

Pantheon Report

Generated at 2017-11-30 08:39:27 (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).

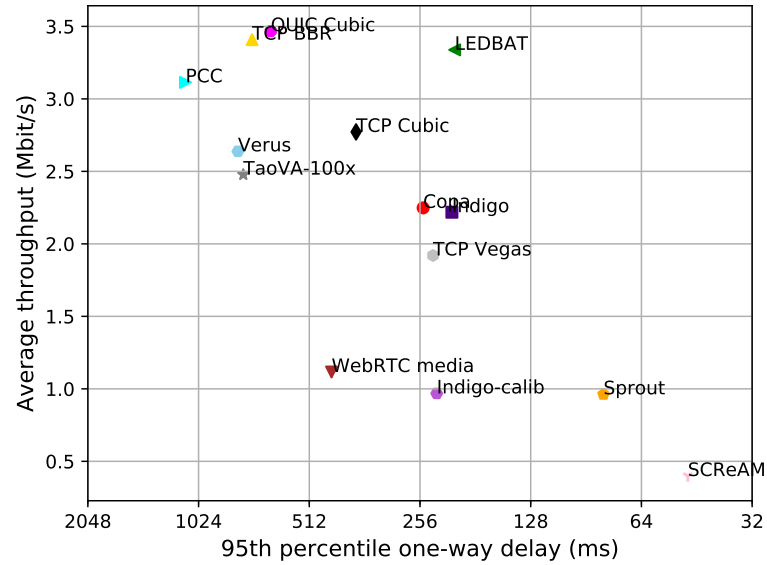
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

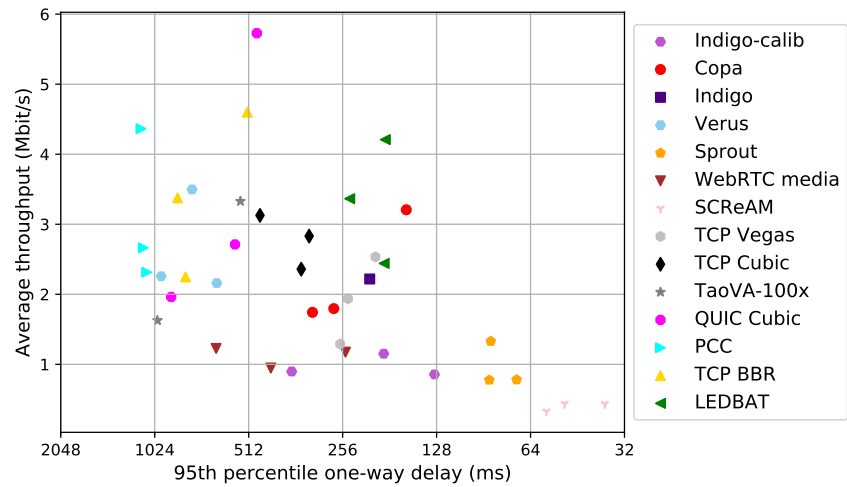
Git summary:

```
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 @ f1a14bffe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



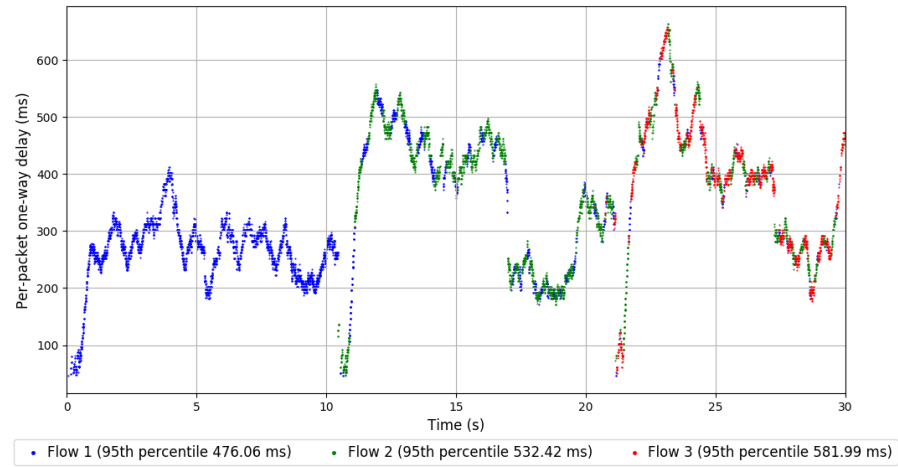
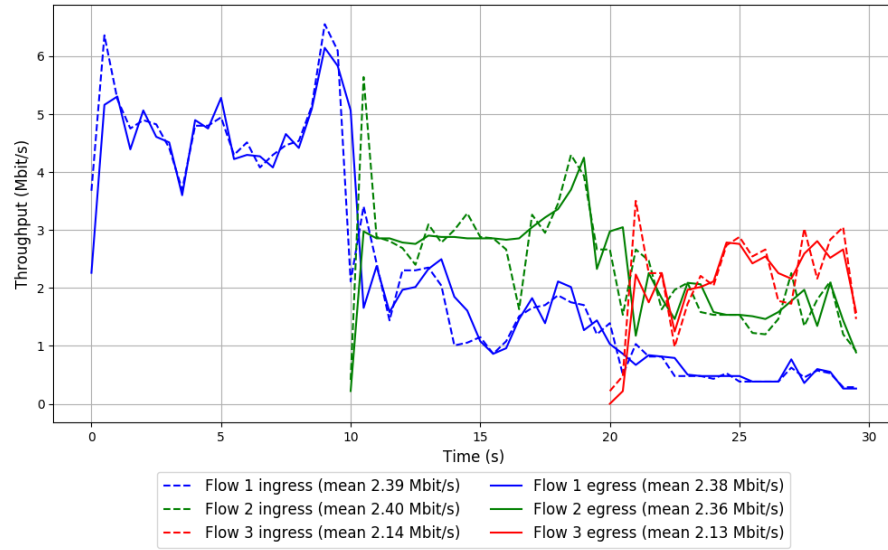
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	1.90	1.61	1.46	605.40	767.45	770.72	1.05	3.01	6.02
TCP Cubic	3	1.76	0.99	1.11	345.28	415.35	533.49	0.73	1.54	2.72
LEDBAT	3	2.21	1.15	1.16	201.23	230.30	242.83	0.21	0.70	1.71
PCC	3	2.03	1.28	0.92	1083.80	1175.23	1231.22	41.30	82.94	97.22
QUIC Cubic	3	2.28	1.30	1.04	524.82	691.00	786.17	1.78	2.46	5.12
SCReAM	3	0.20	0.20	0.21	44.84	44.68	48.09	0.11	0.00	0.35
WebRTC media	3	0.56	0.34	0.23	470.35	446.19	394.10	0.96	1.97	3.89
Sprout	3	0.49	0.46	0.50	78.38	82.70	85.27	0.01	0.45	0.31
TaoVA-100x	2	1.50	1.10	0.78	640.68	752.29	982.49	2.19	5.17	20.50
TCP Vegas	3	6.15	1.09	1.38	1302.91	292.47	241.05	0.24	0.45	0.95
Verus	3	1.85	0.87	0.70	747.57	744.67	838.81	2.62	4.82	3.42
Copa	3	1.48	0.91	0.67	226.20	274.37	316.48	0.21	0.52	2.09
Indigo	1	1.30	0.64	1.52	145.17	159.52	359.29	0.00	0.09	0.57
Indigo-calib	3	0.46	0.43	0.68	175.14	198.15	452.75	0.17	0.24	0.58

Run 1: Statistics of TCP BBR

Start at: 2017-11-30 07:49:18
End at: 2017-11-30 07:49:48
Local clock offset: -13.118 ms
Remote clock offset: 1.844 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.60 Mbit/s
95th percentile per-packet one-way delay: 516.869 ms
Loss rate: 1.45%
-- Flow 1:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 476.063 ms
Loss rate: 0.69%
-- Flow 2:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 532.416 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 581.992 ms
Loss rate: 3.84%

Run 1: Report of TCP BBR — Data Link

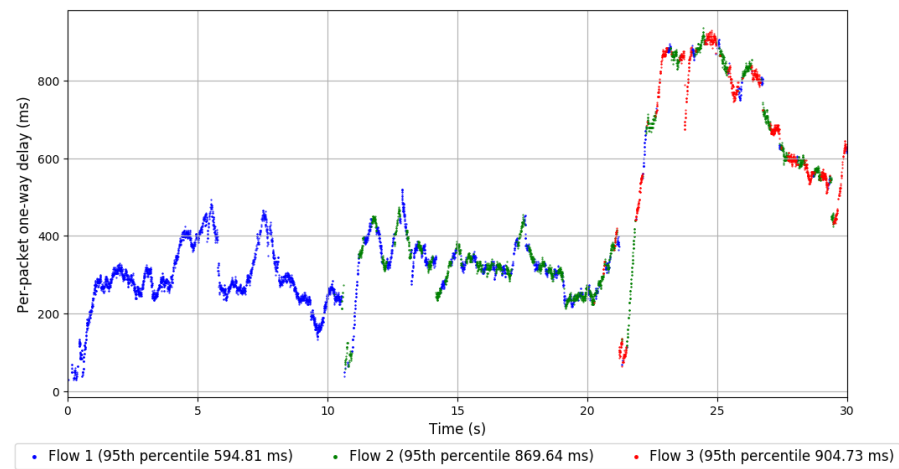
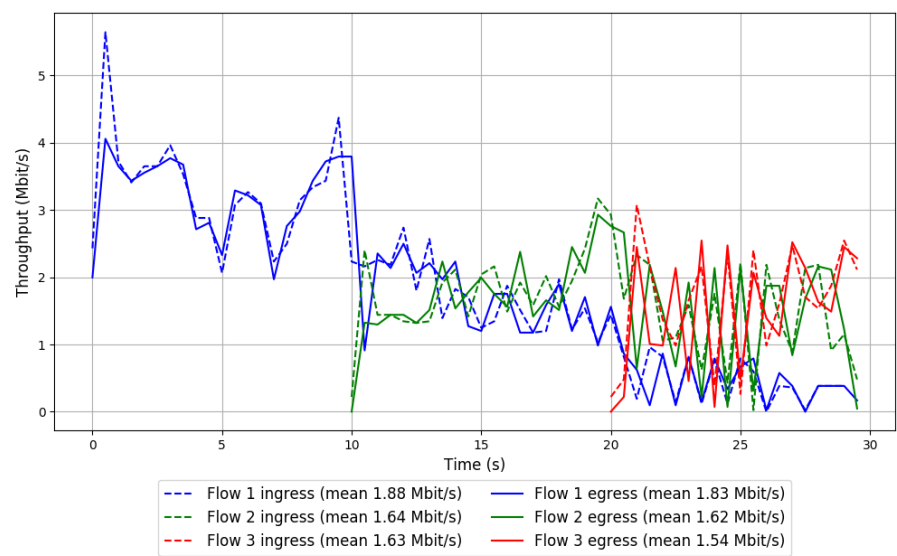


Run 2: Statistics of TCP BBR

Start at: 2017-11-30 08:06:09
End at: 2017-11-30 08:06:39
Local clock offset: -14.701 ms
Remote clock offset: -16.383 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.38 Mbit/s
95th percentile per-packet one-way delay: 864.819 ms
Loss rate: 2.58%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 594.814 ms
Loss rate: 0.95%
-- Flow 2:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 869.640 ms
Loss rate: 2.90%
-- Flow 3:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 904.725 ms
Loss rate: 7.50%

Run 2: Report of TCP BBR — Data Link

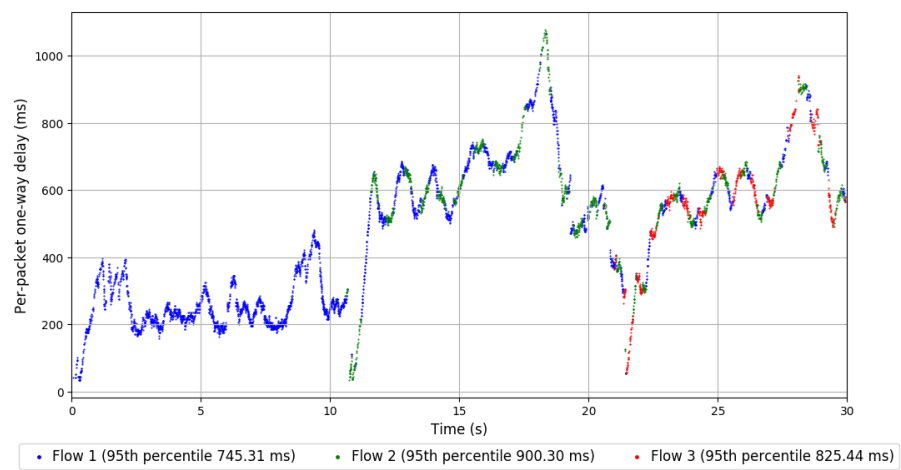
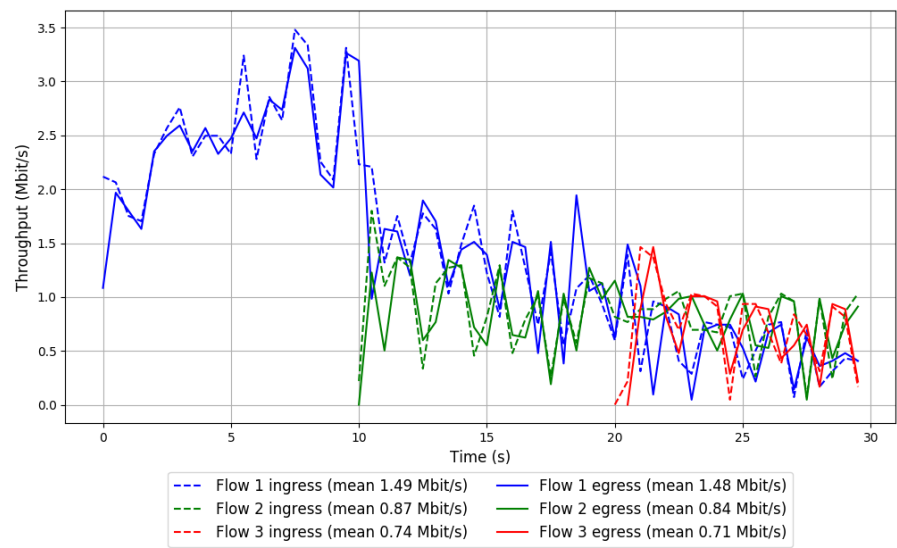


Run 3: Statistics of TCP BBR

Start at: 2017-11-30 08:22:38
End at: 2017-11-30 08:23:08
Local clock offset: -14.396 ms
Remote clock offset: -15.977 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 815.791 ms
Loss rate: 2.81%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 745.311 ms
Loss rate: 1.50%
-- Flow 2:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 900.305 ms
Loss rate: 4.59%
-- Flow 3:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 825.436 ms
Loss rate: 6.71%

Run 3: Report of TCP BBR — Data Link

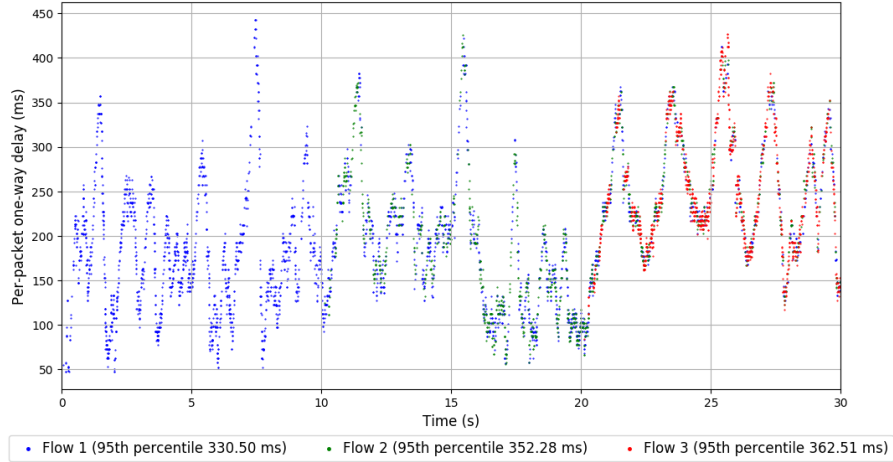
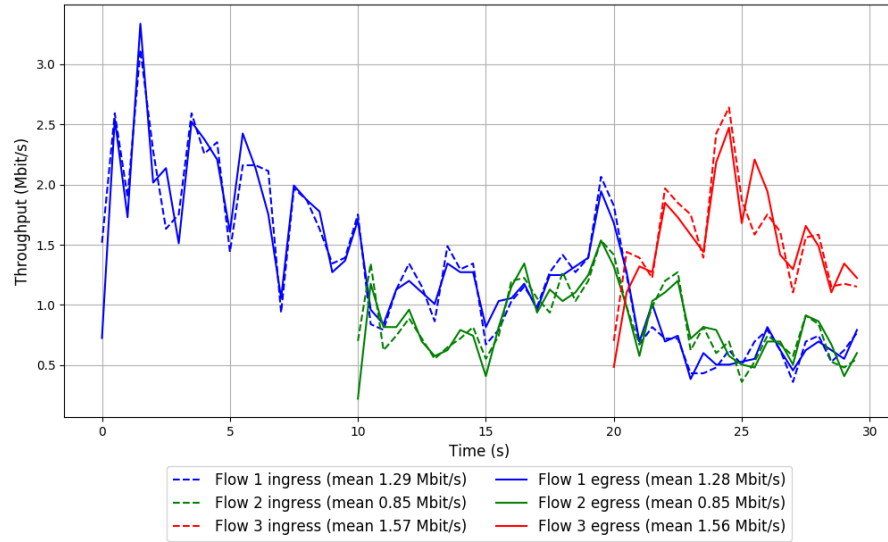


Run 1: Statistics of TCP Cubic

Start at: 2017-11-30 07:58:00
End at: 2017-11-30 07:58:30
Local clock offset: -10.867 ms
Remote clock offset: 1.687 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.36 Mbit/s
95th percentile per-packet one-way delay: 347.413 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 330.496 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 352.279 ms
Loss rate: 1.13%
-- Flow 3:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 362.513 ms
Loss rate: 1.69%

Run 1: Report of TCP Cubic — Data Link

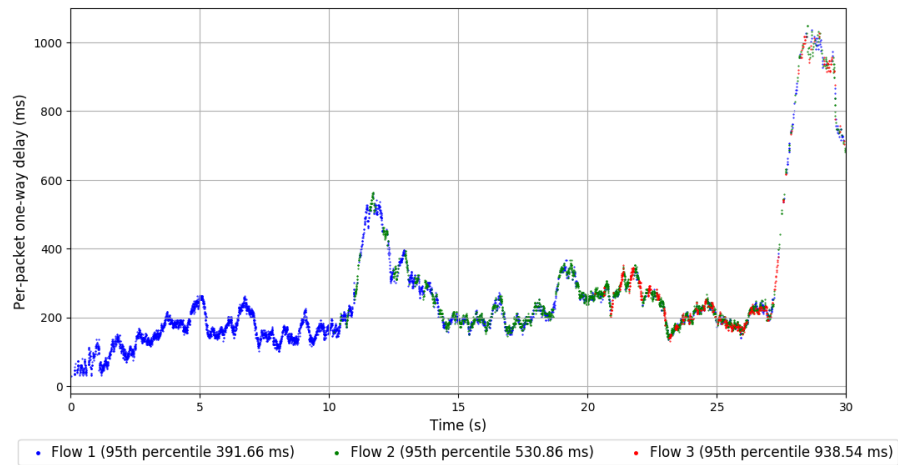
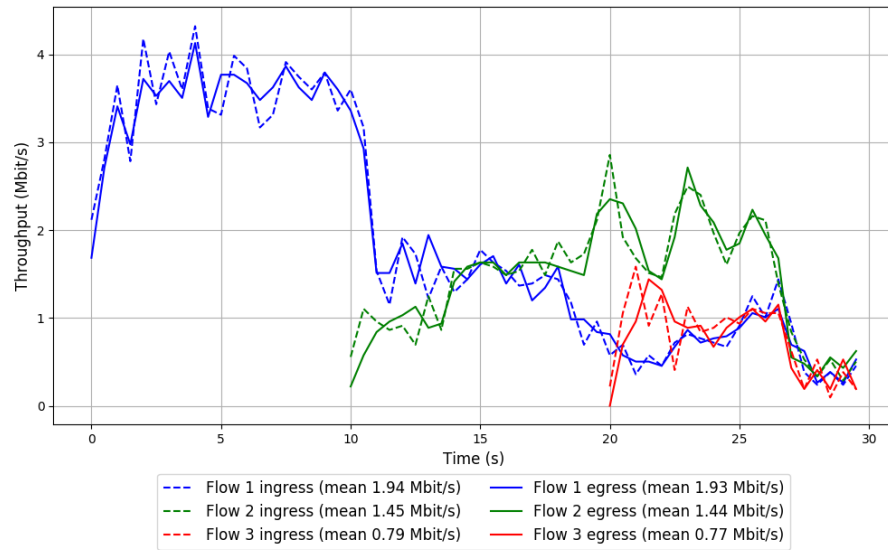


Run 2: Statistics of TCP Cubic

Start at: 2017-11-30 08:14:27
End at: 2017-11-30 08:14:57
Local clock offset: -14.106 ms
Remote clock offset: -16.43 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 470.977 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 391.657 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 530.862 ms
Loss rate: 1.37%
-- Flow 3:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 938.538 ms
Loss rate: 3.72%

Run 2: Report of TCP Cubic — Data Link

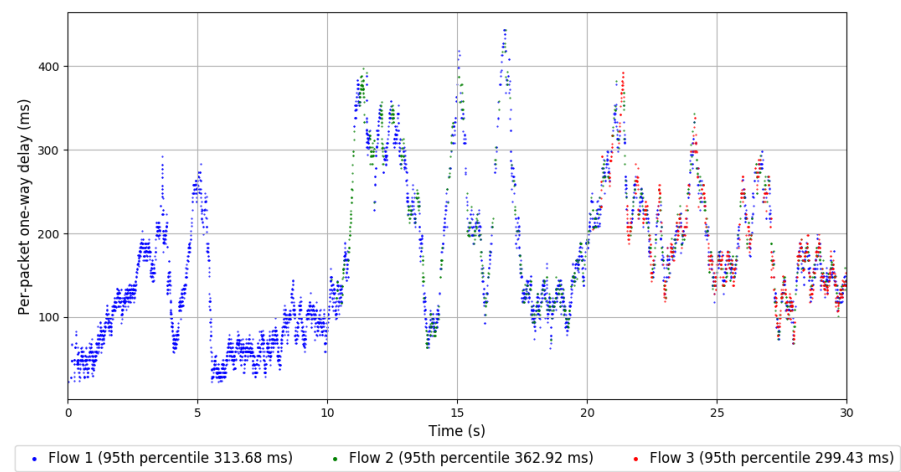
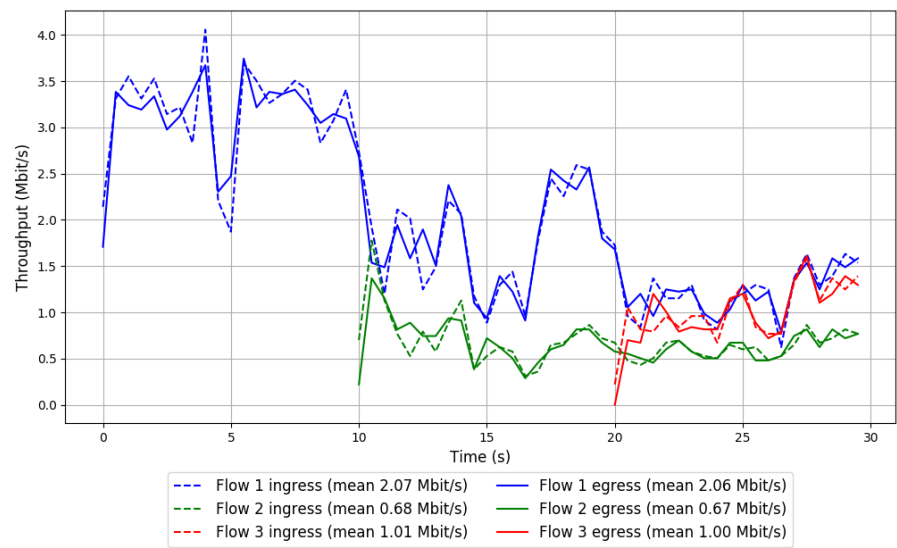


Run 3: Statistics of TCP Cubic

Start at: 2017-11-30 08:31:09
End at: 2017-11-30 08:31:39
Local clock offset: -10.41 ms
Remote clock offset: -18.105 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 327.702 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 2.06 Mbit/s
95th percentile per-packet one-way delay: 313.677 ms
Loss rate: 0.60%
-- Flow 2:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 362.917 ms
Loss rate: 2.12%
-- Flow 3:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 299.427 ms
Loss rate: 2.75%

Run 3: Report of TCP Cubic — Data Link

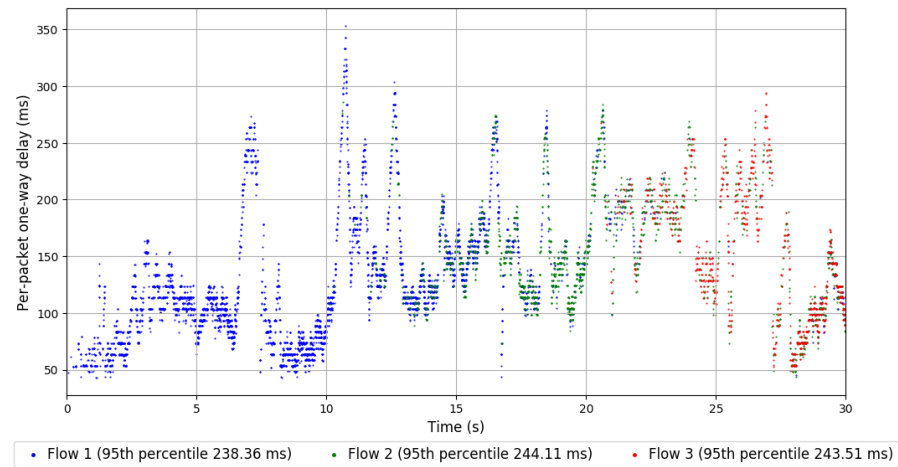
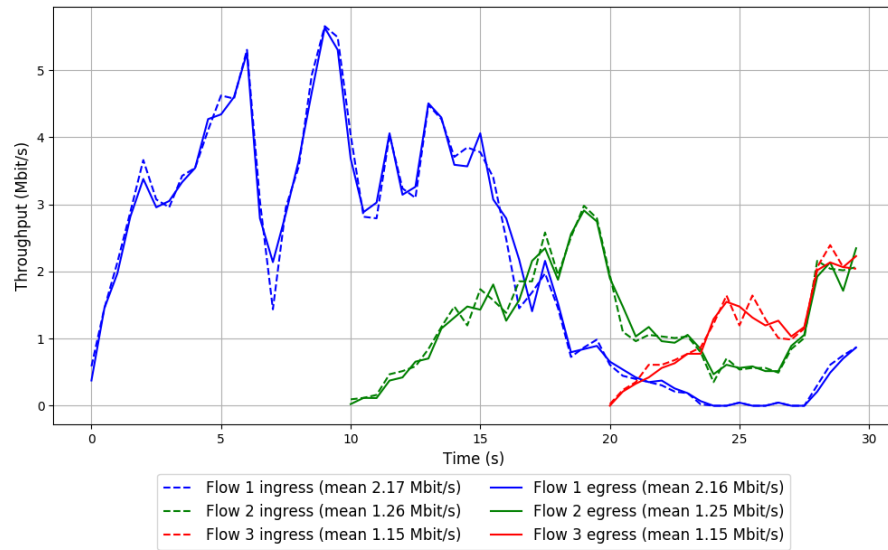


```
Run 1: Statistics of LEDBAT

Start at: 2017-11-30 07:54:35
End at: 2017-11-30 07:55:05
Local clock offset: -11.958 ms
Remote clock offset: 3.093 ms

# Below is generated by plot.py at 2017-11-30 08:38:51
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 242.994 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 238.364 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 244.113 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 243.511 ms
Loss rate: 1.75%
```


Run 1: Report of LEDBAT — Data Link

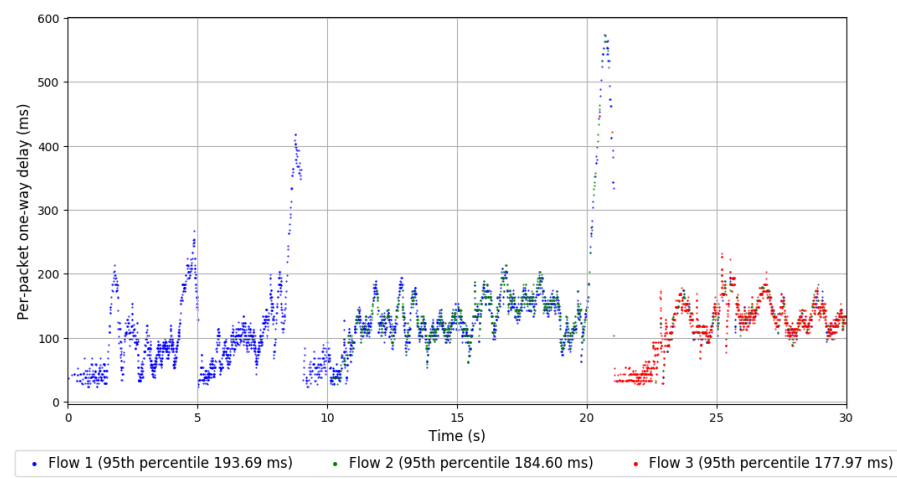
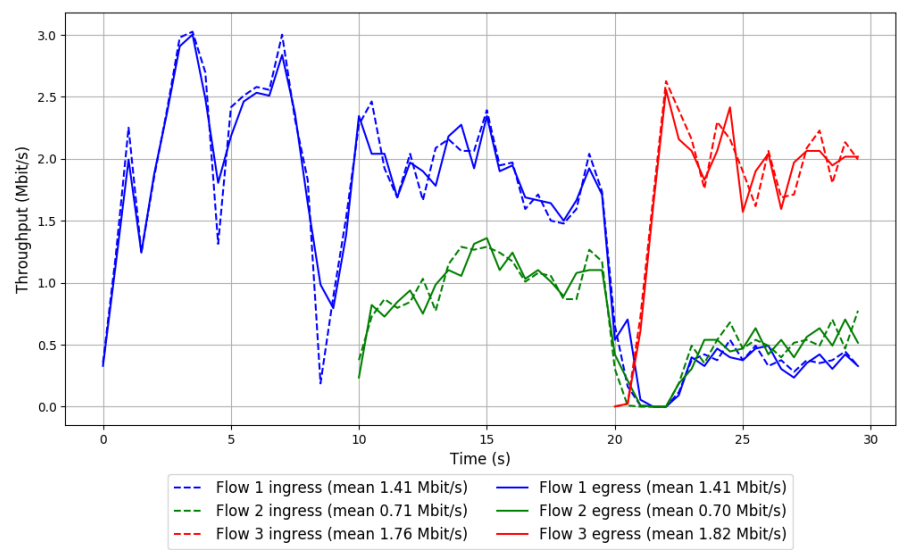


Run 2: Statistics of LEDBAT

Start at: 2017-11-30 08:10:41
End at: 2017-11-30 08:11:11
Local clock offset: -14.061 ms
Remote clock offset: -17.949 ms

Below is generated by plot.py at 2017-11-30 08:38:51
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 188.401 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 193.688 ms
Loss rate: 0.28%
-- Flow 2:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 184.601 ms
Loss rate: 1.00%
-- Flow 3:
Average throughput: 1.82 Mbit/s
95th percentile per-packet one-way delay: 177.970 ms
Loss rate: 1.54%

Run 2: Report of LEDBAT — Data Link

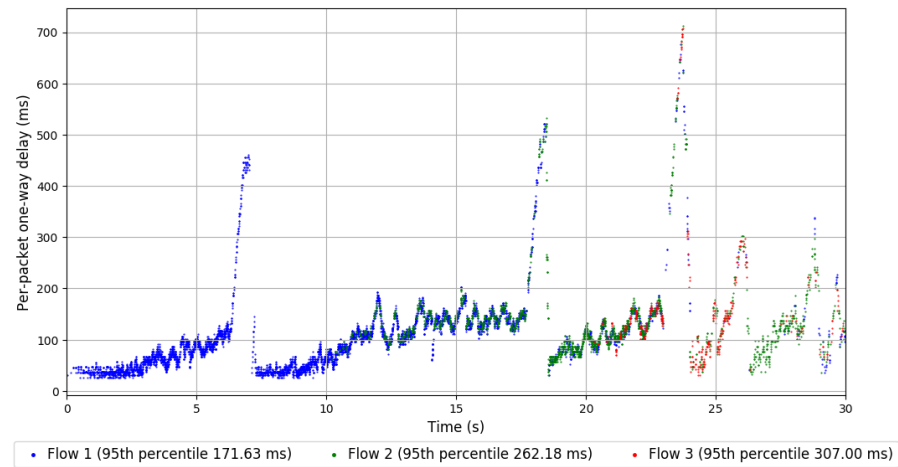
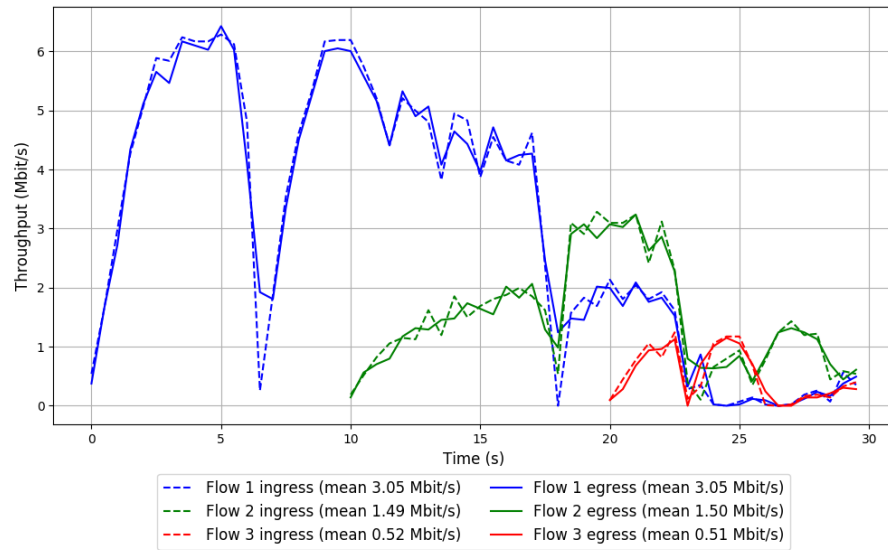


Run 3: Statistics of LEDBAT

Start at: 2017-11-30 08:27:39
End at: 2017-11-30 08:28:09
Local clock offset: -13.256 ms
Remote clock offset: -15.949 ms

Below is generated by plot.py at 2017-11-30 08:38:57
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.21 Mbit/s
95th percentile per-packet one-way delay: 186.836 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 3.05 Mbit/s
95th percentile per-packet one-way delay: 171.627 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 262.179 ms
Loss rate: 0.31%
-- Flow 3:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 306.995 ms
Loss rate: 1.84%

Run 3: Report of LEDBAT — Data Link

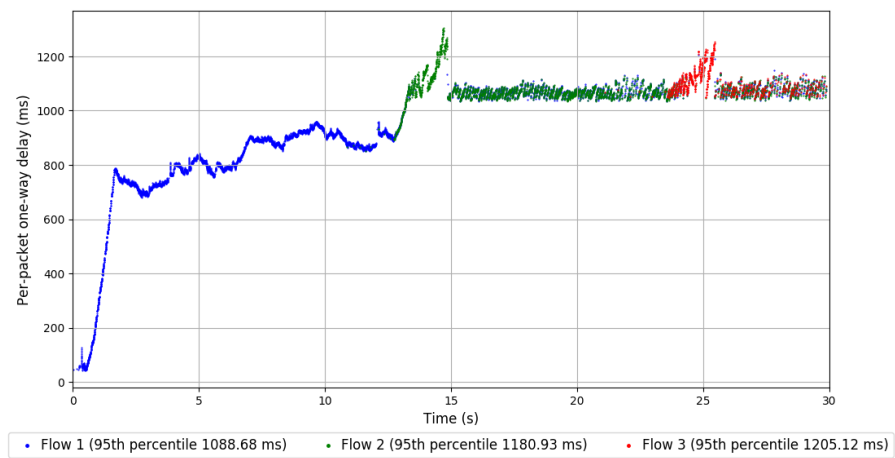
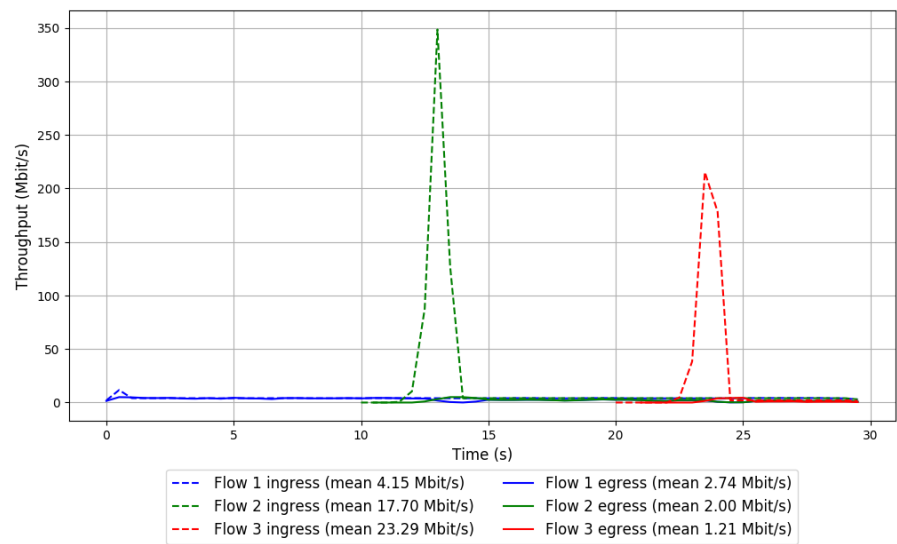


Run 1: Statistics of PCC

Start at: 2017-11-30 07:50:40
End at: 2017-11-30 07:51:10
Local clock offset: -11.081 ms
Remote clock offset: 2.628 ms

Below is generated by plot.py at 2017-11-30 08:39:11
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.36 Mbit/s
95th percentile per-packet one-way delay: 1133.287 ms
Loss rate: 81.52%
-- Flow 1:
Average throughput: 2.74 Mbit/s
95th percentile per-packet one-way delay: 1088.682 ms
Loss rate: 34.14%
-- Flow 2:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 1180.926 ms
Loss rate: 89.20%
-- Flow 3:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 1205.124 ms
Loss rate: 95.37%

Run 1: Report of PCC — Data Link

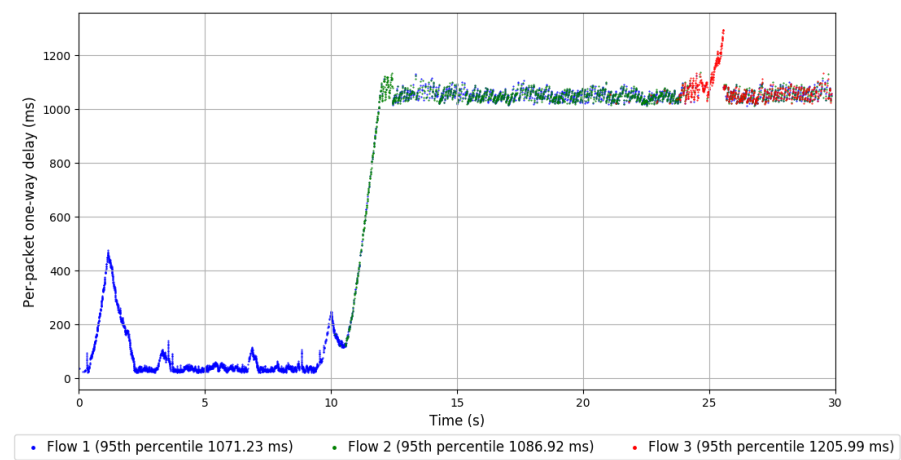
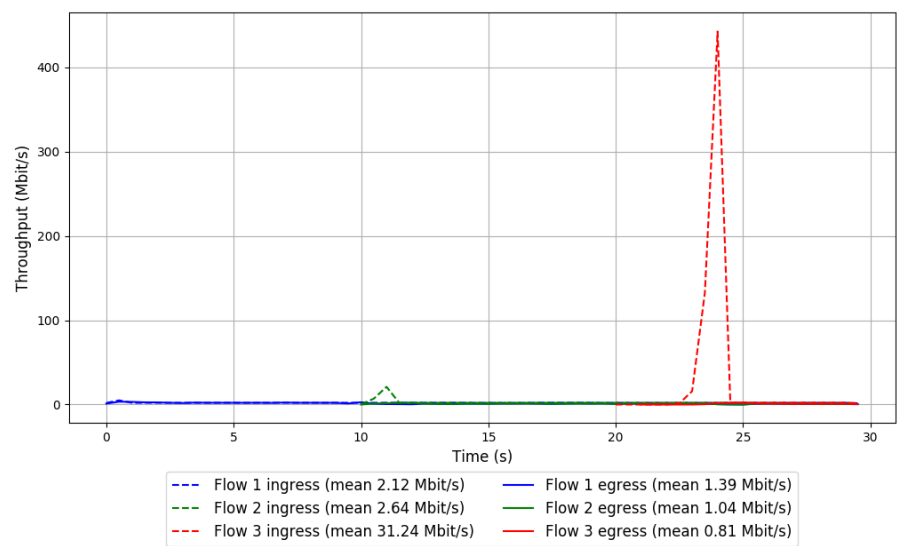


Run 2: Statistics of PCC

Start at: 2017-11-30 08:07:19
End at: 2017-11-30 08:07:49
Local clock offset: -11.522 ms
Remote clock offset: -17.221 ms

Below is generated by plot.py at 2017-11-30 08:39:11
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 1086.568 ms
Loss rate: 83.69%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 1071.226 ms
Loss rate: 34.55%
-- Flow 2:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 1086.922 ms
Loss rate: 61.11%
-- Flow 3:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 1205.986 ms
Loss rate: 97.68%

Run 2: Report of PCC — Data Link

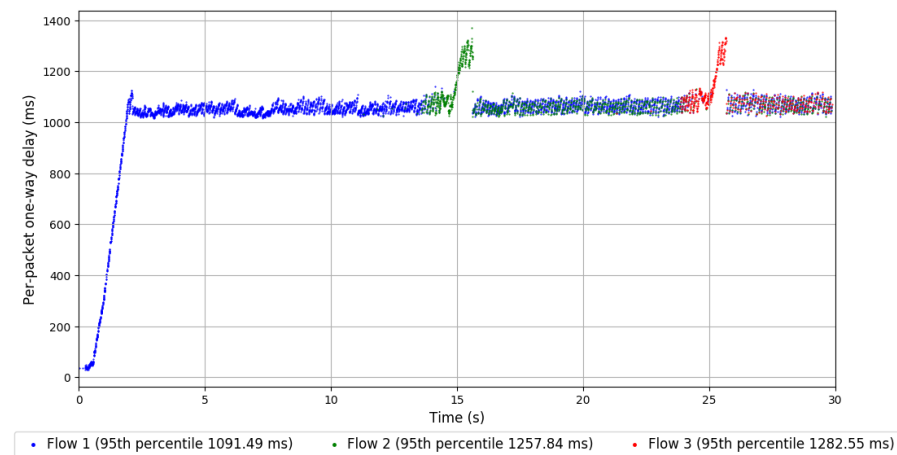
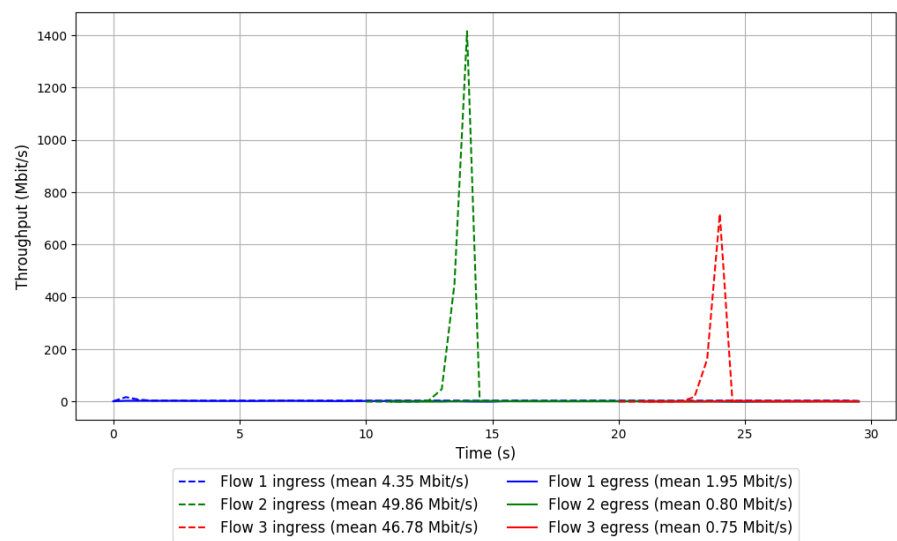


Run 3: Statistics of PCC

Start at: 2017-11-30 08:23:44
End at: 2017-11-30 08:24:14
Local clock offset: -11.494 ms
Remote clock offset: -15.16 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.66 Mbit/s
95th percentile per-packet one-way delay: 1113.569 ms
Loss rate: 94.97%
-- Flow 1:
Average throughput: 1.95 Mbit/s
95th percentile per-packet one-way delay: 1091.494 ms
Loss rate: 55.21%
-- Flow 2:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 1257.841 ms
Loss rate: 98.50%
-- Flow 3:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 1282.553 ms
Loss rate: 98.61%

Run 3: Report of PCC — Data Link

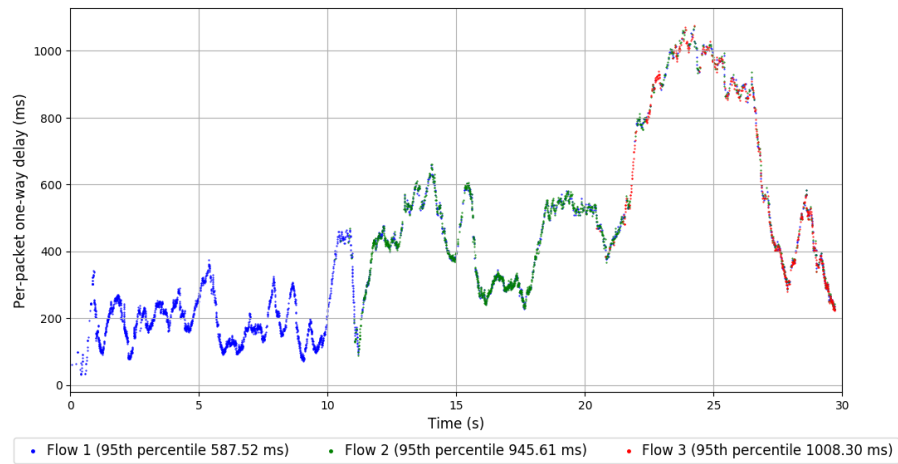
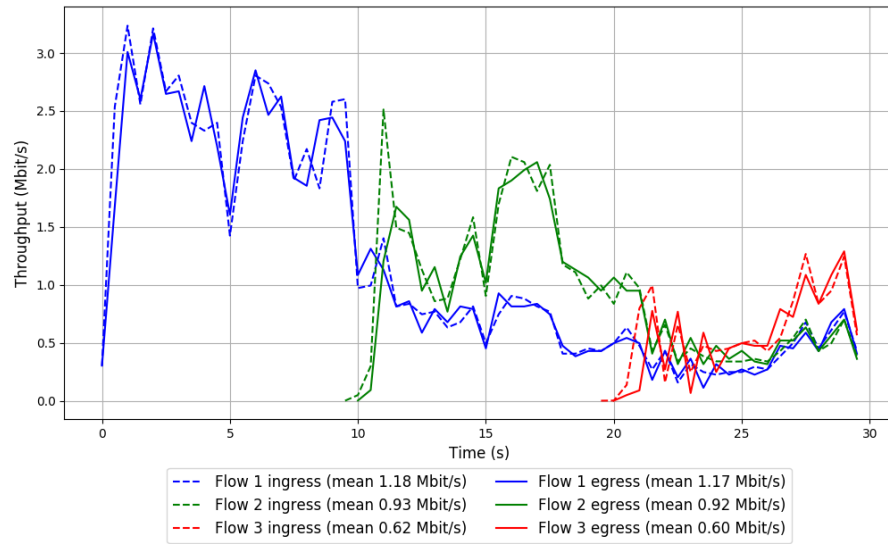


Run 1: Statistics of QUIC Cubic

Start at: 2017-11-30 08:02:46
End at: 2017-11-30 08:03:16
Local clock offset: -14.385 ms
Remote clock offset: -15.585 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.96 Mbit/s
95th percentile per-packet one-way delay: 906.682 ms
Loss rate: 2.52%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 587.520 ms
Loss rate: 1.64%
-- Flow 2:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 945.614 ms
Loss rate: 2.64%
-- Flow 3:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1008.297 ms
Loss rate: 7.31%

Run 1: Report of QUIC Cubic — Data Link

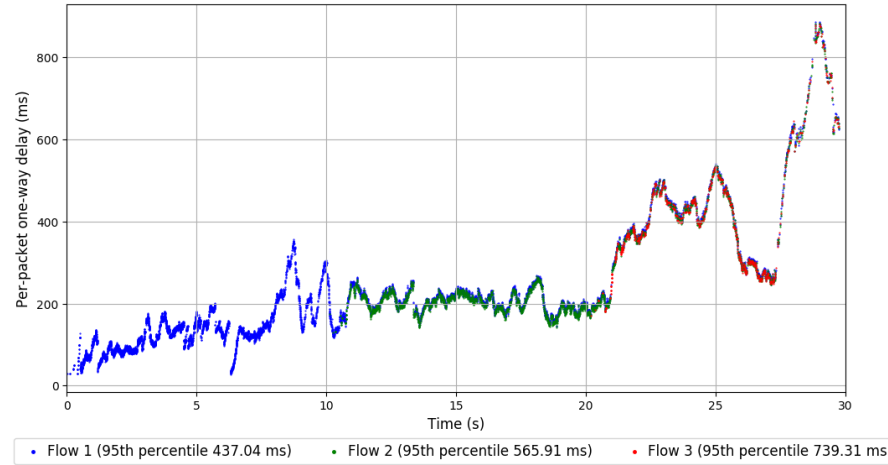
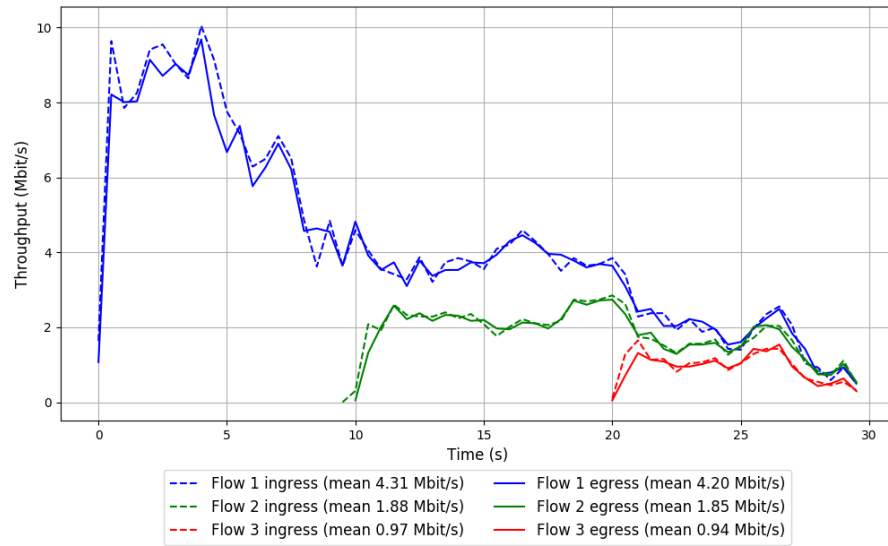


Run 2: Statistics of QUIC Cubic

Start at: 2017-11-30 08:19:14
End at: 2017-11-30 08:19:44
Local clock offset: -12.197 ms
Remote clock offset: -16.478 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.73 Mbit/s
95th percentile per-packet one-way delay: 482.122 ms
Loss rate: 2.63%
-- Flow 1:
Average throughput: 4.20 Mbit/s
95th percentile per-packet one-way delay: 437.042 ms
Loss rate: 2.58%
-- Flow 2:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 565.906 ms
Loss rate: 2.28%
-- Flow 3:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 739.313 ms
Loss rate: 4.78%

Run 2: Report of QUIC Cubic — Data Link

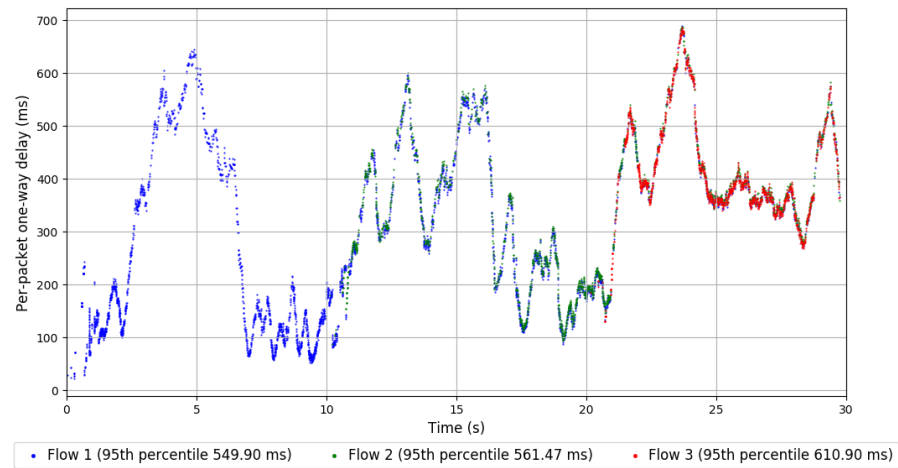
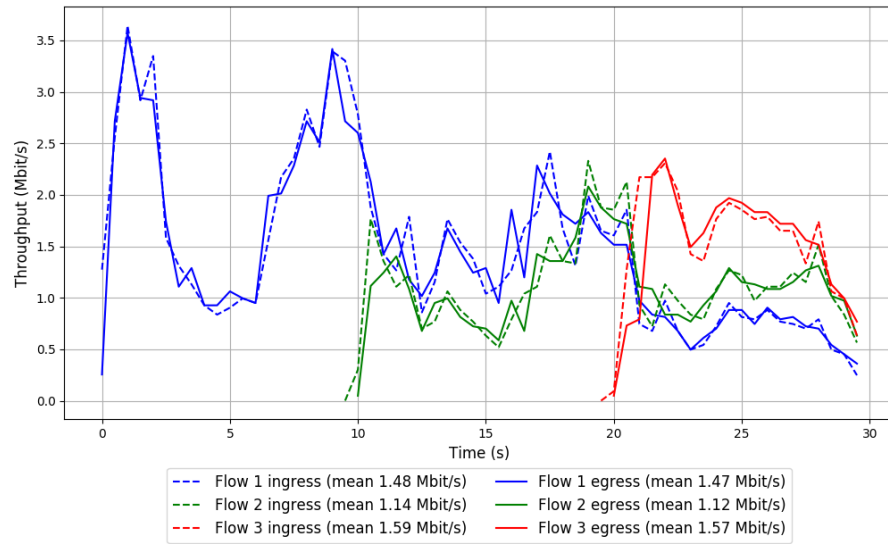


Run 3: Statistics of QUIC Cubic

Start at: 2017-11-30 08:35:49
End at: 2017-11-30 08:36:19
Local clock offset: -11.274 ms
Remote clock offset: -17.687 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 566.317 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 549.897 ms
Loss rate: 1.13%
-- Flow 2:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 561.467 ms
Loss rate: 2.46%
-- Flow 3:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 610.900 ms
Loss rate: 3.28%

Run 3: Report of QUIC Cubic — Data Link

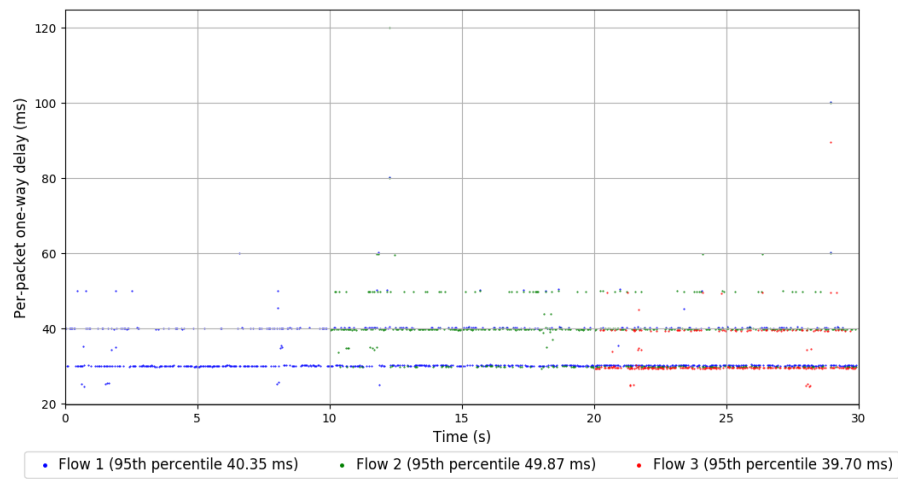
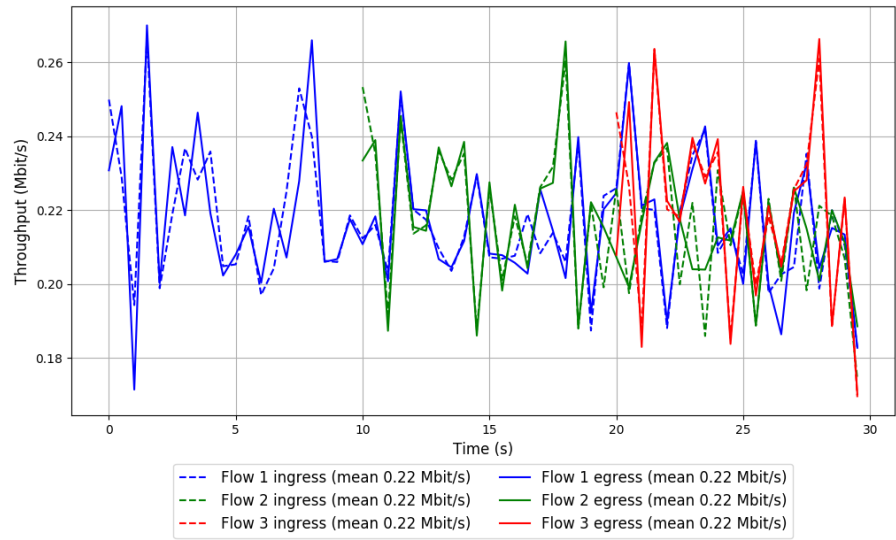


```
Run 1: Statistics of SReAM

Start at: 2017-11-30 08:03:53
End at: 2017-11-30 08:04:23
Local clock offset: -14.225 ms
Remote clock offset: -15.012 ms

# Below is generated by plot.py at 2017-11-30 08:39:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 49.750 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.355 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 49.872 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.699 ms
Loss rate: 0.35%
```

Run 1: Report of SReAM — Data Link

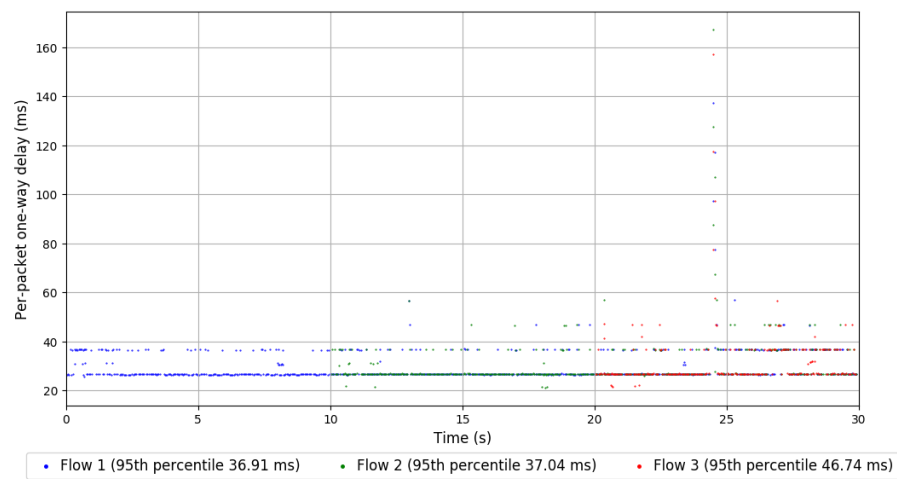
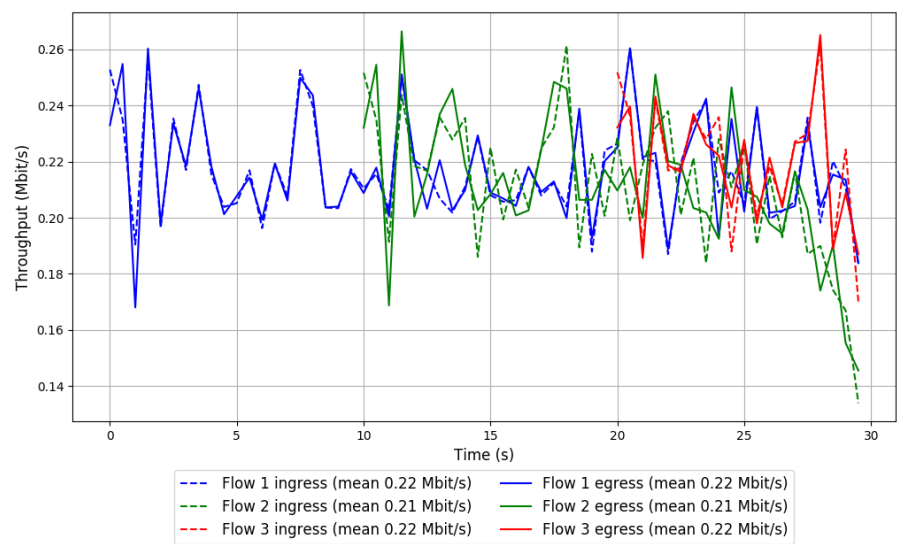


Run 2: Statistics of SReAM

Start at: 2017-11-30 08:20:23
End at: 2017-11-30 08:20:53
Local clock offset: -11.64 ms
Remote clock offset: -16.519 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 36.985 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 36.907 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 37.037 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 46.743 ms
Loss rate: 0.35%

Run 2: Report of SReAM — Data Link

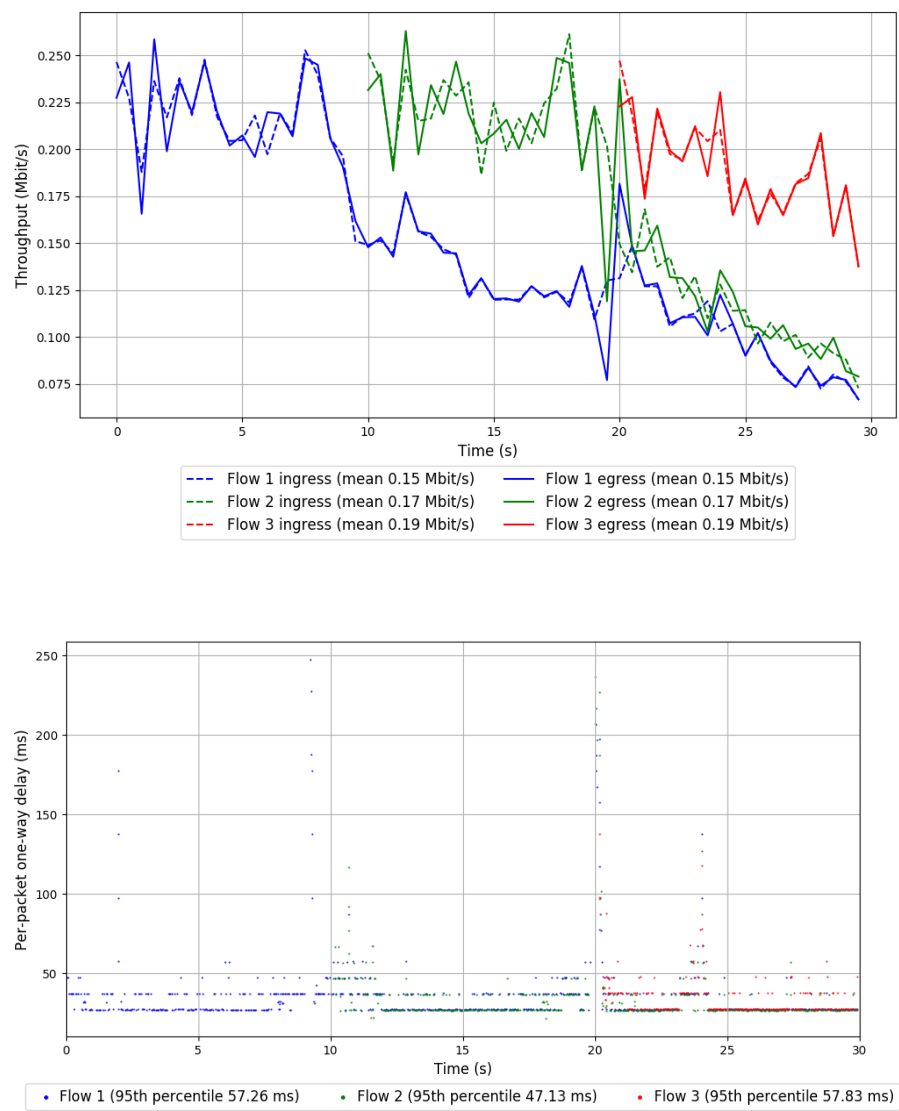


Run 3: Statistics of SReAM

Start at: 2017-11-30 08:37:09
End at: 2017-11-30 08:37:39
Local clock offset: -10.873 ms
Remote clock offset: -16.172 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 56.880 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 57.259 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 47.135 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 57.832 ms
Loss rate: 0.34%

Run 3: Report of SCRaM — Data Link

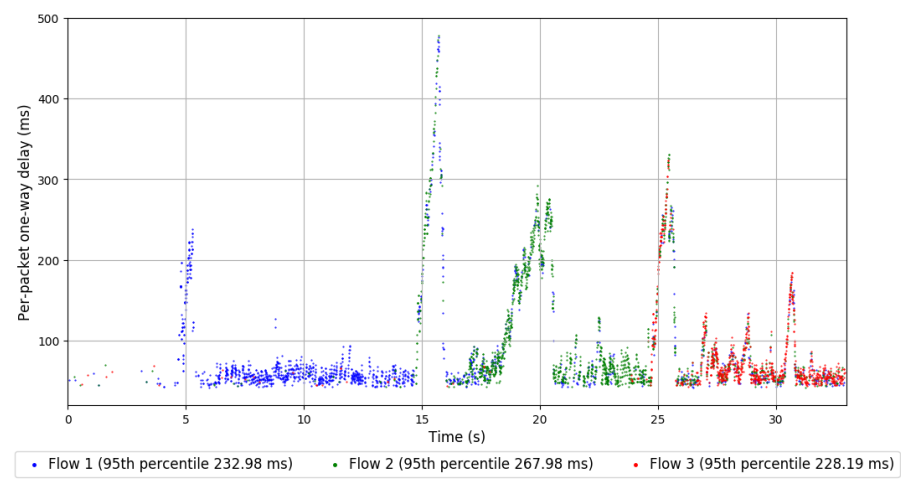
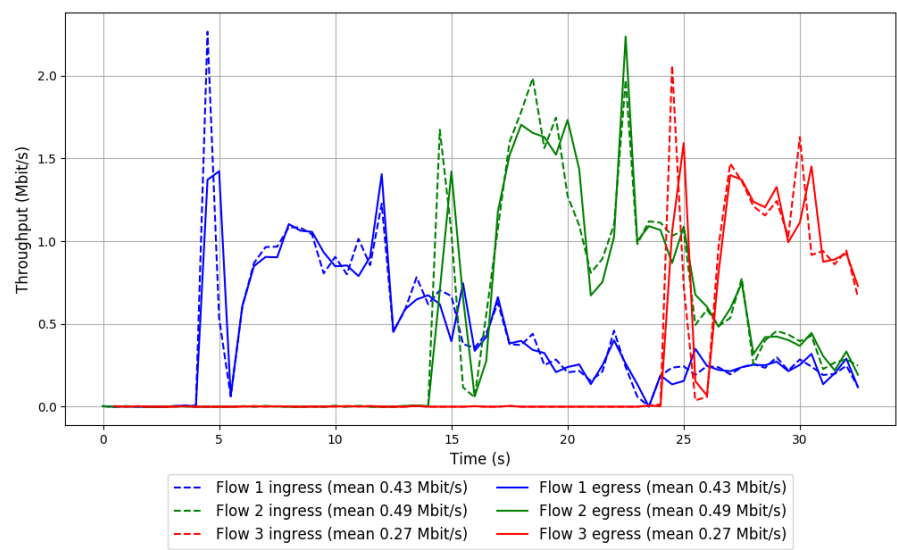


Run 1: Statistics of WebRTC media

Start at: 2017-11-30 07:56:53
End at: 2017-11-30 07:57:23
Local clock offset: -12.463 ms
Remote clock offset: 1.157 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 250.647 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 232.981 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 267.977 ms
Loss rate: 0.38%
-- Flow 3:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 228.192 ms
Loss rate: 0.48%

Run 1: Report of WebRTC media — Data Link

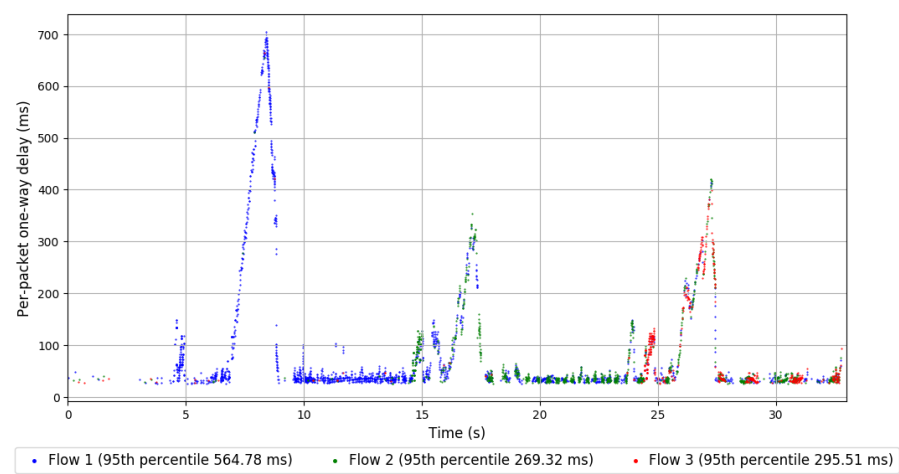
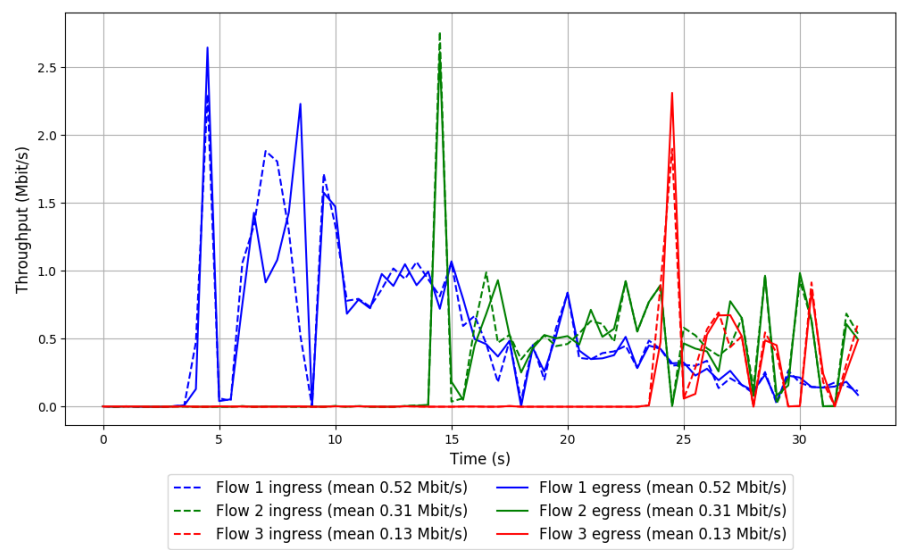


Run 2: Statistics of WebRTC media

Start at: 2017-11-30 08:13:07
End at: 2017-11-30 08:13:37
Local clock offset: -13.709 ms
Remote clock offset: -14.817 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 434.745 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 564.777 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 269.319 ms
Loss rate: 0.69%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 295.510 ms
Loss rate: 2.36%

Run 2: Report of WebRTC media — Data Link

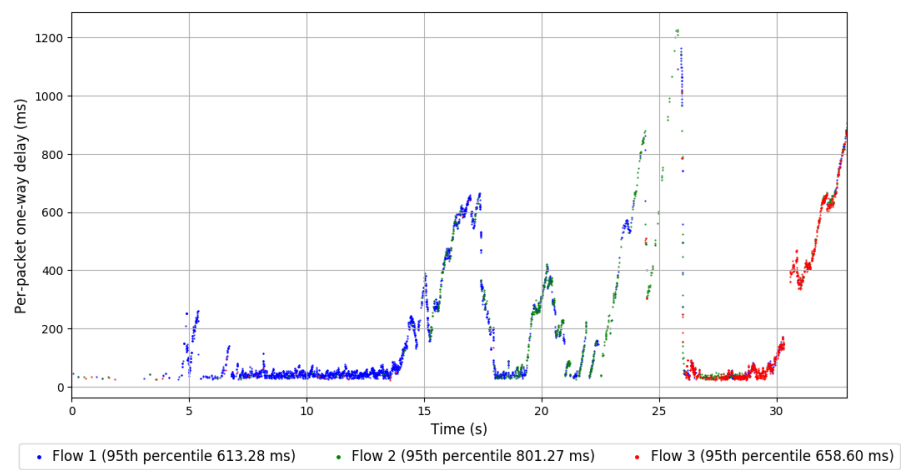
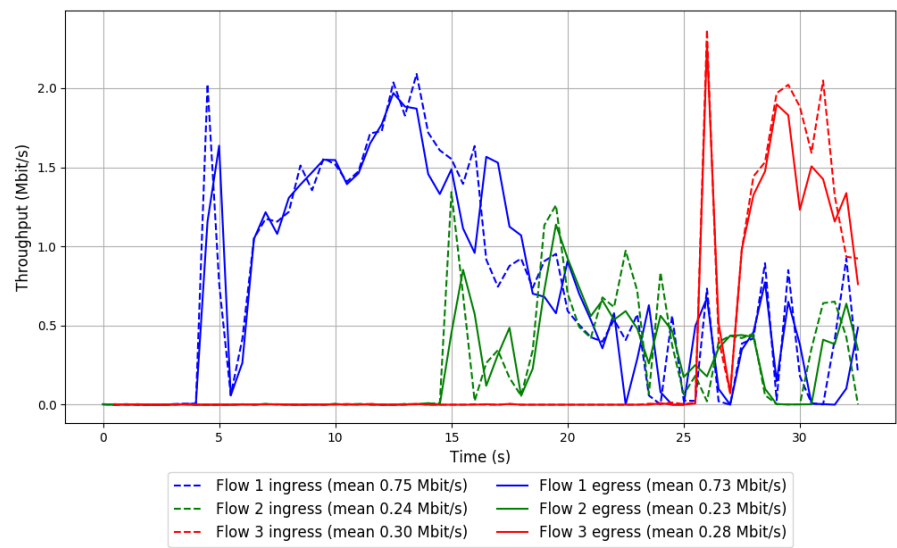


Run 3: Statistics of WebRTC media

Start at: 2017-11-30 08:30:01
End at: 2017-11-30 08:30:31
Local clock offset: -11.721 ms
Remote clock offset: -15.914 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 650.946 ms
Loss rate: 4.37%
-- Flow 1:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 613.281 ms
Loss rate: 2.46%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 801.272 ms
Loss rate: 4.83%
-- Flow 3:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 658.597 ms
Loss rate: 8.84%

Run 3: Report of WebRTC media — Data Link

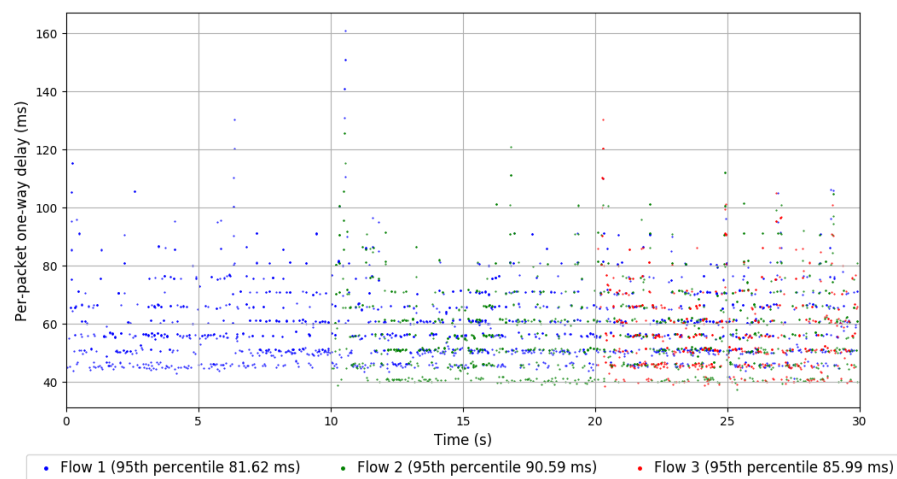
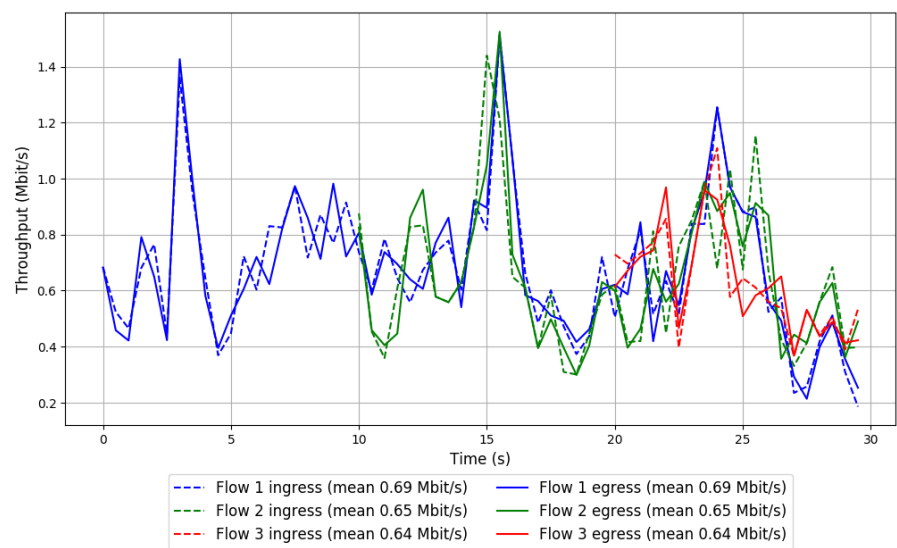


Run 1: Statistics of Sprout

Start at: 2017-11-30 07:55:44
End at: 2017-11-30 07:56:14
Local clock offset: -11.336 ms
Remote clock offset: 0.905 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 85.829 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 81.624 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 90.590 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 85.987 ms
Loss rate: 0.89%

Run 1: Report of Sprout — Data Link

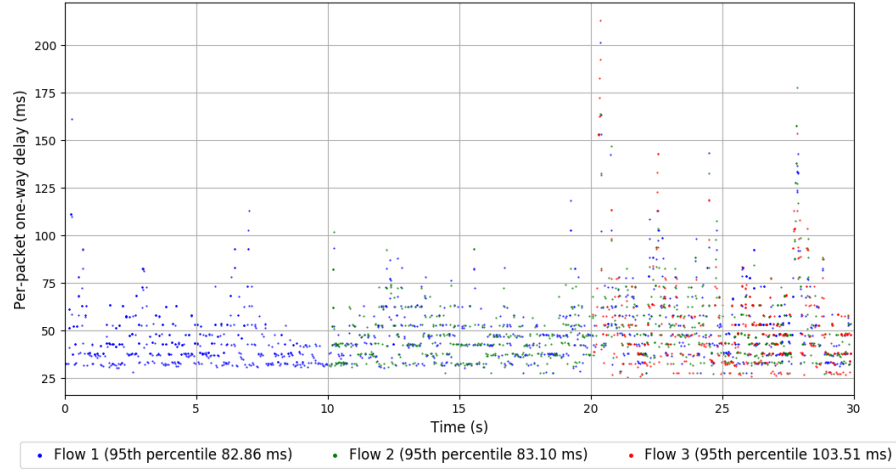
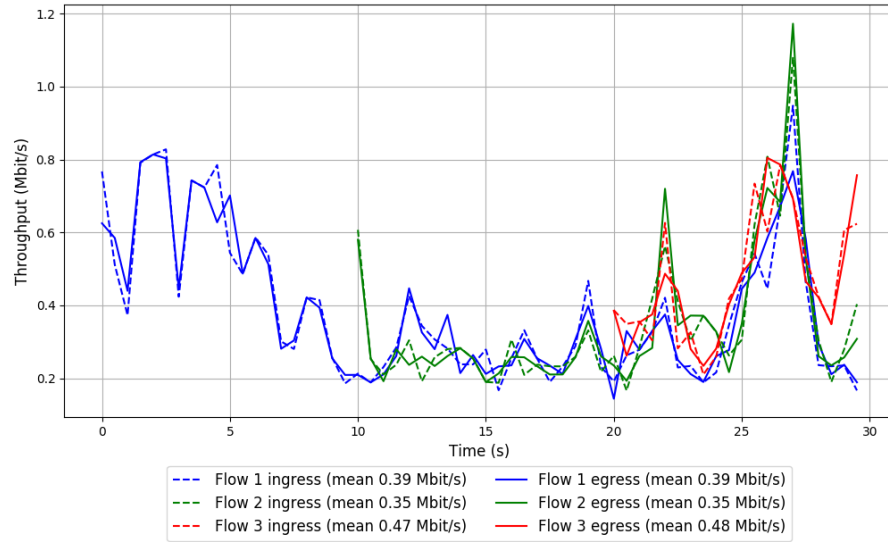


Run 2: Statistics of Sprout

Start at: 2017-11-30 08:11:48
End at: 2017-11-30 08:12:18
Local clock offset: -15.696 ms
Remote clock offset: -15.037 ms

```
# Below is generated by plot.py at 2017-11-30 08:39:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 86.729 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 82.863 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 83.099 ms
Loss rate: 0.85%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 103.510 ms
Loss rate: 0.02%
```


Run 2: Report of Sprout — Data Link

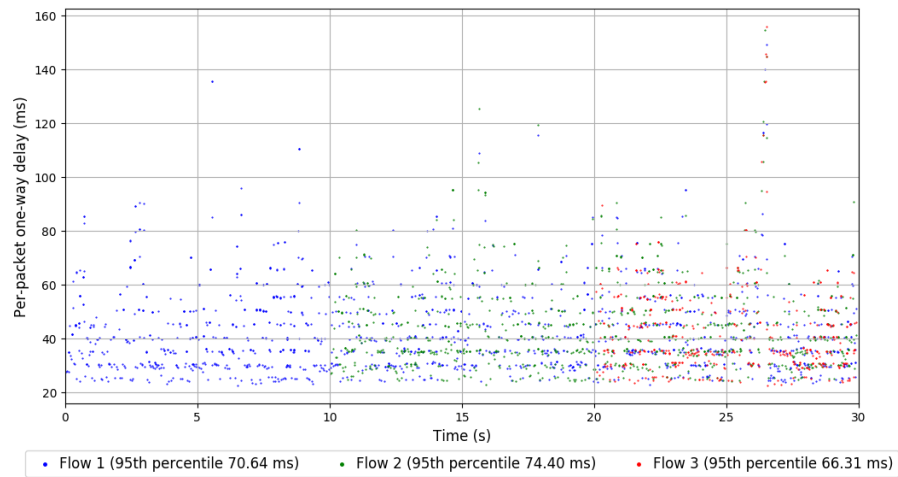
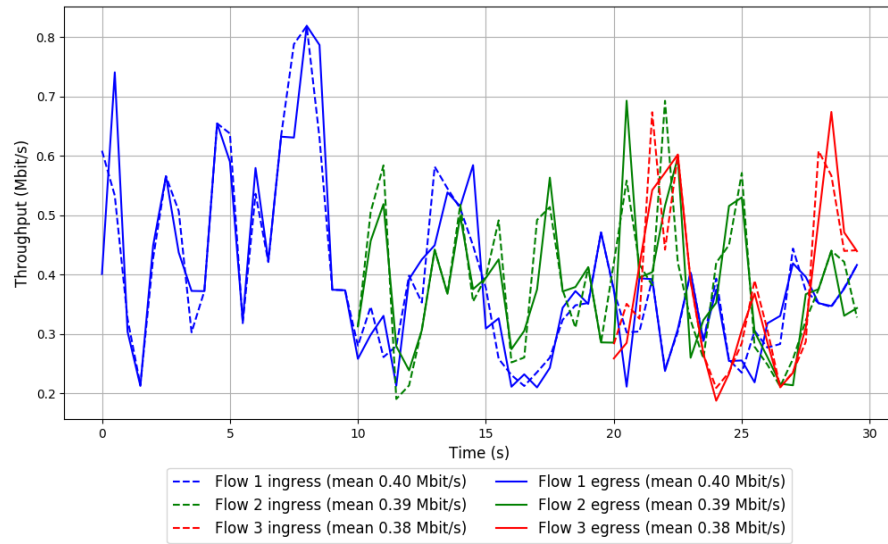


Run 3: Statistics of Sprout

Start at: 2017-11-30 08:28:53
End at: 2017-11-30 08:29:23
Local clock offset: -13.987 ms
Remote clock offset: -17.67 ms

```
# Below is generated by plot.py at 2017-11-30 08:39:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 70.932 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 70.642 ms
Loss rate: 0.01%
-- Flow 2:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 74.399 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 66.314 ms
Loss rate: 0.02%
```

Run 3: Report of Sprout — Data Link

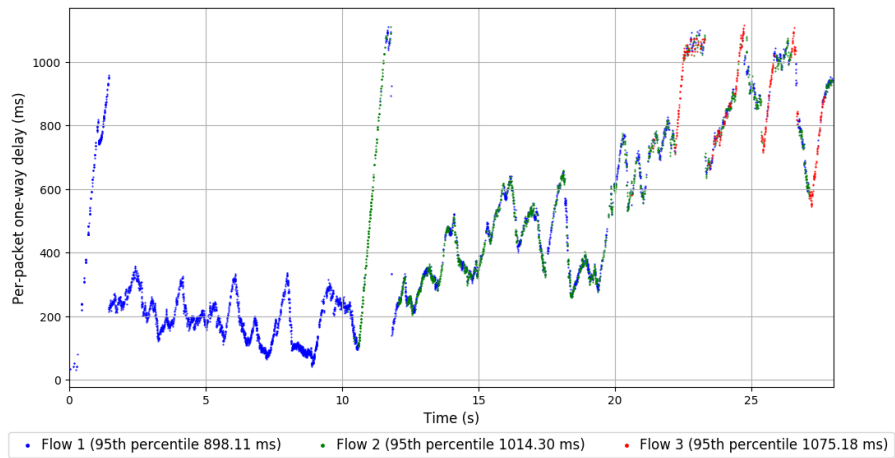
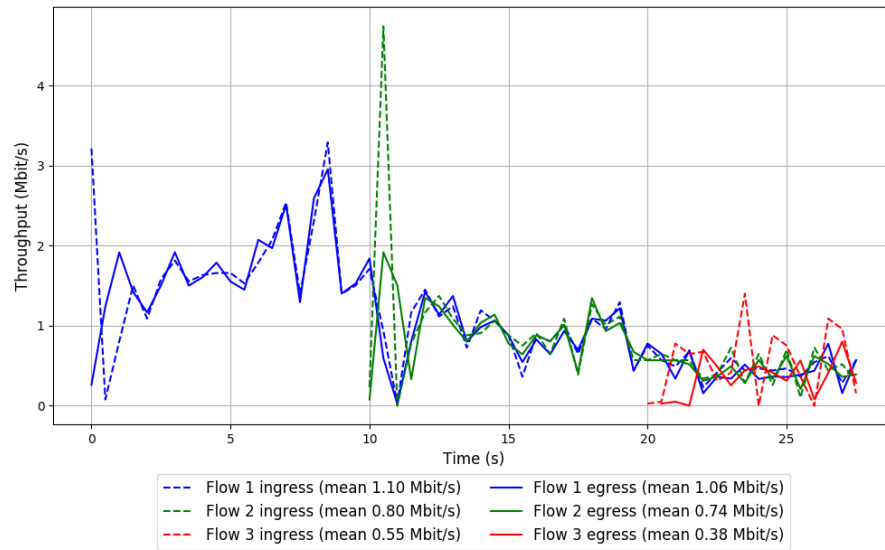


```
Run 1: Statistics of TaoVA-100x

Start at: 2017-11-30 08:00:32
End at: 2017-11-30 08:01:02
Local clock offset: -13.373 ms
Remote clock offset: -16.038 ms

# Below is generated by plot.py at 2017-11-30 08:39:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 1003.650 ms
Loss rate: 7.82%
-- Flow 1:
Average throughput: 1.06 Mbit/s
95th percentile per-packet one-way delay: 898.108 ms
Loss rate: 3.42%
-- Flow 2:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 1014.302 ms
Loss rate: 8.49%
-- Flow 3:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1075.181 ms
Loss rate: 37.29%
```

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

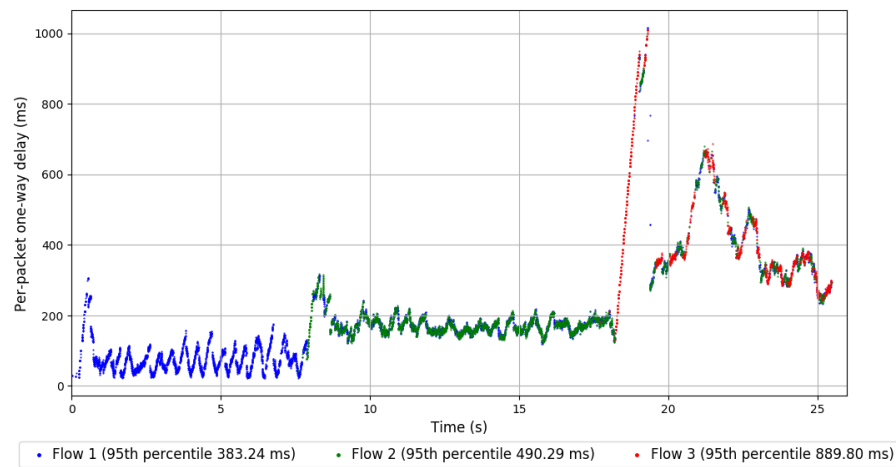
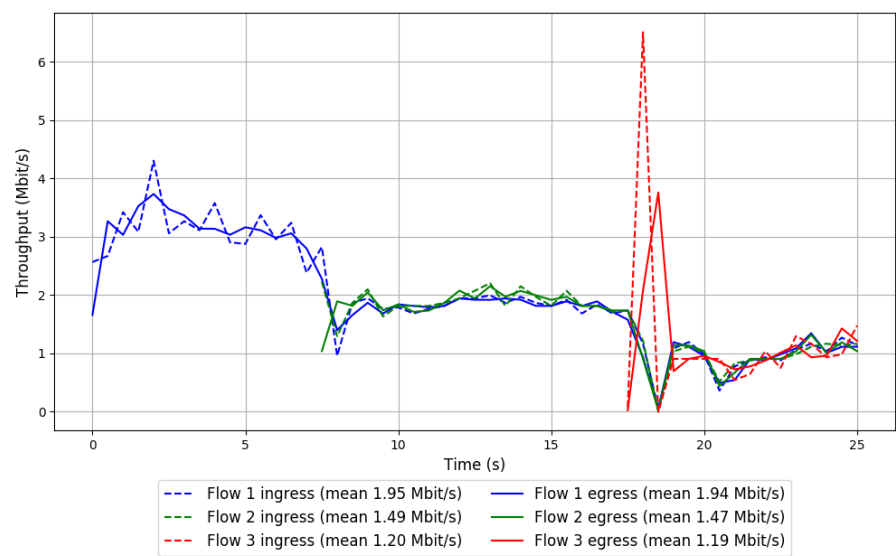


Run 2: Statistics of TaoVA-100x

Start at: 2017-11-30 08:16:55
End at: 2017-11-30 08:17:25
Local clock offset: -12.204 ms
Remote clock offset: -15.661 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.33 Mbit/s
95th percentile per-packet one-way delay: 544.143 ms
Loss rate: 1.54%
-- Flow 1:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 383.243 ms
Loss rate: 0.95%
-- Flow 2:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 490.286 ms
Loss rate: 1.86%
-- Flow 3:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 889.796 ms
Loss rate: 3.72%

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



Run 3: Statistics of TaoVA-100x

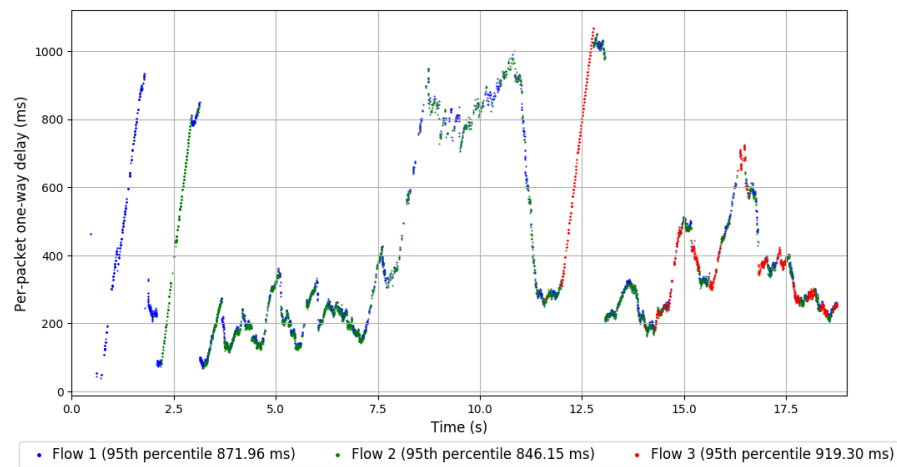
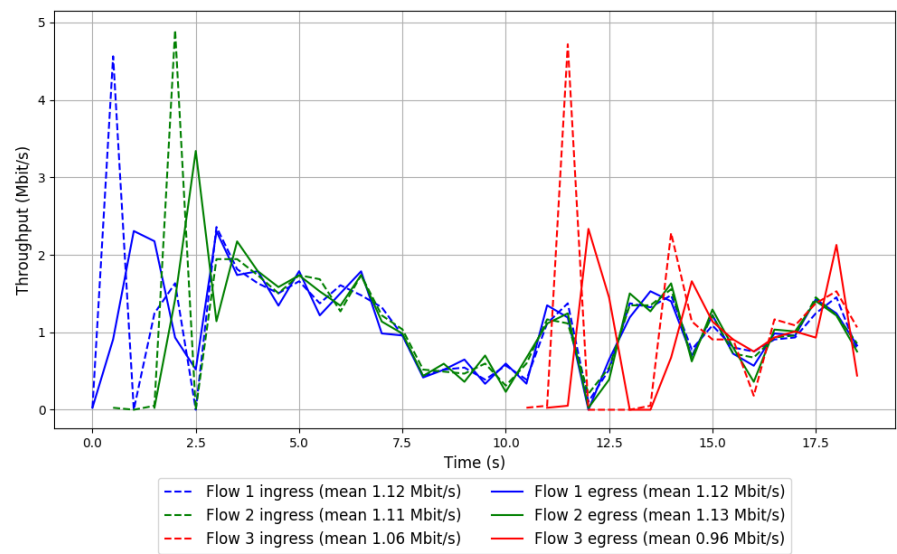
Start at: 2017-11-30 08:33:26

End at: 2017-11-30 08:33:56

Local clock offset: -9.824 ms

Remote clock offset: -16.201 ms

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

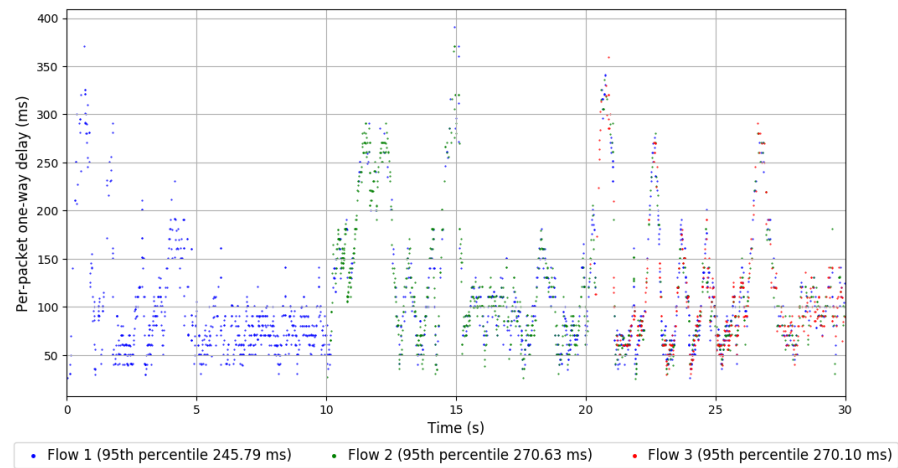
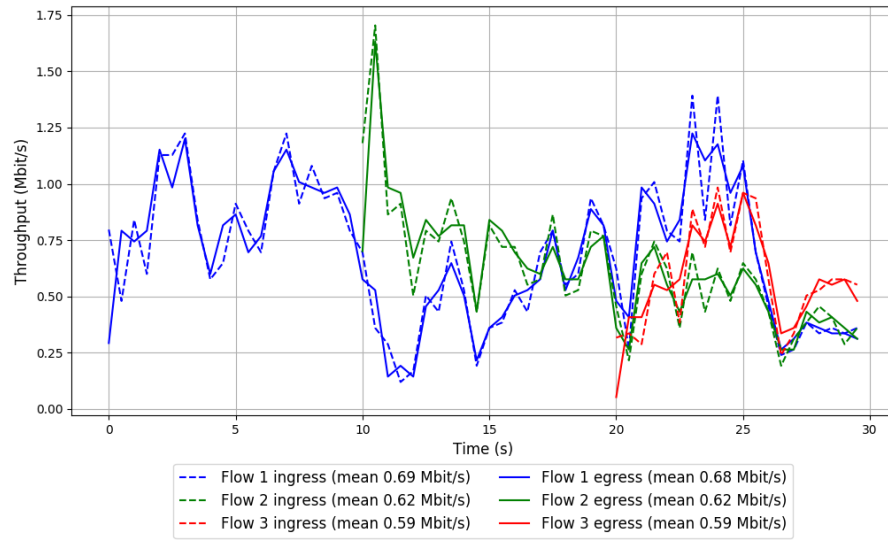


Run 1: Statistics of TCP Vegas

Start at: 2017-11-30 08:01:39
End at: 2017-11-30 08:02:09
Local clock offset: -11.995 ms
Remote clock offset: -16.838 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 260.735 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 245.794 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 270.635 ms
Loss rate: 0.58%
-- Flow 3:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 270.095 ms
Loss rate: 1.85%

Run 1: Report of TCP Vegas — Data Link

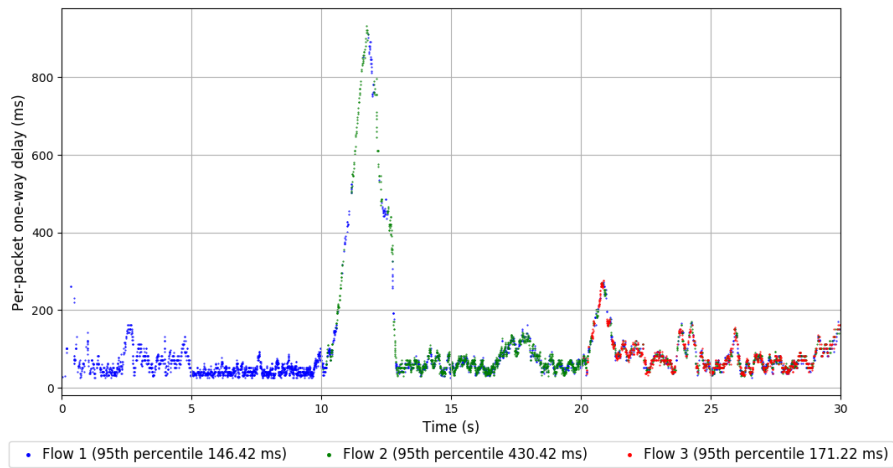
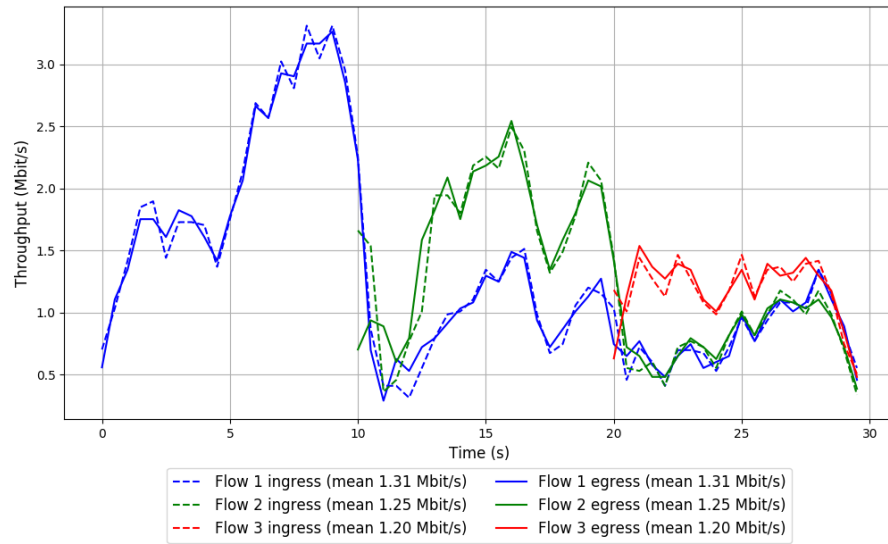


Run 2: Statistics of TCP Vegas

Start at: 2017-11-30 08:18:05
End at: 2017-11-30 08:18:35
Local clock offset: -12.351 ms
Remote clock offset: -16.696 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 201.040 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 146.421 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 430.420 ms
Loss rate: 0.48%
-- Flow 3:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 171.223 ms
Loss rate: 0.50%

Run 2: Report of TCP Vegas — Data Link

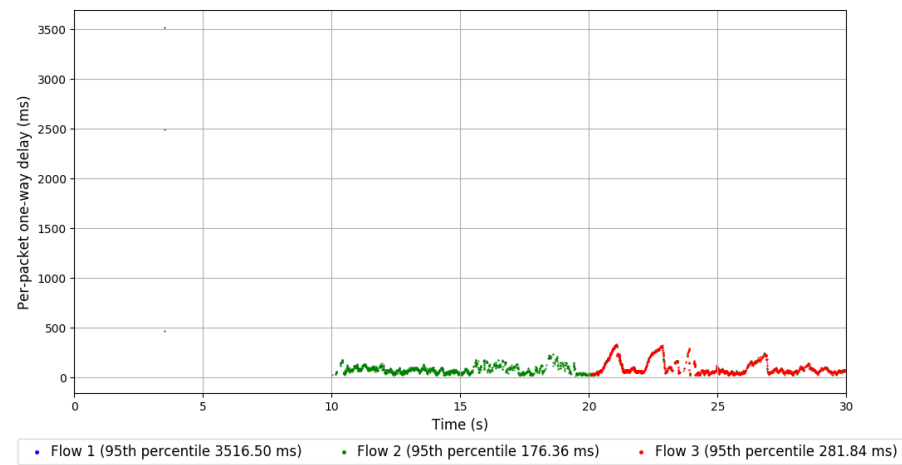
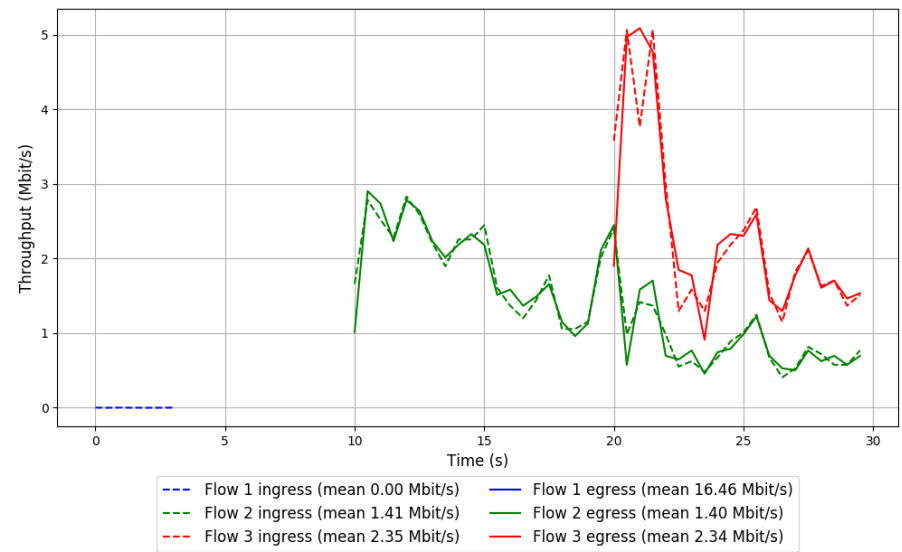


Run 3: Statistics of TCP Vegas

Start at: 2017-11-30 08:34:33
End at: 2017-11-30 08:35:03
Local clock offset: -11.734 ms
Remote clock offset: -16.751 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 246.109 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 16.46 Mbit/s
95th percentile per-packet one-way delay: 3516.504 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 176.359 ms
Loss rate: 0.30%
-- Flow 3:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 281.839 ms
Loss rate: 0.51%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2017-11-30 07:53:23

End at: 2017-11-30 07:53:53

Local clock offset: -12.67 ms

Remote clock offset: 0.764 ms

Below is generated by plot.py at 2017-11-30 08:39:25

Datalink statistics

-- Total of 3 flows:

Average throughput: 3.50 Mbit/s

95th percentile per-packet one-way delay: 777.691 ms

Loss rate: 1.79%

-- Flow 1:

Average throughput: 2.45 Mbit/s

95th percentile per-packet one-way delay: 777.941 ms

Loss rate: 1.86%

-- Flow 2:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 740.982 ms

Loss rate: 1.95%

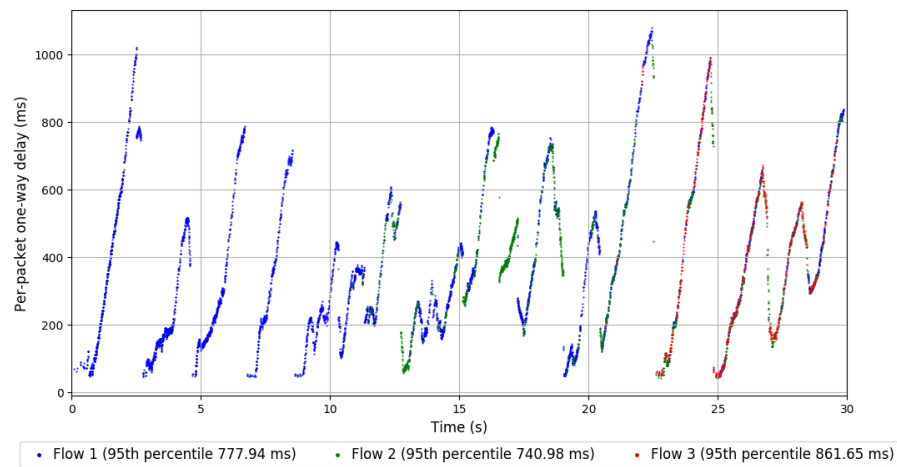
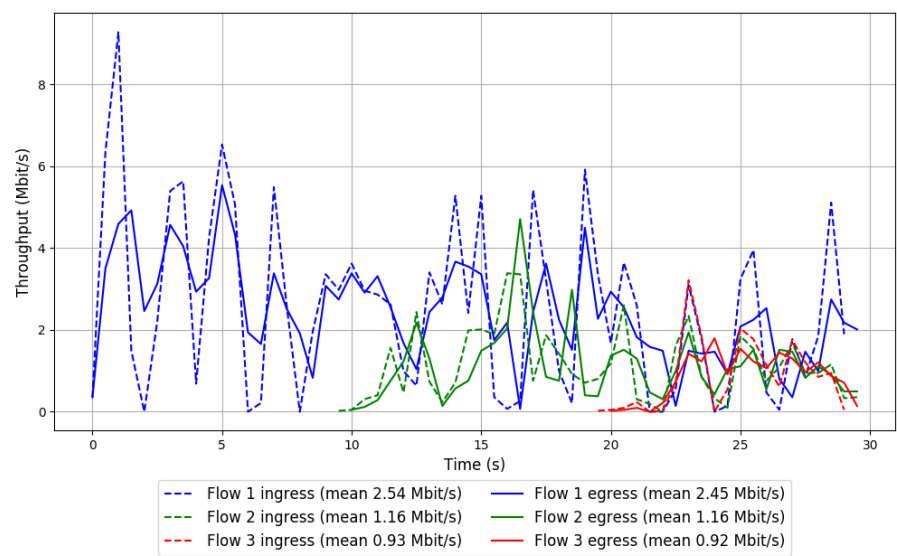
-- Flow 3:

Average throughput: 0.92 Mbit/s

95th percentile per-packet one-way delay: 861.651 ms

Loss rate: 0.83%

Run 1: Report of Verus — Data Link

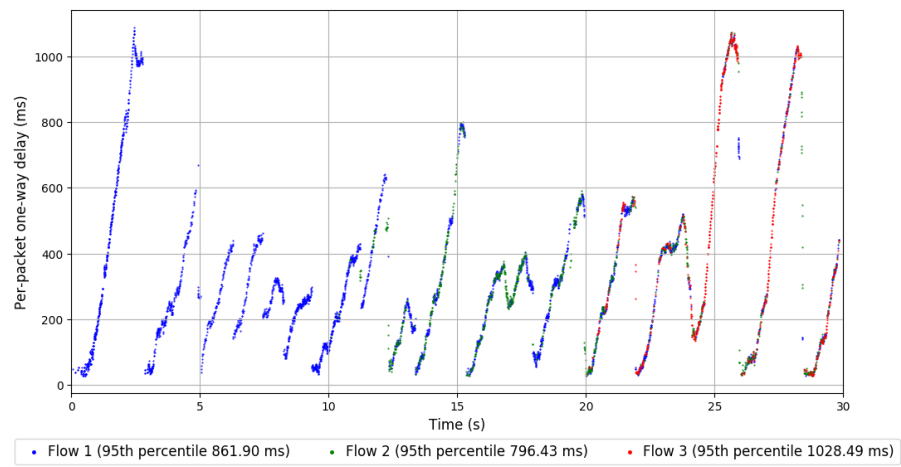
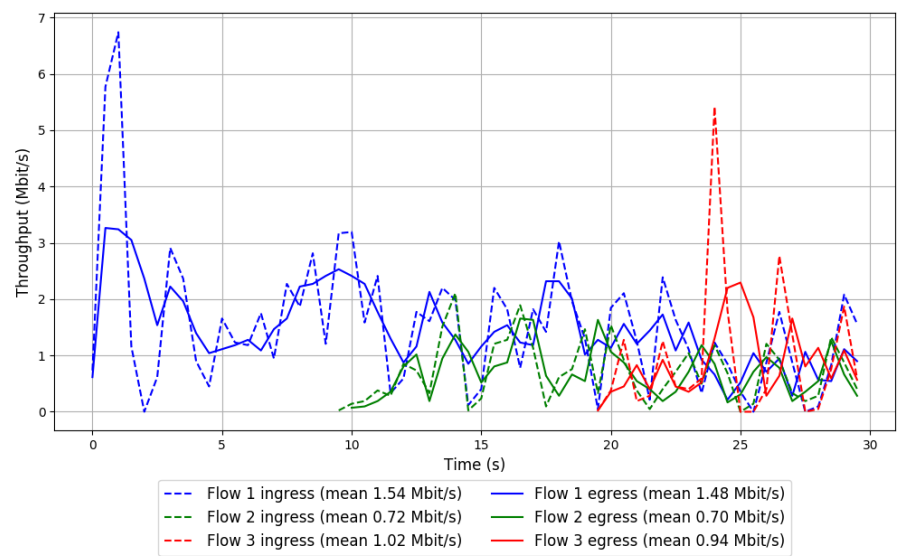


Run 2: Statistics of Verus

Start at: 2017-11-30 08:09:34
End at: 2017-11-30 08:10:04
Local clock offset: -14.434 ms
Remote clock offset: -16.474 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 976.096 ms
Loss rate: 4.08%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 861.897 ms
Loss rate: 3.79%
-- Flow 2:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 796.426 ms
Loss rate: 3.22%
-- Flow 3:
Average throughput: 0.94 Mbit/s
95th percentile per-packet one-way delay: 1028.490 ms
Loss rate: 6.67%

Run 2: Report of Verus — Data Link

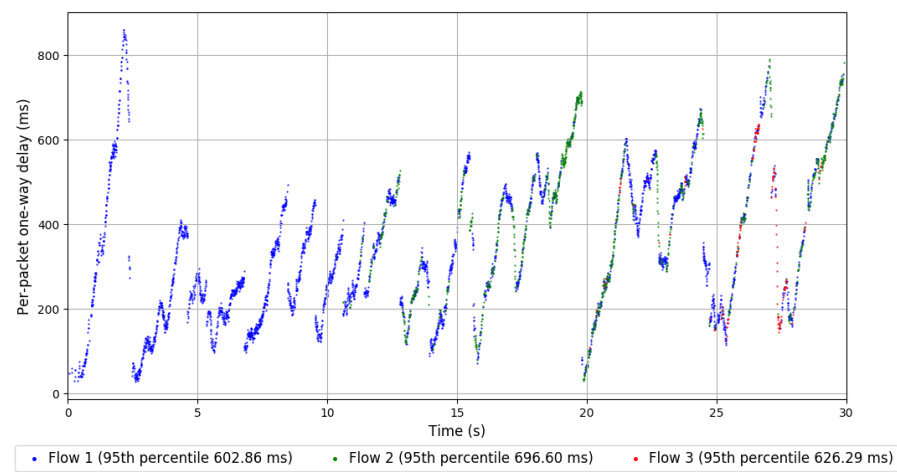
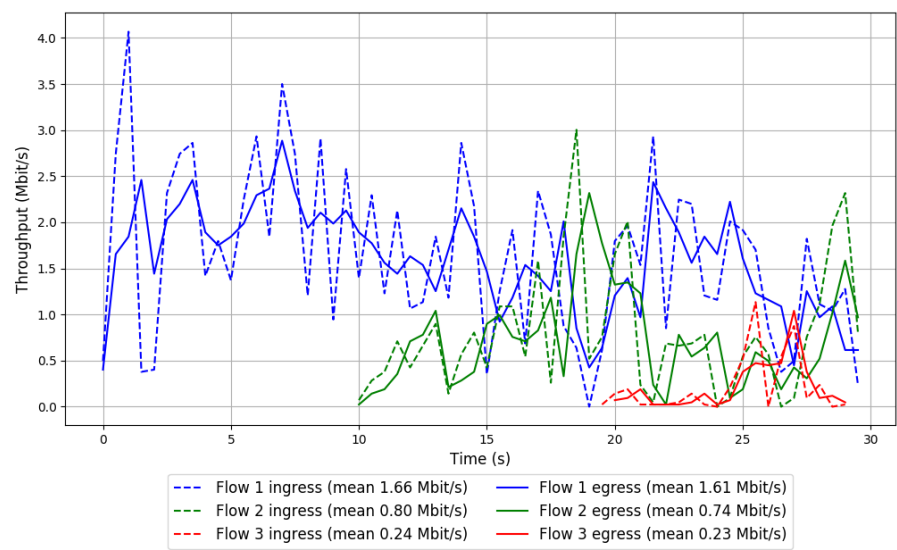


Run 3: Statistics of Verus

Start at: 2017-11-30 08:26:24
End at: 2017-11-30 08:26:54
Local clock offset: -14.027 ms
Remote clock offset: -16.027 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 647.743 ms
Loss rate: 3.91%
-- Flow 1:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 602.857 ms
Loss rate: 2.22%
-- Flow 2:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 696.595 ms
Loss rate: 9.29%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 626.295 ms
Loss rate: 2.76%

Run 3: Report of Verus — Data Link

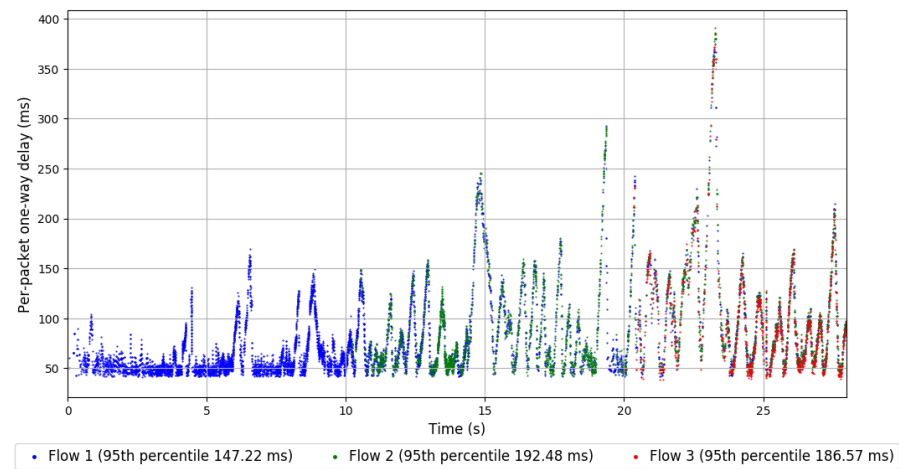
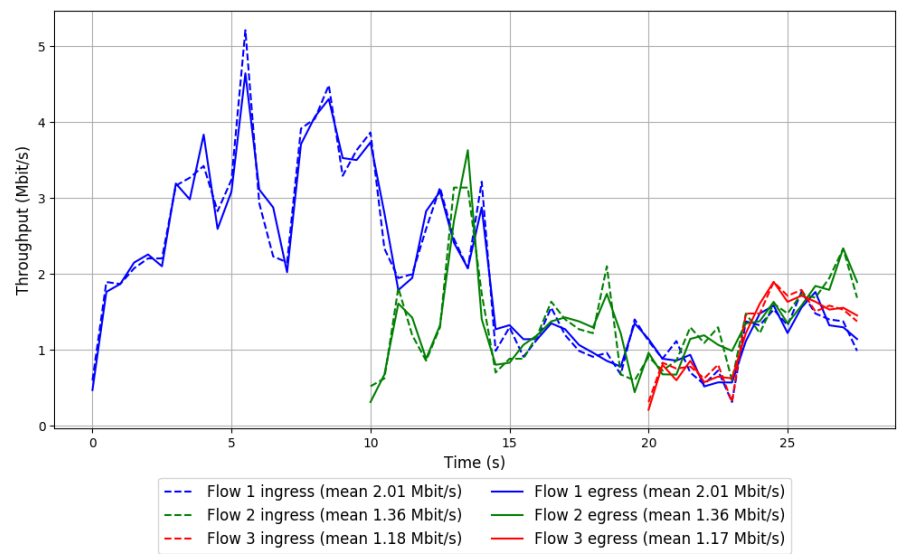


Run 1: Statistics of Copa

Start at: 2017-11-30 07:48:09
End at: 2017-11-30 07:48:39
Local clock offset: -11.917 ms
Remote clock offset: 0.772 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 160.056 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 2.01 Mbit/s
95th percentile per-packet one-way delay: 147.225 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 192.479 ms
Loss rate: 0.53%
-- Flow 3:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 186.573 ms
Loss rate: 1.11%

Run 1: Report of Copa — Data Link

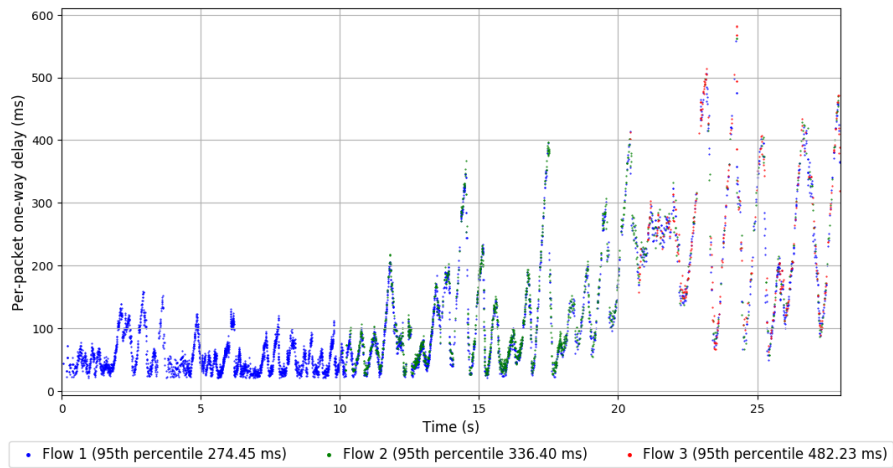
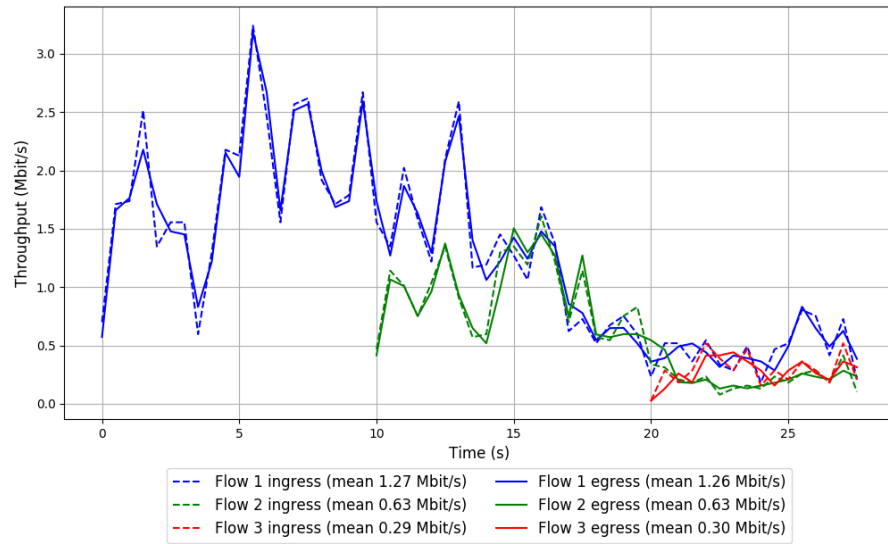


Run 2: Statistics of Copa

Start at: 2017-11-30 08:05:00
End at: 2017-11-30 08:05:30
Local clock offset: -11.735 ms
Remote clock offset: -15.94 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 319.741 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 274.449 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 336.402 ms
Loss rate: 0.61%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 482.228 ms
Loss rate: 3.91%

Run 2: Report of Copa — Data Link

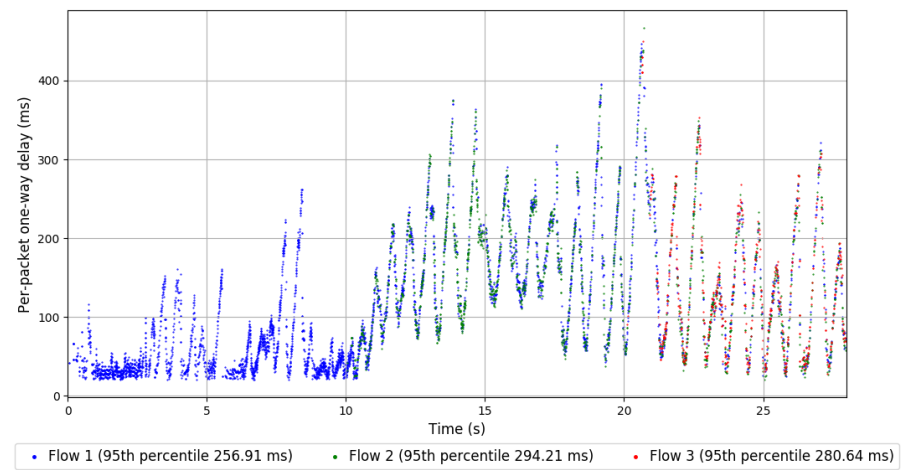
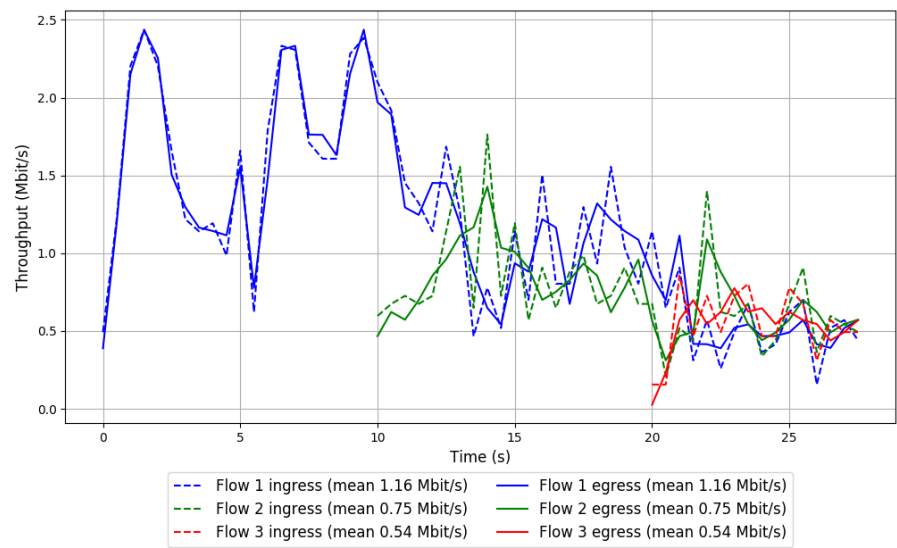


Run 3: Statistics of Copa

Start at: 2017-11-30 08:21:30
End at: 2017-11-30 08:22:00
Local clock offset: -10.729 ms
Remote clock offset: -17.18 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.80 Mbit/s
95th percentile per-packet one-way delay: 273.299 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 256.912 ms
Loss rate: 0.17%
-- Flow 2:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 294.214 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 280.637 ms
Loss rate: 1.25%

Run 3: Report of Copa — Data Link



Run 1: Statistics of Indigo

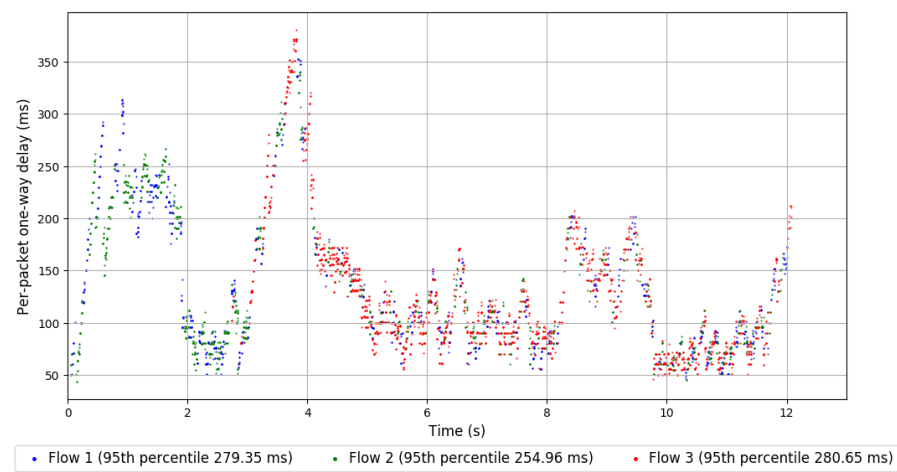
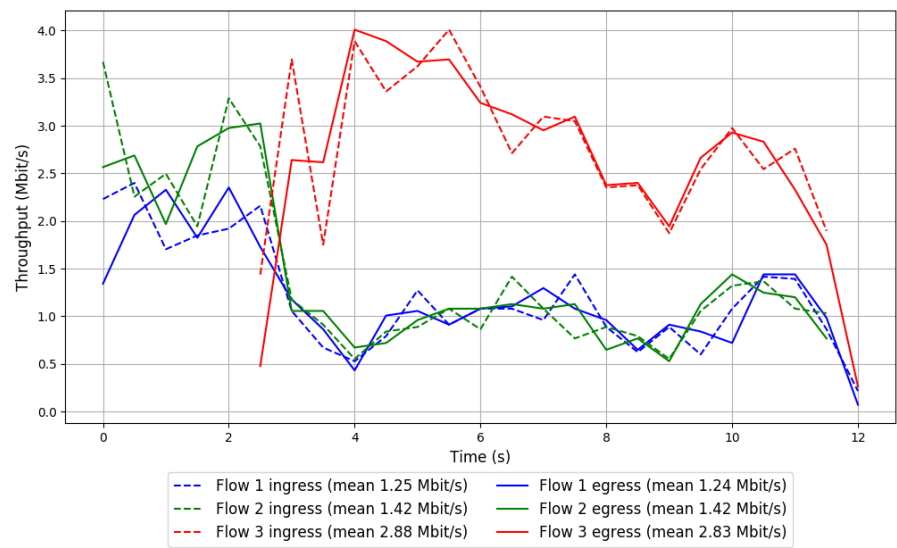
Start at: 2017-11-30 07:52:03

End at: 2017-11-30 07:52:33

Local clock offset: -12.67 ms

Remote clock offset: 1.523 ms

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

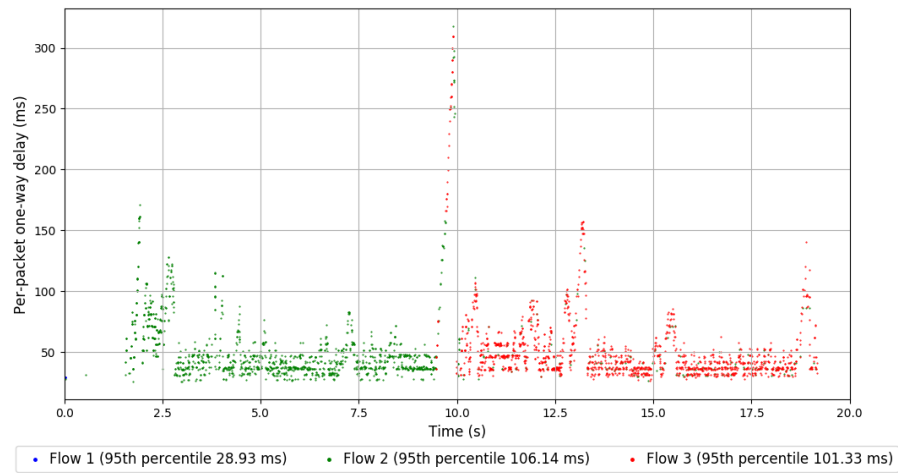
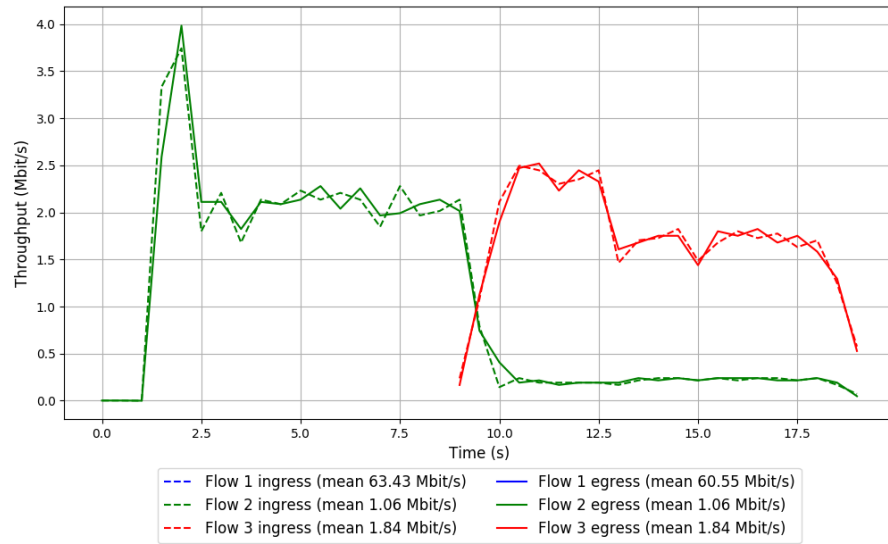
Start at: 2017-11-30 08:08:27

End at: 2017-11-30 08:08:57

Local clock offset: -12.779 ms

Remote clock offset: -16.943 ms

Run 2: Report of Indigo — Data Link

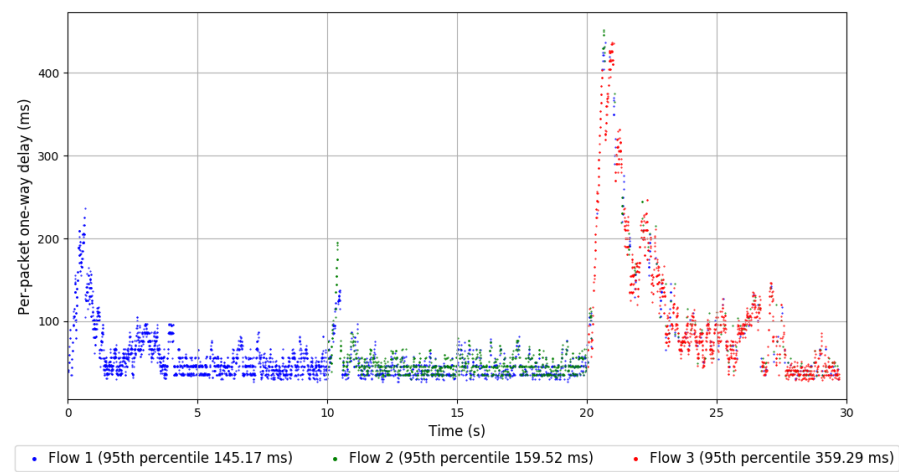
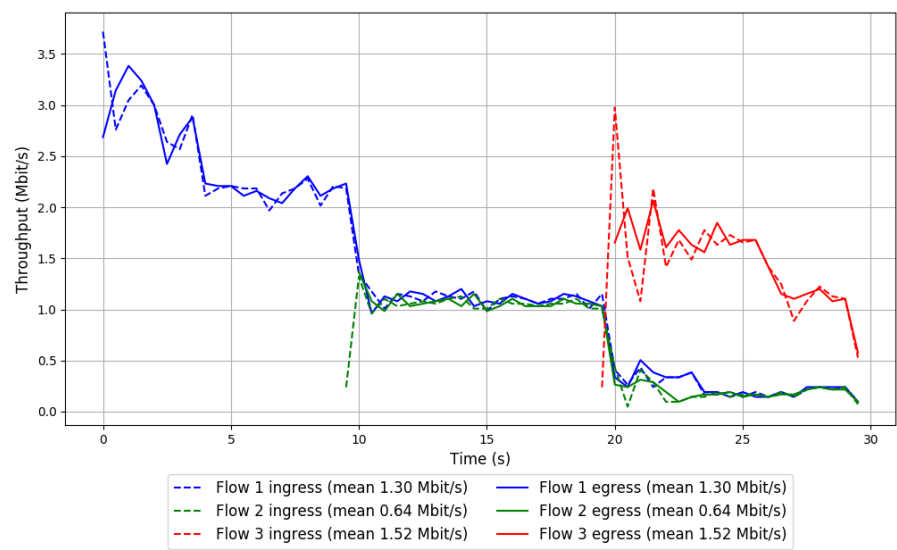


Run 3: Statistics of Indigo

Start at: 2017-11-30 08:25:03
End at: 2017-11-30 08:25:33
Local clock offset: -14.128 ms
Remote clock offset: -16.182 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 209.645 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 145.172 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 159.522 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 359.290 ms
Loss rate: 0.57%

Run 3: Report of Indigo — Data Link

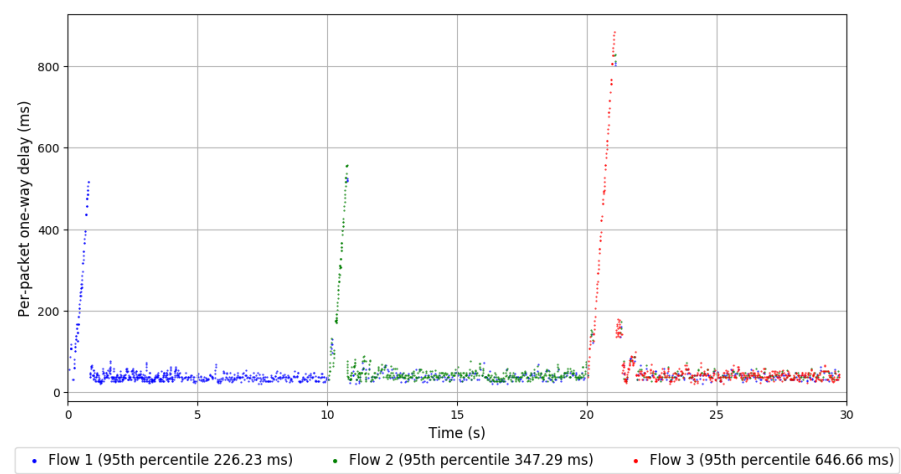
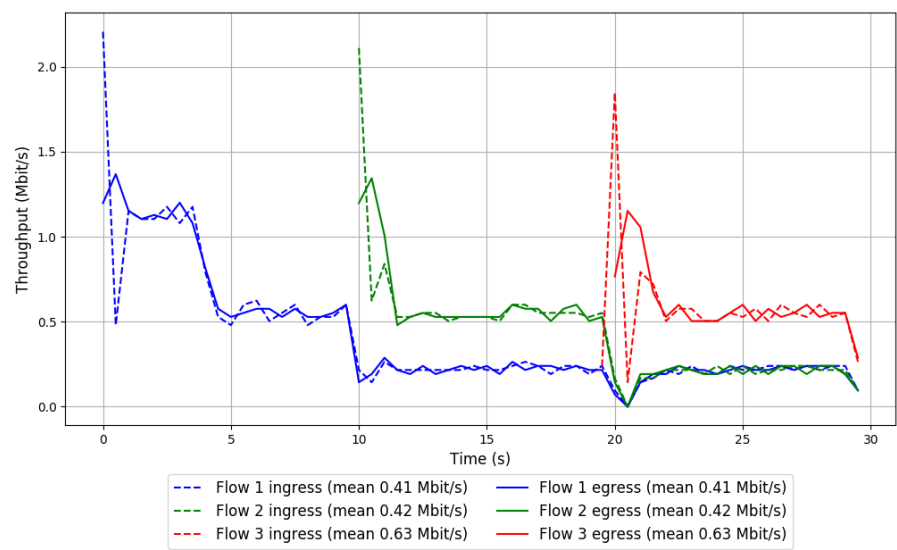


```
Run 1: Statistics of Indigo-calib

Start at: 2017-11-30 07:59:09
End at: 2017-11-30 07:59:39
Local clock offset: -10.007 ms
Remote clock offset: -16.417 ms

# Below is generated by plot.py at 2017-11-30 08:39:25
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 372.714 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 226.230 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 347.294 ms
Loss rate: 0.29%
-- Flow 3:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 646.662 ms
Loss rate: 0.59%
```

Run 1: Report of Indigo-calib — Data Link

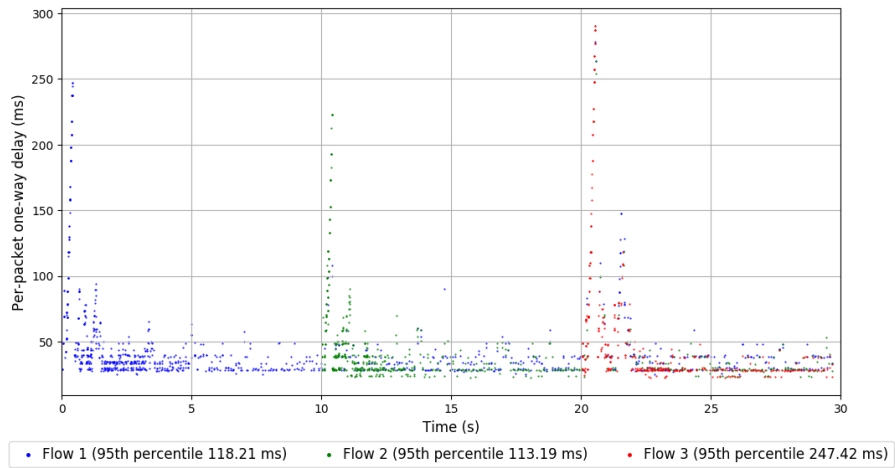
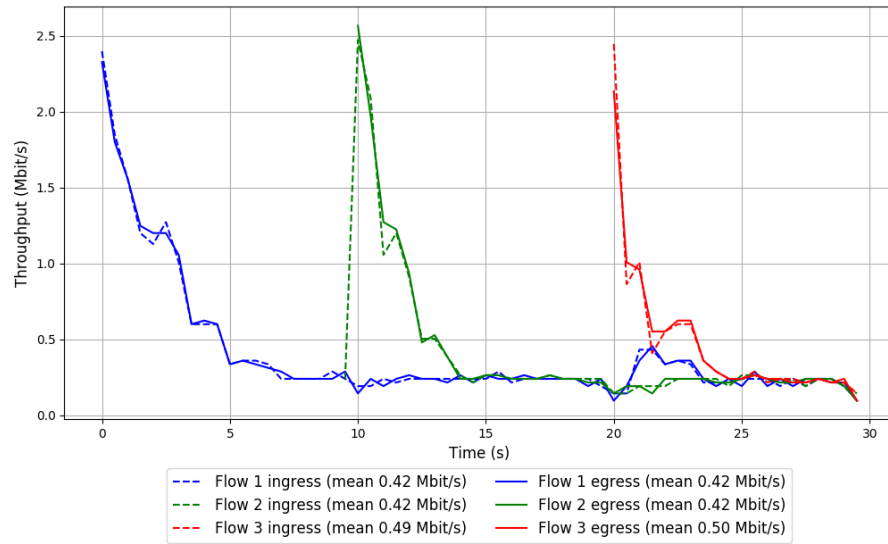


Run 2: Statistics of Indigo-calib

Start at: 2017-11-30 08:15:47
End at: 2017-11-30 08:16:17
Local clock offset: -13.248 ms
Remote clock offset: -18.056 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 129.984 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 118.214 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 113.187 ms
Loss rate: 0.29%
-- Flow 3:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 247.417 ms
Loss rate: 0.75%

Run 2: Report of Indigo-calib — Data Link



Run 3: Statistics of Indigo-calib

Start at: 2017-11-30 08:32:17
End at: 2017-11-30 08:32:47
Local clock offset: -12.159 ms
Remote clock offset: -17.244 ms

Below is generated by plot.py at 2017-11-30 08:39:25
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 189.043 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 180.976 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 133.962 ms
Loss rate: 0.14%
-- Flow 3:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 464.163 ms
Loss rate: 0.40%

Run 3: Report of Indigo-calib — Data Link

