

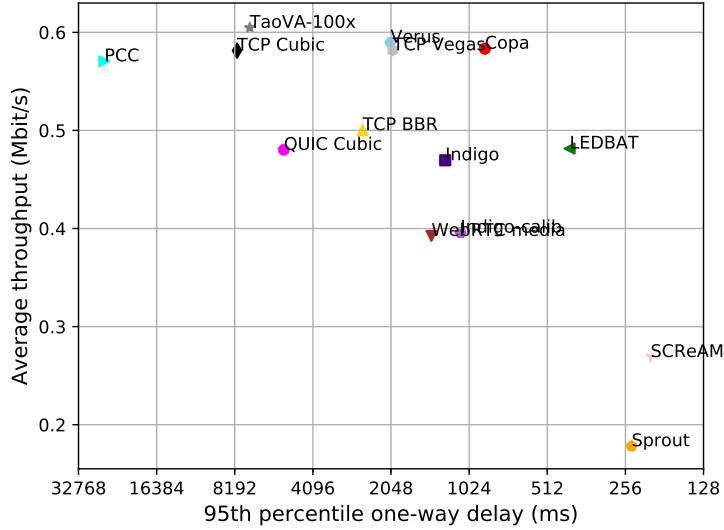
Pantheon Report

Generated at 2017-11-30 08:45:39 (UTC).
Data path: Colombia ppp0 (*remote*) → AWS Brazil 2 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 `gps.ntp.br` and have been applied to correct the timestamps in logs.

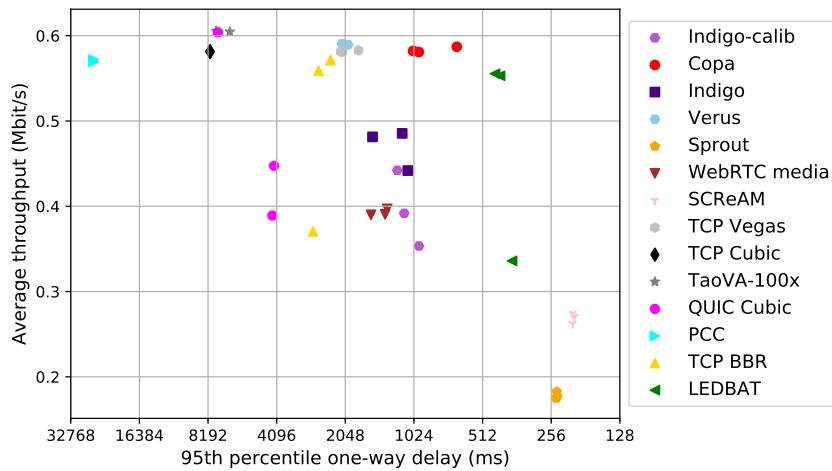
Git summary:

```
branch: indigos @ e3a57ad5ac5cfaca0e3f983c8dd4cc3509e0262
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 @ 03455460fd1a8ffbdad86fab936fdca204b80db
third_party/indigo-no-send-rate @ b39dfa6b2c5f19cb7cd89626cb4f5bb81f9fecda
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

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



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



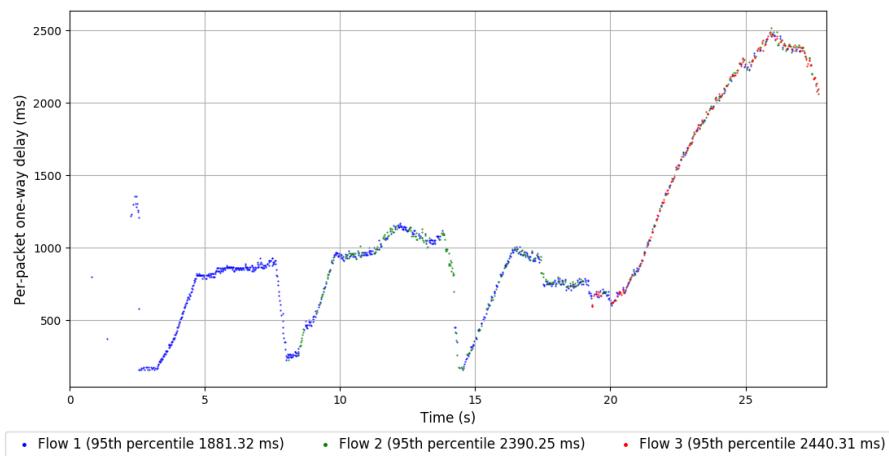
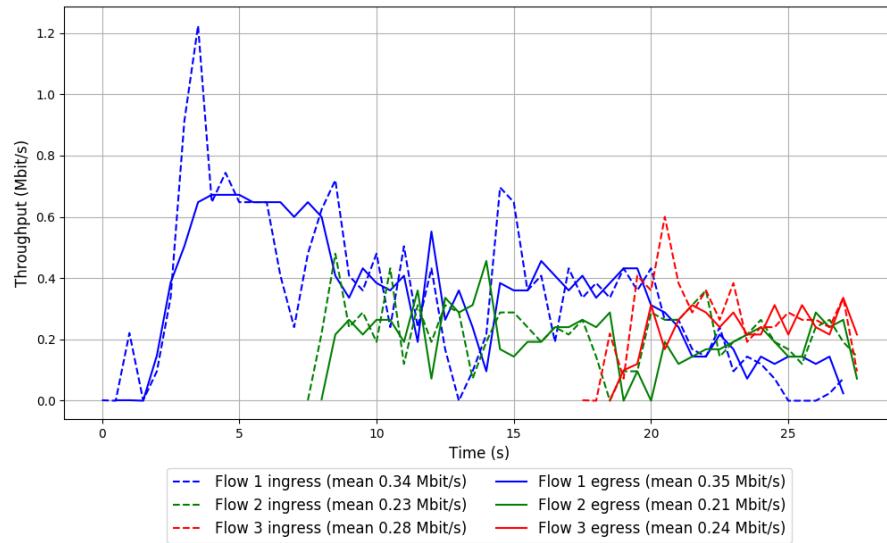
| scheme | # runs | mean avg tput (Mbit/s) | | | mean 95th-%ile delay (ms) | | | mean loss rate (%) | | |
|--------------|--------|------------------------|--------|--------|---------------------------|---------|---------|--------------------|--------|--------|
| | | flow 1 | flow 2 | flow 3 | flow 1 | flow 2 | flow 3 | flow 1 | flow 2 | flow 3 |
| TCP BBR | 3 | 0.24 | 0.29 | 0.22 | 1927.64 | 2621.39 | 2610.20 | 0.77 | 16.68 | 32.49 |
| TCP Cubic | 3 | 0.57 | 0.03 | 0.00 | 8034.11 | 6333.40 | 8373.48 | 30.90 | 37.90 | 74.06 |
| LEDBAT | 3 | 0.17 | 0.38 | 0.21 | 345.86 | 420.36 | 446.94 | 0.00 | 1.24 | 8.28 |
| PCC | 3 | 0.57 | 0.00 | N/A | 26036.73 | N/A | N/A | 98.59 | N/A | N/A |
| QUIC Cubic | 3 | 0.34 | 0.40 | 0.04 | 2652.33 | 5288.42 | 5440.53 | 9.68 | 28.68 | 44.35 |
| SCReAM | 3 | 0.08 | 0.19 | 0.17 | 189.69 | 203.32 | 209.44 | 0.84 | 1.07 | 2.16 |
| WebRTC media | 3 | 0.19 | 0.16 | 0.06 | 1373.24 | 1498.29 | 1556.06 | 1.07 | 1.97 | 10.35 |
| Sprout | 3 | 0.09 | 0.09 | 0.09 | 585.19 | 225.06 | 216.07 | 1.89 | 1.92 | 2.12 |
| TaoVA-100x | 3 | 0.38 | 0.37 | 0.16 | 7385.84 | 6614.48 | 6975.61 | 29.18 | 20.98 | 59.72 |
| TCP Vegas | 3 | 0.43 | 0.20 | 0.14 | 1811.65 | 2056.67 | 2036.05 | 4.10 | 7.75 | 25.13 |
| Verus | 3 | 0.58 | 0.01 | 0.01 | 2056.46 | 2037.59 | 2026.37 | 5.27 | 4.92 | 10.00 |
| Copa | 3 | 0.39 | 0.25 | 0.09 | 841.07 | 912.75 | 1006.63 | 2.87 | 5.88 | 13.58 |
| Indigo | 3 | 0.21 | 0.27 | 0.25 | 903.43 | 1203.15 | 917.76 | 4.75 | 10.76 | 7.69 |
| Indigo-calib | 3 | 0.12 | 0.23 | 0.39 | 1090.66 | 1103.17 | 1081.55 | 7.84 | 6.38 | 13.63 |

Run 1: Statistics of TCP BBR

```
Start at: 2017-11-30 07:14:24
End at: 2017-11-30 07:14:54
Local clock offset: 1.551 ms
Remote clock offset: -7.046 ms

# Below is generated by plot.py at 2017-11-30 08:45:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 2378.337 ms
Loss rate: 6.57%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 1881.319 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 2390.249 ms
Loss rate: 10.37%
-- Flow 3:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 2440.306 ms
Loss rate: 20.51%
```

Run 1: Report of TCP BBR — Data Link

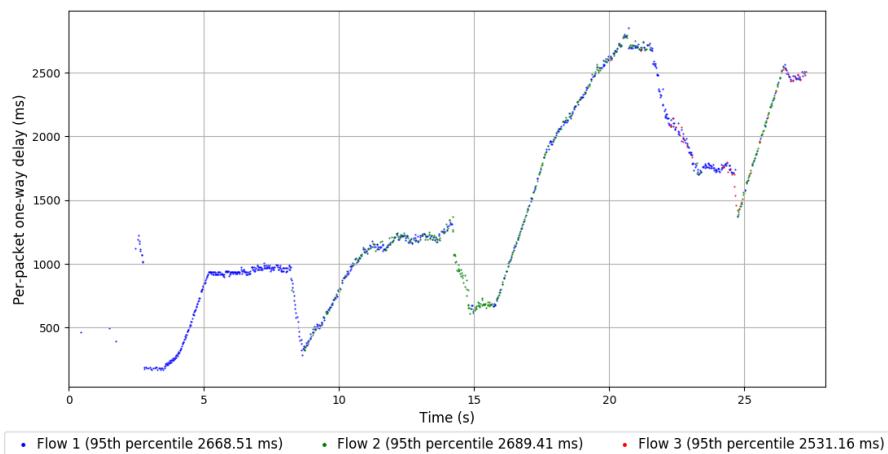
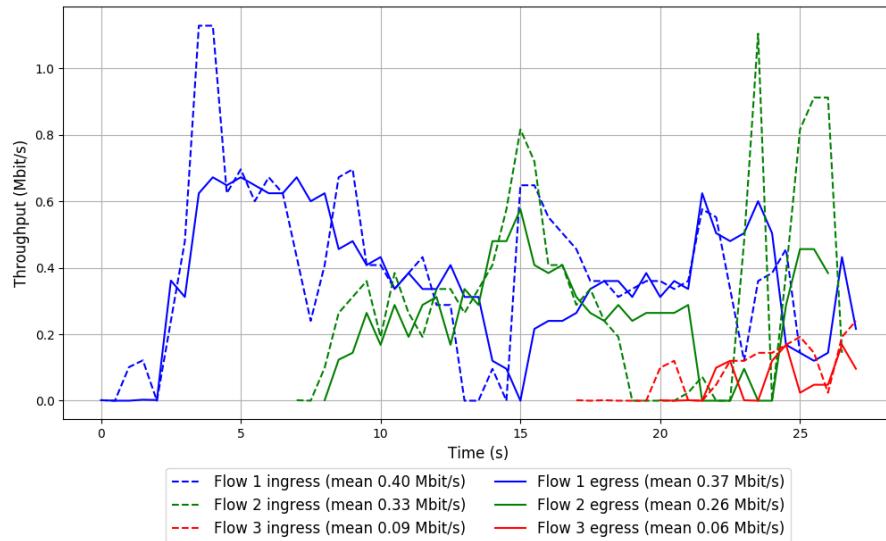


Run 2: Statistics of TCP BBR

```
Start at: 2017-11-30 07:31:52
End at: 2017-11-30 07:32:22
Local clock offset: 1.418 ms
Remote clock offset: -7.366 ms

# Below is generated by plot.py at 2017-11-30 08:45:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 2682.827 ms
Loss rate: 12.78%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 2668.508 ms
Loss rate: 1.80%
-- Flow 2:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 2689.412 ms
Loss rate: 25.18%
-- Flow 3:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 2531.156 ms
Loss rate: 49.09%
```

Run 2: Report of TCP BBR — Data Link

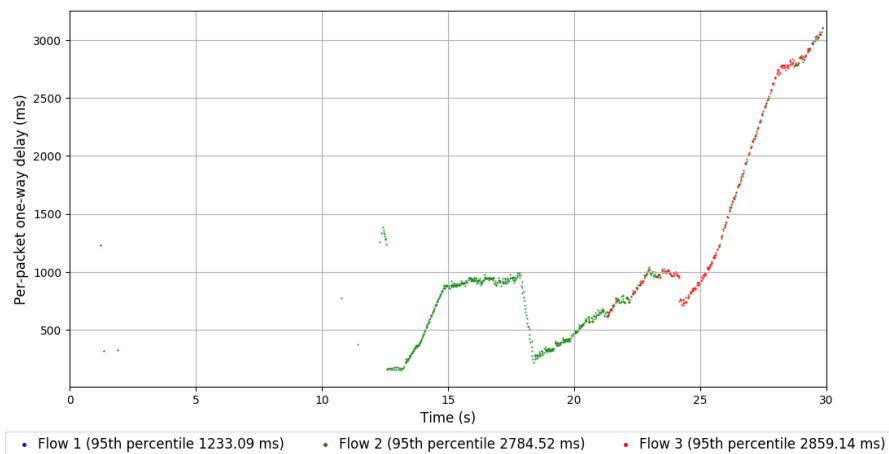
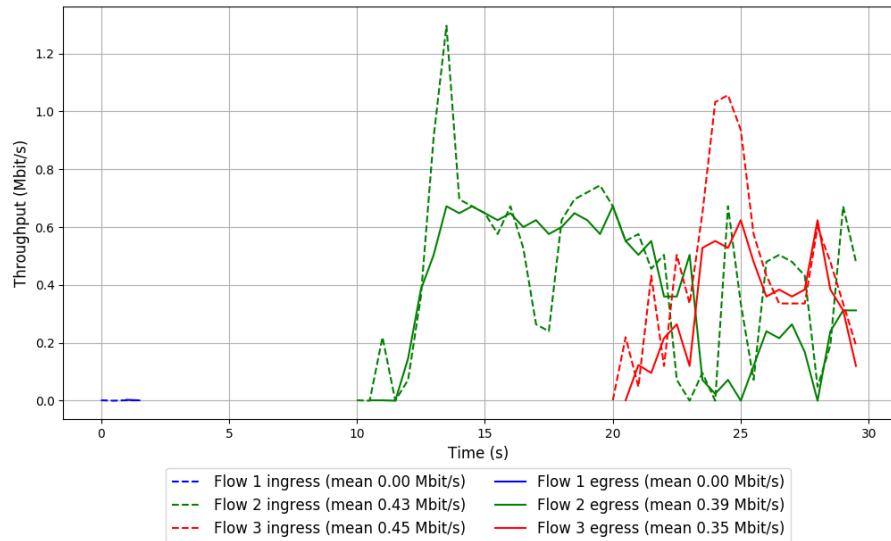


Run 3: Statistics of TCP BBR

```
Start at: 2017-11-30 07:49:20
End at: 2017-11-30 07:49:50
Local clock offset: 1.813 ms
Remote clock offset: -2.783 ms

# Below is generated by plot.py at 2017-11-30 08:45:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 2839.547 ms
Loss rate: 19.05%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 1233.089 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 2784.519 ms
Loss rate: 14.48%
-- Flow 3:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 2859.144 ms
Loss rate: 27.87%
```

Run 3: Report of TCP BBR — Data Link

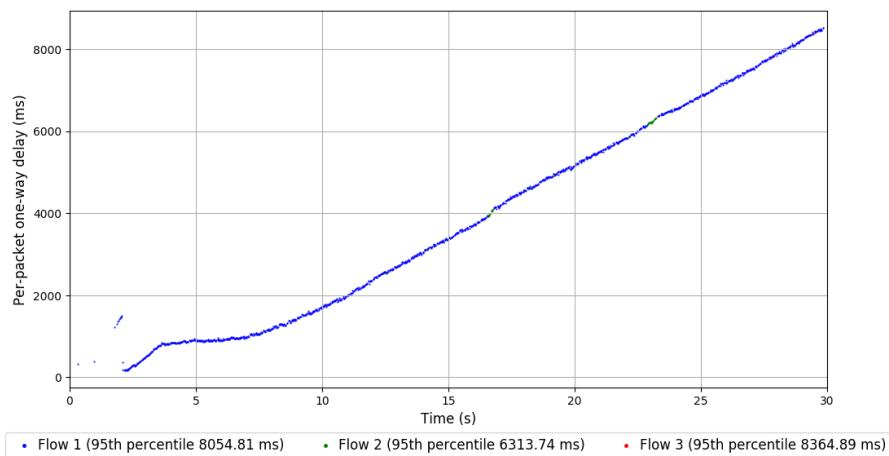
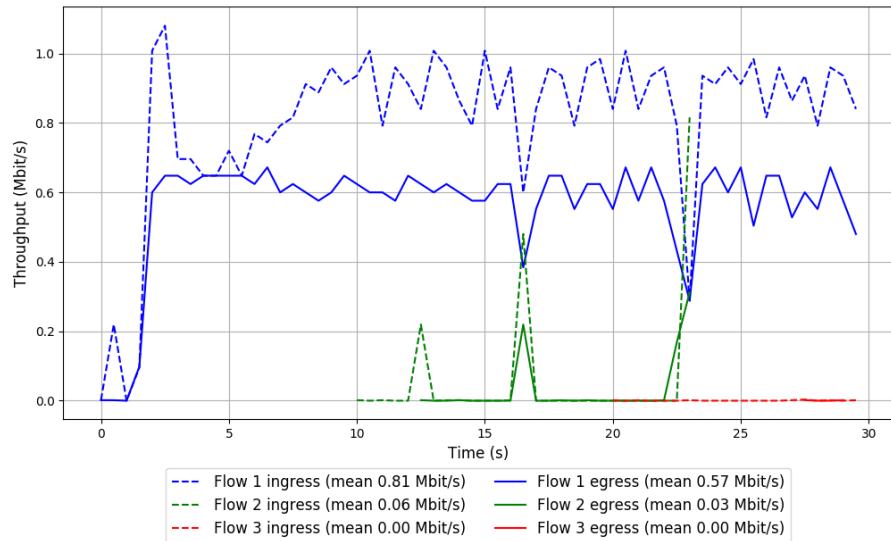


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2017-11-30 07:03:10
End at: 2017-11-30 07:03:40
Local clock offset: 1.331 ms
Remote clock offset: -2.847 ms

# Below is generated by plot.py at 2017-11-30 08:45:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 8044.691 ms
Loss rate: 31.61%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8054.807 ms
Loss rate: 30.91%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6313.744 ms
Loss rate: 53.59%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8364.891 ms
Loss rate: 75.13%
```

Run 1: Report of TCP Cubic — Data Link

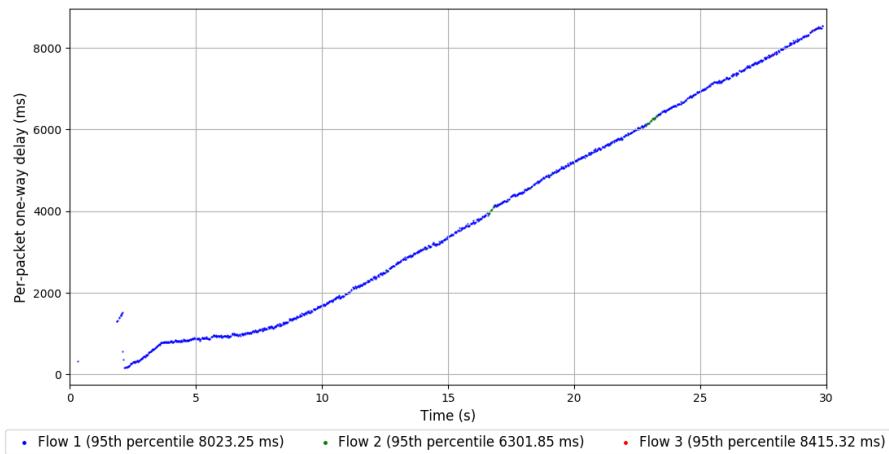
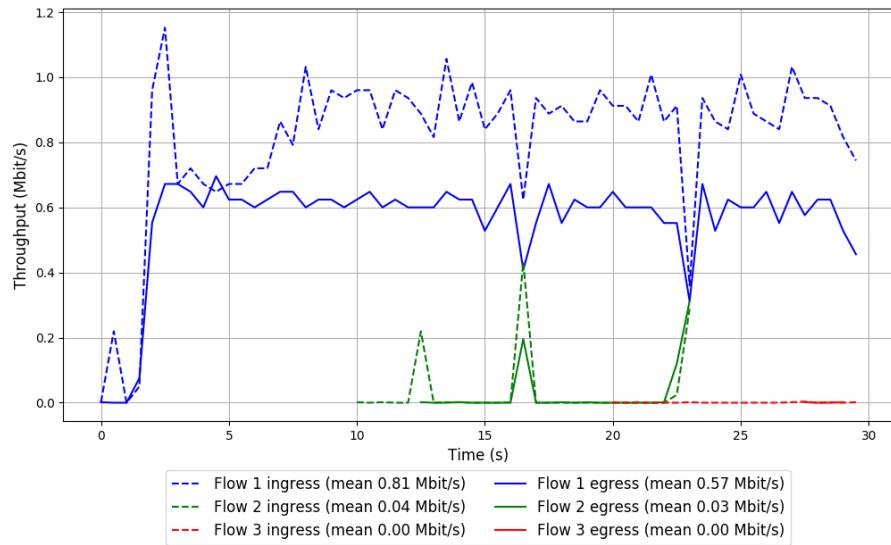


Run 2: Statistics of TCP Cubic

```
Start at: 2017-11-30 07:20:38
End at: 2017-11-30 07:21:08
Local clock offset: 1.555 ms
Remote clock offset: -7.66 ms

# Below is generated by plot.py at 2017-11-30 08:45:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 8023.174 ms
Loss rate: 31.00%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8023.252 ms
Loss rate: 30.92%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6301.851 ms
Loss rate: 34.61%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8415.320 ms
Loss rate: 75.13%
```

Run 2: Report of TCP Cubic — Data Link

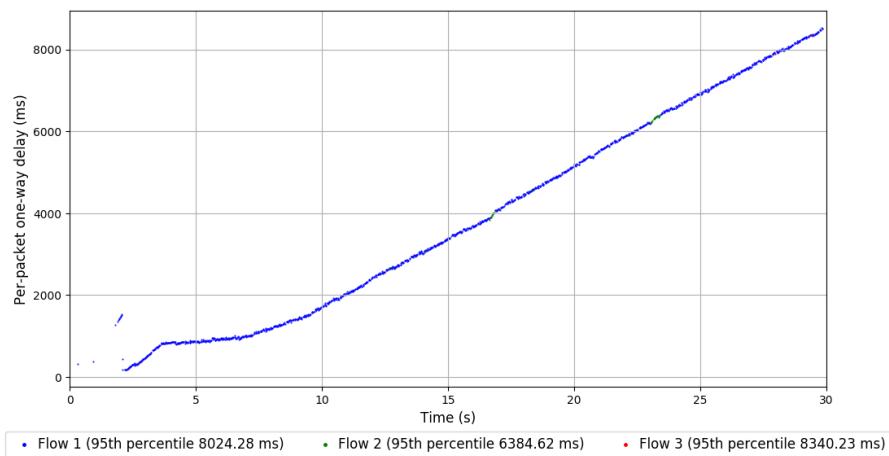
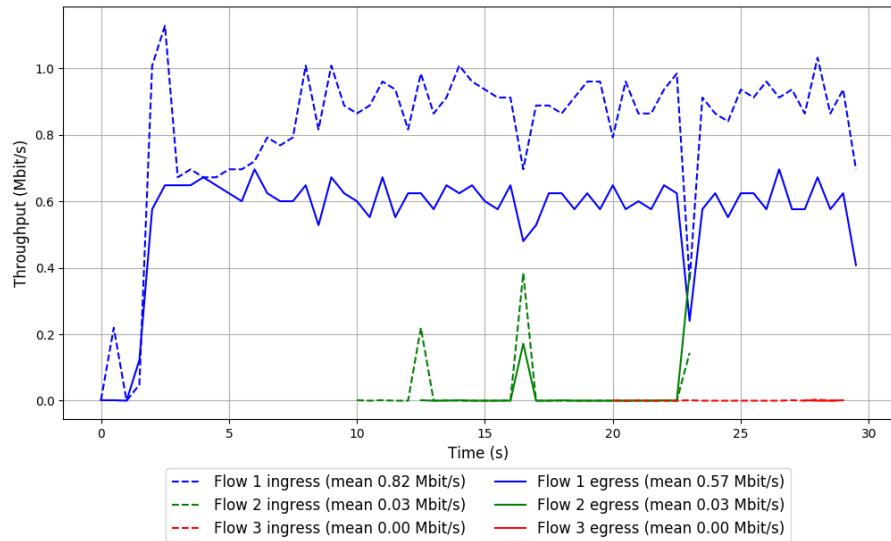


Run 3: Statistics of TCP Cubic

```
Start at: 2017-11-30 07:38:06
End at: 2017-11-30 07:38:36
Local clock offset: 1.544 ms
Remote clock offset: -2.343 ms

# Below is generated by plot.py at 2017-11-30 08:45:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 8024.273 ms
Loss rate: 30.78%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 8024.283 ms
Loss rate: 30.86%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 6384.620 ms
Loss rate: 25.49%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8340.232 ms
Loss rate: 71.93%
```

Run 3: Report of TCP Cubic — Data Link

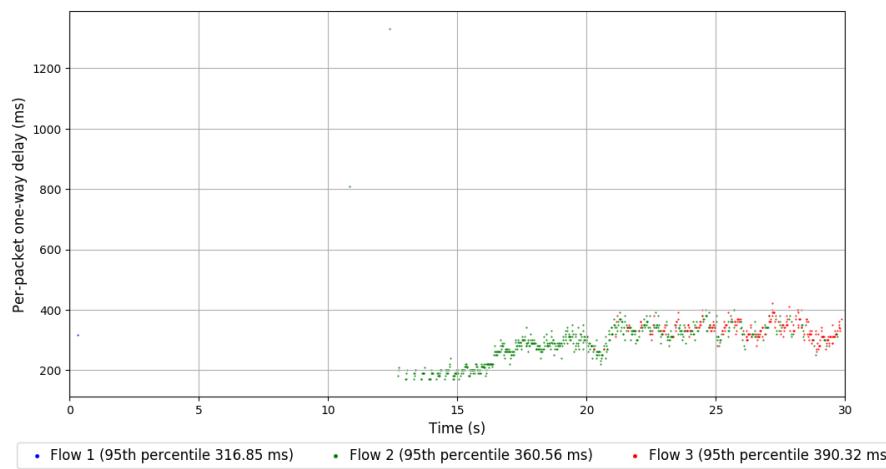
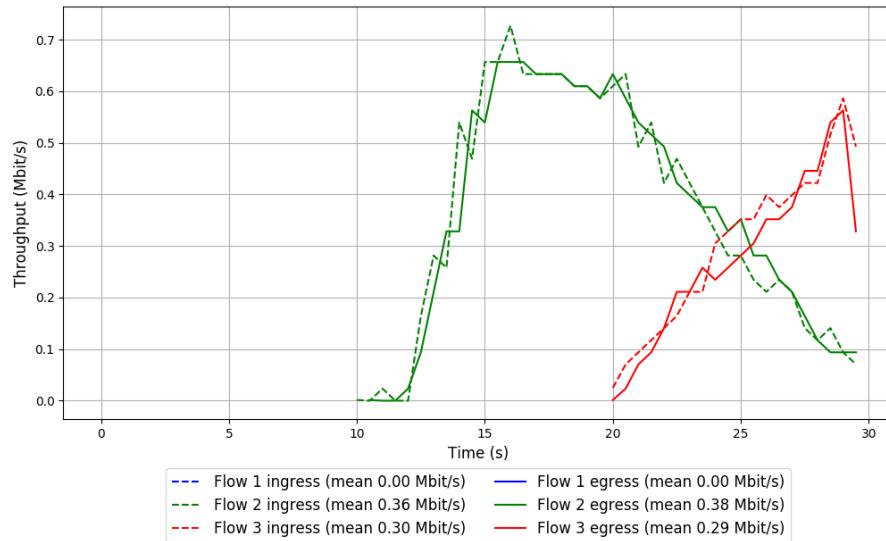


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2017-11-30 07:06:56
End at: 2017-11-30 07:07:26
Local clock offset: 1.508 ms
Remote clock offset: -6.953 ms

# Below is generated by plot.py at 2017-11-30 08:45:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 380.159 ms
Loss rate: 2.76%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 316.854 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 360.557 ms
Loss rate: 0.49%
-- Flow 3:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 390.324 ms
Loss rate: 8.23%
```

Run 1: Report of LEDBAT — Data Link

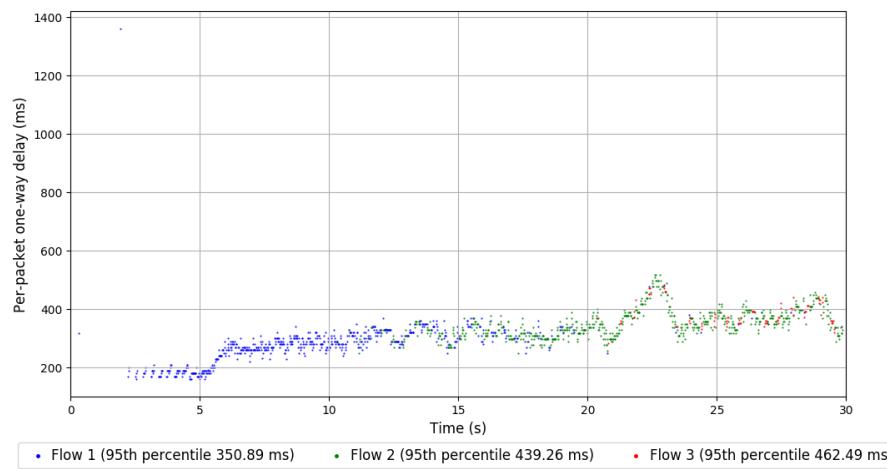
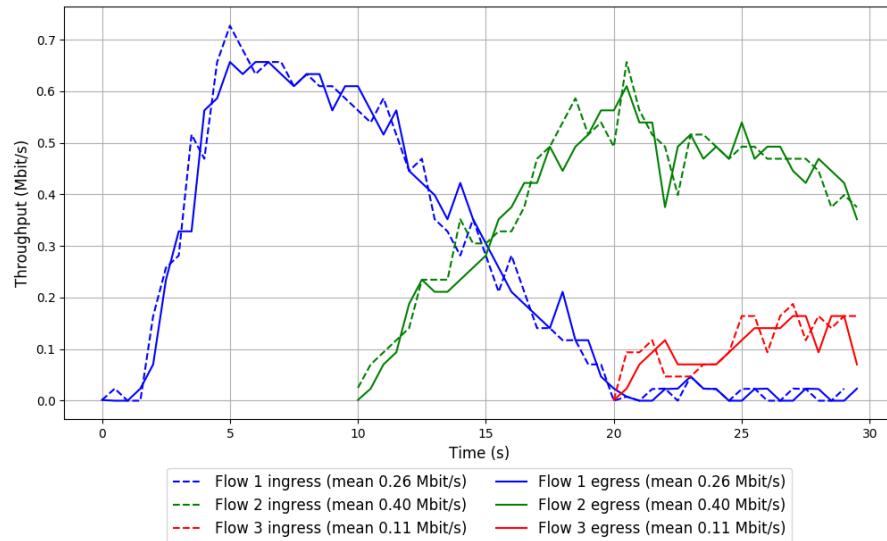


Run 2: Statistics of LEDBAT

```
Start at: 2017-11-30 07:24:24
End at: 2017-11-30 07:24:54
Local clock offset: 1.429 ms
Remote clock offset: -2.104 ms

# Below is generated by plot.py at 2017-11-30 08:45:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 429.182 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 350.893 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 439.262 ms
Loss rate: 2.22%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 462.492 ms
Loss rate: 7.44%
```

Run 2: Report of LEDBAT — Data Link

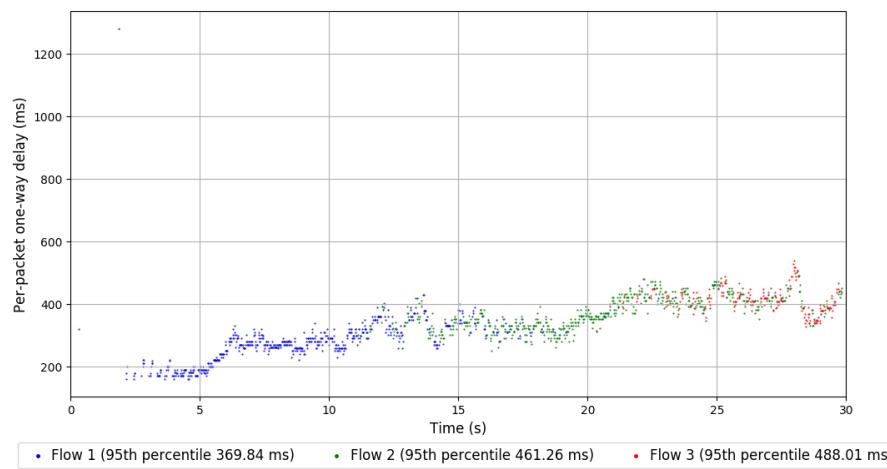
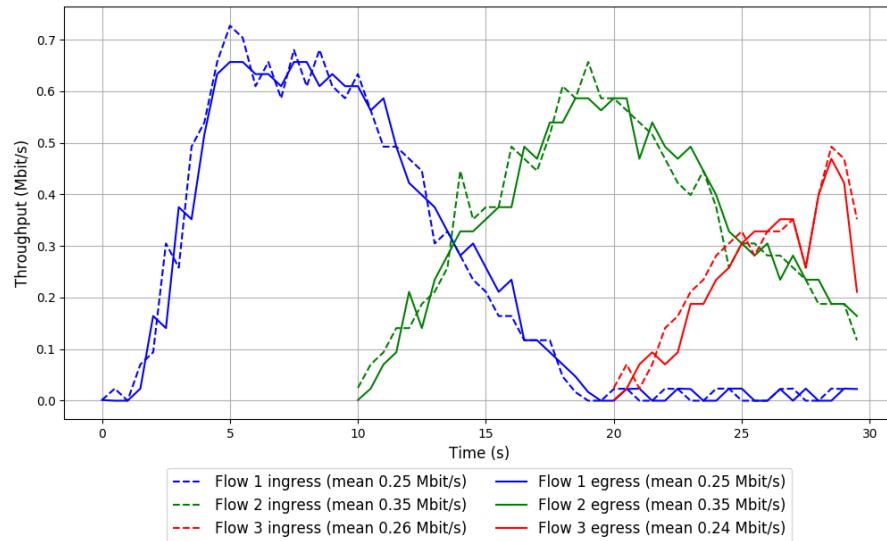


Run 3: Statistics of LEDBAT

```
Start at: 2017-11-30 07:41:52
End at: 2017-11-30 07:42:22
Local clock offset: 1.608 ms
Remote clock offset: -2.64 ms

# Below is generated by plot.py at 2017-11-30 08:45:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 451.439 ms
Loss rate: 1.83%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 369.839 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 461.257 ms
Loss rate: 1.01%
-- Flow 3:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 488.013 ms
Loss rate: 9.17%
```

Run 3: Report of LEDBAT — Data Link

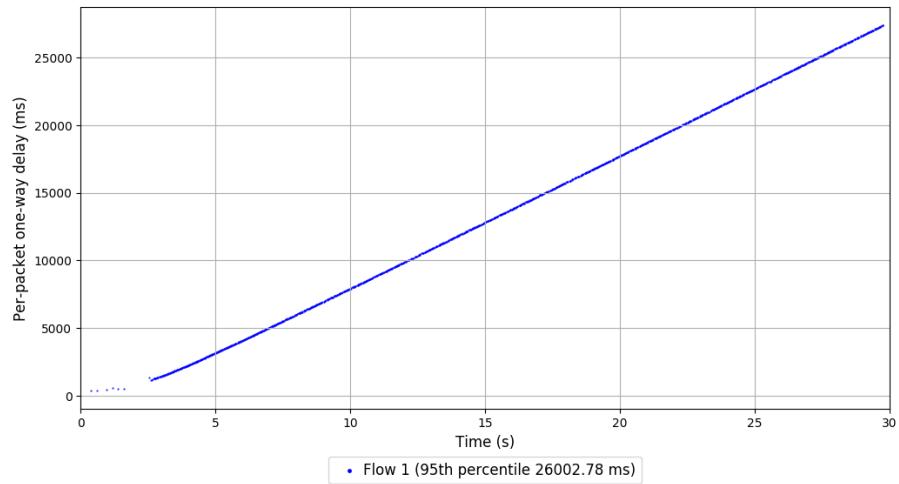
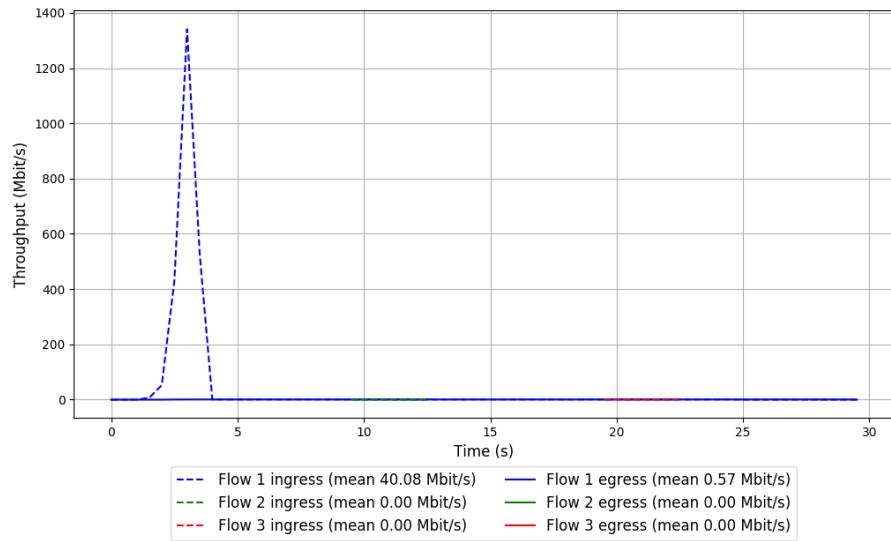


Run 1: Statistics of PCC

```
Start at: 2017-11-30 07:04:25
End at: 2017-11-30 07:04:55
Local clock offset: 1.42 ms
Remote clock offset: -2.091 ms

# Below is generated by plot.py at 2017-11-30 08:45:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26002.775 ms
Loss rate: 98.59%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26002.775 ms
Loss rate: 98.59%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 1: Report of PCC — Data Link

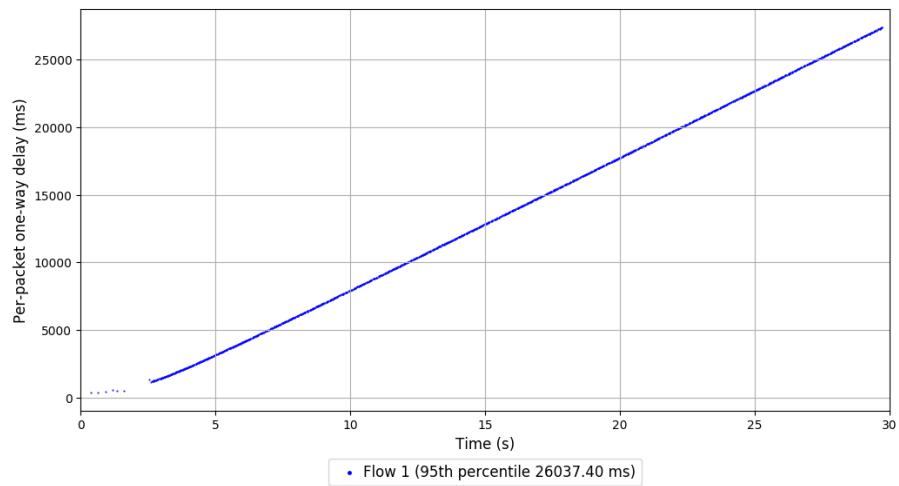
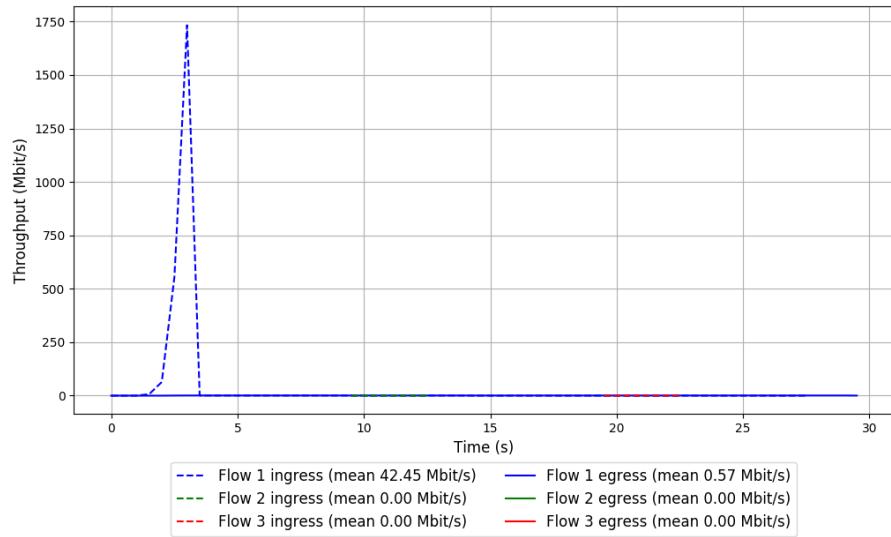


Run 2: Statistics of PCC

```
Start at: 2017-11-30 07:21:53
End at: 2017-11-30 07:22:23
Local clock offset: 1.462 ms
Remote clock offset: -2.879 ms

# Below is generated by plot.py at 2017-11-30 08:45:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26037.401 ms
Loss rate: 98.59%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26037.401 ms
Loss rate: 98.59%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 2: Report of PCC — Data Link

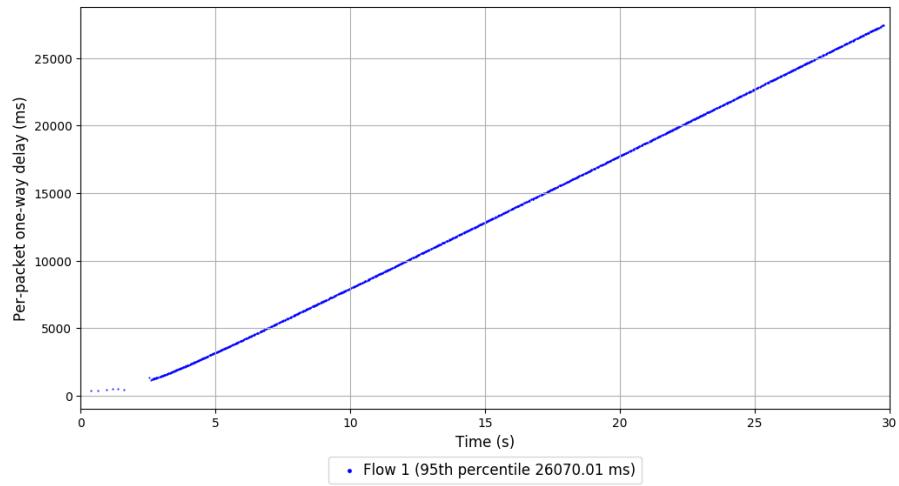
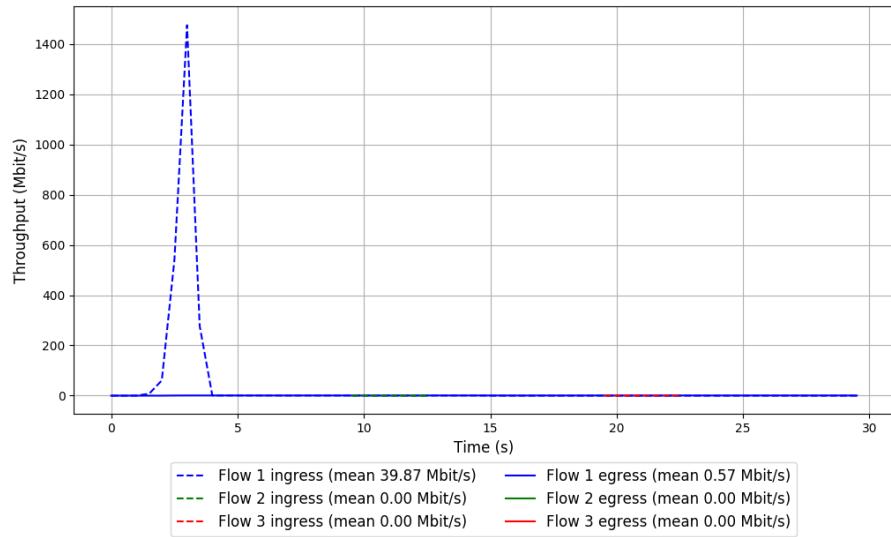


Run 3: Statistics of PCC

```
Start at: 2017-11-30 07:39:21
End at: 2017-11-30 07:39:51
Local clock offset: 1.546 ms
Remote clock offset: -8.286 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26070.005 ms
Loss rate: 98.59%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26070.005 ms
Loss rate: 98.59%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 3: Report of PCC — Data Link

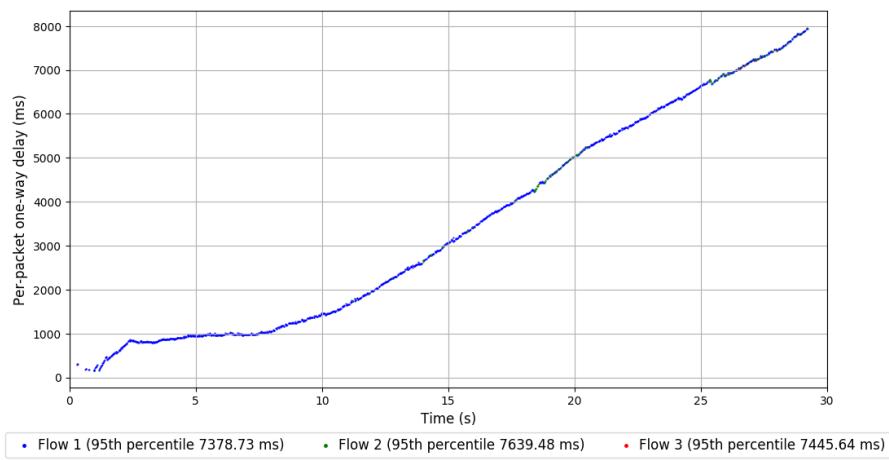
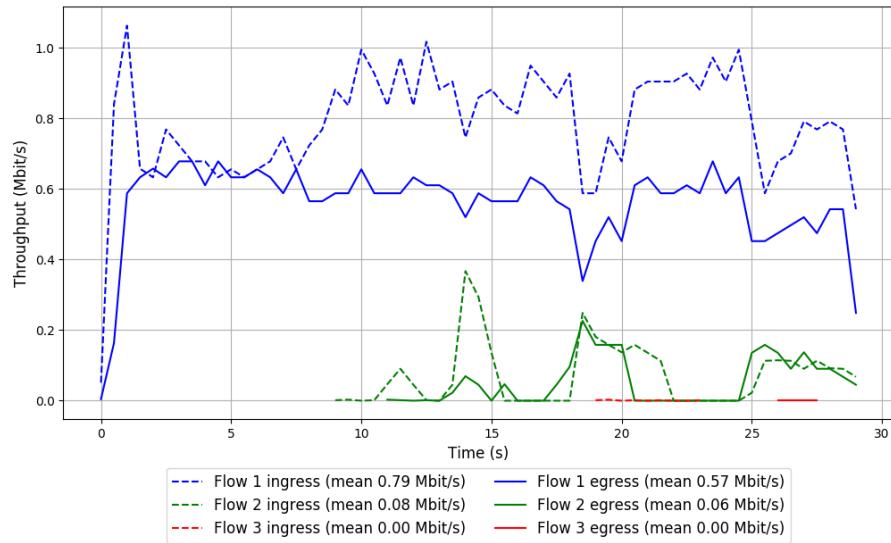


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2017-11-30 06:59:26
End at: 2017-11-30 06:59:56
Local clock offset: 1.206 ms
Remote clock offset: -1.524 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7419.021 ms
Loss rate: 29.31%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 7378.726 ms
Loss rate: 29.04%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 7639.484 ms
Loss rate: 33.48%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 7445.637 ms
Loss rate: 33.33%
```

Run 1: Report of QUIC Cubic — Data Link

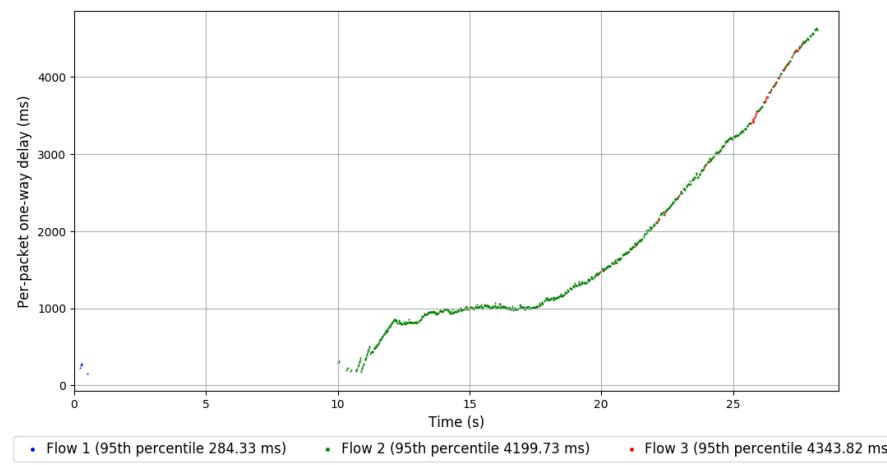
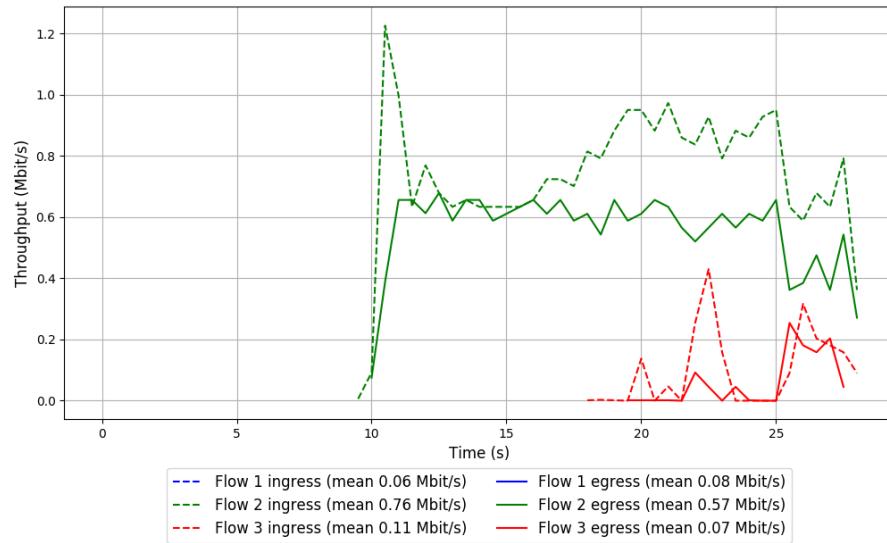


Run 2: Statistics of QUIC Cubic

```
Start at: 2017-11-30 07:16:54
End at: 2017-11-30 07:17:24
Local clock offset: 1.575 ms
Remote clock offset: -7.914 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 4279.587 ms
Loss rate: 27.72%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 284.334 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 4199.730 ms
Loss rate: 26.10%
-- Flow 3:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 4343.816 ms
Loss rate: 50.20%
```

Run 2: Report of QUIC Cubic — Data Link

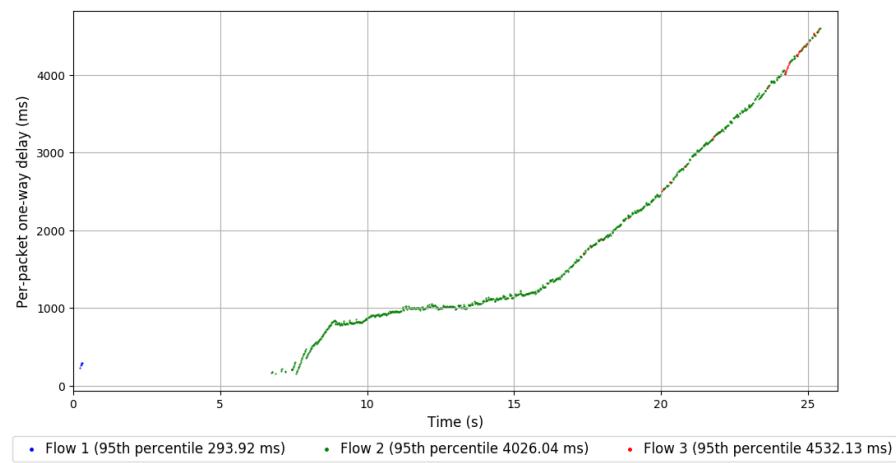
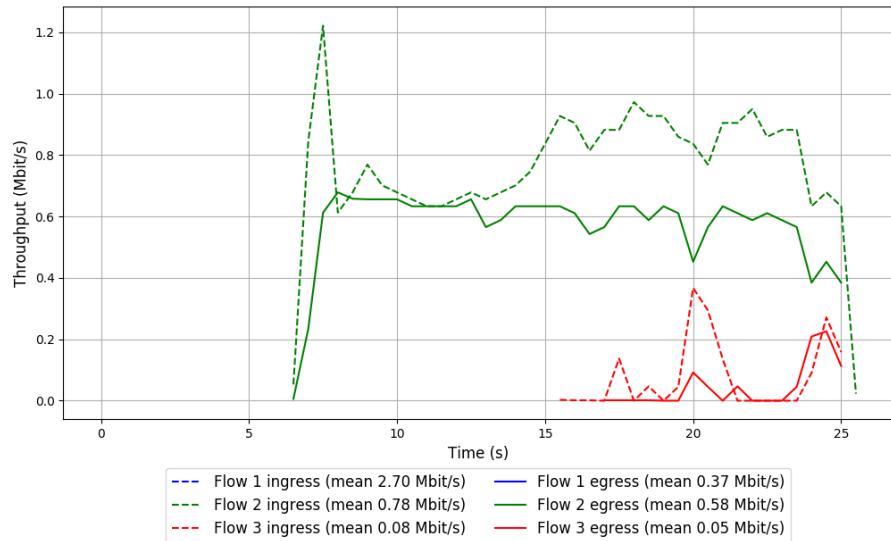


Run 3: Statistics of QUIC Cubic

```
Start at: 2017-11-30 07:34:22
End at: 2017-11-30 07:34:52
Local clock offset: 1.499 ms
Remote clock offset: -2.922 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 4204.072 ms
Loss rate: 27.57%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 293.923 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 4026.043 ms
Loss rate: 26.46%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 4532.134 ms
Loss rate: 49.53%
```

Run 3: Report of QUIC Cubic — Data Link

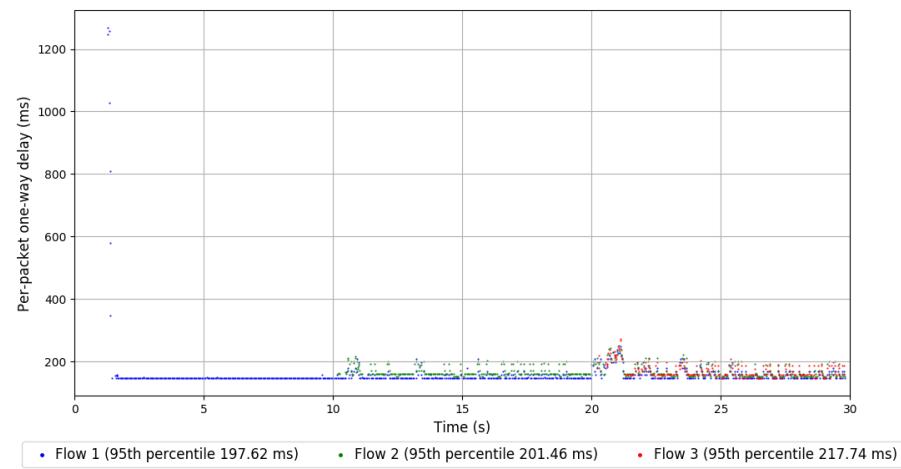
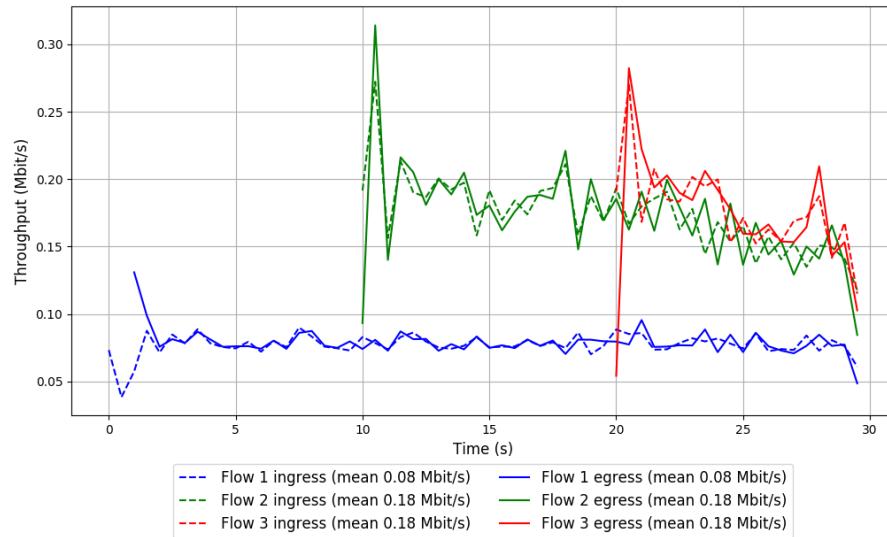


```
Run 1: Statistics of SCReAM
```

```
Start at: 2017-11-30 07:09:25
End at: 2017-11-30 07:09:55
Local clock offset: 1.629 ms
Remote clock offset: -2.706 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 206.010 ms
Loss rate: 1.23%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 197.621 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 201.460 ms
Loss rate: 1.06%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 217.741 ms
Loss rate: 2.15%
```

Run 1: Report of SCReAM — Data Link

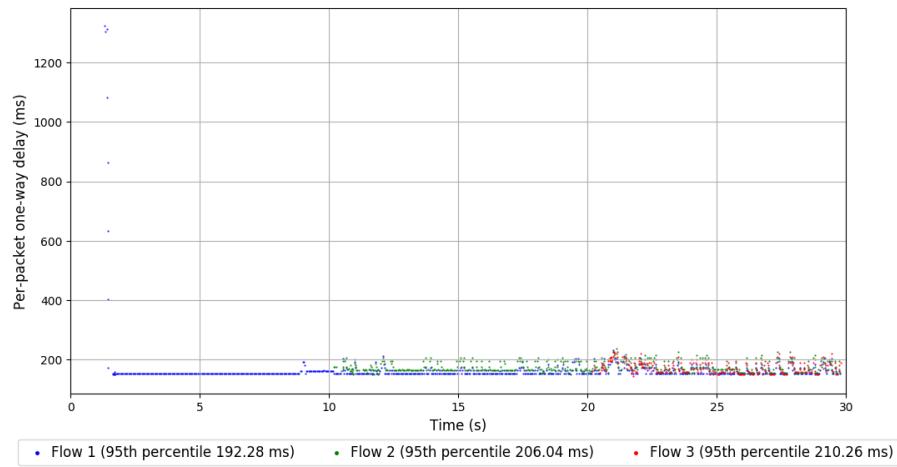
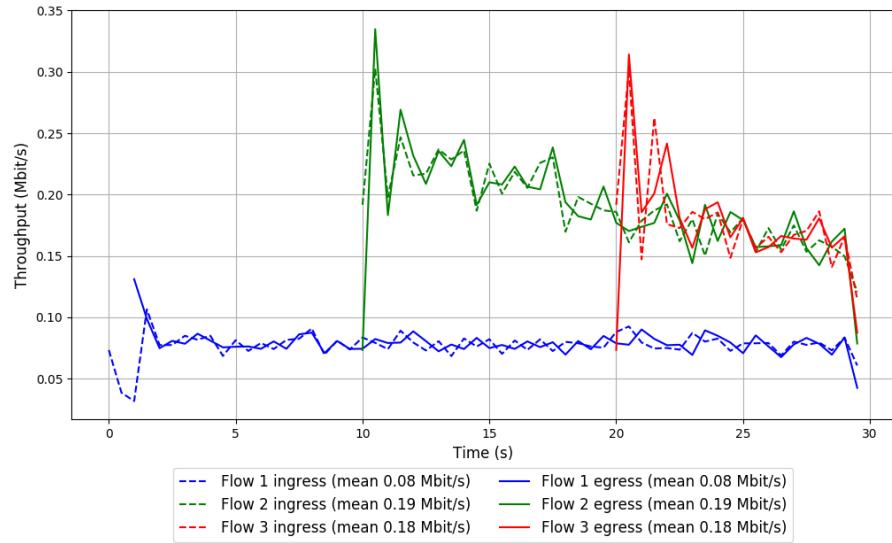


Run 2: Statistics of SCReAM

```
Start at: 2017-11-30 07:26:53
End at: 2017-11-30 07:27:23
Local clock offset: 1.47 ms
Remote clock offset: -2.862 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 205.927 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 192.279 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 206.045 ms
Loss rate: 1.11%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 210.261 ms
Loss rate: 2.14%
```

Run 2: Report of SCReAM — Data Link

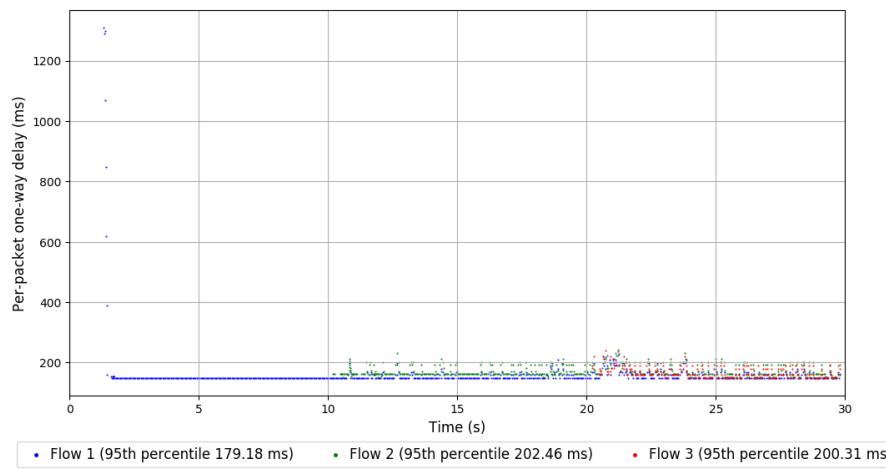
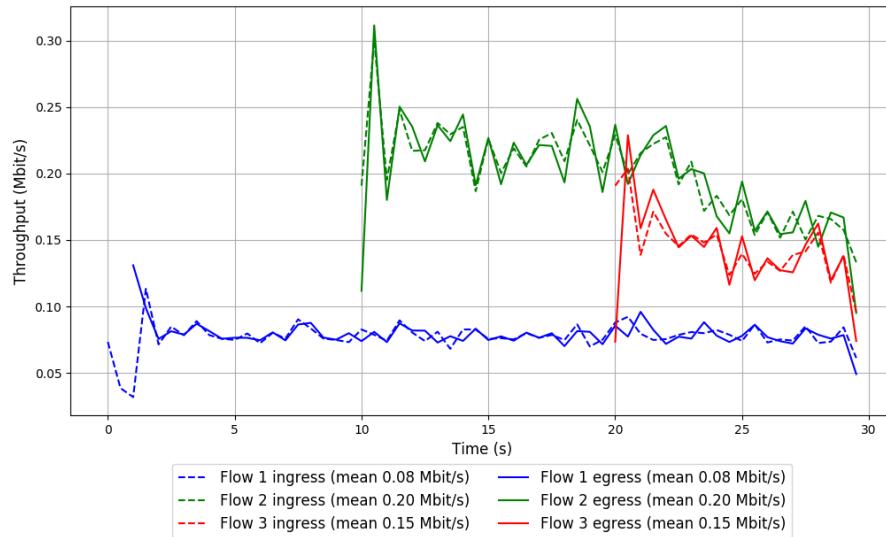


Run 3: Statistics of SCReAM

```
Start at: 2017-11-30 07:44:21
End at: 2017-11-30 07:44:51
Local clock offset: 1.665 ms
Remote clock offset: -3.613 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 202.293 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 179.181 ms
Loss rate: 0.80%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 202.463 ms
Loss rate: 1.03%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 200.312 ms
Loss rate: 2.19%
```

Run 3: Report of SCReAM — Data Link

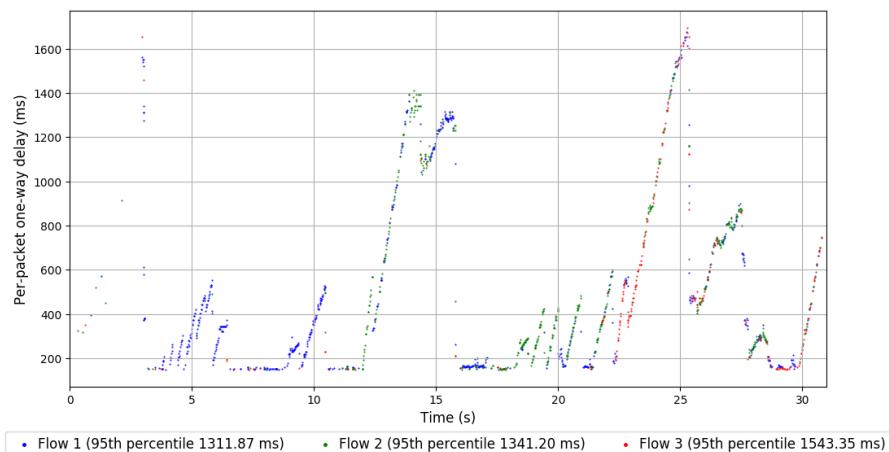
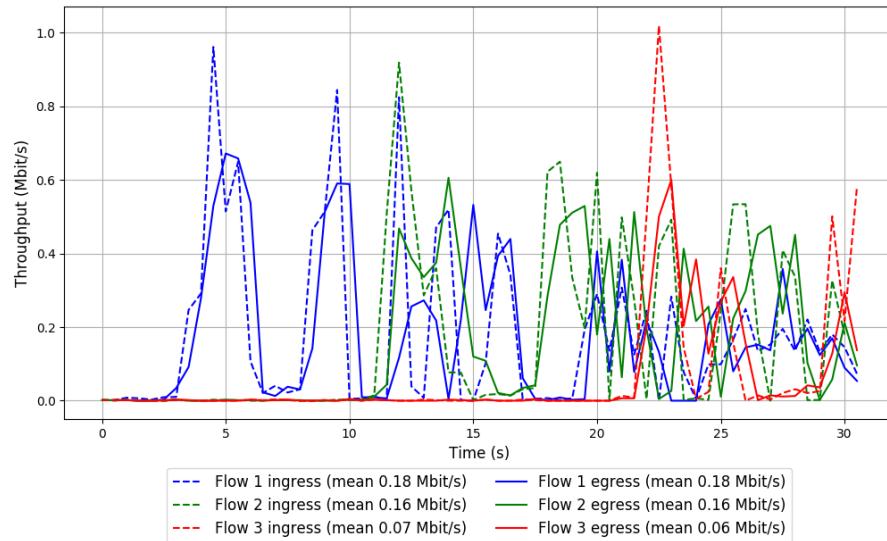


```
Run 1: Statistics of WebRTC media

Start at: 2017-11-30 07:00:41
End at: 2017-11-30 07:01:11
Local clock offset: 1.303 ms
Remote clock offset: -7.267 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 1341.202 ms
Loss rate: 4.44%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 1311.869 ms
Loss rate: 1.95%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 1341.202 ms
Loss rate: 1.44%
-- Flow 3:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 1543.346 ms
Loss rate: 17.85%
```

Run 1: Report of WebRTC media — Data Link

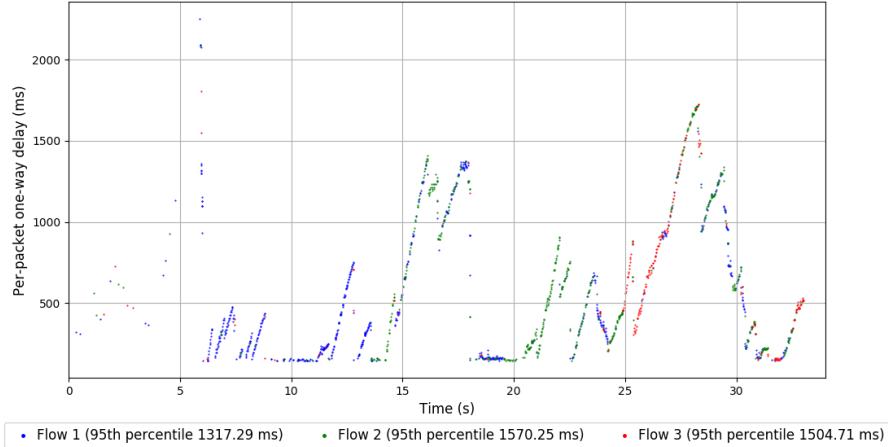
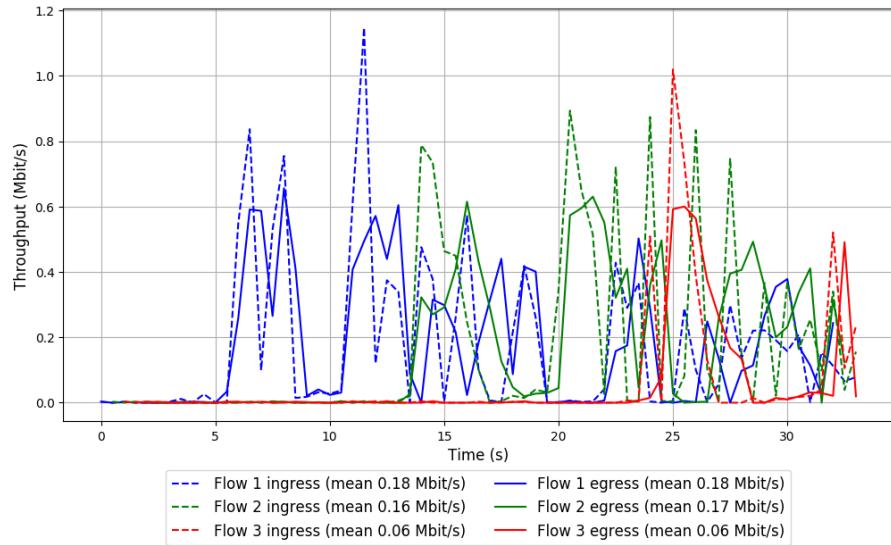


Run 2: Statistics of WebRTC media

```
Start at: 2017-11-30 07:18:09
End at: 2017-11-30 07:18:39
Local clock offset: 1.589 ms
Remote clock offset: -6.846 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 1370.655 ms
Loss rate: 2.59%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 1317.290 ms
Loss rate: 1.23%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 1570.254 ms
Loss rate: 1.82%
-- Flow 3:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 1504.714 ms
Loss rate: 8.90%
```

Run 2: Report of WebRTC media — Data Link

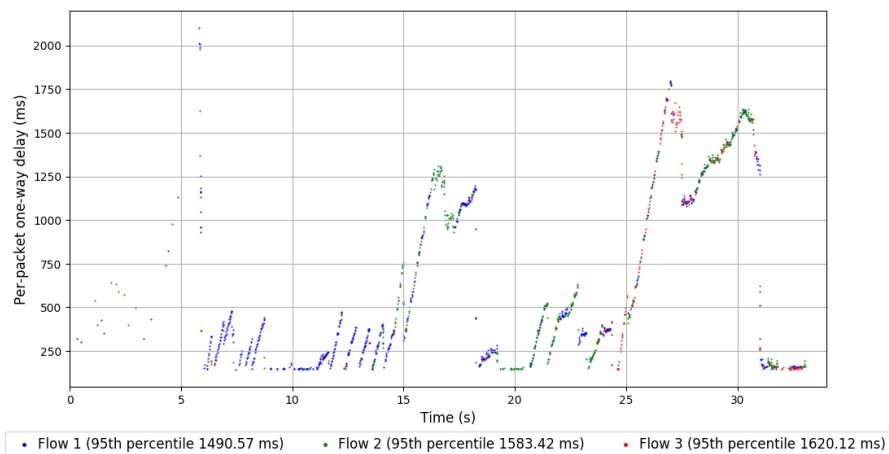
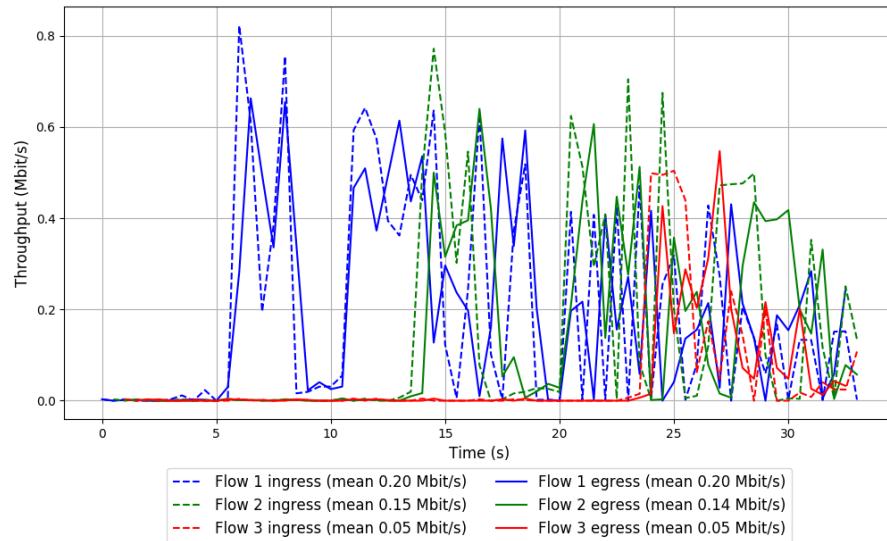


```
Run 3: Statistics of WebRTC media

Start at: 2017-11-30 07:35:37
End at: 2017-11-30 07:36:07
Local clock offset: 1.438 ms
Remote clock offset: -2.877 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 1580.229 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 1490.570 ms
Loss rate: 0.04%
-- Flow 2:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 1583.416 ms
Loss rate: 2.65%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 1620.116 ms
Loss rate: 4.31%
```

Run 3: Report of WebRTC media — Data Link

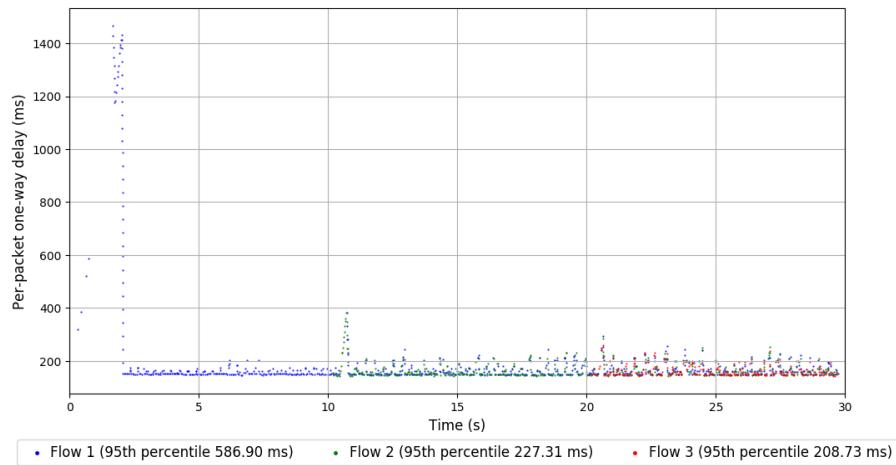
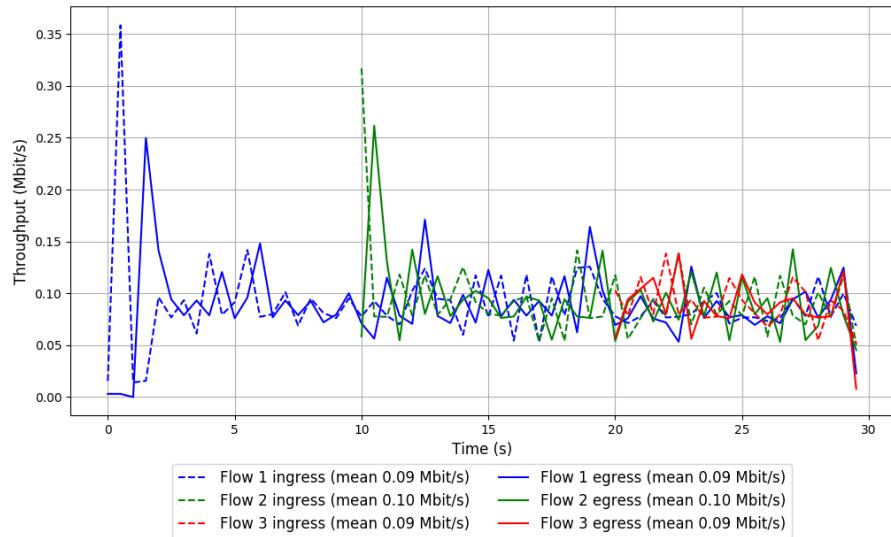


Run 1: Statistics of Sprout

```
Start at: 2017-11-30 07:13:09
End at: 2017-11-30 07:13:39
Local clock offset: 1.671 ms
Remote clock offset: -1.859 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 242.261 ms
Loss rate: 2.01%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 586.903 ms
Loss rate: 2.00%
-- Flow 2:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 227.314 ms
Loss rate: 1.71%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 208.732 ms
Loss rate: 2.71%
```

Run 1: Report of Sprout — Data Link

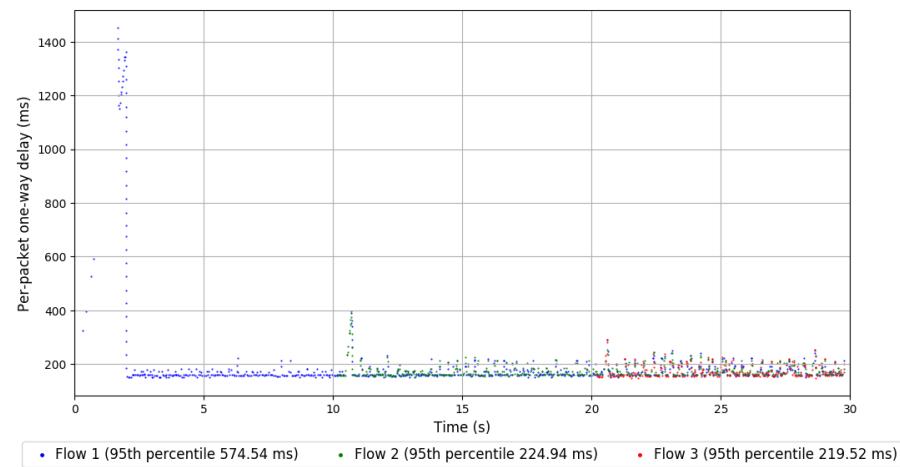
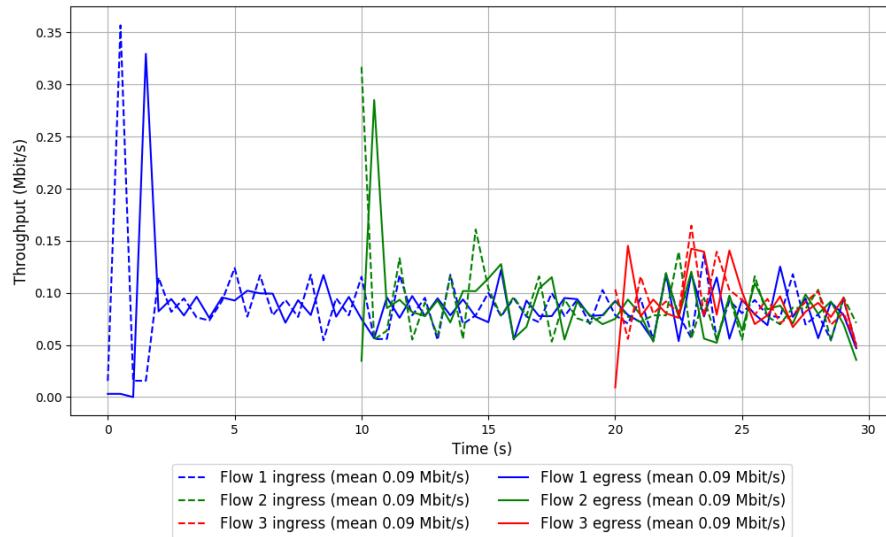


Run 2: Statistics of Sprout

```
Start at: 2017-11-30 07:30:37
End at: 2017-11-30 07:31:07
Local clock offset: 1.475 ms
Remote clock offset: -7.377 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 241.021 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 574.544 ms
Loss rate: 1.62%
-- Flow 2:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 224.938 ms
Loss rate: 2.34%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 219.518 ms
Loss rate: 1.78%
```

Run 2: Report of Sprout — Data Link

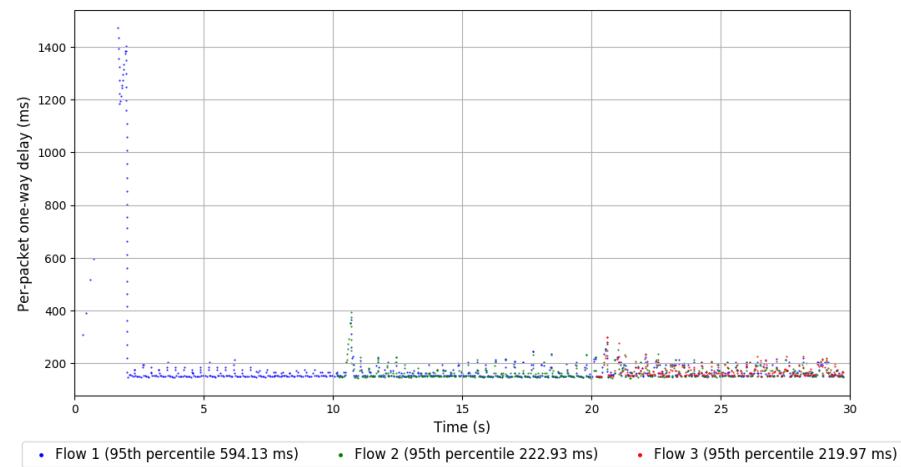
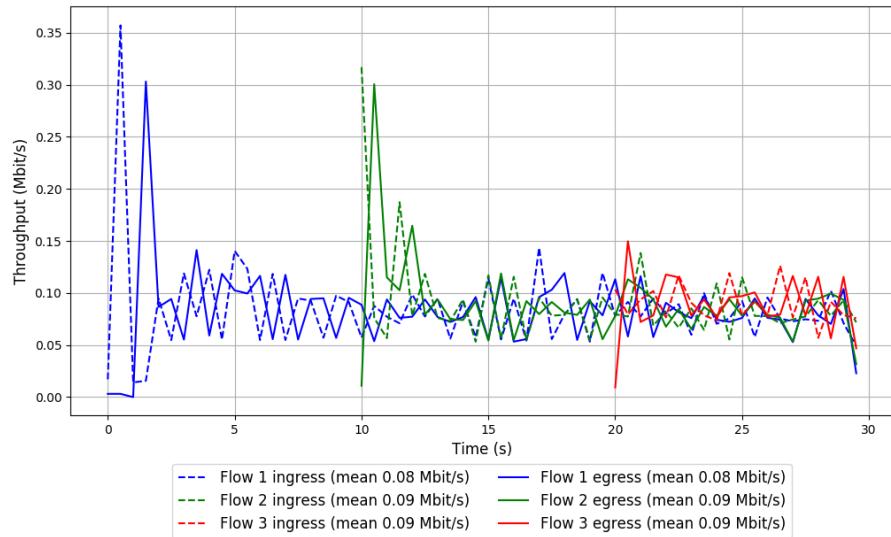


Run 3: Statistics of Sprout

```
Start at: 2017-11-30 07:48:05
End at: 2017-11-30 07:48:35
Local clock offset: 1.77 ms
Remote clock offset: -3.669 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 243.631 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 594.129 ms
Loss rate: 2.06%
-- Flow 2:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 222.928 ms
Loss rate: 1.70%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 219.971 ms
Loss rate: 1.87%
```

Run 3: Report of Sprout — Data Link

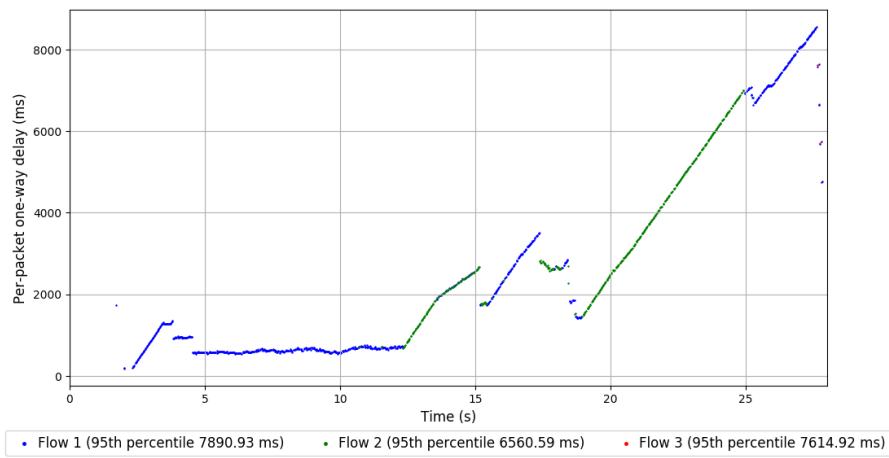
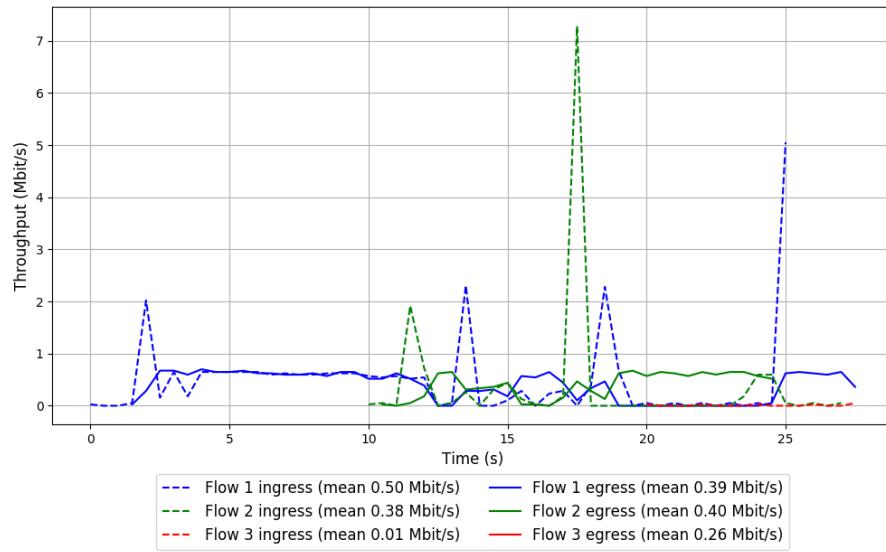


Run 1: Statistics of TaoVA-100x

```
Start at: 2017-11-30 07:05:41
End at: 2017-11-30 07:06:11
Local clock offset: 1.473 ms
Remote clock offset: -6.961 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 7546.544 ms
Loss rate: 17.64%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 7890.929 ms
Loss rate: 20.31%
-- Flow 2:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 6560.591 ms
Loss rate: 11.82%
-- Flow 3:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 7614.917 ms
Loss rate: 66.67%
```

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

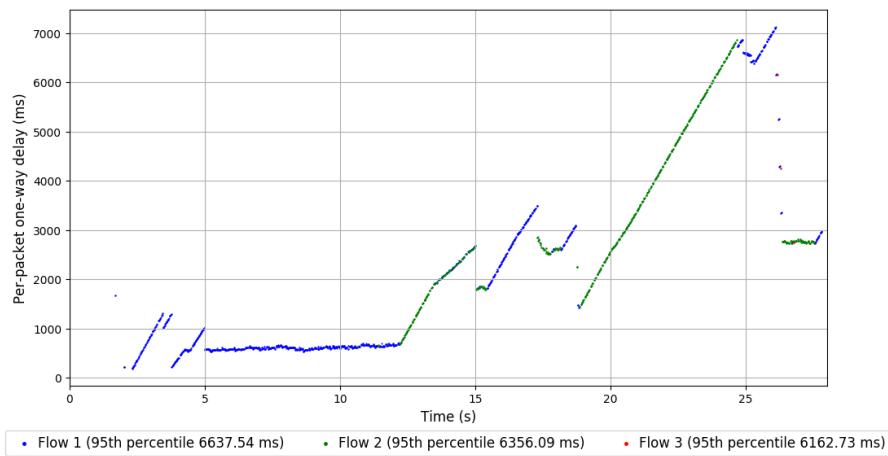
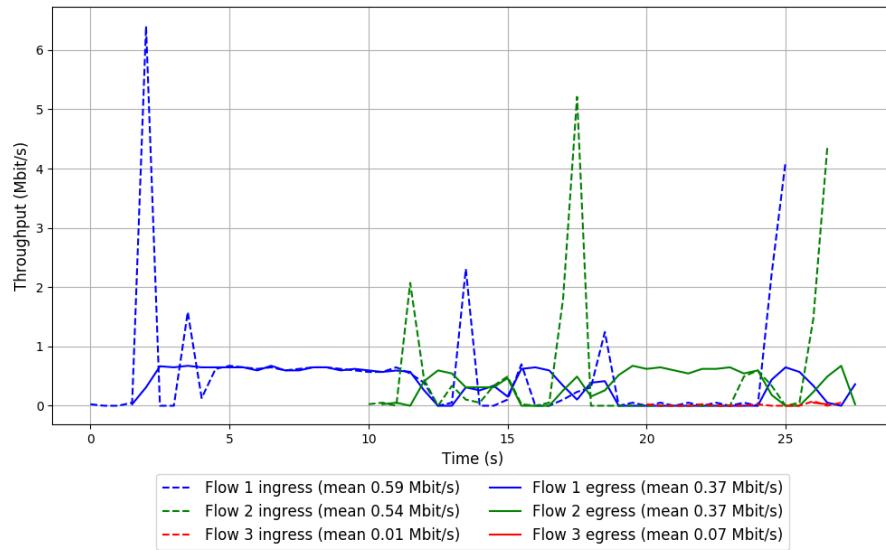


Run 2: Statistics of TaoVA-100x

```
Start at: 2017-11-30 07:23:09
End at: 2017-11-30 07:23:39
Local clock offset: 1.455 ms
Remote clock offset: -7.208 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 6574.781 ms
Loss rate: 34.27%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 6637.538 ms
Loss rate: 35.41%
-- Flow 2:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 6356.092 ms
Loss rate: 32.11%
-- Flow 3:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 6162.732 ms
Loss rate: 62.50%
```

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

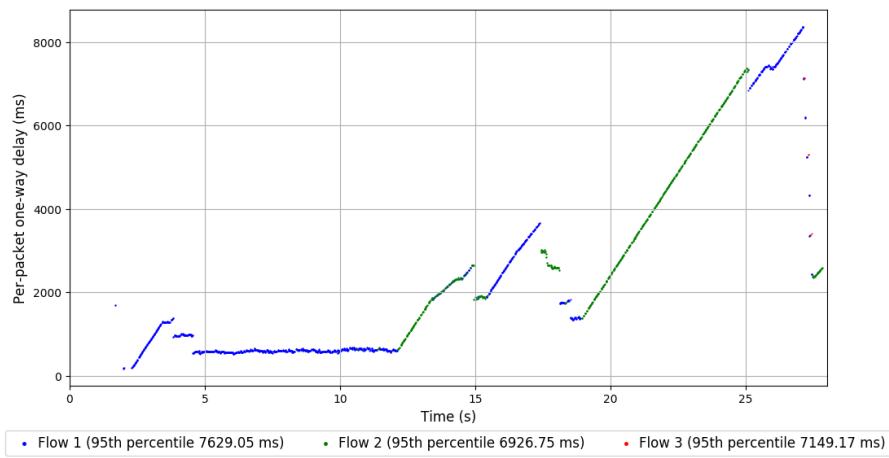
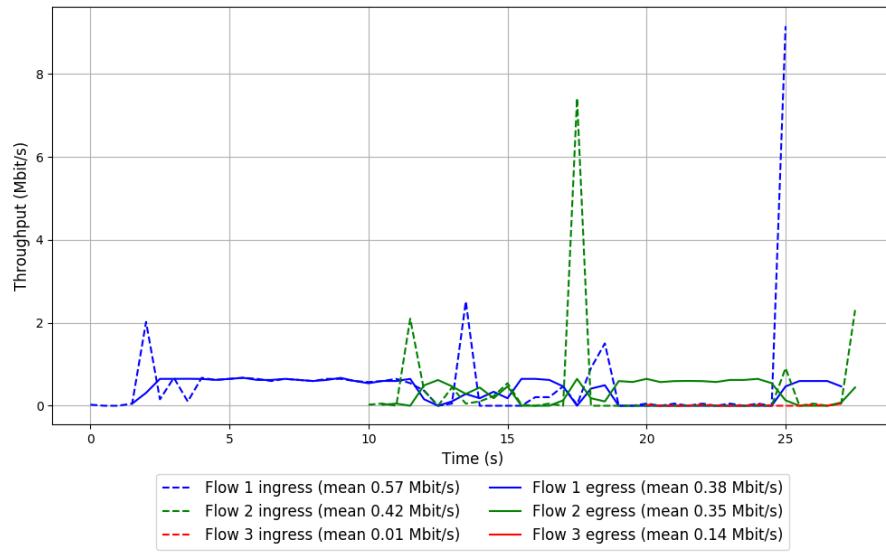


Run 3: Statistics of TaoVA-100x

```
Start at: 2017-11-30 07:40:37
End at: 2017-11-30 07:41:07
Local clock offset: 1.573 ms
Remote clock offset: -8.36 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7391.474 ms
Loss rate: 27.55%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 7629.051 ms
Loss rate: 31.82%
-- Flow 2:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 6926.746 ms
Loss rate: 19.01%
-- Flow 3:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 7149.172 ms
Loss rate: 50.00%
```

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

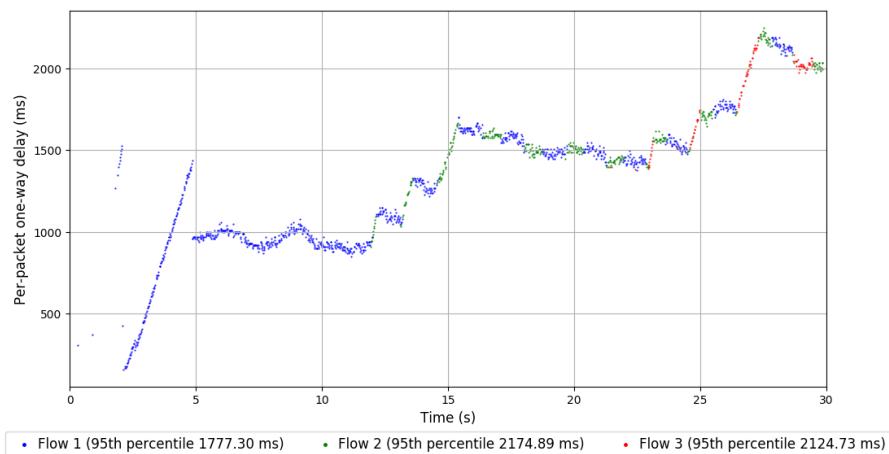
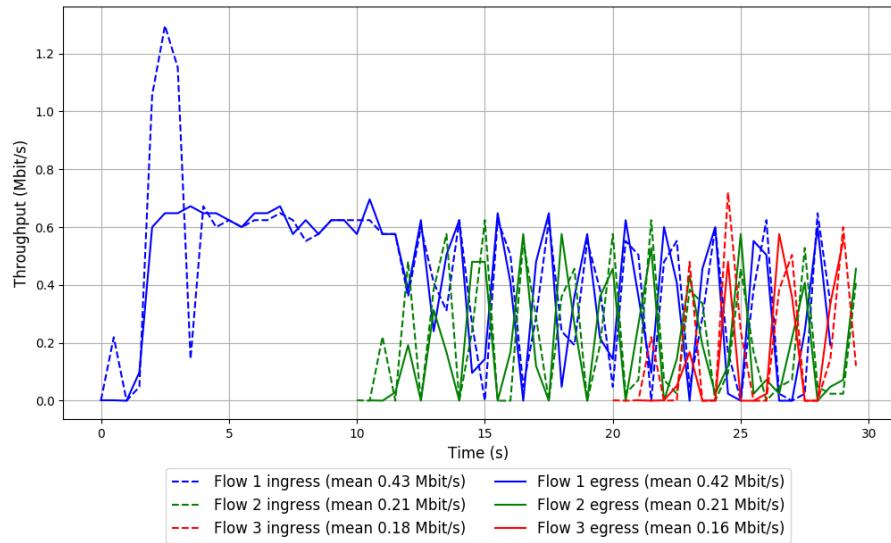


Run 1: Statistics of TCP Vegas

```
Start at: 2017-11-30 07:11:54
End at: 2017-11-30 07:12:24
Local clock offset: 1.609 ms
Remote clock offset: -1.924 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 2107.264 ms
Loss rate: 6.65%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 1777.301 ms
Loss rate: 4.03%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 2174.891 ms
Loss rate: 6.89%
-- Flow 3:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 2124.733 ms
Loss rate: 25.29%
```

Run 1: Report of TCP Vegas — Data Link

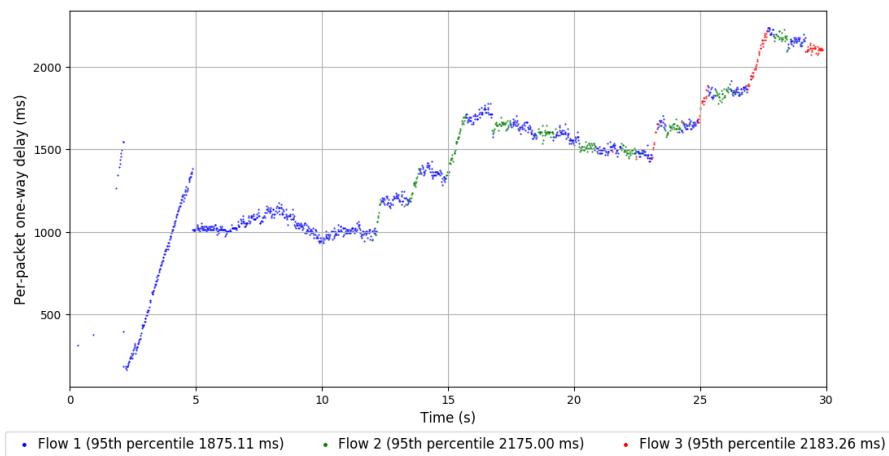
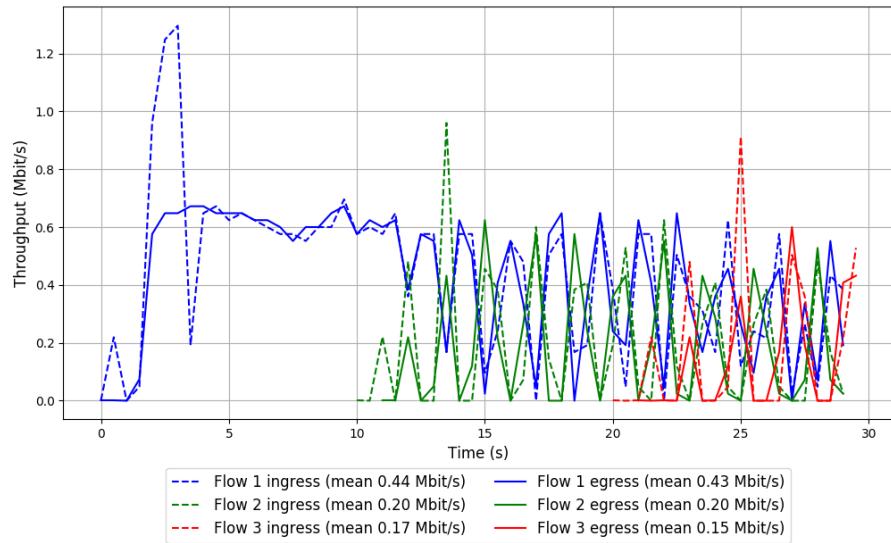


Run 2: Statistics of TCP Vegas

```
Start at: 2017-11-30 07:29:22
End at: 2017-11-30 07:29:52
Local clock offset: 1.406 ms
Remote clock offset: -7.891 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 2145.087 ms
Loss rate: 6.96%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 1875.111 ms
Loss rate: 4.35%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 2175.004 ms
Loss rate: 8.71%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 2183.260 ms
Loss rate: 23.47%
```

Run 2: Report of TCP Vegas — Data Link

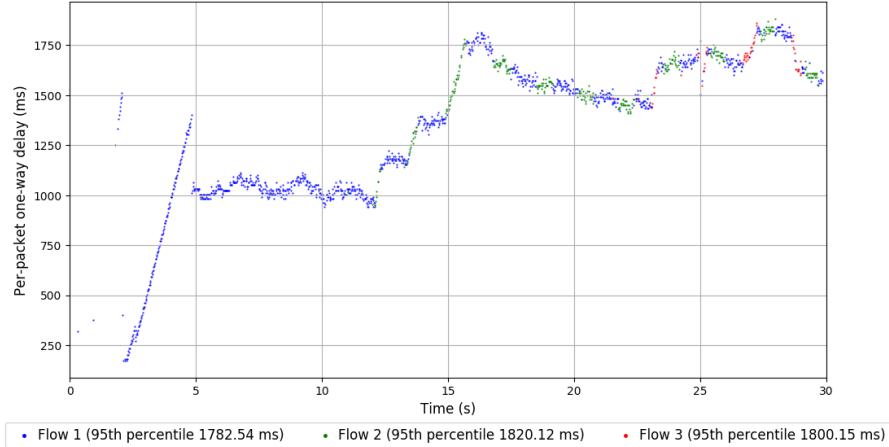
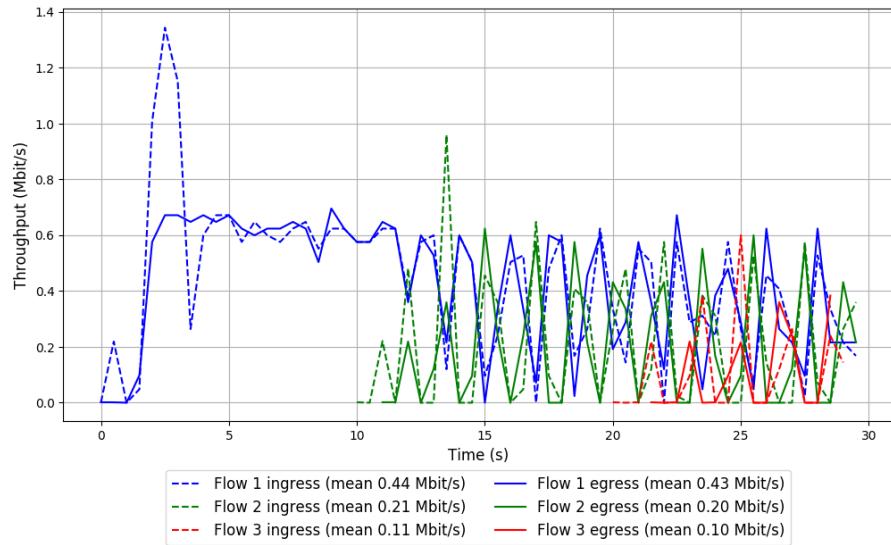


Run 3: Statistics of TCP Vegas

```
Start at: 2017-11-30 07:46:50
End at: 2017-11-30 07:47:20
Local clock offset: 1.68 ms
Remote clock offset: -2.756 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1792.535 ms
Loss rate: 6.03%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 1782.544 ms
Loss rate: 3.91%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 1820.115 ms
Loss rate: 7.66%
-- Flow 3:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 1800.154 ms
Loss rate: 26.64%
```

Run 3: Report of TCP Vegas — Data Link

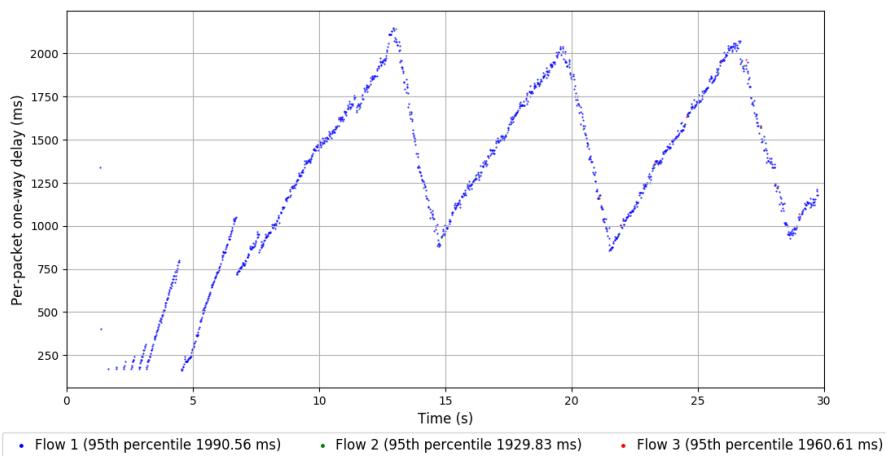
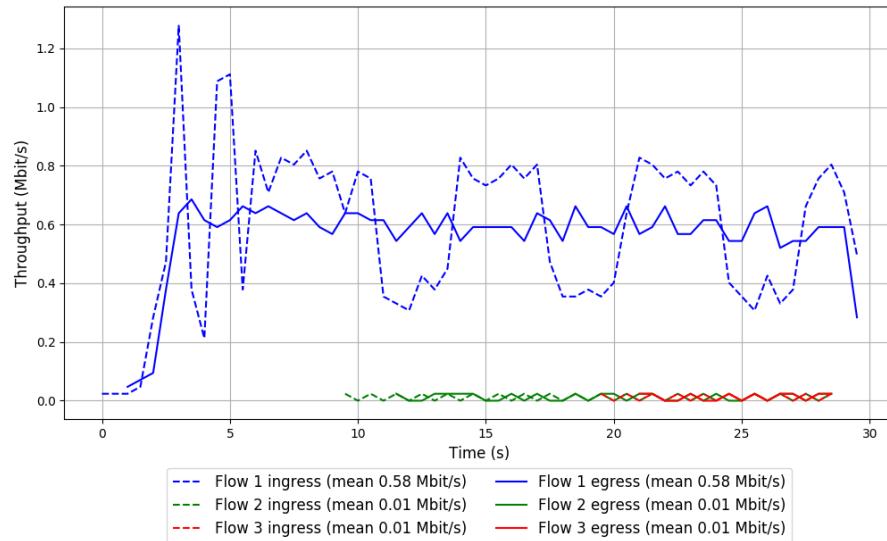


Run 1: Statistics of Verus

```
Start at: 2017-11-30 07:15:39
End at: 2017-11-30 07:16:09
Local clock offset: 1.612 ms
Remote clock offset: -2.392 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1988.110 ms
Loss rate: 5.67%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1990.555 ms
Loss rate: 5.65%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1929.834 ms
Loss rate: 5.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1960.609 ms
Loss rate: 10.00%
```

Run 1: Report of Verus — Data Link

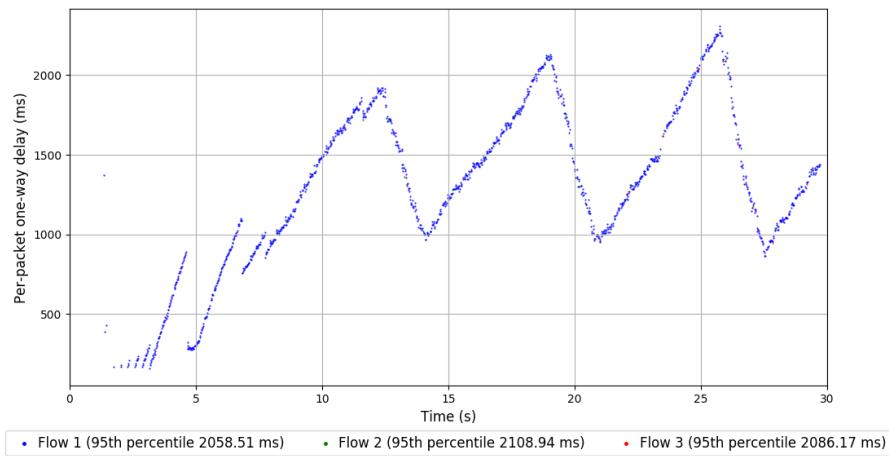
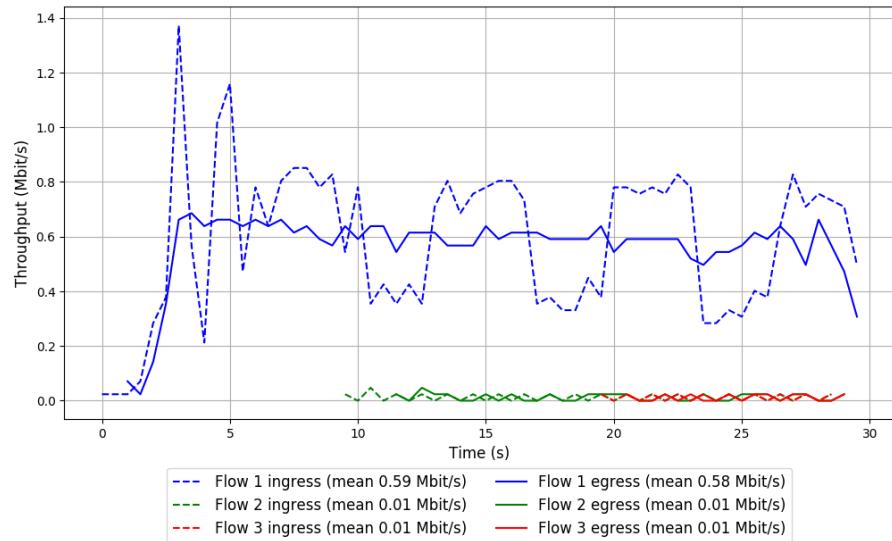


Run 2: Statistics of Verus

```
Start at: 2017-11-30 07:33:07
End at: 2017-11-30 07:33:37
Local clock offset: 1.407 ms
Remote clock offset: -2.9 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 2066.692 ms
Loss rate: 6.55%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 2058.514 ms
Loss rate: 6.55%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2108.940 ms
Loss rate: 4.76%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2086.173 ms
Loss rate: 10.00%
```

Run 2: Report of Verus — Data Link

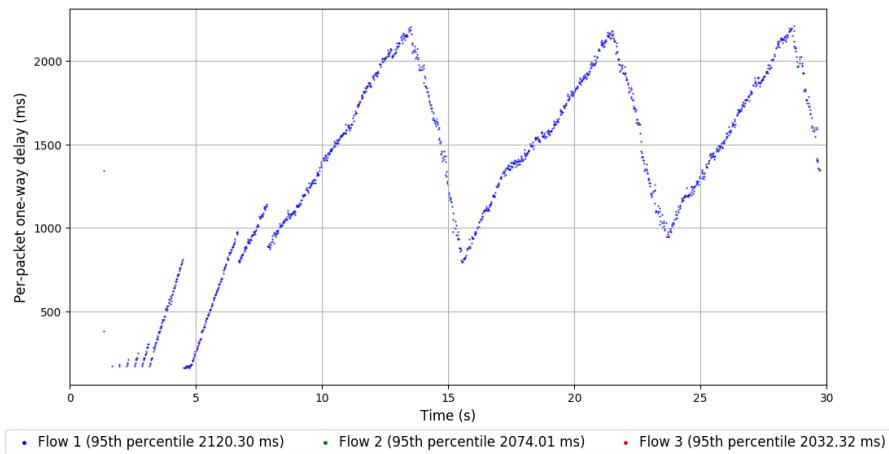
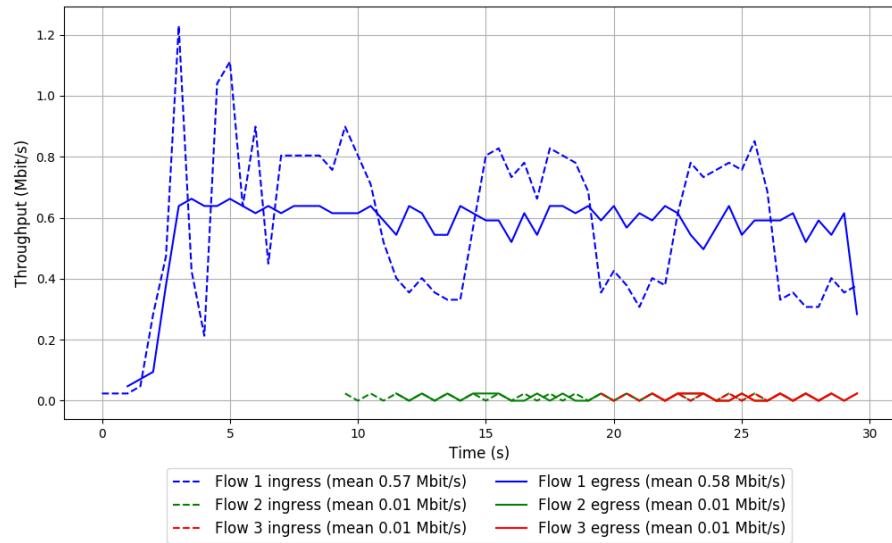


Run 3: Statistics of Verus

```
Start at: 2017-11-30 07:50:34
End at: 2017-11-30 07:51:04
Local clock offset: 1.876 ms
Remote clock offset: -3.227 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 2119.994 ms
Loss rate: 3.67%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 2120.303 ms
Loss rate: 3.61%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2074.007 ms
Loss rate: 5.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2032.317 ms
Loss rate: 10.00%
```

Run 3: Report of Verus — Data Link

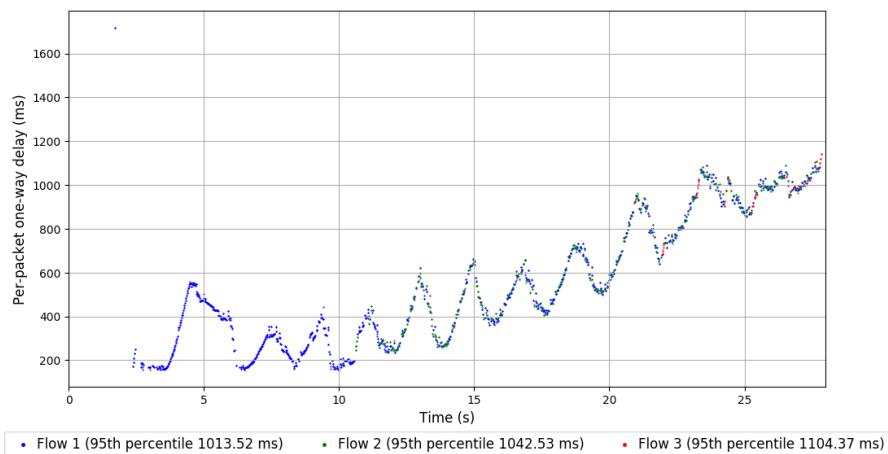
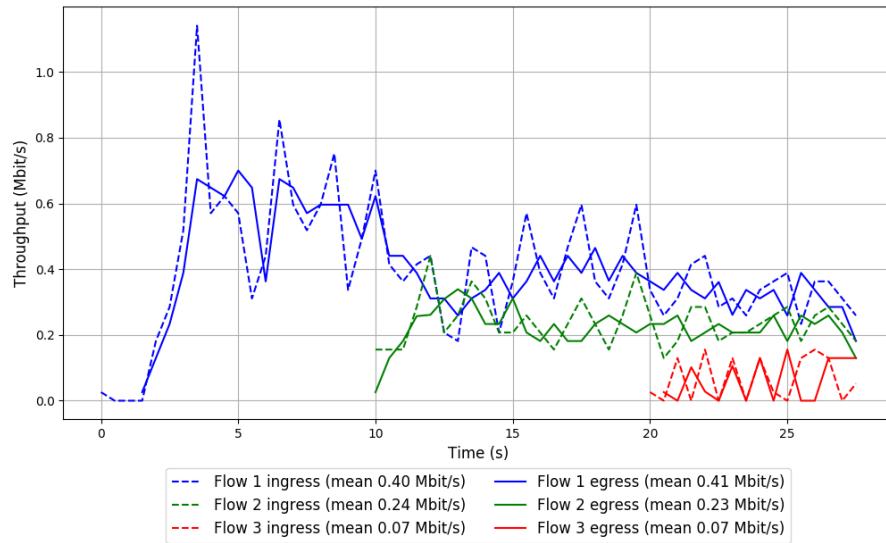


Run 1: Statistics of Copa

```
Start at: 2017-11-30 07:01:55
End at: 2017-11-30 07:02:25
Local clock offset: 1.292 ms
Remote clock offset: -1.604 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1032.801 ms
Loss rate: 4.78%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 1013.517 ms
Loss rate: 3.61%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 1042.534 ms
Loss rate: 6.93%
-- Flow 3:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 1104.369 ms
Loss rate: 12.01%
```

Run 1: Report of Copa — Data Link

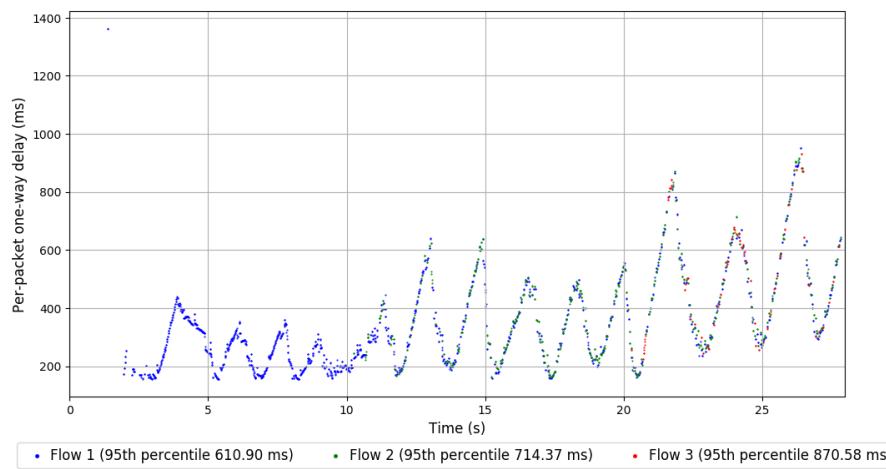
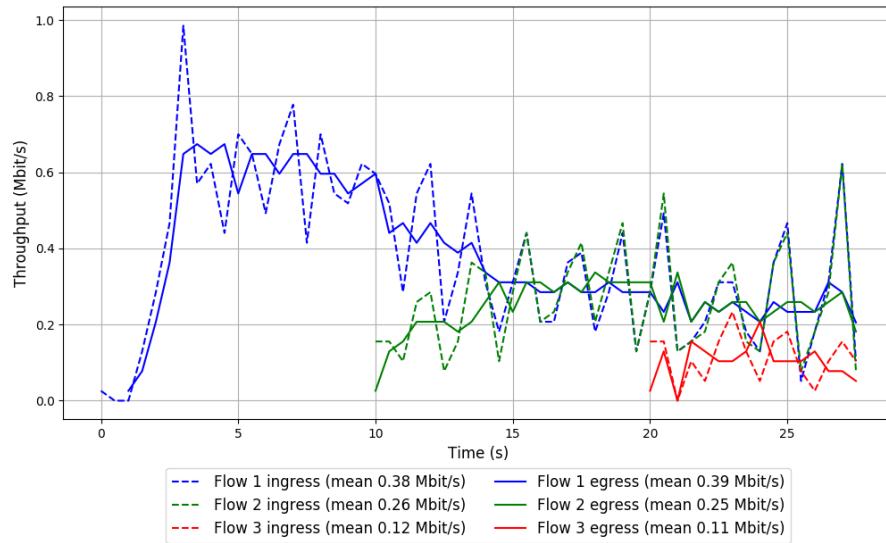


Run 2: Statistics of Copa

```
Start at: 2017-11-30 07:19:23
End at: 2017-11-30 07:19:53
Local clock offset: 1.6 ms
Remote clock offset: -3.225 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 664.369 ms
Loss rate: 3.55%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 610.897 ms
Loss rate: 2.23%
-- Flow 2:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 714.374 ms
Loss rate: 4.99%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 870.584 ms
Loss rate: 11.27%
```

Run 2: Report of Copa — Data Link

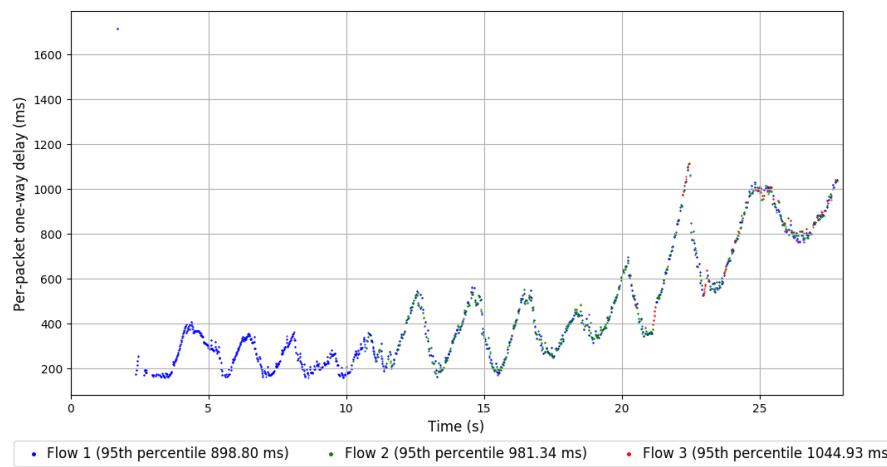
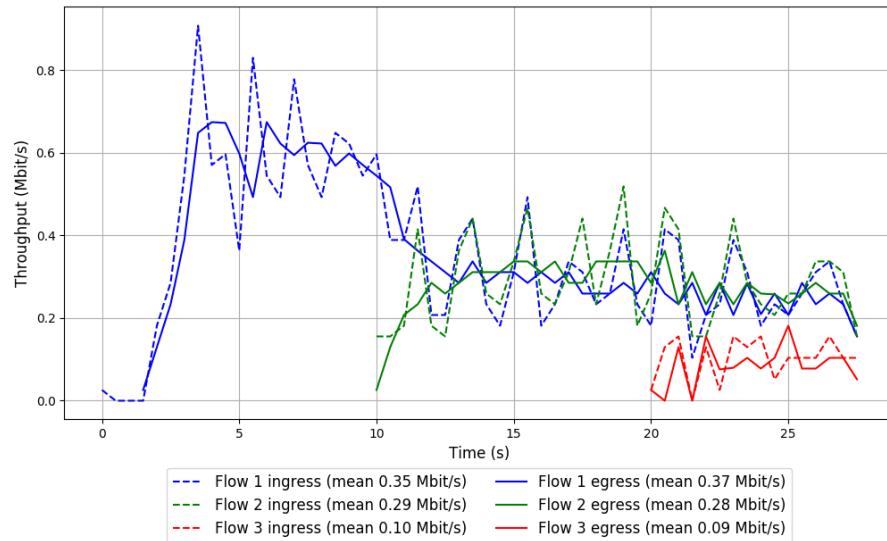


Run 3: Statistics of Copa

```
Start at: 2017-11-30 07:36:51
End at: 2017-11-30 07:37:21
Local clock offset: 1.531 ms
Remote clock offset: -7.447 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 974.710 ms
Loss rate: 4.49%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 898.800 ms
Loss rate: 2.76%
-- Flow 2:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 981.338 ms
Loss rate: 5.72%
-- Flow 3:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 1044.930 ms
Loss rate: 17.46%
```

Run 3: Report of Copa — Data Link

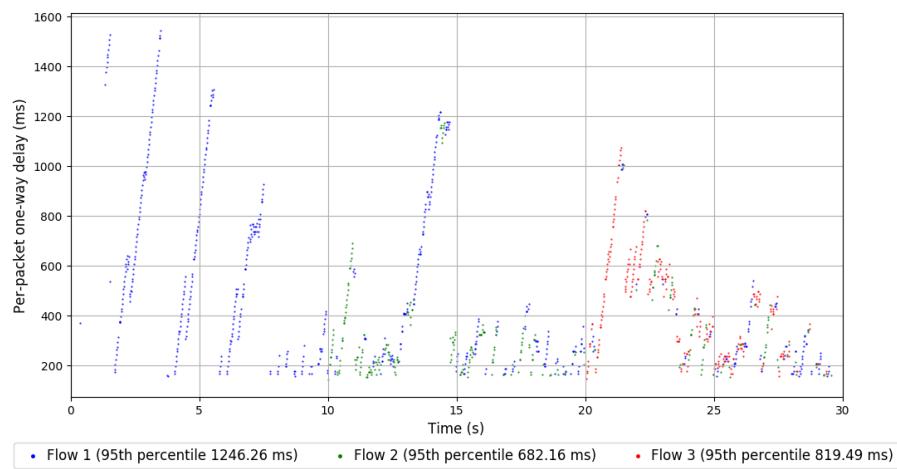
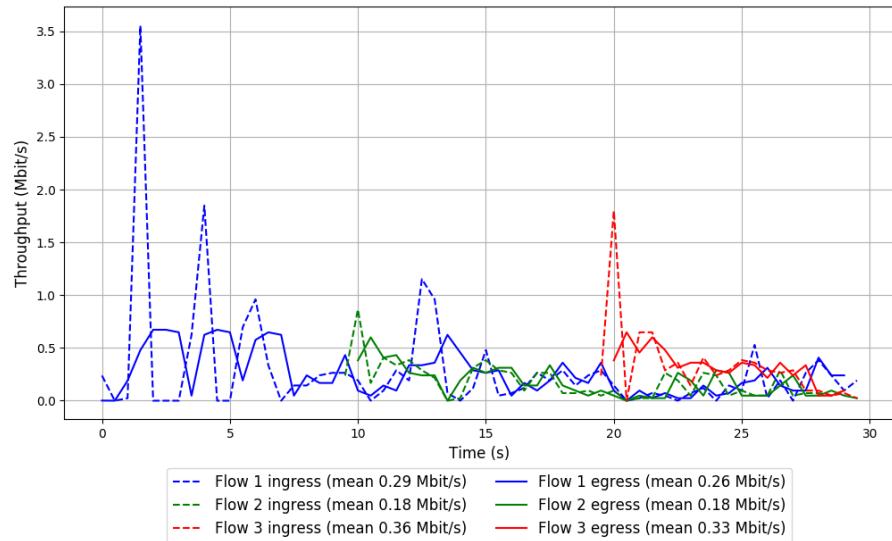


Run 1: Statistics of Indigo

```
Start at: 2017-11-30 07:10:40
End at: 2017-11-30 07:11:10
Local clock offset: 1.649 ms
Remote clock offset: -1.794 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 1153.236 ms
Loss rate: 9.36%
-- Flow 1:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 1246.261 ms
Loss rate: 11.59%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 682.161 ms
Loss rate: 2.03%
-- Flow 3:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 819.491 ms
Loss rate: 11.34%
```

Run 1: Report of Indigo — Data Link

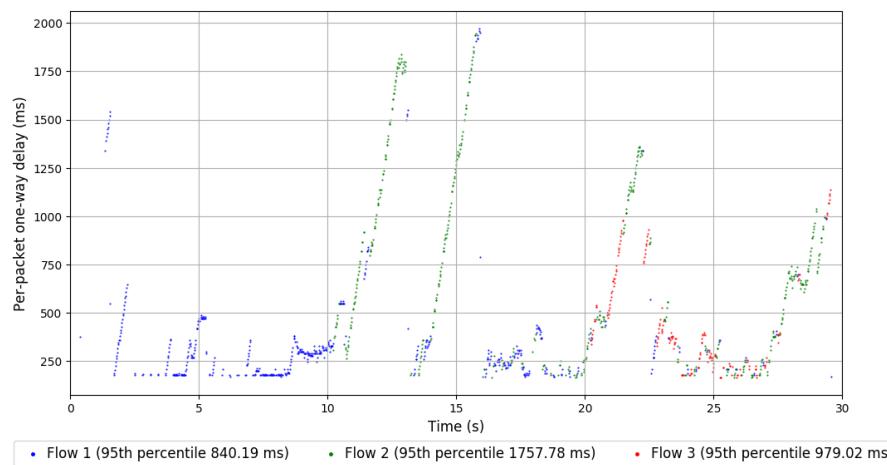
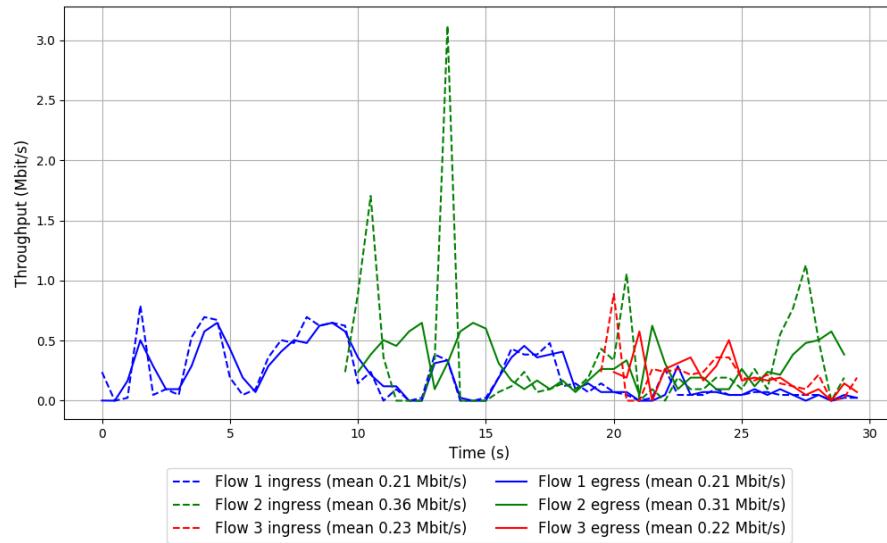


Run 2: Statistics of Indigo

```
Start at: 2017-11-30 07:28:08
End at: 2017-11-30 07:28:38
Local clock offset: 1.444 ms
Remote clock offset: -7.327 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 1555.893 ms
Loss rate: 8.01%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 840.191 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 1757.783 ms
Loss rate: 14.26%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 979.017 ms
Loss rate: 7.57%
```

Run 2: Report of Indigo — Data Link

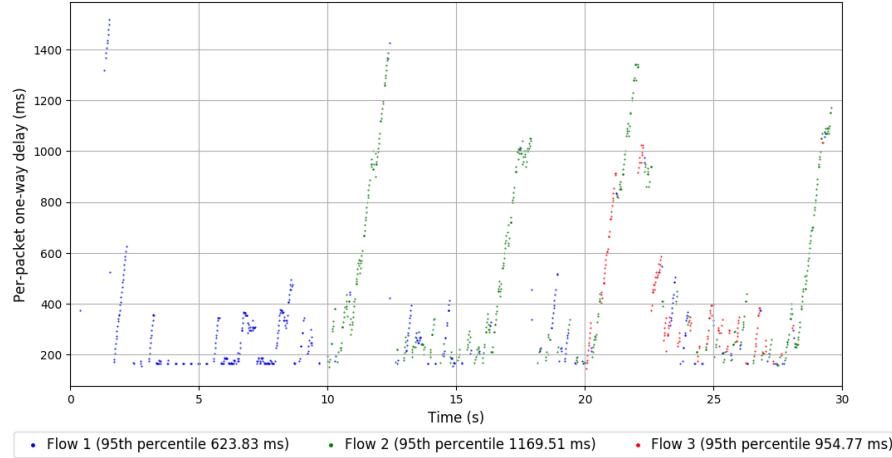
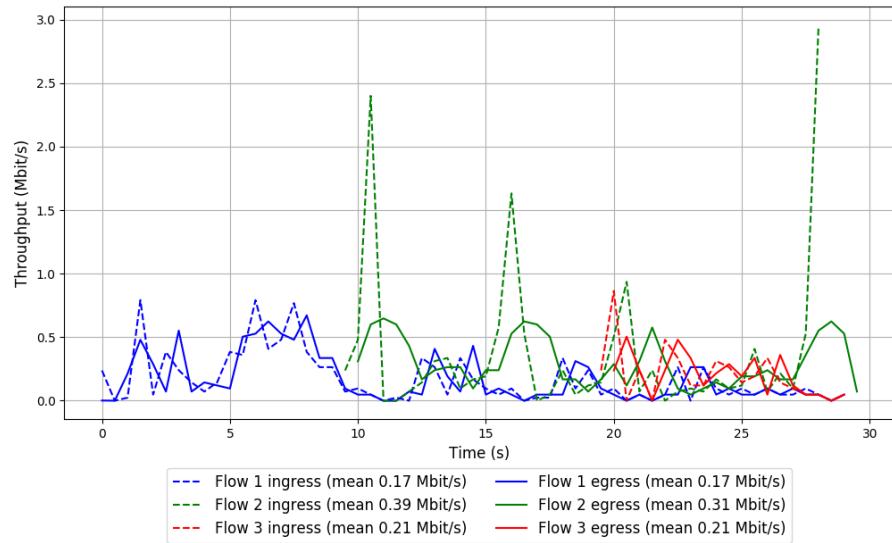


Run 3: Statistics of Indigo

```
Start at: 2017-11-30 07:45:35
End at: 2017-11-30 07:46:05
Local clock offset: 1.731 ms
Remote clock offset: -2.4 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1089.157 ms
Loss rate: 9.28%
-- Flow 1:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 623.830 ms
Loss rate: 1.68%
-- Flow 2:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 1169.506 ms
Loss rate: 15.98%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 954.773 ms
Loss rate: 4.17%
```

Run 3: Report of Indigo — Data Link

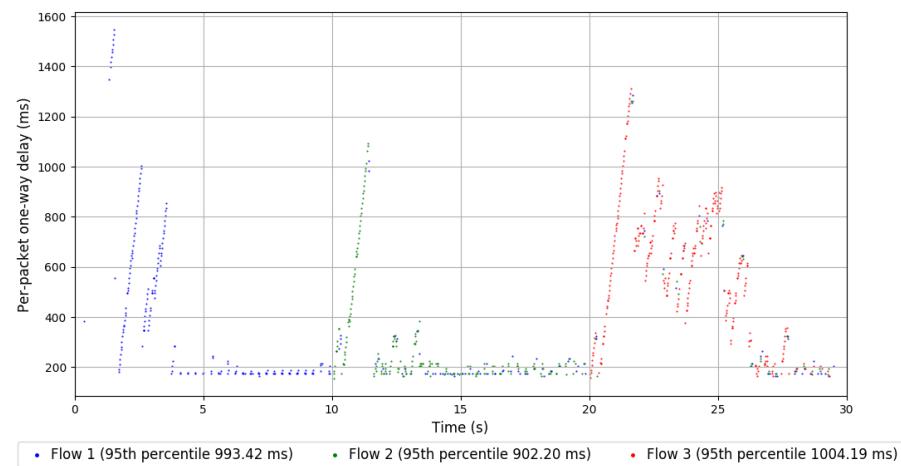
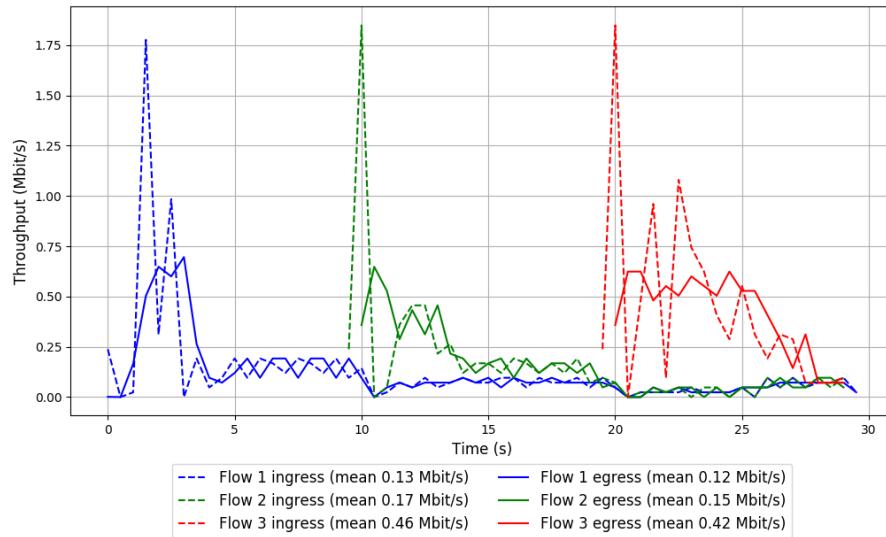


```
Run 1: Statistics of Indigo-calib

Start at: 2017-11-30 07:08:10
End at: 2017-11-30 07:08:40
Local clock offset: 1.582 ms
Remote clock offset: -6.874 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 973.518 ms
Loss rate: 9.40%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 993.424 ms
Loss rate: 8.60%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 902.201 ms
Loss rate: 9.30%
-- Flow 3:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 1004.191 ms
Loss rate: 10.17%
```

Run 1: Report of Indigo-calib — Data Link

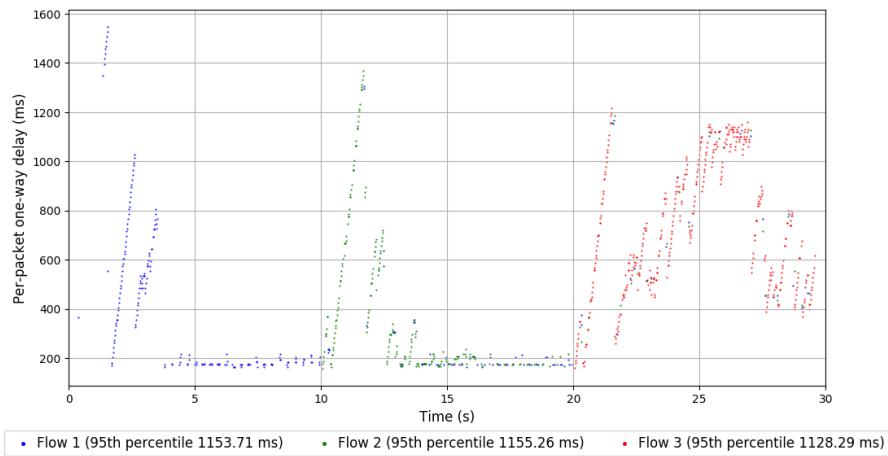
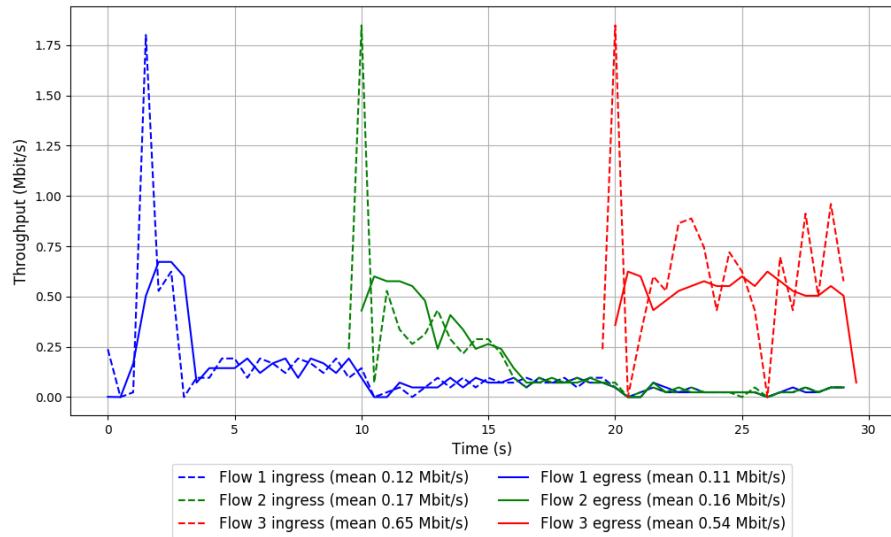


Run 2: Statistics of Indigo-calib

```
Start at: 2017-11-30 07:25:39
End at: 2017-11-30 07:26:09
Local clock offset: 1.49 ms
Remote clock offset: -7.211 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 1130.316 ms
Loss rate: 11.59%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 1153.711 ms
Loss rate: 8.85%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 1155.261 ms
Loss rate: 5.15%
-- Flow 3:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 1128.294 ms
Loss rate: 16.57%
```

Run 2: Report of Indigo-calib — Data Link



Run 3: Statistics of Indigo-calib

```
Start at: 2017-11-30 07:43:06
End at: 2017-11-30 07:43:36
Local clock offset: 1.579 ms
Remote clock offset: -8.365 ms

# Below is generated by plot.py at 2017-11-30 08:45:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 1212.209 ms
Loss rate: 6.60%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 1124.855 ms
Loss rate: 6.08%
-- Flow 2:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 1252.044 ms
Loss rate: 4.70%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 1112.179 ms
Loss rate: 14.14%
```

Run 3: Report of Indigo-calib — Data Link

