

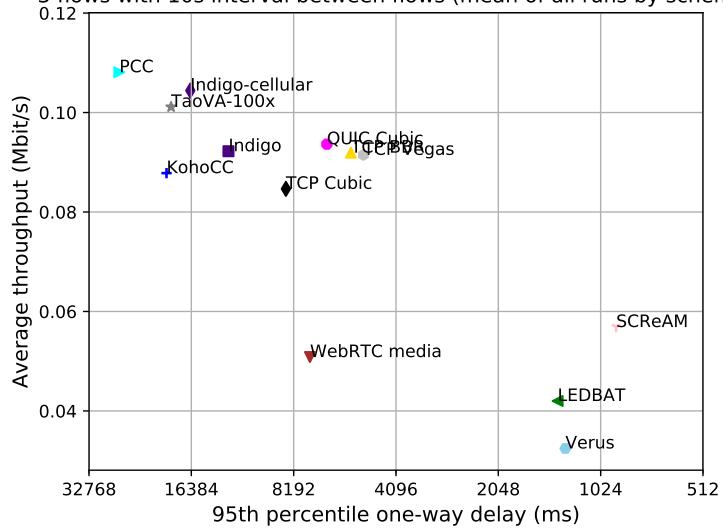
## Pantheon Report

Generated at 2017-09-22 15:29:46 (UTC).  
Data path: Mexico ppp0 (*remote*) → AWS California 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 `time.stanford.edu` and have been applied to correct the timestamps in logs.

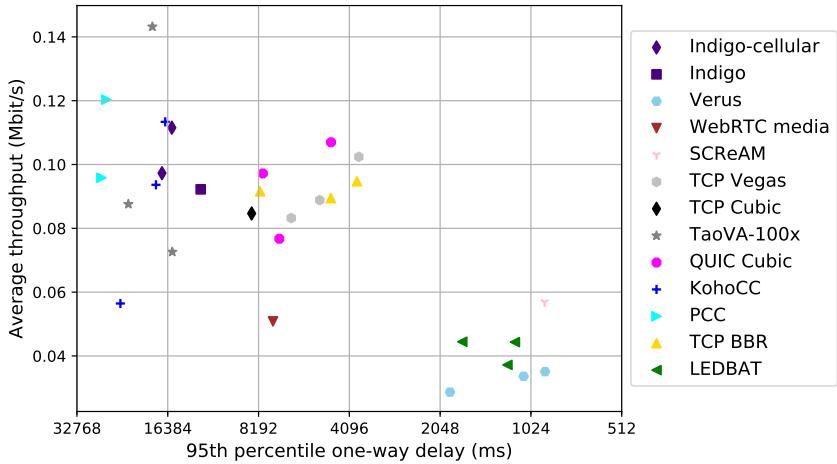
Git summary:

```
branch: indigos @ 46c7c812d4acb71eea4f5fb0b03b3657cea3062f
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/genericCC @ f7ca42f251bf49b432bb71de6d13fa903515c366
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 Mexico ppp0 to AWS California 2 Ethernet, 3 runs of 30s each per scheme  
 3 flows with 10s interval between flows (mean of all runs by scheme)



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



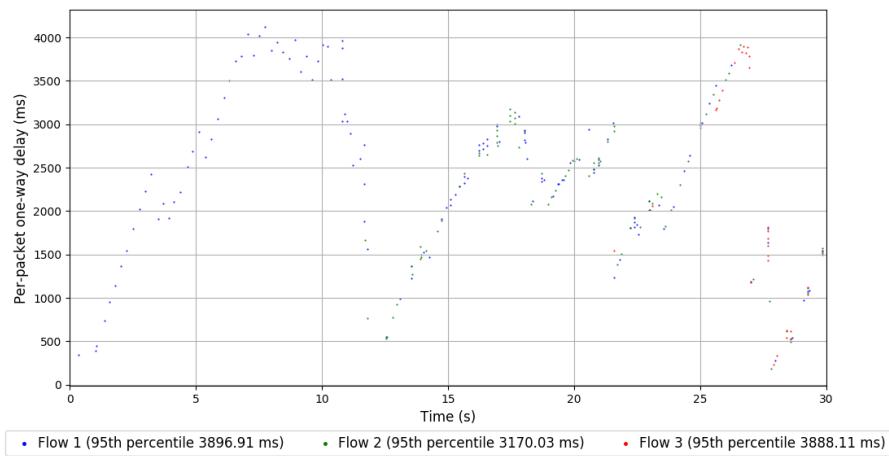
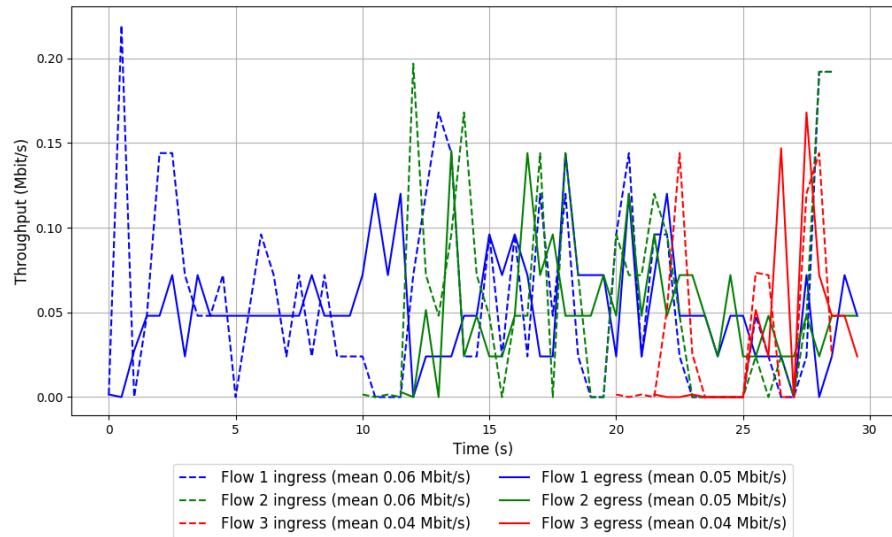
| scheme          | # runs | mean avg tput (Mbit/s) |        |        | mean 95th-%ile delay (ms) |          |          | mean loss rate (%) |        |        |       |
|-----------------|--------|------------------------|--------|--------|---------------------------|----------|----------|--------------------|--------|--------|-------|
|                 |        | flow 1                 | flow 2 | flow 3 | flow 1                    | flow 2   | flow 3   | flow 1             | flow 2 | flow 3 |       |
| TCP BBR         | ∞      | 3                      | 0.06   | 0.04   | 0.01                      | 5364.69  | 5566.02  | 5701.11            | 10.54  | 14.57  | 50.61 |
| TCP Cubic       |        | 1                      | 0.08   | 0.00   | 0.00                      | 8574.94  | 8883.34  | 8831.11            | 36.31  | 60.90  | 83.89 |
| LEDBAT          |        | 3                      | 0.02   | 0.01   | 0.04                      | 1276.52  | 1411.99  | 1598.91            | 1.88   | 1.05   | 1.15  |
| PCC             |        | 2                      | 0.11   | 0.00   | N/A                       | 26685.74 | N/A      | N/A                | 99.73  | N/A    | N/A   |
| QUIC Cubic      |        | 3                      | 0.09   | 0.00   | 0.00                      | 6579.45  | 4731.67  | 5172.74            | 21.27  | 0.00   | 38.01 |
| SCReAM          |        | 1                      | 0.02   | 0.03   | 0.05                      | 1097.23  | 568.56   | 753.45             | 0.58   | 0.92   | 2.08  |
| WebRTC media    |        | 1                      | 0.04   | 0.01   | 0.00                      | 7440.27  | 5980.07  | 5637.15            | 0.00   | 40.08  | 36.73 |
| Sprout          |        | 0                      | N/A    | N/A    | N/A                       | N/A      | N/A      | N/A                | N/A    | N/A    | N/A   |
| TaoVA-100x      |        | 3                      | 0.10   | 0.00   | 31.84                     | 18925.36 | 9856.64  | 7169.18            | 60.60  | 72.73  | 75.00 |
| TCP Vegas       |        | 3                      | 0.06   | 0.05   | 0.00                      | 5137.17  | 5089.56  | 4139.66            | 6.53   | 18.37  | 47.97 |
| Verus           |        | 3                      | 0.02   | 0.02   | 0.02                      | 1252.21  | 1145.97  | 1178.79            | 2.65   | 5.44   | 7.64  |
| Indigo          | ∞      | 1                      | 0.06   | 0.07   | 0.11                      | 12810.24 | 8055.06  | 6996.71            | 18.19  | 34.02  | 69.16 |
| Indigo-cellular |        | 2                      | 0.08   | 0.06   | 0.00                      | 15168.45 | 17198.62 | N/A                | 60.88  | 87.62  | N/A   |
| KohoCC          |        | 3                      | 0.08   | 0.05   | 0.00                      | 18819.31 | 18143.24 | N/A                | 65.75  | 89.68  | N/A   |

Run 1: Statistics of TCP BBR

```
Start at: 2017-09-22 13:29:13
End at: 2017-09-22 13:29:43
Local clock offset: 0.101 ms
Remote clock offset: -0.433 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 3864.965 ms
Loss rate: 8.99%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3896.912 ms
Loss rate: 7.18%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 3170.027 ms
Loss rate: 11.19%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 3888.111 ms
Loss rate: 10.95%
```

## Run 1: Report of TCP BBR — Data Link

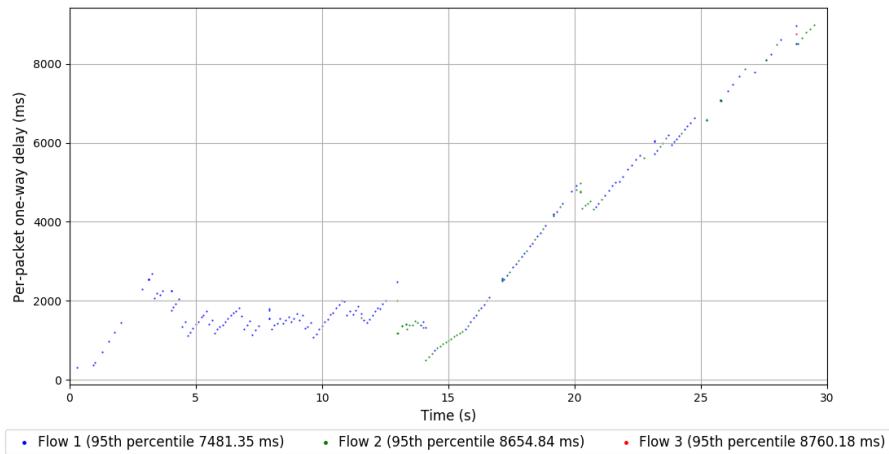
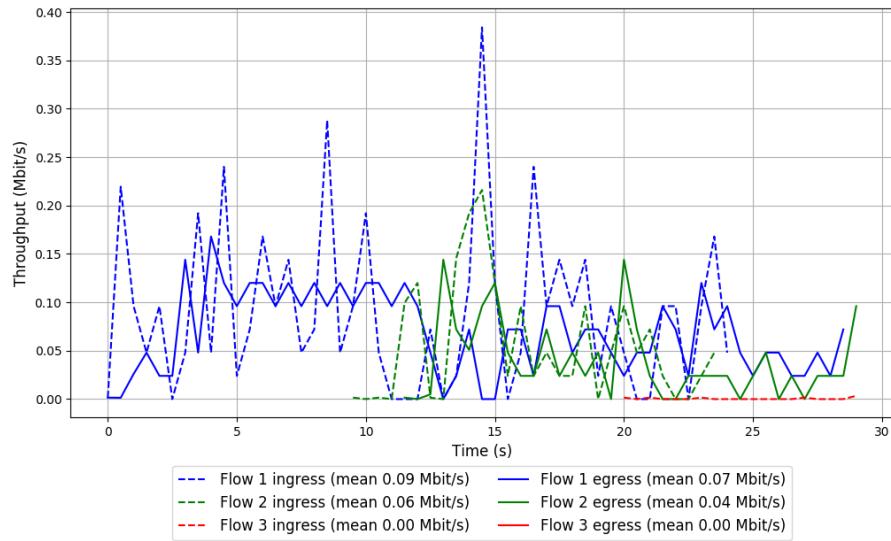


Run 2: Statistics of TCP BBR

```
Start at: 2017-09-22 13:49:56
End at: 2017-09-22 13:50:26
Local clock offset: 0.005 ms
Remote clock offset: -0.07 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 8095.225 ms
Loss rate: 11.64%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 7481.355 ms
Loss rate: 11.34%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 8654.838 ms
Loss rate: 12.05%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8760.180 ms
Loss rate: 83.89%
```

## Run 2: Report of TCP BBR — Data Link

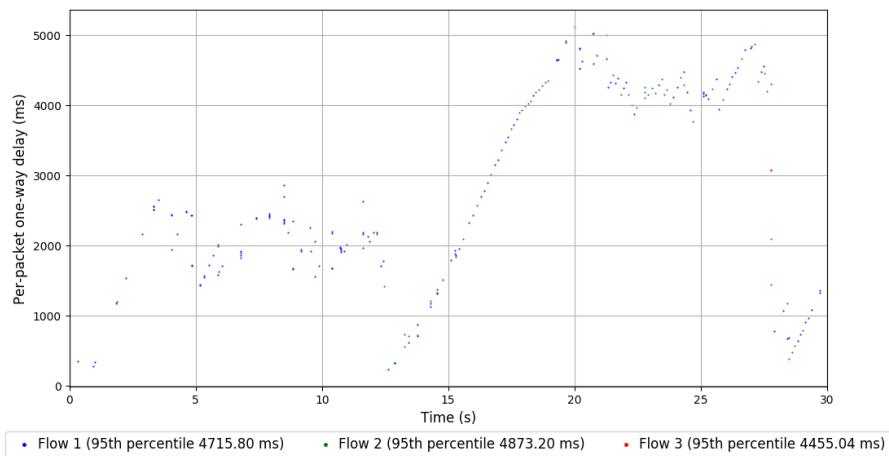
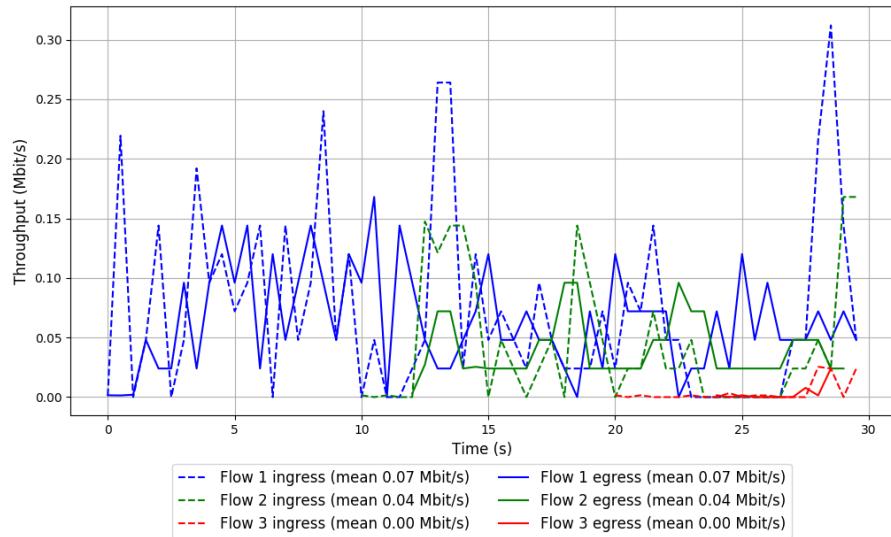


Run 3: Statistics of TCP BBR

```
Start at: 2017-09-22 14:10:11
End at: 2017-09-22 14:10:41
Local clock offset: 0.098 ms
Remote clock offset: 0.165 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 4715.795 ms
Loss rate: 15.77%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 4715.795 ms
Loss rate: 13.10%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 4873.196 ms
Loss rate: 20.46%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4455.037 ms
Loss rate: 56.99%
```

### Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/

Run 1: Report of TCP Cubic — Data Link

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Run 2: Statistics of TCP Cubic

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/

Run 2: Report of TCP Cubic — Data Link

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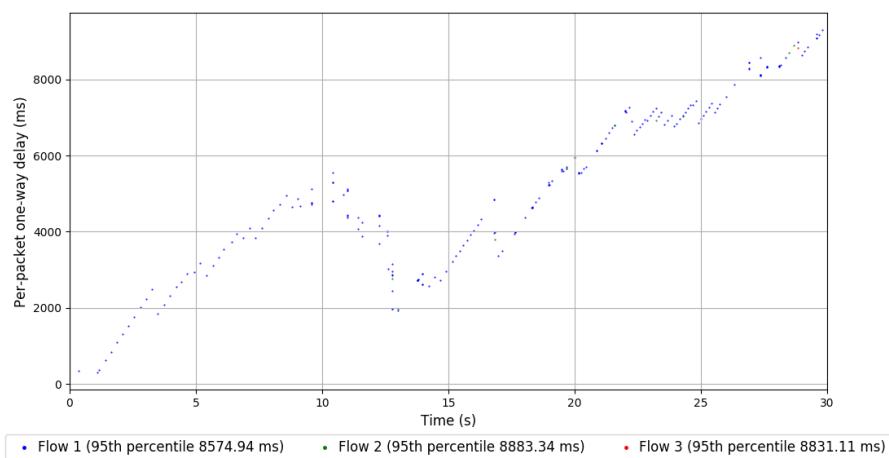
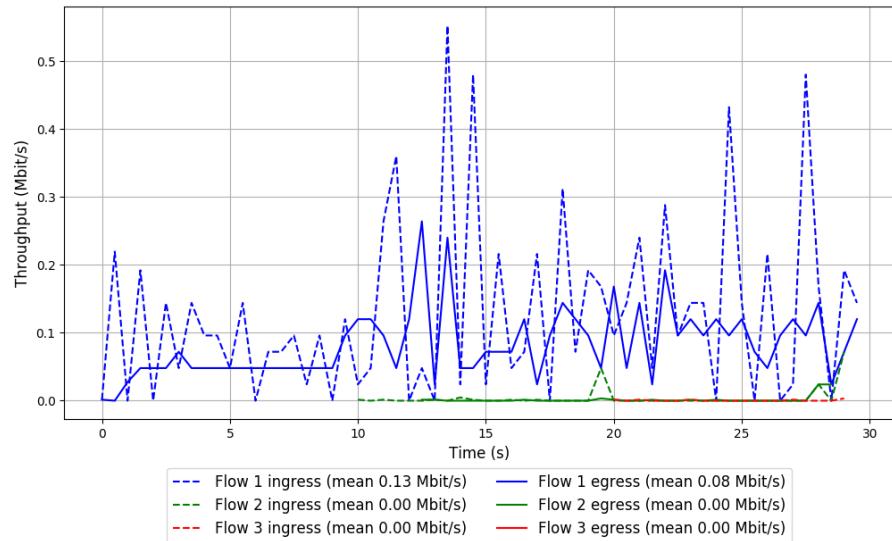
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Run 3: Statistics of TCP Cubic

```
Start at: 2017-09-22 14:21:57
End at: 2017-09-22 14:22:27
Local clock offset: 0.054 ms
Remote clock offset: -0.17 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 8634.226 ms
Loss rate: 36.86%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 8574.945 ms
Loss rate: 36.31%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8883.338 ms
Loss rate: 60.90%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 8831.111 ms
Loss rate: 83.89%
```

### Run 3: Report of TCP Cubic — Data Link

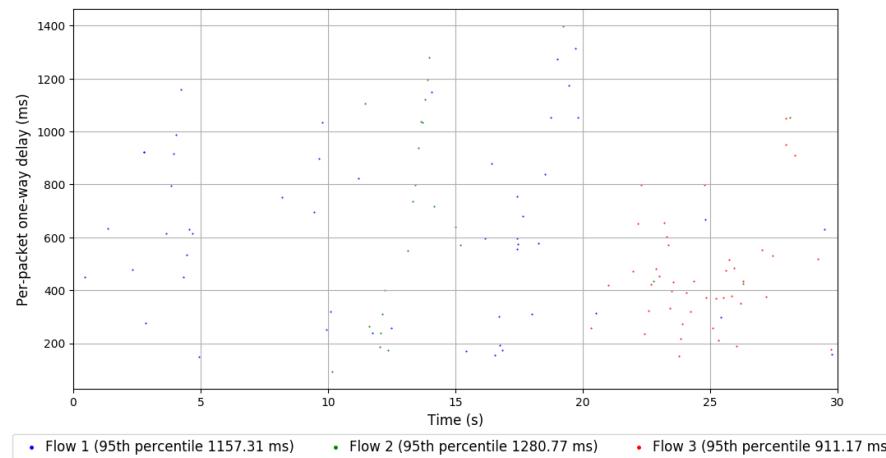
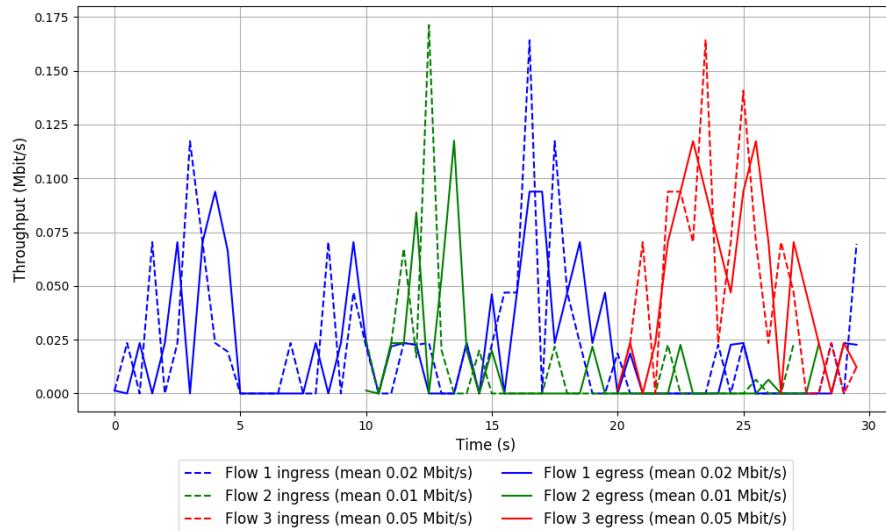


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2017-09-22 13:45:44
End at: 2017-09-22 13:46:14
Local clock offset: 0.002 ms
Remote clock offset: -0.728 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 1157.310 ms
Loss rate: 1.77%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1157.310 ms
Loss rate: 3.81%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1280.771 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 911.172 ms
Loss rate: 0.00%
```

## Run 1: Report of LEDBAT — Data Link

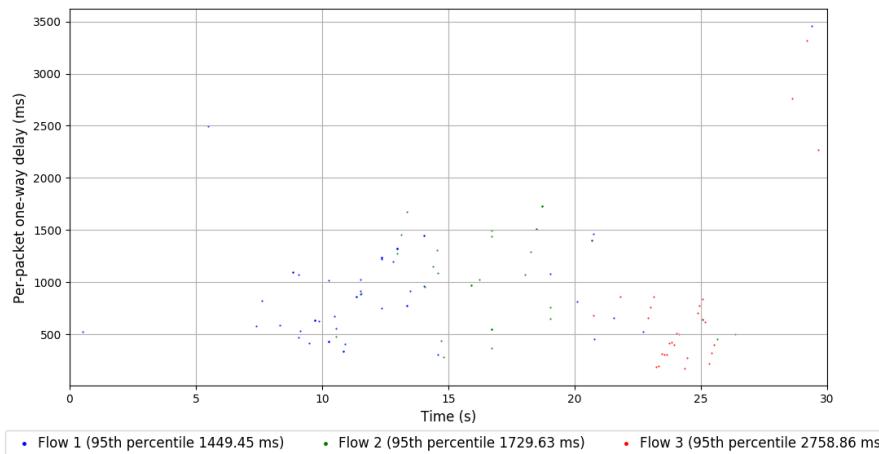
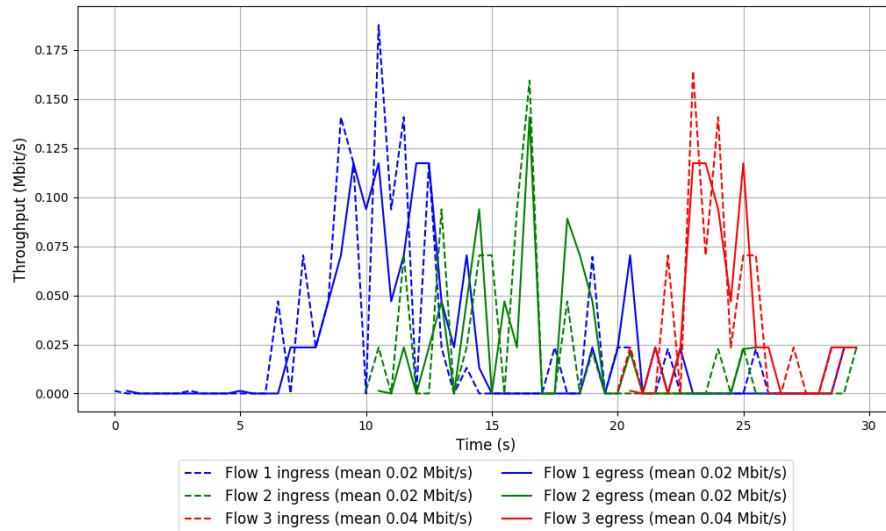


Run 2: Statistics of LEDBAT

```
Start at: 2017-09-22 14:06:12
End at: 2017-09-22 14:06:42
Local clock offset: 0.102 ms
Remote clock offset: -2.39 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 1729.650 ms
Loss rate: 2.62%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1449.449 ms
Loss rate: 1.84%
-- Flow 2:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1729.628 ms
Loss rate: 3.15%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 2758.865 ms
Loss rate: 3.44%
```

## Run 2: Report of LEDBAT — Data Link

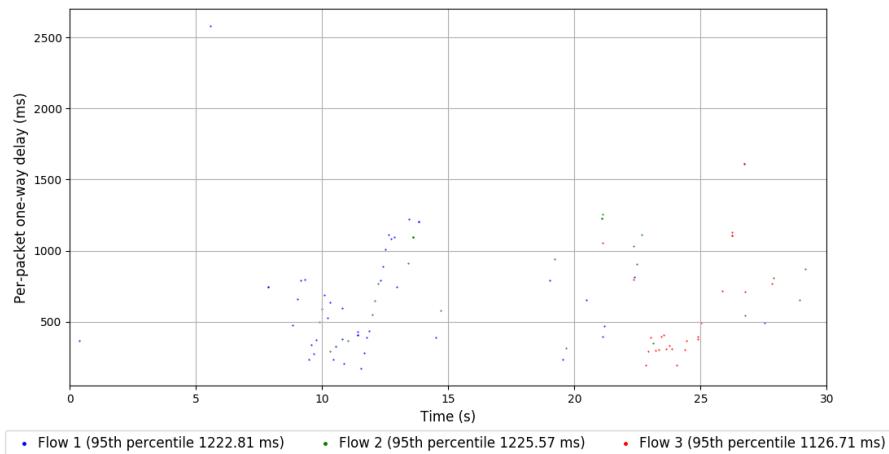
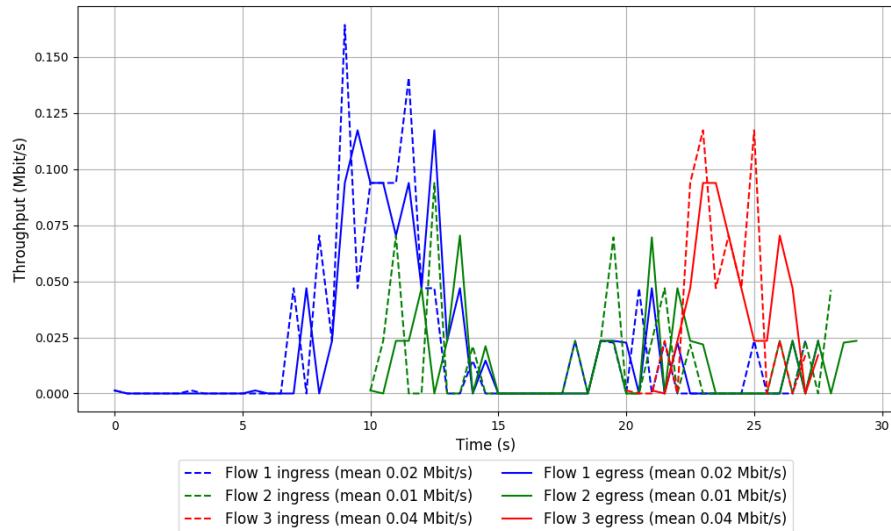


Run 3: Statistics of LEDBAT

```
Start at: 2017-09-22 14:26:19
End at: 2017-09-22 14:26:49
Local clock offset: 0.051 ms
Remote clock offset: -0.104 ms

# Below is generated by plot.py at 2017-09-22 15:29:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 1225.341 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1222.805 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1225.574 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 1126.707 ms
Loss rate: 0.00%
```

### Run 3: Report of LEDBAT — Data Link

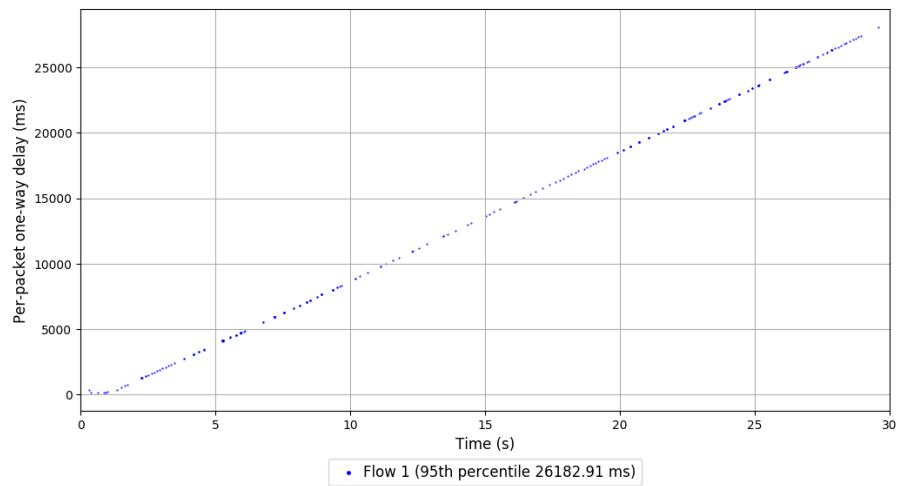
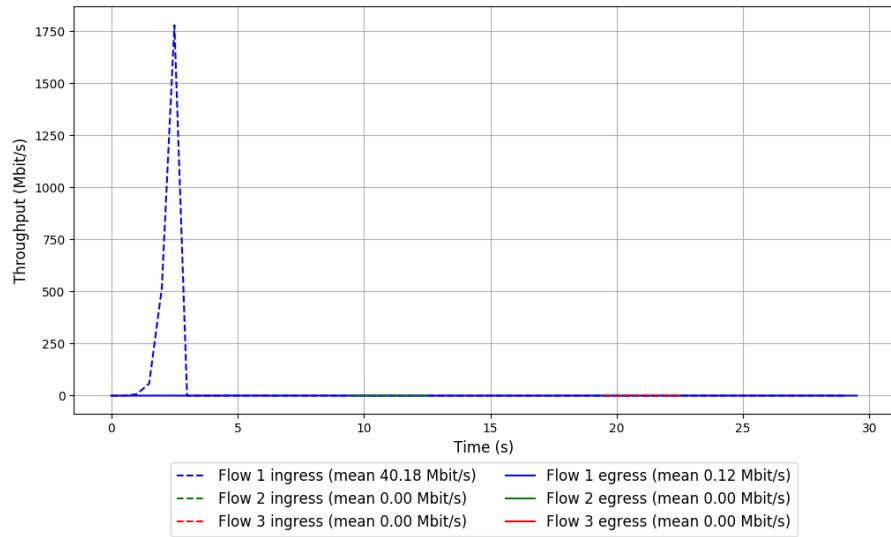


Run 1: Statistics of PCC

```
Start at: 2017-09-22 13:37:57
End at: 2017-09-22 13:38:27
Local clock offset: 0.091 ms
Remote clock offset: -0.751 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 26182.908 ms
Loss rate: 99.70%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 26182.908 ms
Loss rate: 99.70%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

## Run 1: Report of PCC — Data Link

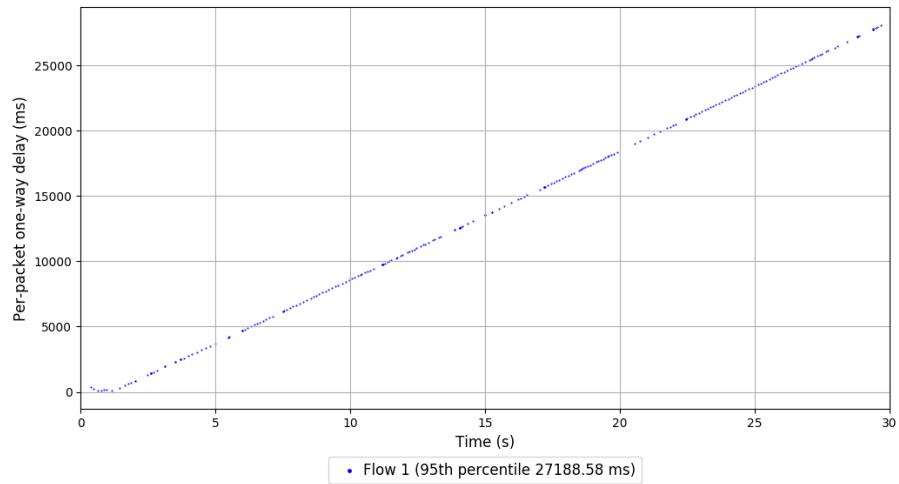
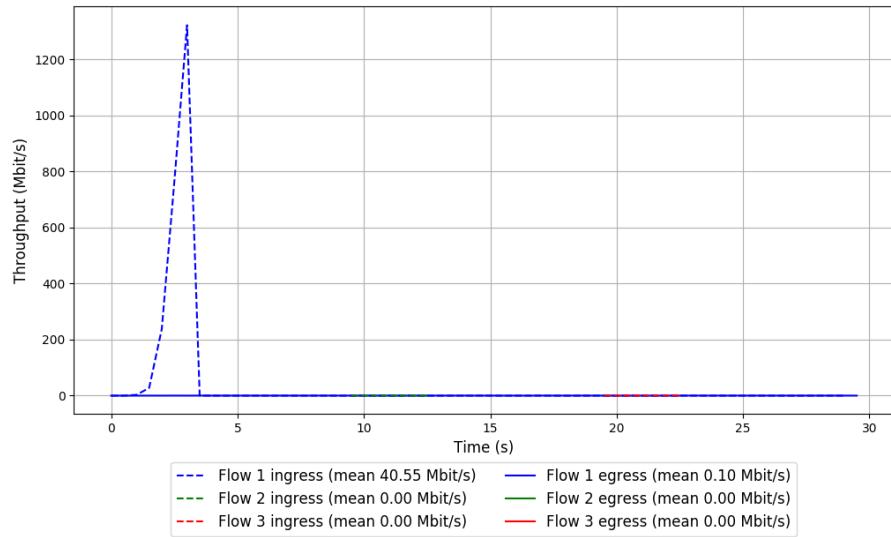


Run 2: Statistics of PCC

```
Start at: 2017-09-22 13:58:24
End at: 2017-09-22 13:58:54
Local clock offset: 0.102 ms
Remote clock offset: -2.441 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 27188.580 ms
Loss rate: 99.76%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 27188.580 ms
Loss rate: 99.76%
-- 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

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/p

Run 3: Report of PCC — Data Link

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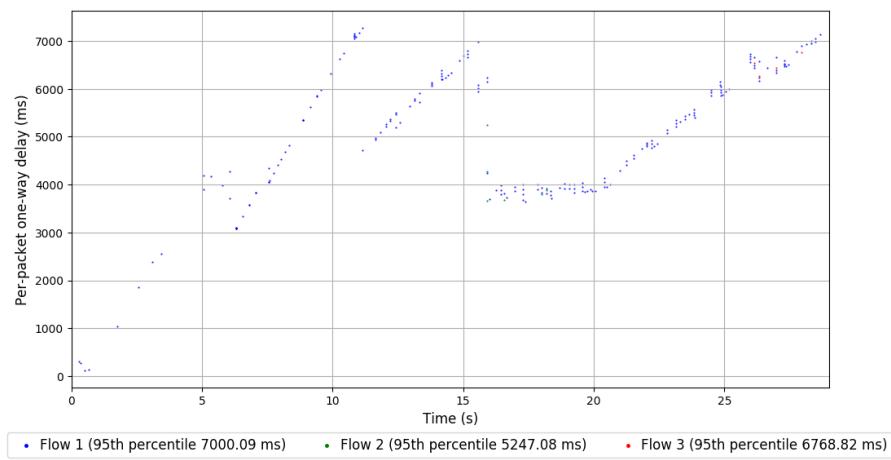
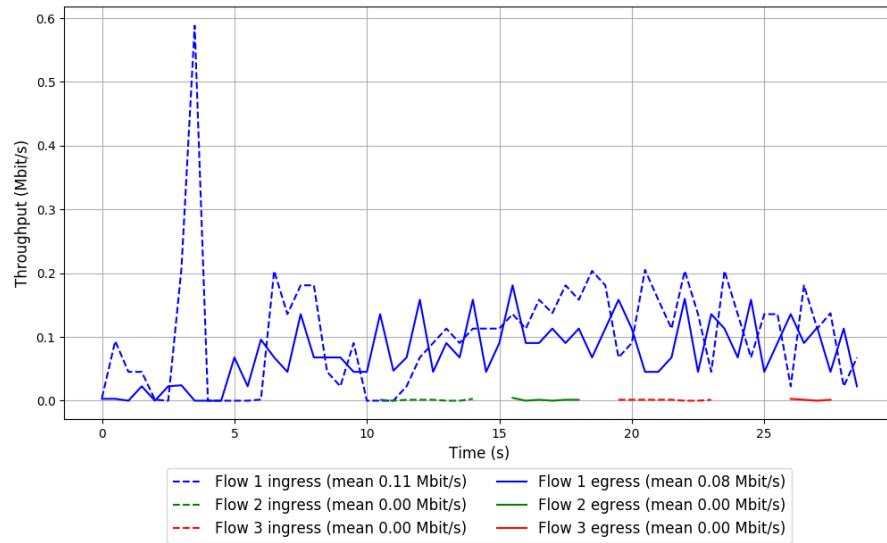
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```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2017-09-22 13:48:30
End at: 2017-09-22 13:49:00
Local clock offset: 0.083 ms
Remote clock offset: -0.667 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 6990.144 ms
Loss rate: 28.63%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 7000.094 ms
Loss rate: 28.66%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5247.077 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6768.816 ms
Loss rate: 33.33%
```

## Run 1: Report of QUIC Cubic — Data Link

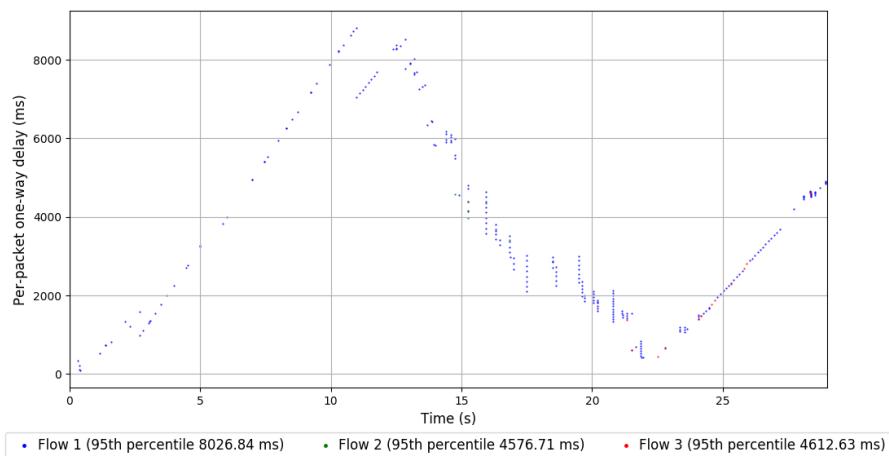
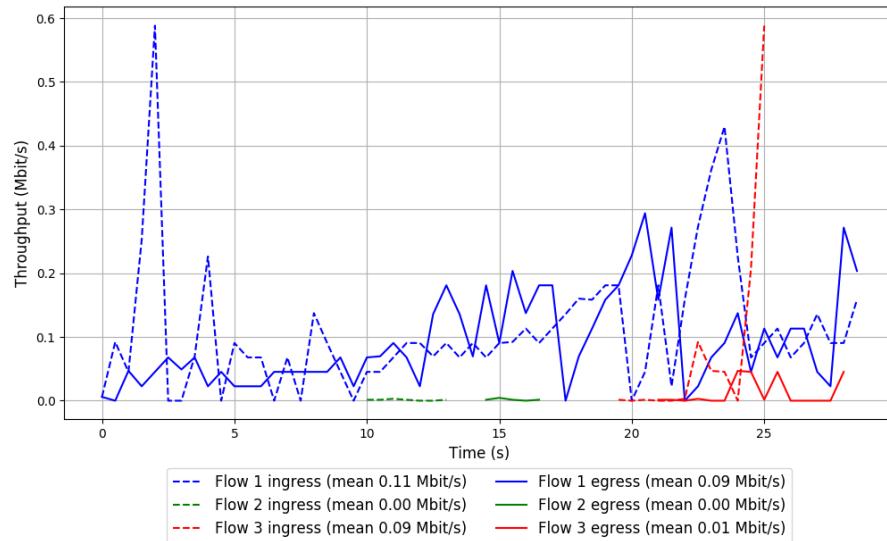


Run 2: Statistics of QUIC Cubic

```
Start at: 2017-09-22 14:08:51
End at: 2017-09-22 14:09:21
Local clock offset: 0.01 ms
Remote clock offset: 0.232 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 7927.229 ms
Loss rate: 25.74%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 8026.839 ms
Loss rate: 17.42%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4576.709 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 4612.628 ms
Loss rate: 80.71%
```

## Run 2: Report of QUIC Cubic — Data Link

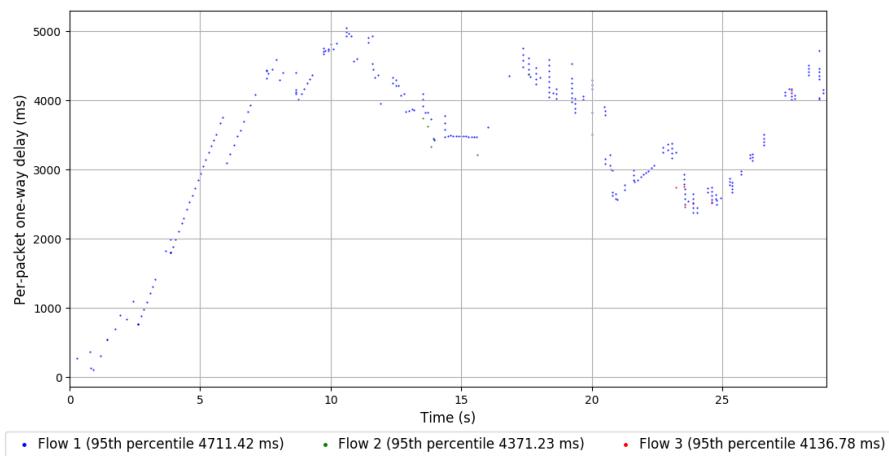
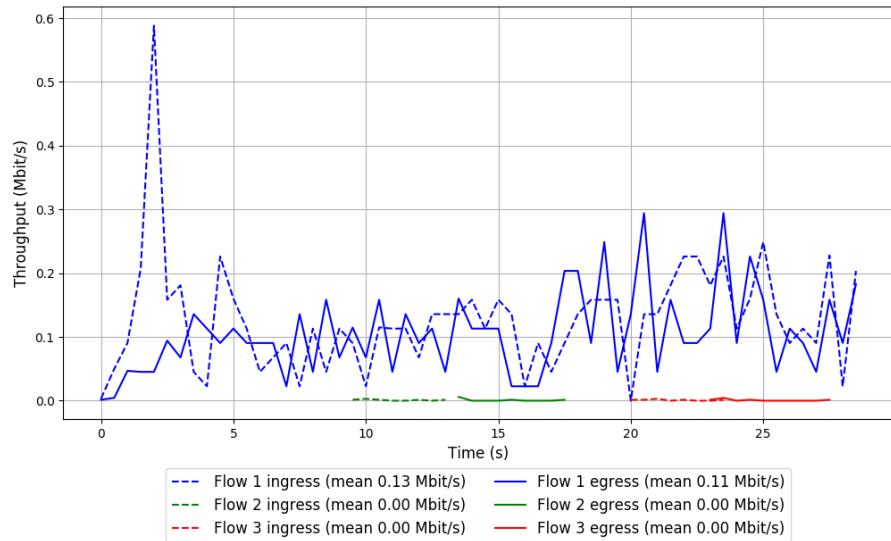


Run 3: Statistics of QUIC Cubic

```
Start at: 2017-09-22 14:28:59
End at: 2017-09-22 14:29:29
Local clock offset: 0.053 ms
Remote clock offset: -0.202 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 4711.417 ms
Loss rate: 17.67%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 4711.417 ms
Loss rate: 17.72%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4371.226 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 4136.781 ms
Loss rate: 0.00%
```

### Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/s

Run 1: Report of SCReAM — Data Link

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Run 2: Statistics of SCReAM

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/s

Run 2: Report of SCReAM — Data Link

Figure is missing

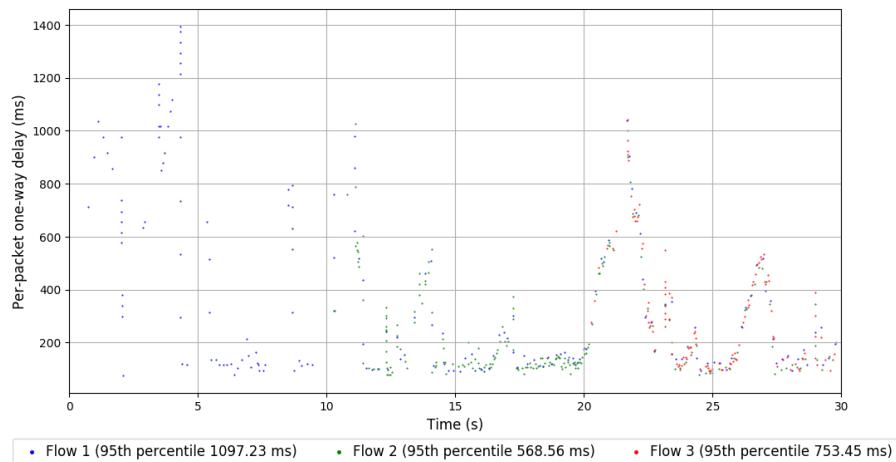
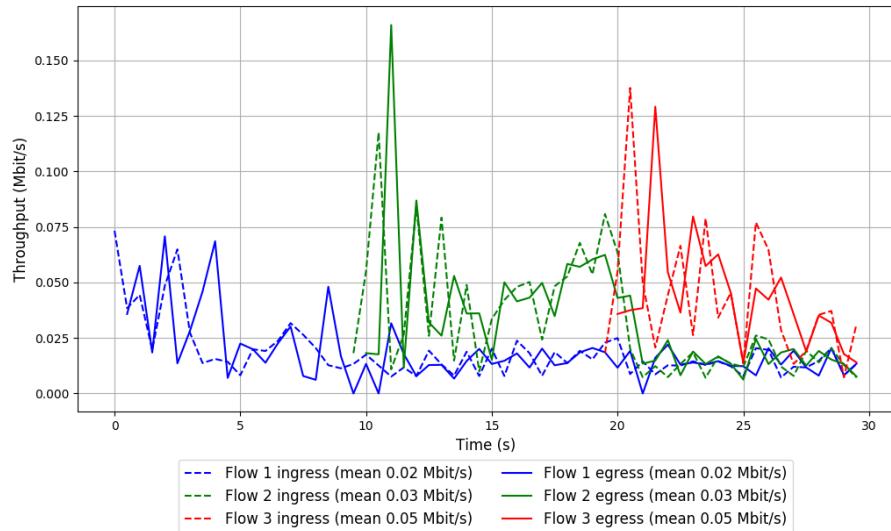
Figure is missing

Run 3: Statistics of SCReAM

```
Start at: 2017-09-22 14:20:37
End at: 2017-09-22 14:21:07
Local clock offset: 0.052 ms
Remote clock offset: -2.375 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 921.774 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1097.230 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 568.562 ms
Loss rate: 0.92%
-- Flow 3:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 753.453 ms
Loss rate: 2.08%
```

### Run 3: Report of SCReAM — Data Link



Run 1: Statistics of WebRTC media

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/v

Run 1: Report of WebRTC media — Data Link

Figure is missing

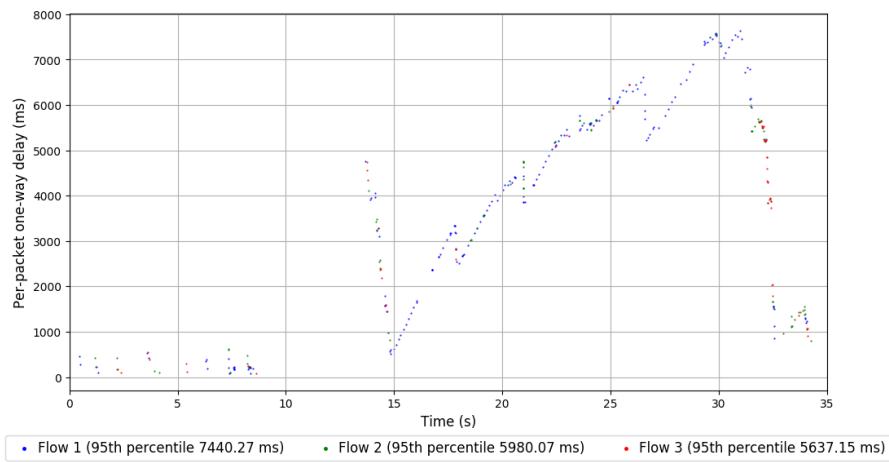
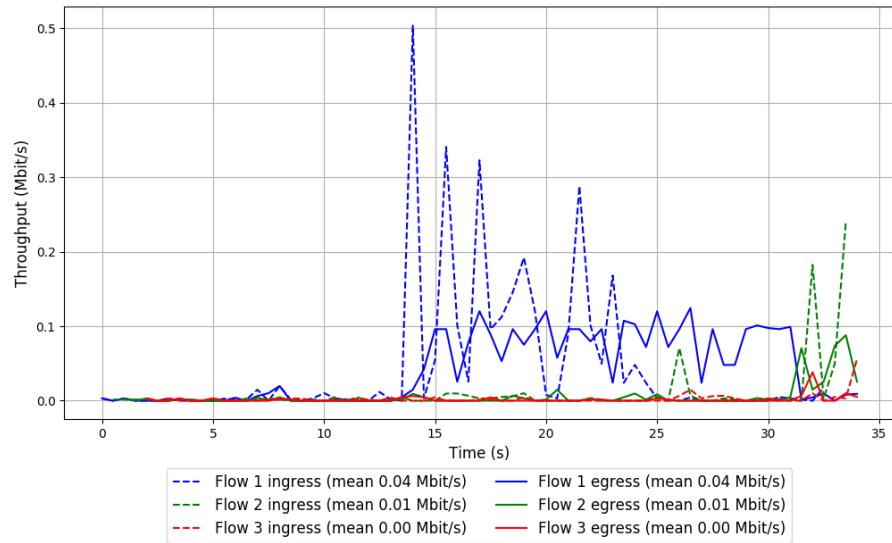
Figure is missing

Run 2: Statistics of WebRTC media

```
Start at: 2017-09-22 13:57:04
End at: 2017-09-22 13:57:34
Local clock offset: 0.01 ms
Remote clock offset: -2.464 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 7336.426 ms
Loss rate: 8.59%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 7440.275 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 5980.066 ms
Loss rate: 40.08%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 5637.153 ms
Loss rate: 36.73%
```

## Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/v

Run 3: Report of WebRTC media — Data Link

Figure is missing

Figure is missing

Run 1: Statistics of Sprout

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/s

Run 1: Report of Sprout — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of Sprout

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/s

Run 2: Report of Sprout — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of Sprout

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/s

Run 3: Report of Sprout — Data Link

Figure is missing

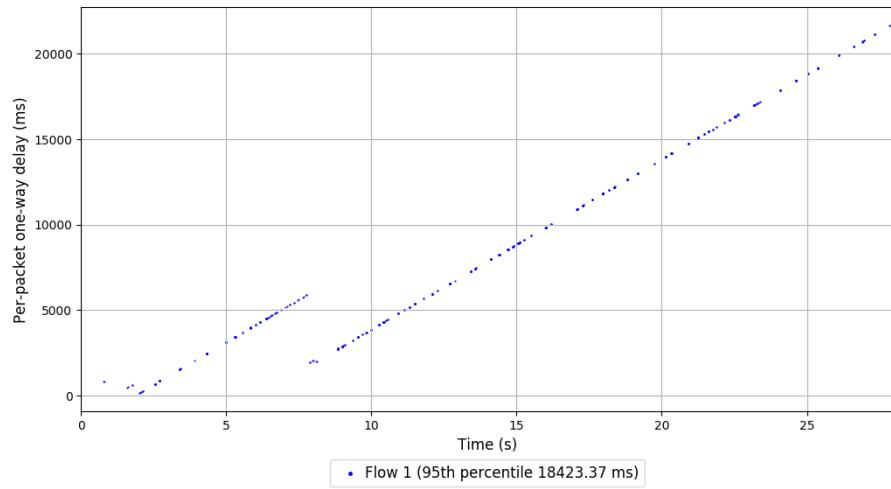
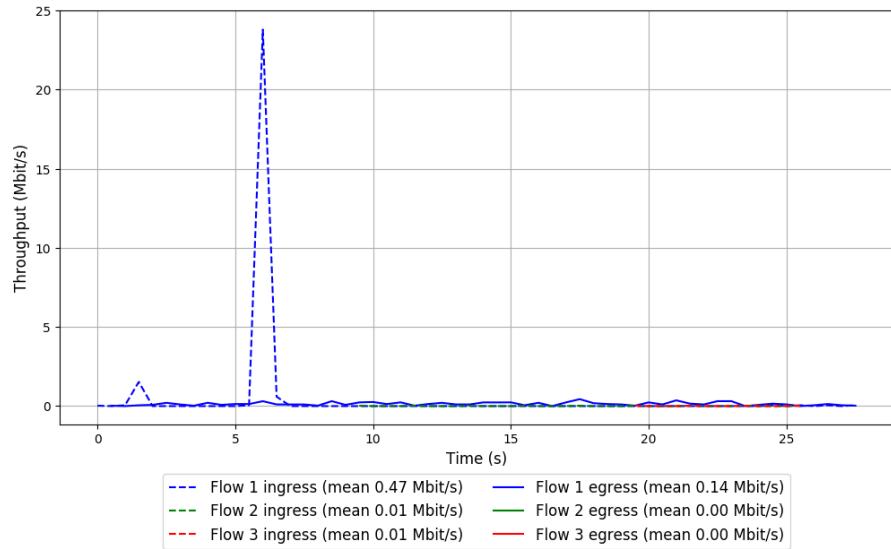
Figure is missing

Run 1: Statistics of TaoVA-100x

```
Start at: 2017-09-22 13:34:55
End at: 2017-09-22 13:35:25
Local clock offset: 0.071 ms
Remote clock offset: -0.752 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 18423.372 ms
Loss rate: 70.86%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 18423.372 ms
Loss rate: 70.48%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

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

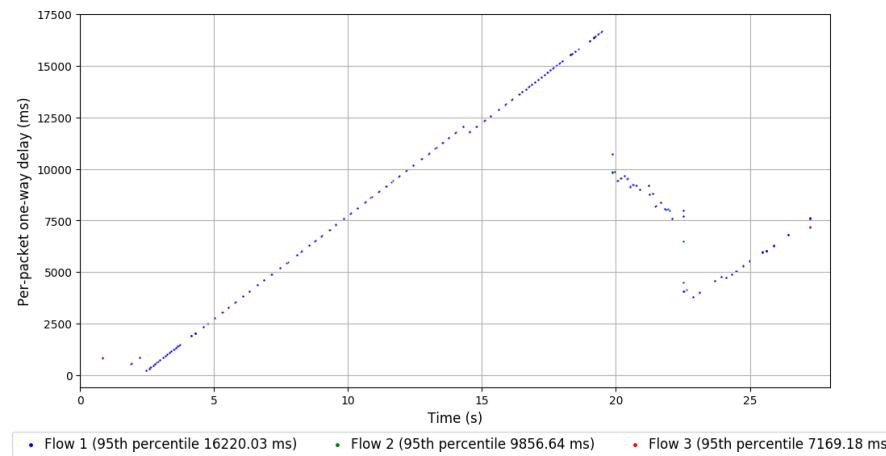
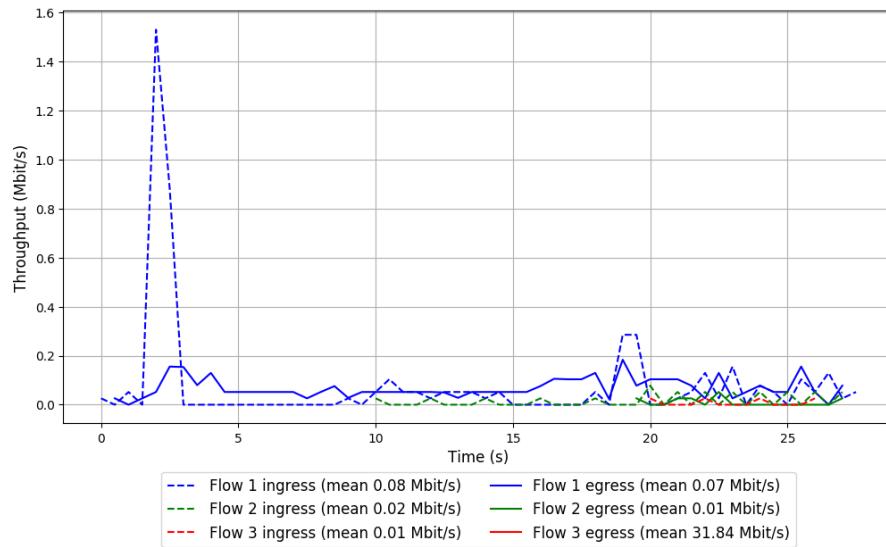


Run 2: Statistics of TaoVA-100x

```
Start at: 2017-09-22 13:55:37
End at: 2017-09-22 13:56:07
Local clock offset: -0.01 ms
Remote clock offset: -2.602 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 15824.931 ms
Loss rate: 26.37%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 16220.033 ms
Loss rate: 19.43%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 9856.642 ms
Loss rate: 72.73%
-- Flow 3:
Average throughput: 31.84 Mbit/s
95th percentile per-packet one-way delay: 7169.178 ms
Loss rate: 75.00%
```

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

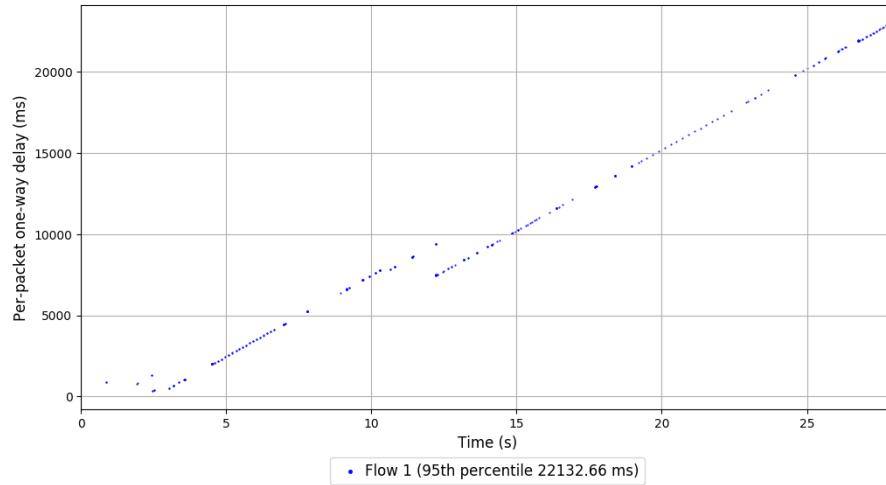
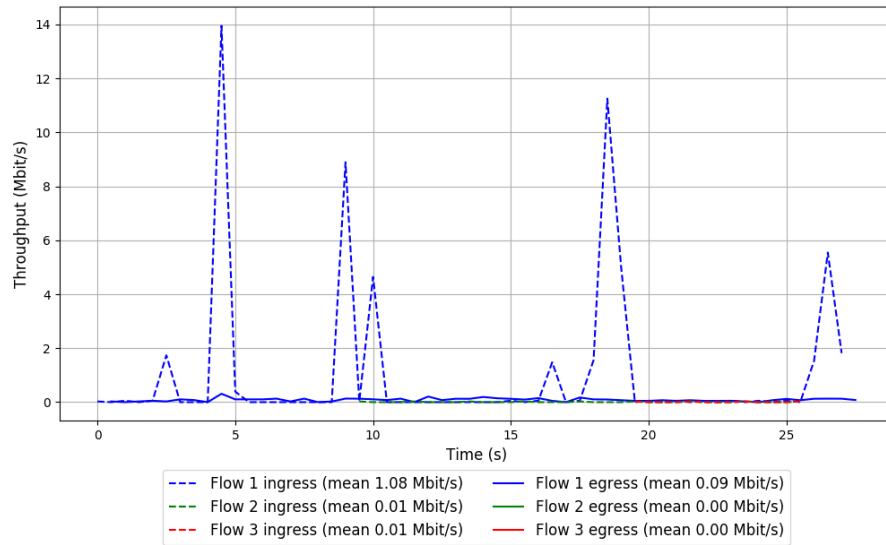


Run 3: Statistics of TaoVA-100x

```
Start at: 2017-09-22 14:15:53
End at: 2017-09-22 14:16:23
Local clock offset: 0.133 ms
Remote clock offset: -0.208 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 22132.661 ms
Loss rate: 91.95%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 22132.661 ms
Loss rate: 91.90%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

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

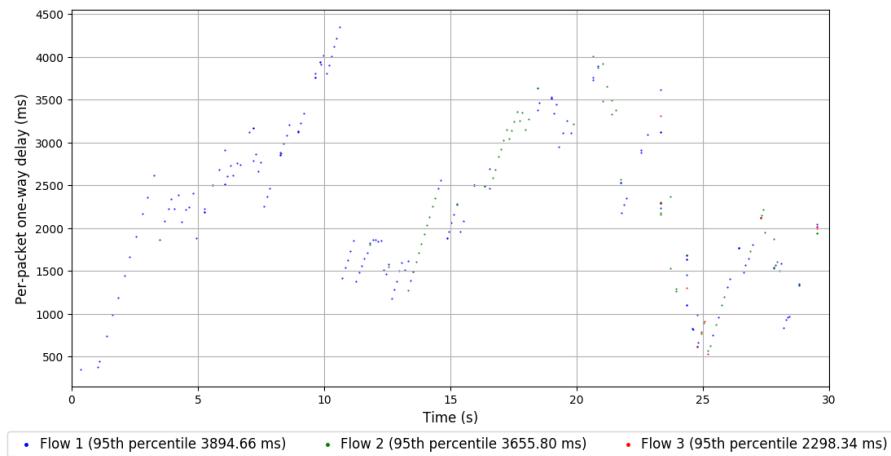
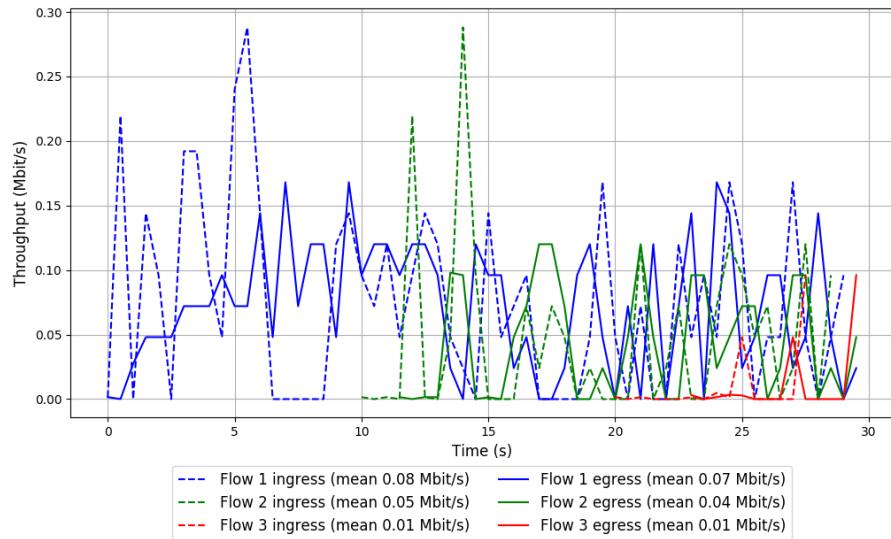


Run 1: Statistics of TCP Vegas

```
Start at: 2017-09-22 13:30:33
End at: 2017-09-22 13:31:03
Local clock offset: 0.018 ms
Remote clock offset: -2.845 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 3809.380 ms
Loss rate: 6.04%
-- Flow 1:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 3894.662 ms
Loss rate: 4.32%
-- Flow 2:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 3655.805 ms
Loss rate: 10.91%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 2298.343 ms
Loss rate: 0.00%
```

## Run 1: Report of TCP Vegas — Data Link

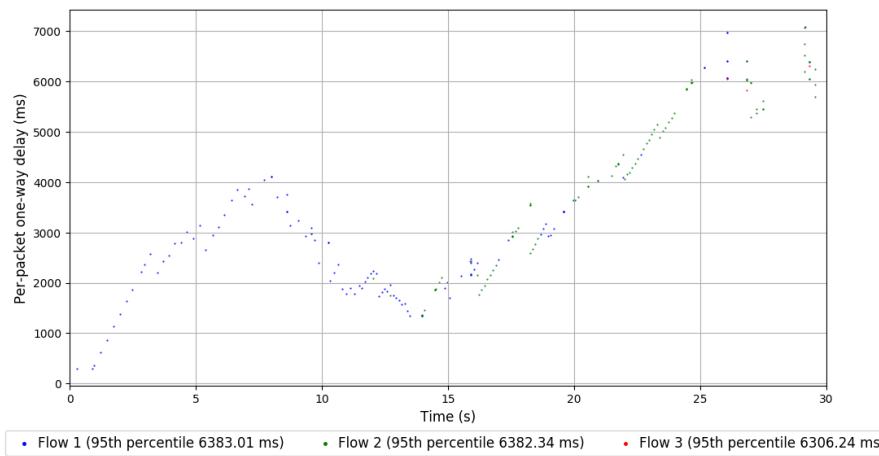
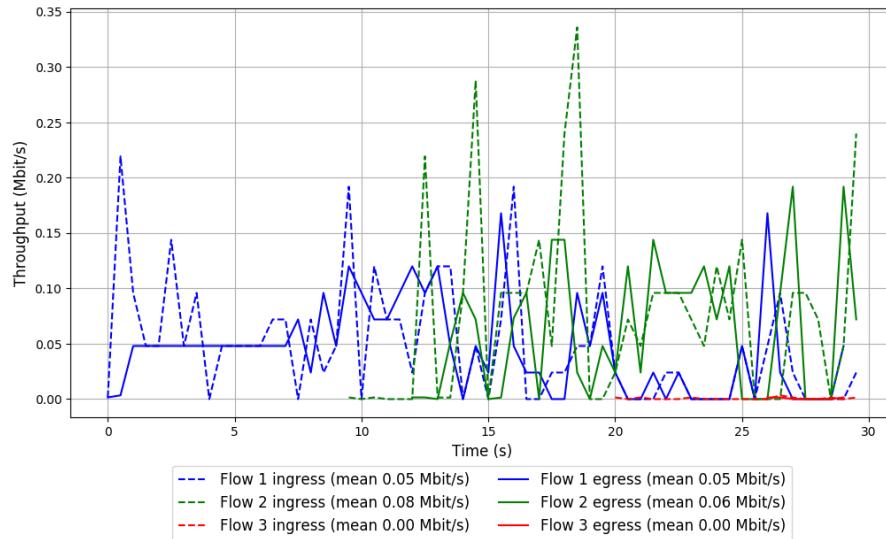


Run 2: Statistics of TCP Vegas

```
Start at: 2017-09-22 13:51:16
End at: 2017-09-22 13:51:46
Local clock offset: 0.011 ms
Remote clock offset: -0.41 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 6383.008 ms
Loss rate: 18.92%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 6383.008 ms
Loss rate: 8.32%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 6382.338 ms
Loss rate: 28.60%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 6306.239 ms
Loss rate: 62.30%
```

## Run 2: Report of TCP Vegas — Data Link

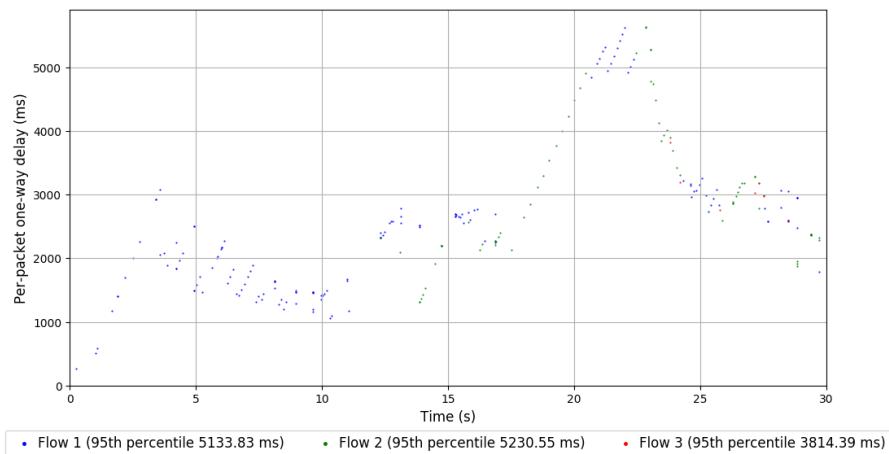
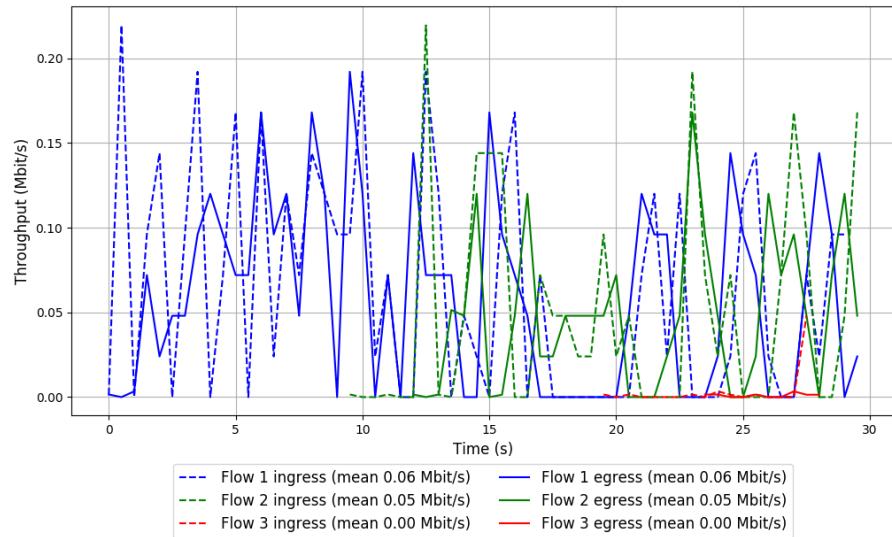


Run 3: Statistics of TCP Vegas

```
Start at: 2017-09-22 14:11:31
End at: 2017-09-22 14:12:01
Local clock offset: 0.026 ms
Remote clock offset: -2.277 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 5133.830 ms
Loss rate: 10.66%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 5133.830 ms
Loss rate: 6.95%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 5230.545 ms
Loss rate: 15.60%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 3814.387 ms
Loss rate: 81.61%
```

### Run 3: Report of TCP Vegas — Data Link

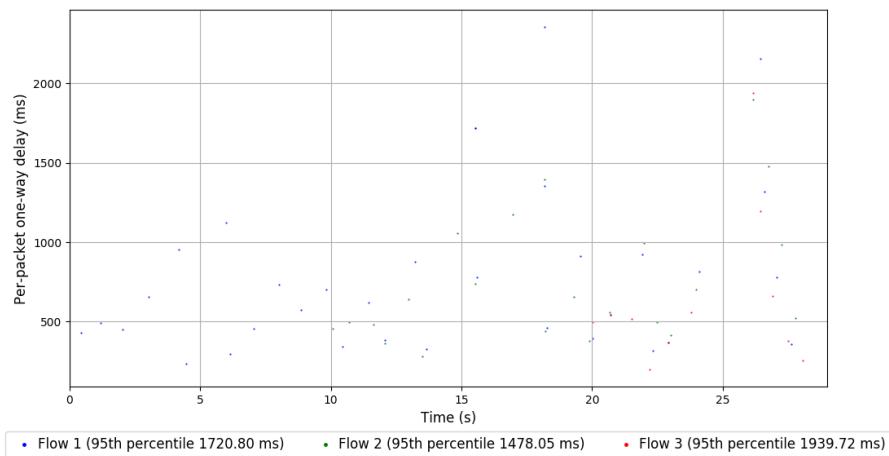
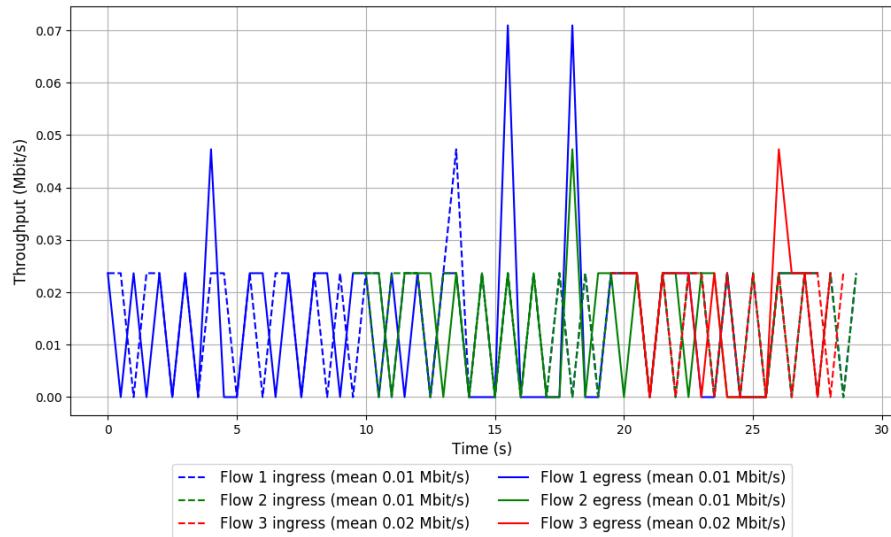


Run 1: Statistics of Verus

```
Start at: 2017-09-22 13:47:05
End at: 2017-09-22 13:47:35
Local clock offset: 0.003 ms
Remote clock offset: -2.699 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 1899.659 ms
Loss rate: 6.94%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1720.800 ms
Loss rate: 5.56%
-- Flow 2:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 1478.052 ms
Loss rate: 8.33%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1939.723 ms
Loss rate: 8.33%
```

## Run 1: Report of Verus — Data Link

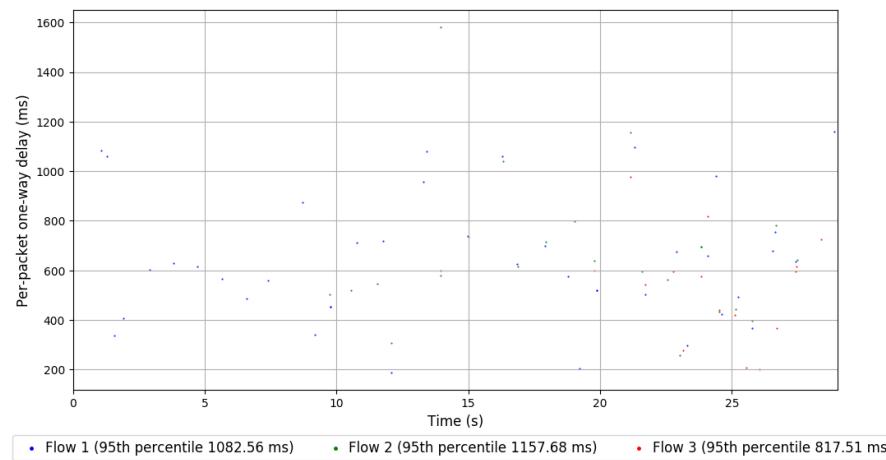
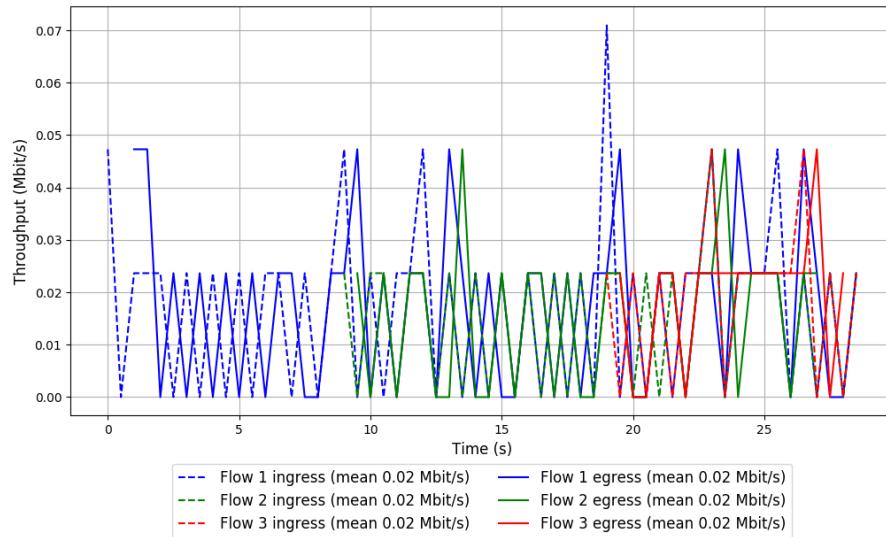


Run 2: Statistics of Verus

```
Start at: 2017-09-22 14:07:31
End at: 2017-09-22 14:08:01
Local clock offset: 0.012 ms
Remote clock offset: -0.32 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 1082.564 ms
Loss rate: 4.82%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1082.564 ms
Loss rate: 2.38%
-- Flow 2:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 1157.676 ms
Loss rate: 8.00%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 817.512 ms
Loss rate: 6.25%
```

## Run 2: Report of Verus — Data Link

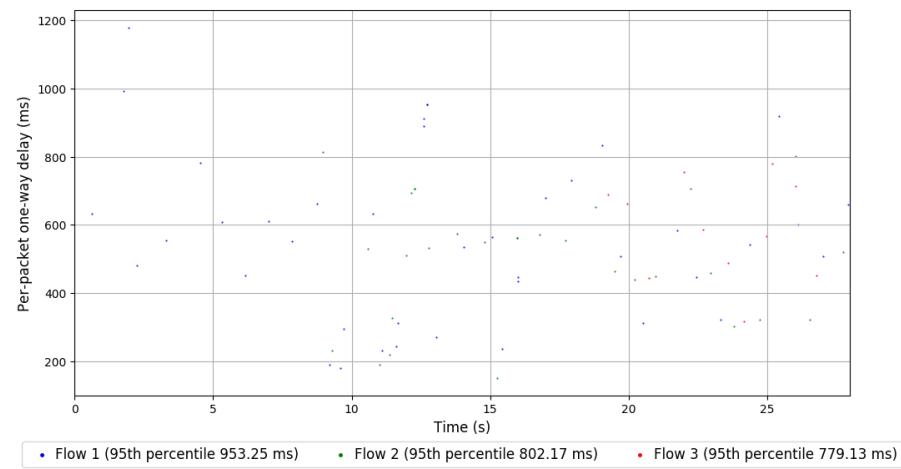
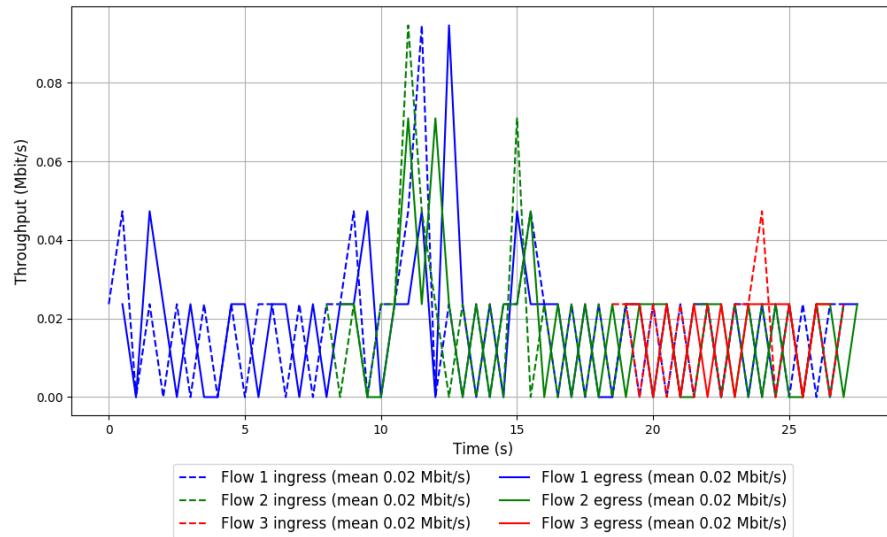


Run 3: Statistics of Verus

```
Start at: 2017-09-22 14:27:38
End at: 2017-09-22 14:28:08
Local clock offset: 0.043 ms
Remote clock offset: -0.194 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 919.161 ms
Loss rate: 1.22%
-- Flow 1:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 953.254 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 802.173 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 0.02 Mbit/s
95th percentile per-packet one-way delay: 779.132 ms
Loss rate: 8.33%
```

### Run 3: Report of Verus — Data Link



Run 1: Statistics of Indigo

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/

Run 1: Report of Indigo — Data Link

Figure is missing

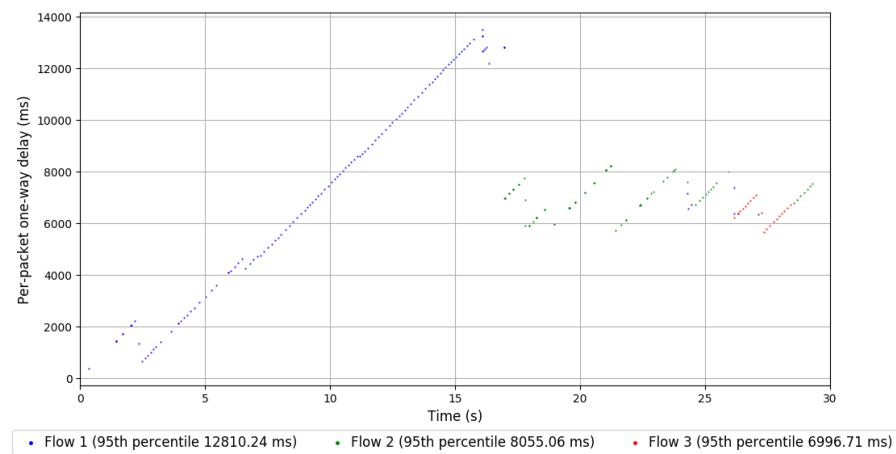
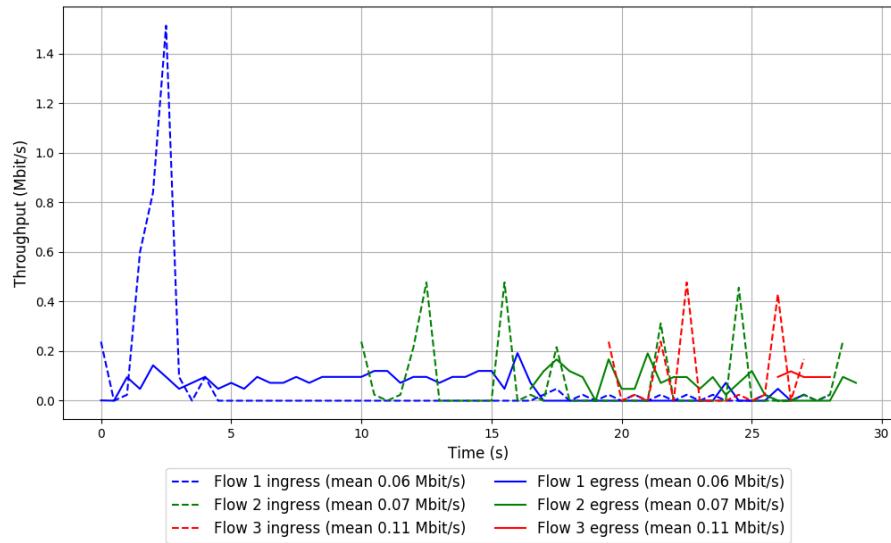
Figure is missing

Run 2: Statistics of Indigo

```
Start at: 2017-09-22 14:04:52
End at: 2017-09-22 14:05:22
Local clock offset: 0.093 ms
Remote clock offset: 0.006 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 12739.318 ms
Loss rate: 33.84%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 12810.244 ms
Loss rate: 18.19%
-- Flow 2:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 8055.055 ms
Loss rate: 34.02%
-- Flow 3:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 6996.714 ms
Loss rate: 69.16%
```

## Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/

Run 3: Report of Indigo — Data Link

Figure is missing

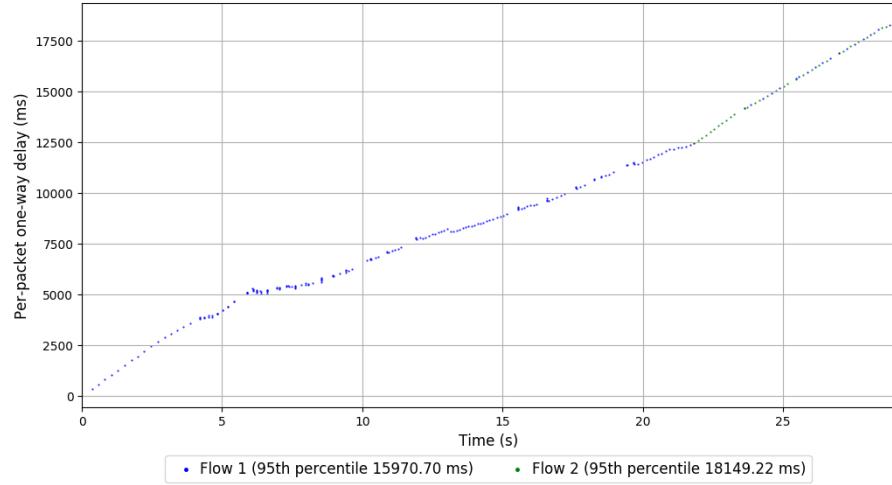
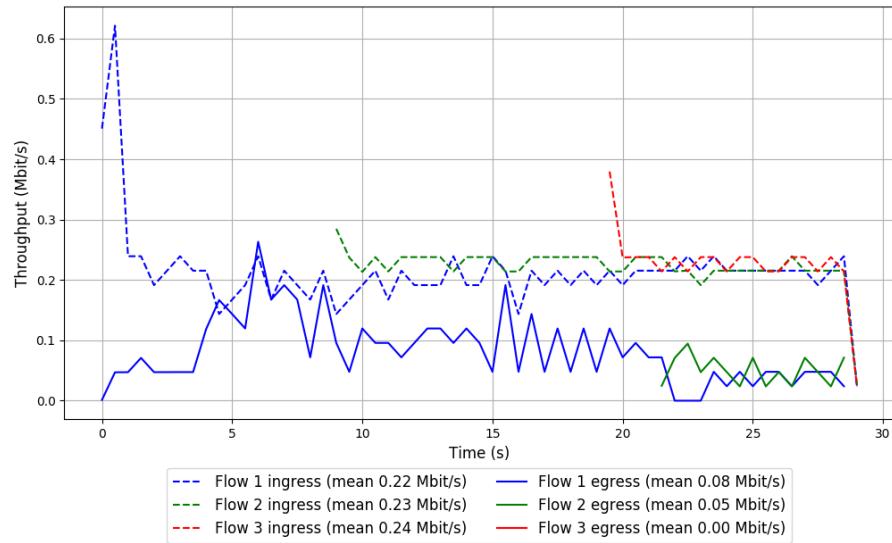
Figure is missing

Run 1: Statistics of Indigo-cellular

```
Start at: 2017-09-22 13:42:42
End at: 2017-09-22 13:43:12
Local clock offset: 0.068 ms
Remote clock offset: -2.88 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 17119.377 ms
Loss rate: 78.76%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 15970.701 ms
Loss rate: 61.81%
-- Flow 2:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 18149.224 ms
Loss rate: 91.66%
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

## Run 1: Report of Indigo-cellular — Data Link



Run 2: Statistics of Indigo-cellular

/home/ubuntu/pantheon\_data/2017-09-22T13-28-Mexico-ppp0-to-AWS-California-2-3-runs-3-flows/

Run 2: Report of Indigo-cellular — Data Link

Figure is missing

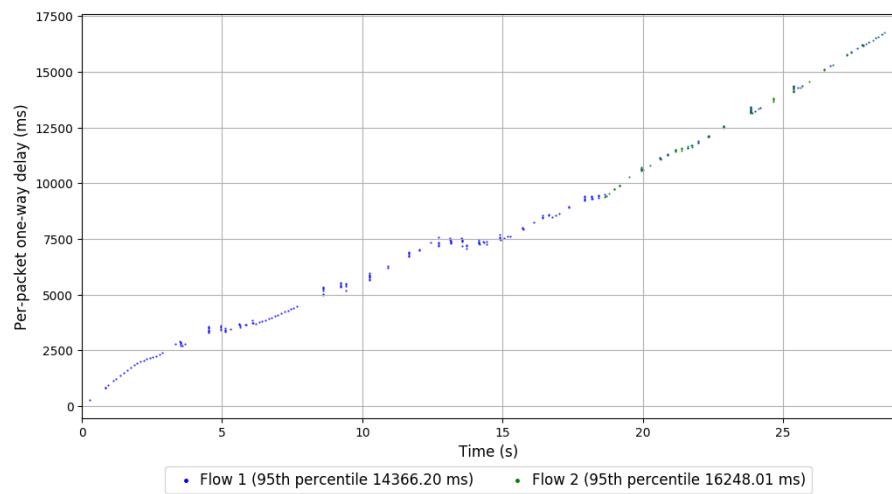
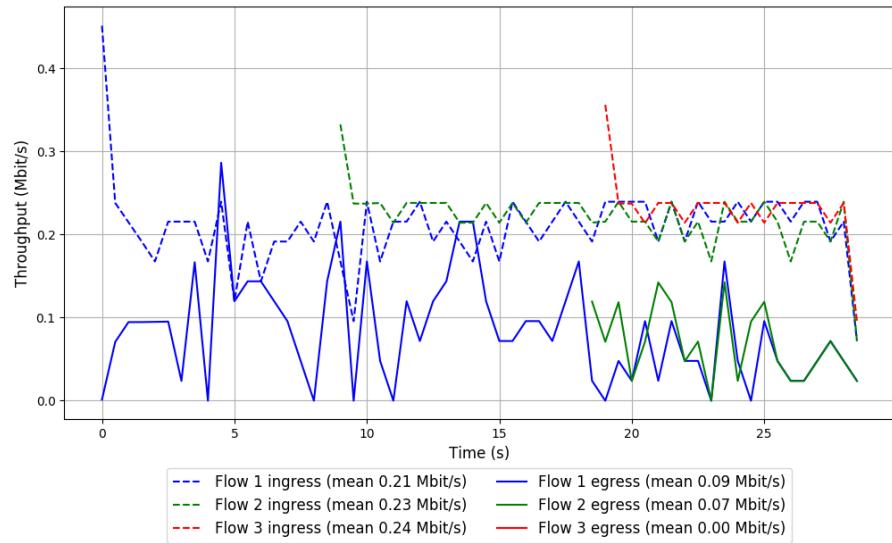
Figure is missing

Run 3: Statistics of Indigo-cellular

```
Start at: 2017-09-22 14:23:17
End at: 2017-09-22 14:23:47
Local clock offset: 0.131 ms
Remote clock offset: -2.203 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 15879.155 ms
Loss rate: 75.30%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 14366.205 ms
Loss rate: 59.95%
-- Flow 2:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 16248.014 ms
Loss rate: 83.58%
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 3: Report of Indigo-cellular — Data Link

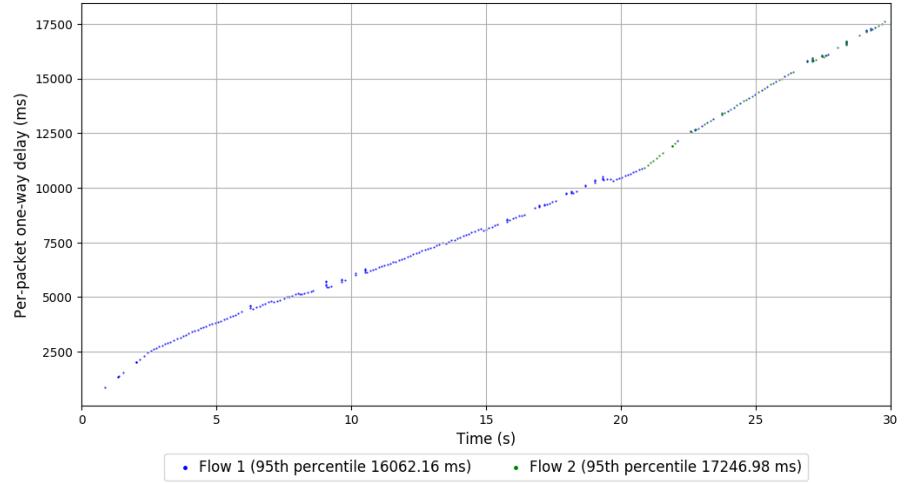
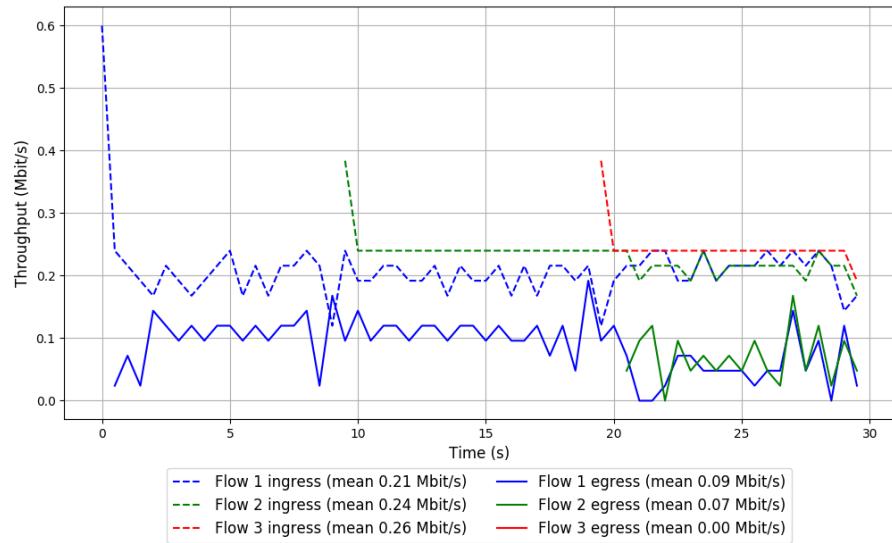


Run 1: Statistics of KohoCC

```
Start at: 2017-09-22 13:31:52
End at: 2017-09-22 13:32:22
Local clock offset: 0.104 ms
Remote clock offset: -0.758 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 16703.443 ms
Loss rate: 75.90%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 16062.162 ms
Loss rate: 58.48%
-- Flow 2:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 17246.980 ms
Loss rate: 86.04%
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

## Run 1: Report of KohoCC — Data Link

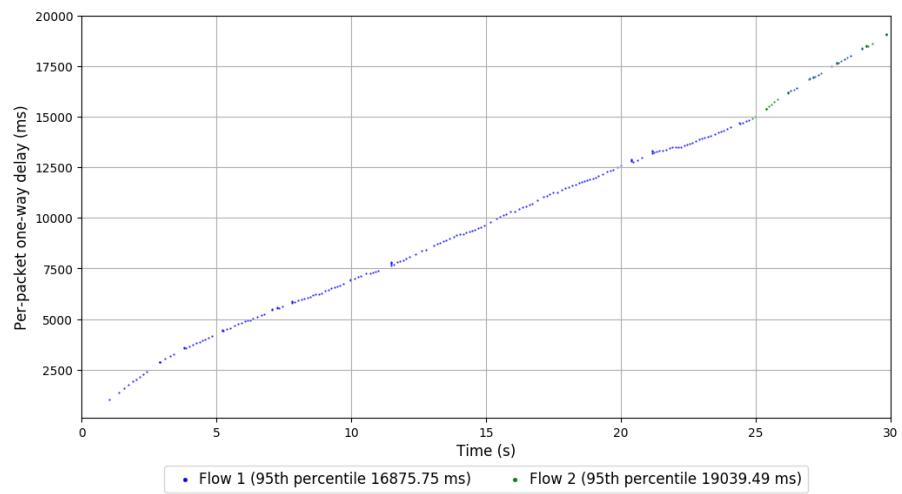
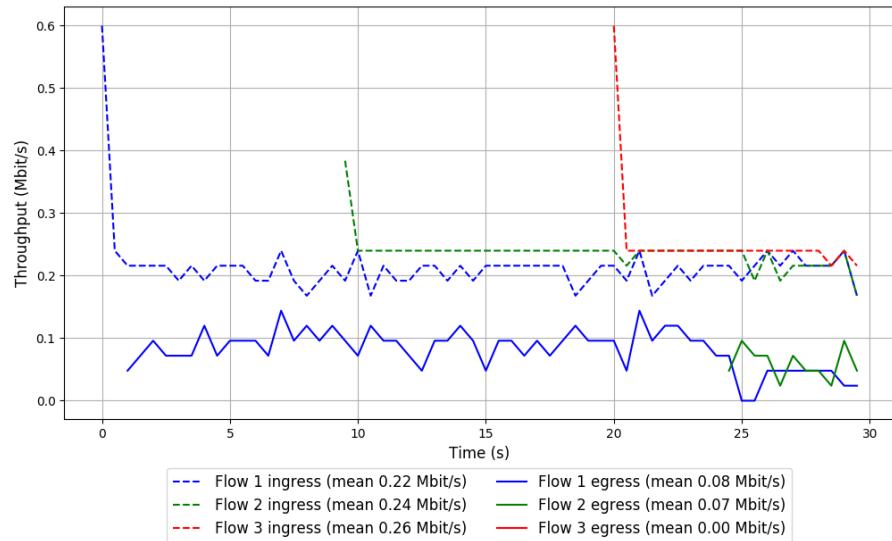


Run 2: Statistics of KohoCC

```
Start at: 2017-09-22 13:52:36
End at: 2017-09-22 13:53:06
Local clock offset: 0.01 ms
Remote clock offset: -2.637 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 17924.949 ms
Loss rate: 80.50%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 16875.752 ms
Loss rate: 63.13%
-- Flow 2:
Average throughput: 0.07 Mbit/s
95th percentile per-packet one-way delay: 19039.493 ms
Loss rate: 93.32%
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

## Run 2: Report of KohoCC — Data Link



Run 3: Statistics of KohoCC

```
Start at: 2017-09-22 14:12:51
End at: 2017-09-22 14:13:21
Local clock offset: 0.026 ms
Remote clock offset: 0.145 ms

# Below is generated by plot.py at 2017-09-22 15:29:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 23520.022 ms
Loss rate: 88.55%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 23520.022 ms
Loss rate: 75.63%
-- Flow 2:
Average throughput: 0.00 Mbit/s
-- Flow 3:
Average throughput: 0.00 Mbit/s
```

Run 3: Report of KohoCC — Data Link

