

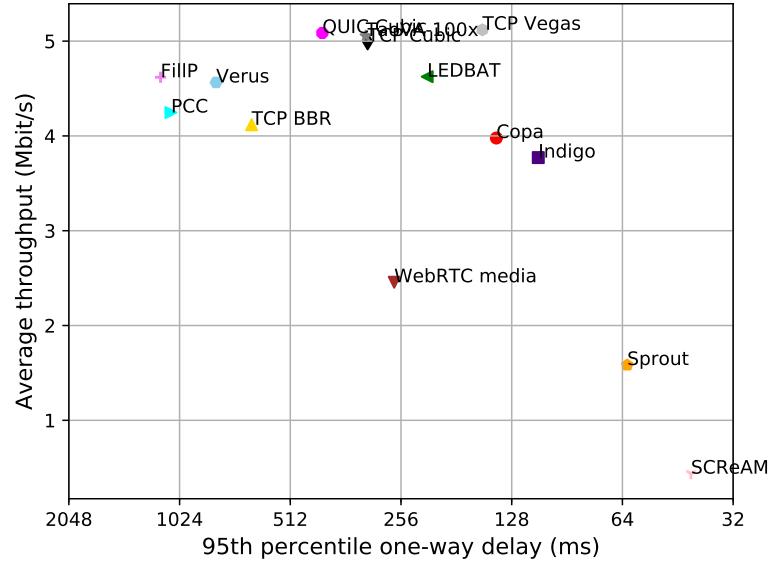
Pantheon Report

Generated at 2018-01-02 22:09:16 (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 and have been applied to correct the timestamps in logs.

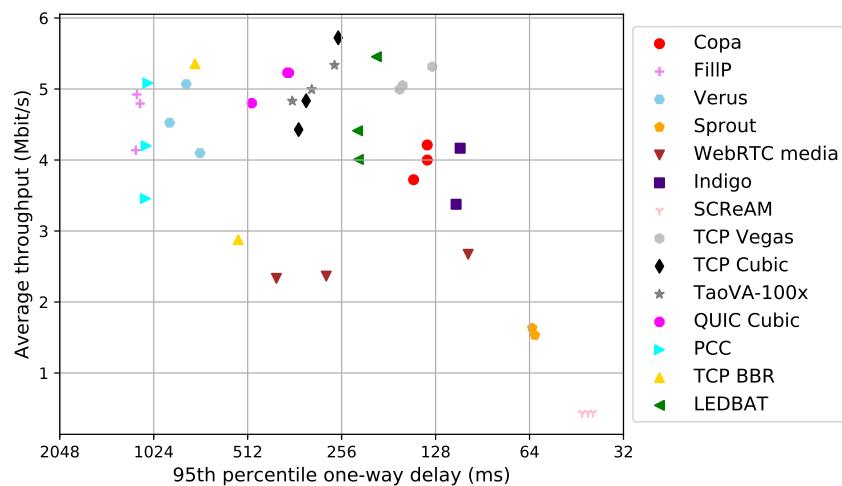
Git summary:

```
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

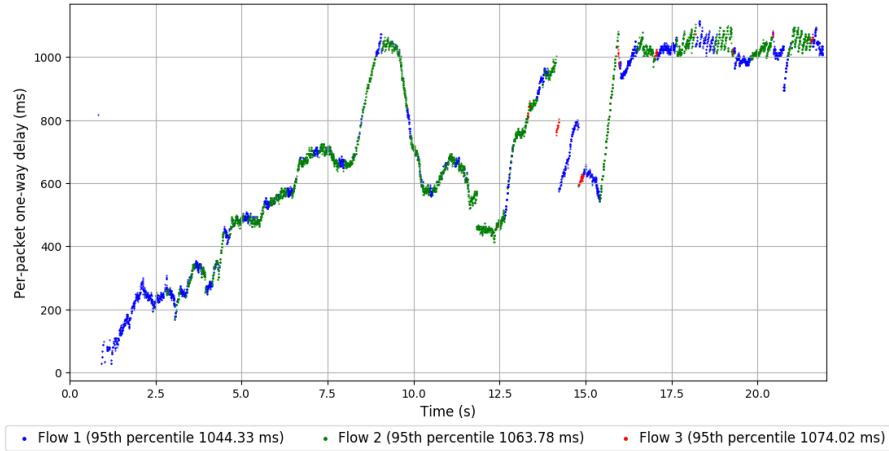
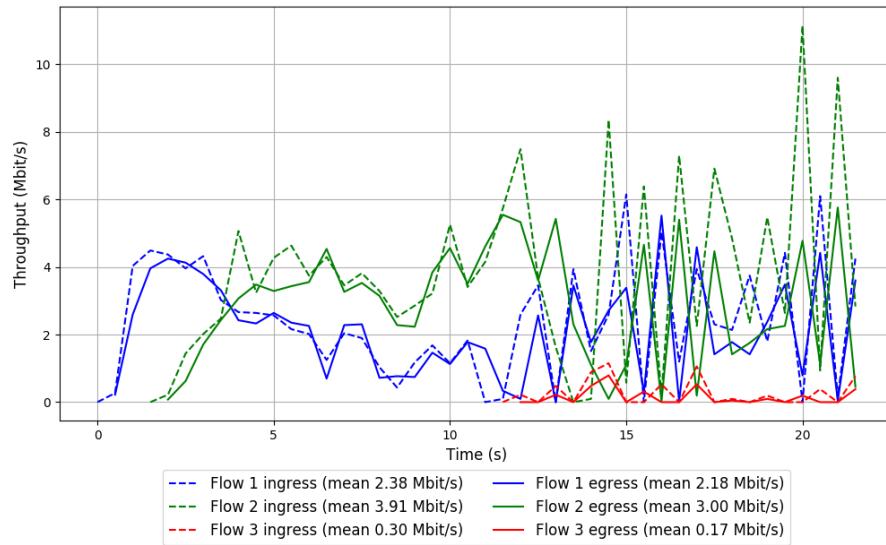


scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	2	2.22	2.04	1.73	491.86	651.74	759.60	0.93	2.81	5.29
TCP Cubic		2.92	2.38	1.55	300.57	300.84	368.94	0.92	0.88	2.05
LEDBAT		3.17	1.64	1.11	209.39	229.43	214.28	0.31	0.83	1.11
PCC		2.77	1.49	1.69	1057.64	1070.68	1144.45	20.16	40.55	95.25
QUIC Cubic		3.33	1.92	1.53	405.38	459.70	471.23	0.68	1.73	3.63
SCReAM		0.22	0.22	0.22	41.77	41.47	38.70	0.13	0.20	0.35
WebRTC media		1.48	0.76	0.23	300.79	281.32	187.70	0.15	0.25	0.47
Sprout		0.80	0.77	0.80	62.09	57.69	64.95	0.21	0.65	0.74
TaoVA-100x		3.07	2.29	1.85	261.92	316.84	428.23	0.37	0.77	2.20
TCP Vegas		2.39	2.38	3.45	141.62	155.65	153.82	0.06	0.16	0.90
Verus		3.16	1.73	0.84	756.73	909.89	889.29	1.33	4.48	6.27
Copa		2.59	1.68	1.03	126.26	152.66	175.35	0.20	0.35	1.08
FillP		3.15	1.61	1.58	1096.84	1194.62	1204.74	92.78	97.57	98.63
Indigo		1.88	1.56	2.60	96.34	92.73	125.25	0.06	0.17	0.29

Run 1: Statistics of TCP BBR

Start at: 2018-01-02 21:30:05
End at: 2018-01-02 21:30:35
Local clock offset: 3.257 ms
Remote clock offset: -14.351 ms

Run 1: Report of TCP BBR — Data Link

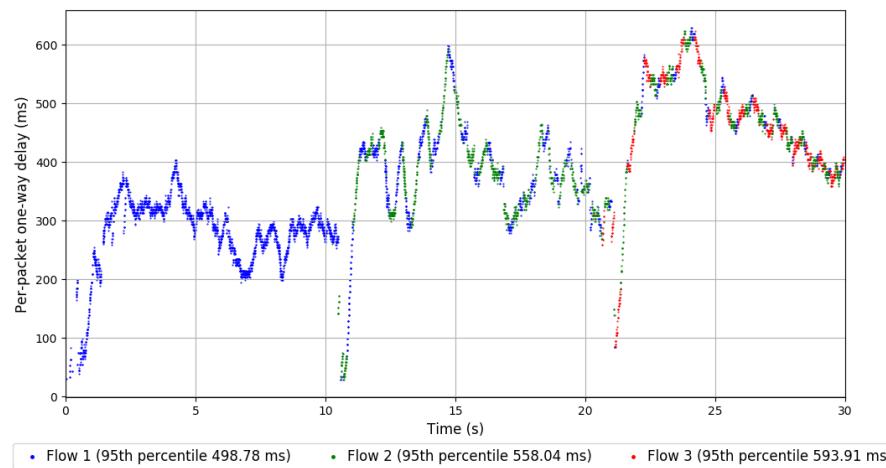
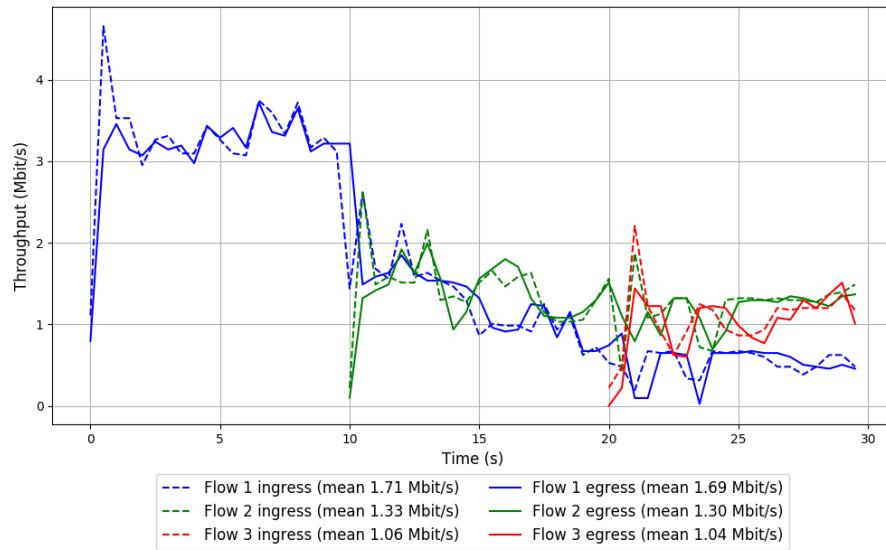


Run 2: Statistics of TCP BBR

```
Start at: 2018-01-02 21:46:47
End at: 2018-01-02 21:47:17
Local clock offset: 3.172 ms
Remote clock offset: -15.898 ms

# Below is generated by plot.py at 2018-01-02 22:08:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.88 Mbit/s
95th percentile per-packet one-way delay: 548.789 ms
Loss rate: 2.55%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 498.779 ms
Loss rate: 1.29%
-- Flow 2:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 558.036 ms
Loss rate: 4.02%
-- Flow 3:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 593.906 ms
Loss rate: 5.00%
```

Run 2: Report of TCP BBR — Data Link

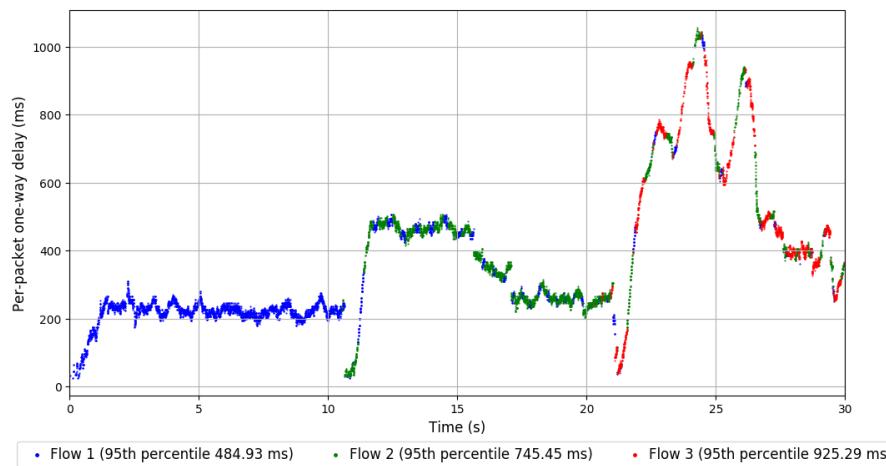
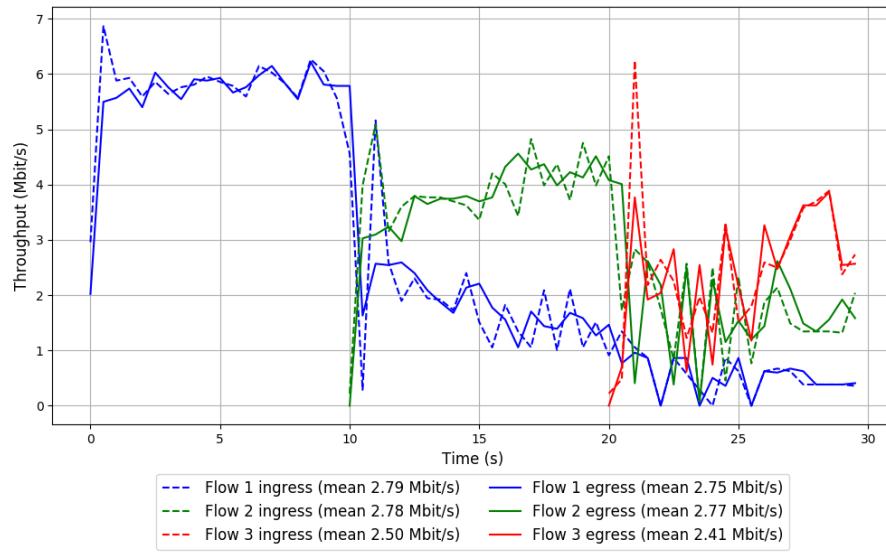


Run 3: Statistics of TCP BBR

```
Start at: 2018-01-02 22:03:24
End at: 2018-01-02 22:03:54
Local clock offset: 3.16 ms
Remote clock offset: -16.068 ms

# Below is generated by plot.py at 2018-01-02 22:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.36 Mbit/s
95th percentile per-packet one-way delay: 755.355 ms
Loss rate: 1.68%
-- Flow 1:
Average throughput: 2.75 Mbit/s
95th percentile per-packet one-way delay: 484.932 ms
Loss rate: 0.57%
-- Flow 2:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 745.450 ms
Loss rate: 1.60%
-- Flow 3:
Average throughput: 2.41 Mbit/s
95th percentile per-packet one-way delay: 925.286 ms
Loss rate: 5.57%
```

Run 3: Report of TCP BBR — Data Link

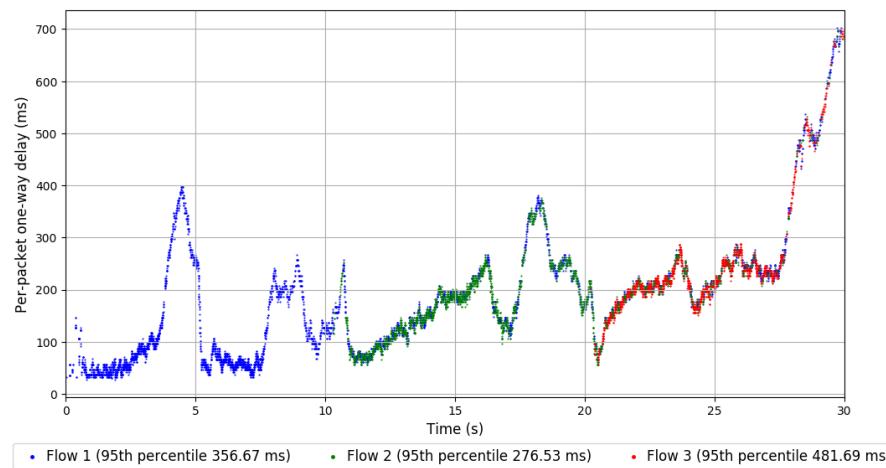
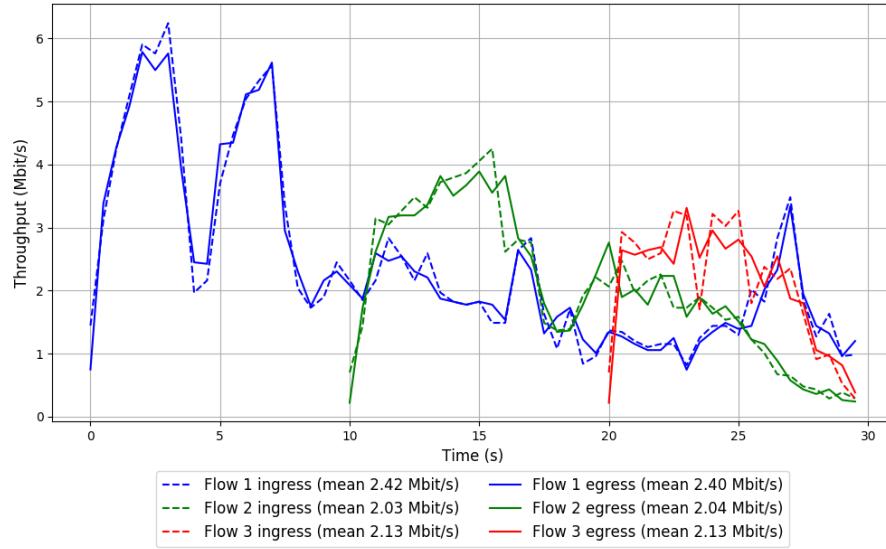


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-01-02 21:33:24
End at: 2018-01-02 21:33:54
Local clock offset: 2.193 ms
Remote clock offset: -14.106 ms

# Below is generated by plot.py at 2018-01-02 22:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.43 Mbit/s
95th percentile per-packet one-way delay: 351.450 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 356.673 ms
Loss rate: 1.16%
-- Flow 2:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 276.533 ms
Loss rate: 0.83%
-- Flow 3:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 481.695 ms
Loss rate: 1.71%
```

Run 1: Report of TCP Cubic — Data Link

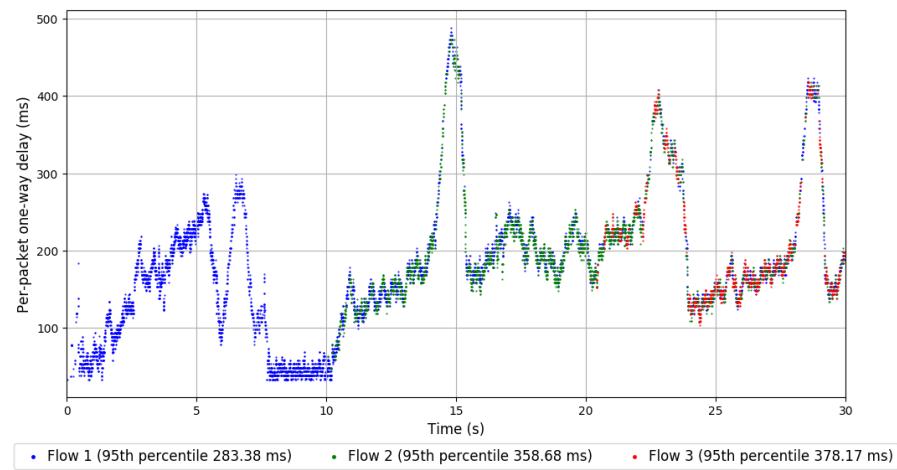
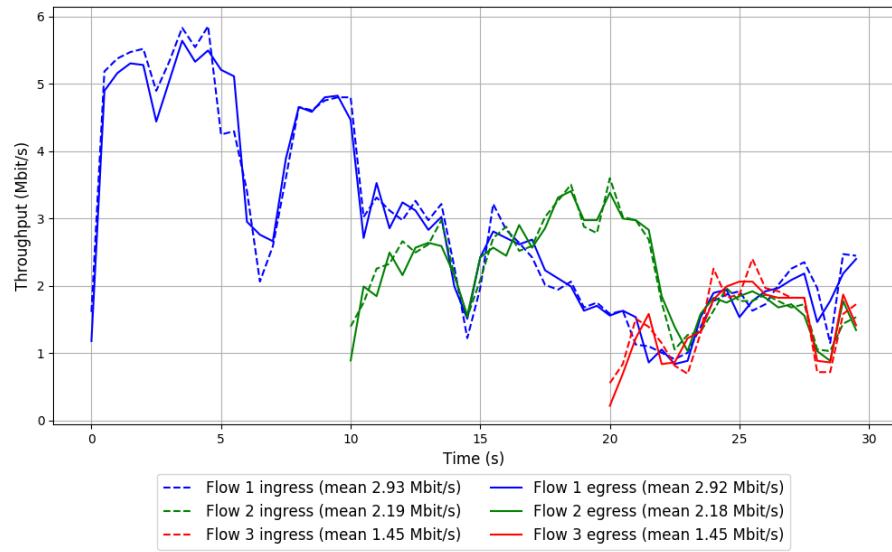


Run 2: Statistics of TCP Cubic

```
Start at: 2018-01-02 21:50:06
End at: 2018-01-02 21:50:36
Local clock offset: 1.116 ms
Remote clock offset: -15.005 ms

# Below is generated by plot.py at 2018-01-02 22:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.83 Mbit/s
95th percentile per-packet one-way delay: 332.535 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 2.92 Mbit/s
95th percentile per-packet one-way delay: 283.379 ms
Loss rate: 0.72%
-- Flow 2:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 358.679 ms
Loss rate: 0.93%
-- Flow 3:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 378.171 ms
Loss rate: 2.16%
```

Run 2: Report of TCP Cubic — Data Link

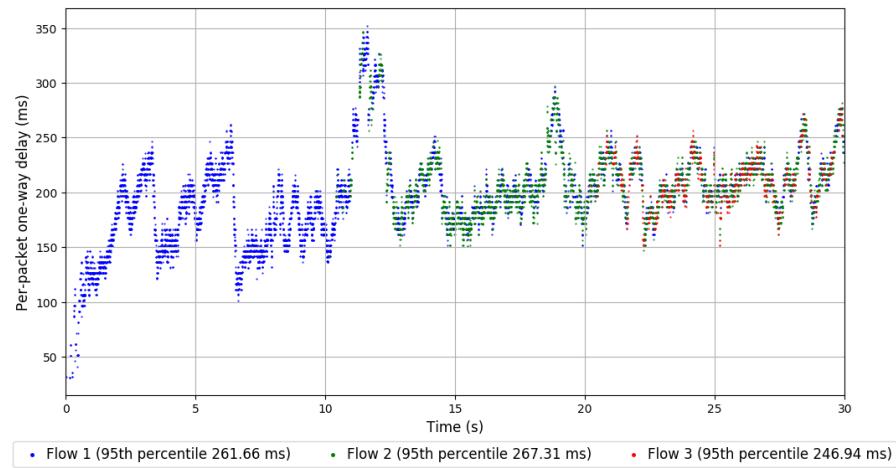
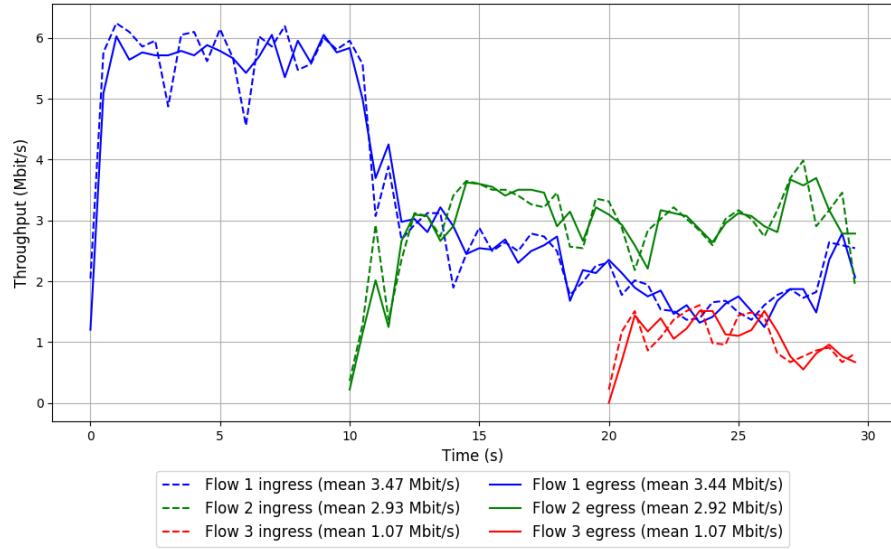


Run 3: Statistics of TCP Cubic

```
Start at: 2018-01-02 22:06:43
End at: 2018-01-02 22:07:13
Local clock offset: 3.092 ms
Remote clock offset: -16.125 ms

# Below is generated by plot.py at 2018-01-02 22:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.72 Mbit/s
95th percentile per-packet one-way delay: 262.488 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 3.44 Mbit/s
95th percentile per-packet one-way delay: 261.656 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 2.92 Mbit/s
95th percentile per-packet one-way delay: 267.308 ms
Loss rate: 0.88%
-- Flow 3:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 246.940 ms
Loss rate: 2.27%
```

Run 3: Report of TCP Cubic — Data Link

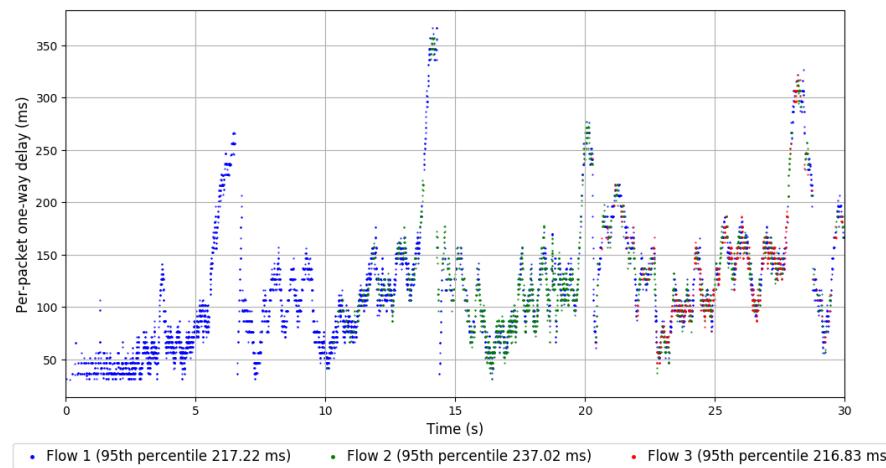
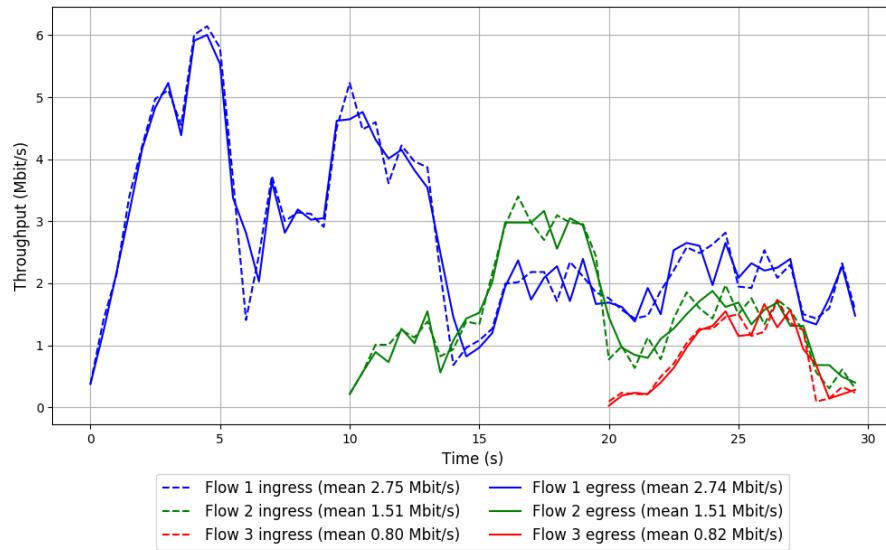


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-01-02 21:32:18
End at: 2018-01-02 21:32:48
Local clock offset: 1.833 ms
Remote clock offset: -13.846 ms

# Below is generated by plot.py at 2018-01-02 22:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.01 Mbit/s
95th percentile per-packet one-way delay: 226.243 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 2.74 Mbit/s
95th percentile per-packet one-way delay: 217.225 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 237.020 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 216.834 ms
Loss rate: 0.73%
```

Run 1: Report of LEDBAT — Data Link

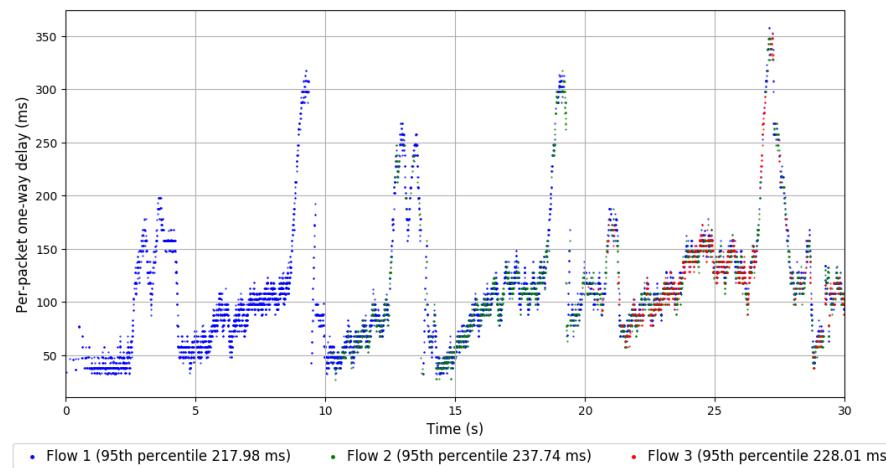
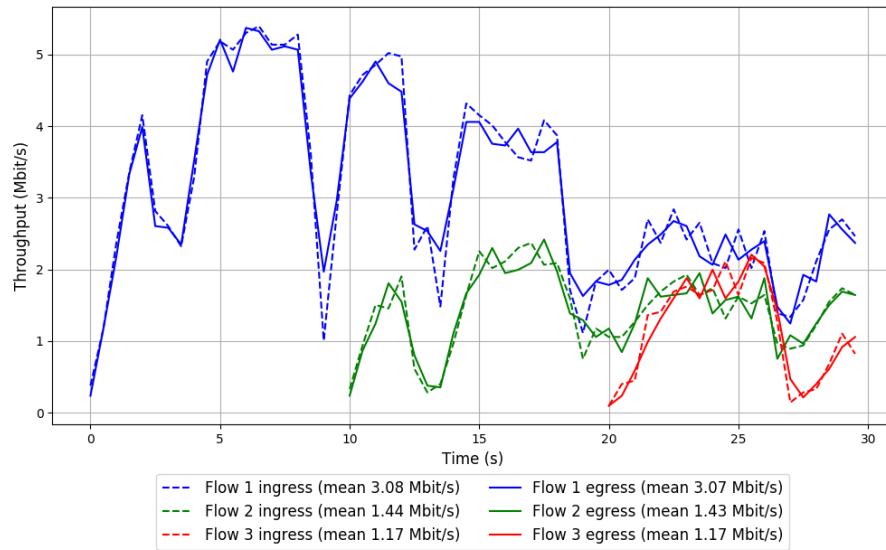


Run 2: Statistics of LEDBAT

```
Start at: 2018-01-02 21:48:59
End at: 2018-01-02 21:49:29
Local clock offset: 0.13 ms
Remote clock offset: -15.573 ms

# Below is generated by plot.py at 2018-01-02 22:08:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.41 Mbit/s
95th percentile per-packet one-way delay: 227.655 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 217.979 ms
Loss rate: 0.38%
-- Flow 2:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 237.737 ms
Loss rate: 0.82%
-- Flow 3:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 228.011 ms
Loss rate: 0.41%
```

Run 2: Report of LEDBAT — Data Link

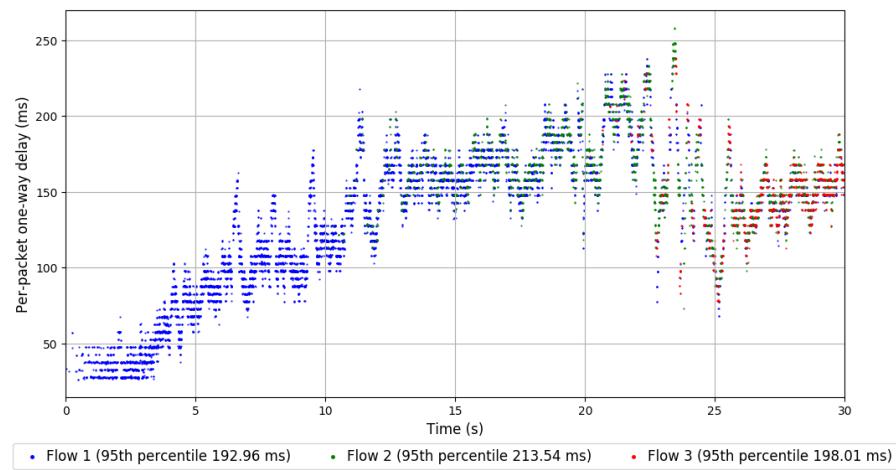
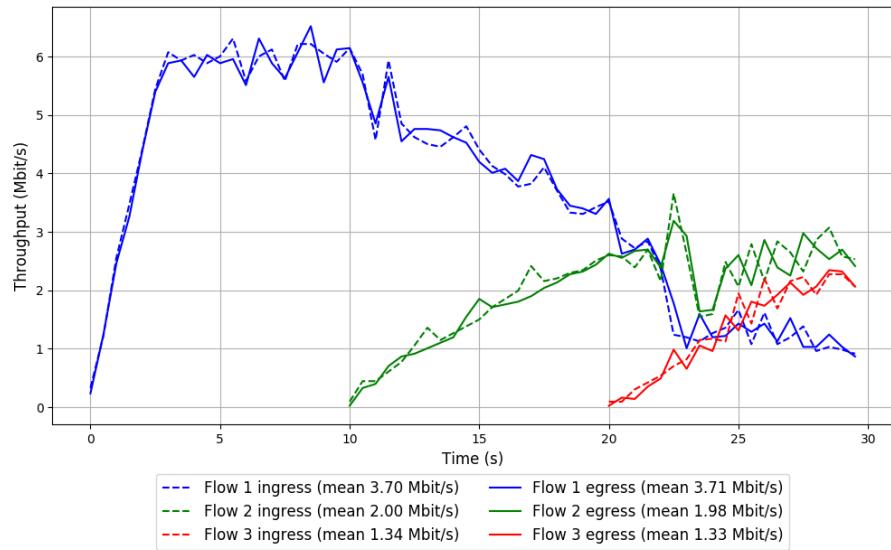


Run 3: Statistics of LEDBAT

```
Start at: 2018-01-02 22:05:36
End at: 2018-01-02 22:06:06
Local clock offset: 0.675 ms
Remote clock offset: -16.888 ms

# Below is generated by plot.py at 2018-01-02 22:08:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.45 Mbit/s
95th percentile per-packet one-way delay: 198.121 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 3.71 Mbit/s
95th percentile per-packet one-way delay: 192.956 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 213.537 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 198.008 ms
Loss rate: 2.20%
```

Run 3: Report of LEDBAT — Data Link

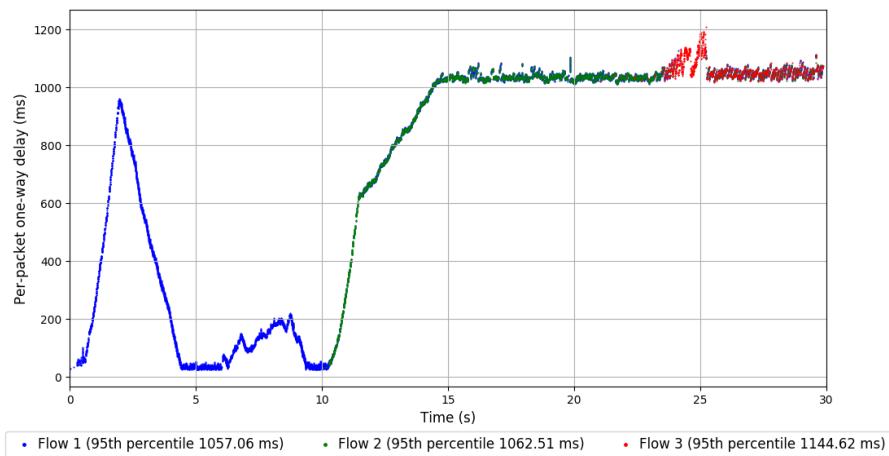
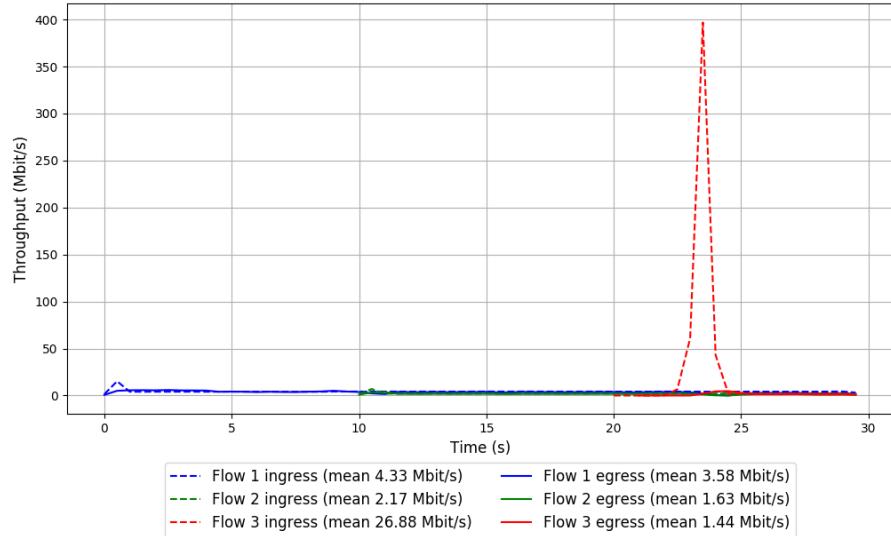


Run 1: Statistics of PCC

```
Start at: 2018-01-02 21:19:01
End at: 2018-01-02 21:19:31
Local clock offset: 3.143 ms
Remote clock offset: -14.745 ms

# Below is generated by plot.py at 2018-01-02 22:08:42
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.08 Mbit/s
95th percentile per-packet one-way delay: 1069.232 ms
Loss rate: 65.32%
-- Flow 1:
Average throughput: 3.58 Mbit/s
95th percentile per-packet one-way delay: 1057.059 ms
Loss rate: 17.52%
-- Flow 2:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 1062.505 ms
Loss rate: 25.27%
-- Flow 3:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 1144.619 ms
Loss rate: 95.21%
```

Run 1: Report of PCC — Data Link

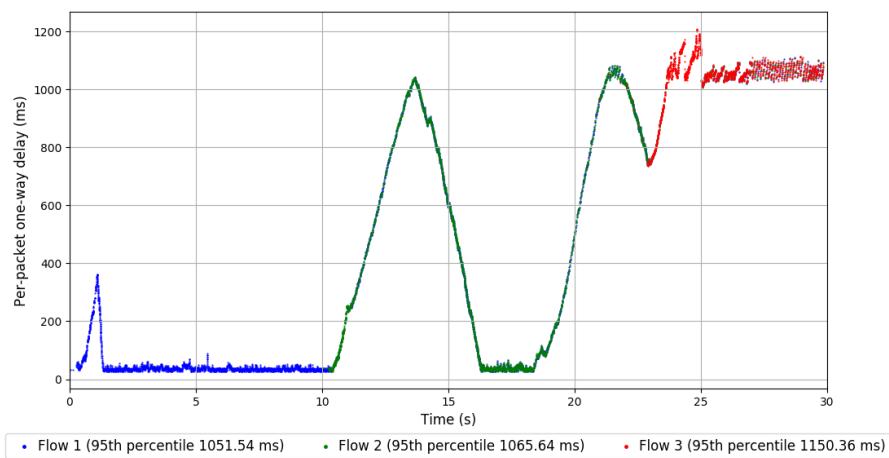
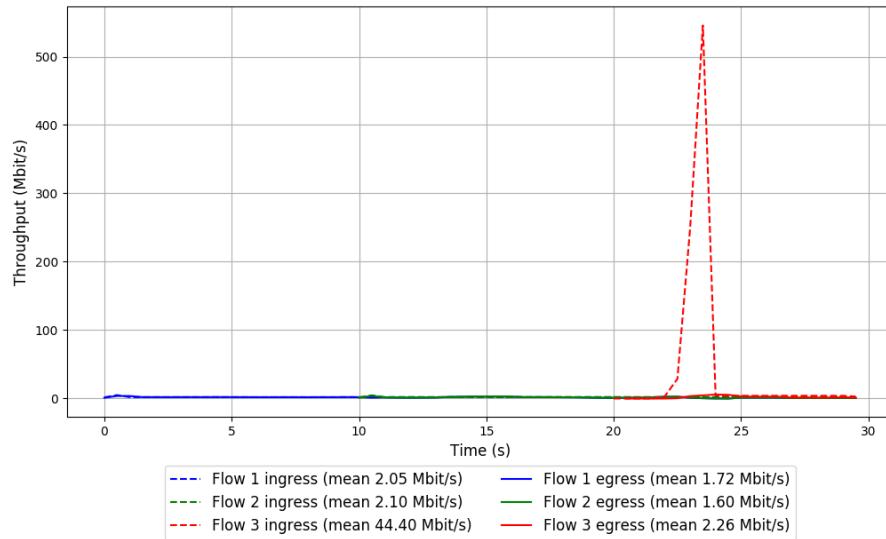


Run 2: Statistics of PCC

```
Start at: 2018-01-02 21:35:37
End at: 2018-01-02 21:36:07
Local clock offset: 2.531 ms
Remote clock offset: -13.07 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 1088.475 ms
Loss rate: 80.92%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 1051.535 ms
Loss rate: 16.01%
-- Flow 2:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 1065.638 ms
Loss rate: 24.11%
-- Flow 3:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 1150.358 ms
Loss rate: 95.42%
```

Run 2: Report of PCC — Data Link

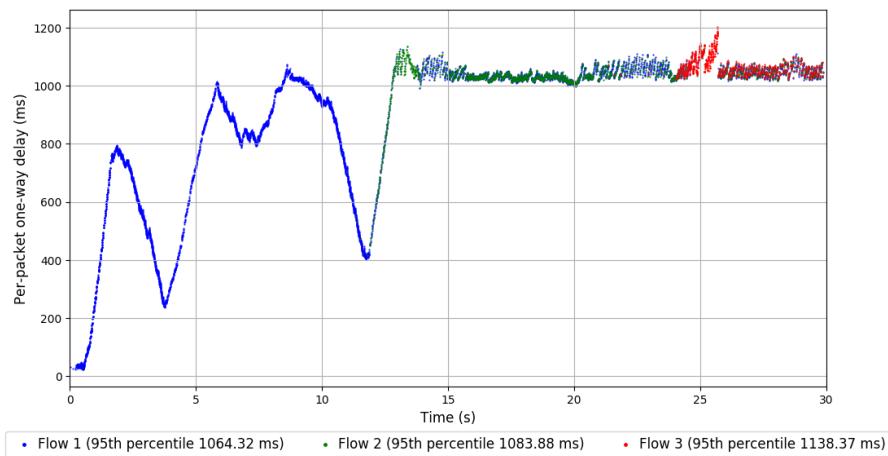
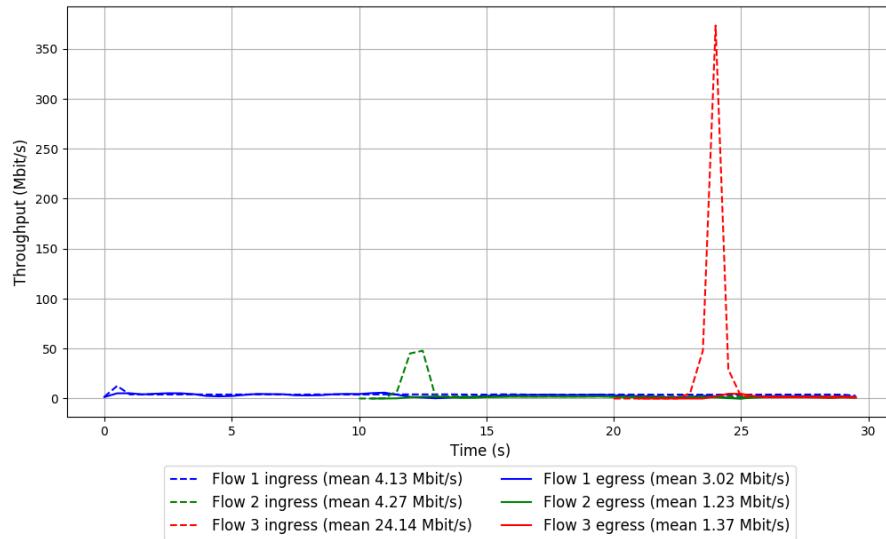


Run 3: Statistics of PCC

```
Start at: 2018-01-02 21:52:18
End at: 2018-01-02 21:52:48
Local clock offset: 2.612 ms
Remote clock offset: -14.816 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.20 Mbit/s
95th percentile per-packet one-way delay: 1082.887 ms
Loss rate: 71.92%
-- Flow 1:
Average throughput: 3.02 Mbit/s
95th percentile per-packet one-way delay: 1064.322 ms
Loss rate: 26.96%
-- Flow 2:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 1083.883 ms
Loss rate: 72.28%
-- Flow 3:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 1138.367 ms
Loss rate: 95.11%
```

Run 3: Report of PCC — Data Link

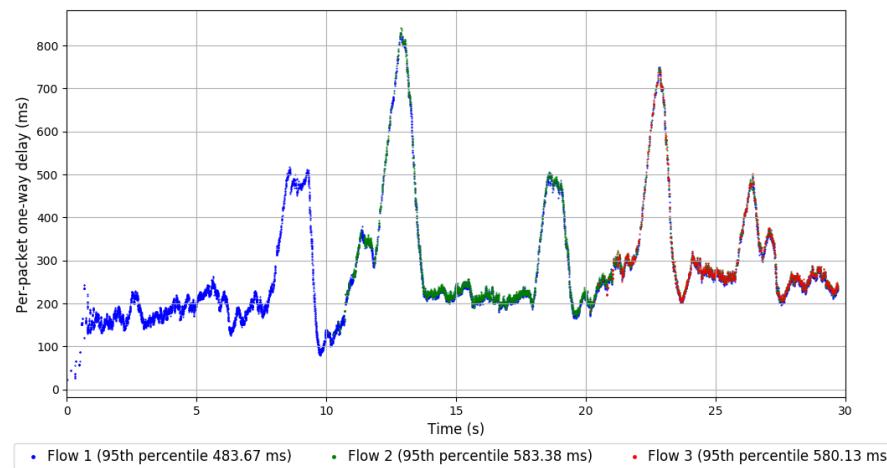
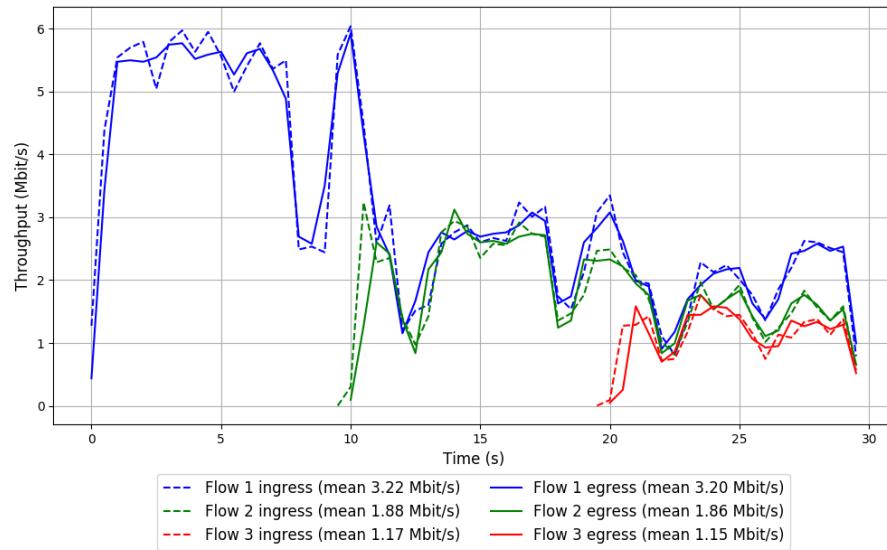


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-01-02 21:27:53
End at: 2018-01-02 21:28:23
Local clock offset: 3.39 ms
Remote clock offset: -13.134 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.80 Mbit/s
95th percentile per-packet one-way delay: 496.840 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 483.668 ms
Loss rate: 0.77%
-- Flow 2:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 583.384 ms
Loss rate: 1.52%
-- Flow 3:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 580.133 ms
Loss rate: 3.77%
```

Run 1: Report of QUIC Cubic — Data Link

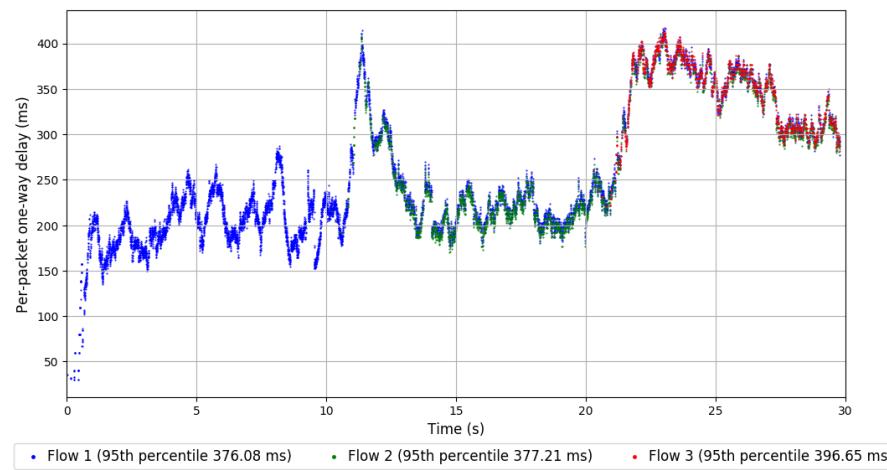
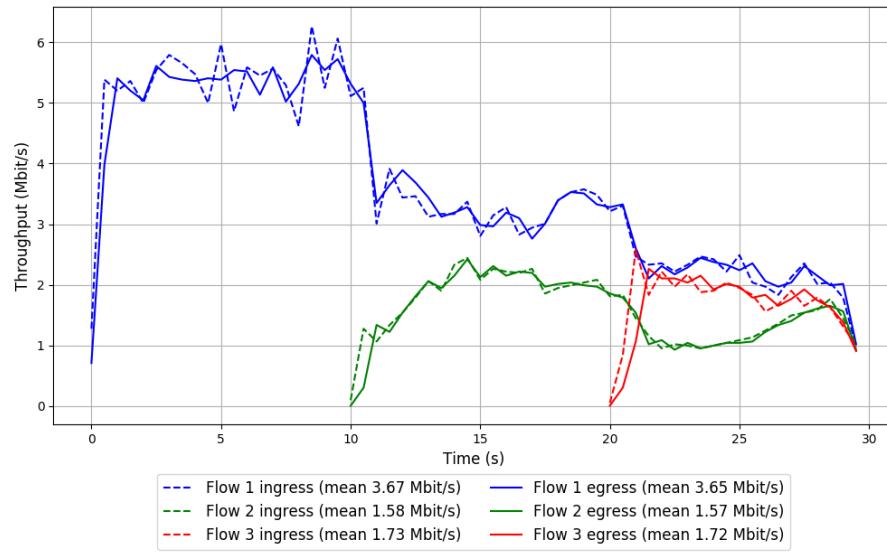


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-01-02 21:44:32
End at: 2018-01-02 21:45:02
Local clock offset: 0.591 ms
Remote clock offset: -14.326 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 381.901 ms
Loss rate: 1.24%
-- Flow 1:
Average throughput: 3.65 Mbit/s
95th percentile per-packet one-way delay: 376.079 ms
Loss rate: 0.64%
-- Flow 2:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 377.215 ms
Loss rate: 2.02%
-- Flow 3:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 396.653 ms
Loss rate: 3.62%
```

Run 2: Report of QUIC Cubic — Data Link

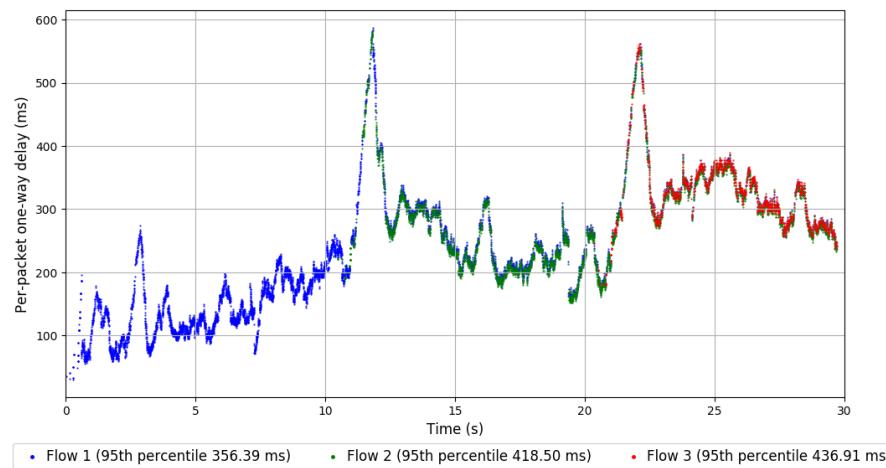
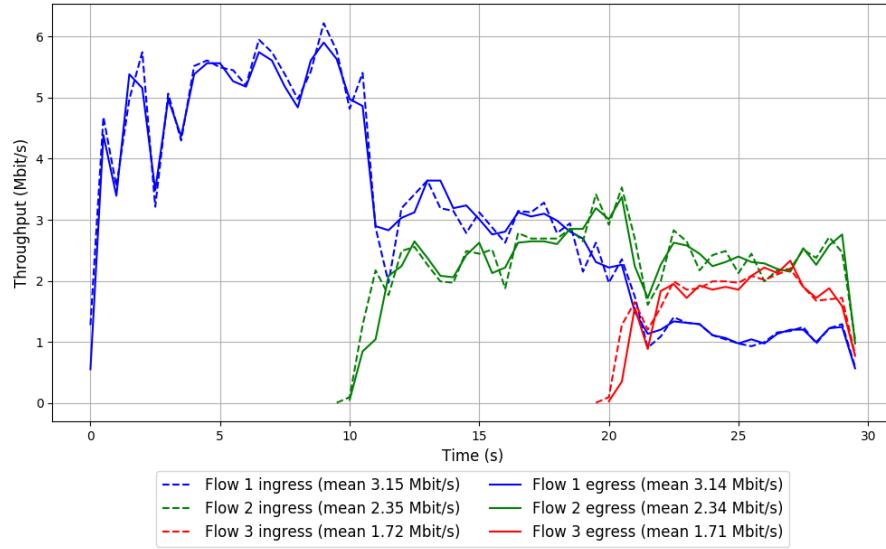


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-01-02 22:01:11
End at: 2018-01-02 22:01:41
Local clock offset: 1.056 ms
Remote clock offset: -15.248 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.23 Mbit/s
95th percentile per-packet one-way delay: 377.986 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 3.14 Mbit/s
95th percentile per-packet one-way delay: 356.392 ms
Loss rate: 0.64%
-- Flow 2:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 418.495 ms
Loss rate: 1.65%
-- Flow 3:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 436.909 ms
Loss rate: 3.50%
```

Run 3: Report of QUIC Cubic — Data Link

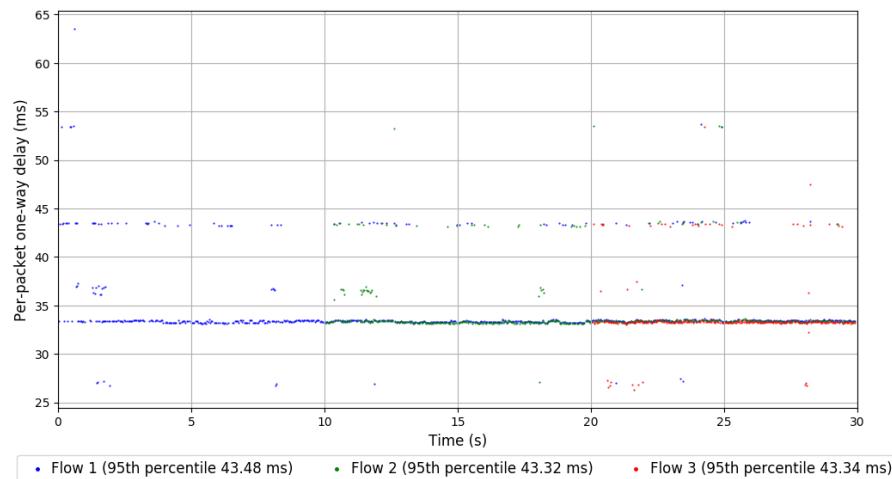
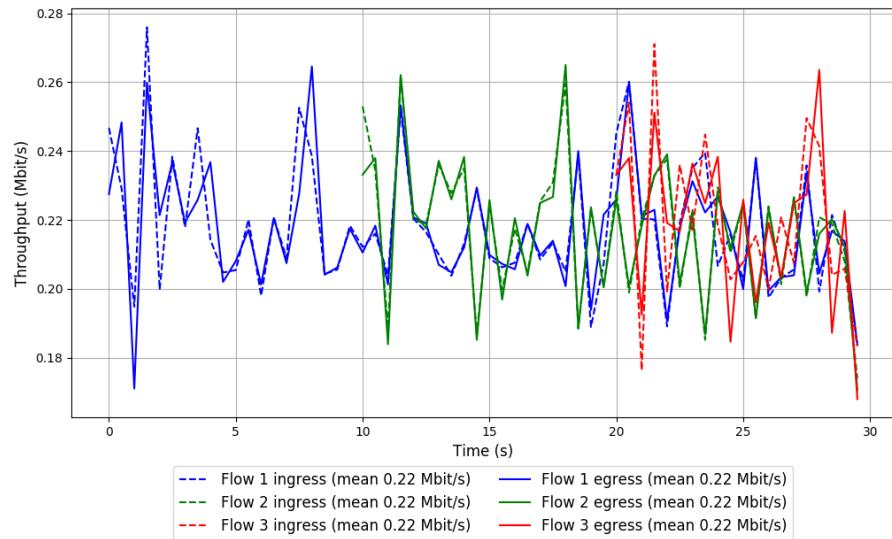


```
Run 1: Statistics of SCReAM

Start at: 2018-01-02 21:28:59
End at: 2018-01-02 21:29:29
Local clock offset: 0.495 ms
Remote clock offset: -13.95 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 43.430 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 43.478 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 43.318 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 43.338 ms
Loss rate: 0.35%
```

Run 1: Report of SCReAM — Data Link

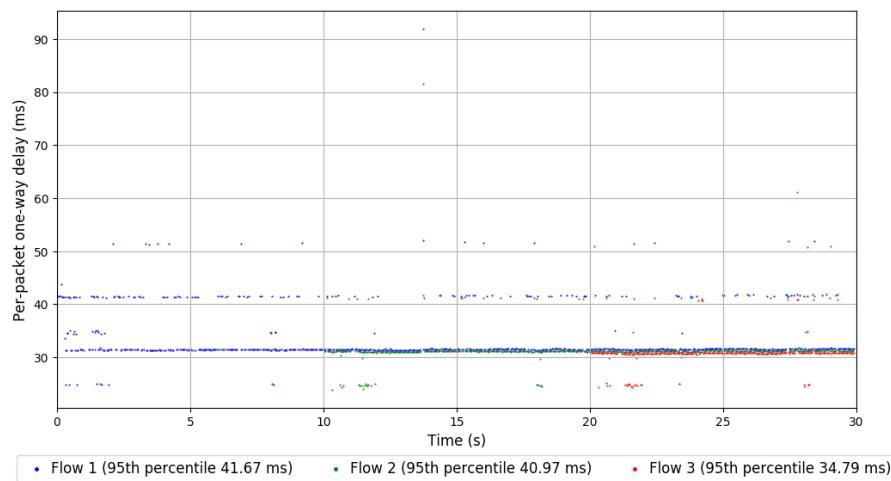
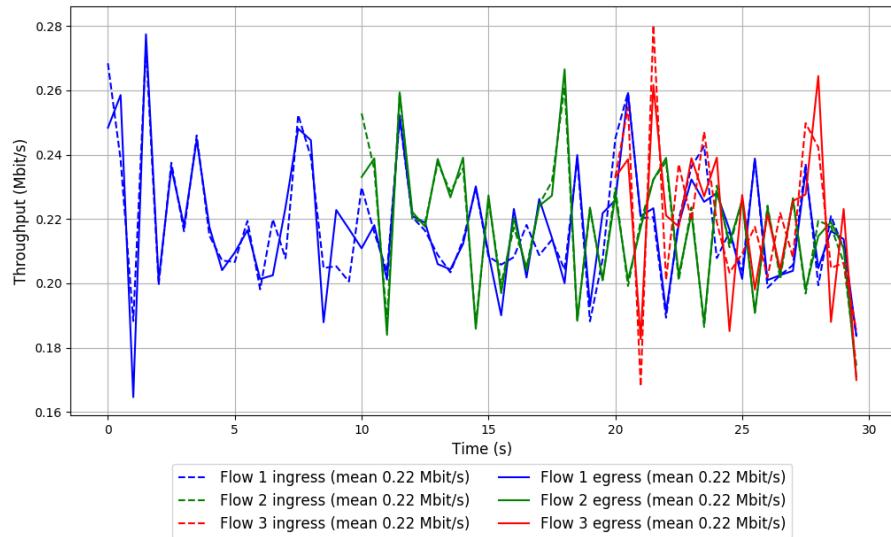


Run 2: Statistics of SCReAM

```
Start at: 2018-01-02 21:45:41
End at: 2018-01-02 21:46:11
Local clock offset: 3.364 ms
Remote clock offset: -14.135 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 41.519 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.668 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.969 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 34.789 ms
Loss rate: 0.35%
```

Run 2: Report of SCReAM — Data Link

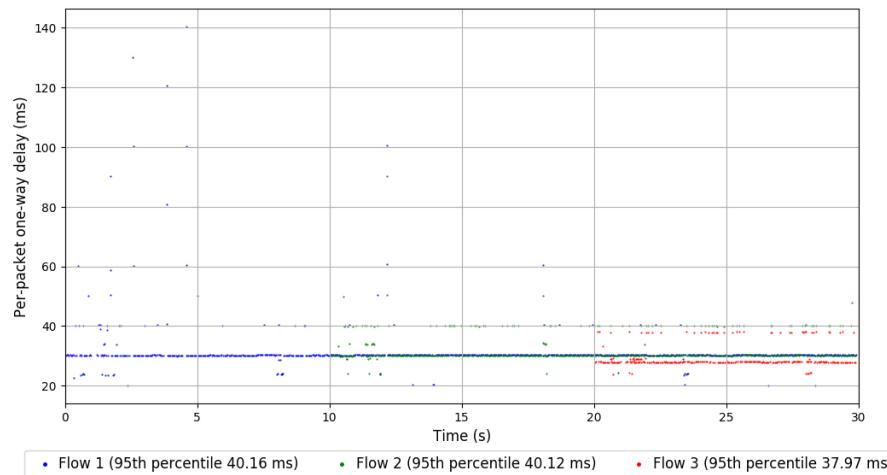
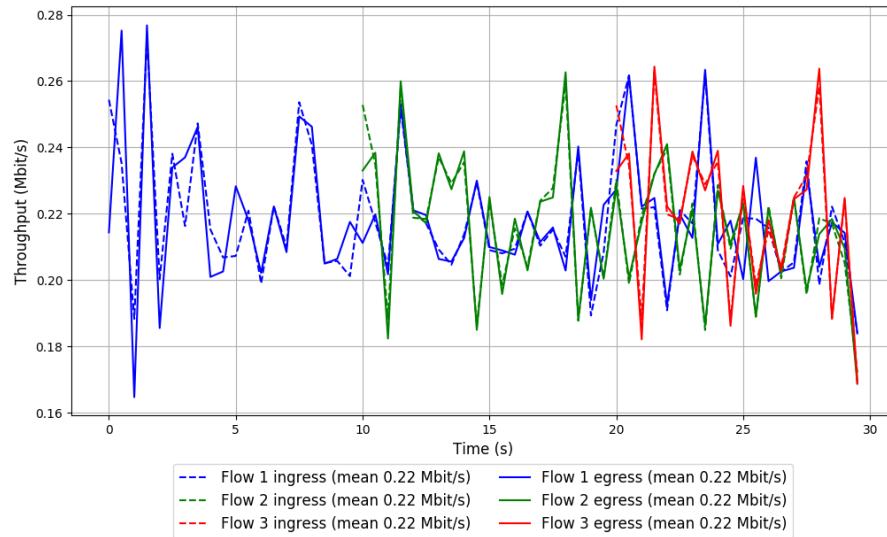


Run 3: Statistics of SCReAM

```
Start at: 2018-01-02 22:02:18
End at: 2018-01-02 22:02:48
Local clock offset: 3.154 ms
Remote clock offset: -16.851 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 40.084 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.158 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.115 ms
Loss rate: 0.20%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 37.972 ms
Loss rate: 0.35%
```

Run 3: Report of SCReAM — Data Link

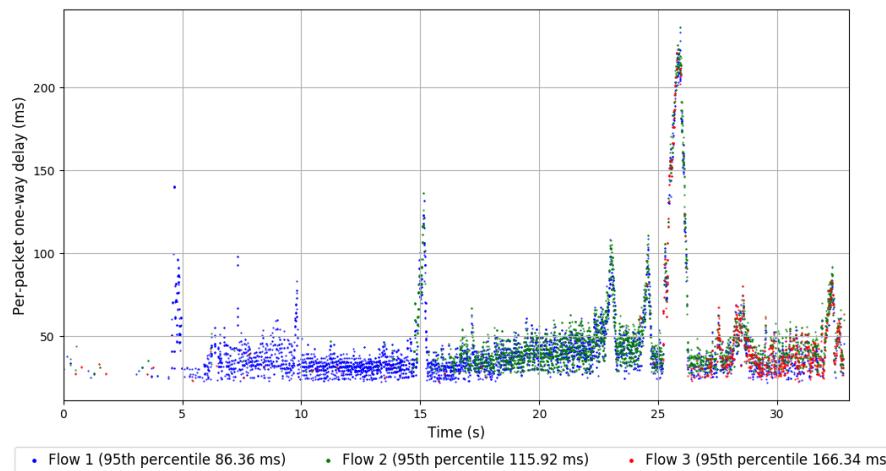
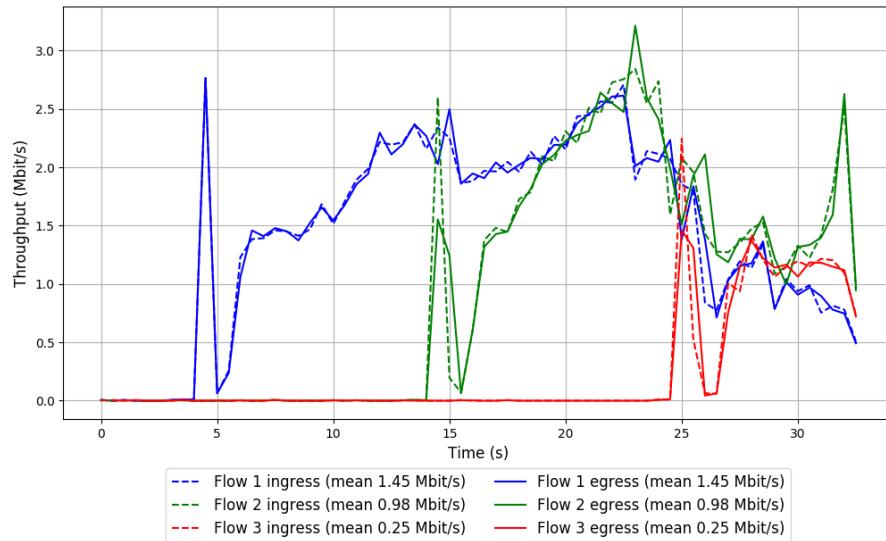


```
Run 1: Statistics of WebRTC media

Start at: 2018-01-02 21:17:55
End at: 2018-01-02 21:18:25
Local clock offset: 2.11 ms
Remote clock offset: -14.769 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.67 Mbit/s
95th percentile per-packet one-way delay: 100.633 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 86.359 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 115.922 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 166.344 ms
Loss rate: 1.09%
```

Run 1: Report of WebRTC media — Data Link

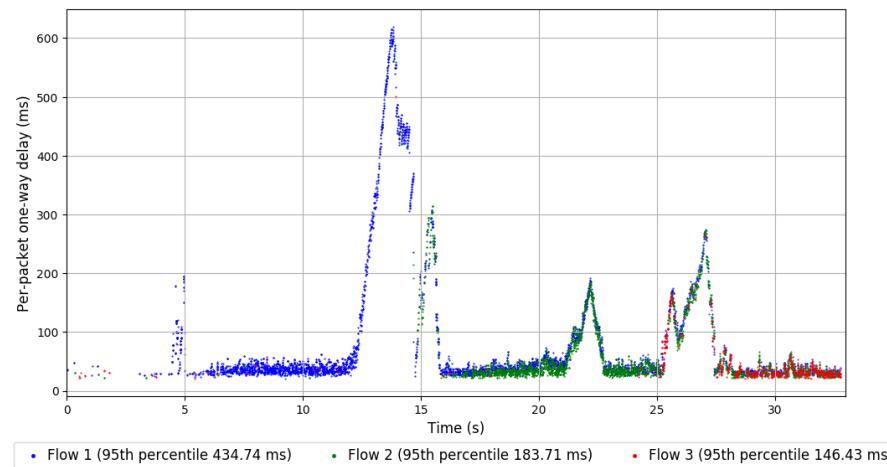
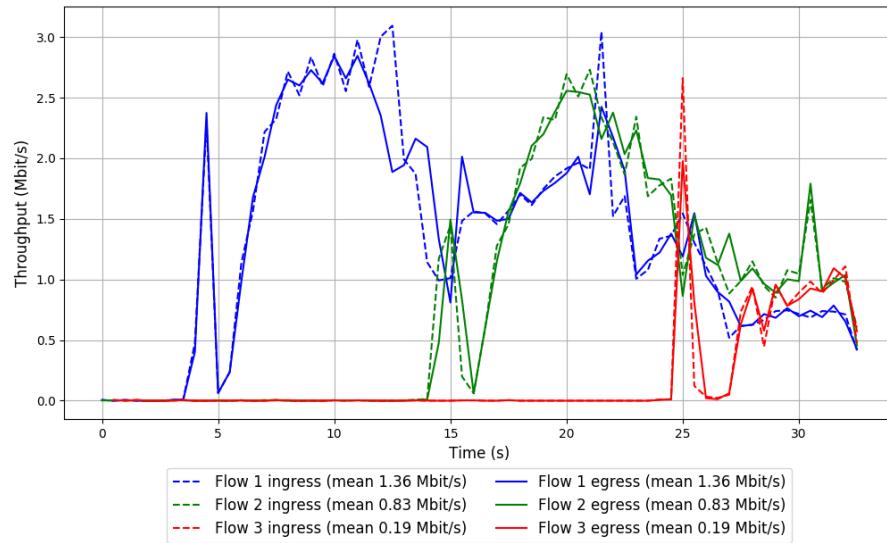


Run 2: Statistics of WebRTC media

```
Start at: 2018-01-02 21:34:31
End at: 2018-01-02 21:35:01
Local clock offset: 3.412 ms
Remote clock offset: -15.084 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 286.693 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 434.741 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 183.711 ms
Loss rate: 0.36%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 146.434 ms
Loss rate: 0.00%
```

Run 2: Report of WebRTC media — Data Link

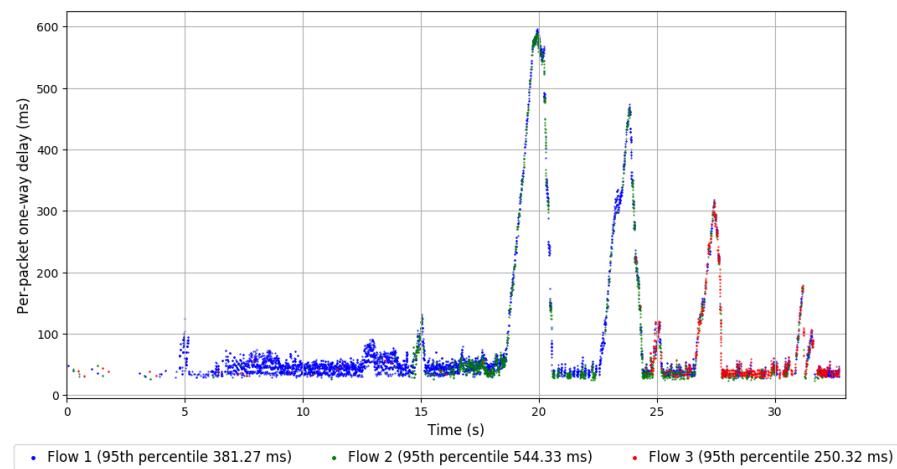
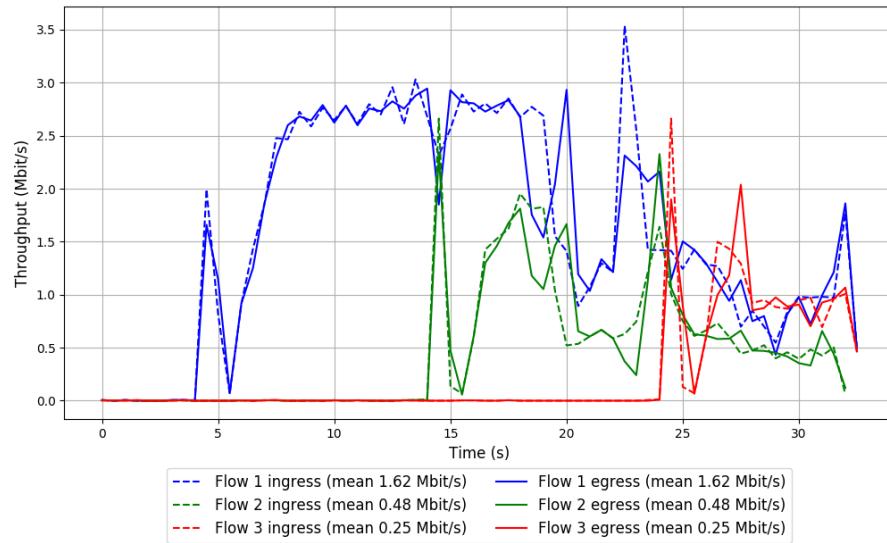


Run 3: Statistics of WebRTC media

```
Start at: 2018-01-02 21:51:12
End at: 2018-01-02 21:51:42
Local clock offset: 0.178 ms
Remote clock offset: -14.532 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.33 Mbit/s
95th percentile per-packet one-way delay: 414.079 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 381.274 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 544.331 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 250.319 ms
Loss rate: 0.33%
```

Run 3: Report of WebRTC media — Data Link

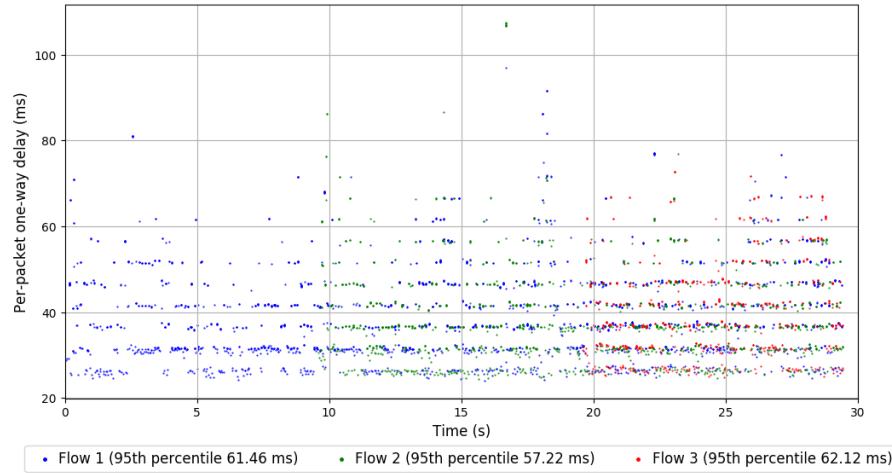
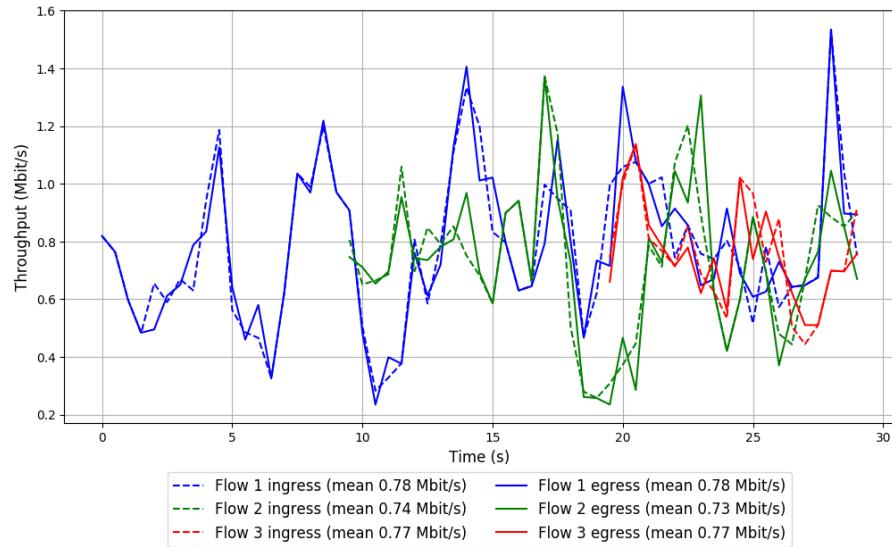


Run 1: Statistics of Sprout

```
Start at: 2018-01-02 21:24:35
End at: 2018-01-02 21:25:05
Local clock offset: 2.787 ms
Remote clock offset: -14.968 ms

# Below is generated by plot.py at 2018-01-02 22:08:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 61.516 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 61.463 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 57.223 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 62.115 ms
Loss rate: 1.07%
```

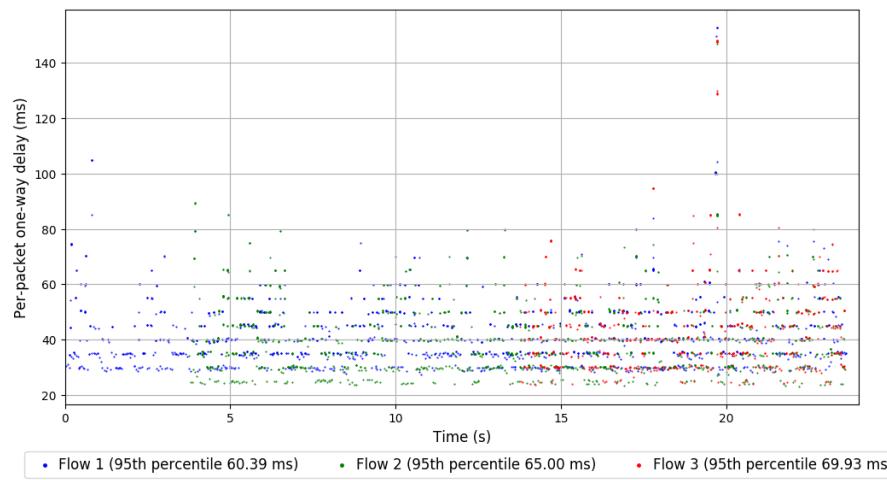
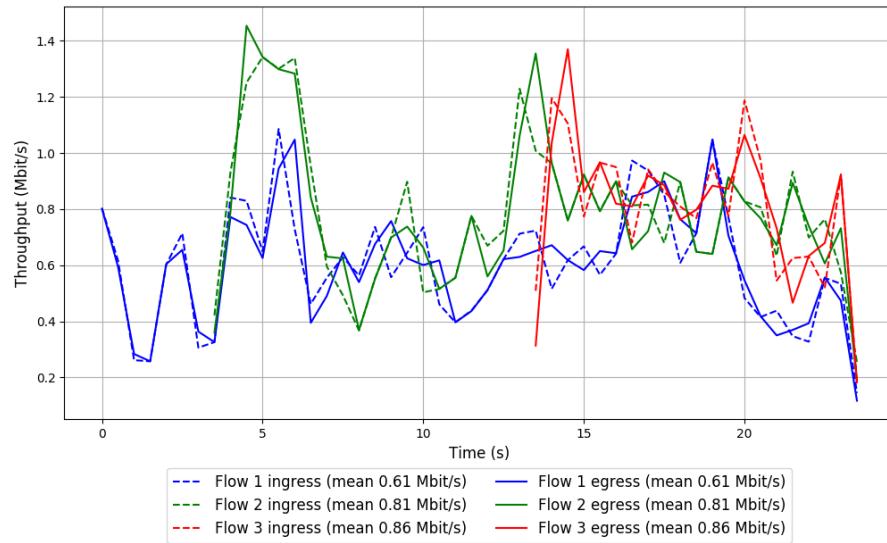
Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-01-02 21:41:11
End at: 2018-01-02 21:41:41
Local clock offset: 0.174 ms
Remote clock offset: -14.597 ms

Run 2: Report of Sprout — Data Link

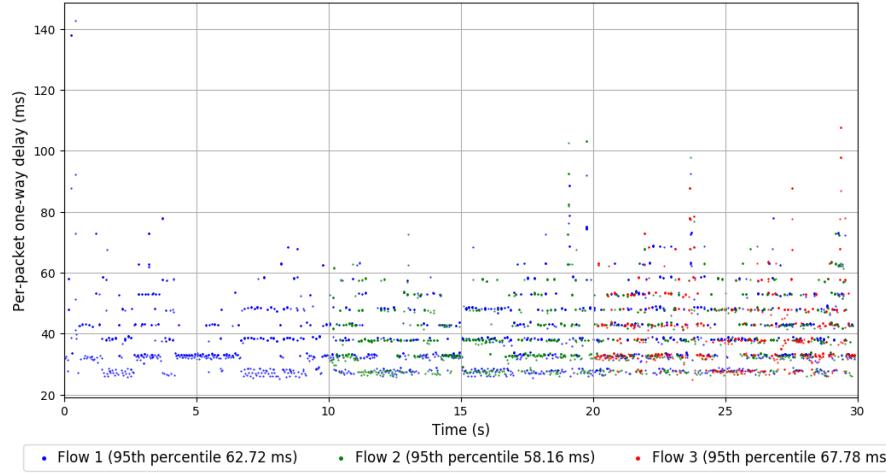
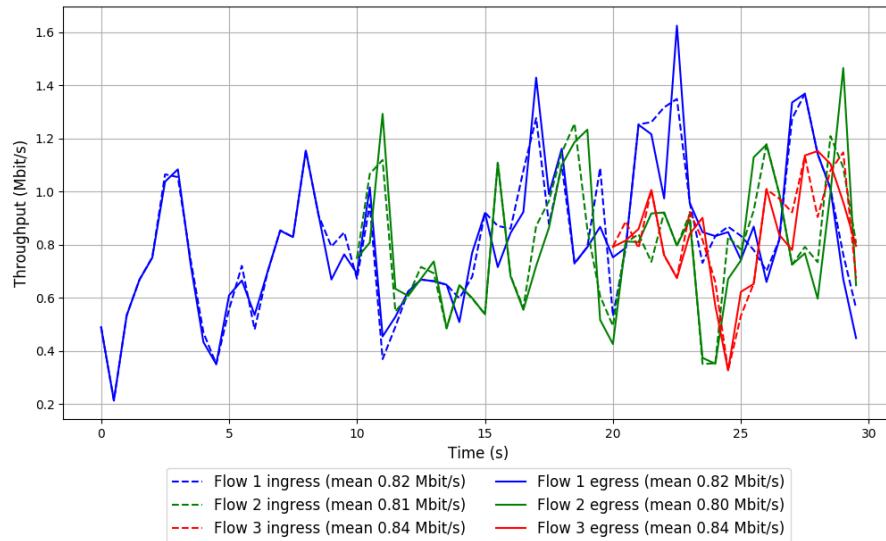


Run 3: Statistics of Sprout

```
Start at: 2018-01-02 21:57:51
End at: 2018-01-02 21:58:21
Local clock offset: 2.337 ms
Remote clock offset: -16.438 ms

# Below is generated by plot.py at 2018-01-02 22:08:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 62.719 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 62.719 ms
Loss rate: 0.42%
-- Flow 2:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 58.161 ms
Loss rate: 0.50%
-- Flow 3:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 67.784 ms
Loss rate: 0.41%
```

Run 3: Report of Sprout — Data Link

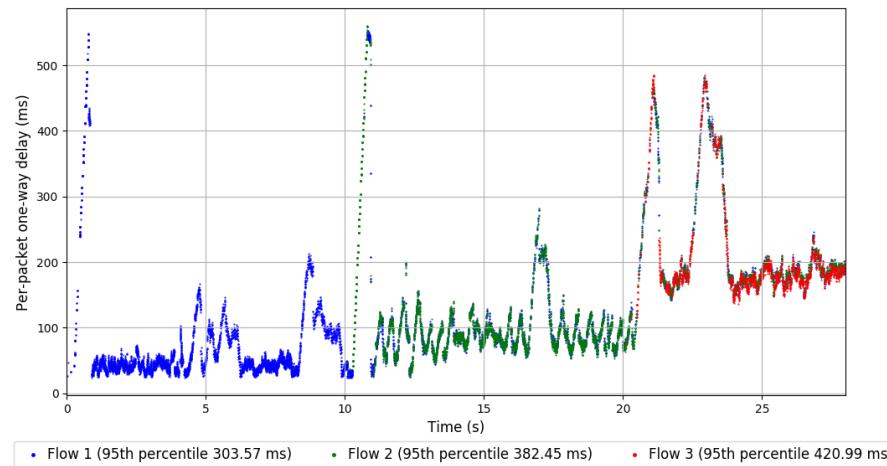
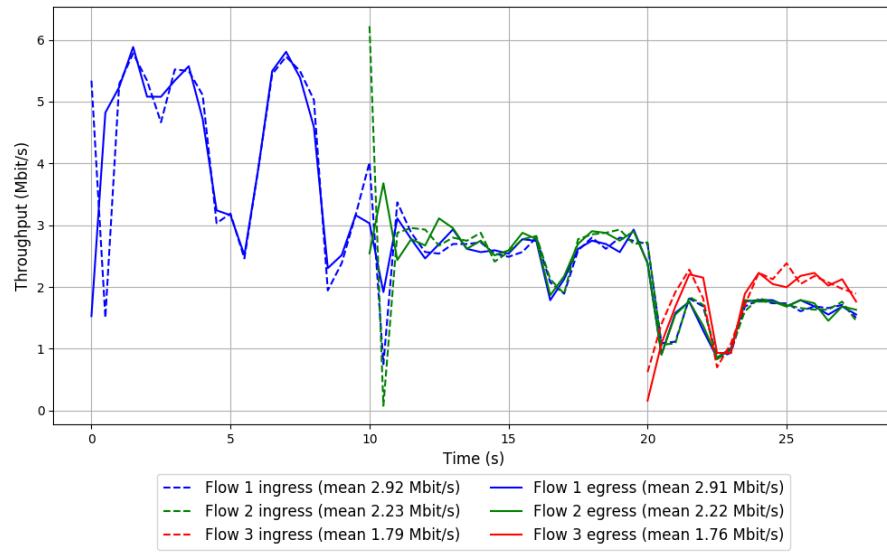


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-01-02 21:25:41
End at: 2018-01-02 21:26:11
Local clock offset: 3.792 ms
Remote clock offset: -13.762 ms

# Below is generated by plot.py at 2018-01-02 22:08:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.83 Mbit/s
95th percentile per-packet one-way delay: 368.412 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 303.574 ms
Loss rate: 0.37%
-- Flow 2:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 382.453 ms
Loss rate: 0.72%
-- Flow 3:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 420.988 ms
Loss rate: 2.83%
```

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

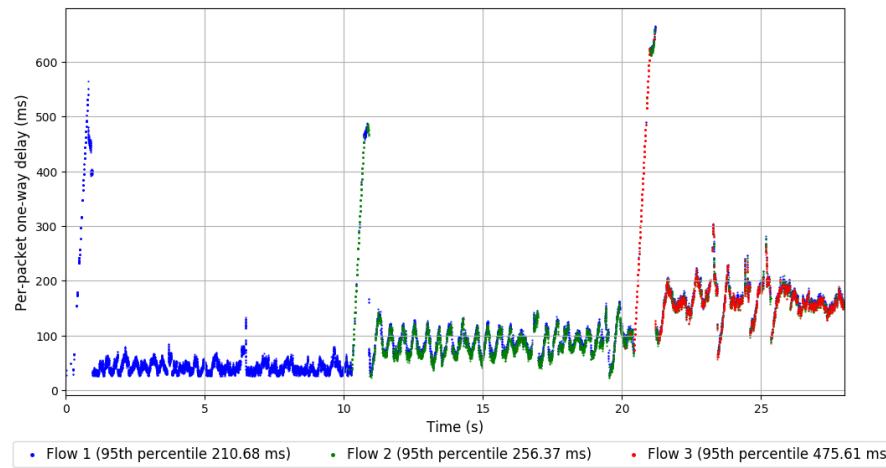
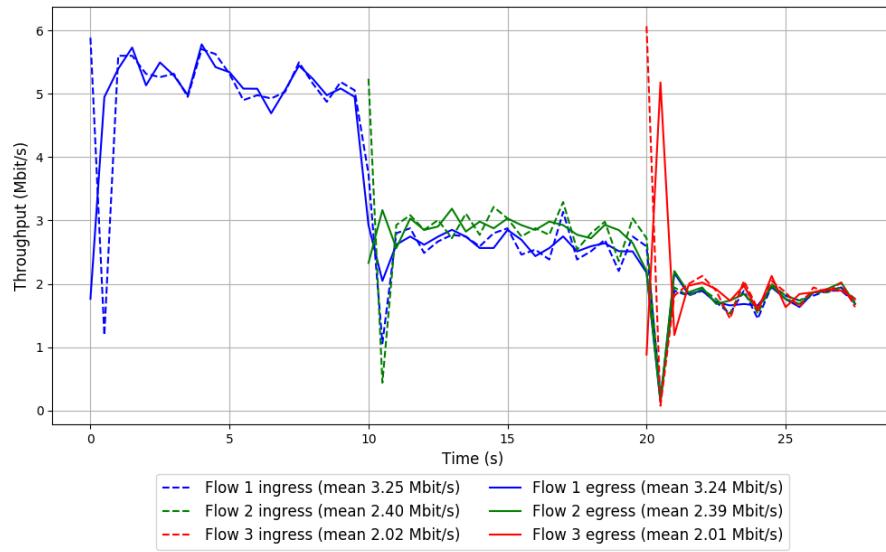


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-01-02 21:42:17
End at: 2018-01-02 21:42:47
Local clock offset: 3.27 ms
Remote clock offset: -13.056 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 269.829 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 3.24 Mbit/s
95th percentile per-packet one-way delay: 210.683 ms
Loss rate: 0.36%
-- Flow 2:
Average throughput: 2.39 Mbit/s
95th percentile per-packet one-way delay: 256.370 ms
Loss rate: 0.75%
-- Flow 3:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 475.609 ms
Loss rate: 1.86%
```

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

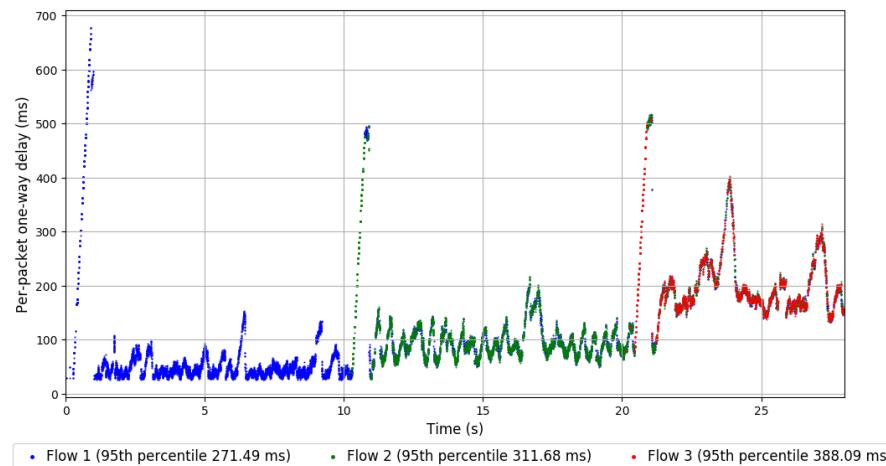
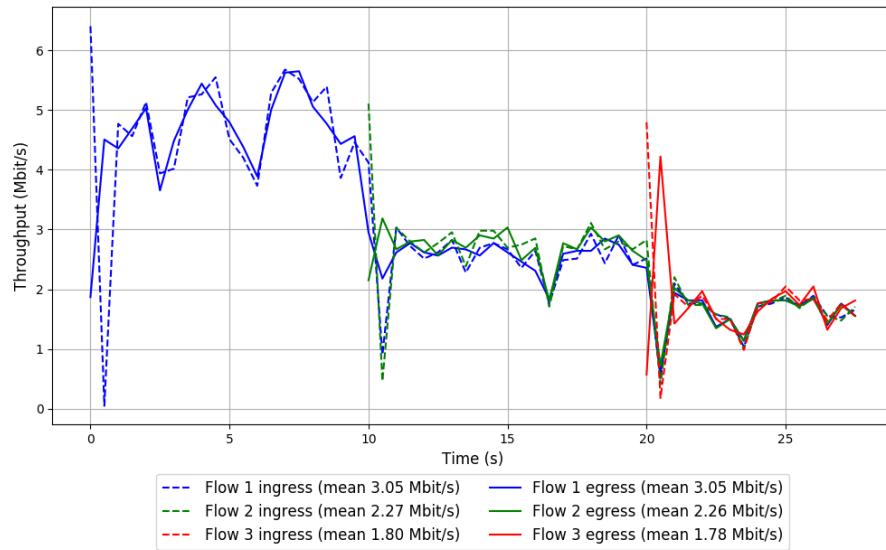


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-01-02 21:58:57
End at: 2018-01-02 21:59:27
Local clock offset: 2.966 ms
Remote clock offset: -14.153 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.99 Mbit/s
95th percentile per-packet one-way delay: 319.243 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 3.05 Mbit/s
95th percentile per-packet one-way delay: 271.491 ms
Loss rate: 0.38%
-- Flow 2:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 311.684 ms
Loss rate: 0.83%
-- Flow 3:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 388.089 ms
Loss rate: 1.91%
```

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

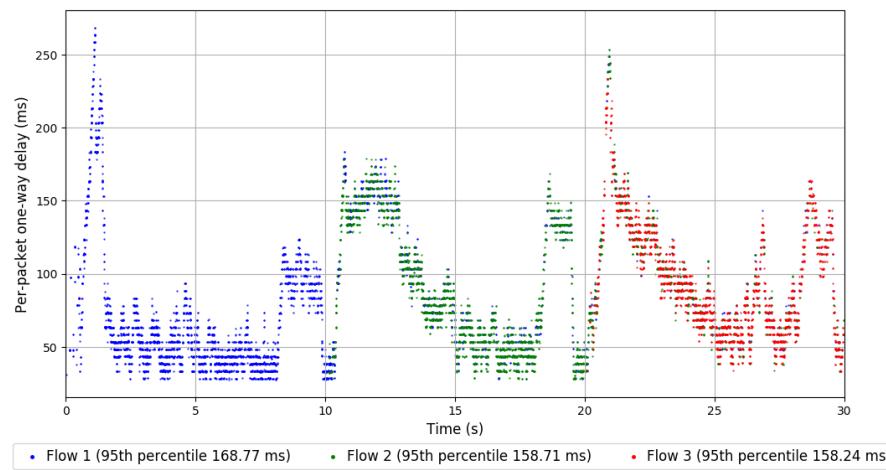
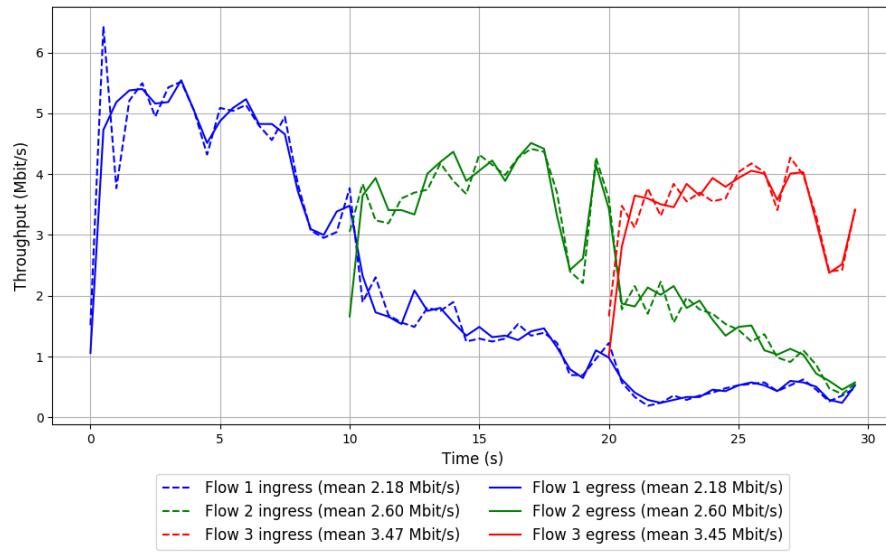


Run 1: Statistics of TCP Vegas

```
Start at: 2018-01-02 21:26:47
End at: 2018-01-02 21:27:17
Local clock offset: 3.66 ms
Remote clock offset: -13.901 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.05 Mbit/s
95th percentile per-packet one-way delay: 163.234 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 168.769 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 158.711 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 3.45 Mbit/s
95th percentile per-packet one-way delay: 158.241 ms
Loss rate: 0.97%
```

Run 1: Report of TCP Vegas — Data Link

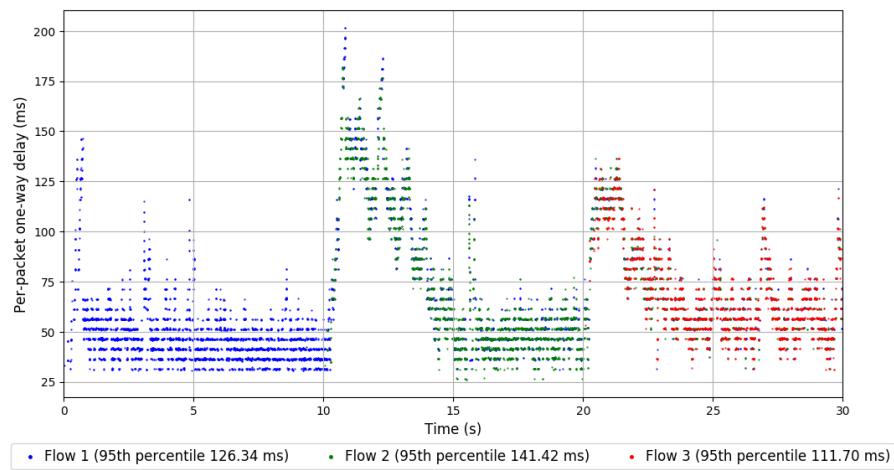
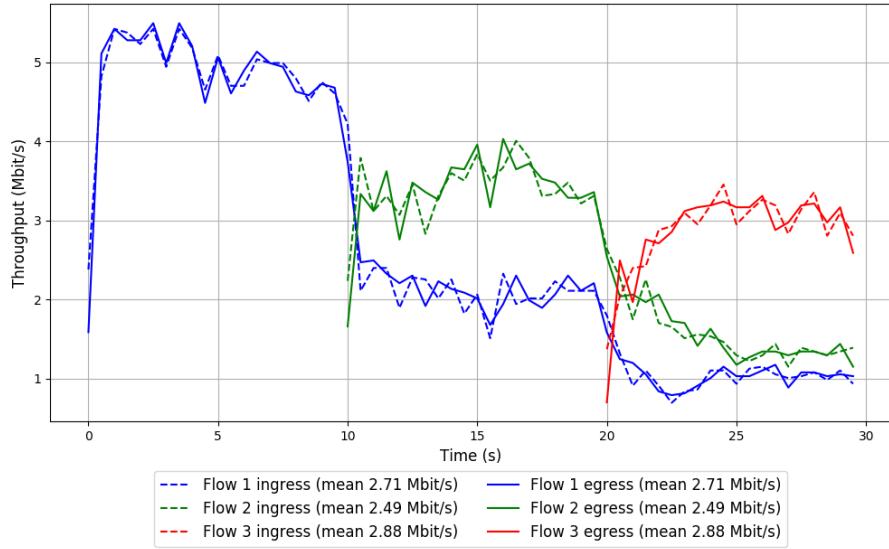


Run 2: Statistics of TCP Vegas

```
Start at: 2018-01-02 21:43:25
End at: 2018-01-02 21:43:55
Local clock offset: 0.012 ms
Remote clock offset: -15.243 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.31 Mbit/s
95th percentile per-packet one-way delay: 131.184 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 126.343 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 141.421 ms
Loss rate: 0.29%
-- Flow 3:
Average throughput: 2.88 Mbit/s
95th percentile per-packet one-way delay: 111.701 ms
Loss rate: 0.80%
```

Run 2: Report of TCP Vegas — Data Link

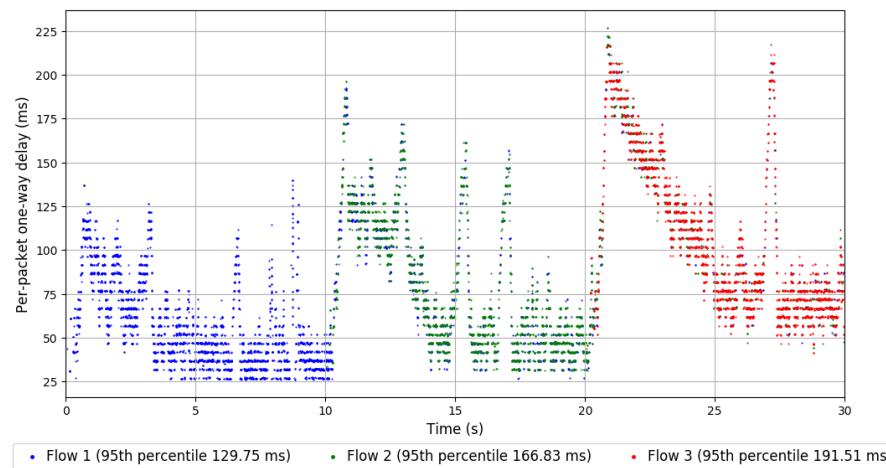
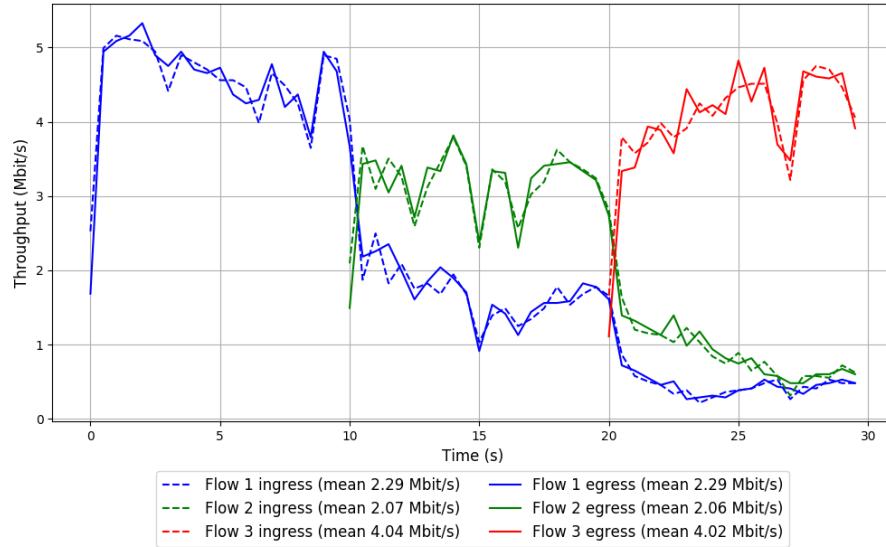


Run 3: Statistics of TCP Vegas

```
Start at: 2018-01-02 22:00:05
End at: 2018-01-02 22:00:35
Local clock offset: 1.797 ms
Remote clock offset: -14.79 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.99 Mbit/s
95th percentile per-packet one-way delay: 166.863 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 129.753 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 166.832 ms
Loss rate: 0.15%
-- Flow 3:
Average throughput: 4.02 Mbit/s
95th percentile per-packet one-way delay: 191.507 ms
Loss rate: 0.93%
```

Run 3: Report of TCP Vegas — Data Link

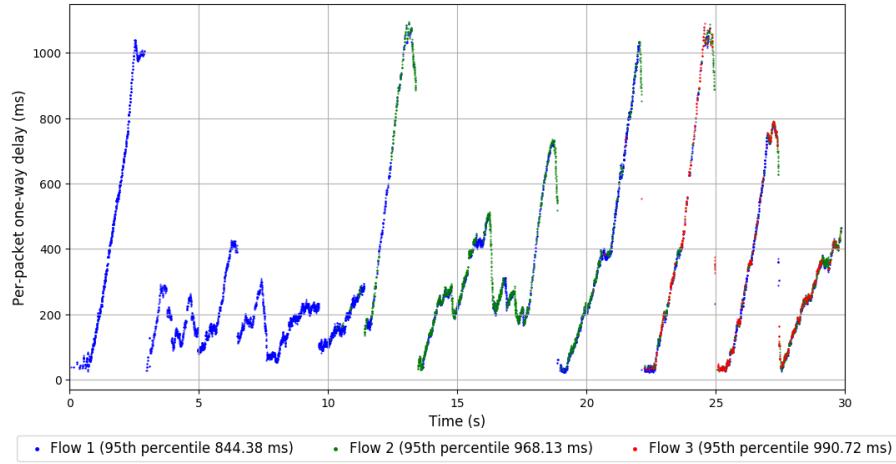
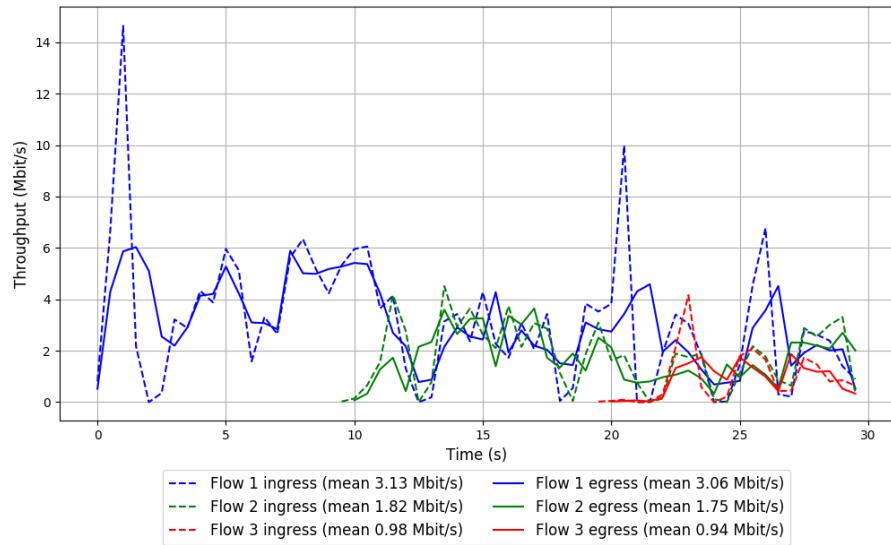


Run 1: Statistics of Verus

```
Start at: 2018-01-02 21:31:12
End at: 2018-01-02 21:31:42
Local clock offset: 2.138 ms
Remote clock offset: -14.464 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.53 Mbit/s
95th percentile per-packet one-way delay: 910.503 ms
Loss rate: 3.20%
-- Flow 1:
Average throughput: 3.06 Mbit/s
95th percentile per-packet one-way delay: 844.383 ms
Loss rate: 2.28%
-- Flow 2:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 968.128 ms
Loss rate: 4.34%
-- Flow 3:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 990.723 ms
Loss rate: 7.77%
```

Run 1: Report of Verus — Data Link

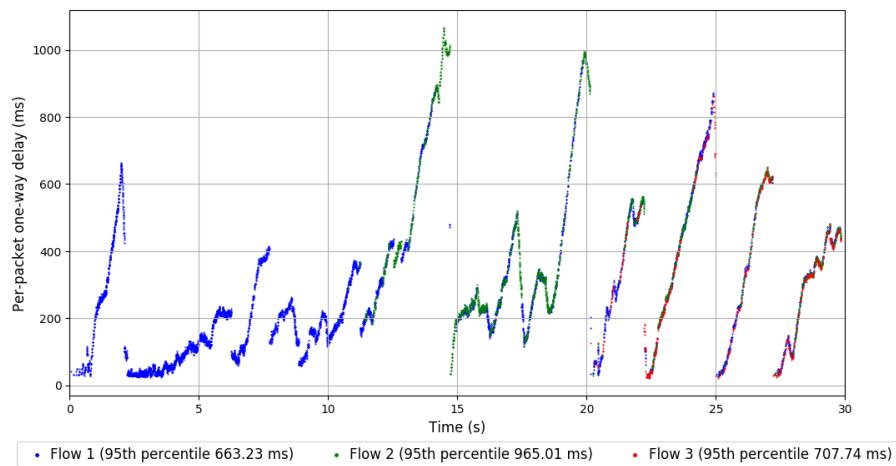
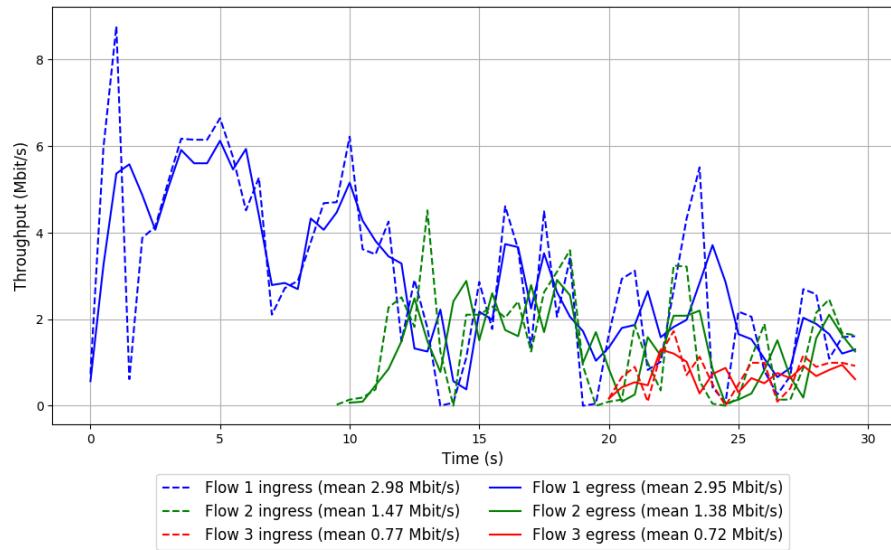


Run 2: Statistics of Verus

```
Start at: 2018-01-02 21:47:53
End at: 2018-01-02 21:48:23
Local clock offset: 4.161 ms
Remote clock offset: -15.747 ms

# Below is generated by plot.py at 2018-01-02 22:08:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.10 Mbit/s
95th percentile per-packet one-way delay: 727.942 ms
Loss rate: 2.86%
-- Flow 1:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 663.234 ms
Loss rate: 1.25%
-- Flow 2:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 965.006 ms
Loss rate: 6.53%
-- Flow 3:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 707.740 ms
Loss rate: 7.70%
```

Run 2: Report of Verus — Data Link

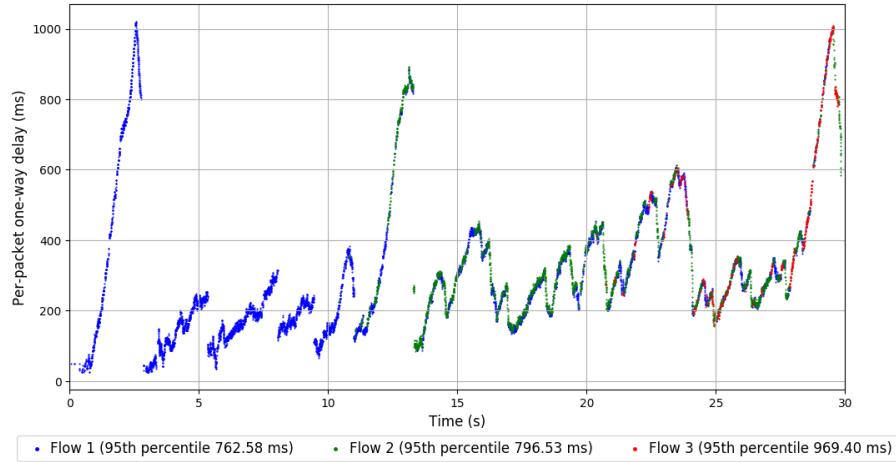
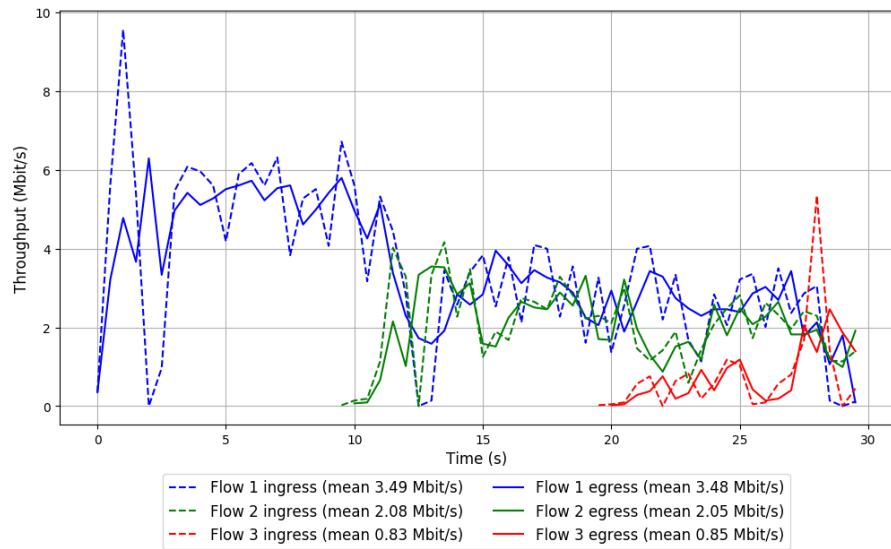


Run 3: Statistics of Verus

```
Start at: 2018-01-02 22:04:30
End at: 2018-01-02 22:05:00
Local clock offset: 3.702 ms
Remote clock offset: -14.571 ms

# Below is generated by plot.py at 2018-01-02 22:09:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.07 Mbit/s
95th percentile per-packet one-way delay: 805.641 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 3.48 Mbit/s
95th percentile per-packet one-way delay: 762.579 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 796.533 ms
Loss rate: 2.57%
-- Flow 3:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 969.399 ms
Loss rate: 3.33%
```

Run 3: Report of Verus — Data Link

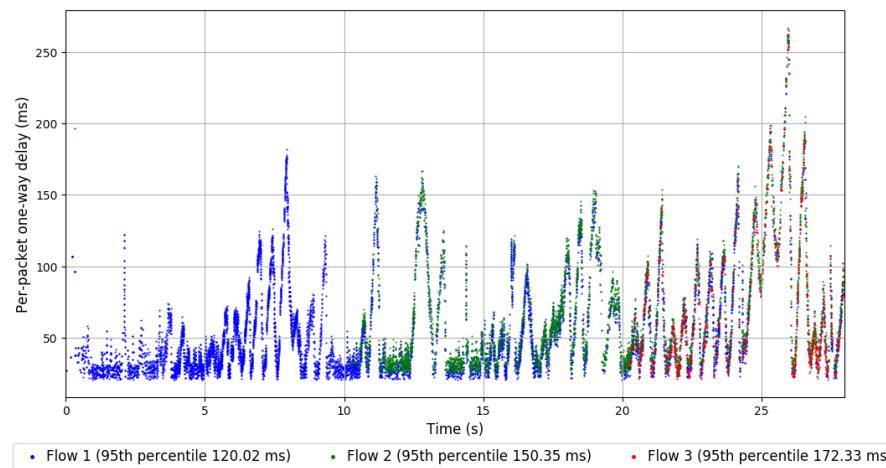
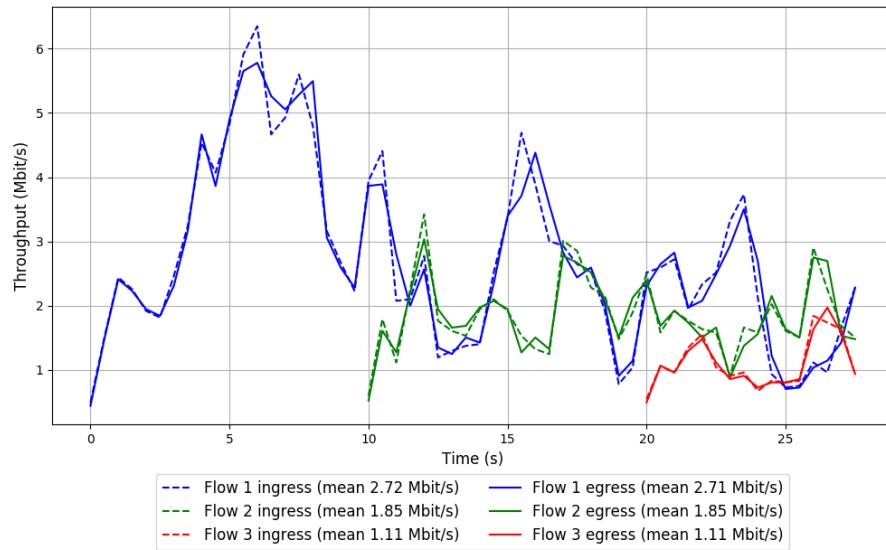


Run 1: Statistics of Copa

```
Start at: 2018-01-02 21:23:29
End at: 2018-01-02 21:23:59
Local clock offset: 2.783 ms
Remote clock offset: -14.056 ms

# Below is generated by plot.py at 2018-01-02 22:09:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 136.117 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 120.015 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 150.354 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 172.327 ms
Loss rate: 1.02%
```

Run 1: Report of Copa — Data Link

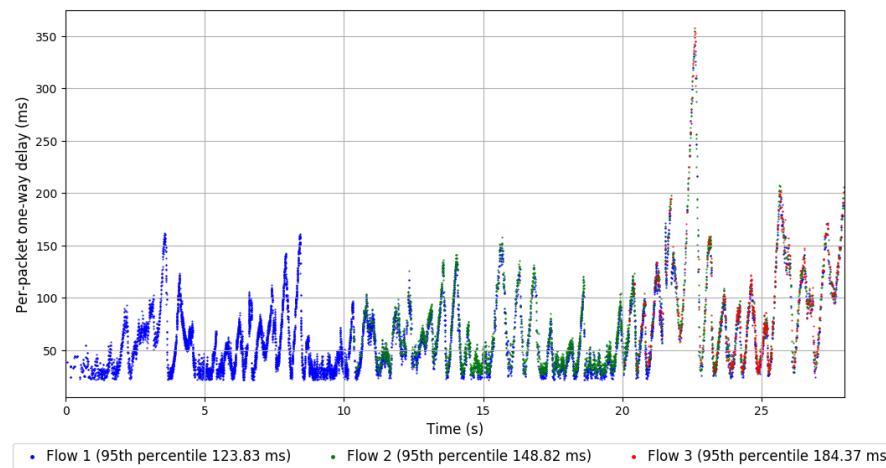
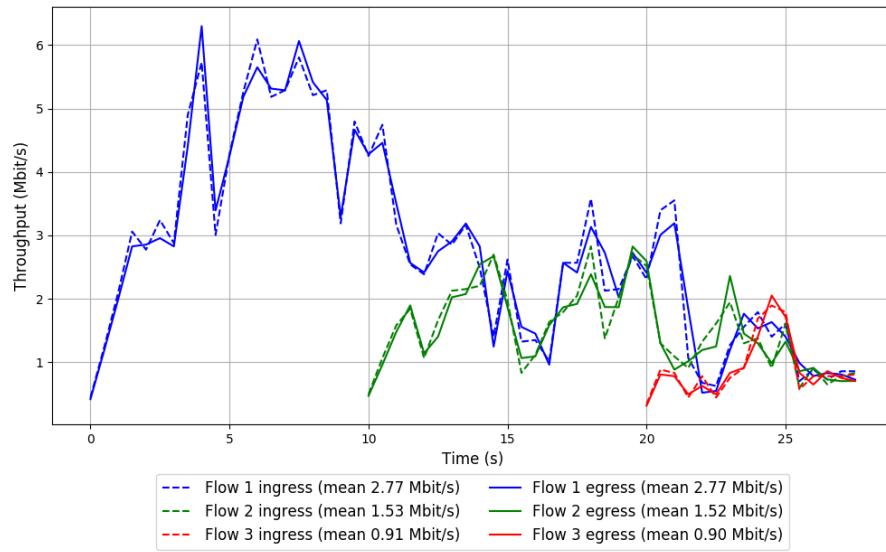


Run 2: Statistics of Copa

```
Start at: 2018-01-02 21:40:05
End at: 2018-01-02 21:40:35
Local clock offset: 3.123 ms
Remote clock offset: -12.764 ms

# Below is generated by plot.py at 2018-01-02 22:09:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.00 Mbit/s
95th percentile per-packet one-way delay: 136.081 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 123.832 ms
Loss rate: 0.20%
-- Flow 2:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 148.817 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 184.367 ms
Loss rate: 1.78%
```

Run 2: Report of Copa — Data Link

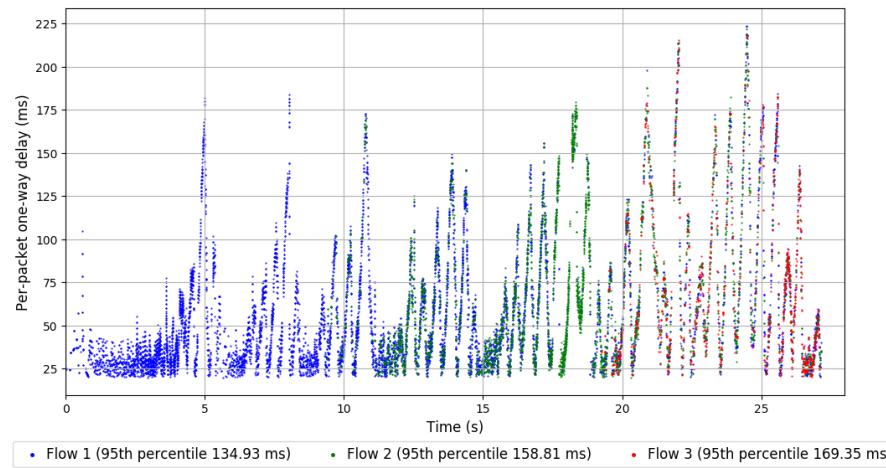
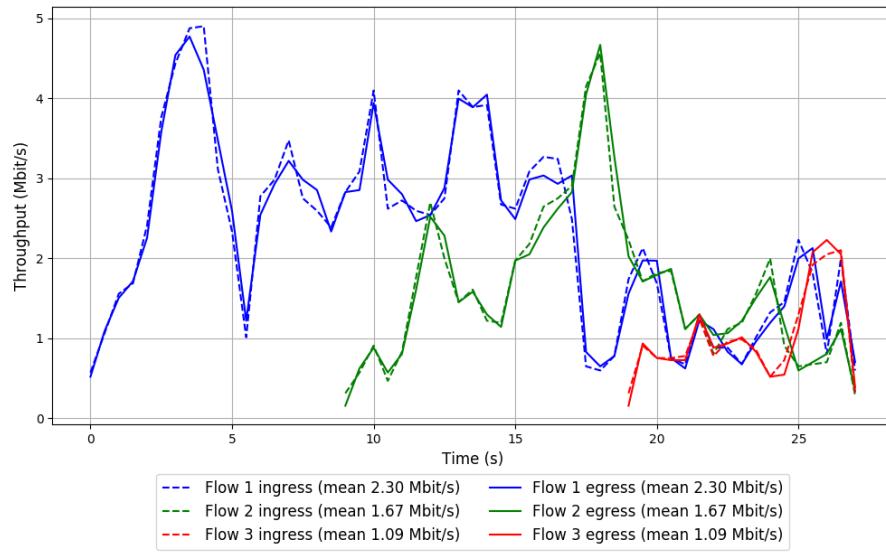


Run 3: Statistics of Copa

```
Start at: 2018-01-02 21:56:45
End at: 2018-01-02 21:57:15
Local clock offset: 4.078 ms
Remote clock offset: -15.953 ms

# Below is generated by plot.py at 2018-01-02 22:09:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.72 Mbit/s
95th percentile per-packet one-way delay: 150.538 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 134.932 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 158.807 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 169.353 ms
Loss rate: 0.45%
```

Run 3: Report of Copa — Data Link

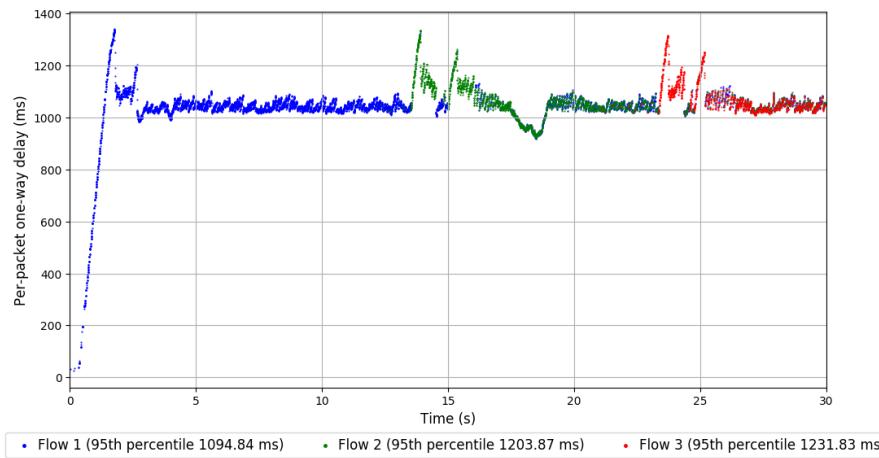
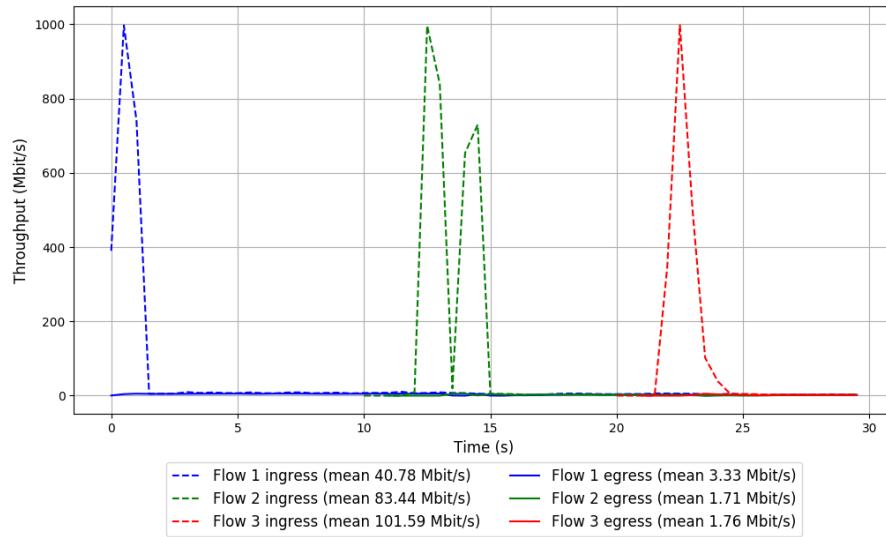


```
Run 1: Statistics of FillP
```

```
Start at: 2018-01-02 21:20:08
End at: 2018-01-02 21:20:38
Local clock offset: 3.027 ms
Remote clock offset: -13.505 ms

# Below is generated by plot.py at 2018-01-02 22:09:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.92 Mbit/s
95th percentile per-packet one-way delay: 1159.654 ms
Loss rate: 96.22%
-- Flow 1:
Average throughput: 3.33 Mbit/s
95th percentile per-packet one-way delay: 1094.837 ms
Loss rate: 91.85%
-- Flow 2:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 1203.867 ms
Loss rate: 98.07%
-- Flow 3:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 1231.832 ms
Loss rate: 98.45%
```

Run 1: Report of FillP — Data Link

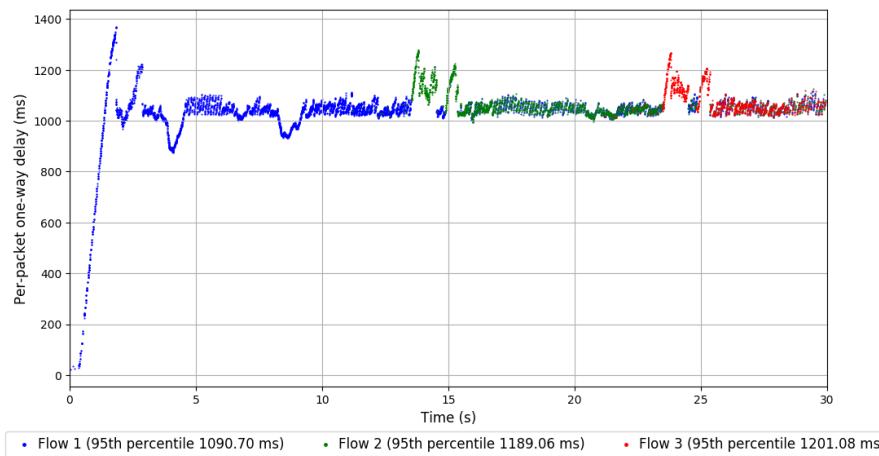
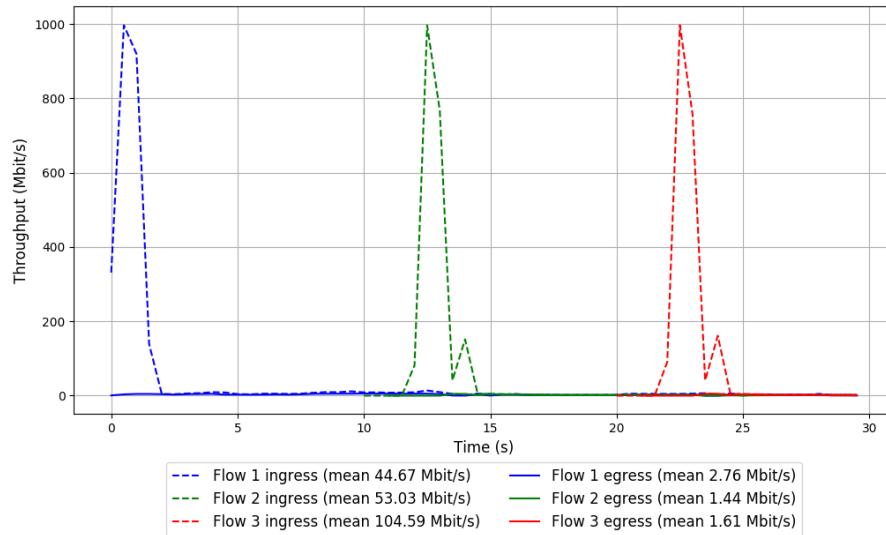


Run 2: Statistics of FillP

```
Start at: 2018-01-02 21:36:44
End at: 2018-01-02 21:37:14
Local clock offset: 4.035 ms
Remote clock offset: -13.027 ms

# Below is generated by plot.py at 2018-01-02 22:09:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.14 Mbit/s
95th percentile per-packet one-way delay: 1168.666 ms
Loss rate: 96.40%
-- Flow 1:
Average throughput: 2.76 Mbit/s
95th percentile per-packet one-way delay: 1090.702 ms
Loss rate: 93.83%
-- Flow 2:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 1189.059 ms
Loss rate: 97.44%
-- Flow 3:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 1201.081 ms
Loss rate: 98.64%
```

Run 2: Report of FillP — Data Link

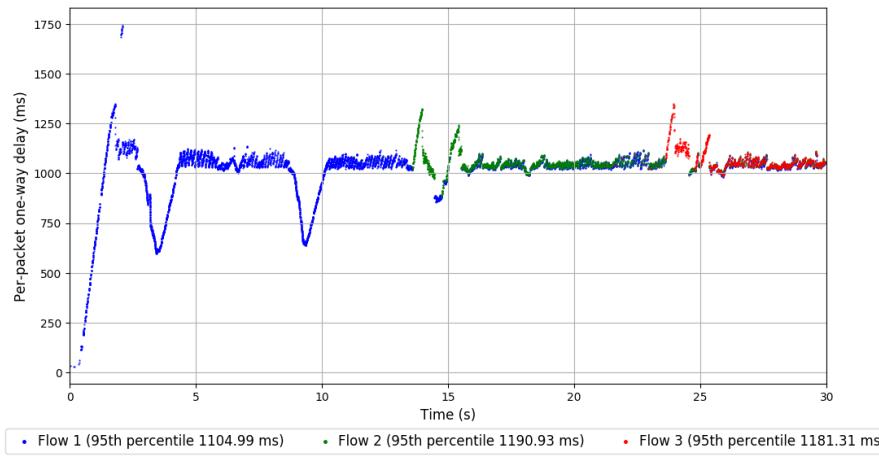
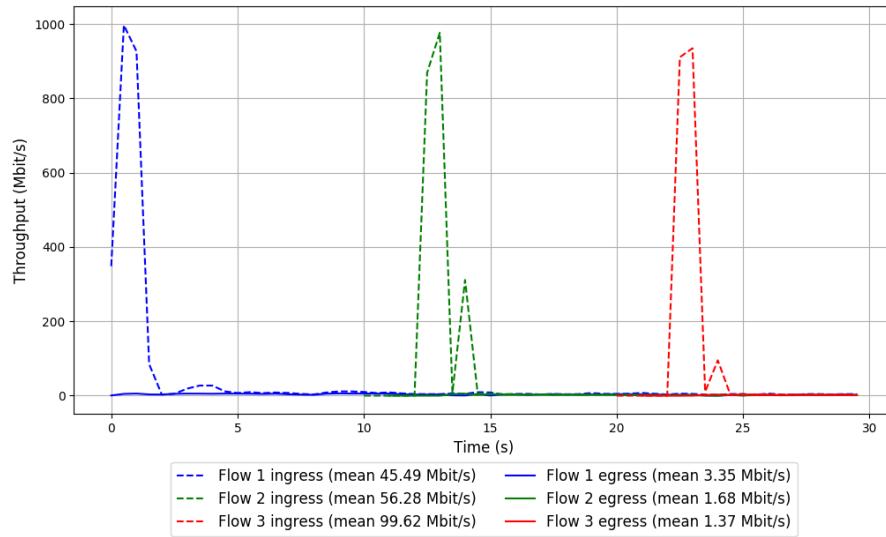


Run 3: Statistics of FillP

```
Start at: 2018-01-02 21:53:25
End at: 2018-01-02 21:53:55
Local clock offset: 1.624 ms
Remote clock offset: -13.58 ms

# Below is generated by plot.py at 2018-01-02 22:09:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.80 Mbit/s
95th percentile per-packet one-way delay: 1132.563 ms
Loss rate: 95.87%
-- Flow 1:
Average throughput: 3.35 Mbit/s
95th percentile per-packet one-way delay: 1104.989 ms
Loss rate: 92.65%
-- Flow 2:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 1190.935 ms
Loss rate: 97.21%
-- Flow 3:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 1181.306 ms
Loss rate: 98.79%
```

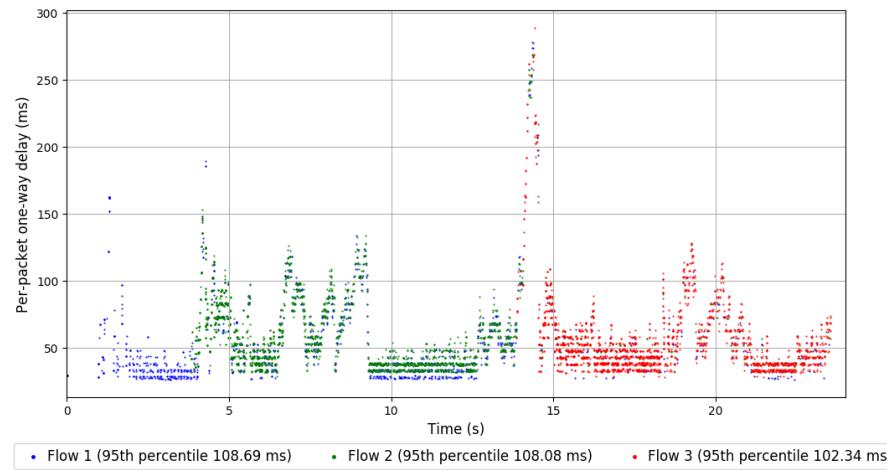
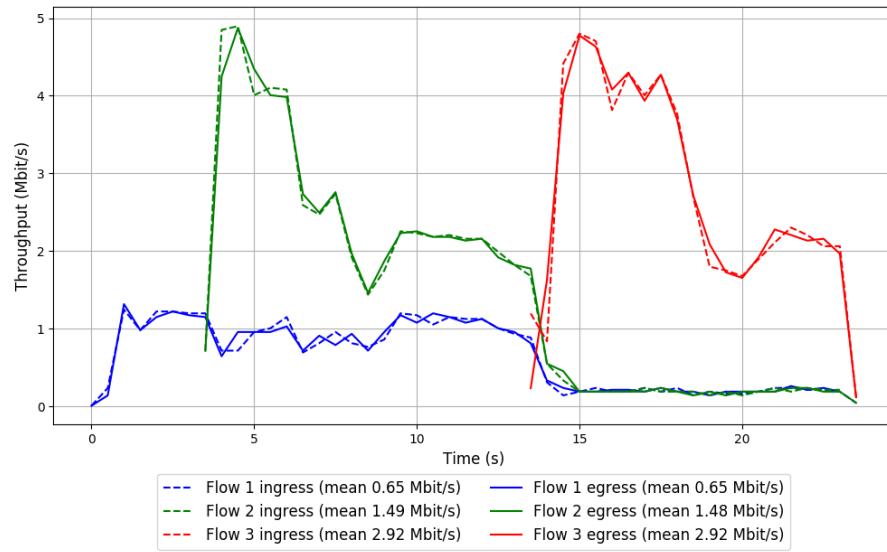
Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo

Start at: 2018-01-02 21:21:16
End at: 2018-01-02 21:21:46
Local clock offset: 1.393 ms
Remote clock offset: -13.918 ms

Run 1: Report of Indigo — Data Link

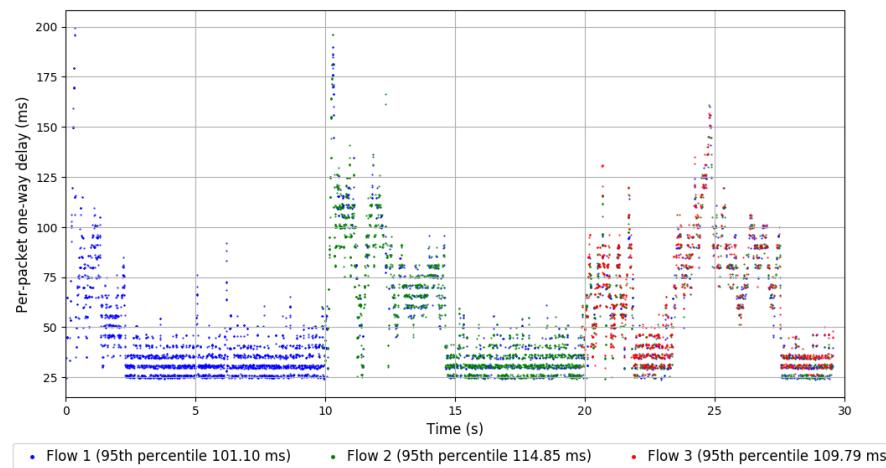
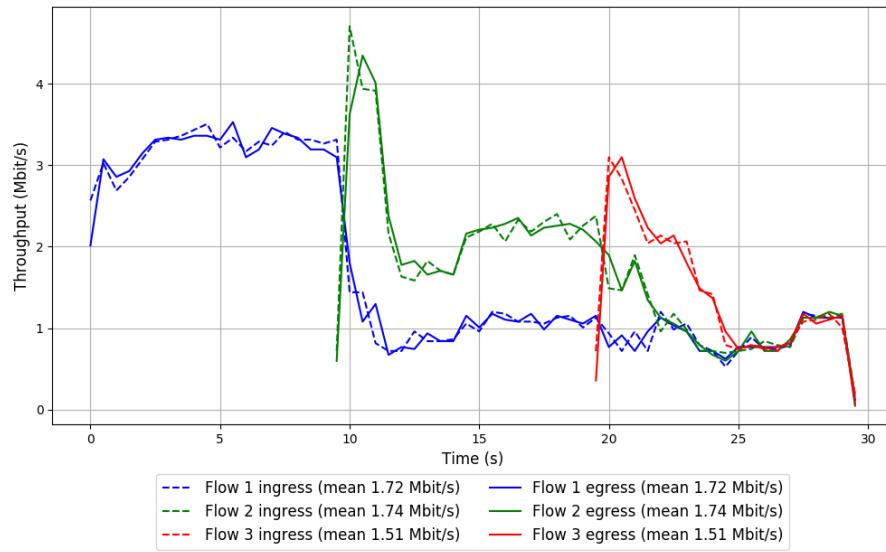


Run 2: Statistics of Indigo

```
Start at: 2018-01-02 21:37:52
End at: 2018-01-02 21:38:22
Local clock offset: 3.454 ms
Remote clock offset: -14.568 ms

# Below is generated by plot.py at 2018-01-02 22:09:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.38 Mbit/s
95th percentile per-packet one-way delay: 110.003 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 101.098 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 114.848 ms
Loss rate: 0.25%
-- Flow 3:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 109.793 ms
Loss rate: 0.41%
```

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2018-01-02 21:54:33
End at: 2018-01-02 21:55:03
Local clock offset: 2.549 ms
Remote clock offset: -15.857 ms

# Below is generated by plot.py at 2018-01-02 22:09:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.17 Mbit/s
95th percentile per-packet one-way delay: 106.771 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 91.575 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 70.610 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 3.70 Mbit/s
95th percentile per-packet one-way delay: 140.708 ms
Loss rate: 0.17%
```

Run 3: Report of Indigo — Data Link

