

Pantheon Report

Generated at 2019-01-02 19:16:38 (UTC).

Data path: AWS Brazil 2 on `ens5` (*local*) → Colombia cellular on `ppp0` (*remote*).

Repeated the test of 19 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

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

System info:

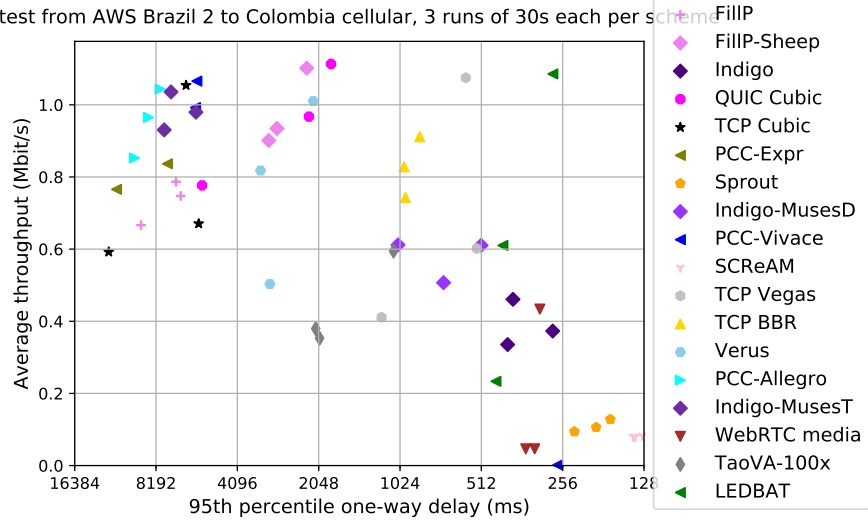
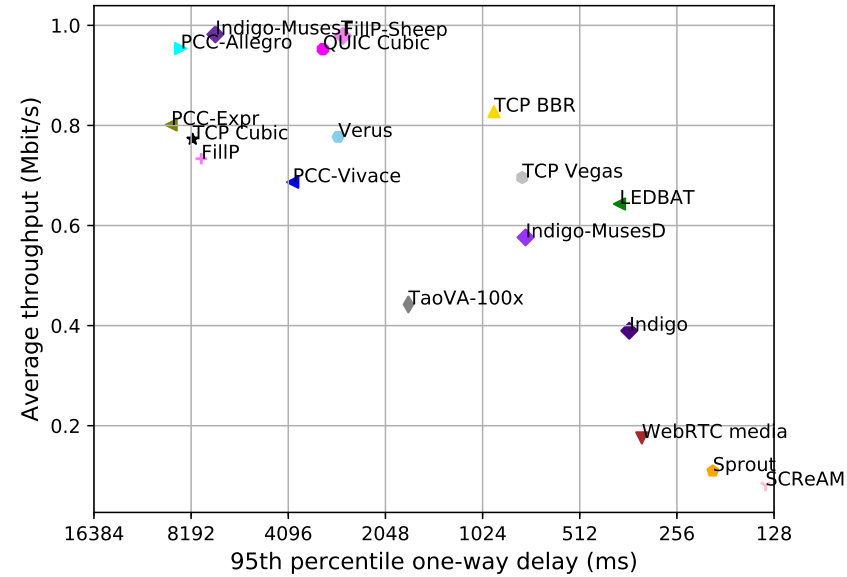
```
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

```
branch: muses @ c654af0b7d59d4ef4b914cfac404e1fc2e96dc68
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/muses-refactored @ 31f8f0ba8ef8b1da76c2bc0cd0a7850c33ff64fb
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
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 @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

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



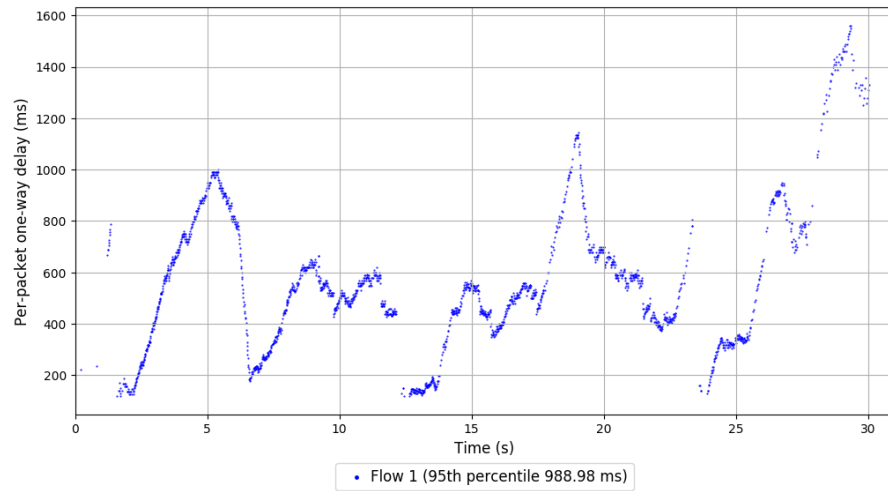
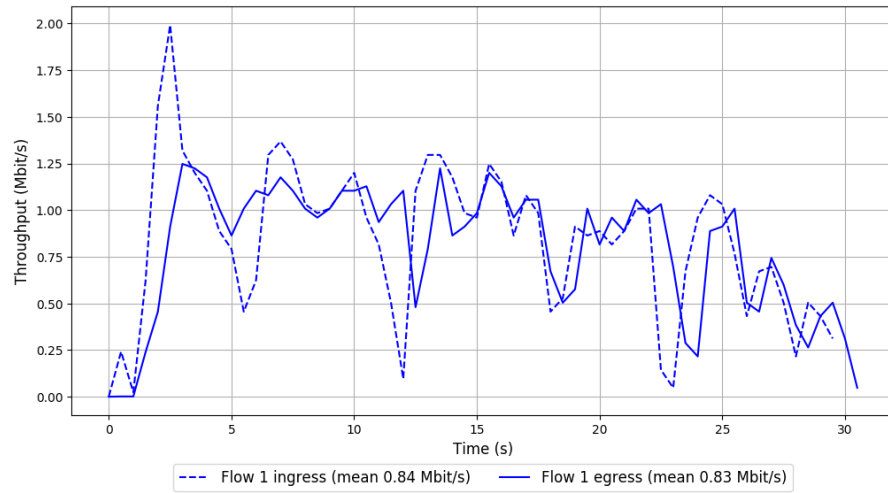
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.83	944.10	1.64
Copa	0	N/A	N/A	N/A
TCP Cubic	3	0.77	8099.45	25.89
FillP	3	0.74	7619.77	21.02
FillP-Sheep	3	0.98	2774.59	3.28
Indigo	3	0.39	359.66	0.29
Indigo-MusesD	3	0.58	753.70	0.14
Indigo-MusesT	3	0.98	6893.84	62.26
LEDBAT	3	0.64	385.61	0.26
PCC-Allegro	3	0.95	8829.42	95.33
PCC-Expr	2	0.80	9451.41	85.70
QUIC Cubic	3	0.95	3200.22	7.54
SCReAM	3	0.08	136.12	0.17
Sprout	3	0.11	198.20	0.54
TaoVA-100x	3	0.44	1738.76	2.65
TCP Vegas	3	0.69	771.88	0.61
Verus	3	0.78	2870.71	3.44
PCC-Vivace	3	0.69	3968.52	14.76
WebRTC media	3	0.18	328.92	0.03

Run 1: Statistics of TCP BBR

Start at: 2019-01-02 18:21:50
End at: 2019-01-02 18:22:20
Local clock offset: -2.206 ms
Remote clock offset: 31.416 ms

Below is generated by plot.py at 2019-01-02 19:16:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 988.975 ms
Loss rate: 2.09%
-- Flow 1:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 988.975 ms
Loss rate: 2.09%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-01-02 18:43:27

End at: 2019-01-02 18:43:57

Local clock offset: 5.001 ms

Remote clock offset: 2.046 ms

Below is generated by plot.py at 2019-01-02 19:16:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.91 Mbit/s

95th percentile per-packet one-way delay: 865.745 ms

Loss rate: 1.86%

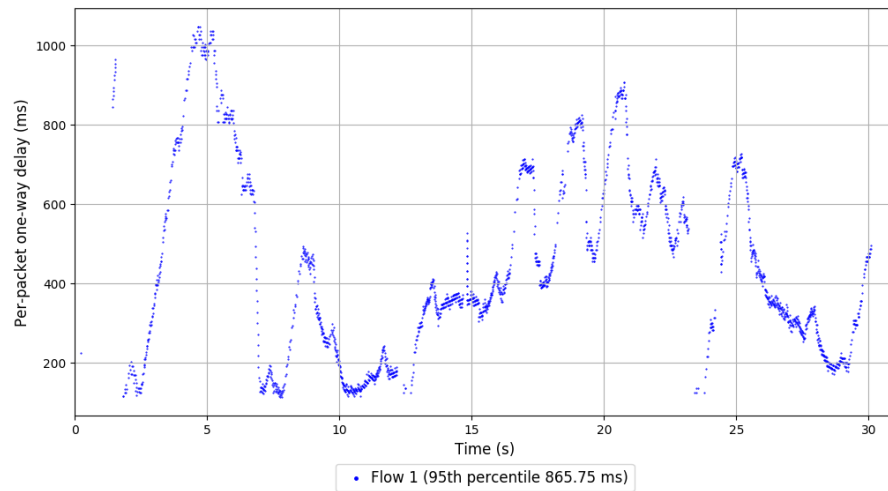
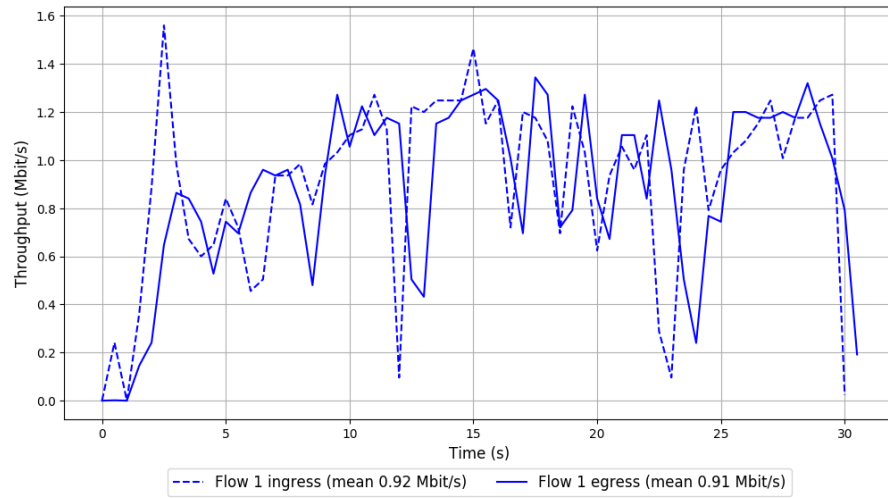
-- Flow 1:

Average throughput: 0.91 Mbit/s

95th percentile per-packet one-way delay: 865.745 ms

Loss rate: 1.86%

Run 2: Report of TCP BBR — Data Link

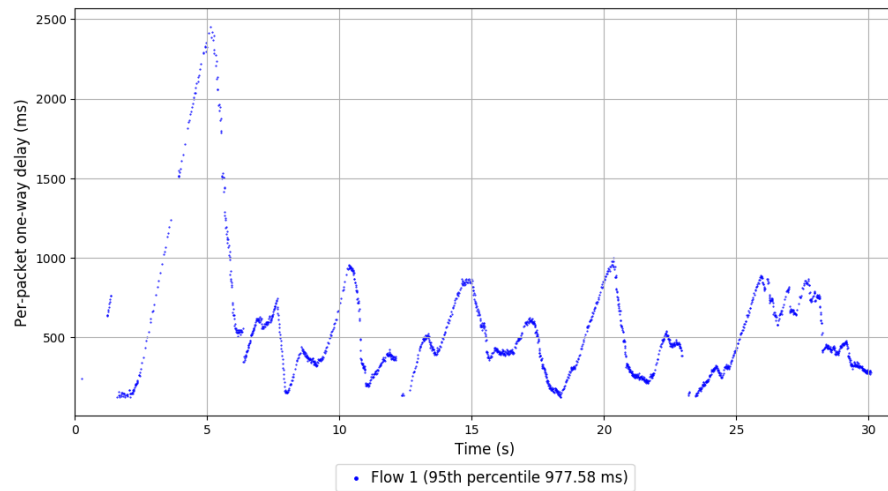
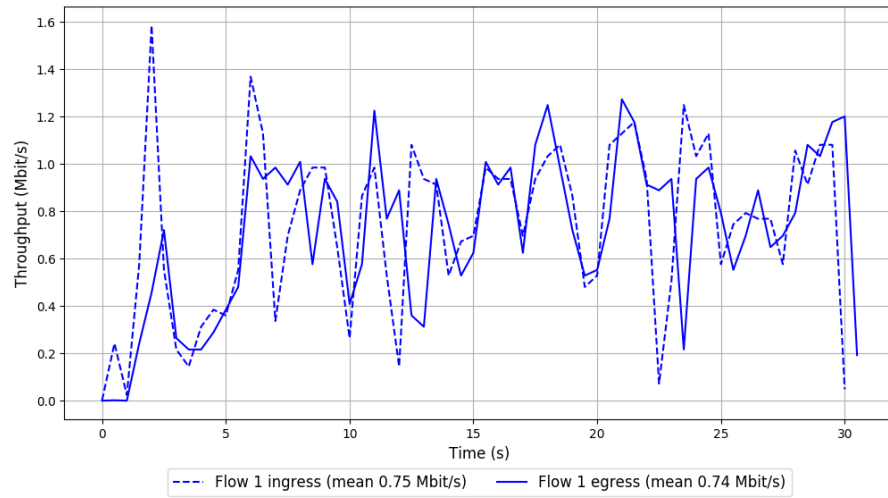


Run 3: Statistics of TCP BBR

Start at: 2019-01-02 19:05:06
End at: 2019-01-02 19:05:36
Local clock offset: 1.343 ms
Remote clock offset: -5.235 ms

Below is generated by plot.py at 2019-01-02 19:16:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 977.575 ms
Loss rate: 0.97%
-- Flow 1:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 977.575 ms
Loss rate: 0.97%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

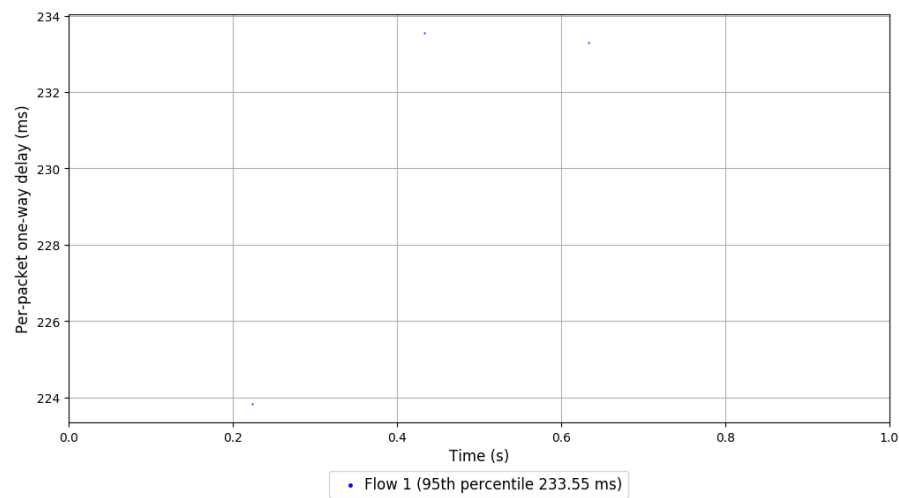
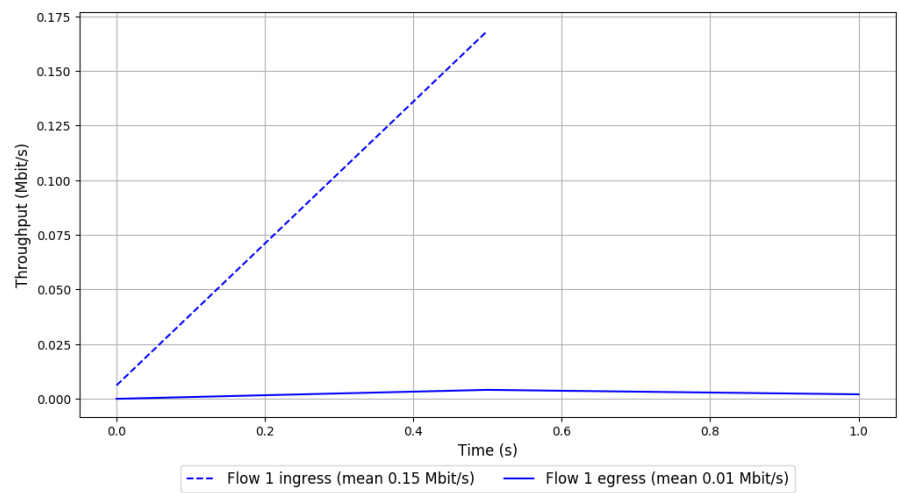
Start at: 2019-01-02 18:15:01

End at: 2019-01-02 18:15:31

Local clock offset: -3.374 ms

Remote clock offset: 25.425 ms

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

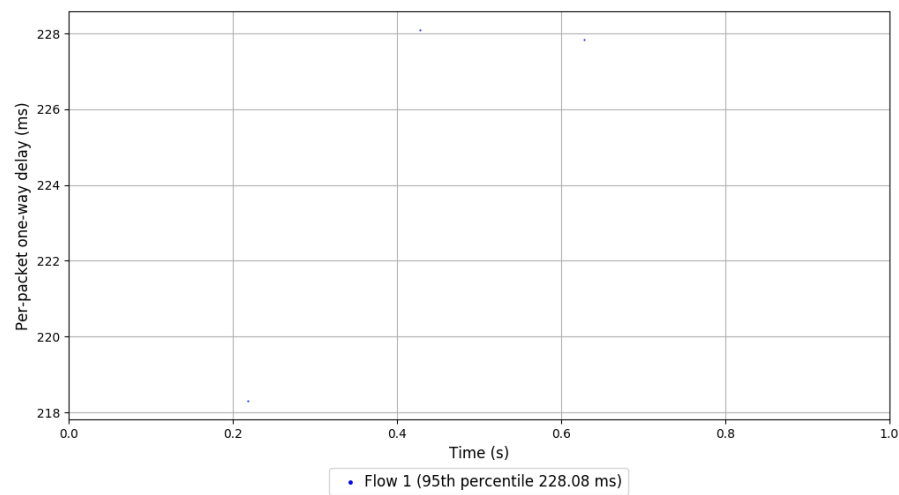
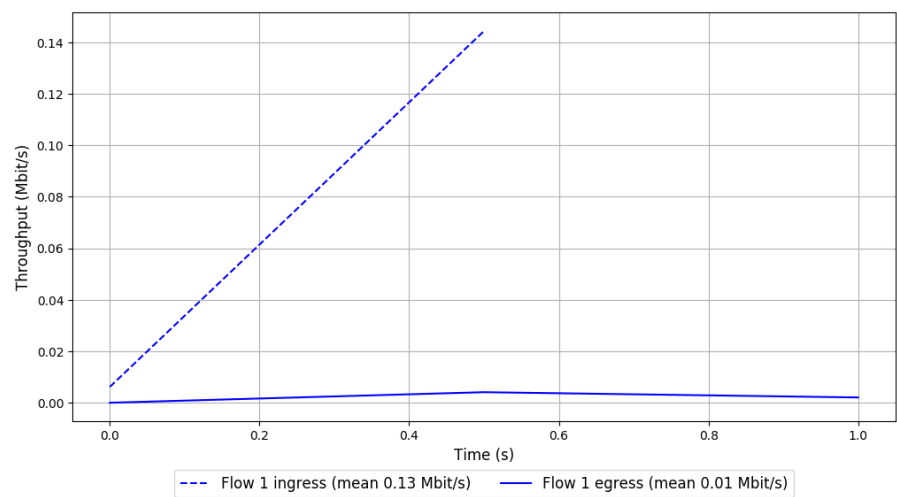
Start at: 2019-01-02 18:36:39

End at: 2019-01-02 18:37:09

Local clock offset: 2.251 ms

Remote clock offset: 15.803 ms

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

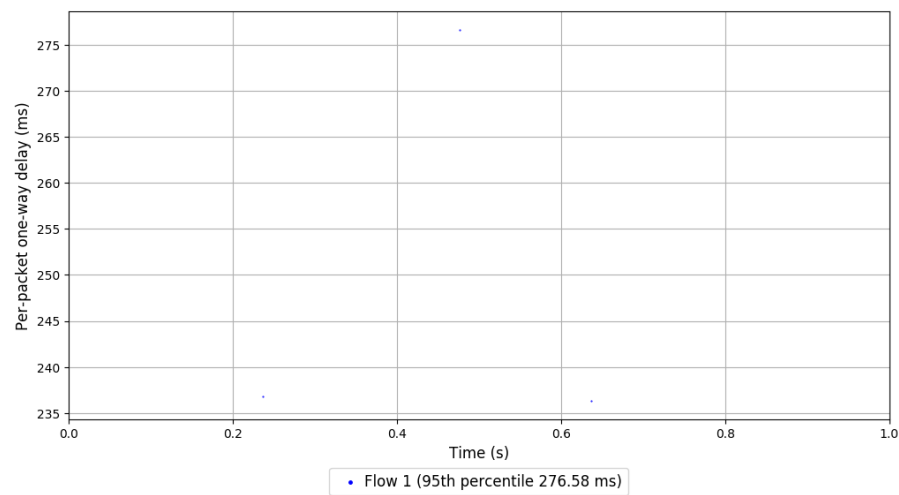
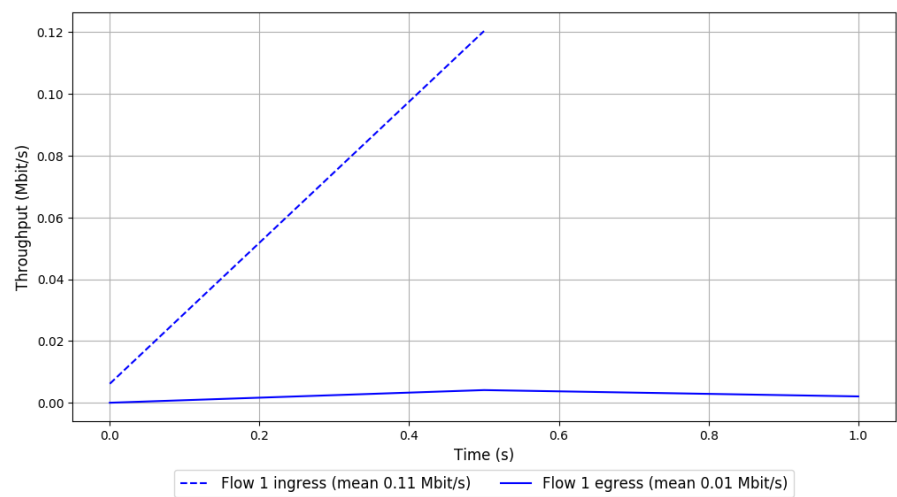
Start at: 2019-01-02 18:58:17

End at: 2019-01-02 18:58:47

Local clock offset: 3.778 ms

Remote clock offset: -3.974 ms

Run 3: Report of Copa — Data Link

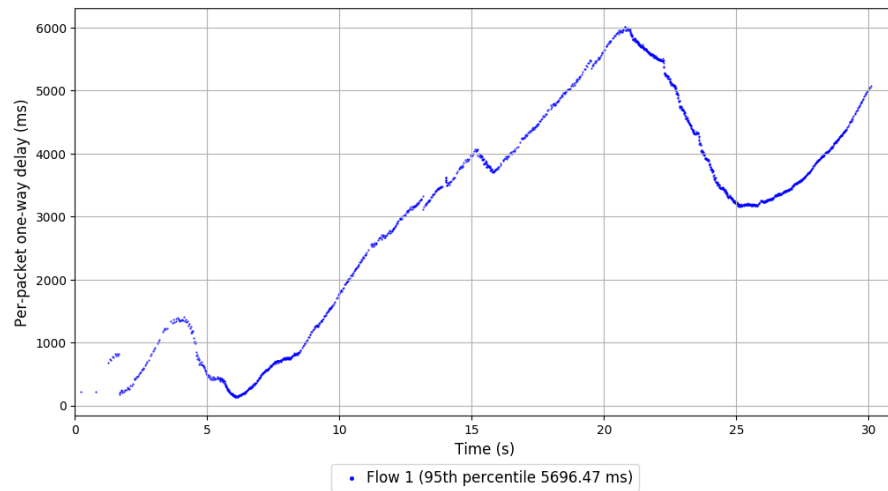
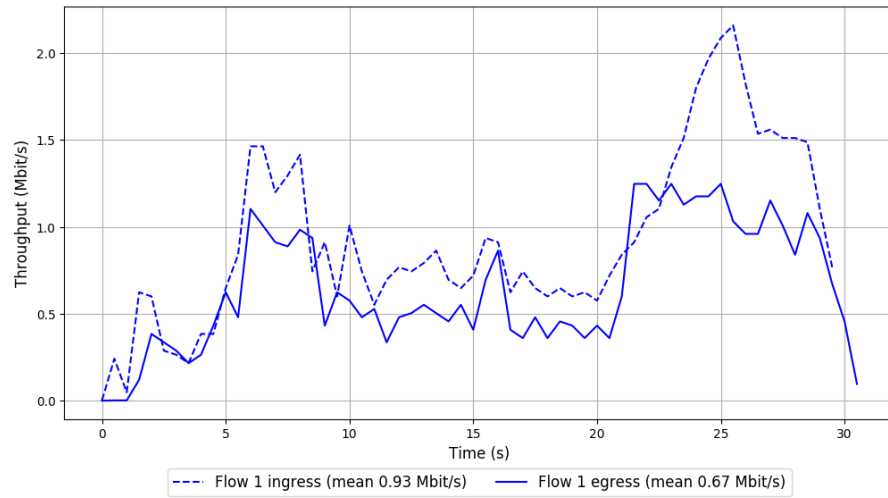


Run 1: Statistics of TCP Cubic

Start at: 2019-01-02 18:11:36
End at: 2019-01-02 18:12:06
Local clock offset: -4.324 ms
Remote clock offset: 28.318 ms

Below is generated by plot.py at 2019-01-02 19:16:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 5696.468 ms
Loss rate: 27.98%
-- Flow 1:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 5696.468 ms
Loss rate: 27.98%

Run 1: Report of TCP Cubic — Data Link

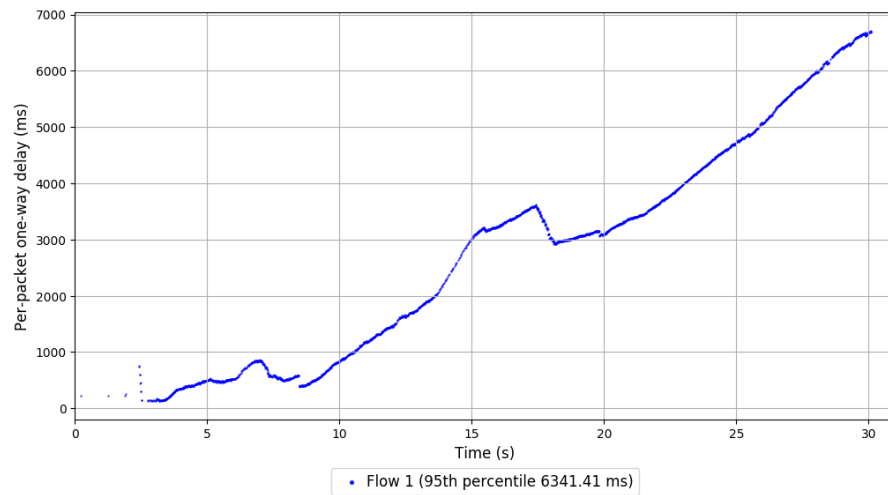
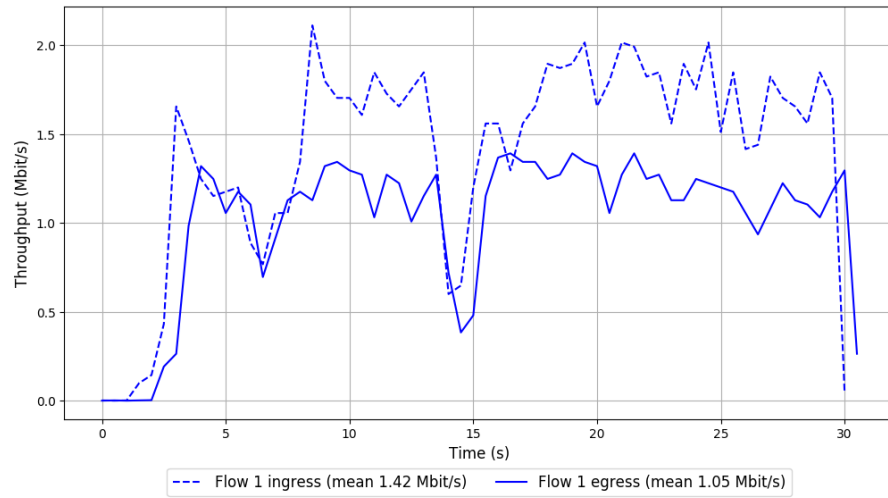


Run 2: Statistics of TCP Cubic

Start at: 2019-01-02 18:33:15
End at: 2019-01-02 18:33:45
Local clock offset: 1.973 ms
Remote clock offset: 24.022 ms

Below is generated by plot.py at 2019-01-02 19:16:08
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 6341.409 ms
Loss rate: 26.33%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 6341.409 ms
Loss rate: 26.33%

Run 2: Report of TCP Cubic — Data Link

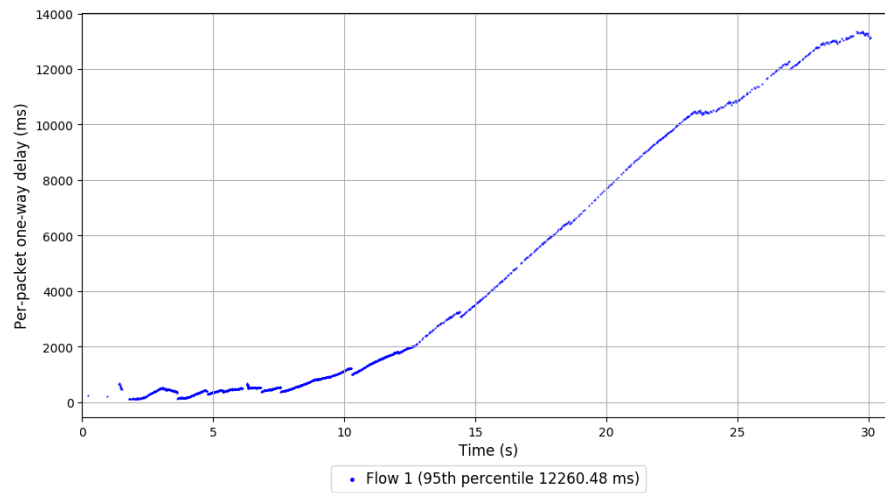
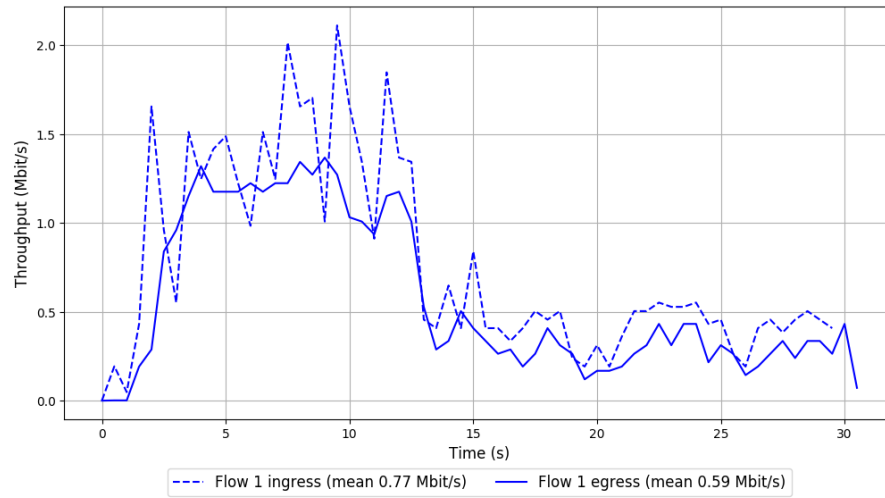


Run 3: Statistics of TCP Cubic

Start at: 2019-01-02 18:54:50
End at: 2019-01-02 18:55:20
Local clock offset: 7.961 ms
Remote clock offset: -5.407 ms

Below is generated by plot.py at 2019-01-02 19:16:08
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 12260.479 ms
Loss rate: 23.37%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 12260.479 ms
Loss rate: 23.37%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-01-02 18:22:58

End at: 2019-01-02 18:23:28

Local clock offset: -1.787 ms

Remote clock offset: 31.81 ms

Below is generated by plot.py at 2019-01-02 19:16:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.67 Mbit/s

95th percentile per-packet one-way delay: 9313.406 ms

Loss rate: 29.40%

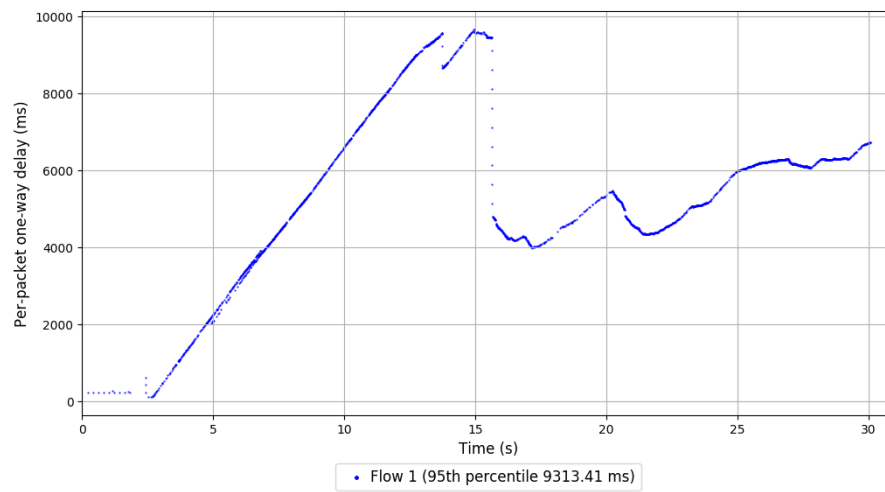
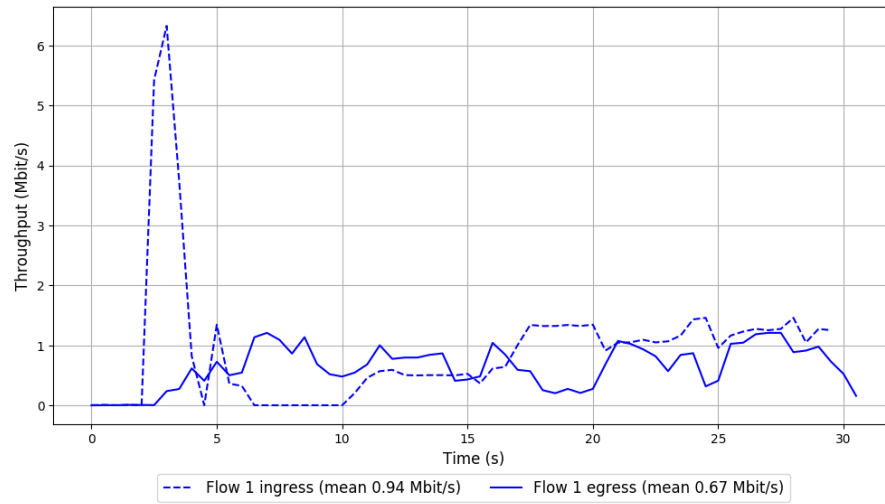
-- Flow 1:

Average throughput: 0.67 Mbit/s

95th percentile per-packet one-way delay: 9313.406 ms

Loss rate: 29.40%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-01-02 18:44:36

End at: 2019-01-02 18:45:06

Local clock offset: 5.374 ms

Remote clock offset: 3.838 ms

Below is generated by plot.py at 2019-01-02 19:16:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.75 Mbit/s

95th percentile per-packet one-way delay: 6637.766 ms

Loss rate: 20.28%

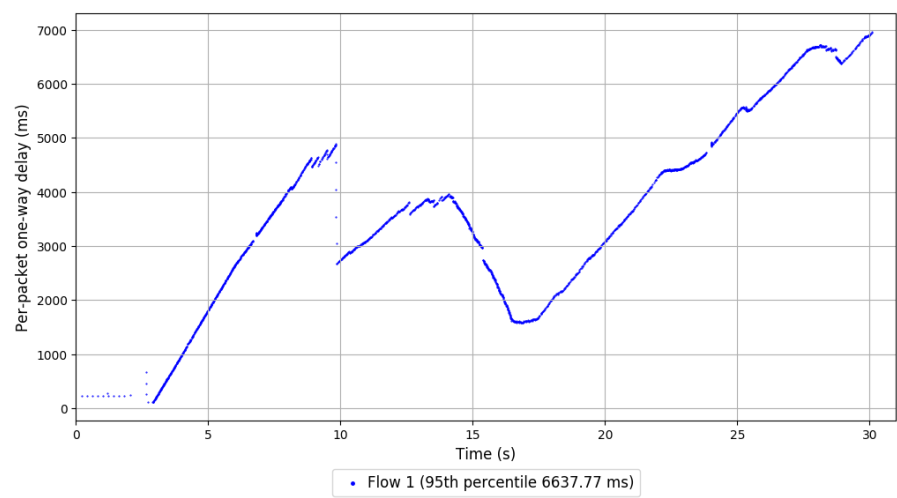
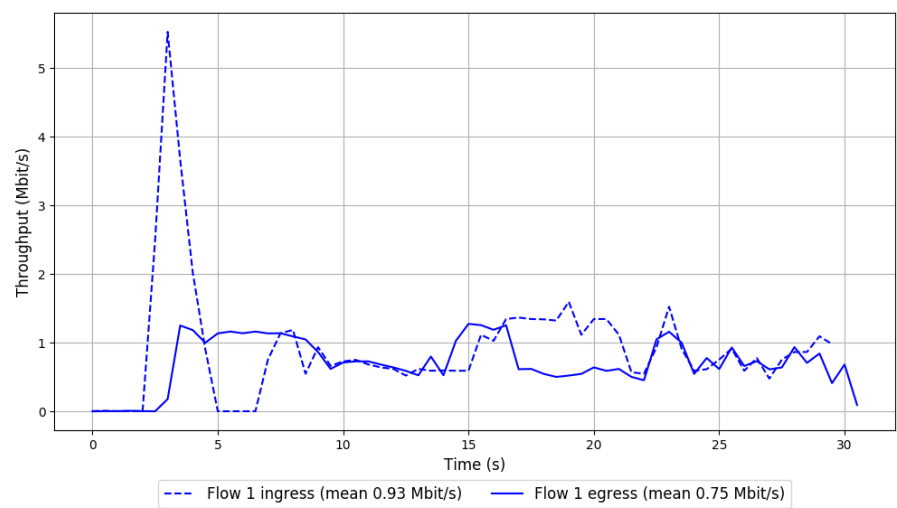
-- Flow 1:

Average throughput: 0.75 Mbit/s

95th percentile per-packet one-way delay: 6637.766 ms

Loss rate: 20.28%

Run 2: Report of FillP — Data Link

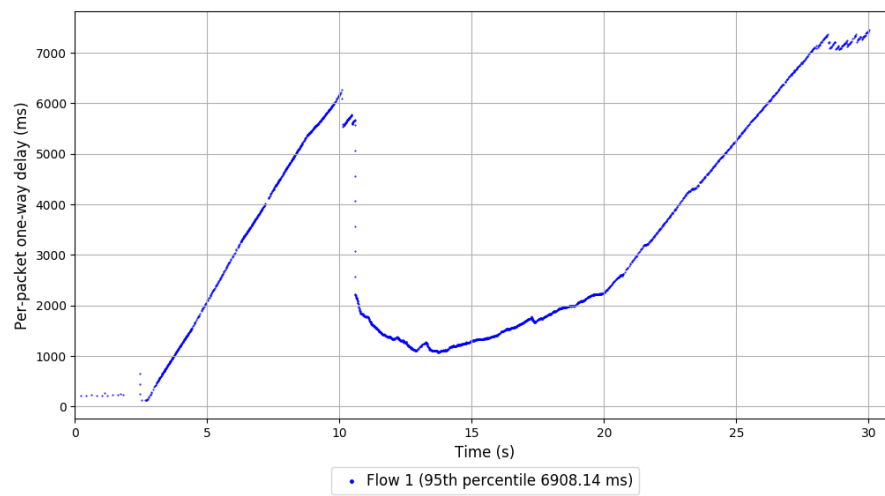
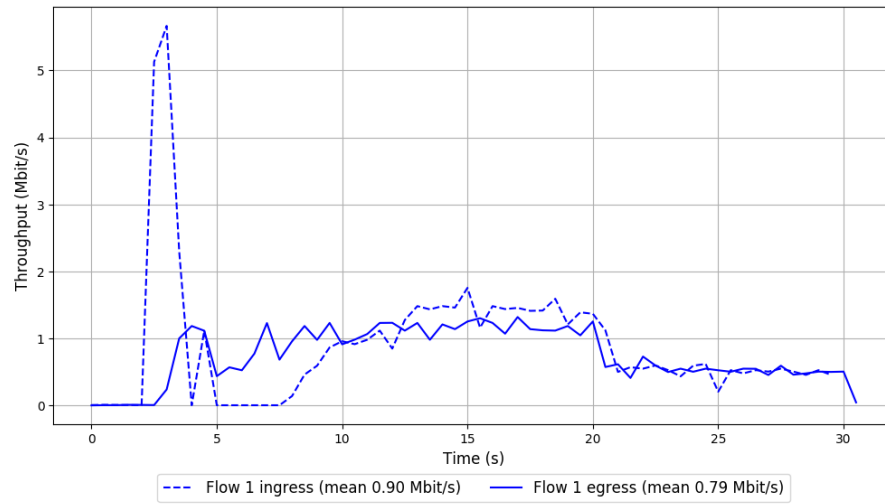


Run 3: Statistics of FillP

Start at: 2019-01-02 19:06:14
End at: 2019-01-02 19:06:44
Local clock offset: 0.261 ms
Remote clock offset: -5.873 ms

Below is generated by plot.py at 2019-01-02 19:16:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 6908.140 ms
Loss rate: 13.37%
-- Flow 1:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 6908.140 ms
Loss rate: 13.37%

Run 3: Report of FillP — Data Link

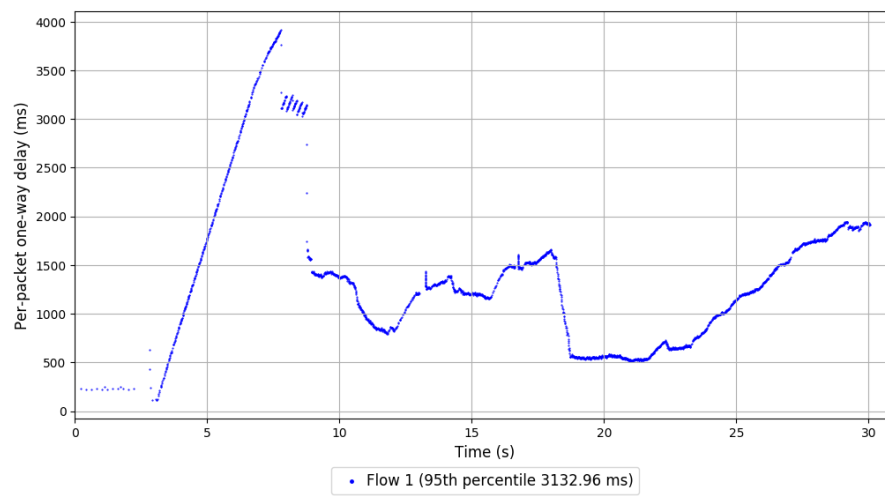
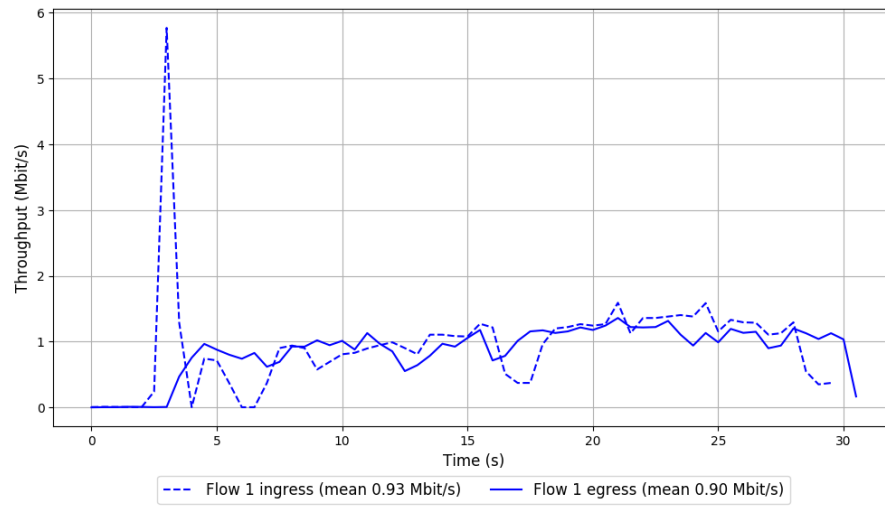


Run 1: Statistics of FillP-Sheep

Start at: 2019-01-02 18:24:07
End at: 2019-01-02 18:24:37
Local clock offset: -0.796 ms
Remote clock offset: 32.291 ms

Below is generated by plot.py at 2019-01-02 19:16:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 3132.962 ms
Loss rate: 3.99%
-- Flow 1:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 3132.962 ms
Loss rate: 3.99%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-01-02 18:45:44

End at: 2019-01-02 18:46:14

Local clock offset: 5.666 ms

Remote clock offset: 3.932 ms

Below is generated by plot.py at 2019-01-02 19:16:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.93 Mbit/s

95th percentile per-packet one-way delay: 2923.027 ms

Loss rate: 3.46%

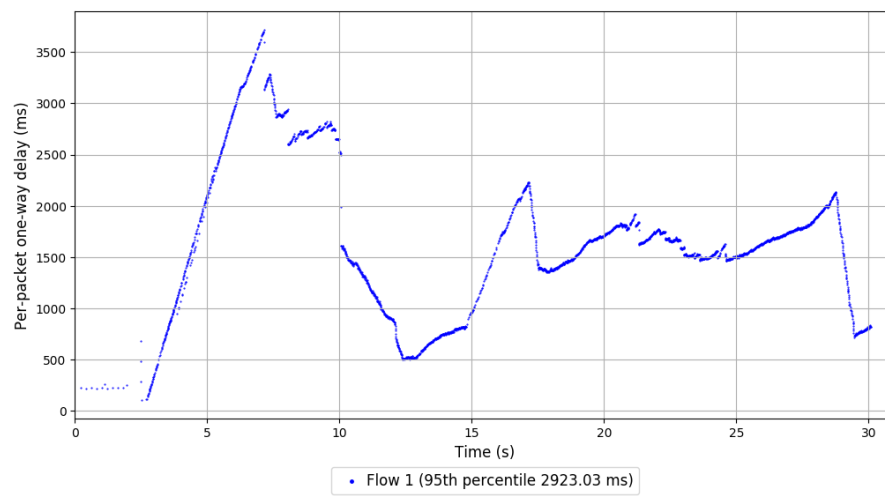
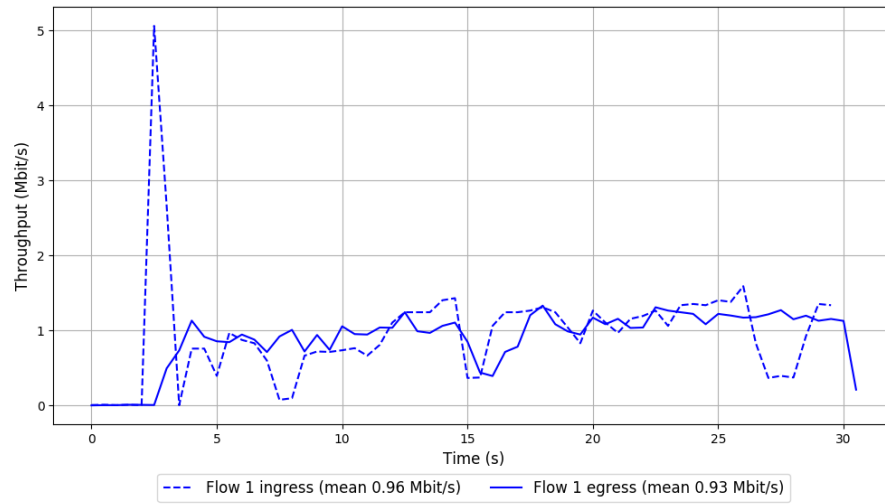
-- Flow 1:

Average throughput: 0.93 Mbit/s

95th percentile per-packet one-way delay: 2923.027 ms

Loss rate: 3.46%

Run 2: Report of FillP-Sheep — Data Link

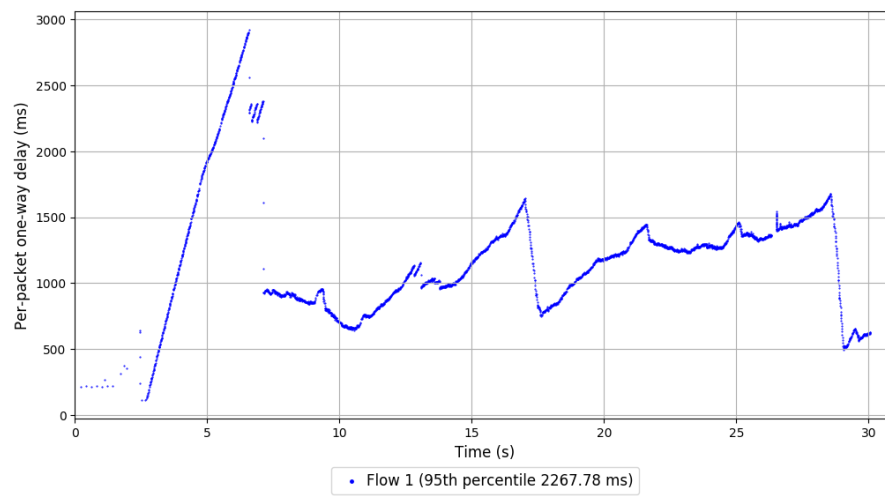
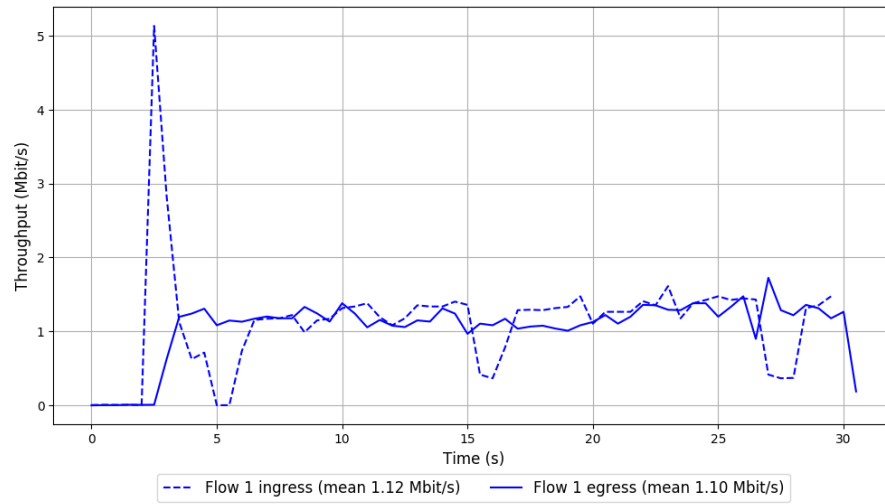


Run 3: Statistics of FillP-Sheep

Start at: 2019-01-02 19:07:23
End at: 2019-01-02 19:07:53
Local clock offset: 0.658 ms
Remote clock offset: -6.021 ms

Below is generated by plot.py at 2019-01-02 19:16:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 2267.785 ms
Loss rate: 2.38%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 2267.785 ms
Loss rate: 2.38%

Run 3: Report of FillP-Sheep — Data Link

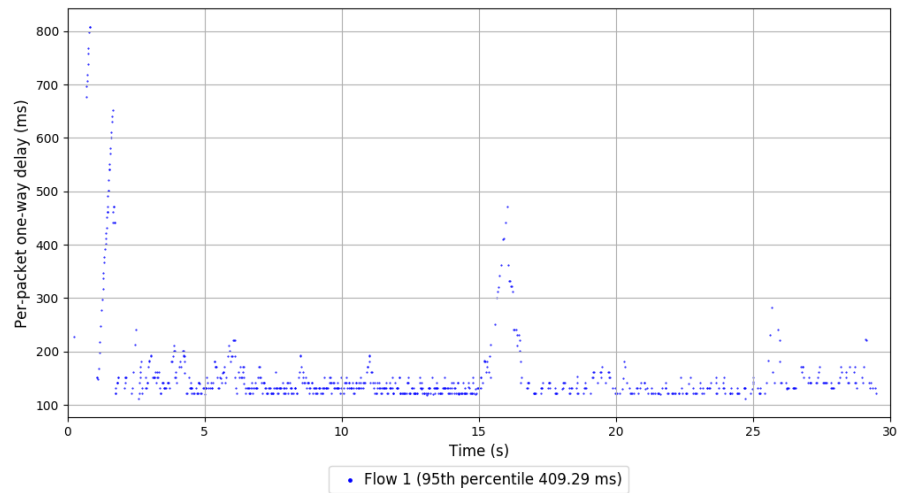
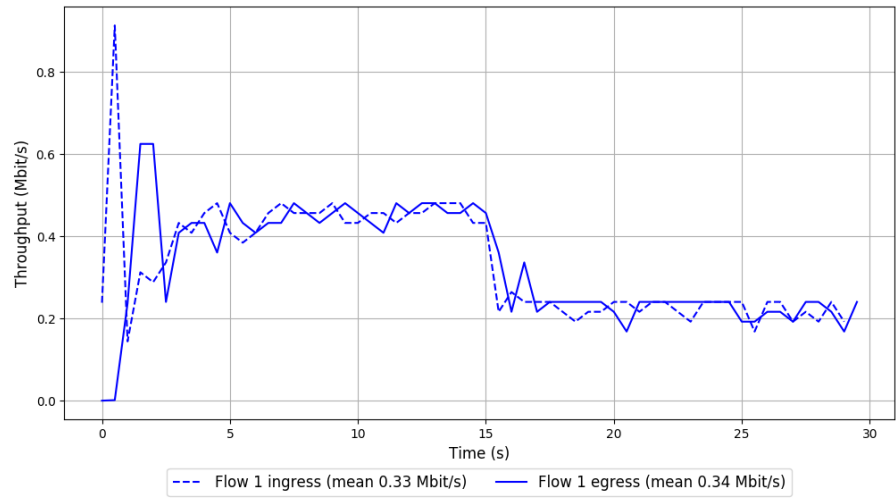


Run 1: Statistics of Indigo

Start at: 2019-01-02 18:17:17
End at: 2019-01-02 18:17:47
Local clock offset: -3.46 ms
Remote clock offset: 26.265 ms

Below is generated by plot.py at 2019-01-02 19:16:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 409.292 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 0.34 Mbit/s
95th percentile per-packet one-way delay: 409.292 ms
Loss rate: 0.24%

Run 1: Report of Indigo — Data Link

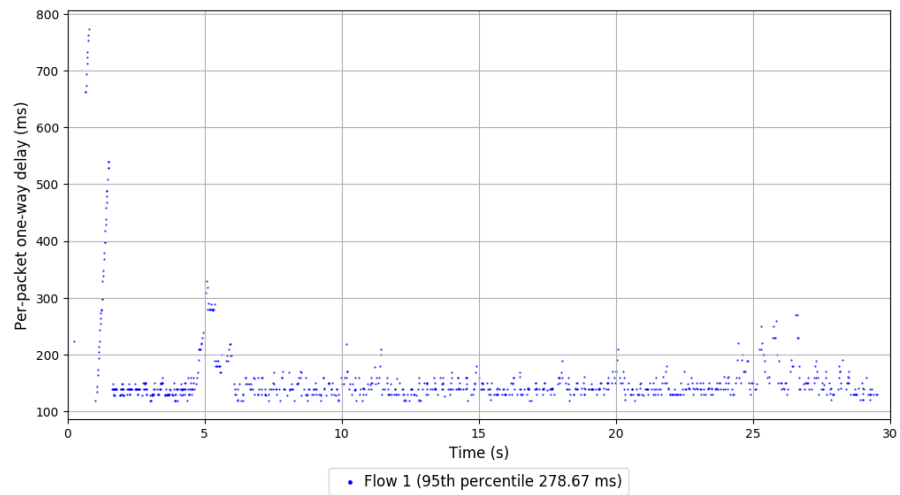
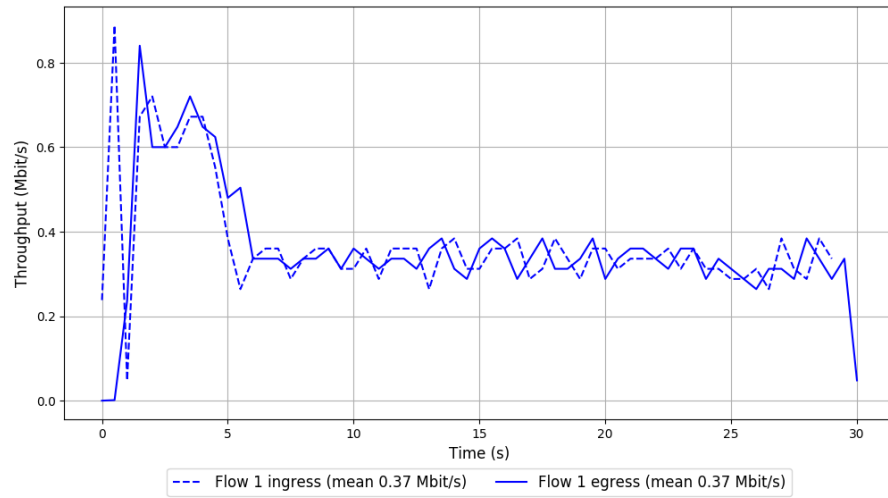


Run 2: Statistics of Indigo

Start at: 2019-01-02 18:38:55
End at: 2019-01-02 18:39:25
Local clock offset: 3.661 ms
Remote clock offset: 12.141 ms

Below is generated by plot.py at 2019-01-02 19:16:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 278.669 ms
Loss rate: 0.44%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 278.669 ms
Loss rate: 0.44%

Run 2: Report of Indigo — Data Link

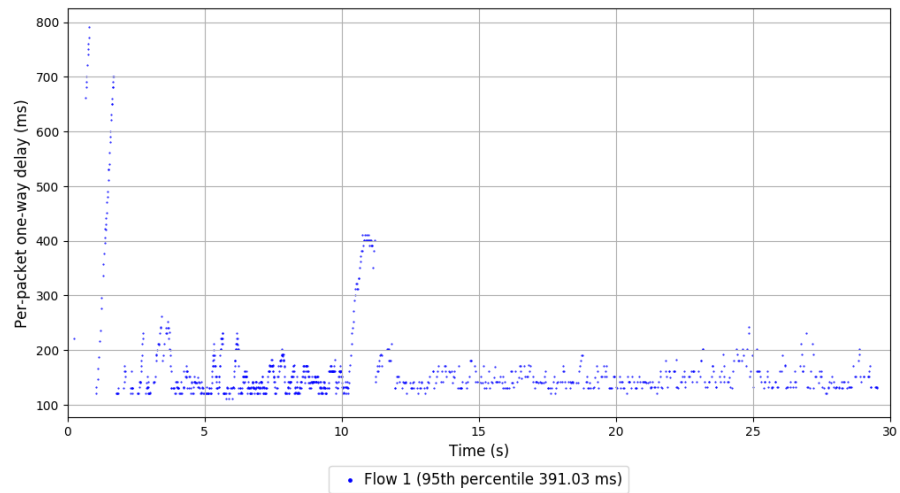
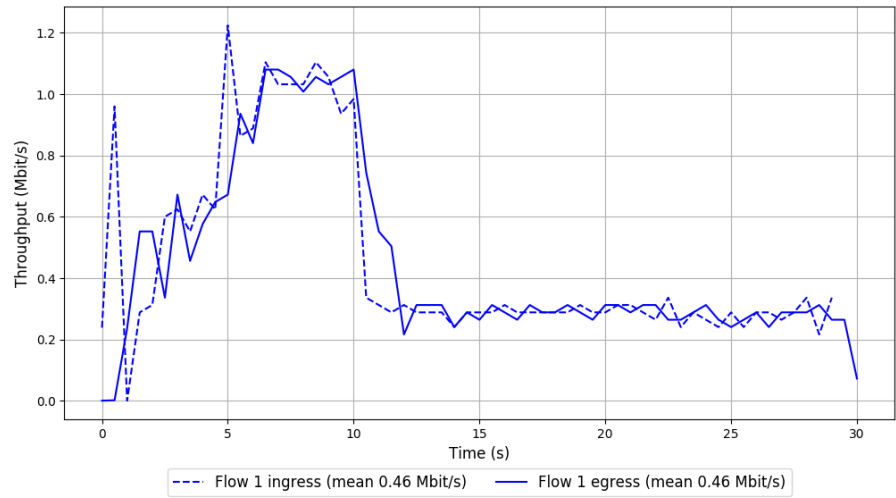


Run 3: Statistics of Indigo

Start at: 2019-01-02 19:00:33
End at: 2019-01-02 19:01:03
Local clock offset: 3.225 ms
Remote clock offset: -3.929 ms

Below is generated by plot.py at 2019-01-02 19:16:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 391.026 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 391.026 ms
Loss rate: 0.18%

Run 3: Report of Indigo — Data Link

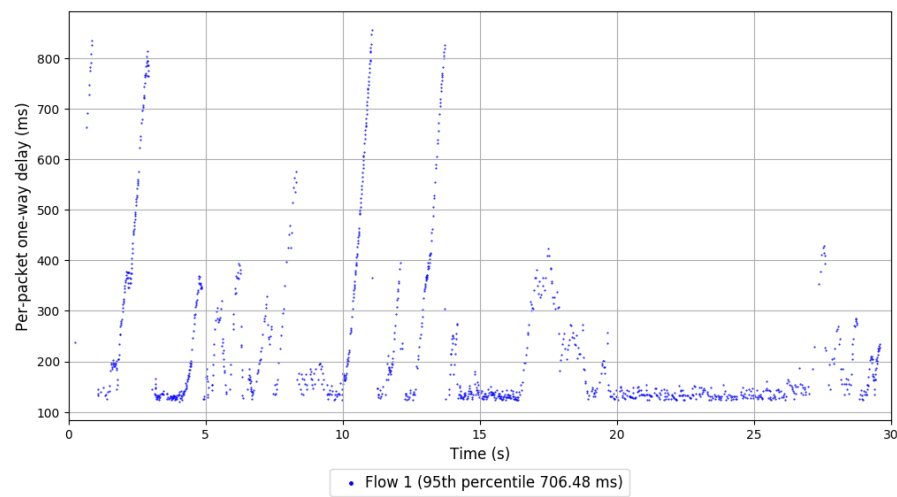
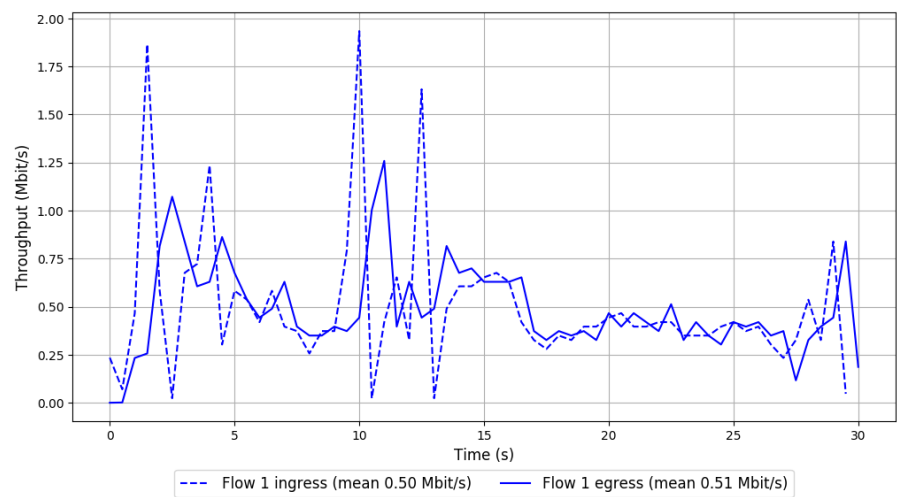



```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-02 18:25:15
End at: 2019-01-02 18:25:45
Local clock offset: -1.135 ms
Remote clock offset: 32.542 ms

# Below is generated by plot.py at 2019-01-02 19:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 706.484 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 706.484 ms
Loss rate: 0.16%
```

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-02 18:46:53

End at: 2019-01-02 18:47:23

Local clock offset: 5.92 ms

Remote clock offset: 2.616 ms

Below is generated by plot.py at 2019-01-02 19:16:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 513.137 ms

Loss rate: 0.13%

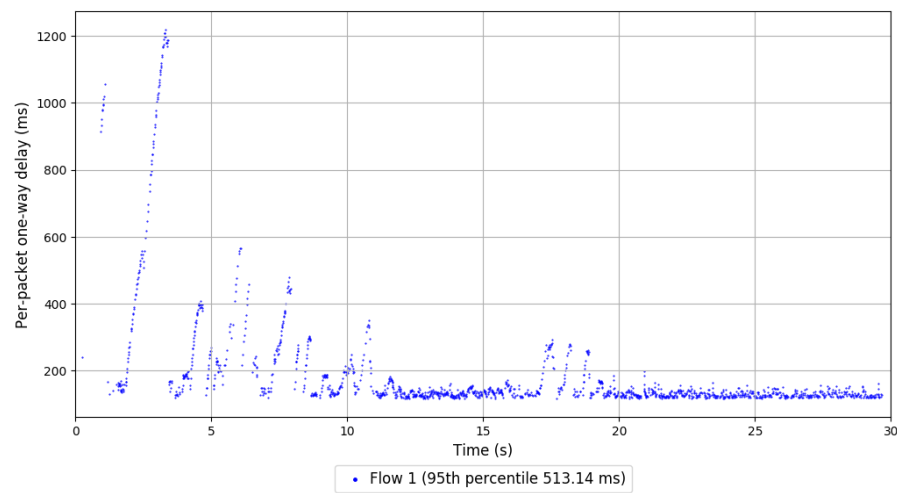
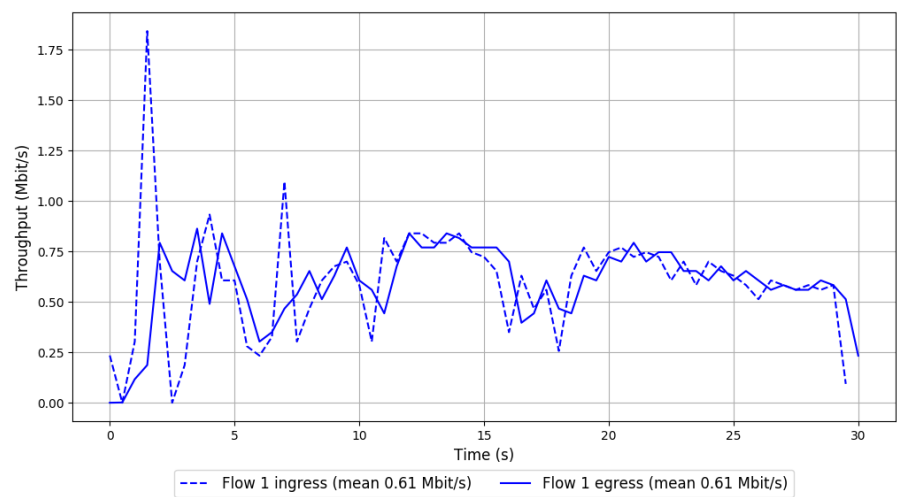
-- Flow 1:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 513.137 ms

Loss rate: 0.13%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-02 19:08:31

End at: 2019-01-02 19:09:01

Local clock offset: 0.529 ms

Remote clock offset: -5.99 ms

Below is generated by plot.py at 2019-01-02 19:16:15

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 1041.470 ms

Loss rate: 0.13%

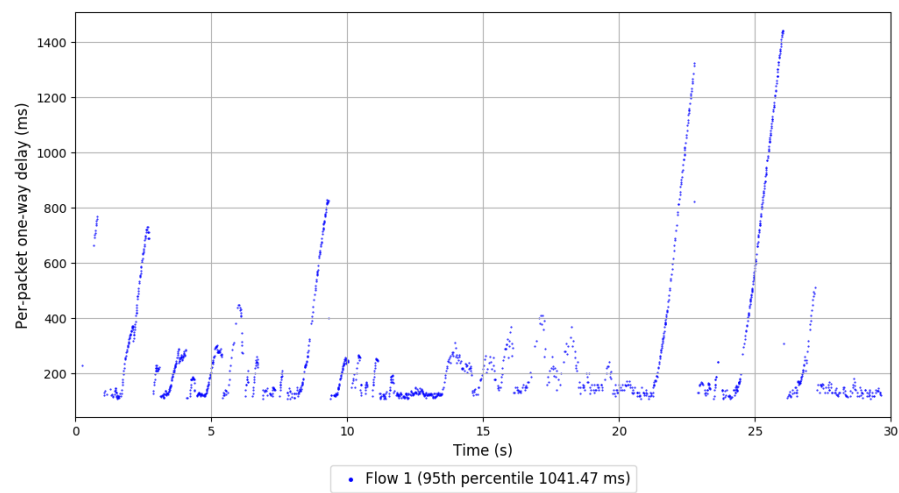
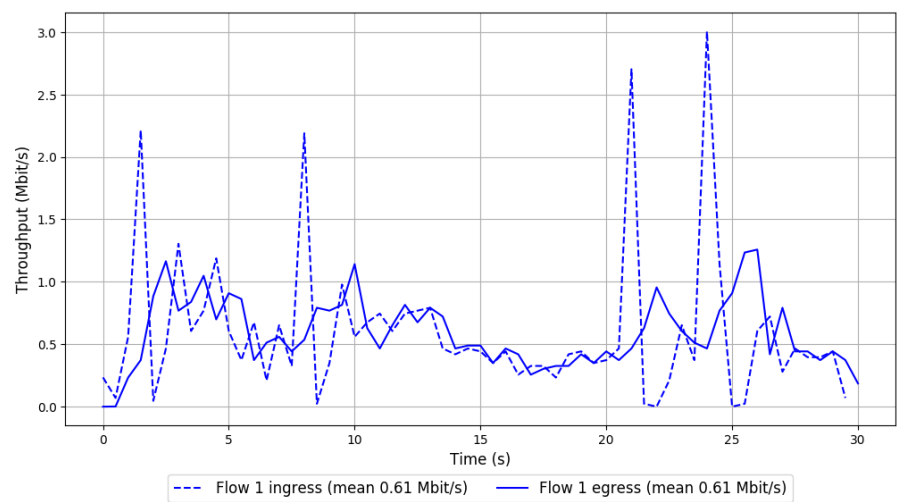
-- Flow 1:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 1041.470 ms

Loss rate: 0.13%

Run 3: Report of Indigo-MusesD — Data Link

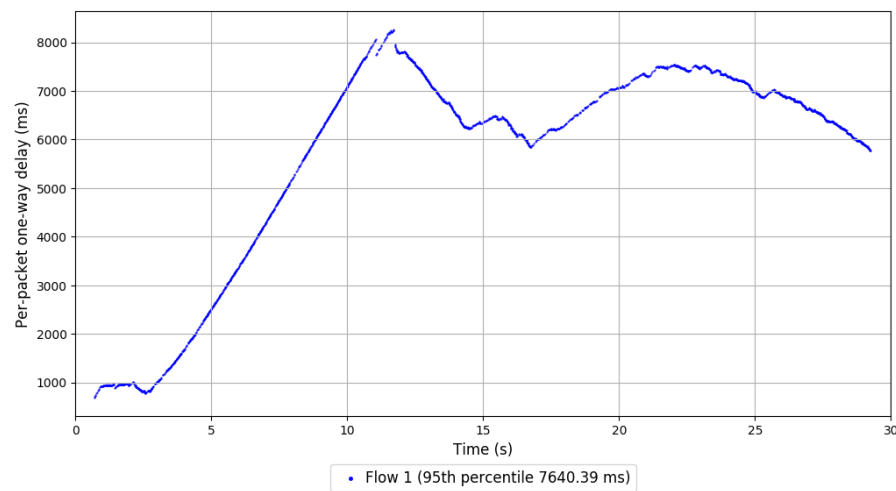
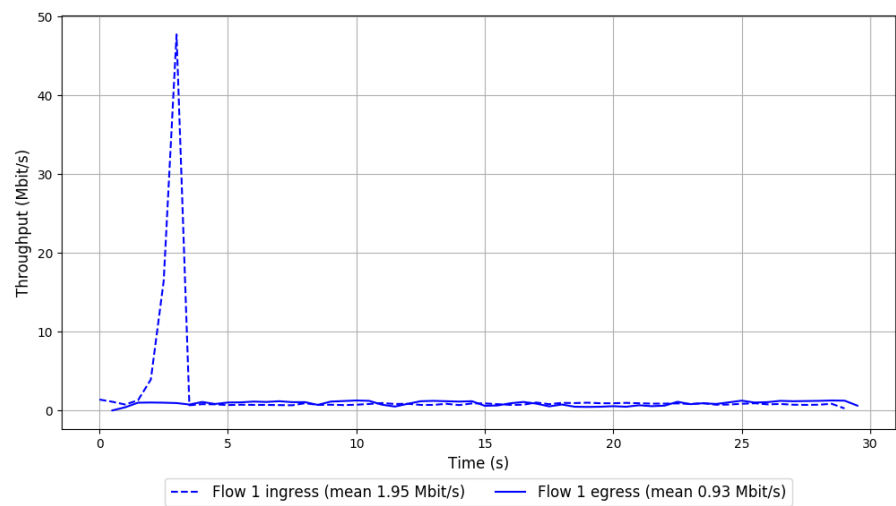


```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-02 18:26:23
End at: 2019-01-02 18:26:53
Local clock offset: -0.805 ms
Remote clock offset: 33.163 ms

# Below is generated by plot.py at 2019-01-02 19:16:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 7640.386 ms
Loss rate: 53.26%
-- Flow 1:
Average throughput: 0.93 Mbit/s
95th percentile per-packet one-way delay: 7640.386 ms
Loss rate: 53.26%
```

Run 1: Report of Indigo-MusesT — Data Link

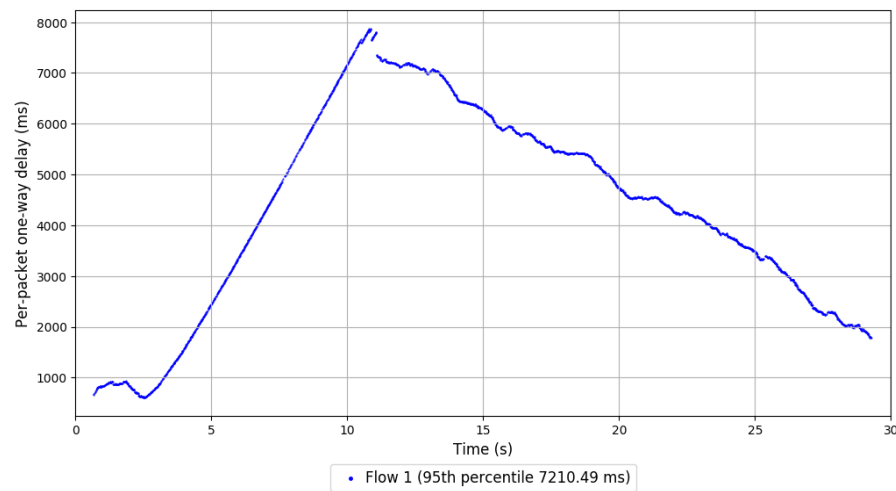
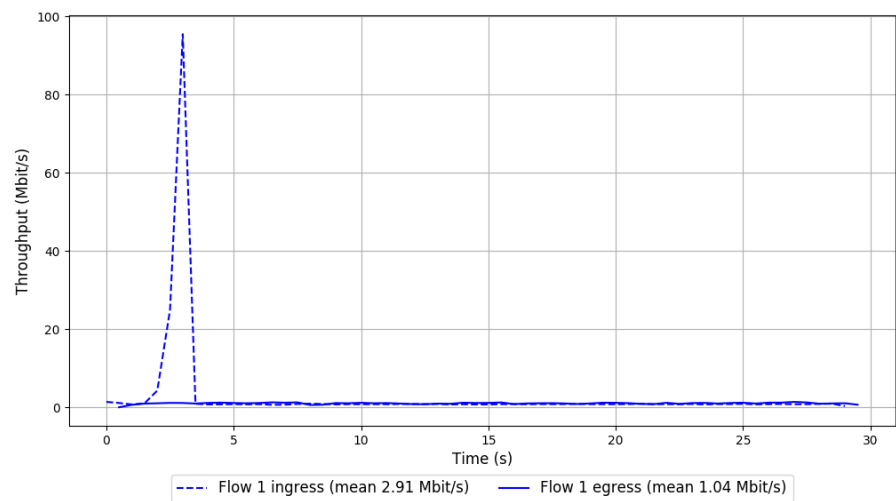


Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-02 18:48:01
End at: 2019-01-02 18:48:31
Local clock offset: 5.543 ms
Remote clock offset: -2.792 ms

Below is generated by plot.py at 2019-01-02 19:16:17
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 7210.491 ms
Loss rate: 65.12%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 7210.491 ms
Loss rate: 65.12%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-02 19:09:45

End at: 2019-01-02 19:10:15

Local clock offset: 0.342 ms

Remote clock offset: -6.513 ms

Below is generated by plot.py at 2019-01-02 19:16:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 5830.655 ms

Loss rate: 68.41%

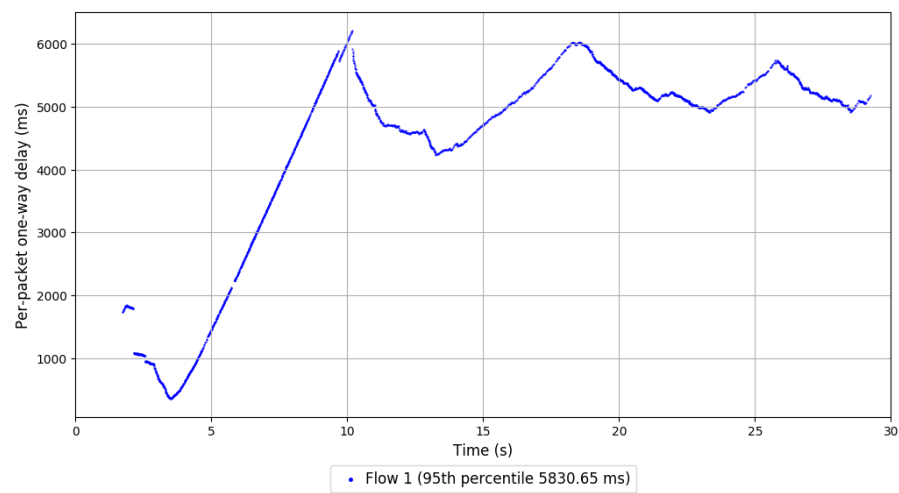
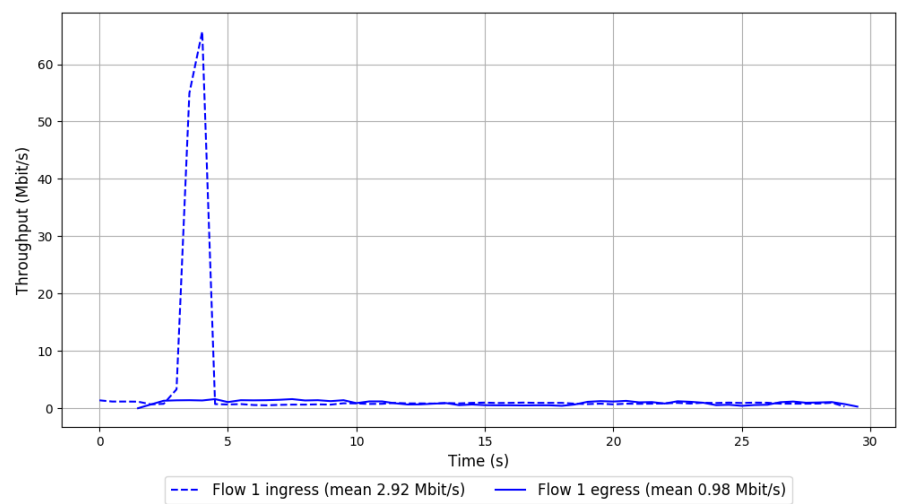
-- Flow 1:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 5830.655 ms

Loss rate: 68.41%

Run 3: Report of Indigo-MusesT — Data Link

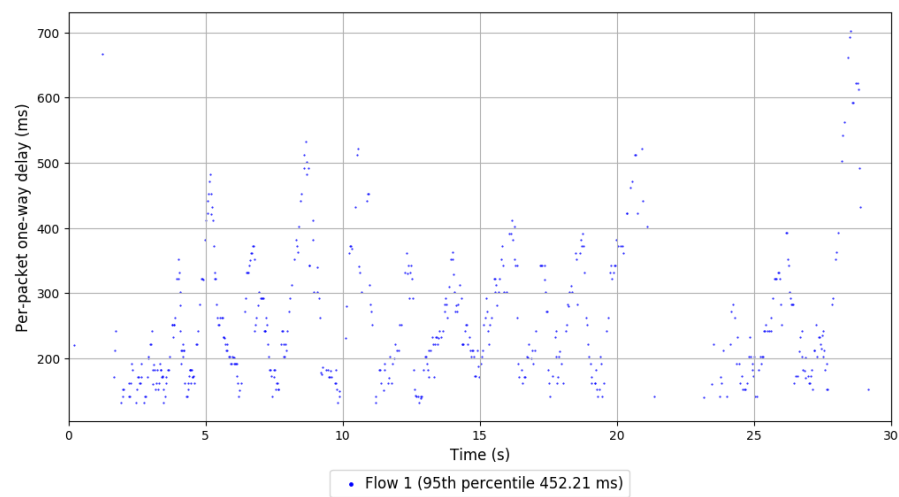
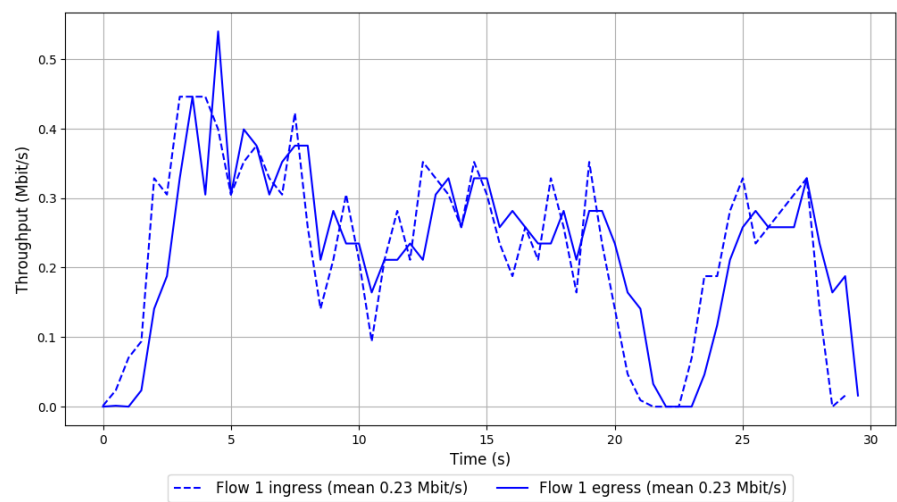


```
Run 1: Statistics of LEDBAT

Start at: 2019-01-02 18:16:09
End at: 2019-01-02 18:16:39
Local clock offset: -3.064 ms
Remote clock offset: 29.79 ms

# Below is generated by plot.py at 2019-01-02 19:16:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 452.206 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 452.206 ms
Loss rate: 0.00%
```

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2019-01-02 18:37:47

End at: 2019-01-02 18:38:17

Local clock offset: 2.493 ms

Remote clock offset: 13.57 ms

Below is generated by plot.py at 2019-01-02 19:16:18

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 426.169 ms

Loss rate: 0.13%

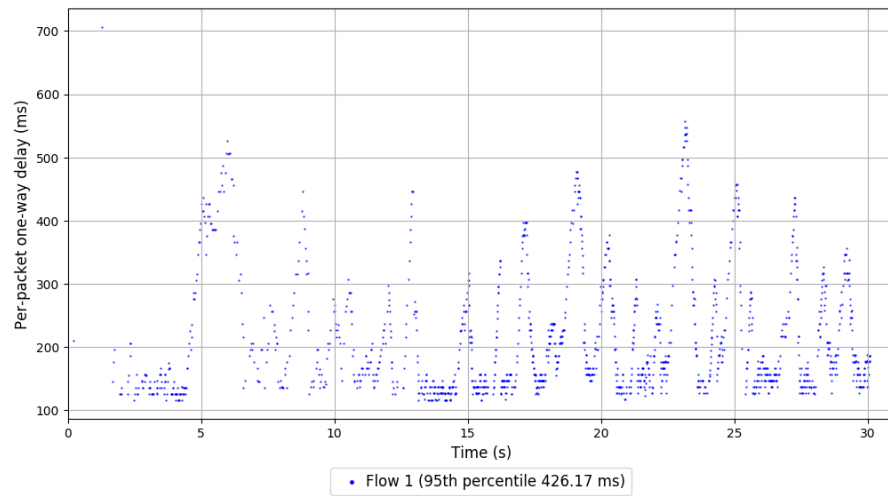
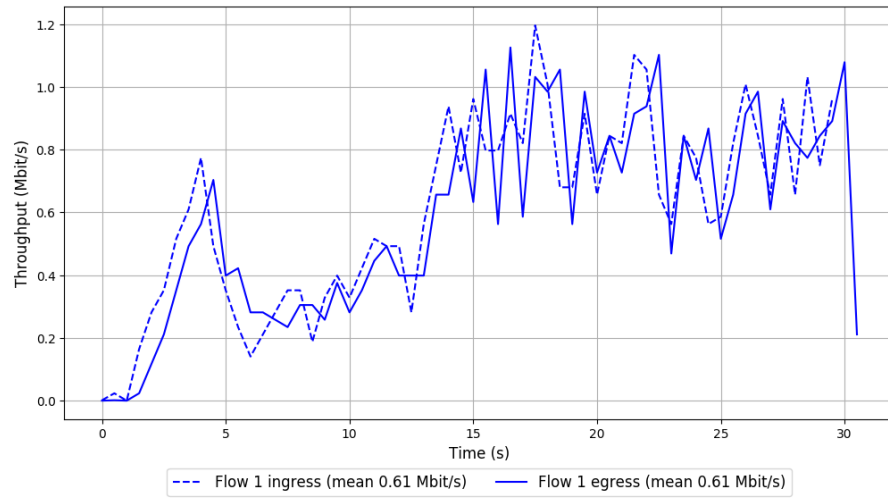
-- Flow 1:

Average throughput: 0.61 Mbit/s

95th percentile per-packet one-way delay: 426.169 ms

Loss rate: 0.13%

Run 2: Report of LEDBAT — Data Link

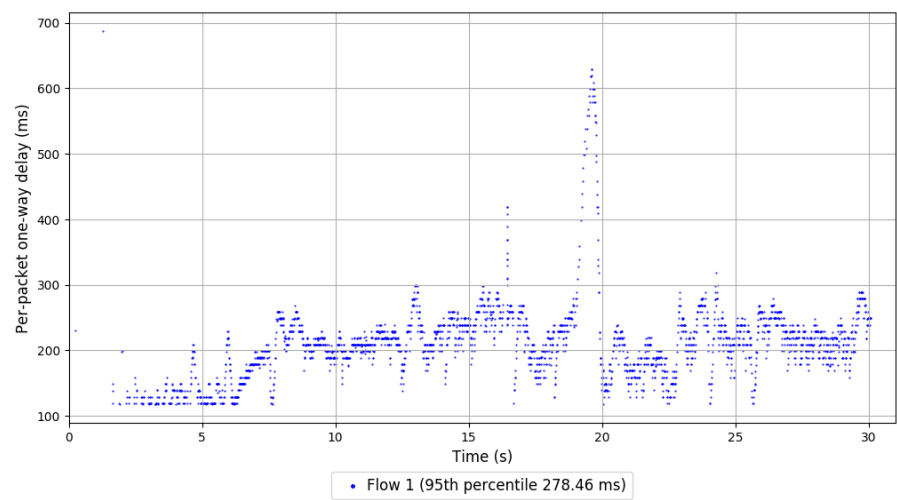
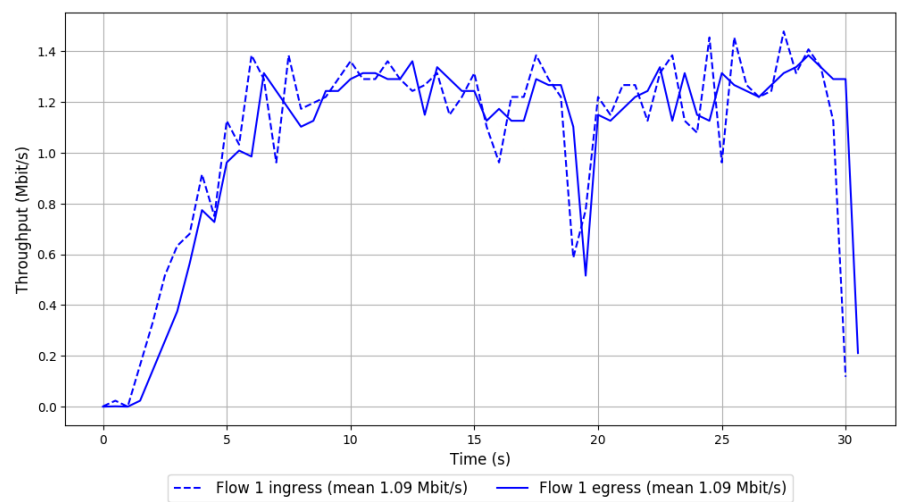


Run 3: Statistics of LEDBAT

Start at: 2019-01-02 18:59:24
End at: 2019-01-02 18:59:54
Local clock offset: 3.052 ms
Remote clock offset: -3.152 ms

Below is generated by plot.py at 2019-01-02 19:16:18
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 278.464 ms
Loss rate: 0.65%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 278.464 ms
Loss rate: 0.65%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-02 18:32:06

End at: 2019-01-02 18:32:36

Local clock offset: 1.634 ms

Remote clock offset: 28.054 ms

Below is generated by plot.py at 2019-01-02 19:16:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.96 Mbit/s

95th percentile per-packet one-way delay: 8728.363 ms

Loss rate: 96.29%

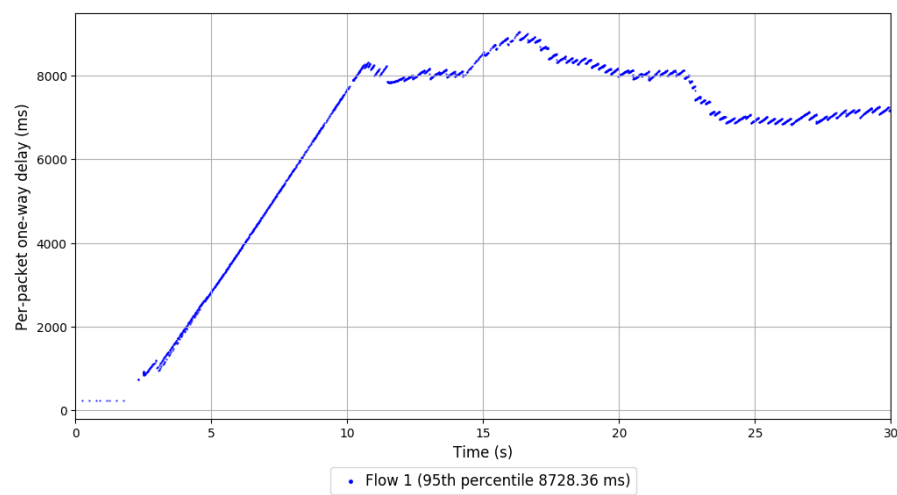
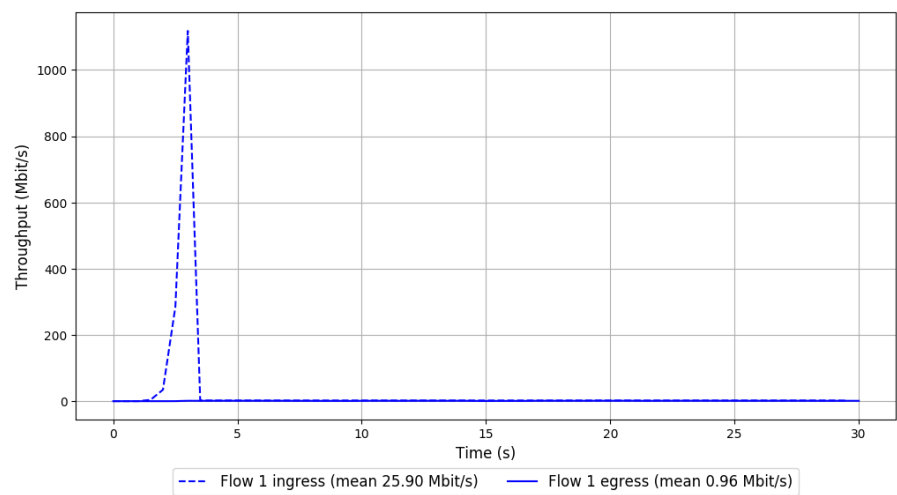
-- Flow 1:

Average throughput: 0.96 Mbit/s

95th percentile per-packet one-way delay: 8728.363 ms

Loss rate: 96.29%

Run 1: Report of PCC-Allegro — Data Link

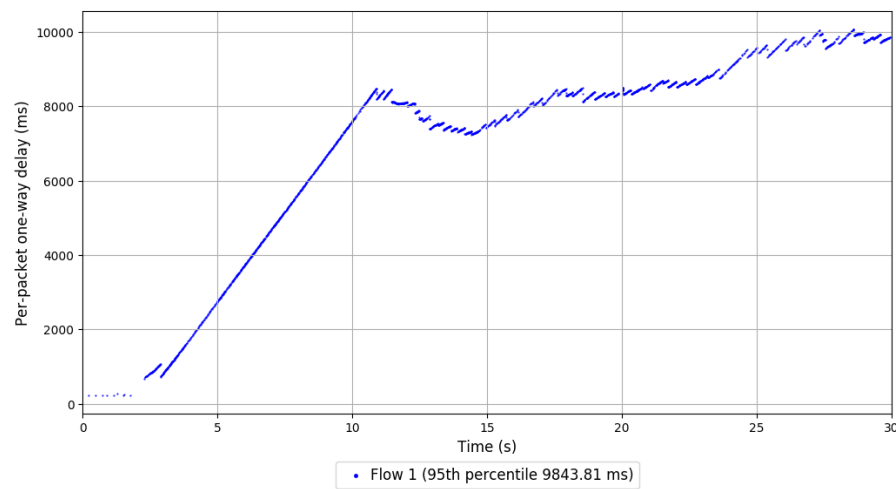
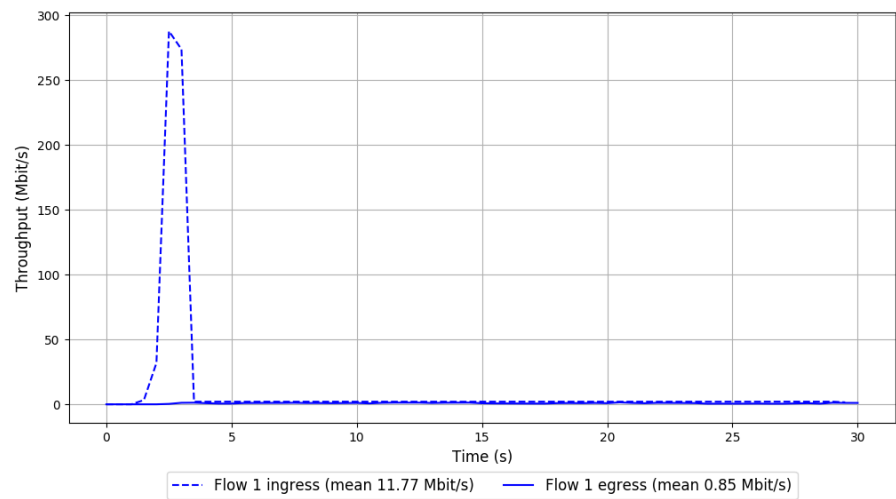


Run 2: Statistics of PCC-Allegro

Start at: 2019-01-02 18:53:41
End at: 2019-01-02 18:54:11
Local clock offset: 8.064 ms
Remote clock offset: -6.033 ms

Below is generated by plot.py at 2019-01-02 19:16:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 9843.812 ms
Loss rate: 92.80%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 9843.812 ms
Loss rate: 92.80%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-02 19:15:26

End at: 2019-01-02 19:15:56

Local clock offset: -0.854 ms

Remote clock offset: -8.042 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 7916.077 ms

Loss rate: 96.90%

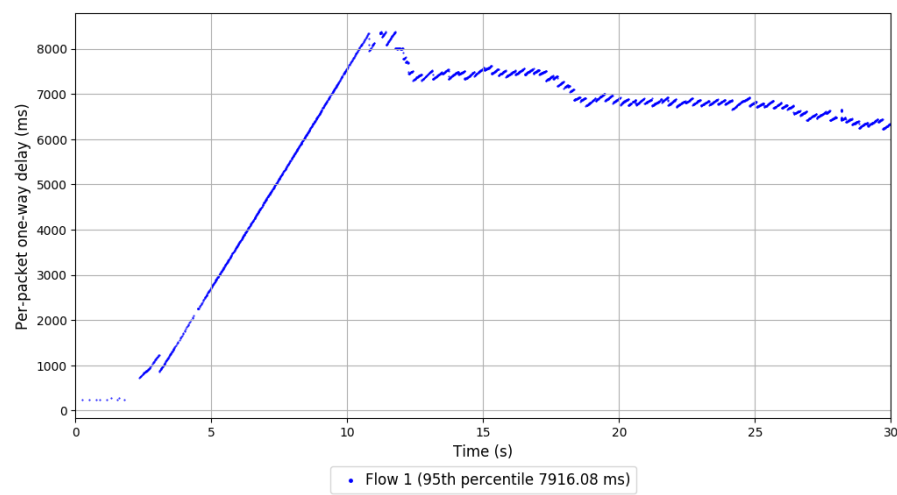
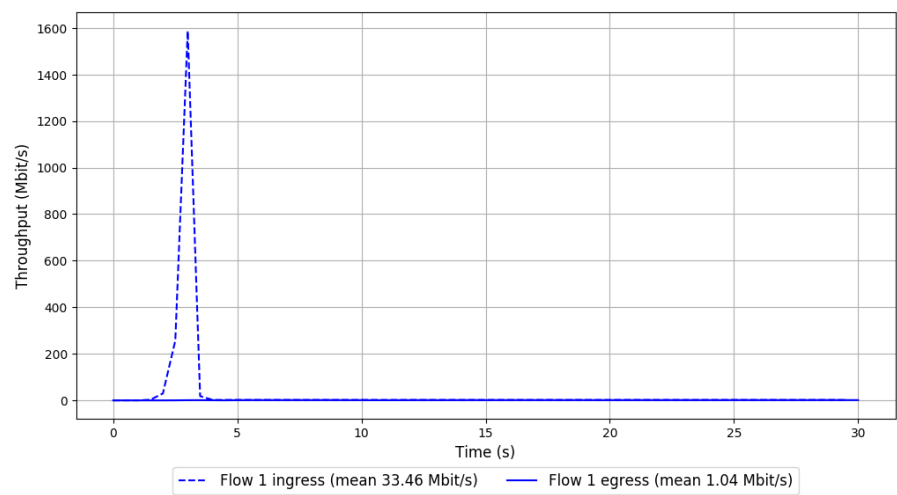
-- Flow 1:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 7916.077 ms

Loss rate: 96.90%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

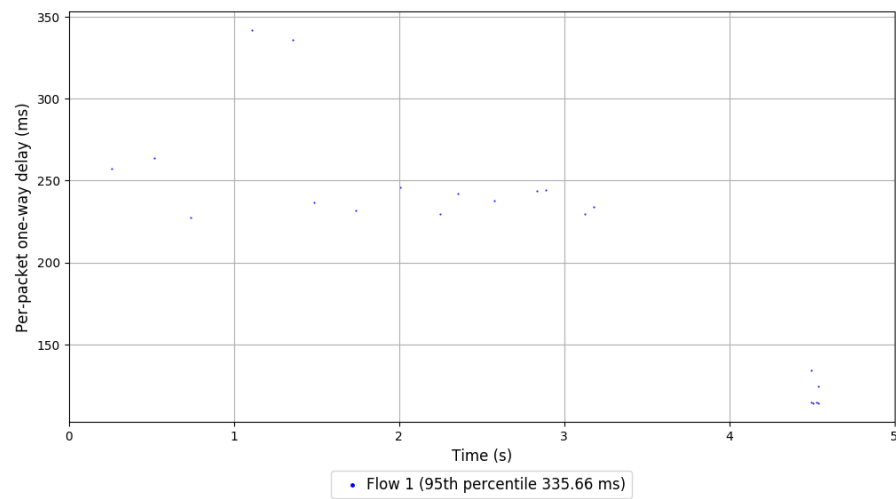
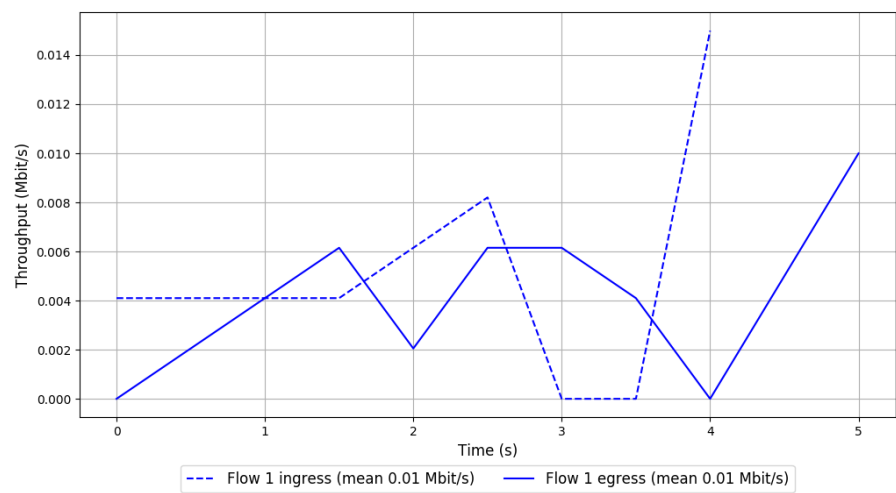
Start at: 2019-01-02 18:19:33

End at: 2019-01-02 18:20:03

Local clock offset: -2.881 ms

Remote clock offset: 26.977 ms

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2019-01-02 18:41:11

End at: 2019-01-02 18:41:41

Local clock offset: 3.558 ms

Remote clock offset: 8.568 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 7431.680 ms

Loss rate: 84.99%

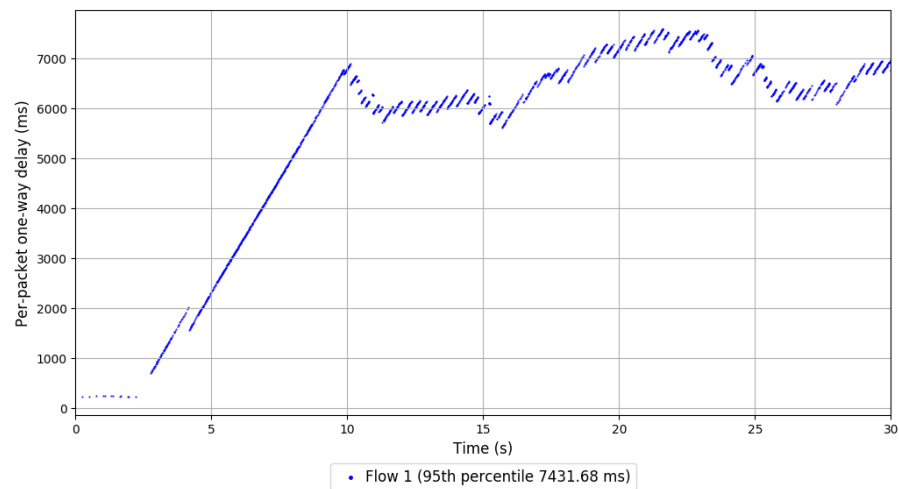
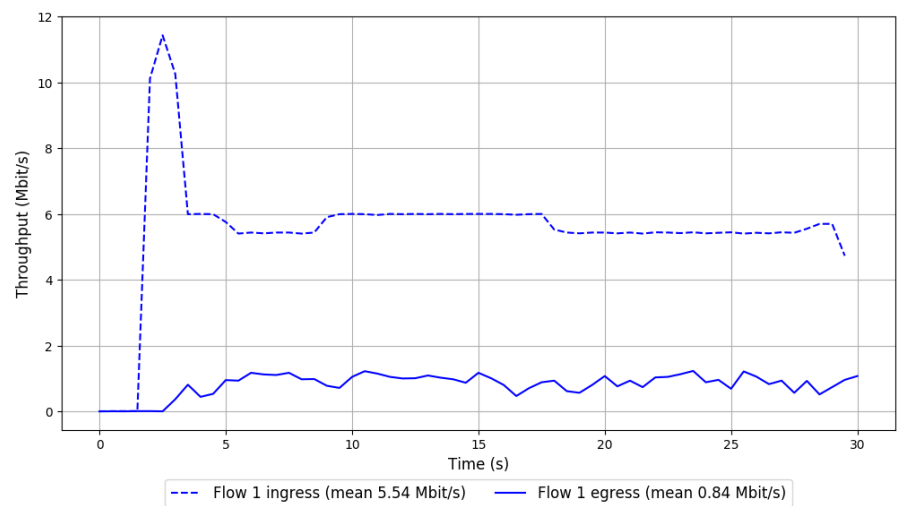
-- Flow 1:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 7431.680 ms

Loss rate: 84.99%

Run 2: Report of PCC-Expr — Data Link

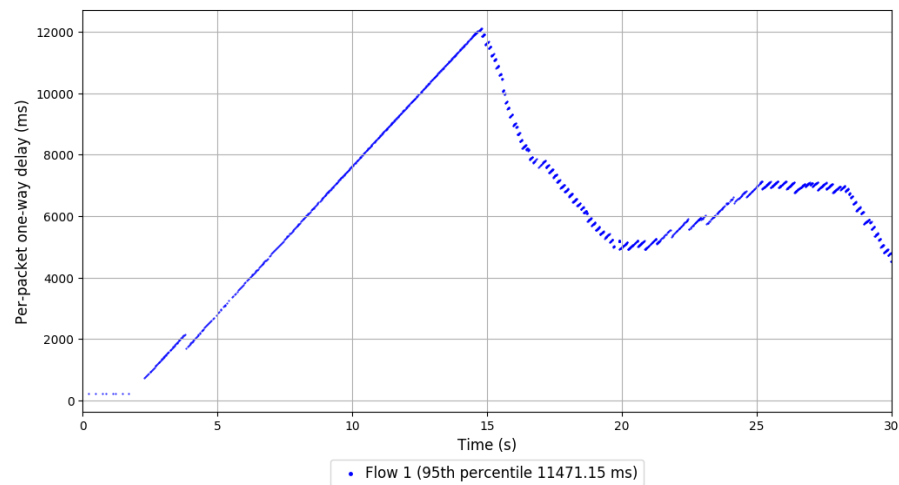
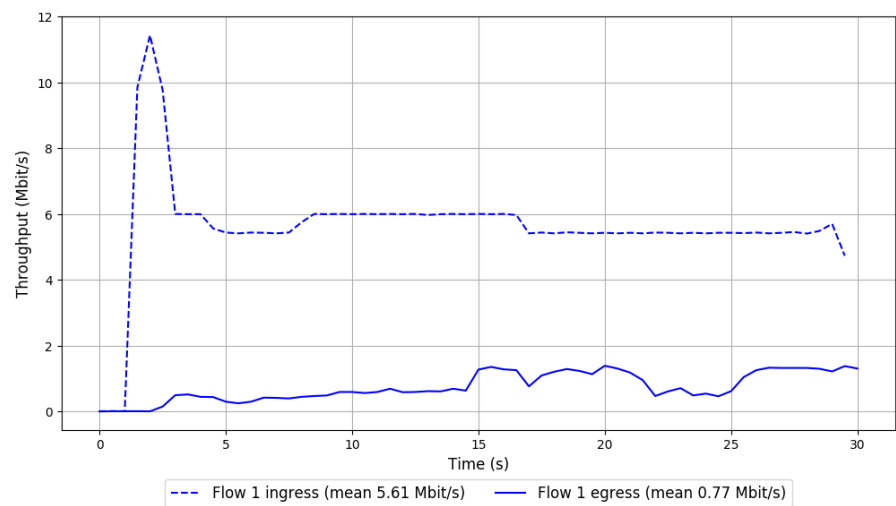


Run 3: Statistics of PCC-Expr

Start at: 2019-01-02 19:02:49
End at: 2019-01-02 19:03:19
Local clock offset: 1.282 ms
Remote clock offset: -5.507 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 11471.146 ms
Loss rate: 86.42%
-- Flow 1:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 11471.146 ms
Loss rate: 86.42%

Run 3: Report of PCC-Expr — Data Link

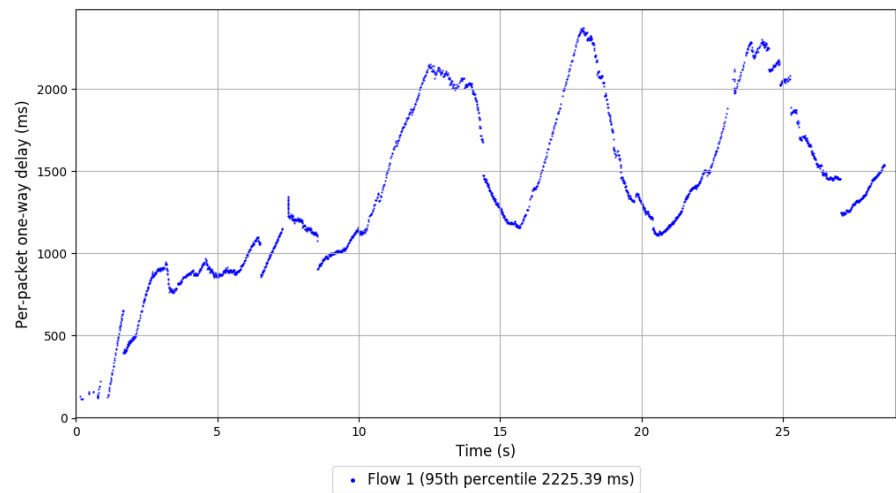
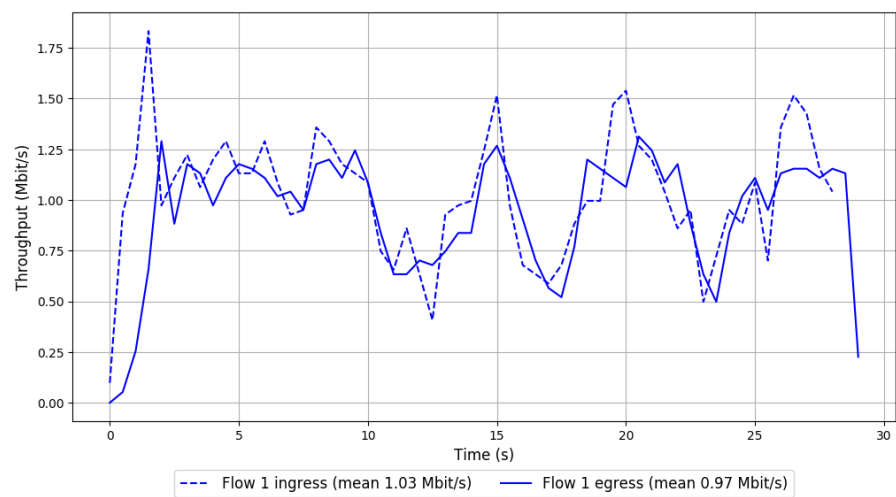


Run 1: Statistics of QUIC Cubic

Start at: 2019-01-02 18:20:41
End at: 2019-01-02 18:21:11
Local clock offset: -1.749 ms
Remote clock offset: 31.161 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 2225.386 ms
Loss rate: 5.92%
-- Flow 1:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 2225.386 ms
Loss rate: 5.92%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-02 18:42:19

End at: 2019-01-02 18:42:49

Local clock offset: 4.605 ms

Remote clock offset: 7.079 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 1842.901 ms

Loss rate: 4.49%

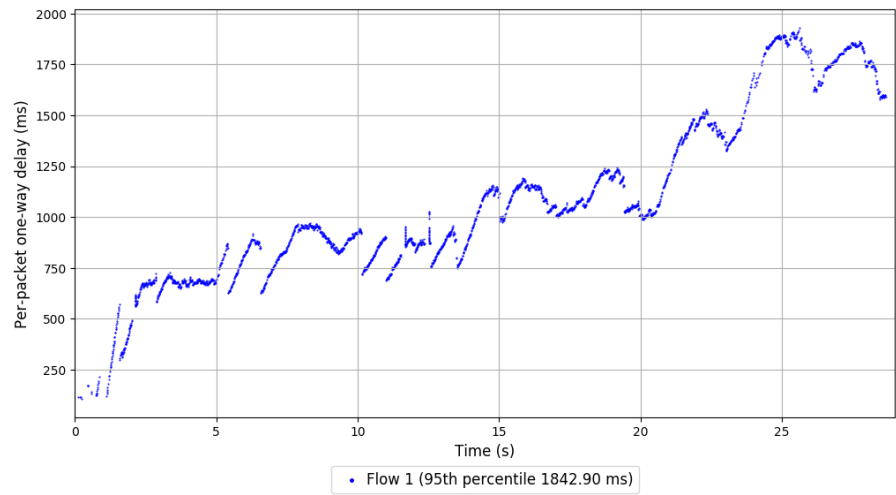
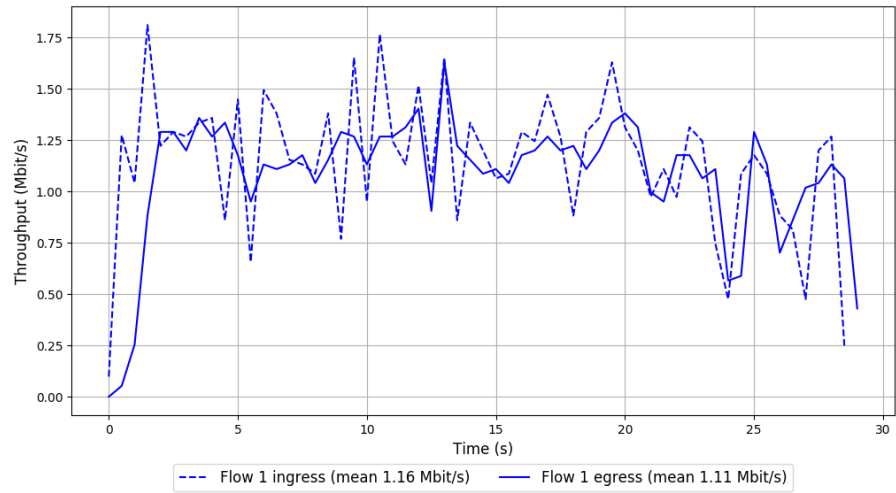
-- Flow 1:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 1842.901 ms

Loss rate: 4.49%

Run 2: Report of QUIC Cubic — Data Link

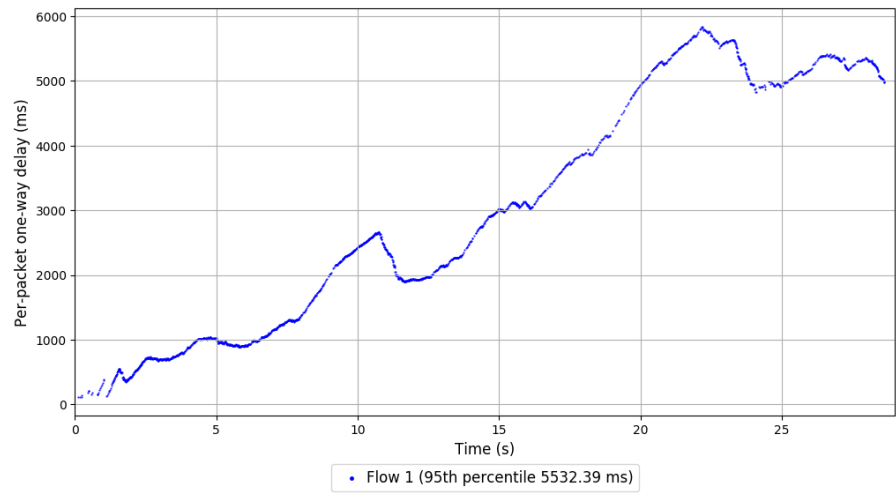
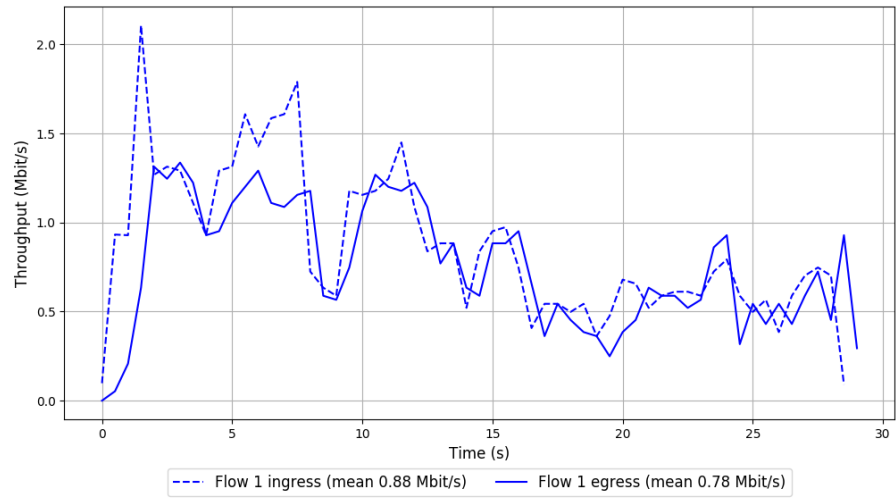


Run 3: Statistics of QUIC Cubic

Start at: 2019-01-02 19:03:58
End at: 2019-01-02 19:04:28
Local clock offset: 0.889 ms
Remote clock offset: -6.008 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 5532.388 ms
Loss rate: 12.20%
-- Flow 1:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 5532.388 ms
Loss rate: 12.20%

Run 3: Report of QUIC Cubic — Data Link

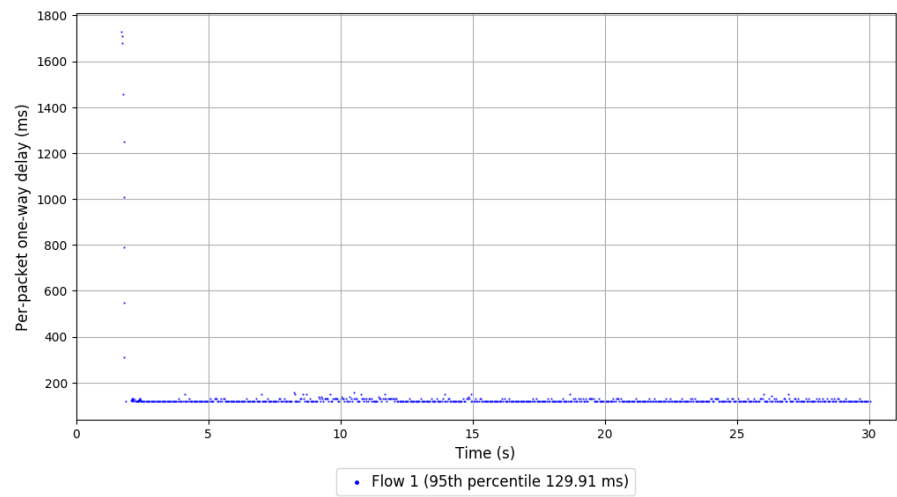
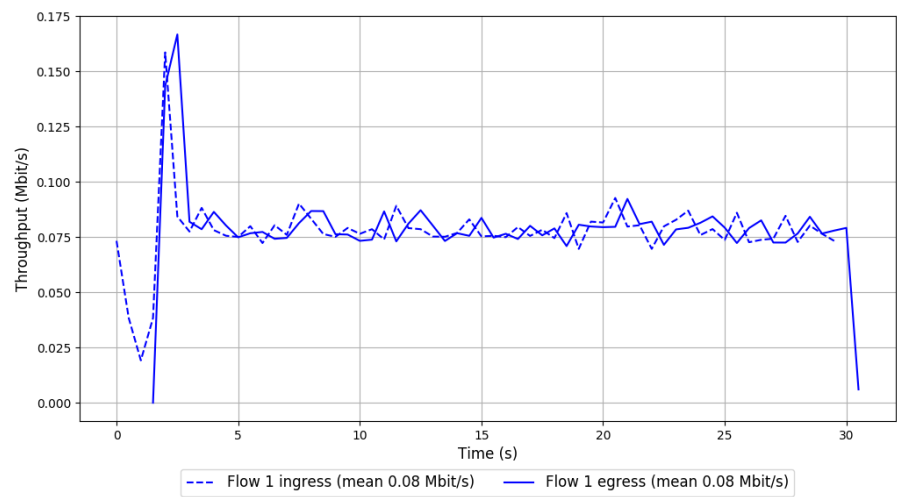


Run 1: Statistics of SCReAM

Start at: 2019-01-02 18:30:58
End at: 2019-01-02 18:31:28
Local clock offset: 1.268 ms
Remote clock offset: 31.581 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 129.910 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 129.910 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link

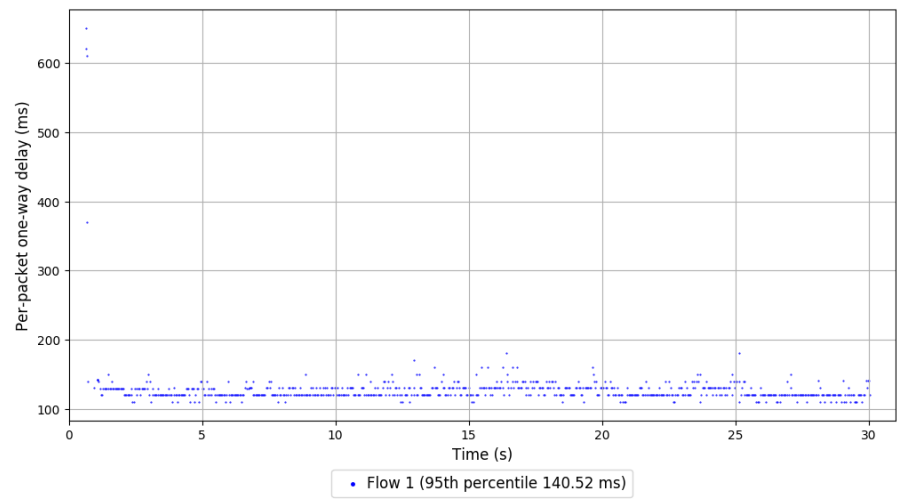
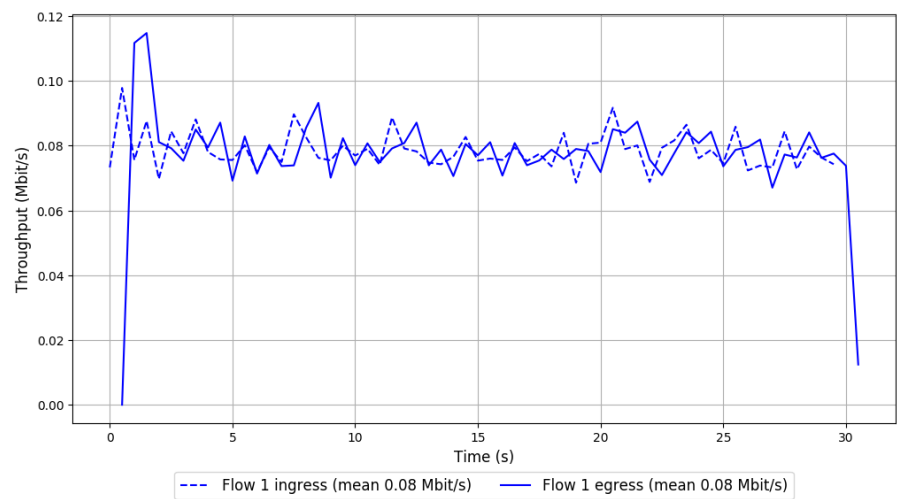


Run 2: Statistics of SCReAM

Start at: 2019-01-02 18:52:33
End at: 2019-01-02 18:53:03
Local clock offset: 7.679 ms
Remote clock offset: -1.846 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 140.522 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 140.522 ms
Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

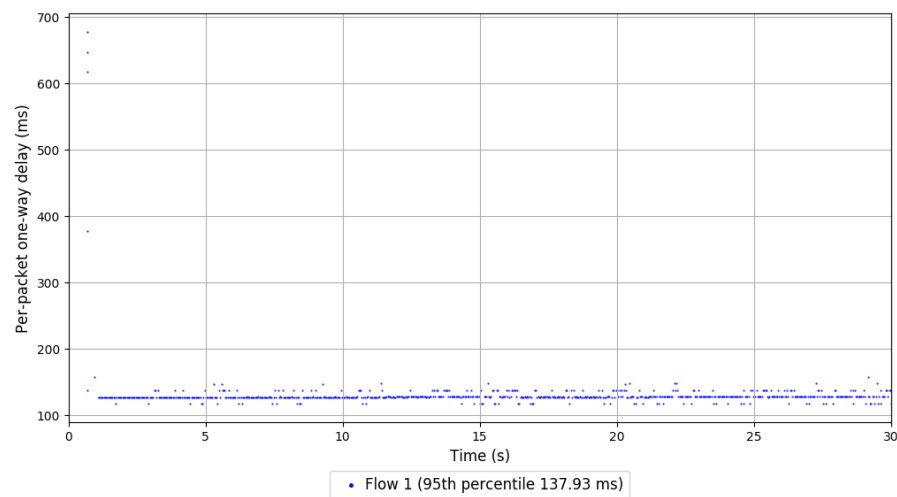
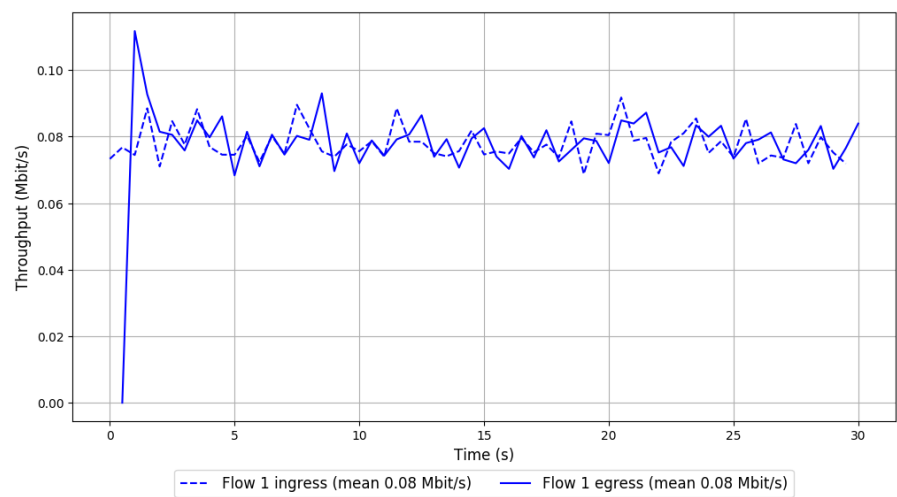


Run 3: Statistics of SCReAM

Start at: 2019-01-02 19:14:18
End at: 2019-01-02 19:14:48
Local clock offset: -0.045 ms
Remote clock offset: -8.587 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 137.927 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 137.927 ms
Loss rate: 0.26%

Run 3: Report of SReAM — Data Link

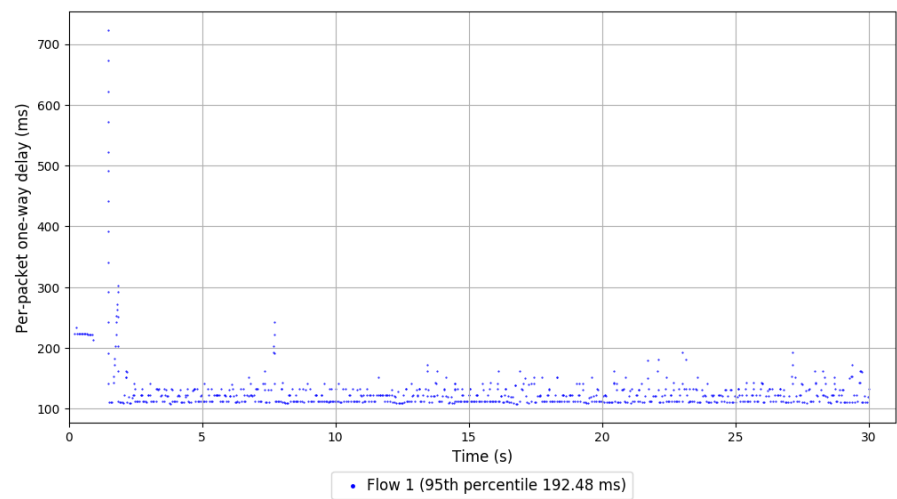
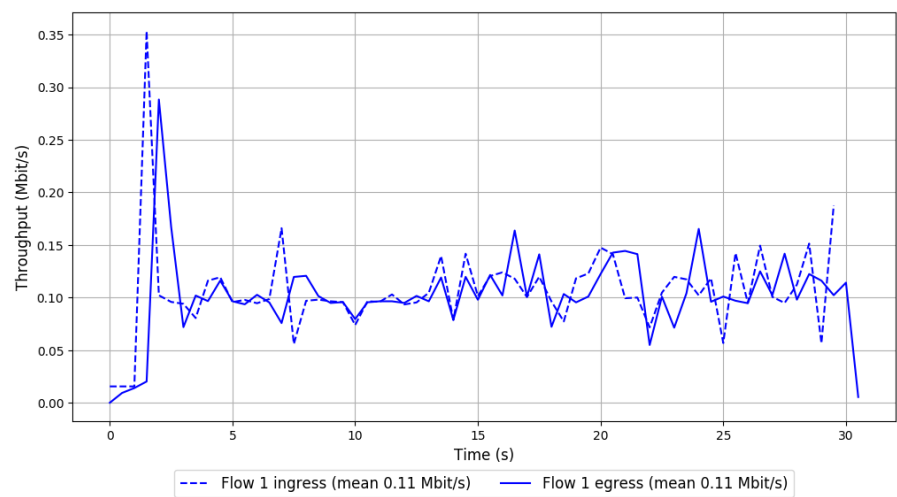


Run 1: Statistics of Sprout

Start at: 2019-01-02 18:12:45
End at: 2019-01-02 18:13:15
Local clock offset: -4.004 ms
Remote clock offset: 24.925 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 192.479 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 192.479 ms
Loss rate: 1.12%

Run 1: Report of Sprout — Data Link

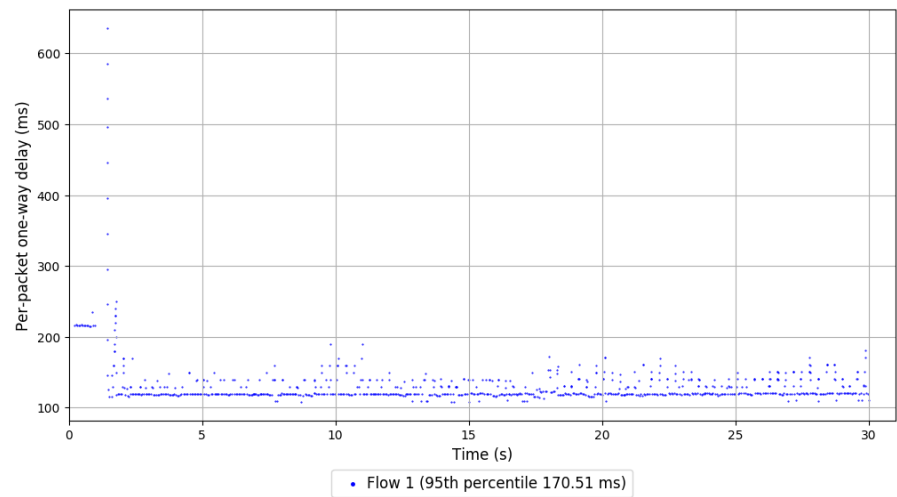
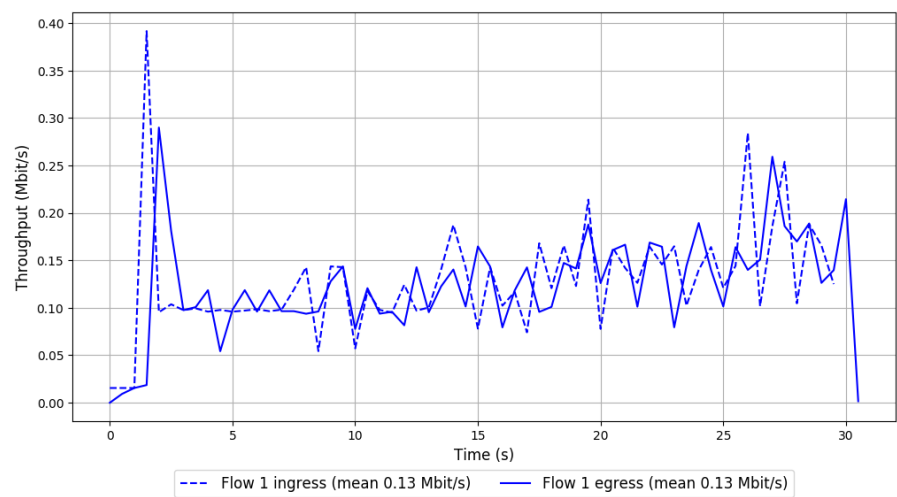


Run 2: Statistics of Sprout

Start at: 2019-01-02 18:34:23
End at: 2019-01-02 18:34:53
Local clock offset: 1.572 ms
Remote clock offset: 20.558 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 170.512 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 170.512 ms
Loss rate: 0.00%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2019-01-02 18:55:59

End at: 2019-01-02 18:56:29

Local clock offset: 6.756 ms

Remote clock offset: -7.29 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 231.608 ms

Loss rate: 0.50%

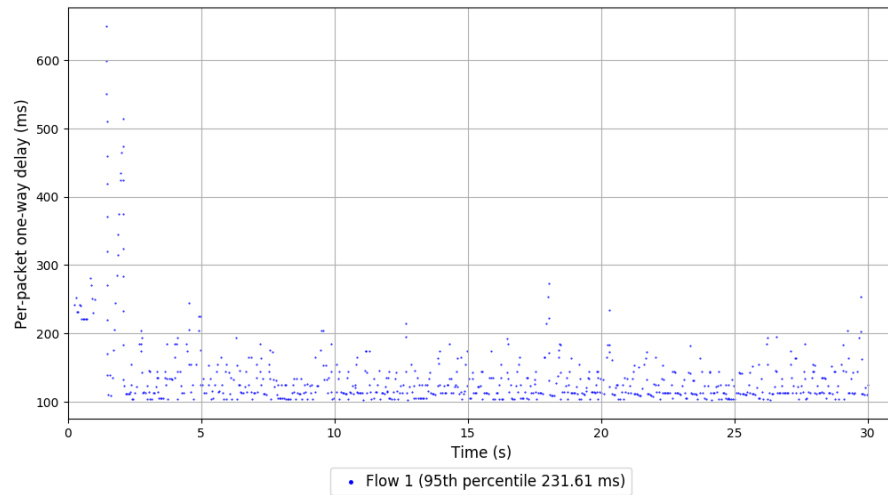
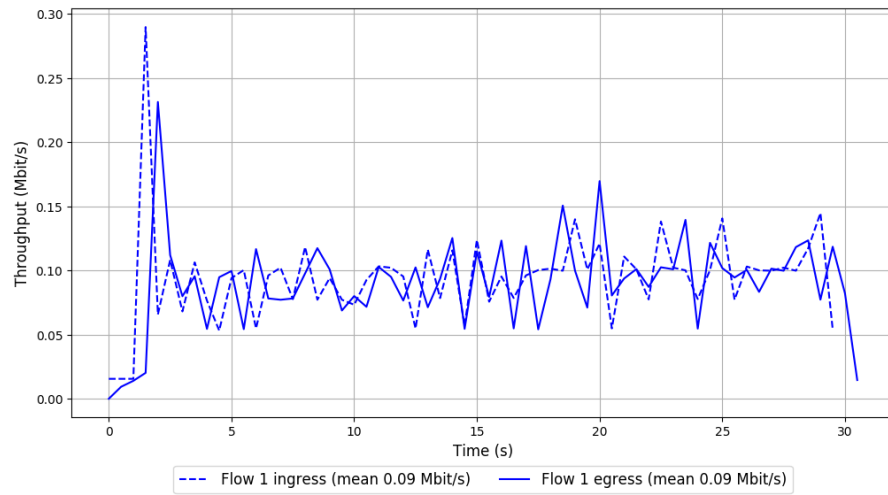
-- Flow 1:

Average throughput: 0.09 Mbit/s

95th percentile per-packet one-way delay: 231.608 ms

Loss rate: 0.50%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-01-02 18:18:25

End at: 2019-01-02 18:18:55

Local clock offset: -2.49 ms

Remote clock offset: 30.341 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 2033.228 ms

Loss rate: 3.44%

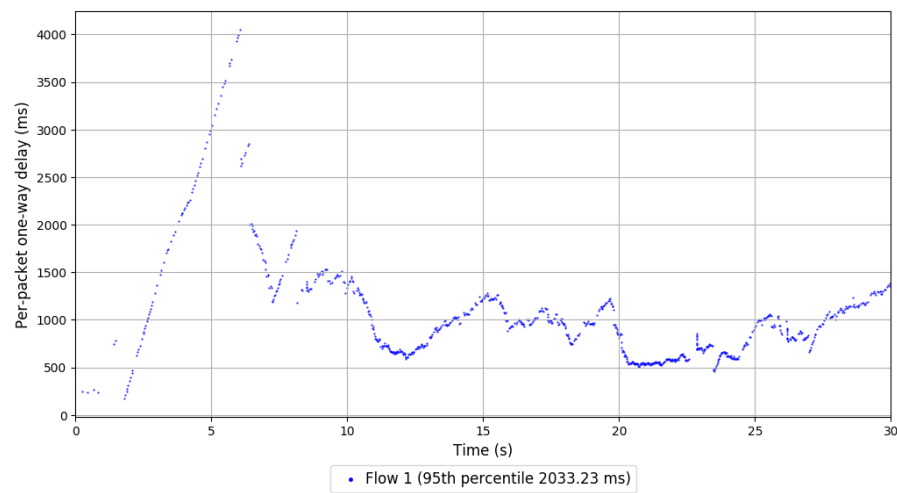
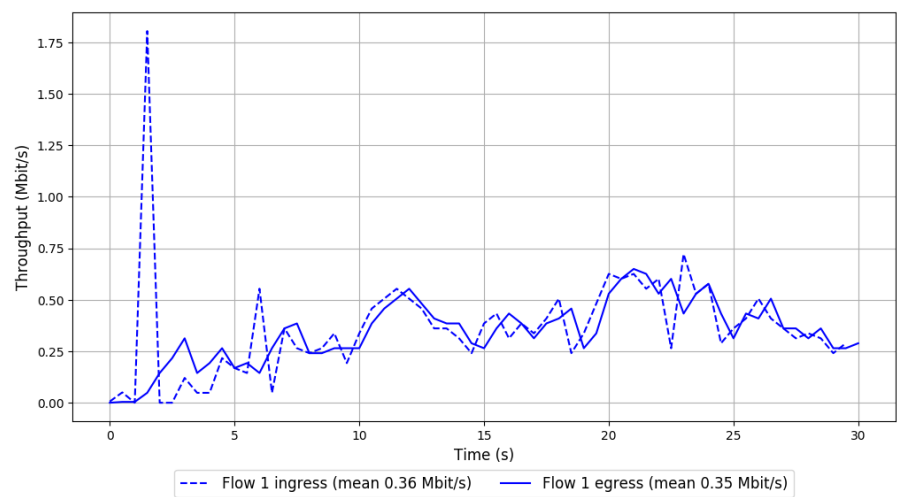
-- Flow 1:

Average throughput: 0.35 Mbit/s

95th percentile per-packet one-way delay: 2033.228 ms

Loss rate: 3.44%

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

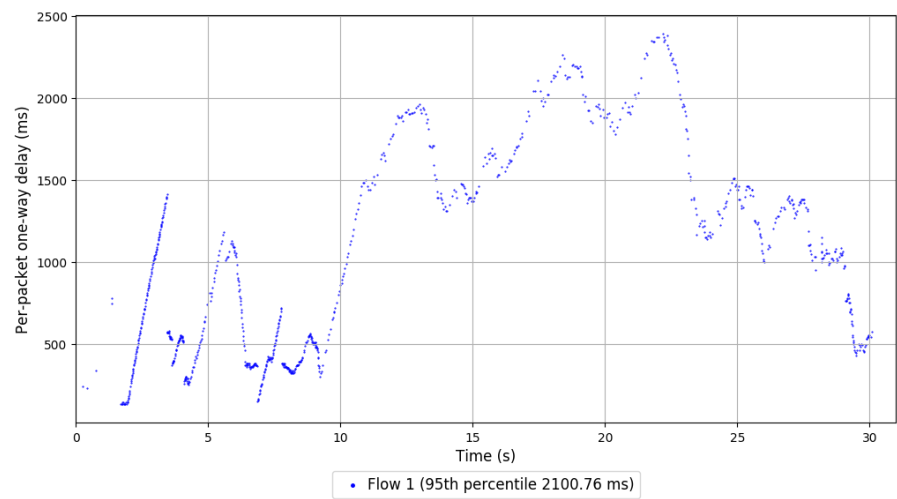
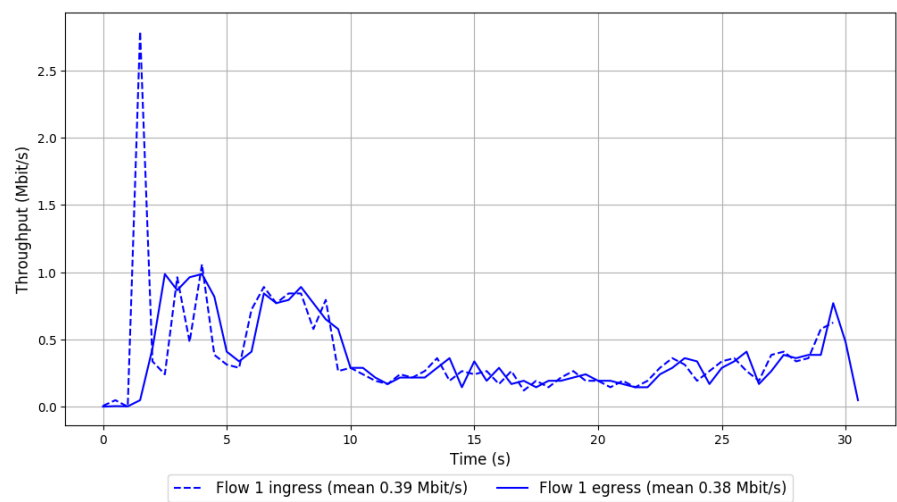


Run 2: Statistics of TaoVA-100x

Start at: 2019-01-02 18:40:03
End at: 2019-01-02 18:40:33
Local clock offset: 3.211 ms
Remote clock offset: 10.226 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 2100.756 ms
Loss rate: 2.59%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 2100.756 ms
Loss rate: 2.59%

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

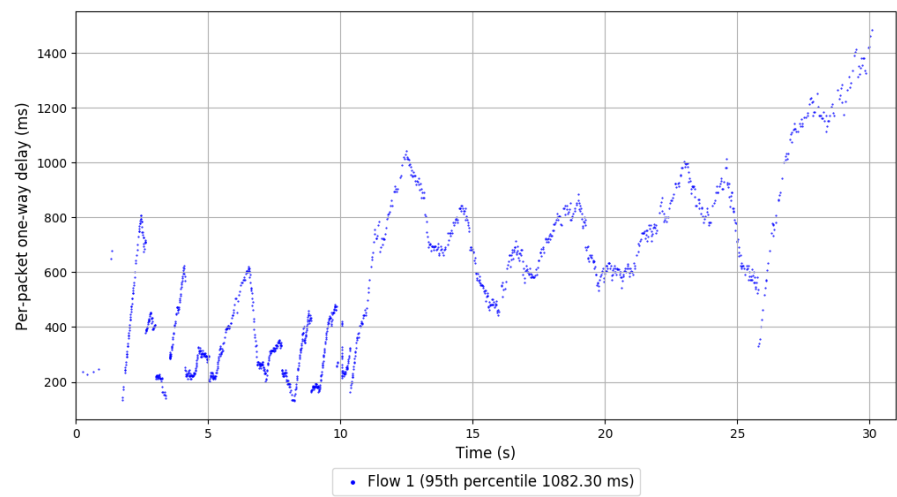
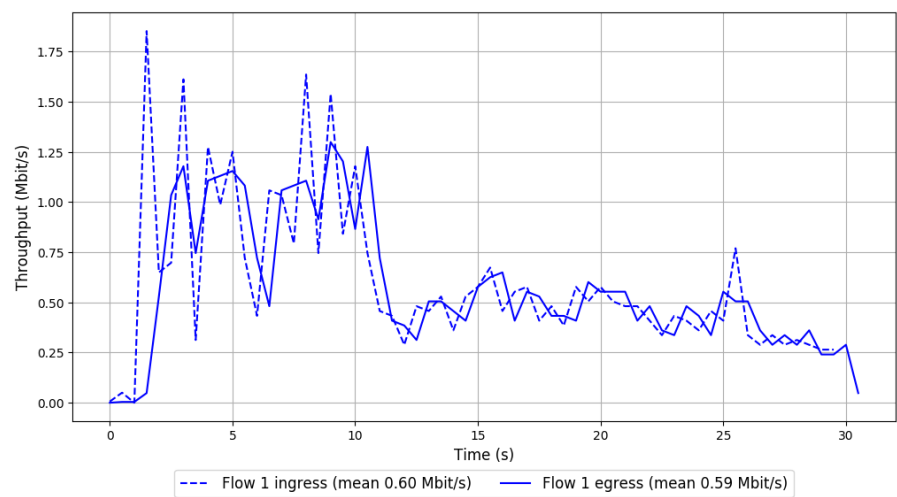


Run 3: Statistics of TaoVA-100x

Start at: 2019-01-02 19:01:41
End at: 2019-01-02 19:02:11
Local clock offset: 1.793 ms
Remote clock offset: -4.264 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1082.295 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1082.295 ms
Loss rate: 1.93%

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

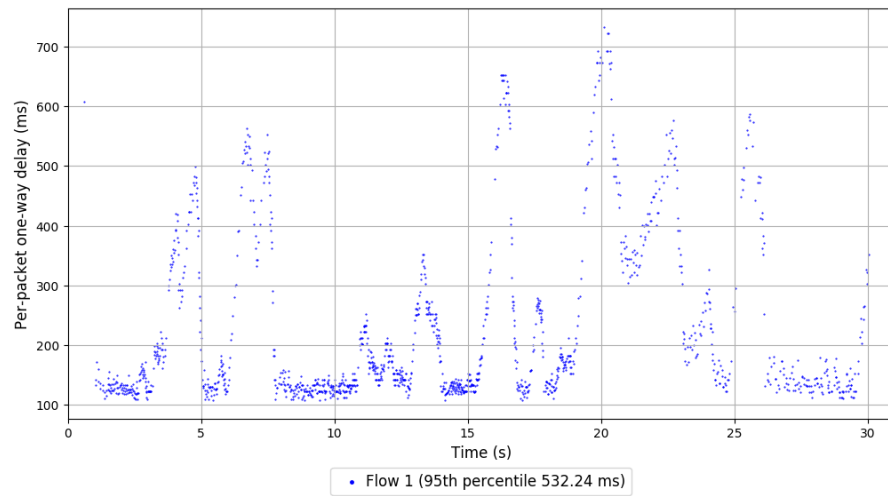
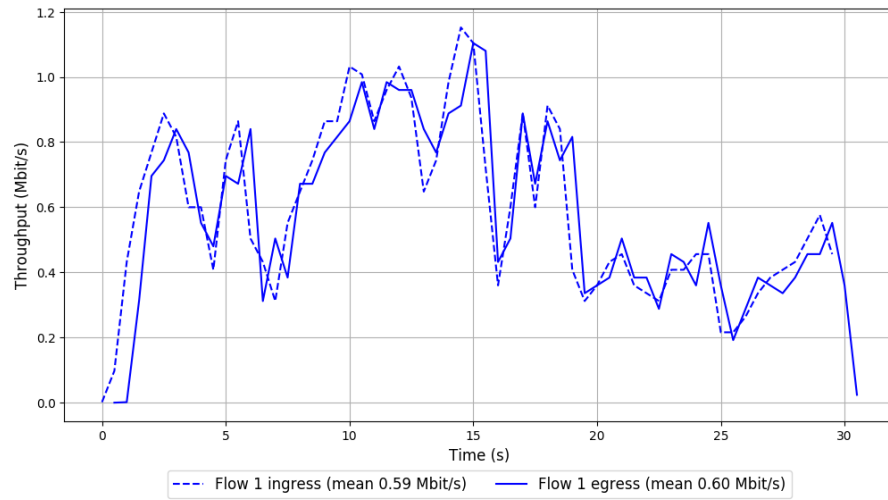


Run 1: Statistics of TCP Vegas

Start at: 2019-01-02 18:13:53
End at: 2019-01-02 18:14:23
Local clock offset: -4.459 ms
Remote clock offset: 25.237 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 532.240 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 532.240 ms
Loss rate: 0.67%

Run 1: Report of TCP Vegas — Data Link

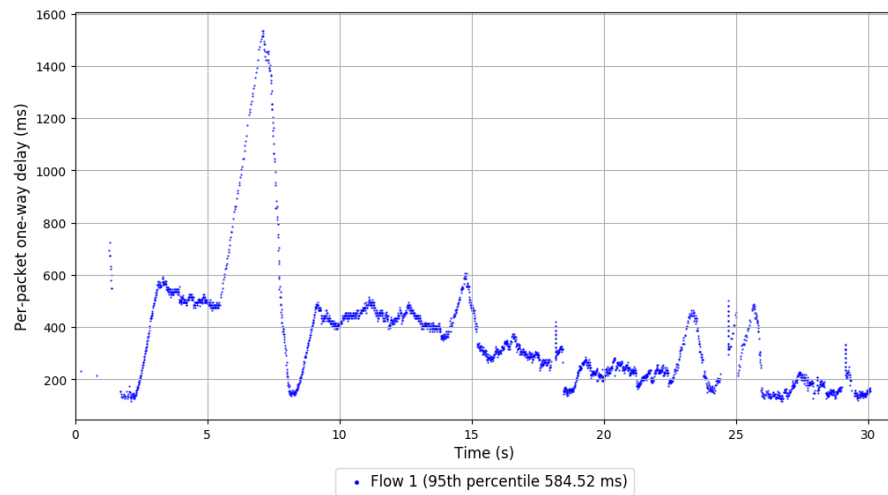
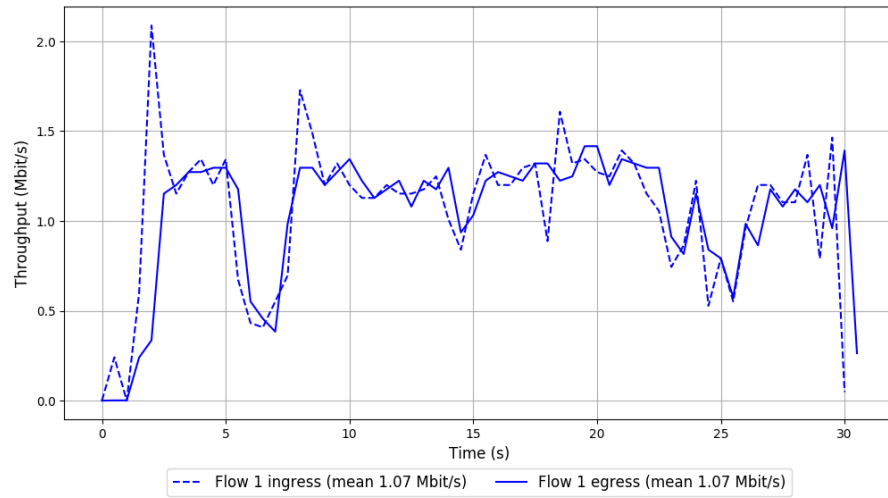


Run 2: Statistics of TCP Vegas

Start at: 2019-01-02 18:35:31
End at: 2019-01-02 18:36:01
Local clock offset: 2.638 ms
Remote clock offset: 18.602 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 584.516 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 584.516 ms
Loss rate: 0.37%

Run 2: Report of TCP Vegas — Data Link

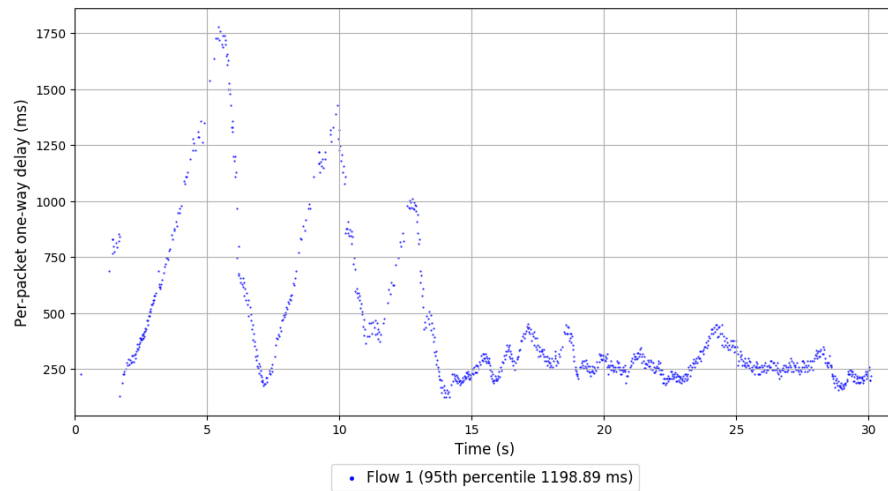
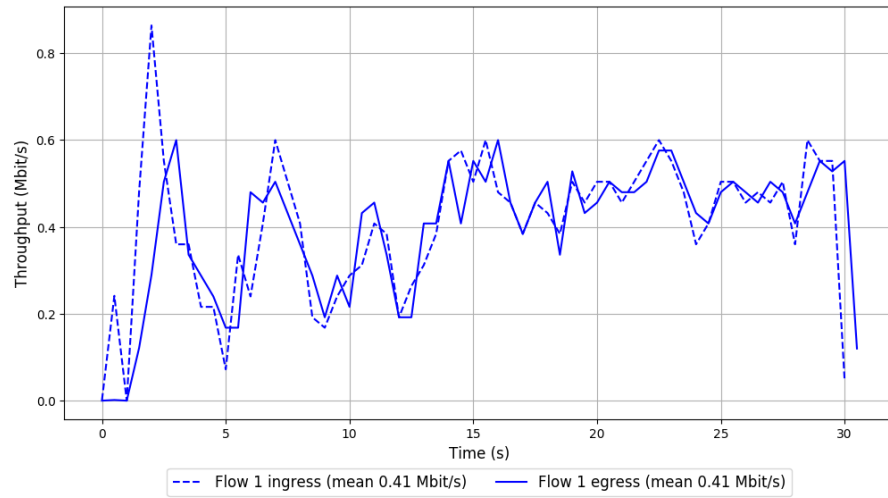


Run 3: Statistics of TCP Vegas

Start at: 2019-01-02 18:57:09
End at: 2019-01-02 18:57:39
Local clock offset: 5.54 ms
Remote clock offset: -2.333 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 1198.892 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 1198.892 ms
Loss rate: 0.78%

Run 3: Report of TCP Vegas — Data Link

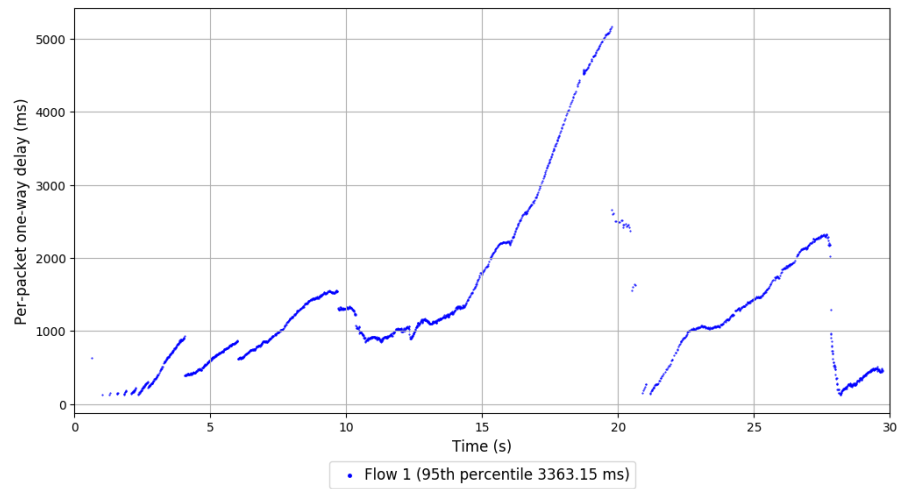
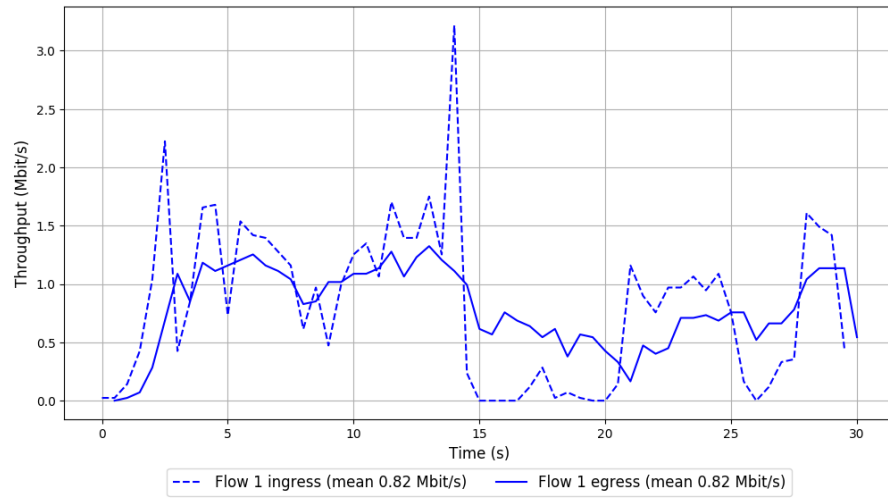


Run 1: Statistics of Verus

Start at: 2019-01-02 18:28:40
End at: 2019-01-02 18:29:10
Local clock offset: 0.661 ms
Remote clock offset: 33.598 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 3363.148 ms
Loss rate: 2.66%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 3363.148 ms
Loss rate: 2.66%

Run 1: Report of Verus — Data Link

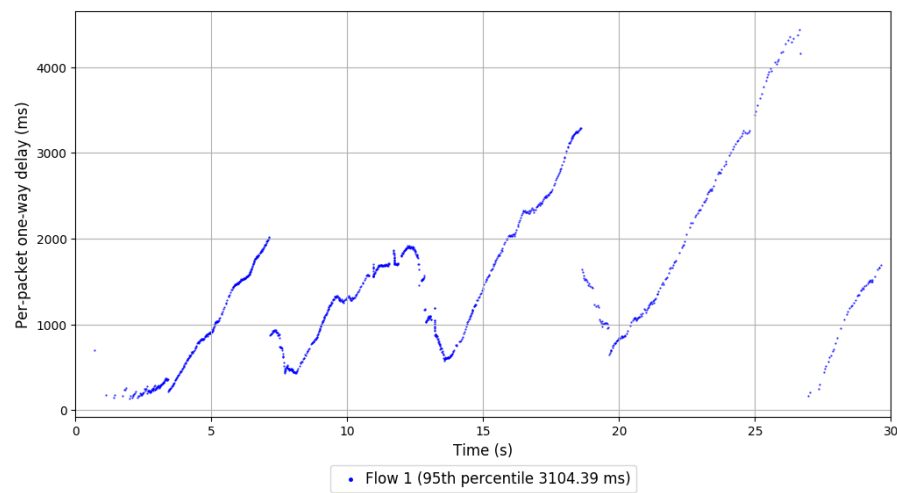
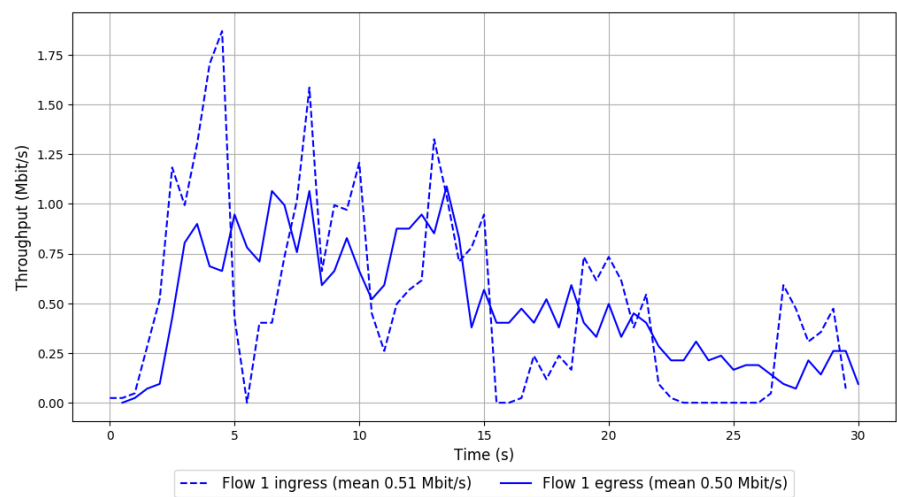


Run 2: Statistics of Verus

Start at: 2019-01-02 18:50:17
End at: 2019-01-02 18:50:47
Local clock offset: 6.944 ms
Remote clock offset: -0.267 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 3104.387 ms
Loss rate: 4.13%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 3104.387 ms
Loss rate: 4.13%

Run 2: Report of Verus — Data Link

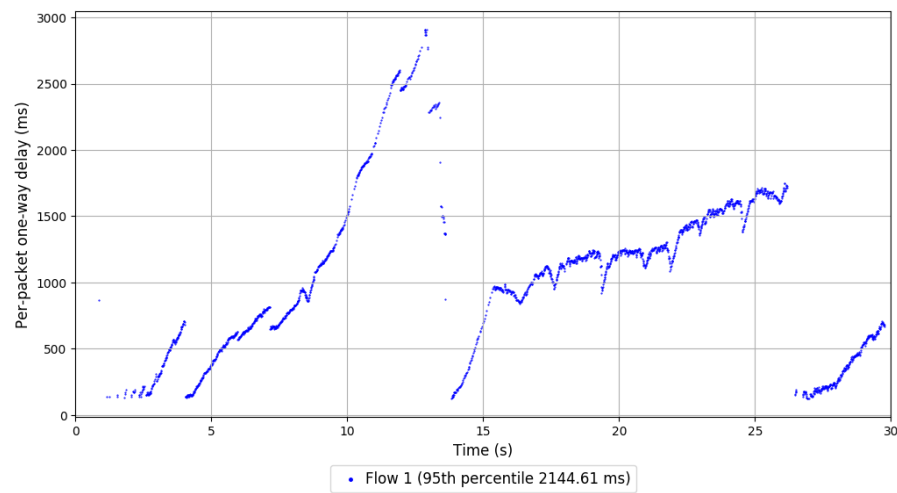
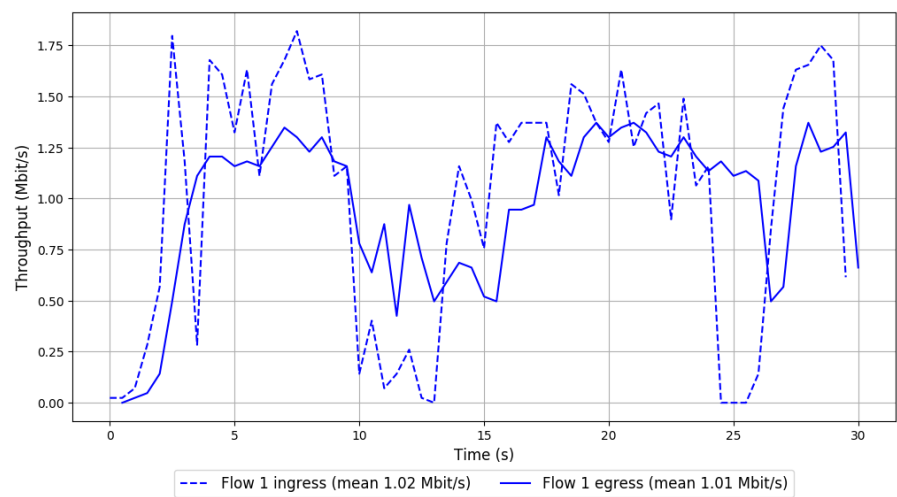


Run 3: Statistics of Verus

Start at: 2019-01-02 19:12:03
End at: 2019-01-02 19:12:33
Local clock offset: -0.728 ms
Remote clock offset: -5.816 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 2144.609 ms
Loss rate: 3.52%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 2144.609 ms
Loss rate: 3.52%

Run 3: Report of Verus — Data Link

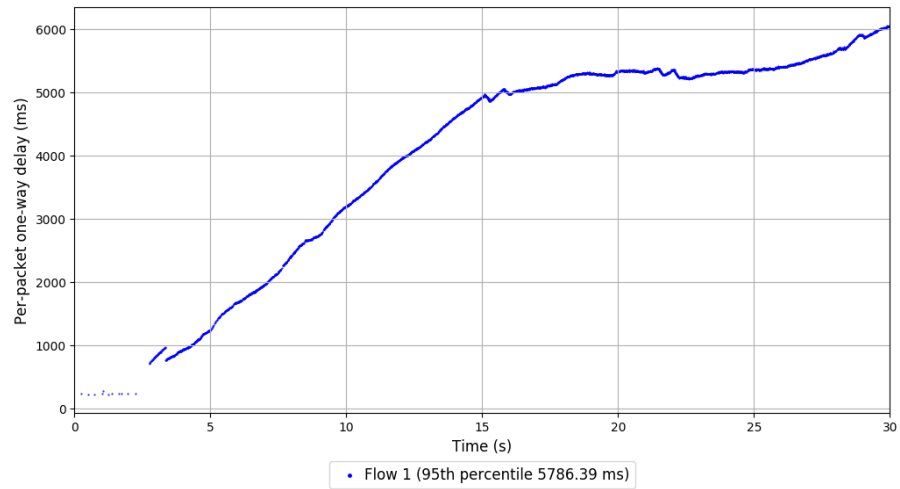
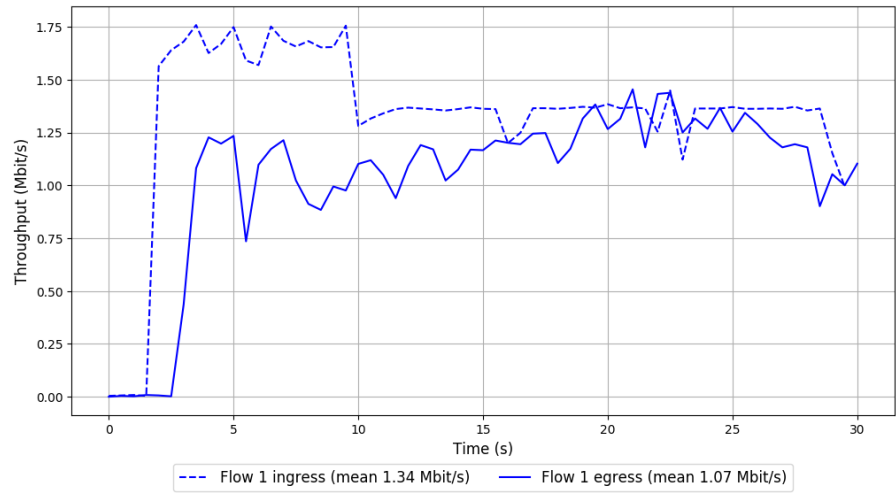


Run 1: Statistics of PCC-Vivace

Start at: 2019-01-02 18:27:31
End at: 2019-01-02 18:28:01
Local clock offset: 0.337 ms
Remote clock offset: 33.302 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 5786.390 ms
Loss rate: 20.76%
-- Flow 1:
Average throughput: 1.07 Mbit/s
95th percentile per-packet one-way delay: 5786.390 ms
Loss rate: 20.76%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-01-02 18:49:09

End at: 2019-01-02 18:49:39

Local clock offset: 5.96 ms

Remote clock offset: 0.327 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 267.207 ms

Loss rate: 0.00%

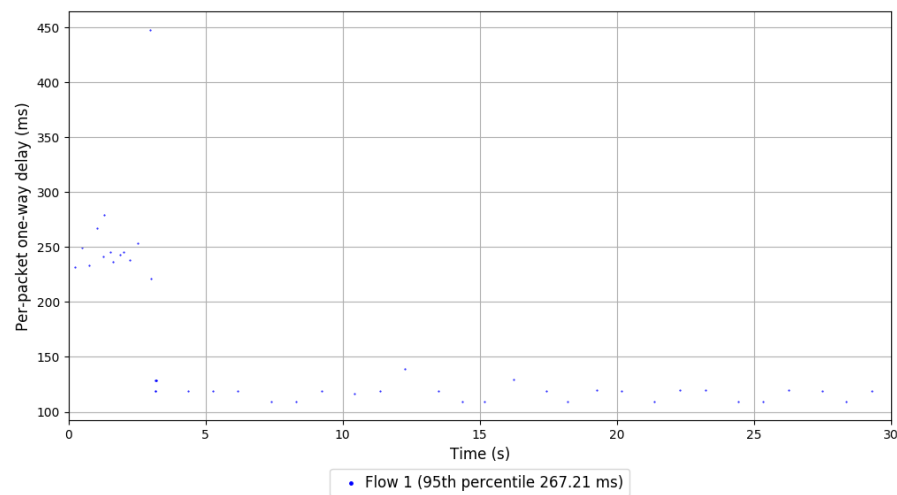
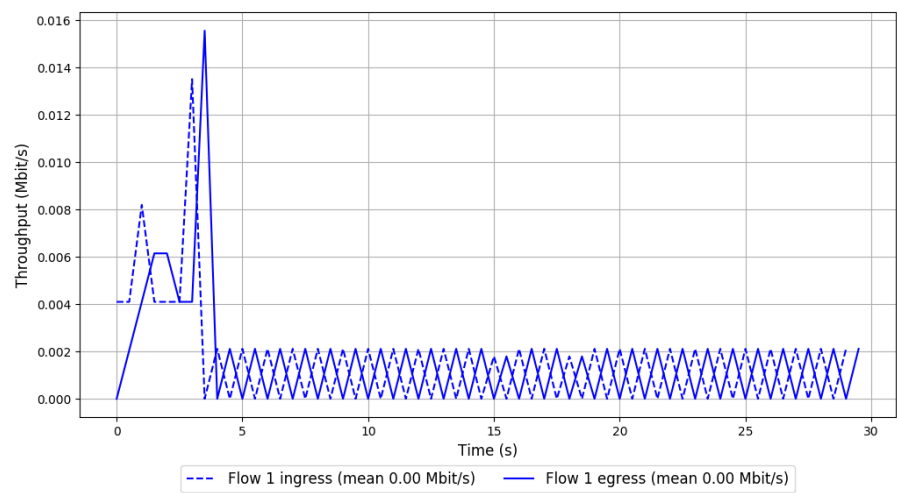
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 267.207 ms

Loss rate: 0.00%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-01-02 19:10:54

End at: 2019-01-02 19:11:24

Local clock offset: -0.565 ms

Remote clock offset: -6.85 ms

Below is generated by plot.py at 2019-01-02 19:16:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.99 Mbit/s

95th percentile per-packet one-way delay: 5851.953 ms

Loss rate: 23.51%

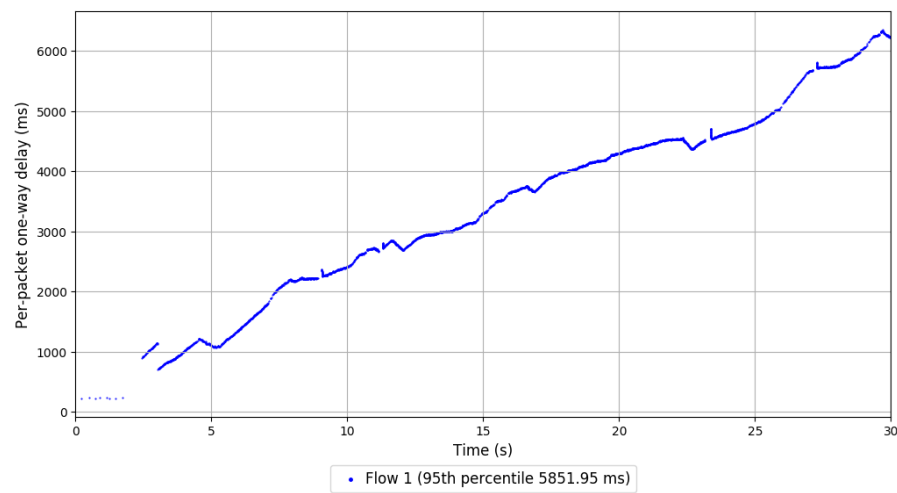
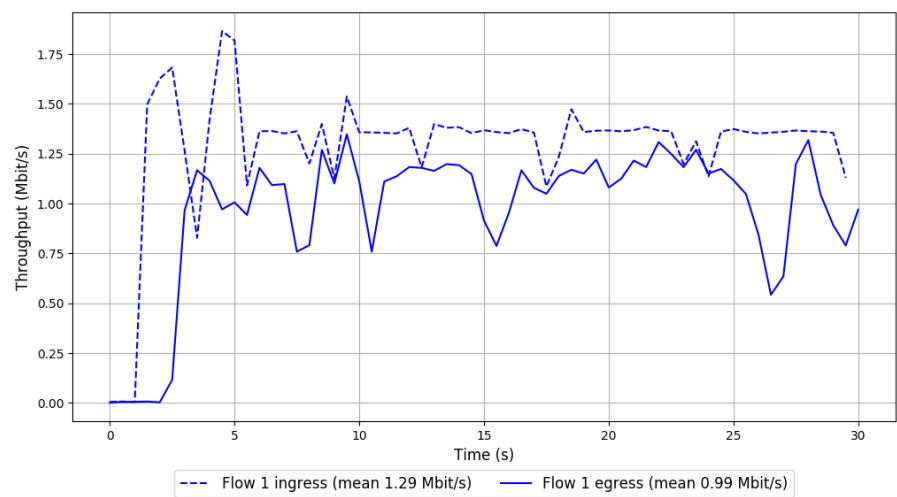
-- Flow 1:

Average throughput: 0.99 Mbit/s

95th percentile per-packet one-way delay: 5851.953 ms

Loss rate: 23.51%

Run 3: Report of PCC-Vivace — Data Link

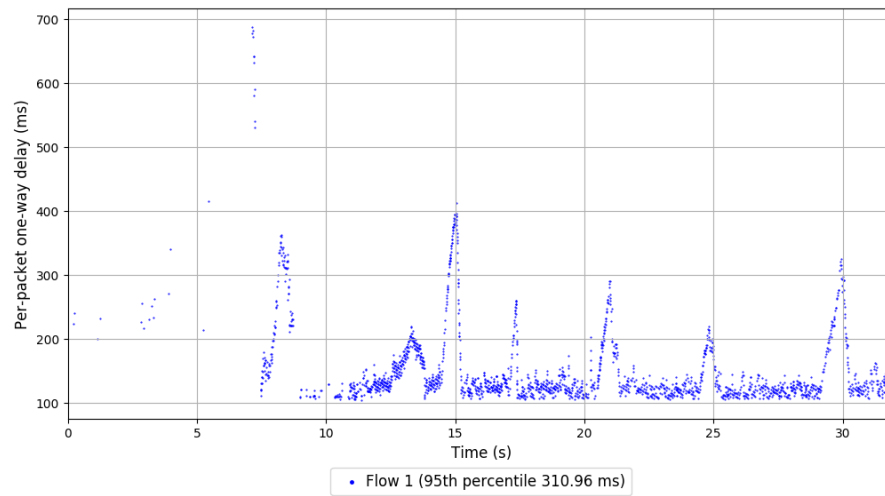
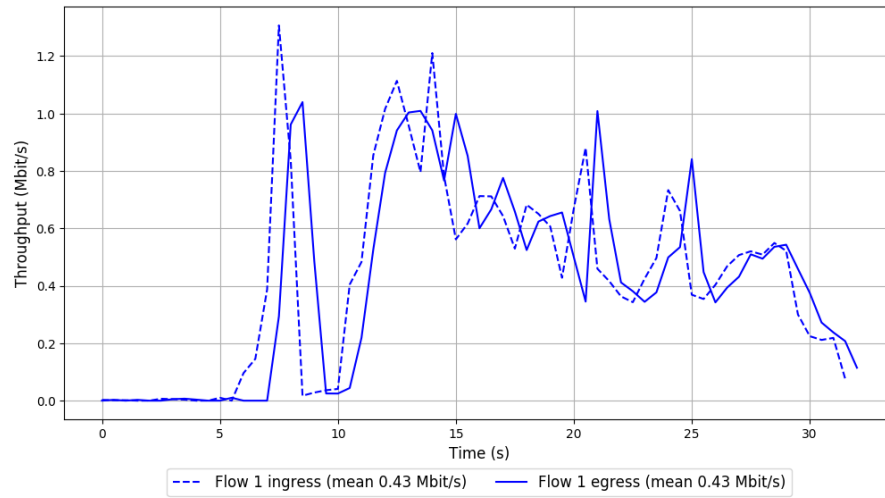



```
Run 1: Statistics of WebRTC media

Start at: 2019-01-02 18:29:50
End at: 2019-01-02 18:30:20
Local clock offset: 1.02 ms
Remote clock offset: 34.173 ms

# Below is generated by plot.py at 2019-01-02 19:16:36
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 310.963 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 310.963 ms
Loss rate: 0.08%
```

Run 1: Report of WebRTC media — Data Link

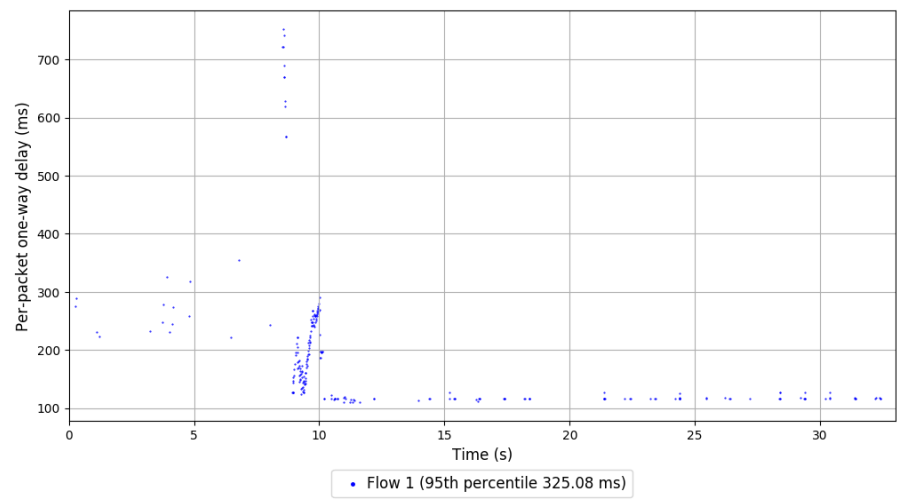
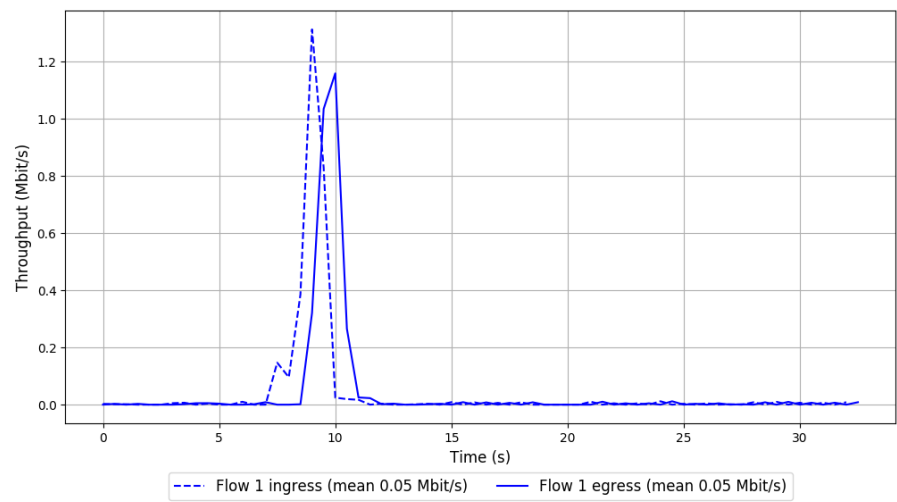


Run 2: Statistics of WebRTC media

Start at: 2019-01-02 18:51:25
End at: 2019-01-02 18:51:55
Local clock offset: 7.347 ms
Remote clock offset: -1.152 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 325.082 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 325.082 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-02 19:13:11
End at: 2019-01-02 19:13:41
Local clock offset: -0.746 ms
Remote clock offset: -7.654 ms

Below is generated by plot.py at 2019-01-02 19:16:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 350.706 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 350.706 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

