

Pantheon Report

Generated at 2017-12-05 09:35:15 (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).

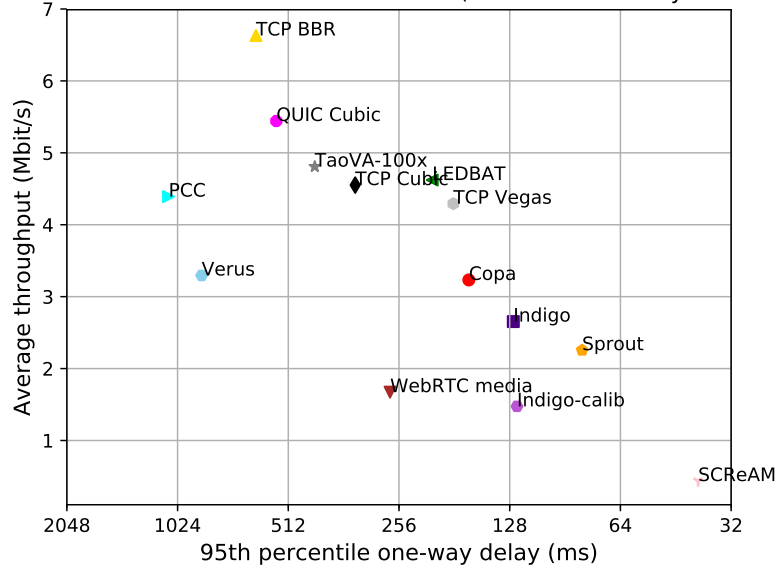
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

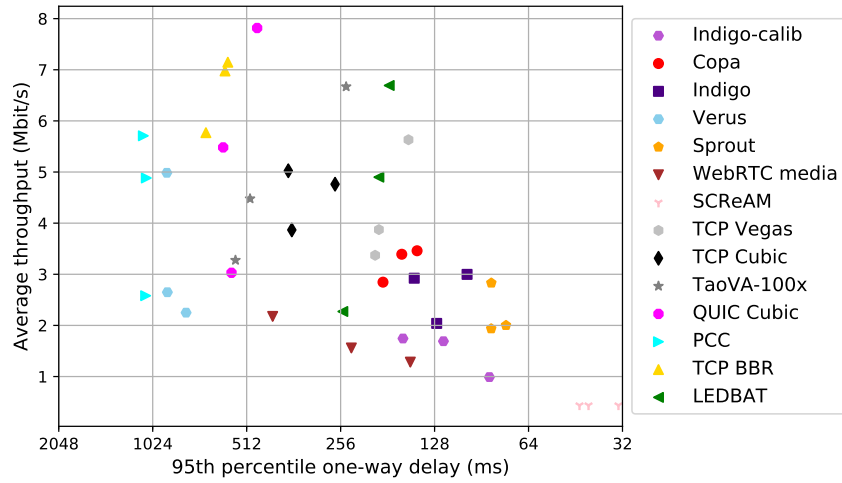
Git summary:

```
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



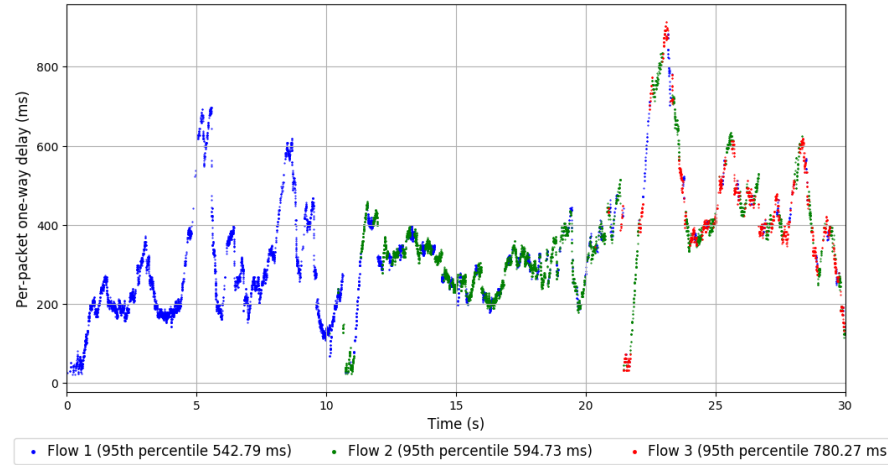
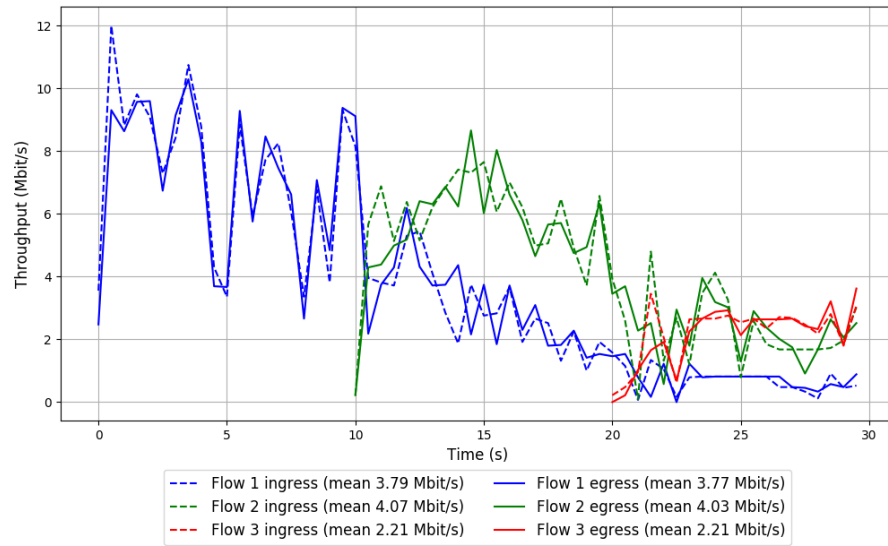
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	3.69	3.56	1.90	563.59	673.43	845.24	0.47	1.39	5.88
TCP Cubic	3	2.43	2.35	1.74	314.41	367.13	331.03	0.54	0.90	2.14
LEDBAT	3	3.20	1.65	1.01	194.78	227.93	228.25	0.38	0.99	1.67
PCC	3	3.05	1.30	1.62	1065.90	1124.28	1192.36	32.46	57.97	85.53
QUIC Cubic	3	3.16	2.62	1.78	344.15	570.78	616.51	0.45	1.60	2.89
SCReAM	3	0.22	0.22	0.22	36.24	39.38	35.75	0.13	0.26	0.23
WebRTC media	3	0.85	0.51	0.33	245.45	278.23	328.57	0.03	0.50	0.77
Sprout	3	1.20	1.09	1.01	76.33	84.75	90.56	0.05	0.05	0.65
TaoVA-100x	3	3.02	2.09	1.62	337.88	500.95	607.58	0.50	1.30	5.32
TCP Vegas	3	1.97	2.26	2.50	148.19	185.81	229.07	0.30	0.35	1.39
Verus	3	2.49	0.87	0.67	885.47	820.70	852.24	13.83	9.68	6.38
Copa	3	2.11	1.35	0.91	147.42	191.83	221.49	0.16	0.41	1.42
Indigo	3	1.44	1.01	1.65	118.16	137.19	111.82	0.01	0.07	0.25
Indigo-calib	3	0.42	1.10	1.00	98.58	130.51	107.32	0.07	0.09	0.12

Run 1: Statistics of TCP BBR

Start at: 2017-12-05 08:55:09
End at: 2017-12-05 08:55:39
Local clock offset: 4.746 ms
Remote clock offset: -15.081 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.15 Mbit/s
95th percentile per-packet one-way delay: 588.393 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 3.77 Mbit/s
95th percentile per-packet one-way delay: 542.792 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 4.03 Mbit/s
95th percentile per-packet one-way delay: 594.728 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 780.268 ms
Loss rate: 3.39%

Run 1: Report of TCP BBR — Data Link

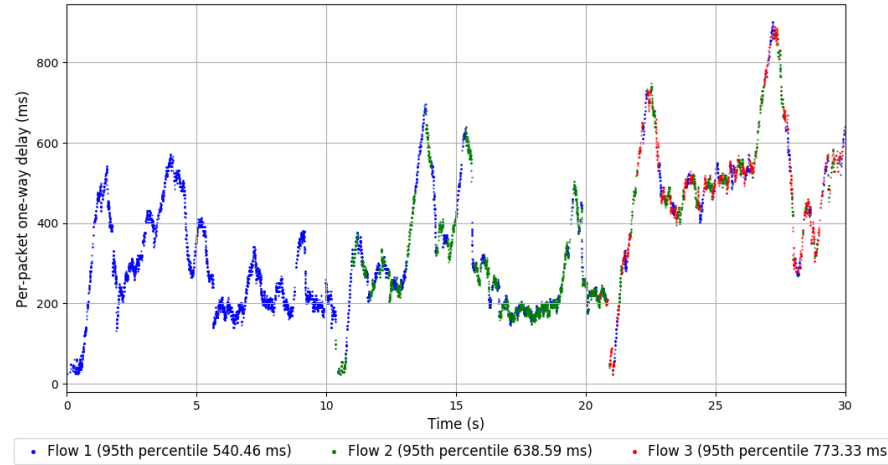
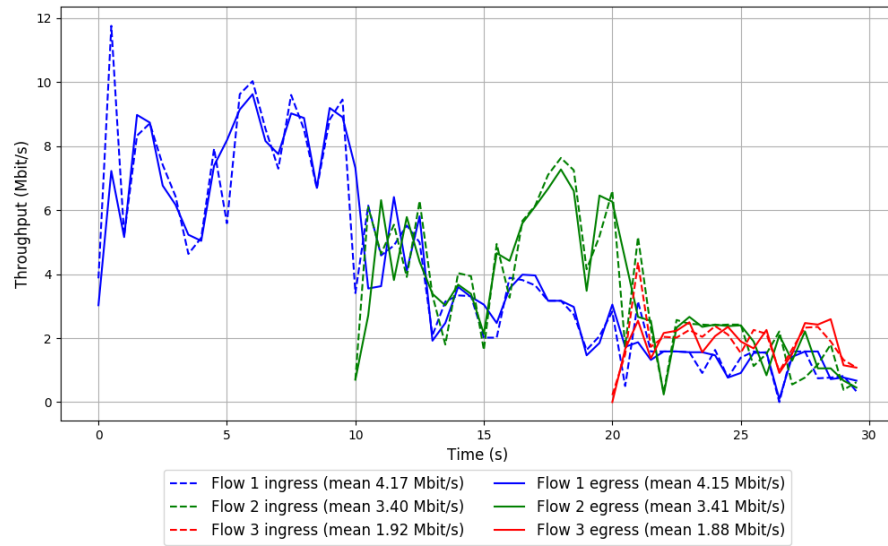


Run 2: Statistics of TCP BBR

Start at: 2017-12-05 09:10:51
End at: 2017-12-05 09:11:21
Local clock offset: 3.775 ms
Remote clock offset: -15.266 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.98 Mbit/s
95th percentile per-packet one-way delay: 600.615 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 540.457 ms
Loss rate: 0.50%
-- Flow 2:
Average throughput: 3.41 Mbit/s
95th percentile per-packet one-way delay: 638.587 ms
Loss rate: 0.97%
-- Flow 3:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 773.332 ms
Loss rate: 4.59%

Run 2: Report of TCP BBR — Data Link

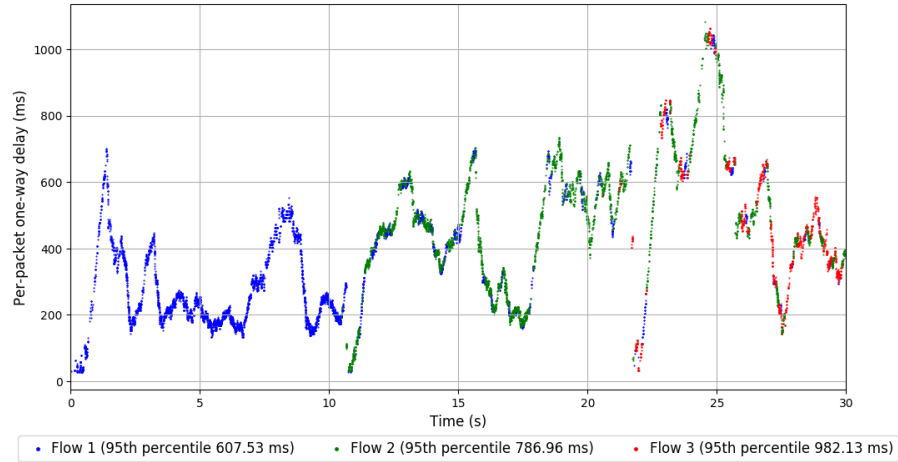
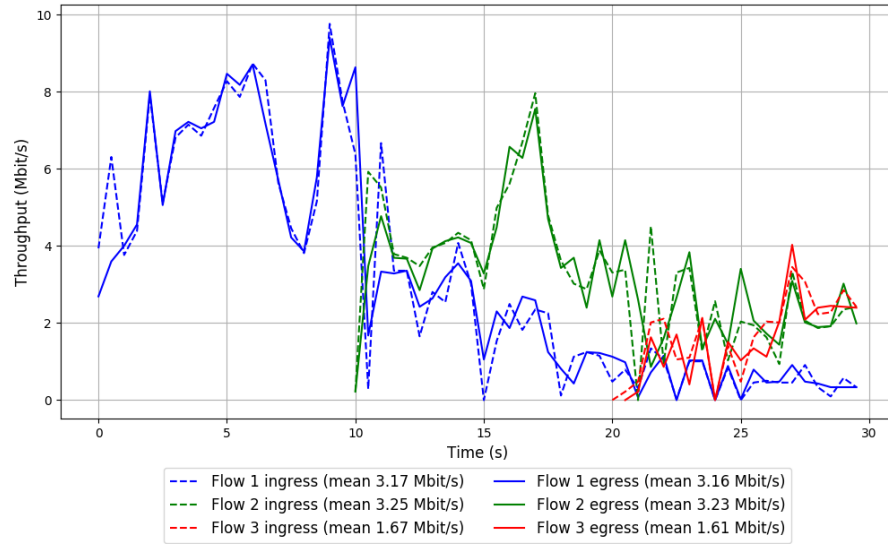


Run 3: Statistics of TCP BBR

Start at: 2017-12-05 09:26:20
End at: 2017-12-05 09:26:50
Local clock offset: 2.772 ms
Remote clock offset: -13.122 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.77 Mbit/s
95th percentile per-packet one-way delay: 691.622 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 3.16 Mbit/s
95th percentile per-packet one-way delay: 607.534 ms
Loss rate: 0.56%
-- Flow 2:
Average throughput: 3.23 Mbit/s
95th percentile per-packet one-way delay: 786.964 ms
Loss rate: 1.74%
-- Flow 3:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 982.132 ms
Loss rate: 9.67%

Run 3: Report of TCP BBR — Data Link

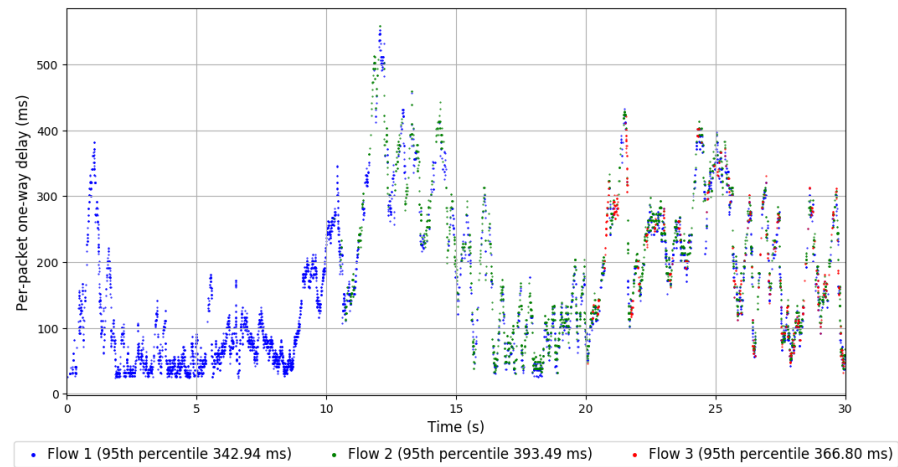
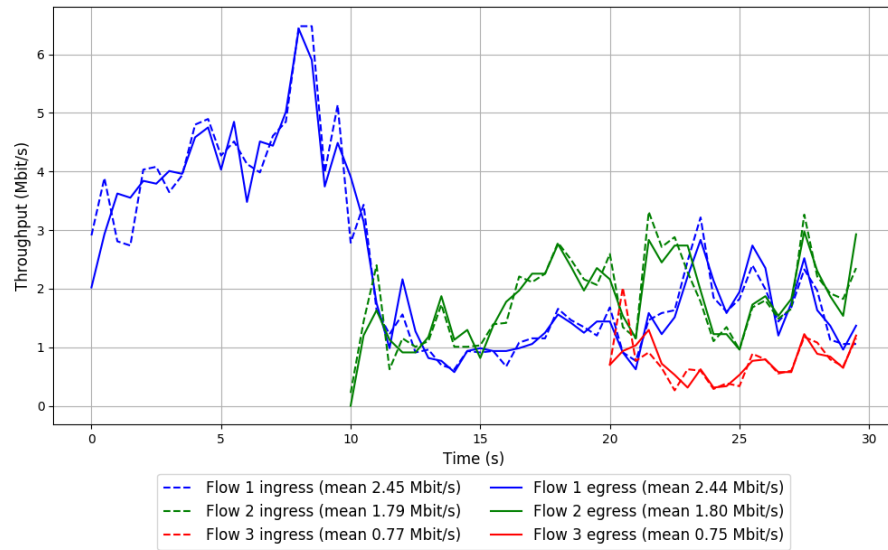


Run 1: Statistics of TCP Cubic

Start at: 2017-12-05 08:48:33
End at: 2017-12-05 08:49:03
Local clock offset: 3.162 ms
Remote clock offset: -15.502 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.87 Mbit/s
95th percentile per-packet one-way delay: 366.993 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 2.44 Mbit/s
95th percentile per-packet one-way delay: 342.936 ms
Loss rate: 0.39%
-- Flow 2:
Average throughput: 1.80 Mbit/s
95th percentile per-packet one-way delay: 393.490 ms
Loss rate: 0.77%
-- Flow 3:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 366.803 ms
Loss rate: 2.68%

Run 1: Report of TCP Cubic — Data Link

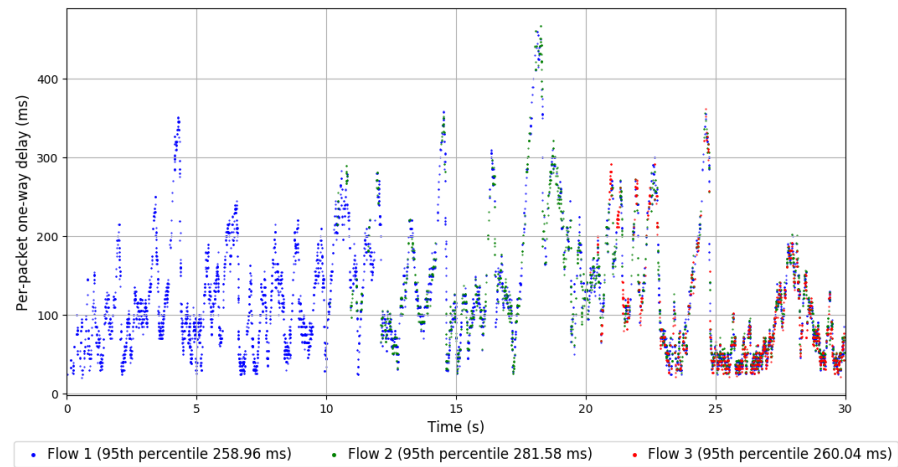
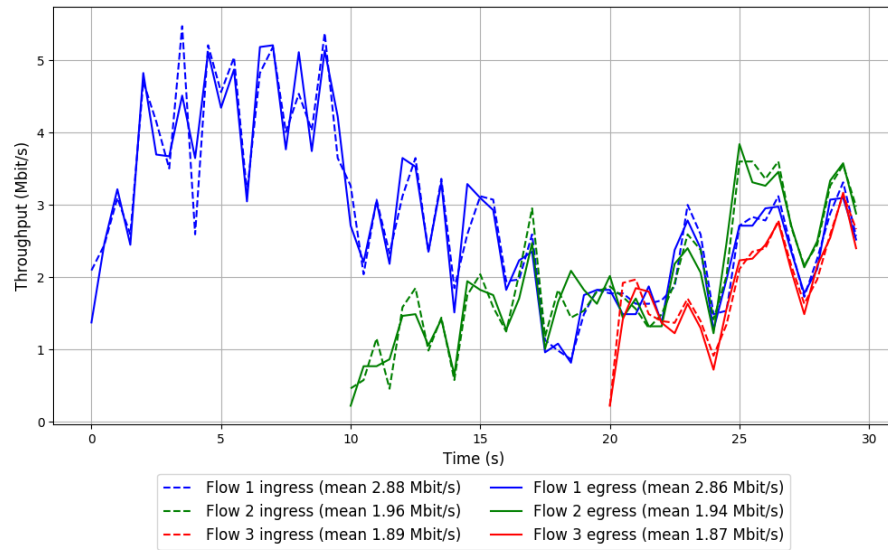


Run 2: Statistics of TCP Cubic

Start at: 2017-12-05 09:04:10
End at: 2017-12-05 09:04:40
Local clock offset: 5.553 ms
Remote clock offset: -15.16 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.76 Mbit/s
95th percentile per-packet one-way delay: 266.714 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 2.86 Mbit/s
95th percentile per-packet one-way delay: 258.961 ms
Loss rate: 0.60%
-- Flow 2:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 281.582 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 1.87 Mbit/s
95th percentile per-packet one-way delay: 260.035 ms
Loss rate: 2.37%

Run 2: Report of TCP Cubic — Data Link

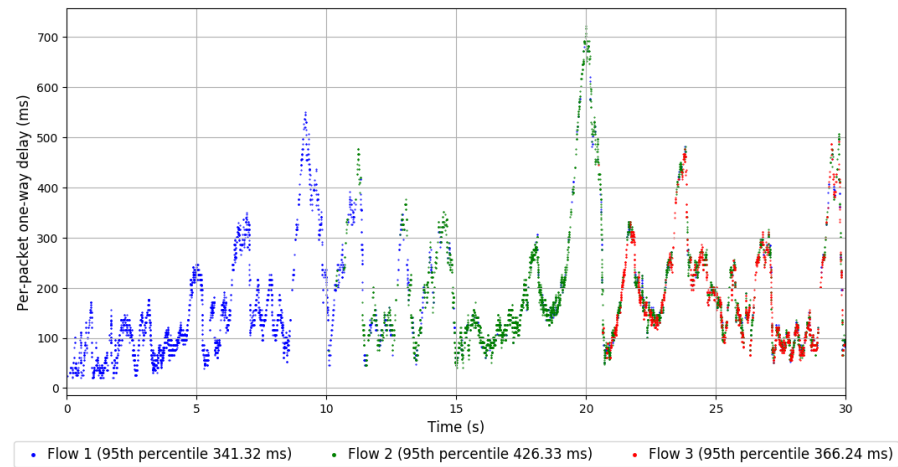
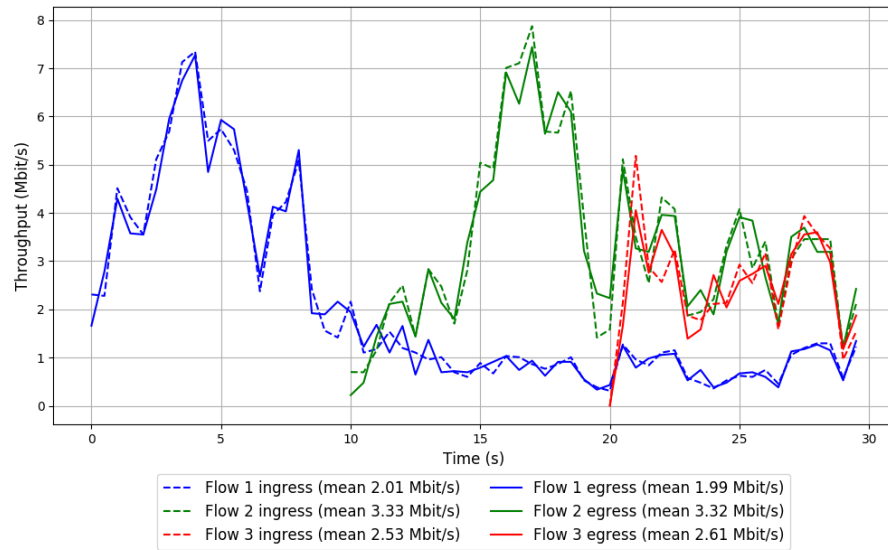


Run 3: Statistics of TCP Cubic

Start at: 2017-12-05 09:19:42
End at: 2017-12-05 09:20:12
Local clock offset: 3.908 ms
Remote clock offset: -16.857 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.02 Mbit/s
95th percentile per-packet one-way delay: 376.594 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 341.324 ms
Loss rate: 0.62%
-- Flow 2:
Average throughput: 3.32 Mbit/s
95th percentile per-packet one-way delay: 426.330 ms
Loss rate: 0.69%
-- Flow 3:
Average throughput: 2.61 Mbit/s
95th percentile per-packet one-way delay: 366.244 ms
Loss rate: 1.38%

Run 3: Report of TCP Cubic — Data Link

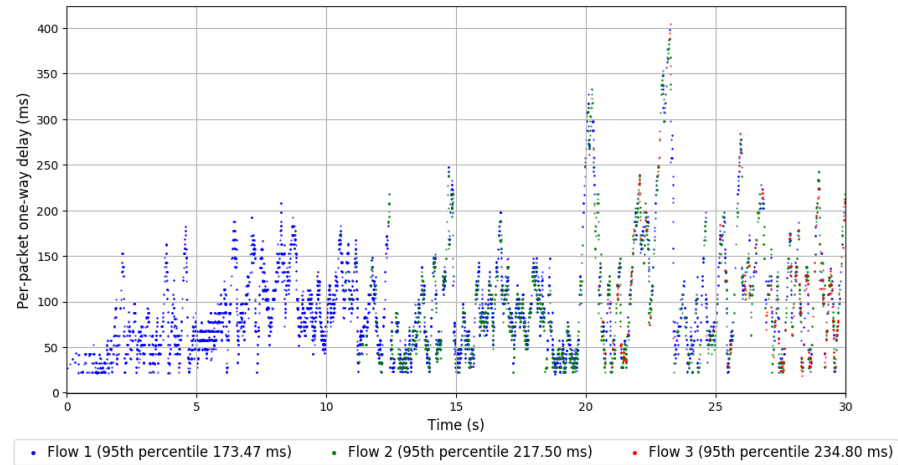
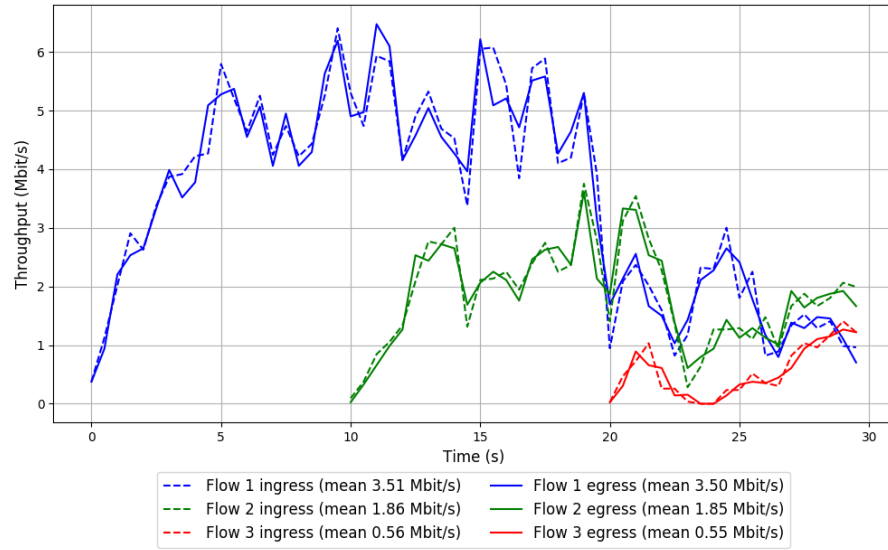


Run 1: Statistics of LEDBAT

Start at: 2017-12-05 09:01:55
End at: 2017-12-05 09:02:25
Local clock offset: 5.692 ms
Remote clock offset: -16.401 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.90 Mbit/s
95th percentile per-packet one-way delay: 193.095 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 3.50 Mbit/s
95th percentile per-packet one-way delay: 173.469 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 217.500 ms
Loss rate: 1.07%
-- Flow 3:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 234.803 ms
Loss rate: 3.18%

Run 1: Report of LEDBAT — Data Link

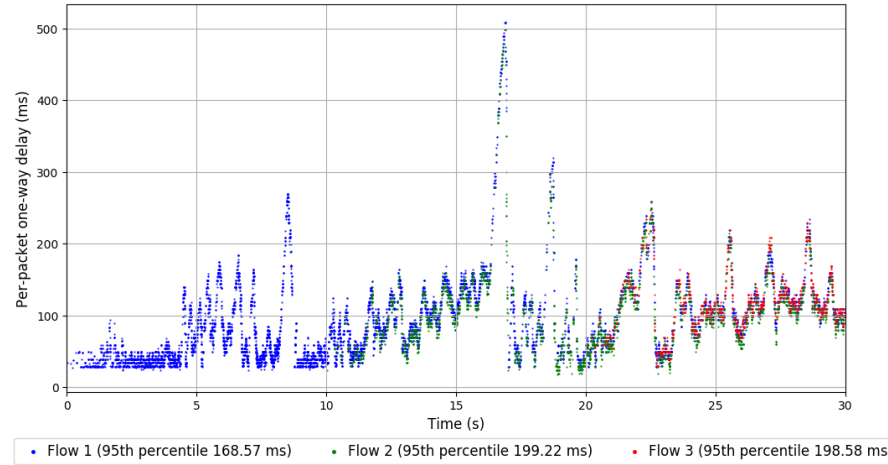
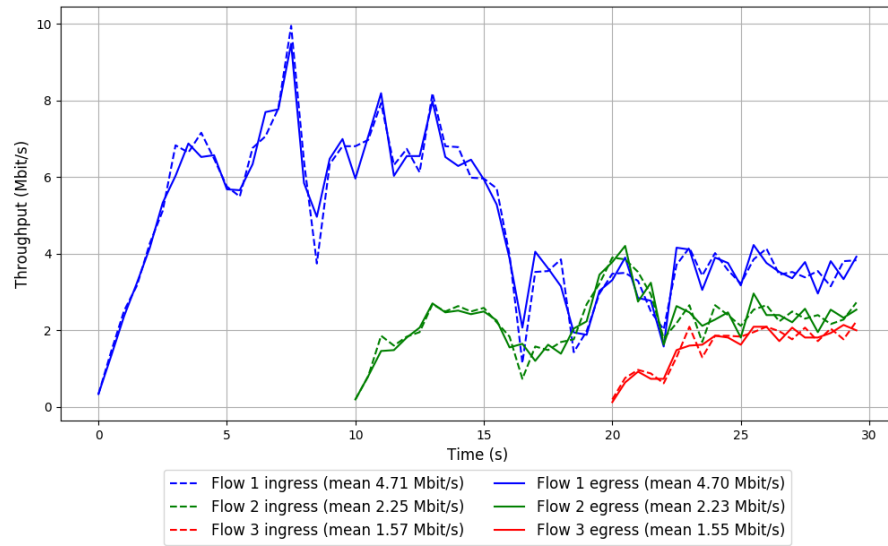


Run 2: Statistics of LEDBAT

Start at: 2017-12-05 09:17:30
End at: 2017-12-05 09:18:00
Local clock offset: 6.732 ms
Remote clock offset: -15.271 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.69 Mbit/s
95th percentile per-packet one-way delay: 178.920 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 4.70 Mbit/s
95th percentile per-packet one-way delay: 168.570 ms
Loss rate: 0.36%
-- Flow 2:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 199.221 ms
Loss rate: 0.81%
-- Flow 3:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 198.582 ms
Loss rate: 1.43%

Run 2: Report of LEDBAT — Data Link

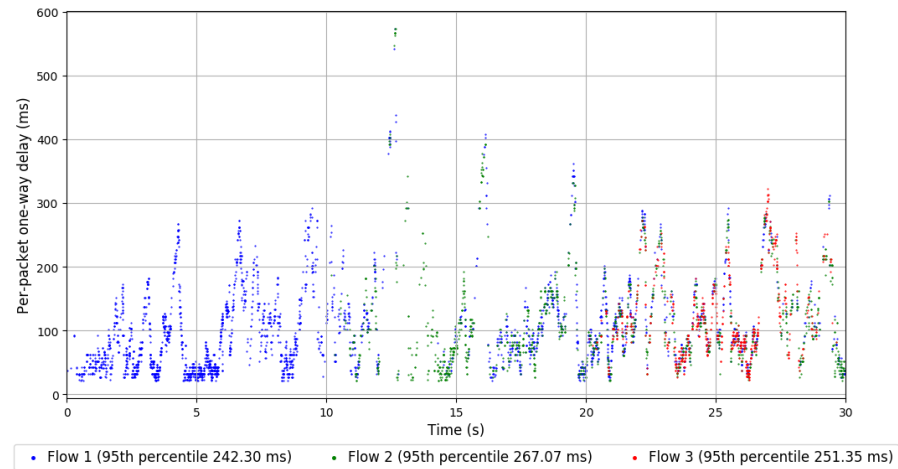
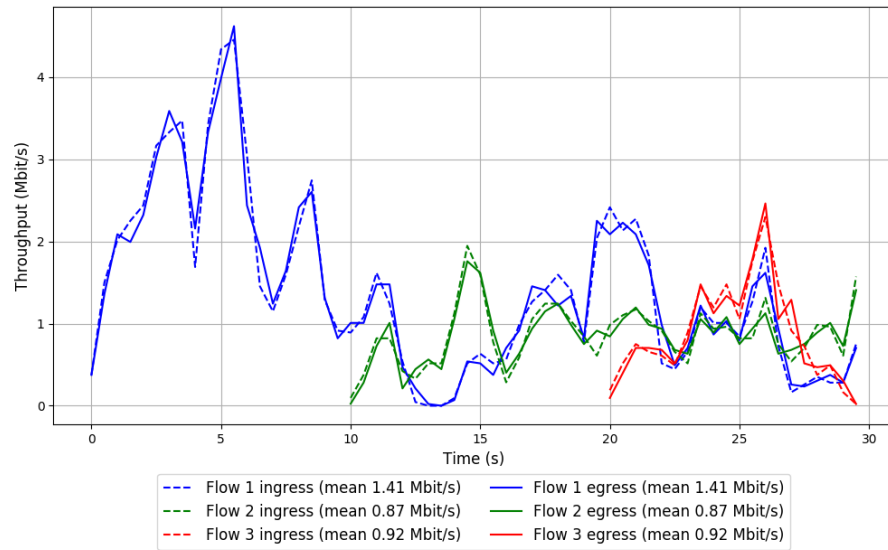


Run 3: Statistics of LEDBAT

Start at: 2017-12-05 09:32:59
End at: 2017-12-05 09:33:29
Local clock offset: 5.229 ms
Remote clock offset: -13.009 ms

Below is generated by plot.py at 2017-12-05 09:34:36
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.27 Mbit/s
95th percentile per-packet one-way delay: 251.884 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 242.300 ms
Loss rate: 0.31%
-- Flow 2:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 267.067 ms
Loss rate: 1.08%
-- Flow 3:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 251.355 ms
Loss rate: 0.40%

Run 3: Report of LEDBAT — Data Link

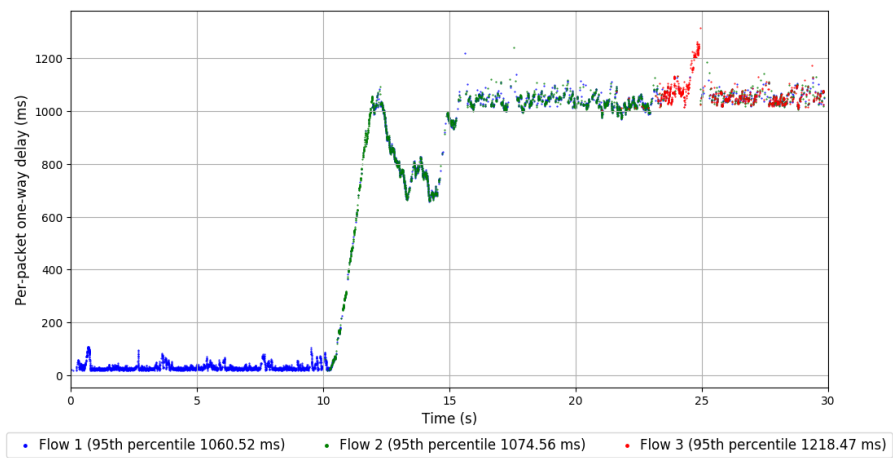
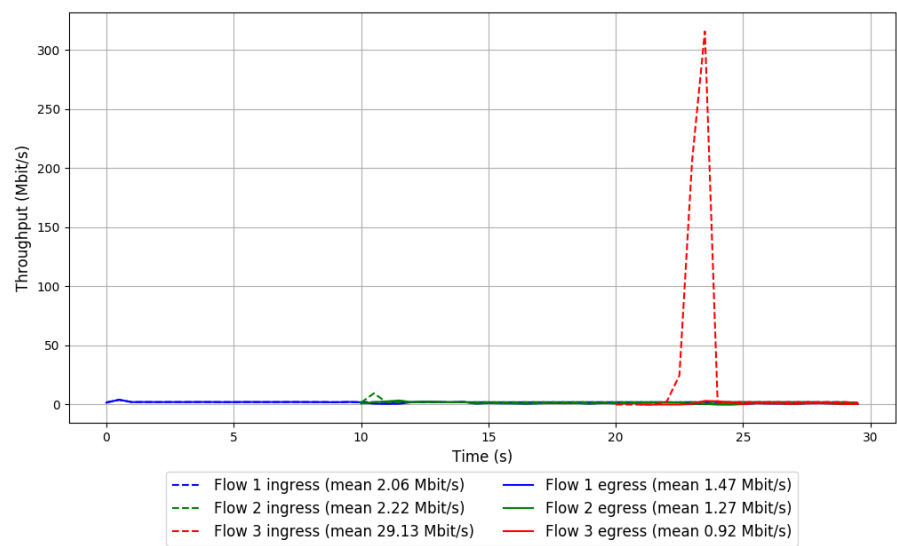


Run 1: Statistics of PCC

Start at: 2017-12-05 08:51:51
End at: 2017-12-05 08:52:21
Local clock offset: 5.251 ms
Remote clock offset: -16.937 ms

Below is generated by plot.py at 2017-12-05 09:34:45
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.58 Mbit/s
95th percentile per-packet one-way delay: 1078.661 ms
Loss rate: 80.37%
-- Flow 1:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 1060.523 ms
Loss rate: 28.79%
-- Flow 2:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 1074.559 ms
Loss rate: 43.00%
-- Flow 3:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 1218.470 ms
Loss rate: 97.17%

Run 1: Report of PCC — Data Link

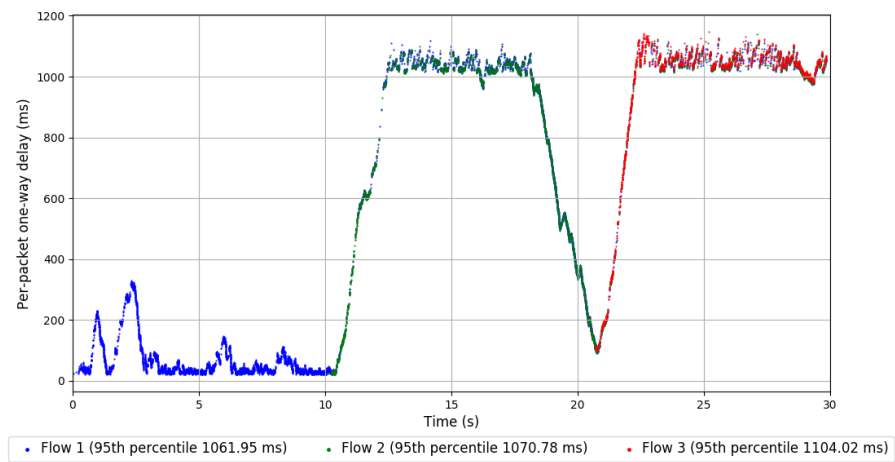
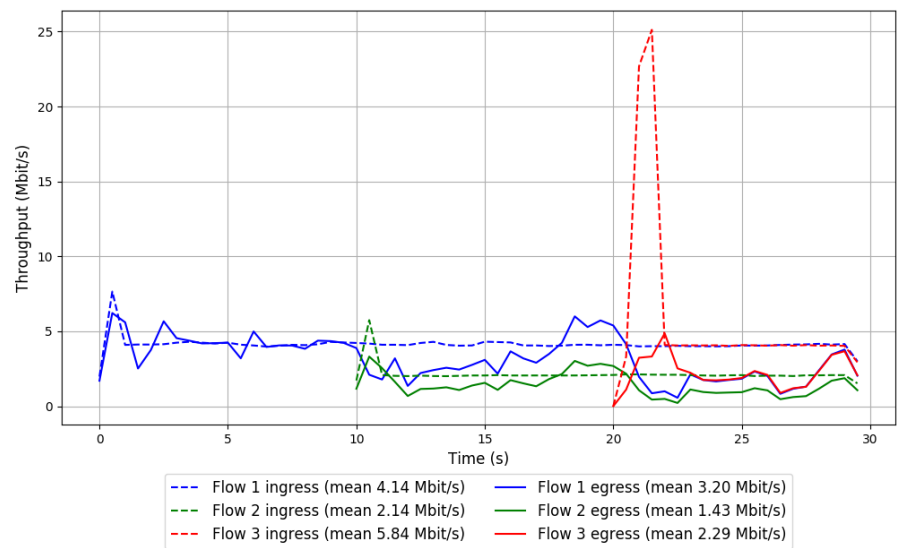


Run 2: Statistics of PCC

Start at: 2017-12-05 09:07:31
End at: 2017-12-05 09:08:01
Local clock offset: 5.209 ms
Remote clock offset: -14.802 ms

Below is generated by plot.py at 2017-12-05 09:34:45
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.88 Mbit/s
95th percentile per-packet one-way delay: 1073.527 ms
Loss rate: 34.85%
-- Flow 1:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 1061.953 ms
Loss rate: 22.80%
-- Flow 2:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 1070.782 ms
Loss rate: 33.27%
-- Flow 3:
Average throughput: 2.29 Mbit/s
95th percentile per-packet one-way delay: 1104.020 ms
Loss rate: 61.92%

Run 2: Report of PCC — Data Link

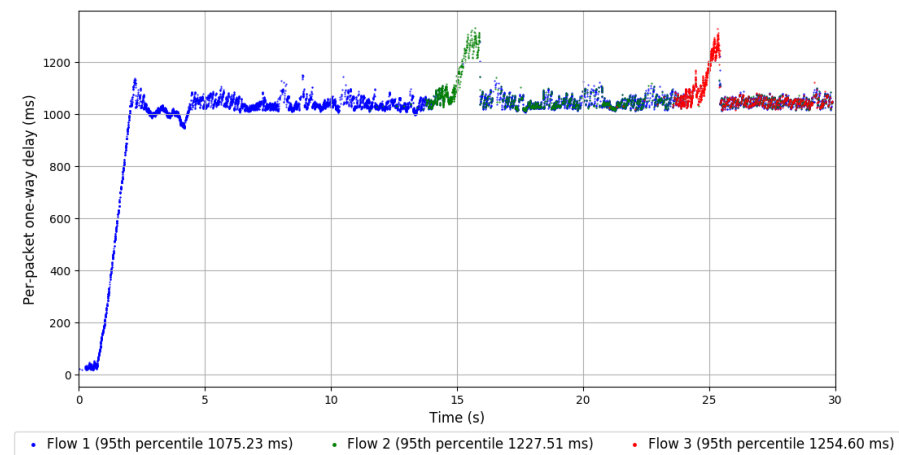
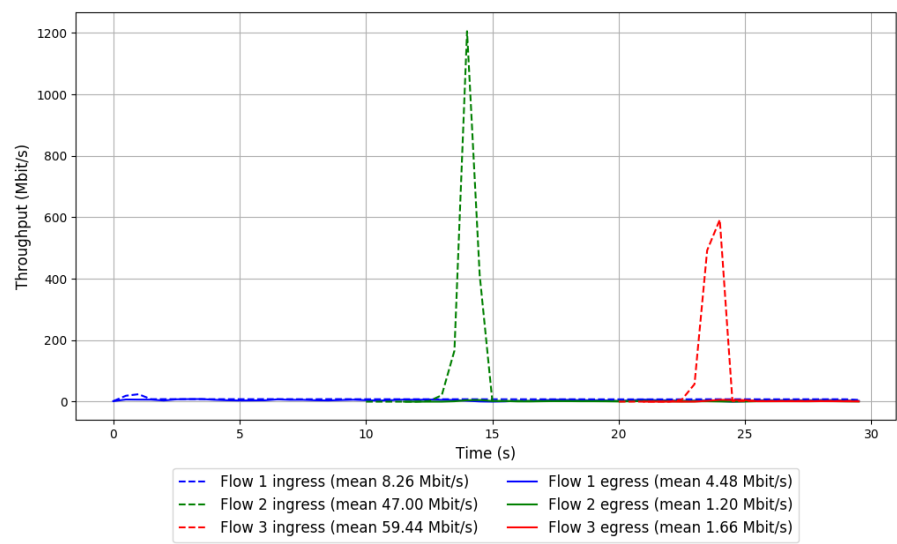


Run 3: Statistics of PCC

Start at: 2017-12-05 09:23:01
End at: 2017-12-05 09:23:31
Local clock offset: 6.634 ms
Remote clock offset: -13.996 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.71 Mbit/s
95th percentile per-packet one-way delay: 1097.342 ms
Loss rate: 90.35%
-- Flow 1:
Average throughput: 4.48 Mbit/s
95th percentile per-packet one-way delay: 1075.226 ms
Loss rate: 45.78%
-- Flow 2:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 1227.505 ms
Loss rate: 97.65%
-- Flow 3:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 1254.596 ms
Loss rate: 97.50%

Run 3: Report of PCC — Data Link

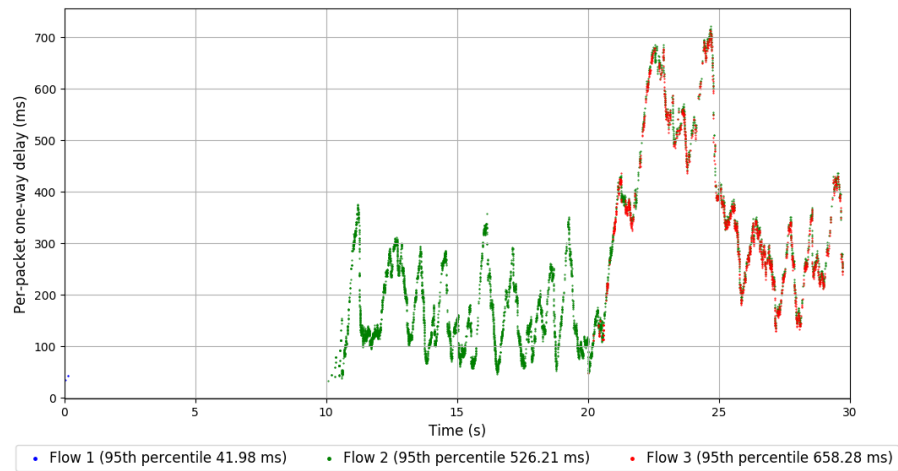
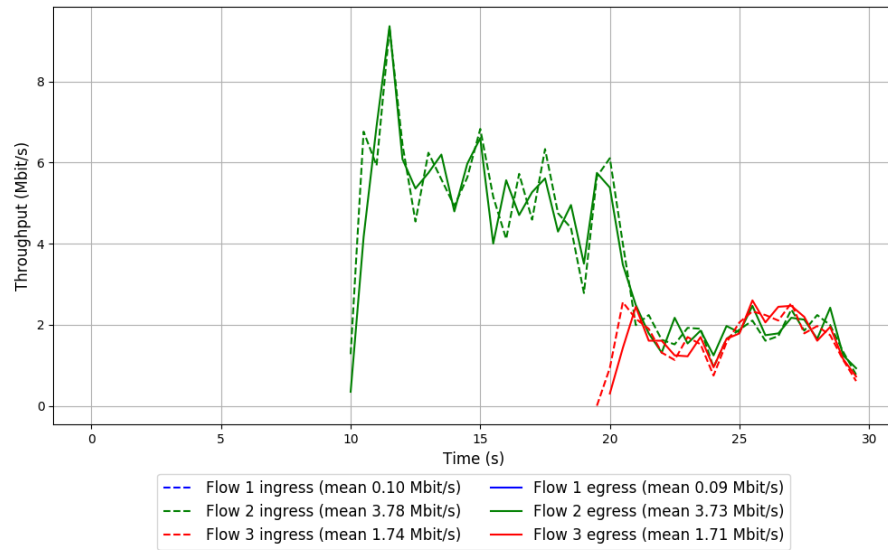


Run 1: Statistics of QUIC Cubic

Start at: 2017-12-05 08:58:31
End at: 2017-12-05 08:59:01
Local clock offset: 5.624 ms
Remote clock offset: -14.303 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.03 Mbit/s
95th percentile per-packet one-way delay: 572.622 ms
Loss rate: 1.58%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 41.982 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 3.73 Mbit/s
95th percentile per-packet one-way delay: 526.208 ms
Loss rate: 1.35%
-- Flow 3:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 658.279 ms
Loss rate: 2.59%

Run 1: Report of QUIC Cubic — Data Link

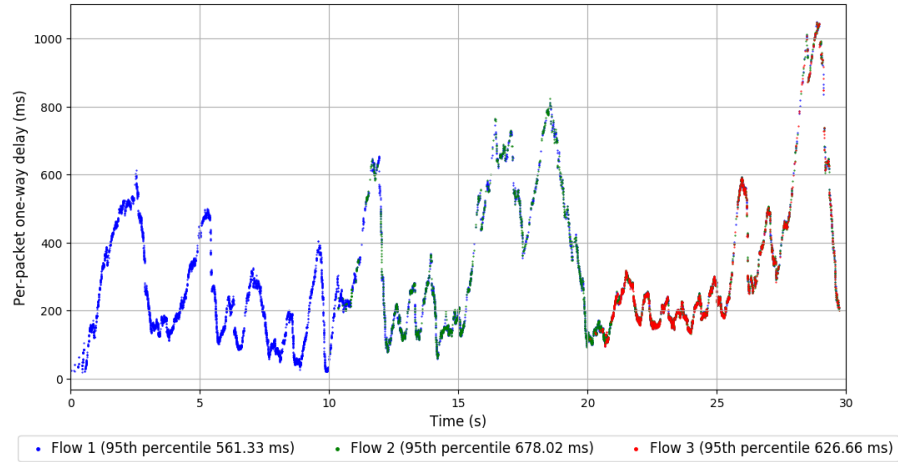
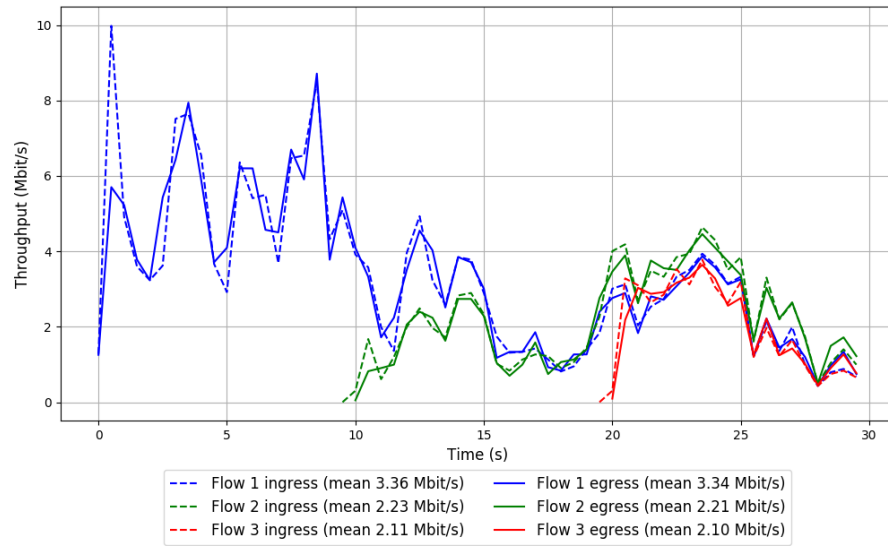


Run 2: Statistics of QUIC Cubic

Start at: 2017-12-05 09:14:10
End at: 2017-12-05 09:14:40
Local clock offset: 6.94 ms
Remote clock offset: -15.467 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.48 Mbit/s
95th percentile per-packet one-way delay: 608.918 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 3.34 Mbit/s
95th percentile per-packet one-way delay: 561.333 ms
Loss rate: 0.68%
-- Flow 2:
Average throughput: 2.21 Mbit/s
95th percentile per-packet one-way delay: 678.020 ms
Loss rate: 1.59%
-- Flow 3:
Average throughput: 2.10 Mbit/s
95th percentile per-packet one-way delay: 626.663 ms
Loss rate: 1.98%

Run 2: Report of QUIC Cubic — Data Link

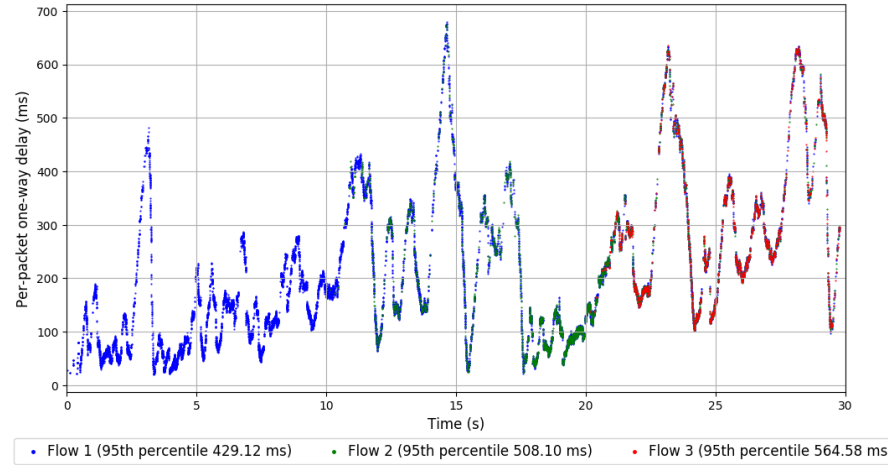
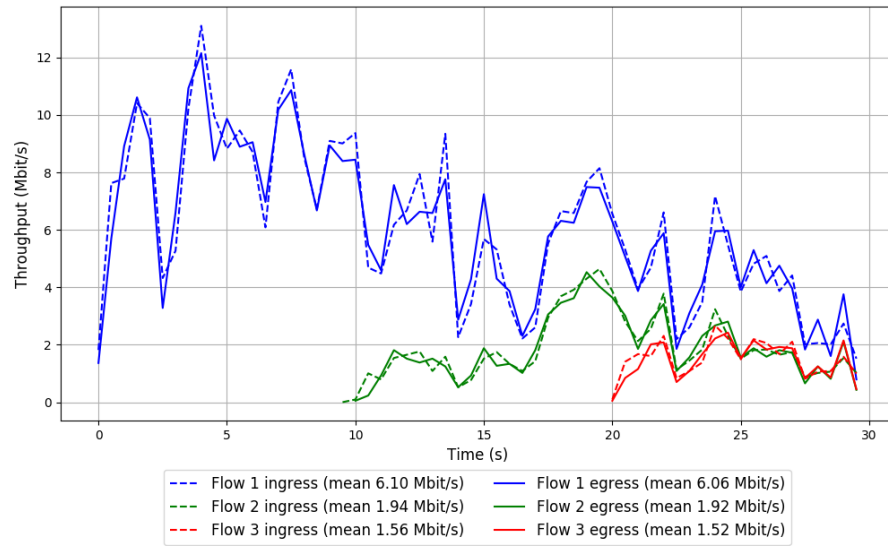


Run 3: Statistics of QUIC Cubic

Start at: 2017-12-05 09:29:39
End at: 2017-12-05 09:30:09
Local clock offset: 5.911 ms
Remote clock offset: -13.537 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 7.82 Mbit/s
95th percentile per-packet one-way delay: 473.955 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 6.06 Mbit/s
95th percentile per-packet one-way delay: 429.124 ms
Loss rate: 0.67%
-- Flow 2:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 508.101 ms
Loss rate: 1.86%
-- Flow 3:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 564.576 ms
Loss rate: 4.10%

Run 3: Report of QUIC Cubic — Data Link

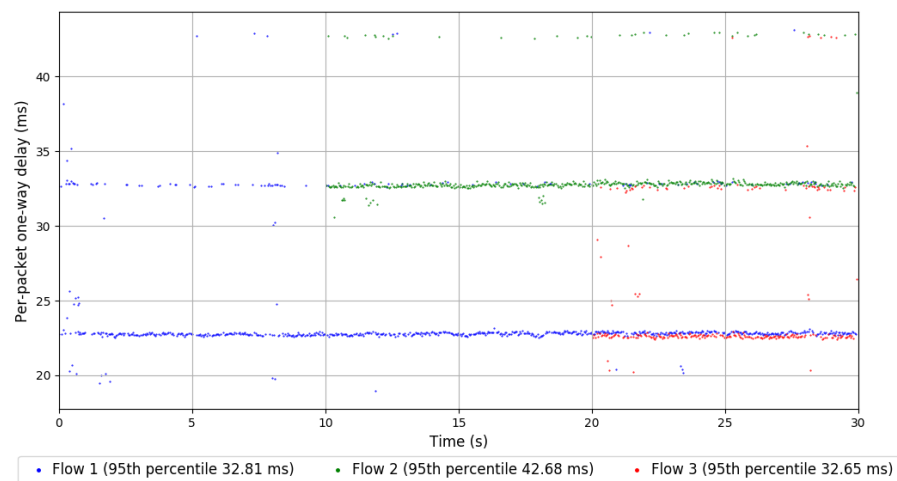
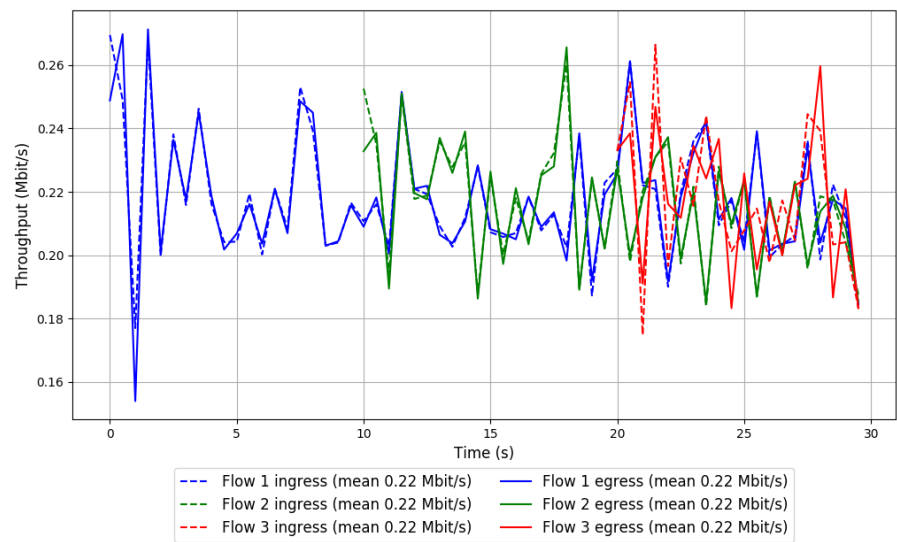


```
Run 1: Statistics of SReAM

Start at: 2017-12-05 08:54:03
End at: 2017-12-05 08:54:33
Local clock offset: 5.759 ms
Remote clock offset: -16.224 ms

# Below is generated by plot.py at 2017-12-05 09:35:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 32.965 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 32.811 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 42.679 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 32.647 ms
Loss rate: 0.00%
```

Run 1: Report of SReAM — Data Link

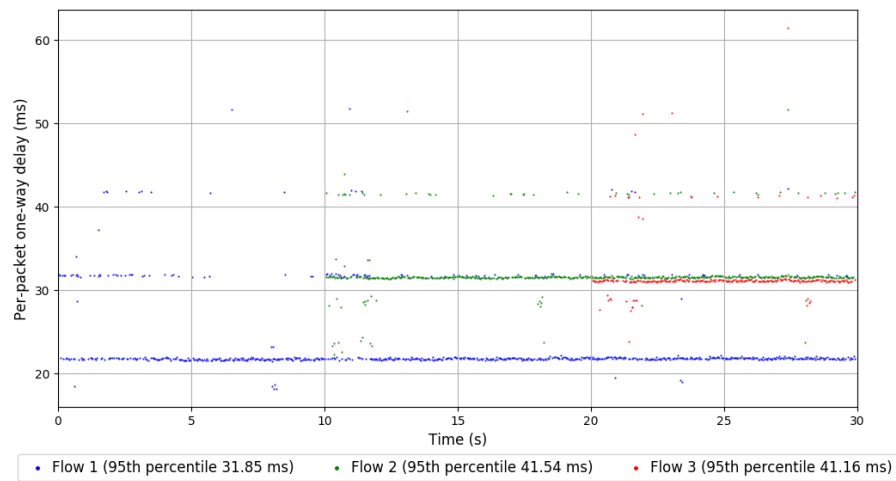
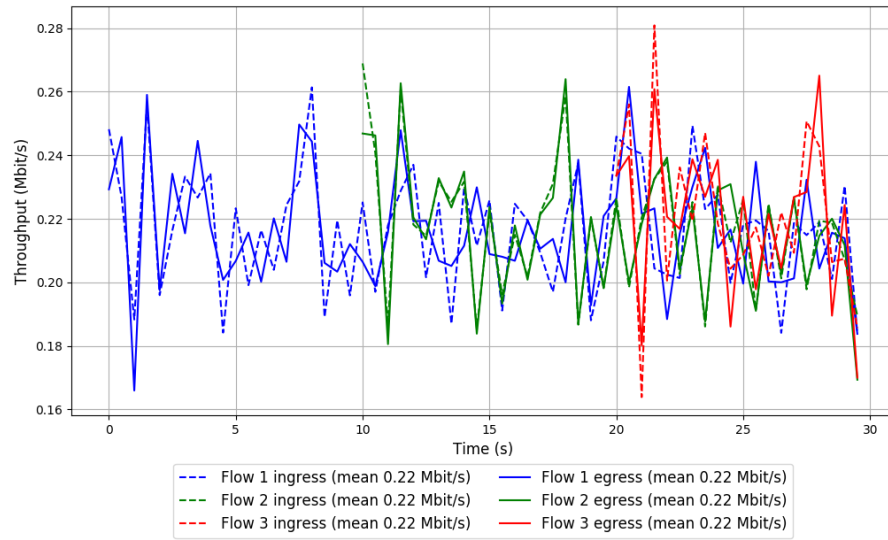


Run 2: Statistics of SReAM

Start at: 2017-12-05 09:09:45
End at: 2017-12-05 09:10:15
Local clock offset: 7.428 ms
Remote clock offset: -16.088 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 41.112 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 31.846 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.536 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 41.164 ms
Loss rate: 0.35%

Run 2: Report of SReAM — Data Link

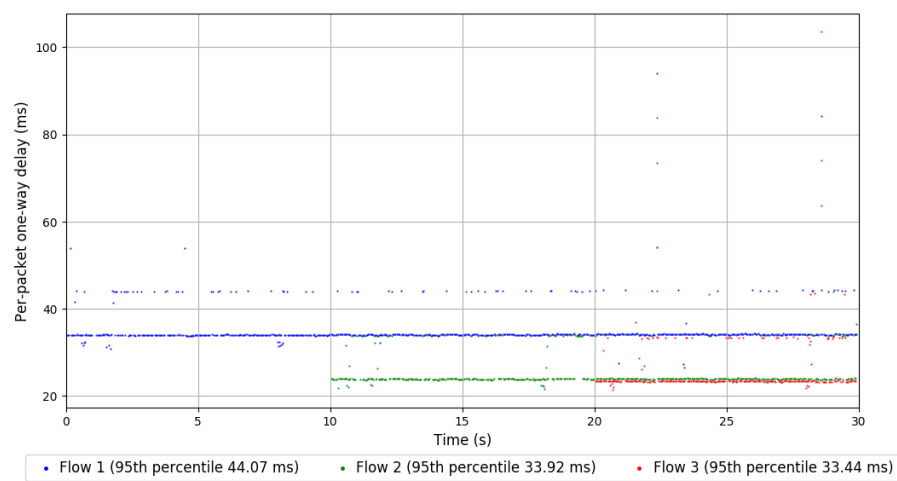
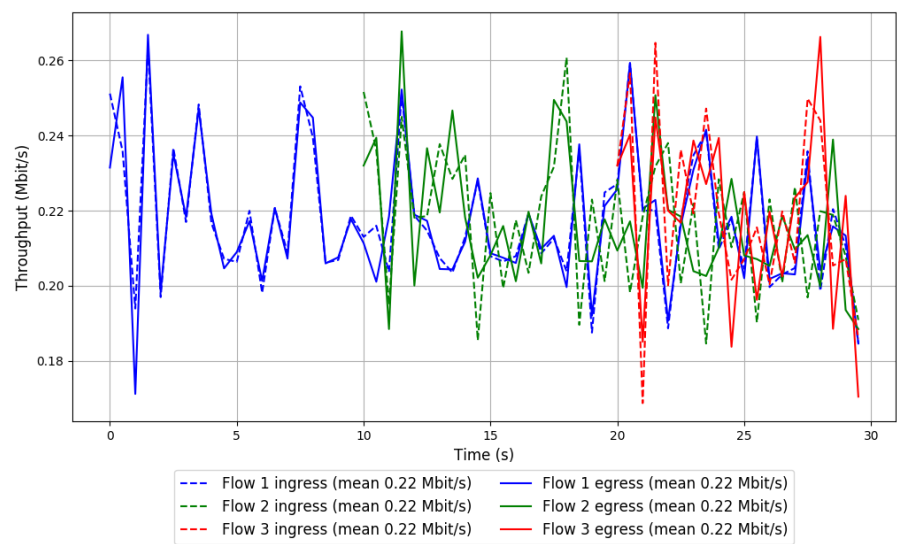


Run 3: Statistics of SReAM

Start at: 2017-12-05 09:25:14
End at: 2017-12-05 09:25:44
Local clock offset: 4.11 ms
Remote clock offset: -16.497 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 43.942 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 44.068 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 33.919 ms
Loss rate: 0.19%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 33.436 ms
Loss rate: 0.35%

Run 3: Report of SReAM — Data Link

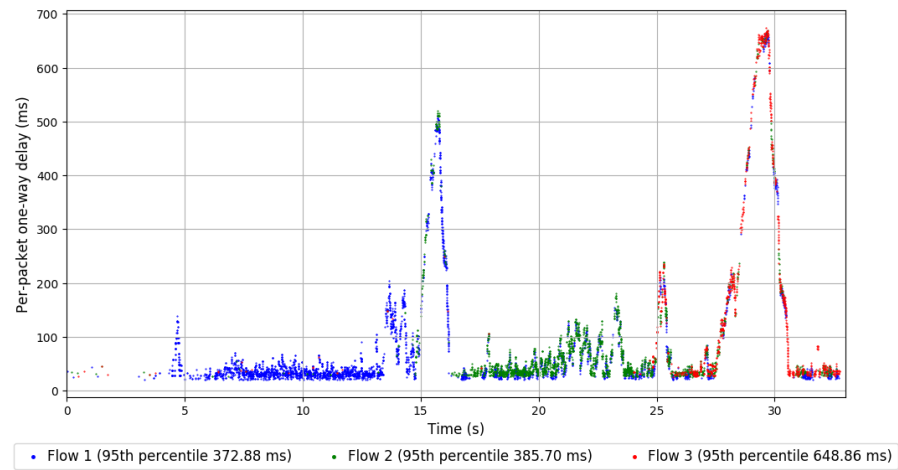
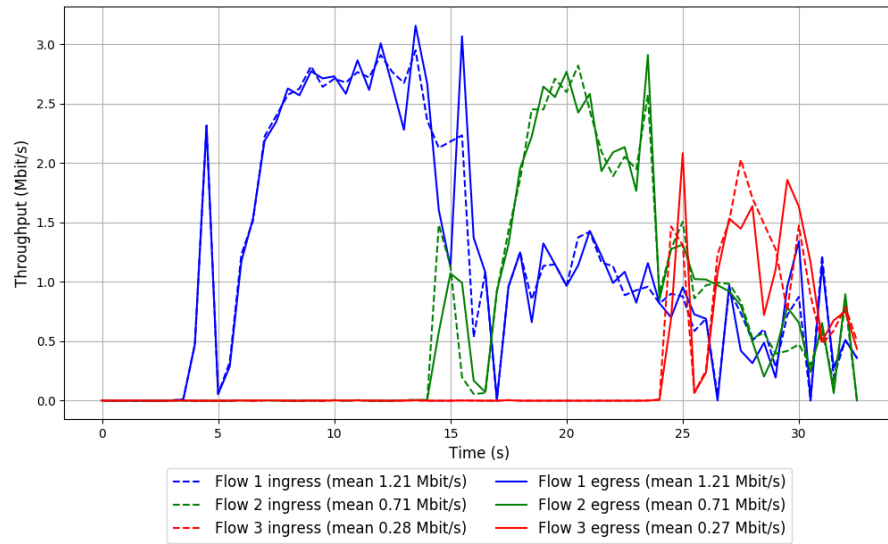


Run 1: Statistics of WebRTC media

Start at: 2017-12-05 08:59:37
End at: 2017-12-05 09:00:07
Local clock offset: 6.153 ms
Remote clock offset: -14.38 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 422.711 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 372.881 ms
Loss rate: 0.02%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 385.697 ms
Loss rate: 0.10%
-- Flow 3:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 648.856 ms
Loss rate: 1.01%

Run 1: Report of WebRTC media — Data Link

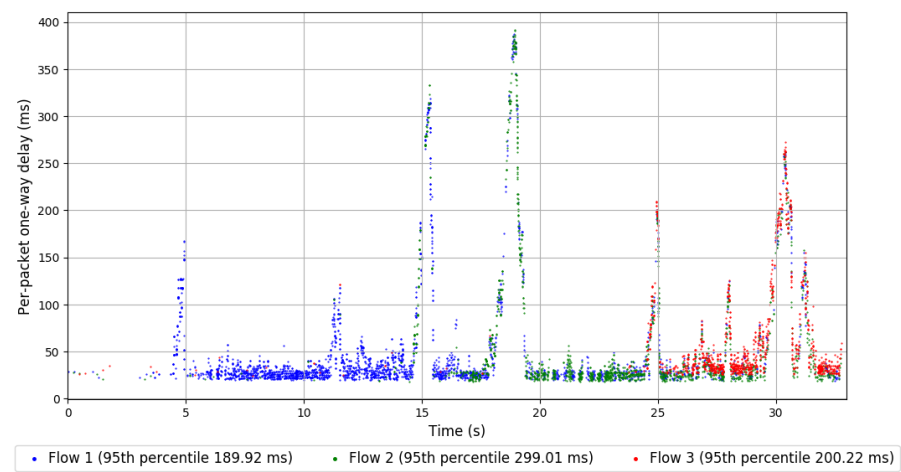
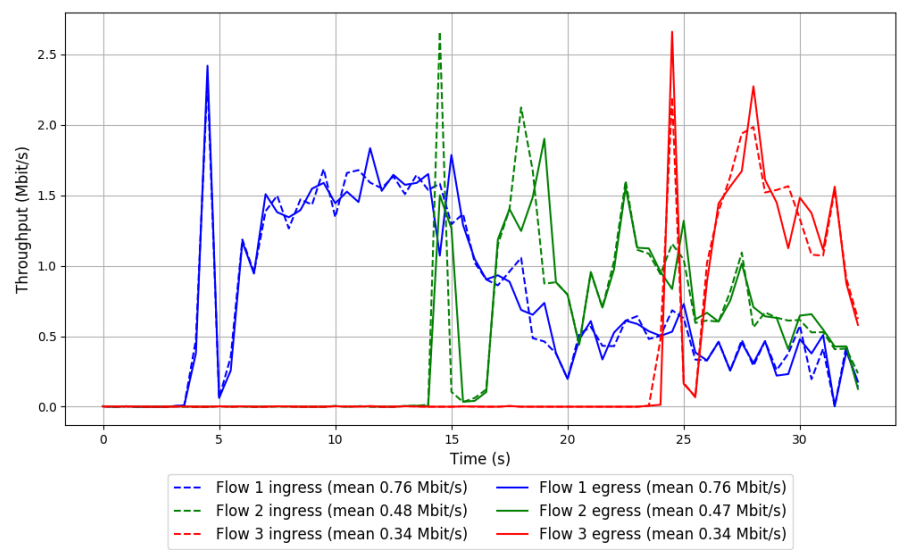


Run 2: Statistics of WebRTC media

Start at: 2017-12-05 09:15:16
End at: 2017-12-05 09:15:46
Local clock offset: 6.889 ms
Remote clock offset: -14.924 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 236.485 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 189.919 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 299.010 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 200.223 ms
Loss rate: 0.60%

Run 2: Report of WebRTC media — Data Link

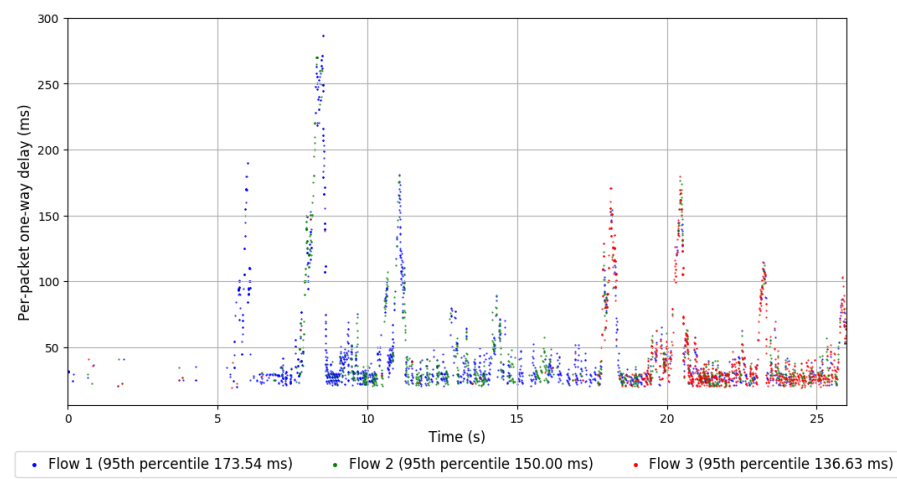
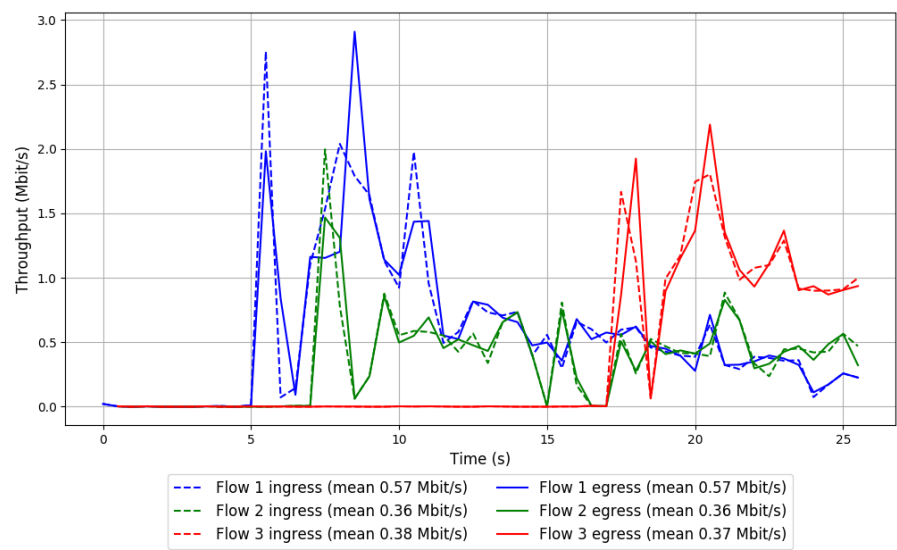


Run 3: Statistics of WebRTC media

Start at: 2017-12-05 09:30:46
End at: 2017-12-05 09:31:16
Local clock offset: 5.766 ms
Remote clock offset: -13.66 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 153.050 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 173.542 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 149.996 ms
Loss rate: 0.82%
-- Flow 3:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 136.628 ms
Loss rate: 0.71%

Run 3: Report of WebRTC media — Data Link

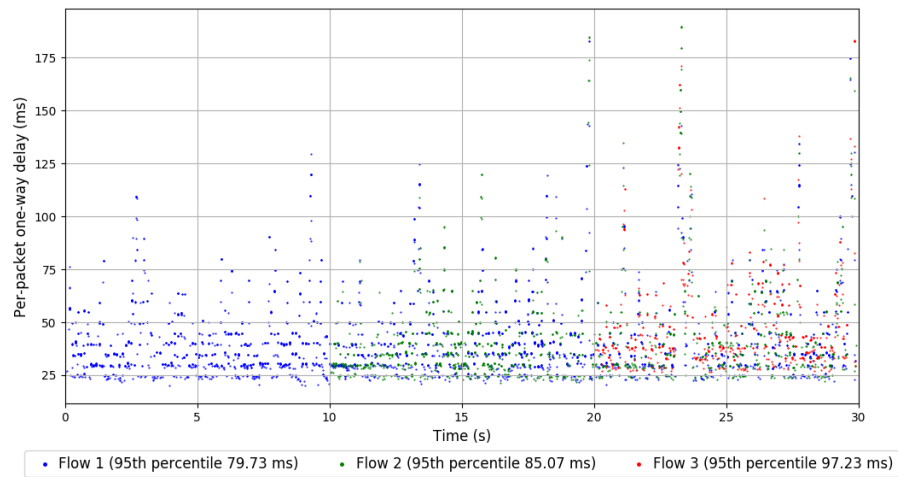
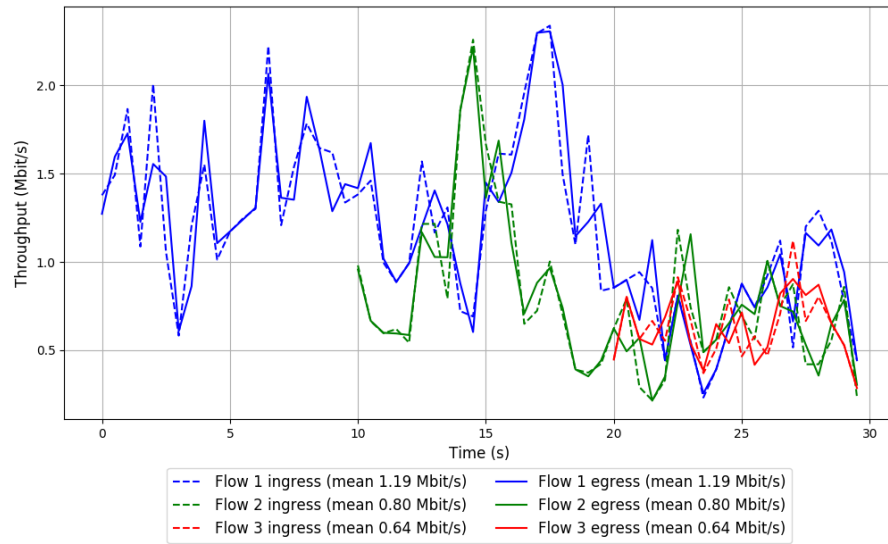


```
Run 1: Statistics of Sprout

Start at: 2017-12-05 08:56:18
End at: 2017-12-05 08:56:48
Local clock offset: 3.813 ms
Remote clock offset: -15.646 ms

# Below is generated by plot.py at 2017-12-05 09:35:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 84.292 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 79.730 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 85.074 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 97.226 ms
Loss rate: 0.01%
```

Run 1: Report of Sprout — Data Link

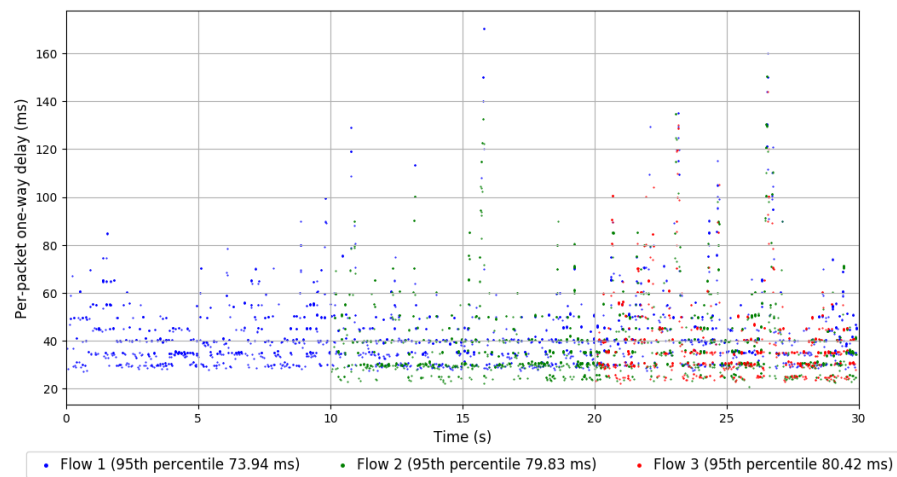
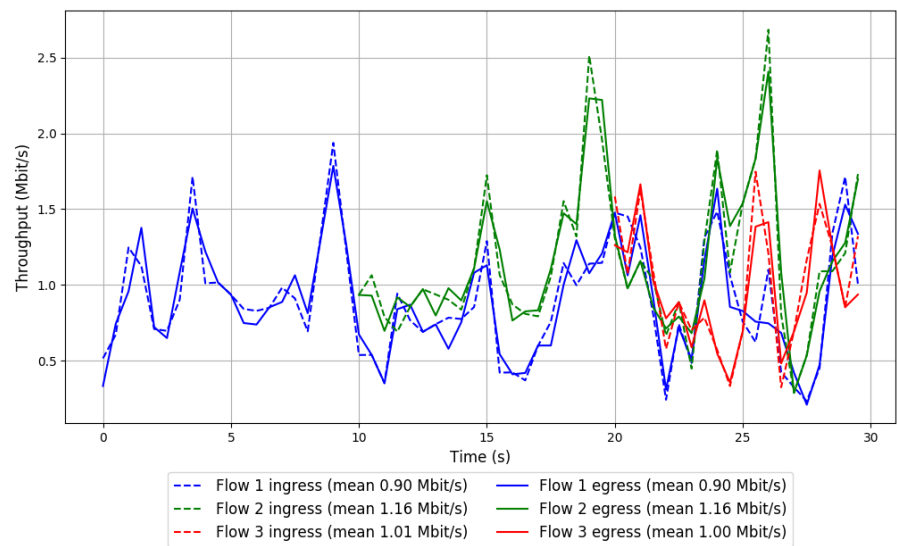


Run 2: Statistics of Sprout

Start at: 2017-12-05 09:11:58
End at: 2017-12-05 09:12:28
Local clock offset: 2.763 ms
Remote clock offset: -16.338 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.00 Mbit/s
95th percentile per-packet one-way delay: 75.578 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 73.938 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 79.831 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 80.423 ms
Loss rate: 1.93%

Run 2: Report of Sprout — Data Link

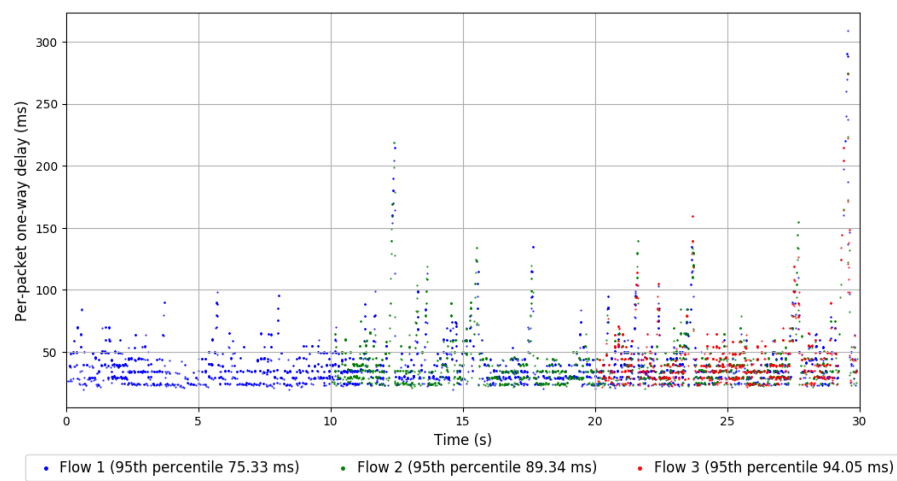
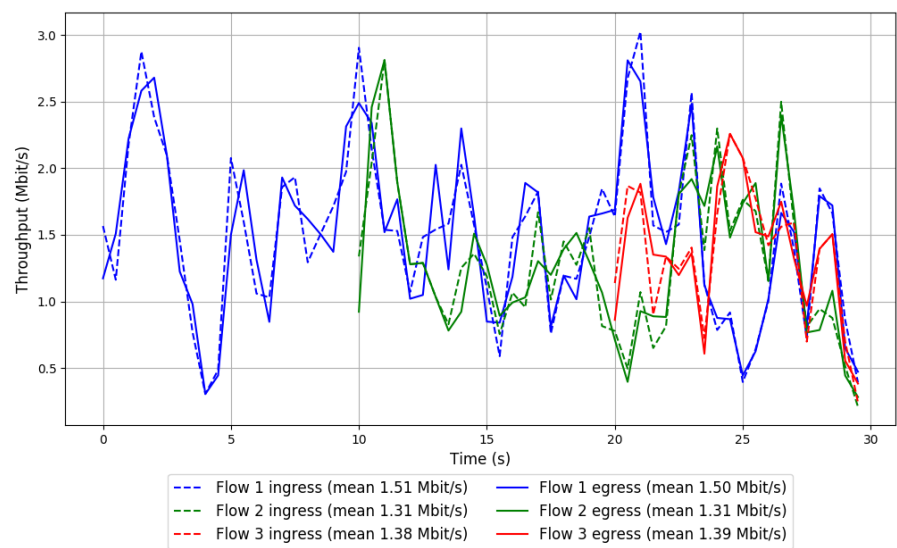


Run 3: Statistics of Sprout

Start at: 2017-12-05 09:27:26
End at: 2017-12-05 09:27:56
Local clock offset: 5.834 ms
Remote clock offset: -12.904 ms

```
# Below is generated by plot.py at 2017-12-05 09:35:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 84.219 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 75.330 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 89.341 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 94.046 ms
Loss rate: 0.01%
```

Run 3: Report of Sprout — Data Link

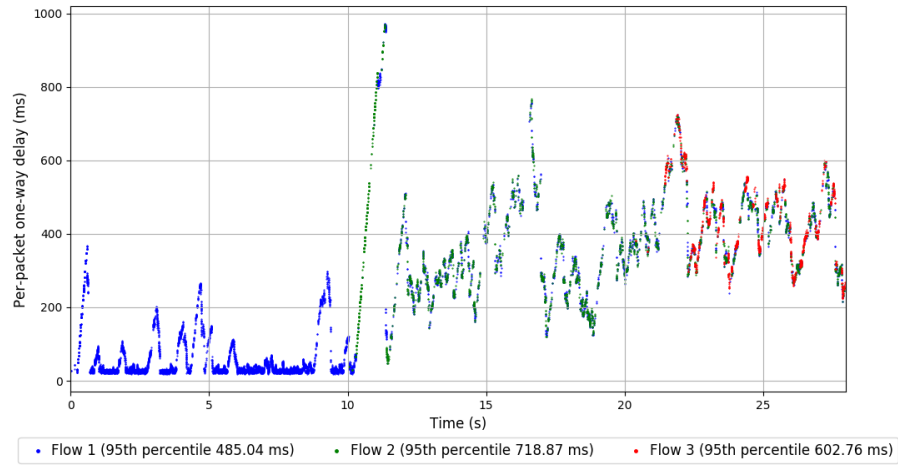
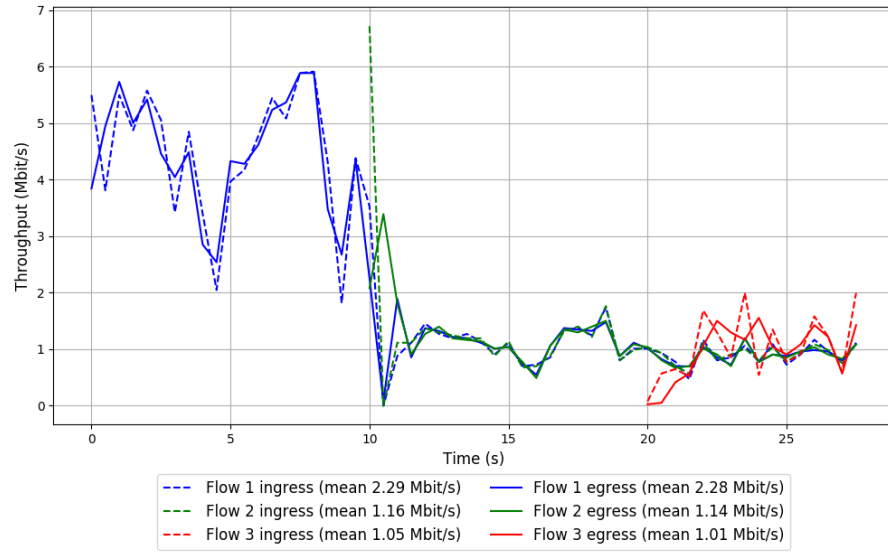


Run 1: Statistics of TaoVA-100x

Start at: 2017-12-05 08:50:45
End at: 2017-12-05 08:51:15
Local clock offset: 6.682 ms
Remote clock offset: -16.327 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.28 Mbit/s
95th percentile per-packet one-way delay: 556.090 ms
Loss rate: 1.73%
-- Flow 1:
Average throughput: 2.28 Mbit/s
95th percentile per-packet one-way delay: 485.042 ms
Loss rate: 0.76%
-- Flow 2:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 718.866 ms
Loss rate: 2.25%
-- Flow 3:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 602.763 ms
Loss rate: 7.87%

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

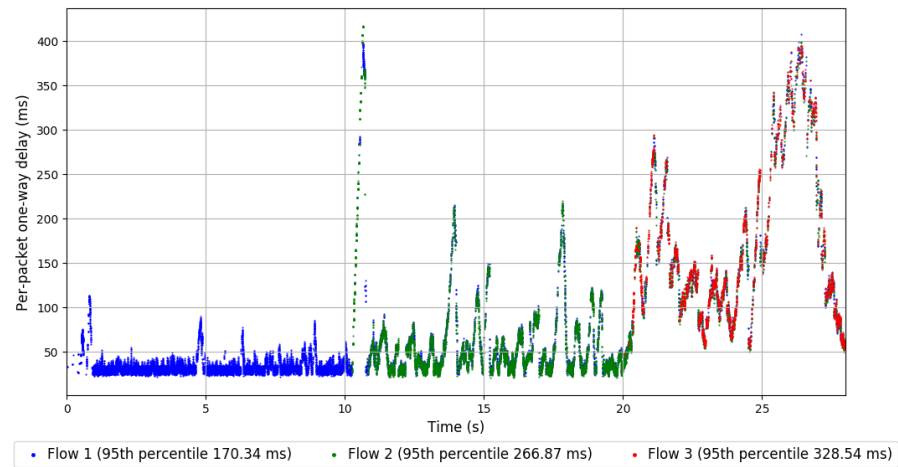
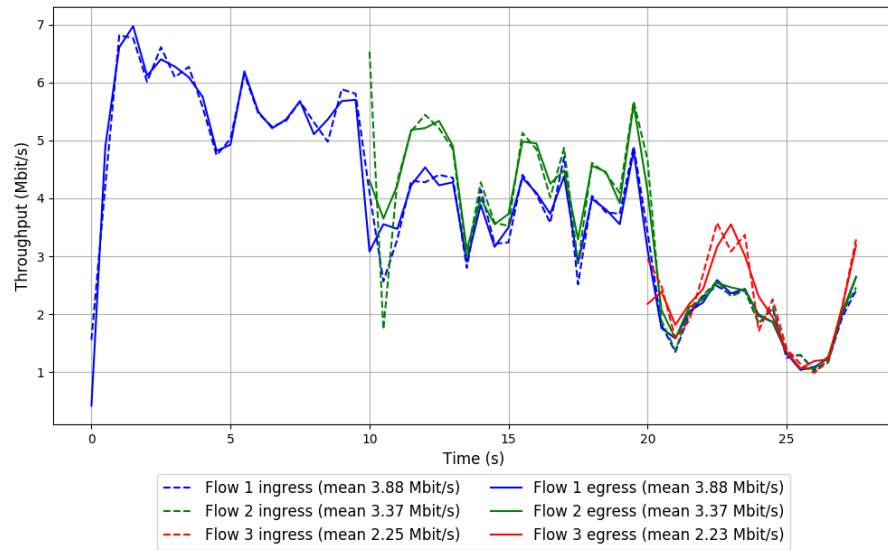


Run 2: Statistics of TaoVA-100x

Start at: 2017-12-05 09:06:24
End at: 2017-12-05 09:06:54
Local clock offset: 3.207 ms
Remote clock offset: -15.286 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 6.67 Mbit/s
95th percentile per-packet one-way delay: 245.768 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 3.88 Mbit/s
95th percentile per-packet one-way delay: 170.339 ms
Loss rate: 0.17%
-- Flow 2:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 266.874 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 328.538 ms
Loss rate: 1.89%

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

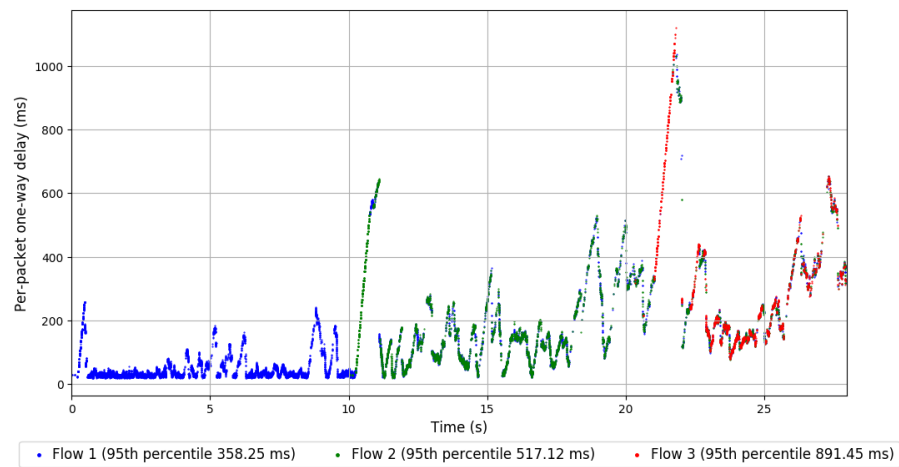
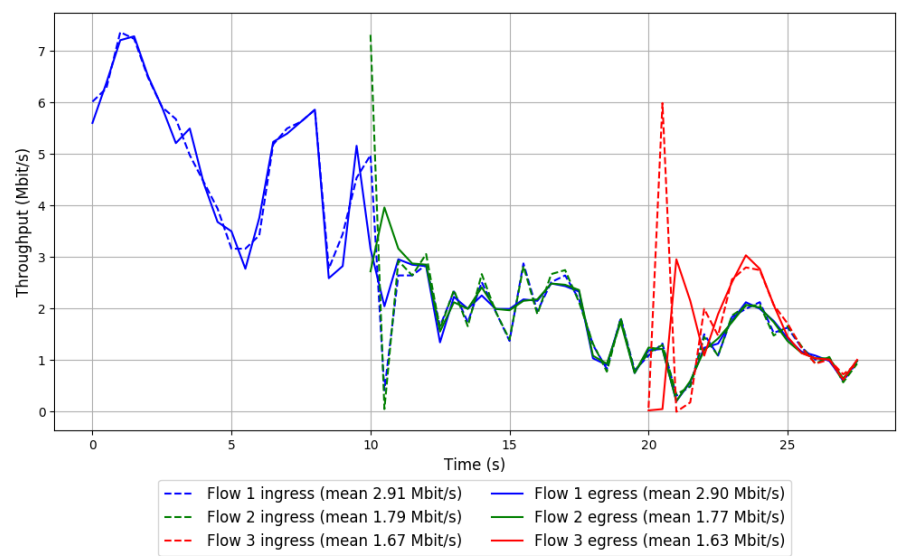


Run 3: Statistics of TaoVA-100x

Start at: 2017-12-05 09:21:55
End at: 2017-12-05 09:22:25
Local clock offset: 6.242 ms
Remote clock offset: -14.915 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.48 Mbit/s
95th percentile per-packet one-way delay: 499.417 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 2.90 Mbit/s
95th percentile per-packet one-way delay: 358.254 ms
Loss rate: 0.56%
-- Flow 2:
Average throughput: 1.77 Mbit/s
95th percentile per-packet one-way delay: 517.123 ms
Loss rate: 1.32%
-- Flow 3:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 891.450 ms
Loss rate: 6.19%

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

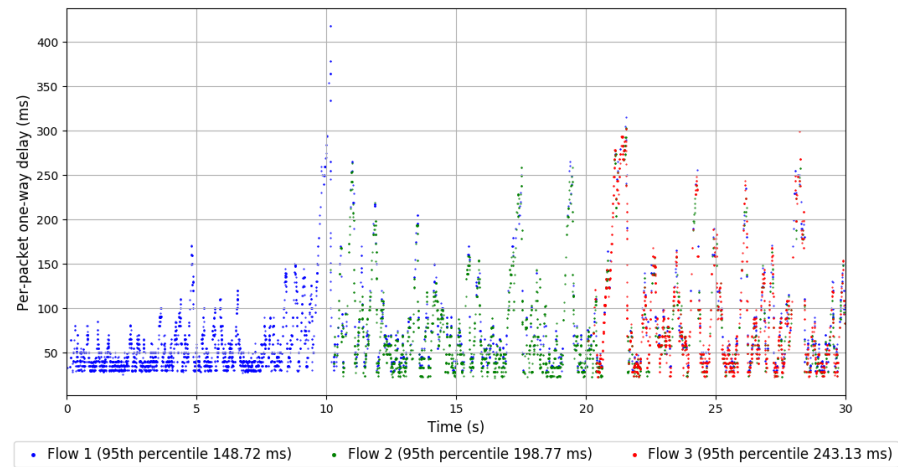
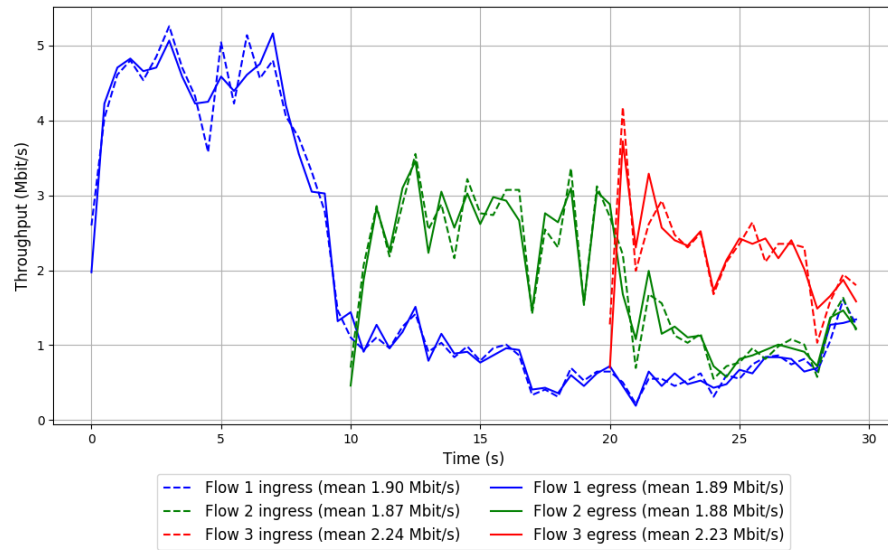


Run 1: Statistics of TCP Vegas

Start at: 2017-12-05 08:49:39
End at: 2017-12-05 08:50:09
Local clock offset: 5.053 ms
Remote clock offset: -17.675 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.87 Mbit/s
95th percentile per-packet one-way delay: 193.027 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 1.89 Mbit/s
95th percentile per-packet one-way delay: 148.720 ms
Loss rate: 0.27%
-- Flow 2:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 198.774 ms
Loss rate: 0.45%
-- Flow 3:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 243.126 ms
Loss rate: 1.02%

Run 1: Report of TCP Vegas — Data Link

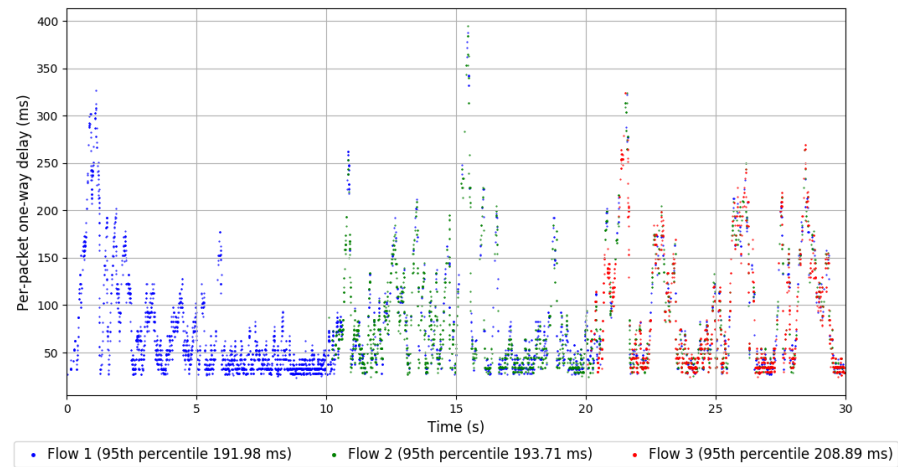
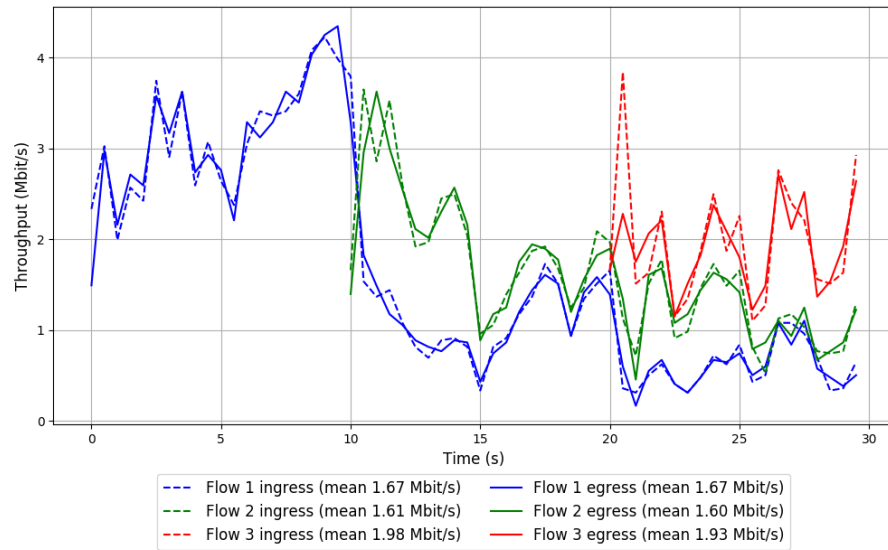


Run 2: Statistics of TCP Vegas

Start at: 2017-12-05 09:05:18
End at: 2017-12-05 09:05:48
Local clock offset: 2.742 ms
Remote clock offset: -15.769 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.37 Mbit/s
95th percentile per-packet one-way delay: 198.476 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 191.976 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 193.708 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 208.891 ms
Loss rate: 2.75%

Run 2: Report of TCP Vegas — Data Link

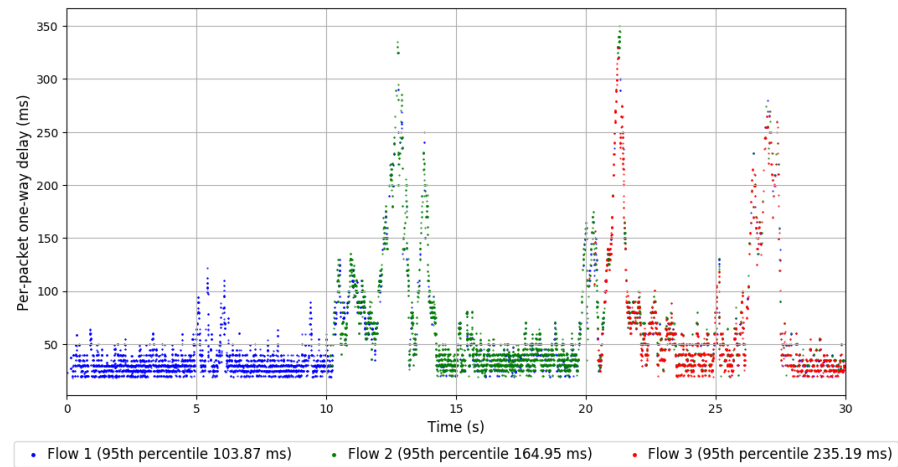
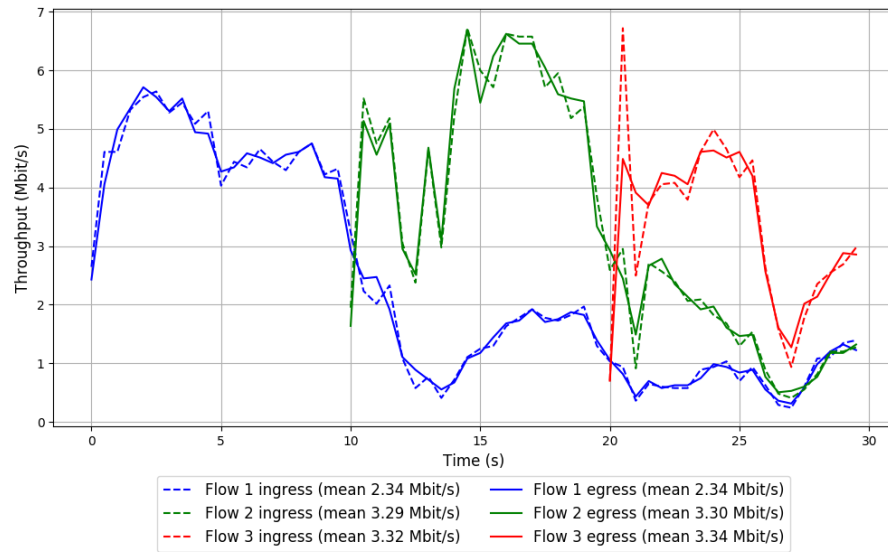


Run 3: Statistics of TCP Vegas

Start at: 2017-12-05 09:20:49
End at: 2017-12-05 09:21:19
Local clock offset: 6.962 ms
Remote clock offset: -15.272 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 5.63 Mbit/s
95th percentile per-packet one-way delay: 155.173 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 103.873 ms
Loss rate: 0.19%
-- Flow 2:
Average throughput: 3.30 Mbit/s
95th percentile per-packet one-way delay: 164.952 ms
Loss rate: 0.05%
-- Flow 3:
Average throughput: 3.34 Mbit/s
95th percentile per-packet one-way delay: 235.193 ms
Loss rate: 0.40%

Run 3: Report of TCP Vegas — Data Link

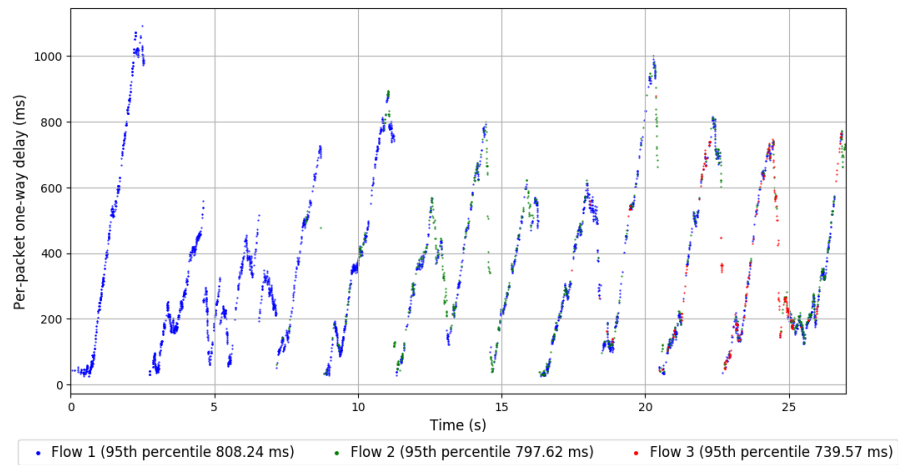
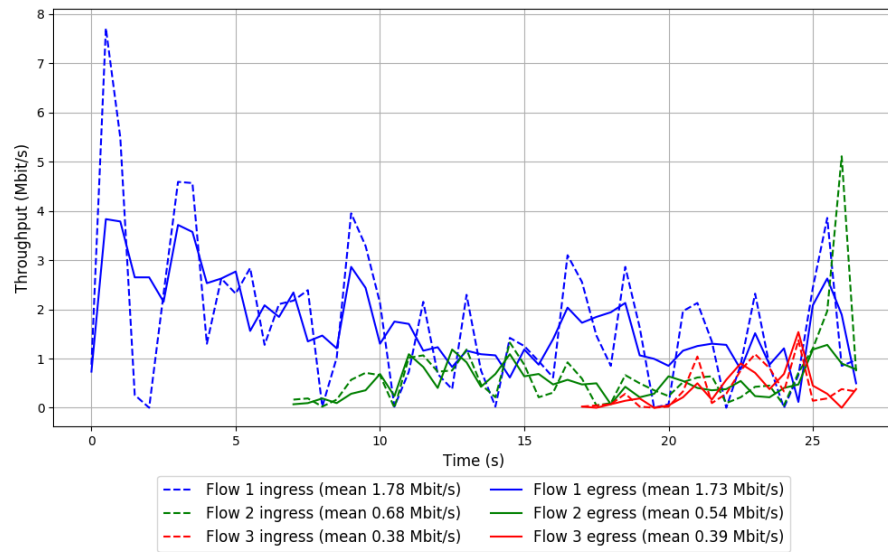


Run 1: Statistics of Verus

Start at: 2017-12-05 08:52:57
End at: 2017-12-05 08:53:27
Local clock offset: 3.343 ms
Remote clock offset: -15.397 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 800.437 ms
Loss rate: 6.56%
-- Flow 1:
Average throughput: 1.73 Mbit/s
95th percentile per-packet one-way delay: 808.235 ms
Loss rate: 2.78%
-- Flow 2:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 797.617 ms
Loss rate: 20.49%
-- Flow 3:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 739.573 ms
Loss rate: 4.97%

Run 1: Report of Verus — Data Link

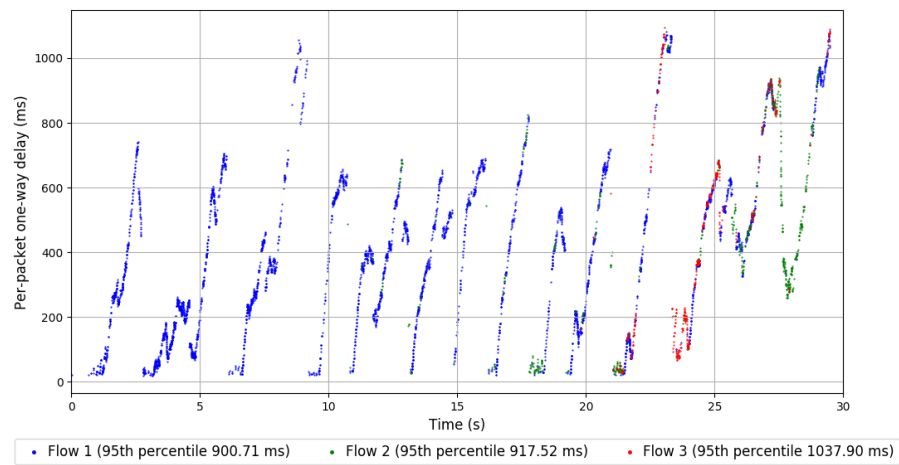
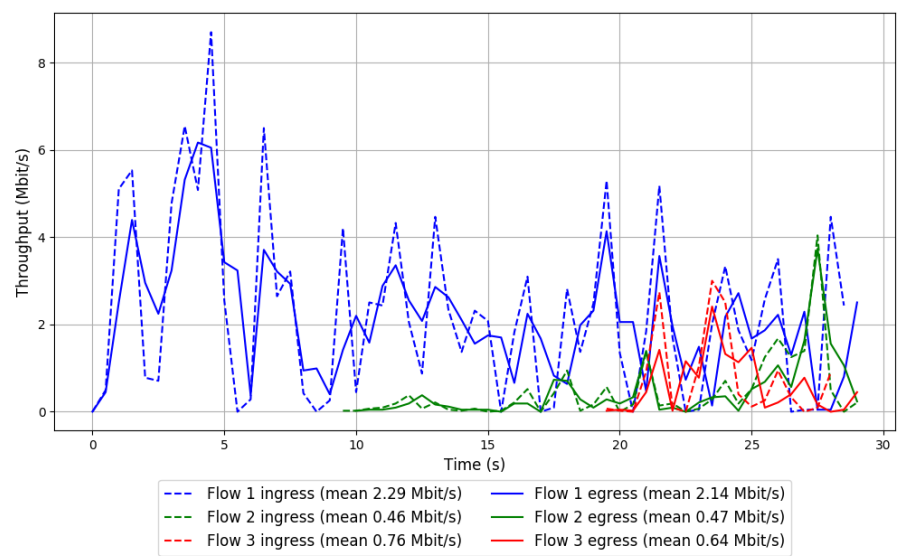


Run 2: Statistics of Verus

Start at: 2017-12-05 09:08:38
End at: 2017-12-05 09:09:08
Local clock offset: 7.165 ms
Remote clock offset: -16.819 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.65 Mbit/s
95th percentile per-packet one-way delay: 919.041 ms
Loss rate: 4.35%
-- Flow 1:
Average throughput: 2.14 Mbit/s
95th percentile per-packet one-way delay: 900.709 ms
Loss rate: 4.35%
-- Flow 2:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 917.522 ms
Loss rate: 1.83%
-- Flow 3:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 1037.900 ms
Loss rate: 7.73%

Run 2: Report of Verus — Data Link

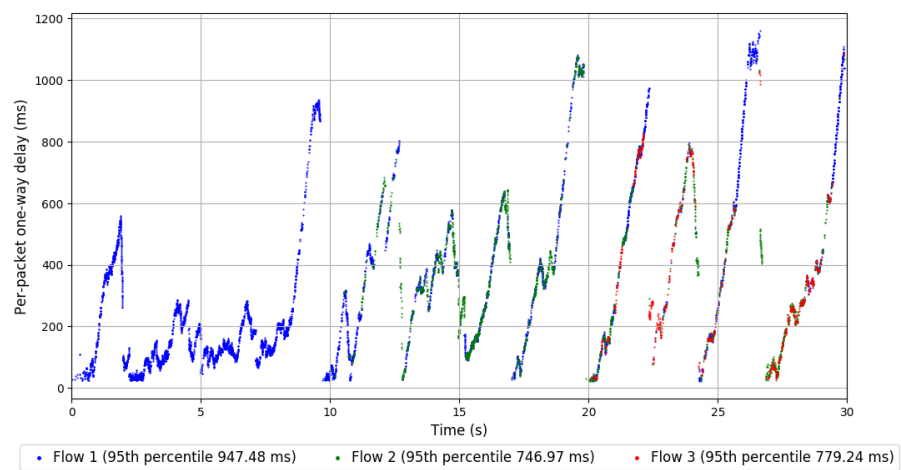
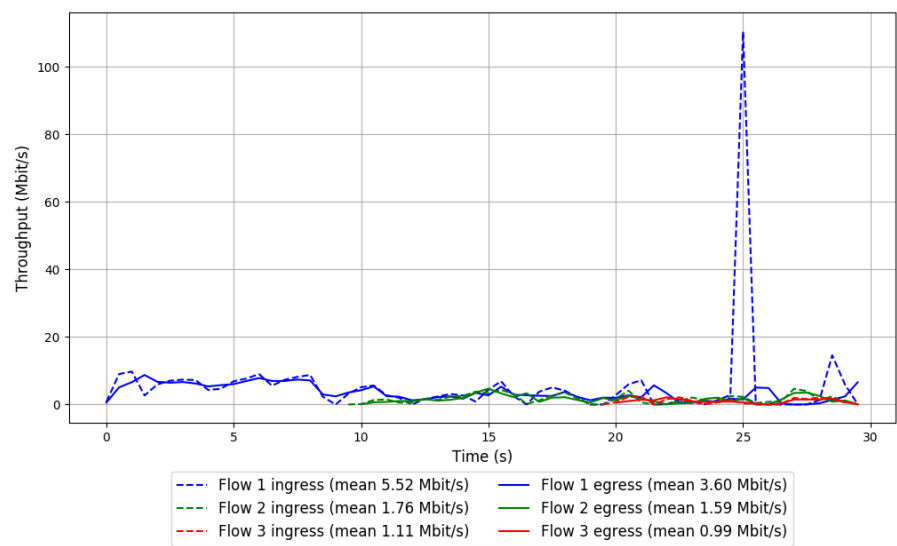


Run 3: Statistics of Verus

Start at: 2017-12-05 09:24:08
End at: 2017-12-05 09:24:38
Local clock offset: 4.548 ms
Remote clock offset: -13.429 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 4.98 Mbit/s
95th percentile per-packet one-way delay: 922.704 ms
Loss rate: 28.48%
-- Flow 1:
Average throughput: 3.60 Mbit/s
95th percentile per-packet one-way delay: 947.480 ms
Loss rate: 34.37%
-- Flow 2:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 746.973 ms
Loss rate: 6.73%
-- Flow 3:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 779.244 ms
Loss rate: 6.44%

Run 3: Report of Verus — Data Link

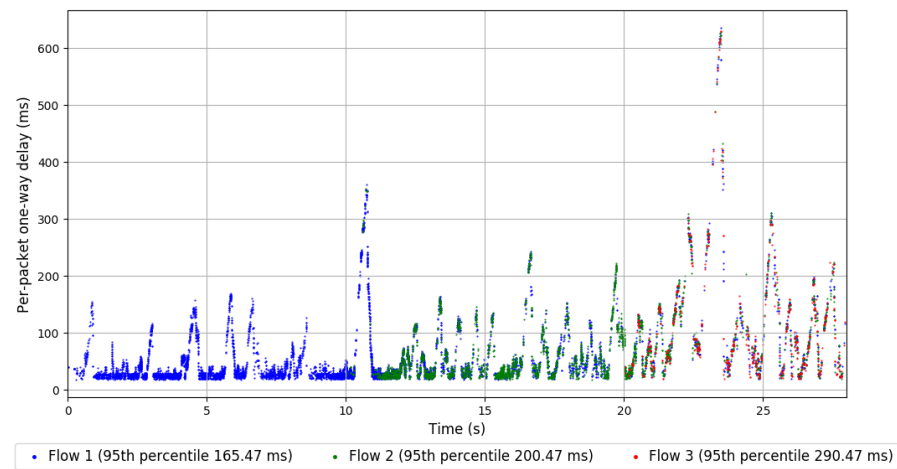
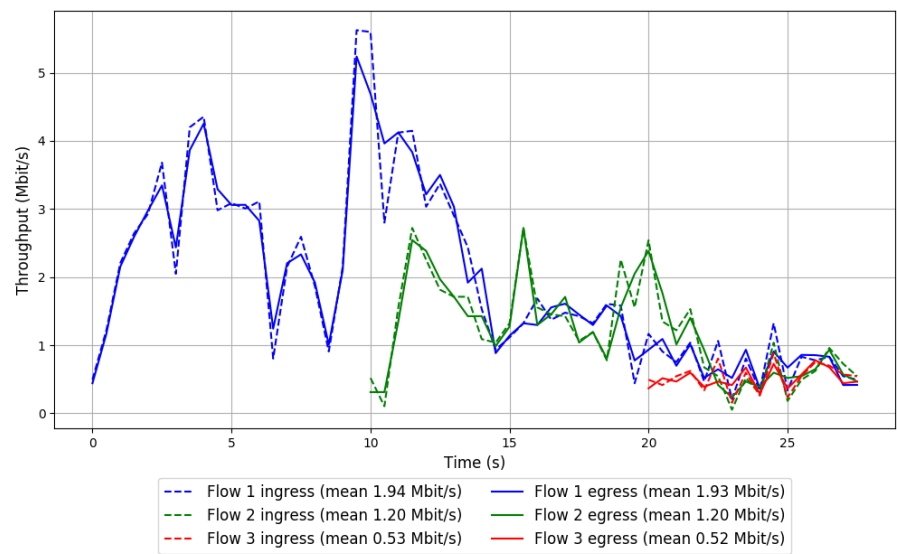


Run 1: Statistics of Copa

Start at: 2017-12-05 09:00:47
End at: 2017-12-05 09:01:17
Local clock offset: 6.361 ms
Remote clock offset: -15.022 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.85 Mbit/s
95th percentile per-packet one-way delay: 187.278 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 165.471 ms
Loss rate: 0.22%
-- Flow 2:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 200.472 ms
Loss rate: 0.78%
-- Flow 3:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 290.474 ms
Loss rate: 3.09%

Run 1: Report of Copa — Data Link

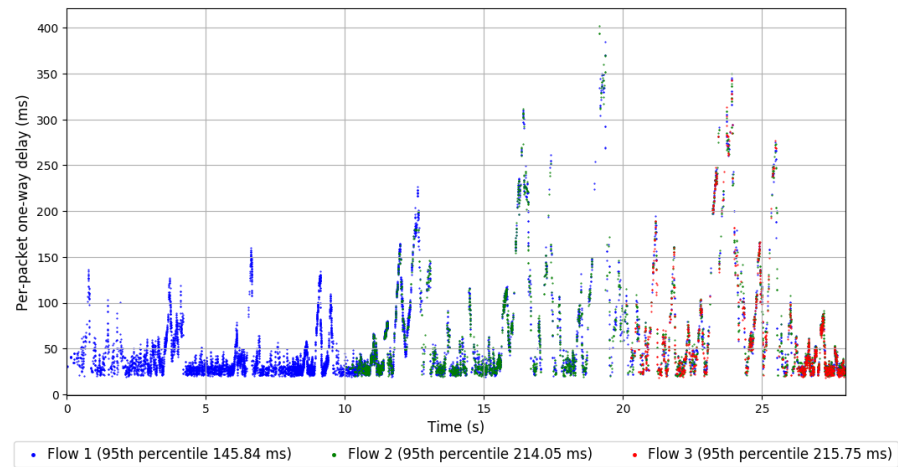
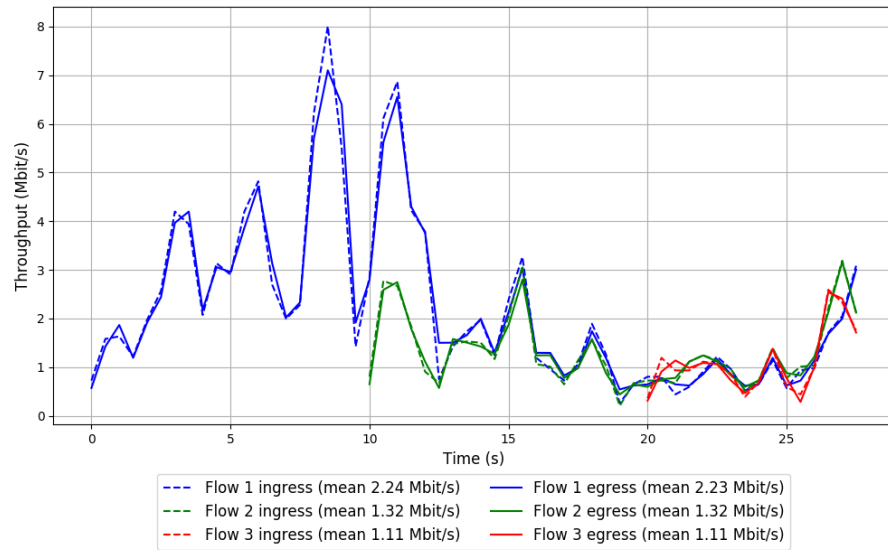


Run 2: Statistics of Copa

Start at: 2017-12-05 09:16:22
End at: 2017-12-05 09:16:52
Local clock offset: 5.028 ms
Remote clock offset: -16.004 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 163.049 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 145.840 ms
Loss rate: 0.21%
-- Flow 2:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 214.047 ms
Loss rate: 0.45%
-- Flow 3:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 215.748 ms
Loss rate: 0.88%

Run 2: Report of Copa — Data Link

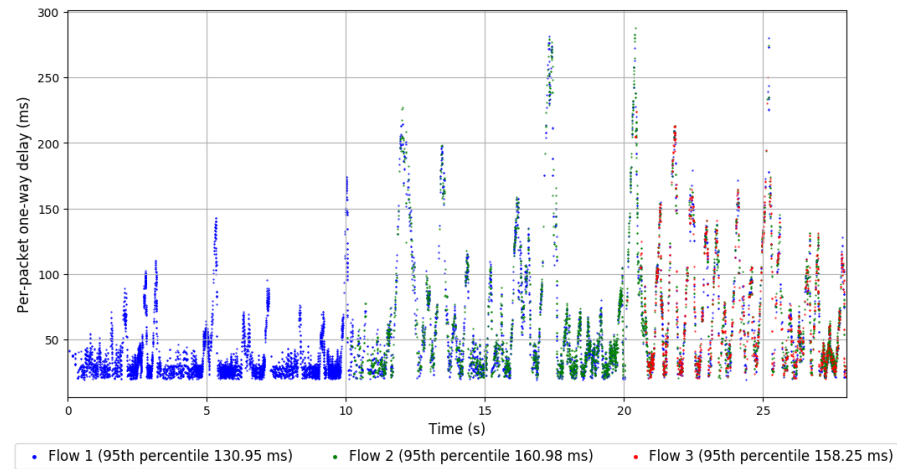
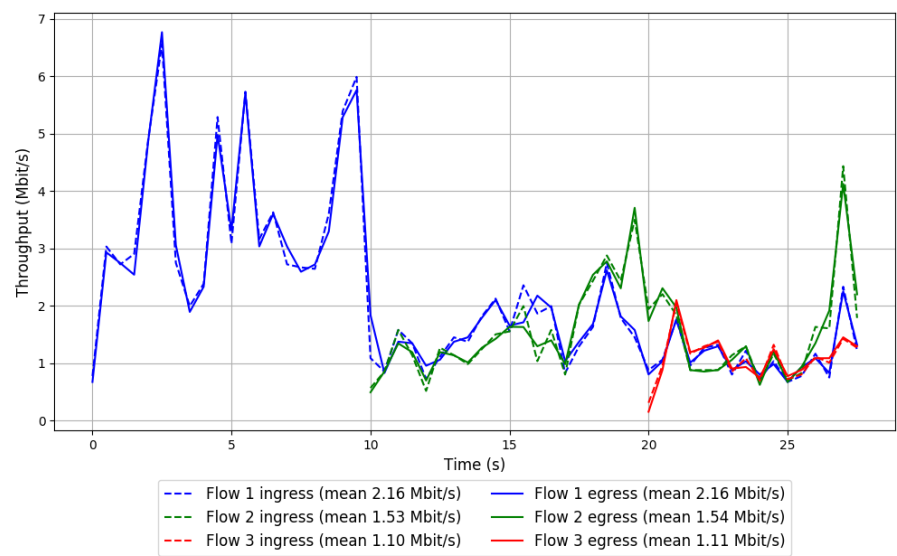


Run 3: Statistics of Copa

Start at: 2017-12-05 09:31:52
End at: 2017-12-05 09:32:22
Local clock offset: 5.083 ms
Remote clock offset: -14.166 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.46 Mbit/s
95th percentile per-packet one-way delay: 145.641 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 130.948 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 1.54 Mbit/s
95th percentile per-packet one-way delay: 160.980 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 158.249 ms
Loss rate: 0.30%

Run 3: Report of Copa — Data Link

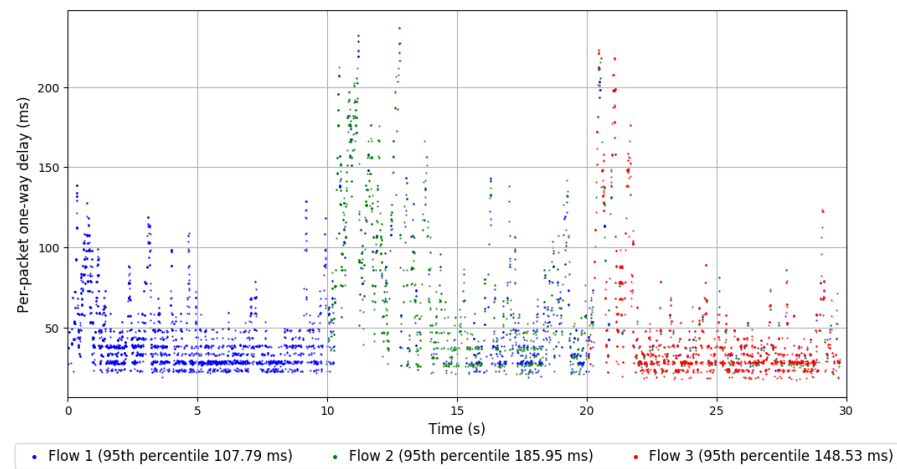
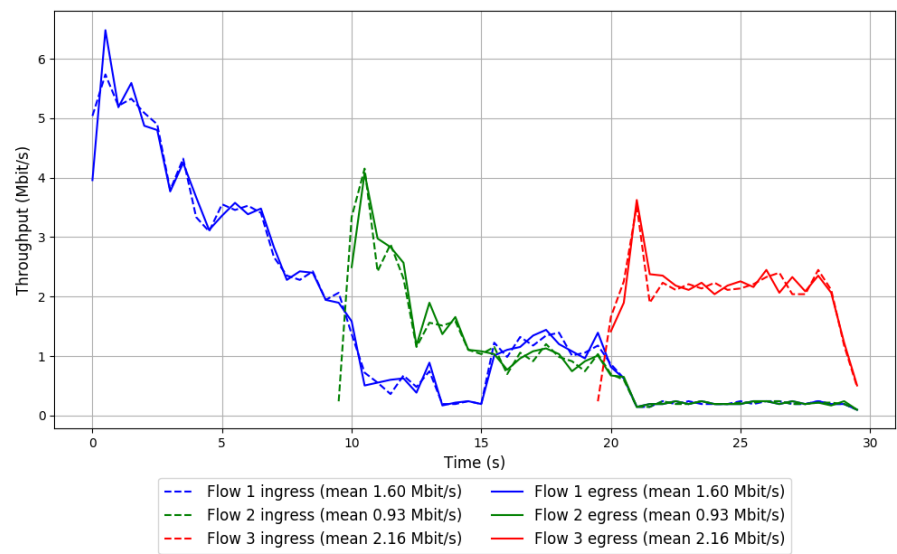


```
Run 1: Statistics of Indigo

Start at: 2017-12-05 08:57:25
End at: 2017-12-05 08:57:55
Local clock offset: 4.9 ms
Remote clock offset: -16.245 ms

# Below is generated by plot.py at 2017-12-05 09:35:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 2.92 Mbit/s
95th percentile per-packet one-way delay: 148.722 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 107.792 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 185.954 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 148.529 ms
Loss rate: 0.17%
```

Run 1: Report of Indigo — Data Link

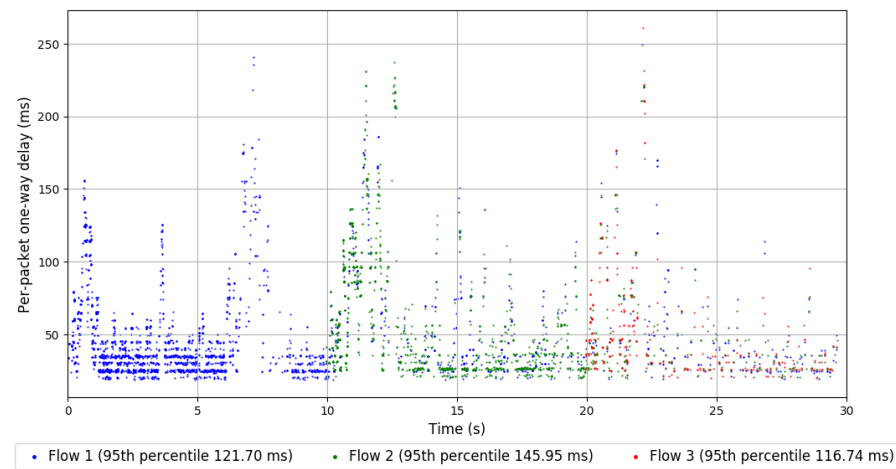
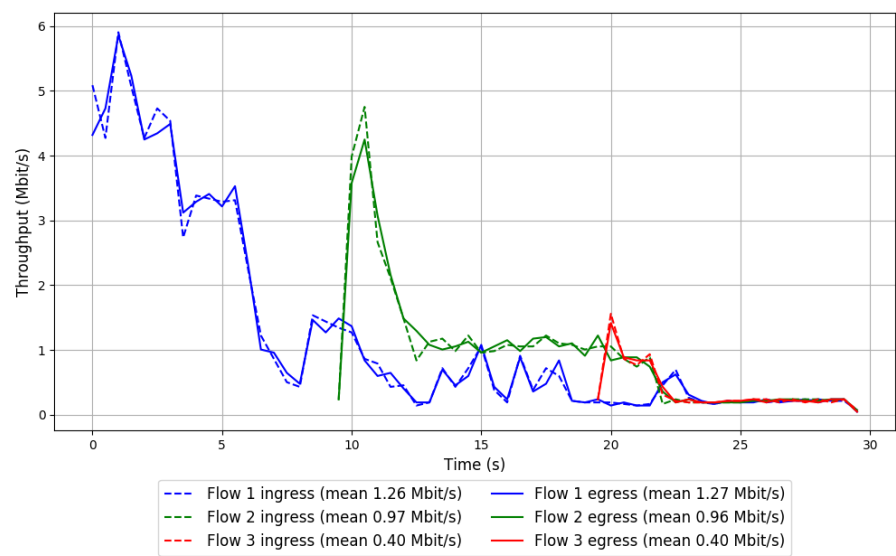


Run 2: Statistics of Indigo

Start at: 2017-12-05 09:13:04
End at: 2017-12-05 09:13:34
Local clock offset: 6.197 ms
Remote clock offset: -16.822 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 126.031 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 121.697 ms
Loss rate: 0.03%
-- Flow 2:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 145.953 ms
Loss rate: 0.06%
-- Flow 3:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 116.737 ms
Loss rate: 0.31%

Run 2: Report of Indigo — Data Link

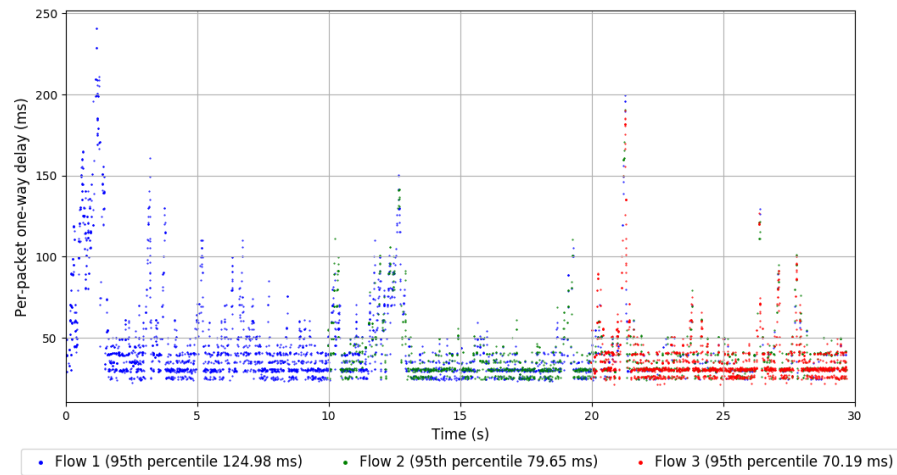
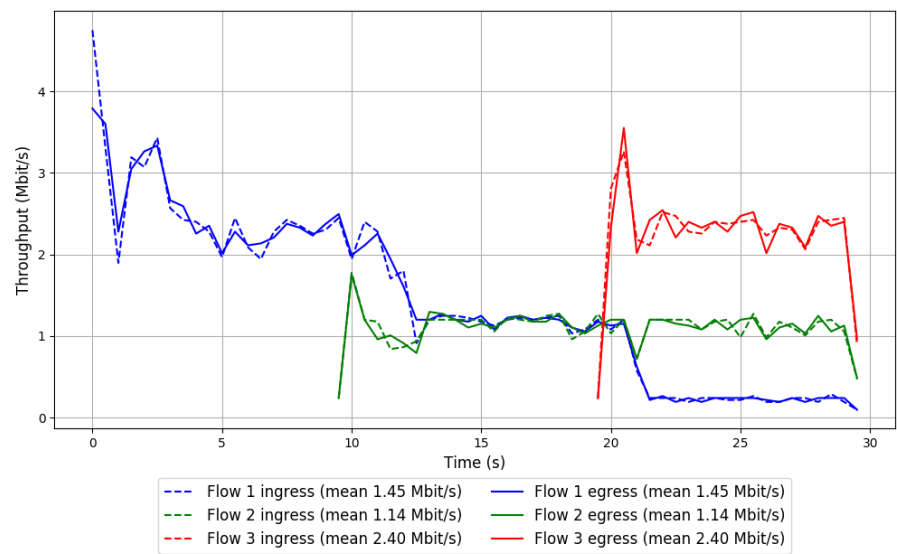


Run 3: Statistics of Indigo

Start at: 2017-12-05 09:28:33
End at: 2017-12-05 09:29:03
Local clock offset: 4.651 ms
Remote clock offset: -13.461 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 3.00 Mbit/s
95th percentile per-packet one-way delay: 100.718 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 124.981 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 79.653 ms
Loss rate: 0.16%
-- Flow 3:
Average throughput: 2.40 Mbit/s
95th percentile per-packet one-way delay: 70.194 ms
Loss rate: 0.26%

Run 3: Report of Indigo — Data Link

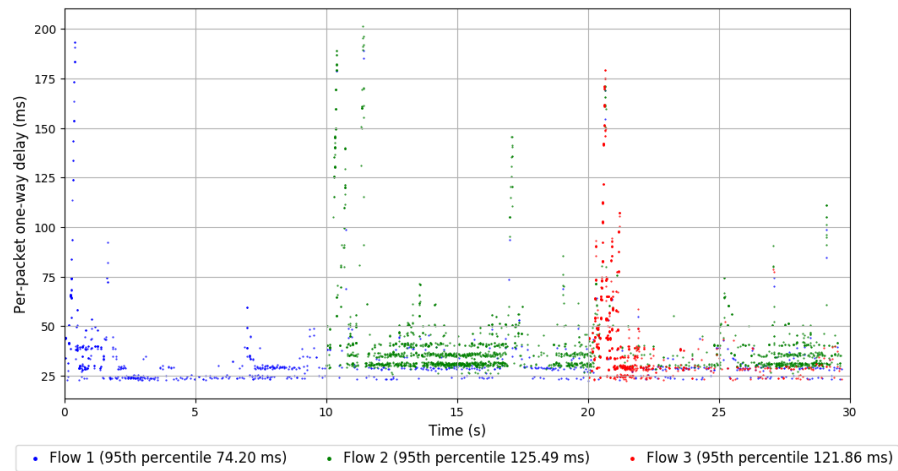
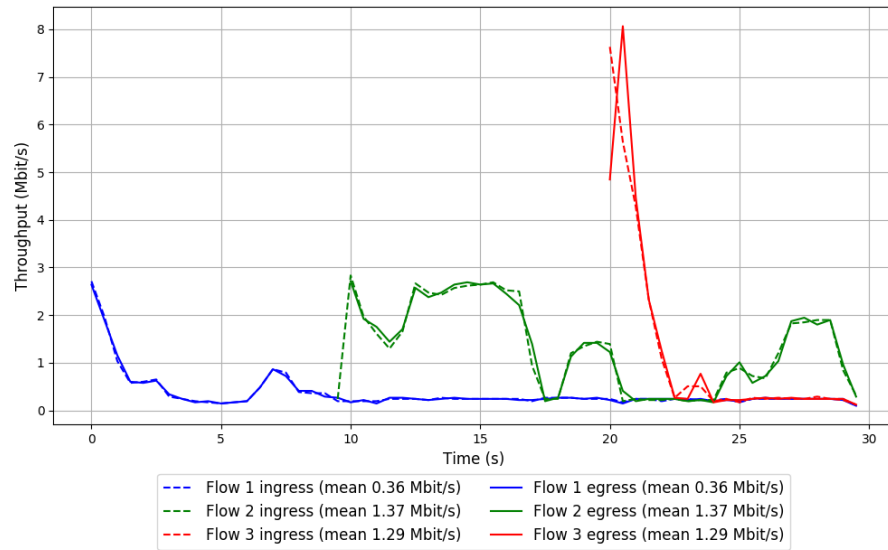


```
Run 1: Statistics of Indigo-calib

Start at: 2017-12-05 08:47:27
End at: 2017-12-05 08:47:57
Local clock offset: 3.884 ms
Remote clock offset: -16.42 ms

# Below is generated by plot.py at 2017-12-05 09:35:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 119.893 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 74.201 ms
Loss rate: 0.11%
-- Flow 2:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 125.486 ms
Loss rate: 0.22%
-- Flow 3:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 121.859 ms
Loss rate: 0.10%
```

Run 1: Report of Indigo-calib — Data Link

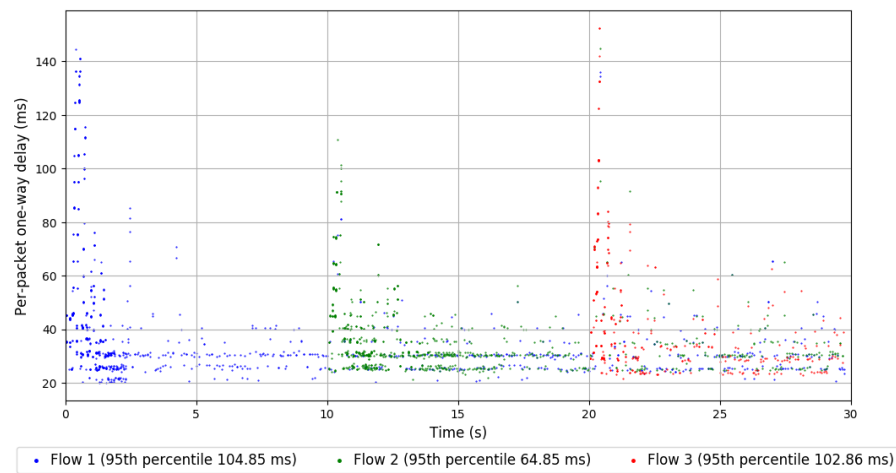
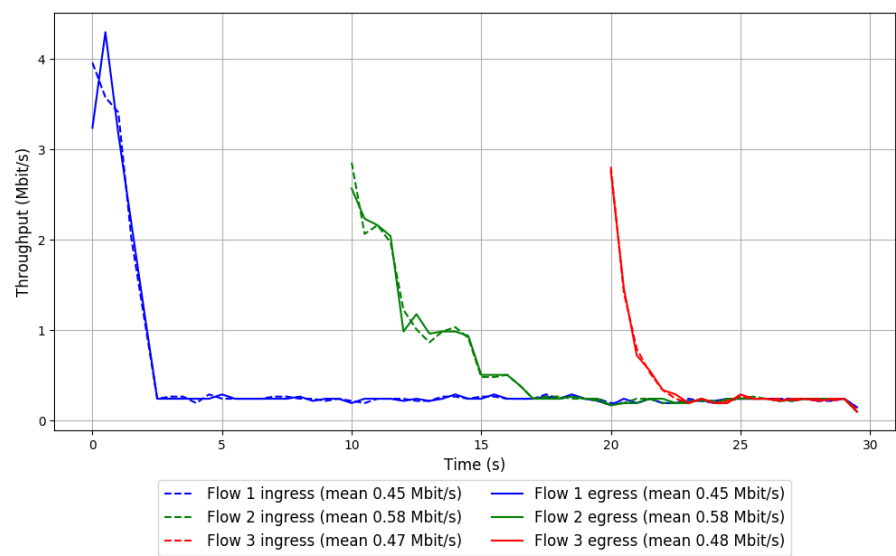


Run 2: Statistics of Indigo-calib

Start at: 2017-12-05 09:03:02
End at: 2017-12-05 09:03:32
Local clock offset: 4.936 ms
Remote clock offset: -15.348 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 85.415 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 104.851 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 64.854 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 102.855 ms
Loss rate: 0.26%

Run 2: Report of Indigo-calib — Data Link



Run 3: Statistics of Indigo-calib

Start at: 2017-12-05 09:18:36
End at: 2017-12-05 09:19:06
Local clock offset: 7.052 ms
Remote clock offset: -16.795 ms

Below is generated by plot.py at 2017-12-05 09:35:13
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 161.609 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 116.696 ms
Loss rate: 0.09%
-- Flow 2:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 201.188 ms
Loss rate: 0.04%
-- Flow 3:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 97.239 ms
Loss rate: 0.00%

Run 3: Report of Indigo-calib — Data Link

