

Pantheon Report

Generated at 2017-11-30 08:38:30 (UTC).

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

Repeated the test of 14 congestion control schemes 3 times.

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

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

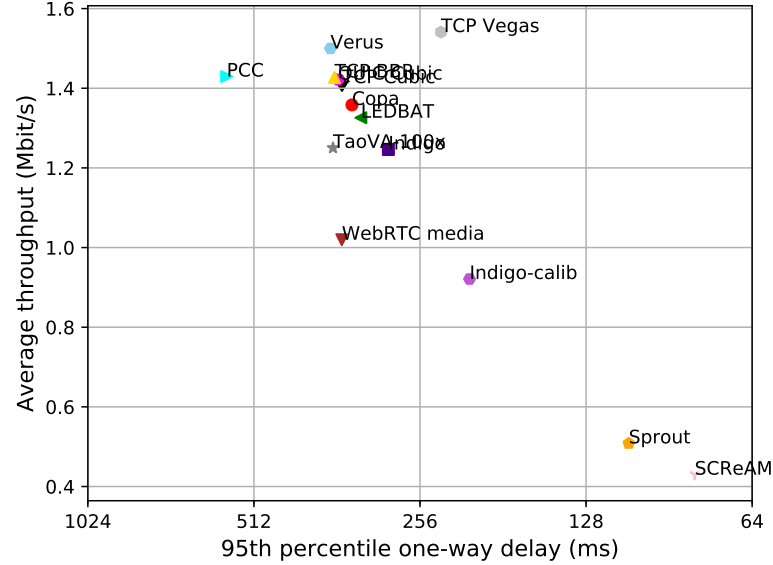
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

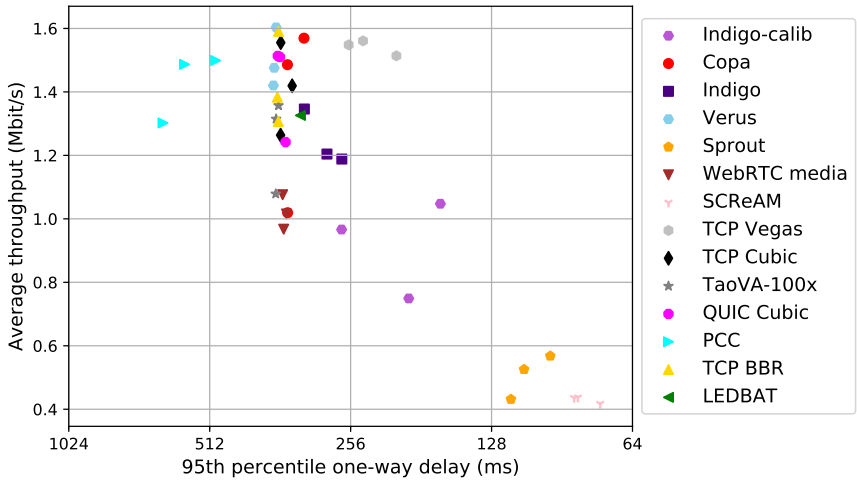
Git summary:

```
branch: indigos @ e3a57ad5ac5cfcaca0e3f983c8dd4cc3509e0262
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/genericCC @ b5b7c38e8391001927dc41c6cfa2627d03dde737
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-cellular @ aee99e8eb842cb053f8c9a80e28cd256a930bbc2
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/indigo-no-cwnd @ 3e58442c04028a11d7b02456e137604633ba2d6c
third_party/indigo-no-delivery-rate @ 57caa40858b964906edff4876d5a7e5bfff666c5
third_party/indigo-no-queuing-delay @ 03455460fd1a8ffbdad86fabb936fdca204b80db
third_party/indigo-no-send-rate @ b39dfa6b2c5f19cb7cd89626cb4f5bb81f9fecda
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



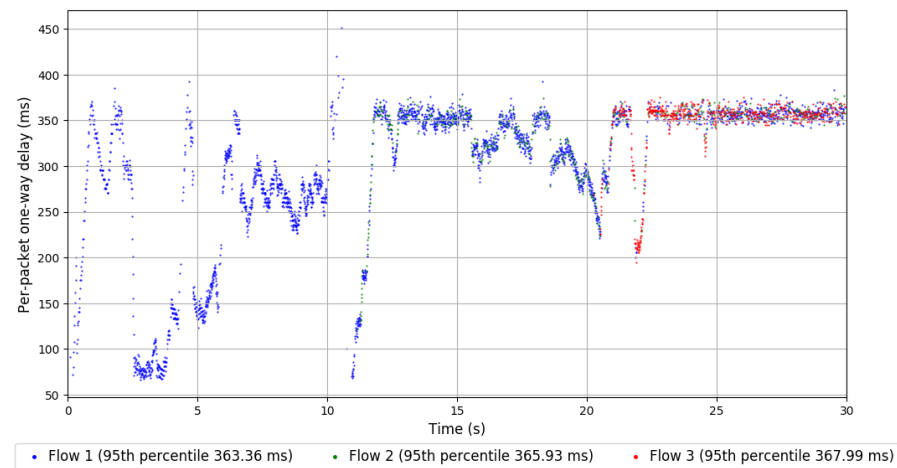
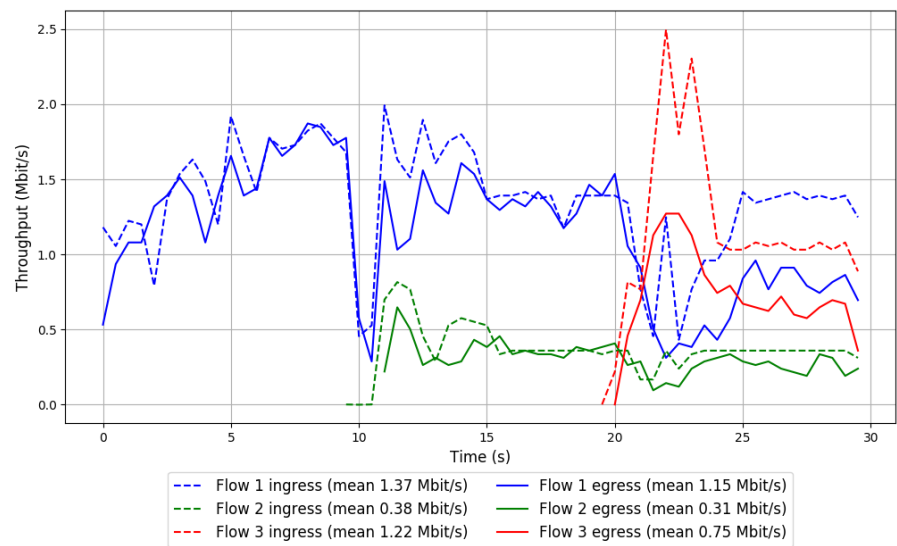
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	0.89	0.47	0.70	362.82	367.08	367.35	10.75	16.35	32.64
TCP Cubic	3	1.02	0.42	0.37	353.14	355.10	356.23	2.53	7.05	9.63
LEDBAT	1	0.55	0.97	0.42	253.24	332.54	343.96	0.50	0.72	3.38
PCC	3	0.86	0.62	0.50	369.36	694.16	755.39	66.42	89.95	93.82
QUIC Cubic	3	0.85	0.63	0.50	359.87	360.84	363.35	8.50	11.19	18.77
SCReAM	3	0.22	0.22	0.22	80.88	82.39	81.09	0.16	0.41	0.48
WebRTC media	3	0.54	0.34	0.15	350.08	355.47	350.61	3.24	6.79	9.10
Sprout	3	0.25	0.26	0.26	106.36	106.74	107.54	0.68	0.60	1.96
TaoVA-100x	3	0.98	0.31	0.35	364.30	376.04	398.80	20.40	65.03	69.87
TCP Vegas	3	0.76	0.68	0.98	218.84	235.97	254.19	0.50	0.73	2.36
Verus	3	1.38	0.15	0.08	371.71	375.05	372.50	24.96	62.18	59.91
Copa	3	0.85	0.60	0.47	323.17	344.71	353.97	1.72	2.70	6.45
Indigo	3	0.44	0.73	0.98	249.89	232.31	326.79	2.19	2.09	4.59
Indigo-calib	3	0.40	0.48	0.63	176.76	221.96	196.87	6.48	10.27	9.60

Run 1: Statistics of TCP BBR

Start at: 2017-11-30 07:05:06
End at: 2017-11-30 07:05:36
Local clock offset: -14.034 ms
Remote clock offset: -13.322 ms

Below is generated by plot.py at 2017-11-30 08:37:59
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 364.973 ms
Loss rate: 21.52%
-- Flow 1:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 363.359 ms
Loss rate: 15.86%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 365.926 ms
Loss rate: 22.52%
-- Flow 3:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 367.986 ms
Loss rate: 39.95%

Run 1: Report of TCP BBR — Data Link

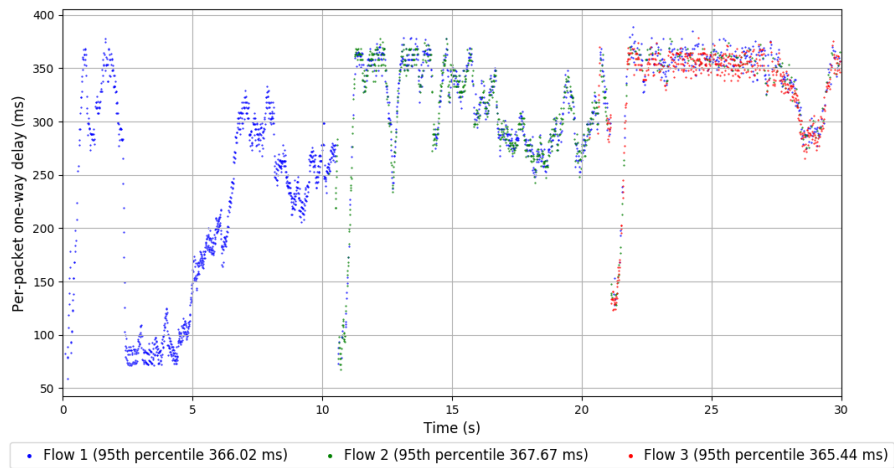
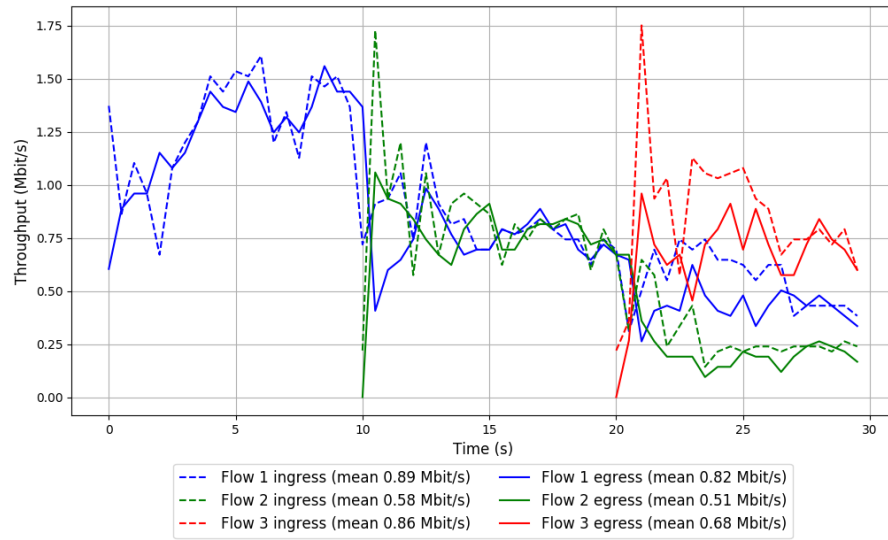


Run 2: Statistics of TCP BBR

Start at: 2017-11-30 07:21:33
End at: 2017-11-30 07:22:03
Local clock offset: -15.989 ms
Remote clock offset: -14.392 ms

Below is generated by plot.py at 2017-11-30 08:37:59
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 367.028 ms
Loss rate: 11.58%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 366.024 ms
Loss rate: 7.58%
-- Flow 2:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 367.674 ms
Loss rate: 12.35%
-- Flow 3:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 365.438 ms
Loss rate: 22.99%

Run 2: Report of TCP BBR — Data Link

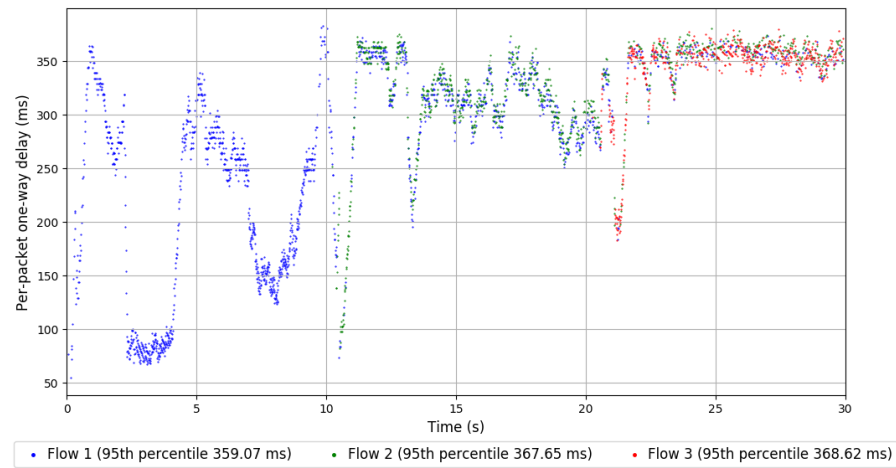
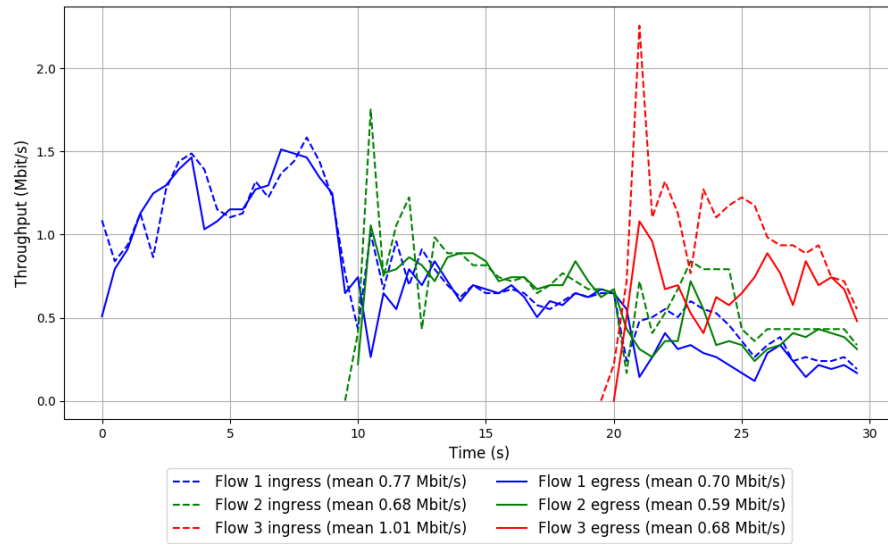


Run 3: Statistics of TCP BBR

Start at: 2017-11-30 07:37:37
End at: 2017-11-30 07:38:07
Local clock offset: -13.132 ms
Remote clock offset: -14.235 ms

Below is generated by plot.py at 2017-11-30 08:37:59
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 365.215 ms
Loss rate: 16.05%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 359.074 ms
Loss rate: 8.80%
-- Flow 2:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 367.651 ms
Loss rate: 14.18%
-- Flow 3:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 368.625 ms
Loss rate: 34.99%

Run 3: Report of TCP BBR — Data Link

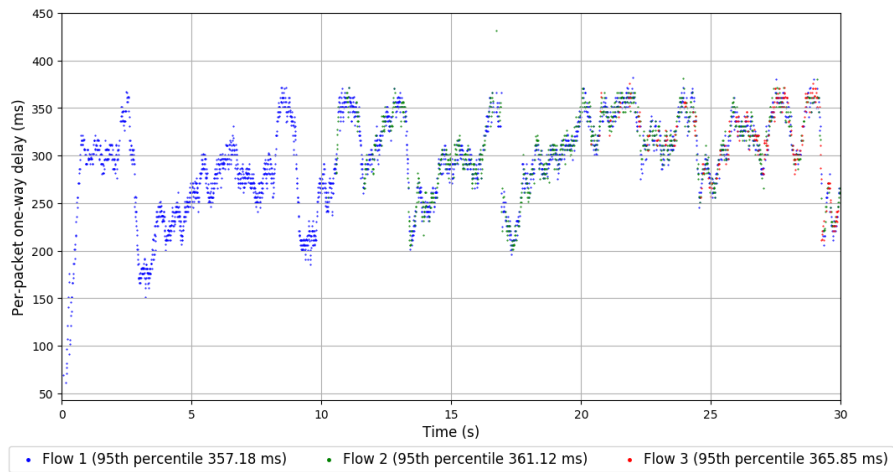
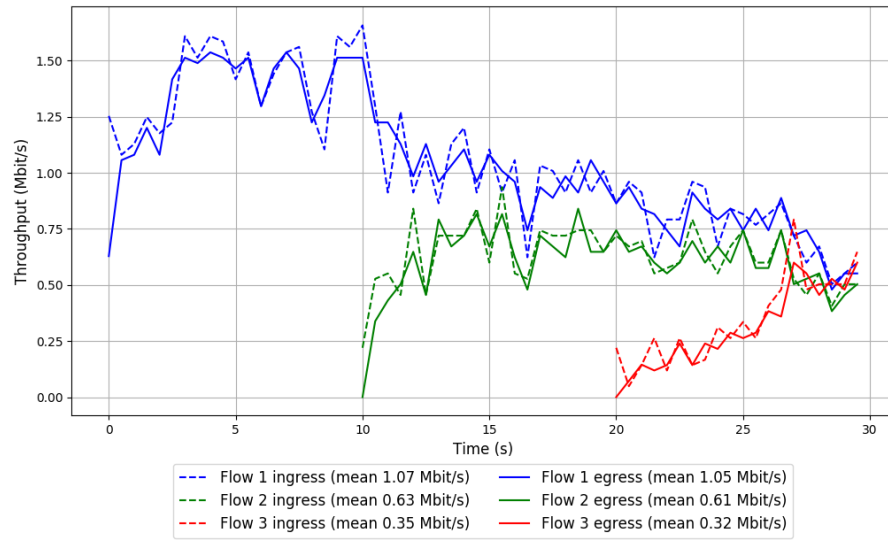


Run 1: Statistics of TCP Cubic

Start at: 2017-11-30 07:13:22
End at: 2017-11-30 07:13:52
Local clock offset: -14.001 ms
Remote clock offset: -15.891 ms

Below is generated by plot.py at 2017-11-30 08:37:59
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 360.958 ms
Loss rate: 2.98%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 357.181 ms
Loss rate: 1.69%
-- Flow 2:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 361.121 ms
Loss rate: 4.11%
-- Flow 3:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 365.845 ms
Loss rate: 10.86%

Run 1: Report of TCP Cubic — Data Link

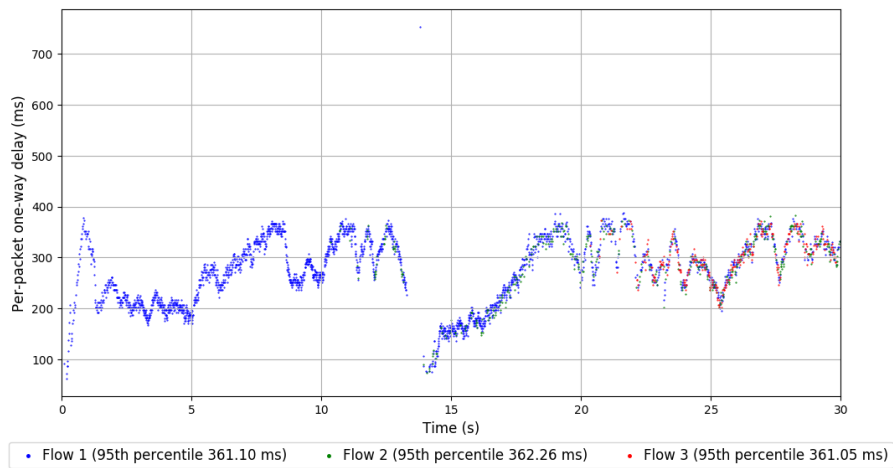
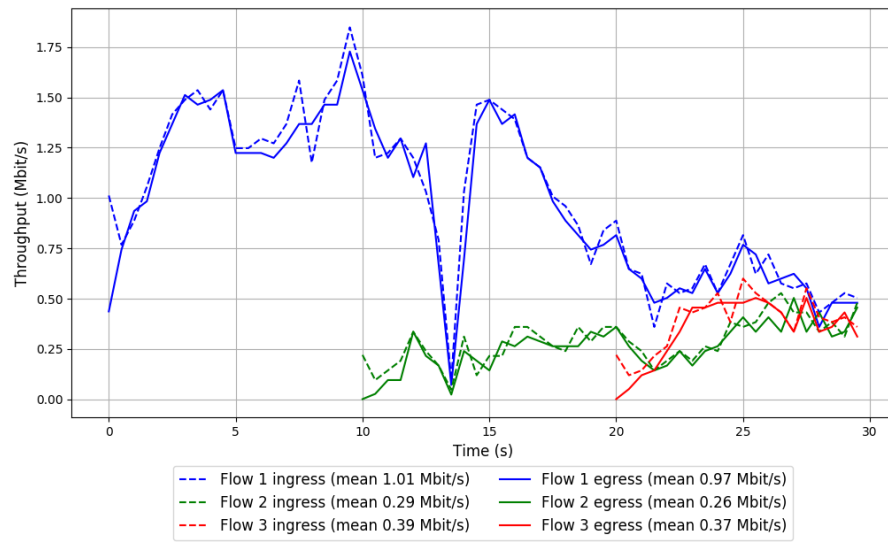


Run 2: Statistics of TCP Cubic

Start at: 2017-11-30 07:29:34
End at: 2017-11-30 07:30:04
Local clock offset: -12.415 ms
Remote clock offset: -14.322 ms

Below is generated by plot.py at 2017-11-30 08:37:59
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 361.267 ms
Loss rate: 5.10%
-- Flow 1:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 361.102 ms
Loss rate: 3.54%
-- Flow 2:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 362.256 ms
Loss rate: 10.00%
-- Flow 3:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 361.054 ms
Loss rate: 9.96%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2017-11-30 07:45:45

End at: 2017-11-30 07:46:15

Local clock offset: -12.17 ms

Remote clock offset: 1.607 ms

Below is generated by plot.py at 2017-11-30 08:37:59

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.42 Mbit/s

95th percentile per-packet one-way delay: 341.278 ms

Loss rate: 3.78%

-- Flow 1:

Average throughput: 1.03 Mbit/s

95th percentile per-packet one-way delay: 341.127 ms

Loss rate: 2.35%

-- Flow 2:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 341.913 ms

Loss rate: 7.04%

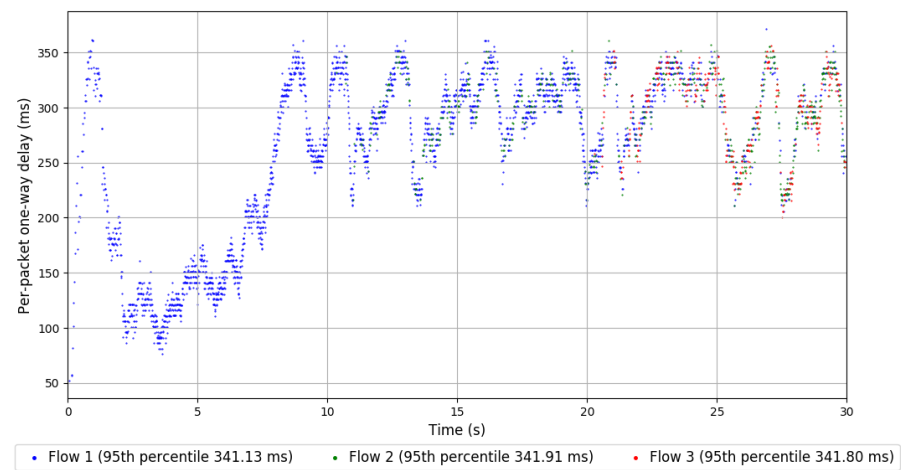
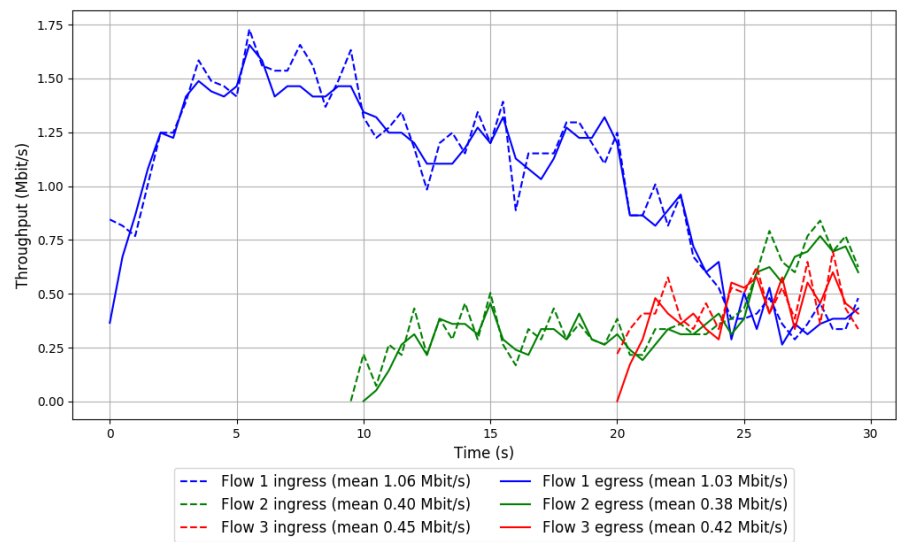
-- Flow 3:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 341.798 ms

Loss rate: 8.08%

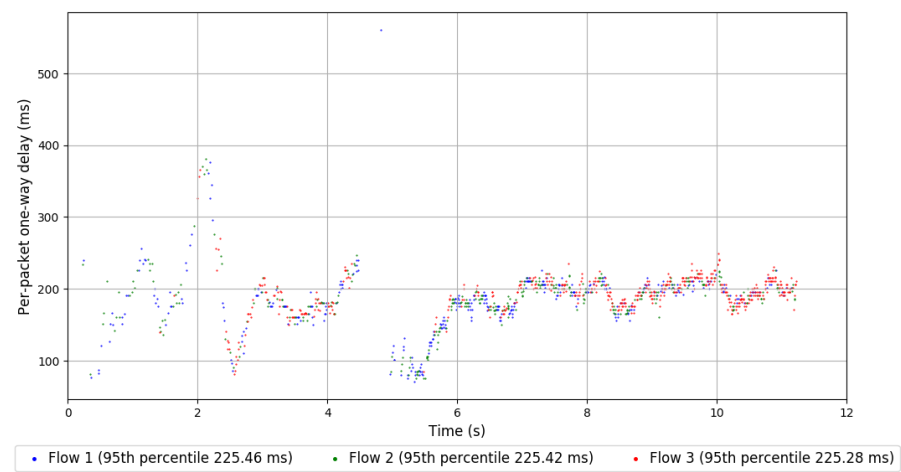
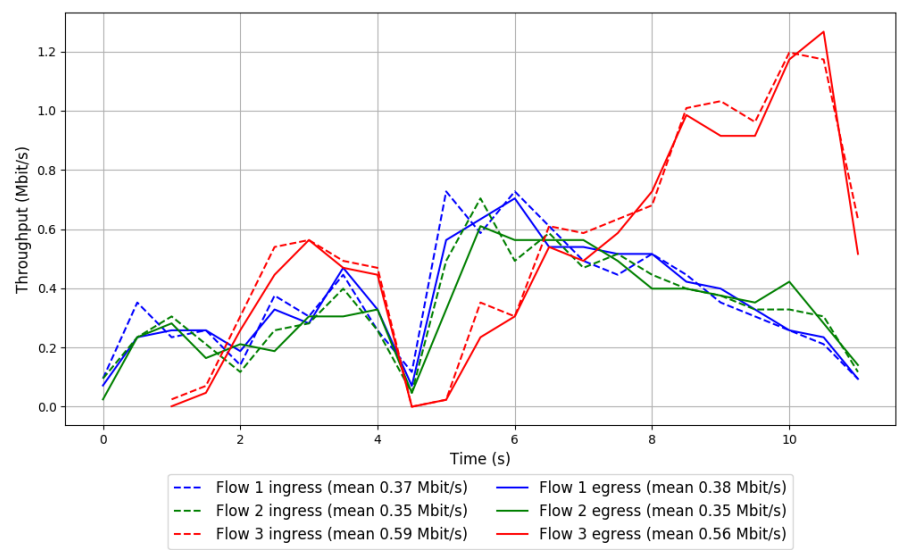
Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of LEDBAT

Start at: 2017-11-30 07:02:49
End at: 2017-11-30 07:03:19
Local clock offset: -14.091 ms
Remote clock offset: -13.891 ms

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

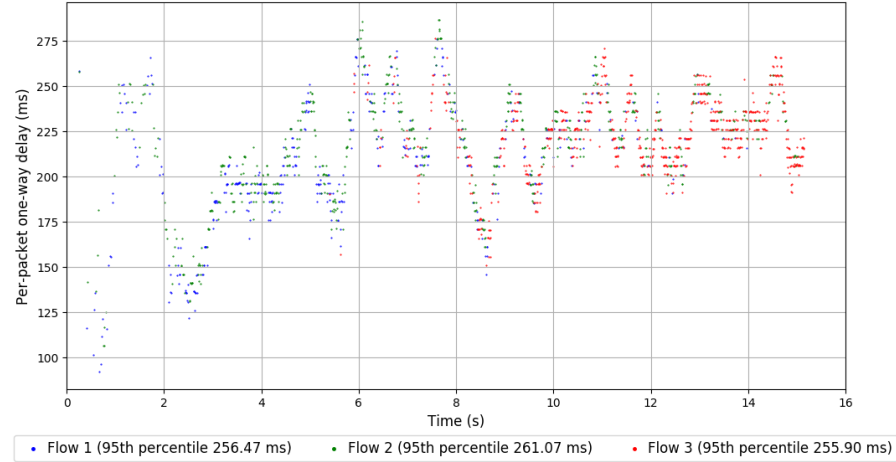
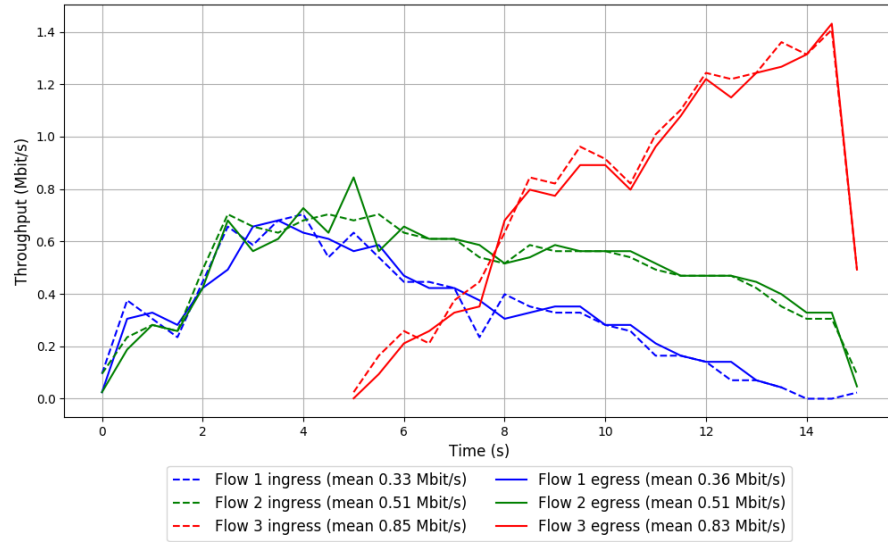
Start at: 2017-11-30 07:19:14

End at: 2017-11-30 07:19:44

Local clock offset: -15.896 ms

Remote clock offset: -15.697 ms

Run 2: Report of LEDBAT — Data Link

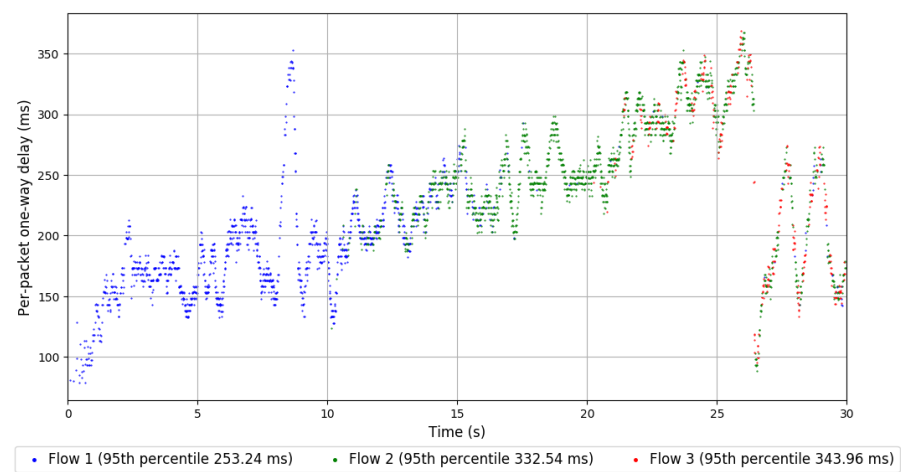
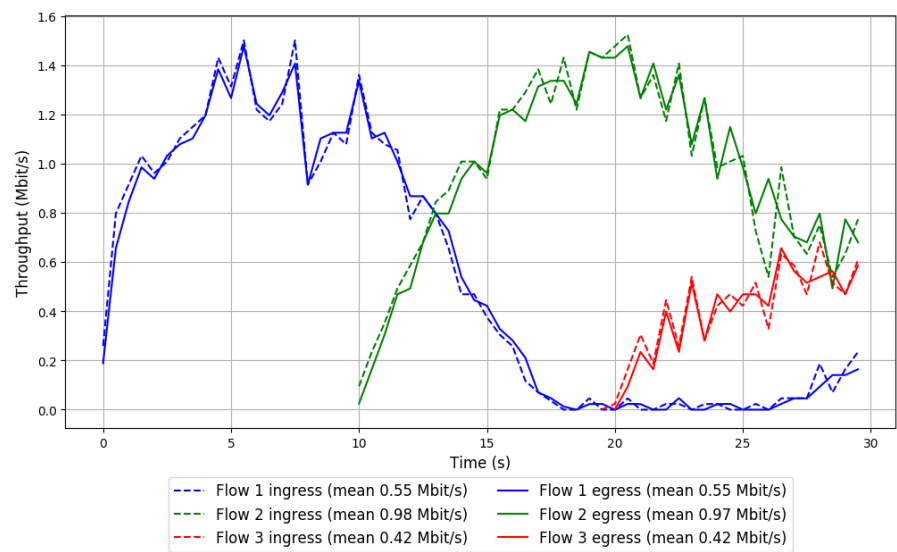


Run 3: Statistics of LEDBAT

Start at: 2017-11-30 07:35:16
End at: 2017-11-30 07:35:46
Local clock offset: -13.784 ms
Remote clock offset: -14.437 ms

Below is generated by plot.py at 2017-11-30 08:37:59
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 327.721 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 253.238 ms
Loss rate: 0.50%
-- Flow 2:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 332.539 ms
Loss rate: 0.72%
-- Flow 3:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 343.957 ms
Loss rate: 3.38%

Run 3: Report of LEDBAT — Data Link

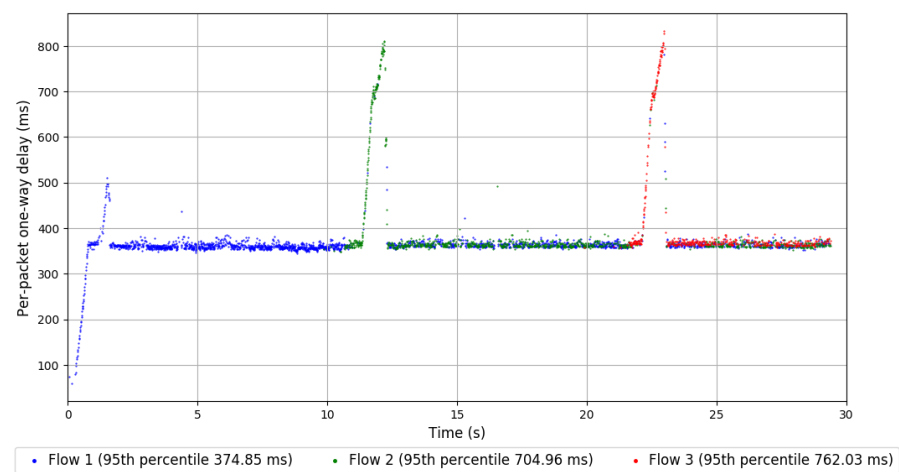
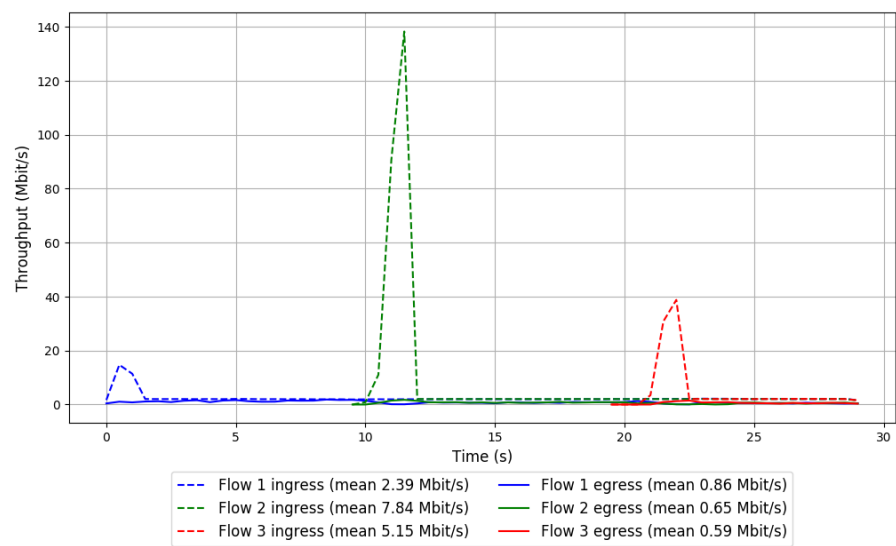


Run 1: Statistics of PCC

Start at: 2017-11-30 07:09:40
End at: 2017-11-30 07:10:10
Local clock offset: -14.84 ms
Remote clock offset: -13.81 ms

Below is generated by plot.py at 2017-11-30 08:38:06
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 579.509 ms
Loss rate: 84.25%
-- Flow 1:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 374.850 ms
Loss rate: 63.96%
-- Flow 2:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 704.964 ms
Loss rate: 91.85%
-- Flow 3:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 762.026 ms
Loss rate: 88.99%

Run 1: Report of PCC — Data Link

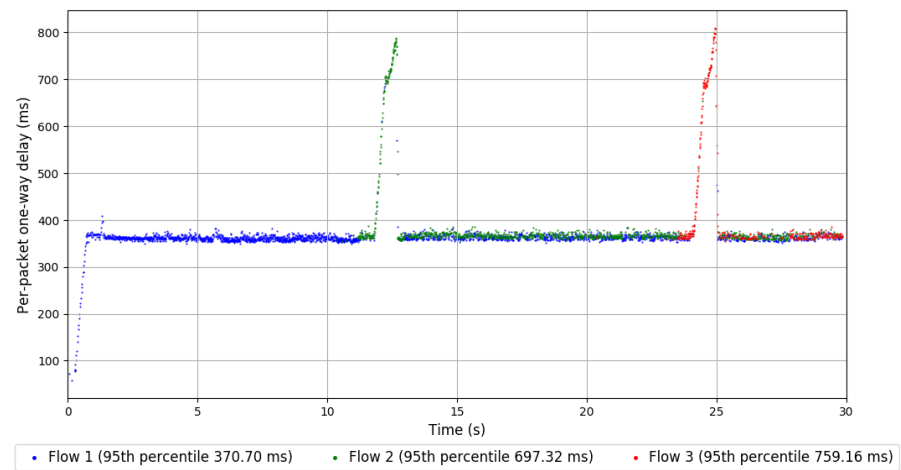
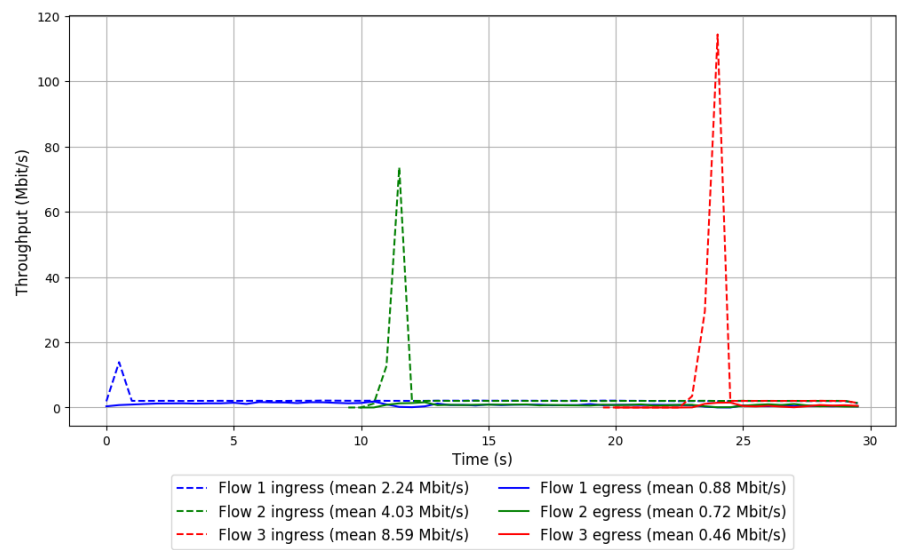


Run 2: Statistics of PCC

Start at: 2017-11-30 07:26:08
End at: 2017-11-30 07:26:38
Local clock offset: -13.688 ms
Remote clock offset: -14.368 ms

Below is generated by plot.py at 2017-11-30 08:38:08
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 497.337 ms
Loss rate: 80.72%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 370.701 ms
Loss rate: 60.90%
-- Flow 2:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 697.323 ms
Loss rate: 82.37%
-- Flow 3:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 759.158 ms
Loss rate: 94.80%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2017-11-30 07:42:11

End at: 2017-11-30 07:42:41

Local clock offset: -11.3 ms

Remote clock offset: 2.558 ms

Below is generated by plot.py at 2017-11-30 08:38:14

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.30 Mbit/s

95th percentile per-packet one-way delay: 644.046 ms

Loss rate: 92.09%

-- Flow 1:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 362.534 ms

Loss rate: 74.41%

-- Flow 2:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 680.178 ms

Loss rate: 95.62%

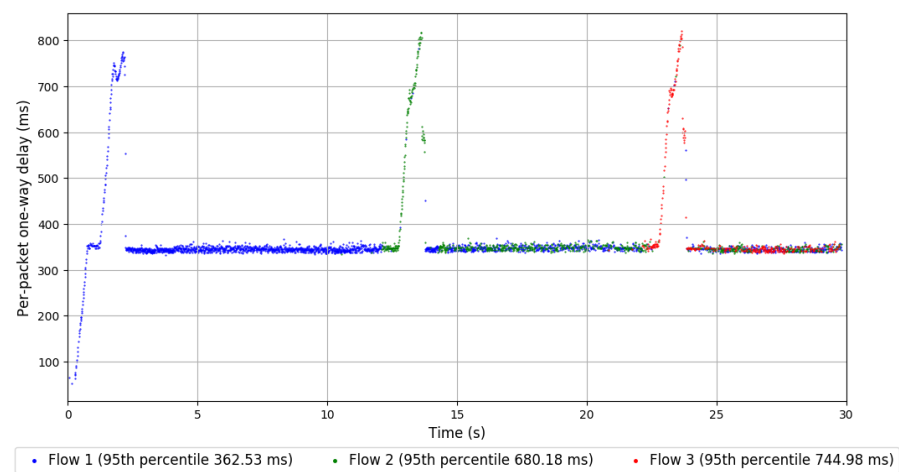
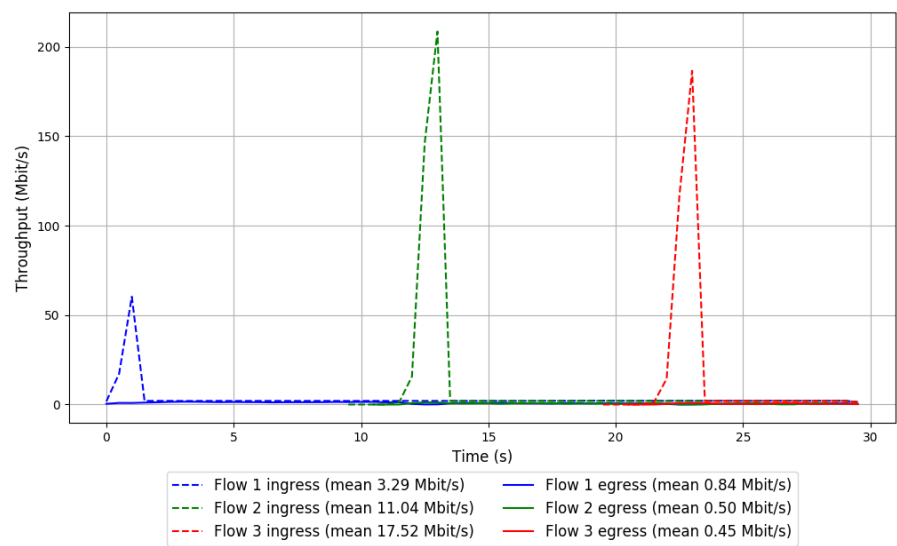
-- Flow 3:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 744.979 ms

Loss rate: 97.66%

Run 3: Report of PCC — Data Link

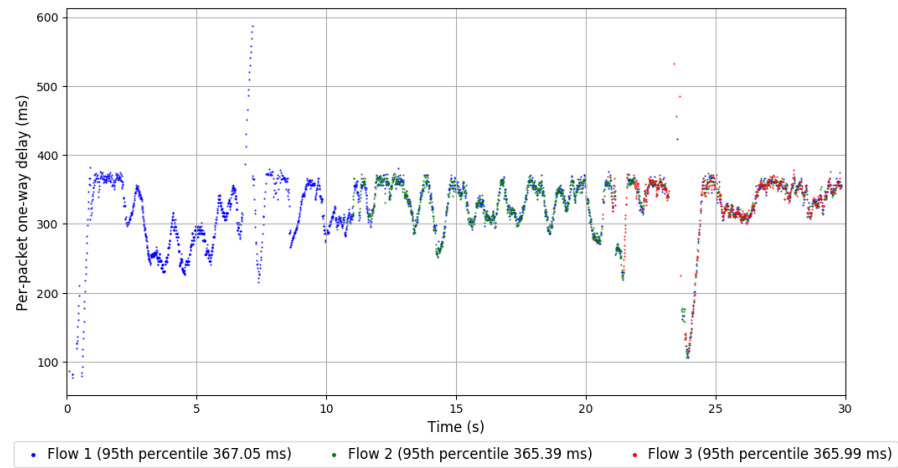
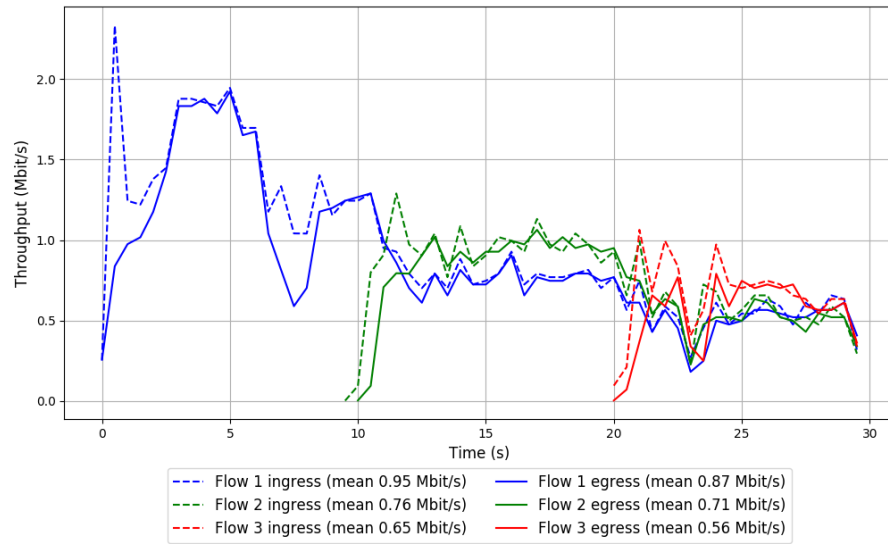


Run 1: Statistics of QUIC Cubic

Start at: 2017-11-30 07:11:00
End at: 2017-11-30 07:11:30
Local clock offset: -13.938 ms
Remote clock offset: -15.383 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 366.189 ms
Loss rate: 9.93%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 367.048 ms
Loss rate: 9.23%
-- Flow 2:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 365.387 ms
Loss rate: 8.30%
-- Flow 3:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 365.989 ms
Loss rate: 16.85%

Run 1: Report of QUIC Cubic — Data Link

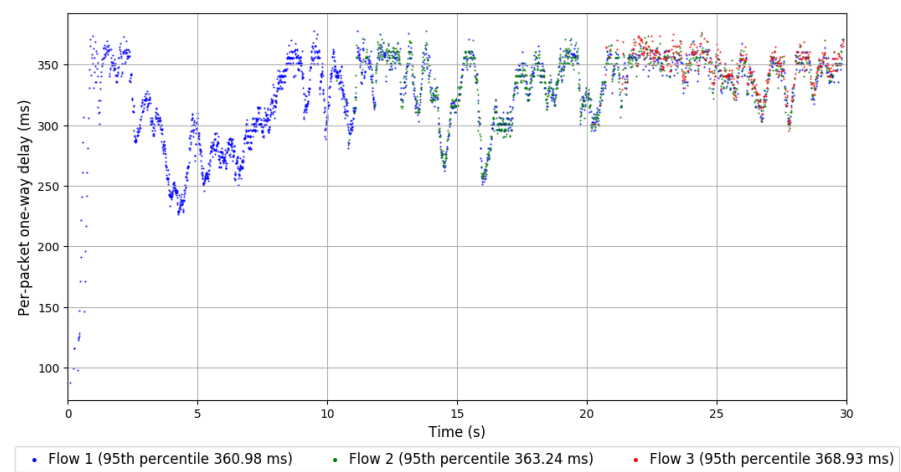
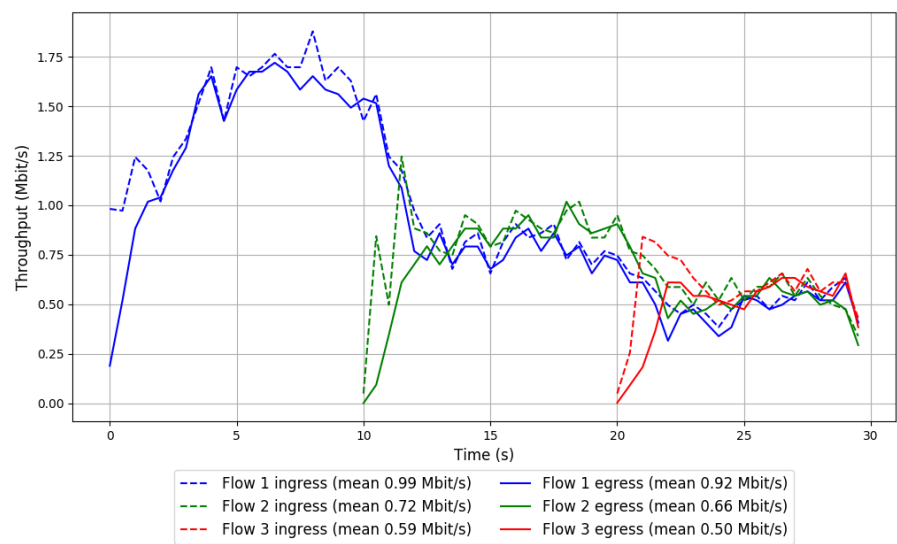


Run 2: Statistics of QUIC Cubic

Start at: 2017-11-30 07:27:17
End at: 2017-11-30 07:27:47
Local clock offset: -13.125 ms
Remote clock offset: -13.159 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 362.475 ms
Loss rate: 9.13%
-- Flow 1:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 360.978 ms
Loss rate: 7.11%
-- Flow 2:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 363.242 ms
Loss rate: 10.28%
-- Flow 3:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 368.930 ms
Loss rate: 16.58%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2017-11-30 07:43:25

End at: 2017-11-30 07:43:55

Local clock offset: -9.169 ms

Remote clock offset: 0.487 ms

Below is generated by plot.py at 2017-11-30 08:38:14

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 352.543 ms

Loss rate: 12.54%

-- Flow 1:

Average throughput: 0.77 Mbit/s

95th percentile per-packet one-way delay: 351.576 ms

Loss rate: 9.17%

-- Flow 2:

Average throughput: 0.51 Mbit/s

95th percentile per-packet one-way delay: 353.883 ms

Loss rate: 14.98%

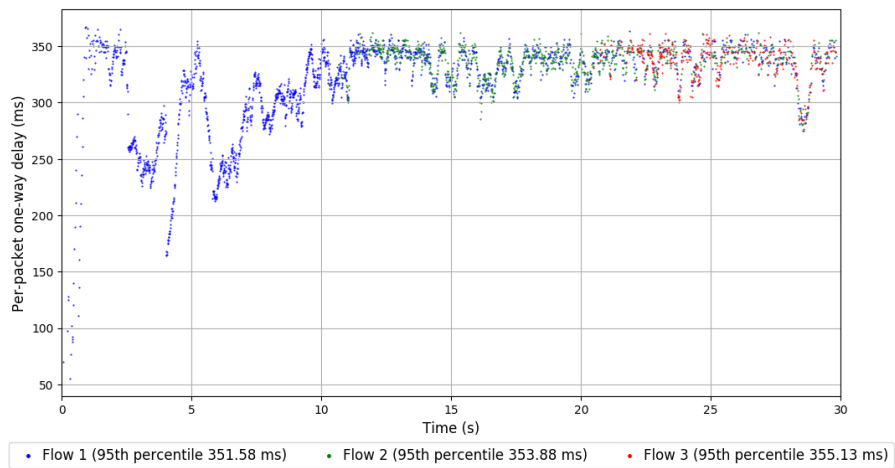
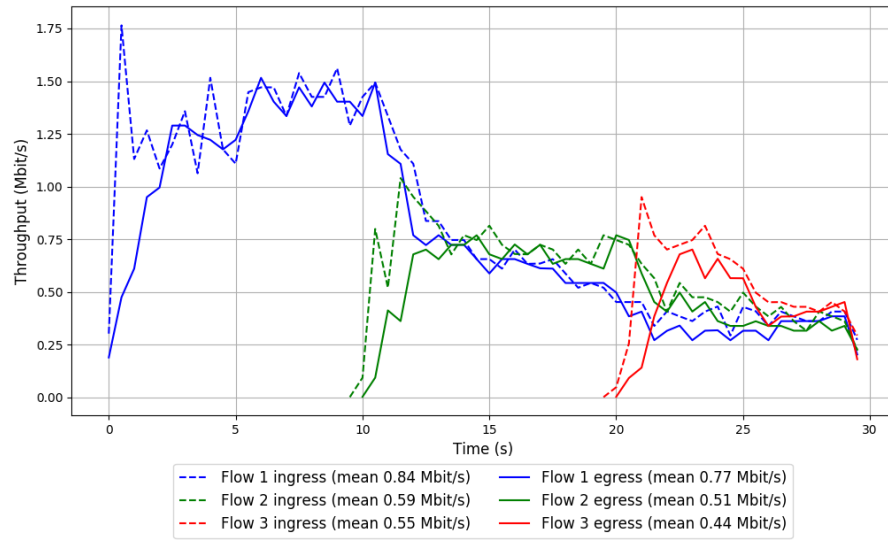
-- Flow 3:

Average throughput: 0.44 Mbit/s

95th percentile per-packet one-way delay: 355.134 ms

Loss rate: 22.89%

Run 3: Report of QUIC Cubic — Data Link

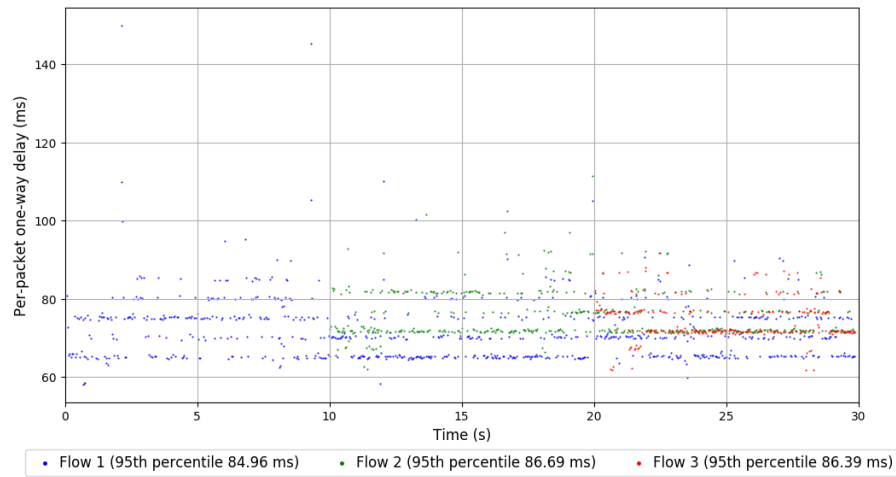
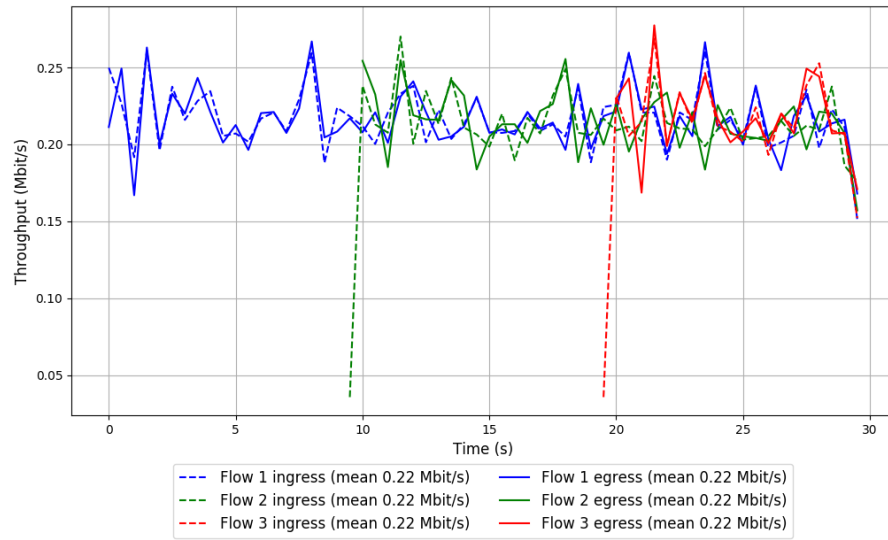


Run 1: Statistics of SReAM

Start at: 2017-11-30 07:12:12
End at: 2017-11-30 07:12:42
Local clock offset: -16.262 ms
Remote clock offset: -15.393 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 85.287 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 84.963 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 86.688 ms
Loss rate: 0.40%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 86.385 ms
Loss rate: 0.35%

Run 1: Report of SReAM — Data Link

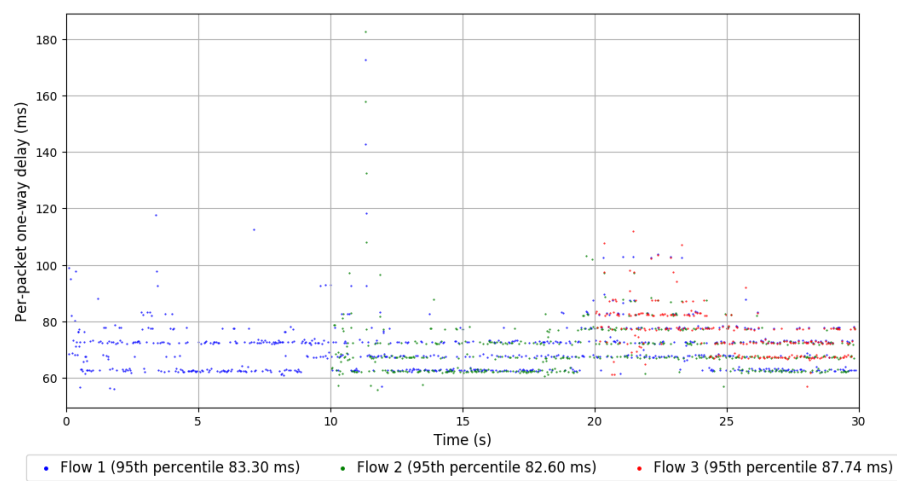
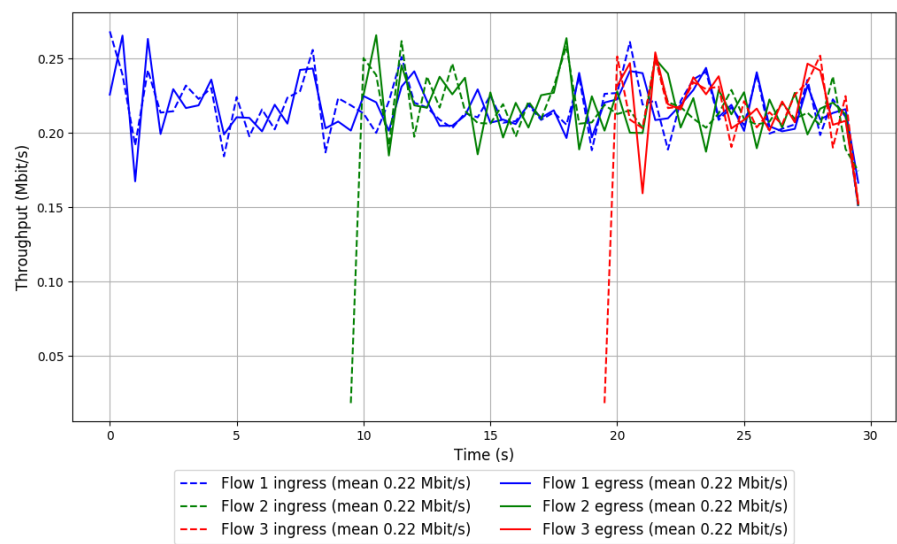


Run 2: Statistics of SReAM

Start at: 2017-11-30 07:28:26
End at: 2017-11-30 07:28:56
Local clock offset: -12.393 ms
Remote clock offset: -13.473 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 83.739 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 83.299 ms
Loss rate: 0.12%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 82.600 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 87.736 ms
Loss rate: 0.74%

Run 2: Report of SReAM — Data Link

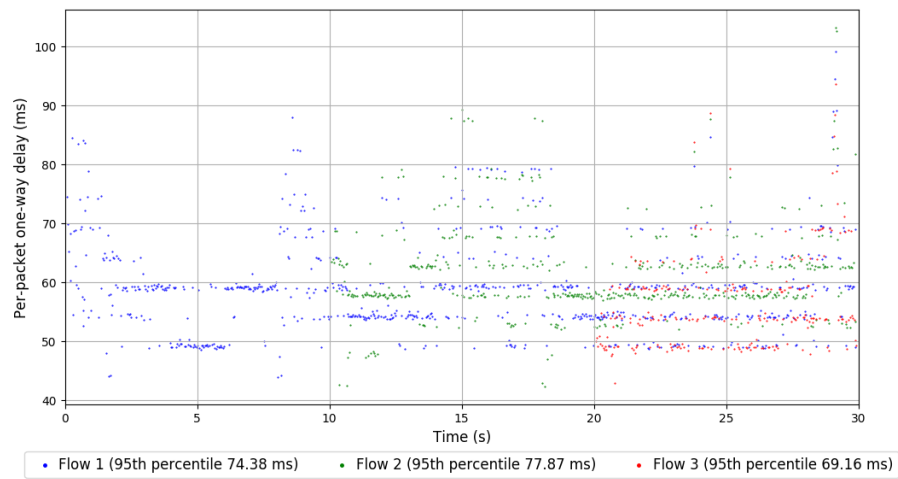
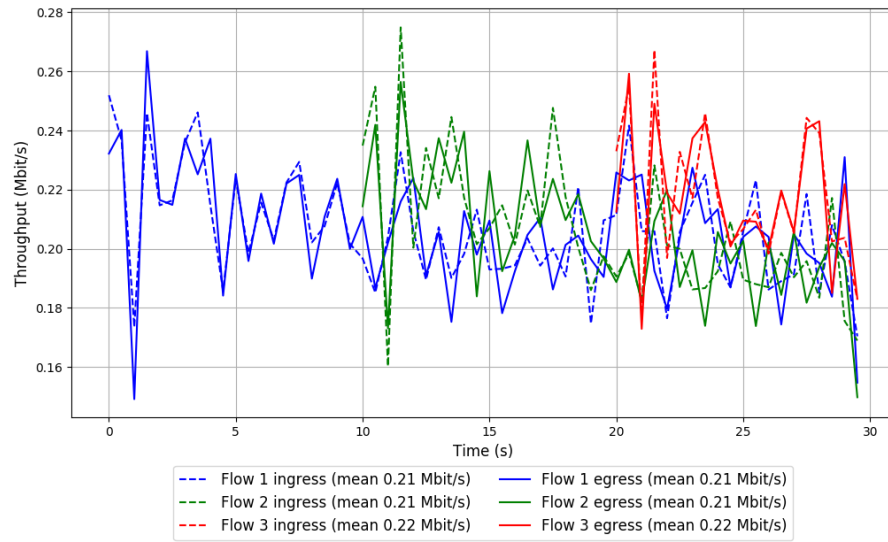


Run 3: Statistics of SReAM

Start at: 2017-11-30 07:44:37
End at: 2017-11-30 07:45:07
Local clock offset: -10.204 ms
Remote clock offset: 1.68 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 75.021 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 74.377 ms
Loss rate: 0.25%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 77.867 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 69.161 ms
Loss rate: 0.35%

Run 3: Report of SReAM — Data Link

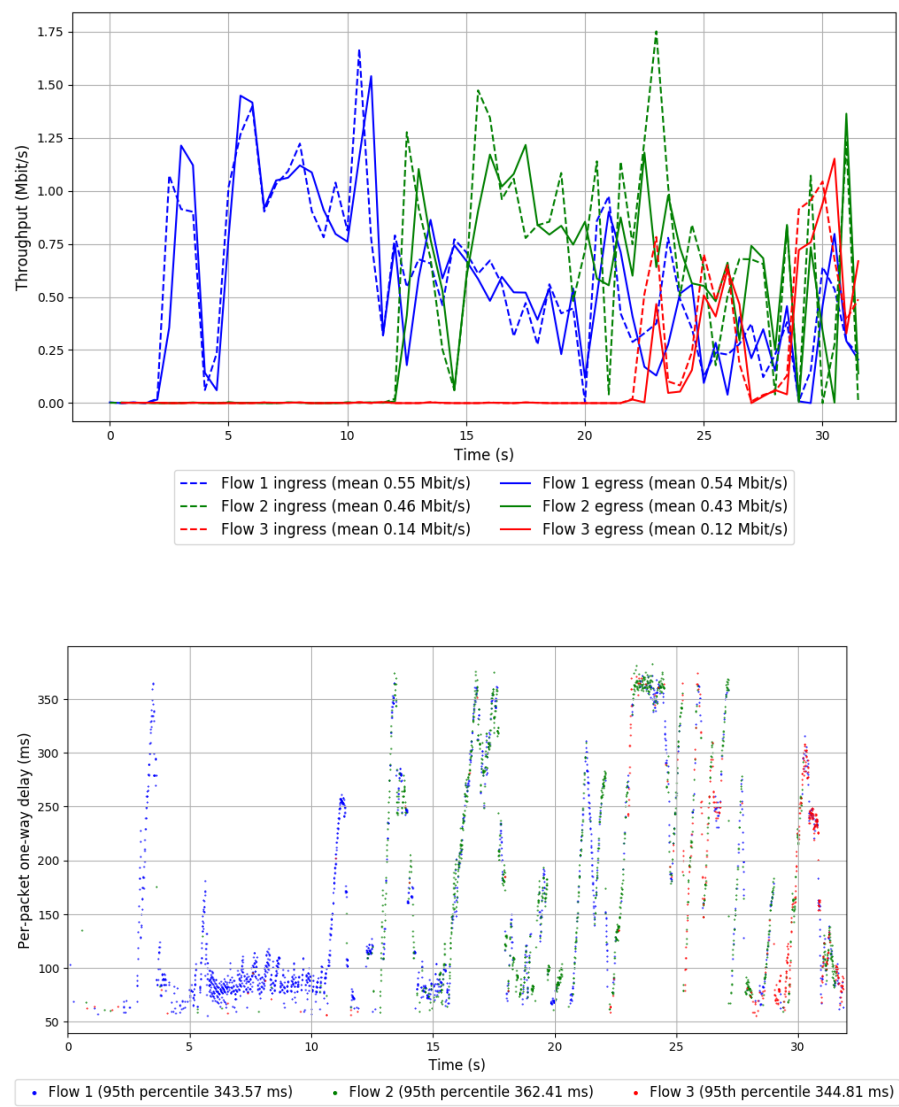


Run 1: Statistics of WebRTC media

Start at: 2017-11-30 06:59:22
End at: 2017-11-30 06:59:52
Local clock offset: -16.515 ms
Remote clock offset: -14.103 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 357.670 ms
Loss rate: 5.31%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 343.568 ms
Loss rate: 2.77%
-- Flow 2:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 362.412 ms
Loss rate: 6.49%
-- Flow 3:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 344.815 ms
Loss rate: 11.84%

Run 1: Report of WebRTC media — Data Link

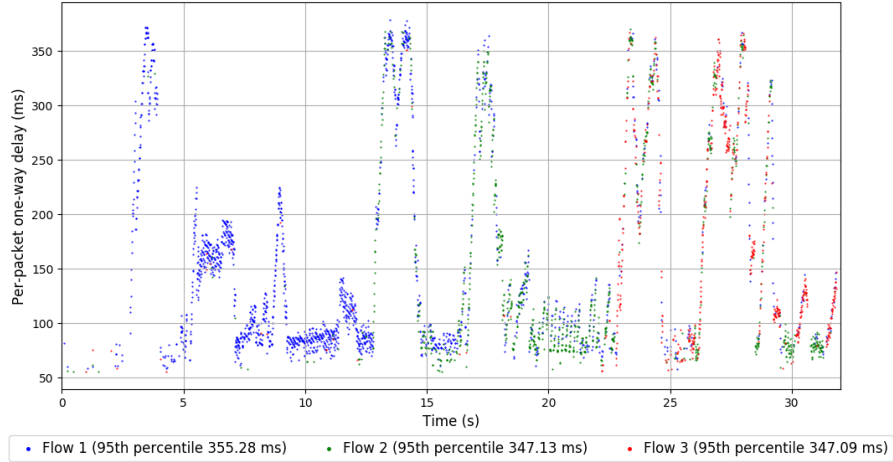
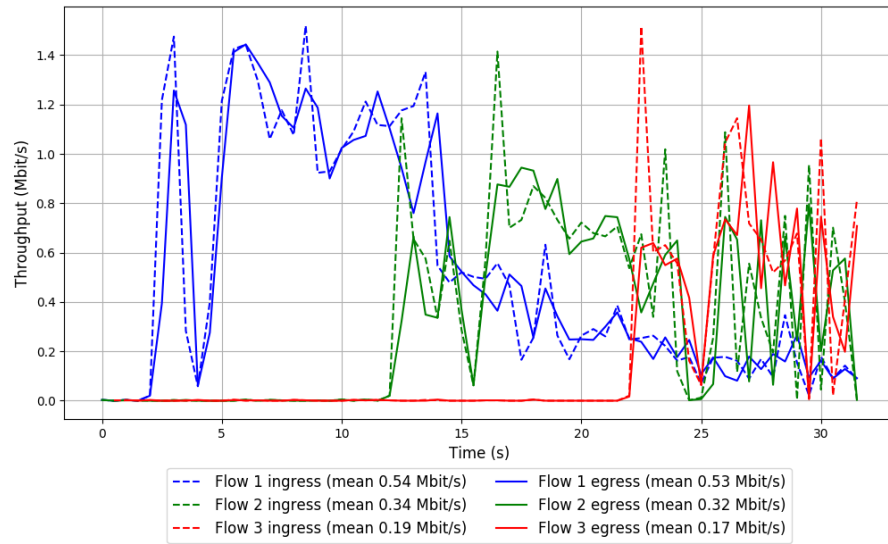


Run 2: Statistics of WebRTC media

Start at: 2017-11-30 07:15:45
End at: 2017-11-30 07:16:15
Local clock offset: -15.995 ms
Remote clock offset: -15.011 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 350.906 ms
Loss rate: 4.15%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 355.278 ms
Loss rate: 2.09%
-- Flow 2:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 347.126 ms
Loss rate: 4.94%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 347.087 ms
Loss rate: 8.75%

Run 2: Report of WebRTC media — Data Link

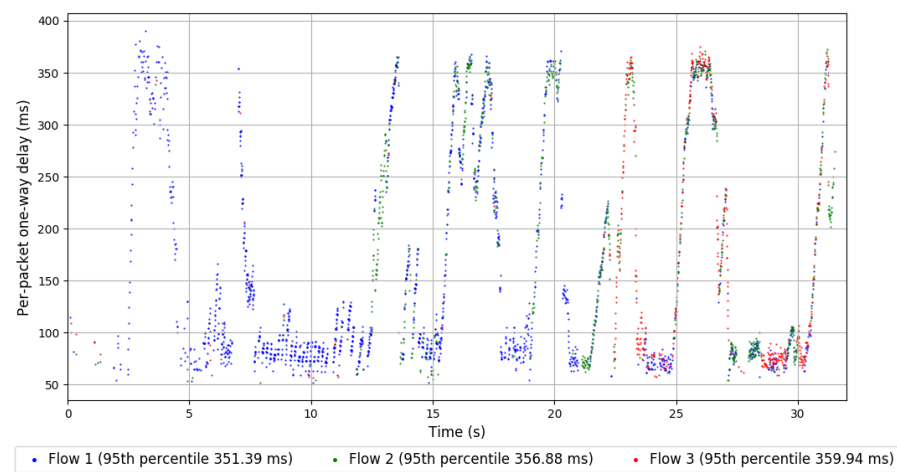
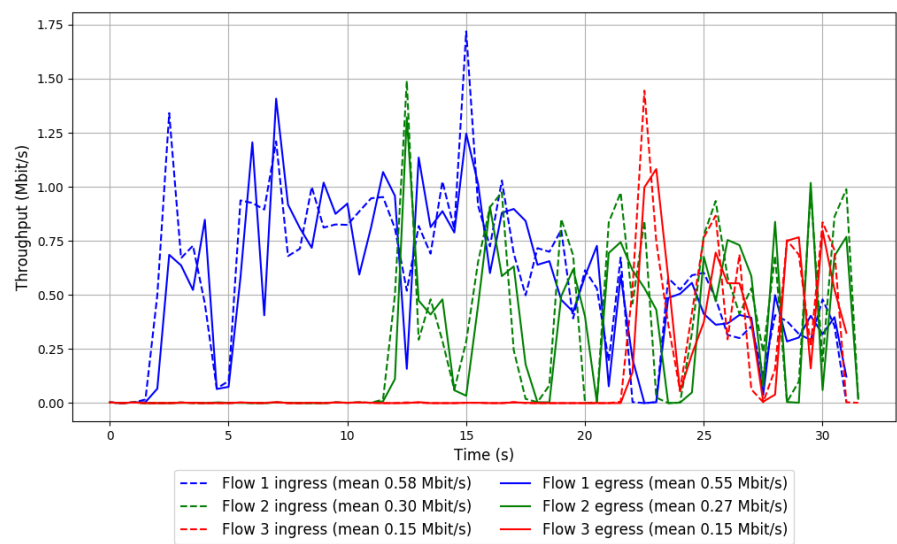


Run 3: Statistics of WebRTC media

Start at: 2017-11-30 07:31:49
End at: 2017-11-30 07:32:19
Local clock offset: -14.992 ms
Remote clock offset: -15.728 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 355.832 ms
Loss rate: 6.31%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 351.392 ms
Loss rate: 4.86%
-- Flow 2:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 356.878 ms
Loss rate: 8.93%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 359.941 ms
Loss rate: 6.70%

Run 3: Report of WebRTC media — Data Link

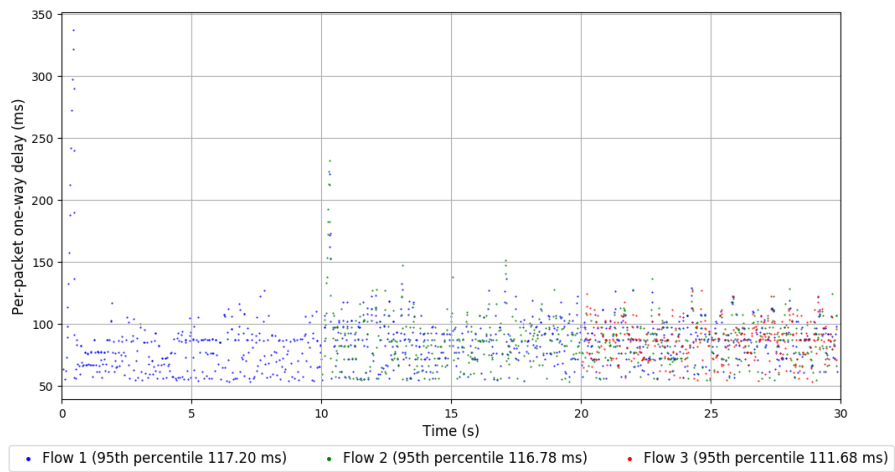
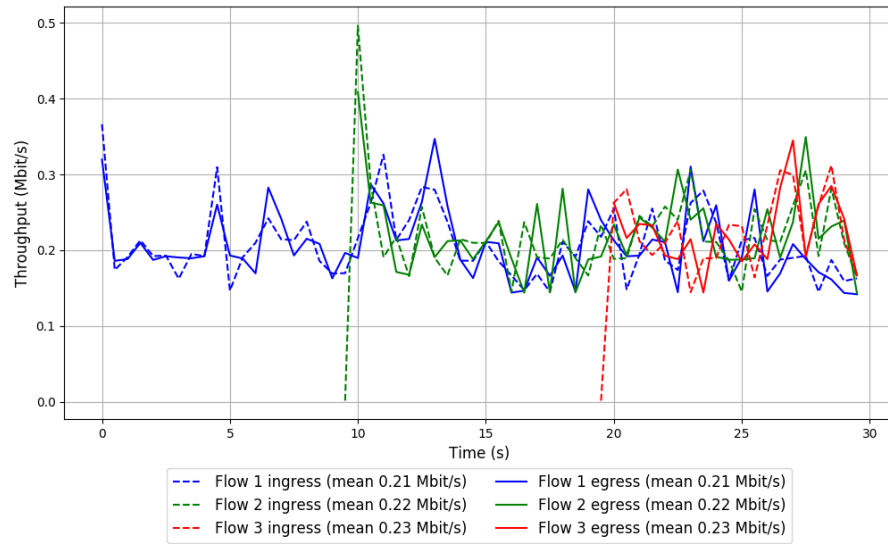


Run 1: Statistics of Sprout

Start at: 2017-11-30 07:14:31
End at: 2017-11-30 07:15:01
Local clock offset: -15.229 ms
Remote clock offset: -14.436 ms

Below is generated by plot.py at 2017-11-30 08:38:14
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 116.361 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 117.199 ms
Loss rate: 0.53%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 116.776 ms
Loss rate: 0.98%
-- Flow 3:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 111.680 ms
Loss rate: 1.02%

Run 1: Report of Sprout — Data Link

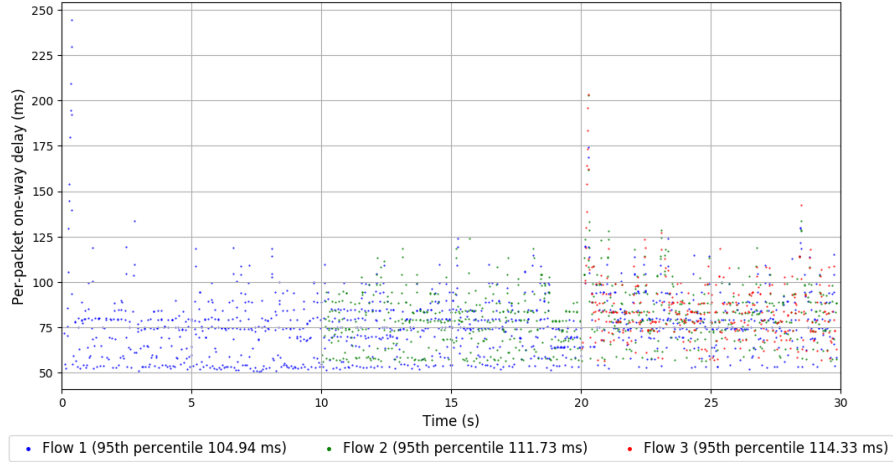
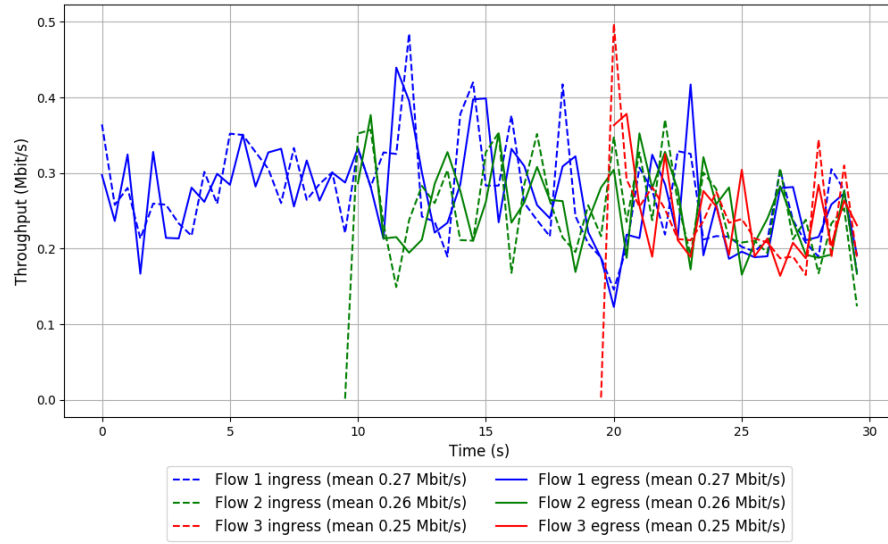


Run 2: Statistics of Sprout

Start at: 2017-11-30 07:30:42
End at: 2017-11-30 07:31:12
Local clock offset: -14.66 ms
Remote clock offset: -14.829 ms

```
# Below is generated by plot.py at 2017-11-30 08:38:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 109.088 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 104.940 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 111.731 ms
Loss rate: 0.02%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 114.328 ms
Loss rate: 1.96%
```


Run 2: Report of Sprout — Data Link

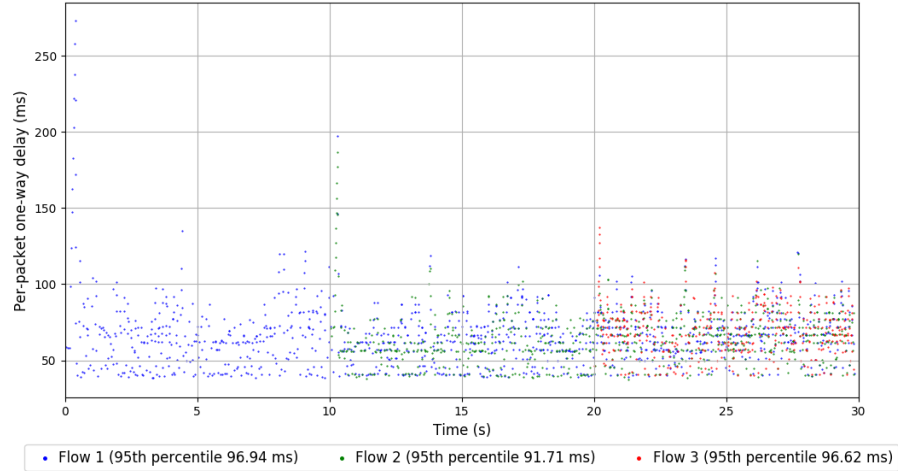
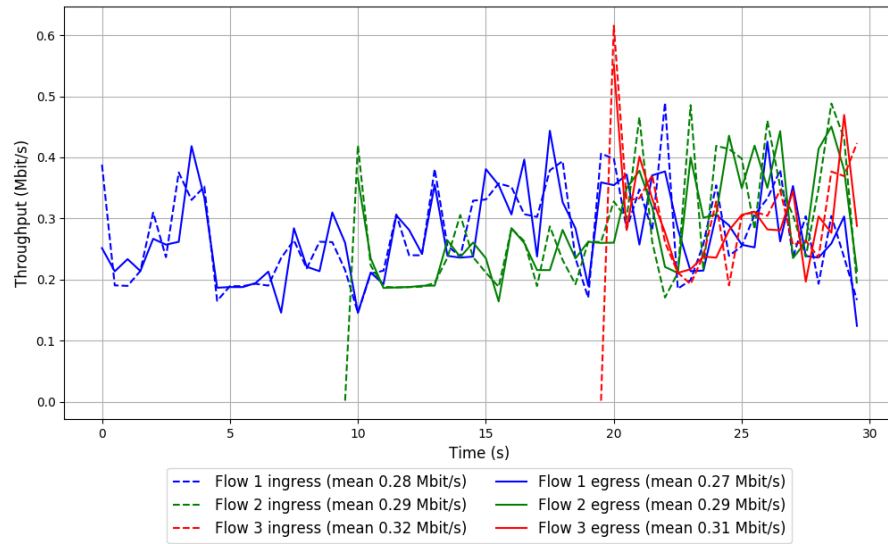


Run 3: Statistics of Sprout

Start at: 2017-11-30 07:46:52
End at: 2017-11-30 07:47:23
Local clock offset: -11.952 ms
Remote clock offset: -0.011 ms

```
# Below is generated by plot.py at 2017-11-30 08:38:14
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 95.892 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 96.945 ms
Loss rate: 1.09%
-- Flow 2:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 91.709 ms
Loss rate: 0.79%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 96.622 ms
Loss rate: 2.90%
```

Run 3: Report of Sprout — Data Link

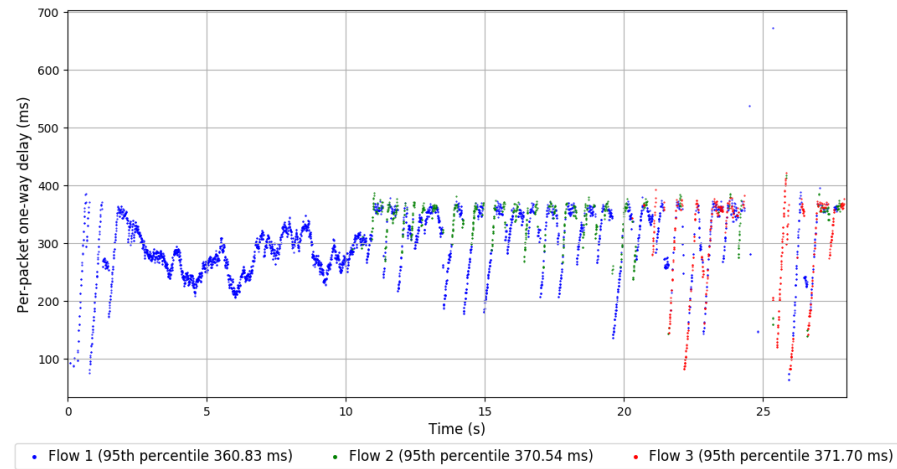
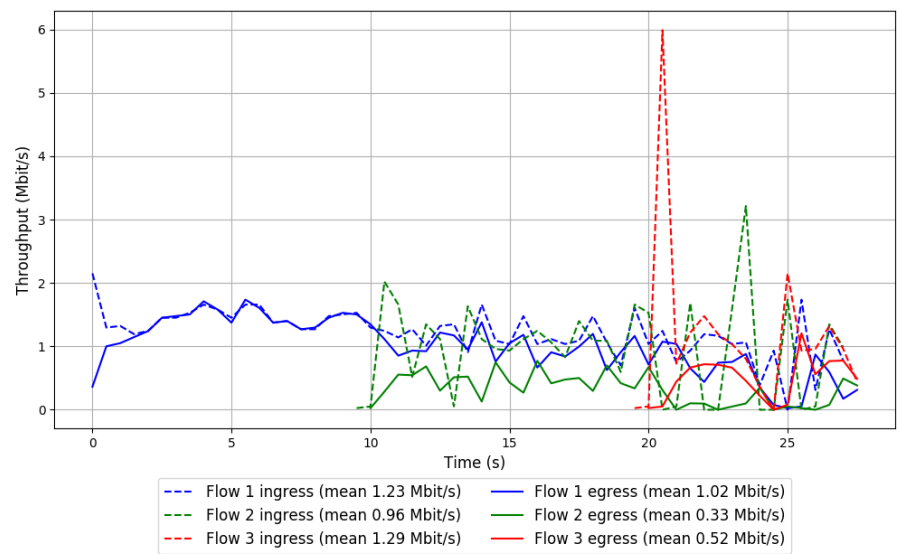


Run 1: Statistics of TaoVA-100x

Start at: 2017-11-30 07:03:56
End at: 2017-11-30 07:04:26
Local clock offset: -16.735 ms
Remote clock offset: -15.316 ms

Below is generated by plot.py at 2017-11-30 08:38:17
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 364.963 ms
Loss rate: 37.40%
-- Flow 1:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 360.830 ms
Loss rate: 16.70%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 370.539 ms
Loss rate: 65.47%
-- Flow 3:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 371.696 ms
Loss rate: 60.11%

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

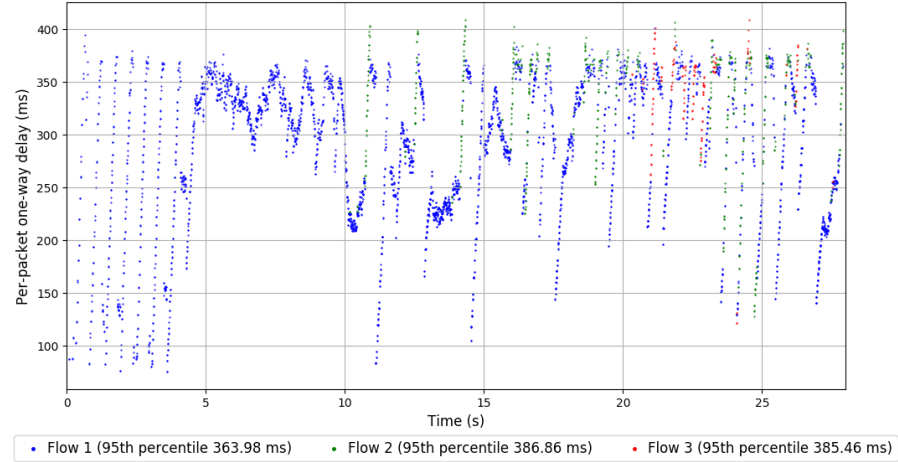
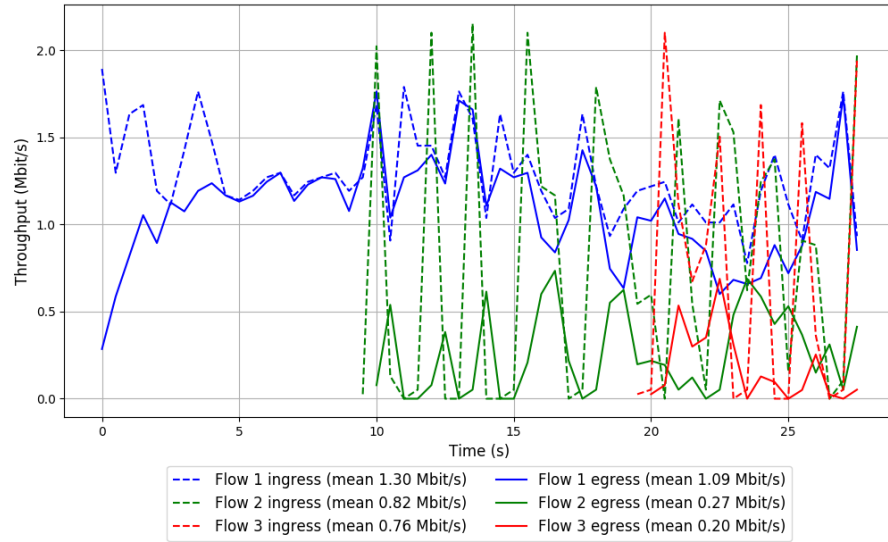


Run 2: Statistics of TaoVA-100x

Start at: 2017-11-30 07:20:22
End at: 2017-11-30 07:20:52
Local clock offset: -12.83 ms
Remote clock offset: -14.558 ms

Below is generated by plot.py at 2017-11-30 08:38:19
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 369.392 ms
Loss rate: 35.51%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 363.982 ms
Loss rate: 15.91%
-- Flow 2:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 386.858 ms
Loss rate: 67.28%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 385.456 ms
Loss rate: 75.97%

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

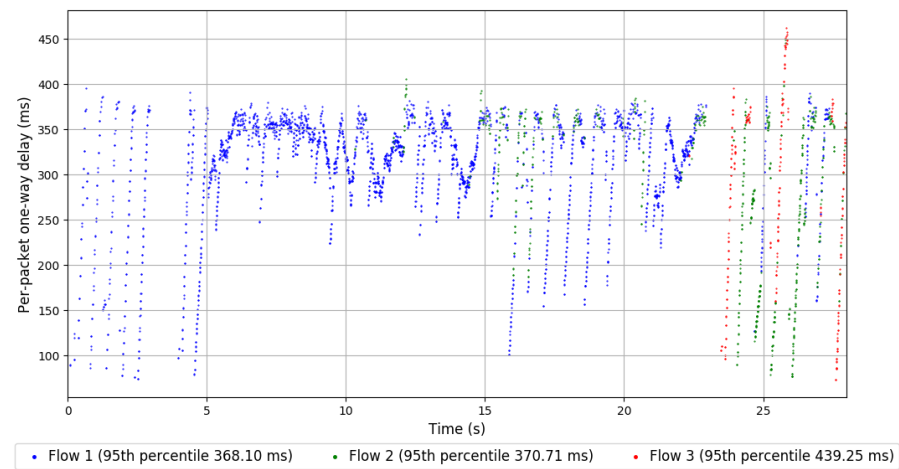
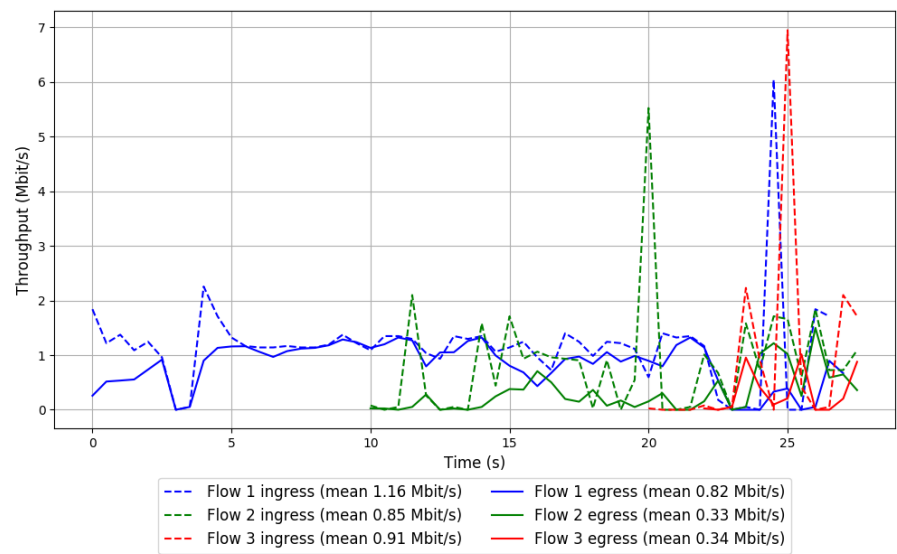


Run 3: Statistics of TaoVA-100x

Start at: 2017-11-30 07:36:23
End at: 2017-11-30 07:36:53
Local clock offset: -11.76 ms
Remote clock offset: -14.104 ms

Below is generated by plot.py at 2017-11-30 08:38:20
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 369.998 ms
Loss rate: 44.18%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 368.096 ms
Loss rate: 28.58%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 370.715 ms
Loss rate: 62.35%
-- Flow 3:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 439.251 ms
Loss rate: 73.54%

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

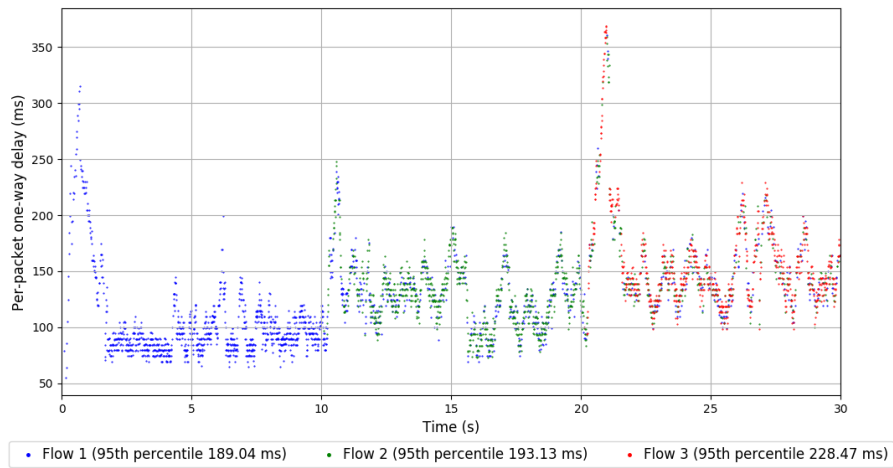
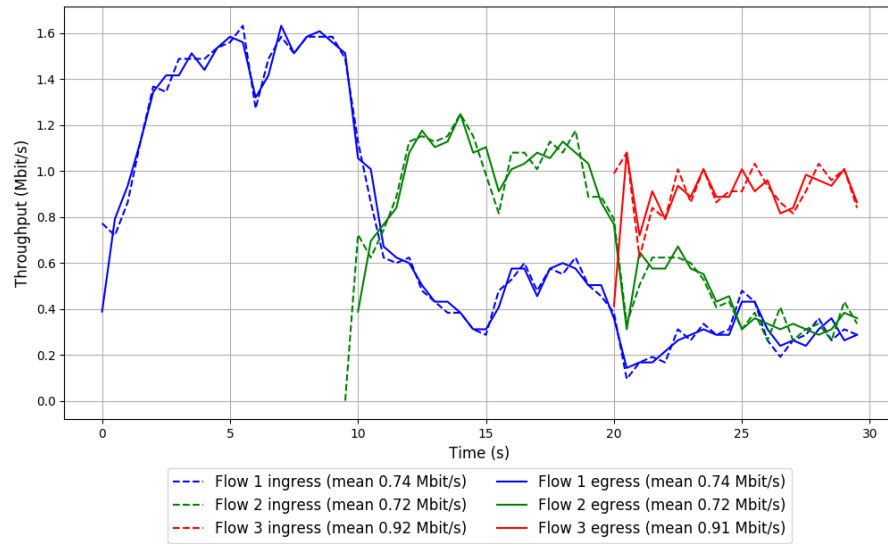


Run 1: Statistics of TCP Vegas

Start at: 2017-11-30 07:07:24
End at: 2017-11-30 07:07:54
Local clock offset: -15.791 ms
Remote clock offset: -14.403 ms

Below is generated by plot.py at 2017-11-30 08:38:20
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 204.388 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 189.036 ms
Loss rate: 0.27%
-- Flow 2:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 193.128 ms
Loss rate: 0.58%
-- Flow 3:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 228.474 ms
Loss rate: 2.62%

Run 1: Report of TCP Vegas — Data Link

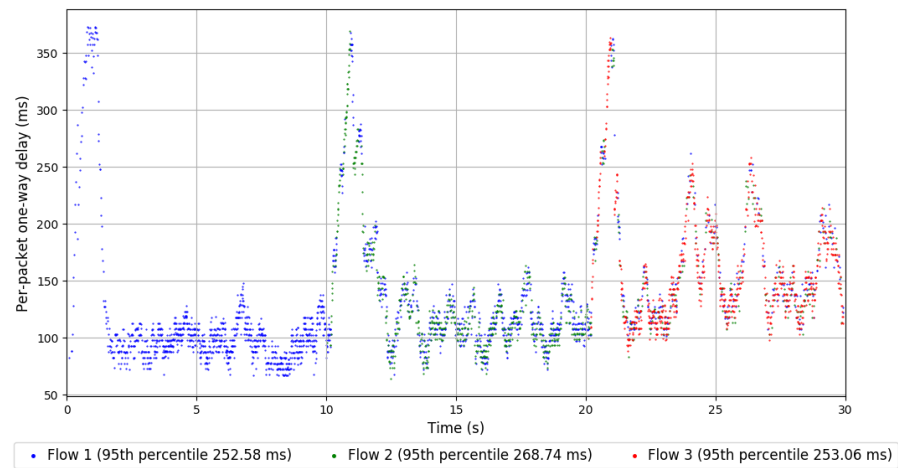
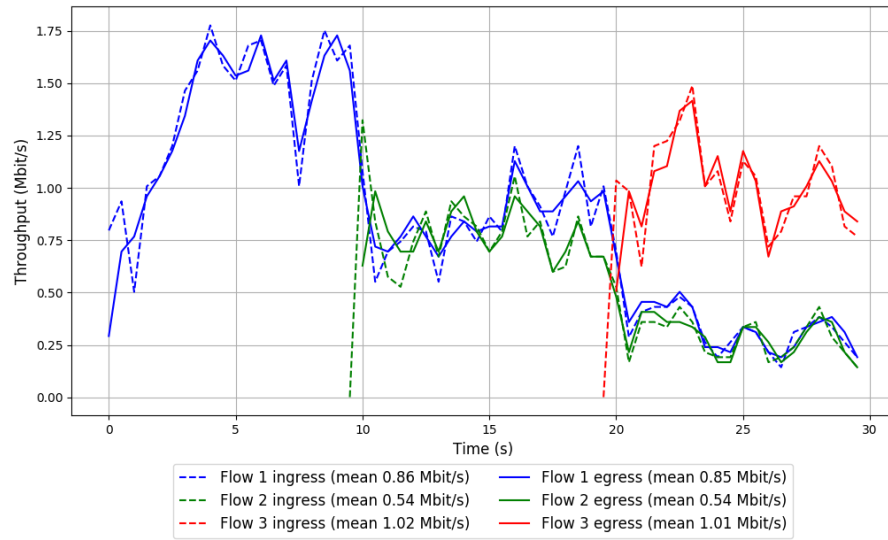


Run 2: Statistics of TCP Vegas

Start at: 2017-11-30 07:23:51
End at: 2017-11-30 07:24:21
Local clock offset: -14.616 ms
Remote clock offset: -14.477 ms

Below is generated by plot.py at 2017-11-30 08:38:20
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 258.457 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 252.576 ms
Loss rate: 0.84%
-- Flow 2:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 268.738 ms
Loss rate: 0.55%
-- Flow 3:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 253.064 ms
Loss rate: 2.01%

Run 2: Report of TCP Vegas — Data Link

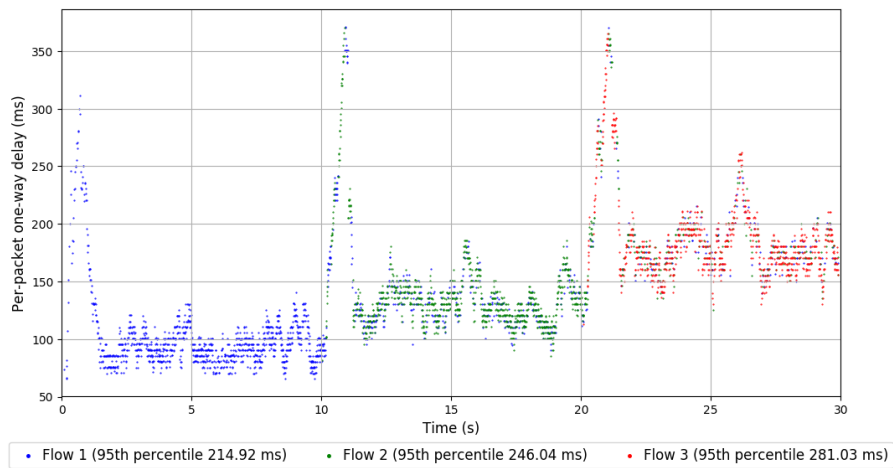
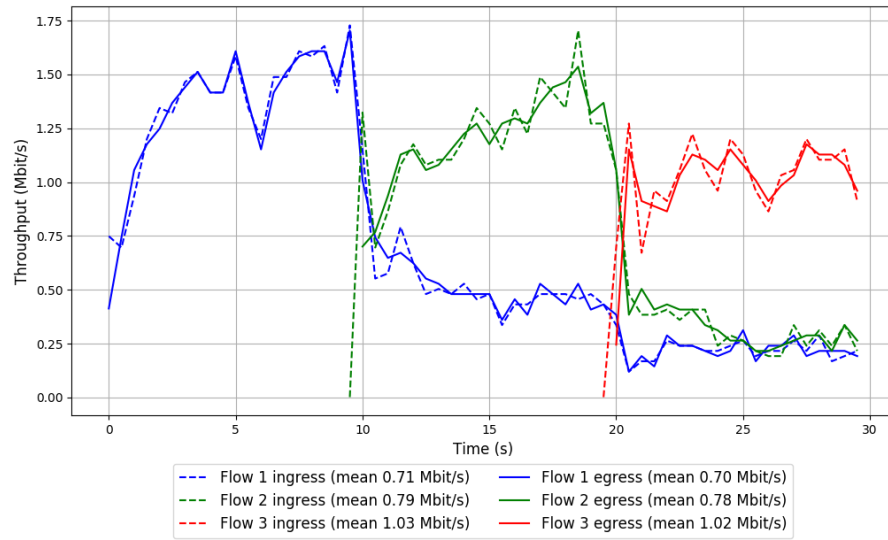


Run 3: Statistics of TCP Vegas

Start at: 2017-11-30 07:39:56
End at: 2017-11-30 07:40:26
Local clock offset: -14.176 ms
Remote clock offset: -14.089 ms

Below is generated by plot.py at 2017-11-30 08:38:20
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.56 Mbit/s
95th percentile per-packet one-way delay: 240.838 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 214.917 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 246.041 ms
Loss rate: 1.07%
-- Flow 3:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 281.032 ms
Loss rate: 2.46%

Run 3: Report of TCP Vegas — Data Link

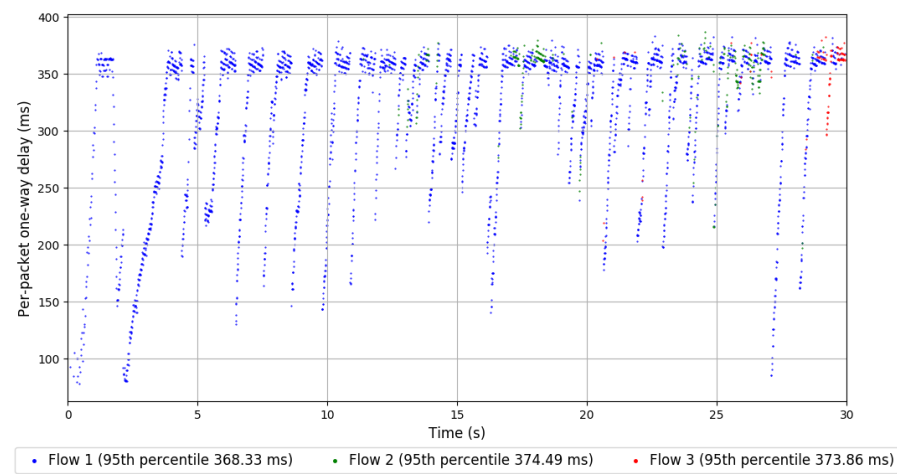
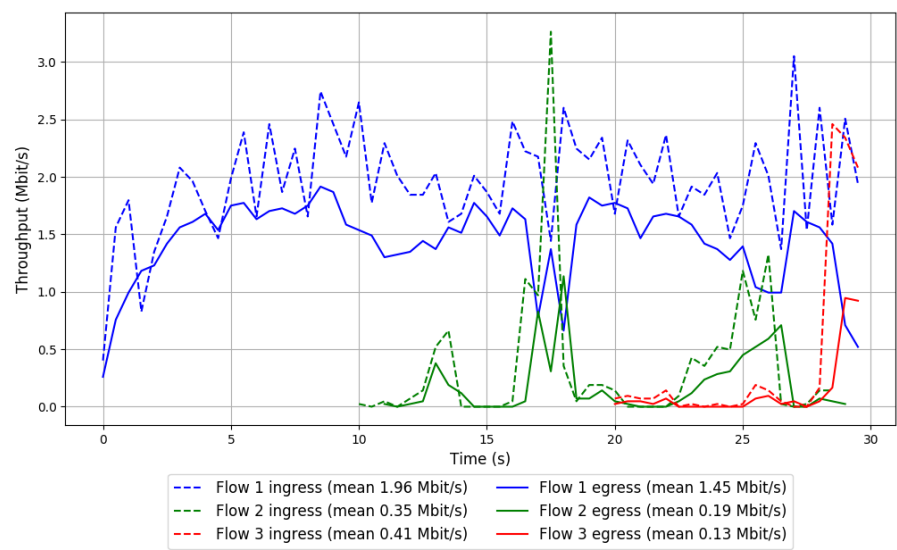


Run 1: Statistics of Verus

Start at: 2017-11-30 07:00:33
End at: 2017-11-30 07:01:03
Local clock offset: -14.212 ms
Remote clock offset: -14.553 ms

Below is generated by plot.py at 2017-11-30 08:38:20
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.60 Mbit/s
95th percentile per-packet one-way delay: 369.268 ms
Loss rate: 30.96%
-- Flow 1:
Average throughput: 1.45 Mbit/s
95th percentile per-packet one-way delay: 368.335 ms
Loss rate: 26.48%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 374.492 ms
Loss rate: 48.31%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 373.861 ms
Loss rate: 68.15%

Run 1: Report of Verus — Data Link

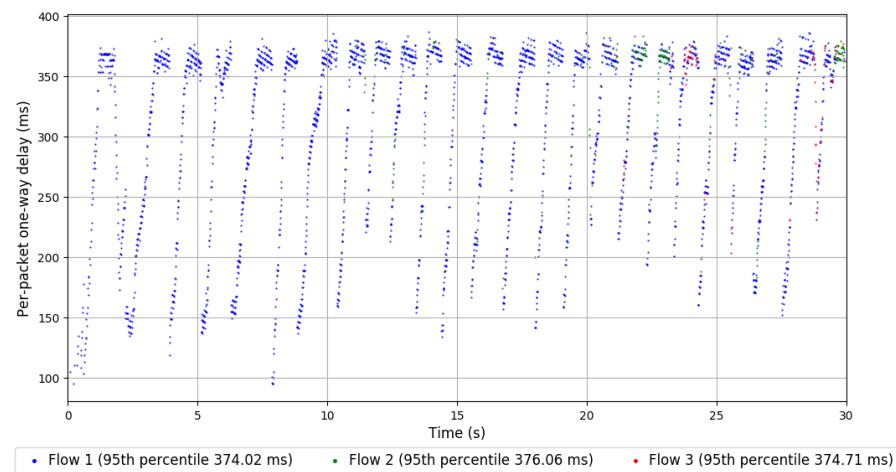
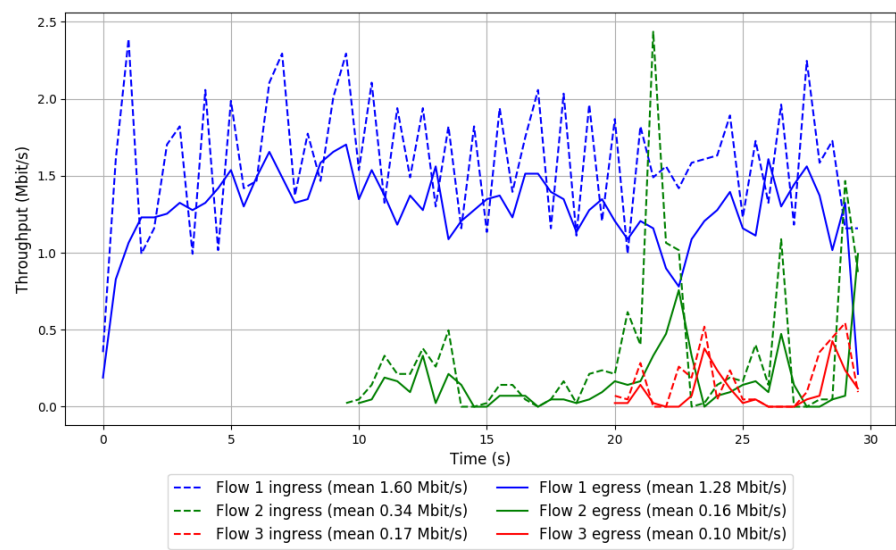


Run 2: Statistics of Verus

Start at: 2017-11-30 07:16:55
End at: 2017-11-30 07:17:25
Local clock offset: -13.133 ms
Remote clock offset: -14.633 ms

Below is generated by plot.py at 2017-11-30 08:38:20
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 374.229 ms
Loss rate: 24.66%
-- Flow 1:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 374.016 ms
Loss rate: 20.18%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 376.055 ms
Loss rate: 52.81%
-- Flow 3:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 374.710 ms
Loss rate: 39.57%

Run 2: Report of Verus — Data Link

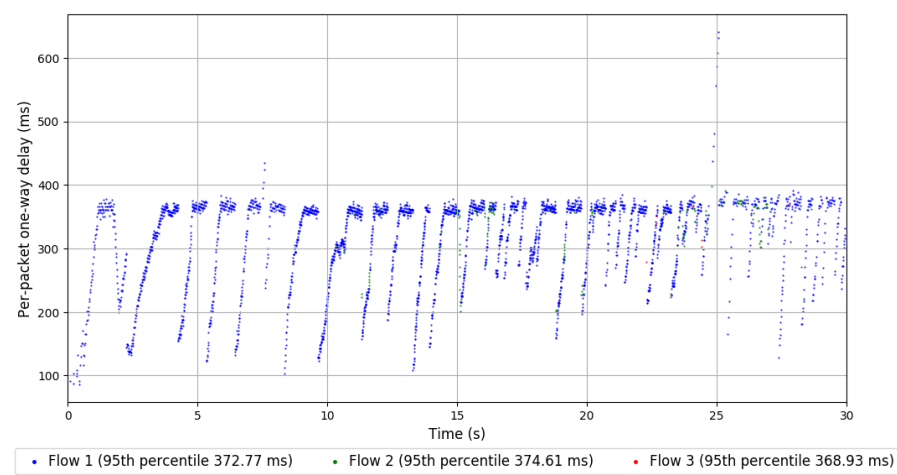
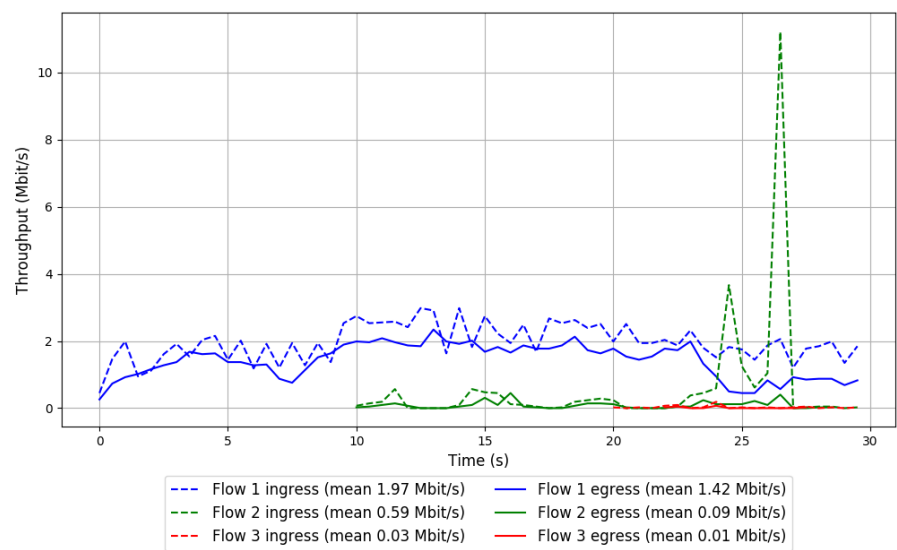


Run 3: Statistics of Verus

Start at: 2017-11-30 07:32:58
End at: 2017-11-30 07:33:28
Local clock offset: -13.338 ms
Remote clock offset: -15.807 ms

Below is generated by plot.py at 2017-11-30 08:38:23
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 372.783 ms
Loss rate: 37.77%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 372.766 ms
Loss rate: 28.23%
-- Flow 2:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 374.609 ms
Loss rate: 85.41%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 368.933 ms
Loss rate: 72.00%

Run 3: Report of Verus — Data Link

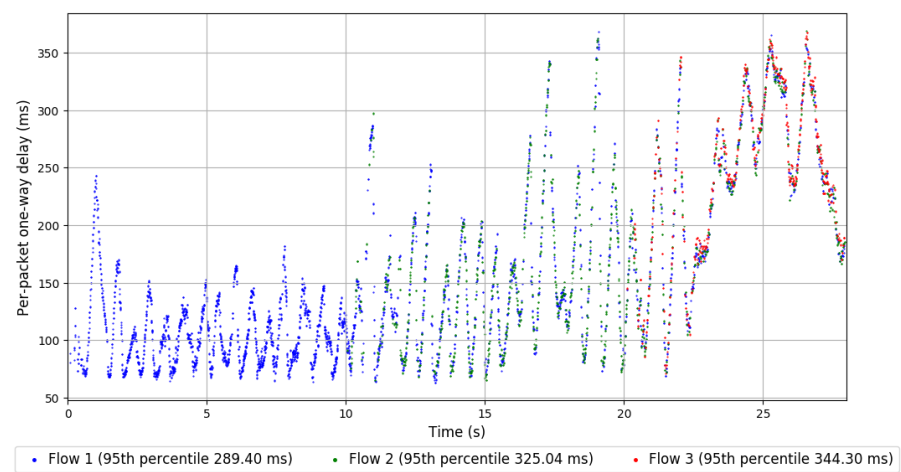
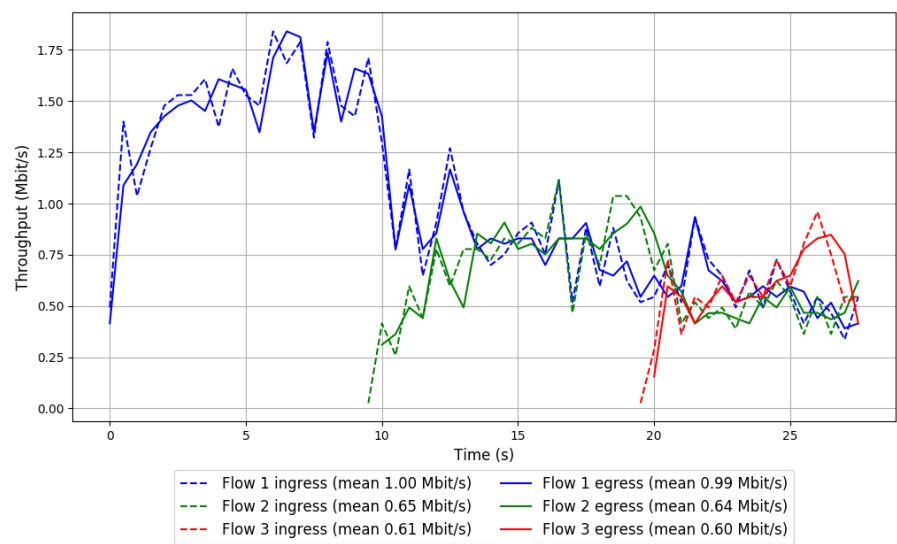


Run 1: Statistics of Copa

Start at: 2017-11-30 07:08:31
End at: 2017-11-30 07:09:01
Local clock offset: -16.523 ms
Remote clock offset: -14.454 ms

Below is generated by plot.py at 2017-11-30 08:38:27
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 322.025 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 289.399 ms
Loss rate: 0.76%
-- Flow 2:
Average throughput: 0.64 Mbit/s
95th percentile per-packet one-way delay: 325.037 ms
Loss rate: 1.63%
-- Flow 3:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 344.300 ms
Loss rate: 3.83%

Run 1: Report of Copa — Data Link

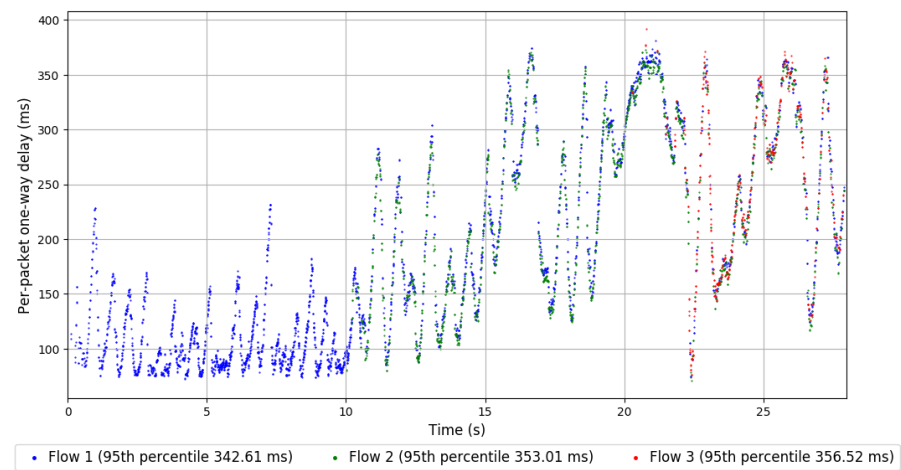
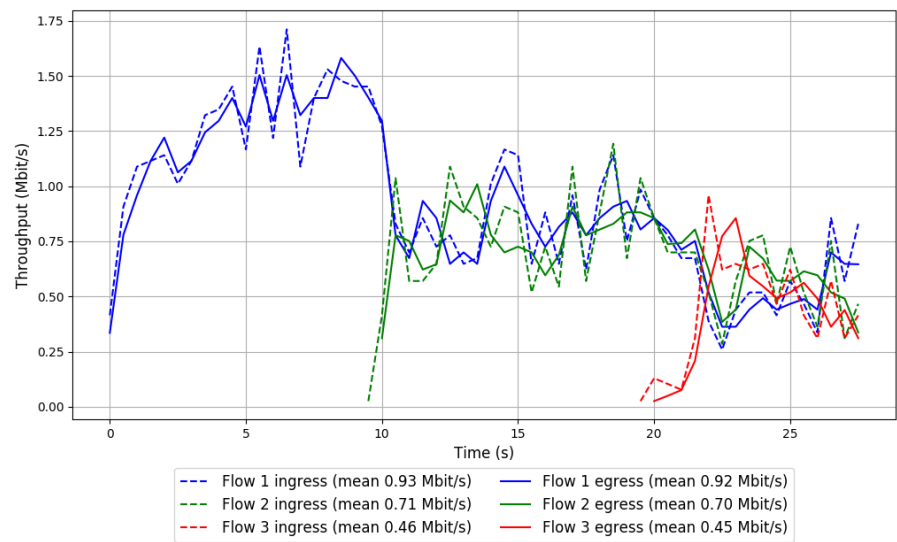


Run 2: Statistics of Copa

Start at: 2017-11-30 07:25:00
End at: 2017-11-30 07:25:30
Local clock offset: -11.926 ms
Remote clock offset: -15.385 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 349.267 ms
Loss rate: 1.88%
-- Flow 1:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 342.611 ms
Loss rate: 1.42%
-- Flow 2:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 353.015 ms
Loss rate: 1.73%
-- Flow 3:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 356.522 ms
Loss rate: 5.63%

Run 2: Report of Copa — Data Link

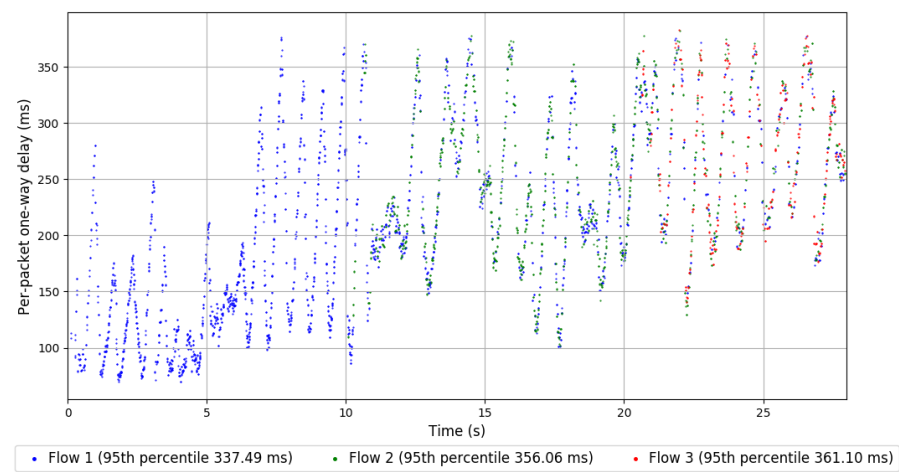
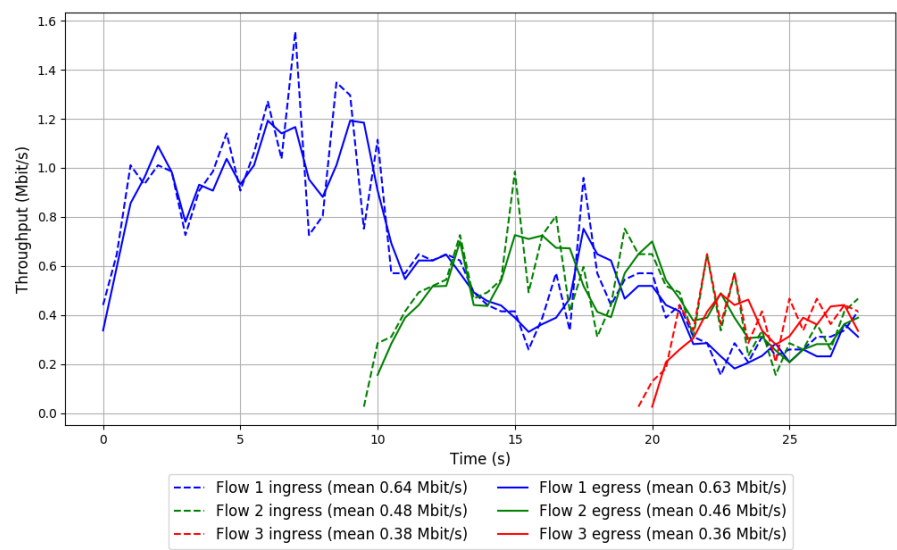


Run 3: Statistics of Copa

Start at: 2017-11-30 07:41:02
End at: 2017-11-30 07:41:32
Local clock offset: -12.79 ms
Remote clock offset: -16.401 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.02 Mbit/s
95th percentile per-packet one-way delay: 348.989 ms
Loss rate: 4.20%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 337.493 ms
Loss rate: 2.98%
-- Flow 2:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 356.064 ms
Loss rate: 4.74%
-- Flow 3:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 361.098 ms
Loss rate: 9.88%

Run 3: Report of Copa — Data Link

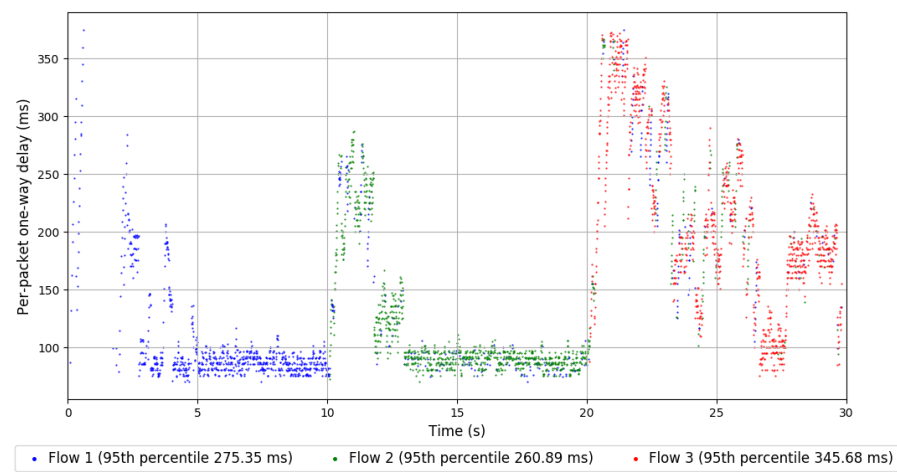
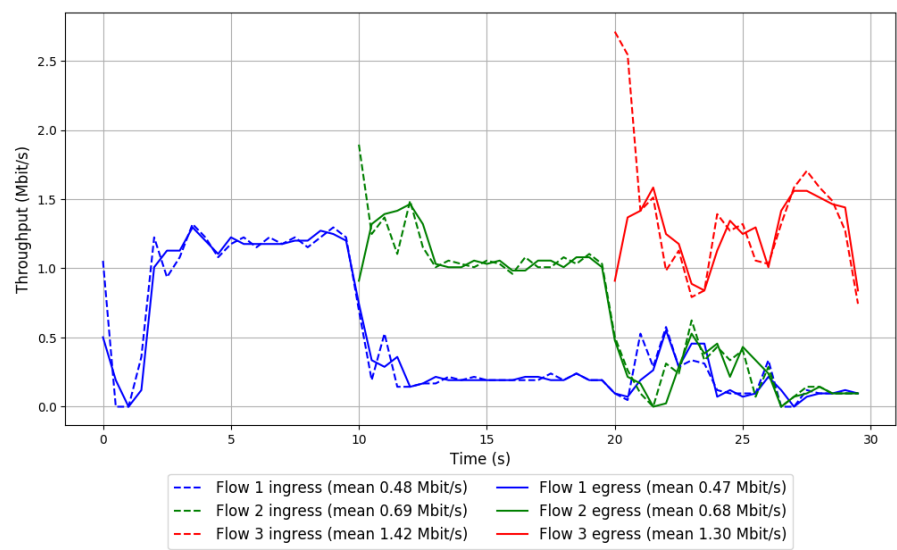


Run 1: Statistics of Indigo

Start at: 2017-11-30 07:06:16
End at: 2017-11-30 07:06:46
Local clock offset: -12.759 ms
Remote clock offset: -14.536 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.35 Mbit/s
95th percentile per-packet one-way delay: 321.402 ms
Loss rate: 4.47%
-- Flow 1:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 275.345 ms
Loss rate: 2.17%
-- Flow 2:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 260.891 ms
Loss rate: 2.46%
-- Flow 3:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 345.680 ms
Loss rate: 8.84%

Run 1: Report of Indigo — Data Link

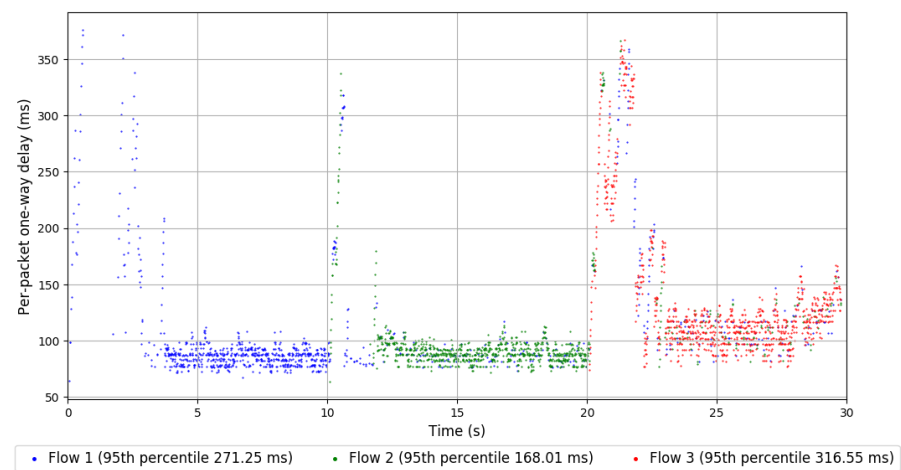
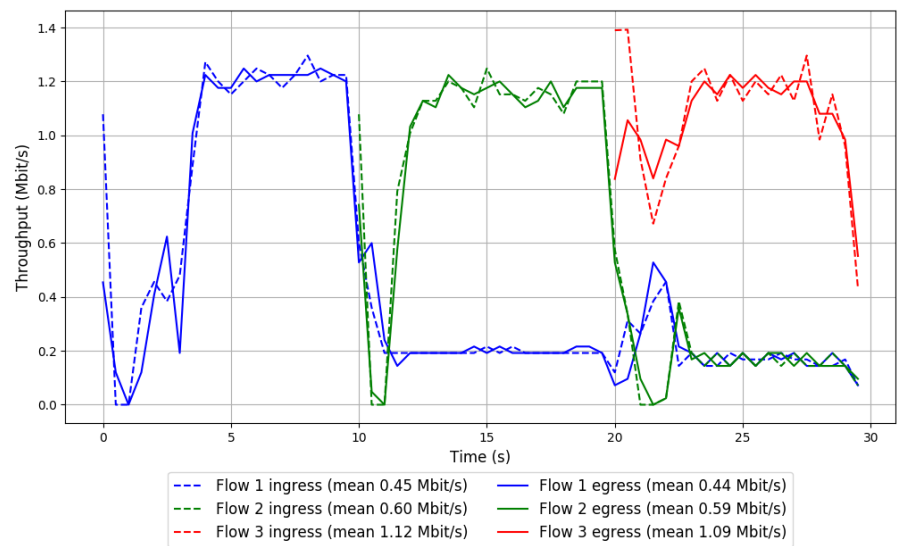


Run 2: Statistics of Indigo

Start at: 2017-11-30 07:22:44
End at: 2017-11-30 07:23:14
Local clock offset: -14.236 ms
Remote clock offset: -13.923 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 267.320 ms
Loss rate: 2.10%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 271.251 ms
Loss rate: 2.16%
-- Flow 2:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 168.010 ms
Loss rate: 2.11%
-- Flow 3:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 316.550 ms
Loss rate: 2.00%

Run 2: Report of Indigo — Data Link

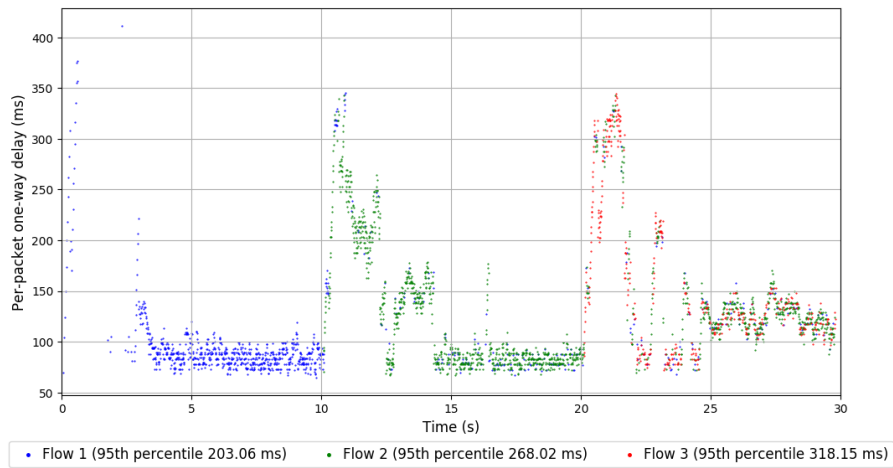
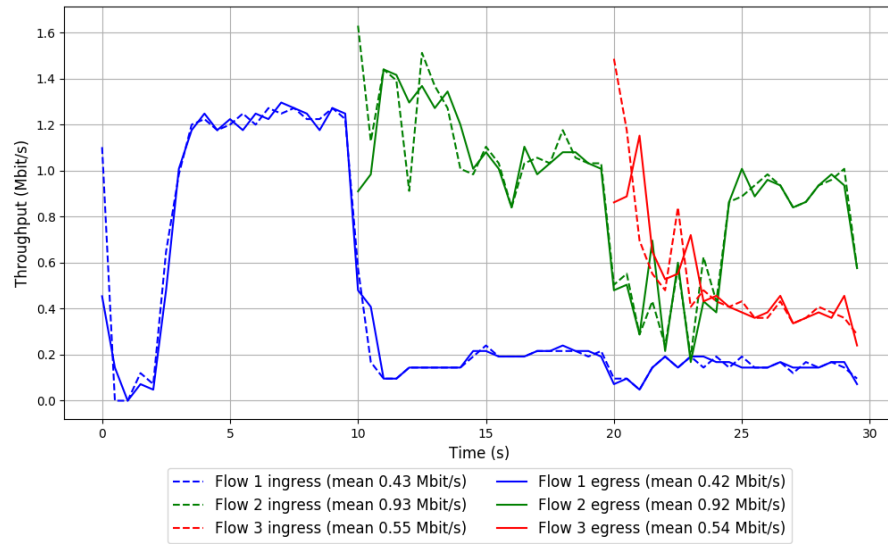


Run 3: Statistics of Indigo

Start at: 2017-11-30 07:38:48
End at: 2017-11-30 07:39:18
Local clock offset: -12.686 ms
Remote clock offset: -14.81 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 287.597 ms
Loss rate: 2.07%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 203.061 ms
Loss rate: 2.24%
-- Flow 2:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 268.022 ms
Loss rate: 1.70%
-- Flow 3:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 318.152 ms
Loss rate: 2.92%

Run 3: Report of Indigo — Data Link

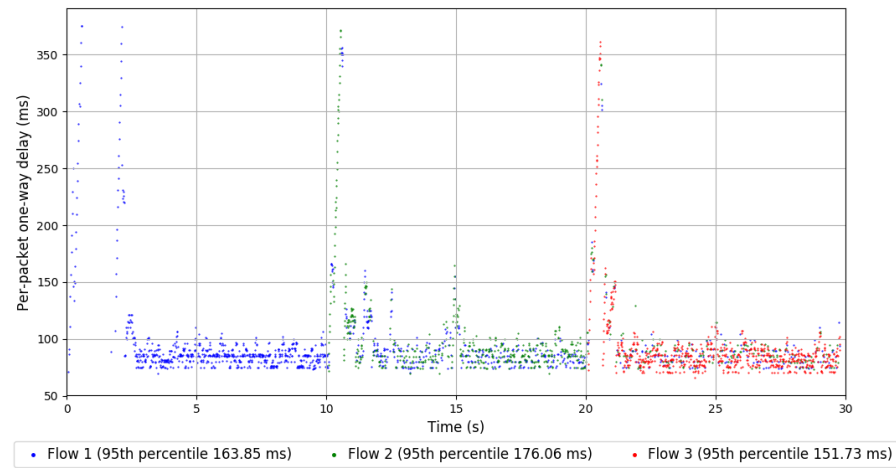
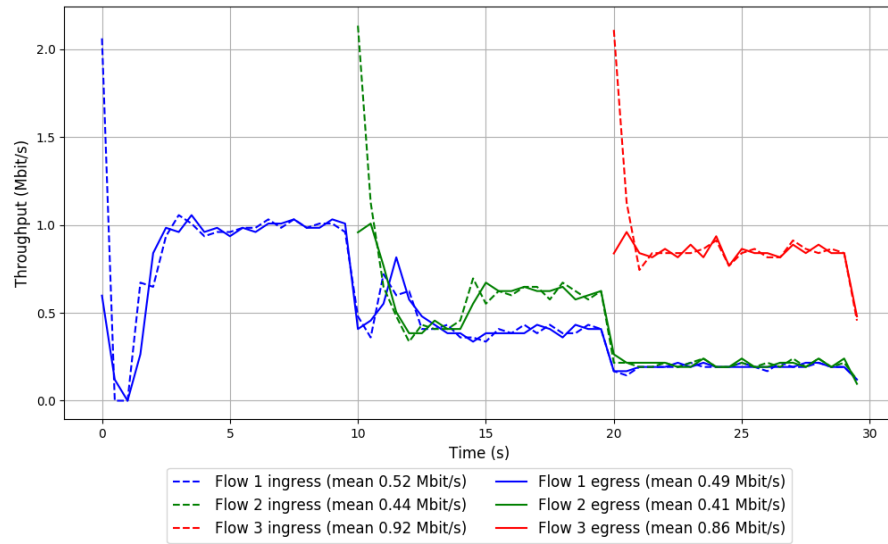


```
Run 1: Statistics of Indigo-calib

Start at: 2017-11-30 07:01:41
End at: 2017-11-30 07:02:11
Local clock offset: -14.133 ms
Remote clock offset: -14.199 ms

# Below is generated by plot.py at 2017-11-30 08:38:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 164.640 ms
Loss rate: 5.78%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 163.846 ms
Loss rate: 4.53%
-- Flow 2:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 176.059 ms
Loss rate: 6.36%
-- Flow 3:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 151.734 ms
Loss rate: 7.33%
```

Run 1: Report of Indigo-calib — Data Link

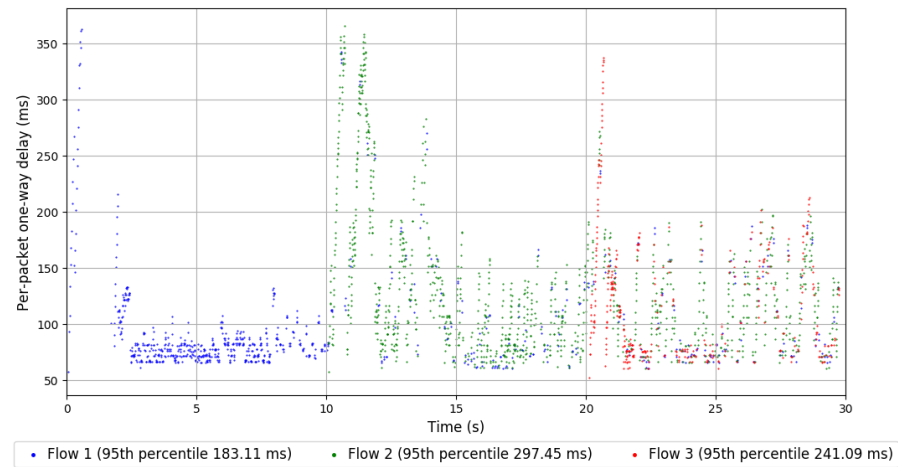
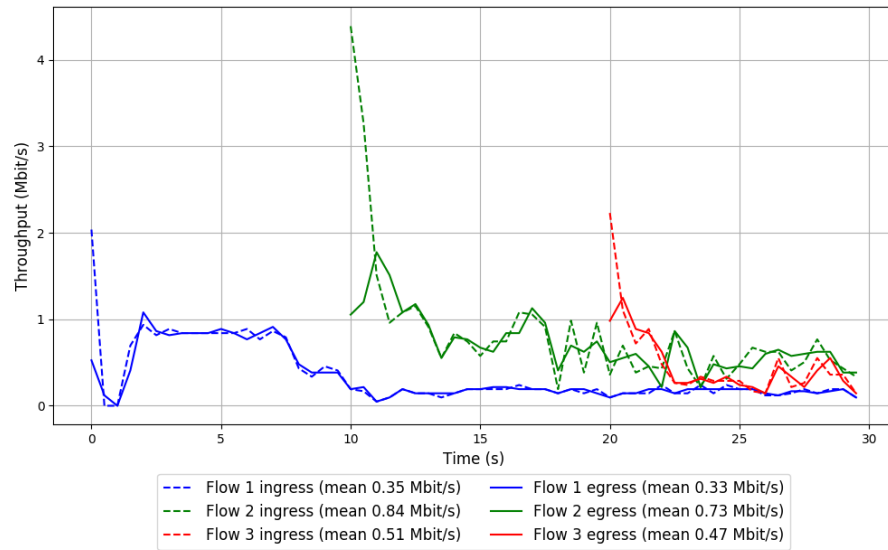


Run 2: Statistics of Indigo-calib

Start at: 2017-11-30 07:18:05
End at: 2017-11-30 07:18:35
Local clock offset: -18.01 ms
Remote clock offset: -13.921 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 267.583 ms
Loss rate: 10.52%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 183.108 ms
Loss rate: 6.83%
-- Flow 2:
Average throughput: 0.73 Mbit/s
95th percentile per-packet one-way delay: 297.452 ms
Loss rate: 13.40%
-- Flow 3:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 241.086 ms
Loss rate: 8.74%

Run 2: Report of Indigo-calib — Data Link



Run 3: Statistics of Indigo-calib

Start at: 2017-11-30 07:34:07
End at: 2017-11-30 07:34:37
Local clock offset: -13.893 ms
Remote clock offset: -15.12 ms

Below is generated by plot.py at 2017-11-30 08:38:28
Datalink statistics
-- Total of 3 flows:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 192.356 ms
Loss rate: 10.04%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 183.315 ms
Loss rate: 8.09%
-- Flow 2:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 192.356 ms
Loss rate: 11.05%
-- Flow 3:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 197.803 ms
Loss rate: 12.72%

Run 3: Report of Indigo-calib — Data Link

