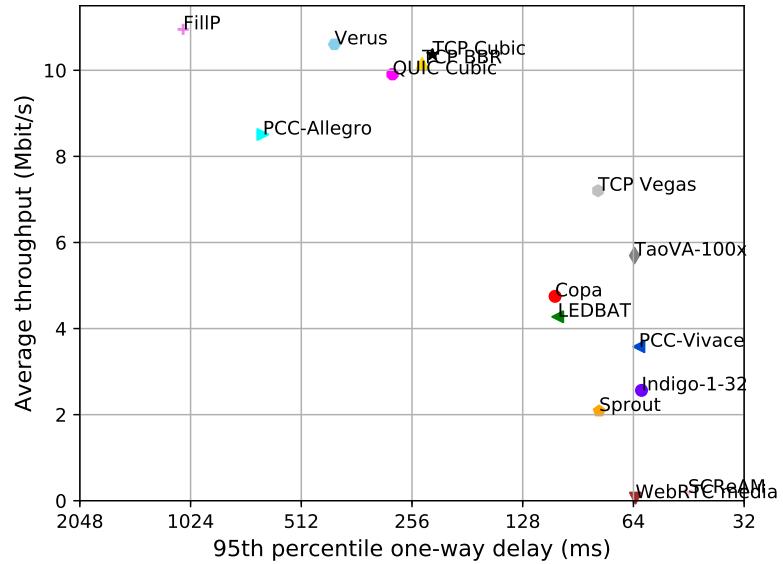


## Pantheon Report

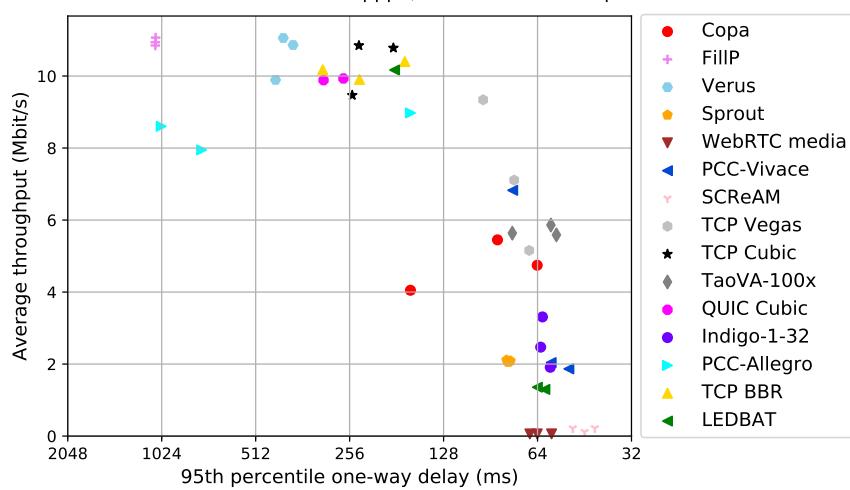
Generated at 2018-04-16 22:39:43 (UTC).  
Data path: AWS India 1 Ethernet (*local*) → India ppp0 (*remote*).  
Repeated the test of 16 congestion control schemes 3 times.  
Each test lasted for 30 seconds running 1 flow.  
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).  
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo\_fast**).  
NTP offsets were measured against **nets.org.sg** and have been applied to correct the timestamps in logs.

```
Git summary:  
branch: master @ 4ed32c0e22b4dd733f97c1d3aaab2e5bb16f66b4  
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50  
M datagrump/sender.cc  
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44  
third_party/genericCC @ d223989828276fa83a807da6e0341dc0c7b89aec  
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9  
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d  
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d  
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f  
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89  
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681  
M datagrump/sender.cc  
third_party/libutp @ 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/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab  
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42  
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885  
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681  
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce  
M src/examples/cellsim.cc  
M src/examples/sproutbt2.cc  
M src/network/sproutconn.cc  
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494  
M src/verus.hpp  
M tools/plot.py  
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3  
third_party/webrtc @ f271183af822eee5d0031620f4bebf38aedc5581
```

test from AWS 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



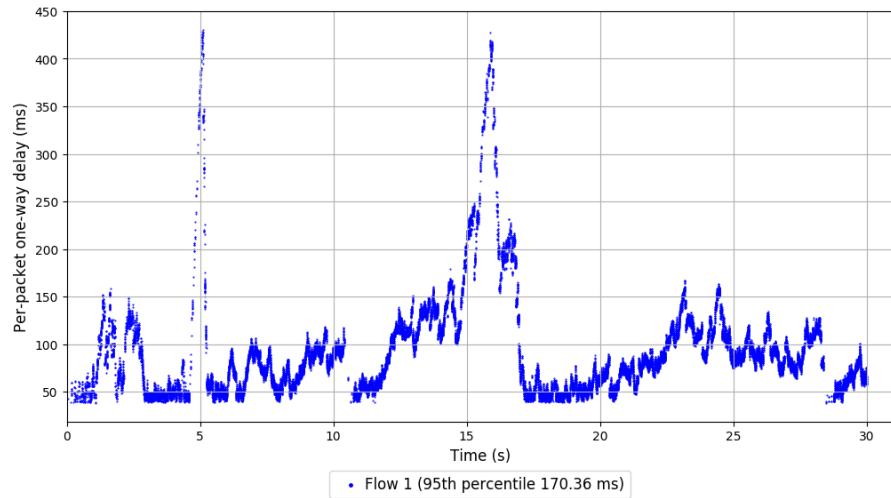
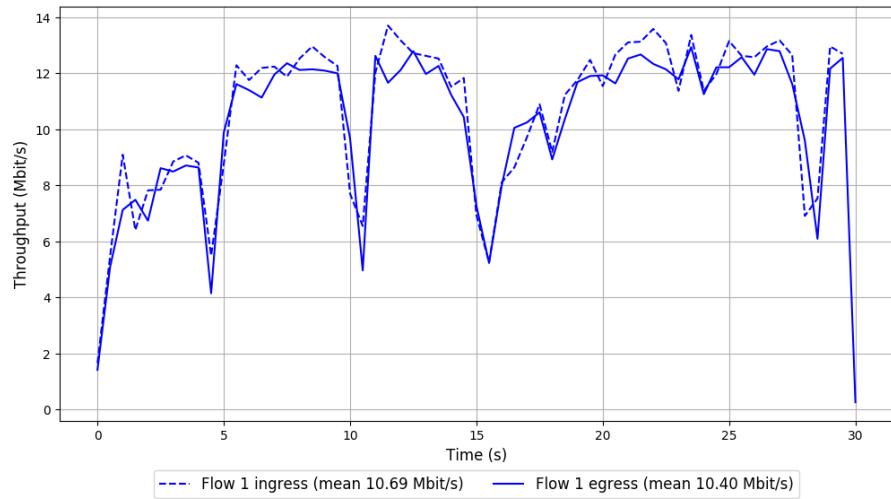
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	10.16	240.21	2.05
TCP Cubic	3	10.37	225.17	0.29
LEDBAT	3	4.28	102.83	1.78
PCC-Allegro	3	8.51	651.32	1.52
QUIC Cubic	2	9.91	289.17	0.61
SCReAM	3	0.18	45.49	0.41
WebRTC media	3	0.06	63.19	0.32
Sprout	3	2.08	79.34	0.93
TaoVA-100x	3	5.70	63.59	0.11
TCP Vegas	3	7.20	79.89	0.15
Verus	3	10.60	416.07	0.80
Copa	3	4.75	104.53	0.09
FillP	3	10.95	1072.73	17.00
Indigo-1-32	3	2.56	60.84	0.95
PCC-Vivace	3	3.58	61.86	0.15
PCC-Expr	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

```
Start at: 2018-04-16 21:58:56
End at: 2018-04-16 21:59:26
Local clock offset: 1.661 ms
Remote clock offset: -8.49 ms

# Below is generated by plot.py at 2018-04-16 22:38:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.40 Mbit/s
95th percentile per-packet one-way delay: 170.363 ms
Loss rate: 2.76%
-- Flow 1:
Average throughput: 10.40 Mbit/s
95th percentile per-packet one-way delay: 170.363 ms
Loss rate: 2.76%
```

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

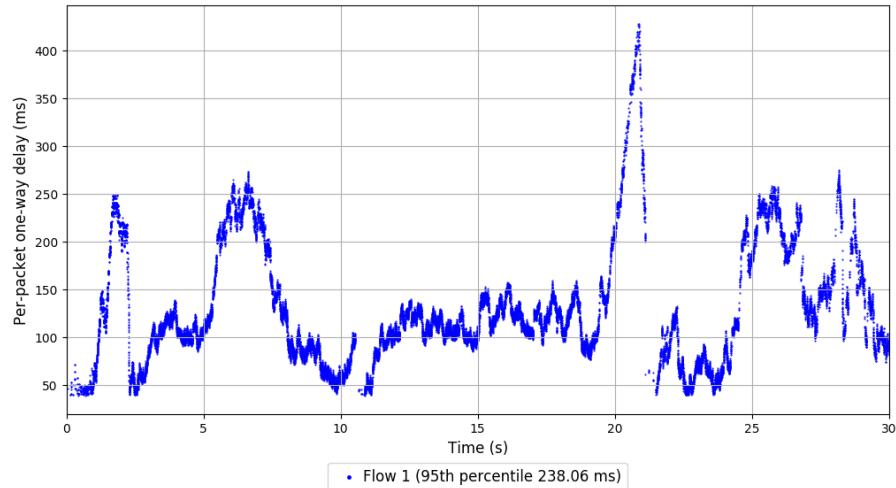
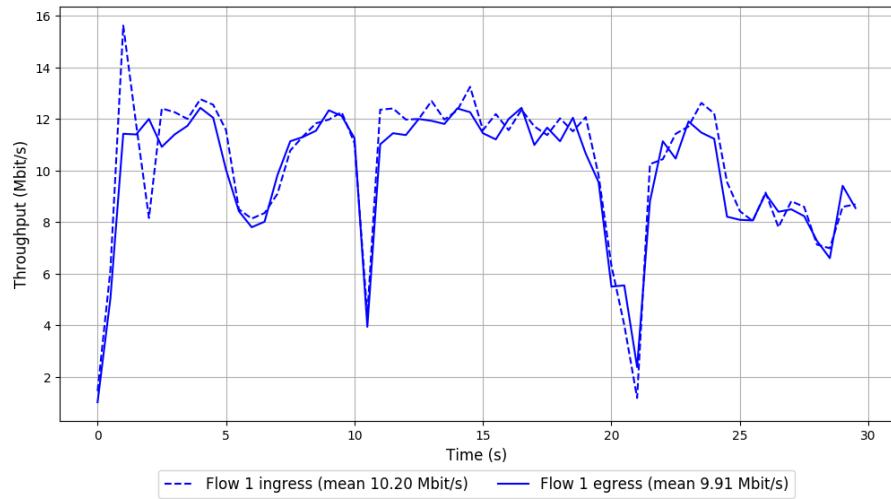


Run 2: Statistics of TCP BBR

```
Start at: 2018-04-16 22:17:35
End at: 2018-04-16 22:18:05
Local clock offset: -4.029 ms
Remote clock offset: -6.985 ms

# Below is generated by plot.py at 2018-04-16 22:38:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.91 Mbit/s
95th percentile per-packet one-way delay: 238.061 ms
Loss rate: 2.98%
-- Flow 1:
Average throughput: 9.91 Mbit/s
95th percentile per-packet one-way delay: 238.061 ms
Loss rate: 2.98%
```

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

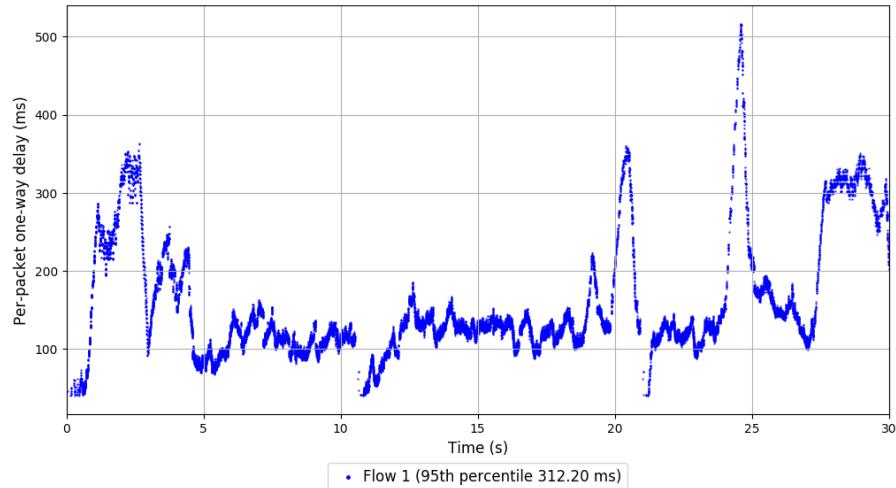
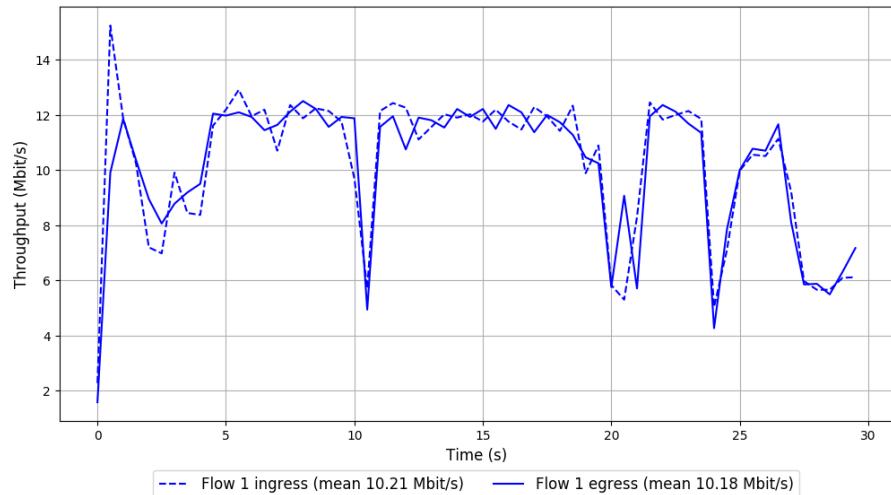


Run 3: Statistics of TCP BBR

```
Start at: 2018-04-16 22:36:09
End at: 2018-04-16 22:36:39
Local clock offset: -4.809 ms
Remote clock offset: -7.907 ms

# Below is generated by plot.py at 2018-04-16 22:38:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.18 Mbit/s
95th percentile per-packet one-way delay: 312.201 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 10.18 Mbit/s
95th percentile per-packet one-way delay: 312.201 ms
Loss rate: 0.42%
```

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

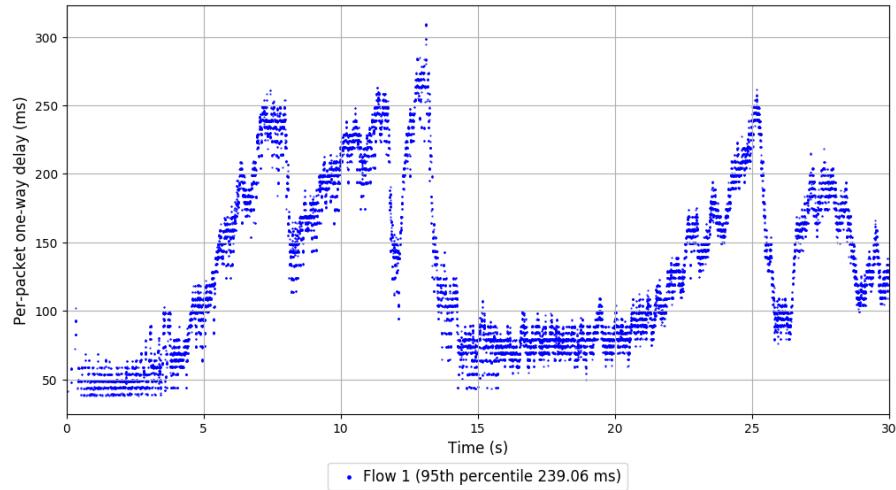
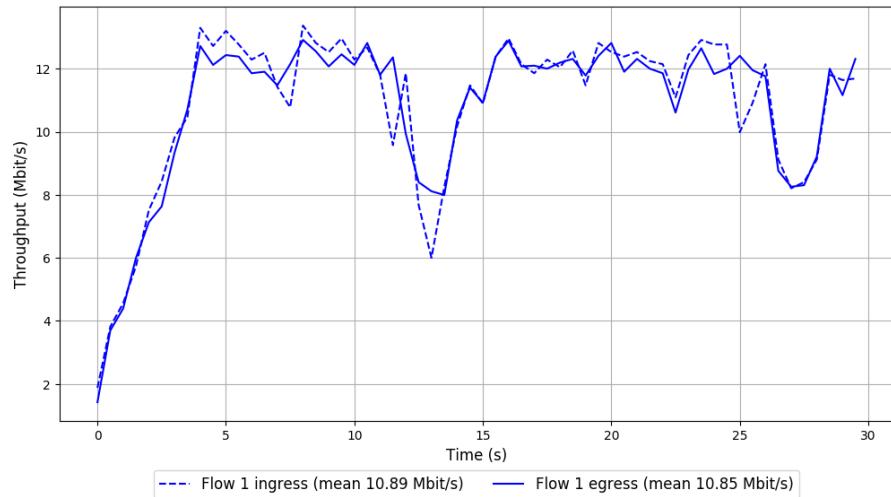


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-04-16 21:42:29
End at: 2018-04-16 21:42:59
Local clock offset: 0.226 ms
Remote clock offset: -9.7 ms

# Below is generated by plot.py at 2018-04-16 22:38:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.85 Mbit/s
95th percentile per-packet one-way delay: 239.058 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 10.85 Mbit/s
95th percentile per-packet one-way delay: 239.058 ms
Loss rate: 0.48%
```

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

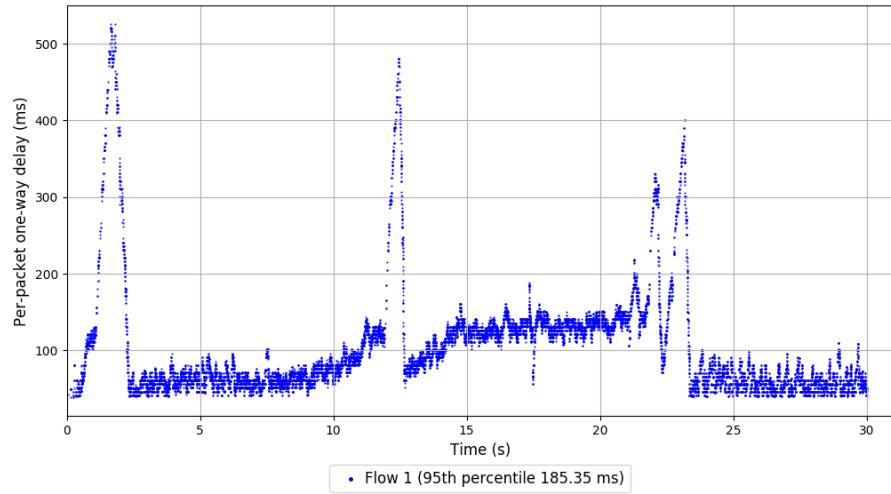
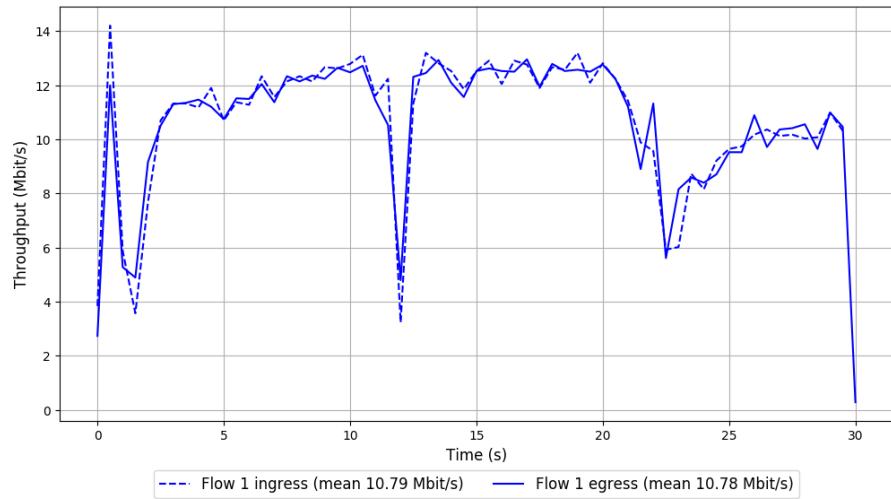


Run 2: Statistics of TCP Cubic

```
Start at: 2018-04-16 22:01:09
End at: 2018-04-16 22:01:39
Local clock offset: 1.34 ms
Remote clock offset: -7.978 ms

# Below is generated by plot.py at 2018-04-16 22:38:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.78 Mbit/s
95th percentile per-packet one-way delay: 185.352 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 10.78 Mbit/s
95th percentile per-packet one-way delay: 185.352 ms
Loss rate: 0.13%
```

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

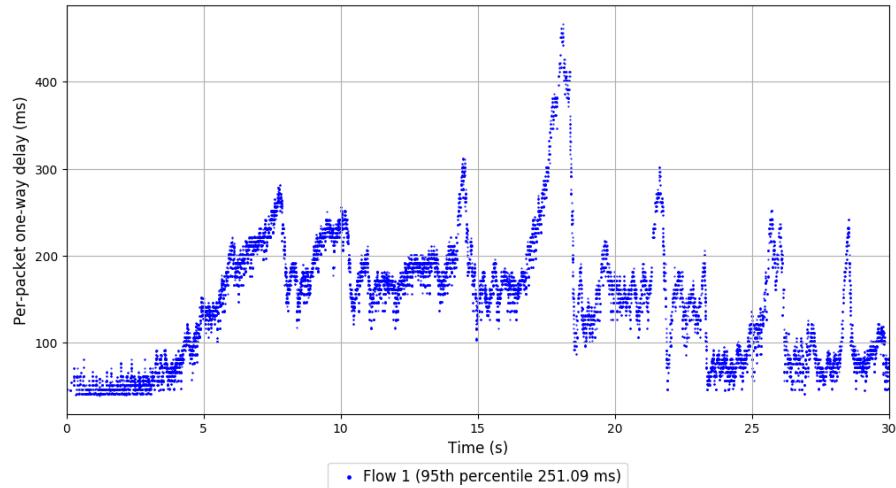
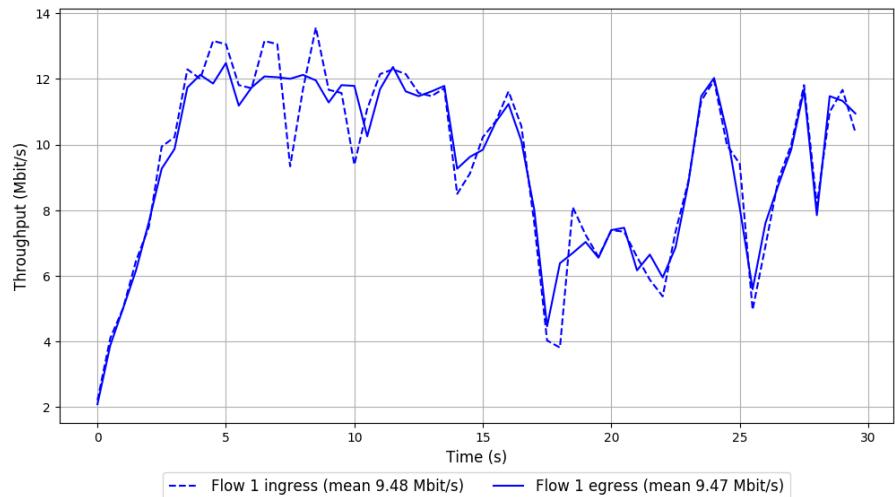


Run 3: Statistics of TCP Cubic

```
Start at: 2018-04-16 22:19:47
End at: 2018-04-16 22:20:17
Local clock offset: -4.93 ms
Remote clock offset: -8.034 ms

# Below is generated by plot.py at 2018-04-16 22:38:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.47 Mbit/s
95th percentile per-packet one-way delay: 251.095 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 9.47 Mbit/s
95th percentile per-packet one-way delay: 251.095 ms
Loss rate: 0.27%
```

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

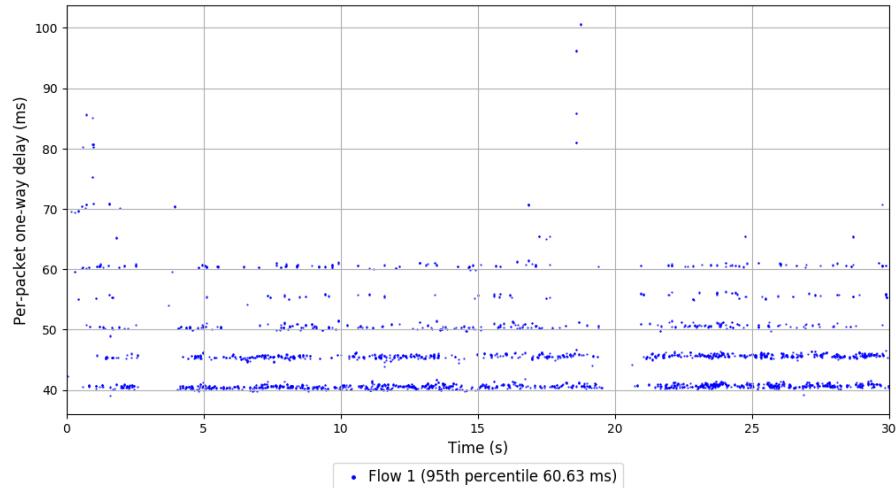
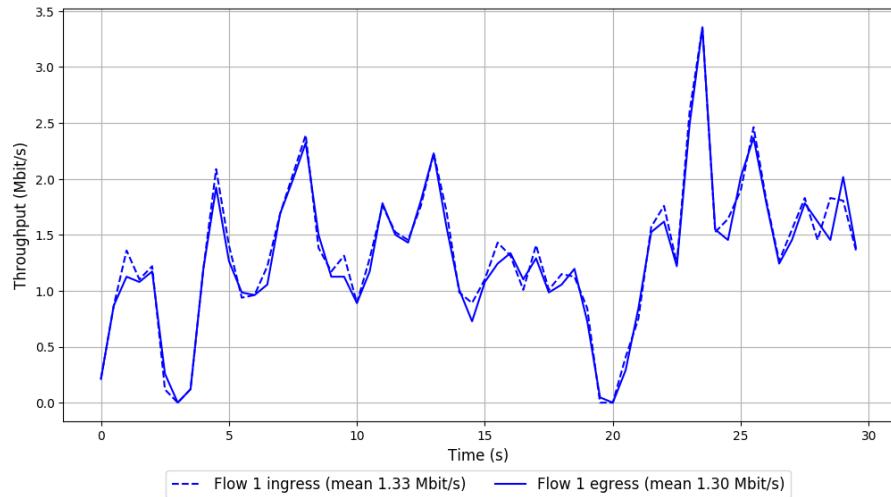


```
Run 1: Statistics of LEDBAT

Start at: 2018-04-16 21:47:56
End at: 2018-04-16 21:48:26
Local clock offset: 0.802 ms
Remote clock offset: -9.224 ms

# Below is generated by plot.py at 2018-04-16 22:38:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 60.629 ms
Loss rate: 2.73%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 60.629 ms
Loss rate: 2.73%
```

## Run 1: Report of LEDBAT — Data Link

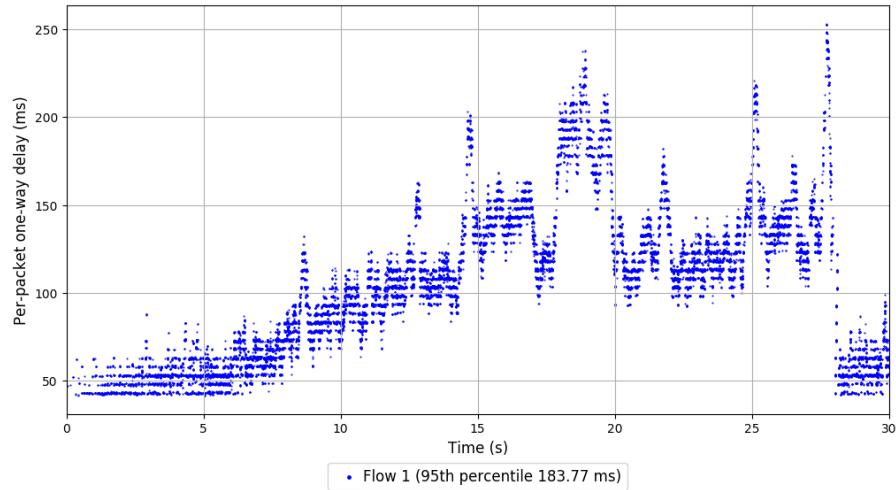
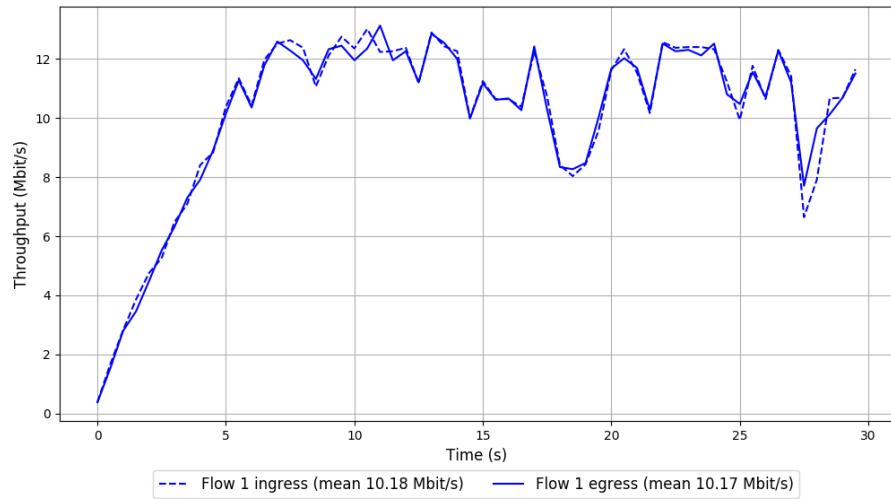


Run 2: Statistics of LEDBAT

```
Start at: 2018-04-16 22:06:38
End at: 2018-04-16 22:07:08
Local clock offset: -1.75 ms
Remote clock offset: -6.907 ms

# Below is generated by plot.py at 2018-04-16 22:38:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.17 Mbit/s
95th percentile per-packet one-way delay: 183.768 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 10.17 Mbit/s
95th percentile per-packet one-way delay: 183.768 ms
Loss rate: 0.19%
```

Run 2: Report of LEDBAT — Data Link

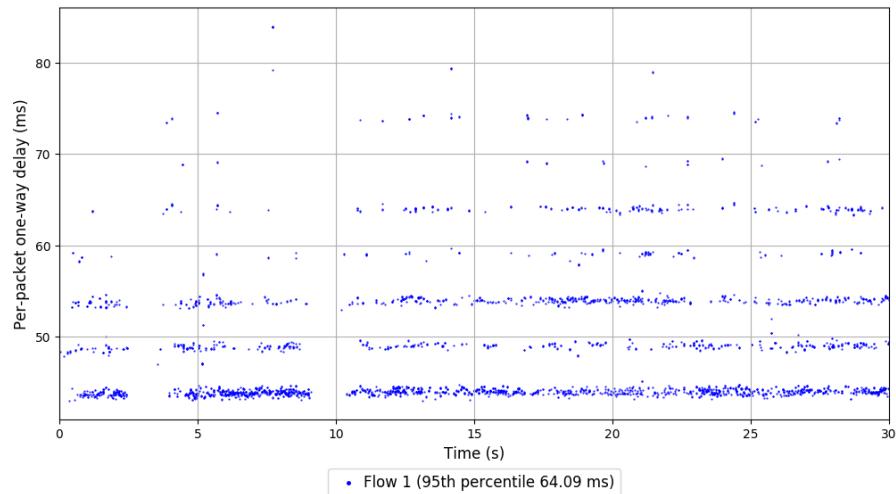
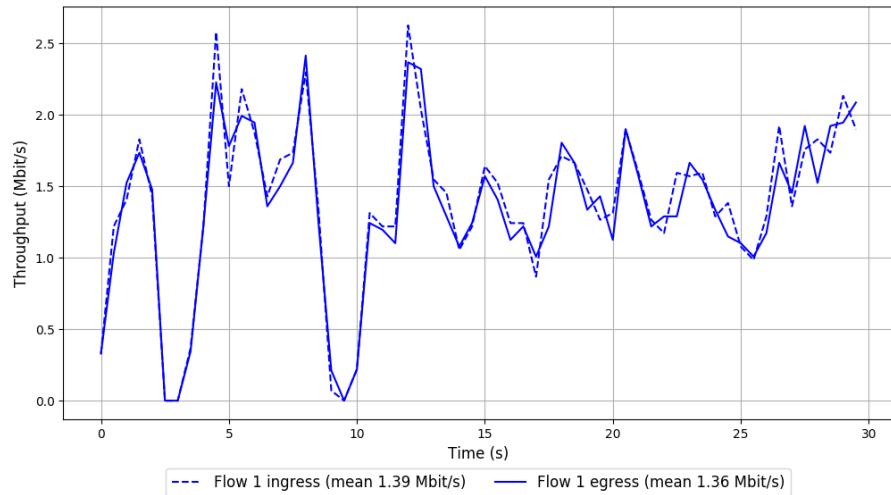


```
Run 3: Statistics of LEDBAT
```

```
Start at: 2018-04-16 22:25:14
End at: 2018-04-16 22:25:44
Local clock offset: -4.816 ms
Remote clock offset: -6.683 ms

# Below is generated by plot.py at 2018-04-16 22:38:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 64.088 ms
Loss rate: 2.42%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 64.088 ms
Loss rate: 2.42%
```

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

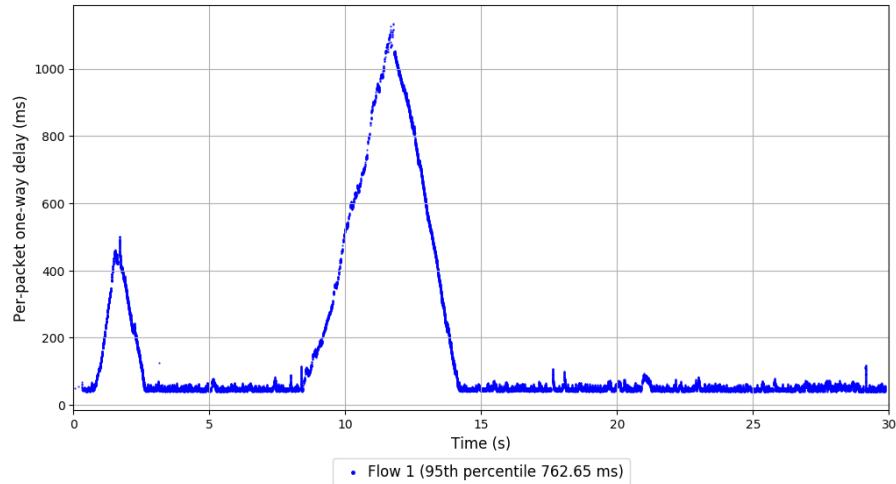
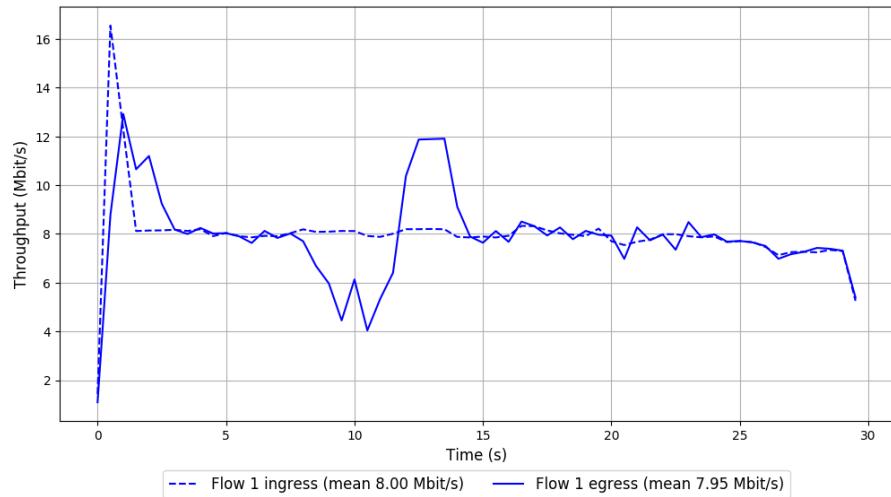


```
Run 1: Statistics of PCC-Allegro
```

```
Start at: 2018-04-16 21:56:44
End at: 2018-04-16 21:57:14
Local clock offset: 1.246 ms
Remote clock offset: -7.8 ms

# Below is generated by plot.py at 2018-04-16 22:39:00
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.95 Mbit/s
95th percentile per-packet one-way delay: 762.649 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 7.95 Mbit/s
95th percentile per-packet one-way delay: 762.649 ms
Loss rate: 0.80%
```

## Run 1: Report of PCC-Allegro — Data Link

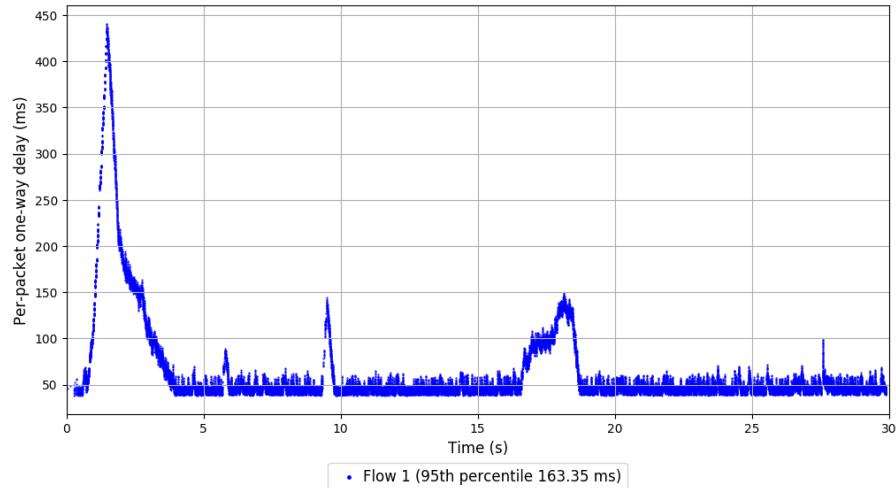
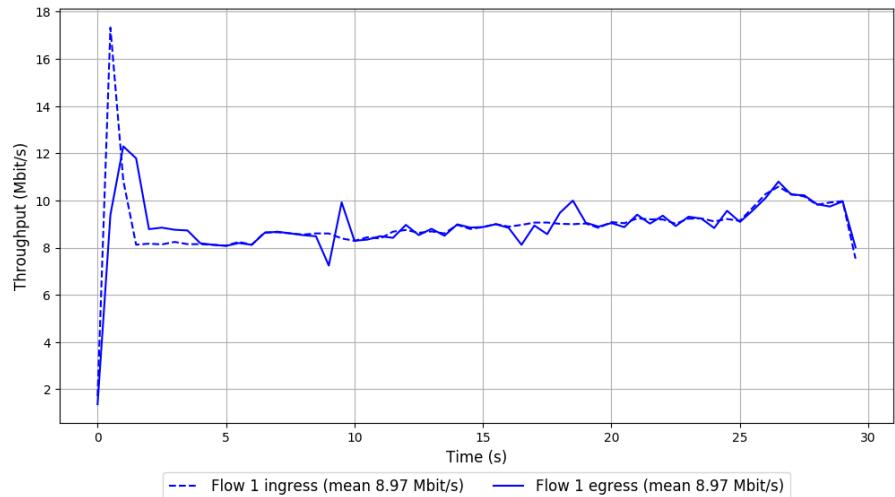


Run 2: Statistics of PCC-Allegro

```
Start at: 2018-04-16 22:15:24
End at: 2018-04-16 22:15:54
Local clock offset: -3.806 ms
Remote clock offset: -7.715 ms

# Below is generated by plot.py at 2018-04-16 22:39:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.97 Mbit/s
95th percentile per-packet one-way delay: 163.349 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 8.97 Mbit/s
95th percentile per-packet one-way delay: 163.349 ms
Loss rate: 0.10%
```

## Run 2: Report of PCC-Allegro — Data Link

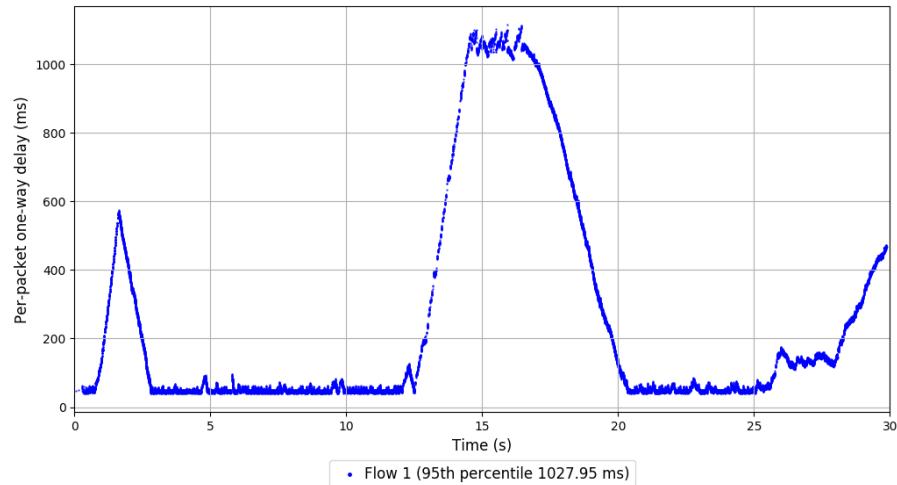
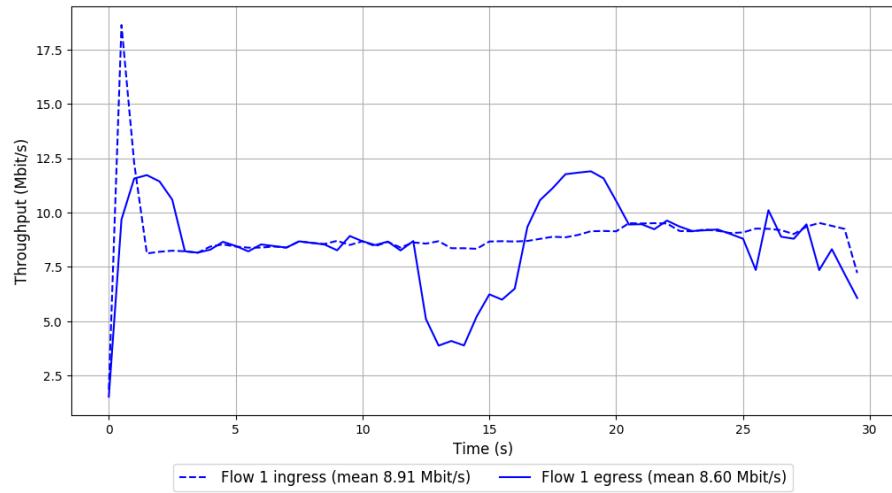


```
Run 3: Statistics of PCC-Allegro
```

```
Start at: 2018-04-16 22:33:58
End at: 2018-04-16 22:34:28
Local clock offset: -5.371 ms
Remote clock offset: -7.636 ms

# Below is generated by plot.py at 2018-04-16 22:39:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 8.60 Mbit/s
95th percentile per-packet one-way delay: 1027.950 ms
Loss rate: 3.66%
-- Flow 1:
Average throughput: 8.60 Mbit/s
95th percentile per-packet one-way delay: 1027.950 ms
Loss rate: 3.66%
```

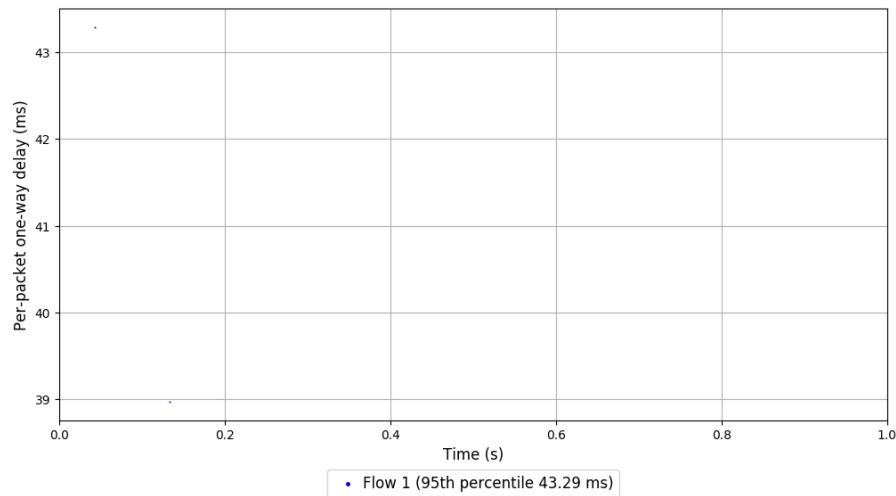
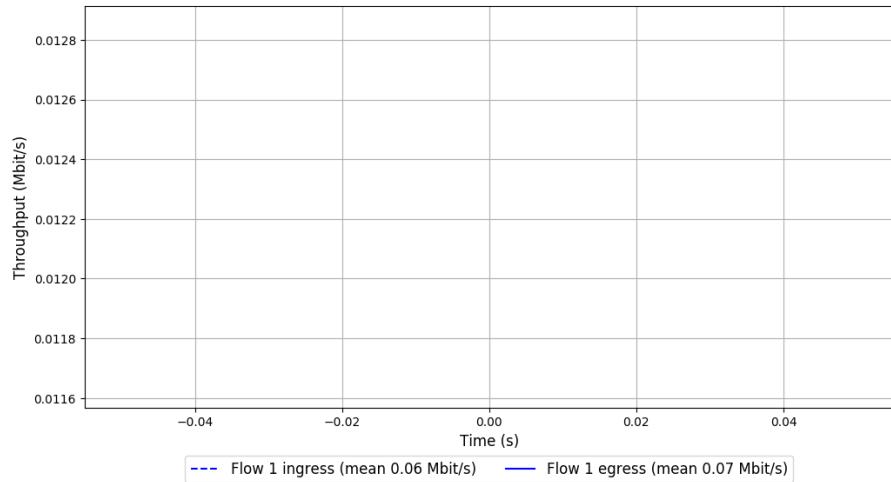
### Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-04-16 21:46:51  
End at: 2018-04-16 21:47:21  
Local clock offset: -0.19 ms  
Remote clock offset: -10.169 ms

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

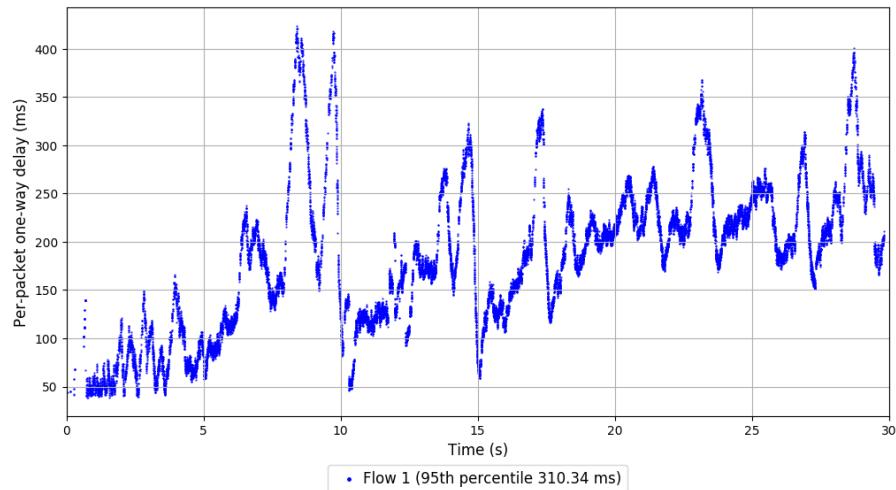
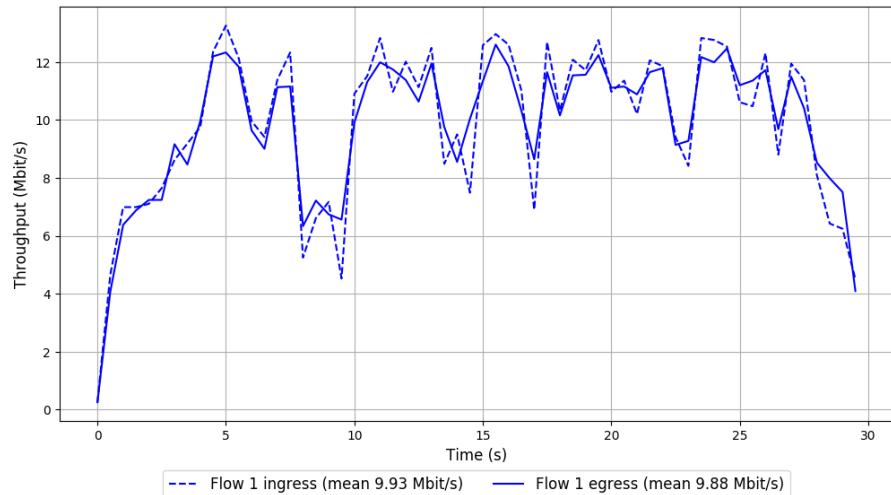


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-04-16 22:05:32
End at: 2018-04-16 22:06:02
Local clock offset: -0.597 ms
Remote clock offset: -7.512 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.88 Mbit/s
95th percentile per-packet one-way delay: 310.339 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 9.88 Mbit/s
95th percentile per-packet one-way delay: 310.339 ms
Loss rate: 0.54%
```

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

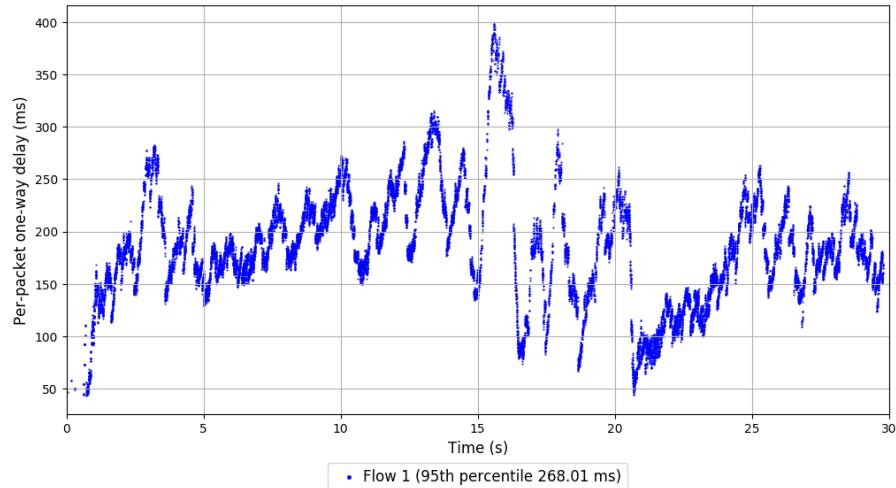
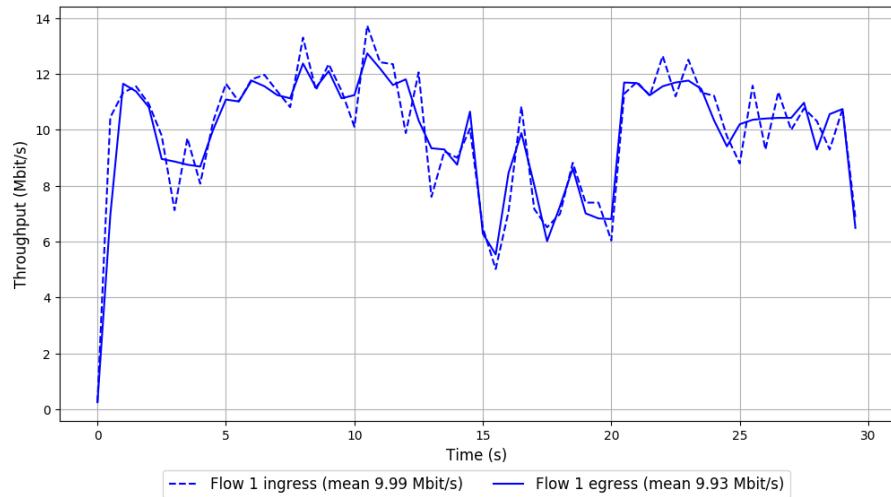


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-04-16 22:24:08
End at: 2018-04-16 22:24:38
Local clock offset: -5.568 ms
Remote clock offset: -7.315 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.93 Mbit/s
95th percentile per-packet one-way delay: 268.010 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 9.93 Mbit/s
95th percentile per-packet one-way delay: 268.010 ms
Loss rate: 0.68%
```

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

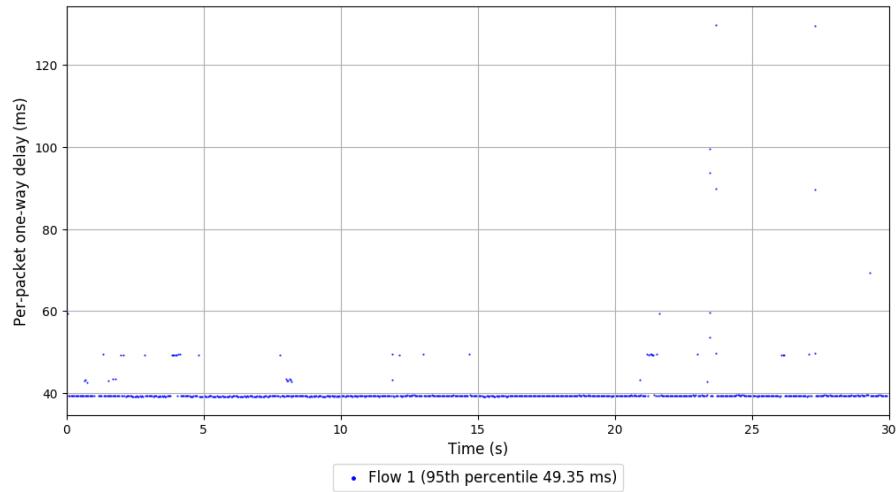
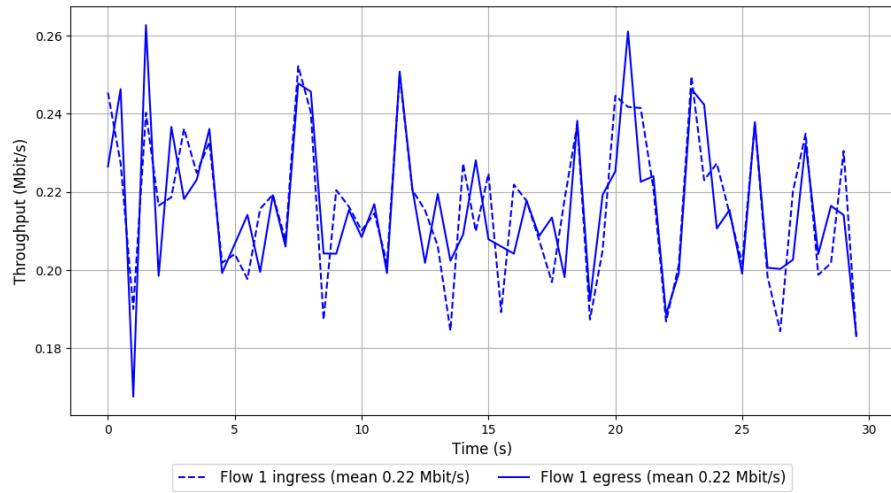


```
Run 1: Statistics of SCReAM

Start at: 2018-04-16 21:55:39
End at: 2018-04-16 21:56:09
Local clock offset: 1.588 ms
Remote clock offset: -8.8 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 49.348 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 49.348 ms
Loss rate: 0.13%
```

Run 1: Report of SCReAM — Data Link

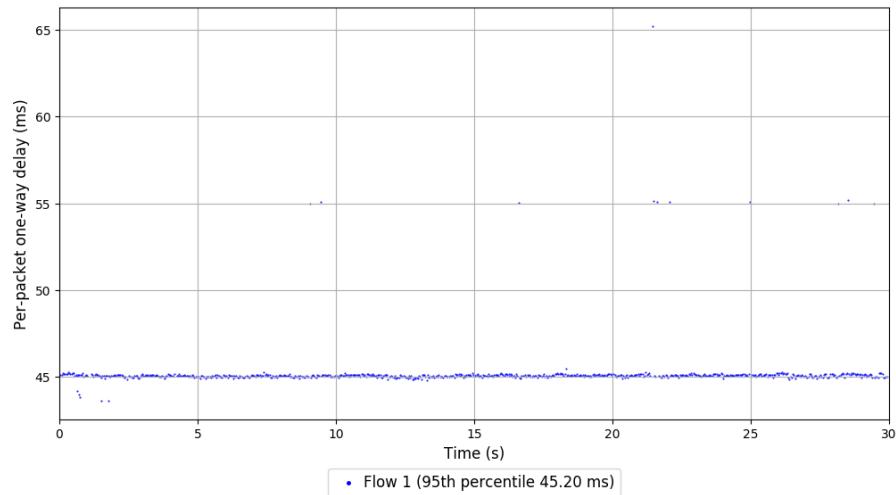
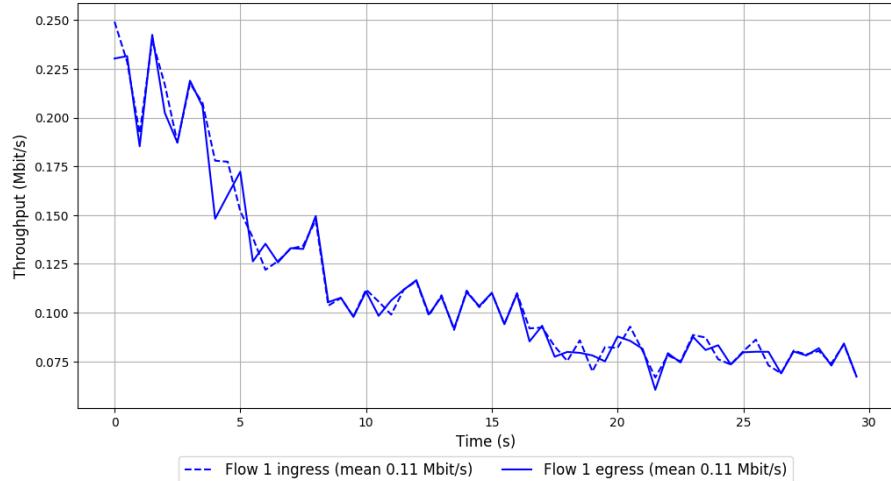


Run 2: Statistics of SCReAM

```
Start at: 2018-04-16 22:14:19
End at: 2018-04-16 22:14:49
Local clock offset: -3.706 ms
Remote clock offset: -8.014 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 45.199 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 45.199 ms
Loss rate: 1.11%
```

## Run 2: Report of SCReAM — Data Link

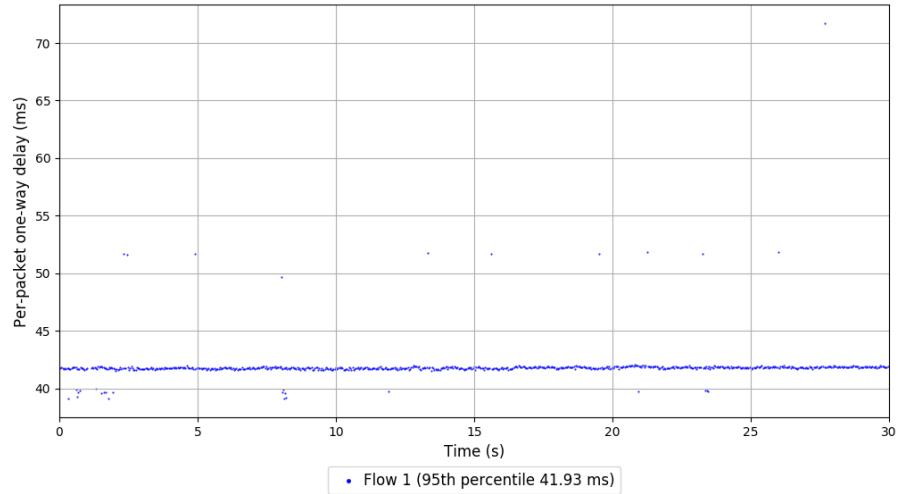
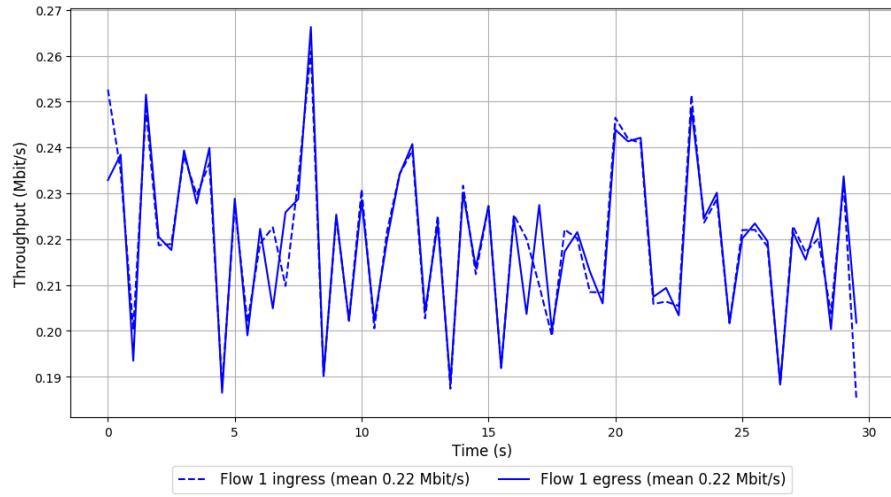


Run 3: Statistics of SCReAM

```
Start at: 2018-04-16 22:32:53
End at: 2018-04-16 22:33:23
Local clock offset: -5.454 ms
Remote clock offset: -8.294 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.927 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.927 ms
Loss rate: 0.00%
```

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

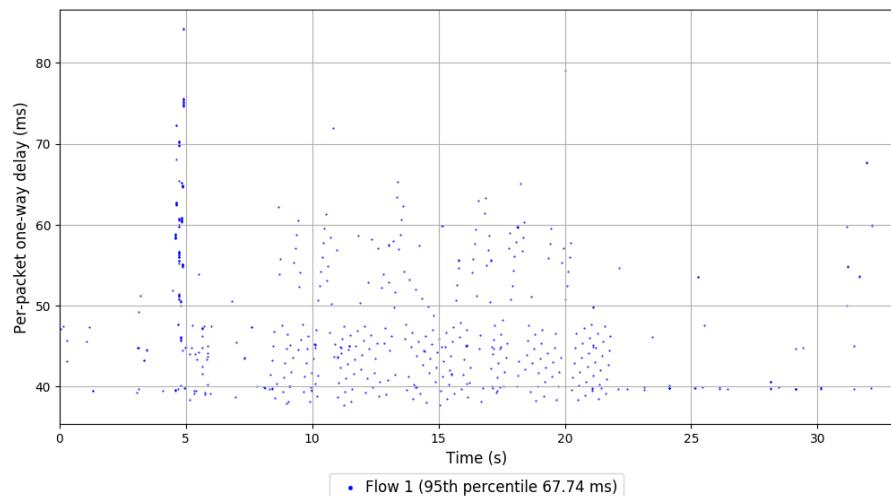
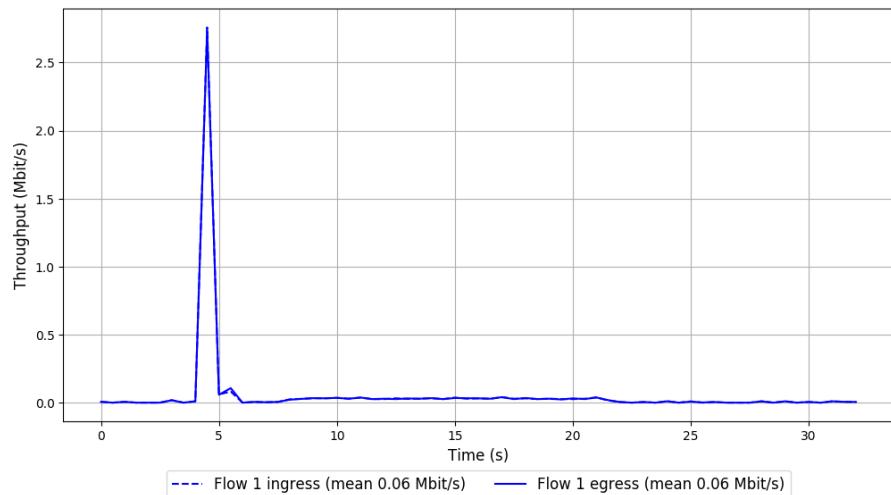


```
Run 1: Statistics of WebRTC media

Start at: 2018-04-16 21:45:46
End at: 2018-04-16 21:46:16
Local clock offset: 0.037 ms
Remote clock offset: -9.715 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 67.738 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 67.738 ms
Loss rate: 0.00%
```

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

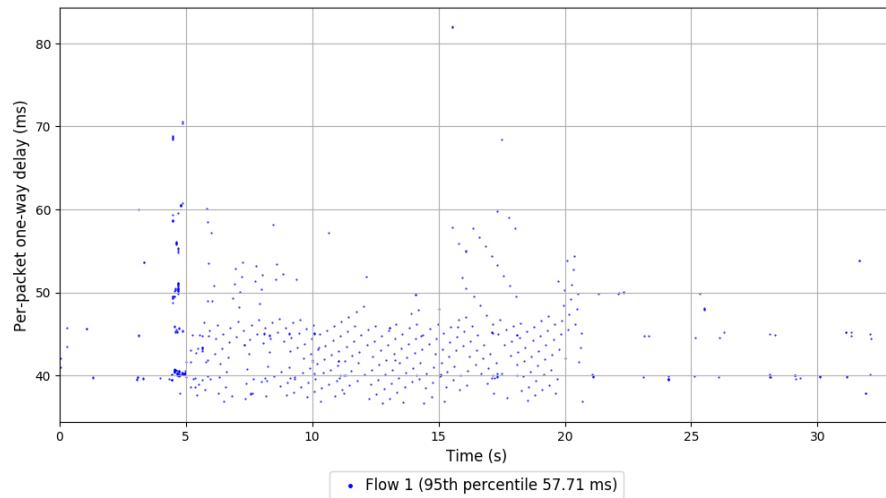
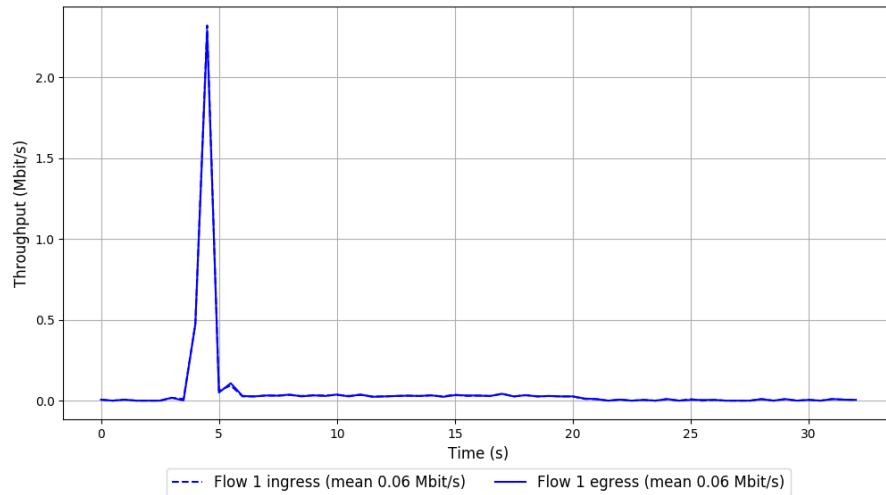


Run 2: Statistics of WebRTC media

```
Start at: 2018-04-16 22:04:27
End at: 2018-04-16 22:04:57
Local clock offset: -0.131 ms
Remote clock offset: -8.431 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 57.708 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 57.708 ms
Loss rate: 0.95%
```

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

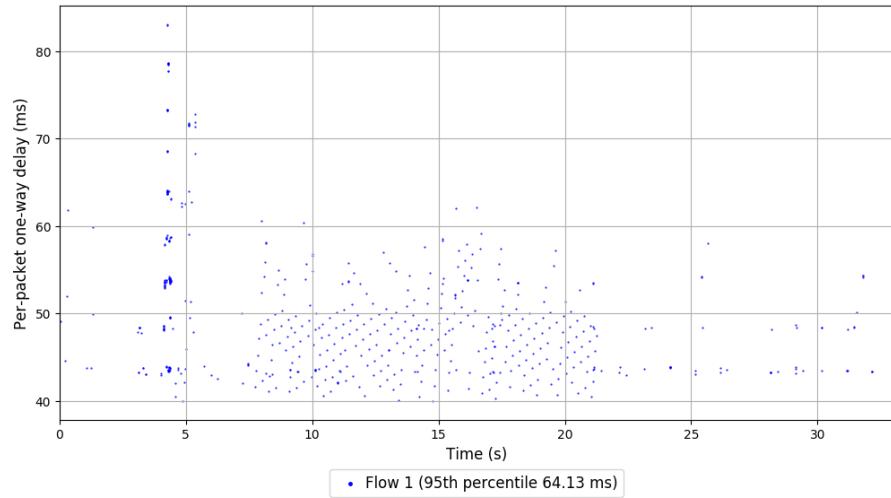
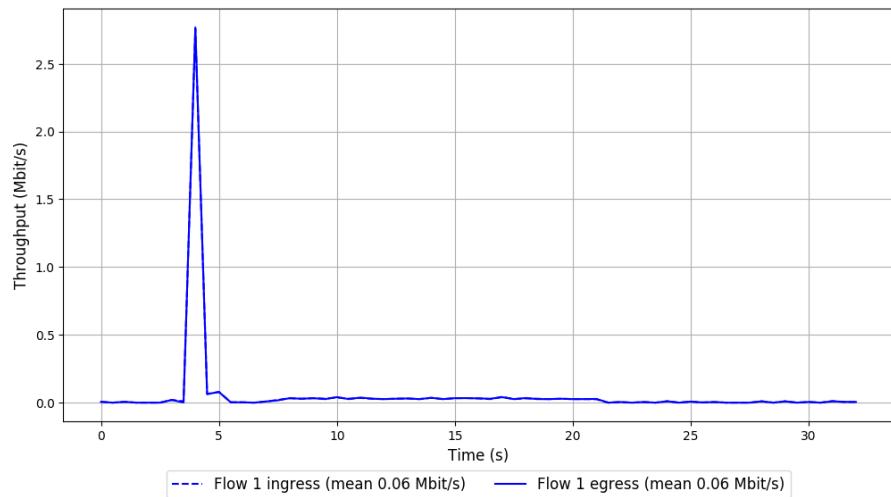


Run 3: Statistics of WebRTC media

```
Start at: 2018-04-16 22:23:03
End at: 2018-04-16 22:23:33
Local clock offset: -5.433 ms
Remote clock offset: -7.223 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 64.132 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 64.132 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

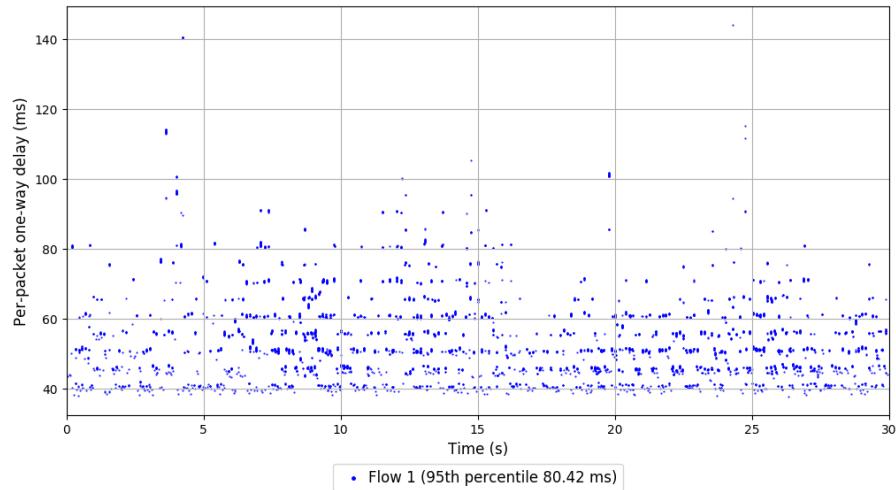
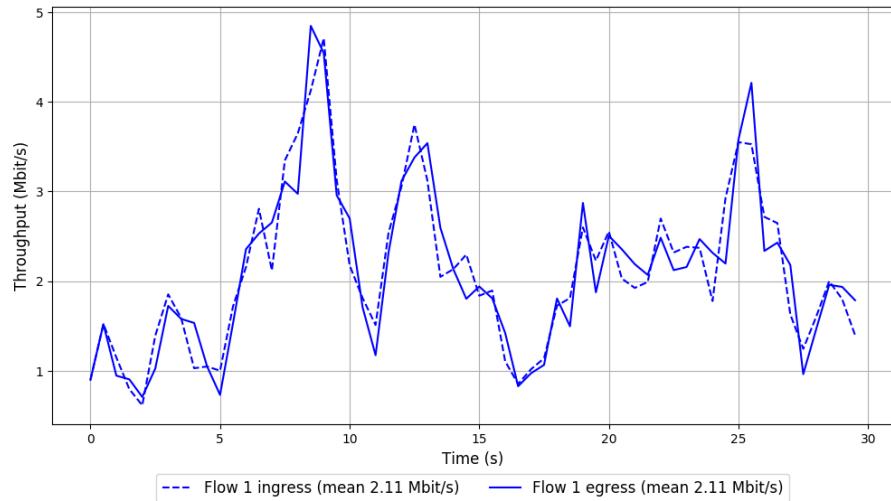


```
Run 1: Statistics of Sprout
```

```
Start at: 2018-04-16 21:50:11
End at: 2018-04-16 21:50:41
Local clock offset: 1.467 ms
Remote clock offset: -9.085 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 80.424 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 80.424 ms
Loss rate: 0.00%
```

## Run 1: Report of Sprout — Data Link

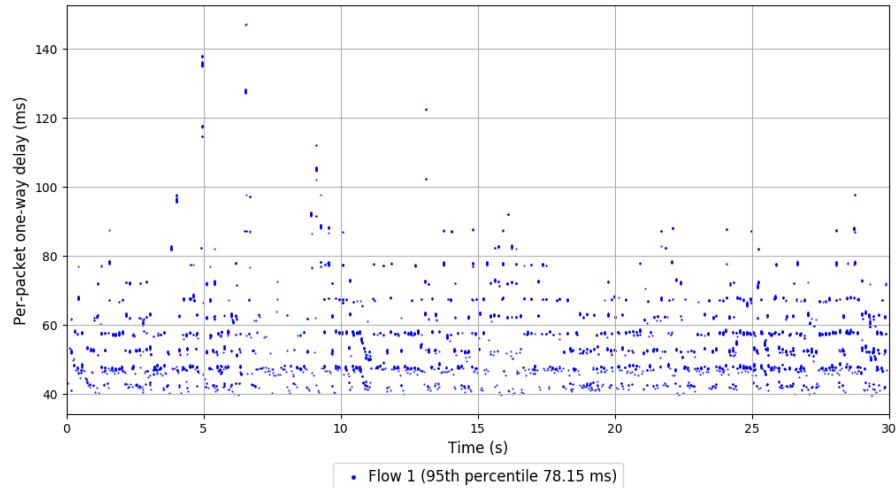
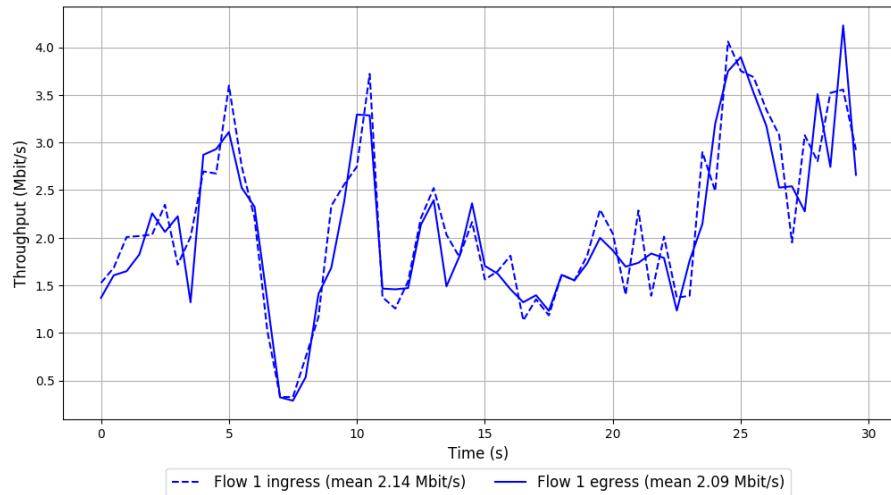


Run 2: Statistics of Sprout

```
Start at: 2018-04-16 22:08:50
End at: 2018-04-16 22:09:20
Local clock offset: -1.718 ms
Remote clock offset: -6.877 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 78.152 ms
Loss rate: 2.50%
-- Flow 1:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 78.152 ms
Loss rate: 2.50%
```

## Run 2: Report of Sprout — Data Link

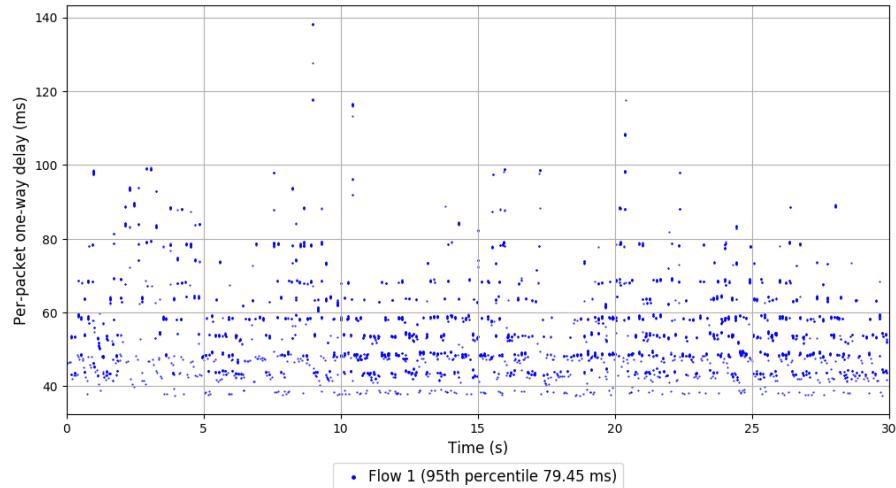
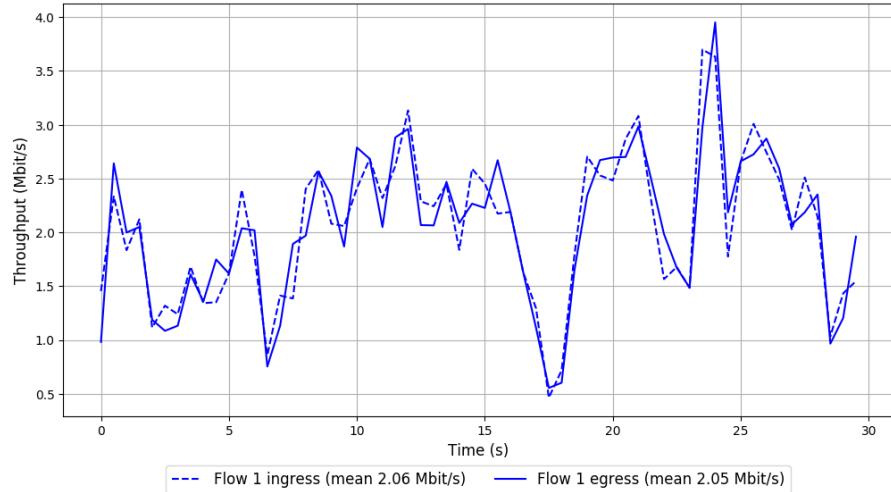


Run 3: Statistics of Sprout

```
Start at: 2018-04-16 22:27:25
End at: 2018-04-16 22:27:55
Local clock offset: -4.695 ms
Remote clock offset: -7.483 ms

# Below is generated by plot.py at 2018-04-16 22:39:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 79.446 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 79.446 ms
Loss rate: 0.29%
```

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

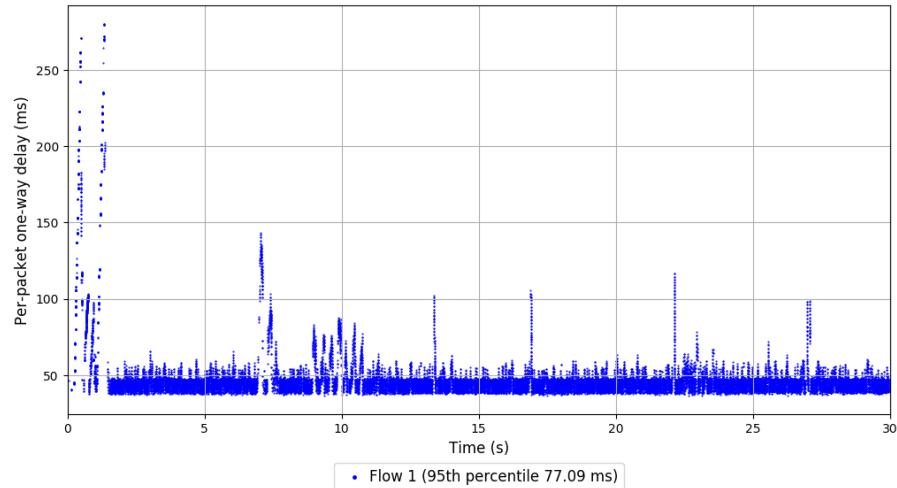
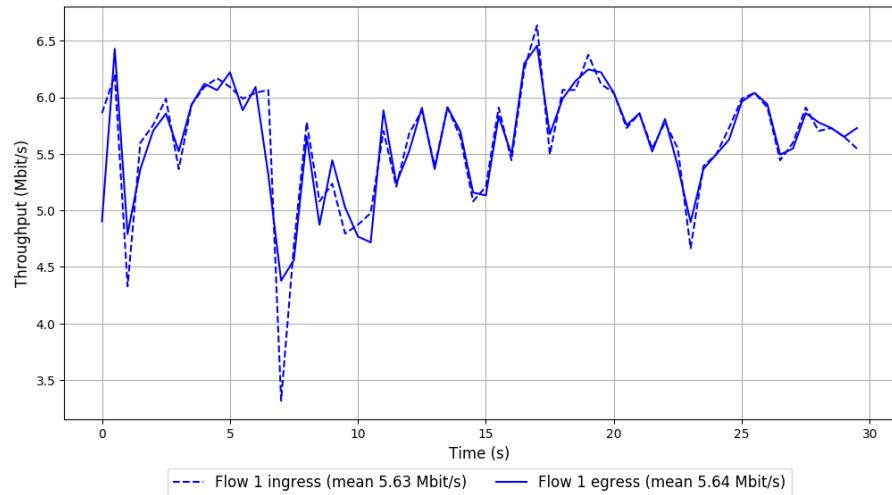


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-04-16 21:51:16
End at: 2018-04-16 21:51:46
Local clock offset: 1.666 ms
Remote clock offset: -9.789 ms

# Below is generated by plot.py at 2018-04-16 22:39:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.64 Mbit/s
95th percentile per-packet one-way delay: 77.088 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 5.64 Mbit/s
95th percentile per-packet one-way delay: 77.088 ms
Loss rate: 0.09%
```

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

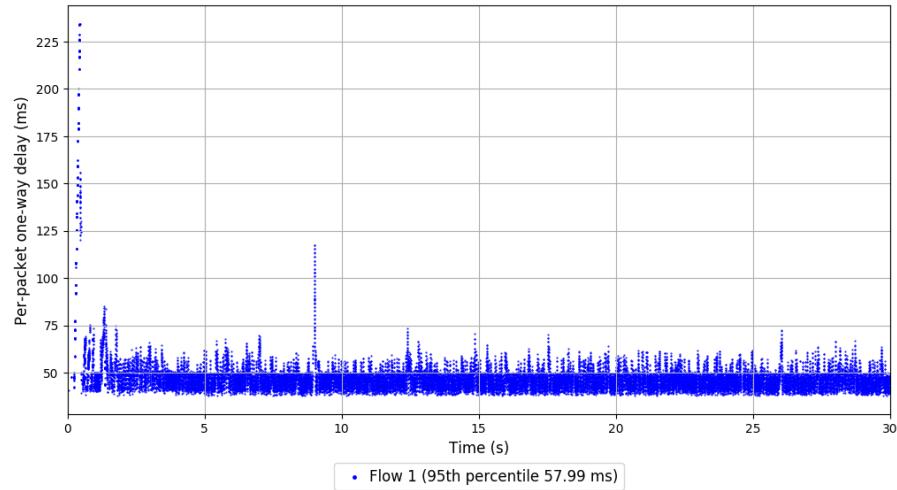
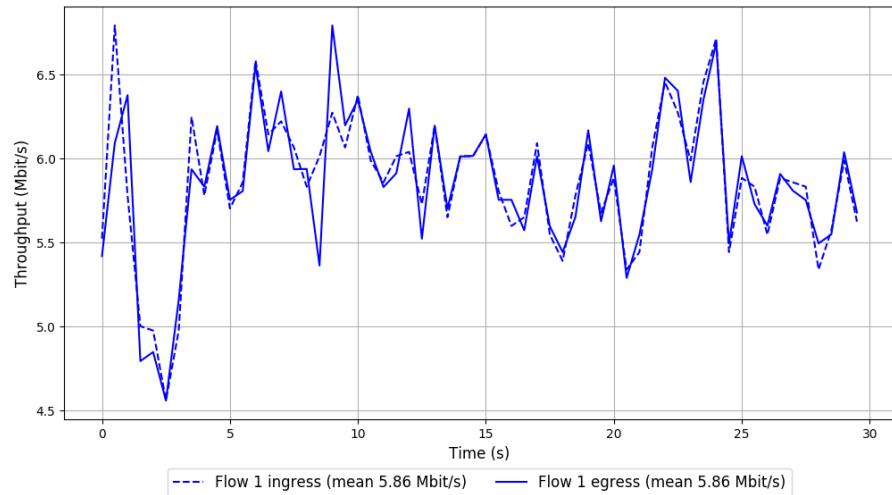


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-04-16 22:09:55
End at: 2018-04-16 22:10:25
Local clock offset: -3.496 ms
Remote clock offset: -8.024 ms

# Below is generated by plot.py at 2018-04-16 22:39:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.86 Mbit/s
95th percentile per-packet one-way delay: 57.993 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 5.86 Mbit/s
95th percentile per-packet one-way delay: 57.993 ms
Loss rate: 0.13%
```

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

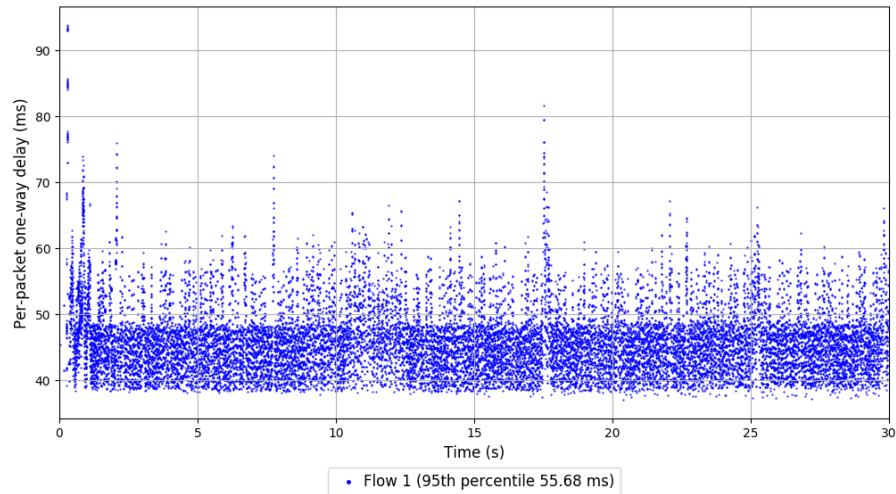
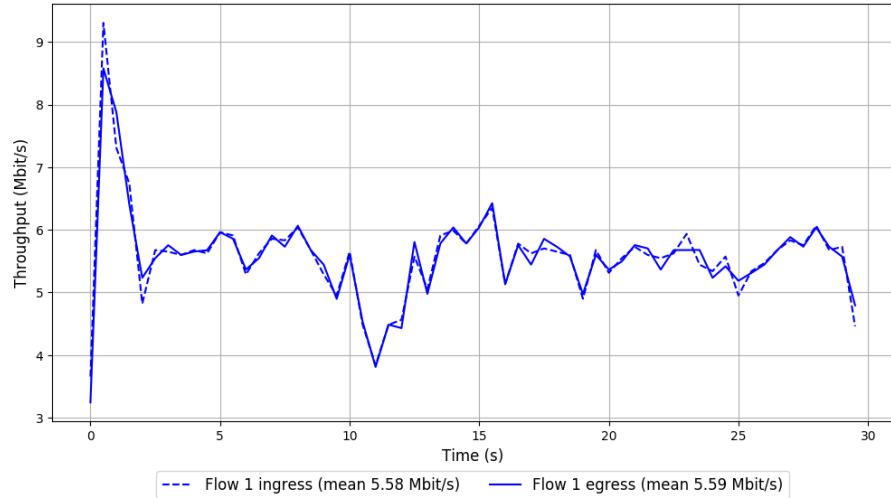


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-04-16 22:28:30
End at: 2018-04-16 22:29:00
Local clock offset: -4.014 ms
Remote clock offset: -7.74 ms

# Below is generated by plot.py at 2018-04-16 22:39:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.59 Mbit/s
95th percentile per-packet one-way delay: 55.676 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 5.59 Mbit/s
95th percentile per-packet one-way delay: 55.676 ms
Loss rate: 0.11%
```

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

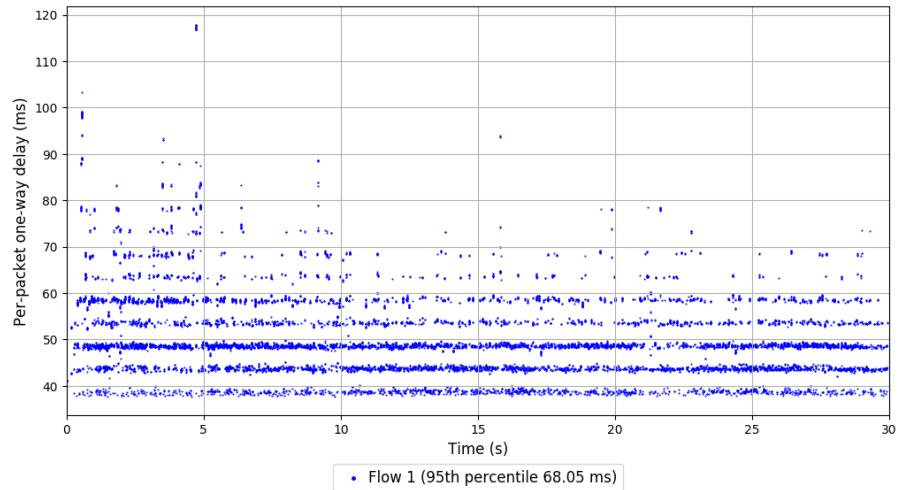
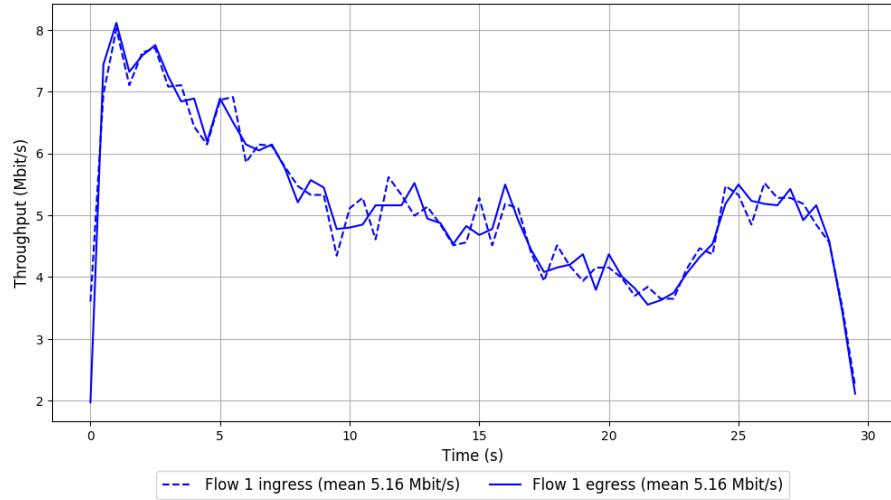


Run 1: Statistics of TCP Vegas

```
Start at: 2018-04-16 21:57:50
End at: 2018-04-16 21:58:20
Local clock offset: 2.136 ms
Remote clock offset: -9.251 ms

# Below is generated by plot.py at 2018-04-16 22:39:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.16 Mbit/s
95th percentile per-packet one-way delay: 68.053 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 5.16 Mbit/s
95th percentile per-packet one-way delay: 68.053 ms
Loss rate: 0.20%
```

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

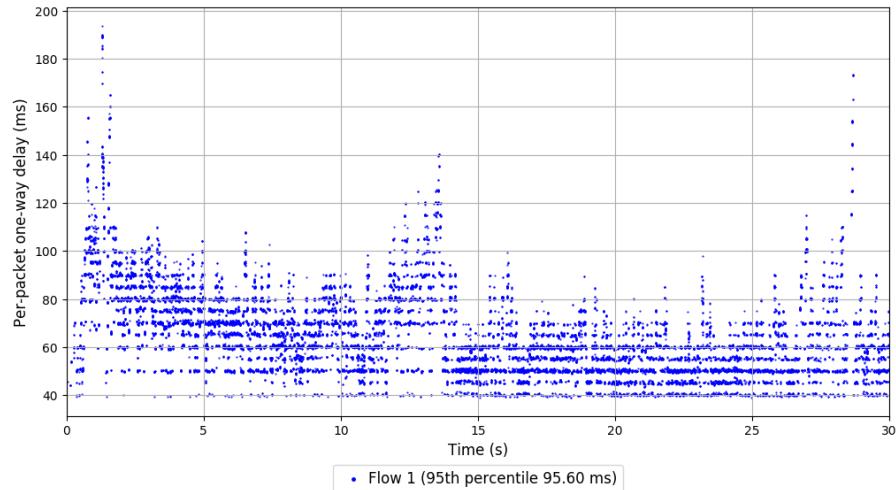
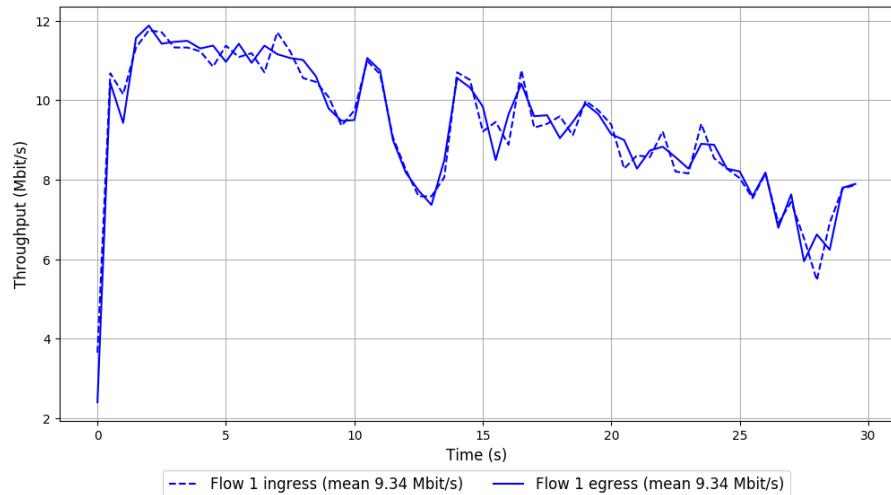


Run 2: Statistics of TCP Vegas

```
Start at: 2018-04-16 22:16:30
End at: 2018-04-16 22:17:00
Local clock offset: -3.923 ms
Remote clock offset: -7.729 ms

# Below is generated by plot.py at 2018-04-16 22:39:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.34 Mbit/s
95th percentile per-packet one-way delay: 95.601 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 9.34 Mbit/s
95th percentile per-packet one-way delay: 95.601 ms
Loss rate: 0.11%
```

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

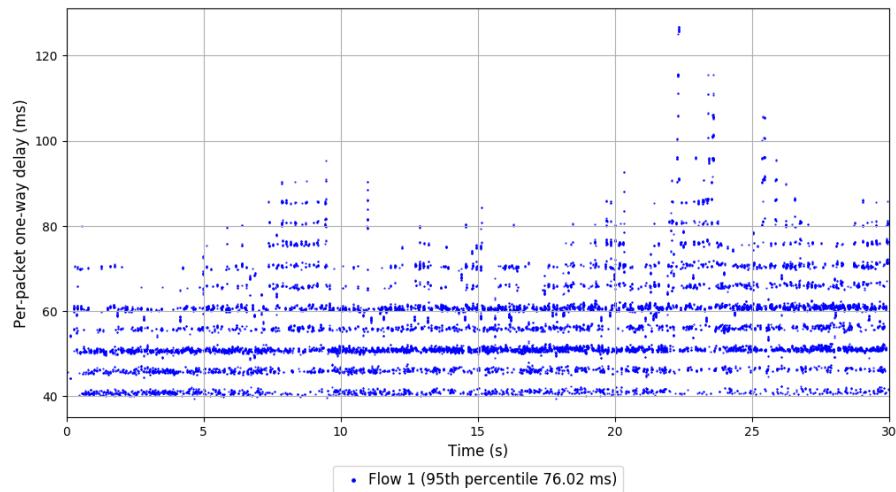
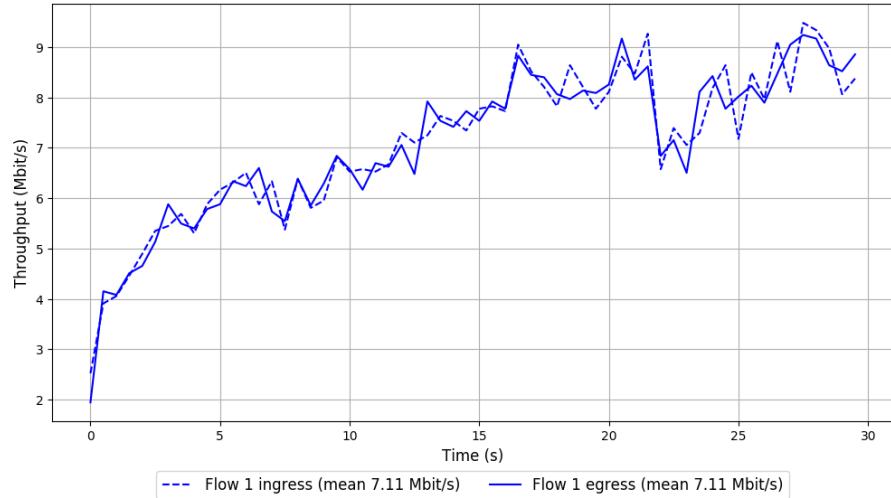


Run 3: Statistics of TCP Vegas

```
Start at: 2018-04-16 22:35:04
End at: 2018-04-16 22:35:34
Local clock offset: -10.762 ms
Remote clock offset: -14.351 ms

# Below is generated by plot.py at 2018-04-16 22:39:23
# Datalink statistics
-- Total of 1 flow:
Average throughput: 7.11 Mbit/s
95th percentile per-packet one-way delay: 76.022 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 7.11 Mbit/s
95th percentile per-packet one-way delay: 76.022 ms
Loss rate: 0.14%
```

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

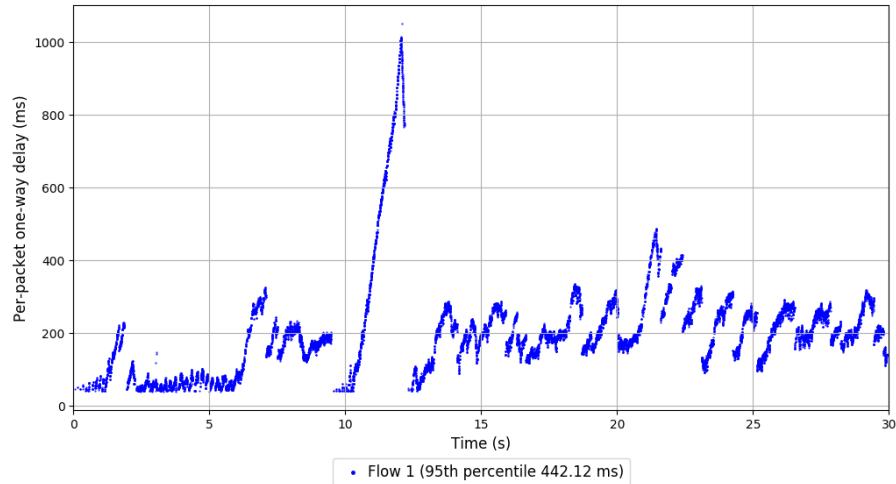
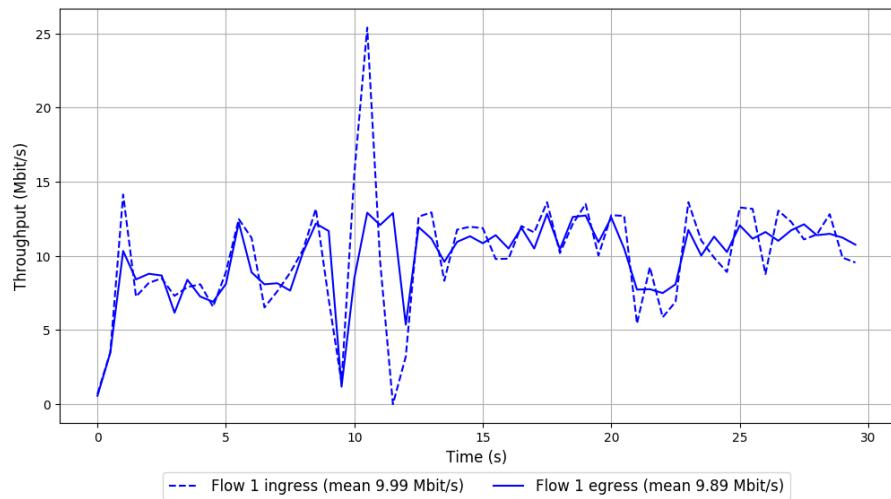


Run 1: Statistics of Verus

```
Start at: 2018-04-16 21:49:05
End at: 2018-04-16 21:49:35
Local clock offset: 0.081 ms
Remote clock offset: -9.755 ms

# Below is generated by plot.py at 2018-04-16 22:39:27
# Datalink statistics
-- Total of 1 flow:
Average throughput: 9.89 Mbit/s
95th percentile per-packet one-way delay: 442.125 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 9.89 Mbit/s
95th percentile per-packet one-way delay: 442.125 ms
Loss rate: 1.12%
```

## Run 1: Report of Verus — Data Link

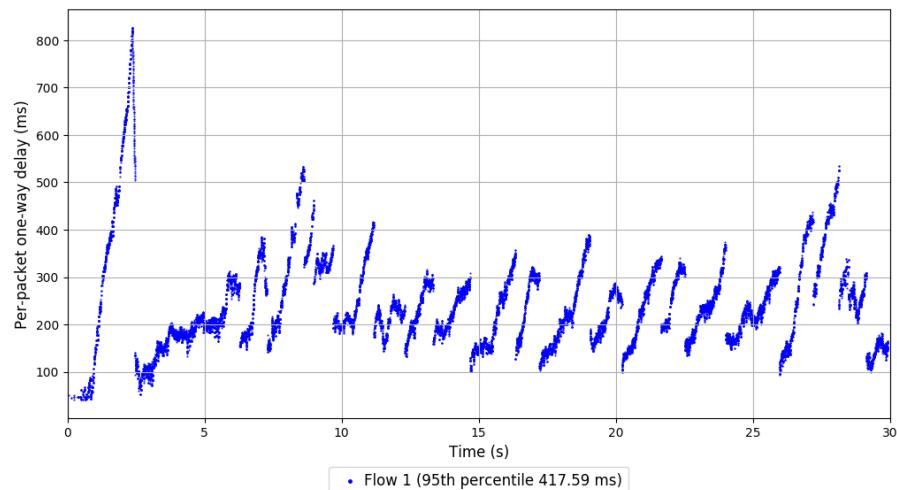
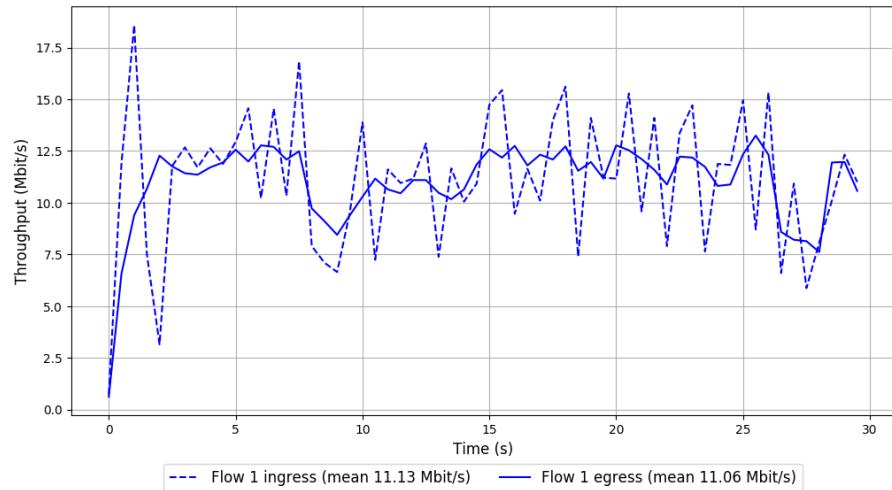


Run 2: Statistics of Verus

```
Start at: 2018-04-16 22:07:44
End at: 2018-04-16 22:08:14
Local clock offset: -2.497 ms
Remote clock offset: -8.324 ms

# Below is generated by plot.py at 2018-04-16 22:39:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.06 Mbit/s
95th percentile per-packet one-way delay: 417.589 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 11.06 Mbit/s
95th percentile per-packet one-way delay: 417.589 ms
Loss rate: 0.79%
```

## Run 2: Report of Verus — Data Link

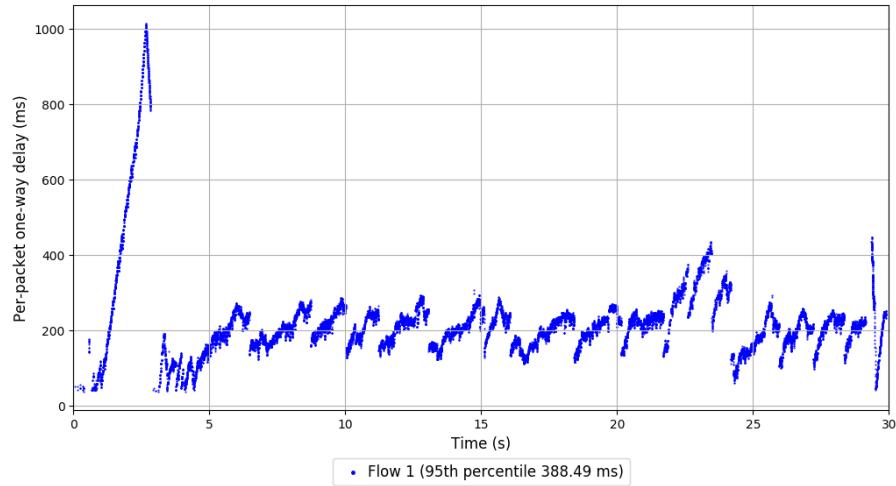
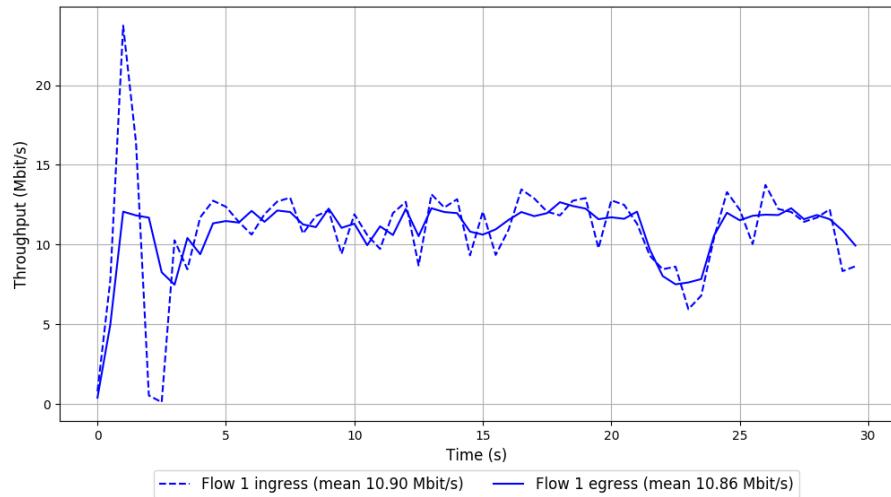


Run 3: Statistics of Verus

```
Start at: 2018-04-16 22:26:19
End at: 2018-04-16 22:26:49
Local clock offset: -4.728 ms
Remote clock offset: -8.062 ms

# Below is generated by plot.py at 2018-04-16 22:39:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.86 Mbit/s
95th percentile per-packet one-way delay: 388.491 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 10.86 Mbit/s
95th percentile per-packet one-way delay: 388.491 ms
Loss rate: 0.48%
```

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

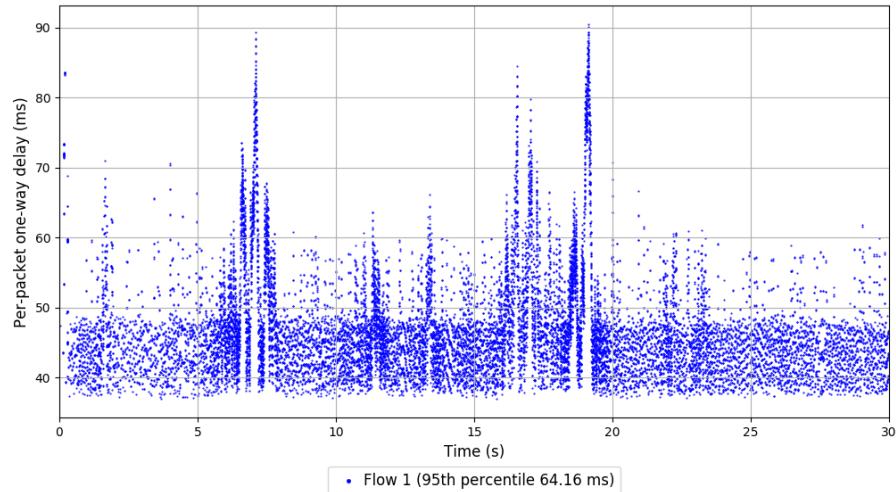
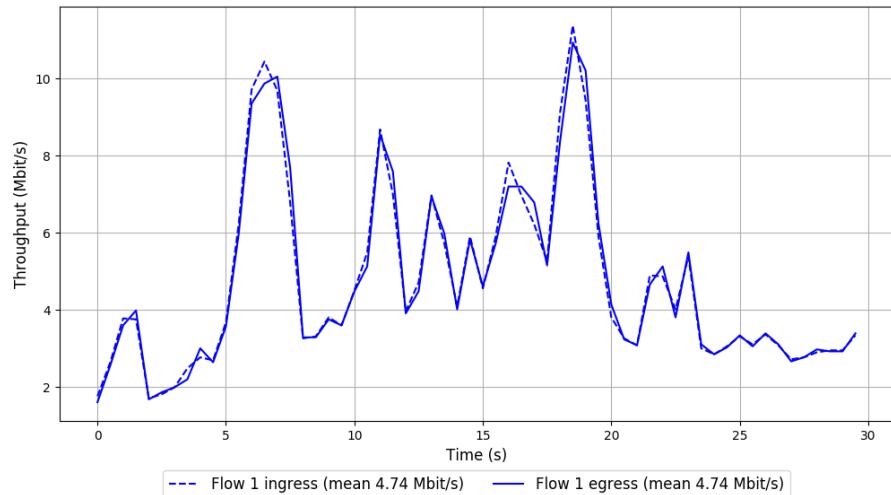


Run 1: Statistics of Copa

```
Start at: 2018-04-16 21:44:40
End at: 2018-04-16 21:45:10
Local clock offset: -0.062 ms
Remote clock offset: -10.298 ms

# Below is generated by plot.py at 2018-04-16 22:39:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.74 Mbit/s
95th percentile per-packet one-way delay: 64.160 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 4.74 Mbit/s
95th percentile per-packet one-way delay: 64.160 ms
Loss rate: 0.08%
```

## Run 1: Report of Copa — Data Link

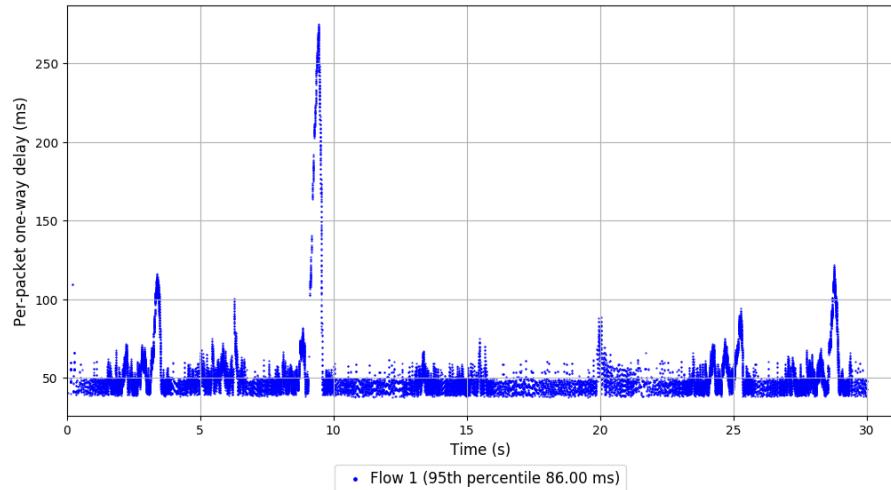
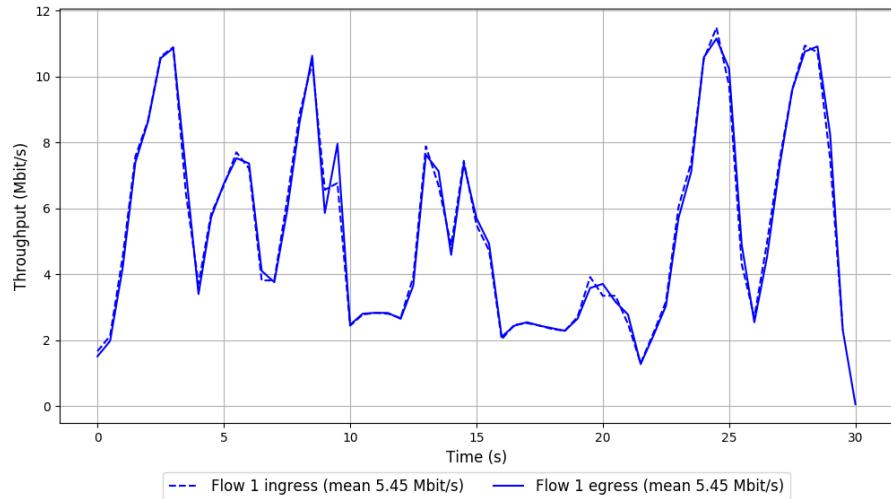


Run 2: Statistics of Copa

```
Start at: 2018-04-16 22:03:21
End at: 2018-04-16 22:03:51
Local clock offset: -0.336 ms
Remote clock offset: -7.827 ms

# Below is generated by plot.py at 2018-04-16 22:39:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 5.45 Mbit/s
95th percentile per-packet one-way delay: 85.996 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 5.45 Mbit/s
95th percentile per-packet one-way delay: 85.996 ms
Loss rate: 0.04%
```

## Run 2: Report of Copa — Data Link

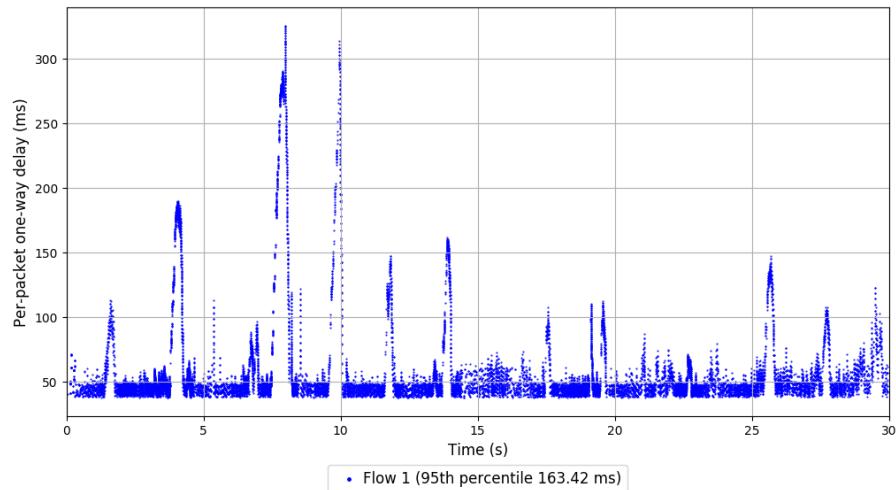
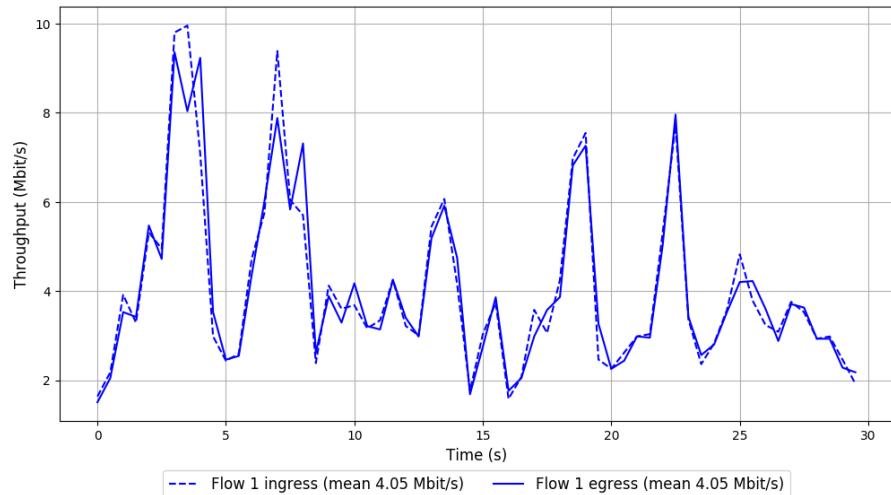


Run 3: Statistics of Copa

```
Start at: 2018-04-16 22:21:57
End at: 2018-04-16 22:22:27
Local clock offset: -4.723 ms
Remote clock offset: -8.222 ms

# Below is generated by plot.py at 2018-04-16 22:39:35
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.05 Mbit/s
95th percentile per-packet one-way delay: 163.424 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 4.05 Mbit/s
95th percentile per-packet one-way delay: 163.424 ms
Loss rate: 0.16%
```

### Run 3: Report of Copa — Data Link

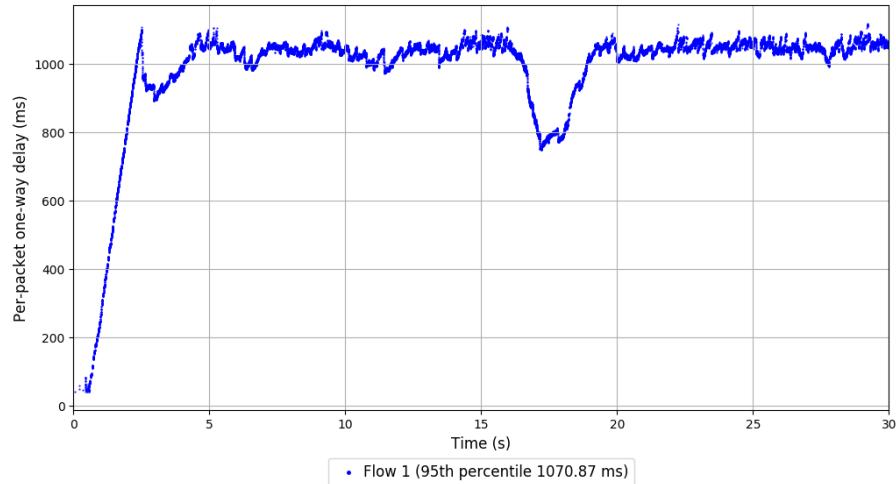
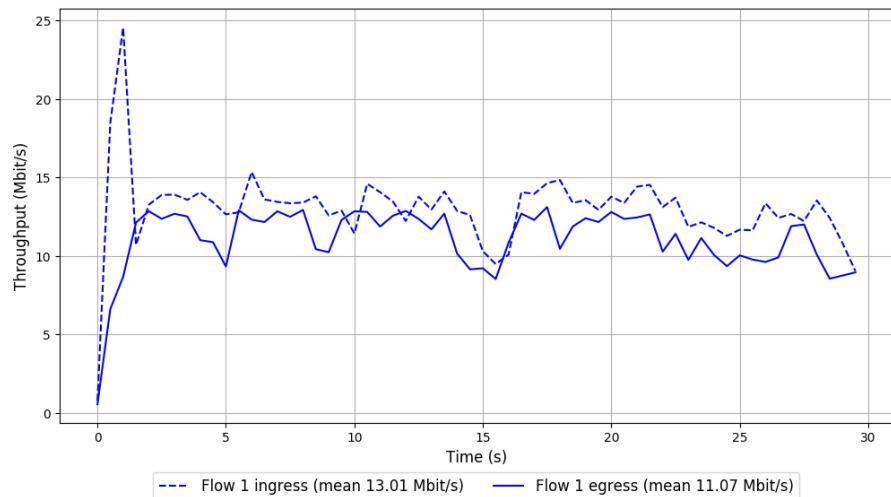


```
Run 1: Statistics of FillP
```

```
Start at: 2018-04-16 21:53:27
End at: 2018-04-16 21:53:57
Local clock offset: 1.397 ms
Remote clock offset: -8.946 ms

# Below is generated by plot.py at 2018-04-16 22:39:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 11.07 Mbit/s
95th percentile per-packet one-way delay: 1070.866 ms
Loss rate: 15.02%
-- Flow 1:
Average throughput: 11.07 Mbit/s
95th percentile per-packet one-way delay: 1070.866 ms
Loss rate: 15.02%
```

## Run 1: Report of FillP — Data Link

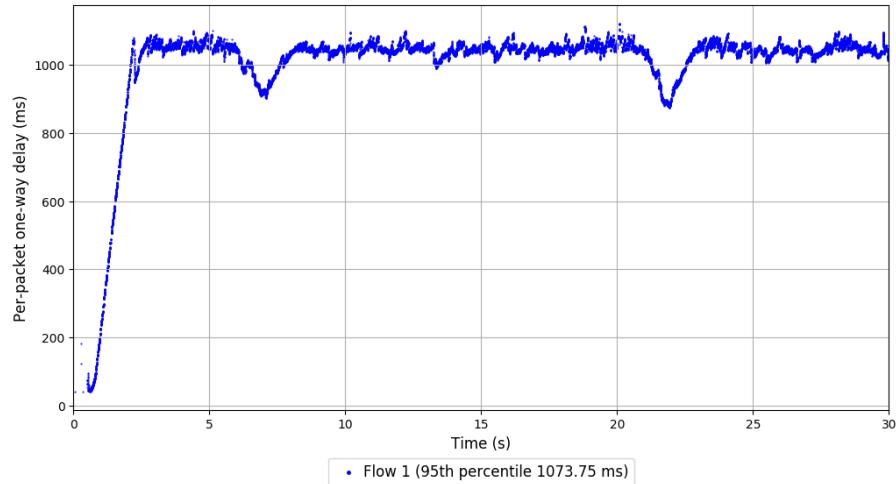
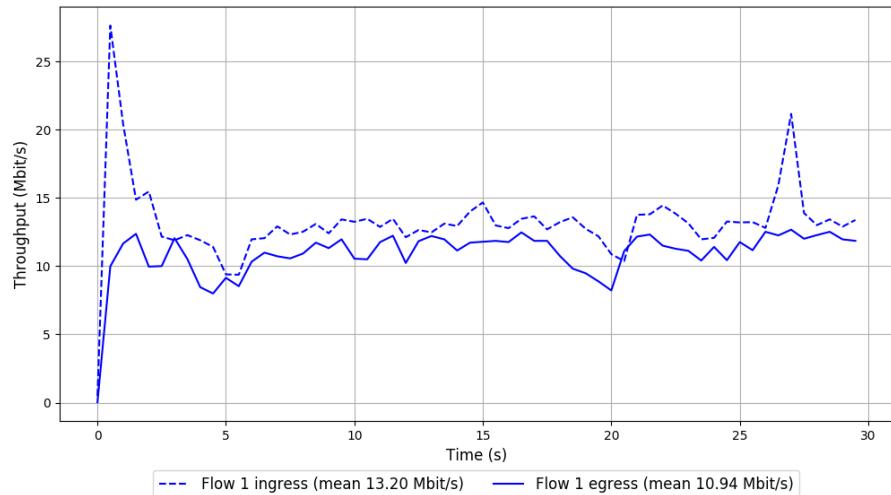


Run 2: Statistics of FillP

```
Start at: 2018-04-16 22:12:07
End at: 2018-04-16 22:12:37
Local clock offset: -3.92 ms
Remote clock offset: -7.42 ms

# Below is generated by plot.py at 2018-04-16 22:39:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.94 Mbit/s
95th percentile per-packet one-way delay: 1073.749 ms
Loss rate: 17.19%
-- Flow 1:
Average throughput: 10.94 Mbit/s
95th percentile per-packet one-way delay: 1073.749 ms
Loss rate: 17.19%
```

## Run 2: Report of FillP — Data Link

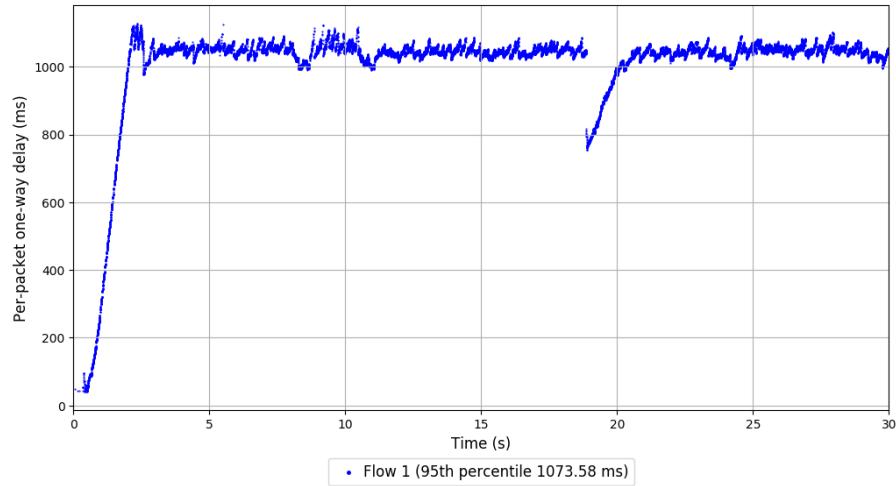
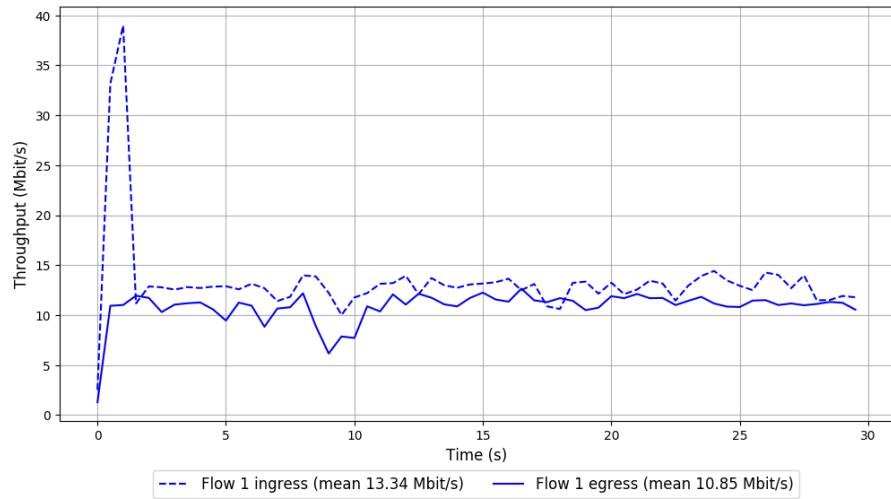


Run 3: Statistics of FillP

```
Start at: 2018-04-16 22:30:41
End at: 2018-04-16 22:31:11
Local clock offset: -5.444 ms
Remote clock offset: -7.873 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.85 Mbit/s
95th percentile per-packet one-way delay: 1073.576 ms
Loss rate: 18.78%
-- Flow 1:
Average throughput: 10.85 Mbit/s
95th percentile per-packet one-way delay: 1073.576 ms
Loss rate: 18.78%
```

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

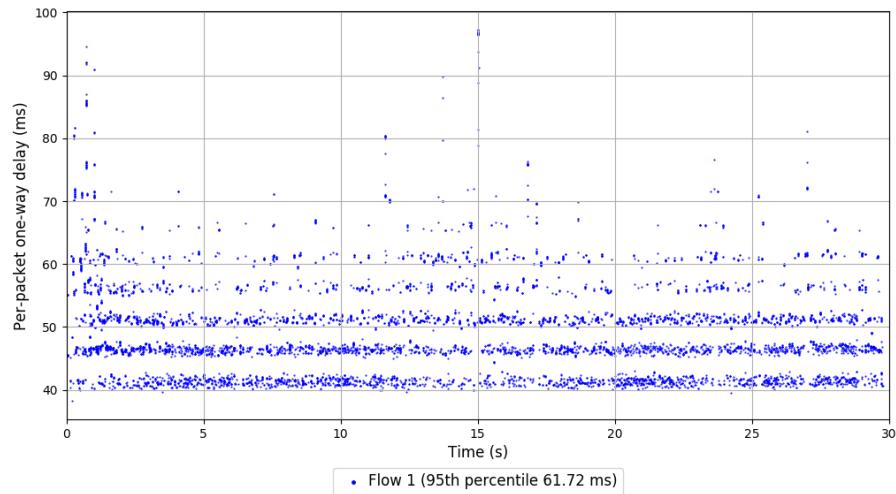
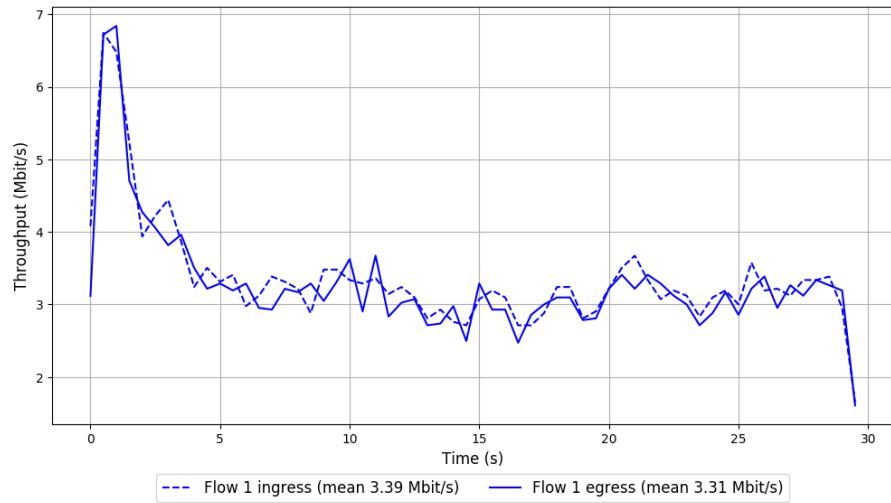


```
Run 1: Statistics of Indigo-1-32
```

```
Start at: 2018-04-16 21:52:22
End at: 2018-04-16 21:52:52
Local clock offset: 1.787 ms
Remote clock offset: -9.006 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 61.721 ms
Loss rate: 2.50%
-- Flow 1:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 61.721 ms
Loss rate: 2.50%
```

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

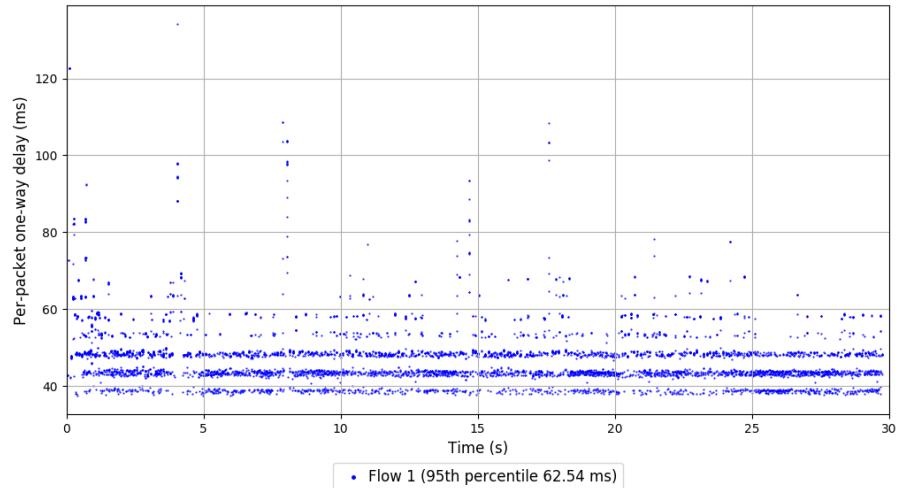
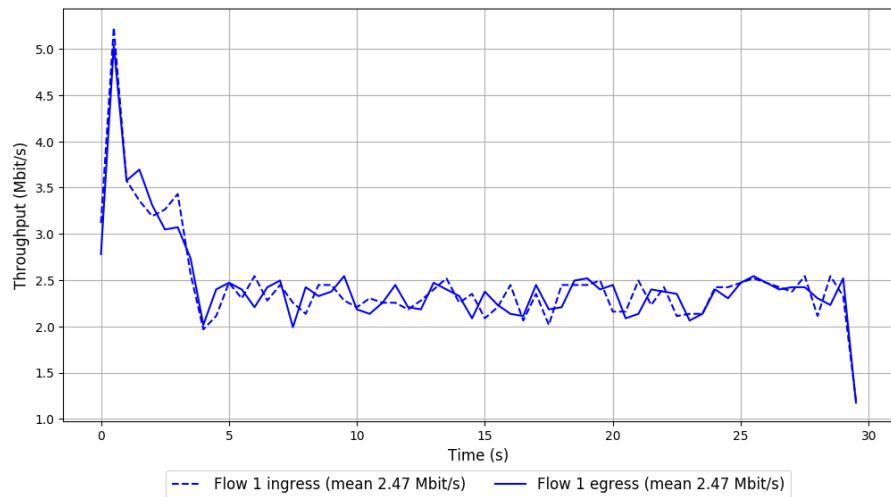


Run 2: Statistics of Indigo-1-32

```
Start at: 2018-04-16 22:11:01
End at: 2018-04-16 22:11:31
Local clock offset: -3.023 ms
Remote clock offset: -7.389 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 62.539 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 62.539 ms
Loss rate: 0.23%
```

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

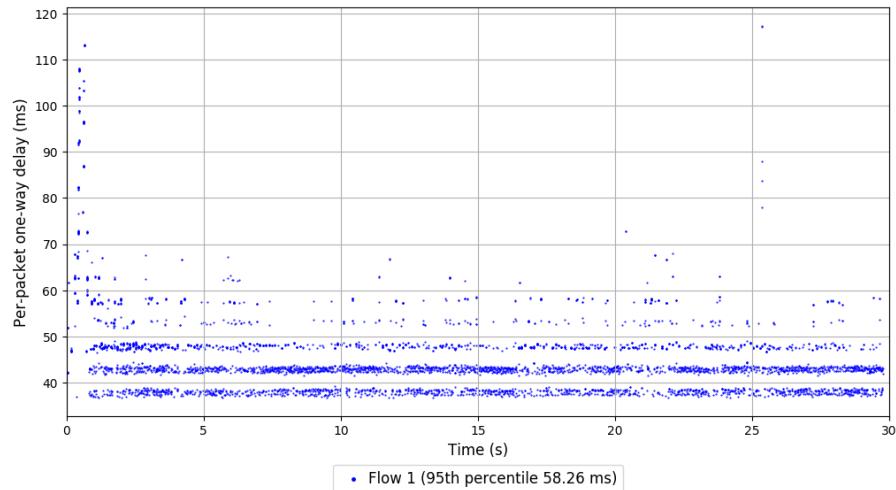
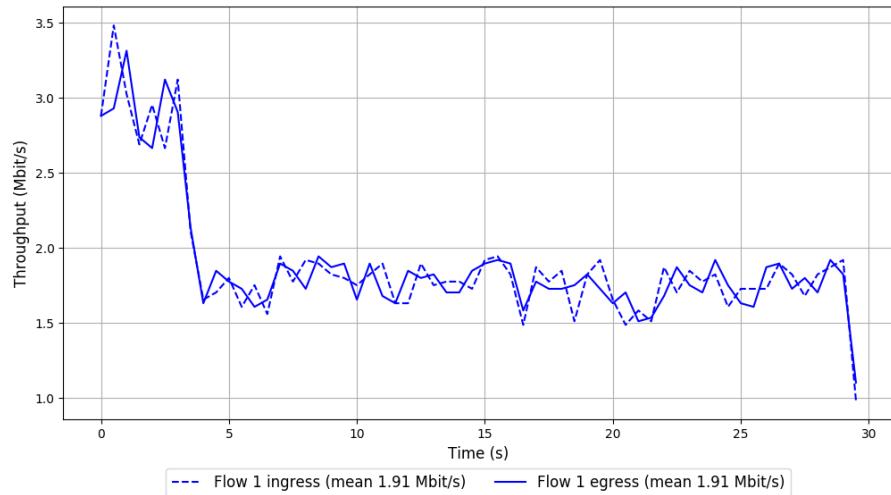


Run 3: Statistics of Indigo-1-32

```
Start at: 2018-04-16 22:29:36
End at: 2018-04-16 22:30:06
Local clock offset: -4.104 ms
Remote clock offset: -7.991 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 58.262 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 58.262 ms
Loss rate: 0.11%
```

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

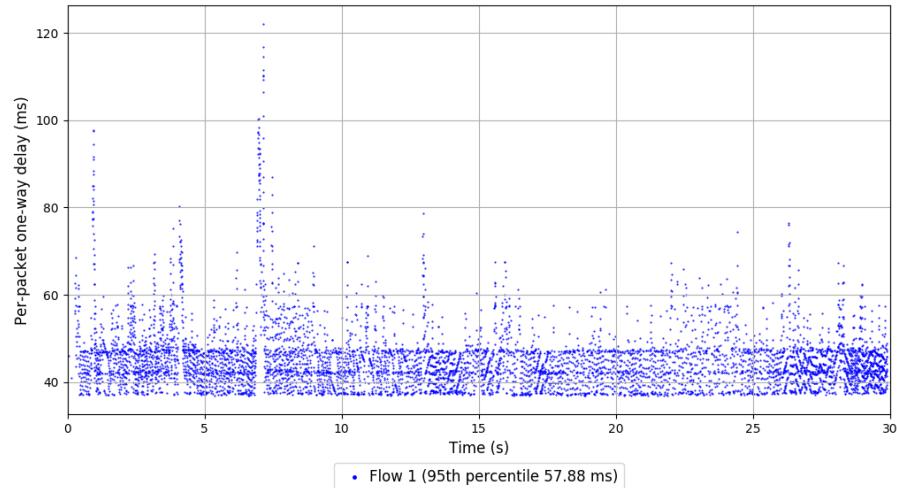
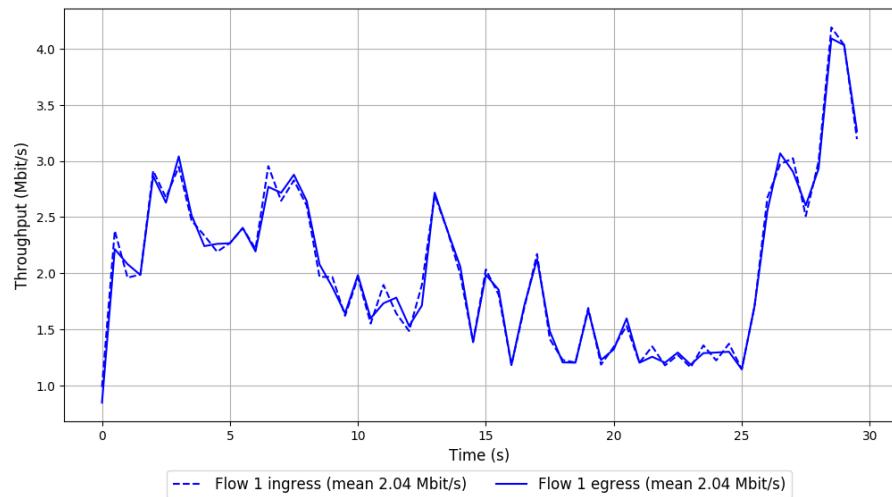


```
Run 1: Statistics of PCC-Vivace
```

```
Start at: 2018-04-16 21:54:33
End at: 2018-04-16 21:55:03
Local clock offset: 1.612 ms
Remote clock offset: -9.589 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 57.884 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 57.884 ms
Loss rate: 0.25%
```

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

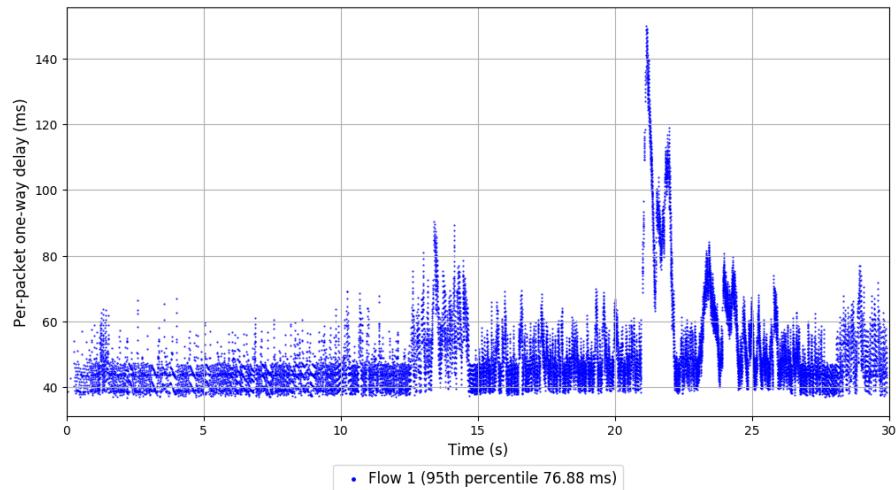
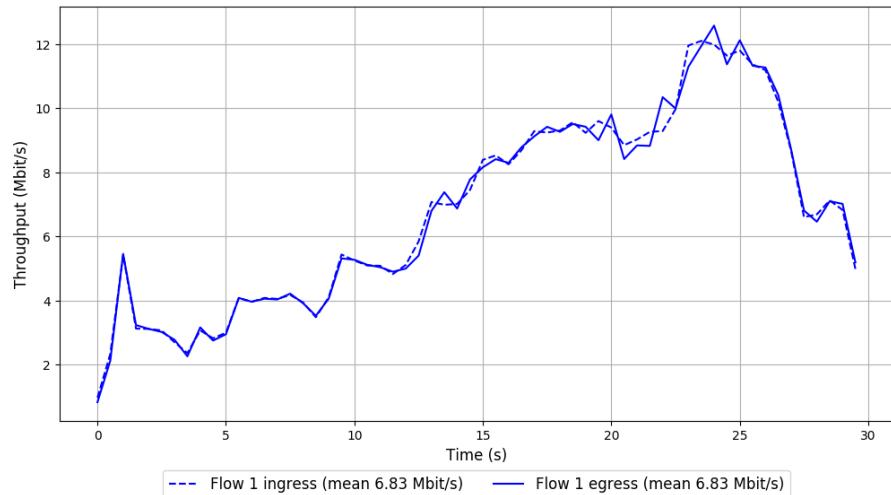


Run 2: Statistics of PCC-Vivace

```
Start at: 2018-04-16 22:13:13
End at: 2018-04-16 22:13:43
Local clock offset: -3.532 ms
Remote clock offset: -8.051 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 6.83 Mbit/s
95th percentile per-packet one-way delay: 76.881 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 6.83 Mbit/s
95th percentile per-packet one-way delay: 76.881 ms
Loss rate: 0.10%
```

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

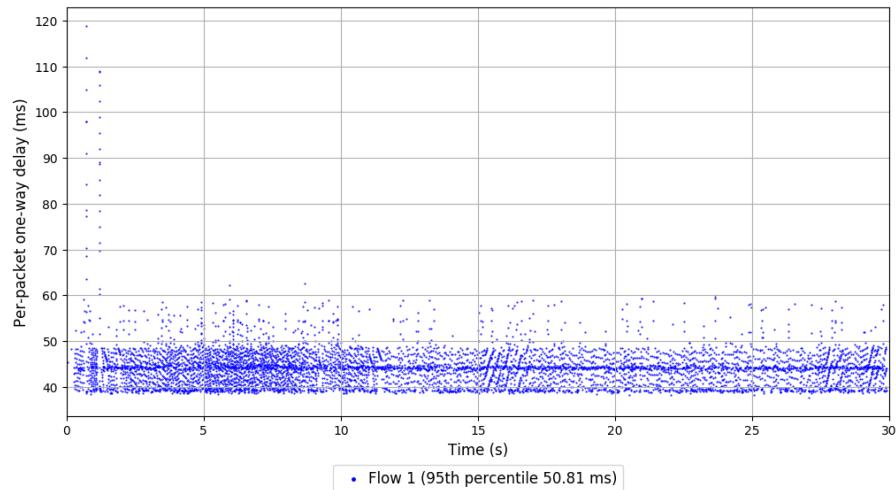
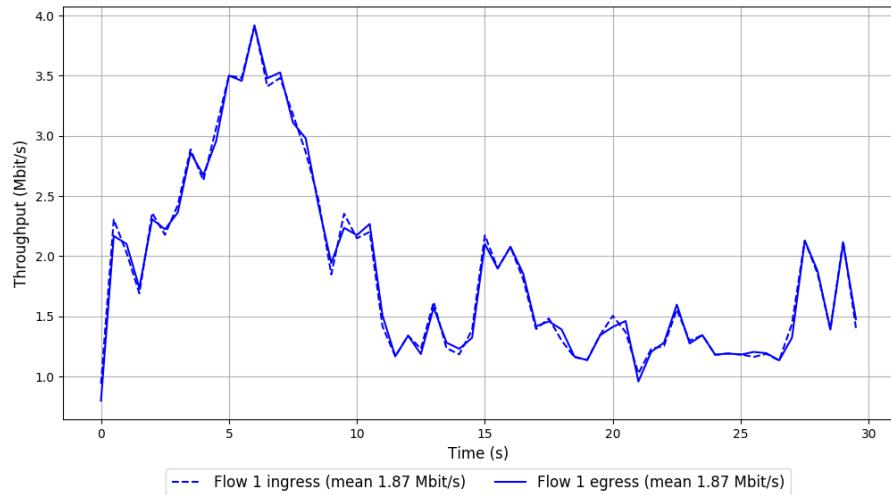


Run 3: Statistics of PCC-Vivace

```
Start at: 2018-04-16 22:31:48
End at: 2018-04-16 22:32:18
Local clock offset: -5.112 ms
Remote clock offset: -8.416 ms

# Below is generated by plot.py at 2018-04-16 22:39:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 50.807 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 50.807 ms
Loss rate: 0.10%
```

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



Run 1: Statistics of PCC-Expr

Start at: 2018-04-16 21:43:35

End at: 2018-04-16 21:44:05

Local clock offset: -0.5 ms

Remote clock offset: -9.823 ms

Run 1: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of PCC-Expr

Start at: 2018-04-16 22:02:16  
End at: 2018-04-16 22:02:46  
Local clock offset: 1.754 ms  
Remote clock offset: -8.695 ms

Run 2: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of PCC-Expr

Start at: 2018-04-16 22:20:52

End at: 2018-04-16 22:21:22

Local clock offset: -4.044 ms

Remote clock offset: -8.206 ms

Run 3: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing