

Pantheon Report

Generated at 2018-01-02 22:09:16 (UTC).

Data path: AWS India 1 Ethernet (*local*) → India ppp0 (*remote*).

Repeated the test of 14 congestion control schemes 3 times.

Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

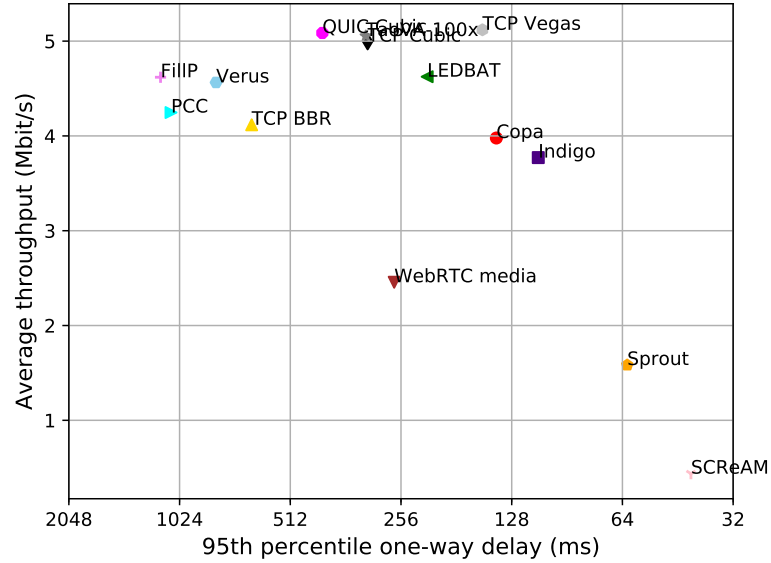
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

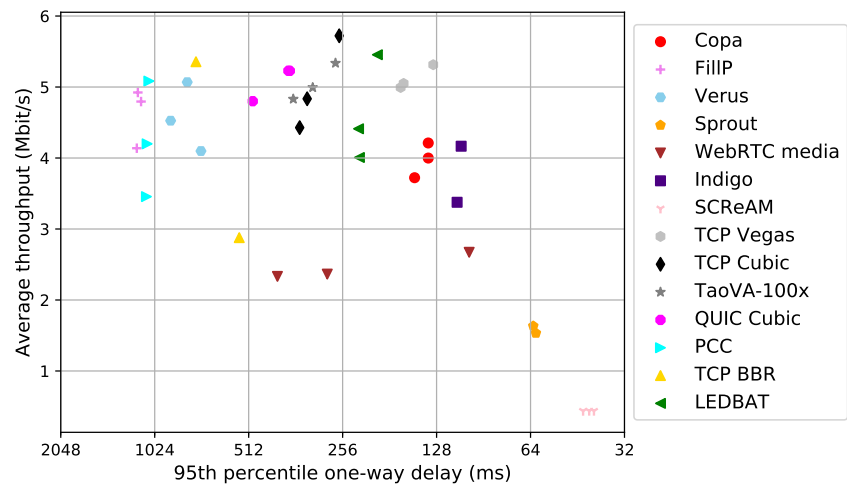
Git summary:

```
branch: master @ 904a5750834816b1e46a2c86405d707788d27c16
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ dcaef6b00654e660f73f7ed679d2eab61ce08639
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeab30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



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

Run 1: Statistics of TCP BBR

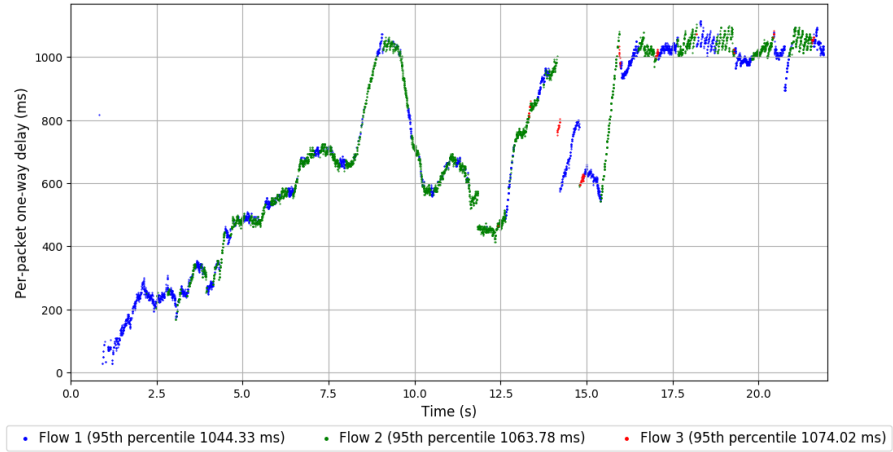
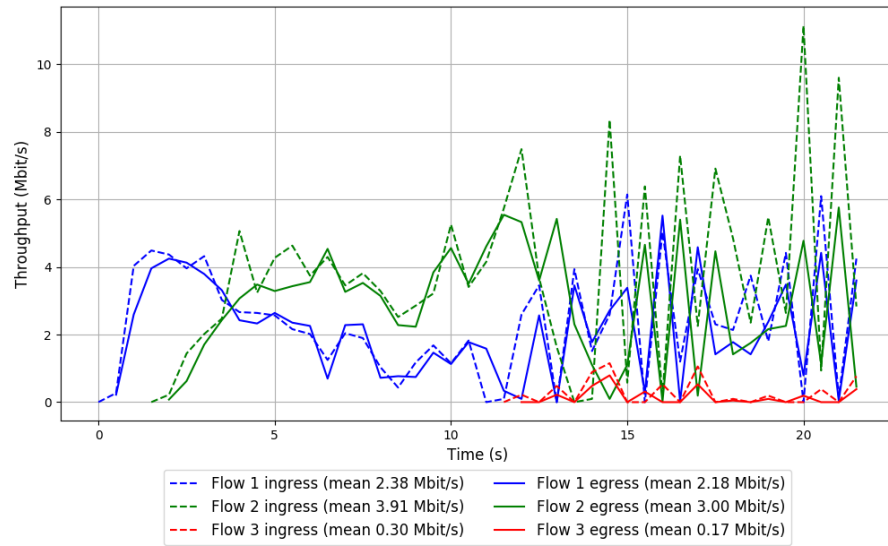
Start at: 2018-01-02 21:30:05

End at: 2018-01-02 21:30:35

Local clock offset: 3.257 ms

Remote clock offset: -14.351 ms

Run 1: Report of TCP BBR — Data Link

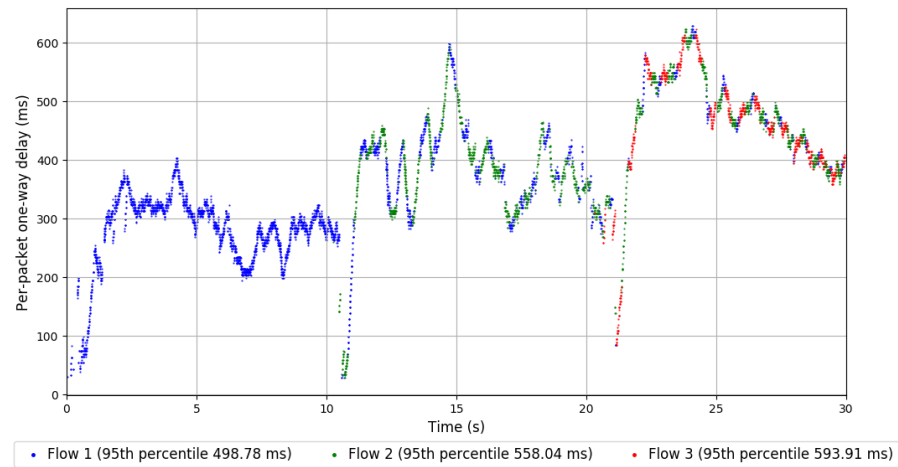
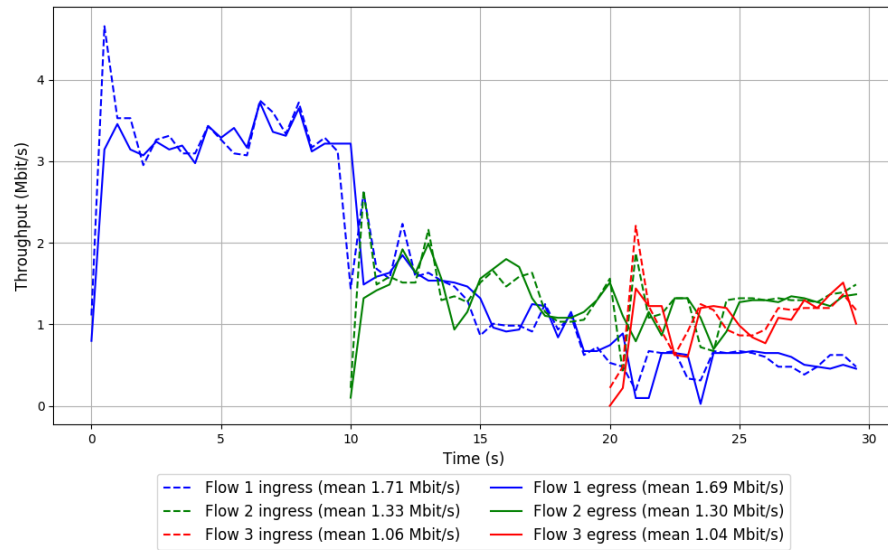


Run 2: Statistics of TCP BBR

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

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

Run 2: Report of TCP BBR — Data Link

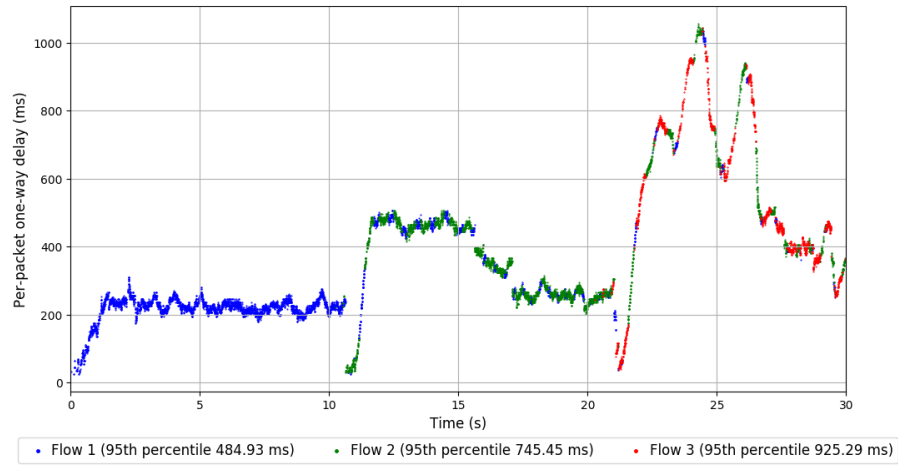
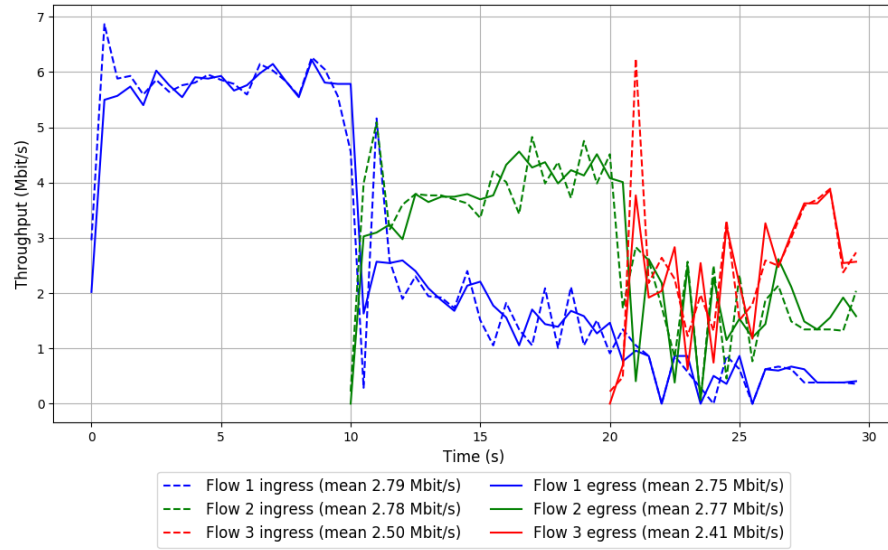


Run 3: Statistics of TCP BBR

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

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

Run 3: Report of TCP BBR — Data Link

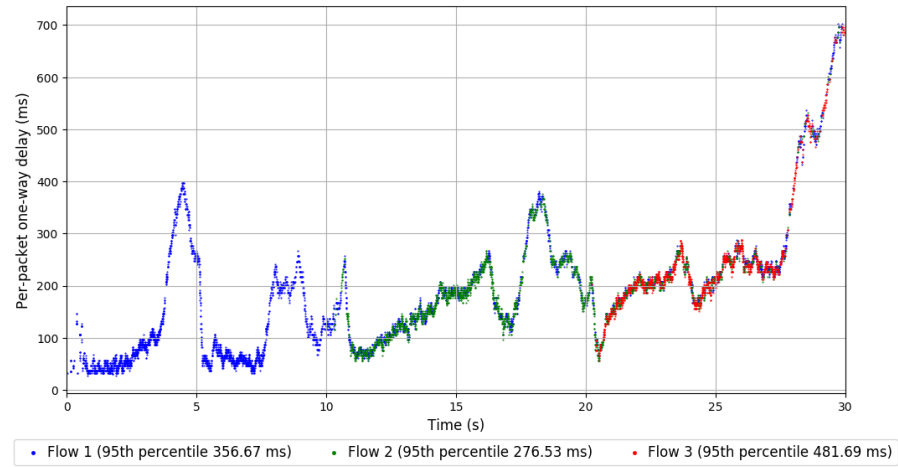
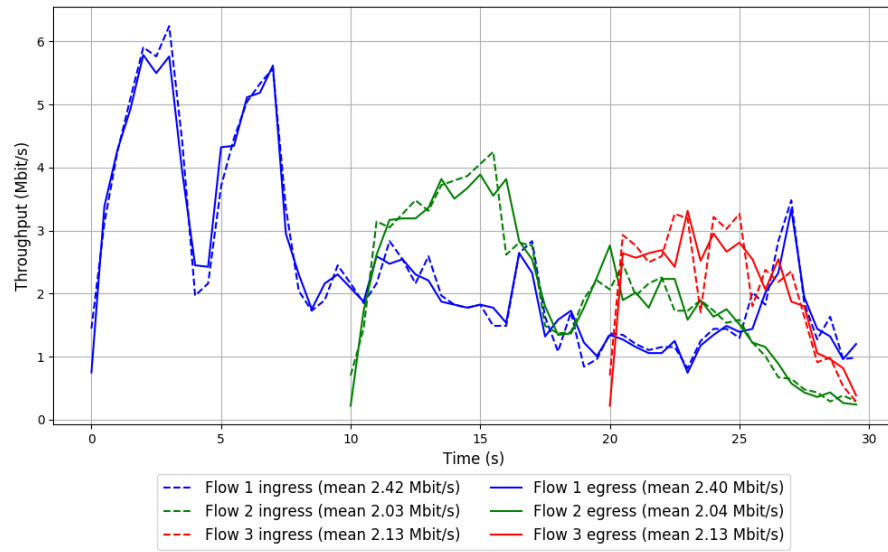


Run 1: Statistics of TCP Cubic

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

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

Run 1: Report of TCP Cubic — Data Link

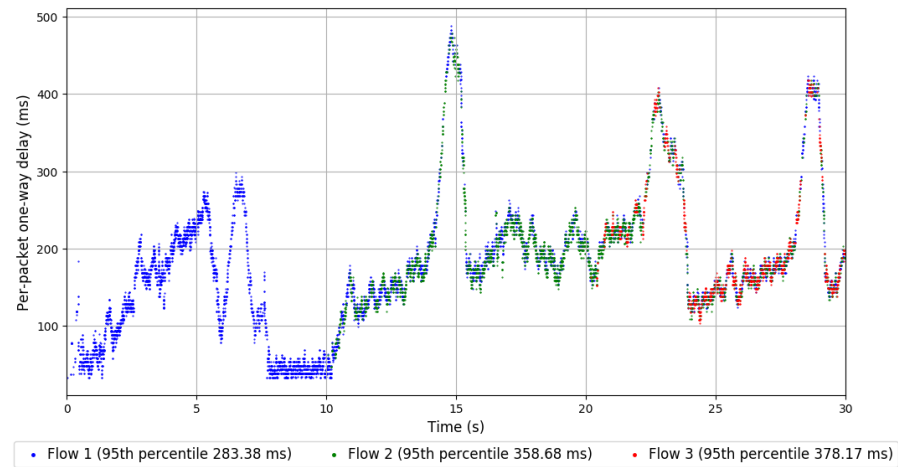
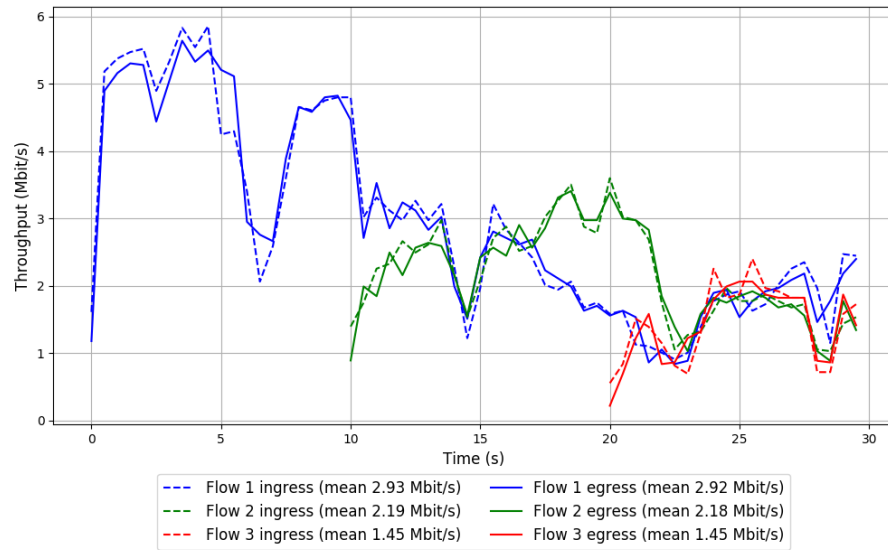


Run 2: Statistics of TCP Cubic

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

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

Run 2: Report of TCP Cubic — Data Link

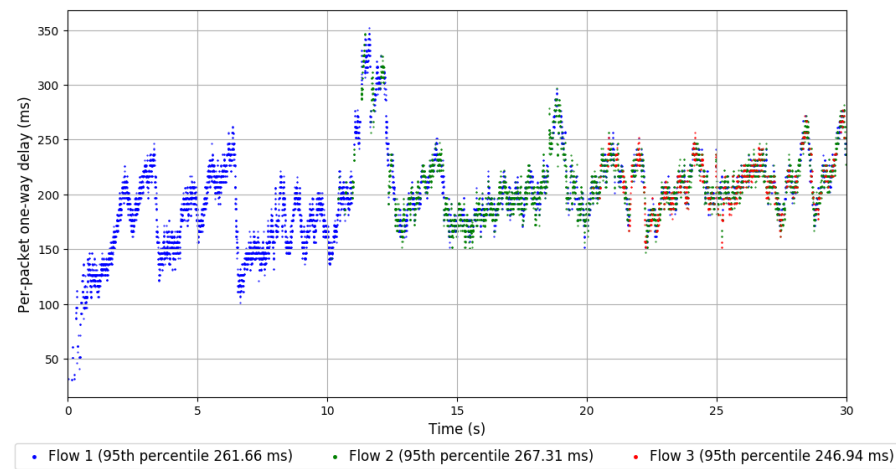
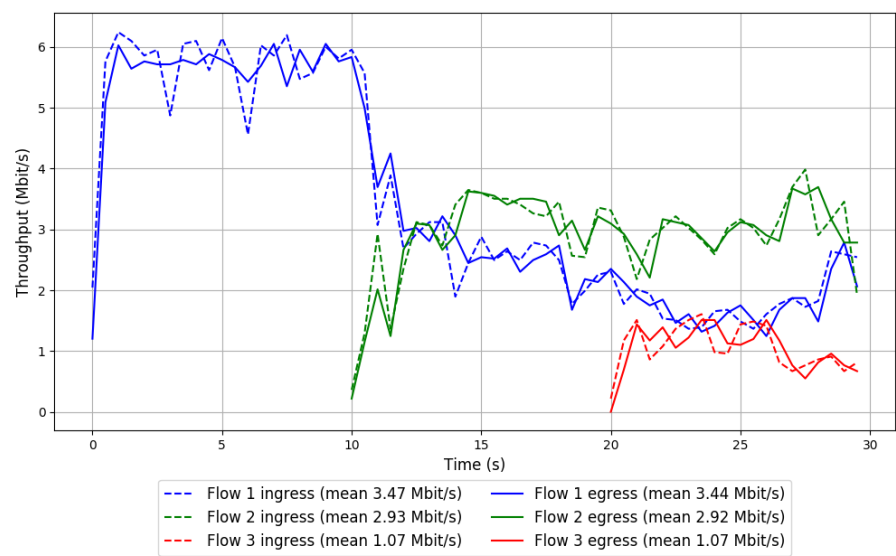


Run 3: Statistics of TCP Cubic

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

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

Run 3: Report of TCP Cubic — Data Link

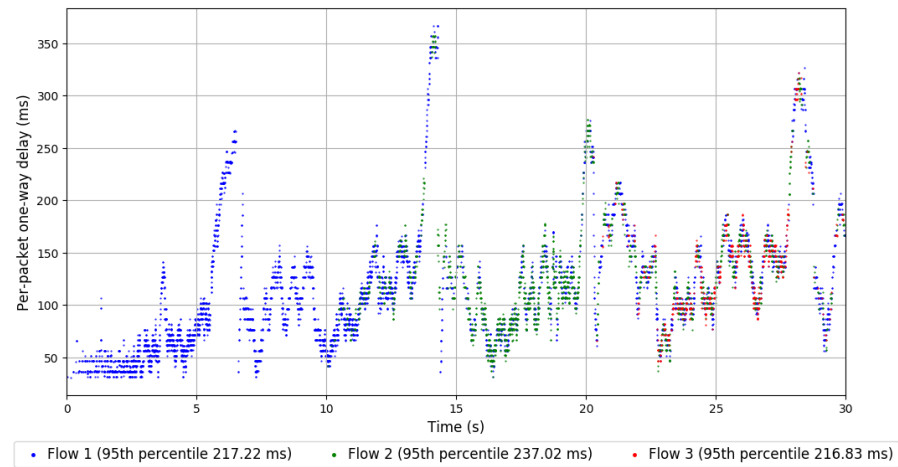
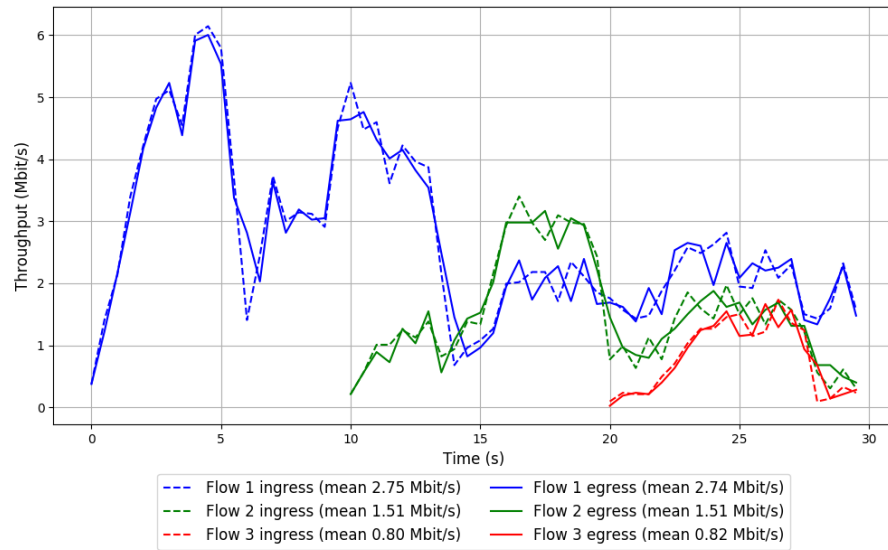


Run 1: Statistics of LEDBAT

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

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

Run 1: Report of LEDBAT — Data Link

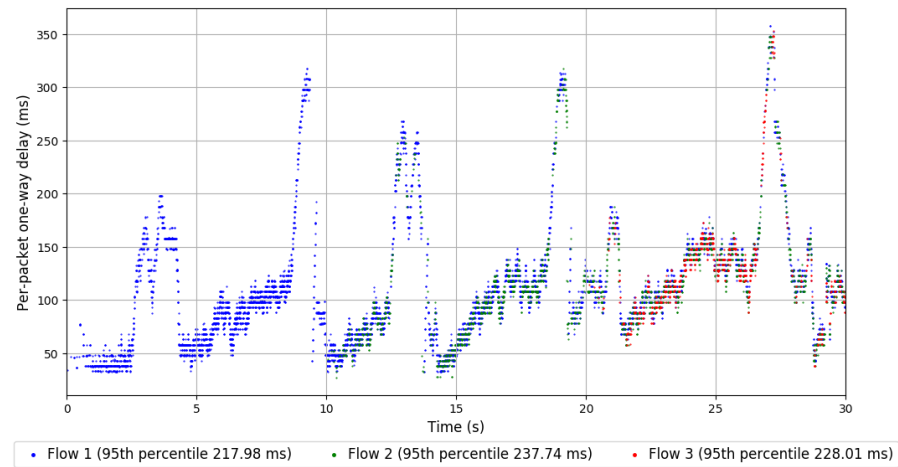
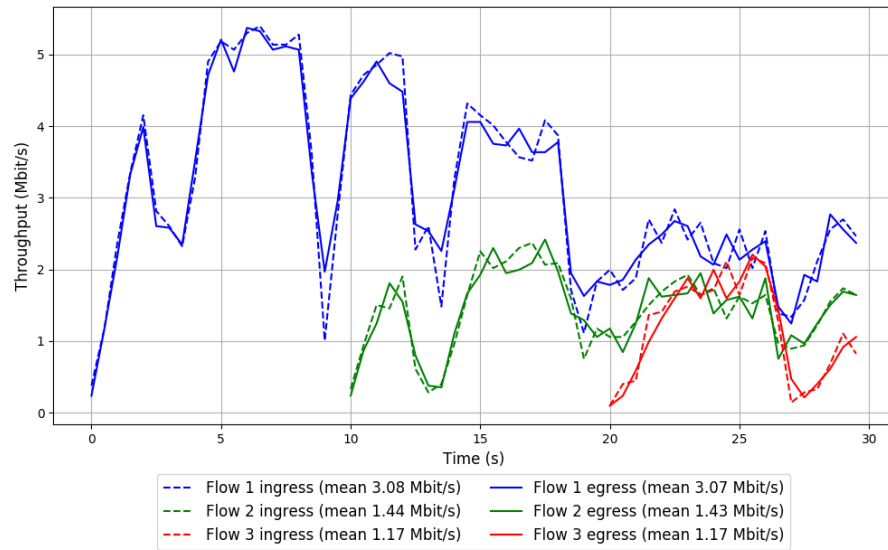


Run 2: Statistics of LEDBAT

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

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

Run 2: Report of LEDBAT — Data Link

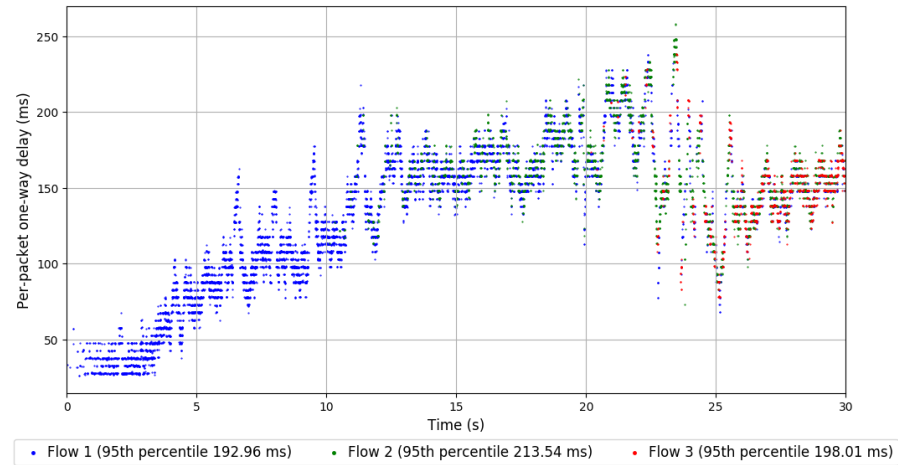
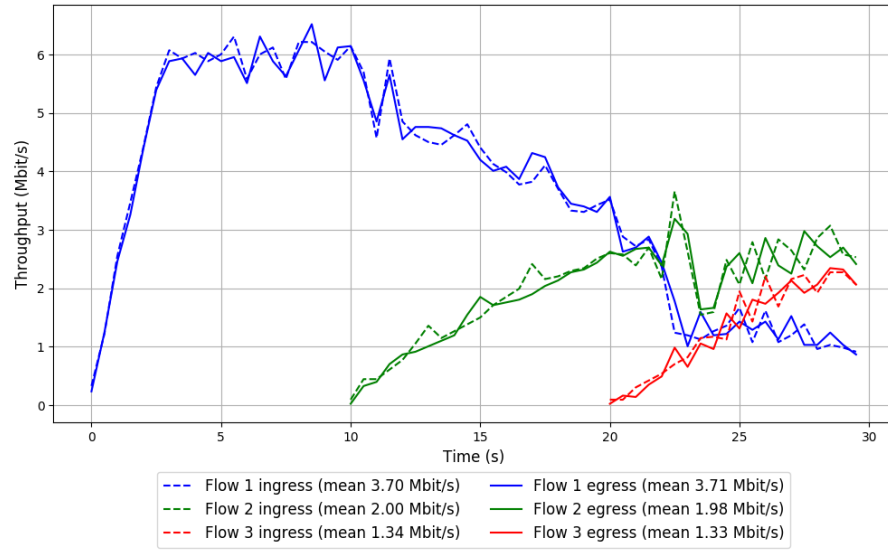


Run 3: Statistics of LEDBAT

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

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

Run 3: Report of LEDBAT — Data Link

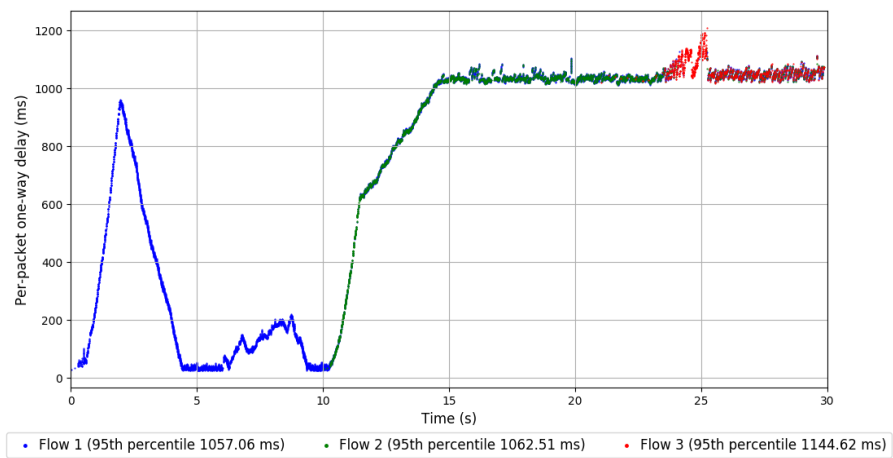
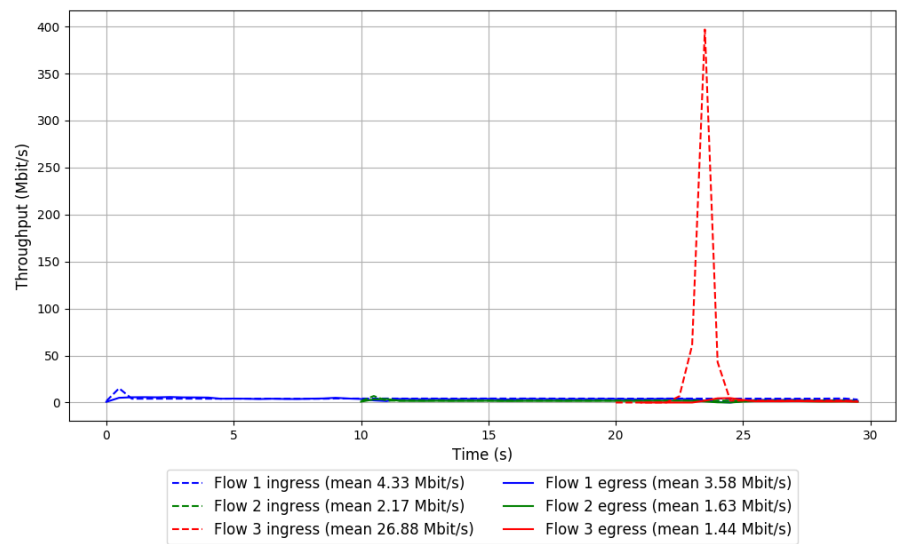


Run 1: Statistics of PCC

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

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

Run 1: Report of PCC — Data Link

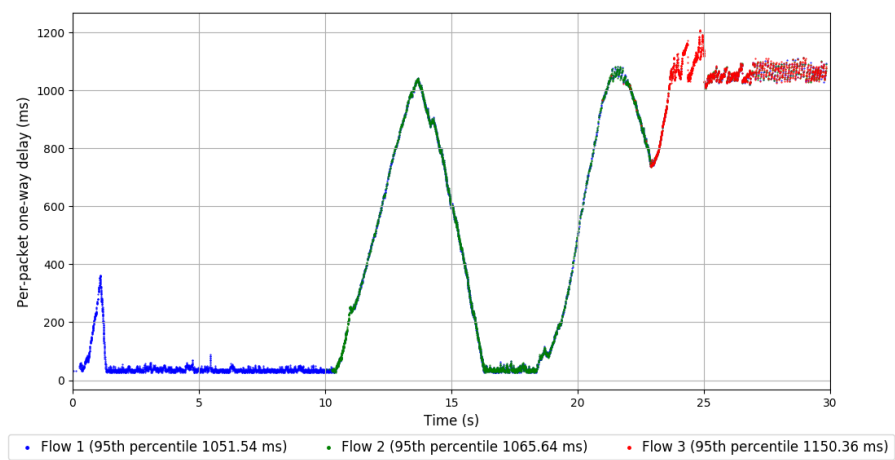
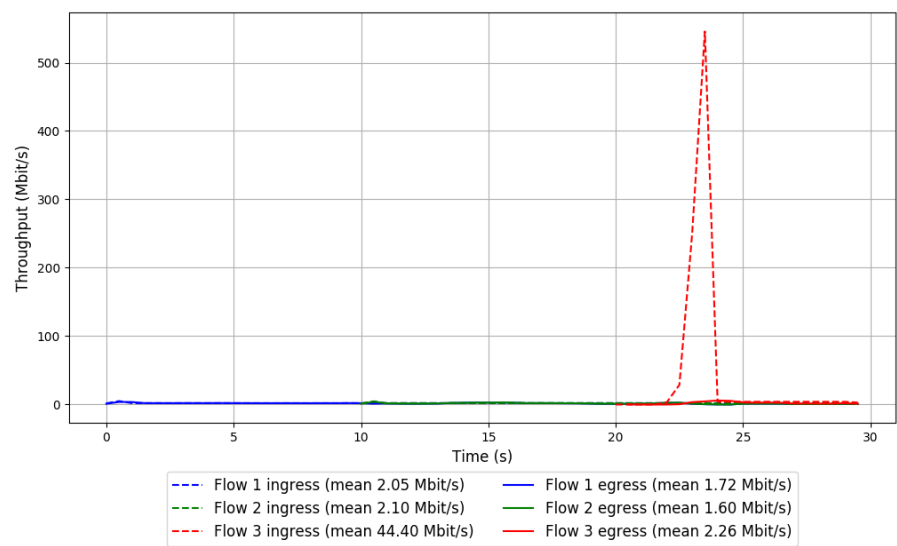


Run 2: Statistics of PCC

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

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

Run 2: Report of PCC — Data Link

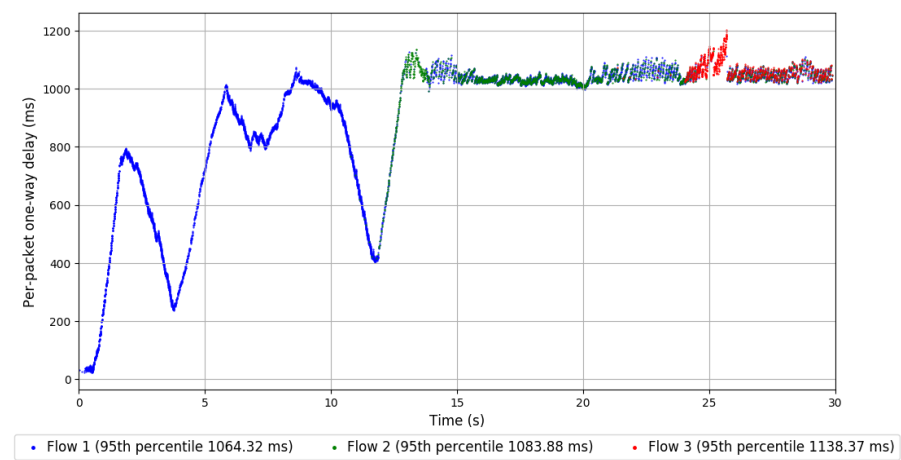
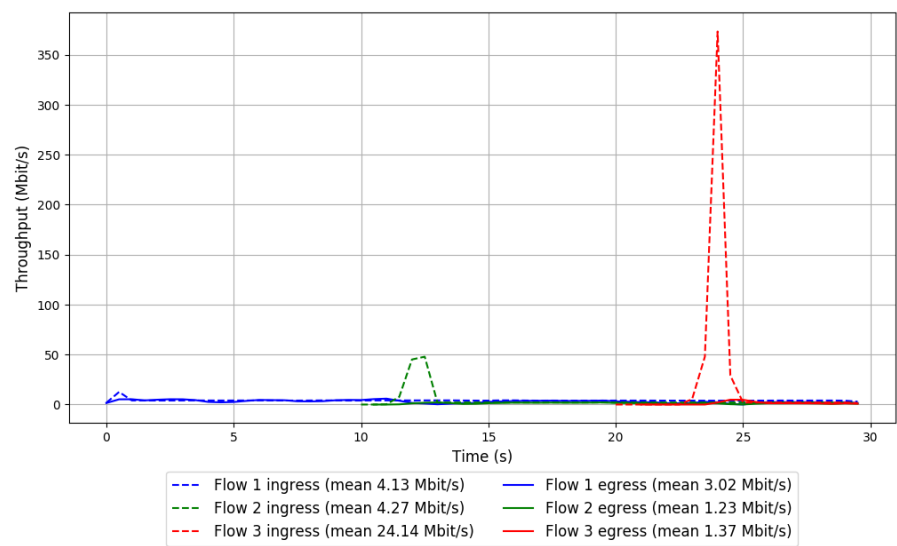


Run 3: Statistics of PCC

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

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

Run 3: Report of PCC — Data Link

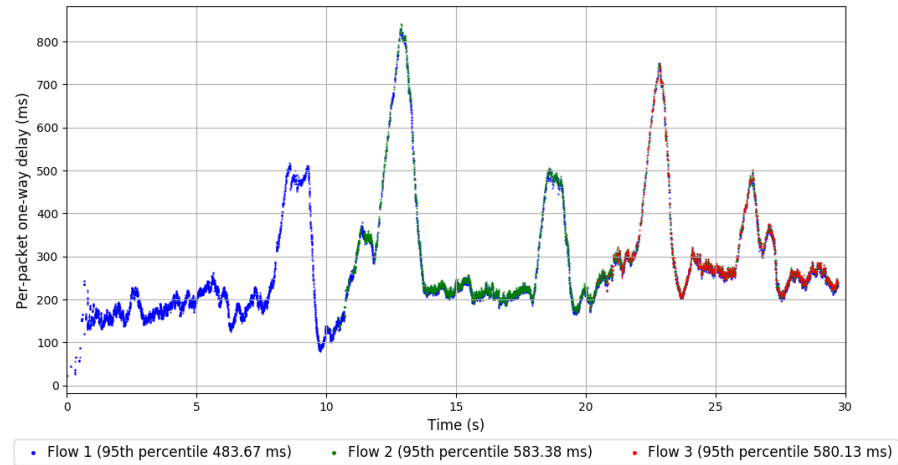
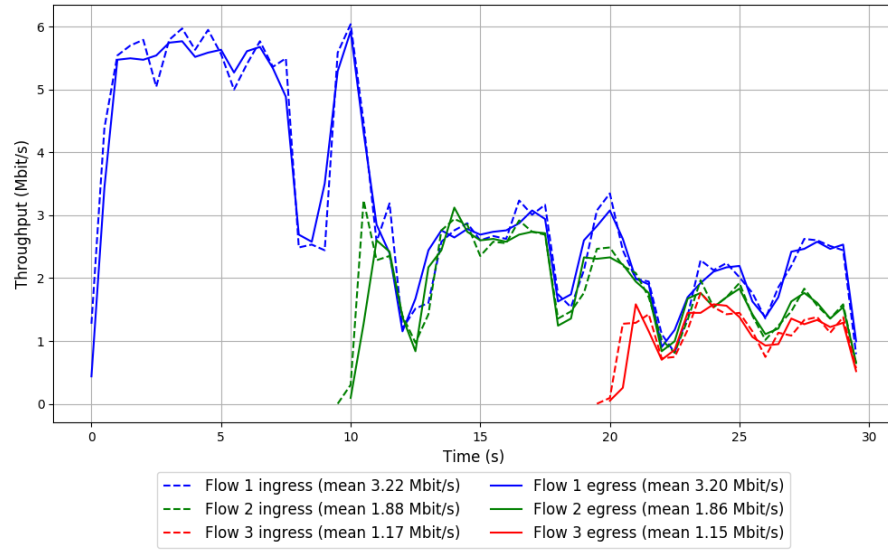


Run 1: Statistics of QUIC Cubic

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

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

Run 1: Report of QUIC Cubic — Data Link

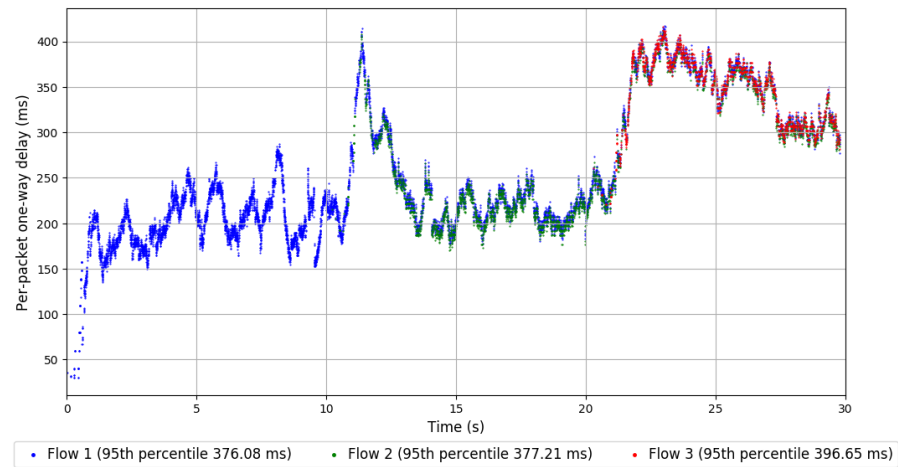
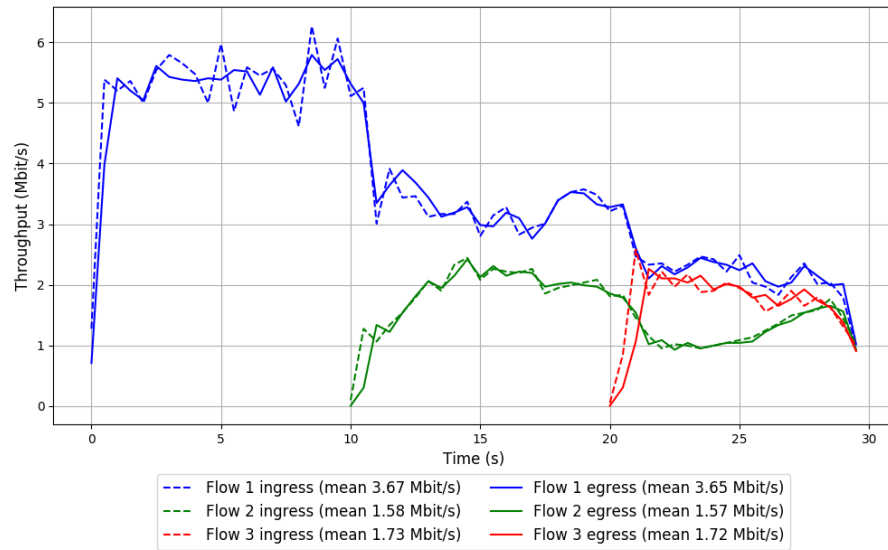


Run 2: Statistics of QUIC Cubic

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

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

Run 2: Report of QUIC Cubic — Data Link

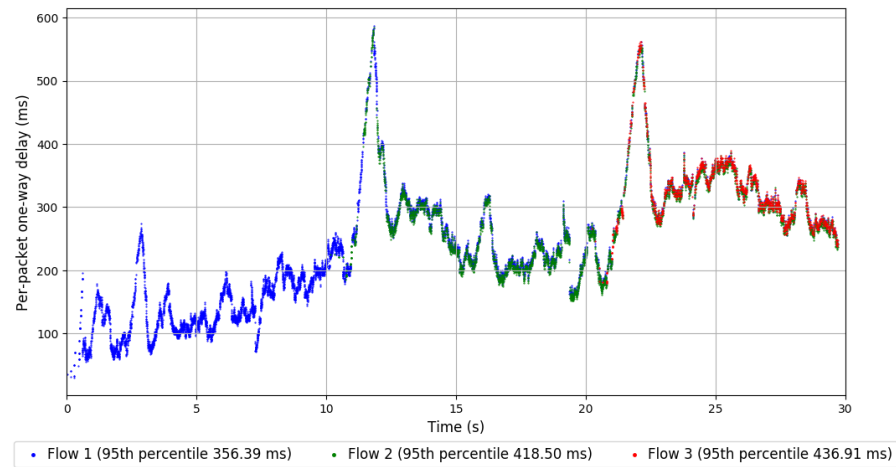
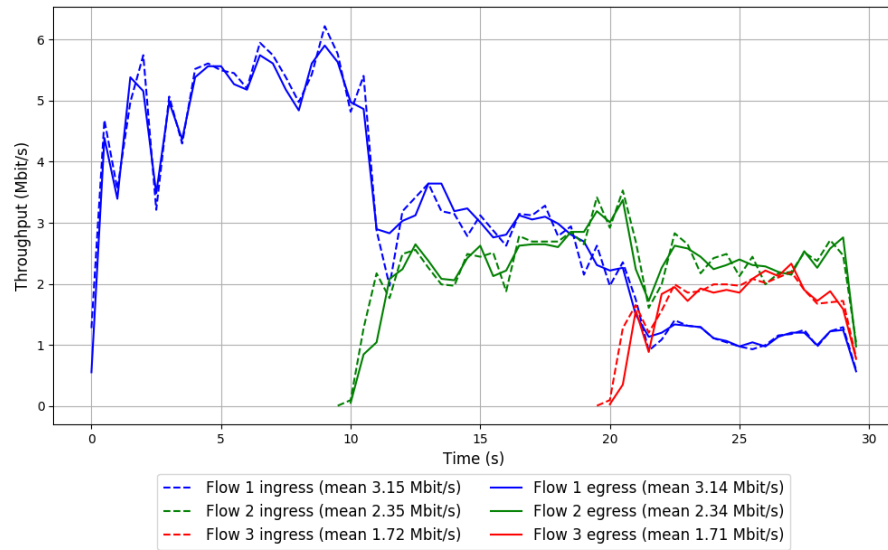


Run 3: Statistics of QUIC Cubic

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

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

Run 3: Report of QUIC Cubic — Data Link

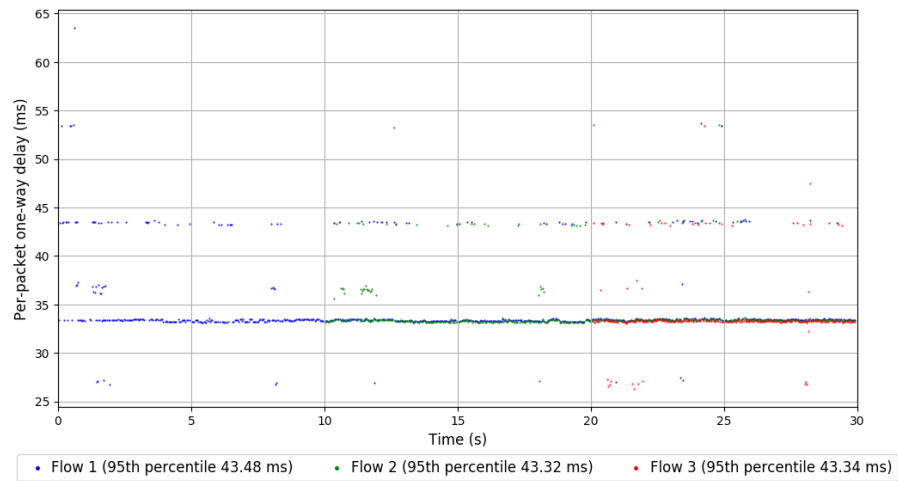
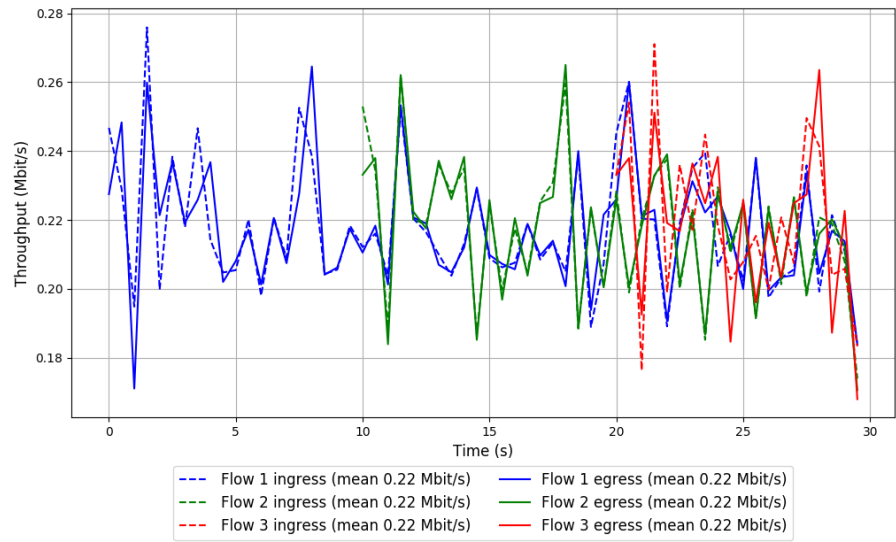


```
Run 1: Statistics of SReAM

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

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

Run 1: Report of SReAM — Data Link

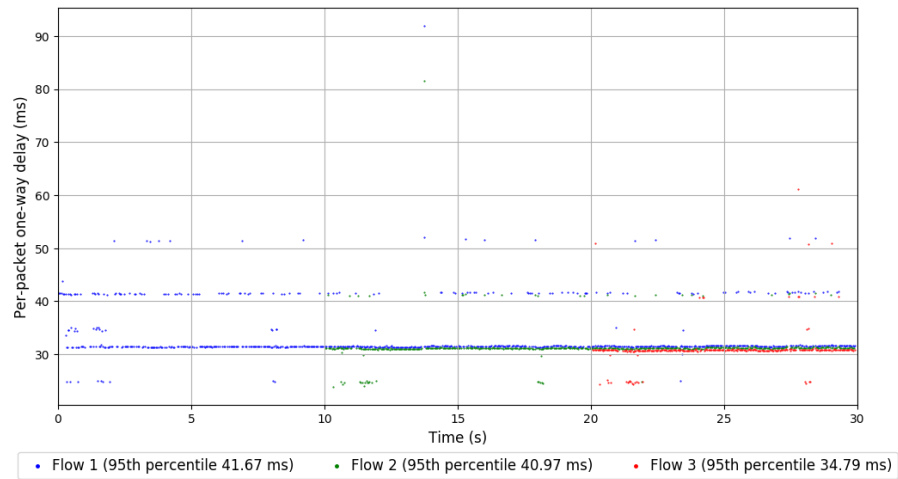
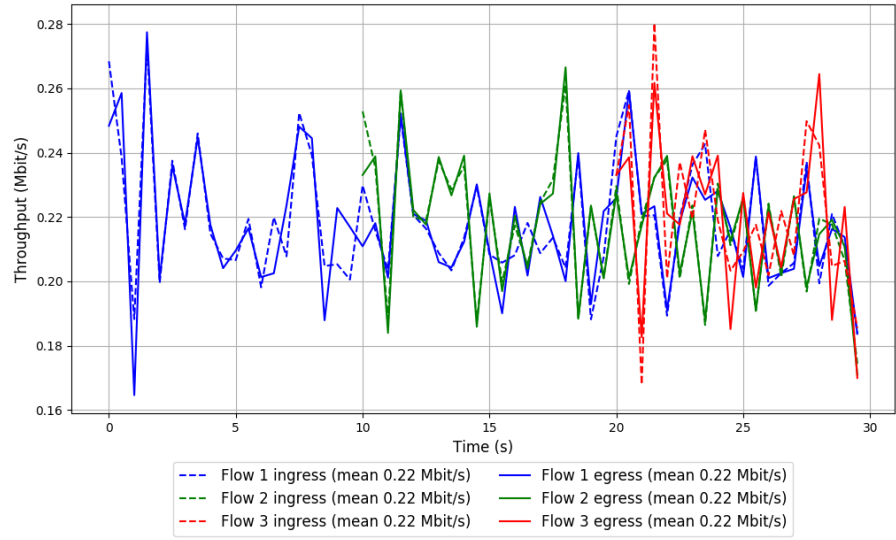


Run 2: Statistics of SReAM

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

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

Run 2: Report of SReAM — Data Link

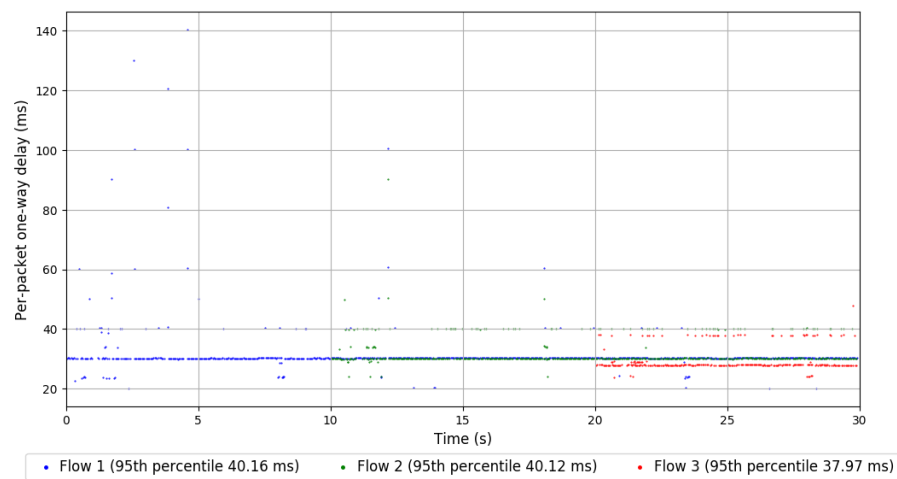
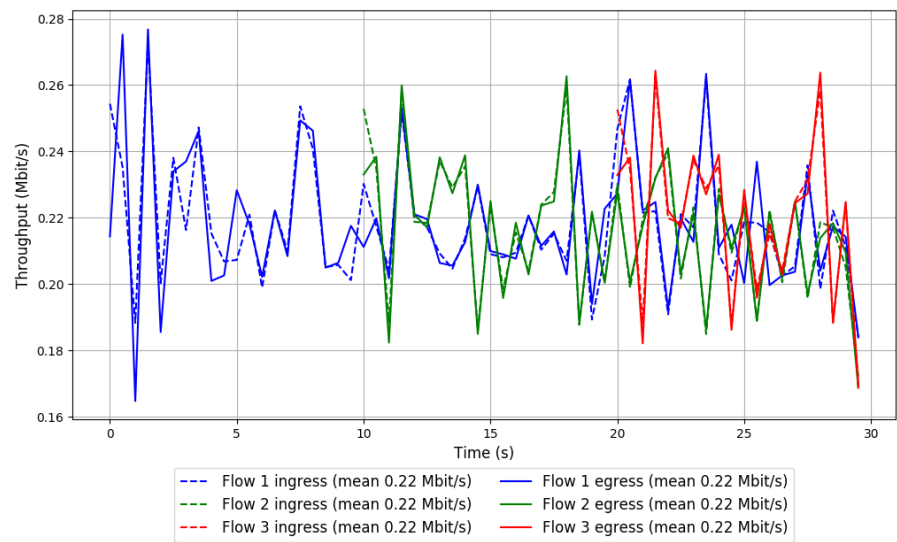


Run 3: Statistics of SReAM

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

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

Run 3: Report of SReAM — Data Link

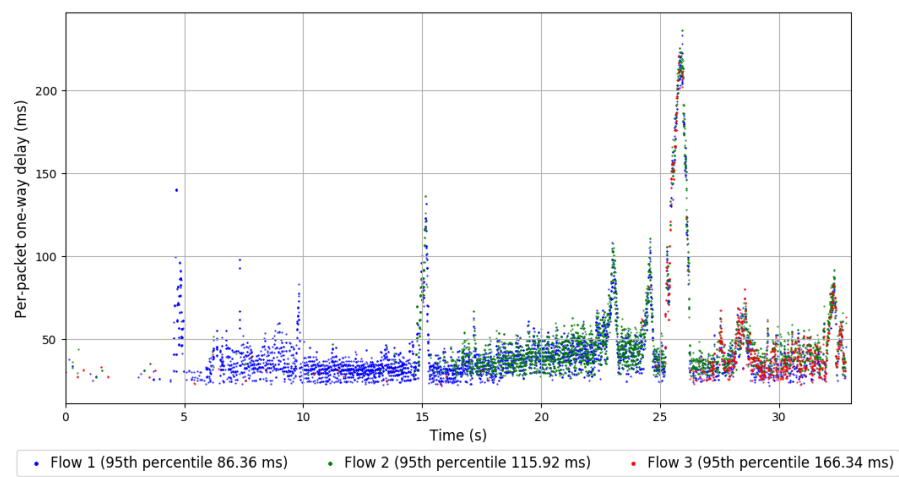
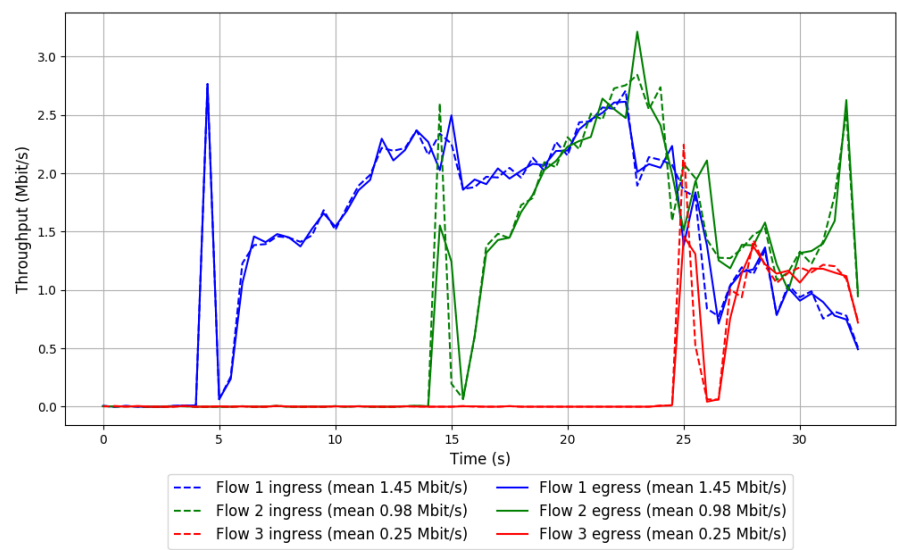


Run 1: Statistics of WebRTC media

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

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

Run 1: Report of WebRTC media — Data Link

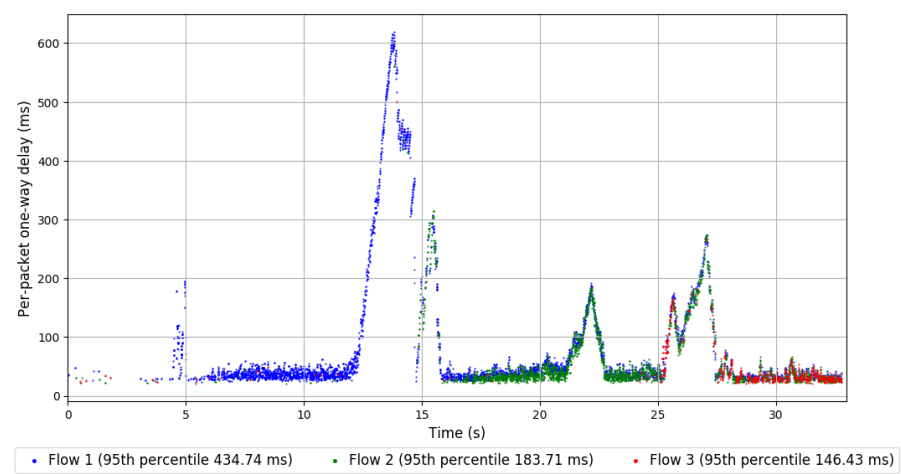
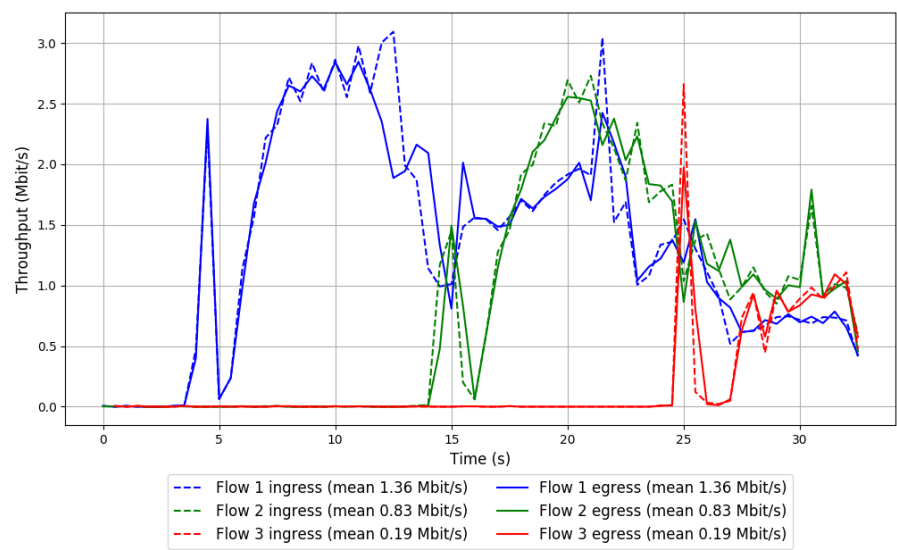


Run 2: Statistics of WebRTC media

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

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

Run 2: Report of WebRTC media — Data Link

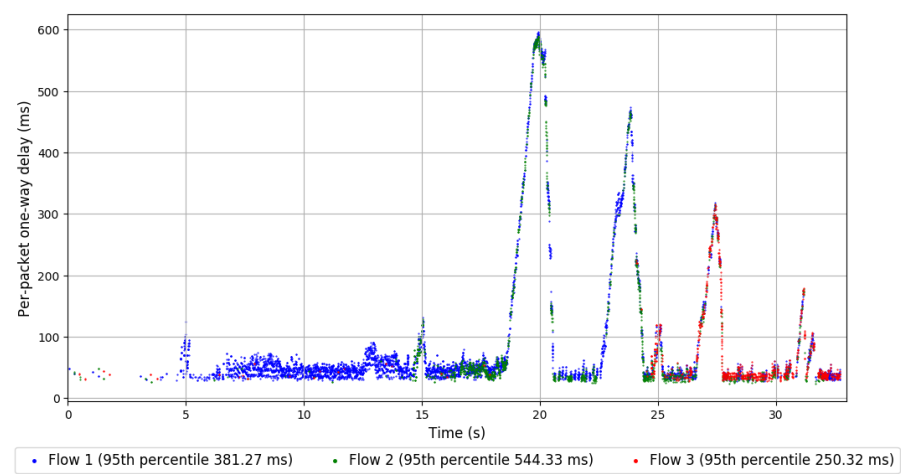
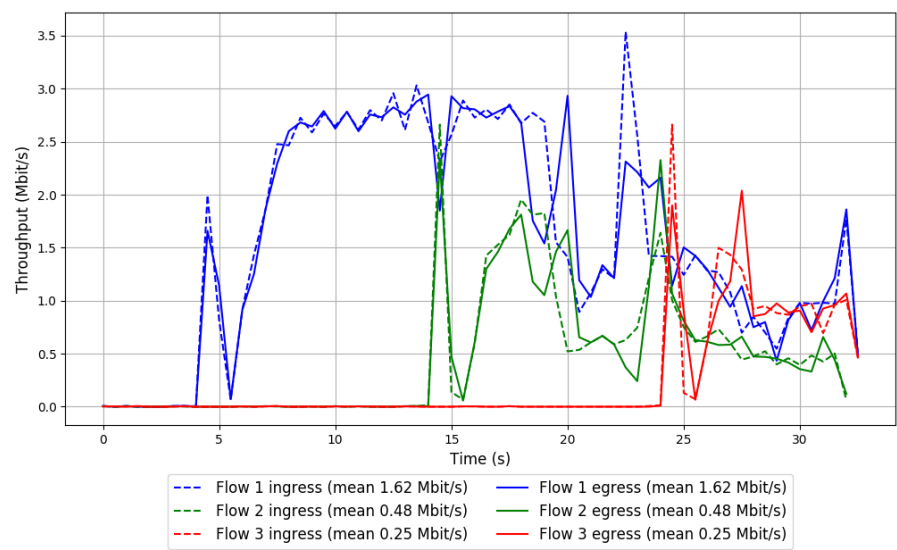


Run 3: Statistics of WebRTC media

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

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

Run 3: Report of WebRTC media — Data Link

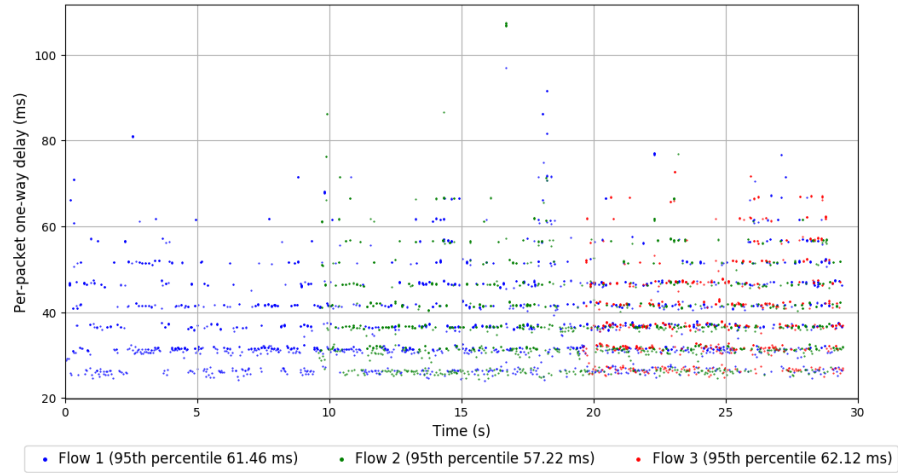
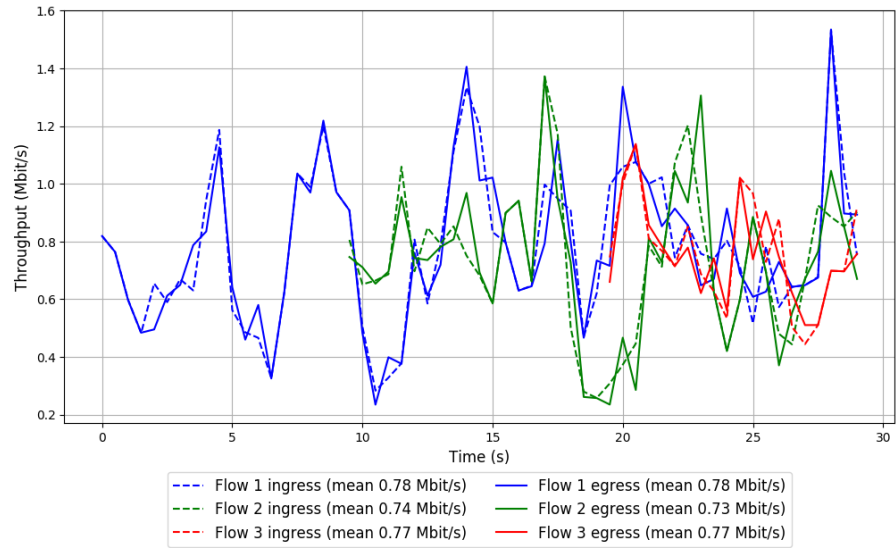


Run 1: Statistics of Sprout

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

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

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

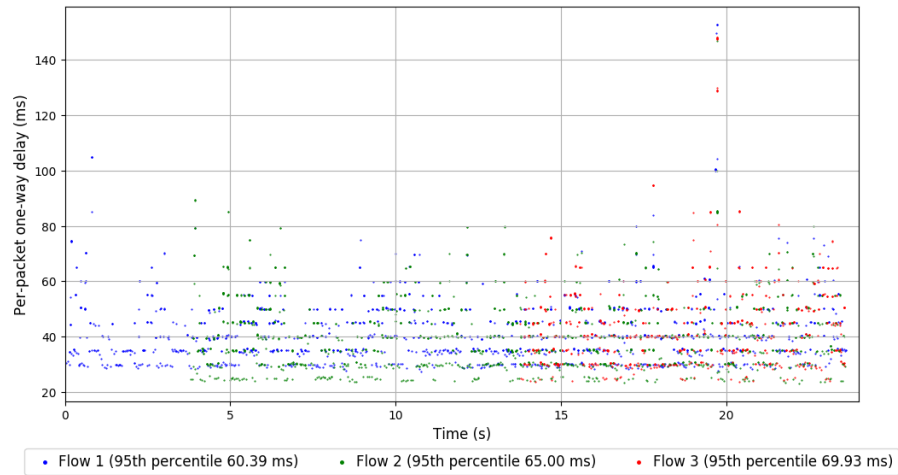
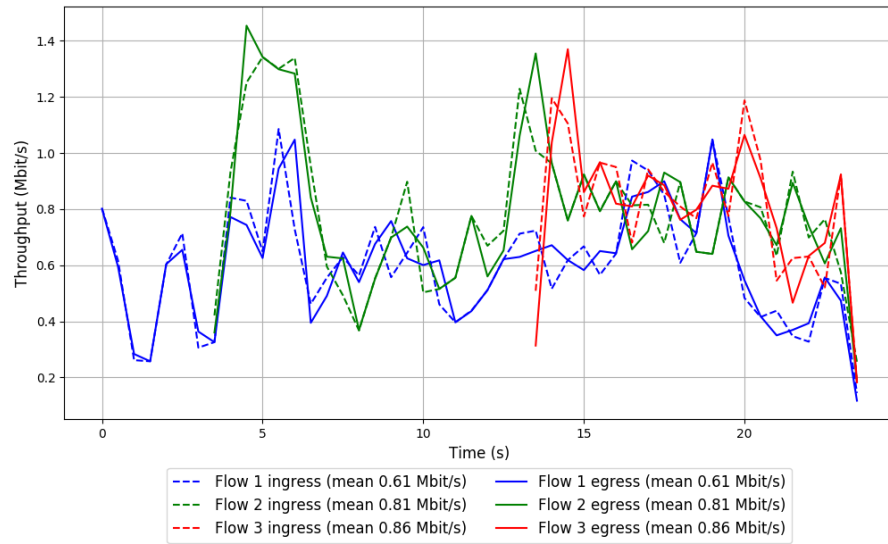
Start at: 2018-01-02 21:41:11

End at: 2018-01-02 21:41:41

Local clock offset: 0.174 ms

Remote clock offset: -14.597 ms

Run 2: Report of Sprout — Data Link

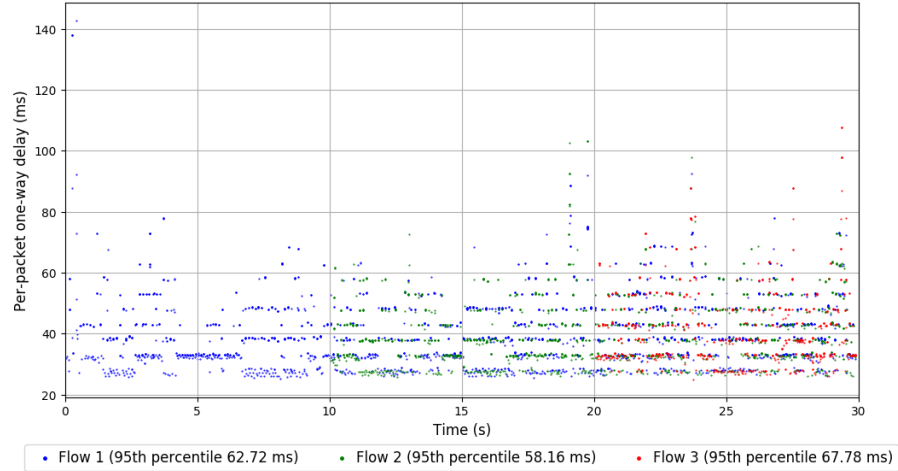
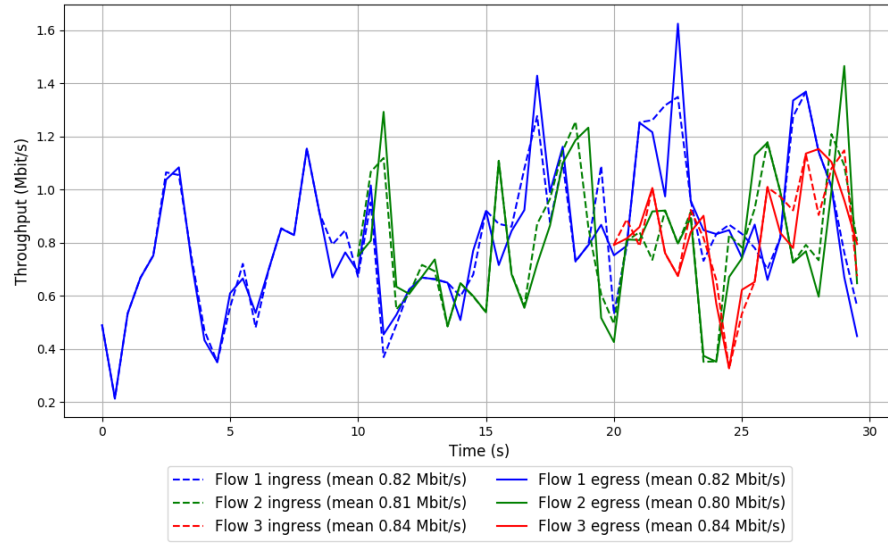


Run 3: Statistics of Sprout

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

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

Run 3: Report of Sprout — Data Link

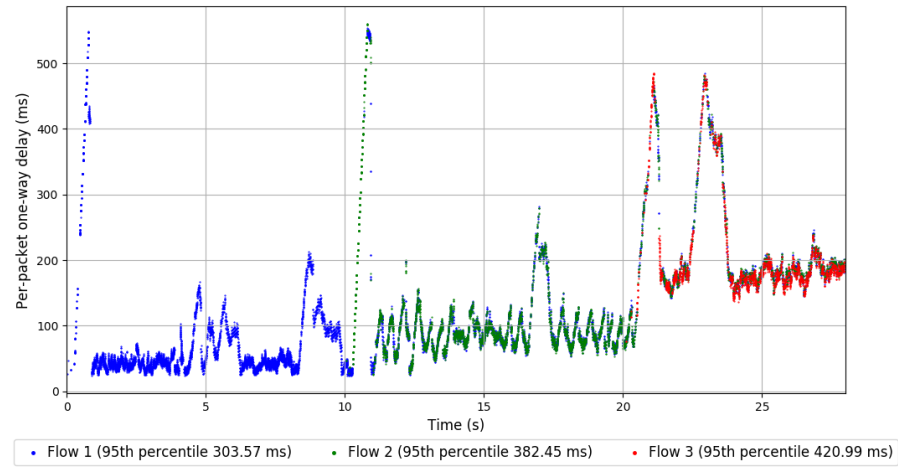
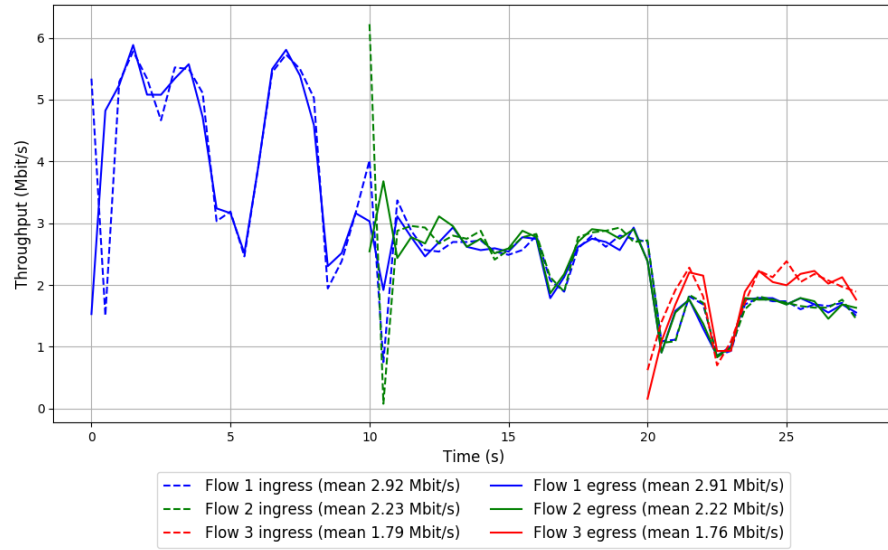


Run 1: Statistics of TaoVA-100x

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

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

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

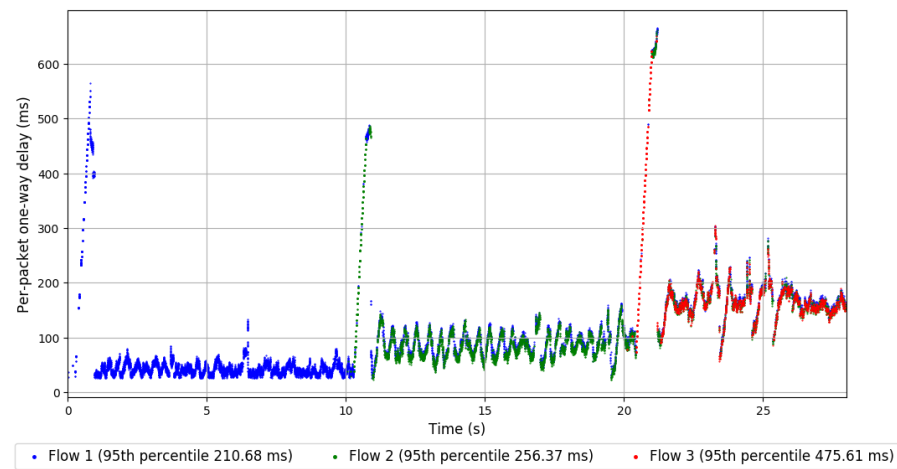
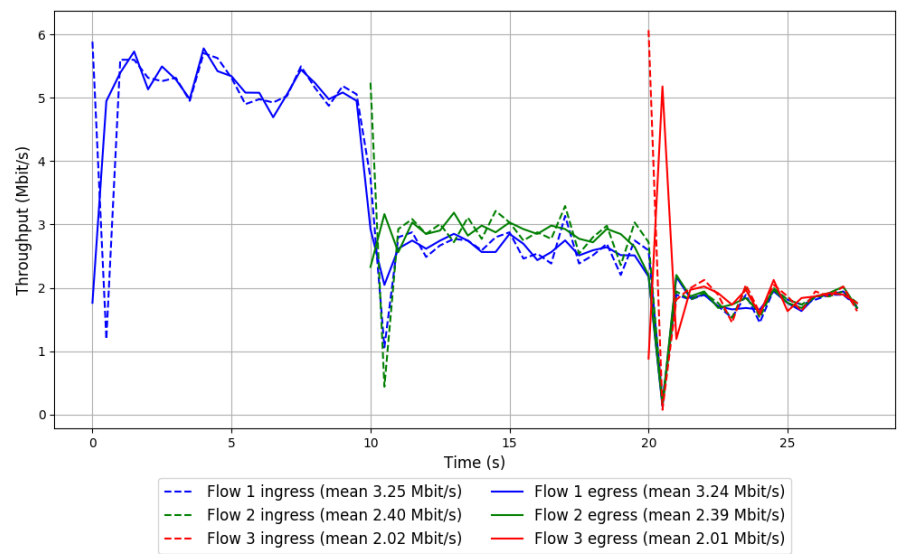


Run 2: Statistics of TaoVA-100x

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

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

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

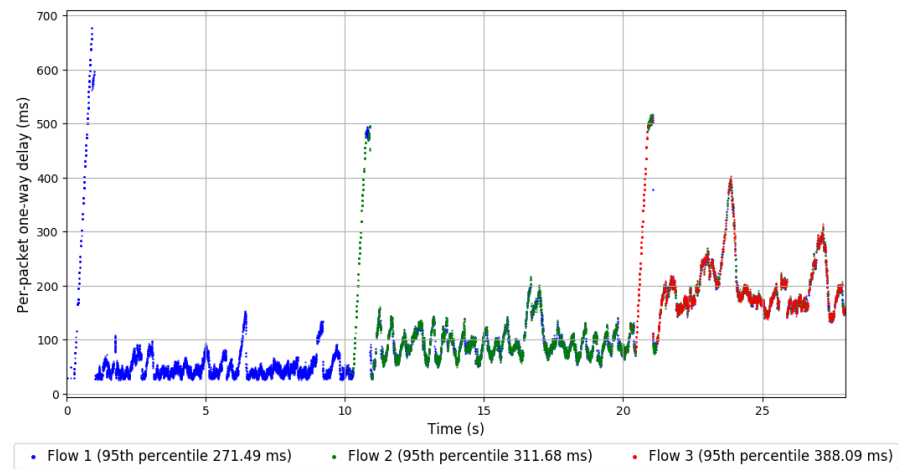
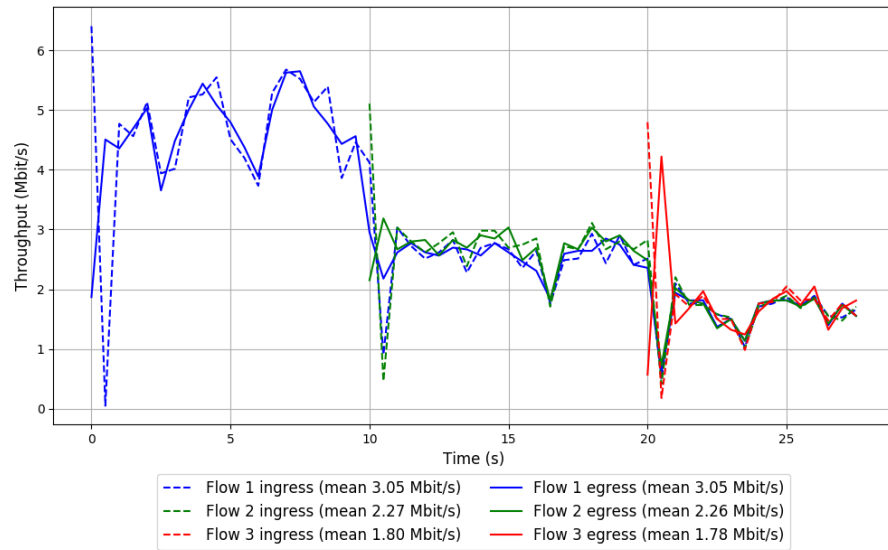


Run 3: Statistics of TaoVA-100x

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

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

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

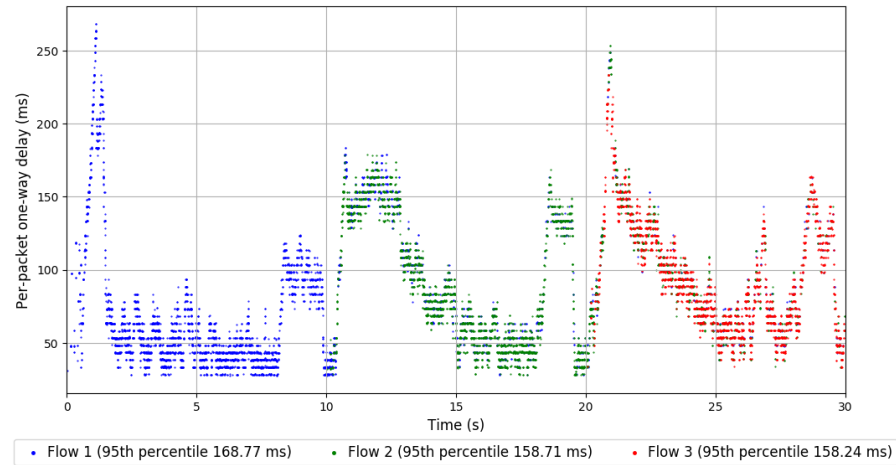
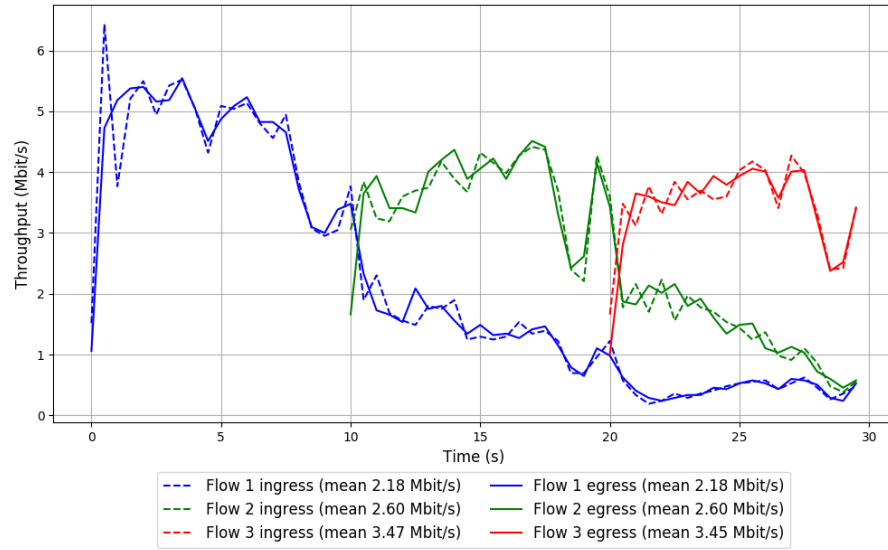


Run 1: Statistics of TCP Vegas

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

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

Run 1: Report of TCP Vegas — Data Link

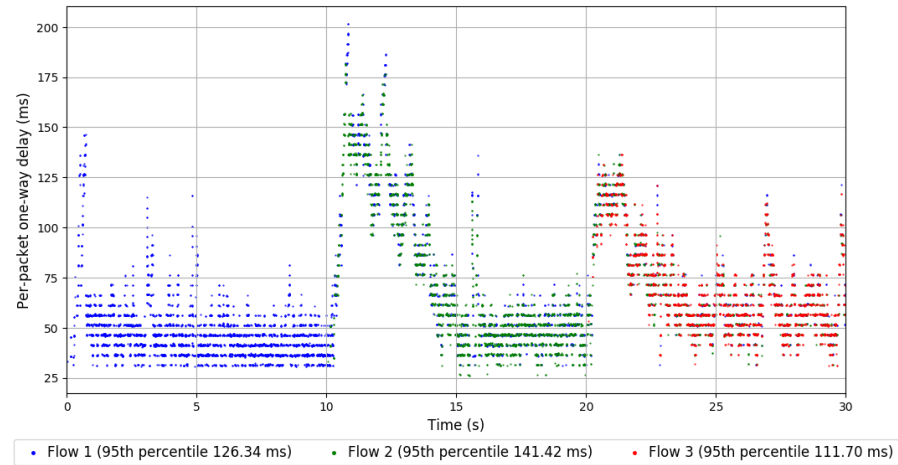
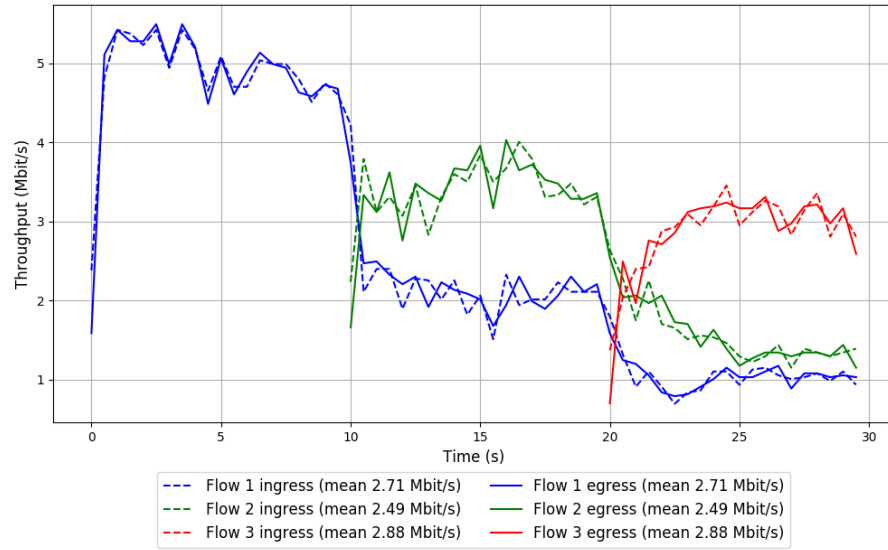


Run 2: Statistics of TCP Vegas

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

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

Run 2: Report of TCP Vegas — Data Link

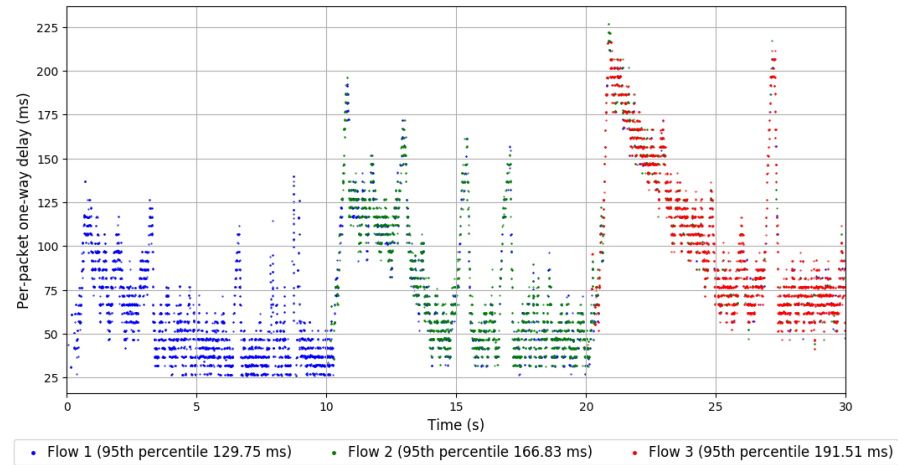
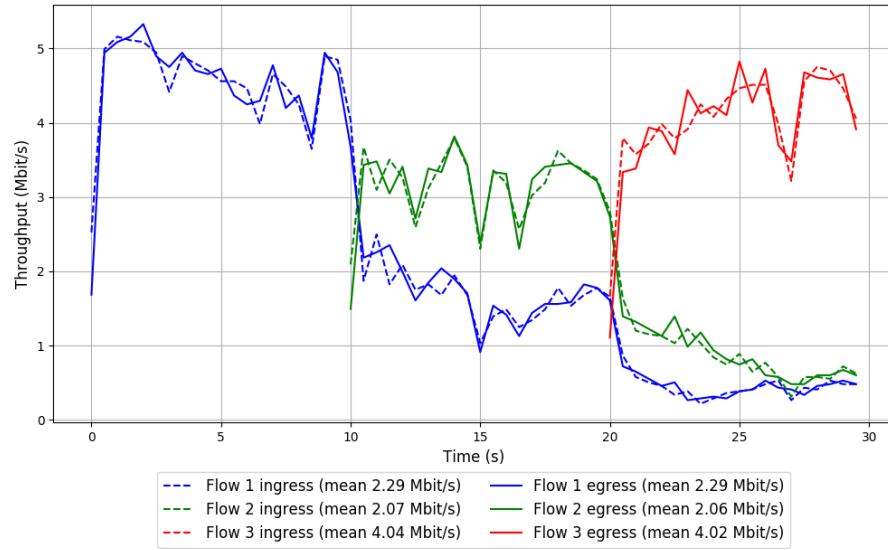


Run 3: Statistics of TCP Vegas

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

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

Run 3: Report of TCP Vegas — Data Link

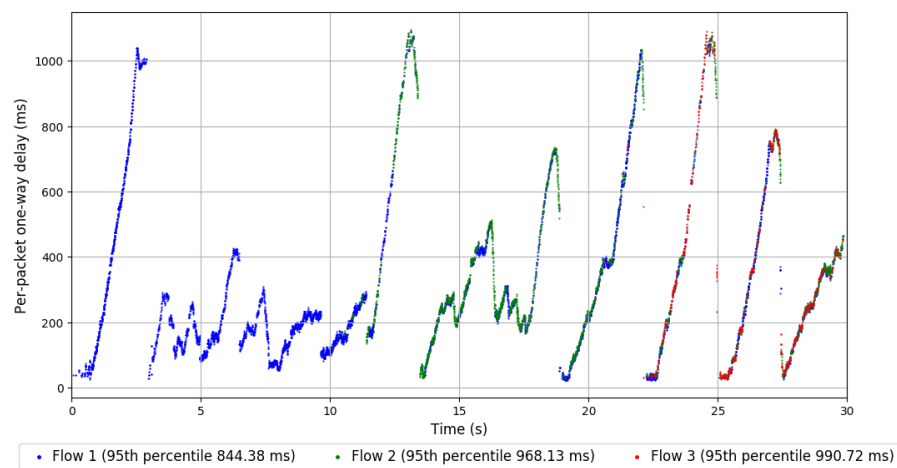
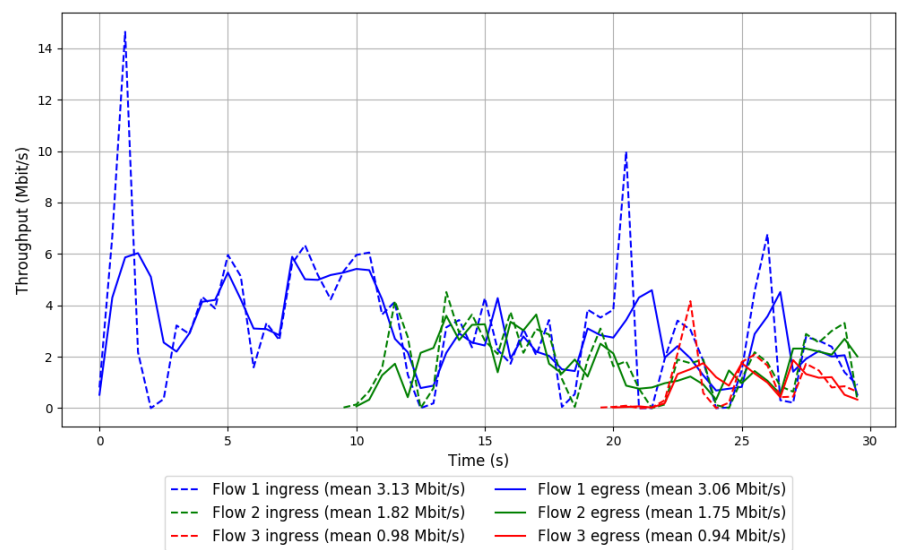


Run 1: Statistics of Verus

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

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

Run 1: Report of Verus — Data Link

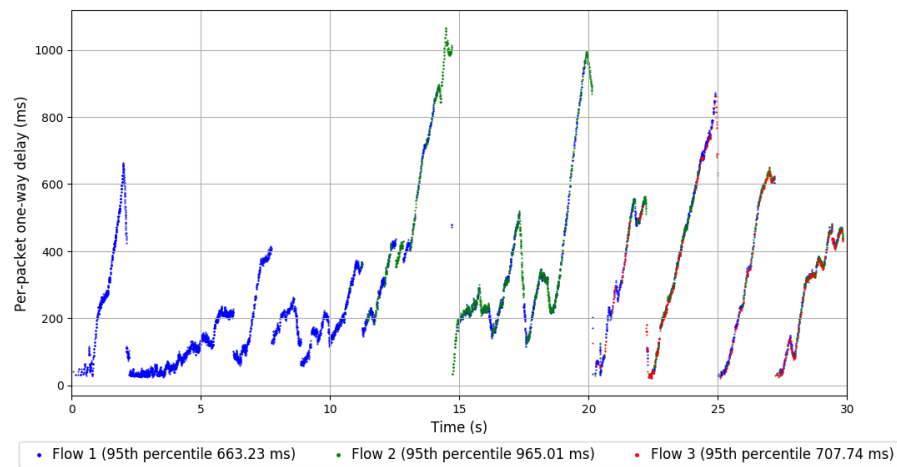
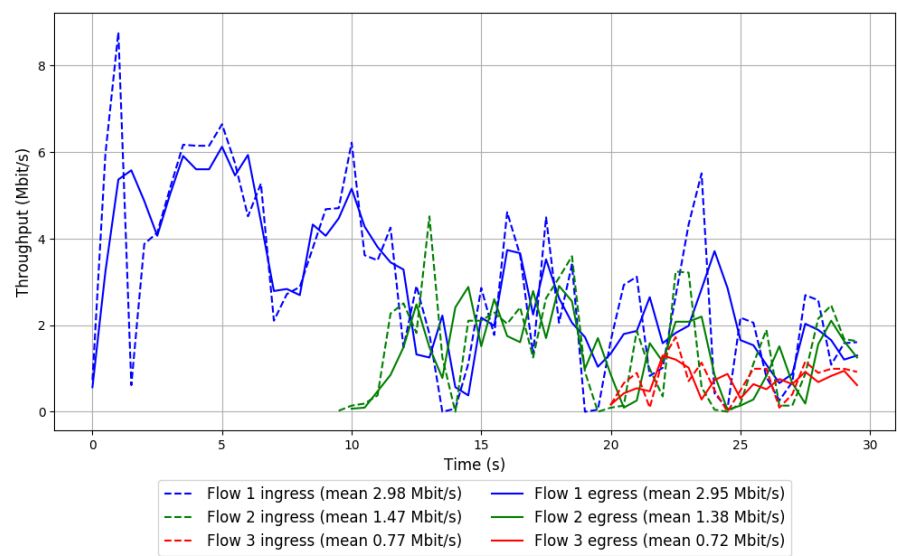


Run 2: Statistics of Verus

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

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

Run 2: Report of Verus — Data Link

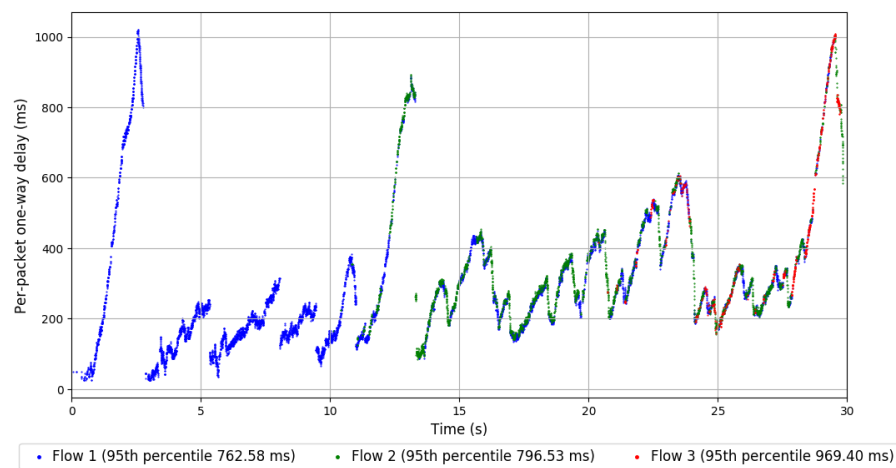
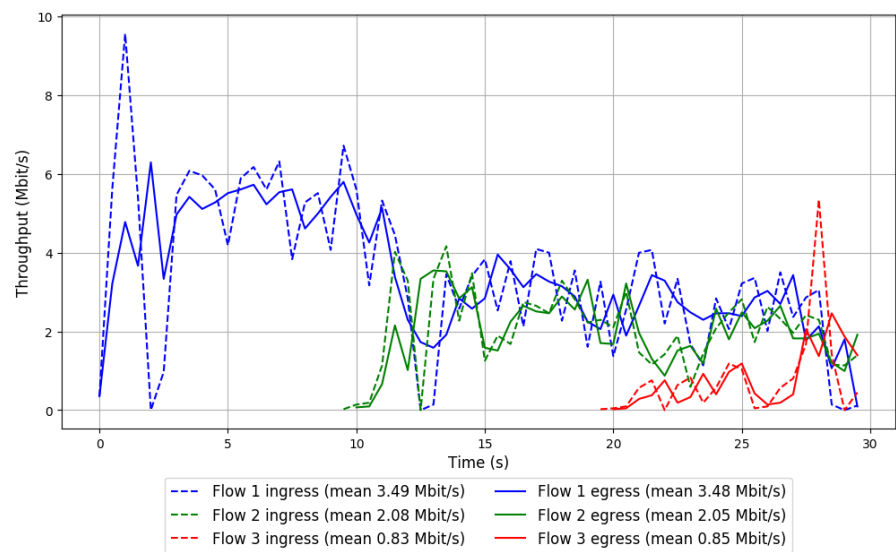


Run 3: Statistics of Verus

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

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

Run 3: Report of Verus — Data Link

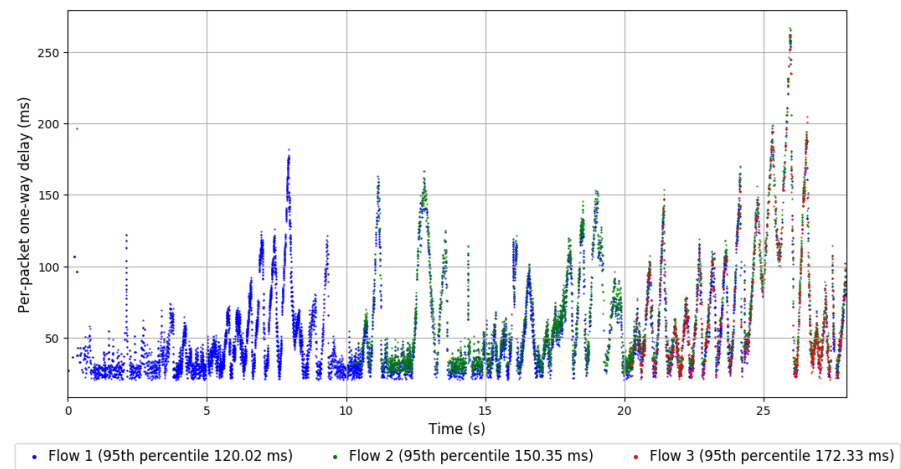
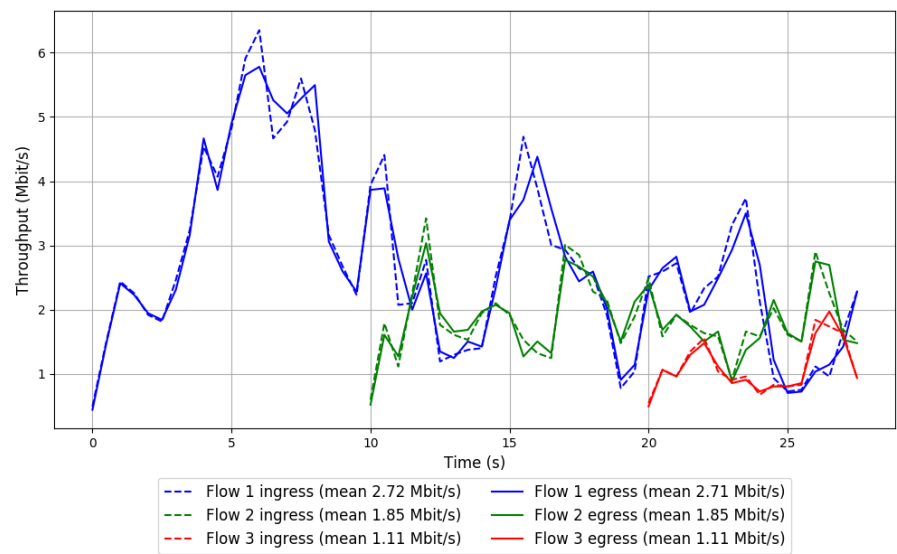


Run 1: Statistics of Copa

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

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

Run 1: Report of Copa — Data Link

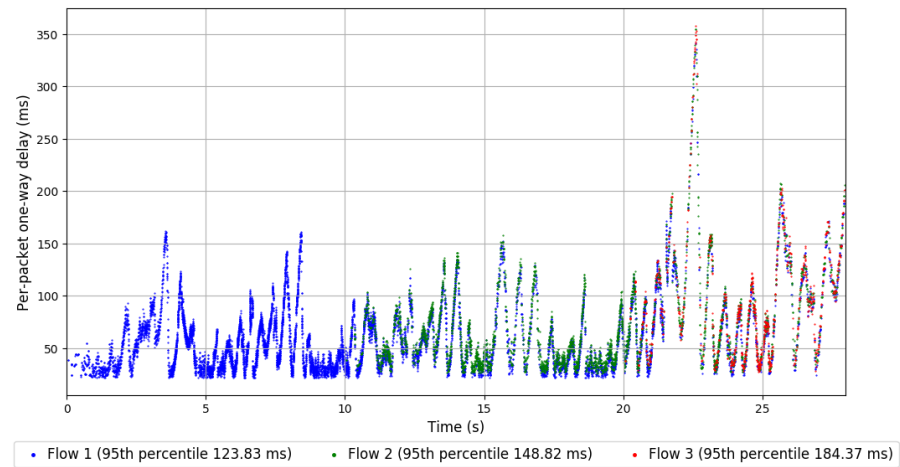
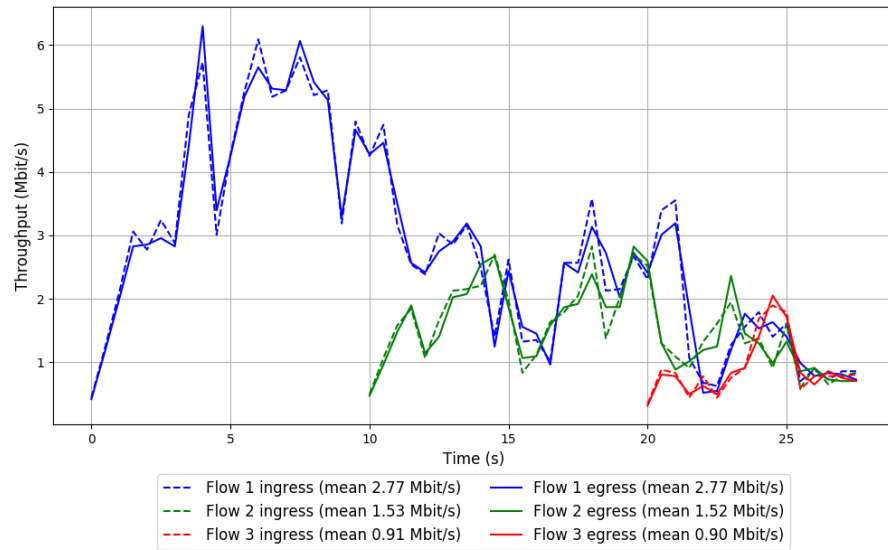


Run 2: Statistics of Copa

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

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

Run 2: Report of Copa — Data Link

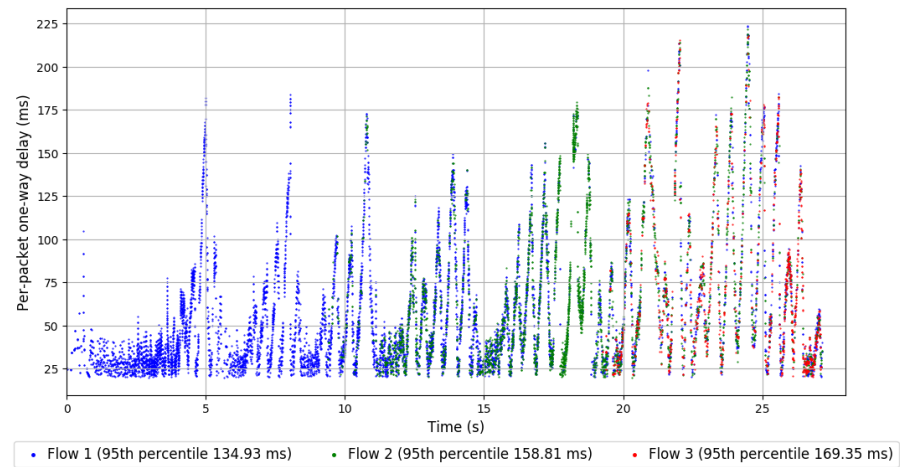
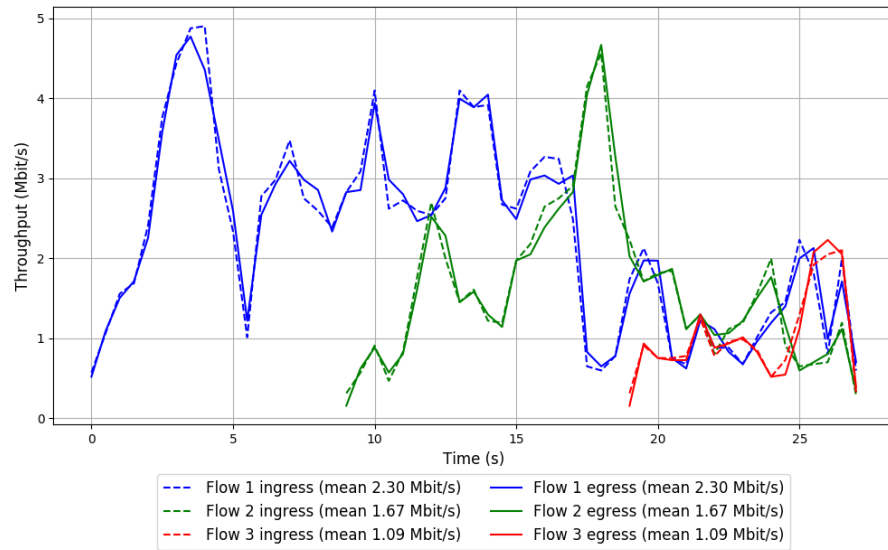


Run 3: Statistics of Copa

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

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

Run 3: Report of Copa — Data Link

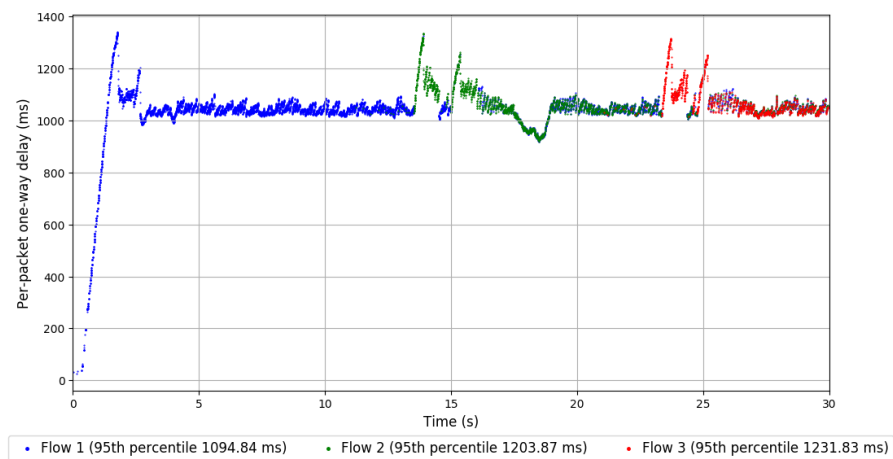
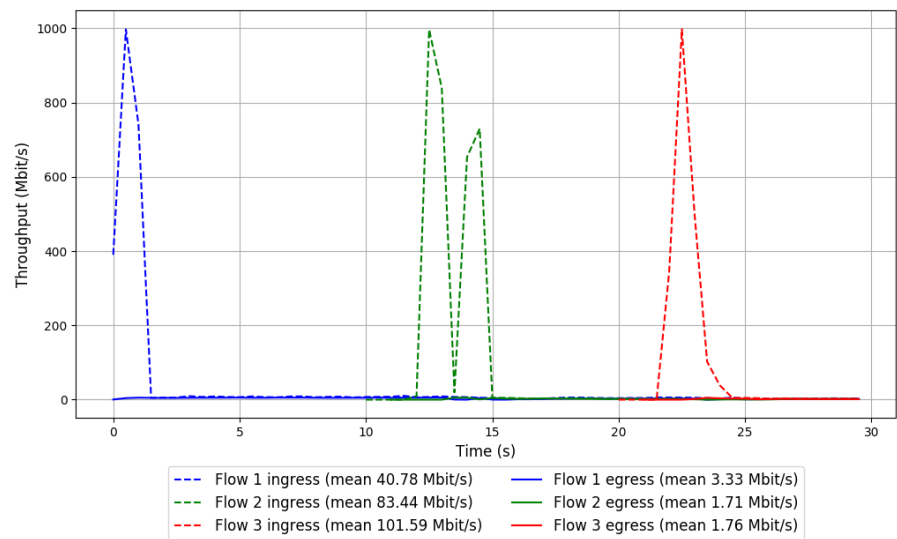


Run 1: Statistics of FillP

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

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

Run 1: Report of FillP — Data Link

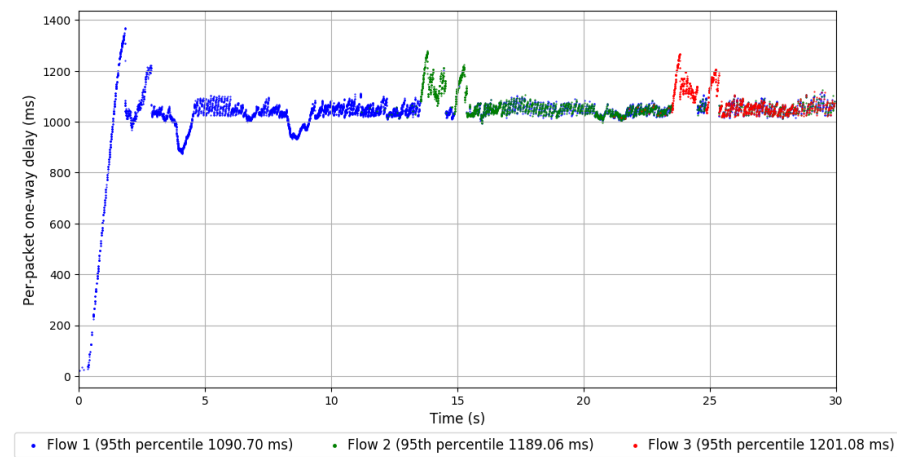
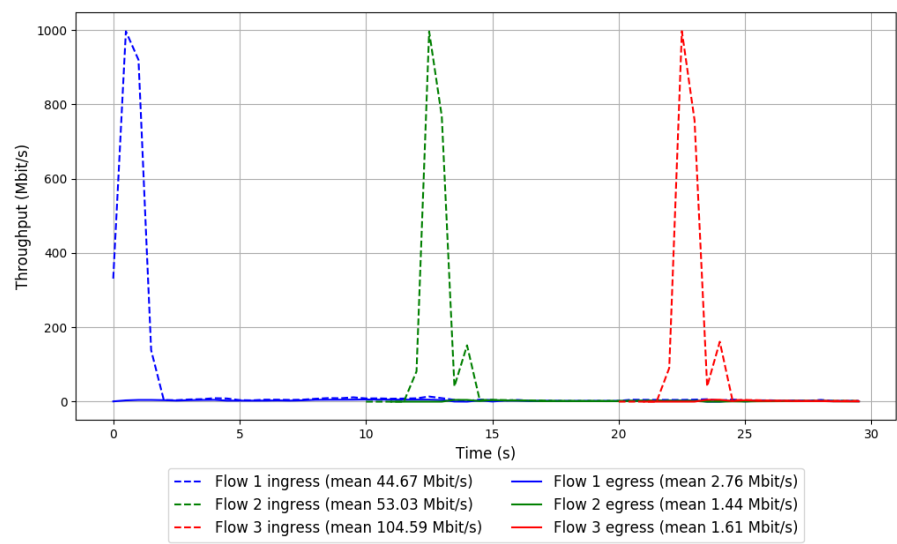


Run 2: Statistics of FillP

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

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

Run 2: Report of FillP — Data Link

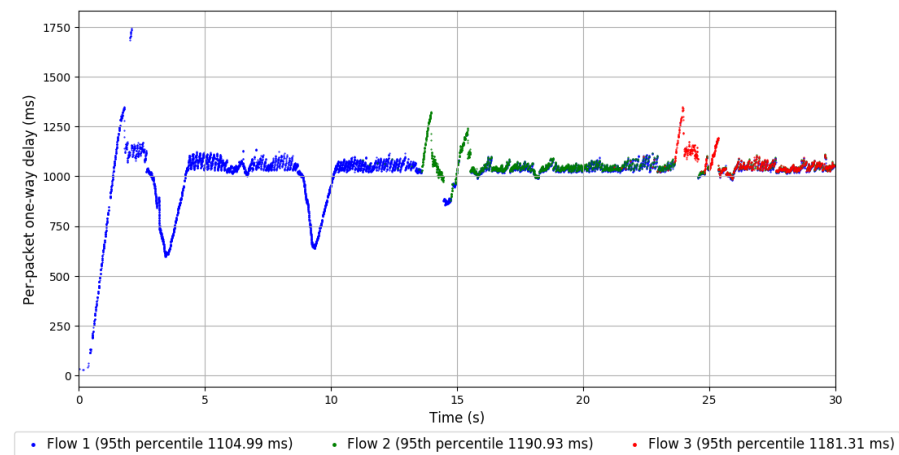
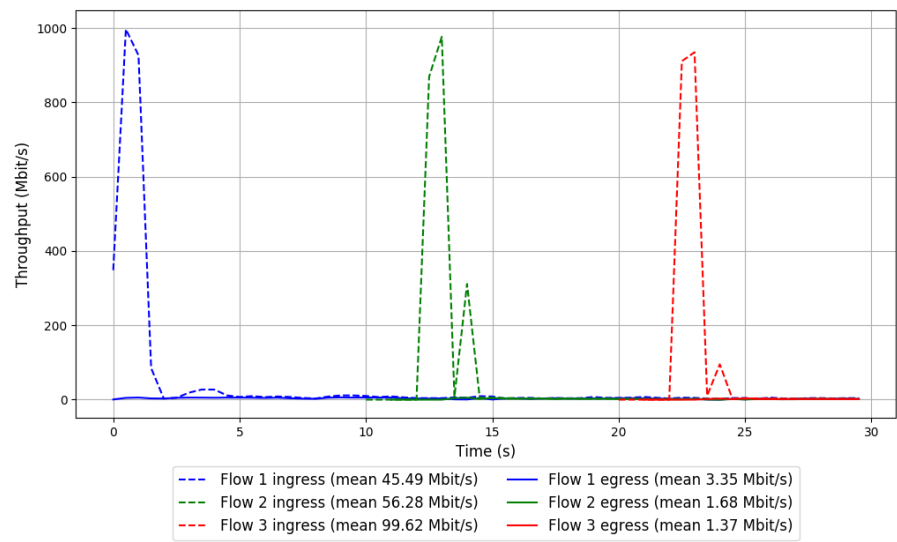


Run 3: Statistics of FillP

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

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

Run 3: Report of FillP — Data Link



Run 1: Statistics of Indigo

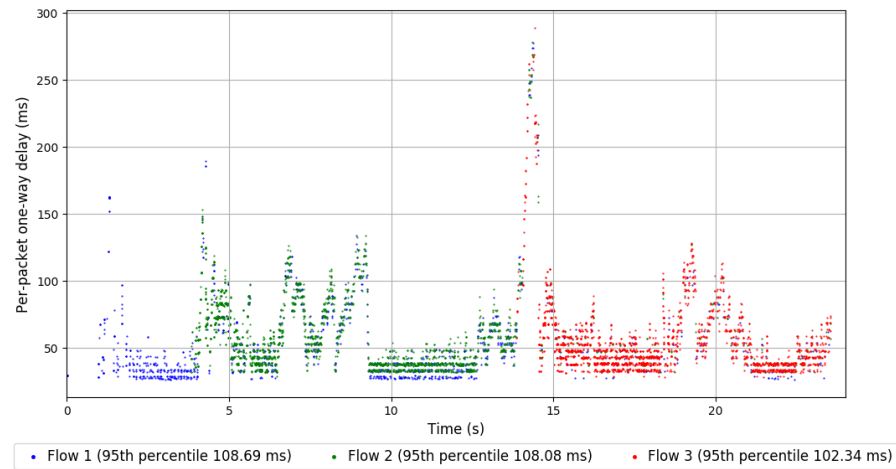
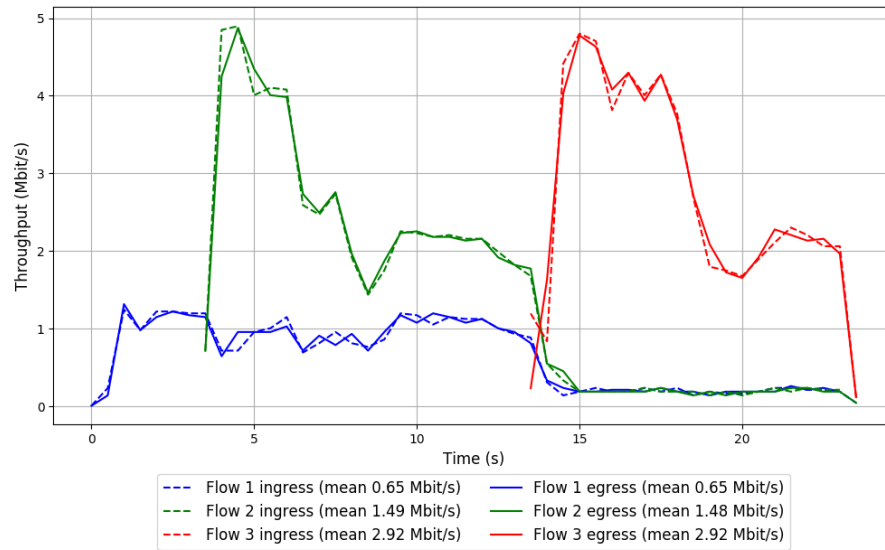
Start at: 2018-01-02 21:21:16

End at: 2018-01-02 21:21:46

Local clock offset: 1.393 ms

Remote clock offset: -13.918 ms

Run 1: Report of Indigo — Data Link

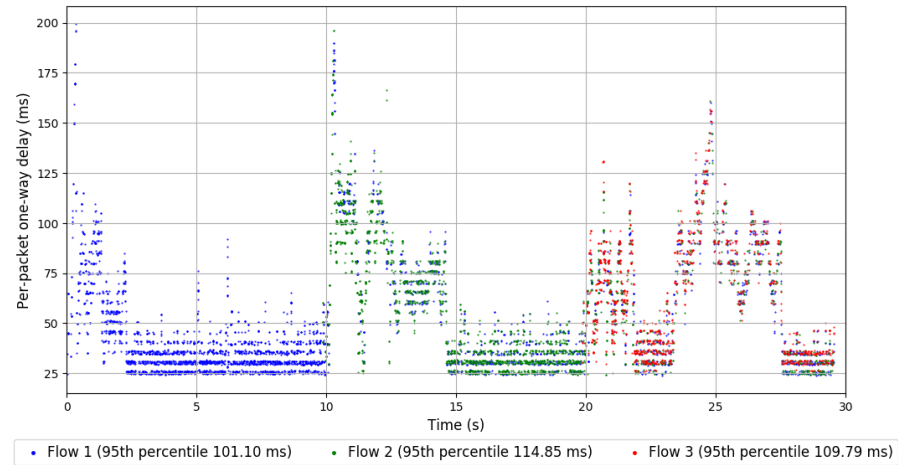
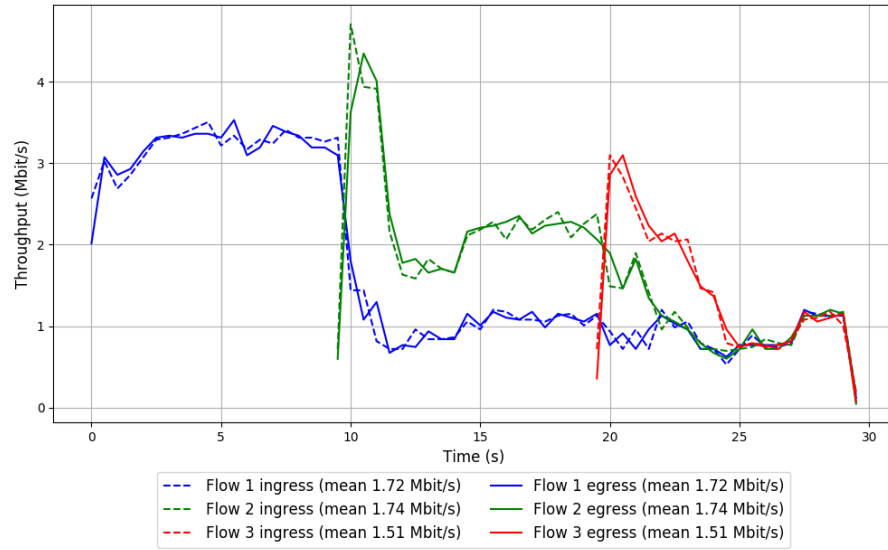


Run 2: Statistics of Indigo

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

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

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

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

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

Run 3: Report of Indigo — Data Link

