

Pantheon Report

Generated at 2018-08-21 18:44:35 (UTC).

Data path: AWS India 1 Ethernet (*local*) → India ppp0 ppp0 (*remote*).

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against **nets.org.sg** and have been applied to correct the timestamps in logs.

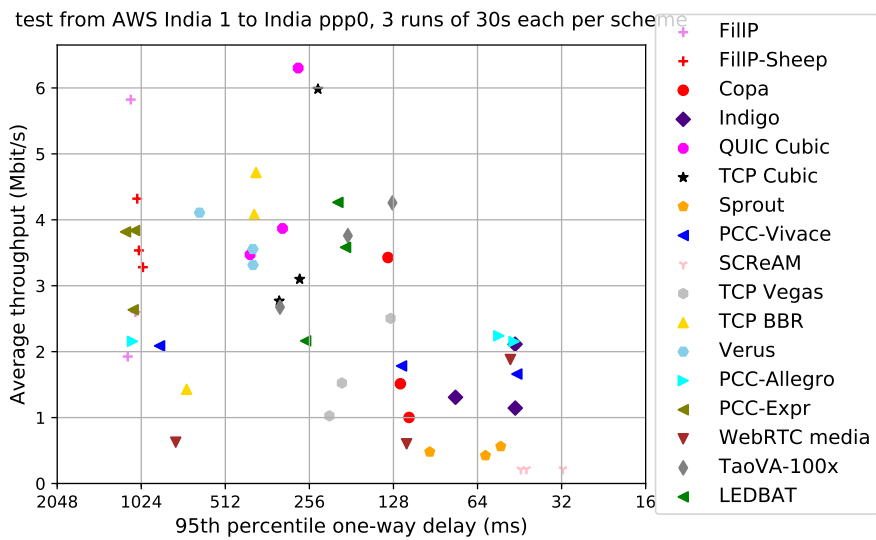
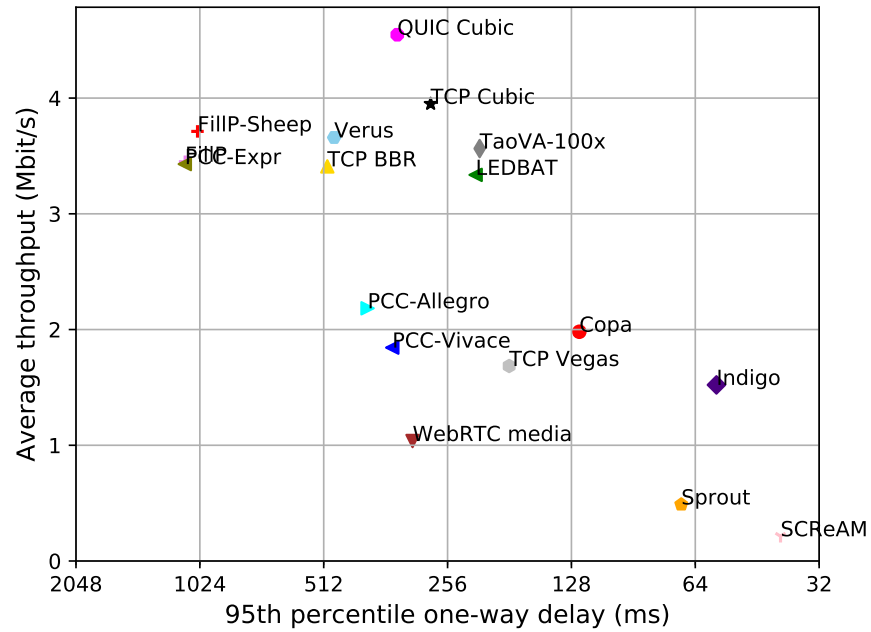
System info:

```
Linux 4.15.0-1017-aws
net.core.default_qdisc = fq_codel
net.core.rmem_default = 16777216
net.core.rmem_max = 33554432
net.core.wmem_default = 212992
net.core.wmem_max = 212992
net.ipv4.tcp_rmem = 4096 87380 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304
```

Git summary:

```
branch: master @ 7719b900495aa706f8452ab7d4a94dd562e9296e
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfef58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ 6f038ed31259d366f9840f65b82cbe8f464b1b39
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from AWS India 1 to India ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



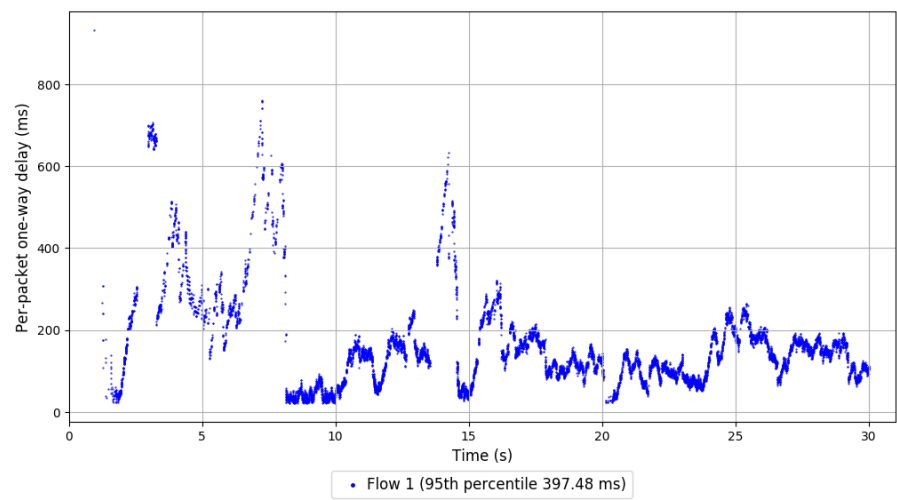
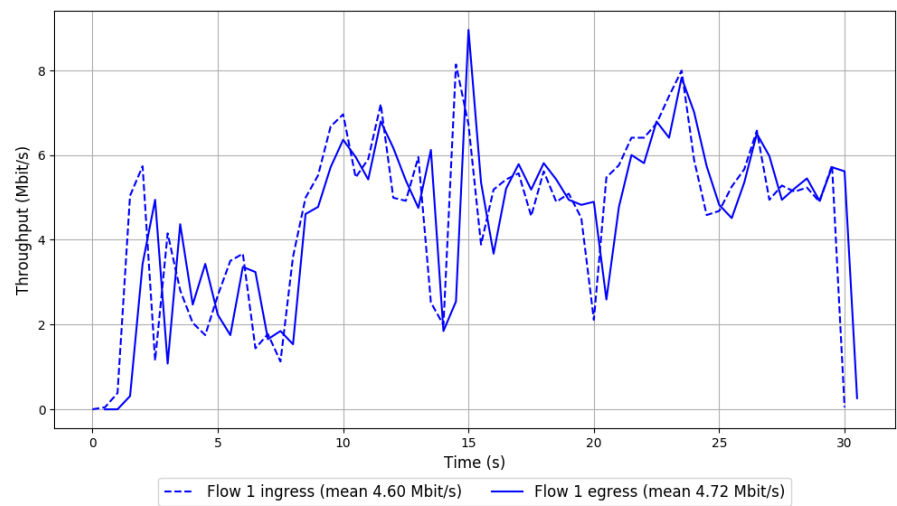
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	3.41	501.76	1.09
Copa	3	1.98	122.47	0.12
TCP Cubic	3	3.95	281.46	0.42
FillP	3	3.45	1111.90	63.07
FillP-Sheep	3	3.71	1037.60	18.46
Indigo	3	1.52	56.86	0.06
LEDBAT	3	3.33	218.84	0.40
PCC-Allegro	3	2.18	400.54	16.93
PCC-Expr	3	3.43	1114.08	42.00
QUIC Cubic	3	4.55	339.22	0.96
SCReAM	3	0.21	39.72	0.09
Sprout	3	0.49	69.22	0.20
TaoVA-100x	3	3.57	213.91	0.27
TCP Vegas	3	1.68	181.34	0.18
Verus	3	3.66	482.92	1.03
PCC-Vivace	3	1.84	348.88	1.53
WebRTC media	3	1.04	311.44	0.25

Run 1: Statistics of TCP BBR

Start at: 2018-08-21 17:53:31
End at: 2018-08-21 17:54:02
Local clock offset: -2.733 ms
Remote clock offset: -63.594 ms

Below is generated by plot.py at 2018-08-21 18:43:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.72 Mbit/s
95th percentile per-packet one-way delay: 397.475 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 4.72 Mbit/s
95th percentile per-packet one-way delay: 397.475 ms
Loss rate: 0.52%

Run 1: Report of TCP BBR — Data Link

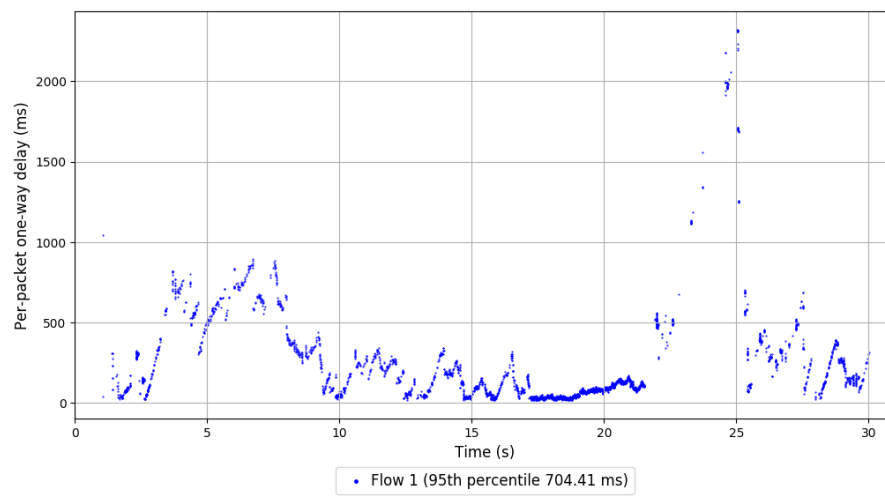
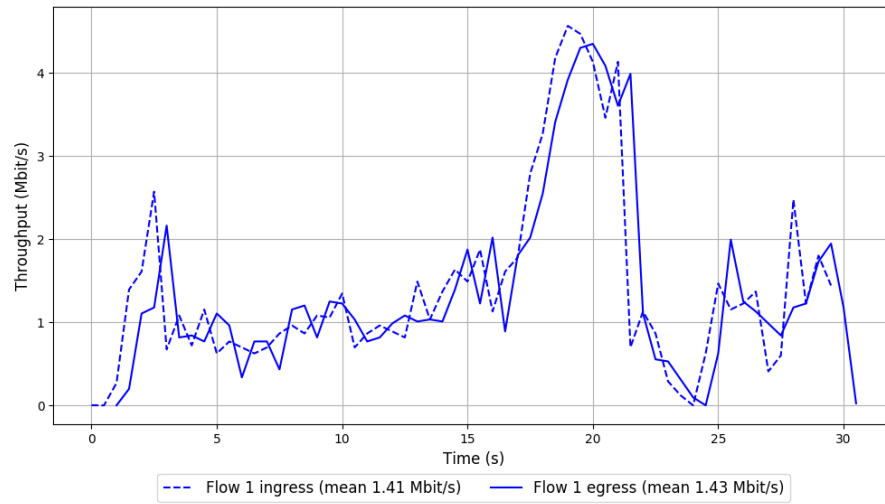


Run 2: Statistics of TCP BBR

Start at: 2018-08-21 18:12:11
End at: 2018-08-21 18:12:41
Local clock offset: -3.028 ms
Remote clock offset: -62.311 ms

Below is generated by plot.py at 2018-08-21 18:43:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 704.406 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 704.406 ms
Loss rate: 1.93%

Run 2: Report of TCP BBR — Data Link

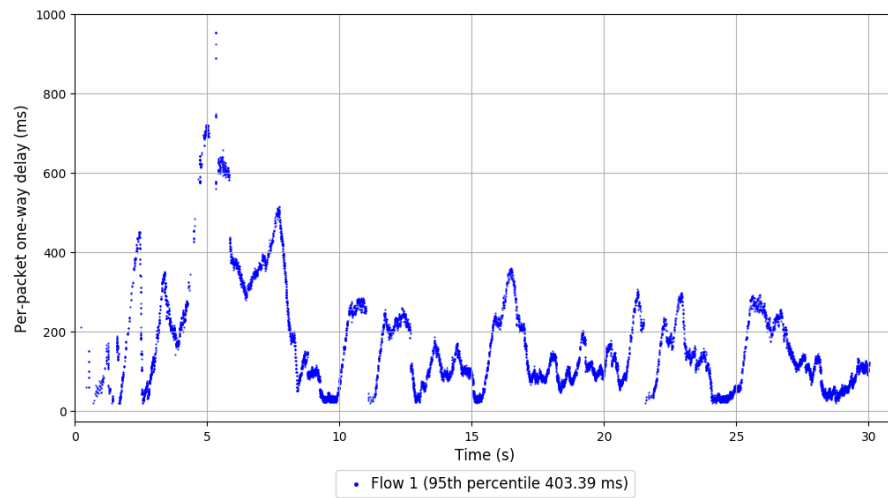
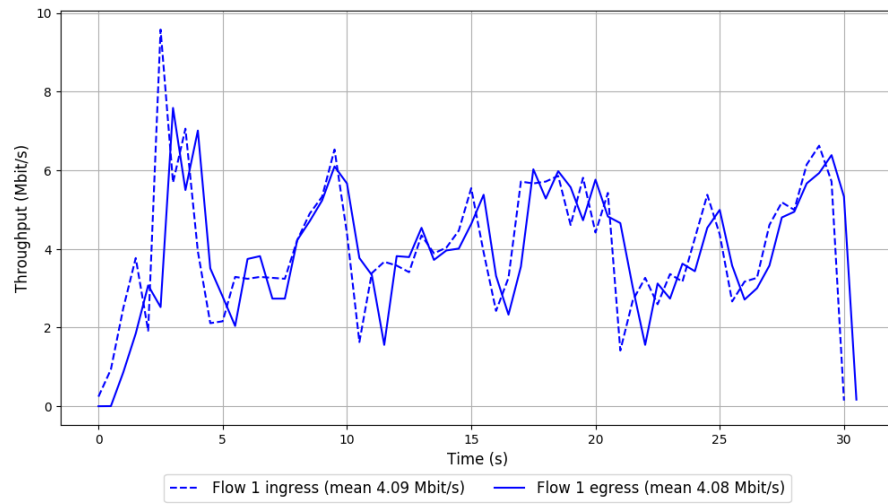


Run 3: Statistics of TCP BBR

Start at: 2018-08-21 18:31:09
End at: 2018-08-21 18:31:39
Local clock offset: -4.289 ms
Remote clock offset: -63.749 ms

Below is generated by plot.py at 2018-08-21 18:43:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.08 Mbit/s
95th percentile per-packet one-way delay: 403.392 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 4.08 Mbit/s
95th percentile per-packet one-way delay: 403.392 ms
Loss rate: 0.83%

Run 3: Report of TCP BBR — Data Link

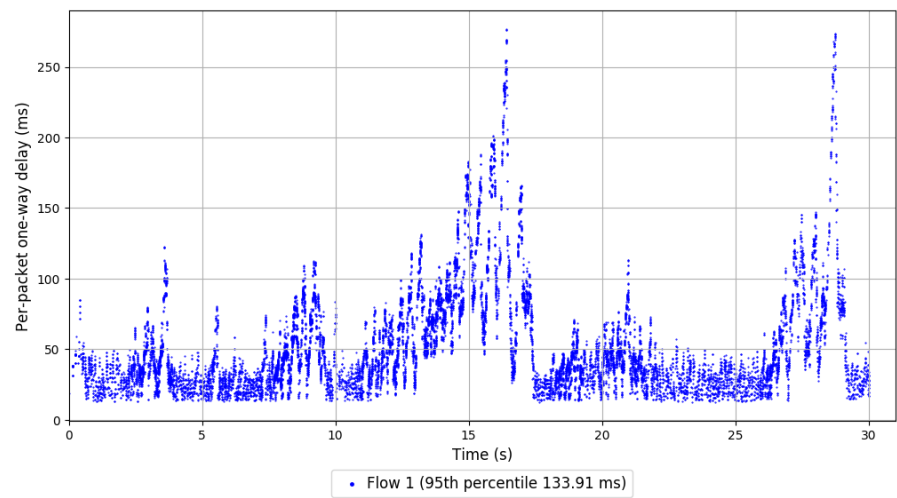
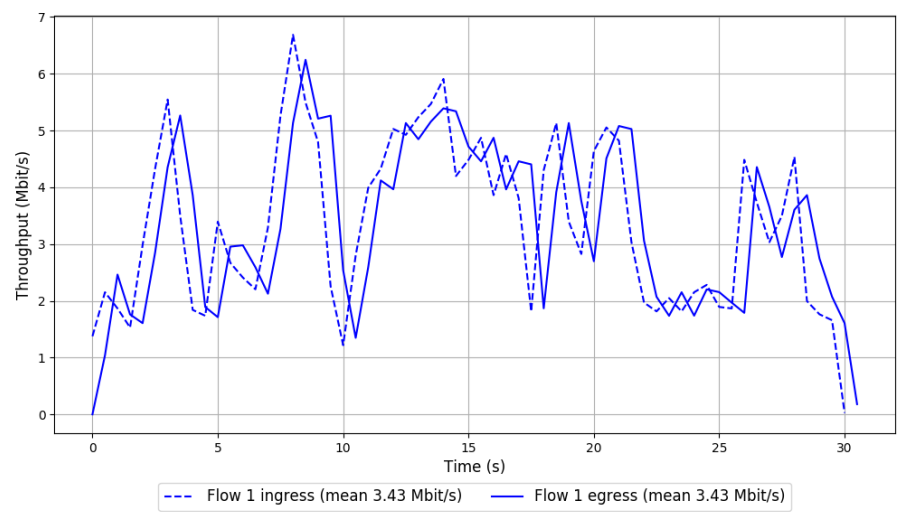


Run 1: Statistics of Copa

Start at: 2018-08-21 17:51:22
End at: 2018-08-21 17:51:52
Local clock offset: -0.202 ms
Remote clock offset: -63.315 ms

Below is generated by plot.py at 2018-08-21 18:44:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.43 Mbit/s
95th percentile per-packet one-way delay: 133.909 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 3.43 Mbit/s
95th percentile per-packet one-way delay: 133.909 ms
Loss rate: 0.01%

Run 1: Report of Copa — Data Link

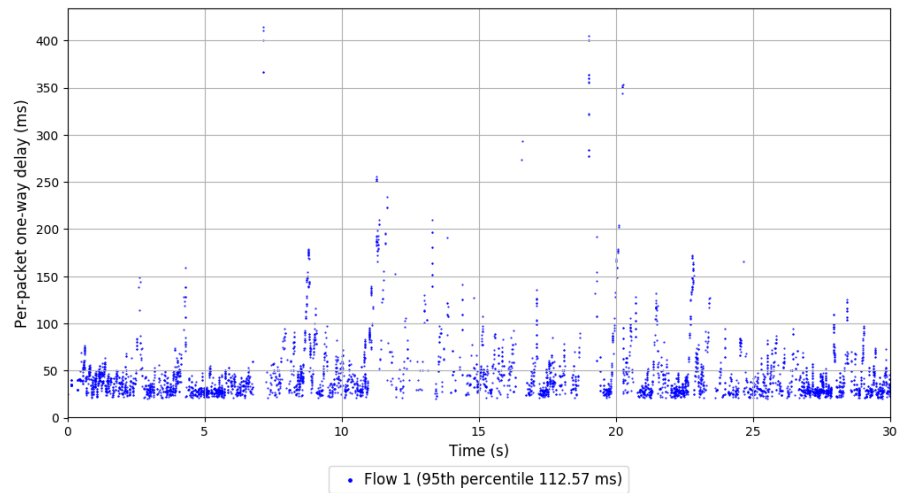
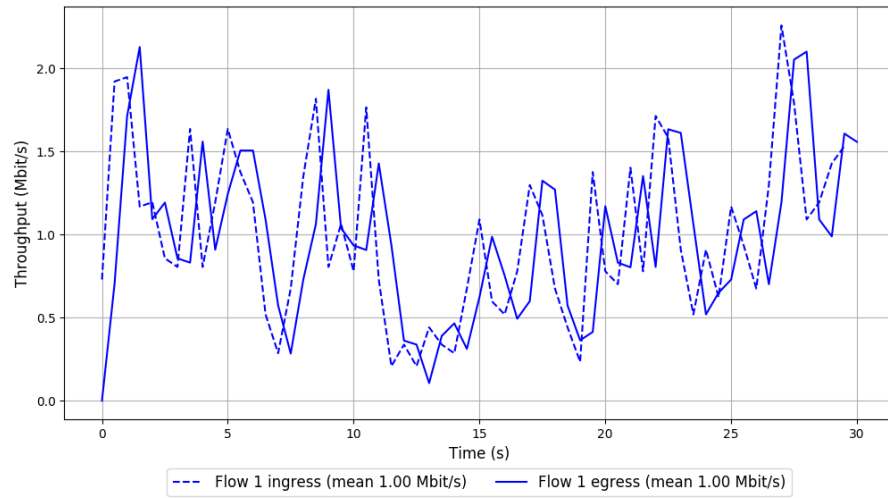


Run 2: Statistics of Copa

Start at: 2018-08-21 18:09:52
End at: 2018-08-21 18:10:22
Local clock offset: -6.165 ms
Remote clock offset: -63.188 ms

Below is generated by plot.py at 2018-08-21 18:44:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 112.567 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.00 Mbit/s
95th percentile per-packet one-way delay: 112.567 ms
Loss rate: 0.00%

Run 2: Report of Copa — Data Link

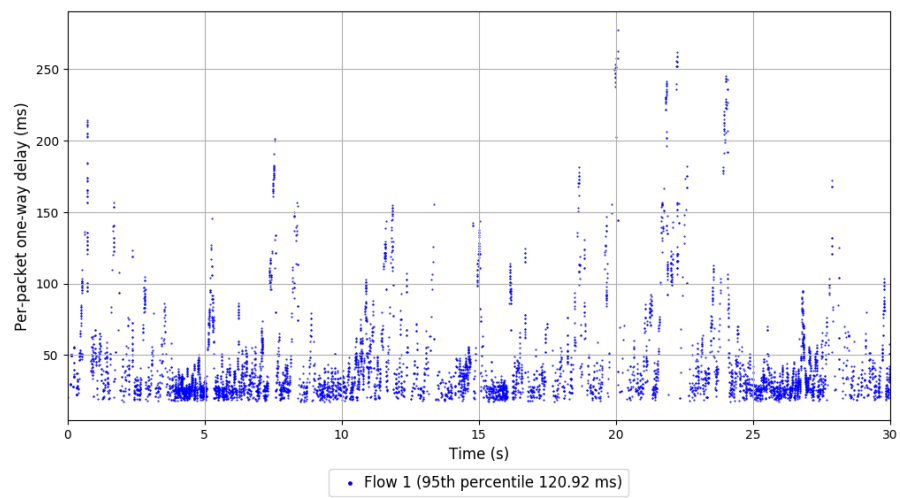
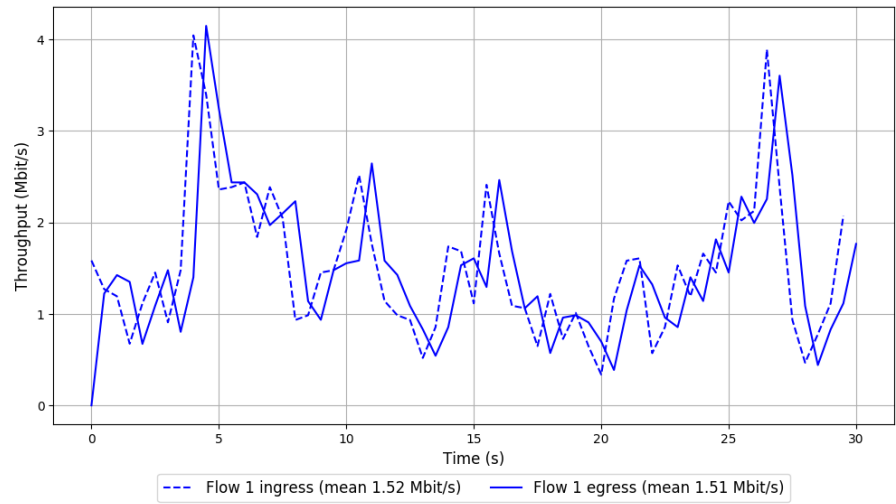


Run 3: Statistics of Copa

Start at: 2018-08-21 18:29:00
End at: 2018-08-21 18:29:30
Local clock offset: -3.444 ms
Remote clock offset: -63.113 ms

Below is generated by plot.py at 2018-08-21 18:44:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 120.921 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 120.921 ms
Loss rate: 0.34%

Run 3: Report of Copa — Data Link

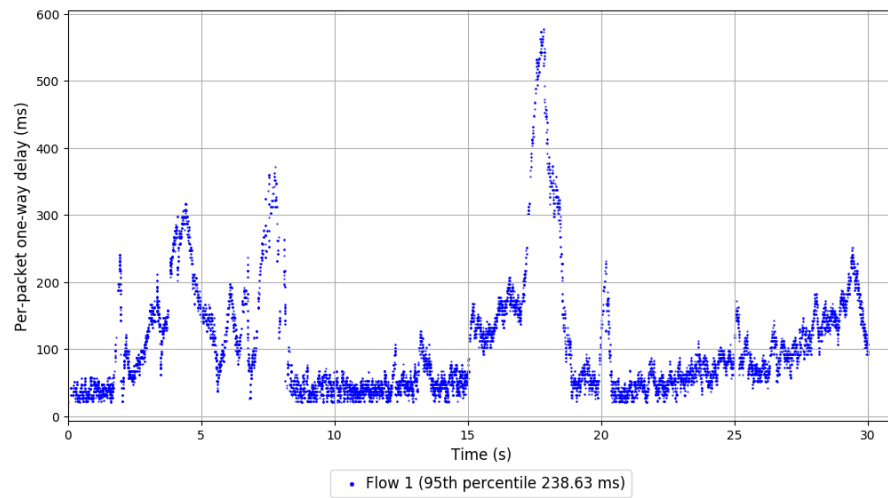
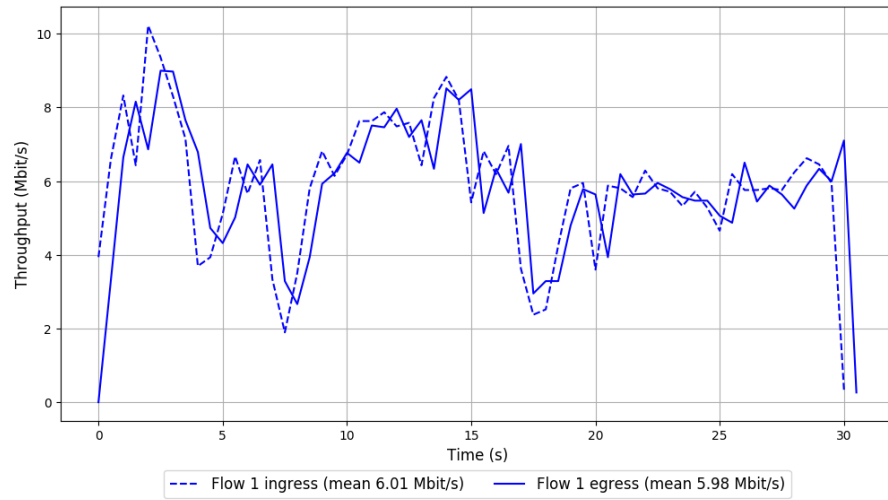


Run 1: Statistics of TCP Cubic

Start at: 2018-08-21 17:56:51
End at: 2018-08-21 17:57:21
Local clock offset: -0.145 ms
Remote clock offset: -61.932 ms

Below is generated by plot.py at 2018-08-21 18:44:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.98 Mbit/s
95th percentile per-packet one-way delay: 238.629 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 5.98 Mbit/s
95th percentile per-packet one-way delay: 238.629 ms
Loss rate: 0.50%

Run 1: Report of TCP Cubic — Data Link

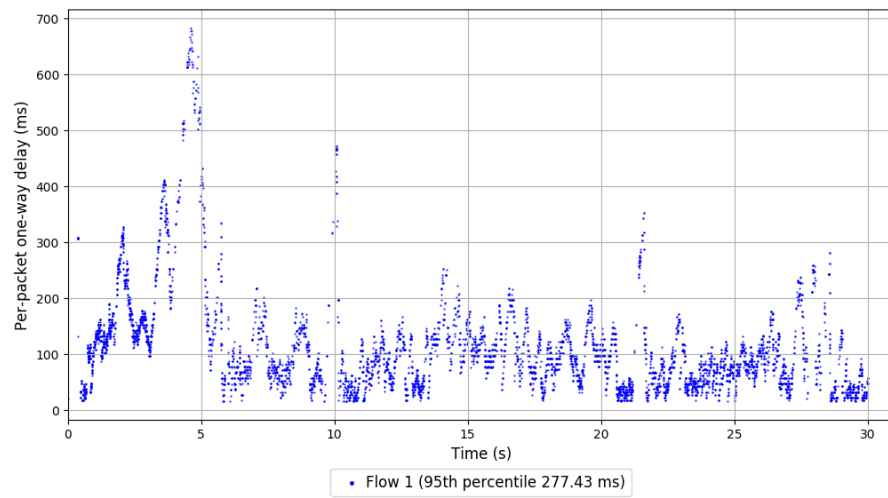
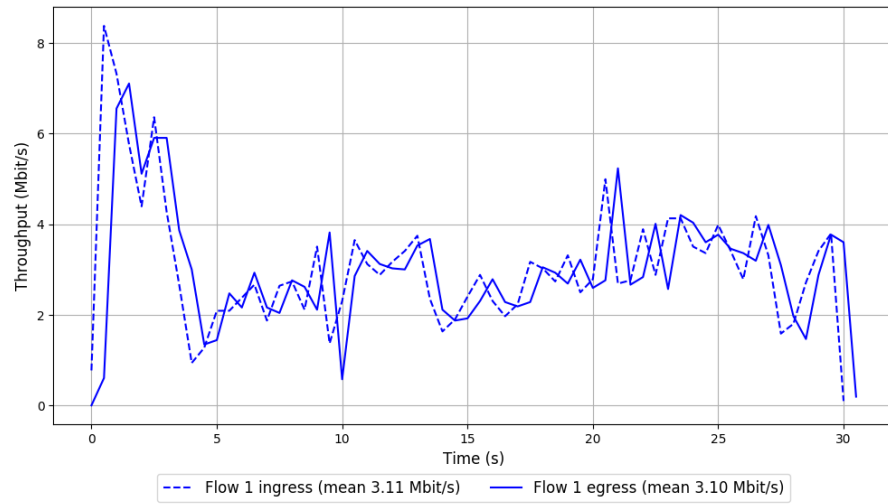


Run 2: Statistics of TCP Cubic

Start at: 2018-08-21 18:15:25
End at: 2018-08-21 18:15:55
Local clock offset: -0.563 ms
Remote clock offset: -62.702 ms

Below is generated by plot.py at 2018-08-21 18:44:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.10 Mbit/s
95th percentile per-packet one-way delay: 277.432 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 3.10 Mbit/s
95th percentile per-packet one-way delay: 277.432 ms
Loss rate: 0.27%

Run 2: Report of TCP Cubic — Data Link

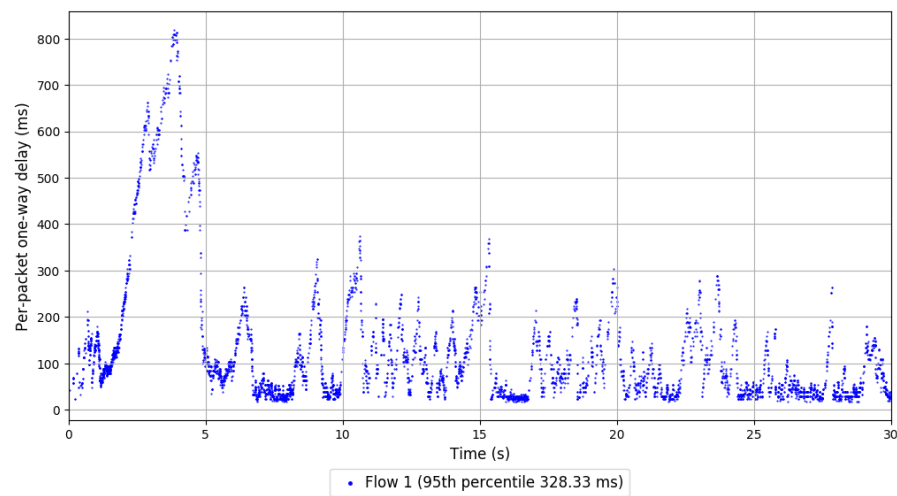
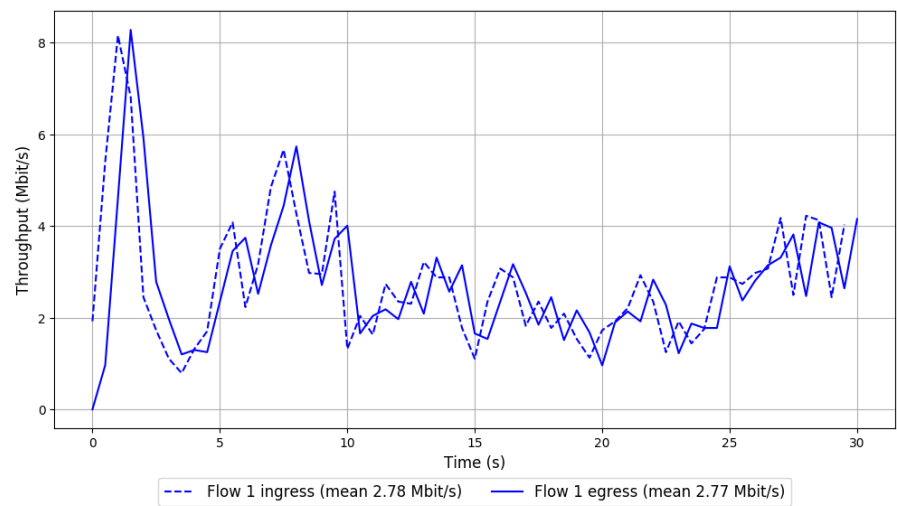


Run 3: Statistics of TCP Cubic

Start at: 2018-08-21 18:34:23
End at: 2018-08-21 18:34:53
Local clock offset: -2.479 ms
Remote clock offset: -64.011 ms

Below is generated by plot.py at 2018-08-21 18:44:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 328.332 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 2.77 Mbit/s
95th percentile per-packet one-way delay: 328.332 ms
Loss rate: 0.48%

Run 3: Report of TCP Cubic — Data Link

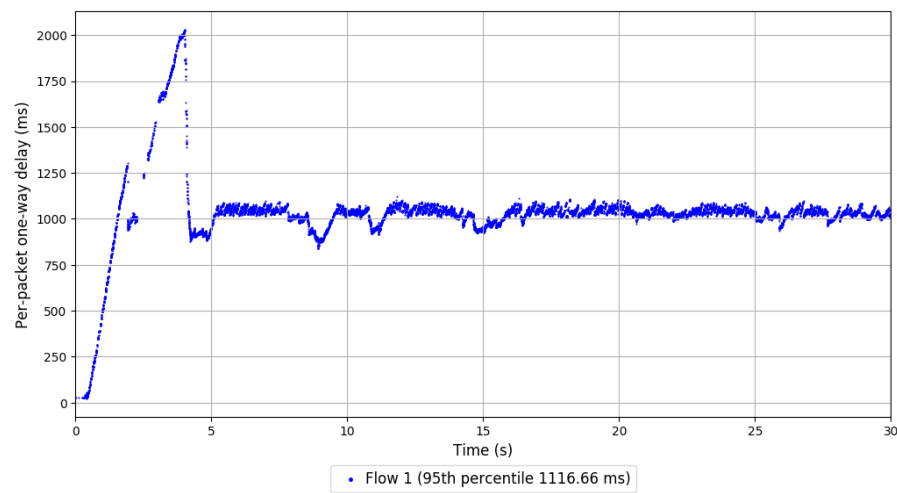
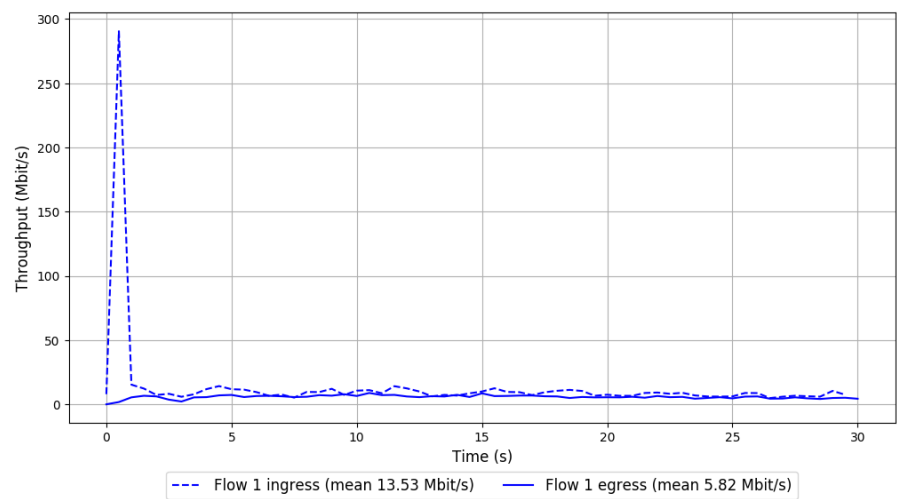


Run 1: Statistics of FillP

Start at: 2018-08-21 17:54:36
End at: 2018-08-21 17:55:06
Local clock offset: -3.537 ms
Remote clock offset: -62.305 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.82 Mbit/s
95th percentile per-packet one-way delay: 1116.661 ms
Loss rate: 56.99%
-- Flow 1:
Average throughput: 5.82 Mbit/s
95th percentile per-packet one-way delay: 1116.661 ms
Loss rate: 56.99%

Run 1: Report of FillP — Data Link

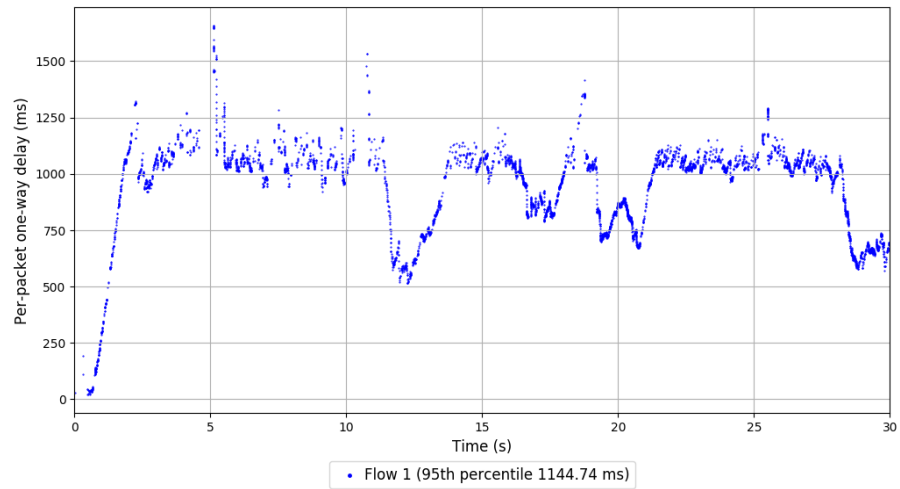
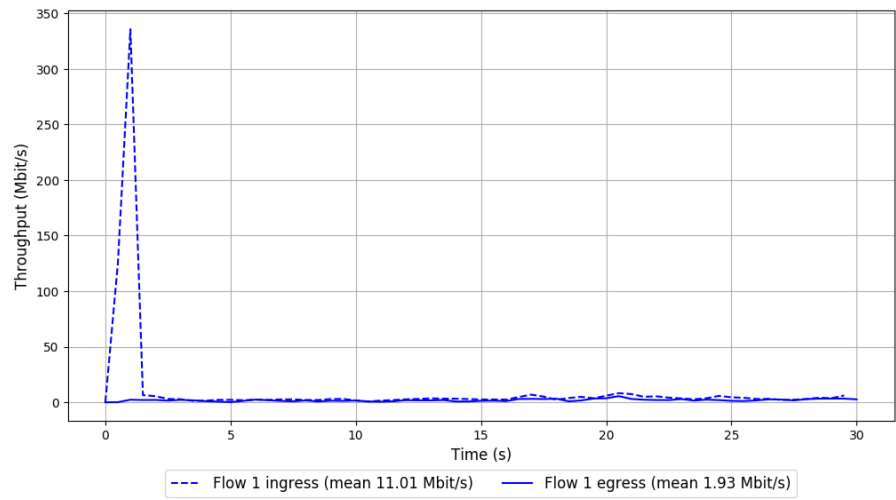


Run 2: Statistics of FillP

Start at: 2018-08-21 18:13:16
End at: 2018-08-21 18:13:46
Local clock offset: -3.815 ms
Remote clock offset: -62.292 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 1144.739 ms
Loss rate: 82.52%
-- Flow 1:
Average throughput: 1.93 Mbit/s
95th percentile per-packet one-way delay: 1144.739 ms
Loss rate: 82.52%

Run 2: Report of FillP — Data Link

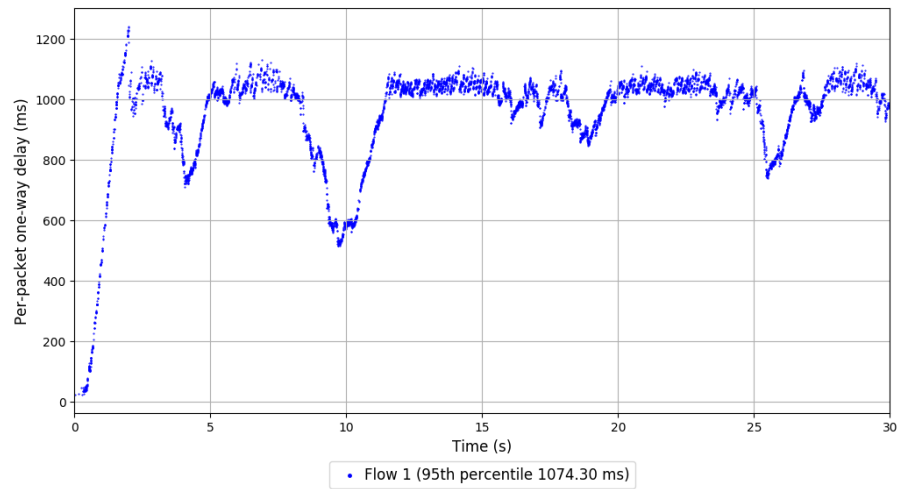
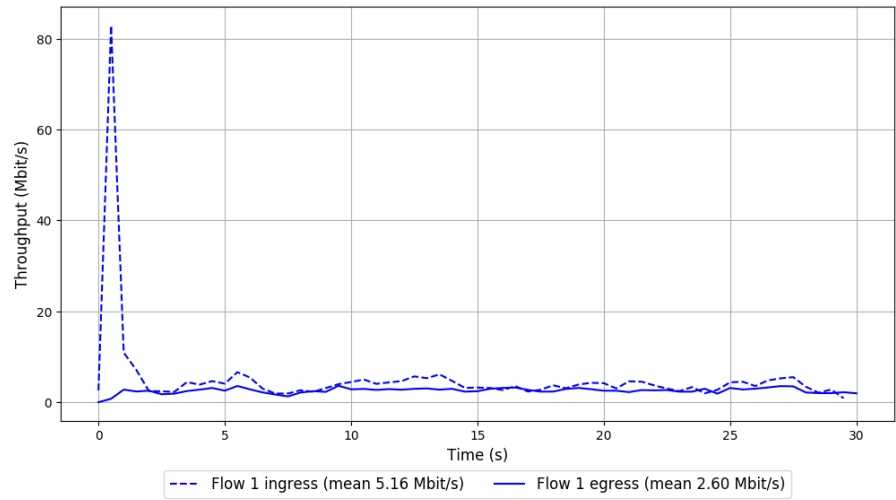


Run 3: Statistics of FillP

Start at: 2018-08-21 18:32:14
End at: 2018-08-21 18:32:44
Local clock offset: -3.669 ms
Remote clock offset: -63.921 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 1074.300 ms
Loss rate: 49.71%
-- Flow 1:
Average throughput: 2.60 Mbit/s
95th percentile per-packet one-way delay: 1074.300 ms
Loss rate: 49.71%

Run 3: Report of FillP — Data Link

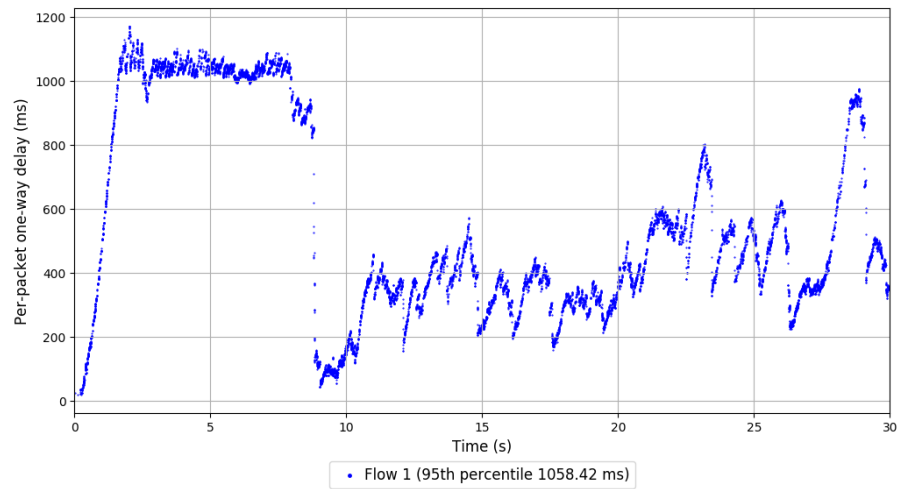
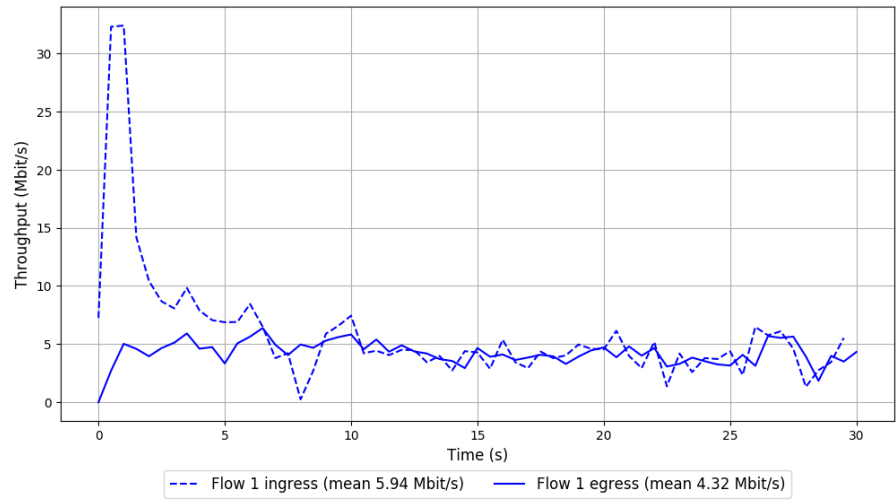


Run 1: Statistics of FillP-Sheep

Start at: 2018-08-21 18:04:25
End at: 2018-08-21 18:04:55
Local clock offset: -2.719 ms
Remote clock offset: -62.289 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.32 Mbit/s
95th percentile per-packet one-way delay: 1058.420 ms
Loss rate: 27.25%
-- Flow 1:
Average throughput: 4.32 Mbit/s
95th percentile per-packet one-way delay: 1058.420 ms
Loss rate: 27.25%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2018-08-21 18:23:23

End at: 2018-08-21 18:23:53

Local clock offset: -3.695 ms

Remote clock offset: -61.862 ms

Below is generated by plot.py at 2018-08-21 18:44:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.28 Mbit/s

95th percentile per-packet one-way delay: 1010.221 ms

Loss rate: 14.20%

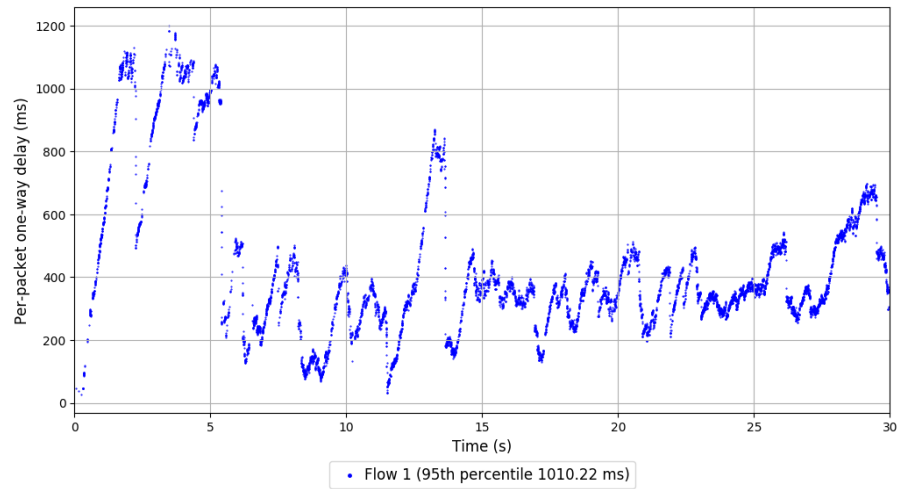
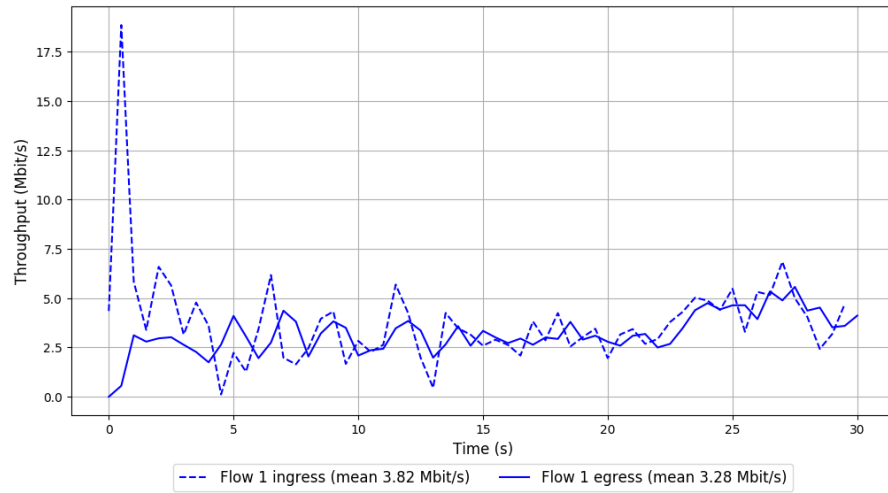
-- Flow 1:

Average throughput: 3.28 Mbit/s

95th percentile per-packet one-way delay: 1010.221 ms

Loss rate: 14.20%

Run 2: Report of FillP-Sheep — Data Link

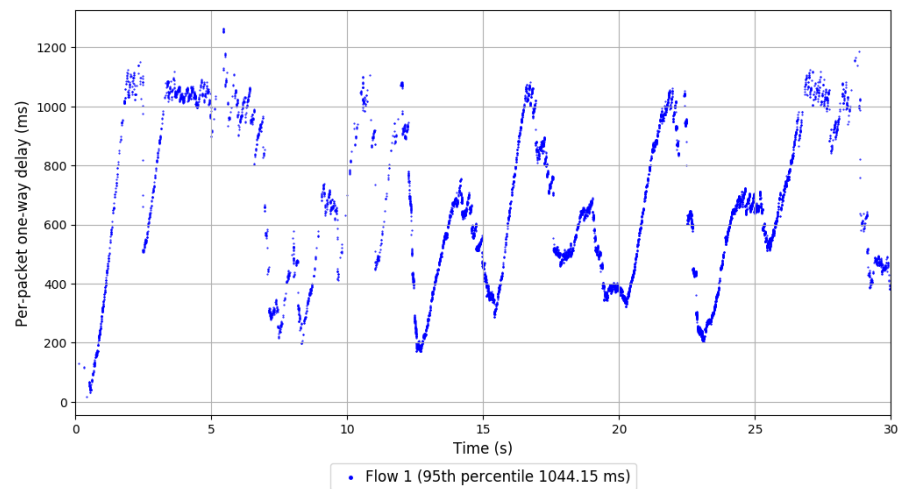
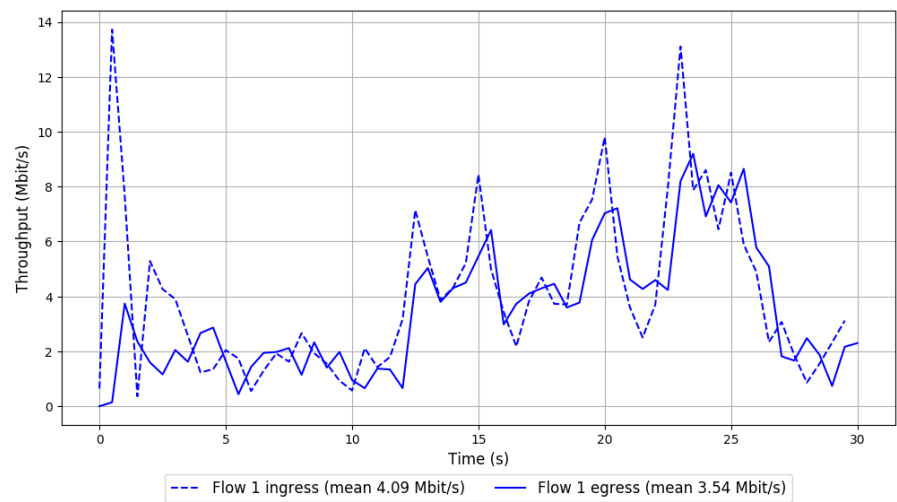


Run 3: Statistics of FillP-Sheep

Start at: 2018-08-21 18:42:10
End at: 2018-08-21 18:42:40
Local clock offset: -0.924 ms
Remote clock offset: -65.306 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 1044.150 ms
Loss rate: 13.94%
-- Flow 1:
Average throughput: 3.54 Mbit/s
95th percentile per-packet one-way delay: 1044.150 ms
Loss rate: 13.94%

Run 3: Report of FillP-Sheep — Data Link

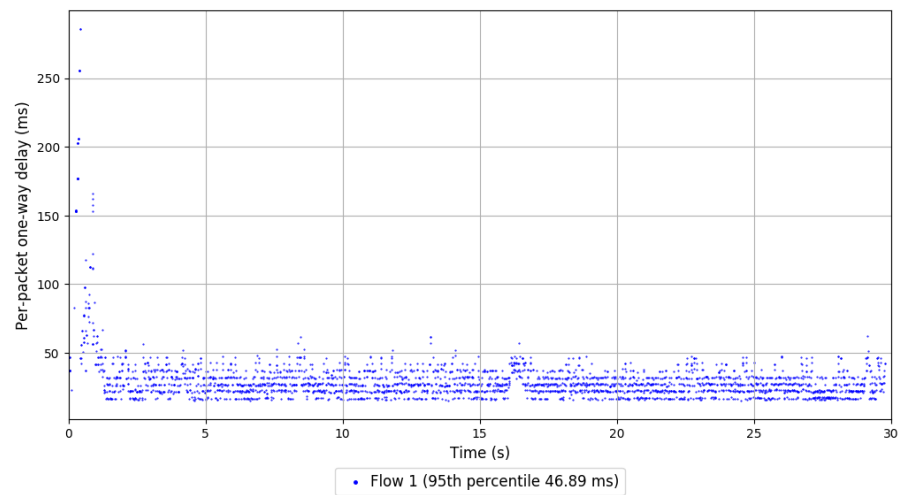
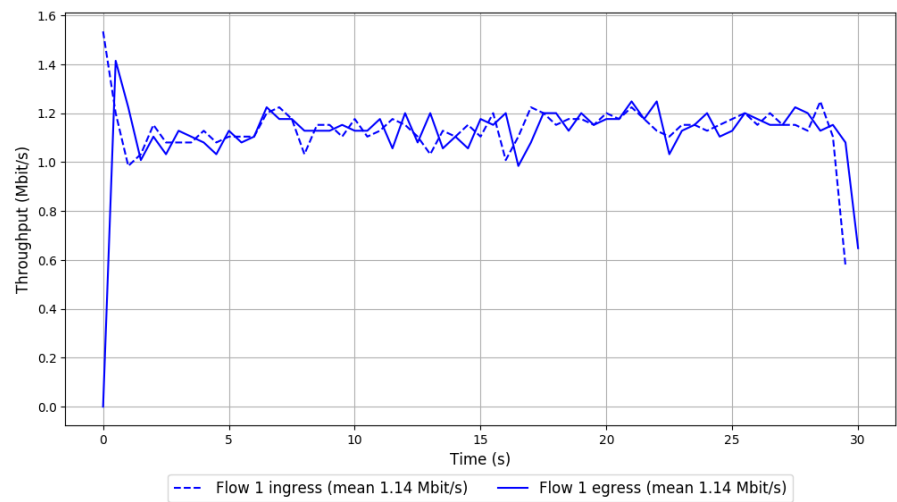


Run 1: Statistics of Indigo

Start at: 2018-08-21 18:05:30
End at: 2018-08-21 18:06:00
Local clock offset: -3.016 ms
Remote clock offset: -62.029 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 46.887 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 1.14 Mbit/s
95th percentile per-packet one-way delay: 46.887 ms
Loss rate: 0.07%

Run 1: Report of Indigo — Data Link

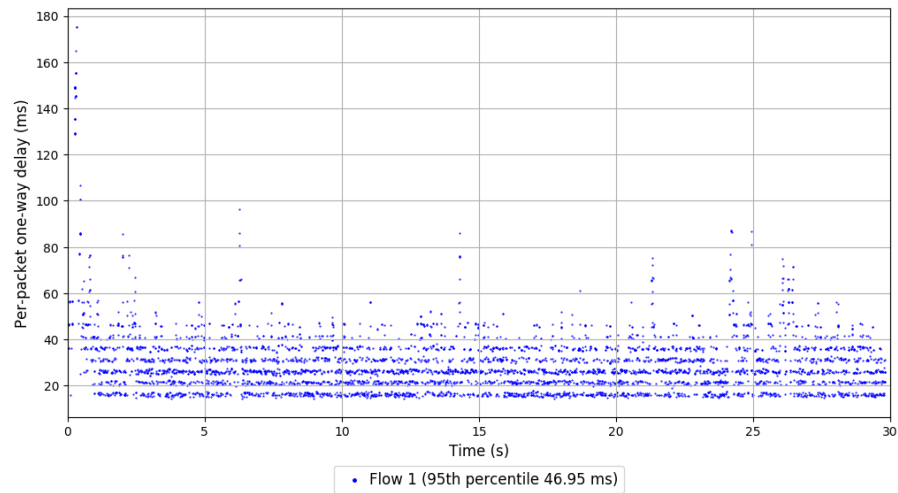
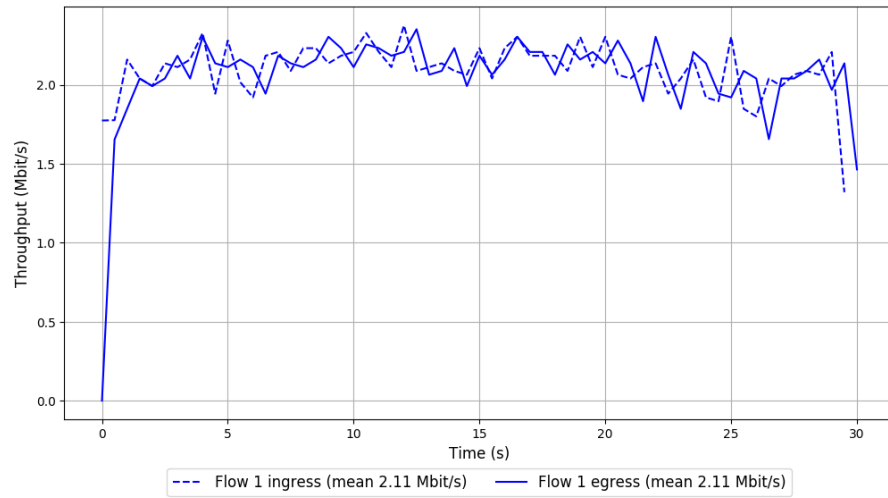


Run 2: Statistics of Indigo

Start at: 2018-08-21 18:24:27
End at: 2018-08-21 18:24:57
Local clock offset: -6.322 ms
Remote clock offset: -65.712 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 46.945 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 46.945 ms
Loss rate: 0.04%

Run 2: Report of Indigo — Data Link

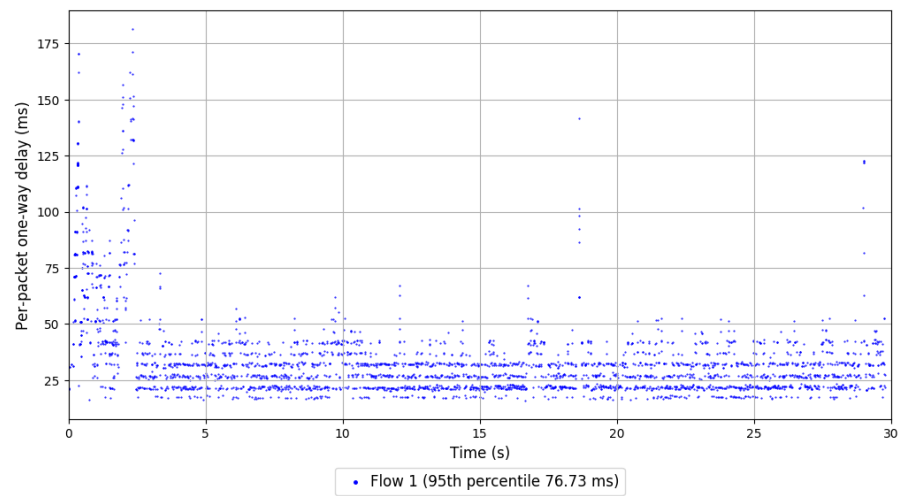
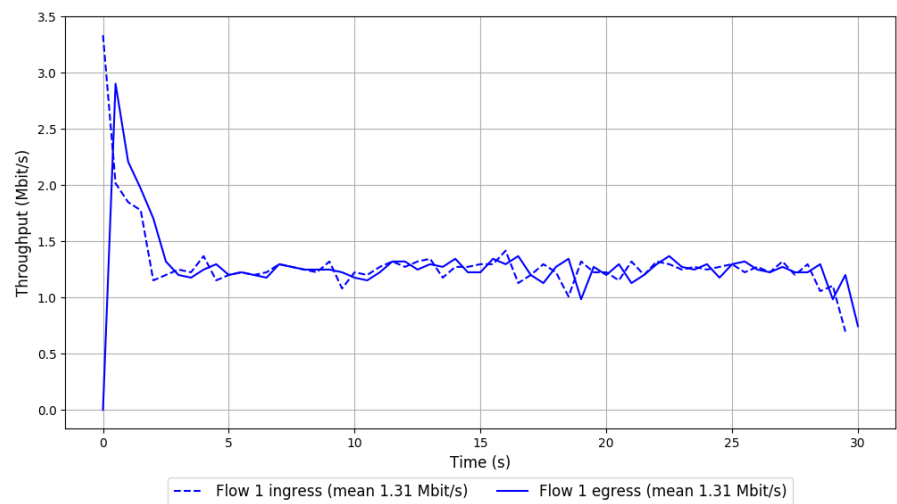


Run 3: Statistics of Indigo

Start at: 2018-08-21 18:43:15
End at: 2018-08-21 18:43:45
Local clock offset: 0.471 ms
Remote clock offset: -64.888 ms

Below is generated by plot.py at 2018-08-21 18:44:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 76.735 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 76.735 ms
Loss rate: 0.06%

Run 3: Report of Indigo — Data Link

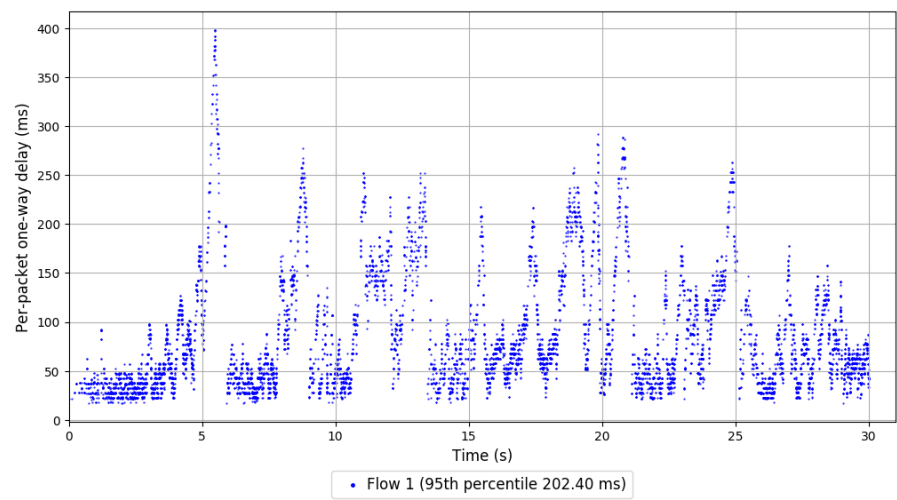
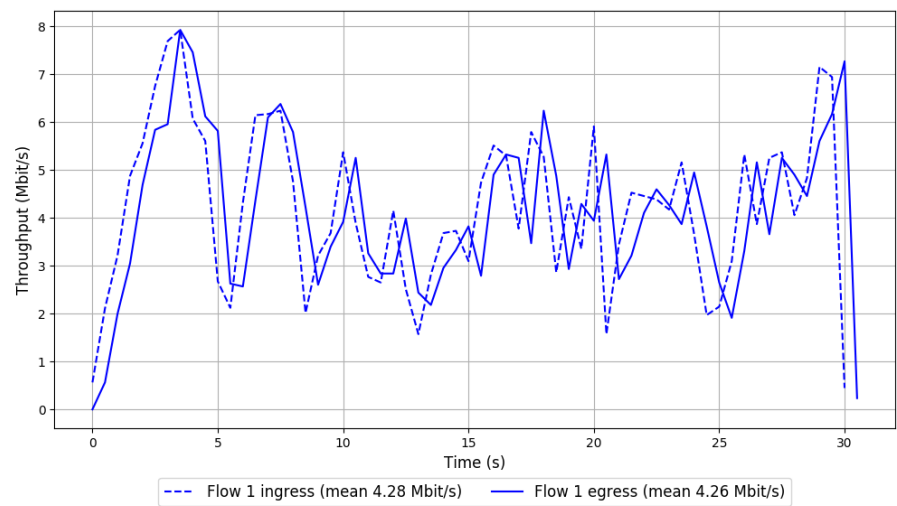


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Run 1: Statistics of LEDBAT

Start at: 2018-08-21 18:02:15
End at: 2018-08-21 18:02:45
Local clock offset: -1.338 ms
Remote clock offset: -63.146 ms

# Below is generated by plot.py at 2018-08-21 18:44:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.26 Mbit/s
95th percentile per-packet one-way delay: 202.404 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 4.26 Mbit/s
95th percentile per-packet one-way delay: 202.404 ms
Loss rate: 0.38%
```

Run 1: Report of LEDBAT — Data Link

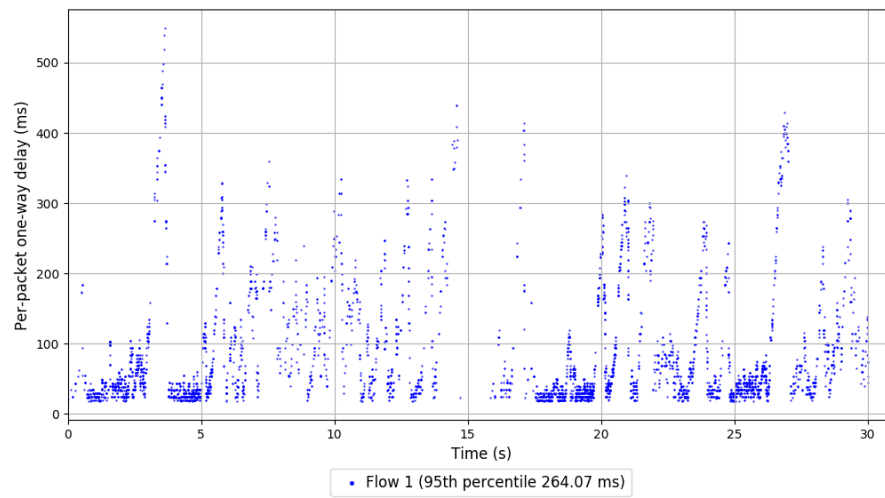
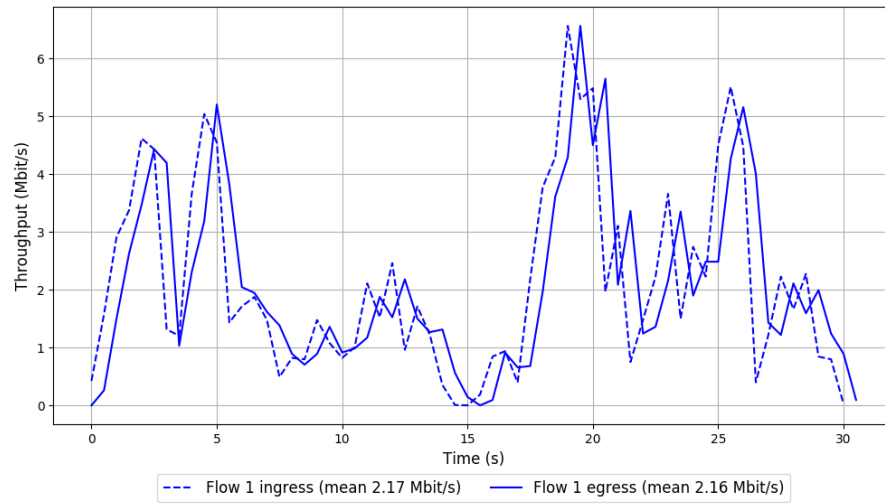


Run 2: Statistics of LEDBAT

Start at: 2018-08-21 18:21:13
End at: 2018-08-21 18:21:43
Local clock offset: -0.996 ms
Remote clock offset: -62.453 ms

Below is generated by plot.py at 2018-08-21 18:44:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 264.073 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 264.073 ms
Loss rate: 0.23%

Run 2: Report of LEDBAT — Data Link

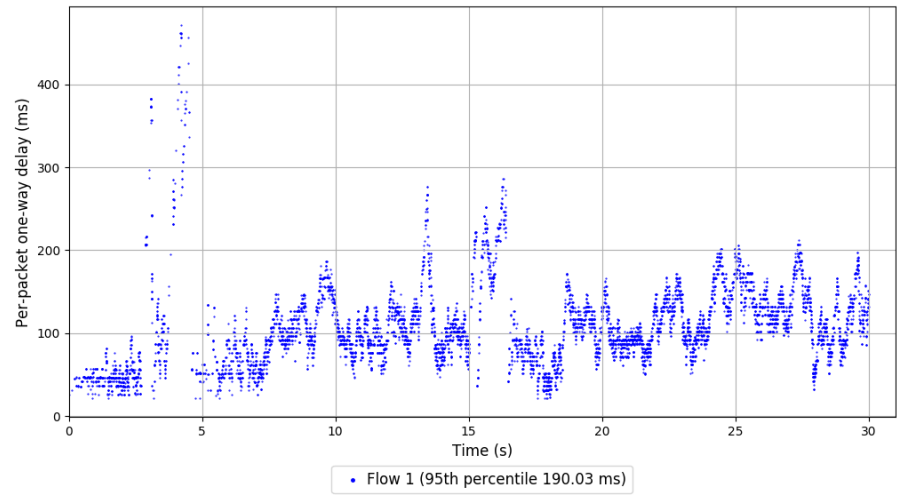
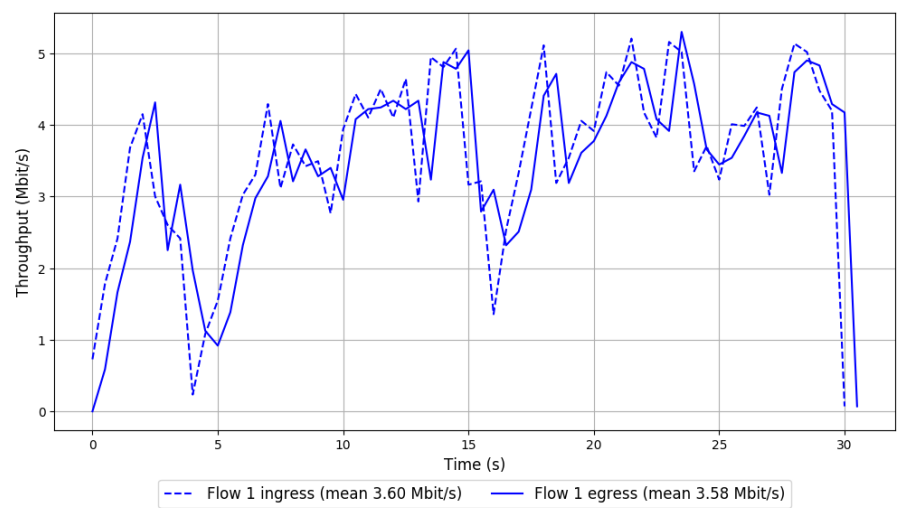


Run 3: Statistics of LEDBAT

Start at: 2018-08-21 18:40:00
End at: 2018-08-21 18:40:30
Local clock offset: -5.257 ms
Remote clock offset: -64.45 ms

Below is generated by plot.py at 2018-08-21 18:44:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.58 Mbit/s
95th percentile per-packet one-way delay: 190.028 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 3.58 Mbit/s
95th percentile per-packet one-way delay: 190.028 ms
Loss rate: 0.58%

Run 3: Report of LEDBAT — Data Link

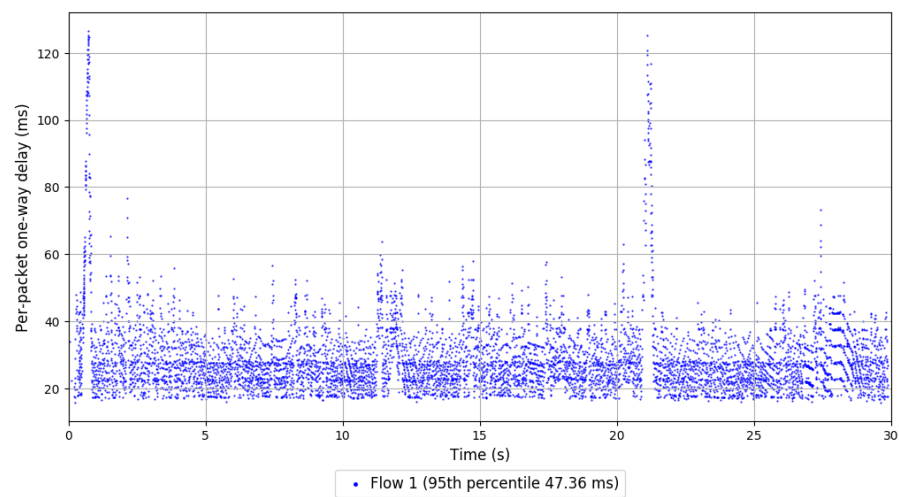
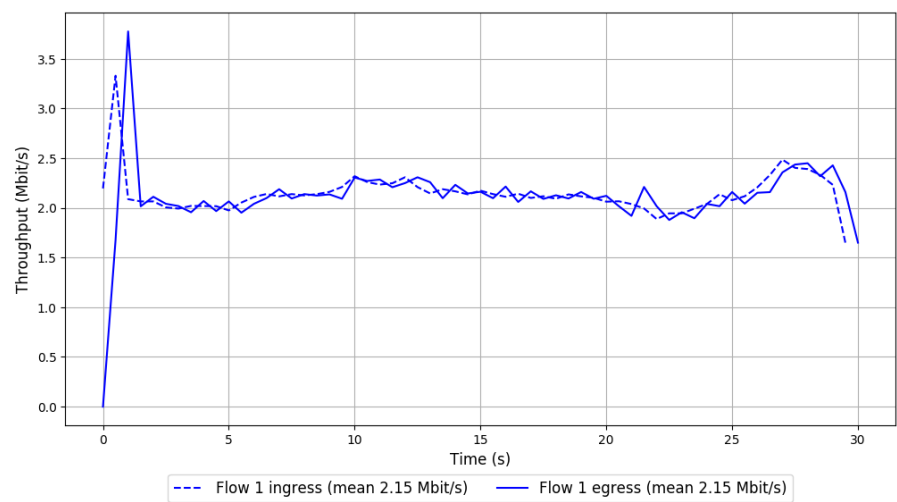


```
Run 1: Statistics of PCC-Allegro

Start at: 2018-08-21 18:01:10
End at: 2018-08-21 18:01:40
Local clock offset: -0.581 ms
Remote clock offset: -62.799 ms

# Below is generated by plot.py at 2018-08-21 18:44:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 47.361 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 47.361 ms
Loss rate: 0.13%
```

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-08-21 18:20:08

End at: 2018-08-21 18:20:38

Local clock offset: -1.065 ms

Remote clock offset: -61.928 ms

Below is generated by plot.py at 2018-08-21 18:44:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.16 Mbit/s

95th percentile per-packet one-way delay: 1100.577 ms

Loss rate: 50.54%

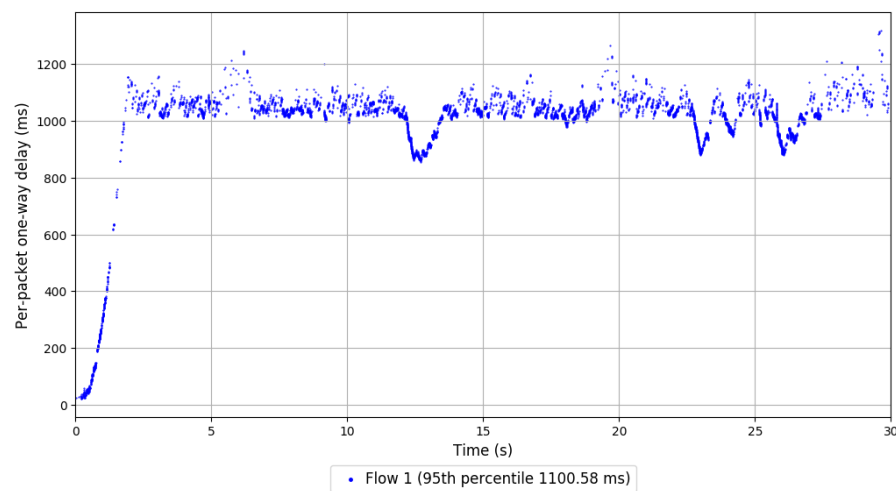
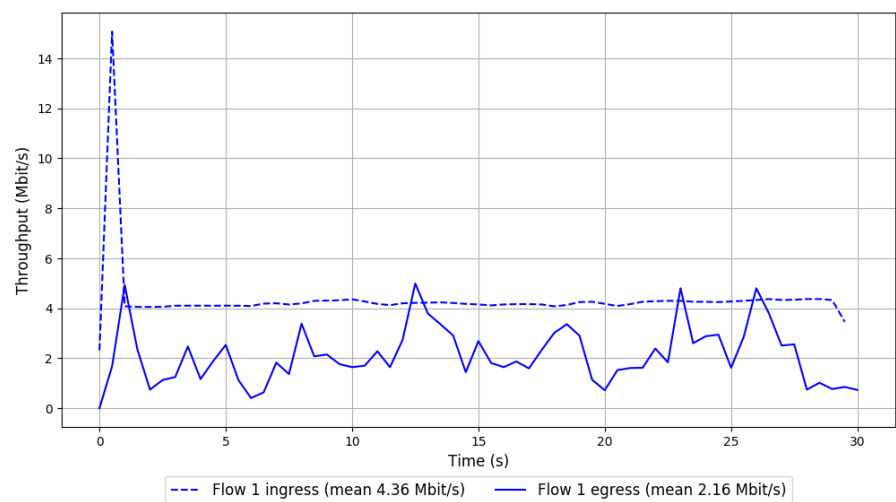
-- Flow 1:

Average throughput: 2.16 Mbit/s

95th percentile per-packet one-way delay: 1100.577 ms

Loss rate: 50.54%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-08-21 18:38:56

End at: 2018-08-21 18:39:26

Local clock offset: -3.56 ms

Remote clock offset: -65.228 ms

Below is generated by plot.py at 2018-08-21 18:44:12

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.24 Mbit/s

95th percentile per-packet one-way delay: 53.686 ms

Loss rate: 0.13%

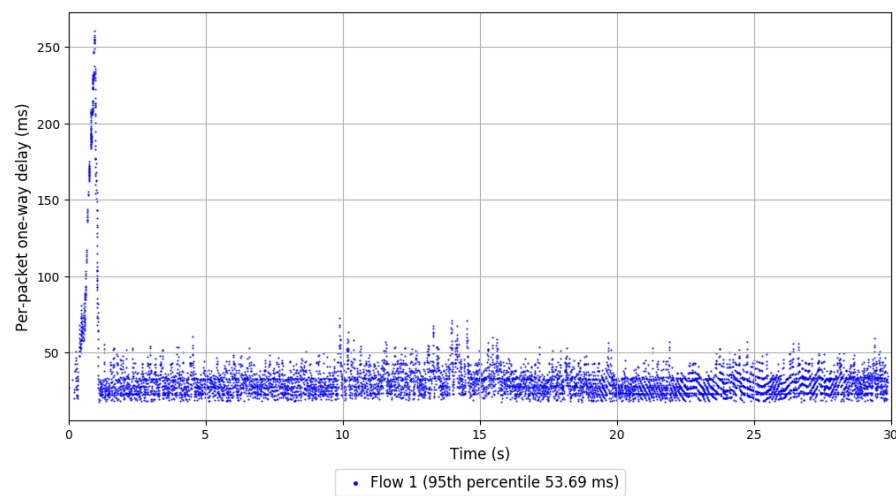
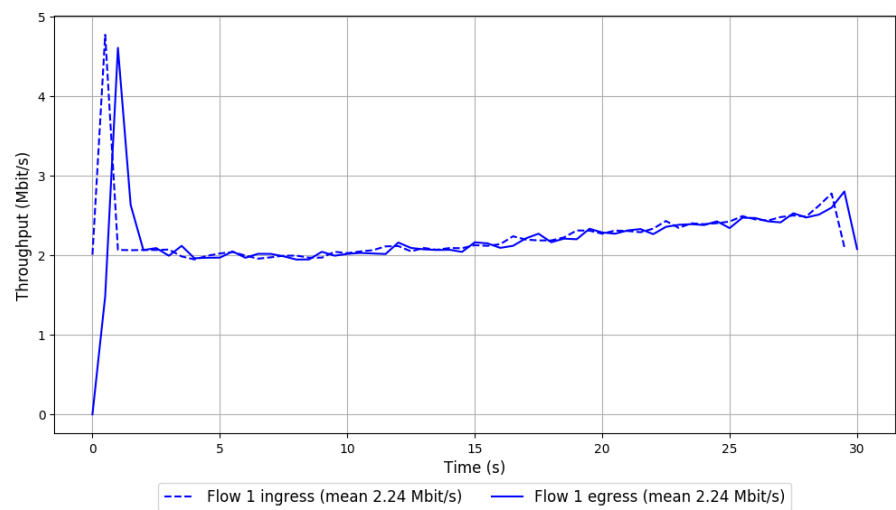
-- Flow 1:

Average throughput: 2.24 Mbit/s

95th percentile per-packet one-way delay: 53.686 ms

Loss rate: 0.13%

Run 3: Report of PCC-Allegro — Data Link

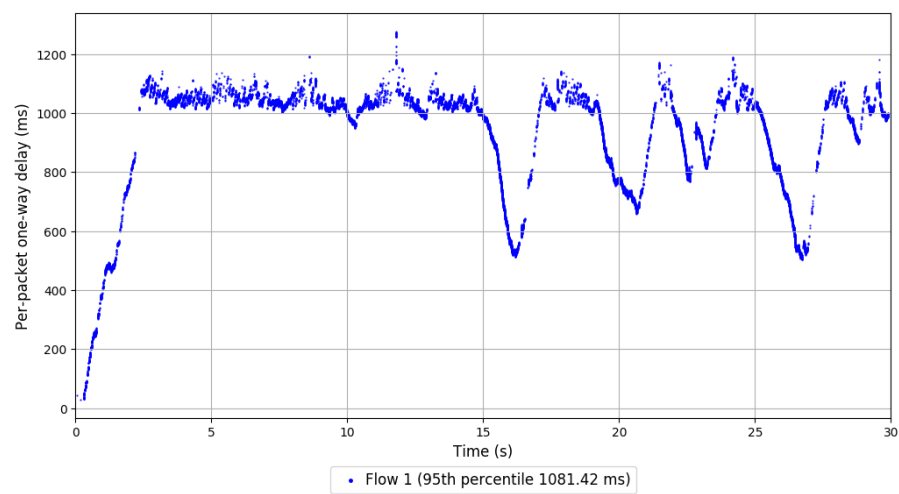
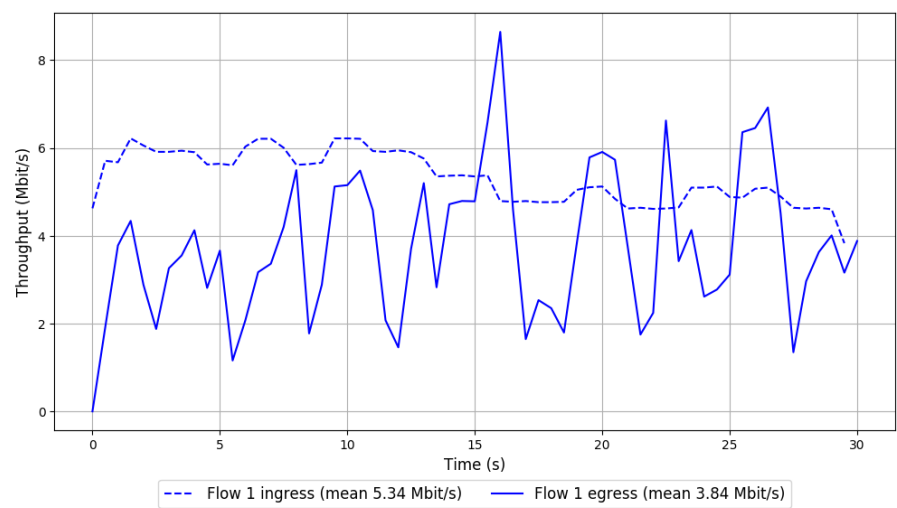


Run 1: Statistics of PCC-Expr

Start at: 2018-08-21 17:59:01
End at: 2018-08-21 17:59:31
Local clock offset: -2.631 ms
Remote clock offset: -62.484 ms

Below is generated by plot.py at 2018-08-21 18:44:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.84 Mbit/s
95th percentile per-packet one-way delay: 1081.425 ms
Loss rate: 28.24%
-- Flow 1:
Average throughput: 3.84 Mbit/s
95th percentile per-packet one-way delay: 1081.425 ms
Loss rate: 28.24%

Run 1: Report of PCC-Expr — Data Link

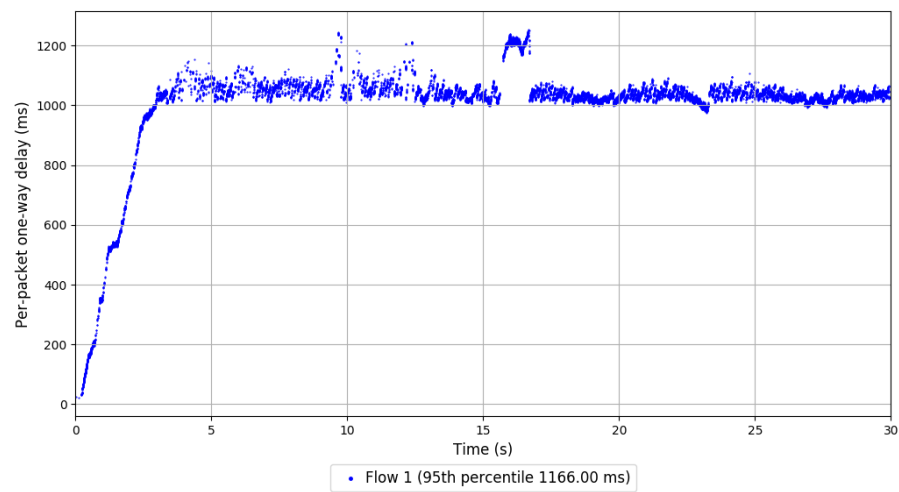
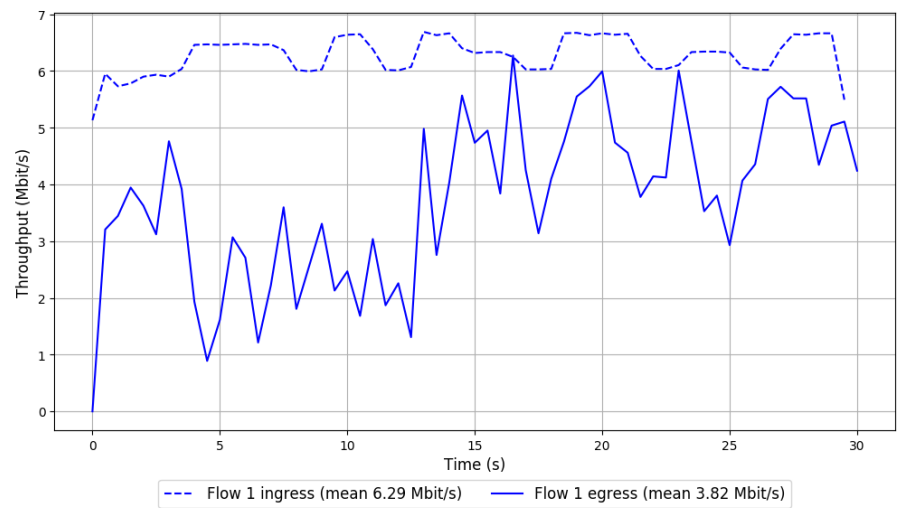


Run 2: Statistics of PCC-Expr

Start at: 2018-08-21 18:17:53
End at: 2018-08-21 18:18:24
Local clock offset: -2.947 ms
Remote clock offset: -61.918 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.82 Mbit/s
95th percentile per-packet one-way delay: 1165.997 ms
Loss rate: 39.39%
-- Flow 1:
Average throughput: 3.82 Mbit/s
95th percentile per-packet one-way delay: 1165.997 ms
Loss rate: 39.39%

Run 2: Report of PCC-Expr — Data Link

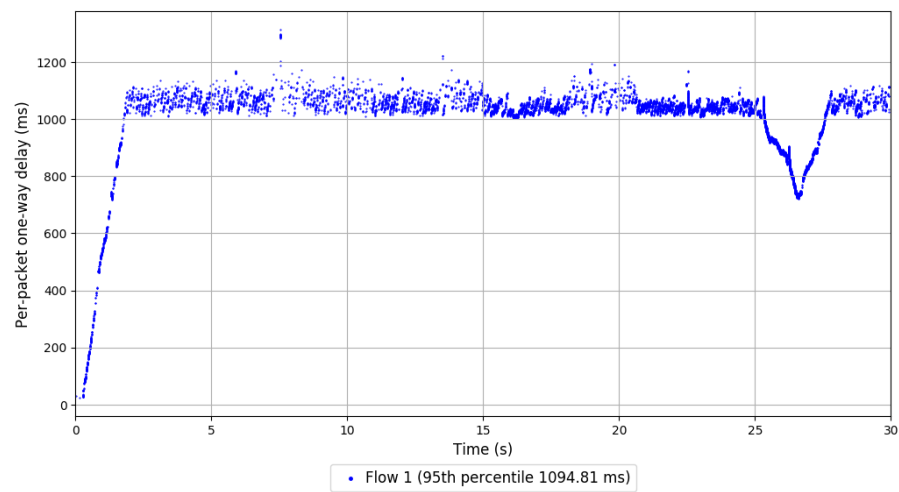
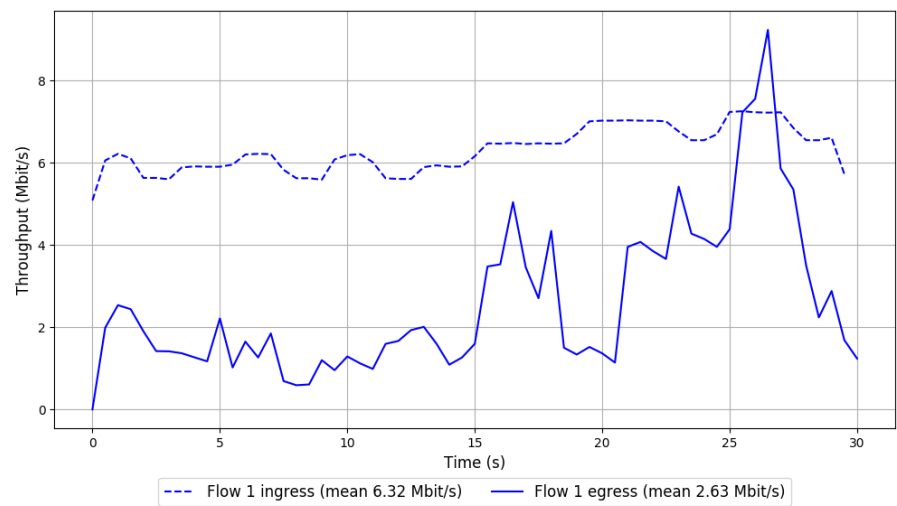


Run 3: Statistics of PCC-Expr

Start at: 2018-08-21 18:36:32
End at: 2018-08-21 18:37:02
Local clock offset: -2.238 ms
Remote clock offset: -64.705 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.63 Mbit/s
95th percentile per-packet one-way delay: 1094.809 ms
Loss rate: 58.38%
-- Flow 1:
Average throughput: 2.63 Mbit/s
95th percentile per-packet one-way delay: 1094.809 ms
Loss rate: 58.38%

Run 3: Report of PCC-Expr — Data Link

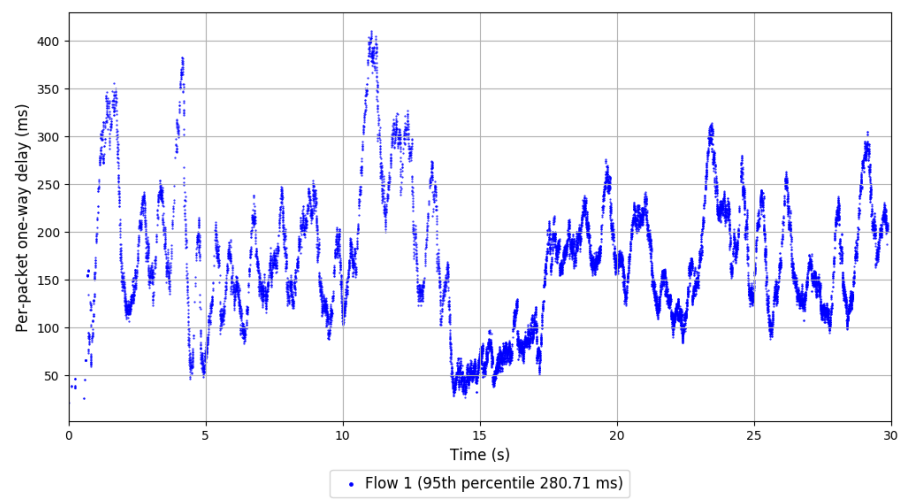
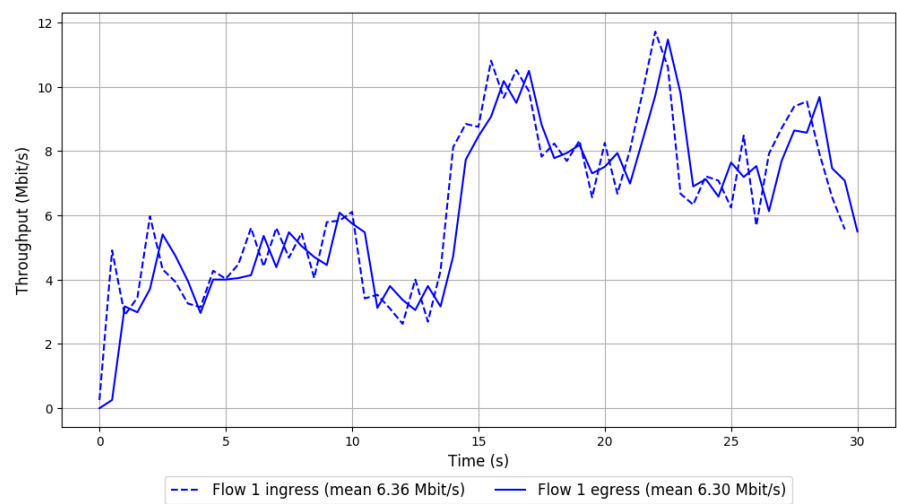


Run 1: Statistics of QUIC Cubic

Start at: 2018-08-21 17:52:27
End at: 2018-08-21 17:52:57
Local clock offset: -2.931 ms
Remote clock offset: -63.851 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.30 Mbit/s
95th percentile per-packet one-way delay: 280.706 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 6.30 Mbit/s
95th percentile per-packet one-way delay: 280.706 ms
Loss rate: 0.94%

Run 1: Report of QUIC Cubic — Data Link

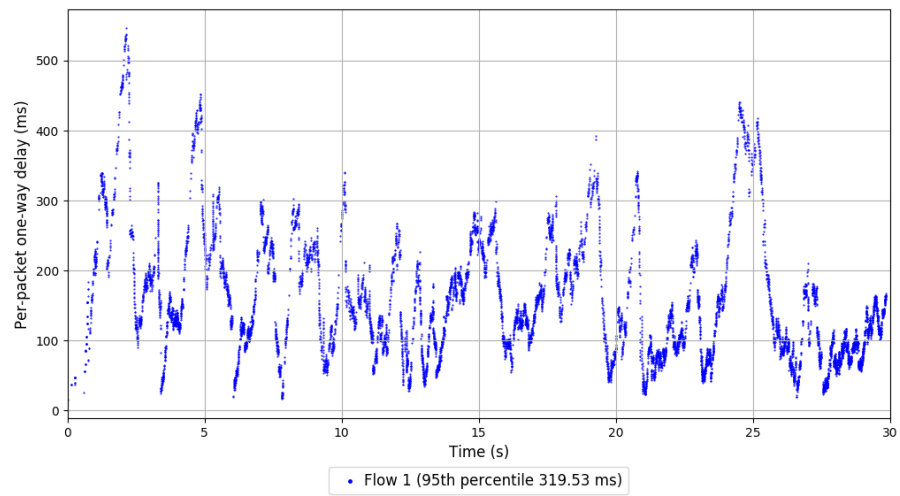
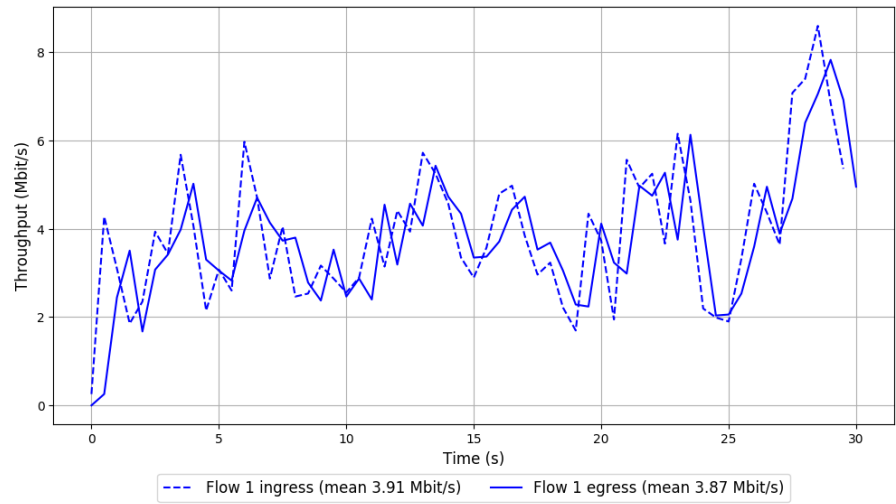


Run 2: Statistics of QUIC Cubic

Start at: 2018-08-21 18:10:59
End at: 2018-08-21 18:11:29
Local clock offset: -0.999 ms
Remote clock offset: -62.419 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.87 Mbit/s
95th percentile per-packet one-way delay: 319.531 ms
Loss rate: 1.23%
-- Flow 1:
Average throughput: 3.87 Mbit/s
95th percentile per-packet one-way delay: 319.531 ms
Loss rate: 1.23%

Run 2: Report of QUIC Cubic — Data Link

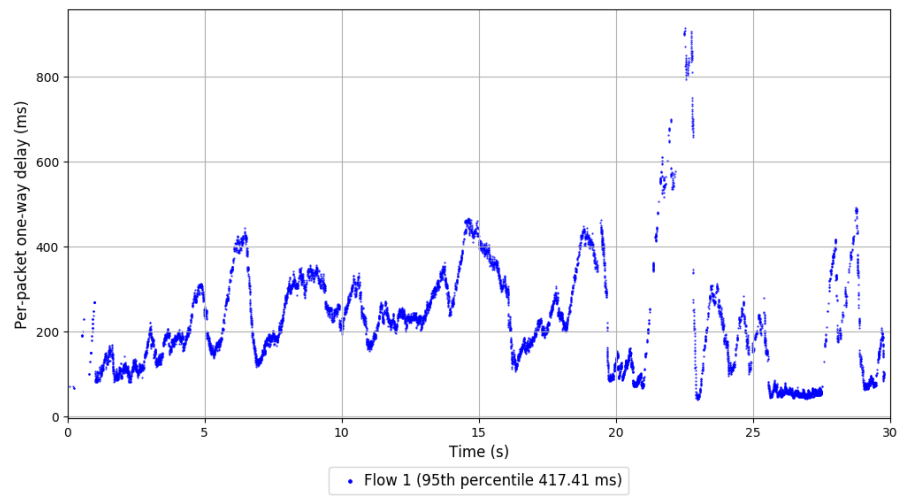
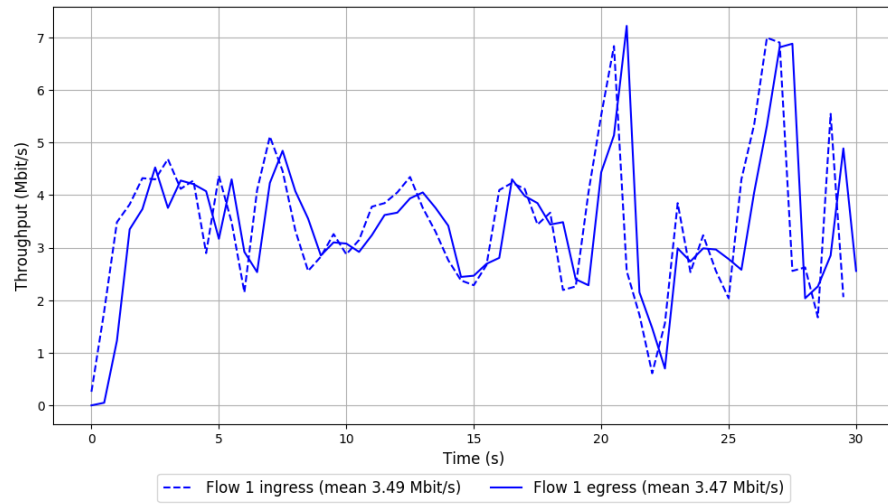


Run 3: Statistics of QUIC Cubic

Start at: 2018-08-21 18:30:05
End at: 2018-08-21 18:30:35
Local clock offset: -2.802 ms
Remote clock offset: -63.634 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.47 Mbit/s
95th percentile per-packet one-way delay: 417.410 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 3.47 Mbit/s
95th percentile per-packet one-way delay: 417.410 ms
Loss rate: 0.70%

Run 3: Report of QUIC Cubic — Data Link

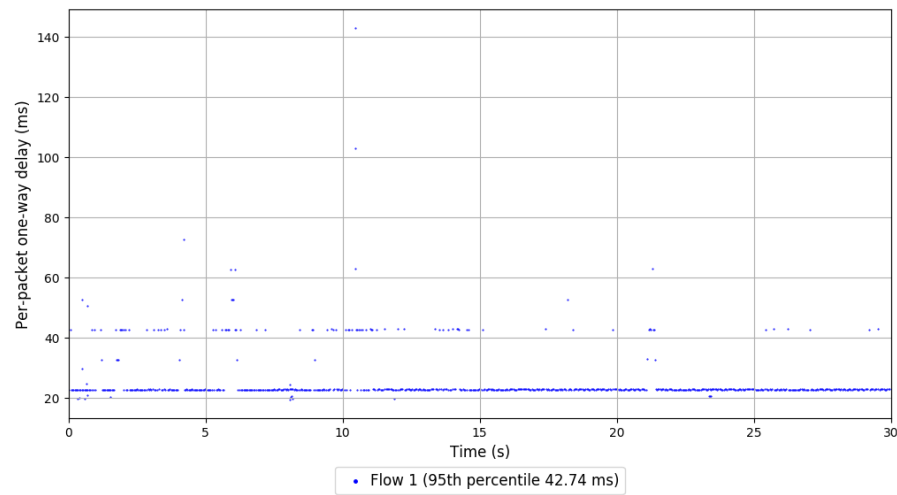
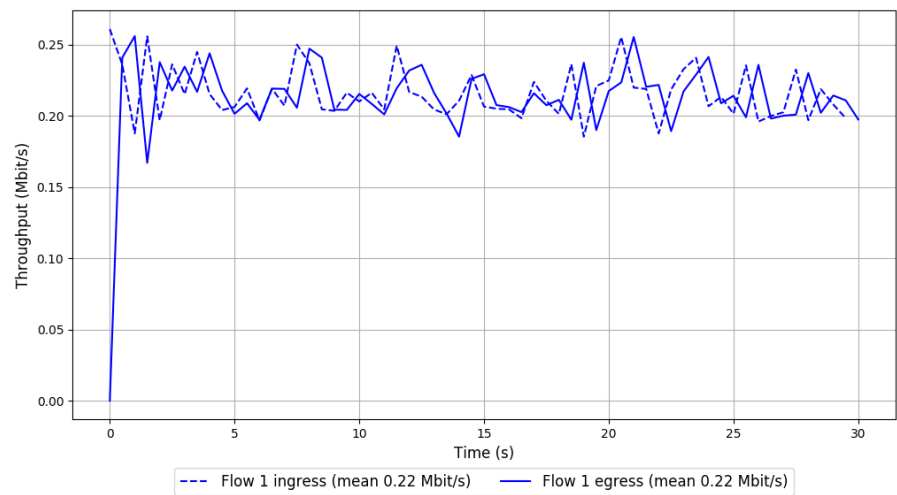


Run 1: Statistics of SCReAM

Start at: 2018-08-21 17:49:13
End at: 2018-08-21 17:49:43
Local clock offset: -2.337 ms
Remote clock offset: -63.73 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 42.742 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 42.742 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link

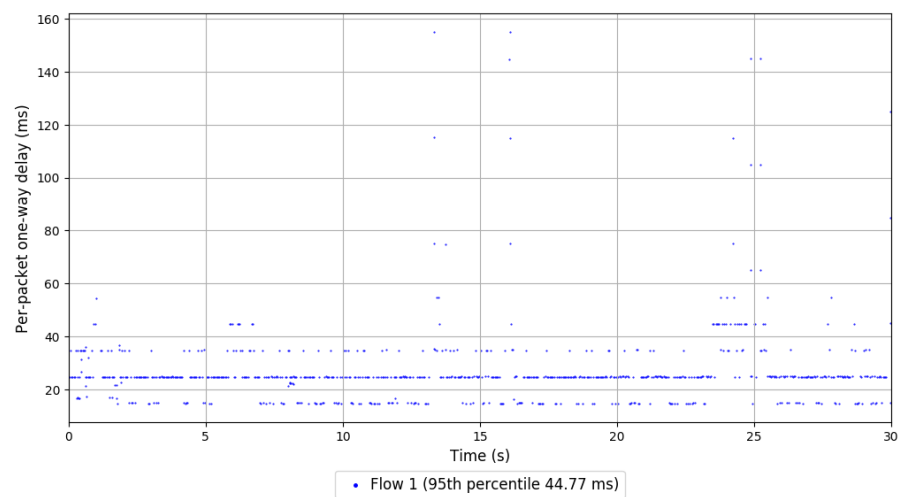
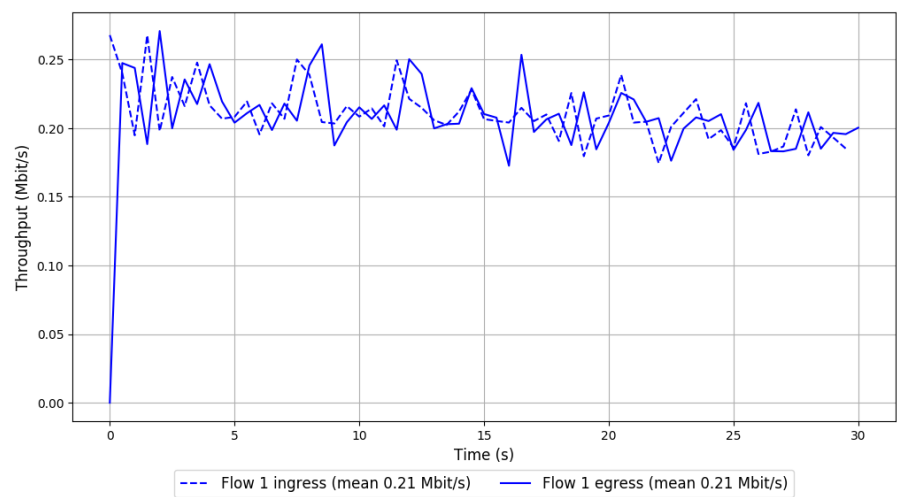


Run 2: Statistics of SCReAM

Start at: 2018-08-21 18:07:39
End at: 2018-08-21 18:08:09
Local clock offset: -2.241 ms
Remote clock offset: -62.184 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 44.770 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 44.770 ms
Loss rate: 0.00%

Run 2: Report of SReAM — Data Link

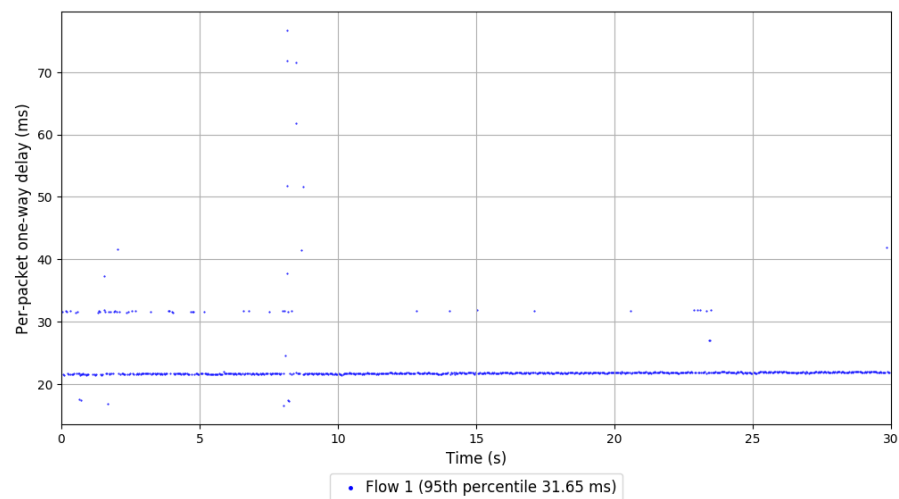
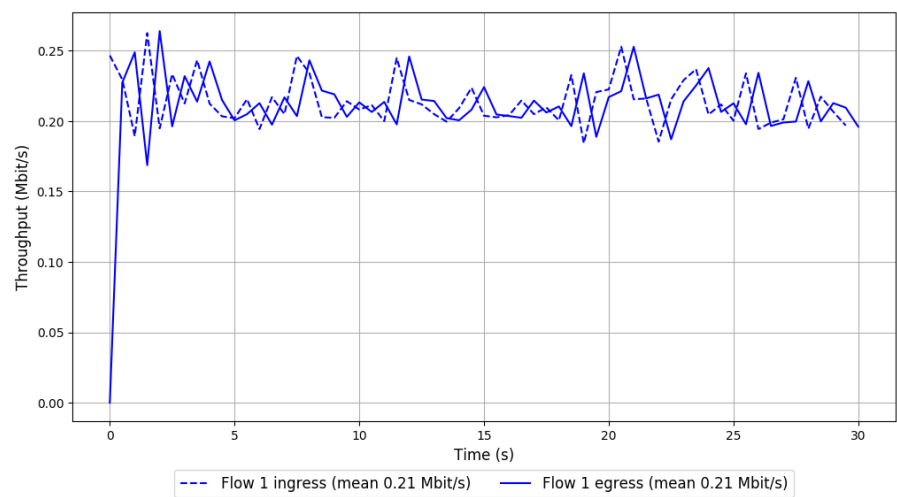


Run 3: Statistics of SCReAM

Start at: 2018-08-21 18:26:50
End at: 2018-08-21 18:27:20
Local clock offset: -2.105 ms
Remote clock offset: -61.496 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 31.651 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 31.651 ms
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

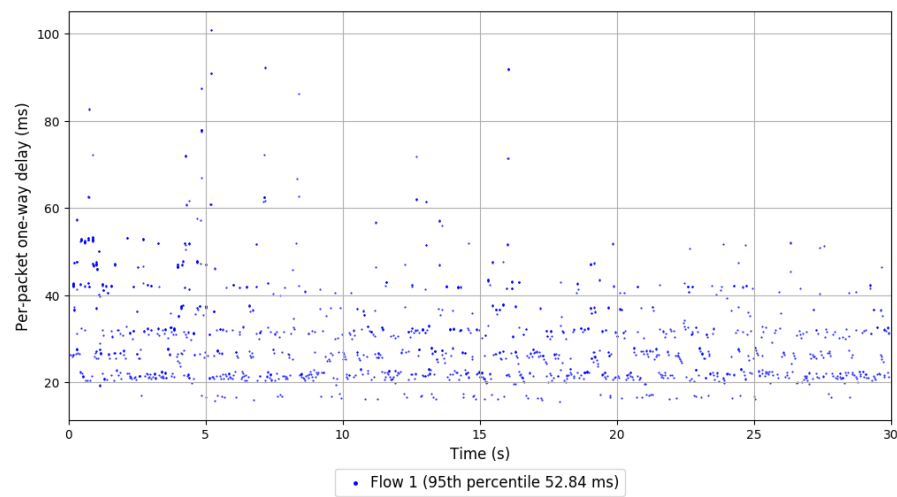
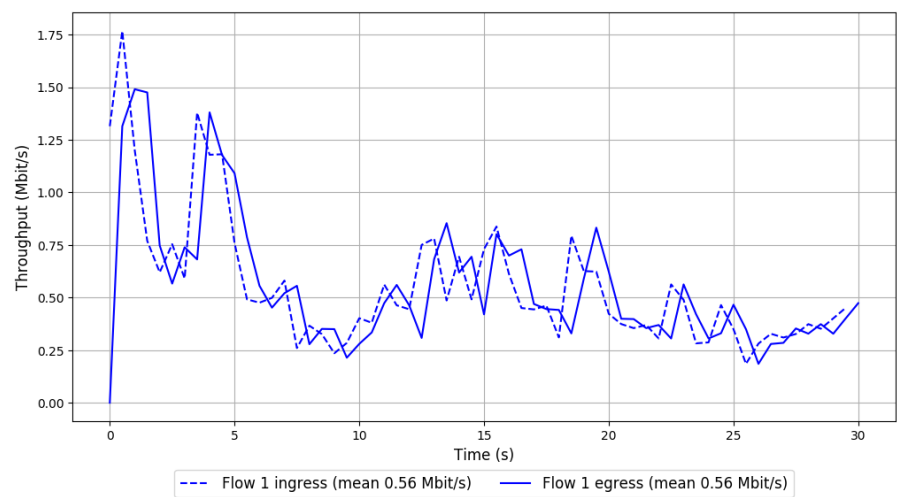


Run 1: Statistics of Sprout

Start at: 2018-08-21 17:48:09
End at: 2018-08-21 17:48:39
Local clock offset: 0.562 ms
Remote clock offset: -63.067 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 52.840 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 52.840 ms
Loss rate: 0.00%

Run 1: Report of Sprout — Data Link

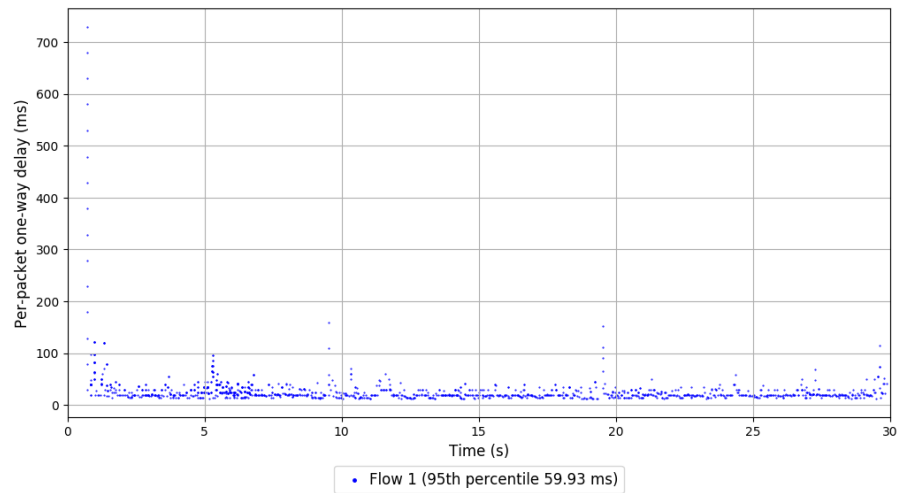
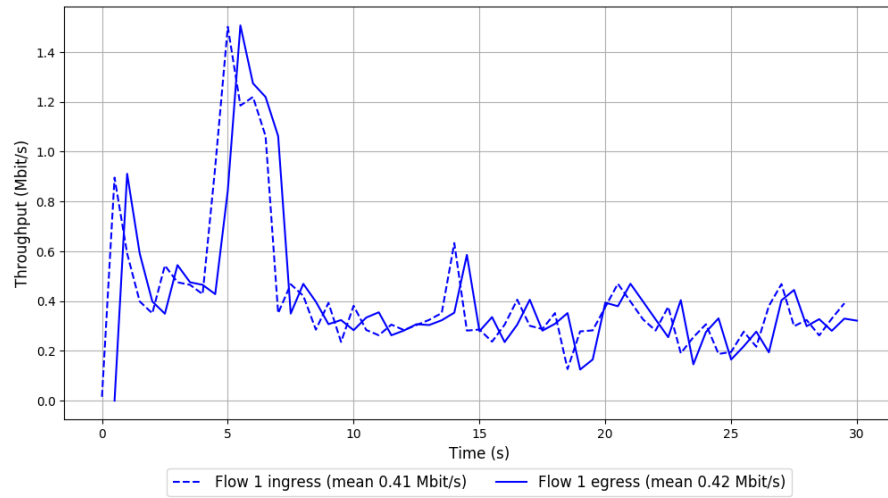


Run 2: Statistics of Sprout

Start at: 2018-08-21 18:06:35
End at: 2018-08-21 18:07:05
Local clock offset: -1.708 ms
Remote clock offset: -63.062 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 59.934 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 59.934 ms
Loss rate: 0.29%

Run 2: Report of Sprout — Data Link

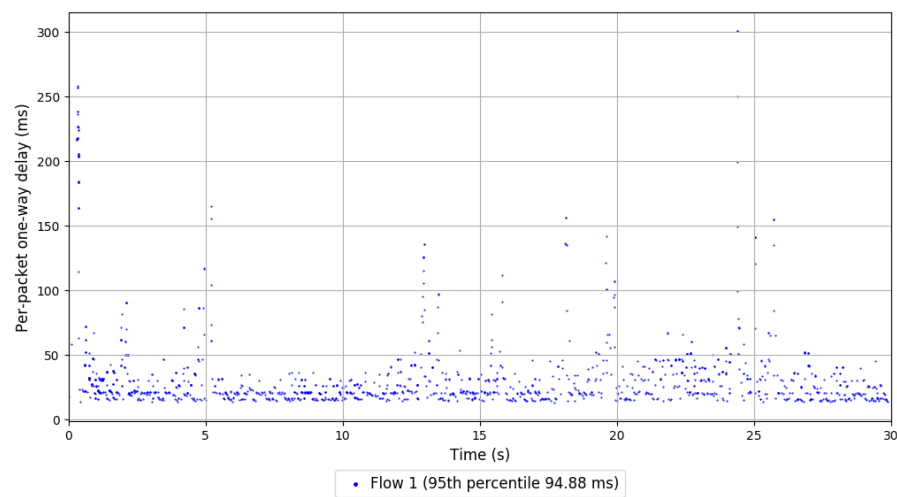
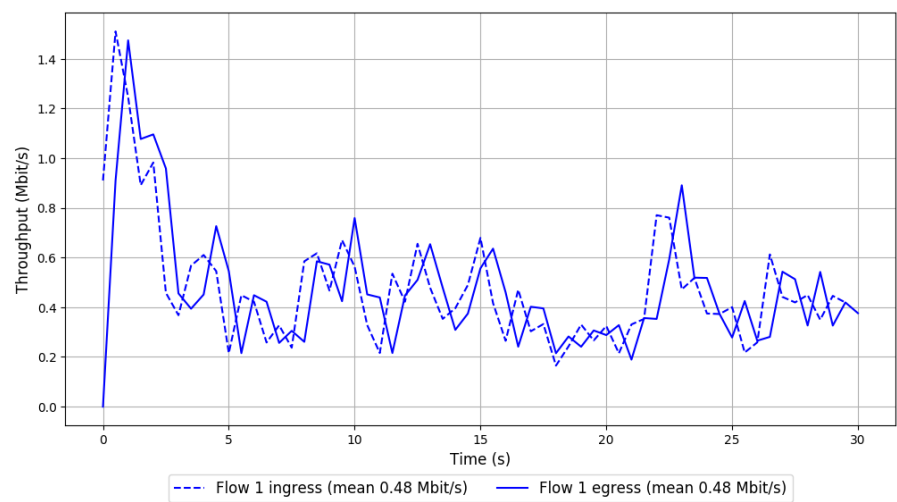


Run 3: Statistics of Sprout

Start at: 2018-08-21 18:25:46
End at: 2018-08-21 18:26:16
Local clock offset: -2.502 ms
Remote clock offset: -61.652 ms

Below is generated by plot.py at 2018-08-21 18:44:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 94.880 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 94.880 ms
Loss rate: 0.32%

Run 3: Report of Sprout — Data Link

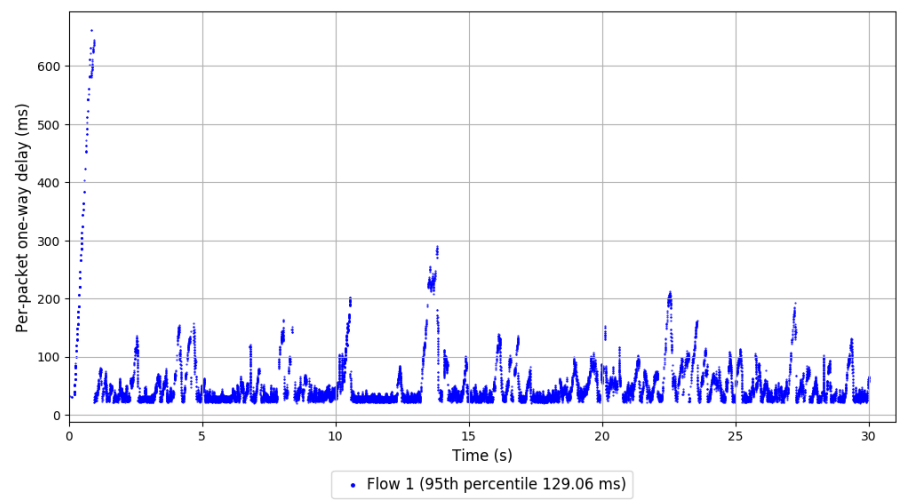
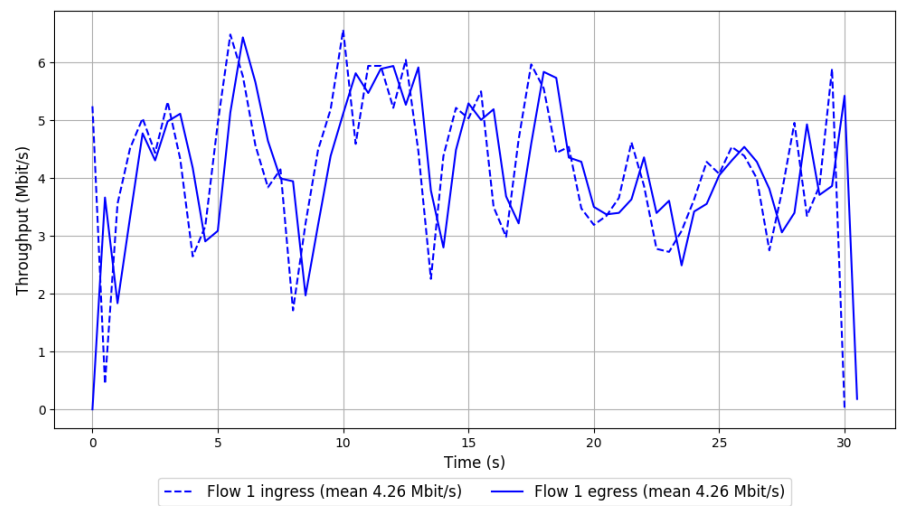


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-08-21 18:00:05
End at: 2018-08-21 18:00:35
Local clock offset: -3.651 ms
Remote clock offset: -62.677 ms

# Below is generated by plot.py at 2018-08-21 18:44:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 4.26 Mbit/s
95th percentile per-packet one-way delay: 129.058 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 4.26 Mbit/s
95th percentile per-packet one-way delay: 129.058 ms
Loss rate: 0.24%
```

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

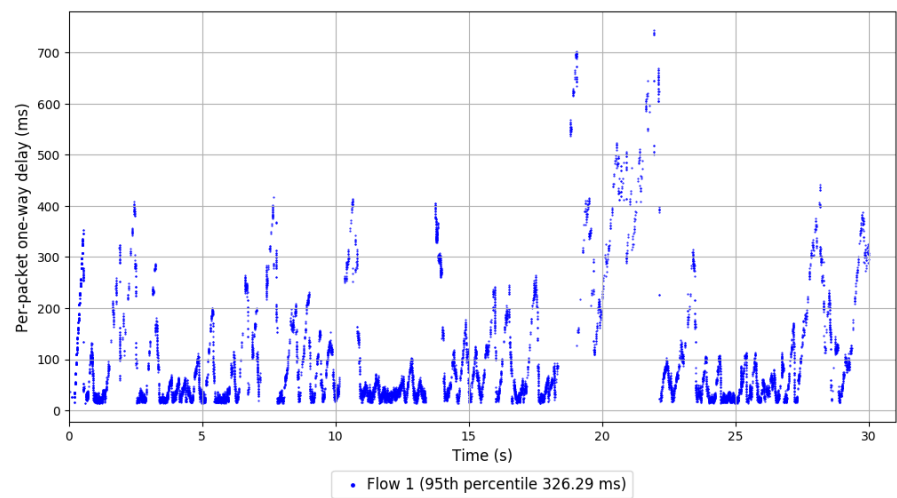
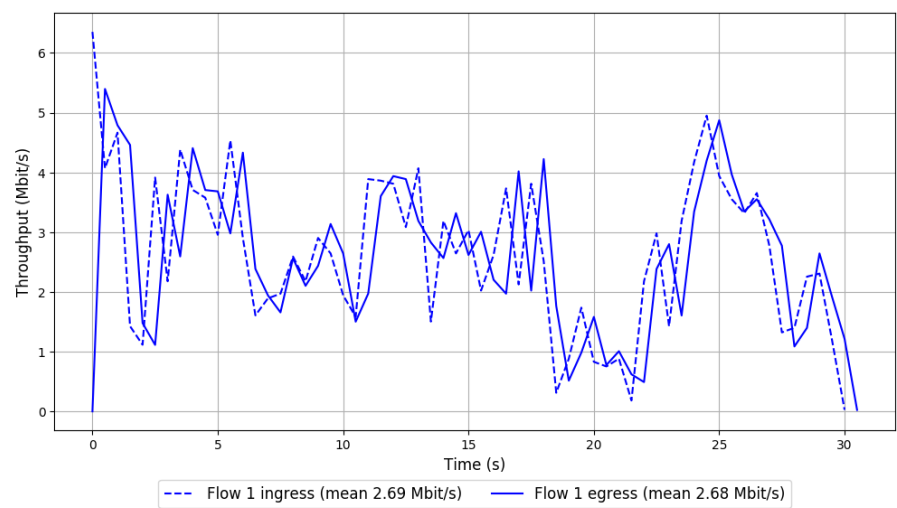


Run 2: Statistics of TaoVA-100x

Start at: 2018-08-21 18:19:03
End at: 2018-08-21 18:19:33
Local clock offset: 0.578 ms
Remote clock offset: -62.284 ms

Below is generated by plot.py at 2018-08-21 18:44:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.68 Mbit/s
95th percentile per-packet one-way delay: 326.286 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 2.68 Mbit/s
95th percentile per-packet one-way delay: 326.286 ms
Loss rate: 0.52%

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

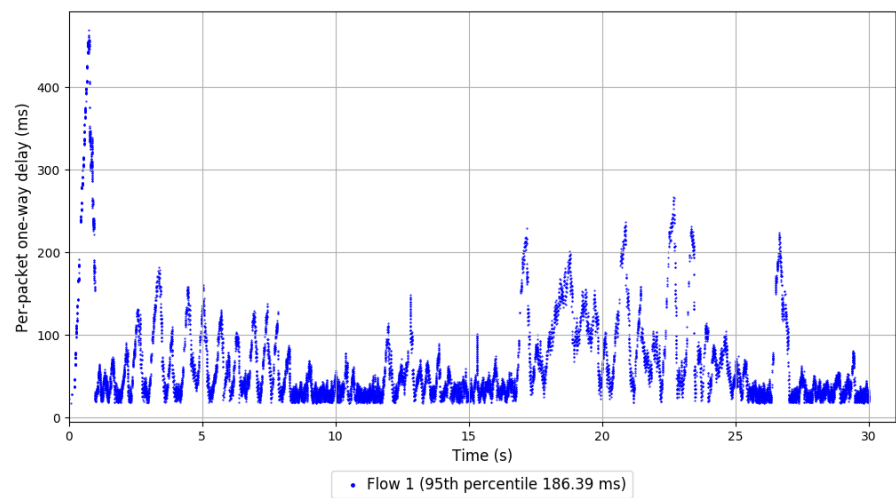
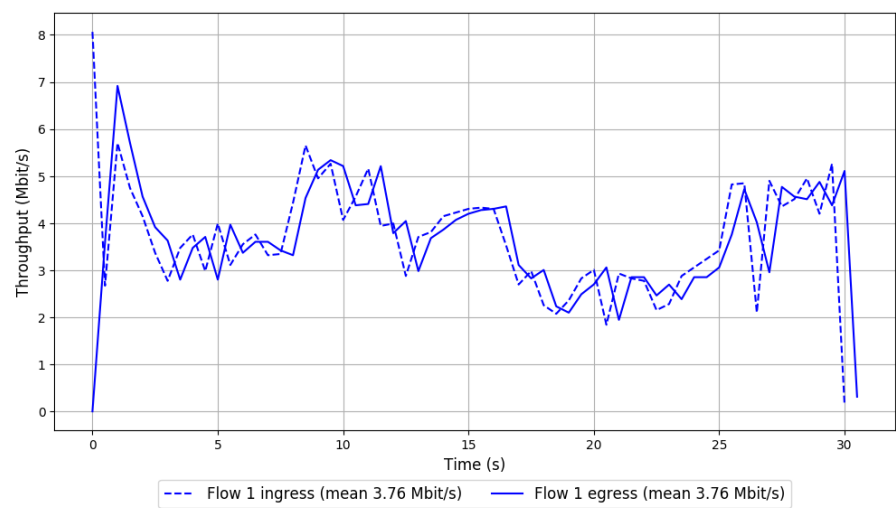


Run 3: Statistics of TaoVA-100x

Start at: 2018-08-21 18:37:37
End at: 2018-08-21 18:38:07
Local clock offset: -6.824 ms
Remote clock offset: -65.169 ms

Below is generated by plot.py at 2018-08-21 18:44:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.76 Mbit/s
95th percentile per-packet one-way delay: 186.391 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 3.76 Mbit/s
95th percentile per-packet one-way delay: 186.391 ms
Loss rate: 0.05%

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

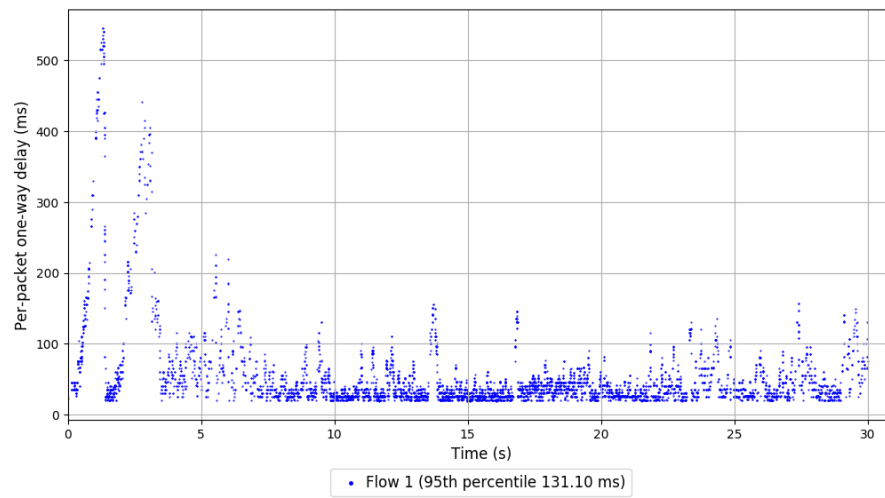
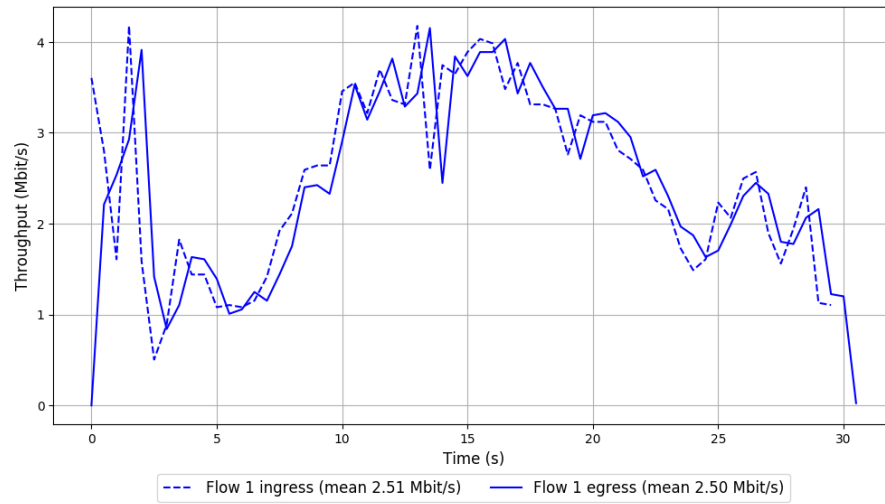


Run 1: Statistics of TCP Vegas

Start at: 2018-08-21 17:57:56
End at: 2018-08-21 17:58:26
Local clock offset: -3.582 ms
Remote clock offset: -63.357 ms

Below is generated by plot.py at 2018-08-21 18:44:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 131.098 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 2.50 Mbit/s
95th percentile per-packet one-way delay: 131.098 ms
Loss rate: 0.11%

Run 1: Report of TCP Vegas — Data Link

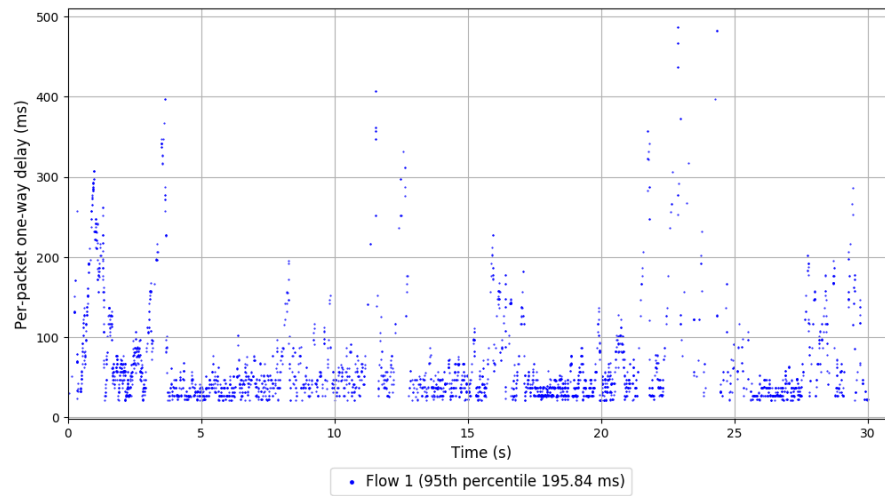
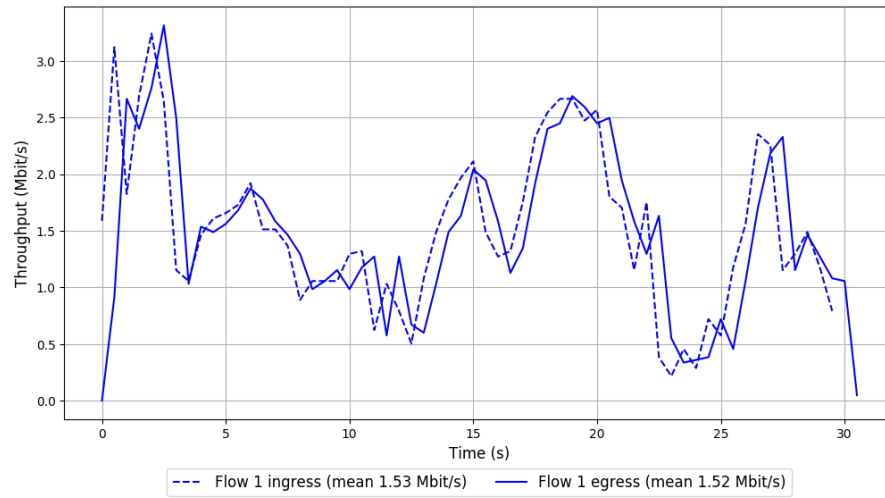


Run 2: Statistics of TCP Vegas

Start at: 2018-08-21 18:16:35
End at: 2018-08-21 18:17:05
Local clock offset: -0.019 ms
Remote clock offset: -62.095 ms

Below is generated by plot.py at 2018-08-21 18:44:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 195.836 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 195.836 ms
Loss rate: 0.13%

Run 2: Report of TCP Vegas — Data Link

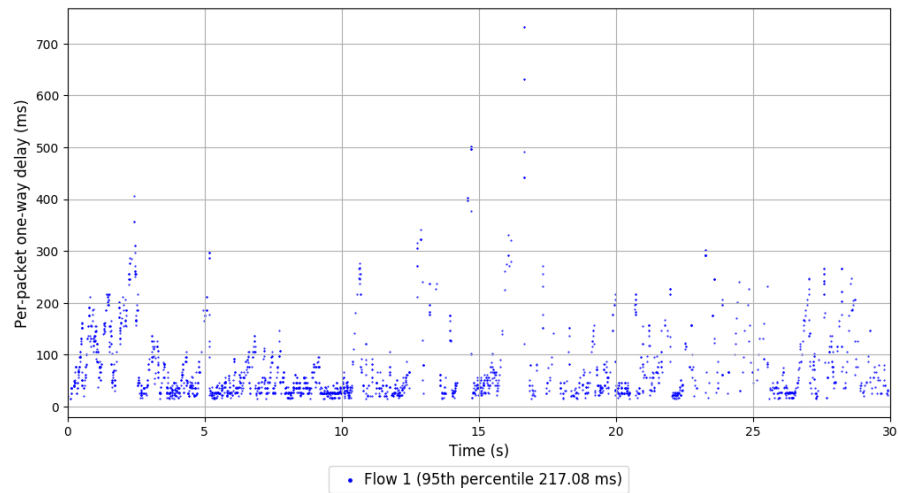
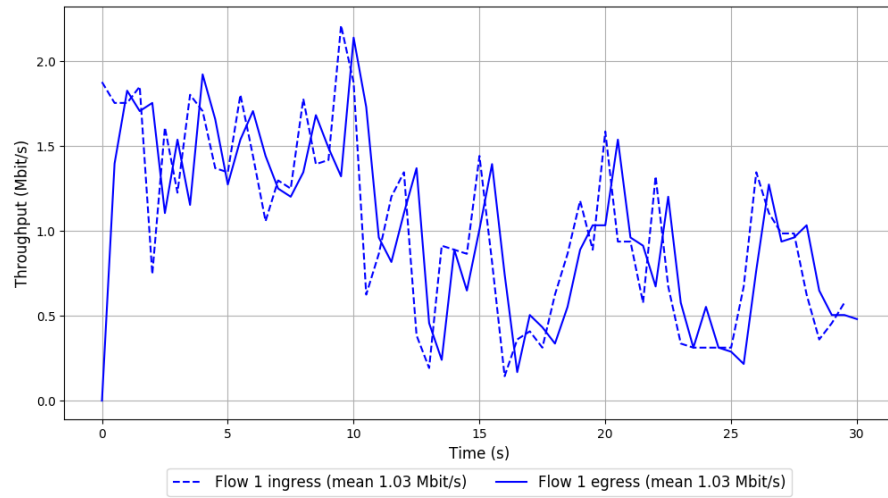


Run 3: Statistics of TCP Vegas

Start at: 2018-08-21 18:35:28
End at: 2018-08-21 18:35:58
Local clock offset: -1.879 ms
Remote clock offset: -64.844 ms

Below is generated by plot.py at 2018-08-21 18:44:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 217.084 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 217.084 ms
Loss rate: 0.31%

Run 3: Report of TCP Vegas — Data Link

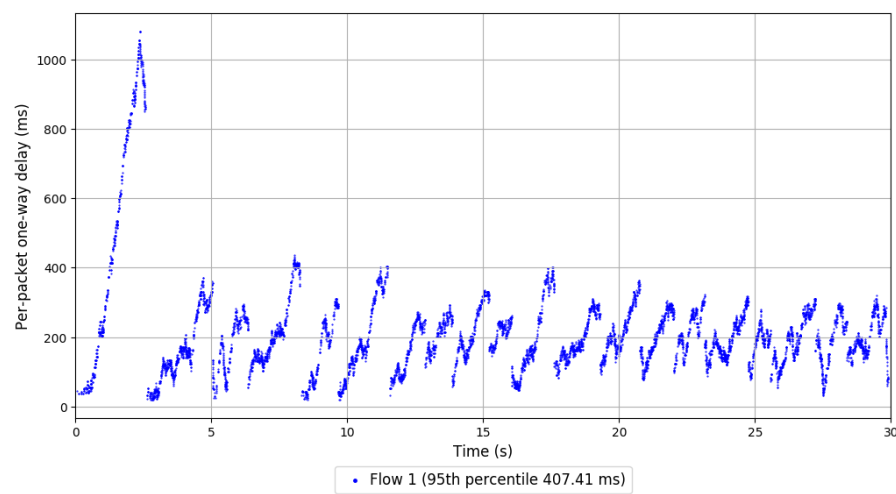
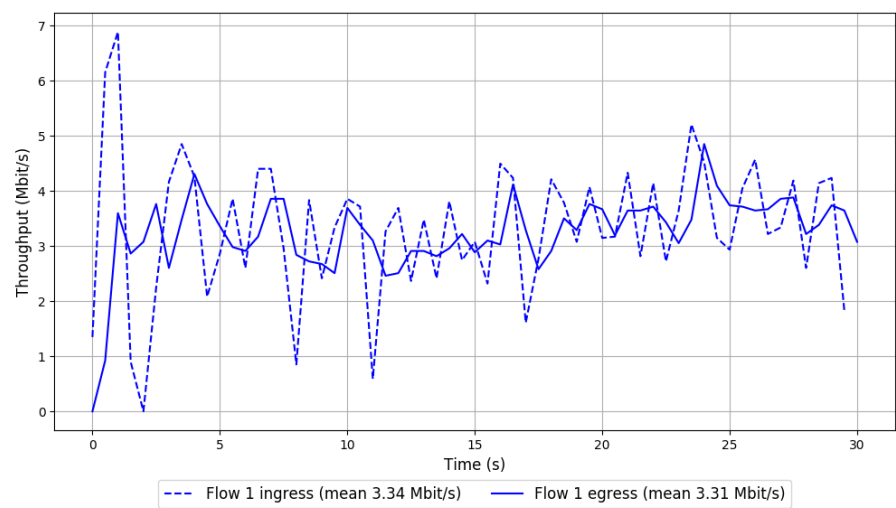


Run 1: Statistics of Verus

Start at: 2018-08-21 17:50:17
End at: 2018-08-21 17:50:47
Local clock offset: -2.781 ms
Remote clock offset: -62.241 ms

Below is generated by plot.py at 2018-08-21 18:44:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 407.410 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 3.31 Mbit/s
95th percentile per-packet one-way delay: 407.410 ms
Loss rate: 0.96%

Run 1: Report of Verus — Data Link

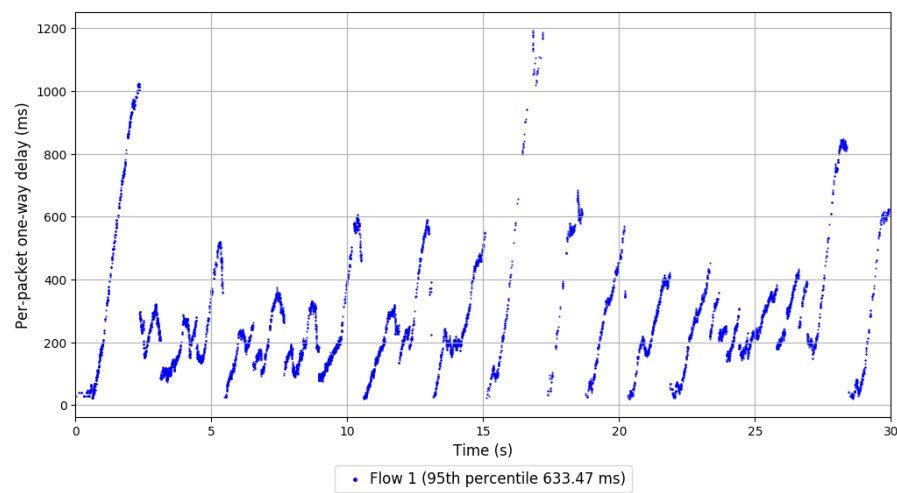
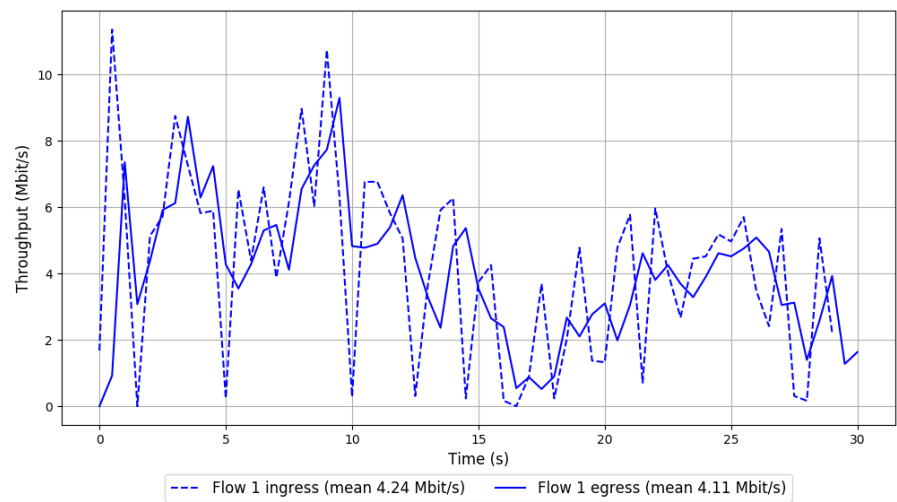


Run 2: Statistics of Verus

Start at: 2018-08-21 18:08:45
End at: 2018-08-21 18:09:15
Local clock offset: -5.266 ms
Remote clock offset: -62.41 ms

Below is generated by plot.py at 2018-08-21 18:44:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.11 Mbit/s
95th percentile per-packet one-way delay: 633.467 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 4.11 Mbit/s
95th percentile per-packet one-way delay: 633.467 ms
Loss rate: 1.33%

Run 2: Report of Verus — Data Link

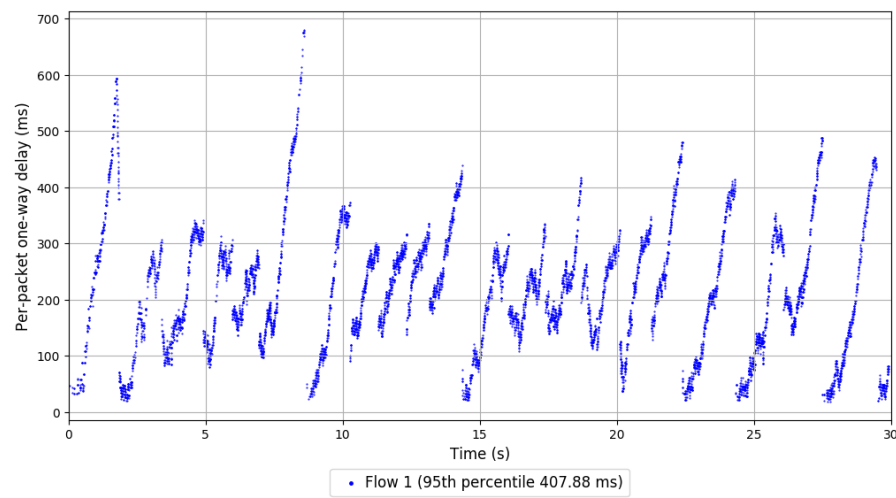
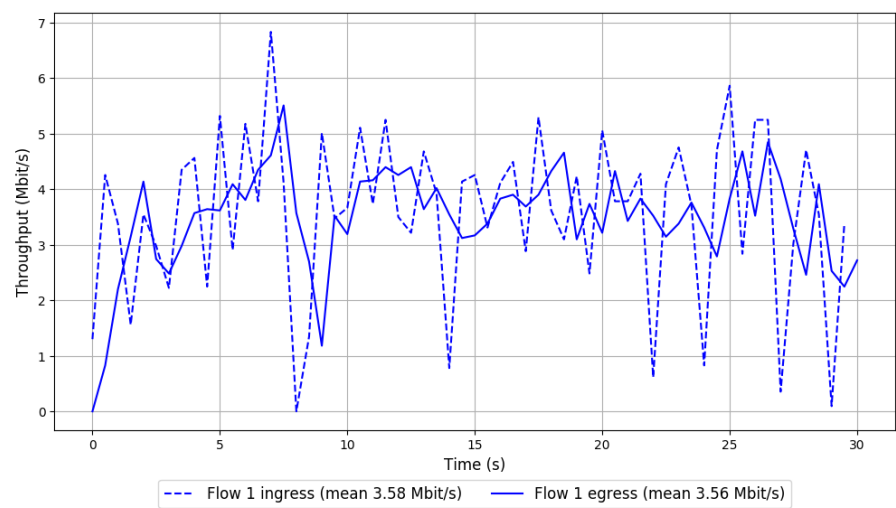


Run 3: Statistics of Verus

Start at: 2018-08-21 18:27:55
End at: 2018-08-21 18:28:25
Local clock offset: -2.981 ms
Remote clock offset: -61.956 ms

Below is generated by plot.py at 2018-08-21 18:44:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 407.876 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 3.56 Mbit/s
95th percentile per-packet one-way delay: 407.876 ms
Loss rate: 0.81%

Run 3: Report of Verus — Data Link

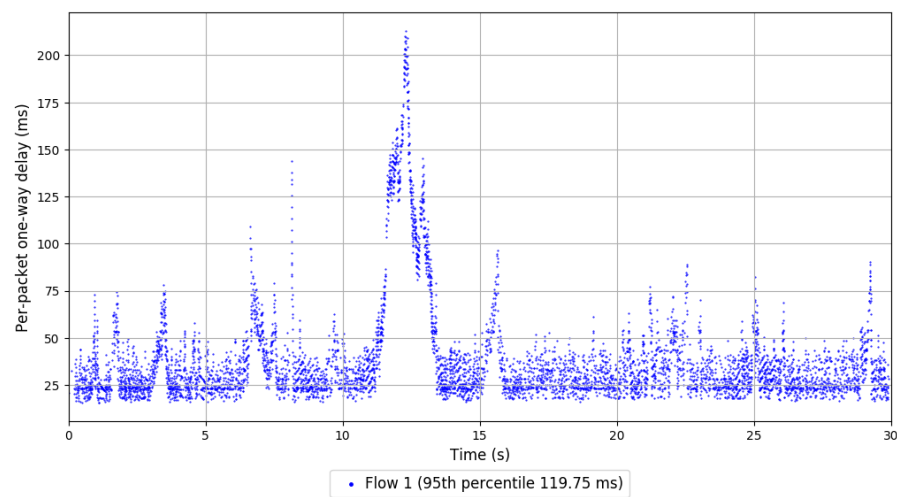
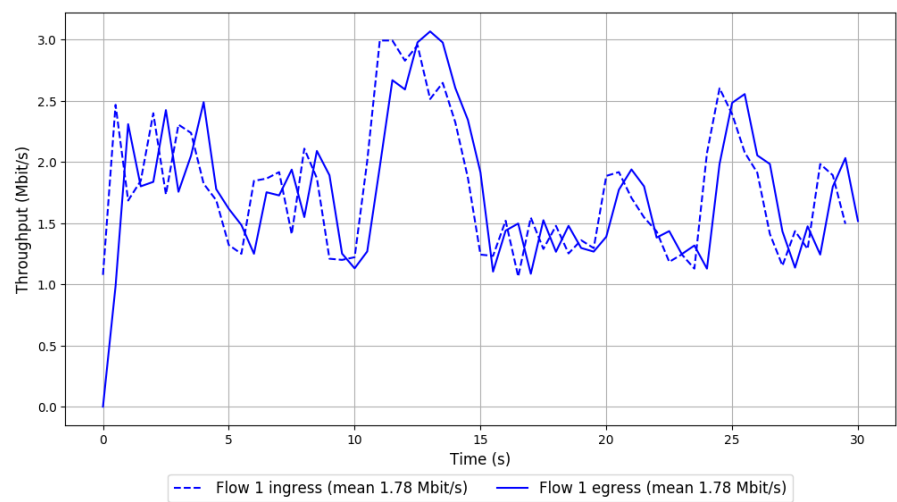


Run 1: Statistics of PCC-Vivace

Start at: 2018-08-21 18:03:20
End at: 2018-08-21 18:03:50
Local clock offset: -1.177 ms
Remote clock offset: -63.078 ms

Below is generated by plot.py at 2018-08-21 18:44:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 119.750 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 119.750 ms
Loss rate: 0.09%

Run 1: Report of PCC-Vivace — Data Link

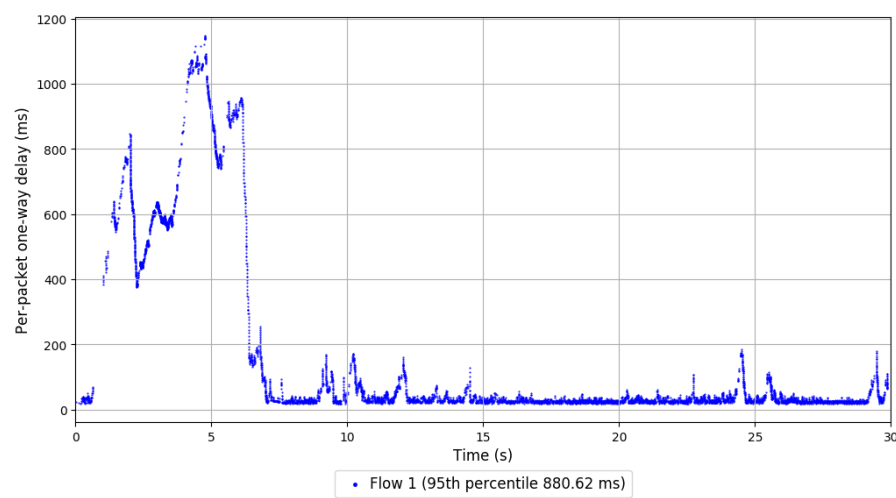
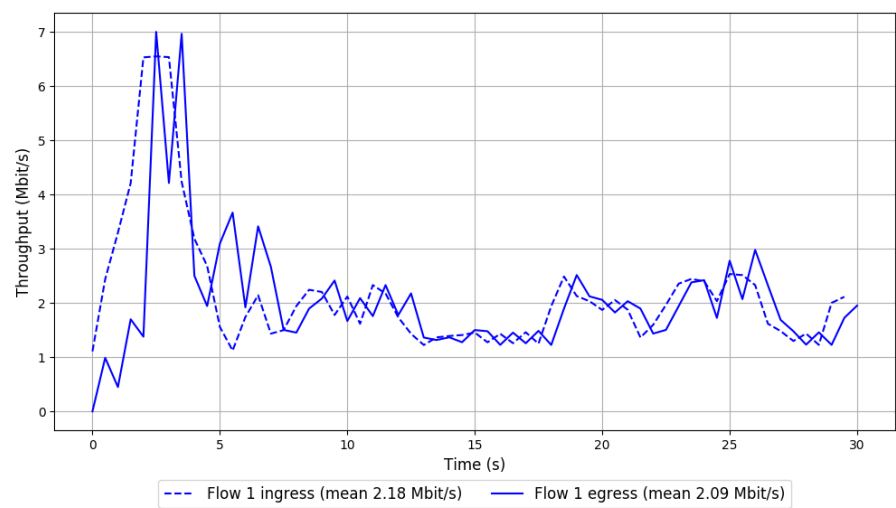


Run 2: Statistics of PCC-Vivace

Start at: 2018-08-21 18:22:18
End at: 2018-08-21 18:22:48
Local clock offset: -2.806 ms
Remote clock offset: -61.669 ms

Below is generated by plot.py at 2018-08-21 18:44:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 880.615 ms
Loss rate: 4.45%
-- Flow 1:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 880.615 ms
Loss rate: 4.45%

Run 2: Report of PCC-Vivace — Data Link

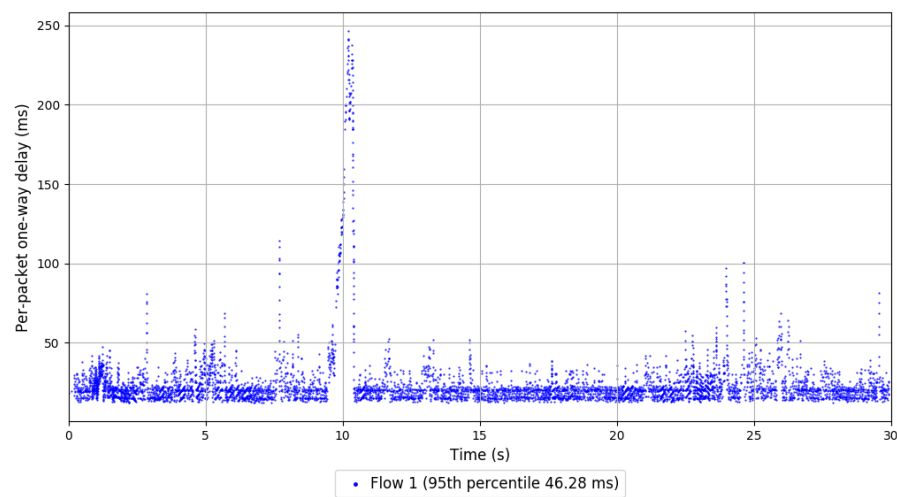
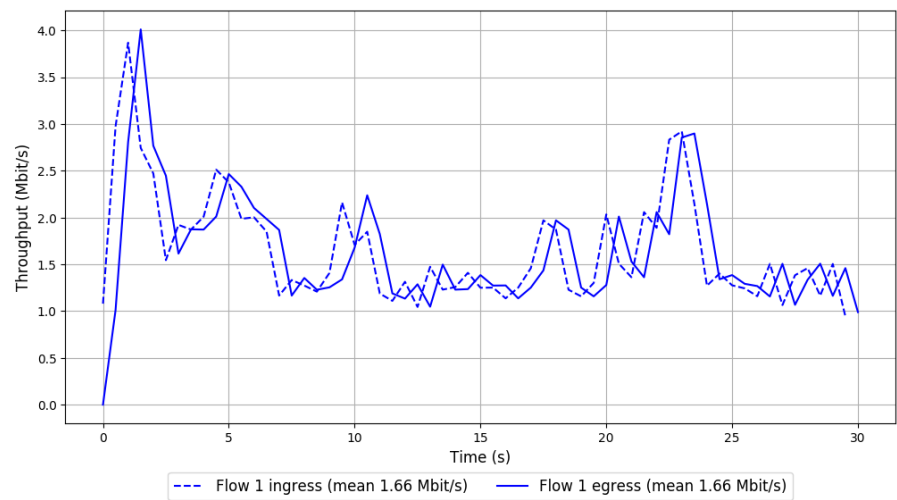


Run 3: Statistics of PCC-Vivace

Start at: 2018-08-21 18:41:05
End at: 2018-08-21 18:41:35
Local clock offset: -0.846 ms
Remote clock offset: -65.71 ms

Below is generated by plot.py at 2018-08-21 18:44:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 46.282 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 46.282 ms
Loss rate: 0.05%

Run 3: Report of PCC-Vivace — Data Link

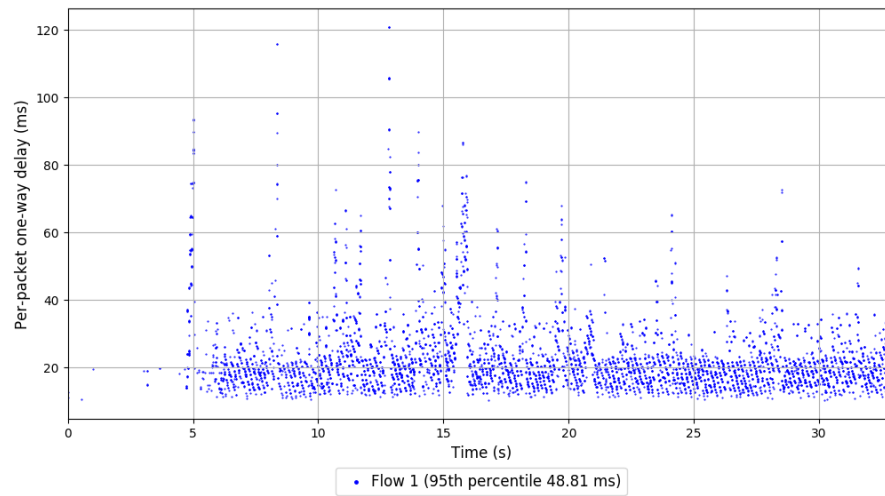
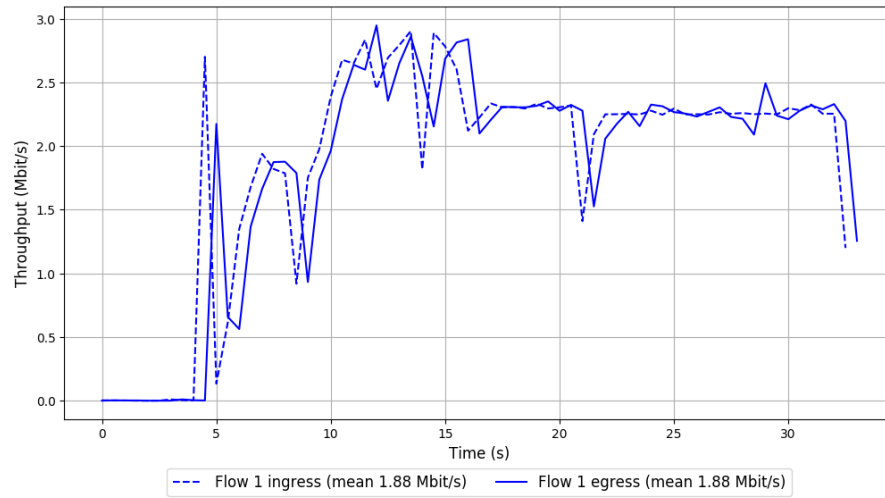


Run 1: Statistics of WebRTC media

Start at: 2018-08-21 17:55:46
End at: 2018-08-21 17:56:16
Local clock offset: 1.255 ms
Remote clock offset: -62.833 ms

Below is generated by plot.py at 2018-08-21 18:44:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 48.807 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 1.88 Mbit/s
95th percentile per-packet one-way delay: 48.807 ms
Loss rate: 0.06%

Run 1: Report of WebRTC media — Data Link

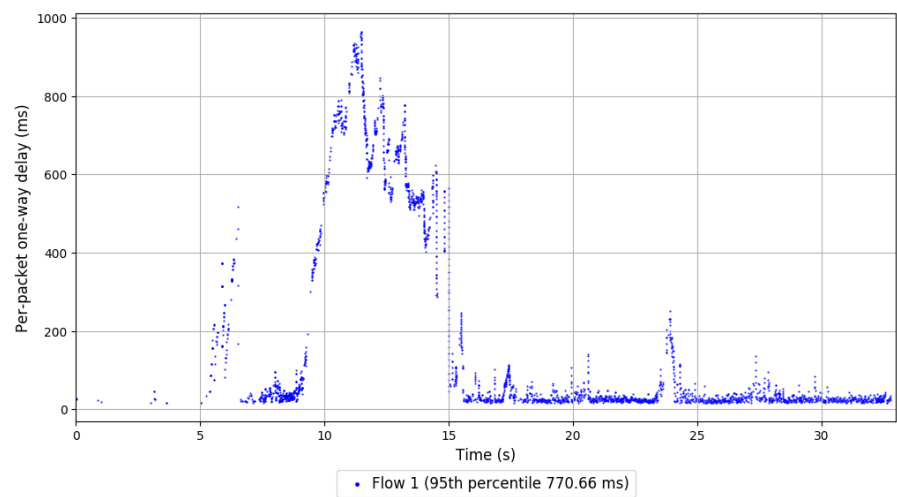
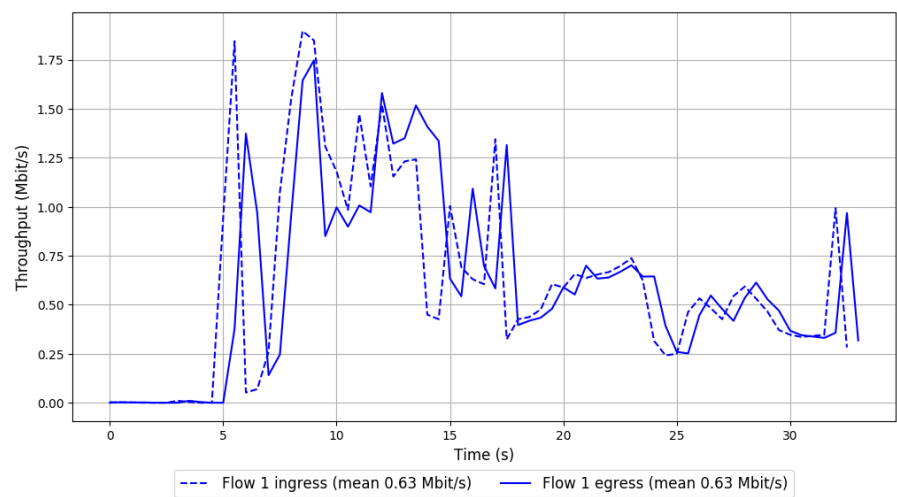


Run 2: Statistics of WebRTC media

Start at: 2018-08-21 18:14:21
End at: 2018-08-21 18:14:51
Local clock offset: -1.07 ms
Remote clock offset: -62.664 ms

Below is generated by plot.py at 2018-08-21 18:44:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 770.662 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 770.662 ms
Loss rate: 0.63%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-08-21 18:33:19
End at: 2018-08-21 18:33:49
Local clock offset: -1.825 ms
Remote clock offset: -63.477 ms

Below is generated by plot.py at 2018-08-21 18:44:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 114.843 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 114.843 ms
Loss rate: 0.05%

Run 3: Report of WebRTC media — Data Link

