

Pantheon Report

Generated at 2017-12-20 19:46:21 (UTC).

Data path: AWS Brazil 2 Ethernet (*local*) → Colombia 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).

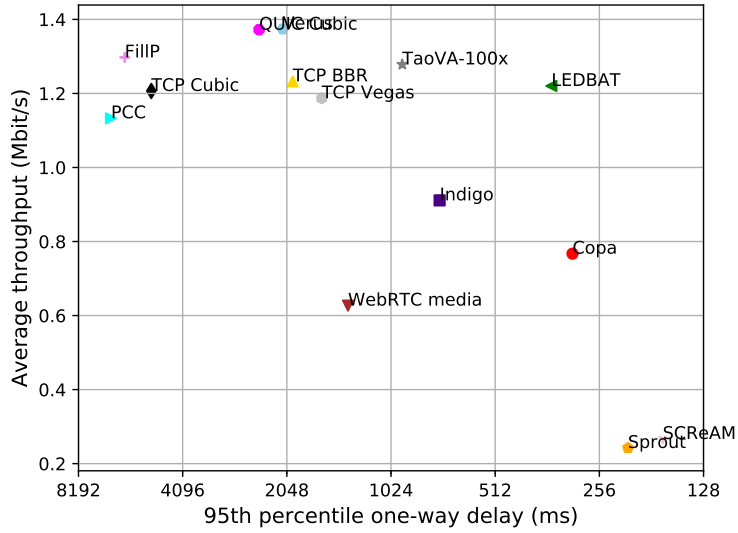
Tested BBR with qdisc of Fair Queuing (*fq*), and other schemes with the default Linux qdisc (*pfifo_fast*).

NTP offsets were measured against `gps.ntp.br` and have been applied to correct the timestamps in logs.

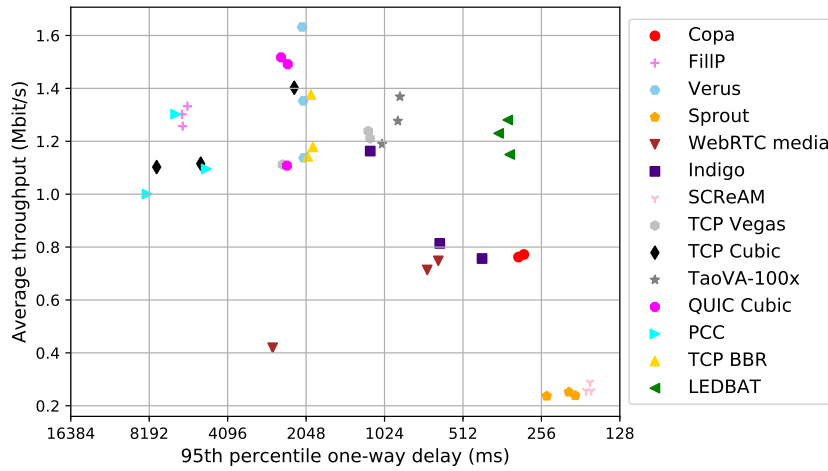
Git summary:

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

test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
 3 flows with 10s interval between flows (mean of all runs by scheme)



test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
 3 flows with 10s interval between flows



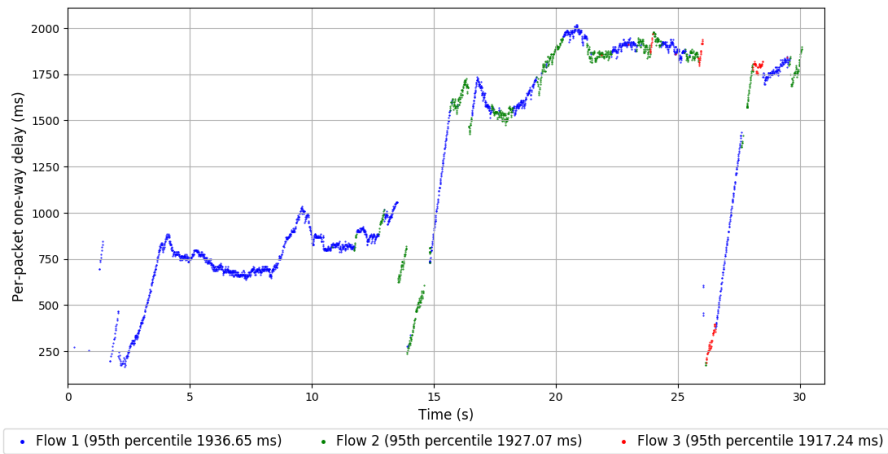
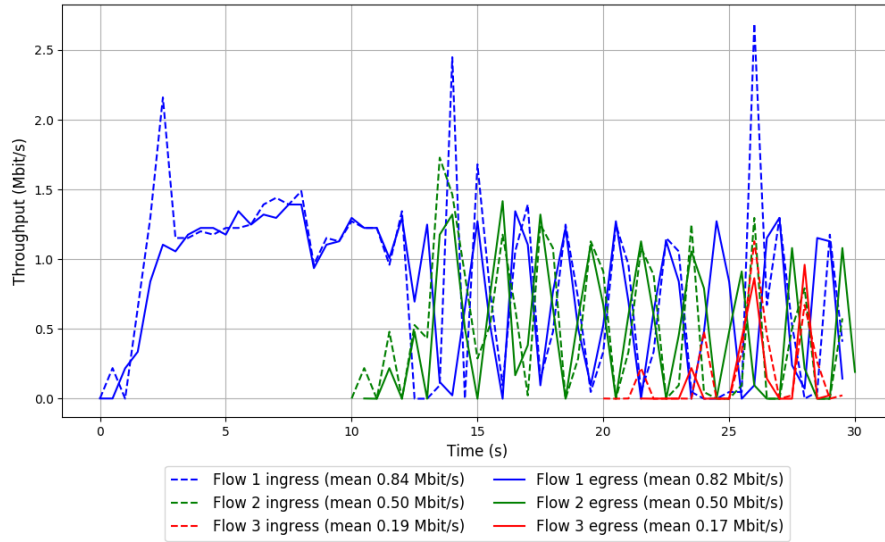
scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	3	0.87	0.51	0.20	1877.64	2028.36	2124.66	3.71	7.80	31.82
TCP Cubic	3	1.04	0.28	0.04	5066.03	4803.60	5097.00	15.36	32.09	66.94
LEDBAT	3	0.89	0.36	0.30	352.28	349.22	362.45	0.51	0.42	3.94
PCC	3	0.77	0.55	0.00	6544.40	6584.43	5932.89	49.55	29.64	38.33
QUIC Cubic	3	1.09	0.37	0.14	2386.84	2491.45	2416.23	5.80	16.14	33.33
SCReAM	3	0.08	0.20	0.16	157.95	171.41	169.12	0.22	0.42	0.35
WebRTC media	3	0.38	0.18	0.08	1288.79	1229.40	1064.09	0.07	0.17	0.58
Sprout	3	0.11	0.12	0.14	381.71	187.23	205.33	0.38	0.21	0.62
TaoVA-100x	3	0.75	0.58	0.46	890.89	948.56	1105.38	2.08	2.56	9.51
TCP Vegas	3	0.79	0.36	0.49	1756.35	989.47	988.67	1.50	2.30	7.37
Verus	3	1.36	0.01	0.01	2105.44	2077.84	2005.49	4.41	8.02	16.67
Copa	2	0.68	0.88	0.48	2869.75	291.08	325.86	0.00	0.78	2.62
FillP	3	1.28	0.04	0.00	6018.46	5783.65	5536.37	96.09	40.84	77.29
Indigo	3	0.49	0.35	0.58	857.25	560.43	511.10	0.72	0.47	0.60

Run 1: Statistics of TCP BBR

Start at: 2017-12-20 18:53:59
End at: 2017-12-20 18:54:29
Local clock offset: -0.101 ms
Remote clock offset: 17.824 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 1927.166 ms
Loss rate: 4.50%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 1936.655 ms
Loss rate: 3.51%
-- Flow 2:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 1927.067 ms
Loss rate: 3.00%
-- Flow 3:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 1917.237 ms
Loss rate: 26.61%
```

Run 1: Report of TCP BBR — Data Link

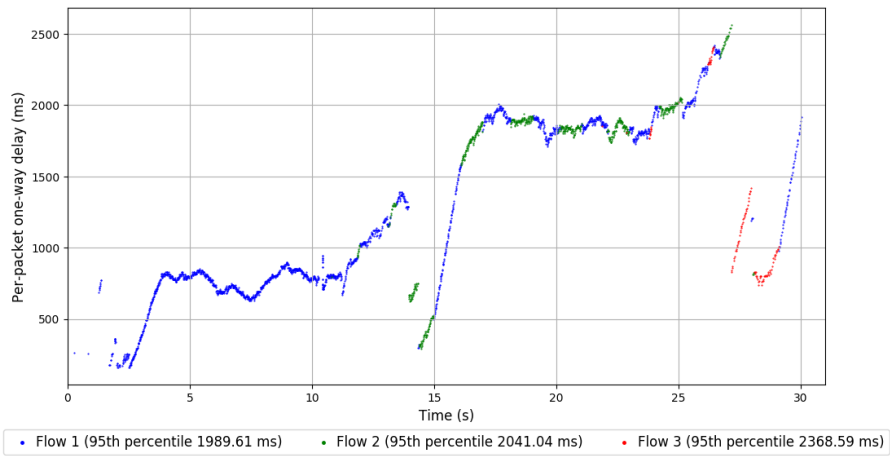
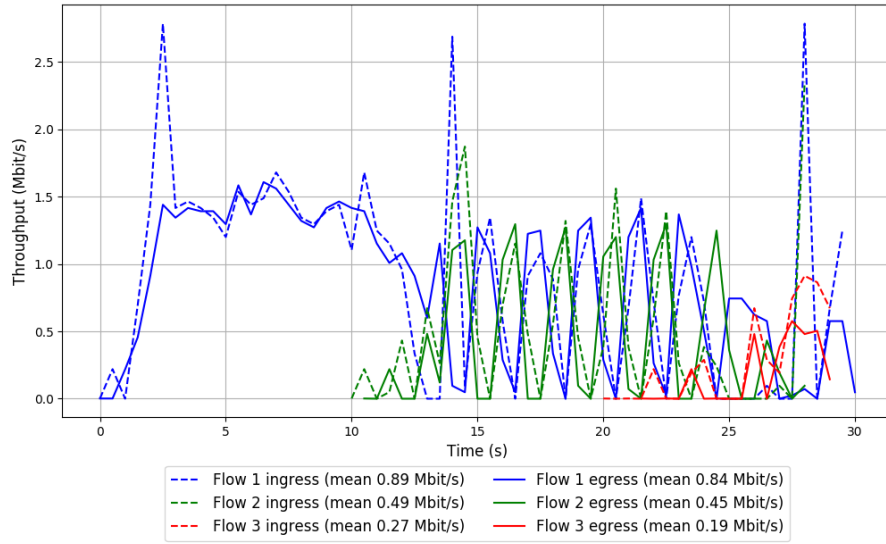


Run 2: Statistics of TCP BBR

Start at: 2017-12-20 19:12:48
End at: 2017-12-20 19:13:18
Local clock offset: -0.03 ms
Remote clock offset: 18.235 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 2019.775 ms
Loss rate: 10.65%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 1989.606 ms
Loss rate: 6.56%
-- Flow 2:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 2041.035 ms
Loss rate: 13.26%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 2368.587 ms
Loss rate: 44.69%
```

Run 2: Report of TCP BBR — Data Link

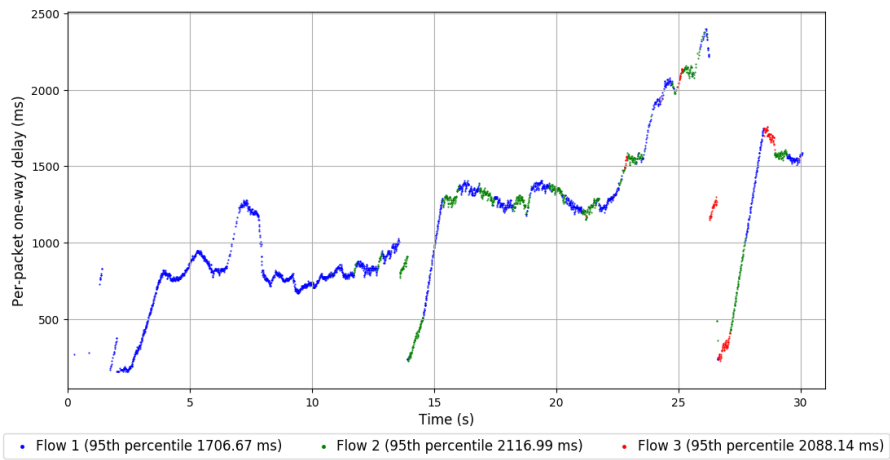
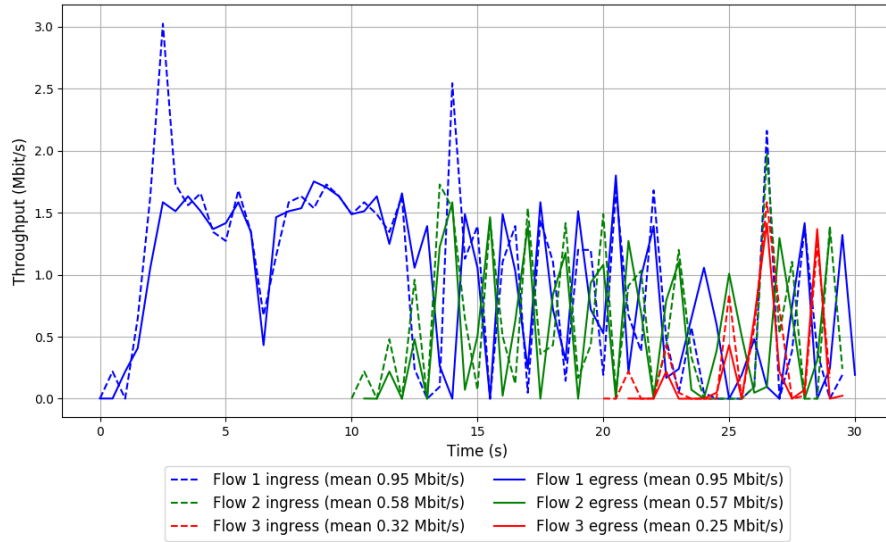


Run 3: Statistics of TCP BBR

Start at: 2017-12-20 19:31:41
End at: 2017-12-20 19:32:11
Local clock offset: -0.036 ms
Remote clock offset: 13.869 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 1961.168 ms
Loss rate: 4.26%
-- Flow 1:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 1706.666 ms
Loss rate: 1.05%
-- Flow 2:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 2116.985 ms
Loss rate: 7.15%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 2088.143 ms
Loss rate: 24.15%
```


Run 3: Report of TCP BBR — Data Link

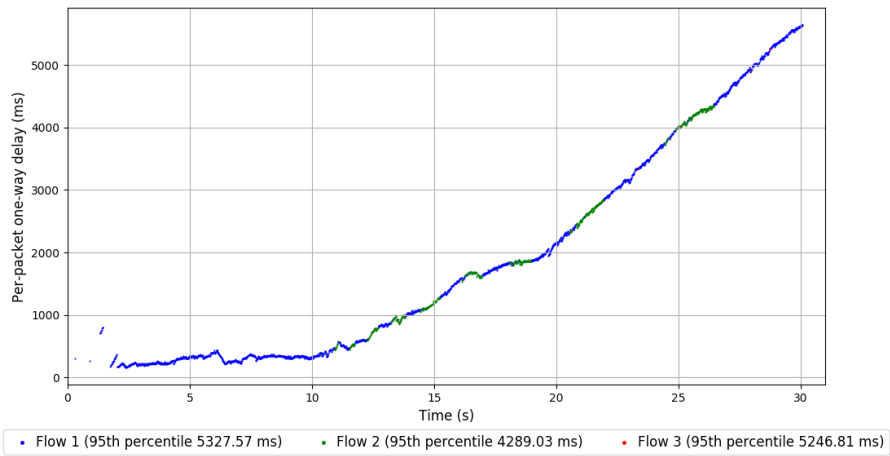
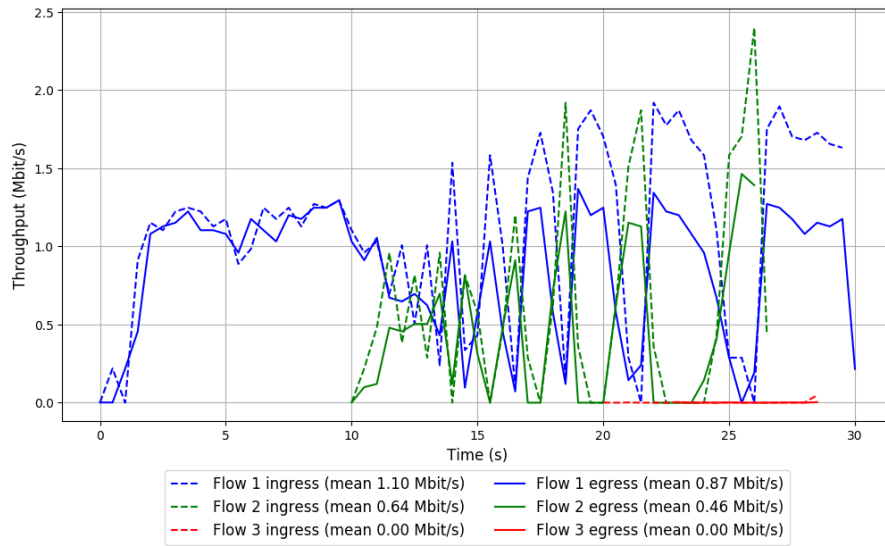


Run 1: Statistics of TCP Cubic

Start at: 2017-12-20 18:52:44
End at: 2017-12-20 18:53:14
Local clock offset: -0.033 ms
Remote clock offset: 16.969 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 5197.179 ms
Loss rate: 23.65%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 5327.573 ms
Loss rate: 21.28%
-- Flow 2:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 4289.026 ms
Loss rate: 30.80%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5246.808 ms
Loss rate: 87.02%
```

Run 1: Report of TCP Cubic — Data Link

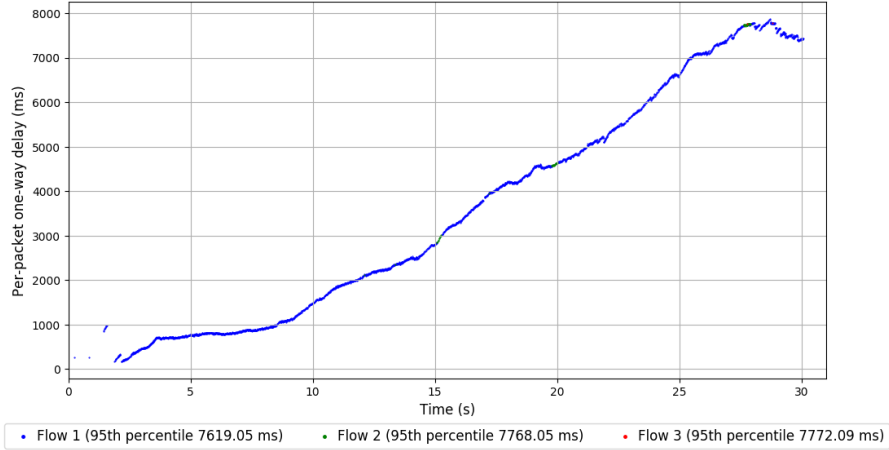
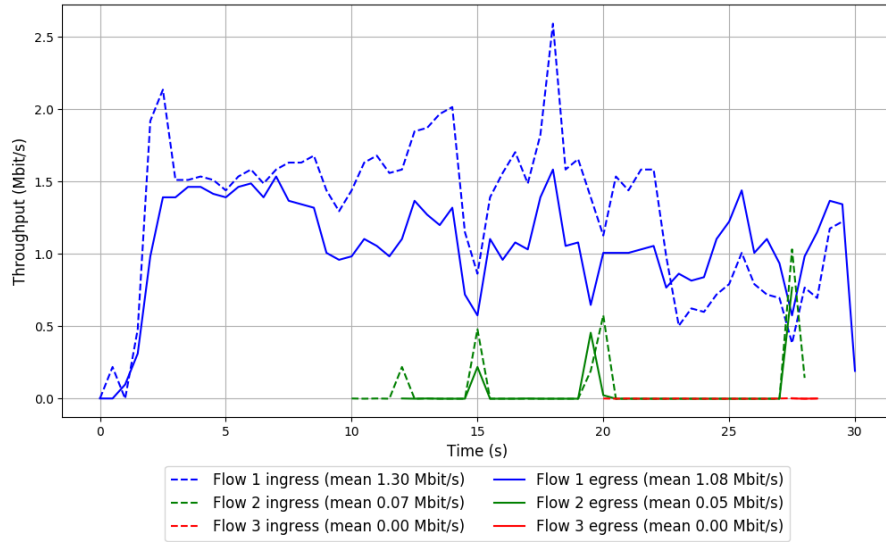


Run 2: Statistics of TCP Cubic

Start at: 2017-12-20 19:11:33
End at: 2017-12-20 19:12:03
Local clock offset: -0.01 ms
Remote clock offset: 15.036 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 7669.258 ms
Loss rate: 18.42%
-- Flow 1:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 7619.052 ms
Loss rate: 17.53%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 7768.052 ms
Loss rate: 44.41%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 7772.093 ms
Loss rate: 71.93%
```

Run 2: Report of TCP Cubic — Data Link

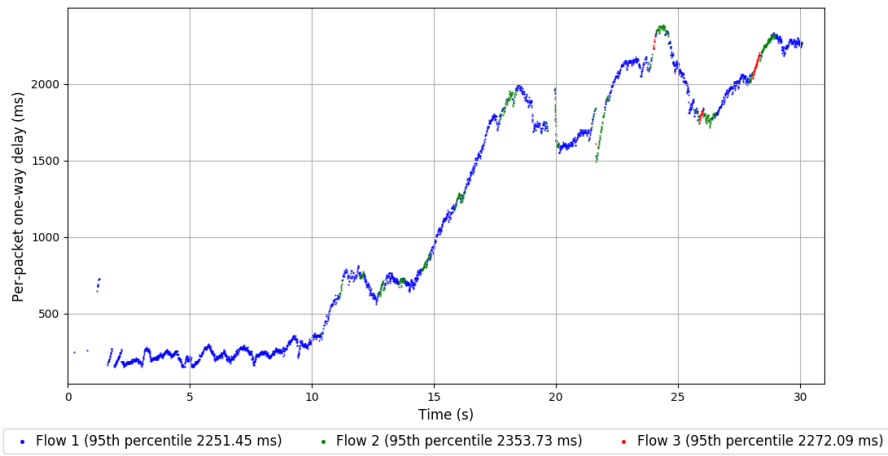
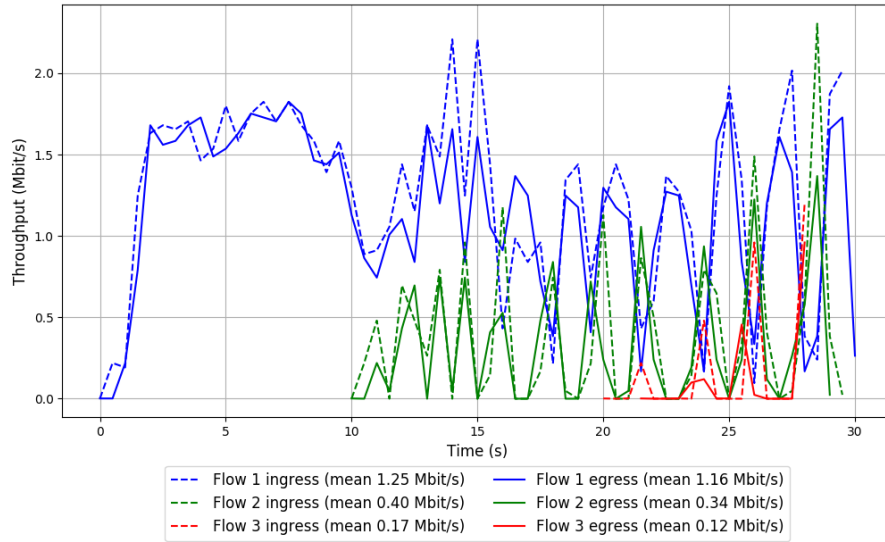


Run 3: Statistics of TCP Cubic

Start at: 2017-12-20 19:30:21
End at: 2017-12-20 19:30:51
Local clock offset: -0.005 ms
Remote clock offset: 13.202 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 2273.757 ms
Loss rate: 10.69%
-- Flow 1:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 2251.450 ms
Loss rate: 7.26%
-- Flow 2:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 2353.728 ms
Loss rate: 21.07%
-- Flow 3:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 2272.086 ms
Loss rate: 41.88%
```

Run 3: Report of TCP Cubic — Data Link

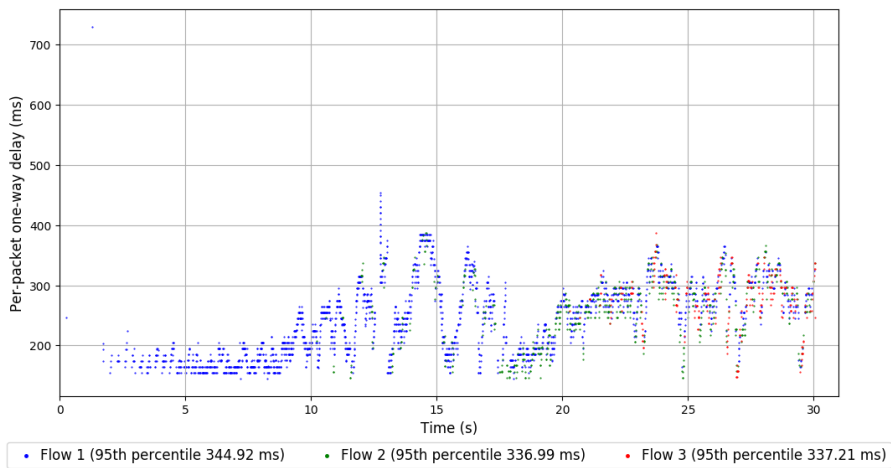
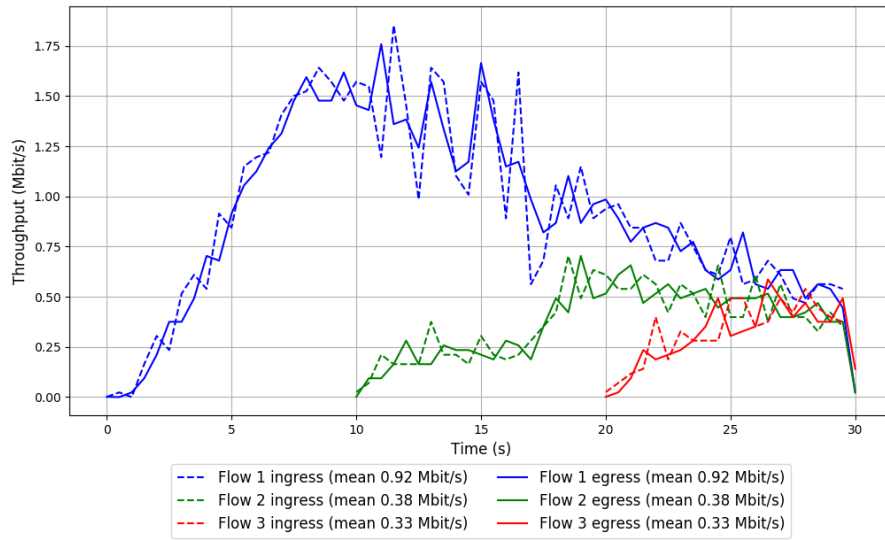


Run 1: Statistics of LEDBAT

Start at: 2017-12-20 19:02:47
End at: 2017-12-20 19:03:17
Local clock offset: 0.003 ms
Remote clock offset: 11.466 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 344.780 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 344.920 ms
Loss rate: 0.64%
-- Flow 2:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 336.986 ms
Loss rate: 1.08%
-- Flow 3:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 337.215 ms
Loss rate: 1.08%
```


Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2017-12-20 19:21:35

End at: 2017-12-20 19:22:05

Local clock offset: -0.015 ms

Remote clock offset: 8.645 ms

Below is generated by plot.py at 2017-12-20 19:45:49

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.15 Mbit/s

95th percentile per-packet one-way delay: 338.697 ms

Loss rate: 0.85%

-- Flow 1:

Average throughput: 0.83 Mbit/s

95th percentile per-packet one-way delay: 338.236 ms

Loss rate: 0.43%

-- Flow 2:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 348.143 ms

Loss rate: 0.17%

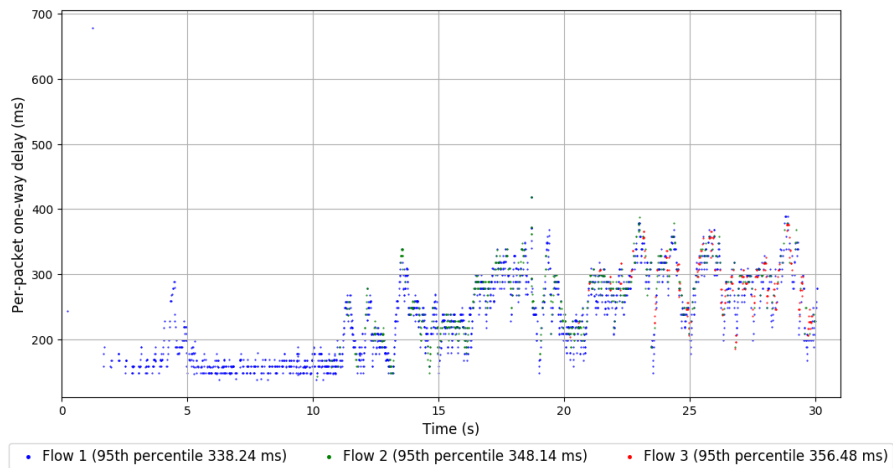
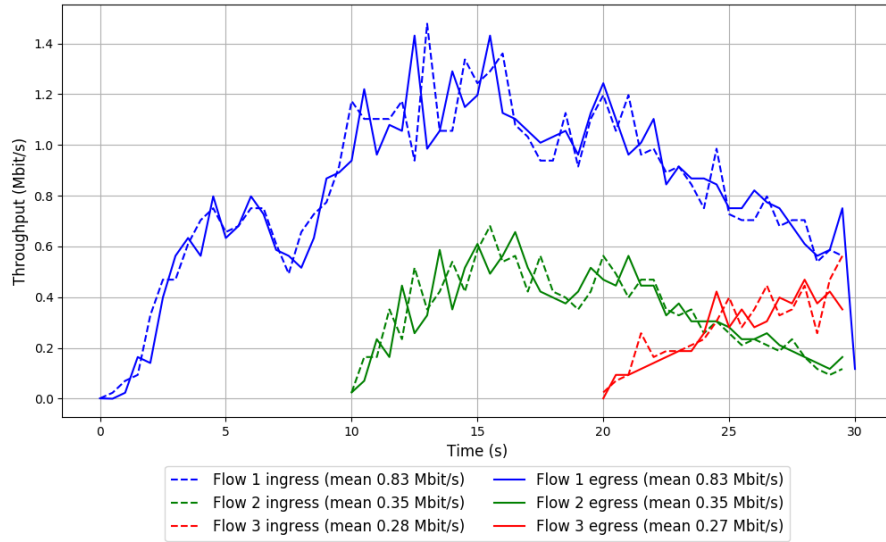
-- Flow 3:

Average throughput: 0.27 Mbit/s

95th percentile per-packet one-way delay: 356.479 ms

Loss rate: 6.25%

Run 2: Report of LEDBAT — Data Link

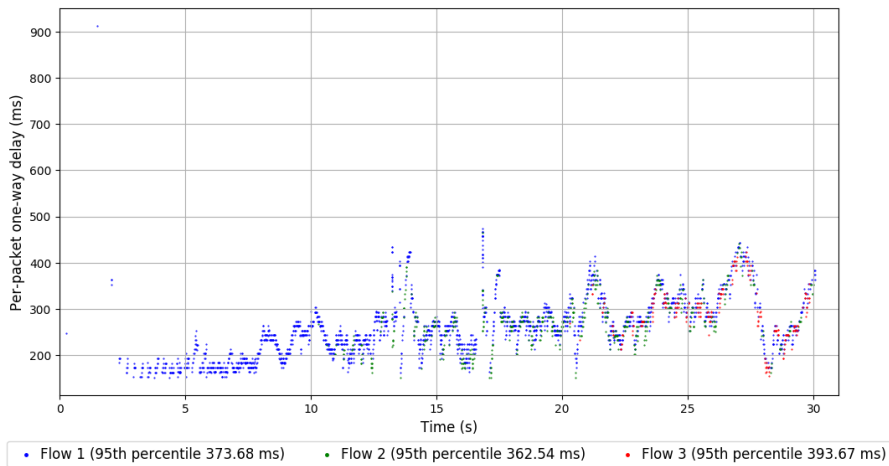
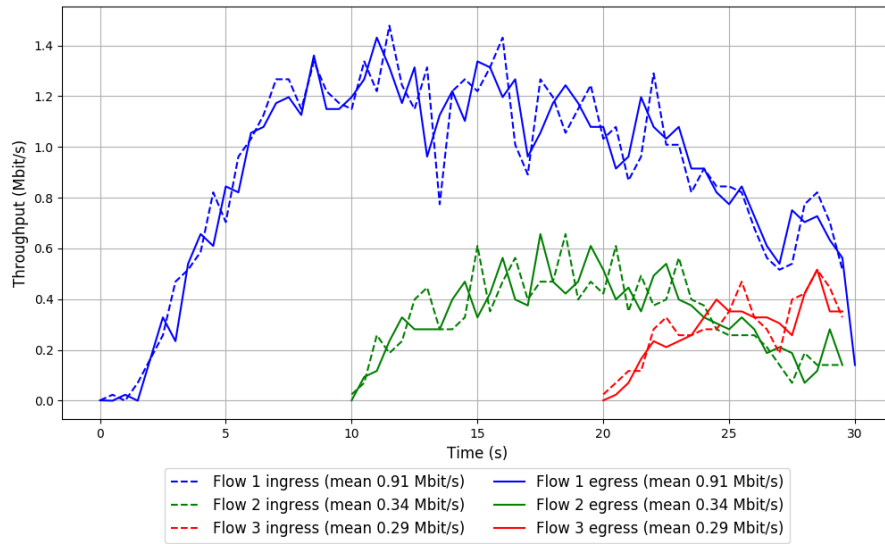


Run 3: Statistics of LEDBAT

Start at: 2017-12-20 19:40:25
End at: 2017-12-20 19:40:55
Local clock offset: -0.012 ms
Remote clock offset: 12.619 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:52
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.23 Mbit/s
95th percentile per-packet one-way delay: 373.674 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 373.679 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 362.542 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 393.669 ms
Loss rate: 4.49%
```

Run 3: Report of LEDBAT — Data Link

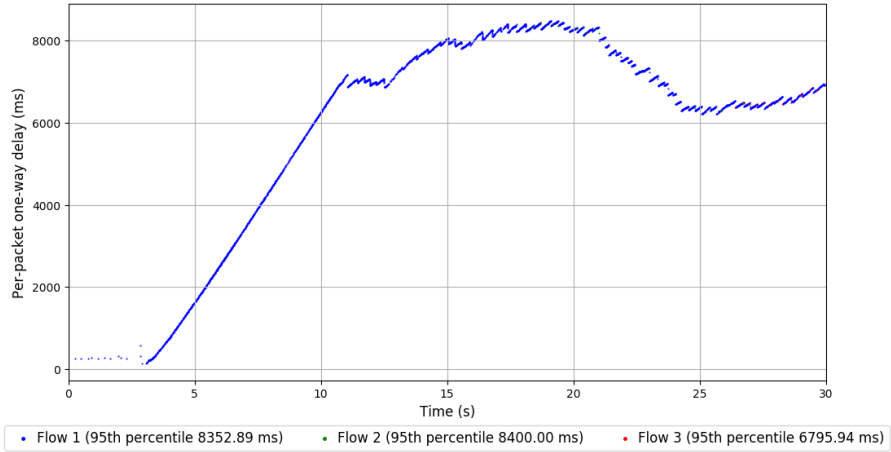
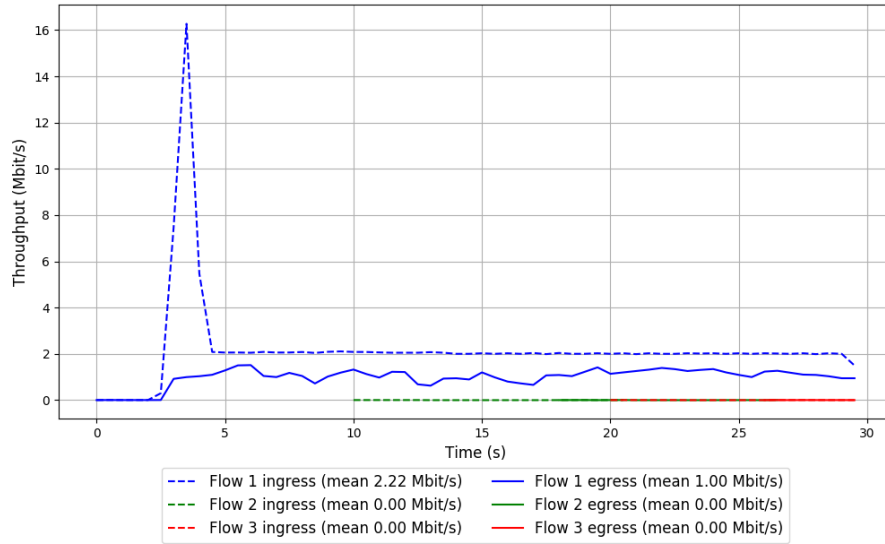


Run 1: Statistics of PCC

Start at: 2017-12-20 18:50:14
End at: 2017-12-20 18:50:44
Local clock offset: -0.036 ms
Remote clock offset: 11.699 ms

```
# Below is generated by plot.py at 2017-12-20 19:45:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 8354.513 ms
Loss rate: 55.24%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 8352.893 ms
Loss rate: 55.25%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8400.003 ms
Loss rate: 26.01%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6795.935 ms
Loss rate: 47.76%
```

Run 1: Report of PCC — Data Link

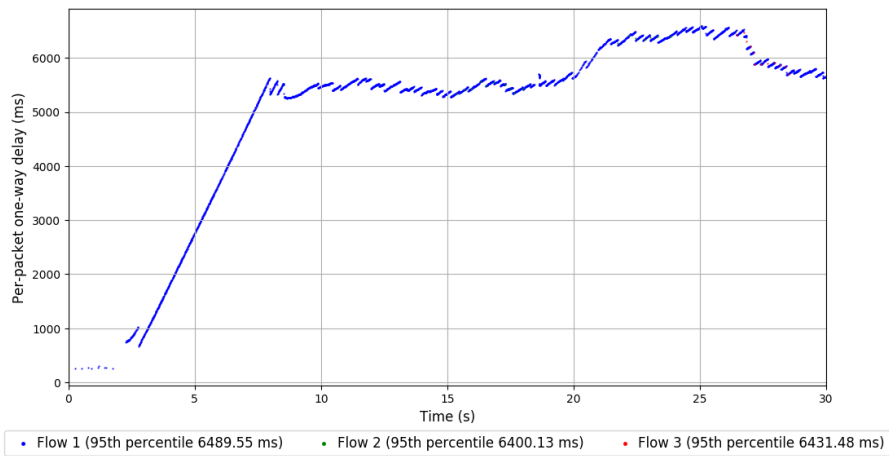
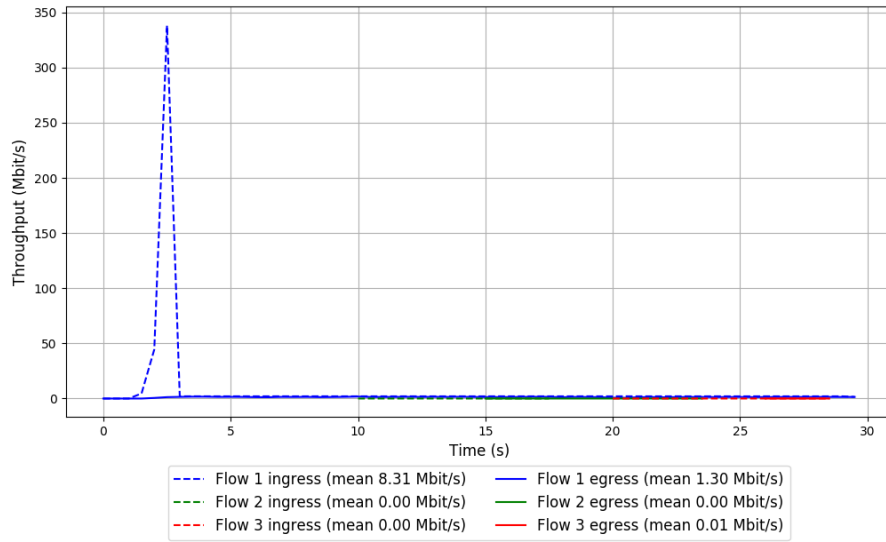


Run 2: Statistics of PCC

Start at: 2017-12-20 19:09:03
End at: 2017-12-20 19:09:33
Local clock offset: -0.064 ms
Remote clock offset: 16.971 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 6489.015 ms
Loss rate: 84.41%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 6489.548 ms
Loss rate: 84.42%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6400.128 ms
Loss rate: 14.80%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 6431.483 ms
Loss rate: 44.83%
```


Run 2: Report of PCC — Data Link

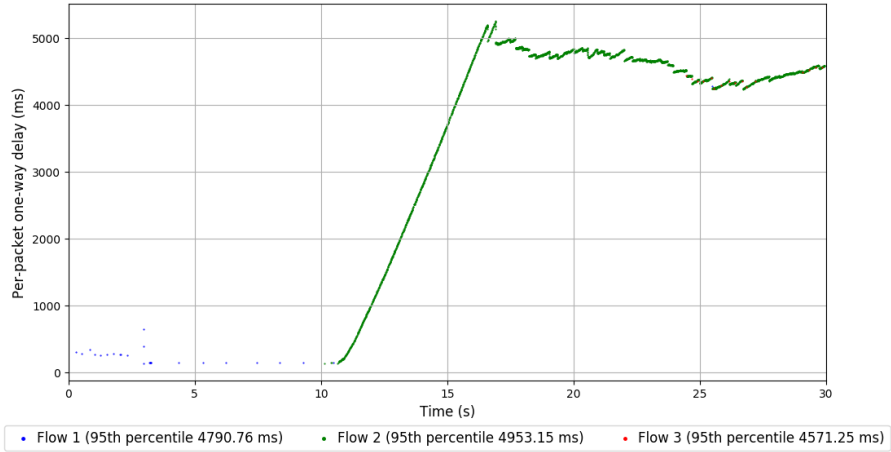
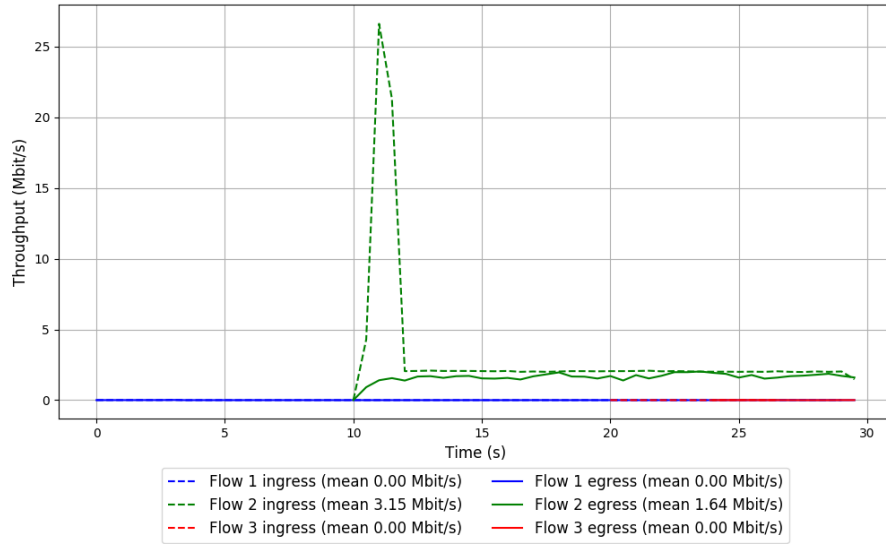


Run 3: Statistics of PCC

Start at: 2017-12-20 19:27:51
End at: 2017-12-20 19:28:21
Local clock offset: -0.007 ms
Remote clock offset: 10.075 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 4952.217 ms
Loss rate: 48.07%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4790.761 ms
Loss rate: 8.98%
-- Flow 2:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 4953.145 ms
Loss rate: 48.11%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4571.254 ms
Loss rate: 22.41%
```

Run 3: Report of PCC — Data Link

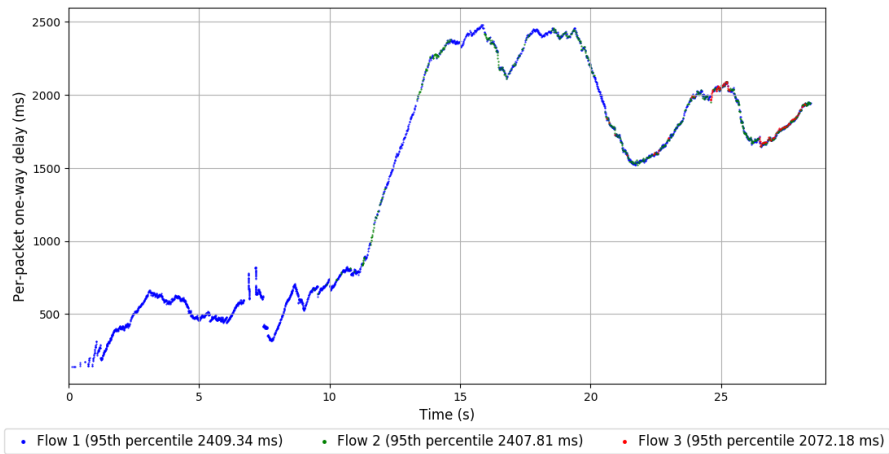
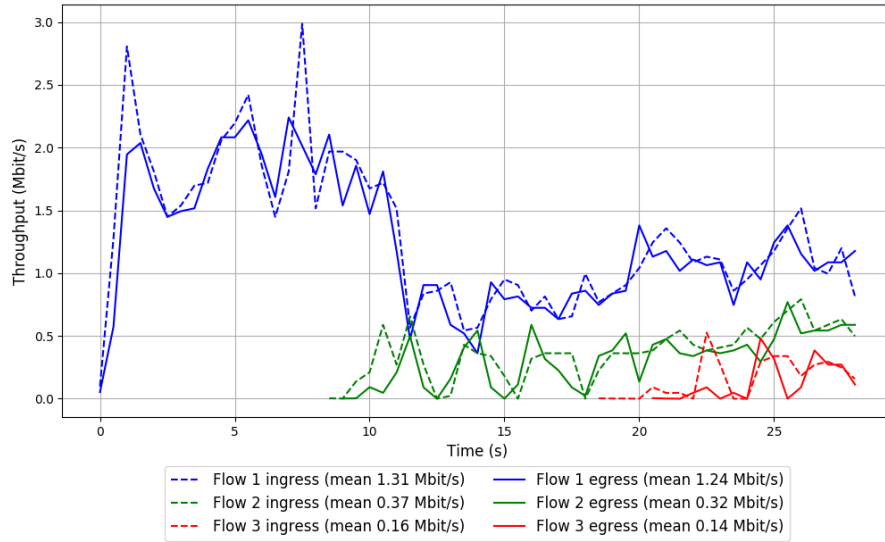


Run 1: Statistics of QUIC Cubic

Start at: 2017-12-20 18:56:29
End at: 2017-12-20 18:56:59
Local clock offset: -0.091 ms
Remote clock offset: 11.713 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.49 Mbit/s
95th percentile per-packet one-way delay: 2407.881 ms
Loss rate: 8.01%
-- Flow 1:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 2409.335 ms
Loss rate: 5.51%
-- Flow 2:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 2407.814 ms
Loss rate: 15.59%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 2072.181 ms
Loss rate: 31.96%
```

Run 1: Report of QUIC Cubic — Data Link

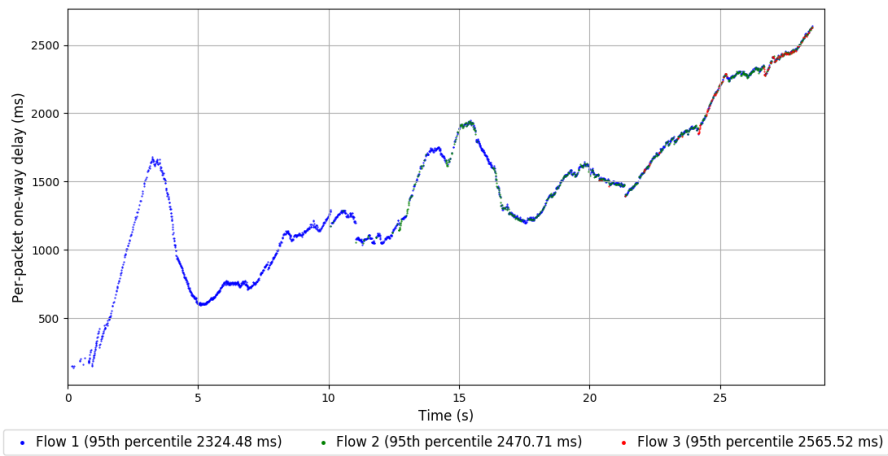
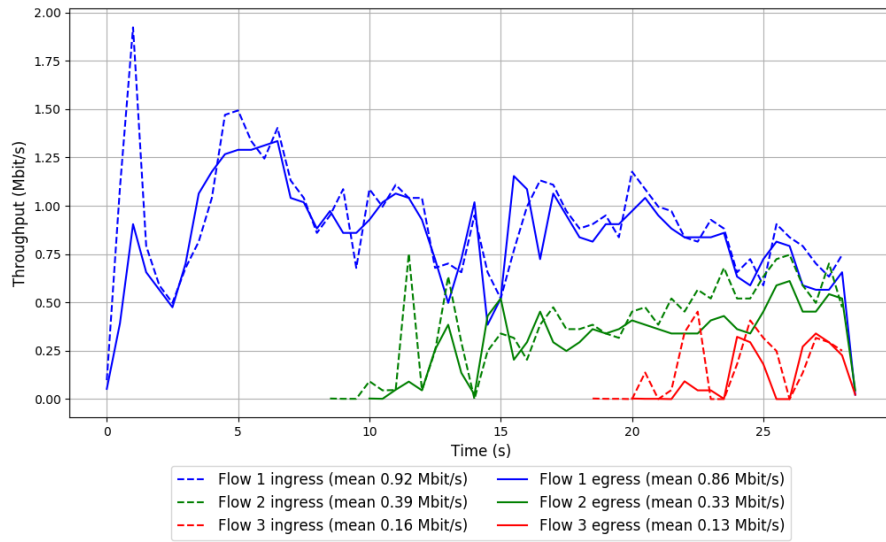


Run 2: Statistics of QUIC Cubic

Start at: 2017-12-20 19:15:18
End at: 2017-12-20 19:15:48
Local clock offset: -0.015 ms
Remote clock offset: 16.598 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 2426.286 ms
Loss rate: 11.41%
-- Flow 1:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 2324.476 ms
Loss rate: 7.46%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 2470.707 ms
Loss rate: 20.78%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 2565.517 ms
Loss rate: 31.77%
```

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2017-12-20 19:34:11

End at: 2017-12-20 19:34:41

Local clock offset: -0.01 ms

Remote clock offset: 17.368 ms

Below is generated by plot.py at 2017-12-20 19:46:00

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.52 Mbit/s

95th percentile per-packet one-way delay: 2555.147 ms

Loss rate: 7.29%

-- Flow 1:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 2426.722 ms

Loss rate: 4.43%

-- Flow 2:

Average throughput: 0.47 Mbit/s

95th percentile per-packet one-way delay: 2595.827 ms

Loss rate: 12.06%

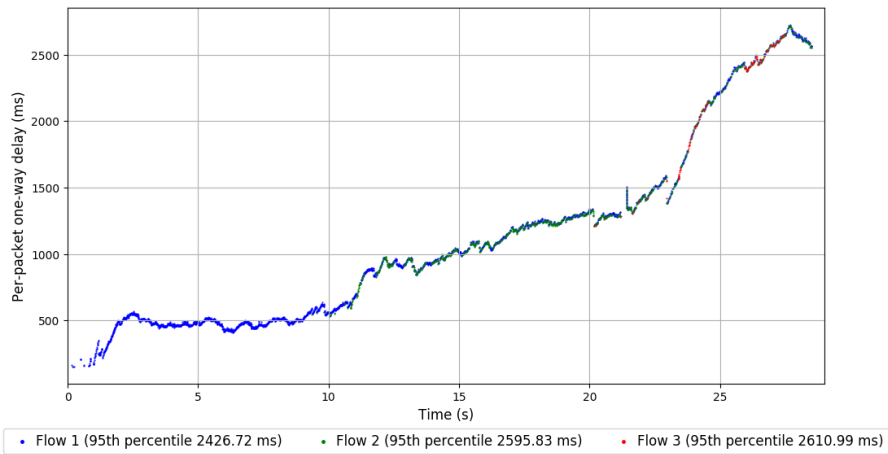
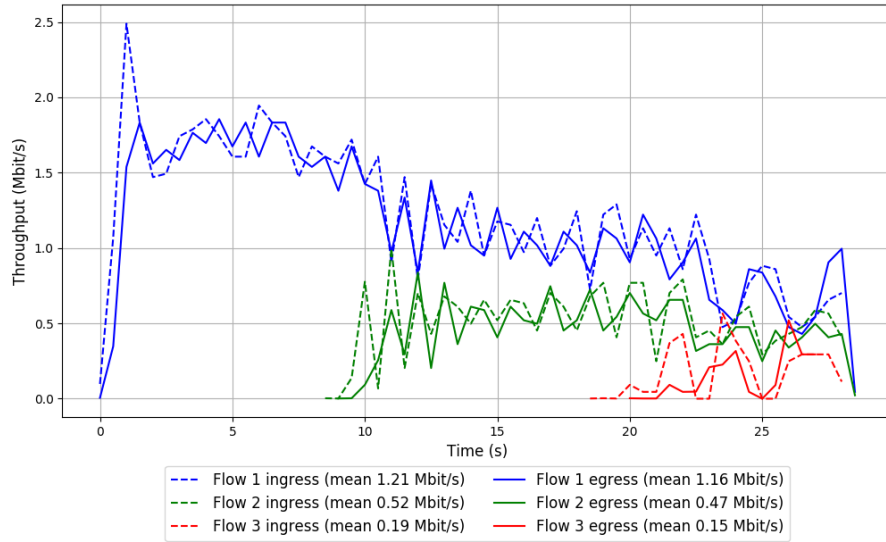
-- Flow 3:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 2610.993 ms

Loss rate: 36.27%

Run 3: Report of QUIC Cubic — Data Link

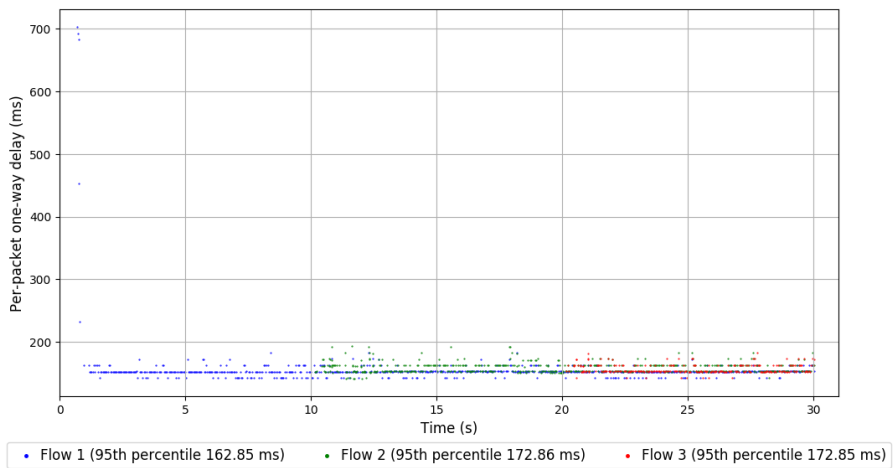
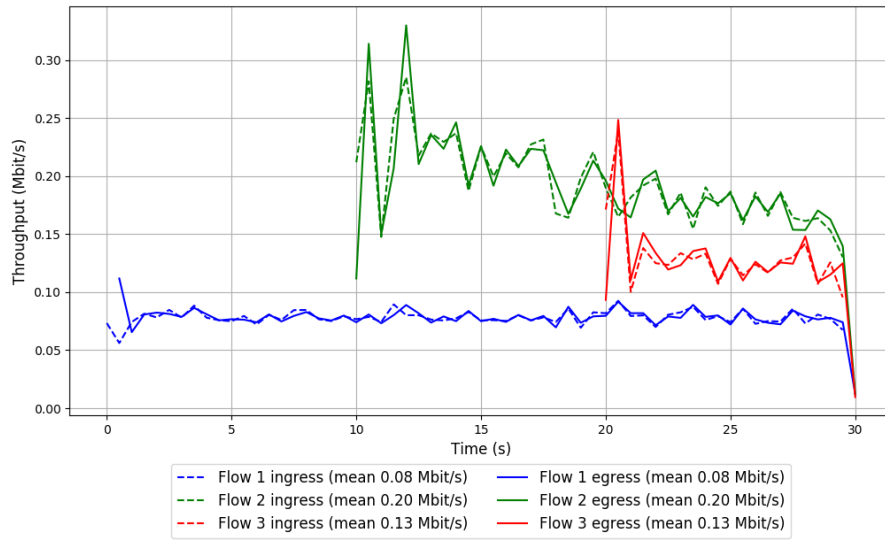


Run 1: Statistics of SCReAM

Start at: 2017-12-20 18:48:59
End at: 2017-12-20 18:49:29
Local clock offset: -0.032 ms
Remote clock offset: 17.762 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 172.695 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 162.848 ms
Loss rate: 0.27%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 172.860 ms
Loss rate: 0.46%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 172.848 ms
Loss rate: 0.34%
```

Run 1: Report of SCReAM — Data Link

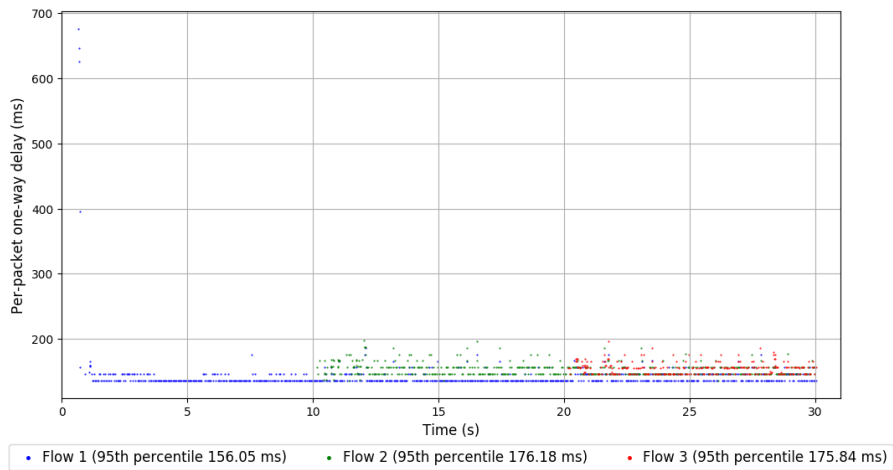
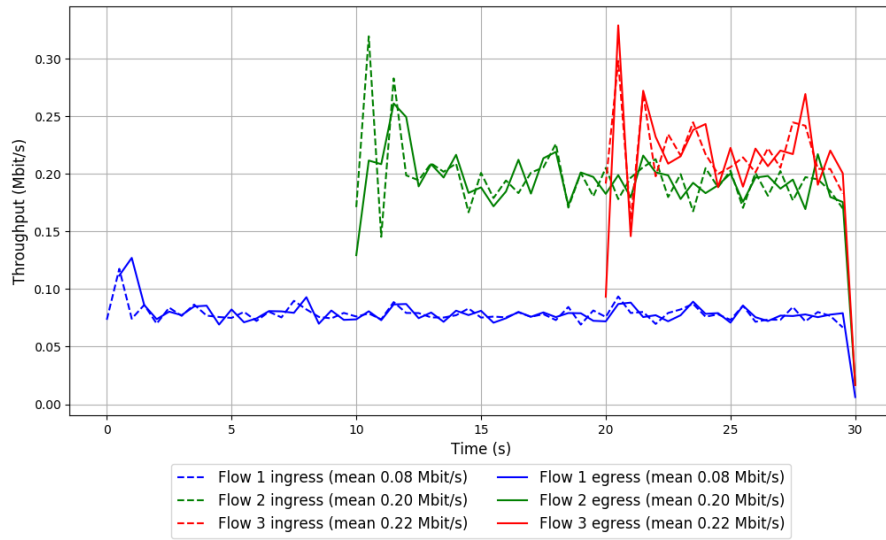


Run 2: Statistics of SCReAM

Start at: 2017-12-20 19:07:48
End at: 2017-12-20 19:08:18
Local clock offset: -0.011 ms
Remote clock offset: 10.786 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 166.474 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 156.047 ms
Loss rate: 0.27%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 176.184 ms
Loss rate: 0.39%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 175.835 ms
Loss rate: 0.35%
```

Run 2: Report of SCReAM — Data Link

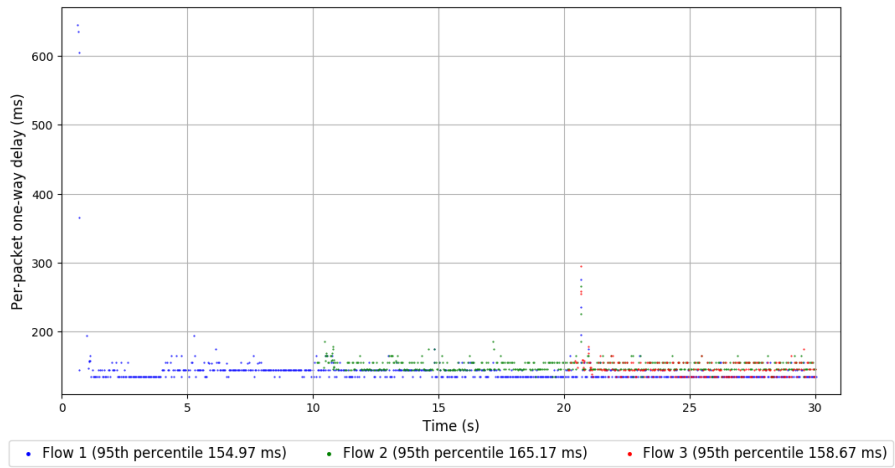
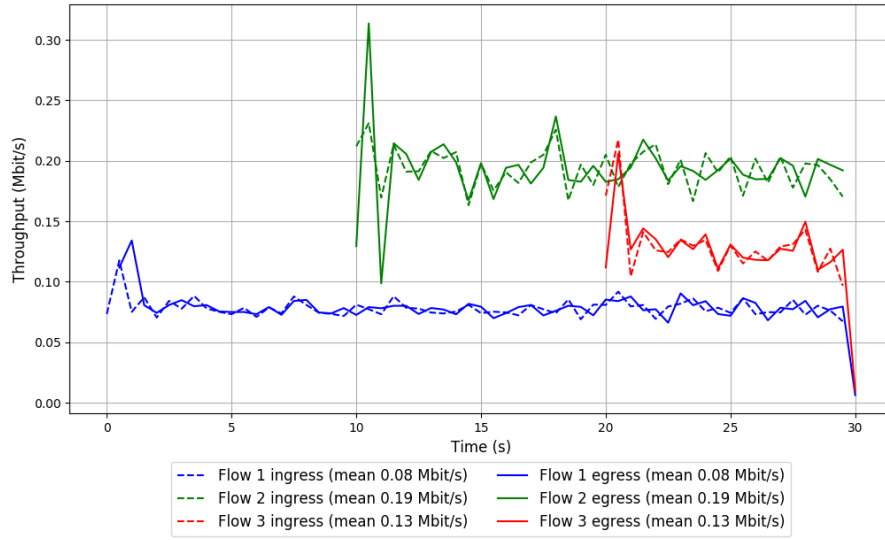


Run 3: Statistics of SCReAM

Start at: 2017-12-20 19:26:37
End at: 2017-12-20 19:27:07
Local clock offset: -0.022 ms
Remote clock offset: 10.305 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 164.785 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 154.967 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 165.172 ms
Loss rate: 0.40%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 158.674 ms
Loss rate: 0.35%
```

Run 3: Report of SCReAM — Data Link

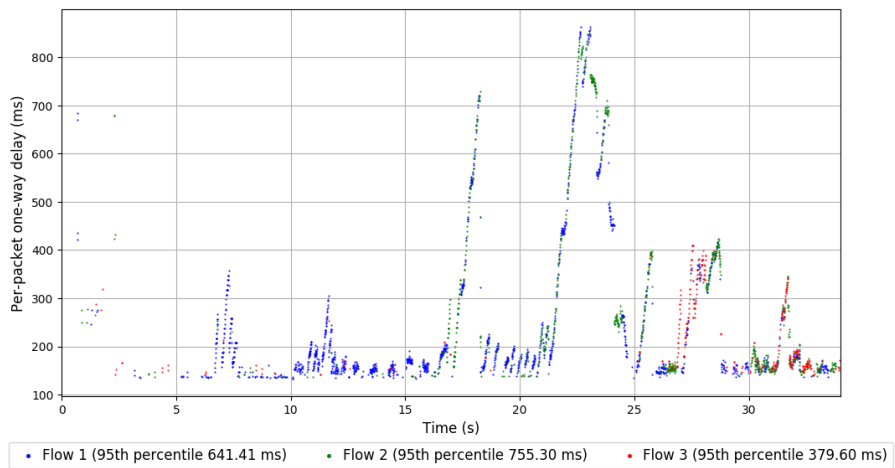
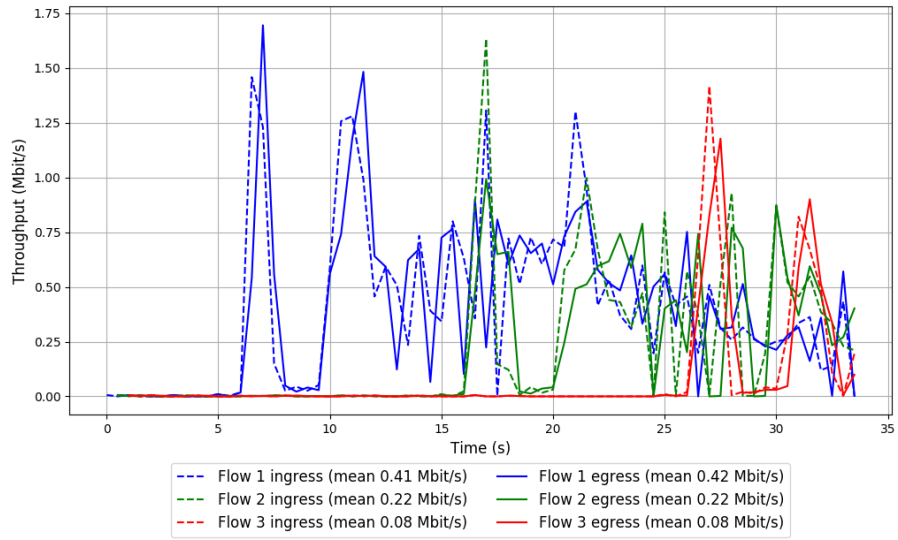


Run 1: Statistics of WebRTC media

Start at: 2017-12-20 18:57:44
End at: 2017-12-20 18:58:14
Local clock offset: -0.02 ms
Remote clock offset: 12.181 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 701.948 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 641.412 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 755.297 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 379.599 ms
Loss rate: 1.75%
```


Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2017-12-20 19:16:34

End at: 2017-12-20 19:17:04

Local clock offset: -0.024 ms

Remote clock offset: 7.028 ms

Below is generated by plot.py at 2017-12-20 19:46:02

Datalink statistics

-- Total of 3 flows:

Average throughput: 0.42 Mbit/s

95th percentile per-packet one-way delay: 2751.844 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.26 Mbit/s

95th percentile per-packet one-way delay: 2809.668 ms

Loss rate: 0.00%

-- Flow 2:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 2257.566 ms

Loss rate: 0.00%

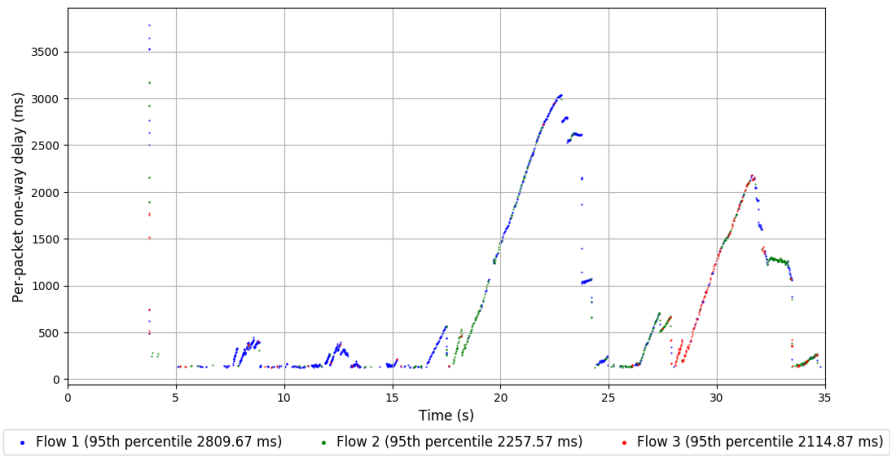
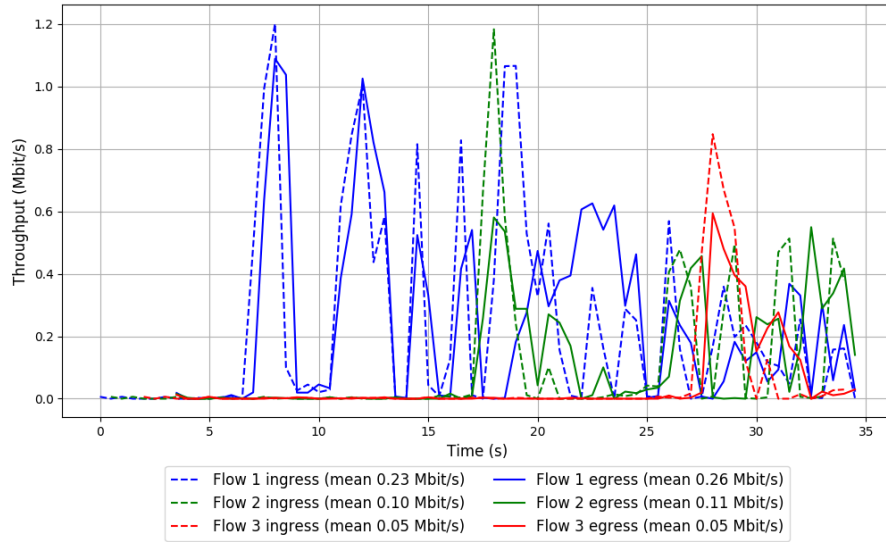
-- Flow 3:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 2114.871 ms

Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link

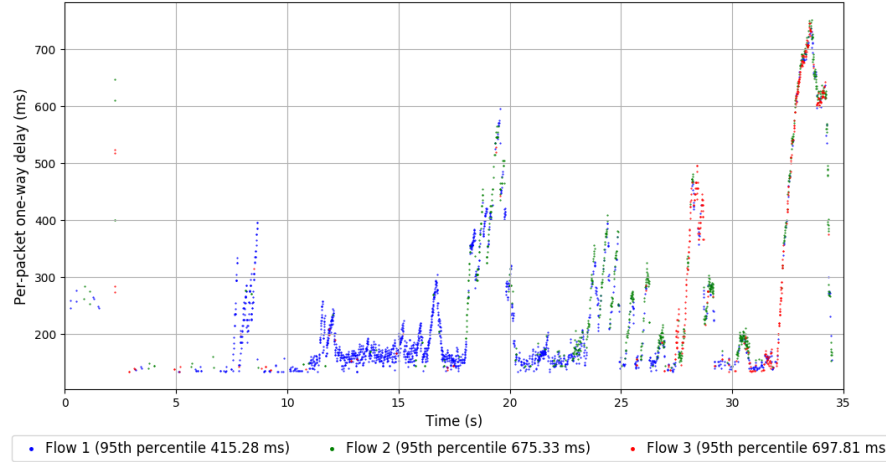
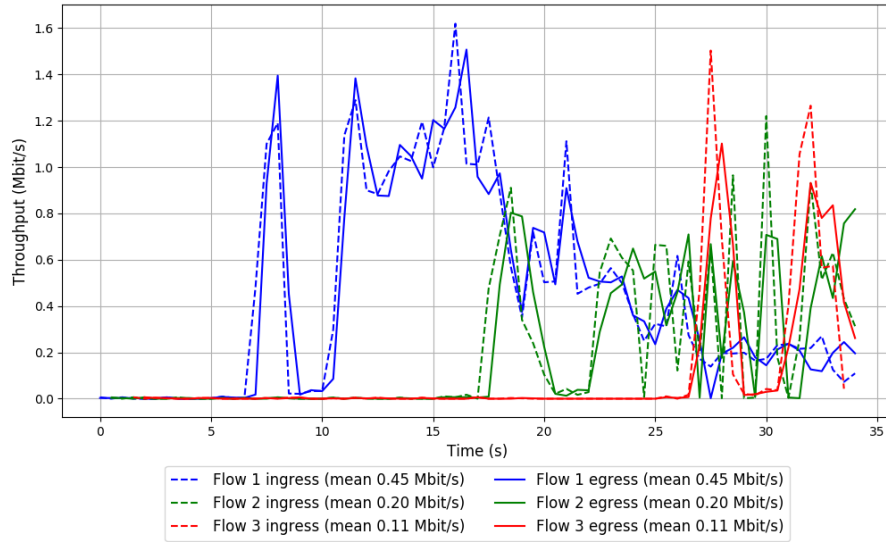


Run 3: Statistics of WebRTC media

Start at: 2017-12-20 19:35:26
End at: 2017-12-20 19:35:56
Local clock offset: -0.005 ms
Remote clock offset: 10.103 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 636.690 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 415.283 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 675.333 ms
Loss rate: 0.51%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 697.810 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

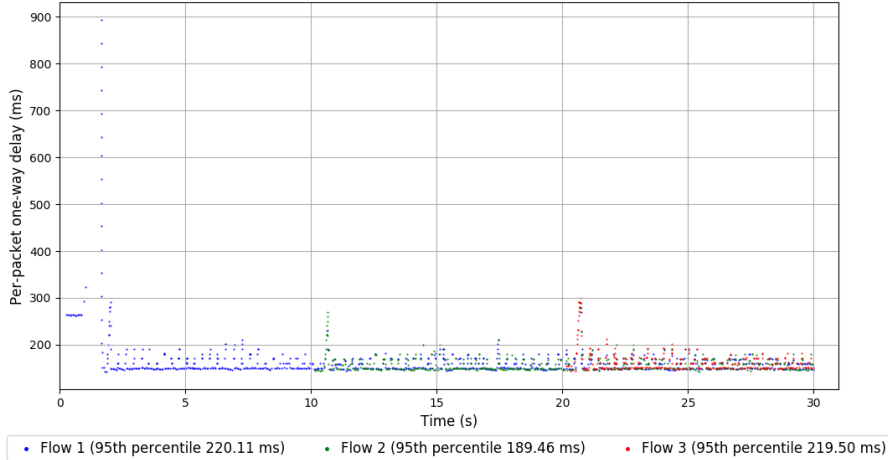
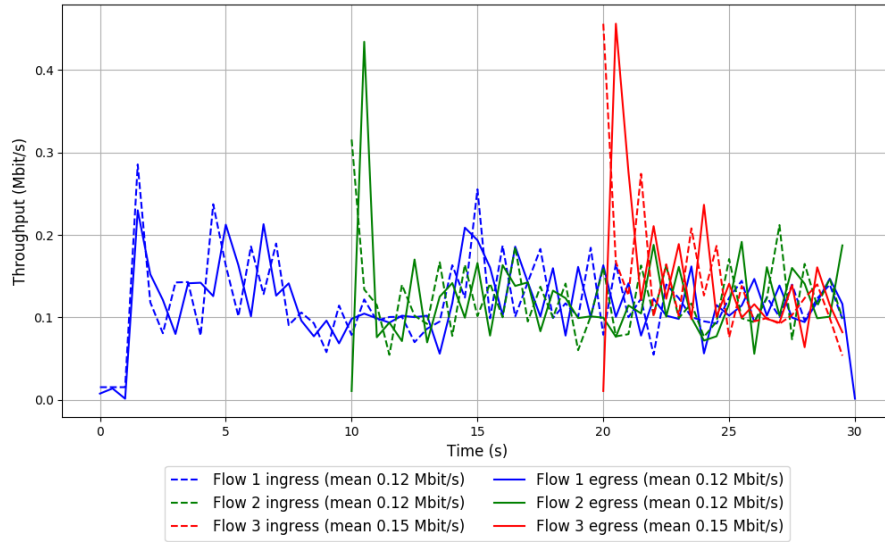


Run 1: Statistics of Sprout

Start at: 2017-12-20 19:05:16
End at: 2017-12-20 19:05:46
Local clock offset: -0.087 ms
Remote clock offset: 17.833 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 200.957 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 220.107 ms
Loss rate: 0.36%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 189.464 ms
Loss rate: 0.54%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 219.504 ms
Loss rate: 0.05%
```

Run 1: Report of Sprout — Data Link

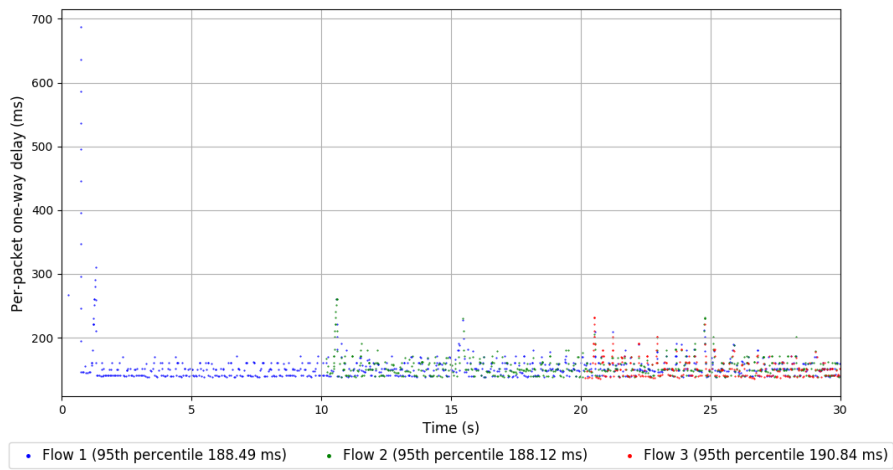
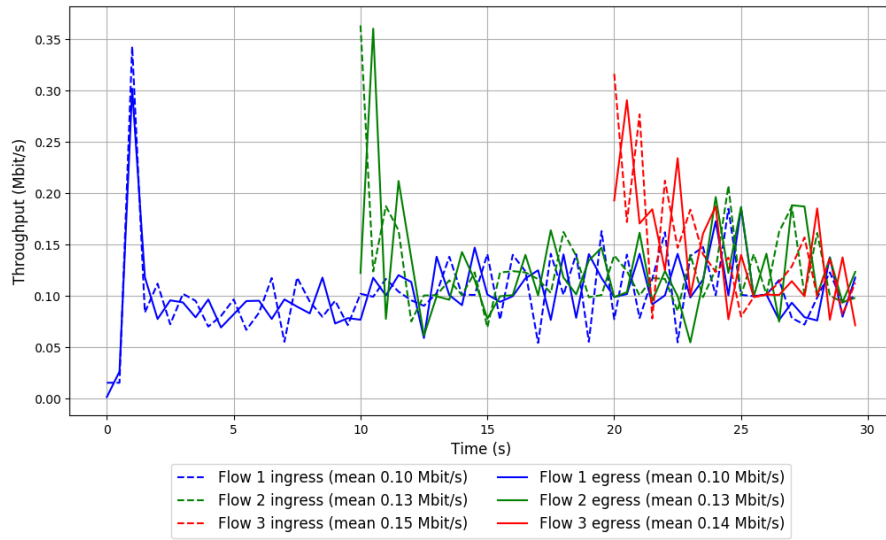


Run 2: Statistics of Sprout

Start at: 2017-12-20 19:24:04
End at: 2017-12-20 19:24:34
Local clock offset: -0.095 ms
Remote clock offset: 11.006 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 189.860 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 188.486 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 188.118 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 190.835 ms
Loss rate: 1.70%
```


Run 2: Report of Sprout — Data Link

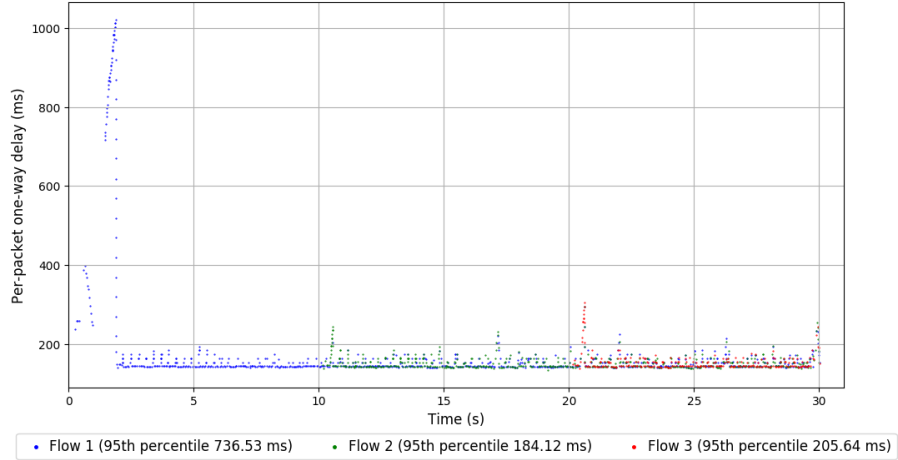
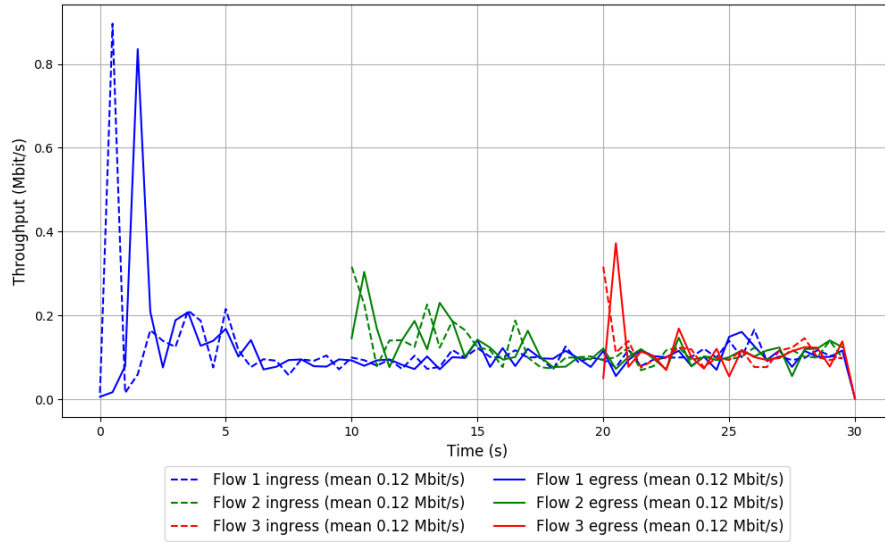


Run 3: Statistics of Sprout

Start at: 2017-12-20 19:42:57
End at: 2017-12-20 19:43:27
Local clock offset: -0.011 ms
Remote clock offset: 11.823 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 244.229 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 736.528 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 184.123 ms
Loss rate: 0.03%
-- Flow 3:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 205.641 ms
Loss rate: 0.10%
```

Run 3: Report of Sprout — Data Link

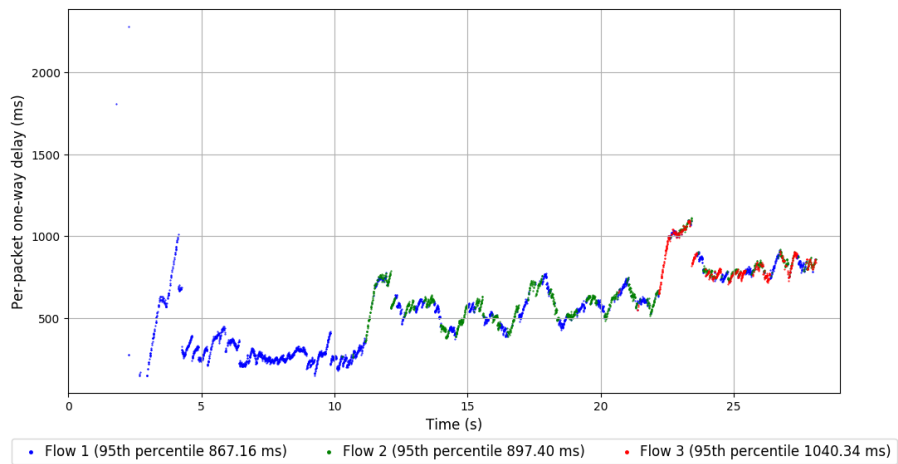
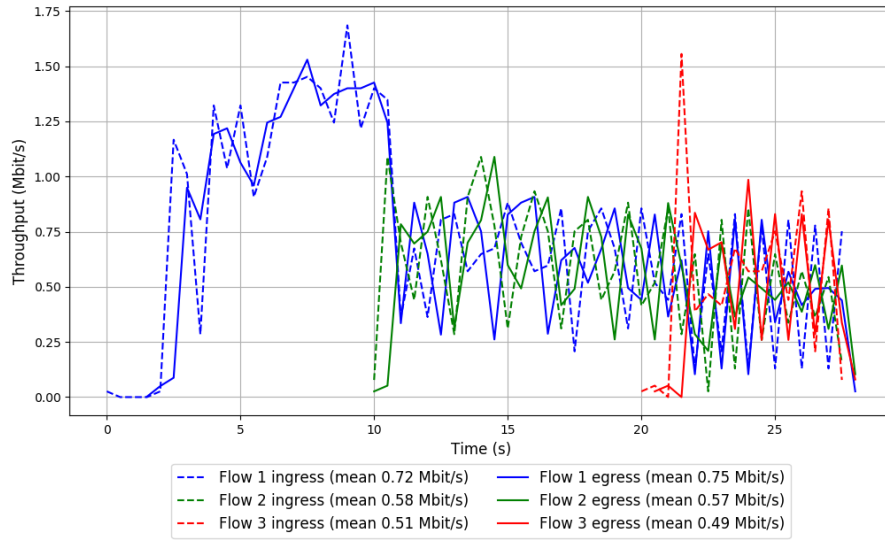


Run 1: Statistics of TaoVA-100x

Start at: 2017-12-20 18:59:00
End at: 2017-12-20 18:59:30
Local clock offset: -0.027 ms
Remote clock offset: 16.526 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 910.230 ms
Loss rate: 2.78%
-- Flow 1:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 867.160 ms
Loss rate: 2.13%
-- Flow 2:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 897.403 ms
Loss rate: 1.62%
-- Flow 3:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1040.343 ms
Loss rate: 9.07%
```

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

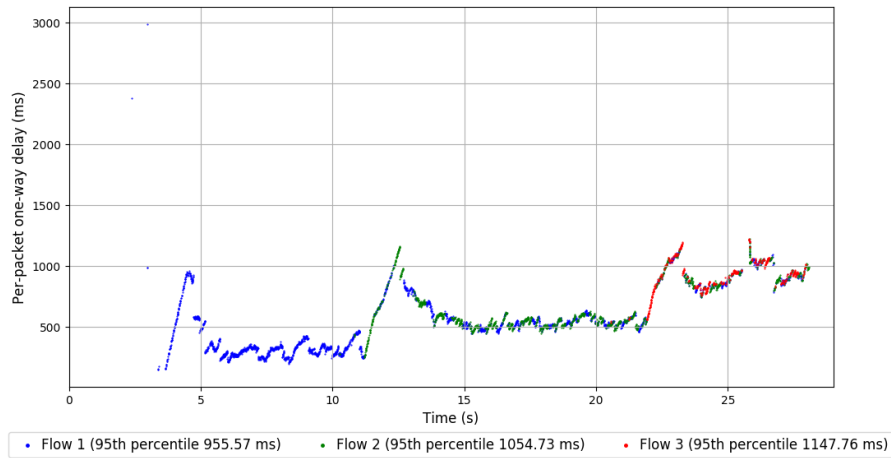
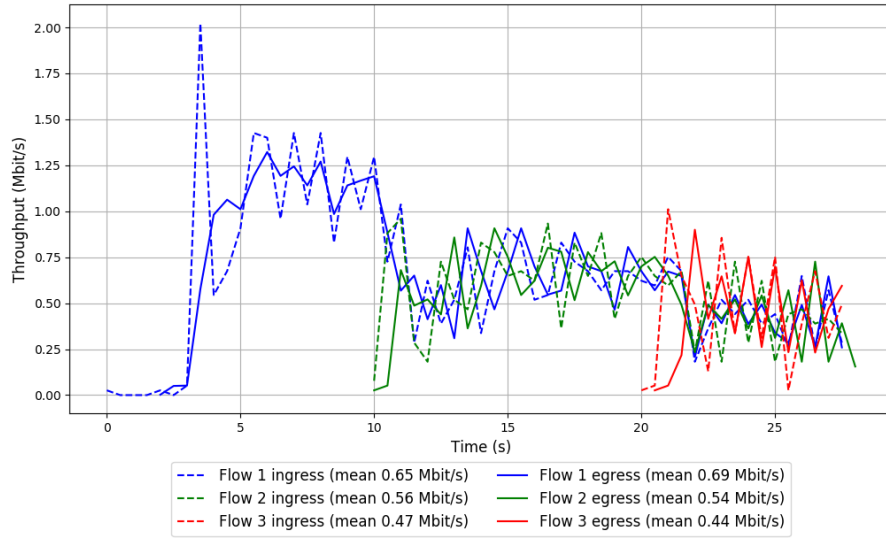


Run 2: Statistics of TaoVA-100x

Start at: 2017-12-20 19:17:48
End at: 2017-12-20 19:18:18
Local clock offset: -0.023 ms
Remote clock offset: 14.948 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 1046.214 ms
Loss rate: 3.60%
-- Flow 1:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 955.567 ms
Loss rate: 2.43%
-- Flow 2:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 1054.730 ms
Loss rate: 2.99%
-- Flow 3:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1147.760 ms
Loss rate: 11.07%
```

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

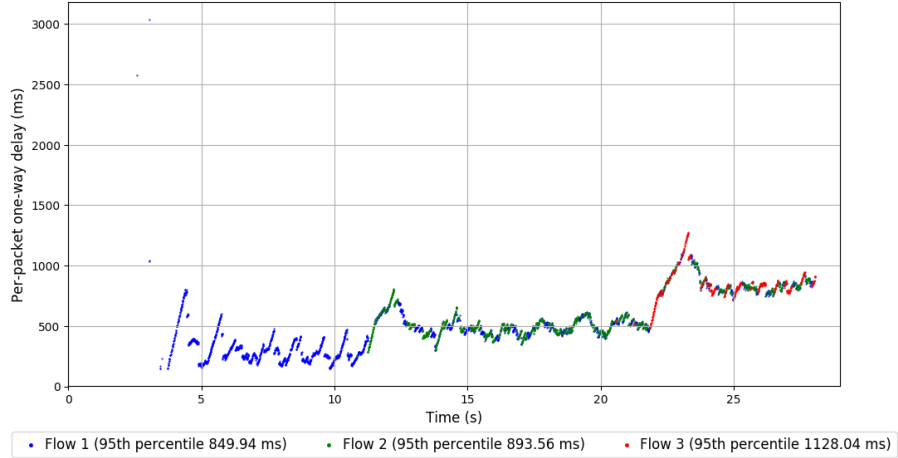
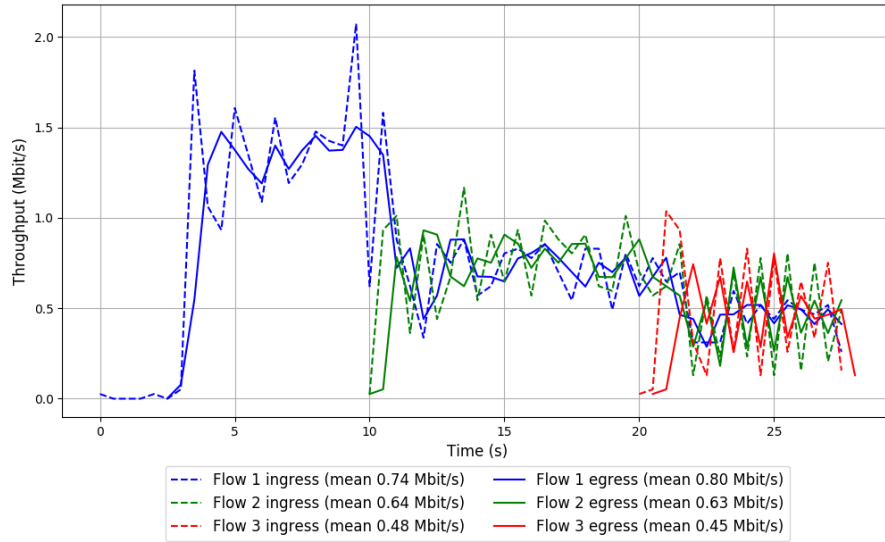


Run 3: Statistics of TaoVA-100x

Start at: 2017-12-20 19:36:41
End at: 2017-12-20 19:37:11
Local clock offset: -0.07 ms
Remote clock offset: 15.068 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.37 Mbit/s
95th percentile per-packet one-way delay: 893.821 ms
Loss rate: 2.82%
-- Flow 1:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 849.938 ms
Loss rate: 1.69%
-- Flow 2:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 893.556 ms
Loss rate: 3.06%
-- Flow 3:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 1128.035 ms
Loss rate: 8.39%
```


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



Run 1: Statistics of TCP Vegas

Start at: 2017-12-20 19:04:02

End at: 2017-12-20 19:04:32

Local clock offset: -0.073 ms

Remote clock offset: 10.84 ms

Below is generated by plot.py at 2017-12-20 19:46:09

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 1182.926 ms

Loss rate: 2.41%

-- Flow 1:

Average throughput: 0.89 Mbit/s

95th percentile per-packet one-way delay: 1192.759 ms

Loss rate: 1.25%

-- Flow 2:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 1182.748 ms

Loss rate: 3.97%

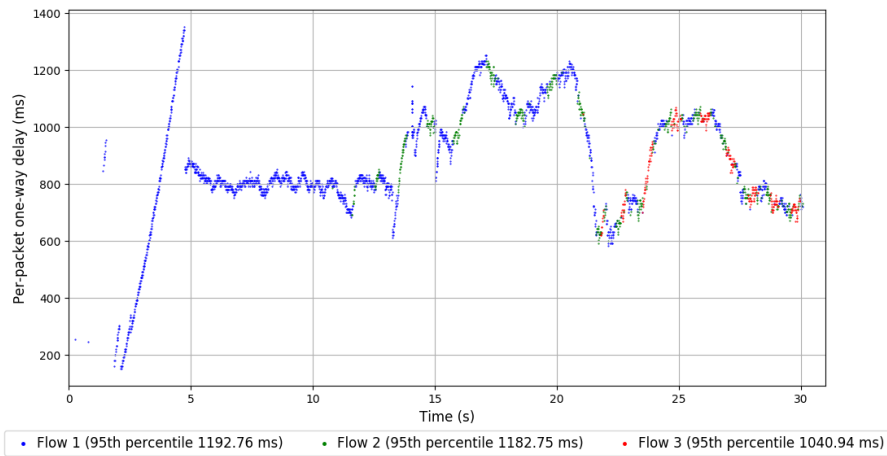
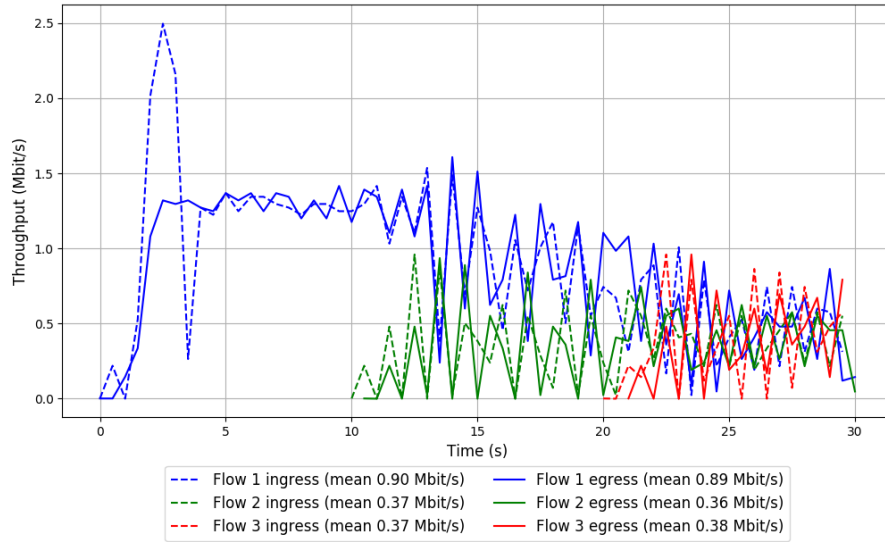
-- Flow 3:

Average throughput: 0.38 Mbit/s

95th percentile per-packet one-way delay: 1040.939 ms

Loss rate: 7.84%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2017-12-20 19:22:50

End at: 2017-12-20 19:23:20

Local clock offset: -0.018 ms

Remote clock offset: 9.955 ms

Below is generated by plot.py at 2017-12-20 19:46:09

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 2523.734 ms

Loss rate: 2.20%

-- Flow 1:

Average throughput: 0.71 Mbit/s

95th percentile per-packet one-way delay: 2873.758 ms

Loss rate: 1.93%

-- Flow 2:

Average throughput: 0.34 Mbit/s

95th percentile per-packet one-way delay: 772.346 ms

Loss rate: 0.83%

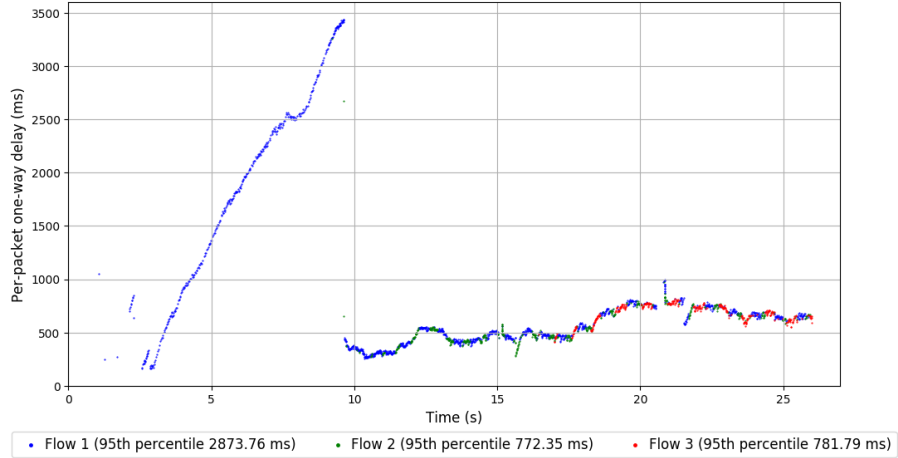
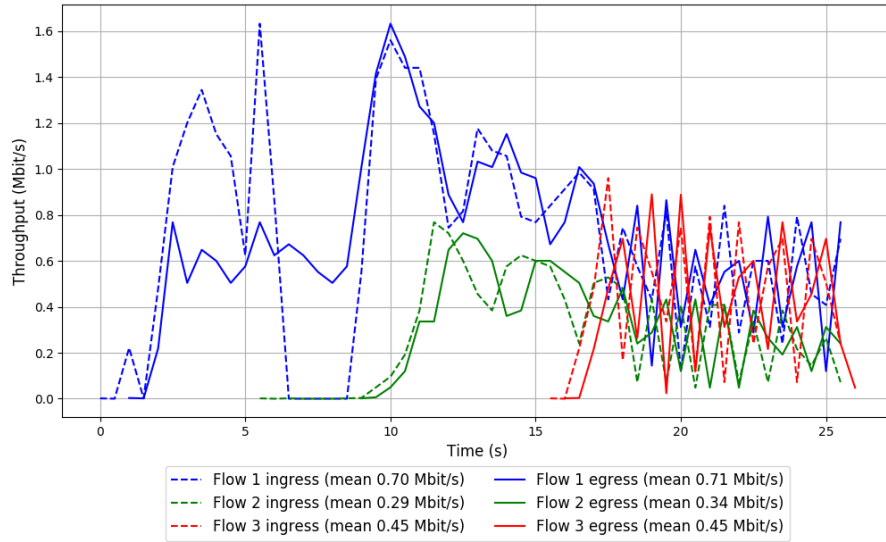
-- Flow 3:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 781.792 ms

Loss rate: 5.08%

Run 2: Report of TCP Vegas — Data Link

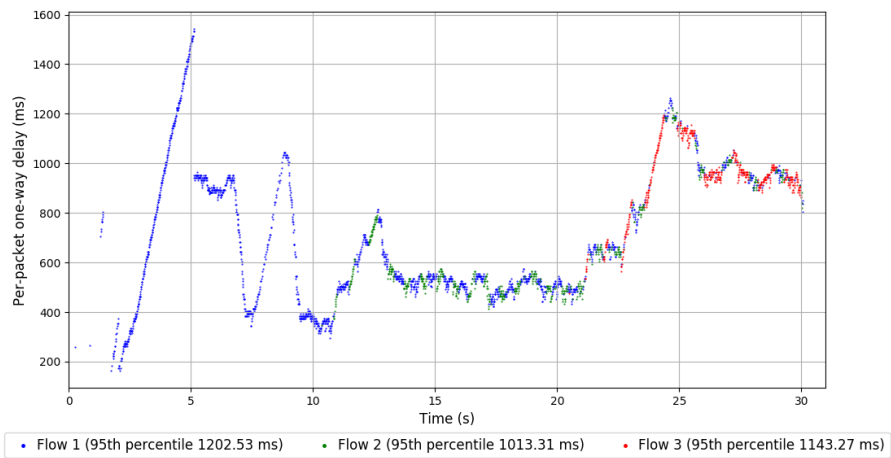
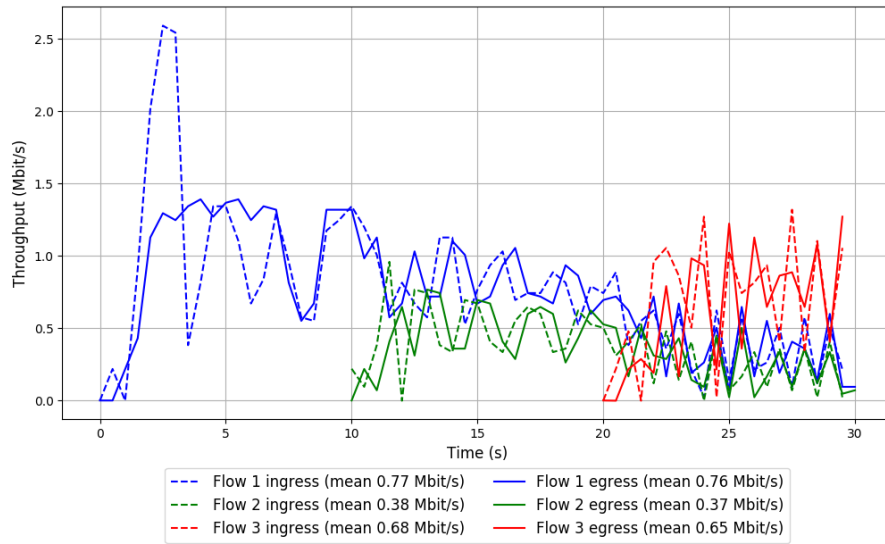


Run 3: Statistics of TCP Vegas

Start at: 2017-12-20 19:41:42
End at: 2017-12-20 19:42:12
Local clock offset: -0.03 ms
Remote clock offset: 11.192 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 1163.345 ms
Loss rate: 2.91%
-- Flow 1:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 1202.529 ms
Loss rate: 1.31%
-- Flow 2:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 1013.314 ms
Loss rate: 2.09%
-- Flow 3:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 1143.270 ms
Loss rate: 9.20%
```

Run 3: Report of TCP Vegas — Data Link

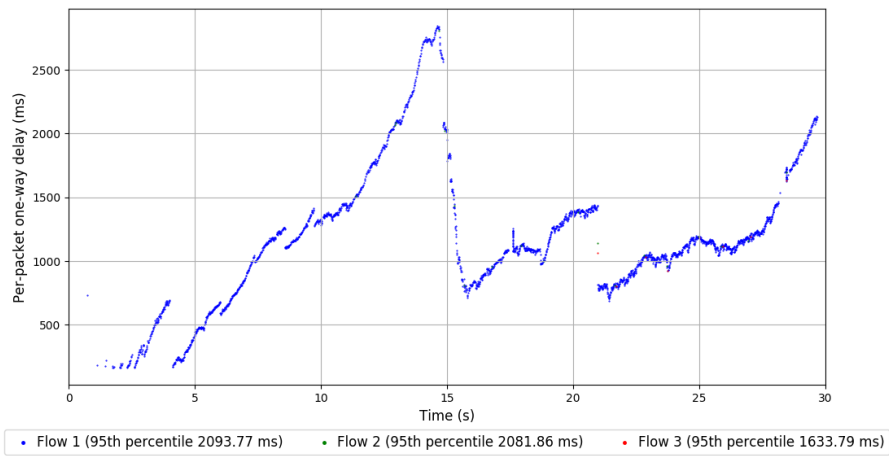
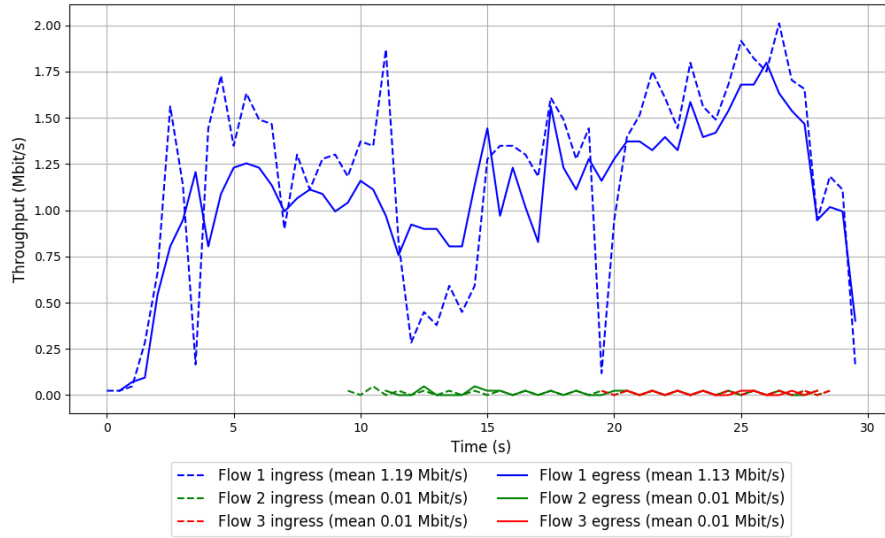


Run 1: Statistics of Verus

Start at: 2017-12-20 18:51:29
End at: 2017-12-20 18:51:59
Local clock offset: -0.087 ms
Remote clock offset: 10.815 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 2093.774 ms
Loss rate: 7.08%
-- Flow 1:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 2093.774 ms
Loss rate: 7.02%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2081.860 ms
Loss rate: 9.52%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1633.789 ms
Loss rate: 20.00%
```


Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2017-12-20 19:10:18

End at: 2017-12-20 19:10:48

Local clock offset: -0.068 ms

Remote clock offset: 9.776 ms

Below is generated by plot.py at 2017-12-20 19:46:11

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.35 Mbit/s

95th percentile per-packet one-way delay: 2100.863 ms

Loss rate: 3.21%

-- Flow 1:

Average throughput: 1.34 Mbit/s

95th percentile per-packet one-way delay: 2100.863 ms

Loss rate: 3.18%

-- Flow 2:

Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 2024.843 ms

Loss rate: 4.55%

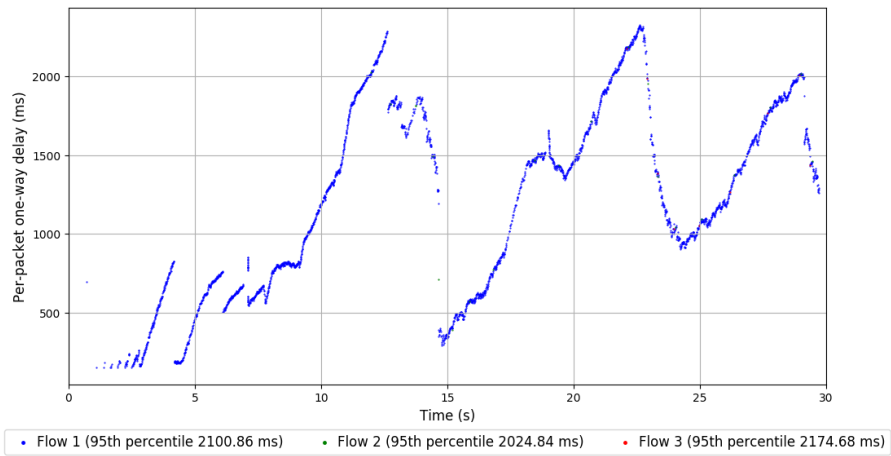
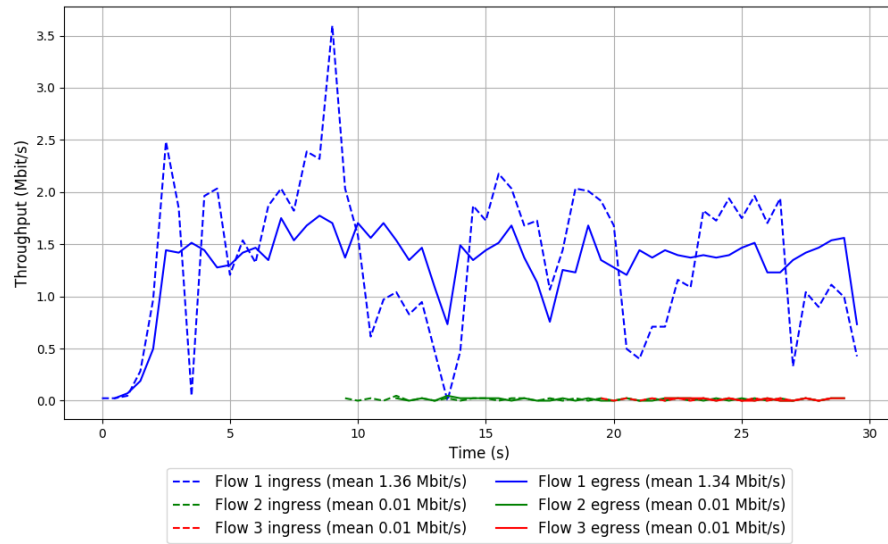
-- Flow 3:

Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 2174.678 ms

Loss rate: 10.00%

Run 2: Report of Verus — Data Link

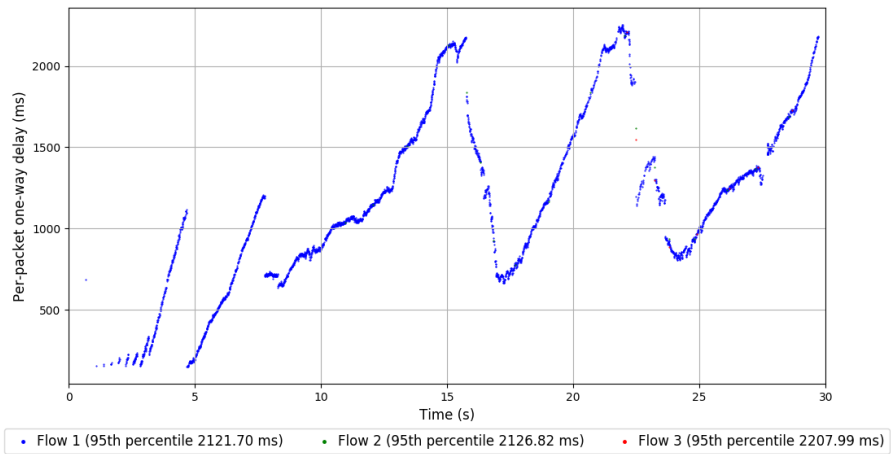
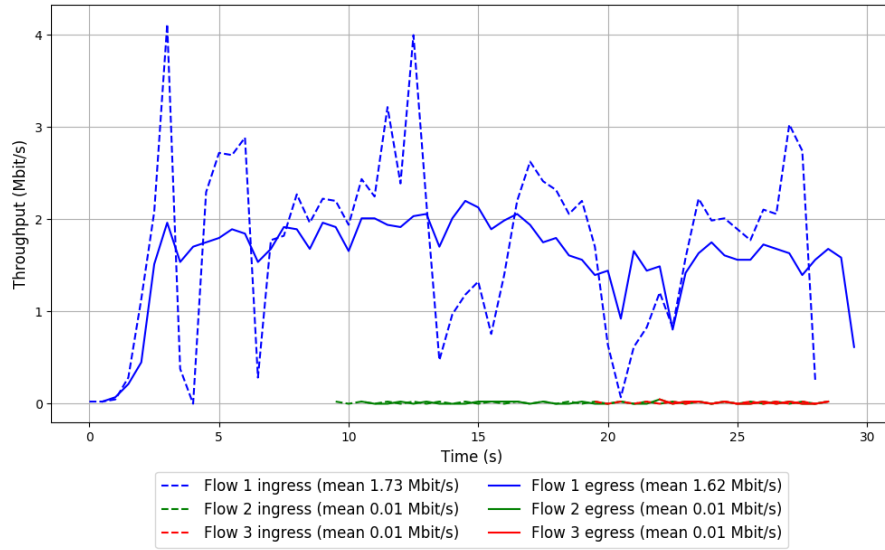


Run 3: Statistics of Verus

Start at: 2017-12-20 19:29:06
End at: 2017-12-20 19:29:36
Local clock offset: -0.005 ms
Remote clock offset: 15.026 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 2122.118 ms
Loss rate: 3.10%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 2121.698 ms
Loss rate: 3.02%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2126.824 ms
Loss rate: 10.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2207.994 ms
Loss rate: 20.00%
```

Run 3: Report of Verus — Data Link

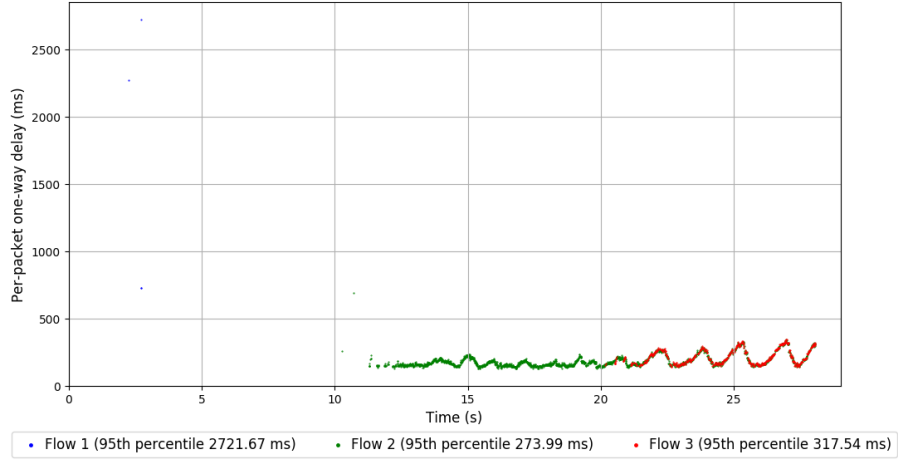
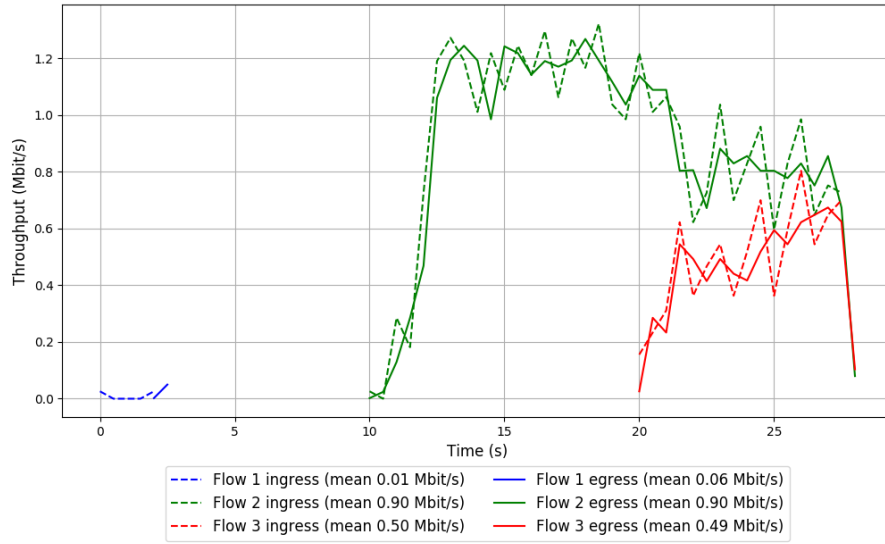


Run 1: Statistics of Copa

Start at: 2017-12-20 18:55:14
End at: 2017-12-20 18:55:44
Local clock offset: -0.018 ms
Remote clock offset: 11.268 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 298.977 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 2721.667 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 273.986 ms
Loss rate: 0.87%
-- Flow 3:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 317.537 ms
Loss rate: 3.24%
```

Run 1: Report of Copa — Data Link

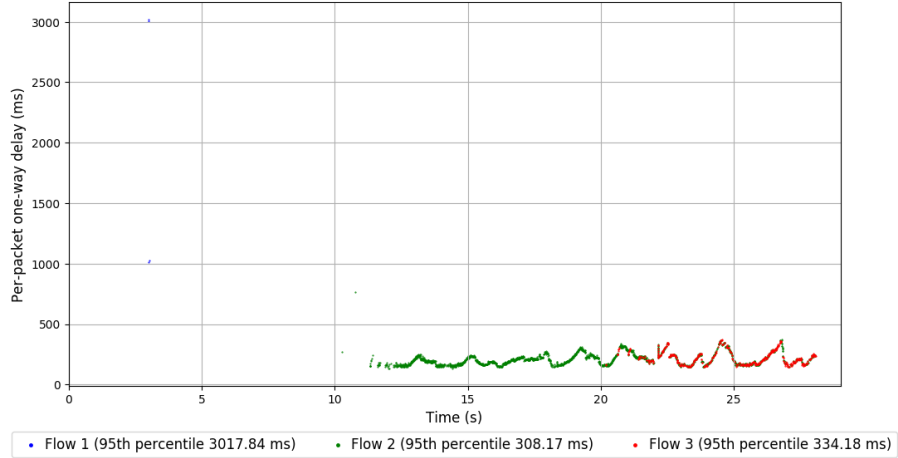
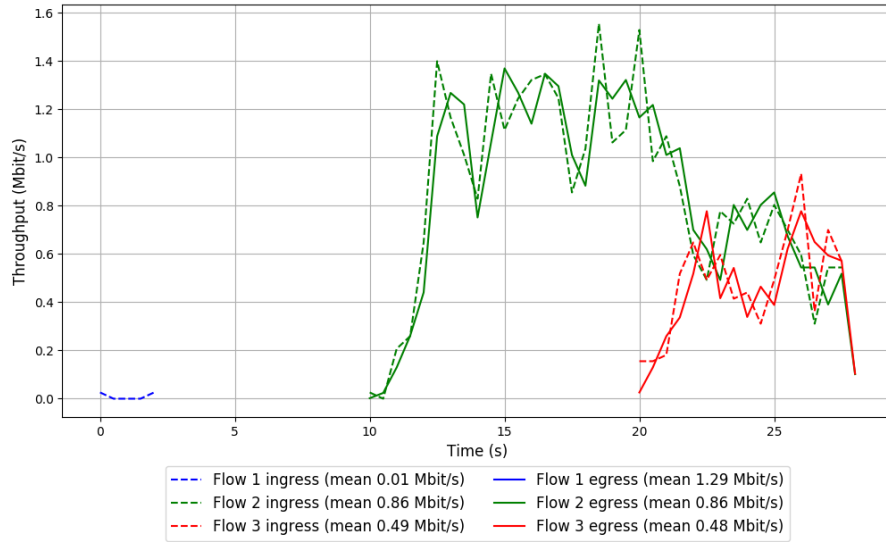


Run 2: Statistics of Copa

Start at: 2017-12-20 19:14:03
End at: 2017-12-20 19:14:33
Local clock offset: -0.006 ms
Remote clock offset: 17.056 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.76 Mbit/s
95th percentile per-packet one-way delay: 313.341 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 3017.835 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 308.171 ms
Loss rate: 0.68%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 334.184 ms
Loss rate: 2.00%
```


Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

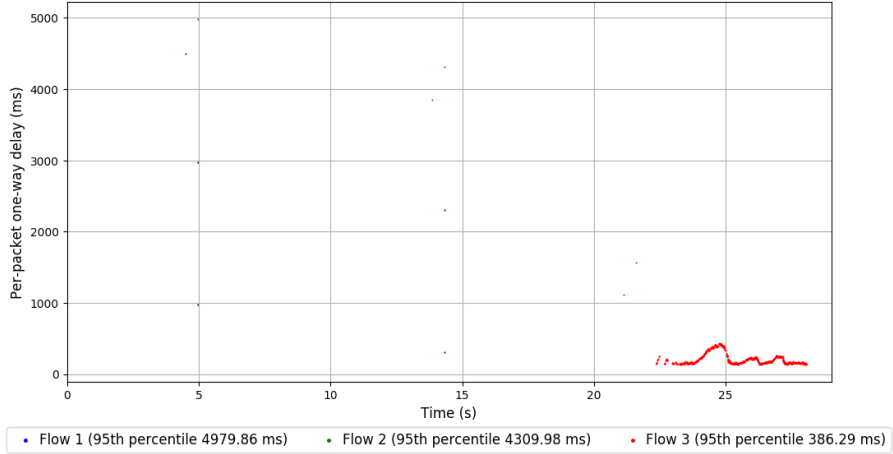
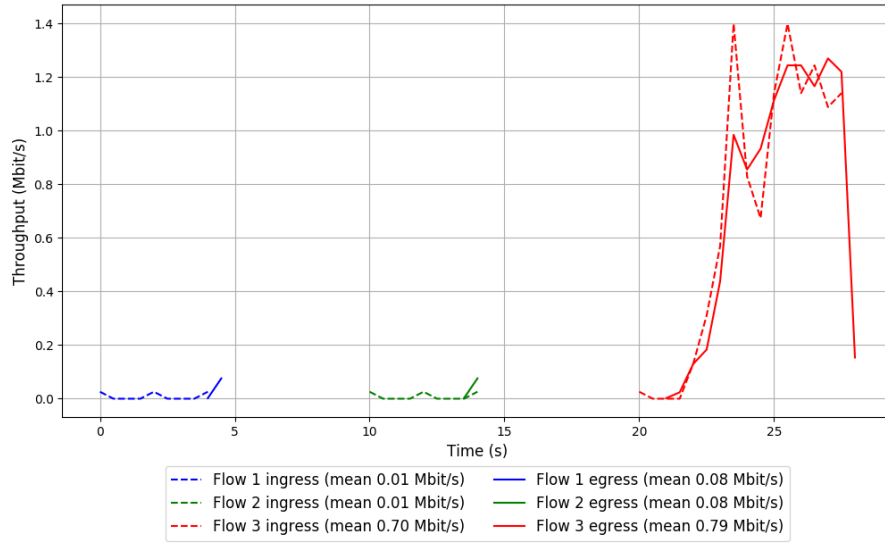
Start at: 2017-12-20 19:32:56

End at: 2017-12-20 19:33:26

Local clock offset: -0.008 ms

Remote clock offset: 8.587 ms

Run 3: Report of Copa — Data Link

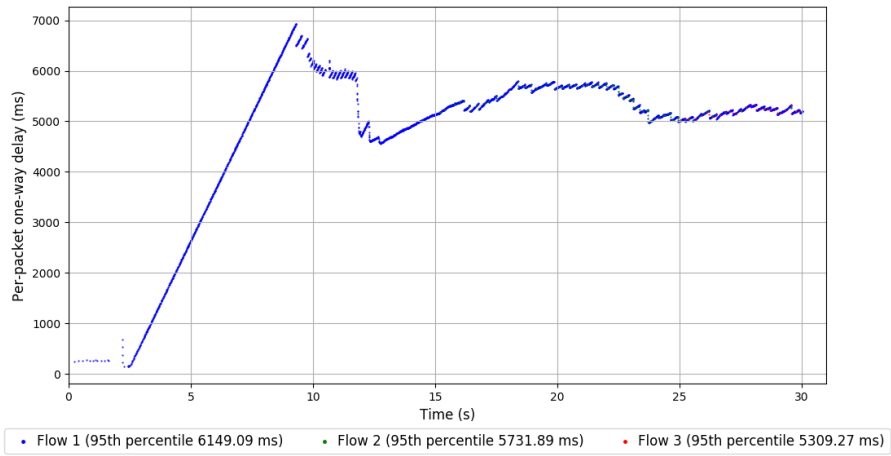
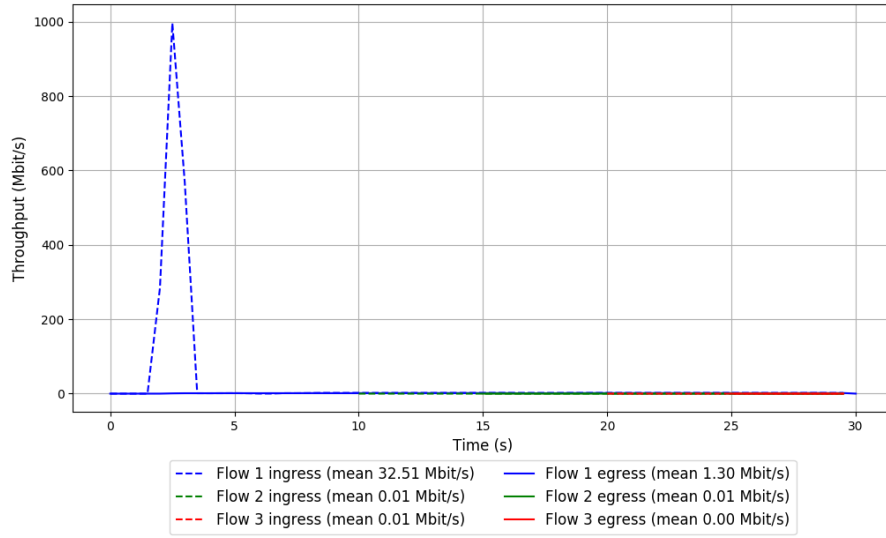


Run 1: Statistics of FillP

Start at: 2017-12-20 19:06:32
End at: 2017-12-20 19:07:02
Local clock offset: -0.008 ms
Remote clock offset: 11.264 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:17
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 6130.533 ms
Loss rate: 96.02%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 6149.086 ms
Loss rate: 96.03%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 5731.887 ms
Loss rate: 10.62%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5309.272 ms
Loss rate: 75.49%
```

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2017-12-20 19:25:20

End at: 2017-12-20 19:25:50

Local clock offset: -0.007 ms

Remote clock offset: 11.27 ms

Below is generated by plot.py at 2017-12-20 19:46:18

Datalink statistics

-- Total of 3 flows:

Average throughput: 1.33 Mbit/s

95th percentile per-packet one-way delay: 5845.724 ms

Loss rate: 95.92%

-- Flow 1:

Average throughput: 1.33 Mbit/s

95th percentile per-packet one-way delay: 5855.484 ms

Loss rate: 95.93%

-- Flow 2:

Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 5395.511 ms

Loss rate: 11.99%

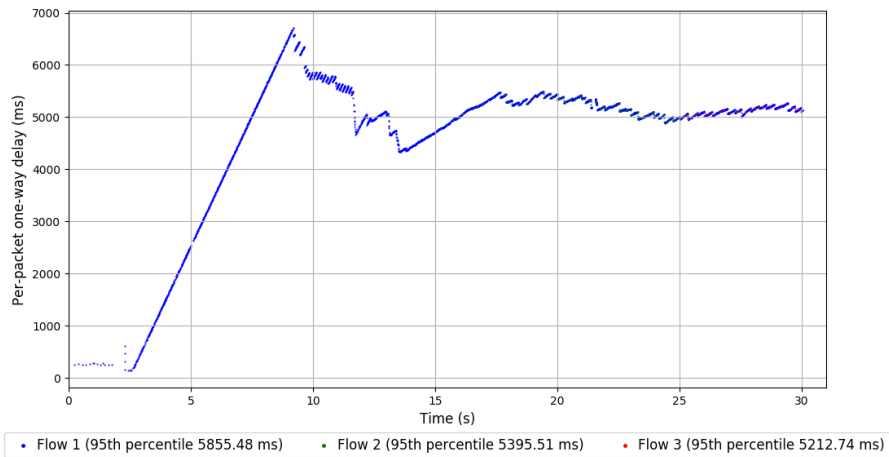
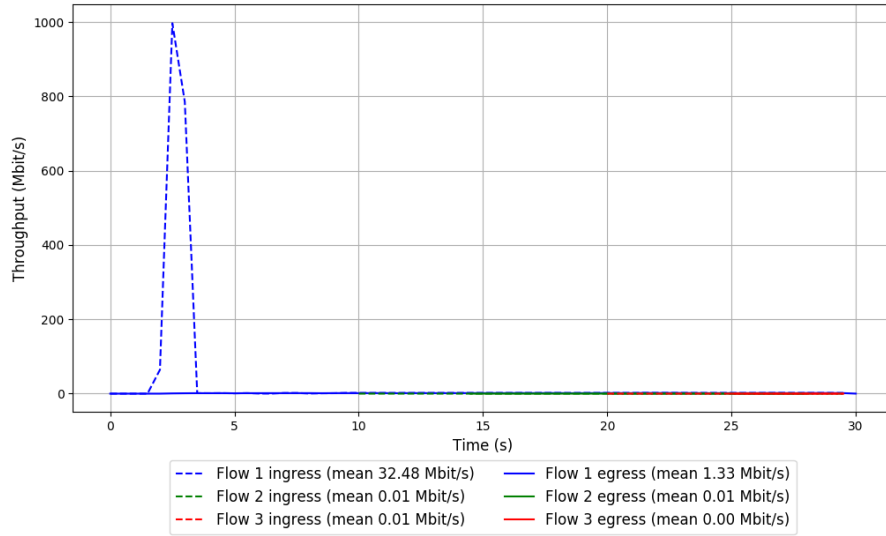
-- Flow 3:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 5212.741 ms

Loss rate: 76.08%

Run 2: Report of FillP — Data Link

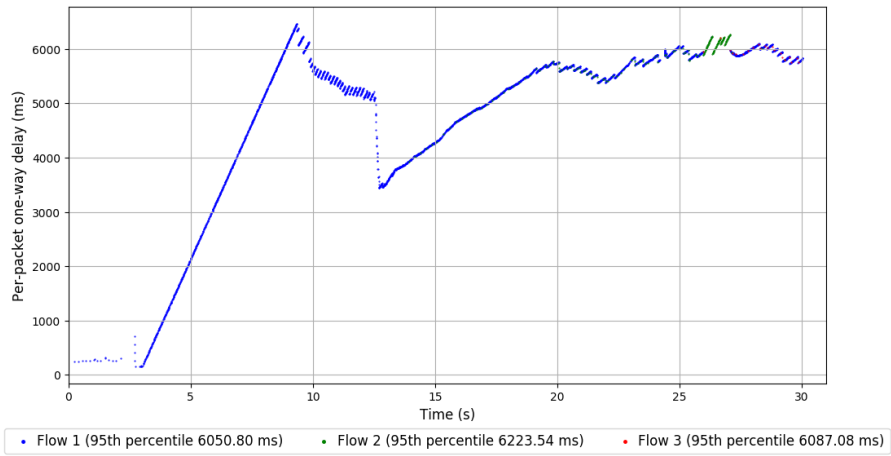
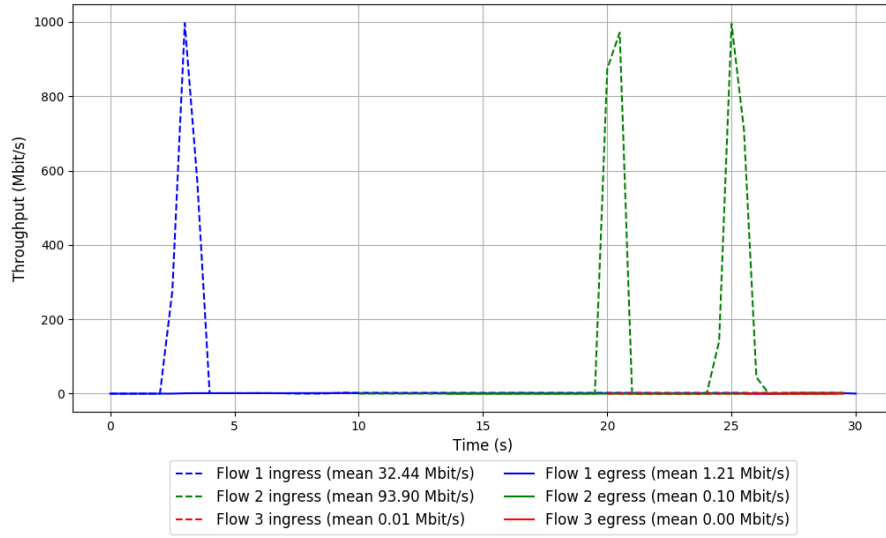


Run 3: Statistics of FillP

Start at: 2017-12-20 19:44:13
End at: 2017-12-20 19:44:43
Local clock offset: 0.004 ms
Remote clock offset: 14.745 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 6094.522 ms
Loss rate: 98.68%
-- Flow 1:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 6050.796 ms
Loss rate: 96.30%
-- Flow 2:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 6223.541 ms
Loss rate: 99.92%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6087.083 ms
Loss rate: 80.31%
```


Run 3: Report of FillP — Data Link

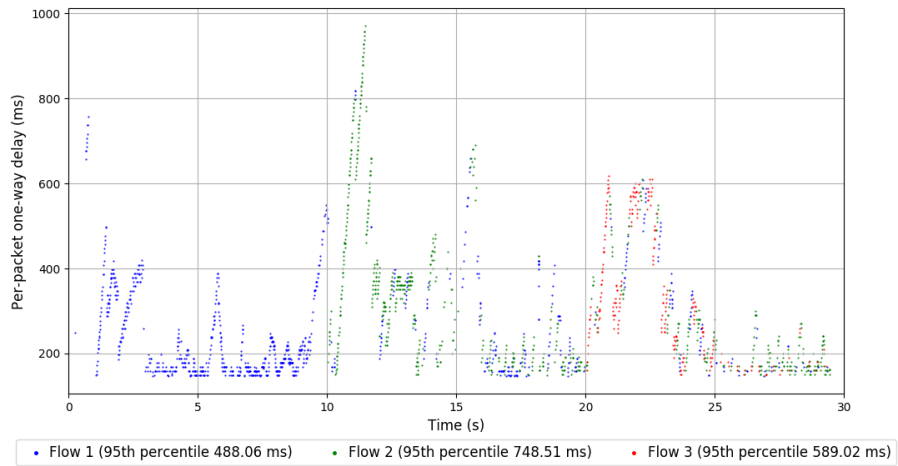
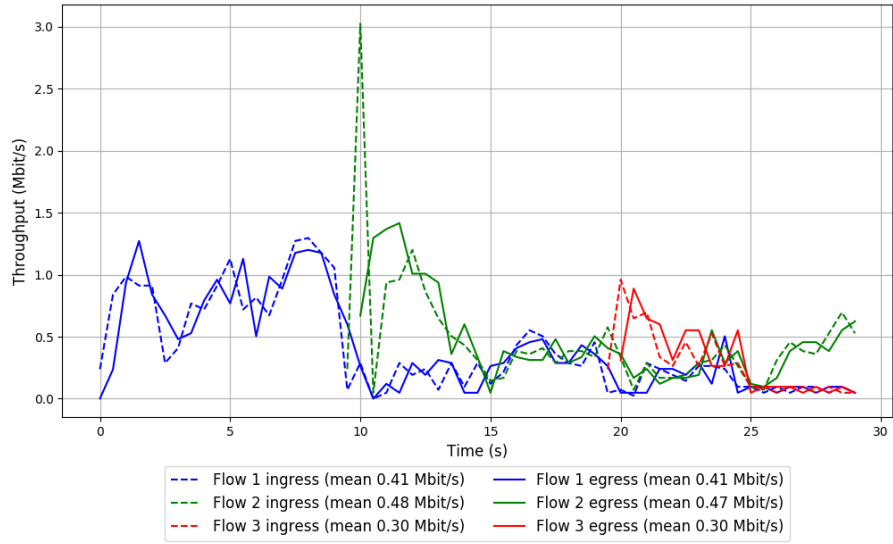


Run 1: Statistics of Indigo

Start at: 2017-12-20 19:00:17
End at: 2017-12-20 19:00:47
Local clock offset: -0.021 ms
Remote clock offset: 11.653 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 628.523 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 488.065 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 748.513 ms
Loss rate: 1.42%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 589.020 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

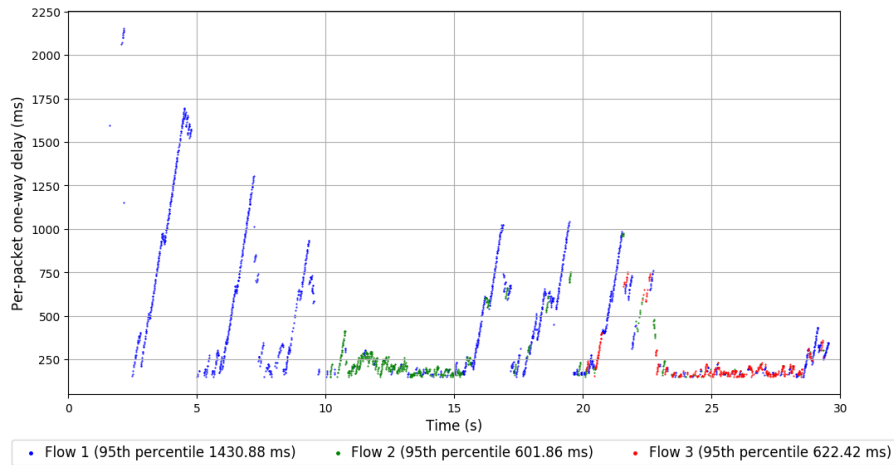
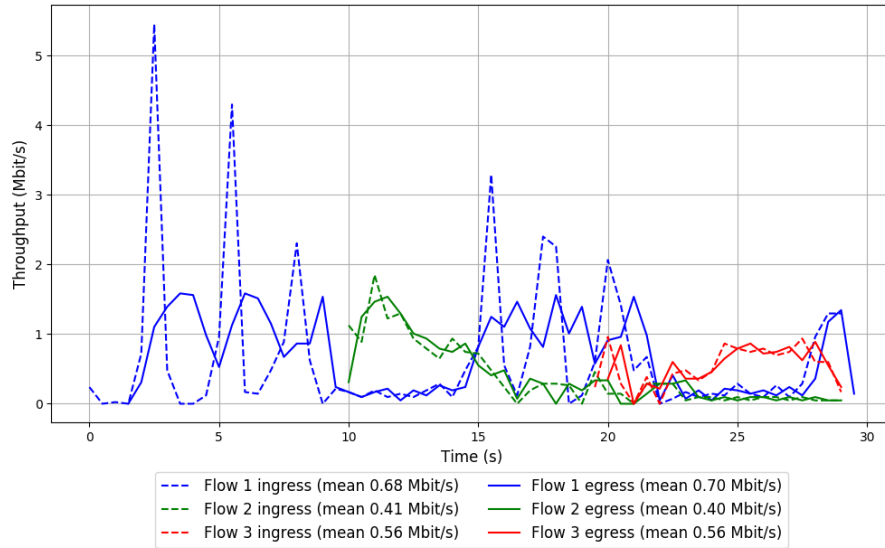


Run 2: Statistics of Indigo

Start at: 2017-12-20 19:19:03
End at: 2017-12-20 19:19:33
Local clock offset: -0.081 ms
Remote clock offset: 14.574 ms

```
# Below is generated by plot.py at 2017-12-20 19:46:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.16 Mbit/s
95th percentile per-packet one-way delay: 1161.961 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 1430.875 ms
Loss rate: 1.74%
-- Flow 2:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 601.862 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 622.421 ms
Loss rate: 1.37%
```

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2017-12-20 19:37:56

End at: 2017-12-20 19:38:26

Local clock offset: -0.067 ms

Remote clock offset: 17.26 ms

Below is generated by plot.py at 2017-12-20 19:46:19

Datalink statistics

-- Total of 3 flows:

Average throughput: 0.76 Mbit/s

95th percentile per-packet one-way delay: 432.572 ms

Loss rate: 0.22%

-- Flow 1:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 652.813 ms

Loss rate: 0.11%

-- Flow 2:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 330.910 ms

Loss rate: 0.00%

-- Flow 3:

Average throughput: 0.89 Mbit/s

95th percentile per-packet one-way delay: 321.860 ms

Loss rate: 0.44%

Run 3: Report of Indigo — Data Link

