

## Pantheon Report

Generated at 2017-12-11 08:59:19 (UTC).

Data path: China ppp0 (*remote*) → AWS Korea Ethernet (*local*).

Repeated the test of 14 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

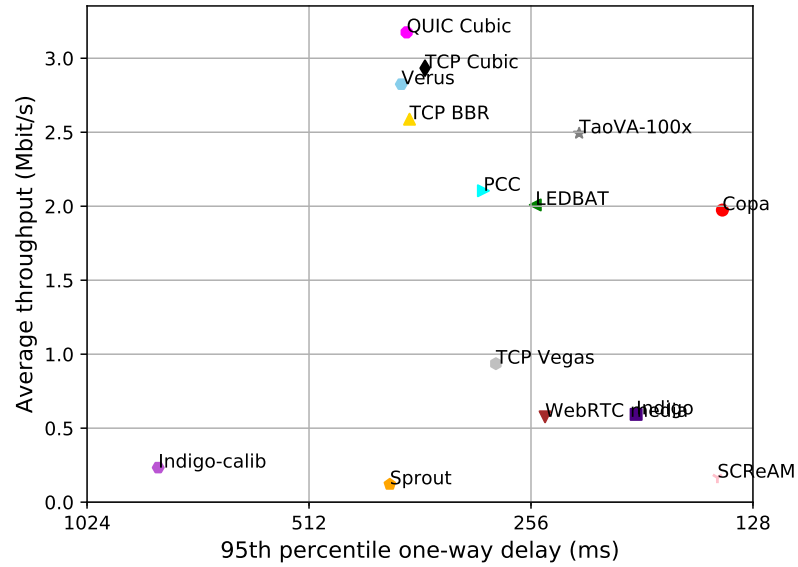
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo\_fast**).

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

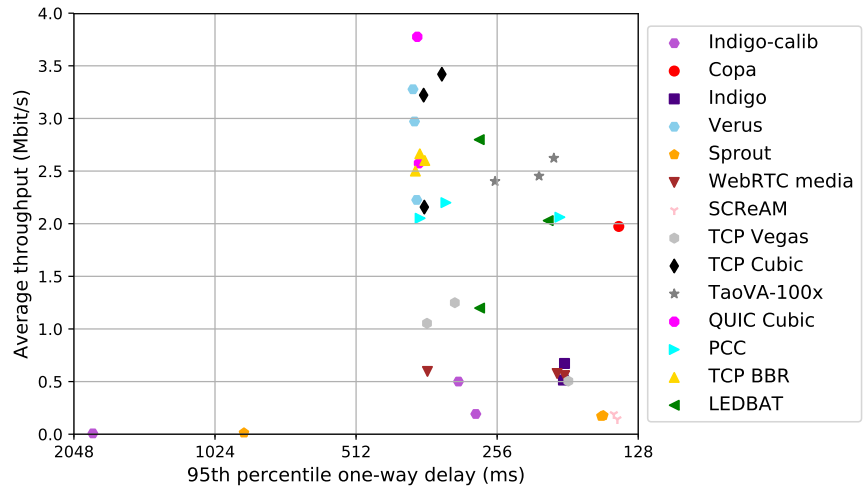
Git summary:

```
branch: indigos @ e3a57ad5ac5cfcaca0e3f983c8dd4cc3509e0262
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/genericCC @ b5b7c38e8391001927dc41c6cfa2627d03dde737
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/indigo-cellular @ aee99e8eb842cb053f8c9a80e28cd256a930bbc2
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/indigo-no-cwnd @ 3e58442c04028a11d7b02456e137604633ba2d6c
third_party/indigo-no-delivery-rate @ 57caa40858b964906edff4876d5a7e5bfff666c5
third_party/indigo-no-queuing-delay @ 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 @ f1a14bffe749737437f61b1eaaeb30b267cde681
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 China ppp0 to AWS Korea Ethernet, 3 runs of 30s each per scheme  
(mean of all runs by scheme)



test from China ppp0 to AWS Korea Ethernet, 3 runs of 30s each per scheme



| scheme       | # runs | mean avg tput (Mbit/s)<br>flow 1 | mean 95th-%ile delay (ms)<br>flow 1 | mean loss rate (%)<br>flow 1 |
|--------------|--------|----------------------------------|-------------------------------------|------------------------------|
| TCP BBR      | 3      | 2.59                             | 374.08                              | 5.83                         |
| TCP Cubic    | 3      | 2.93                             | 356.45                              | 2.49                         |
| LEDBAT       | 3      | 2.01                             | 252.62                              | 1.03                         |
| PCC          | 3      | 2.10                             | 297.02                              | 21.05                        |
| QUIC Cubic   | 2      | 3.17                             | 377.47                              | 5.36                         |
| SCReAM       | 2      | 0.17                             | 143.04                              | 0.36                         |
| WebRTC media | 3      | 0.58                             | 244.99                              | 1.42                         |
| Sprout       | 3      | 0.12                             | 397.83                              | 20.42                        |
| TaoVA-100x   | 3      | 2.49                             | 220.26                              | 2.81                         |
| TCP Vegas    | 3      | 0.93                             | 285.66                              | 3.27                         |
| Verus        | 3      | 2.83                             | 383.78                              | 39.95                        |
| Copa         | 1      | 1.97                             | 140.83                              | 0.42                         |
| Indigo       | 2      | 0.59                             | 184.35                              | 0.84                         |
| Indigo-calib | 3      | 0.23                             | 819.94                              | 35.22                        |

Run 1: Statistics of TCP BBR

Start at: 2017-12-11 07:35:10

End at: 2017-12-11 07:35:40

Local clock offset: -5.708 ms

Remote clock offset: 1.813 ms

# Below is generated by plot.py at 2017-12-11 08:58:51

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.60 Mbit/s

95th percentile per-packet one-way delay: 365.317 ms

Loss rate: 3.35%

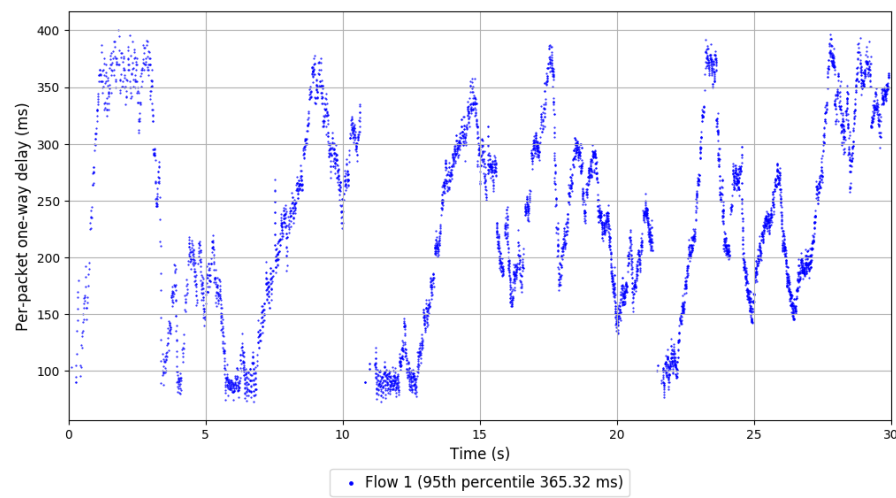
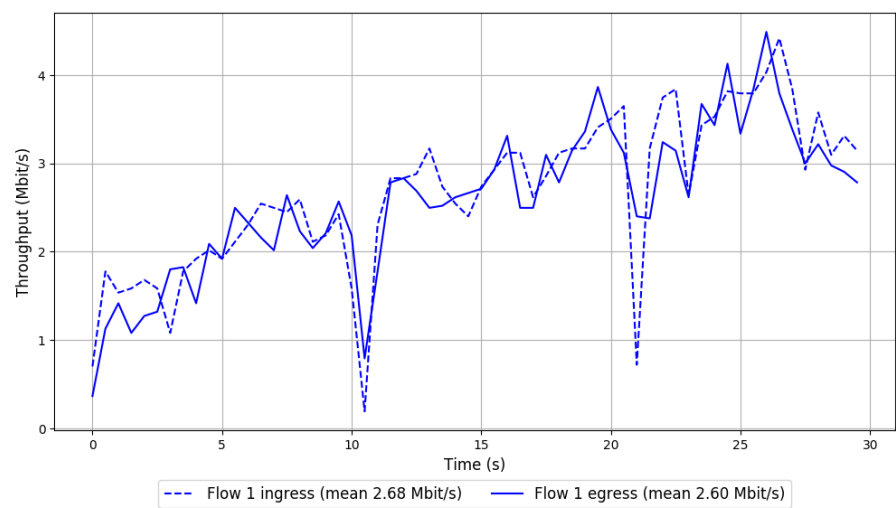
-- Flow 1:

Average throughput: 2.60 Mbit/s

95th percentile per-packet one-way delay: 365.317 ms

Loss rate: 3.35%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2017-12-11 07:51:20

End at: 2017-12-11 07:51:50

Local clock offset: -9.525 ms

Remote clock offset: 1.513 ms

# Below is generated by plot.py at 2017-12-11 08:58:51

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.66 Mbit/s

95th percentile per-packet one-way delay: 374.336 ms

Loss rate: 5.01%

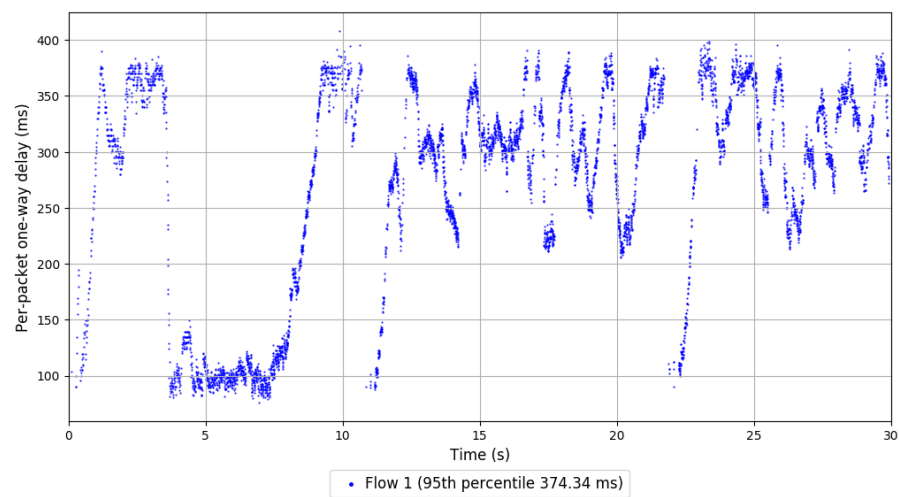
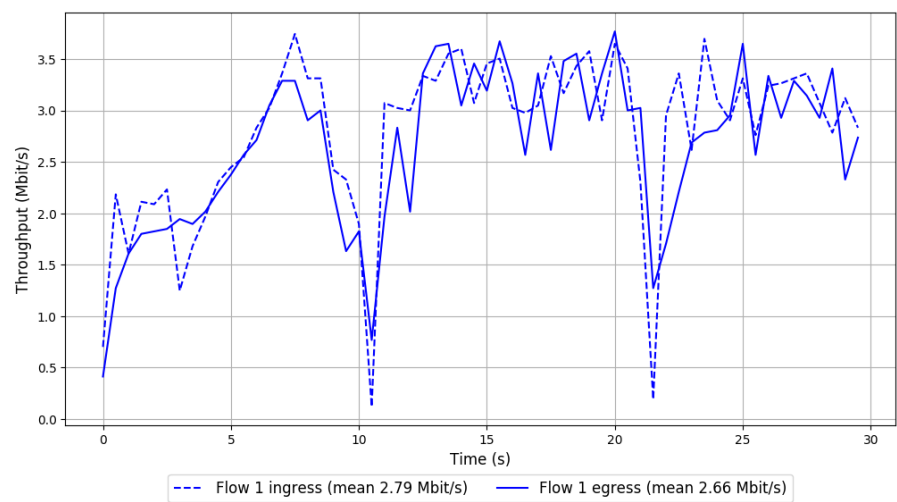
-- Flow 1:

Average throughput: 2.66 Mbit/s

95th percentile per-packet one-way delay: 374.336 ms

Loss rate: 5.01%

Run 2: Report of TCP BBR — Data Link



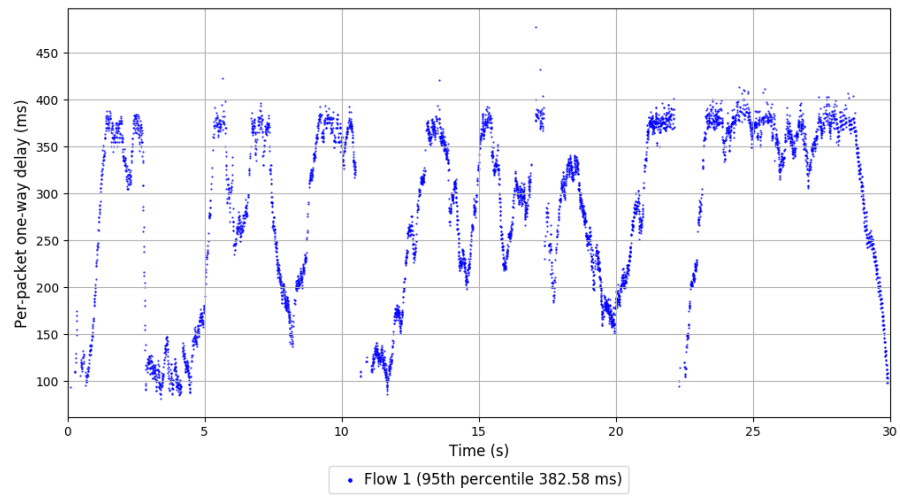
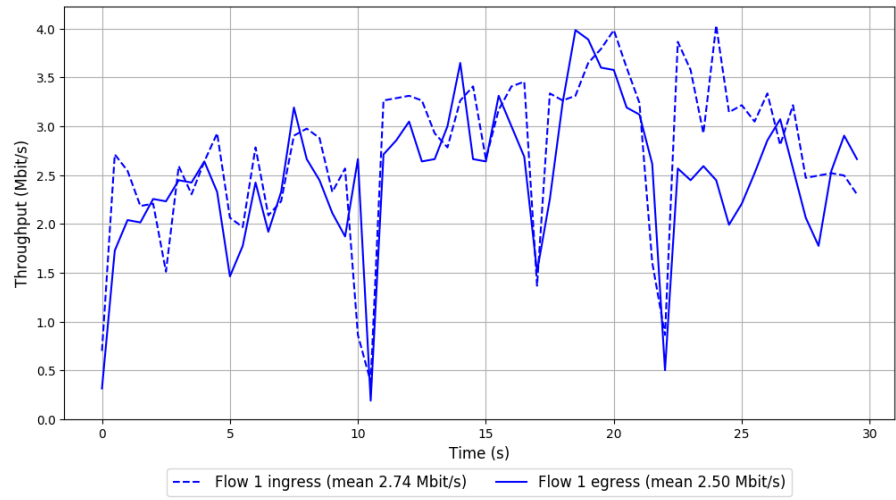
Run 3: Statistics of TCP BBR

Start at: 2017-12-11 08:07:29  
End at: 2017-12-11 08:07:59  
Local clock offset: -12.626 ms  
Remote clock offset: 1.379 ms

# Below is generated by plot.py at 2017-12-11 08:58:51  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.50 Mbit/s  
95th percentile per-packet one-way delay: 382.578 ms  
Loss rate: 9.13%  
-- Flow 1:  
Average throughput: 2.50 Mbit/s  
95th percentile per-packet one-way delay: 382.578 ms  
Loss rate: 9.13%



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



Run 1: Statistics of TCP Cubic

Start at: 2017-12-11 07:32:52

End at: 2017-12-11 07:33:22

Local clock offset: -6.528 ms

Remote clock offset: 1.936 ms

# Below is generated by plot.py at 2017-12-11 08:58:51

# Datalink statistics

-- Total of 1 flow:

Average throughput: 3.22 Mbit/s

95th percentile per-packet one-way delay: 367.366 ms

Loss rate: 2.31%

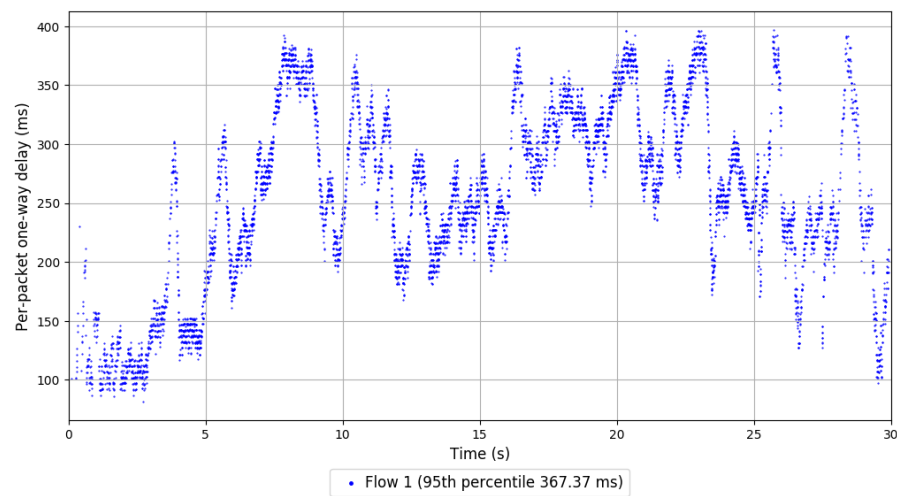
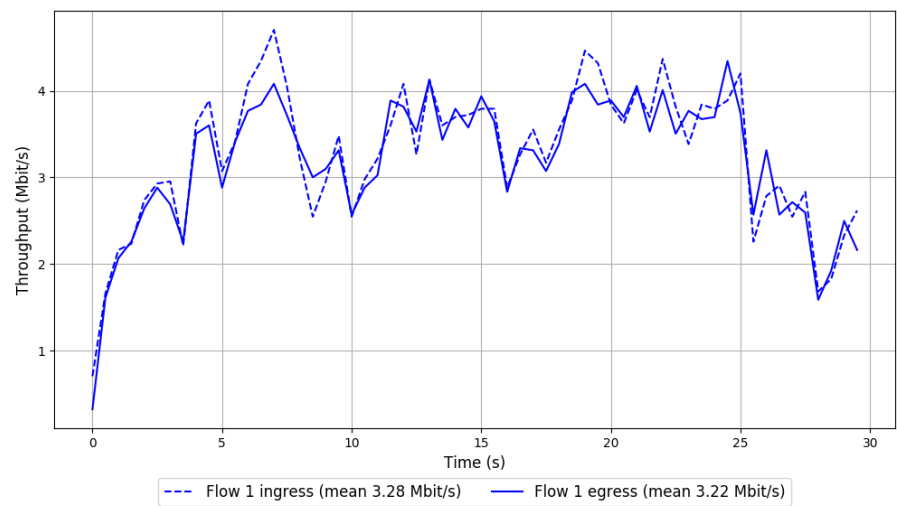
-- Flow 1:

Average throughput: 3.22 Mbit/s

95th percentile per-packet one-way delay: 367.366 ms

Loss rate: 2.31%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2017-12-11 07:49:01

End at: 2017-12-11 07:49:31

Local clock offset: -8.442 ms

Remote clock offset: 1.612 ms

# Below is generated by plot.py at 2017-12-11 08:58:52

# Datalink statistics

-- Total of 1 flow:

Average throughput: 3.42 Mbit/s

95th percentile per-packet one-way delay: 335.888 ms

Loss rate: 2.36%

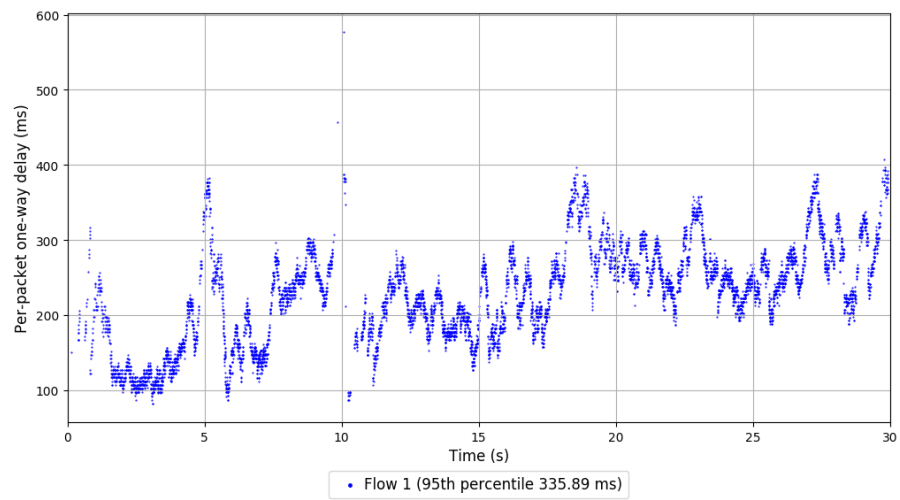
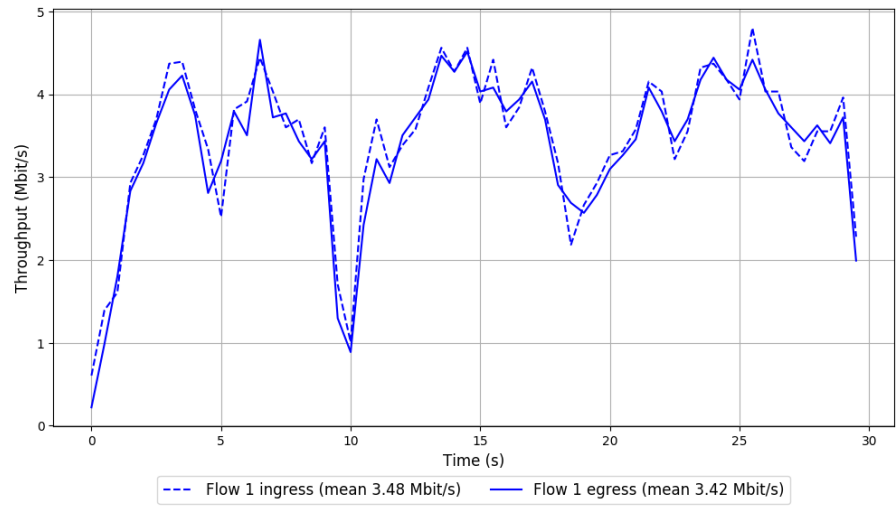
-- Flow 1:

Average throughput: 3.42 Mbit/s

95th percentile per-packet one-way delay: 335.888 ms

Loss rate: 2.36%

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

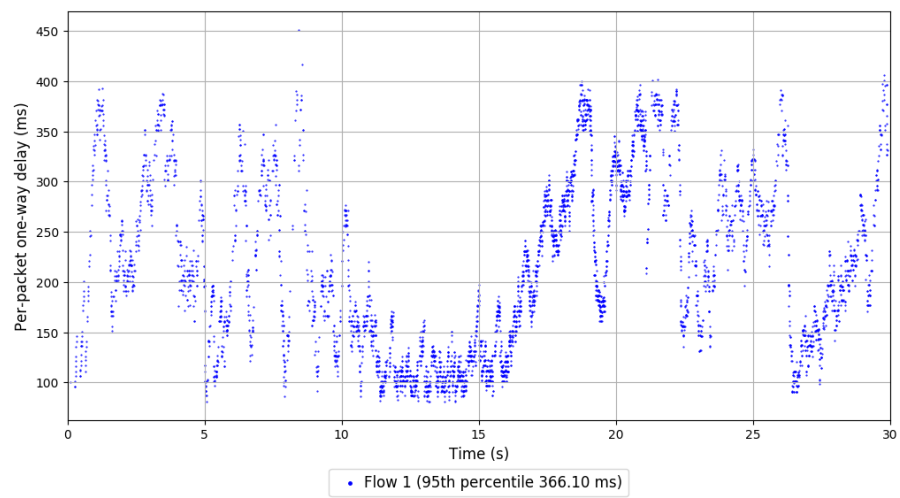
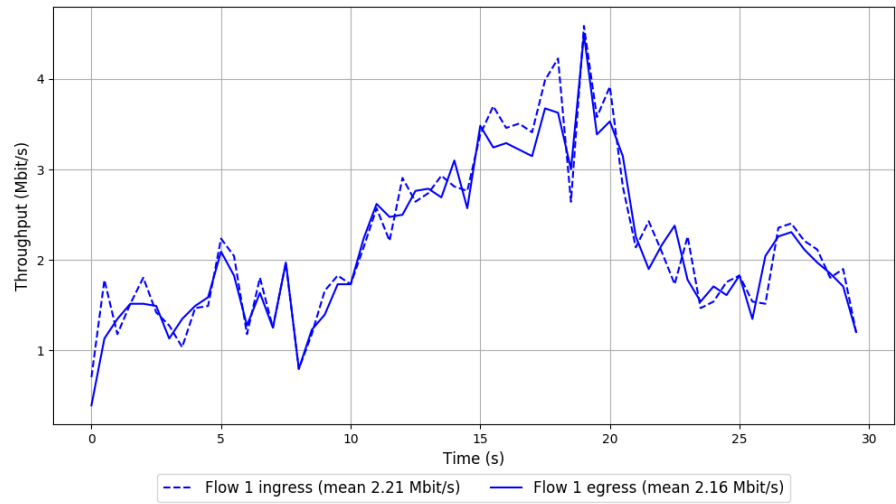


Run 3: Statistics of TCP Cubic

Start at: 2017-12-11 08:05:11  
End at: 2017-12-11 08:05:41  
Local clock offset: -12.734 ms  
Remote clock offset: 1.485 ms

# Below is generated by plot.py at 2017-12-11 08:58:52  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.16 Mbit/s  
95th percentile per-packet one-way delay: 366.101 ms  
Loss rate: 2.81%  
-- Flow 1:  
Average throughput: 2.16 Mbit/s  
95th percentile per-packet one-way delay: 366.101 ms  
Loss rate: 2.81%

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



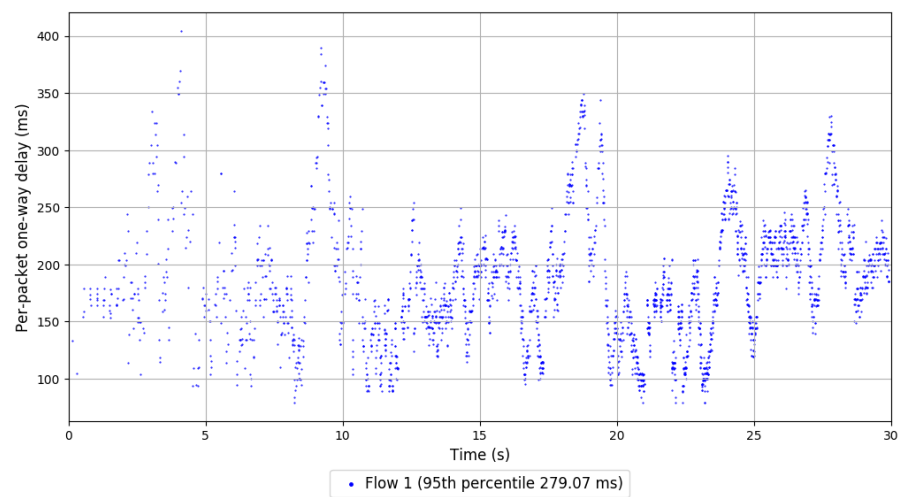
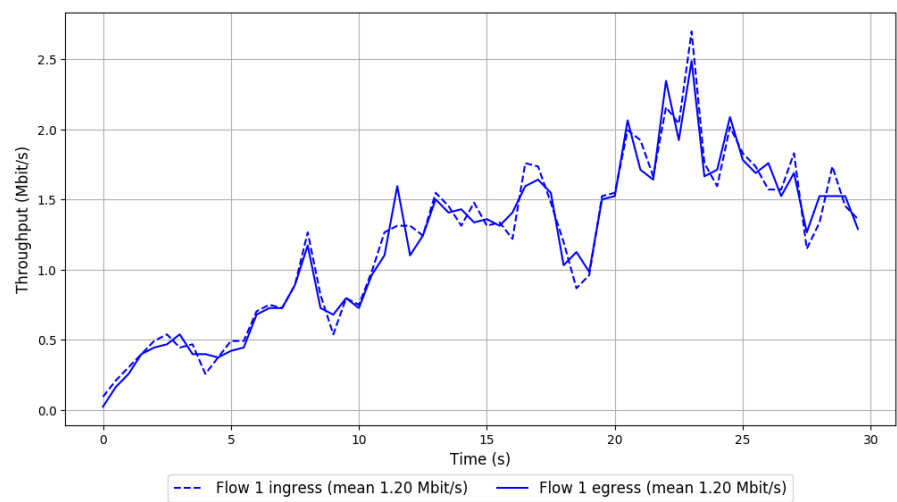
```
Run 1: Statistics of LEDBAT

Start at: 2017-12-11 07:24:45
End at: 2017-12-11 07:25:15
Local clock offset: -12.255 ms
Remote clock offset: 2.254 ms

# Below is generated by plot.py at 2017-12-11 08:58:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 279.071 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 279.071 ms
Loss rate: 0.98%
```



Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2017-12-11 07:40:58

End at: 2017-12-11 07:41:28

Local clock offset: -6.306 ms

Remote clock offset: 1.71 ms

# Below is generated by plot.py at 2017-12-11 08:58:52

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.03 Mbit/s

95th percentile per-packet one-way delay: 199.224 ms

Loss rate: 1.15%

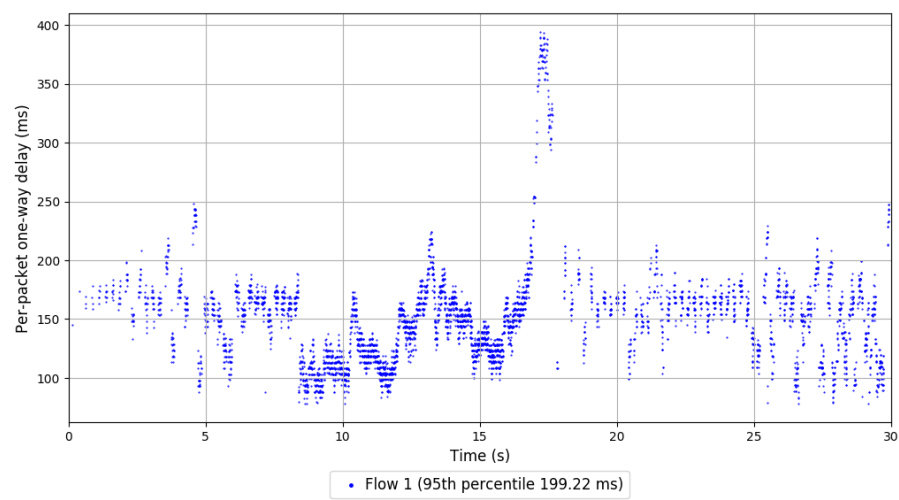
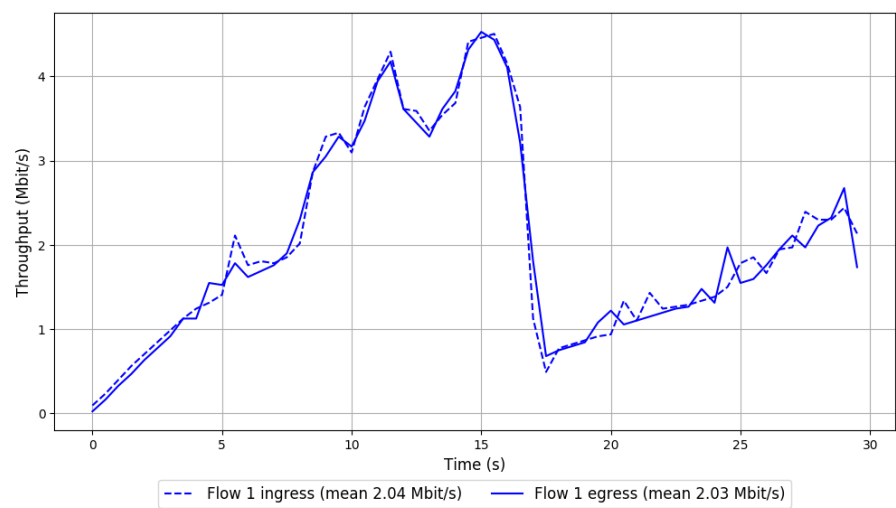
-- Flow 1:

Average throughput: 2.03 Mbit/s

95th percentile per-packet one-way delay: 199.224 ms

Loss rate: 1.15%

Run 2: Report of LEDBAT — Data Link

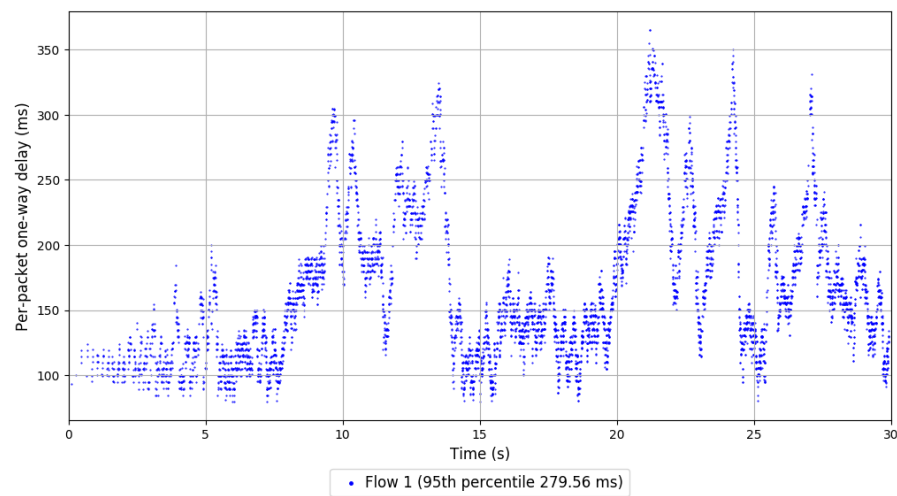
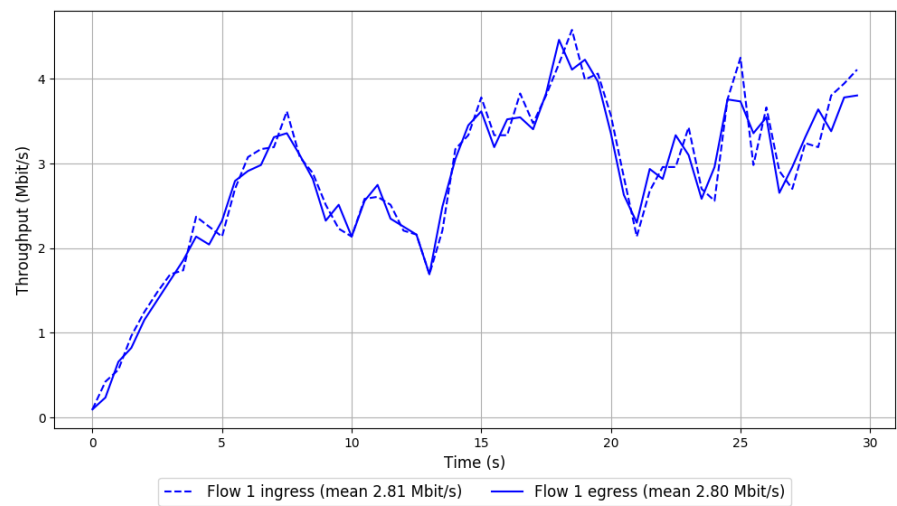


Run 3: Statistics of LEDBAT

Start at: 2017-12-11 07:57:06  
End at: 2017-12-11 07:57:36  
Local clock offset: -13.345 ms  
Remote clock offset: 1.298 ms

# Below is generated by plot.py at 2017-12-11 08:58:54  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.80 Mbit/s  
95th percentile per-packet one-way delay: 279.560 ms  
Loss rate: 0.97%  
-- Flow 1:  
Average throughput: 2.80 Mbit/s  
95th percentile per-packet one-way delay: 279.560 ms  
Loss rate: 0.97%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC

Start at: 2017-12-11 07:31:43

End at: 2017-12-11 07:32:13

Local clock offset: -8.026 ms

Remote clock offset: 2.024 ms

# Below is generated by plot.py at 2017-12-11 08:58:59

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.20 Mbit/s

95th percentile per-packet one-way delay: 329.252 ms

Loss rate: 29.47%

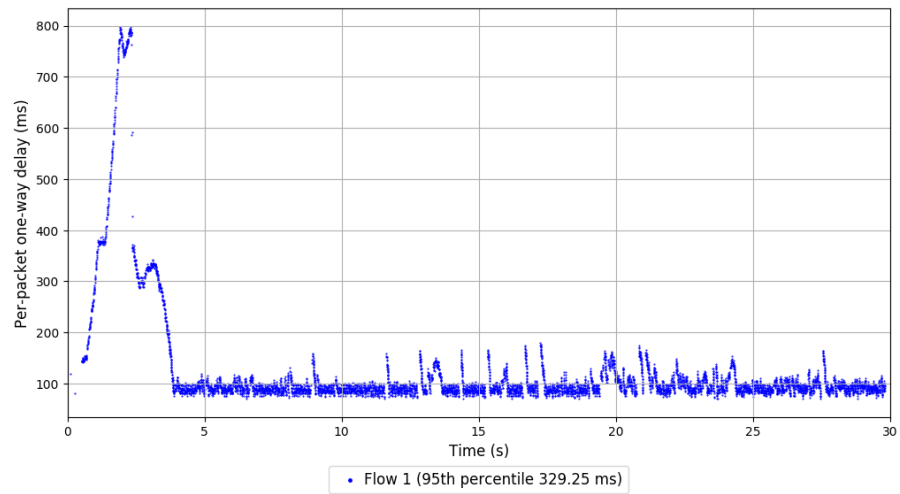
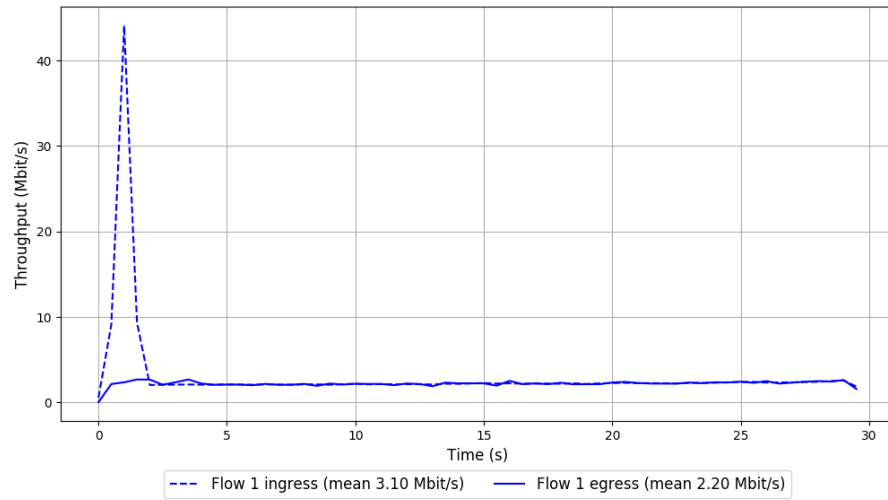
-- Flow 1:

Average throughput: 2.20 Mbit/s

95th percentile per-packet one-way delay: 329.252 ms

Loss rate: 29.47%

## Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2017-12-11 07:47:52

End at: 2017-12-11 07:48:22

Local clock offset: -7.824 ms

Remote clock offset: 1.685 ms

# Below is generated by plot.py at 2017-12-11 08:59:00

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.05 Mbit/s

95th percentile per-packet one-way delay: 373.734 ms

Loss rate: 29.27%

-- Flow 1:

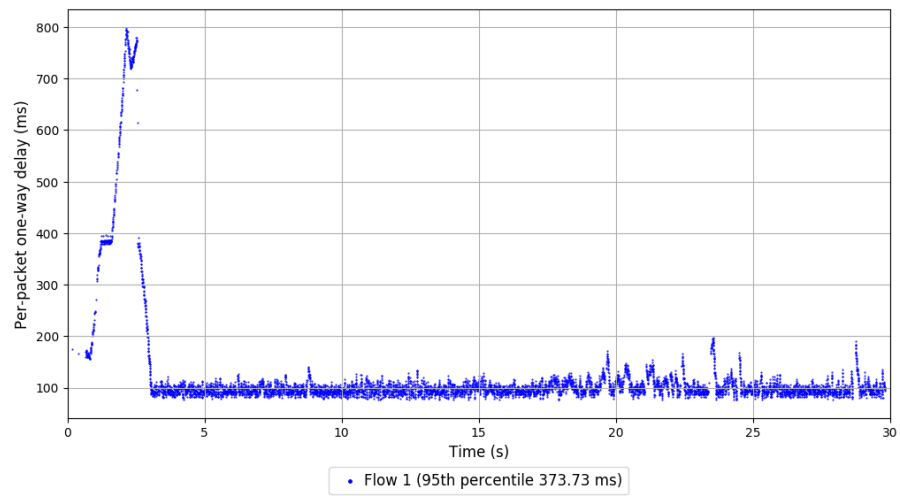
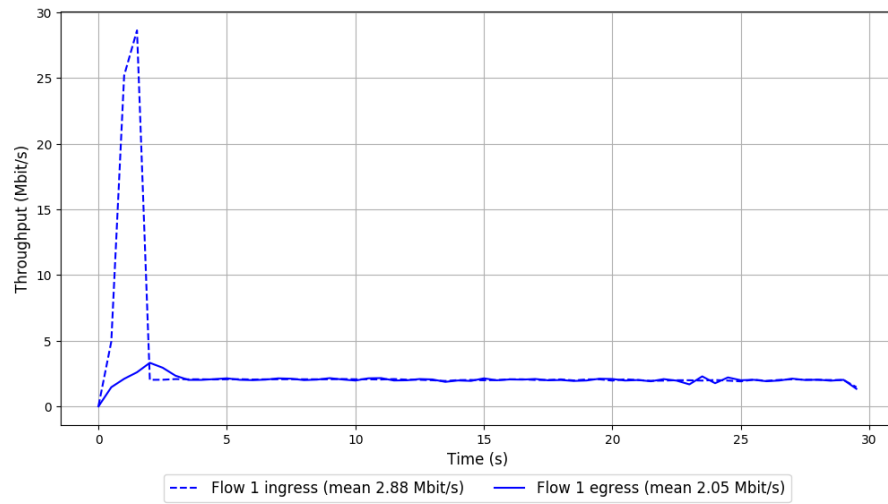
Average throughput: 2.05 Mbit/s

95th percentile per-packet one-way delay: 373.734 ms

Loss rate: 29.27%



## Run 2: Report of PCC — Data Link

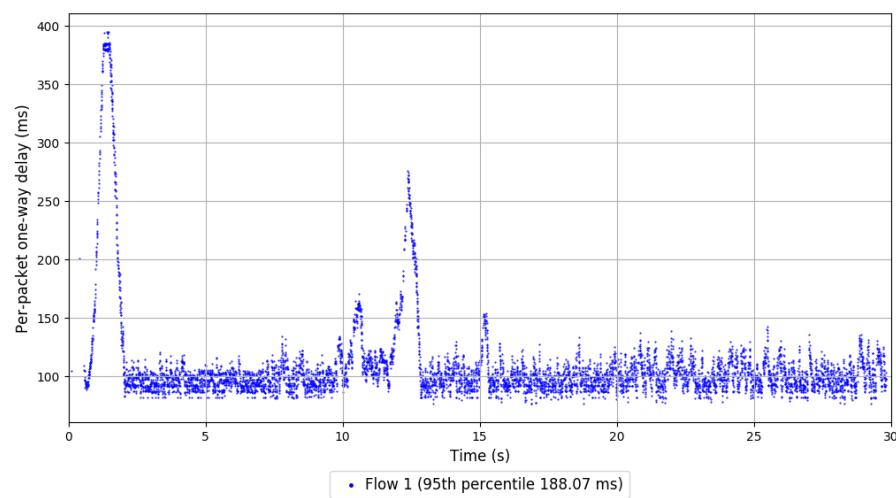
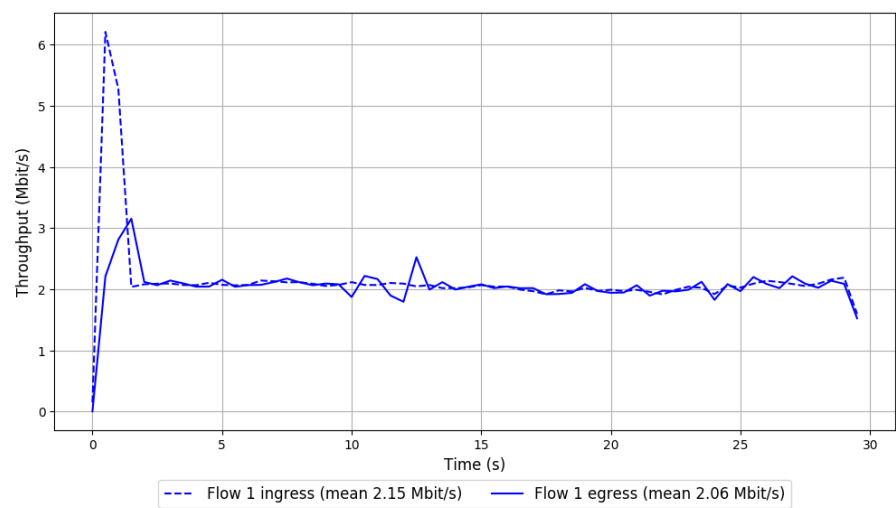


Run 3: Statistics of PCC

Start at: 2017-12-11 08:04:03  
End at: 2017-12-11 08:04:33  
Local clock offset: -12.689 ms  
Remote clock offset: 1.281 ms

# Below is generated by plot.py at 2017-12-11 08:59:01  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.06 Mbit/s  
95th percentile per-packet one-way delay: 188.066 ms  
Loss rate: 4.41%  
-- Flow 1:  
Average throughput: 2.06 Mbit/s  
95th percentile per-packet one-way delay: 188.066 ms  
Loss rate: 4.41%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2017-12-11 07:30:33

End at: 2017-12-11 07:31:03

Local clock offset: -9.875 ms

Remote clock offset: 1.983 ms

# Below is generated by plot.py at 2017-12-11 08:59:01

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.57 Mbit/s

95th percentile per-packet one-way delay: 375.888 ms

Loss rate: 5.59%

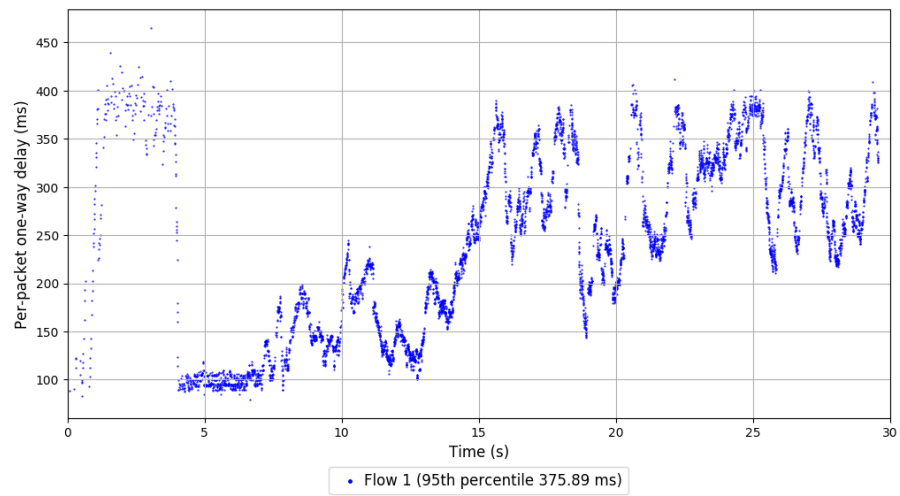
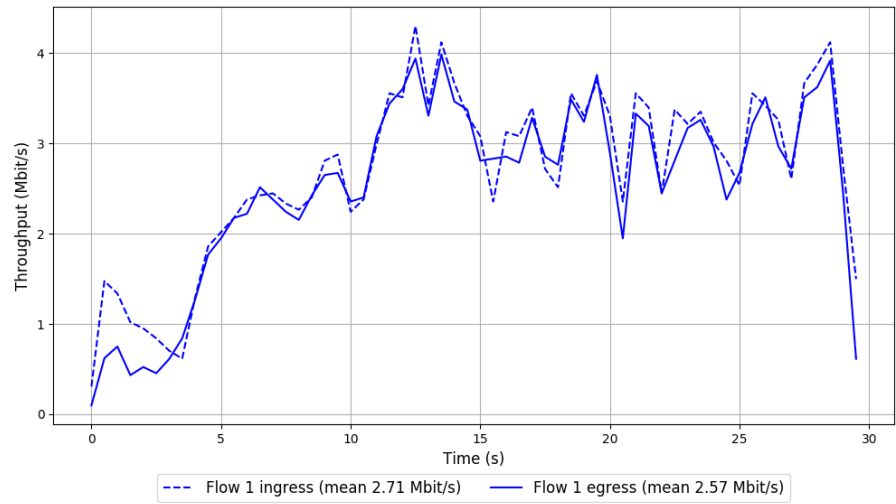
-- Flow 1:

Average throughput: 2.57 Mbit/s

95th percentile per-packet one-way delay: 375.888 ms

Loss rate: 5.59%

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



Run 2: Statistics of QUIC Cubic

Start at: 2017-12-11 07:46:43

End at: 2017-12-11 07:47:13

Local clock offset: -7.364 ms

Remote clock offset: 1.595 ms

# Below is generated by plot.py at 2017-12-11 08:59:03

# Datalink statistics

-- Total of 1 flow:

Average throughput: 3.78 Mbit/s

95th percentile per-packet one-way delay: 379.061 ms

Loss rate: 5.13%

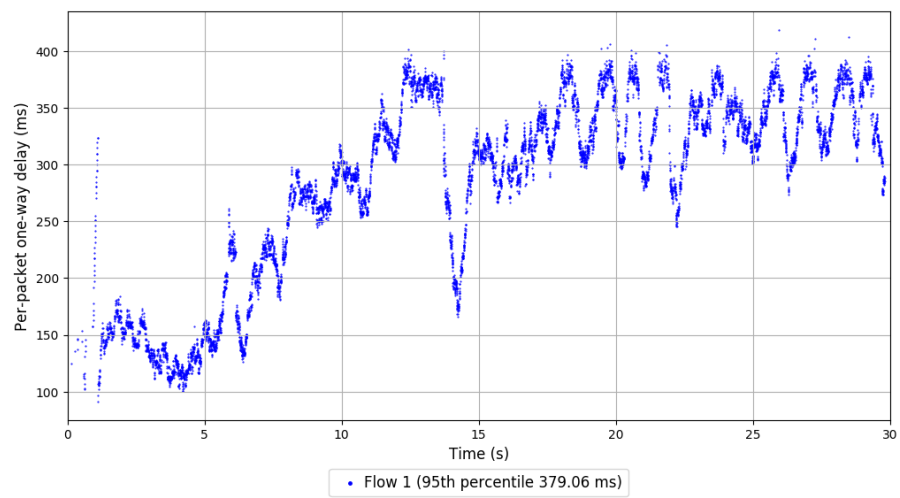
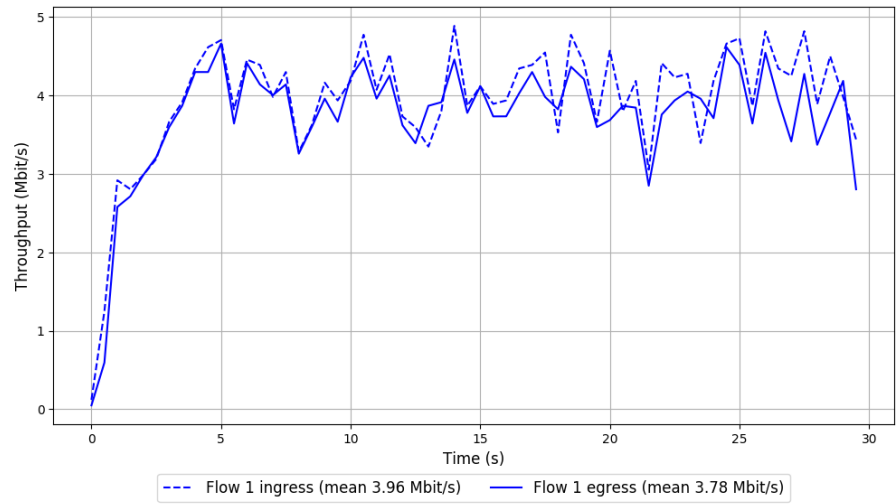
-- Flow 1:

Average throughput: 3.78 Mbit/s

95th percentile per-packet one-way delay: 379.061 ms

Loss rate: 5.13%

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



Run 3: Statistics of QUIC Cubic

Start at: 2017-12-11 08:02:51

End at: 2017-12-11 08:03:21

Local clock offset: -12.734 ms

Remote clock offset: 1.392 ms



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

Figure is missing

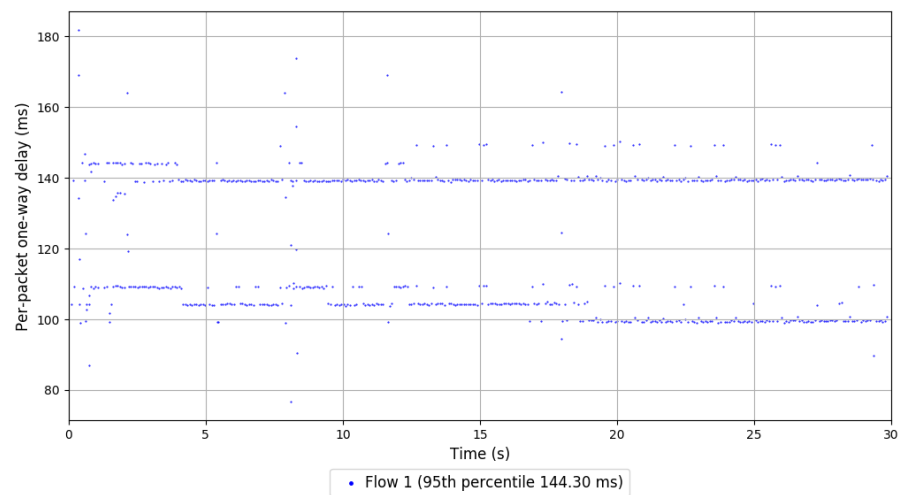
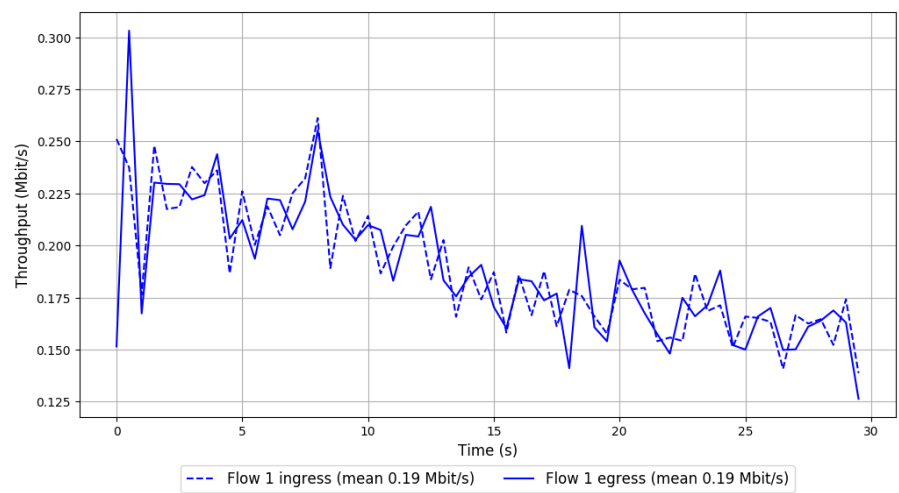
Figure is missing

Run 1: Statistics of SCReAM

Start at: 2017-12-11 07:27:05  
End at: 2017-12-11 07:27:36  
Local clock offset: -12.788 ms  
Remote clock offset: 2.17 ms

# Below is generated by plot.py at 2017-12-11 08:59:03  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.19 Mbit/s  
95th percentile per-packet one-way delay: 144.298 ms  
Loss rate: 0.44%  
-- Flow 1:  
Average throughput: 0.19 Mbit/s  
95th percentile per-packet one-way delay: 144.298 ms  
Loss rate: 0.44%

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

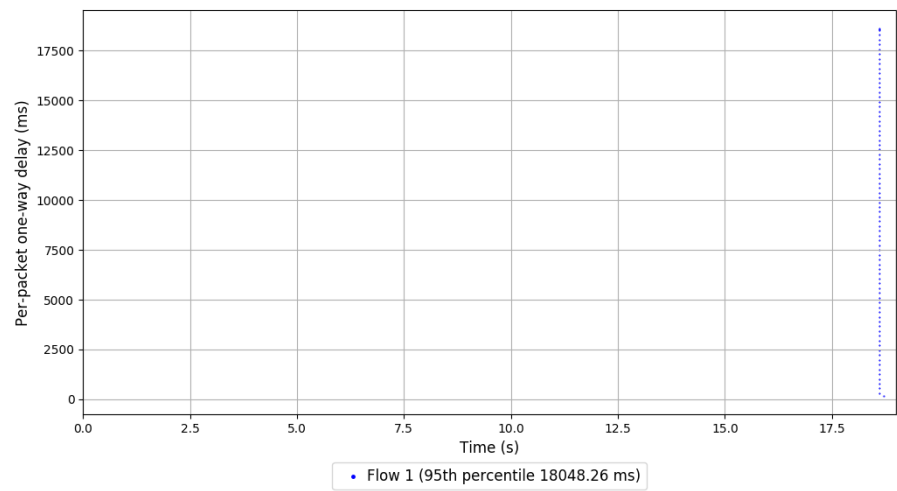
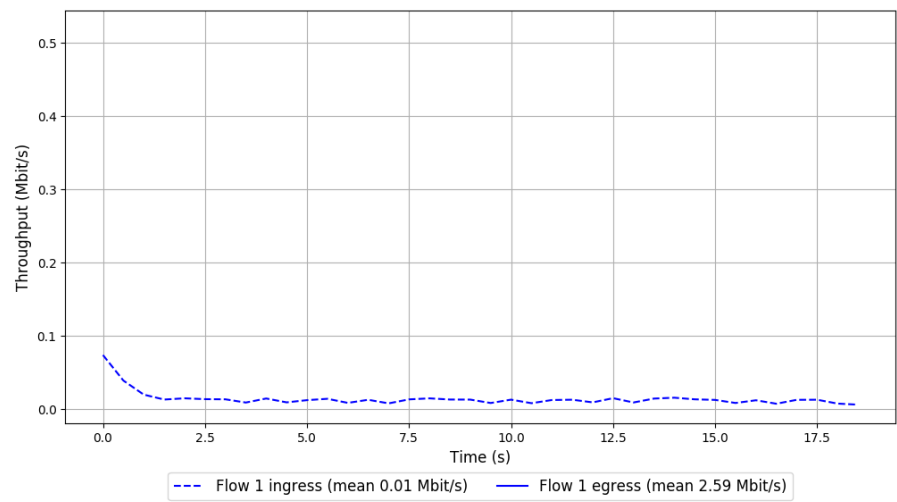
Start at: 2017-12-11 07:43:16

End at: 2017-12-11 07:43:46

Local clock offset: -6.429 ms

Remote clock offset: 1.758 ms

Run 2: Report of SReAM — Data Link

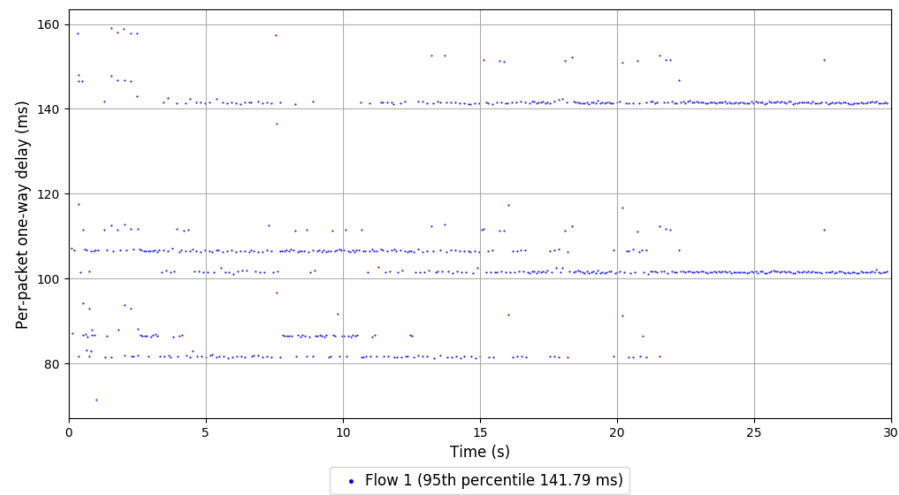
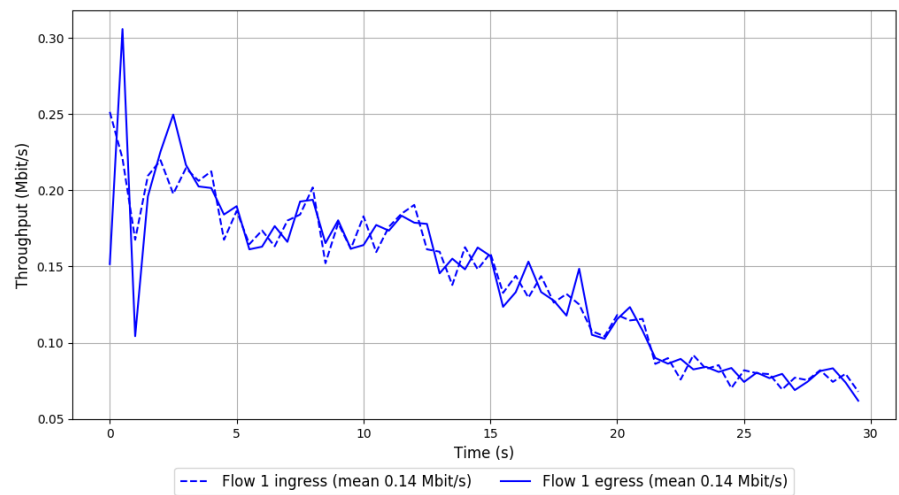


Run 3: Statistics of SCReAM

Start at: 2017-12-11 07:59:25  
End at: 2017-12-11 07:59:55  
Local clock offset: -13.665 ms  
Remote clock offset: 1.394 ms

# Below is generated by plot.py at 2017-12-11 08:59:03  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 141.789 ms  
Loss rate: 0.29%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 141.789 ms  
Loss rate: 0.29%

Run 3: Report of SReAM — Data Link



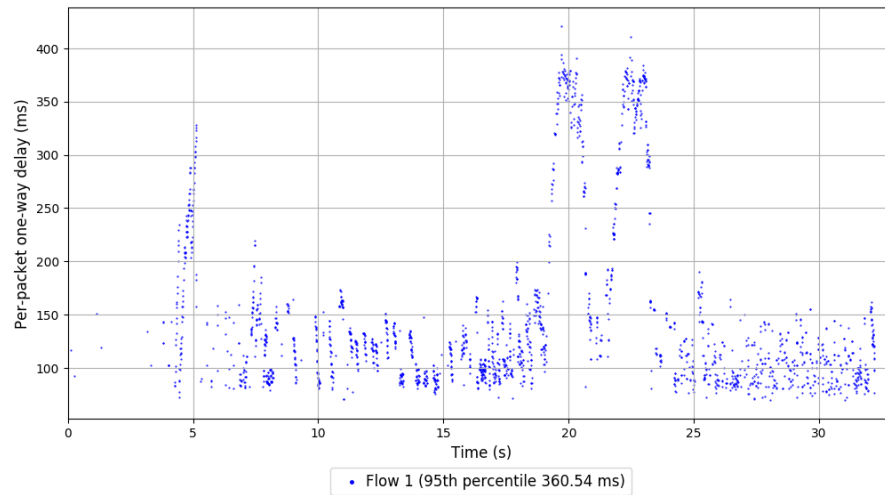
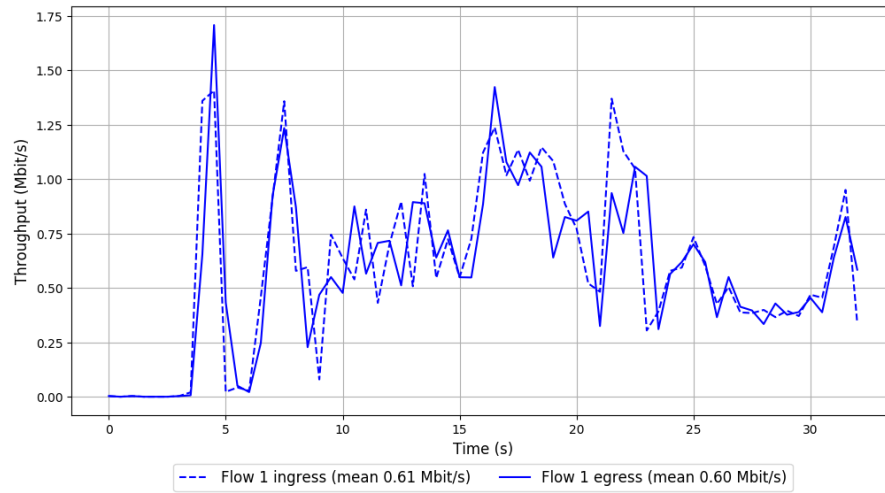
Run 1: Statistics of WebRTC media

Start at: 2017-12-11 07:23:12  
End at: 2017-12-11 07:23:42  
Local clock offset: -13.186 ms  
Remote clock offset: 2.441 ms

# Below is generated by plot.py at 2017-12-11 08:59:03  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.60 Mbit/s  
95th percentile per-packet one-way delay: 360.535 ms  
Loss rate: 2.03%  
-- Flow 1:  
Average throughput: 0.60 Mbit/s  
95th percentile per-packet one-way delay: 360.535 ms  
Loss rate: 2.03%



# Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2017-12-11 07:39:49

End at: 2017-12-11 07:40:19

Local clock offset: -7.134 ms

Remote clock offset: 1.725 ms

# Below is generated by plot.py at 2017-12-11 08:59:03

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 183.781 ms

Loss rate: 0.69%

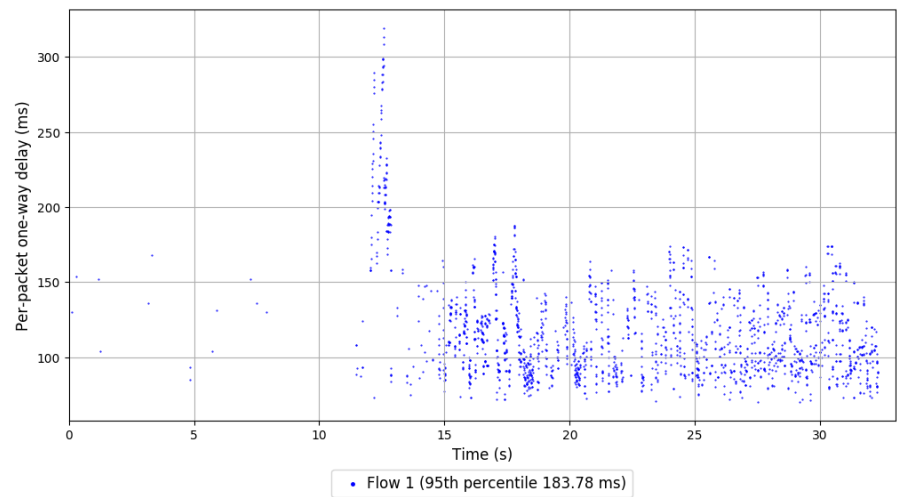
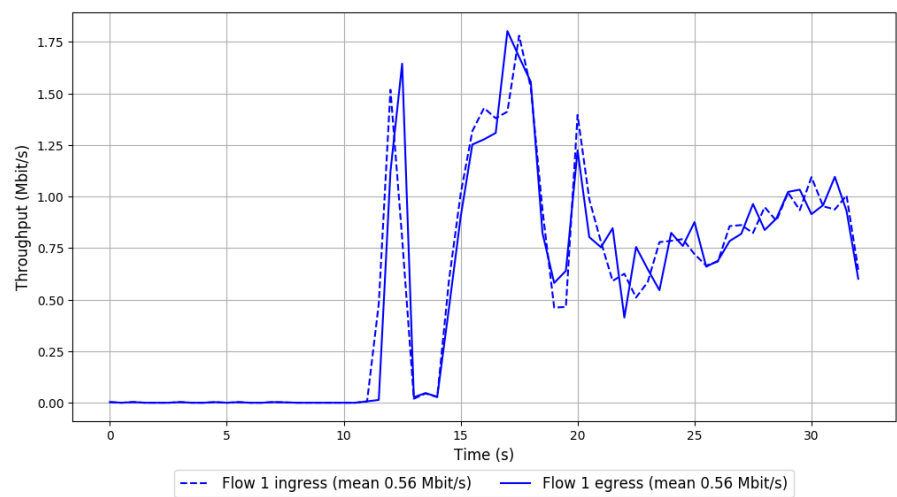
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 183.781 ms

Loss rate: 0.69%

Run 2: Report of WebRTC media — Data Link

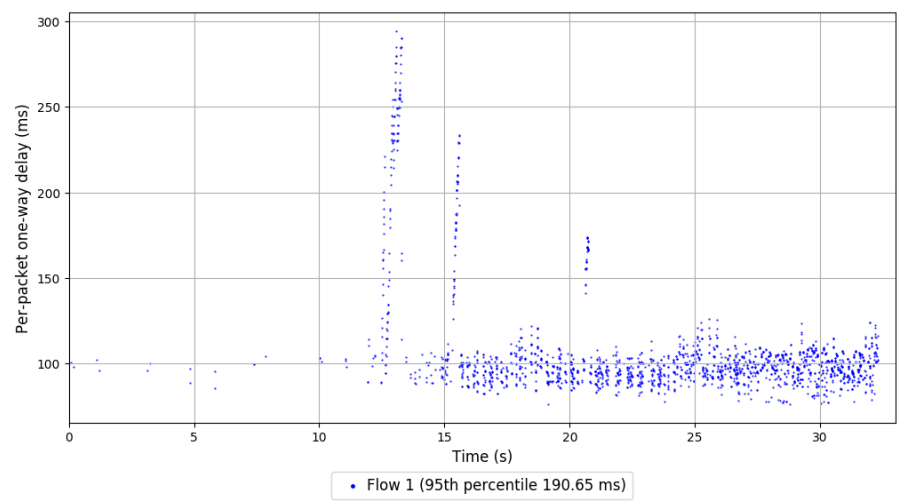
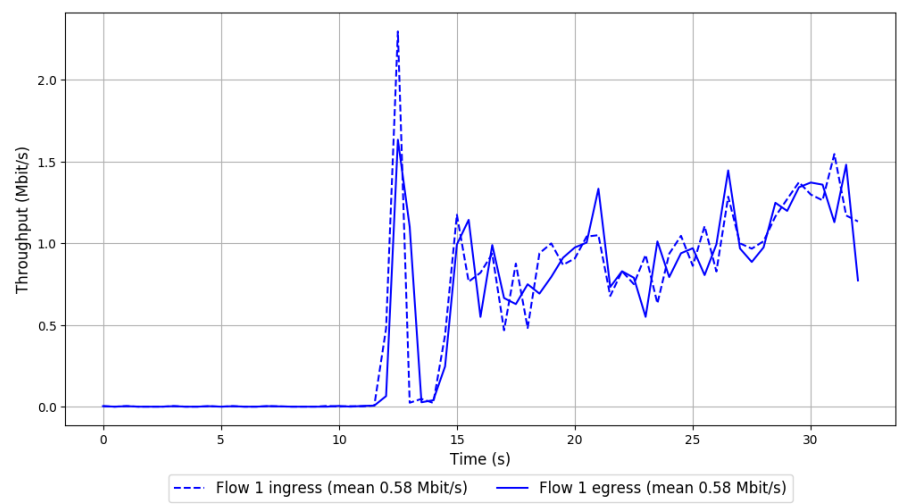


Run 3: Statistics of WebRTC media

Start at: 2017-12-11 07:55:58  
End at: 2017-12-11 07:56:28  
Local clock offset: -12.536 ms  
Remote clock offset: 1.393 ms

# Below is generated by plot.py at 2017-12-11 08:59:03  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.58 Mbit/s  
95th percentile per-packet one-way delay: 190.647 ms  
Loss rate: 1.54%  
-- Flow 1:  
Average throughput: 0.58 Mbit/s  
95th percentile per-packet one-way delay: 190.647 ms  
Loss rate: 1.54%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2017-12-11 07:34:01

End at: 2017-12-11 07:34:31

Local clock offset: -5.955 ms

Remote clock offset: 1.823 ms

# Below is generated by plot.py at 2017-12-11 08:59:03

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.17 Mbit/s

95th percentile per-packet one-way delay: 153.391 ms

Loss rate: 0.69%

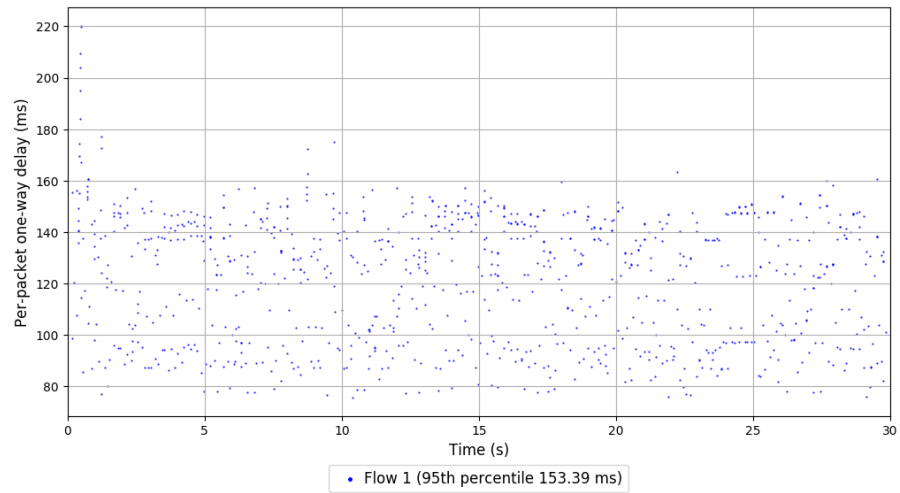
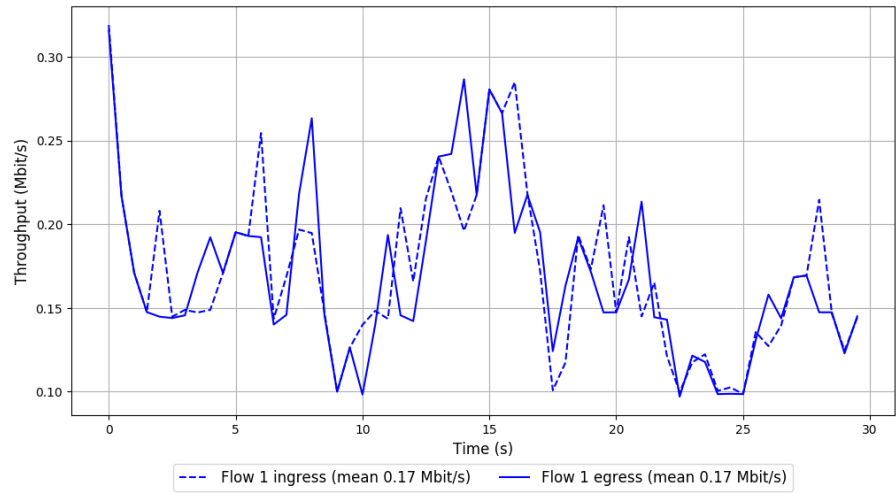
-- Flow 1:

Average throughput: 0.17 Mbit/s

95th percentile per-packet one-way delay: 153.391 ms

Loss rate: 0.69%

## Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2017-12-11 07:50:11

End at: 2017-12-11 07:50:41

Local clock offset: -8.978 ms

Remote clock offset: 1.452 ms

# Below is generated by plot.py at 2017-12-11 08:59:03

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 888.129 ms

Loss rate: 60.11%

-- Flow 1:

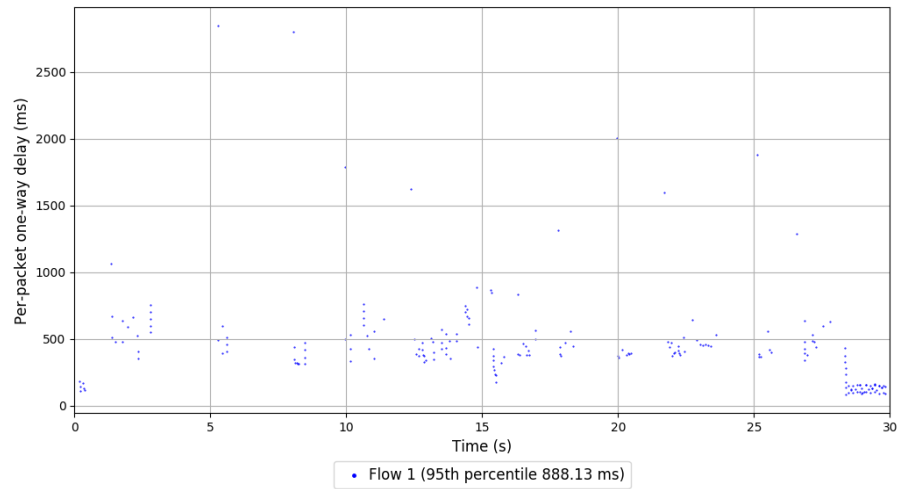
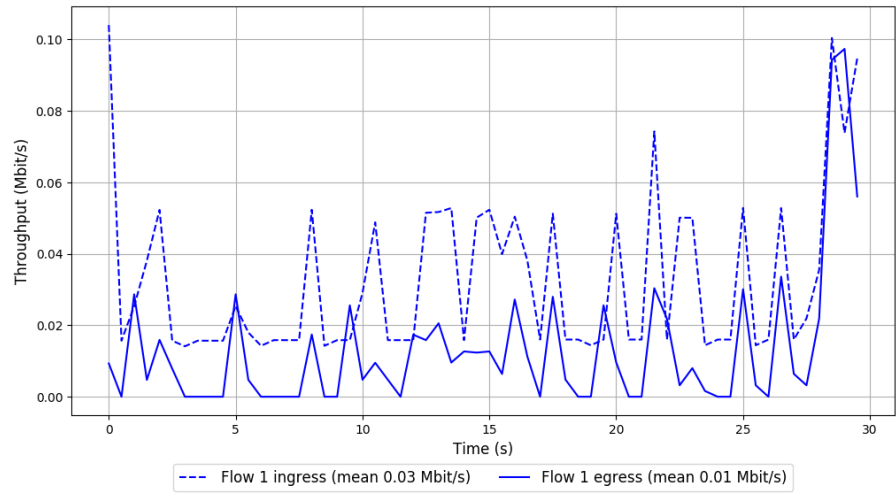
Average throughput: 0.01 Mbit/s

95th percentile per-packet one-way delay: 888.129 ms

Loss rate: 60.11%



## Run 2: Report of Sprout — Data Link

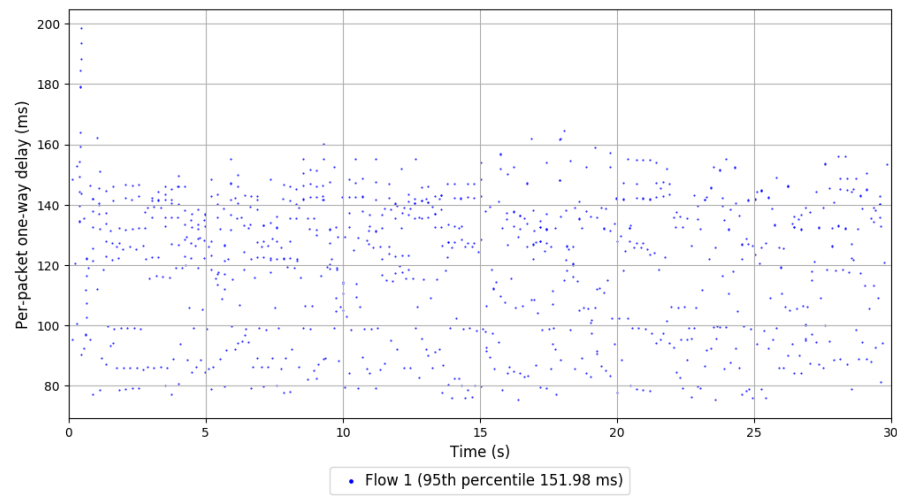
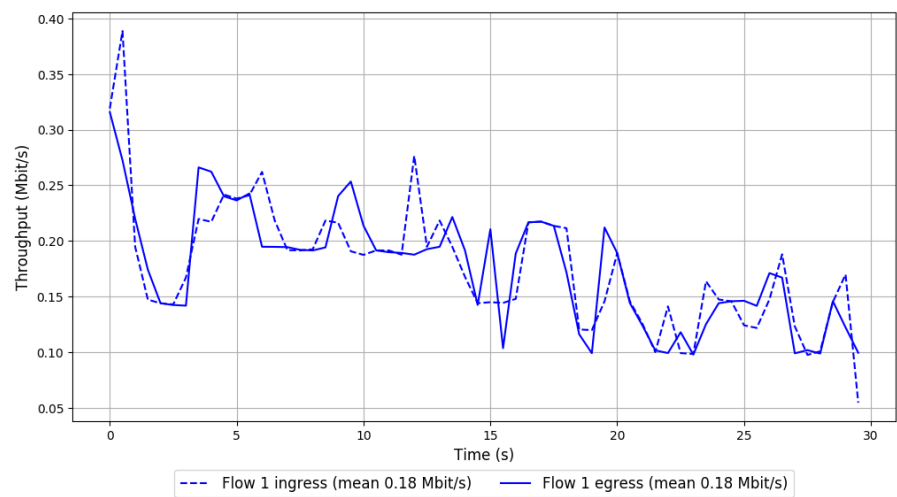


Run 3: Statistics of Sprout

Start at: 2017-12-11 08:06:20  
End at: 2017-12-11 08:06:50  
Local clock offset: -12.861 ms  
Remote clock offset: 1.641 ms

# Below is generated by plot.py at 2017-12-11 08:59:03  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.18 Mbit/s  
95th percentile per-packet one-way delay: 151.977 ms  
Loss rate: 0.45%  
-- Flow 1:  
Average throughput: 0.18 Mbit/s  
95th percentile per-packet one-way delay: 151.977 ms  
Loss rate: 0.45%

Run 3: Report of Sprout — Data Link

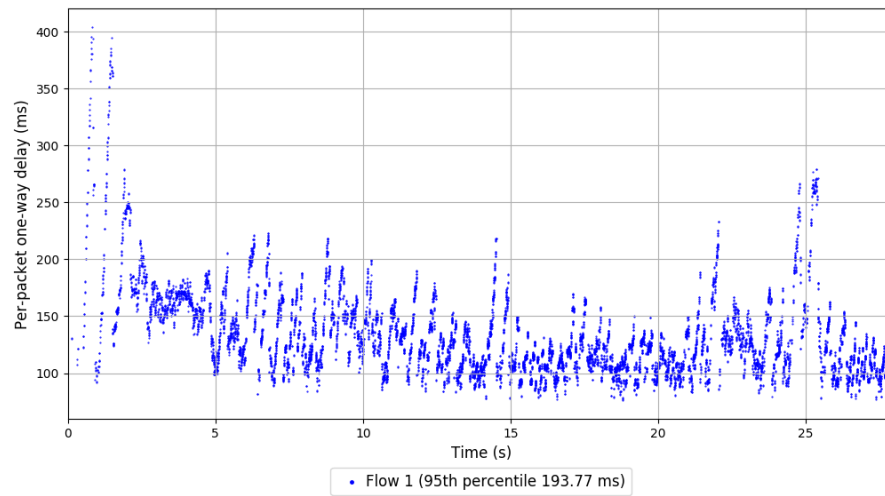
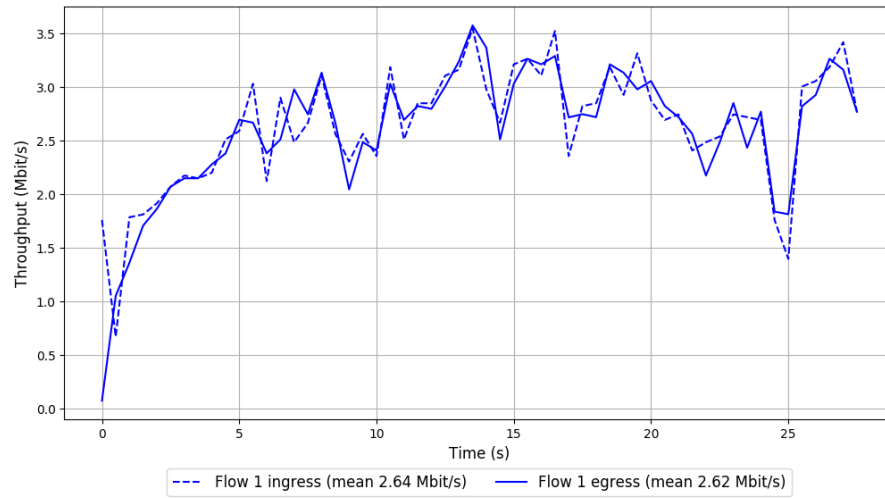


Run 1: Statistics of TaoVA-100x

Start at: 2017-12-11 07:28:15  
End at: 2017-12-11 07:28:45  
Local clock offset: -13.349 ms  
Remote clock offset: 2.129 ms

# Below is generated by plot.py at 2017-12-11 08:59:11  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.62 Mbit/s  
95th percentile per-packet one-way delay: 193.766 ms  
Loss rate: 1.38%  
-- Flow 1:  
Average throughput: 2.62 Mbit/s  
95th percentile per-packet one-way delay: 193.766 ms  
Loss rate: 1.38%

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



Run 2: Statistics of TaoVA-100x

Start at: 2017-12-11 07:44:26

End at: 2017-12-11 07:44:56

Local clock offset: -6.586 ms

Remote clock offset: 1.69 ms

# Below is generated by plot.py at 2017-12-11 08:59:11

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.40 Mbit/s

95th percentile per-packet one-way delay: 258.646 ms

Loss rate: 5.67%

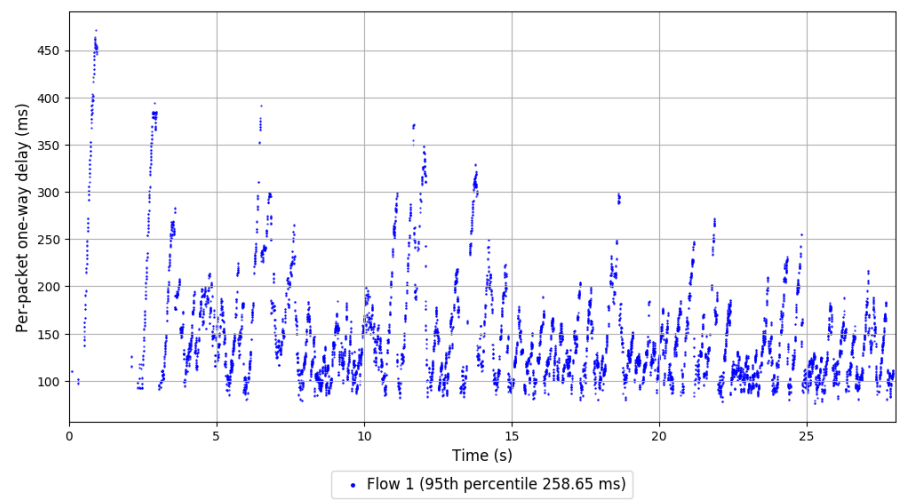
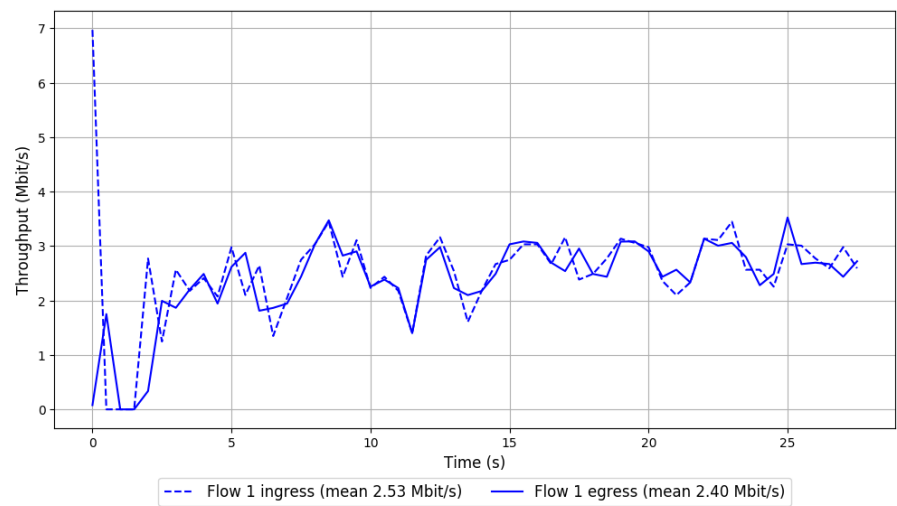
-- Flow 1:

Average throughput: 2.40 Mbit/s

95th percentile per-packet one-way delay: 258.646 ms

Loss rate: 5.67%

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



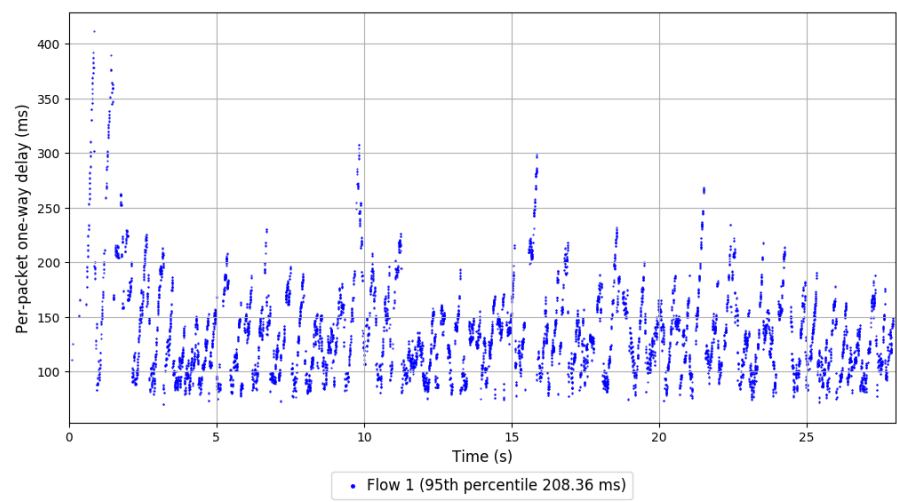
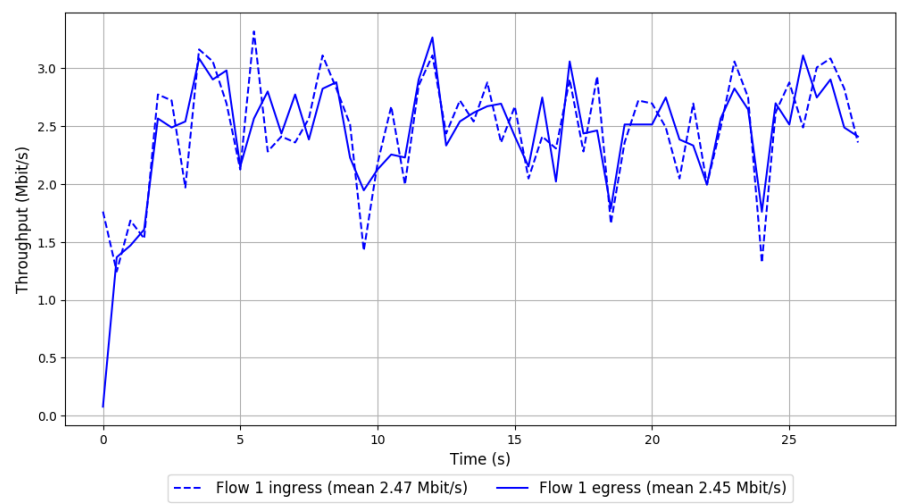
Run 3: Statistics of TaoVA-100x

Start at: 2017-12-11 08:00:33  
End at: 2017-12-11 08:01:03  
Local clock offset: -13.217 ms  
Remote clock offset: 1.448 ms

# Below is generated by plot.py at 2017-12-11 08:59:11  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.45 Mbit/s  
95th percentile per-packet one-way delay: 208.362 ms  
Loss rate: 1.38%  
-- Flow 1:  
Average throughput: 2.45 Mbit/s  
95th percentile per-packet one-way delay: 208.362 ms  
Loss rate: 1.38%



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

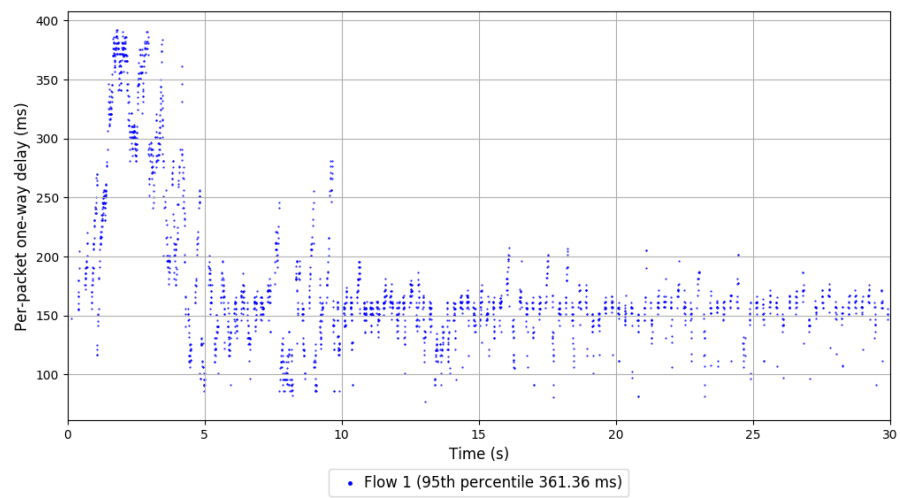
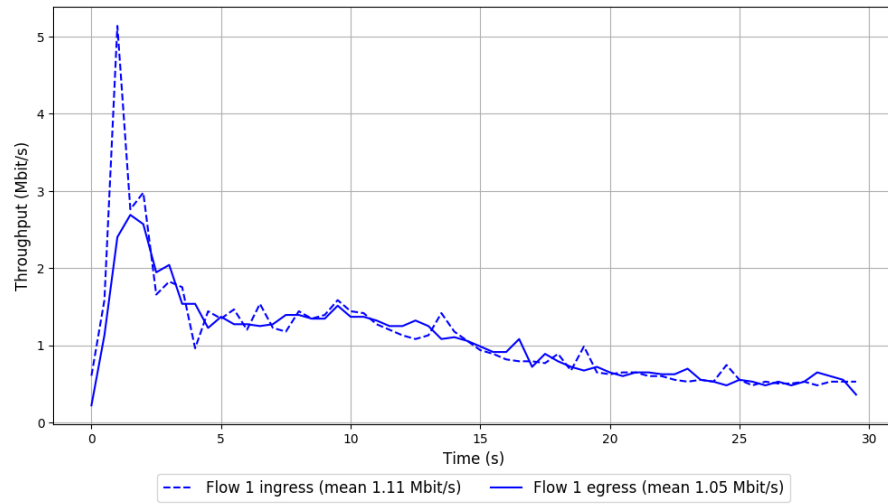


Run 1: Statistics of TCP Vegas

Start at: 2017-12-11 07:20:54  
End at: 2017-12-11 07:21:24  
Local clock offset: -10.256 ms  
Remote clock offset: 2.492 ms

# Below is generated by plot.py at 2017-12-11 08:59:11  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.05 Mbit/s  
95th percentile per-packet one-way delay: 361.360 ms  
Loss rate: 5.01%  
-- Flow 1:  
Average throughput: 1.05 Mbit/s  
95th percentile per-packet one-way delay: 361.360 ms  
Loss rate: 5.01%

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



Run 2: Statistics of TCP Vegas

Start at: 2017-12-11 07:37:31

End at: 2017-12-11 07:38:01

Local clock offset: -6.306 ms

Remote clock offset: 1.722 ms

# Below is generated by plot.py at 2017-12-11 08:59:11

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.25 Mbit/s

95th percentile per-packet one-way delay: 315.181 ms

Loss rate: 3.38%

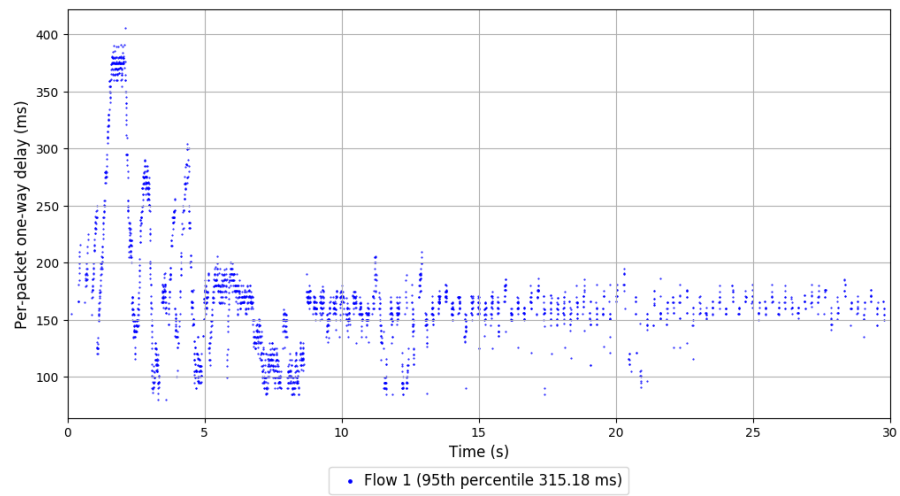
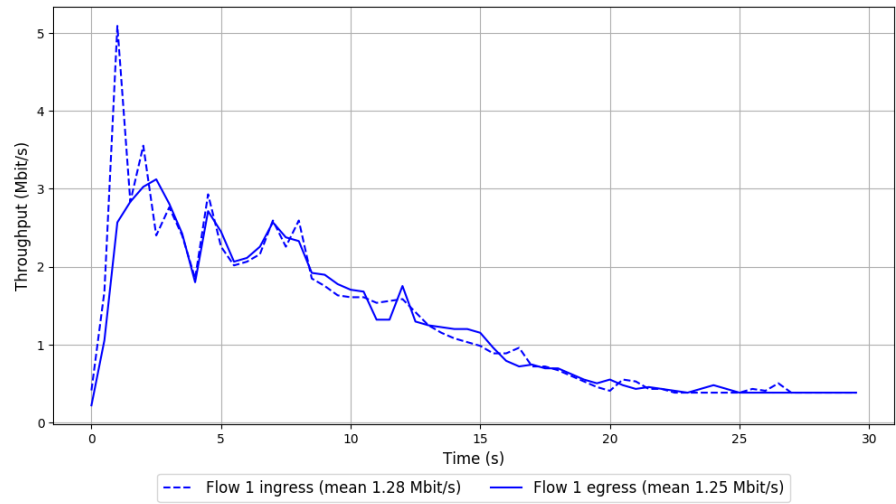
-- Flow 1:

Average throughput: 1.25 Mbit/s

95th percentile per-packet one-way delay: 315.181 ms

Loss rate: 3.38%

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

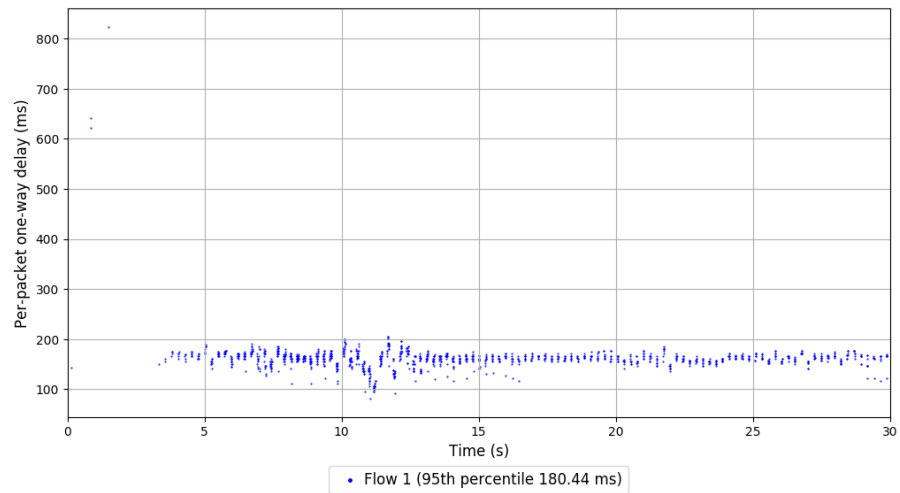
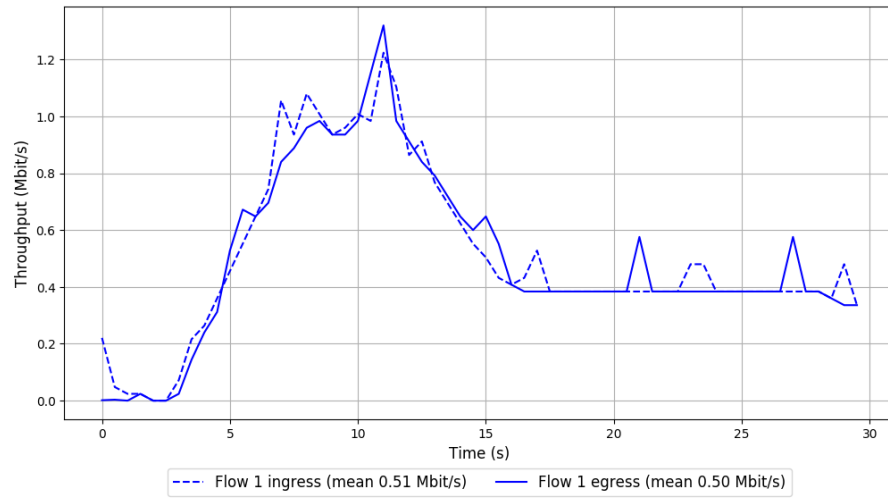


Run 3: Statistics of TCP Vegas

Start at: 2017-12-11 07:53:40  
End at: 2017-12-11 07:54:10  
Local clock offset: -10.993 ms  
Remote clock offset: 1.593 ms

# Below is generated by plot.py at 2017-12-11 08:59:12  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.50 Mbit/s  
95th percentile per-packet one-way delay: 180.445 ms  
Loss rate: 1.42%  
-- Flow 1:  
Average throughput: 0.50 Mbit/s  
95th percentile per-packet one-way delay: 180.445 ms  
Loss rate: 1.42%

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



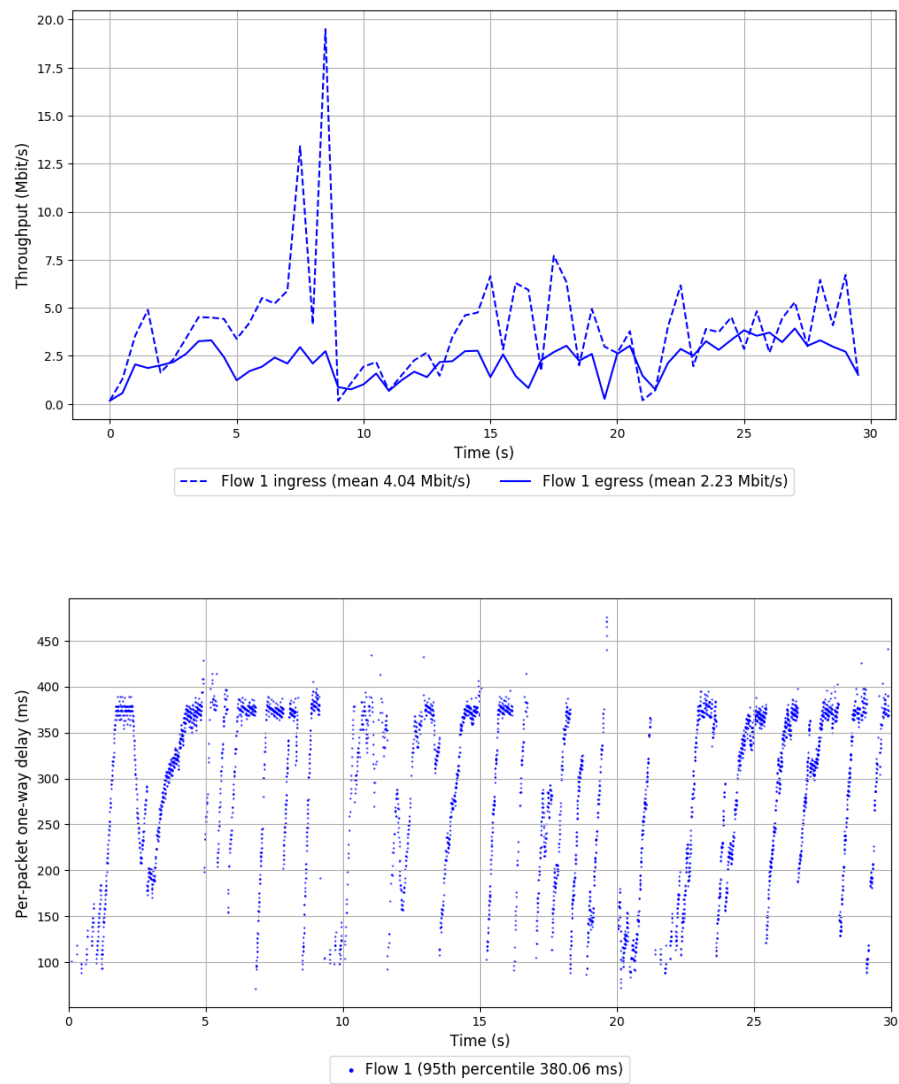
Run 1: Statistics of Verus

Start at: 2017-12-11 07:25:55  
End at: 2017-12-11 07:26:25  
Local clock offset: -12.299 ms  
Remote clock offset: 2.258 ms

# Below is generated by plot.py at 2017-12-11 08:59:12  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.23 Mbit/s  
95th percentile per-packet one-way delay: 380.063 ms  
Loss rate: 44.63%  
-- Flow 1:  
Average throughput: 2.23 Mbit/s  
95th percentile per-packet one-way delay: 380.063 ms  
Loss rate: 44.63%



Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2017-12-11 07:42:07

End at: 2017-12-11 07:42:37

Local clock offset: -6.295 ms

Remote clock offset: 1.725 ms

# Below is generated by plot.py at 2017-12-11 08:59:17

# Datalink statistics

-- Total of 1 flow:

Average throughput: 3.28 Mbit/s

95th percentile per-packet one-way delay: 387.107 ms

Loss rate: 47.95%

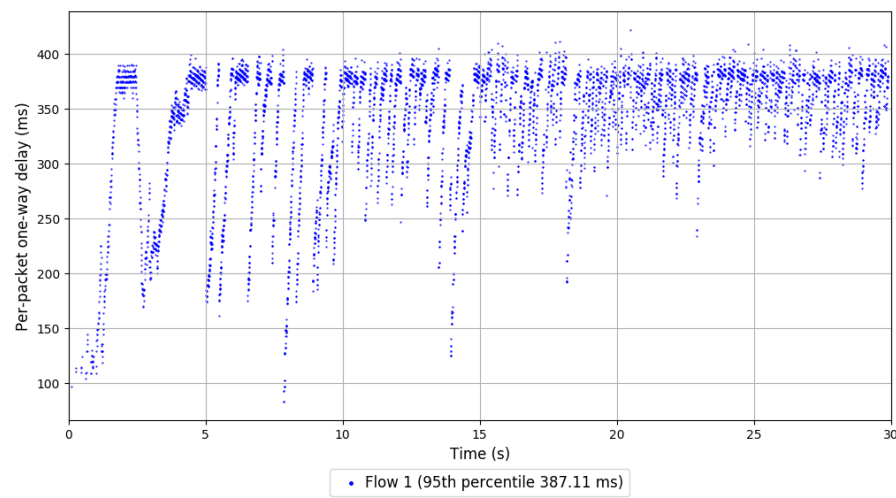
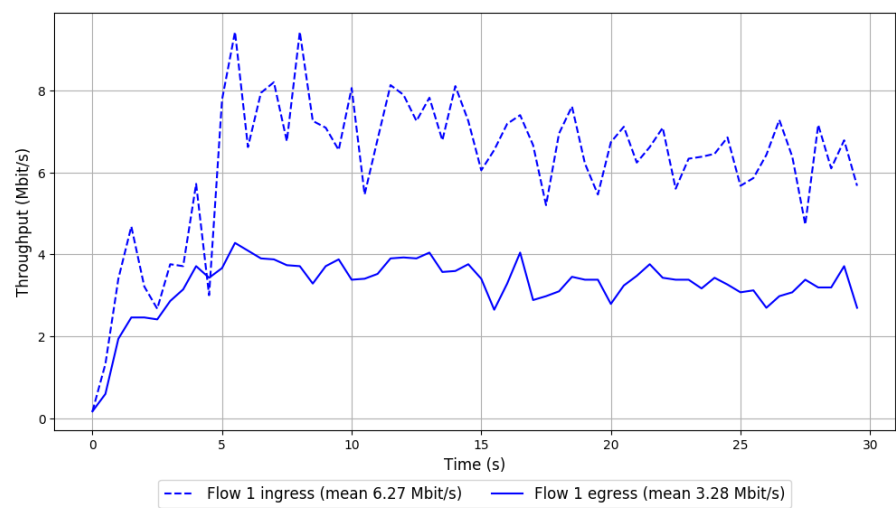
-- Flow 1:

Average throughput: 3.28 Mbit/s

95th percentile per-packet one-way delay: 387.107 ms

Loss rate: 47.95%

Run 2: Report of Verus — Data Link

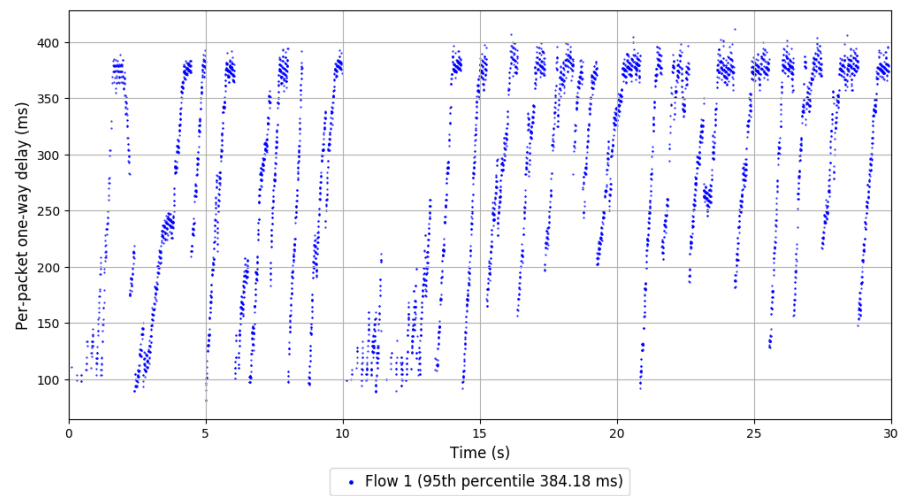
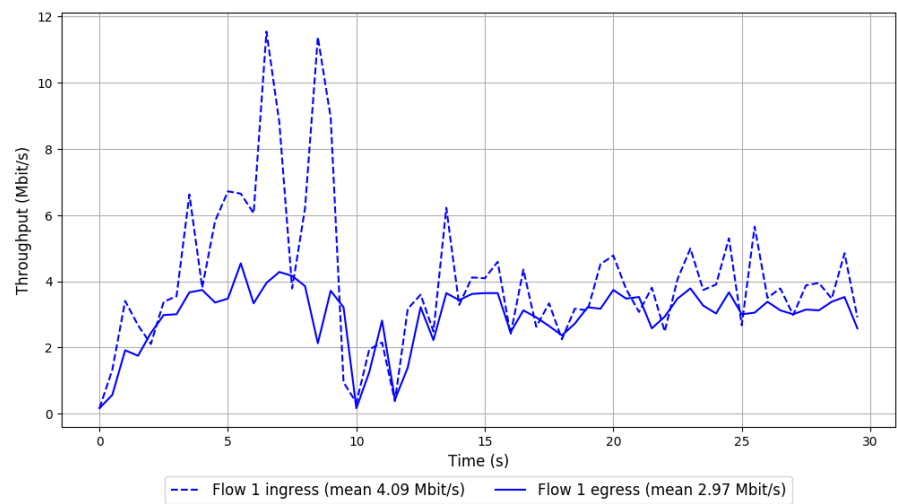


Run 3: Statistics of Verus

Start at: 2017-12-11 07:58:15  
End at: 2017-12-11 07:58:45  
Local clock offset: -14.315 ms  
Remote clock offset: 1.443 ms

# Below is generated by plot.py at 2017-12-11 08:59:17  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 2.97 Mbit/s  
95th percentile per-packet one-way delay: 384.181 ms  
Loss rate: 27.27%  
-- Flow 1:  
Average throughput: 2.97 Mbit/s  
95th percentile per-packet one-way delay: 384.181 ms  
Loss rate: 27.27%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2017-12-11 07:36:22

End at: 2017-12-11 07:36:52

Local clock offset: -5.895 ms

Remote clock offset: 1.896 ms

# Below is generated by plot.py at 2017-12-11 08:59:17

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.97 Mbit/s

95th percentile per-packet one-way delay: 140.826 ms

Loss rate: 0.42%

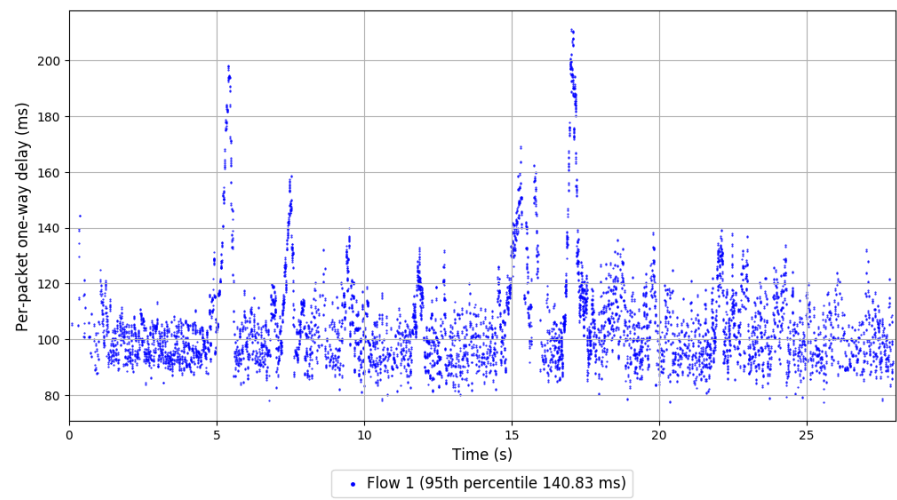
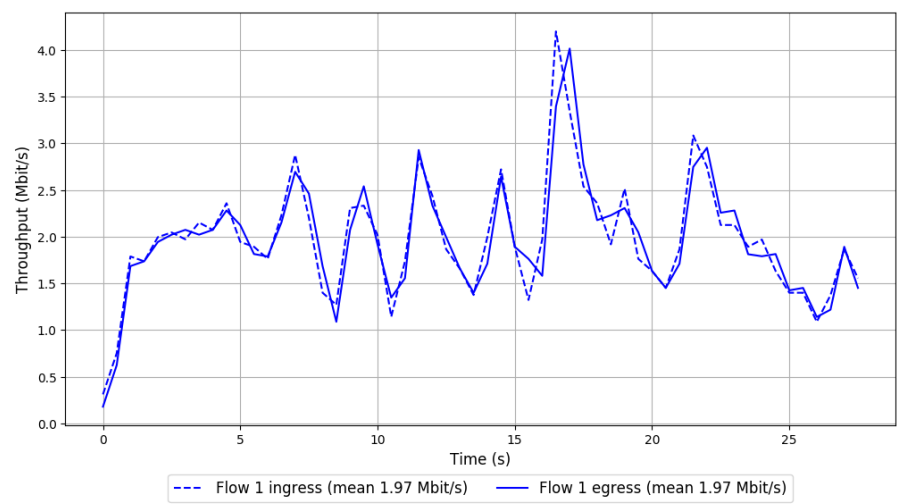
-- Flow 1:

Average throughput: 1.97 Mbit/s

95th percentile per-packet one-way delay: 140.826 ms

Loss rate: 0.42%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2017-12-11 07:52:29

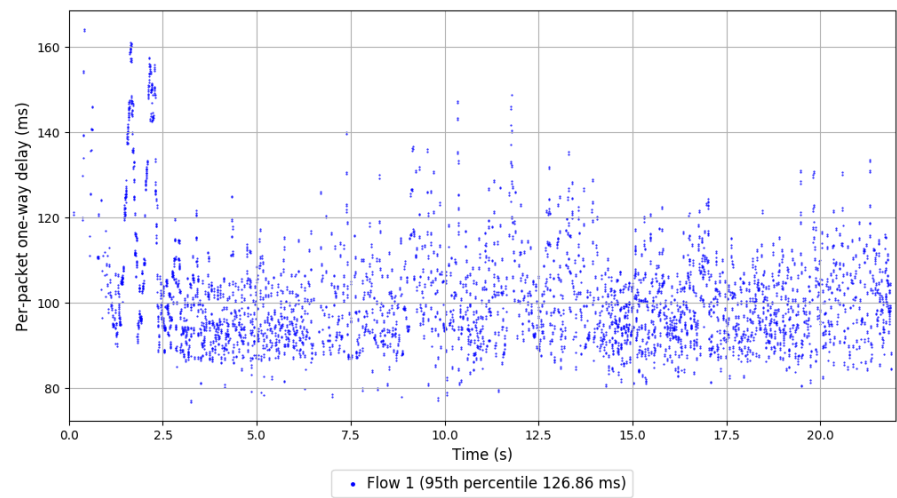
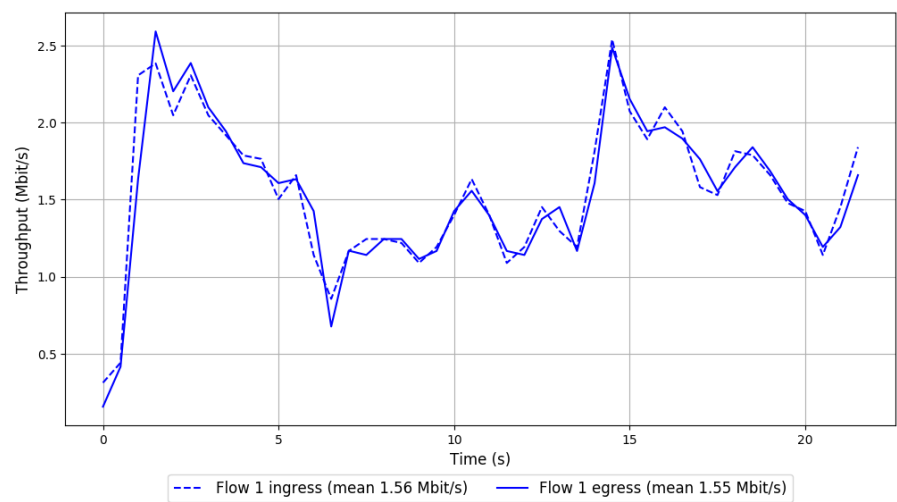
End at: 2017-12-11 07:52:59

Local clock offset: -10.38 ms

Remote clock offset: 1.525 ms



Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

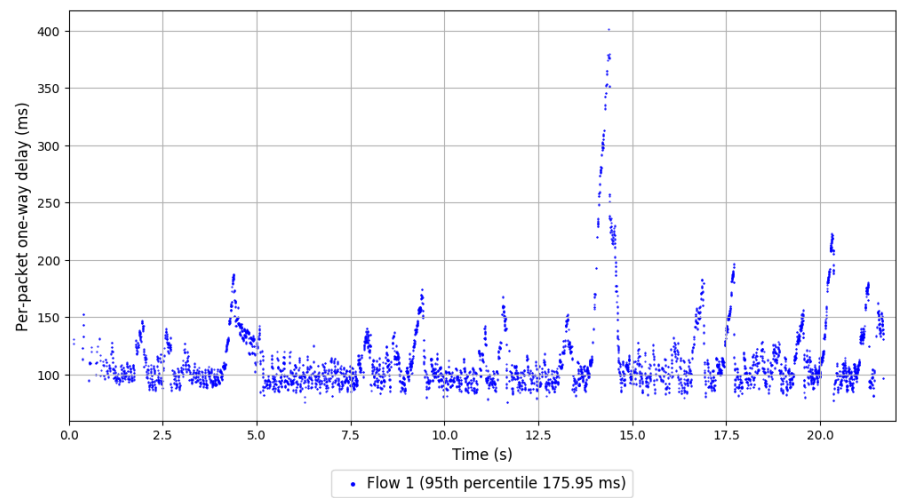
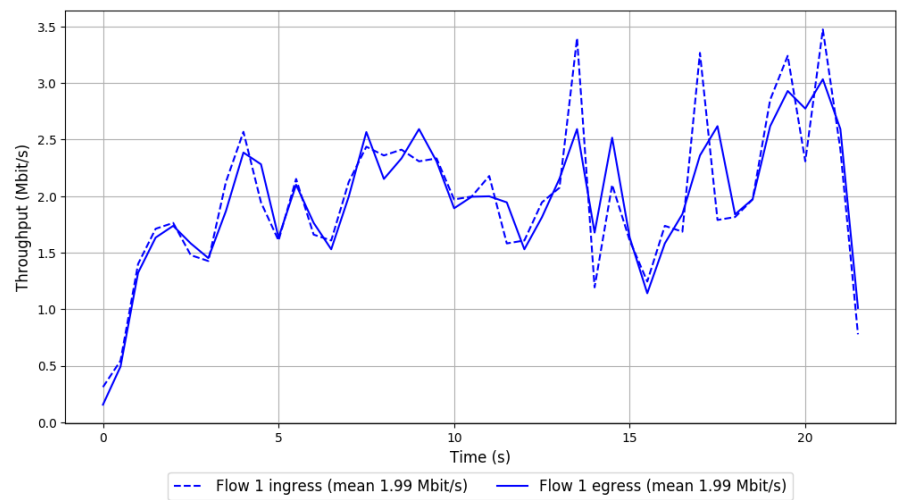
Start at: 2017-12-11 08:08:38

End at: 2017-12-11 08:09:08

Local clock offset: -11.453 ms

Remote clock offset: 1.349 ms

Run 3: Report of Copa — Data Link

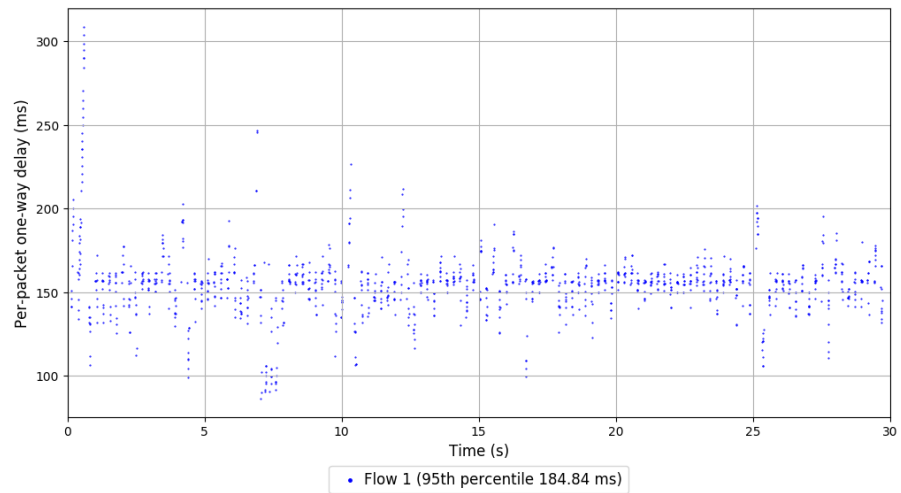
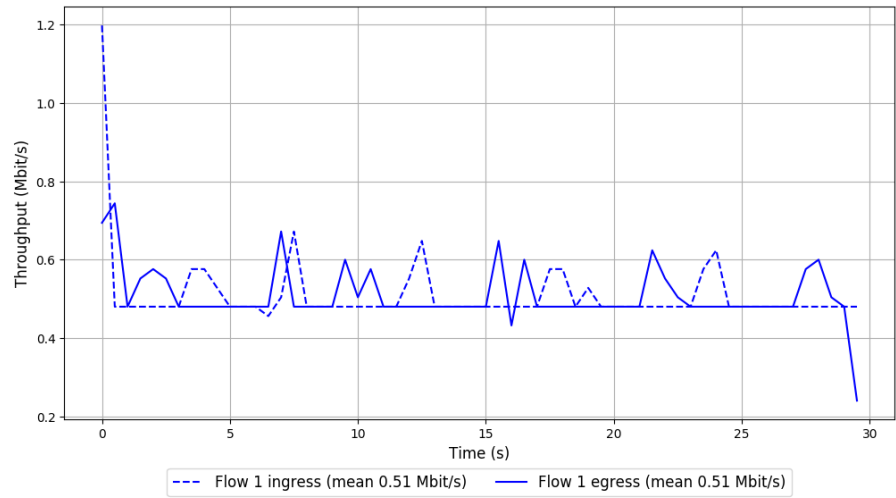


Run 1: Statistics of Indigo

Start at: 2017-12-11 07:29:24  
End at: 2017-12-11 07:29:54  
Local clock offset: -11.205 ms  
Remote clock offset: 2.047 ms

# Below is generated by plot.py at 2017-12-11 08:59:17  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.51 Mbit/s  
95th percentile per-packet one-way delay: 184.839 ms  
Loss rate: 0.78%  
-- Flow 1:  
Average throughput: 0.51 Mbit/s  
95th percentile per-packet one-way delay: 184.839 ms  
Loss rate: 0.78%

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



Run 2: Statistics of Indigo

Start at: 2017-12-11 07:45:35

End at: 2017-12-11 07:46:05

Local clock offset: -6.961 ms

Remote clock offset: 1.7 ms

Run 2: Report of Indigo — Data Link

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Figure is missing

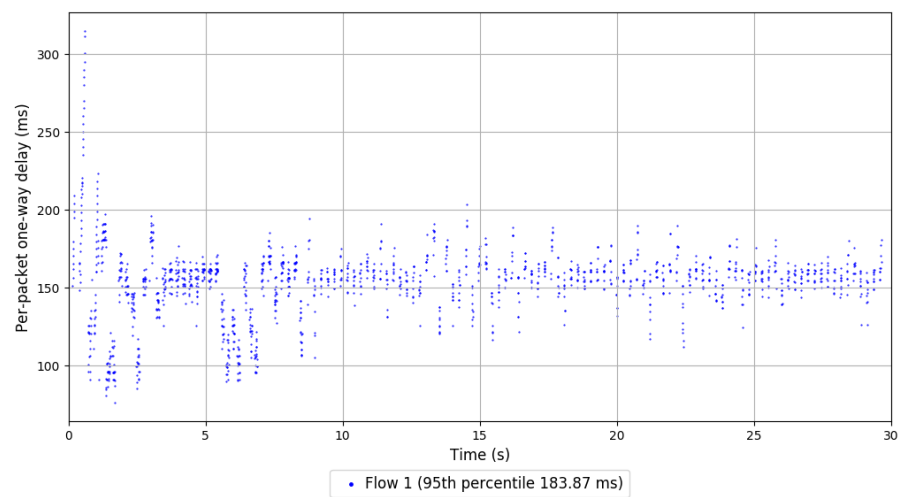
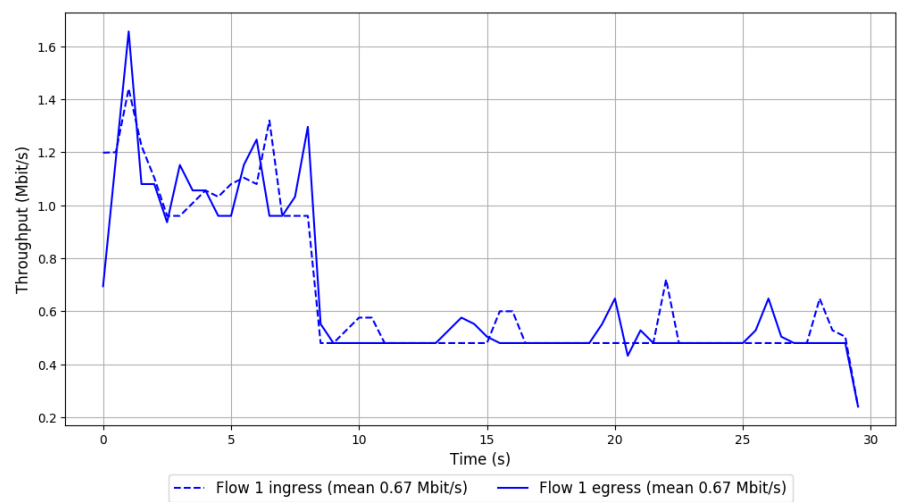
Run 3: Statistics of Indigo

Start at: 2017-12-11 08:01:42  
End at: 2017-12-11 08:02:12  
Local clock offset: -12.921 ms  
Remote clock offset: 1.399 ms

# Below is generated by plot.py at 2017-12-11 08:59:17  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.67 Mbit/s  
95th percentile per-packet one-way delay: 183.866 ms  
Loss rate: 0.90%  
-- Flow 1:  
Average throughput: 0.67 Mbit/s  
95th percentile per-packet one-way delay: 183.866 ms  
Loss rate: 0.90%



Run 3: Report of Indigo — Data Link

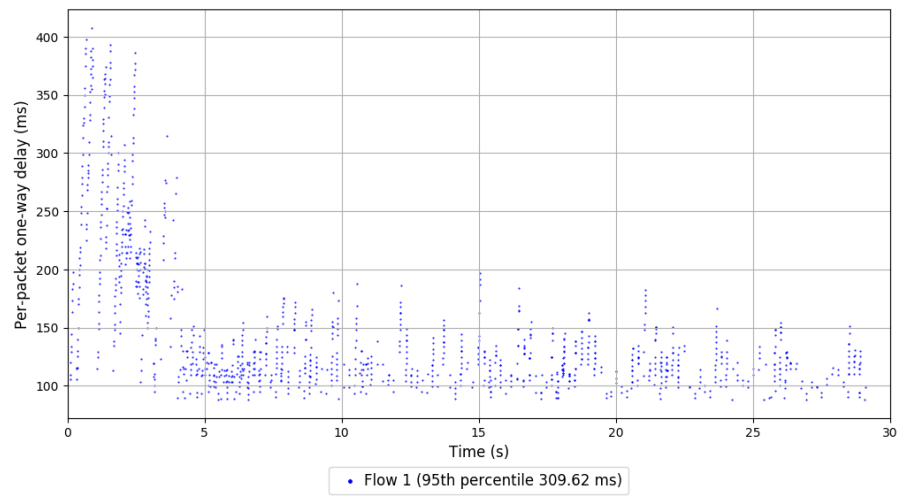
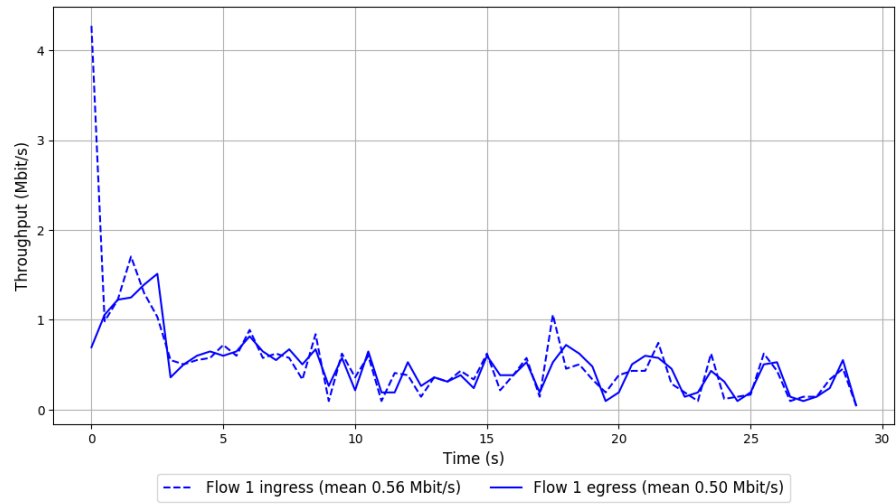


```
Run 1: Statistics of Indigo-calib

Start at: 2017-12-11 07:22:02
End at: 2017-12-11 07:22:32
Local clock offset: -12.756 ms
Remote clock offset: 2.442 ms

# Below is generated by plot.py at 2017-12-11 08:59:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 309.617 ms
Loss rate: 10.44%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 309.617 ms
Loss rate: 10.44%
```

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



Run 2: Statistics of Indigo-calib

Start at: 2017-12-11 07:38:41

End at: 2017-12-11 07:39:11

Local clock offset: -7.055 ms

Remote clock offset: 1.739 ms

# Below is generated by plot.py at 2017-12-11 08:59:17

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 284.272 ms

Loss rate: 2.28%

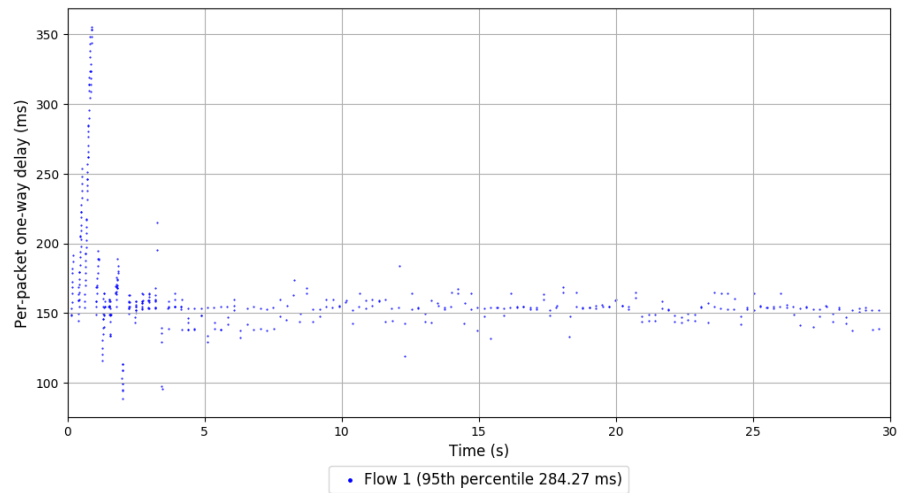
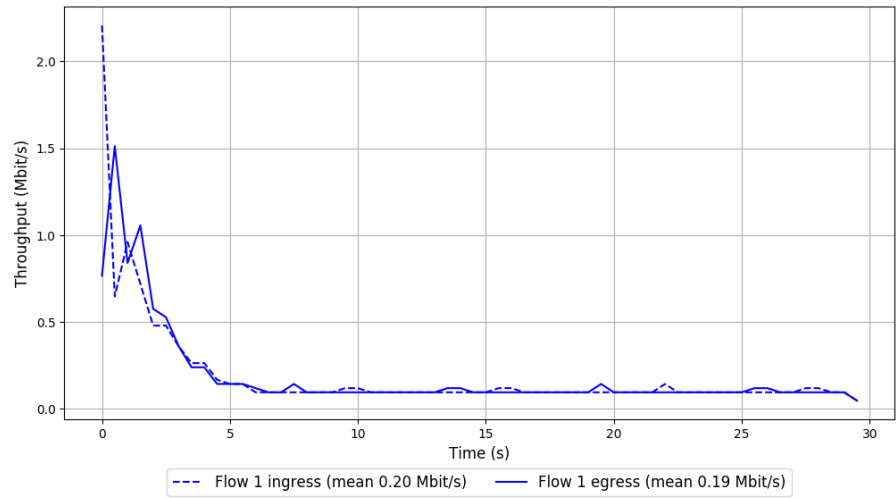
-- Flow 1:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 284.272 ms

Loss rate: 2.28%

## Run 2: Report of Indigo-calib — Data Link



Run 3: Statistics of Indigo-calib

Start at: 2017-12-11 07:54:49  
End at: 2017-12-11 07:55:19  
Local clock offset: -11.817 ms  
Remote clock offset: 1.167 ms

# Below is generated by plot.py at 2017-12-11 08:59:17  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1865.944 ms  
Loss rate: 92.95%  
-- Flow 1:  
Average throughput: 0.01 Mbit/s  
95th percentile per-packet one-way delay: 1865.944 ms  
Loss rate: 92.95%

Run 3: Report of Indigo-calib — Data Link

