

## Pantheon Report

Generated at 2018-04-16 22:48:44 (UTC).

Data path: AWS Brazil 2 Ethernet (*local*) → Colombia ppp0 (*remote*).

Repeated the test of 16 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).

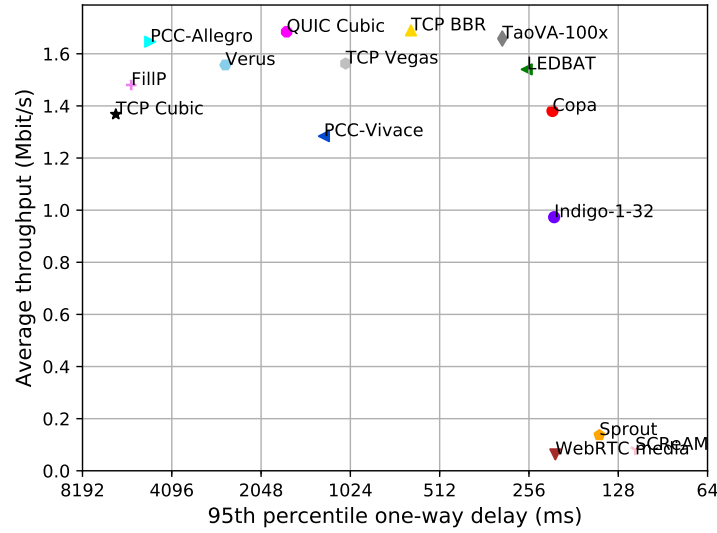
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo\_fast**).

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

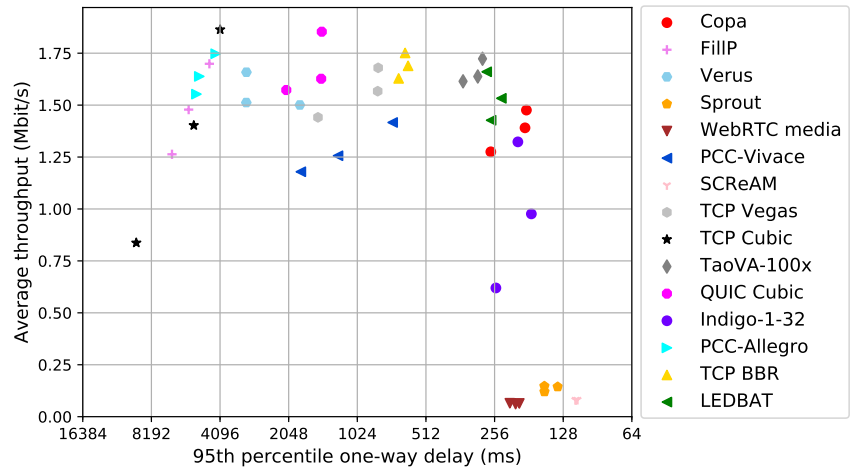
Git summary:

```
branch: master @ 4ed32c0e22b4dd733f97c1d3aaab2e5bb16f66b4
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
third_party/genericCC @ d223989828276fa83a807da6e0341dc0c7b89aec
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ f271183af822eee5d0031620f4bebf38aedc5581
```

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



test from AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme



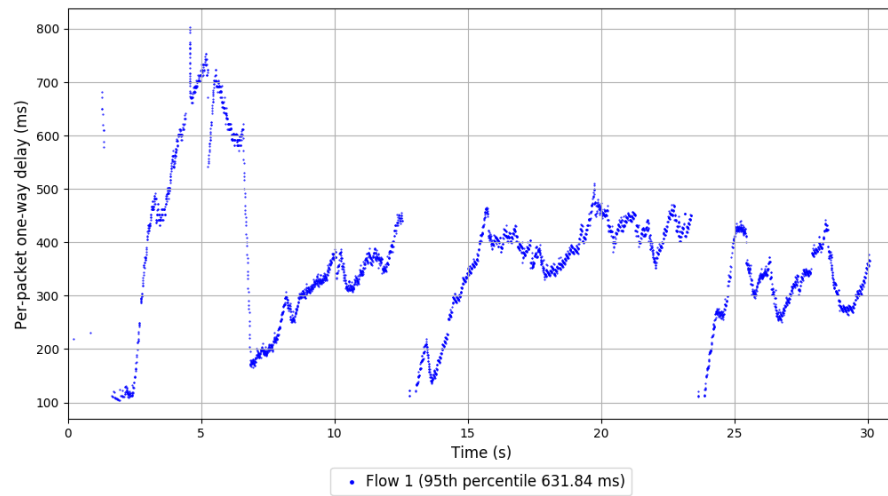
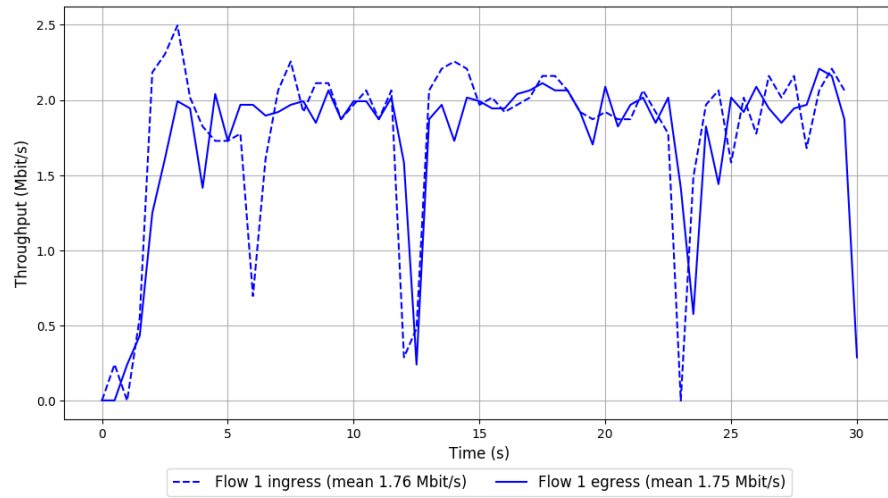
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.69	639.88	0.93
TCP Cubic	3	1.37	6324.54	20.79
LEDBAT	3	1.54	260.50	0.58
PCC-Allegro	3	1.65	4842.44	62.99
QUIC Cubic	3	1.68	1679.65	4.43
SCReAM	3	0.08	112.19	0.00
WebRTC media	3	0.06	208.63	0.00
Sprout	3	0.14	148.28	0.00
TaoVA-100x	3	1.66	314.84	0.35
TCP Vegas	3	1.56	1062.21	1.45
Verus	3	1.56	2702.74	3.22
Copa	3	1.38	213.28	0.06
FillP	3	1.48	5613.00	31.28
Indigo-1-32	3	0.97	210.53	0.04
PCC-Vivace	3	1.29	1257.49	5.72
PCC-Expr	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

Start at: 2018-04-16 21:51:13  
End at: 2018-04-16 21:51:43  
Local clock offset: -7.928 ms  
Remote clock offset: 10.427 ms

# Below is generated by plot.py at 2018-04-16 22:48:14  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.75 Mbit/s  
95th percentile per-packet one-way delay: 631.837 ms  
Loss rate: 1.09%  
-- Flow 1:  
Average throughput: 1.75 Mbit/s  
95th percentile per-packet one-way delay: 631.837 ms  
Loss rate: 1.09%

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



Run 2: Statistics of TCP BBR

Start at: 2018-04-16 22:11:19

End at: 2018-04-16 22:11:49

Local clock offset: -5.838 ms

Remote clock offset: 12.38 ms

# Below is generated by plot.py at 2018-04-16 22:48:14

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 613.184 ms

Loss rate: 1.22%

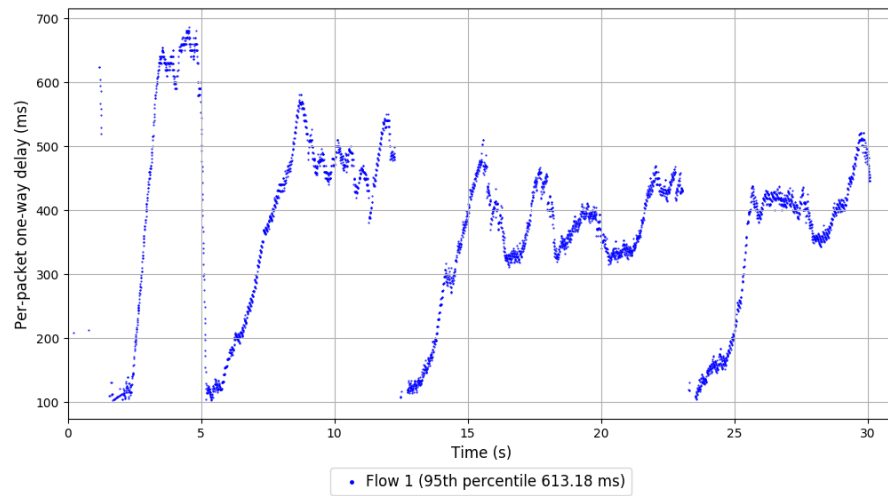
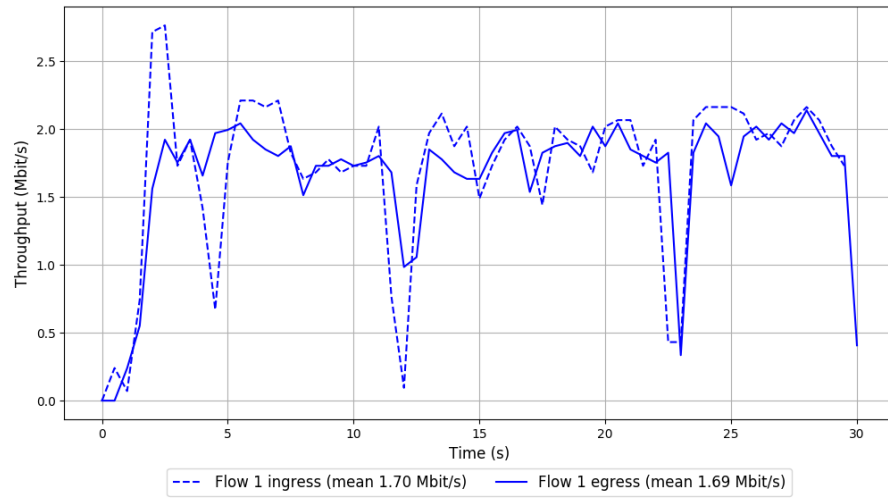
-- Flow 1:

Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 613.184 ms

Loss rate: 1.22%

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



Run 3: Statistics of TCP BBR

Start at: 2018-04-16 22:31:26

End at: 2018-04-16 22:31:56

Local clock offset: -6.21 ms

Remote clock offset: 6.893 ms

# Below is generated by plot.py at 2018-04-16 22:48:14

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 674.616 ms

Loss rate: 0.47%

-- Flow 1:

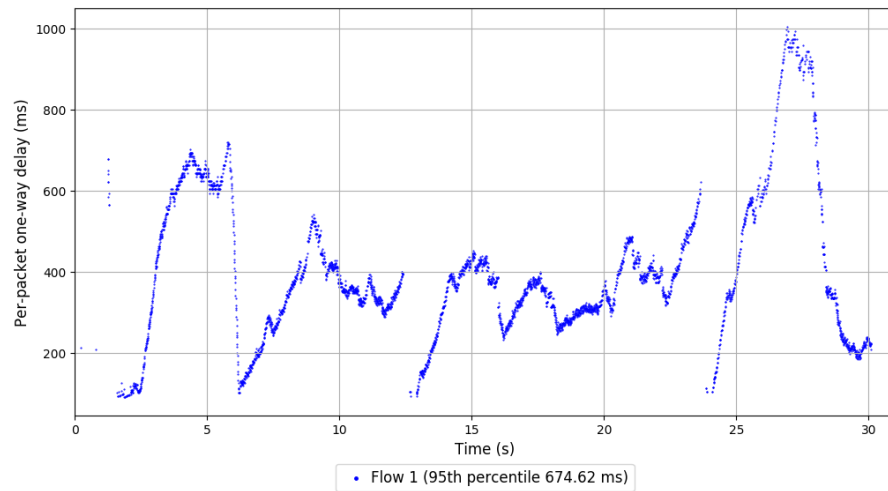
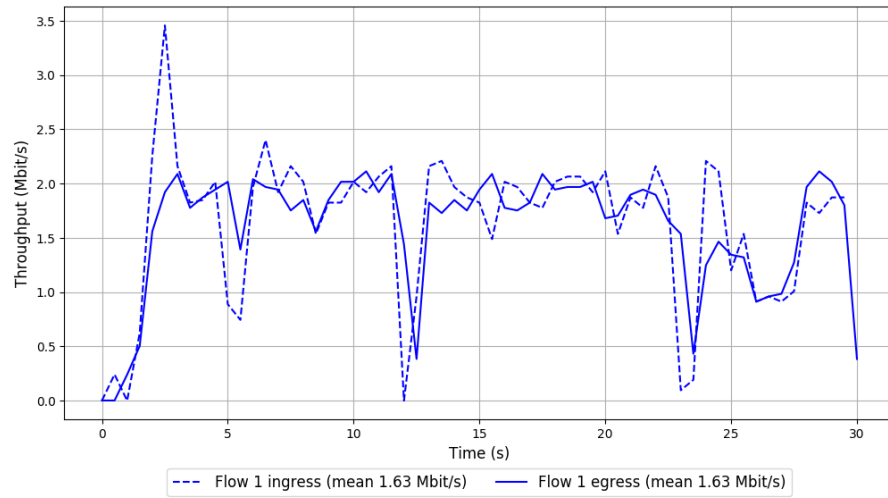
Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 674.616 ms

Loss rate: 0.47%



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



Run 1: Statistics of TCP Cubic

Start at: 2018-04-16 22:06:35

End at: 2018-04-16 22:07:05

Local clock offset: -6.806 ms

Remote clock offset: 5.833 ms

# Below is generated by plot.py at 2018-04-16 22:48:14

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.40 Mbit/s

95th percentile per-packet one-way delay: 5339.761 ms

Loss rate: 21.77%

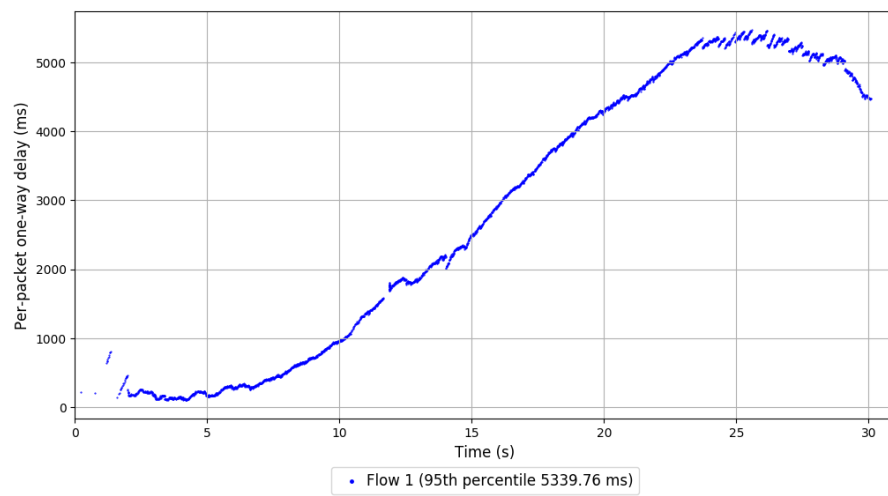
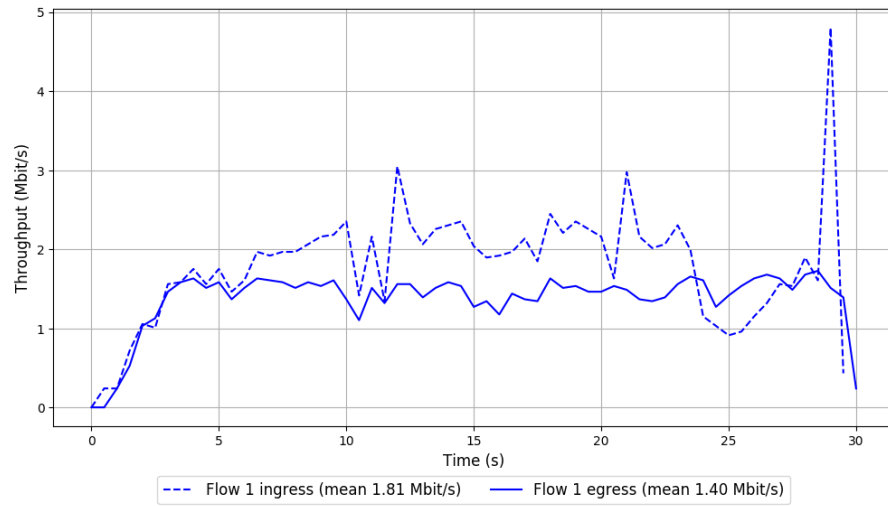
-- Flow 1:

Average throughput: 1.40 Mbit/s

95th percentile per-packet one-way delay: 5339.761 ms

Loss rate: 21.77%

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

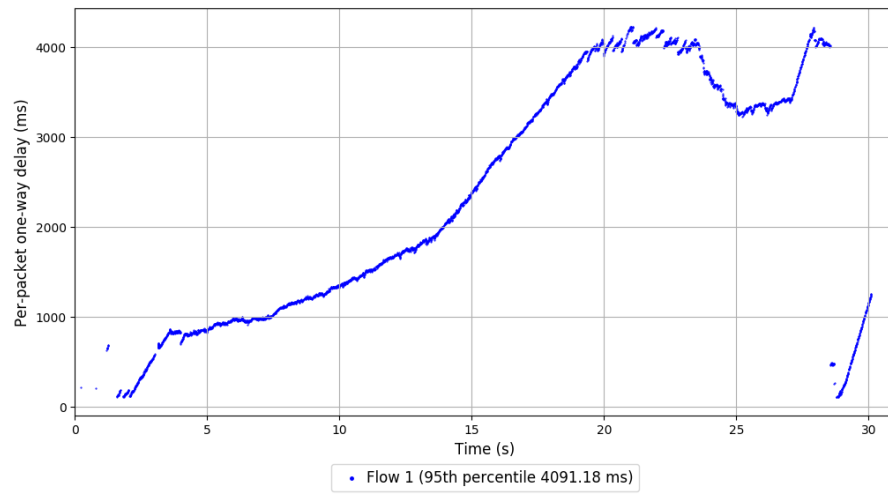
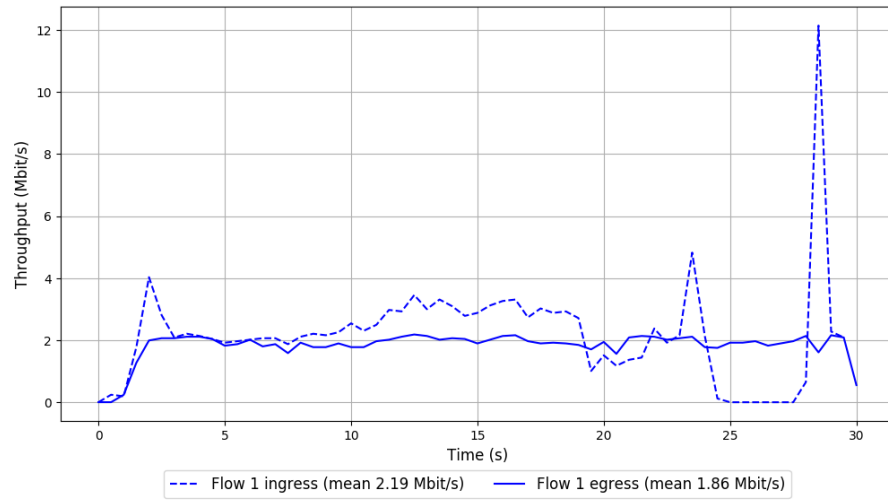


Run 2: Statistics of TCP Cubic

Start at: 2018-04-16 22:26:41  
End at: 2018-04-16 22:27:11  
Local clock offset: -7.652 ms  
Remote clock offset: 11.719 ms

# Below is generated by plot.py at 2018-04-16 22:48:14  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.86 Mbit/s  
95th percentile per-packet one-way delay: 4091.176 ms  
Loss rate: 15.06%  
-- Flow 1:  
Average throughput: 1.86 Mbit/s  
95th percentile per-packet one-way delay: 4091.176 ms  
Loss rate: 15.06%

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



Run 3: Statistics of TCP Cubic

Start at: 2018-04-16 22:46:48

End at: 2018-04-16 22:47:18

Local clock offset: -4.466 ms

Remote clock offset: 6.192 ms

# Below is generated by plot.py at 2018-04-16 22:48:14

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 9542.685 ms

Loss rate: 25.53%

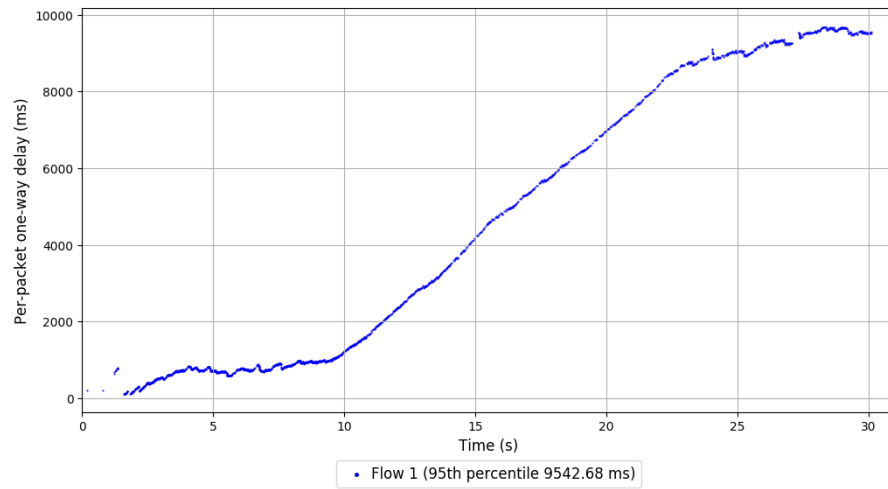
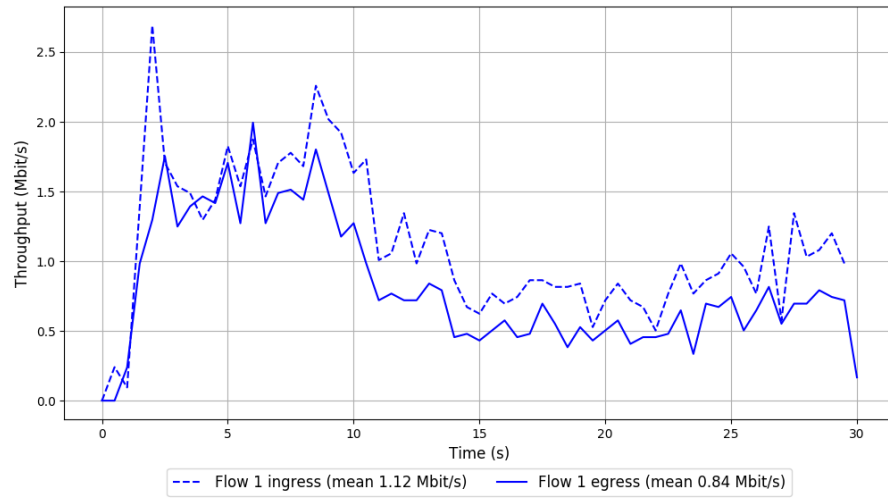
-- Flow 1:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 9542.685 ms

Loss rate: 25.53%

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



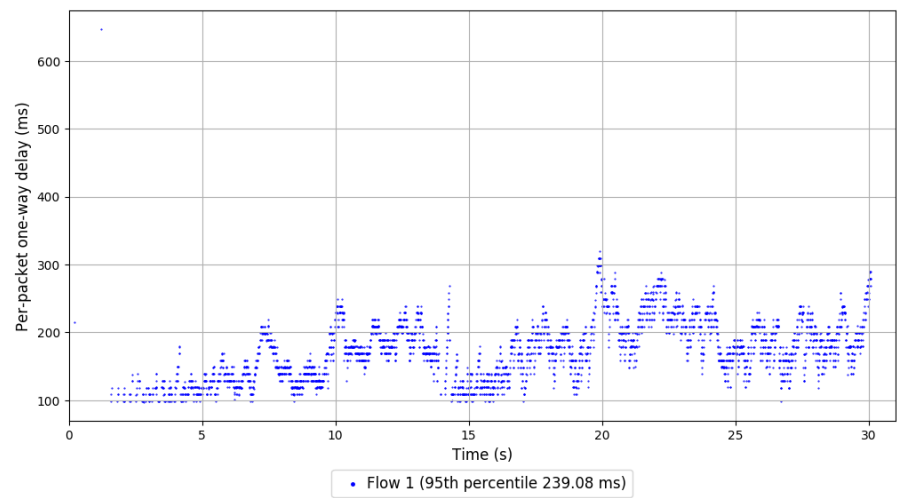
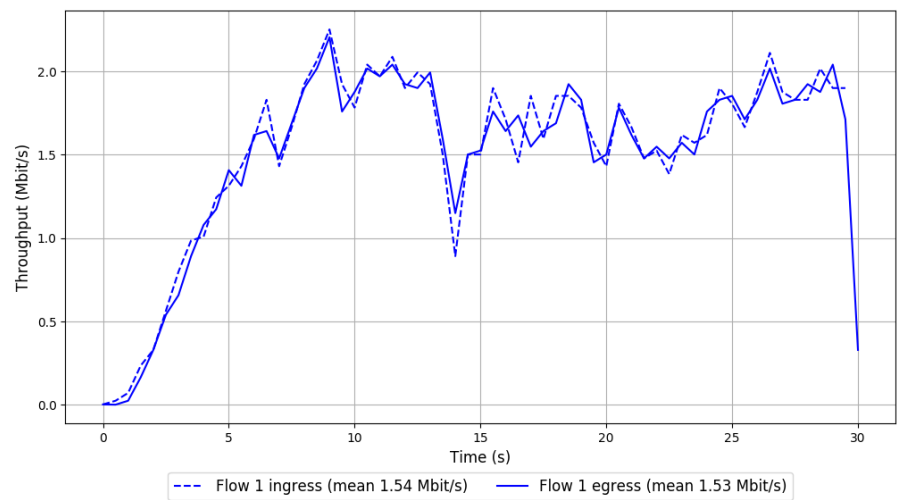
```
Run 1: Statistics of LEDBAT

Start at: 2018-04-16 21:57:07
End at: 2018-04-16 21:57:37
Local clock offset: -7.387 ms
Remote clock offset: 6.436 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 239.082 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 239.082 ms
Loss rate: 0.61%
```



Run 1: Report of LEDBAT — Data Link

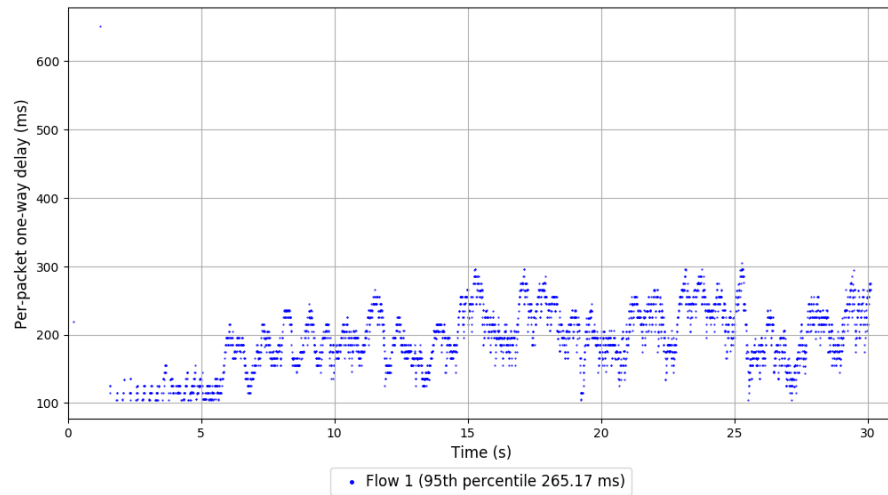
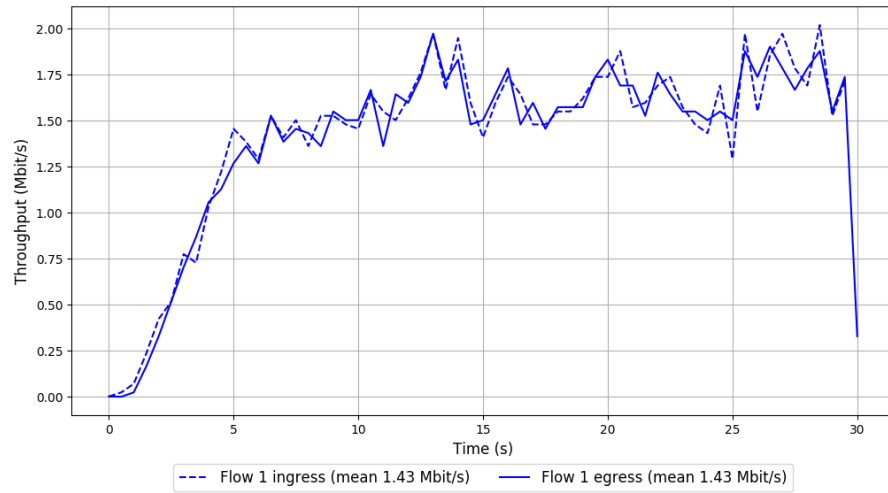


Run 2: Statistics of LEDBAT

Start at: 2018-04-16 22:17:14  
End at: 2018-04-16 22:17:44  
Local clock offset: -6.616 ms  
Remote clock offset: 10.791 ms

# Below is generated by plot.py at 2018-04-16 22:48:14  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.43 Mbit/s  
95th percentile per-packet one-way delay: 265.167 ms  
Loss rate: 0.47%  
-- Flow 1:  
Average throughput: 1.43 Mbit/s  
95th percentile per-packet one-way delay: 265.167 ms  
Loss rate: 0.47%

## Run 2: Report of LEDBAT — Data Link

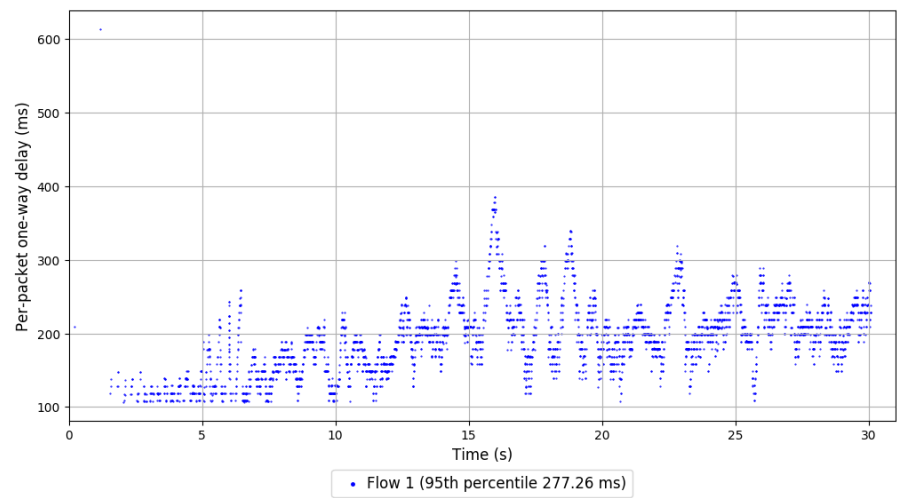
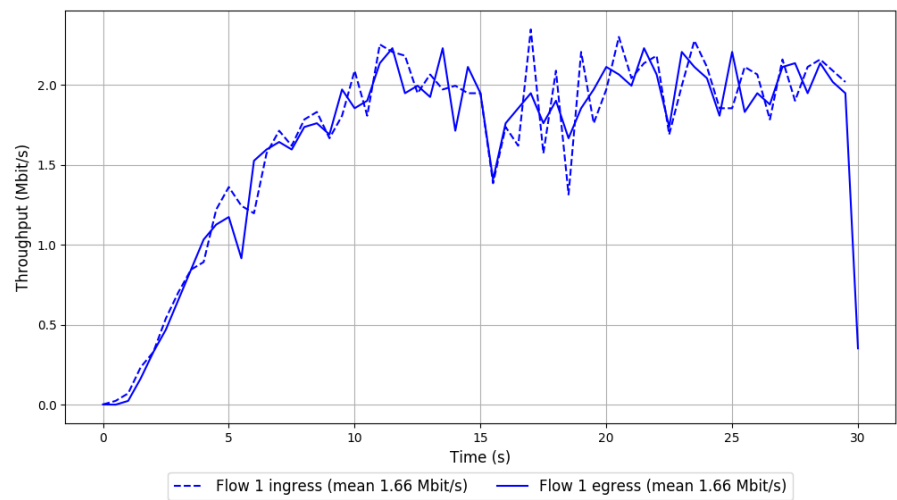


Run 3: Statistics of LEDBAT

Start at: 2018-04-16 22:37:20  
End at: 2018-04-16 22:37:50  
Local clock offset: -6.437 ms  
Remote clock offset: 11.832 ms

# Below is generated by plot.py at 2018-04-16 22:48:15  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.66 Mbit/s  
95th percentile per-packet one-way delay: 277.256 ms  
Loss rate: 0.66%  
-- Flow 1:  
Average throughput: 1.66 Mbit/s  
95th percentile per-packet one-way delay: 277.256 ms  
Loss rate: 0.66%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2018-04-16 21:54:46

End at: 2018-04-16 21:55:16

Local clock offset: -7.268 ms

Remote clock offset: 6.451 ms

# Below is generated by plot.py at 2018-04-16 22:48:20

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 5049.845 ms

Loss rate: 62.88%

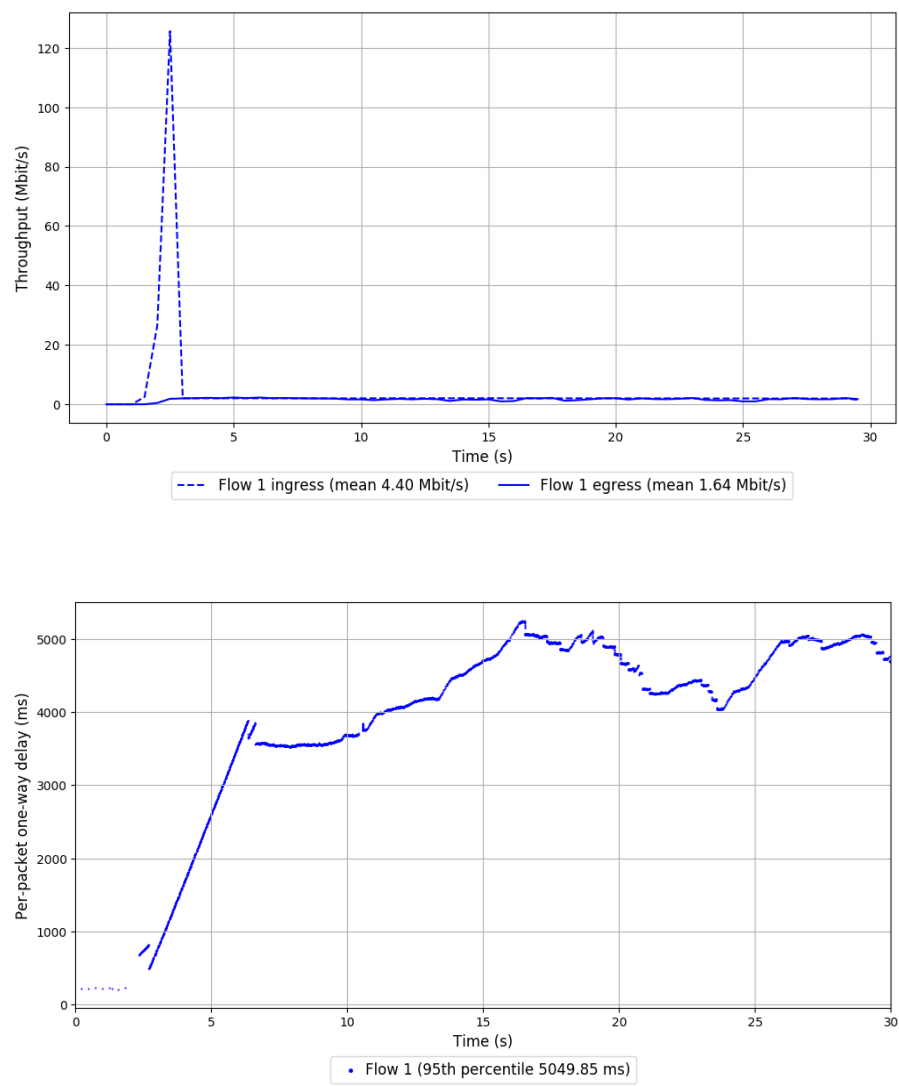
-- Flow 1:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 5049.845 ms

Loss rate: 62.88%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-04-16 22:14:52

End at: 2018-04-16 22:15:22

Local clock offset: -7.415 ms

Remote clock offset: 11.682 ms

# Below is generated by plot.py at 2018-04-16 22:48:21

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 5198.316 ms

Loss rate: 65.37%

-- Flow 1:

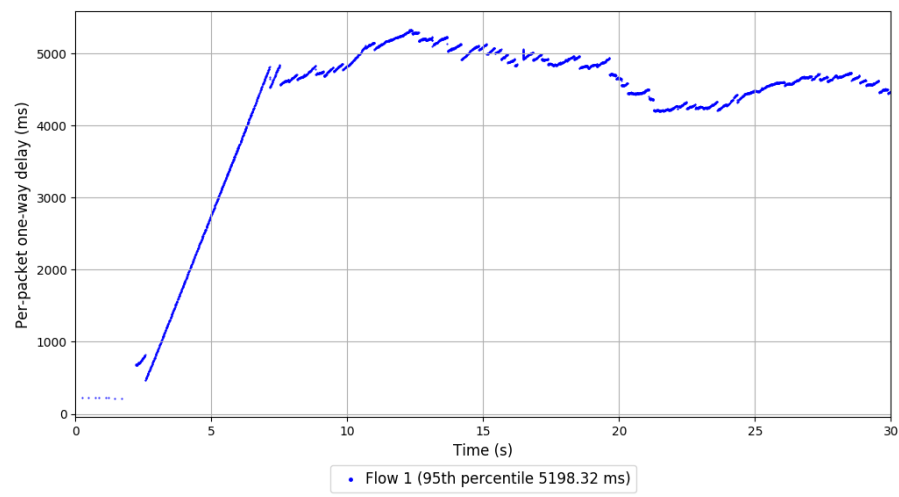
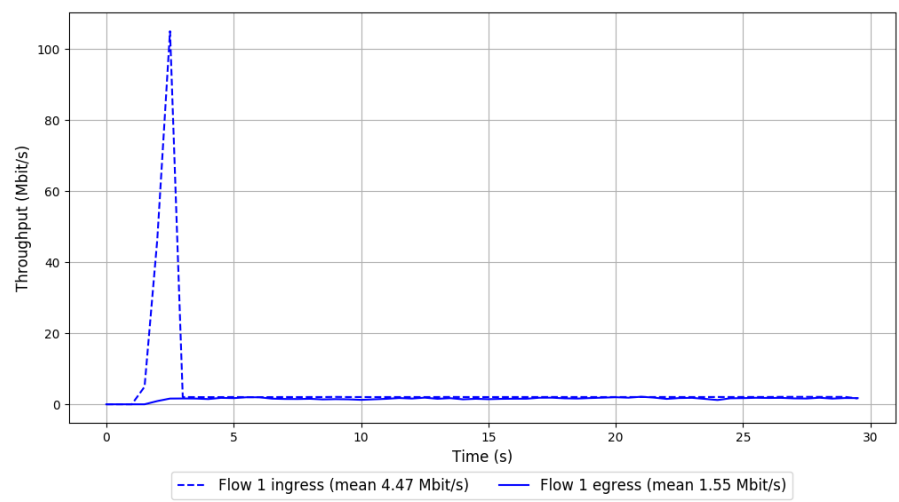
Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 5198.316 ms

Loss rate: 65.37%



Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-04-16 22:34:58

End at: 2018-04-16 22:35:28

Local clock offset: -7.006 ms

Remote clock offset: 11.74 ms

# Below is generated by plot.py at 2018-04-16 22:48:22

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.75 Mbit/s

95th percentile per-packet one-way delay: 4279.148 ms

Loss rate: 60.71%

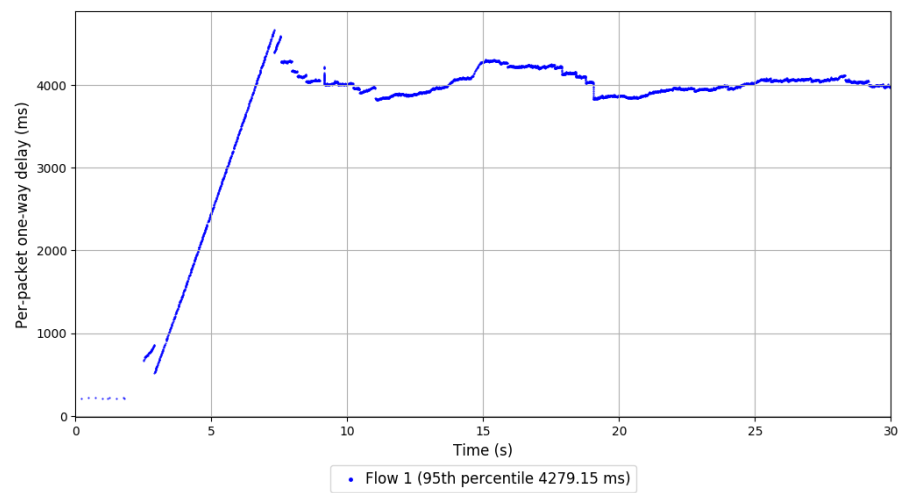
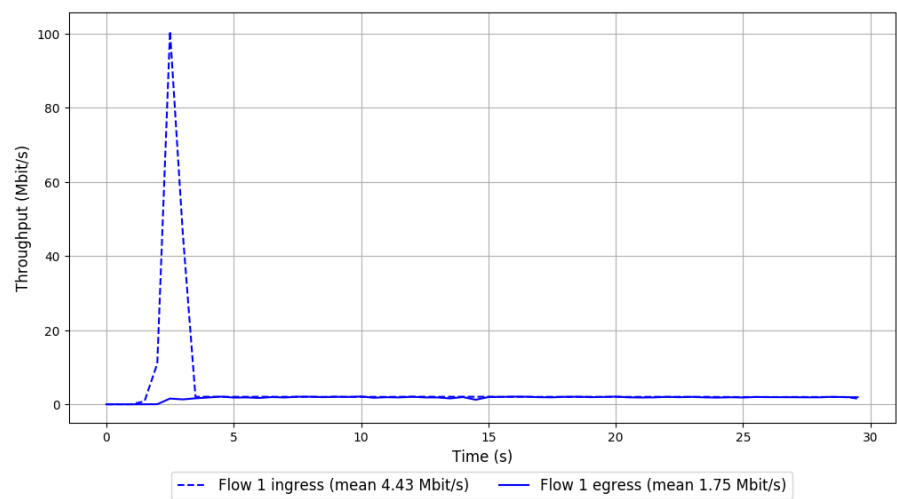
-- Flow 1:

Average throughput: 1.75 Mbit/s

95th percentile per-packet one-way delay: 4279.148 ms

Loss rate: 60.71%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-04-16 22:03:03

End at: 2018-04-16 22:03:33

Local clock offset: -7.091 ms

Remote clock offset: 12.315 ms

# Below is generated by plot.py at 2018-04-16 22:48:22

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 1474.916 ms

Loss rate: 4.83%

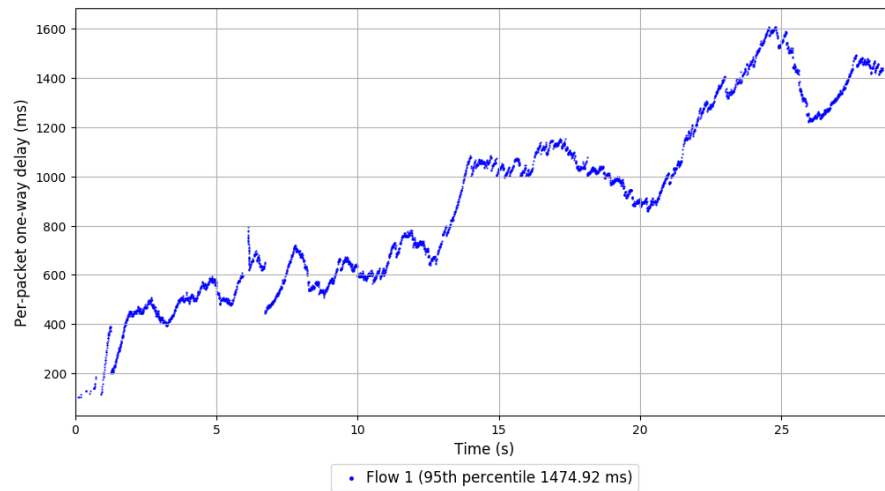
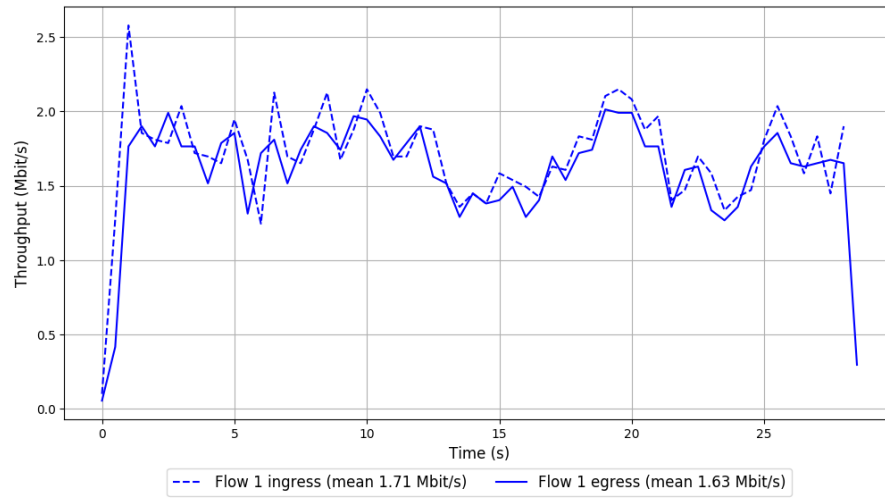
-- Flow 1:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 1474.916 ms

Loss rate: 4.83%

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



Run 2: Statistics of QUIC Cubic

Start at: 2018-04-16 22:23:08

End at: 2018-04-16 22:23:38

Local clock offset: -6.748 ms

Remote clock offset: 6.049 ms

# Below is generated by plot.py at 2018-04-16 22:48:22

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.57 Mbit/s

95th percentile per-packet one-way delay: 2098.037 ms

Loss rate: 4.32%

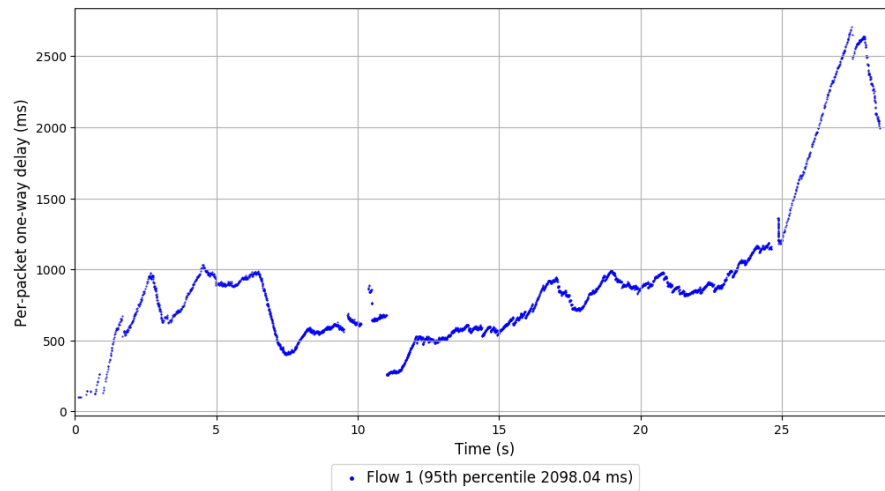
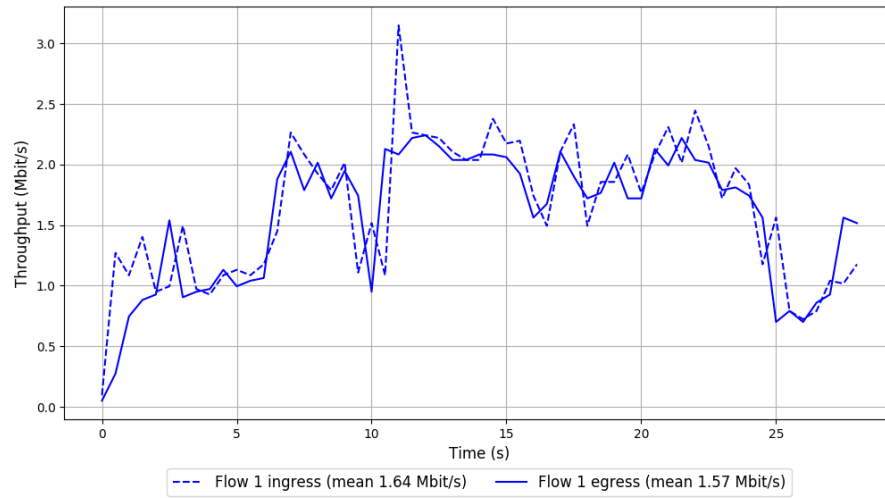
-- Flow 1:

Average throughput: 1.57 Mbit/s

95th percentile per-packet one-way delay: 2098.037 ms

Loss rate: 4.32%

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



Run 3: Statistics of QUIC Cubic

Start at: 2018-04-16 22:43:15

End at: 2018-04-16 22:43:45

Local clock offset: -5.565 ms

Remote clock offset: 12.645 ms

# Below is generated by plot.py at 2018-04-16 22:48:22

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.85 Mbit/s

95th percentile per-packet one-way delay: 1466.011 ms

Loss rate: 4.15%

-- Flow 1:

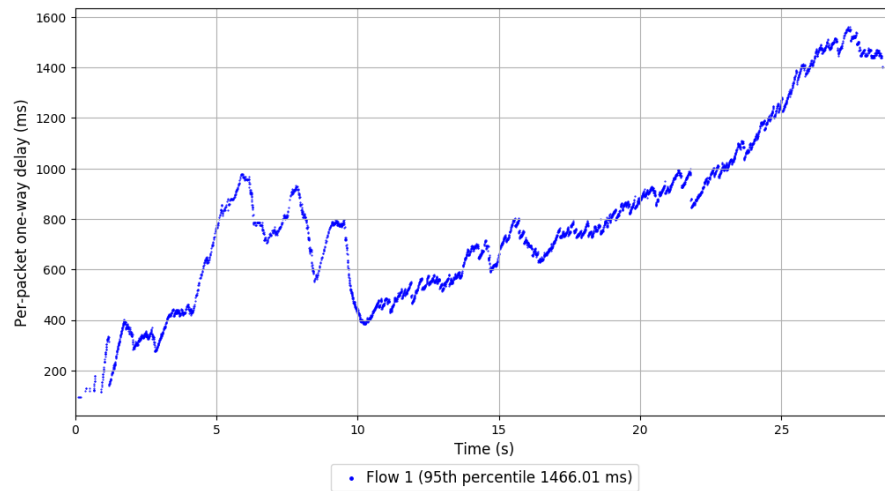
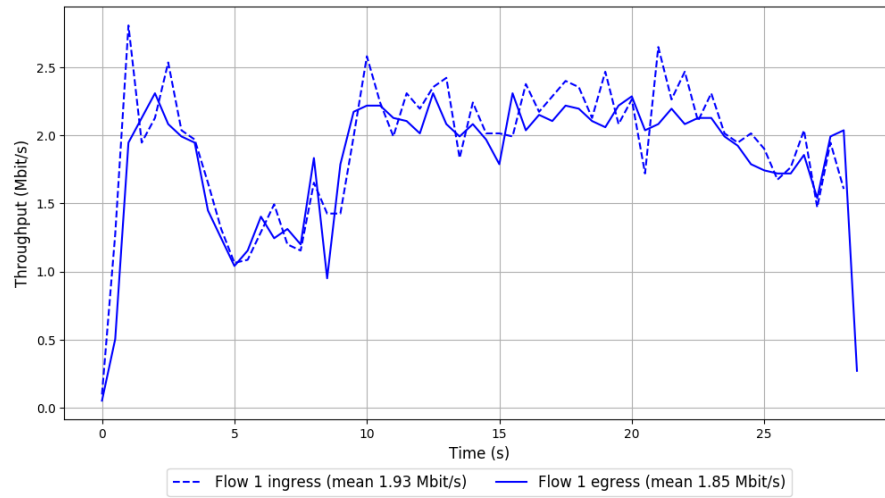
Average throughput: 1.85 Mbit/s

95th percentile per-packet one-way delay: 1466.011 ms

Loss rate: 4.15%



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

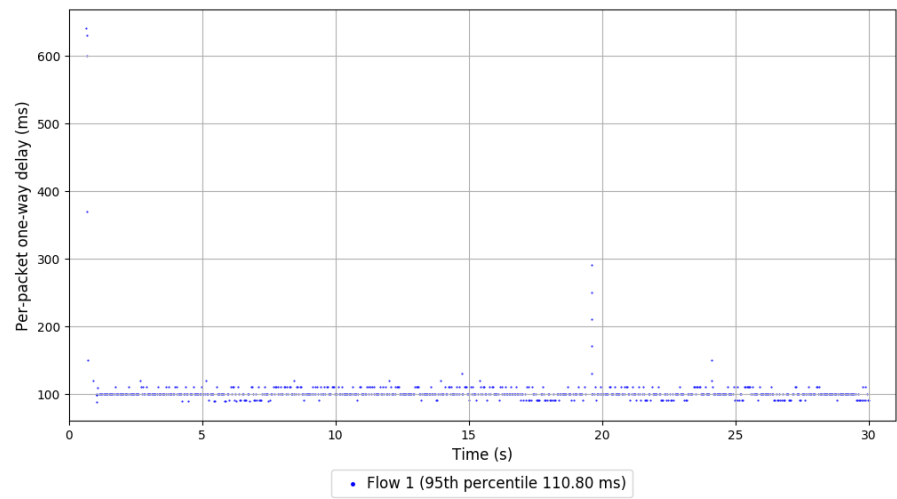
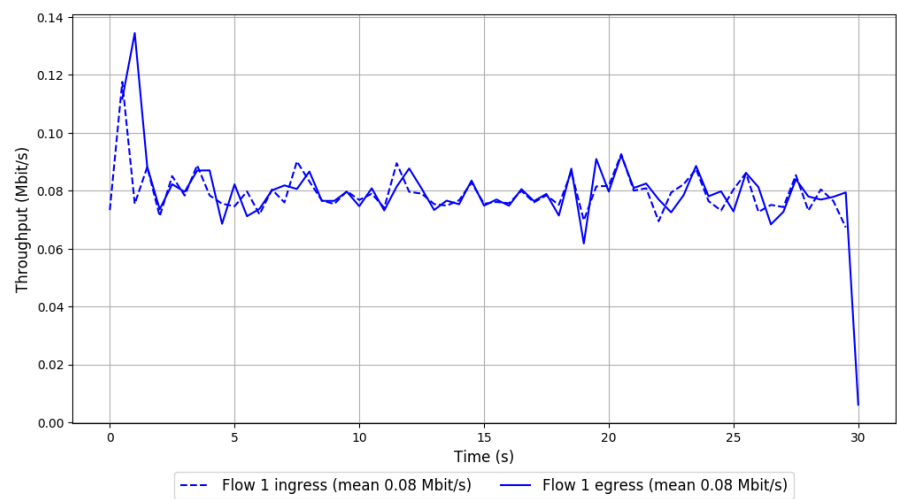


```
Run 1: Statistics of SCReAM

Start at: 2018-04-16 22:05:25
End at: 2018-04-16 22:05:55
Local clock offset: -6.84 ms
Remote clock offset: 5.755 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 110.797 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 110.797 ms
Loss rate: 0.00%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-04-16 22:25:30

End at: 2018-04-16 22:26:00

Local clock offset: -6.835 ms

Remote clock offset: 6.066 ms

# Below is generated by plot.py at 2018-04-16 22:48:22

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 112.635 ms

Loss rate: 0.00%

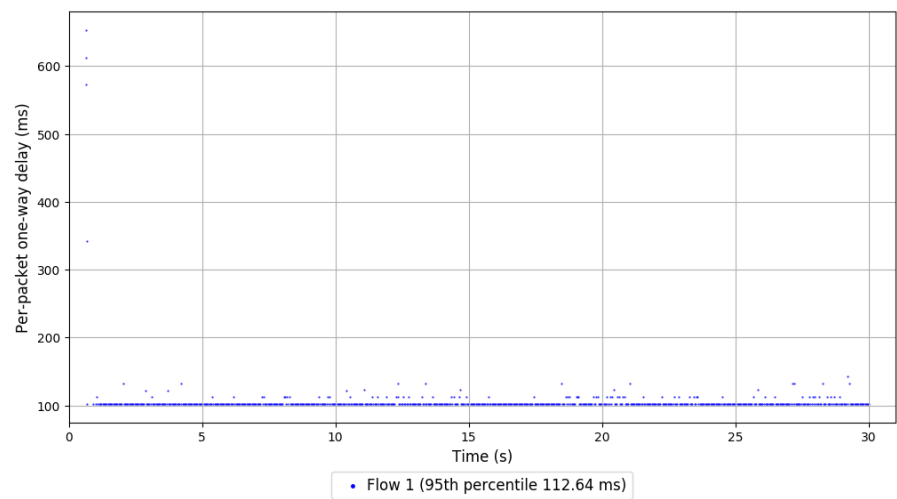
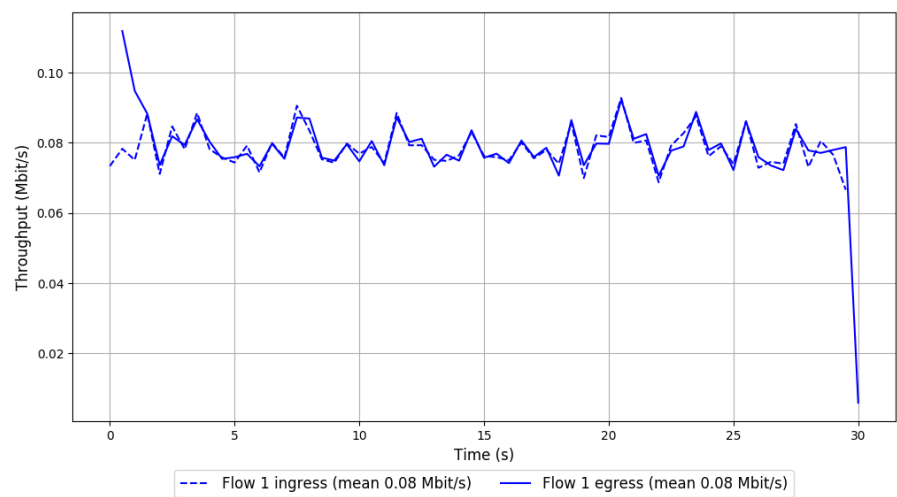
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 112.635 ms

Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-04-16 22:45:38

End at: 2018-04-16 22:46:08

Local clock offset: -5.309 ms

Remote clock offset: 6.255 ms

# Below is generated by plot.py at 2018-04-16 22:48:22

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 113.134 ms

Loss rate: 0.00%

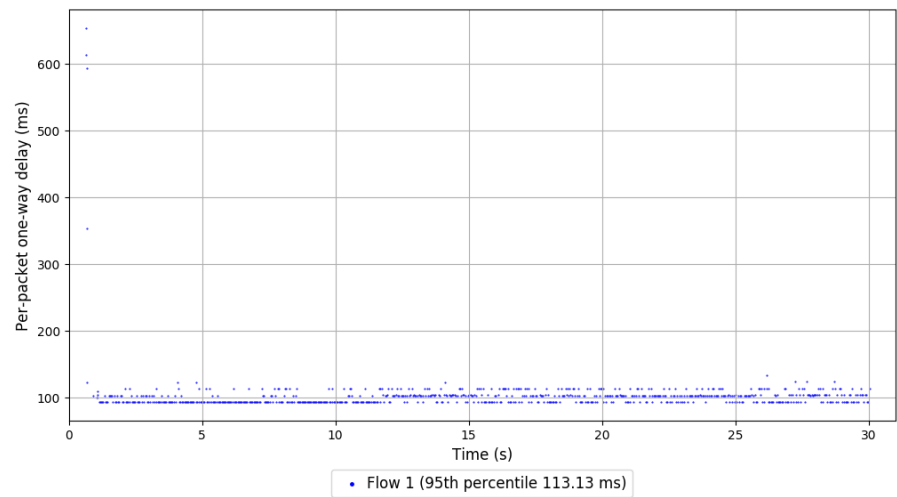
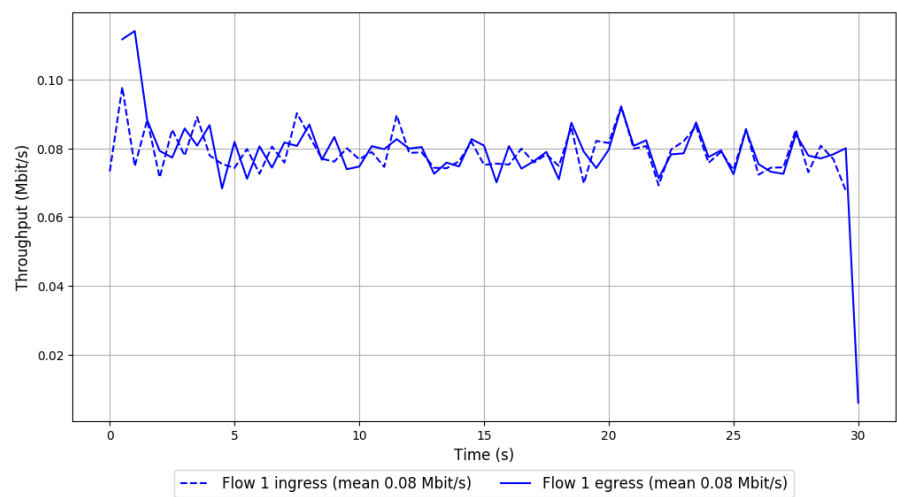
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 113.134 ms

Loss rate: 0.00%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-04-16 21:55:57

End at: 2018-04-16 21:56:27

Local clock offset: -7.221 ms

Remote clock offset: 5.62 ms

# Below is generated by plot.py at 2018-04-16 22:48:24

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 207.079 ms

Loss rate: 0.00%

-- Flow 1:

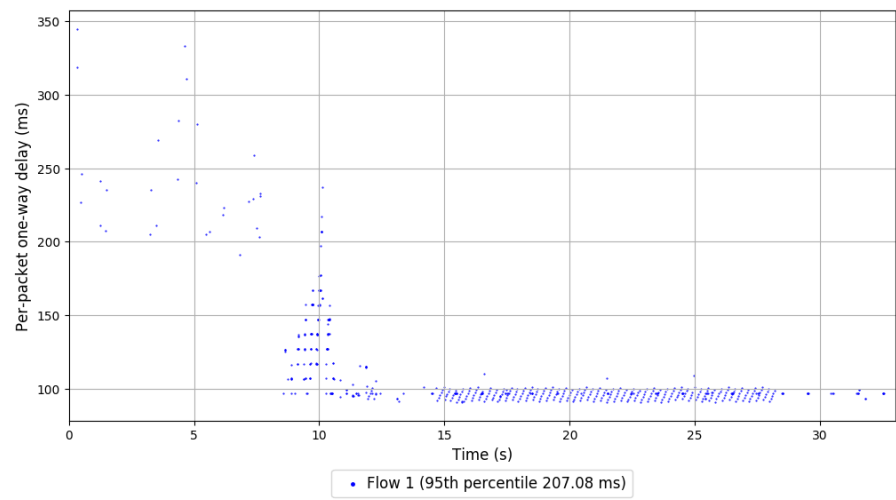
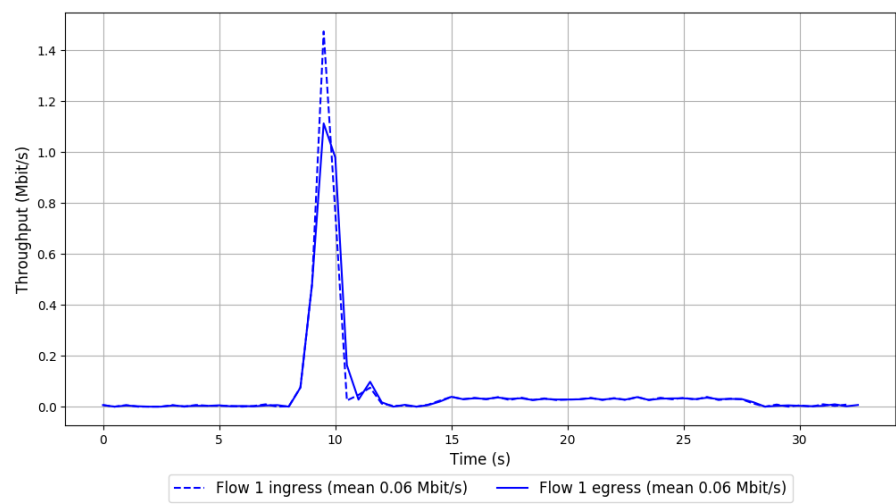
Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 207.079 ms

Loss rate: 0.00%



Run 1: Report of WebRTC media — Data Link

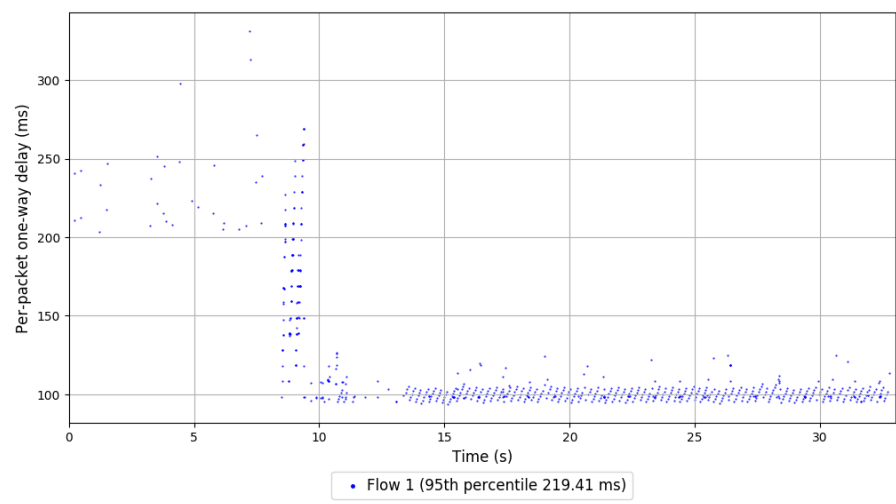
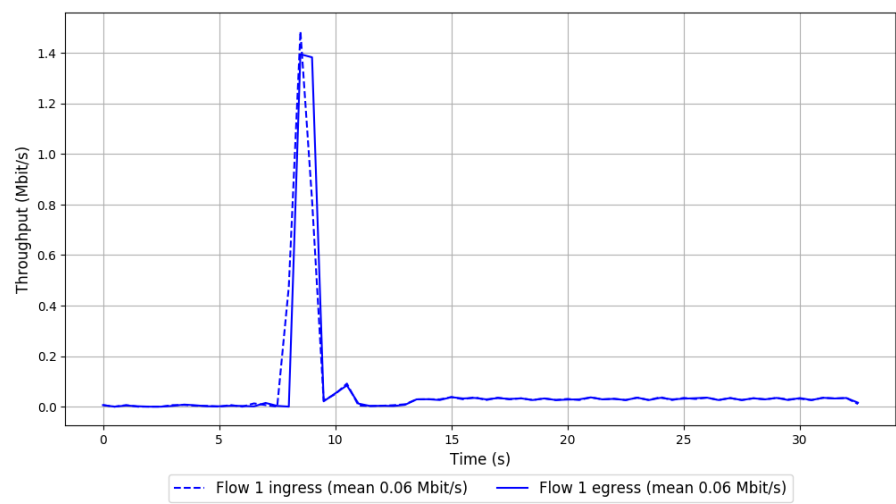


Run 2: Statistics of WebRTC media

Start at: 2018-04-16 22:16:03  
End at: 2018-04-16 22:16:33  
Local clock offset: -7.395 ms  
Remote clock offset: 11.599 ms

# Below is generated by plot.py at 2018-04-16 22:48:24  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.06 Mbit/s  
95th percentile per-packet one-way delay: 219.412 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 0.06 Mbit/s  
95th percentile per-packet one-way delay: 219.412 ms  
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-04-16 22:36:09

End at: 2018-04-16 22:36:39

Local clock offset: -6.795 ms

Remote clock offset: 12.65 ms

# Below is generated by plot.py at 2018-04-16 22:48:24

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 199.406 ms

Loss rate: 0.00%

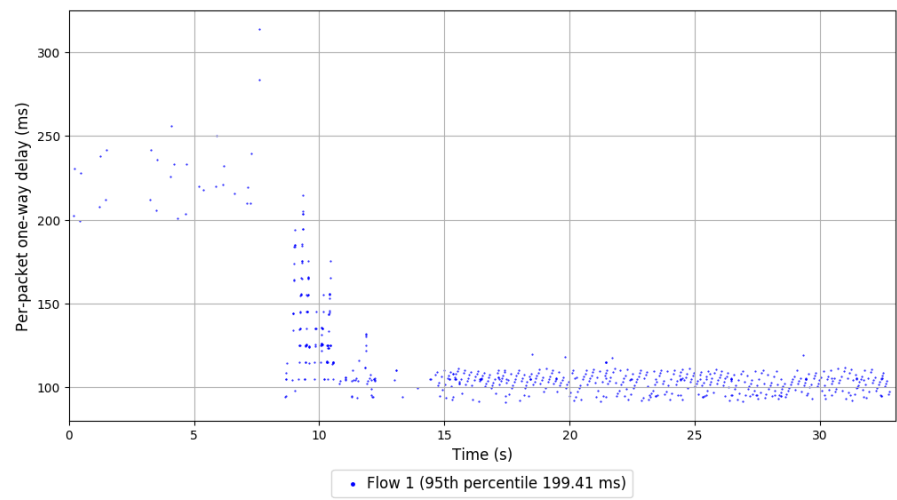
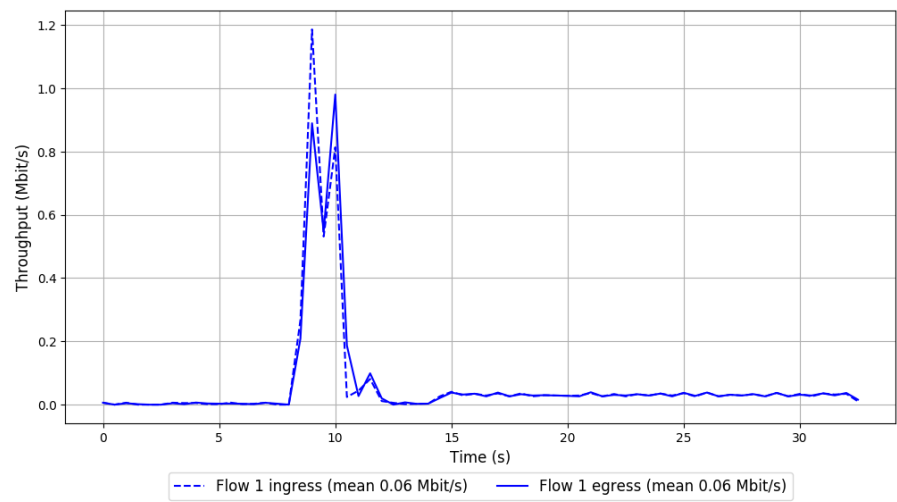
-- Flow 1:

Average throughput: 0.06 Mbit/s

95th percentile per-packet one-way delay: 199.406 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link



Run 1: Statistics of Sprout

Start at: 2018-04-16 21:58:18

End at: 2018-04-16 21:58:48

Local clock offset: -8.111 ms

Remote clock offset: 6.507 ms

# Below is generated by plot.py at 2018-04-16 22:48:25

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 154.804 ms

Loss rate: 0.00%

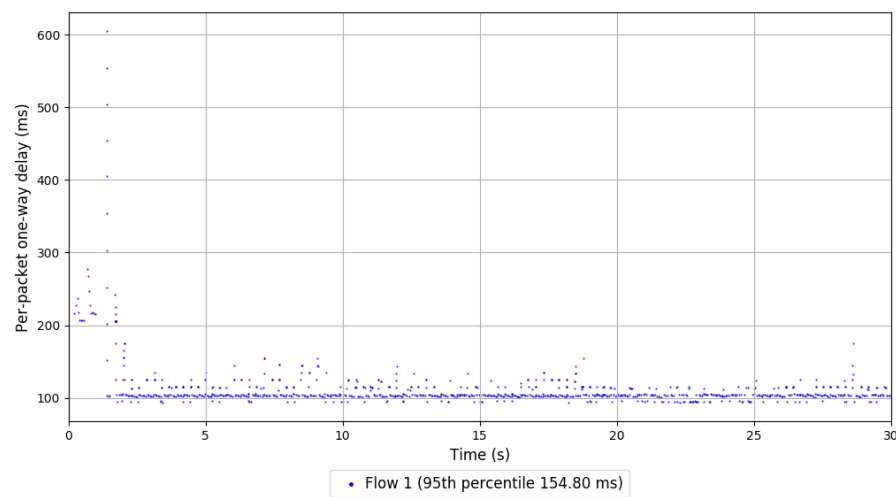
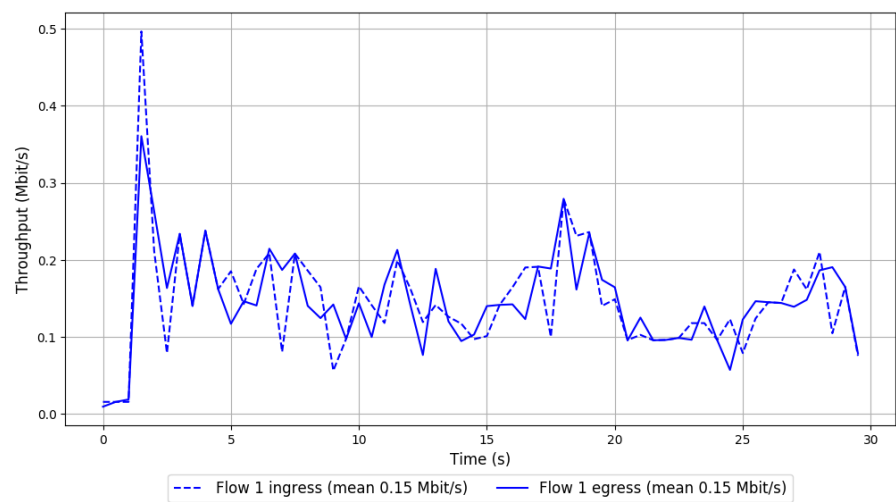
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 154.804 ms

Loss rate: 0.00%

Run 1: Report of Sprout — Data Link



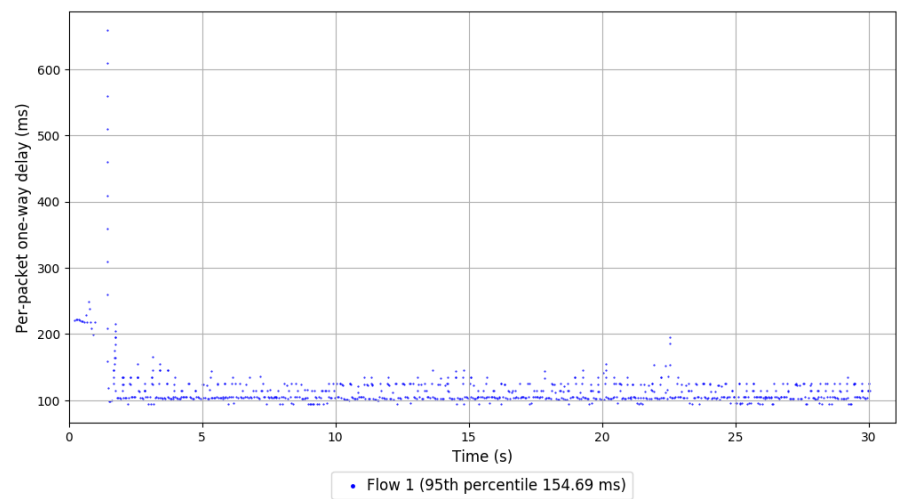
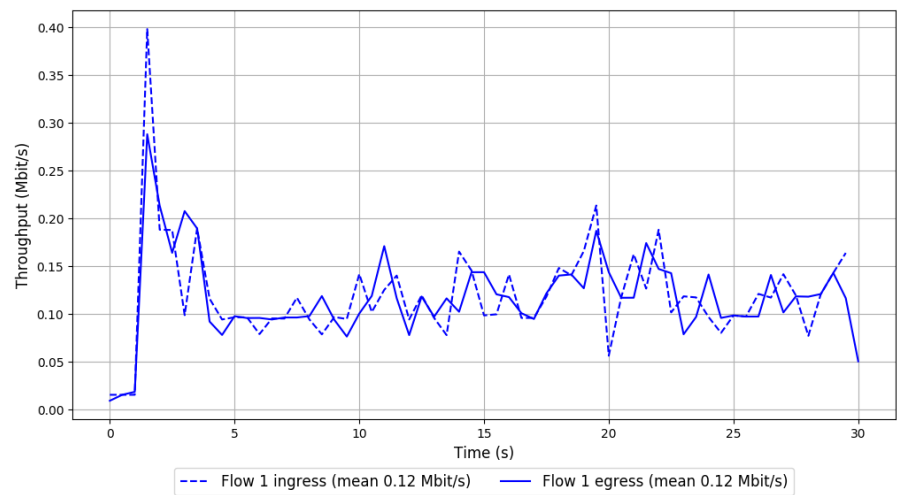
Run 2: Statistics of Sprout

Start at: 2018-04-16 22:18:24  
End at: 2018-04-16 22:18:54  
Local clock offset: -7.438 ms  
Remote clock offset: 11.669 ms

# Below is generated by plot.py at 2018-04-16 22:48:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.12 Mbit/s  
95th percentile per-packet one-way delay: 154.690 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 0.12 Mbit/s  
95th percentile per-packet one-way delay: 154.690 ms  
Loss rate: 0.00%



Run 2: Report of Sprout — Data Link

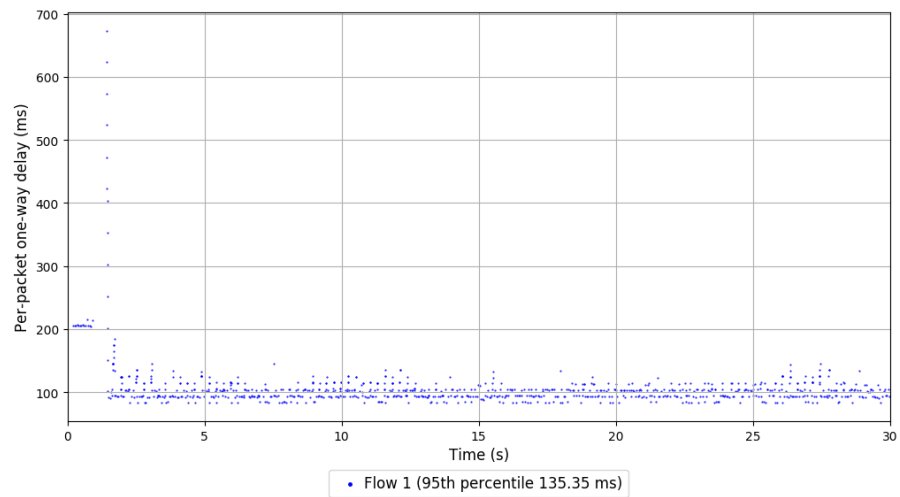
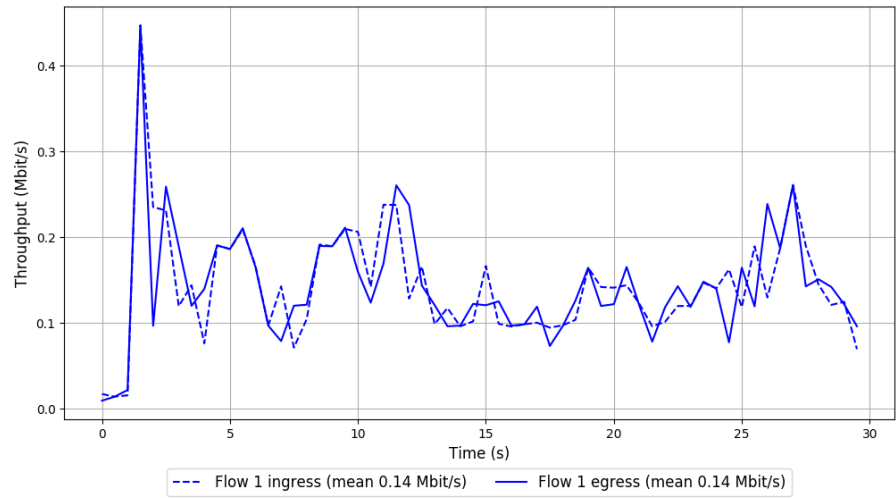


Run 3: Statistics of Sprout

Start at: 2018-04-16 22:38:32  
End at: 2018-04-16 22:39:02  
Local clock offset: -5.436 ms  
Remote clock offset: 7.004 ms

# Below is generated by plot.py at 2018-04-16 22:48:25  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 135.346 ms  
Loss rate: 0.00%  
-- Flow 1:  
Average throughput: 0.14 Mbit/s  
95th percentile per-packet one-way delay: 135.346 ms  
Loss rate: 0.00%

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



Run 1: Statistics of TaoVA-100x

Start at: 2018-04-16 22:04:14

End at: 2018-04-16 22:04:44

Local clock offset: -6.987 ms

Remote clock offset: 10.585 ms

# Below is generated by plot.py at 2018-04-16 22:48:29

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.61 Mbit/s

95th percentile per-packet one-way delay: 351.974 ms

Loss rate: 0.21%

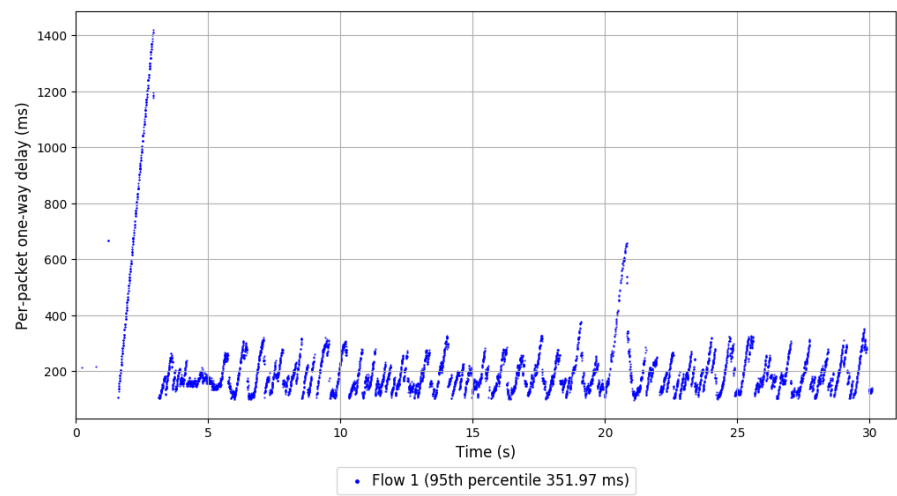
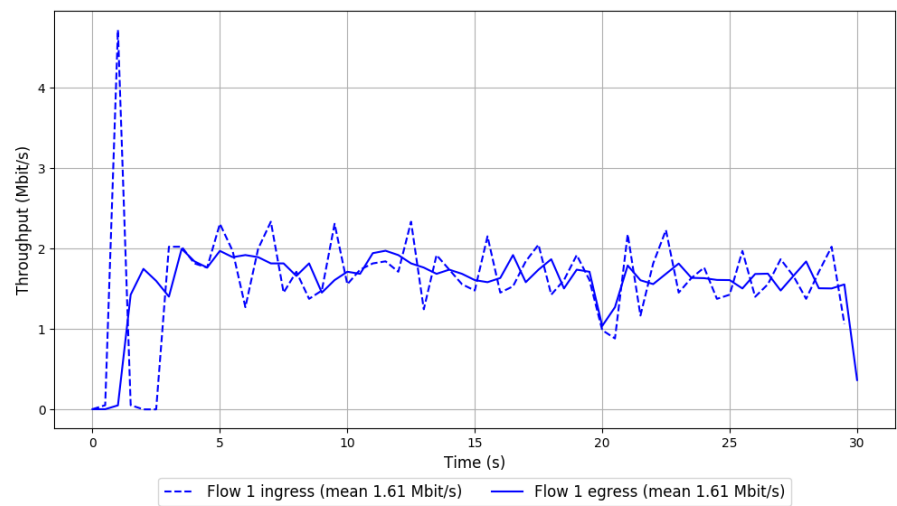
-- Flow 1:

Average throughput: 1.61 Mbit/s

95th percentile per-packet one-way delay: 351.974 ms

Loss rate: 0.21%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-04-16 22:24:19

End at: 2018-04-16 22:24:49

Local clock offset: -5.966 ms

Remote clock offset: 6.879 ms

# Below is generated by plot.py at 2018-04-16 22:48:30

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.72 Mbit/s

95th percentile per-packet one-way delay: 289.190 ms

Loss rate: 0.55%

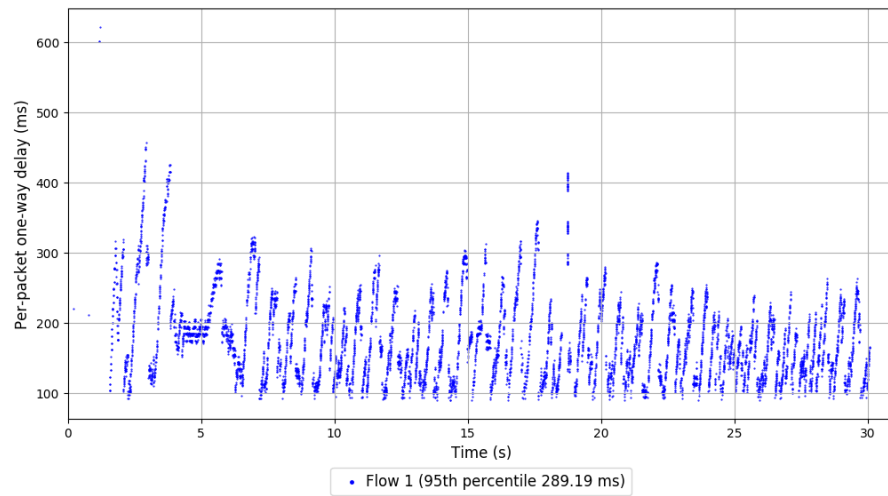
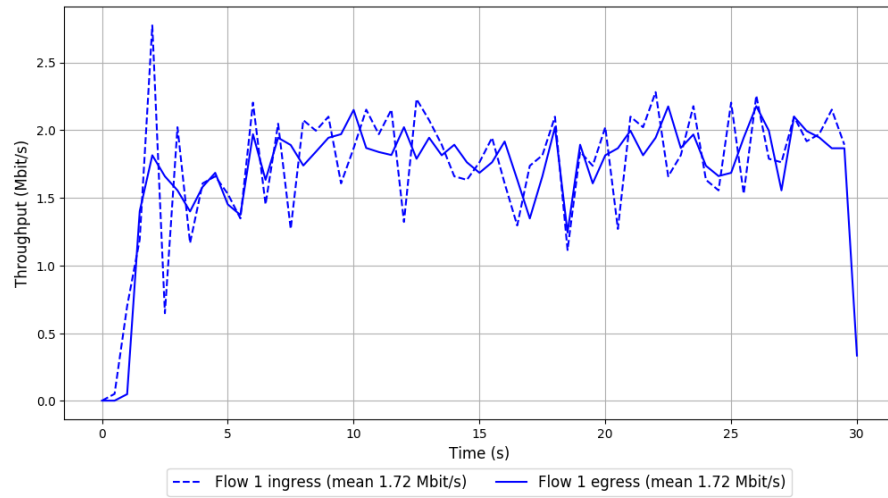
-- Flow 1:

Average throughput: 1.72 Mbit/s

95th percentile per-packet one-way delay: 289.190 ms

Loss rate: 0.55%

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



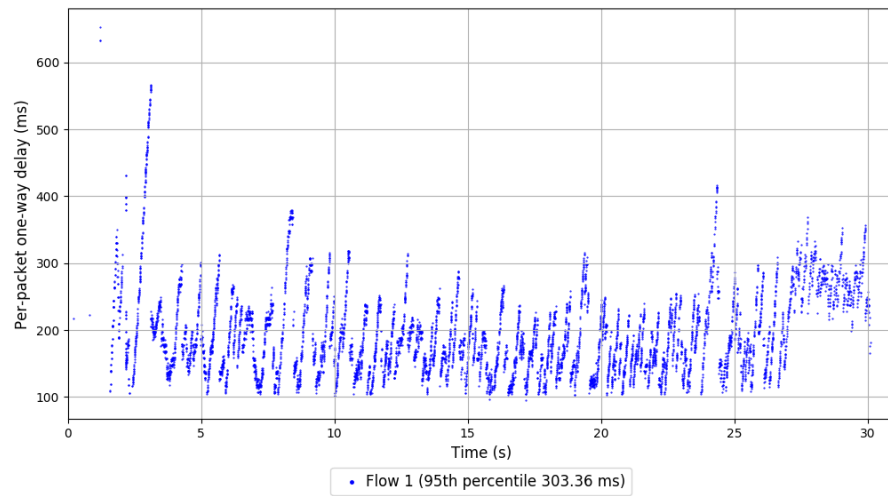
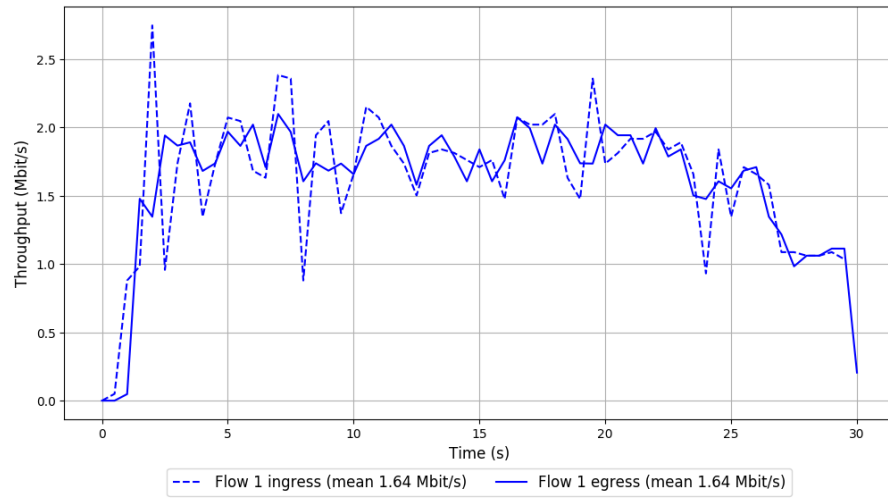
Run 3: Statistics of TaoVA-100x

Start at: 2018-04-16 22:44:26  
End at: 2018-04-16 22:44:56  
Local clock offset: -5.463 ms  
Remote clock offset: 12.714 ms

# Below is generated by plot.py at 2018-04-16 22:48:32  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.64 Mbit/s  
95th percentile per-packet one-way delay: 303.358 ms  
Loss rate: 0.29%  
-- Flow 1:  
Average throughput: 1.64 Mbit/s  
95th percentile per-packet one-way delay: 303.358 ms  
Loss rate: 0.29%



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

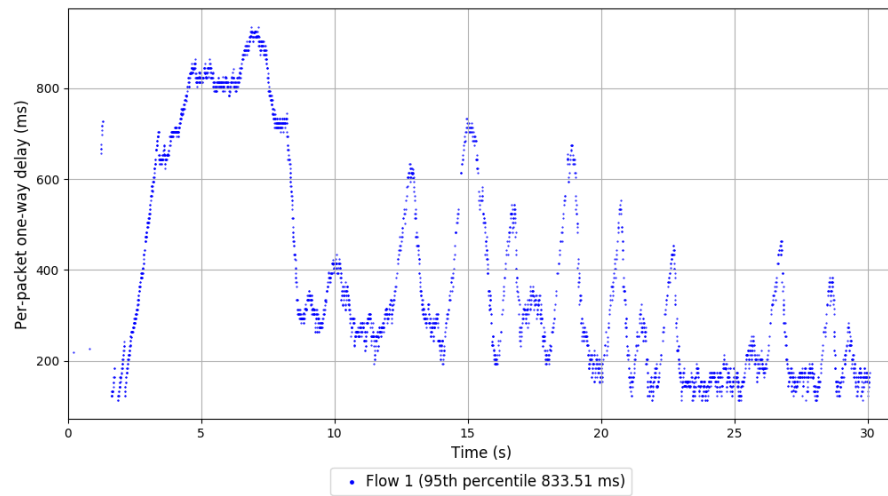
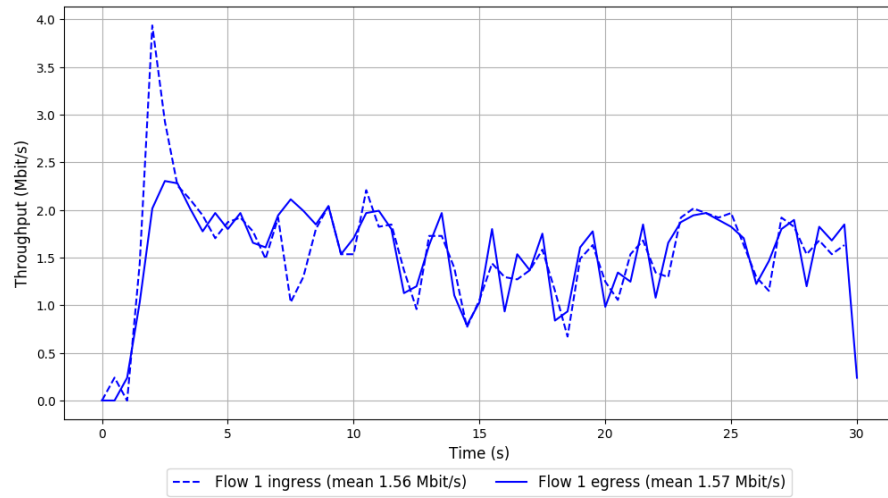


Run 1: Statistics of TCP Vegas

Start at: 2018-04-16 21:52:24  
End at: 2018-04-16 21:52:54  
Local clock offset: -7.2 ms  
Remote clock offset: 10.472 ms

# Below is generated by plot.py at 2018-04-16 22:48:32  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.57 Mbit/s  
95th percentile per-packet one-way delay: 833.507 ms  
Loss rate: 0.18%  
-- Flow 1:  
Average throughput: 1.57 Mbit/s  
95th percentile per-packet one-way delay: 833.507 ms  
Loss rate: 0.18%

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

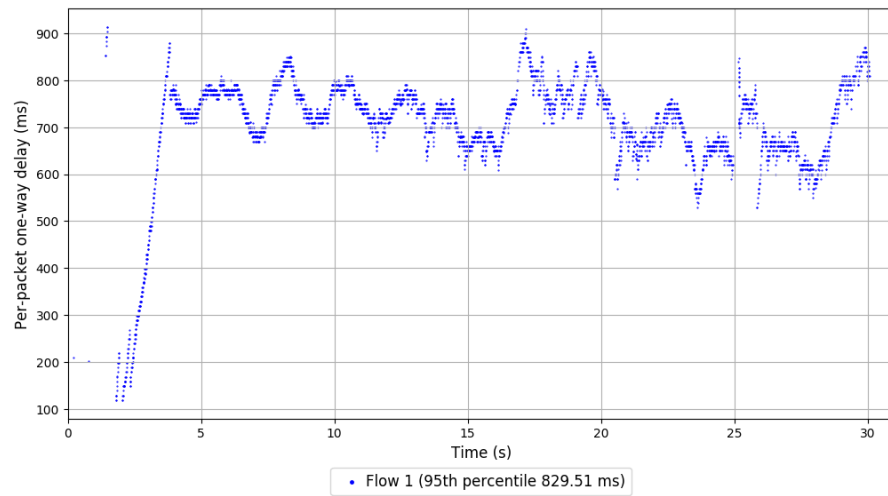
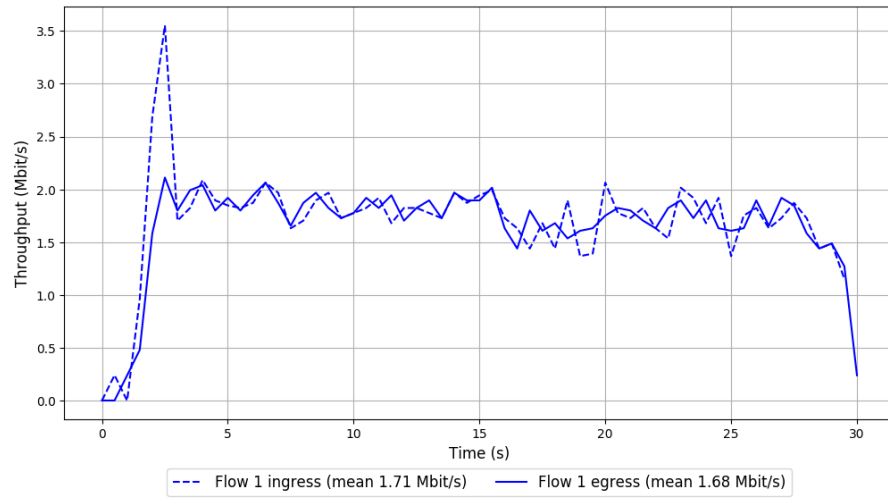


Run 2: Statistics of TCP Vegas

Start at: 2018-04-16 22:12:30  
End at: 2018-04-16 22:13:00  
Local clock offset: -7.362 ms  
Remote clock offset: 11.531 ms

# Below is generated by plot.py at 2018-04-16 22:48:32  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.68 Mbit/s  
95th percentile per-packet one-way delay: 829.515 ms  
Loss rate: 1.90%  
-- Flow 1:  
Average throughput: 1.68 Mbit/s  
95th percentile per-packet one-way delay: 829.515 ms  
Loss rate: 1.90%

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



Run 3: Statistics of TCP Vegas

Start at: 2018-04-16 22:32:37

End at: 2018-04-16 22:33:07

Local clock offset: -7.011 ms

Remote clock offset: 7.012 ms

# Below is generated by plot.py at 2018-04-16 22:48:32

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.44 Mbit/s

95th percentile per-packet one-way delay: 1523.600 ms

Loss rate: 2.26%

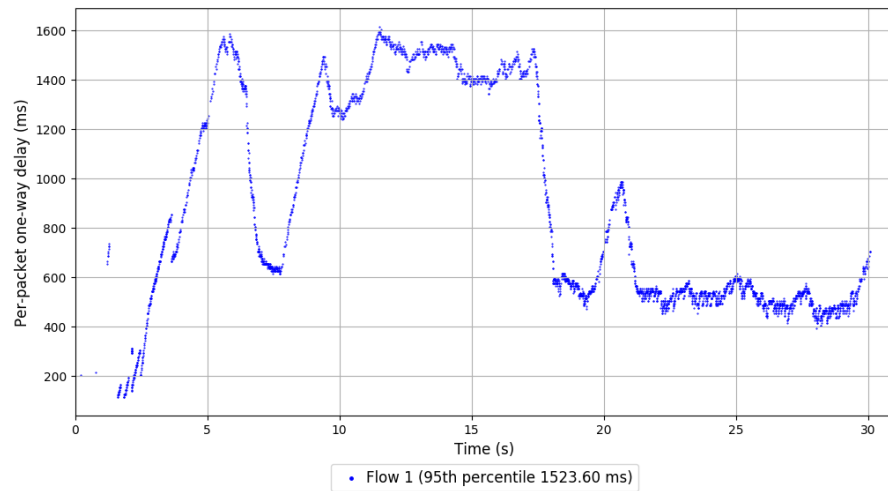
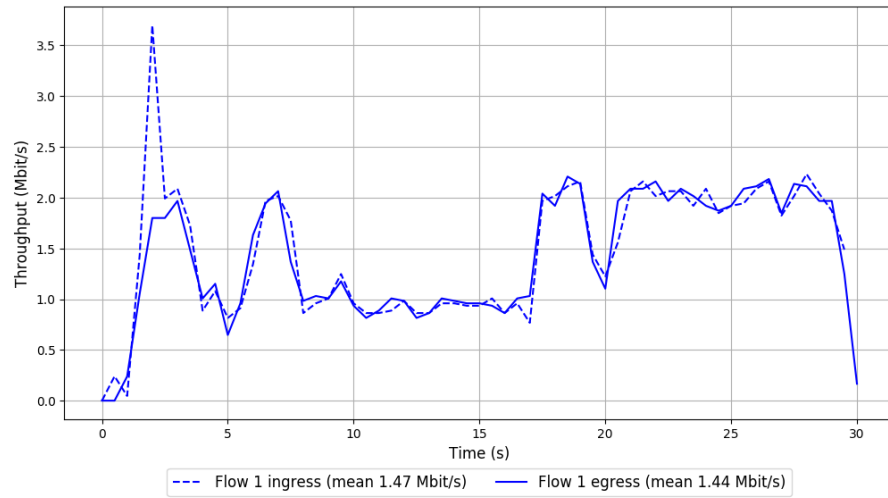
-- Flow 1:

Average throughput: 1.44 Mbit/s

95th percentile per-packet one-way delay: 1523.600 ms

Loss rate: 2.26%

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



Run 1: Statistics of Verus

Start at: 2018-04-16 21:50:01

End at: 2018-04-16 21:50:31

Local clock offset: -7.889 ms

Remote clock offset: 6.421 ms

# Below is generated by plot.py at 2018-04-16 22:48:32

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 3137.329 ms

Loss rate: 2.69%

-- Flow 1:

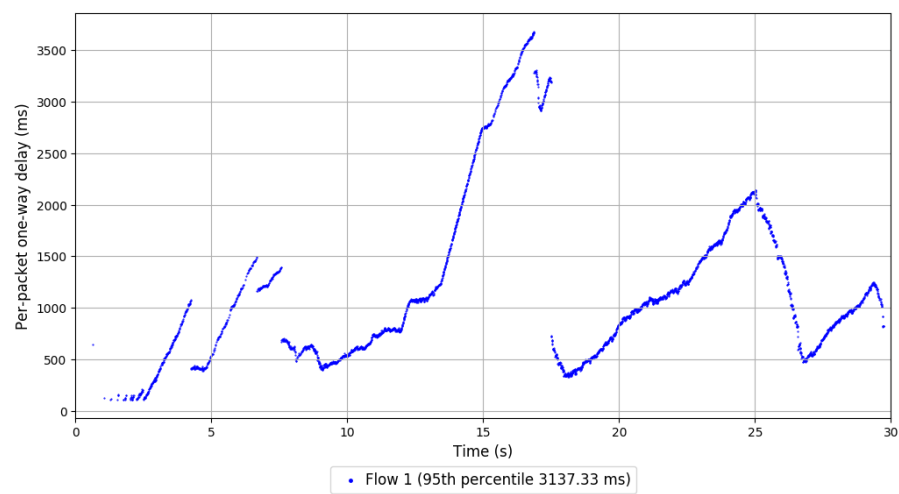
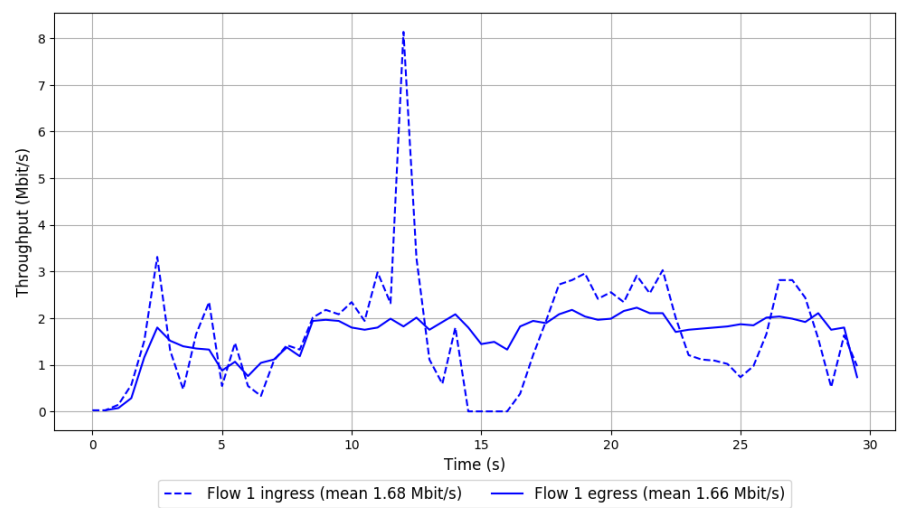
Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 3137.329 ms

Loss rate: 2.69%



Run 1: Report of Verus — Data Link

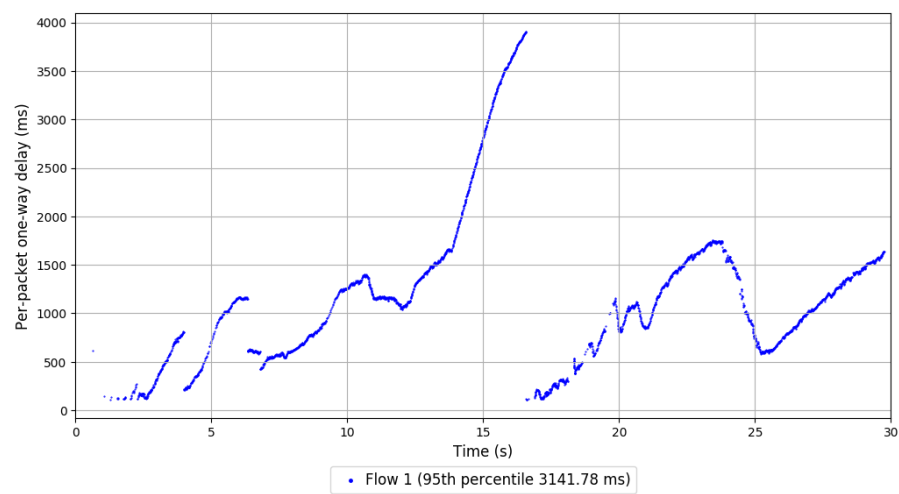
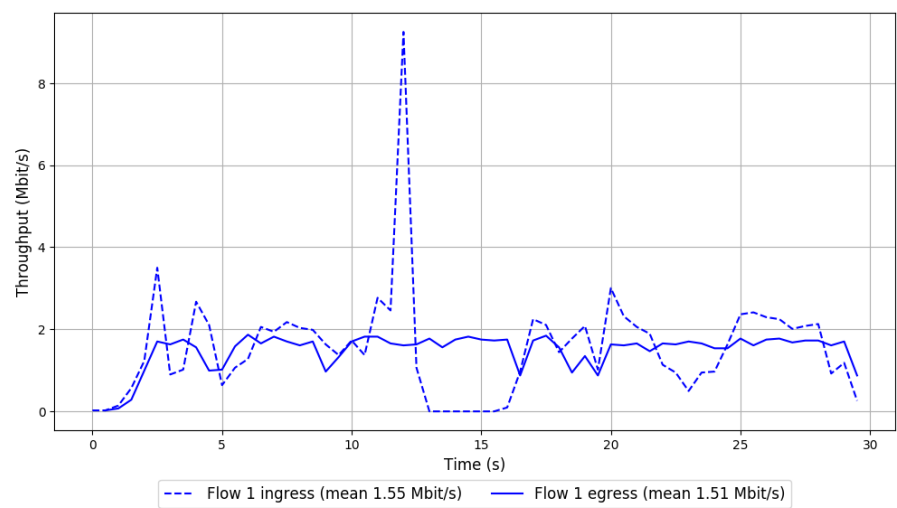


Run 2: Statistics of Verus

Start at: 2018-04-16 22:10:08  
End at: 2018-04-16 22:10:38  
Local clock offset: -6.644 ms  
Remote clock offset: 10.641 ms

# Below is generated by plot.py at 2018-04-16 22:48:32  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.51 Mbit/s  
95th percentile per-packet one-way delay: 3141.785 ms  
Loss rate: 4.24%  
-- Flow 1:  
Average throughput: 1.51 Mbit/s  
95th percentile per-packet one-way delay: 3141.785 ms  
Loss rate: 4.24%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-04-16 22:30:14

End at: 2018-04-16 22:30:44

Local clock offset: -7.014 ms

Remote clock offset: 6.067 ms

# Below is generated by plot.py at 2018-04-16 22:48:33

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.50 Mbit/s

95th percentile per-packet one-way delay: 1829.095 ms

Loss rate: 2.74%

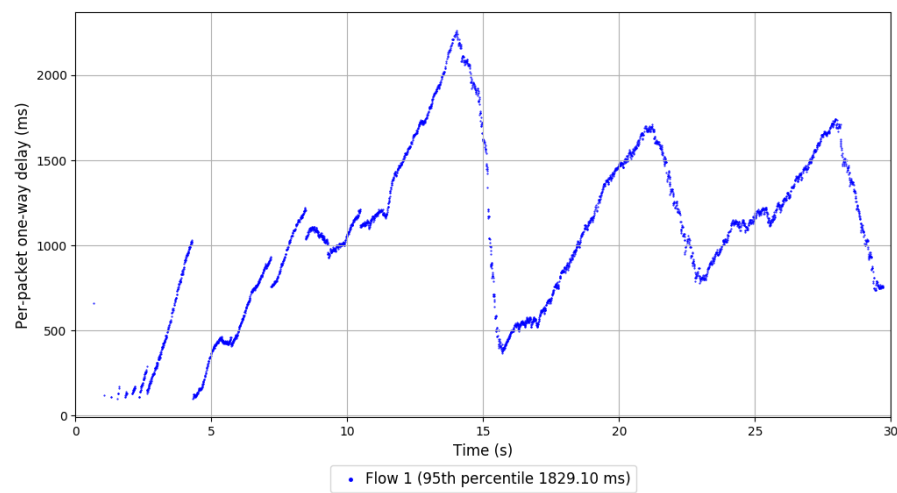
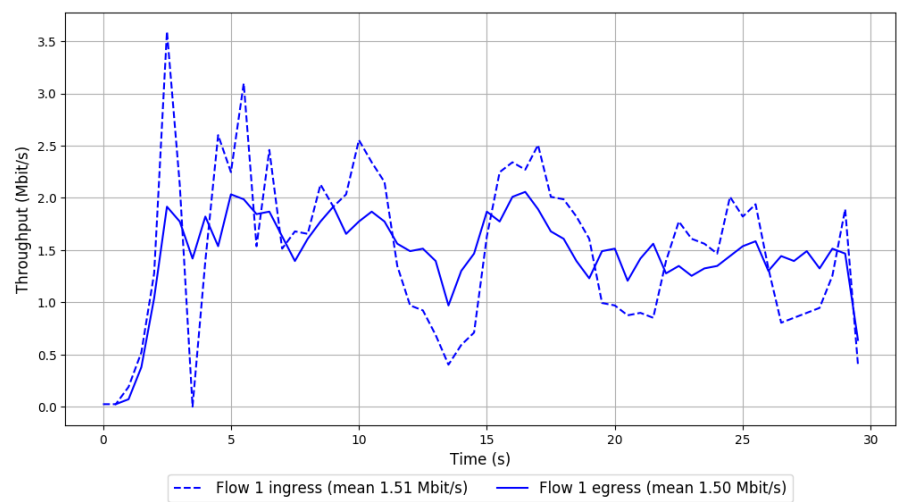
-- Flow 1:

Average throughput: 1.50 Mbit/s

95th percentile per-packet one-way delay: 1829.095 ms

Loss rate: 2.74%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-04-16 22:01:52

End at: 2018-04-16 22:02:22

Local clock offset: -8.031 ms

Remote clock offset: 6.6 ms

# Below is generated by plot.py at 2018-04-16 22:48:37

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 188.270 ms

Loss rate: 0.00%

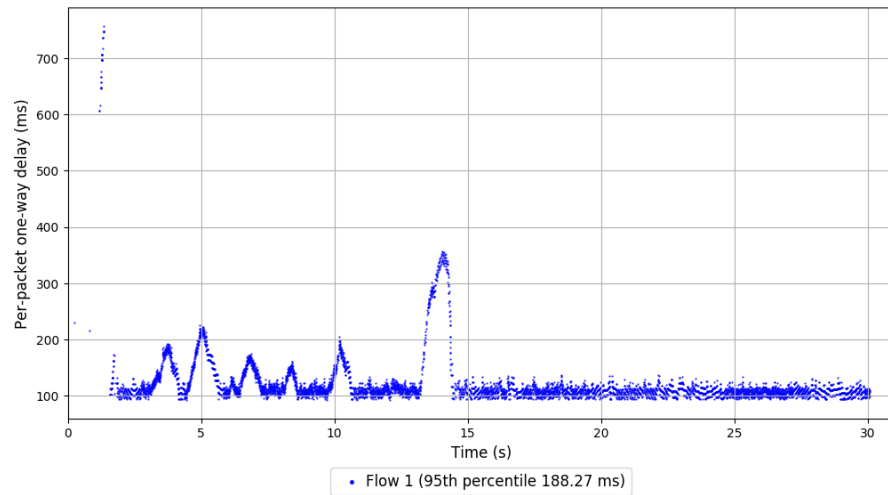
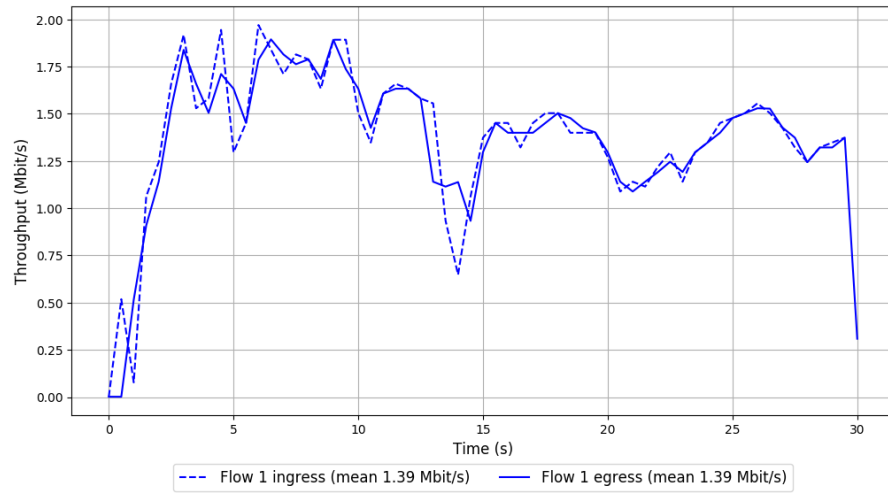
-- Flow 1:

Average throughput: 1.39 Mbit/s

95th percentile per-packet one-way delay: 188.270 ms

Loss rate: 0.00%

## Run 1: Report of Copa — Data Link



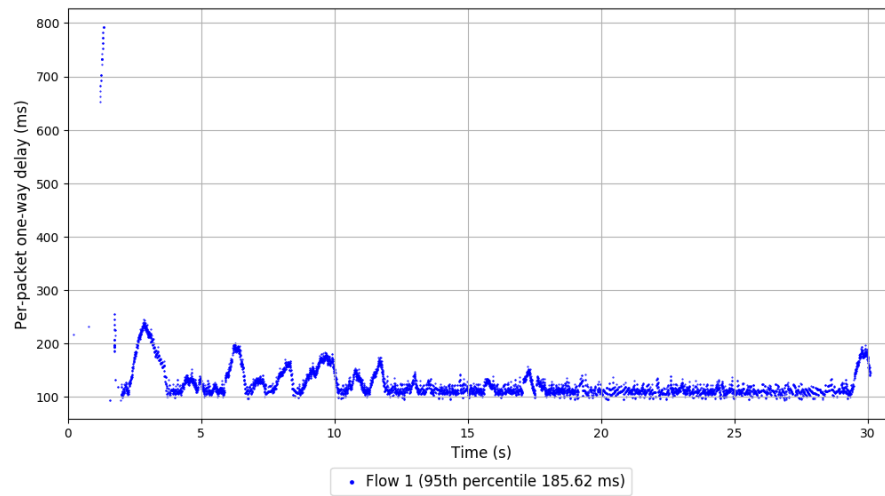
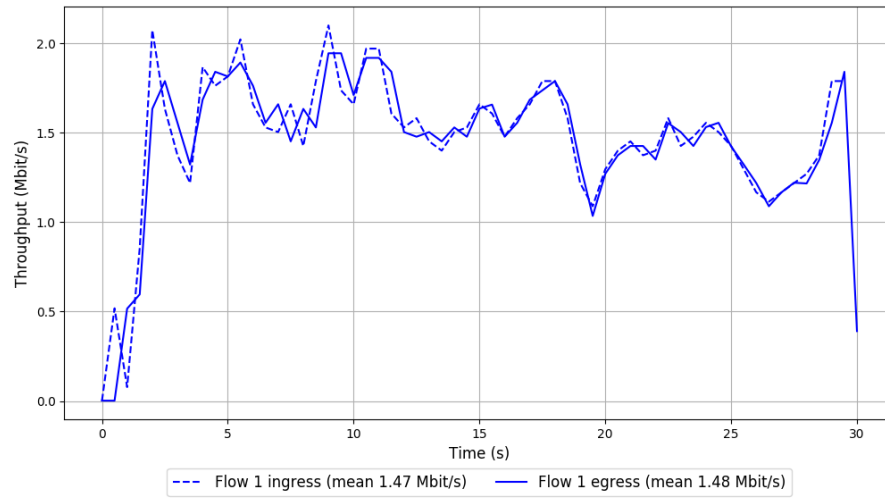
Run 2: Statistics of Copa

Start at: 2018-04-16 22:21:57  
End at: 2018-04-16 22:22:27  
Local clock offset: -6.742 ms  
Remote clock offset: 10.791 ms

# Below is generated by plot.py at 2018-04-16 22:48:38  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.48 Mbit/s  
95th percentile per-packet one-way delay: 185.623 ms  
Loss rate: 0.14%  
-- Flow 1:  
Average throughput: 1.48 Mbit/s  
95th percentile per-packet one-way delay: 185.623 ms  
Loss rate: 0.14%



## Run 2: Report of Copa — Data Link

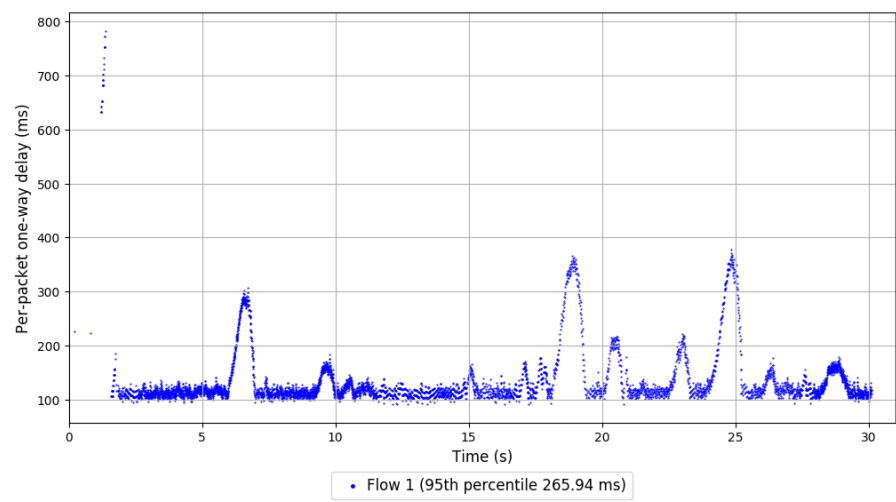
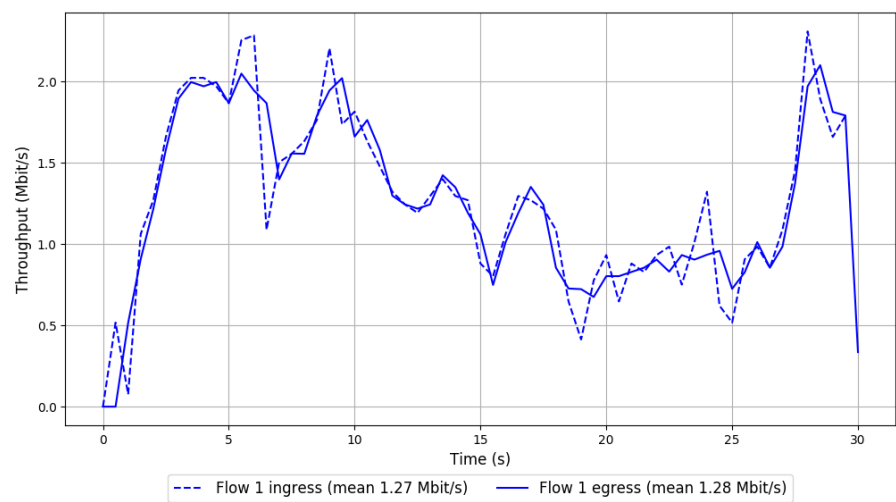


Run 3: Statistics of Copa

Start at: 2018-04-16 22:42:04  
End at: 2018-04-16 22:42:34  
Local clock offset: -4.888 ms  
Remote clock offset: 12.628 ms

# Below is generated by plot.py at 2018-04-16 22:48:39  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.28 Mbit/s  
95th percentile per-packet one-way delay: 265.943 ms  
Loss rate: 0.03%  
-- Flow 1:  
Average throughput: 1.28 Mbit/s  
95th percentile per-packet one-way delay: 265.943 ms  
Loss rate: 0.03%

Run 3: Report of Copa — Data Link

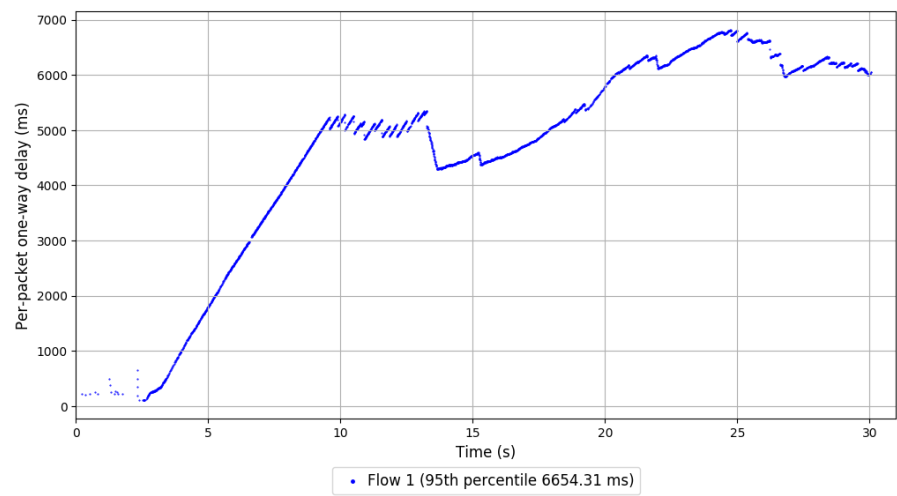
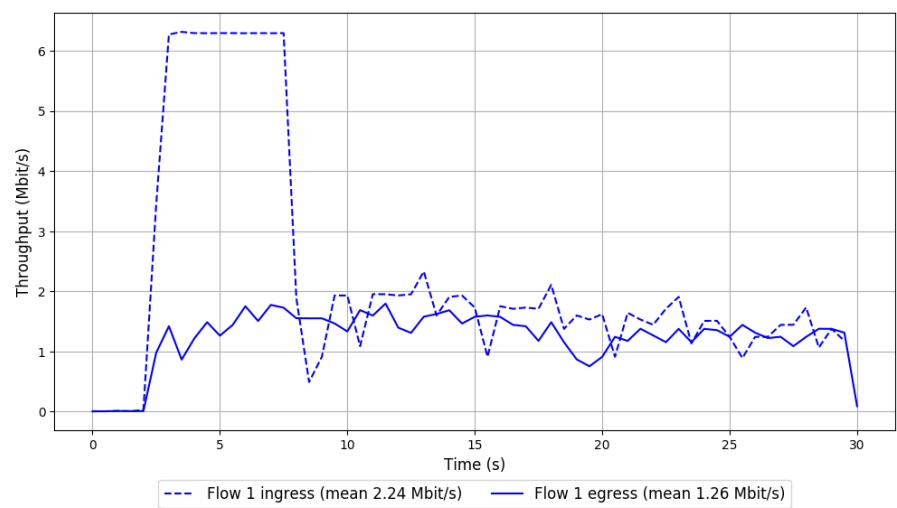


Run 1: Statistics of FillP

Start at: 2018-04-16 22:00:40  
End at: 2018-04-16 22:01:10  
Local clock offset: -8.153 ms  
Remote clock offset: 11.396 ms

# Below is generated by plot.py at 2018-04-16 22:48:39  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.26 Mbit/s  
95th percentile per-packet one-way delay: 6654.310 ms  
Loss rate: 43.77%  
-- Flow 1:  
Average throughput: 1.26 Mbit/s  
95th percentile per-packet one-way delay: 6654.310 ms  
Loss rate: 43.77%

Run 1: Report of FillP — Data Link

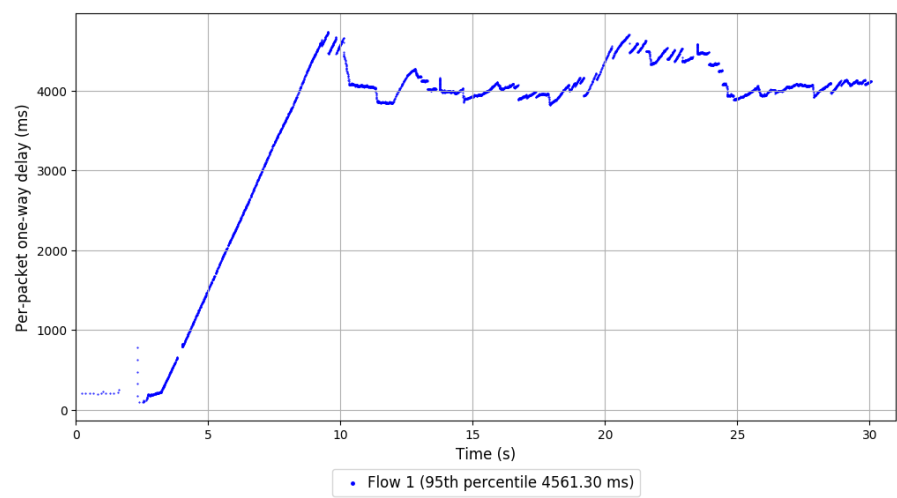
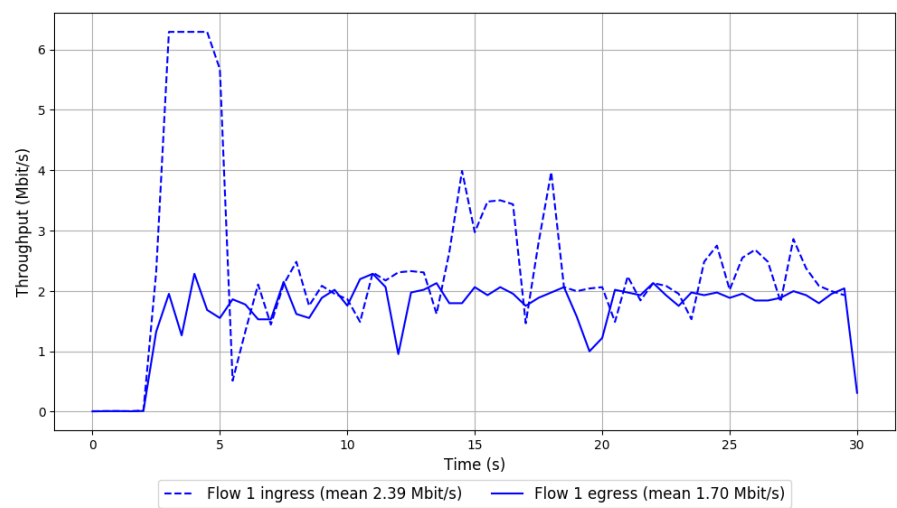


Run 2: Statistics of FillP

Start at: 2018-04-16 22:20:46  
End at: 2018-04-16 22:21:16  
Local clock offset: -6.658 ms  
Remote clock offset: 11.699 ms

# Below is generated by plot.py at 2018-04-16 22:48:39  
# Datalink statistics  
-- Total of 1 flow:  
Average throughput: 1.70 Mbit/s  
95th percentile per-packet one-way delay: 4561.298 ms  
Loss rate: 29.07%  
-- Flow 1:  
Average throughput: 1.70 Mbit/s  
95th percentile per-packet one-way delay: 4561.298 ms  
Loss rate: 29.07%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-04-16 22:40:53

End at: 2018-04-16 22:41:23

Local clock offset: -6.547 ms

Remote clock offset: 6.996 ms

# Below is generated by plot.py at 2018-04-16 22:48:39

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.48 Mbit/s

95th percentile per-packet one-way delay: 5623.392 ms

Loss rate: 20.99%

-- Flow 1:

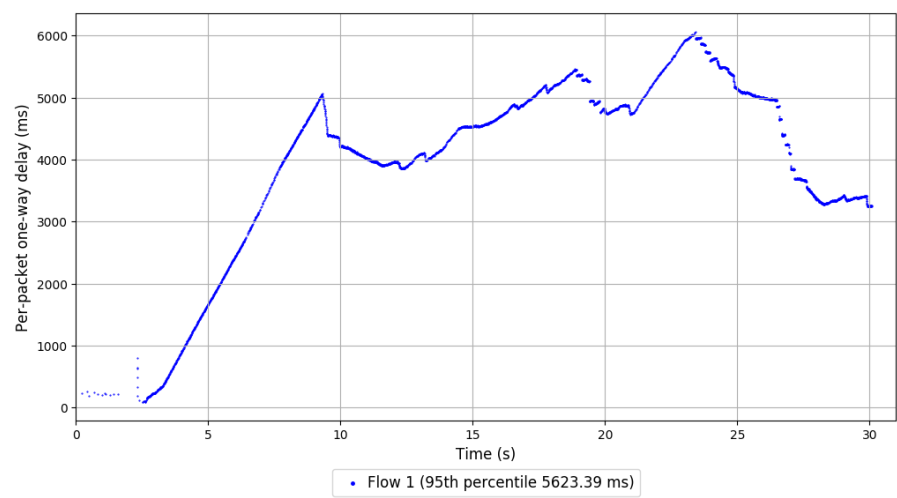
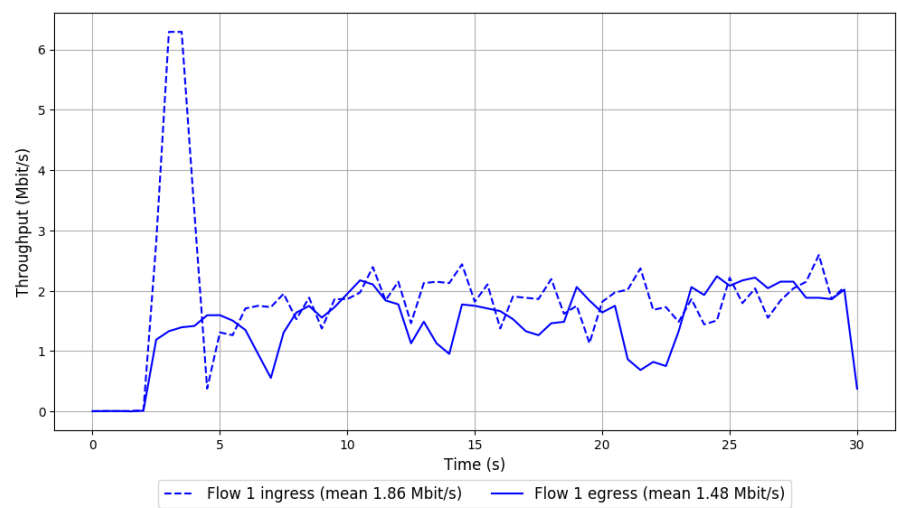
Average throughput: 1.48 Mbit/s

95th percentile per-packet one-way delay: 5623.392 ms

Loss rate: 20.99%



Run 3: Report of FillP — Data Link

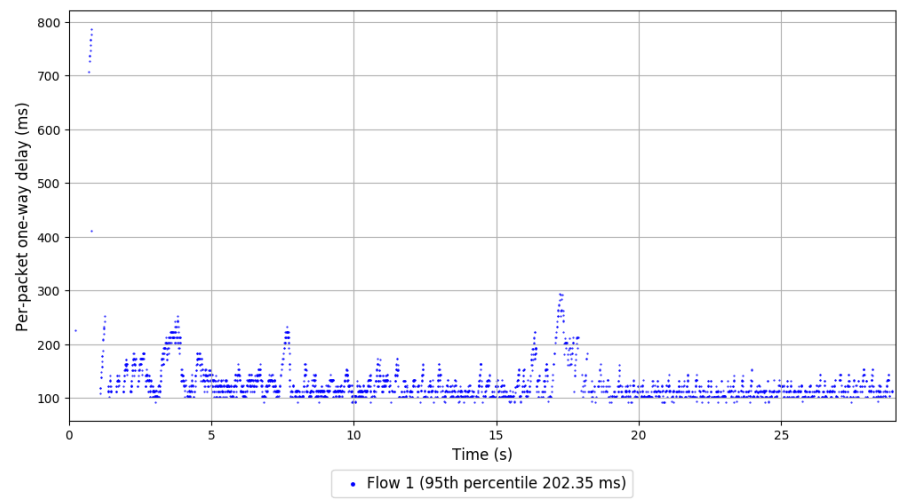
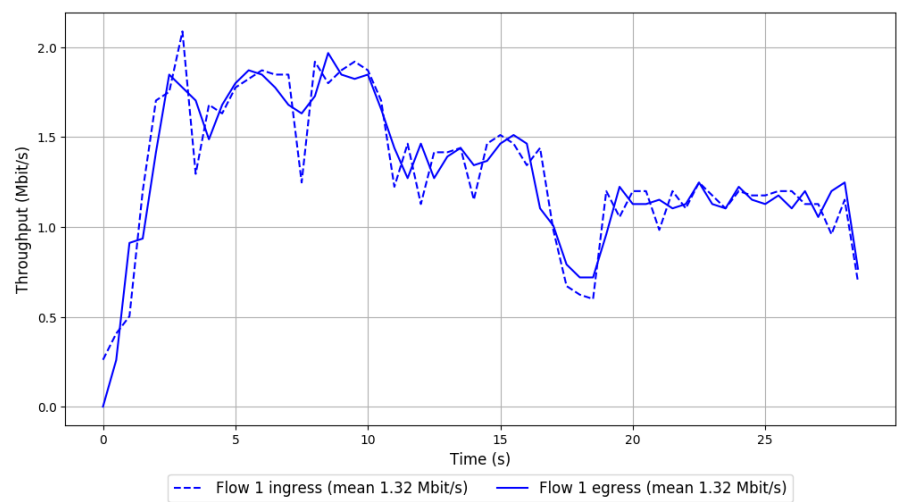


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-04-16 21:53:35
End at: 2018-04-16 21:54:05
Local clock offset: -7.161 ms
Remote clock offset: 6.45 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 202.355 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 202.355 ms
Loss rate: 0.03%
```

Run 1: Report of Indigo-1-32 — Data Link



Run 2: Statistics of Indigo-1-32

Start at: 2018-04-16 22:13:41

End at: 2018-04-16 22:14:11

Local clock offset: -7.359 ms

Remote clock offset: 6.786 ms

# Below is generated by plot.py at 2018-04-16 22:48:39

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.62 Mbit/s

95th percentile per-packet one-way delay: 252.664 ms

Loss rate: 0.00%

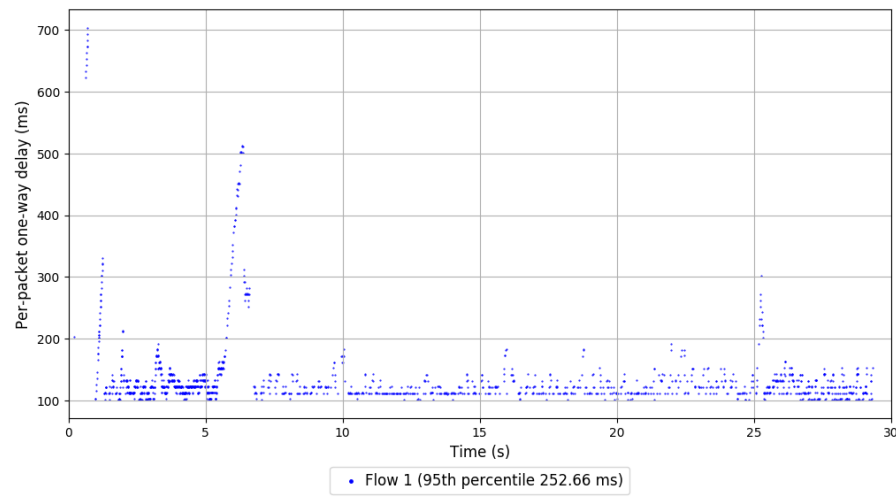
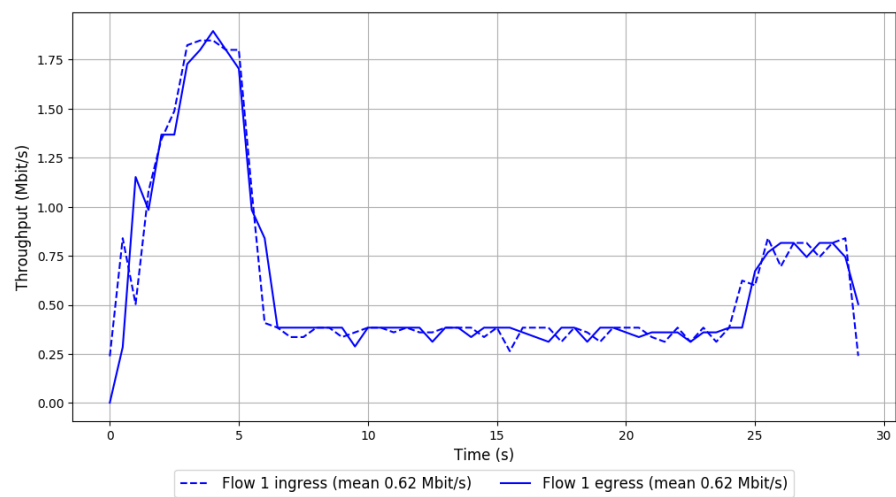
-- Flow 1:

Average throughput: 0.62 Mbit/s

95th percentile per-packet one-way delay: 252.664 ms

Loss rate: 0.00%

Run 2: Report of Indigo-1-32 — Data Link



Run 3: Statistics of Indigo-1-32

Start at: 2018-04-16 22:33:47

End at: 2018-04-16 22:34:18

Local clock offset: -7.05 ms

Remote clock offset: 6.148 ms

# Below is generated by plot.py at 2018-04-16 22:48:40

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 176.576 ms

Loss rate: 0.09%

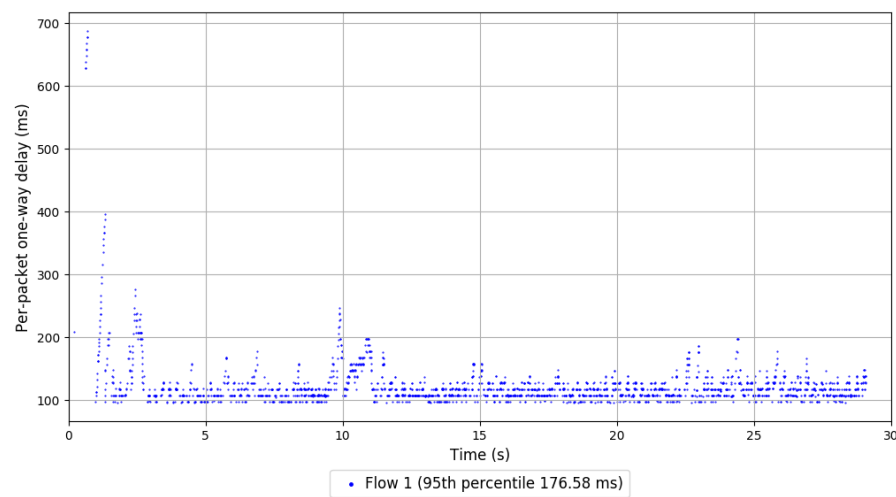
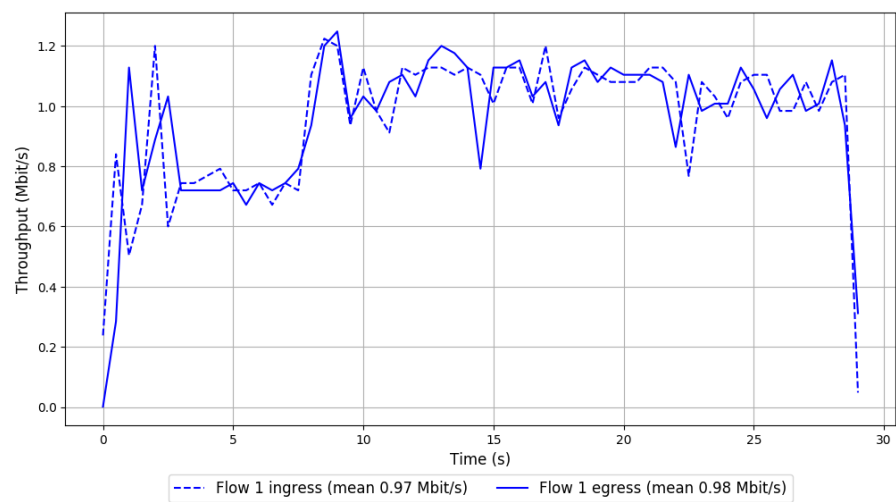
-- Flow 1:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 176.576 ms

Loss rate: 0.09%

Run 3: Report of Indigo-1-32 — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2018-04-16 21:48:50

End at: 2018-04-16 21:49:20

Local clock offset: -7.901 ms

Remote clock offset: 5.657 ms

# Below is generated by plot.py at 2018-04-16 22:48:41

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 1244.412 ms

Loss rate: 1.97%

-- Flow 1:

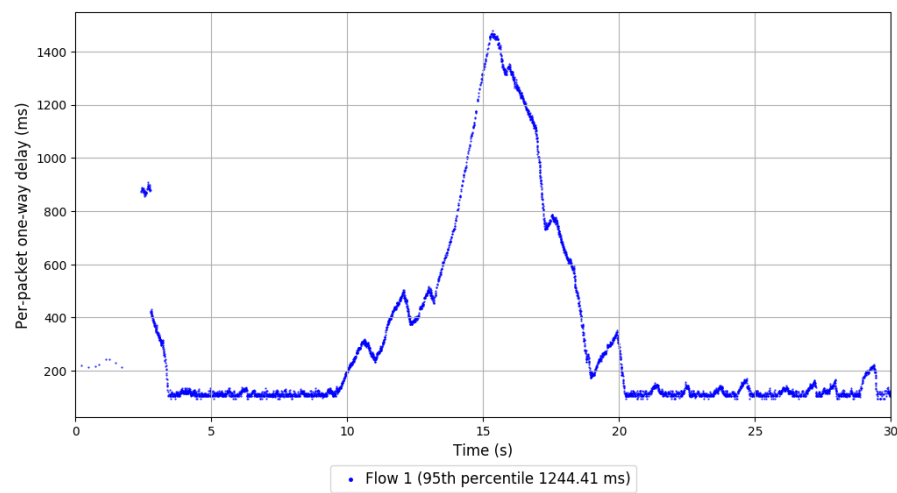
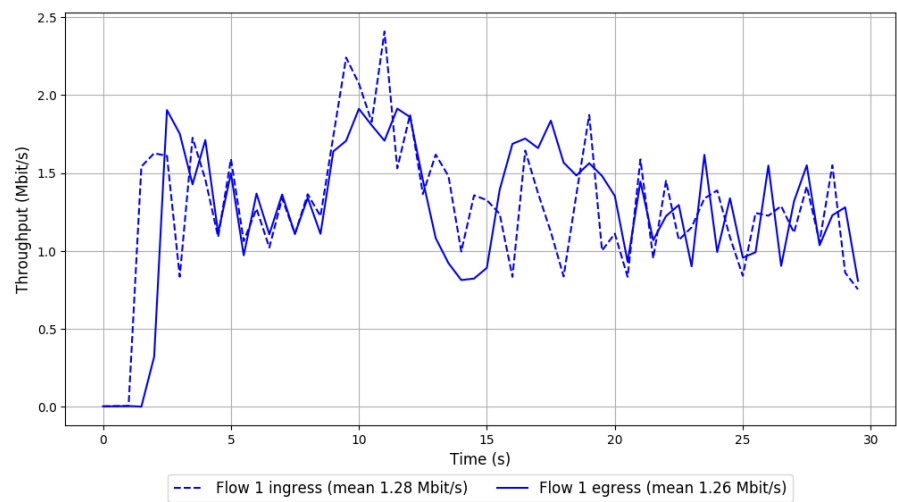
Average throughput: 1.26 Mbit/s

95th percentile per-packet one-way delay: 1244.412 ms

Loss rate: 1.97%



Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2018-04-16 22:08:57

End at: 2018-04-16 22:09:27

Local clock offset: -5.917 ms

Remote clock offset: 6.775 ms

# Below is generated by plot.py at 2018-04-16 22:48:42

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.18 Mbit/s

95th percentile per-packet one-way delay: 1811.308 ms

Loss rate: 14.39%

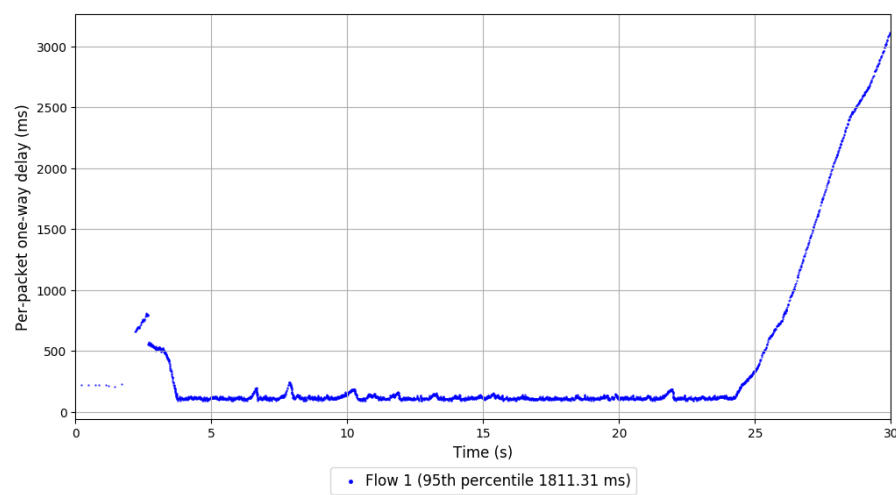
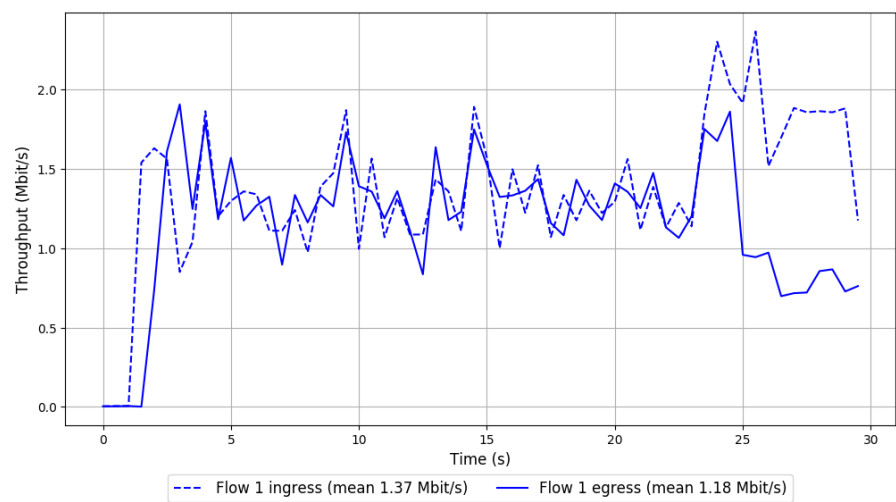
-- Flow 1:

Average throughput: 1.18 Mbit/s

95th percentile per-packet one-way delay: 1811.308 ms

Loss rate: 14.39%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2018-04-16 22:29:03

End at: 2018-04-16 22:29:33

Local clock offset: -6.905 ms

Remote clock offset: 6.901 ms

# Below is generated by plot.py at 2018-04-16 22:48:42

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.42 Mbit/s

95th percentile per-packet one-way delay: 716.737 ms

Loss rate: 0.80%

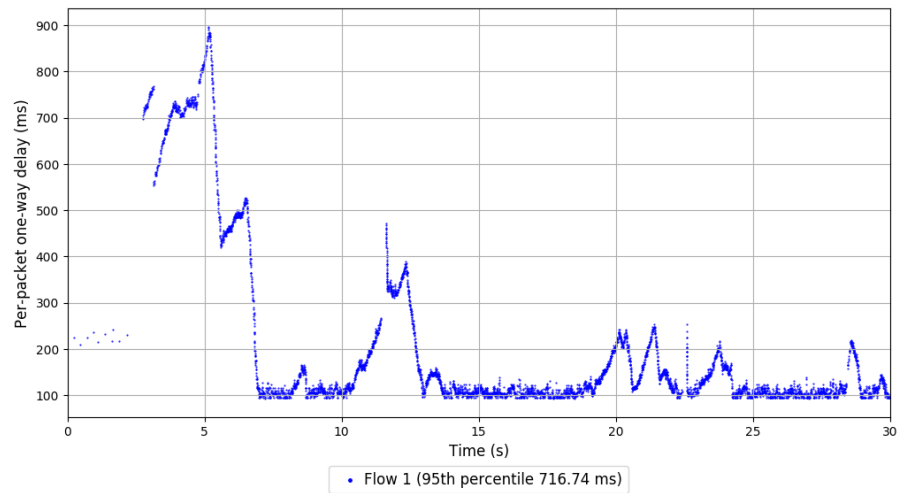
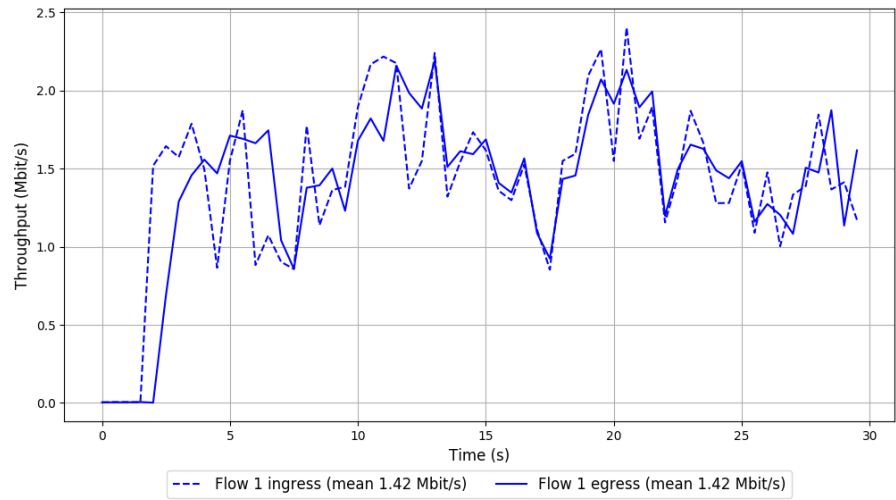
-- Flow 1:

Average throughput: 1.42 Mbit/s

95th percentile per-packet one-way delay: 716.737 ms

Loss rate: 0.80%

### Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2018-04-16 21:47:40  
End at: 2018-04-16 21:48:10  
Local clock offset: -7.879 ms  
Remote clock offset: 12.096 ms

Run 1: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of PCC-Expr

Start at: 2018-04-16 22:07:47

End at: 2018-04-16 22:08:17

Local clock offset: -6.732 ms

Remote clock offset: 5.829 ms



Run 2: Report of PCC-Expr — Data Link

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Figure is missing

Run 3: Statistics of PCC-Expr

Start at: 2018-04-16 22:27:52

End at: 2018-04-16 22:28:22

Local clock offset: -6.846 ms

Remote clock offset: 12.567 ms

### Run 3: Report of PCC-Expr — Data Link

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