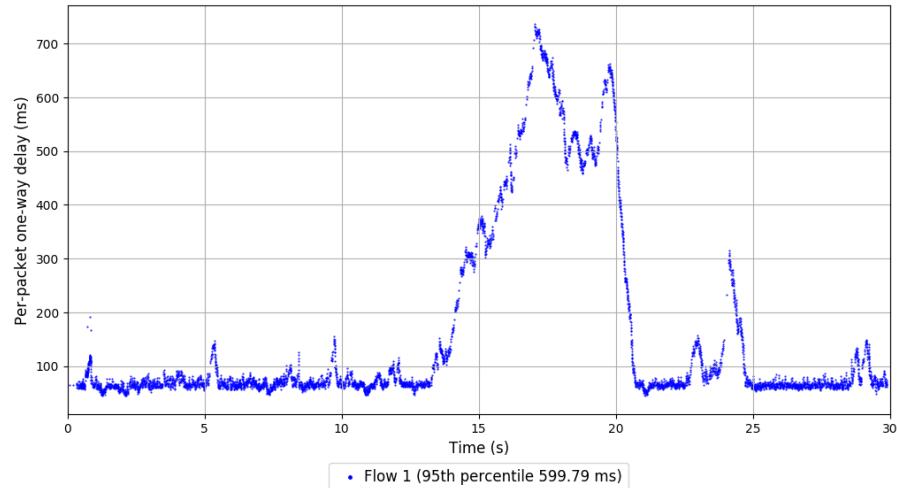
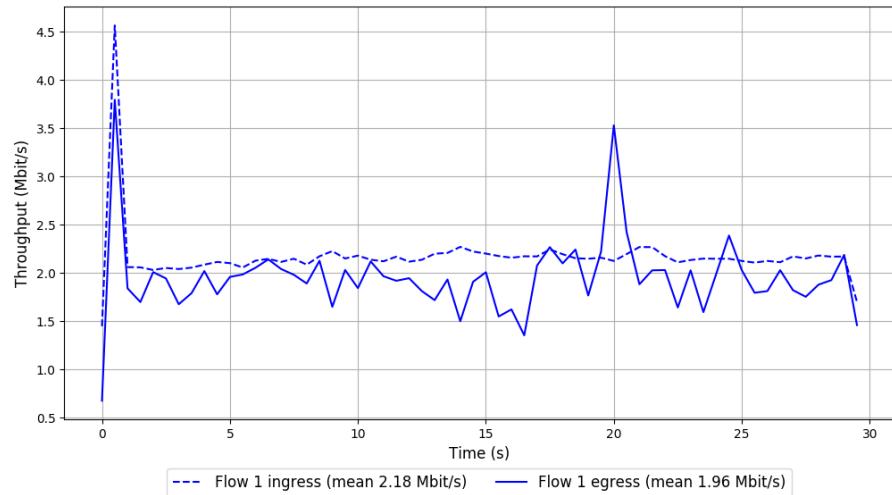


Run 2: Statistics of PCC

```
Start at: 2018-04-10 06:05:14
End at: 2018-04-10 06:05:44
Local clock offset: -6.083 ms
Remote clock offset: -2.842 ms

# Below is generated by plot.py at 2018-04-10 06:30:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.96 Mbit/s
95th percentile per-packet one-way delay: 599.786 ms
Loss rate: 9.92%
-- Flow 1:
Average throughput: 1.96 Mbit/s
95th percentile per-packet one-way delay: 599.786 ms
Loss rate: 9.92%
```

## Run 2: Report of PCC — Data Link

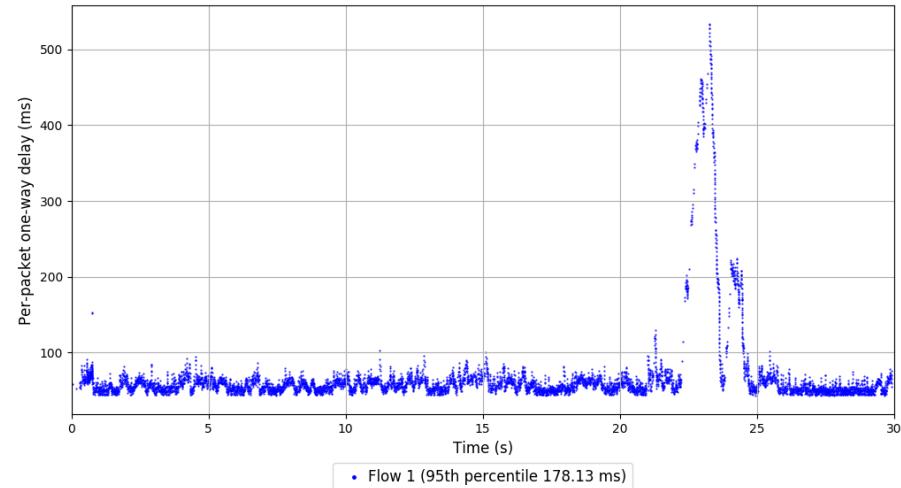
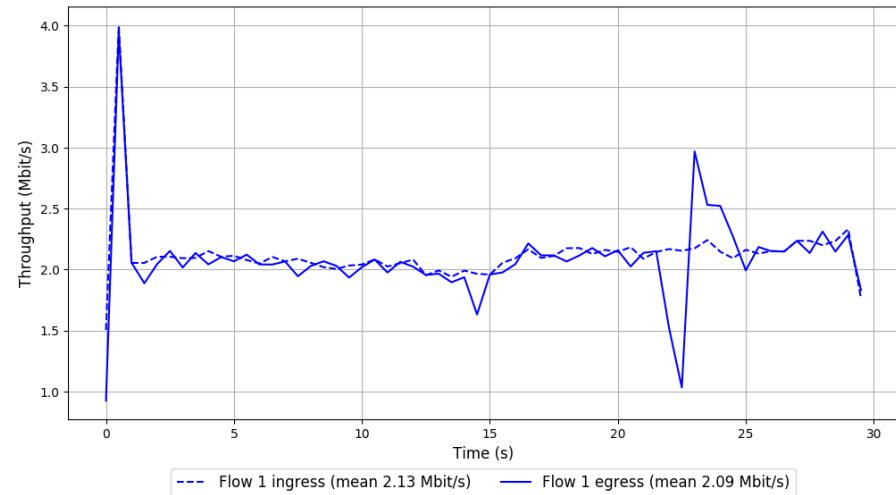


Run 3: Statistics of PCC

```
Start at: 2018-04-10 06:24:51
End at: 2018-04-10 06:25:21
Local clock offset: -4.559 ms
Remote clock offset: -1.995 ms

# Below is generated by plot.py at 2018-04-10 06:30:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 178.131 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 178.131 ms
Loss rate: 1.90%
```

### Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

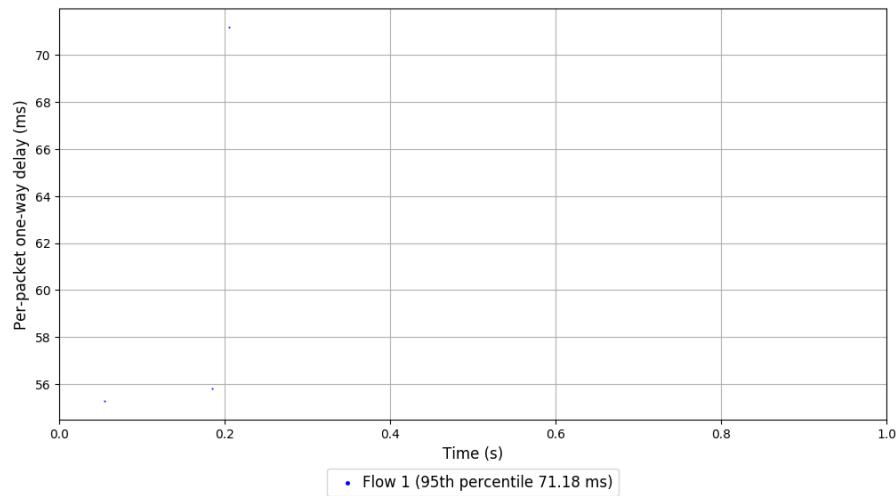
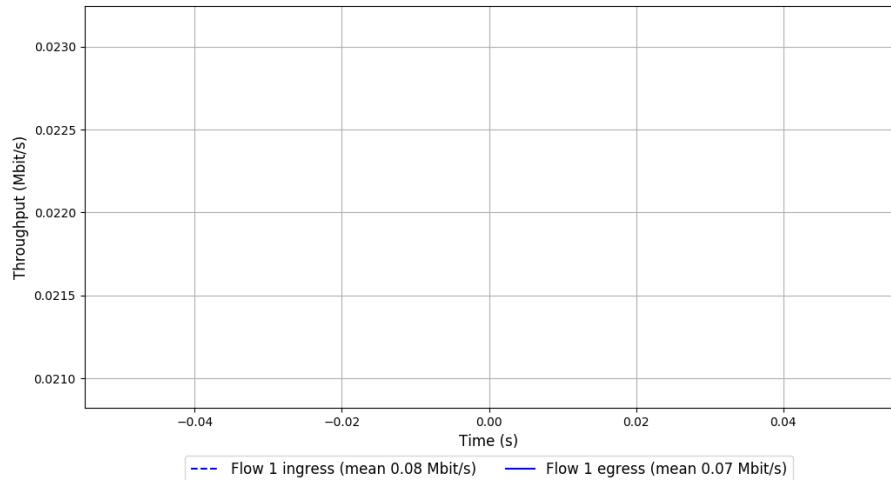
Start at: 2018-04-10 05:48:57

End at: 2018-04-10 05:49:27

Local clock offset: -6.196 ms

Remote clock offset: -3.092 ms

## Run 1: Report of QUIC Cubic — Data Link

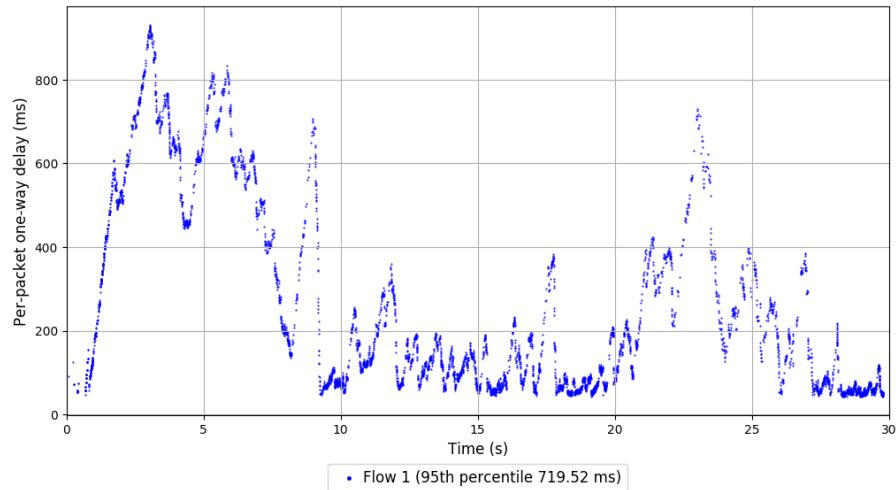
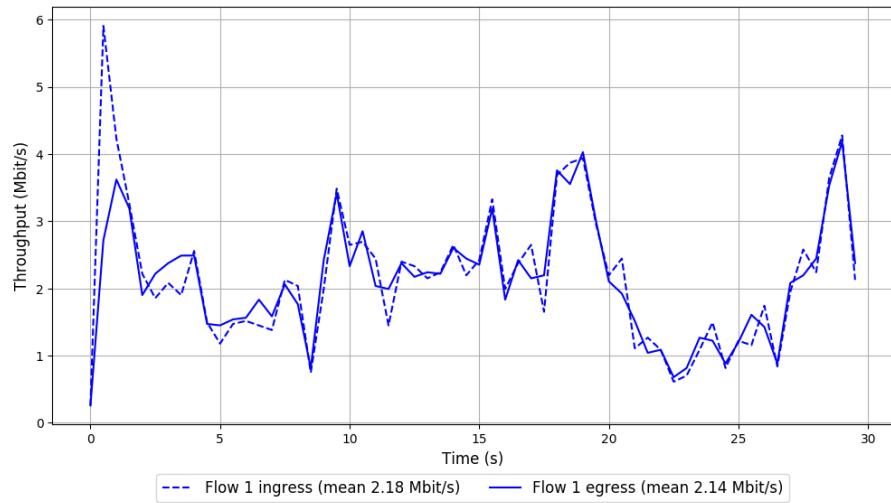


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-04-10 06:08:30
End at: 2018-04-10 06:09:00
Local clock offset: -7.064 ms
Remote clock offset: -2.384 ms

# Below is generated by plot.py at 2018-04-10 06:30:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 719.522 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 719.522 ms
Loss rate: 1.85%
```

## Run 2: Report of QUIC Cubic — Data Link

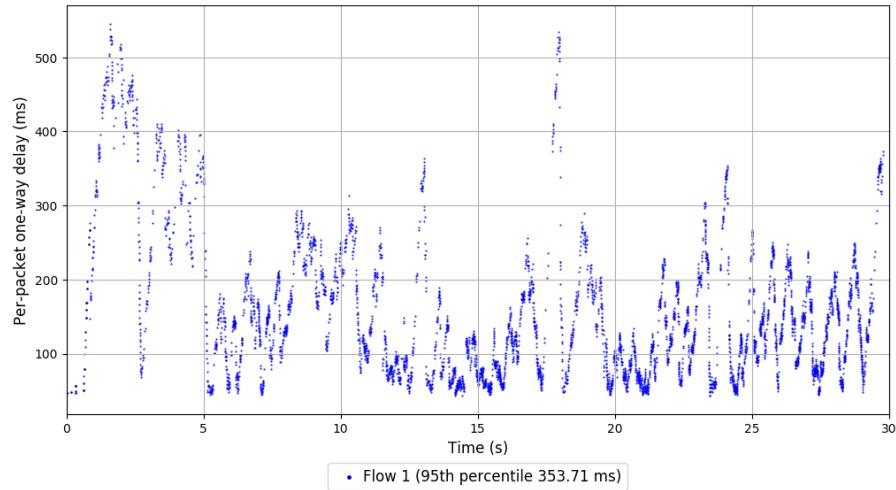
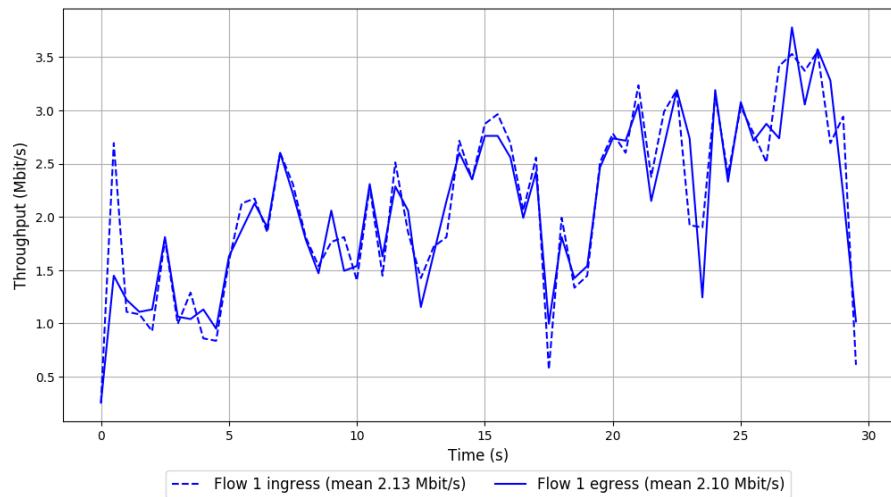


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-04-10 06:28:07
End at: 2018-04-10 06:28:37
Local clock offset: -4.423 ms
Remote clock offset: -3.373 ms

# Below is generated by plot.py at 2018-04-10 06:30:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 353.714 ms
Loss rate: 1.41%
-- Flow 1:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 353.714 ms
Loss rate: 1.41%
```

### Run 3: Report of QUIC Cubic — Data Link

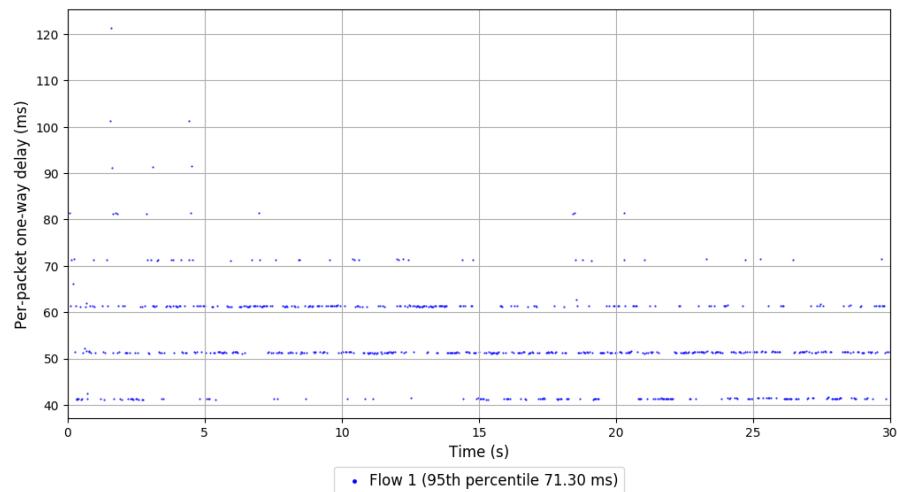
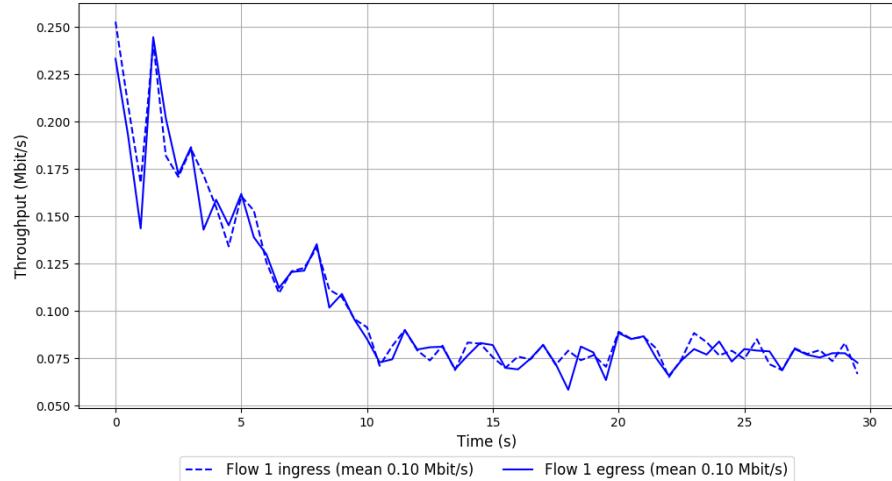


```
Run 1: Statistics of SCReAM

Start at: 2018-04-10 05:43:32
End at: 2018-04-10 05:44:02
Local clock offset: -12.99 ms
Remote clock offset: -10.989 ms

# Below is generated by plot.py at 2018-04-10 06:30:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 71.300 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 71.300 ms
Loss rate: 1.68%
```

## Run 1: Report of SCReAM — Data Link

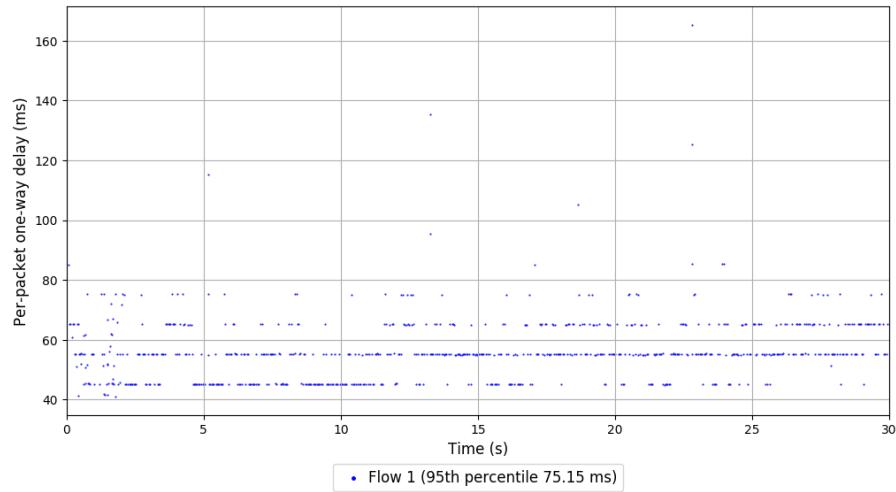
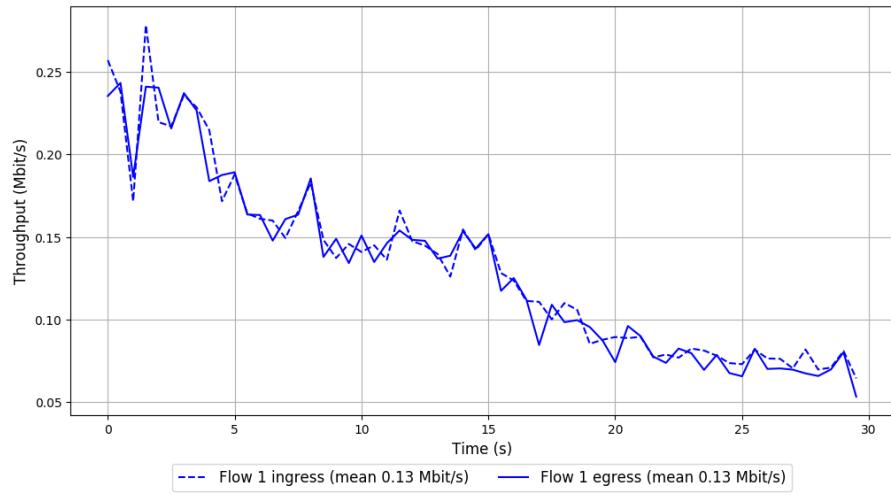


Run 2: Statistics of SCReAM

```
Start at: 2018-04-10 06:03:05
End at: 2018-04-10 06:03:35
Local clock offset: -6.224 ms
Remote clock offset: -2.318 ms

# Below is generated by plot.py at 2018-04-10 06:30:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 75.152 ms
Loss rate: 1.80%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 75.152 ms
Loss rate: 1.80%
```

## Run 2: Report of SCReAM — Data Link

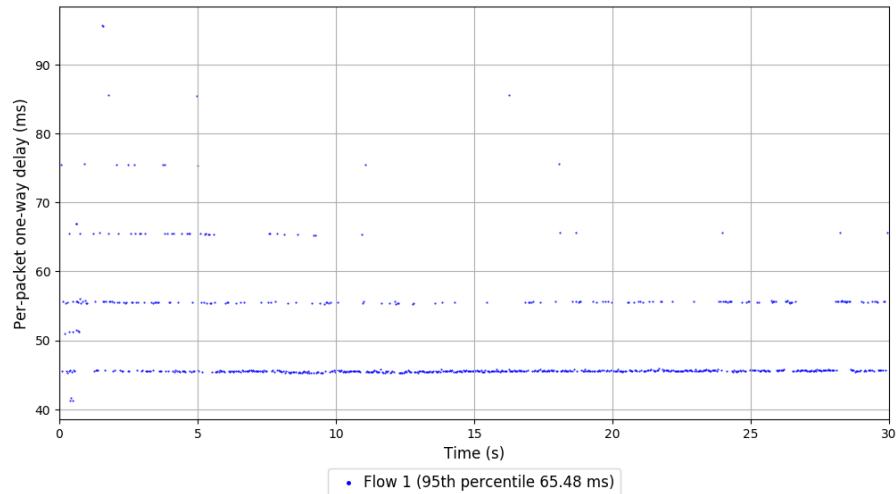
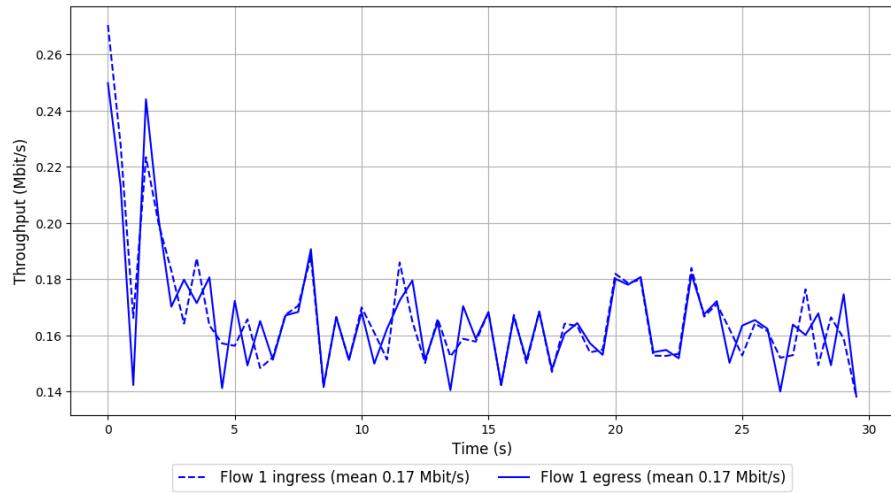


Run 3: Statistics of SCReAM

```
Start at: 2018-04-10 06:22:36
End at: 2018-04-10 06:23:06
Local clock offset: -4.337 ms
Remote clock offset: -3.445 ms

# Below is generated by plot.py at 2018-04-10 06:30:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 65.483 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 65.483 ms
Loss rate: 0.32%
```

### Run 3: Report of SCReAM — Data Link

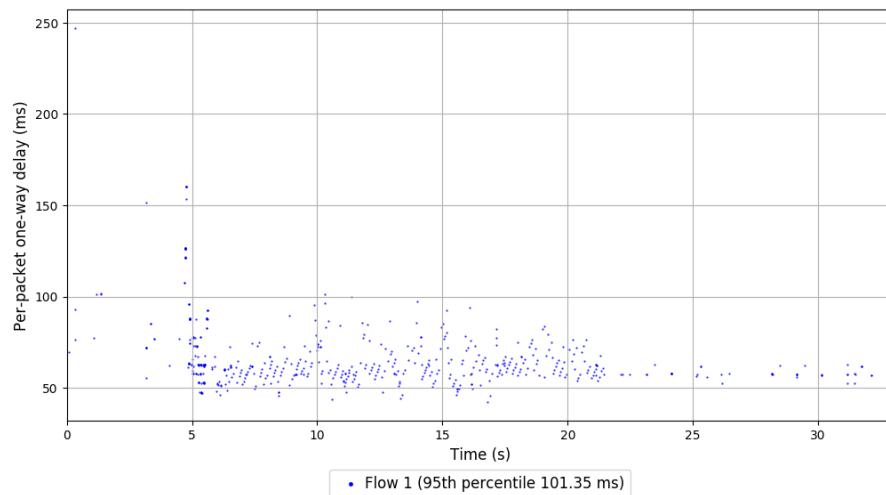
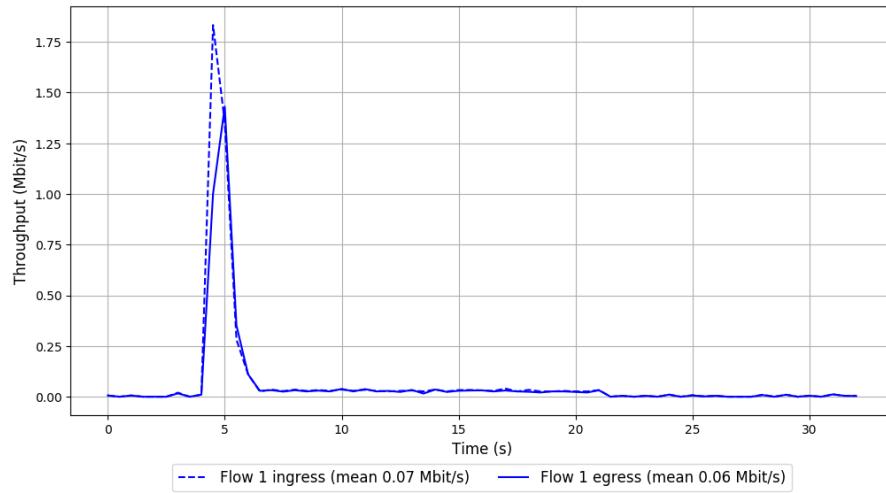


```
Run 1: Statistics of WebRTC media

Start at: 2018-04-10 05:32:35
End at: 2018-04-10 05:33:05
Local clock offset: -12.149 ms
Remote clock offset: -3.264 ms

# Below is generated by plot.py at 2018-04-10 06:30:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 101.351 ms
Loss rate: 16.51%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 101.351 ms
Loss rate: 16.51%
```

### Run 1: Report of WebRTC media — Data Link

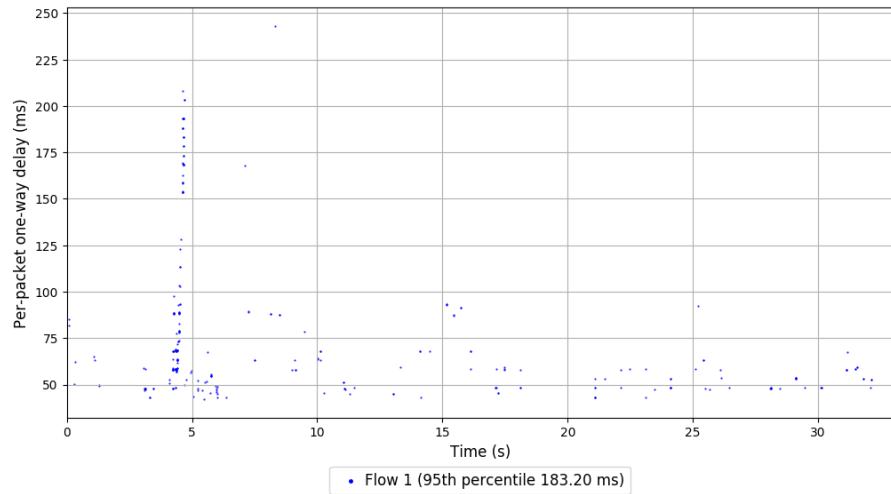
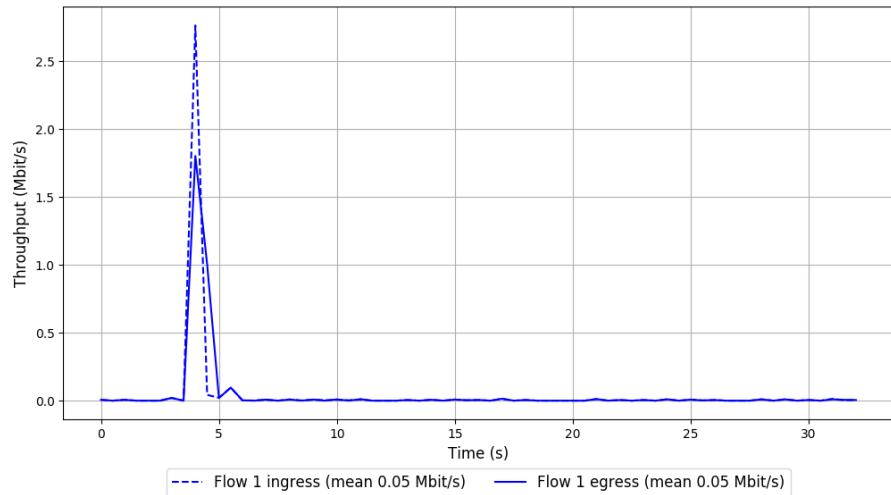


Run 2: Statistics of WebRTC media

```
Start at: 2018-04-10 05:52:12
End at: 2018-04-10 05:52:42
Local clock offset: -6.031 ms
Remote clock offset: -2.923 ms

# Below is generated by plot.py at 2018-04-10 06:30:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 183.196 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 183.196 ms
Loss rate: 0.00%
```

## Run 2: Report of WebRTC media — Data Link

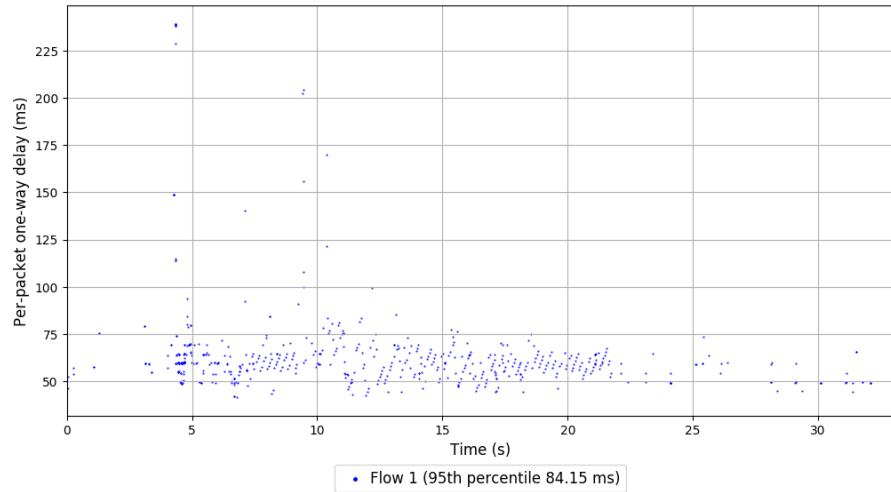
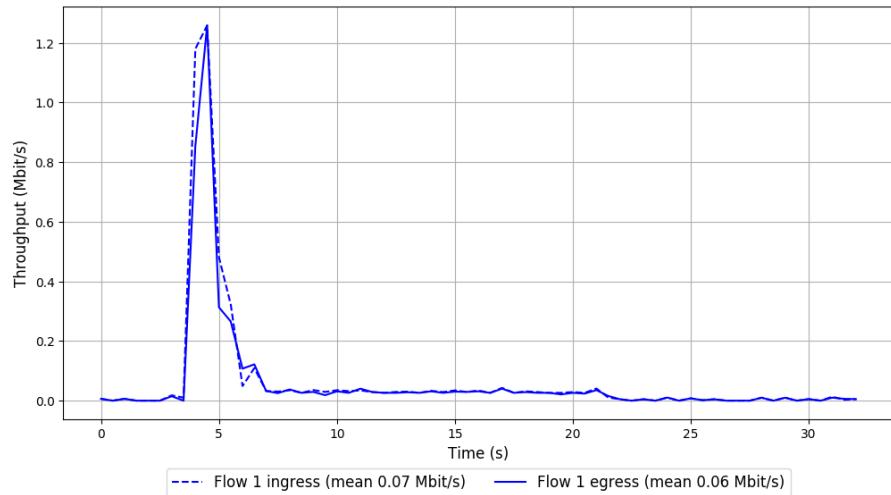


```
Run 3: Statistics of WebRTC media

Start at: 2018-04-10 06:11:45
End at: 2018-04-10 06:12:15
Local clock offset: -8.007 ms
Remote clock offset: -2.451 ms

# Below is generated by plot.py at 2018-04-10 06:30:53
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 84.154 ms
Loss rate: 12.46%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 84.154 ms
Loss rate: 12.46%
```

### Run 3: Report of WebRTC media — Data Link

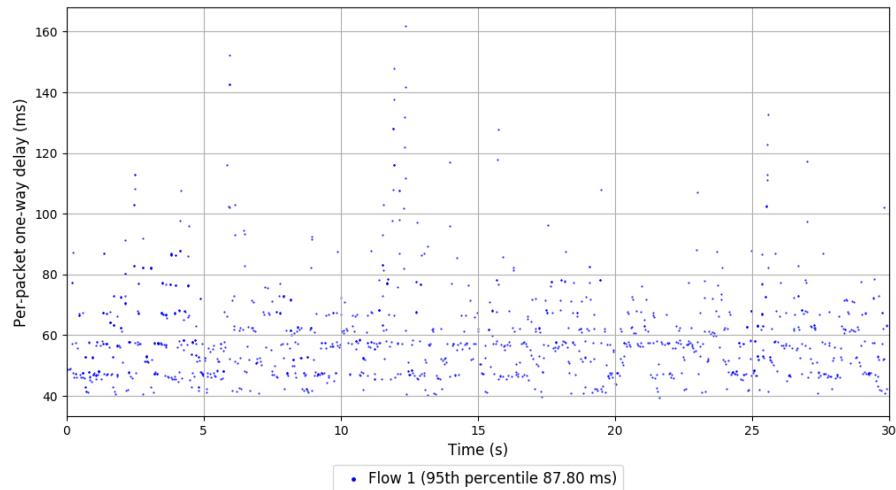
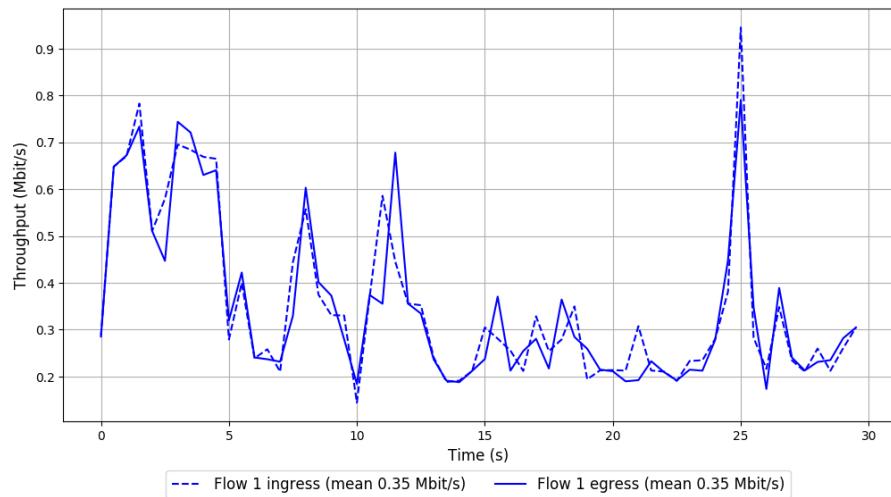


Run 1: Statistics of Sprout

```
Start at: 2018-04-10 05:50:02
End at: 2018-04-10 05:50:32
Local clock offset: -6.613 ms
Remote clock offset: -3.148 ms

# Below is generated by plot.py at 2018-04-10 06:30:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 87.802 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 87.802 ms
Loss rate: 1.25%
```

## Run 1: Report of Sprout — Data Link

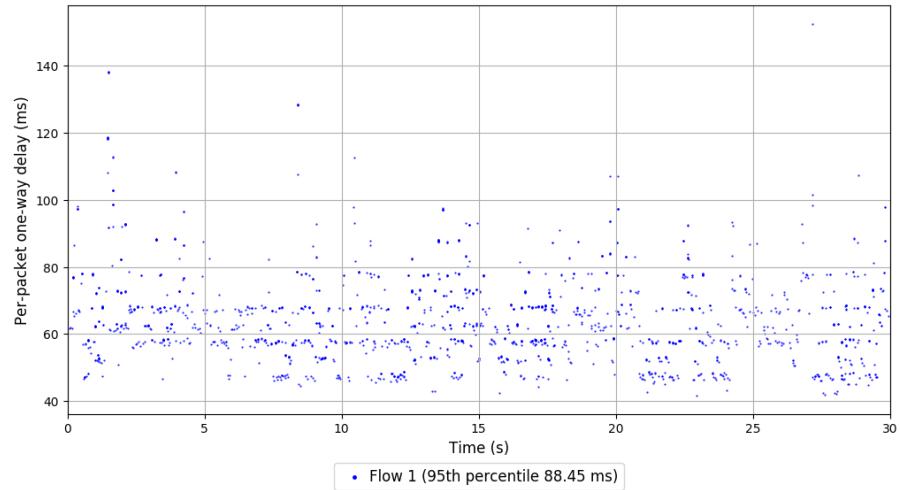
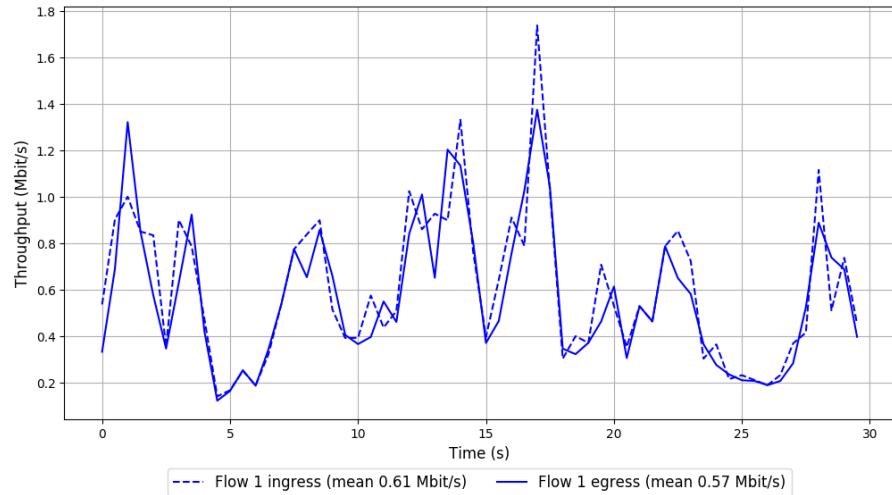


Run 2: Statistics of Sprout

```
Start at: 2018-04-10 06:09:35
End at: 2018-04-10 06:10:05
Local clock offset: -7.602 ms
Remote clock offset: -2.905 ms

# Below is generated by plot.py at 2018-04-10 06:30:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 88.450 ms
Loss rate: 5.81%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 88.450 ms
Loss rate: 5.81%
```

## Run 2: Report of Sprout — Data Link

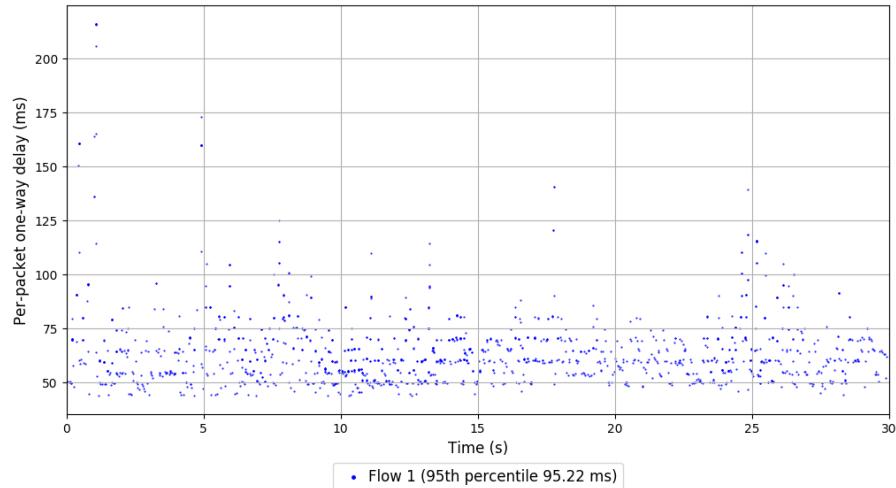
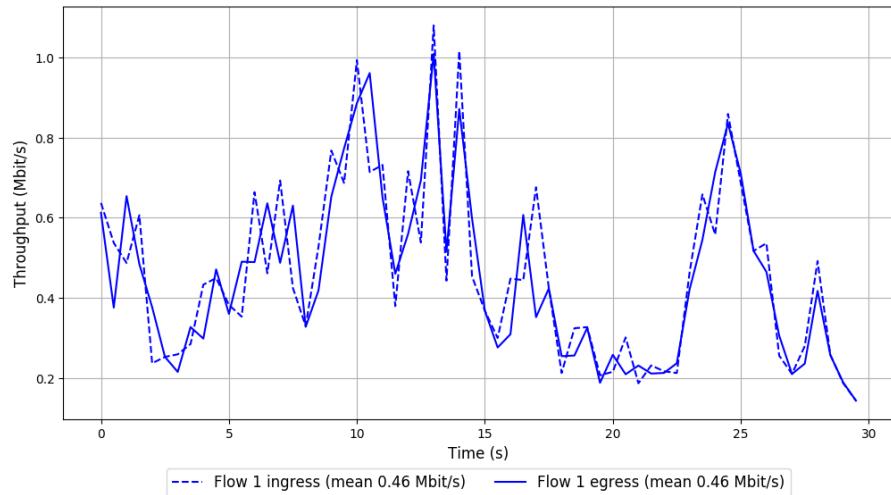


Run 3: Statistics of Sprout

```
Start at: 2018-04-10 06:29:12
End at: 2018-04-10 06:29:42
Local clock offset: -3.938 ms
Remote clock offset: -1.352 ms

# Below is generated by plot.py at 2018-04-10 06:30:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 95.220 ms
Loss rate: 1.86%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 95.220 ms
Loss rate: 1.86%
```

### Run 3: Report of Sprout — Data Link

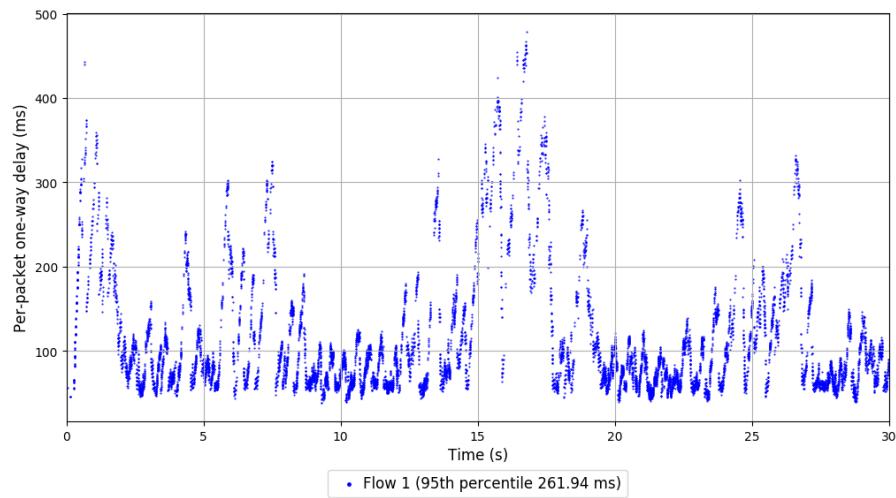
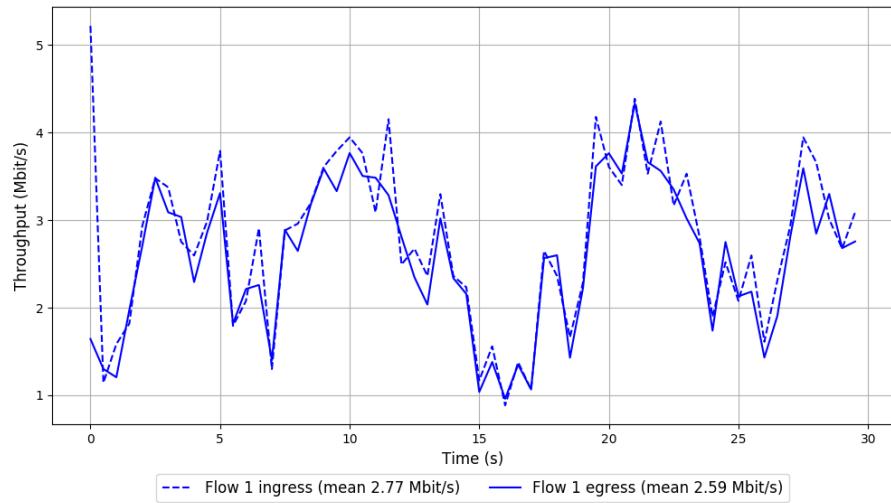


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-04-10 05:34:50
End at: 2018-04-10 05:35:20
Local clock offset: -12.942 ms
Remote clock offset: -4.602 ms

# Below is generated by plot.py at 2018-04-10 06:31:01
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.59 Mbit/s
95th percentile per-packet one-way delay: 261.943 ms
Loss rate: 6.82%
-- Flow 1:
Average throughput: 2.59 Mbit/s
95th percentile per-packet one-way delay: 261.943 ms
Loss rate: 6.82%
```

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

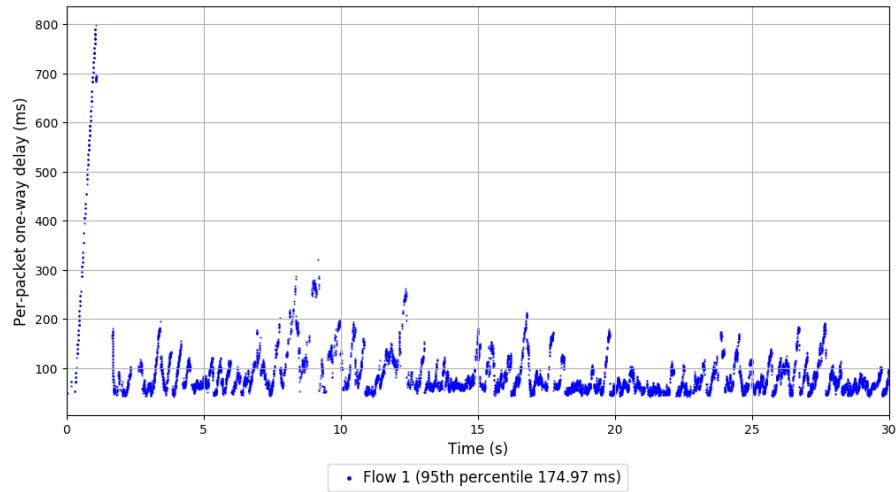
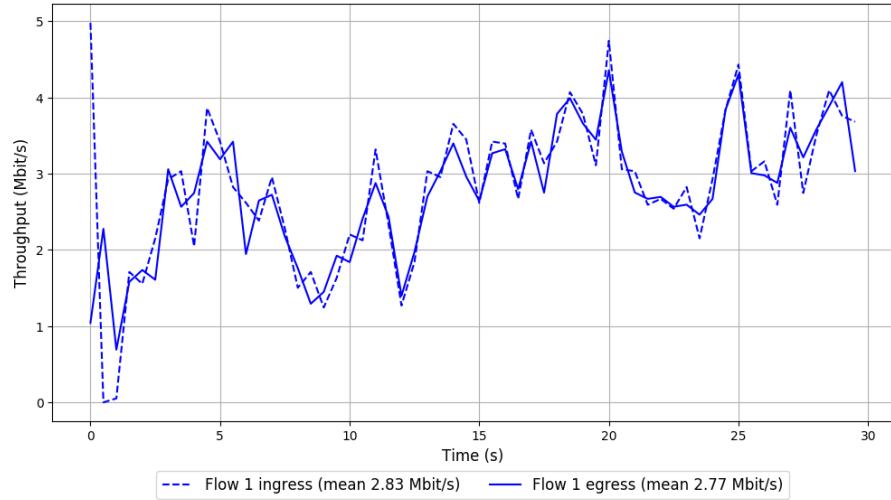


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-04-10 05:54:22
End at: 2018-04-10 05:54:52
Local clock offset: -5.784 ms
Remote clock offset: -2.693 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 174.970 ms
Loss rate: 2.24%
-- Flow 1:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 174.970 ms
Loss rate: 2.24%
```

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

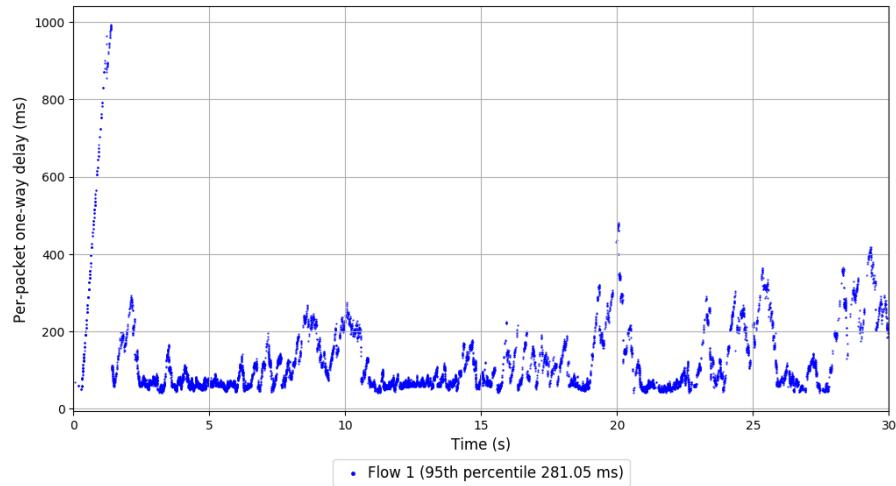
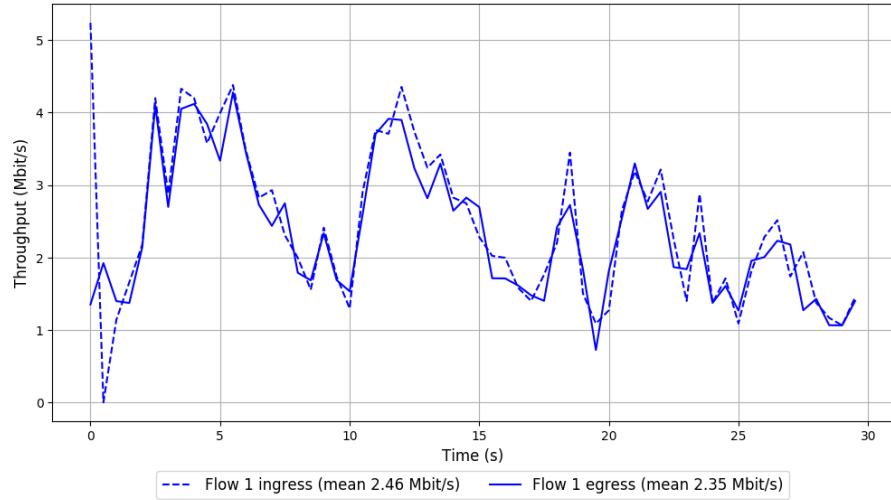


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-04-10 06:13:55
End at: 2018-04-10 06:14:25
Local clock offset: -7.117 ms
Remote clock offset: -2.814 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 281.045 ms
Loss rate: 4.88%
-- Flow 1:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 281.045 ms
Loss rate: 4.88%
```

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

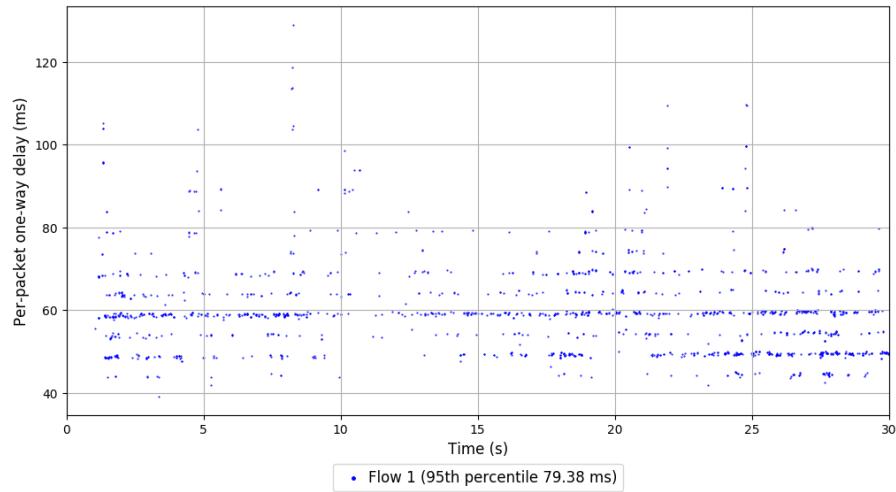
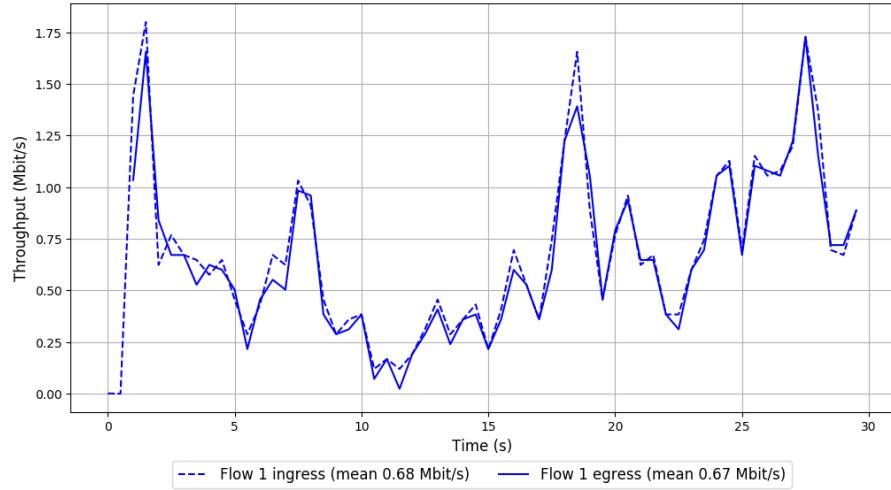


Run 1: Statistics of TCP Vegas

```
Start at: 2018-04-10 05:39:11
End at: 2018-04-10 05:39:41
Local clock offset: -13.404 ms
Remote clock offset: -4.981 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 79.380 ms
Loss rate: 4.80%
-- Flow 1:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 79.380 ms
Loss rate: 4.80%
```

## Run 1: Report of TCP Vegas — Data Link

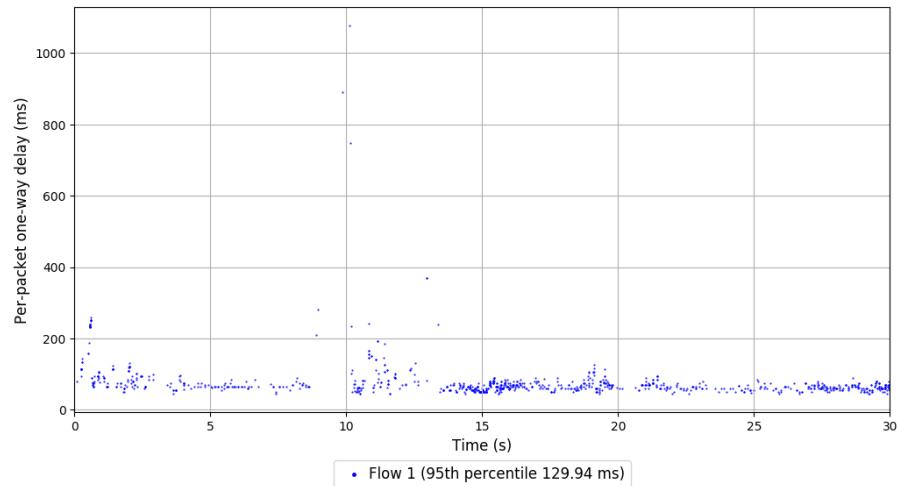
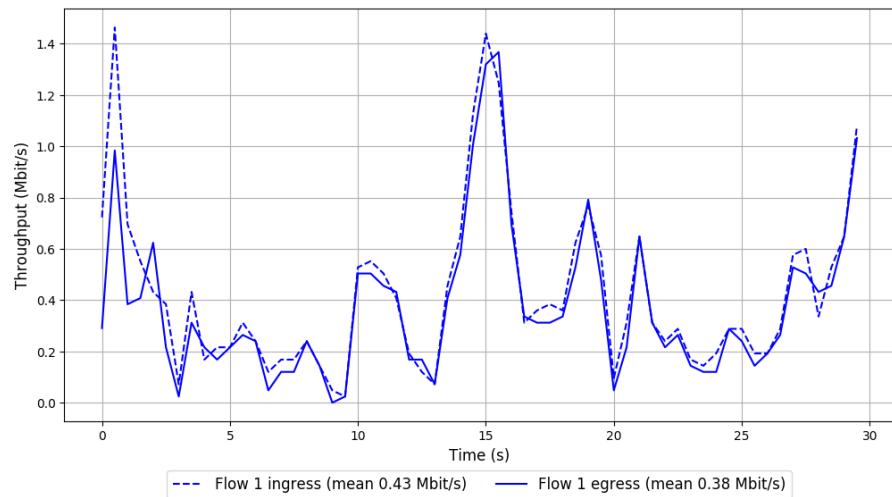


Run 2: Statistics of TCP Vegas

```
Start at: 2018-04-10 05:58:44
End at: 2018-04-10 05:59:14
Local clock offset: -5.419 ms
Remote clock offset: -2.365 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 129.941 ms
Loss rate: 11.79%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 129.941 ms
Loss rate: 11.79%
```

## Run 2: Report of TCP Vegas — Data Link

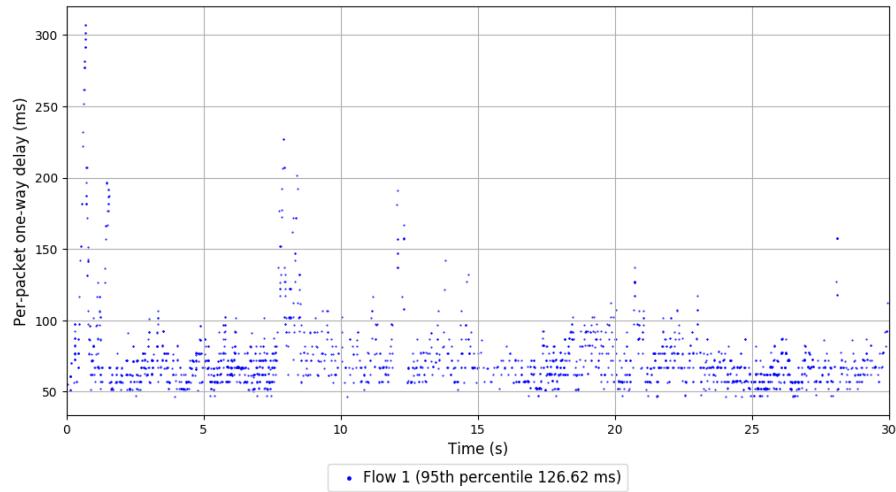
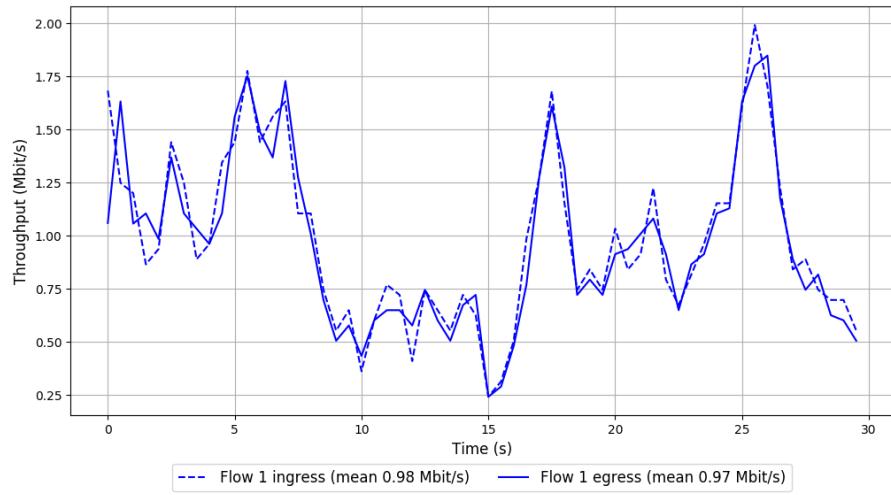


Run 3: Statistics of TCP Vegas

```
Start at: 2018-04-10 06:18:15
End at: 2018-04-10 06:18:45
Local clock offset: -4.684 ms
Remote clock offset: -1.481 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 126.617 ms
Loss rate: 1.83%
-- Flow 1:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 126.617 ms
Loss rate: 1.83%
```

### Run 3: Report of TCP Vegas — Data Link

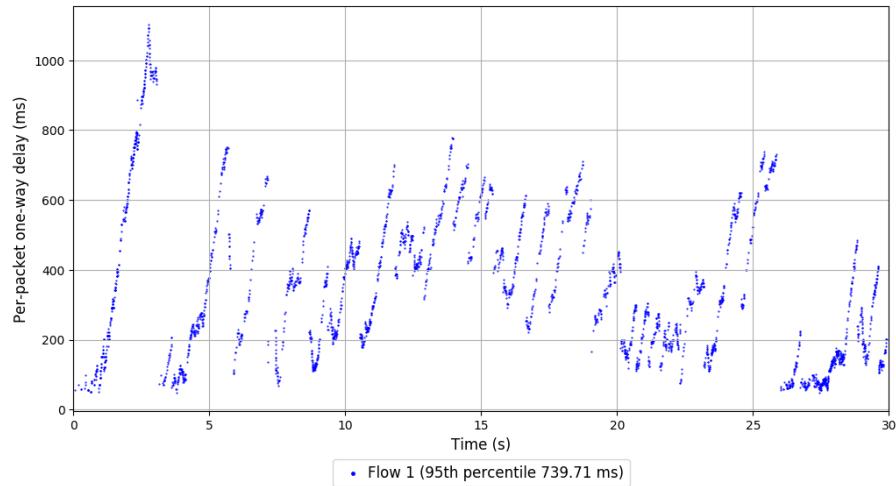
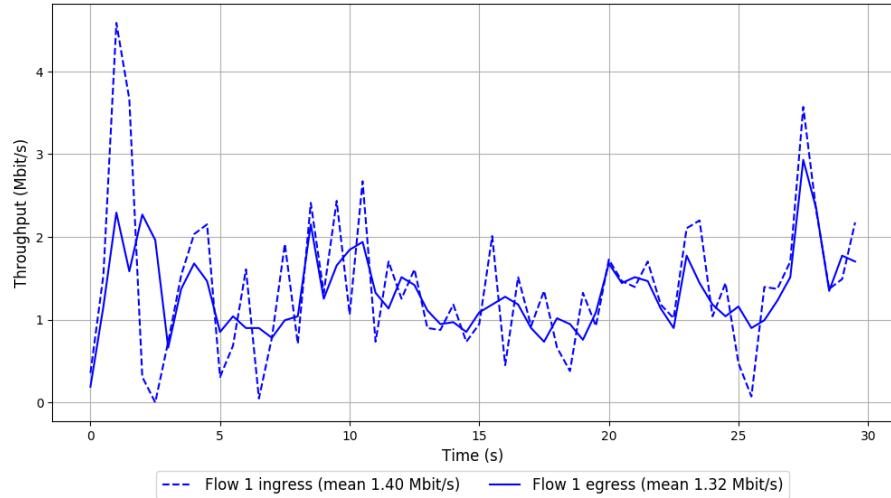


Run 1: Statistics of Verus

```
Start at: 2018-04-10 05:41:22
End at: 2018-04-10 05:41:52
Local clock offset: -11.189 ms
Remote clock offset: -3.632 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 739.708 ms
Loss rate: 5.58%
-- Flow 1:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 739.708 ms
Loss rate: 5.58%
```

## Run 1: Report of Verus — Data Link

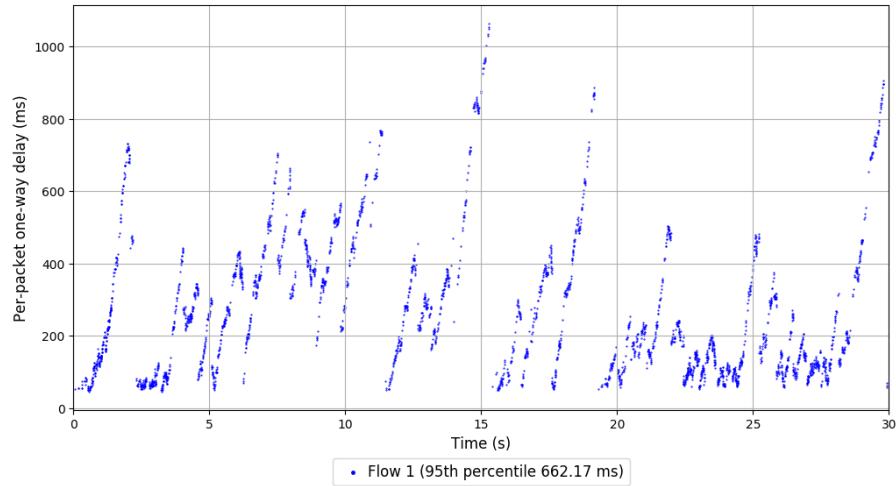
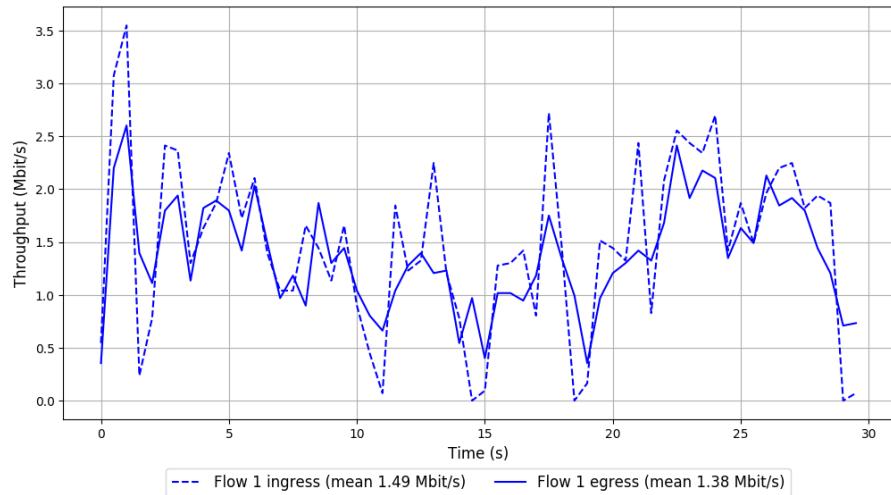


Run 2: Statistics of Verus

```
Start at: 2018-04-10 06:00:54
End at: 2018-04-10 06:01:24
Local clock offset: -6.002 ms
Remote clock offset: -2.56 ms

# Below is generated by plot.py at 2018-04-10 06:31:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 662.171 ms
Loss rate: 7.35%
-- Flow 1:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 662.171 ms
Loss rate: 7.35%
```

## Run 2: Report of Verus — Data Link

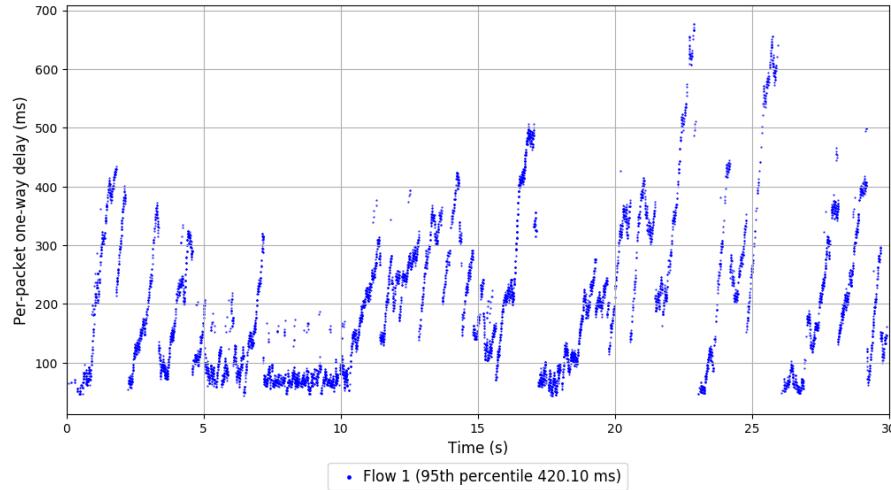
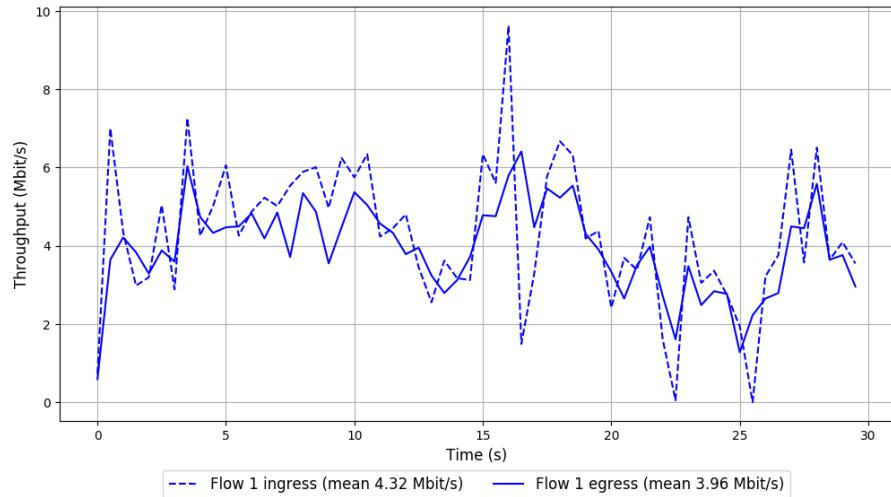


Run 3: Statistics of Verus

```
Start at: 2018-04-10 06:20:25
End at: 2018-04-10 06:20:55
Local clock offset: -4.641 ms
Remote clock offset: -2.596 ms

# Below is generated by plot.py at 2018-04-10 06:31:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.96 Mbit/s
95th percentile per-packet one-way delay: 420.095 ms
Loss rate: 8.44%
-- Flow 1:
Average throughput: 3.96 Mbit/s
95th percentile per-packet one-way delay: 420.095 ms
Loss rate: 8.44%
```

### Run 3: Report of Verus — Data Link

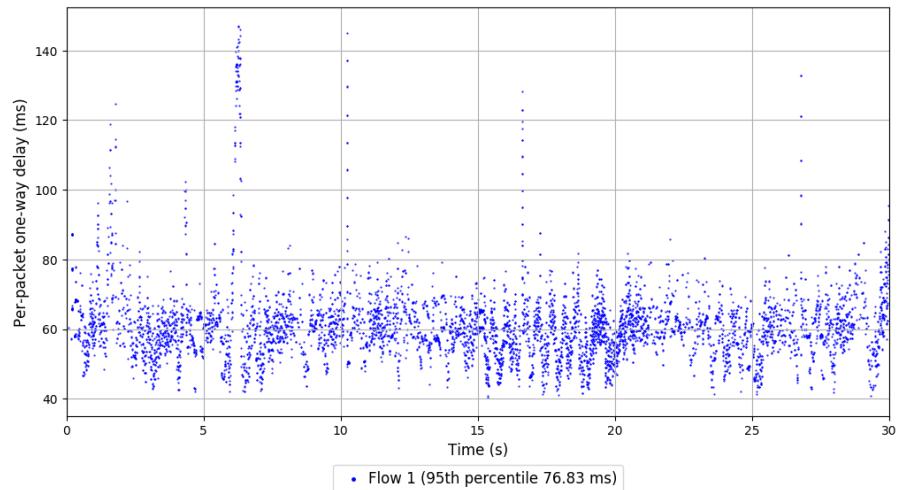
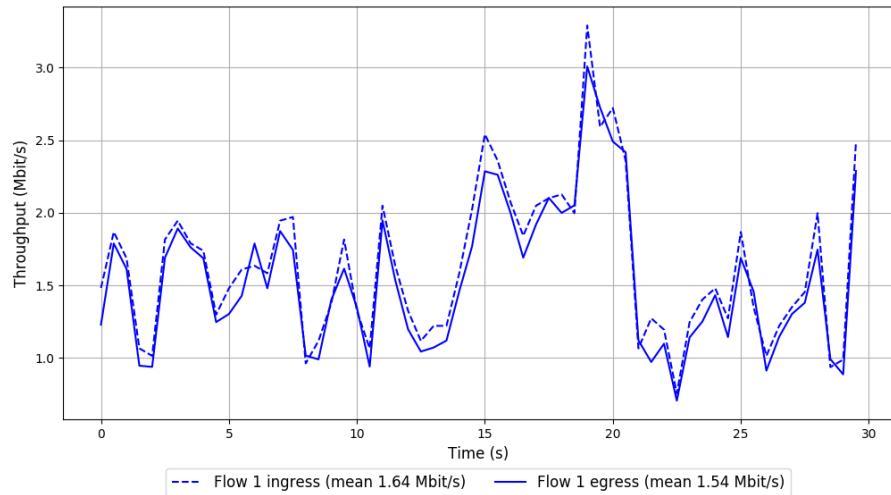


Run 1: Statistics of Copa

```
Start at: 2018-04-10 05:33:40
End at: 2018-04-10 05:34:10
Local clock offset: -12.819 ms
Remote clock offset: -3.43 ms

# Below is generated by plot.py at 2018-04-10 06:31:07
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 76.831 ms
Loss rate: 5.82%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 76.831 ms
Loss rate: 5.82%
```

## Run 1: Report of Copa — Data Link

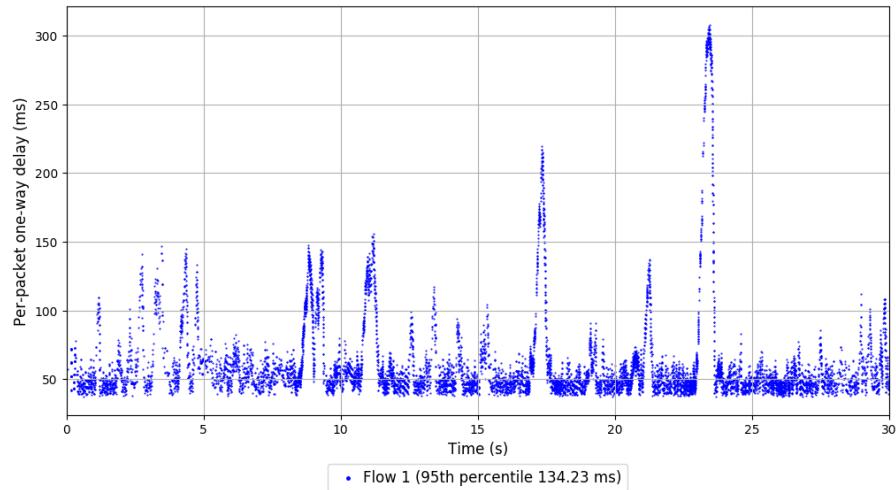
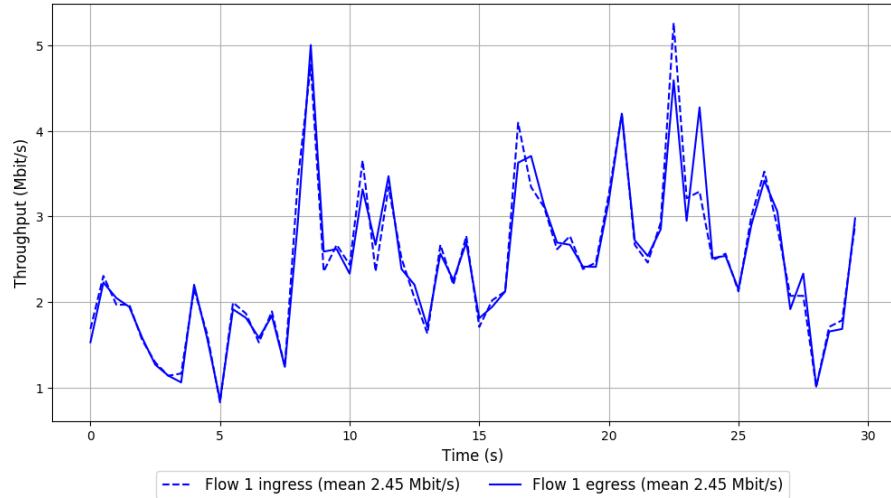


Run 2: Statistics of Copa

```
Start at: 2018-04-10 05:53:17
End at: 2018-04-10 05:53:47
Local clock offset: -5.771 ms
Remote clock offset: -3.492 ms

# Below is generated by plot.py at 2018-04-10 06:31:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 134.233 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 134.233 ms
Loss rate: 0.36%
```

## Run 2: Report of Copa — Data Link

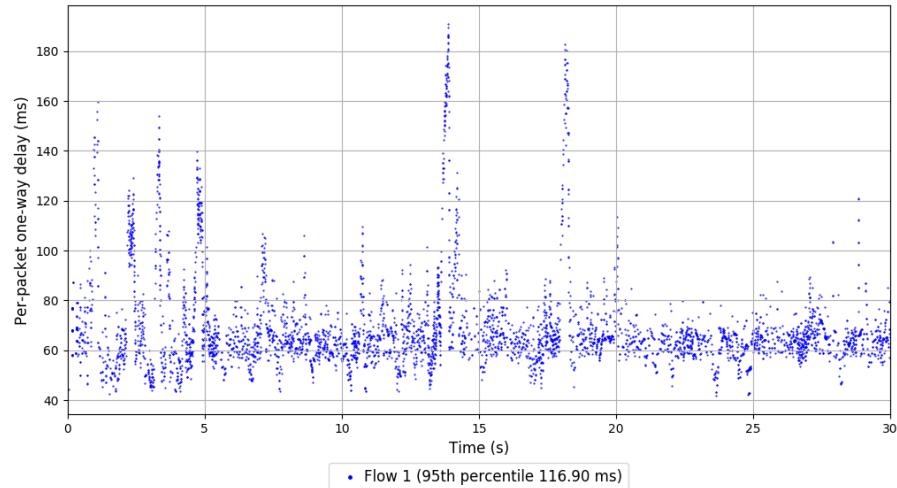
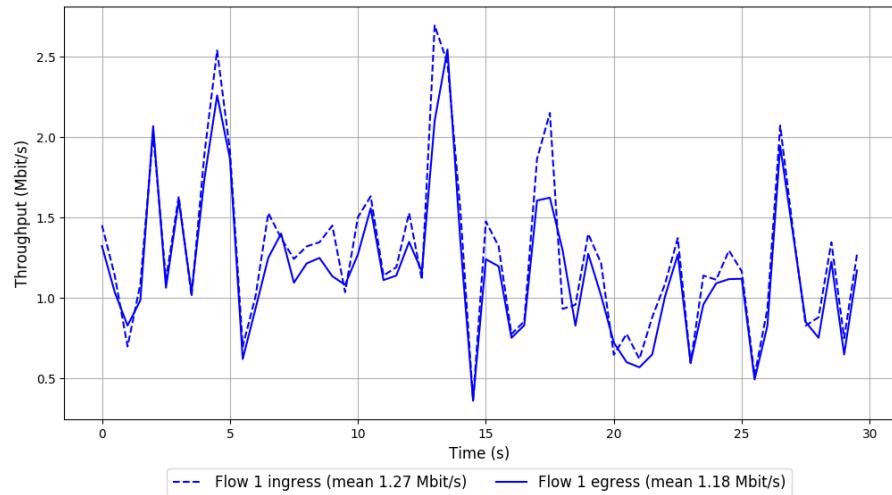


Run 3: Statistics of Copa

```
Start at: 2018-04-10 06:12:50
End at: 2018-04-10 06:13:20
Local clock offset: -7.332 ms
Remote clock offset: -3.315 ms

# Below is generated by plot.py at 2018-04-10 06:31:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 116.899 ms
Loss rate: 7.72%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 116.899 ms
Loss rate: 7.72%
```

### Run 3: Report of Copa — Data Link

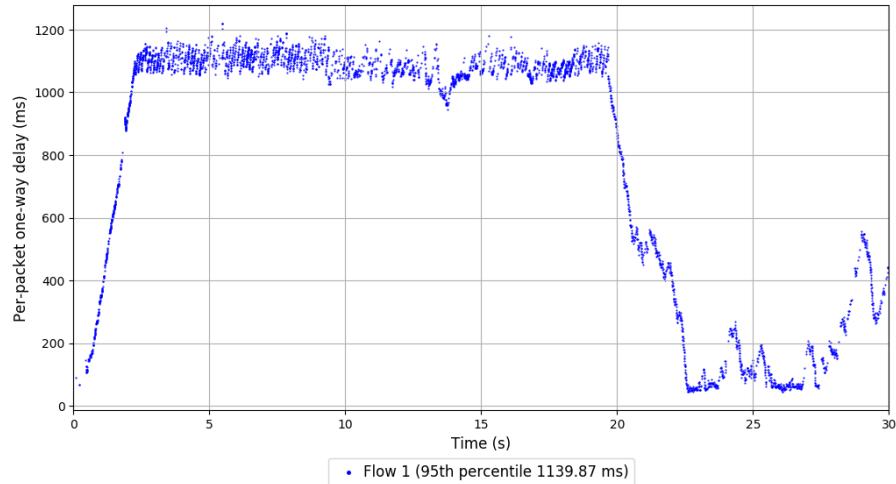
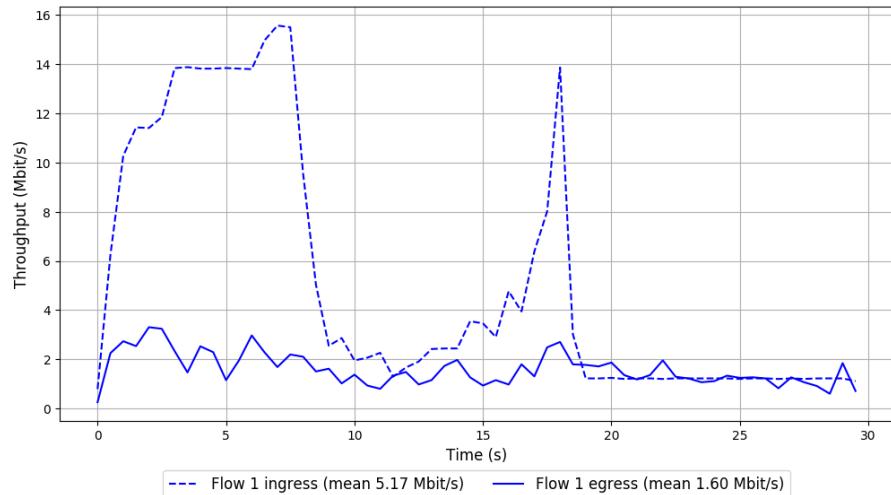


```
Run 1: Statistics of FillP
```

```
Start at: 2018-04-10 05:42:27
End at: 2018-04-10 05:42:57
Local clock offset: -9.599 ms
Remote clock offset: -4.334 ms

# Below is generated by plot.py at 2018-04-10 06:31:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 1139.869 ms
Loss rate: 69.11%
-- Flow 1:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 1139.869 ms
Loss rate: 69.11%
```

## Run 1: Report of FillP — Data Link

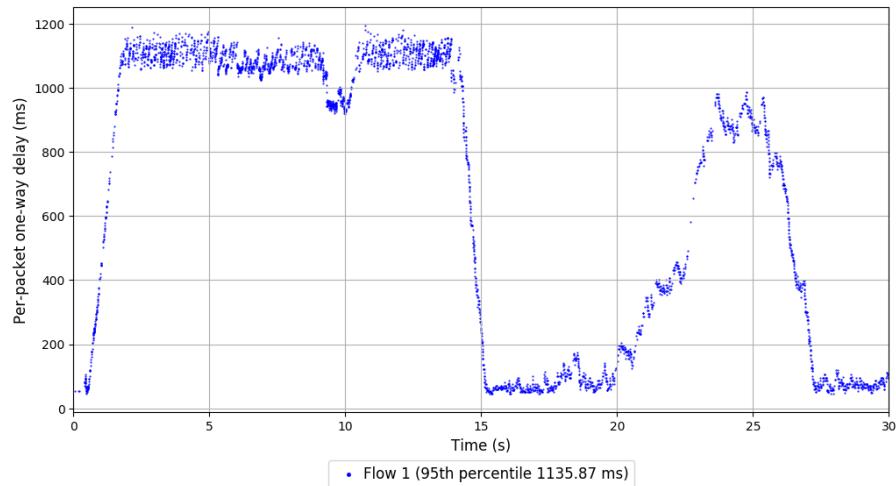
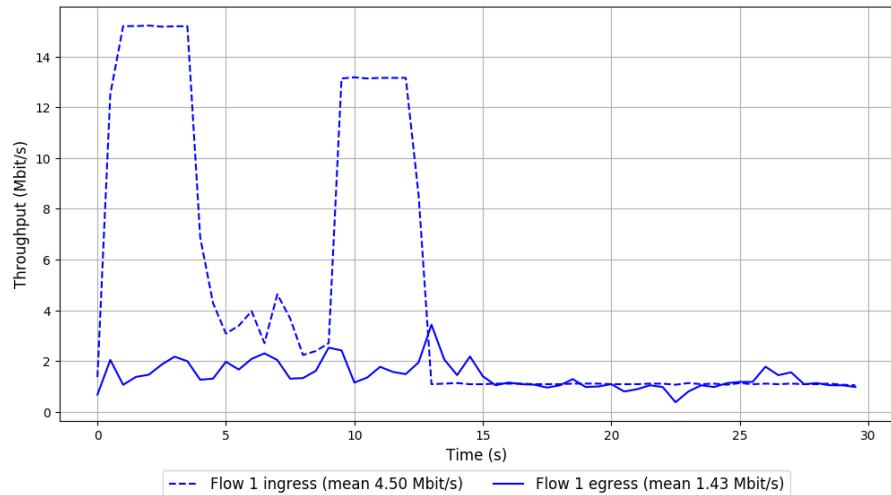


Run 2: Statistics of FillP

```
Start at: 2018-04-10 06:01:59
End at: 2018-04-10 06:02:29
Local clock offset: -6.459 ms
Remote clock offset: -2.664 ms

# Below is generated by plot.py at 2018-04-10 06:31:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 1135.869 ms
Loss rate: 68.32%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 1135.869 ms
Loss rate: 68.32%
```

## Run 2: Report of FillP — Data Link

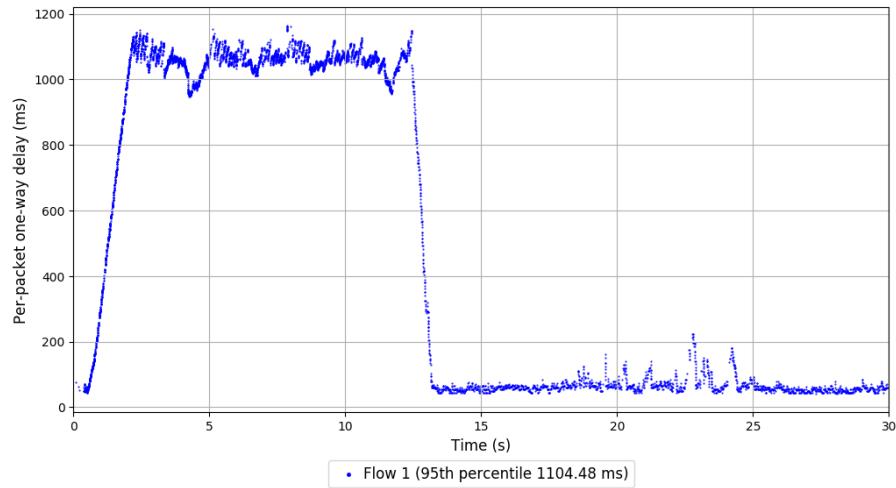
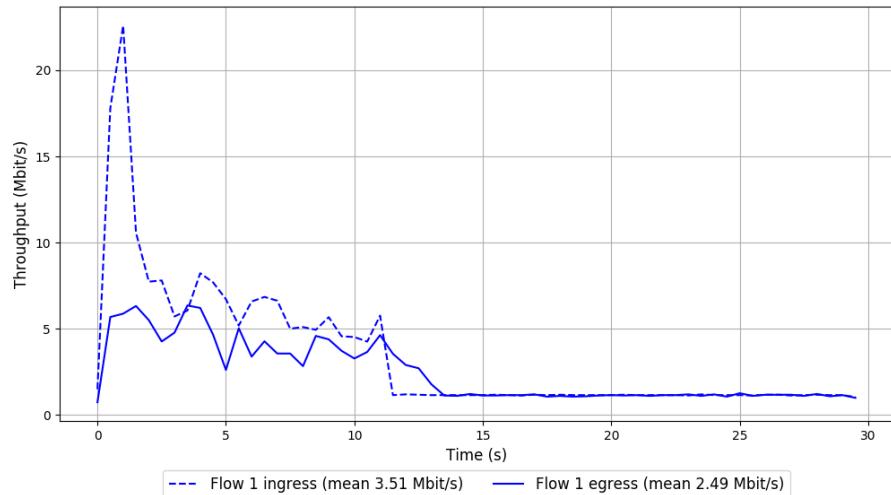


```
Run 3: Statistics of FillP
```

```
Start at: 2018-04-10 06:21:31
End at: 2018-04-10 06:22:01
Local clock offset: -4.68 ms
Remote clock offset: -1.718 ms

# Below is generated by plot.py at 2018-04-10 06:31:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 1104.480 ms
Loss rate: 29.36%
-- Flow 1:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 1104.480 ms
Loss rate: 29.36%
```

### Run 3: Report of FillP — Data Link

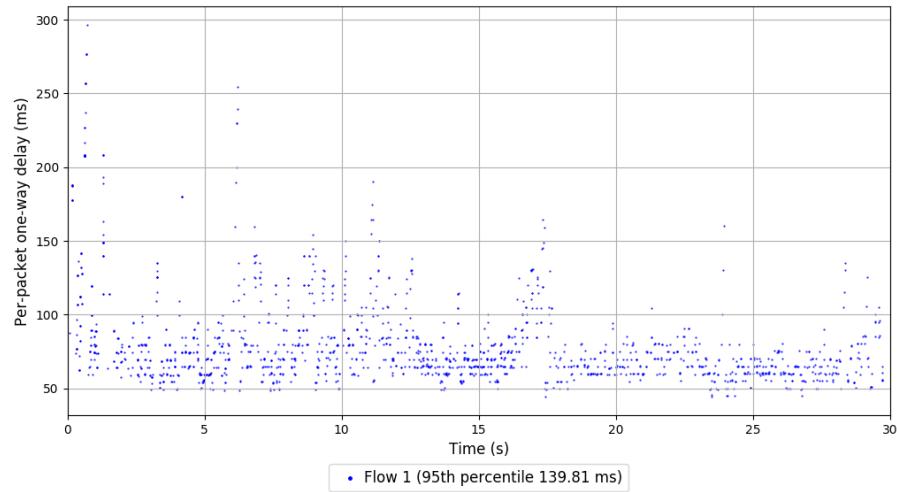
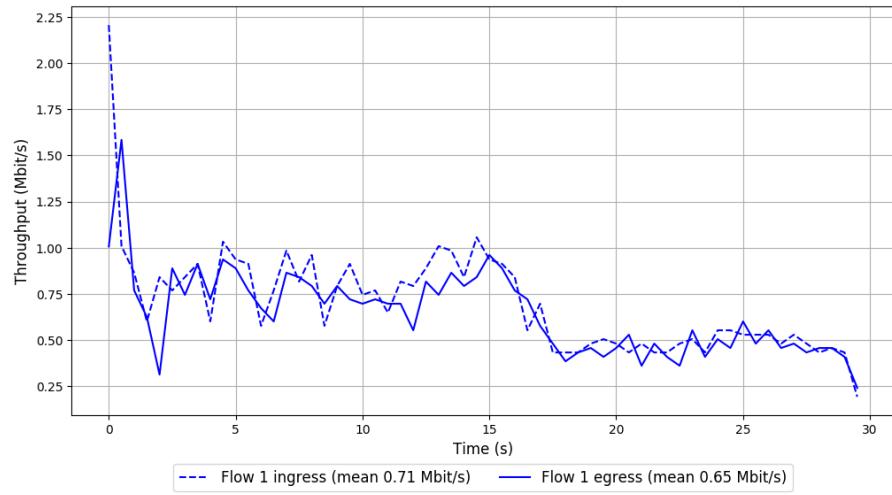


Run 1: Statistics of Indigo-1-32

```
Start at: 2018-04-10 05:38:06
End at: 2018-04-10 05:38:36
Local clock offset: -14.336 ms
Remote clock offset: -3.178 ms

# Below is generated by plot.py at 2018-04-10 06:31:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 139.813 ms
Loss rate: 7.94%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 139.813 ms
Loss rate: 7.94%
```

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

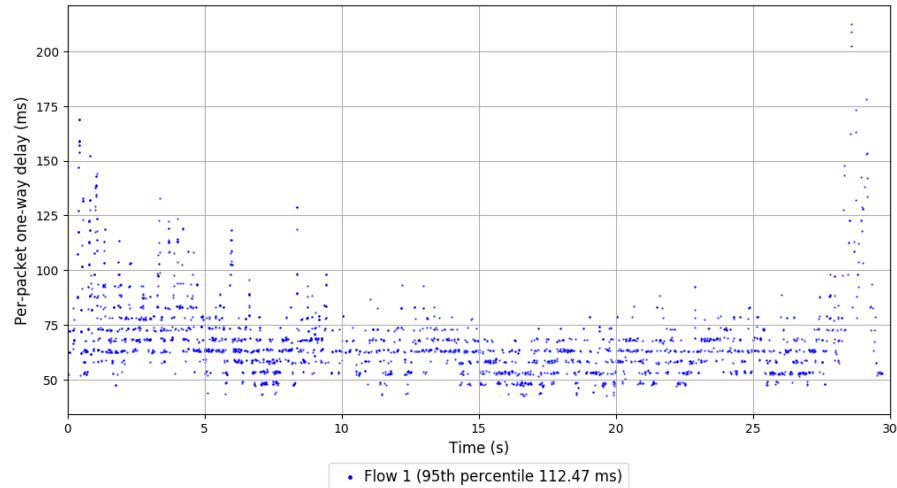
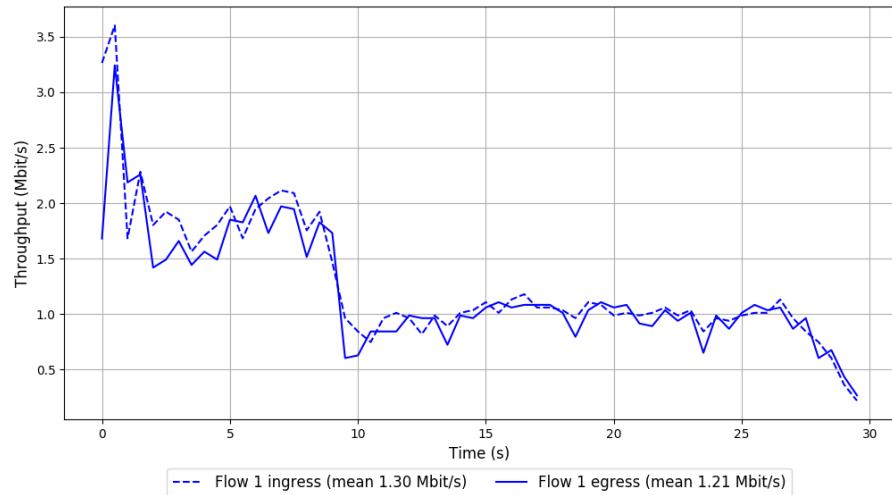


Run 2: Statistics of Indigo-1-32

```
Start at: 2018-04-10 05:57:39
End at: 2018-04-10 05:58:09
Local clock offset: -5.398 ms
Remote clock offset: -3.127 ms

# Below is generated by plot.py at 2018-04-10 06:31:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 112.473 ms
Loss rate: 6.55%
-- Flow 1:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 112.473 ms
Loss rate: 6.55%
```

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

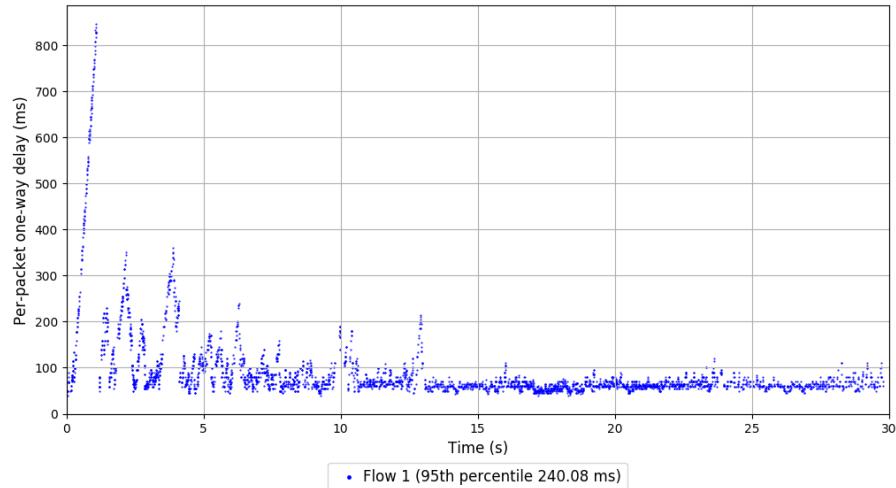
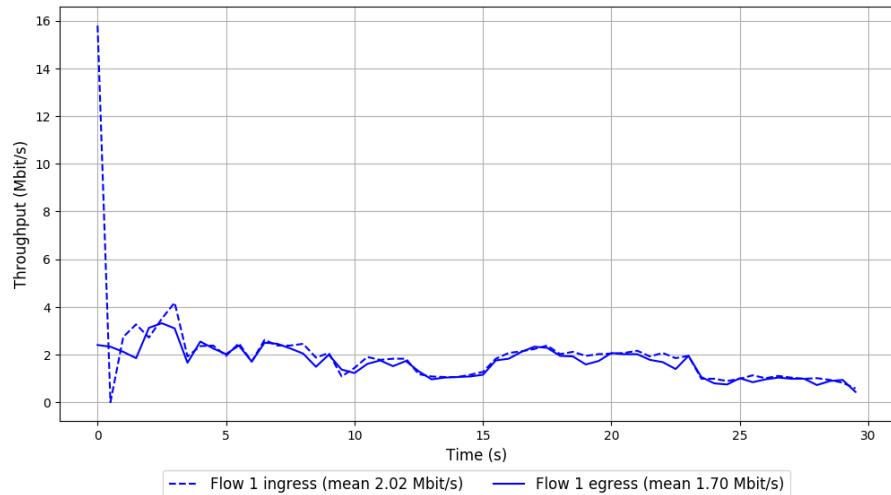


Run 3: Statistics of Indigo-1-32

```
Start at: 2018-04-10 06:17:10
End at: 2018-04-10 06:17:40
Local clock offset: -5.119 ms
Remote clock offset: -2.881 ms

# Below is generated by plot.py at 2018-04-10 06:31:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 240.080 ms
Loss rate: 16.21%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 240.080 ms
Loss rate: 16.21%
```

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

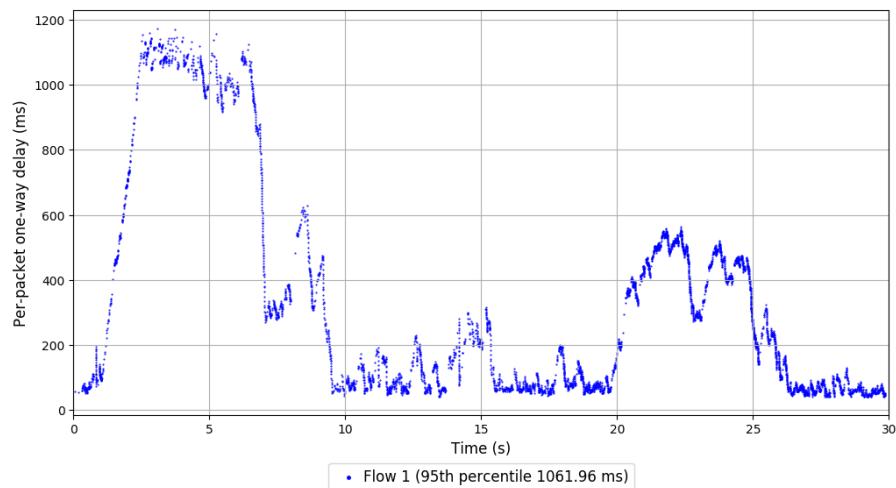
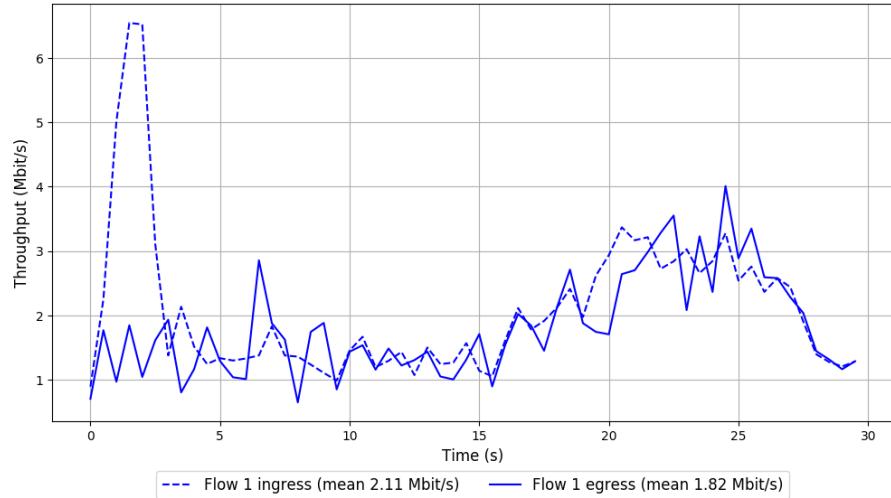


Run 1: Statistics of Vivace-latency

```
Start at: 2018-04-10 05:46:47
End at: 2018-04-10 05:47:17
Local clock offset: -7.516 ms
Remote clock offset: -3.255 ms

# Below is generated by plot.py at 2018-04-10 06:31:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 1061.964 ms
Loss rate: 13.72%
-- Flow 1:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 1061.964 ms
Loss rate: 13.72%
```

## Run 1: Report of Vivace-latency — Data Link

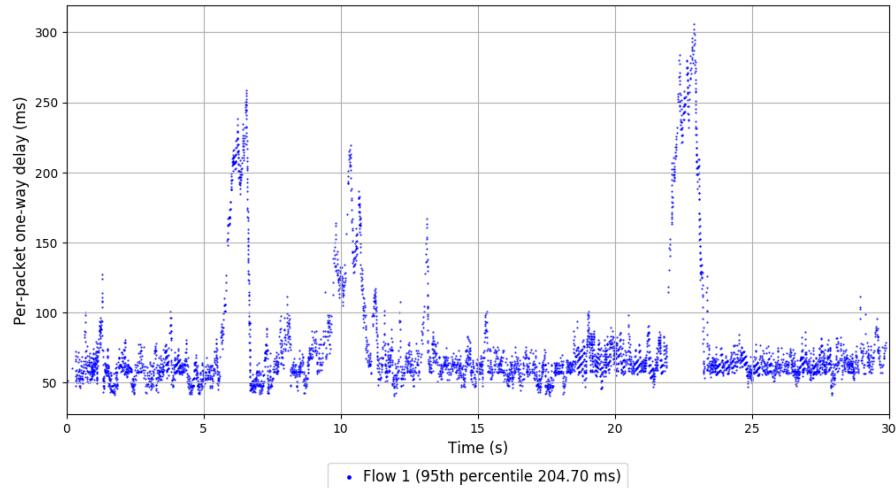
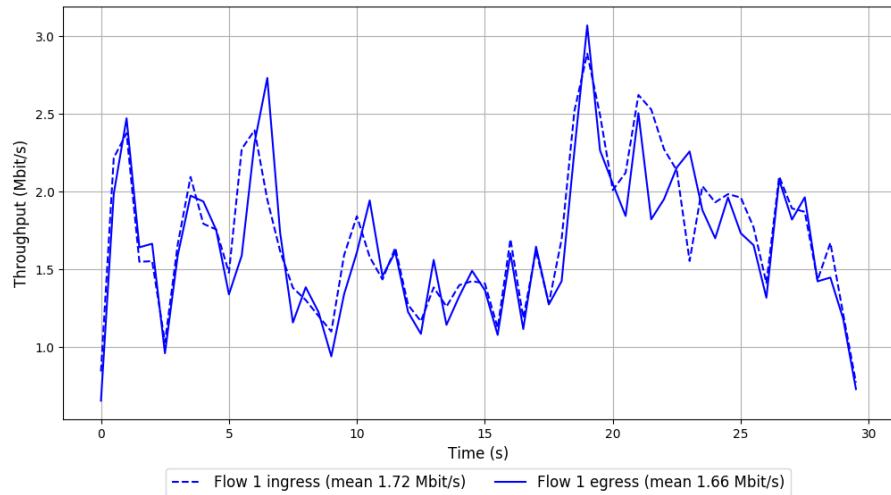


Run 2: Statistics of Vivace-latency

```
Start at: 2018-04-10 06:06:19
End at: 2018-04-10 06:06:50
Local clock offset: -6.932 ms
Remote clock offset: -2.48 ms

# Below is generated by plot.py at 2018-04-10 06:31:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 204.703 ms
Loss rate: 3.24%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 204.703 ms
Loss rate: 3.24%
```

## Run 2: Report of Vivace-latency — Data Link

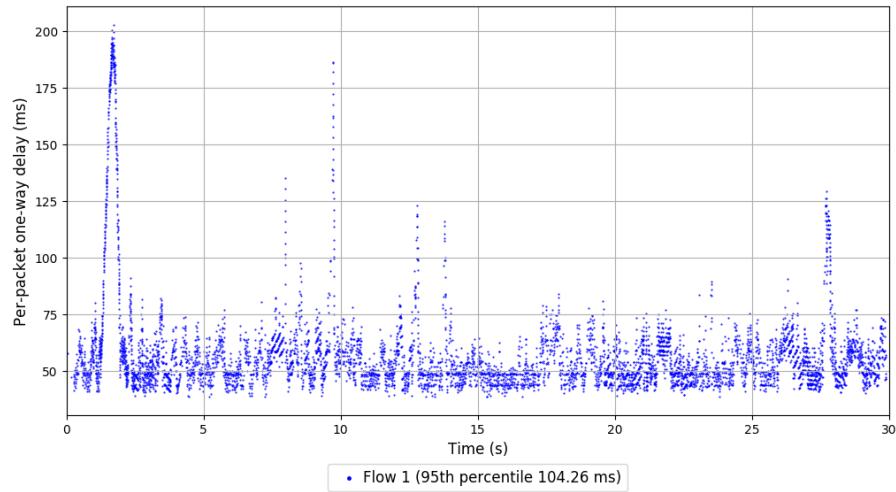
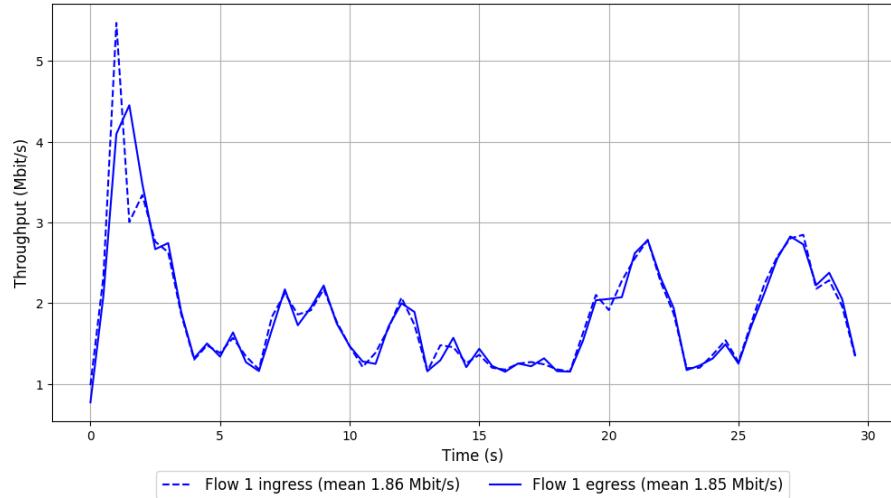


Run 3: Statistics of Vivace-latency

```
Start at: 2018-04-10 06:25:56
End at: 2018-04-10 06:26:26
Local clock offset: -4.297 ms
Remote clock offset: -2.668 ms

# Below is generated by plot.py at 2018-04-10 06:31:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 104.264 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 104.264 ms
Loss rate: 0.53%
```

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

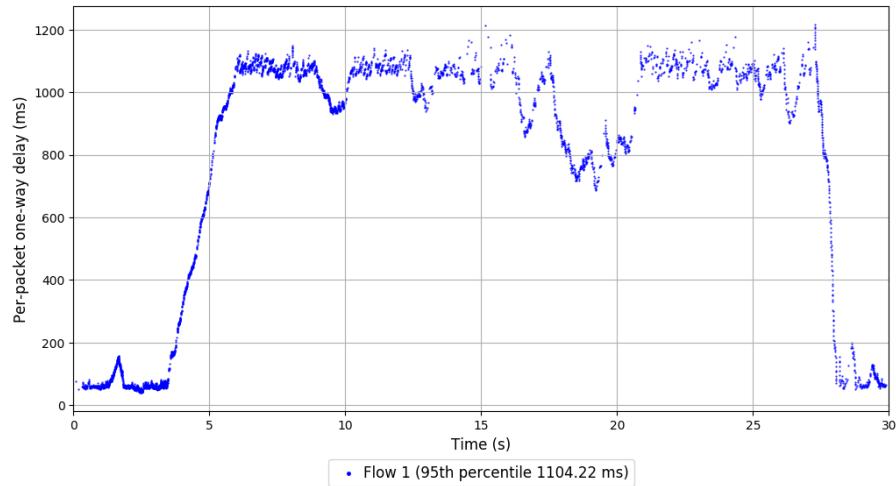
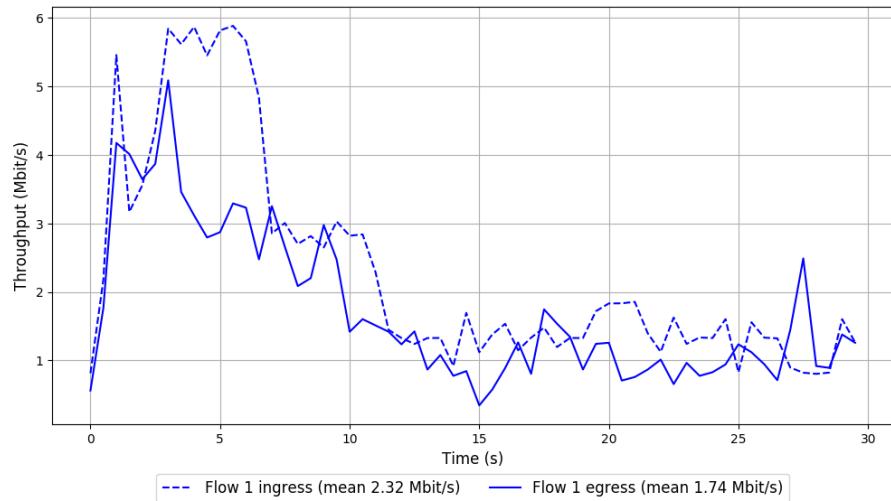


```
Run 1: Statistics of Vivace-loss
```

```
Start at: 2018-04-10 05:37:01
End at: 2018-04-10 05:37:31
Local clock offset: -13.59 ms
Remote clock offset: -3.86 ms

# Below is generated by plot.py at 2018-04-10 06:31:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 1104.221 ms
Loss rate: 25.09%
-- Flow 1:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 1104.221 ms
Loss rate: 25.09%
```

## Run 1: Report of Vivace-loss — Data Link

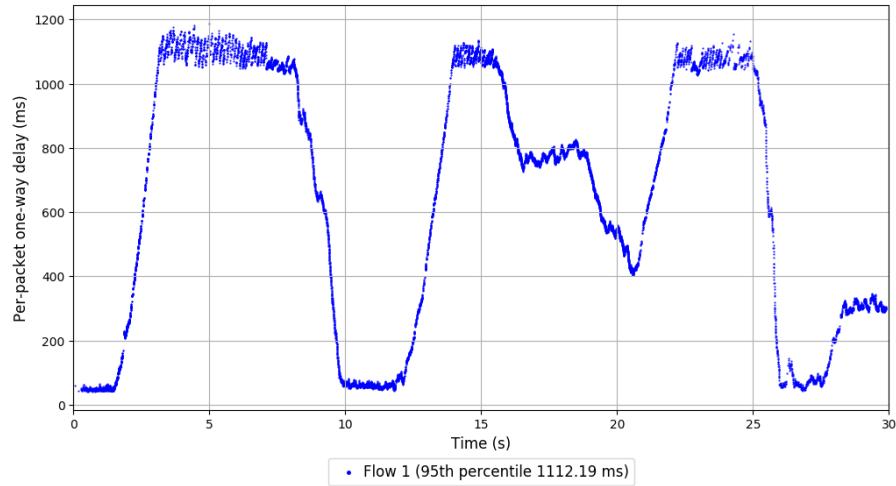
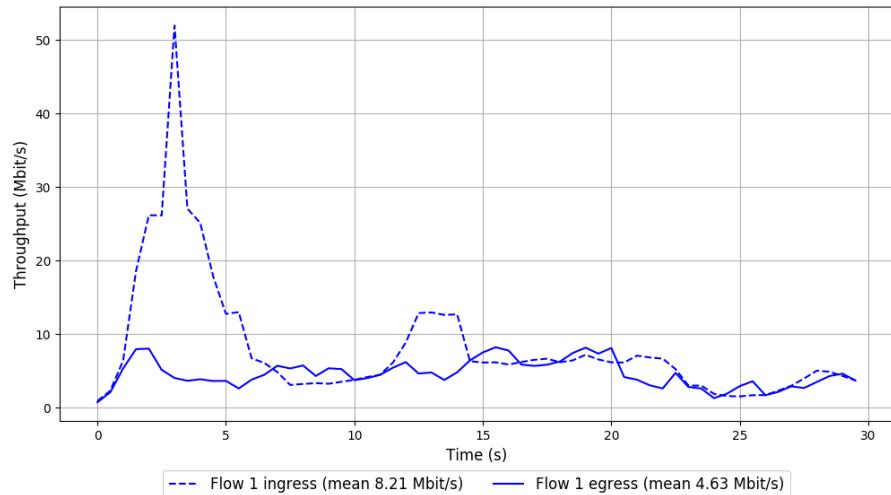


Run 2: Statistics of Vivace-loss

```
Start at: 2018-04-10 05:56:33
End at: 2018-04-10 05:57:03
Local clock offset: -6.308 ms
Remote clock offset: -2.567 ms

# Below is generated by plot.py at 2018-04-10 06:31:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1112.193 ms
Loss rate: 43.68%
-- Flow 1:
Average throughput: 4.63 Mbit/s
95th percentile per-packet one-way delay: 1112.193 ms
Loss rate: 43.68%
```

Run 2: Report of Vivace-loss — Data Link

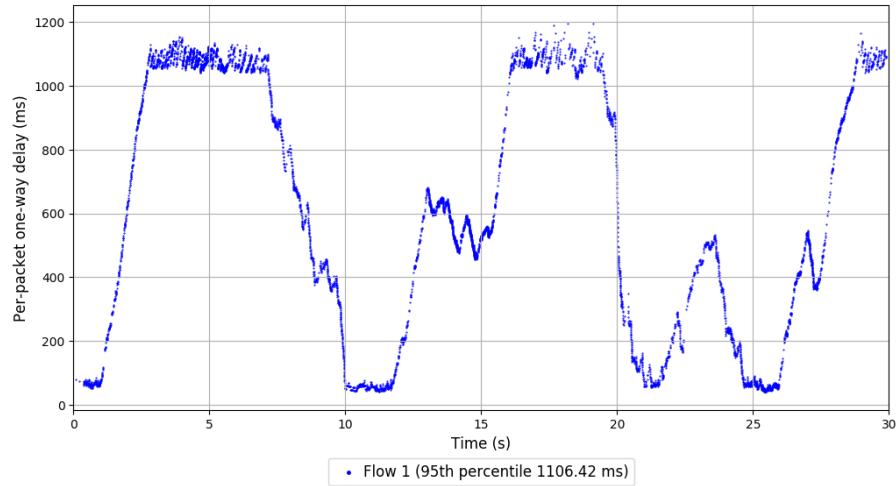
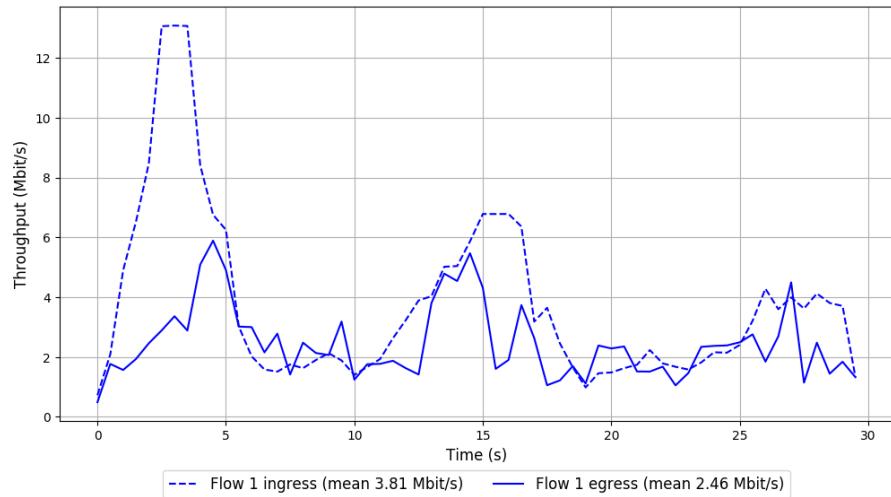


Run 3: Statistics of Vivace-loss

```
Start at: 2018-04-10 06:16:05
End at: 2018-04-10 06:16:35
Local clock offset: -6.348 ms
Remote clock offset: -2.285 ms

# Below is generated by plot.py at 2018-04-10 06:31:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 1106.420 ms
Loss rate: 35.54%
-- Flow 1:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 1106.420 ms
Loss rate: 35.54%
```

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

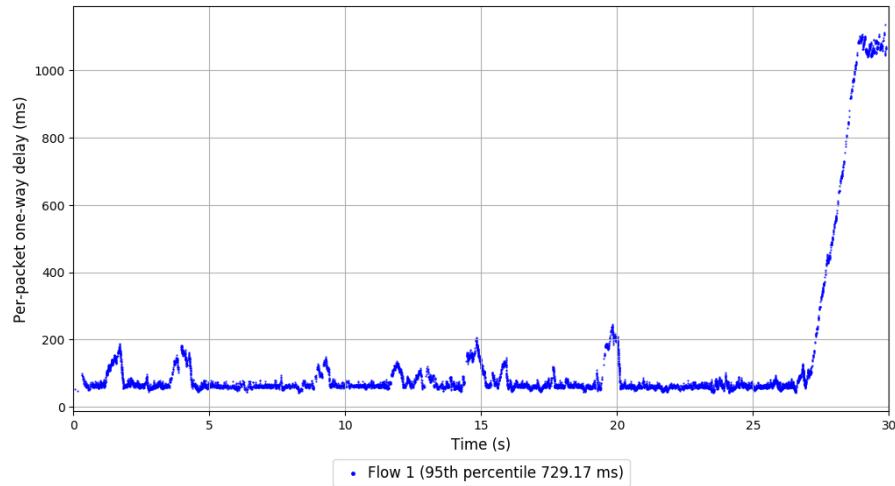
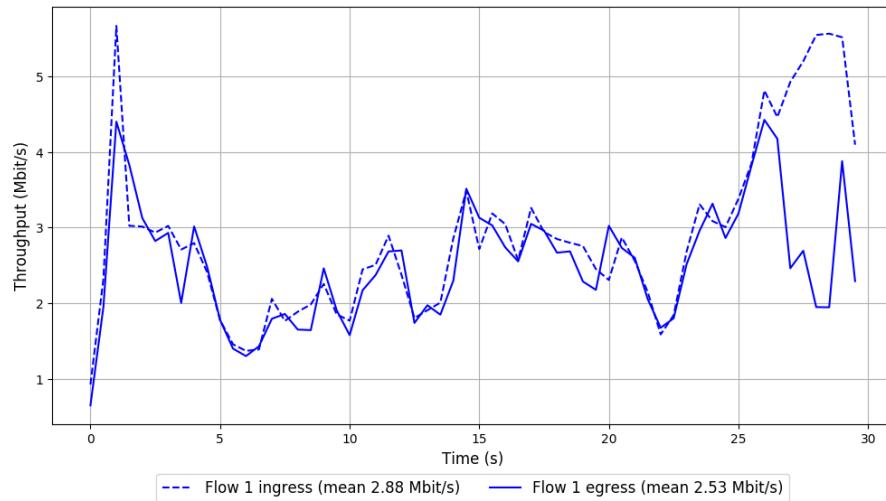


Run 1: Statistics of Vivace-LTE

```
Start at: 2018-04-10 05:35:55
End at: 2018-04-10 05:36:25
Local clock offset: -13.303 ms
Remote clock offset: -3.528 ms

# Below is generated by plot.py at 2018-04-10 06:31:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 729.166 ms
Loss rate: 12.22%
-- Flow 1:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 729.166 ms
Loss rate: 12.22%
```

Run 1: Report of Vivace-LTE — Data Link

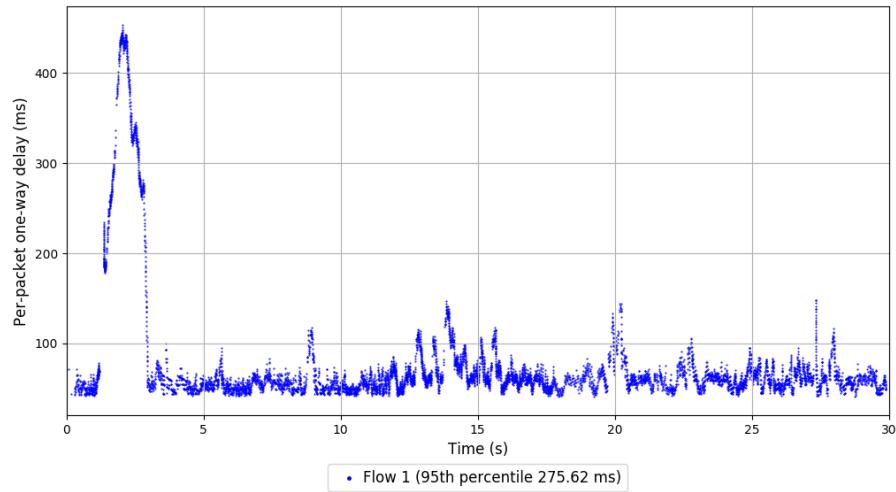
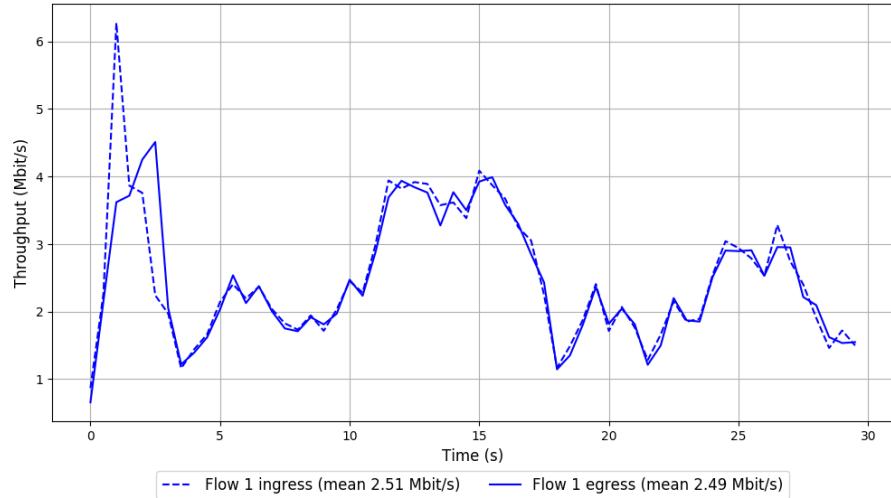


Run 2: Statistics of Vivace-LTE

```
Start at: 2018-04-10 05:55:27
End at: 2018-04-10 05:55:57
Local clock offset: -5.472 ms
Remote clock offset: -2.359 ms

# Below is generated by plot.py at 2018-04-10 06:31:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 275.619 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 275.619 ms
Loss rate: 1.10%
```

## Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

```
Start at: 2018-04-10 06:15:00
End at: 2018-04-10 06:15:30
Local clock offset: -6.501 ms
Remote clock offset: -2.32 ms

# Below is generated by plot.py at 2018-04-10 06:31:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 831.604 ms
Loss rate: 1.47%
-- Flow 1:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 831.604 ms
Loss rate: 1.47%
```

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

