

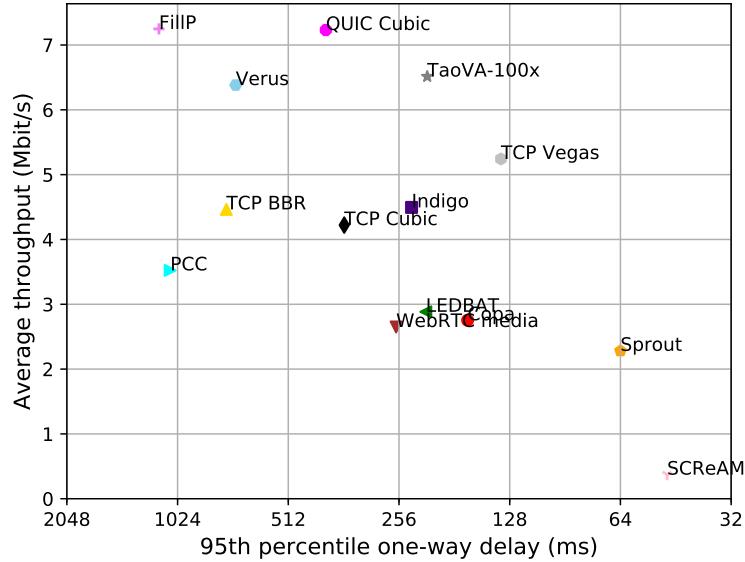
## Pantheon Report

Generated at 2017-12-20 19:34:46 (UTC).  
Data path: AWS India 1 Ethernet (*local*) → India 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 [nets.org.sg](http://nets.org.sg) and have been applied to correct the timestamps in logs.

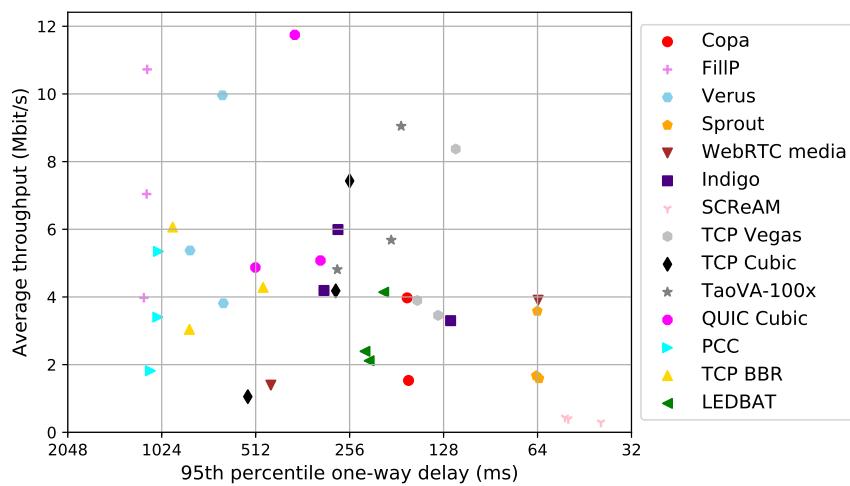
### Git summary:

```
branch: master @ 904a5750834816b1e46a2c86405d707788d27c16
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ dcaef6b00654e660f73f7ed679d2eab61ce08639
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 @ b3465b942e2826f2b179eab4a906ce6bb7cf3cf
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 India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme  
 3 flows with 10s interval between flows (mean of all runs by scheme)



test from AWS India 1 Ethernet to India ppp0, 3 runs of 30s each per scheme  
 3 flows with 10s interval between flows



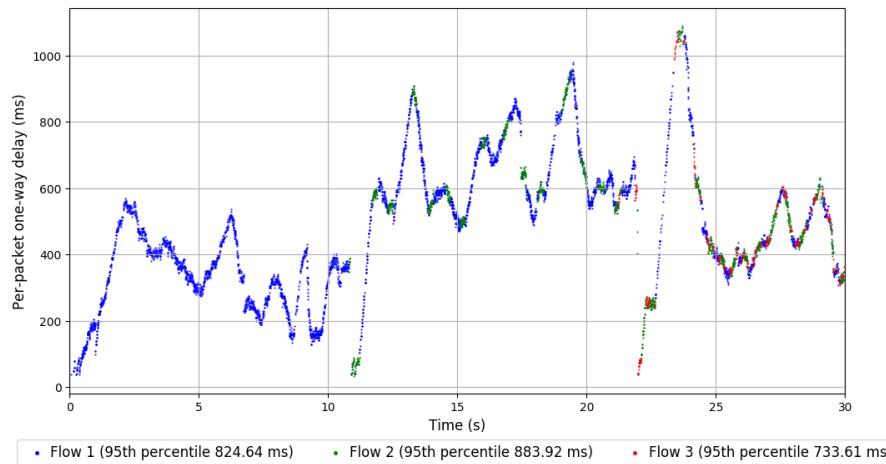
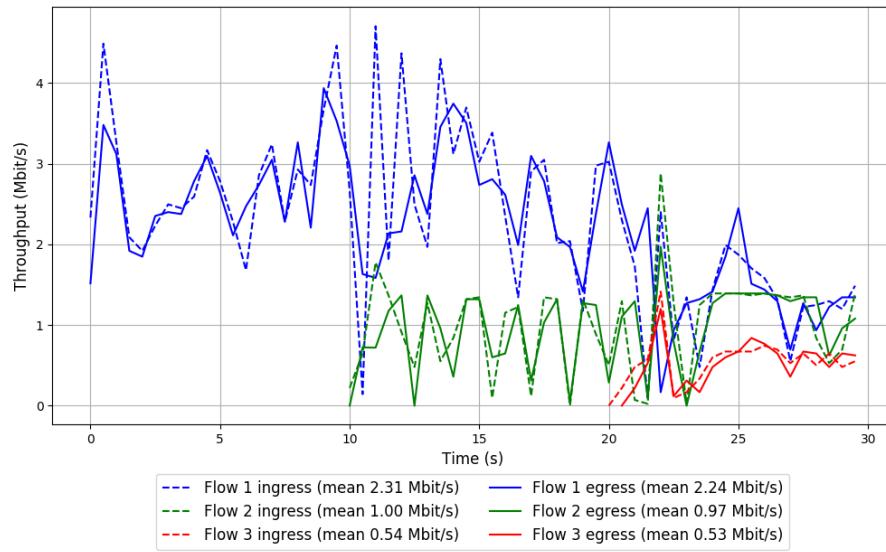
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	2.87	1.52	2.22	749.99	791.25	530.03	2.66	4.91	6.07
TCP Cubic		2.89	1.64	0.78	286.14	385.36	469.52	0.88	1.61	3.83
LEDBAT		1.99	0.93	0.89	212.93	219.21	229.62	0.26	0.53	1.92
PCC		2.13	1.46	1.32	1063.42	1073.54	1101.62	48.83	39.77	50.50
QUIC Cubic		4.82	2.57	2.19	377.30	407.43	455.03	0.71	1.58	3.54
SCReAM		0.15	0.22	0.22	51.03	49.46	46.47	0.16	0.14	0.35
WebRTC media		1.40	0.95	0.32	264.55	289.40	179.69	0.22	0.34	0.73
Sprout		1.13	1.05	1.40	65.29	61.21	63.97	0.06	0.29	1.01
TaoVA-100x		3.66	3.24	2.74	179.22	224.29	264.02	0.29	0.58	1.62
TCP Vegas		6.23	3.27	3.82	1053.44	135.39	142.34	0.14	0.39	0.53
Verus		4.38	2.52	1.06	690.46	819.65	721.85	2.94	27.68	14.70
Copa	2	1.15	2.23	0.93	96.81	172.21	120.28	0.08	0.51	0.47
FillP		4.68	2.37	3.57	1100.20	1165.52	1191.94	88.91	96.29	97.93
Indigo		3.31	1.12	1.37	220.67	323.57	220.08	0.51	1.71	0.50

Run 1: Statistics of TCP BBR

```
Start at: 2017-12-20 18:51:48
End at: 2017-12-20 18:52:18
Local clock offset: 2.221 ms
Remote clock offset: -20.296 ms

# Below is generated by plot.py at 2017-12-20 19:33:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 834.636 ms
Loss rate: 3.78%
-- Flow 1:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 824.637 ms
Loss rate: 3.29%
-- Flow 2:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 883.918 ms
Loss rate: 4.68%
-- Flow 3:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 733.611 ms
Loss rate: 6.72%
```

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

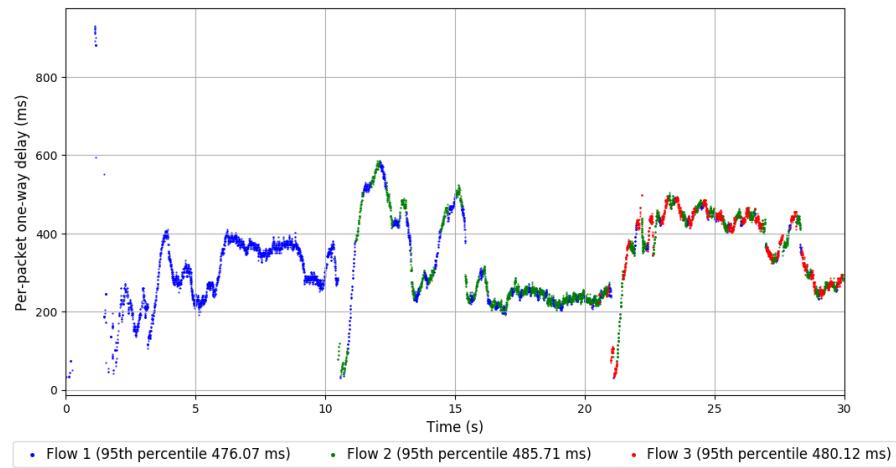
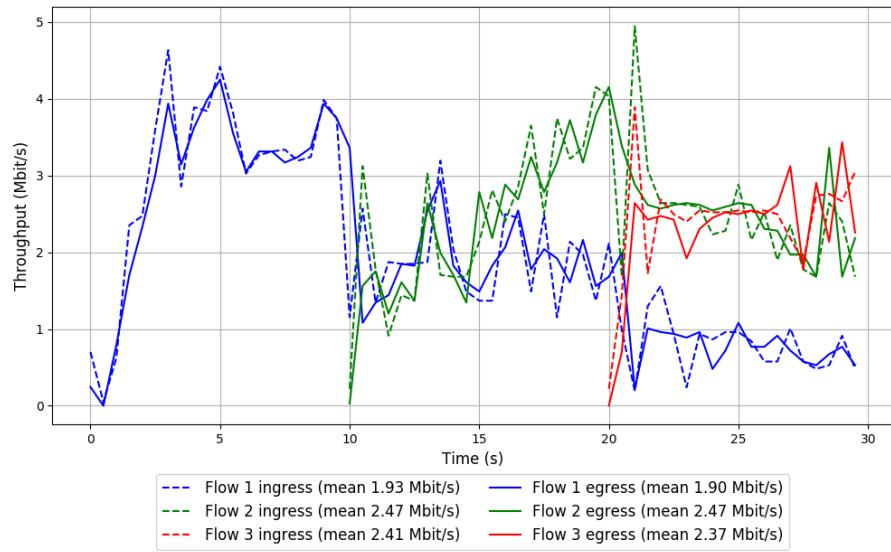


Run 2: Statistics of TCP BBR

```
Start at: 2017-12-20 19:08:36
End at: 2017-12-20 19:09:06
Local clock offset: 2.628 ms
Remote clock offset: -20.67 ms

# Below is generated by plot.py at 2017-12-20 19:33:54
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.28 Mbit/s
95th percentile per-packet one-way delay: 484.654 ms
Loss rate: 1.91%
-- Flow 1:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 476.068 ms
Loss rate: 1.09%
-- Flow 2:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 485.714 ms
Loss rate: 1.58%
-- Flow 3:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 480.125 ms
Loss rate: 4.57%
```

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

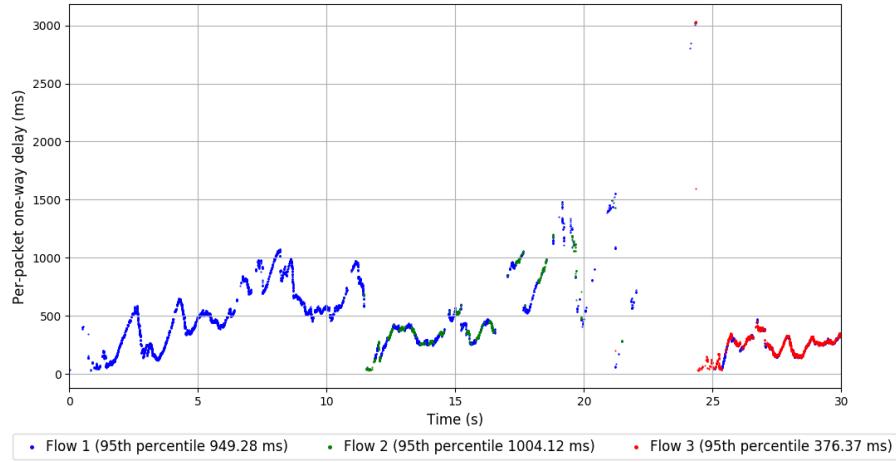
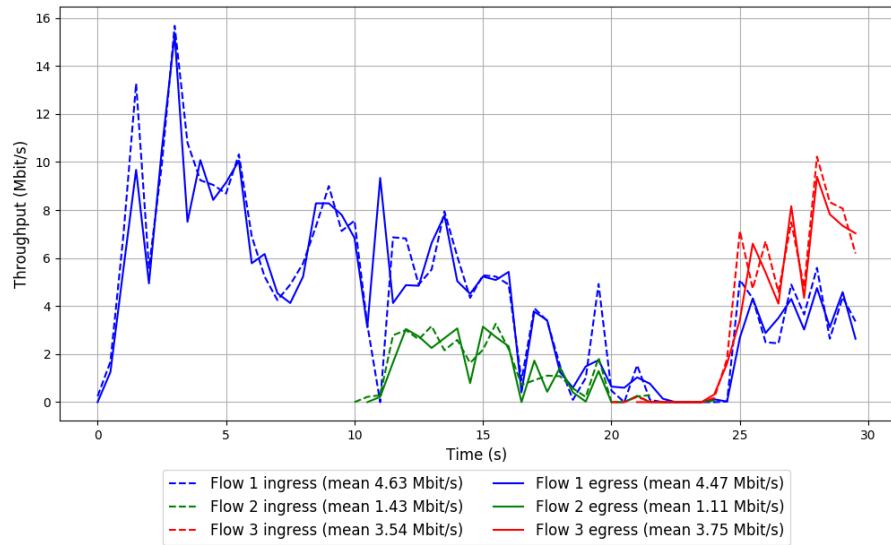


Run 3: Statistics of TCP BBR

```
Start at: 2017-12-20 19:25:24
End at: 2017-12-20 19:25:54
Local clock offset: 2.403 ms
Remote clock offset: -20.807 ms

# Below is generated by plot.py at 2017-12-20 19:33:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 6.07 Mbit/s
95th percentile per-packet one-way delay: 944.457 ms
Loss rate: 4.63%
-- Flow 1:
Average throughput: 4.47 Mbit/s
95th percentile per-packet one-way delay: 949.277 ms
Loss rate: 3.59%
-- Flow 2:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 1004.122 ms
Loss rate: 8.48%
-- Flow 3:
Average throughput: 3.75 Mbit/s
95th percentile per-packet one-way delay: 376.368 ms
Loss rate: 6.93%
```

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

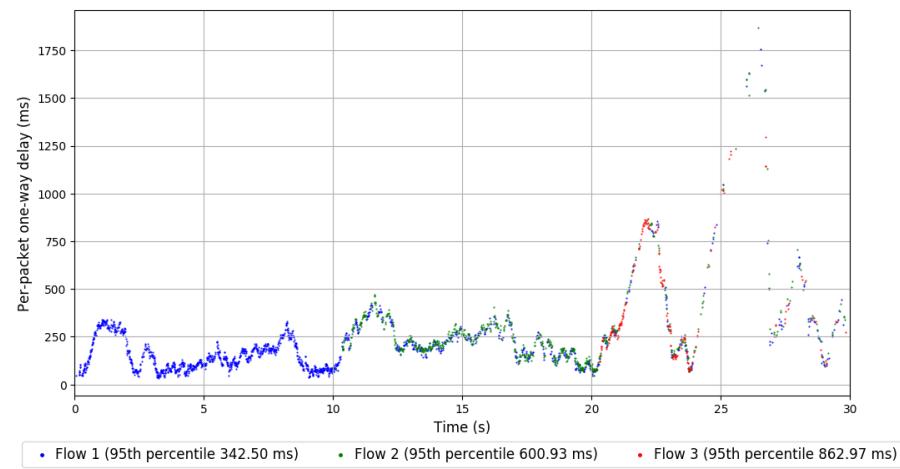
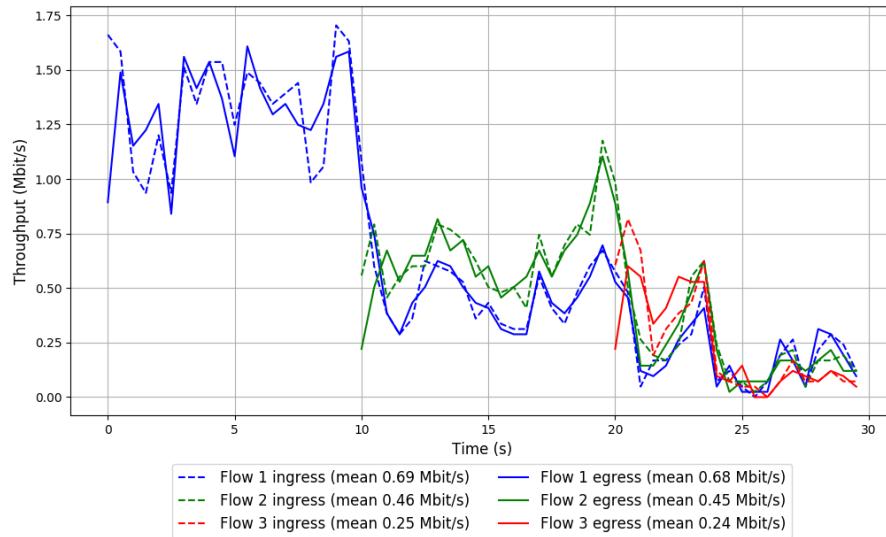


Run 1: Statistics of TCP Cubic

```
Start at: 2017-12-20 18:49:35
End at: 2017-12-20 18:50:05
Local clock offset: 3.148 ms
Remote clock offset: -21.776 ms

# Below is generated by plot.py at 2017-12-20 19:33:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 542.561 ms
Loss rate: 2.17%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 342.501 ms
Loss rate: 1.46%
-- Flow 2:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 600.932 ms
Loss rate: 2.64%
-- Flow 3:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 862.969 ms
Loss rate: 6.27%
```

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

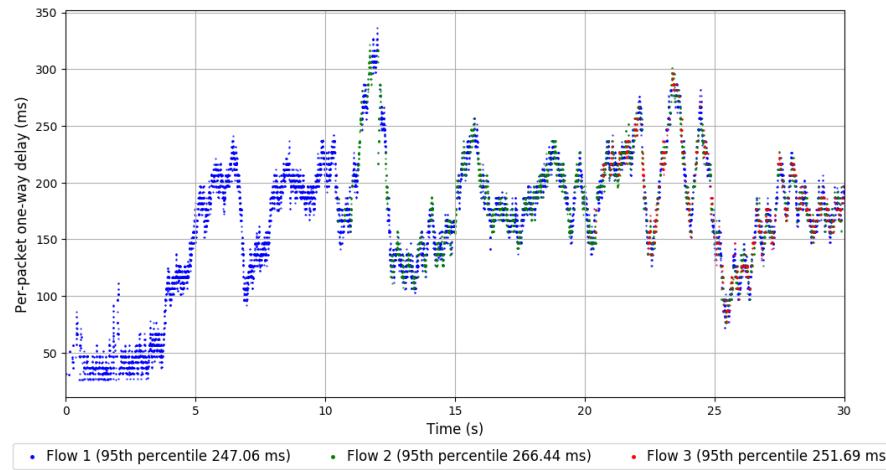
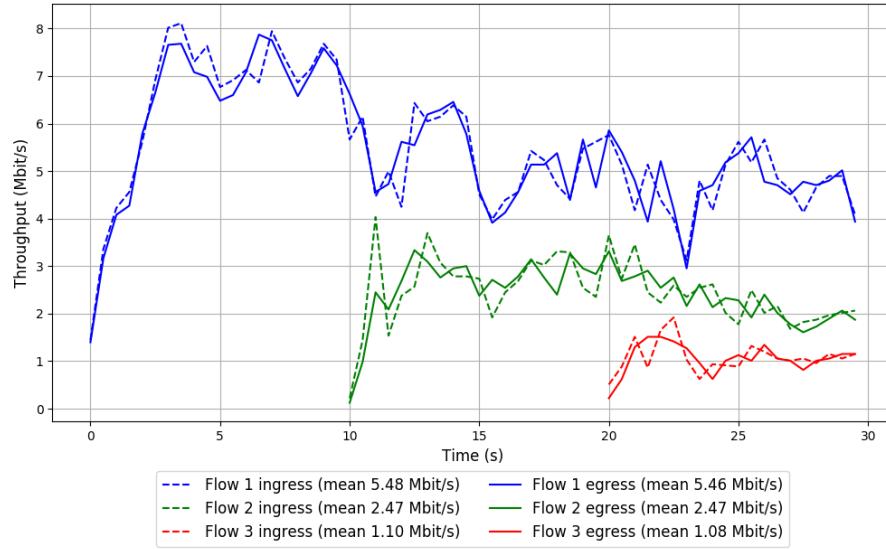


Run 2: Statistics of TCP Cubic

```
Start at: 2017-12-20 19:06:22
End at: 2017-12-20 19:06:52
Local clock offset: 6.262 ms
Remote clock offset: -21.221 ms

# Below is generated by plot.py at 2017-12-20 19:33:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.43 Mbit/s
95th percentile per-packet one-way delay: 255.947 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 5.46 Mbit/s
95th percentile per-packet one-way delay: 247.065 ms
Loss rate: 0.61%
-- Flow 2:
Average throughput: 2.47 Mbit/s
95th percentile per-packet one-way delay: 266.436 ms
Loss rate: 1.44%
-- Flow 3:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 251.692 ms
Loss rate: 2.43%
```

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

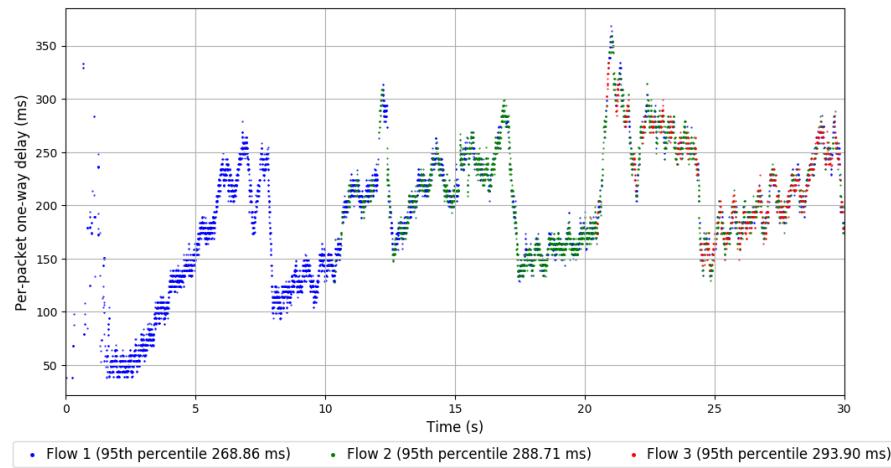
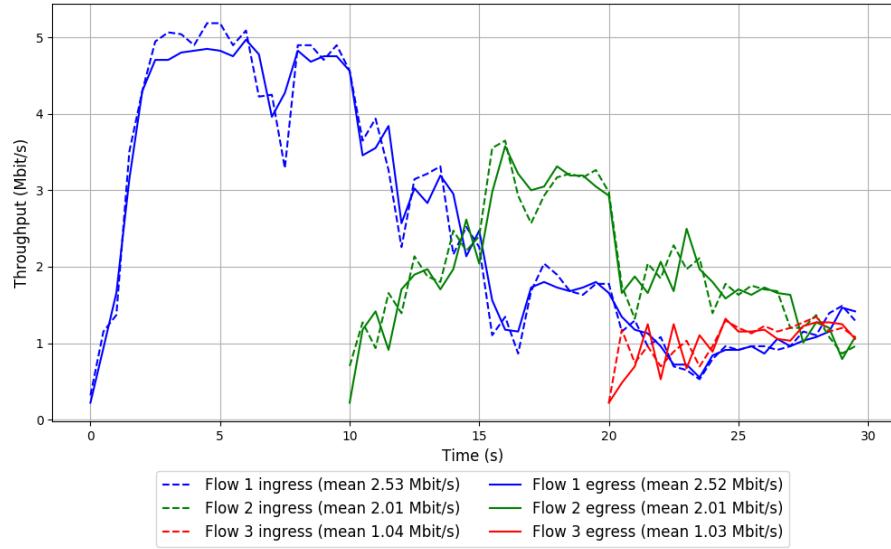


Run 3: Statistics of TCP Cubic

```
Start at: 2017-12-20 19:23:11
End at: 2017-12-20 19:23:41
Local clock offset: -0.034 ms
Remote clock offset: -19.426 ms

# Below is generated by plot.py at 2017-12-20 19:33:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.18 Mbit/s
95th percentile per-packet one-way delay: 283.589 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 2.52 Mbit/s
95th percentile per-packet one-way delay: 268.861 ms
Loss rate: 0.57%
-- Flow 2:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 288.710 ms
Loss rate: 0.75%
-- Flow 3:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 293.899 ms
Loss rate: 2.79%
```

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

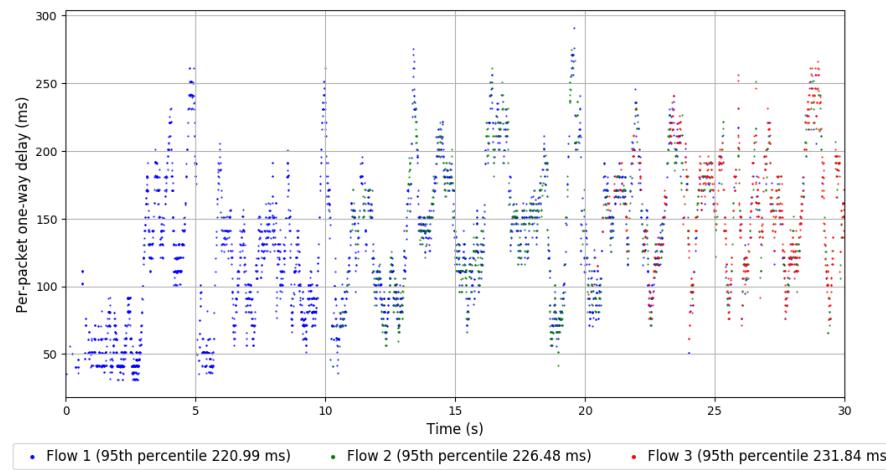
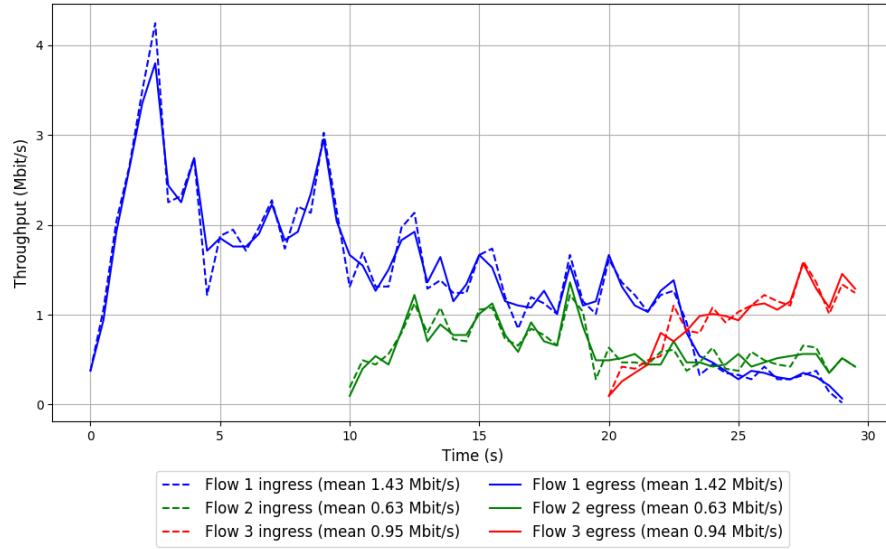


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2017-12-20 18:50:41
End at: 2017-12-20 18:51:11
Local clock offset: 2.84 ms
Remote clock offset: -22.094 ms

# Below is generated by plot.py at 2017-12-20 19:33:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 221.688 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 220.987 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 226.483 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 231.835 ms
Loss rate: 1.62%
```

## Run 1: Report of LEDBAT — Data Link

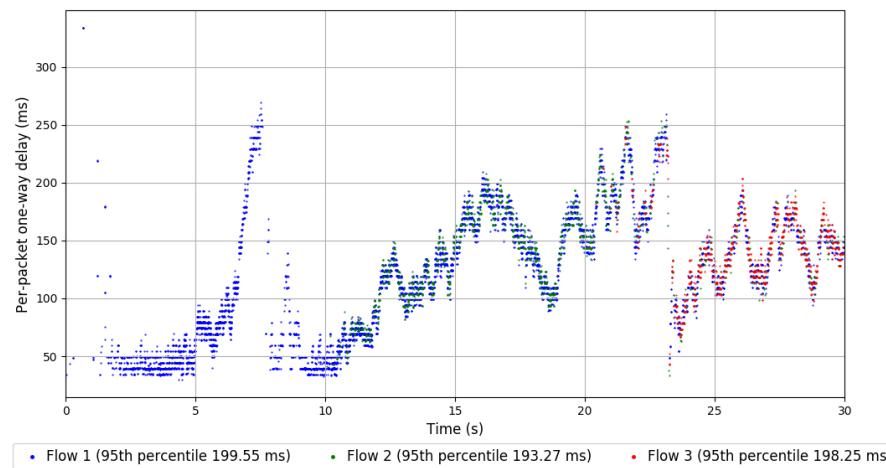
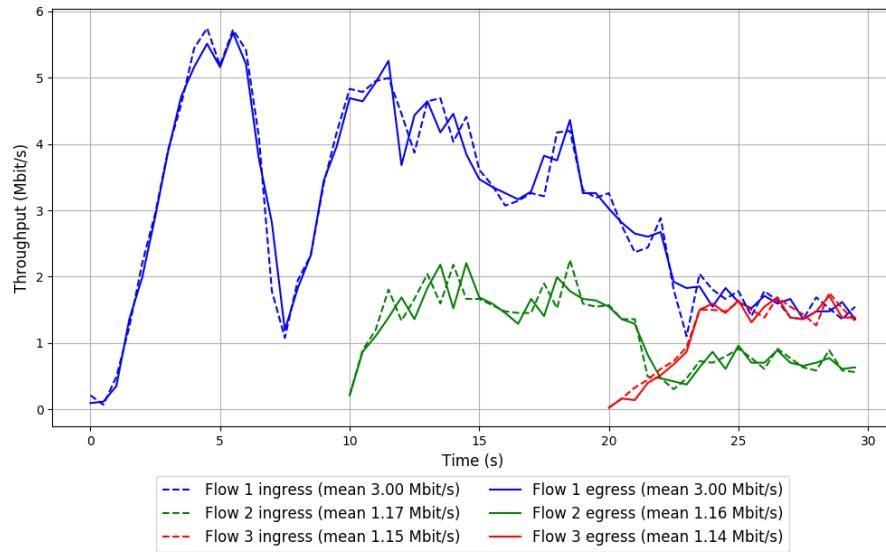


Run 2: Statistics of LEDBAT

```
Start at: 2017-12-20 19:07:29
End at: 2017-12-20 19:07:59
Local clock offset: 4.57 ms
Remote clock offset: -20.623 ms

# Below is generated by plot.py at 2017-12-20 19:33:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.14 Mbit/s
95th percentile per-packet one-way delay: 199.138 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 3.00 Mbit/s
95th percentile per-packet one-way delay: 199.546 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 193.268 ms
Loss rate: 0.55%
-- Flow 3:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 198.255 ms
Loss rate: 2.37%
```

## Run 2: Report of LEDBAT — Data Link

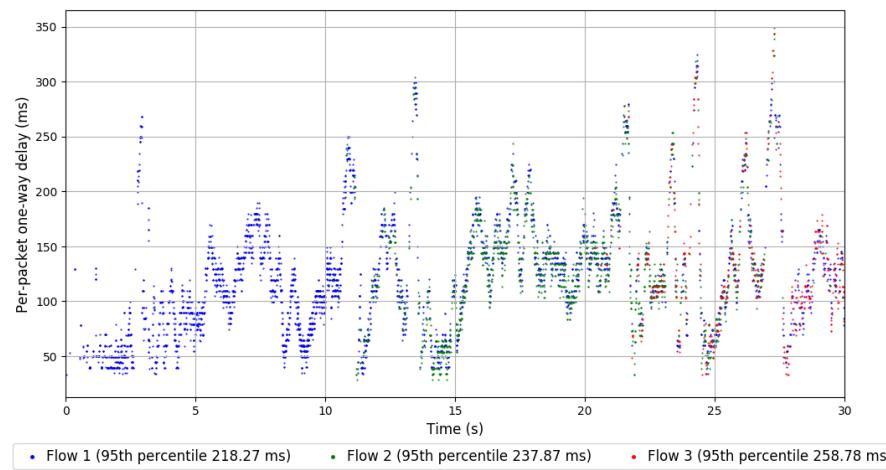
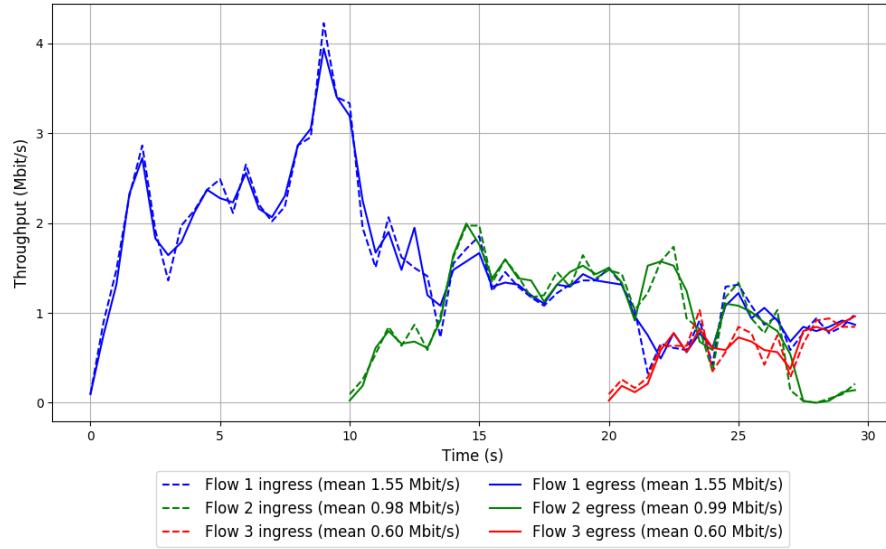


Run 3: Statistics of LEDBAT

```
Start at: 2017-12-20 19:24:17
End at: 2017-12-20 19:24:47
Local clock offset: 4.508 ms
Remote clock offset: -19.497 ms

# Below is generated by plot.py at 2017-12-20 19:33:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.39 Mbit/s
95th percentile per-packet one-way delay: 228.601 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 218.270 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 237.867 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 258.784 ms
Loss rate: 1.77%
```

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

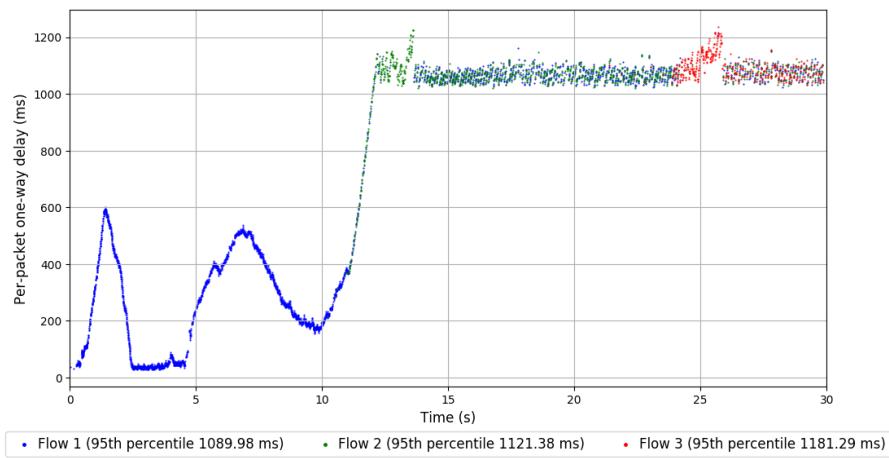
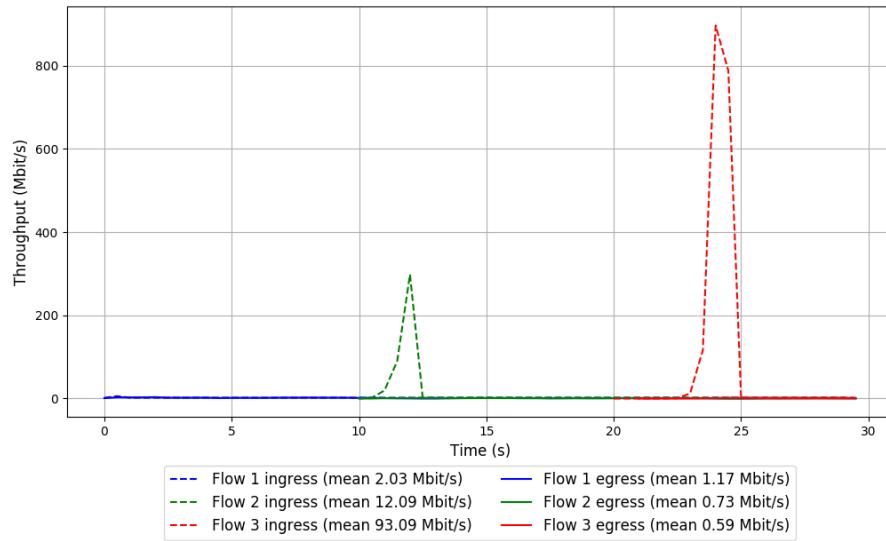


Run 1: Statistics of PCC

```
Start at: 2017-12-20 18:48:28
End at: 2017-12-20 18:48:58
Local clock offset: 2.937 ms
Remote clock offset: -21.183 ms

# Below is generated by plot.py at 2017-12-20 19:34:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 1113.082 ms
Loss rate: 95.55%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 1089.976 ms
Loss rate: 42.67%
-- Flow 2:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 1121.379 ms
Loss rate: 94.01%
-- Flow 3:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1181.287 ms
Loss rate: 99.45%
```

## Run 1: Report of PCC — Data Link

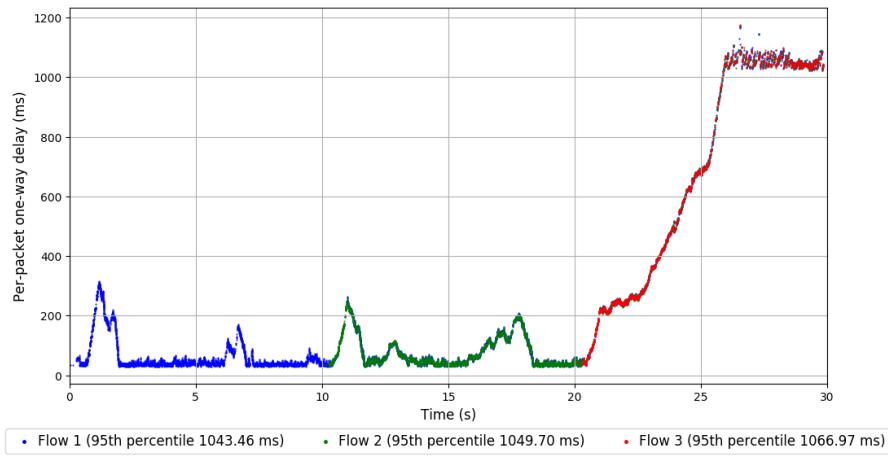
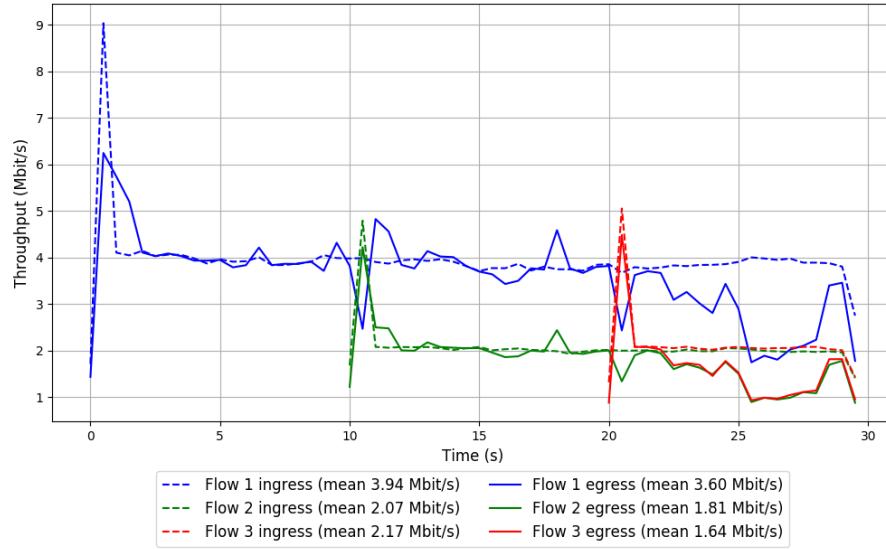


Run 2: Statistics of PCC

```
Start at: 2017-12-20 19:05:14
End at: 2017-12-20 19:05:44
Local clock offset: 1.909 ms
Remote clock offset: -20.247 ms

# Below is generated by plot.py at 2017-12-20 19:34:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.35 Mbit/s
95th percentile per-packet one-way delay: 1049.228 ms
Loss rate: 11.45%
-- Flow 1:
Average throughput: 3.60 Mbit/s
95th percentile per-packet one-way delay: 1043.460 ms
Loss rate: 8.62%
-- Flow 2:
Average throughput: 1.81 Mbit/s
95th percentile per-packet one-way delay: 1049.705 ms
Loss rate: 12.57%
-- Flow 3:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 1066.967 ms
Loss rate: 24.84%
```

## Run 2: Report of PCC — Data Link

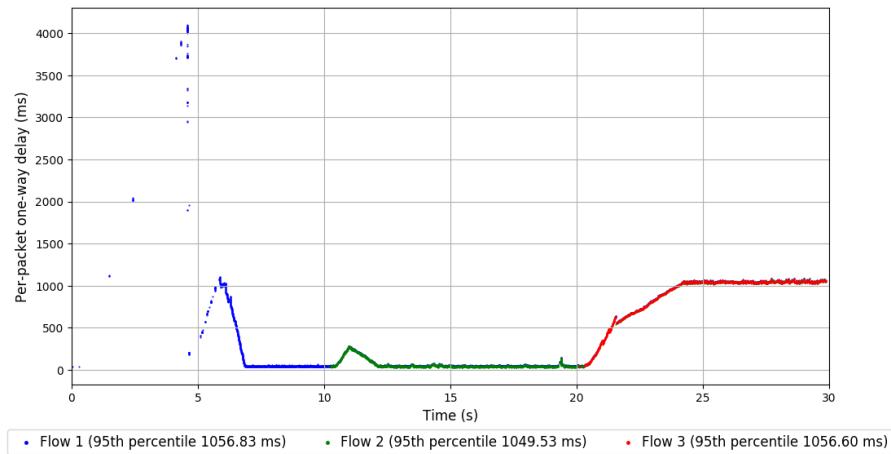
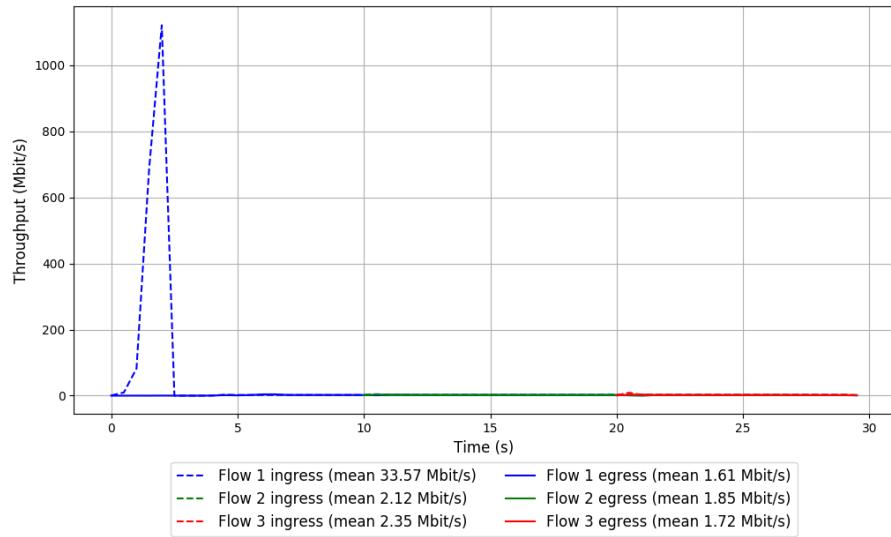


Run 3: Statistics of PCC

```
Start at: 2017-12-20 19:22:03
End at: 2017-12-20 19:22:33
Local clock offset: 0.593 ms
Remote clock offset: -22.551 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.40 Mbit/s
95th percentile per-packet one-way delay: 1054.105 ms
Loss rate: 90.49%
-- Flow 1:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 1056.825 ms
Loss rate: 95.21%
-- Flow 2:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 1049.534 ms
Loss rate: 12.73%
-- Flow 3:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 1056.596 ms
Loss rate: 27.22%
```

### Run 3: Report of PCC — Data Link

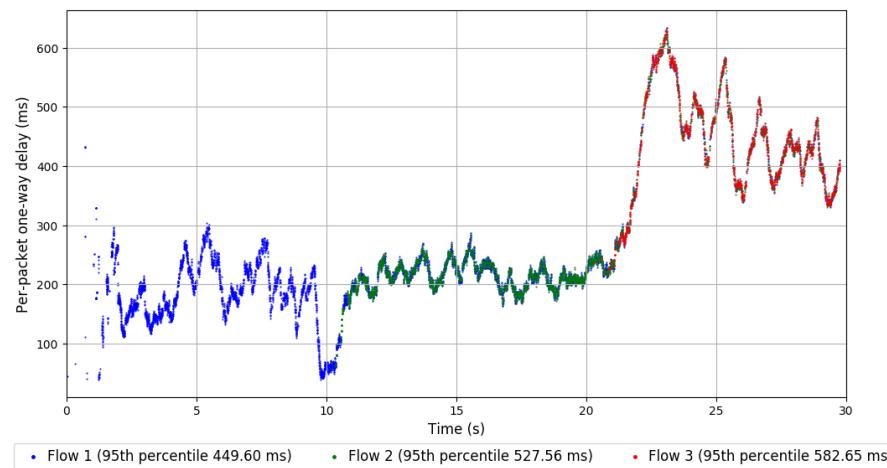
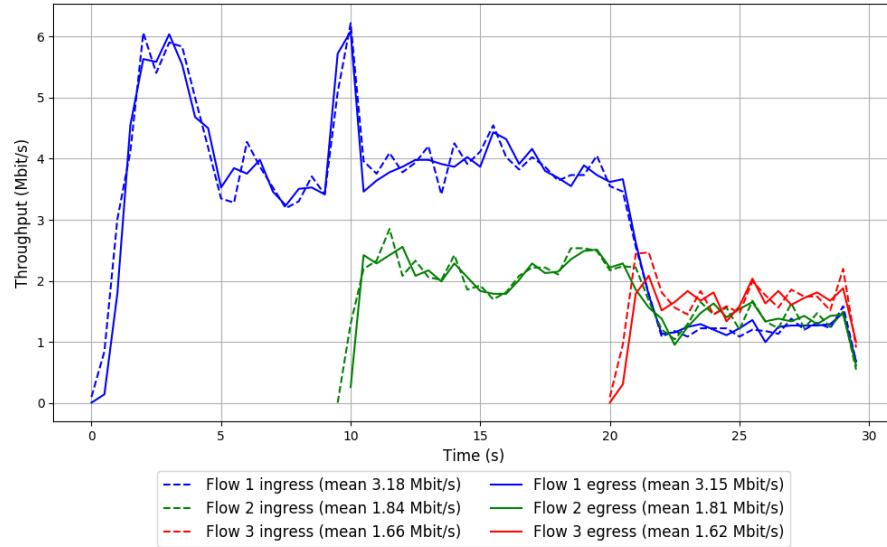


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2017-12-20 18:54:01
End at: 2017-12-20 18:54:31
Local clock offset: 6.276 ms
Remote clock offset: -21.186 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.87 Mbit/s
95th percentile per-packet one-way delay: 513.045 ms
Loss rate: 1.54%
-- Flow 1:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 449.595 ms
Loss rate: 0.86%
-- Flow 2:
Average throughput: 1.81 Mbit/s
95th percentile per-packet one-way delay: 527.559 ms
Loss rate: 1.75%
-- Flow 3:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 582.654 ms
Loss rate: 5.03%
```

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

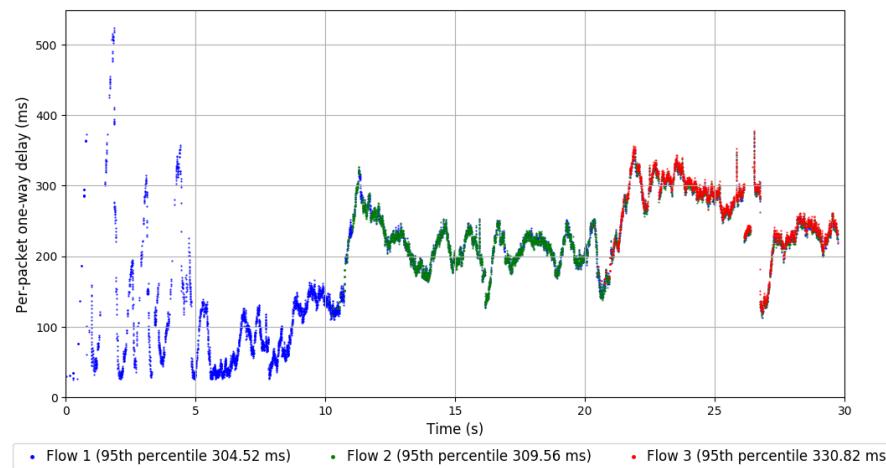
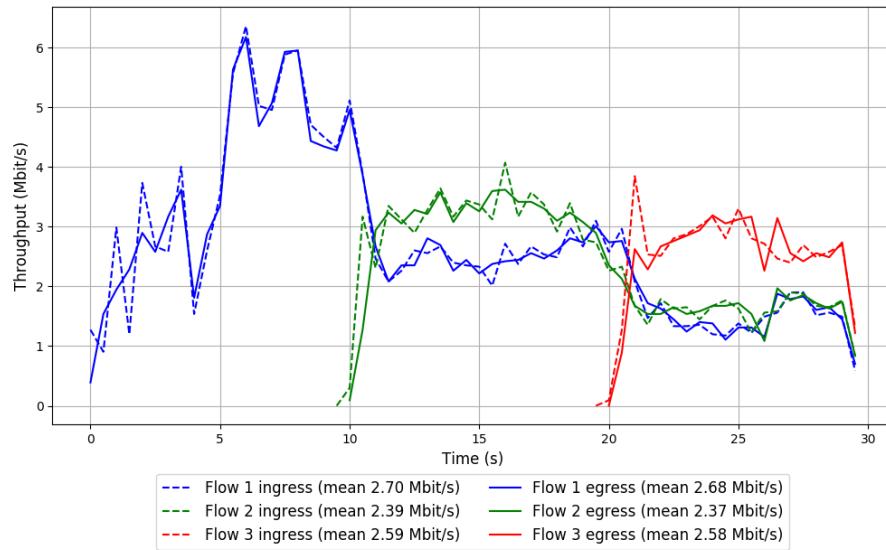


Run 2: Statistics of QUIC Cubic

```
Start at: 2017-12-20 19:10:49
End at: 2017-12-20 19:11:19
Local clock offset: 5.859 ms
Remote clock offset: -21.922 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.08 Mbit/s
95th percentile per-packet one-way delay: 317.396 ms
Loss rate: 1.22%
-- Flow 1:
Average throughput: 2.68 Mbit/s
95th percentile per-packet one-way delay: 304.517 ms
Loss rate: 0.68%
-- Flow 2:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 309.563 ms
Loss rate: 1.27%
-- Flow 3:
Average throughput: 2.58 Mbit/s
95th percentile per-packet one-way delay: 330.818 ms
Loss rate: 2.83%
```

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

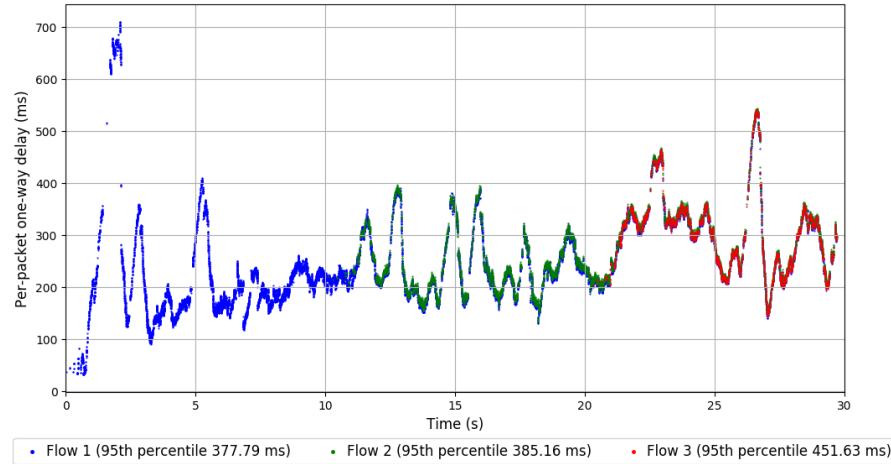
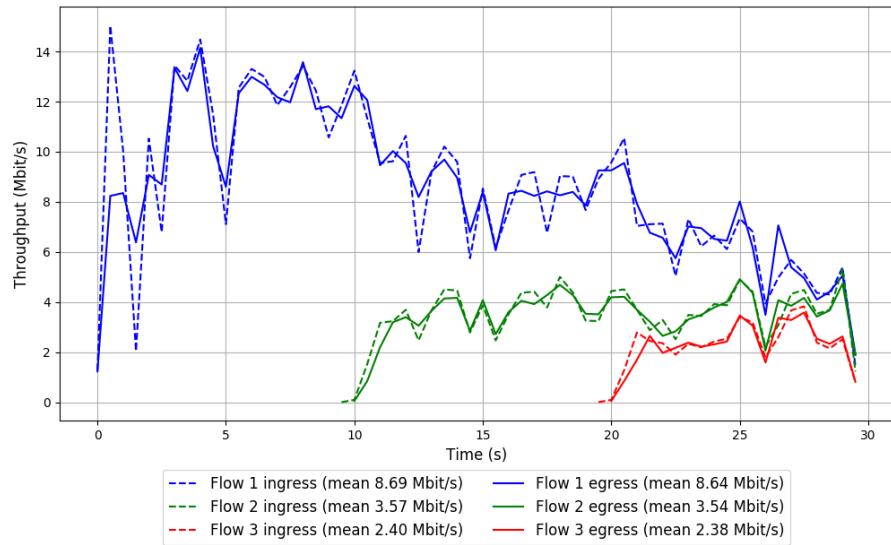


Run 3: Statistics of QUIC Cubic

```
Start at: 2017-12-20 19:27:38
End at: 2017-12-20 19:28:08
Local clock offset: 3.704 ms
Remote clock offset: -20.088 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 11.75 Mbit/s
95th percentile per-packet one-way delay: 383.701 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 8.64 Mbit/s
95th percentile per-packet one-way delay: 377.791 ms
Loss rate: 0.60%
-- Flow 2:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 385.156 ms
Loss rate: 1.72%
-- Flow 3:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 451.631 ms
Loss rate: 2.77%
```

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

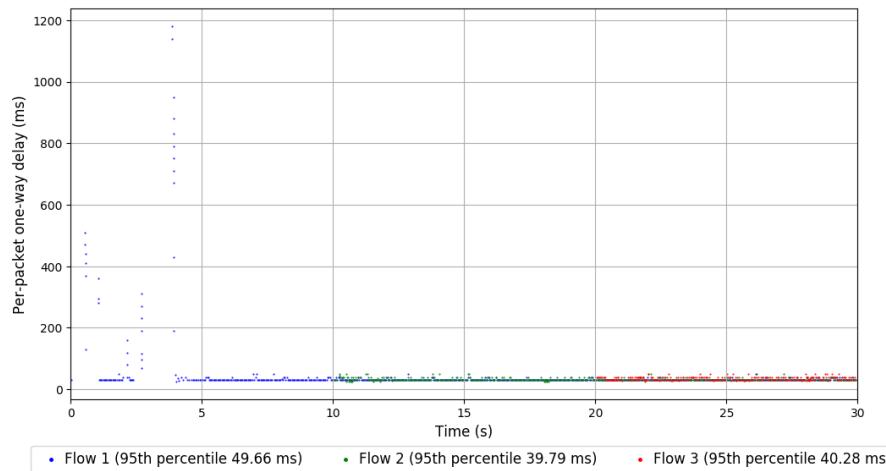
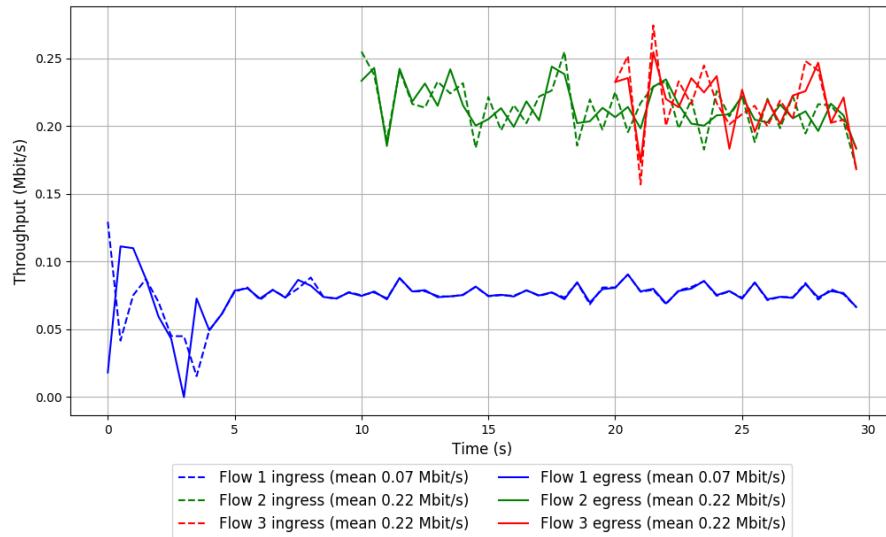


```
Run 1: Statistics of SCReAM
```

```
Start at: 2017-12-20 18:55:08
End at: 2017-12-20 18:55:38
Local clock offset: 6.198 ms
Remote clock offset: -23.377 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 40.083 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 49.656 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.788 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.282 ms
Loss rate: 0.36%
```

## Run 1: Report of SCReAM — Data Link

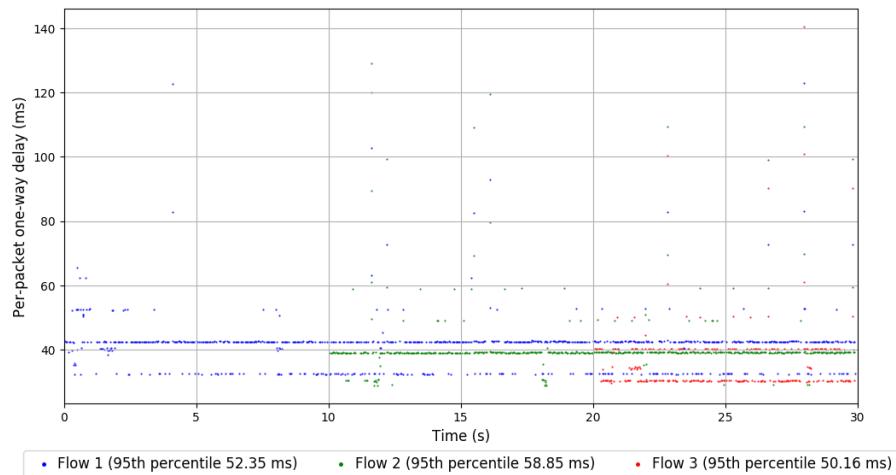
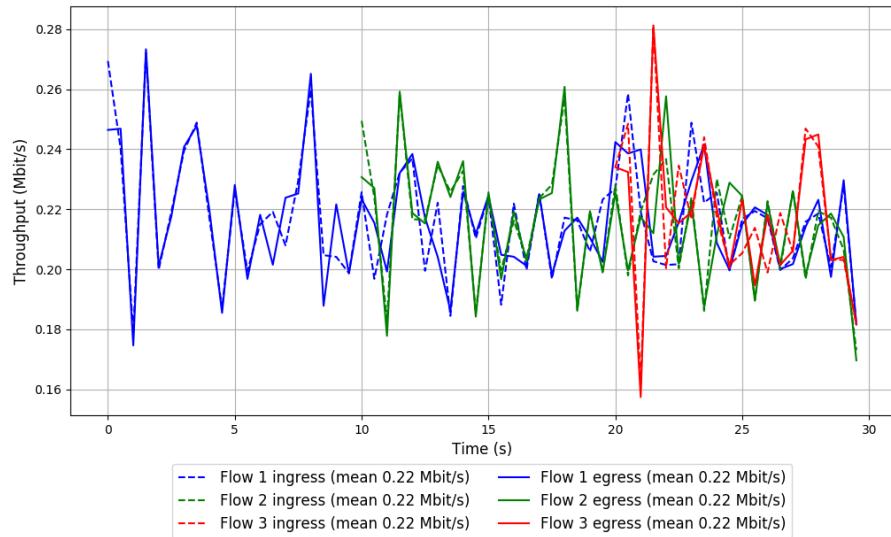


Run 2: Statistics of SCReAM

```
Start at: 2017-12-20 19:11:56
End at: 2017-12-20 19:12:26
Local clock offset: 4.938 ms
Remote clock offset: -19.708 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 52.272 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 52.347 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 58.851 ms
Loss rate: 0.21%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 50.162 ms
Loss rate: 0.35%
```

## Run 2: Report of SCReAM — Data Link

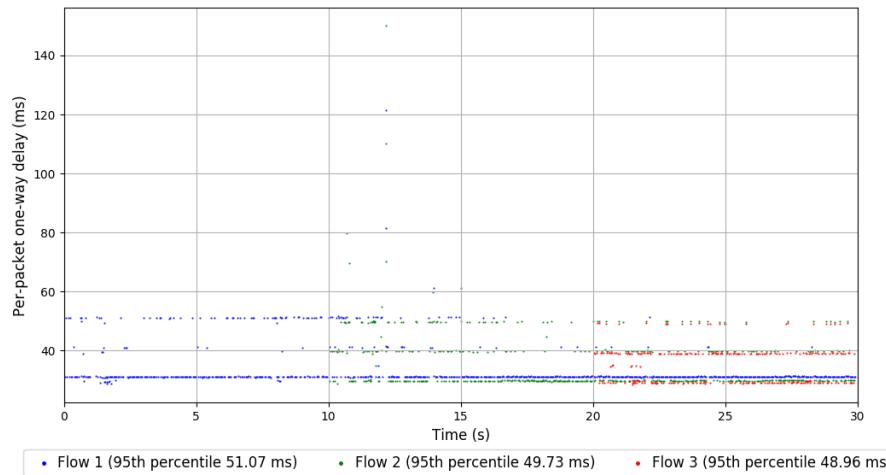
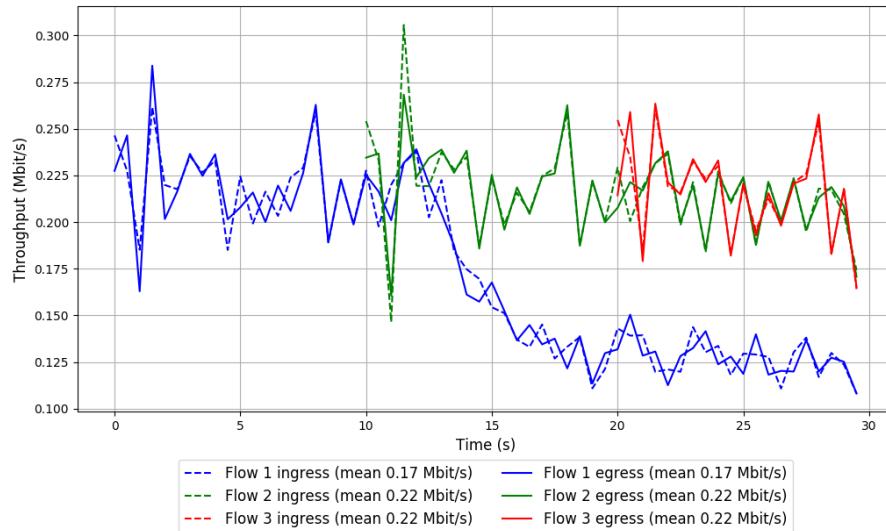


Run 3: Statistics of SCReAM

```
Start at: 2017-12-20 19:28:45
End at: 2017-12-20 19:29:15
Local clock offset: 4.26 ms
Remote clock offset: -20.942 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 50.994 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 51.073 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 49.727 ms
Loss rate: 0.21%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 48.961 ms
Loss rate: 0.35%
```

Run 3: Report of SCReAM — Data Link



Run 1: Statistics of WebRTC media

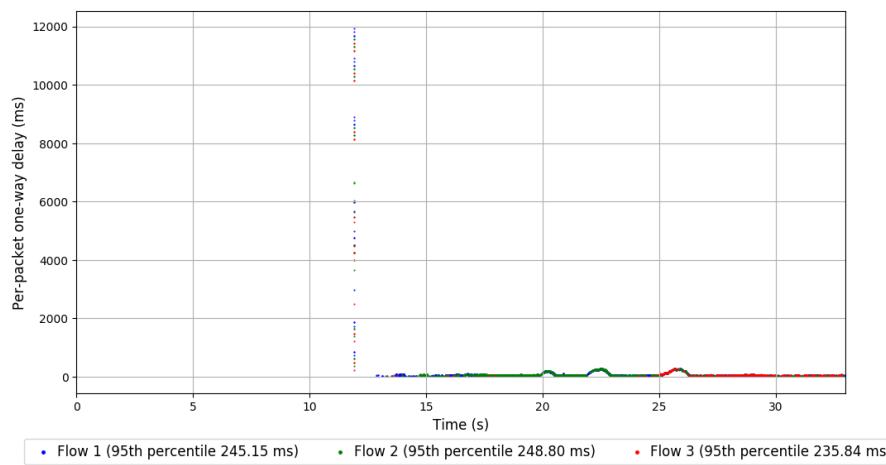
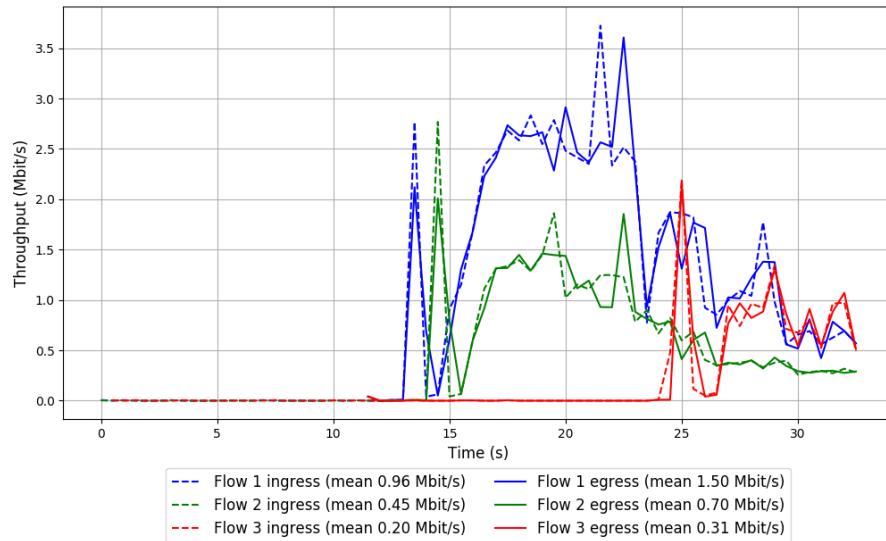
Start at: 2017-12-20 18:52:54

End at: 2017-12-20 18:53:24

Local clock offset: 2.059 ms

Remote clock offset: -21.665 ms

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

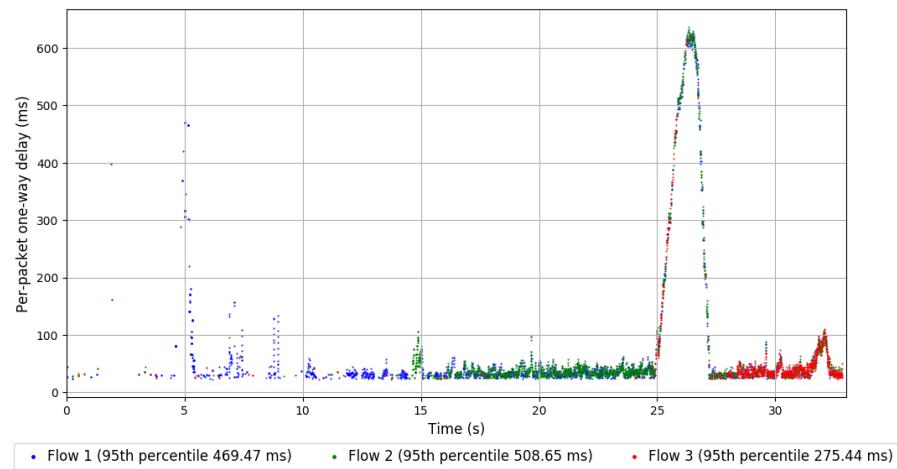
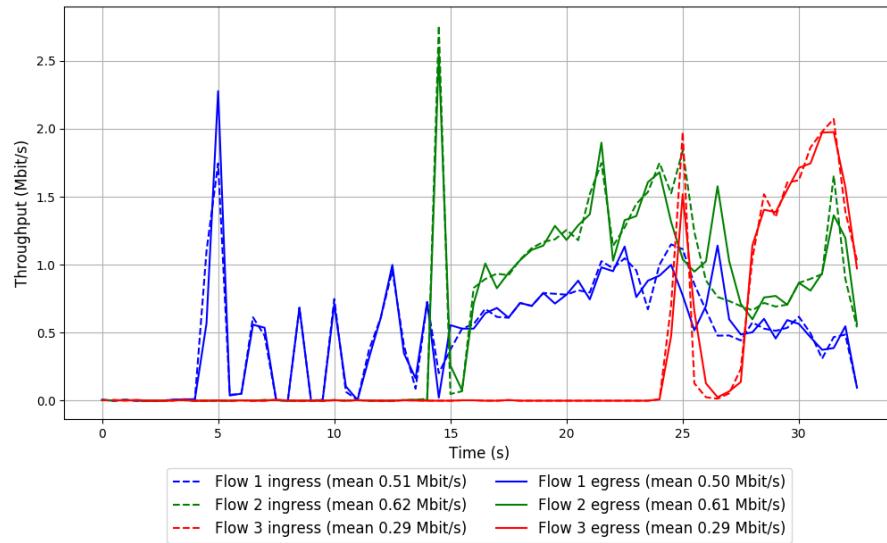


Run 2: Statistics of WebRTC media

```
Start at: 2017-12-20 19:09:43
End at: 2017-12-20 19:10:13
Local clock offset: 6.625 ms
Remote clock offset: -22.177 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 457.739 ms
Loss rate: 0.49%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 469.472 ms
Loss rate: 0.33%
-- Flow 2:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 508.649 ms
Loss rate: 0.45%
-- Flow 3:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 275.439 ms
Loss rate: 0.86%
```

Run 2: Report of WebRTC media — Data Link

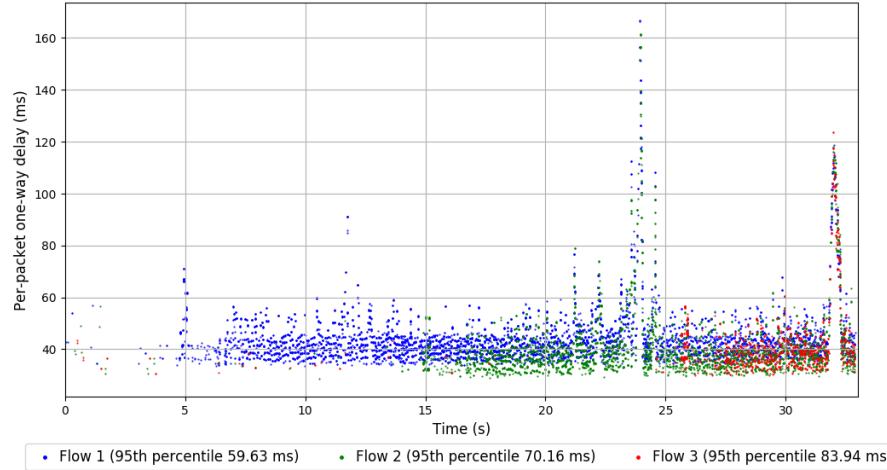
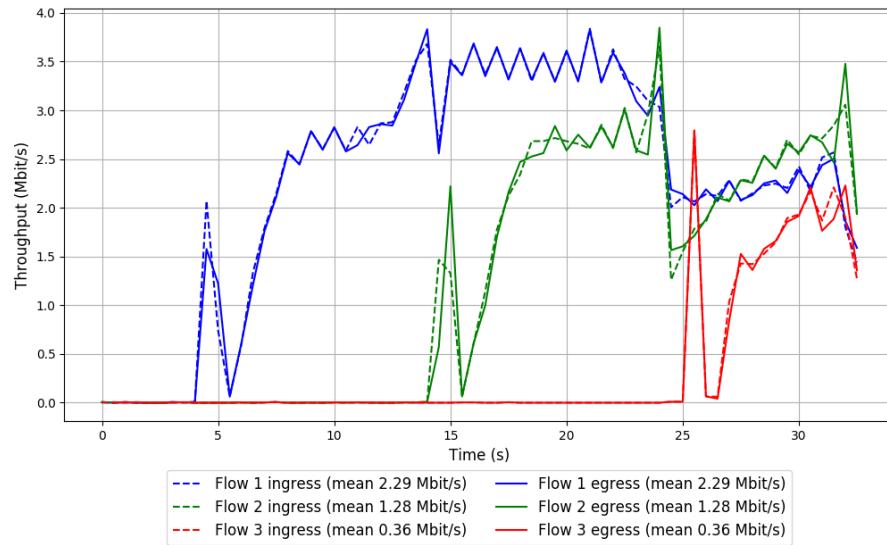


Run 3: Statistics of WebRTC media

```
Start at: 2017-12-20 19:26:31
End at: 2017-12-20 19:27:01
Local clock offset: 1.882 ms
Remote clock offset: -20.373 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.90 Mbit/s
95th percentile per-packet one-way delay: 63.705 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 59.629 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 70.161 ms
Loss rate: 0.23%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 83.943 ms
Loss rate: 0.61%
```

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

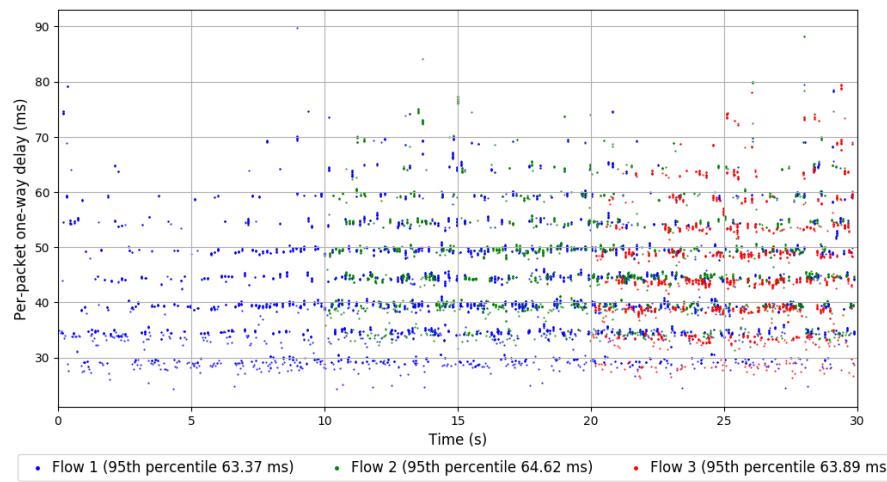
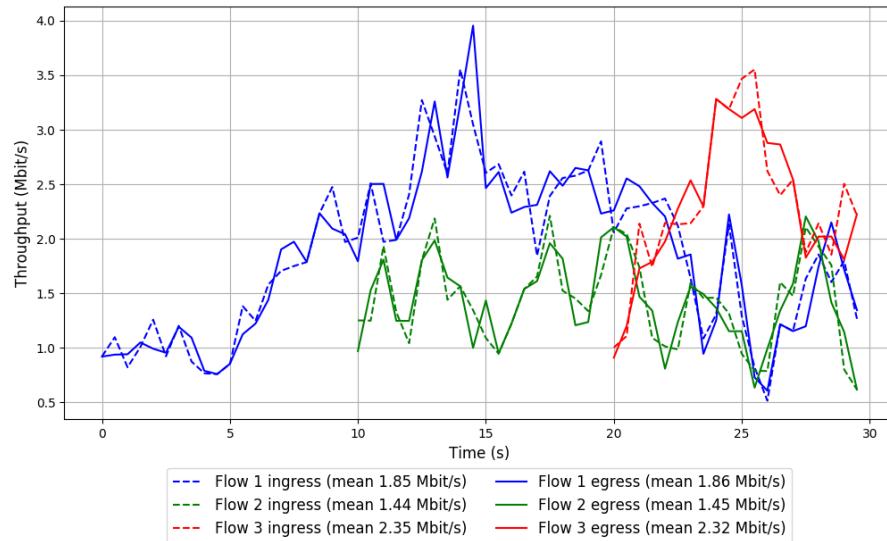


Run 1: Statistics of Sprout

```
Start at: 2017-12-20 18:42:52
End at: 2017-12-20 18:43:22
Local clock offset: 4.56 ms
Remote clock offset: -20.867 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.58 Mbit/s
95th percentile per-packet one-way delay: 64.114 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 63.365 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 64.625 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 63.894 ms
Loss rate: 1.48%
```

## Run 1: Report of Sprout — Data Link

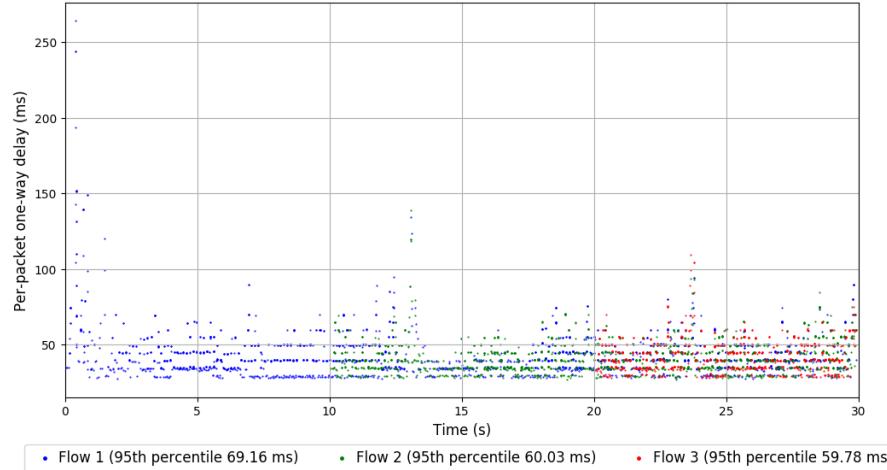
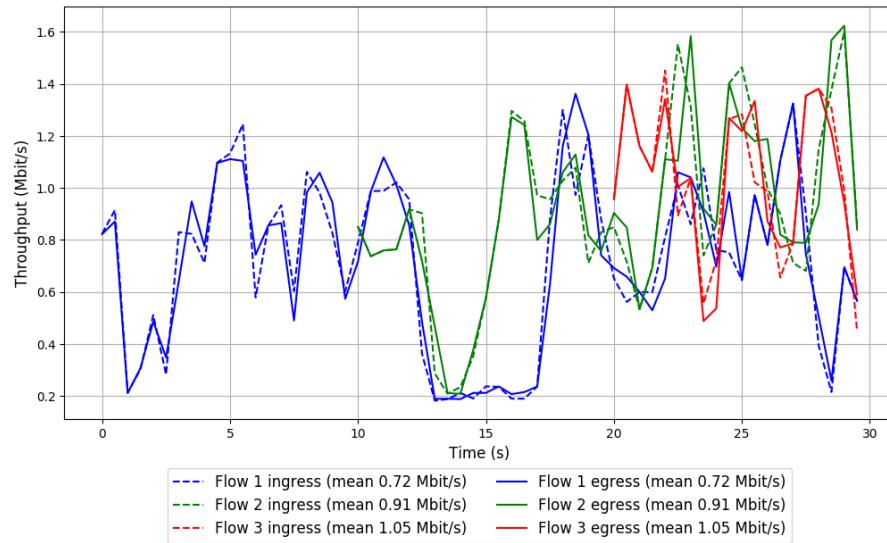


Run 2: Statistics of Sprout

```
Start at: 2017-12-20 18:59:38
End at: 2017-12-20 19:00:08
Local clock offset: 5.354 ms
Remote clock offset: -20.771 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 64.596 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 69.159 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 60.030 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 59.783 ms
Loss rate: 0.01%
```

## Run 2: Report of Sprout — Data Link

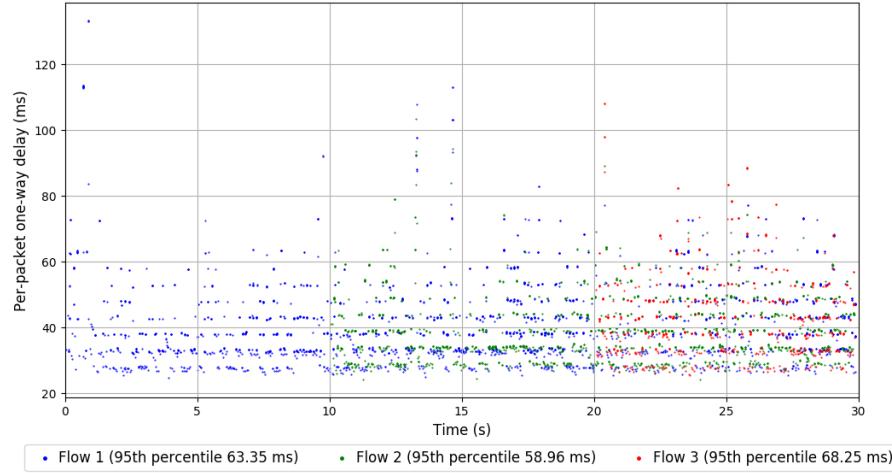
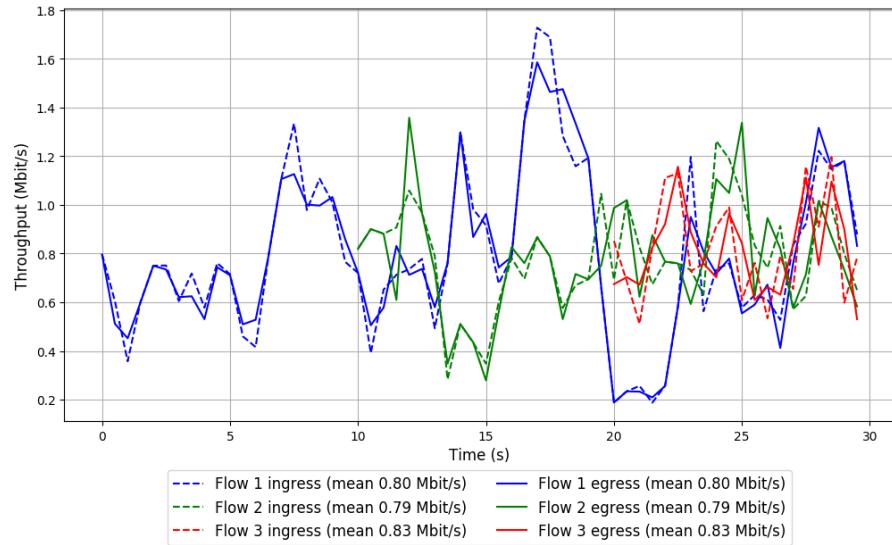


Run 3: Statistics of Sprout

```
Start at: 2017-12-20 19:16:27
End at: 2017-12-20 19:16:57
Local clock offset: 5.431 ms
Remote clock offset: -21.344 ms

# Below is generated by plot.py at 2017-12-20 19:34:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 63.312 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 63.347 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 58.962 ms
Loss rate: 0.81%
-- Flow 3:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 68.246 ms
Loss rate: 1.54%
```

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

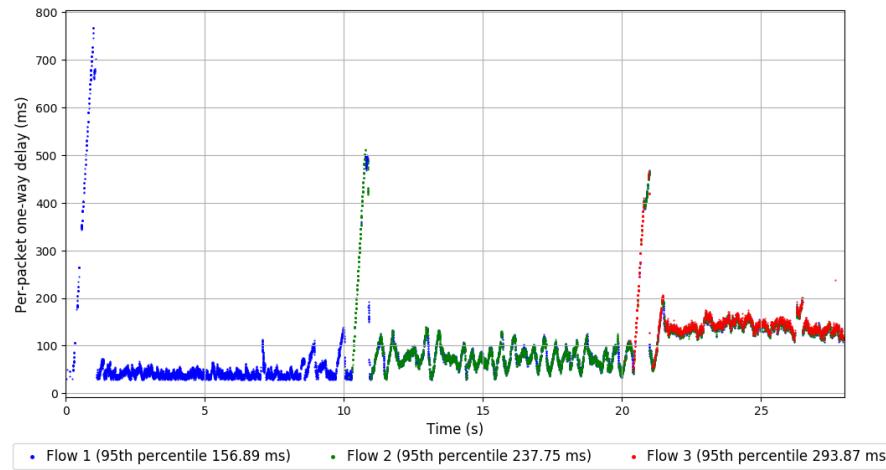
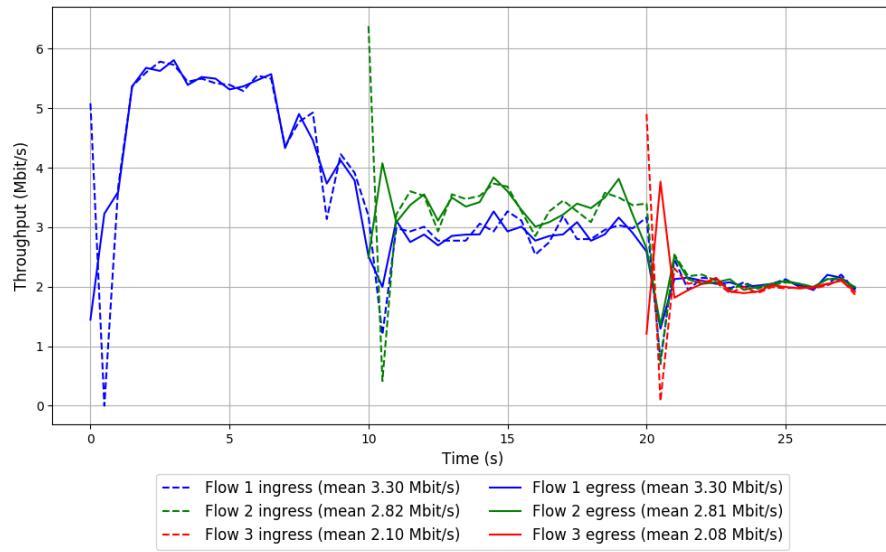


Run 1: Statistics of TaoVA-100x

```
Start at: 2017-12-20 18:56:14
End at: 2017-12-20 18:56:44
Local clock offset: 4.755 ms
Remote clock offset: -20.492 ms

# Below is generated by plot.py at 2017-12-20 19:34:21
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.68 Mbit/s
95th percentile per-packet one-way delay: 188.295 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 156.890 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 2.81 Mbit/s
95th percentile per-packet one-way delay: 237.747 ms
Loss rate: 0.59%
-- Flow 3:
Average throughput: 2.08 Mbit/s
95th percentile per-packet one-way delay: 293.870 ms
Loss rate: 1.57%
```

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

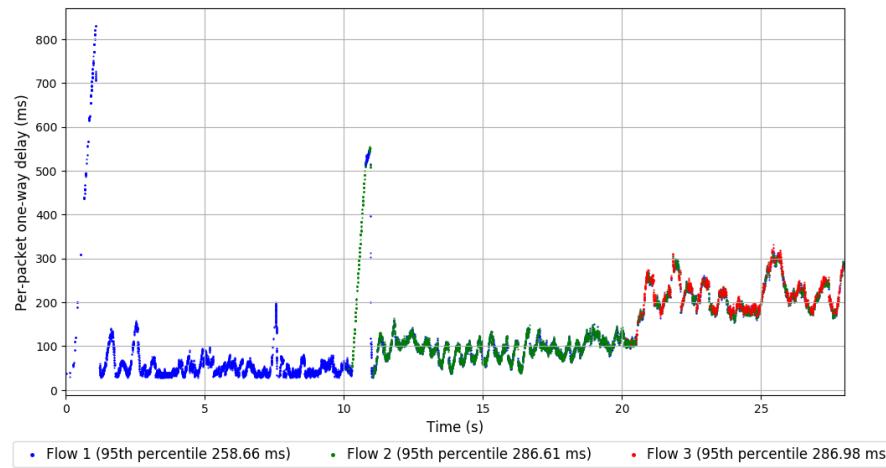
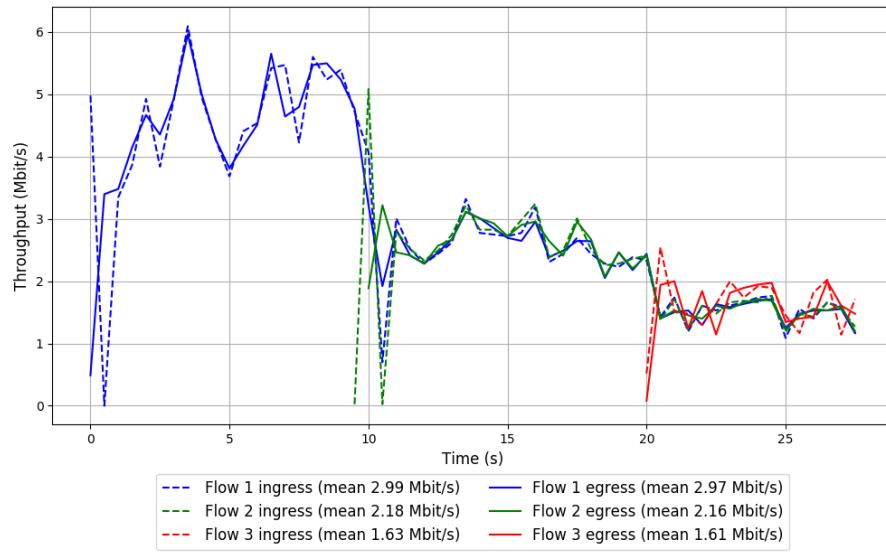


Run 2: Statistics of TaoVA-100x

```
Start at: 2017-12-20 19:13:03
End at: 2017-12-20 19:13:33
Local clock offset: 4.251 ms
Remote clock offset: -20.193 ms

# Below is generated by plot.py at 2017-12-20 19:34:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.81 Mbit/s
95th percentile per-packet one-way delay: 280.338 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 2.97 Mbit/s
95th percentile per-packet one-way delay: 258.658 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 286.606 ms
Loss rate: 0.97%
-- Flow 3:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 286.983 ms
Loss rate: 2.73%
```

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

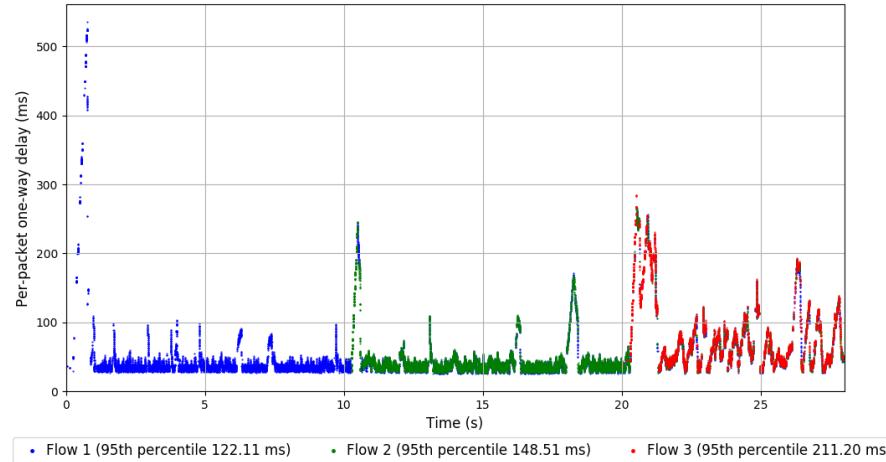
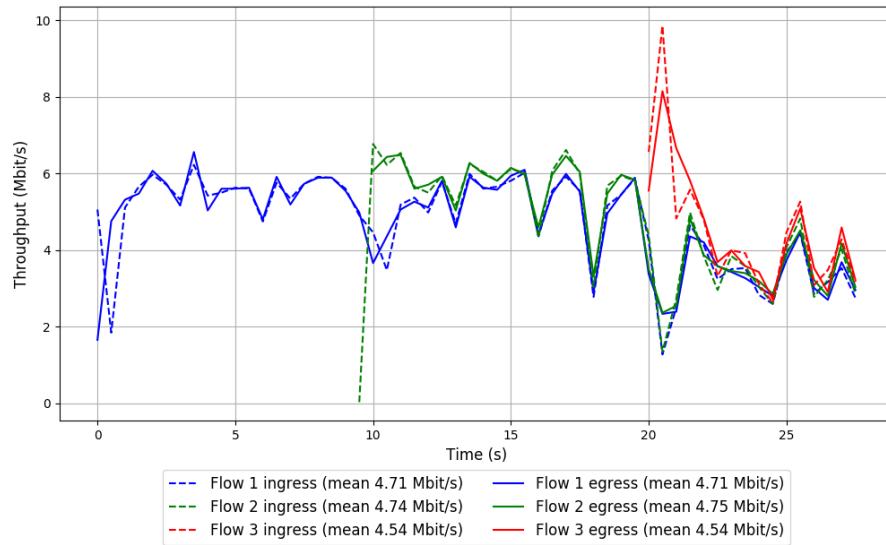


Run 3: Statistics of TaoVA-100x

```
Start at: 2017-12-20 19:29:52
End at: 2017-12-20 19:30:22
Local clock offset: 4.547 ms
Remote clock offset: -20.361 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.05 Mbit/s
95th percentile per-packet one-way delay: 175.016 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 4.71 Mbit/s
95th percentile per-packet one-way delay: 122.110 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 4.75 Mbit/s
95th percentile per-packet one-way delay: 148.511 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 4.54 Mbit/s
95th percentile per-packet one-way delay: 211.198 ms
Loss rate: 0.57%
```

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

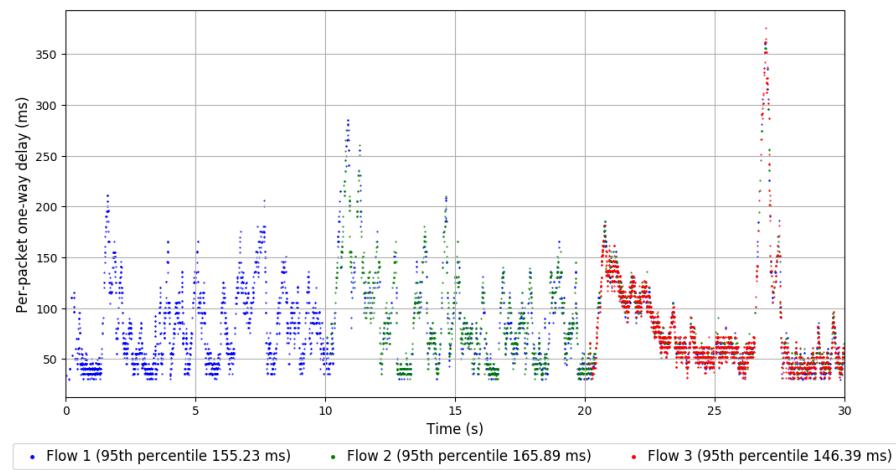
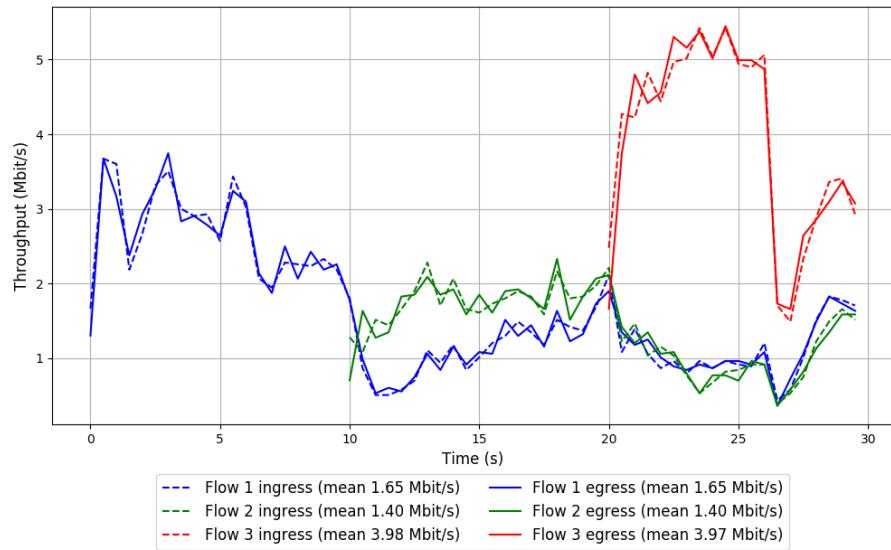


Run 1: Statistics of TCP Vegas

```
Start at: 2017-12-20 18:58:31
End at: 2017-12-20 18:59:01
Local clock offset: 4.642 ms
Remote clock offset: -20.91 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.90 Mbit/s
95th percentile per-packet one-way delay: 155.396 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 155.232 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 165.893 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 3.97 Mbit/s
95th percentile per-packet one-way delay: 146.389 ms
Loss rate: 0.46%
```

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

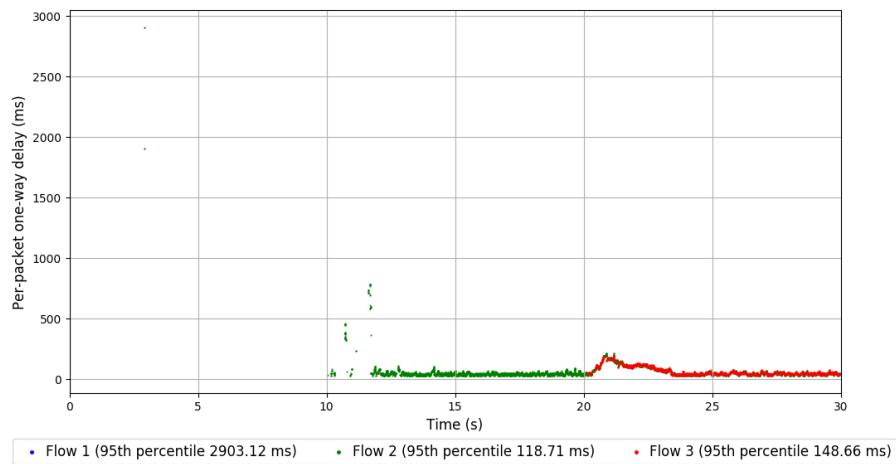
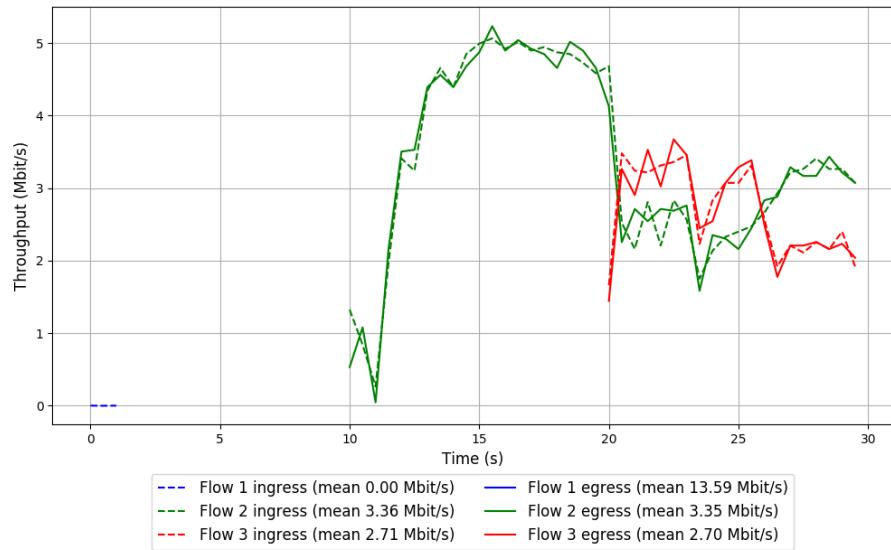


Run 2: Statistics of TCP Vegas

```
Start at: 2017-12-20 19:15:20
End at: 2017-12-20 19:15:50
Local clock offset: 5.957 ms
Remote clock offset: -21.087 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 133.309 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 13.59 Mbit/s
95th percentile per-packet one-way delay: 2903.119 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 3.35 Mbit/s
95th percentile per-packet one-way delay: 118.712 ms
Loss rate: 0.36%
-- Flow 3:
Average throughput: 2.70 Mbit/s
95th percentile per-packet one-way delay: 148.658 ms
Loss rate: 0.71%
```

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

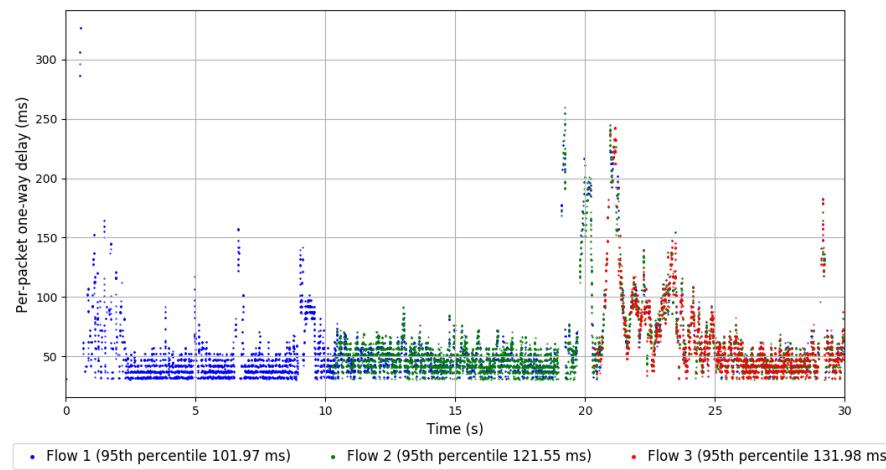
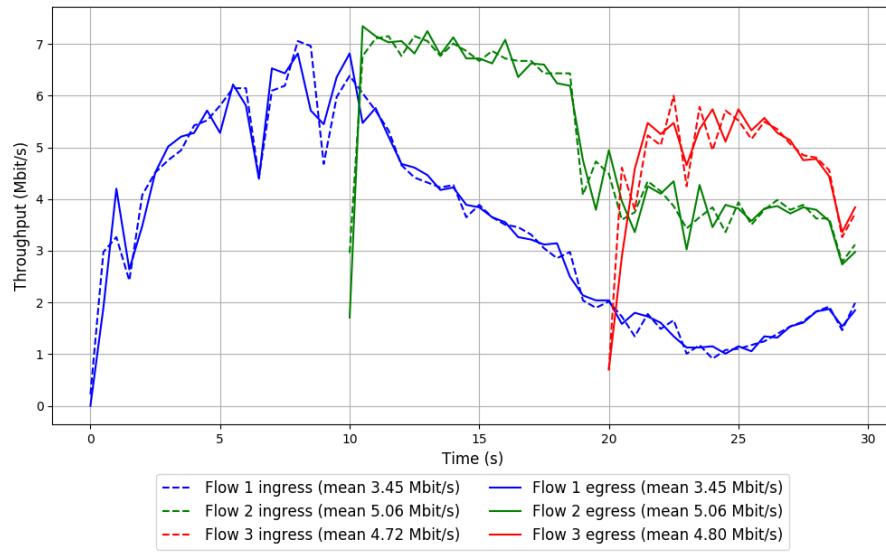


Run 3: Statistics of TCP Vegas

```
Start at: 2017-12-20 19:32:12
End at: 2017-12-20 19:32:42
Local clock offset: 4.249 ms
Remote clock offset: -19.85 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 8.37 Mbit/s
95th percentile per-packet one-way delay: 117.020 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 3.45 Mbit/s
95th percentile per-packet one-way delay: 101.968 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 5.06 Mbit/s
95th percentile per-packet one-way delay: 121.552 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 4.80 Mbit/s
95th percentile per-packet one-way delay: 131.976 ms
Loss rate: 0.43%
```

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

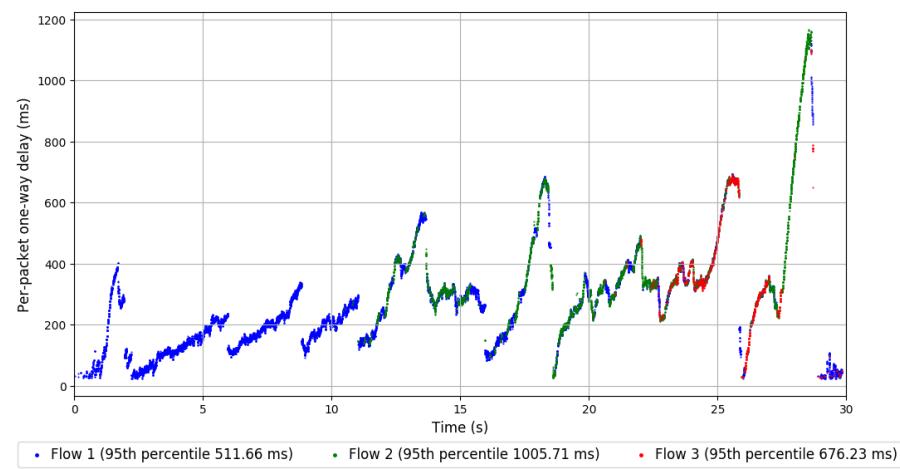
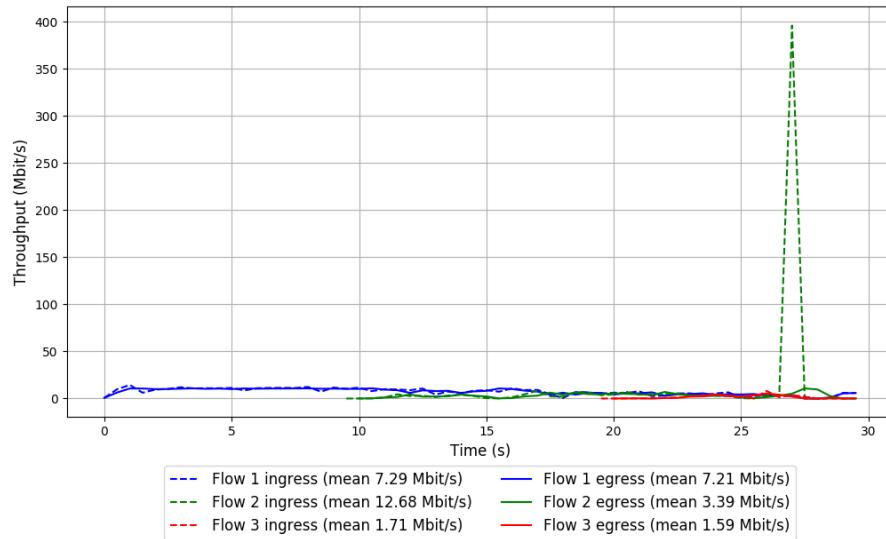


Run 1: Statistics of Verus

```
Start at: 2017-12-20 18:45:07
End at: 2017-12-20 18:45:37
Local clock offset: 3.87 ms
Remote clock offset: -24.158 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.96 Mbit/s
95th percentile per-packet one-way delay: 654.106 ms
Loss rate: 39.03%
-- Flow 1:
Average throughput: 7.21 Mbit/s
95th percentile per-packet one-way delay: 511.662 ms
Loss rate: 1.20%
-- Flow 2:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 1005.708 ms
Loss rate: 73.63%
-- Flow 3:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 676.231 ms
Loss rate: 9.24%
```

## Run 1: Report of Verus — Data Link

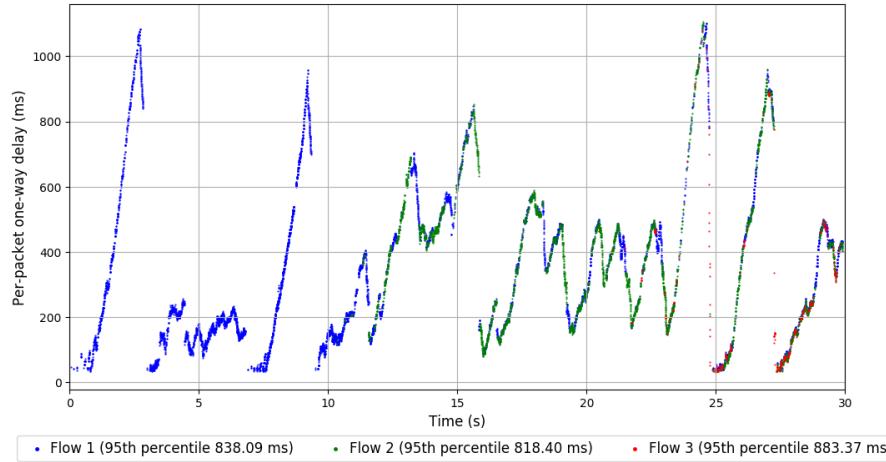
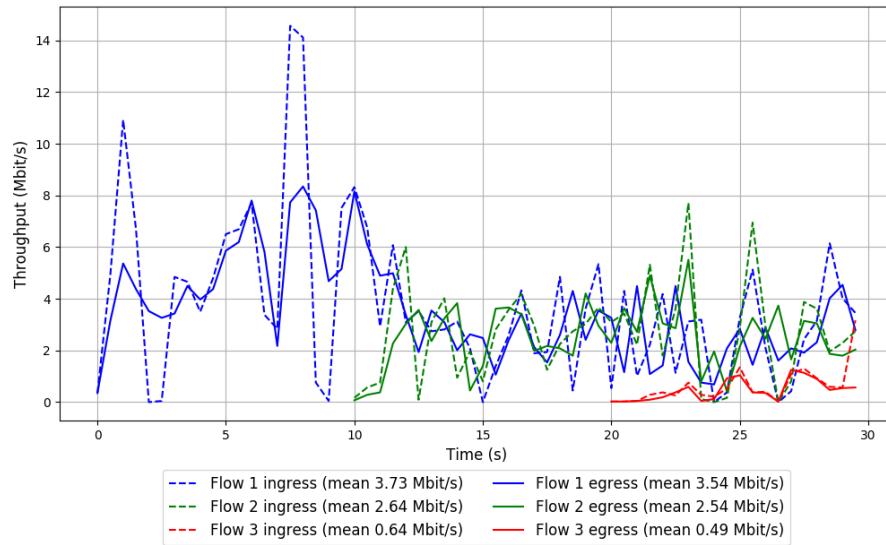


Run 2: Statistics of Verus

```
Start at: 2017-12-20 19:01:52
End at: 2017-12-20 19:02:22
Local clock offset: 3.975 ms
Remote clock offset: -20.471 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.37 Mbit/s
95th percentile per-packet one-way delay: 830.879 ms
Loss rate: 5.75%
-- Flow 1:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 838.089 ms
Loss rate: 5.11%
-- Flow 2:
Average throughput: 2.54 Mbit/s
95th percentile per-packet one-way delay: 818.404 ms
Loss rate: 4.49%
-- Flow 3:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 883.371 ms
Loss rate: 27.63%
```

## Run 2: Report of Verus — Data Link

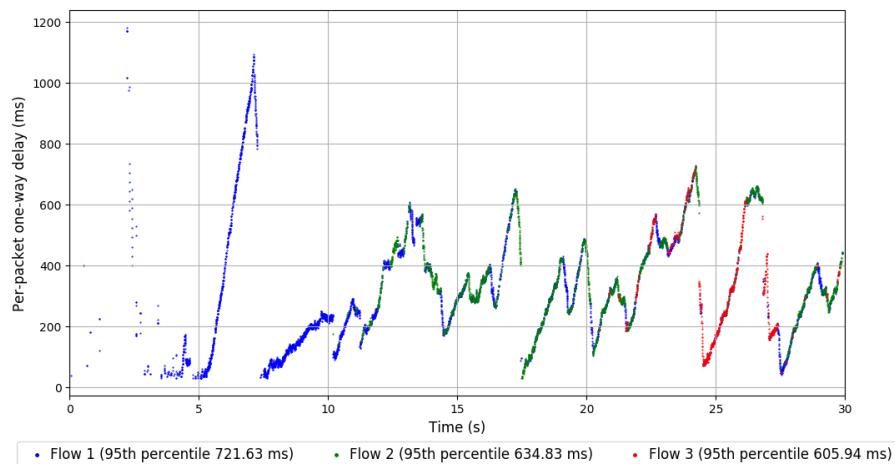
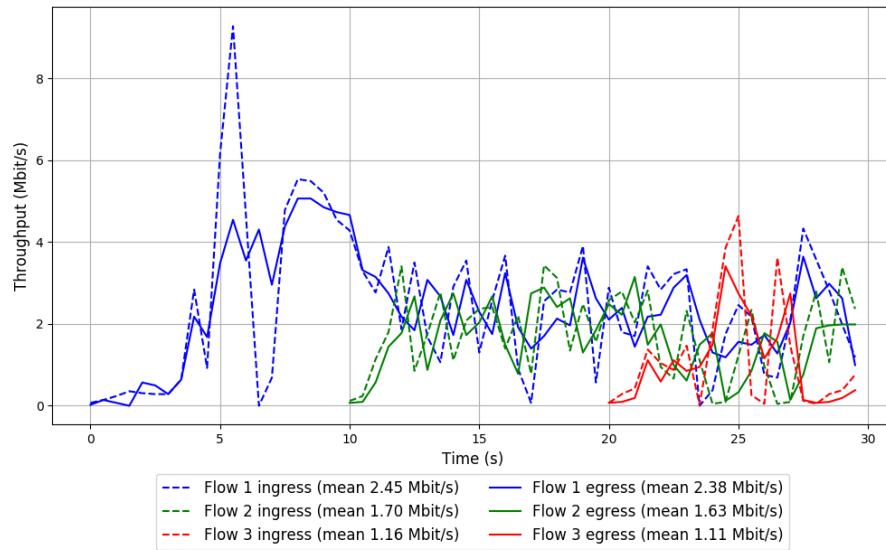


Run 3: Statistics of Verus

```
Start at: 2017-12-20 19:18:41
End at: 2017-12-20 19:19:12
Local clock offset: 3.557 ms
Remote clock offset: -20.576 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.81 Mbit/s
95th percentile per-packet one-way delay: 649.738 ms
Loss rate: 3.65%
-- Flow 1:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 721.630 ms
Loss rate: 2.50%
-- Flow 2:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 634.827 ms
Loss rate: 4.92%
-- Flow 3:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 605.943 ms
Loss rate: 7.23%
```

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



Run 1: Statistics of Copa

Start at: 2017-12-20 18:46:16  
End at: 2017-12-20 18:46:46  
Local clock offset: 4.374 ms  
Remote clock offset: -21.717 ms

### Run 1: Report of Copa — Data Link

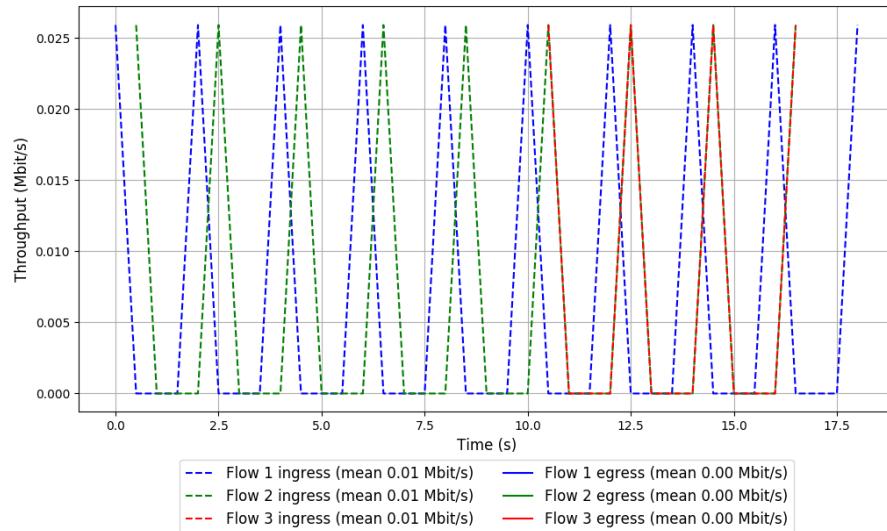


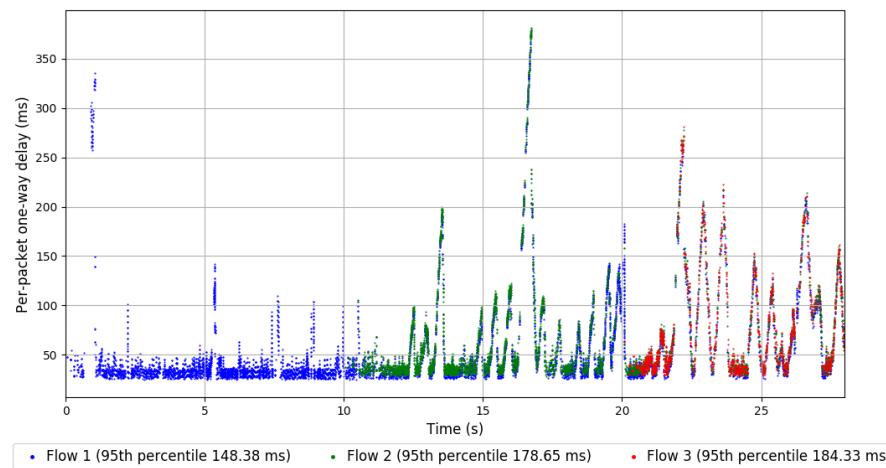
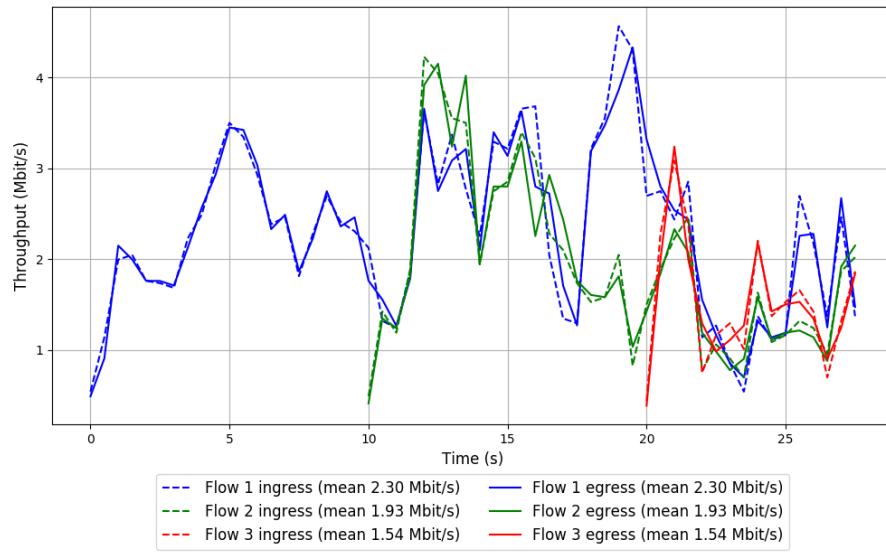
Figure is missing

Run 2: Statistics of Copa

```
Start at: 2017-12-20 19:02:59
End at: 2017-12-20 19:03:29
Local clock offset: 4.504 ms
Remote clock offset: -22.963 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.97 Mbit/s
95th percentile per-packet one-way delay: 167.470 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 148.384 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 178.646 ms
Loss rate: 0.26%
-- Flow 3:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 184.329 ms
Loss rate: 0.94%
```

## Run 2: Report of Copa — Data Link

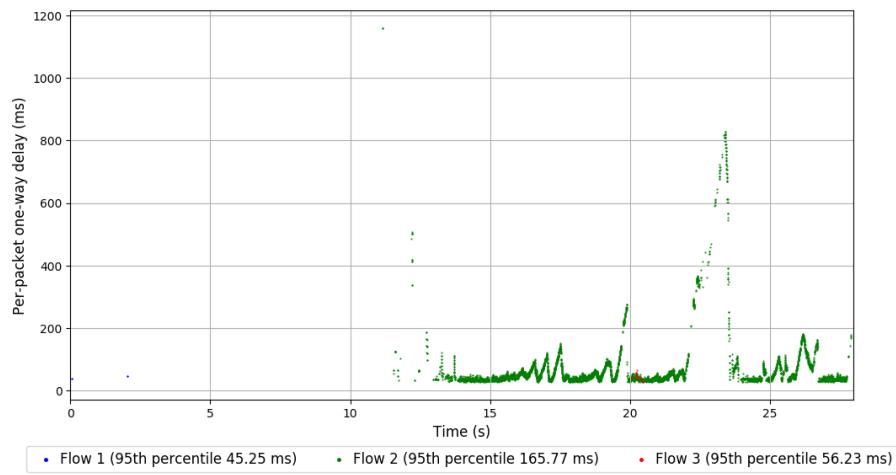
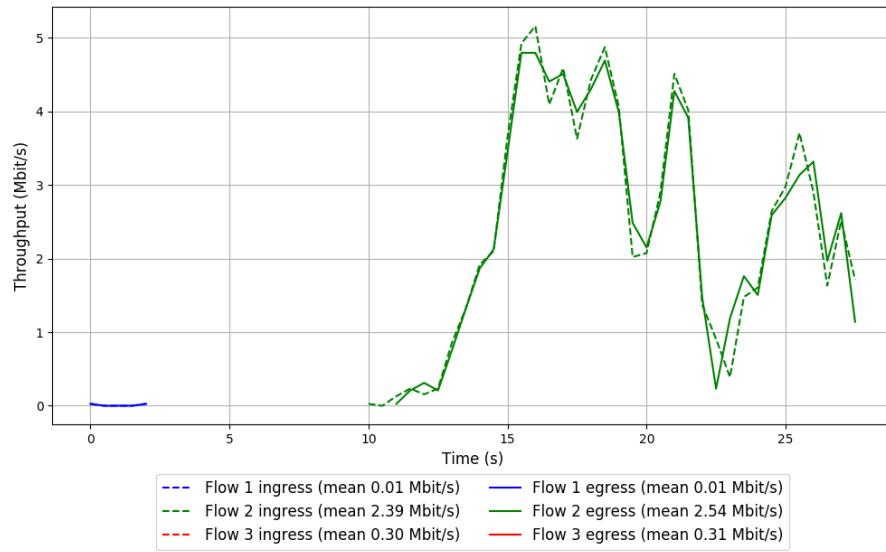


Run 3: Statistics of Copa

```
Start at: 2017-12-20 19:19:50
End at: 2017-12-20 19:20:20
Local clock offset: 4.709 ms
Remote clock offset: -19.654 ms

# Below is generated by plot.py at 2017-12-20 19:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 165.752 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 45.246 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 2.54 Mbit/s
95th percentile per-packet one-way delay: 165.772 ms
Loss rate: 0.76%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 56.235 ms
Loss rate: 0.00%
```

### Run 3: Report of Copa — Data Link

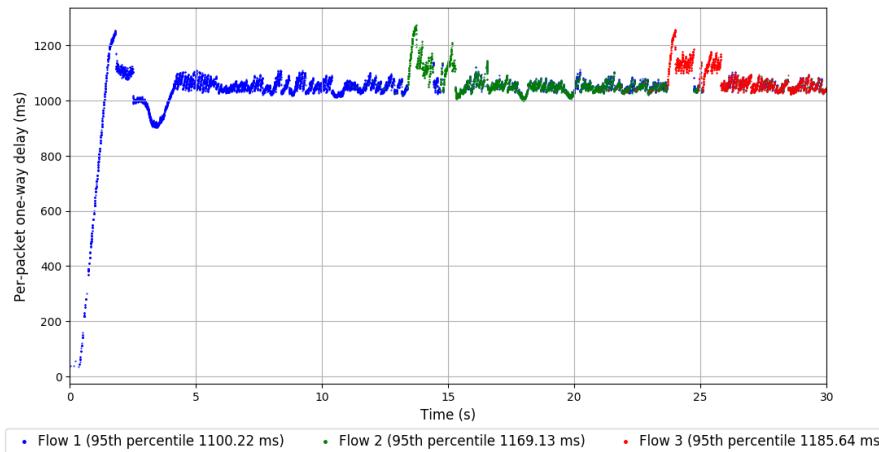
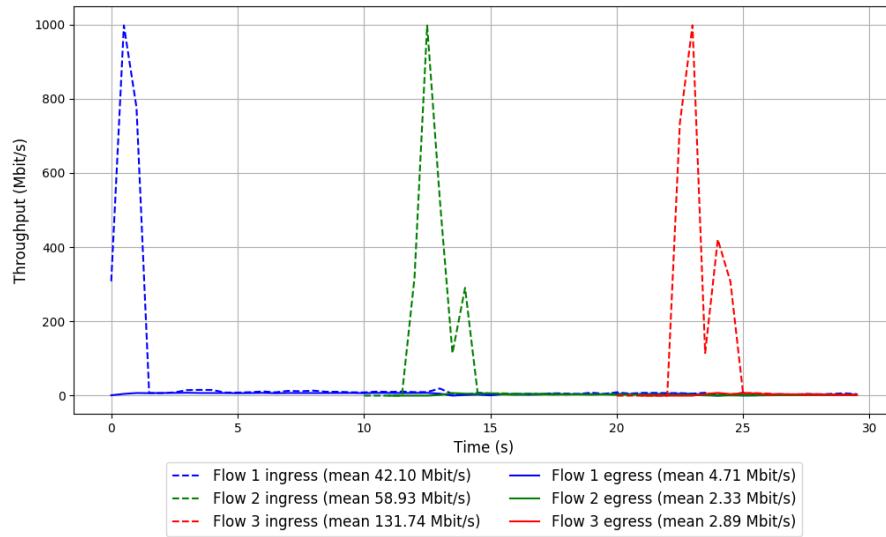


Run 1: Statistics of FillP

```
Start at: 2017-12-20 18:57:21
End at: 2017-12-20 18:57:51
Local clock offset: 3.193 ms
Remote clock offset: -20.188 ms

# Below is generated by plot.py at 2017-12-20 19:34:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.04 Mbit/s
95th percentile per-packet one-way delay: 1144.470 ms
Loss rate: 94.37%
-- Flow 1:
Average throughput: 4.71 Mbit/s
95th percentile per-packet one-way delay: 1100.224 ms
Loss rate: 88.82%
-- Flow 2:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 1169.133 ms
Loss rate: 96.26%
-- Flow 3:
Average throughput: 2.89 Mbit/s
95th percentile per-packet one-way delay: 1185.640 ms
Loss rate: 98.04%
```

## Run 1: Report of FillP — Data Link

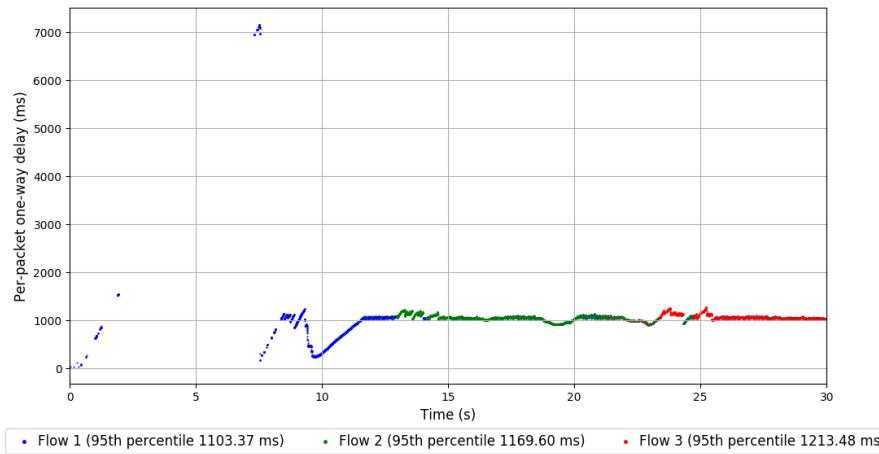
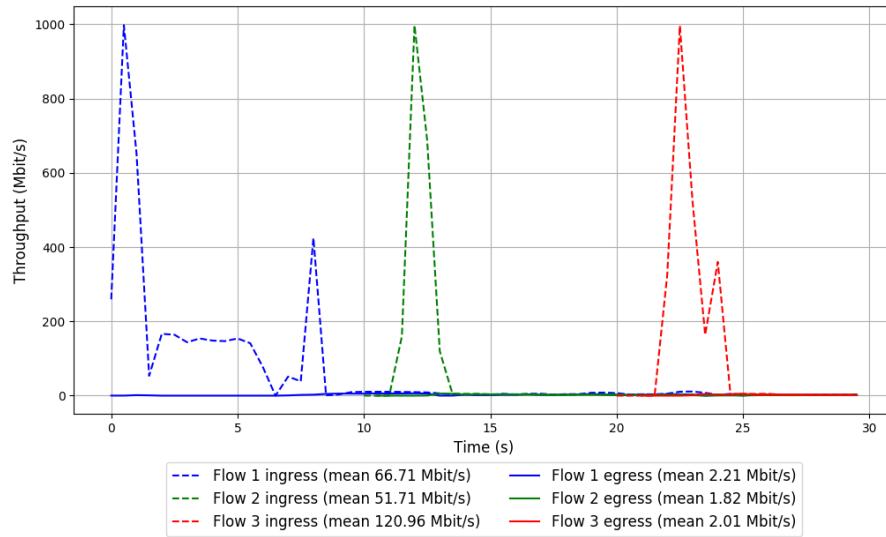


Run 2: Statistics of FillP

```
Start at: 2017-12-20 19:14:11
End at: 2017-12-20 19:14:41
Local clock offset: 2.715 ms
Remote clock offset: -19.434 ms

# Below is generated by plot.py at 2017-12-20 19:34:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.98 Mbit/s
95th percentile per-packet one-way delay: 1167.959 ms
Loss rate: 97.19%
-- Flow 1:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 1103.369 ms
Loss rate: 96.69%
-- Flow 2:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 1169.598 ms
Loss rate: 96.60%
-- Flow 3:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 1213.485 ms
Loss rate: 98.52%
```

## Run 2: Report of FillP — Data Link

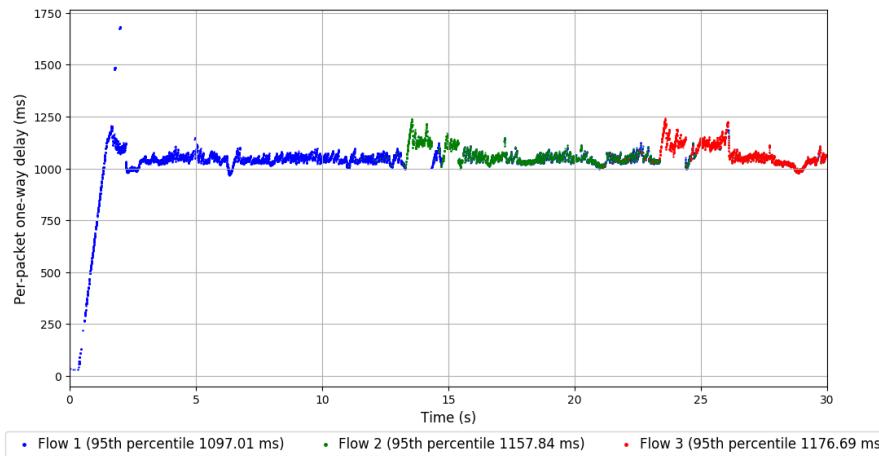
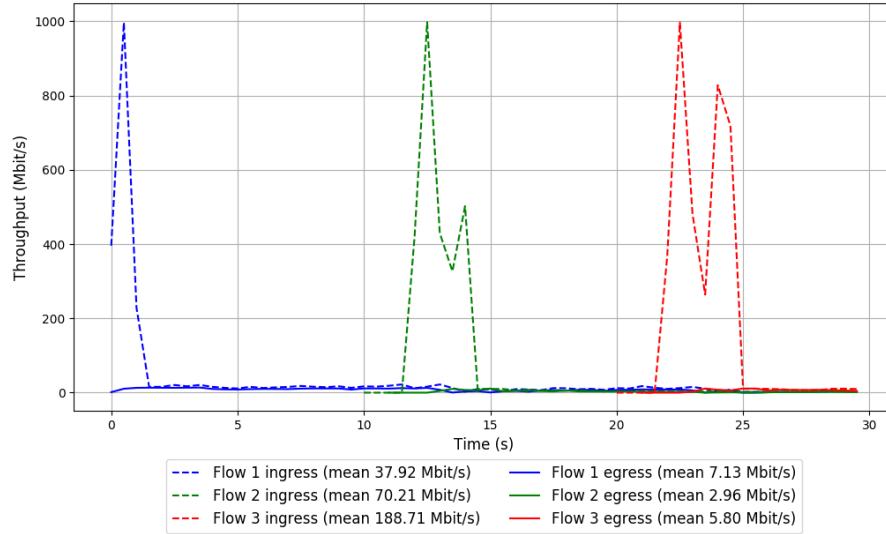


Run 3: Statistics of FillP

```
Start at: 2017-12-20 19:31:01
End at: 2017-12-20 19:31:31
Local clock offset: 5.832 ms
Remote clock offset: -20.804 ms

# Below is generated by plot.py at 2017-12-20 19:34:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 10.73 Mbit/s
95th percentile per-packet one-way delay: 1140.065 ms
Loss rate: 92.73%
-- Flow 1:
Average throughput: 7.13 Mbit/s
95th percentile per-packet one-way delay: 1097.012 ms
Loss rate: 81.23%
-- Flow 2:
Average throughput: 2.96 Mbit/s
95th percentile per-packet one-way delay: 1157.841 ms
Loss rate: 96.00%
-- Flow 3:
Average throughput: 5.80 Mbit/s
95th percentile per-packet one-way delay: 1176.695 ms
Loss rate: 97.24%
```

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

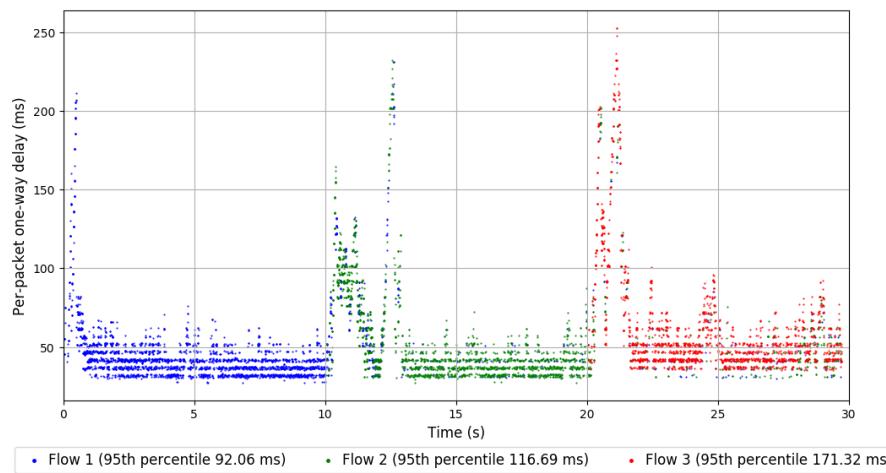
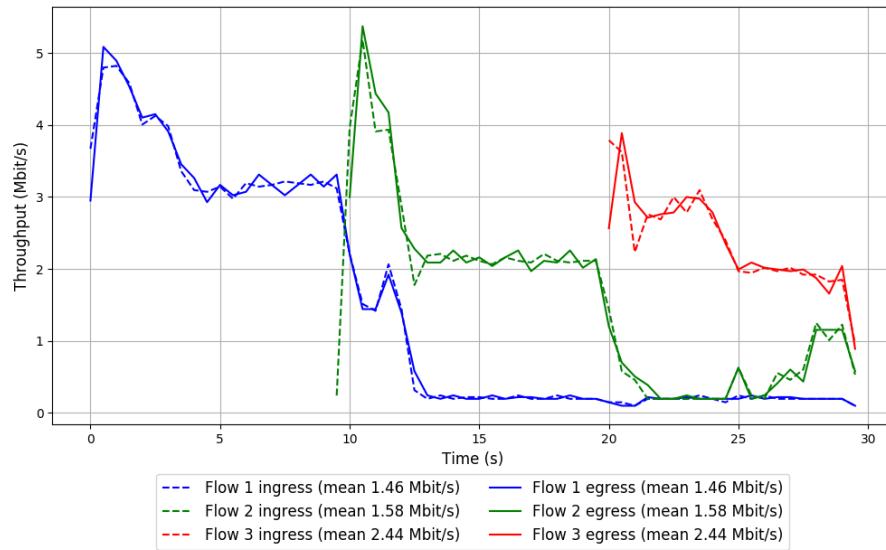


Run 1: Statistics of Indigo

```
Start at: 2017-12-20 18:47:22
End at: 2017-12-20 18:47:52
Local clock offset: 2.757 ms
Remote clock offset: -21.843 ms

# Below is generated by plot.py at 2017-12-20 19:34:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 121.529 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 92.062 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.58 Mbit/s
95th percentile per-packet one-way delay: 116.691 ms
Loss rate: 0.27%
-- Flow 3:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 171.319 ms
Loss rate: 0.40%
```

## Run 1: Report of Indigo — Data Link

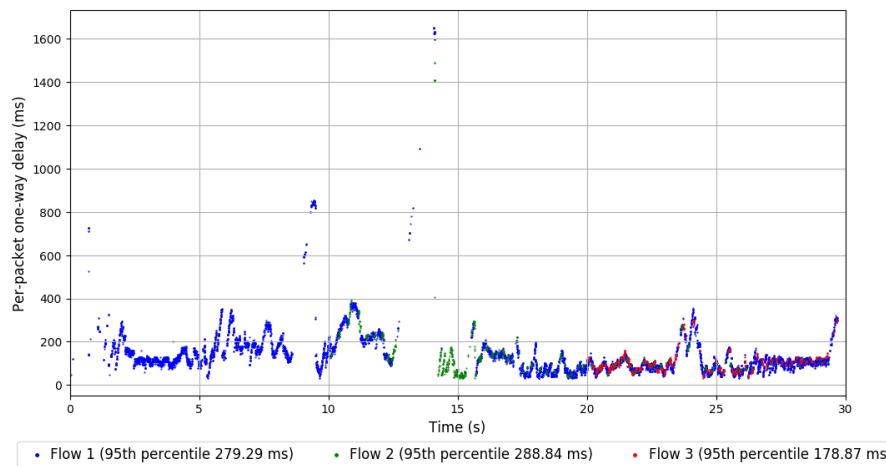
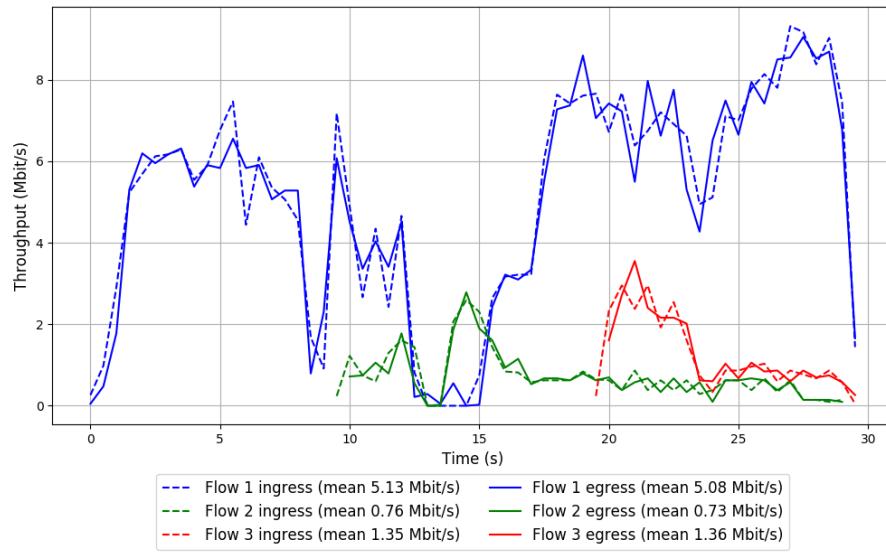


Run 2: Statistics of Indigo

```
Start at: 2017-12-20 19:04:07
End at: 2017-12-20 19:04:37
Local clock offset: 2.712 ms
Remote clock offset: -20.52 ms

# Below is generated by plot.py at 2017-12-20 19:34:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.99 Mbit/s
95th percentile per-packet one-way delay: 279.013 ms
Loss rate: 1.40%
-- Flow 1:
Average throughput: 5.08 Mbit/s
95th percentile per-packet one-way delay: 279.289 ms
Loss rate: 1.19%
-- Flow 2:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 288.841 ms
Loss rate: 4.55%
-- Flow 3:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 178.874 ms
Loss rate: 0.28%
```

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2017-12-20 19:20:56
End at: 2017-12-20 19:21:26
Local clock offset: 2.597 ms
Remote clock offset: -18.595 ms

# Below is generated by plot.py at 2017-12-20 19:34:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.19 Mbit/s
95th percentile per-packet one-way delay: 309.300 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 3.40 Mbit/s
95th percentile per-packet one-way delay: 290.672 ms
Loss rate: 0.35%
-- Flow 2:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 565.175 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 310.059 ms
Loss rate: 0.83%
```

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

