

Pantheon Report

Generated at 2017-12-11 10:36:53 (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).

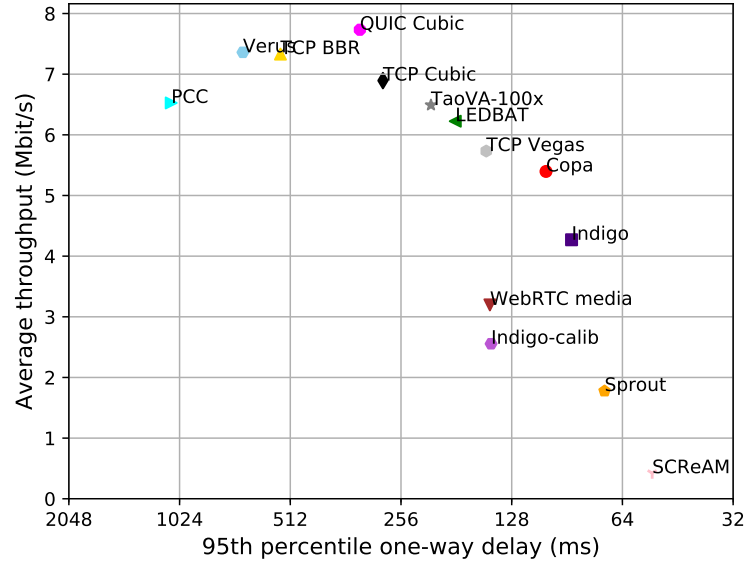
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against **nets.org.sg** and have been applied to correct the timestamps in logs.

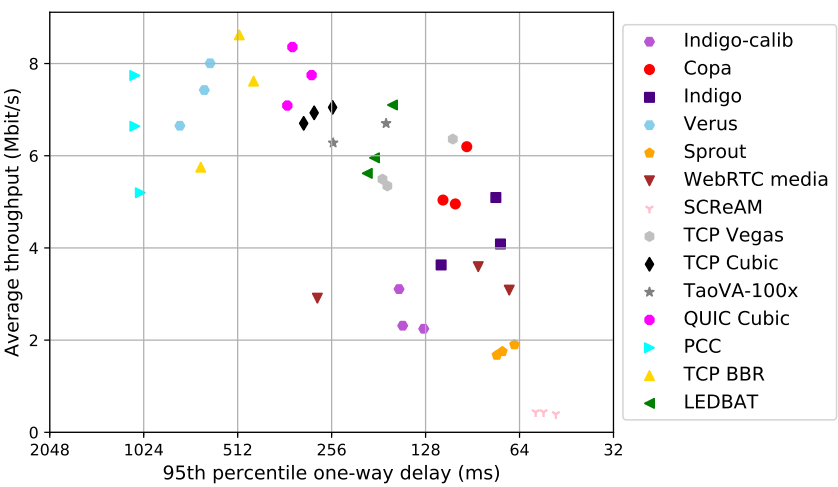
Git summary:

```
branch: indigos @ e3a57ad5ac5cfcaca0e3f983c8dd4cc3509e0262
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/genericCC @ b5b7c38e8391001927dc41c6cfa2627d03dde737
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-cellular @ aee99e8eb842cb053f8c9a80e28cd256a930bbc2
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/indigo-no-cwnd @ 3e58442c04028a11d7b02456e137604633ba2d6c
third_party/indigo-no-delivery-rate @ 57caa40858b964906edff4876d5a7e5bfff666c5
third_party/indigo-no-queuing-delay @ 03455460fd1a8ffbdad86fabb936fdca204b80db
third_party/indigo-no-send-rate @ b39dfa6b2c5f19cb7cd89626cb4f5bb81f9fecda
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
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 @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



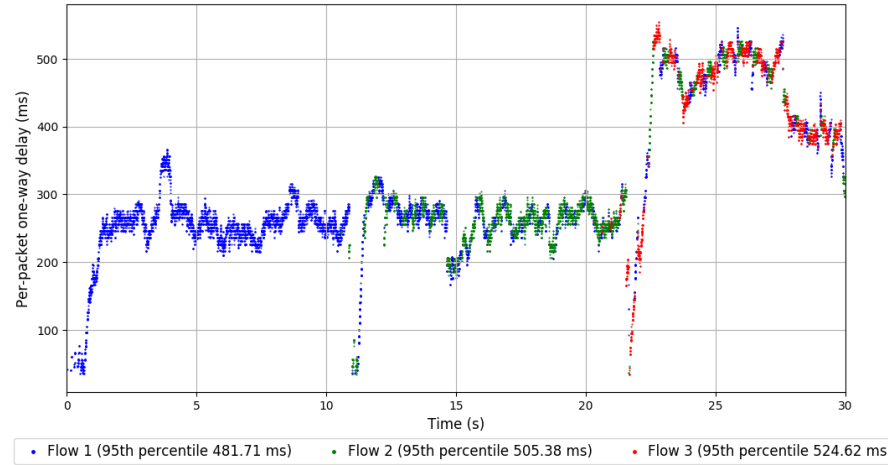
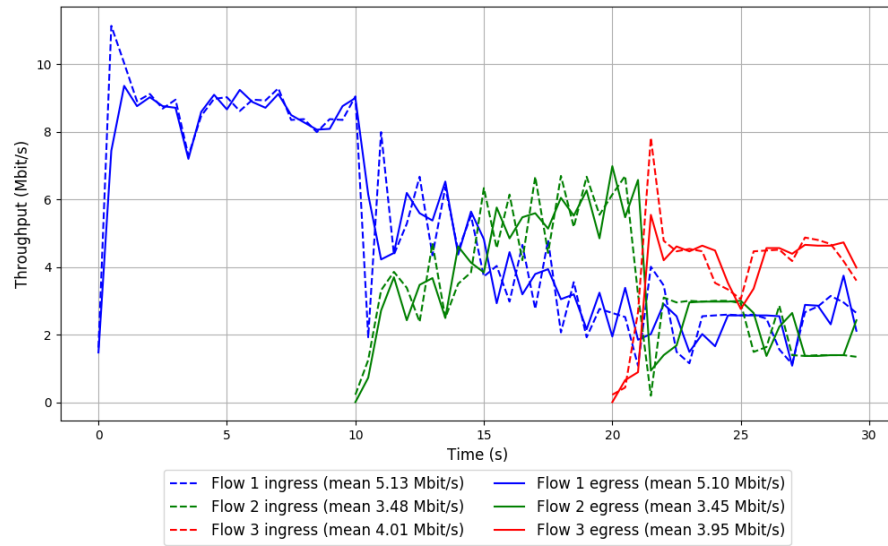
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	4.24	2.84	3.86	458.79	563.62	625.23	0.73	1.20	4.39
TCP Cubic	3	4.65	2.50	1.81	274.86	288.78	335.91	0.37	0.85	2.79
LEDBAT	3	4.35	2.14	1.39	175.31	187.43	191.58	0.39	0.82	3.12
PCC	3	4.51	2.27	1.80	1067.17	1094.30	1116.76	23.63	62.07	68.75
QUIC Cubic	3	5.56	2.23	2.20	323.72	333.11	350.24	0.66	1.40	3.08
SCReAM	3	0.21	0.21	0.21	53.11	49.71	46.46	0.26	0.39	0.69
WebRTC media	3	1.94	1.00	0.27	106.72	147.86	186.87	0.24	0.42	1.14
Sprout	3	0.85	0.98	0.83	69.88	73.09	73.40	0.41	0.08	0.48
TaoVA-100x	2	3.73	3.15	2.65	153.01	217.16	414.50	0.35	0.67	1.56
TCP Vegas	3	3.04	2.51	3.09	124.16	151.75	194.14	0.12	0.22	0.84
Verus	3	4.86	3.00	1.64	606.80	785.98	765.75	1.27	2.57	5.90
Copa	3	3.24	2.58	1.78	101.47	103.70	118.55	0.21	0.28	0.91
Indigo	3	1.96	2.34	2.31	81.09	88.74	91.33	0.12	0.15	0.55
Indigo-calib	3	1.04	1.52	1.54	115.52	151.89	133.08	0.12	0.14	0.22

Run 1: Statistics of TCP BBR

Start at: 2017-12-11 09:49:56
End at: 2017-12-11 09:50:26
Local clock offset: 0.765 ms
Remote clock offset: -12.959 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 8.62 Mbit/s
95th percentile per-packet one-way delay: 505.982 ms
Loss rate: 1.40%
-- Flow 1:
Average throughput: 5.10 Mbit/s
95th percentile per-packet one-way delay: 481.706 ms
Loss rate: 0.89%
-- Flow 2:
Average throughput: 3.45 Mbit/s
95th percentile per-packet one-way delay: 505.379 ms
Loss rate: 0.58%
-- Flow 3:
Average throughput: 3.95 Mbit/s
95th percentile per-packet one-way delay: 524.624 ms
Loss rate: 4.80%

Run 1: Report of TCP BBR — Data Link

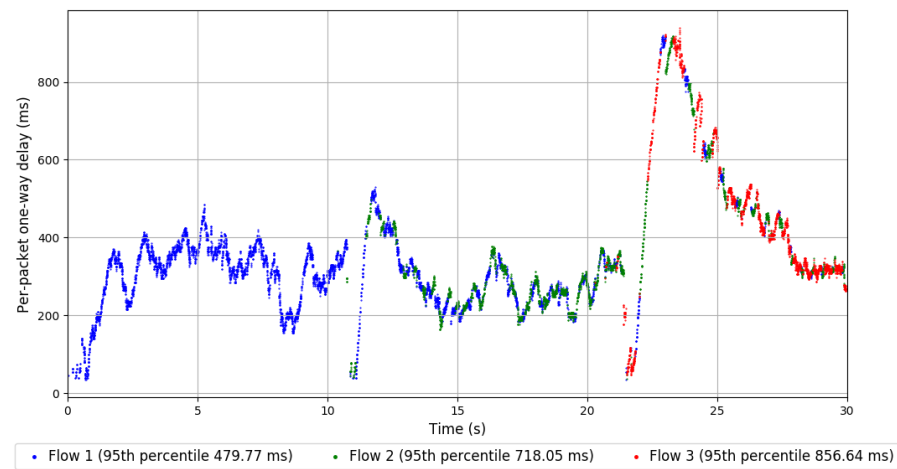
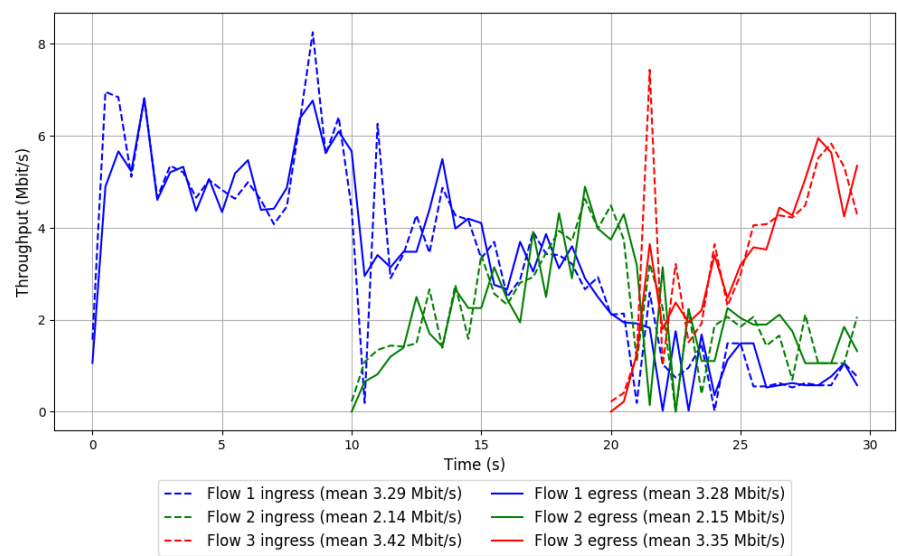


Run 2: Statistics of TCP BBR

Start at: 2017-12-11 10:05:29
End at: 2017-12-11 10:05:59
Local clock offset: -0.684 ms
Remote clock offset: -11.829 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.75 Mbit/s
95th percentile per-packet one-way delay: 672.239 ms
Loss rate: 1.76%
-- Flow 1:
Average throughput: 3.28 Mbit/s
95th percentile per-packet one-way delay: 479.770 ms
Loss rate: 0.70%
-- Flow 2:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 718.048 ms
Loss rate: 1.65%
-- Flow 3:
Average throughput: 3.35 Mbit/s
95th percentile per-packet one-way delay: 856.644 ms
Loss rate: 4.98%

Run 2: Report of TCP BBR — Data Link

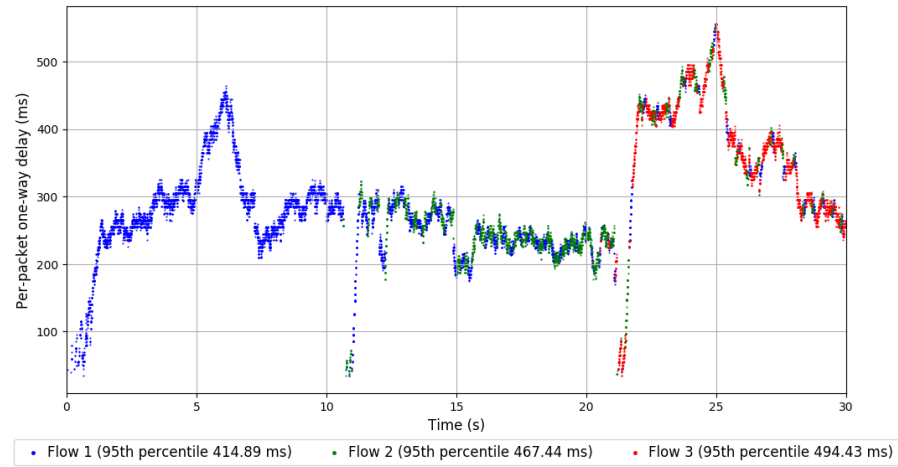
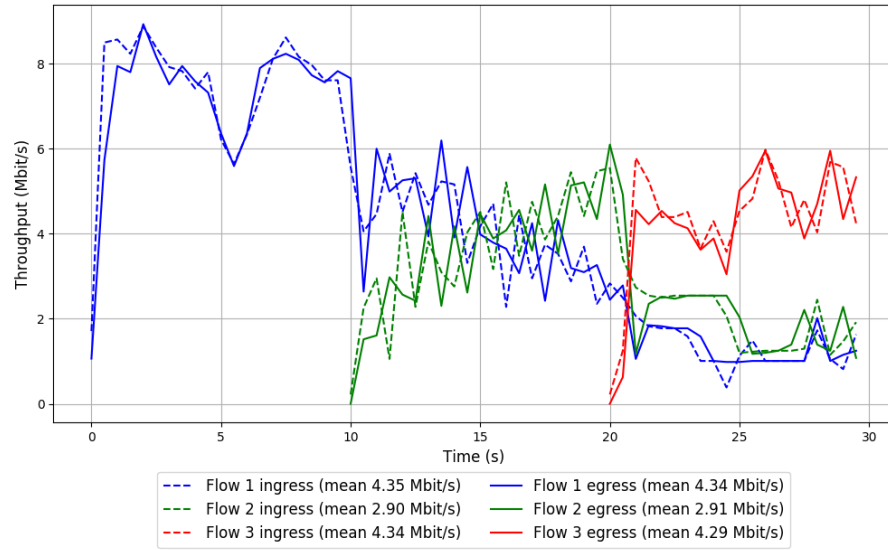


Run 3: Statistics of TCP BBR

Start at: 2017-12-11 10:21:11
End at: 2017-12-11 10:21:41
Local clock offset: -2.908 ms
Remote clock offset: -12.281 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.62 Mbit/s
95th percentile per-packet one-way delay: 455.338 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 4.34 Mbit/s
95th percentile per-packet one-way delay: 414.893 ms
Loss rate: 0.61%
-- Flow 2:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 467.438 ms
Loss rate: 1.38%
-- Flow 3:
Average throughput: 4.29 Mbit/s
95th percentile per-packet one-way delay: 494.433 ms
Loss rate: 3.39%

Run 3: Report of TCP BBR — Data Link

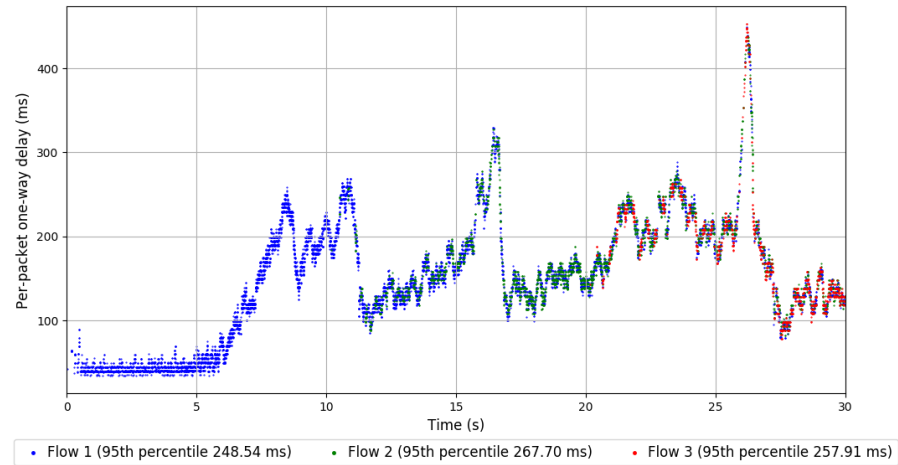
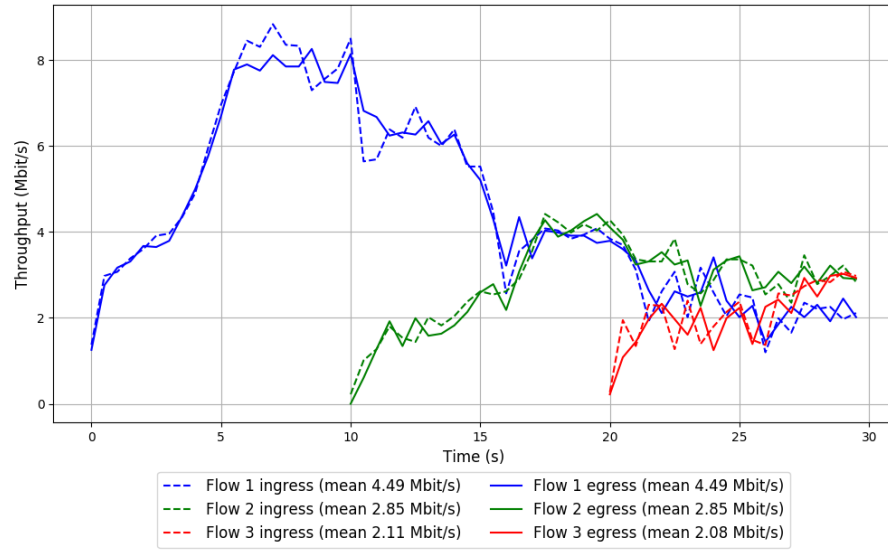


Run 1: Statistics of TCP Cubic

Start at: 2017-12-11 09:59:57
End at: 2017-12-11 10:00:27
Local clock offset: 1.792 ms
Remote clock offset: -11.142 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.05 Mbit/s
95th percentile per-packet one-way delay: 254.190 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 4.49 Mbit/s
95th percentile per-packet one-way delay: 248.542 ms
Loss rate: 0.32%
-- Flow 2:
Average throughput: 2.85 Mbit/s
95th percentile per-packet one-way delay: 267.705 ms
Loss rate: 0.99%
-- Flow 3:
Average throughput: 2.08 Mbit/s
95th percentile per-packet one-way delay: 257.911 ms
Loss rate: 2.63%

Run 1: Report of TCP Cubic — Data Link

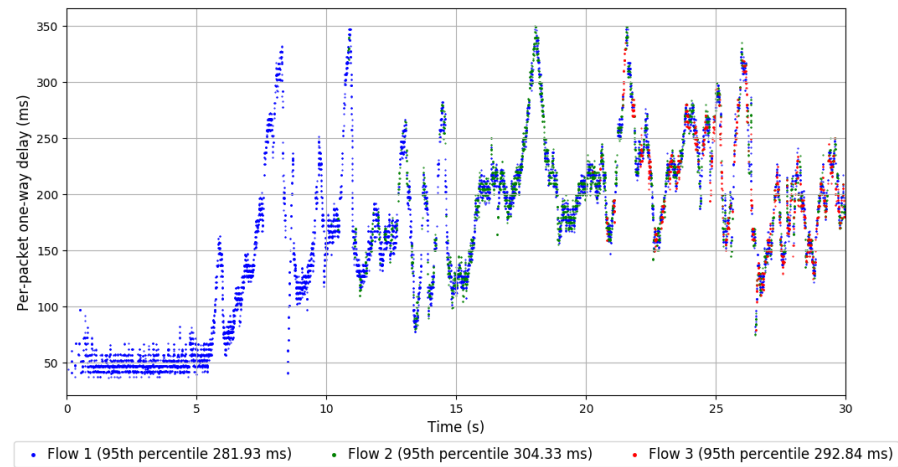
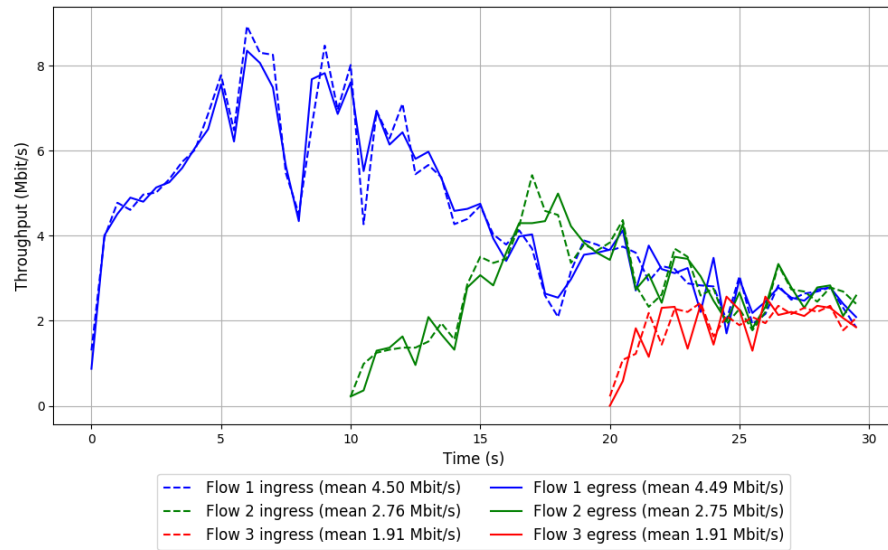


Run 2: Statistics of TCP Cubic

Start at: 2017-12-11 10:15:26
End at: 2017-12-11 10:15:56
Local clock offset: -0.433 ms
Remote clock offset: -11.274 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.93 Mbit/s
95th percentile per-packet one-way delay: 291.180 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 4.49 Mbit/s
95th percentile per-packet one-way delay: 281.926 ms
Loss rate: 0.33%
-- Flow 2:
Average throughput: 2.75 Mbit/s
95th percentile per-packet one-way delay: 304.333 ms
Loss rate: 1.09%
-- Flow 3:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 292.844 ms
Loss rate: 2.34%

Run 2: Report of TCP Cubic — Data Link

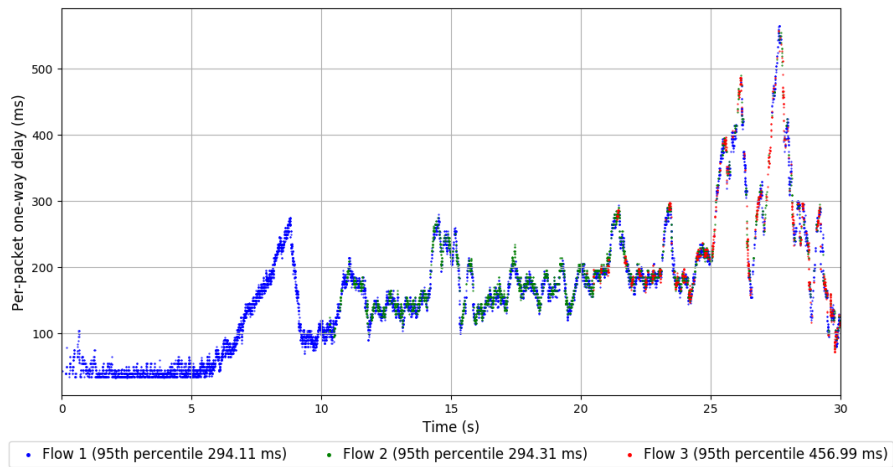
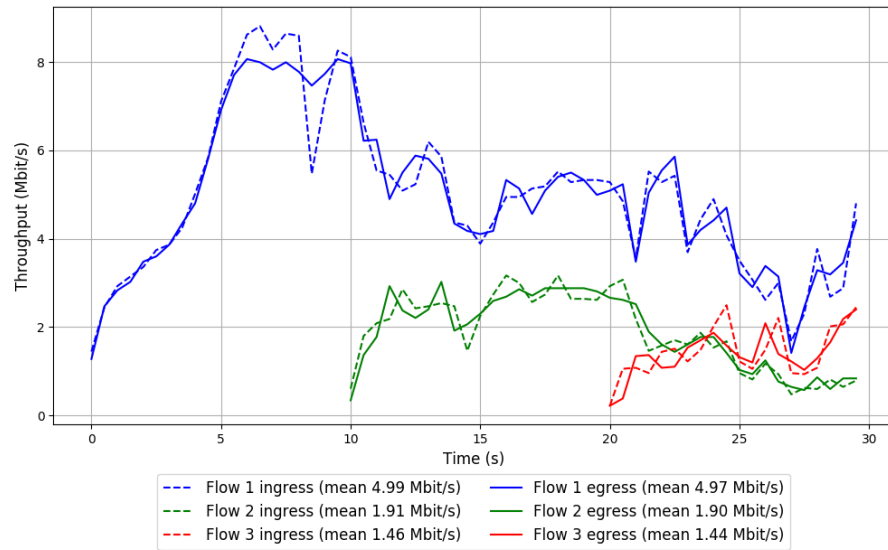


Run 3: Statistics of TCP Cubic

Start at: 2017-12-11 10:31:09
End at: 2017-12-11 10:31:39
Local clock offset: 0.76 ms
Remote clock offset: -12.754 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 314.635 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 4.97 Mbit/s
95th percentile per-packet one-way delay: 294.109 ms
Loss rate: 0.46%
-- Flow 2:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 294.308 ms
Loss rate: 0.47%
-- Flow 3:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 456.989 ms
Loss rate: 3.40%

Run 3: Report of TCP Cubic — Data Link

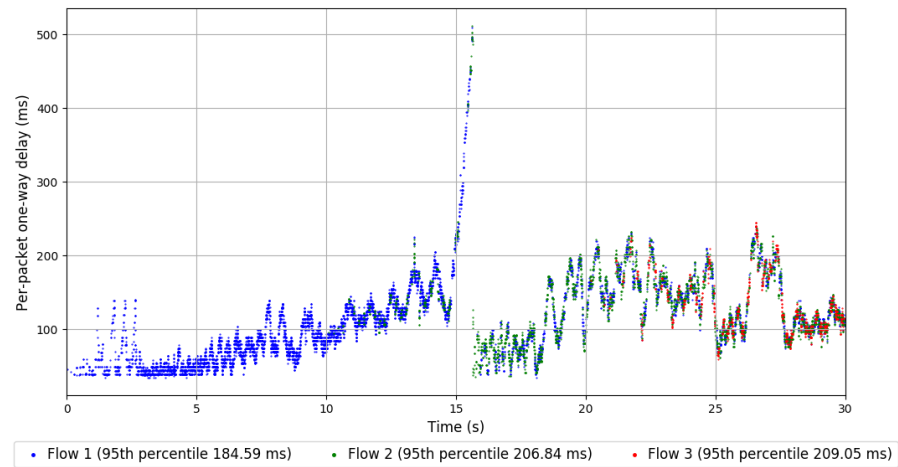
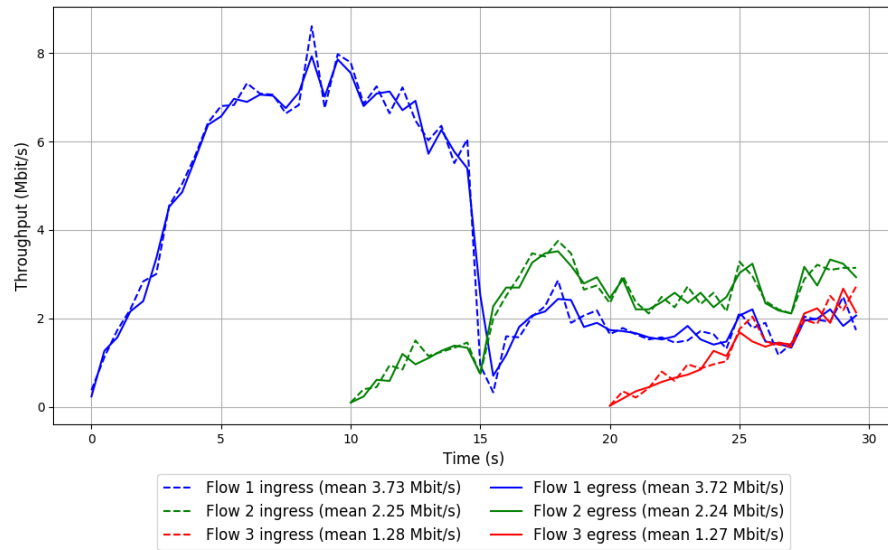


```
Run 1: Statistics of LEDBAT

Start at: 2017-12-11 10:03:16
End at: 2017-12-11 10:03:46
Local clock offset: -0.472 ms
Remote clock offset: -11.637 ms

# Below is generated by plot.py at 2017-12-11 10:36:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.62 Mbit/s
95th percentile per-packet one-way delay: 196.805 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 3.72 Mbit/s
95th percentile per-packet one-way delay: 184.593 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 206.842 ms
Loss rate: 0.86%
-- Flow 3:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 209.049 ms
Loss rate: 3.40%
```


Run 1: Report of LEDBAT — Data Link

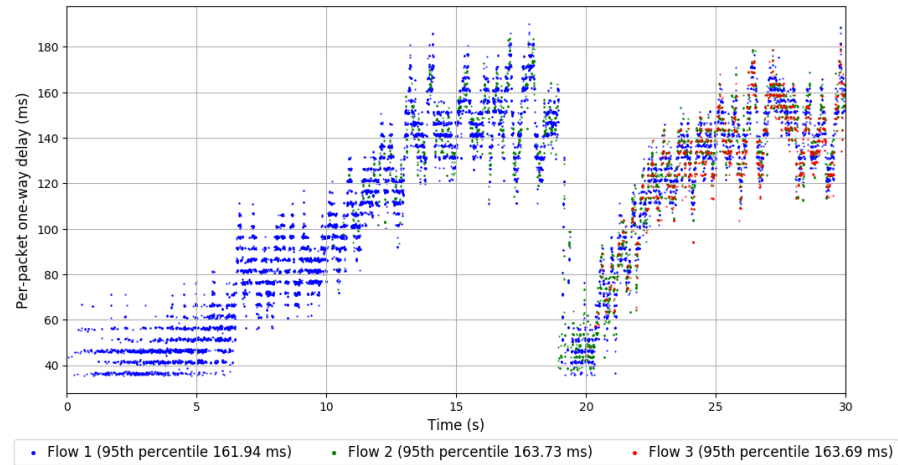
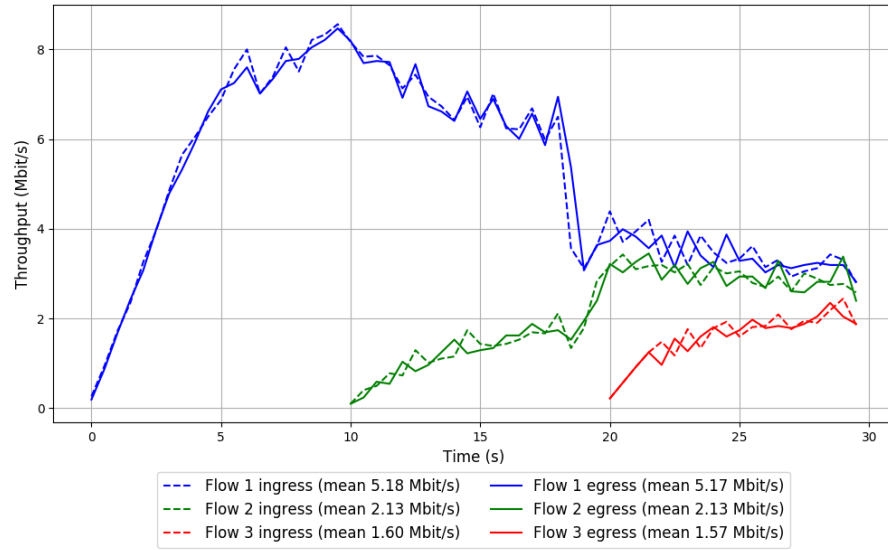


Run 2: Statistics of LEDBAT

Start at: 2017-12-11 10:18:45
End at: 2017-12-11 10:19:15
Local clock offset: 0.202 ms
Remote clock offset: -12.121 ms

Below is generated by plot.py at 2017-12-11 10:36:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.10 Mbit/s
95th percentile per-packet one-way delay: 163.448 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 5.17 Mbit/s
95th percentile per-packet one-way delay: 161.936 ms
Loss rate: 0.37%
-- Flow 2:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 163.731 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 163.689 ms
Loss rate: 2.51%

Run 2: Report of LEDBAT — Data Link

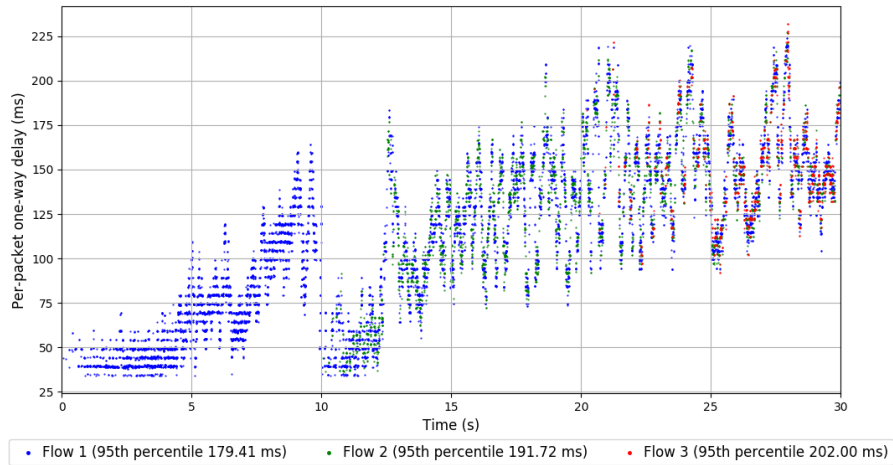
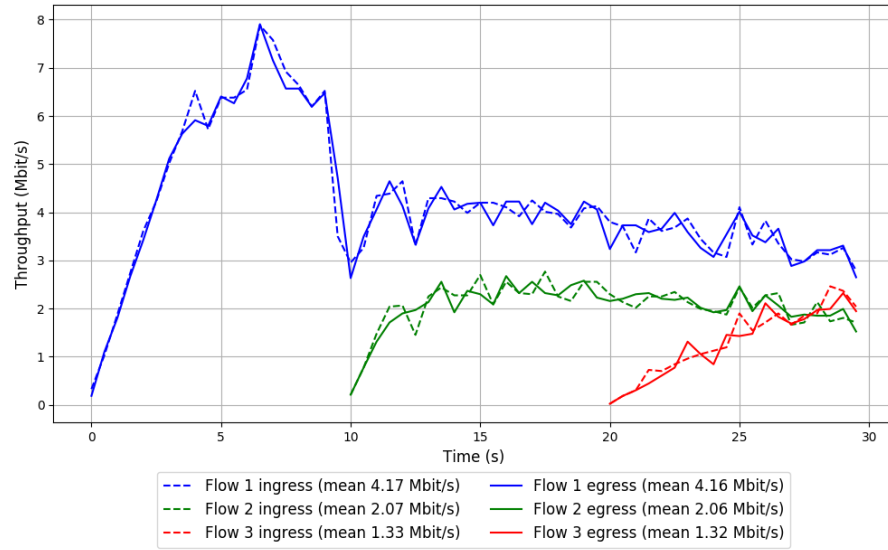


Run 3: Statistics of LEDBAT

Start at: 2017-12-11 10:34:28
End at: 2017-12-11 10:34:58
Local clock offset: 1.738 ms
Remote clock offset: -10.52 ms

Below is generated by plot.py at 2017-12-11 10:36:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.95 Mbit/s
95th percentile per-packet one-way delay: 186.609 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 4.16 Mbit/s
95th percentile per-packet one-way delay: 179.408 ms
Loss rate: 0.49%
-- Flow 2:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 191.715 ms
Loss rate: 0.85%
-- Flow 3:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 202.002 ms
Loss rate: 3.45%

Run 3: Report of LEDBAT — Data Link

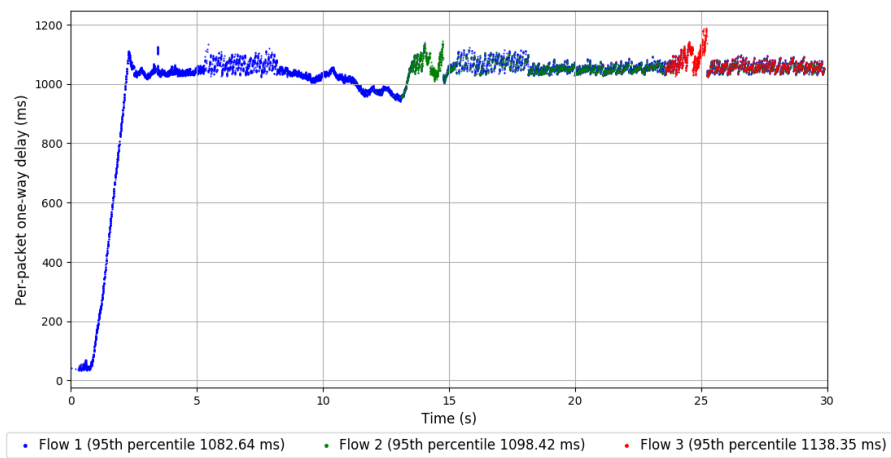
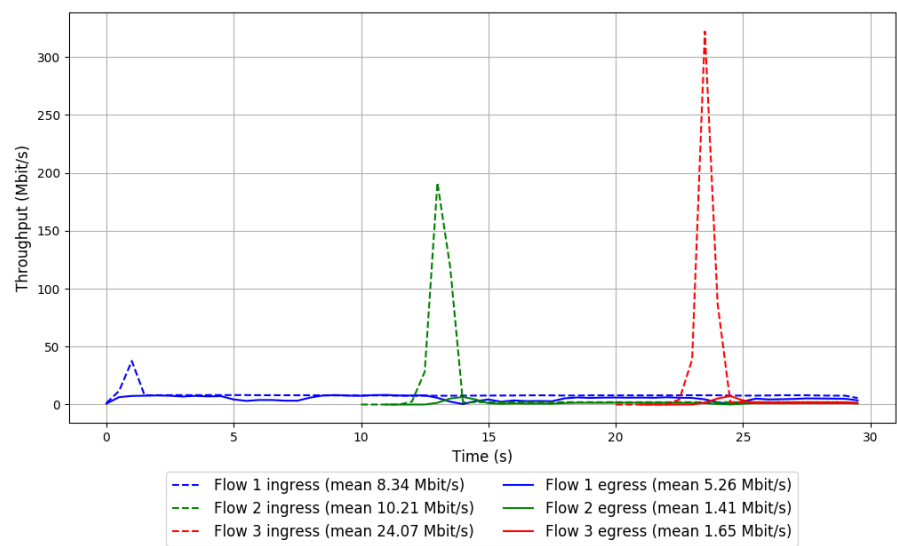


Run 1: Statistics of PCC

Start at: 2017-12-11 09:54:24
End at: 2017-12-11 09:54:54
Local clock offset: 1.108 ms
Remote clock offset: -12.22 ms

Below is generated by plot.py at 2017-12-11 10:36:26
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.64 Mbit/s
95th percentile per-packet one-way delay: 1093.173 ms
Loss rate: 71.27%
-- Flow 1:
Average throughput: 5.26 Mbit/s
95th percentile per-packet one-way delay: 1082.643 ms
Loss rate: 37.04%
-- Flow 2:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 1098.424 ms
Loss rate: 86.87%
-- Flow 3:
Average throughput: 1.65 Mbit/s
95th percentile per-packet one-way delay: 1138.350 ms
Loss rate: 93.90%

Run 1: Report of PCC — Data Link

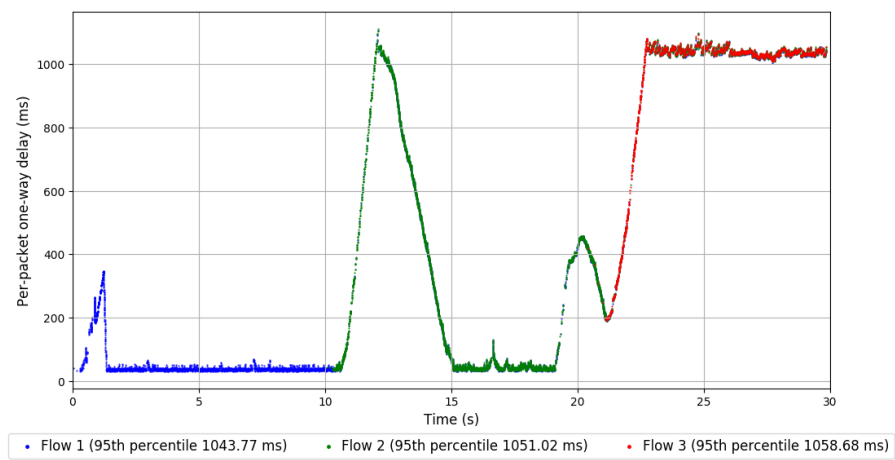
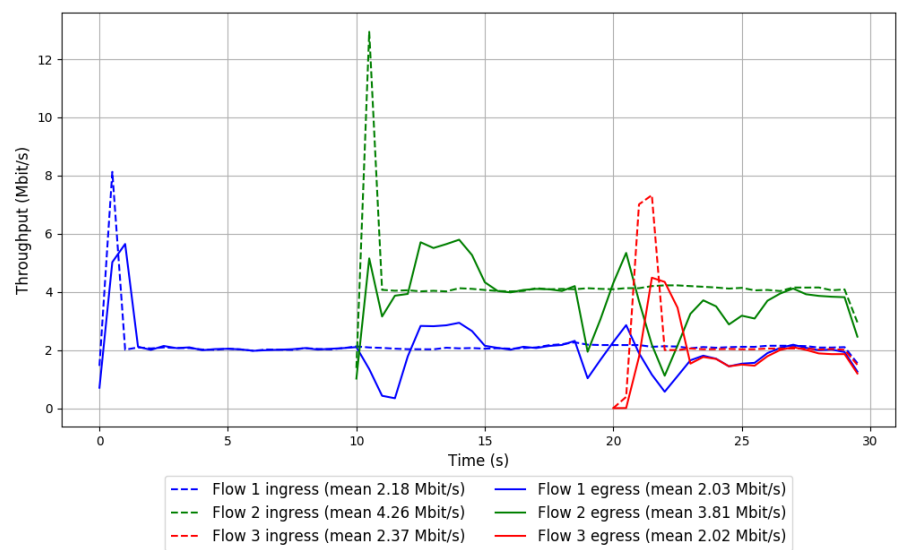


Run 2: Statistics of PCC

Start at: 2017-12-11 10:09:54
End at: 2017-12-11 10:10:24
Local clock offset: 1.92 ms
Remote clock offset: -11.913 ms

Below is generated by plot.py at 2017-12-11 10:36:26
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.20 Mbit/s
95th percentile per-packet one-way delay: 1050.034 ms
Loss rate: 10.36%
-- Flow 1:
Average throughput: 2.03 Mbit/s
95th percentile per-packet one-way delay: 1043.771 ms
Loss rate: 7.04%
-- Flow 2:
Average throughput: 3.81 Mbit/s
95th percentile per-packet one-way delay: 1051.016 ms
Loss rate: 10.73%
-- Flow 3:
Average throughput: 2.02 Mbit/s
95th percentile per-packet one-way delay: 1058.680 ms
Loss rate: 18.31%

Run 2: Report of PCC — Data Link

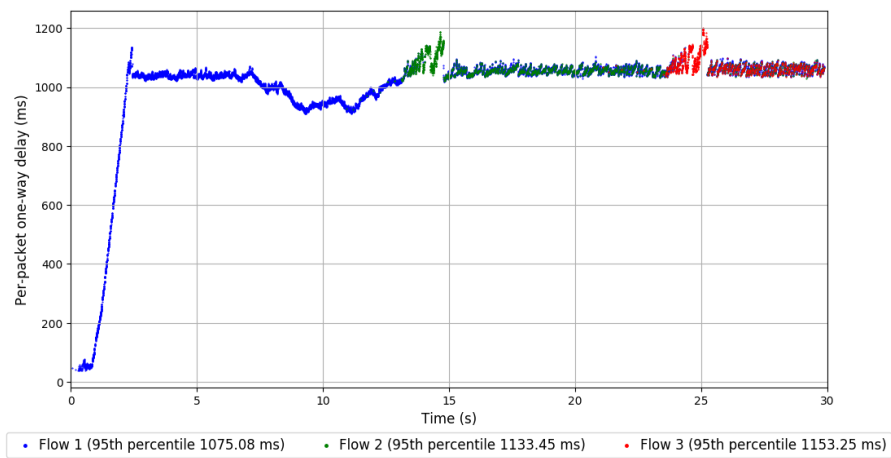
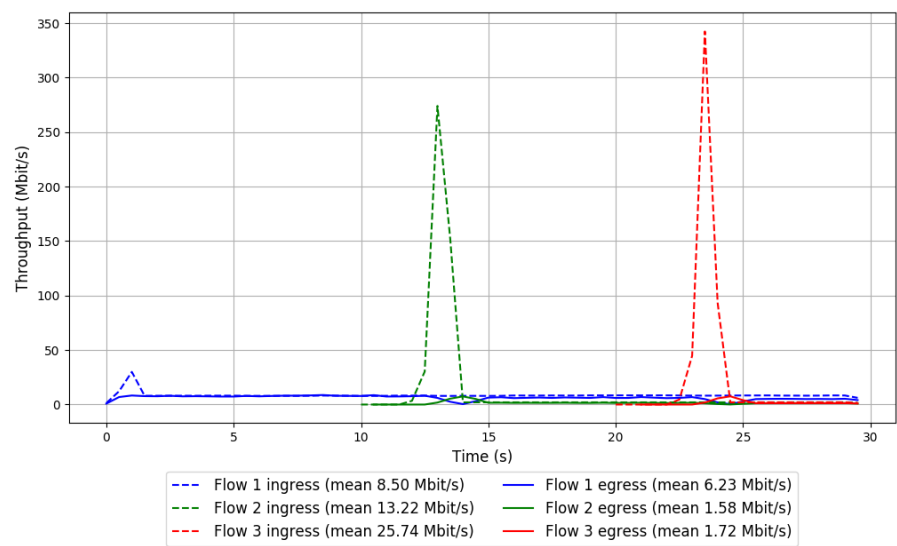


Run 3: Statistics of PCC

Start at: 2017-12-11 10:25:37
End at: 2017-12-11 10:26:07
Local clock offset: -2.53 ms
Remote clock offset: -10.16 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.74 Mbit/s
95th percentile per-packet one-way delay: 1093.790 ms
Loss rate: 70.02%
-- Flow 1:
Average throughput: 6.23 Mbit/s
95th percentile per-packet one-way delay: 1075.083 ms
Loss rate: 26.80%
-- Flow 2:
Average throughput: 1.58 Mbit/s
95th percentile per-packet one-way delay: 1133.453 ms
Loss rate: 88.62%
-- Flow 3:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 1153.248 ms
Loss rate: 94.04%

Run 3: Report of PCC — Data Link

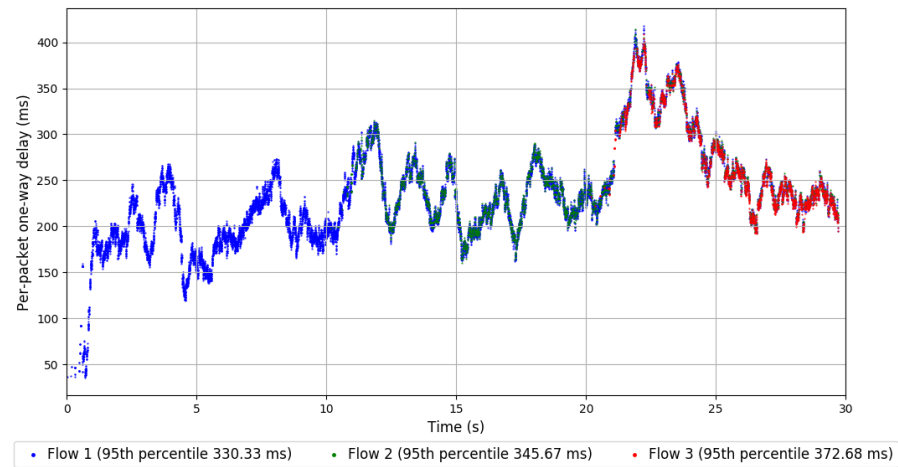
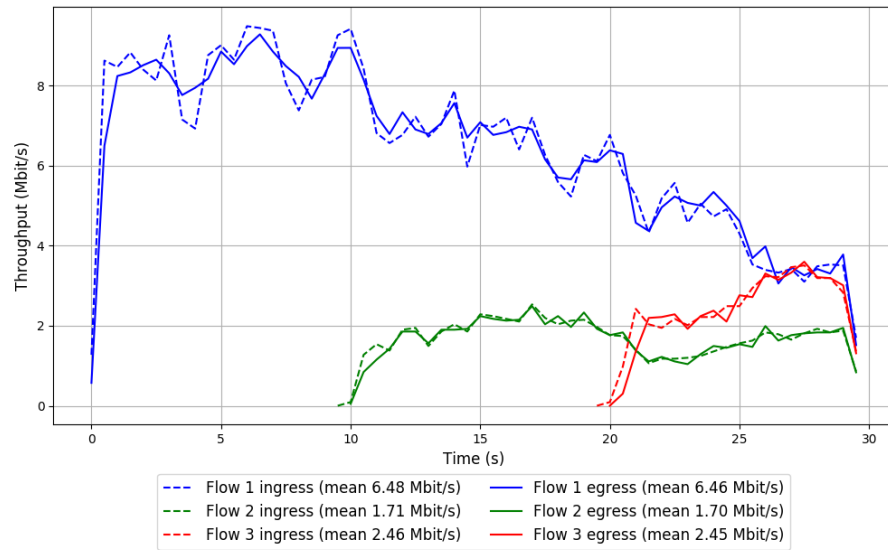


Run 1: Statistics of QUIC Cubic

Start at: 2017-12-11 09:48:49
End at: 2017-12-11 09:49:19
Local clock offset: 2.635 ms
Remote clock offset: -11.564 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 8.36 Mbit/s
95th percentile per-packet one-way delay: 341.893 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 6.46 Mbit/s
95th percentile per-packet one-way delay: 330.328 ms
Loss rate: 0.57%
-- Flow 2:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 345.669 ms
Loss rate: 1.57%
-- Flow 3:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 372.679 ms
Loss rate: 2.97%

Run 1: Report of QUIC Cubic — Data Link

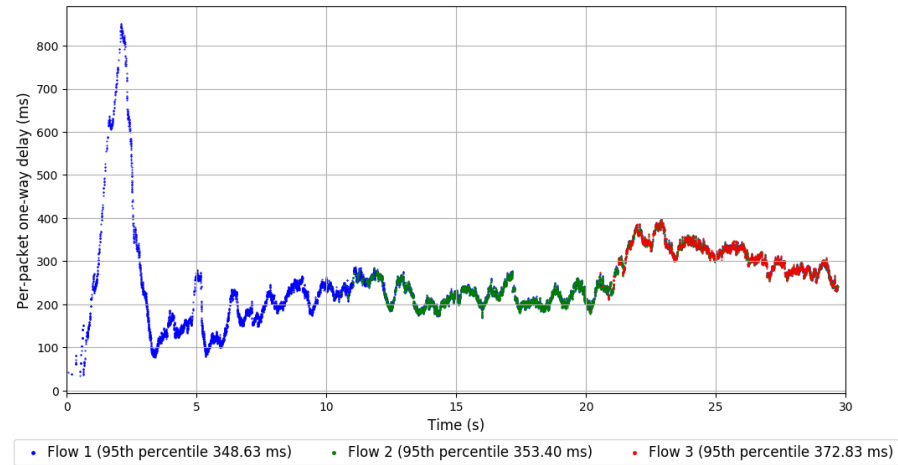
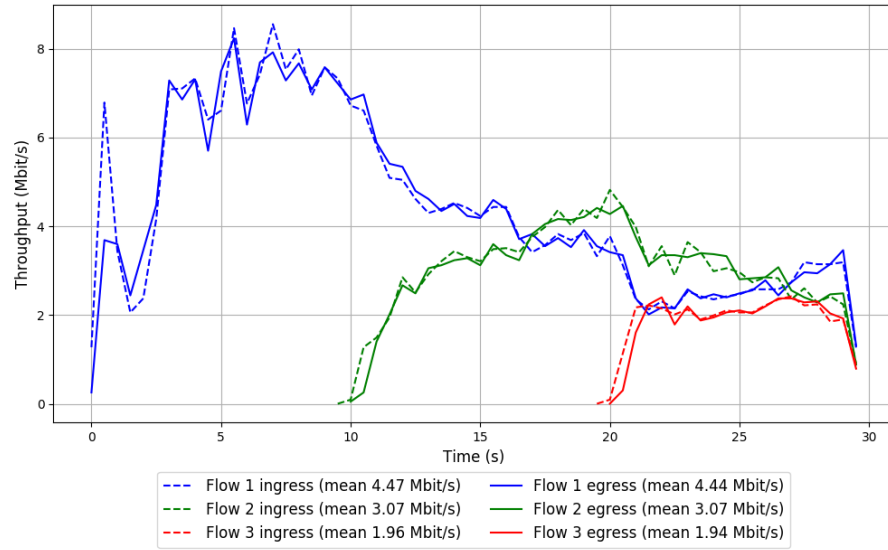


Run 2: Statistics of QUIC Cubic

Start at: 2017-12-11 10:04:23
End at: 2017-12-11 10:04:53
Local clock offset: 3.361 ms
Remote clock offset: -11.43 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.09 Mbit/s
95th percentile per-packet one-way delay: 355.001 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 4.44 Mbit/s
95th percentile per-packet one-way delay: 348.634 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 353.397 ms
Loss rate: 1.17%
-- Flow 3:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 372.835 ms
Loss rate: 3.27%

Run 2: Report of QUIC Cubic — Data Link

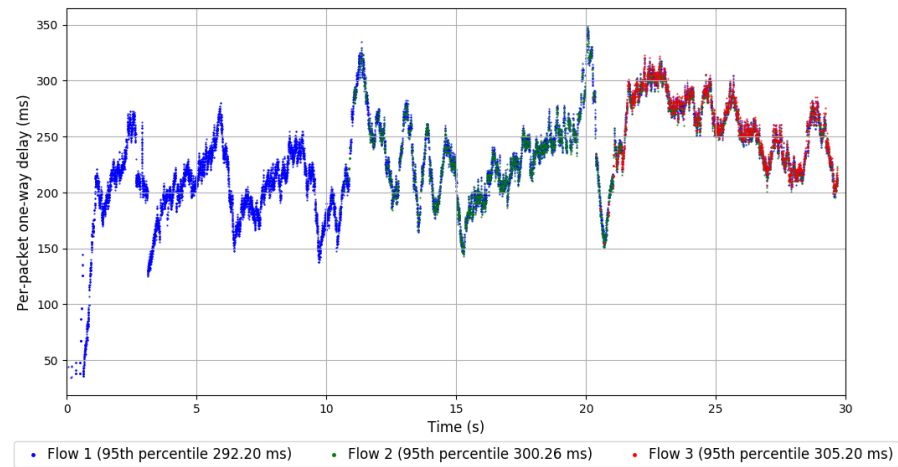
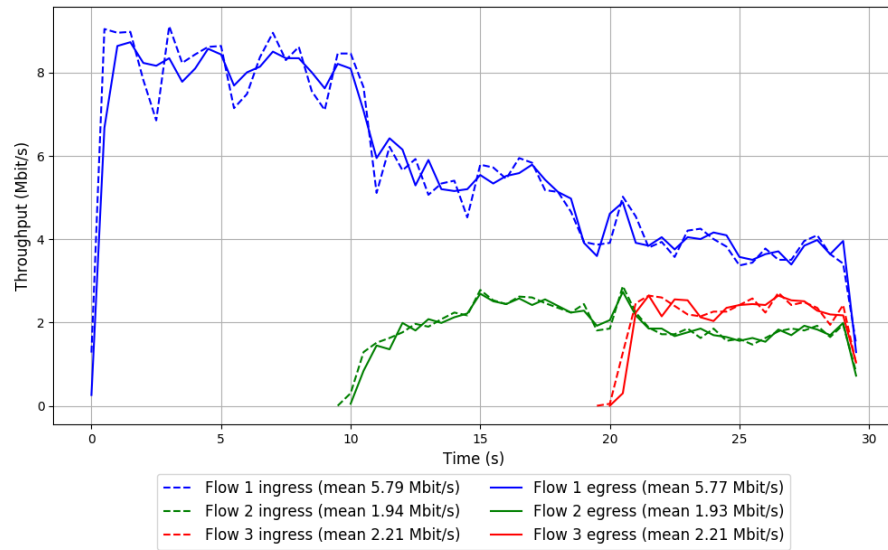


Run 3: Statistics of QUIC Cubic

Start at: 2017-12-11 10:19:59
End at: 2017-12-11 10:20:29
Local clock offset: 0.964 ms
Remote clock offset: -12.446 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.75 Mbit/s
95th percentile per-packet one-way delay: 296.711 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 5.77 Mbit/s
95th percentile per-packet one-way delay: 292.205 ms
Loss rate: 0.62%
-- Flow 2:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 300.256 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 305.205 ms
Loss rate: 3.01%

Run 3: Report of QUIC Cubic — Data Link

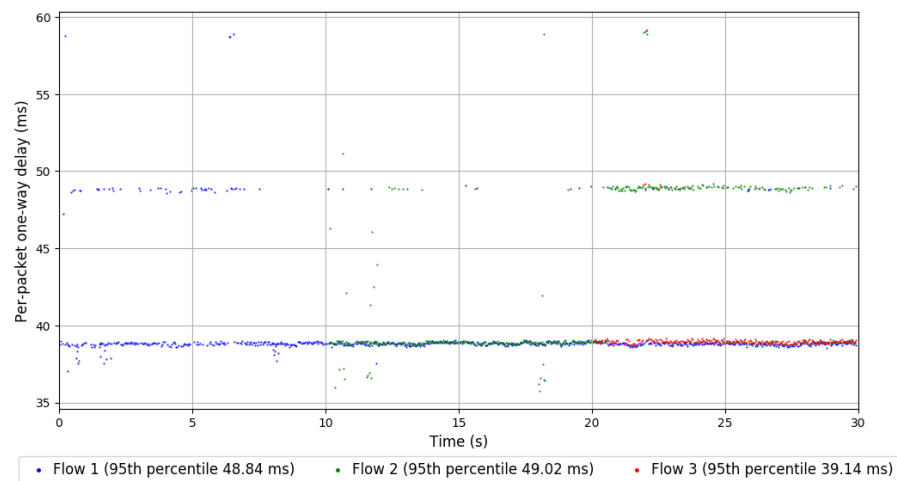
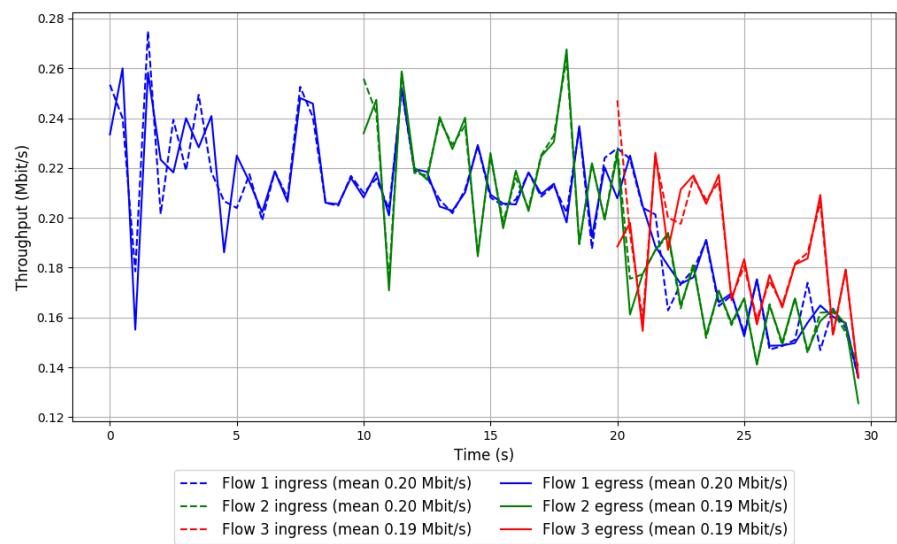


```
Run 1: Statistics of SCReAM

Start at: 2017-12-11 10:01:03
End at: 2017-12-11 10:01:33
Local clock offset: 1.222 ms
Remote clock offset: -12.558 ms

# Below is generated by plot.py at 2017-12-11 10:36:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 48.944 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 48.840 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 49.020 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 39.139 ms
Loss rate: 1.38%
```

Run 1: Report of SReAM — Data Link

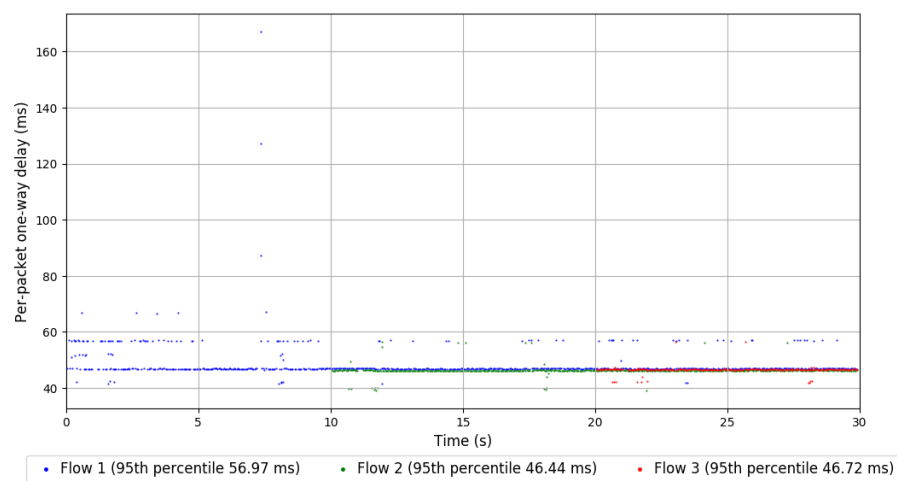
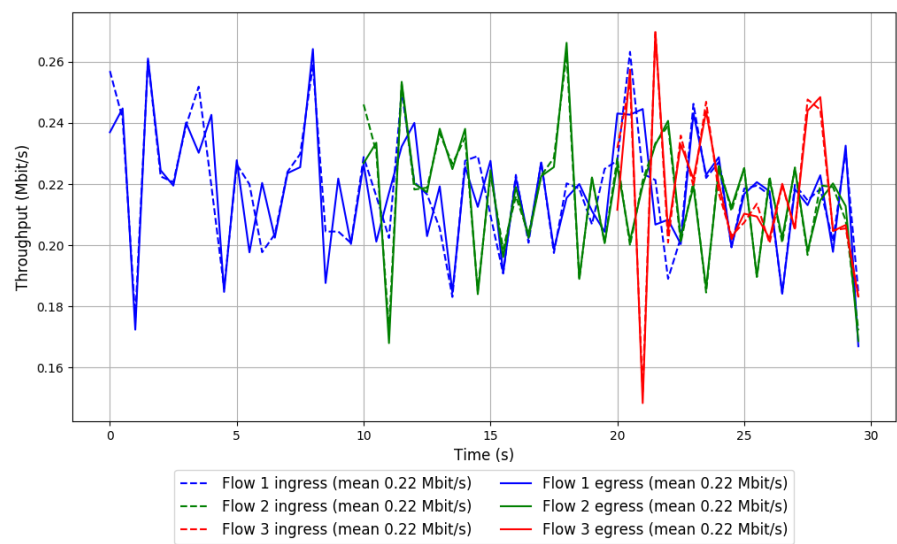


Run 2: Statistics of SReAM

Start at: 2017-12-11 10:16:33
End at: 2017-12-11 10:17:03
Local clock offset: -3.096 ms
Remote clock offset: -11.175 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 56.805 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 56.973 ms
Loss rate: 0.26%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.439 ms
Loss rate: 0.21%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.719 ms
Loss rate: 0.35%

Run 2: Report of SReAM — Data Link

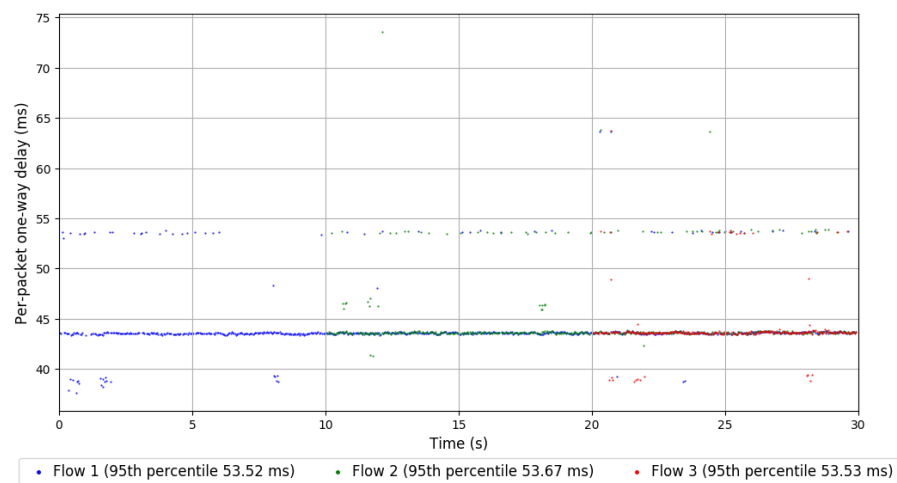
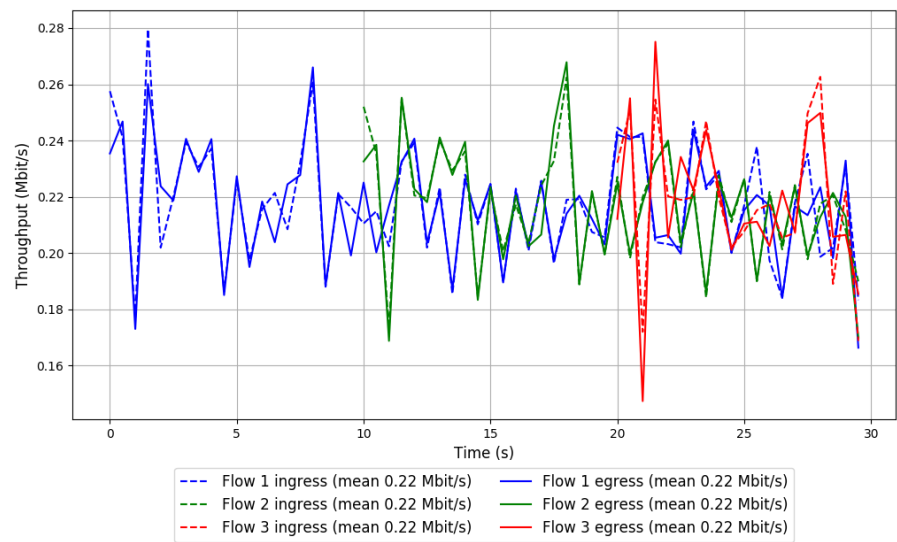


Run 3: Statistics of SReAM

Start at: 2017-12-11 10:32:16
End at: 2017-12-11 10:32:46
Local clock offset: -0.561 ms
Remote clock offset: -11.989 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 53.619 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 53.520 ms
Loss rate: 0.26%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 53.670 ms
Loss rate: 0.40%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 53.530 ms
Loss rate: 0.35%

Run 3: Report of SReAM — Data Link

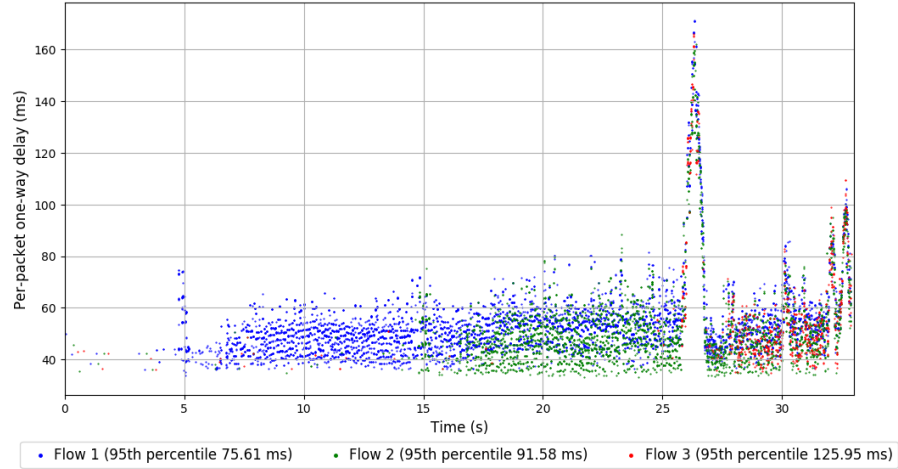
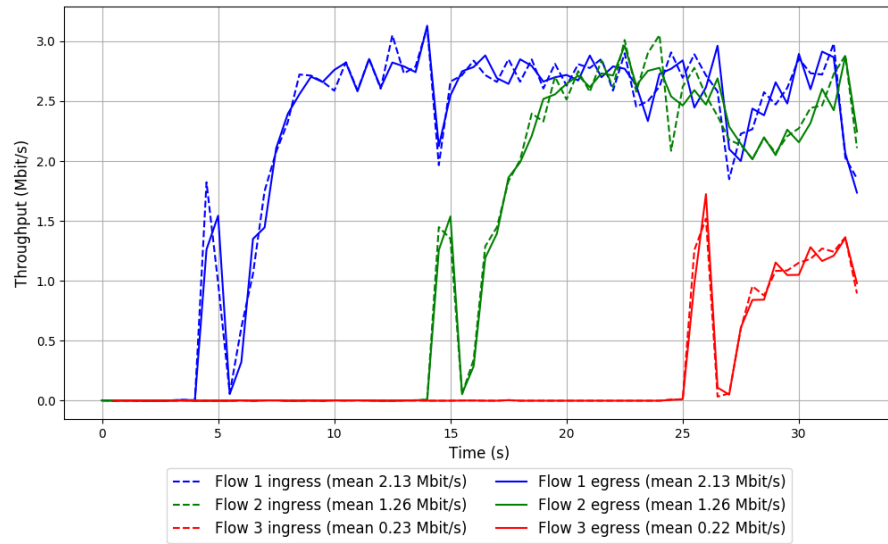


Run 1: Statistics of WebRTC media

Start at: 2017-12-11 09:51:03
End at: 2017-12-11 09:51:33
Local clock offset: 0.672 ms
Remote clock offset: -13.332 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.59 Mbit/s
95th percentile per-packet one-way delay: 86.786 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 75.611 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 91.575 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 125.953 ms
Loss rate: 1.24%

Run 1: Report of WebRTC media — Data Link

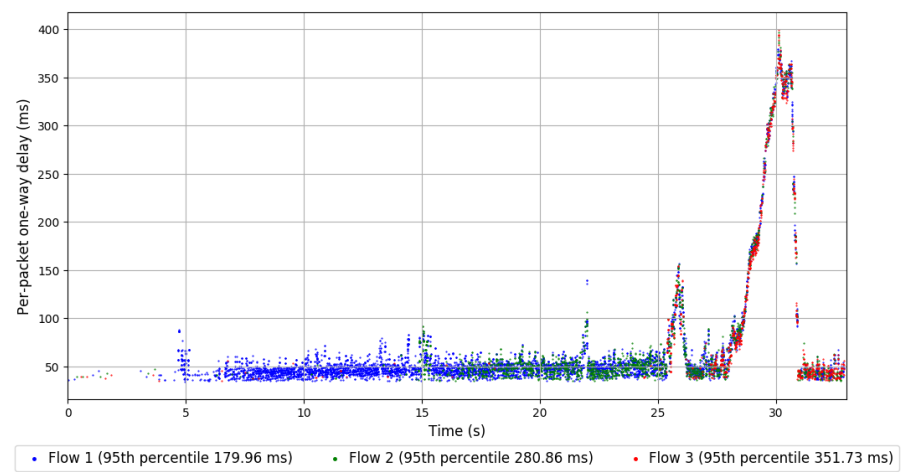
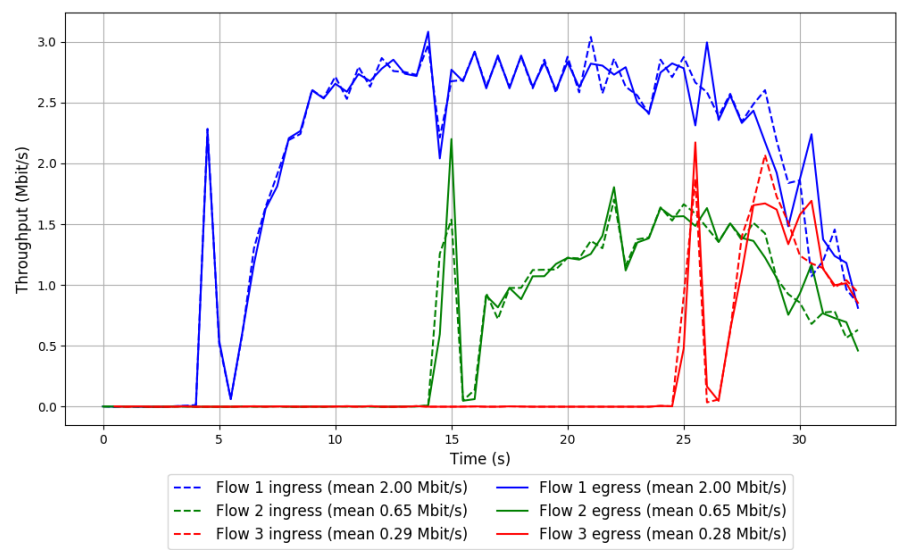


Run 2: Statistics of WebRTC media

Start at: 2017-12-11 10:06:35
End at: 2017-12-11 10:07:05
Local clock offset: -0.477 ms
Remote clock offset: -12.044 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 284.399 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 179.958 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 280.863 ms
Loss rate: 0.45%
-- Flow 3:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 351.734 ms
Loss rate: 1.39%

Run 2: Report of WebRTC media — Data Link

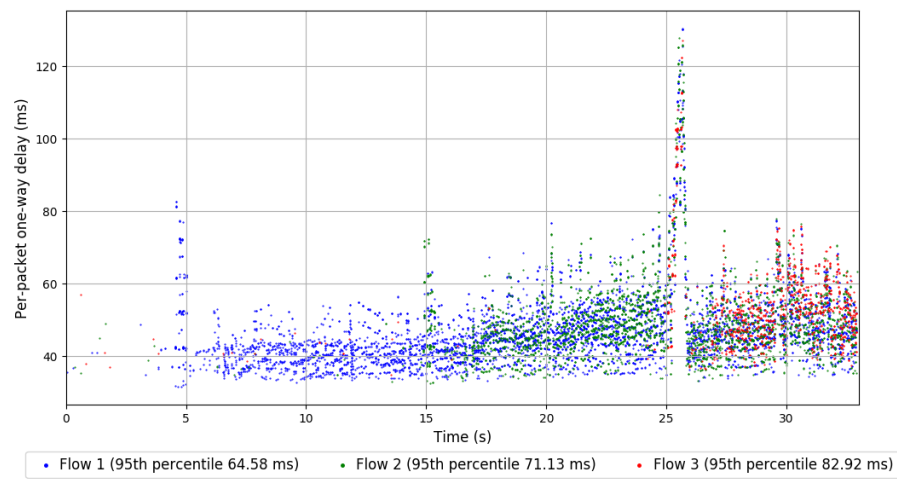
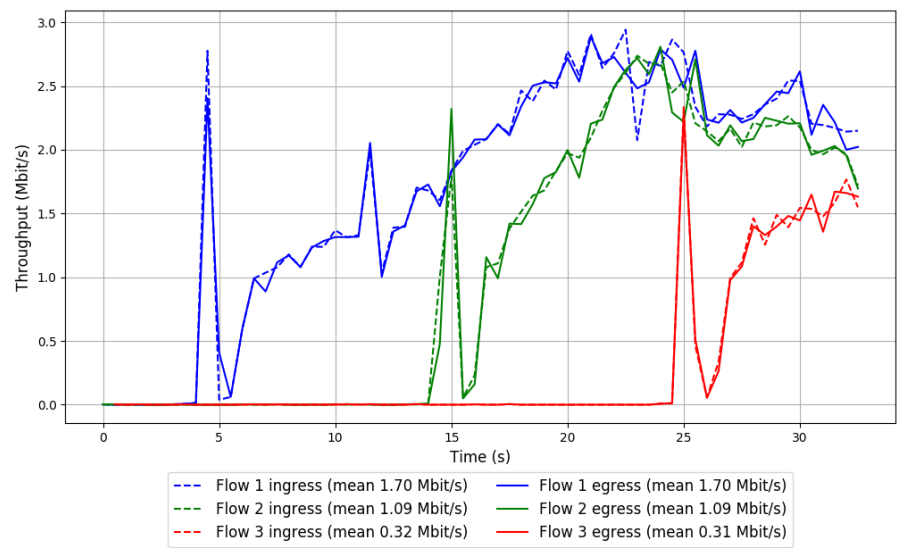


Run 3: Statistics of WebRTC media

Start at: 2017-12-11 10:22:17
End at: 2017-12-11 10:22:47
Local clock offset: 1.217 ms
Remote clock offset: -10.976 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 69.041 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 64.585 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 71.132 ms
Loss rate: 0.33%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 82.920 ms
Loss rate: 0.80%

Run 3: Report of WebRTC media — Data Link

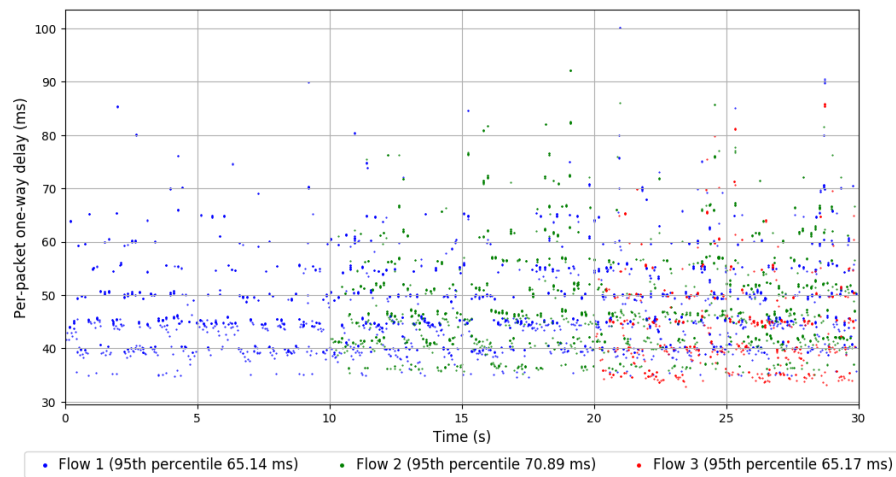
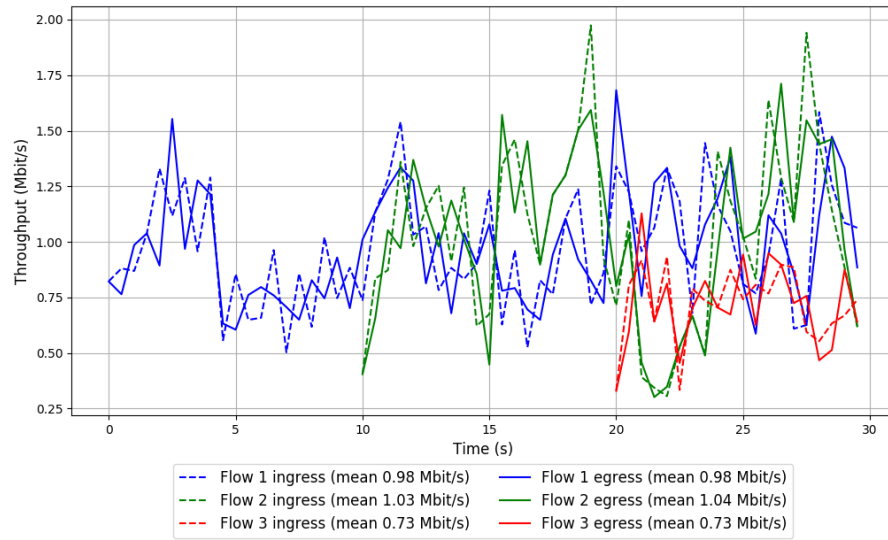


Run 1: Statistics of Sprout

Start at: 2017-12-11 09:58:50
End at: 2017-12-11 09:59:20
Local clock offset: 1.705 ms
Remote clock offset: -12.758 ms

Below is generated by plot.py at 2017-12-11 10:36:29
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 66.434 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 65.137 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 70.893 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 65.165 ms
Loss rate: 0.70%

Run 1: Report of Sprout — Data Link

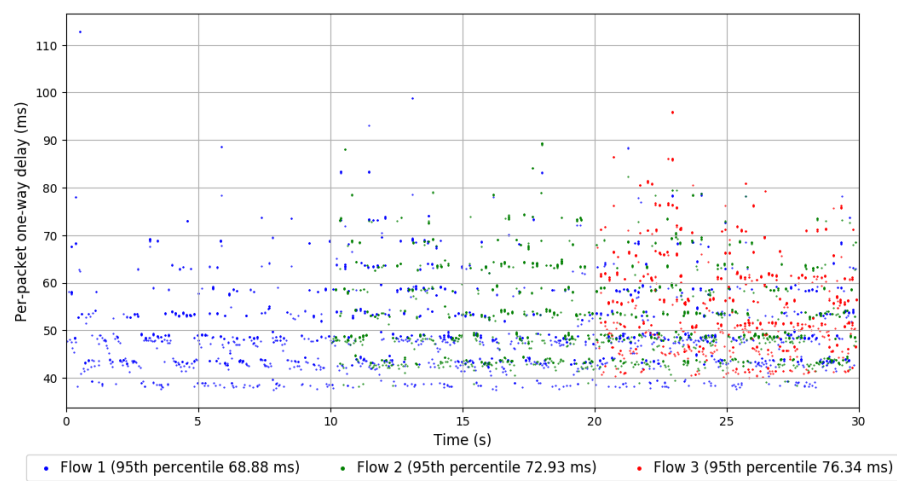
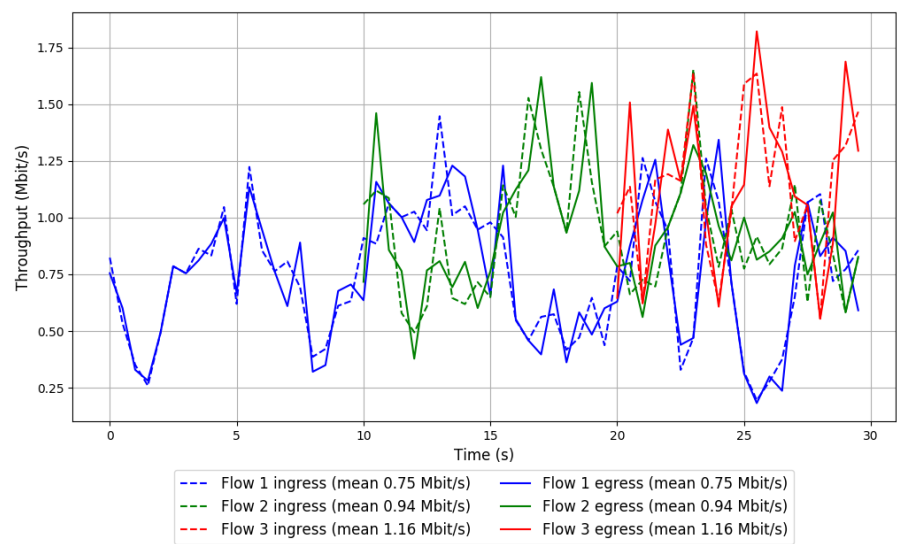


Run 2: Statistics of Sprout

Start at: 2017-12-11 10:14:20
End at: 2017-12-11 10:14:50
Local clock offset: -1.708 ms
Remote clock offset: -9.837 ms

```
# Below is generated by plot.py at 2017-12-11 10:36:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 72.640 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 68.878 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 72.929 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 76.341 ms
Loss rate: 0.75%
```


Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2017-12-11 10:30:03

End at: 2017-12-11 10:30:33

Local clock offset: -2.958 ms

Remote clock offset: -11.4 ms

Below is generated by plot.py at 2017-12-11 10:36:29

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.67 Mbit/s

95th percentile per-packet one-way delay: 75.657 ms

Loss rate: 0.25%

-- Flow 1:

Average throughput: 0.83 Mbit/s

95th percentile per-packet one-way delay: 75.631 ms

Loss rate: 0.33%

-- Flow 2:

Average throughput: 0.97 Mbit/s

95th percentile per-packet one-way delay: 75.455 ms

Loss rate: 0.23%

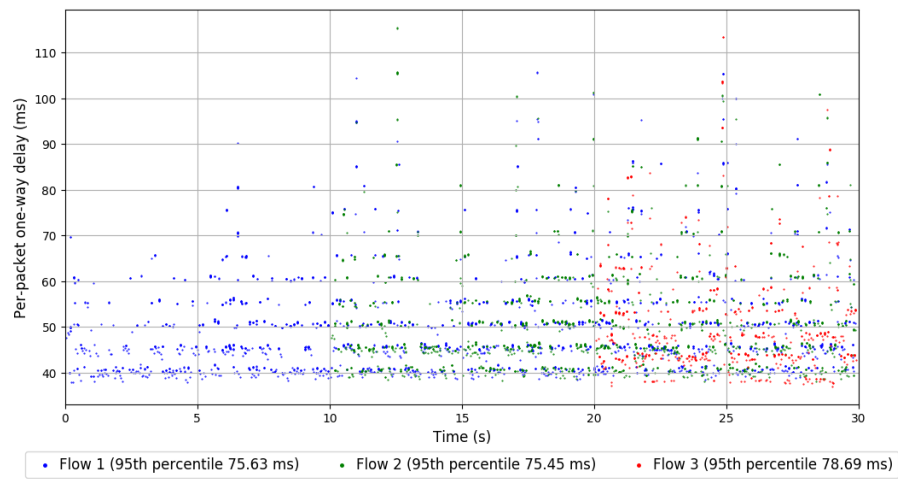
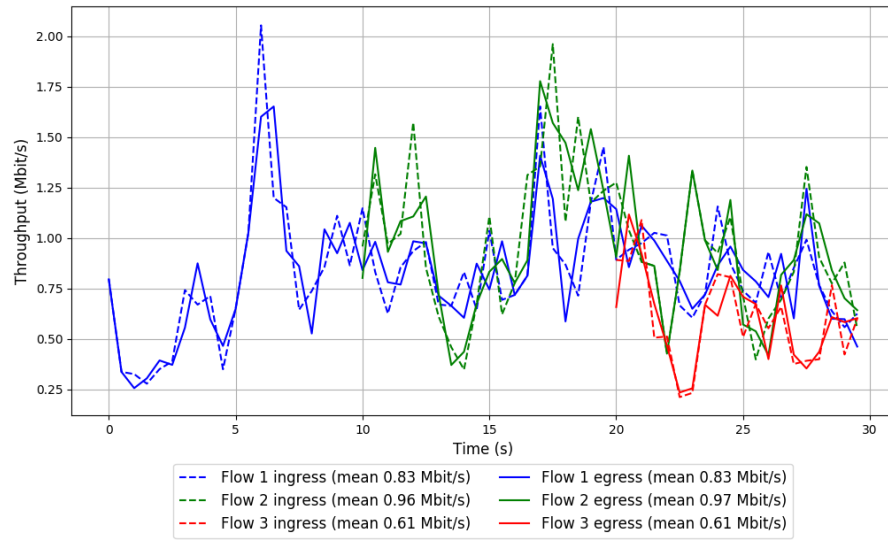
-- Flow 3:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 78.689 ms

Loss rate: 0.00%

Run 3: Report of Sprout — Data Link

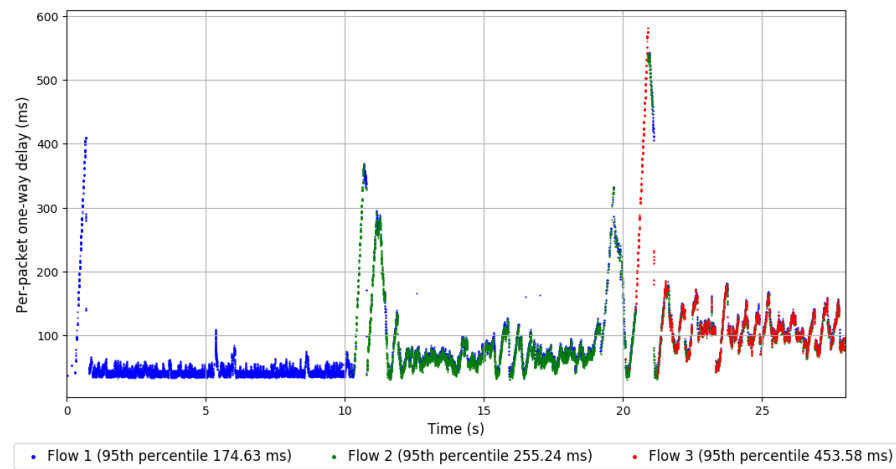
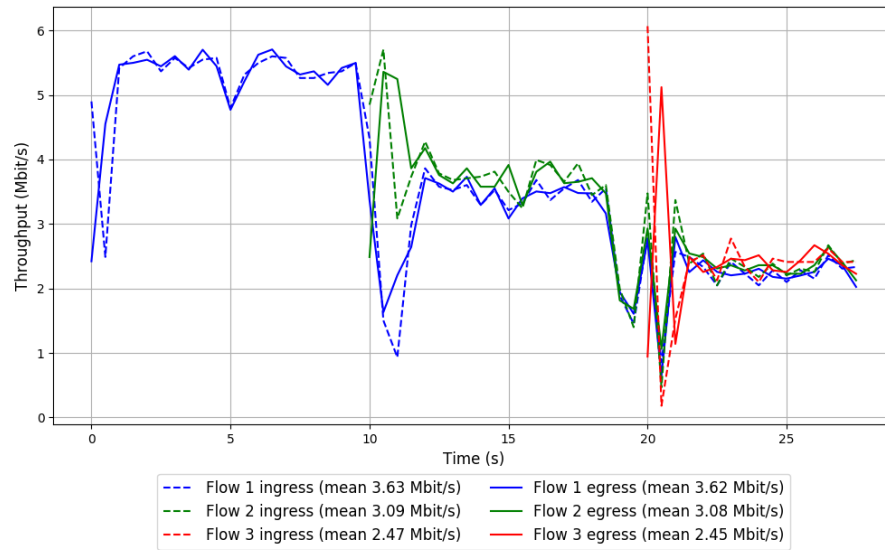


Run 1: Statistics of TaoVA-100x

Start at: 2017-12-11 09:53:16
End at: 2017-12-11 09:53:47
Local clock offset: 2.891 ms
Remote clock offset: -12.03 ms

Below is generated by plot.py at 2017-12-11 10:36:40
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.28 Mbit/s
95th percentile per-packet one-way delay: 253.191 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 3.62 Mbit/s
95th percentile per-packet one-way delay: 174.626 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 255.243 ms
Loss rate: 0.77%
-- Flow 3:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 453.576 ms
Loss rate: 1.80%

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



Run 2: Statistics of TaoVA-100x

Start at: 2017-12-11 10:08:48

End at: 2017-12-11 10:09:18

Local clock offset: -1.449 ms

Remote clock offset: -11.838 ms

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

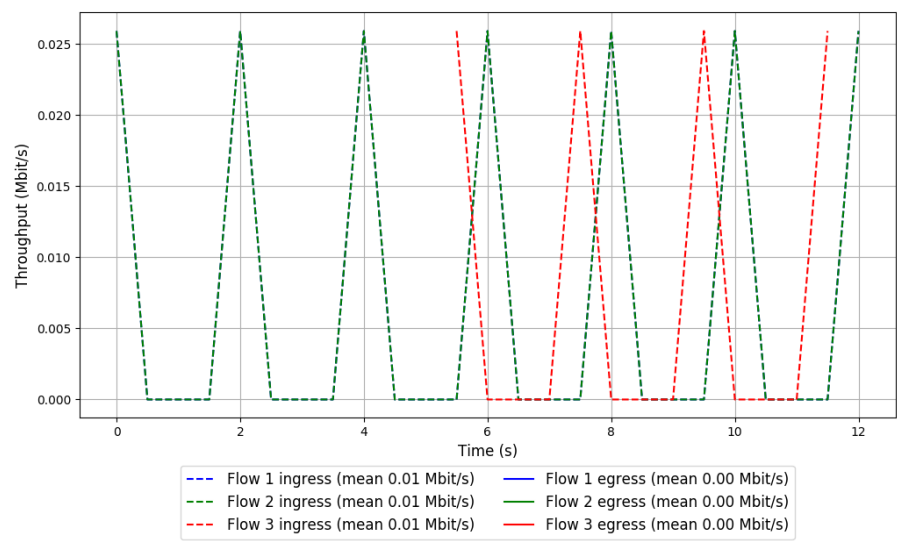


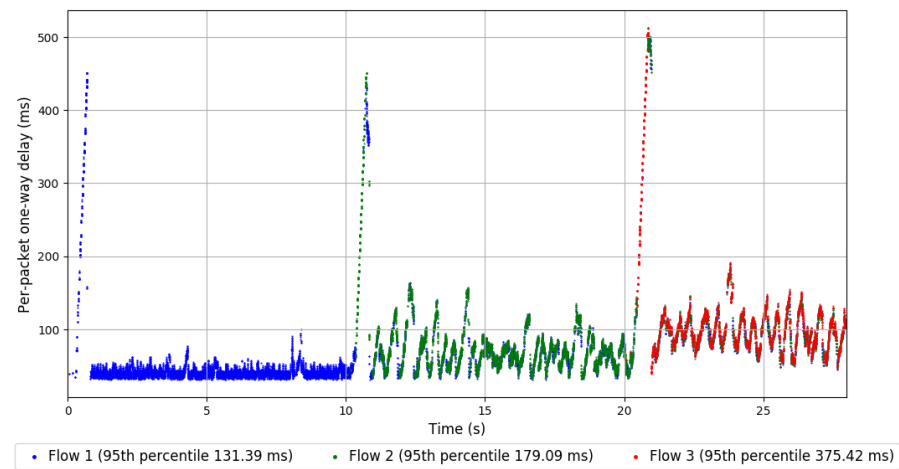
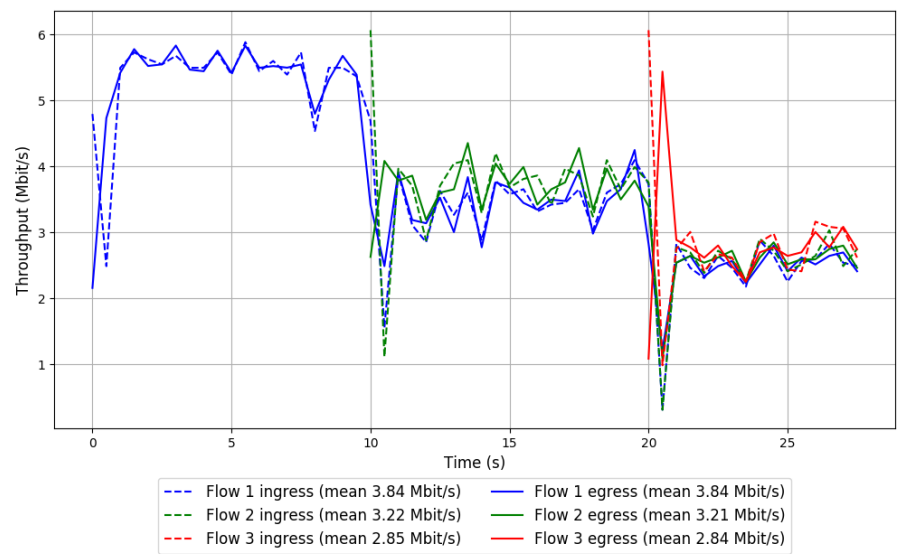
Figure is missing

Run 3: Statistics of TaoVA-100x

Start at: 2017-12-11 10:24:30
End at: 2017-12-11 10:25:00
Local clock offset: -0.384 ms
Remote clock offset: -12.285 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 171.270 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 3.84 Mbit/s
95th percentile per-packet one-way delay: 131.394 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 179.086 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 2.84 Mbit/s
95th percentile per-packet one-way delay: 375.418 ms
Loss rate: 1.32%

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

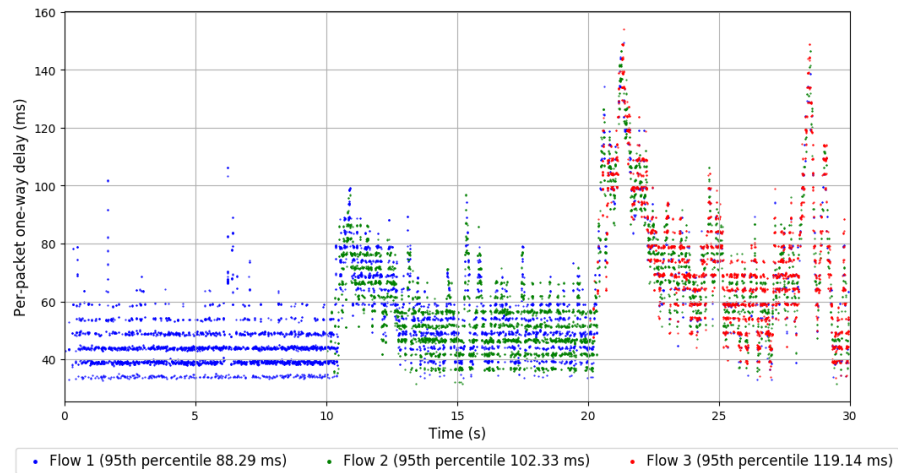
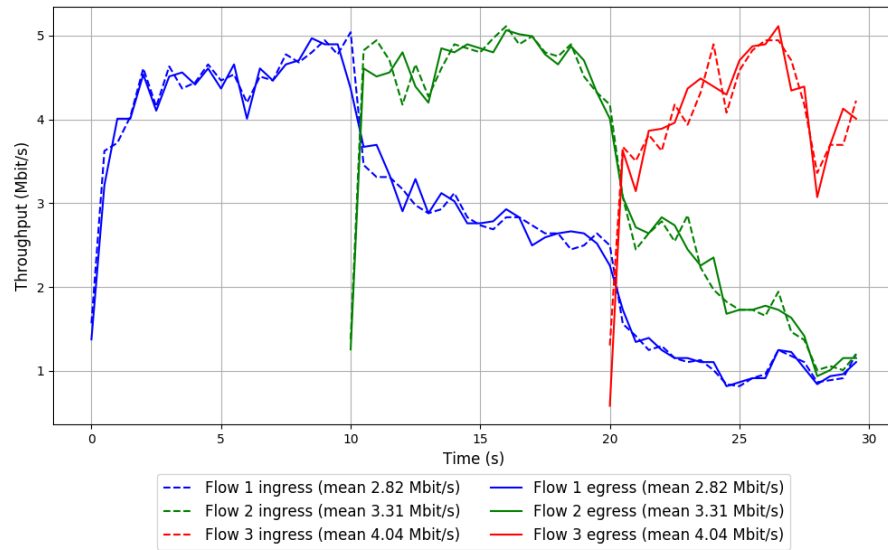


Run 1: Statistics of TCP Vegas

Start at: 2017-12-11 10:02:09
End at: 2017-12-11 10:02:39
Local clock offset: 3.02 ms
Remote clock offset: -10.646 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.36 Mbit/s
95th percentile per-packet one-way delay: 104.715 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 2.82 Mbit/s
95th percentile per-packet one-way delay: 88.287 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 102.325 ms
Loss rate: 0.11%
-- Flow 3:
Average throughput: 4.04 Mbit/s
95th percentile per-packet one-way delay: 119.140 ms
Loss rate: 0.81%

Run 1: Report of TCP Vegas — Data Link

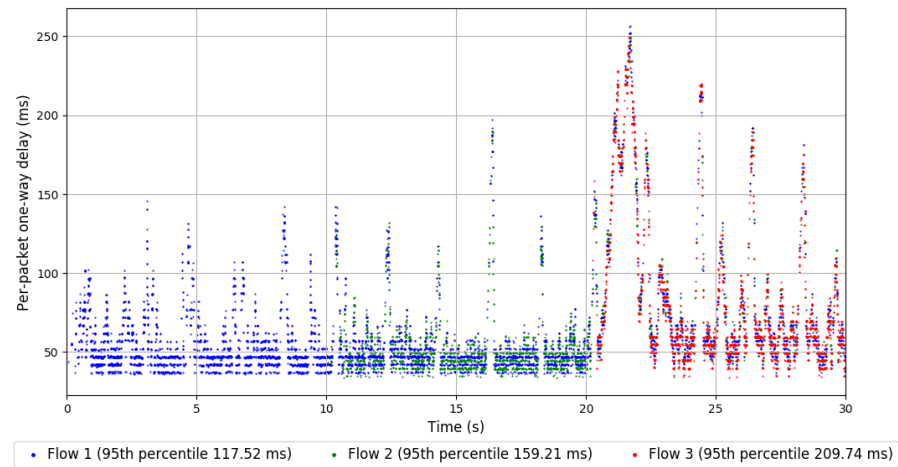
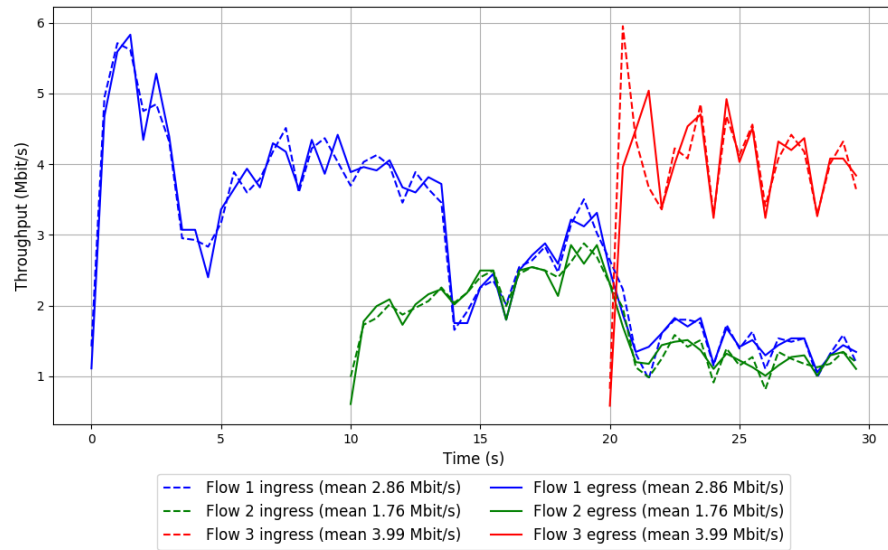


Run 2: Statistics of TCP Vegas

Start at: 2017-12-11 10:17:39
End at: 2017-12-11 10:18:09
Local clock offset: -0.448 ms
Remote clock offset: -11.924 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.34 Mbit/s
95th percentile per-packet one-way delay: 169.685 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 2.86 Mbit/s
95th percentile per-packet one-way delay: 117.519 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 159.206 ms
Loss rate: 0.27%
-- Flow 3:
Average throughput: 3.99 Mbit/s
95th percentile per-packet one-way delay: 209.738 ms
Loss rate: 0.64%

Run 2: Report of TCP Vegas — Data Link

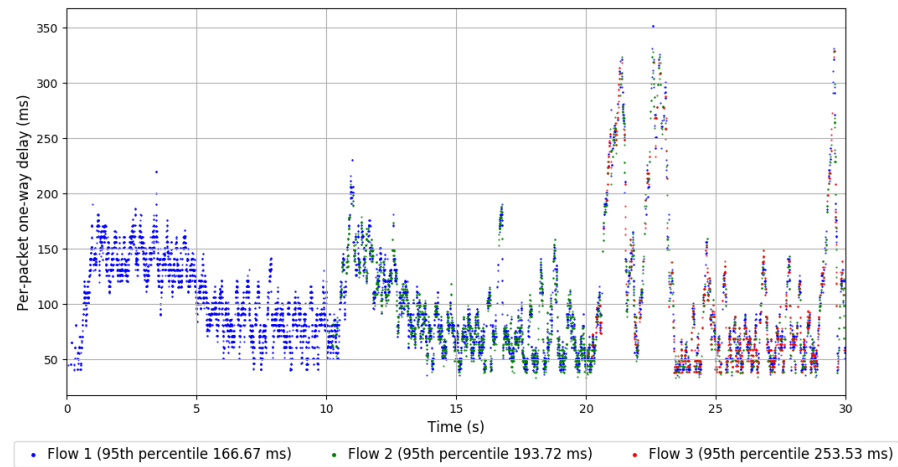
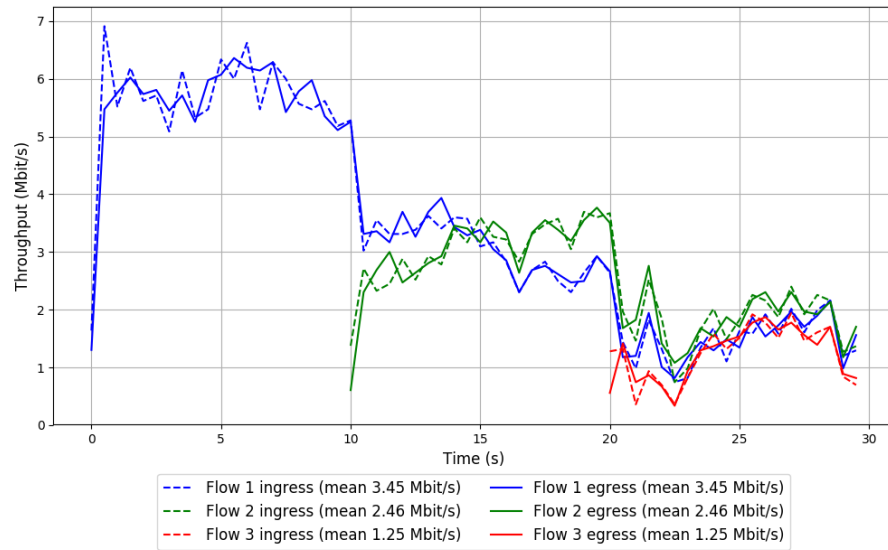


Run 3: Statistics of TCP Vegas

Start at: 2017-12-11 10:33:22
End at: 2017-12-11 10:33:52
Local clock offset: 0.223 ms
Remote clock offset: -9.945 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.49 Mbit/s
95th percentile per-packet one-way delay: 175.919 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 3.45 Mbit/s
95th percentile per-packet one-way delay: 166.672 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 2.46 Mbit/s
95th percentile per-packet one-way delay: 193.722 ms
Loss rate: 0.29%
-- Flow 3:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 253.535 ms
Loss rate: 1.06%

Run 3: Report of TCP Vegas — Data Link

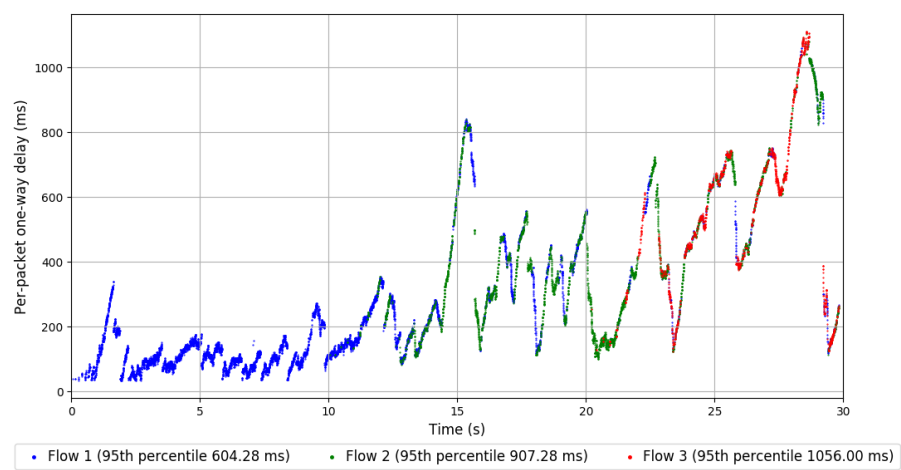
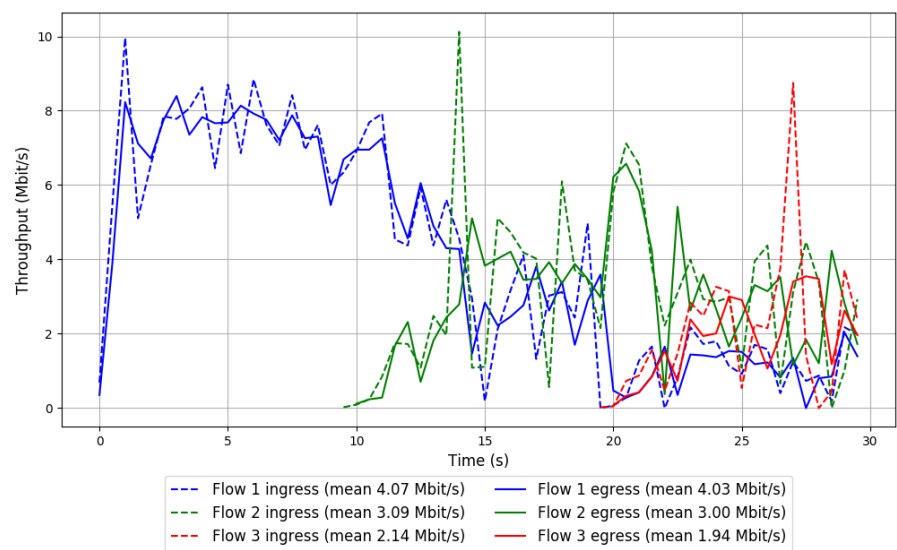


Run 1: Statistics of Verus

Start at: 2017-12-11 09:52:09
End at: 2017-12-11 09:52:39
Local clock offset: 2.835 ms
Remote clock offset: -12.808 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.65 Mbit/s
95th percentile per-packet one-way delay: 784.296 ms
Loss rate: 2.95%
-- Flow 1:
Average throughput: 4.03 Mbit/s
95th percentile per-packet one-way delay: 604.278 ms
Loss rate: 1.20%
-- Flow 2:
Average throughput: 3.00 Mbit/s
95th percentile per-packet one-way delay: 907.285 ms
Loss rate: 3.44%
-- Flow 3:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 1055.997 ms
Loss rate: 11.62%

Run 1: Report of Verus — Data Link

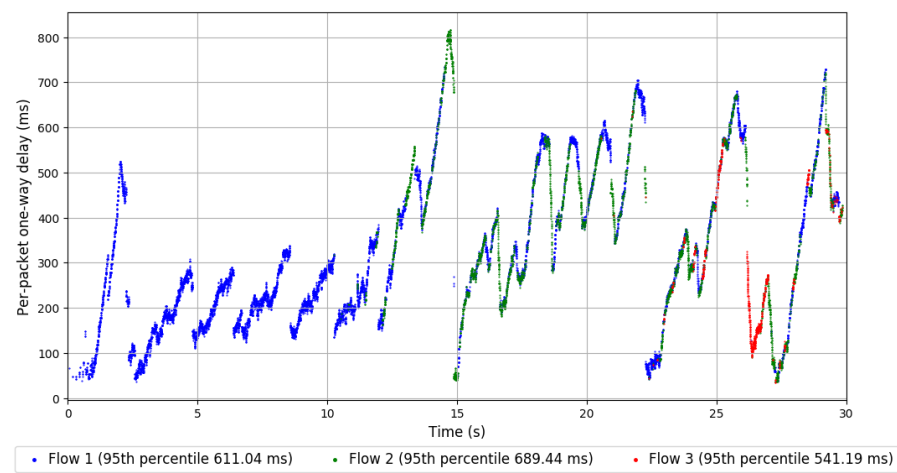
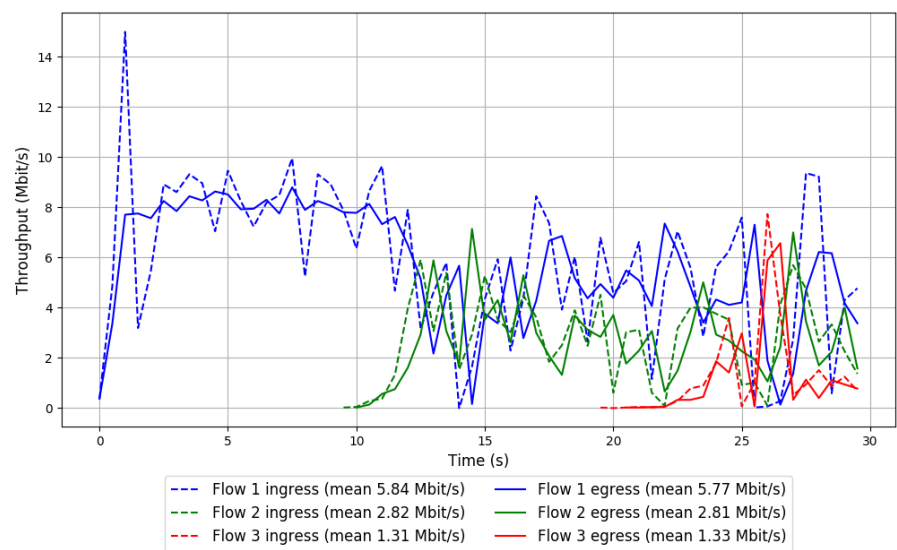


Run 2: Statistics of Verus

Start at: 2017-12-11 10:07:41
End at: 2017-12-11 10:08:11
Local clock offset: -1.879 ms
Remote clock offset: -11.902 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 8.01 Mbit/s
95th percentile per-packet one-way delay: 627.418 ms
Loss rate: 2.02%
-- Flow 1:
Average throughput: 5.77 Mbit/s
95th percentile per-packet one-way delay: 611.036 ms
Loss rate: 1.89%
-- Flow 2:
Average throughput: 2.81 Mbit/s
95th percentile per-packet one-way delay: 689.440 ms
Loss rate: 1.92%
-- Flow 3:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 541.194 ms
Loss rate: 4.30%

Run 2: Report of Verus — Data Link

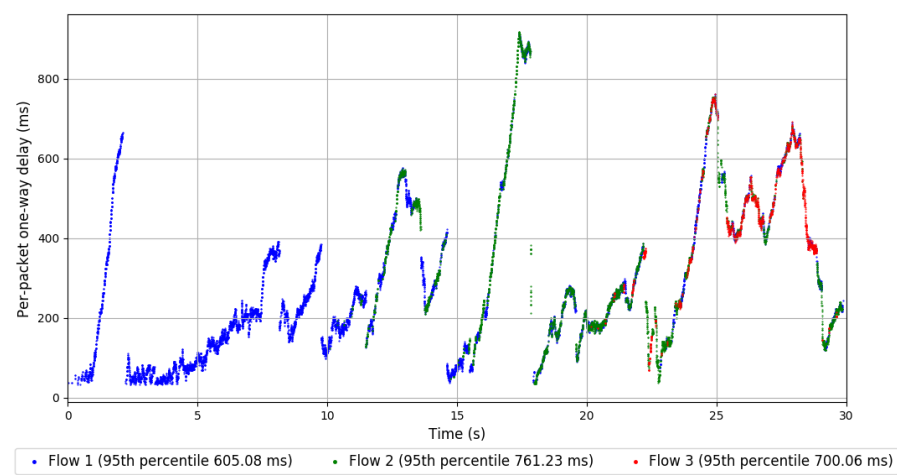
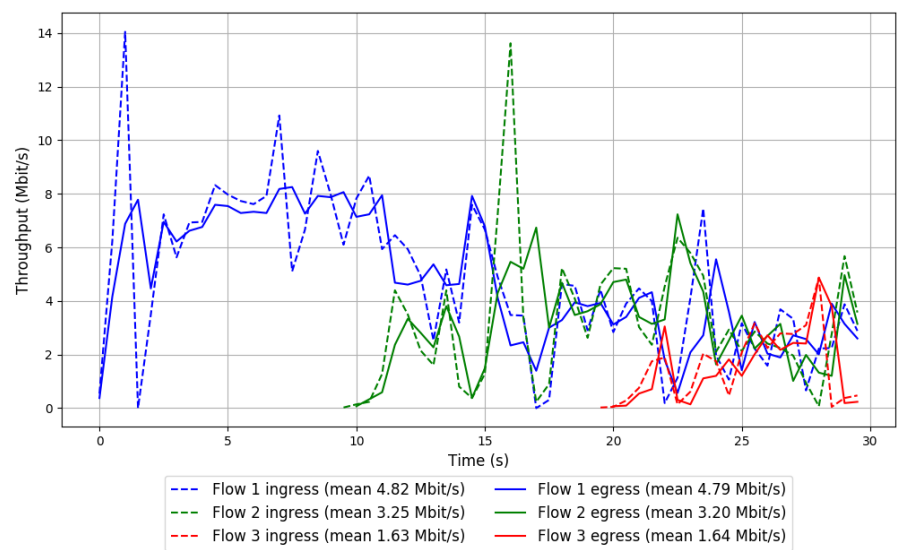


Run 3: Statistics of Verus

Start at: 2017-12-11 10:23:24
End at: 2017-12-11 10:23:54
Local clock offset: 1.213 ms
Remote clock offset: -12.577 ms

Below is generated by plot.py at 2017-12-11 10:36:42
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.42 Mbit/s
95th percentile per-packet one-way delay: 654.867 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 4.79 Mbit/s
95th percentile per-packet one-way delay: 605.076 ms
Loss rate: 0.72%
-- Flow 2:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 761.229 ms
Loss rate: 2.36%
-- Flow 3:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 700.063 ms
Loss rate: 1.79%

Run 3: Report of Verus — Data Link

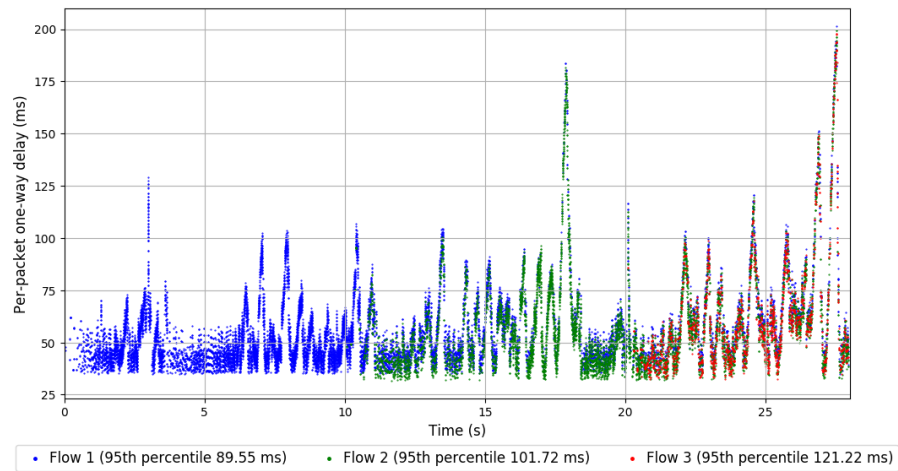
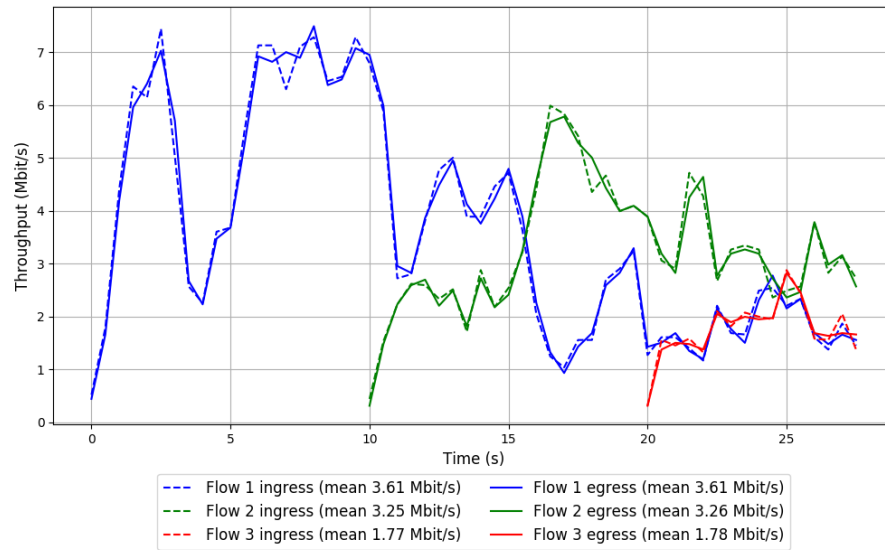


Run 1: Statistics of Copa

Start at: 2017-12-11 09:55:31
End at: 2017-12-11 09:56:01
Local clock offset: 2.561 ms
Remote clock offset: -11.079 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.20 Mbit/s
95th percentile per-packet one-way delay: 94.457 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 3.61 Mbit/s
95th percentile per-packet one-way delay: 89.554 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 3.26 Mbit/s
95th percentile per-packet one-way delay: 101.723 ms
Loss rate: 0.31%
-- Flow 3:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 121.220 ms
Loss rate: 0.65%

Run 1: Report of Copa — Data Link

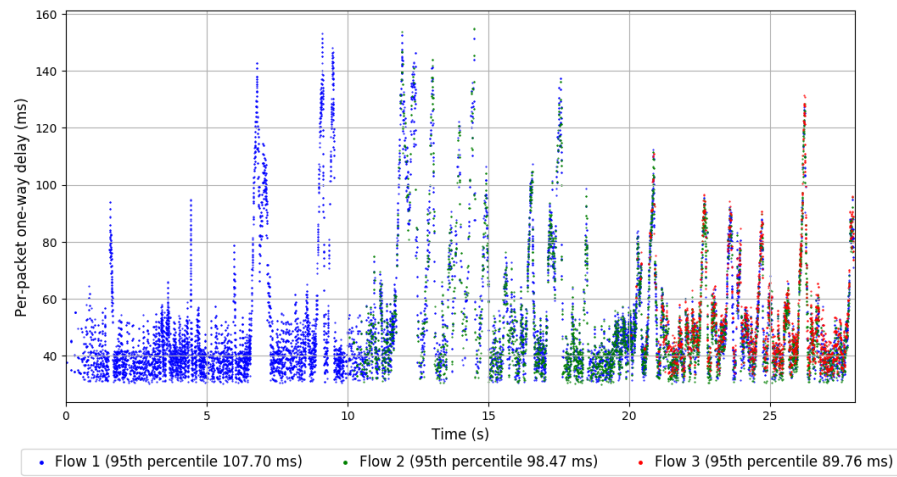
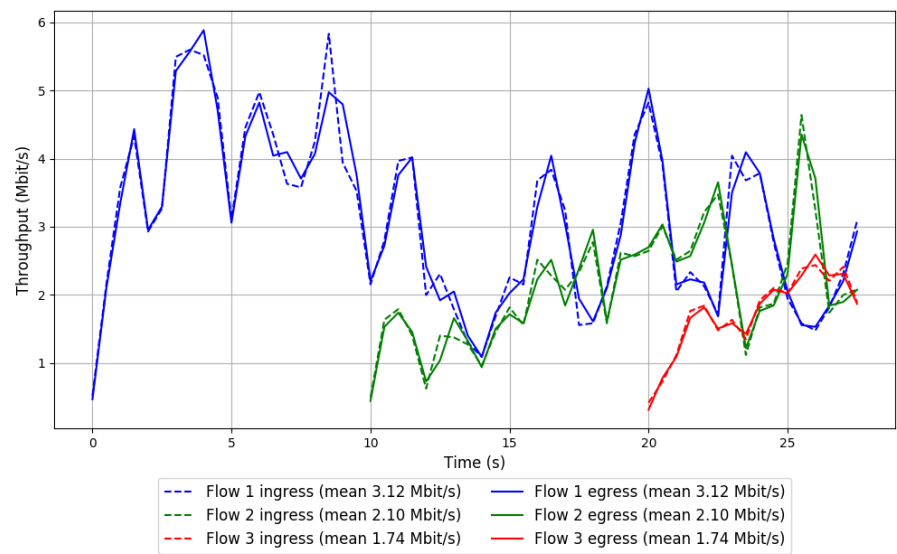


Run 2: Statistics of Copa

Start at: 2017-12-11 10:11:00
End at: 2017-12-11 10:11:30
Local clock offset: -1.362 ms
Remote clock offset: -15.288 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.95 Mbit/s
95th percentile per-packet one-way delay: 102.761 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 3.12 Mbit/s
95th percentile per-packet one-way delay: 107.702 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 98.473 ms
Loss rate: 0.24%
-- Flow 3:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 89.761 ms
Loss rate: 0.84%

Run 2: Report of Copa — Data Link

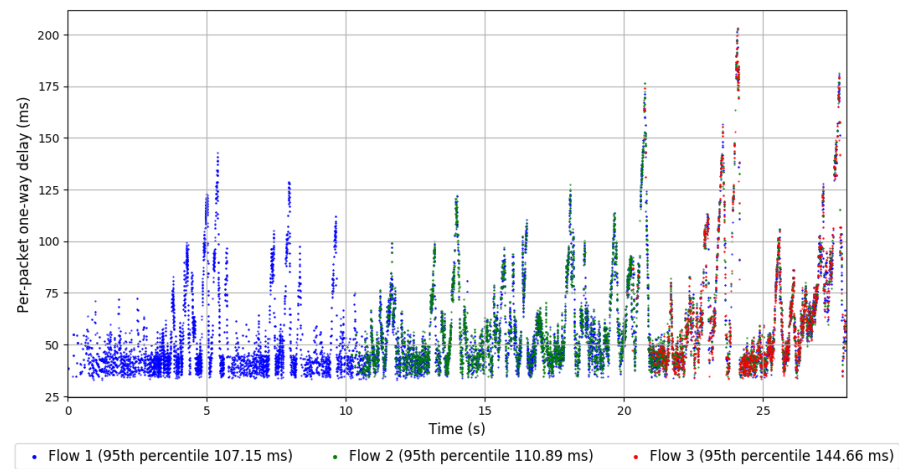
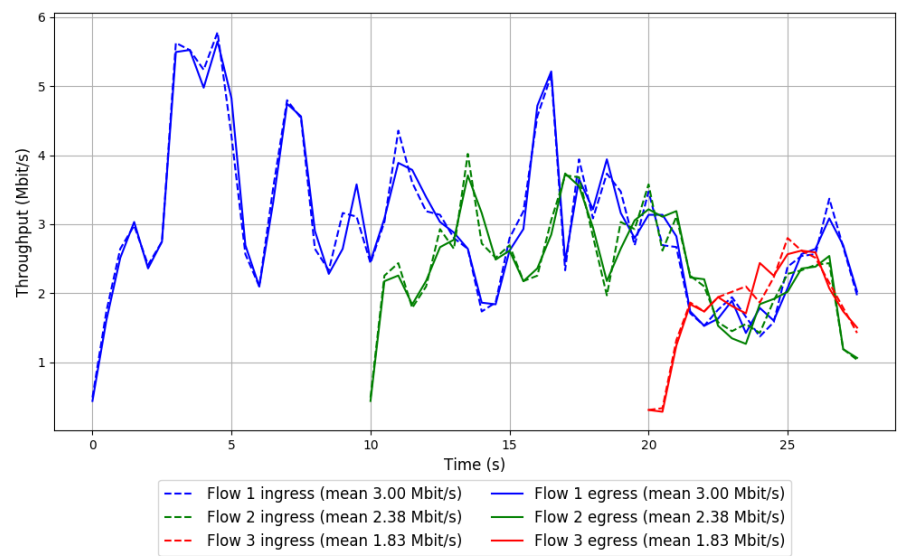


Run 3: Statistics of Copa

Start at: 2017-12-11 10:26:44
End at: 2017-12-11 10:27:14
Local clock offset: 1.715 ms
Remote clock offset: -10.568 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.04 Mbit/s
95th percentile per-packet one-way delay: 112.574 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 3.00 Mbit/s
95th percentile per-packet one-way delay: 107.146 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 110.890 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 144.658 ms
Loss rate: 1.25%

Run 3: Report of Copa — Data Link

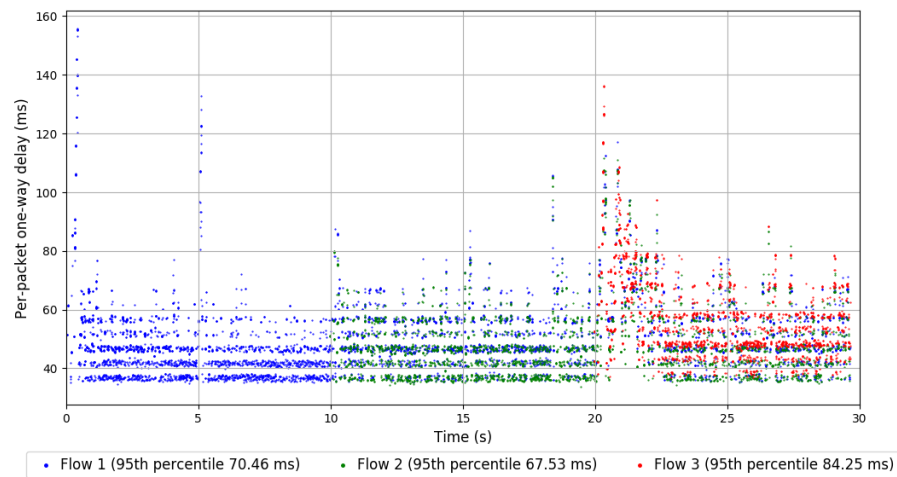
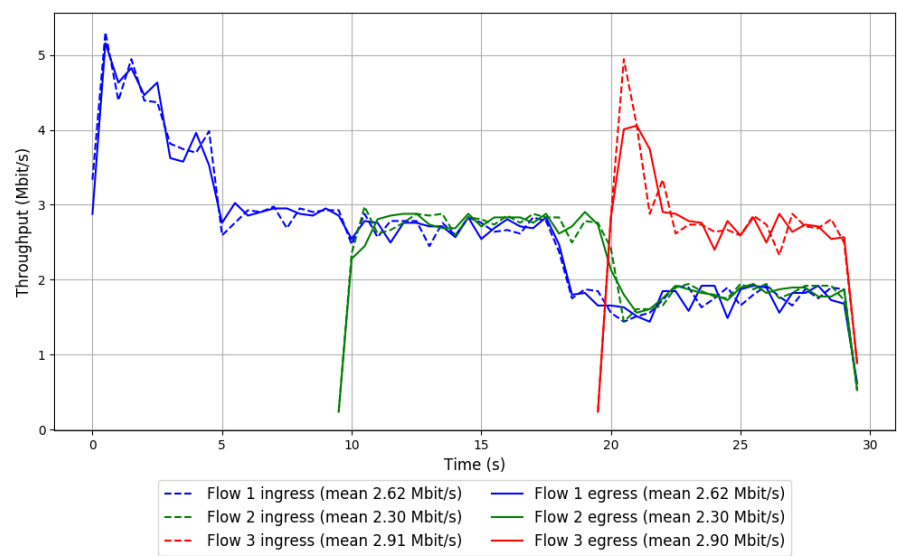


```
Run 1: Statistics of Indigo

Start at: 2017-12-11 09:56:37
End at: 2017-12-11 09:57:07
Local clock offset: 0.038 ms
Remote clock offset: -12.225 ms

# Below is generated by plot.py at 2017-12-11 10:36:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.09 Mbit/s
95th percentile per-packet one-way delay: 76.223 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 2.62 Mbit/s
95th percentile per-packet one-way delay: 70.457 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 67.526 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 2.90 Mbit/s
95th percentile per-packet one-way delay: 84.249 ms
Loss rate: 0.68%
```

Run 1: Report of Indigo — Data Link

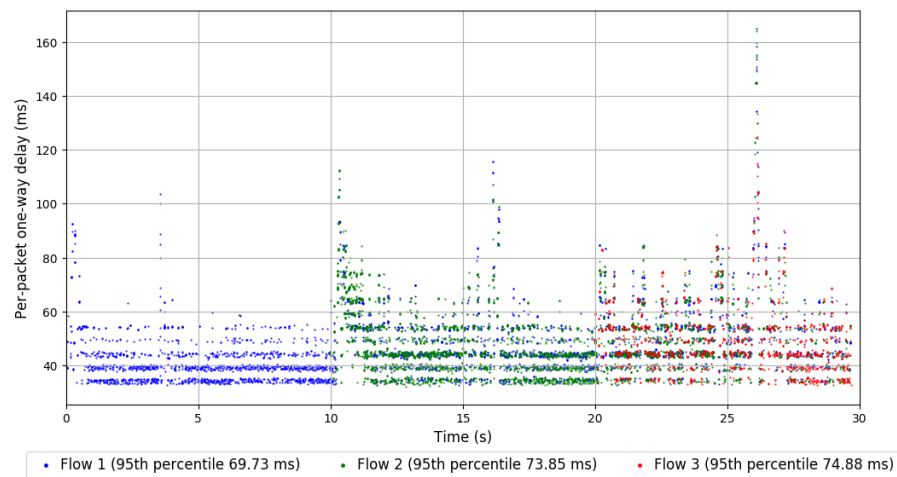
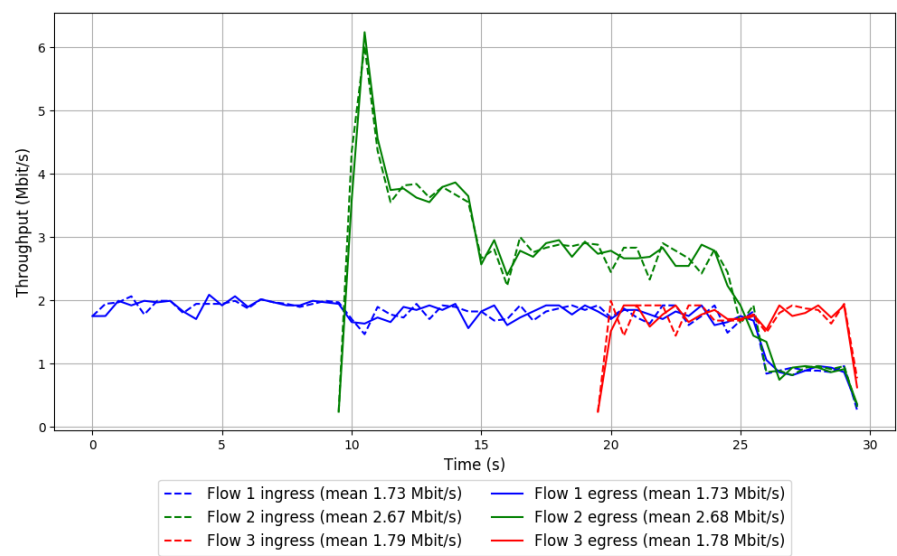


Run 2: Statistics of Indigo

Start at: 2017-12-11 10:12:07
End at: 2017-12-11 10:12:37
Local clock offset: -0.336 ms
Remote clock offset: -12.174 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 73.662 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 69.733 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 2.68 Mbit/s
95th percentile per-packet one-way delay: 73.853 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 74.879 ms
Loss rate: 0.69%

Run 2: Report of Indigo — Data Link

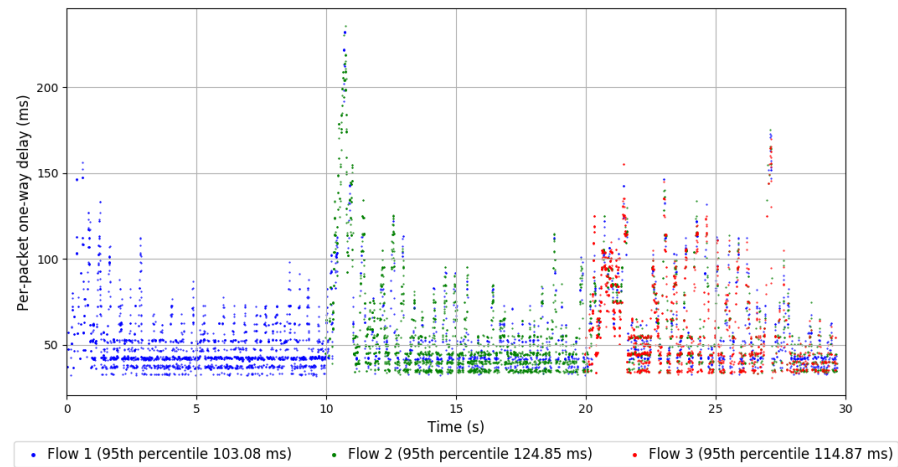
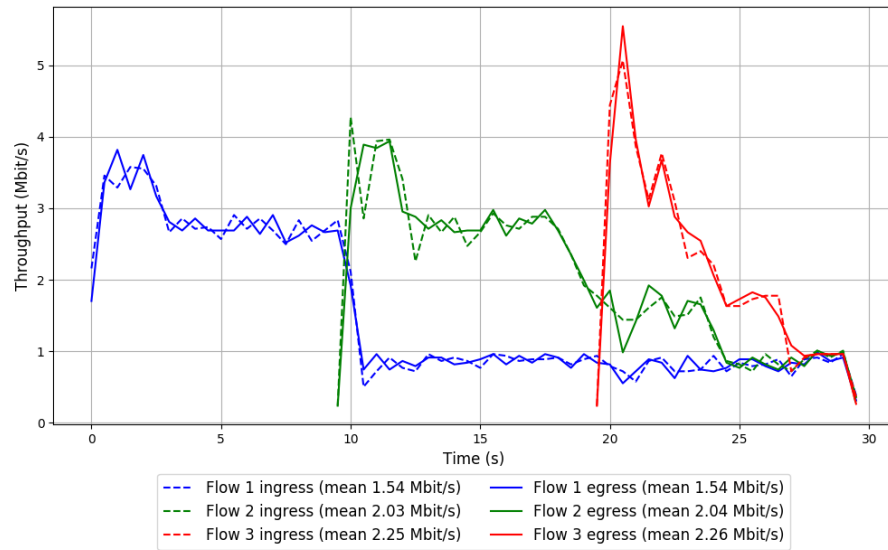


Run 3: Statistics of Indigo

Start at: 2017-12-11 10:27:51
End at: 2017-12-11 10:28:21
Local clock offset: 1.904 ms
Remote clock offset: -11.443 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.63 Mbit/s
95th percentile per-packet one-way delay: 114.123 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 103.085 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 124.853 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 114.867 ms
Loss rate: 0.27%

Run 3: Report of Indigo — Data Link

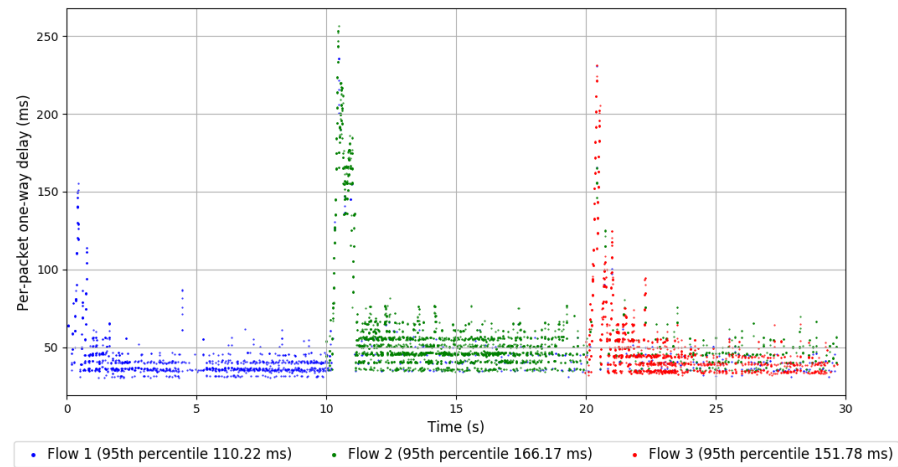
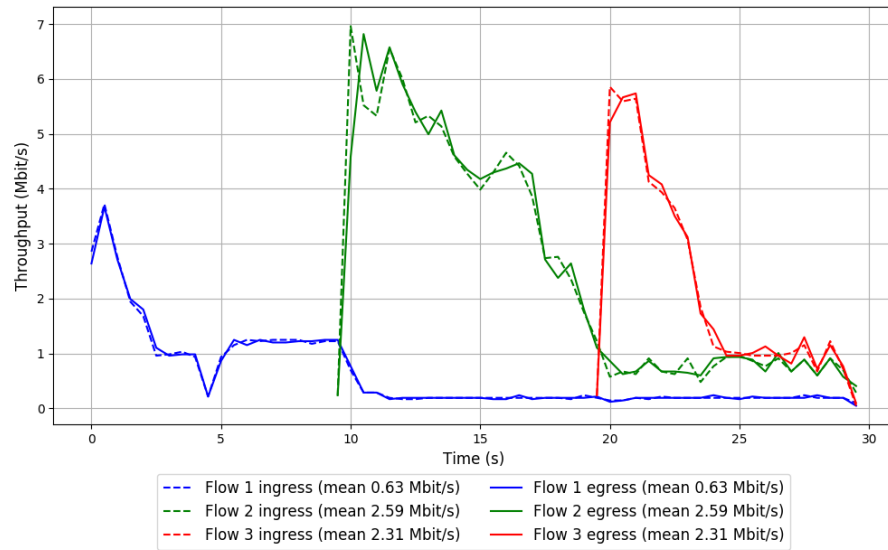


```
Run 1: Statistics of Indigo-calib

Start at: 2017-12-11 09:57:44
End at: 2017-12-11 09:58:14
Local clock offset: 2.497 ms
Remote clock offset: -12.495 ms

# Below is generated by plot.py at 2017-12-11 10:36:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.11 Mbit/s
95th percentile per-packet one-way delay: 155.686 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 110.221 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 2.59 Mbit/s
95th percentile per-packet one-way delay: 166.174 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 151.780 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo-calib — Data Link

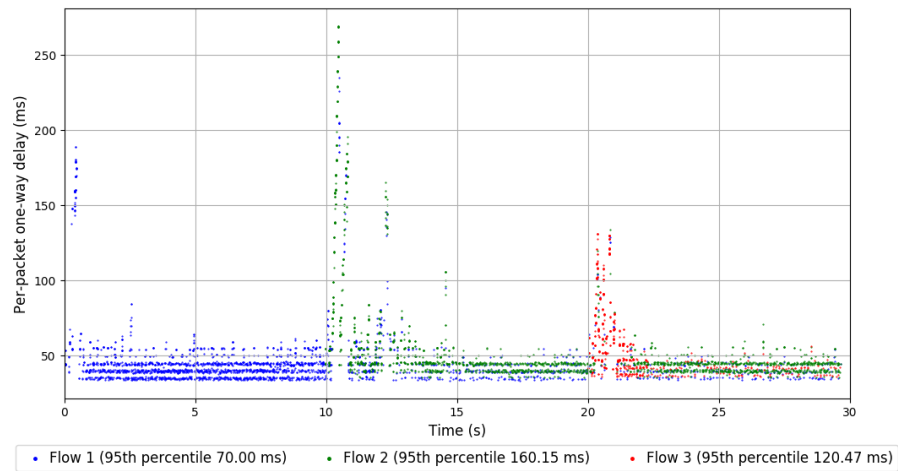
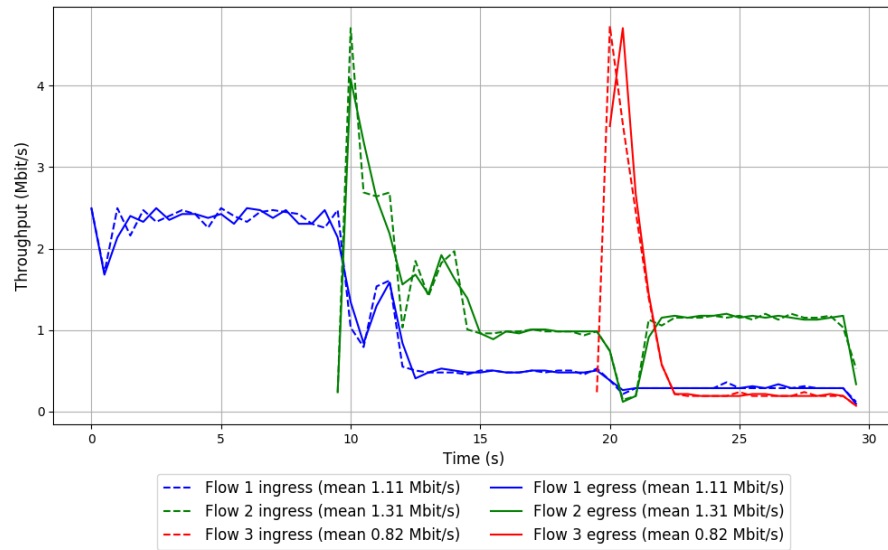


Run 2: Statistics of Indigo-calib

Start at: 2017-12-11 10:13:14
End at: 2017-12-11 10:13:44
Local clock offset: -0.692 ms
Remote clock offset: -12.337 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 129.769 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 70.000 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 160.153 ms
Loss rate: 0.42%
-- Flow 3:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 120.471 ms
Loss rate: 0.15%

Run 2: Report of Indigo-calib — Data Link



Run 3: Statistics of Indigo-calib

Start at: 2017-12-11 10:28:57
End at: 2017-12-11 10:29:27
Local clock offset: -2.463 ms
Remote clock offset: -9.998 ms

Below is generated by plot.py at 2017-12-11 10:36:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 151.518 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 166.348 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 129.335 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 127.000 ms
Loss rate: 0.50%

Run 3: Report of Indigo-calib — Data Link

