

Pantheon Report

Generated at 2019-01-24 14:11:56 (UTC).

Data path: AWS India 1 on `ens5` (*local*) → India cellular on `ppp0` (*remote*).

Repeated the test of 21 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:

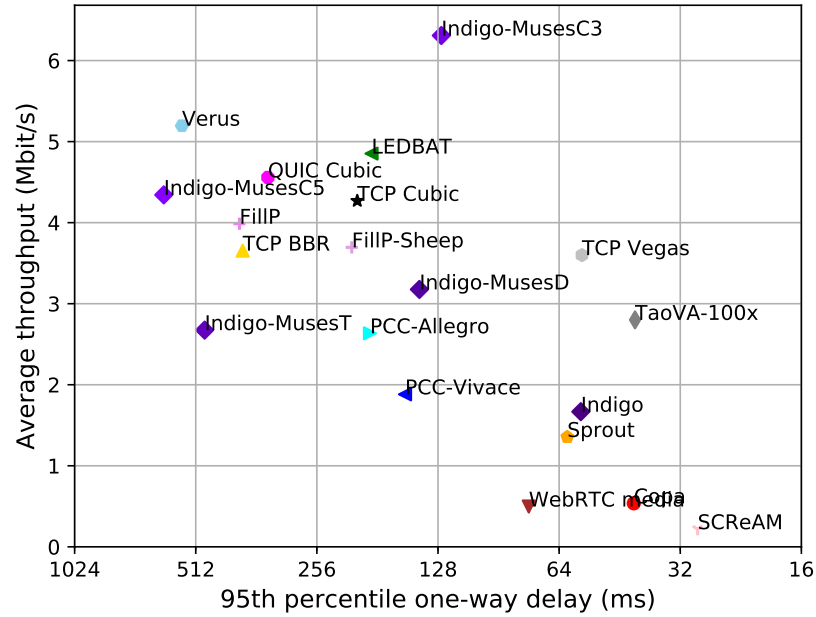
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

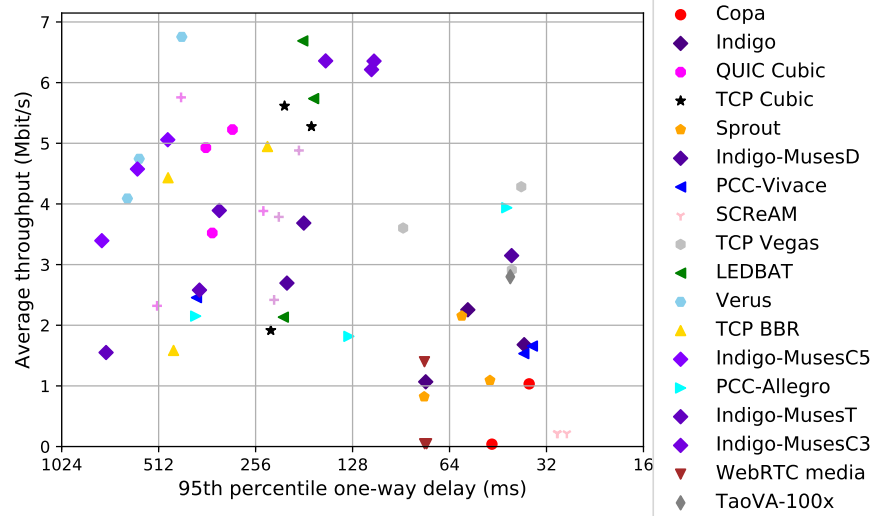
```
branch: muses @ 0b8e9a949603c3842368430acf469eec3b941f9f
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ d9c5ea33091330aca25ecd105ab2db6d34d5c40d
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
```

third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851

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



test from AWS India 1 to India cellular, 3 runs of 30s each per scheme



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	3.66	391.34	0.92
Copa	2	0.54	41.75	57.53
TCP Cubic	3	4.27	203.18	0.39
FillP	3	3.99	398.71	1.00
FillP-Sheep	3	3.70	209.65	0.27
Indigo	3	1.67	56.53	0.08
Indigo-MusesC3	3	6.31	125.58	0.44
Indigo-MusesC5	3	4.34	614.67	1.24
Indigo-MusesD	3	3.18	142.37	0.27
Indigo-MusesT	3	2.67	486.59	1.58
LEDBAT	3	4.85	187.26	0.27
PCC-Allegro	3	2.64	188.92	0.12
PCC-Expr	0	N/A	N/A	N/A
QUIC Cubic	3	4.56	338.79	0.73
SCReAM	3	0.22	28.97	0.09
Sprout	3	1.35	61.09	0.08
TaoVA-100x	1	2.80	41.45	37.39
TCP Vegas	3	3.60	56.17	0.04
Verus	3	5.19	554.13	1.29
PCC-Vivace	3	1.88	154.59	0.08
WebRTC media	3	0.50	76.14	0.02

Run 1: Statistics of TCP BBR

Start at: 2019-01-24 13:02:02

End at: 2019-01-24 13:02:32

Local clock offset: 0.692 ms

Remote clock offset: -6.021 ms

Below is generated by plot.py at 2019-01-24 14:11:08

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.59 Mbit/s

95th percentile per-packet one-way delay: 460.219 ms

Loss rate: 1.49%

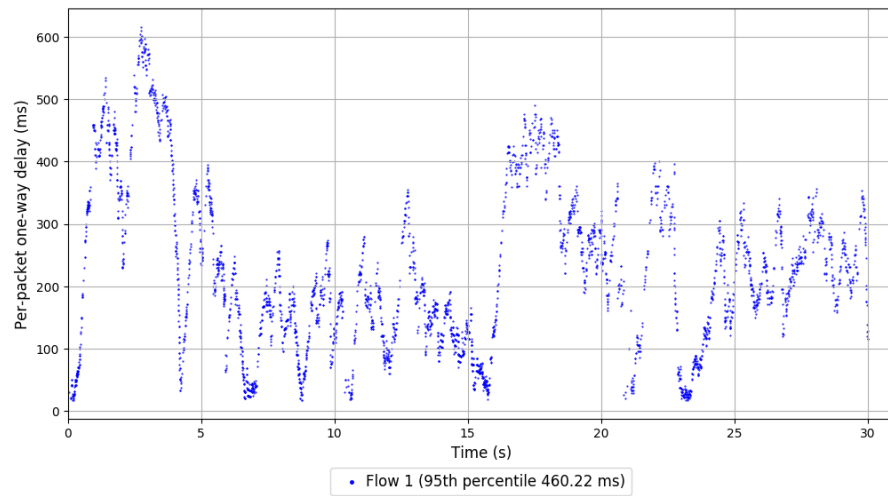
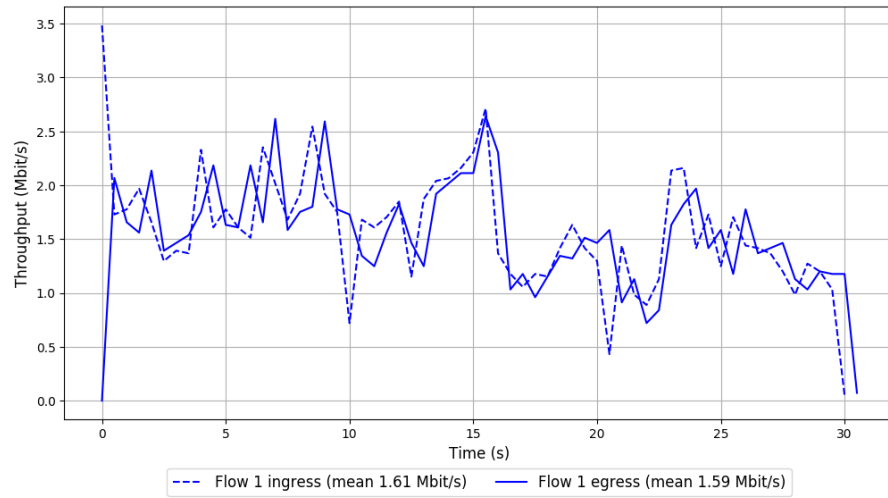
-- Flow 1:

Average throughput: 1.59 Mbit/s

95th percentile per-packet one-way delay: 460.219 ms

Loss rate: 1.49%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-01-24 13:25:36

End at: 2019-01-24 13:26:06

Local clock offset: 3.433 ms

Remote clock offset: -4.562 ms

Below is generated by plot.py at 2019-01-24 14:11:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.43 Mbit/s

95th percentile per-packet one-way delay: 478.629 ms

Loss rate: 0.59%

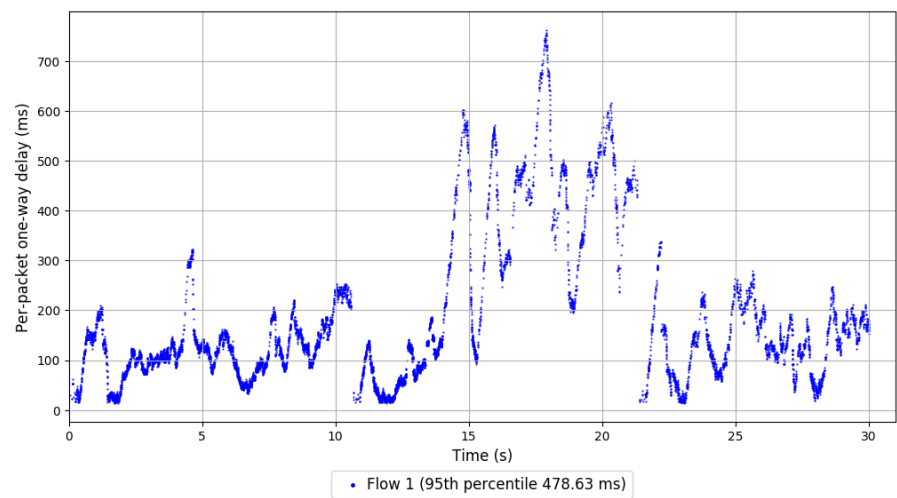
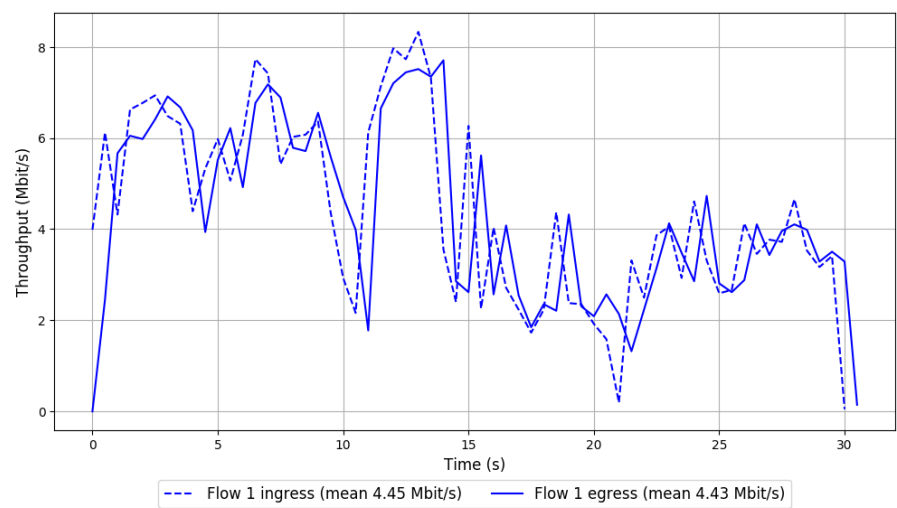
-- Flow 1:

Average throughput: 4.43 Mbit/s

95th percentile per-packet one-way delay: 478.629 ms

Loss rate: 0.59%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-01-24 13:49:09

End at: 2019-01-24 13:49:39

Local clock offset: 4.111 ms

Remote clock offset: -2.69 ms

Below is generated by plot.py at 2019-01-24 14:11:13

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.95 Mbit/s

95th percentile per-packet one-way delay: 235.158 ms

Loss rate: 0.67%

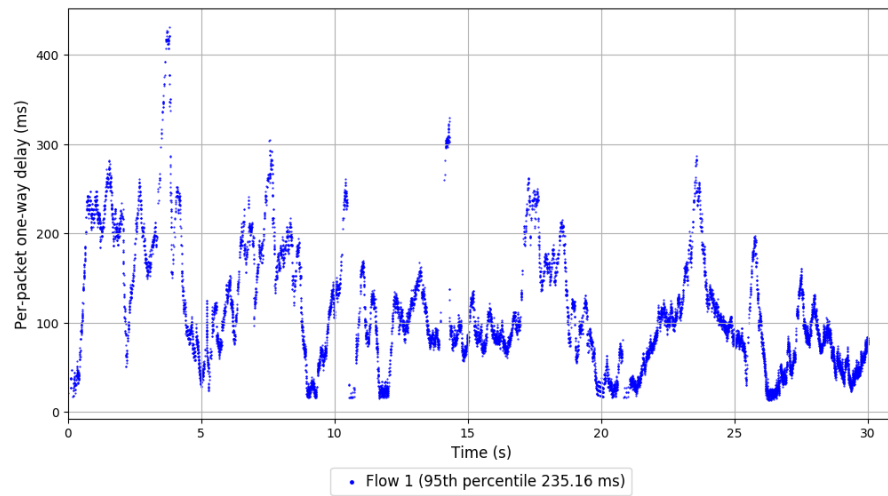
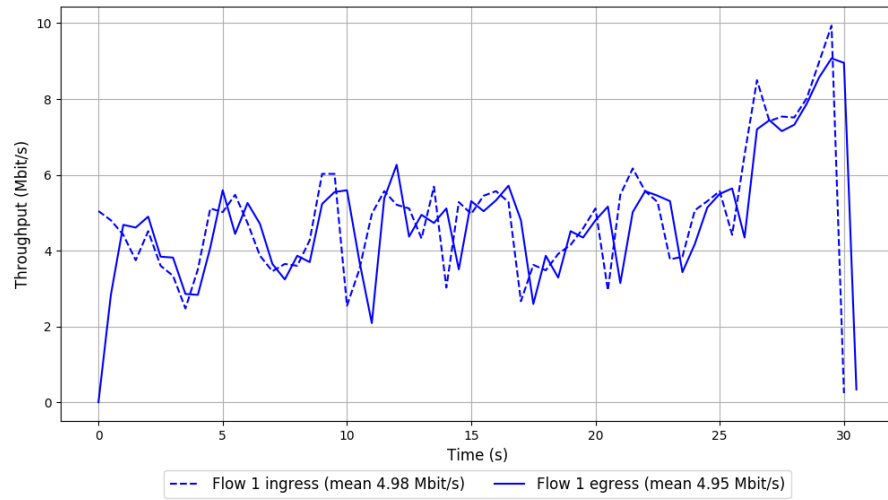
-- Flow 1:

Average throughput: 4.95 Mbit/s

95th percentile per-packet one-way delay: 235.158 ms

Loss rate: 0.67%

Run 3: Report of TCP BBR — Data Link

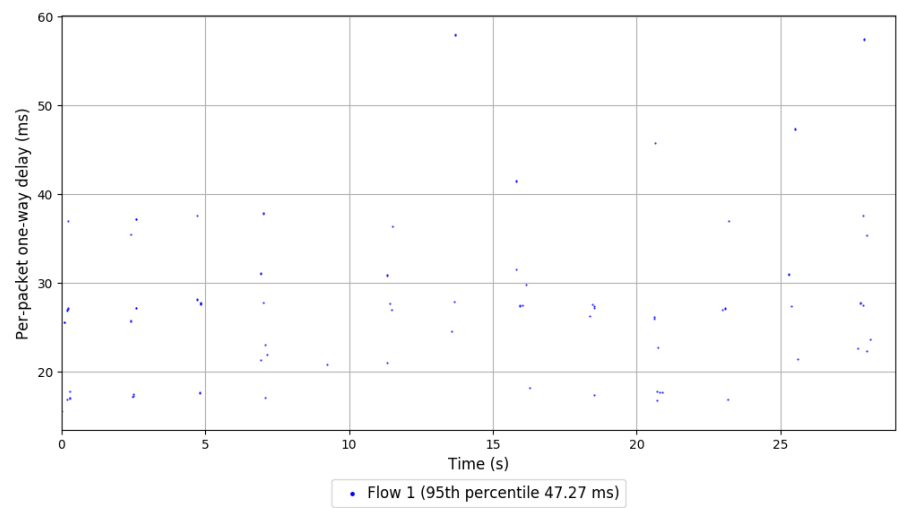
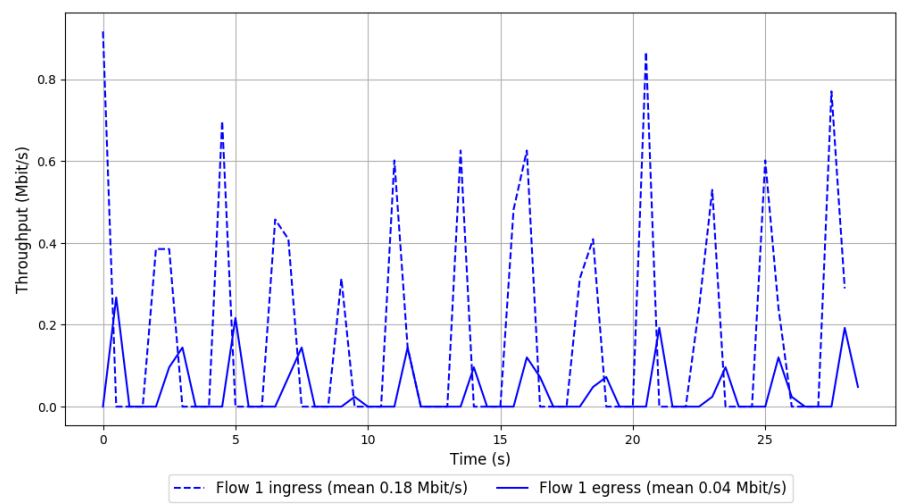


Run 1: Statistics of Copa

Start at: 2019-01-24 13:22:13
End at: 2019-01-24 13:22:43
Local clock offset: 1.362 ms
Remote clock offset: -4.609 ms

Below is generated by plot.py at 2019-01-24 14:11:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 47.271 ms
Loss rate: 78.49%
-- Flow 1:
Average throughput: 0.04 Mbit/s
95th percentile per-packet one-way delay: 47.271 ms
Loss rate: 78.49%

Run 1: Report of Copa — Data Link

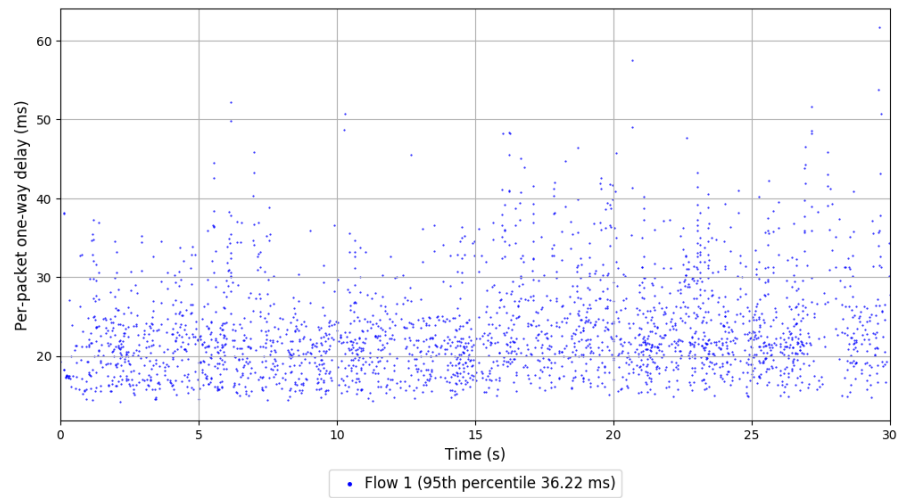
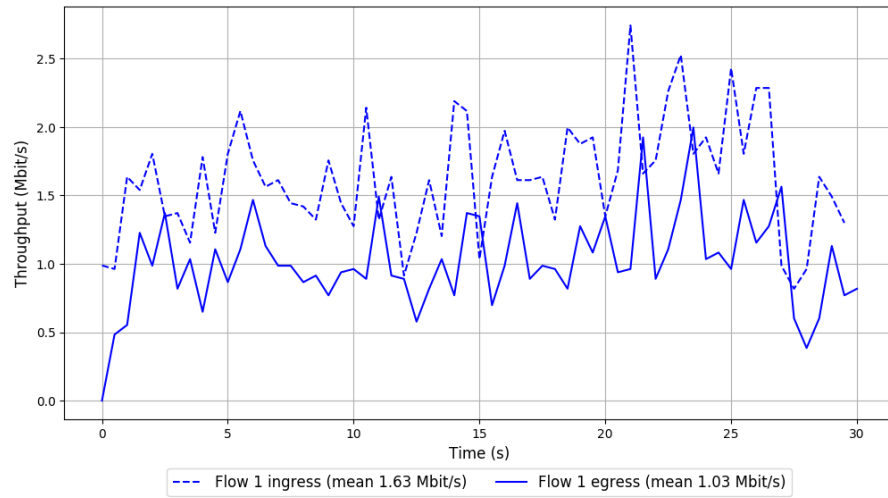


Run 2: Statistics of Copa

Start at: 2019-01-24 13:45:47
End at: 2019-01-24 13:46:17
Local clock offset: 3.68 ms
Remote clock offset: -3.249 ms

Below is generated by plot.py at 2019-01-24 14:11:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 36.224 ms
Loss rate: 36.58%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 36.224 ms
Loss rate: 36.58%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

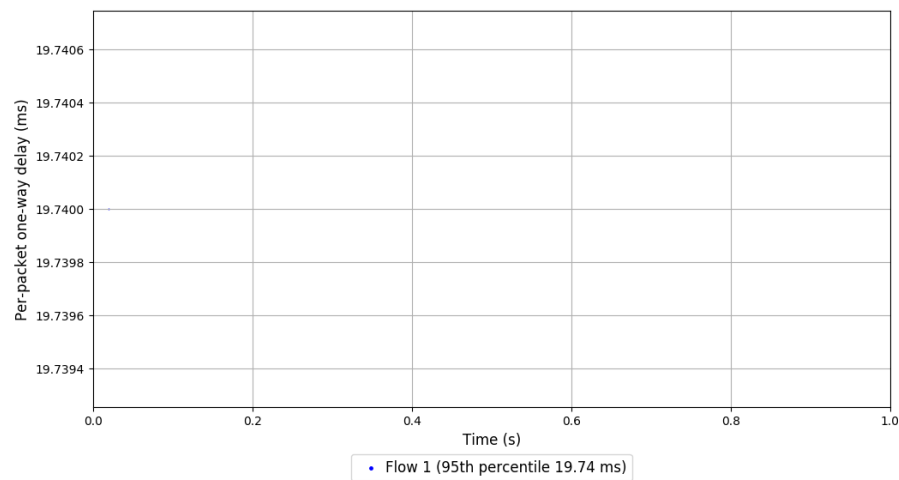
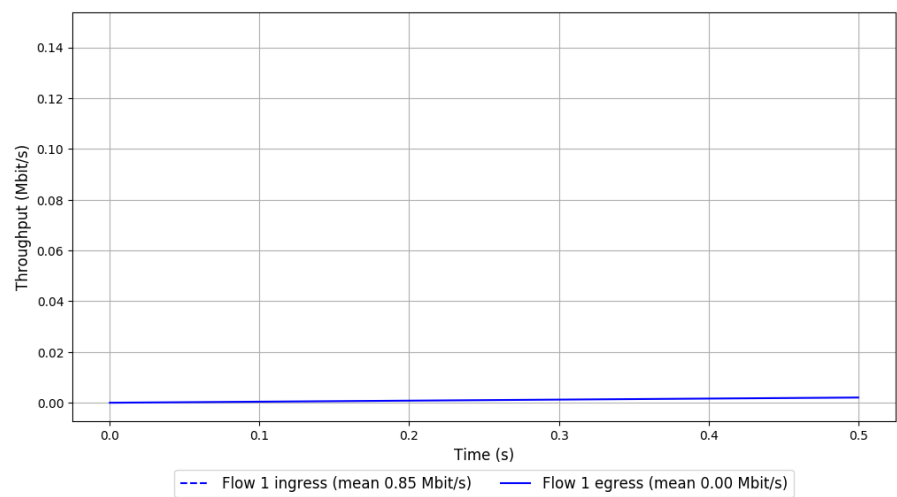
Start at: 2019-01-24 14:09:22

End at: 2019-01-24 14:09:53

Local clock offset: 2.325 ms

Remote clock offset: -2.671 ms

Run 3: Report of Copa — Data Link

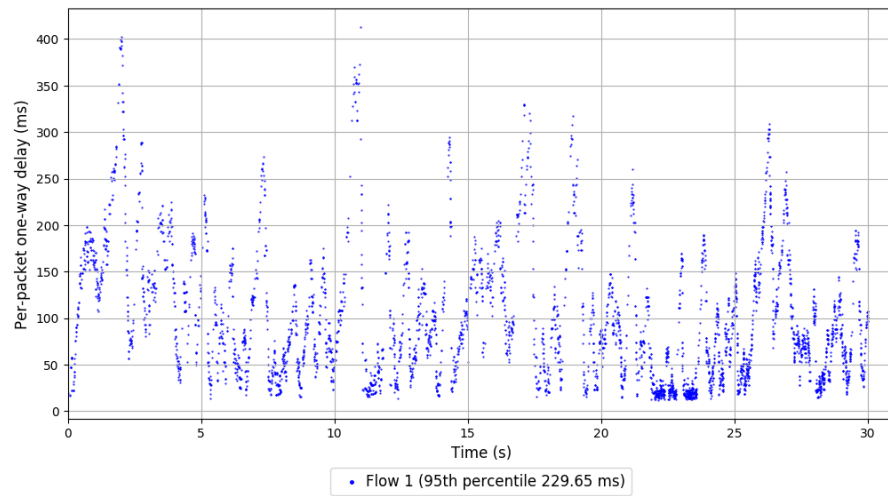
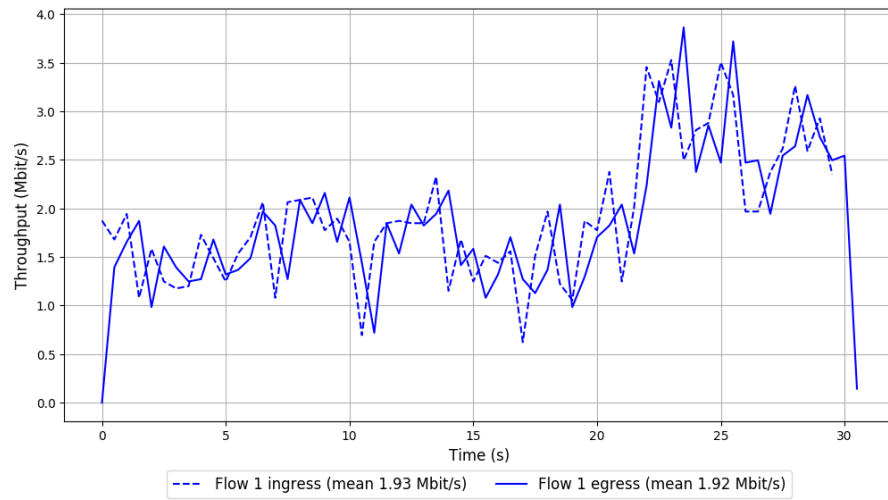


Run 1: Statistics of TCP Cubic

Start at: 2019-01-24 13:06:29
End at: 2019-01-24 13:06:59
Local clock offset: 3.634 ms
Remote clock offset: -8.264 ms

Below is generated by plot.py at 2019-01-24 14:11:13
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 229.654 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 1.92 Mbit/s
95th percentile per-packet one-way delay: 229.654 ms
Loss rate: 0.60%

Run 1: Report of TCP Cubic — Data Link

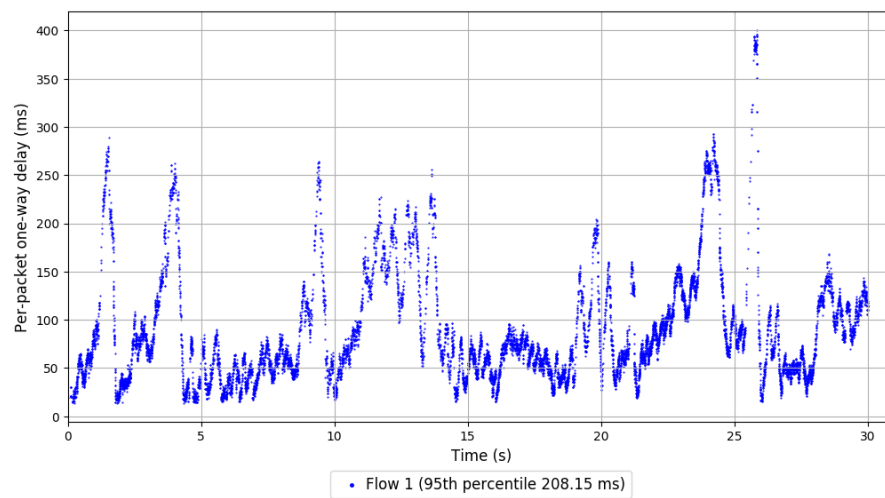
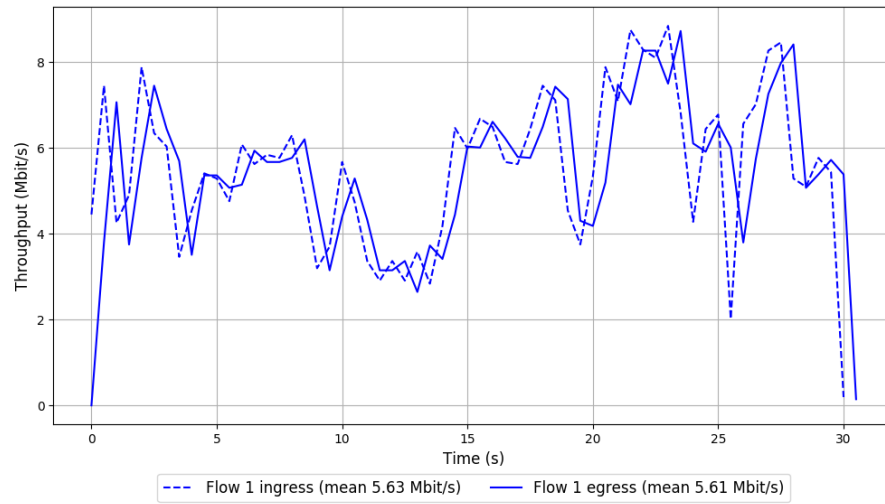


Run 2: Statistics of TCP Cubic

Start at: 2019-01-24 13:30:04
End at: 2019-01-24 13:30:34
Local clock offset: 2.985 ms
Remote clock offset: -5.423 ms

Below is generated by plot.py at 2019-01-24 14:11:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.61 Mbit/s
95th percentile per-packet one-way delay: 208.153 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 5.61 Mbit/s
95th percentile per-packet one-way delay: 208.153 ms
Loss rate: 0.41%

Run 2: Report of TCP Cubic — Data Link

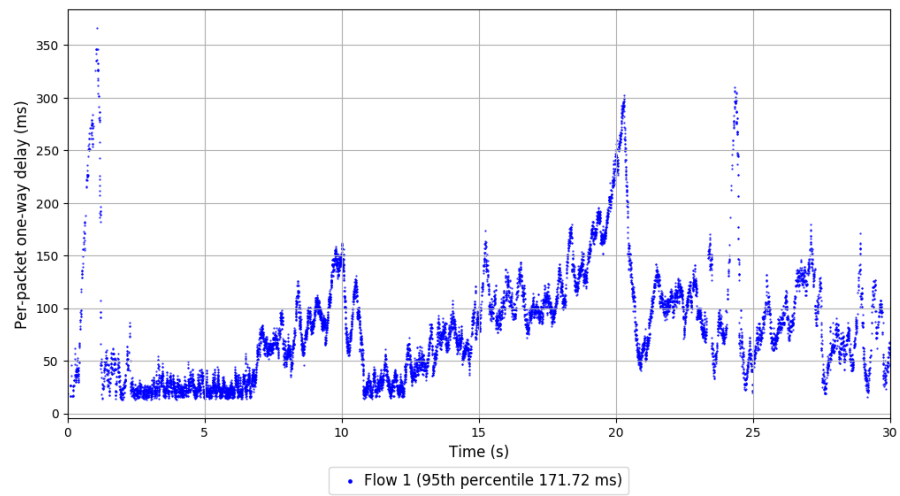
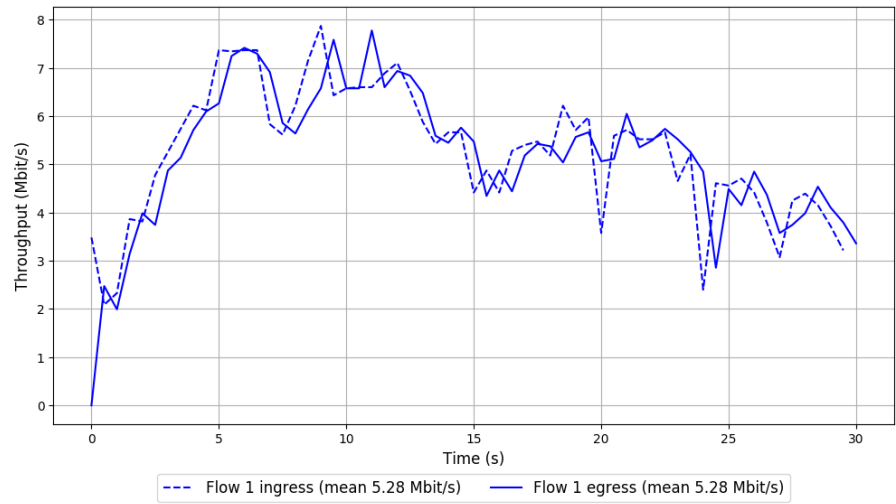


Run 3: Statistics of TCP Cubic

Start at: 2019-01-24 13:53:44
End at: 2019-01-24 13:54:14
Local clock offset: 6.228 ms
Remote clock offset: -3.939 ms

Below is generated by plot.py at 2019-01-24 14:11:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.28 Mbit/s
95th percentile per-packet one-way delay: 171.720 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 5.28 Mbit/s
95th percentile per-packet one-way delay: 171.720 ms
Loss rate: 0.17%

Run 3: Report of TCP Cubic — Data Link

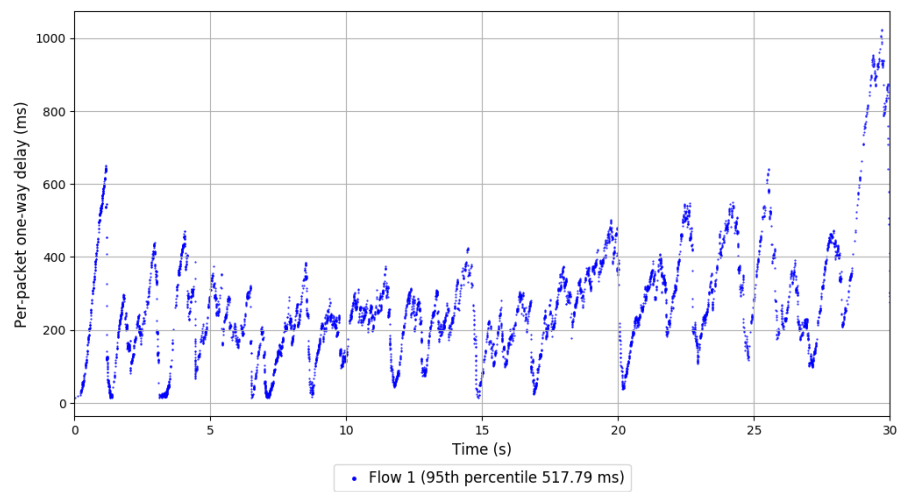
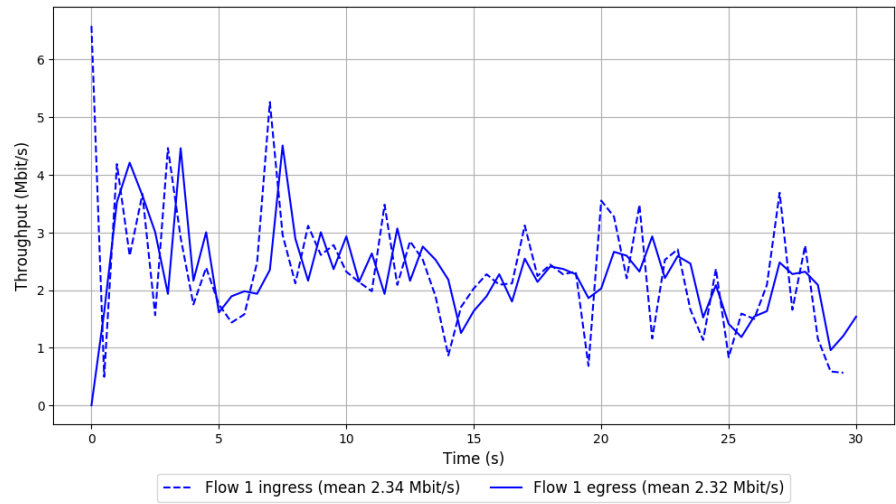


Run 1: Statistics of FillP

Start at: 2019-01-24 13:04:15
End at: 2019-01-24 13:04:45
Local clock offset: 3.516 ms
Remote clock offset: -5.298 ms

Below is generated by plot.py at 2019-01-24 14:11:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 517.791 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 517.791 ms
Loss rate: 1.09%

Run 1: Report of FillP — Data Link

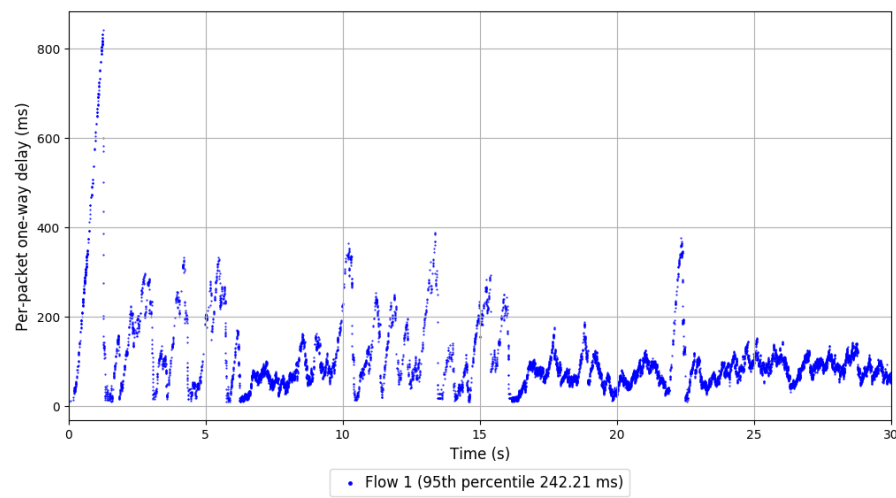
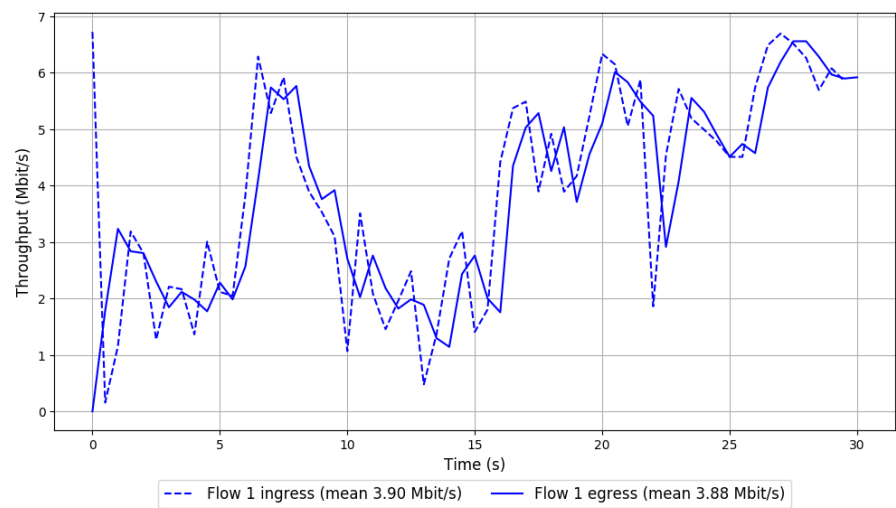


Run 2: Statistics of FillP

Start at: 2019-01-24 13:27:50
End at: 2019-01-24 13:28:20
Local clock offset: 4.208 ms
Remote clock offset: -3.906 ms

Below is generated by plot.py at 2019-01-24 14:11:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.88 Mbit/s
95th percentile per-packet one-way delay: 242.211 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 3.88 Mbit/s
95th percentile per-packet one-way delay: 242.211 ms
Loss rate: 0.55%

Run 2: Report of FillP — Data Link

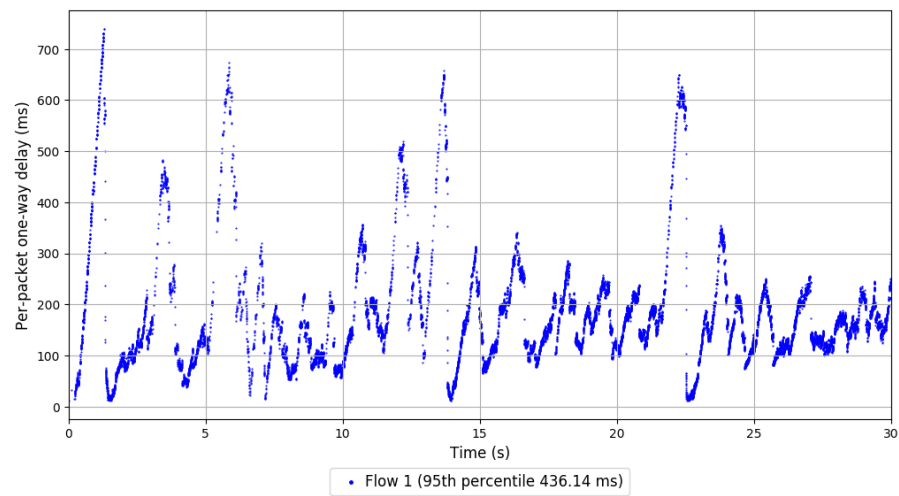
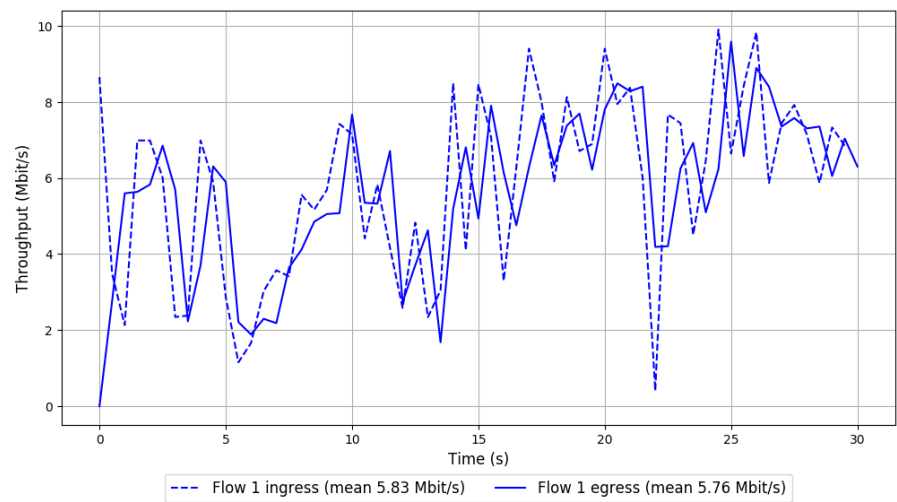


Run 3: Statistics of FillP

Start at: 2019-01-24 13:51:24
End at: 2019-01-24 13:51:54
Local clock offset: 4.556 ms
Remote clock offset: -4.258 ms

Below is generated by plot.py at 2019-01-24 14:11:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.76 Mbit/s
95th percentile per-packet one-way delay: 436.141 ms
Loss rate: 1.35%
-- Flow 1:
Average throughput: 5.76 Mbit/s
95th percentile per-packet one-way delay: 436.141 ms
Loss rate: 1.35%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-24 13:00:53

End at: 2019-01-24 13:01:23

Local clock offset: 1.734 ms

Remote clock offset: -8.017 ms

Below is generated by plot.py at 2019-01-24 14:11:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 224.259 ms

Loss rate: 0.32%

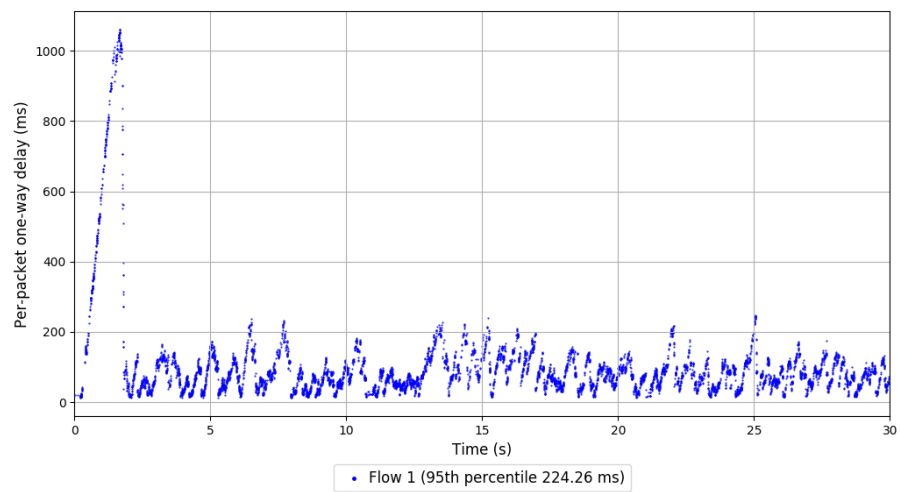
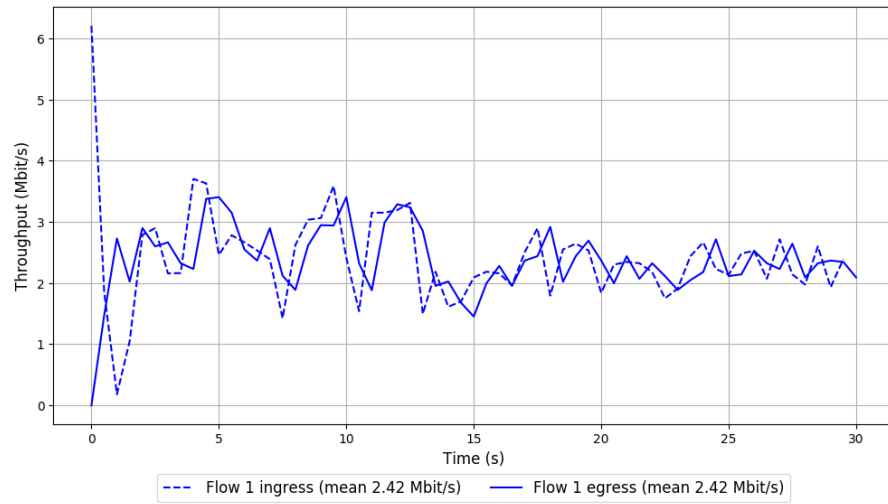
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 224.259 ms

Loss rate: 0.32%

Run 1: Report of FillP-Sheep — Data Link

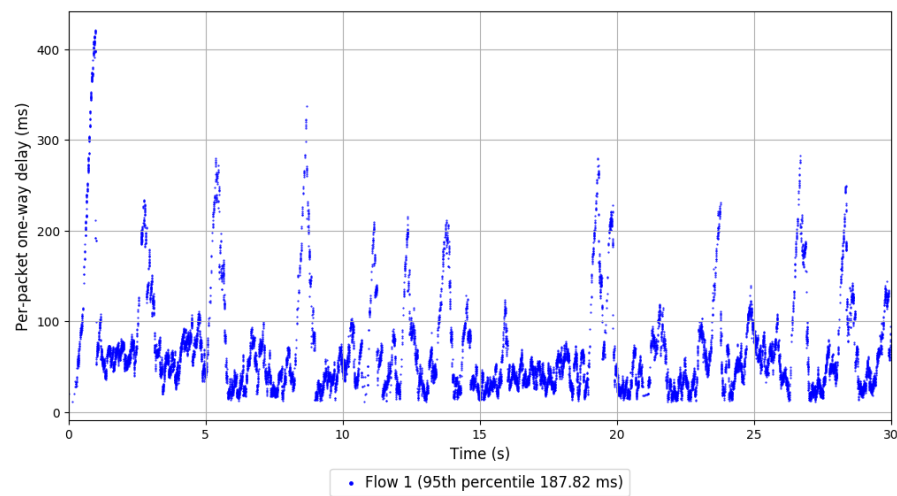
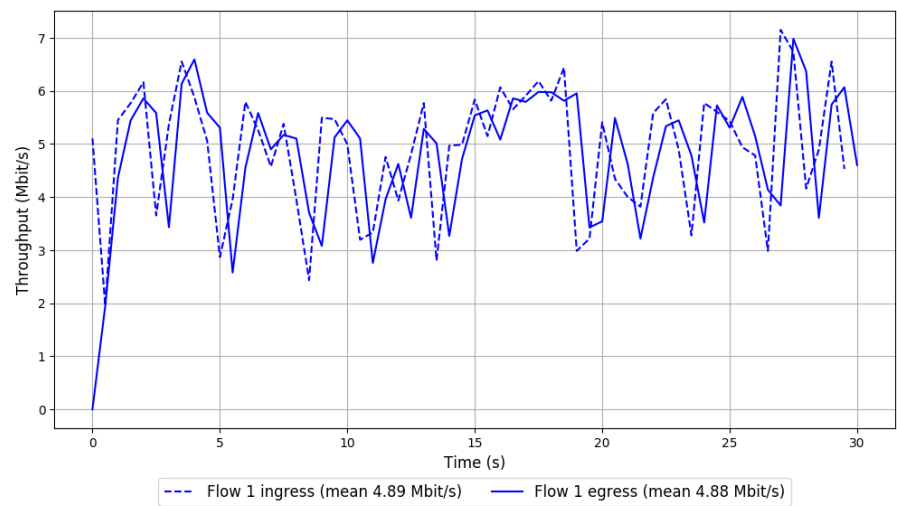


Run 2: Statistics of FillP-Sheep

Start at: 2019-01-24 13:24:25
End at: 2019-01-24 13:24:55
Local clock offset: 4.045 ms
Remote clock offset: -4.653 ms

Below is generated by plot.py at 2019-01-24 14:11:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.88 Mbit/s
95th percentile per-packet one-way delay: 187.822 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 4.88 Mbit/s
95th percentile per-packet one-way delay: 187.822 ms
Loss rate: 0.35%

Run 2: Report of FillP-Sheep — Data Link

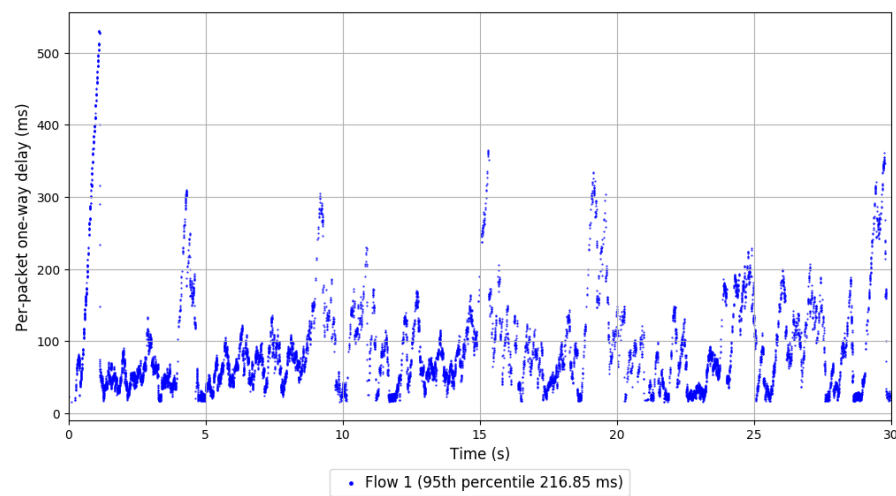
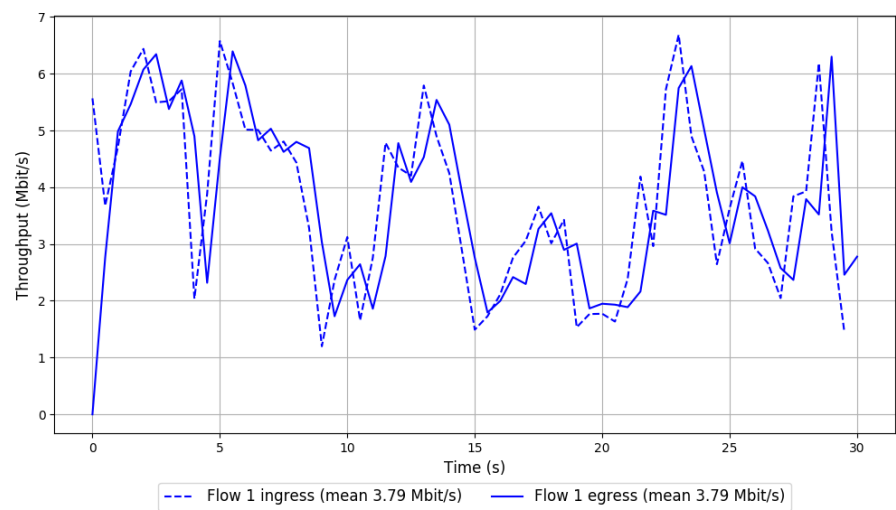


Run 3: Statistics of FillP-Sheep

Start at: 2019-01-24 13:48:02
End at: 2019-01-24 13:48:32
Local clock offset: 4.141 ms
Remote clock offset: -3.196 ms

Below is generated by plot.py at 2019-01-24 14:11:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.79 Mbit/s
95th percentile per-packet one-way delay: 216.854 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 3.79 Mbit/s
95th percentile per-packet one-way delay: 216.854 ms
Loss rate: 0.13%

Run 3: Report of FillP-Sheep — Data Link



Run 1: Statistics of Indigo

Start at: 2019-01-24 13:07:36

End at: 2019-01-24 13:08:06

Local clock offset: 4.799 ms

Remote clock offset: -7.926 ms

Below is generated by plot.py at 2019-01-24 14:11:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 75.888 ms

Loss rate: 0.04%

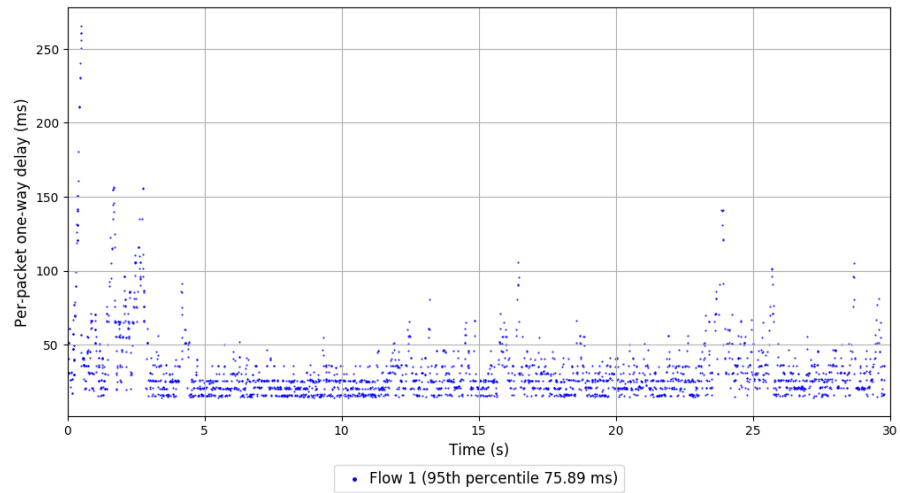
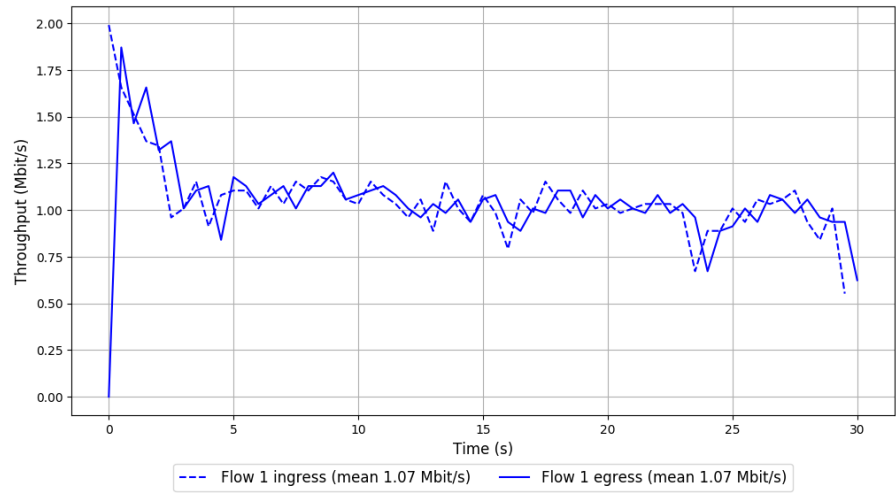
-- Flow 1:

Average throughput: 1.07 Mbit/s

95th percentile per-packet one-way delay: 75.888 ms

Loss rate: 0.04%

Run 1: Report of Indigo — Data Link

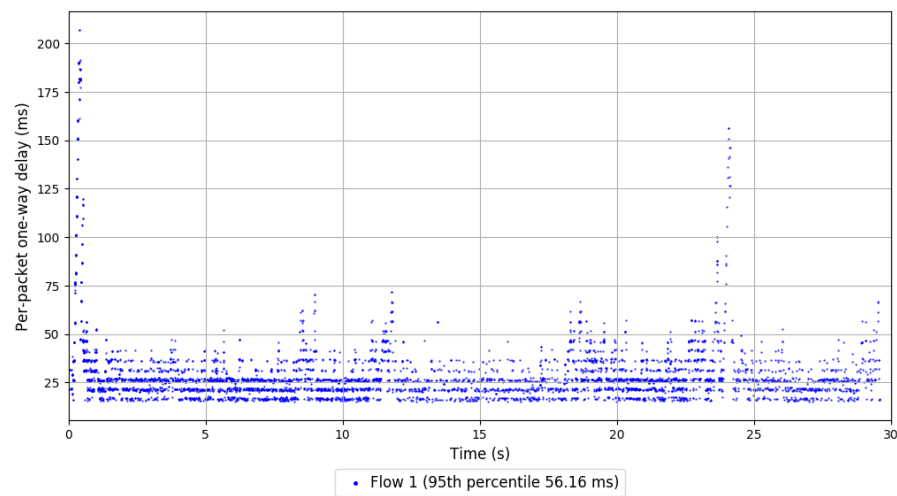
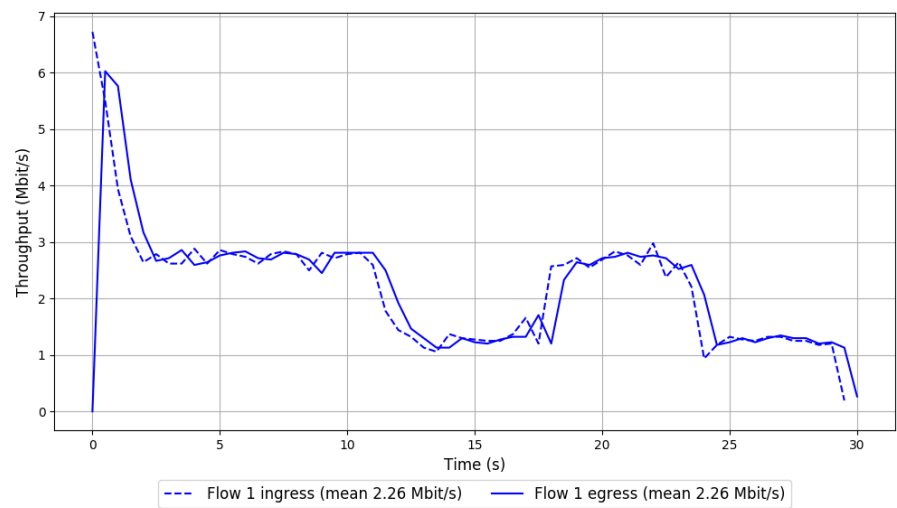


Run 2: Statistics of Indigo

Start at: 2019-01-24 13:31:11
End at: 2019-01-24 13:31:41
Local clock offset: 2.48 ms
Remote clock offset: -3.443 ms

Below is generated by plot.py at 2019-01-24 14:11:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 56.157 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 2.26 Mbit/s
95th percentile per-packet one-way delay: 56.157 ms
Loss rate: 0.07%

Run 2: Report of Indigo — Data Link

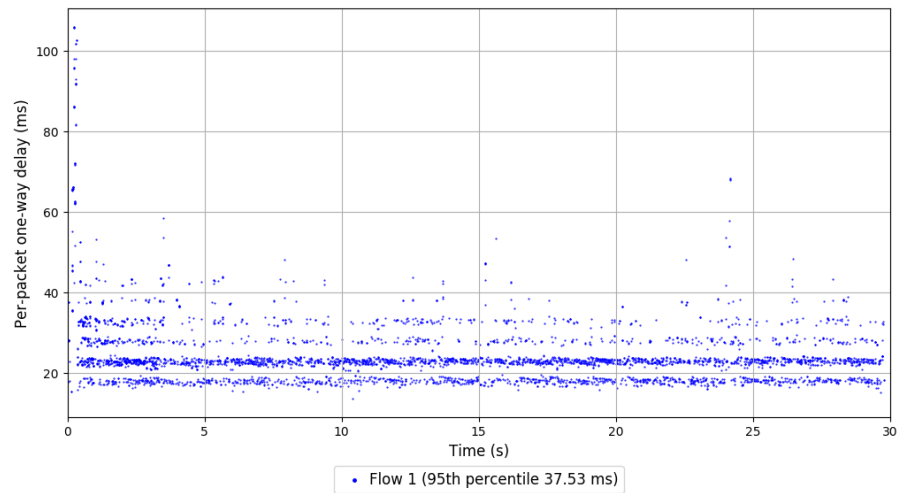
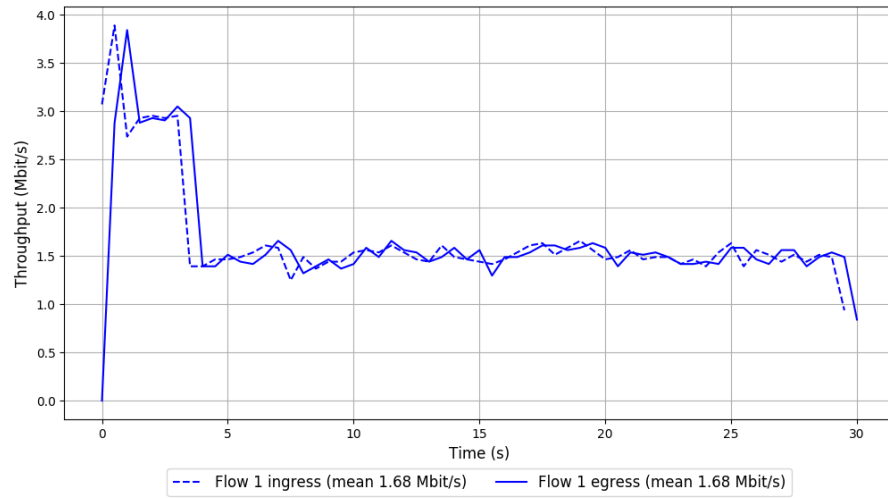


Run 3: Statistics of Indigo

Start at: 2019-01-24 13:54:51
End at: 2019-01-24 13:55:21
Local clock offset: 4.533 ms
Remote clock offset: -4.028 ms

Below is generated by plot.py at 2019-01-24 14:11:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 37.533 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 37.533 ms
Loss rate: 0.14%

Run 3: Report of Indigo — Data Link

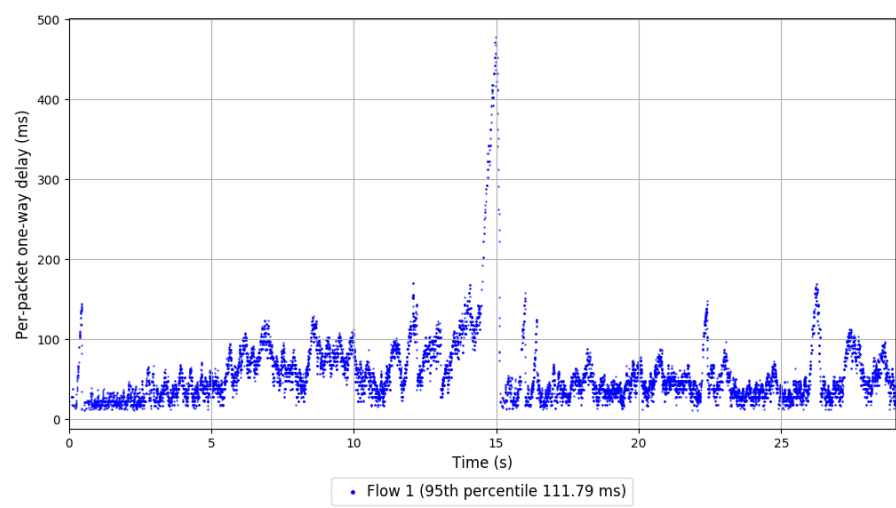
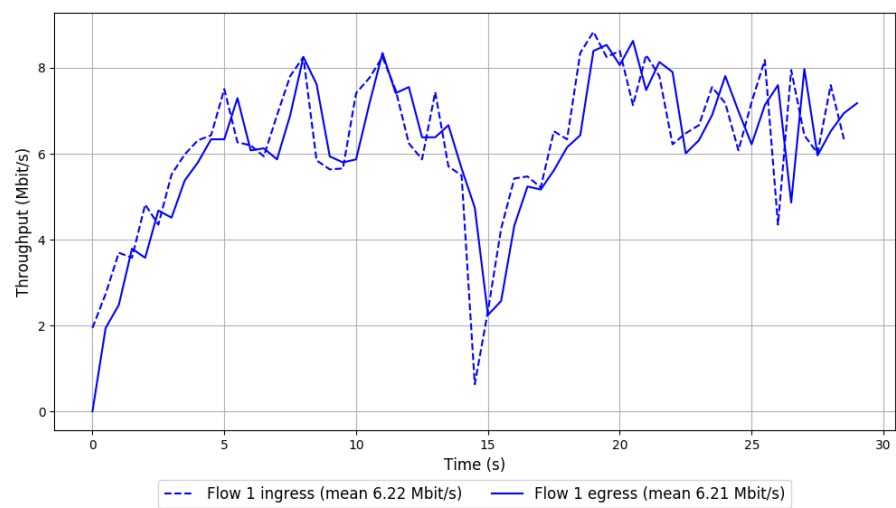


Run 1: Statistics of Indigo-MusesC3

Start at: 2019-01-24 13:19:59
End at: 2019-01-24 13:20:29
Local clock offset: 2.84 ms
Remote clock offset: -6.362 ms

Below is generated by plot.py at 2019-01-24 14:11:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.21 Mbit/s
95th percentile per-packet one-way delay: 111.788 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 6.21 Mbit/s
95th percentile per-packet one-way delay: 111.788 ms
Loss rate: 0.10%

Run 1: Report of Indigo-MusesC3 — Data Link



Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-24 13:43:31

End at: 2019-01-24 13:44:01

Local clock offset: 3.463 ms

Remote clock offset: -2.68 ms

Below is generated by plot.py at 2019-01-24 14:11:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 6.35 Mbit/s

95th percentile per-packet one-way delay: 109.795 ms

Loss rate: 0.52%

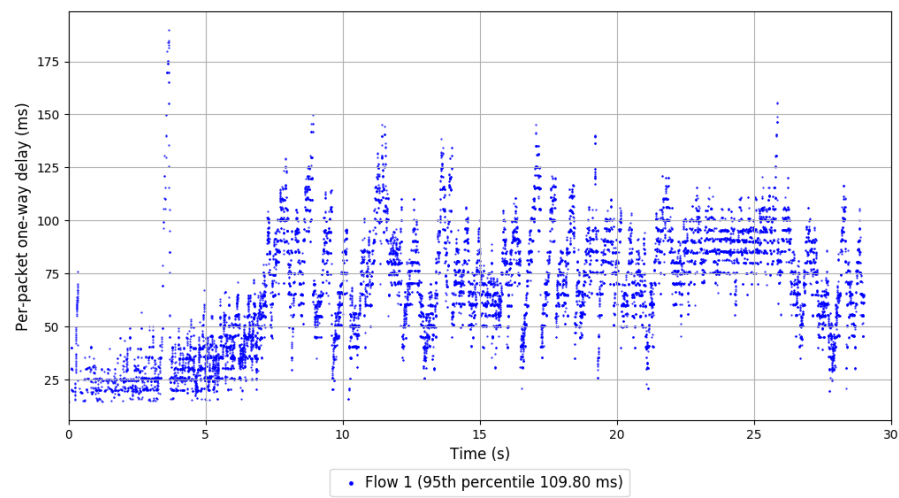
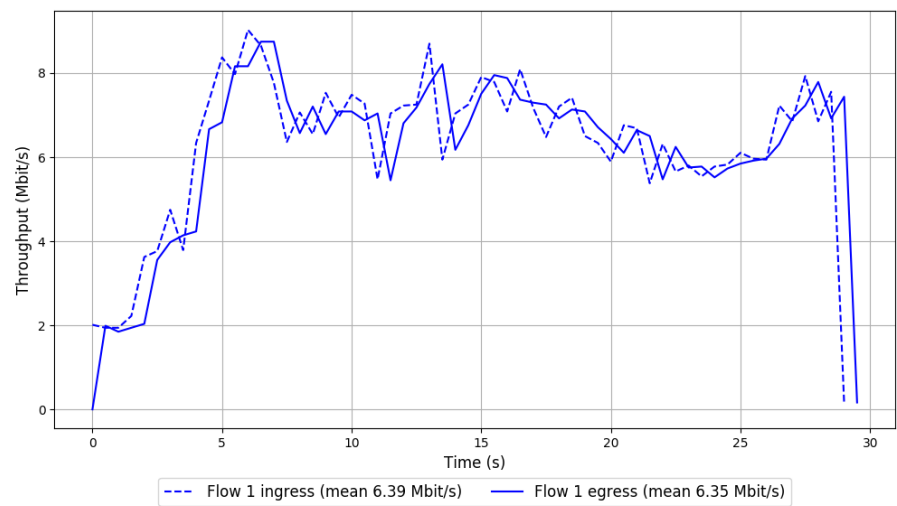
-- Flow 1:

Average throughput: 6.35 Mbit/s

95th percentile per-packet one-way delay: 109.795 ms

Loss rate: 0.52%

Run 2: Report of Indigo-MusesC3 — Data Link

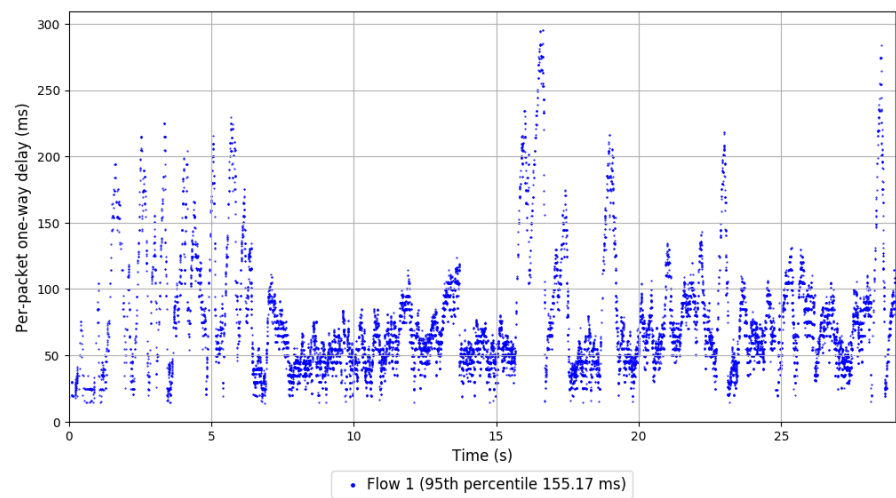
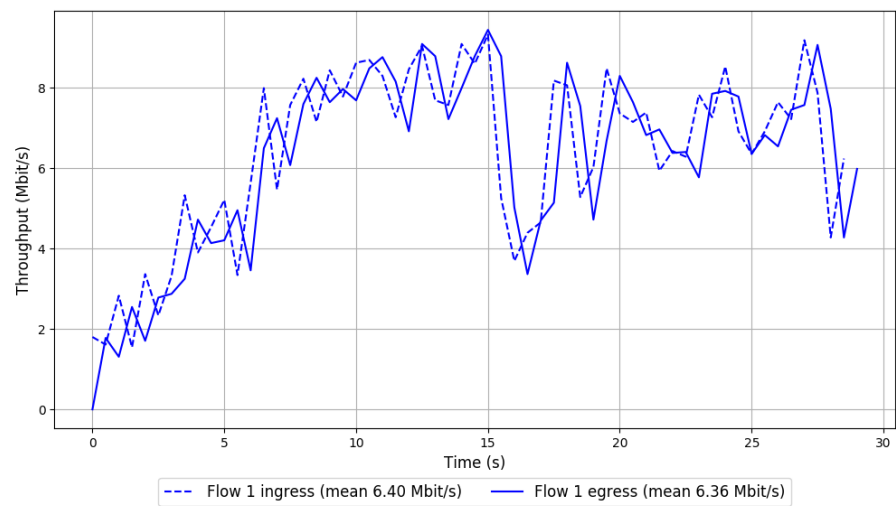


Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-24 14:07:10
End at: 2019-01-24 14:07:40
Local clock offset: 4.602 ms
Remote clock offset: -3.775 ms

Below is generated by plot.py at 2019-01-24 14:11:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.36 Mbit/s
95th percentile per-packet one-way delay: 155.168 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 6.36 Mbit/s
95th percentile per-packet one-way delay: 155.168 ms
Loss rate: 0.69%

Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-24 13:13:07

End at: 2019-01-24 13:13:37

Local clock offset: 1.024 ms

Remote clock offset: -6.337 ms

Below is generated by plot.py at 2019-01-24 14:11:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.58 Mbit/s

95th percentile per-packet one-way delay: 595.819 ms

Loss rate: 0.82%

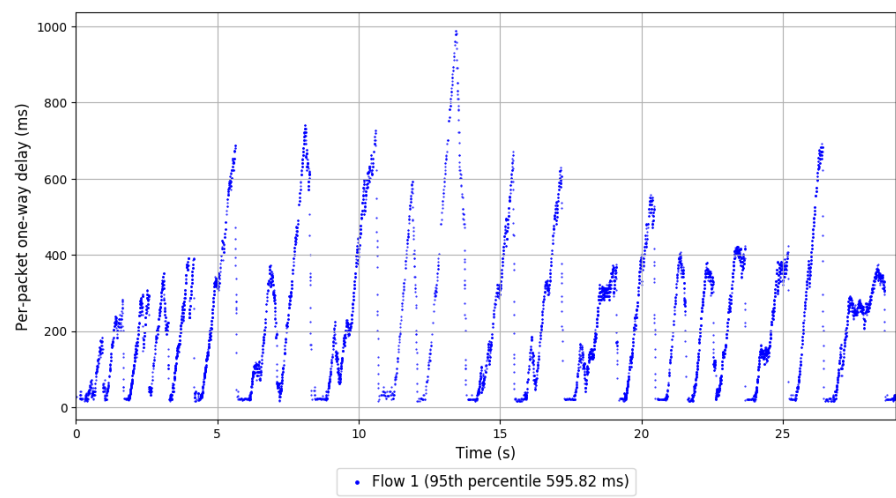
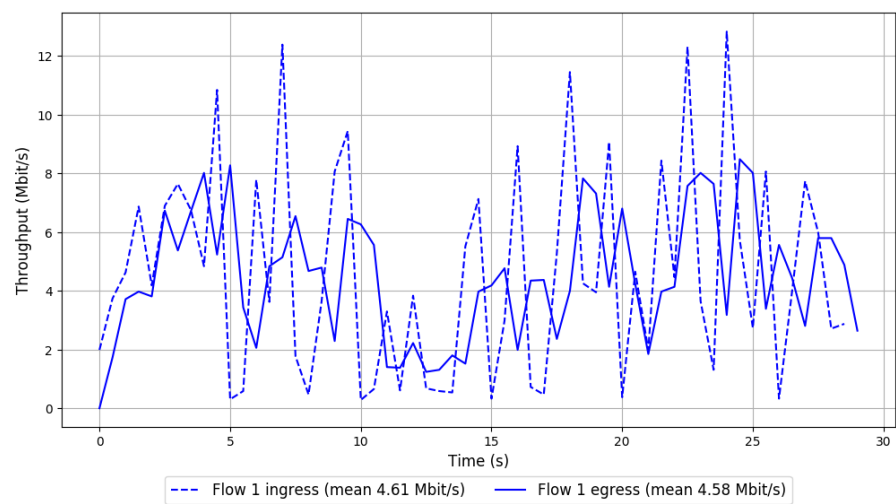
-- Flow 1:

Average throughput: 4.58 Mbit/s

95th percentile per-packet one-way delay: 595.819 ms

Loss rate: 0.82%

Run 1: Report of Indigo-MusesC5 — Data Link

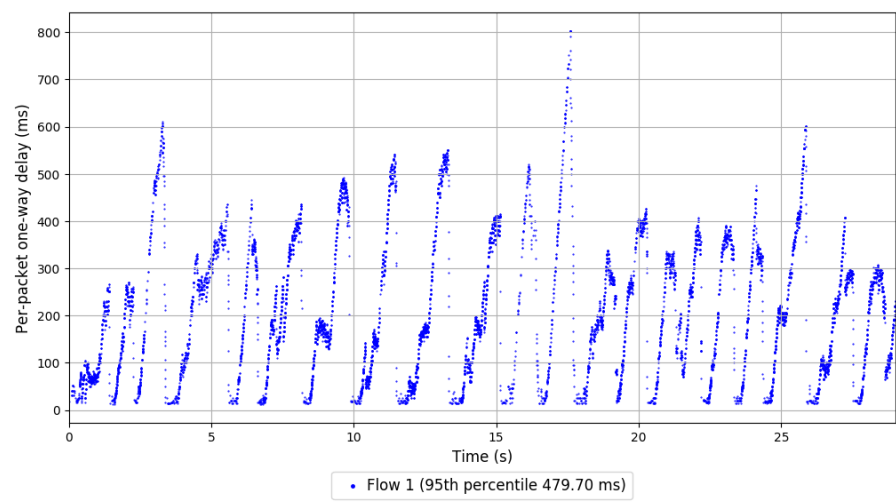
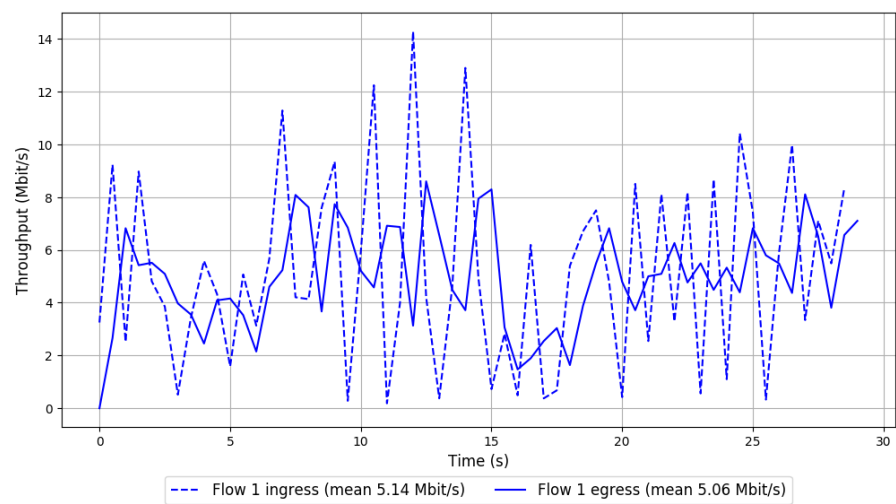


Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-24 13:36:50
End at: 2019-01-24 13:37:20
Local clock offset: 3.862 ms
Remote clock offset: -3.253 ms

Below is generated by plot.py at 2019-01-24 14:11:27
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.06 Mbit/s
95th percentile per-packet one-way delay: 479.704 ms
Loss rate: 1.54%
-- Flow 1:
Average throughput: 5.06 Mbit/s
95th percentile per-packet one-way delay: 479.704 ms
Loss rate: 1.54%

Run 2: Report of Indigo-MusesC5 — Data Link



Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-24 14:00:27

End at: 2019-01-24 14:00:58

Local clock offset: 5.612 ms

Remote clock offset: -2.558 ms

Below is generated by plot.py at 2019-01-24 14:11:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.39 Mbit/s

95th percentile per-packet one-way delay: 768.485 ms

Loss rate: 1.36%

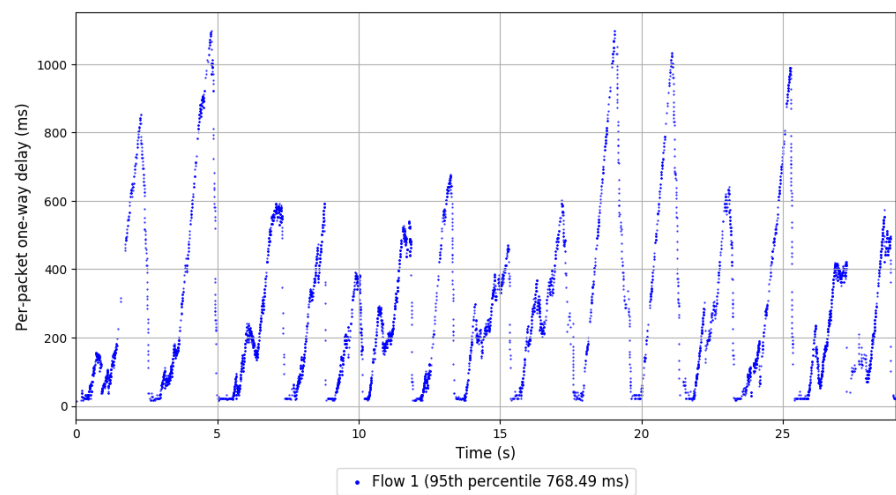
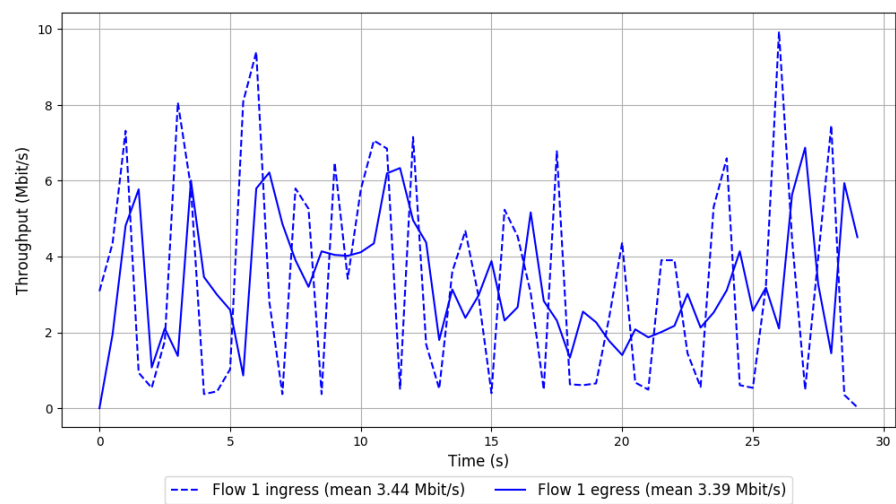
-- Flow 1:

Average throughput: 3.39 Mbit/s

95th percentile per-packet one-way delay: 768.485 ms

Loss rate: 1.36%

Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-24 13:09:48

End at: 2019-01-24 13:10:18

Local clock offset: 2.949 ms

Remote clock offset: -6.07 ms

Below is generated by plot.py at 2019-01-24 14:11:27

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.70 Mbit/s

95th percentile per-packet one-way delay: 204.629 ms

Loss rate: 0.62%

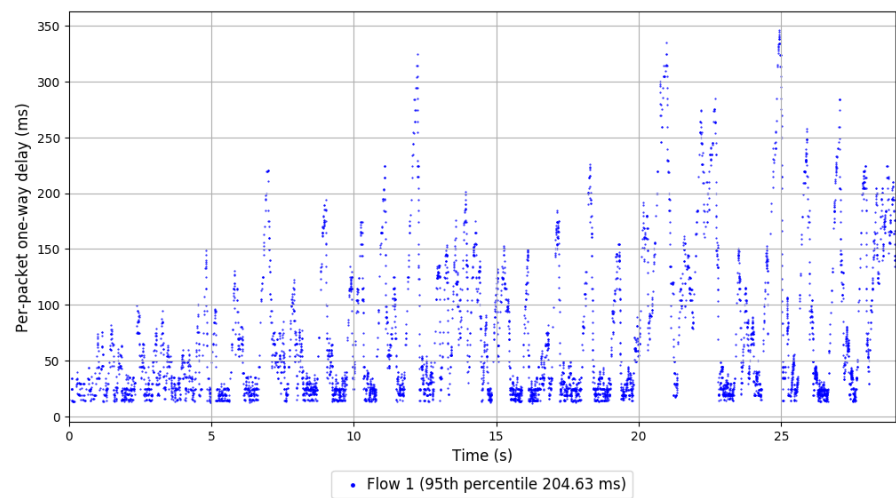
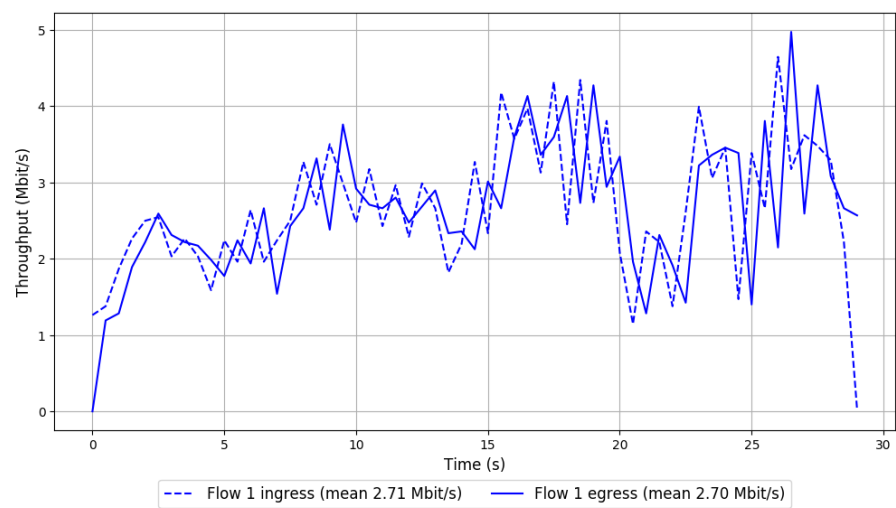
-- Flow 1:

Average throughput: 2.70 Mbit/s

95th percentile per-packet one-way delay: 204.629 ms

Loss rate: 0.62%

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-24 13:33:31

End at: 2019-01-24 13:34:01

Local clock offset: 3.168 ms

Remote clock offset: -3.34 ms

Below is generated by plot.py at 2019-01-24 14:11:28

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.68 Mbit/s

95th percentile per-packet one-way delay: 181.415 ms

Loss rate: 0.19%

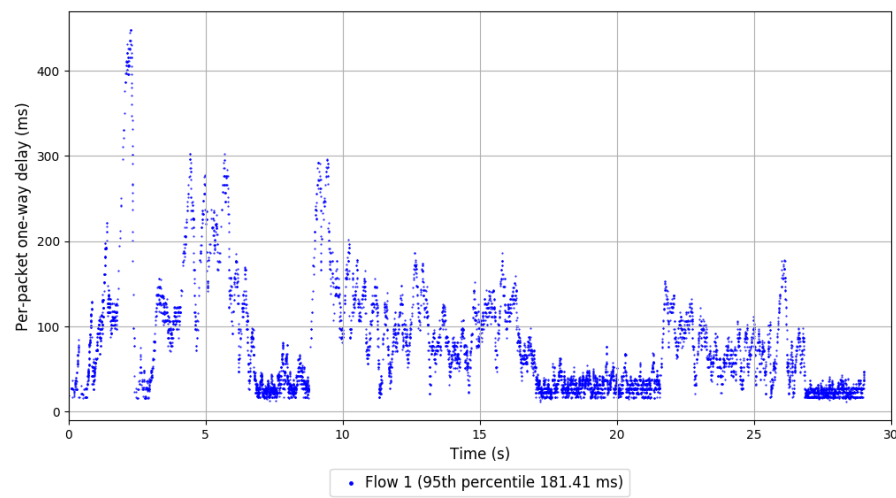
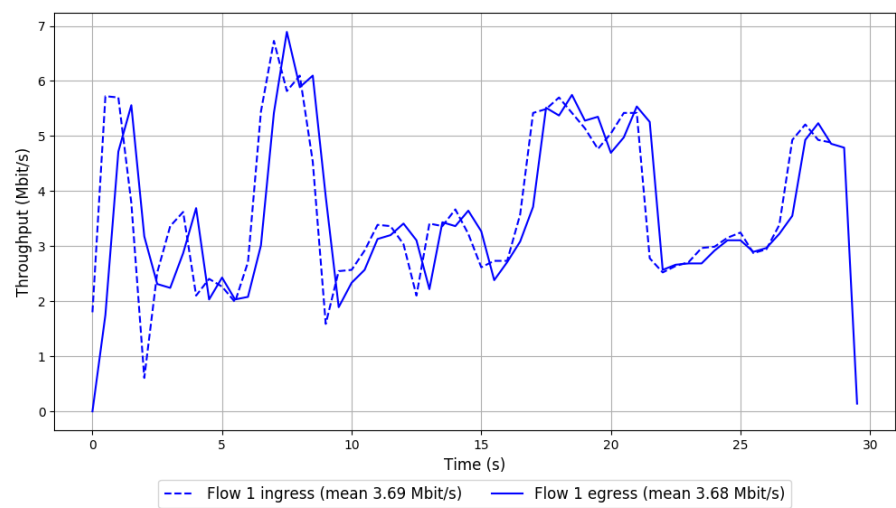
-- Flow 1:

Average throughput: 3.68 Mbit/s

95th percentile per-packet one-way delay: 181.415 ms

Loss rate: 0.19%

Run 2: Report of Indigo-MusesD — Data Link

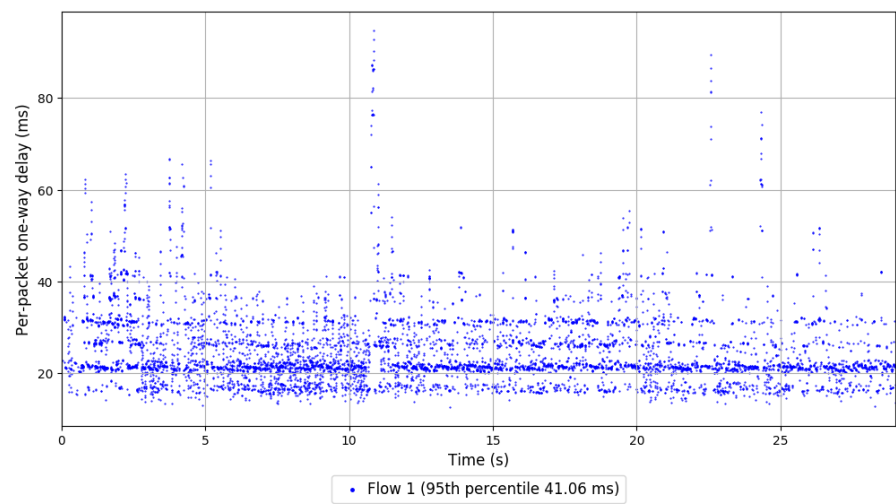
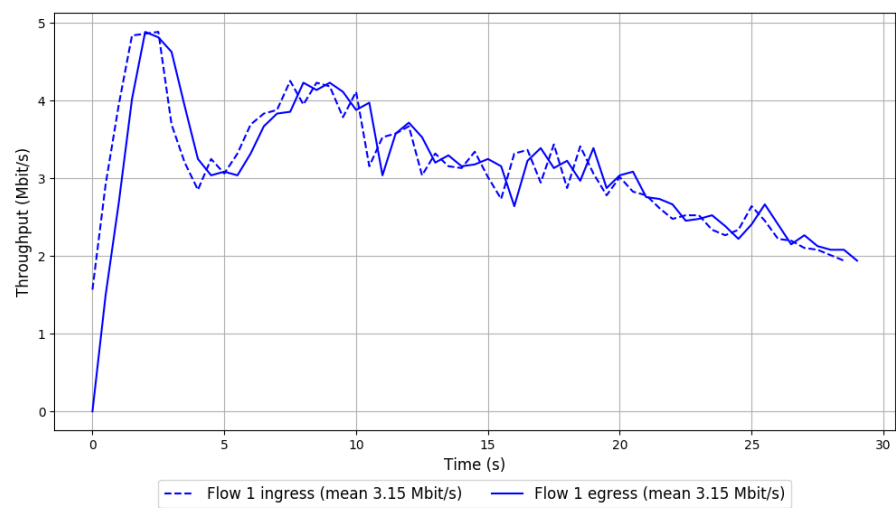


Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-24 13:57:09
End at: 2019-01-24 13:57:39
Local clock offset: 5.656 ms
Remote clock offset: -4.528 ms

Below is generated by plot.py at 2019-01-24 14:11:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 41.064 ms
Loss rate: 0.01%
-- Flow 1:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 41.064 ms
Loss rate: 0.01%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-24 13:03:08

End at: 2019-01-24 13:03:39

Local clock offset: 1.701 ms

Remote clock offset: -6.036 ms

Below is generated by plot.py at 2019-01-24 14:11:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 745.491 ms

Loss rate: 2.66%

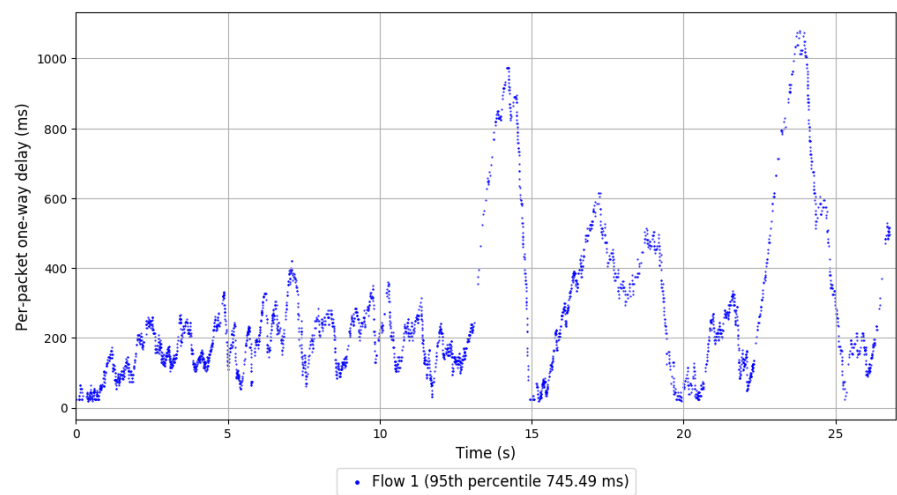
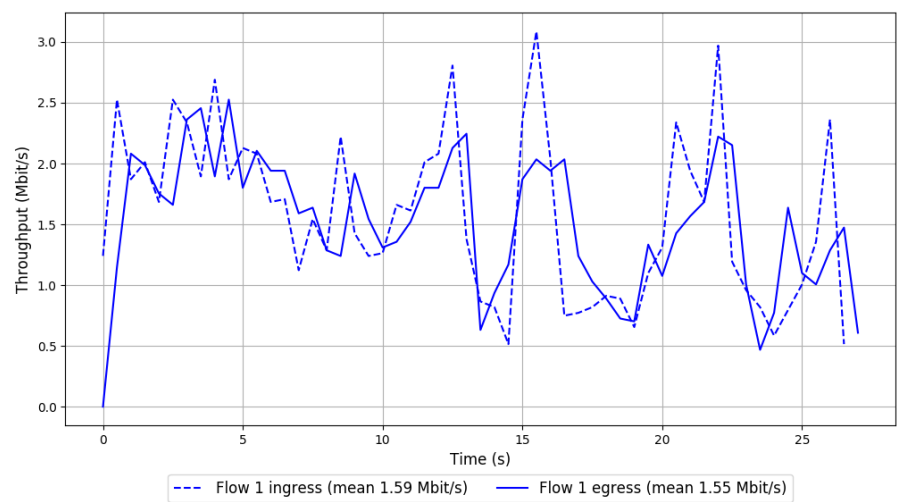
-- Flow 1:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 745.491 ms

Loss rate: 2.66%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-24 13:26:44

End at: 2019-01-24 13:27:14

Local clock offset: 2.428 ms

Remote clock offset: -5.826 ms

Below is generated by plot.py at 2019-01-24 14:11:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.58 Mbit/s

95th percentile per-packet one-way delay: 382.391 ms

Loss rate: 1.57%

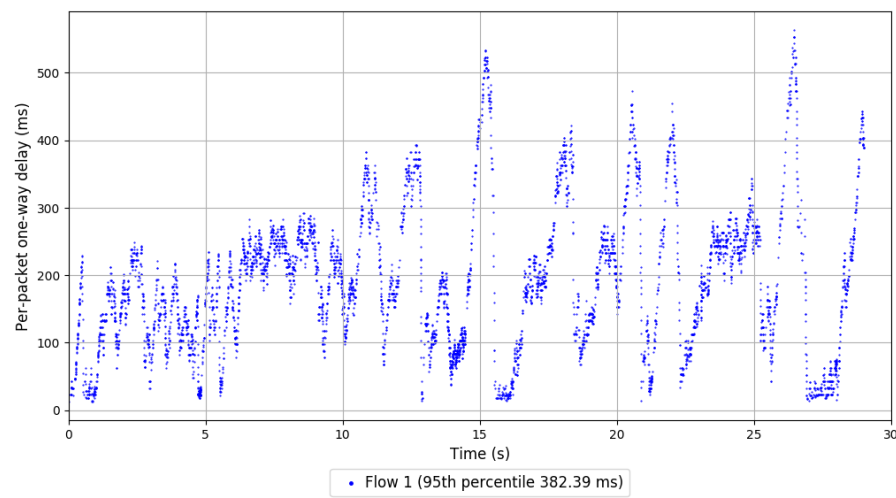
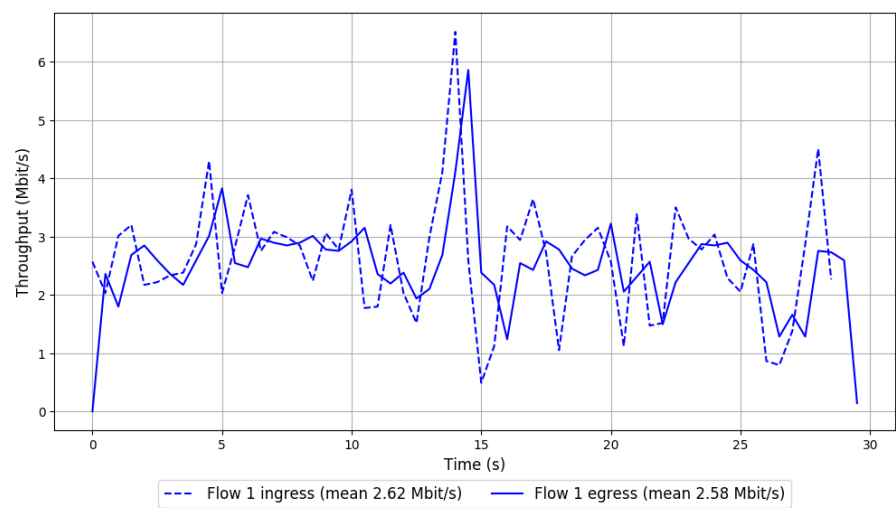
-- Flow 1:

Average throughput: 2.58 Mbit/s

95th percentile per-packet one-way delay: 382.391 ms

Loss rate: 1.57%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-24 13:50:17

End at: 2019-01-24 13:50:47

Local clock offset: 4.107 ms

Remote clock offset: -3.168 ms

Below is generated by plot.py at 2019-01-24 14:11:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.89 Mbit/s

95th percentile per-packet one-way delay: 331.900 ms

Loss rate: 0.52%

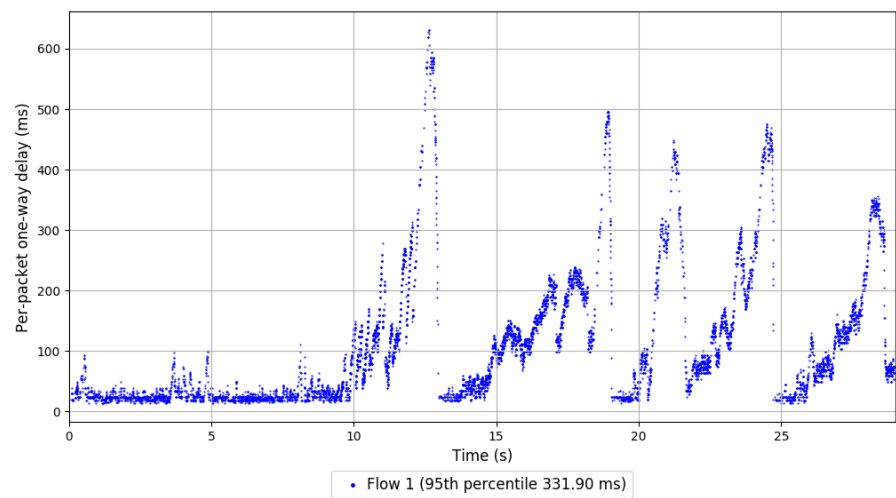
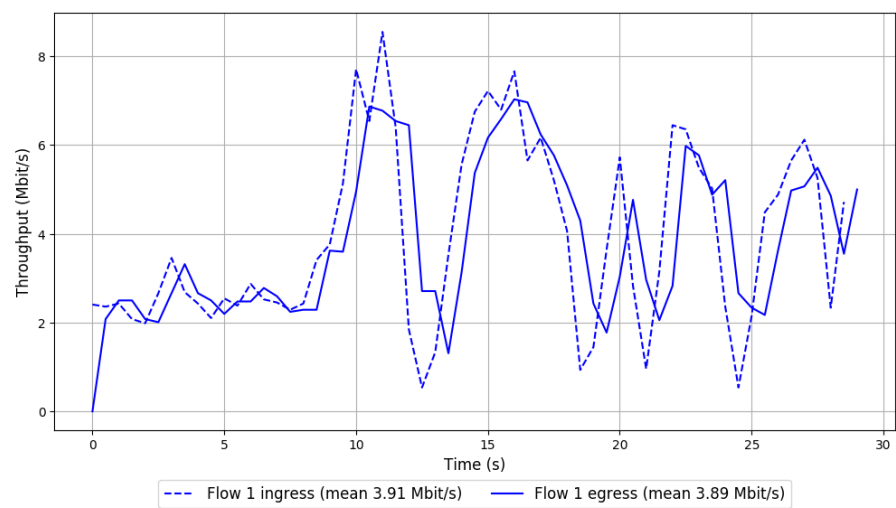
-- Flow 1:

Average throughput: 3.89 Mbit/s

95th percentile per-packet one-way delay: 331.900 ms

Loss rate: 0.52%

Run 3: Report of Indigo-MusesT — Data Link

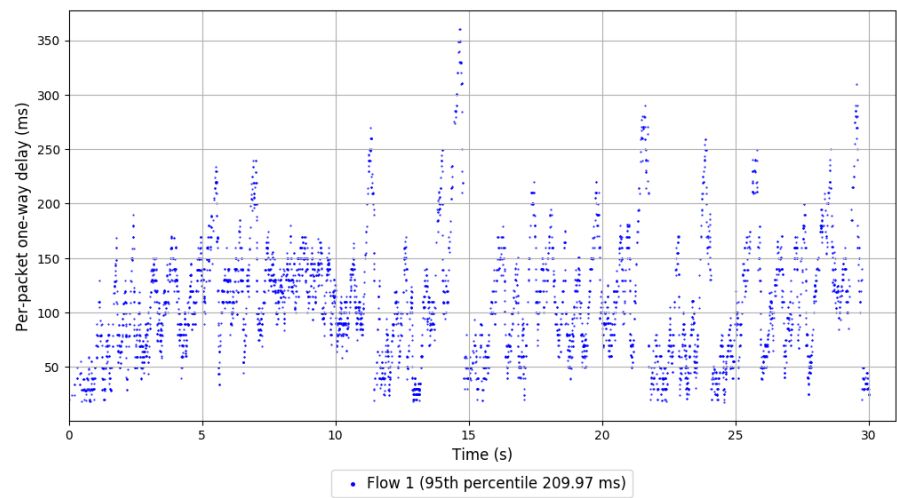
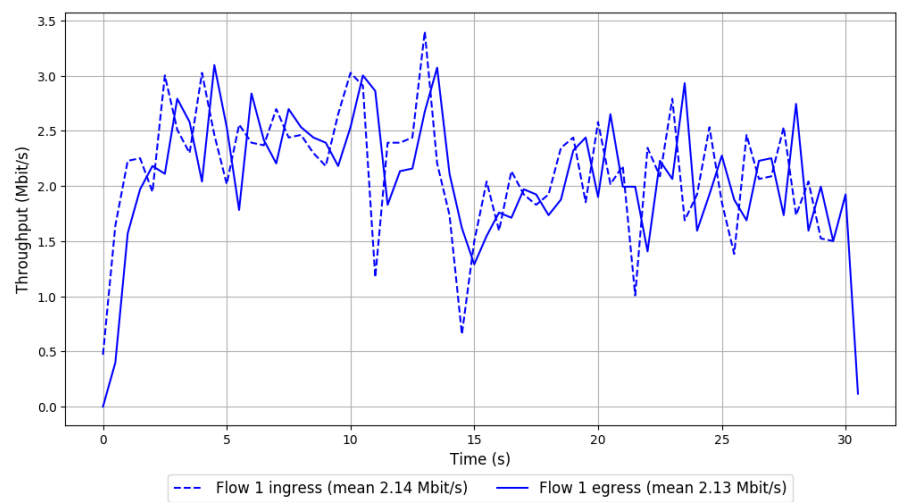



```
Run 1: Statistics of LEDBAT

Start at: 2019-01-24 13:05:22
End at: 2019-01-24 13:05:52
Local clock offset: 3.298 ms
Remote clock offset: -5.363 ms

# Below is generated by plot.py at 2019-01-24 14:11:34
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 209.968 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 209.968 ms
Loss rate: 0.16%
```

Run 1: Report of LEDBAT — Data Link

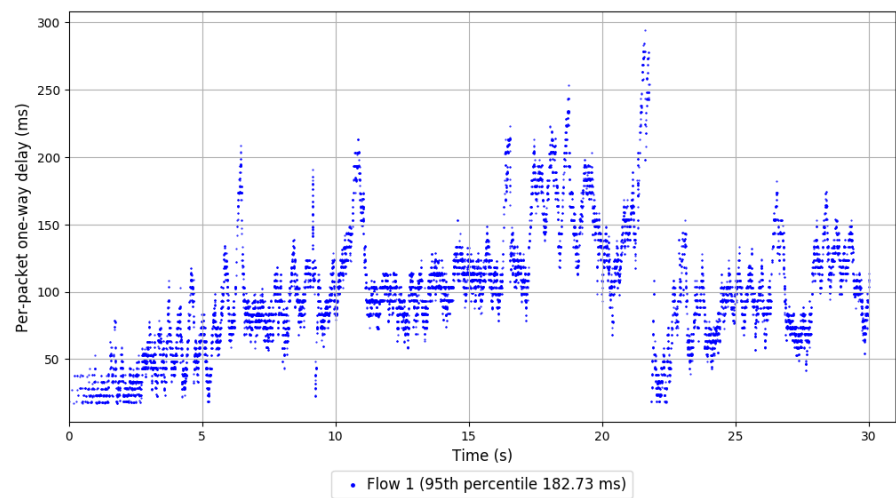
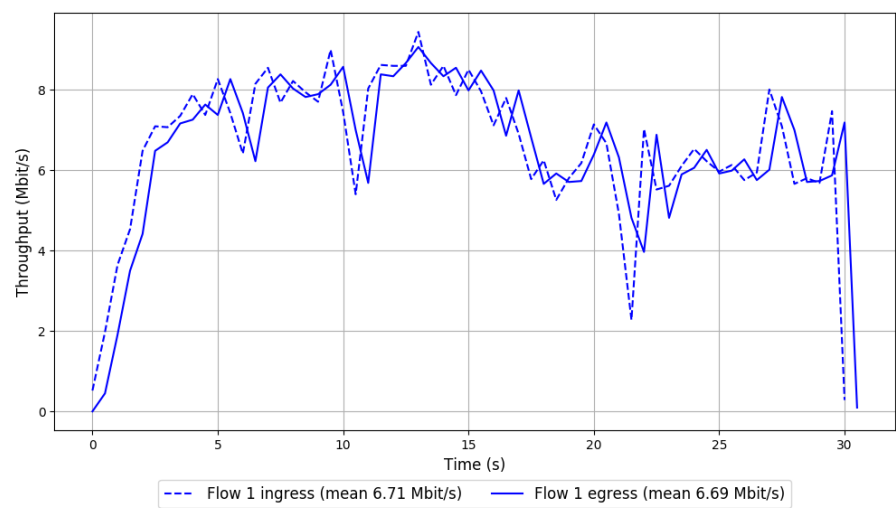


Run 2: Statistics of LEDBAT

Start at: 2019-01-24 13:28:57
End at: 2019-01-24 13:29:27
Local clock offset: 3.134 ms
Remote clock offset: -6.126 ms

Below is generated by plot.py at 2019-01-24 14:11:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.69 Mbit/s
95th percentile per-packet one-way delay: 182.732 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 6.69 Mbit/s
95th percentile per-packet one-way delay: 182.732 ms
Loss rate: 0.41%

Run 2: Report of LEDBAT — Data Link

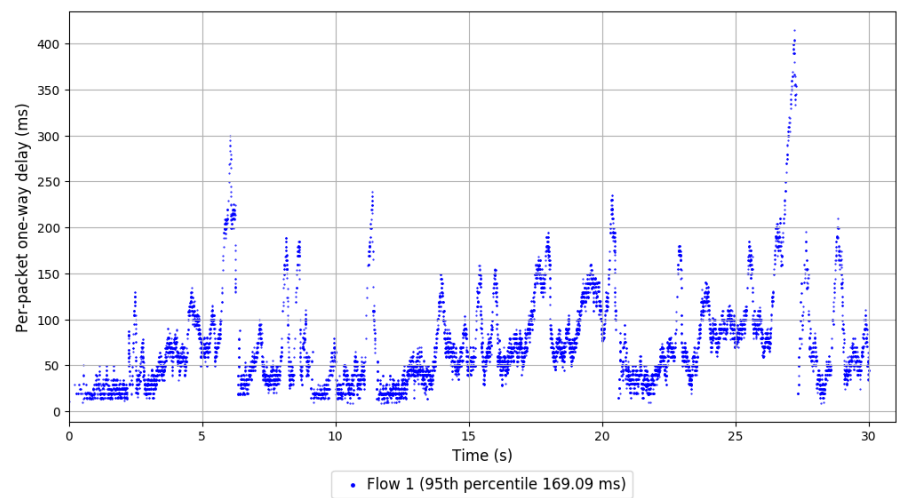
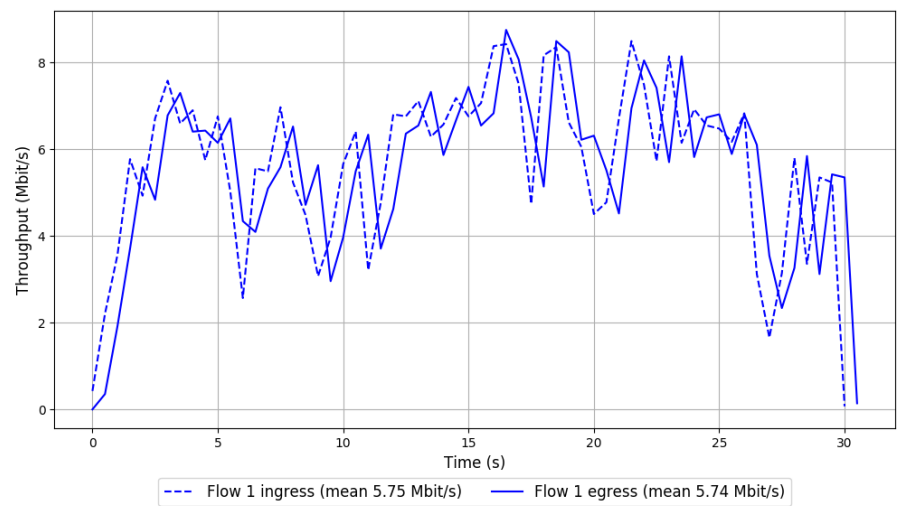


Run 3: Statistics of LEDBAT

Start at: 2019-01-24 13:52:31
End at: 2019-01-24 13:53:01
Local clock offset: 6.035 ms
Remote clock offset: -4.778 ms

Below is generated by plot.py at 2019-01-24 14:11:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.74 Mbit/s
95th percentile per-packet one-way delay: 169.093 ms
Loss rate: 0.23%
-- Flow 1:
Average throughput: 5.74 Mbit/s
95th percentile per-packet one-way delay: 169.093 ms
Loss rate: 0.23%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-24 13:08:42

End at: 2019-01-24 13:09:12

Local clock offset: 6.566 ms

Remote clock offset: -6.656 ms

Below is generated by plot.py at 2019-01-24 14:11:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 392.872 ms

Loss rate: 0.22%

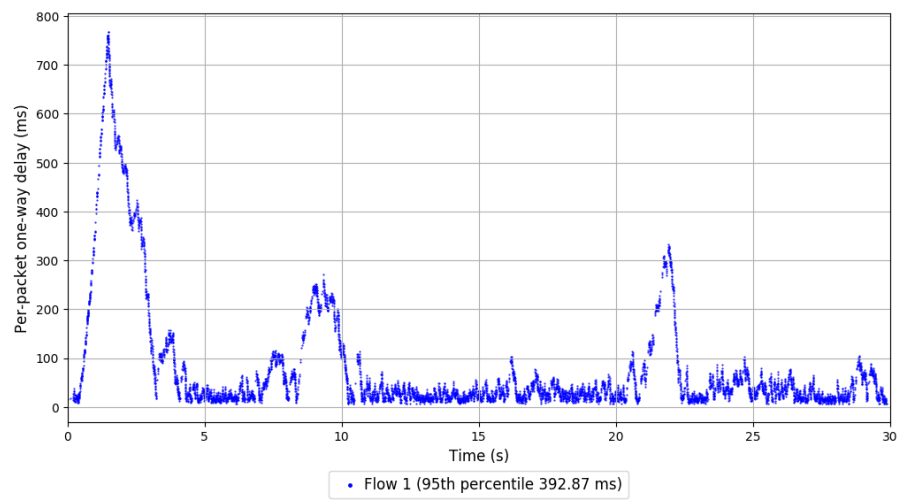
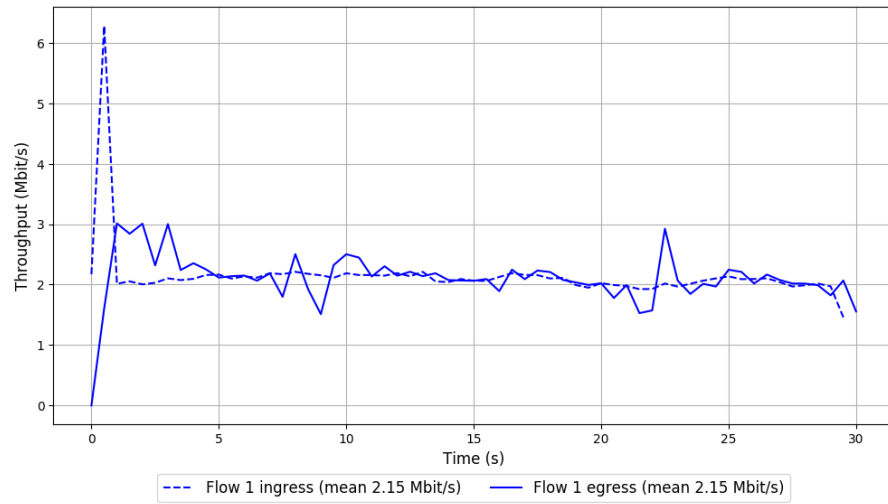
-- Flow 1:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 392.872 ms

Loss rate: 0.22%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-01-24 13:32:23

End at: 2019-01-24 13:32:53

Local clock offset: 2.905 ms

Remote clock offset: -4.79 ms

Below is generated by plot.py at 2019-01-24 14:11:40

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 131.397 ms

Loss rate: 0.09%

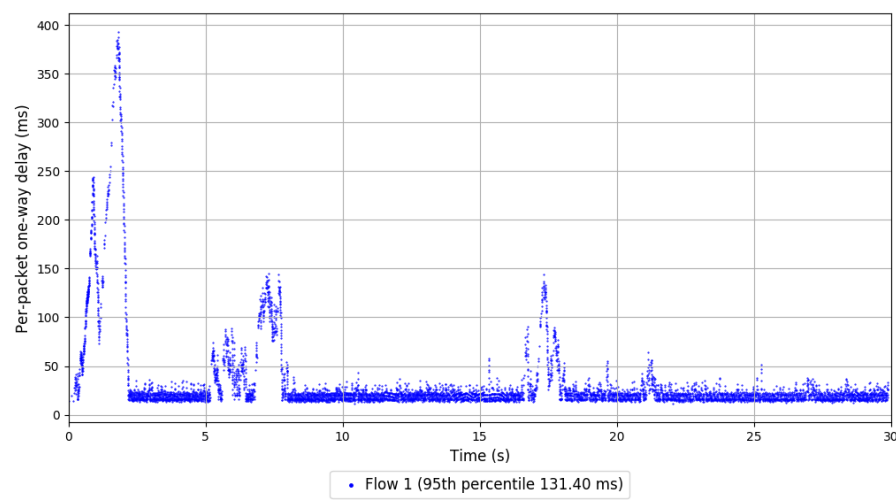
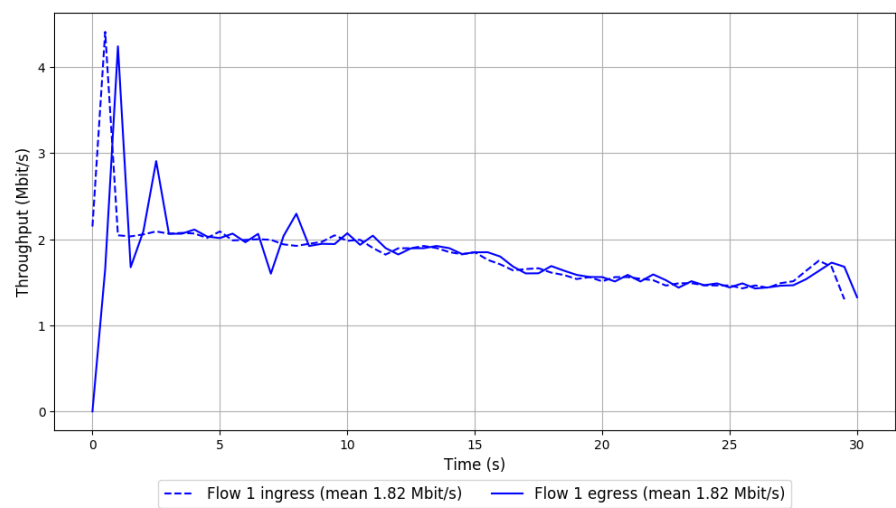
-- Flow 1:

Average throughput: 1.82 Mbit/s

95th percentile per-packet one-way delay: 131.397 ms

Loss rate: 0.09%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-24 13:56:02

End at: 2019-01-24 13:56:32

Local clock offset: 6.529 ms

Remote clock offset: -2.65 ms

Below is generated by plot.py at 2019-01-24 14:11:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.94 Mbit/s

95th percentile per-packet one-way delay: 42.502 ms

Loss rate: 0.05%

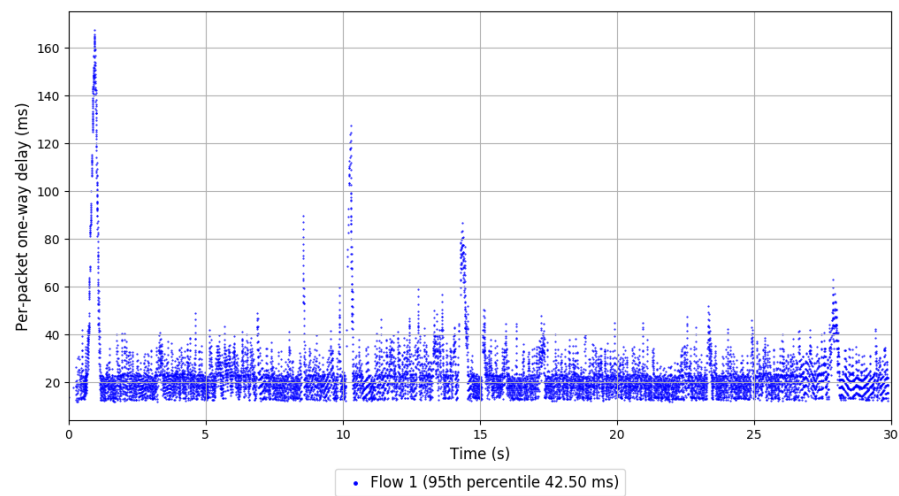
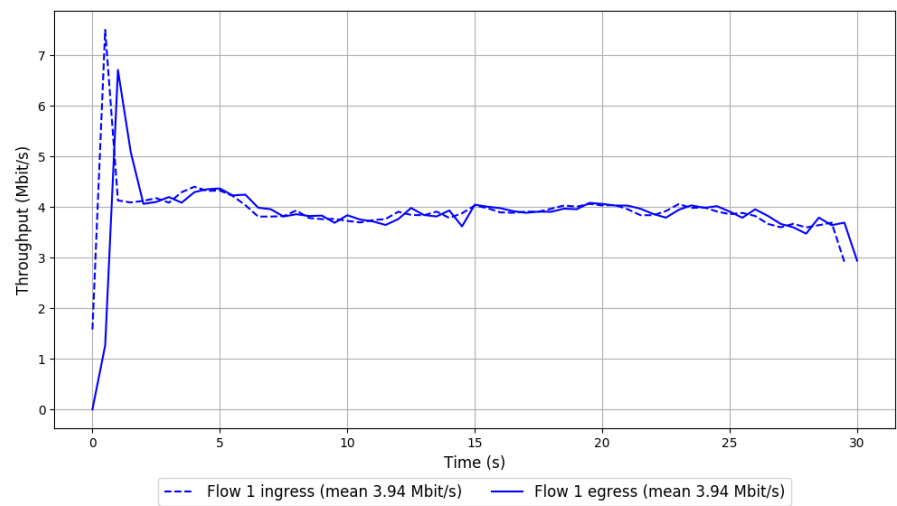
-- Flow 1:

Average throughput: 3.94 Mbit/s

95th percentile per-packet one-way delay: 42.502 ms

Loss rate: 0.05%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

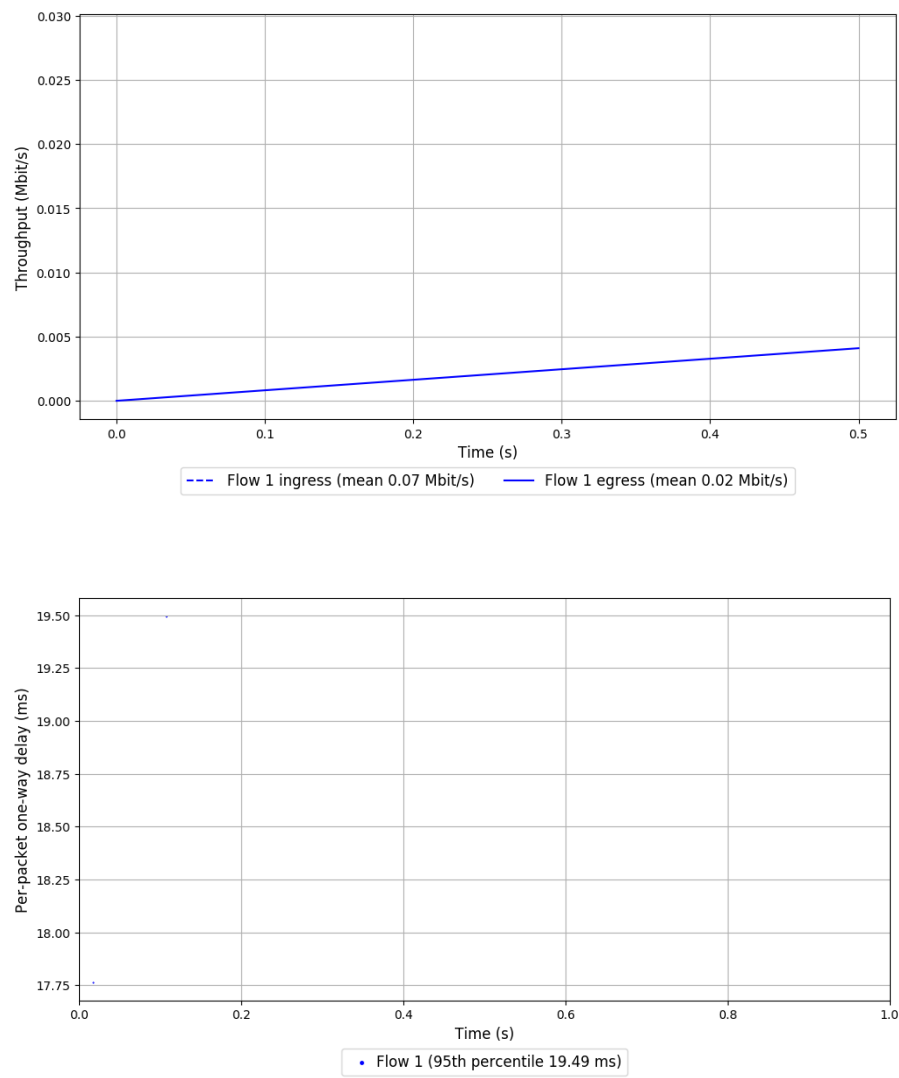
Start at: 2019-01-24 13:15:22

End at: 2019-01-24 13:15:52

Local clock offset: 0.399 ms

Remote clock offset: -5.3 ms

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

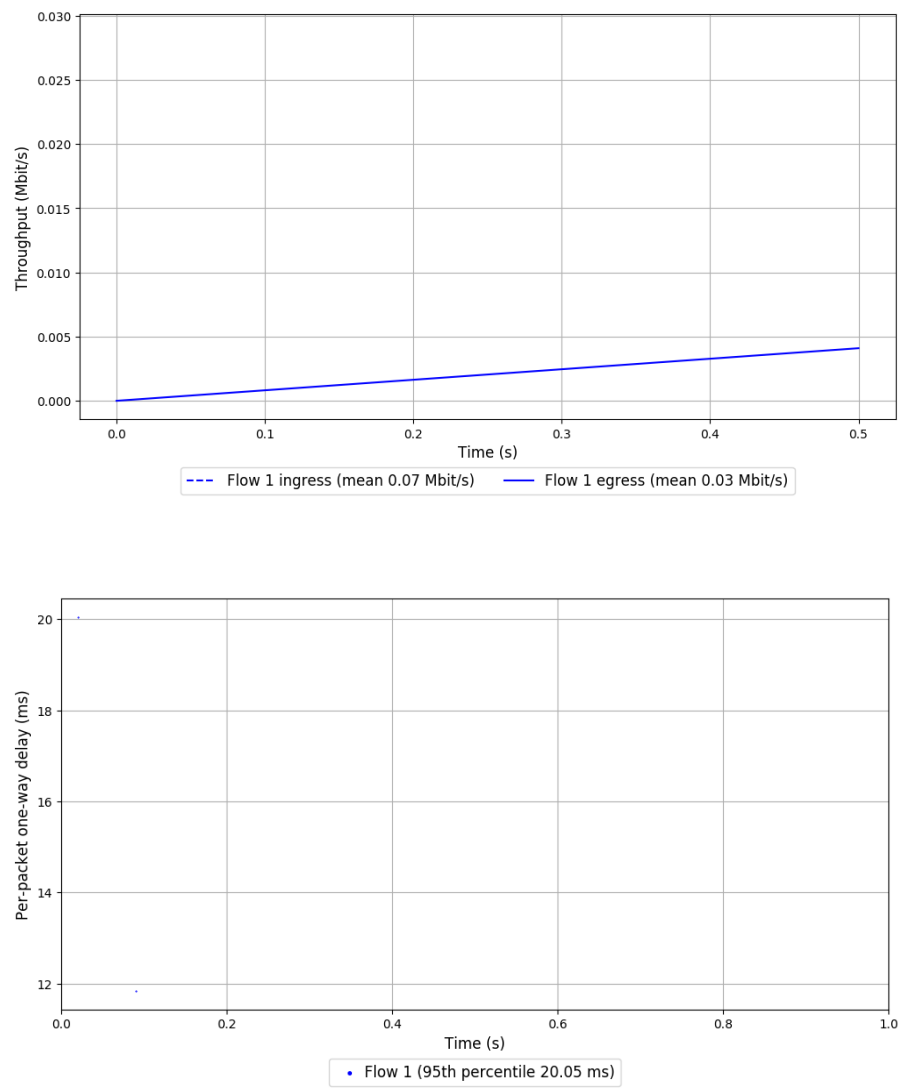
Start at: 2019-01-24 13:39:04

End at: 2019-01-24 13:39:34

Local clock offset: 4.167 ms

Remote clock offset: -4.246 ms

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

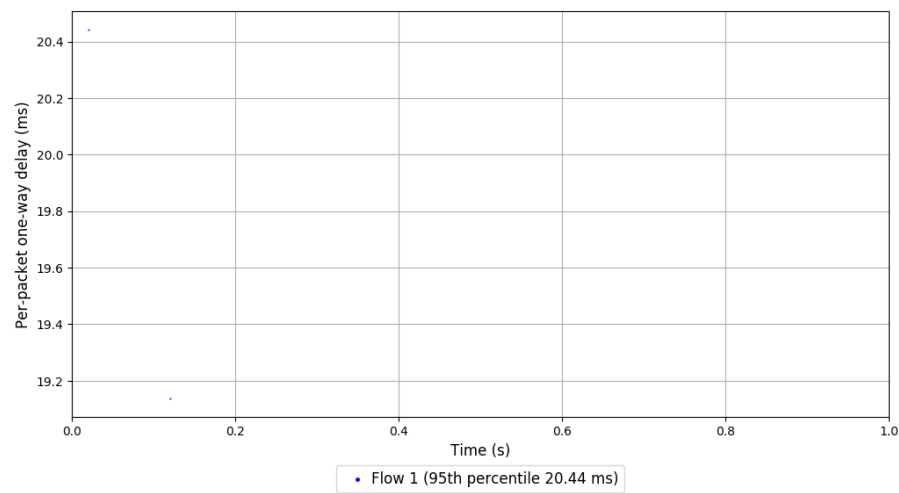
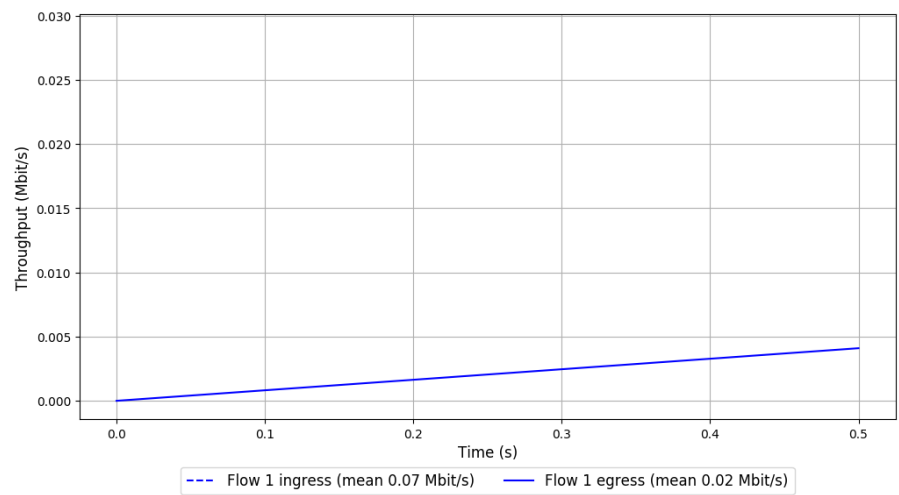
Start at: 2019-01-24 14:02:45

End at: 2019-01-24 14:03:15

Local clock offset: 6.152 ms

Remote clock offset: -2.669 ms

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-01-24 13:12:00

End at: 2019-01-24 13:12:30

Local clock offset: 0.884 ms

Remote clock offset: -5.998 ms

Below is generated by plot.py at 2019-01-24 14:11:42

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.52 Mbit/s

95th percentile per-packet one-way delay: 348.979 ms

Loss rate: 0.84%

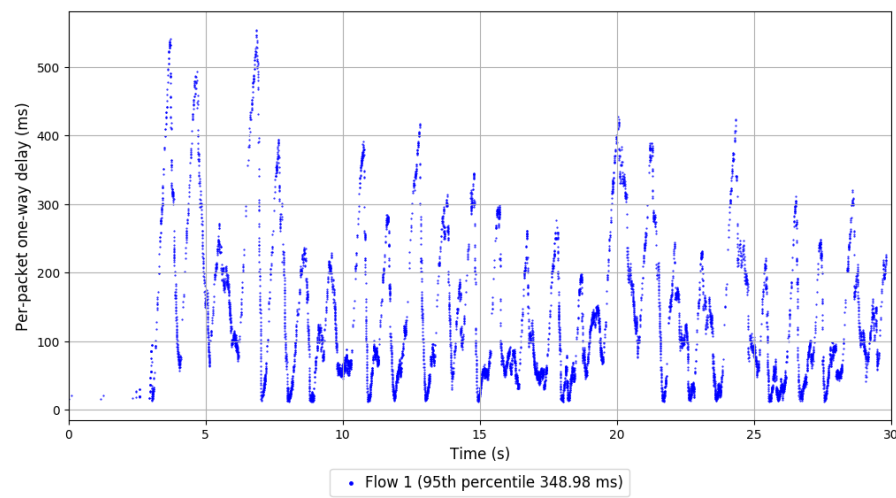
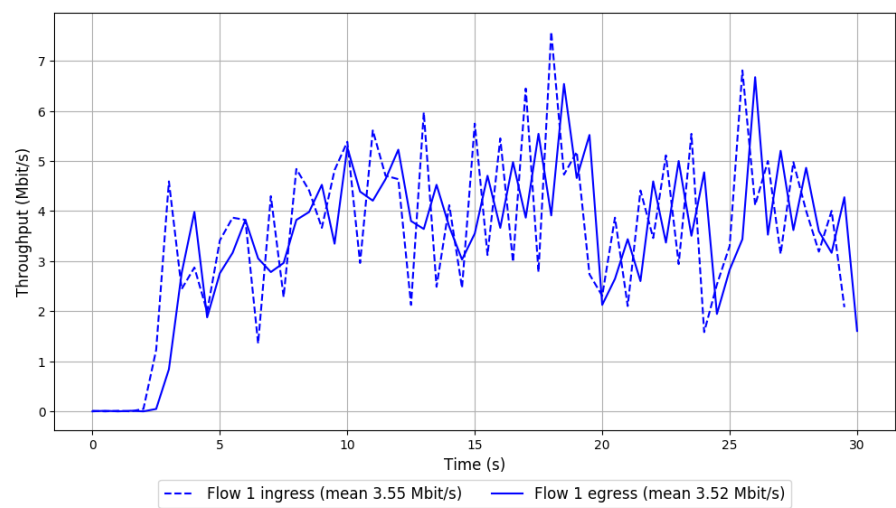
-- Flow 1:

Average throughput: 3.52 Mbit/s

95th percentile per-packet one-way delay: 348.979 ms

Loss rate: 0.84%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-24 13:35:43

End at: 2019-01-24 13:36:13

Local clock offset: 4.814 ms

Remote clock offset: -4.163 ms

Below is generated by plot.py at 2019-01-24 14:11:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.93 Mbit/s

95th percentile per-packet one-way delay: 365.326 ms

Loss rate: 0.82%

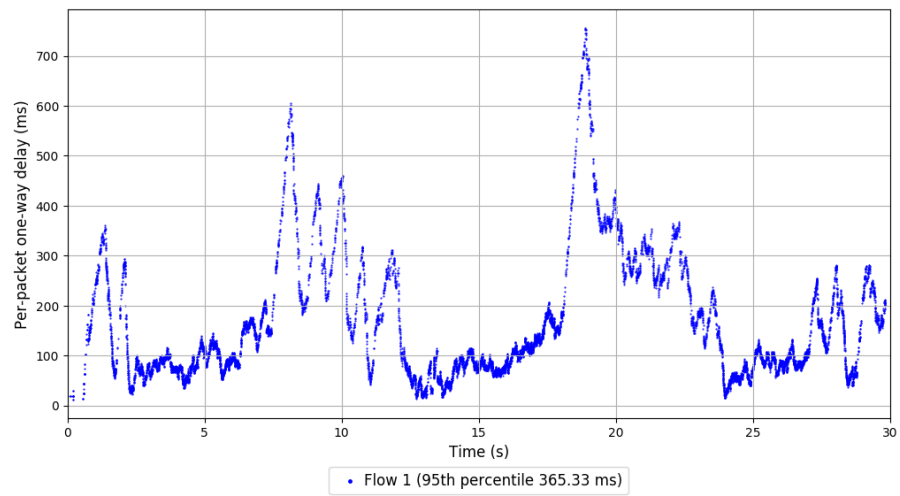
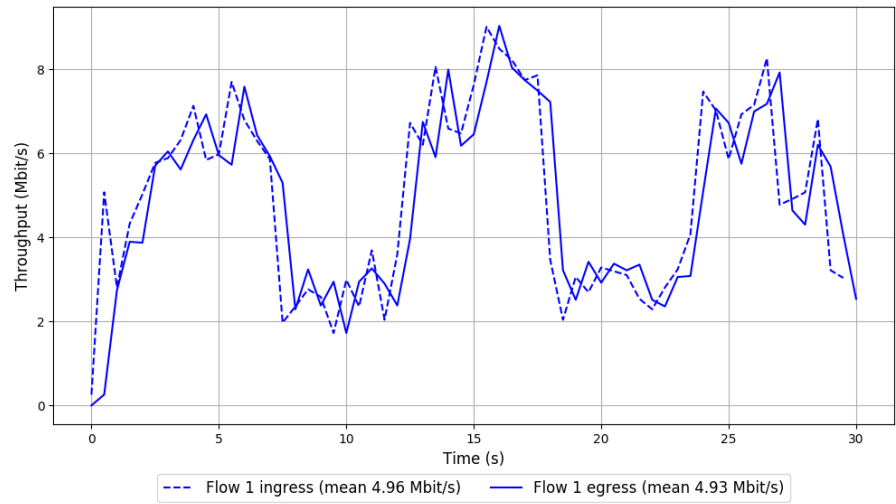
-- Flow 1:

Average throughput: 4.93 Mbit/s

95th percentile per-packet one-way delay: 365.326 ms

Loss rate: 0.82%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-24 13:59:21

End at: 2019-01-24 13:59:51

Local clock offset: 5.99 ms

Remote clock offset: -5.049 ms

Below is generated by plot.py at 2019-01-24 14:11:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.23 Mbit/s

95th percentile per-packet one-way delay: 302.077 ms

Loss rate: 0.53%

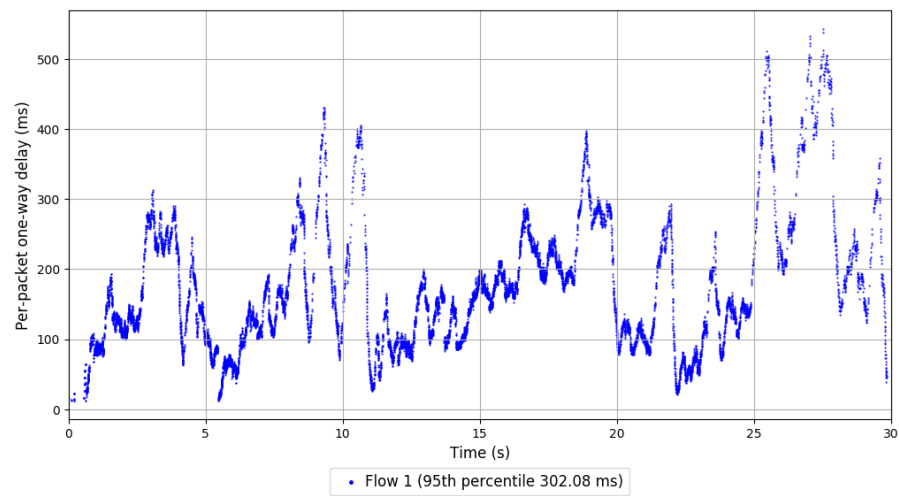
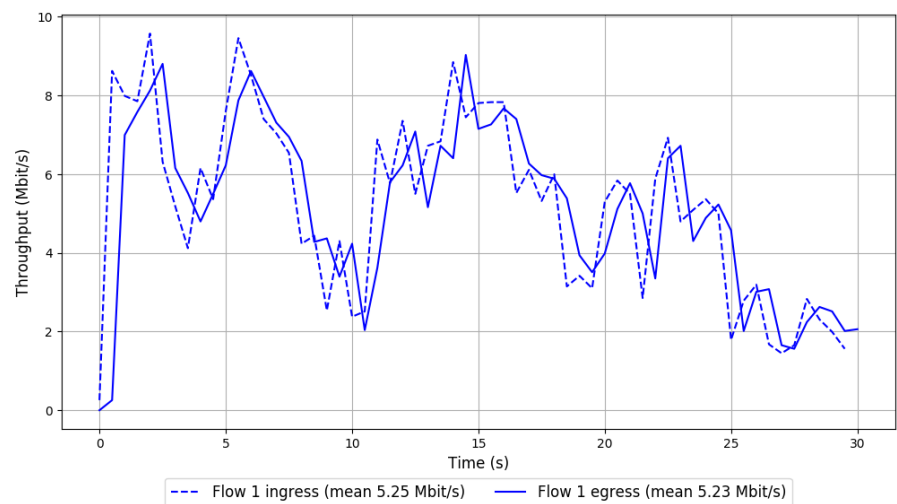
-- Flow 1:

Average throughput: 5.23 Mbit/s

95th percentile per-packet one-way delay: 302.077 ms

Loss rate: 0.53%

Run 3: Report of QUIC Cubic — Data Link

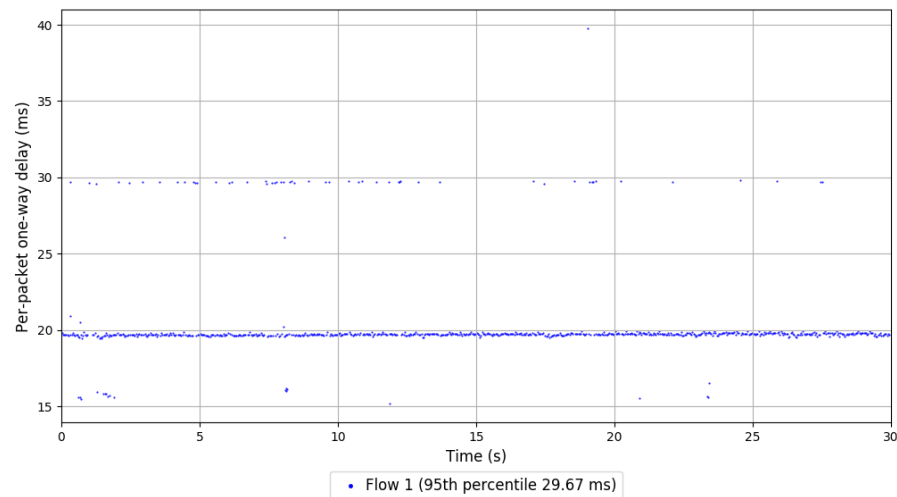
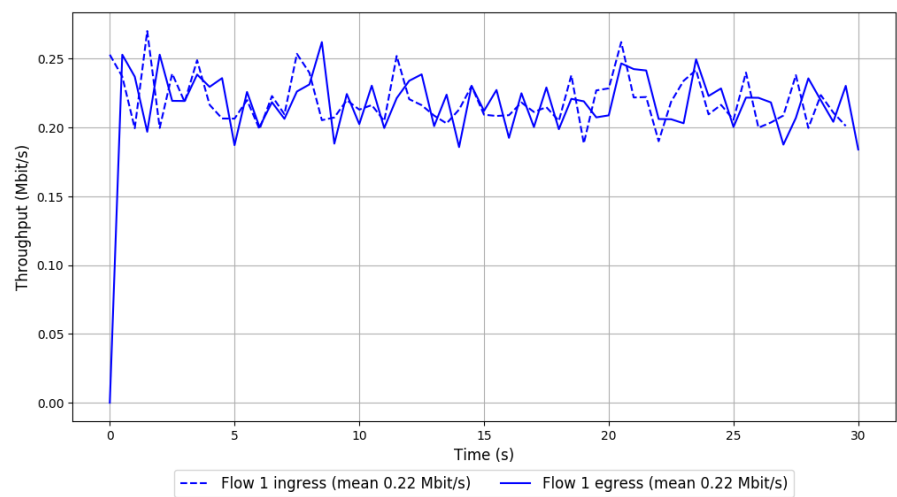



```
Run 1: Statistics of SCReAM

Start at: 2019-01-24 13:16:38
End at: 2019-01-24 13:17:08
Local clock offset: 1.859 ms
Remote clock offset: -6.291 ms

# Below is generated by plot.py at 2019-01-24 14:11:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 29.670 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 29.670 ms
Loss rate: 0.13%
```

Run 1: Report of SReAM — Data Link

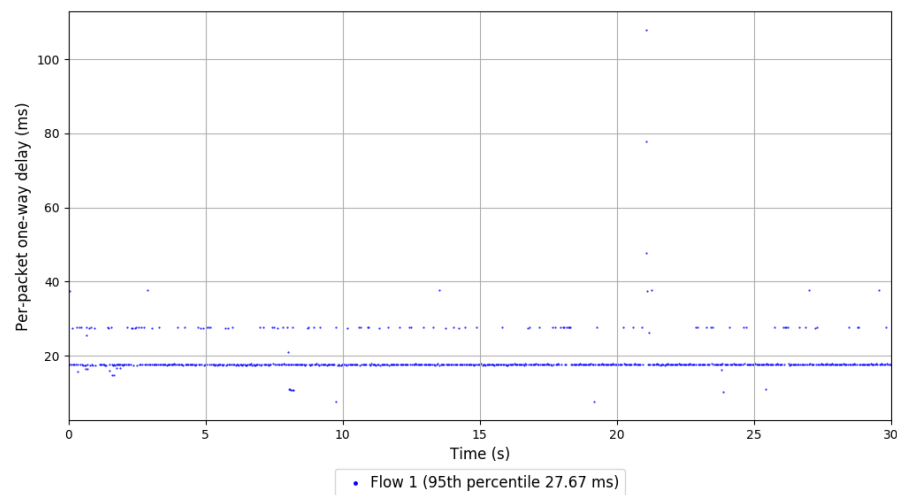
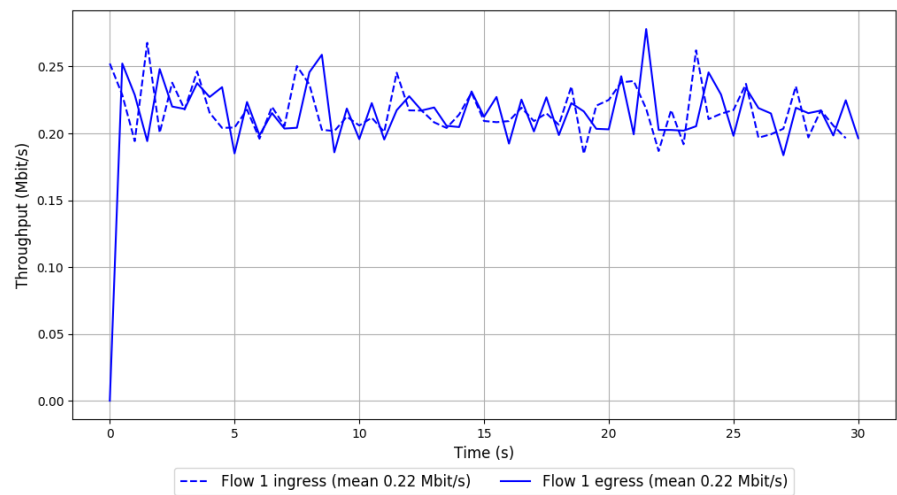


Run 2: Statistics of SCReAM

Start at: 2019-01-24 13:40:10
End at: 2019-01-24 13:40:40
Local clock offset: 5.33 ms
Remote clock offset: -4.378 ms

Below is generated by plot.py at 2019-01-24 14:11:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 27.666 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 27.666 ms
Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2019-01-24 14:03:51

End at: 2019-01-24 14:04:21

Local clock offset: 3.917 ms

Remote clock offset: -4.32 ms

Below is generated by plot.py at 2019-01-24 14:11:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 29.571 ms

Loss rate: 0.13%

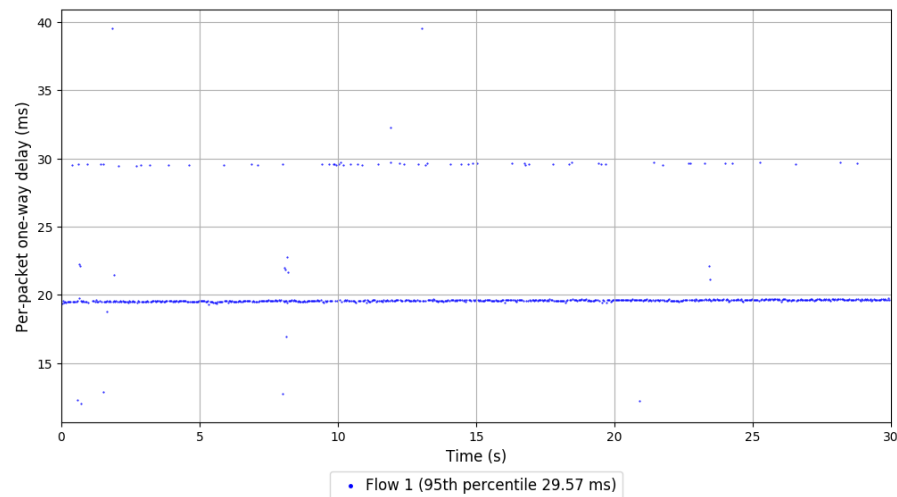
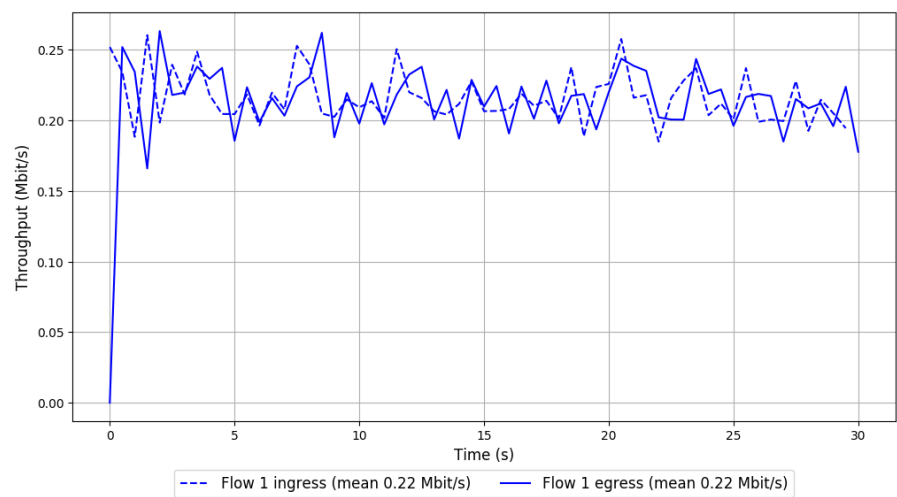
-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 29.571 ms

Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

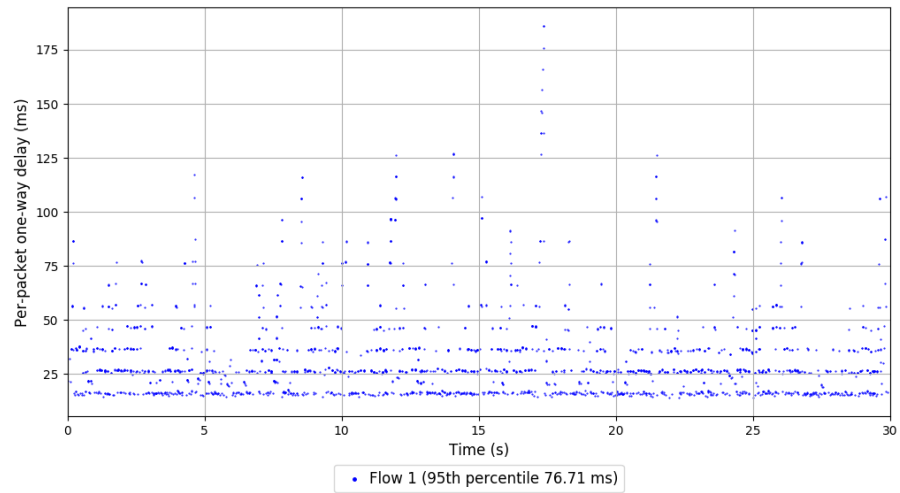
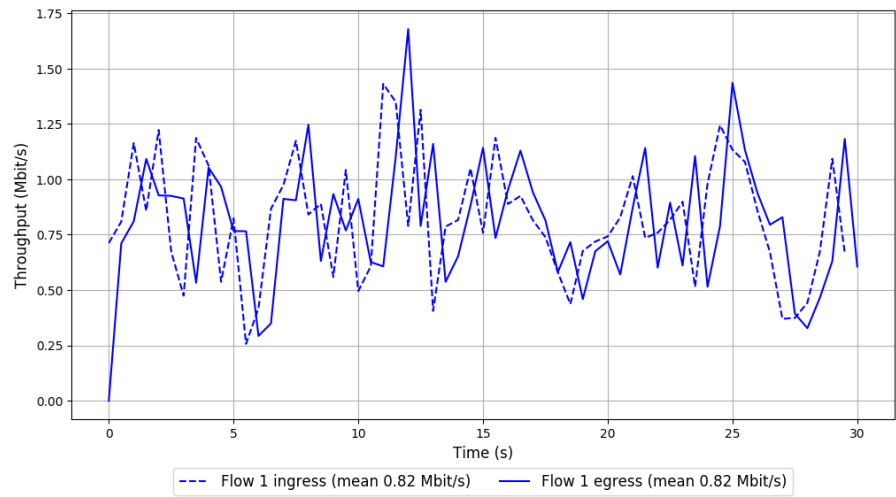


Run 1: Statistics of Sprout

Start at: 2019-01-24 13:10:54
End at: 2019-01-24 13:11:24
Local clock offset: 1.489 ms
Remote clock offset: -5.243 ms

Below is generated by plot.py at 2019-01-24 14:11:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 76.713 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.82 Mbit/s
95th percentile per-packet one-way delay: 76.713 ms
Loss rate: 0.12%

Run 1: Report of Sprout — Data Link

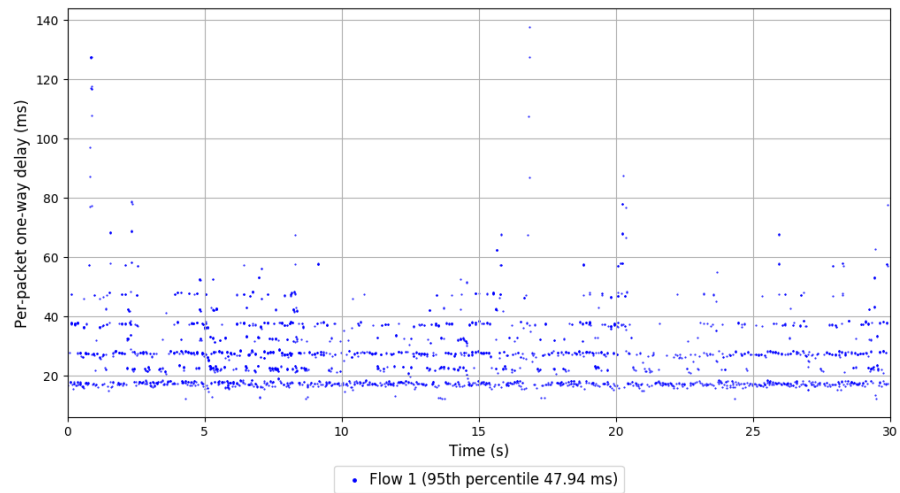
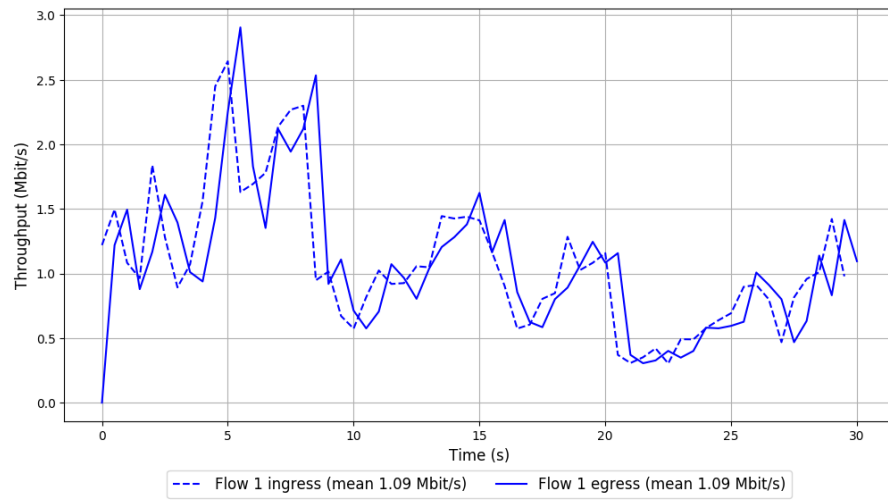


Run 2: Statistics of Sprout

Start at: 2019-01-24 13:34:37
End at: 2019-01-24 13:35:07
Local clock offset: 2.635 ms
Remote clock offset: -3.282 ms

Below is generated by plot.py at 2019-01-24 14:11:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 47.935 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 1.09 Mbit/s
95th percentile per-packet one-way delay: 47.935 ms
Loss rate: 0.11%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2019-01-24 13:58:15

End at: 2019-01-24 13:58:45

Local clock offset: 1.772 ms

Remote clock offset: -2.72 ms

Below is generated by plot.py at 2019-01-24 14:11:46

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 58.636 ms

Loss rate: 0.00%

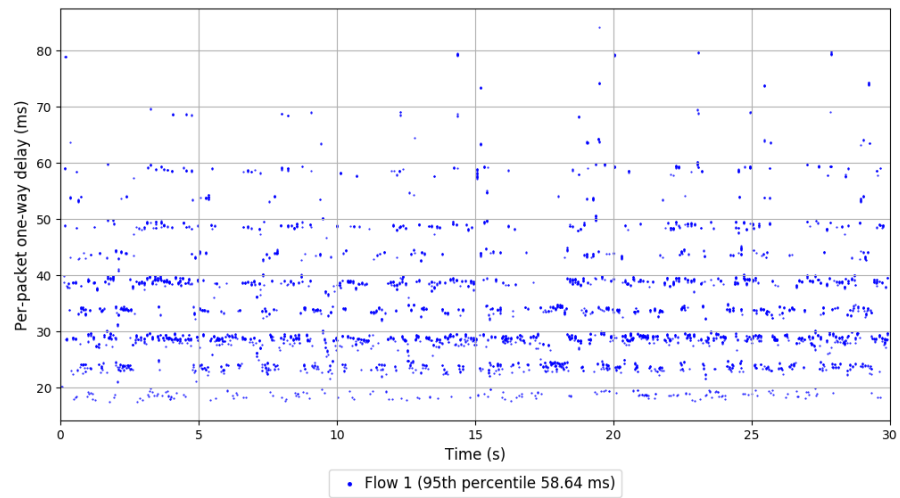
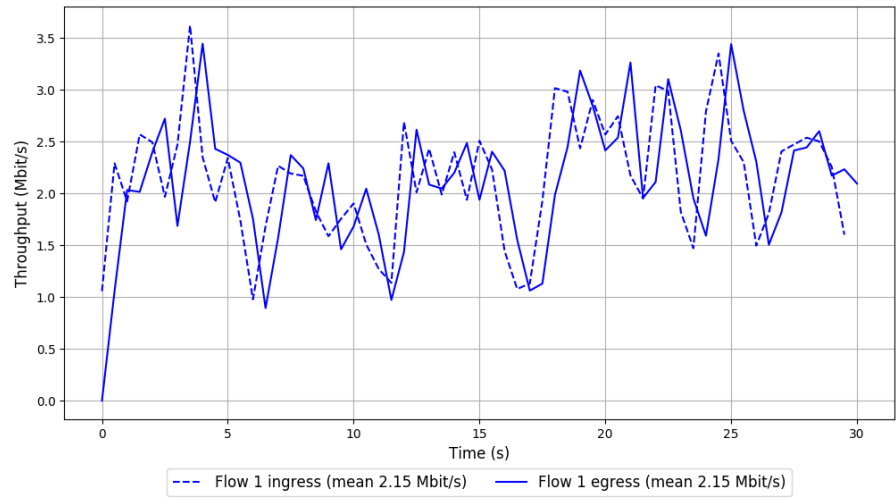
-- Flow 1:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 58.636 ms

Loss rate: 0.00%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

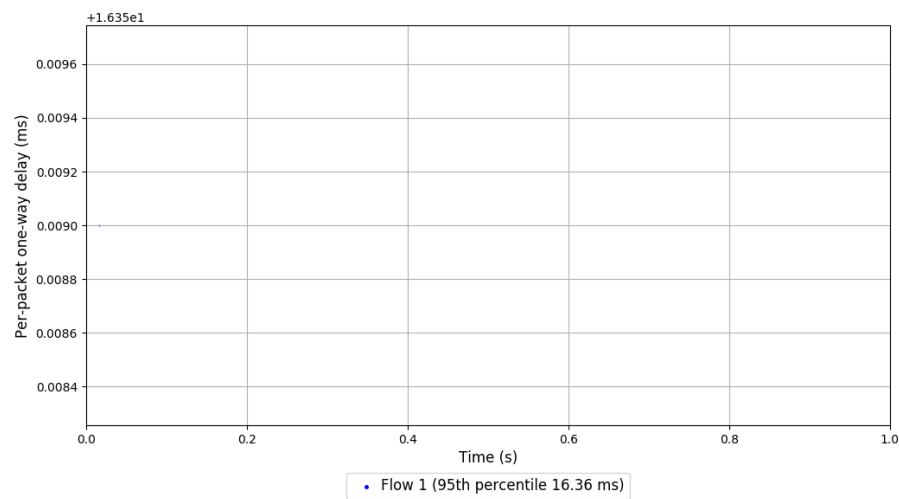
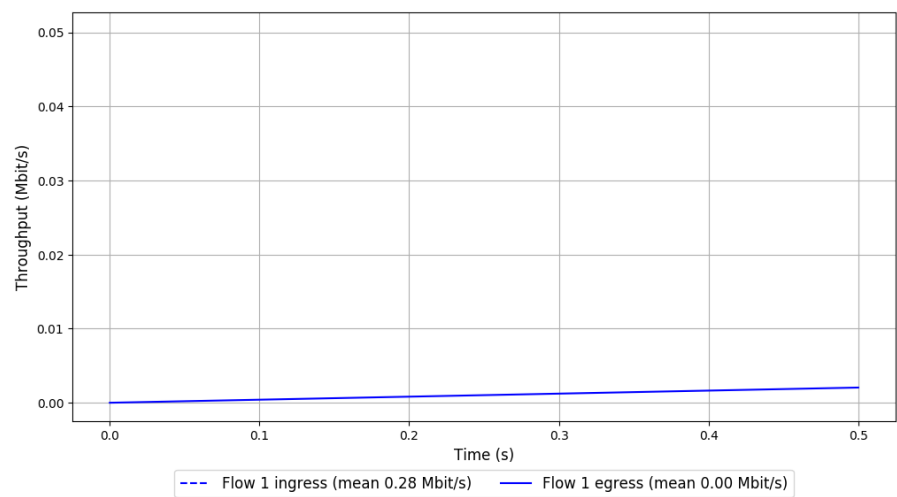
Start at: 2019-01-24 13:23:19

End at: 2019-01-24 13:23:49

Local clock offset: 3.078 ms

Remote clock offset: -4.314 ms

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-01-24 13:46:54

End at: 2019-01-24 13:47:24

Local clock offset: 2.991 ms

Remote clock offset: -4.396 ms

Below is generated by plot.py at 2019-01-24 14:11:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 41.451 ms

Loss rate: 37.39%

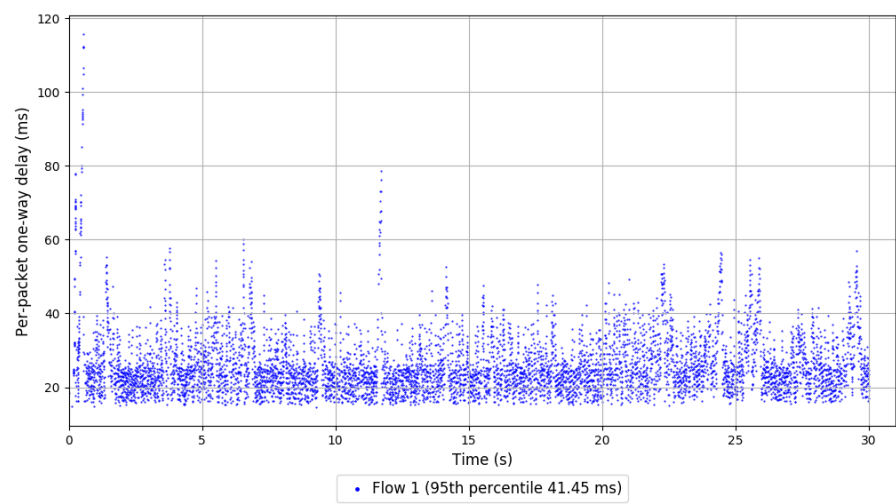
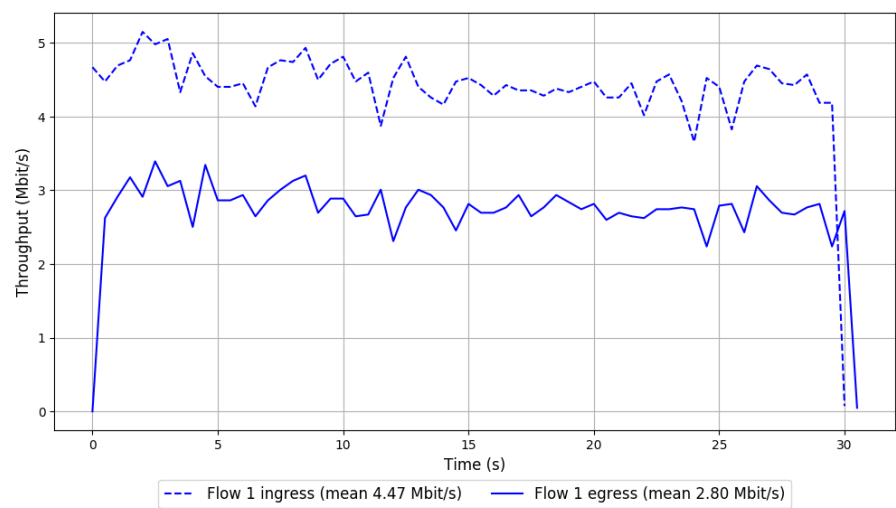
-- Flow 1:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 41.451 ms

Loss rate: 37.39%

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



Run 3: Statistics of TaoVA-100x

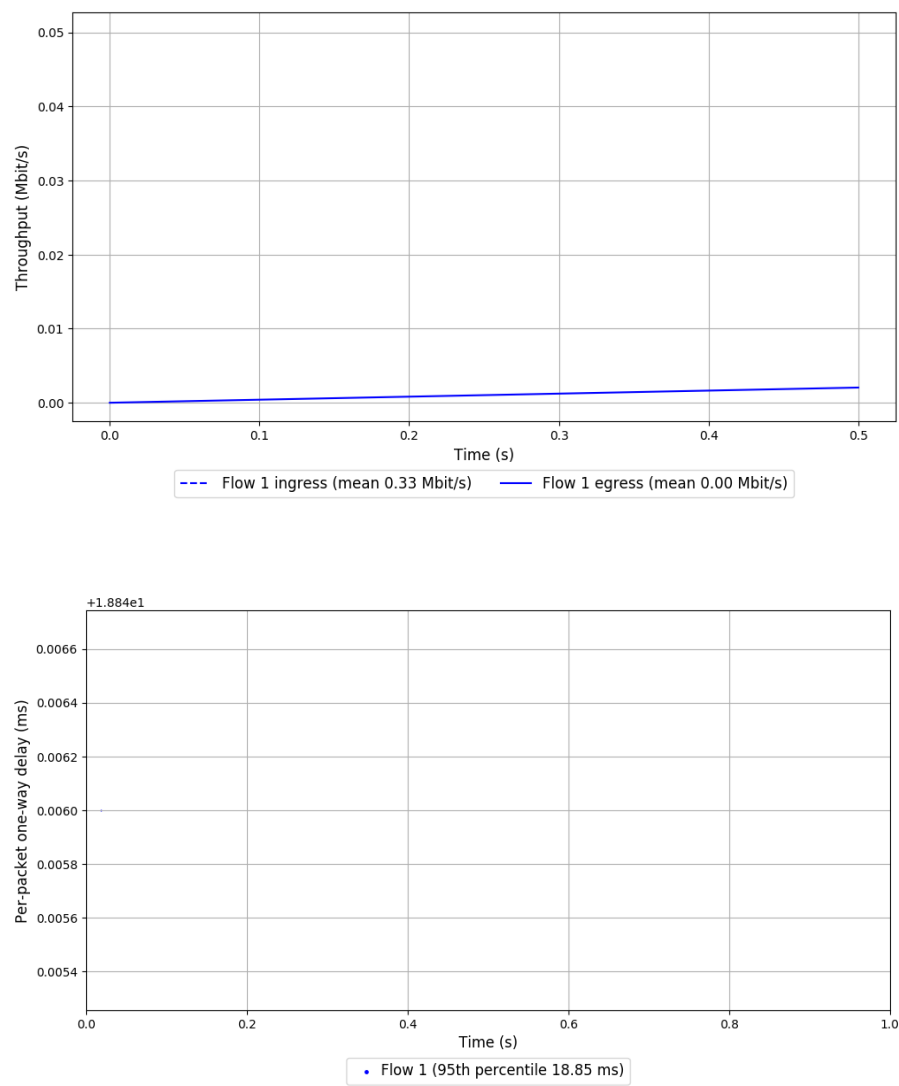
Start at: 2019-01-24 14:10:28

End at: 2019-01-24 14:10:58

Local clock offset: 2.647 ms

Remote clock offset: -2.91 ms

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

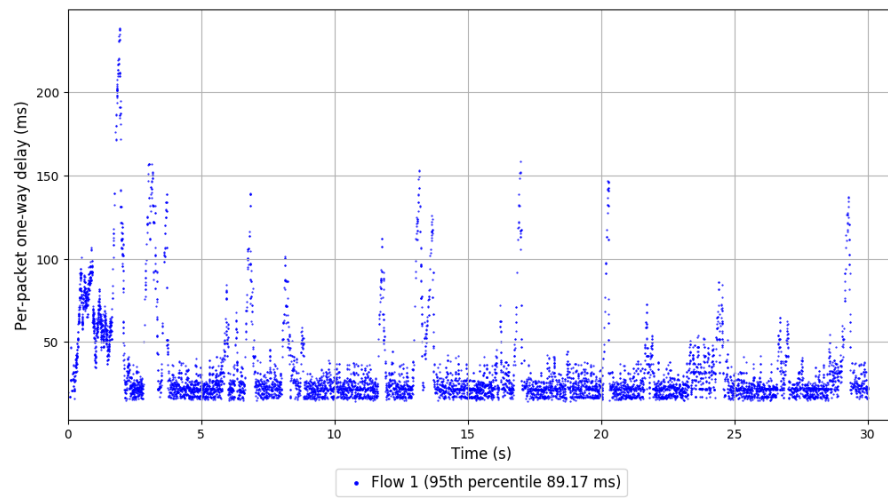
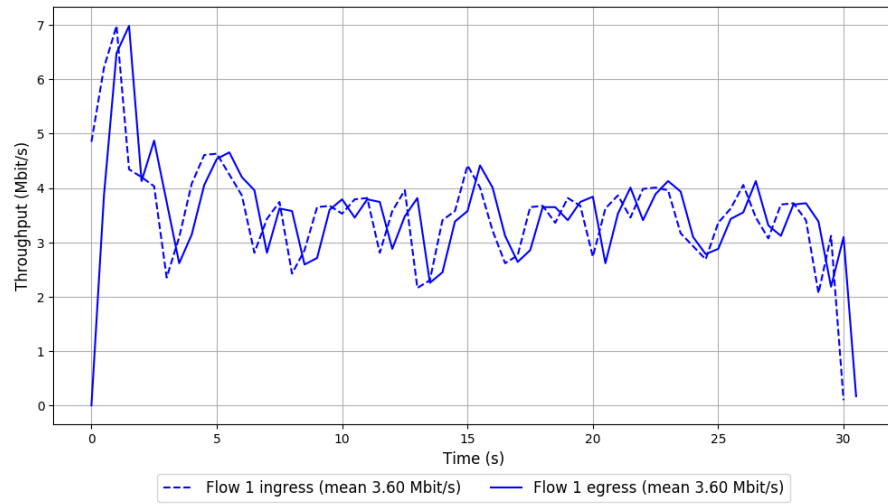


Run 1: Statistics of TCP Vegas

Start at: 2019-01-24 13:14:14
End at: 2019-01-24 13:14:44
Local clock offset: 1.108 ms
Remote clock offset: -6.346 ms

Below is generated by plot.py at 2019-01-24 14:11:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.60 Mbit/s
95th percentile per-packet one-way delay: 89.172 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 3.60 Mbit/s
95th percentile per-packet one-way delay: 89.172 ms
Loss rate: 0.06%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2019-01-24 13:37:58

End at: 2019-01-24 13:38:28

Local clock offset: 2.588 ms

Remote clock offset: -3.26 ms

Below is generated by plot.py at 2019-01-24 14:11:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.91 Mbit/s

95th percentile per-packet one-way delay: 40.997 ms

Loss rate: 0.03%

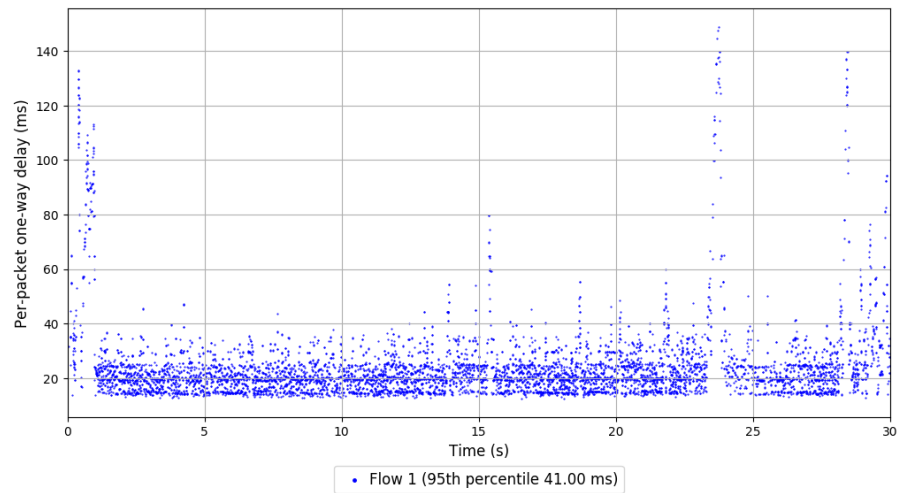
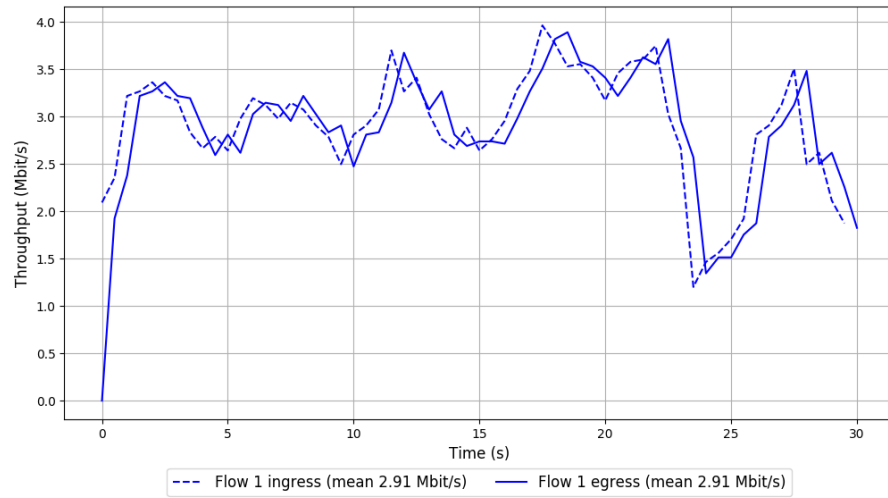
-- Flow 1:

Average throughput: 2.91 Mbit/s

95th percentile per-packet one-way delay: 40.997 ms

Loss rate: 0.03%

Run 2: Report of TCP Vegas — Data Link

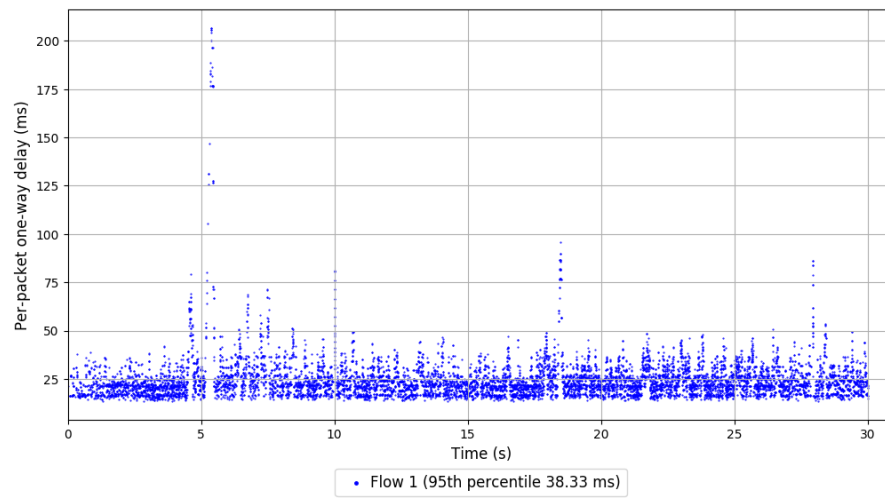
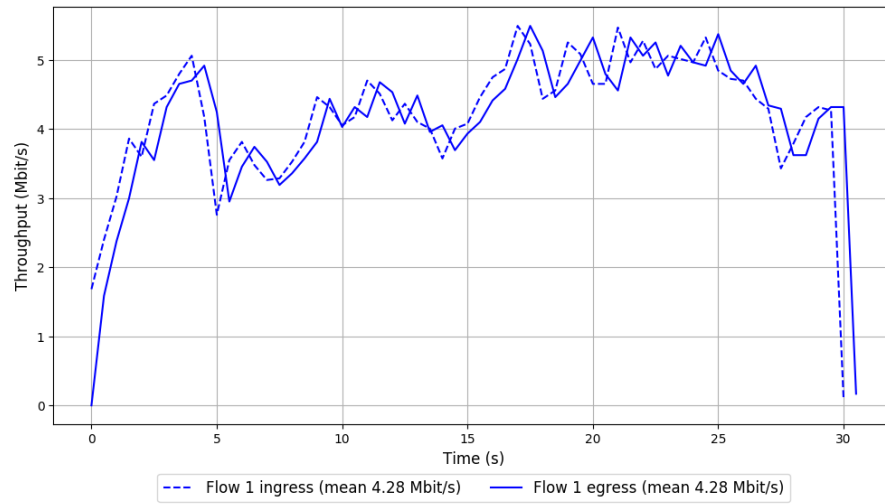


Run 3: Statistics of TCP Vegas

Start at: 2019-01-24 14:01:38
End at: 2019-01-24 14:02:08
Local clock offset: 4.762 ms
Remote clock offset: -2.676 ms

Below is generated by plot.py at 2019-01-24 14:11:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.28 Mbit/s
95th percentile per-packet one-way delay: 38.328 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 4.28 Mbit/s
95th percentile per-packet one-way delay: 38.328 ms
Loss rate: 0.04%

Run 3: Report of TCP Vegas — Data Link

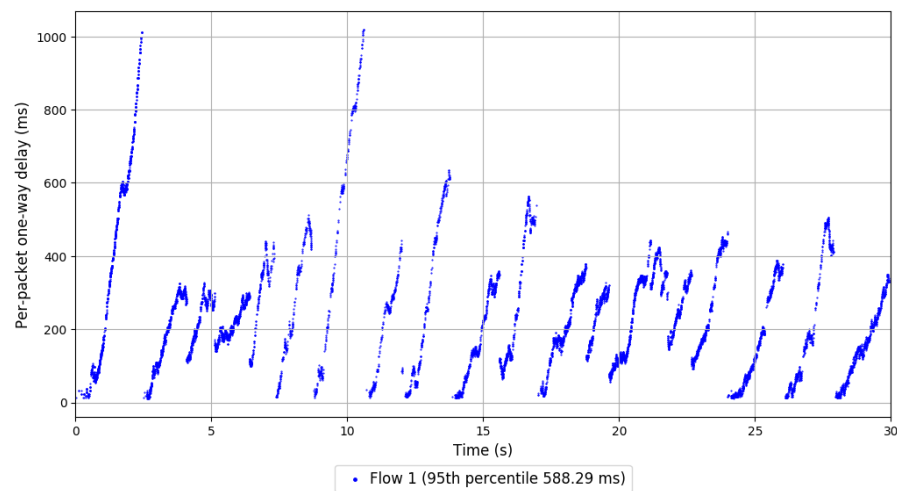
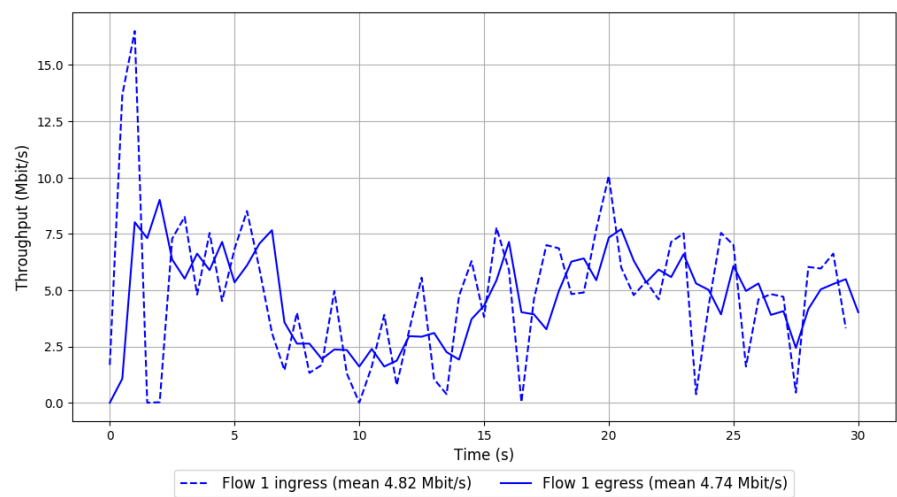


Run 1: Statistics of Verus

Start at: 2019-01-24 13:17:44
End at: 2019-01-24 13:18:14
Local clock offset: 2.623 ms
Remote clock offset: -6.203 ms

Below is generated by plot.py at 2019-01-24 14:11:52
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.74 Mbit/s
95th percentile per-packet one-way delay: 588.288 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 4.74 Mbit/s
95th percentile per-packet one-way delay: 588.288 ms
Loss rate: 1.13%

Run 1: Report of Verus — Data Link

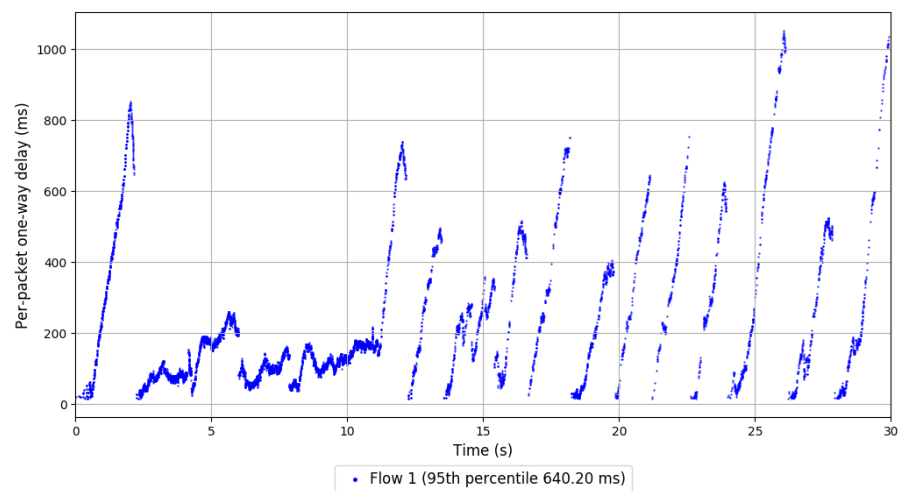
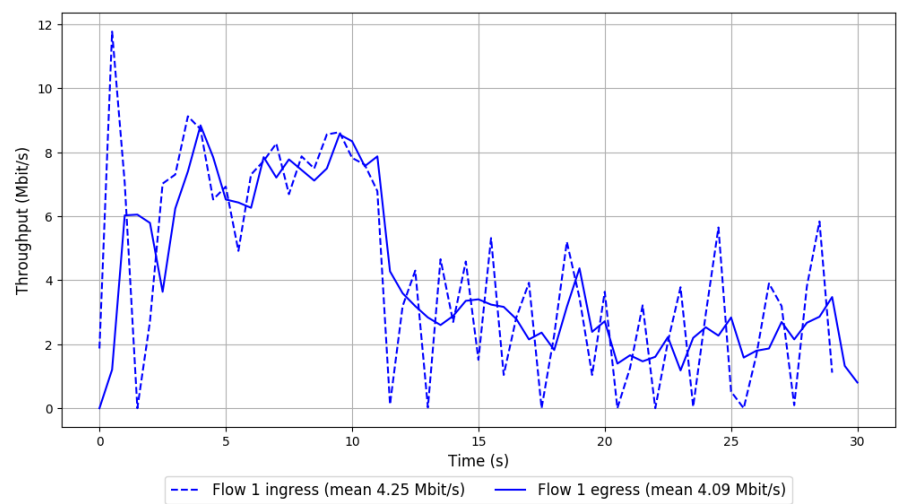


Run 2: Statistics of Verus

Start at: 2019-01-24 13:41:16
End at: 2019-01-24 13:41:46
Local clock offset: 2.842 ms
Remote clock offset: -3.247 ms

Below is generated by plot.py at 2019-01-24 14:11:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 640.197 ms
Loss rate: 1.31%
-- Flow 1:
Average throughput: 4.09 Mbit/s
95th percentile per-packet one-way delay: 640.197 ms
Loss rate: 1.31%

Run 2: Report of Verus — Data Link

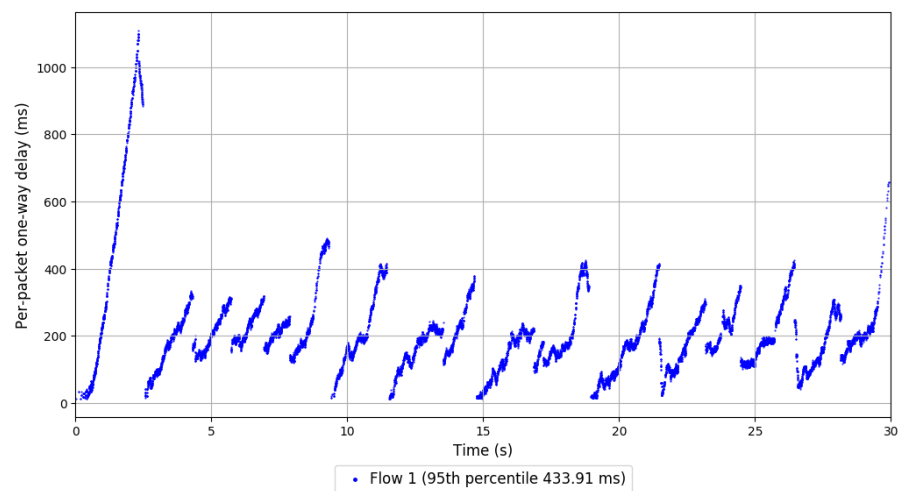
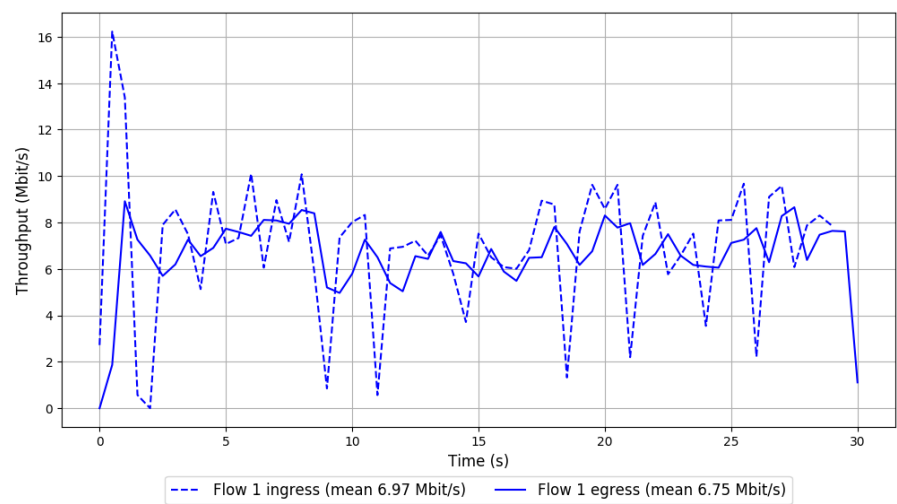


Run 3: Statistics of Verus

Start at: 2019-01-24 14:04:57
End at: 2019-01-24 14:05:27
Local clock offset: 4.145 ms
Remote clock offset: -4.121 ms

Below is generated by plot.py at 2019-01-24 14:11:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.75 Mbit/s
95th percentile per-packet one-way delay: 433.914 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 6.75 Mbit/s
95th percentile per-packet one-way delay: 433.914 ms
Loss rate: 1.44%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-01-24 13:18:52

End at: 2019-01-24 13:19:22

Local clock offset: 1.141 ms

Remote clock offset: -6.106 ms

Below is generated by plot.py at 2019-01-24 14:11:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 35.400 ms

Loss rate: 0.05%

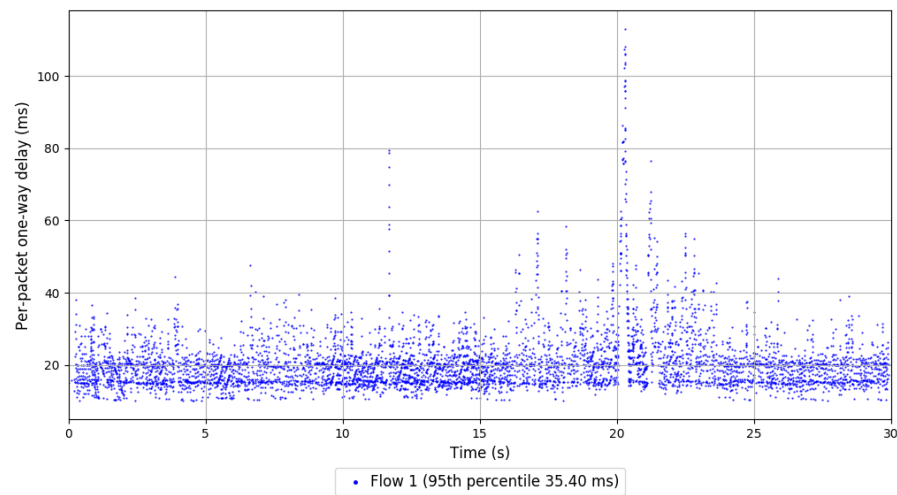
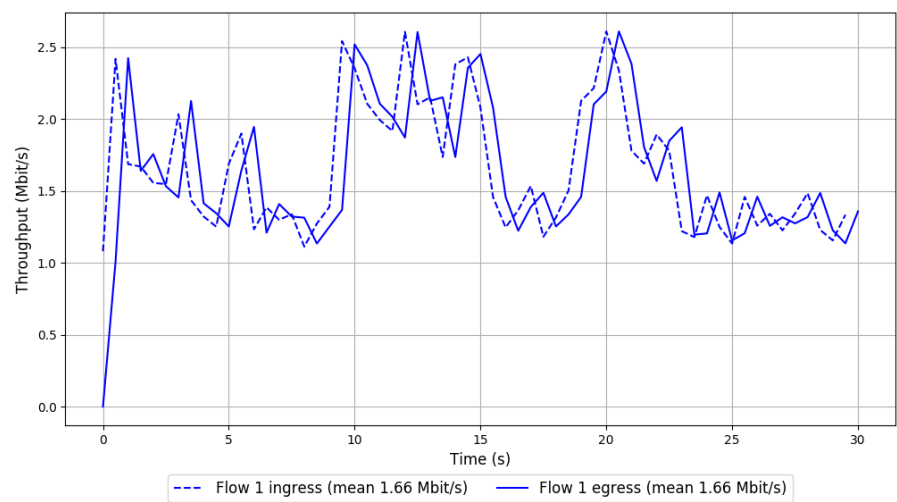
-- Flow 1:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 35.400 ms

Loss rate: 0.05%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-01-24 13:42:23

End at: 2019-01-24 13:42:53

Local clock offset: 4.808 ms

Remote clock offset: -3.801 ms

Below is generated by plot.py at 2019-01-24 14:11:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.46 Mbit/s

95th percentile per-packet one-way delay: 390.723 ms

Loss rate: 0.14%

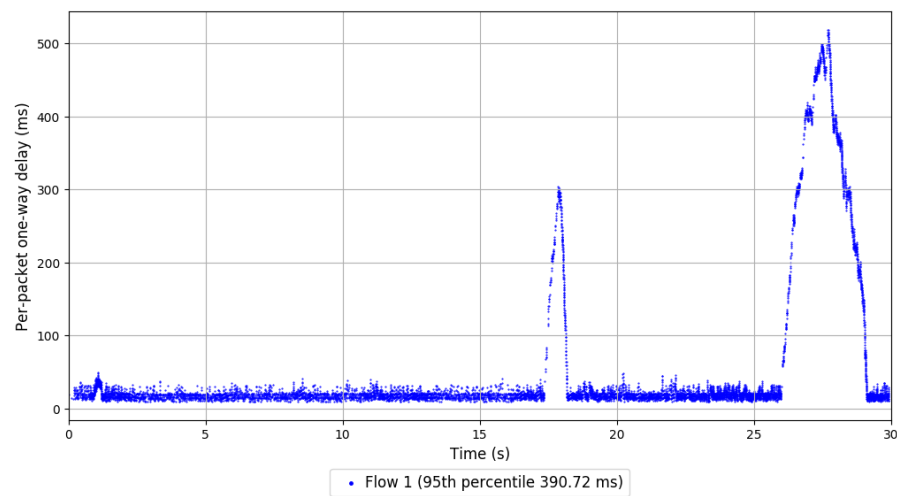
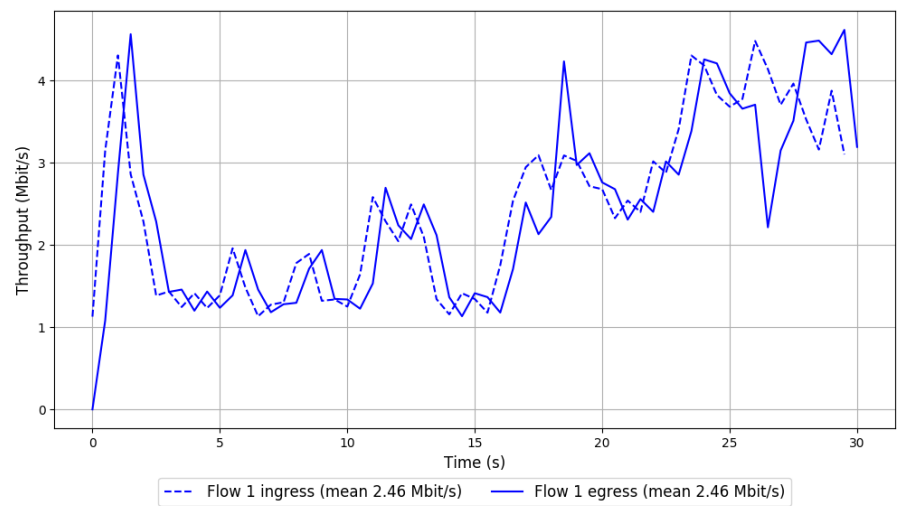
-- Flow 1:

Average throughput: 2.46 Mbit/s

95th percentile per-packet one-way delay: 390.723 ms

Loss rate: 0.14%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-01-24 14:06:04

End at: 2019-01-24 14:06:34

Local clock offset: 4.008 ms

Remote clock offset: -2.444 ms

Below is generated by plot.py at 2019-01-24 14:11:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.53 Mbit/s

95th percentile per-packet one-way delay: 37.637 ms

Loss rate: 0.05%

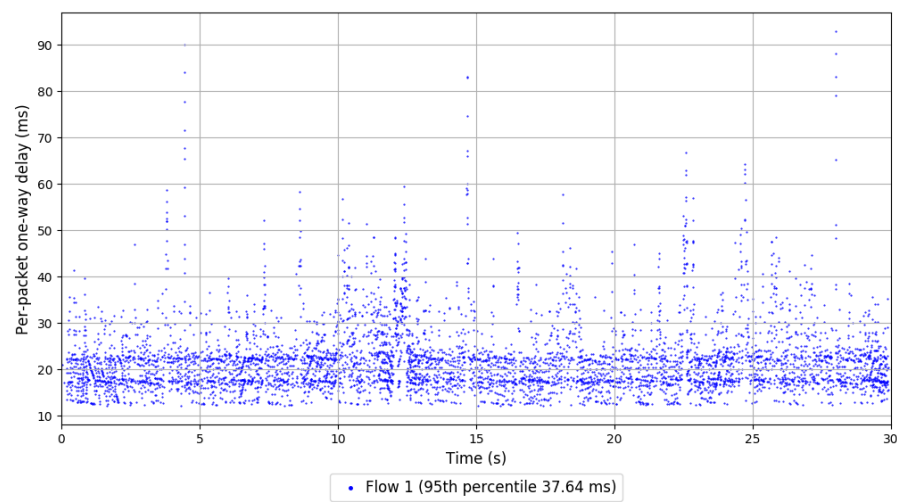
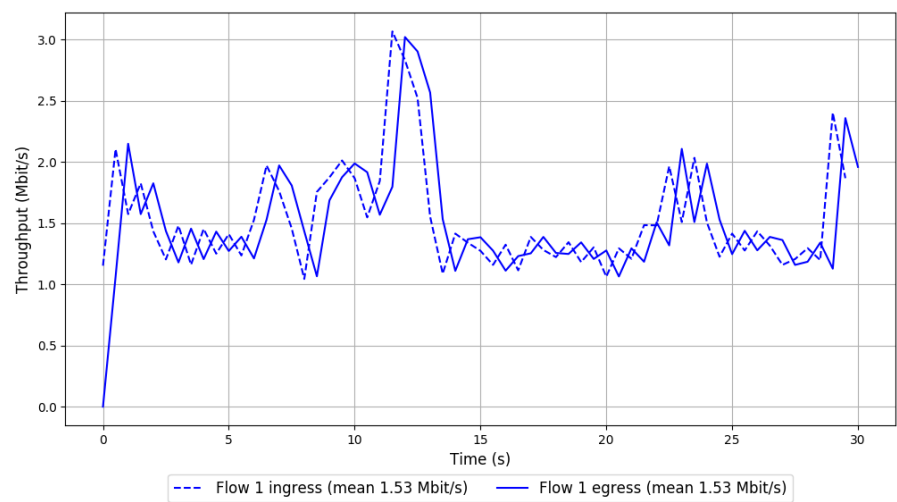
-- Flow 1:

Average throughput: 1.53 Mbit/s

95th percentile per-packet one-way delay: 37.637 ms

Loss rate: 0.05%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-01-24 13:21:07

End at: 2019-01-24 13:21:37

Local clock offset: 1.305 ms

Remote clock offset: -6.094 ms

Below is generated by plot.py at 2019-01-24 14:11:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.40 Mbit/s

95th percentile per-packet one-way delay: 76.561 ms

Loss rate: 0.07%

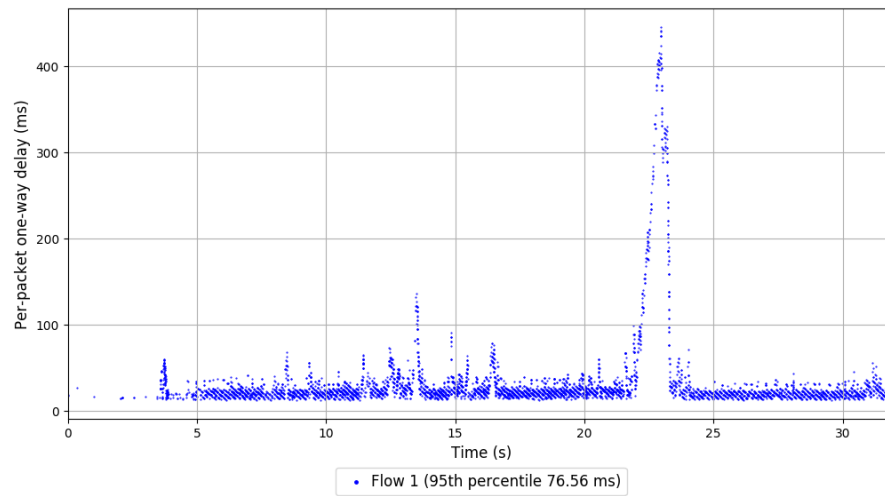
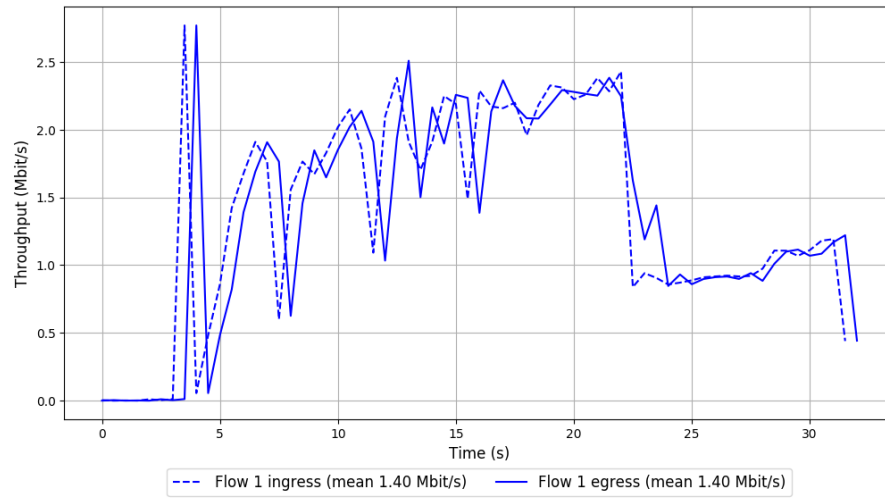
-- Flow 1:

Average throughput: 1.40 Mbit/s

95th percentile per-packet one-way delay: 76.561 ms

Loss rate: 0.07%

Run 1: Report of WebRTC media — Data Link

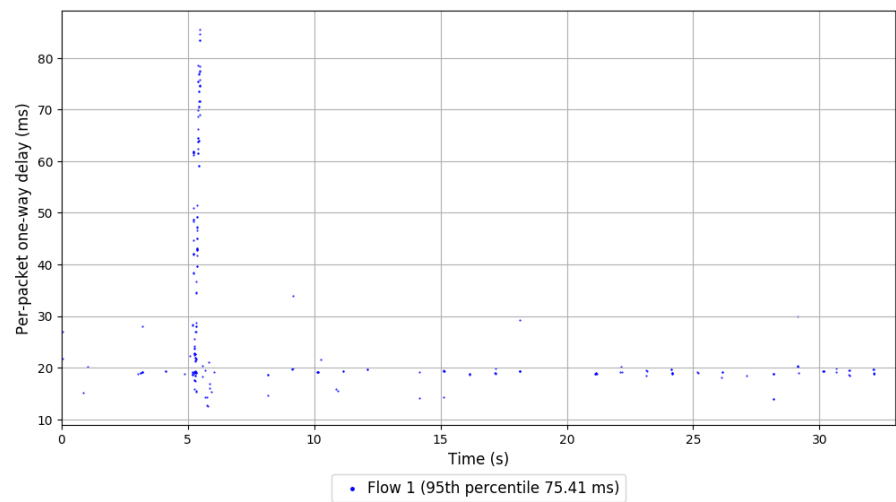
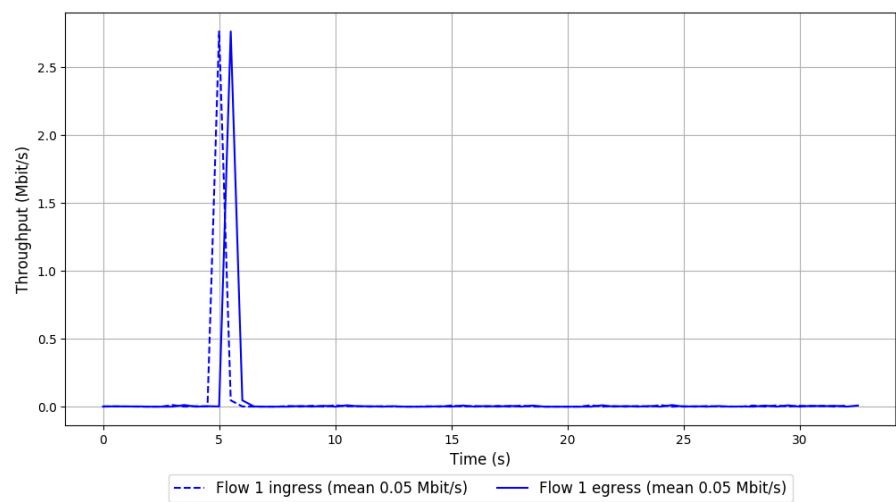


Run 2: Statistics of WebRTC media

Start at: 2019-01-24 13:44:39
End at: 2019-01-24 13:45:09
Local clock offset: 3.364 ms
Remote clock offset: -4.098 ms

Below is generated by plot.py at 2019-01-24 14:11:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 75.406 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 75.406 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-24 14:08:17

End at: 2019-01-24 14:08:47

Local clock offset: 3.27 ms

Remote clock offset: -3.22 ms

Below is generated by plot.py at 2019-01-24 14:11:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 76.468 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 76.468 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

