

Pantheon Report

Generated at 2018-03-05 19:49:31 (UTC).

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

Repeated the test of 17 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).

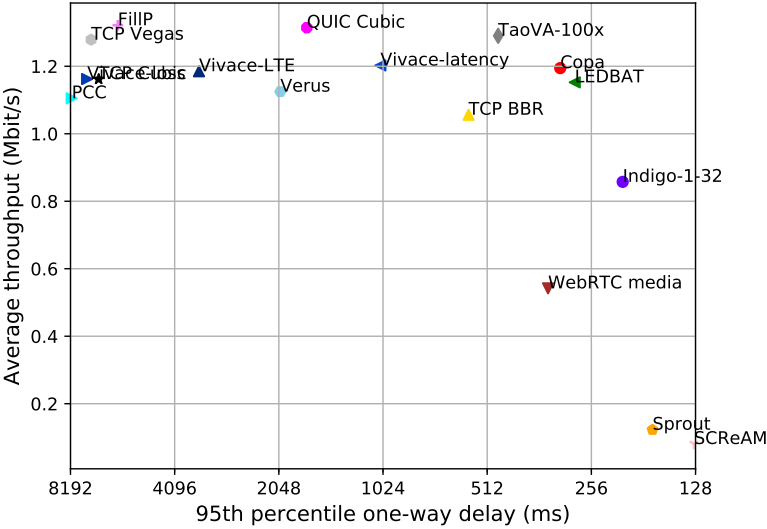
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

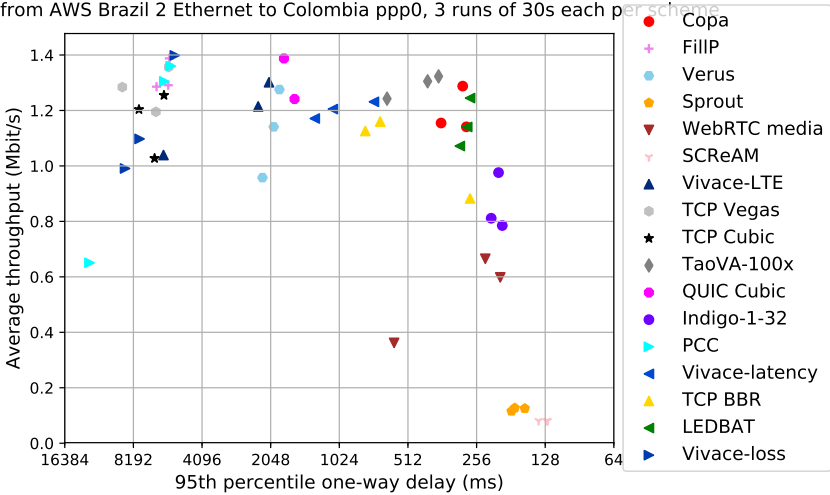
Git summary:

```
branch: master @ f12c42a2c63fdd9a862eefa0468859bf379b6623
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeab30b267cde681
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 @ a488197ddd041ace68a42849b2540ad834825f42
```

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	1.06	579.56	6.99
TCP Cubic	3	1.16	6792.49	24.13
LEDBAT	3	1.15	286.06	0.62
PCC	3	1.10	8124.86	86.10
QUIC Cubic	2	1.31	1700.23	5.69
SCReAM	3	0.08	129.26	0.13
WebRTC media	3	0.54	341.59	0.21
Sprout	3	0.13	170.46	0.23
TaoVA-100x	3	1.29	475.96	0.66
TCP Vegas	3	1.28	7141.07	27.43
Verus	3	1.13	2028.82	5.05
Copa	3	1.19	314.93	0.21
FillP	3	1.32	5980.97	96.00
Indigo-1-32	3	0.86	207.85	0.19
Vivace-latency	3	1.20	1042.31	1.28
Vivace-loss	3	1.16	7331.56	38.69
Vivace-LTE	3	1.18	3484.11	12.75

Run 1: Statistics of TCP BBR

Start at: 2018-03-05 18:58:06

End at: 2018-03-05 18:58:36

Local clock offset: -7.737 ms

Remote clock offset: -6.384 ms

Below is generated by plot.py at 2018-03-05 19:48:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.13 Mbit/s

95th percentile per-packet one-way delay: 787.420 ms

Loss rate: 1.37%

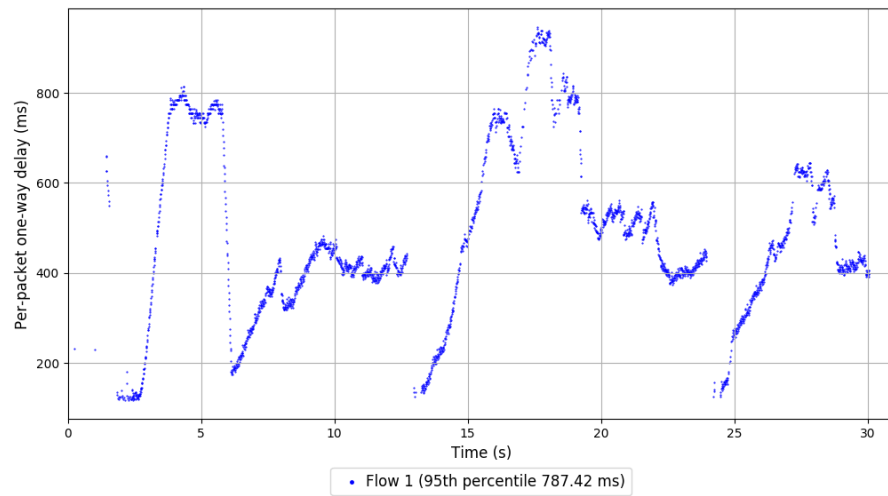
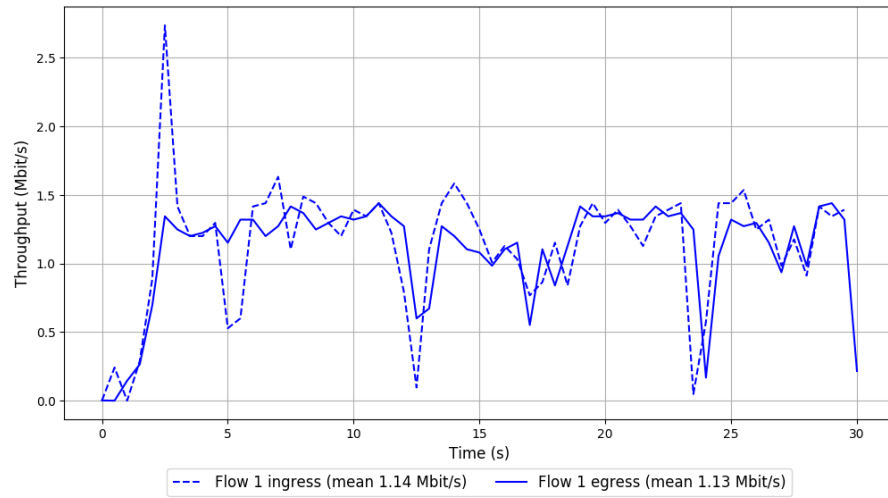
-- Flow 1:

Average throughput: 1.13 Mbit/s

95th percentile per-packet one-way delay: 787.420 ms

Loss rate: 1.37%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-03-05 19:19:12

End at: 2018-03-05 19:19:42

Local clock offset: -7.988 ms

Remote clock offset: -5.49 ms

Below is generated by plot.py at 2018-03-05 19:48:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 677.815 ms

Loss rate: 1.54%

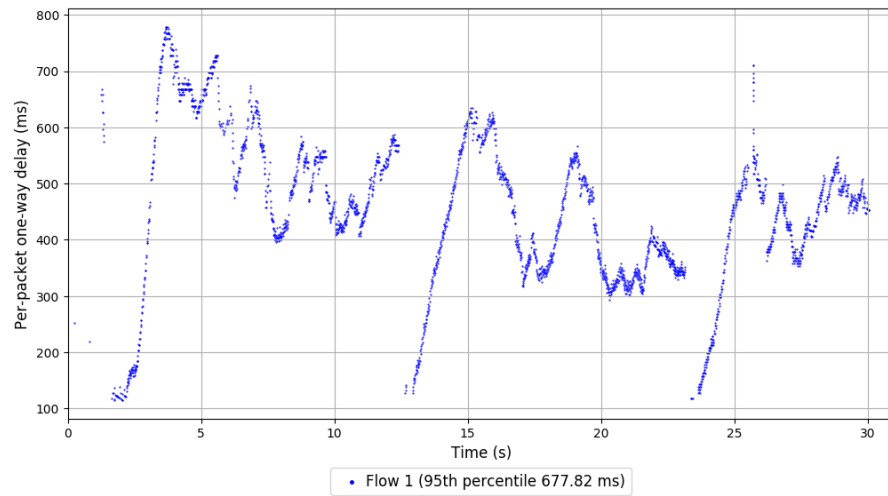
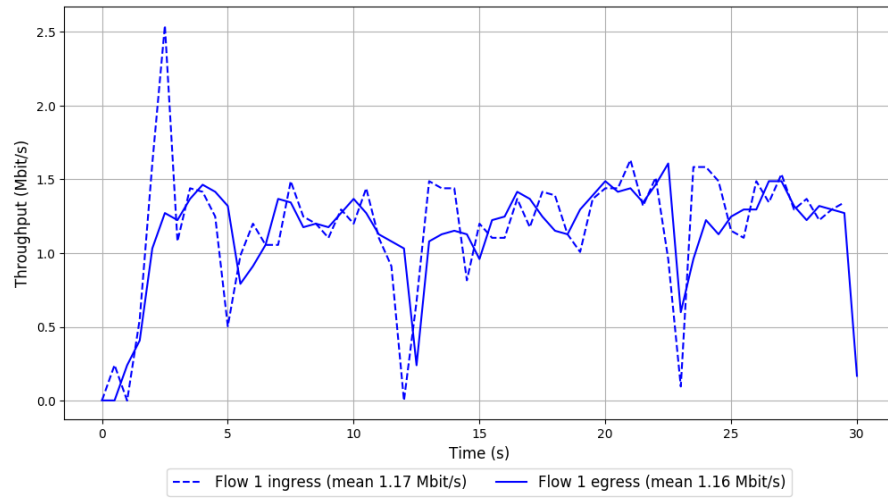
-- Flow 1:

Average throughput: 1.16 Mbit/s

95th percentile per-packet one-way delay: 677.815 ms

Loss rate: 1.54%

Run 2: Report of TCP BBR — Data Link

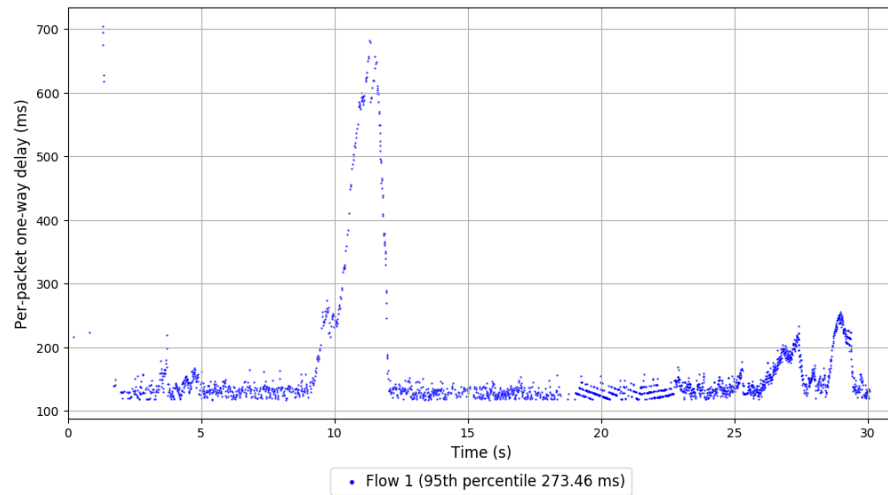
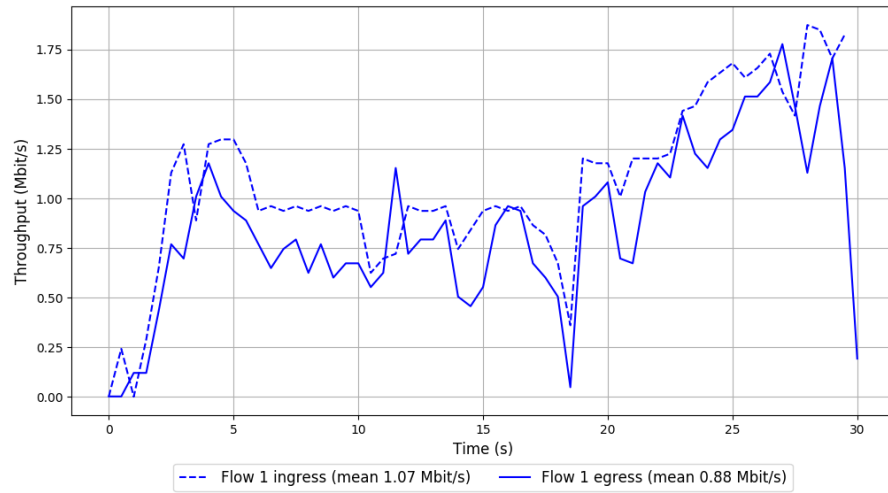


Run 3: Statistics of TCP BBR

Start at: 2018-03-05 19:40:18
End at: 2018-03-05 19:40:48
Local clock offset: -7.139 ms
Remote clock offset: -0.366 ms

Below is generated by plot.py at 2018-03-05 19:48:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 273.458 ms
Loss rate: 18.06%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 273.458 ms
Loss rate: 18.06%

Run 3: Report of TCP BBR — Data Link

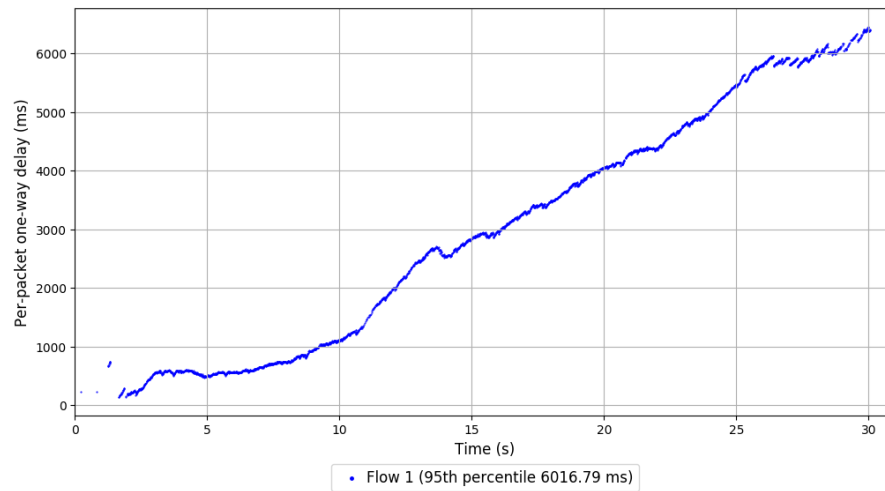
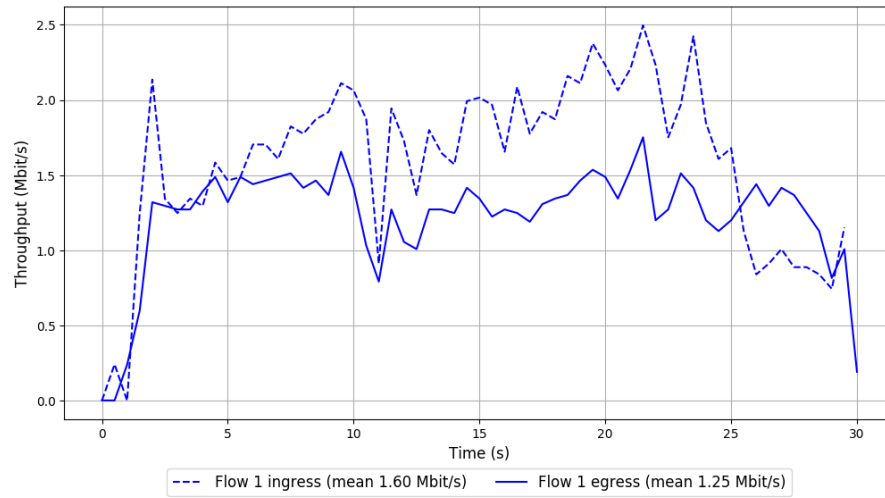


Run 1: Statistics of TCP Cubic

Start at: 2018-03-05 18:47:35
End at: 2018-03-05 18:48:05
Local clock offset: -8.287 ms
Remote clock offset: -0.754 ms

Below is generated by plot.py at 2018-03-05 19:48:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 6016.788 ms
Loss rate: 21.75%
-- Flow 1:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 6016.788 ms
Loss rate: 21.75%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-03-05 19:08:40

End at: 2018-03-05 19:09:10

Local clock offset: -7.689 ms

Remote clock offset: -5.53 ms

Below is generated by plot.py at 2018-03-05 19:48:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.20 Mbit/s

95th percentile per-packet one-way delay: 7745.550 ms

Loss rate: 23.25%

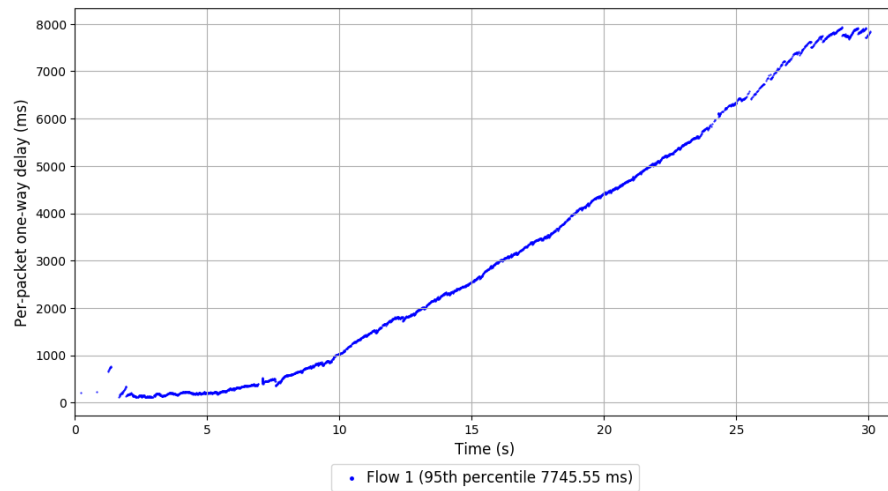
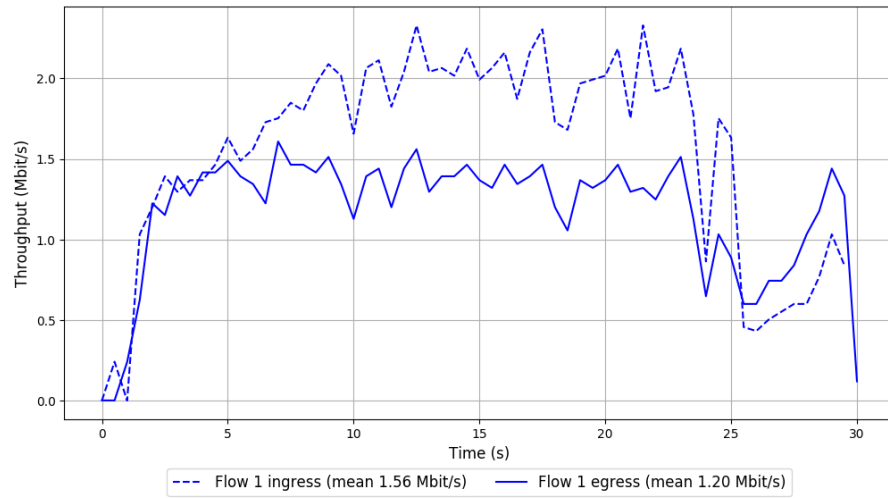
-- Flow 1:

Average throughput: 1.20 Mbit/s

95th percentile per-packet one-way delay: 7745.550 ms

Loss rate: 23.25%

Run 2: Report of TCP Cubic — Data Link

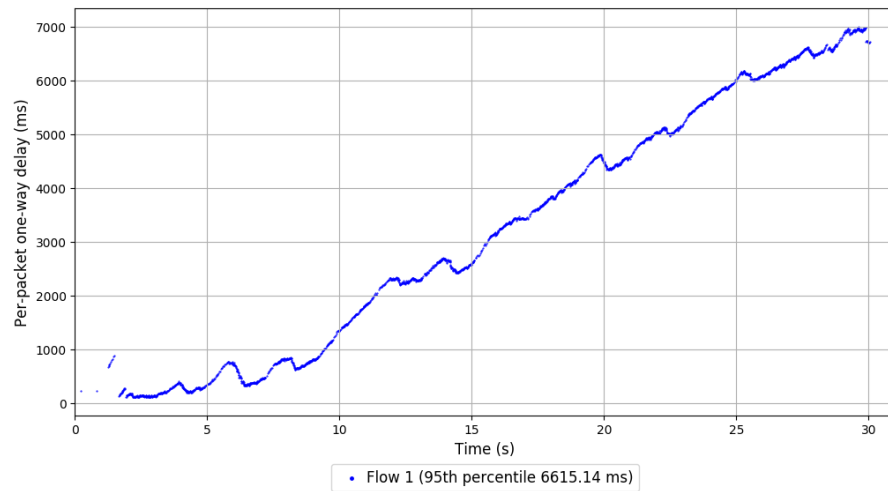
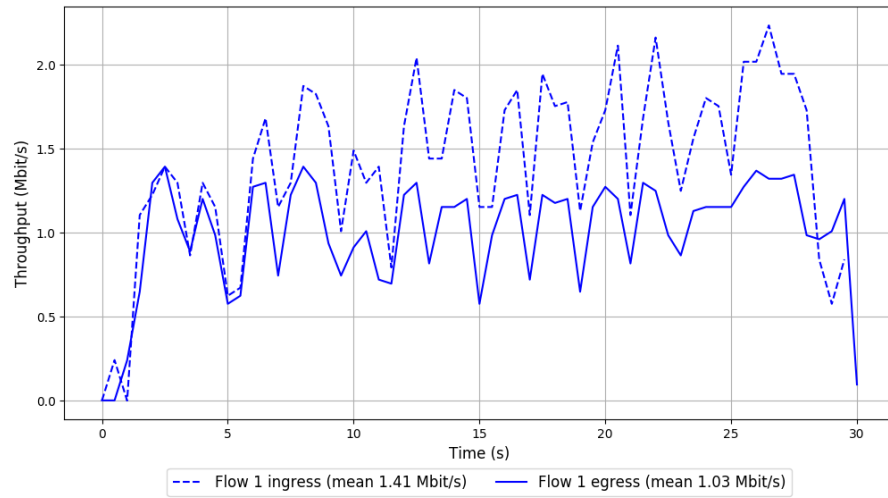


Run 3: Statistics of TCP Cubic

Start at: 2018-03-05 19:29:46
End at: 2018-03-05 19:30:16
Local clock offset: -7.428 ms
Remote clock offset: -6.114 ms

Below is generated by plot.py at 2018-03-05 19:48:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 6615.139 ms
Loss rate: 27.38%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 6615.139 ms
Loss rate: 27.38%

Run 3: Report of TCP Cubic — Data Link

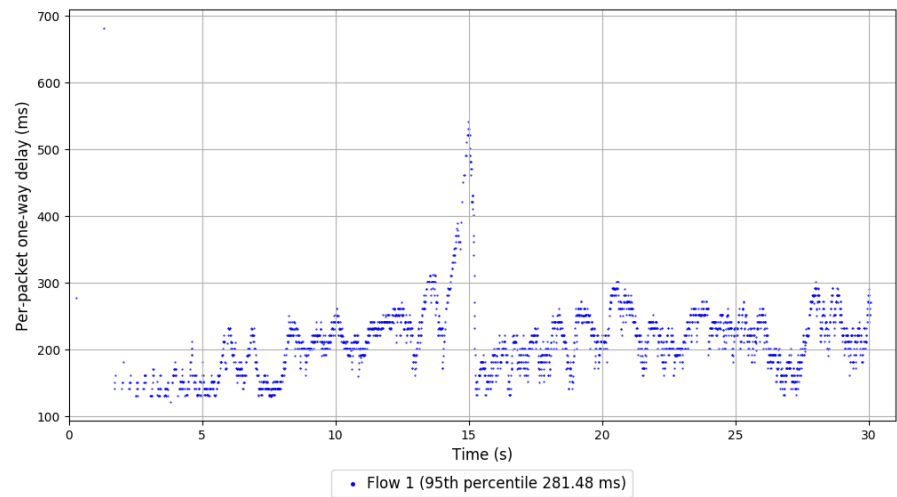
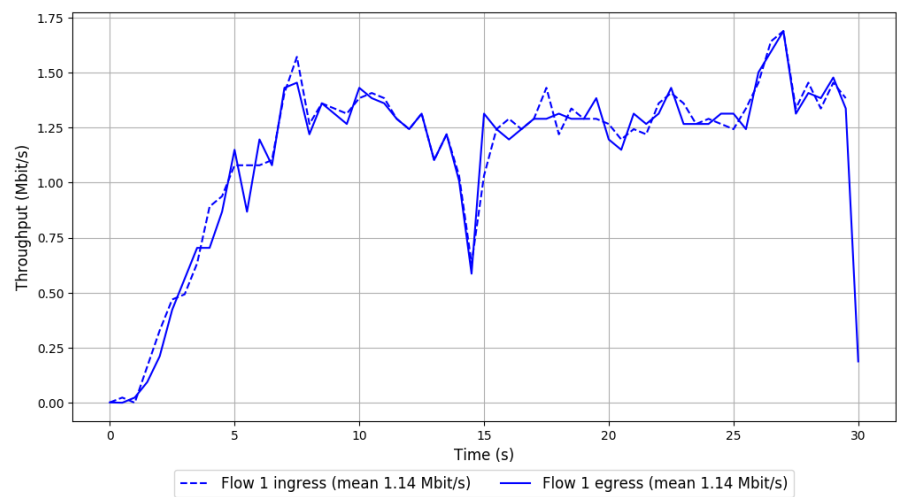


Run 1: Statistics of LEDBAT

Start at: 2018-03-05 18:49:55
End at: 2018-03-05 18:50:25
Local clock offset: -8.269 ms
Remote clock offset: -0.781 ms

Below is generated by plot.py at 2018-03-05 19:48:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 281.483 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 281.483 ms
Loss rate: 0.69%

Run 1: Report of LEDBAT — Data Link

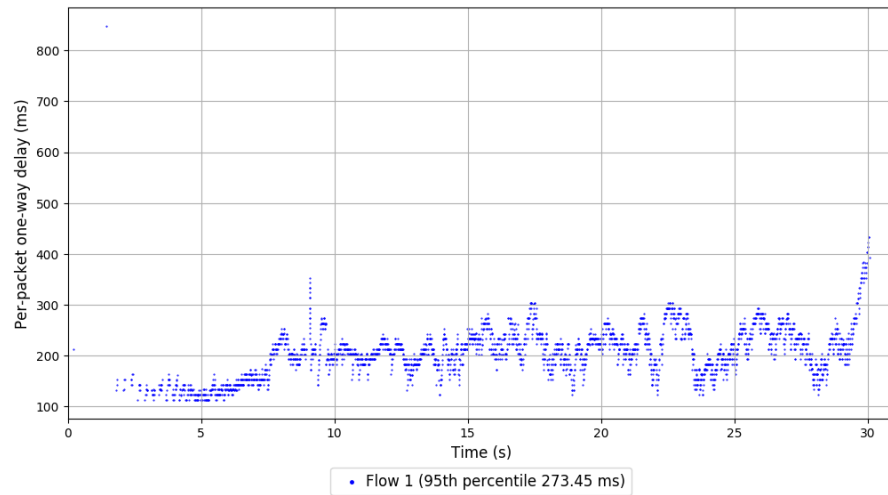
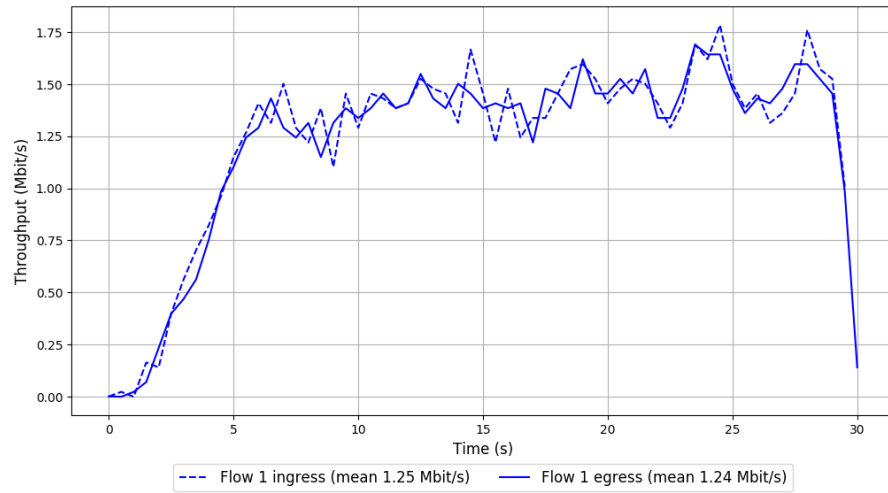


Run 2: Statistics of LEDBAT

Start at: 2018-03-05 19:11:00
End at: 2018-03-05 19:11:30
Local clock offset: -7.761 ms
Remote clock offset: -5.379 ms

Below is generated by plot.py at 2018-03-05 19:48:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 273.450 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 273.450 ms
Loss rate: 0.81%

Run 2: Report of LEDBAT — Data Link

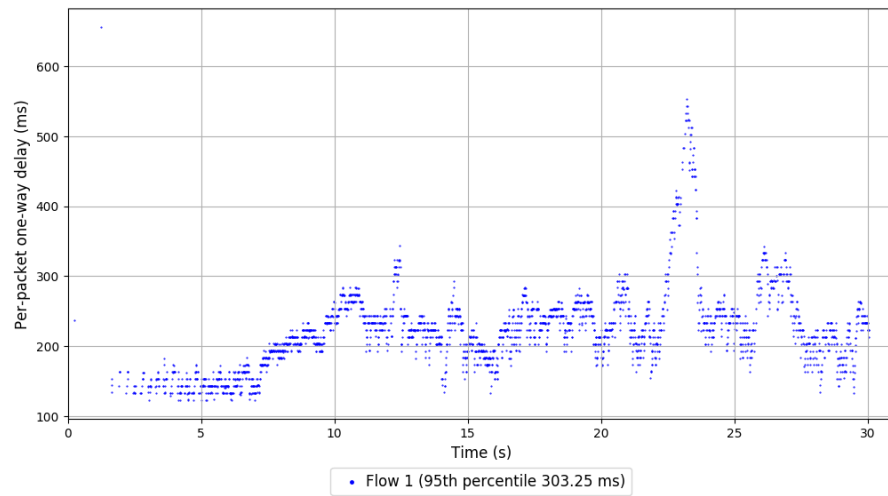
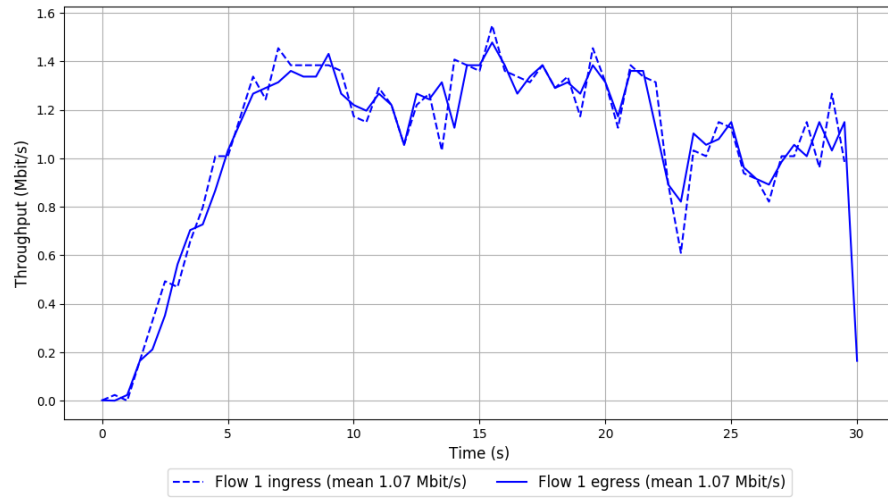


Run 3: Statistics of LEDBAT

Start at: 2018-03-05 19:32:06
End at: 2018-03-05 19:32:36
Local clock offset: -7.316 ms
Remote clock offset: -0.434 ms

Below is generated by plot.py at 2018-03-05 19:48:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 303.255 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 303.255 ms
Loss rate: 0.37%

Run 3: Report of LEDBAT — Data Link

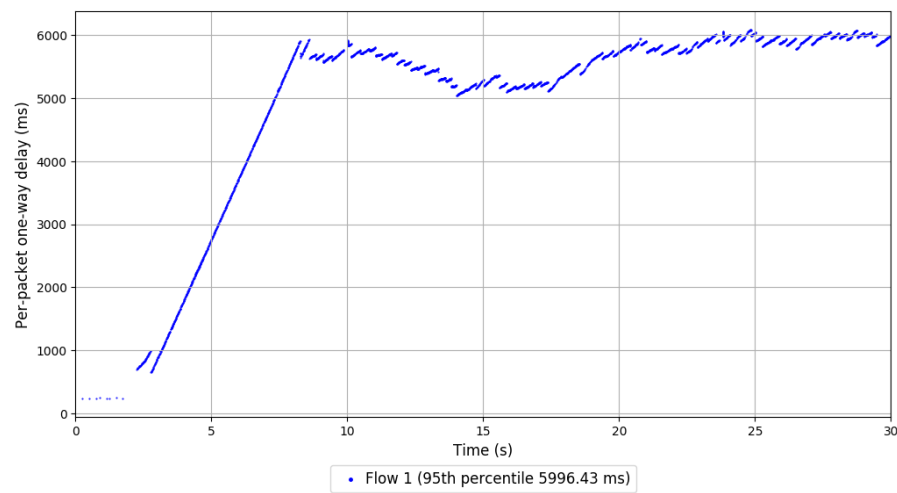
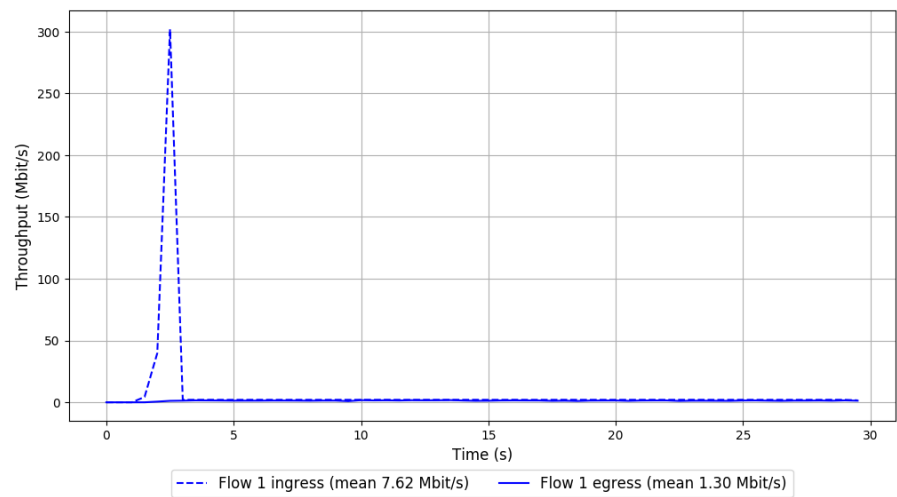


Run 1: Statistics of PCC

Start at: 2018-03-05 18:55:45
End at: 2018-03-05 18:56:15
Local clock offset: -7.805 ms
Remote clock offset: -0.701 ms

Below is generated by plot.py at 2018-03-05 19:49:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 5996.431 ms
Loss rate: 82.96%
-- Flow 1:
Average throughput: 1.30 Mbit/s
95th percentile per-packet one-way delay: 5996.431 ms
Loss rate: 82.96%

Run 1: Report of PCC — Data Link

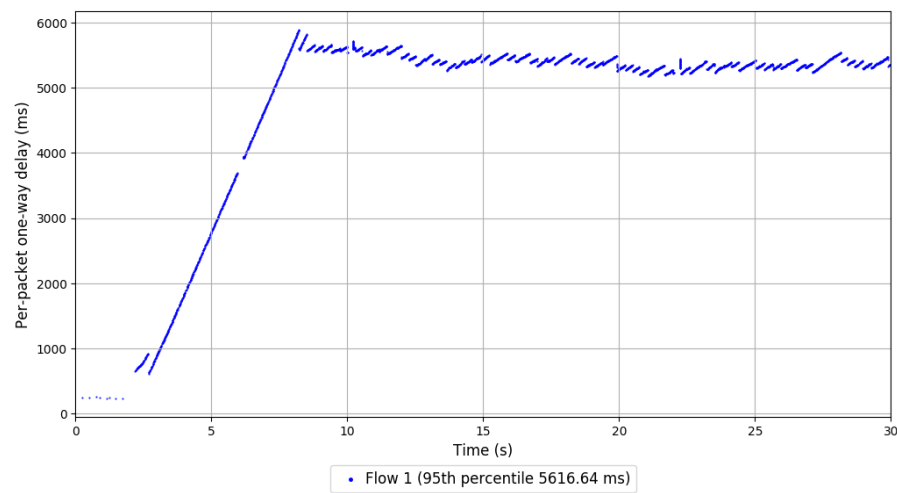
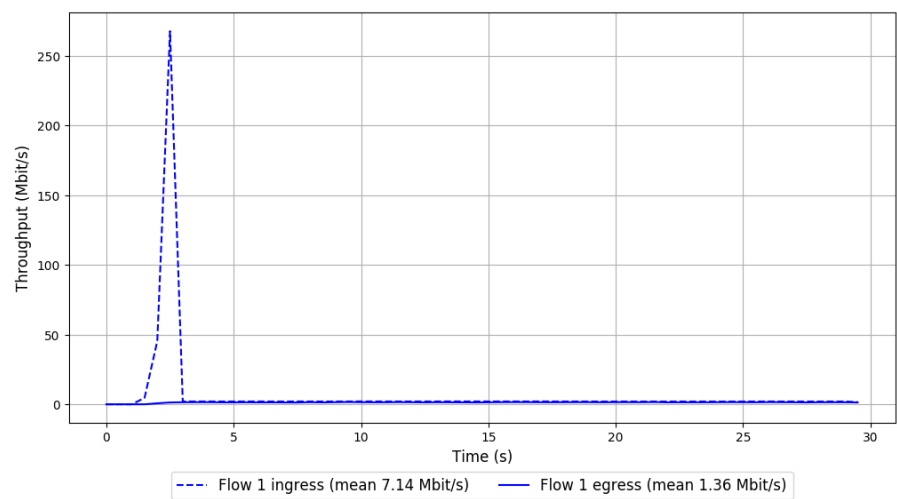


Run 2: Statistics of PCC

Start at: 2018-03-05 19:16:51
End at: 2018-03-05 19:17:21
Local clock offset: -7.906 ms
Remote clock offset: -5.485 ms

Below is generated by plot.py at 2018-03-05 19:49:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 5616.640 ms
Loss rate: 81.06%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 5616.640 ms
Loss rate: 81.06%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-03-05 19:37:57

End at: 2018-03-05 19:38:27

Local clock offset: -7.141 ms

Remote clock offset: -6.13 ms

Below is generated by plot.py at 2018-03-05 19:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.65 Mbit/s

95th percentile per-packet one-way delay: 12761.501 ms

Loss rate: 94.27%

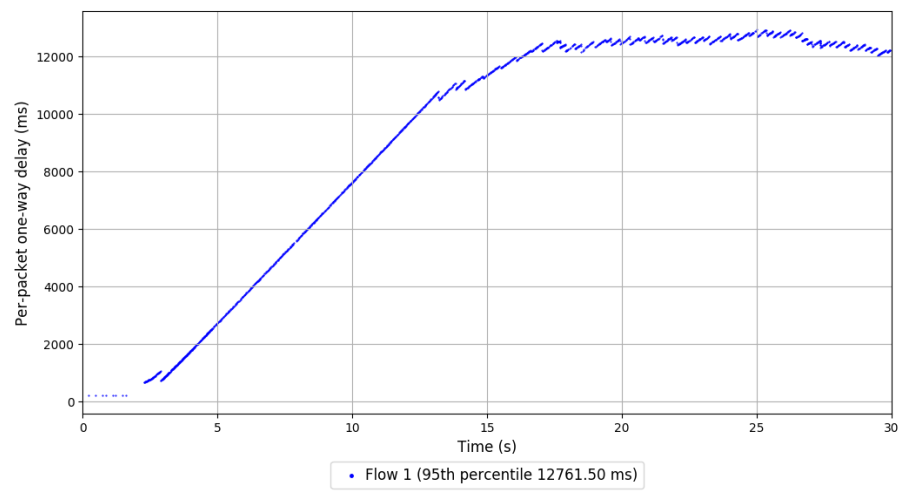
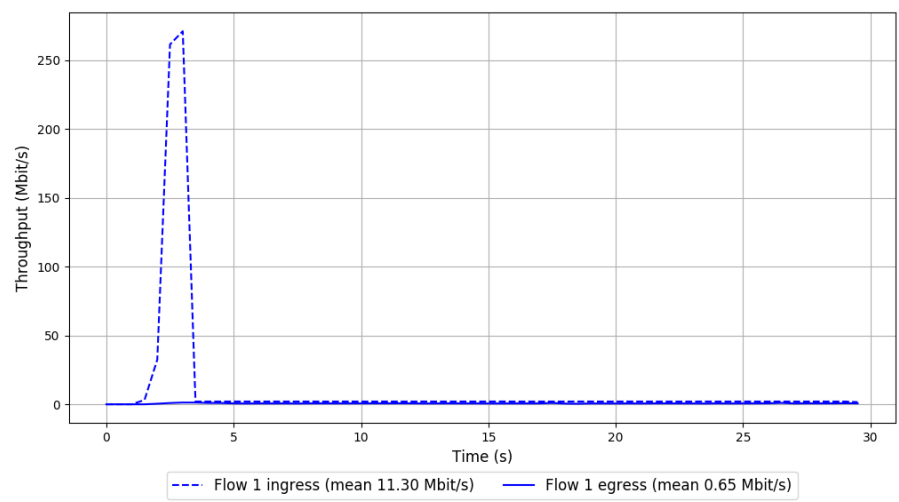
-- Flow 1:

Average throughput: 0.65 Mbit/s

95th percentile per-packet one-way delay: 12761.501 ms

Loss rate: 94.27%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

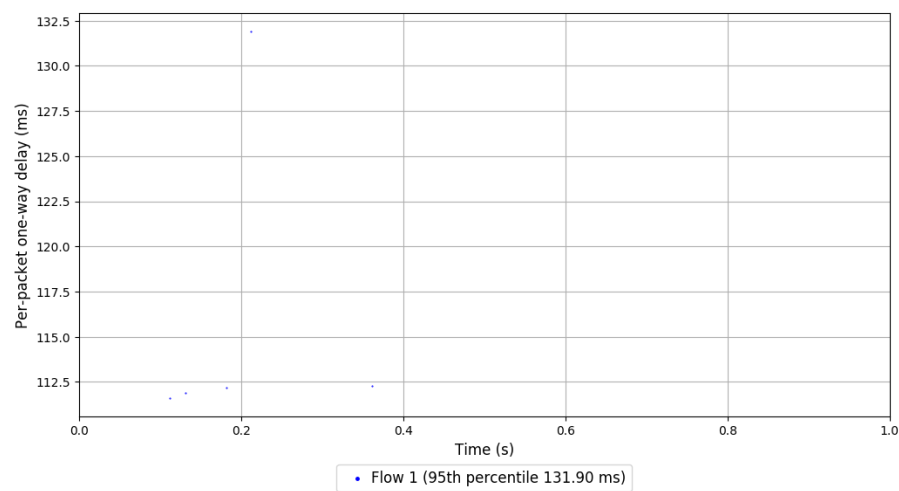
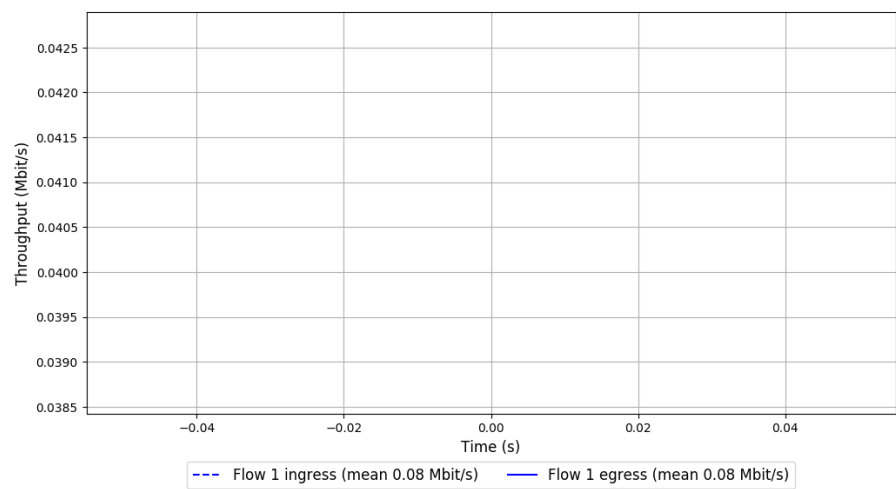
Start at: 2018-03-05 18:54:36

End at: 2018-03-05 18:55:06

Local clock offset: -7.899 ms

Remote clock offset: -5.58 ms

Run 1: Report of QUIC Cubic — Data Link

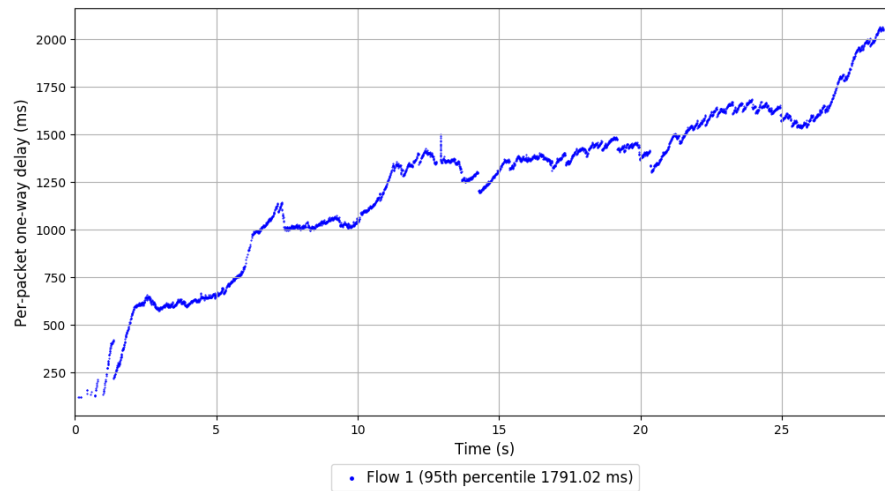
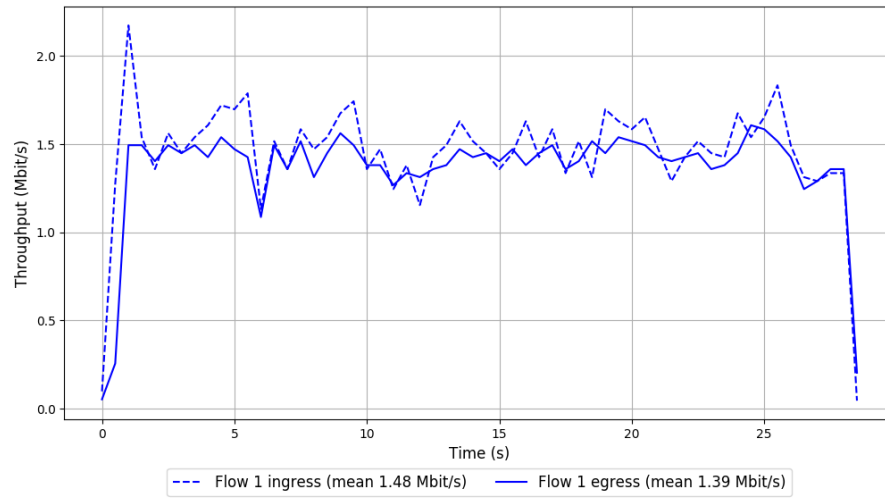


Run 2: Statistics of QUIC Cubic

Start at: 2018-03-05 19:15:41
End at: 2018-03-05 19:16:11
Local clock offset: -7.82 ms
Remote clock offset: -0.615 ms

Below is generated by plot.py at 2018-03-05 19:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 1791.024 ms
Loss rate: 6.21%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 1791.024 ms
Loss rate: 6.21%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-03-05 19:36:47

End at: 2018-03-05 19:37:17

Local clock offset: -7.175 ms

Remote clock offset: -1.25 ms

Below is generated by plot.py at 2018-03-05 19:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 1609.442 ms

Loss rate: 5.17%

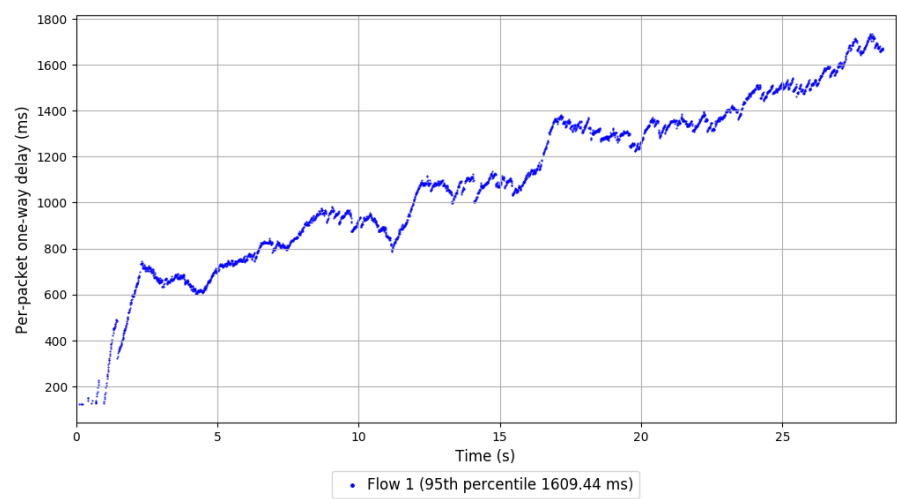
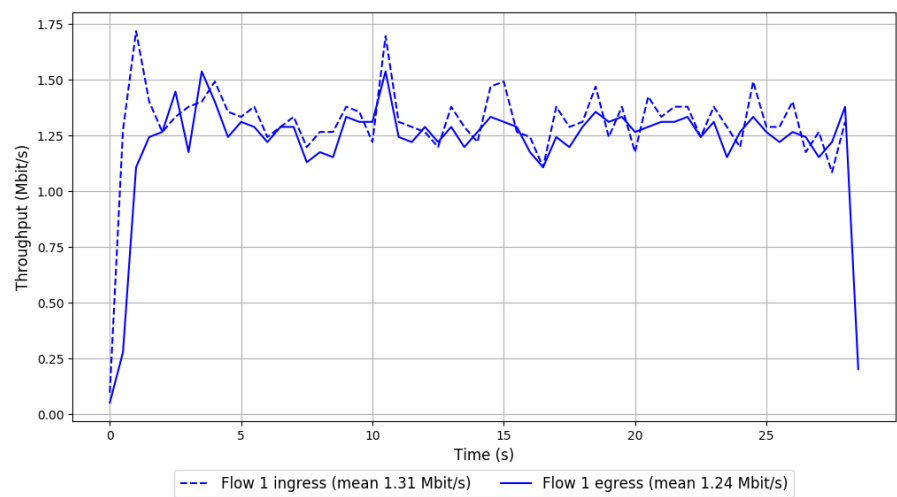
-- Flow 1:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 1609.442 ms

Loss rate: 5.17%

Run 3: Report of QUIC Cubic — Data Link

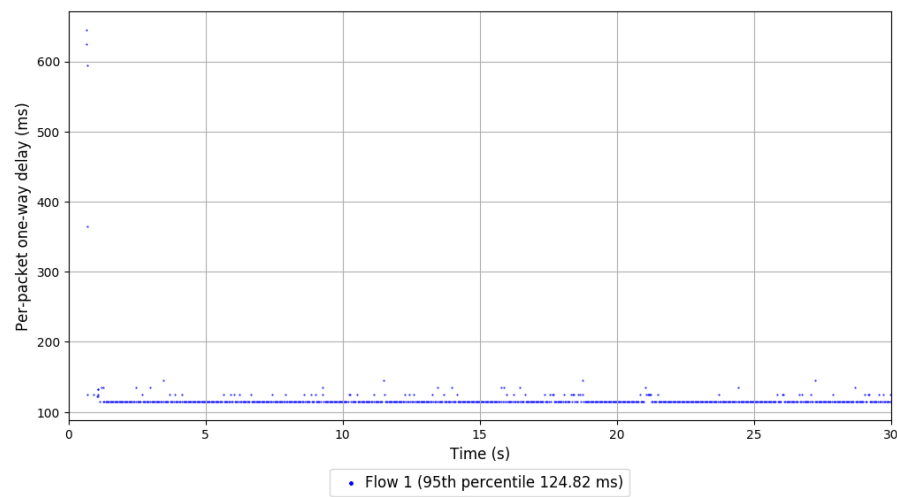
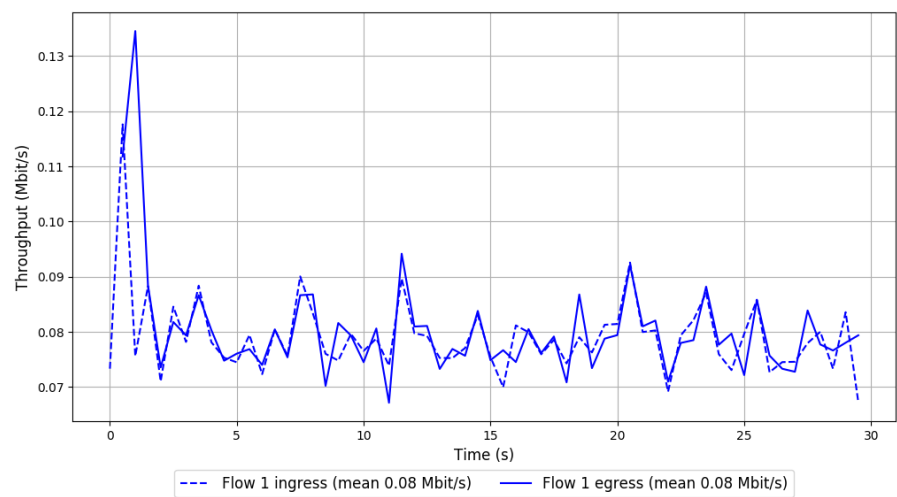


Run 1: Statistics of SCReAM

Start at: 2018-03-05 18:48:45
End at: 2018-03-05 18:49:15
Local clock offset: -8.466 ms
Remote clock offset: -0.679 ms

Below is generated by plot.py at 2018-03-05 19:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.819 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.819 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-03-05 19:09:50

End at: 2018-03-05 19:10:20

Local clock offset: -7.739 ms

Remote clock offset: 0.169 ms

Below is generated by plot.py at 2018-03-05 19:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 136.807 ms

Loss rate: 0.13%

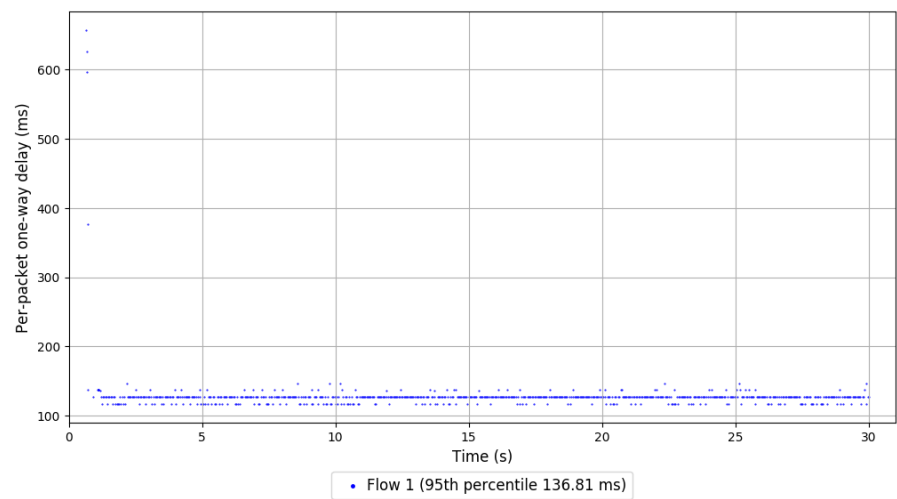
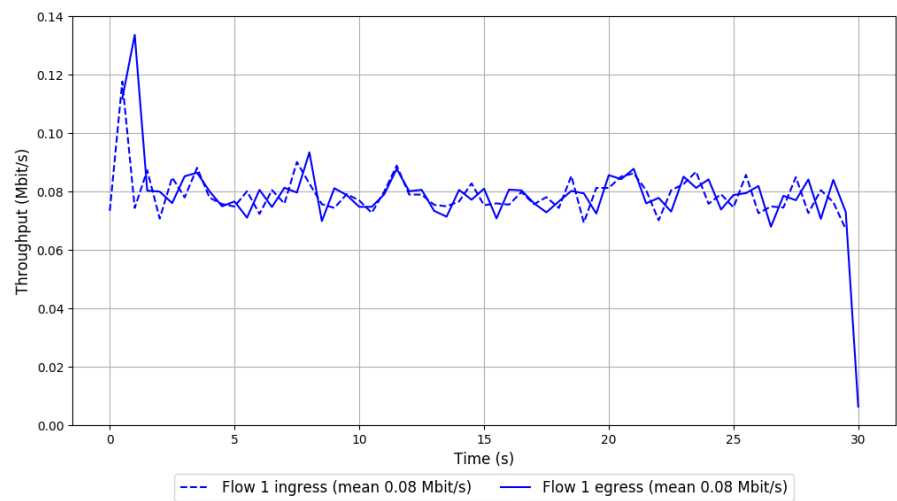
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 136.807 ms

Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

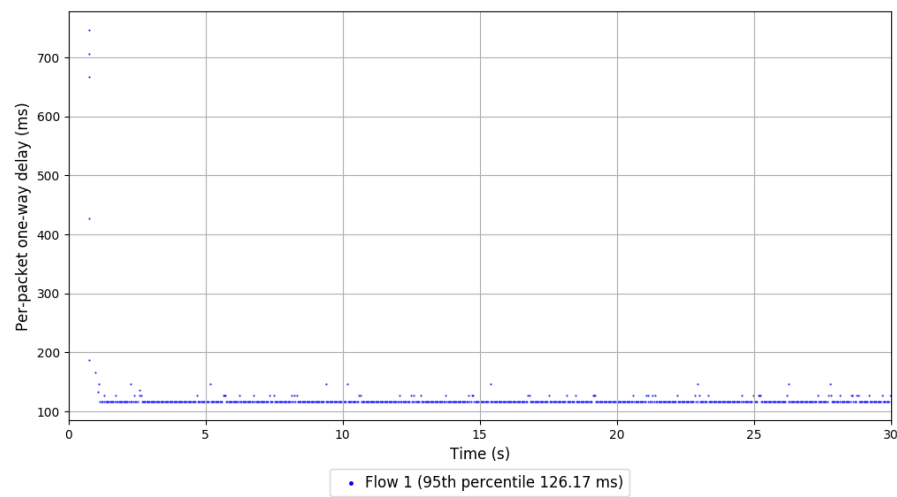
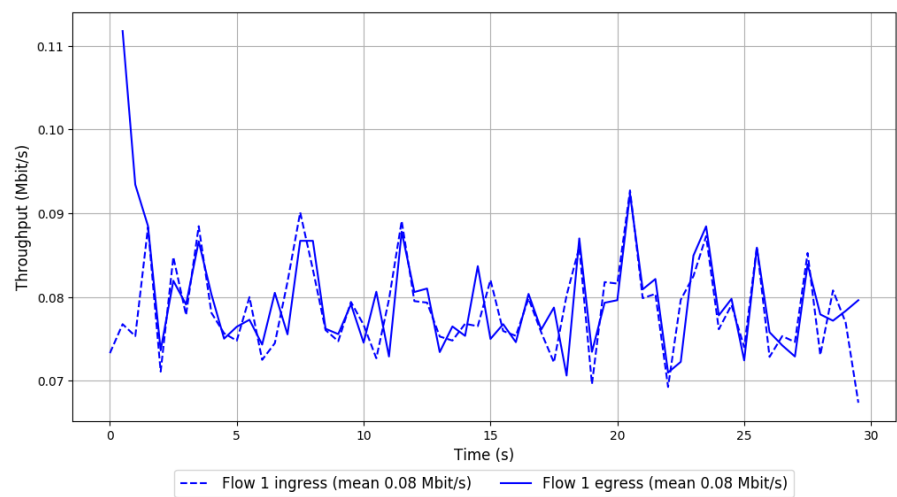


Run 3: Statistics of SCReAM

Start at: 2018-03-05 19:30:56
End at: 2018-03-05 19:31:26
Local clock offset: -7.424 ms
Remote clock offset: -0.507 ms

Below is generated by plot.py at 2018-03-05 19:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 126.166 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 126.166 ms
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

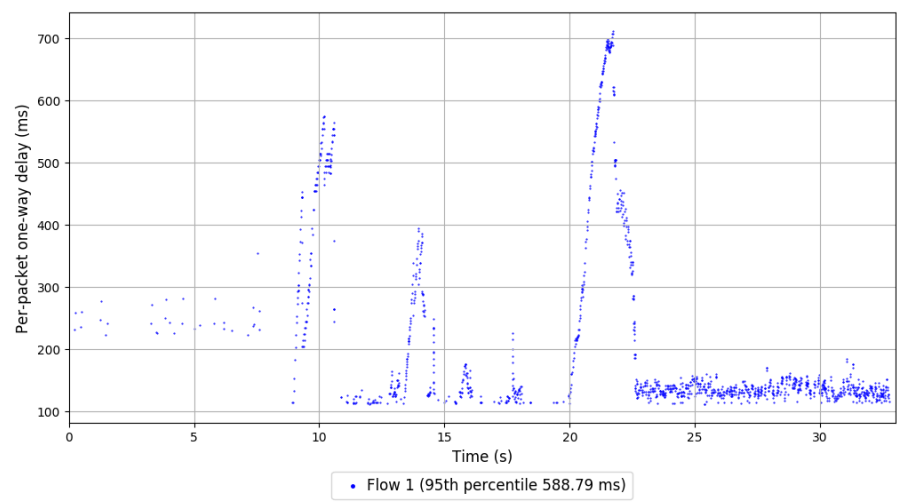
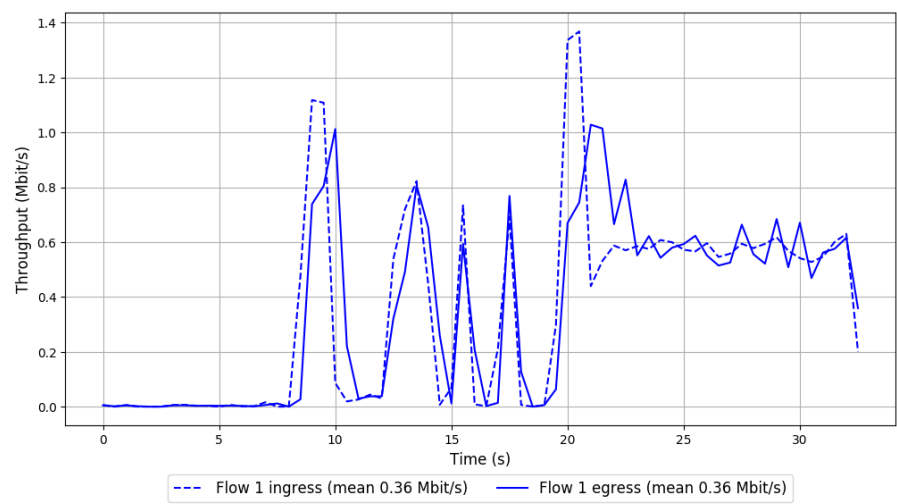


```
Run 1: Statistics of WebRTC media

Start at: 2018-03-05 19:00:27
End at: 2018-03-05 19:00:57
Local clock offset: -7.729 ms
Remote clock offset: -0.712 ms

# Below is generated by plot.py at 2018-03-05 19:49:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 588.791 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 588.791 ms
Loss rate: 0.15%
```

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-03-05 19:21:33

End at: 2018-03-05 19:22:03

Local clock offset: -7.989 ms

Remote clock offset: 0.231 ms

Below is generated by plot.py at 2018-03-05 19:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.67 Mbit/s

95th percentile per-packet one-way delay: 234.426 ms

Loss rate: 0.18%

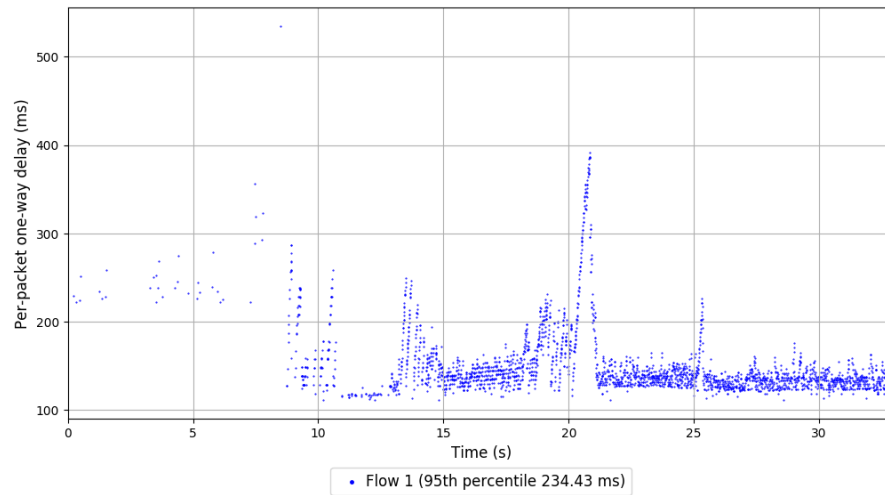
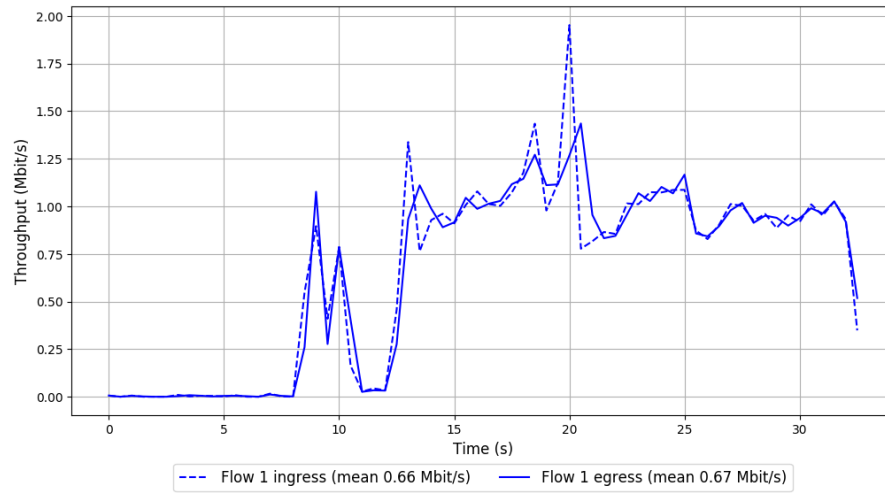
-- Flow 1:

Average throughput: 0.67 Mbit/s

95th percentile per-packet one-way delay: 234.426 ms

Loss rate: 0.18%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-03-05 19:42:38

End at: 2018-03-05 19:43:08

Local clock offset: -7.142 ms

Remote clock offset: -5.99 ms

Below is generated by plot.py at 2018-03-05 19:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 201.548 ms

Loss rate: 0.30%

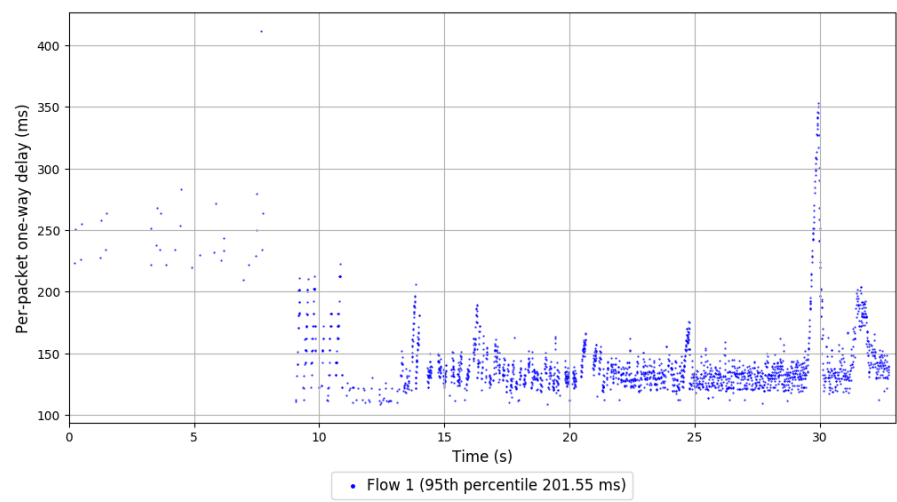
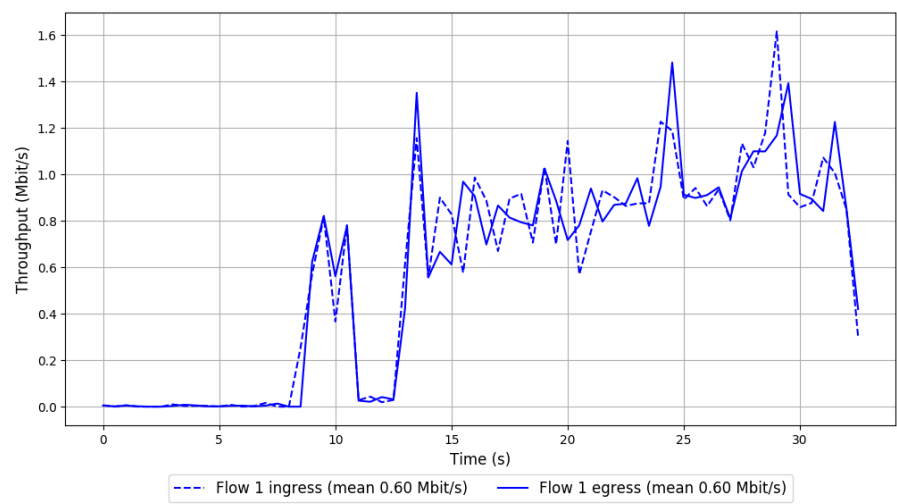
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 201.548 ms

Loss rate: 0.30%

Run 3: Report of WebRTC media — Data Link

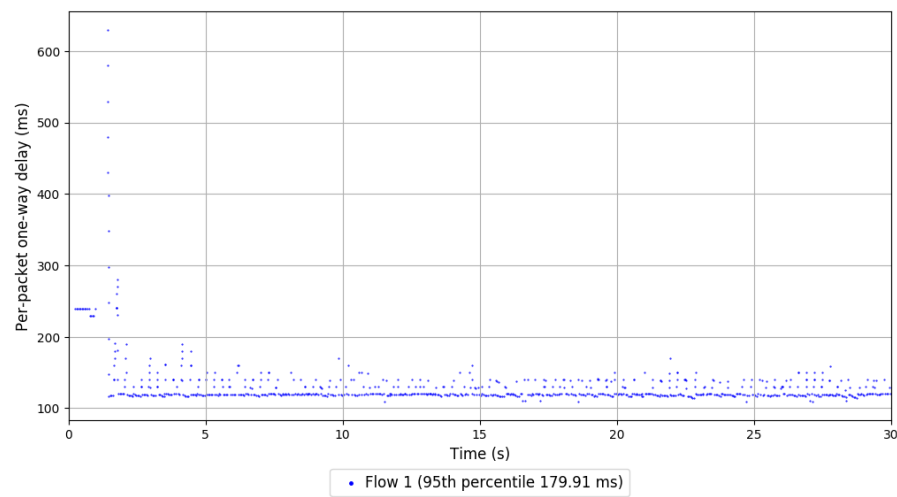
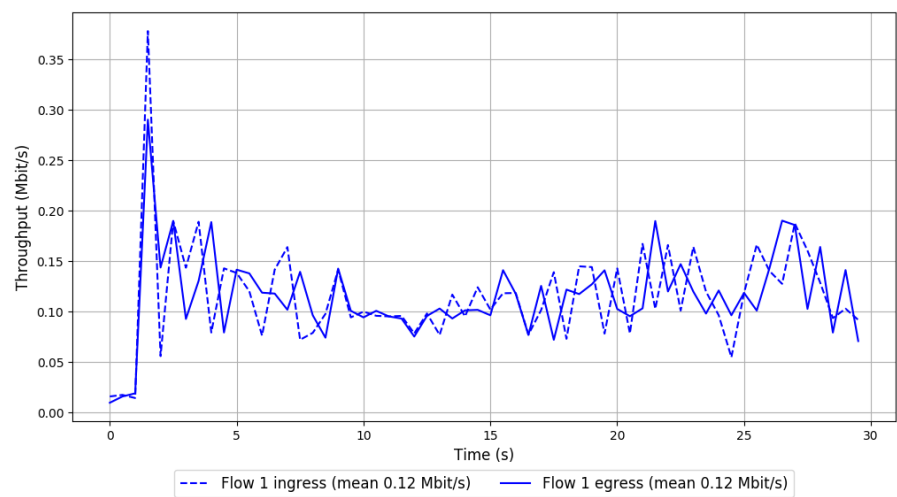


```
Run 1: Statistics of Sprout

Start at: 2018-03-05 18:56:56
End at: 2018-03-05 18:57:26
Local clock offset: -7.739 ms
Remote clock offset: 0.206 ms

# Below is generated by plot.py at 2018-03-05 19:49:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 179.911 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 179.911 ms
Loss rate: 0.35%
```

Run 1: Report of Sprout — Data Link

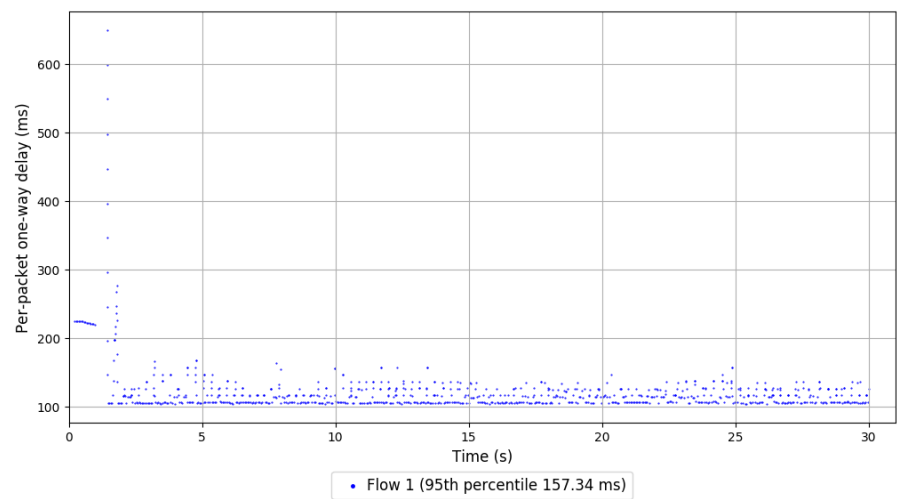
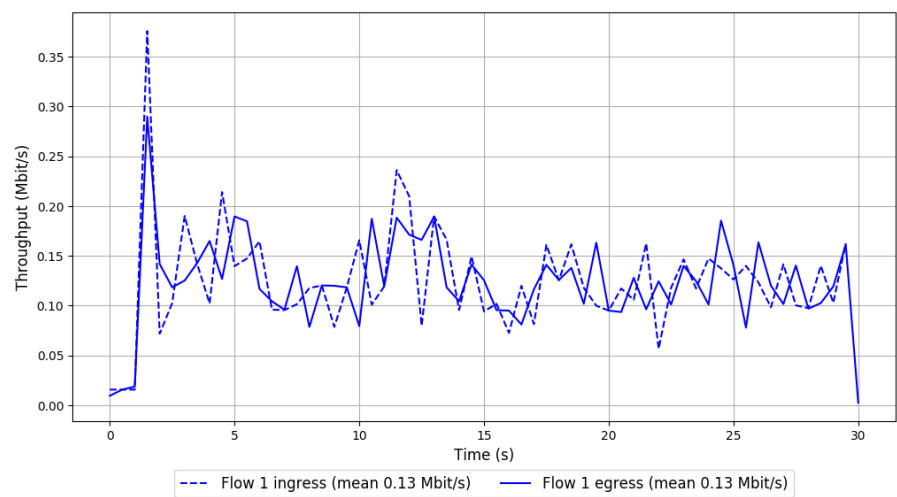


Run 2: Statistics of Sprout

Start at: 2018-03-05 19:18:01
End at: 2018-03-05 19:18:31
Local clock offset: -7.905 ms
Remote clock offset: -5.403 ms

Below is generated by plot.py at 2018-03-05 19:49:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 157.340 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 157.340 ms
Loss rate: 0.32%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2018-03-05 19:39:07

End at: 2018-03-05 19:39:37

Local clock offset: -7.13 ms

Remote clock offset: 0.521 ms

Below is generated by plot.py at 2018-03-05 19:49:05

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 174.129 ms

Loss rate: 0.02%

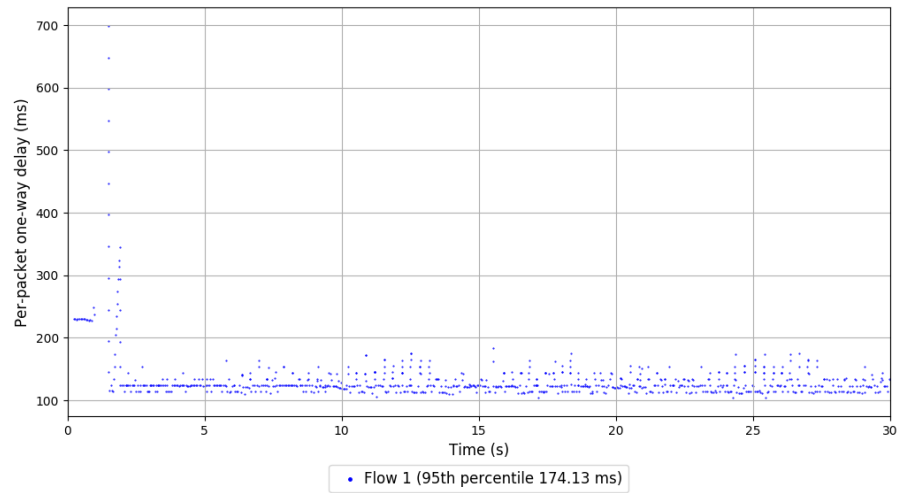
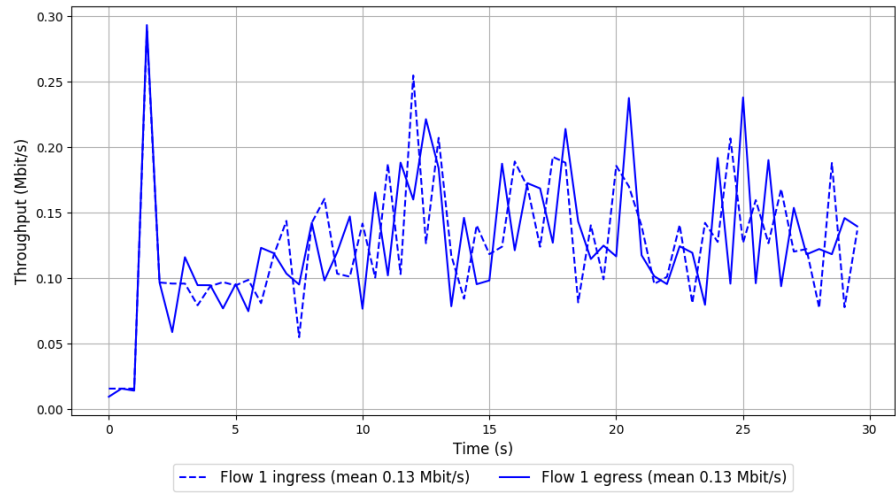
-- Flow 1:

Average throughput: 0.13 Mbit/s

95th percentile per-packet one-way delay: 174.129 ms

Loss rate: 0.02%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-03-05 19:02:47

End at: 2018-03-05 19:03:17

Local clock offset: -7.671 ms

Remote clock offset: -0.828 ms

Below is generated by plot.py at 2018-03-05 19:49:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 632.275 ms

Loss rate: 0.90%

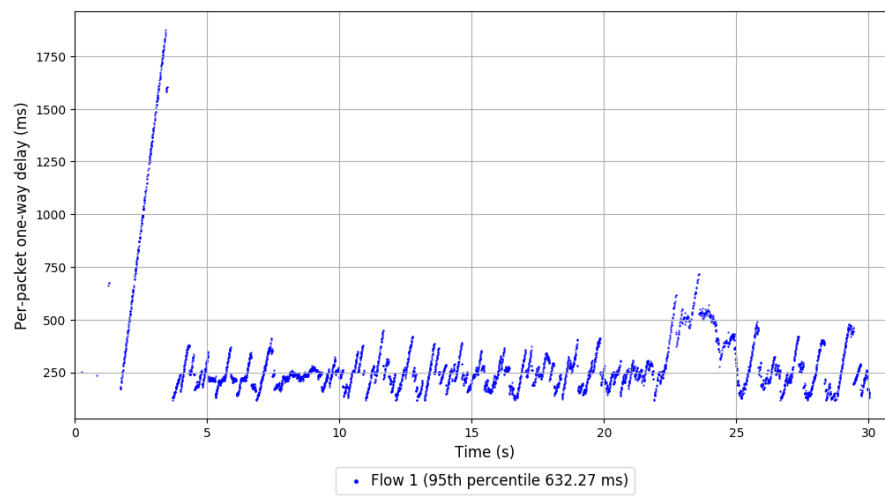
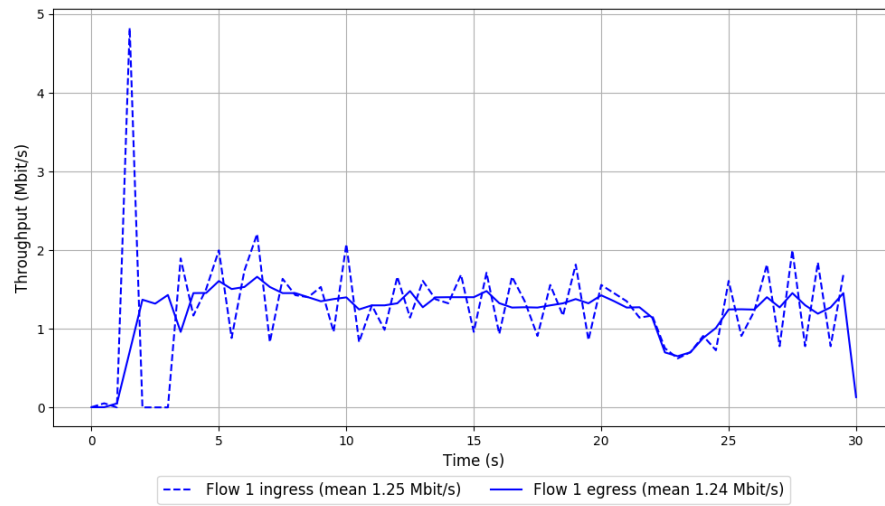
-- Flow 1:

Average throughput: 1.24 Mbit/s

95th percentile per-packet one-way delay: 632.275 ms

Loss rate: 0.90%

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-03-05 19:23:54

End at: 2018-03-05 19:24:24

Local clock offset: -7.987 ms

Remote clock offset: -5.399 ms

Below is generated by plot.py at 2018-03-05 19:49:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.32 Mbit/s

95th percentile per-packet one-way delay: 375.824 ms

Loss rate: 0.39%

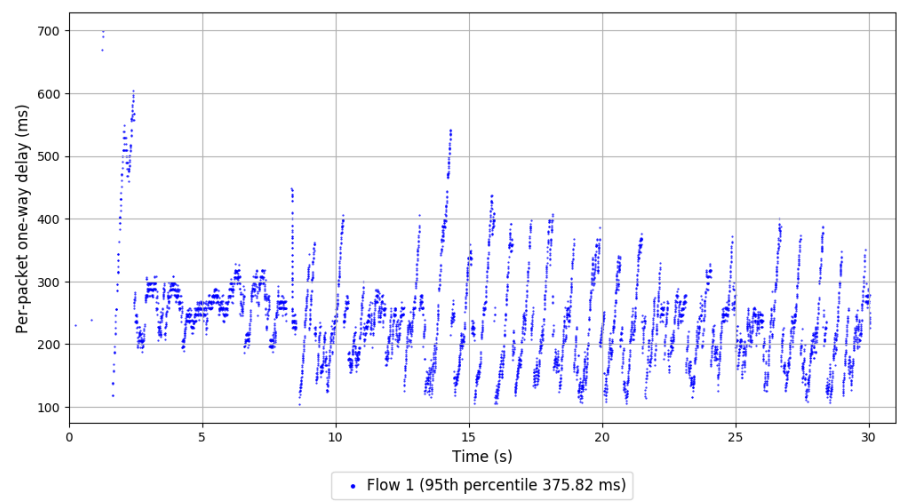
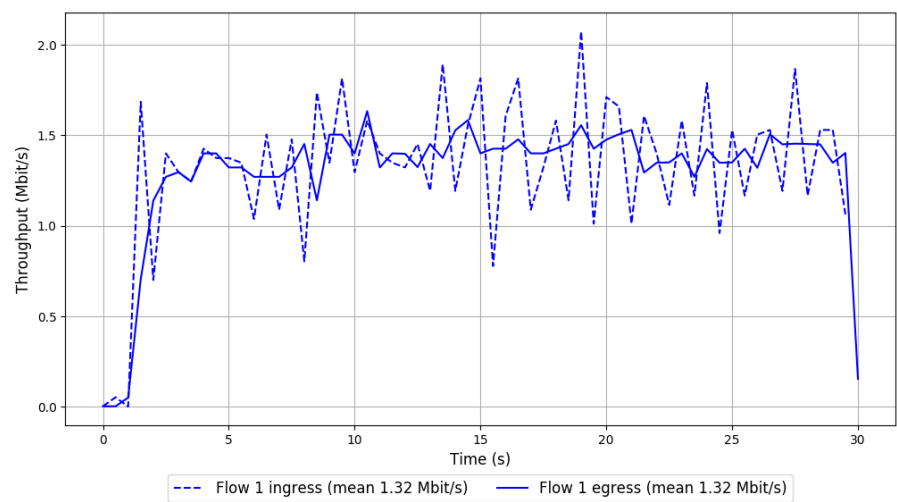
-- Flow 1:

Average throughput: 1.32 Mbit/s

95th percentile per-packet one-way delay: 375.824 ms

Loss rate: 0.39%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-03-05 19:44:59

End at: 2018-03-05 19:45:29

Local clock offset: -7.132 ms

Remote clock offset: 0.599 ms

Below is generated by plot.py at 2018-03-05 19:49:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.31 Mbit/s

95th percentile per-packet one-way delay: 419.772 ms

Loss rate: 0.69%

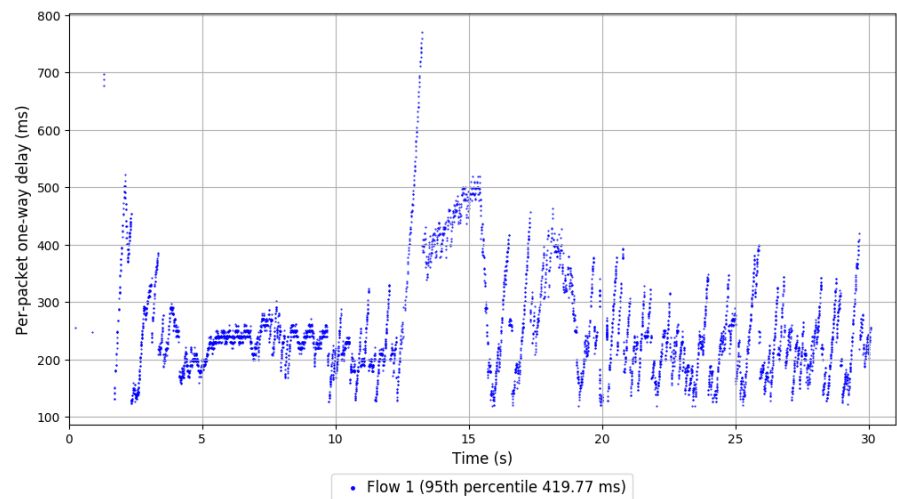
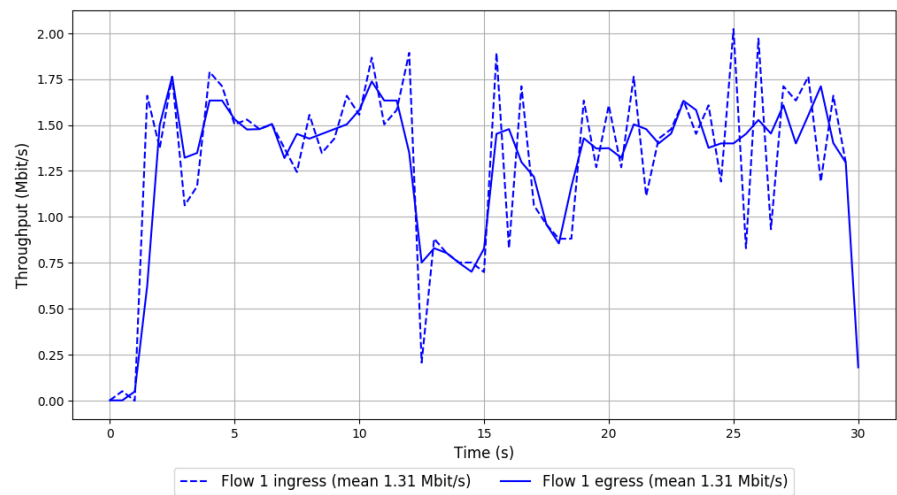
-- Flow 1:

Average throughput: 1.31 Mbit/s

95th percentile per-packet one-way delay: 419.772 ms

Loss rate: 0.69%

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

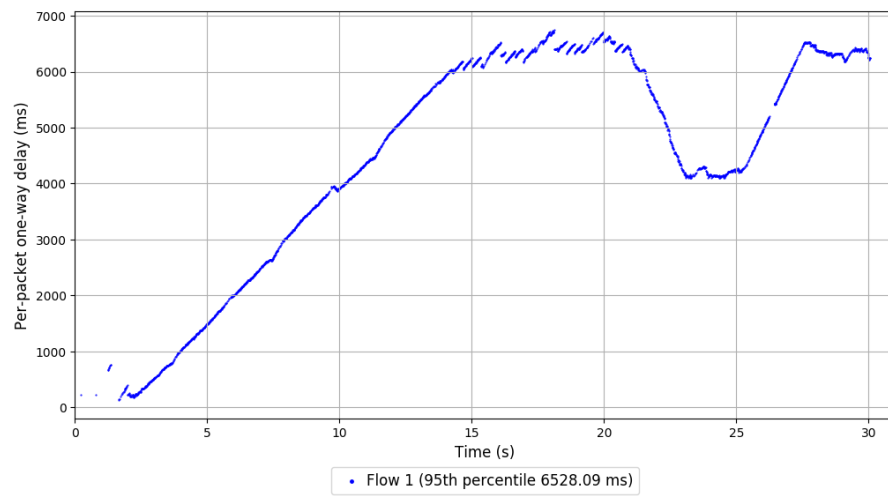
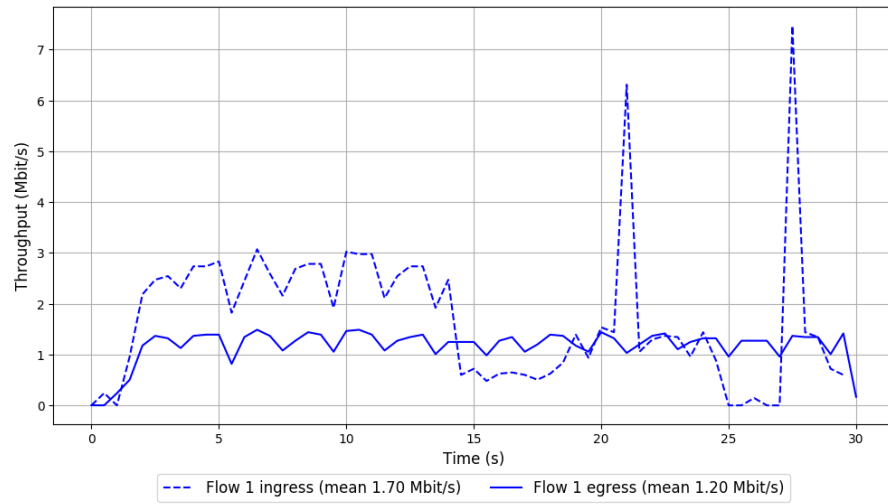


Run 1: Statistics of TCP Vegas

Start at: 2018-03-05 19:05:09
End at: 2018-03-05 19:05:39
Local clock offset: -7.681 ms
Remote clock offset: -6.429 ms

Below is generated by plot.py at 2018-03-05 19:49:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 6528.094 ms
Loss rate: 30.14%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 6528.094 ms
Loss rate: 30.14%

Run 1: Report of TCP Vegas — Data Link

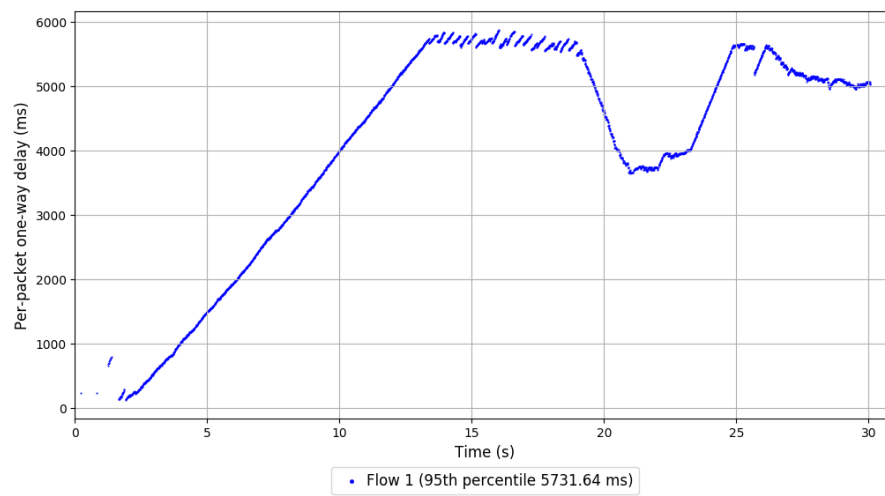
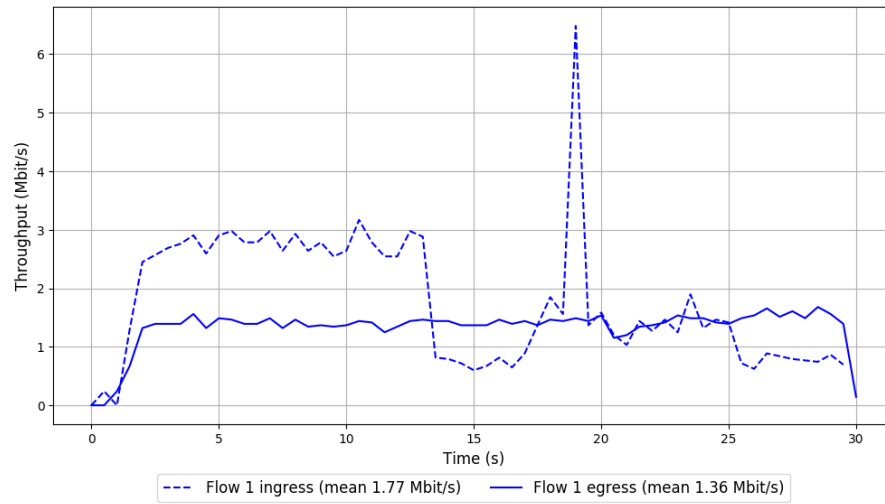


Run 2: Statistics of TCP Vegas

Start at: 2018-03-05 19:26:14
End at: 2018-03-05 19:26:44
Local clock offset: -7.659 ms
Remote clock offset: -5.295 ms

Below is generated by plot.py at 2018-03-05 19:49:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 5731.640 ms
Loss rate: 23.51%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 5731.640 ms
Loss rate: 23.51%

Run 2: Report of TCP Vegas — Data Link

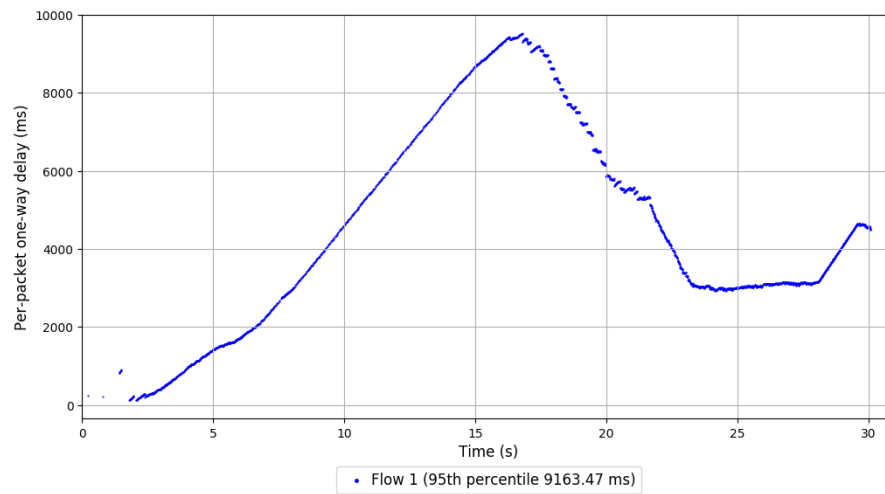
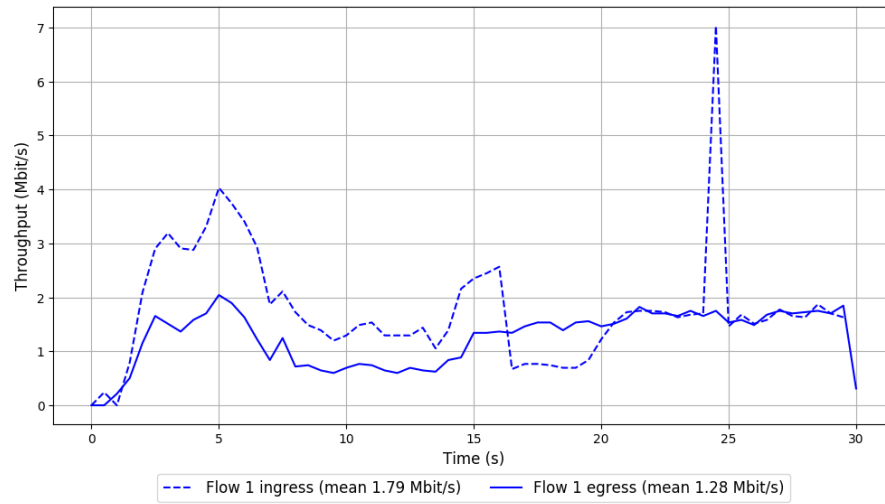


Run 3: Statistics of TCP Vegas

Start at: 2018-03-05 19:47:20
End at: 2018-03-05 19:47:50
Local clock offset: -7.154 ms
Remote clock offset: -5.908 ms

Below is generated by plot.py at 2018-03-05 19:49:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 9163.467 ms
Loss rate: 28.63%
-- Flow 1:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 9163.467 ms
Loss rate: 28.63%

Run 3: Report of TCP Vegas — Data Link

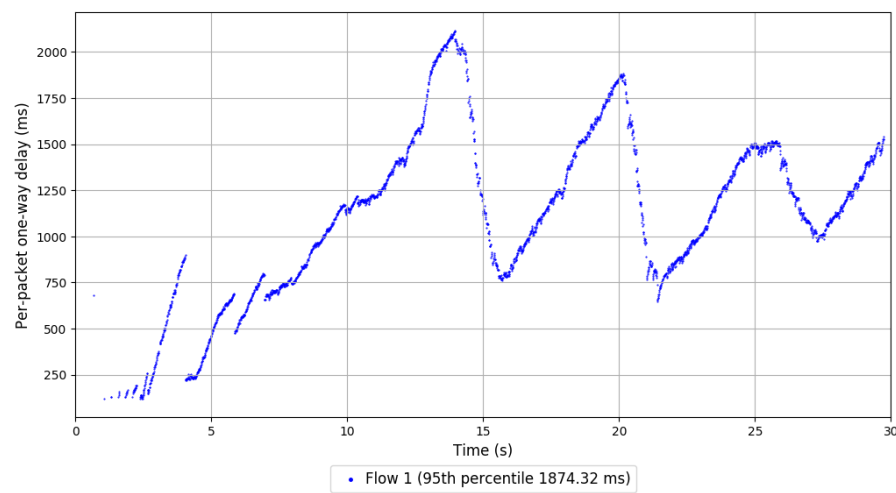
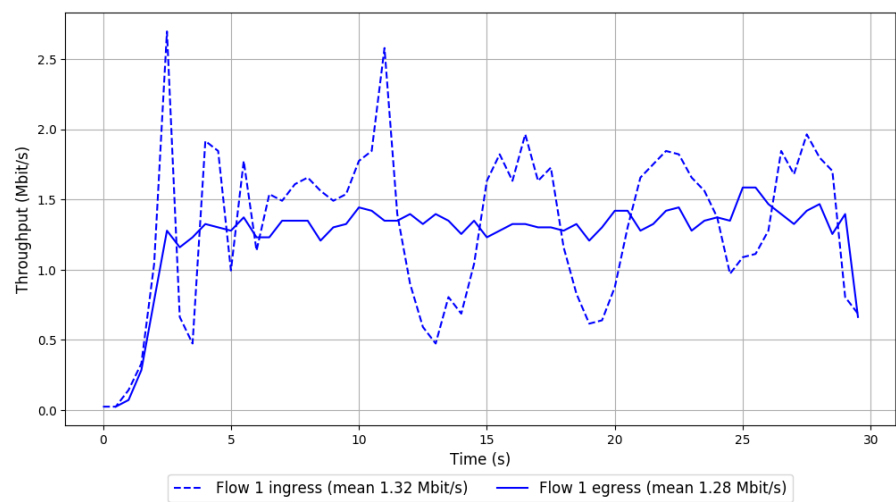


Run 1: Statistics of Verus

Start at: 2018-03-05 18:46:25
End at: 2018-03-05 18:46:55
Local clock offset: -8.324 ms
Remote clock offset: -5.618 ms

Below is generated by plot.py at 2018-03-05 19:49:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 1874.320 ms
Loss rate: 5.49%
-- Flow 1:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 1874.320 ms
Loss rate: 5.49%

Run 1: Report of Verus — Data Link

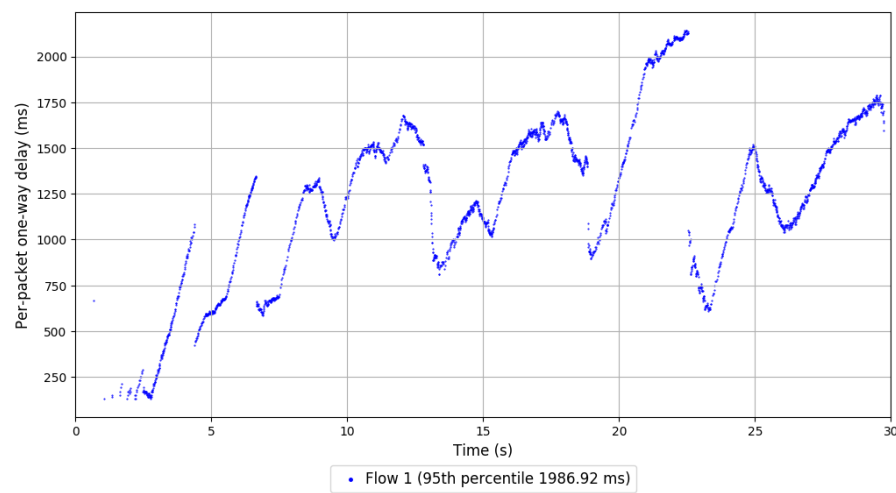
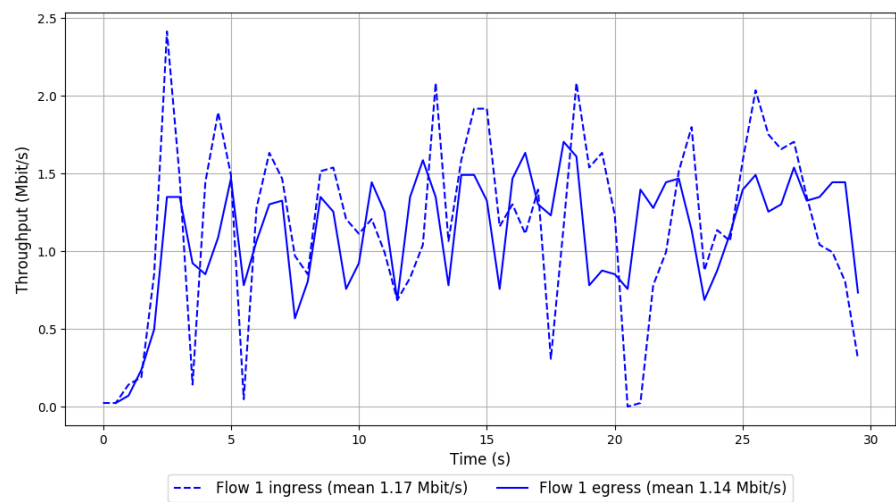


Run 2: Statistics of Verus

Start at: 2018-03-05 19:07:30
End at: 2018-03-05 19:08:00
Local clock offset: -7.741 ms
Remote clock offset: -5.456 ms

Below is generated by plot.py at 2018-03-05 19:49:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 1986.921 ms
Loss rate: 4.30%
-- Flow 1:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 1986.921 ms
Loss rate: 4.30%

Run 2: Report of Verus — Data Link

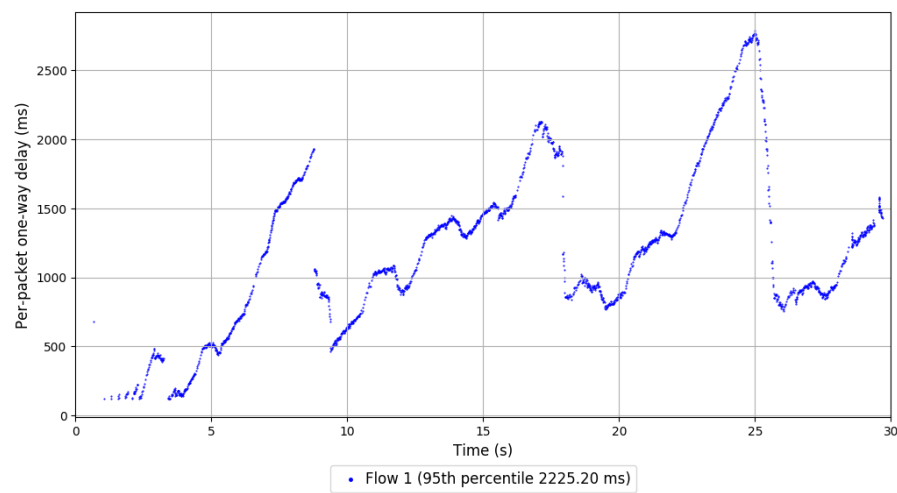
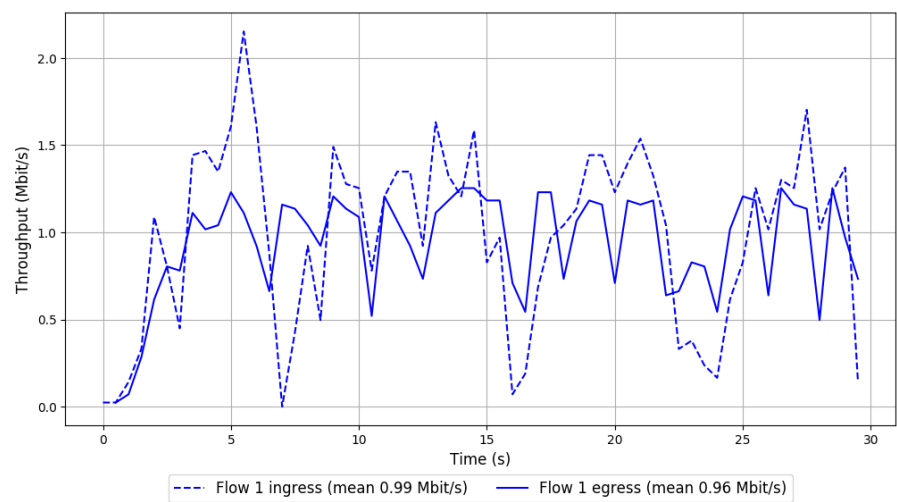


Run 3: Statistics of Verus

Start at: 2018-03-05 19:28:35
End at: 2018-03-05 19:29:05
Local clock offset: -7.522 ms
Remote clock offset: -5.314 ms

Below is generated by plot.py at 2018-03-05 19:49:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 2225.205 ms
Loss rate: 5.36%
-- Flow 1:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 2225.205 ms
Loss rate: 5.36%

Run 3: Report of Verus — Data Link

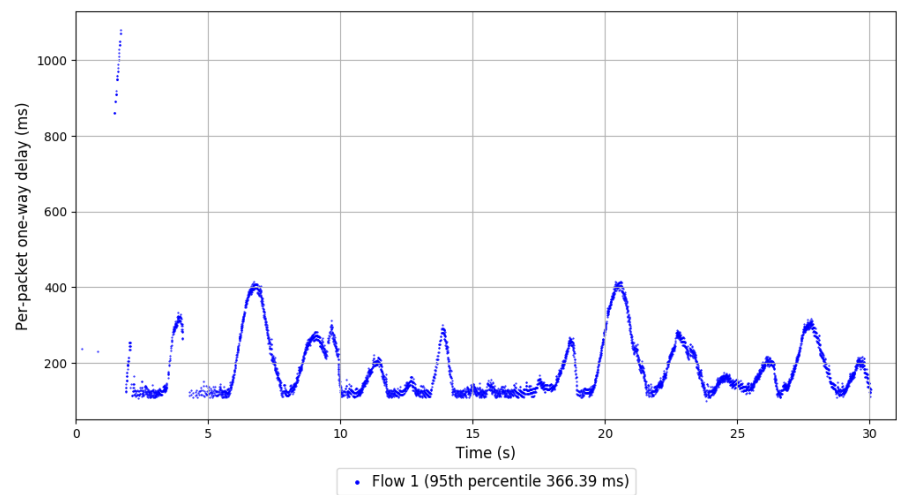
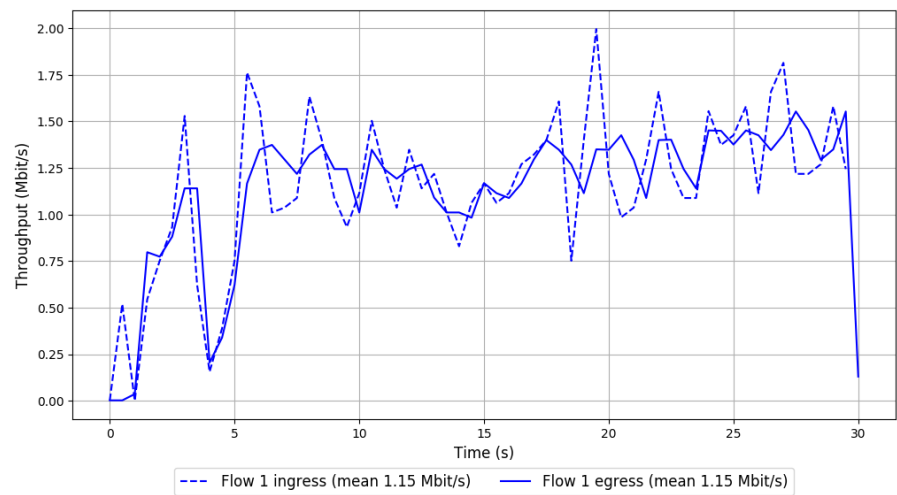


Run 1: Statistics of Copa

Start at: 2018-03-05 19:01:37
End at: 2018-03-05 19:02:07
Local clock offset: -7.647 ms
Remote clock offset: -6.409 ms

Below is generated by plot.py at 2018-03-05 19:49:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 366.386 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 1.15 Mbit/s
95th percentile per-packet one-way delay: 366.386 ms
Loss rate: 0.23%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-03-05 19:22:43

End at: 2018-03-05 19:23:13

Local clock offset: -8.042 ms

Remote clock offset: -6.25 ms

Below is generated by plot.py at 2018-03-05 19:49:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.14 Mbit/s

95th percentile per-packet one-way delay: 283.905 ms

Loss rate: 0.23%

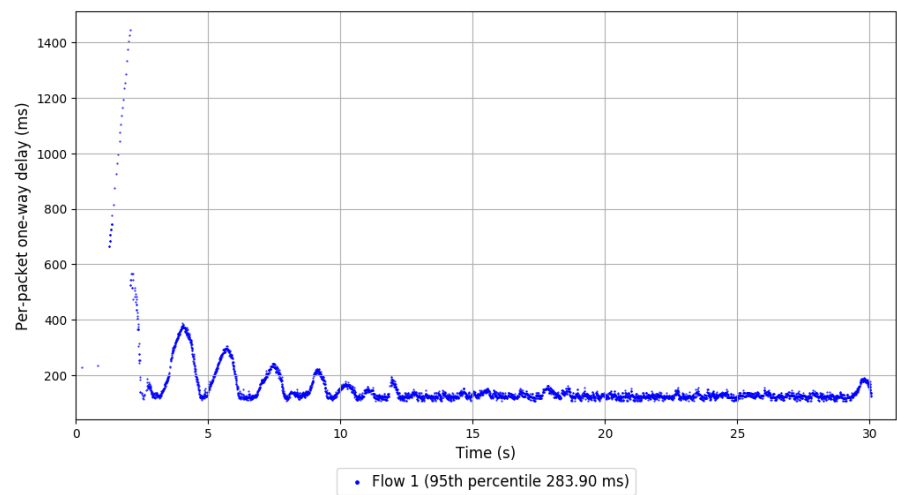
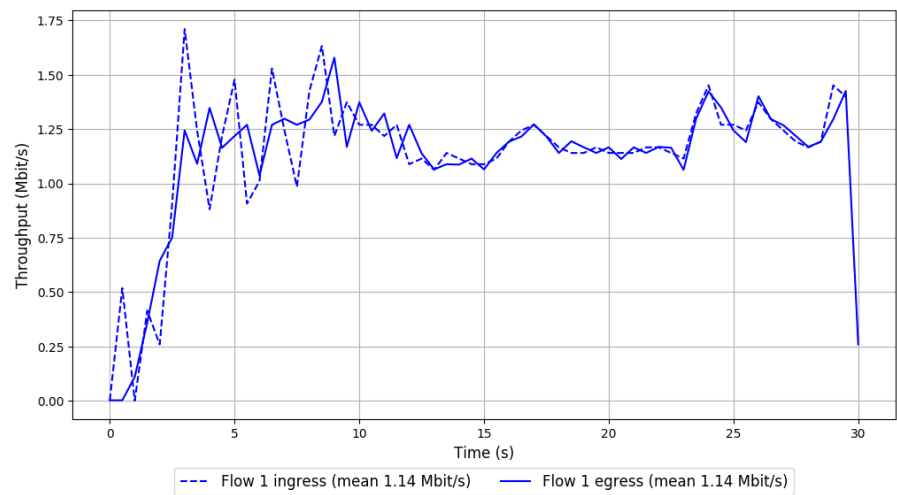
-- Flow 1:

Average throughput: 1.14 Mbit/s

95th percentile per-packet one-way delay: 283.905 ms

Loss rate: 0.23%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-03-05 19:43:49

End at: 2018-03-05 19:44:19

Local clock offset: -7.135 ms

Remote clock offset: 0.644 ms

Below is generated by plot.py at 2018-03-05 19:49:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 294.494 ms

Loss rate: 0.17%

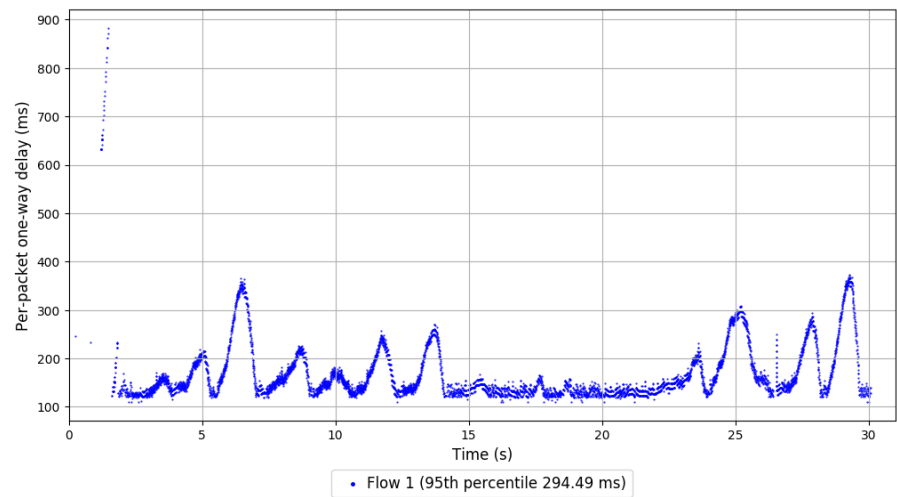
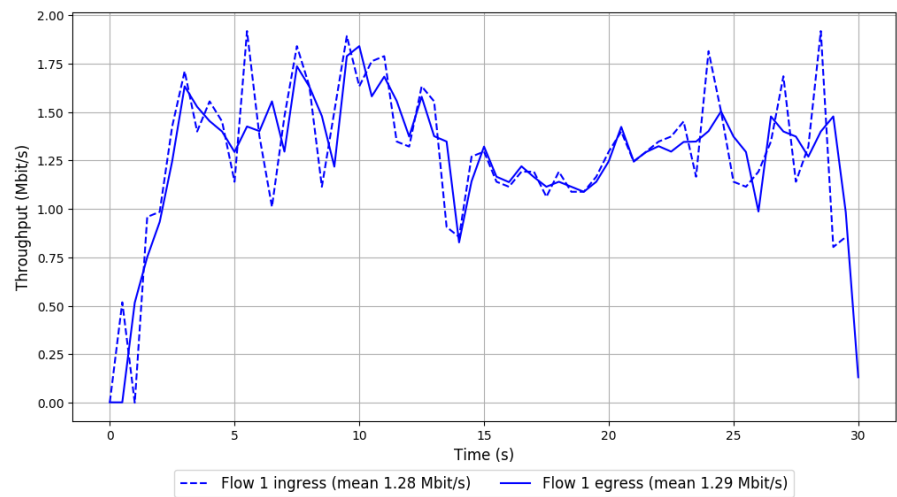
-- Flow 1:

Average throughput: 1.29 Mbit/s

95th percentile per-packet one-way delay: 294.494 ms

Loss rate: 0.17%

Run 3: Report of Copa — Data Link

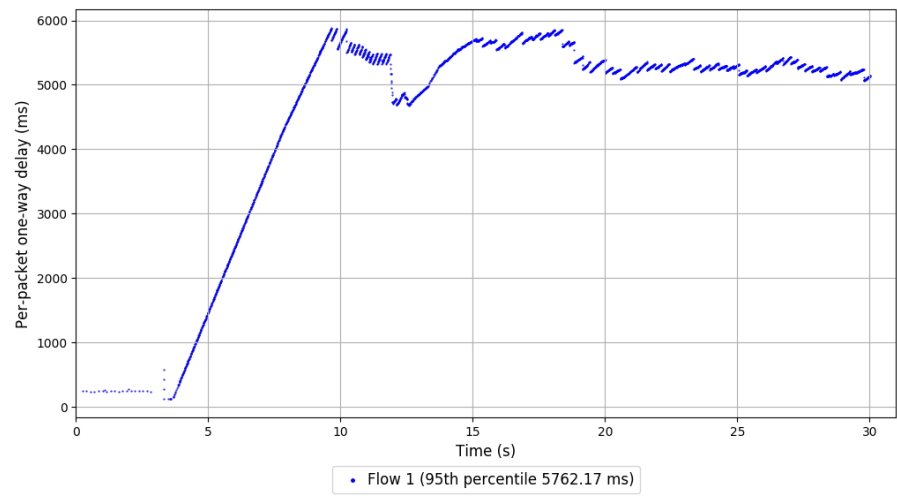
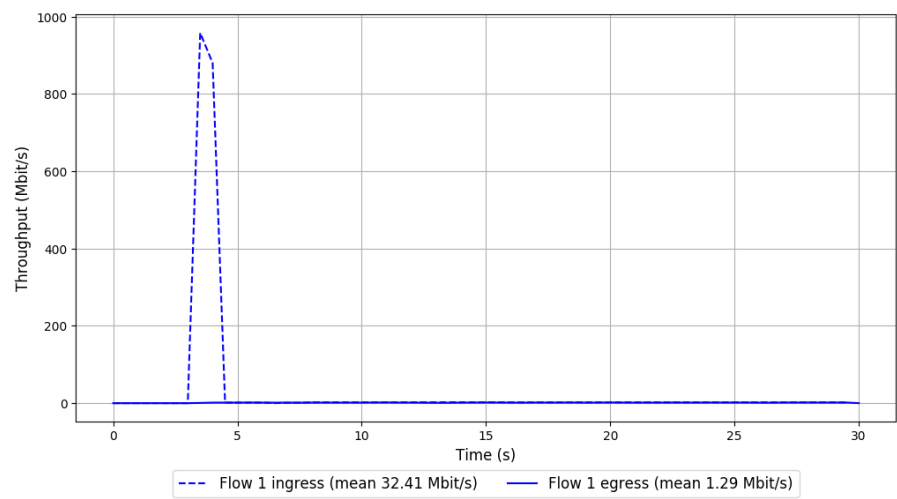


Run 1: Statistics of FillP

Start at: 2018-03-05 18:59:16
End at: 2018-03-05 18:59:46
Local clock offset: -7.756 ms
Remote clock offset: -0.763 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 5762.166 ms
Loss rate: 96.04%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 5762.166 ms
Loss rate: 96.04%

Run 1: Report of FillP — Data Link

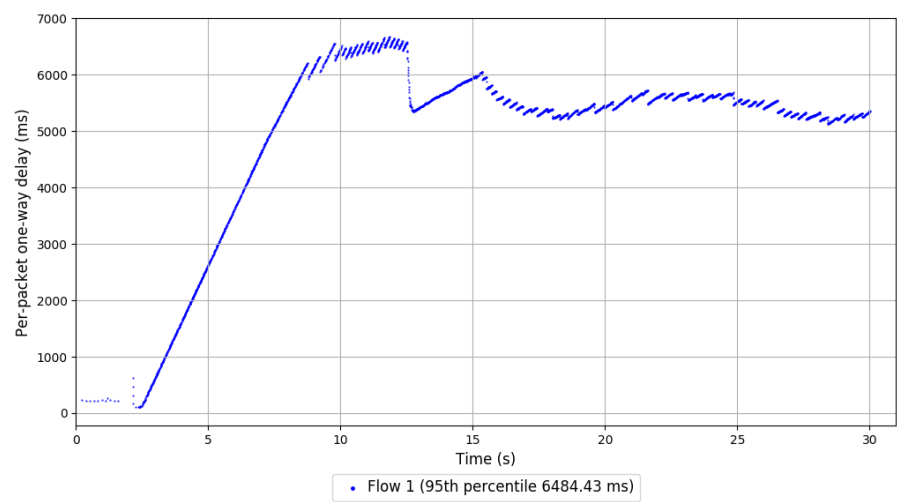
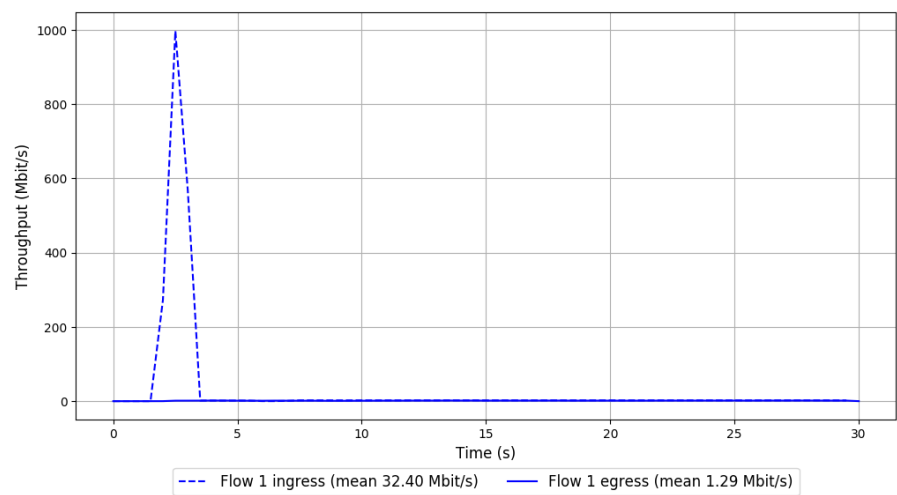


Run 2: Statistics of FillP

Start at: 2018-03-05 19:20:22
End at: 2018-03-05 19:20:52
Local clock offset: -7.982 ms
Remote clock offset: -6.114 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 6484.427 ms
Loss rate: 96.05%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 6484.427 ms
Loss rate: 96.05%

Run 2: Report of FillP — Data Link

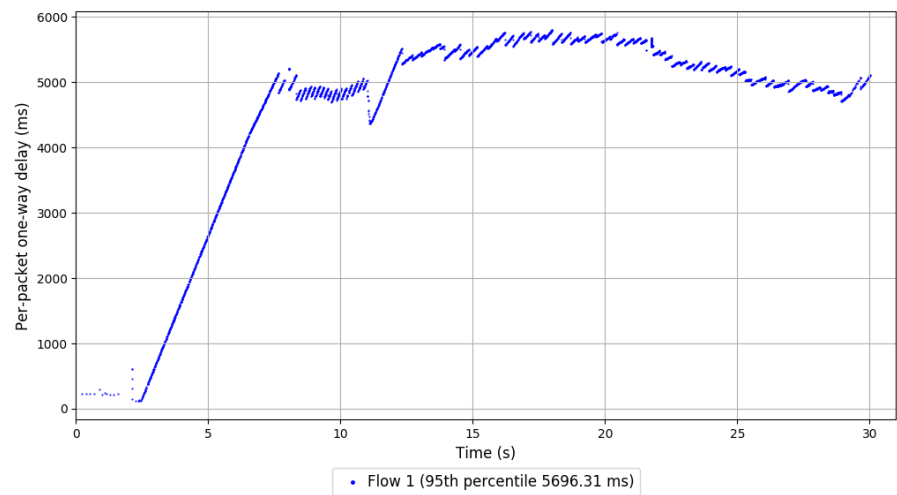
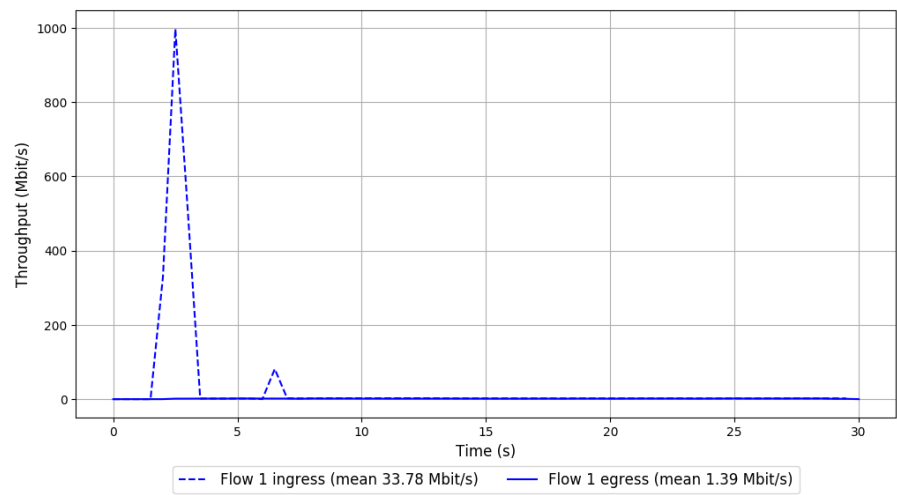


Run 3: Statistics of FillP

Start at: 2018-03-05 19:41:28
End at: 2018-03-05 19:41:58
Local clock offset: -7.135 ms
Remote clock offset: -5.095 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 5696.309 ms
Loss rate: 95.91%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 5696.309 ms
Loss rate: 95.91%

Run 3: Report of FillP — Data Link

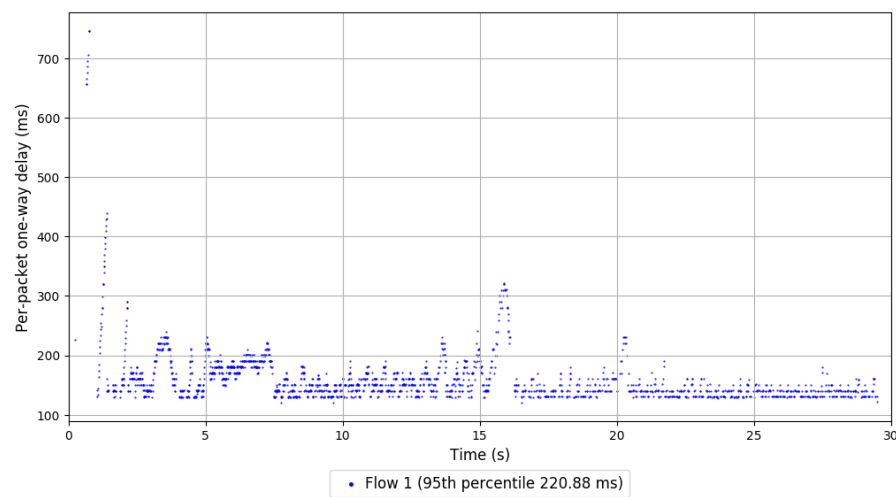
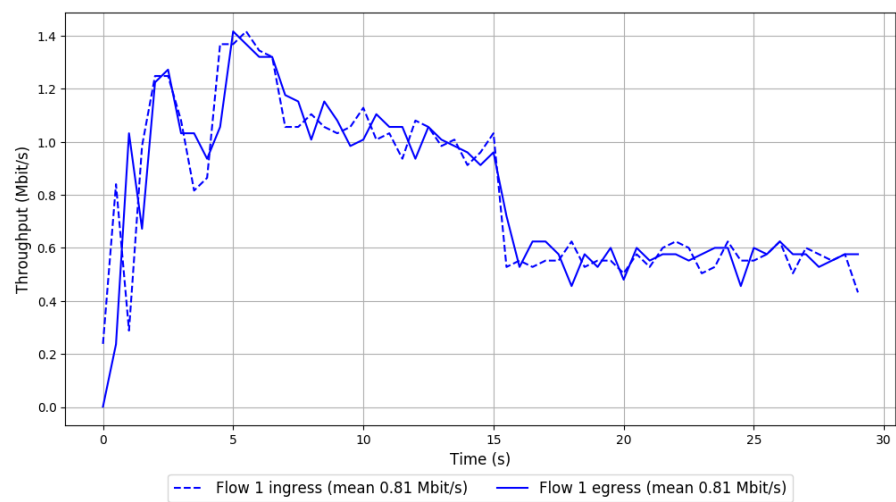


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-03-05 18:52:15
End at: 2018-03-05 18:52:45
Local clock offset: -8.028 ms
Remote clock offset: -0.76 ms

# Below is generated by plot.py at 2018-03-05 19:49:28
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 220.881 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 0.81 Mbit/s
95th percentile per-packet one-way delay: 220.881 ms
Loss rate: 0.05%
```

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

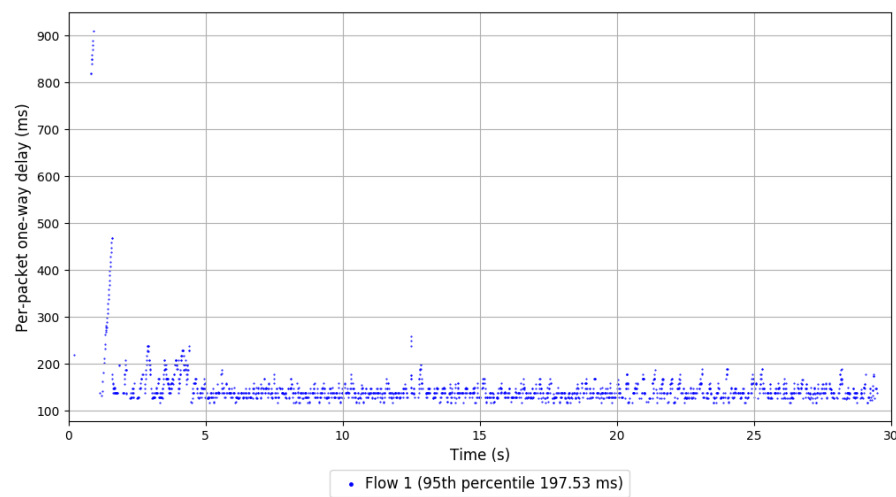
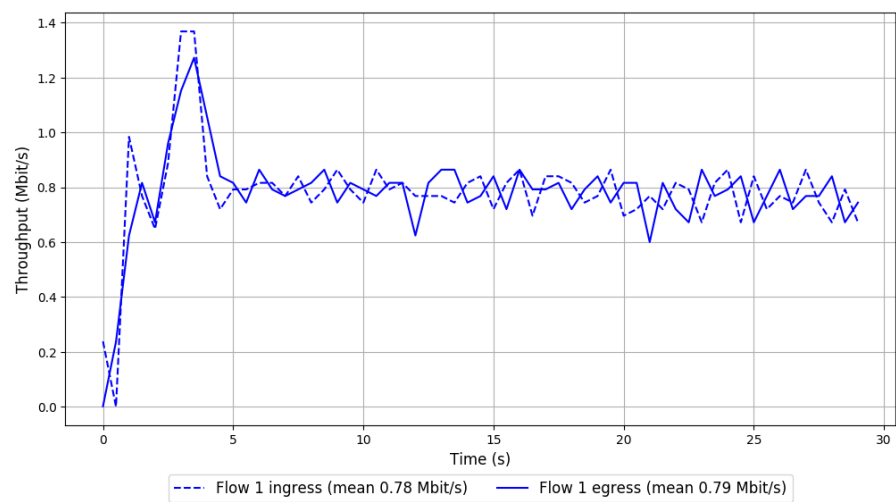


Run 2: Statistics of Indigo-1-32

Start at: 2018-03-05 19:13:20
End at: 2018-03-05 19:13:50
Local clock offset: -7.797 ms
Remote clock offset: -0.639 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 197.535 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 197.535 ms
Loss rate: 0.26%

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

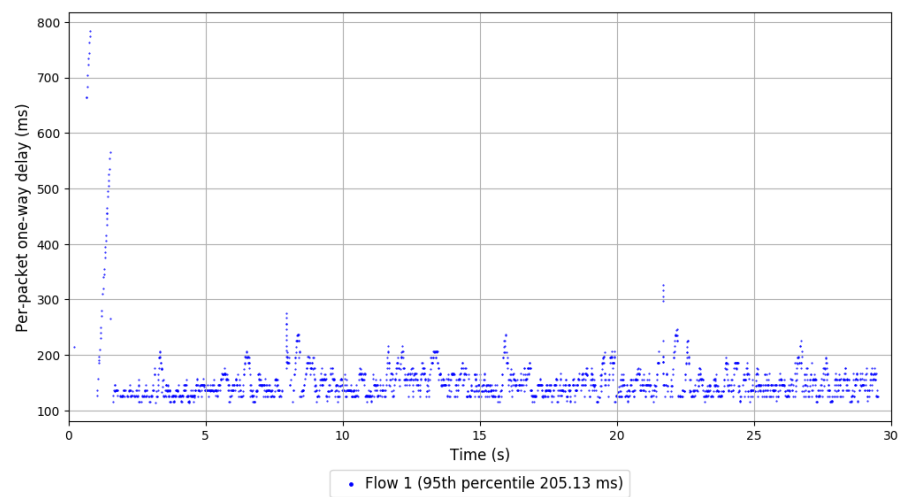
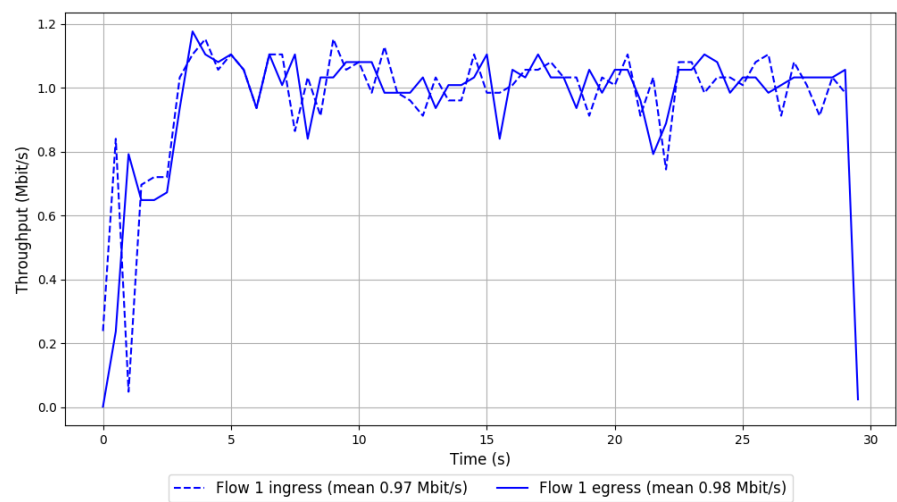


Run 3: Statistics of Indigo-1-32

Start at: 2018-03-05 19:34:27
End at: 2018-03-05 19:34:57
Local clock offset: -7.241 ms
Remote clock offset: -5.301 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 205.135 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 205.135 ms
Loss rate: 0.25%

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

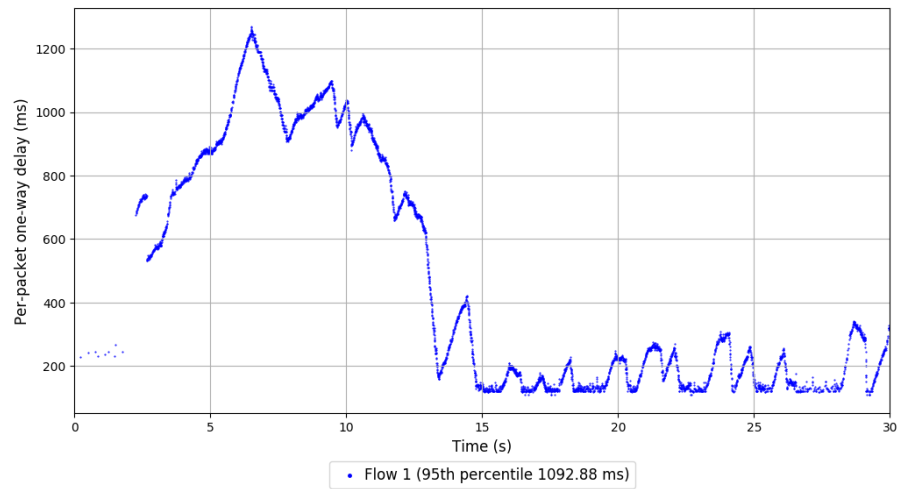
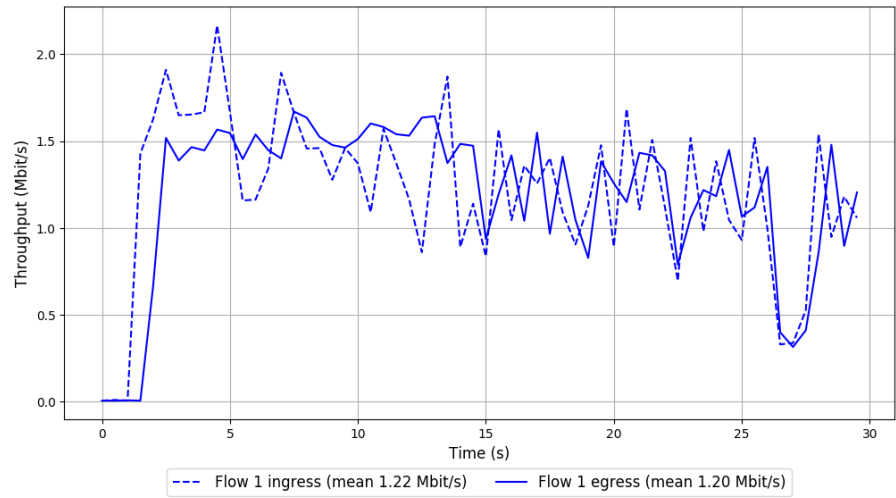


Run 1: Statistics of Vivace-latency

Start at: 2018-03-05 19:03:58
End at: 2018-03-05 19:04:28
Local clock offset: -7.651 ms
Remote clock offset: -0.738 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 1092.881 ms
Loss rate: 1.56%
-- Flow 1:
Average throughput: 1.20 Mbit/s
95th percentile per-packet one-way delay: 1092.881 ms
Loss rate: 1.56%

Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-03-05 19:25:04

End at: 2018-03-05 19:25:34

Local clock offset: -7.781 ms

Remote clock offset: 0.424 ms

Below is generated by plot.py at 2018-03-05 19:49:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.23 Mbit/s

95th percentile per-packet one-way delay: 722.002 ms

Loss rate: 1.15%

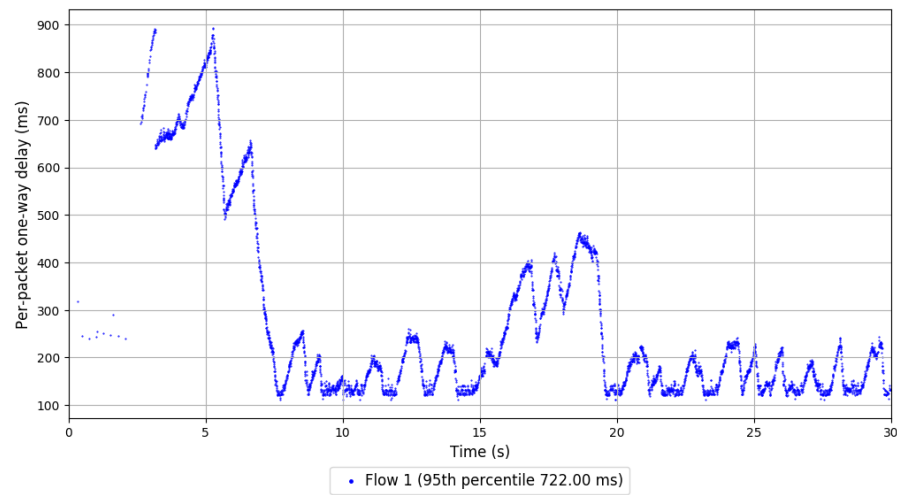
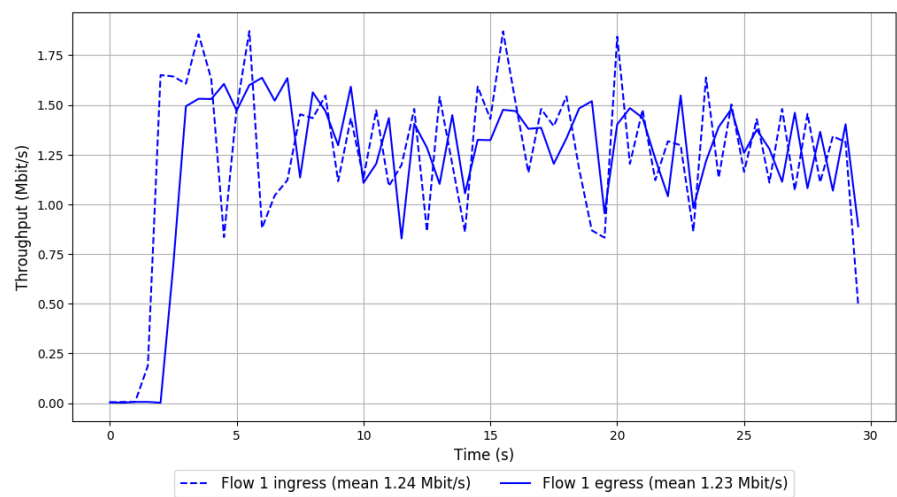
-- Flow 1:

Average throughput: 1.23 Mbit/s

95th percentile per-packet one-way delay: 722.002 ms

Loss rate: 1.15%

Run 2: Report of Vivace-latency — Data Link

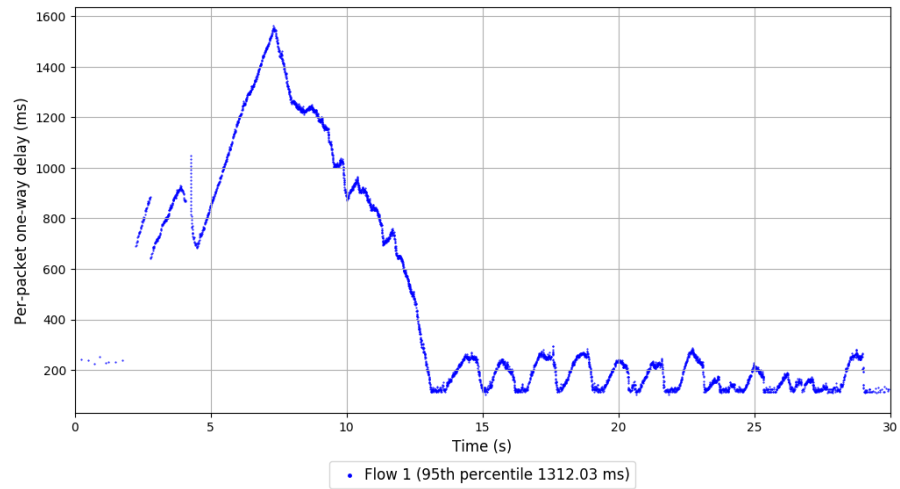
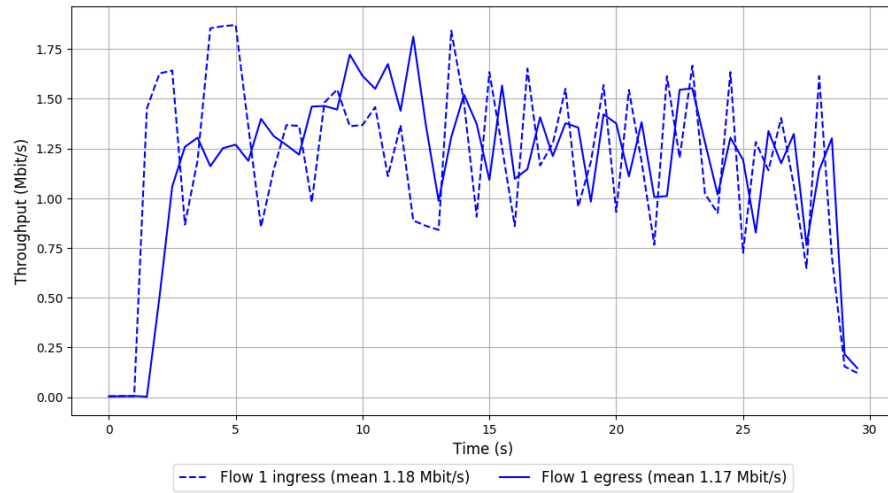


Run 3: Statistics of Vivace-latency

Start at: 2018-03-05 19:46:09
End at: 2018-03-05 19:46:39
Local clock offset: -7.139 ms
Remote clock offset: -5.863 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 1312.034 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 1.17 Mbit/s
95th percentile per-packet one-way delay: 1312.034 ms
Loss rate: 1.13%

Run 3: Report of Vivace-latency — Data Link

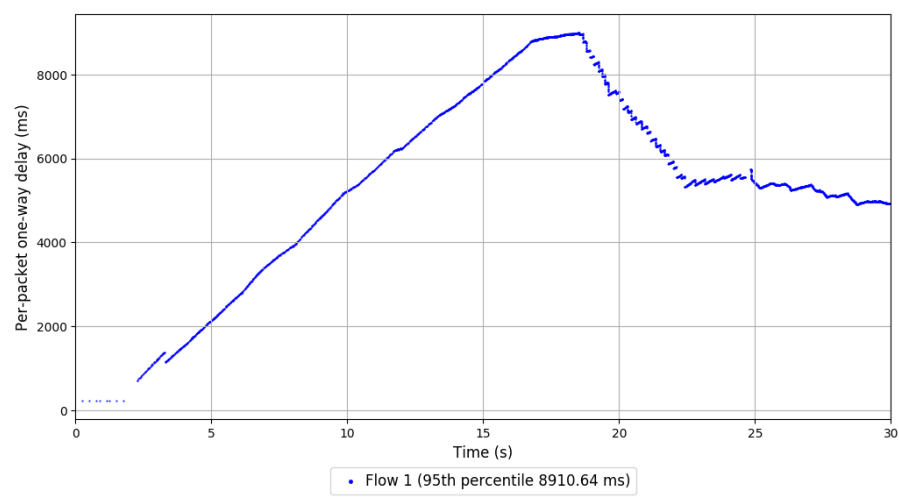
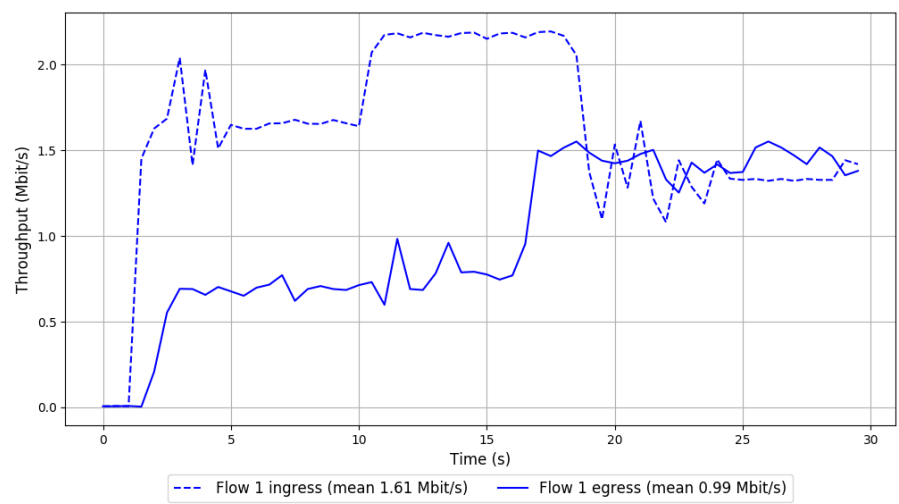


Run 1: Statistics of Vivace-loss

Start at: 2018-03-05 18:53:25
End at: 2018-03-05 18:53:55
Local clock offset: -7.924 ms
Remote clock offset: -6.449 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 8910.642 ms
Loss rate: 38.72%
-- Flow 1:
Average throughput: 0.99 Mbit/s
95th percentile per-packet one-way delay: 8910.642 ms
Loss rate: 38.72%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-03-05 19:14:31

End at: 2018-03-05 19:15:01

Local clock offset: -7.889 ms

Remote clock offset: -5.35 ms

Below is generated by plot.py at 2018-03-05 19:49:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.40 Mbit/s

95th percentile per-packet one-way delay: 5390.216 ms

Loss rate: 33.75%

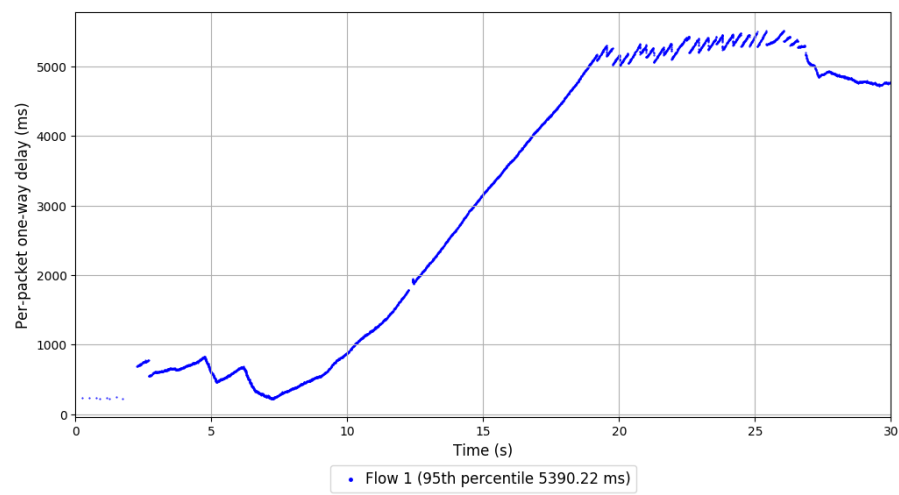
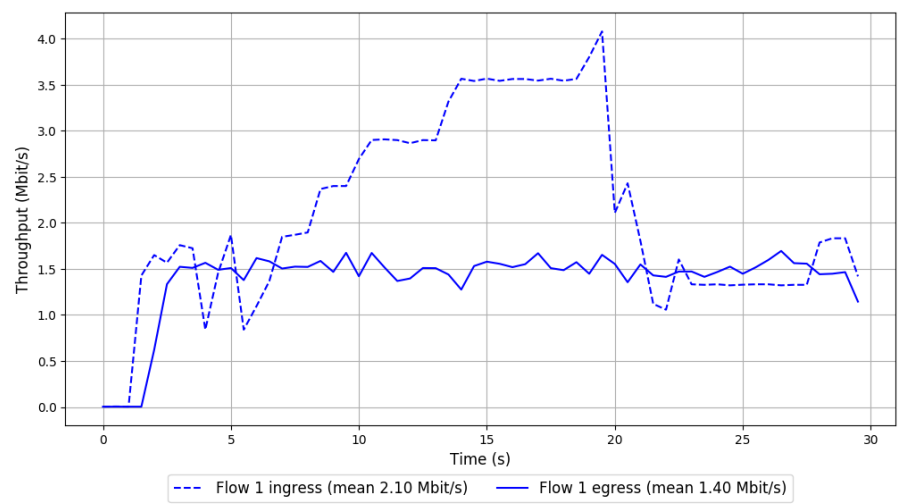
-- Flow 1:

Average throughput: 1.40 Mbit/s

95th percentile per-packet one-way delay: 5390.216 ms

Loss rate: 33.75%

Run 2: Report of Vivace-loss — Data Link

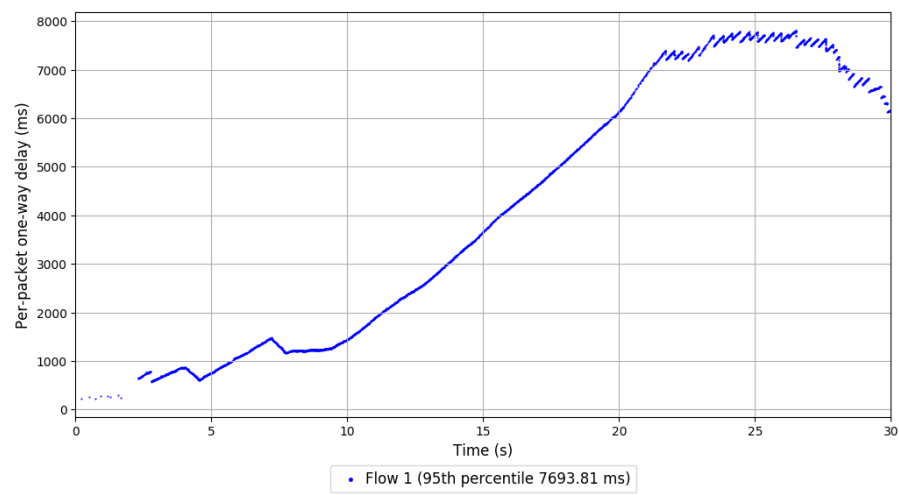
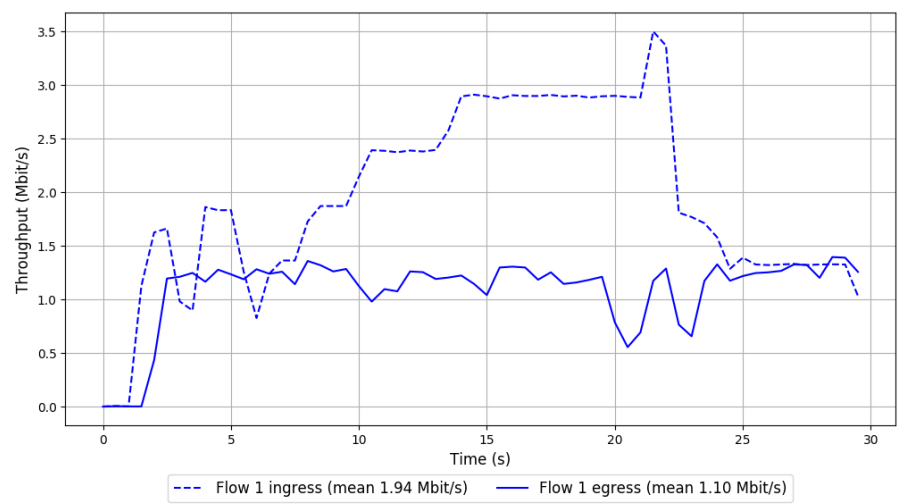


Run 3: Statistics of Vivace-loss

Start at: 2018-03-05 19:35:37
End at: 2018-03-05 19:36:07
Local clock offset: -7.278 ms
Remote clock offset: -5.244 ms

Below is generated by plot.py at 2018-03-05 19:49:28
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 7693.808 ms
Loss rate: 43.61%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 7693.808 ms
Loss rate: 43.61%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-03-05 18:45:14

End at: 2018-03-05 18:45:44

Local clock offset: -8.185 ms

Remote clock offset: -1.508 ms

Below is generated by plot.py at 2018-03-05 19:49:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.21 Mbit/s

95th percentile per-packet one-way delay: 2323.687 ms

Loss rate: 4.12%

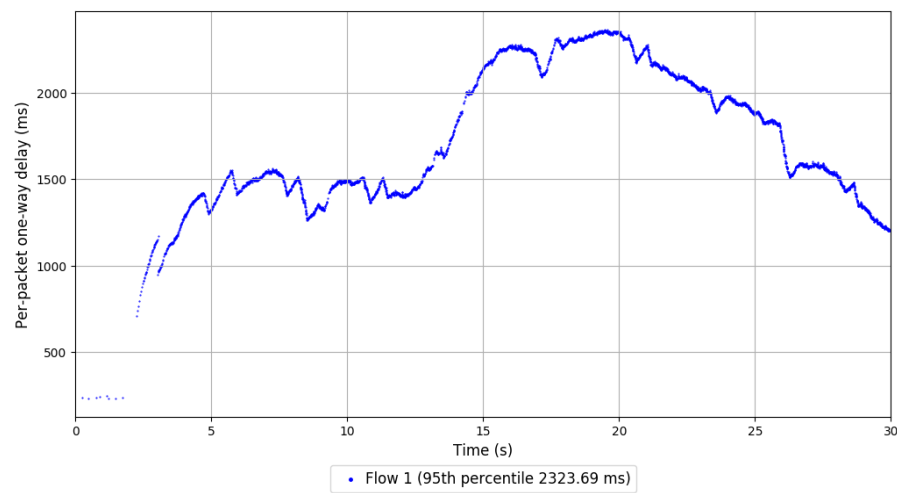
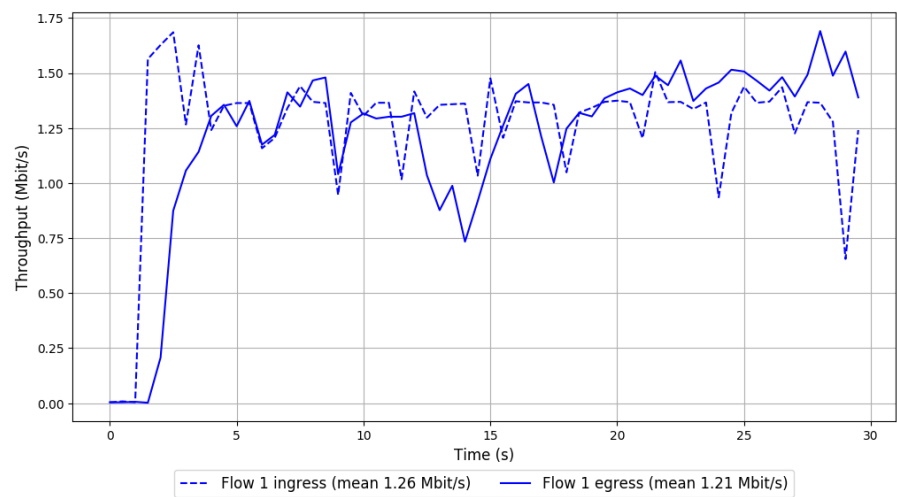
-- Flow 1:

Average throughput: 1.21 Mbit/s

95th percentile per-packet one-way delay: 2323.687 ms

Loss rate: 4.12%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-03-05 19:06:19

End at: 2018-03-05 19:06:49

Local clock offset: -7.681 ms

Remote clock offset: 0.222 ms

Below is generated by plot.py at 2018-03-05 19:49:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.30 Mbit/s

95th percentile per-packet one-way delay: 2082.703 ms

Loss rate: 7.93%

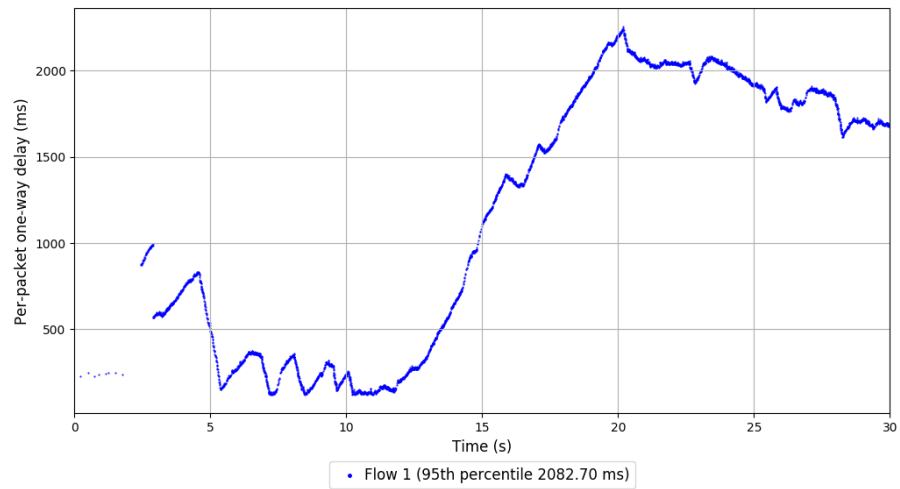
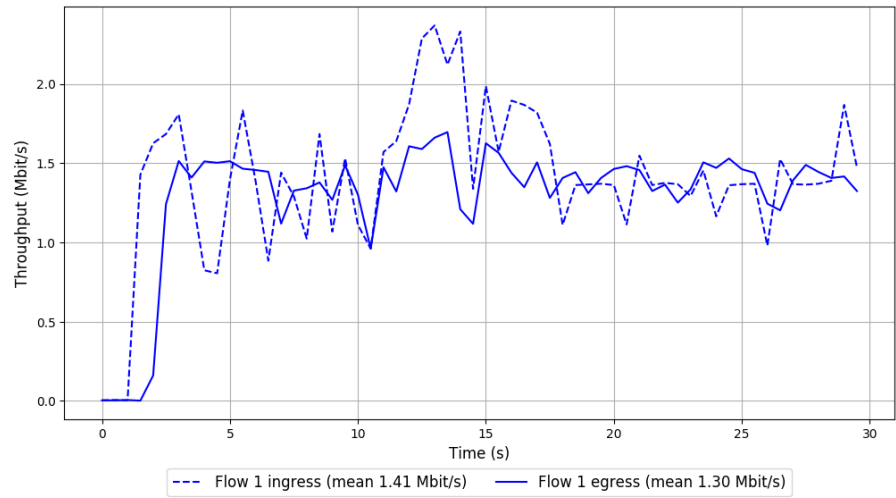
-- Flow 1:

Average throughput: 1.30 Mbit/s

95th percentile per-packet one-way delay: 2082.703 ms

Loss rate: 7.93%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-03-05 19:27:25

End at: 2018-03-05 19:27:55

Local clock offset: -7.567 ms

Remote clock offset: 0.285 ms

Below is generated by plot.py at 2018-03-05 19:49:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 6045.932 ms

Loss rate: 26.19%

-- Flow 1:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 6045.932 ms

Loss rate: 26.19%

Run 3: Report of Vivace-LTE — Data Link

