

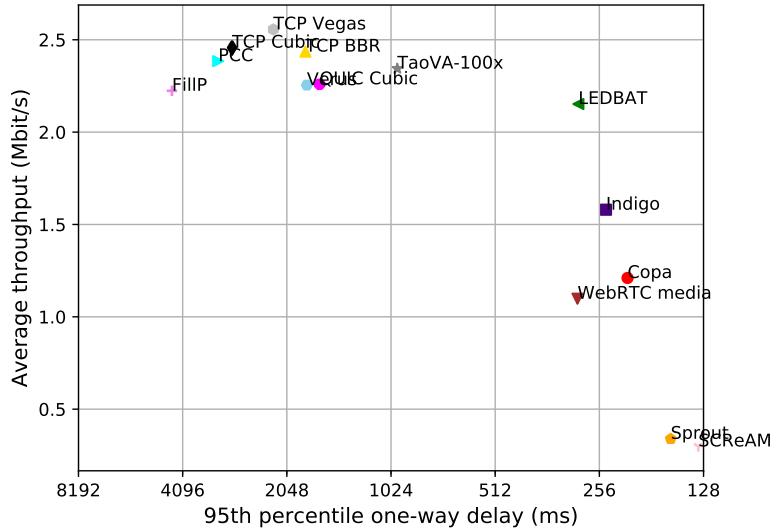
## Pantheon Report

Generated at 2018-01-10 16:37:09 (UTC).  
Data path: AWS Brazil 2 Ethernet (*local*) → Colombia ppp0 (*remote*).  
Repeated the test of 14 congestion control schemes 3 times.  
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.  
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 `gps.ntp.br` and have been applied to correct the timestamps in logs.

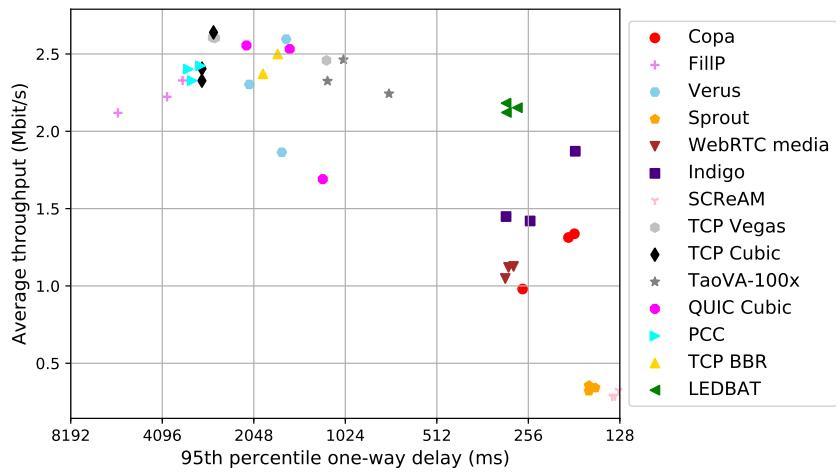
### Git summary:

```
branch: master @ 56d1792c316a5efca3f2d21342905405fedffb48
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ ec9585325218d5048c4d4152fa42240af54c6e67
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ 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/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme  
 3 flows with 10s interval between flows (mean of all runs by scheme)



test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme  
 3 flows with 10s interval between flows



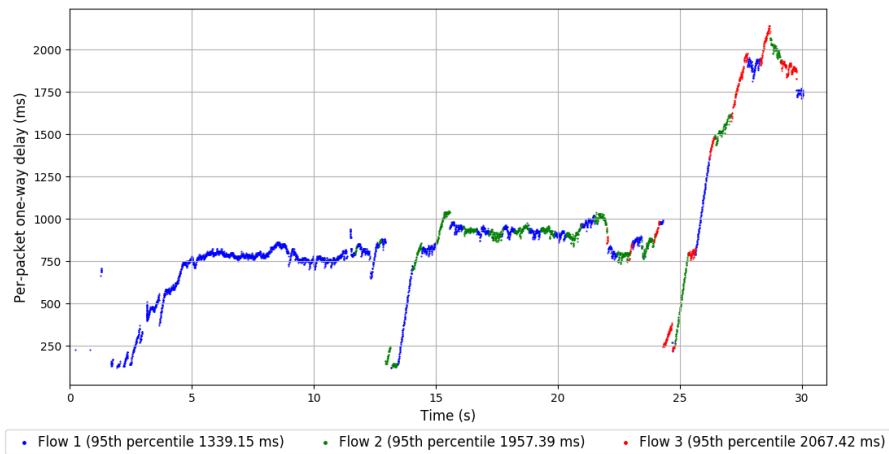
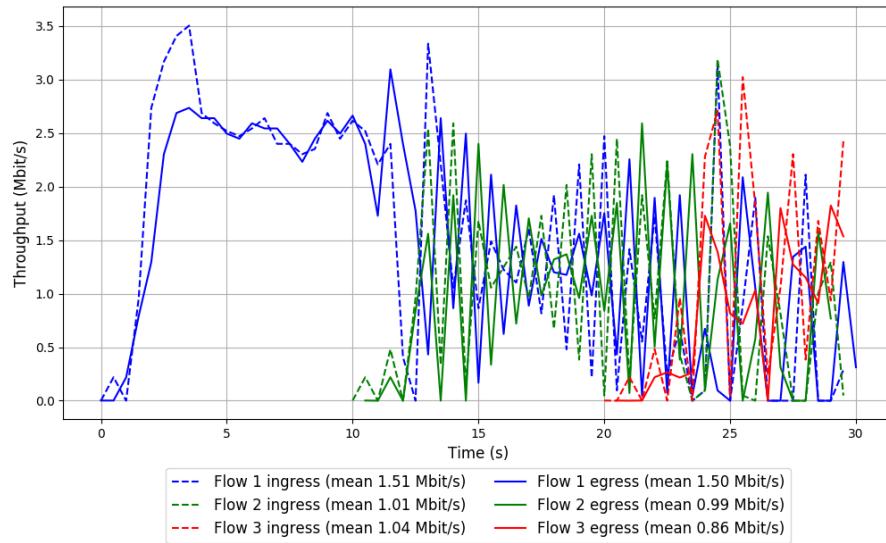
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	1.65	0.85	0.86	1514.63	1813.23	1933.50	1.90	5.77	23.19
TCP Cubic		2.37	0.12	0.10	2948.64	2985.89	2857.29	12.71	27.73	34.59
LEDBAT		1.59	0.58	0.43	288.80	293.04	311.88	0.49	0.68	2.41
PCC		1.50	1.41	0.00	3187.98	3268.79	3129.08	52.50	88.71	4.60
QUIC Cubic		1.42	1.19	0.26	1275.22	1663.99	1678.46	3.26	9.18	23.63
SCReAM		0.08	0.21	0.19	130.12	133.33	132.70	0.13	0.06	0.33
WebRTC media		0.61	0.36	0.14	249.25	331.08	357.93	0.12	0.39	2.06
Sprout		0.16	0.16	0.21	164.34	152.35	156.43	0.18	0.02	0.05
TaoVA-100x		1.28	1.13	0.90	706.01	1039.32	1092.97	0.90	2.03	2.23
TCP Vegas		1.98	0.77	0.30	2126.80	2203.05	1833.16	7.02	10.60	38.24
Verus		2.24	0.01	0.01	1792.31	1813.81	1738.93	5.11	6.20	12.22
Copa		0.05	1.38	0.80	2974.38	204.74	236.02	0.00	0.21	0.81
FillP		1.87	0.64	0.13	4425.77	3320.47	3189.08	94.61	99.44	99.89
Indigo		0.78	0.83	0.71	245.94	257.98	209.48	0.05	0.12	0.94

Run 1: Statistics of TCP BBR

```
Start at: 2018-01-10 15:44:26
End at: 2018-01-10 15:44:56
Local clock offset: 1.394 ms
Remote clock offset: 0.166 ms

# Below is generated by plot.py at 2018-01-10 16:36:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 1910.592 ms
Loss rate: 5.71%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1339.155 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 1957.388 ms
Loss rate: 5.99%
-- Flow 3:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 2067.420 ms
Loss rate: 26.36%
```

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



Run 2: Statistics of TCP BBR

Start at: 2018-01-10 15:59:50  
End at: 2018-01-10 16:00:20  
Local clock offset: 2.338 ms

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

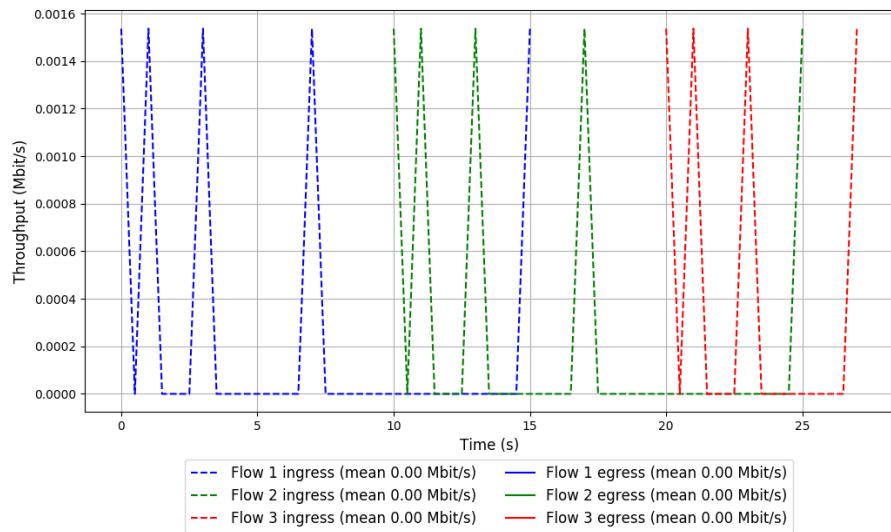


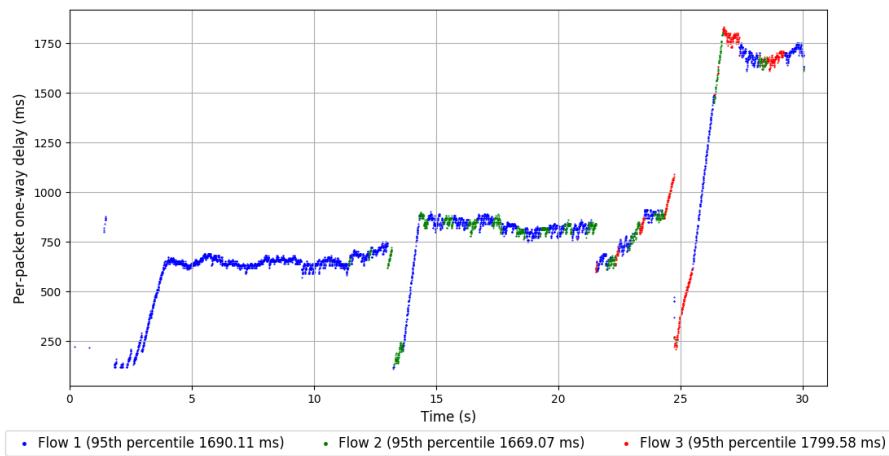
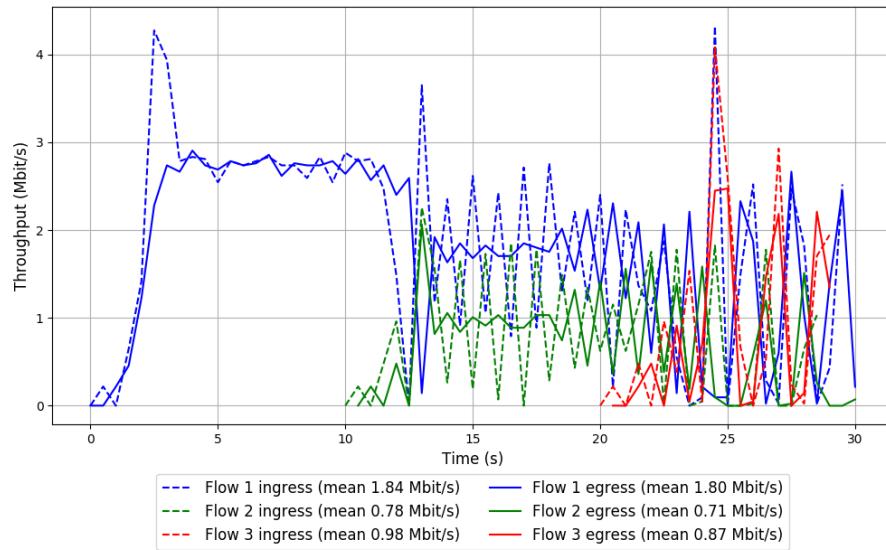
Figure is missing

Run 3: Statistics of TCP BBR

```
Start at: 2018-01-10 16:18:20
End at: 2018-01-10 16:18:50
Local clock offset: 2.906 ms
Remote clock offset: -3.13 ms

# Below is generated by plot.py at 2018-01-10 16:36:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 1709.108 ms
Loss rate: 5.39%
-- Flow 1:
Average throughput: 1.80 Mbit/s
95th percentile per-packet one-way delay: 1690.113 ms
Loss rate: 2.92%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 1669.067 ms
Loss rate: 5.54%
-- Flow 3:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 1799.581 ms
Loss rate: 20.02%
```

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

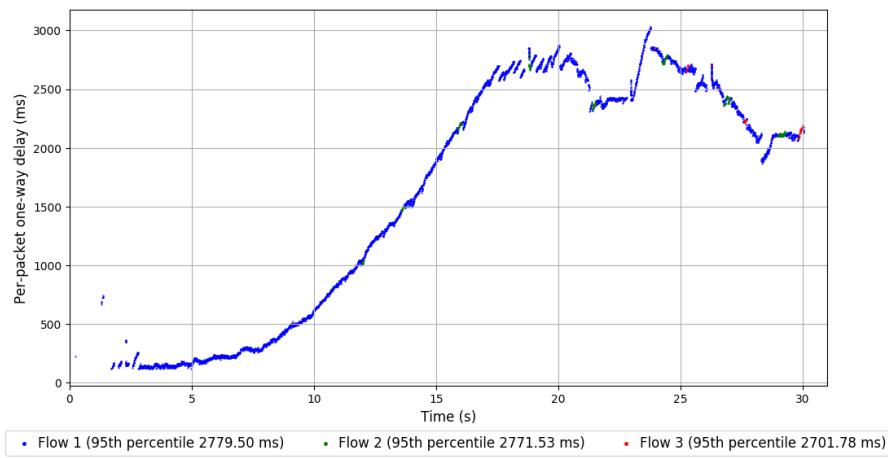
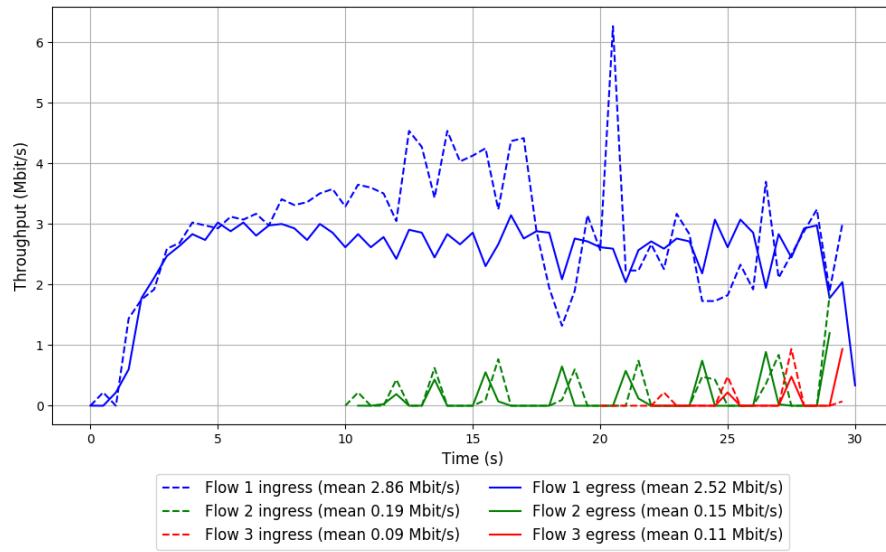


```
Run 1: Statistics of TCP Cubic

Start at: 2018-01-10 15:53:44
End at: 2018-01-10 15:54:14
Local clock offset: 1.978 ms

# Below is generated by plot.py at 2018-01-10 16:36:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.64 Mbit/s
95th percentile per-packet one-way delay: 2778.801 ms
Loss rate: 12.94%
-- Flow 1:
Average throughput: 2.52 Mbit/s
95th percentile per-packet one-way delay: 2779.496 ms
Loss rate: 12.41%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 2771.534 ms
Loss rate: 27.13%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 2701.775 ms
Loss rate: 4.20%
```

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

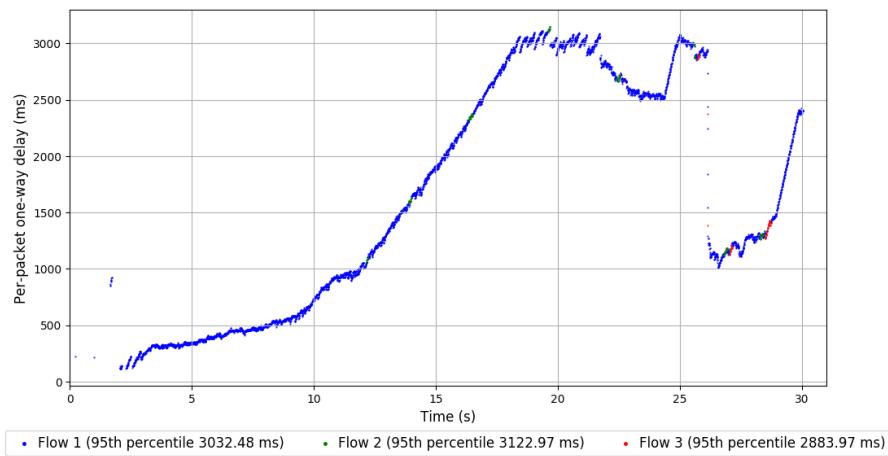
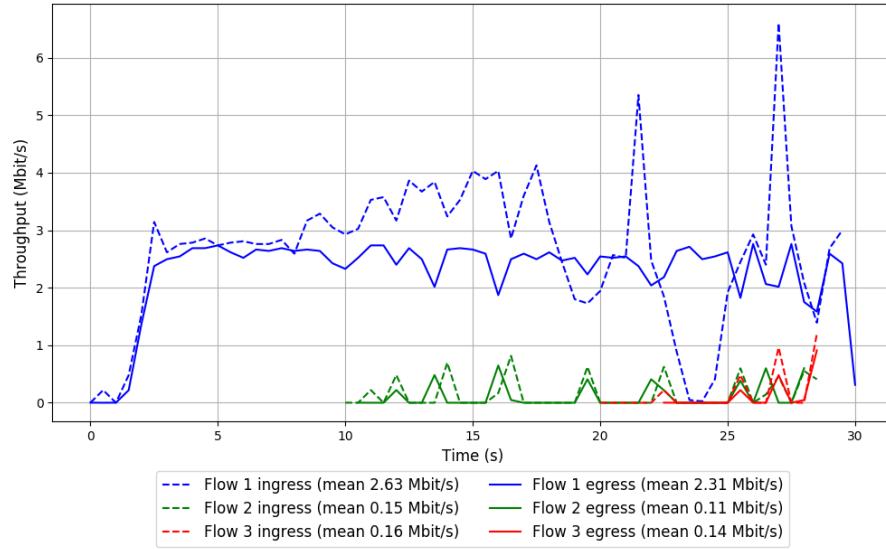


Run 2: Statistics of TCP Cubic

```
Start at: 2018-01-10 16:10:48
End at: 2018-01-10 16:11:18
Local clock offset: 2.699 ms
Remote clock offset: -4.026 ms

# Below is generated by plot.py at 2018-01-10 16:36:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 3032.607 ms
Loss rate: 13.84%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 3032.480 ms
Loss rate: 12.71%
-- Flow 2:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 3122.973 ms
Loss rate: 30.66%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 2883.972 ms
Loss rate: 41.88%
```

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

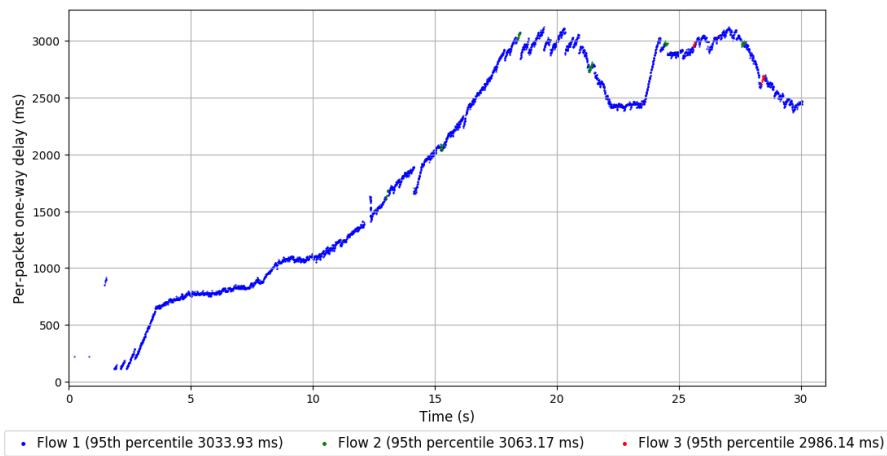
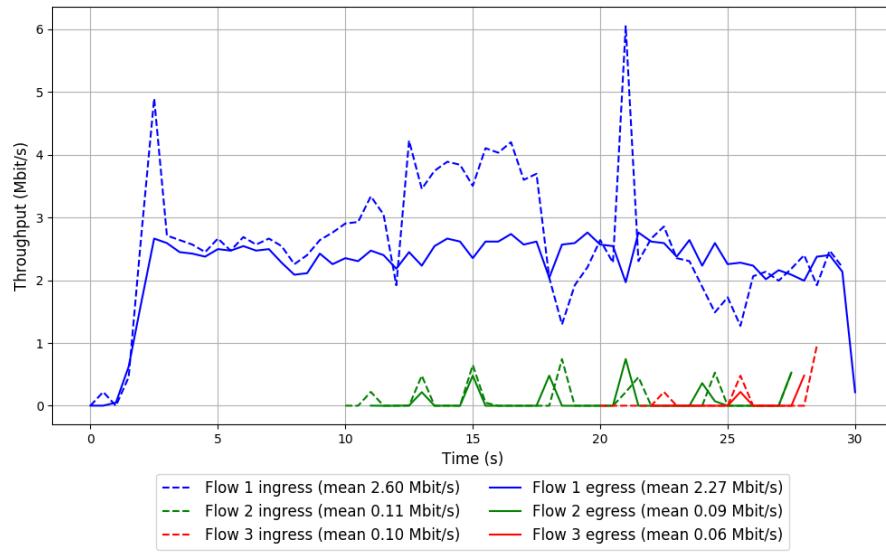


Run 3: Statistics of TCP Cubic

```
Start at: 2018-01-10 16:29:34
End at: 2018-01-10 16:30:04
Local clock offset: 3.162 ms
Remote clock offset: 1.046 ms

# Below is generated by plot.py at 2018-01-10 16:36:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 3034.010 ms
Loss rate: 13.78%
-- Flow 1:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 3033.935 ms
Loss rate: 13.02%
-- Flow 2:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 3063.170 ms
Loss rate: 25.41%
-- Flow 3:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 2986.136 ms
Loss rate: 57.70%
```

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

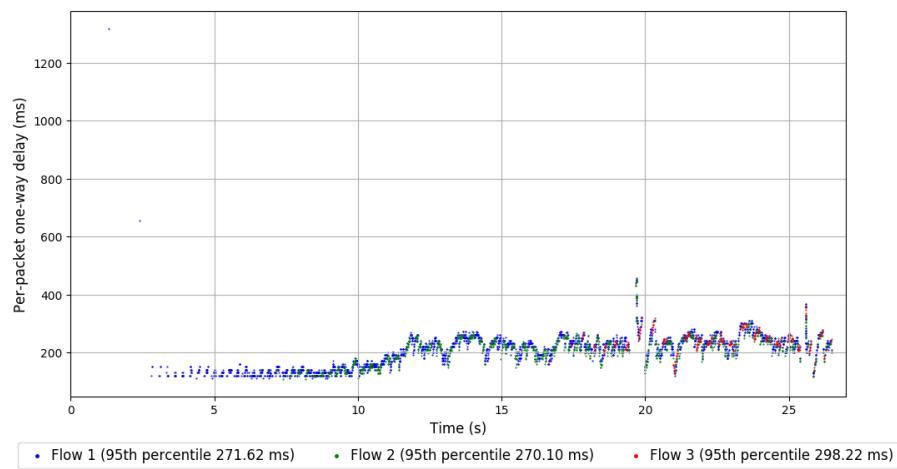
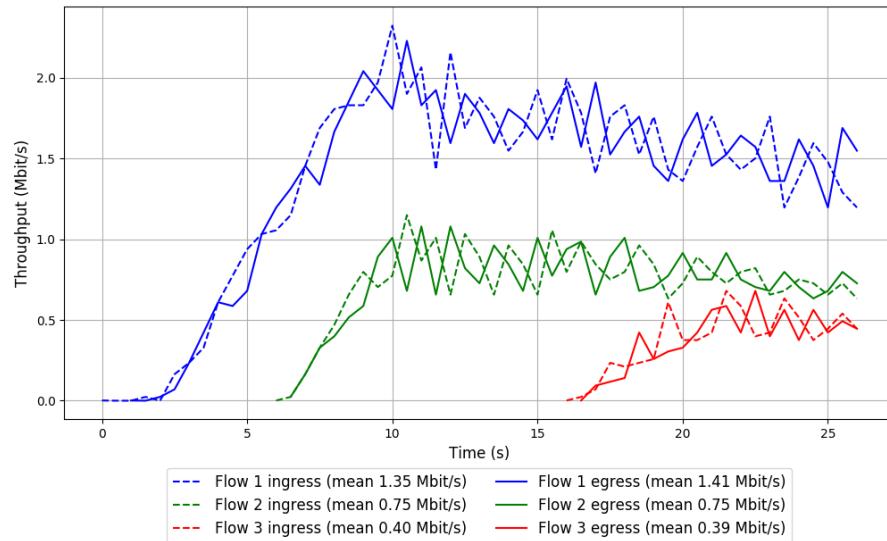


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-01-10 15:43:11
End at: 2018-01-10 15:43:41
Local clock offset: 1.412 ms
Remote clock offset: -4.6 ms

# Below is generated by plot.py at 2018-01-10 16:36:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 278.136 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 271.619 ms
Loss rate: 0.36%
-- Flow 2:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 270.102 ms
Loss rate: 0.78%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 298.220 ms
Loss rate: 3.28%
```

Run 1: Report of LEDBAT — Data Link

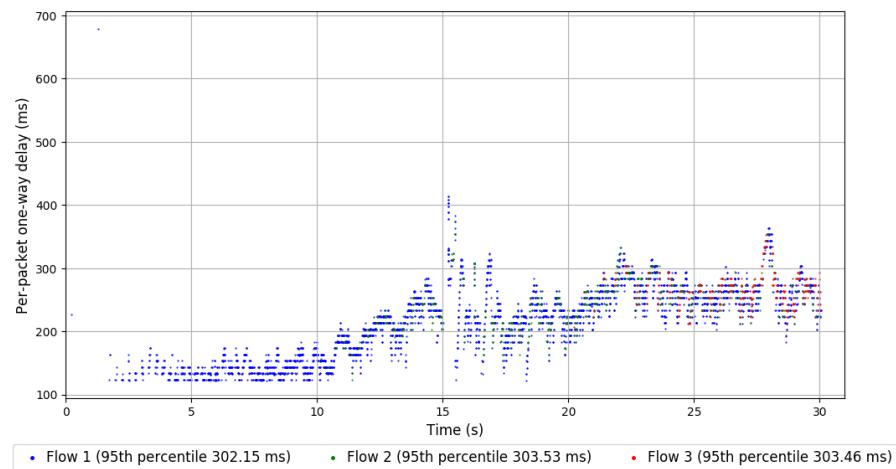
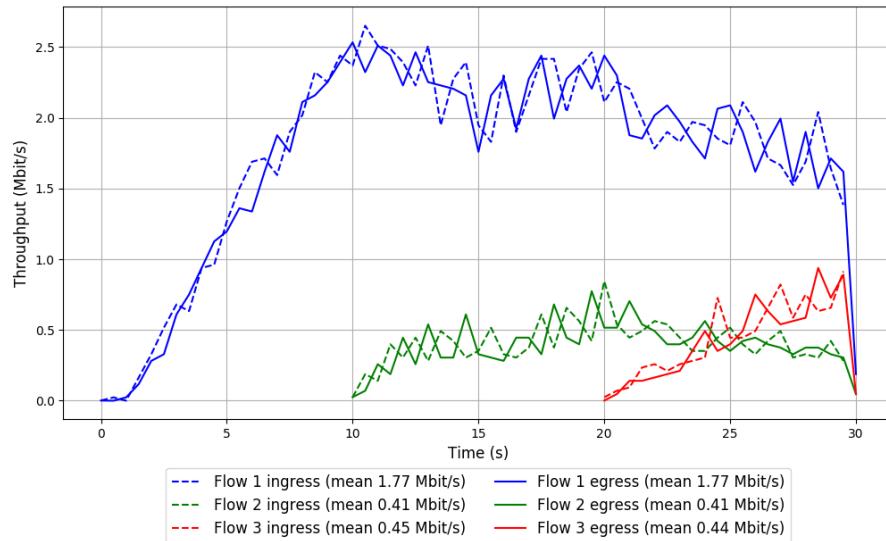


```
Run 2: Statistics of LEDBAT
```

```
Start at: 2018-01-10 15:58:49
End at: 2018-01-10 15:59:19
Local clock offset: 2.21 ms

# Below is generated by plot.py at 2018-01-10 16:36:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 303.007 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 1.77 Mbit/s
95th percentile per-packet one-way delay: 302.155 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 303.534 ms
Loss rate: 0.86%
-- Flow 3:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 303.463 ms
Loss rate: 2.38%
```

Run 2: Report of LEDBAT — Data Link

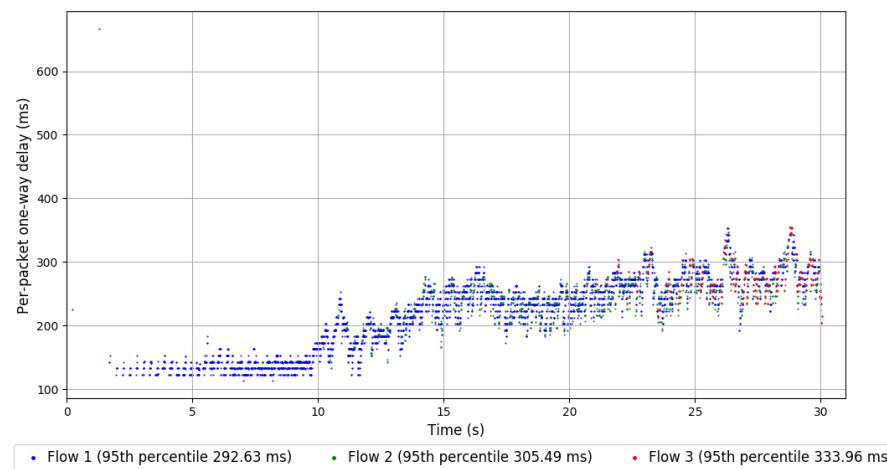
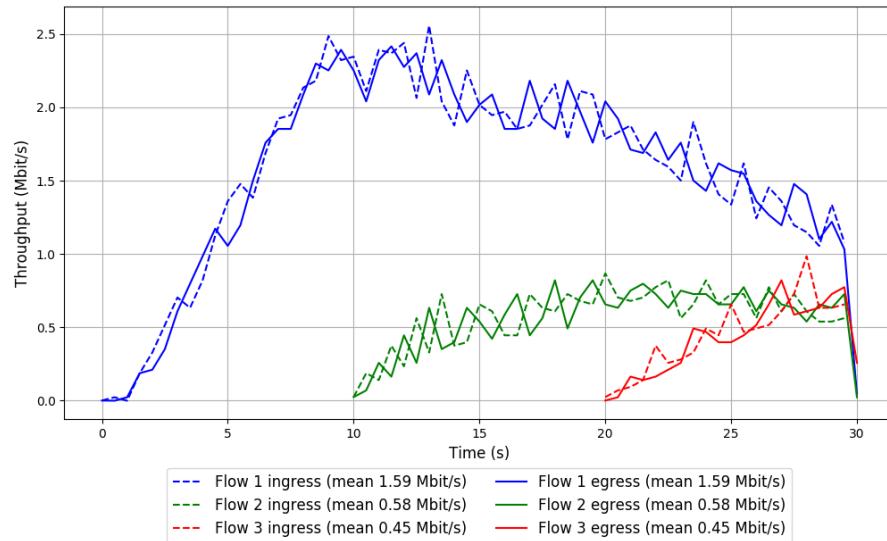


Run 3: Statistics of LEDBAT

```
Start at: 2018-01-10 16:17:05
End at: 2018-01-10 16:17:35
Local clock offset: 2.886 ms
Remote clock offset: 1.366 ms

# Below is generated by plot.py at 2018-01-10 16:36:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 302.299 ms
Loss rate: 0.57%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 292.627 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 305.485 ms
Loss rate: 0.40%
-- Flow 3:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 333.962 ms
Loss rate: 1.58%
```

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

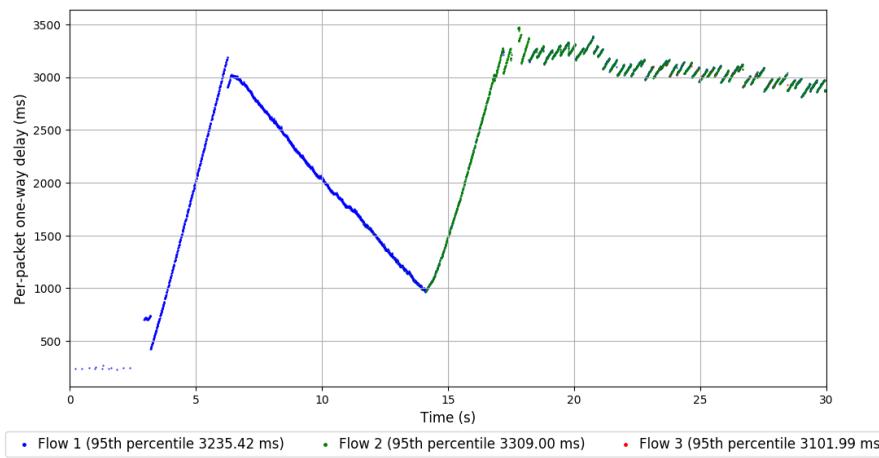
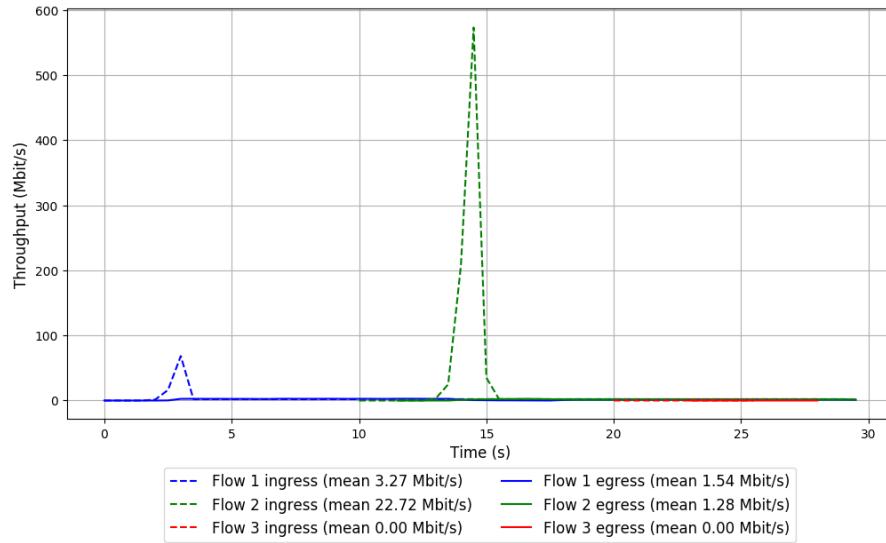


```
Run 1: Statistics of PCC

Start at: 2018-01-10 15:51:42
End at: 2018-01-10 15:52:12
Local clock offset: 1.882 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 3264.852 ms
Loss rate: 87.40%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 3235.423 ms
Loss rate: 53.31%
-- Flow 2:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 3309.004 ms
Loss rate: 94.79%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 3101.987 ms
Loss rate: 9.20%
```

## Run 1: Report of PCC — Data Link

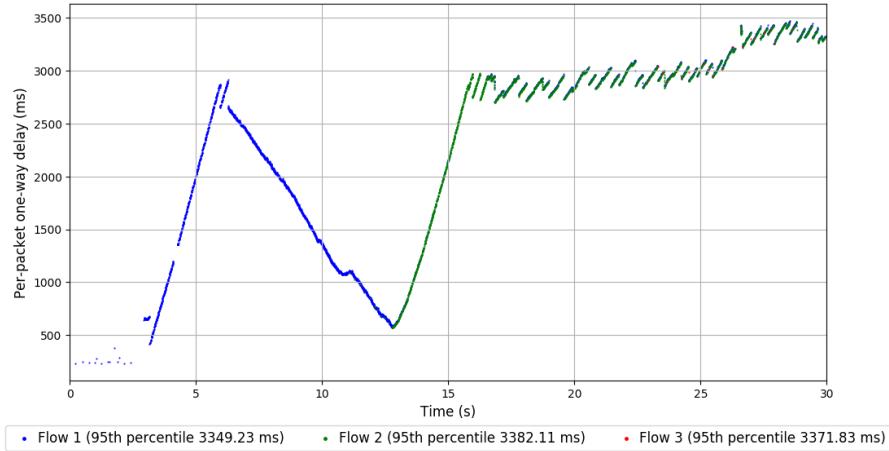
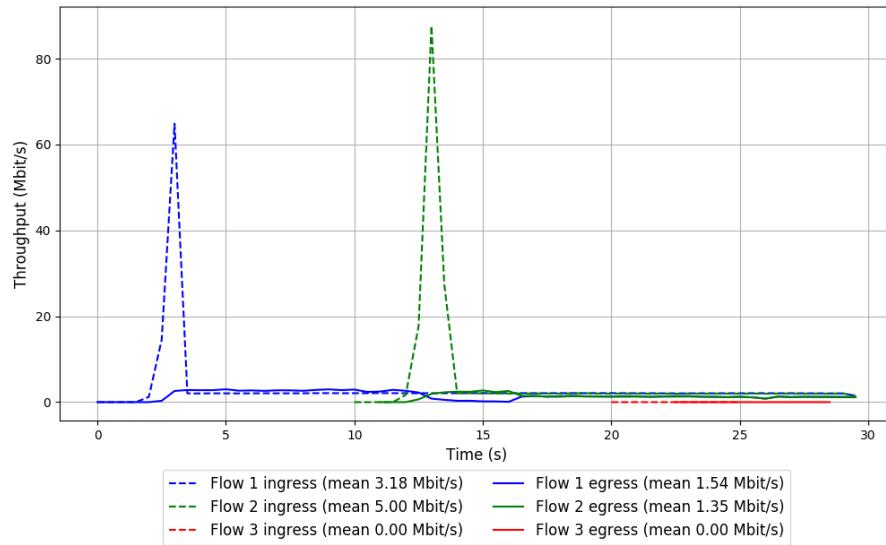


Run 2: Statistics of PCC

```
Start at: 2018-01-10 16:08:18
End at: 2018-01-10 16:08:48
Local clock offset: 2.704 ms
Remote clock offset: -4.077 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 3362.289 ms
Loss rate: 63.26%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 3349.234 ms
Loss rate: 51.73%
-- Flow 2:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 3382.111 ms
Loss rate: 74.32%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 3371.828 ms
Loss rate: 0.00%
```

## Run 2: Report of PCC — Data Link

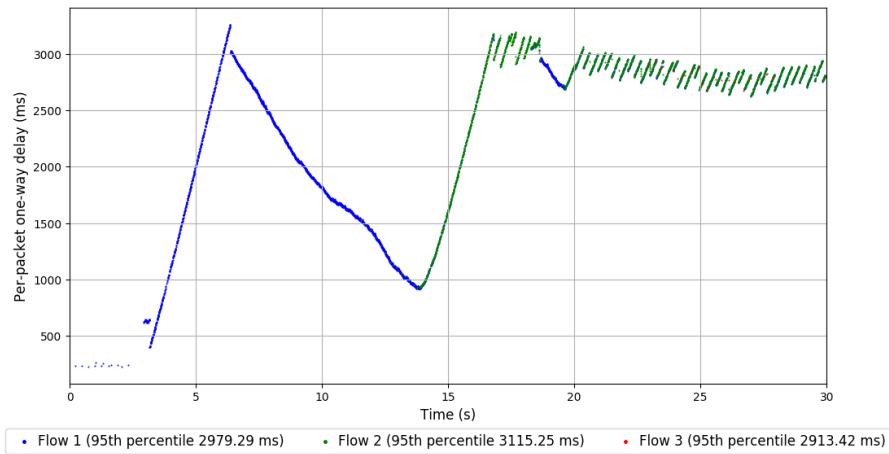
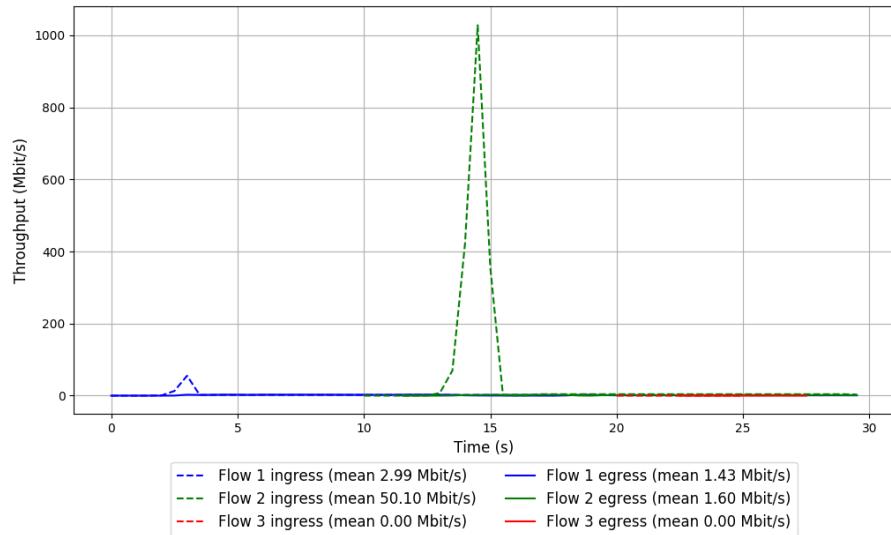


Run 3: Statistics of PCC

```
Start at: 2018-01-10 16:27:04
End at: 2018-01-10 16:27:34
Local clock offset: 3.097 ms
Remote clock offset: 1.31 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.42 Mbit/s
95th percentile per-packet one-way delay: 3068.921 ms
Loss rate: 93.36%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 2979.286 ms
Loss rate: 52.47%
-- Flow 2:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 3115.247 ms
Loss rate: 97.03%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 2913.419 ms
Loss rate: 4.60%
```

### Run 3: Report of PCC — Data Link

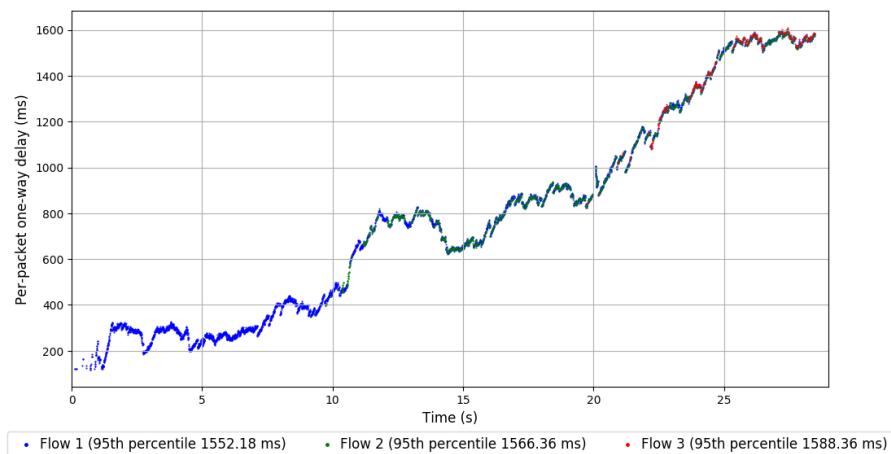
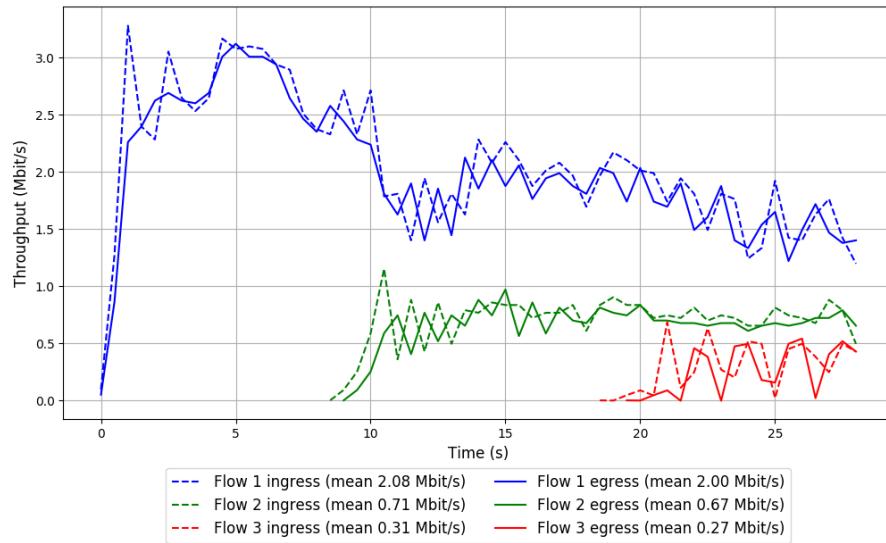


```
Run 1: Statistics of QUIC Cubic

Start at: 2018-01-10 15:55:48
End at: 2018-01-10 15:56:18
Local clock offset: 2.059 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 1560.409 ms
Loss rate: 5.44%
-- Flow 1:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 1552.178 ms
Loss rate: 4.09%
-- Flow 2:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 1566.358 ms
Loss rate: 8.09%
-- Flow 3:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 1588.363 ms
Loss rate: 19.95%
```

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

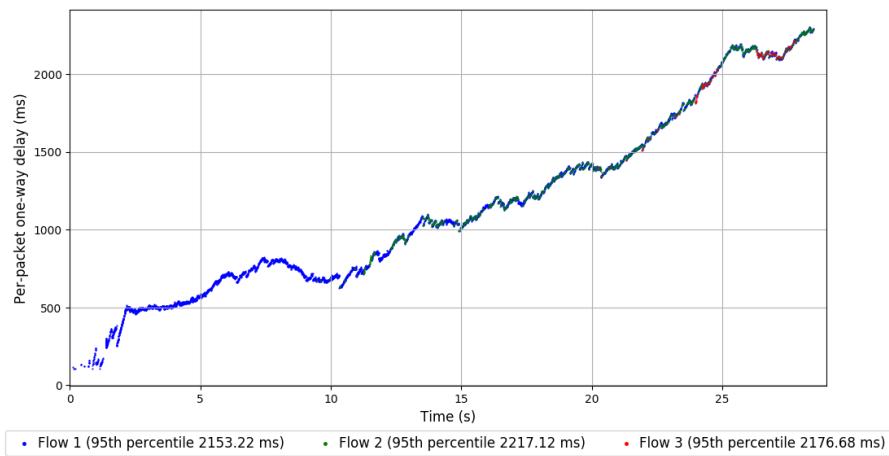
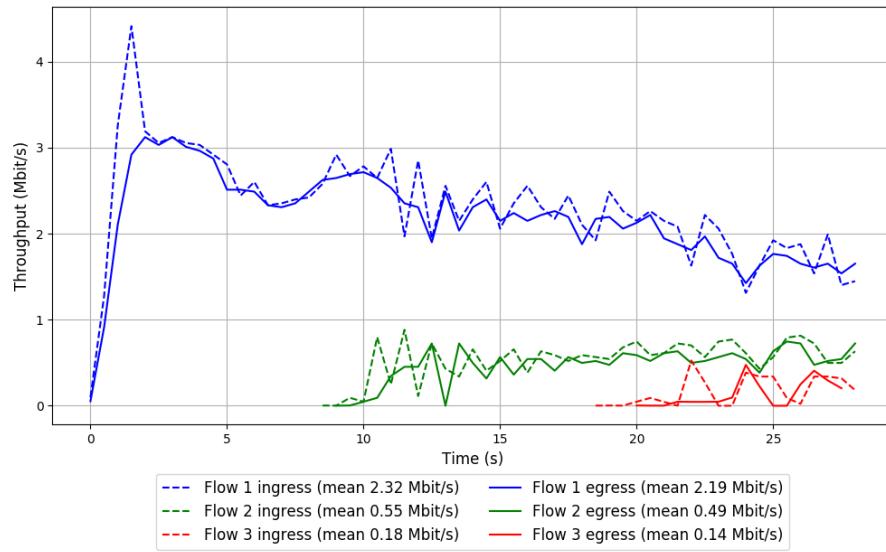


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-01-10 16:13:21
End at: 2018-01-10 16:13:51
Local clock offset: 2.823 ms
Remote clock offset: -3.171 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.55 Mbit/s
95th percentile per-packet one-way delay: 2165.058 ms
Loss rate: 7.39%
-- Flow 1:
Average throughput: 2.19 Mbit/s
95th percentile per-packet one-way delay: 2153.220 ms
Loss rate: 5.70%
-- Flow 2:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 2217.116 ms
Loss rate: 13.30%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 2176.684 ms
Loss rate: 35.93%
```

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

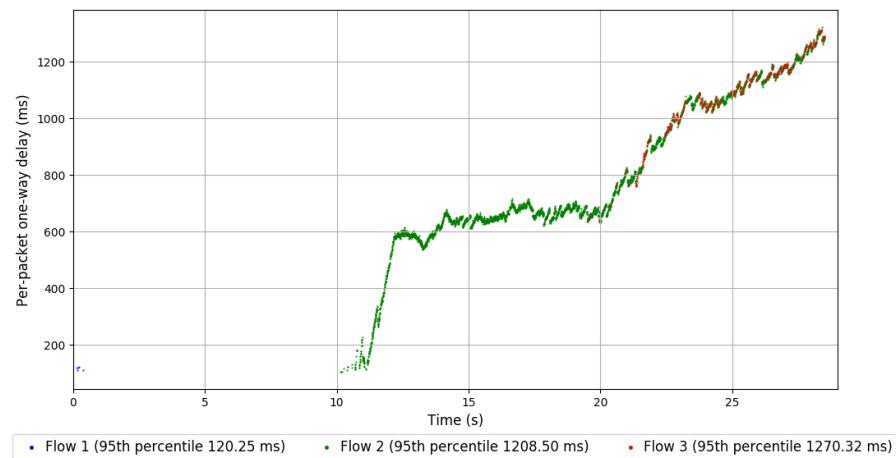
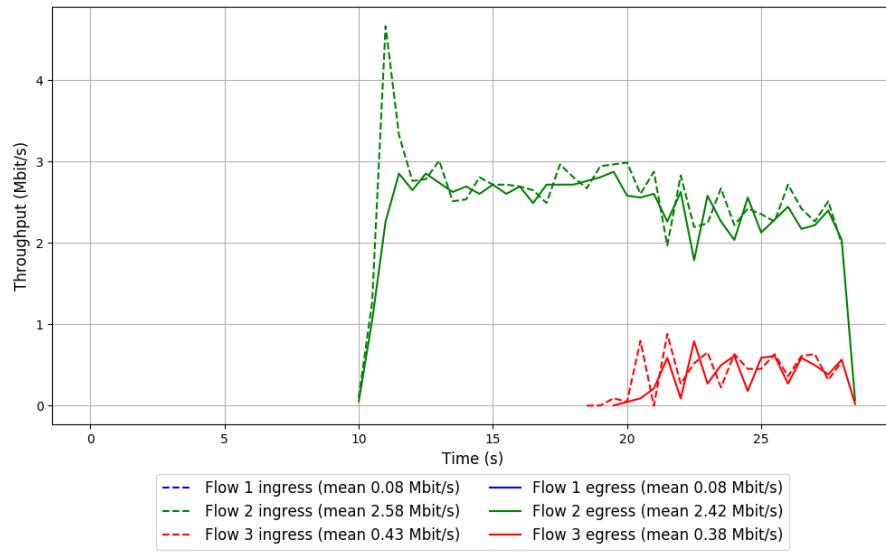


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-01-10 16:32:07
End at: 2018-01-10 16:32:37
Local clock offset: 3.215 ms
Remote clock offset: -4.366 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 1214.716 ms
Loss rate: 6.85%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 120.249 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.42 Mbit/s
95th percentile per-packet one-way delay: 1208.498 ms
Loss rate: 6.15%
-- Flow 3:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1270.322 ms
Loss rate: 15.02%
```

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

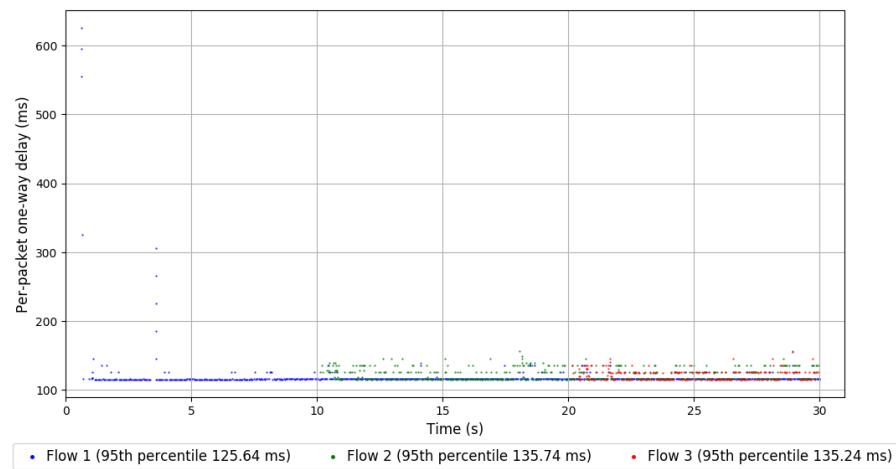
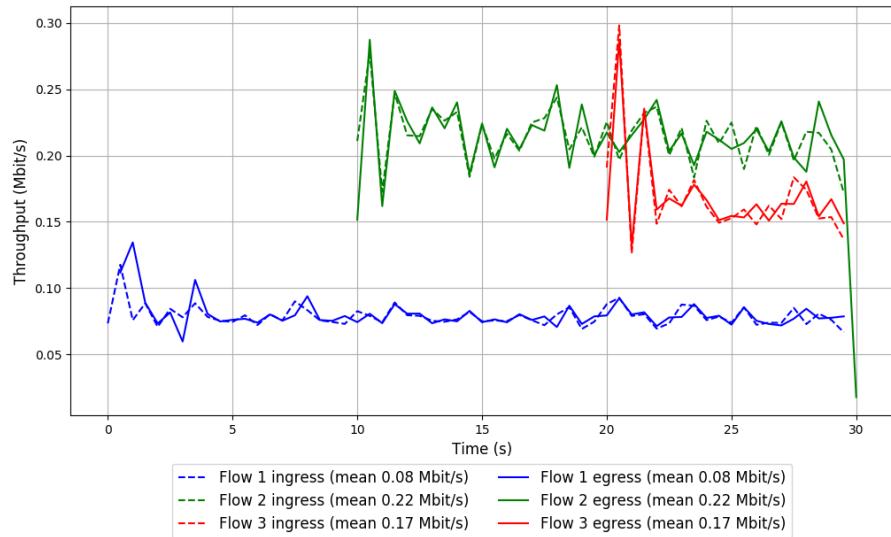


```
Run 1: Statistics of SCReAM

Start at: 2018-01-10 15:46:42
End at: 2018-01-10 15:47:12
Local clock offset: 1.605 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 135.623 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 125.645 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 135.744 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 135.244 ms
Loss rate: 0.34%
```

Run 1: Report of SCReAM — Data Link

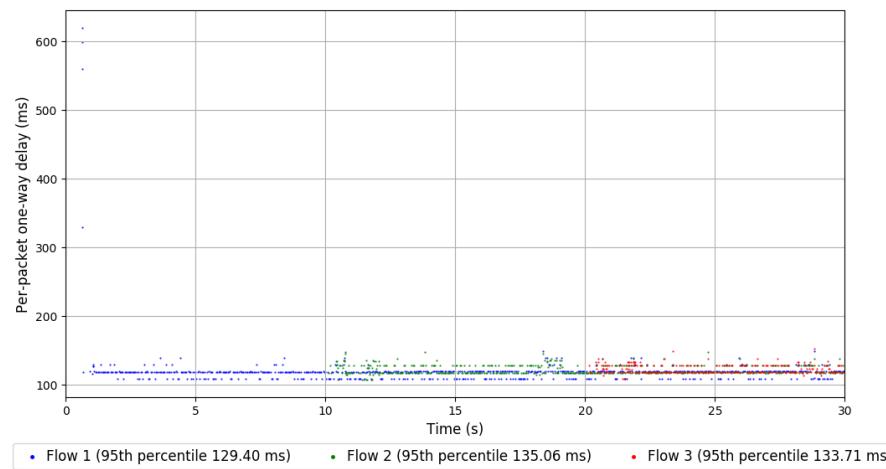
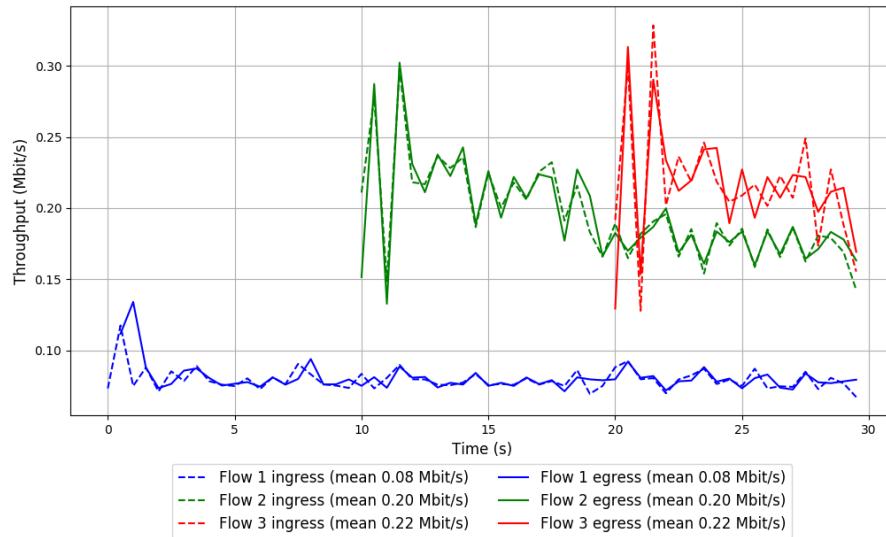


Run 2: Statistics of SCReAM

```
Start at: 2018-01-10 16:02:04
End at: 2018-01-10 16:02:34
Local clock offset: 2.427 ms
Remote clock offset: -4.437 ms

# Below is generated by plot.py at 2018-01-10 16:36:31
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 132.815 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 129.399 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 135.063 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 133.714 ms
Loss rate: 0.30%
```

## Run 2: Report of SCReAM — Data Link

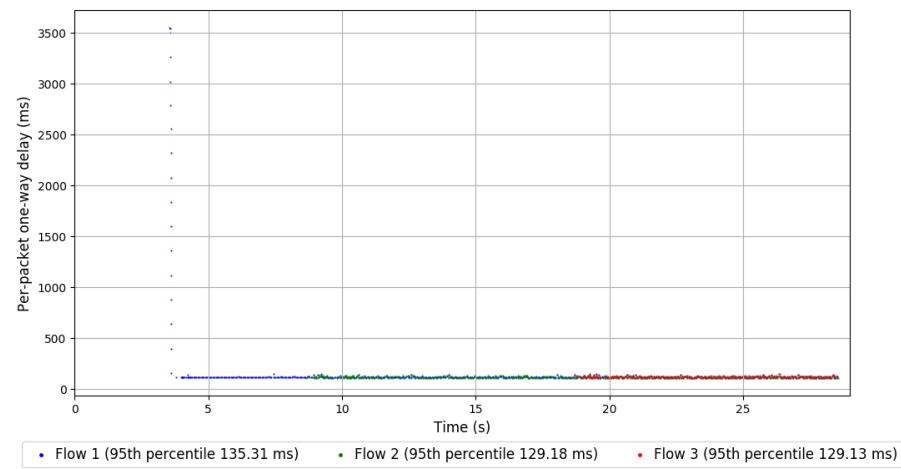
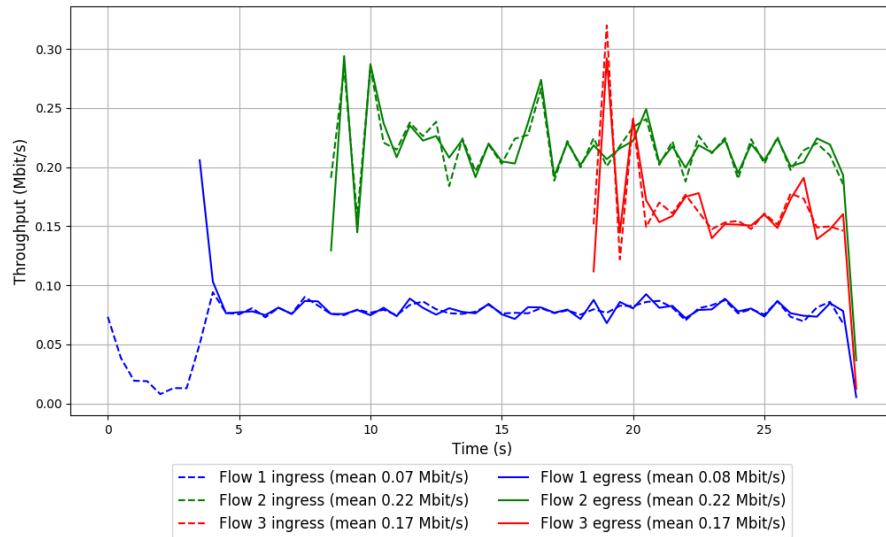


Run 3: Statistics of SCReAM

```
Start at: 2018-01-10 16:20:51
End at: 2018-01-10 16:21:21
Local clock offset: 2.959 ms
Remote clock offset: -4.313 ms

# Below is generated by plot.py at 2018-01-10 16:36:34
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 129.190 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 135.311 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 129.178 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 129.133 ms
Loss rate: 0.34%
```

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

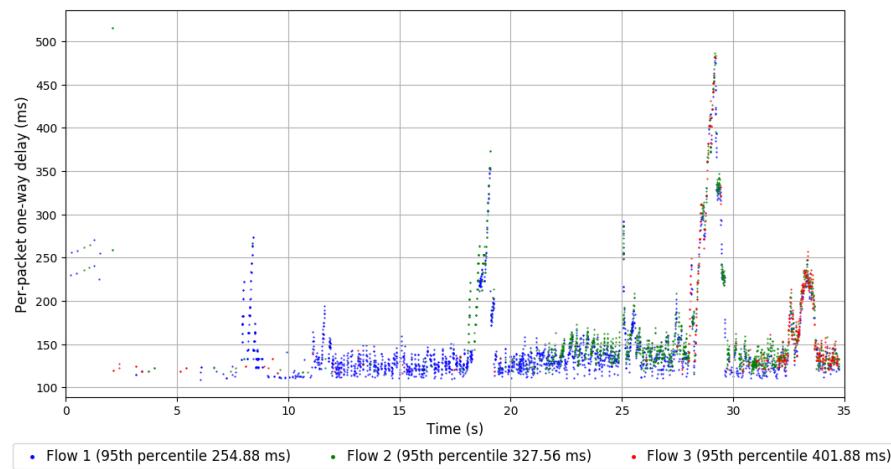
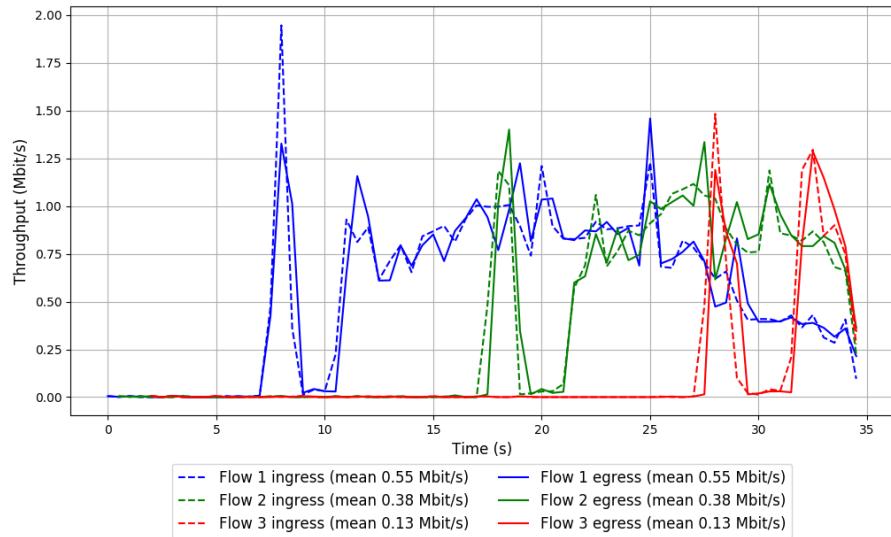


```
Run 1: Statistics of WebRTC media

Start at: 2018-01-10 15:45:41
End at: 2018-01-10 15:46:11
Local clock offset: 1.497 ms
Remote clock offset: 0.66 ms

# Below is generated by plot.py at 2018-01-10 16:36:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 304.779 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 254.876 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 327.565 ms
Loss rate: 0.14%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 401.882 ms
Loss rate: 1.12%
```

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

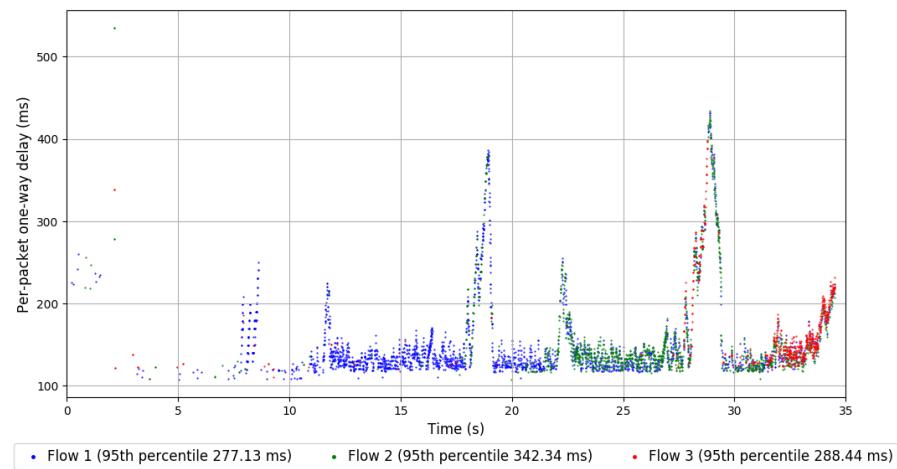
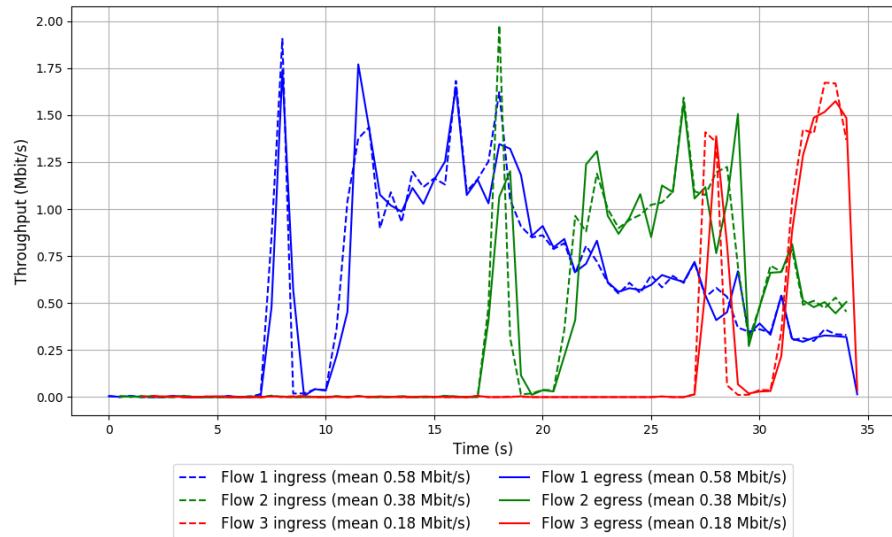


```
Run 2: Statistics of WebRTC media

Start at: 2018-01-10 16:00:49
End at: 2018-01-10 16:01:19
Local clock offset: 2.366 ms

# Below is generated by plot.py at 2018-01-10 16:36:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 297.423 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 277.135 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 342.336 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 288.439 ms
Loss rate: 3.78%
```

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

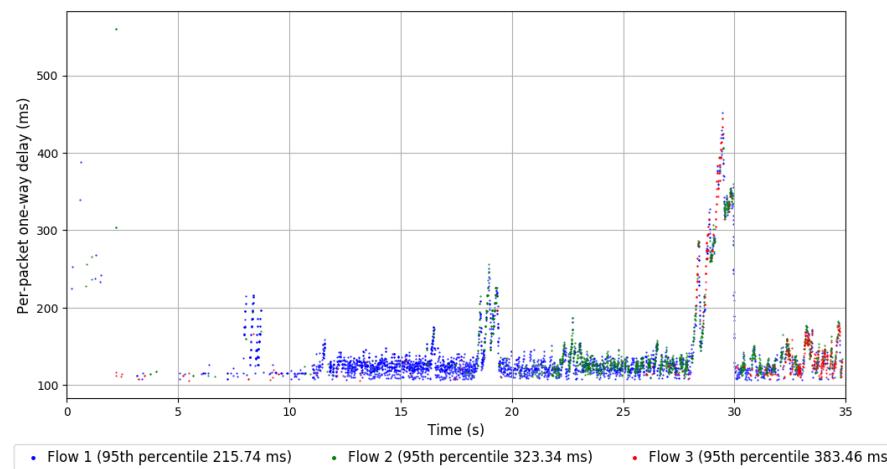
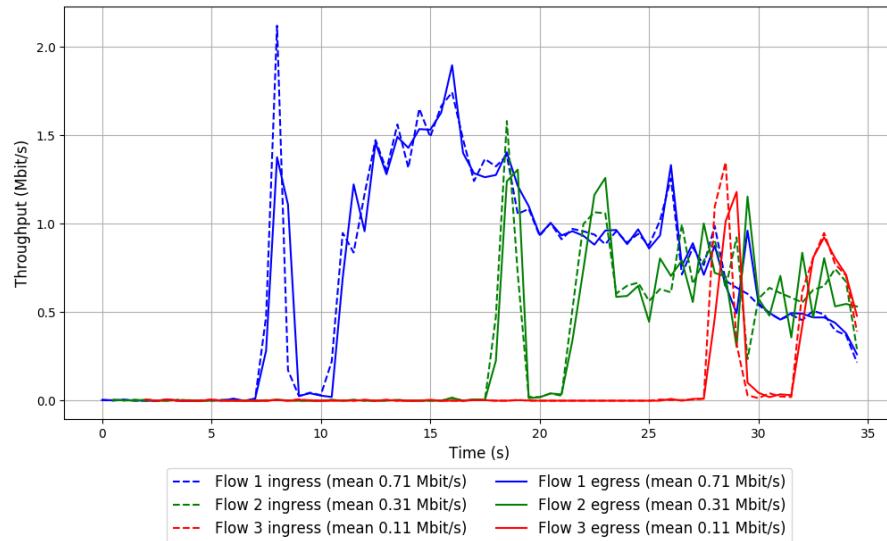


```
Run 3: Statistics of WebRTC media
```

```
Start at: 2018-01-10 16:19:36
End at: 2018-01-10 16:20:06
Local clock offset: 2.934 ms
Remote clock offset: -3.521 ms

# Below is generated by plot.py at 2018-01-10 16:36:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 286.411 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 215.740 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 323.343 ms
Loss rate: 0.45%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 383.456 ms
Loss rate: 1.29%
```

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

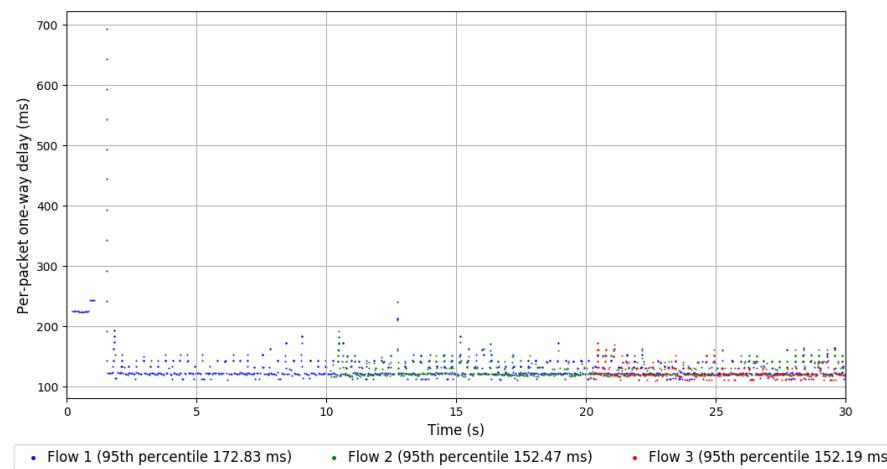
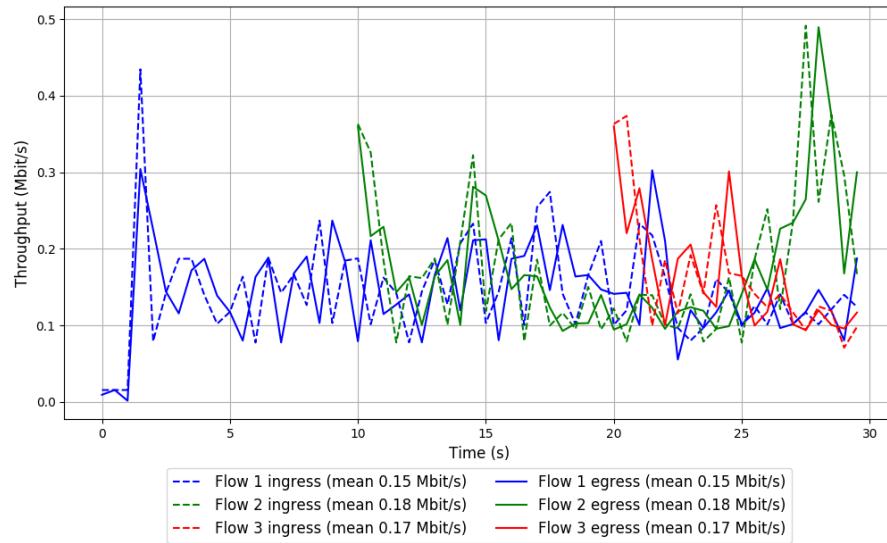


```
Run 1: Statistics of Sprout

Start at: 2018-01-10 15:50:42
End at: 2018-01-10 15:51:12
Local clock offset: 1.766 ms

# Below is generated by plot.py at 2018-01-10 16:36:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 161.834 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 172.828 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 152.471 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 152.185 ms
Loss rate: 0.00%
```

## Run 1: Report of Sprout — Data Link

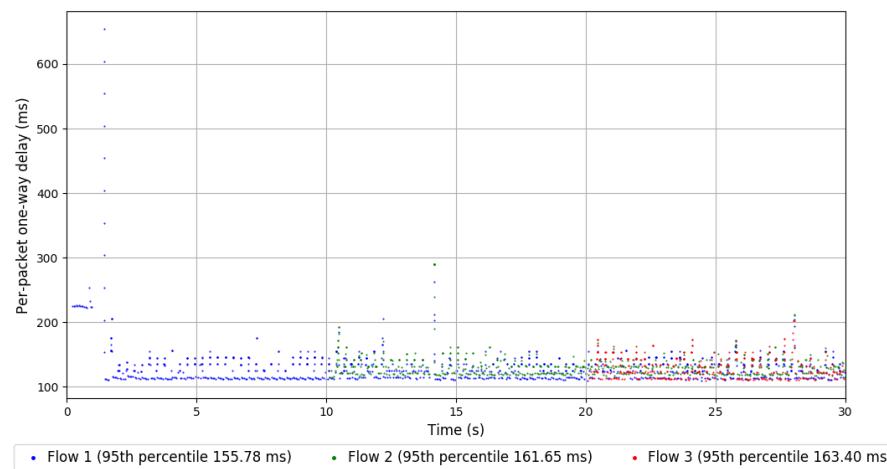
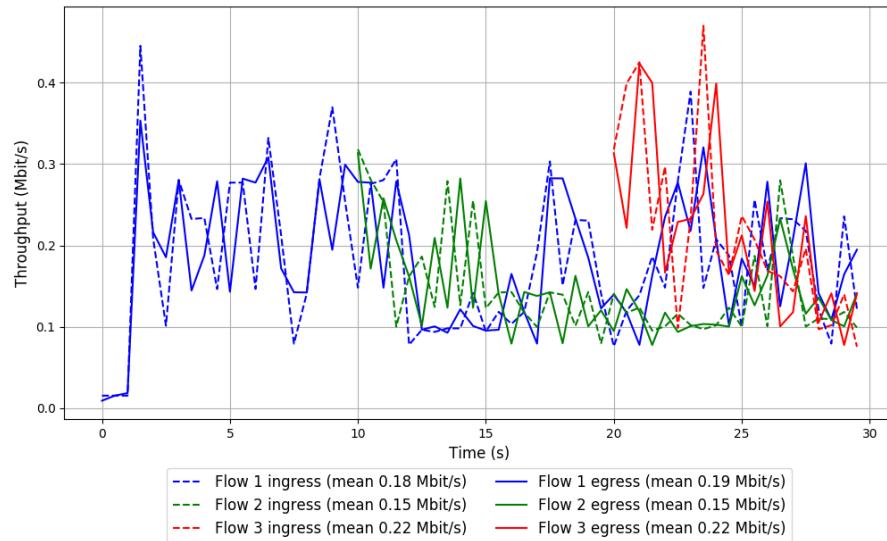


Run 2: Statistics of Sprout

```
Start at: 2018-01-10 16:07:03
End at: 2018-01-10 16:07:33
Local clock offset: 2.676 ms
Remote clock offset: 0.368 ms

# Below is generated by plot.py at 2018-01-10 16:36:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 161.838 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 155.776 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 161.653 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 163.399 ms
Loss rate: 0.04%
```

## Run 2: Report of Sprout — Data Link

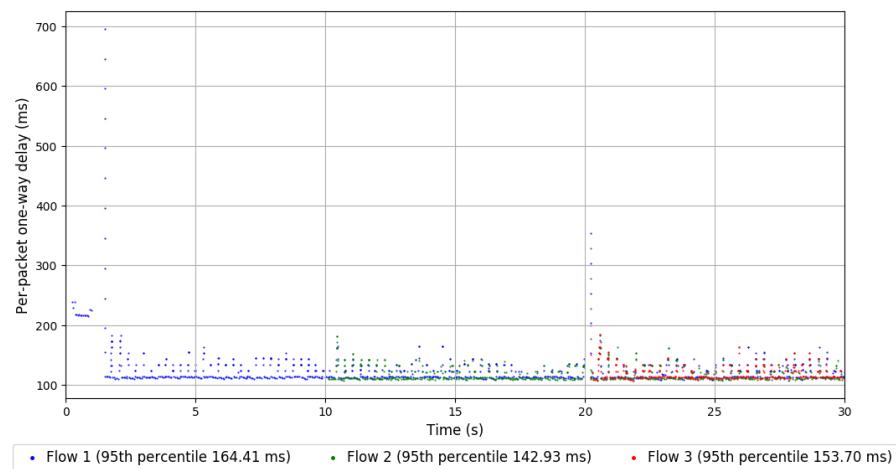
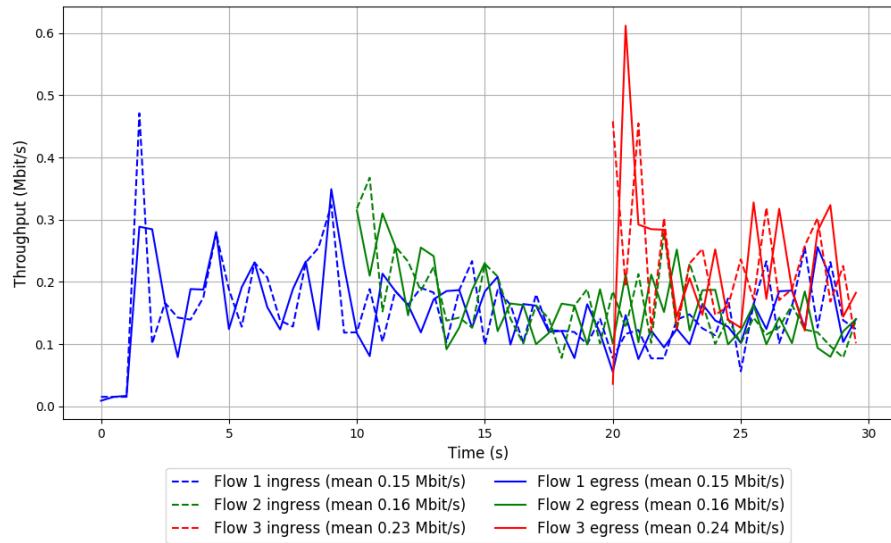


Run 3: Statistics of Sprout

```
Start at: 2018-01-10 16:25:50
End at: 2018-01-10 16:26:20
Local clock offset: 3.069 ms
Remote clock offset: -4.703 ms

# Below is generated by plot.py at 2018-01-10 16:36:39
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 154.175 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 164.407 ms
Loss rate: 0.51%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 142.930 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 153.704 ms
Loss rate: 0.11%
```

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

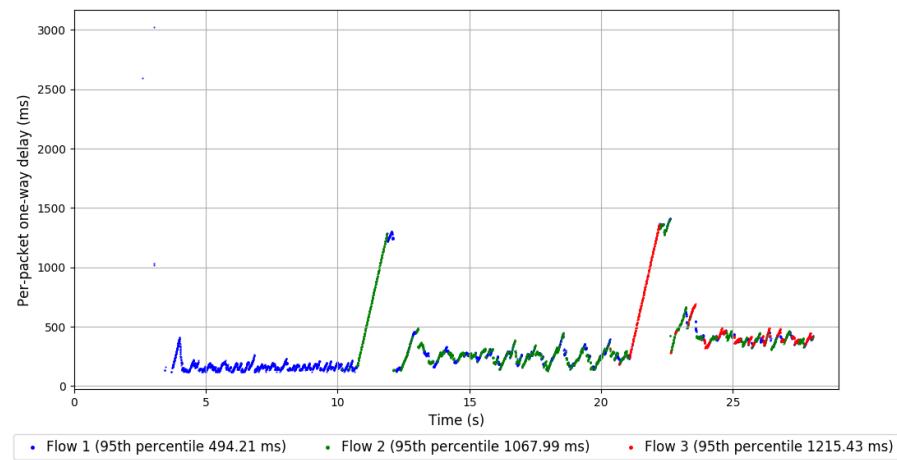
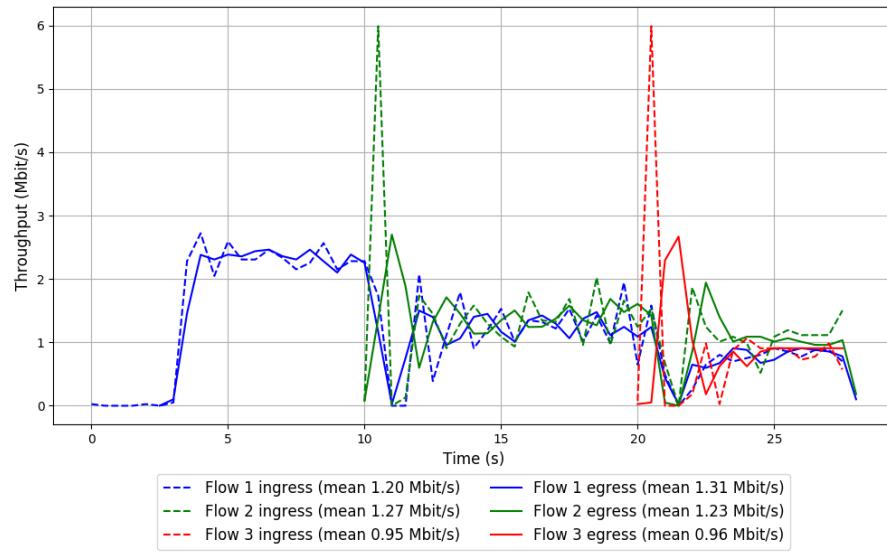


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-01-10 15:56:48
End at: 2018-01-10 15:57:18
Local clock offset: 2.109 ms

# Below is generated by plot.py at 2018-01-10 16:36:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 1038.411 ms
Loss rate: 1.71%
-- Flow 1:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 494.210 ms
Loss rate: 0.74%
-- Flow 2:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 1067.989 ms
Loss rate: 2.95%
-- Flow 3:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 1215.431 ms
Loss rate: 2.25%
```

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

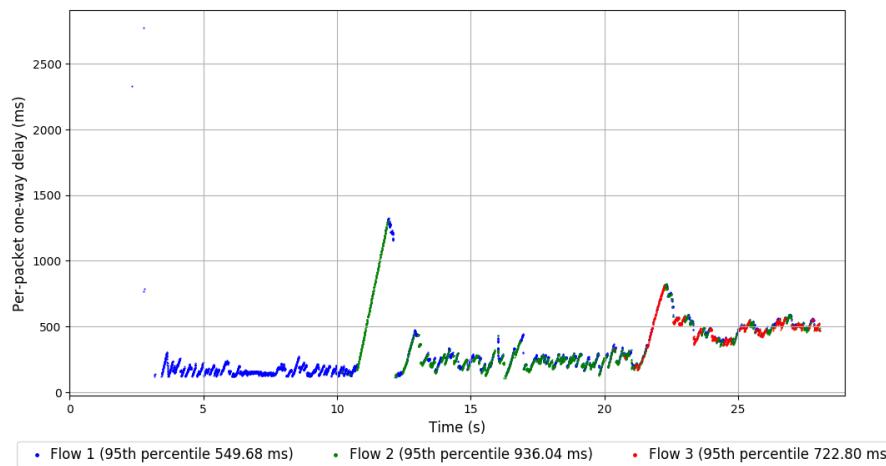
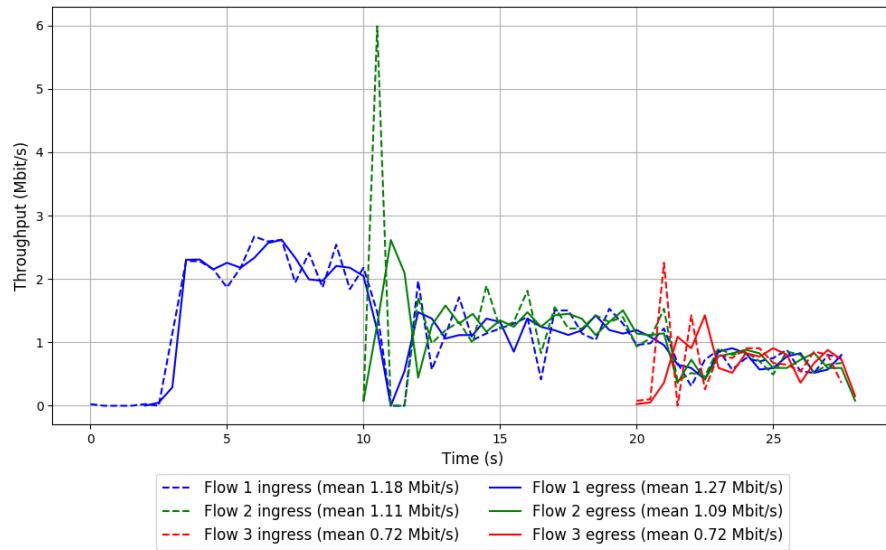


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-01-10 16:14:36
End at: 2018-01-10 16:15:06
Local clock offset: 2.853 ms
Remote clock offset: 1.279 ms

# Below is generated by plot.py at 2018-01-10 16:36:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 735.592 ms
Loss rate: 1.42%
-- Flow 1:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 549.682 ms
Loss rate: 1.14%
-- Flow 2:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 936.045 ms
Loss rate: 1.56%
-- Flow 3:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 722.796 ms
Loss rate: 2.51%
```

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

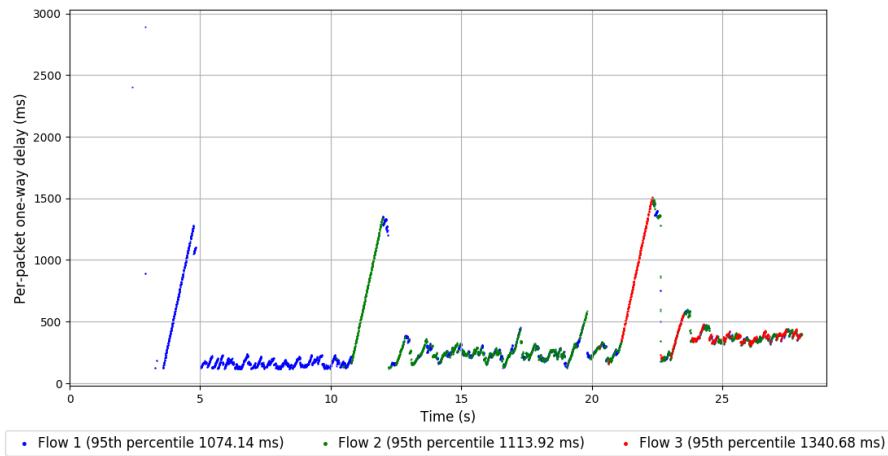
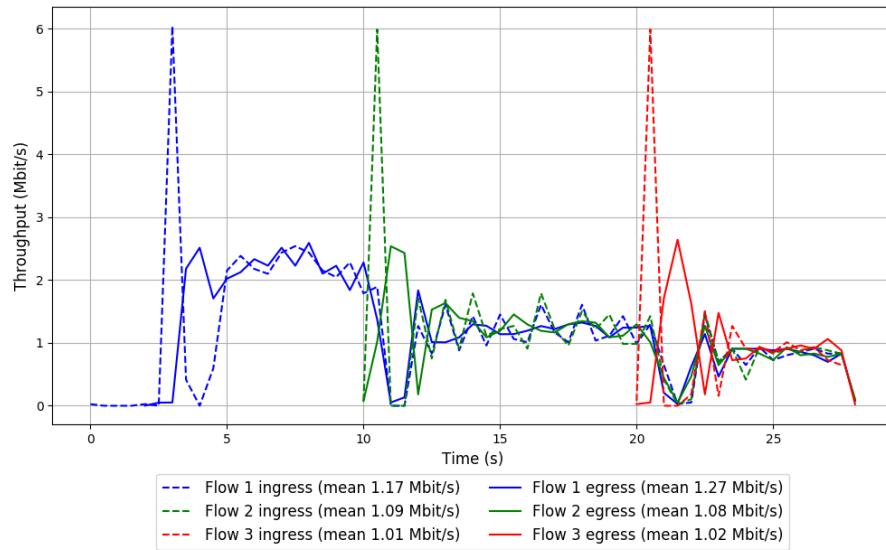


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-01-10 16:33:22
End at: 2018-01-10 16:33:52
Local clock offset: 3.155 ms
Remote clock offset: 1.34 ms

# Below is generated by plot.py at 2018-01-10 16:36:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 1171.790 ms
Loss rate: 1.22%
-- Flow 1:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 1074.137 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 1113.925 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 1340.679 ms
Loss rate: 1.94%
```

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

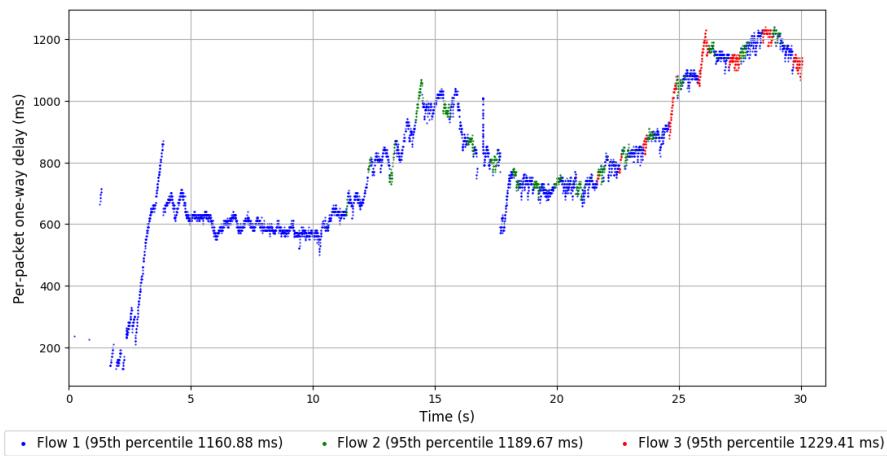
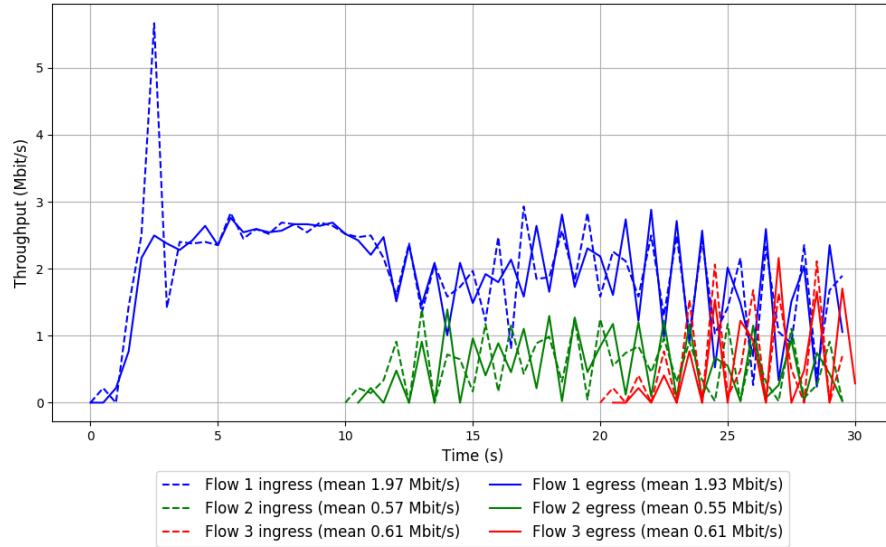


```
Run 1: Statistics of TCP Vegas
```

```
Start at: 2018-01-10 15:47:41
End at: 2018-01-10 15:48:11
Local clock offset: 1.667 ms

# Below is generated by plot.py at 2018-01-10 16:36:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 1180.987 ms
Loss rate: 3.69%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 1160.885 ms
Loss rate: 3.08%
-- Flow 2:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 1189.667 ms
Loss rate: 5.31%
-- Flow 3:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1229.407 ms
Loss rate: 6.69%
```

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

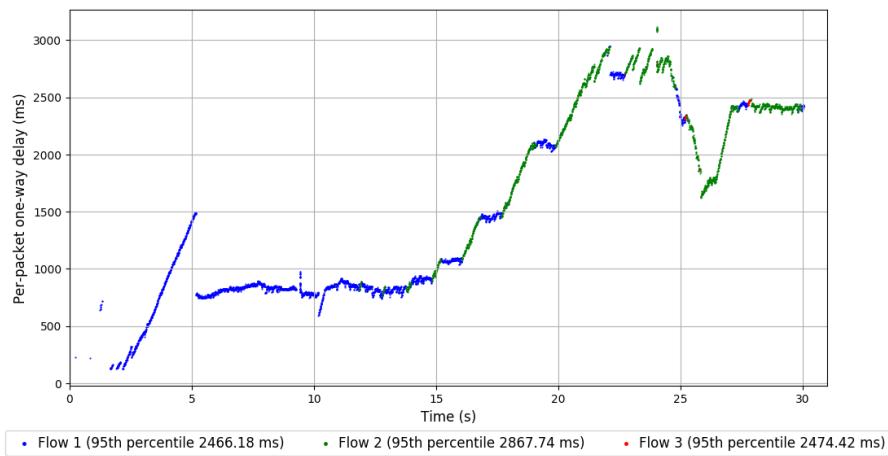
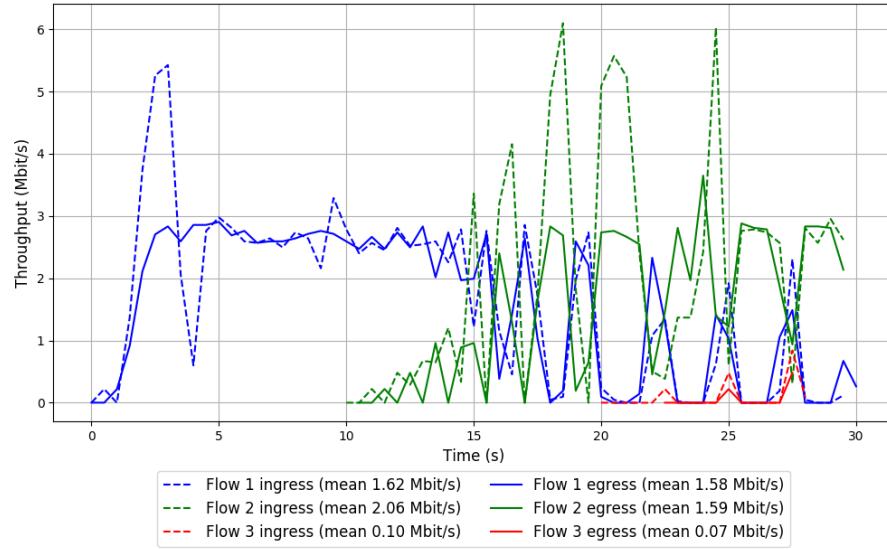


Run 2: Statistics of TCP Vegas

```
Start at: 2018-01-10 16:03:19
End at: 2018-01-10 16:03:49
Local clock offset: 2.5 ms
Remote clock offset: 1.598 ms

# Below is generated by plot.py at 2018-01-10 16:36:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.61 Mbit/s
95th percentile per-packet one-way delay: 2797.295 ms
Loss rate: 14.08%
-- Flow 1:
Average throughput: 1.58 Mbit/s
95th percentile per-packet one-way delay: 2466.182 ms
Loss rate: 3.14%
-- Flow 2:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 2867.745 ms
Loss rate: 26.12%
-- Flow 3:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 2474.419 ms
Loss rate: 57.08%
```

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

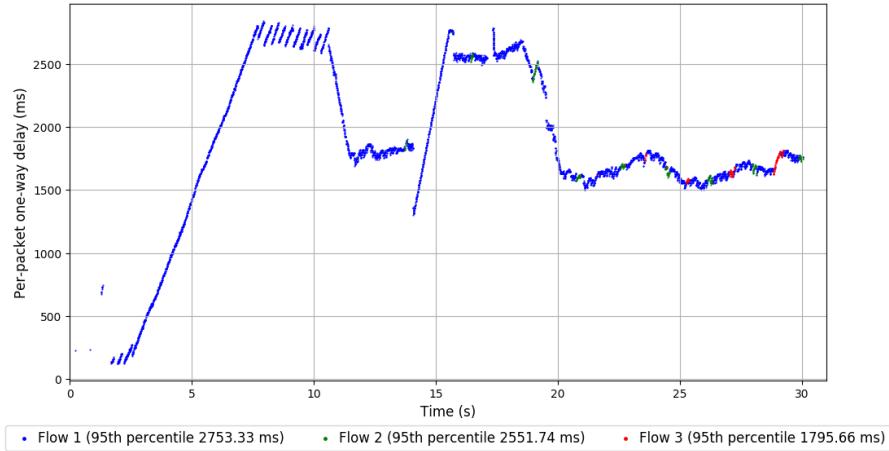
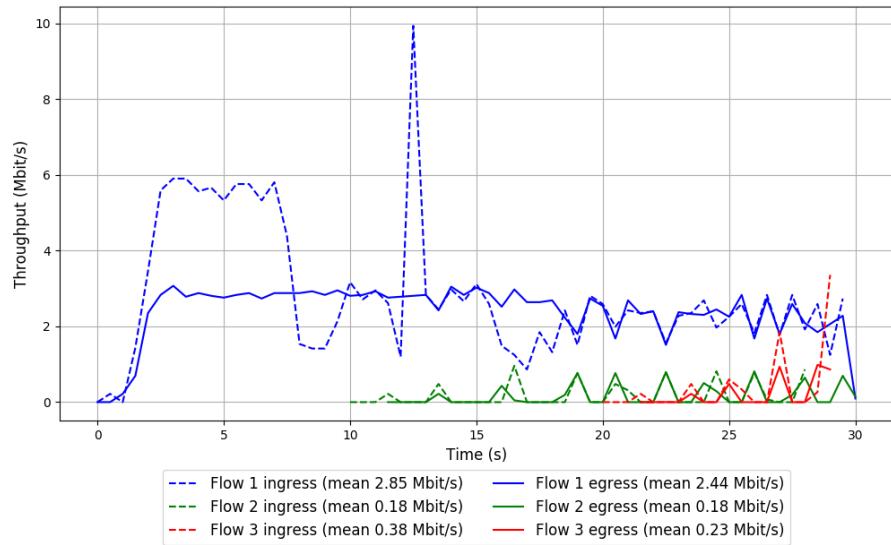


Run 3: Statistics of TCP Vegas

```
Start at: 2018-01-10 16:22:05
End at: 2018-01-10 16:22:35
Local clock offset: 2.975 ms
Remote clock offset: 1.376 ms

# Below is generated by plot.py at 2018-01-10 16:36:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 2743.751 ms
Loss rate: 15.71%
-- Flow 1:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 2753.328 ms
Loss rate: 14.83%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 2551.738 ms
Loss rate: 0.37%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1795.659 ms
Loss rate: 50.96%
```

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

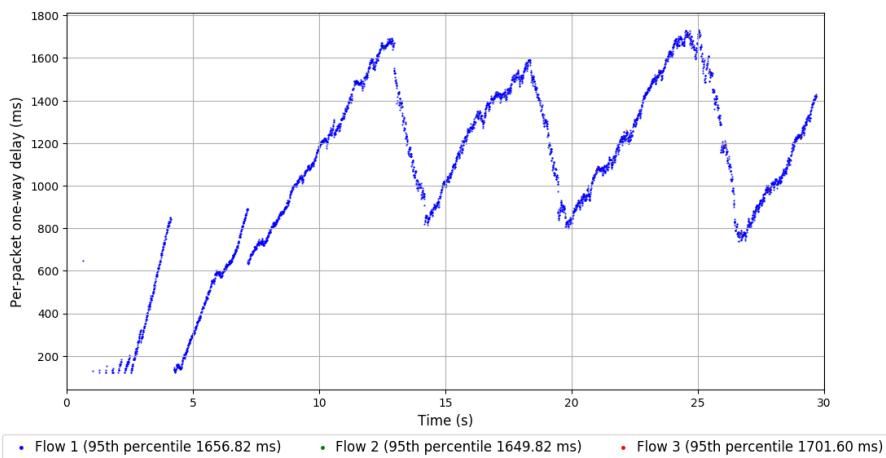
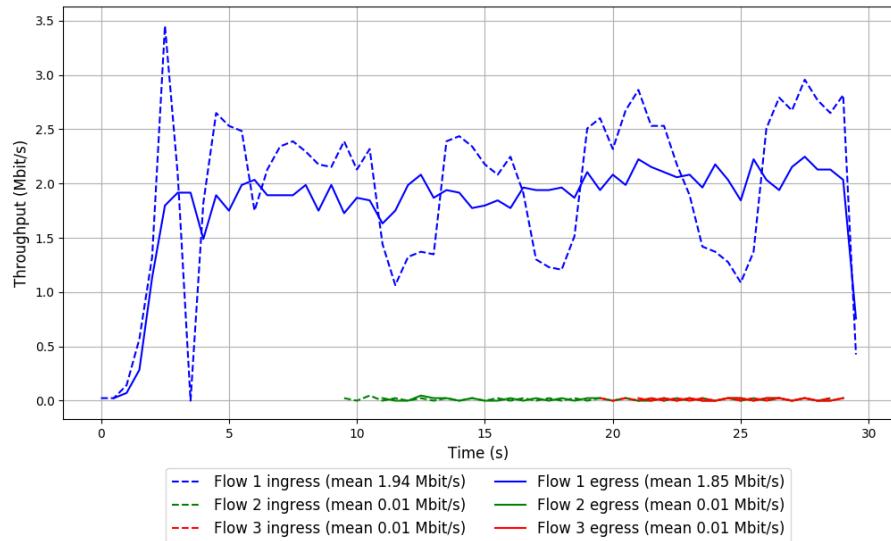


```
Run 1: Statistics of Verus

Start at: 2018-01-10 15:48:42
End at: 2018-01-10 15:49:12
Local clock offset: 1.724 ms

# Below is generated by plot.py at 2018-01-10 16:36:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 1656.819 ms
Loss rate: 6.27%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 1656.819 ms
Loss rate: 6.27%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1649.817 ms
Loss rate: 4.76%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1701.602 ms
Loss rate: 10.00%
```

## Run 1: Report of Verus — Data Link

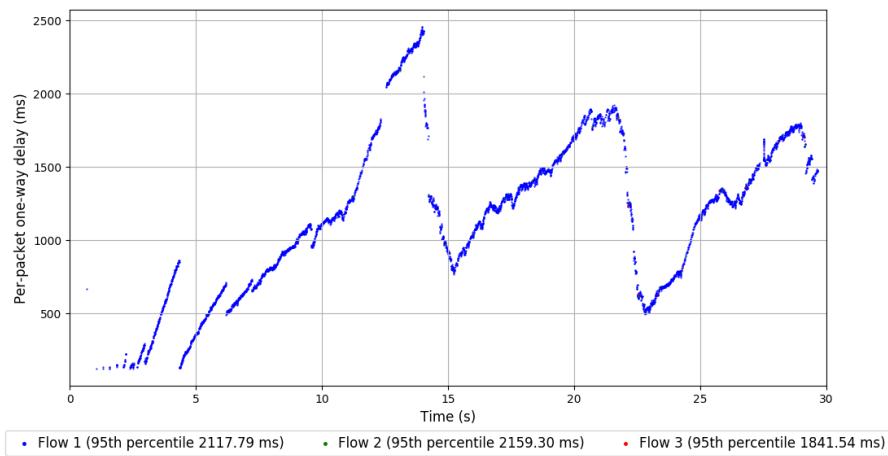
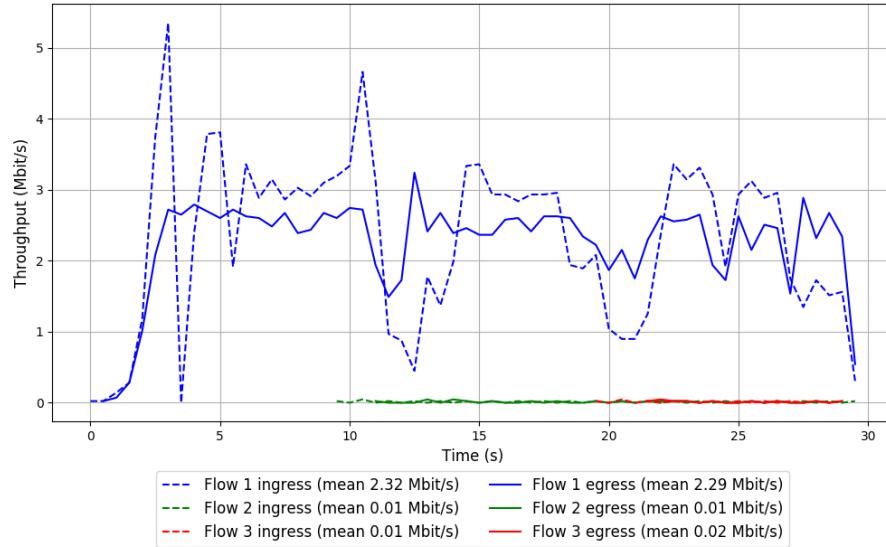


Run 2: Statistics of Verus

```
Start at: 2018-01-10 16:04:33
End at: 2018-01-10 16:05:03
Local clock offset: 2.555 ms
Remote clock offset: -4.17 ms

# Below is generated by plot.py at 2018-01-10 16:36:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 2119.284 ms
Loss rate: 3.09%
-- Flow 1:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 2117.792 ms
Loss rate: 3.04%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2159.298 ms
Loss rate: 9.09%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1841.538 ms
Loss rate: 16.67%
```

## Run 2: Report of Verus — Data Link

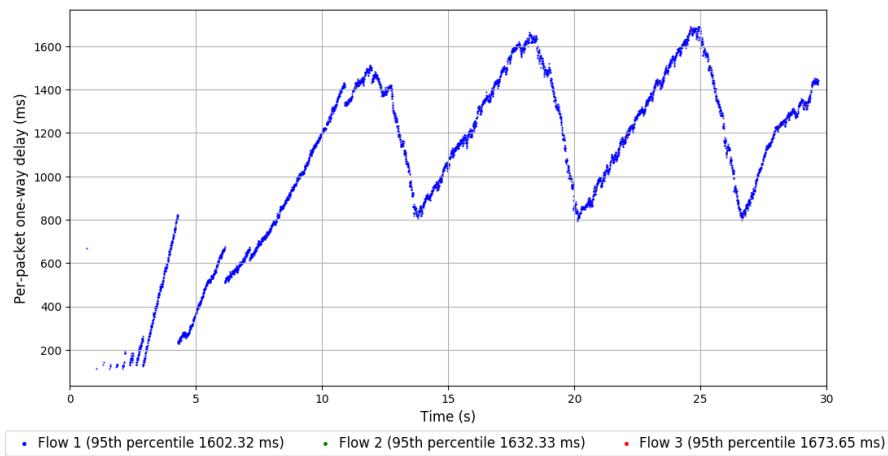
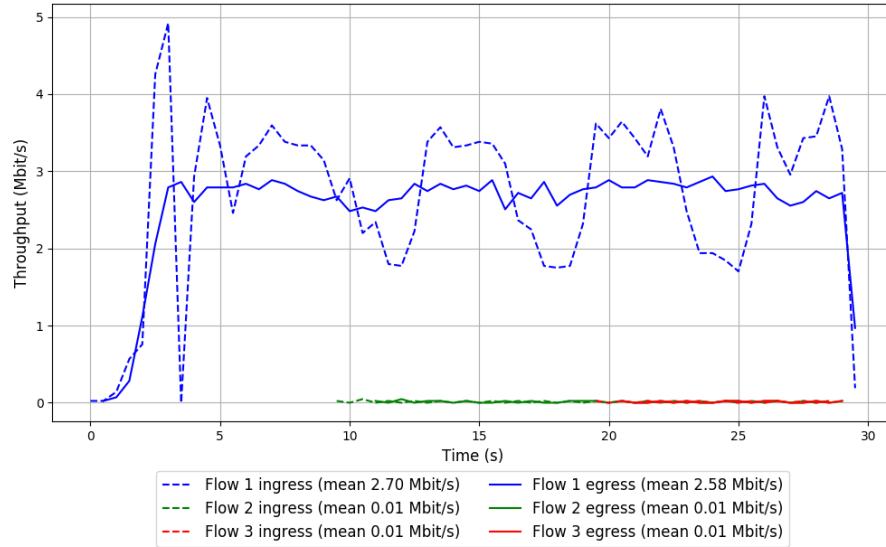


Run 3: Statistics of Verus

```
Start at: 2018-01-10 16:23:20
End at: 2018-01-10 16:23:50
Local clock offset: 2.937 ms
Remote clock offset: 0.559 ms

# Below is generated by plot.py at 2018-01-10 16:36:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 1602.350 ms
Loss rate: 6.02%
-- Flow 1:
Average throughput: 2.58 Mbit/s
95th percentile per-packet one-way delay: 1602.319 ms
Loss rate: 6.02%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1632.326 ms
Loss rate: 4.76%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1673.654 ms
Loss rate: 10.00%
```

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

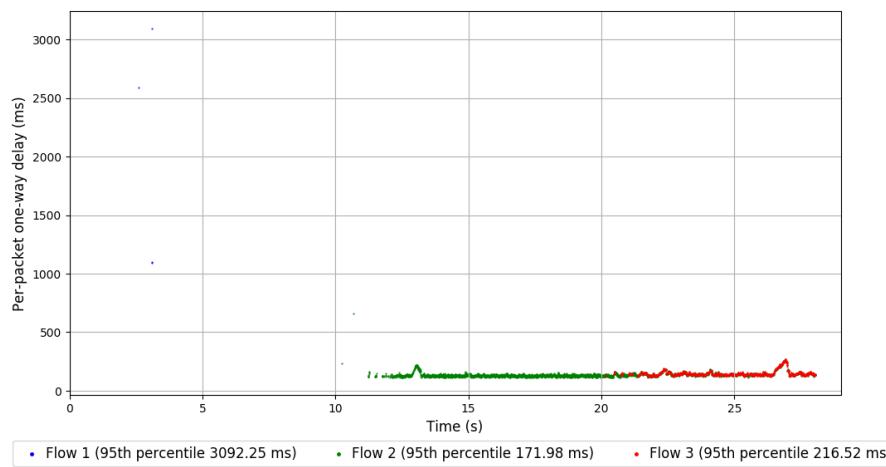
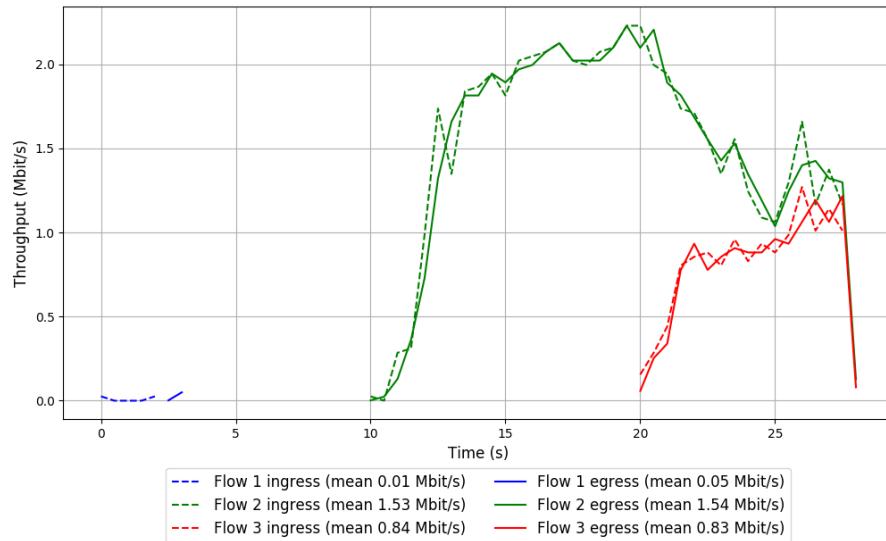


```
Run 1: Statistics of Copa
```

```
Start at: 2018-01-10 15:52:43
End at: 2018-01-10 15:53:13
Local clock offset: 1.952 ms

# Below is generated by plot.py at 2018-01-10 16:36:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.34 Mbit/s
95th percentile per-packet one-way delay: 180.619 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3092.251 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 171.982 ms
Loss rate: 0.24%
-- Flow 3:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 216.516 ms
Loss rate: 0.57%
```

## Run 1: Report of Copa — Data Link

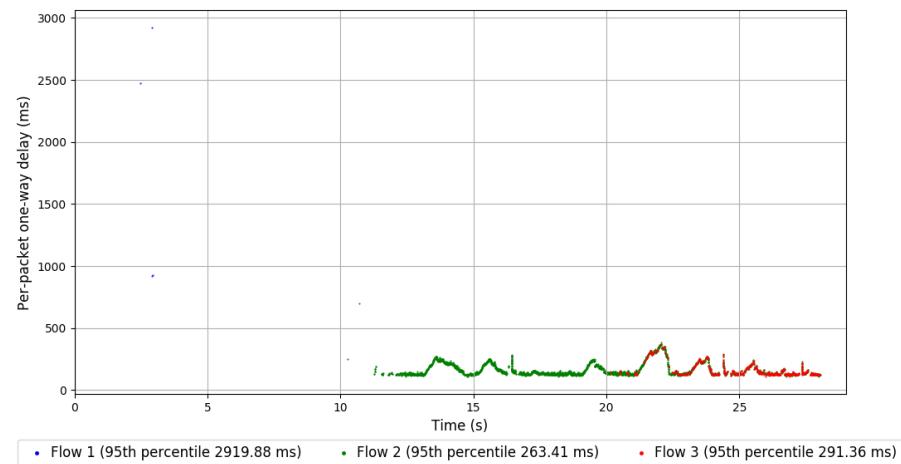
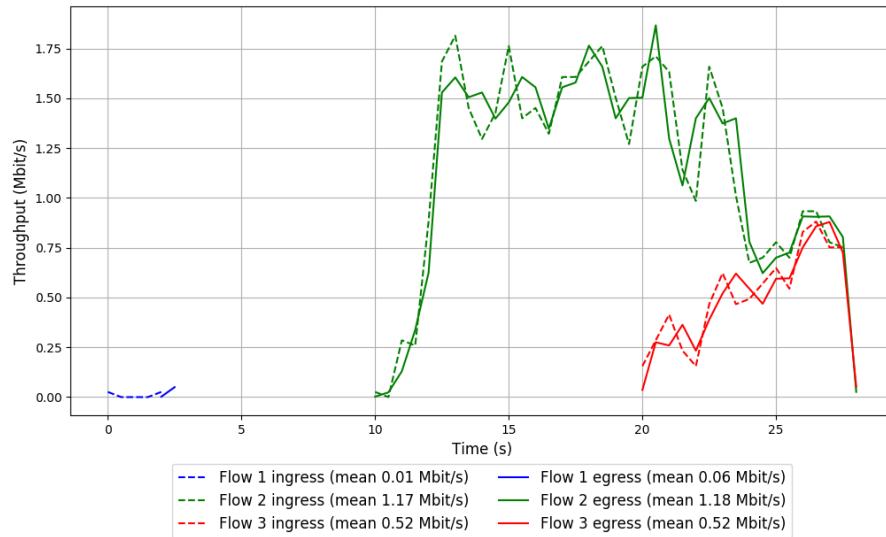


Run 2: Statistics of Copa

```
Start at: 2018-01-10 16:09:33
End at: 2018-01-10 16:10:03
Local clock offset: 2.74 ms
Remote clock offset: 0.445 ms

# Below is generated by plot.py at 2018-01-10 16:36:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 267.247 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 2919.878 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 263.409 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 291.359 ms
Loss rate: 1.25%
```

## Run 2: Report of Copa — Data Link

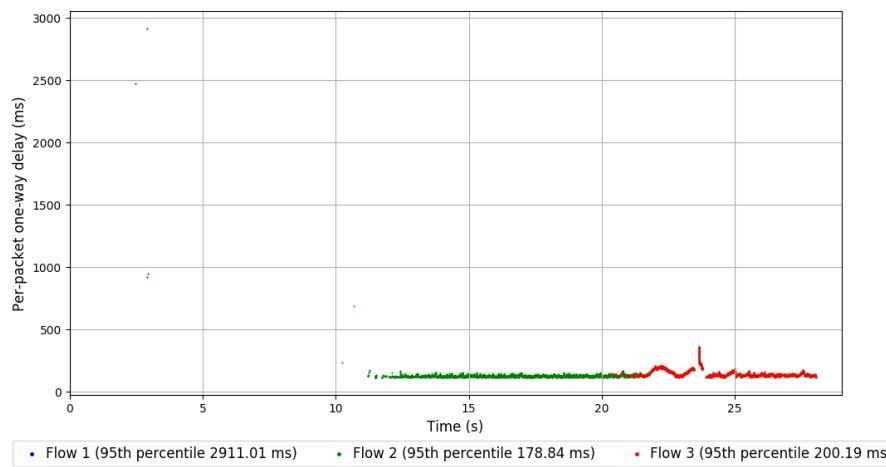
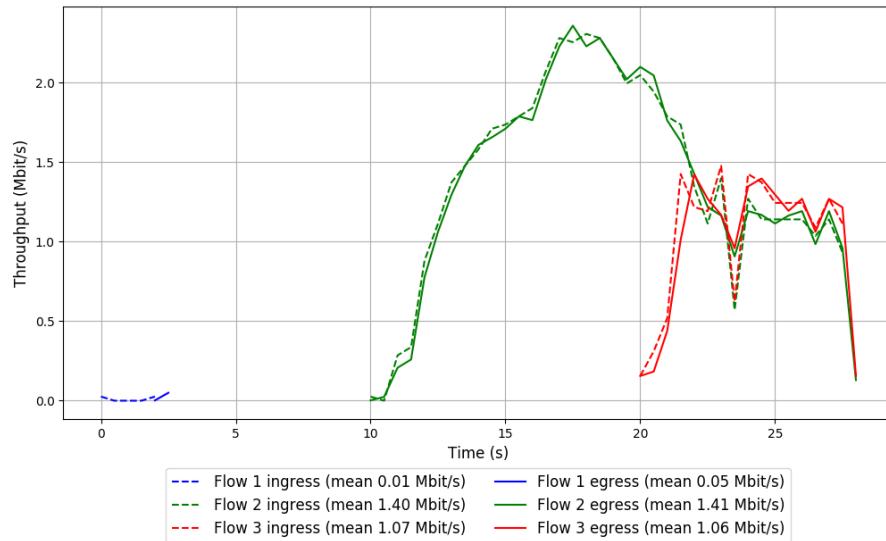


Run 3: Statistics of Copa

```
Start at: 2018-01-10 16:28:20
End at: 2018-01-10 16:28:50
Local clock offset: 3.123 ms
Remote clock offset: 1.105 ms

# Below is generated by plot.py at 2018-01-10 16:36:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 188.866 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 2911.009 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 178.838 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 200.188 ms
Loss rate: 0.61%
```

### Run 3: Report of Copa — Data Link

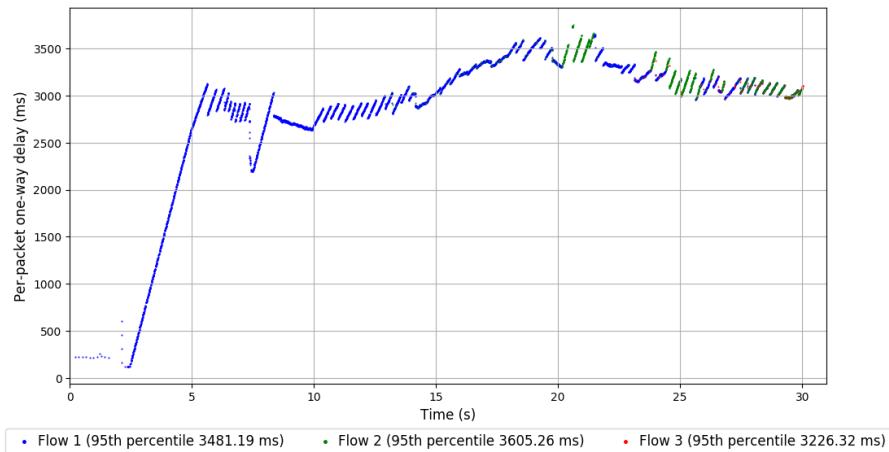
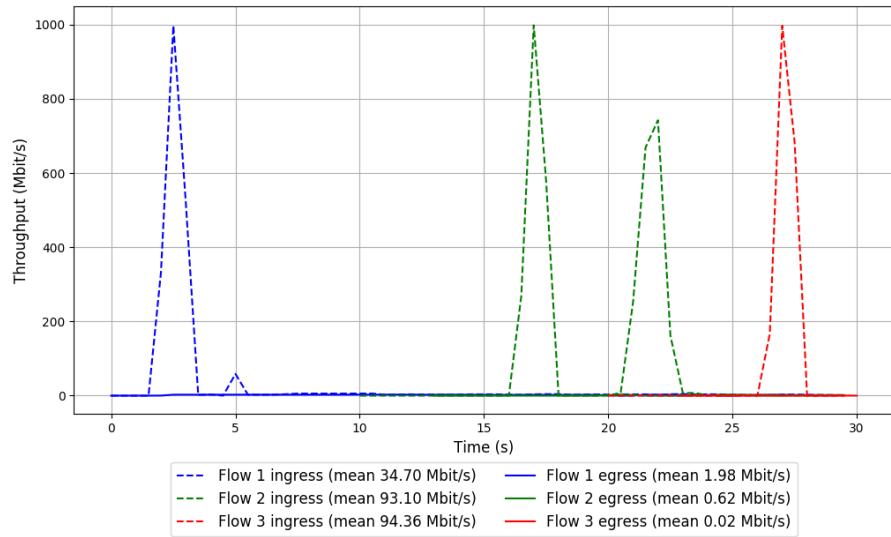


```
Run 1: Statistics of FillP

Start at: 2018-01-10 15:54:45
End at: 2018-01-10 15:55:15
Local clock offset: 2.05 ms

# Below is generated by plot.py at 2018-01-10 16:37:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 3511.882 ms
Loss rate: 98.18%
-- Flow 1:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 3481.190 ms
Loss rate: 94.34%
-- Flow 2:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 3605.265 ms
Loss rate: 99.44%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 3226.316 ms
Loss rate: 99.98%
```

## Run 1: Report of FillP — Data Link

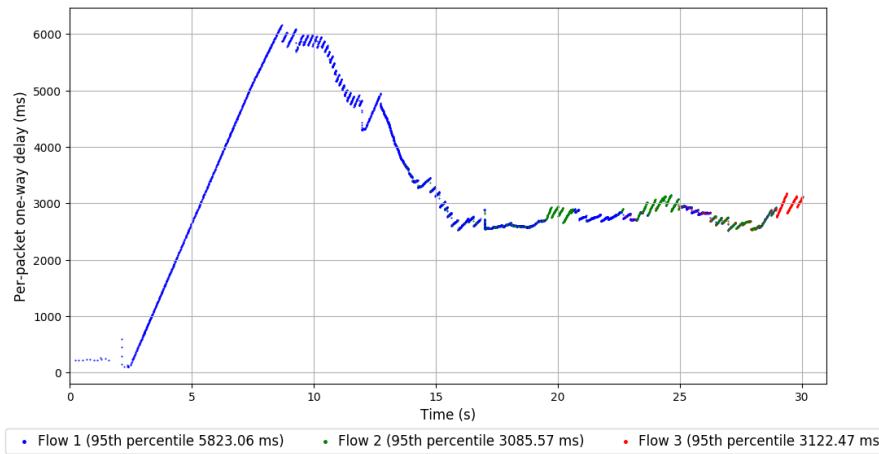
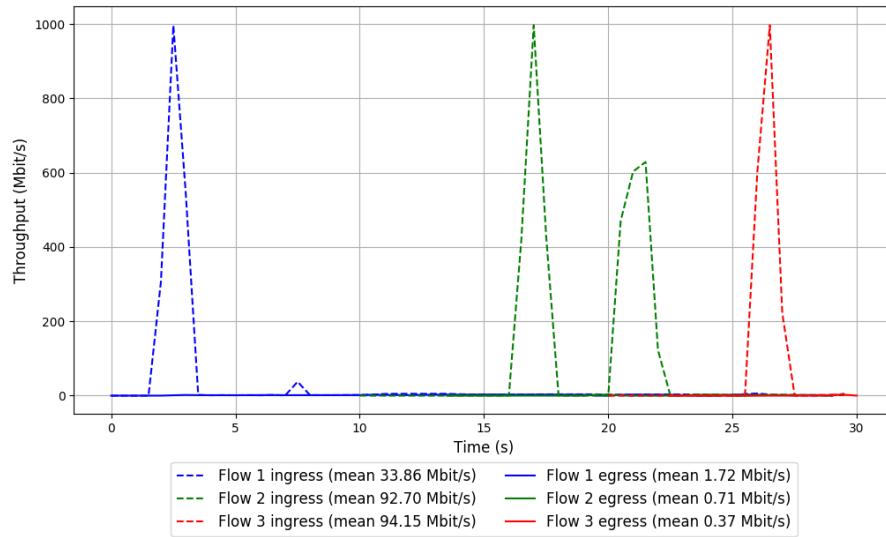


Run 2: Statistics of FillP

```
Start at: 2018-01-10 16:12:03
End at: 2018-01-10 16:12:33
Local clock offset: 2.779 ms
Remote clock offset: -3.518 ms

# Below is generated by plot.py at 2018-01-10 16:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 5733.072 ms
Loss rate: 98.33%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 5823.055 ms
Loss rate: 95.13%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 3085.571 ms
Loss rate: 99.40%
-- Flow 3:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 3122.475 ms
Loss rate: 99.71%
```

## Run 2: Report of FillP — Data Link

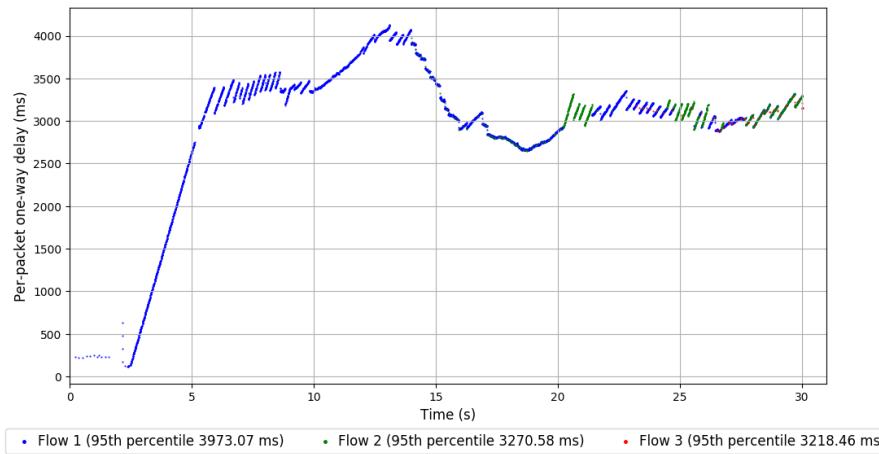
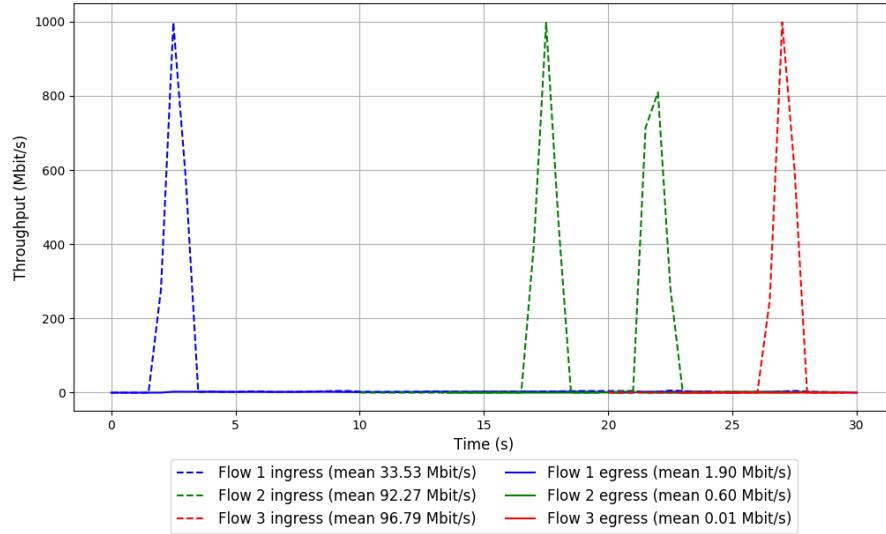


Run 3: Statistics of FillP

```
Start at: 2018-01-10 16:30:50
End at: 2018-01-10 16:31:20
Local clock offset: 3.133 ms
Remote clock offset: 0.957 ms

# Below is generated by plot.py at 2018-01-10 16:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 3950.738 ms
Loss rate: 98.24%
-- Flow 1:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 3973.071 ms
Loss rate: 94.36%
-- Flow 2:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 3270.582 ms
Loss rate: 99.48%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 3218.456 ms
Loss rate: 99.99%
```

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

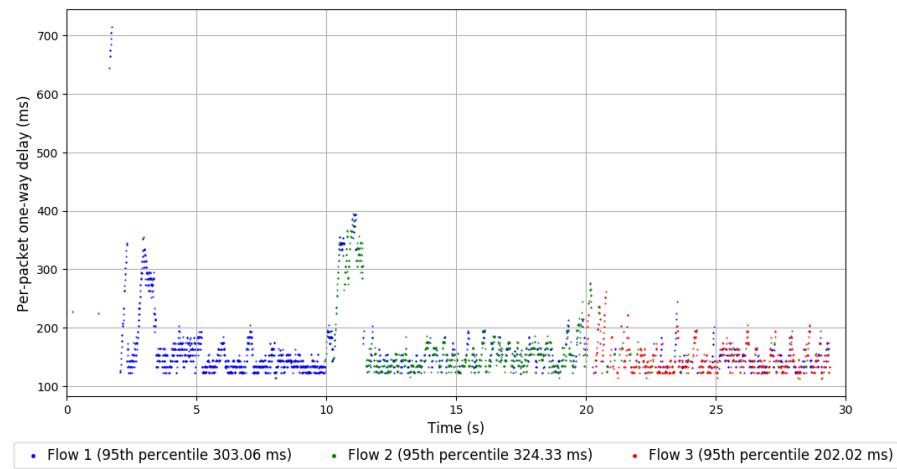
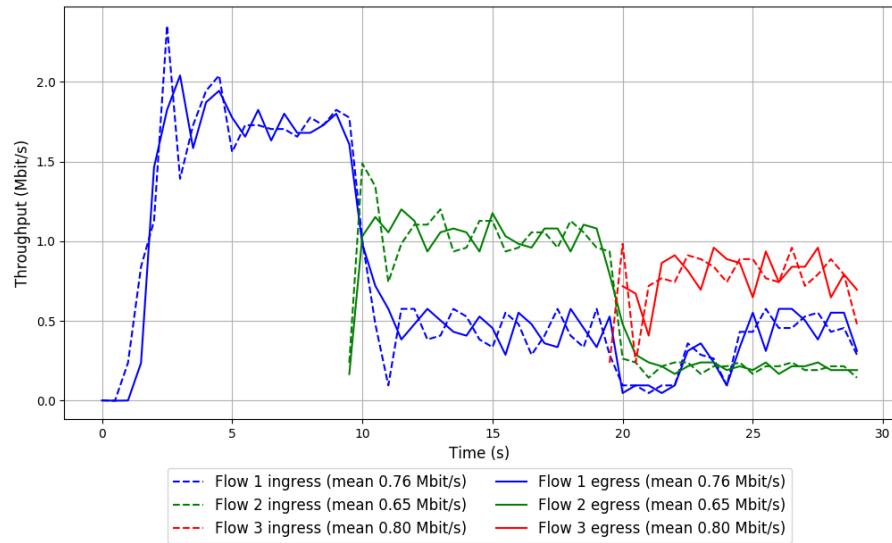


```
Run 1: Statistics of Indigo

Start at: 2018-01-10 15:49:42
End at: 2018-01-10 15:50:12
Local clock offset: 1.697 ms

# Below is generated by plot.py at 2018-01-10 16:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 303.058 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 303.058 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 324.327 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 202.017 ms
Loss rate: 0.64%
```

Run 1: Report of Indigo — Data Link

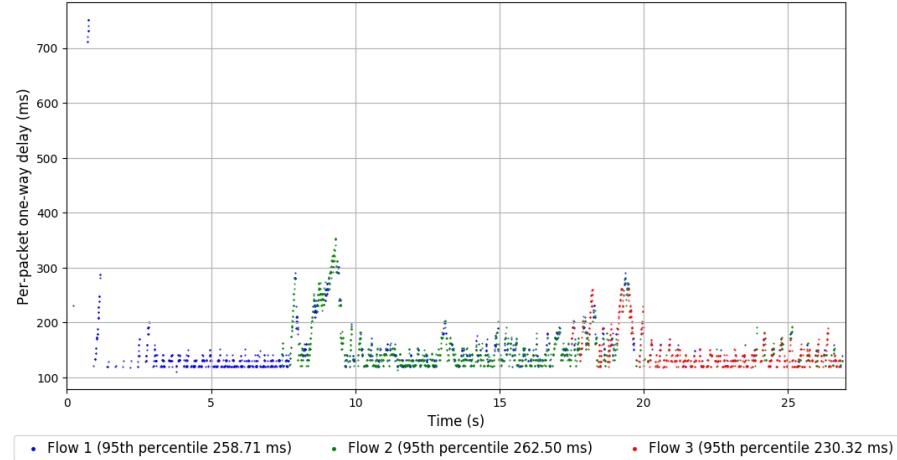
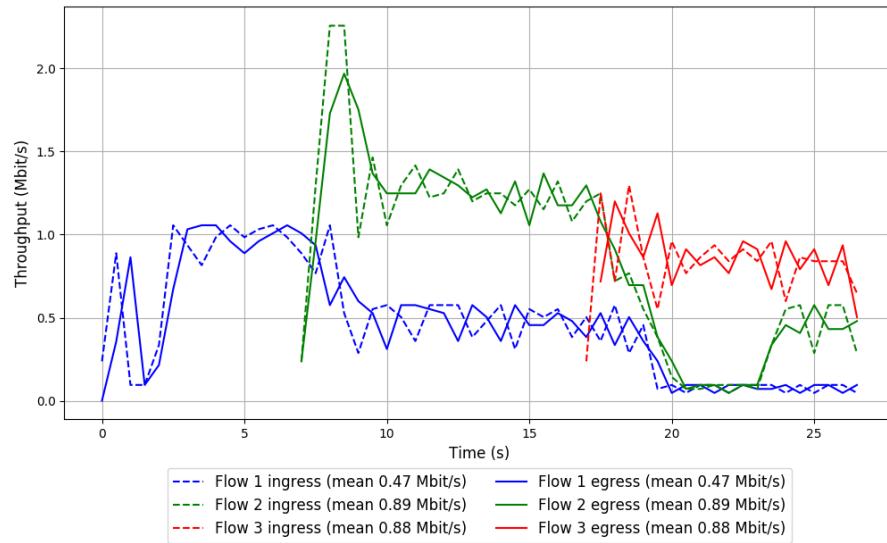


Run 2: Statistics of Indigo

```
Start at: 2018-01-10 16:05:49
End at: 2018-01-10 16:06:19
Local clock offset: 2.624 ms
Remote clock offset: -4.03 ms

# Below is generated by plot.py at 2018-01-10 16:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 252.543 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 258.708 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.89 Mbit/s
95th percentile per-packet one-way delay: 262.498 ms
Loss rate: 0.28%
-- Flow 3:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 230.319 ms
Loss rate: 1.88%
```

## Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2018-01-10 16:24:35
End at: 2018-01-10 16:25:05
Local clock offset: 2.943 ms
Remote clock offset: -3.503 ms

# Below is generated by plot.py at 2018-01-10 16:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 179.421 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 176.049 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 187.105 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 196.100 ms
Loss rate: 0.29%
```

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

