

Pantheon Report

Generated at 2018-04-03 01:45:46 (UTC).

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

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).

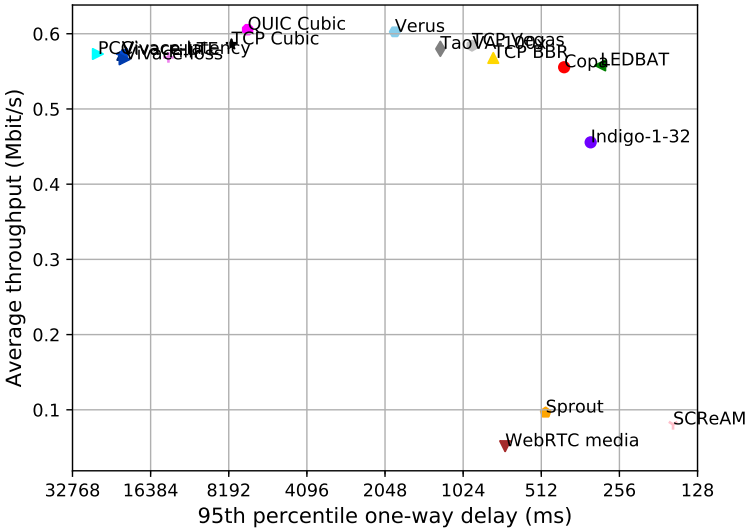
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

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

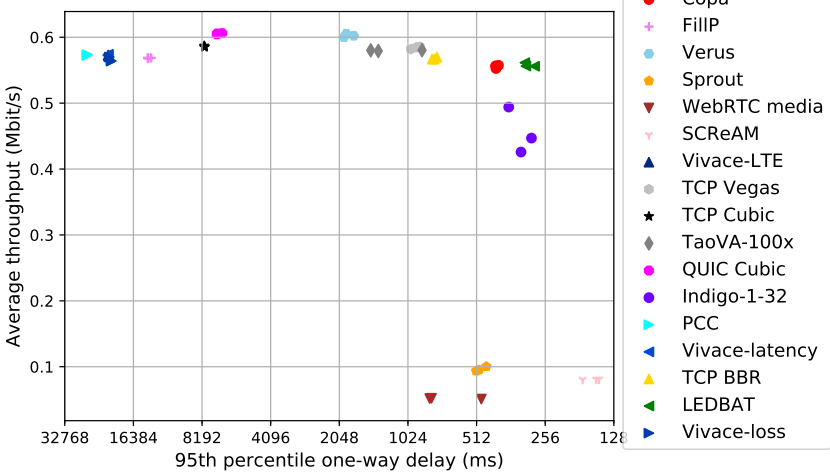
Git summary:

```
branch: master @ eb420b5be9bafccd22cf68b99ff5a2000462fc59
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
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 @ f271183af822eee5d0031620f4bebf38aedc5581
```

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



test from Colombia ppp0 to AWS Brazil 2 Ethernet, 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	0.57	783.77	2.24
TCP Cubic	3	0.59	7996.48	30.92
LEDBAT	3	0.56	303.60	1.36
PCC	3	0.57	26154.84	98.52
QUIC Cubic	3	0.61	6928.74	29.01
SCReAM	3	0.08	159.08	0.84
WebRTC media	3	0.05	705.54	0.03
Sprout	3	0.10	492.67	1.79
TaoVA-100x	3	0.58	1253.67	2.69
TCP Vegas	3	0.58	947.04	1.35
Verus	3	0.60	1876.74	5.58
Copa	3	0.56	418.03	2.91
FillP	3	0.57	13988.66	38.48
Indigo-1-32	3	0.46	330.38	1.56
Vivace-latency	3	0.57	21159.43	70.43
Vivace-loss	3	0.56	20637.23	89.16
Vivace-LTE	3	0.57	21058.53	70.96

Run 1: Statistics of TCP BBR

Start at: 2018-04-02 23:43:59

End at: 2018-04-02 23:44:29

Local clock offset: -2.261 ms

Remote clock offset: 7.006 ms

Below is generated by plot.py at 2018-04-03 01:45:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 784.760 ms

Loss rate: 2.17%

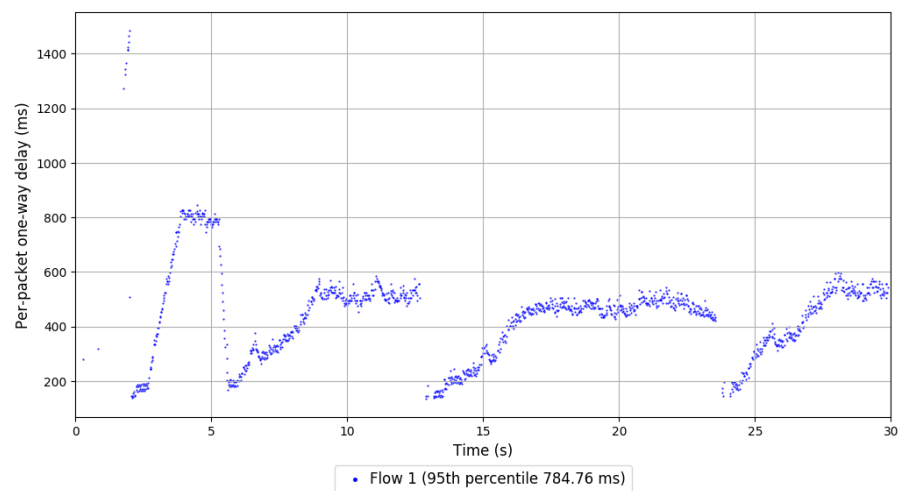
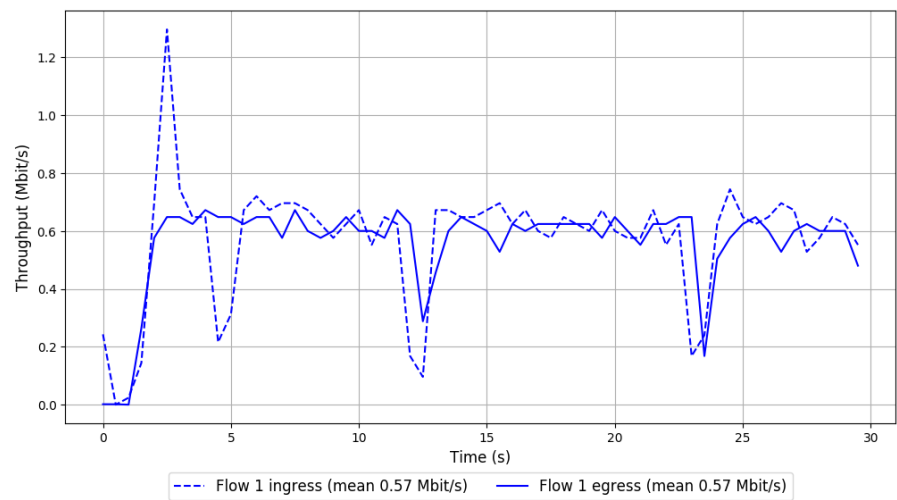
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 784.760 ms

Loss rate: 2.17%

Run 1: Report of TCP BBR — Data Link

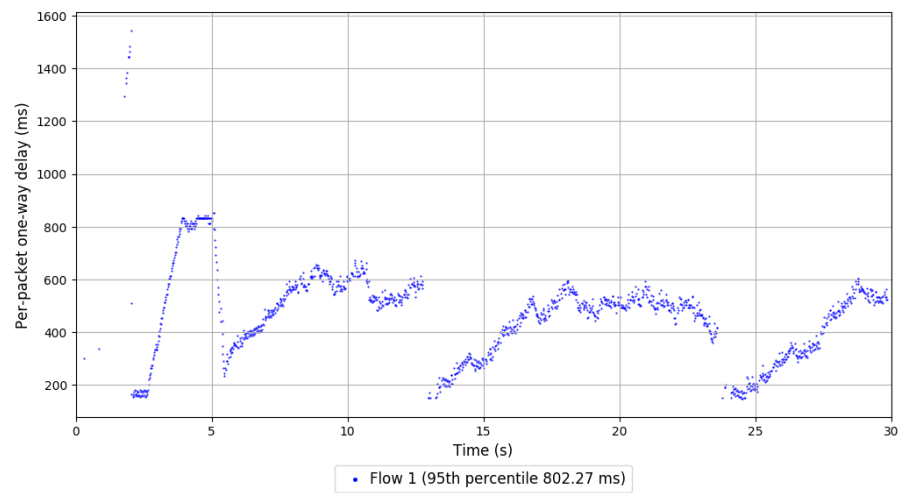
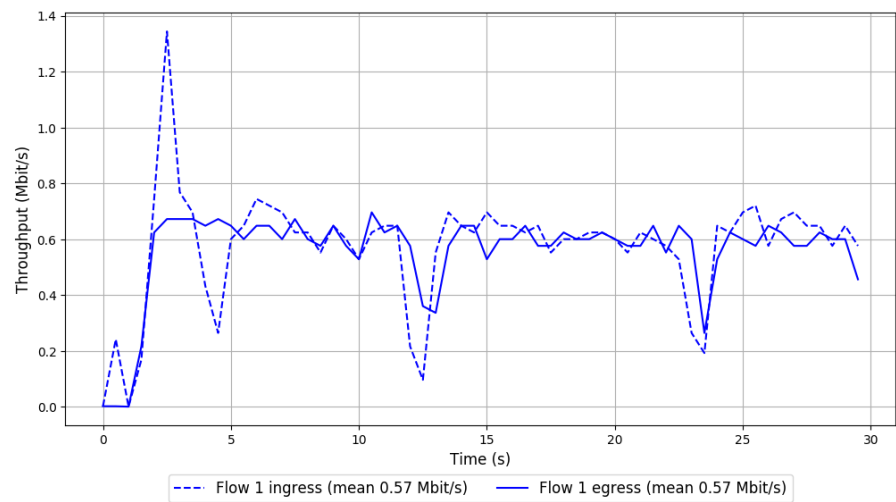


Run 2: Statistics of TCP BBR

Start at: 2018-04-03 00:05:13
End at: 2018-04-03 00:05:43
Local clock offset: 18.434 ms
Remote clock offset: 13.344 ms

Below is generated by plot.py at 2018-04-03 01:45:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 802.268 ms
Loss rate: 2.38%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 802.268 ms
Loss rate: 2.38%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-04-03 00:26:27

End at: 2018-04-03 00:26:57

Local clock offset: 17.64 ms

Remote clock offset: 6.032 ms

Below is generated by plot.py at 2018-04-03 01:45:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 764.275 ms

Loss rate: 2.16%

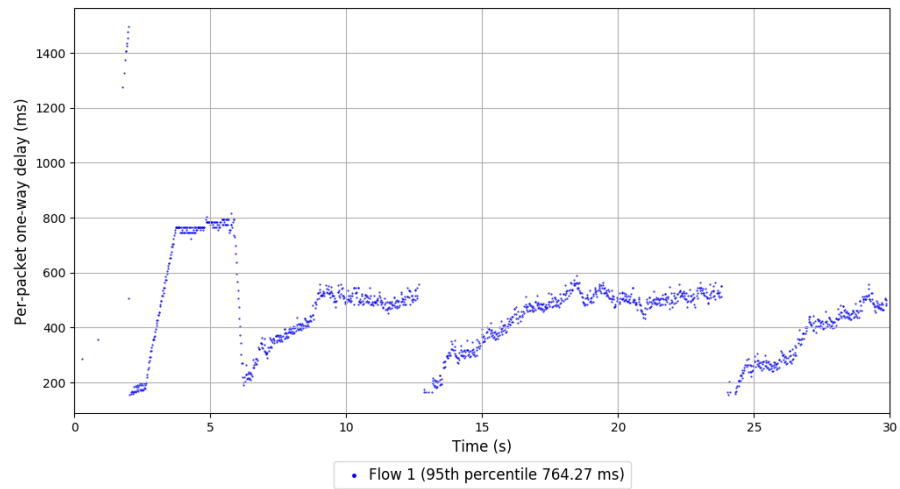
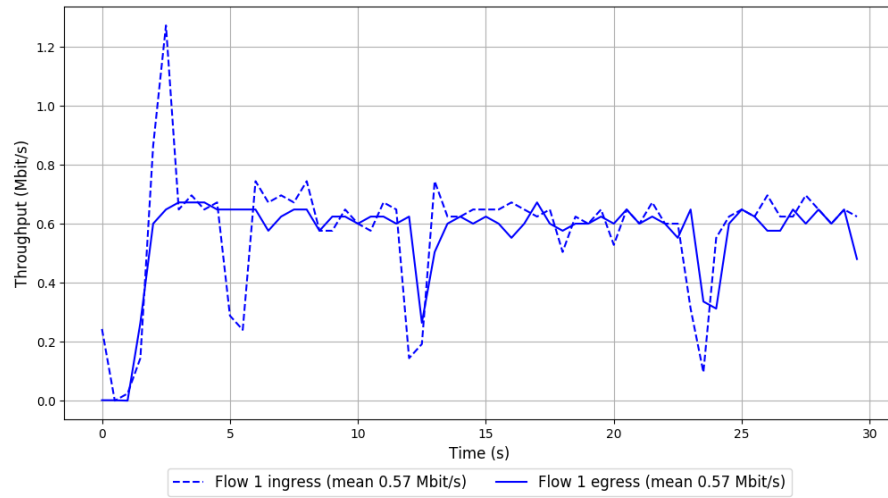
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 764.275 ms

Loss rate: 2.16%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2018-04-02 23:52:14

End at: 2018-04-02 23:52:44

Local clock offset: 14.007 ms

Remote clock offset: 7.402 ms

Below is generated by plot.py at 2018-04-03 01:45:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 7989.998 ms

Loss rate: 30.97%

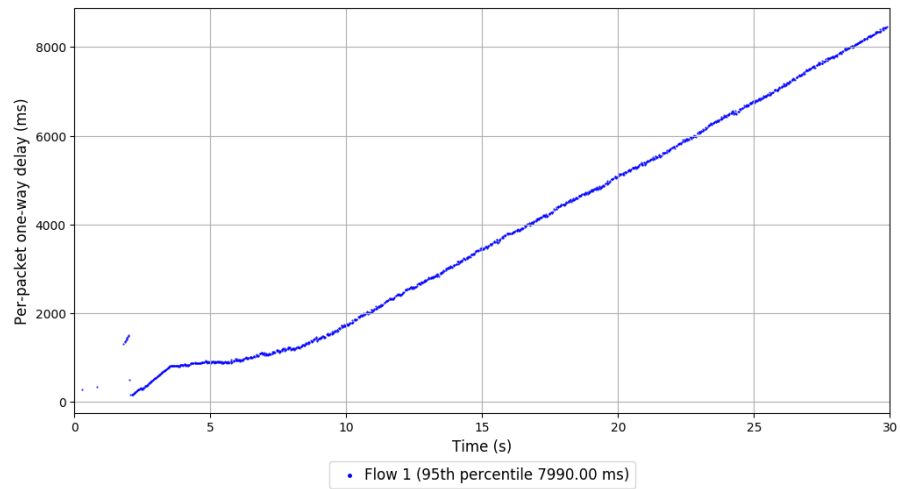
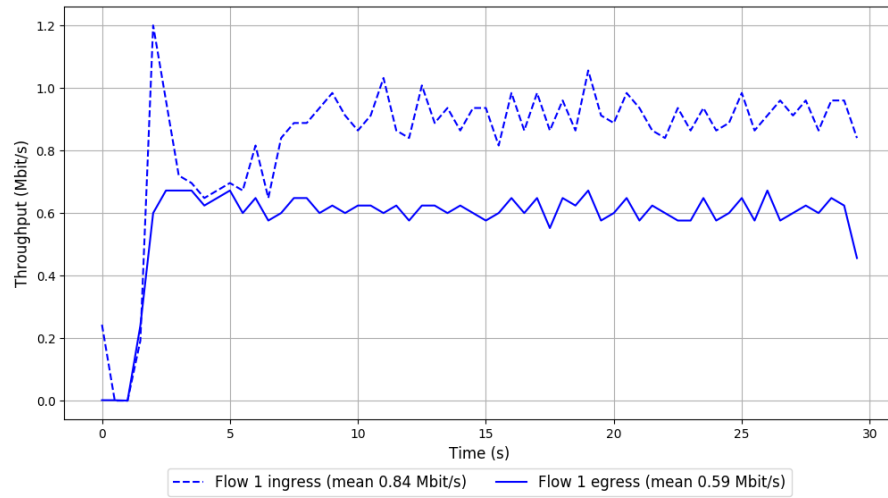
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 7989.998 ms

Loss rate: 30.97%

Run 1: Report of TCP Cubic — Data Link

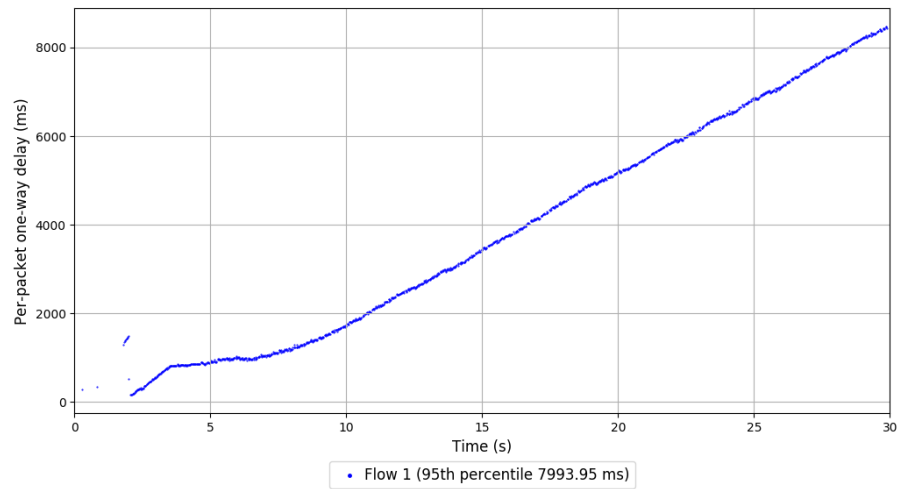
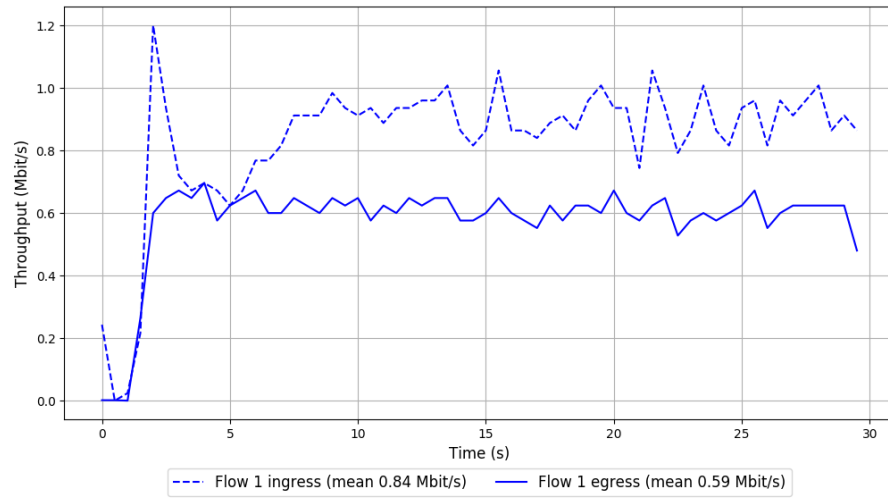


Run 2: Statistics of TCP Cubic

Start at: 2018-04-03 00:13:28
End at: 2018-04-03 00:13:58
Local clock offset: 20.635 ms
Remote clock offset: 13.729 ms

Below is generated by plot.py at 2018-04-03 01:45:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 7993.952 ms
Loss rate: 30.96%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 7993.952 ms
Loss rate: 30.96%

Run 2: Report of TCP Cubic — Data Link

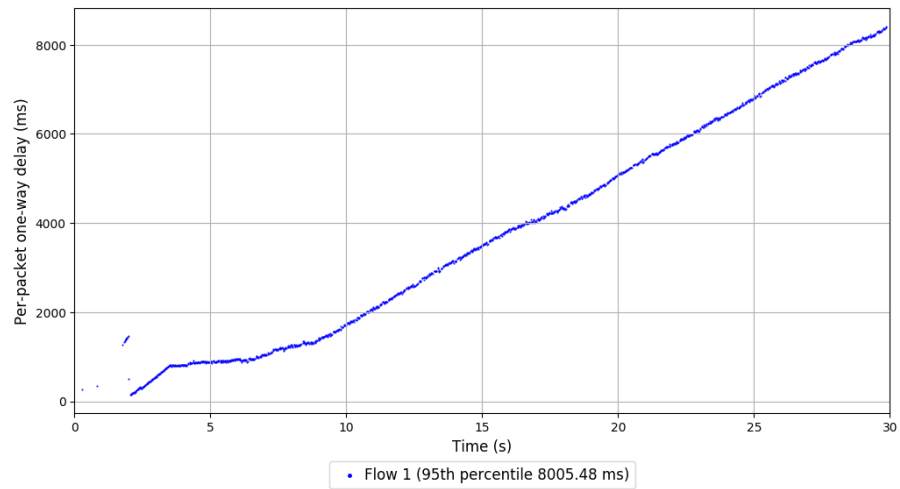
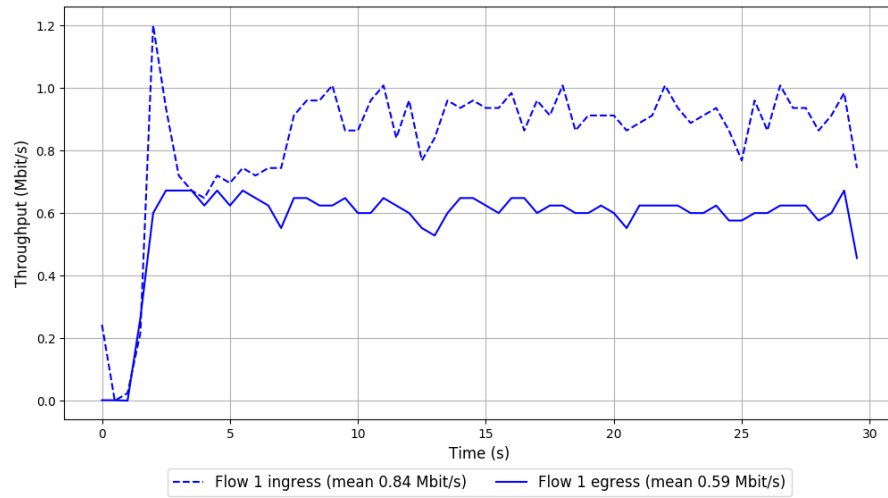


Run 3: Statistics of TCP Cubic

Start at: 2018-04-03 00:34:41
End at: 2018-04-03 00:35:11
Local clock offset: 9.739 ms
Remote clock offset: 12.482 ms

Below is generated by plot.py at 2018-04-03 01:45:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 8005.480 ms
Loss rate: 30.83%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 8005.480 ms
Loss rate: 30.83%

Run 3: Report of TCP Cubic — Data Link

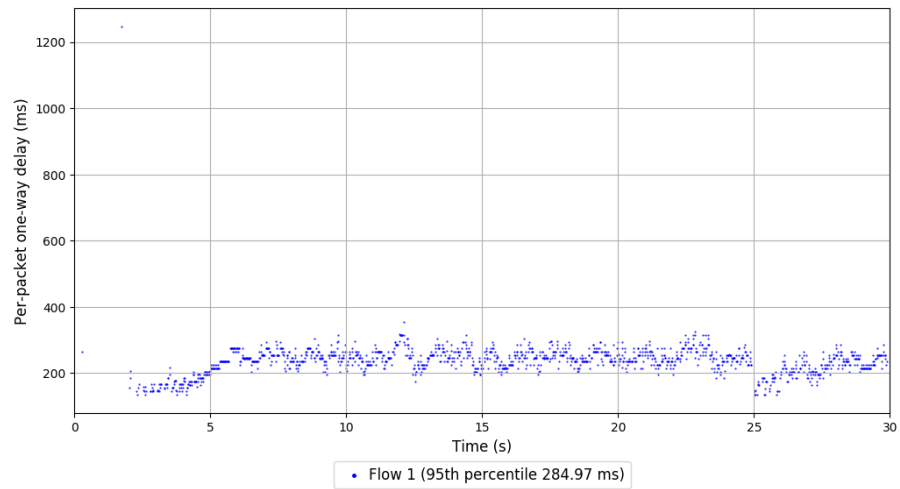
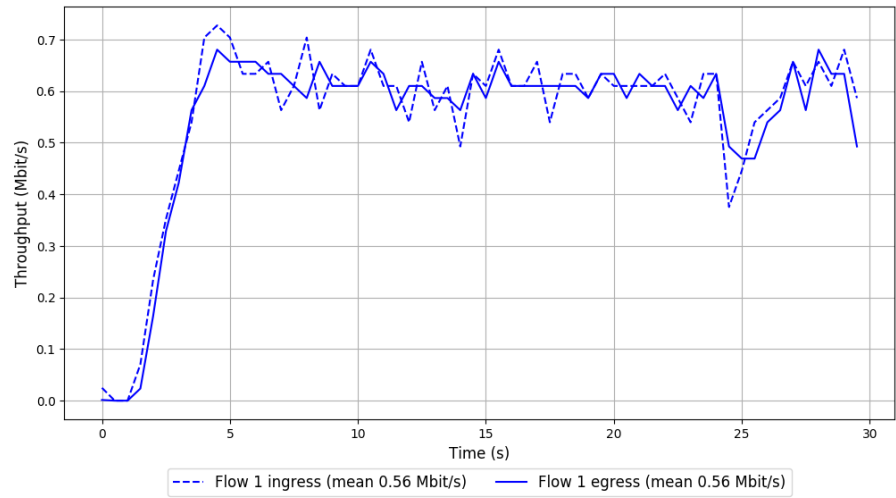


```
Run 1: Statistics of LEDBAT

Start at: 2018-04-02 23:38:06
End at: 2018-04-02 23:38:36
Local clock offset: 4.865 ms
Remote clock offset: 10.87 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 284.969 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 284.969 ms
Loss rate: 1.34%
```


Run 1: Report of LEDBAT — Data Link

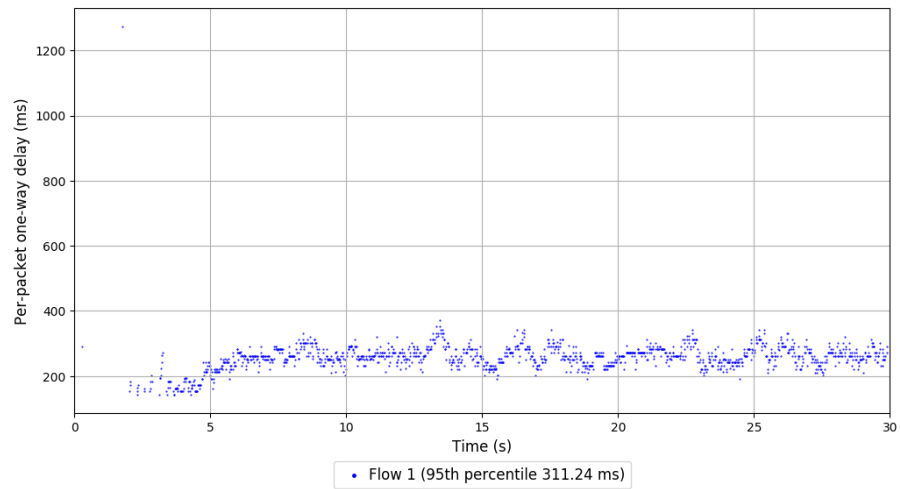
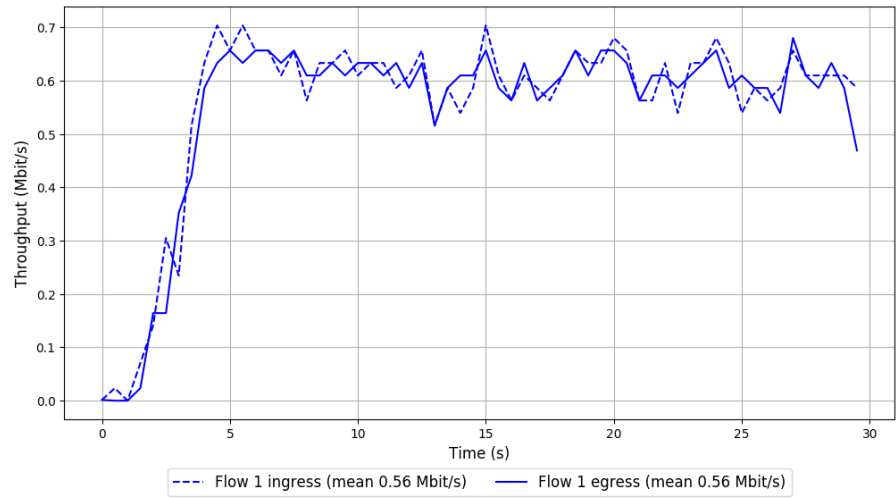


Run 2: Statistics of LEDBAT

Start at: 2018-04-02 23:59:19
End at: 2018-04-02 23:59:50
Local clock offset: 10.837 ms
Remote clock offset: 14.192 ms

Below is generated by plot.py at 2018-04-03 01:45:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 311.242 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 311.242 ms
Loss rate: 1.34%

Run 2: Report of LEDBAT — Data Link

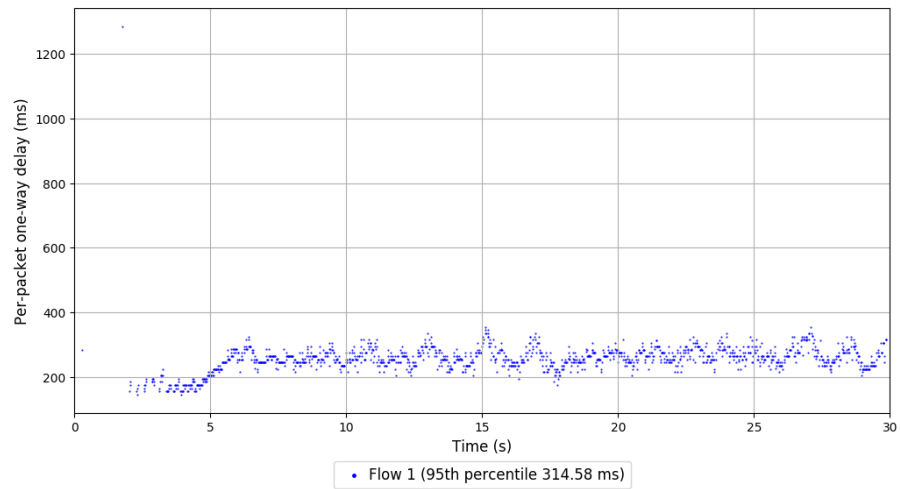
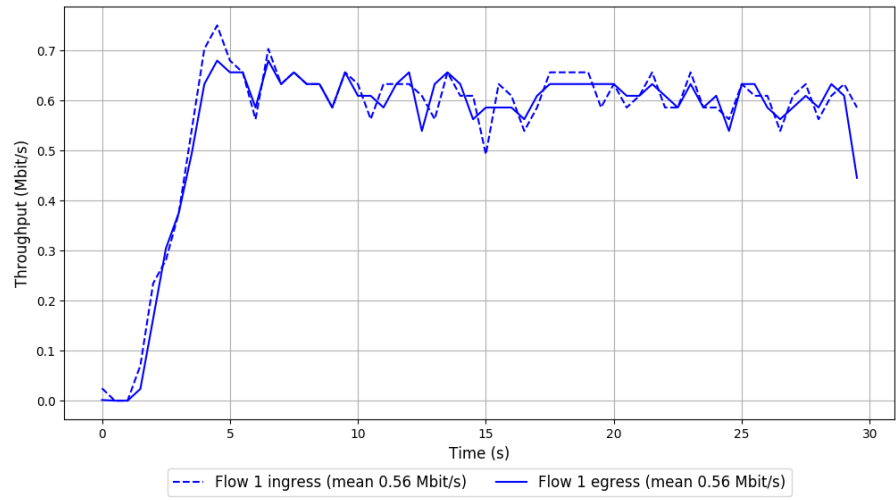


Run 3: Statistics of LEDBAT

Start at: 2018-04-03 00:20:33
End at: 2018-04-03 00:21:03
Local clock offset: 13.336 ms
Remote clock offset: 12.522 ms

Below is generated by plot.py at 2018-04-03 01:45:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 314.585 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 314.585 ms
Loss rate: 1.39%

Run 3: Report of LEDBAT — Data Link

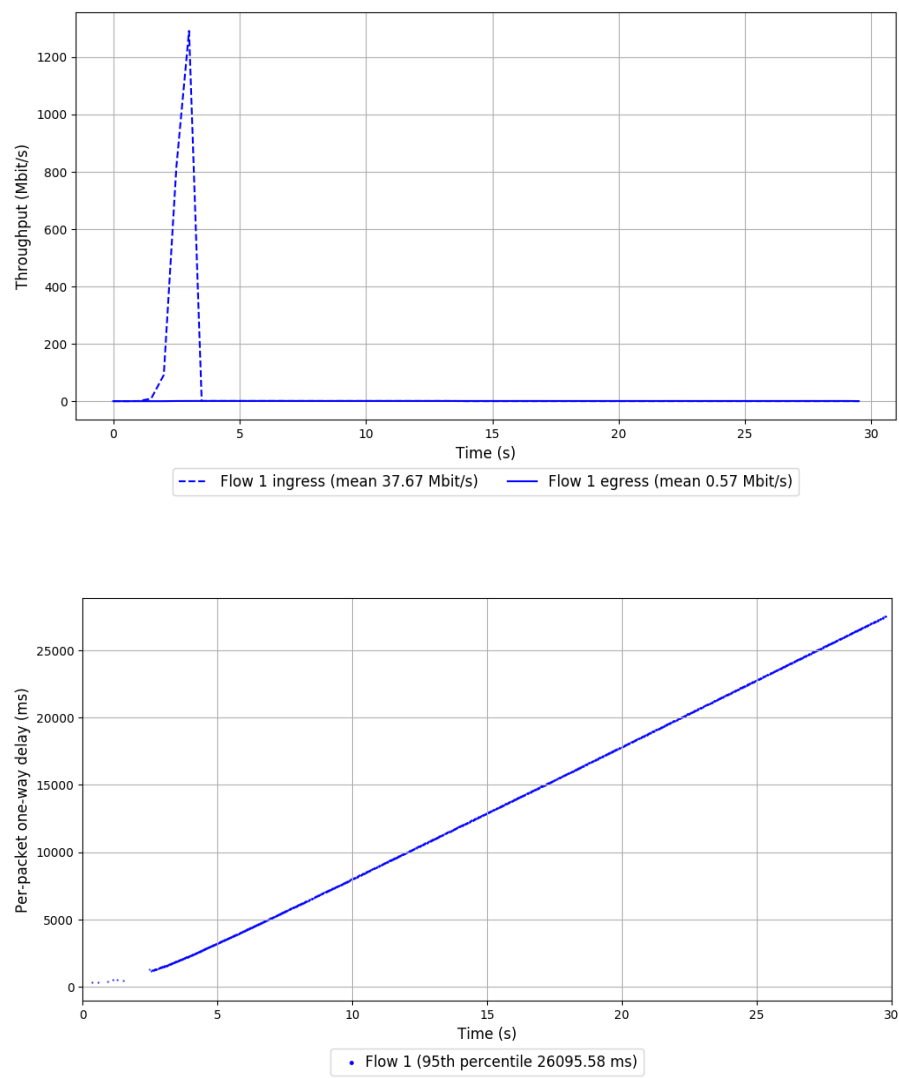


Run 1: Statistics of PCC

Start at: 2018-04-02 23:54:35
End at: 2018-04-02 23:55:05
Local clock offset: -2.107 ms
Remote clock offset: 12.947 ms

Below is generated by plot.py at 2018-04-03 01:45:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26095.580 ms
Loss rate: 98.48%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26095.580 ms
Loss rate: 98.48%

Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-04-03 00:15:49

End at: 2018-04-03 00:16:19

Local clock offset: 14.279 ms

Remote clock offset: 6.183 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26217.633 ms

Loss rate: 98.55%

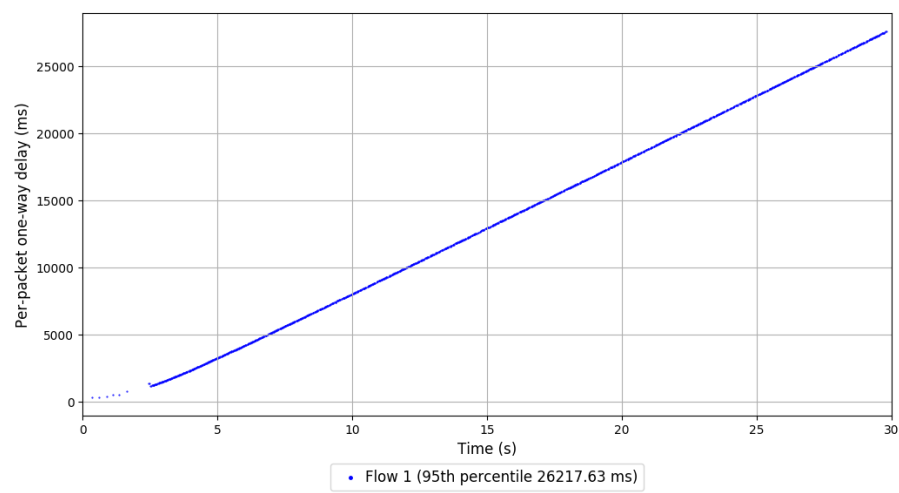
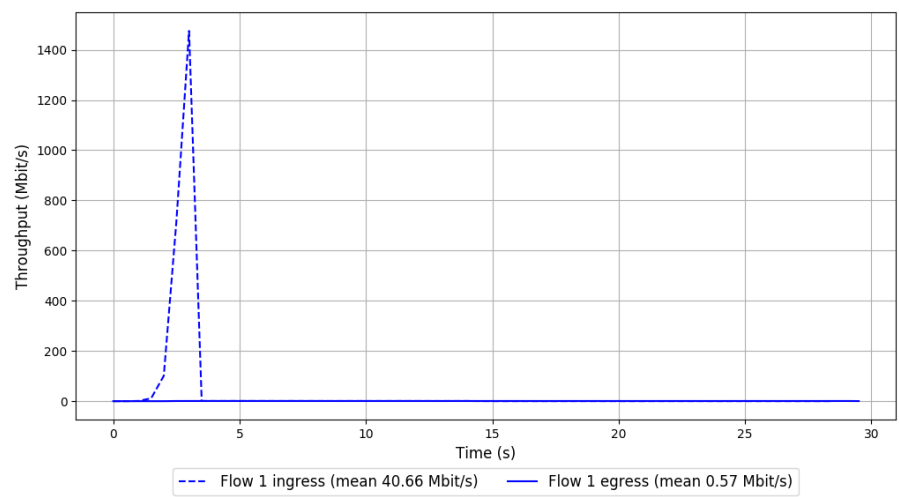
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 26217.633 ms

Loss rate: 98.55%

Run 2: Report of PCC — Data Link

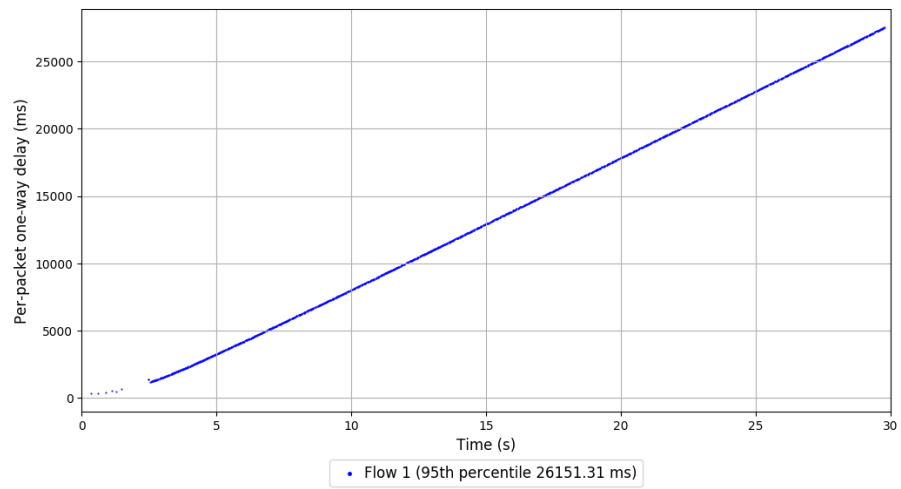
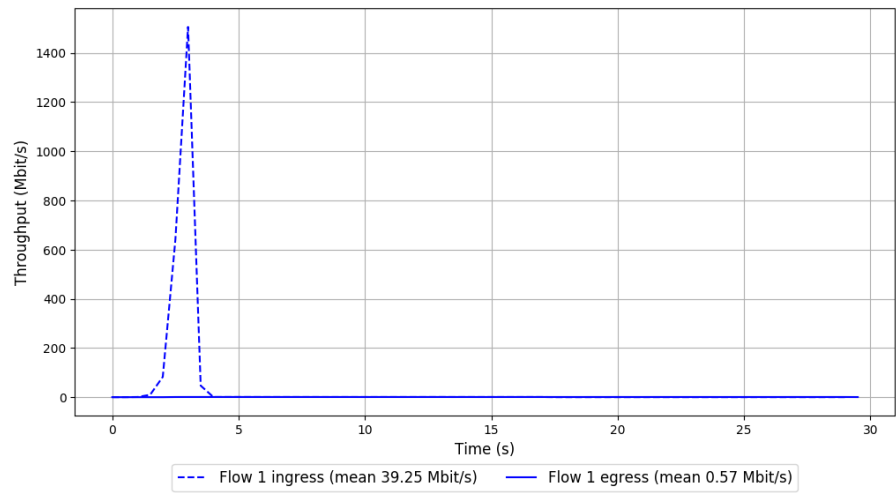


Run 3: Statistics of PCC

Start at: 2018-04-03 00:37:03
End at: 2018-04-03 00:37:33
Local clock offset: 19.159 ms
Remote clock offset: 12.461 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26151.307 ms
Loss rate: 98.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26151.307 ms
Loss rate: 98.54%

Run 3: Report of PCC — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2018-04-02 23:41:38

End at: 2018-04-02 23:42:08

Local clock offset: -2.433 ms

Remote clock offset: 11.173 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 6684.265 ms

Loss rate: 28.89%

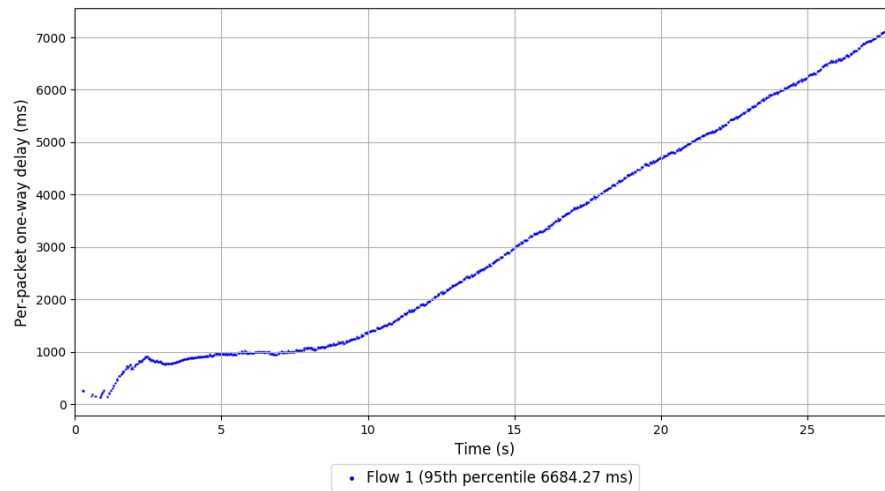
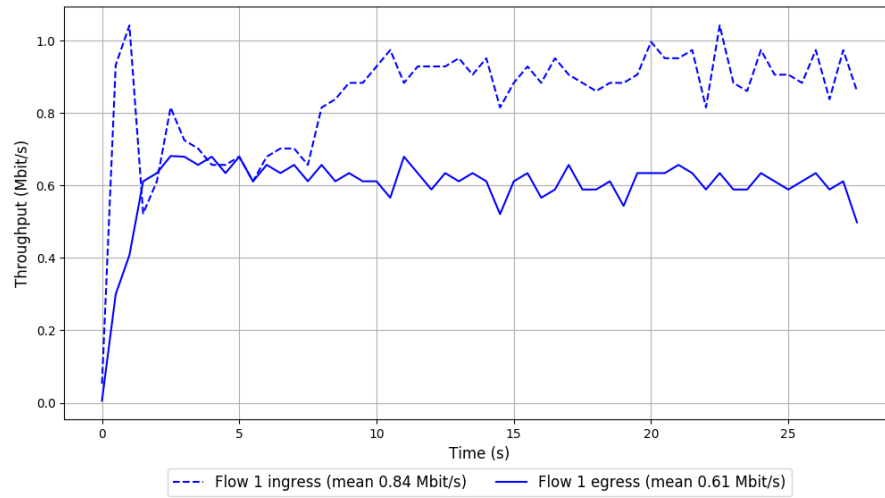
-- Flow 1:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 6684.265 ms

Loss rate: 28.89%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-04-03 00:02:51

End at: 2018-04-03 00:03:21

Local clock offset: 17.871 ms

Remote clock offset: 6.94 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 7048.689 ms

Loss rate: 29.14%

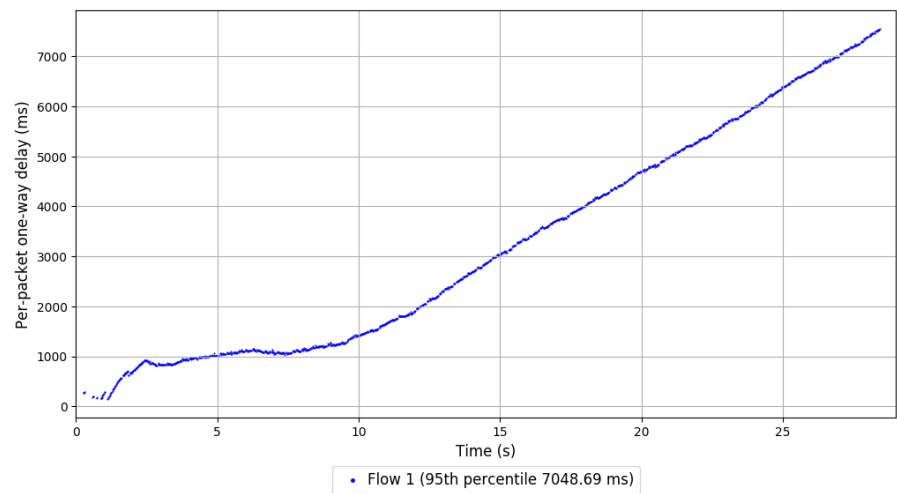
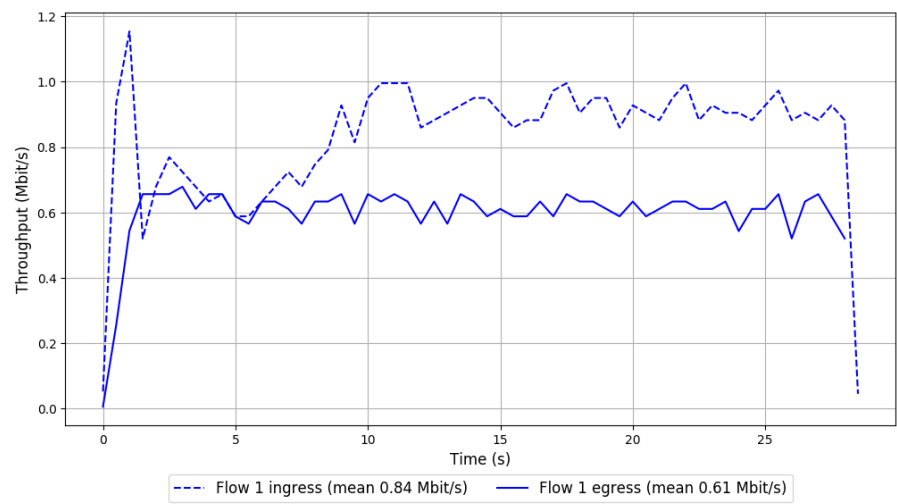
-- Flow 1:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 7048.689 ms

Loss rate: 29.14%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-04-03 00:24:05

End at: 2018-04-03 00:24:35

Local clock offset: 10.904 ms

Remote clock offset: 13.5 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 7053.254 ms

Loss rate: 29.00%

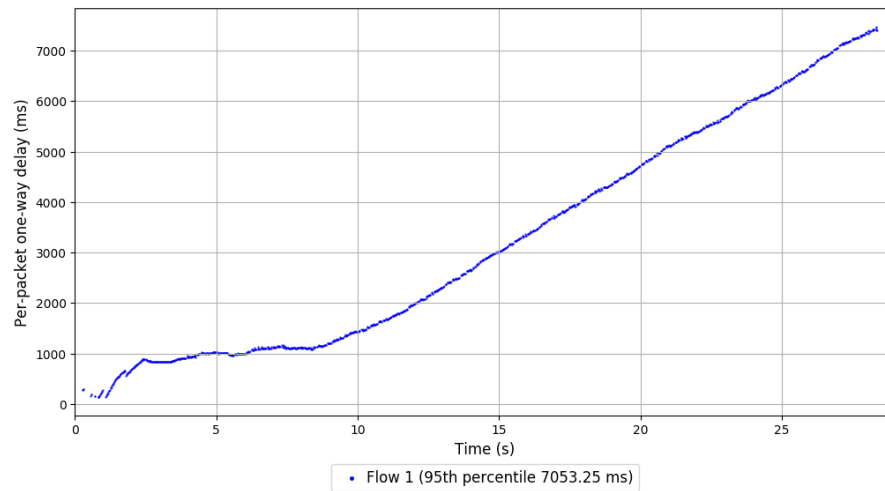
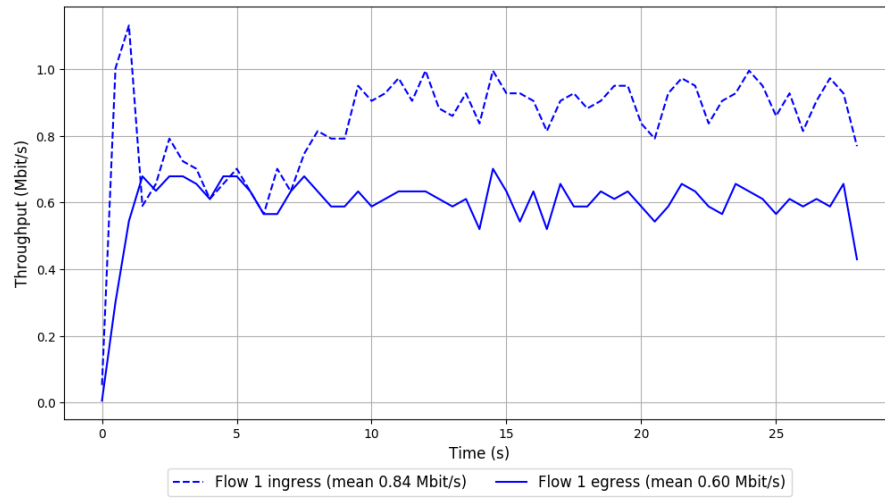
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 7053.254 ms

Loss rate: 29.00%

Run 3: Report of QUIC Cubic — Data Link

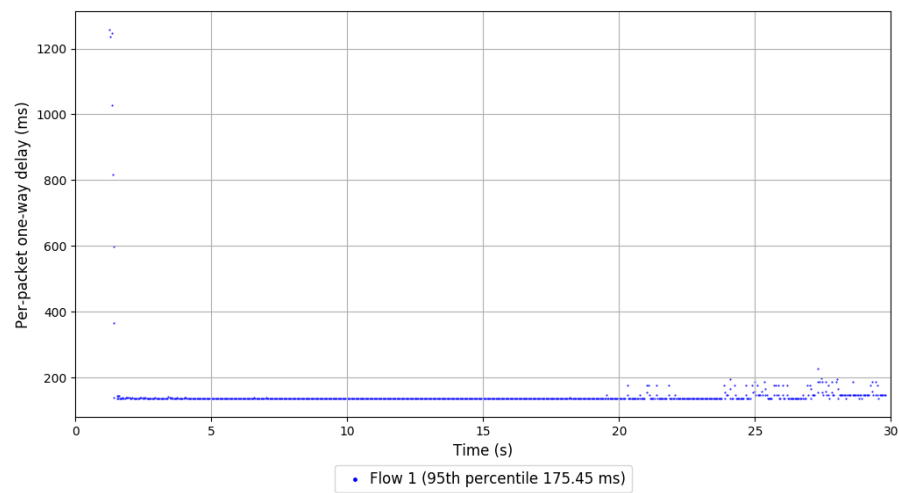
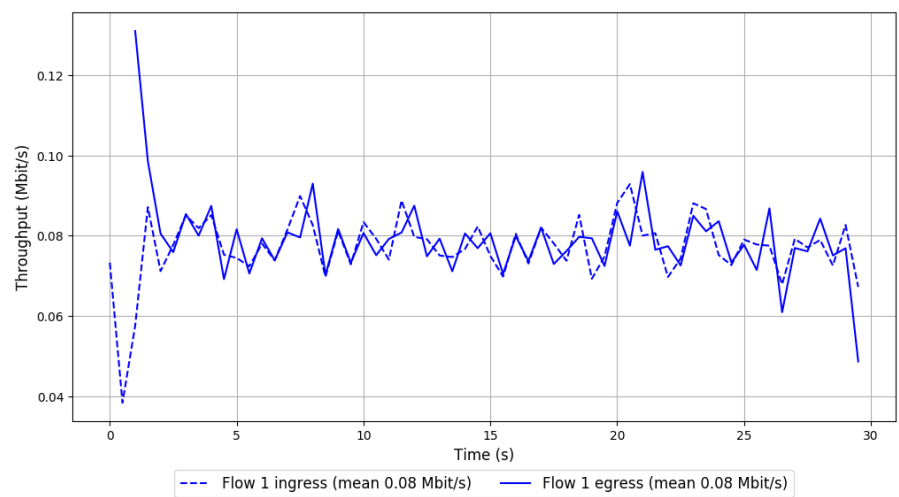


```
Run 1: Statistics of SCReAM

Start at: 2018-04-02 23:58:09
End at: 2018-04-02 23:58:39
Local clock offset: 15.983 ms
Remote clock offset: 12.126 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 175.454 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 175.454 ms
Loss rate: 0.93%
```

Run 1: Report of SReAM — Data Link

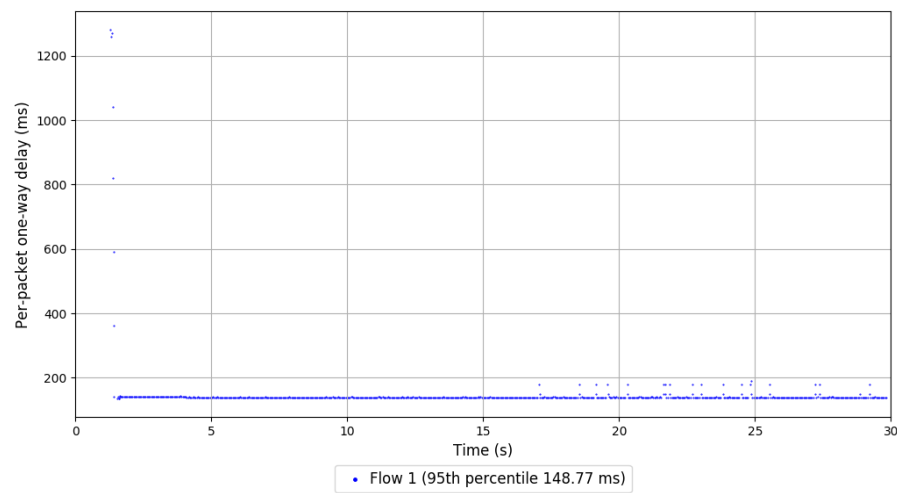
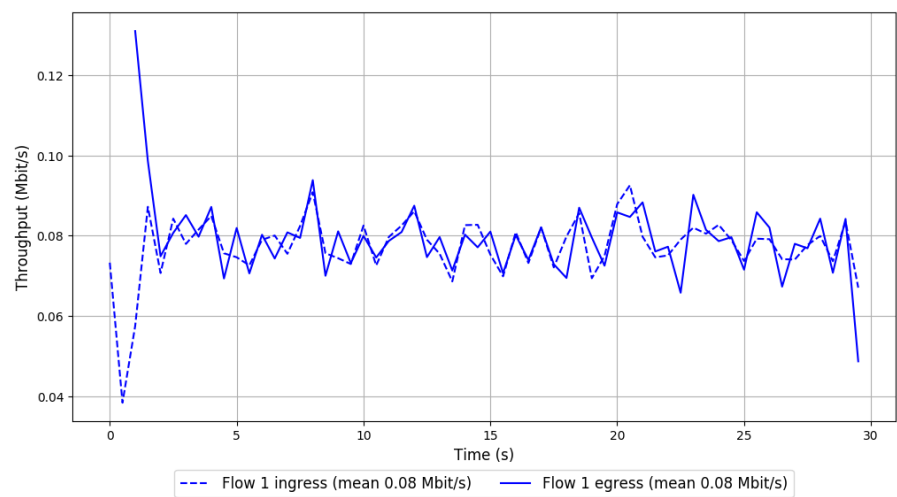


Run 2: Statistics of SCReAM

Start at: 2018-04-03 00:19:22
End at: 2018-04-03 00:19:52
Local clock offset: 14.153 ms
Remote clock offset: 12.468 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 148.771 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 148.771 ms
Loss rate: 0.79%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-04-03 00:40:36

End at: 2018-04-03 00:41:06

Local clock offset: 16.605 ms

Remote clock offset: 5.995 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 153.021 ms

Loss rate: 0.79%

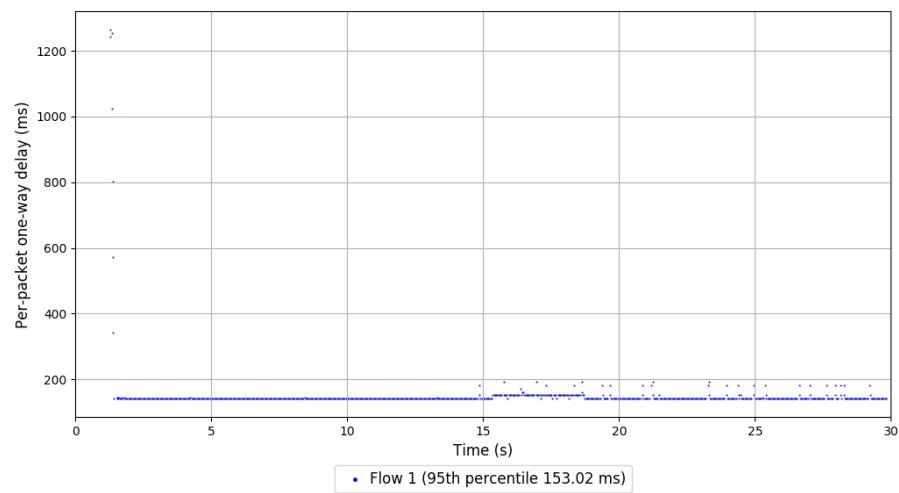
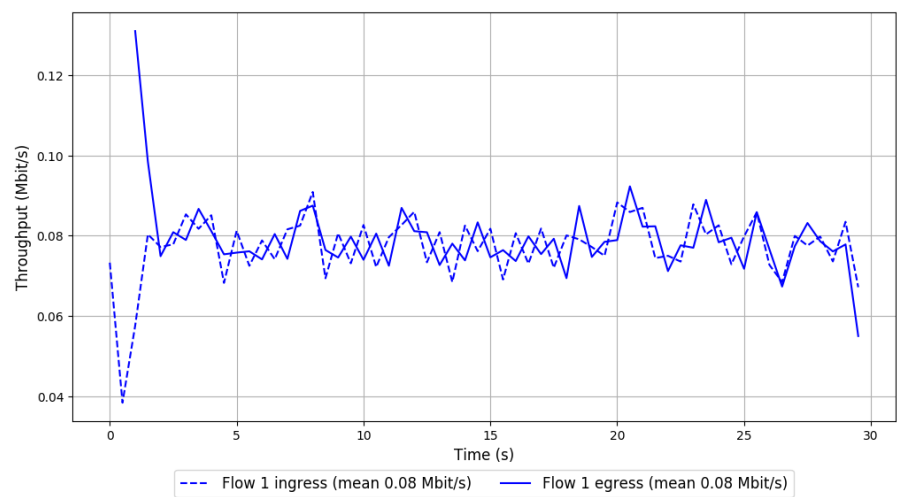
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 153.021 ms

Loss rate: 0.79%

Run 3: Report of SReAM — Data Link

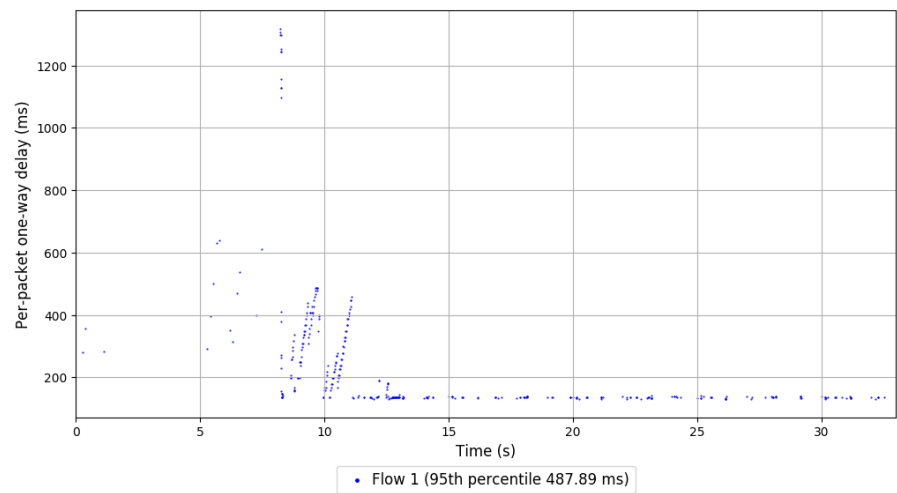
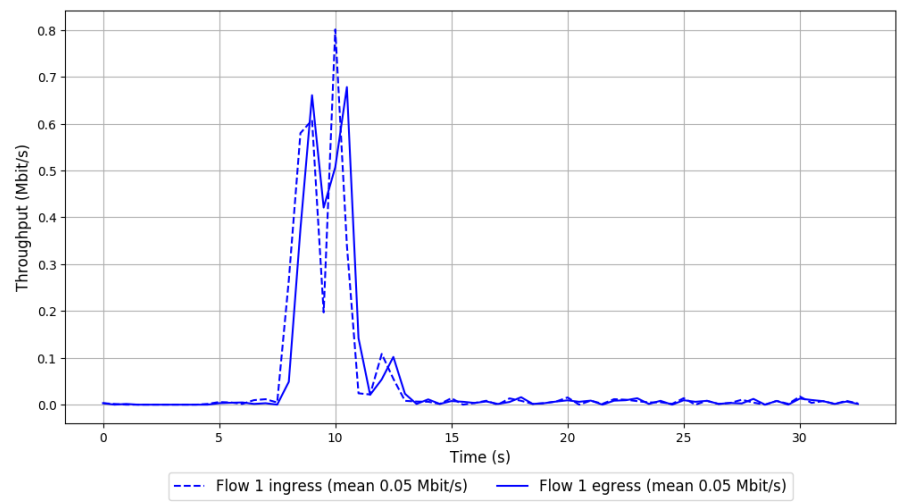


```
Run 1: Statistics of WebRTC media

Start at: 2018-04-02 23:55:48
End at: 2018-04-02 23:56:18
Local clock offset: 15.239 ms
Remote clock offset: 14.026 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 487.890 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 487.890 ms
Loss rate: 0.08%
```


Run 1: Report of WebRTC media — Data Link

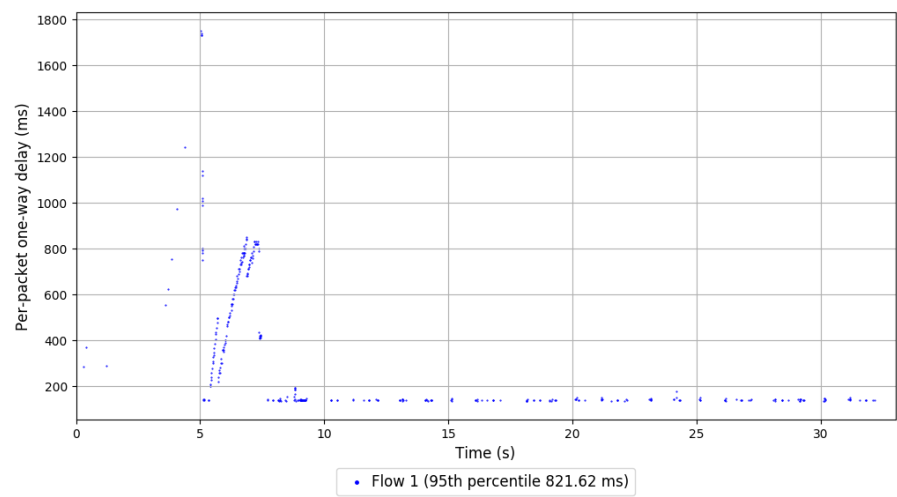
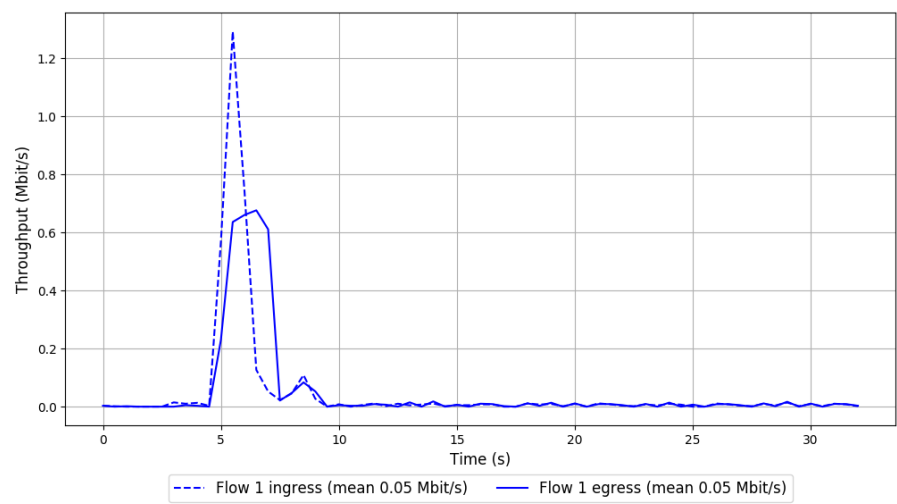


Run 2: Statistics of WebRTC media

Start at: 2018-04-03 00:17:01
End at: 2018-04-03 00:17:31
Local clock offset: 19.647 ms
Remote clock offset: 12.483 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 821.622 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 821.622 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-04-03 00:38:15

End at: 2018-04-03 00:38:45

Local clock offset: 9.132 ms

Remote clock offset: 7.069 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 807.118 ms

Loss rate: 0.00%

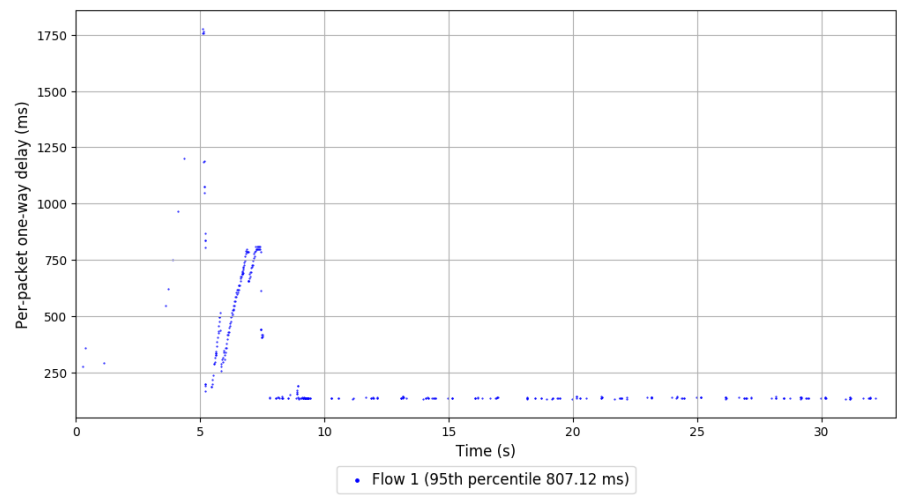
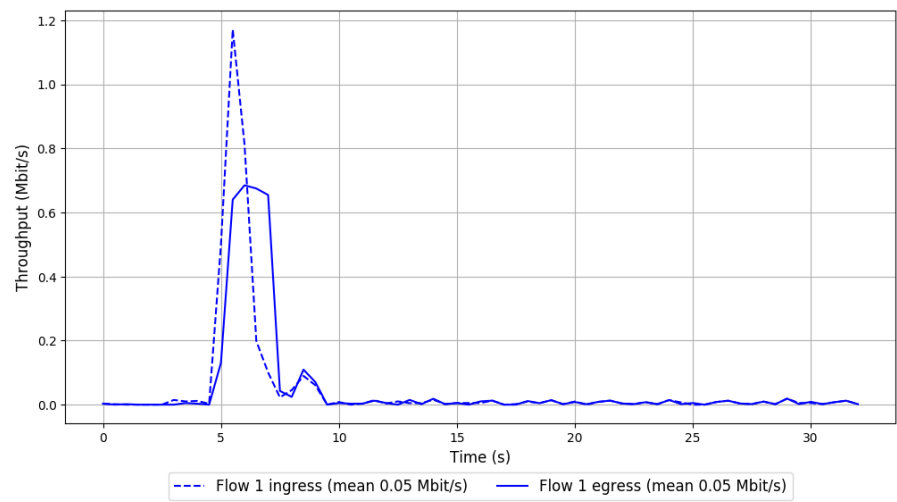
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 807.118 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

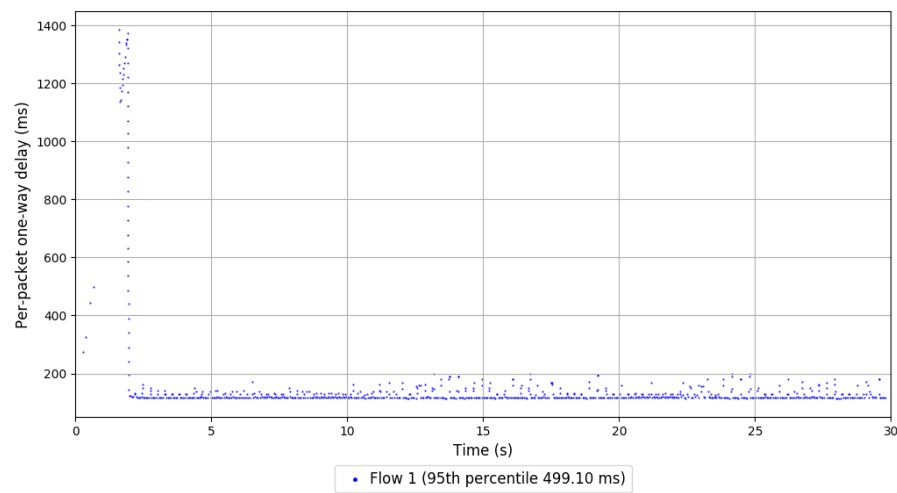
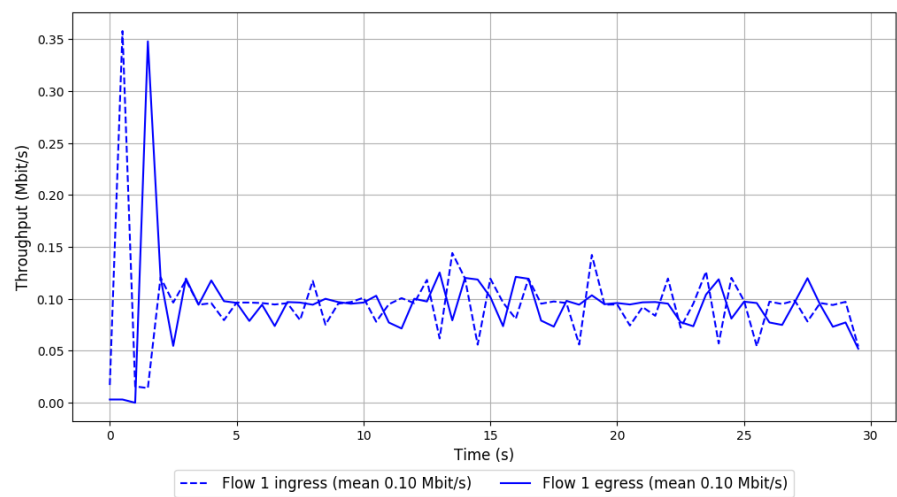


Run 1: Statistics of Sprout

Start at: 2018-04-02 23:42:48
End at: 2018-04-02 23:43:18
Local clock offset: -2.286 ms
Remote clock offset: 12.362 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 499.103 ms
Loss rate: 1.66%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 499.103 ms
Loss rate: 1.66%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-04-03 00:04:02

End at: 2018-04-03 00:04:32

Local clock offset: 2.005 ms

Remote clock offset: 7.992 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 464.374 ms

Loss rate: 1.77%

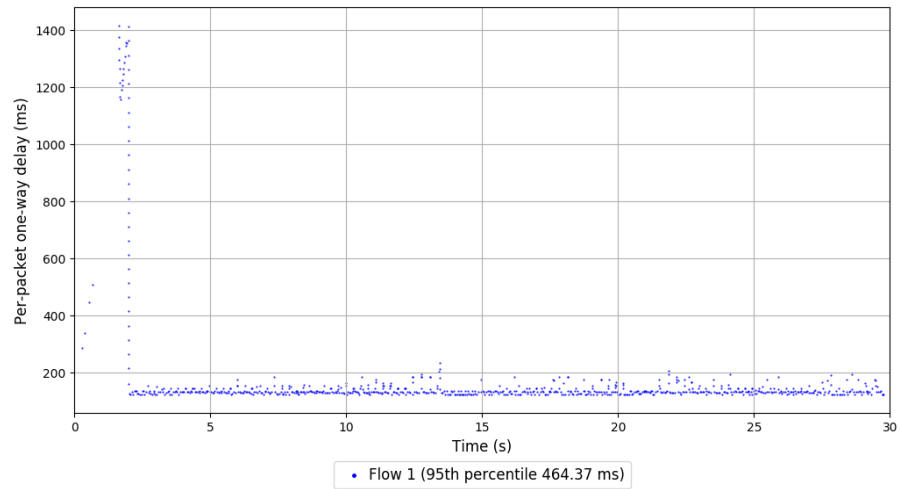
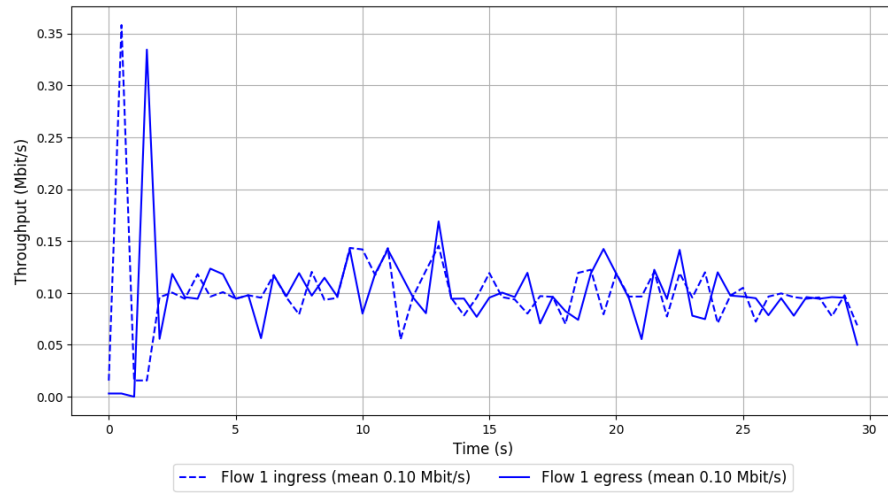
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 464.374 ms

Loss rate: 1.77%

Run 2: Report of Sprout — Data Link

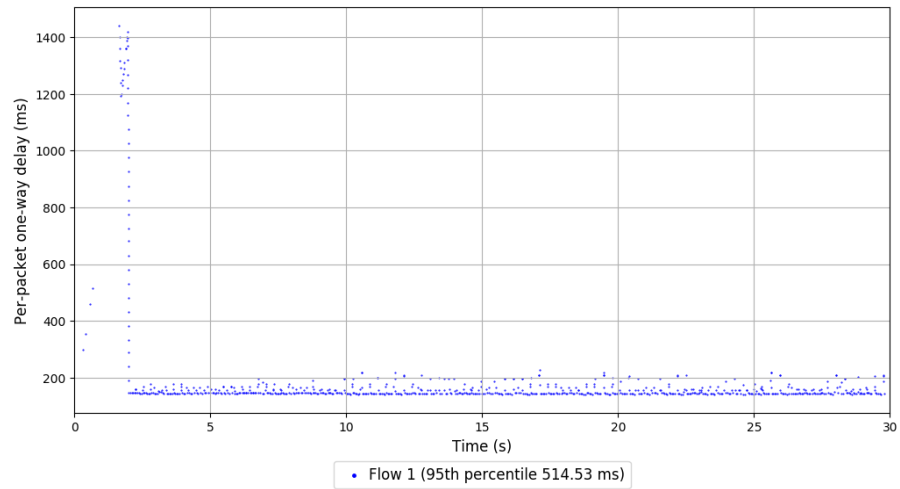
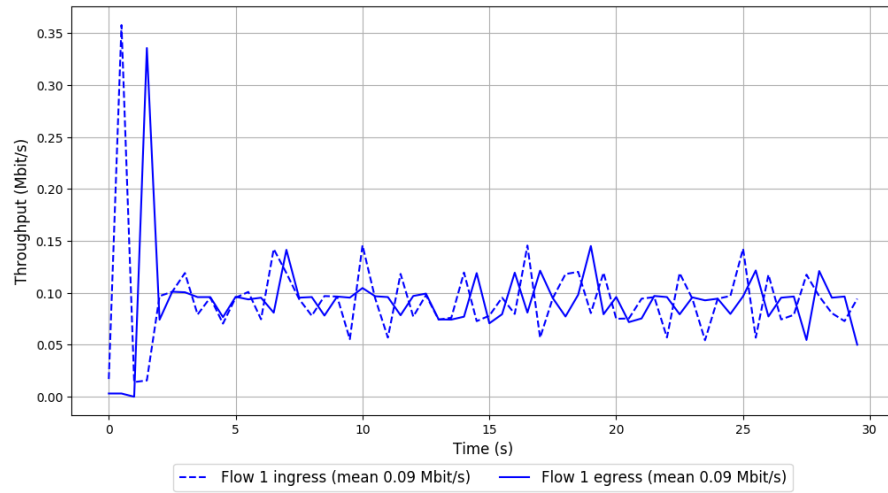


Run 3: Statistics of Sprout

Start at: 2018-04-03 00:25:16
End at: 2018-04-03 00:25:46
Local clock offset: 17.167 ms
Remote clock offset: 6.084 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 514.532 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 514.532 ms
Loss rate: 1.93%

Run 3: Report of Sprout — Data Link

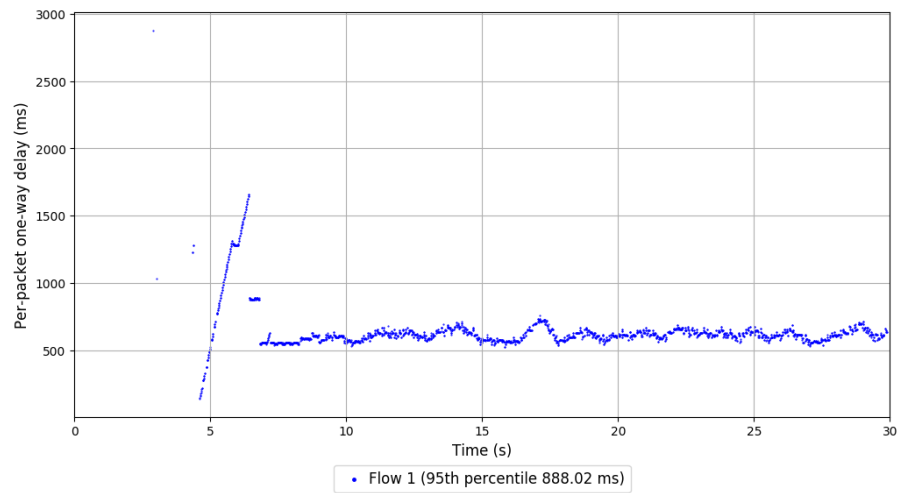
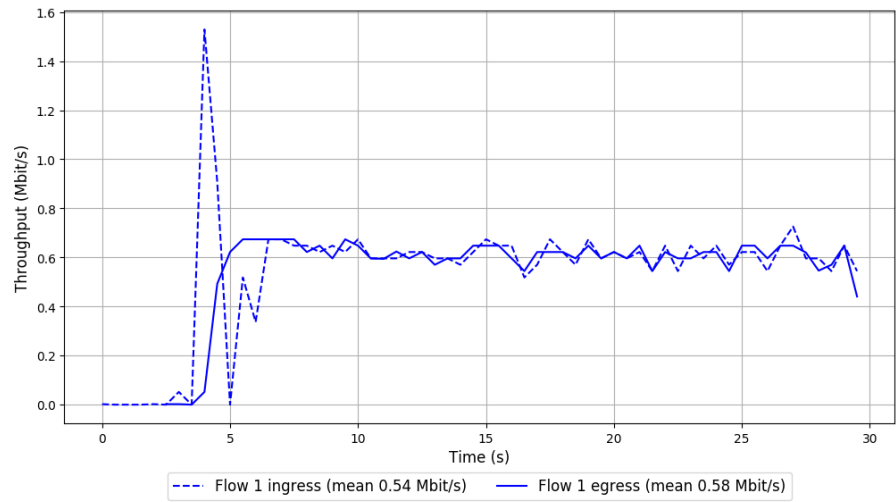


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-04-02 23:49:52
End at: 2018-04-02 23:50:22
Local clock offset: -1.98 ms
Remote clock offset: 12.787 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 888.019 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 888.019 ms
Loss rate: 2.97%
```

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-04-03 00:11:06

End at: 2018-04-03 00:11:36

Local clock offset: 5.44 ms

Remote clock offset: 7.4 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1381.613 ms

Loss rate: 2.57%

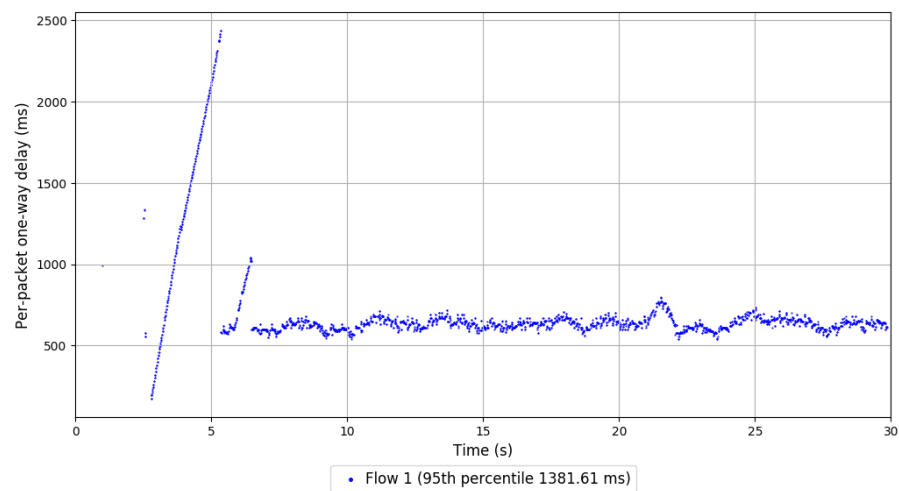
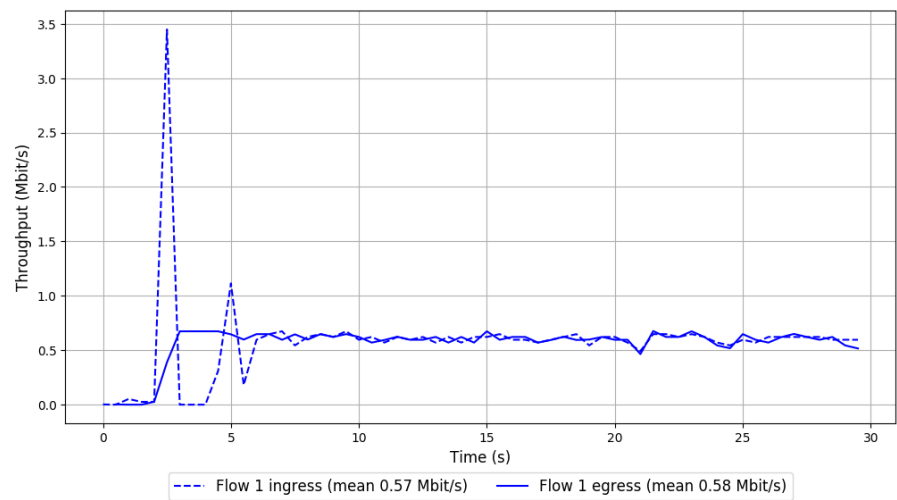
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1381.613 ms

Loss rate: 2.57%

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

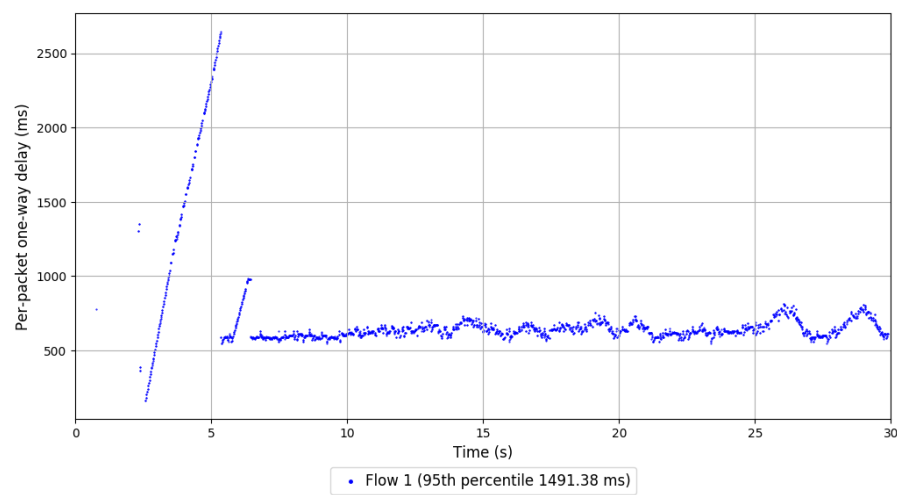
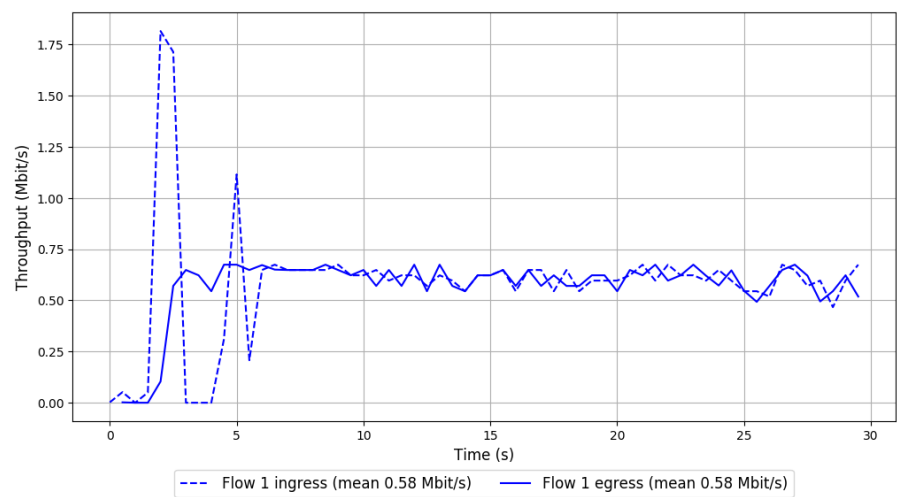


Run 3: Statistics of TaoVA-100x

Start at: 2018-04-03 00:32:20
End at: 2018-04-03 00:32:50
Local clock offset: 19.359 ms
Remote clock offset: 12.407 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1491.385 ms
Loss rate: 2.54%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1491.385 ms
Loss rate: 2.54%

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



Run 1: Statistics of TCP Vegas

Start at: 2018-04-02 23:45:10

End at: 2018-04-02 23:45:40

Local clock offset: 8.124 ms

Remote clock offset: 7.089 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 940.395 ms

Loss rate: 1.50%

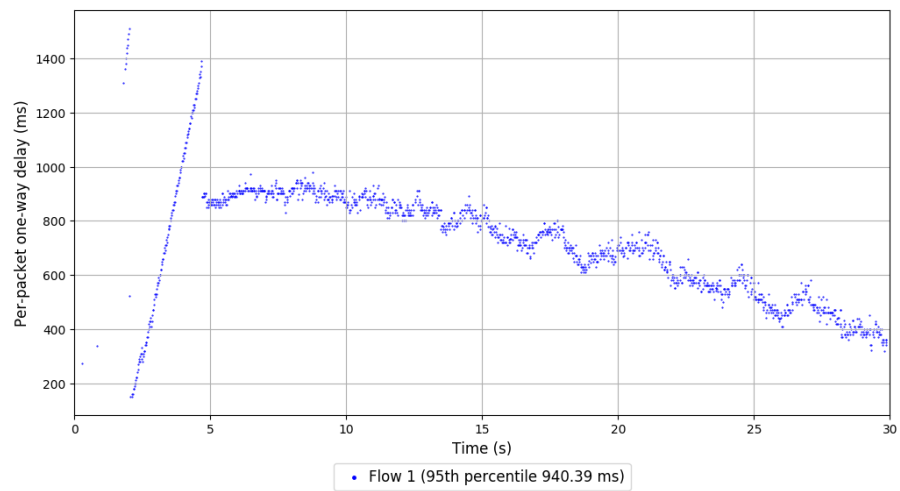
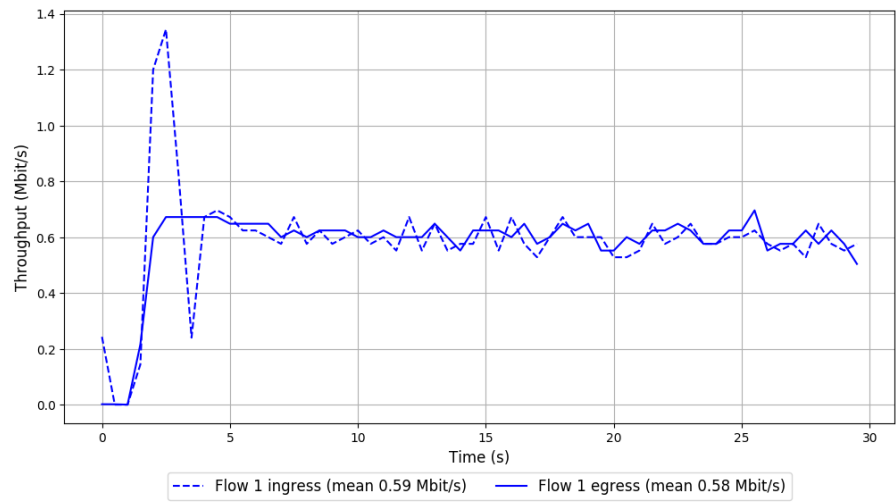
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 940.395 ms

Loss rate: 1.50%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-04-03 00:06:24

End at: 2018-04-03 00:06:54

Local clock offset: 6.369 ms

Remote clock offset: 14.15 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 907.743 ms

Loss rate: 1.16%

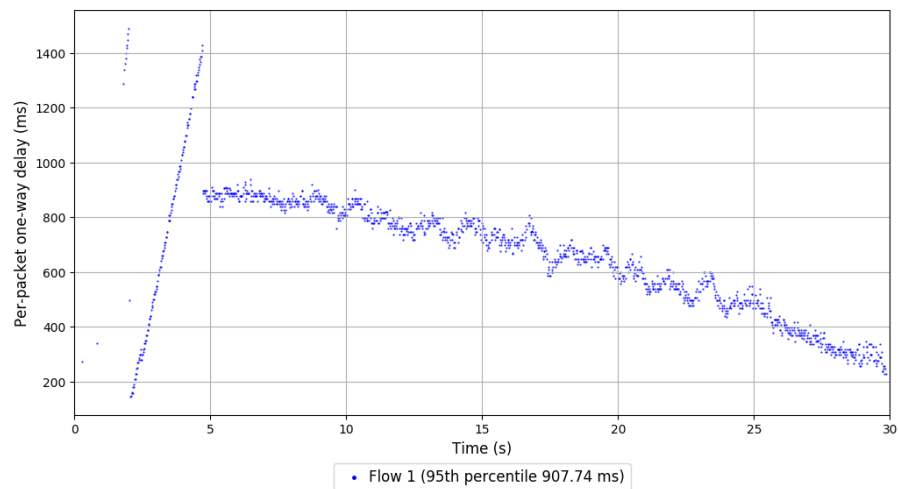
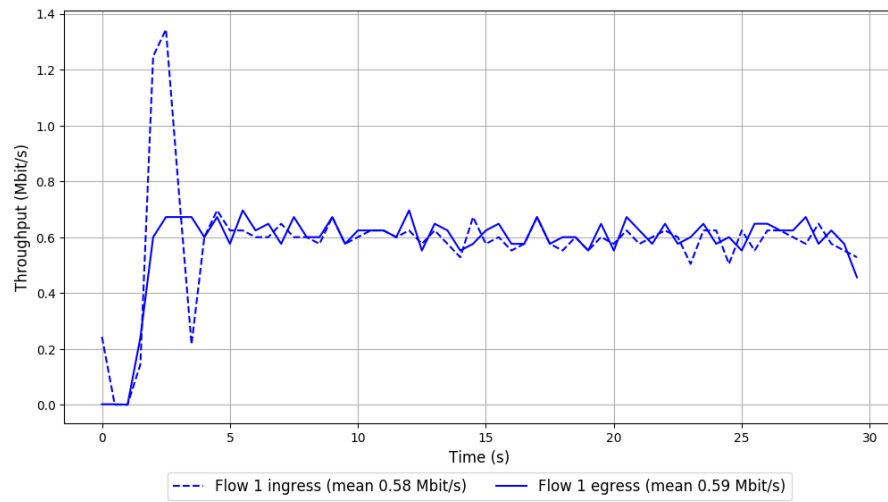
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 907.743 ms

Loss rate: 1.16%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2018-04-03 00:27:37

End at: 2018-04-03 00:28:07

Local clock offset: 8.31 ms

Remote clock offset: 6.06 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 992.981 ms

Loss rate: 1.38%

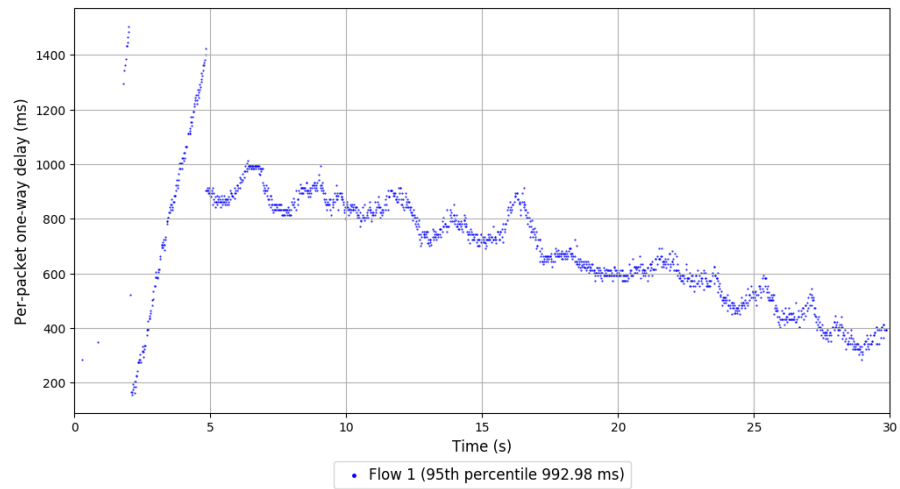
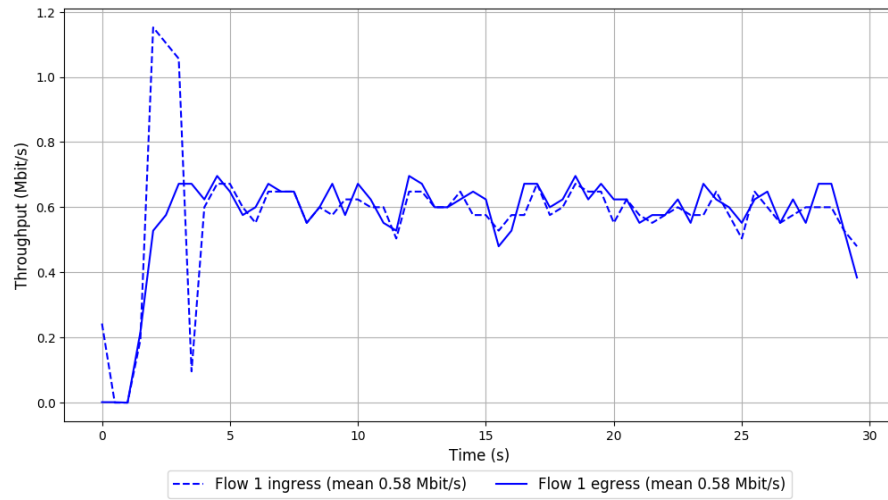
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 992.981 ms

Loss rate: 1.38%

Run 3: Report of TCP Vegas — Data Link

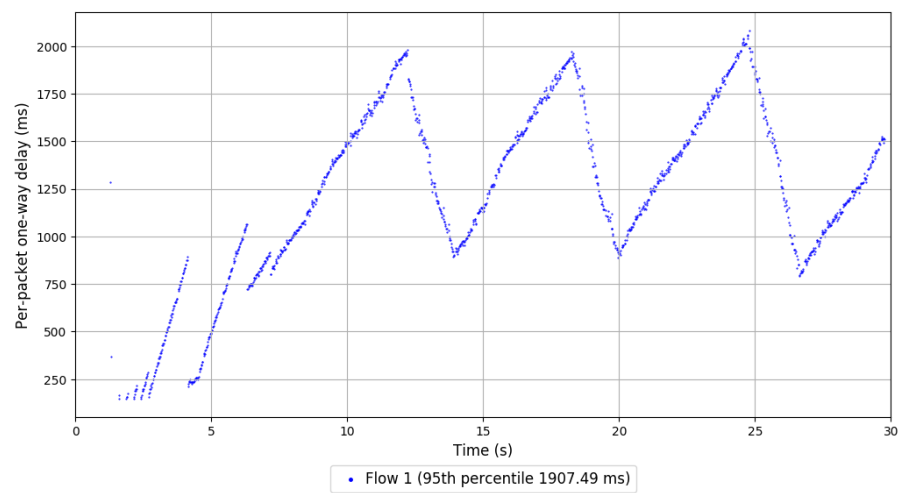
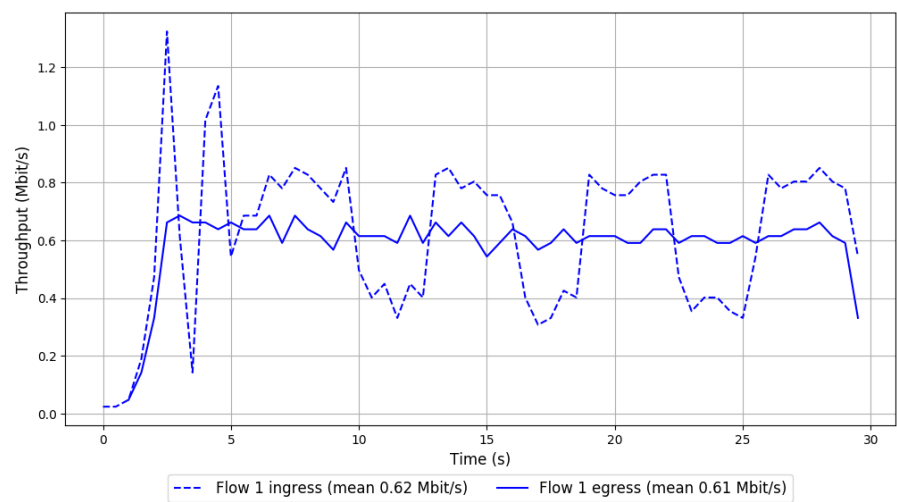


Run 1: Statistics of Verus

Start at: 2018-04-02 23:56:58
End at: 2018-04-02 23:57:28
Local clock offset: -1.862 ms
Remote clock offset: 12.043 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1907.490 ms
Loss rate: 6.90%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1907.490 ms
Loss rate: 6.90%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2018-04-03 00:18:12

End at: 2018-04-03 00:18:42

Local clock offset: 16.668 ms

Remote clock offset: 7.069 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 1954.256 ms

Loss rate: 4.61%

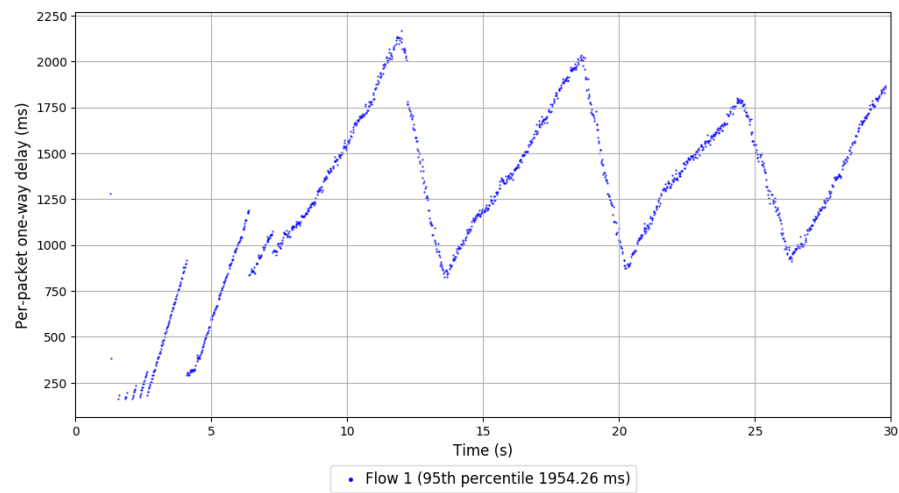
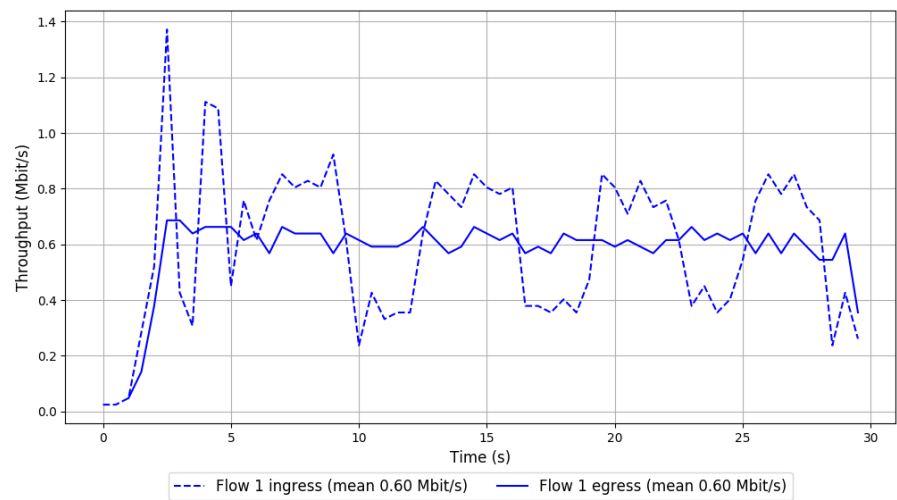
-- Flow 1:

Average throughput: 0.60 Mbit/s

95th percentile per-packet one-way delay: 1954.256 ms

Loss rate: 4.61%

Run 2: Report of Verus — Data Link

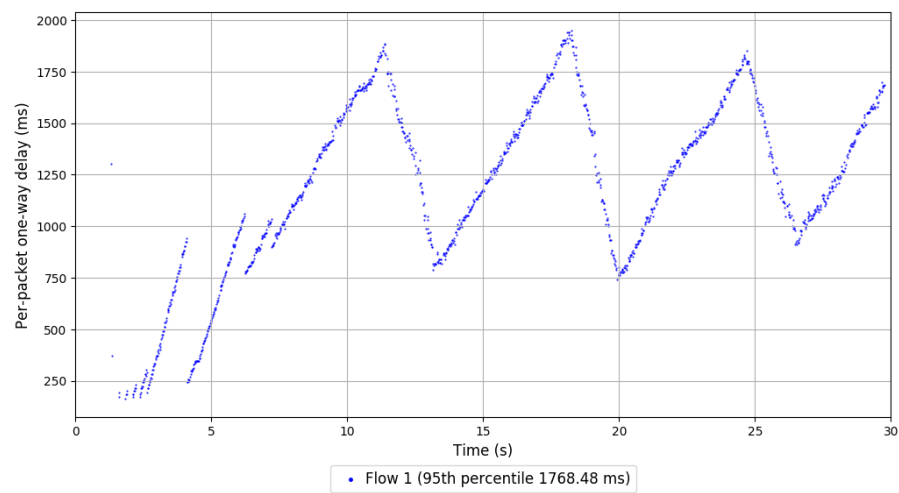
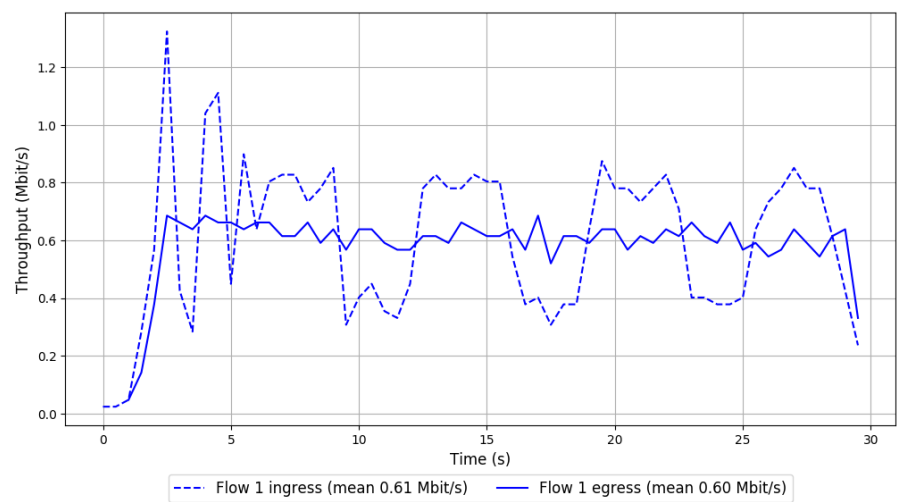


Run 3: Statistics of Verus

Start at: 2018-04-03 00:39:25
End at: 2018-04-03 00:39:55
Local clock offset: 20.362 ms
Remote clock offset: 7.07 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1768.476 ms
Loss rate: 5.23%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1768.476 ms
Loss rate: 5.23%

Run 3: Report of Verus — Data Link

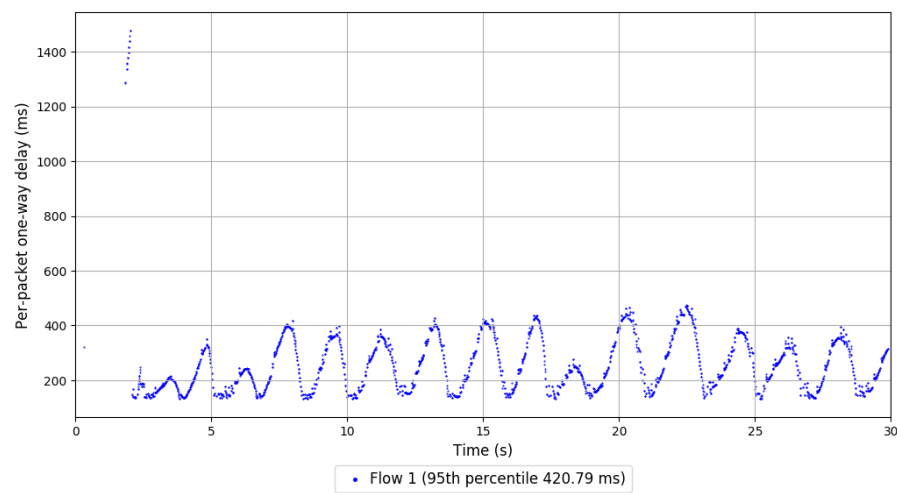
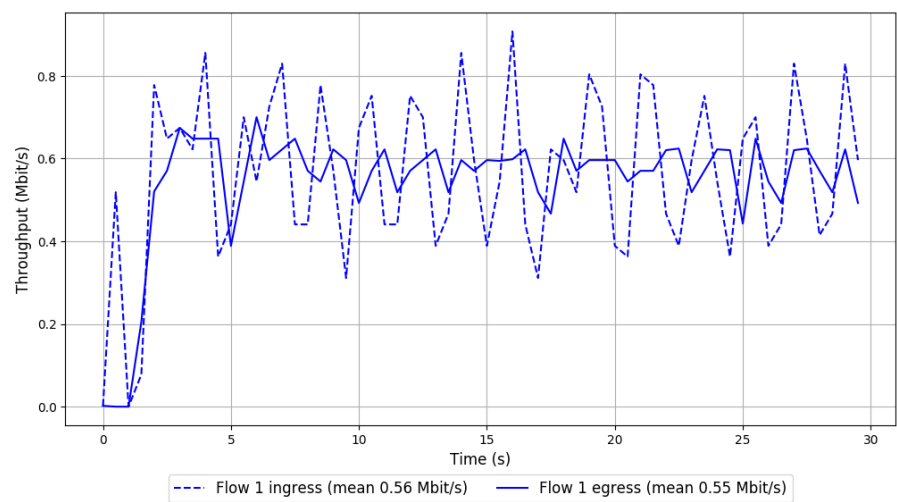


Run 1: Statistics of Copa

Start at: 2018-04-02 23:47:31
End at: 2018-04-02 23:48:01
Local clock offset: 7.665 ms
Remote clock offset: 13.588 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 420.786 ms
Loss rate: 2.93%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 420.786 ms
Loss rate: 2.93%

Run 1: Report of Copa — Data Link

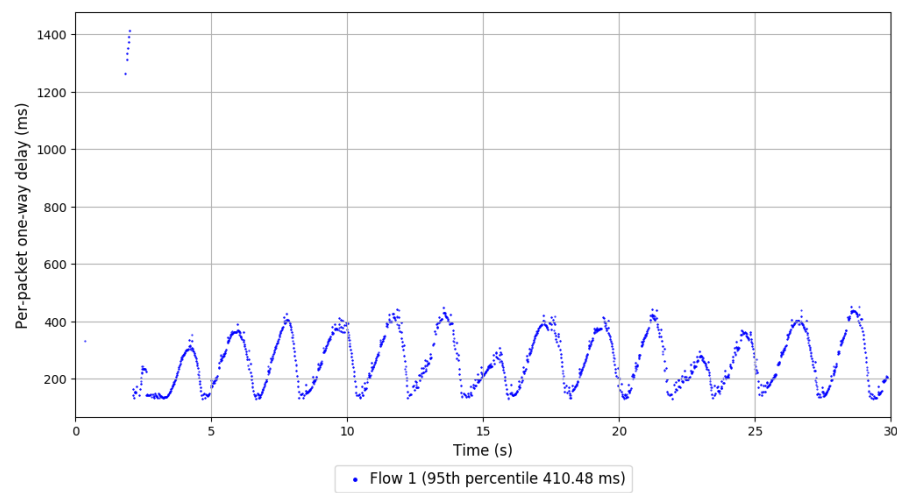
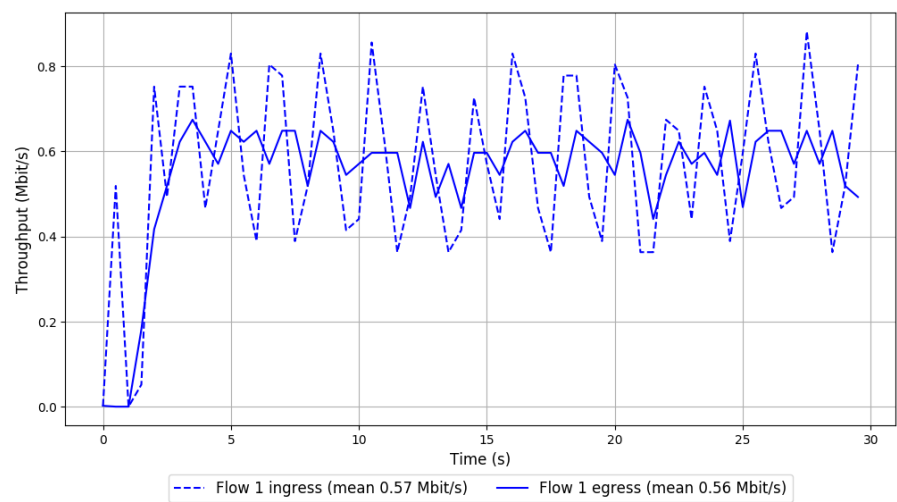


Run 2: Statistics of Copa

Start at: 2018-04-03 00:08:45
End at: 2018-04-03 00:09:15
Local clock offset: 5.29 ms
Remote clock offset: 13.903 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 410.477 ms
Loss rate: 3.20%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 410.477 ms
Loss rate: 3.20%

Run 2: Report of Copa — Data Link

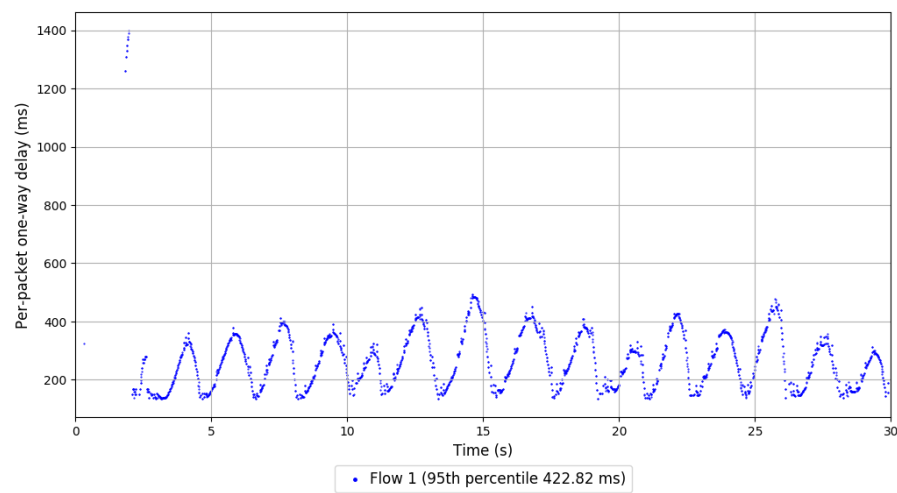
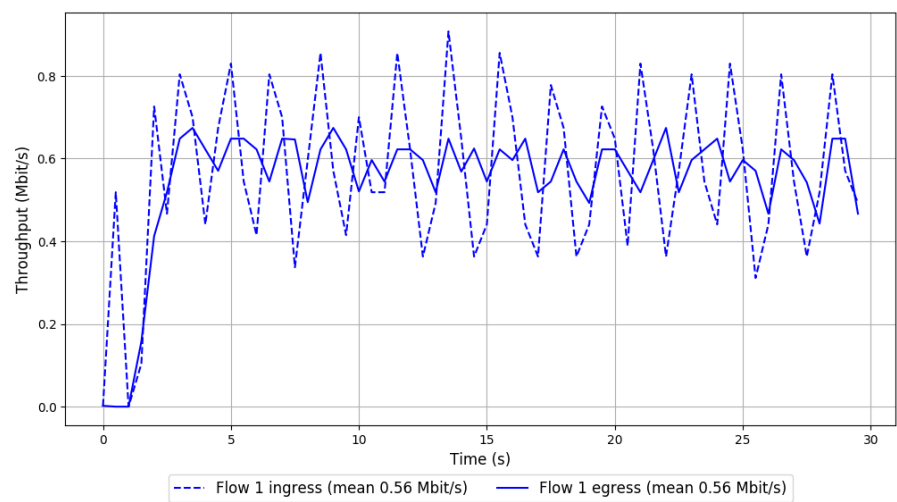


Run 3: Statistics of Copa

Start at: 2018-04-03 00:29:59
End at: 2018-04-03 00:30:29
Local clock offset: 7.53 ms
Remote clock offset: 12.548 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 422.822 ms
Loss rate: 2.60%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 422.822 ms
Loss rate: 2.60%

Run 3: Report of Copa — Data Link

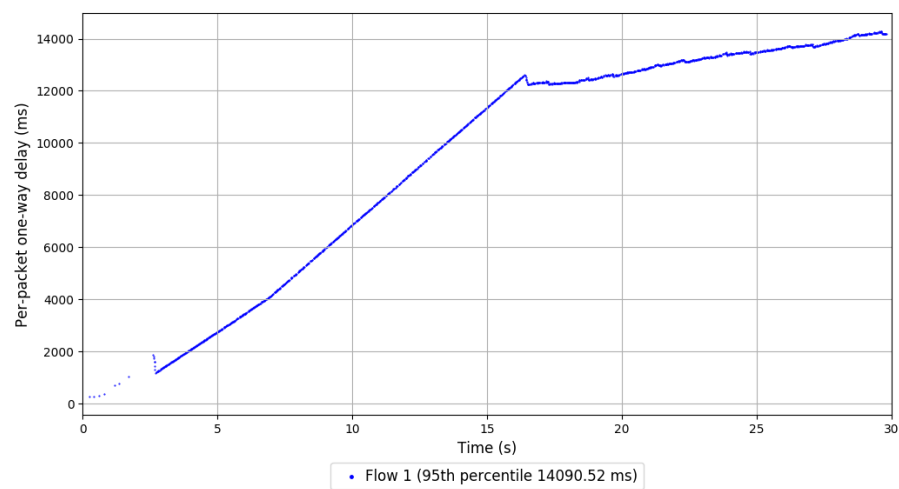
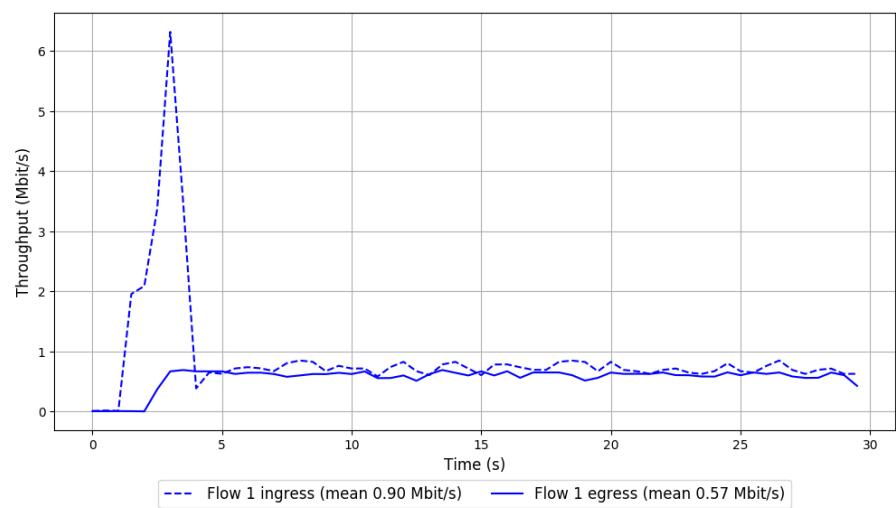


Run 1: Statistics of FillP

Start at: 2018-04-02 23:51:03
End at: 2018-04-02 23:51:33
Local clock offset: -1.819 ms
Remote clock offset: 13.885 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14090.523 ms
Loss rate: 37.95%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14090.523 ms
Loss rate: 37.95%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-04-03 00:12:17

End at: 2018-04-03 00:12:47

Local clock offset: 5.145 ms

Remote clock offset: 6.349 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 13695.390 ms

Loss rate: 37.94%

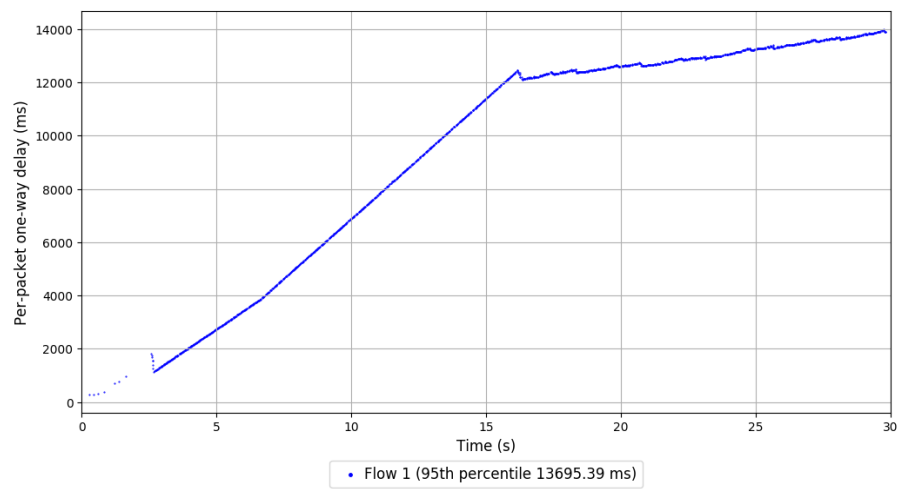
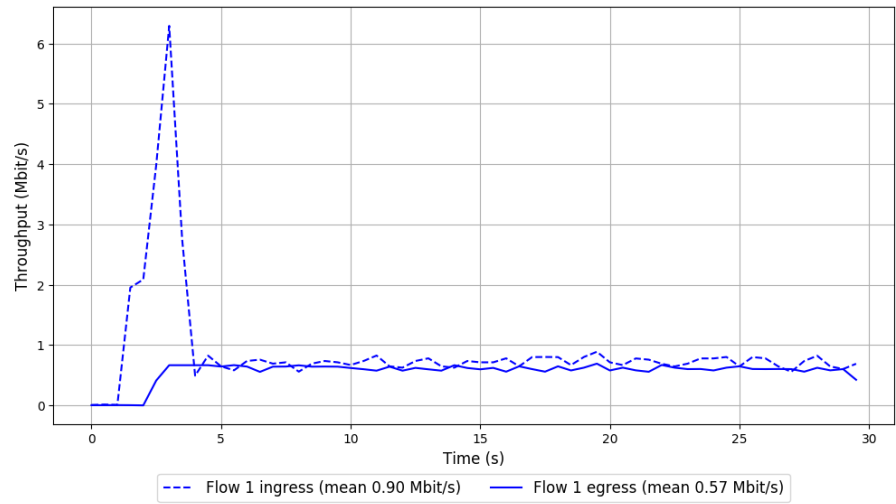
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 13695.390 ms

Loss rate: 37.94%

Run 2: Report of FillP — Data Link

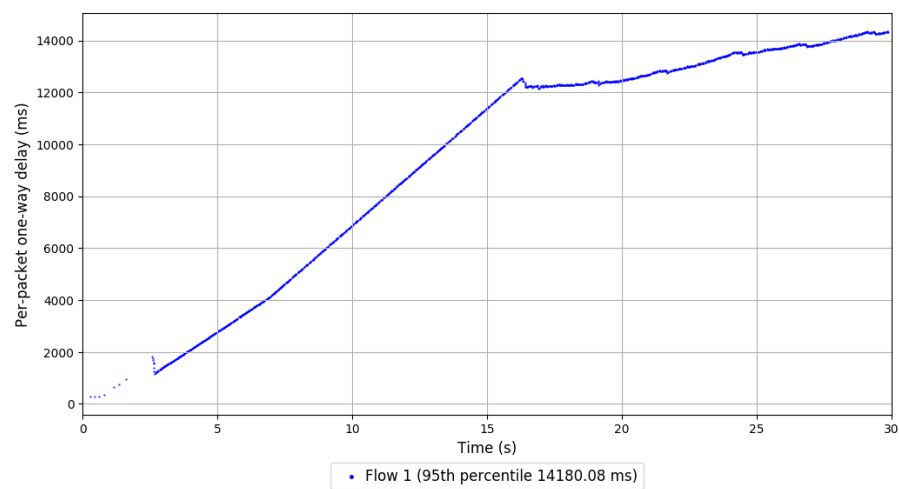
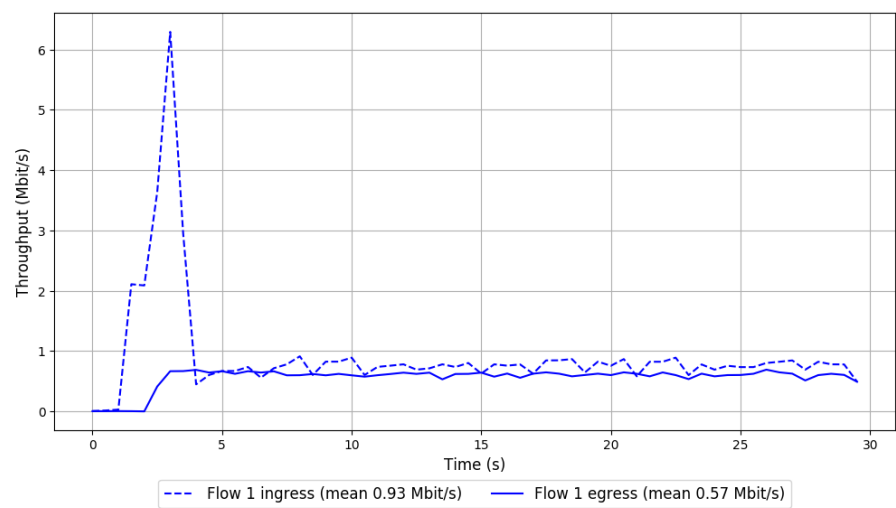


Run 3: Statistics of FillP

Start at: 2018-04-03 00:33:31
End at: 2018-04-03 00:34:01
Local clock offset: 14.949 ms
Remote clock offset: 12.464 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14180.080 ms
Loss rate: 39.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14180.080 ms
Loss rate: 39.54%

Run 3: Report of FillP — Data Link

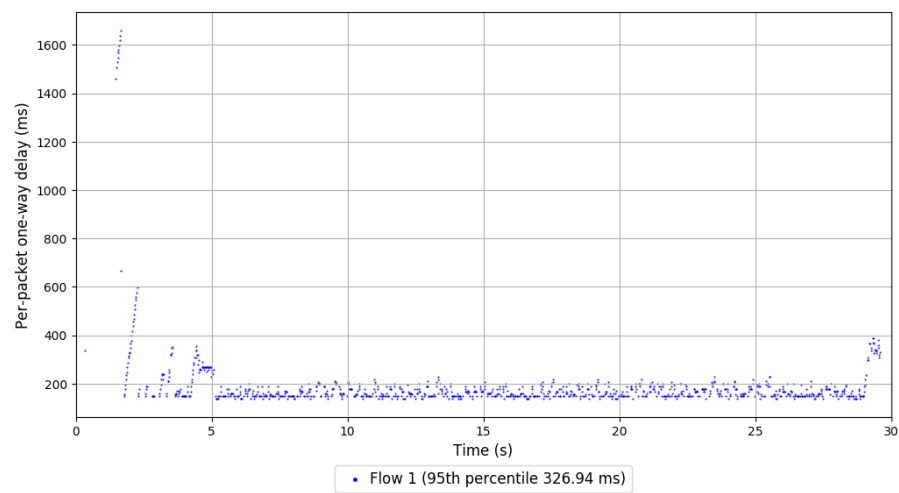
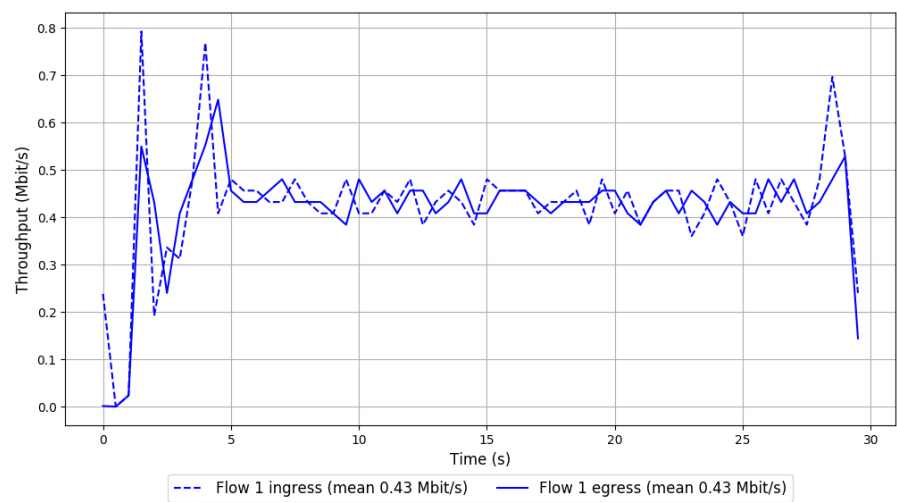


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-04-02 23:53:25
End at: 2018-04-02 23:53:55
Local clock offset: 8.468 ms
Remote clock offset: 13.927 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 326.936 ms
Loss rate: 2.26%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 326.936 ms
Loss rate: 2.26%
```

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

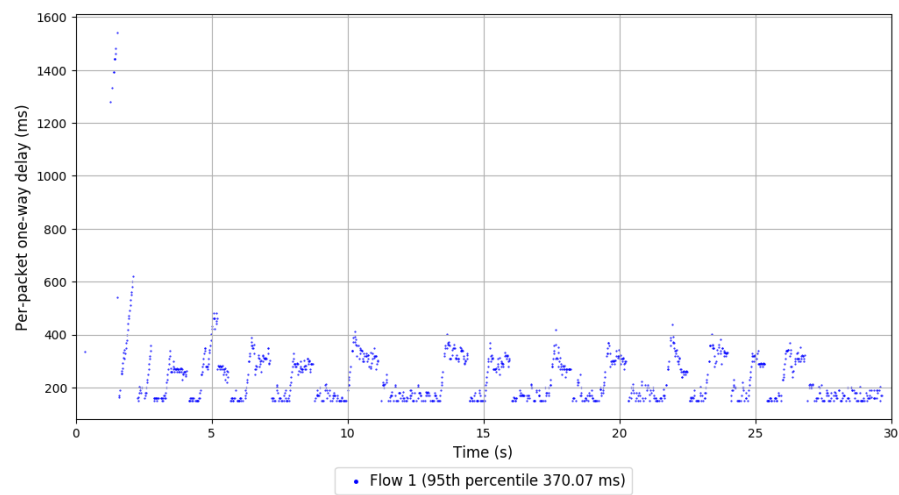
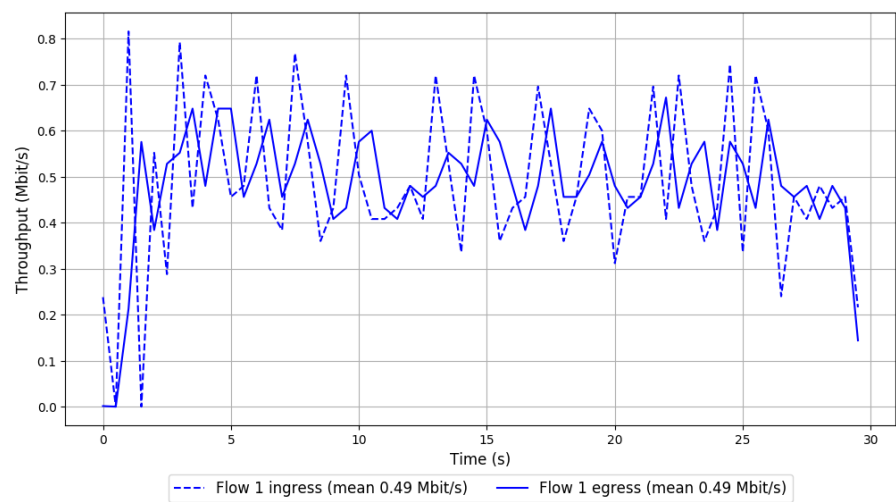


Run 2: Statistics of Indigo-1-32

Start at: 2018-04-03 00:14:38
End at: 2018-04-03 00:15:08
Local clock offset: 19.039 ms
Remote clock offset: 12.598 ms

Below is generated by plot.py at 2018-04-03 01:45:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 370.069 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 370.069 ms
Loss rate: 1.07%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-04-03 00:35:52

End at: 2018-04-03 00:36:22

Local clock offset: 19.427 ms

Remote clock offset: 7.059 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 294.137 ms

Loss rate: 1.36%

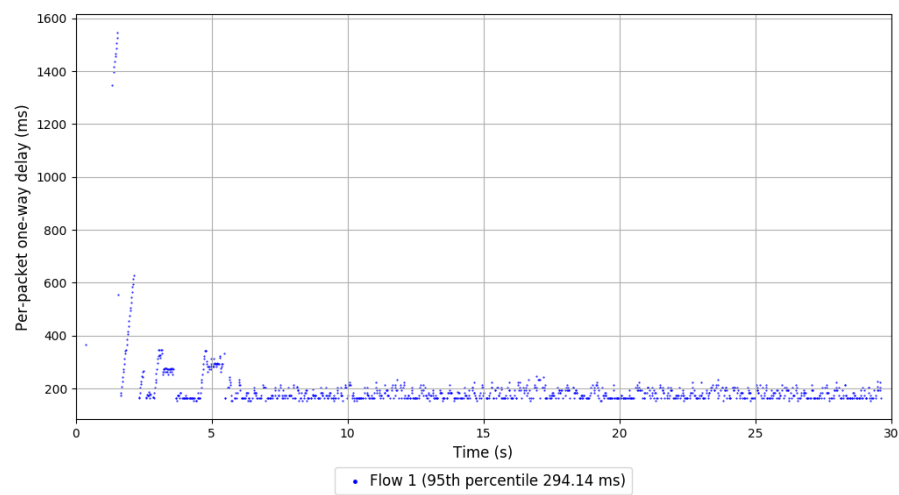
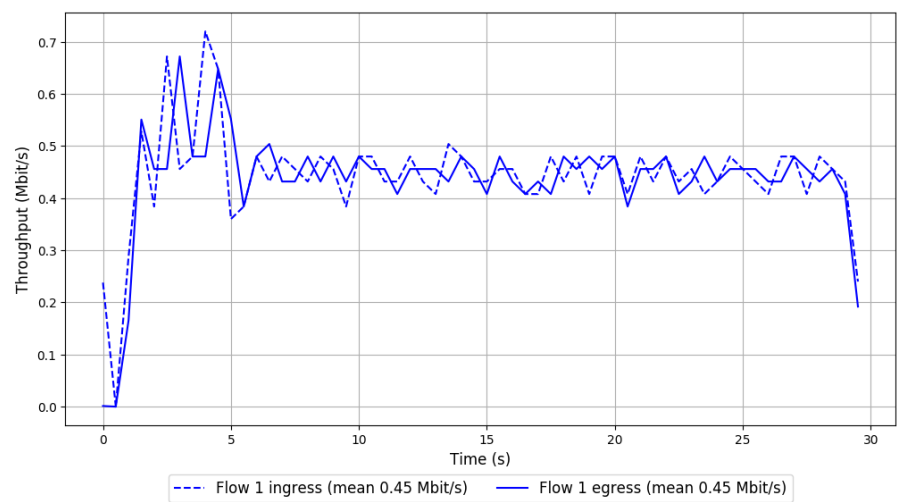
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 294.137 ms

Loss rate: 1.36%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-04-02 23:48:42

End at: 2018-04-02 23:49:12

Local clock offset: -2.069 ms

Remote clock offset: 7.295 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21234.045 ms

Loss rate: 70.53%

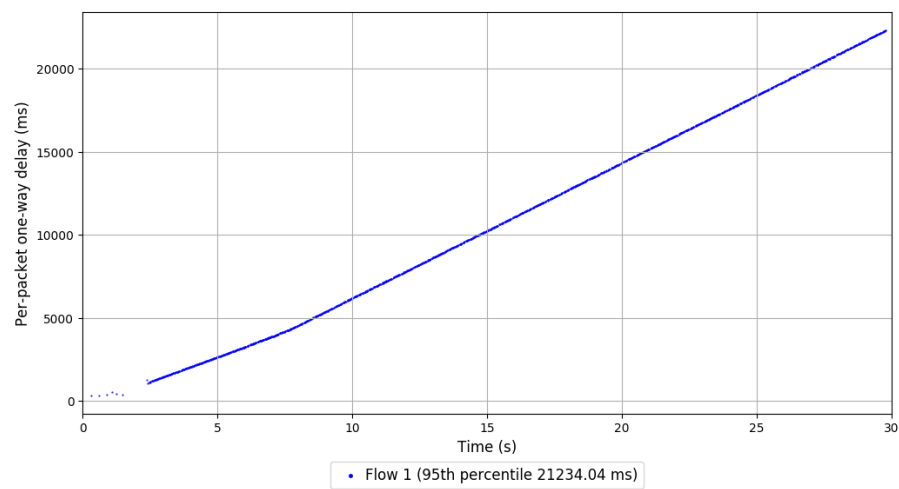
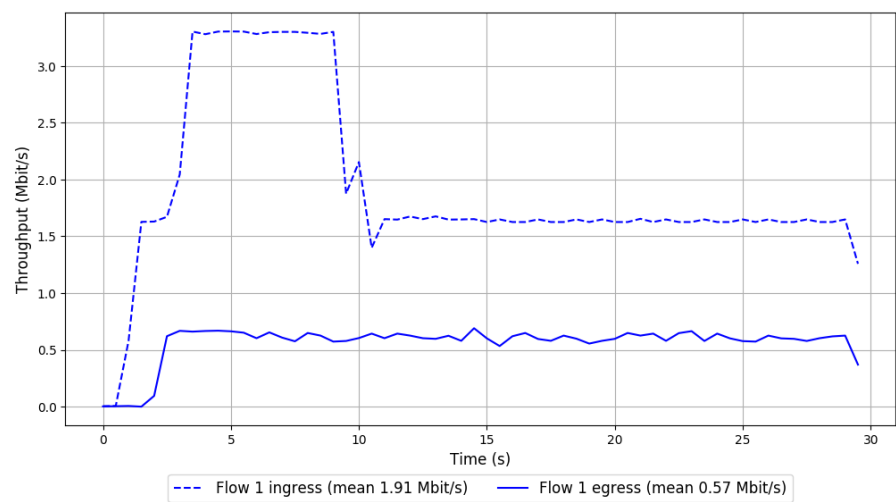
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21234.045 ms

Loss rate: 70.53%

Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-04-03 00:09:56

End at: 2018-04-03 00:10:26

Local clock offset: 19.605 ms

Remote clock offset: 6.477 ms

Below is generated by plot.py at 2018-04-03 01:45:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21135.330 ms

Loss rate: 70.40%

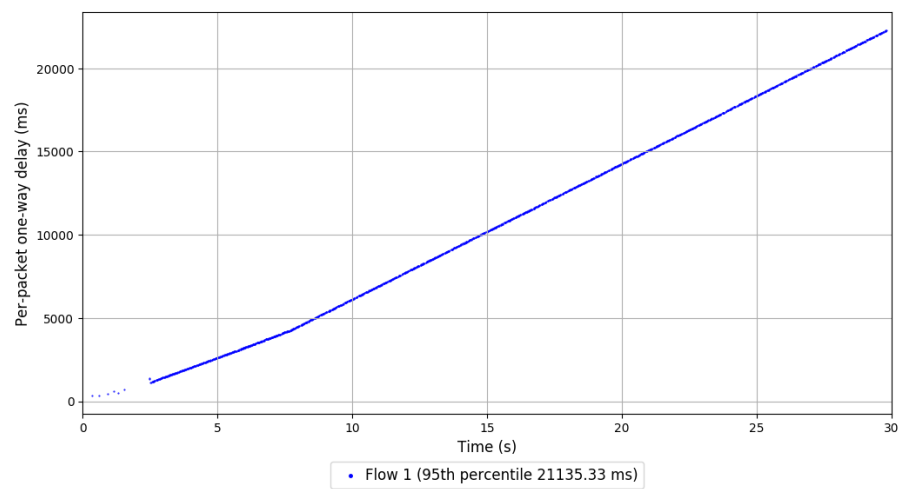
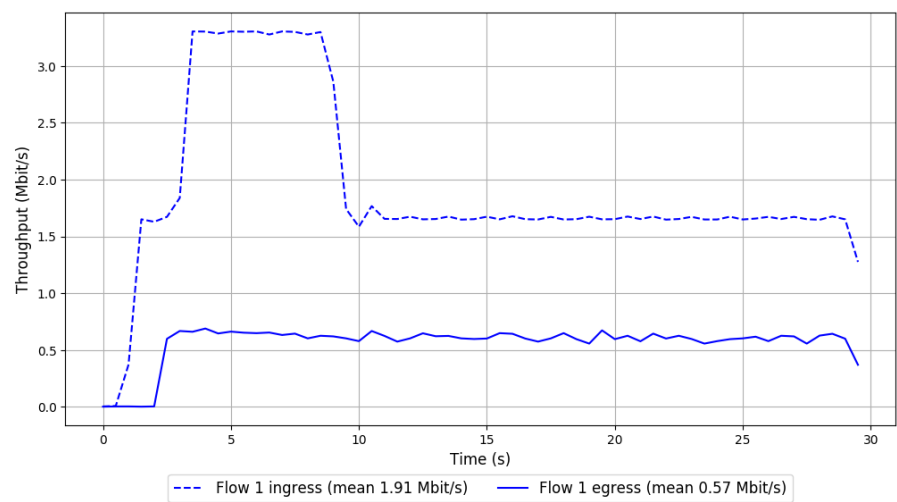
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21135.330 ms

Loss rate: 70.40%

Run 2: Report of Vivace-latency — Data Link



Run 3: Statistics of Vivace-latency

Start at: 2018-04-03 00:31:09

End at: 2018-04-03 00:31:39

Local clock offset: 12.506 ms

Remote clock offset: 6.069 ms

Below is generated by plot.py at 2018-04-03 01:45:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21108.917 ms

Loss rate: 70.37%

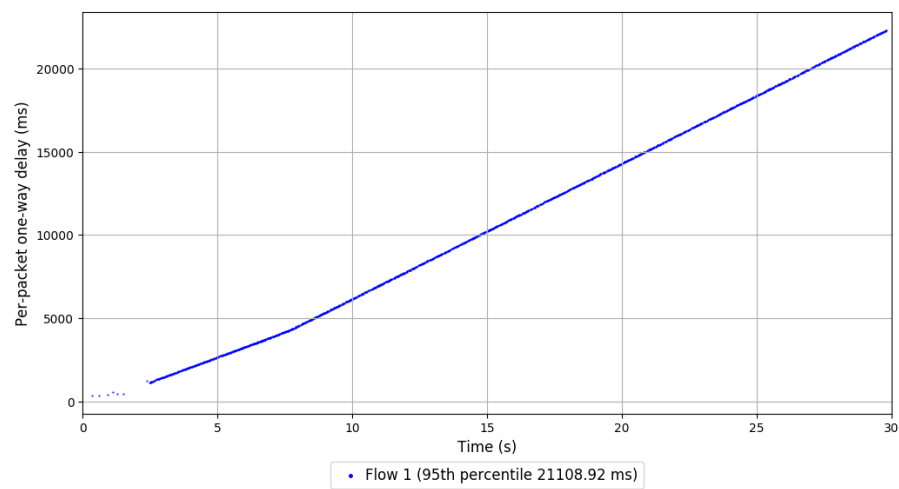
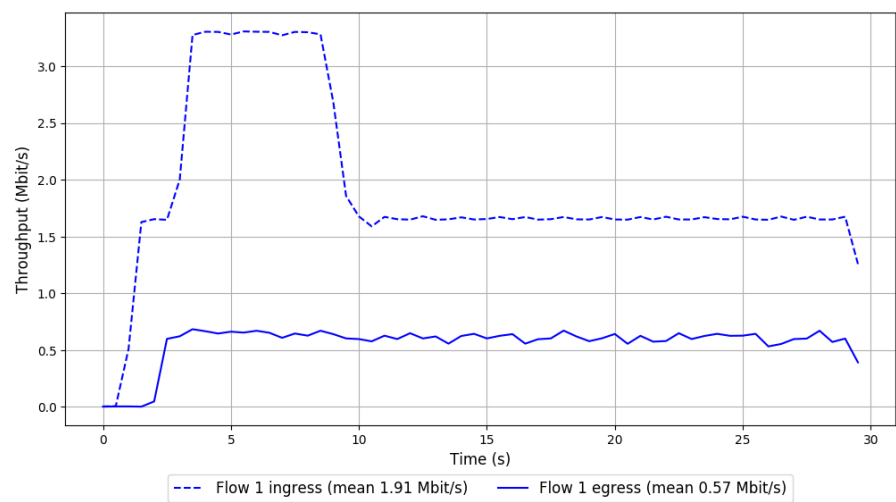
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21108.917 ms

Loss rate: 70.37%

Run 3: Report of Vivace-latency — Data Link



Run 1: Statistics of Vivace-loss

Start at: 2018-04-02 23:40:27

End at: 2018-04-02 23:40:57

Local clock offset: 2.093 ms

Remote clock offset: 13.092 ms

Below is generated by plot.py at 2018-04-03 01:45:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 20508.672 ms

Loss rate: 89.06%

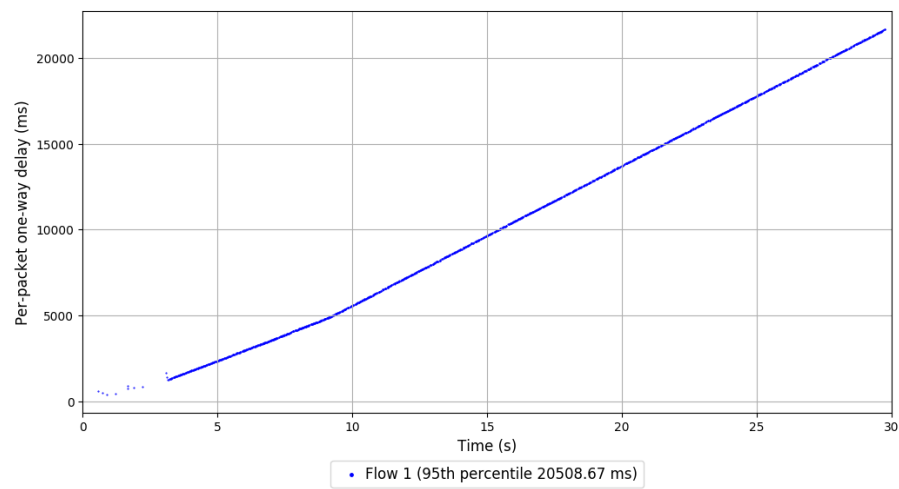
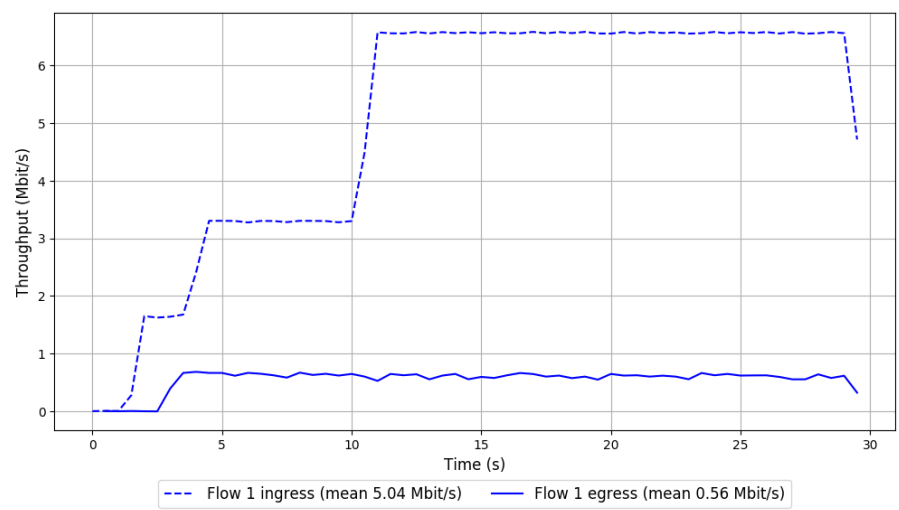
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 20508.672 ms

Loss rate: 89.06%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-04-03 00:01:40

End at: 2018-04-03 00:02:11

Local clock offset: 13.248 ms

Remote clock offset: 13.29 ms

Below is generated by plot.py at 2018-04-03 01:45:43

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 20879.357 ms

Loss rate: 89.22%

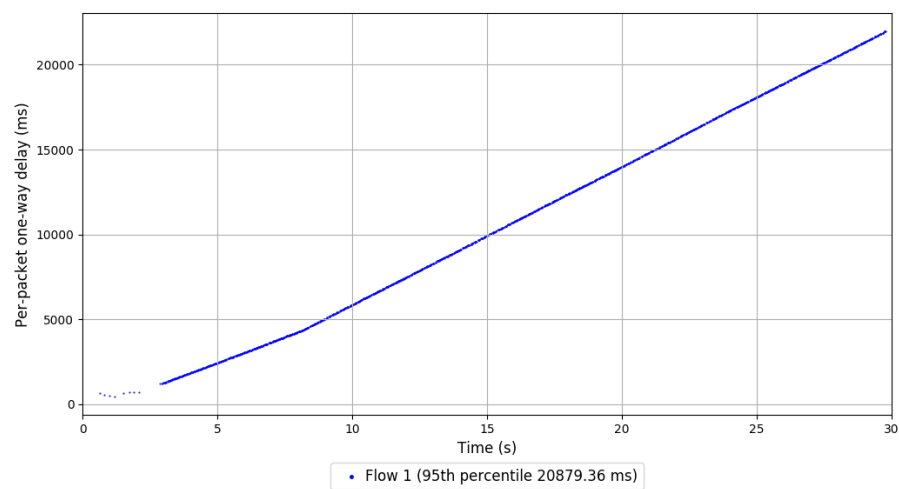
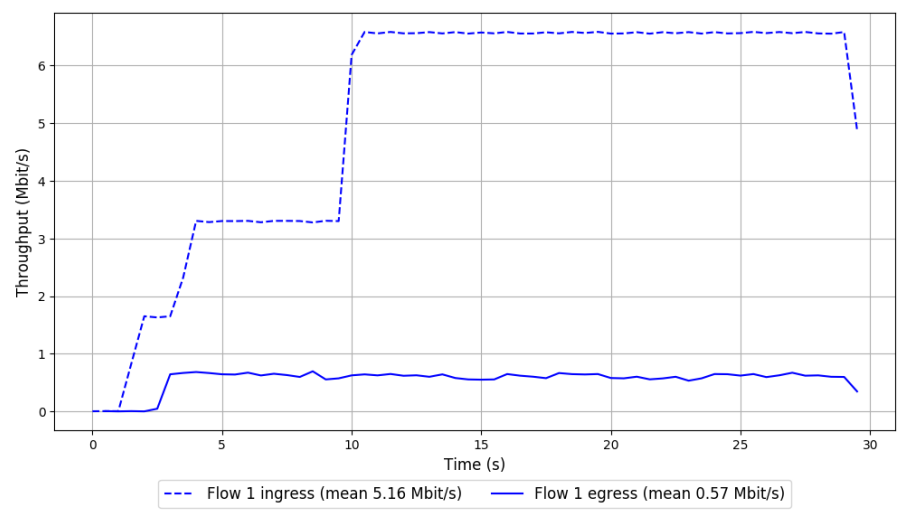
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 20879.357 ms

Loss rate: 89.22%

Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-04-03 00:22:54

End at: 2018-04-03 00:23:24

Local clock offset: 13.462 ms

Remote clock offset: 12.375 ms

Below is generated by plot.py at 2018-04-03 01:45:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 20523.667 ms

Loss rate: 89.21%

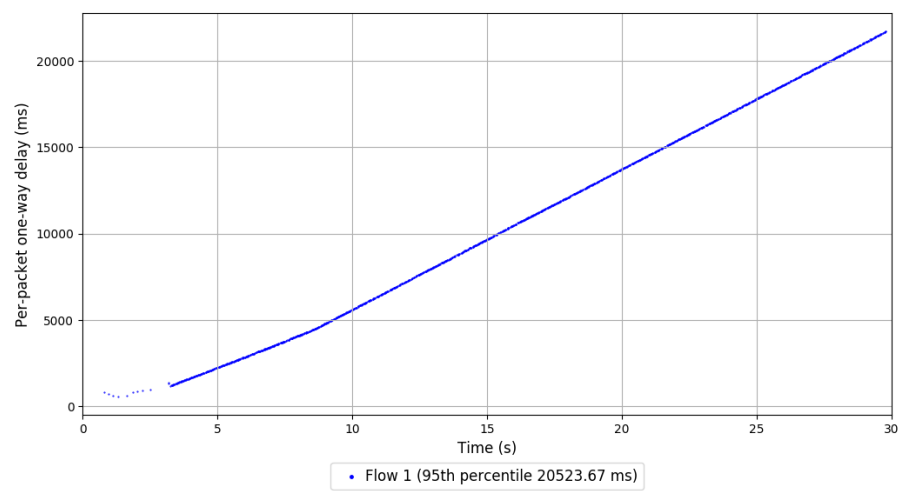
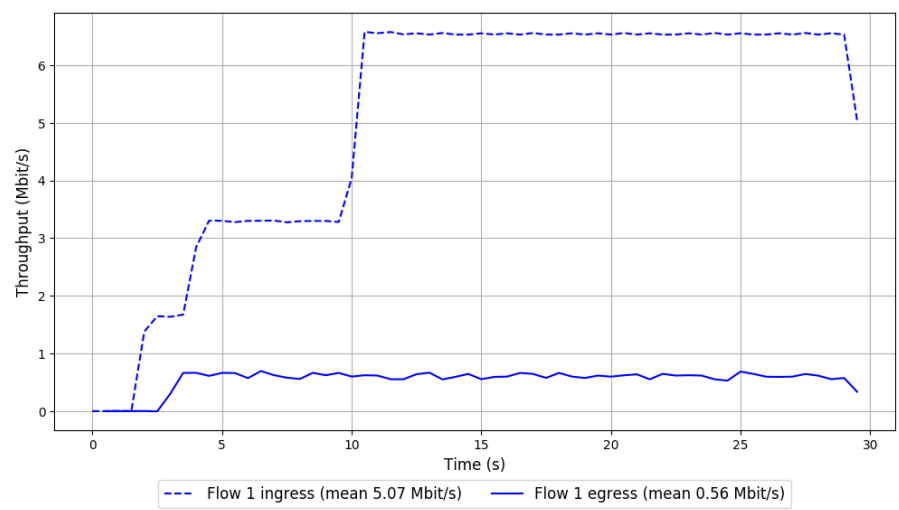
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 20523.667 ms

Loss rate: 89.21%

Run 3: Report of Vivace-loss — Data Link



Run 1: Statistics of Vivace-LTE

Start at: 2018-04-02 23:39:16

End at: 2018-04-02 23:39:46

Local clock offset: 1.108 ms

Remote clock offset: 12.052 ms

Below is generated by plot.py at 2018-04-03 01:45:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21003.990 ms

Loss rate: 71.19%

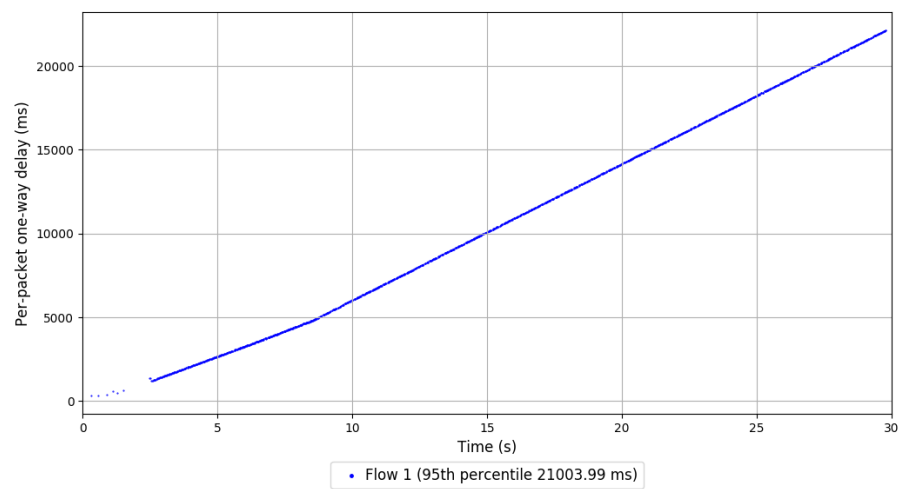
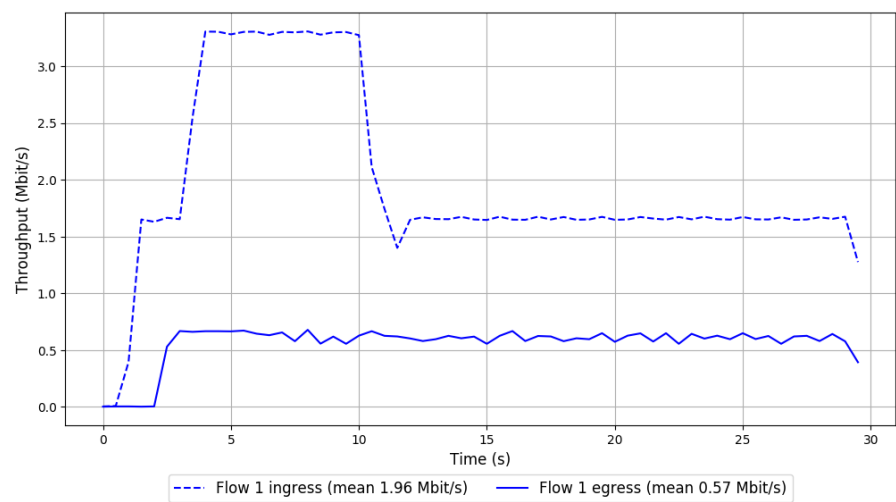
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21003.990 ms

Loss rate: 71.19%

Run 1: Report of Vivace-LTE — Data Link



Run 2: Statistics of Vivace-LTE

Start at: 2018-04-03 00:00:30

End at: 2018-04-03 00:01:00

Local clock offset: 17.613 ms

Remote clock offset: 6.908 ms

Below is generated by plot.py at 2018-04-03 01:45:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21044.818 ms

Loss rate: 71.26%

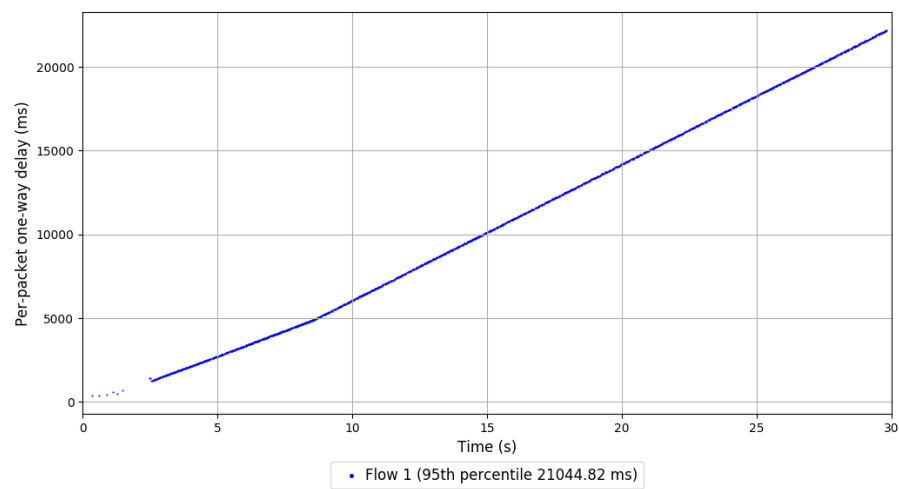
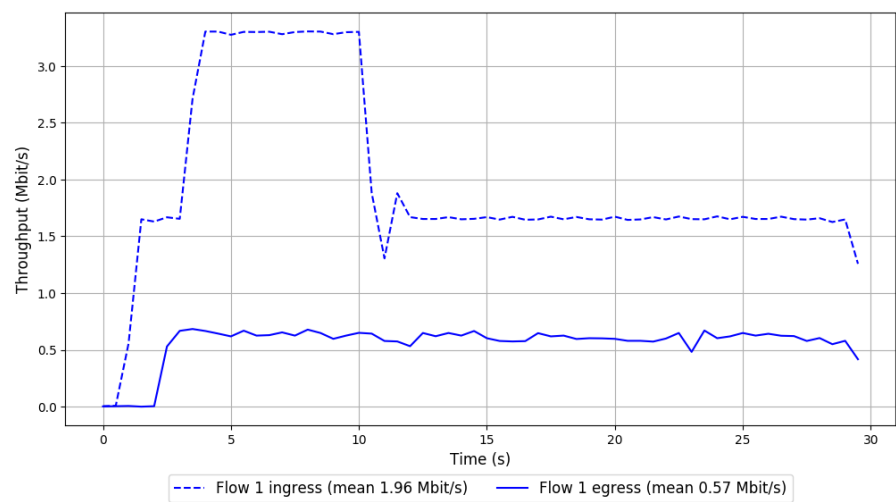
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21044.818 ms

Loss rate: 71.26%

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-04-03 00:21:44

End at: 2018-04-03 00:22:14

Local clock offset: 18.426 ms

Remote clock offset: 6.006 ms

Below is generated by plot.py at 2018-04-03 01:45:44

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21126.775 ms

Loss rate: 70.44%

-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 21126.775 ms

Loss rate: 70.44%

Run 3: Report of Vivace-LTE — Data Link

