

Pantheon Report

Generated at 2018-02-12 21:27:11 (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).

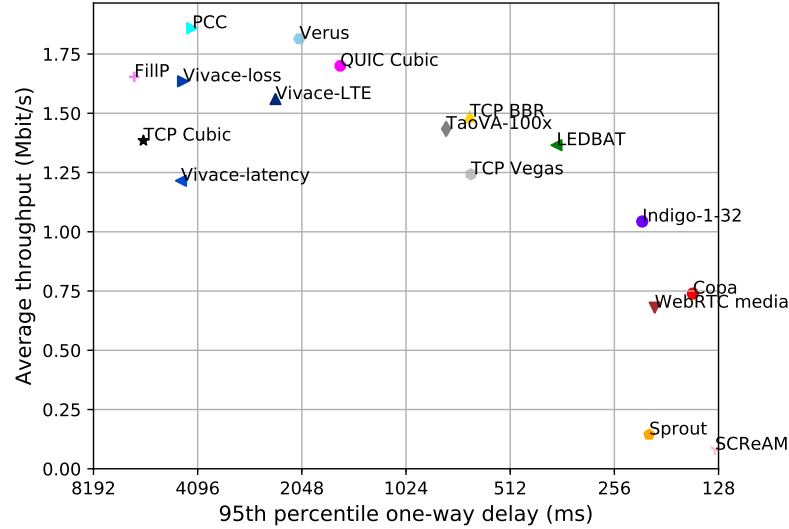
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

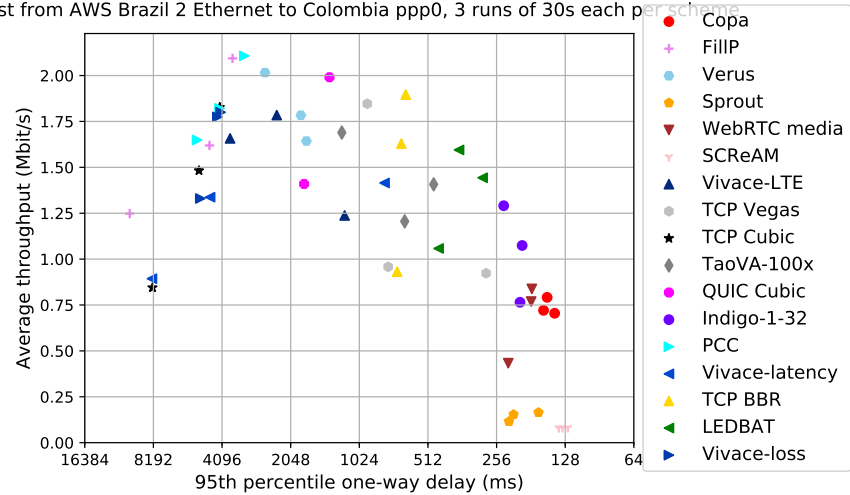
Git summary:

```
branch: master @ 2efdad57c2c56a9458b0d01ff33345e11732665
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 828bbf95fd4941149b5cec90f281d1c69ae1a5c6
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
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-quick @ 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	1.49	669.87	1.36
TCP Cubic	3	1.38	5876.34	21.08
LEDBAT	3	1.36	376.27	0.59
PCC	3	1.86	4246.05	55.15
QUIC Cubic	2	1.70	1586.07	5.21
SCReAM	3	0.08	131.00	0.09
WebRTC media	3	0.68	195.76	0.12
Sprout	3	0.14	203.09	0.19
TaoVA-100x	3	1.44	784.16	0.60
TCP Vegas	3	1.24	664.82	1.04
Verus	3	1.81	2082.45	4.24
Copa	3	0.74	151.82	0.14
FillP	3	1.65	6245.62	95.14
Indigo-1-32	3	1.04	212.69	0.23
Vivace-latency	3	1.21	4577.32	15.12
Vivace-loss	3	1.63	4514.59	26.02
Vivace-LTE	3	1.56	2440.50	2.84

Run 1: Statistics of TCP BBR

Start at: 2018-02-12 20:33:18

End at: 2018-02-12 20:33:48

Local clock offset: -6.992 ms

Remote clock offset: 0.988 ms

Below is generated by plot.py at 2018-02-12 21:26:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.90 Mbit/s

95th percentile per-packet one-way delay: 640.829 ms

Loss rate: 1.46%

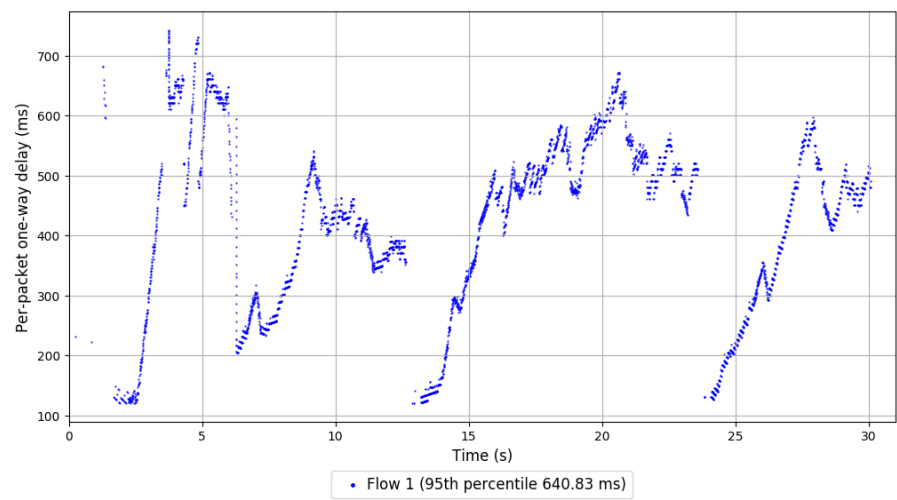
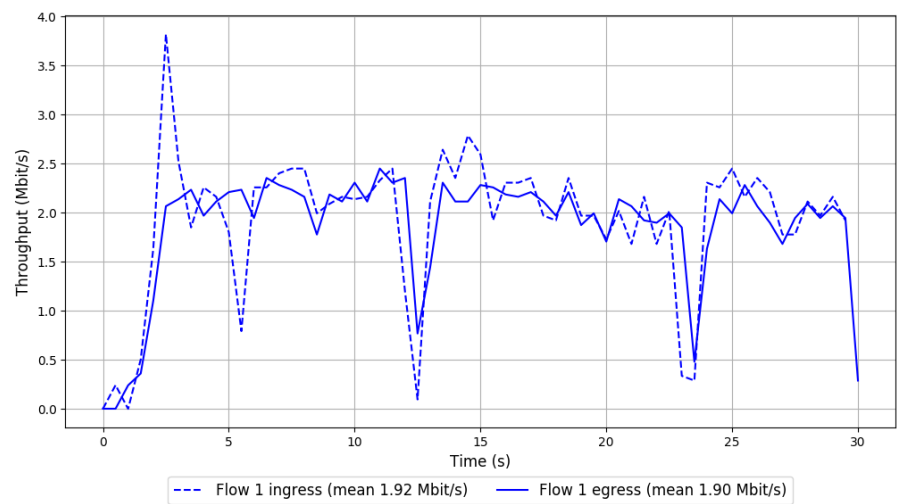
-- Flow 1:

Average throughput: 1.90 Mbit/s

95th percentile per-packet one-way delay: 640.829 ms

Loss rate: 1.46%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-02-12 20:54:27

End at: 2018-02-12 20:54:57

Local clock offset: -3.895 ms

Remote clock offset: 0.354 ms

Below is generated by plot.py at 2018-02-12 21:26:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.93 Mbit/s

95th percentile per-packet one-way delay: 698.895 ms

Loss rate: 1.32%

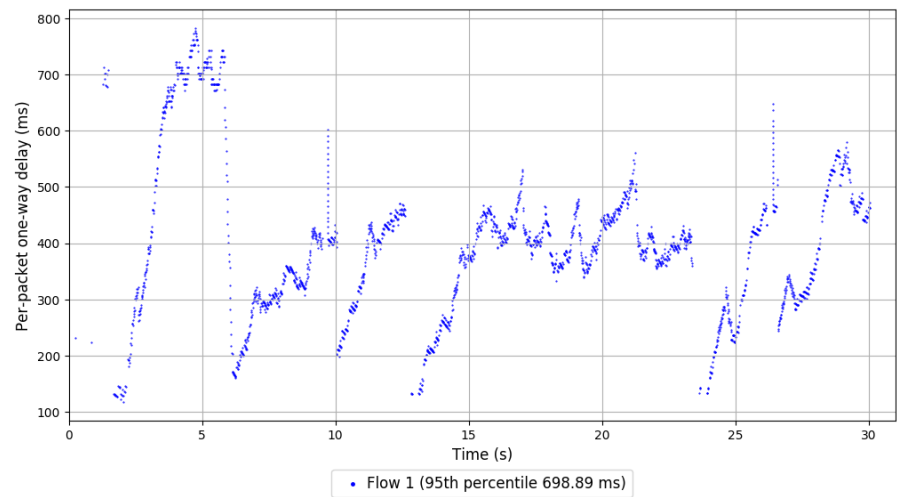
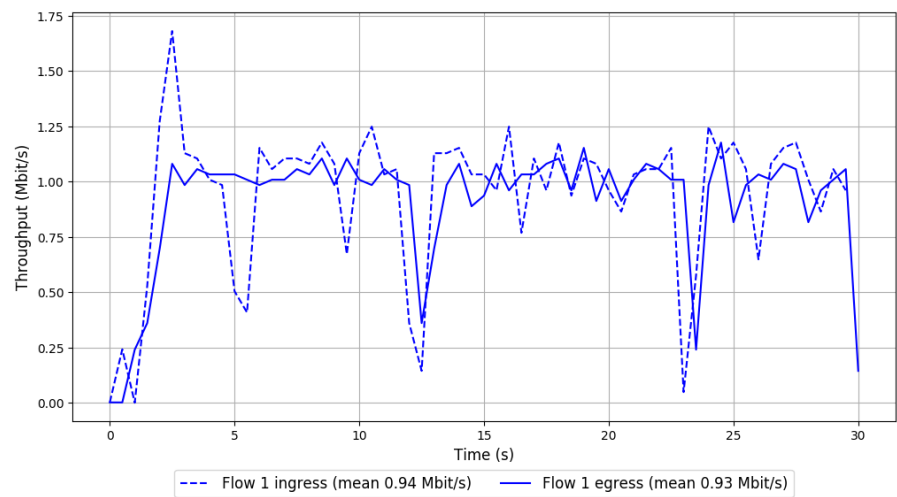
-- Flow 1:

Average throughput: 0.93 Mbit/s

95th percentile per-packet one-way delay: 698.895 ms

Loss rate: 1.32%

Run 2: Report of TCP BBR — Data Link

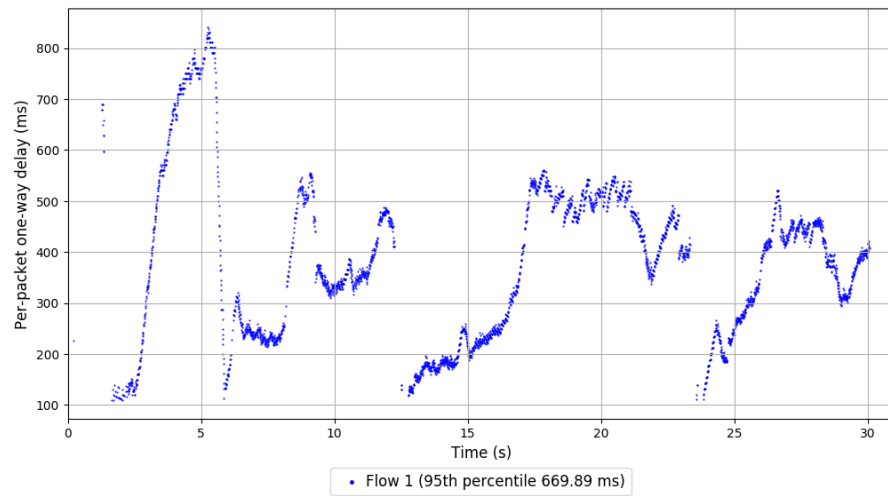
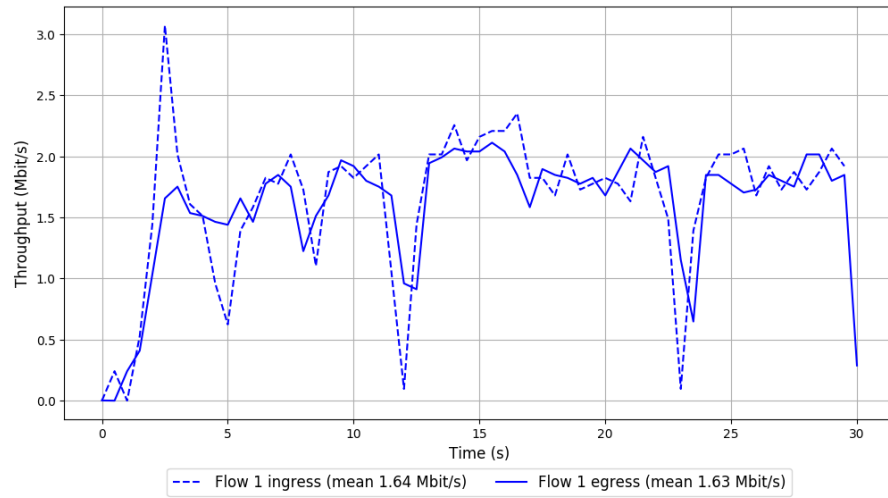


Run 3: Statistics of TCP BBR

Start at: 2018-02-12 21:15:37
End at: 2018-02-12 21:16:07
Local clock offset: -1.04 ms
Remote clock offset: -4.337 ms

Below is generated by plot.py at 2018-02-12 21:26:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 669.890 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 669.890 ms
Loss rate: 1.29%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-02-12 20:28:34

End at: 2018-02-12 20:29:04

Local clock offset: -7.263 ms

Remote clock offset: 1.021 ms

Below is generated by plot.py at 2018-02-12 21:26:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.48 Mbit/s

95th percentile per-packet one-way delay: 5169.526 ms

Loss rate: 19.15%

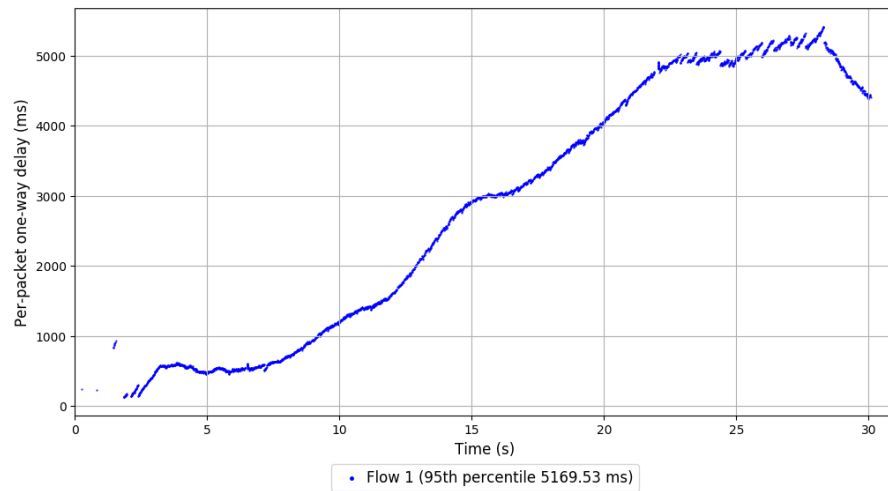
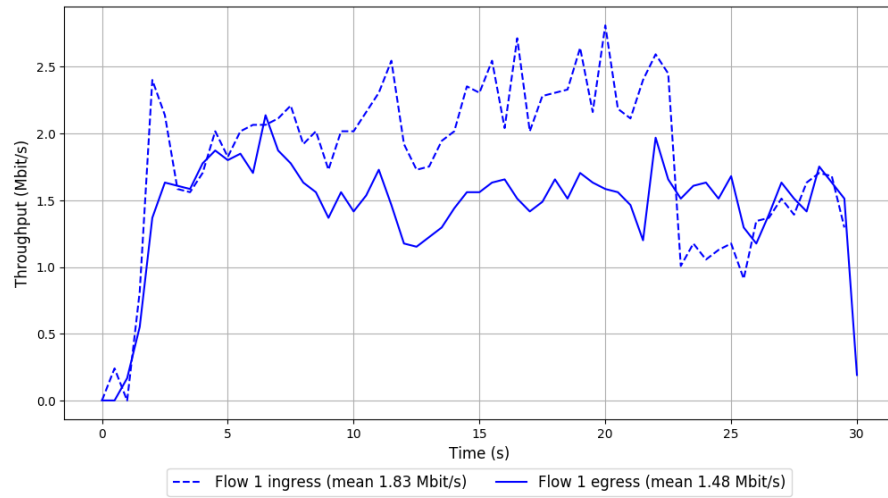
-- Flow 1:

Average throughput: 1.48 Mbit/s

95th percentile per-packet one-way delay: 5169.526 ms

Loss rate: 19.15%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-02-12 20:49:45

End at: 2018-02-12 20:50:15

Local clock offset: -6.134 ms

Remote clock offset: 0.297 ms

Below is generated by plot.py at 2018-02-12 21:26:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 8267.834 ms

Loss rate: 29.16%

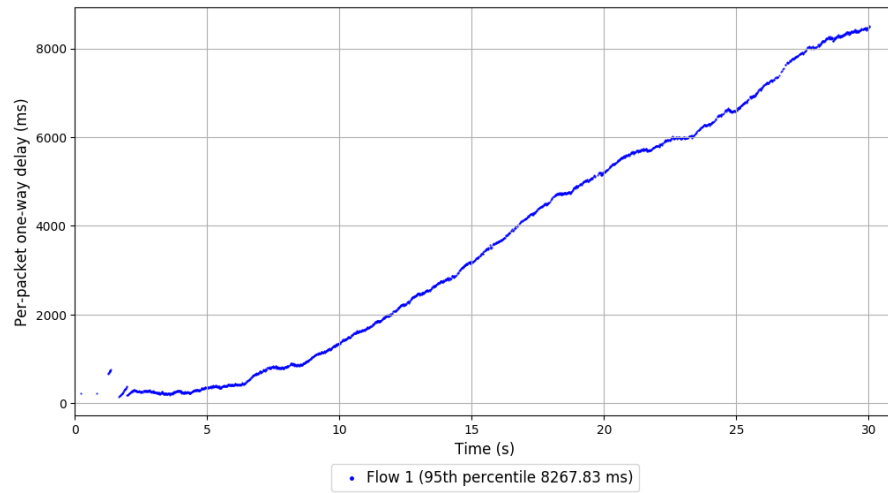
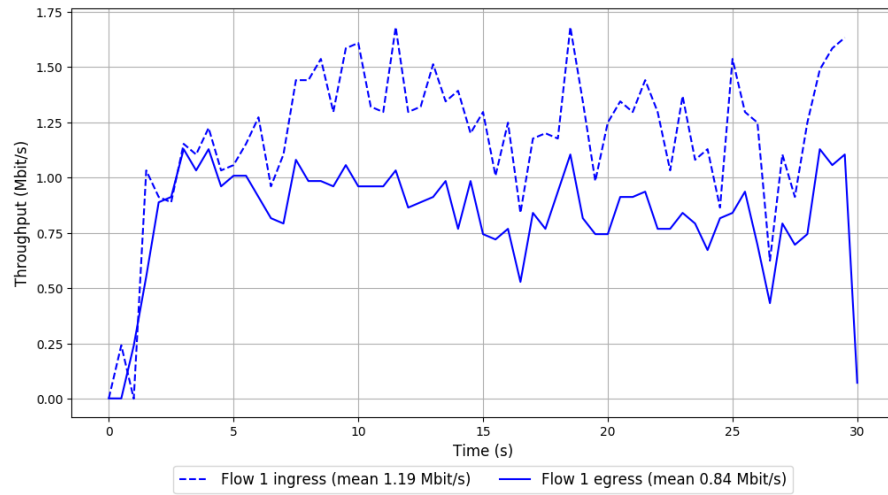
-- Flow 1:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 8267.834 ms

Loss rate: 29.16%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-02-12 21:10:55

End at: 2018-02-12 21:11:25

Local clock offset: -1.291 ms

Remote clock offset: 2.041 ms

Below is generated by plot.py at 2018-02-12 21:26:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.83 Mbit/s

95th percentile per-packet one-way delay: 4191.657 ms

Loss rate: 14.94%

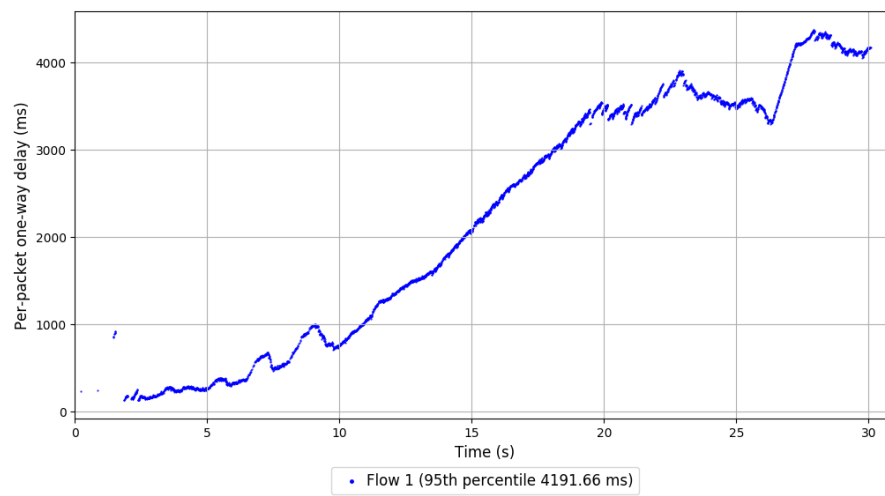
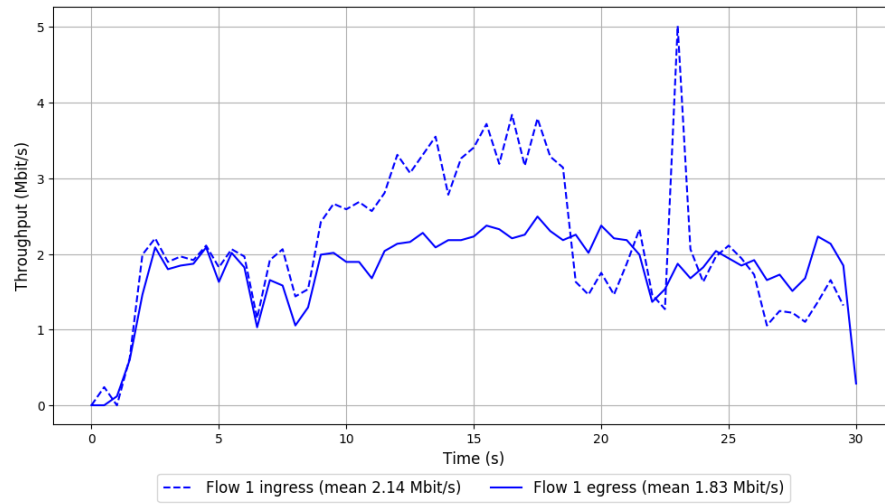
-- Flow 1:

Average throughput: 1.83 Mbit/s

95th percentile per-packet one-way delay: 4191.657 ms

Loss rate: 14.94%

Run 3: Report of TCP Cubic — Data Link

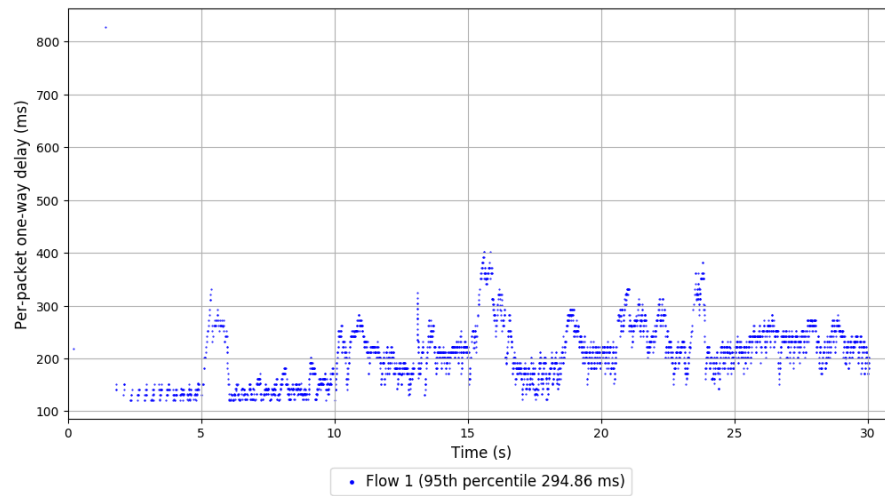
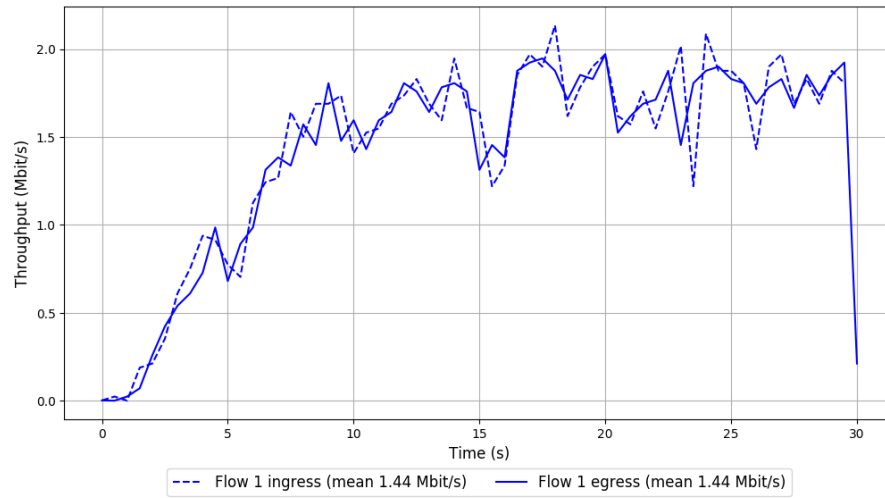


```
Run 1: Statistics of LEDBAT

Start at: 2018-02-12 20:26:14
End at: 2018-02-12 20:26:44
Local clock offset: -7.658 ms
Remote clock offset: -3.829 ms

# Below is generated by plot.py at 2018-02-12 21:26:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 294.864 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 294.864 ms
Loss rate: 0.60%
```

Run 1: Report of LEDBAT — Data Link

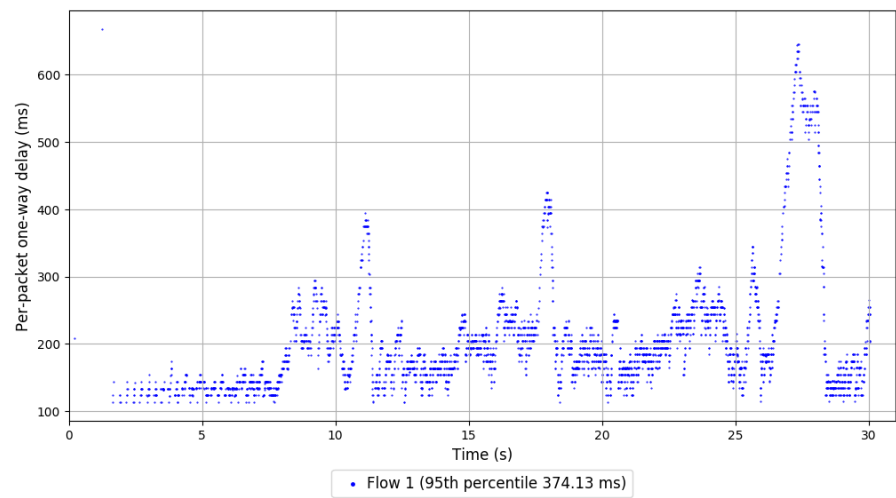
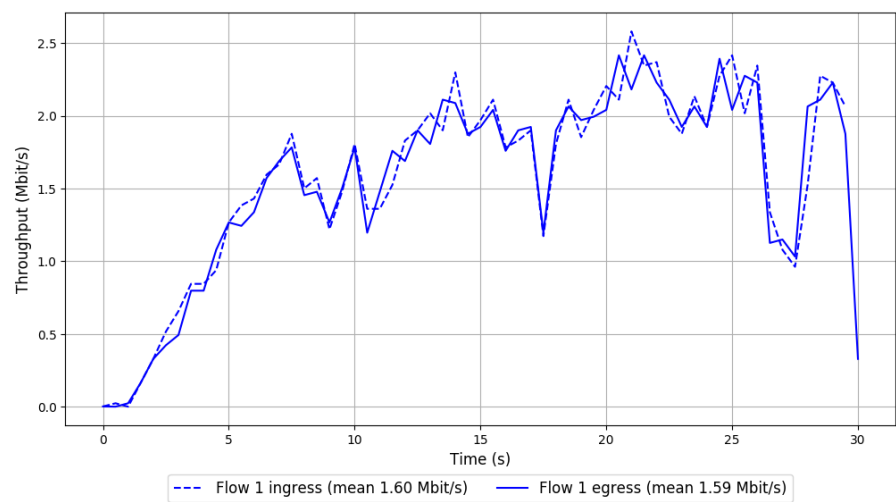


Run 2: Statistics of LEDBAT

Start at: 2018-02-12 20:47:25
End at: 2018-02-12 20:47:55
Local clock offset: -7.812 ms
Remote clock offset: -4.526 ms

Below is generated by plot.py at 2018-02-12 21:26:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 374.135 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 1.59 Mbit/s
95th percentile per-packet one-way delay: 374.135 ms
Loss rate: 0.61%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-02-12 21:08:34

End at: 2018-02-12 21:09:04

Local clock offset: -1.435 ms

Remote clock offset: 1.242 ms

Below is generated by plot.py at 2018-02-12 21:26:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.06 Mbit/s

95th percentile per-packet one-way delay: 459.813 ms

Loss rate: 0.55%

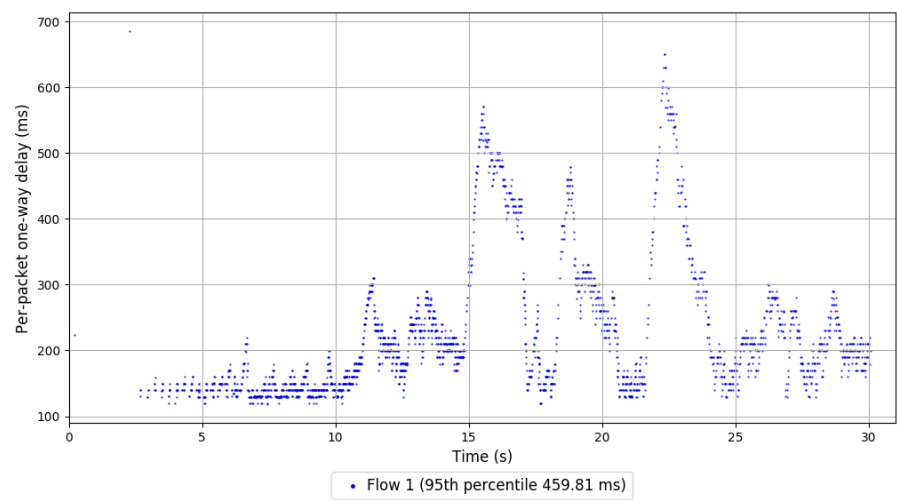
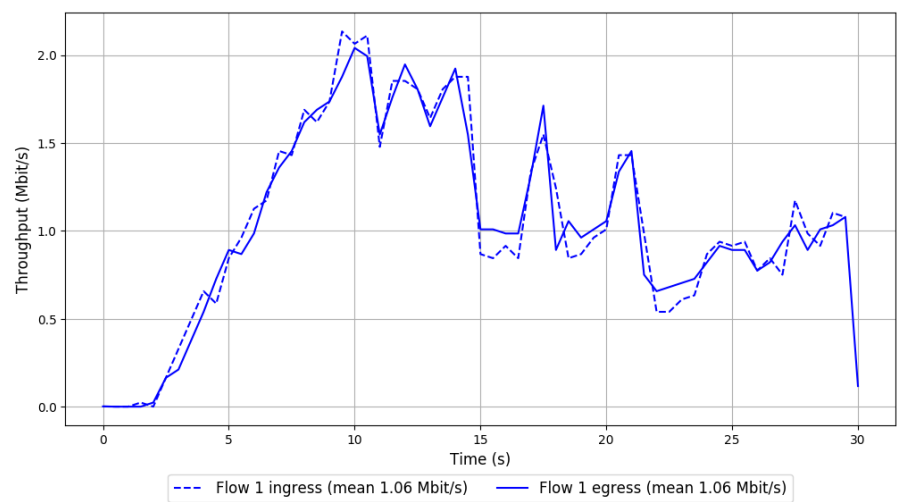
-- Flow 1:

Average throughput: 1.06 Mbit/s

95th percentile per-packet one-way delay: 459.813 ms

Loss rate: 0.55%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC

Start at: 2018-02-12 20:35:39

End at: 2018-02-12 20:36:09

Local clock offset: -7.023 ms

Remote clock offset: 0.187 ms

Below is generated by plot.py at 2018-02-12 21:26:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 4199.024 ms

Loss rate: 57.62%

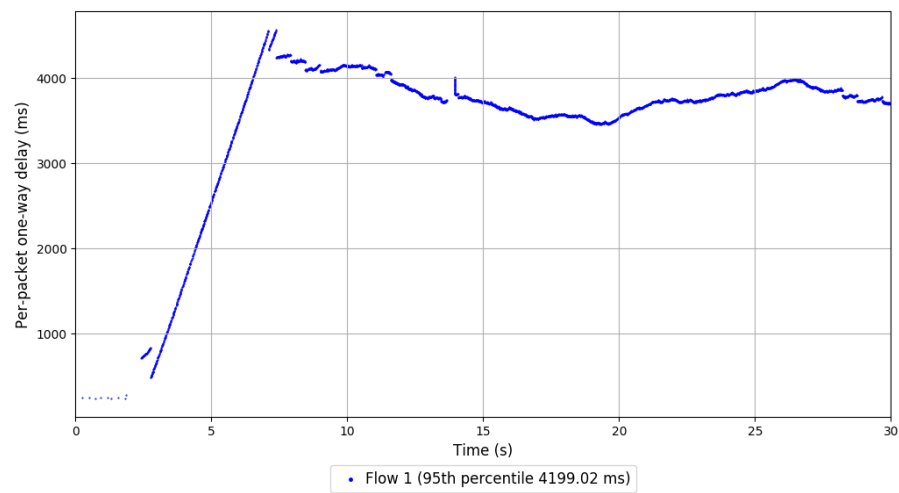
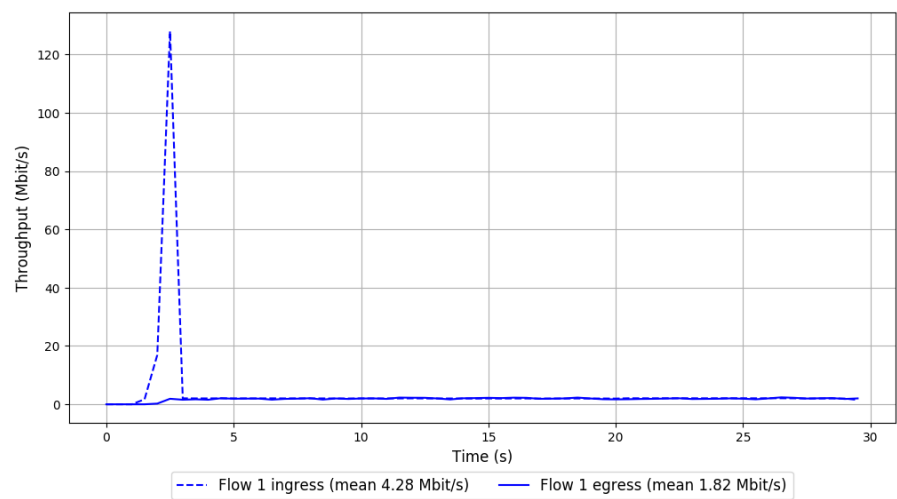
-- Flow 1:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 4199.024 ms

Loss rate: 57.62%

Run 1: Report of PCC — Data Link

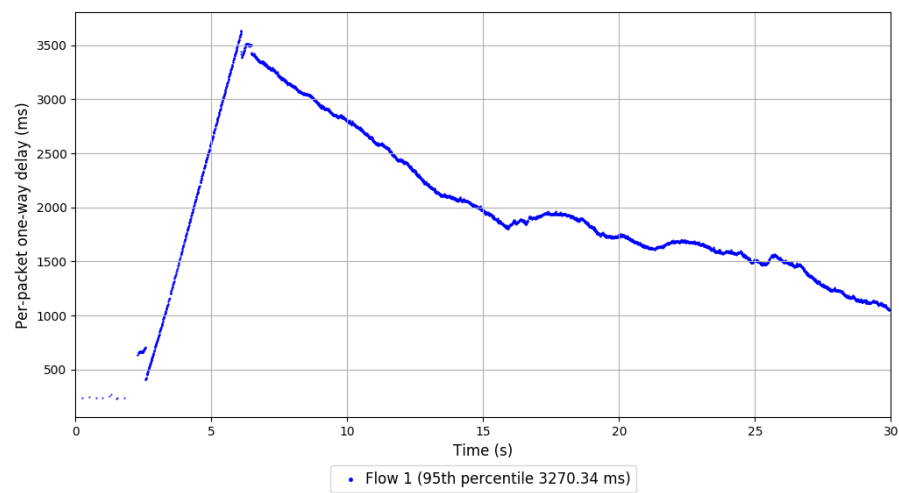
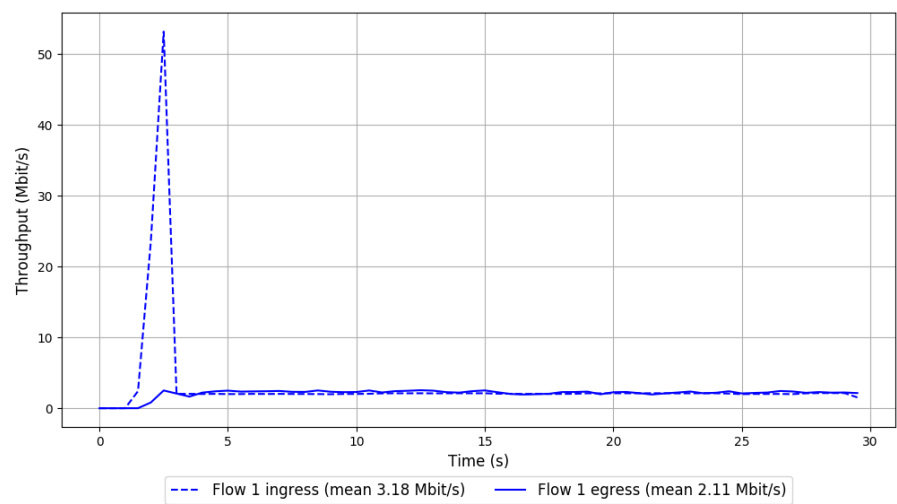


Run 2: Statistics of PCC

Start at: 2018-02-12 20:56:47
End at: 2018-02-12 20:57:17
Local clock offset: -3.123 ms
Remote clock offset: -4.456 ms

Below is generated by plot.py at 2018-02-12 21:26:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 3270.338 ms
Loss rate: 34.10%
-- Flow 1:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 3270.338 ms
Loss rate: 34.10%

Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

Start at: 2018-02-12 21:17:58

End at: 2018-02-12 21:18:28

Local clock offset: -1.045 ms

Remote clock offset: 1.393 ms

Below is generated by plot.py at 2018-02-12 21:26:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.65 Mbit/s

95th percentile per-packet one-way delay: 5268.783 ms

Loss rate: 73.74%

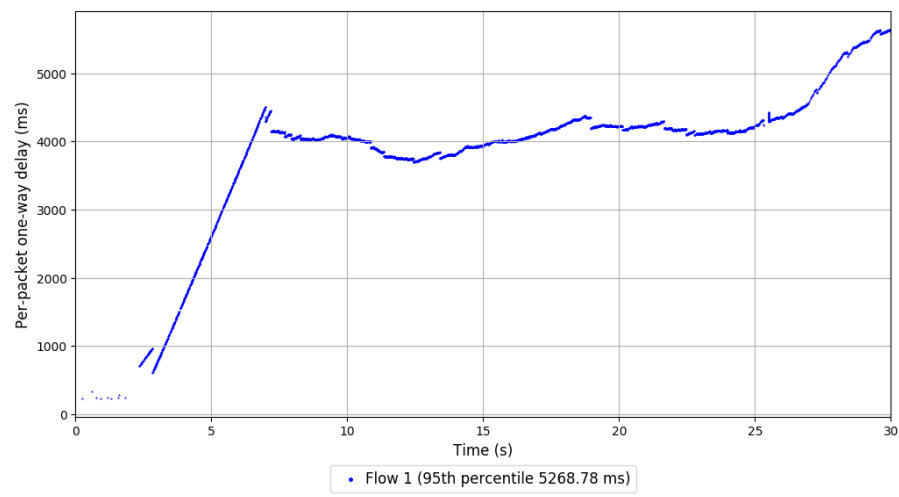
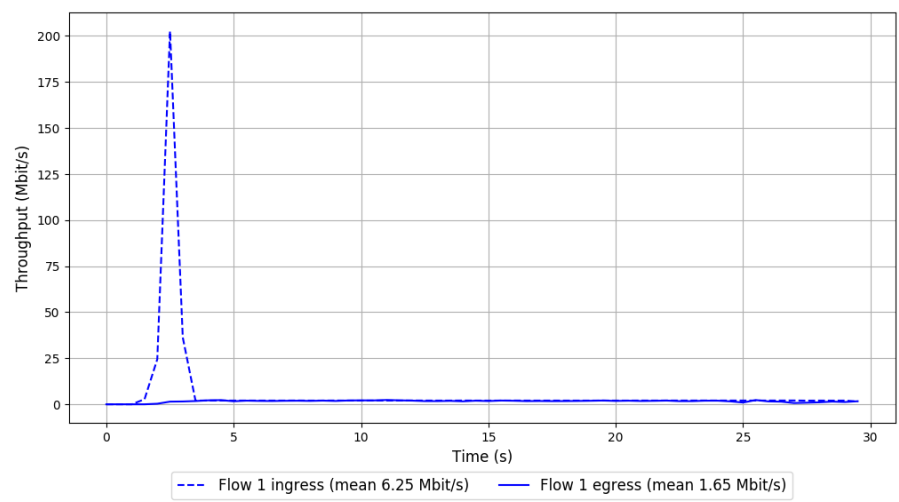
-- Flow 1:

Average throughput: 1.65 Mbit/s

95th percentile per-packet one-way delay: 5268.783 ms

Loss rate: 73.74%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

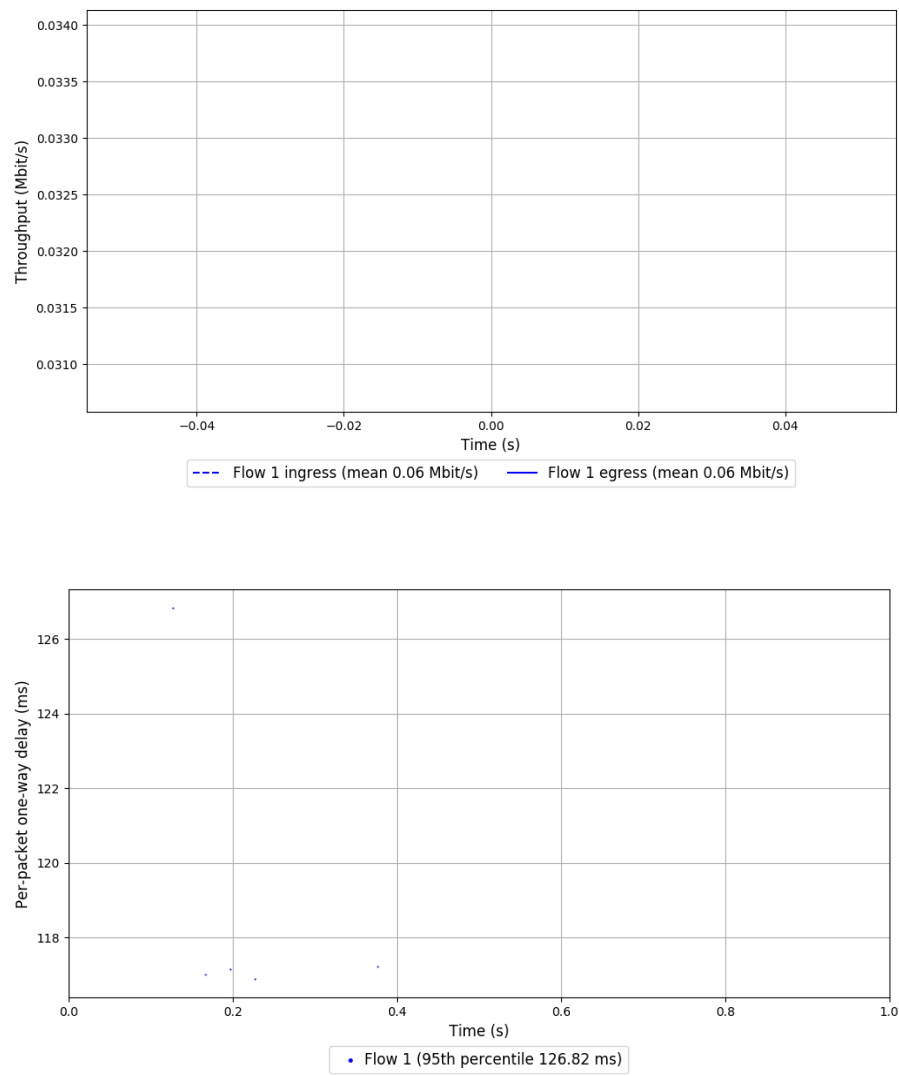
Start at: 2018-02-12 20:36:49

End at: 2018-02-12 20:37:19

Local clock offset: -7.077 ms

Remote clock offset: 0.998 ms

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-02-12 20:57:58

End at: 2018-02-12 20:58:28

Local clock offset: -2.841 ms

Remote clock offset: 0.285 ms

Below is generated by plot.py at 2018-02-12 21:26:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.99 Mbit/s

95th percentile per-packet one-way delay: 1384.110 ms

Loss rate: 4.62%

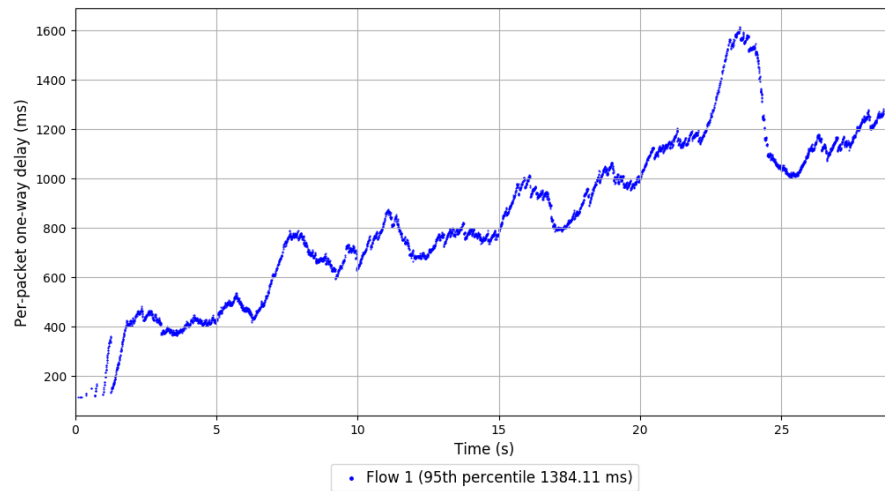
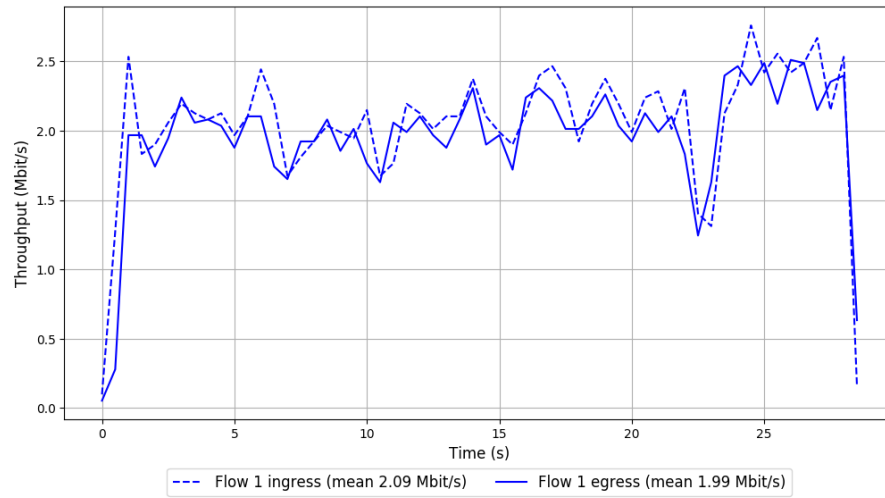
-- Flow 1:

Average throughput: 1.99 Mbit/s

95th percentile per-packet one-way delay: 1384.110 ms

Loss rate: 4.62%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-02-12 21:19:08

End at: 2018-02-12 21:19:38

Local clock offset: -1.01 ms

Remote clock offset: -3.447 ms

Below is generated by plot.py at 2018-02-12 21:26:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.41 Mbit/s

95th percentile per-packet one-way delay: 1788.036 ms

Loss rate: 5.81%

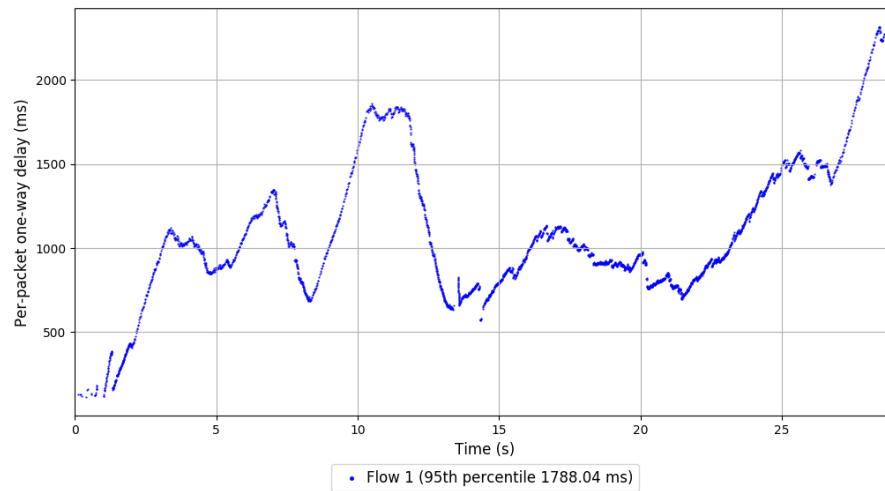
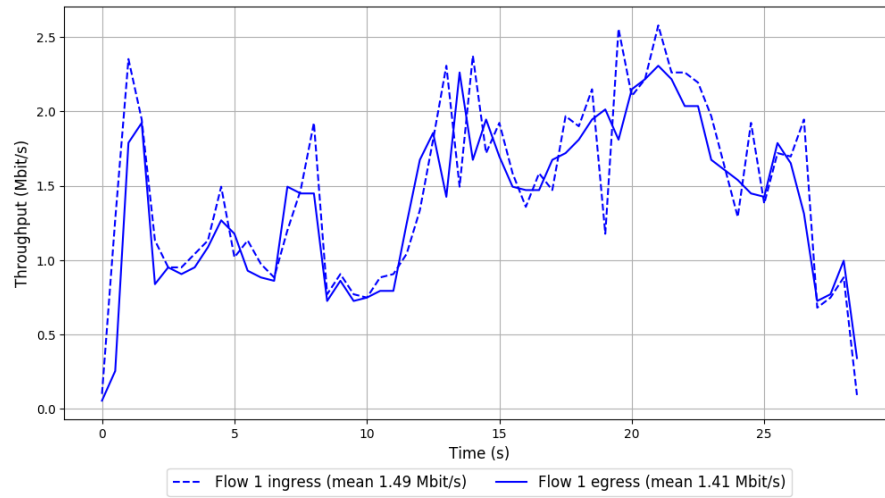
-- Flow 1:

Average throughput: 1.41 Mbit/s

95th percentile per-packet one-way delay: 1788.036 ms

Loss rate: 5.81%

Run 3: Report of QUIC Cubic — Data Link

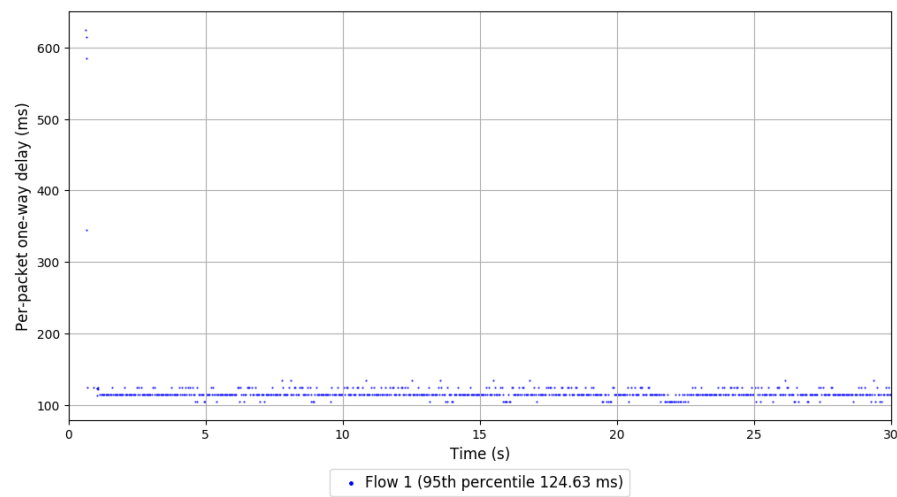
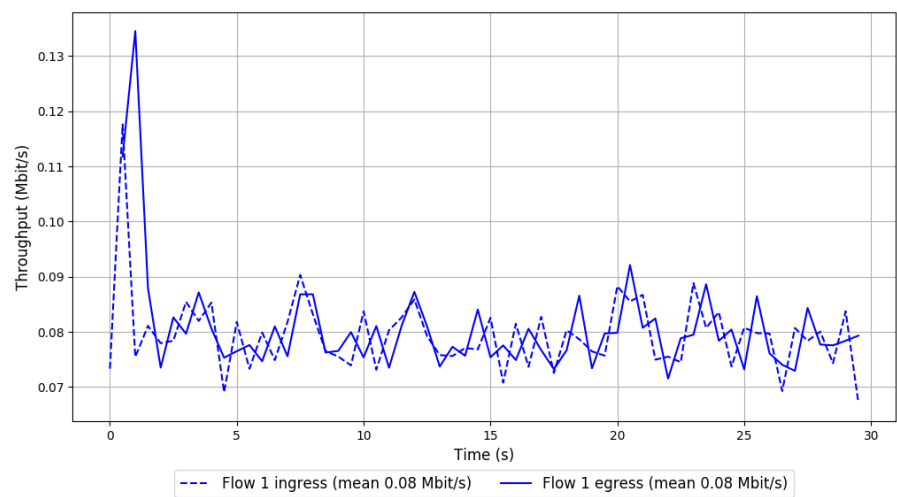


Run 1: Statistics of SCReAM

Start at: 2018-02-12 20:23:54
End at: 2018-02-12 20:24:24
Local clock offset: -8.292 ms
Remote clock offset: -3.886 ms

Below is generated by plot.py at 2018-02-12 21:26:44
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.631 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 124.631 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-02-12 20:45:04

End at: 2018-02-12 20:45:34

Local clock offset: -7.768 ms

Remote clock offset: 1.101 ms

Below is generated by plot.py at 2018-02-12 21:26:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 131.726 ms

Loss rate: 0.13%

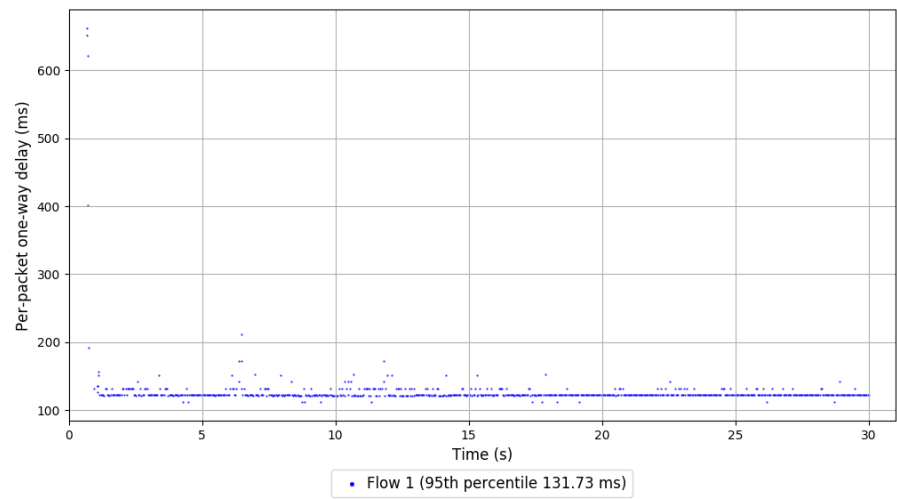
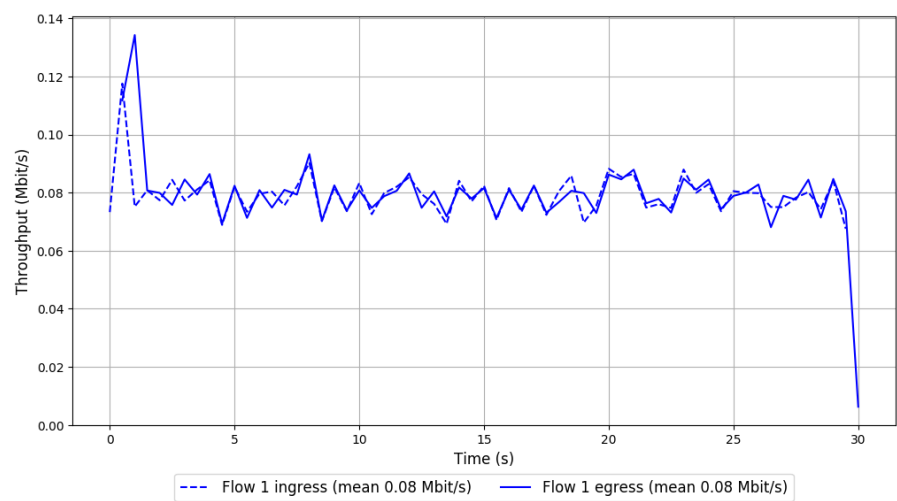
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 131.726 ms

Loss rate: 0.13%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-02-12 21:06:14

End at: 2018-02-12 21:06:44

Local clock offset: -1.532 ms

Remote clock offset: 0.392 ms

Below is generated by plot.py at 2018-02-12 21:26:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 136.647 ms

Loss rate: 0.00%

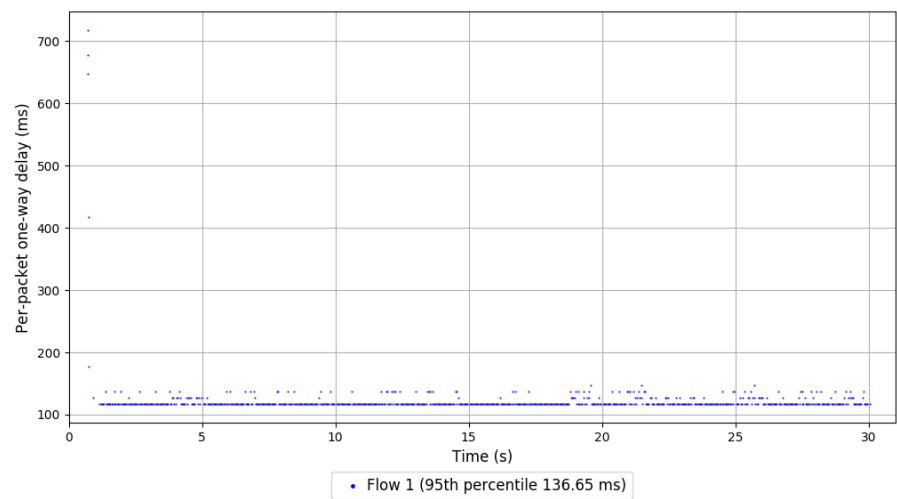
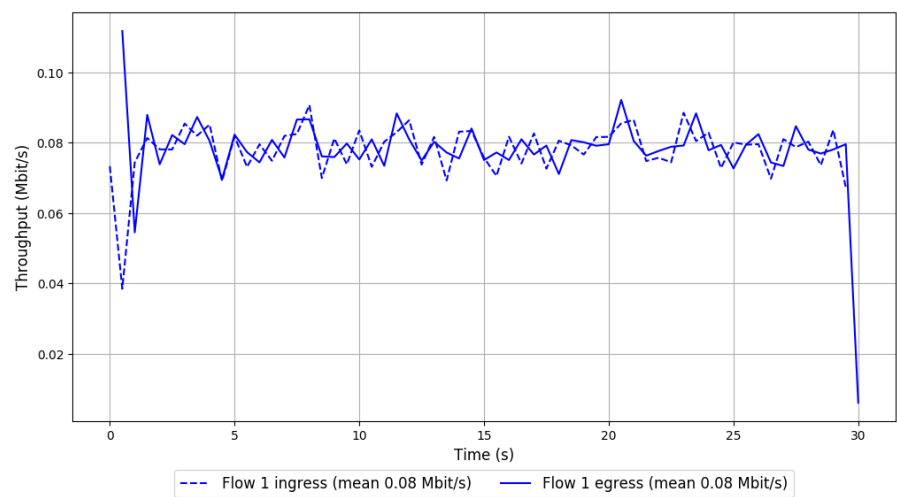
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 136.647 ms

Loss rate: 0.00%

Run 3: Report of SReAM — Data Link

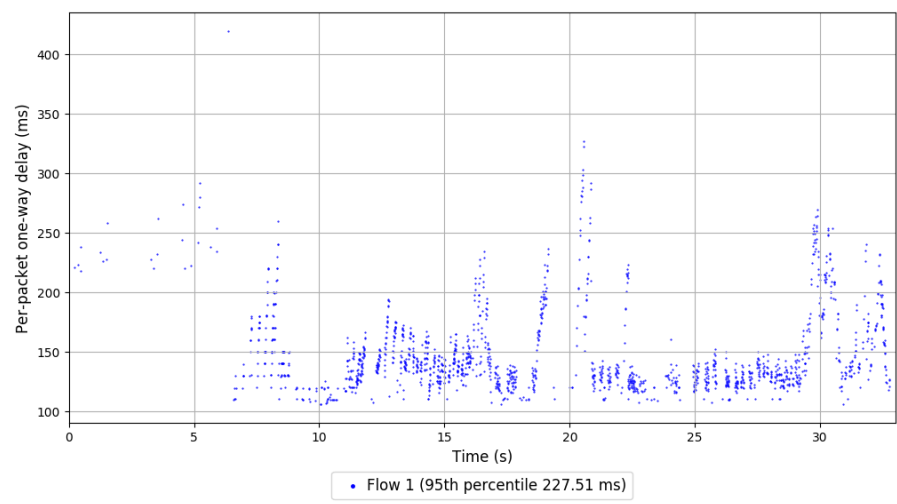
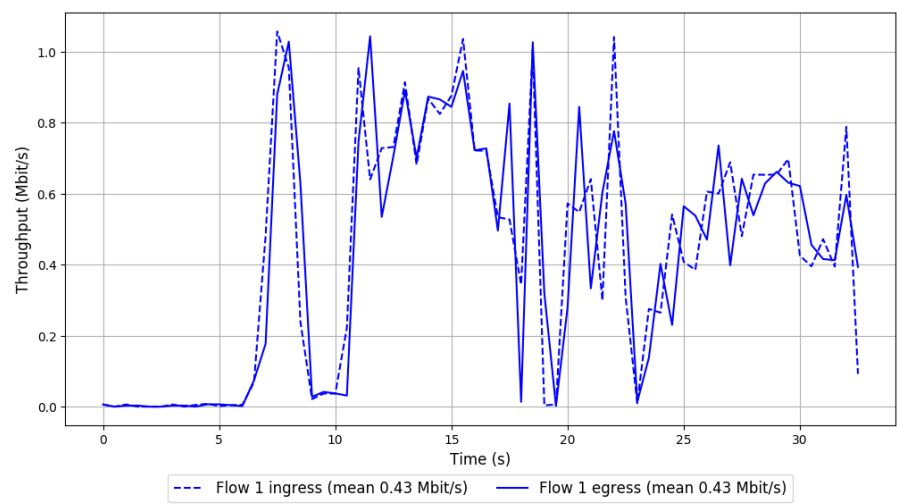


Run 1: Statistics of WebRTC media

Start at: 2018-02-12 20:27:24
End at: 2018-02-12 20:27:54
Local clock offset: -7.407 ms
Remote clock offset: -3.778 ms

Below is generated by plot.py at 2018-02-12 21:26:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 227.508 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 227.508 ms
Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-02-12 20:48:35

End at: 2018-02-12 20:49:05

Local clock offset: -6.858 ms

Remote clock offset: 1.934 ms

Below is generated by plot.py at 2018-02-12 21:26:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.77 Mbit/s

95th percentile per-packet one-way delay: 180.470 ms

Loss rate: 0.24%

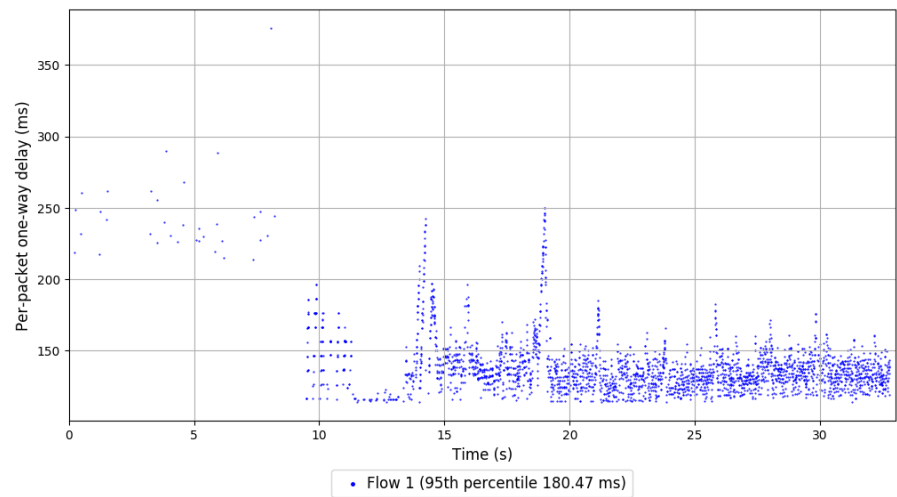
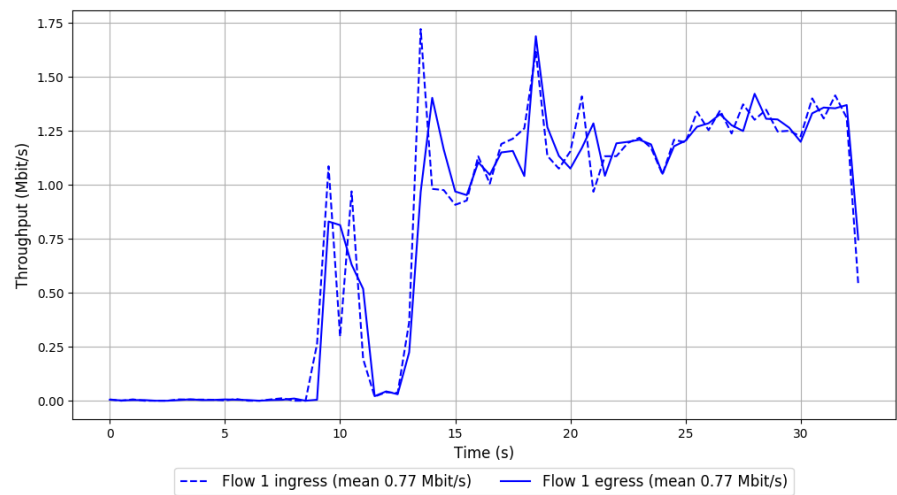
-- Flow 1:

Average throughput: 0.77 Mbit/s

95th percentile per-packet one-way delay: 180.470 ms

Loss rate: 0.24%

Run 2: Report of WebRTC media — Data Link

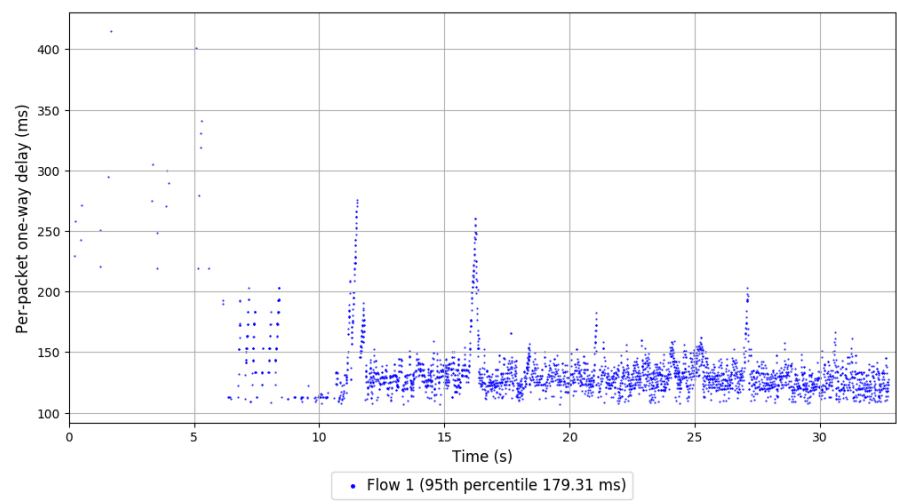
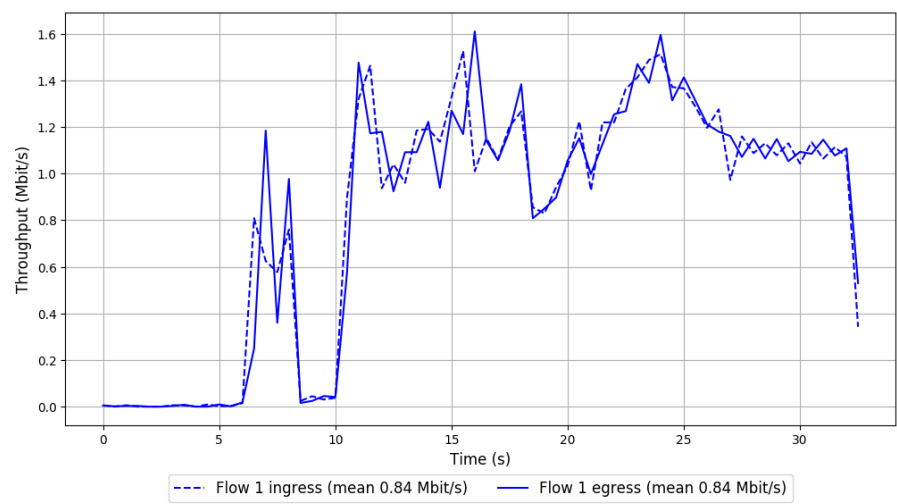


Run 3: Statistics of WebRTC media

Start at: 2018-02-12 21:09:45
End at: 2018-02-12 21:10:15
Local clock offset: -1.282 ms
Remote clock offset: -3.652 ms

Below is generated by plot.py at 2018-02-12 21:26:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 179.310 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 179.310 ms
Loss rate: 0.13%

Run 3: Report of WebRTC media — Data Link

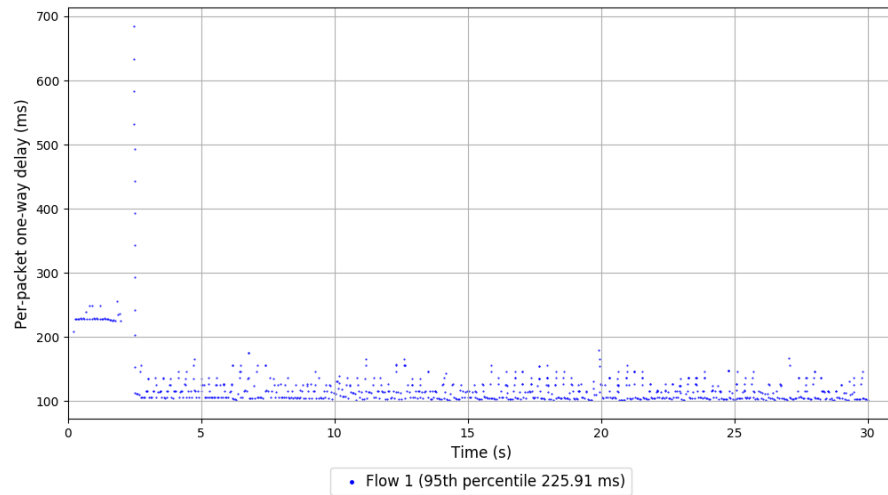
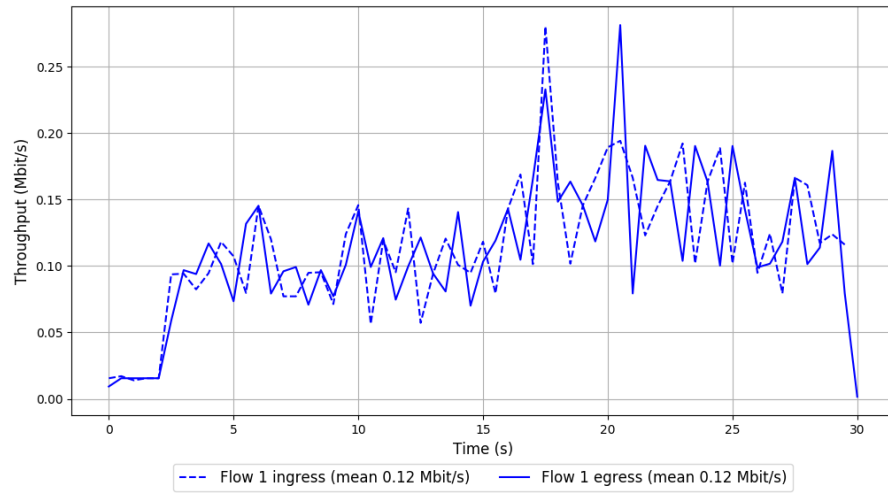


Run 1: Statistics of Sprout

Start at: 2018-02-12 20:22:44
End at: 2018-02-12 20:23:14
Local clock offset: -8.747 ms
Remote clock offset: -4.649 ms

Below is generated by plot.py at 2018-02-12 21:26:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 225.909 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 225.909 ms
Loss rate: 0.55%

Run 1: Report of Sprout — Data Link

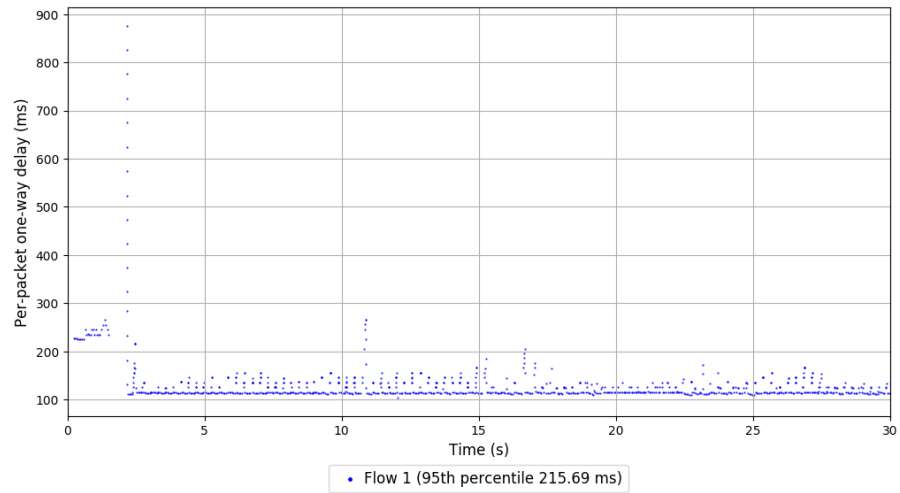
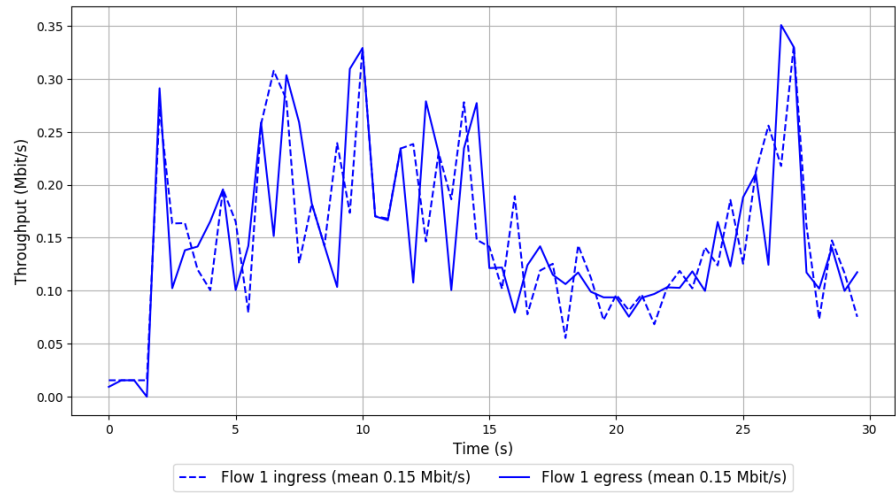


Run 2: Statistics of Sprout

Start at: 2018-02-12 20:43:54
End at: 2018-02-12 20:44:24
Local clock offset: -7.74 ms
Remote clock offset: -4.572 ms

Below is generated by plot.py at 2018-02-12 21:26:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 215.693 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 215.693 ms
Loss rate: 0.02%

Run 2: Report of Sprout — Data Link

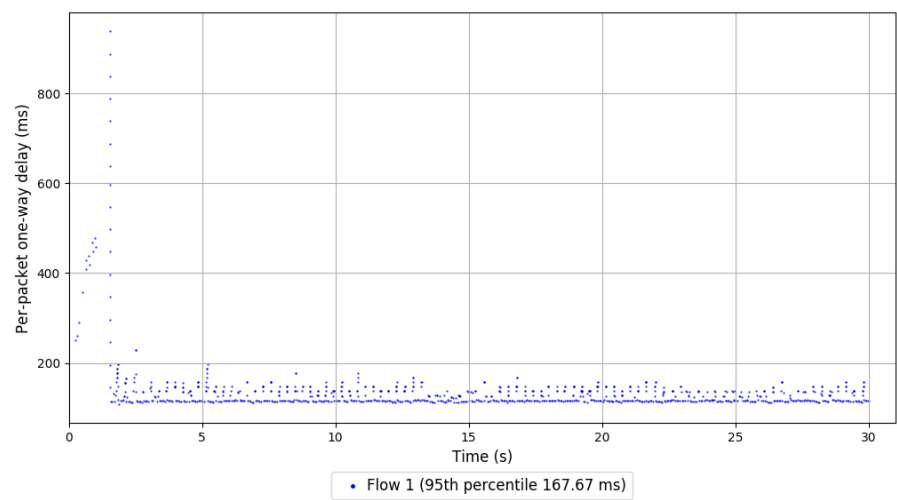
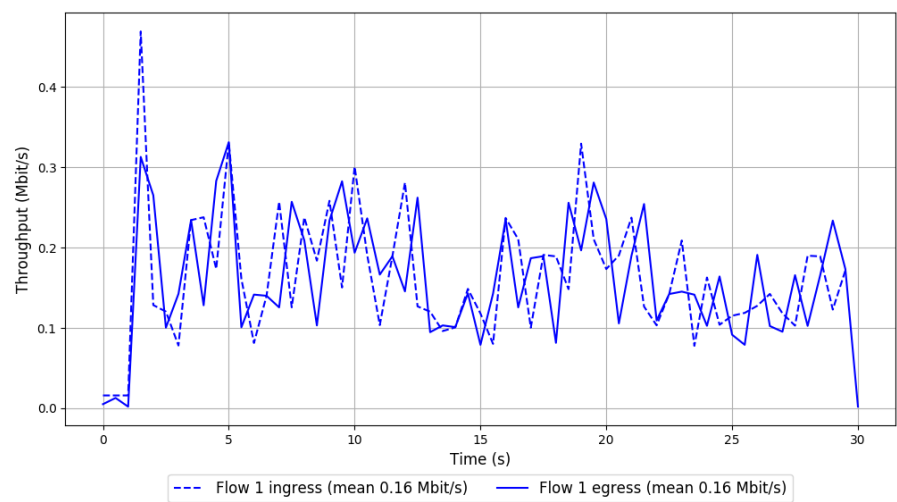


Run 3: Statistics of Sprout

Start at: 2018-02-12 21:05:04
End at: 2018-02-12 21:05:34
Local clock offset: -1.736 ms
Remote clock offset: 0.395 ms

Below is generated by plot.py at 2018-02-12 21:26:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 167.673 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 167.673 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-02-12 20:39:10

End at: 2018-02-12 20:39:40

Local clock offset: -7.2 ms

Remote clock offset: 0.136 ms

Below is generated by plot.py at 2018-02-12 21:26:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 1221.737 ms

Loss rate: 0.74%

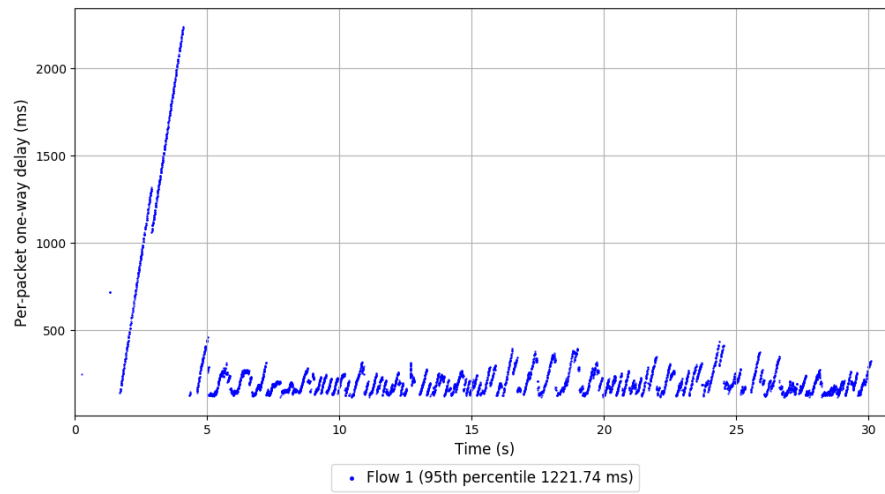
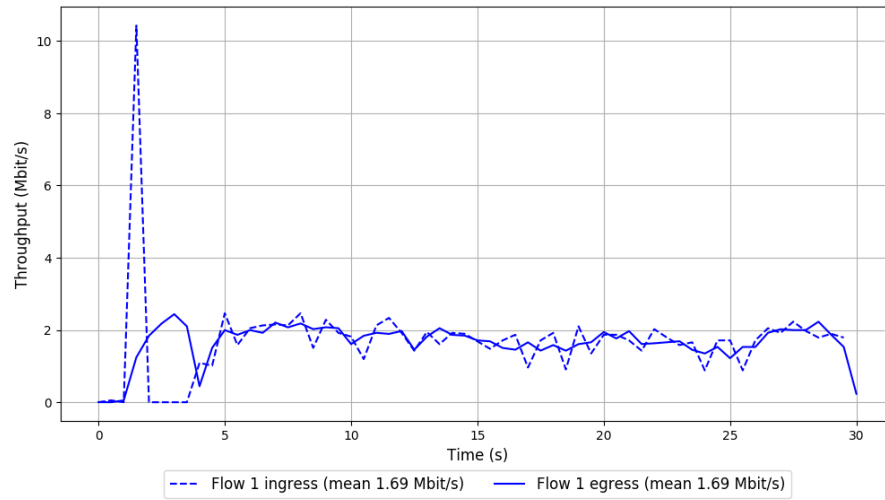
-- Flow 1:

Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 1221.737 ms

Loss rate: 0.74%

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

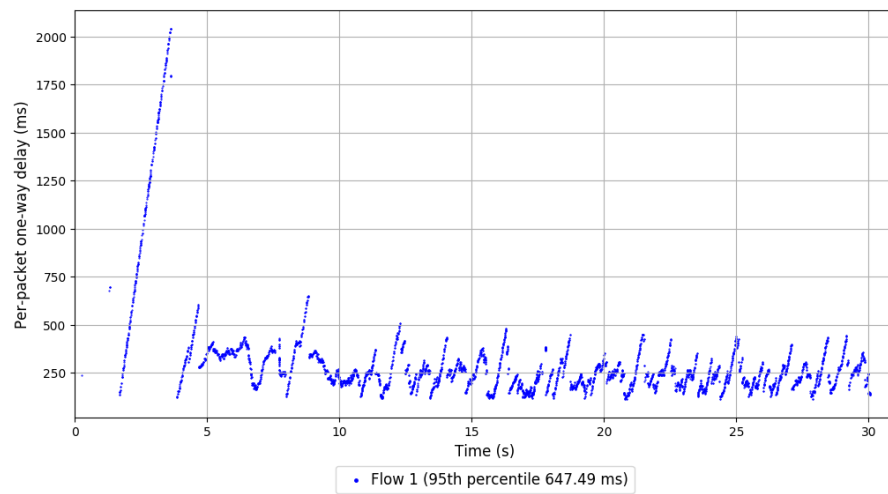
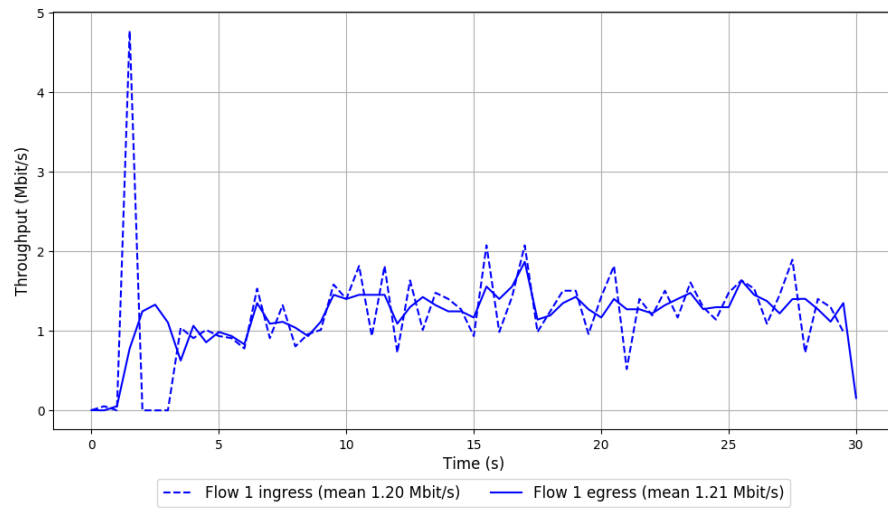


Run 2: Statistics of TaoVA-100x

Start at: 2018-02-12 21:00:19
End at: 2018-02-12 21:00:49
Local clock offset: -2.341 ms
Remote clock offset: -4.555 ms

Below is generated by plot.py at 2018-02-12 21:26:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 647.485 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 1.21 Mbit/s
95th percentile per-packet one-way delay: 647.485 ms
Loss rate: 0.39%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-02-12 21:21:32

End at: 2018-02-12 21:22:02

Local clock offset: -0.855 ms

Remote clock offset: 2.32 ms

Below is generated by plot.py at 2018-02-12 21:26:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.41 Mbit/s

95th percentile per-packet one-way delay: 483.263 ms

Loss rate: 0.67%

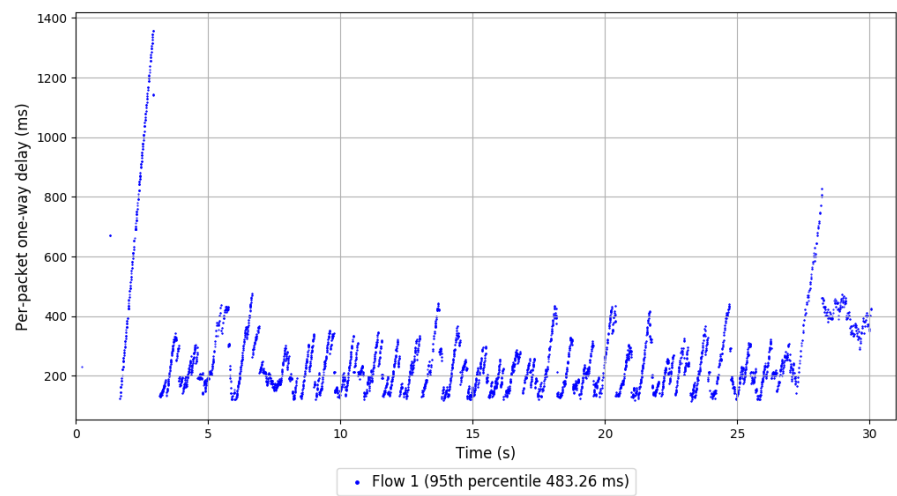
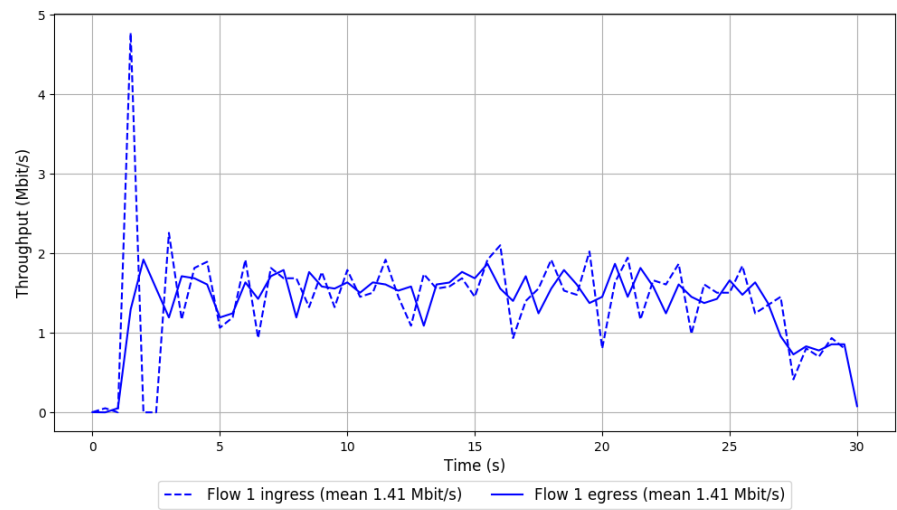
-- Flow 1:

Average throughput: 1.41 Mbit/s

95th percentile per-packet one-way delay: 483.263 ms

Loss rate: 0.67%

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

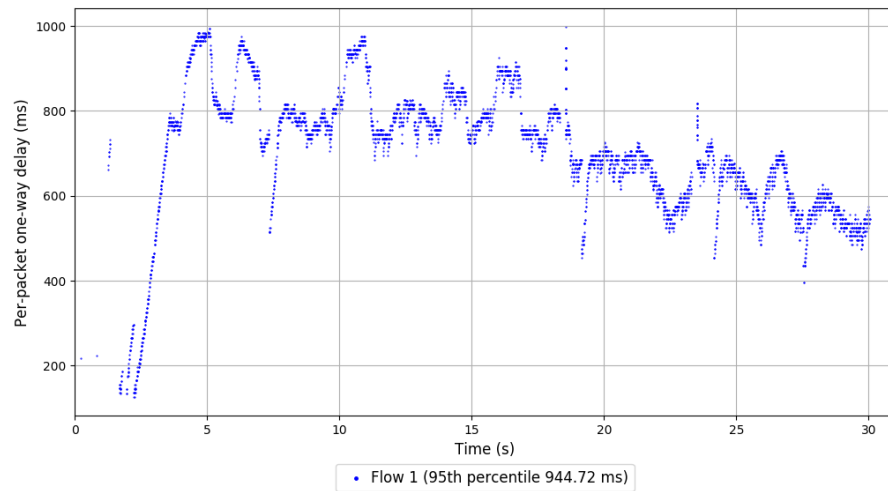
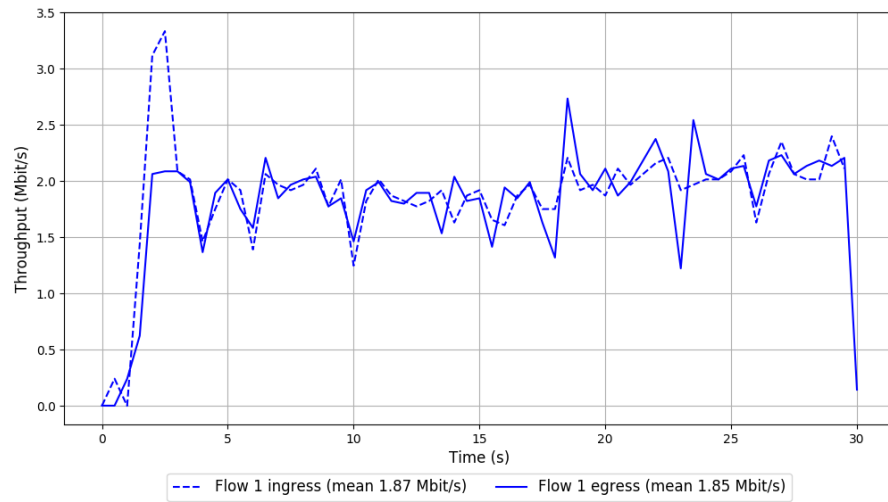


Run 1: Statistics of TCP Vegas

Start at: 2018-02-12 20:32:07
End at: 2018-02-12 20:32:37
Local clock offset: -7.063 ms
Remote clock offset: -4.585 ms

Below is generated by plot.py at 2018-02-12 21:26:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 944.723 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 944.723 ms
Loss rate: 1.97%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-02-12 20:53:16

End at: 2018-02-12 20:53:46

Local clock offset: -4.302 ms

Remote clock offset: 1.11 ms

Below is generated by plot.py at 2018-02-12 21:26:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.96 Mbit/s

95th percentile per-packet one-way delay: 765.071 ms

Loss rate: 0.75%

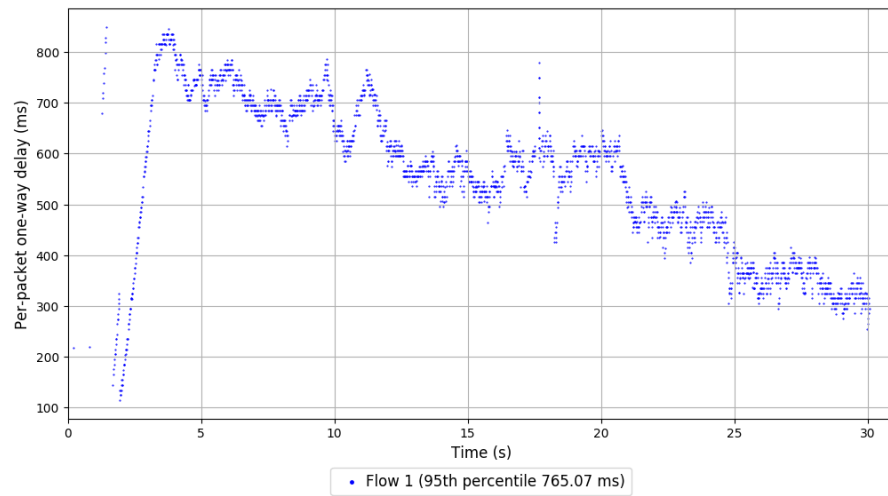
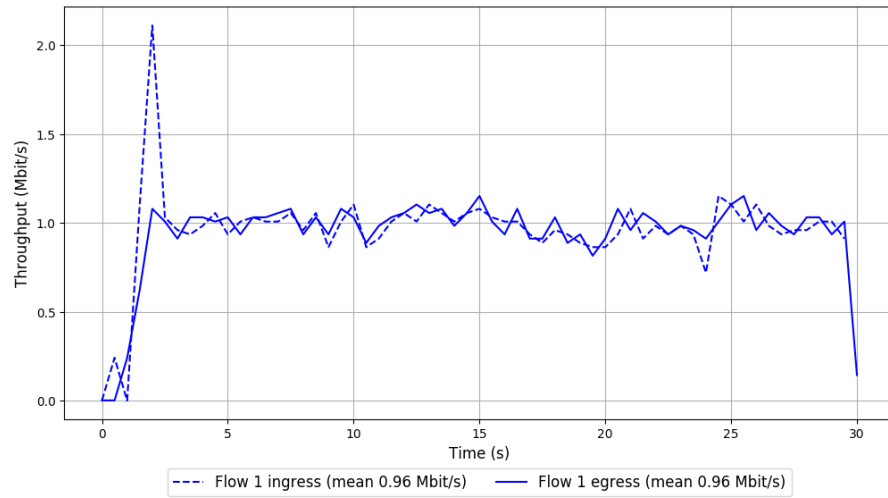
-- Flow 1:

Average throughput: 0.96 Mbit/s

95th percentile per-packet one-way delay: 765.071 ms

Loss rate: 0.75%

Run 2: Report of TCP Vegas — Data Link

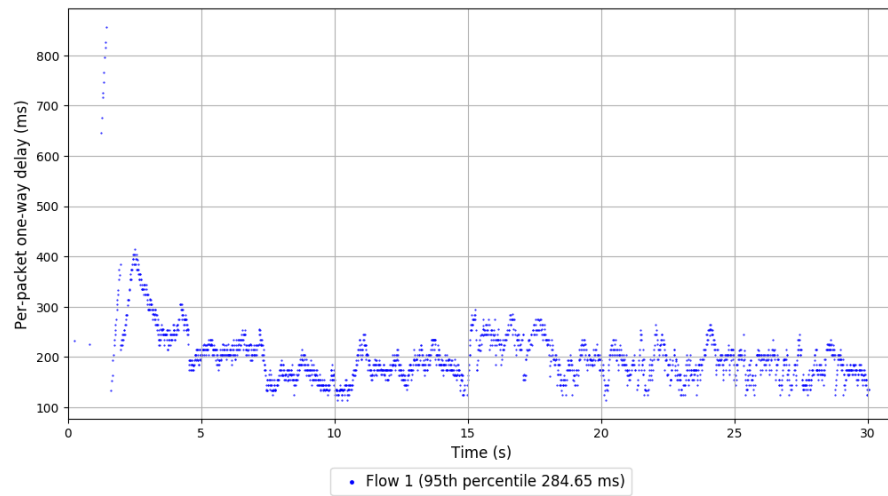
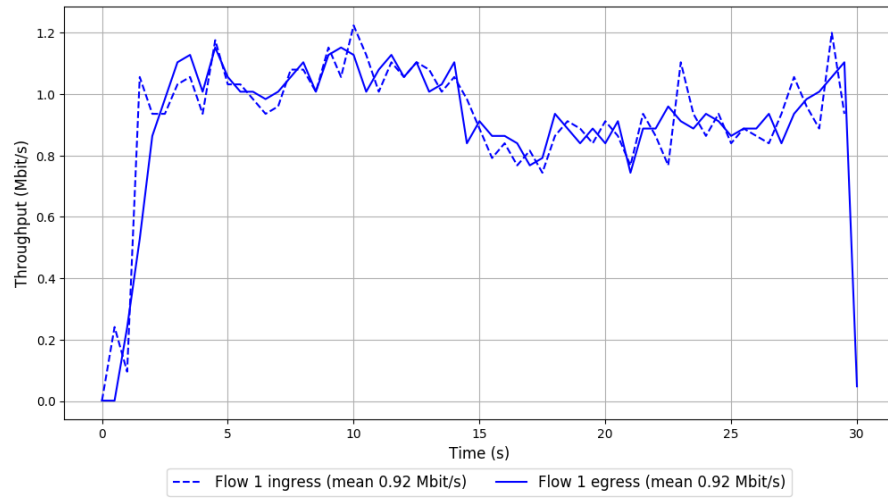


Run 3: Statistics of TCP Vegas

Start at: 2018-02-12 21:14:26
End at: 2018-02-12 21:14:56
Local clock offset: -1.177 ms
Remote clock offset: -3.486 ms

Below is generated by plot.py at 2018-02-12 21:26:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 284.655 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 284.655 ms
Loss rate: 0.39%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2018-02-12 20:40:20

End at: 2018-02-12 20:40:50

Local clock offset: -7.287 ms

Remote clock offset: -3.85 ms

Below is generated by plot.py at 2018-02-12 21:26:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.02 Mbit/s

95th percentile per-packet one-way delay: 2653.633 ms

Loss rate: 2.73%

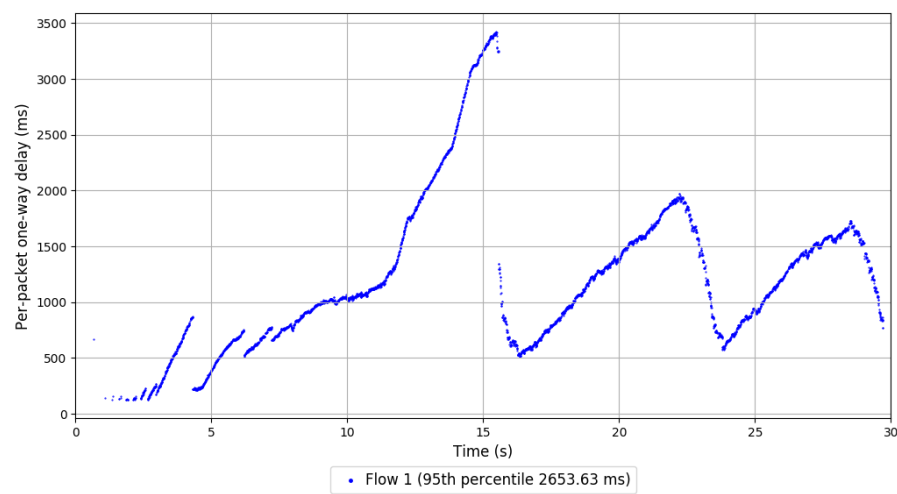
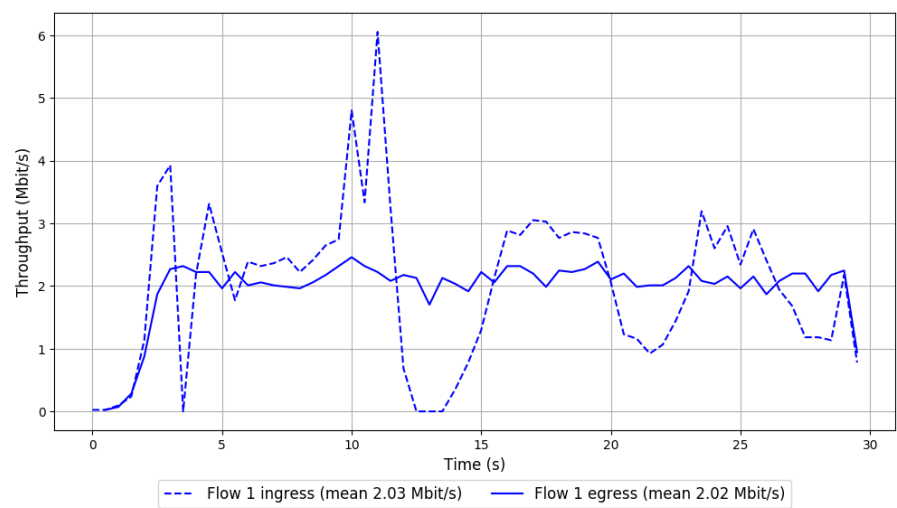
-- Flow 1:

Average throughput: 2.02 Mbit/s

95th percentile per-packet one-way delay: 2653.633 ms

Loss rate: 2.73%

Run 1: Report of Verus — Data Link

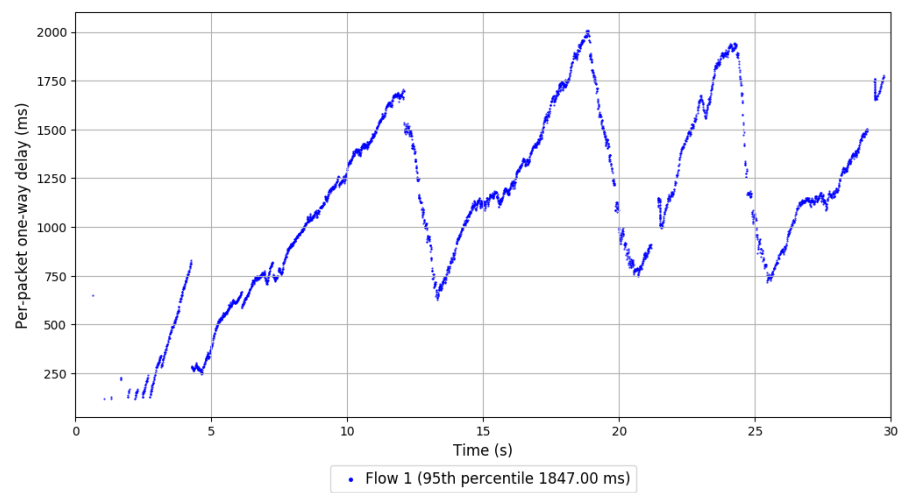
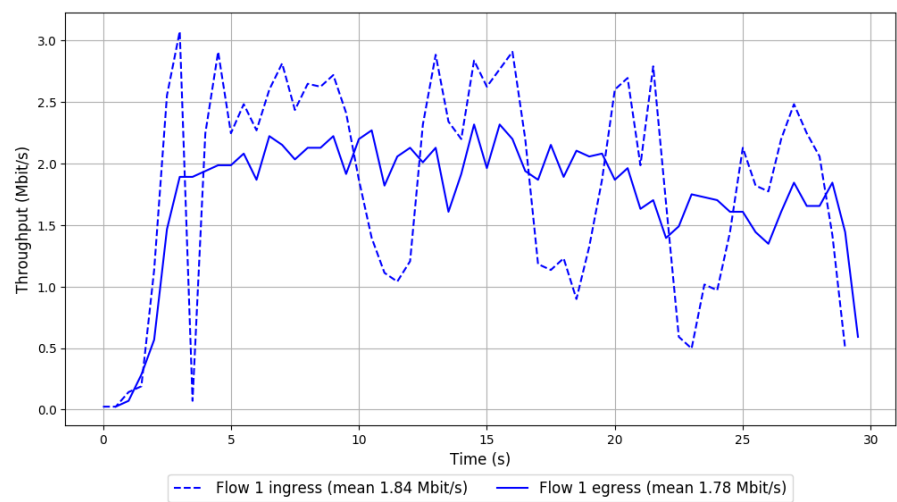


Run 2: Statistics of Verus

Start at: 2018-02-12 21:01:30
End at: 2018-02-12 21:02:00
Local clock offset: -2.227 ms
Remote clock offset: -4.531 ms

Below is generated by plot.py at 2018-02-12 21:26:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 1846.998 ms
Loss rate: 3.79%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 1846.998 ms
Loss rate: 3.79%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2018-02-12 21:22:42

End at: 2018-02-12 21:23:12

Local clock offset: -0.569 ms

Remote clock offset: 0.595 ms

Below is generated by plot.py at 2018-02-12 21:26:55

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 1746.733 ms

Loss rate: 6.19%

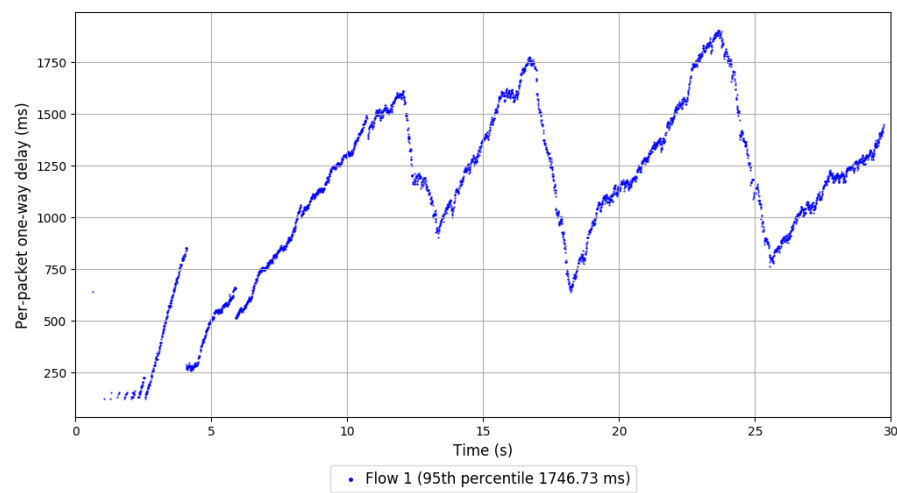
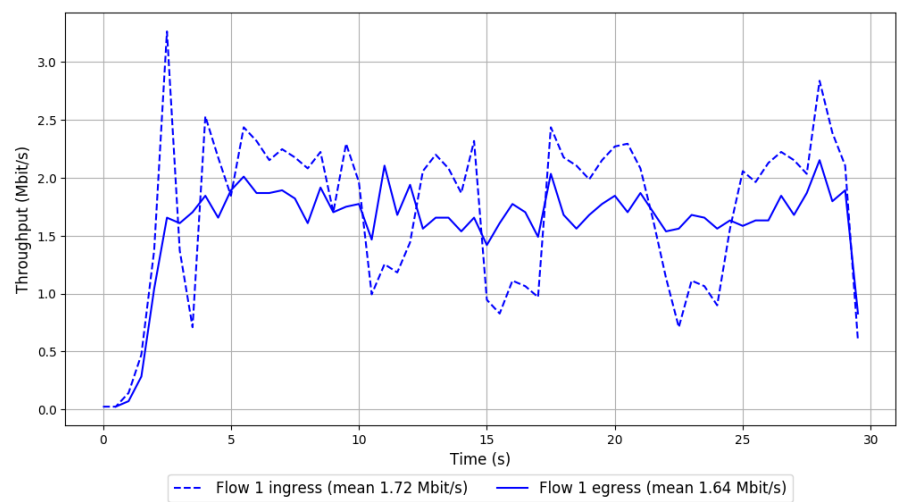
-- Flow 1:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 1746.733 ms

Loss rate: 6.19%

Run 3: Report of Verus — Data Link

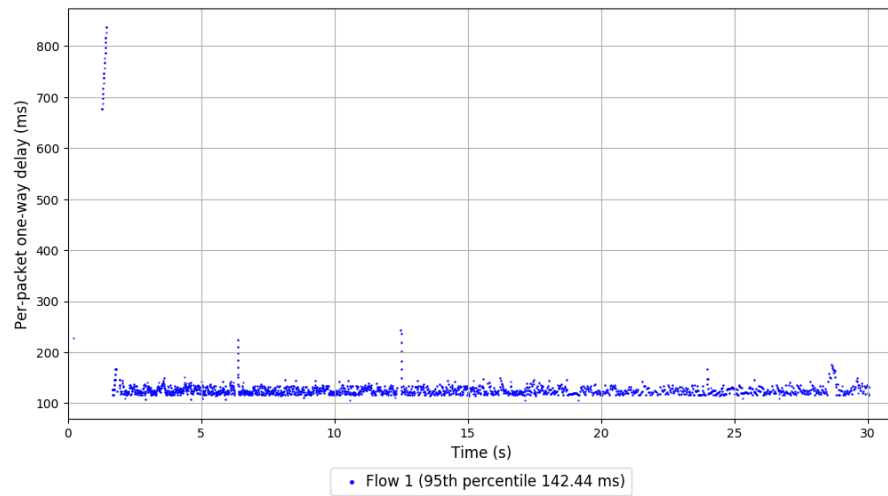
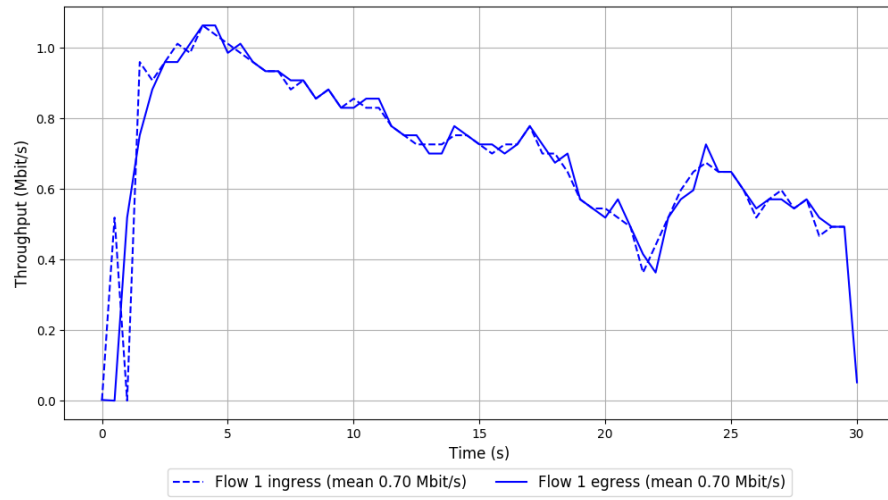


Run 1: Statistics of Copa

Start at: 2018-02-12 20:34:28
End at: 2018-02-12 20:34:58
Local clock offset: -6.993 ms
Remote clock offset: -3.821 ms

Below is generated by plot.py at 2018-02-12 21:26:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 142.435 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 142.435 ms
Loss rate: 0.12%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2018-02-12 20:55:37

End at: 2018-02-12 20:56:07

Local clock offset: -3.487 ms

Remote clock offset: 1.095 ms

Below is generated by plot.py at 2018-02-12 21:26:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.79 Mbit/s

95th percentile per-packet one-way delay: 153.696 ms

Loss rate: 0.11%

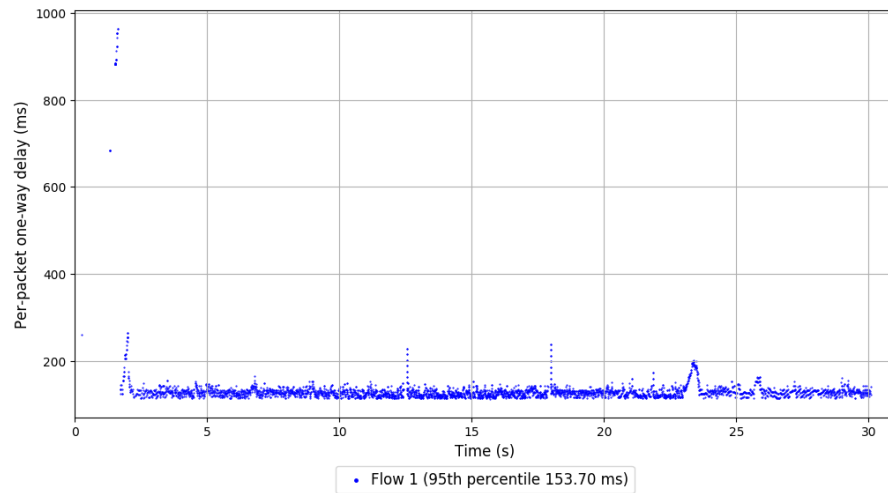
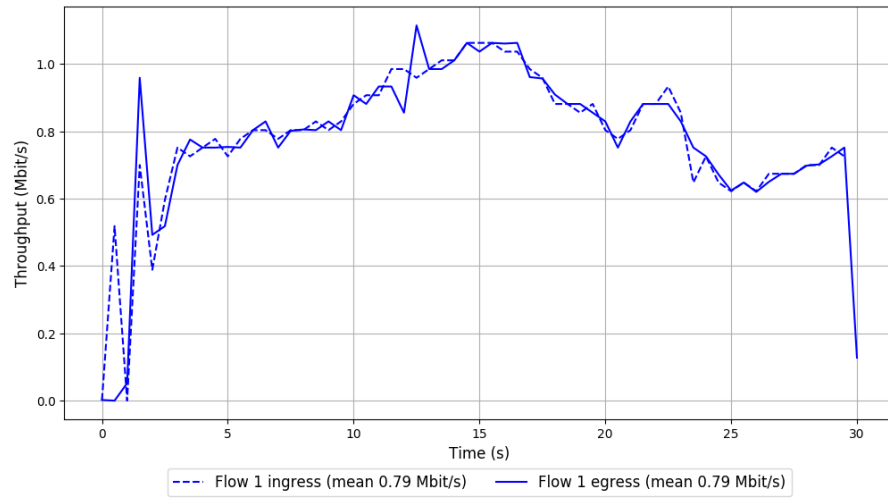
-- Flow 1:

Average throughput: 0.79 Mbit/s

95th percentile per-packet one-way delay: 153.696 ms

Loss rate: 0.11%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2018-02-12 21:16:47

End at: 2018-02-12 21:17:17

Local clock offset: -1.005 ms

Remote clock offset: 0.553 ms

Below is generated by plot.py at 2018-02-12 21:26:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.72 Mbit/s

95th percentile per-packet one-way delay: 159.319 ms

Loss rate: 0.18%

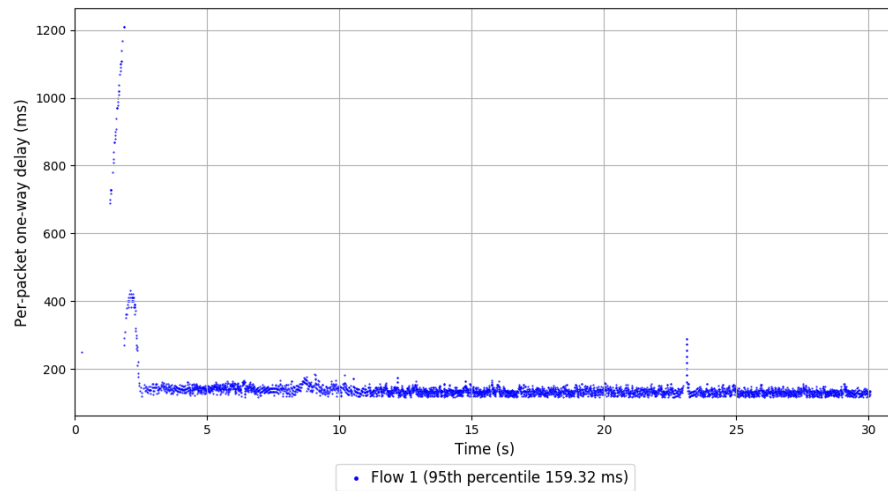
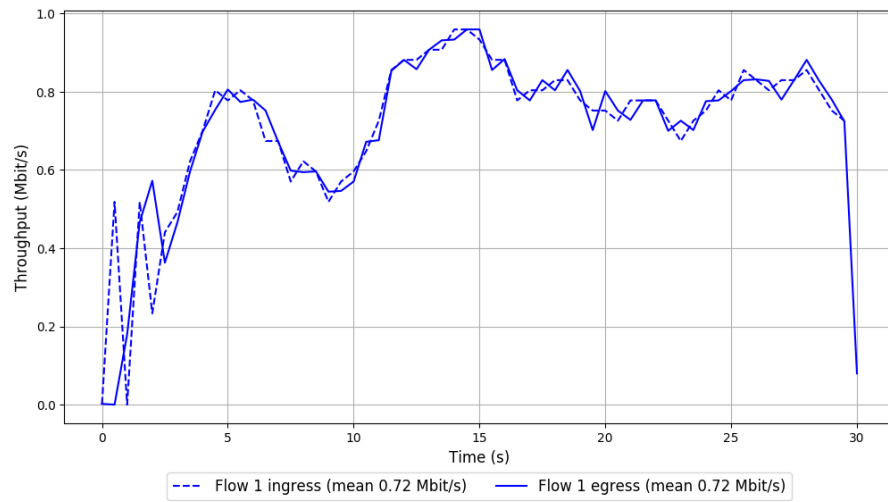
-- Flow 1:

Average throughput: 0.72 Mbit/s

95th percentile per-packet one-way delay: 159.319 ms

Loss rate: 0.18%

Run 3: Report of Copa — Data Link

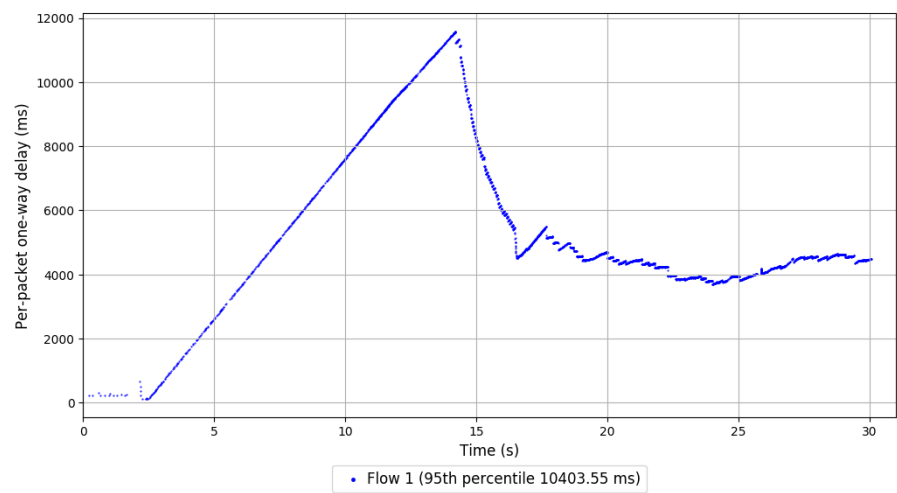
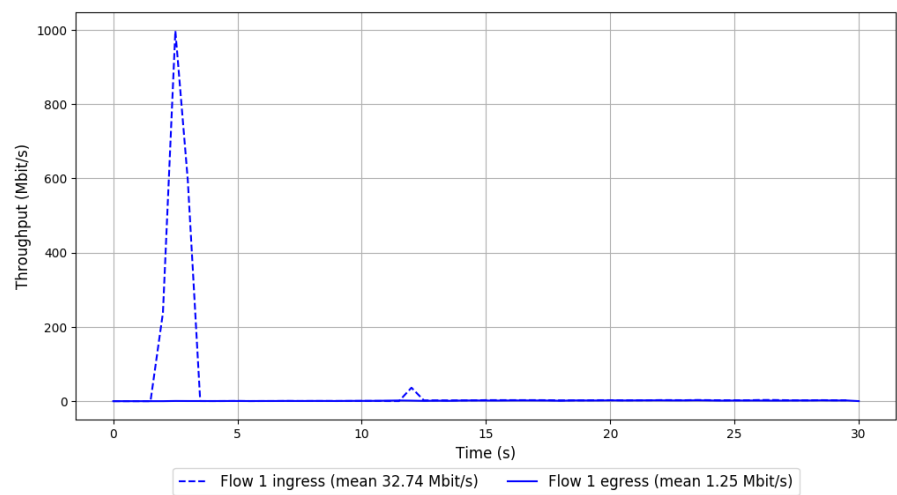


Run 1: Statistics of FillP

Start at: 2018-02-12 20:37:59
End at: 2018-02-12 20:38:29
Local clock offset: -7.145 ms
Remote clock offset: -3.823 ms

Below is generated by plot.py at 2018-02-12 21:27:08
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 10403.552 ms
Loss rate: 96.21%
-- Flow 1:
Average throughput: 1.25 Mbit/s
95th percentile per-packet one-way delay: 10403.552 ms
Loss rate: 96.21%

Run 1: Report of FillP — Data Link

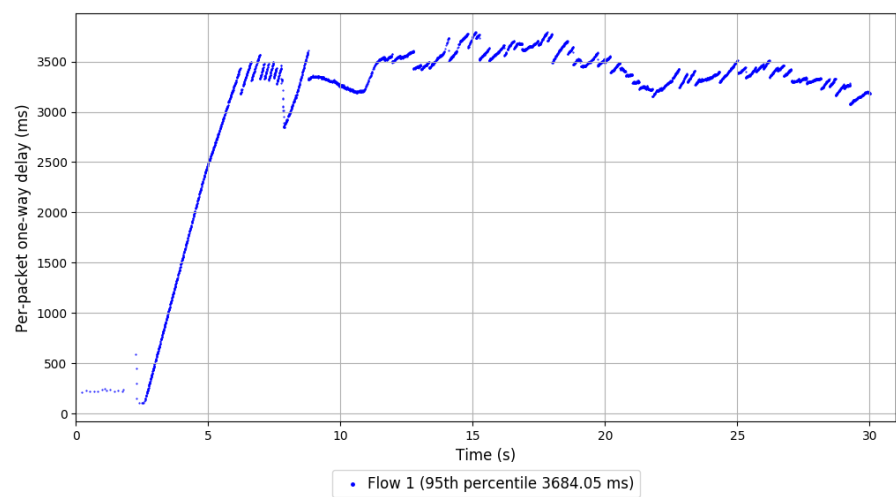
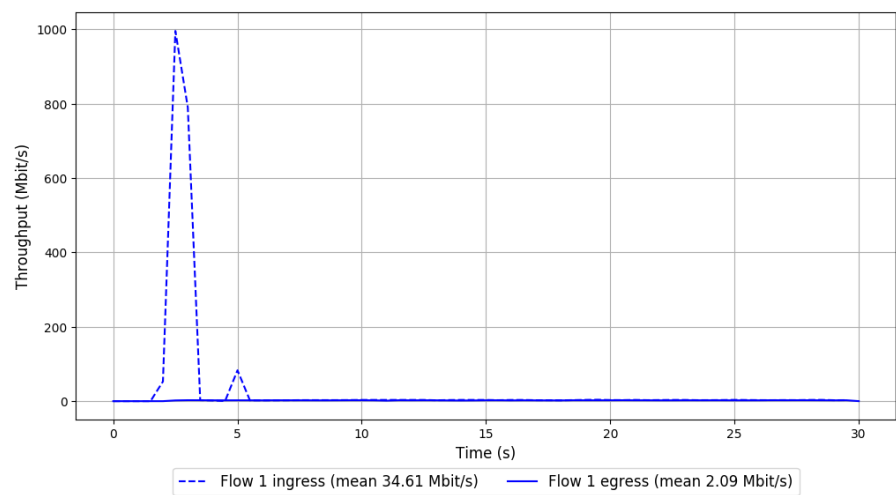


Run 2: Statistics of FillP

Start at: 2018-02-12 20:59:08
End at: 2018-02-12 20:59:38
Local clock offset: -2.547 ms
Remote clock offset: -4.509 ms

Below is generated by plot.py at 2018-02-12 21:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 3684.054 ms
Loss rate: 93.98%
-- Flow 1:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 3684.054 ms
Loss rate: 93.98%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-02-12 21:20:18

End at: 2018-02-12 21:20:48

Local clock offset: -0.992 ms

Remote clock offset: 2.249 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.62 Mbit/s

95th percentile per-packet one-way delay: 4649.252 ms

Loss rate: 95.24%

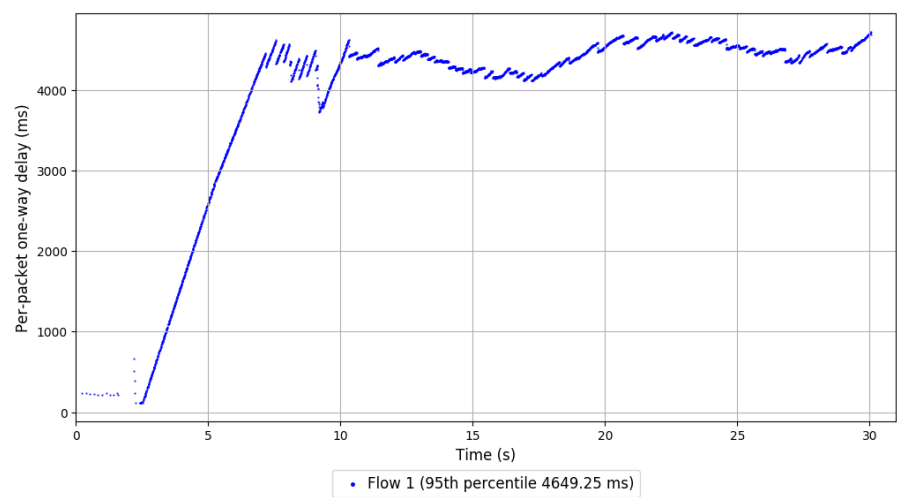
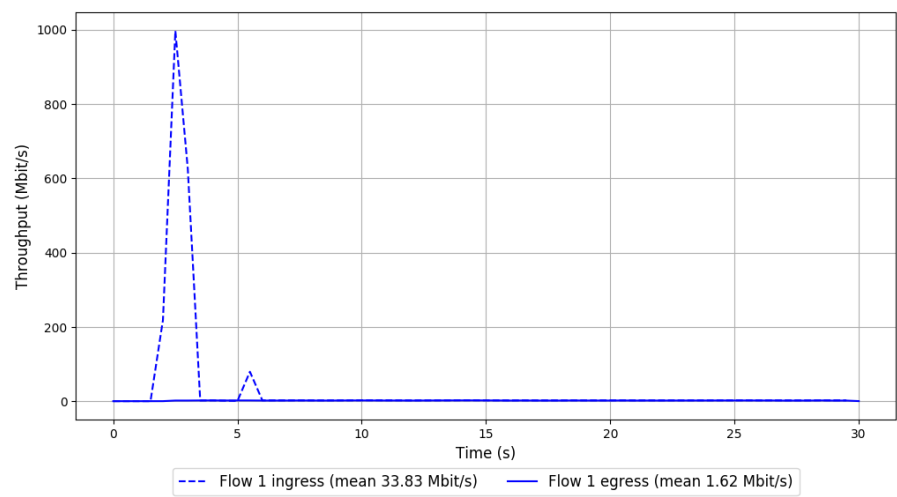
-- Flow 1:

Average throughput: 1.62 Mbit/s

95th percentile per-packet one-way delay: 4649.252 ms

Loss rate: 95.24%

Run 3: Report of FillP — Data Link

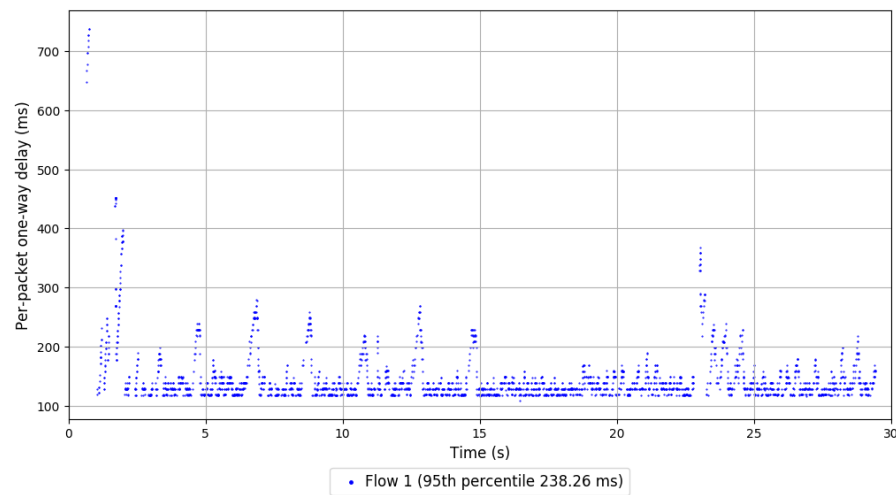
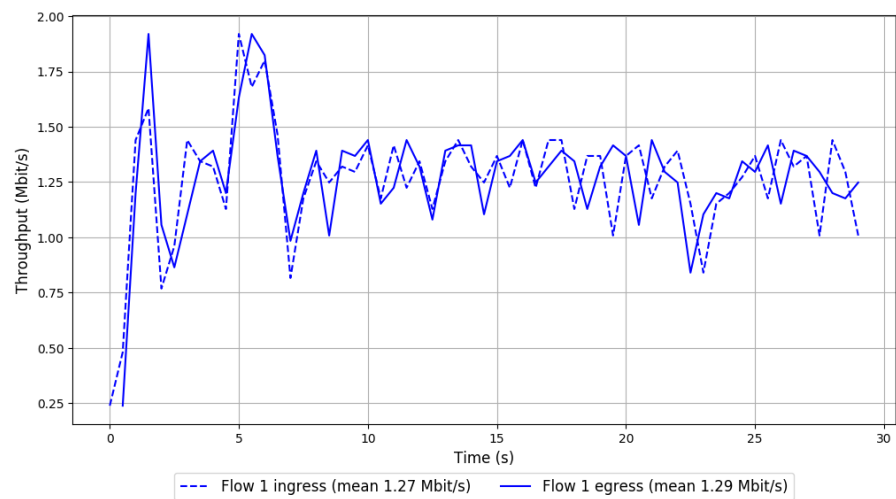


Run 1: Statistics of Indigo-1-32

Start at: 2018-02-12 20:30:57
End at: 2018-02-12 20:31:27
Local clock offset: -7.03 ms
Remote clock offset: -3.829 ms

Below is generated by plot.py at 2018-02-12 21:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 238.256 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 1.29 Mbit/s
95th percentile per-packet one-way delay: 238.256 ms
Loss rate: 0.29%

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-02-12 20:52:06

End at: 2018-02-12 20:52:36

Local clock offset: -4.876 ms

Remote clock offset: 0.339 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.76 Mbit/s

95th percentile per-packet one-way delay: 202.078 ms

Loss rate: 0.21%

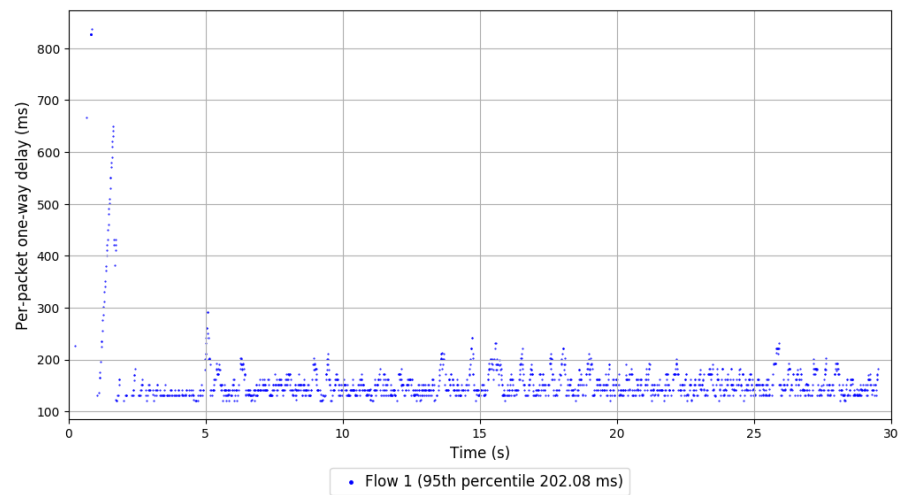
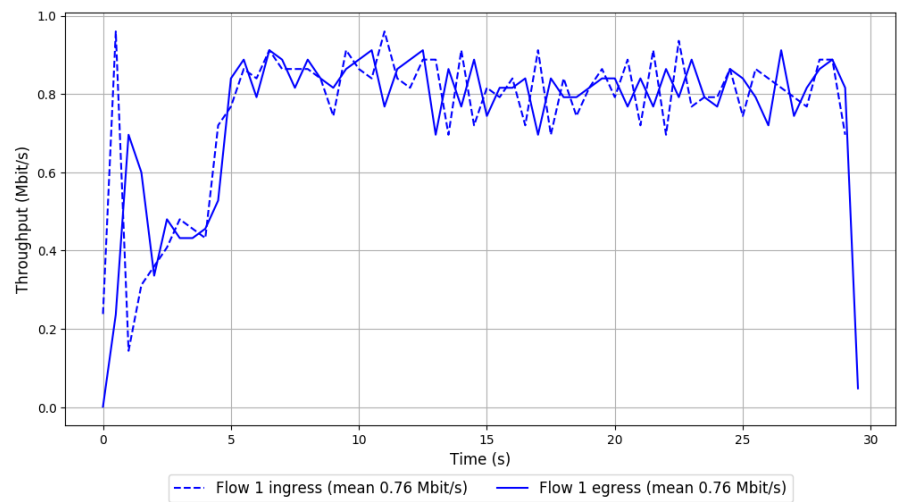
-- Flow 1:

Average throughput: 0.76 Mbit/s

95th percentile per-packet one-way delay: 202.078 ms

Loss rate: 0.21%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-02-12 21:13:16

End at: 2018-02-12 21:13:46

Local clock offset: -1.196 ms

Remote clock offset: 2.109 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 197.731 ms

Loss rate: 0.19%

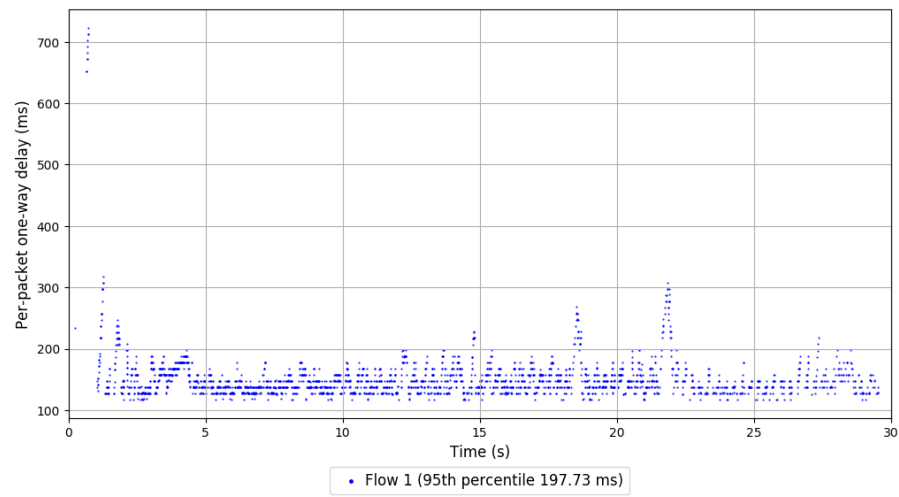
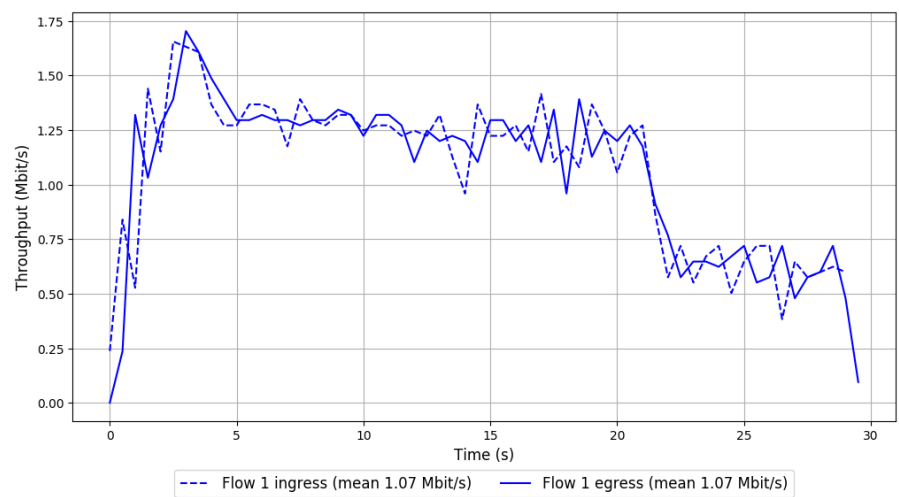
-- Flow 1:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 197.731 ms

Loss rate: 0.19%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-02-12 20:29:46

End at: 2018-02-12 20:30:16

Local clock offset: -7.204 ms

Remote clock offset: 1.795 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.34 Mbit/s

95th percentile per-packet one-way delay: 4622.479 ms

Loss rate: 8.47%

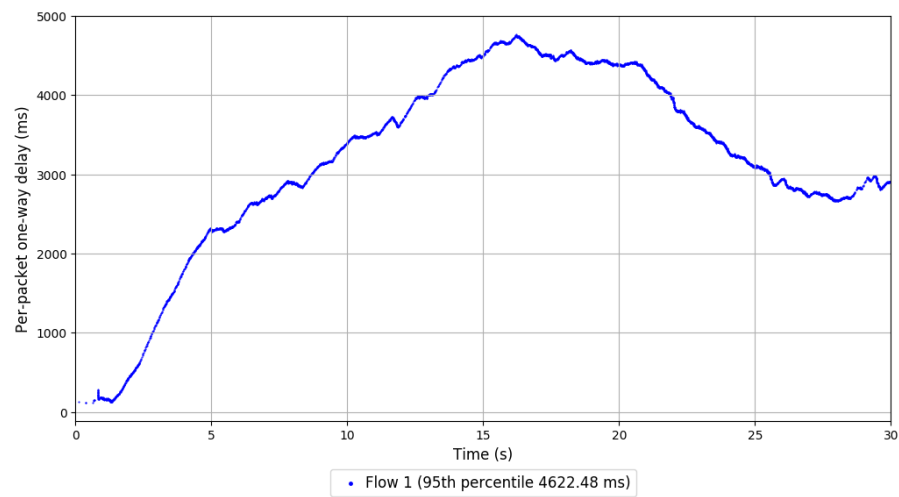
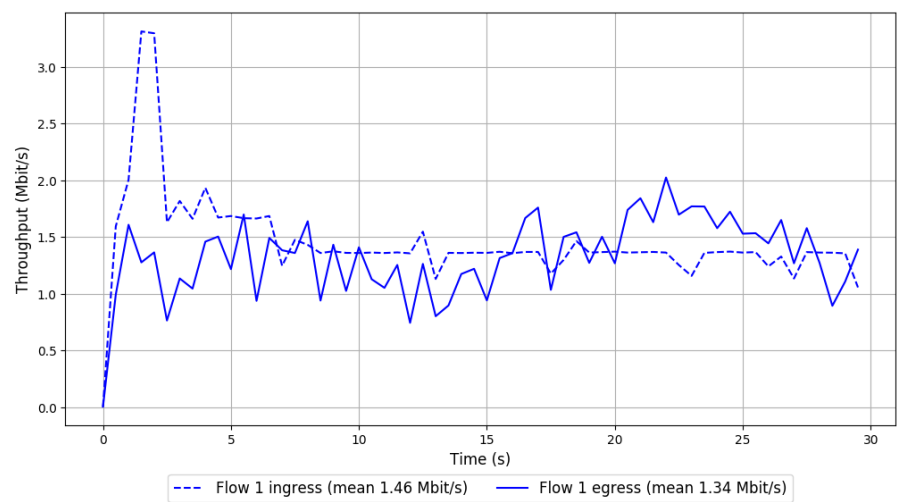
-- Flow 1:

Average throughput: 1.34 Mbit/s

95th percentile per-packet one-way delay: 4622.479 ms

Loss rate: 8.47%

Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-02-12 20:50:55

End at: 2018-02-12 20:51:25

Local clock offset: -5.42 ms

Remote clock offset: 2.04 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.89 Mbit/s

95th percentile per-packet one-way delay: 8315.423 ms

Loss rate: 33.41%

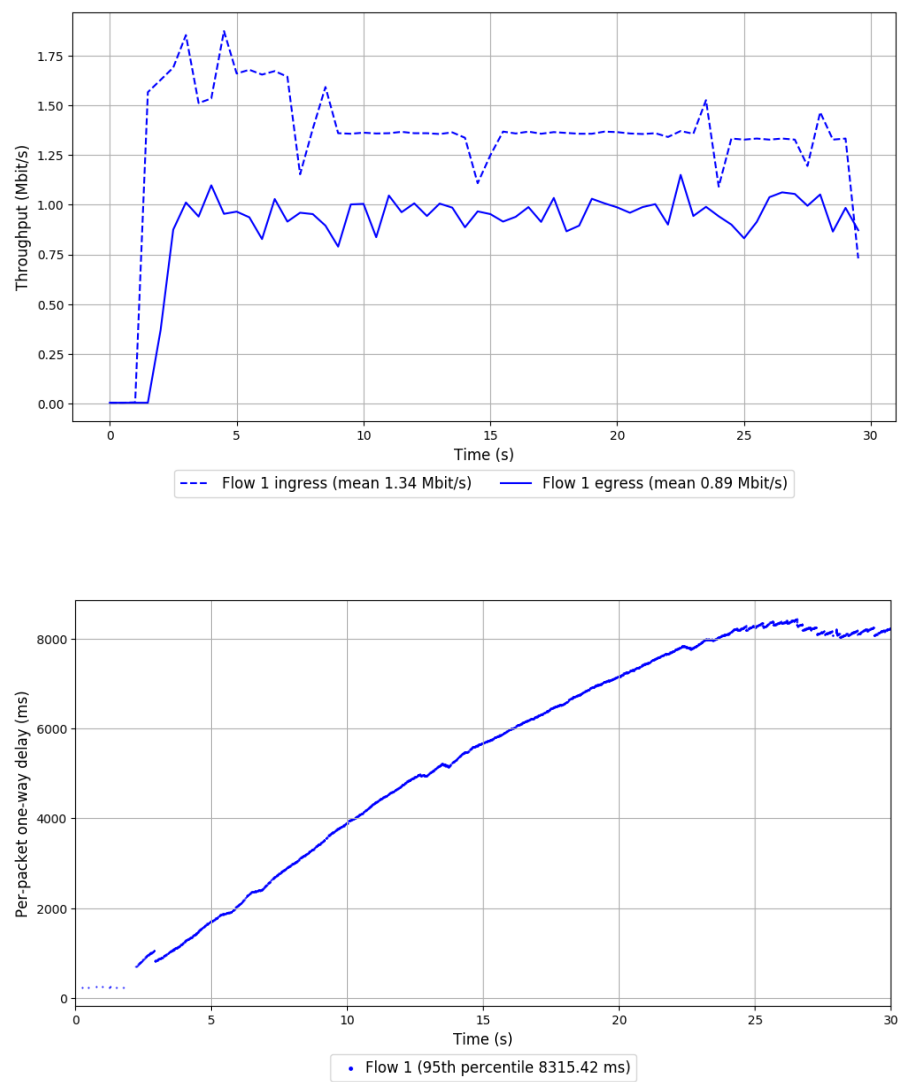
-- Flow 1:

Average throughput: 0.89 Mbit/s

95th percentile per-packet one-way delay: 8315.423 ms

Loss rate: 33.41%

Run 2: Report of Vivace-latency — Data Link

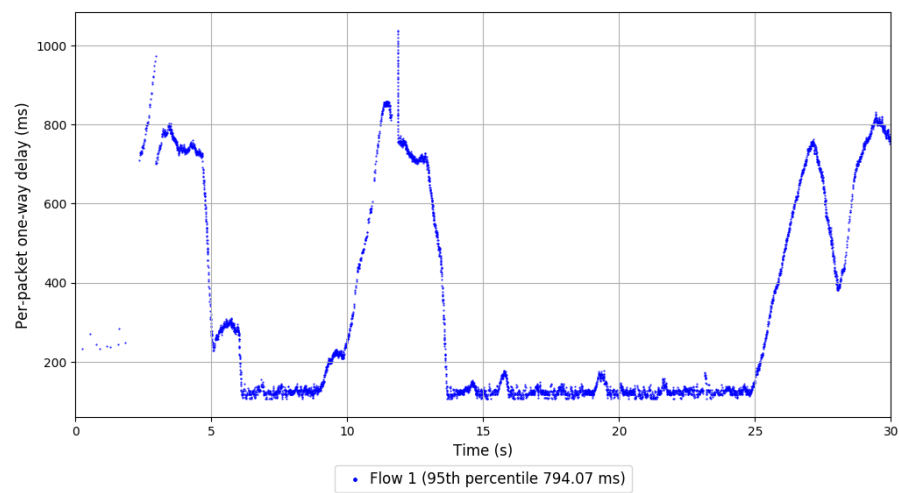
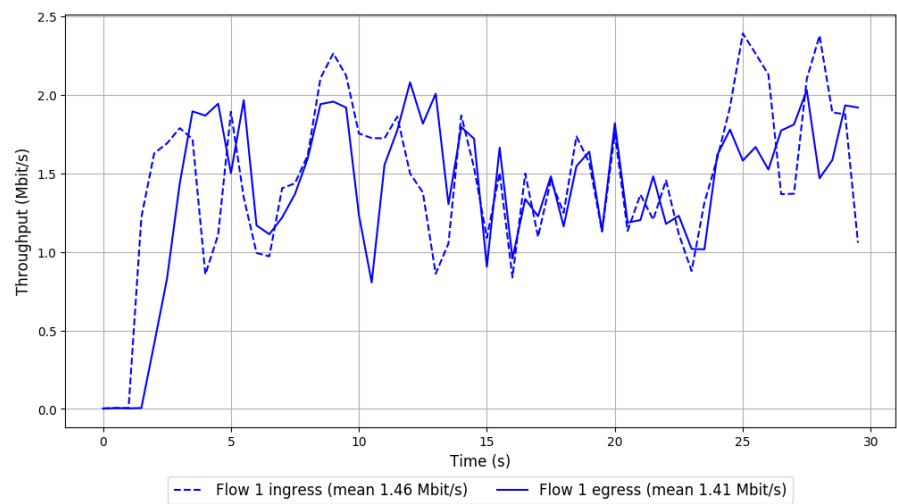


Run 3: Statistics of Vivace-latency

Start at: 2018-02-12 21:12:05
End at: 2018-02-12 21:12:35
Local clock offset: -1.153 ms
Remote clock offset: -4.42 ms

Below is generated by plot.py at 2018-02-12 21:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 794.070 ms
Loss rate: 3.49%
-- Flow 1:
Average throughput: 1.41 Mbit/s
95th percentile per-packet one-way delay: 794.070 ms
Loss rate: 3.49%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-02-12 20:25:04

End at: 2018-02-12 20:25:34

Local clock offset: -7.936 ms

Remote clock offset: -3.774 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.33 Mbit/s

95th percentile per-packet one-way delay: 5099.646 ms

Loss rate: 23.91%

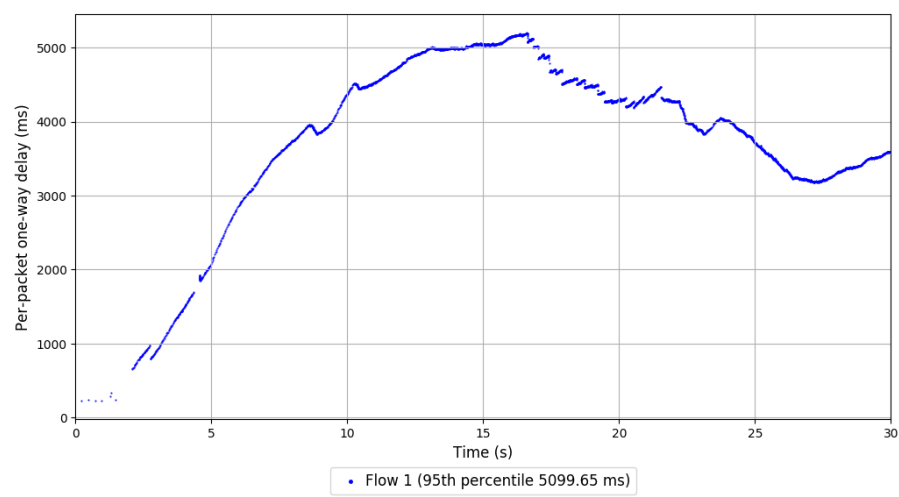
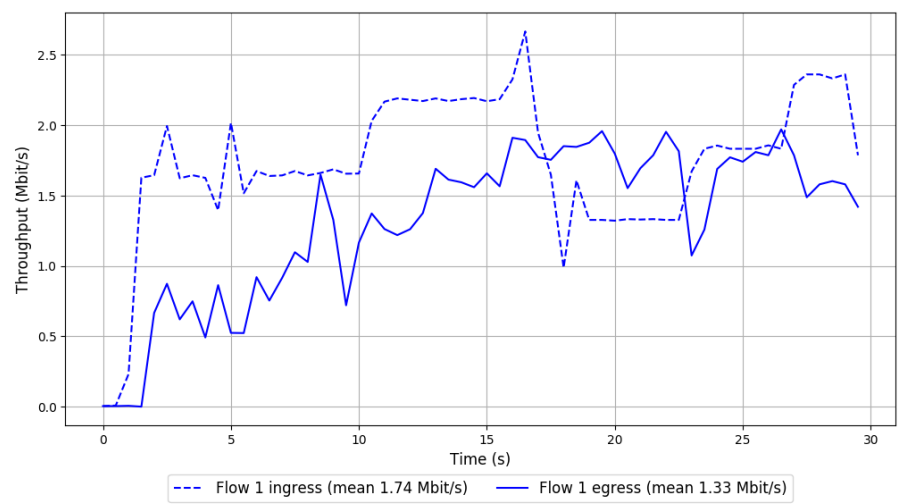
-- Flow 1:

Average throughput: 1.33 Mbit/s

95th percentile per-packet one-way delay: 5099.646 ms

Loss rate: 23.91%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-02-12 20:46:14

End at: 2018-02-12 20:46:44

Local clock offset: -7.991 ms

Remote clock offset: 1.129 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.77 Mbit/s

95th percentile per-packet one-way delay: 4290.455 ms

Loss rate: 21.07%

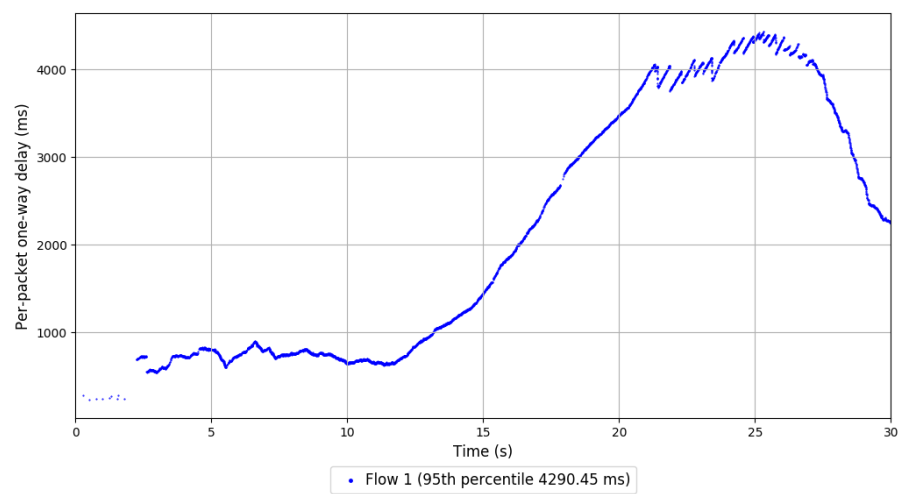
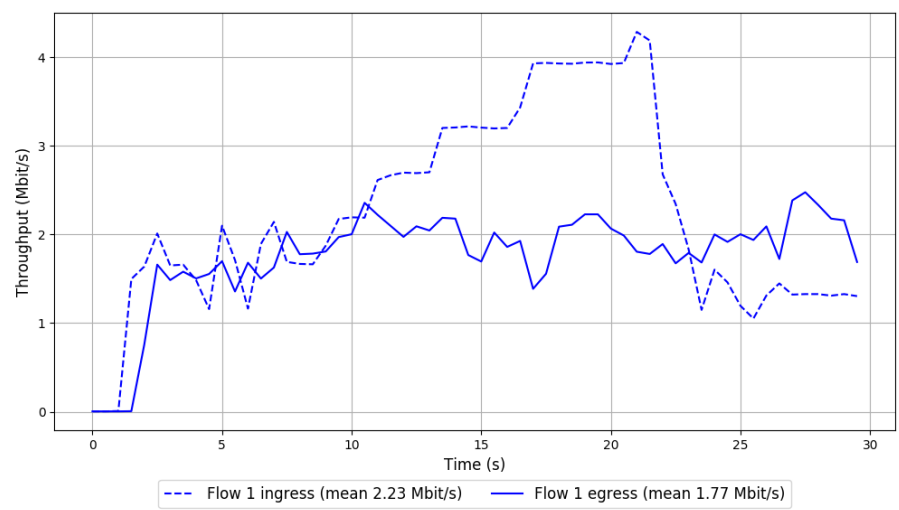
-- Flow 1:

Average throughput: 1.77 Mbit/s

95th percentile per-packet one-way delay: 4290.455 ms

Loss rate: 21.07%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-02-12 21:07:24

End at: 2018-02-12 21:07:54

Local clock offset: -1.464 ms

Remote clock offset: 1.236 ms

Below is generated by plot.py at 2018-02-12 21:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.80 Mbit/s

95th percentile per-packet one-way delay: 4153.678 ms

Loss rate: 33.09%

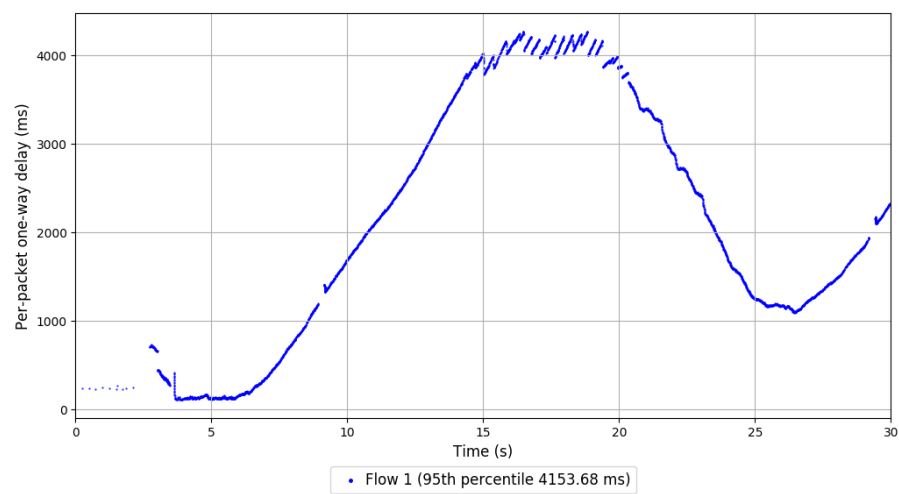
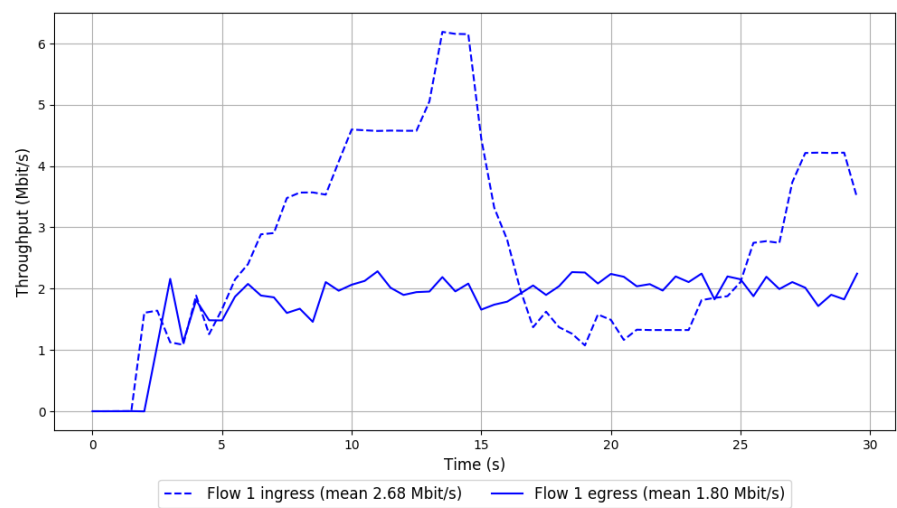
-- Flow 1:

Average throughput: 1.80 Mbit/s

95th percentile per-packet one-way delay: 4153.678 ms

Loss rate: 33.09%

Run 3: Report of Vivace-loss — Data Link

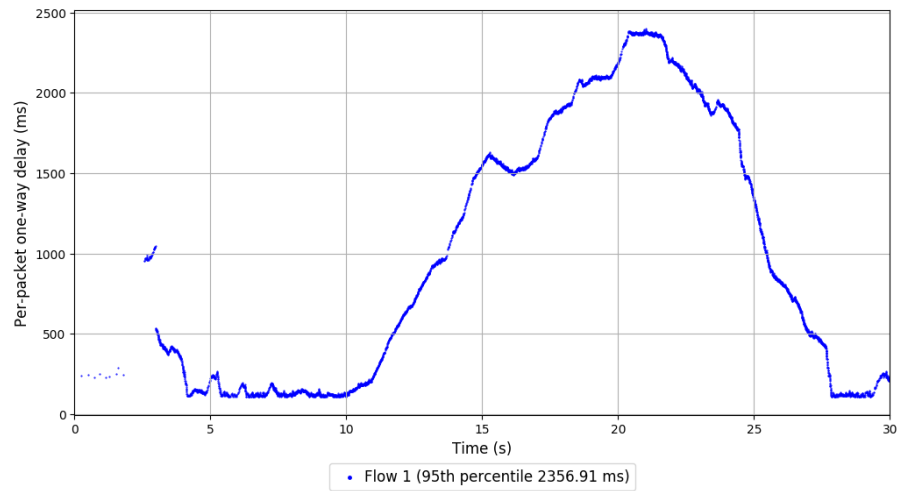
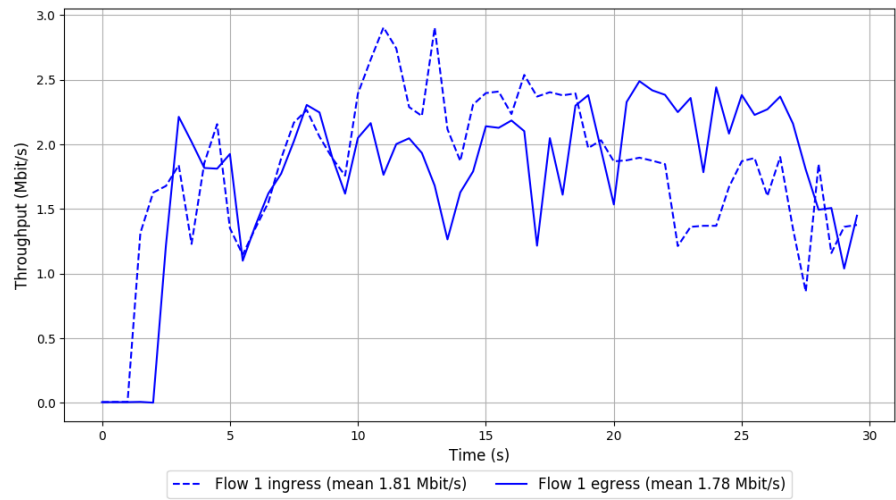


Run 1: Statistics of Vivace-LTE

Start at: 2018-02-12 20:42:43
End at: 2018-02-12 20:43:13
Local clock offset: -7.602 ms
Remote clock offset: -3.825 ms

Below is generated by plot.py at 2018-02-12 21:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 2356.911 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 2356.911 ms
Loss rate: 1.93%

Run 1: Report of Vivace-LTE — Data Link

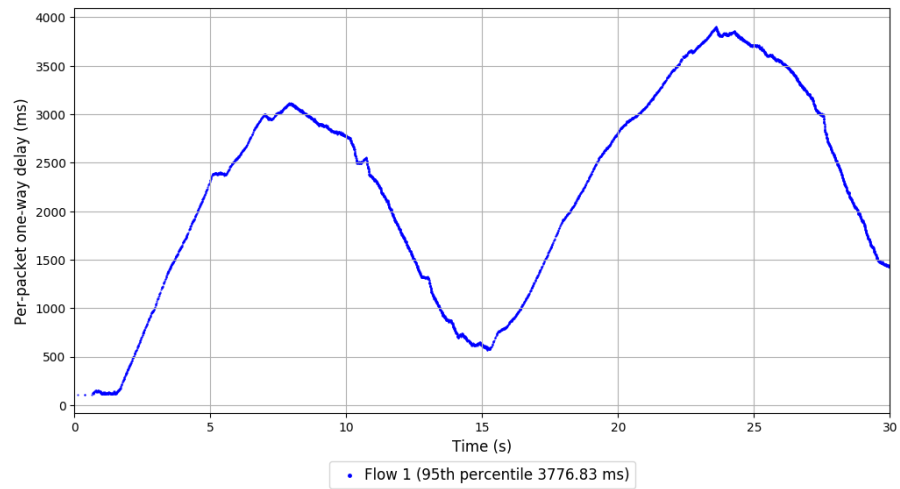
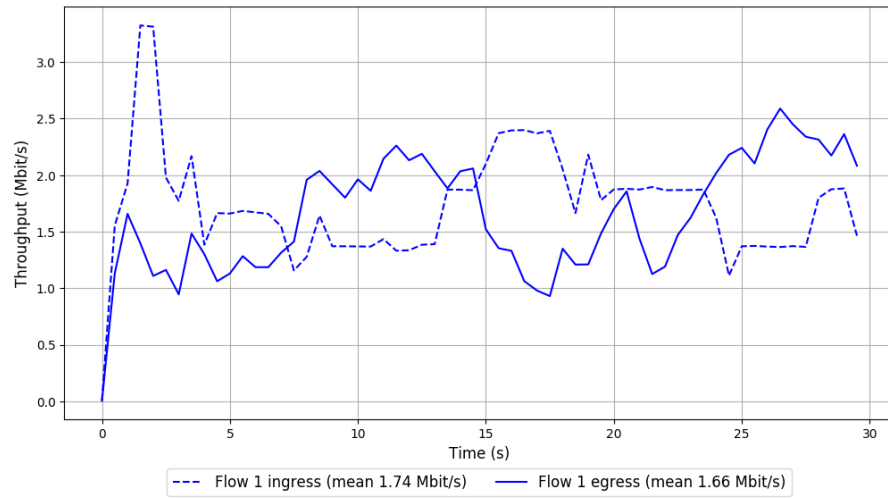


Run 2: Statistics of Vivace-LTE

Start at: 2018-02-12 21:03:53
End at: 2018-02-12 21:04:23
Local clock offset: -1.829 ms
Remote clock offset: -4.497 ms

Below is generated by plot.py at 2018-02-12 21:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 3776.826 ms
Loss rate: 4.86%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 3776.826 ms
Loss rate: 4.86%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-02-12 21:25:03
End at: 2018-02-12 21:25:33
Local clock offset: -0.134 ms
Remote clock offset: -3.286 ms

Below is generated by plot.py at 2018-02-12 21:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 1187.764 ms
Loss rate: 1.74%
-- Flow 1:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 1187.764 ms
Loss rate: 1.74%

Run 3: Report of Vivace-LTE — Data Link

