

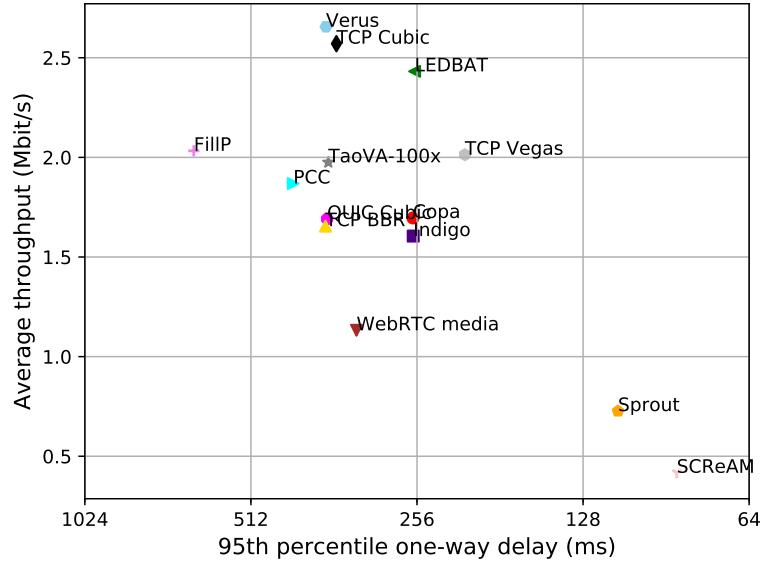
## Pantheon Report

Generated at 2017-12-20 19:33:34 (UTC).  
Data path: India ppp0 (*remote*) → AWS India 1 Ethernet (*local*).  
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.

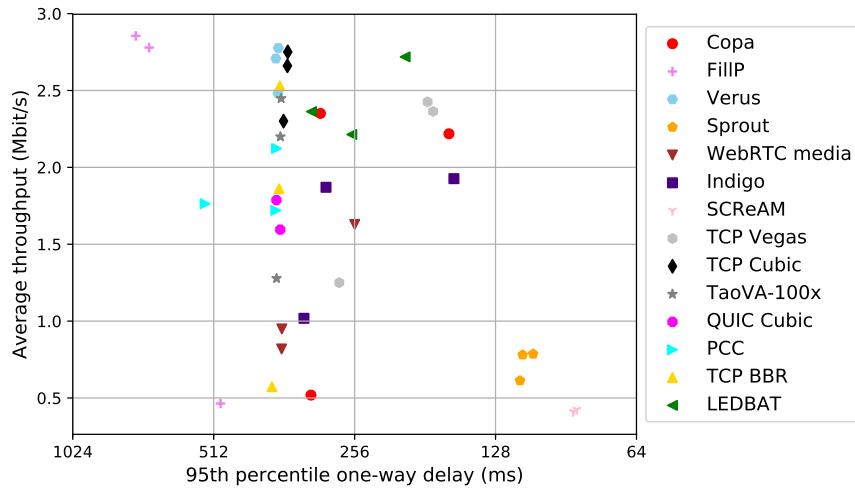
### Git summary:

```
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 India ppp0 to AWS India 1 Ethernet, 3 runs of 30s each per scheme  
 3 flows with 10s interval between flows (mean of all runs by scheme)



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



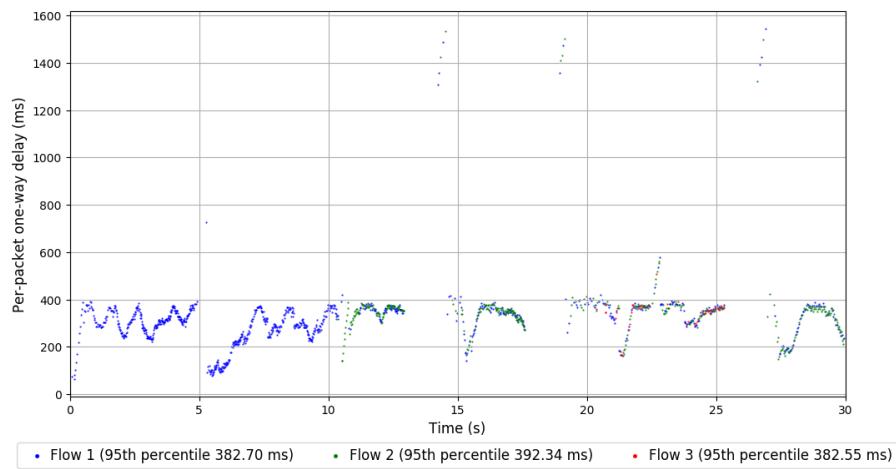
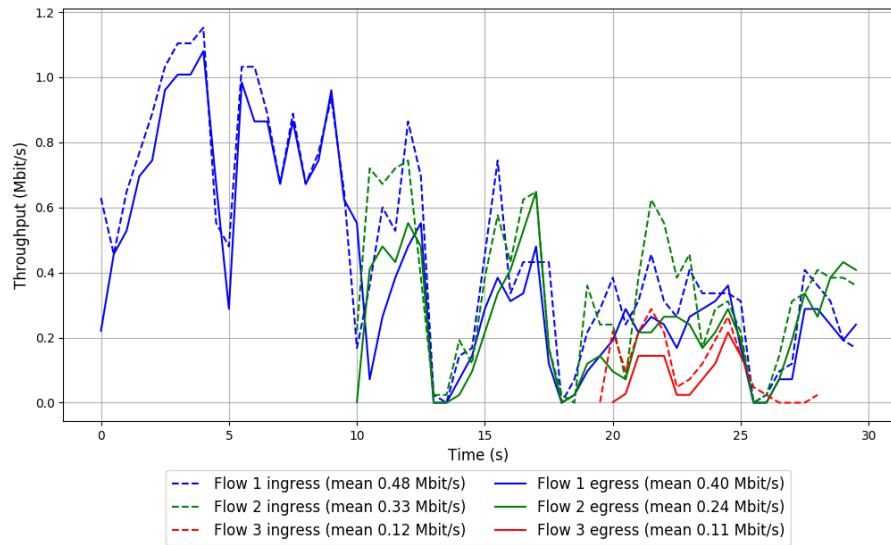
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	1.04	0.57	0.75	373.02	379.87	375.10	10.34	17.70	28.66
TCP Cubic		1.83	0.86	0.54	357.11	359.82	361.48	1.78	3.13	8.75
LEDBAT		1.31	1.29	0.83	235.45	270.05	278.41	0.36	1.03	3.49
PCC		1.12	0.89	0.50	374.68	483.65	747.06	49.96	67.04	84.84
QUIC Cubic		1.06	0.71	0.48	371.86	374.05	374.95	6.36	9.31	18.86
SCReAM		0.21	0.20	0.22	87.52	86.85	86.57	0.26	0.62	0.55
WebRTC media		0.55	0.43	0.16	325.35	332.91	322.93	7.48	11.95	16.16
Sprout		0.37	0.36	0.34	111.46	110.20	115.63	0.64	0.48	2.35
TaoVA-100x		1.21	0.93	0.72	368.66	372.44	375.18	14.32	24.33	45.21
TCP Vegas		1.15	0.85	0.92	193.70	202.61	236.72	0.74	1.01	2.67
Verus		2.21	0.59	0.25	372.37	381.22	374.40	21.05	76.41	43.76
Copa		1.28	0.62	0.60	210.89	252.18	289.14	0.26	0.92	5.66
FillP		1.28	0.81	0.69	465.82	1035.00	628.96	96.12	98.38	96.76
Indigo		0.65	0.99	0.93	236.46	277.65	216.56	1.94	4.03	4.56

Run 1: Statistics of TCP BBR

```
Start at: 2017-12-20 17:57:02
End at: 2017-12-20 17:57:32
Local clock offset: 4.261 ms
Remote clock offset: -19.29 ms

# Below is generated by plot.py at 2017-12-20 19:32:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 384.420 ms
Loss rate: 22.21%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 382.703 ms
Loss rate: 17.15%
-- Flow 2:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 392.339 ms
Loss rate: 29.54%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 382.545 ms
Loss rate: 46.23%
```

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

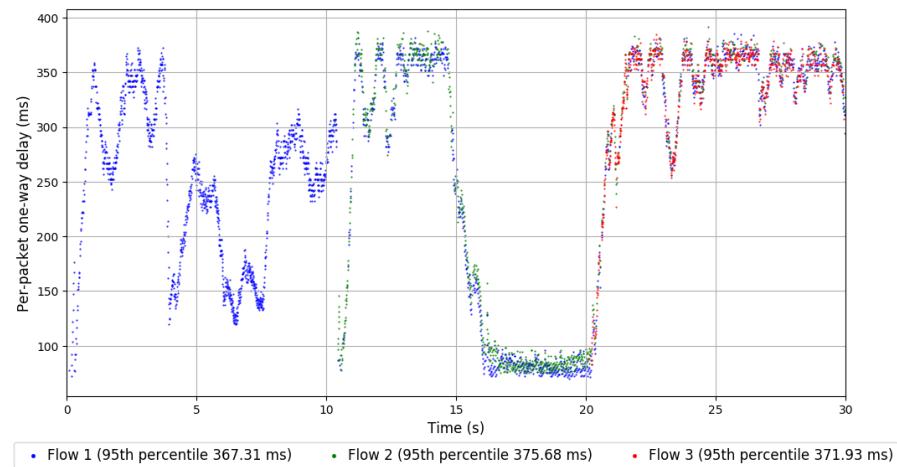
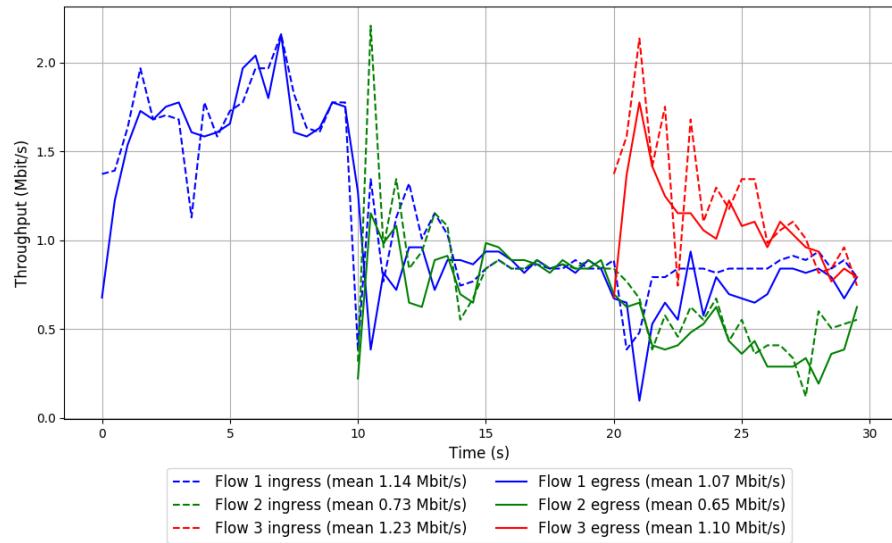


Run 2: Statistics of TCP BBR

```
Start at: 2017-12-20 18:13:56
End at: 2017-12-20 18:14:26
Local clock offset: 3.765 ms
Remote clock offset: -20.904 ms

# Below is generated by plot.py at 2017-12-20 19:32:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 371.207 ms
Loss rate: 8.76%
-- Flow 1:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 367.308 ms
Loss rate: 6.41%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 375.682 ms
Loss rate: 12.01%
-- Flow 3:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 371.929 ms
Loss rate: 11.48%
```

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

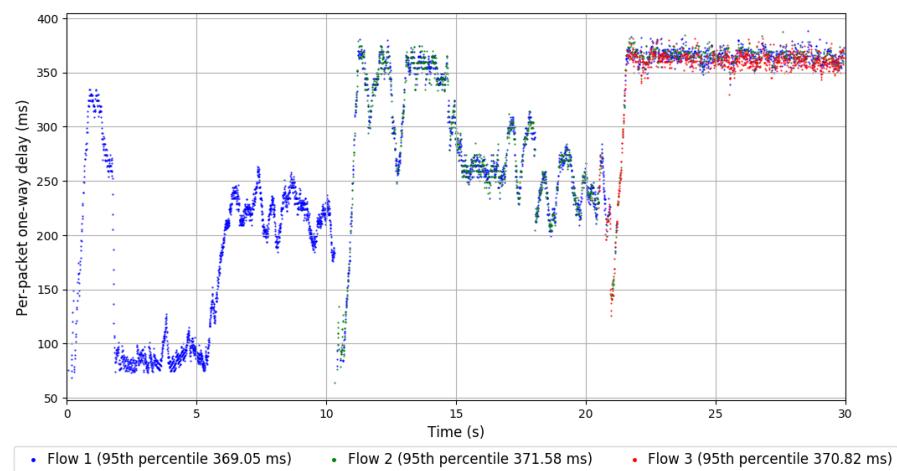
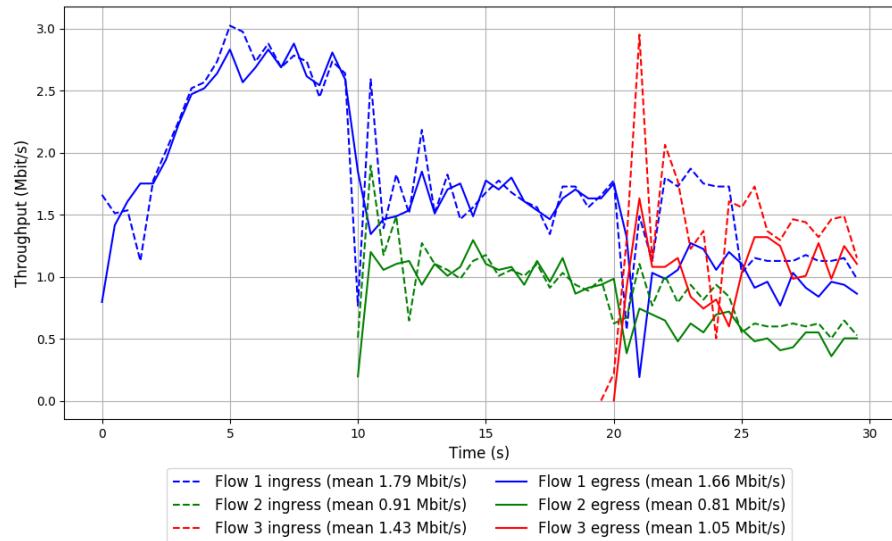


Run 3: Statistics of TCP BBR

```
Start at: 2017-12-20 18:30:39
End at: 2017-12-20 18:31:09
Local clock offset: 2.176 ms
Remote clock offset: -22.042 ms

# Below is generated by plot.py at 2017-12-20 19:32:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 369.833 ms
Loss rate: 11.77%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 369.051 ms
Loss rate: 7.47%
-- Flow 2:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 371.582 ms
Loss rate: 11.54%
-- Flow 3:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 370.822 ms
Loss rate: 28.28%
```

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

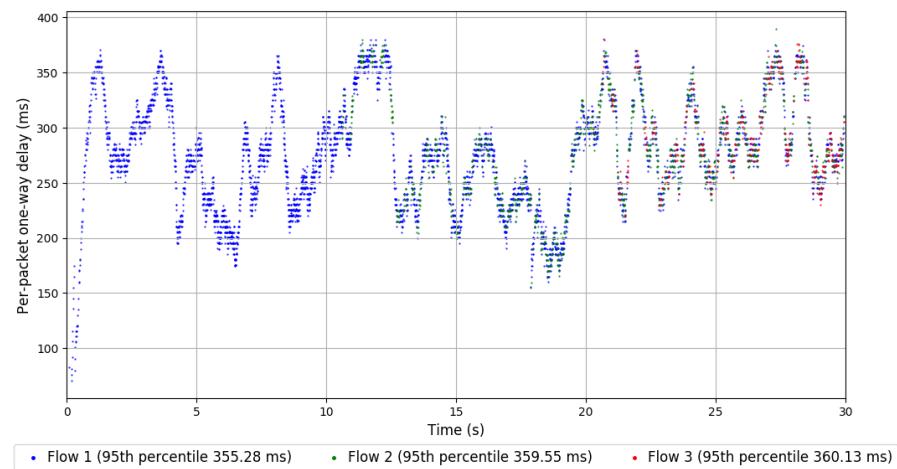
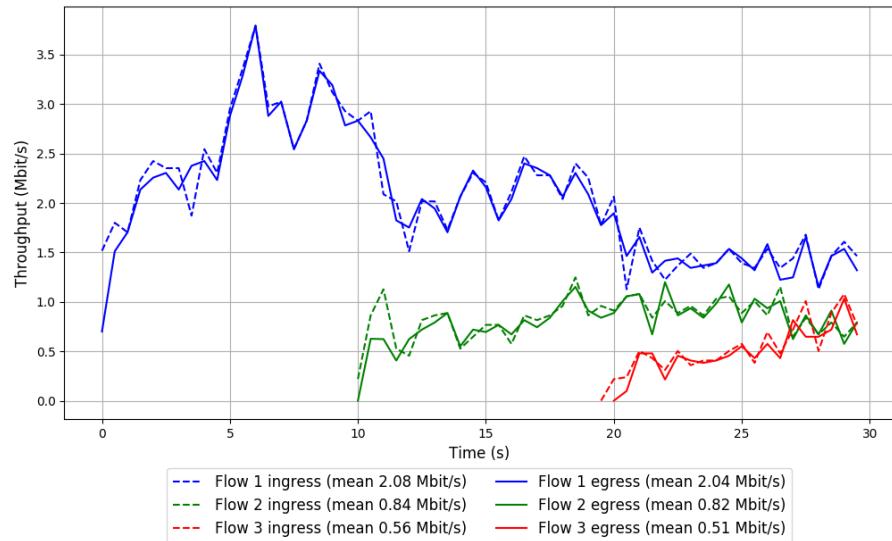


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2017-12-20 18:07:08
End at: 2017-12-20 18:07:38
Local clock offset: 4.659 ms
Remote clock offset: -20.293 ms

# Below is generated by plot.py at 2017-12-20 19:32:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.75 Mbit/s
95th percentile per-packet one-way delay: 355.634 ms
Loss rate: 2.80%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 355.279 ms
Loss rate: 1.87%
-- Flow 2:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 359.546 ms
Loss rate: 3.93%
-- Flow 3:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 360.130 ms
Loss rate: 9.82%
```

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

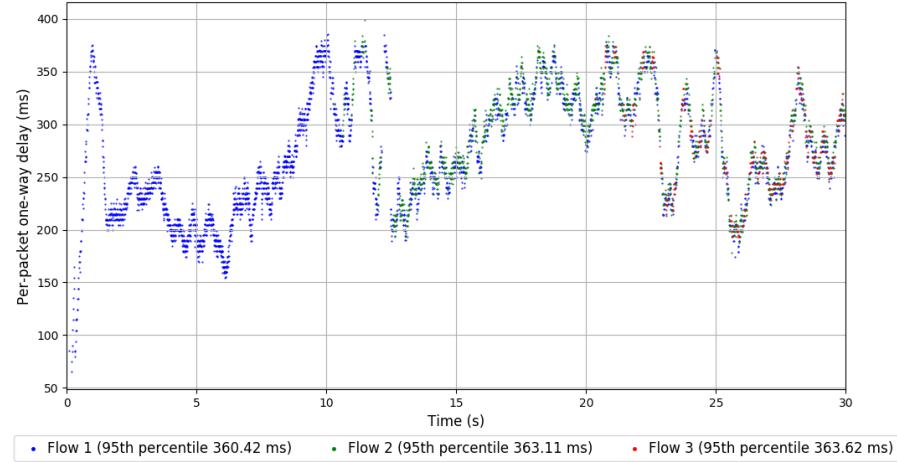
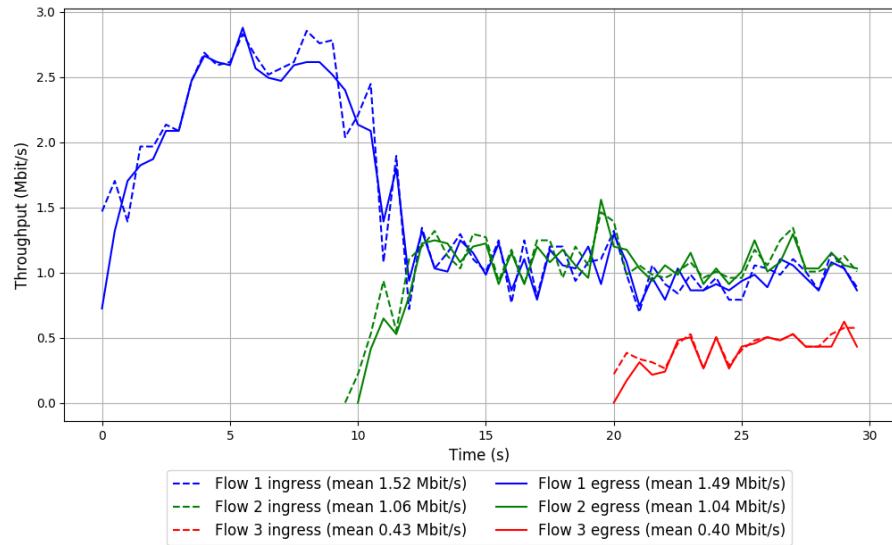


Run 2: Statistics of TCP Cubic

```
Start at: 2017-12-20 18:23:54
End at: 2017-12-20 18:24:24
Local clock offset: 5.697 ms
Remote clock offset: -20.288 ms

# Below is generated by plot.py at 2017-12-20 19:32:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 363.153 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 360.424 ms
Loss rate: 2.40%
-- Flow 2:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 363.112 ms
Loss rate: 2.90%
-- Flow 3:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 363.618 ms
Loss rate: 9.32%
```

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

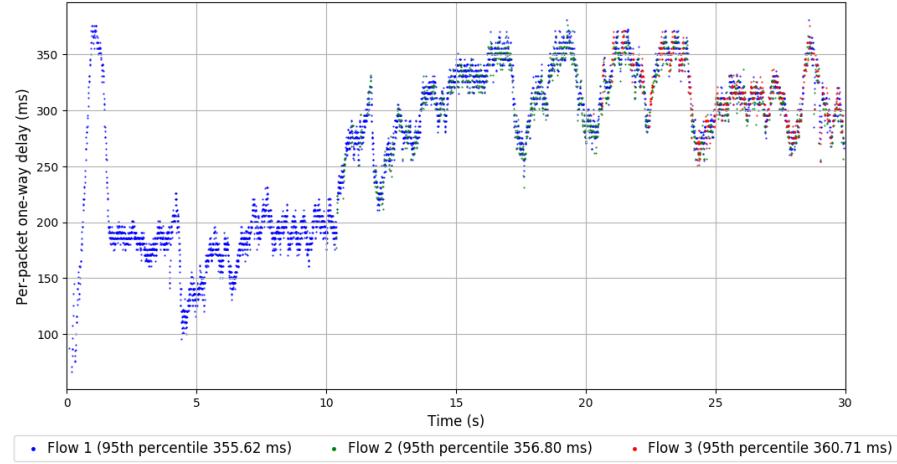
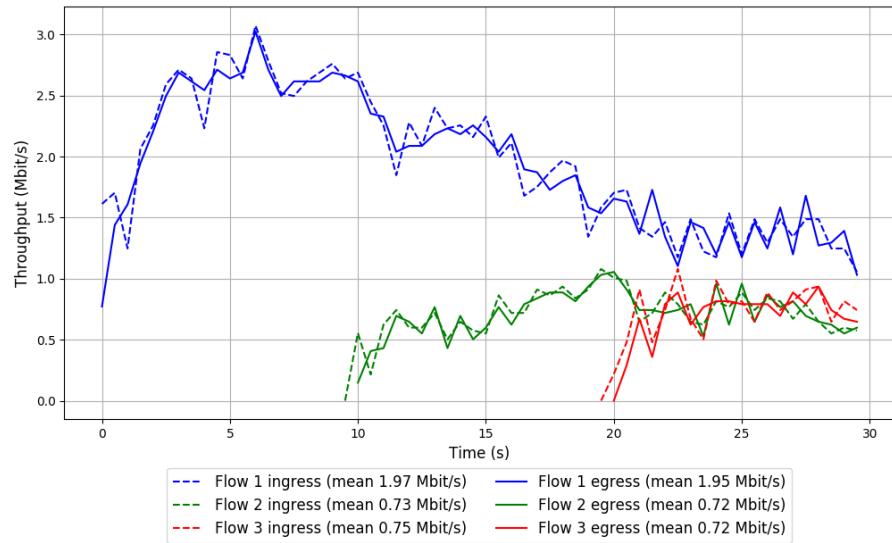


Run 3: Statistics of TCP Cubic

```
Start at: 2017-12-20 18:40:38
End at: 2017-12-20 18:41:08
Local clock offset: 2.336 ms
Remote clock offset: -22.195 ms

# Below is generated by plot.py at 2017-12-20 19:32:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.66 Mbit/s
95th percentile per-packet one-way delay: 356.285 ms
Loss rate: 1.88%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 355.625 ms
Loss rate: 1.06%
-- Flow 2:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 356.801 ms
Loss rate: 2.55%
-- Flow 3:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 360.706 ms
Loss rate: 7.12%
```

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

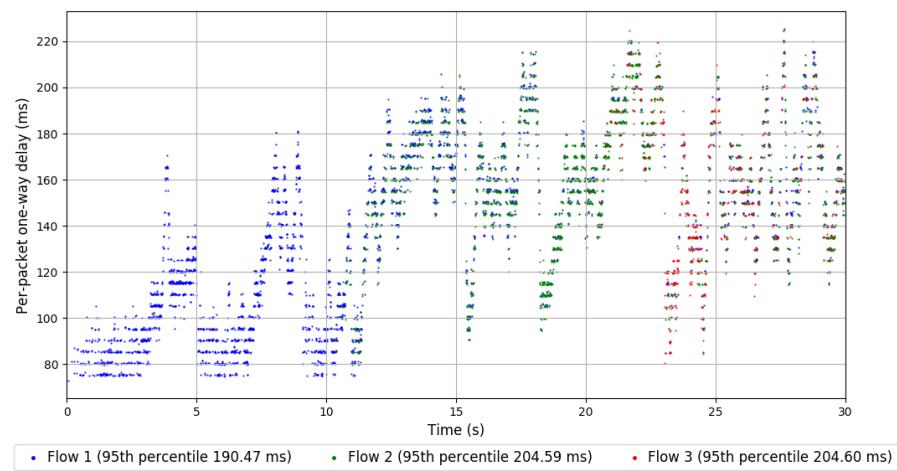
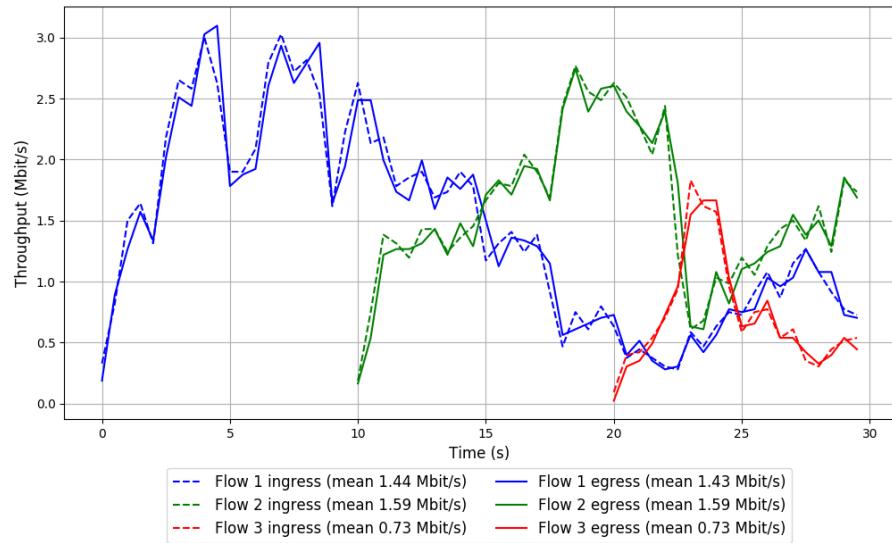


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2017-12-20 18:06:01
End at: 2017-12-20 18:06:31
Local clock offset: 3.771 ms
Remote clock offset: -20.95 ms

# Below is generated by plot.py at 2017-12-20 19:32:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 199.690 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 190.474 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 204.587 ms
Loss rate: 1.00%
-- Flow 3:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 204.603 ms
Loss rate: 2.59%
```

## Run 1: Report of LEDBAT — Data Link

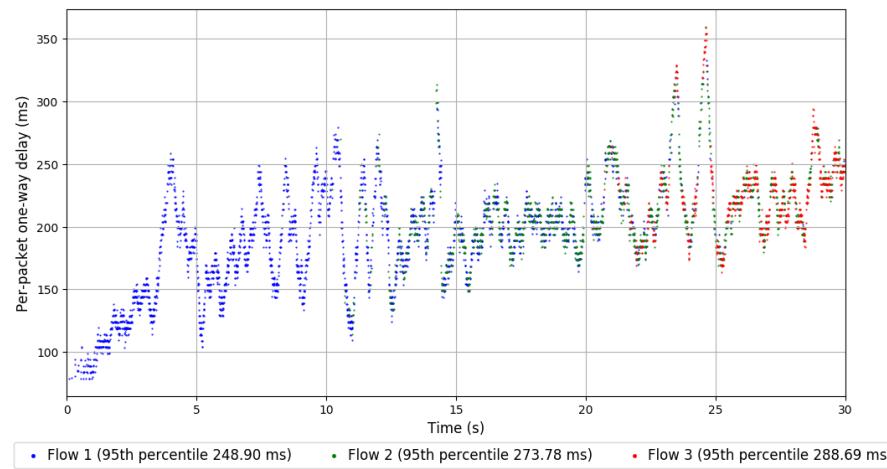
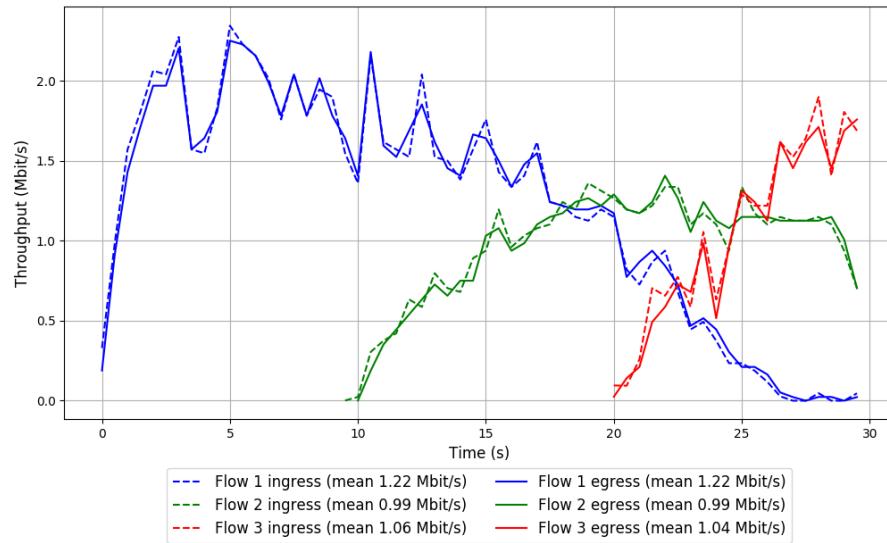


Run 2: Statistics of LEDBAT

```
Start at: 2017-12-20 18:22:47
End at: 2017-12-20 18:23:17
Local clock offset: 4.27 ms
Remote clock offset: -21.761 ms

# Below is generated by plot.py at 2017-12-20 19:32:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 259.651 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 248.895 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 273.777 ms
Loss rate: 1.18%
-- Flow 3:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 288.691 ms
Loss rate: 3.88%
```

## Run 2: Report of LEDBAT — Data Link

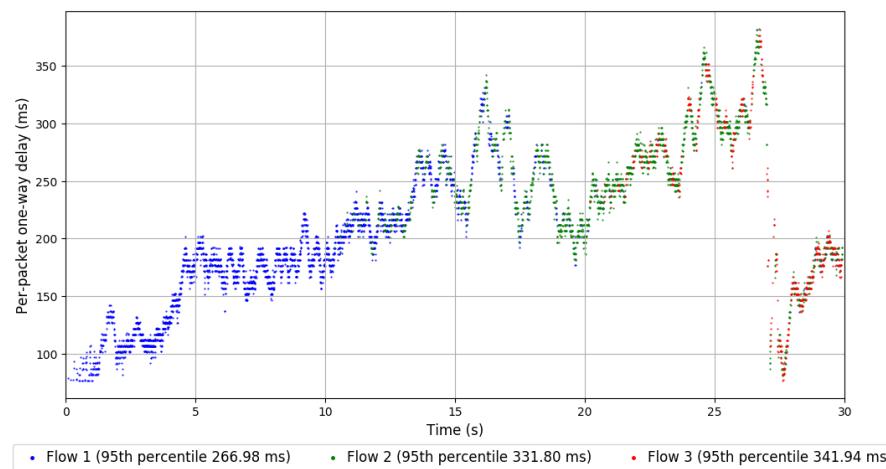
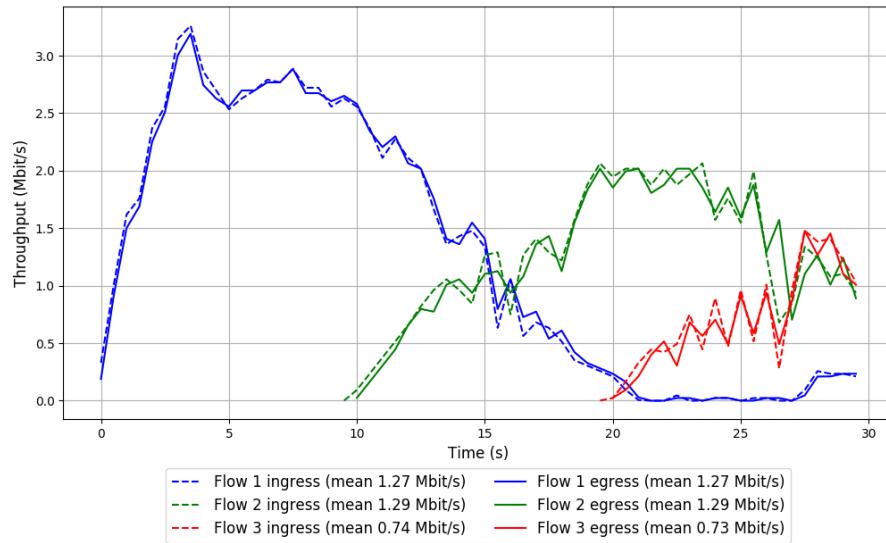


Run 3: Statistics of LEDBAT

```
Start at: 2017-12-20 18:39:31
End at: 2017-12-20 18:40:01
Local clock offset: 4.331 ms
Remote clock offset: -20.858 ms

# Below is generated by plot.py at 2017-12-20 19:32:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 316.450 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 266.977 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 331.799 ms
Loss rate: 0.91%
-- Flow 3:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 341.941 ms
Loss rate: 3.99%
```

Run 3: Report of LEDBAT — Data Link

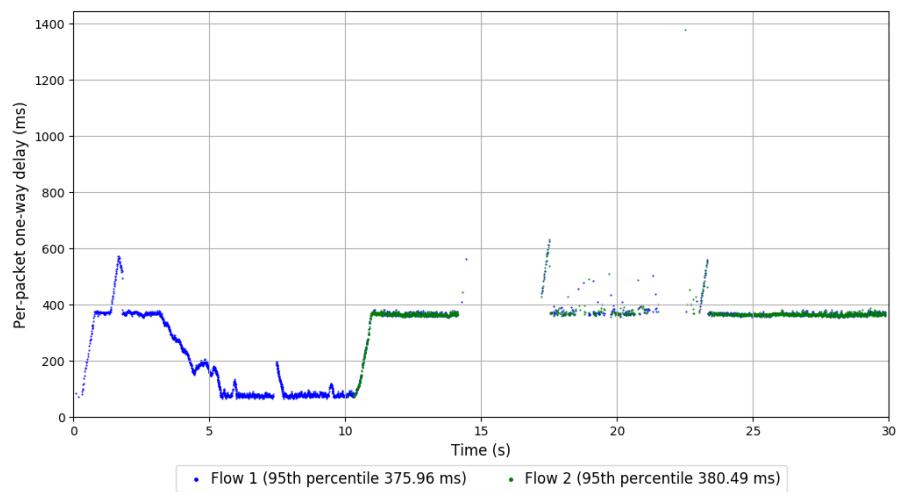
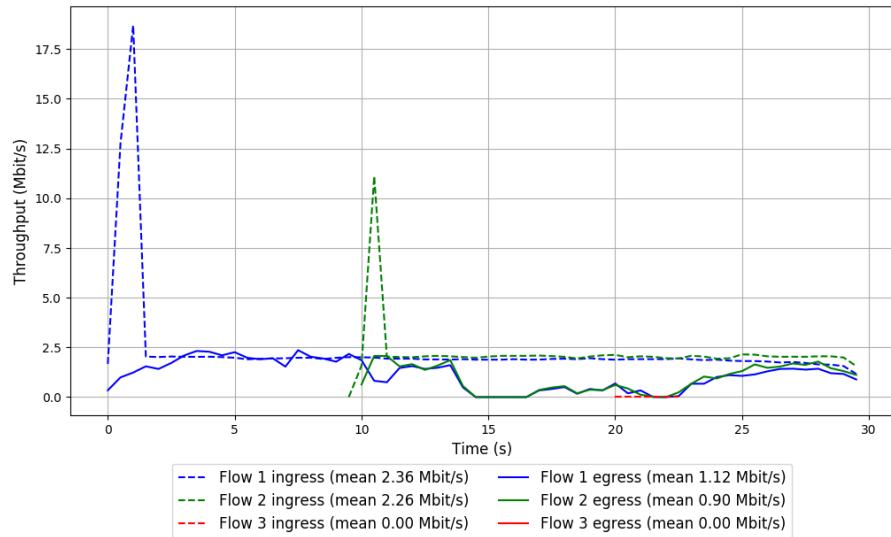


Run 1: Statistics of PCC

```
Start at: 2017-12-20 18:01:35
End at: 2017-12-20 18:02:05
Local clock offset: 3.918 ms
Remote clock offset: -20.801 ms

# Below is generated by plot.py at 2017-12-20 19:33:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 377.153 ms
Loss rate: 55.54%
-- Flow 1:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 375.963 ms
Loss rate: 52.65%
-- Flow 2:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 380.491 ms
Loss rate: 60.06%
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

## Run 1: Report of PCC — Data Link

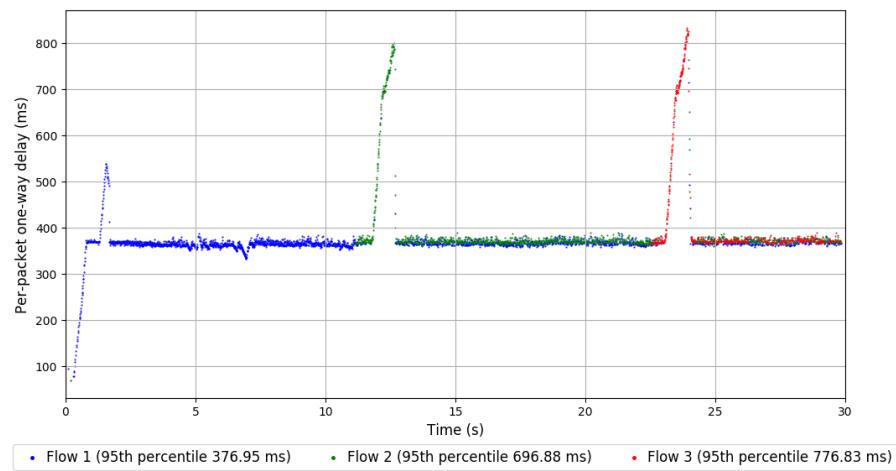
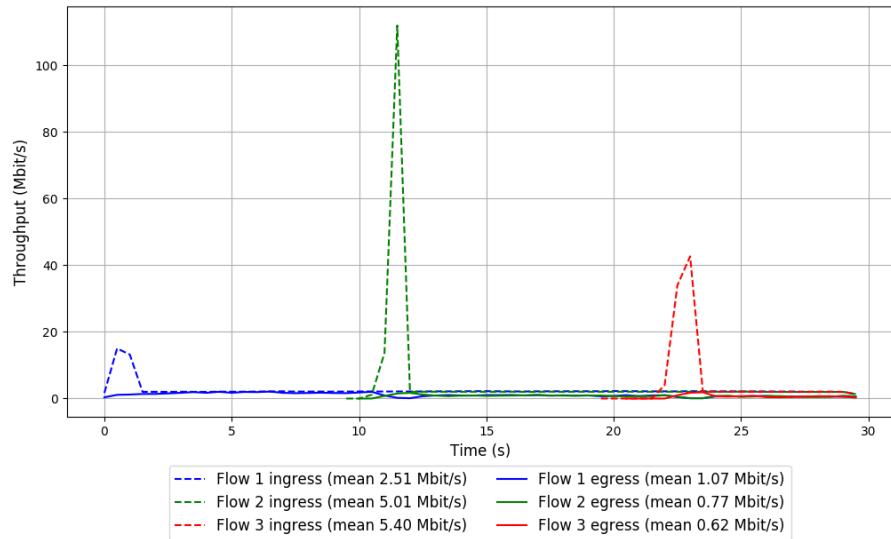


Run 2: Statistics of PCC

```
Start at: 2017-12-20 18:18:21
End at: 2017-12-20 18:18:51
Local clock offset: 2.288 ms
Remote clock offset: -21.039 ms

# Below is generated by plot.py at 2017-12-20 19:33:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 534.097 ms
Loss rate: 76.95%
-- Flow 1:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 376.953 ms
Loss rate: 57.66%
-- Flow 2:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 696.879 ms
Loss rate: 84.96%
-- Flow 3:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 776.833 ms
Loss rate: 89.19%
```

## Run 2: Report of PCC — Data Link

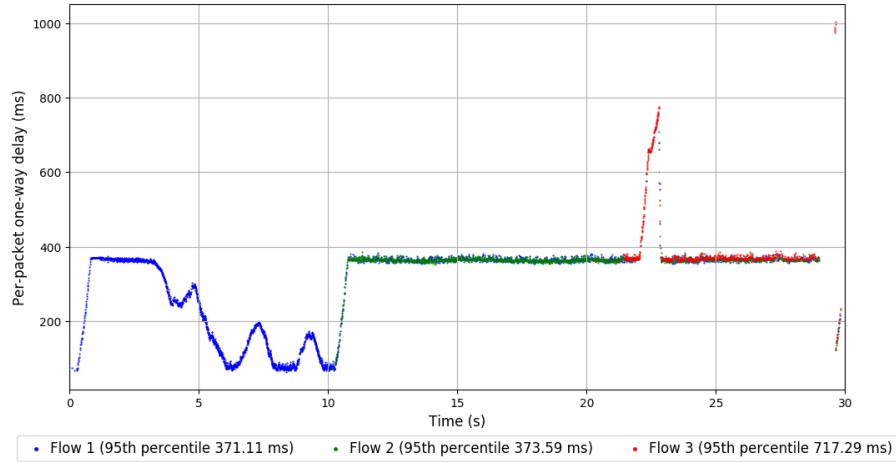
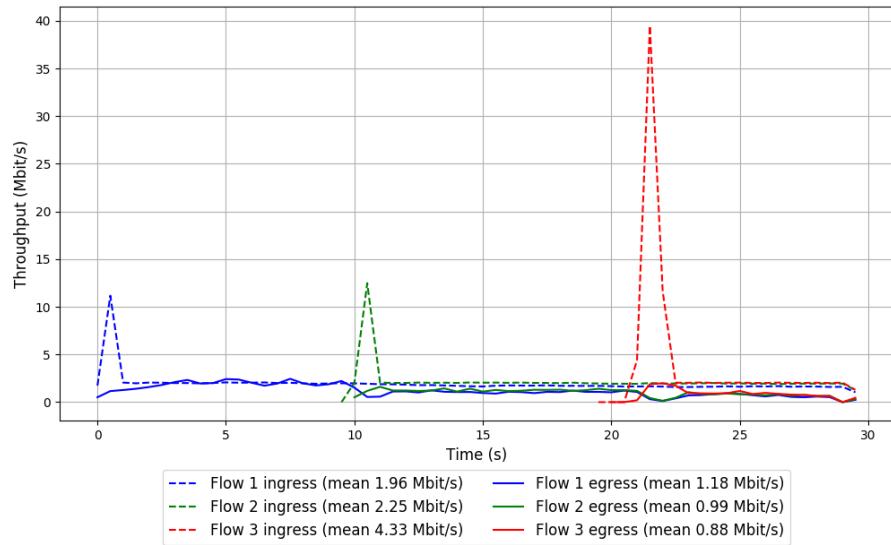


Run 3: Statistics of PCC

```
Start at: 2017-12-20 18:35:04
End at: 2017-12-20 18:35:34
Local clock offset: 3.207 ms
Remote clock offset: -20.615 ms

# Below is generated by plot.py at 2017-12-20 19:33:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 375.933 ms
Loss rate: 56.62%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 371.110 ms
Loss rate: 39.58%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 373.586 ms
Loss rate: 56.09%
-- Flow 3:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 717.289 ms
Loss rate: 80.48%
```

### Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2017-12-20 18:02:42

End at: 2017-12-20 18:03:12

Local clock offset: 4.102 ms

Remote clock offset: -19.022 ms

Run 1: Report of QUIC Cubic — Data Link

Figure is missing

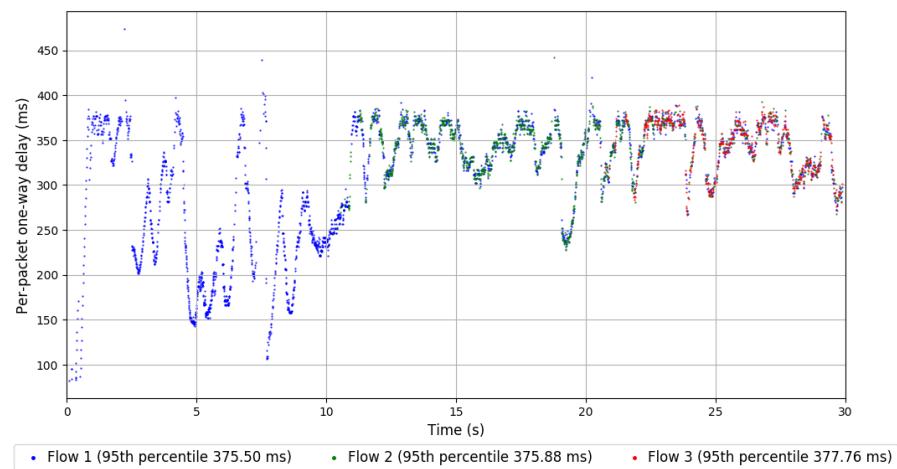
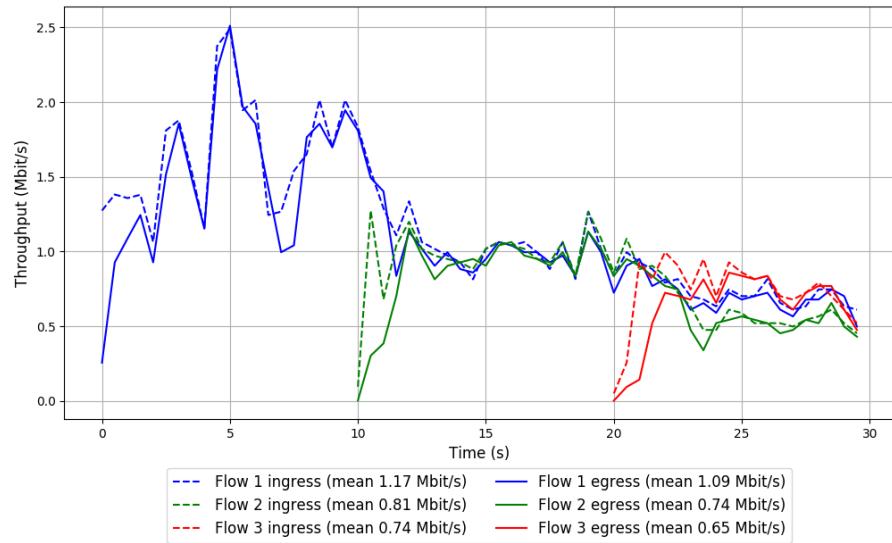
Figure is missing

Run 2: Statistics of QUIC Cubic

```
Start at: 2017-12-20 18:19:28
End at: 2017-12-20 18:19:58
Local clock offset: 6.49 ms
Remote clock offset: -21.221 ms

# Below is generated by plot.py at 2017-12-20 19:33:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 376.080 ms
Loss rate: 8.82%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 375.505 ms
Loss rate: 7.17%
-- Flow 2:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 375.885 ms
Loss rate: 9.58%
-- Flow 3:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 377.759 ms
Loss rate: 15.12%
```

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

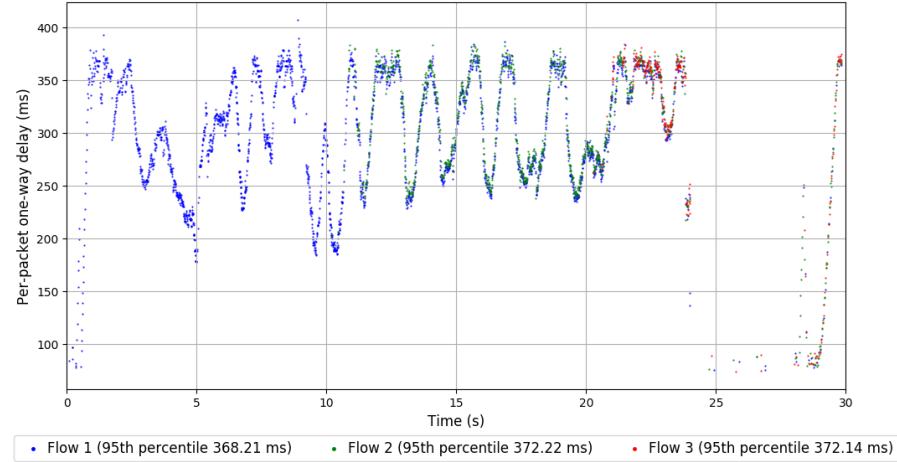
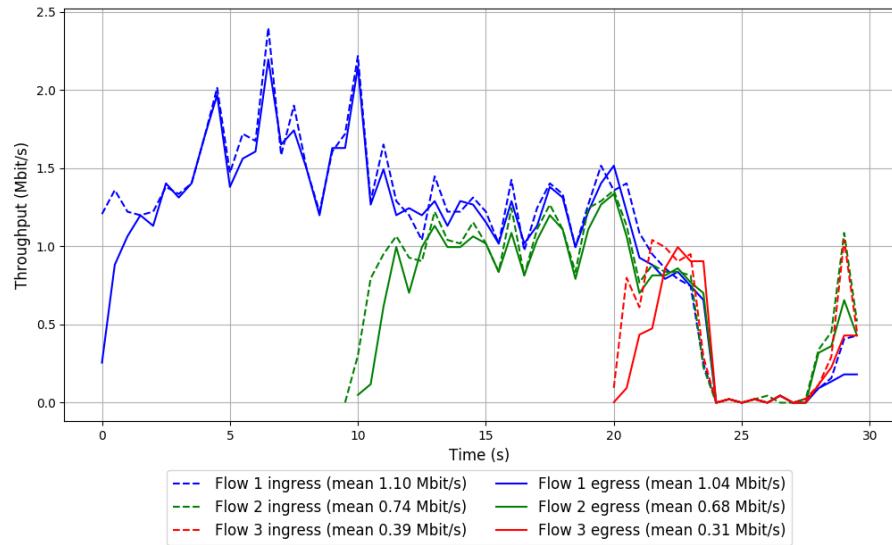


Run 3: Statistics of QUIC Cubic

```
Start at: 2017-12-20 18:36:11
End at: 2017-12-20 18:36:41
Local clock offset: 2.639 ms
Remote clock offset: -22.723 ms

# Below is generated by plot.py at 2017-12-20 19:33:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 368.993 ms
Loss rate: 7.82%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 368.208 ms
Loss rate: 5.54%
-- Flow 2:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 372.219 ms
Loss rate: 9.04%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 372.138 ms
Loss rate: 22.61%
```

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

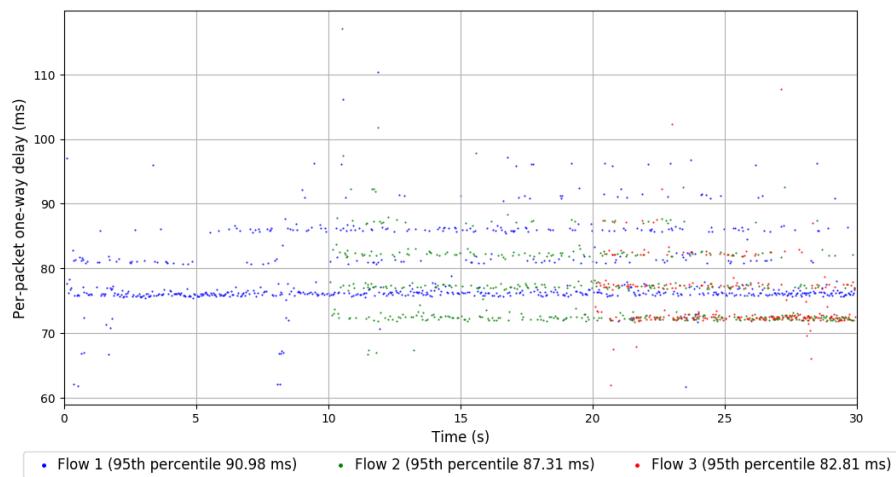
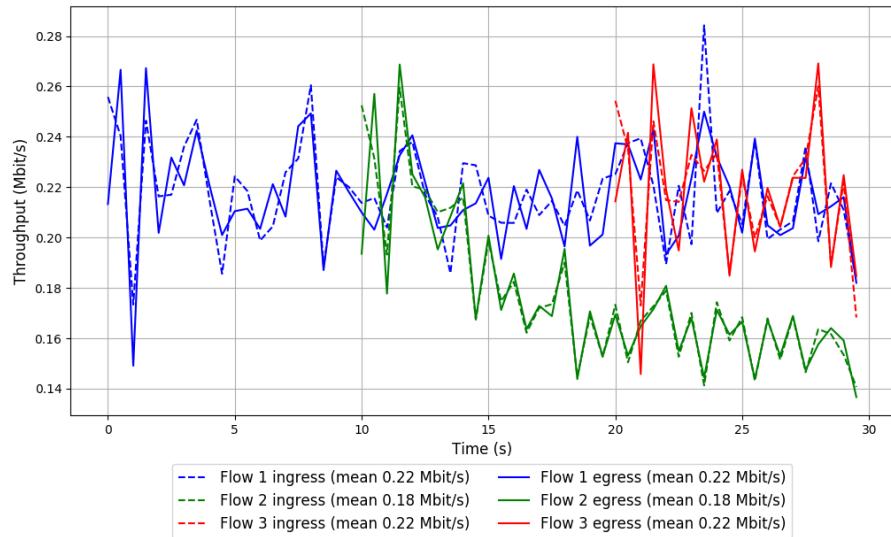


```
Run 1: Statistics of SCReAM

Start at: 2017-12-20 18:00:23
End at: 2017-12-20 18:00:53
Local clock offset: 3.456 ms
Remote clock offset: -21.489 ms

# Below is generated by plot.py at 2017-12-20 19:33:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 87.360 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 90.978 ms
Loss rate: 0.26%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 87.308 ms
Loss rate: 0.63%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 82.806 ms
Loss rate: 0.36%
```

Run 1: Report of SCReAM — Data Link

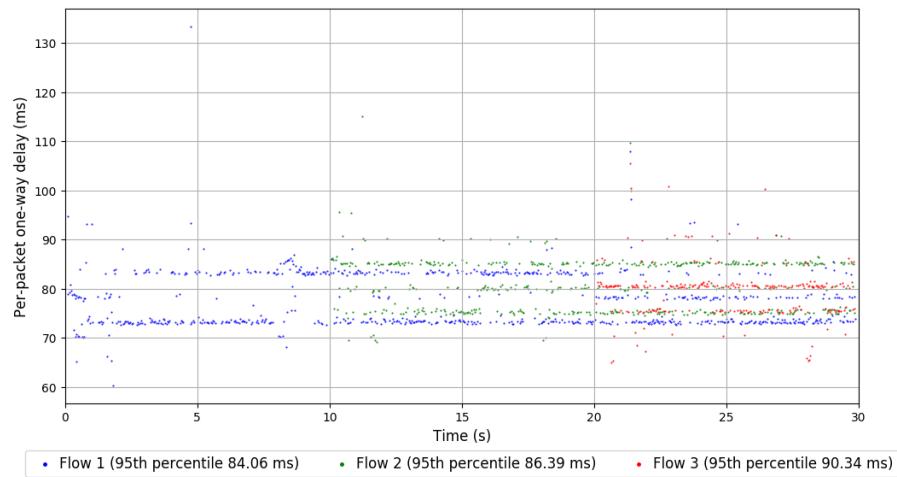
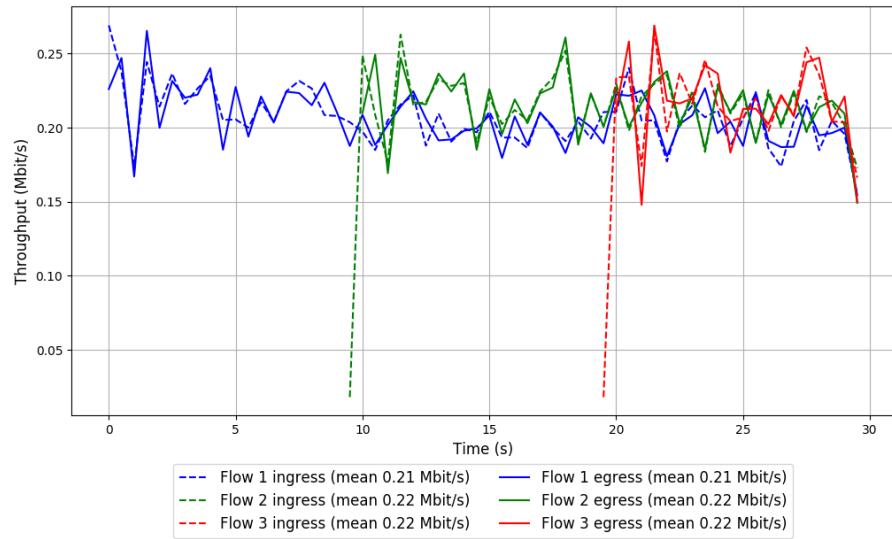


Run 2: Statistics of SCReAM

```
Start at: 2017-12-20 18:17:15
End at: 2017-12-20 18:17:45
Local clock offset: 4.238 ms
Remote clock offset: -20.533 ms

# Below is generated by plot.py at 2017-12-20 19:33:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 85.802 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 84.064 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 86.388 ms
Loss rate: 0.61%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 90.338 ms
Loss rate: 0.74%
```

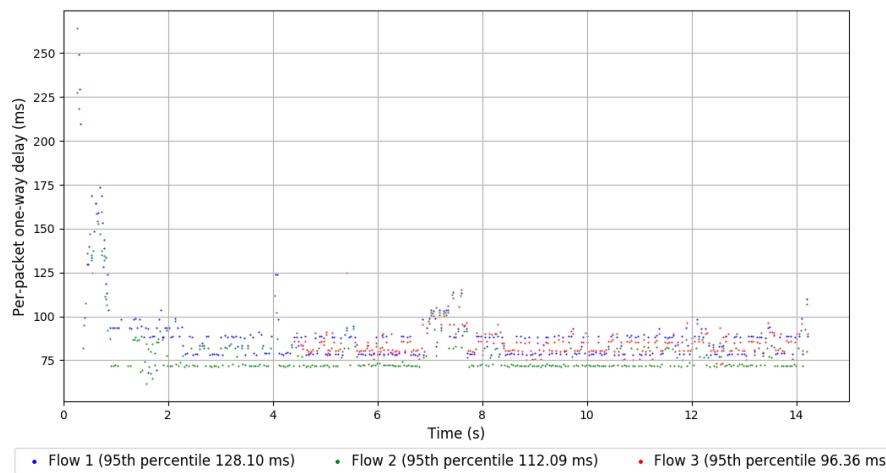
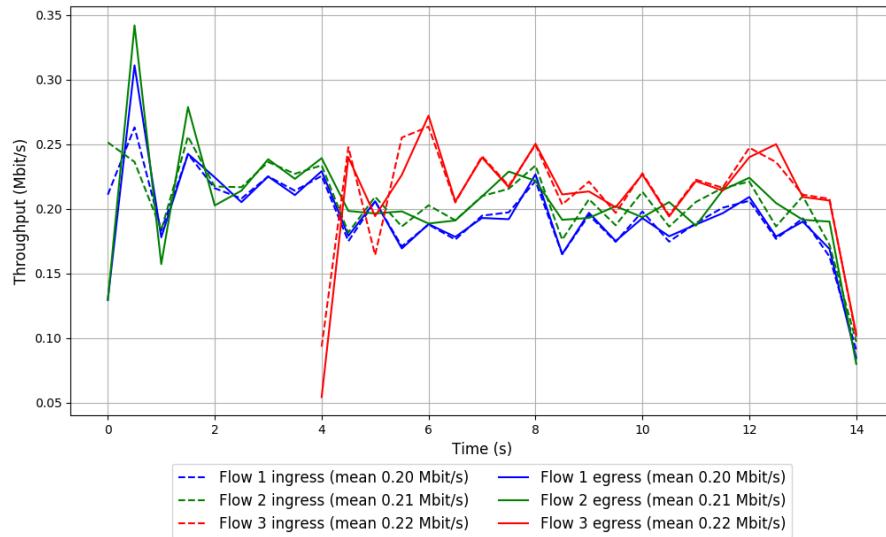
Run 2: Report of SCReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2017-12-20 18:33:58  
End at: 2017-12-20 18:34:28  
Local clock offset: 4.186 ms  
Remote clock offset: -21.182 ms

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

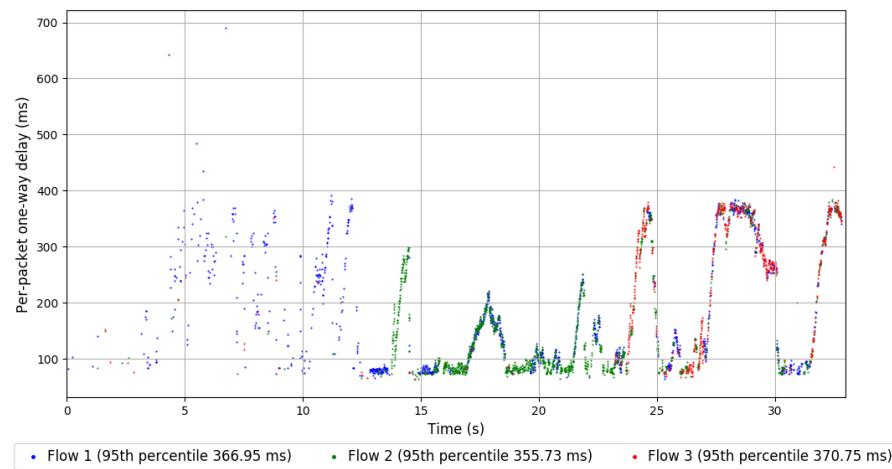
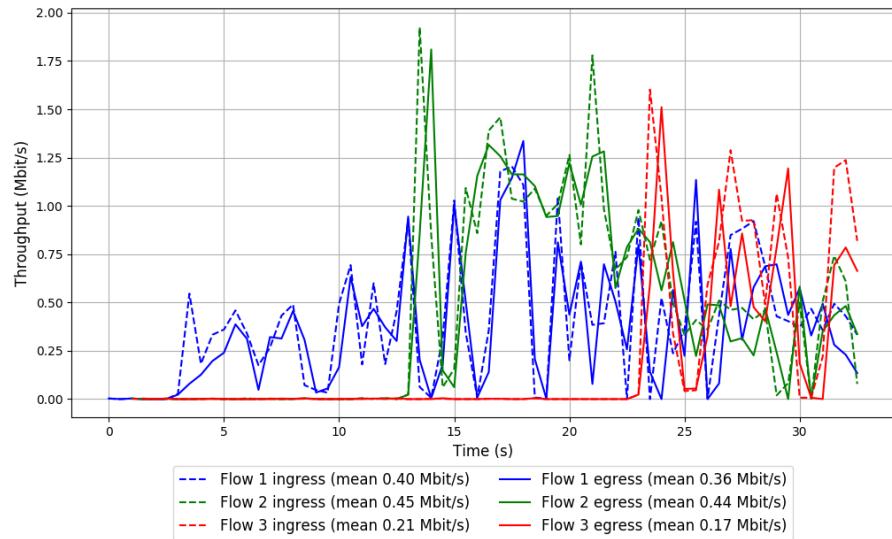


Run 1: Statistics of WebRTC media

```
Start at: 2017-12-20 17:58:09
End at: 2017-12-20 17:58:39
Local clock offset: 3.832 ms
Remote clock offset: -21.31 ms

# Below is generated by plot.py at 2017-12-20 19:33:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 366.211 ms
Loss rate: 8.84%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 366.951 ms
Loss rate: 9.69%
-- Flow 2:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 355.727 ms
Loss rate: 3.11%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 370.755 ms
Loss rate: 19.20%
```

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

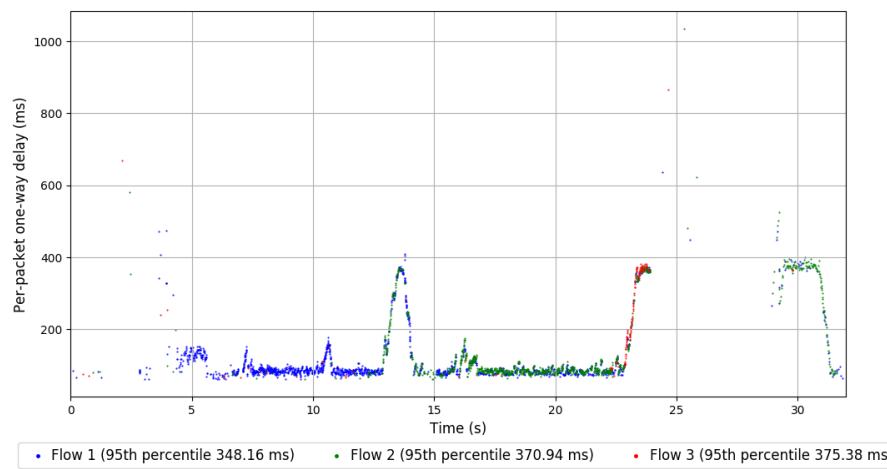
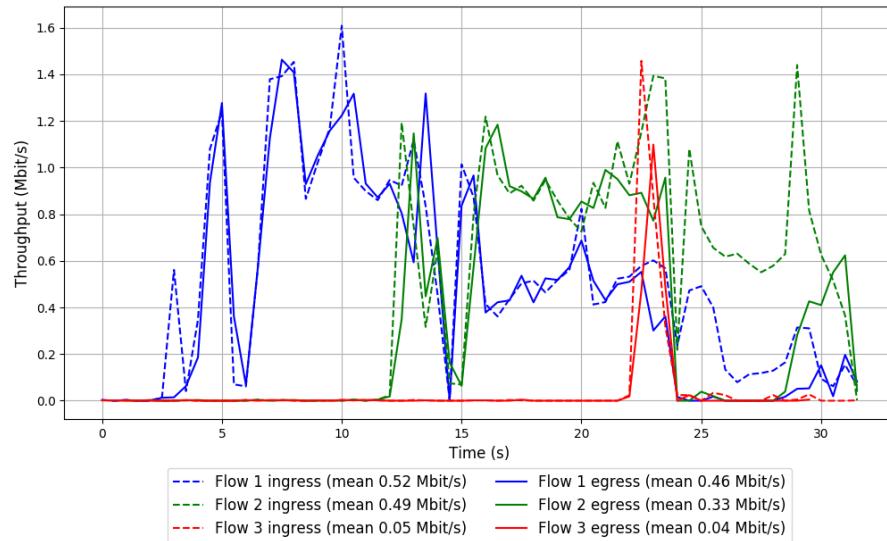


Run 2: Statistics of WebRTC media

```
Start at: 2017-12-20 18:15:02
End at: 2017-12-20 18:15:32
Local clock offset: 4.312 ms
Remote clock offset: -20.409 ms

# Below is generated by plot.py at 2017-12-20 19:33:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 366.598 ms
Loss rate: 21.30%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 348.160 ms
Loss rate: 11.99%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 370.944 ms
Loss rate: 31.29%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 375.381 ms
Loss rate: 25.53%
```

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

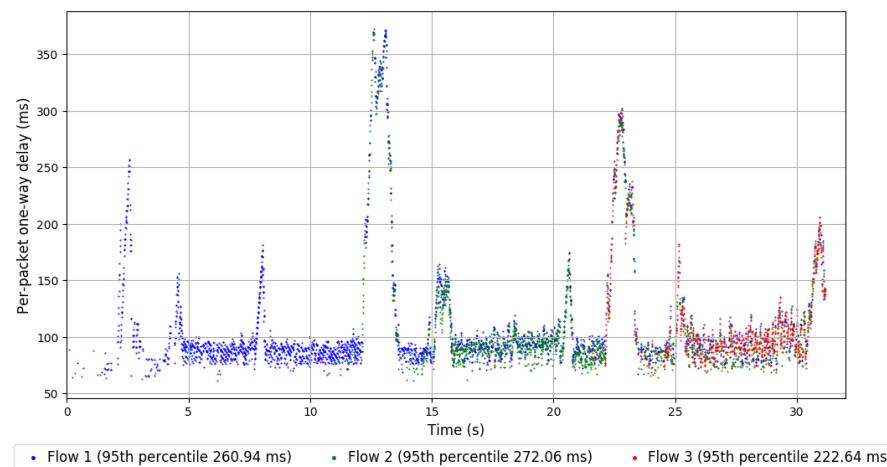
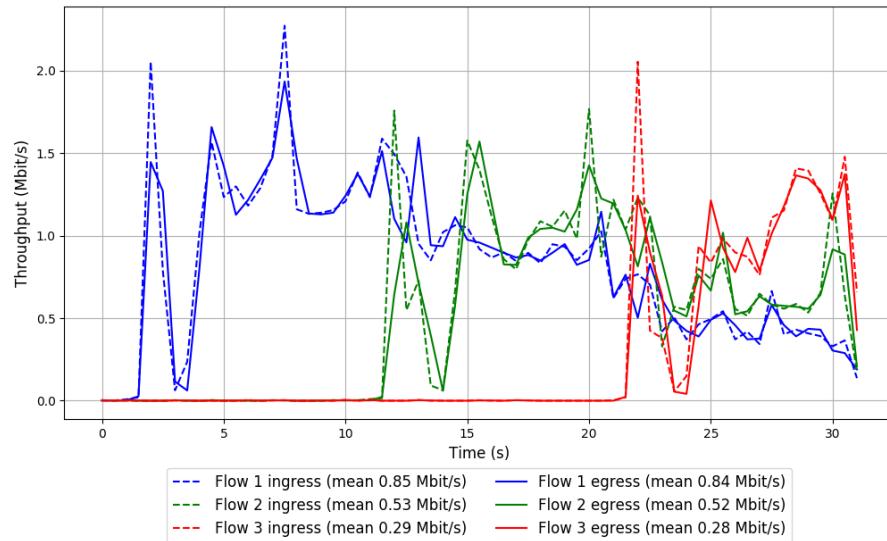


Run 3: Statistics of WebRTC media

```
Start at: 2017-12-20 18:31:45
End at: 2017-12-20 18:32:15
Local clock offset: 4.818 ms
Remote clock offset: -22.325 ms

# Below is generated by plot.py at 2017-12-20 19:33:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 255.881 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 260.936 ms
Loss rate: 0.76%
-- Flow 2:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 272.064 ms
Loss rate: 1.46%
-- Flow 3:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 222.644 ms
Loss rate: 3.75%
```

Run 3: Report of WebRTC media — Data Link

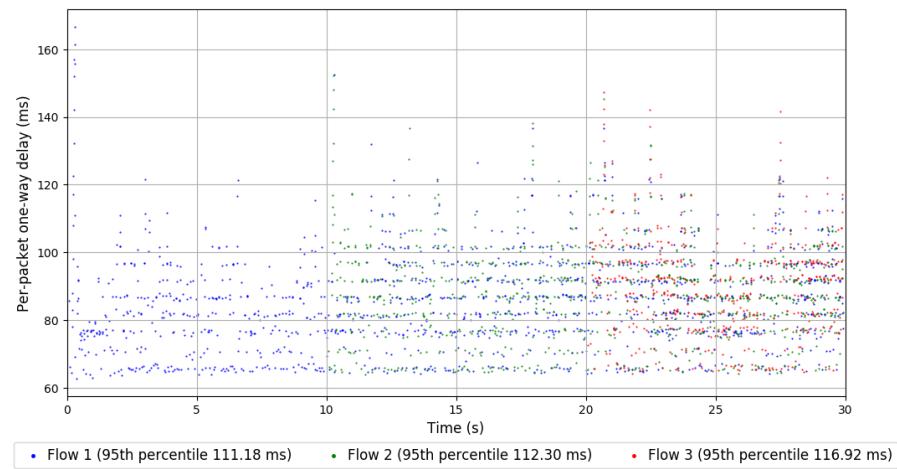
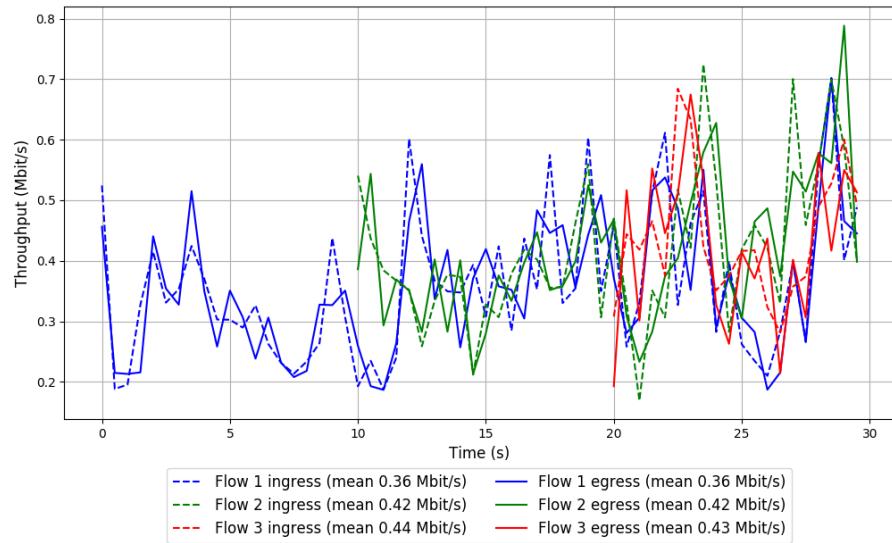


Run 1: Statistics of Sprout

```
Start at: 2017-12-20 18:03:49
End at: 2017-12-20 18:04:19
Local clock offset: 4.222 ms
Remote clock offset: -22.22 ms

# Below is generated by plot.py at 2017-12-20 19:33:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 112.032 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 111.177 ms
Loss rate: 0.74%
-- Flow 2:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 112.303 ms
Loss rate: 0.38%
-- Flow 3:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 116.918 ms
Loss rate: 2.71%
```

## Run 1: Report of Sprout — Data Link

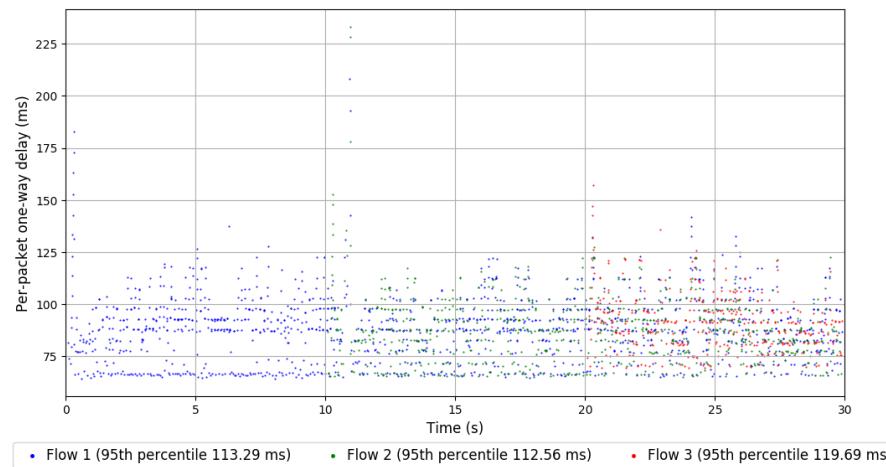
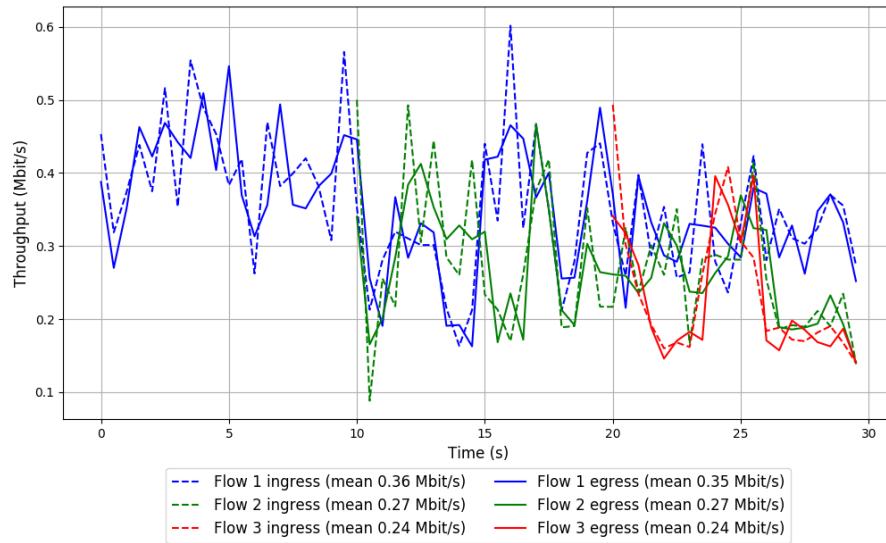


Run 2: Statistics of Sprout

```
Start at: 2017-12-20 18:20:34
End at: 2017-12-20 18:21:04
Local clock offset: 6.1 ms
Remote clock offset: -22.356 ms

# Below is generated by plot.py at 2017-12-20 19:33:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 113.517 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 113.290 ms
Loss rate: 0.63%
-- Flow 2:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 112.557 ms
Loss rate: 1.04%
-- Flow 3:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 119.690 ms
Loss rate: 2.01%
```

## Run 2: Report of Sprout — Data Link

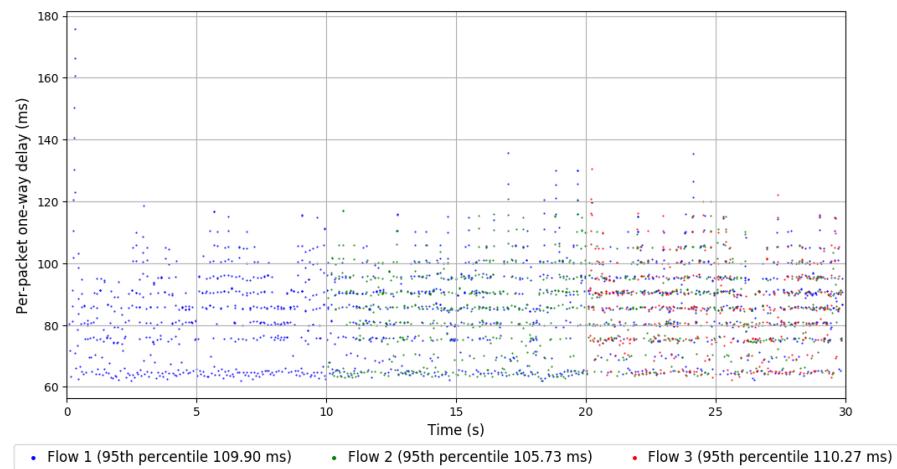
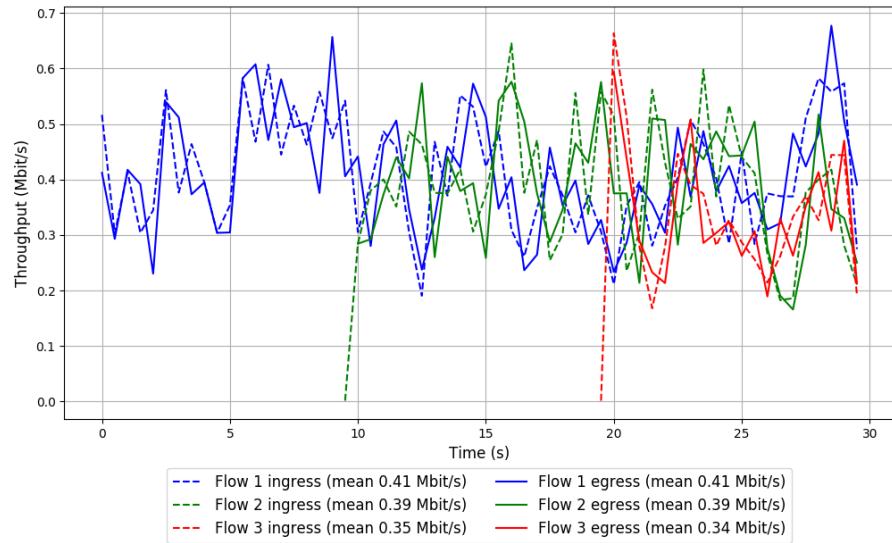


Run 3: Statistics of Sprout

```
Start at: 2017-12-20 18:37:17
End at: 2017-12-20 18:37:47
Local clock offset: 4.82 ms
Remote clock offset: -23.135 ms

# Below is generated by plot.py at 2017-12-20 19:33:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 106.394 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 109.903 ms
Loss rate: 0.54%
-- Flow 2:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 105.735 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 110.271 ms
Loss rate: 2.33%
```

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

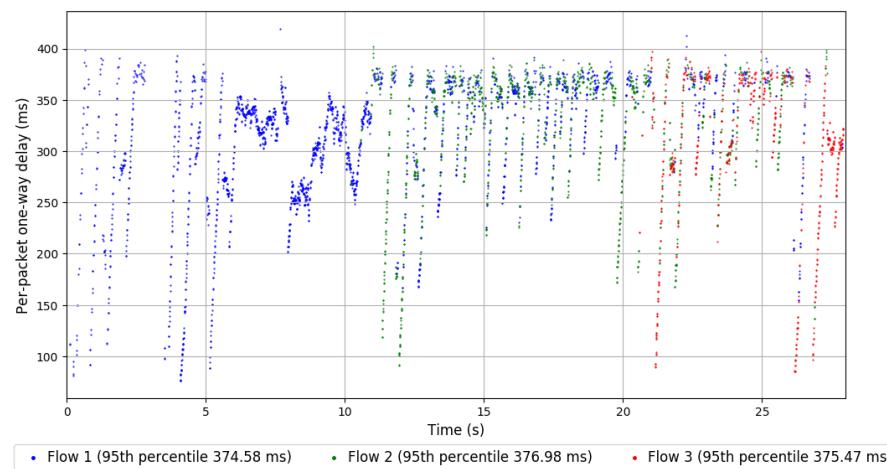
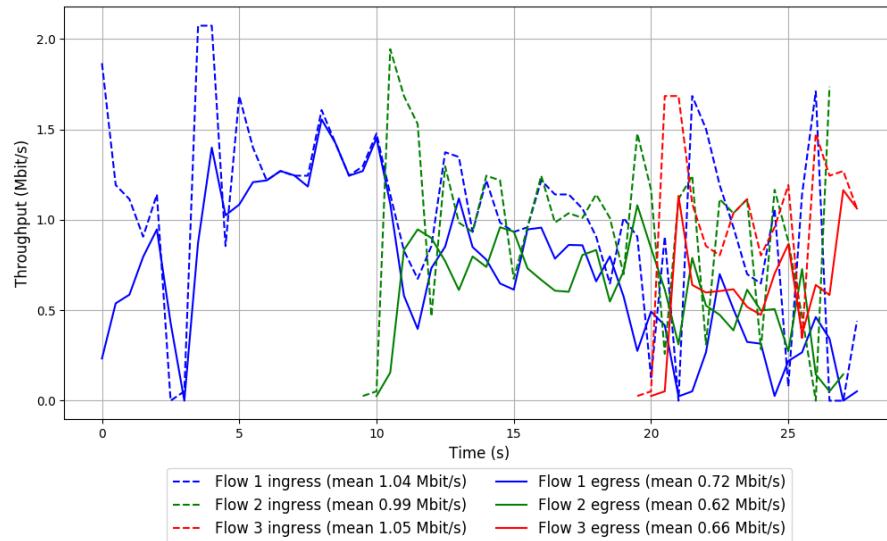


Run 1: Statistics of TaoVA-100x

```
Start at: 2017-12-20 17:52:30
End at: 2017-12-20 17:53:00
Local clock offset: 5.462 ms
Remote clock offset: -20.025 ms

# Below is generated by plot.py at 2017-12-20 19:33:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 375.807 ms
Loss rate: 34.21%
-- Flow 1:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 374.580 ms
Loss rate: 31.11%
-- Flow 2:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 376.979 ms
Loss rate: 36.79%
-- Flow 3:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 375.467 ms
Loss rate: 39.79%
```

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

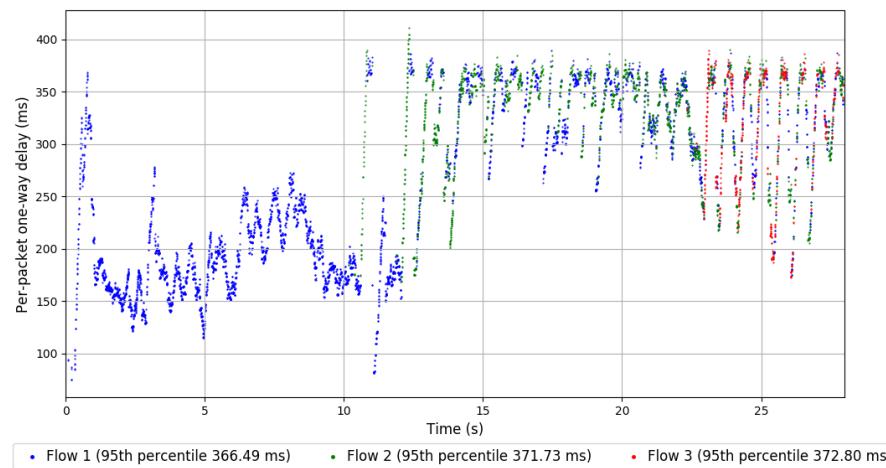
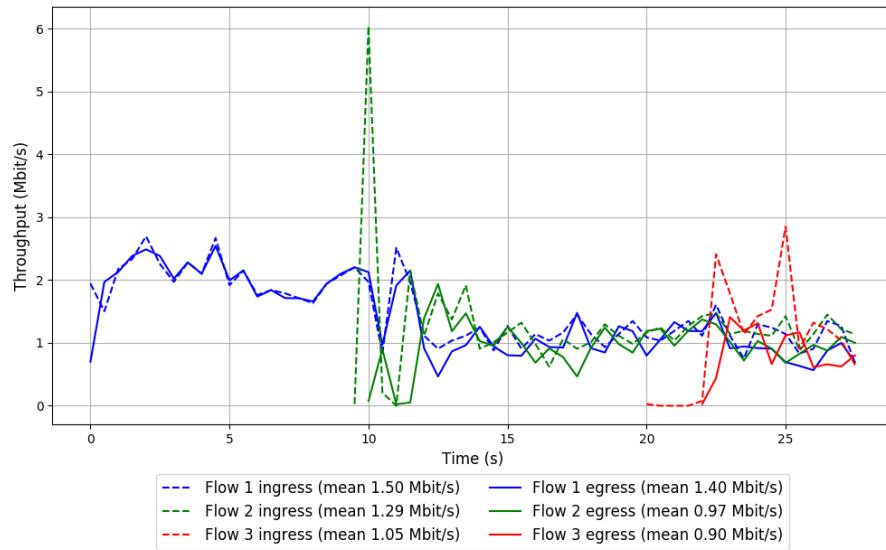


Run 2: Statistics of TaoVA-100x

```
Start at: 2017-12-20 18:09:24
End at: 2017-12-20 18:09:54
Local clock offset: 4.327 ms
Remote clock offset: -20.95 ms

# Below is generated by plot.py at 2017-12-20 19:33:18
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.20 Mbit/s
95th percentile per-packet one-way delay: 368.797 ms
Loss rate: 16.58%
-- Flow 1:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 366.493 ms
Loss rate: 7.15%
-- Flow 2:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 371.729 ms
Loss rate: 25.83%
-- Flow 3:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 372.795 ms
Loss rate: 38.72%
```

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

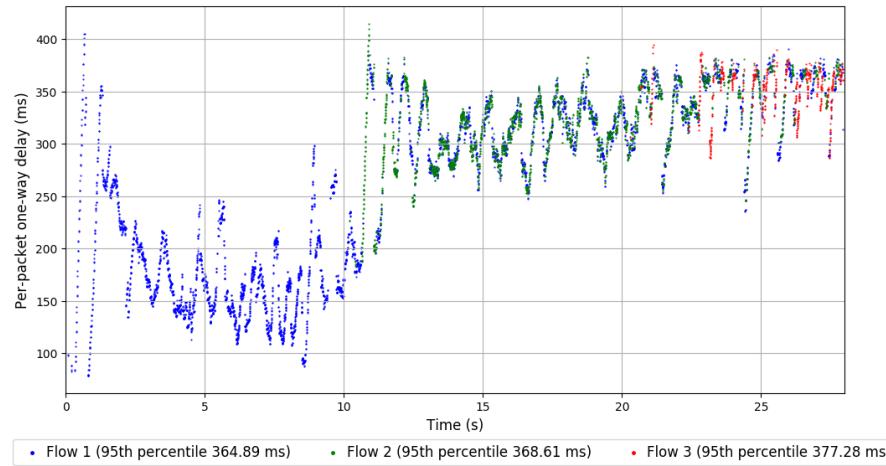
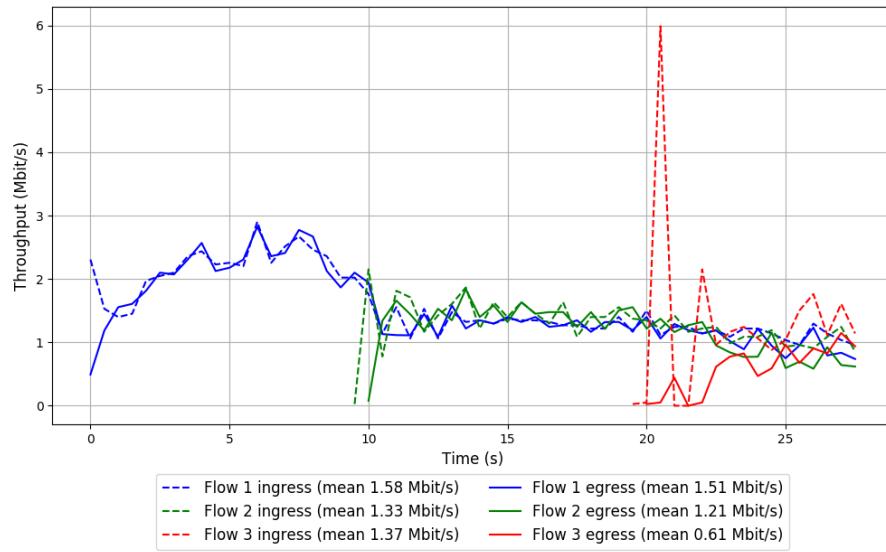


Run 3: Statistics of TaoVA-100x

```
Start at: 2017-12-20 18:26:07
End at: 2017-12-20 18:26:37
Local clock offset: 4.517 ms
Remote clock offset: -21.598 ms

# Below is generated by plot.py at 2017-12-20 19:33:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 367.484 ms
Loss rate: 13.62%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 364.895 ms
Loss rate: 4.71%
-- Flow 2:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 368.611 ms
Loss rate: 10.36%
-- Flow 3:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 377.282 ms
Loss rate: 57.11%
```

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

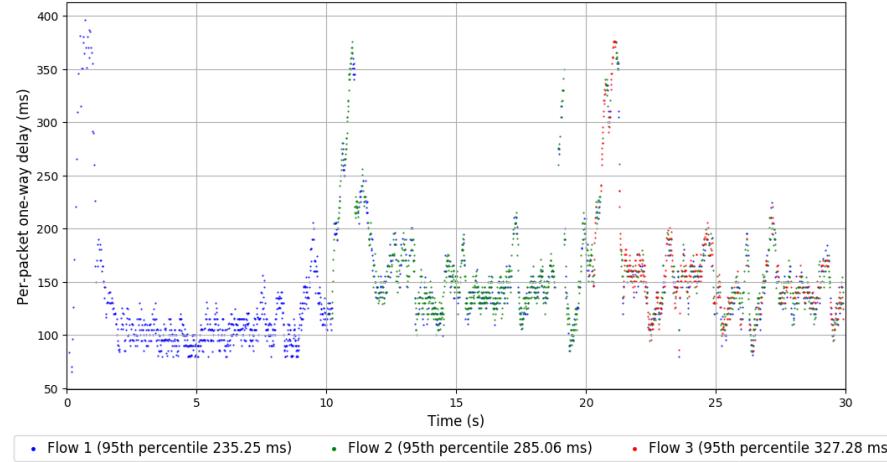
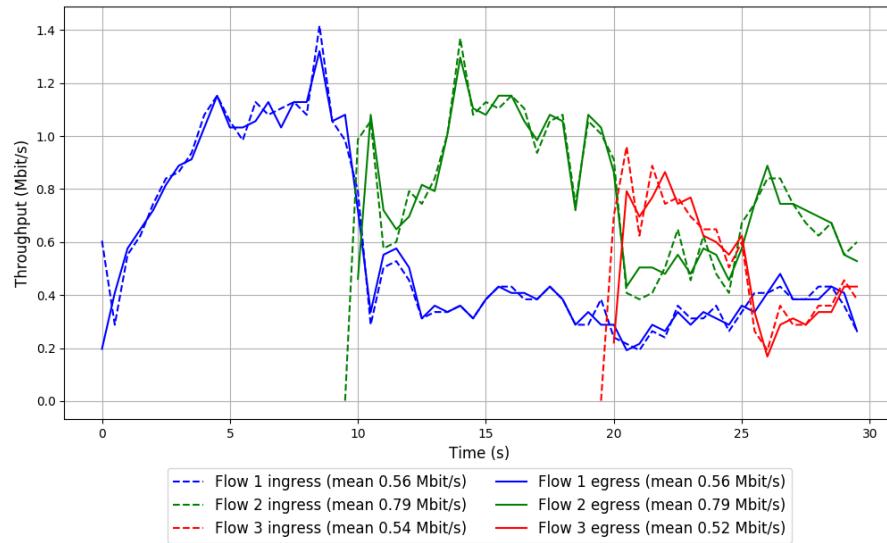


Run 1: Statistics of TCP Vegas

```
Start at: 2017-12-20 17:53:37
End at: 2017-12-20 17:54:07
Local clock offset: 4.936 ms
Remote clock offset: -20.889 ms

# Below is generated by plot.py at 2017-12-20 19:33:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 276.083 ms
Loss rate: 1.46%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 235.245 ms
Loss rate: 0.65%
-- Flow 2:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 285.055 ms
Loss rate: 1.06%
-- Flow 3:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 327.279 ms
Loss rate: 5.14%
```

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

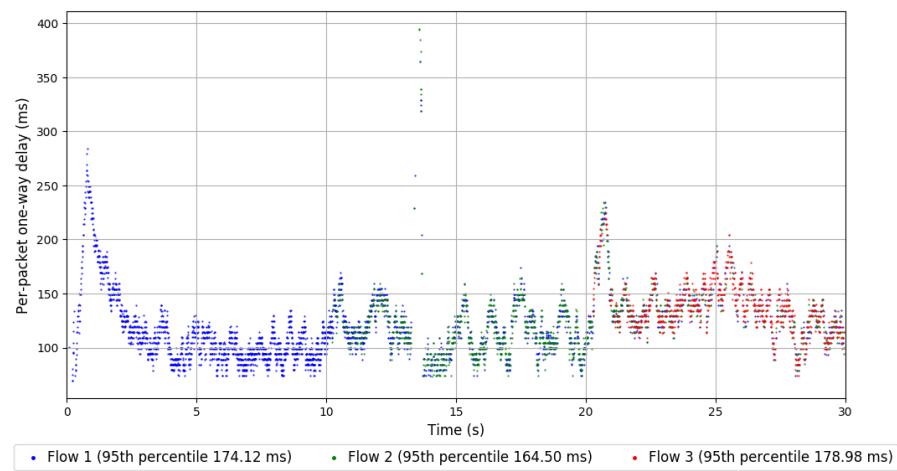
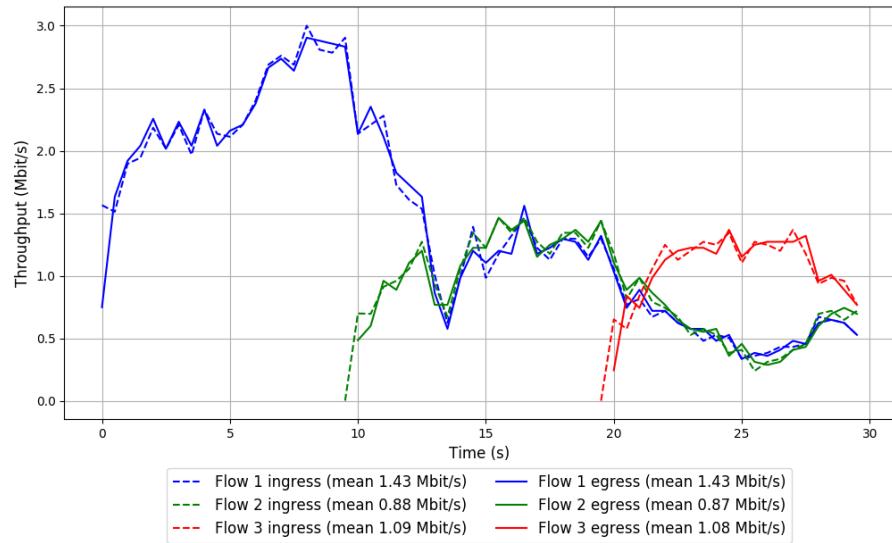


Run 2: Statistics of TCP Vegas

```
Start at: 2017-12-20 18:10:31
End at: 2017-12-20 18:11:01
Local clock offset: 5.974 ms
Remote clock offset: -19.4 ms

# Below is generated by plot.py at 2017-12-20 19:33:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 174.028 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 174.119 ms
Loss rate: 0.53%
-- Flow 2:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 164.496 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 178.982 ms
Loss rate: 1.33%
```

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

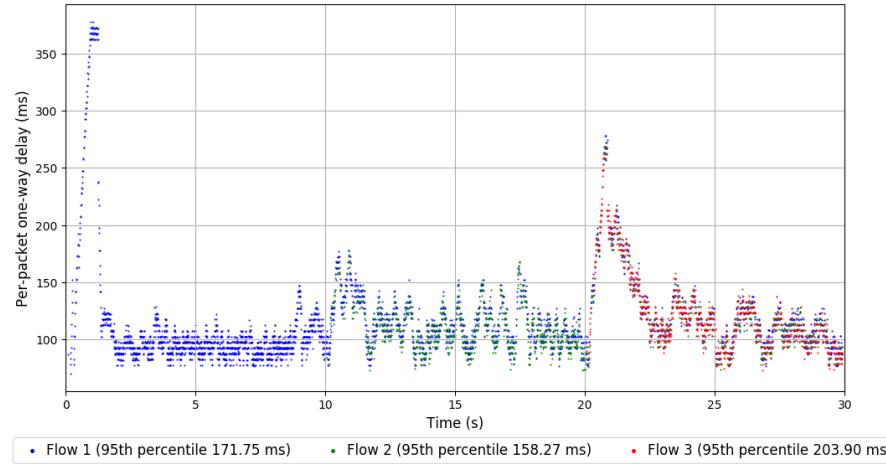
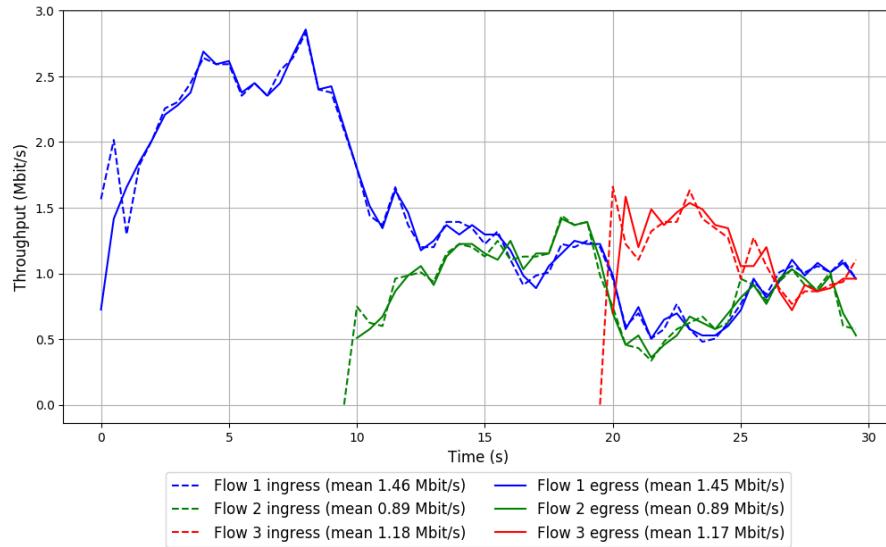


Run 3: Statistics of TCP Vegas

```
Start at: 2017-12-20 18:27:14
End at: 2017-12-20 18:27:44
Local clock offset: 4.433 ms
Remote clock offset: -21.981 ms

# Below is generated by plot.py at 2017-12-20 19:33:20
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.43 Mbit/s
95th percentile per-packet one-way delay: 178.781 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 171.746 ms
Loss rate: 1.05%
-- Flow 2:
Average throughput: 0.89 Mbit/s
95th percentile per-packet one-way delay: 158.267 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 203.896 ms
Loss rate: 1.54%
```

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

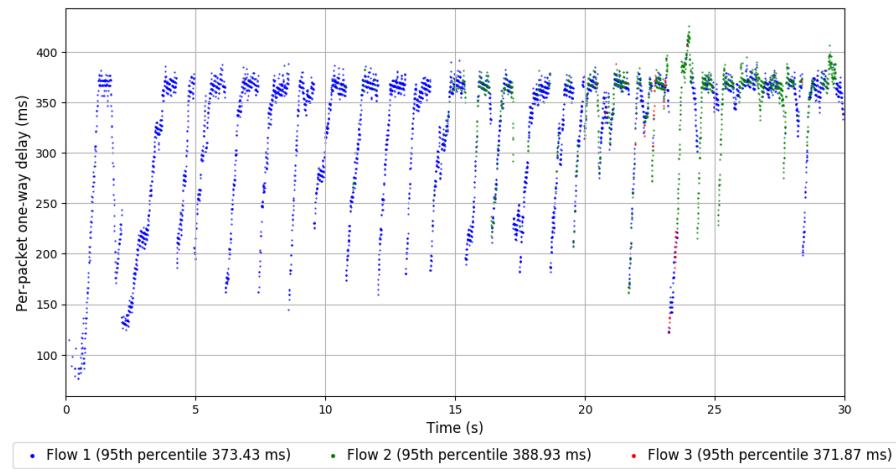
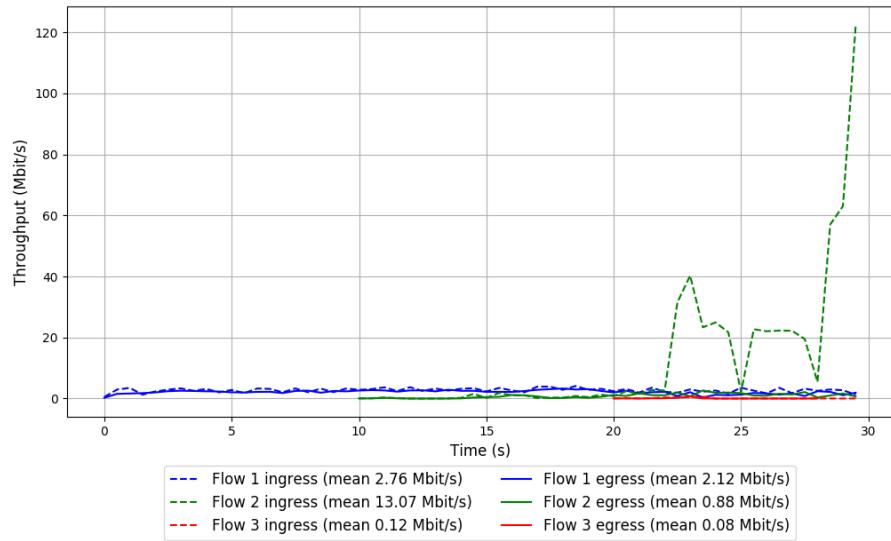


Run 1: Statistics of Verus

```
Start at: 2017-12-20 18:08:17
End at: 2017-12-20 18:08:47
Local clock offset: 1.44 ms
Remote clock offset: -25.517 ms

# Below is generated by plot.py at 2017-12-20 19:33:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 377.169 ms
Loss rate: 76.50%
-- Flow 1:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 373.434 ms
Loss rate: 22.99%
-- Flow 2:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 388.934 ms
Loss rate: 93.50%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 371.870 ms
Loss rate: 48.00%
```

## Run 1: Report of Verus — Data Link

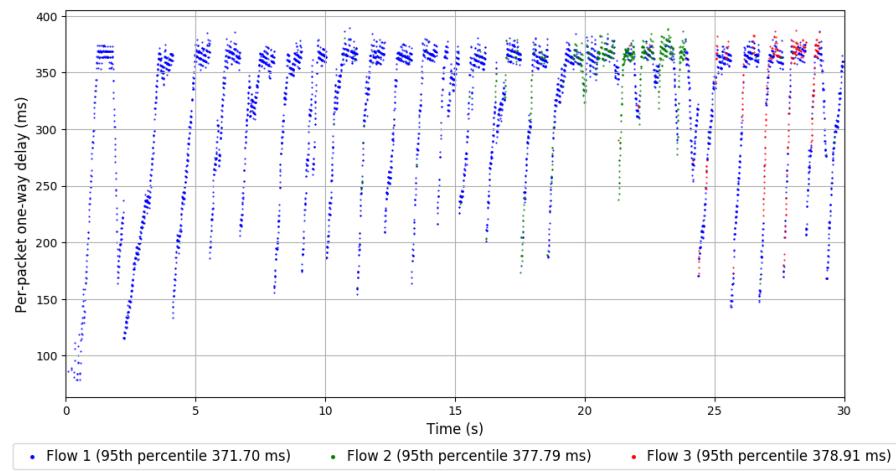
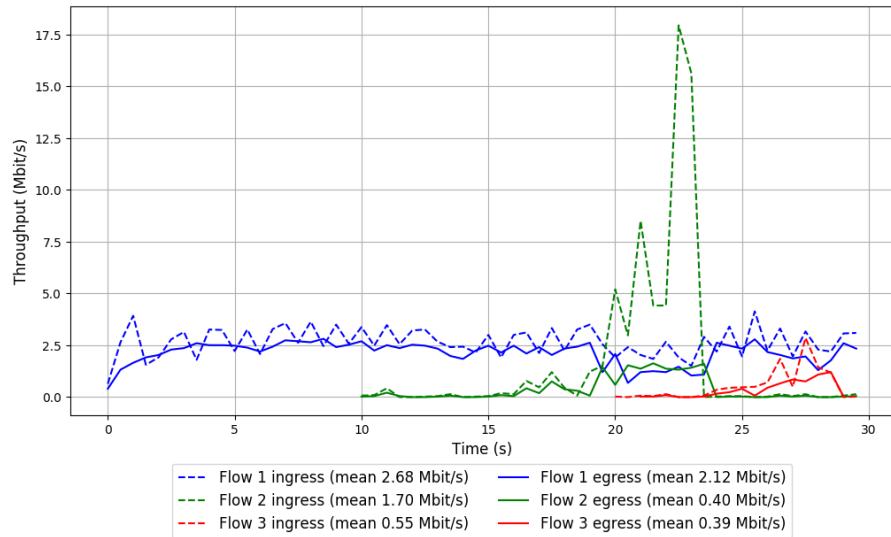


Run 2: Statistics of Verus

```
Start at: 2017-12-20 18:25:01
End at: 2017-12-20 18:25:31
Local clock offset: 2.968 ms
Remote clock offset: -22.602 ms

# Below is generated by plot.py at 2017-12-20 19:33:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.48 Mbit/s
95th percentile per-packet one-way delay: 373.259 ms
Loss rate: 37.73%
-- Flow 1:
Average throughput: 2.12 Mbit/s
95th percentile per-packet one-way delay: 371.699 ms
Loss rate: 21.02%
-- Flow 2:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 377.791 ms
Loss rate: 77.07%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 378.912 ms
Loss rate: 43.14%
```

## Run 2: Report of Verus — Data Link

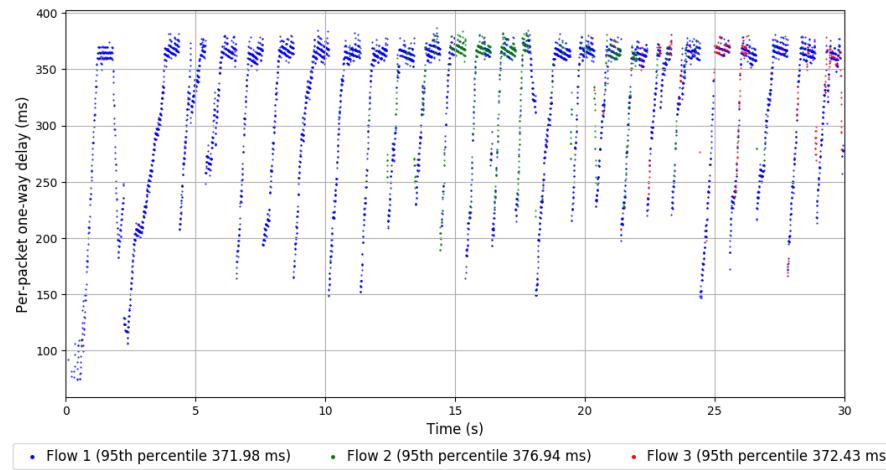
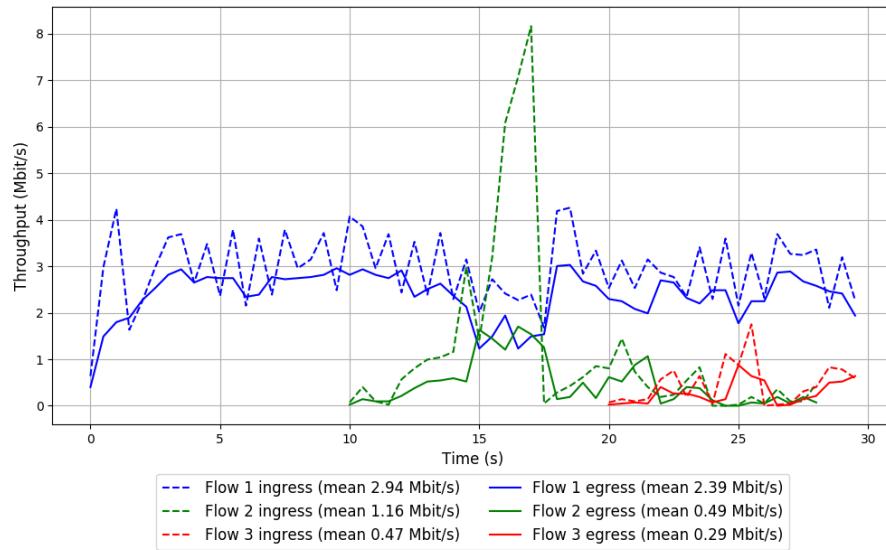


Run 3: Statistics of Verus

```
Start at: 2017-12-20 18:41:44
End at: 2017-12-20 18:42:15
Local clock offset: 2.64 ms
Remote clock offset: -21.124 ms

# Below is generated by plot.py at 2017-12-20 19:33:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.78 Mbit/s
95th percentile per-packet one-way delay: 372.632 ms
Loss rate: 27.41%
-- Flow 1:
Average throughput: 2.39 Mbit/s
95th percentile per-packet one-way delay: 371.978 ms
Loss rate: 19.15%
-- Flow 2:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 376.944 ms
Loss rate: 58.66%
-- Flow 3:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 372.429 ms
Loss rate: 40.15%
```

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

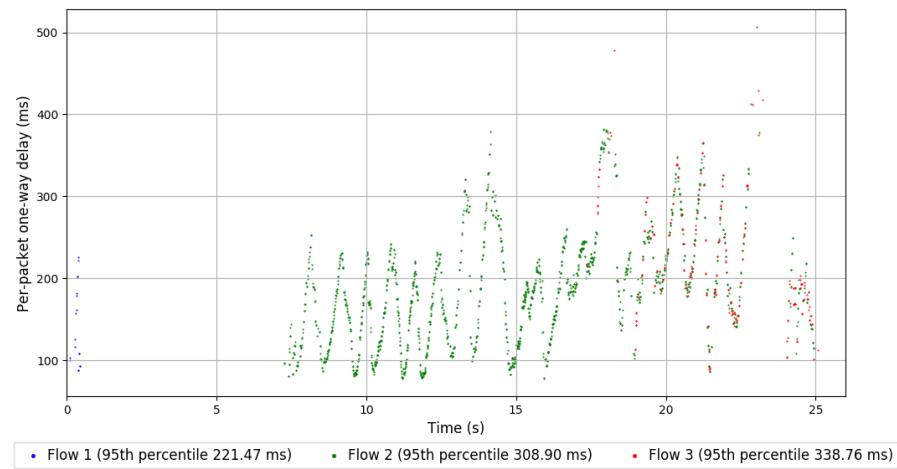
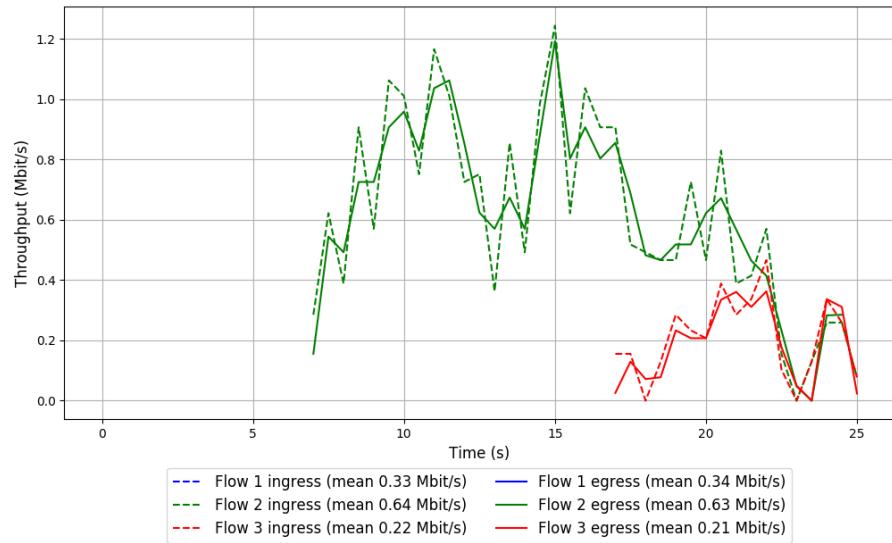


Run 1: Statistics of Copa

```
Start at: 2017-12-20 17:55:55
End at: 2017-12-20 17:56:25
Local clock offset: 3.945 ms
Remote clock offset: -19.921 ms

# Below is generated by plot.py at 2017-12-20 19:33:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 317.319 ms
Loss rate: 2.91%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 221.470 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 308.902 ms
Loss rate: 1.96%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 338.756 ms
Loss rate: 9.26%
```

## Run 1: Report of Copa — Data Link

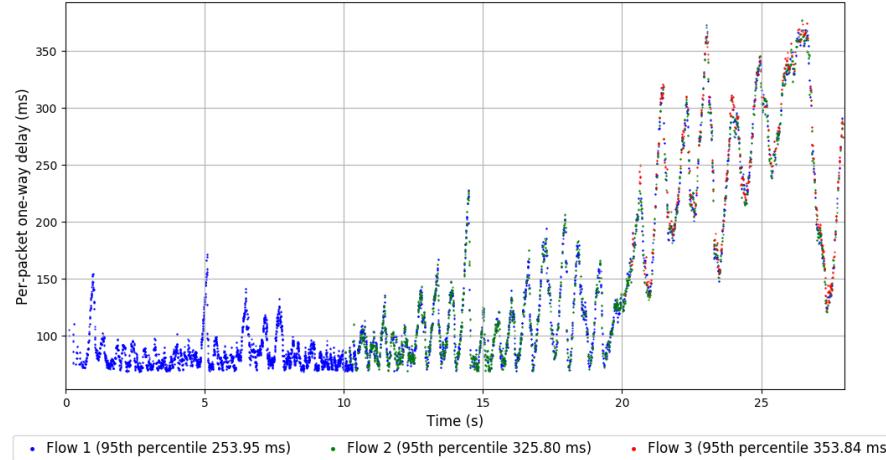
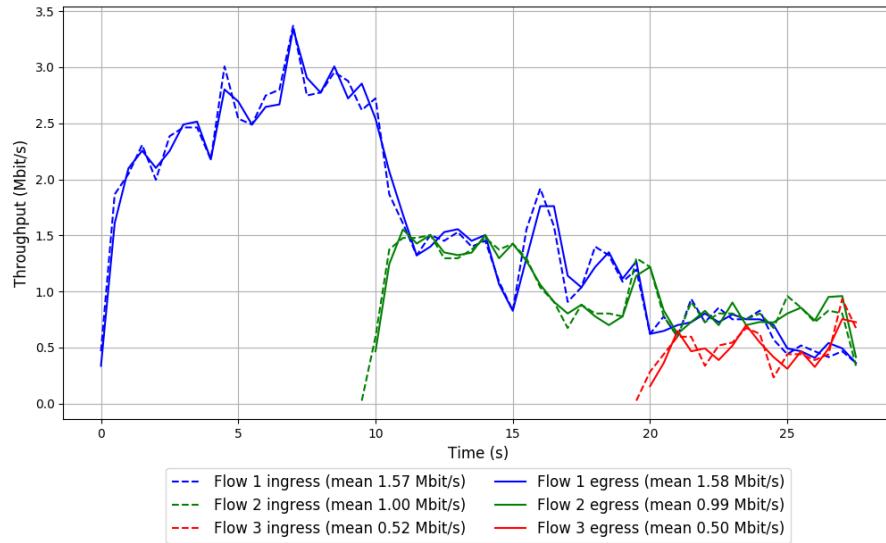


Run 2: Statistics of Copa

```
Start at: 2017-12-20 18:12:49
End at: 2017-12-20 18:13:19
Local clock offset: 3.887 ms
Remote clock offset: -18.549 ms

# Below is generated by plot.py at 2017-12-20 19:33:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 302.892 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 1.58 Mbit/s
95th percentile per-packet one-way delay: 253.951 ms
Loss rate: 0.37%
-- Flow 2:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 325.797 ms
Loss rate: 0.79%
-- Flow 3:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 353.842 ms
Loss rate: 5.21%
```

## Run 2: Report of Copa — Data Link

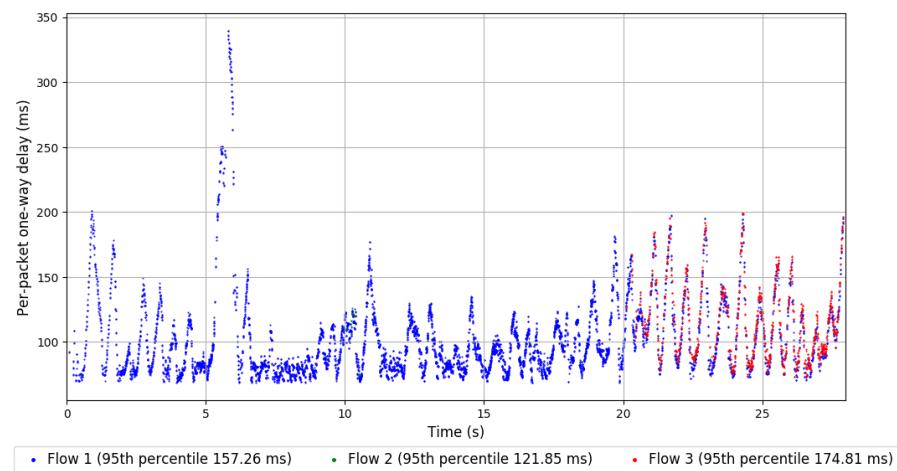
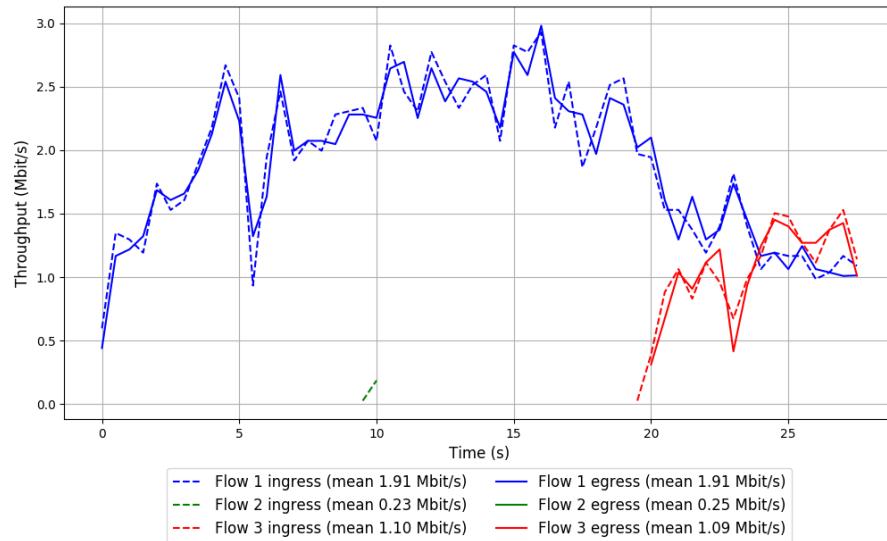


Run 3: Statistics of Copa

```
Start at: 2017-12-20 18:29:33
End at: 2017-12-20 18:30:03
Local clock offset: 2.613 ms
Remote clock offset: -21.066 ms

# Below is generated by plot.py at 2017-12-20 19:33:26
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 160.965 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 157.262 ms
Loss rate: 0.42%
-- Flow 2:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 121.853 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 174.811 ms
Loss rate: 2.52%
```

### Run 3: Report of Copa — Data Link

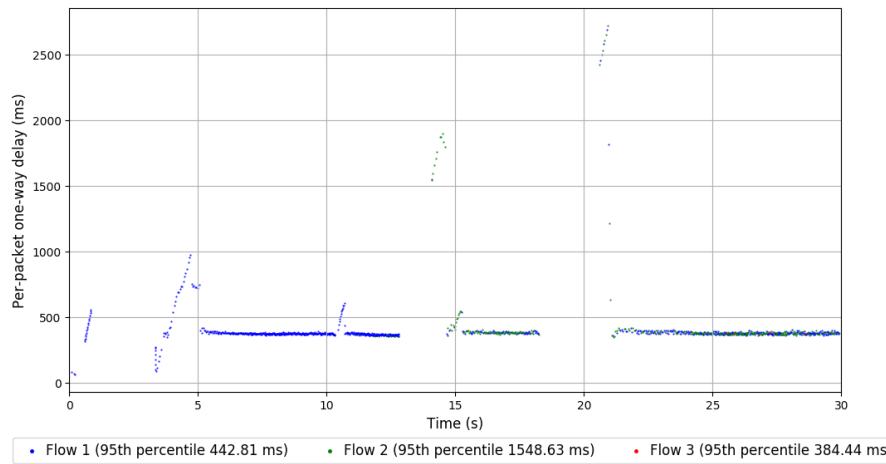
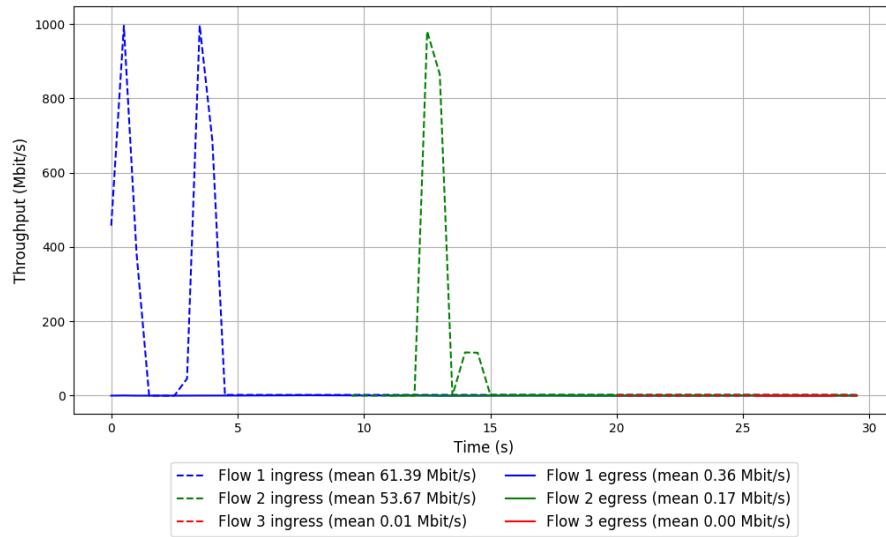


Run 1: Statistics of FillP

```
Start at: 2017-12-20 17:54:43
End at: 2017-12-20 17:55:13
Local clock offset: 6.385 ms
Remote clock offset: -18.65 ms

# Below is generated by plot.py at 2017-12-20 19:33:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 495.066 ms
Loss rate: 99.52%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 442.814 ms
Loss rate: 99.42%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 1548.635 ms
Loss rate: 99.71%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 384.438 ms
Loss rate: 92.36%
```

## Run 1: Report of FillP — Data Link

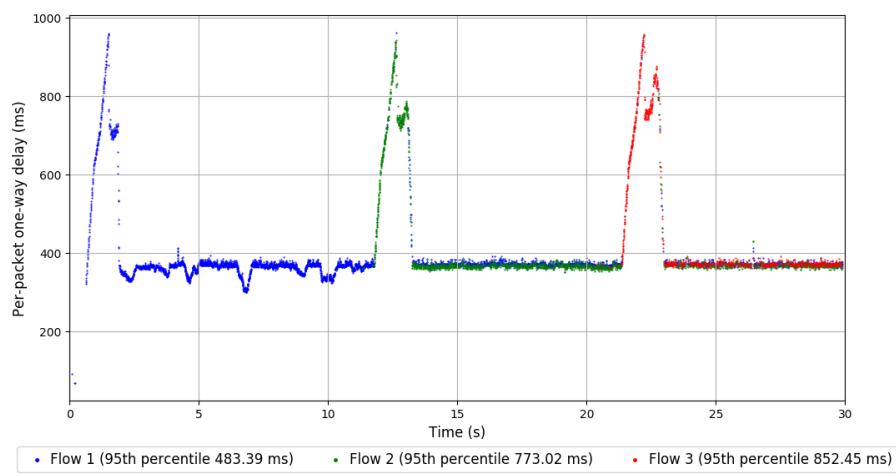
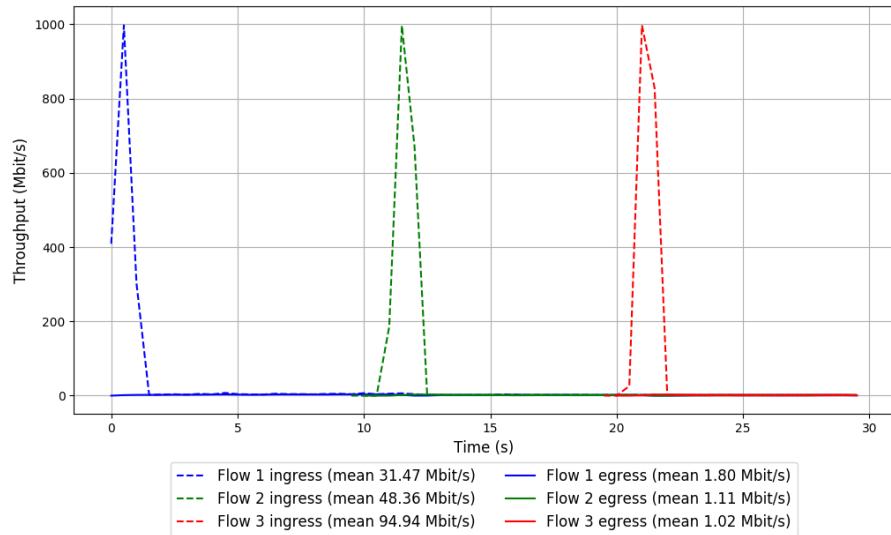


Run 2: Statistics of FillP

```
Start at: 2017-12-20 18:11:37
End at: 2017-12-20 18:12:07
Local clock offset: 6.156 ms
Remote clock offset: -19.947 ms

# Below is generated by plot.py at 2017-12-20 19:33:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.86 Mbit/s
95th percentile per-packet one-way delay: 751.063 ms
Loss rate: 97.01%
-- Flow 1:
Average throughput: 1.80 Mbit/s
95th percentile per-packet one-way delay: 483.388 ms
Loss rate: 94.30%
-- Flow 2:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 773.016 ms
Loss rate: 97.75%
-- Flow 3:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 852.451 ms
Loss rate: 98.97%
```

## Run 2: Report of FillP — Data Link

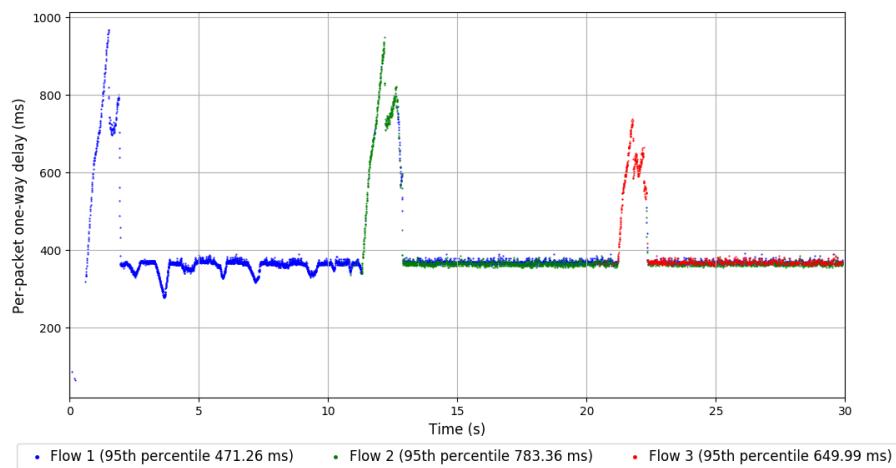
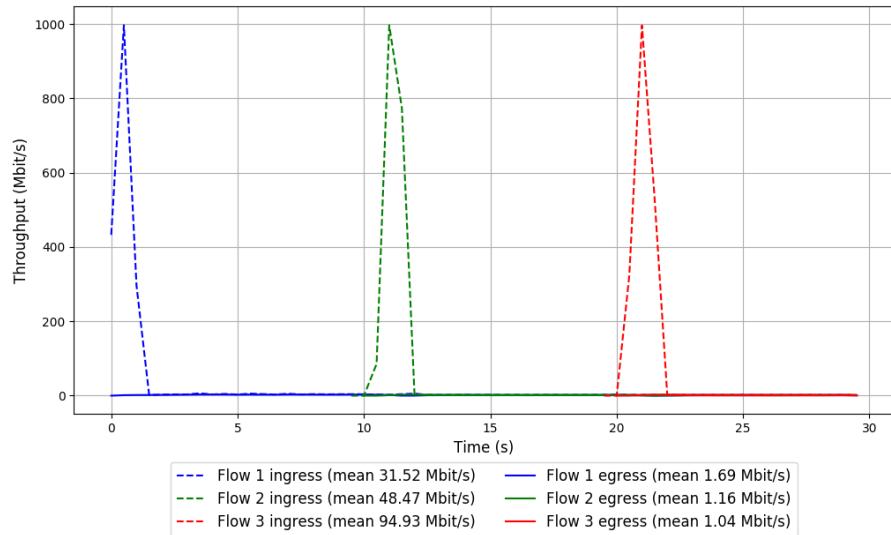


Run 3: Statistics of FillP

```
Start at: 2017-12-20 18:28:21
End at: 2017-12-20 18:28:51
Local clock offset: 4.833 ms
Remote clock offset: -20.08 ms

# Below is generated by plot.py at 2017-12-20 19:33:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.78 Mbit/s
95th percentile per-packet one-way delay: 703.347 ms
Loss rate: 97.09%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 471.264 ms
Loss rate: 94.65%
-- Flow 2:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 783.355 ms
Loss rate: 97.67%
-- Flow 3:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 649.987 ms
Loss rate: 98.95%
```

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

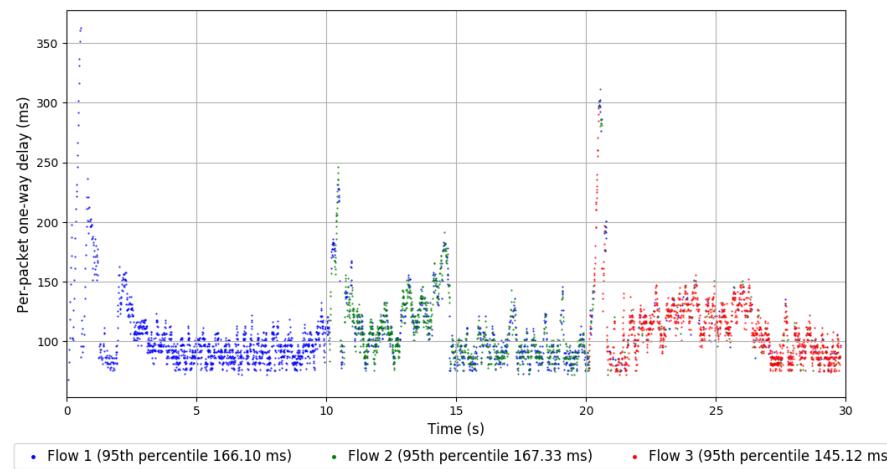
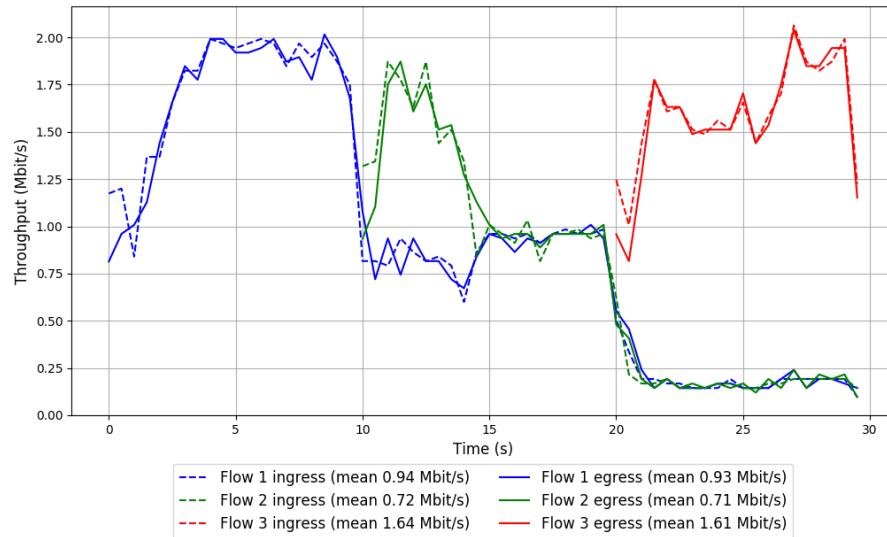


Run 1: Statistics of Indigo

```
Start at: 2017-12-20 17:59:16
End at: 2017-12-20 17:59:46
Local clock offset: 5.62 ms
Remote clock offset: -18.925 ms

# Below is generated by plot.py at 2017-12-20 19:33:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 157.097 ms
Loss rate: 1.49%
-- Flow 1:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 166.101 ms
Loss rate: 1.20%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 167.326 ms
Loss rate: 1.27%
-- Flow 3:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 145.125 ms
Loss rate: 2.17%
```

## Run 1: Report of Indigo — Data Link

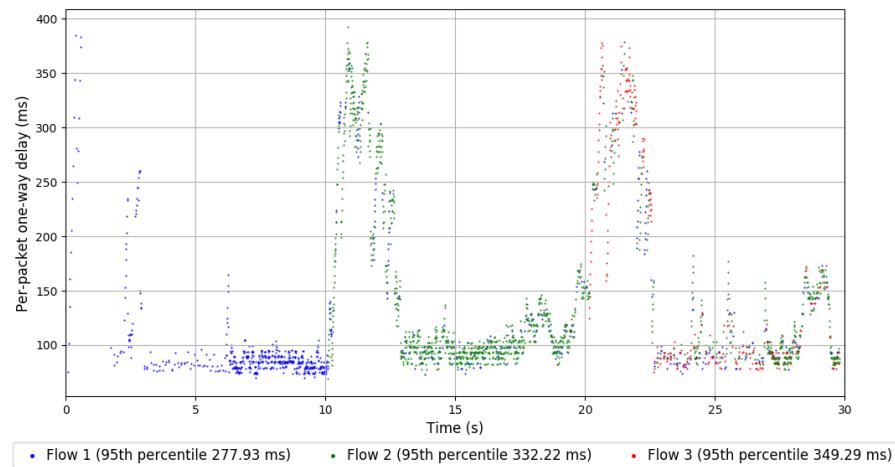
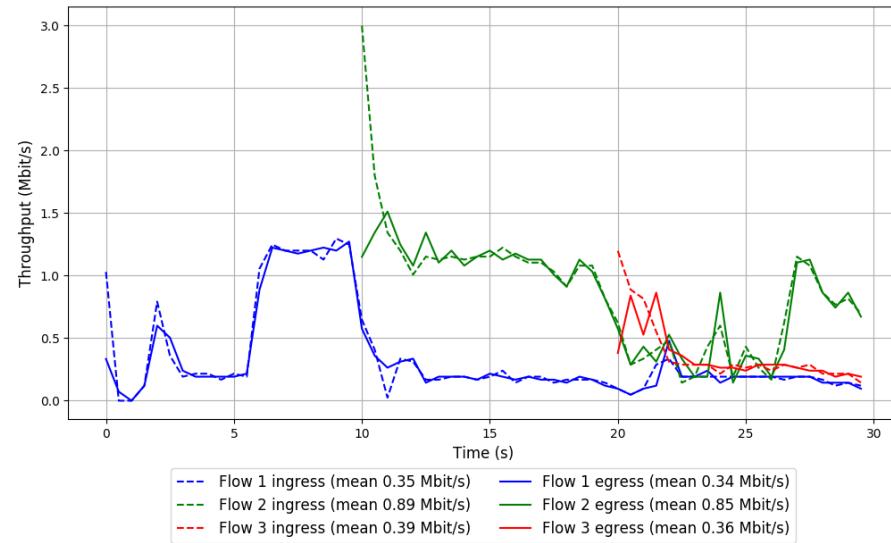


Run 2: Statistics of Indigo

```
Start at: 2017-12-20 18:16:09
End at: 2017-12-20 18:16:39
Local clock offset: 2.132 ms
Remote clock offset: -21.081 ms

# Below is generated by plot.py at 2017-12-20 19:33:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 328.449 ms
Loss rate: 5.12%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 277.931 ms
Loss rate: 3.67%
-- Flow 2:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 332.218 ms
Loss rate: 5.31%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 349.289 ms
Loss rate: 8.26%
```

## Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2017-12-20 18:32:52
End at: 2017-12-20 18:33:22
Local clock offset: 5.013 ms
Remote clock offset: -21.357 ms

# Below is generated by plot.py at 2017-12-20 19:33:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 294.700 ms
Loss rate: 3.58%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 265.353 ms
Loss rate: 0.94%
-- Flow 2:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 333.419 ms
Loss rate: 5.51%
-- Flow 3:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 155.267 ms
Loss rate: 3.26%
```

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

