

Pantheon Report

Generated at 2018-08-22 10:27:17 (UTC).

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

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.

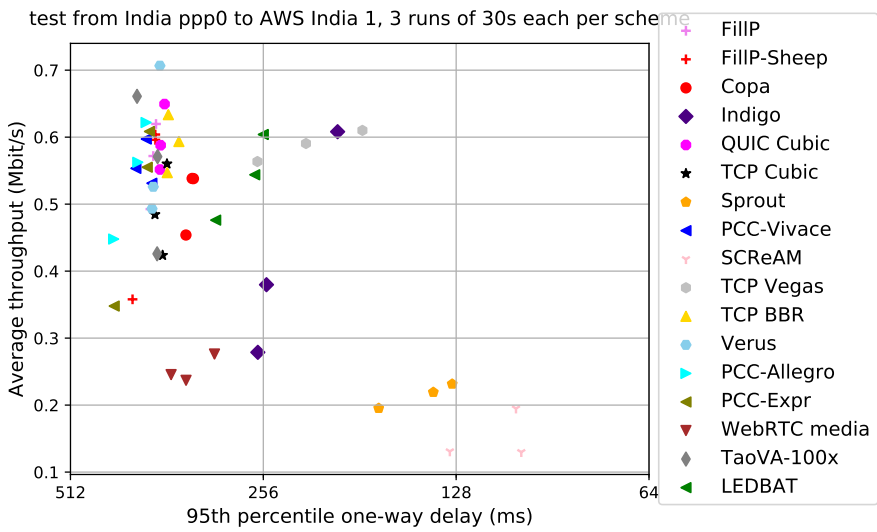
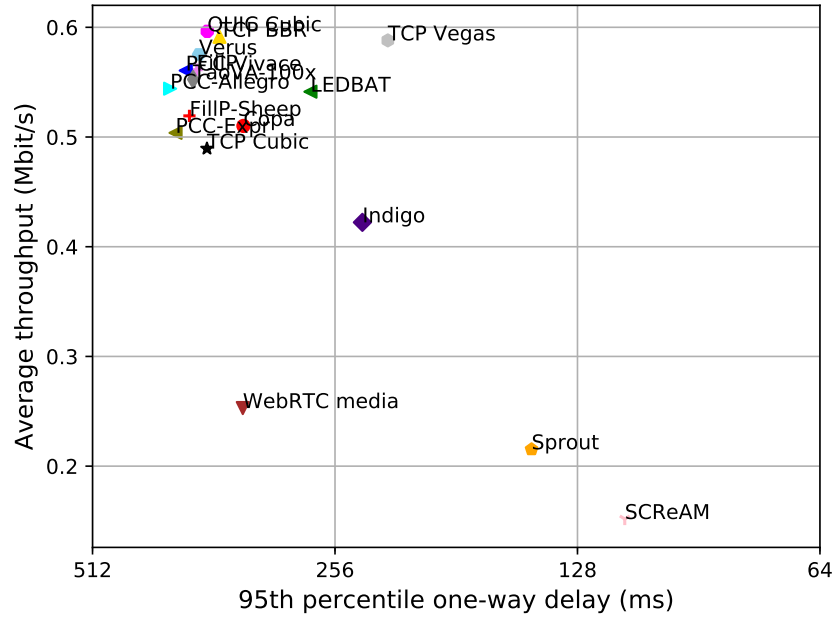
System info:

```
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 @ d0153f8e594aa89e93b032143cedbdf58e562f4
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 India ppp0 to AWS India 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)



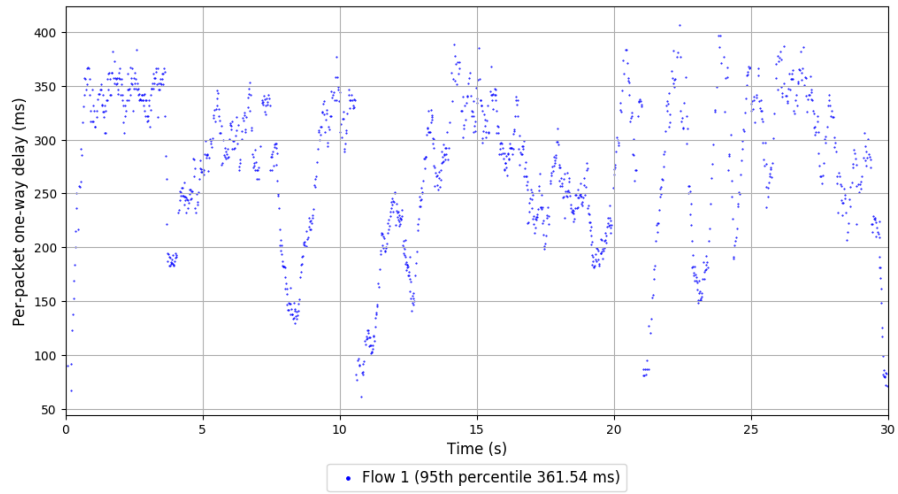
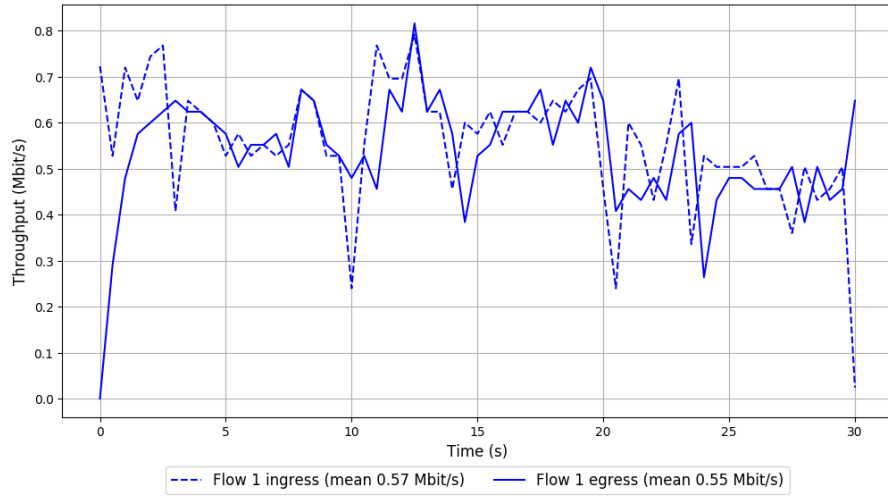
scheme	# runs	mean avg tput (Mbit/s)	mean 95th-%ile delay (ms)	mean loss rate (%)
		flow 1	flow 1	flow 1
TCP BBR	3	0.59	356.13	3.55
Copa	3	0.51	332.60	2.47
TCP Cubic	3	0.49	369.16	5.01
FillP	3	0.56	380.25	47.40
FillP-Sheep	3	0.52	388.12	53.23
Indigo	3	0.42	236.73	3.44
LEDBAT	3	0.54	274.64	0.65
PCC-Allegro	3	0.54	410.13	84.11
PCC-Expr	3	0.51	403.88	92.13
QUIC Cubic	3	0.60	368.82	13.11
SReAM	3	0.15	111.82	0.26
Sprout	3	0.22	145.96	3.11
TaoVA-100x	3	0.55	384.10	44.50
TCP Vegas	3	0.59	220.12	0.62
Verus	3	0.58	377.79	27.25
PCC-Vivace	3	0.56	392.30	58.34
WebRTC media	3	0.26	333.21	8.44

Run 1: Statistics of TCP BBR

Start at: 2018-08-22 09:49:39
End at: 2018-08-22 09:50:09
Local clock offset: 1.635 ms
Remote clock offset: -59.353 ms

Below is generated by plot.py at 2018-08-22 10:26:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 361.541 ms
Loss rate: 3.75%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 361.541 ms
Loss rate: 3.75%

Run 1: Report of TCP BBR — Data Link

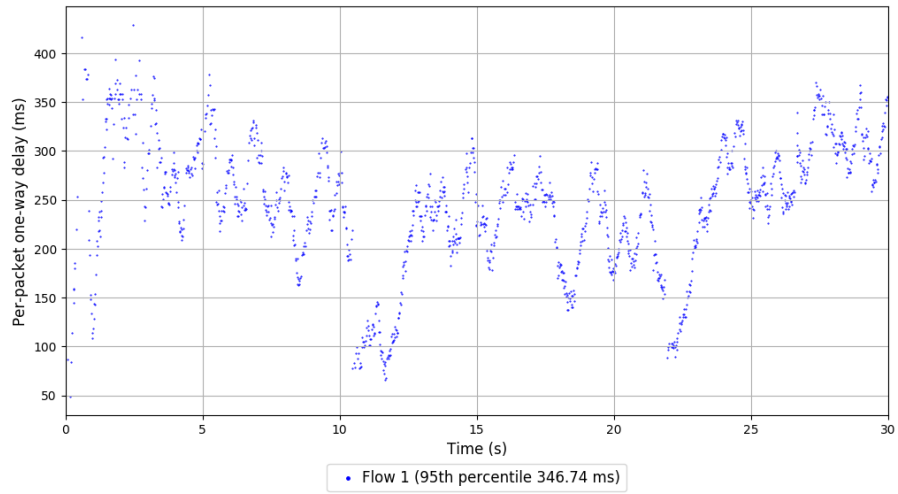
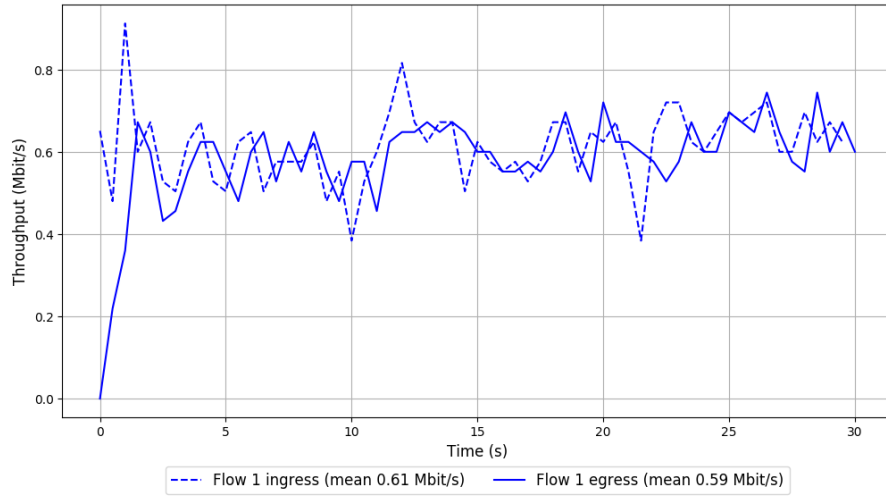


Run 2: Statistics of TCP BBR

Start at: 2018-08-22 10:07:55
End at: 2018-08-22 10:08:25
Local clock offset: 1.744 ms
Remote clock offset: -58.988 ms

Below is generated by plot.py at 2018-08-22 10:26:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 346.738 ms
Loss rate: 3.46%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 346.738 ms
Loss rate: 3.46%

Run 2: Report of TCP BBR — Data Link

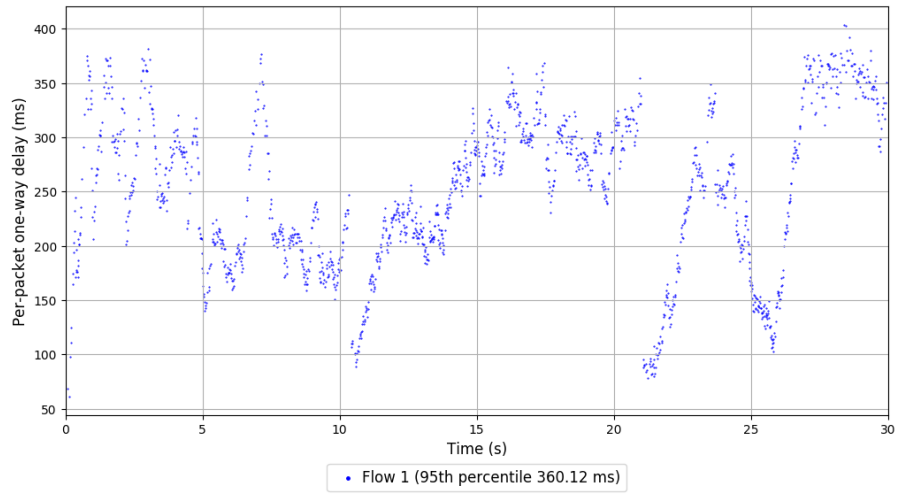
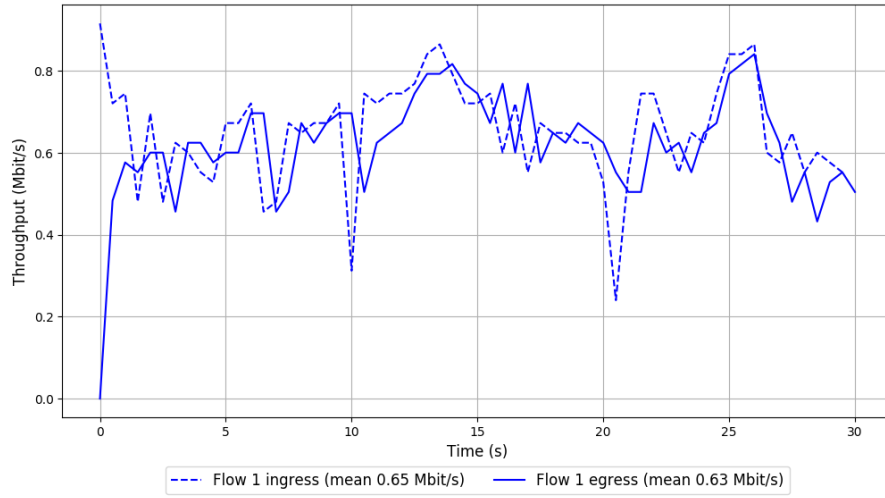


Run 3: Statistics of TCP BBR

Start at: 2018-08-22 10:26:11
End at: 2018-08-22 10:26:41
Local clock offset: 2.601 ms
Remote clock offset: -62.743 ms

Below is generated by plot.py at 2018-08-22 10:26:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 360.123 ms
Loss rate: 3.43%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 360.123 ms
Loss rate: 3.43%

Run 3: Report of TCP BBR — Data Link

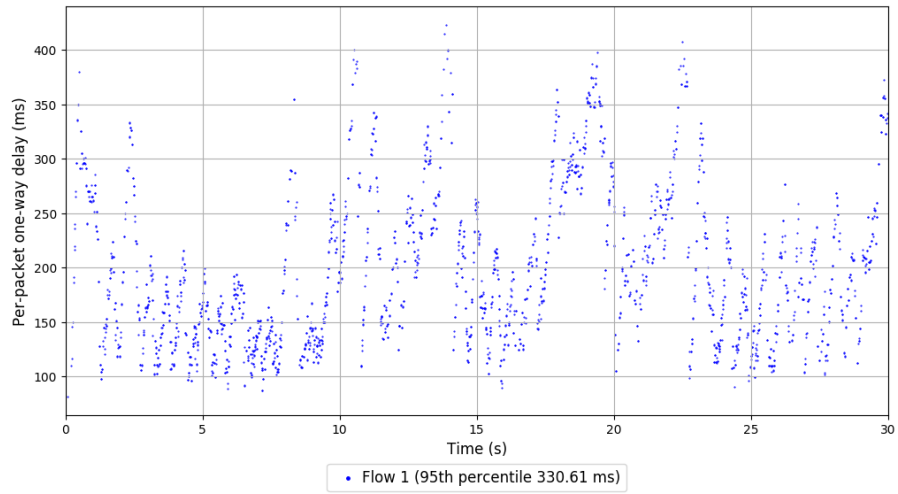
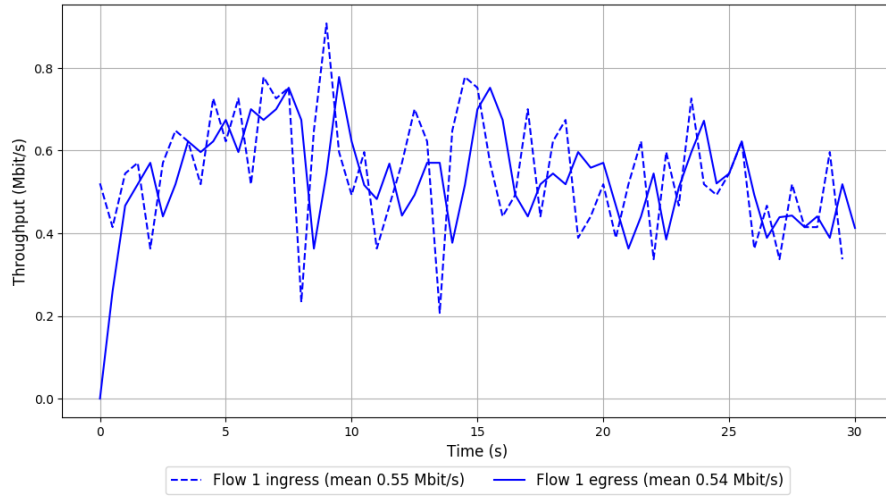


Run 1: Statistics of Copa

Start at: 2018-08-22 09:41:04
End at: 2018-08-22 09:41:34
Local clock offset: 3.135 ms
Remote clock offset: -59.753 ms

Below is generated by plot.py at 2018-08-22 10:26:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 330.613 ms
Loss rate: 1.75%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 330.613 ms
Loss rate: 1.75%

Run 1: Report of Copa — Data Link

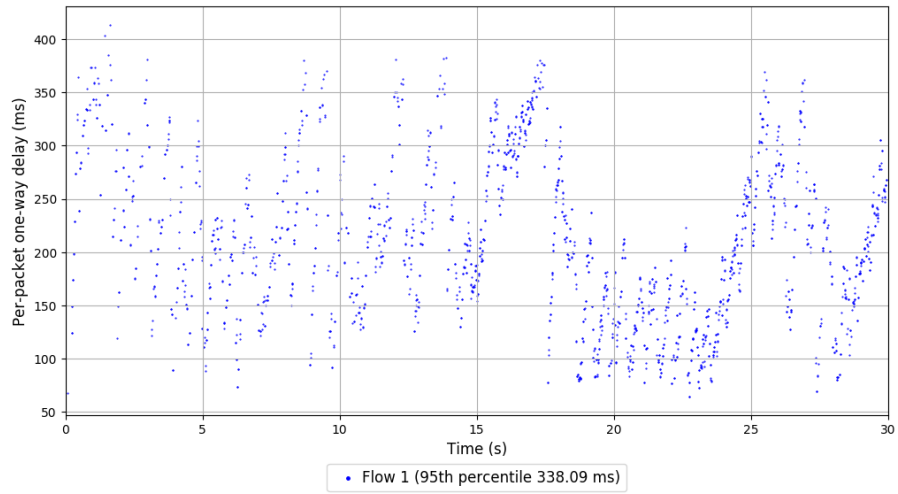
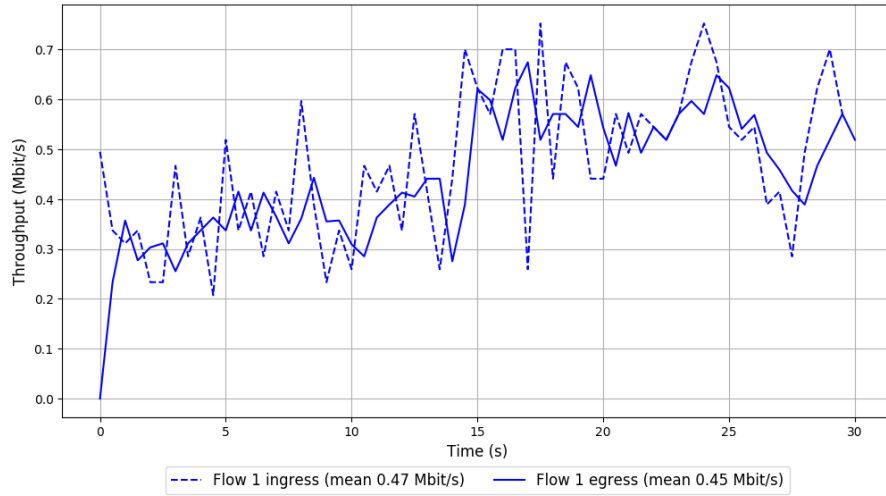


Run 2: Statistics of Copa

Start at: 2018-08-22 09:59:19
End at: 2018-08-22 09:59:49
Local clock offset: 2.454 ms
Remote clock offset: -58.85 ms

Below is generated by plot.py at 2018-08-22 10:26:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 338.088 ms
Loss rate: 3.59%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 338.088 ms
Loss rate: 3.59%

Run 2: Report of Copa — Data Link

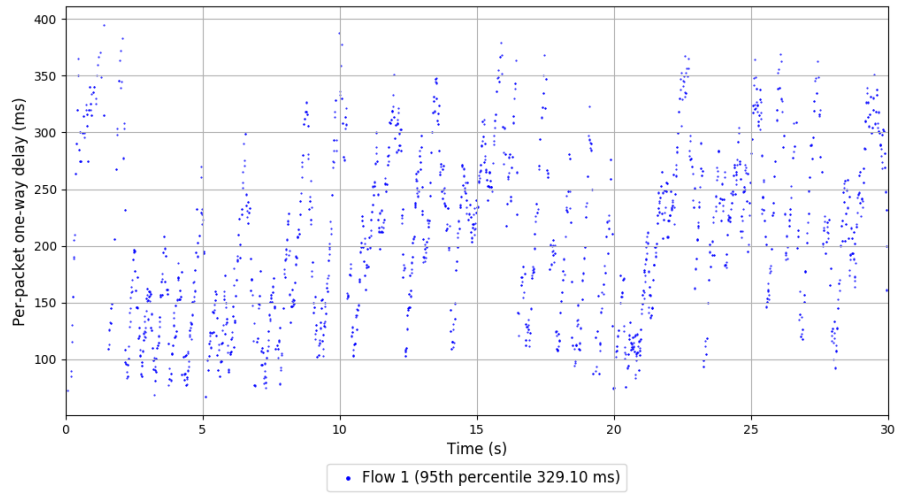
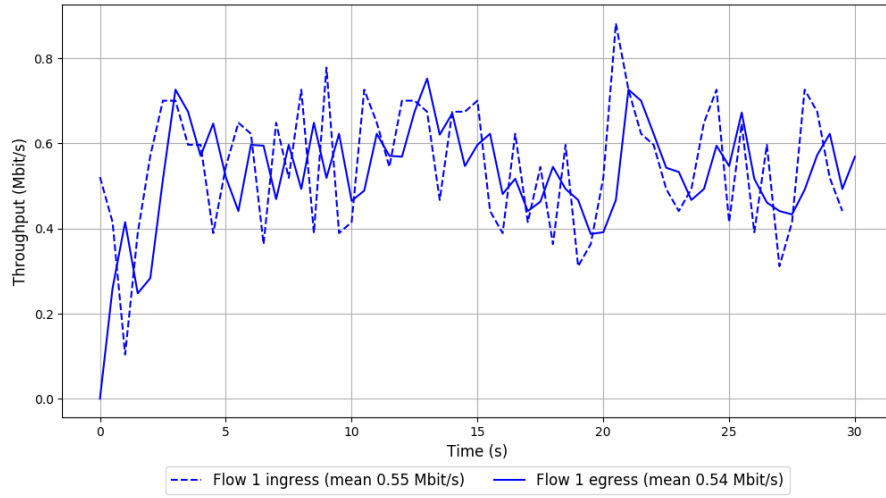


Run 3: Statistics of Copa

Start at: 2018-08-22 10:17:36
End at: 2018-08-22 10:18:06
Local clock offset: 1.636 ms
Remote clock offset: -61.064 ms

Below is generated by plot.py at 2018-08-22 10:26:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 329.099 ms
Loss rate: 2.07%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 329.099 ms
Loss rate: 2.07%

Run 3: Report of Copa — Data Link

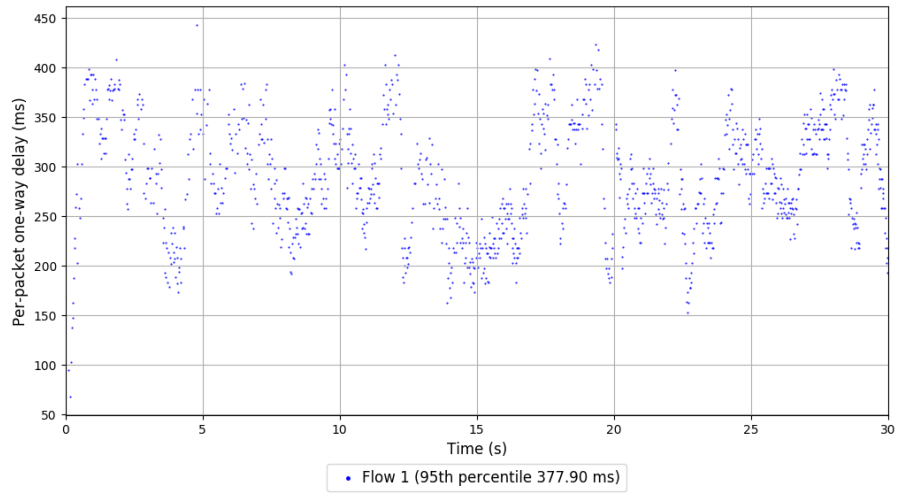
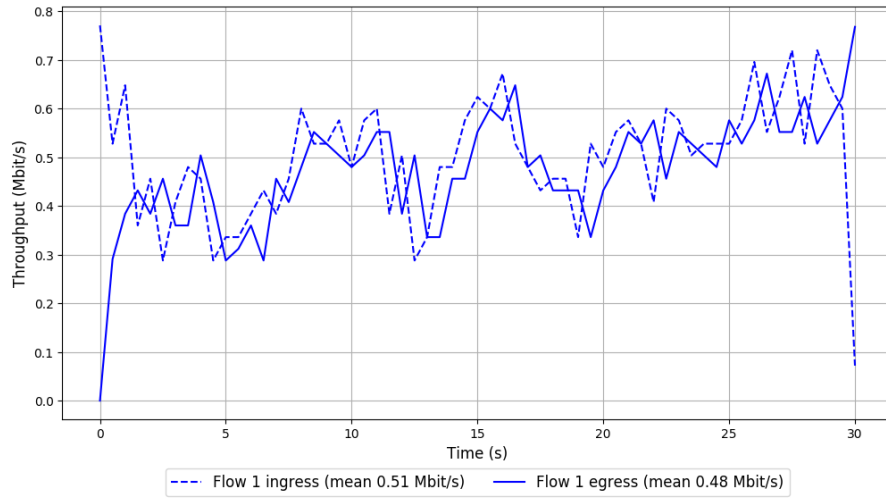


Run 1: Statistics of TCP Cubic

Start at: 2018-08-22 09:40:00
End at: 2018-08-22 09:40:30
Local clock offset: -0.446 ms
Remote clock offset: -60.383 ms

Below is generated by plot.py at 2018-08-22 10:26:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 377.903 ms
Loss rate: 5.33%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 377.903 ms
Loss rate: 5.33%

Run 1: Report of TCP Cubic — Data Link

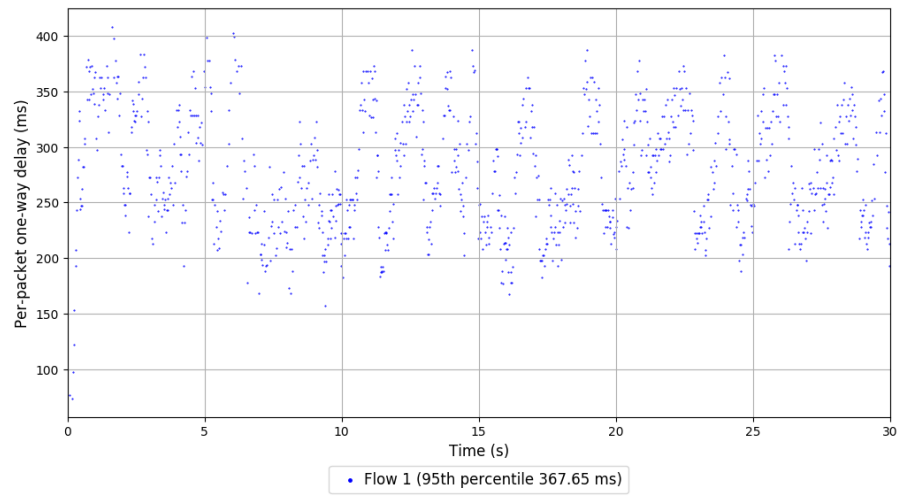
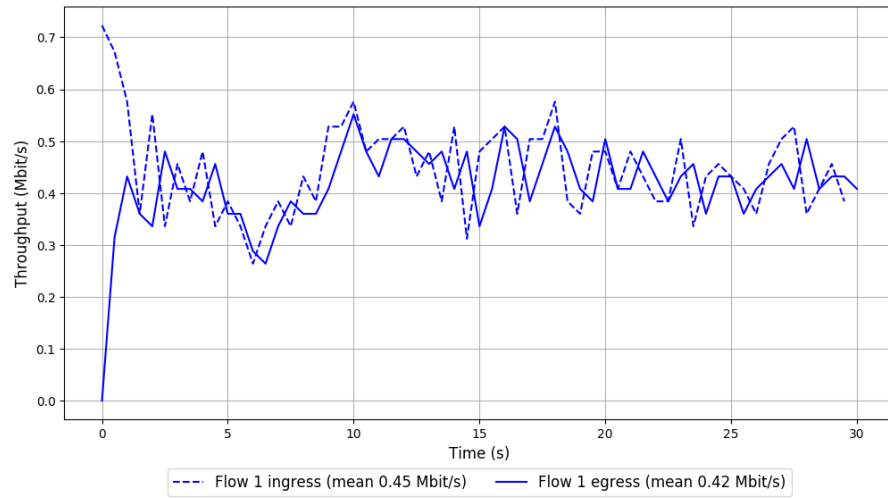


Run 2: Statistics of TCP Cubic

Start at: 2018-08-22 09:58:15
End at: 2018-08-22 09:58:45
Local clock offset: 1.468 ms
Remote clock offset: -58.988 ms

Below is generated by plot.py at 2018-08-22 10:26:49
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 367.650 ms
Loss rate: 5.38%
-- Flow 1:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 367.650 ms
Loss rate: 5.38%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-08-22 10:16:31

End at: 2018-08-22 10:17:01

Local clock offset: 0.951 ms

Remote clock offset: -60.9 ms

Below is generated by plot.py at 2018-08-22 10:26:51

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 361.939 ms

Loss rate: 4.32%

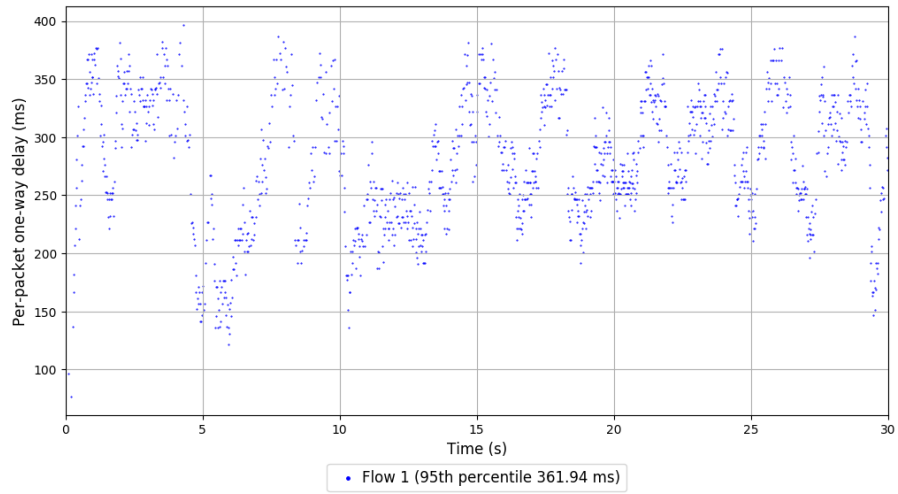
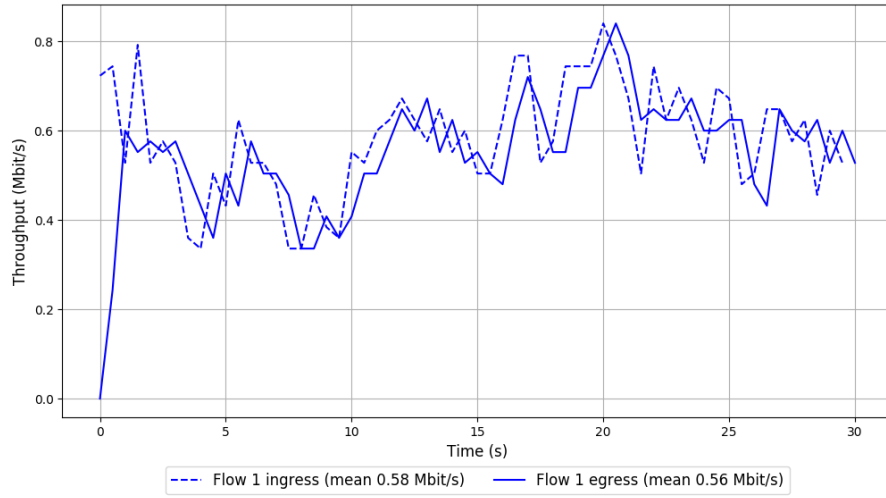
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 361.939 ms

Loss rate: 4.32%

Run 3: Report of TCP Cubic — Data Link

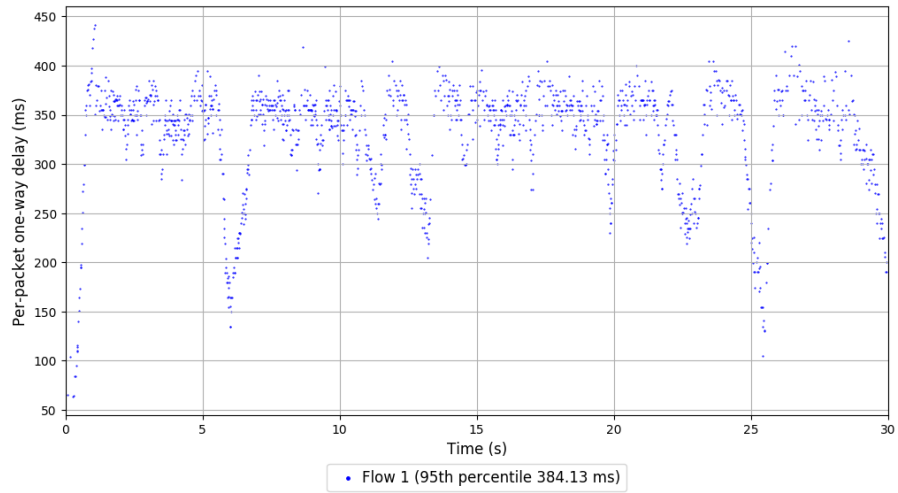
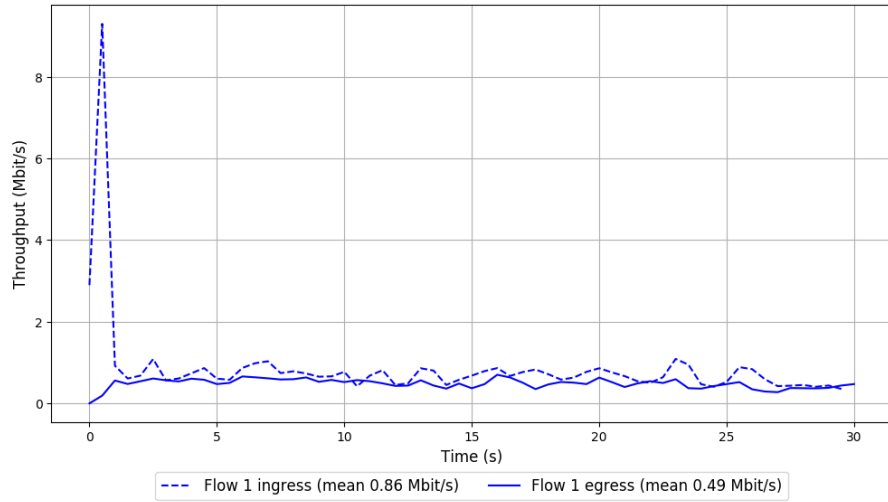


Run 1: Statistics of FillP

Start at: 2018-08-22 09:34:37
End at: 2018-08-22 09:35:07
Local clock offset: 3.46 ms
Remote clock offset: -60.68 ms

Below is generated by plot.py at 2018-08-22 10:26:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 384.127 ms
Loss rate: 43.12%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 384.127 ms
Loss rate: 43.12%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-08-22 09:52:52

End at: 2018-08-22 09:53:22

Local clock offset: 1.711 ms

Remote clock offset: -59.31 ms

Below is generated by plot.py at 2018-08-22 10:26:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.62 Mbit/s

95th percentile per-packet one-way delay: 376.459 ms

Loss rate: 56.46%

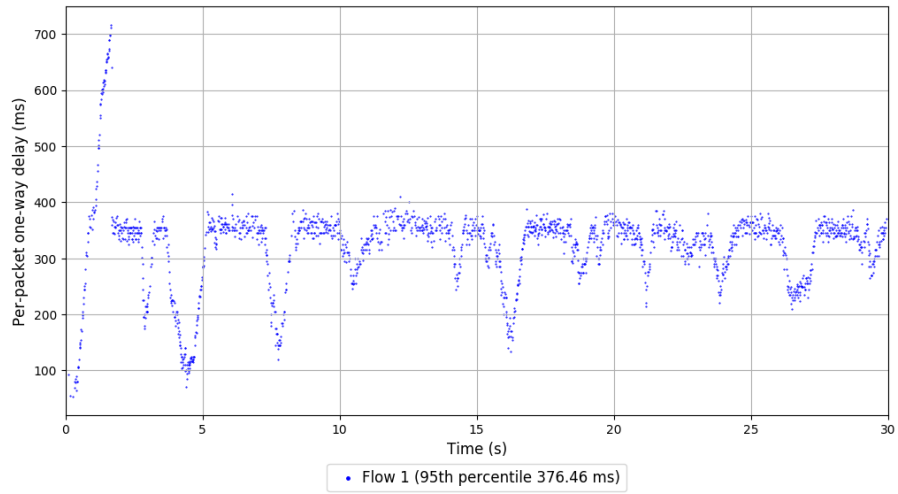
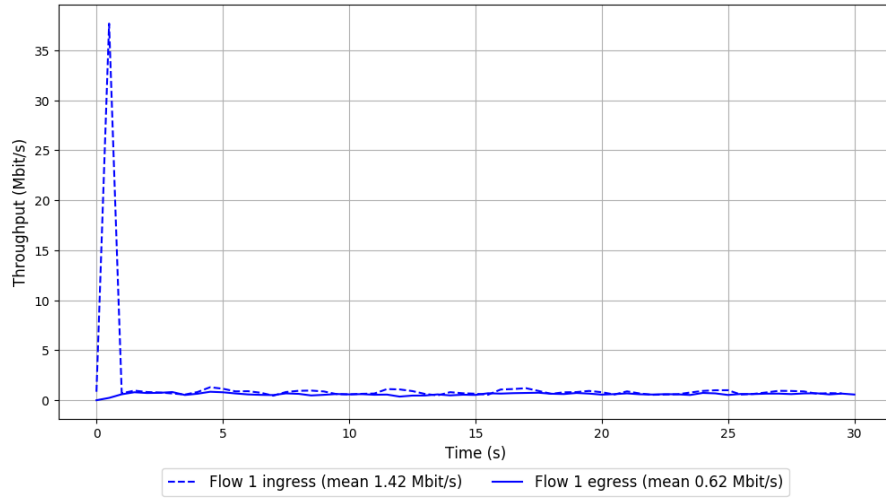
-- Flow 1:

Average throughput: 0.62 Mbit/s

95th percentile per-packet one-way delay: 376.459 ms

Loss rate: 56.46%

Run 2: Report of FillP — Data Link

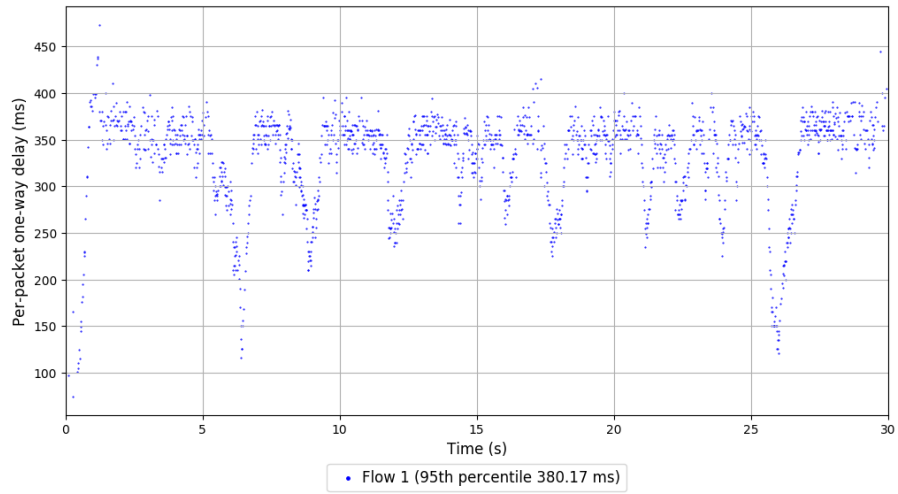
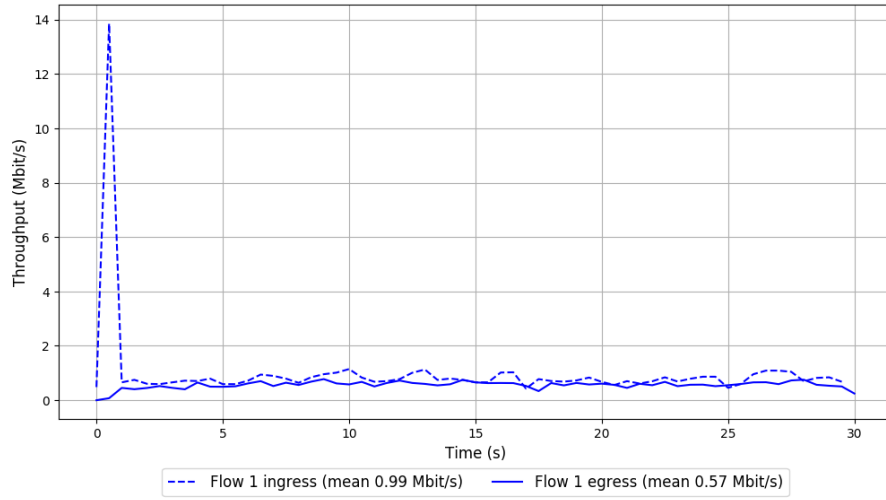


Run 3: Statistics of FillP

Start at: 2018-08-22 10:11:08
End at: 2018-08-22 10:11:38
Local clock offset: 3.332 ms
Remote clock offset: -59.144 ms

Below is generated by plot.py at 2018-08-22 10:26:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 380.173 ms
Loss rate: 42.62%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 380.173 ms
Loss rate: 42.62%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2018-08-22 09:37:50
End at: 2018-08-22 09:38:20
Local clock offset: 1.03 ms
Remote clock offset: -60.155 ms

Below is generated by plot.py at 2018-08-22 10:26:53

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 409.609 ms

Loss rate: 56.93%

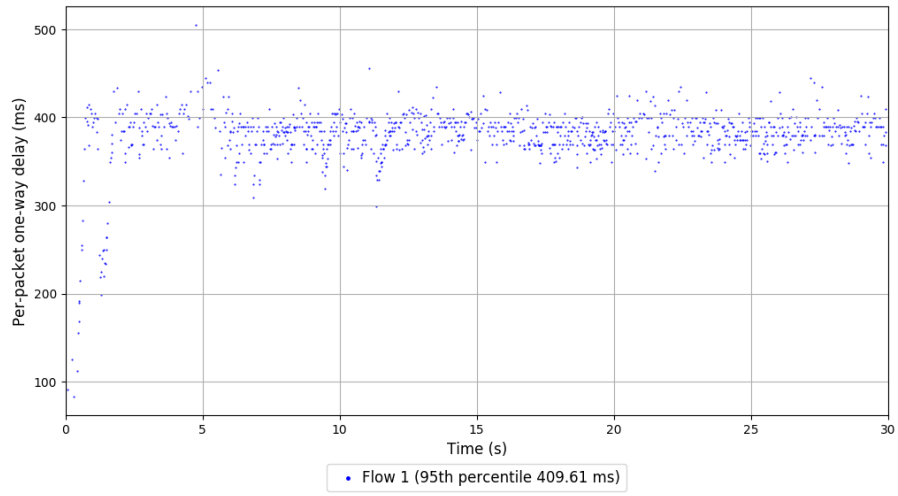
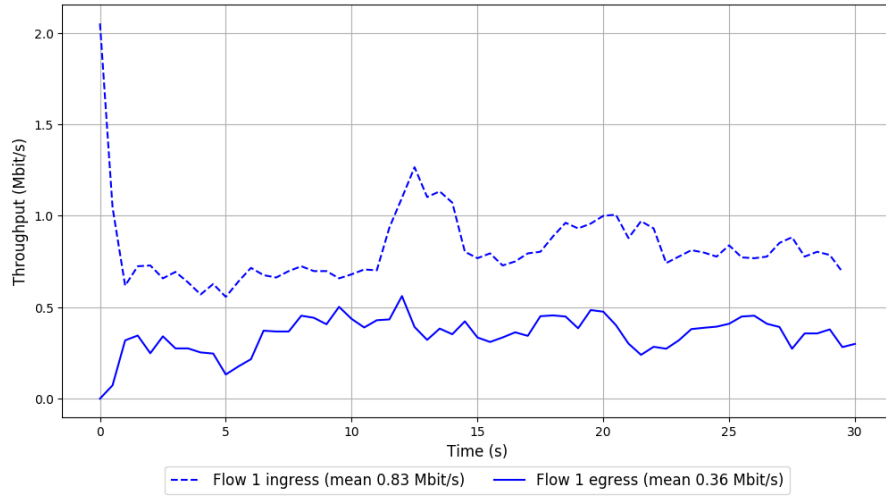
-- Flow 1:

Average throughput: 0.36 Mbit/s

95th percentile per-packet one-way delay: 409.609 ms

Loss rate: 56.93%

Run 1: Report of FillP-Sheep — Data Link

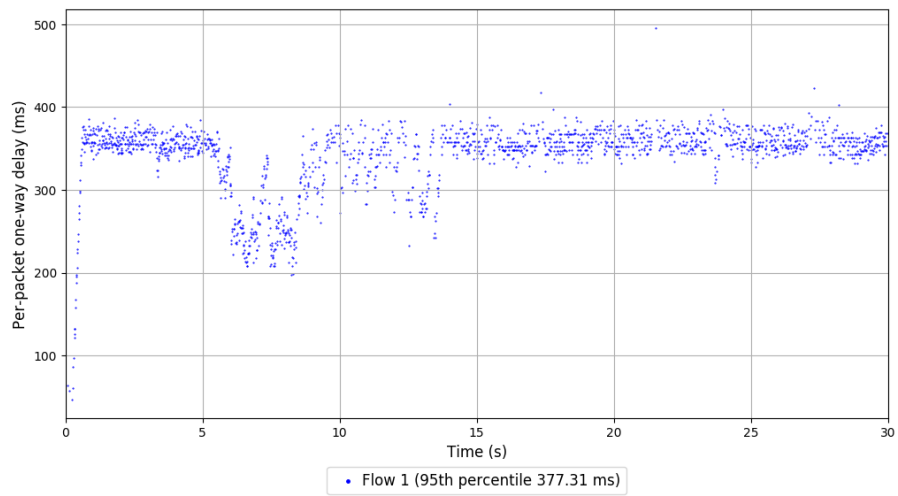
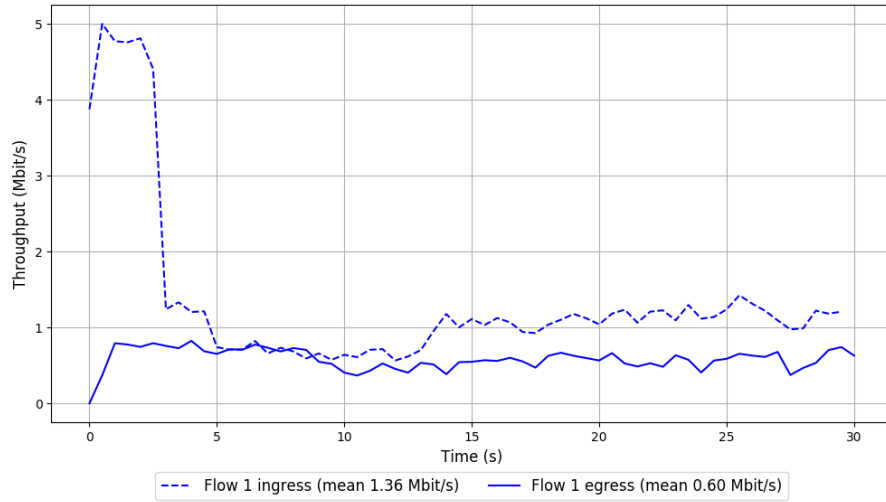


Run 2: Statistics of FillP-Sheep

Start at: 2018-08-22 09:56:05
End at: 2018-08-22 09:56:35
Local clock offset: 1.414 ms
Remote clock offset: -58.528 ms

Below is generated by plot.py at 2018-08-22 10:26:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 377.305 ms
Loss rate: 56.14%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 377.305 ms
Loss rate: 56.14%

Run 2: Report of FillP-Sheep — Data Link

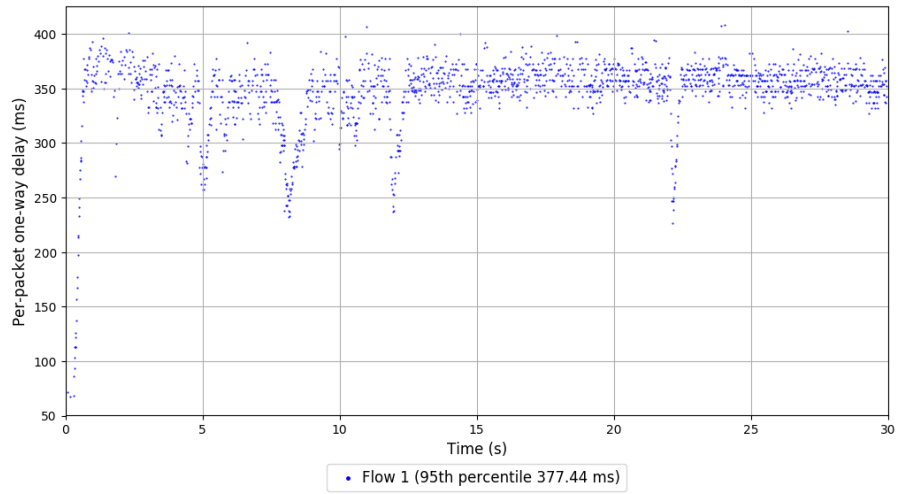
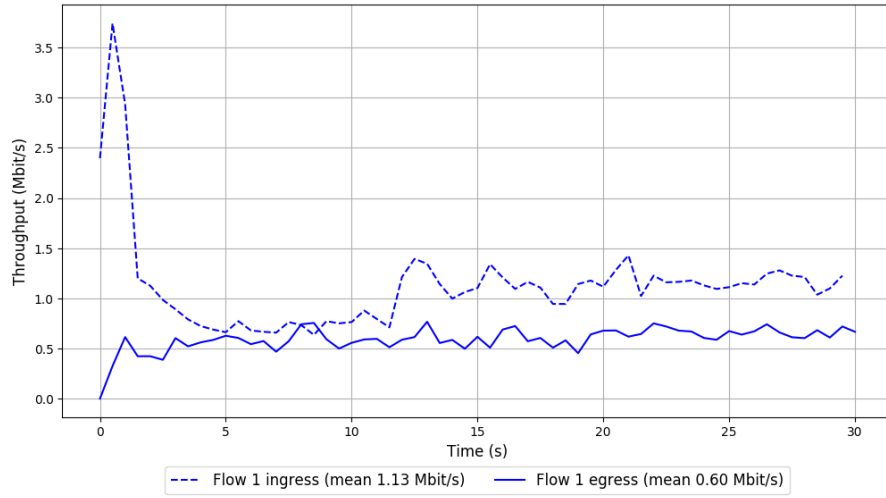


Run 3: Statistics of FillP-Sheep

Start at: 2018-08-22 10:14:22
End at: 2018-08-22 10:14:52
Local clock offset: 1.307 ms
Remote clock offset: -60.838 ms

Below is generated by plot.py at 2018-08-22 10:26:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 377.435 ms
Loss rate: 46.63%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 377.435 ms
Loss rate: 46.63%

Run 3: Report of FillP-Sheep — Data Link

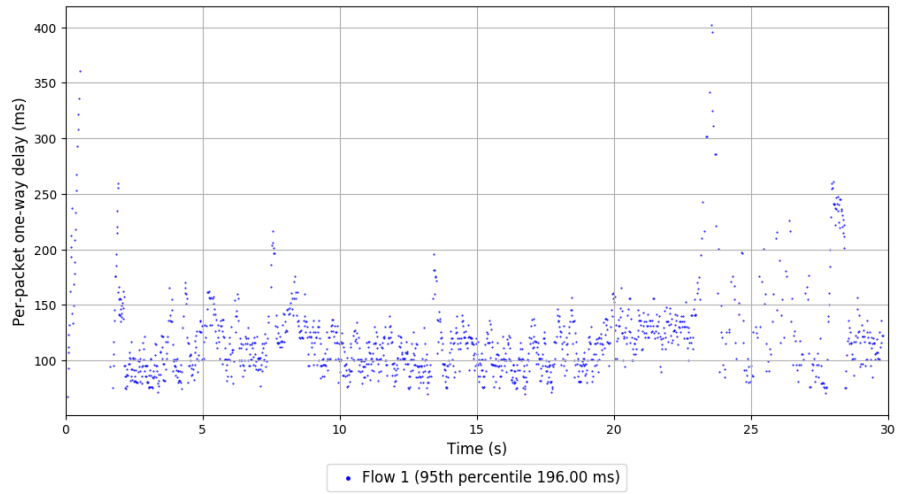
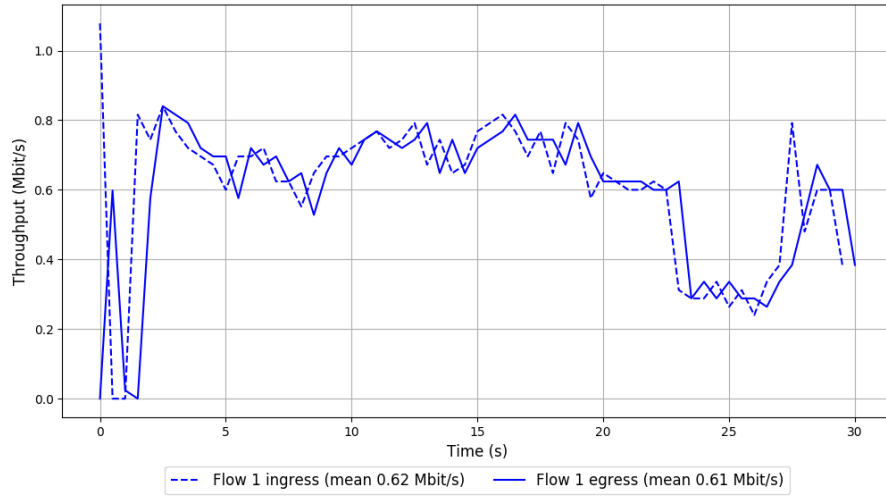


Run 1: Statistics of Indigo

Start at: 2018-08-22 09:45:21
End at: 2018-08-22 09:45:51
Local clock offset: 1.497 ms
Remote clock offset: -59.658 ms

Below is generated by plot.py at 2018-08-22 10:26:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 196.001 ms
Loss rate: 1.70%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 196.001 ms
Loss rate: 1.70%

Run 1: Report of Indigo — Data Link

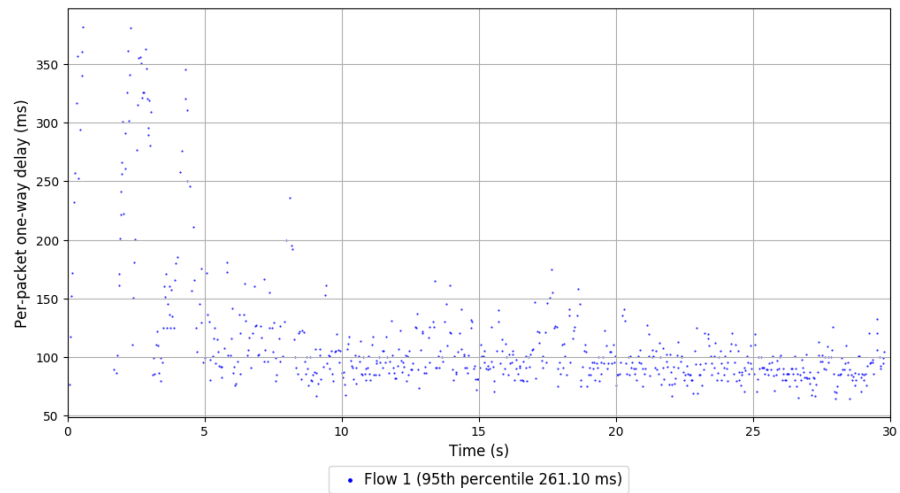
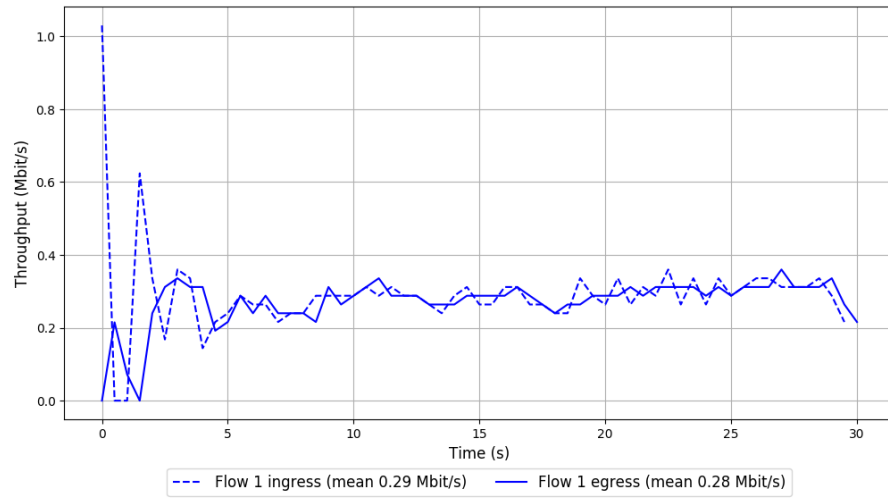


Run 2: Statistics of Indigo

Start at: 2018-08-22 10:03:37
End at: 2018-08-22 10:04:07
Local clock offset: 3.387 ms
Remote clock offset: -58.054 ms

Below is generated by plot.py at 2018-08-22 10:26:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 261.095 ms
Loss rate: 5.73%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 261.095 ms
Loss rate: 5.73%

Run 2: Report of Indigo — Data Link

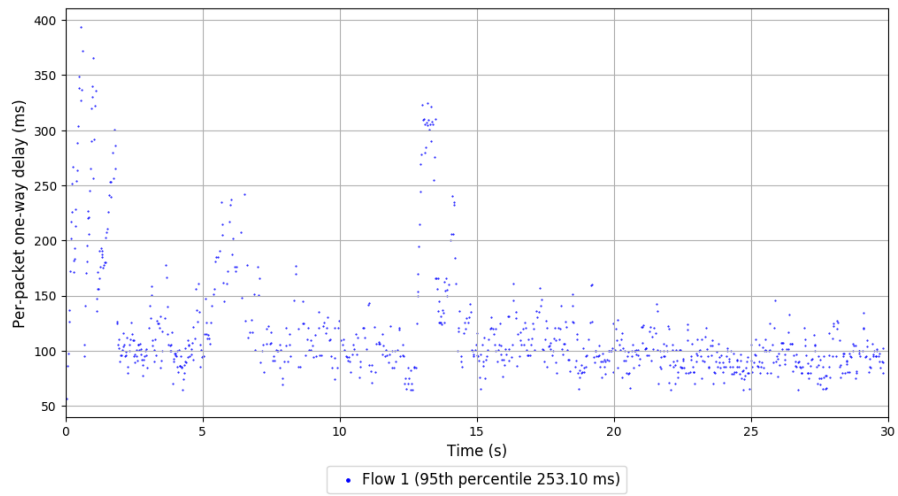
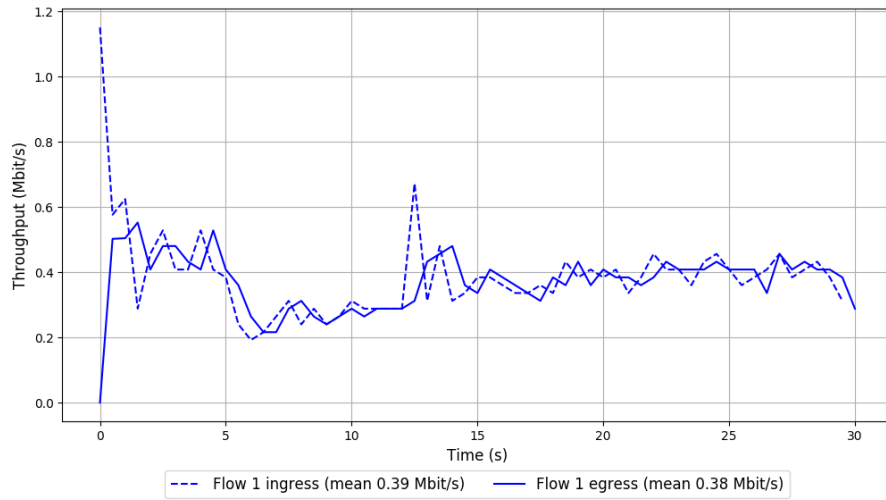


Run 3: Statistics of Indigo

Start at: 2018-08-22 10:21:53
End at: 2018-08-22 10:22:23
Local clock offset: 4.488 ms
Remote clock offset: -61.379 ms

Below is generated by plot.py at 2018-08-22 10:26:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 253.096 ms
Loss rate: 2.89%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 253.096 ms
Loss rate: 2.89%

Run 3: Report of Indigo — Data Link

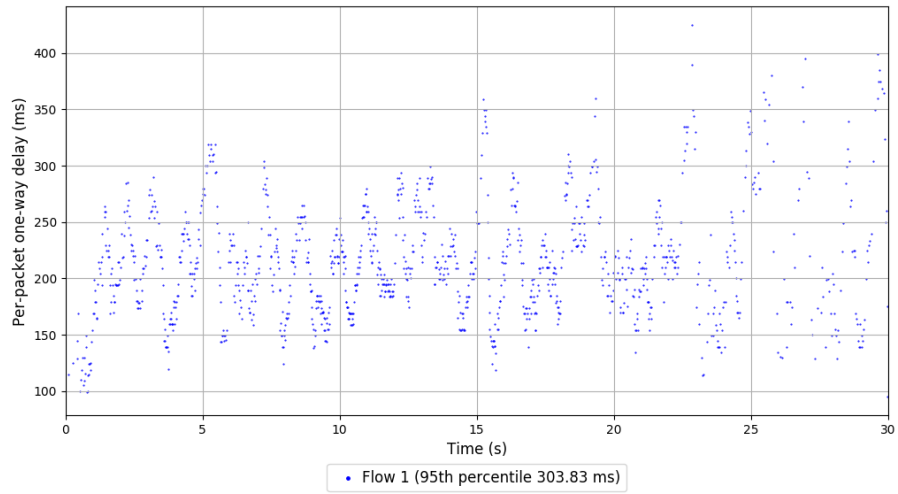
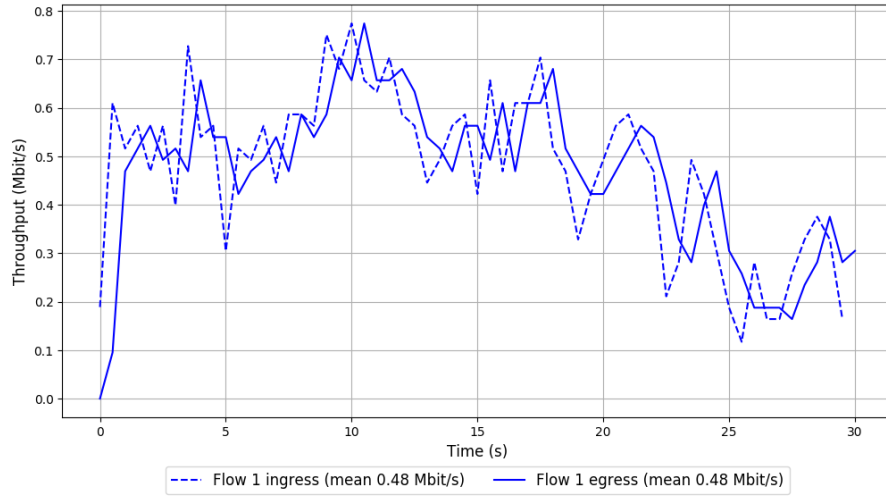


Run 1: Statistics of LEDBAT

Start at: 2018-08-22 09:36:45
End at: 2018-08-22 09:37:15
Local clock offset: 0.302 ms
Remote clock offset: -60.579 ms

Below is generated by plot.py at 2018-08-22 10:26:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 303.830 ms
Loss rate: 0.33%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 303.830 ms
Loss rate: 0.33%

Run 1: Report of LEDBAT — Data Link

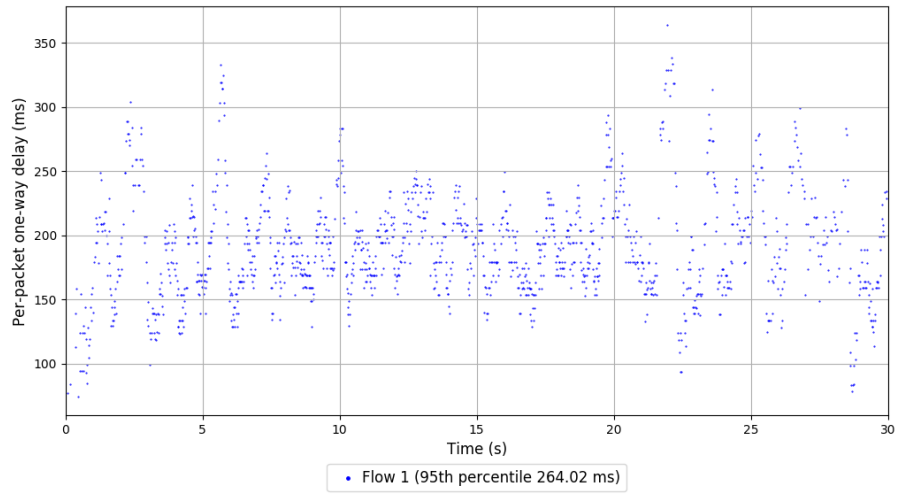
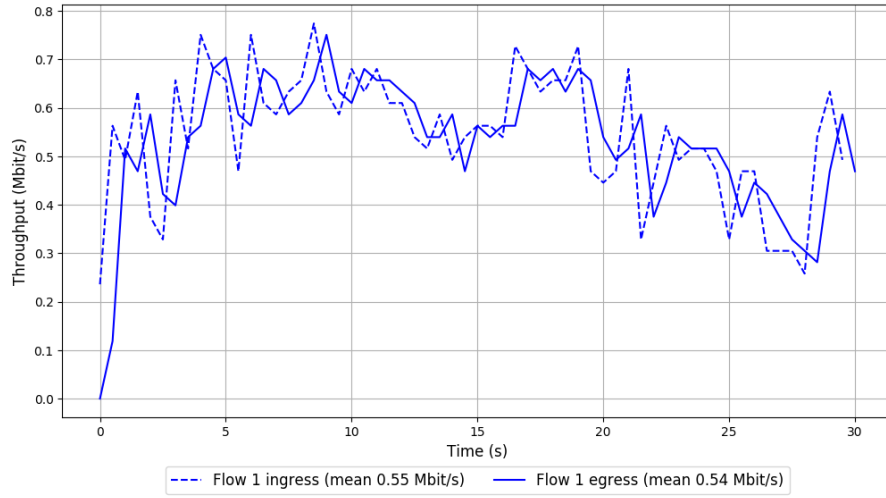


Run 2: Statistics of LEDBAT

Start at: 2018-08-22 09:55:01
End at: 2018-08-22 09:55:31
Local clock offset: 1.298 ms
Remote clock offset: -59.239 ms

Below is generated by plot.py at 2018-08-22 10:26:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 264.020 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 264.020 ms
Loss rate: 0.72%

Run 2: Report of LEDBAT — Data Link

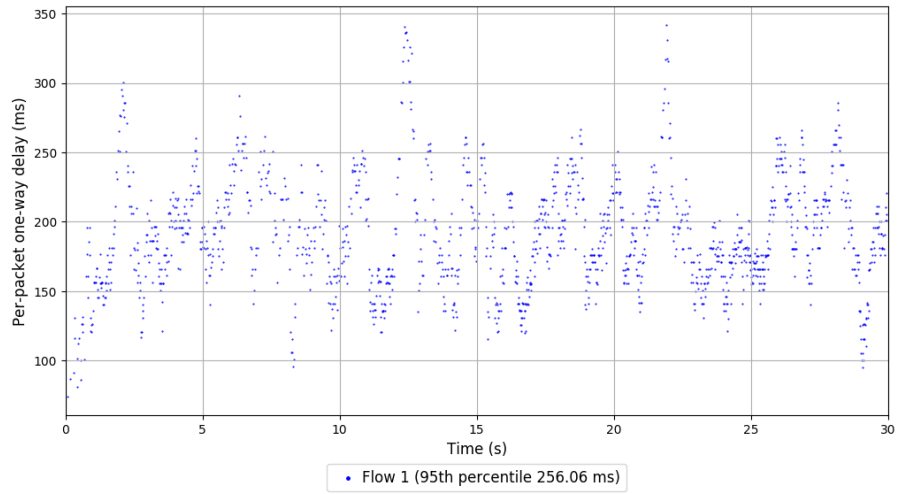
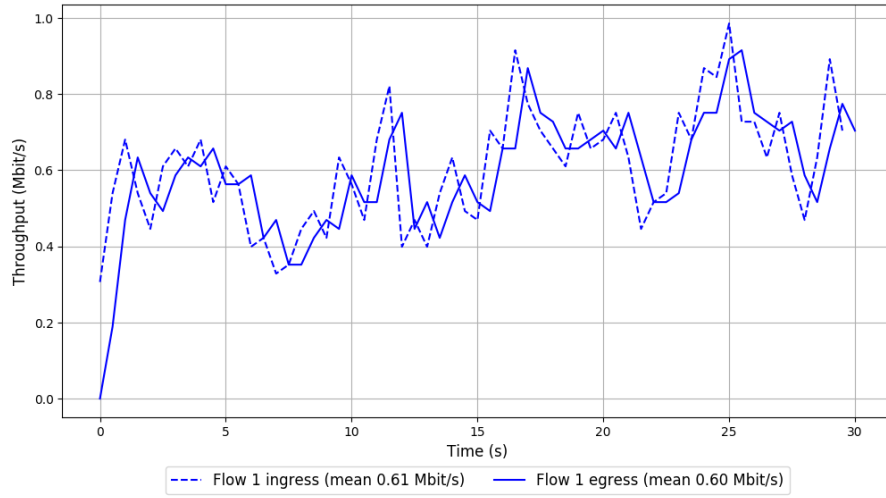


Run 3: Statistics of LEDBAT

Start at: 2018-08-22 10:13:17
End at: 2018-08-22 10:13:47
Local clock offset: 1.594 ms
Remote clock offset: -60.169 ms

Below is generated by plot.py at 2018-08-22 10:26:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 256.060 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 256.060 ms
Loss rate: 0.90%

Run 3: Report of LEDBAT — Data Link

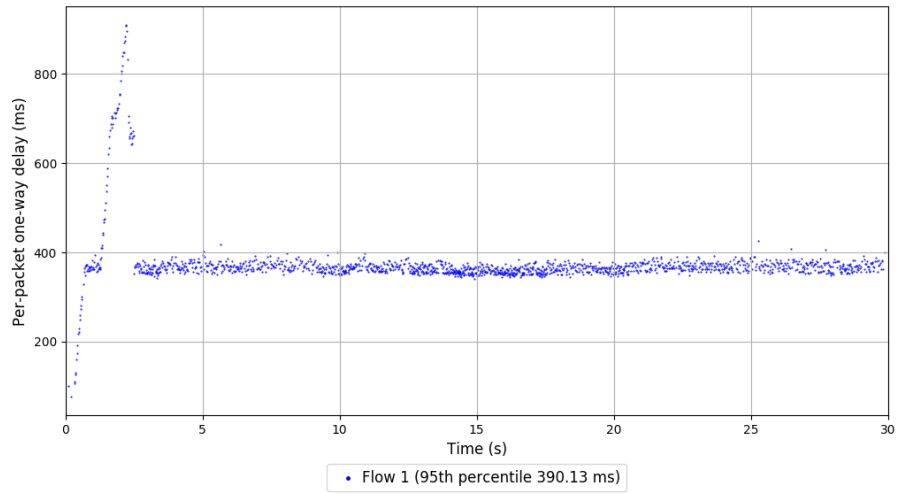
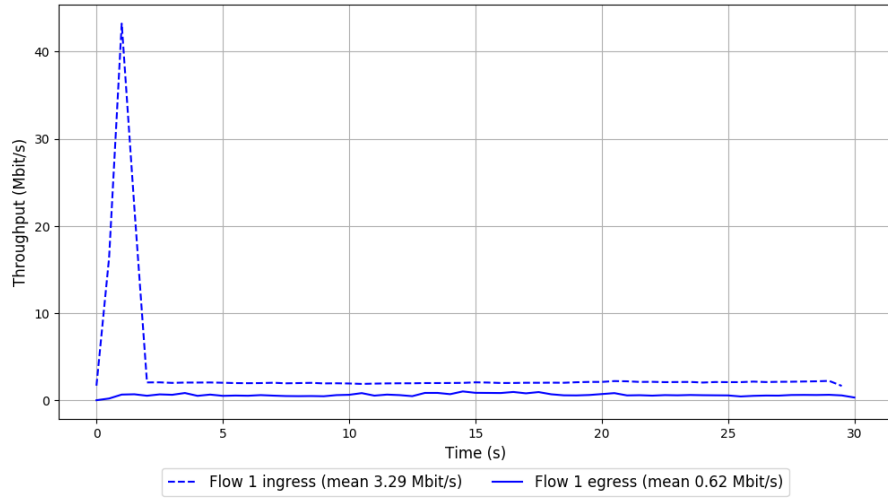


Run 1: Statistics of PCC-Allegro

Start at: 2018-08-22 09:44:17
End at: 2018-08-22 09:44:47
Local clock offset: 1.08 ms
Remote clock offset: -59.577 ms

Below is generated by plot.py at 2018-08-22 10:26:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 390.126 ms
Loss rate: 81.17%
-- Flow 1:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 390.126 ms
Loss rate: 81.17%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-08-22 10:02:33

End at: 2018-08-22 10:03:03

Local clock offset: 2.006 ms

Remote clock offset: -58.568 ms

Below is generated by plot.py at 2018-08-22 10:26:59

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 438.369 ms

Loss rate: 86.76%

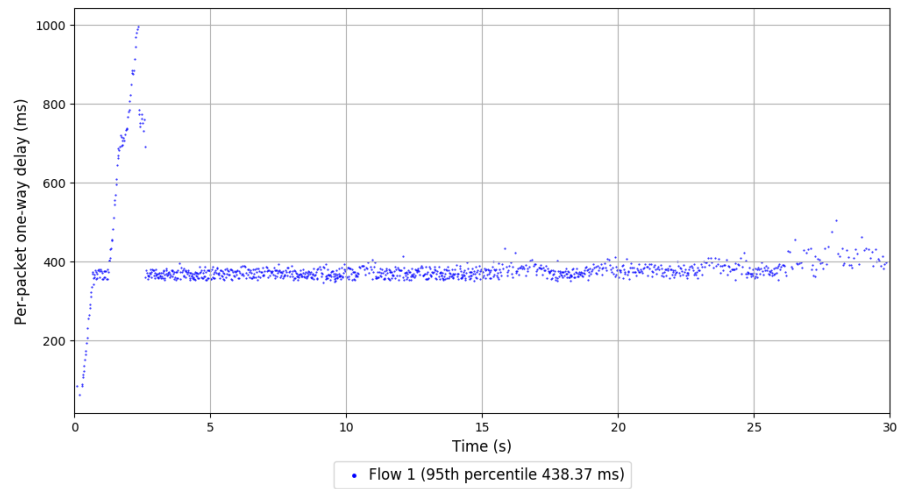
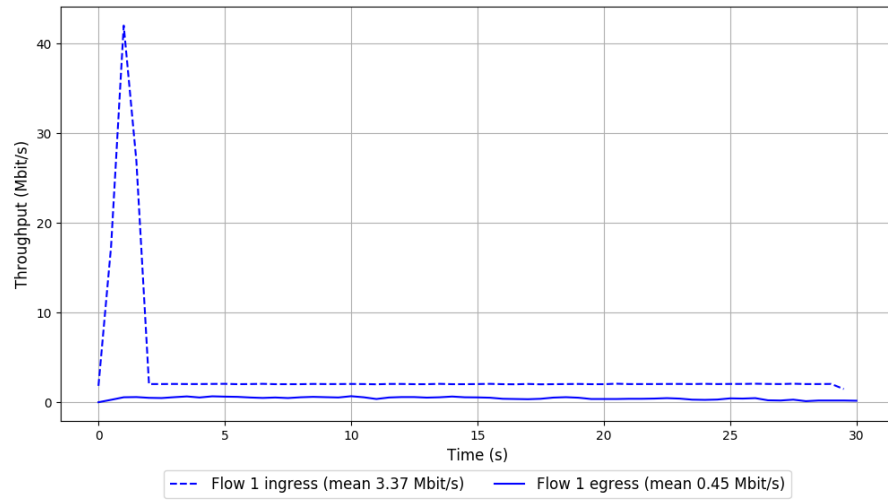
-- Flow 1:

Average throughput: 0.45 Mbit/s

95th percentile per-packet one-way delay: 438.369 ms

Loss rate: 86.76%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-08-22 10:20:49

End at: 2018-08-22 10:21:19

Local clock offset: 1.381 ms

Remote clock offset: -62.301 ms

Below is generated by plot.py at 2018-08-22 10:27:00

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 401.906 ms

Loss rate: 84.40%

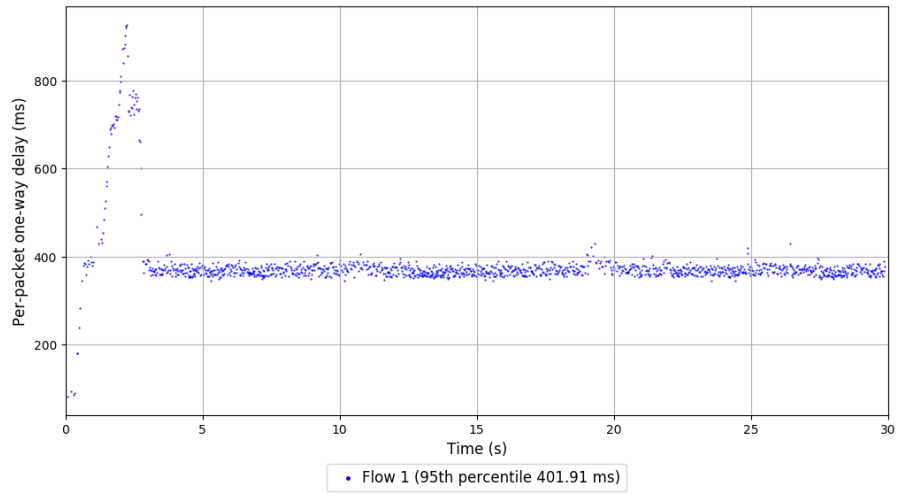
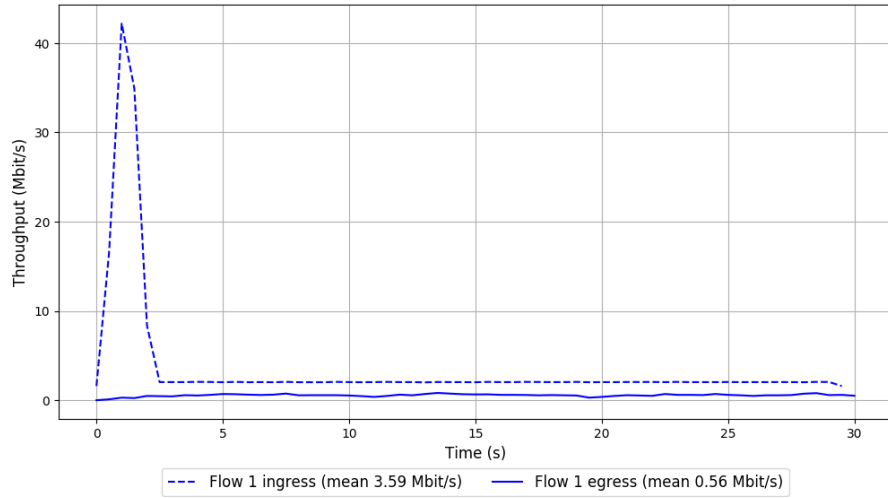
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 401.906 ms

Loss rate: 84.40%

Run 3: Report of PCC-Allegro — Data Link

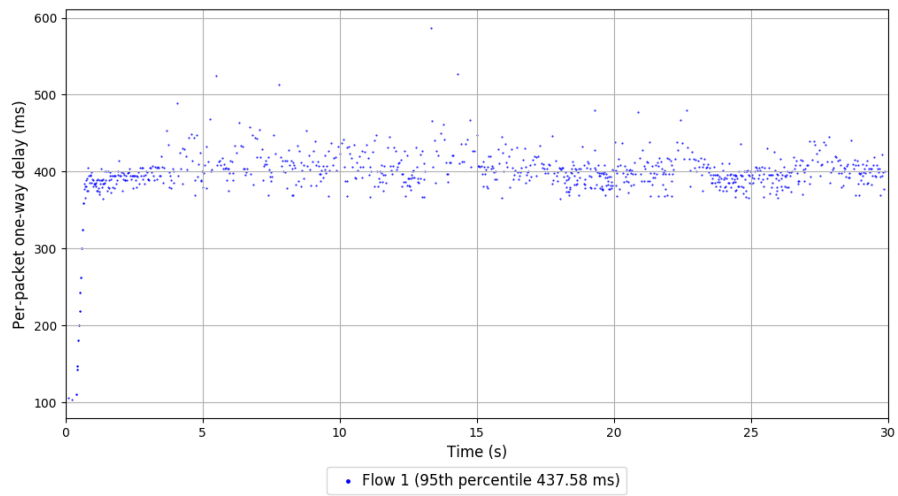
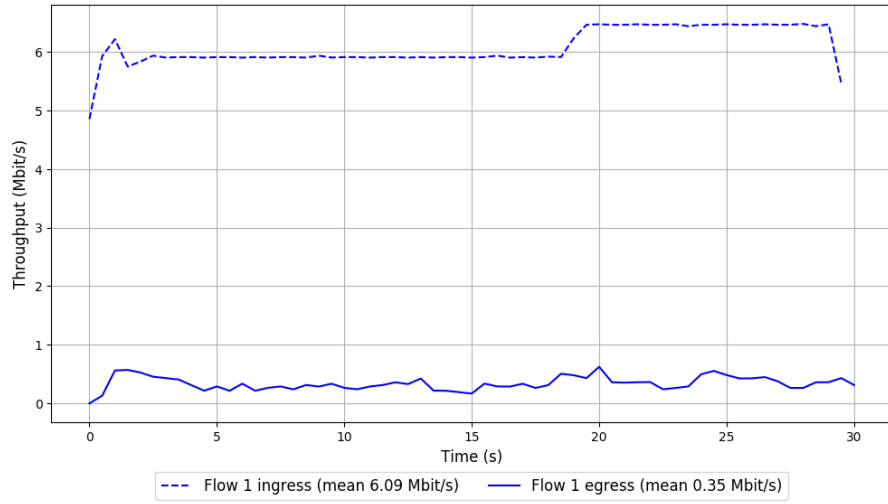


Run 1: Statistics of PCC-Expr

Start at: 2018-08-22 09:38:54
End at: 2018-08-22 09:39:24
Local clock offset: 1.693 ms
Remote clock offset: -59.118 ms

Below is generated by plot.py at 2018-08-22 10:27:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 437.576 ms
Loss rate: 94.32%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 437.576 ms
Loss rate: 94.32%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2018-08-22 09:57:10
End at: 2018-08-22 09:57:40
Local clock offset: 1.499 ms
Remote clock offset: -58.246 ms

Below is generated by plot.py at 2018-08-22 10:27:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 388.573 ms

Loss rate: 91.30%

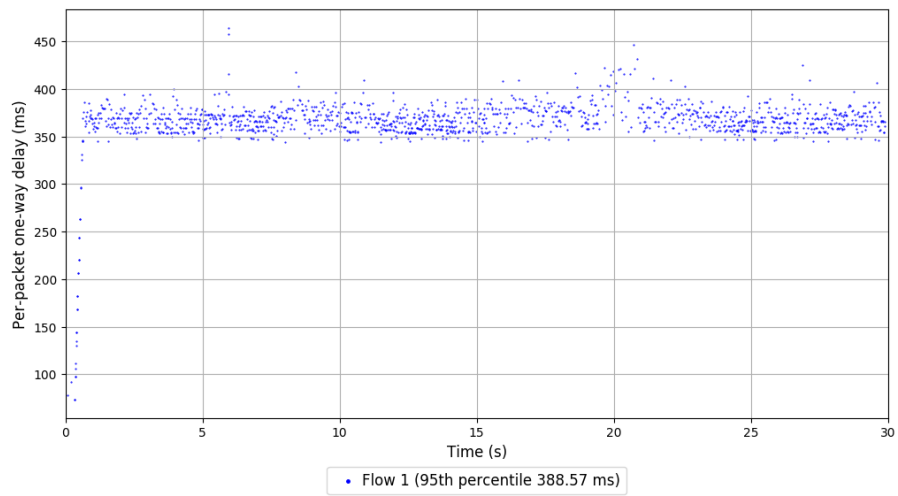
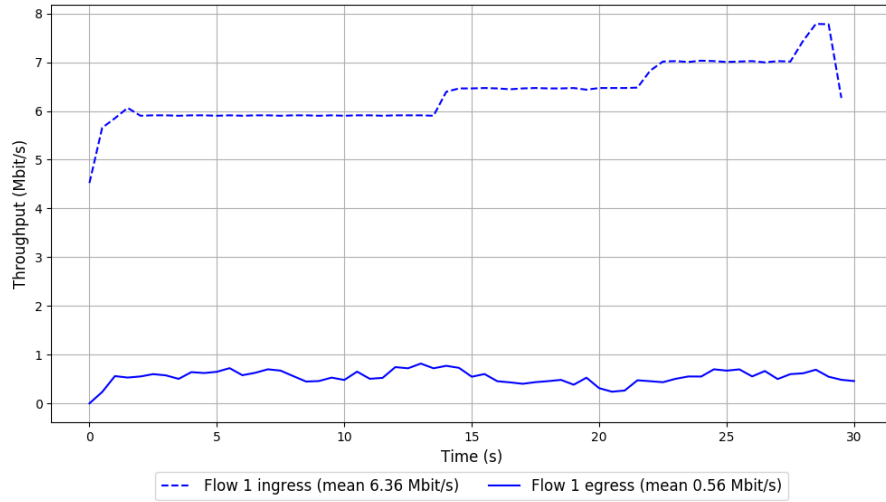
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 388.573 ms

Loss rate: 91.30%

Run 2: Report of PCC-Expr — Data Link

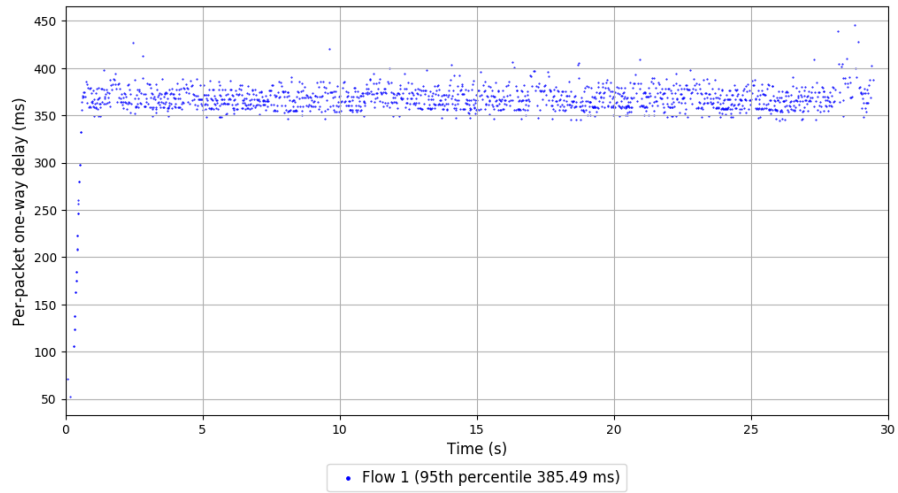
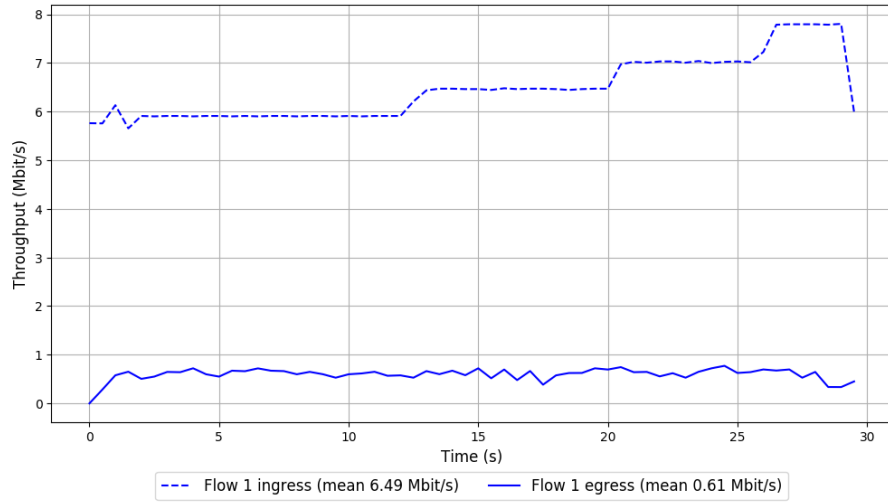


Run 3: Statistics of PCC-Expr

Start at: 2018-08-22 10:15:26
End at: 2018-08-22 10:15:56
Local clock offset: 1.808 ms
Remote clock offset: -61.103 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 385.485 ms
Loss rate: 90.78%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 385.485 ms
Loss rate: 90.78%

Run 3: Report of PCC-Expr — Data Link

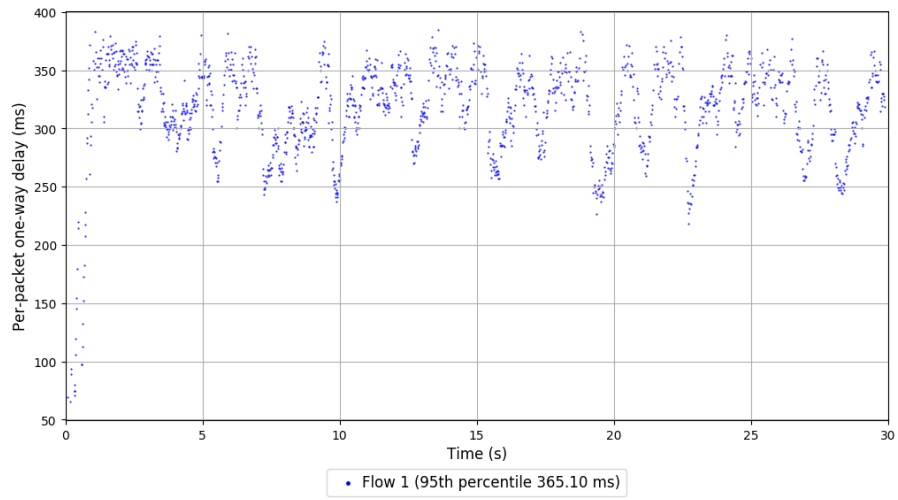
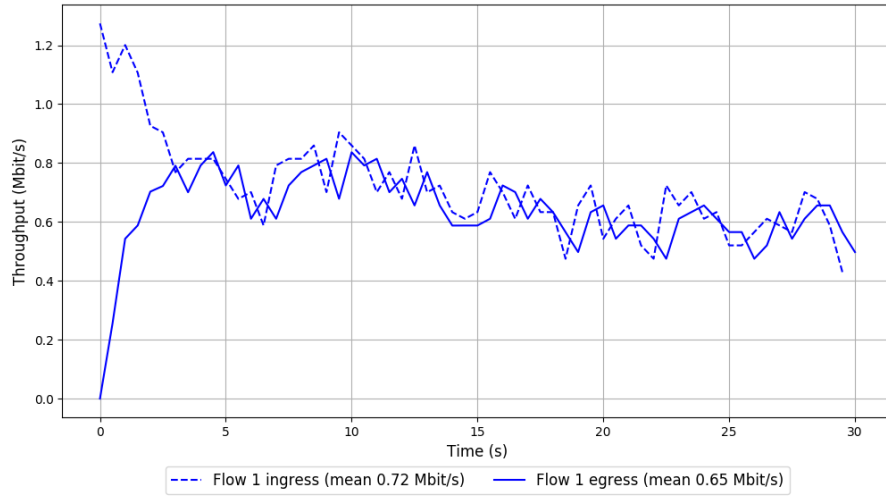


Run 1: Statistics of QUIC Cubic

Start at: 2018-08-22 09:47:30
End at: 2018-08-22 09:48:00
Local clock offset: 1.25 ms
Remote clock offset: -59.418 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 365.102 ms
Loss rate: 10.27%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 365.102 ms
Loss rate: 10.27%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2018-08-22 10:05:46
End at: 2018-08-22 10:06:16
Local clock offset: 1.659 ms
Remote clock offset: -58.551 ms

Below is generated by plot.py at 2018-08-22 10:27:09

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 371.114 ms

Loss rate: 14.67%

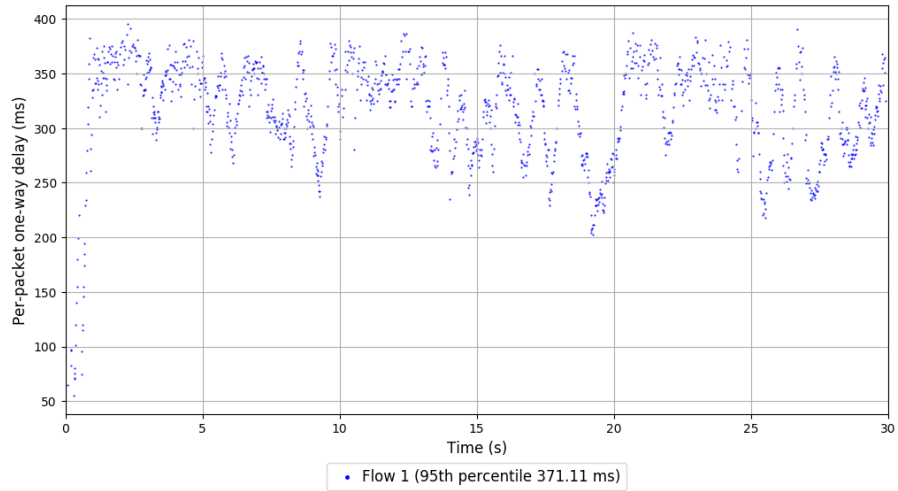
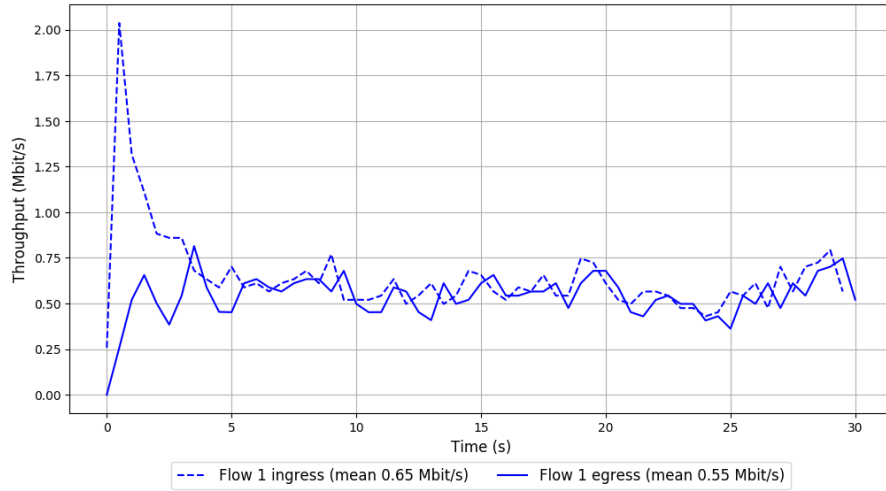
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 371.114 ms

Loss rate: 14.67%

Run 2: Report of QUIC Cubic — Data Link

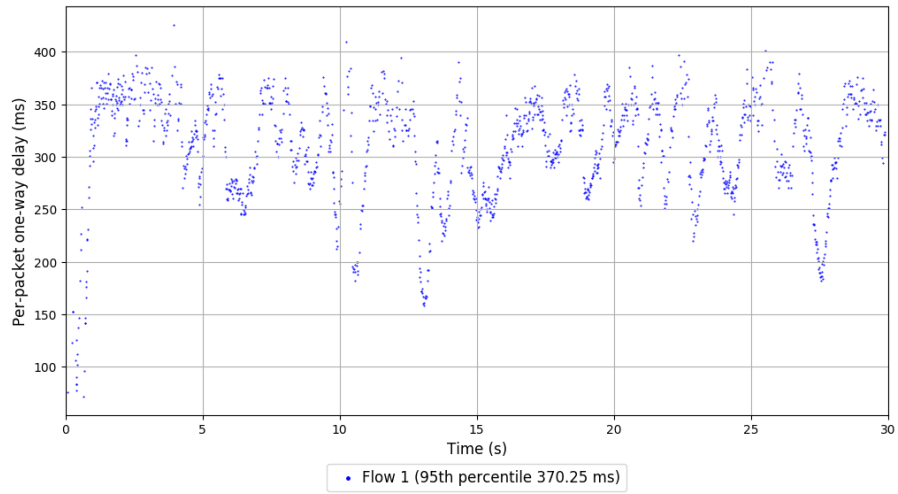
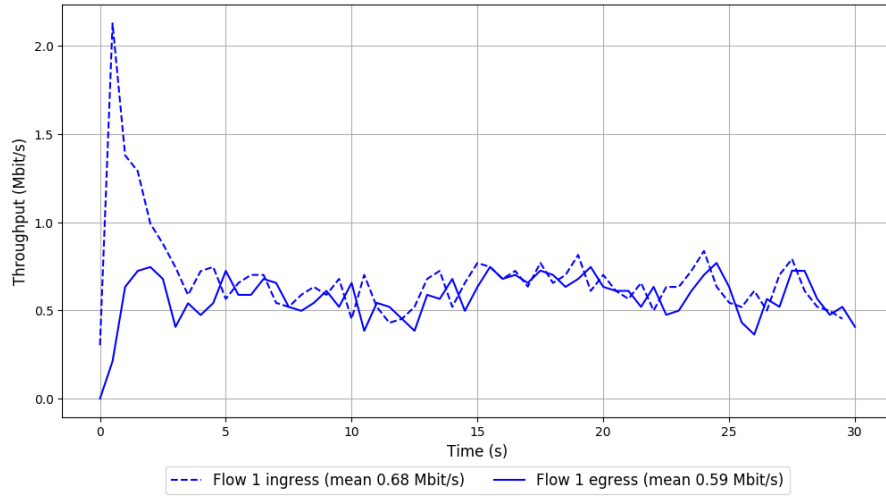


Run 3: Statistics of QUIC Cubic

Start at: 2018-08-22 10:24:02
End at: 2018-08-22 10:24:32
Local clock offset: 2.75 ms
Remote clock offset: -62.496 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 370.254 ms
Loss rate: 14.40%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 370.254 ms
Loss rate: 14.40%

Run 3: Report of QUIC Cubic — Data Link

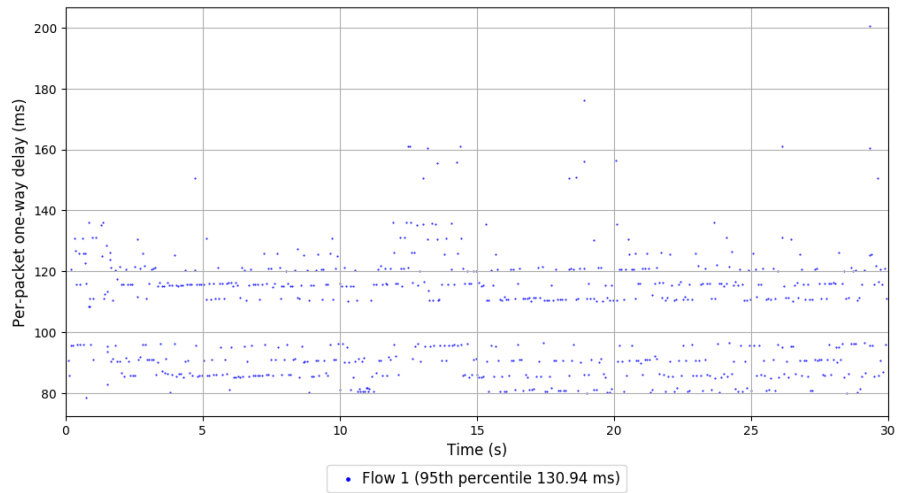
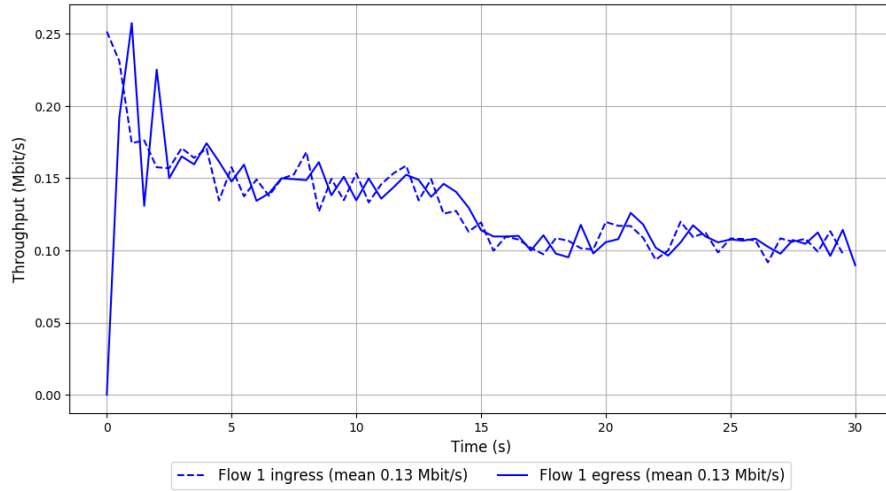


Run 1: Statistics of SCReAM

Start at: 2018-08-22 09:35:41
End at: 2018-08-22 09:36:11
Local clock offset: -0.618 ms
Remote clock offset: -60.571 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 130.939 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 130.939 ms
Loss rate: 0.31%

Run 1: Report of SCReAM — Data Link

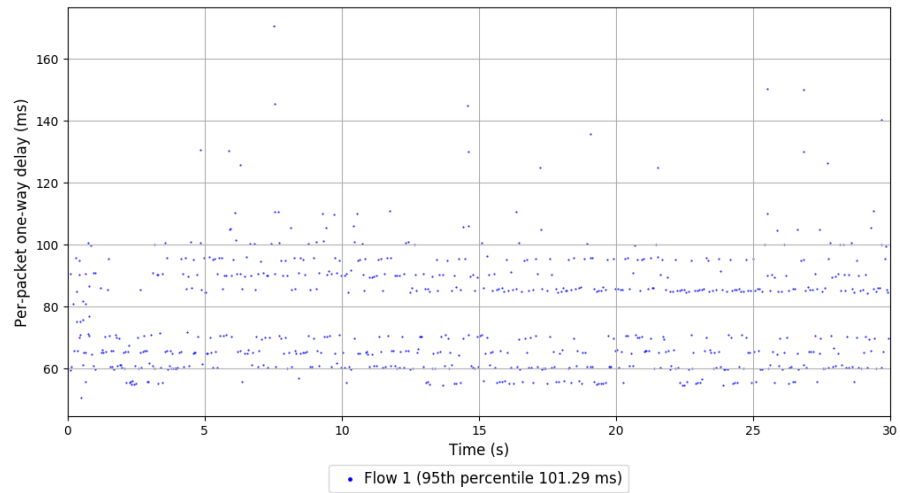
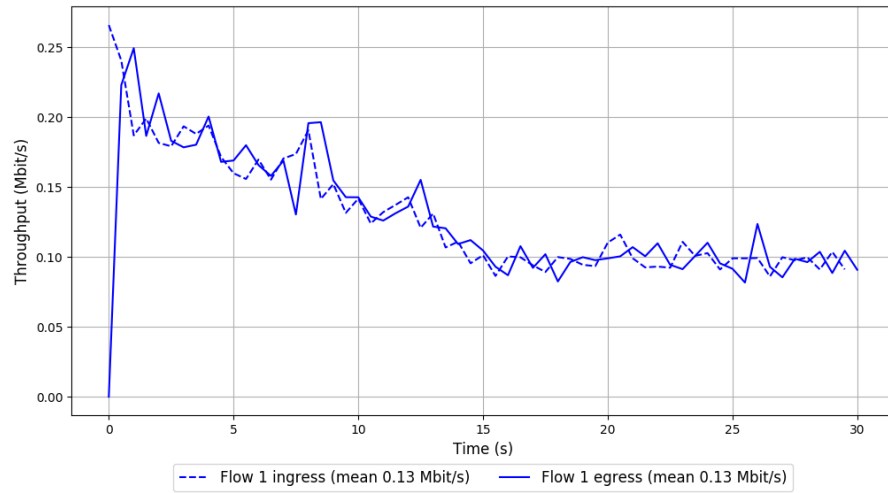


Run 2: Statistics of SCReAM

Start at: 2018-08-22 09:53:56
End at: 2018-08-22 09:54:26
Local clock offset: 0.614 ms
Remote clock offset: -58.225 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 101.286 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 101.286 ms
Loss rate: 0.20%

Run 2: Report of SCReAM — Data Link

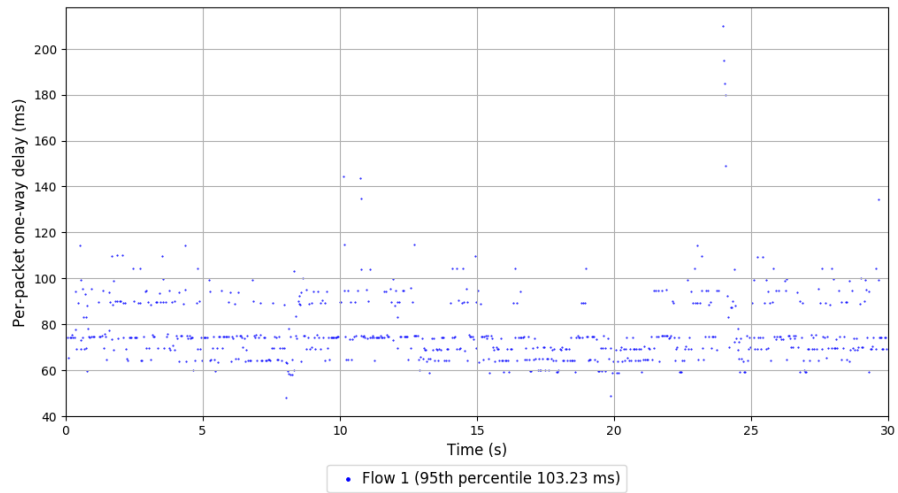
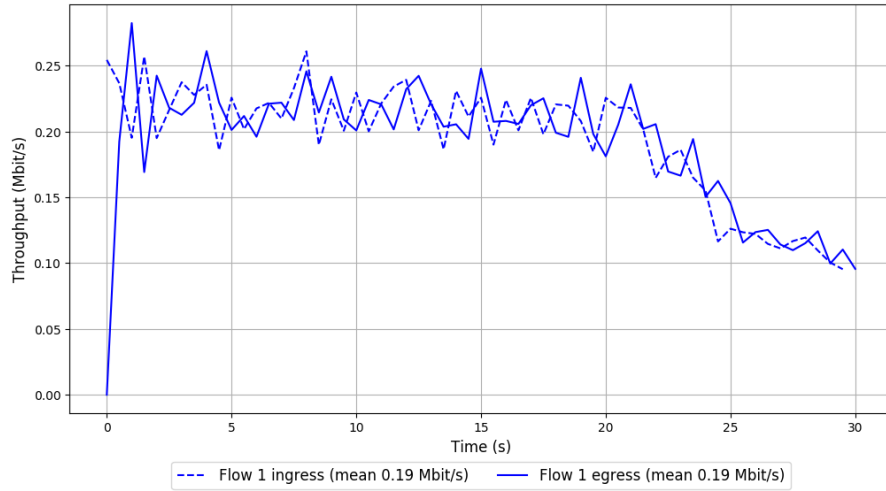


Run 3: Statistics of SCReAM

Start at: 2018-08-22 10:12:13
End at: 2018-08-22 10:12:43
Local clock offset: 1.841 ms
Remote clock offset: -59.948 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 103.233 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 103.233 ms
Loss rate: 0.28%

Run 3: Report of SCReAM — Data Link

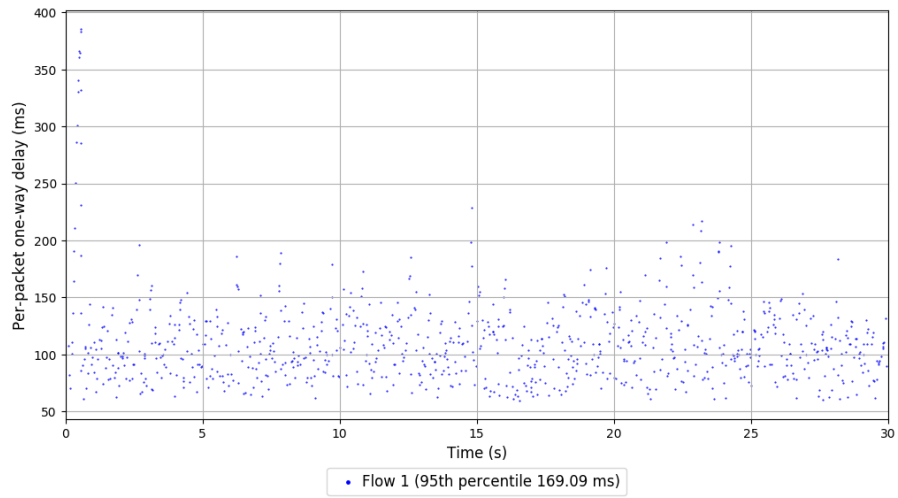
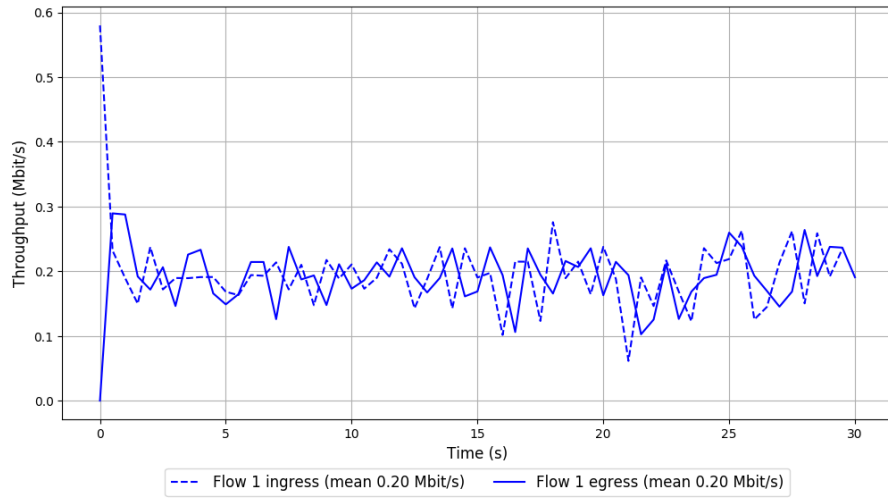


Run 1: Statistics of Sprout

Start at: 2018-08-22 09:46:26
End at: 2018-08-22 09:46:56
Local clock offset: 14.073 ms
Remote clock offset: -58.859 ms

```
# Below is generated by plot.py at 2018-08-22 10:27:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 169.091 ms
Loss rate: 1.96%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 169.091 ms
Loss rate: 1.96%
```

Run 1: Report of Sprout — Data Link

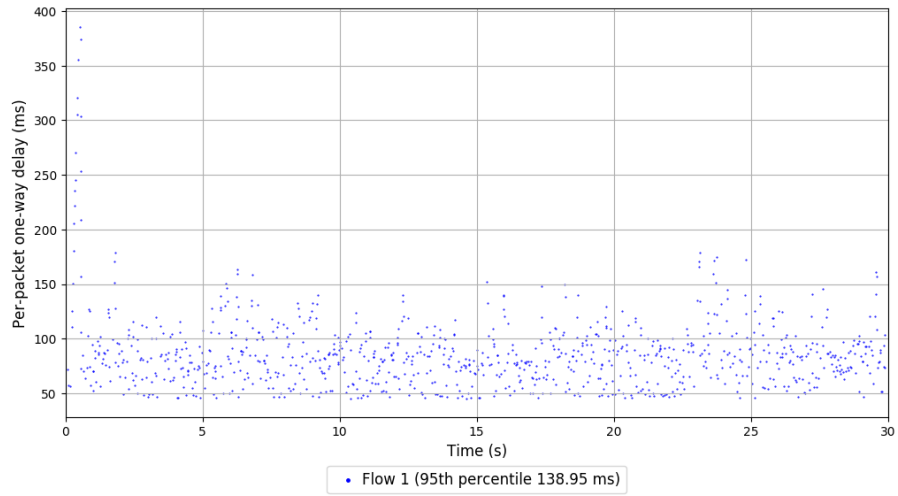
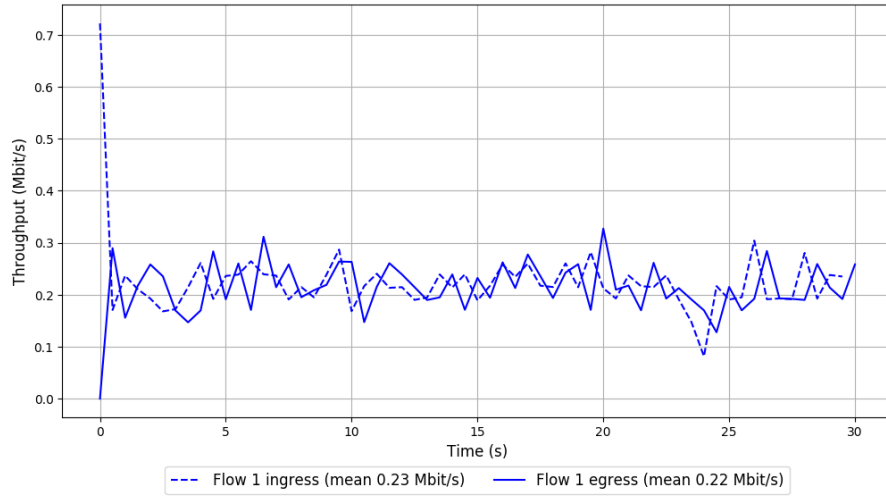


Run 2: Statistics of Sprout

Start at: 2018-08-22 10:04:42
End at: 2018-08-22 10:05:12
Local clock offset: 1.86 ms
Remote clock offset: -58.063 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 138.949 ms
Loss rate: 3.29%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 138.949 ms
Loss rate: 3.29%

Run 2: Report of Sprout — Data Link

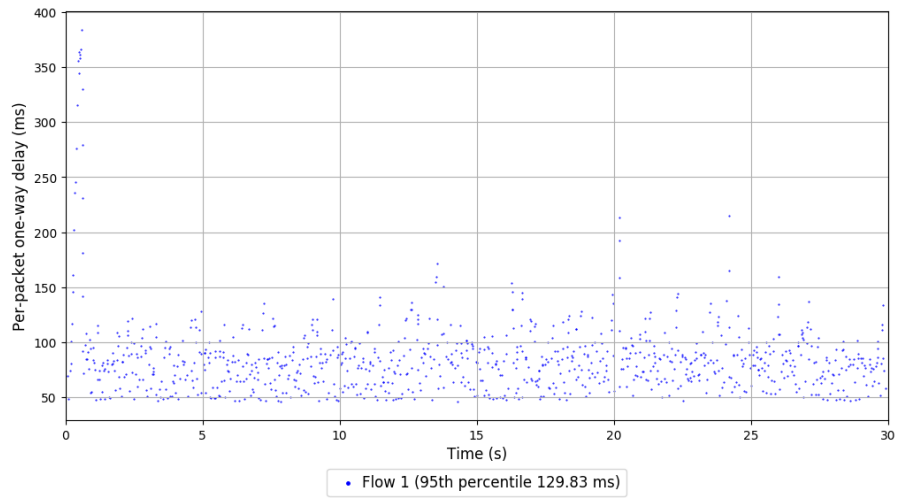
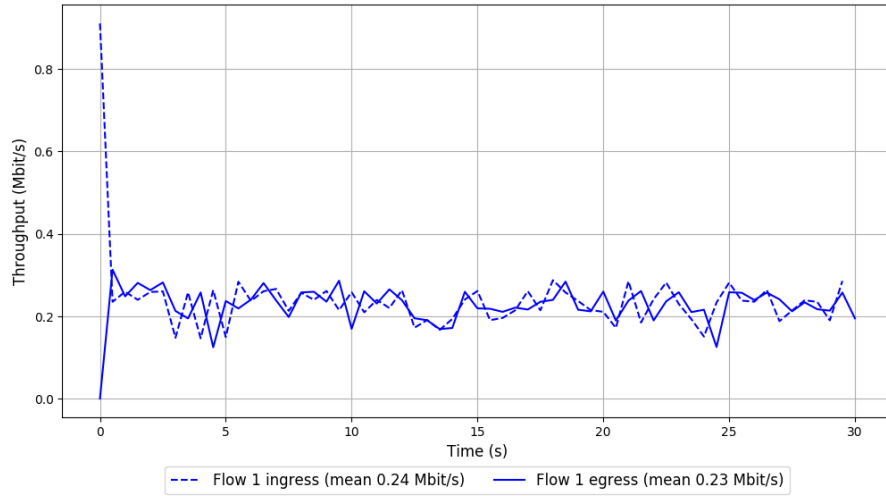


Run 3: Statistics of Sprout

Start at: 2018-08-22 10:22:58
End at: 2018-08-22 10:23:28
Local clock offset: 3.497 ms
Remote clock offset: -61.959 ms

Below is generated by plot.py at 2018-08-22 10:27:09
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 129.832 ms
Loss rate: 4.07%
-- Flow 1:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 129.832 ms
Loss rate: 4.07%

Run 3: Report of Sprout — Data Link

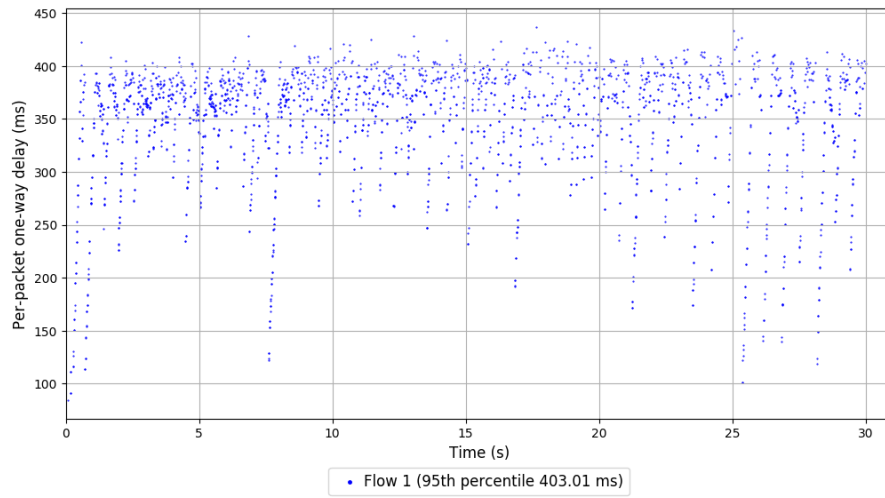
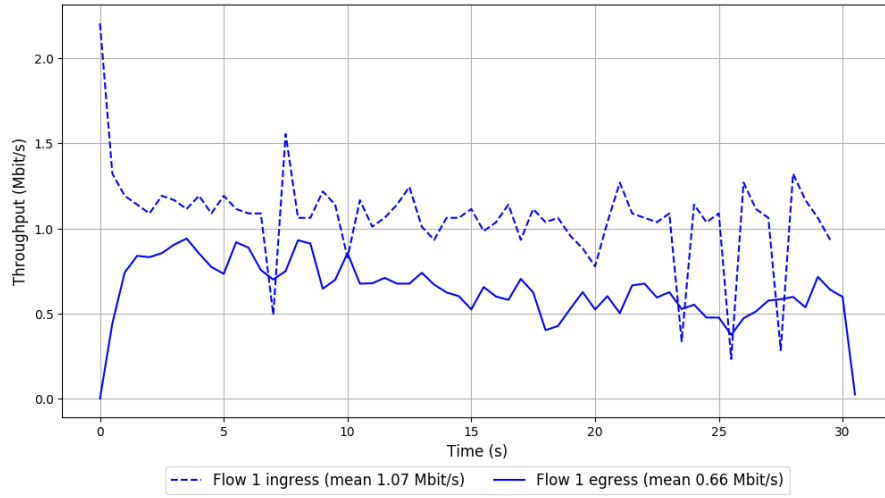


Run 1: Statistics of TaoVA-100x

Start at: 2018-08-22 09:48:35
End at: 2018-08-22 09:49:05
Local clock offset: 31.504 ms
Remote clock offset: -59.473 ms

Below is generated by plot.py at 2018-08-22 10:27:10
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 403.007 ms
Loss rate: 38.12%
-- Flow 1:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 403.007 ms
Loss rate: 38.12%

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

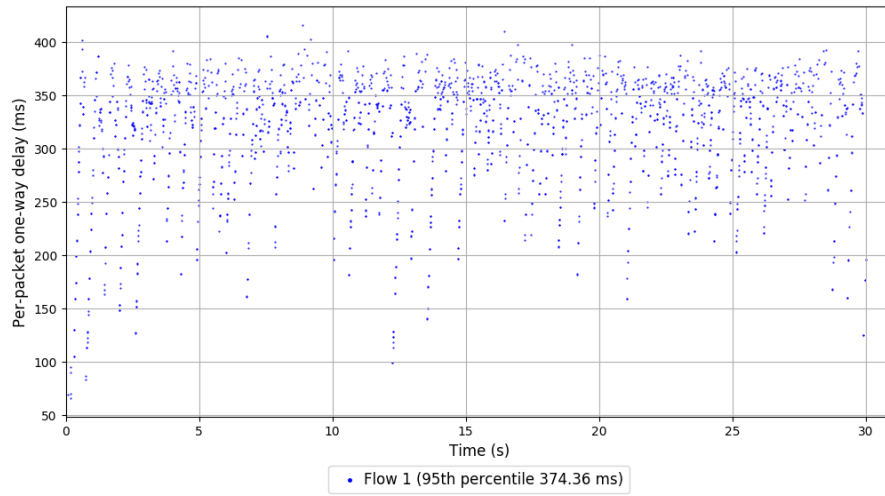
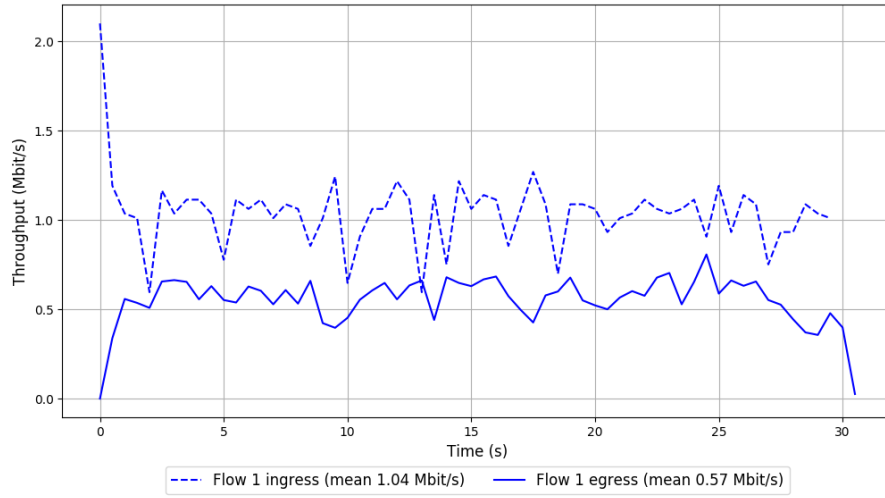


Run 2: Statistics of TaoVA-100x

Start at: 2018-08-22 10:06:51
End at: 2018-08-22 10:07:21
Local clock offset: 3.363 ms
Remote clock offset: -58.742 ms

Below is generated by plot.py at 2018-08-22 10:27:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 374.363 ms
Loss rate: 45.22%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 374.363 ms
Loss rate: 45.22%

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



Run 3: Statistics of TaoVA-100x

Start at: 2018-08-22 10:25:07

End at: 2018-08-22 10:25:37

Local clock offset: 3.667 ms

Remote clock offset: -61.21 ms

Below is generated by plot.py at 2018-08-22 10:27:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 374.925 ms

Loss rate: 50.17%

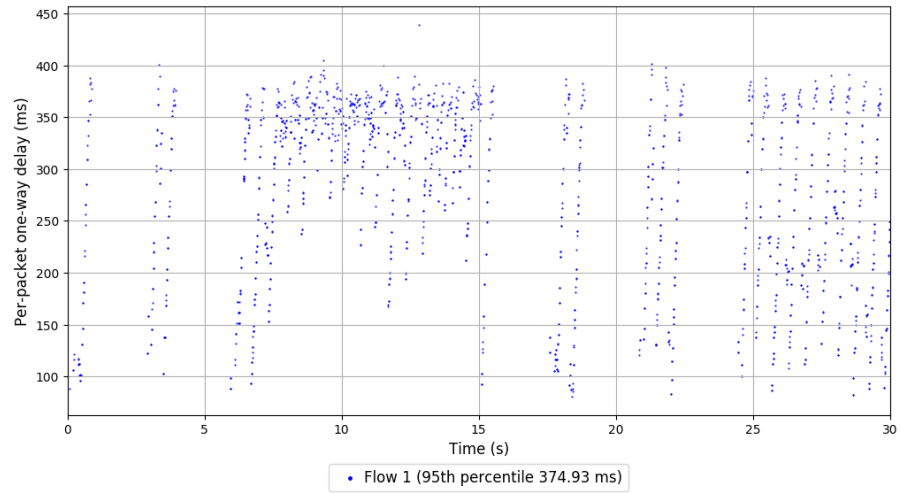
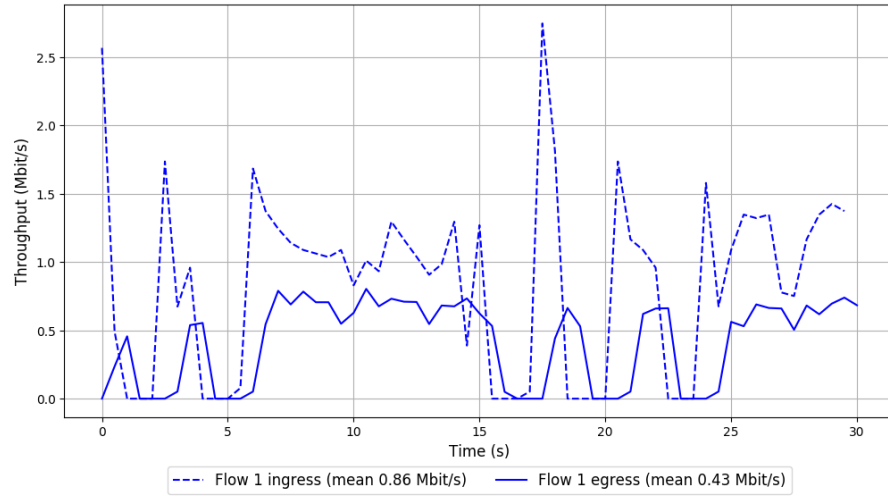
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 374.925 ms

Loss rate: 50.17%

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

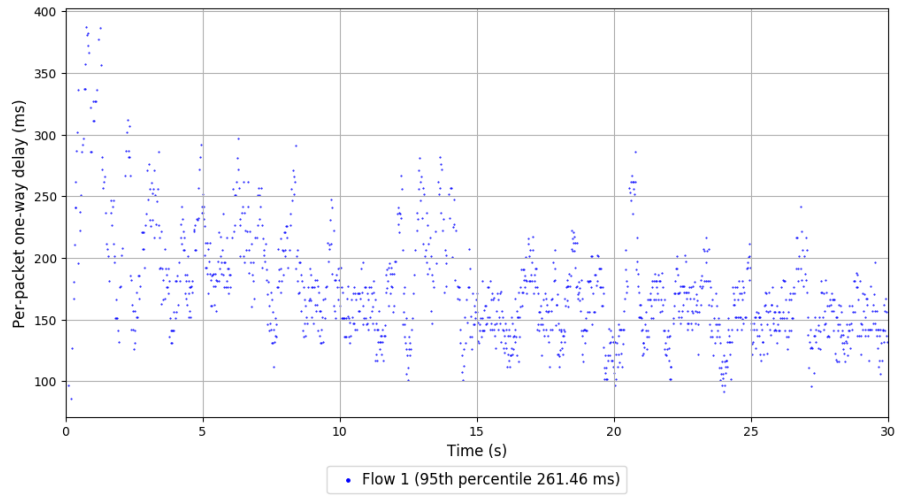
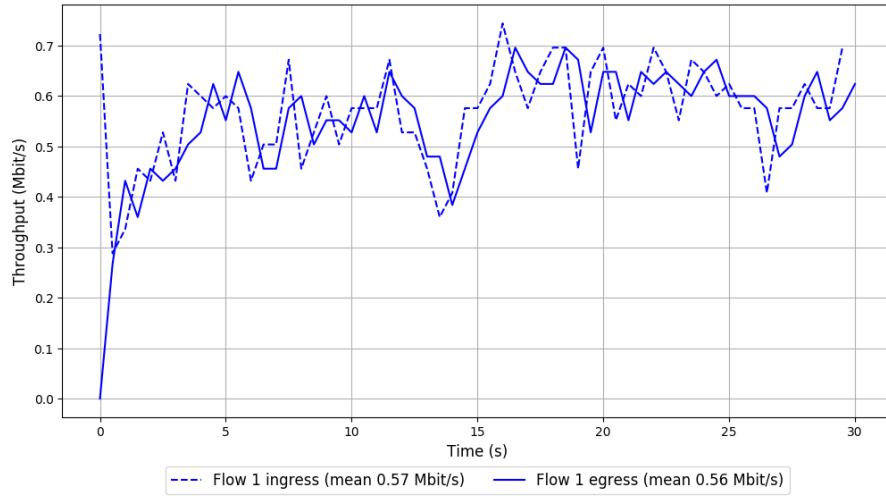


Run 1: Statistics of TCP Vegas

Start at: 2018-08-22 09:33:32
End at: 2018-08-22 09:34:02
Local clock offset: 1.861 ms
Remote clock offset: -61.238 ms

Below is generated by plot.py at 2018-08-22 10:27:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 261.465 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 261.465 ms
Loss rate: 1.06%

Run 1: Report of TCP Vegas — Data Link

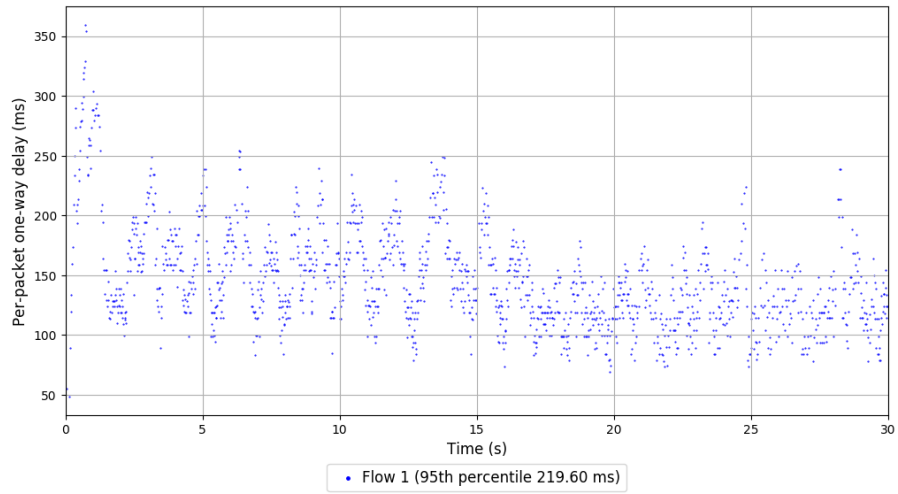
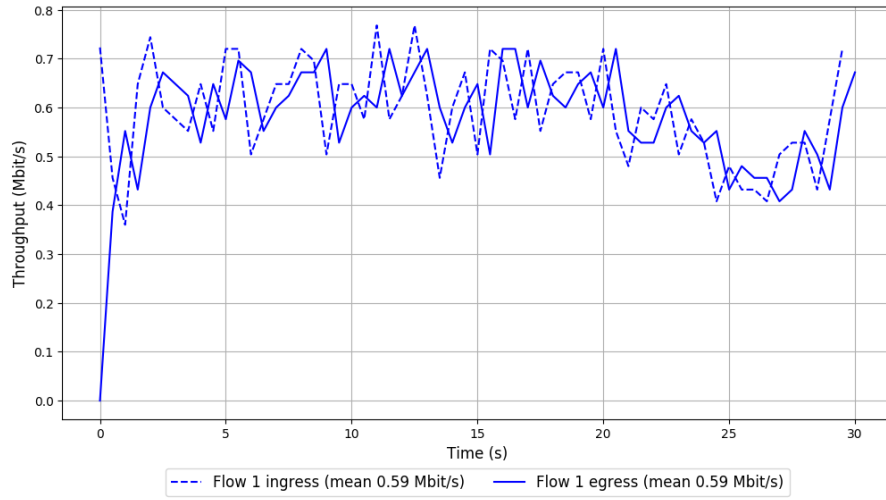


Run 2: Statistics of TCP Vegas

Start at: 2018-08-22 09:51:48
End at: 2018-08-22 09:52:18
Local clock offset: 1.502 ms
Remote clock offset: -58.213 ms

Below is generated by plot.py at 2018-08-22 10:27:11
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 219.603 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 219.603 ms
Loss rate: 0.54%

Run 2: Report of TCP Vegas — Data Link

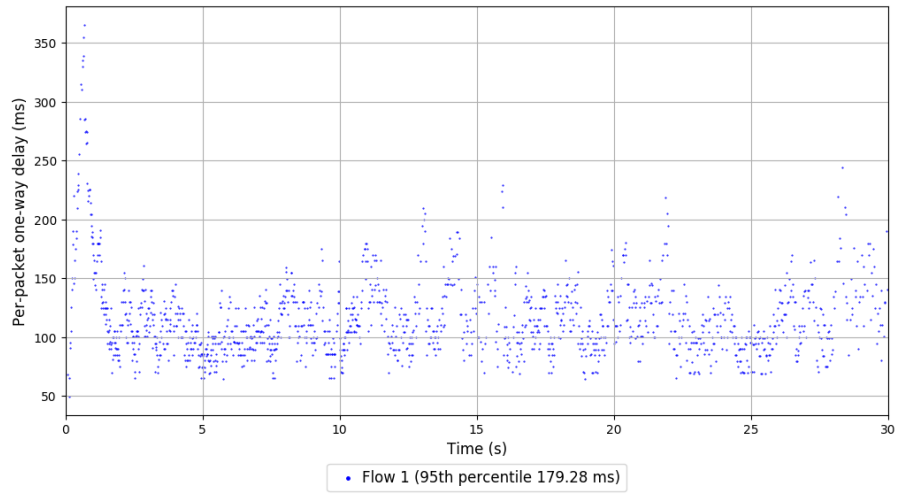
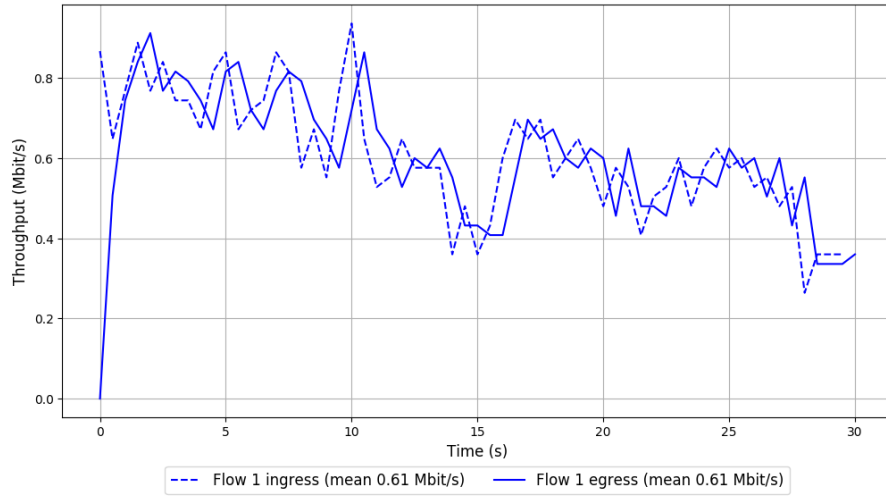


Run 3: Statistics of TCP Vegas

Start at: 2018-08-22 10:10:04
End at: 2018-08-22 10:10:34
Local clock offset: 2.72 ms
Remote clock offset: -59.424 ms

```
# Below is generated by plot.py at 2018-08-22 10:27:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 179.283 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 179.283 ms
Loss rate: 0.26%
```

Run 3: Report of TCP Vegas — Data Link

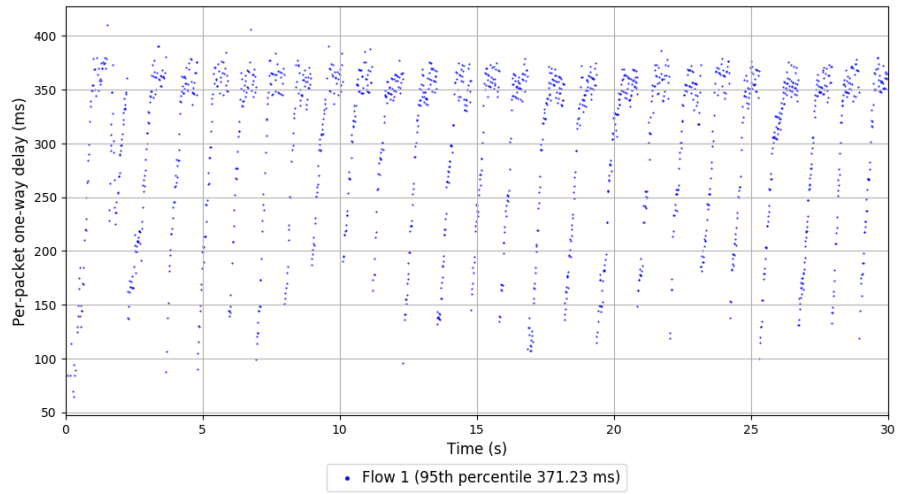
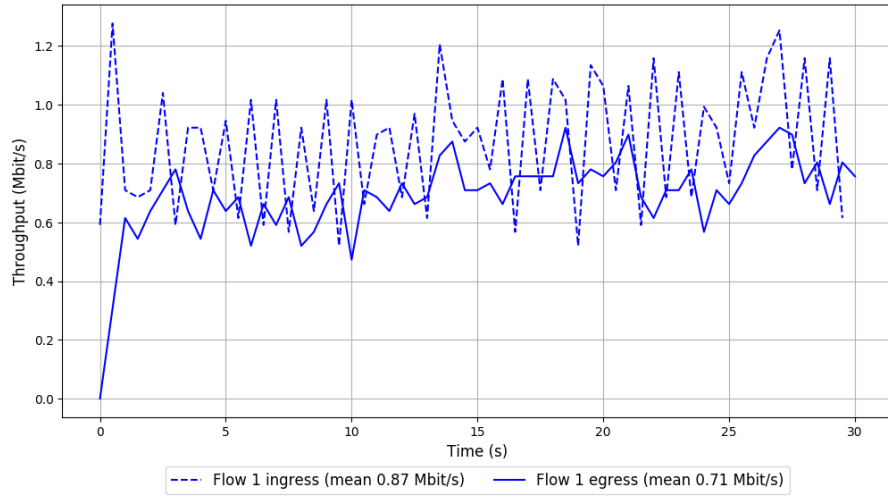


Run 1: Statistics of Verus

Start at: 2018-08-22 09:42:08
End at: 2018-08-22 09:42:38
Local clock offset: 1.532 ms
Remote clock offset: -60.132 ms

Below is generated by plot.py at 2018-08-22 10:27:12
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 371.234 ms
Loss rate: 19.26%
-- Flow 1:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 371.234 ms
Loss rate: 19.26%

Run 1: Report of Verus — Data Link

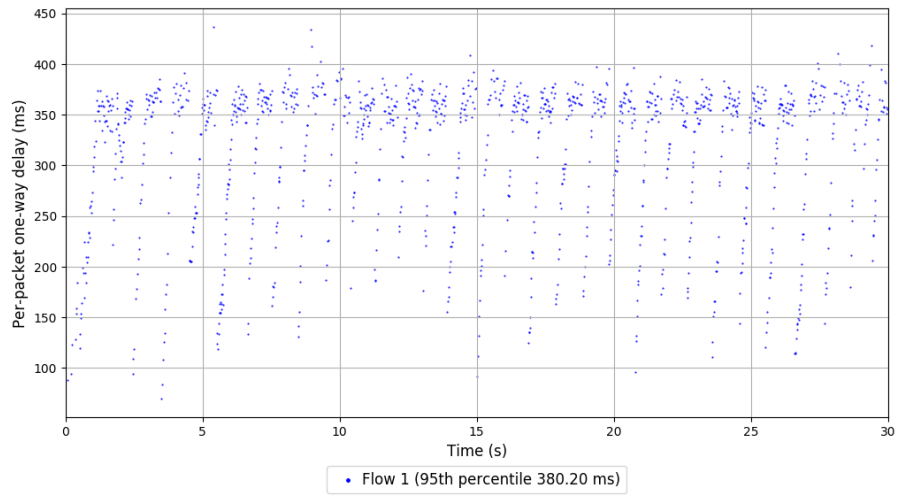
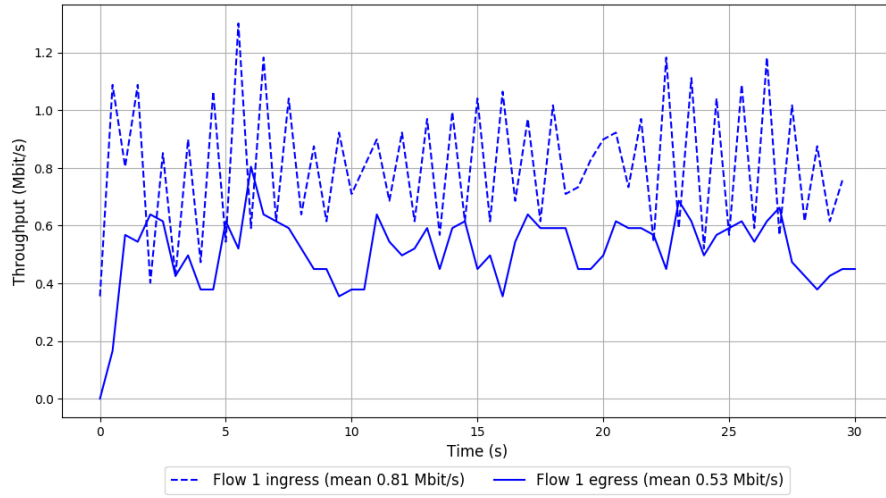


Run 2: Statistics of Verus

Start at: 2018-08-22 10:00:24
End at: 2018-08-22 10:00:54
Local clock offset: 3.995 ms
Remote clock offset: -58.93 ms

Below is generated by plot.py at 2018-08-22 10:27:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 380.201 ms
Loss rate: 34.82%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 380.201 ms
Loss rate: 34.82%

Run 2: Report of Verus — Data Link

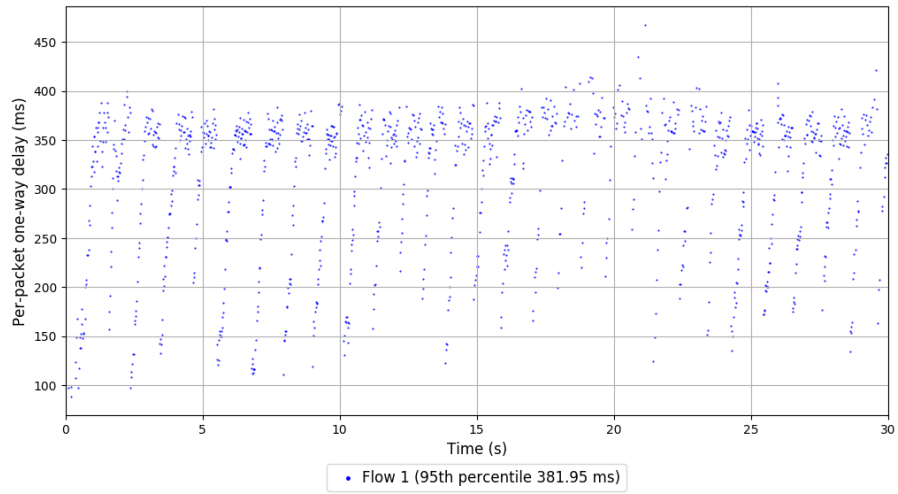
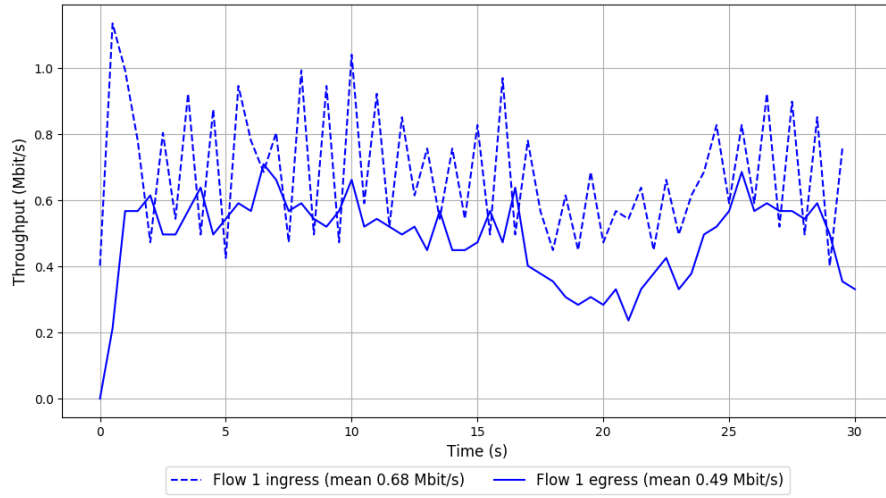


Run 3: Statistics of Verus

Start at: 2018-08-22 10:18:40
End at: 2018-08-22 10:19:10
Local clock offset: 3.287 ms
Remote clock offset: -61.152 ms

```
# Below is generated by plot.py at 2018-08-22 10:27:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 381.948 ms
Loss rate: 27.68%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 381.948 ms
Loss rate: 27.68%
```

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2018-08-22 09:32:28

End at: 2018-08-22 09:32:58

Local clock offset: 3.678 ms

Remote clock offset: -60.86 ms

Below is generated by plot.py at 2018-08-22 10:27:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 404.770 ms

Loss rate: 58.81%

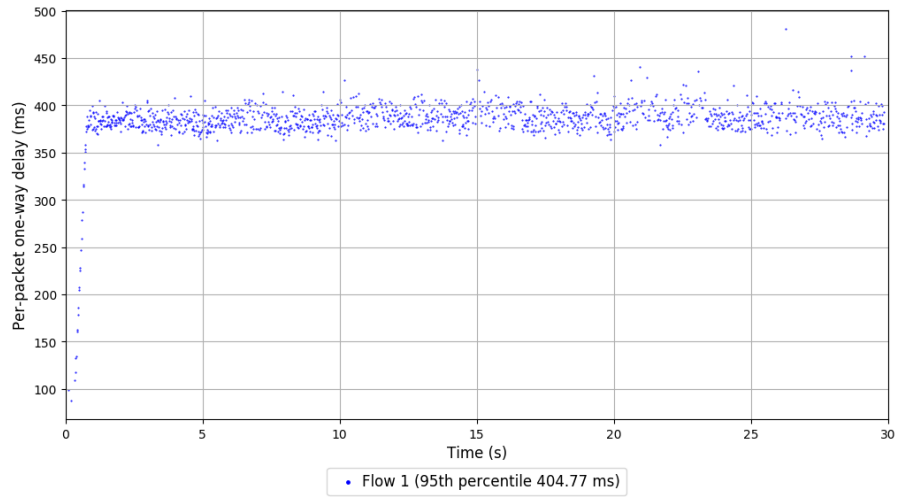
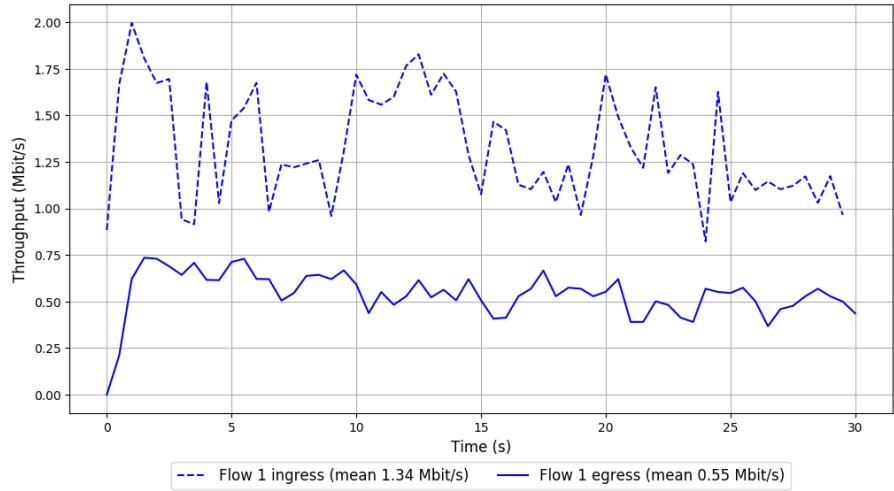
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 404.770 ms

Loss rate: 58.81%

Run 1: Report of PCC-Vivace — Data Link

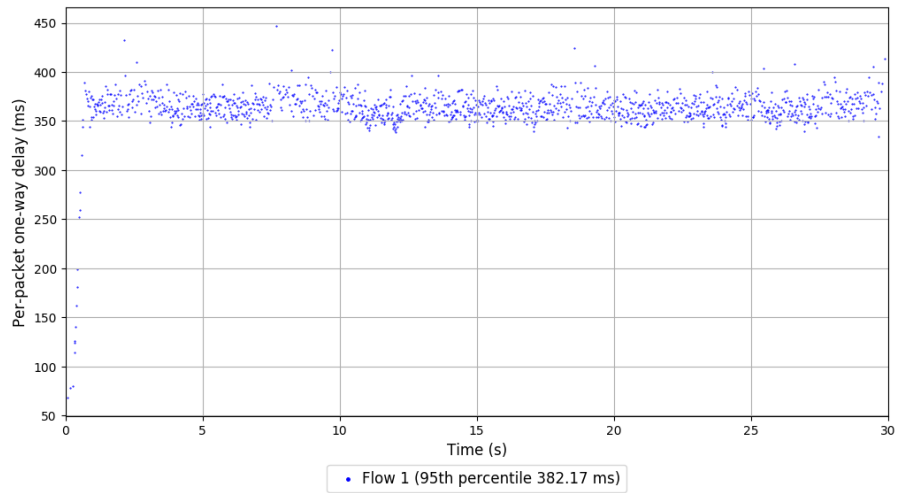
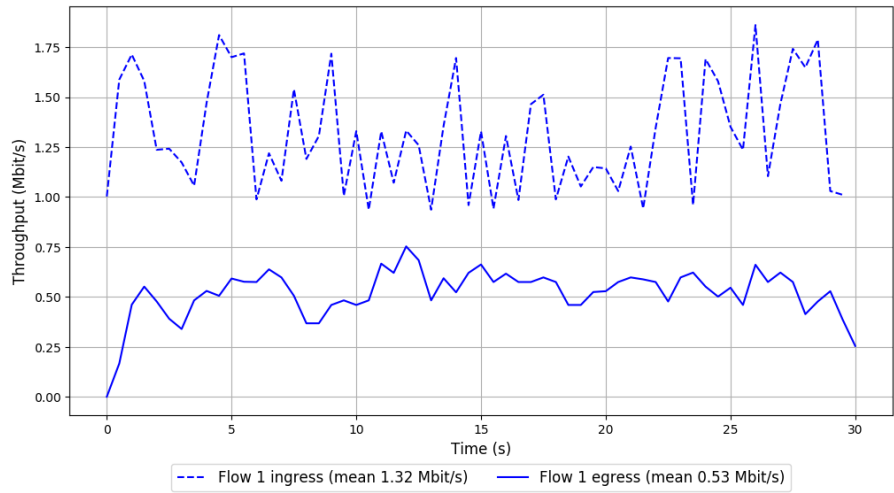


Run 2: Statistics of PCC-Vivace

Start at: 2018-08-22 09:50:43
End at: 2018-08-22 09:51:13
Local clock offset: 0.426 ms
Remote clock offset: -59.235 ms

Below is generated by plot.py at 2018-08-22 10:27:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 382.165 ms
Loss rate: 59.94%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 382.165 ms
Loss rate: 59.94%

Run 2: Report of PCC-Vivace — Data Link

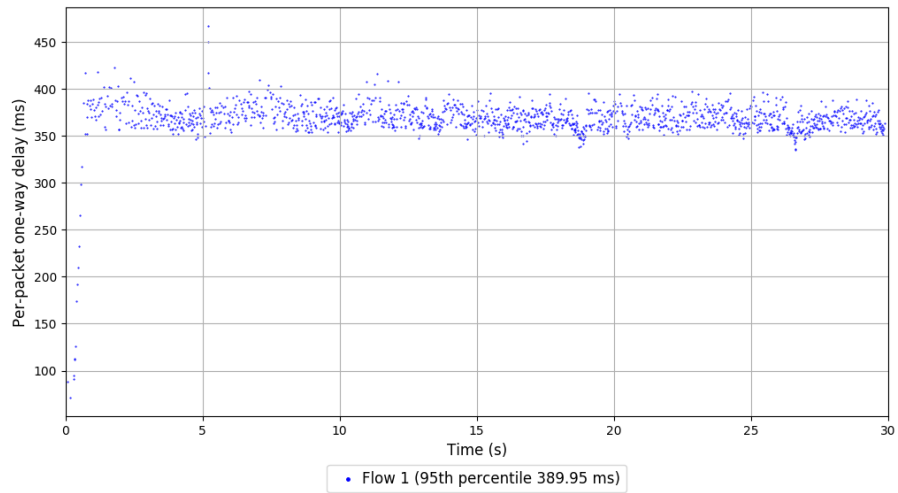
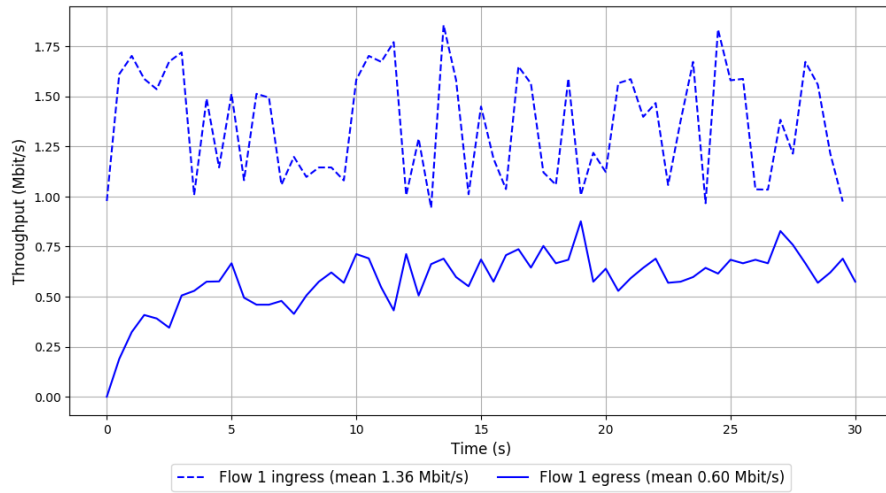


Run 3: Statistics of PCC-Vivace

Start at: 2018-08-22 10:09:00
End at: 2018-08-22 10:09:30
Local clock offset: 3.068 ms
Remote clock offset: -59.294 ms

Below is generated by plot.py at 2018-08-22 10:27:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 389.952 ms
Loss rate: 56.27%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 389.952 ms
Loss rate: 56.27%

Run 3: Report of PCC-Vivace — Data Link

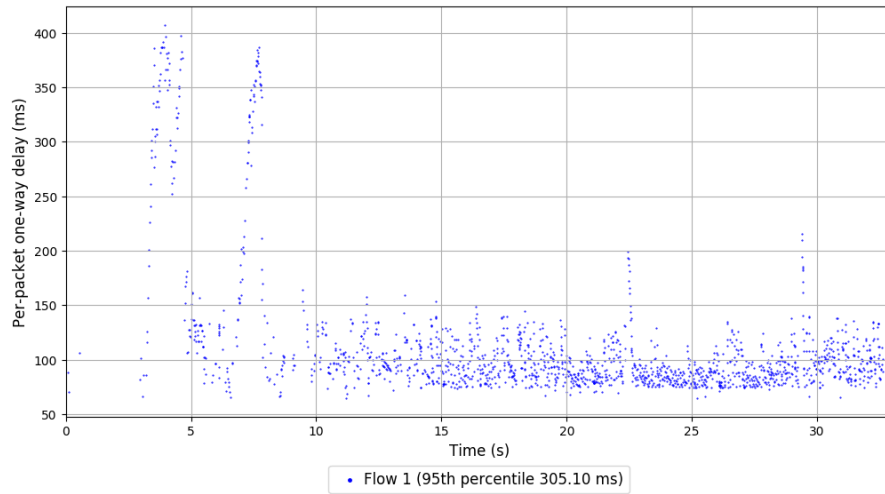
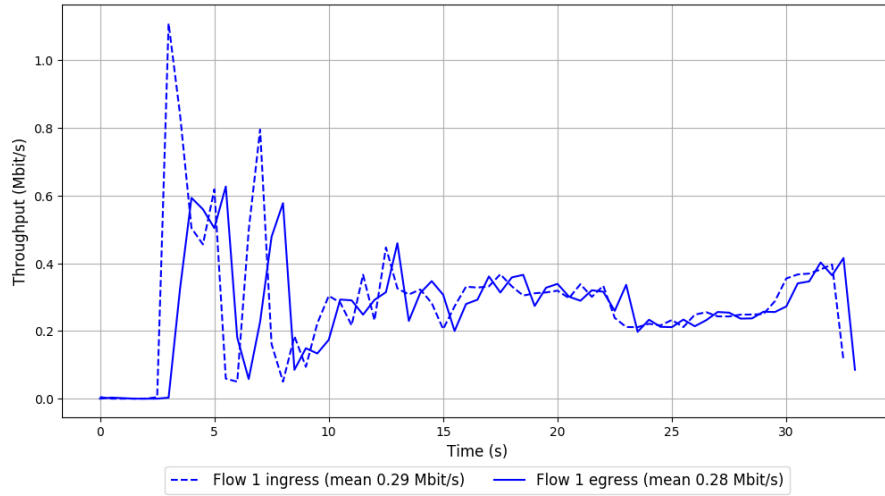


Run 1: Statistics of WebRTC media

Start at: 2018-08-22 09:43:13
End at: 2018-08-22 09:43:43
Local clock offset: -0.289 ms
Remote clock offset: -59.962 ms

Below is generated by plot.py at 2018-08-22 10:27:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 305.100 ms
Loss rate: 5.32%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 305.100 ms
Loss rate: 5.32%

Run 1: Report of WebRTC media — Data Link

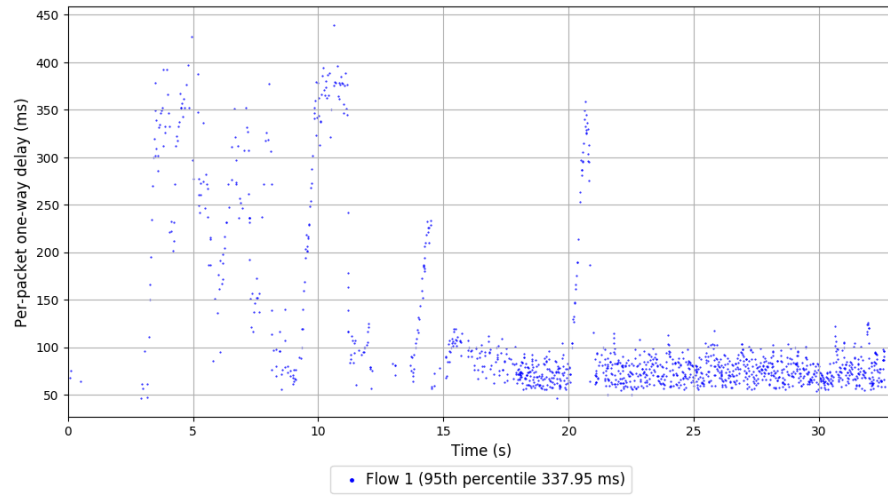
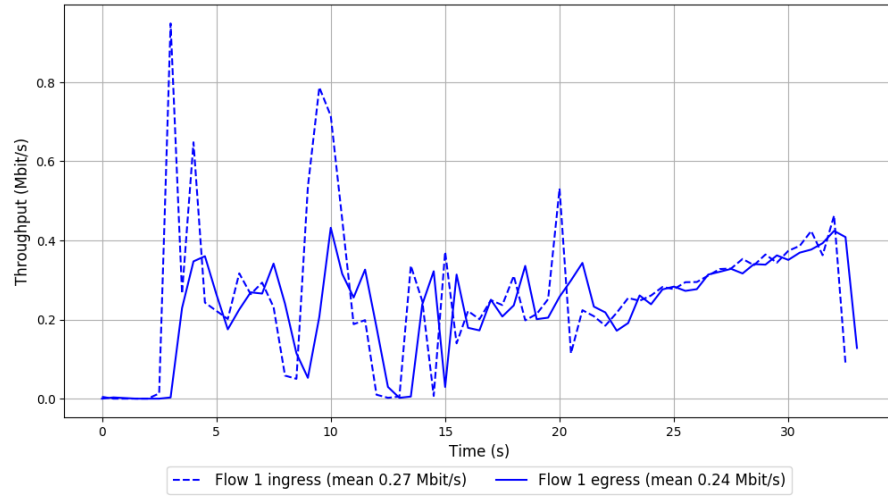


Run 2: Statistics of WebRTC media

Start at: 2018-08-22 10:01:28
End at: 2018-08-22 10:01:58
Local clock offset: 1.483 ms
Remote clock offset: -57.659 ms

Below is generated by plot.py at 2018-08-22 10:27:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 337.954 ms
Loss rate: 11.81%
-- Flow 1:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 337.954 ms
Loss rate: 11.81%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-08-22 10:19:45
End at: 2018-08-22 10:20:15
Local clock offset: 4.076 ms
Remote clock offset: -61.922 ms

```
# Below is generated by plot.py at 2018-08-22 10:27:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 356.583 ms
Loss rate: 8.20%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 356.583 ms
Loss rate: 8.20%
```


Run 3: Report of WebRTC media — Data Link

