

Pantheon Report

Generated at 2019-01-17 06:29:59 (UTC).

Data path: AWS California 1 on *ens5 (local)* → Stanford 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 `time.stanford.edu` and have been applied to correct the timestamps in logs.

System info:

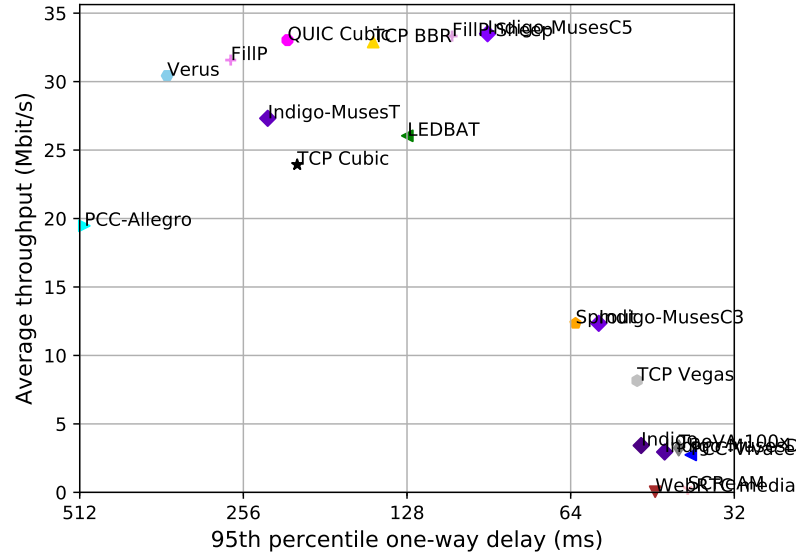
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

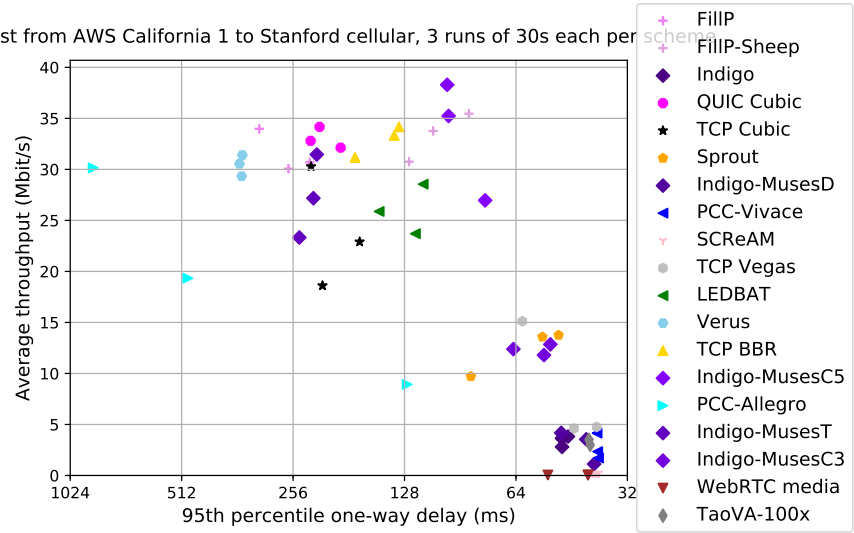
```
branch: muses @ c80a283586bf7b0cc1fe08c69c8f60d56498f81c
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ c3eee875824760ec5b2fd207fefe166e1afe2170
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 California 1 to Stanford cellular, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS California 1 to Stanford cellular, 3 runs of 30s each per



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	32.89	147.71	0.19
Copa	0	N/A	N/A	N/A
TCP Cubic	3	23.93	203.80	0.30
FillP	3	31.57	270.07	0.71
FillP-Sheep	3	33.33	105.77	0.25
Indigo	3	3.42	47.48	0.10
Indigo-MusesC3	3	12.35	56.82	0.08
Indigo-MusesC5	3	33.50	91.00	0.32
Indigo-MusesD	3	2.95	42.99	0.17
Indigo-MusesT	3	27.32	230.92	0.72
LEDBAT	3	26.04	127.84	0.33
PCC-Allegro	3	19.47	502.04	2.70
PCC-Expr	0	N/A	N/A	N/A
QUIC Cubic	3	33.03	212.36	0.60
SCReAM	3	0.21	38.98	0.13
Sprout	3	12.35	62.69	0.15
TaoVA-100x	2	3.25	40.50	31.93
TCP Vegas	3	8.16	48.30	0.05
Verus	3	30.43	353.60	1.21
PCC-Vivace	3	2.74	38.49	0.11
WebRTC media	3	0.05	44.74	0.00

Run 1: Statistics of TCP BBR

Start at: 2019-01-17 05:16:14

End at: 2019-01-17 05:16:44

Local clock offset: -3.856 ms

Remote clock offset: 2.618 ms

Below is generated by plot.py at 2019-01-17 06:28:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 31.16 Mbit/s

95th percentile per-packet one-way delay: 174.184 ms

Loss rate: 0.01%

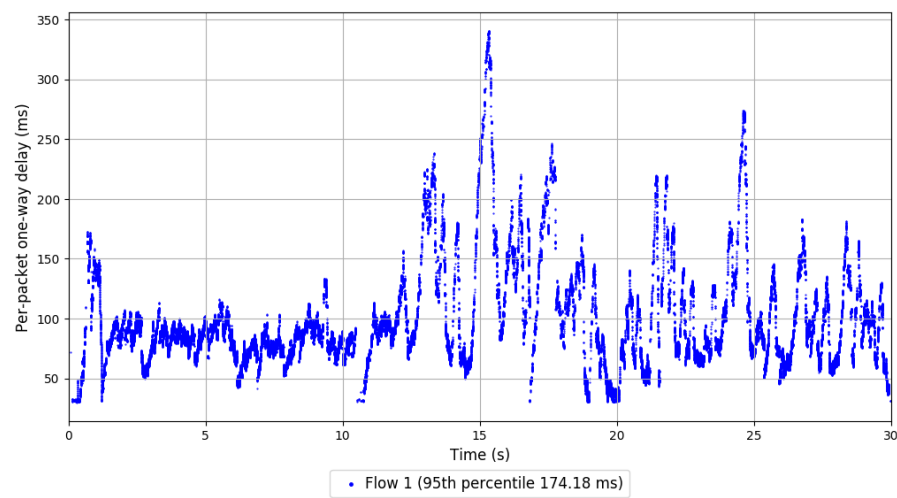
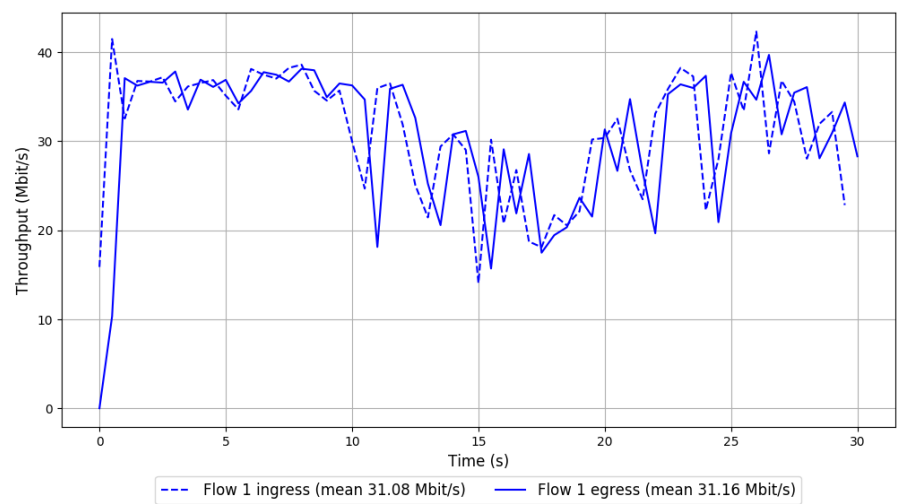
-- Flow 1:

Average throughput: 31.16 Mbit/s

95th percentile per-packet one-way delay: 174.184 ms

Loss rate: 0.01%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-01-17 05:41:56

End at: 2019-01-17 05:42:26

Local clock offset: 3.452 ms

Remote clock offset: -0.504 ms

Below is generated by plot.py at 2019-01-17 06:28:24

Datalink statistics

-- Total of 1 flow:

Average throughput: 33.33 Mbit/s

95th percentile per-packet one-way delay: 136.485 ms

Loss rate: 0.29%

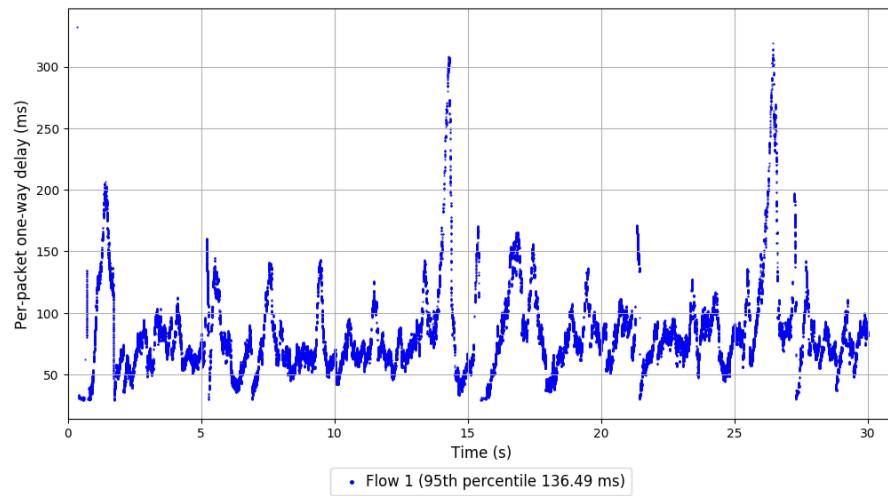
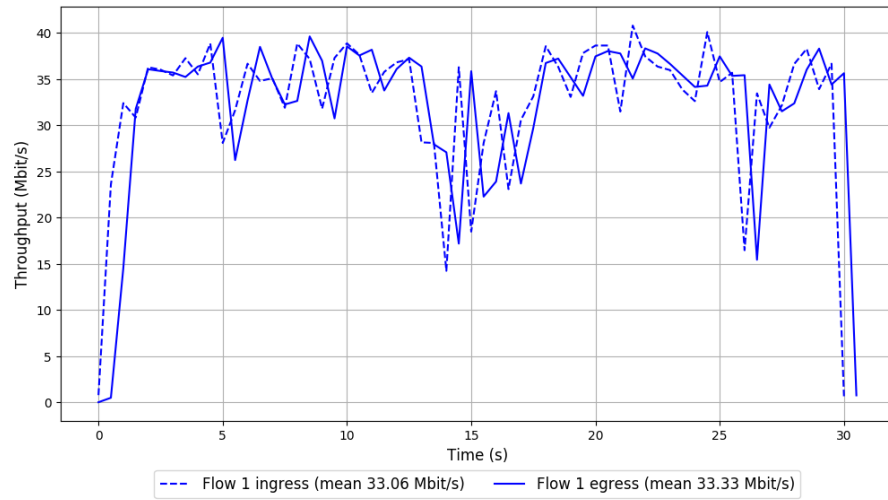
-- Flow 1:

Average throughput: 33.33 Mbit/s

95th percentile per-packet one-way delay: 136.485 ms

Loss rate: 0.29%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-01-17 06:07:38

End at: 2019-01-17 06:08:08

Local clock offset: 3.557 ms

Remote clock offset: -1.43 ms

Below is generated by plot.py at 2019-01-17 06:28:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 34.17 Mbit/s

95th percentile per-packet one-way delay: 132.458 ms

Loss rate: 0.26%

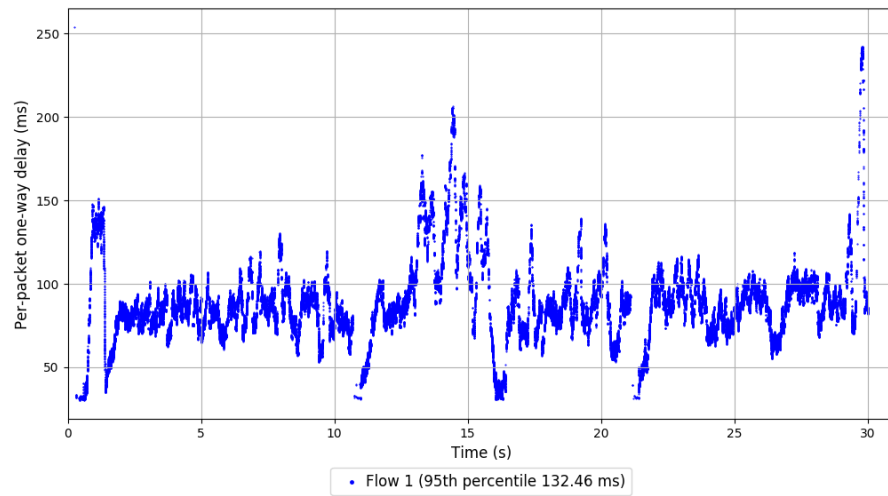
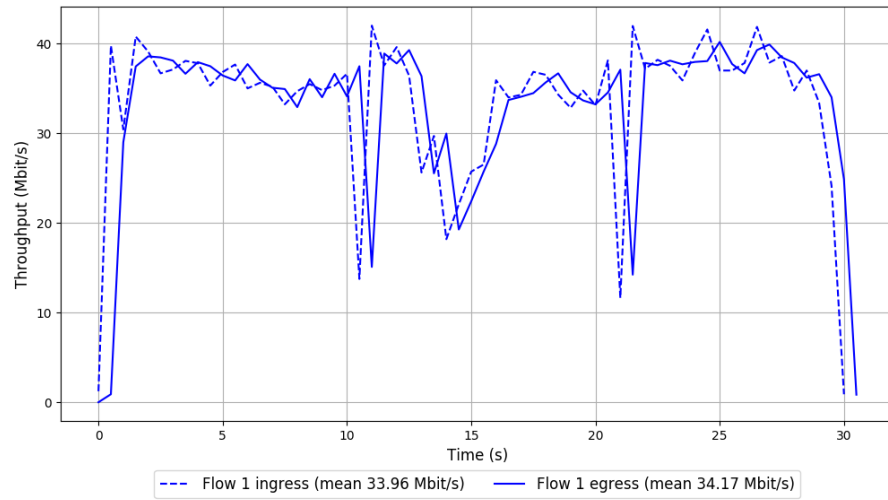
-- Flow 1:

Average throughput: 34.17 Mbit/s

95th percentile per-packet one-way delay: 132.458 ms

Loss rate: 0.26%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

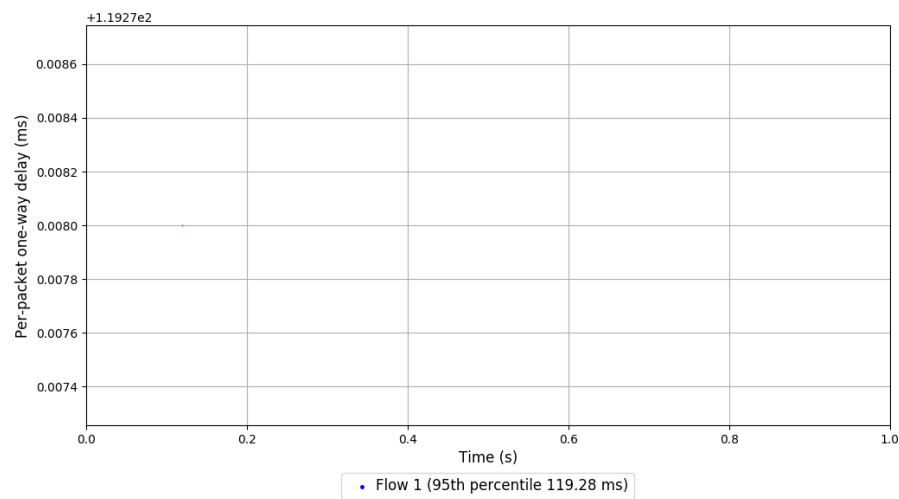
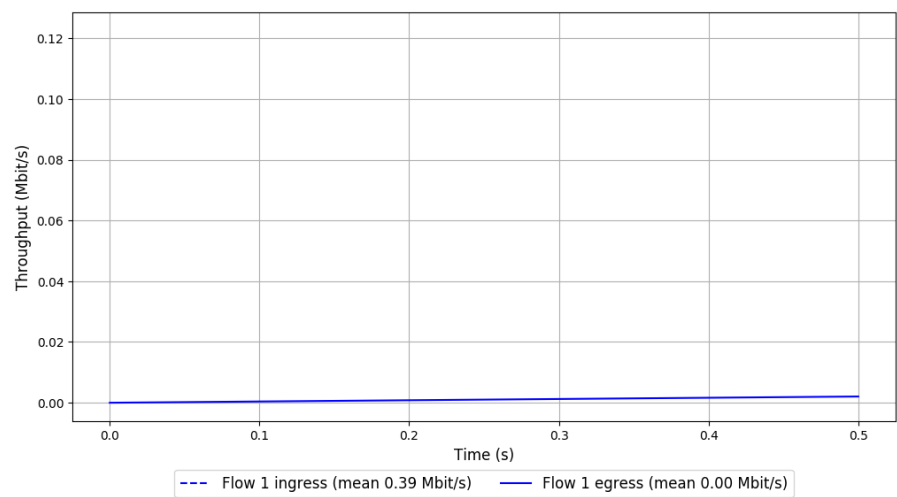
Start at: 2019-01-17 05:30:56

End at: 2019-01-17 05:31:26

Local clock offset: 1.438 ms

Remote clock offset: 1.831 ms

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

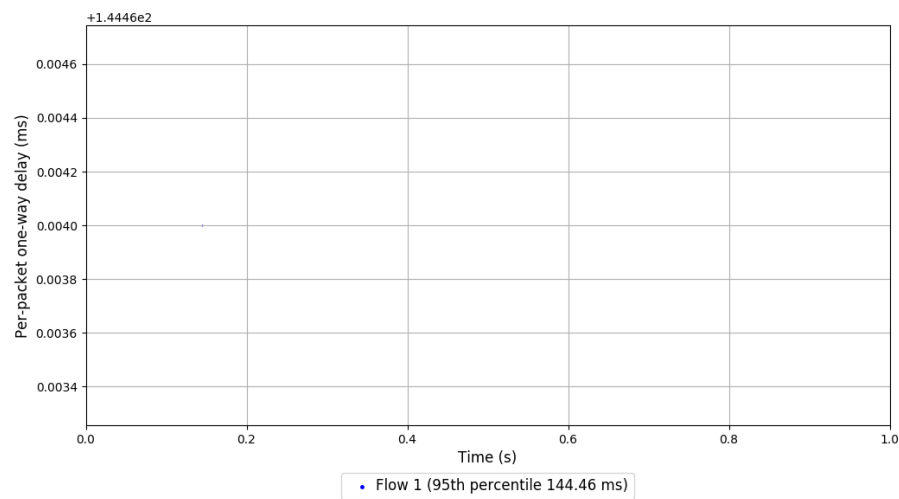
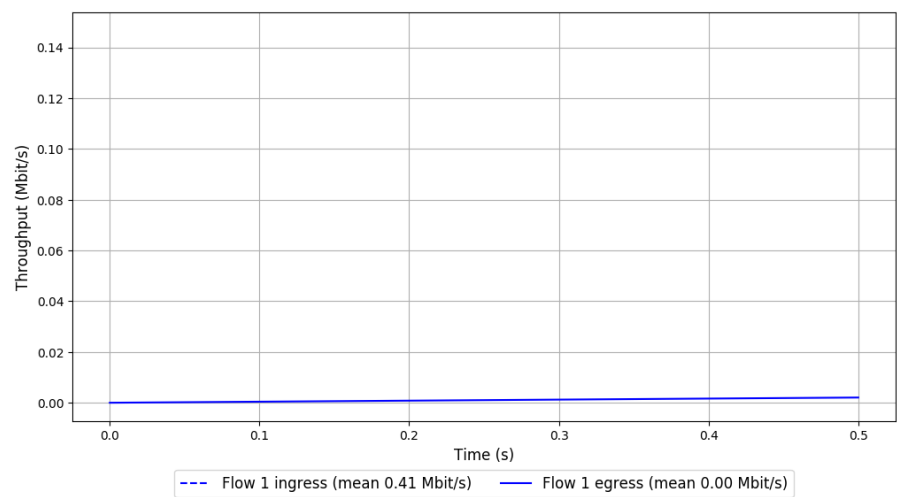
Start at: 2019-01-17 05:56:38

End at: 2019-01-17 05:57:08

Local clock offset: 3.68 ms

Remote clock offset: -1.912 ms

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

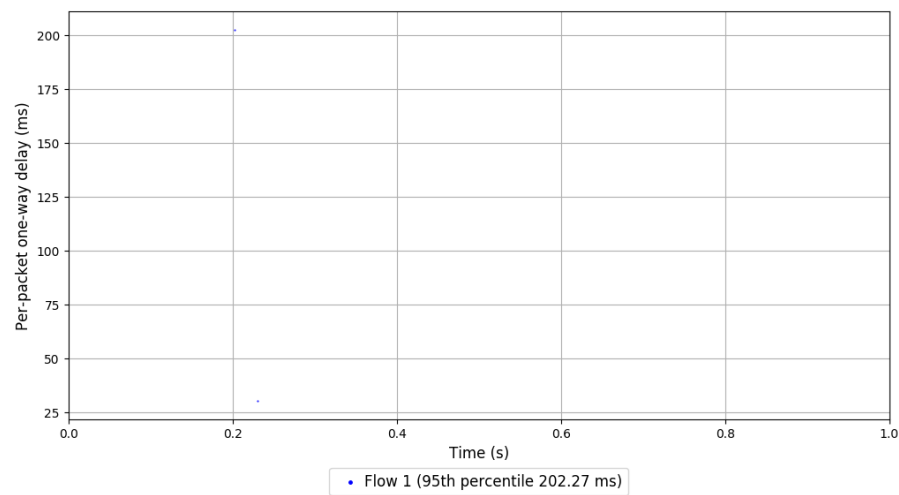
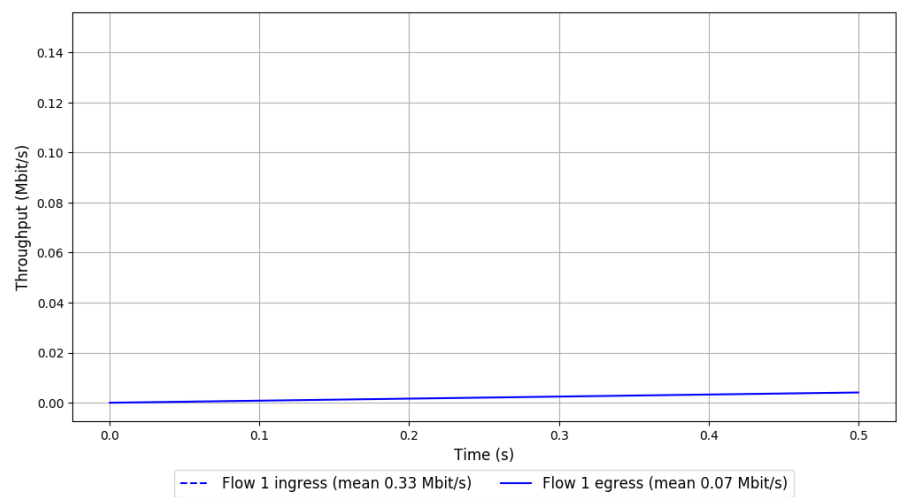
Start at: 2019-01-17 06:22:20

End at: 2019-01-17 06:22:50

Local clock offset: 2.923 ms

Remote clock offset: -1.101 ms

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-01-17 05:28:30

End at: 2019-01-17 05:29:00

Local clock offset: 0.66 ms

Remote clock offset: 2.756 ms

Below is generated by plot.py at 2019-01-17 06:28:25

Datalink statistics

-- Total of 1 flow:

Average throughput: 18.61 Mbit/s

95th percentile per-packet one-way delay: 213.220 ms

Loss rate: 0.35%

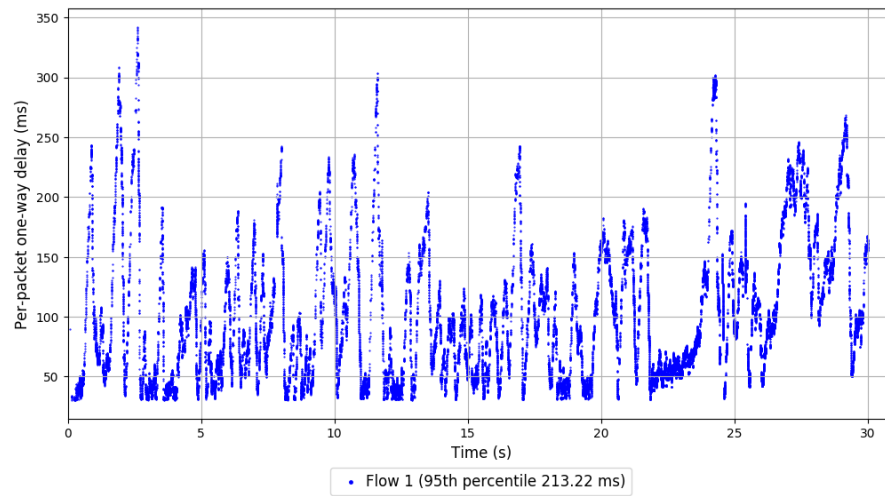
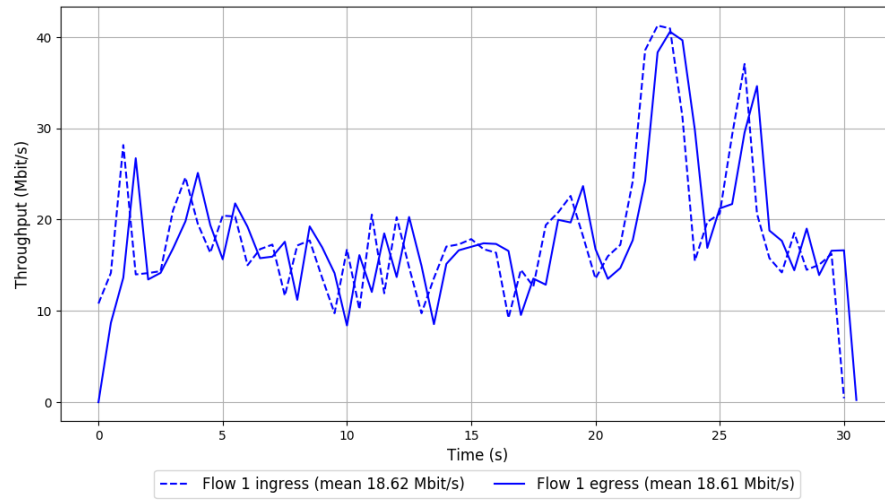
-- Flow 1:

Average throughput: 18.61 Mbit/s

95th percentile per-packet one-way delay: 213.220 ms

Loss rate: 0.35%

Run 1: Report of TCP Cubic — Data Link

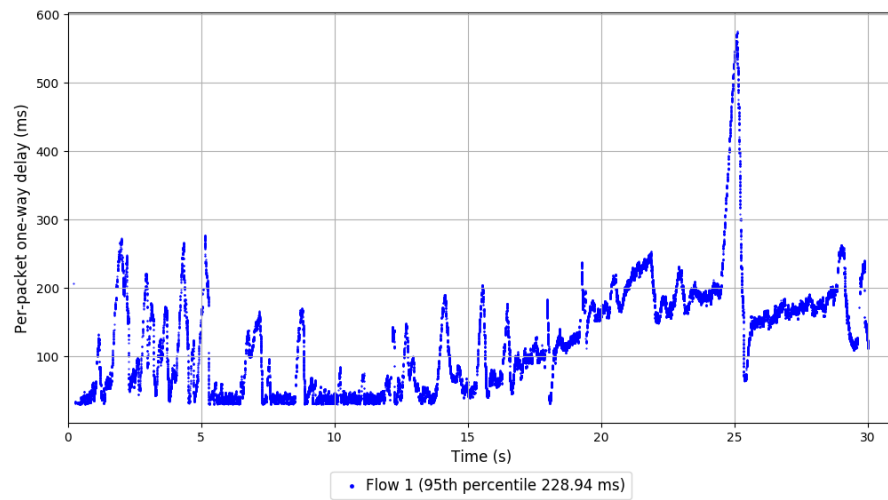
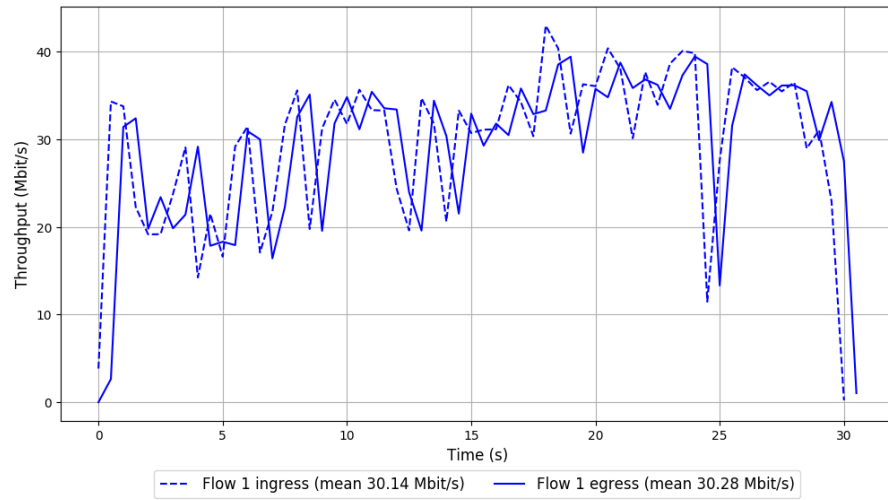


Run 2: Statistics of TCP Cubic

Start at: 2019-01-17 05:54:11
End at: 2019-01-17 05:54:41
Local clock offset: 3.804 ms
Remote clock offset: -1.765 ms

Below is generated by plot.py at 2019-01-17 06:28:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 30.28 Mbit/s
95th percentile per-packet one-way delay: 228.935 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 30.28 Mbit/s
95th percentile per-packet one-way delay: 228.935 ms
Loss rate: 0.22%

Run 2: Report of TCP Cubic — Data Link

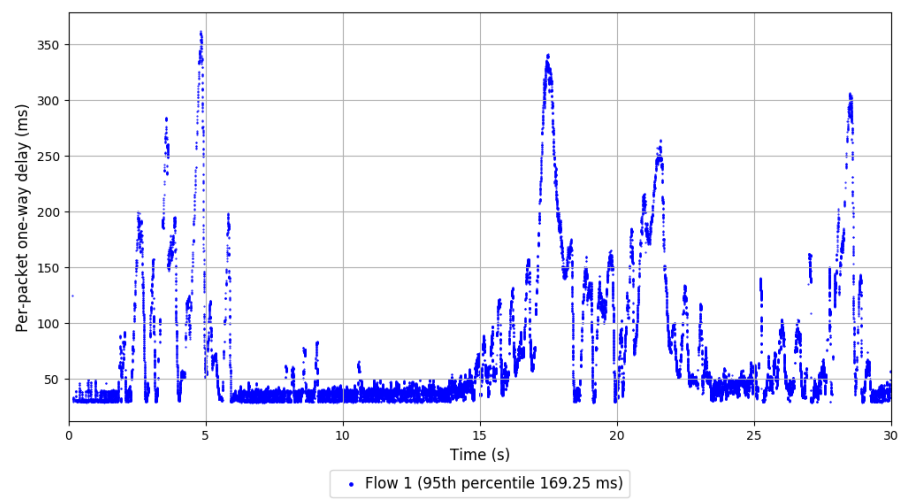
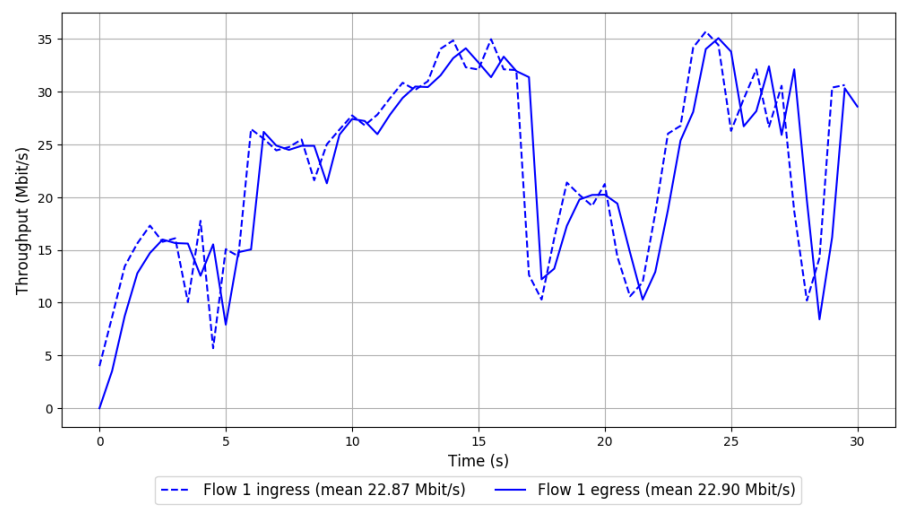


Run 3: Statistics of TCP Cubic

Start at: 2019-01-17 06:19:53
End at: 2019-01-17 06:20:23
Local clock offset: 3.808 ms
Remote clock offset: -1.007 ms

Below is generated by plot.py at 2019-01-17 06:28:25
Datalink statistics
-- Total of 1 flow:
Average throughput: 22.90 Mbit/s
95th percentile per-packet one-way delay: 169.248 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 22.90 Mbit/s
95th percentile per-packet one-way delay: 169.248 ms
Loss rate: 0.34%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-01-17 05:24:49

End at: 2019-01-17 05:25:19

Local clock offset: -1.021 ms

Remote clock offset: 3.006 ms

Below is generated by plot.py at 2019-01-17 06:28:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 33.97 Mbit/s

95th percentile per-packet one-way delay: 315.908 ms

Loss rate: 0.84%

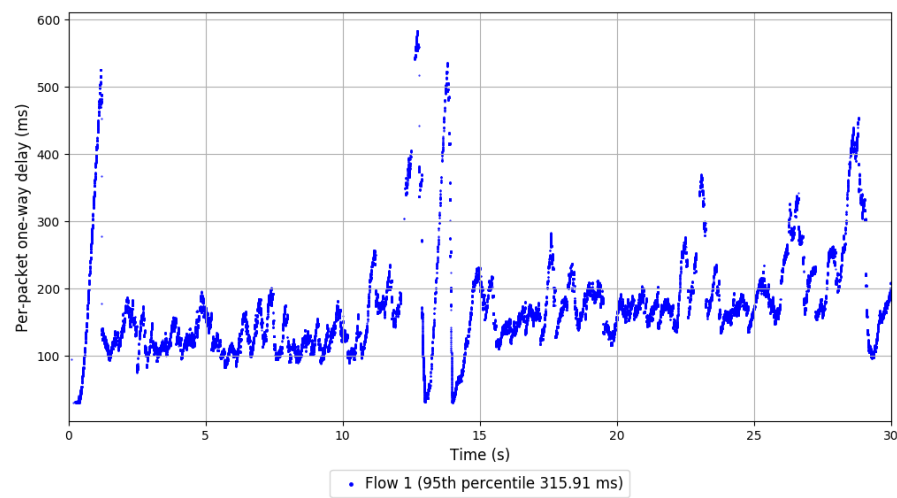
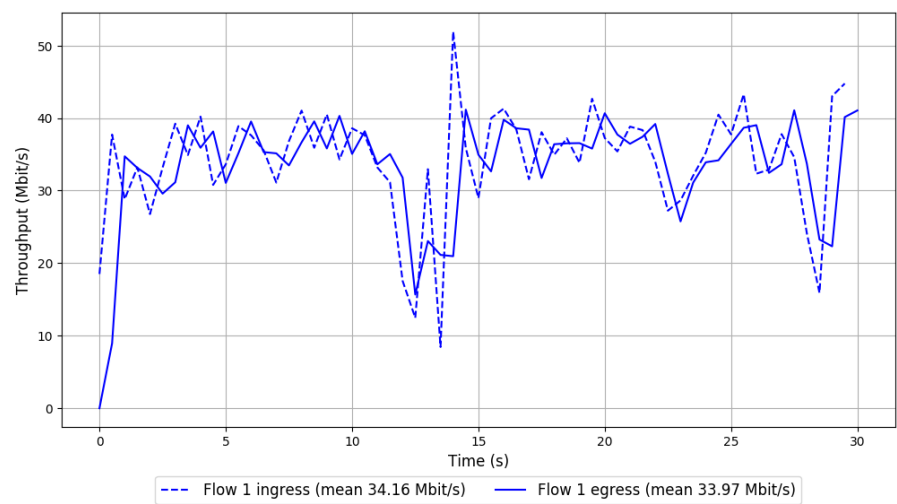
-- Flow 1:

Average throughput: 33.97 Mbit/s

95th percentile per-packet one-way delay: 315.908 ms

Loss rate: 0.84%

Run 1: Report of FillP — Data Link

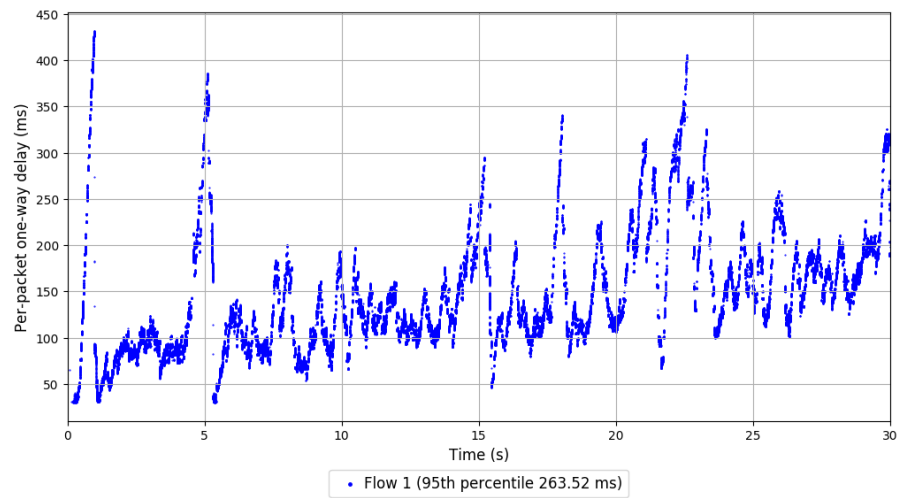
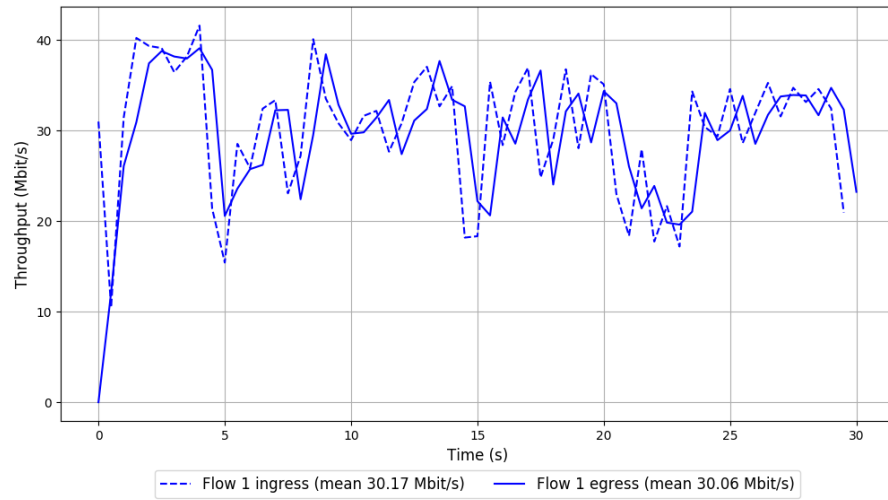


Run 2: Statistics of FillP

Start at: 2019-01-17 05:50:31
End at: 2019-01-17 05:51:01
Local clock offset: 4.153 ms
Remote clock offset: -1.406 ms

Below is generated by plot.py at 2019-01-17 06:28:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 30.06 Mbit/s
95th percentile per-packet one-way delay: 263.517 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 30.06 Mbit/s
95th percentile per-packet one-way delay: 263.517 ms
Loss rate: 0.58%

Run 2: Report of FillP — Data Link

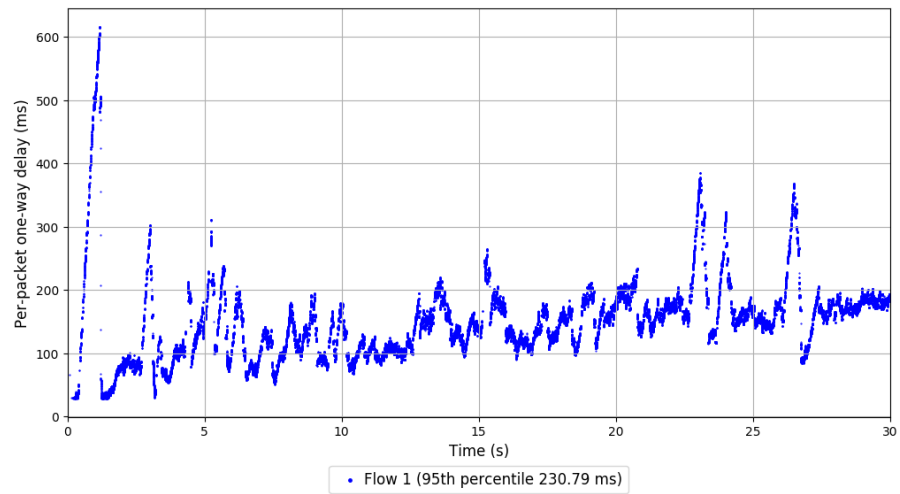
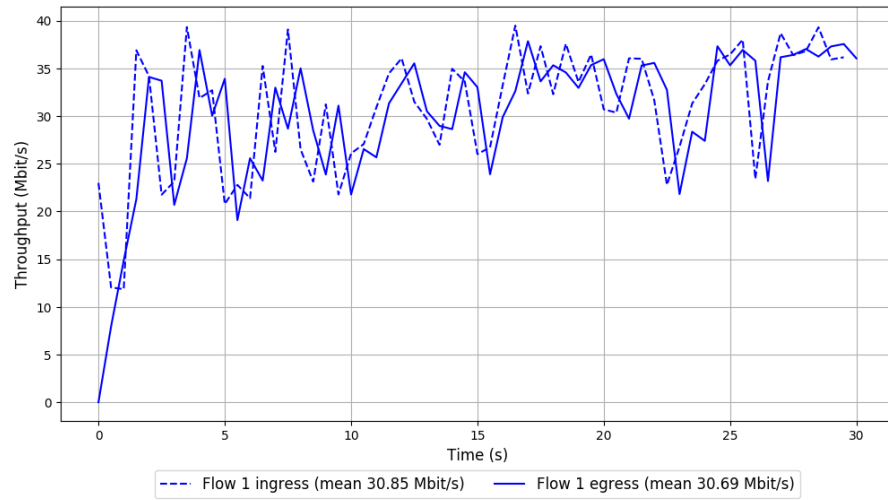


Run 3: Statistics of FillP

Start at: 2019-01-17 06:16:13
End at: 2019-01-17 06:16:43
Local clock offset: 3.703 ms
Remote clock offset: -1.037 ms

Below is generated by plot.py at 2019-01-17 06:28:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 30.69 Mbit/s
95th percentile per-packet one-way delay: 230.789 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 30.69 Mbit/s
95th percentile per-packet one-way delay: 230.789 ms
Loss rate: 0.72%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-17 05:12:33

End at: 2019-01-17 05:13:03

Local clock offset: -3.596 ms

Remote clock offset: 2.469 ms

Below is generated by plot.py at 2019-01-17 06:28:51

Datalink statistics

-- Total of 1 flow:

Average throughput: 33.76 Mbit/s

95th percentile per-packet one-way delay: 107.124 ms

Loss rate: 0.26%

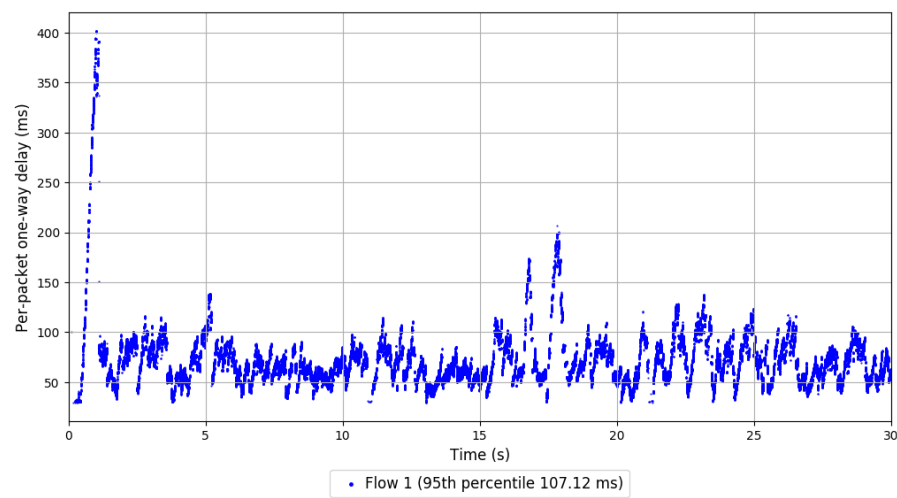
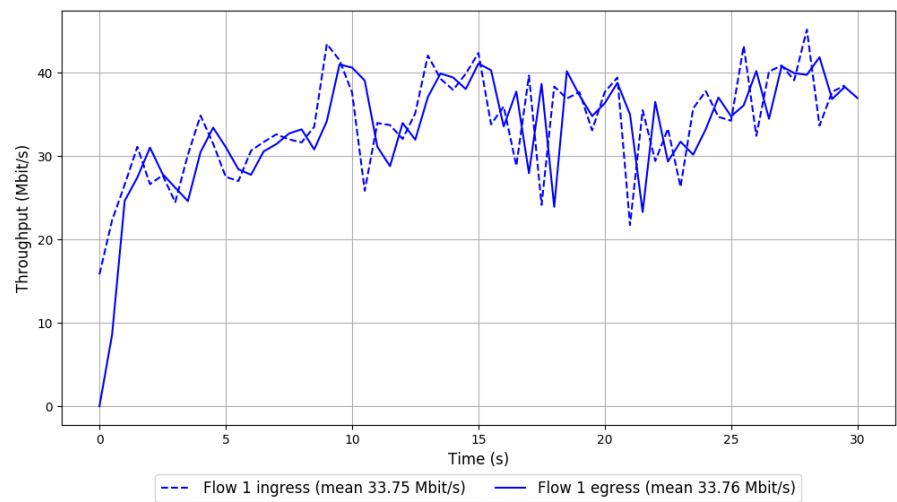
-- Flow 1:

Average throughput: 33.76 Mbit/s

95th percentile per-packet one-way delay: 107.124 ms

Loss rate: 0.26%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-01-17 05:38:15

End at: 2019-01-17 05:38:45

Local clock offset: 2.977 ms

Remote clock offset: 0.003 ms

Below is generated by plot.py at 2019-01-17 06:28:52

Datalink statistics

-- Total of 1 flow:

Average throughput: 30.76 Mbit/s

95th percentile per-packet one-way delay: 124.437 ms

Loss rate: 0.30%

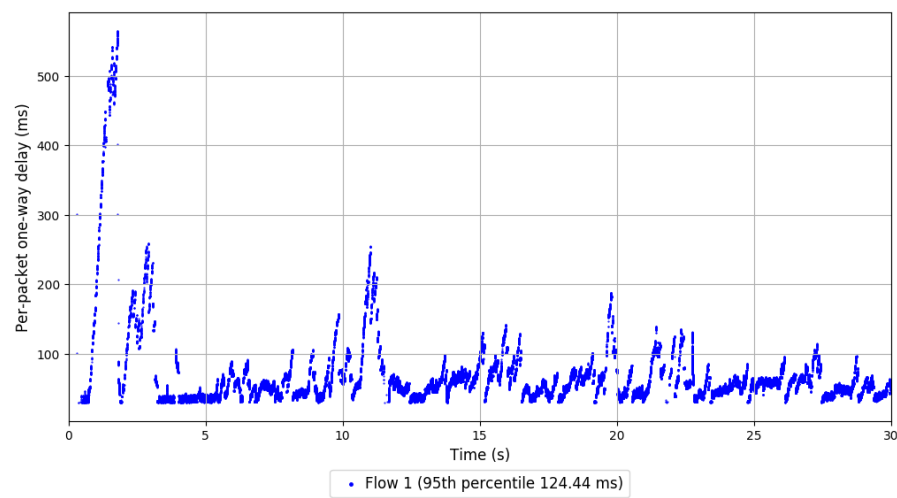
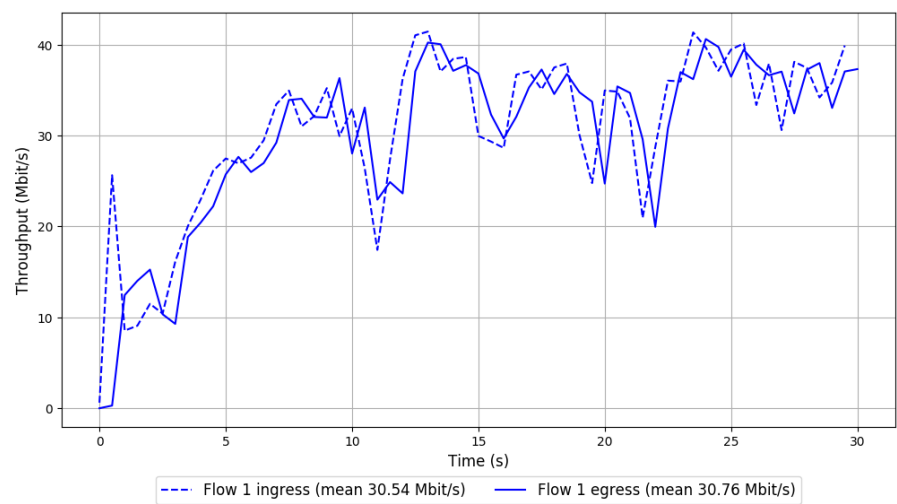
-- Flow 1:

Average throughput: 30.76 Mbit/s

95th percentile per-packet one-way delay: 124.437 ms

Loss rate: 0.30%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-01-17 06:03:57

End at: 2019-01-17 06:04:27

Local clock offset: 3.533 ms

Remote clock offset: -2.01 ms

Below is generated by plot.py at 2019-01-17 06:28:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 35.46 Mbit/s

95th percentile per-packet one-way delay: 85.740 ms

Loss rate: 0.19%

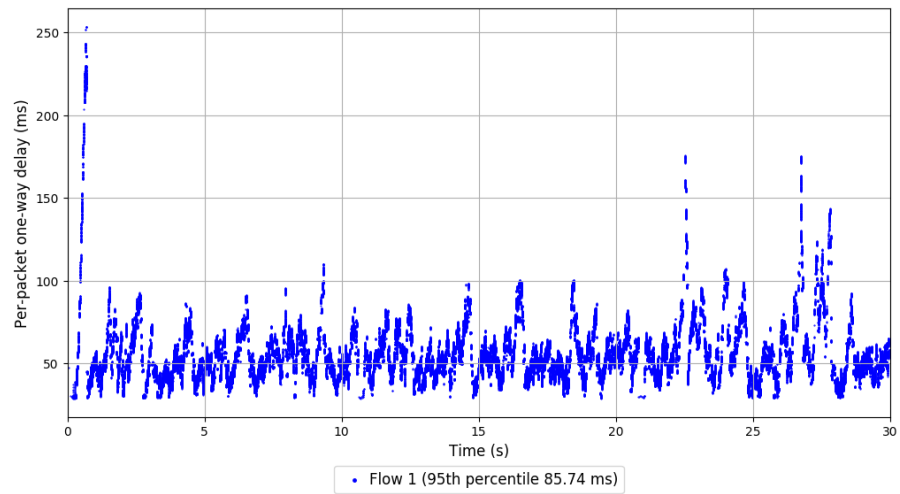
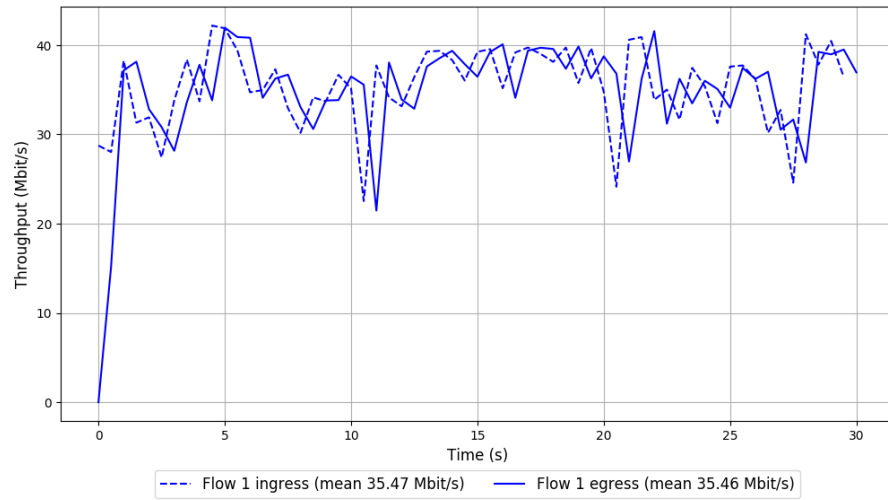
-- Flow 1:

Average throughput: 35.46 Mbit/s

95th percentile per-packet one-way delay: 85.740 ms

Loss rate: 0.19%

Run 3: Report of FillP-Sheep — Data Link

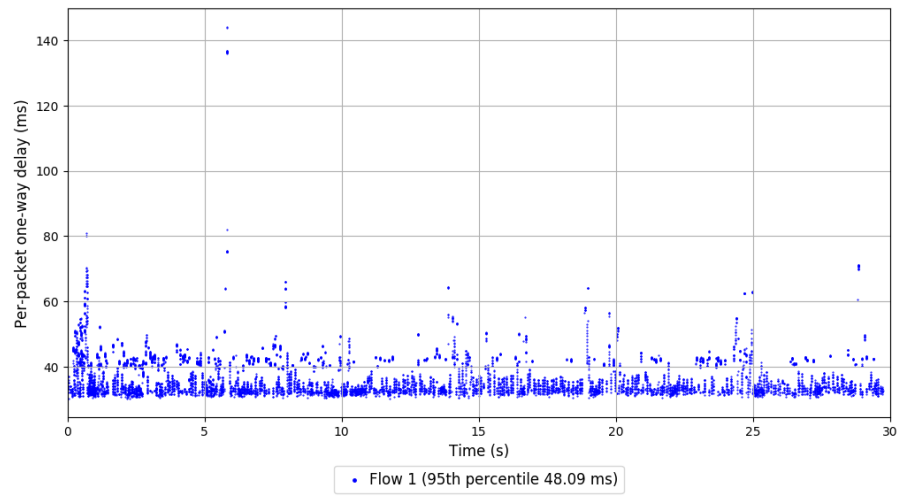
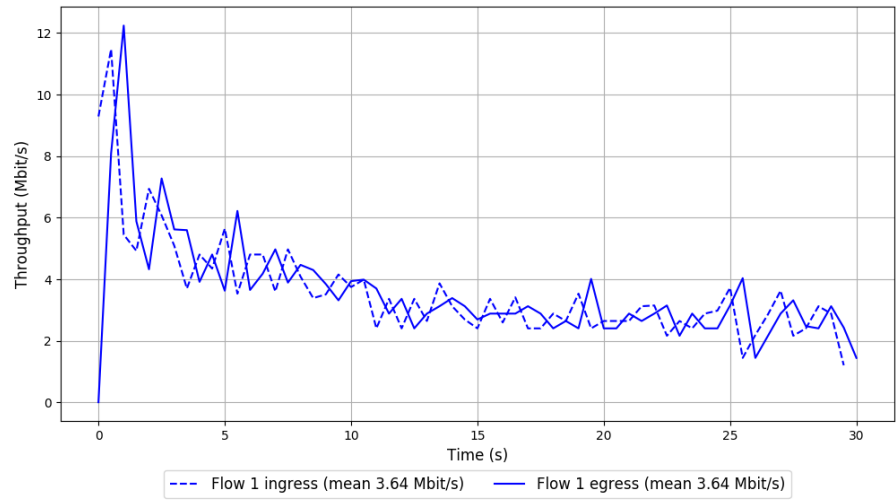


```
Run 1: Statistics of Indigo

Start at: 2019-01-17 05:26:03
End at: 2019-01-17 05:26:33
Local clock offset: -0.36 ms
Remote clock offset: 3.062 ms

# Below is generated by plot.py at 2019-01-17 06:28:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.64 Mbit/s
95th percentile per-packet one-way delay: 48.085 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 3.64 Mbit/s
95th percentile per-packet one-way delay: 48.085 ms
Loss rate: 0.10%
```

Run 1: Report of Indigo — Data Link

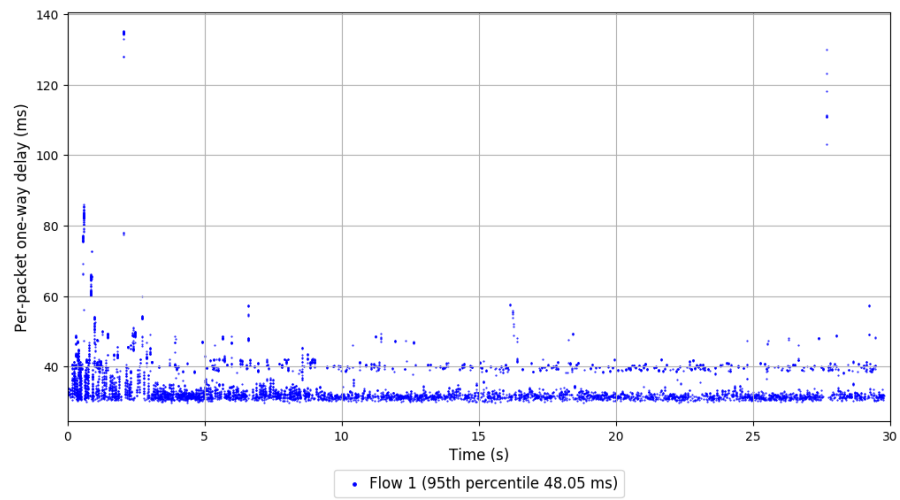
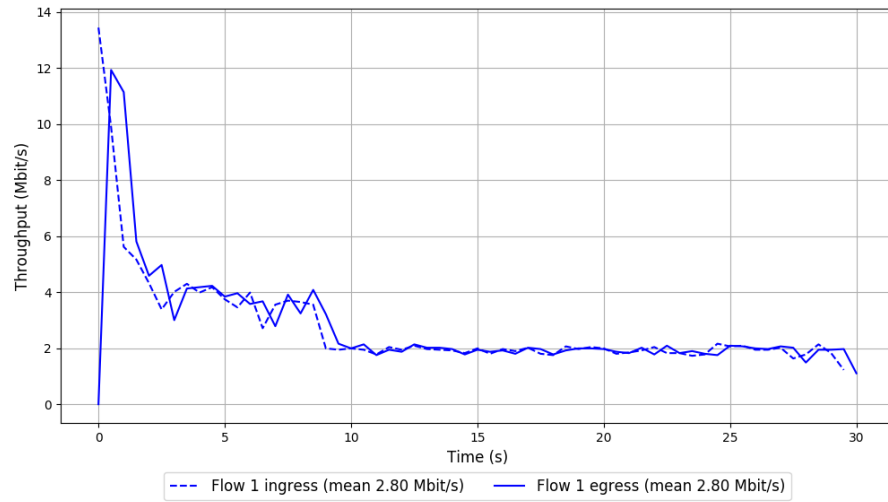


Run 2: Statistics of Indigo

Start at: 2019-01-17 05:51:45
End at: 2019-01-17 05:52:15
Local clock offset: 4.031 ms
Remote clock offset: -1.565 ms

Below is generated by plot.py at 2019-01-17 06:28:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.80 Mbit/s
95th percentile per-packet one-way delay: 48.050 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 2.80 Mbit/s
95th percentile per-packet one-way delay: 48.050 ms
Loss rate: 0.12%

Run 2: Report of Indigo — Data Link

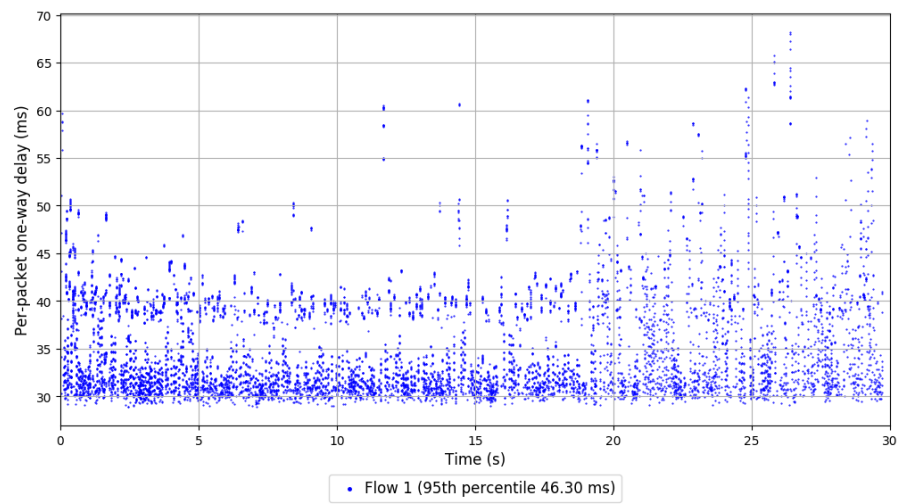
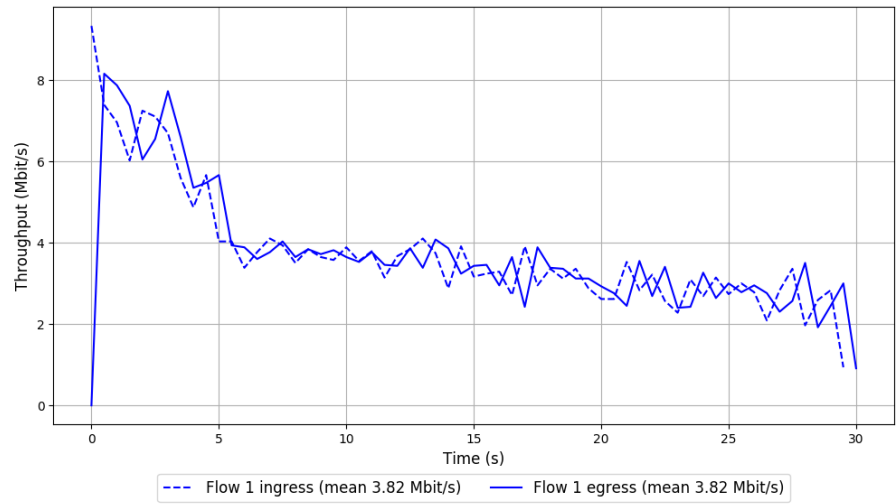


Run 3: Statistics of Indigo

Start at: 2019-01-17 06:17:27
End at: 2019-01-17 06:17:57
Local clock offset: 3.721 ms
Remote clock offset: -1.139 ms

Below is generated by plot.py at 2019-01-17 06:28:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.82 Mbit/s
95th percentile per-packet one-way delay: 46.303 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 3.82 Mbit/s
95th percentile per-packet one-way delay: 46.303 ms
Loss rate: 0.07%

Run 3: Report of Indigo — Data Link

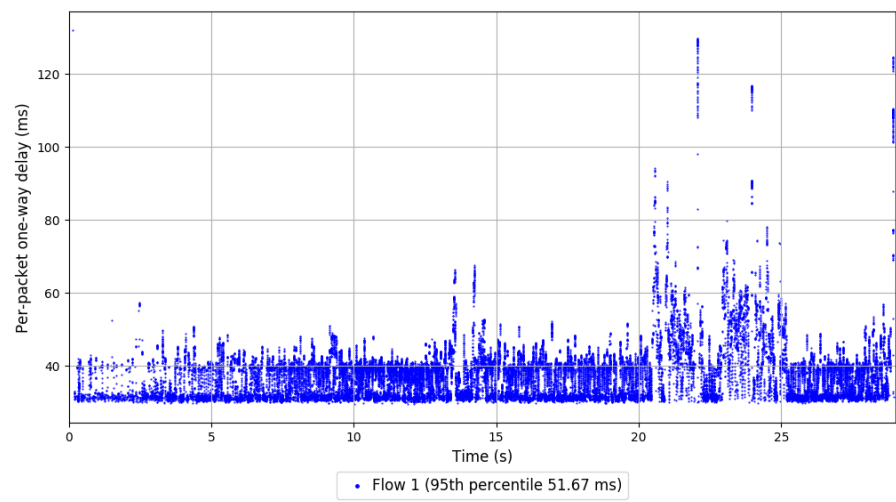
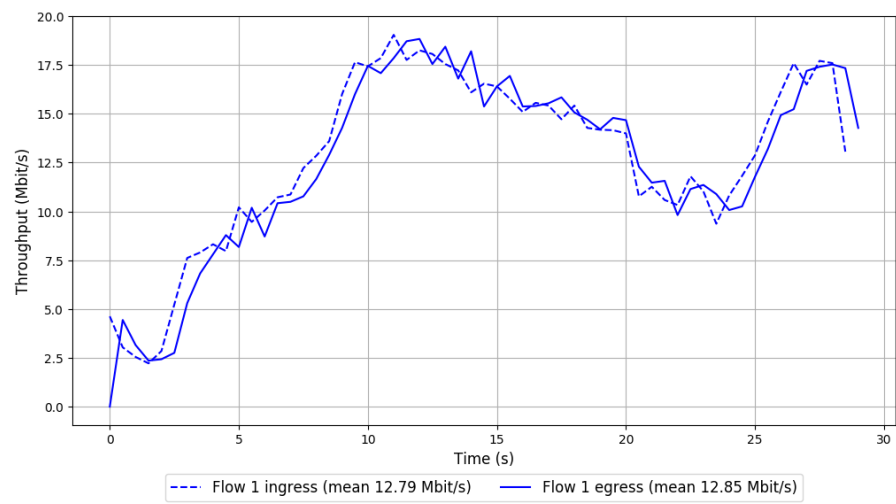



```
Run 1: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:13:47
End at: 2019-01-17 05:14:17
Local clock offset: -3.702 ms
Remote clock offset: 2.518 ms

# Below is generated by plot.py at 2019-01-17 06:28:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 51.671 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 51.671 ms
Loss rate: 0.02%
```

Run 1: Report of Indigo-MusesC3 — Data Link

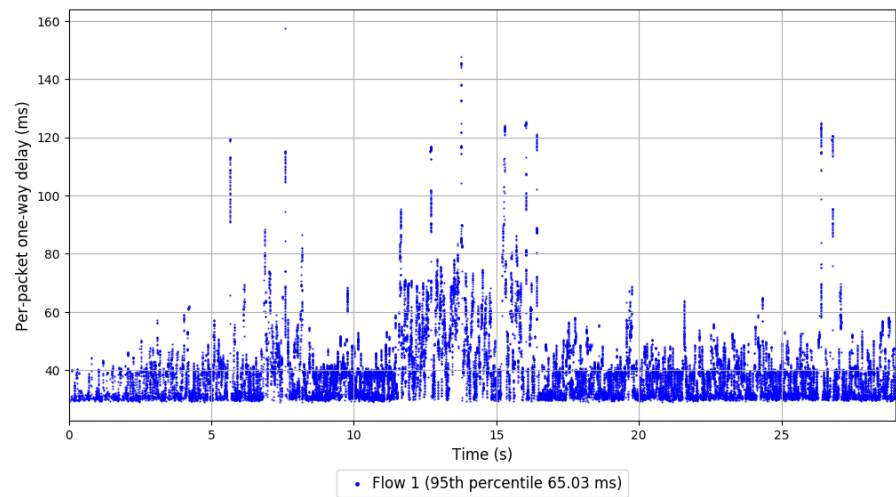
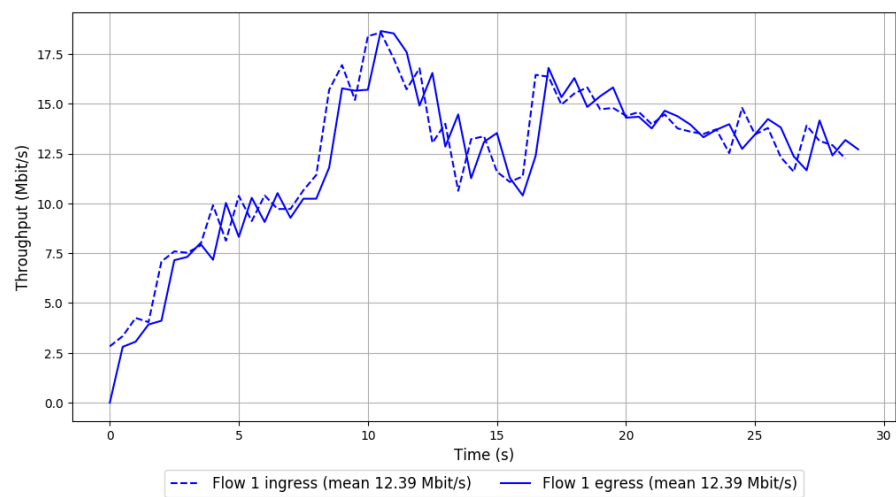


Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:39:29
End at: 2019-01-17 05:39:59
Local clock offset: 3.132 ms
Remote clock offset: -0.093 ms

Below is generated by plot.py at 2019-01-17 06:28:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.39 Mbit/s
95th percentile per-packet one-way delay: 65.031 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 12.39 Mbit/s
95th percentile per-packet one-way delay: 65.031 ms
Loss rate: 0.09%

Run 2: Report of Indigo-MusesC3 — Data Link

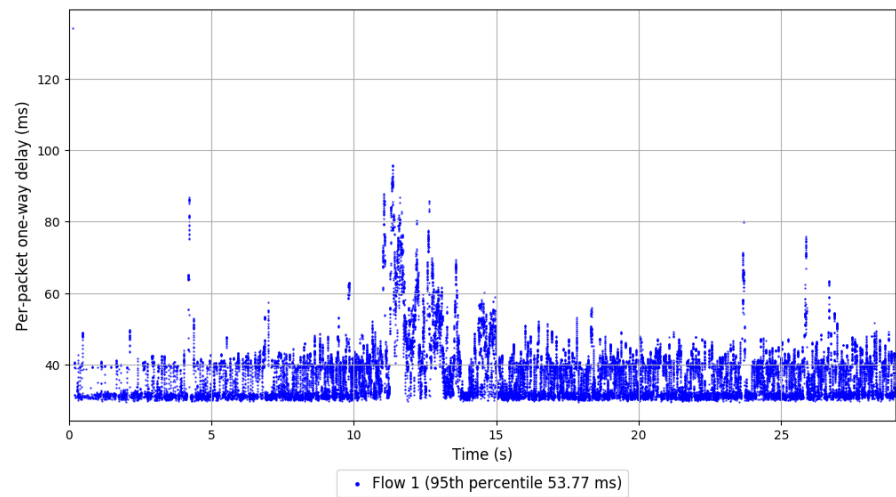
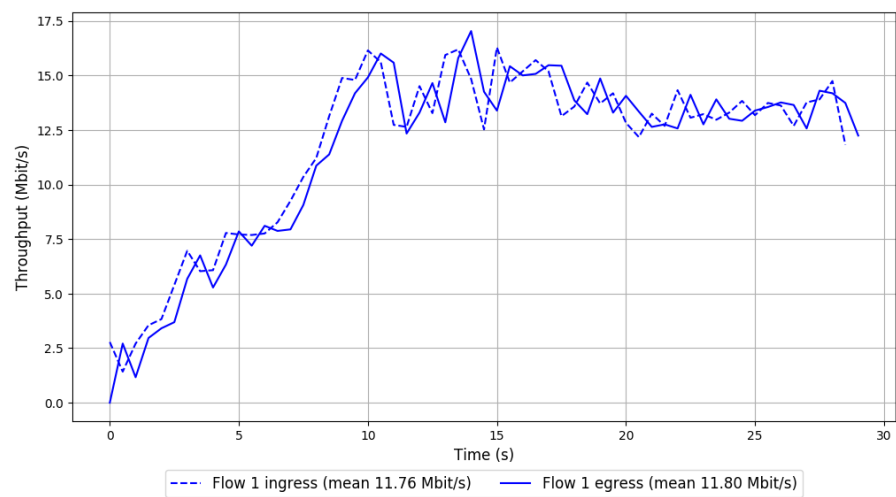


Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-17 06:05:11
End at: 2019-01-17 06:05:41
Local clock offset: 3.538 ms
Remote clock offset: -1.874 ms

Below is generated by plot.py at 2019-01-17 06:28:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.80 Mbit/s
95th percentile per-packet one-way delay: 53.766 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 11.80 Mbit/s
95th percentile per-packet one-way delay: 53.766 ms
Loss rate: 0.12%

Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:35:48

End at: 2019-01-17 05:36:18

Local clock offset: 2.577 ms

Remote clock offset: 0.674 ms

Below is generated by plot.py at 2019-01-17 06:29:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 38.29 Mbit/s

95th percentile per-packet one-way delay: 98.175 ms

Loss rate: 0.26%

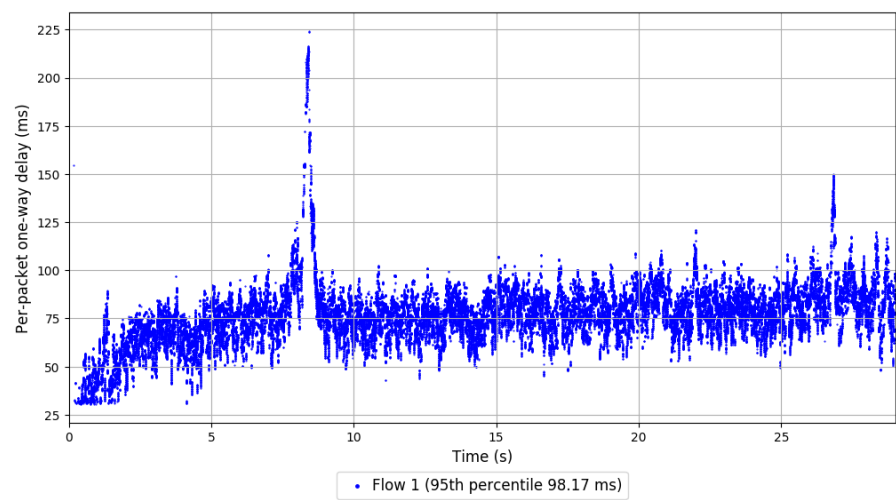
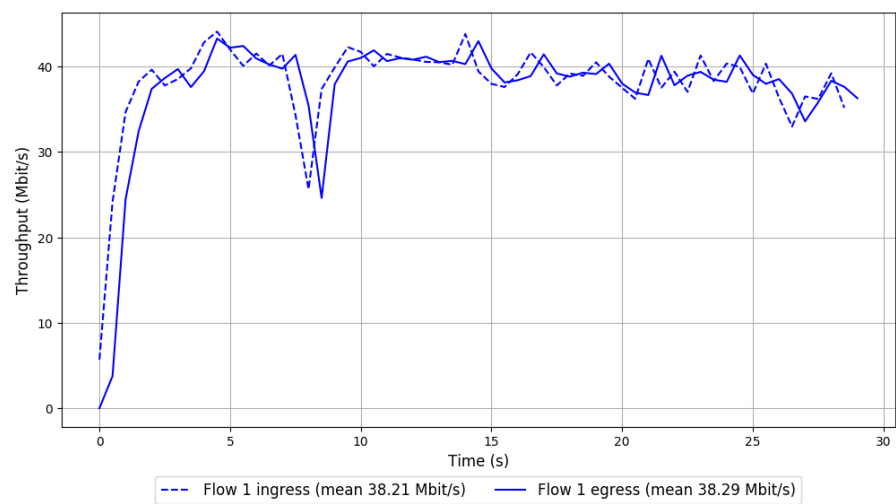
-- Flow 1:

Average throughput: 38.29 Mbit/s

95th percentile per-packet one-way delay: 98.175 ms

Loss rate: 0.26%

Run 1: Report of Indigo-MusesC5 — Data Link

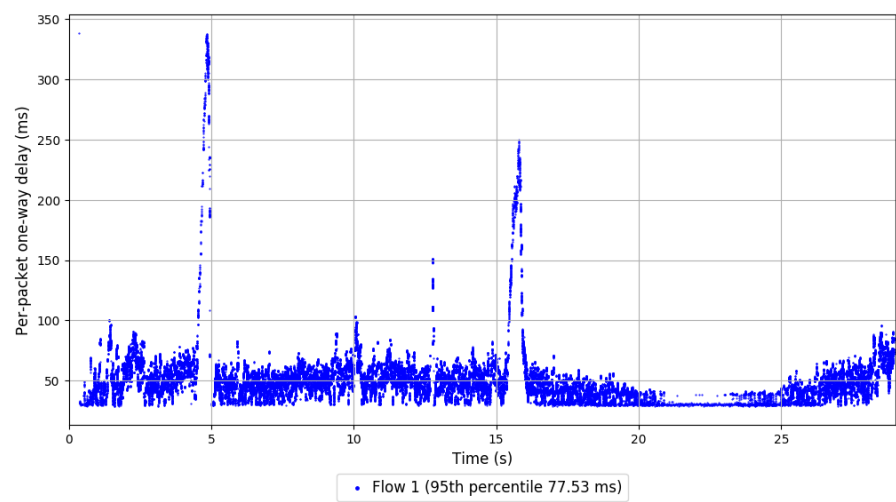
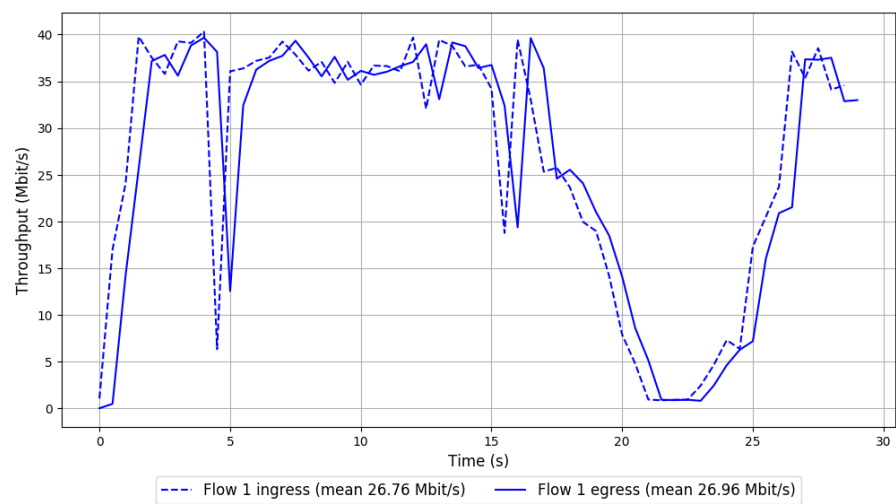


Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-17 06:01:30
End at: 2019-01-17 06:02:00
Local clock offset: 3.573 ms
Remote clock offset: -2.368 ms

Below is generated by plot.py at 2019-01-17 06:29:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 26.96 Mbit/s
95th percentile per-packet one-way delay: 77.529 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 26.96 Mbit/s
95th percentile per-packet one-way delay: 77.529 ms
Loss rate: 0.40%

Run 2: Report of Indigo-MusesC5 — Data Link

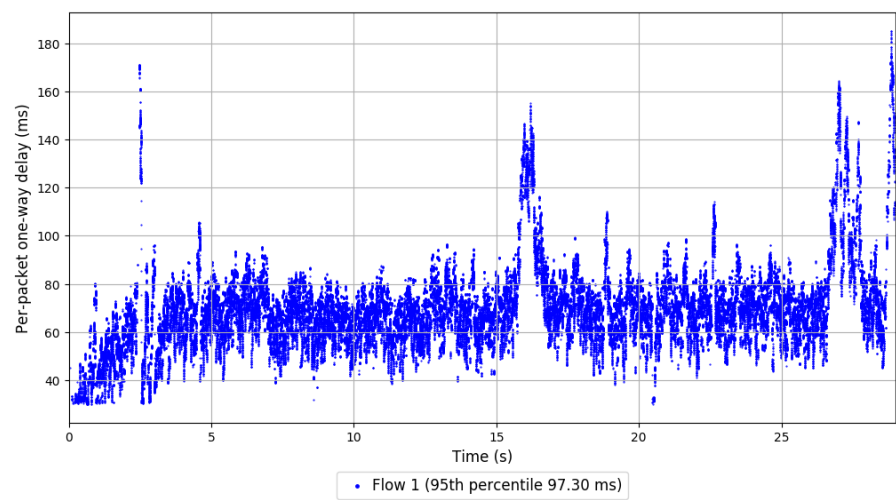
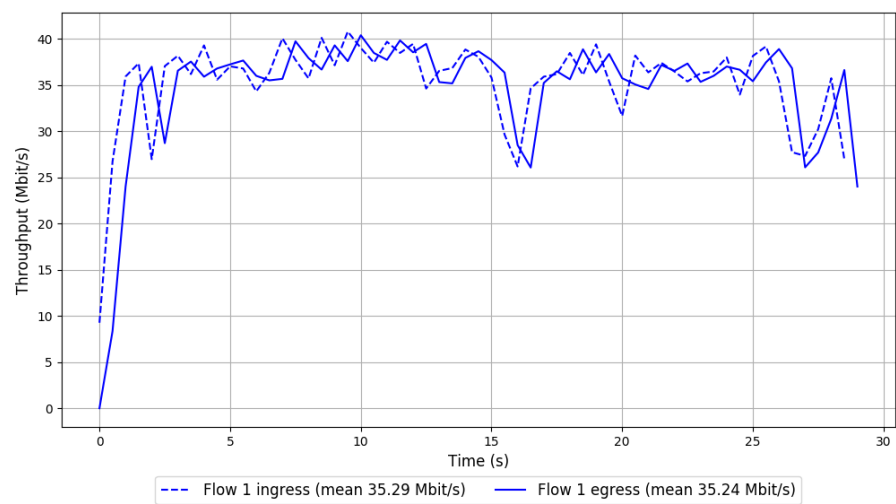


Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-17 06:27:12
End at: 2019-01-17 06:27:42
Local clock offset: 1.448 ms
Remote clock offset: -1.194 ms

Below is generated by plot.py at 2019-01-17 06:29:07
Datalink statistics
-- Total of 1 flow:
Average throughput: 35.24 Mbit/s
95th percentile per-packet one-way delay: 97.304 ms
Loss rate: 0.31%
-- Flow 1:
Average throughput: 35.24 Mbit/s
95th percentile per-packet one-way delay: 97.304 ms
Loss rate: 0.31%

Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:11:20

End at: 2019-01-17 05:11:50

Local clock offset: -3.529 ms

Remote clock offset: 2.349 ms

Below is generated by plot.py at 2019-01-17 06:29:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.18 Mbit/s

95th percentile per-packet one-way delay: 48.286 ms

Loss rate: 0.24%

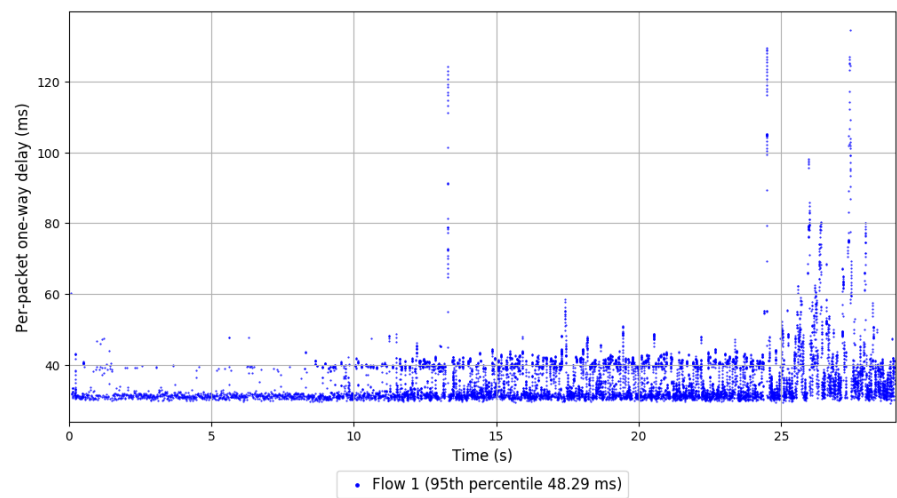
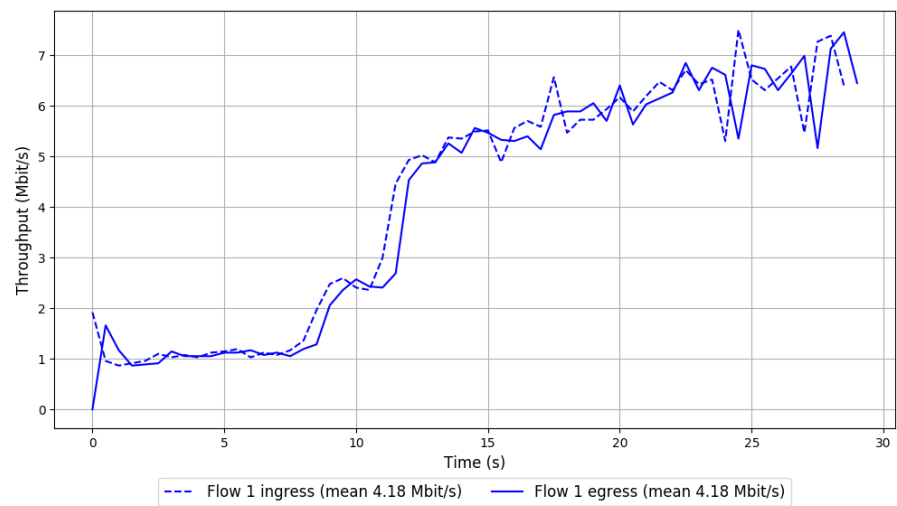
-- Flow 1:

Average throughput: 4.18 Mbit/s

95th percentile per-packet one-way delay: 48.286 ms

Loss rate: 0.24%

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:37:02

End at: 2019-01-17 05:37:32

Local clock offset: 2.796 ms

Remote clock offset: 0.277 ms

Below is generated by plot.py at 2019-01-17 06:29:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 39.360 ms

Loss rate: 0.22%

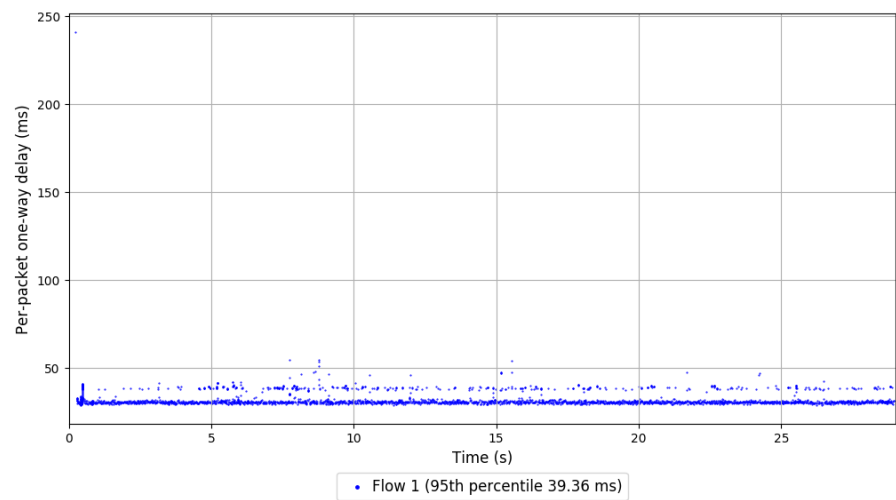
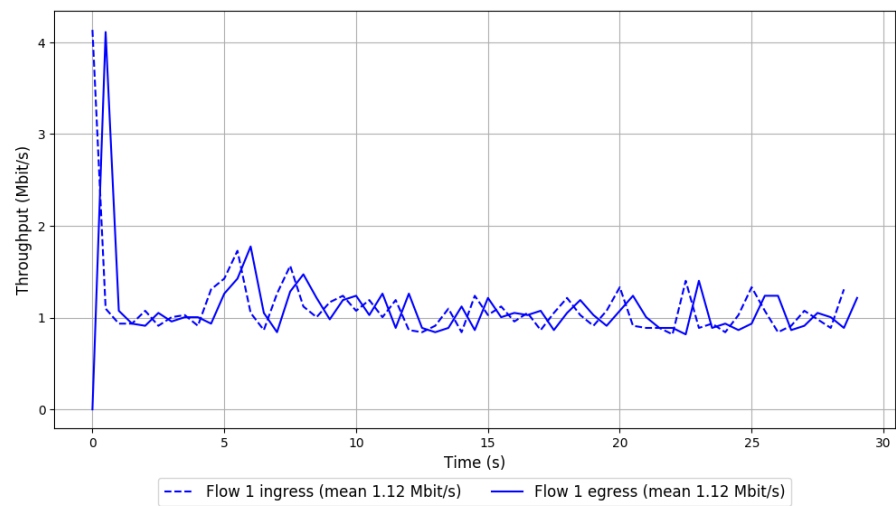
-- Flow 1:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 39.360 ms

Loss rate: 0.22%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-17 06:02:44

End at: 2019-01-17 06:03:14

Local clock offset: 3.54 ms

Remote clock offset: -2.223 ms

Below is generated by plot.py at 2019-01-17 06:29:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.54 Mbit/s

95th percentile per-packet one-way delay: 41.326 ms

Loss rate: 0.05%

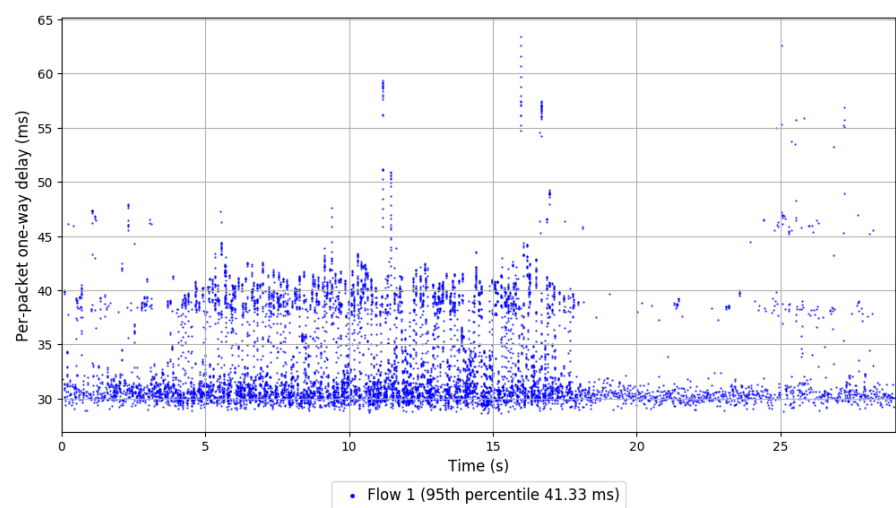
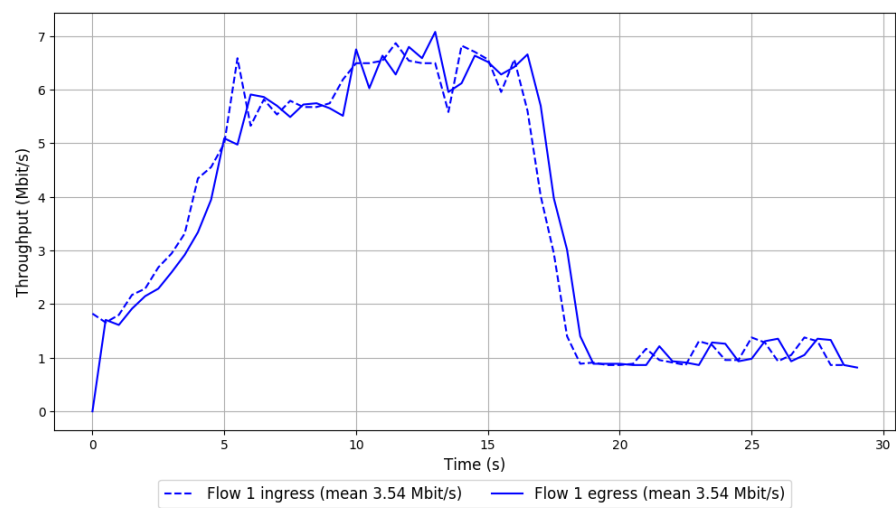
-- Flow 1:

Average throughput: 3.54 Mbit/s

95th percentile per-packet one-way delay: 41.326 ms

Loss rate: 0.05%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-17 05:21:07

End at: 2019-01-17 05:21:37

Local clock offset: -3.327 ms

Remote clock offset: 2.856 ms

Below is generated by plot.py at 2019-01-17 06:29:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 31.46 Mbit/s

95th percentile per-packet one-way delay: 220.911 ms

Loss rate: 0.55%

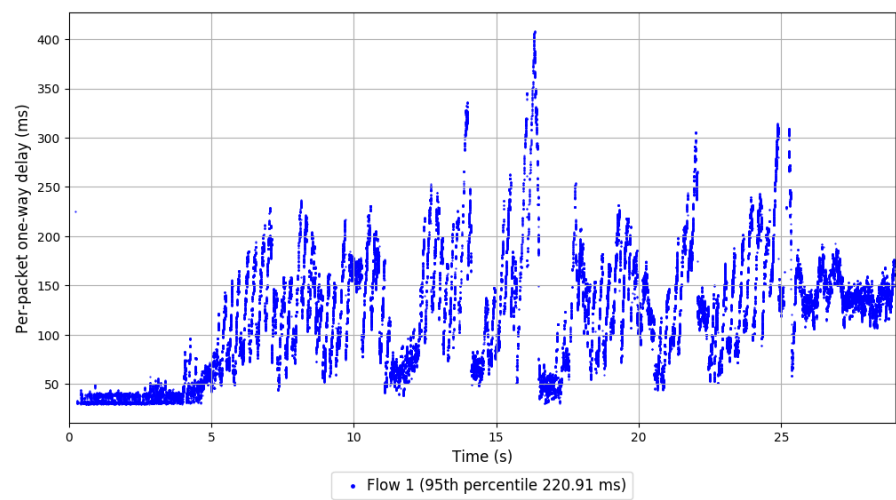
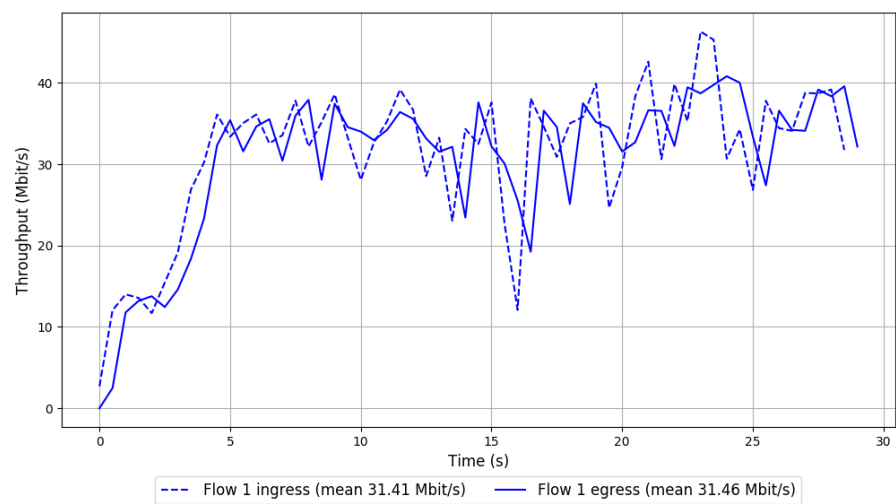
-- Flow 1:

Average throughput: 31.46 Mbit/s

95th percentile per-packet one-way delay: 220.911 ms

Loss rate: 0.55%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-17 05:46:49

End at: 2019-01-17 05:47:19

Local clock offset: 3.933 ms

Remote clock offset: -1.02 ms

Below is generated by plot.py at 2019-01-17 06:29:11

Datalink statistics

-- Total of 1 flow:

Average throughput: 23.32 Mbit/s

95th percentile per-packet one-way delay: 246.251 ms

Loss rate: 0.76%

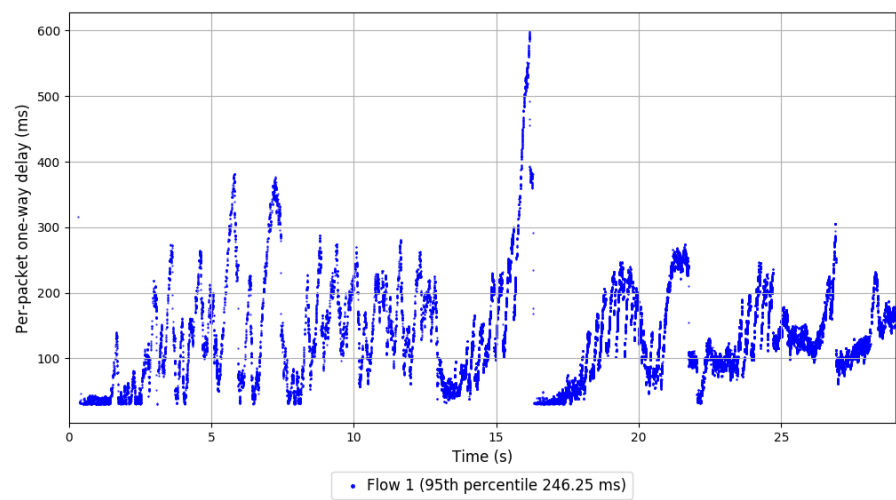
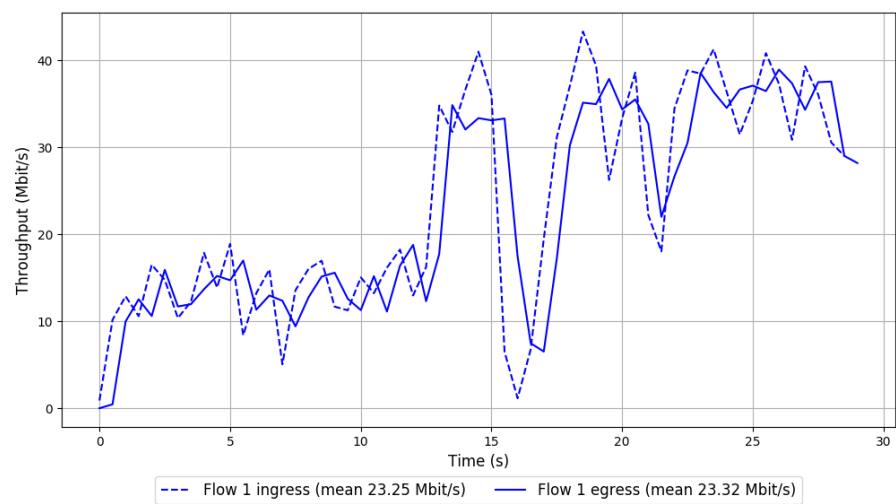
-- Flow 1:

Average throughput: 23.32 Mbit/s

95th percentile per-packet one-way delay: 246.251 ms

Loss rate: 0.76%

Run 2: Report of Indigo-MusesT — Data Link

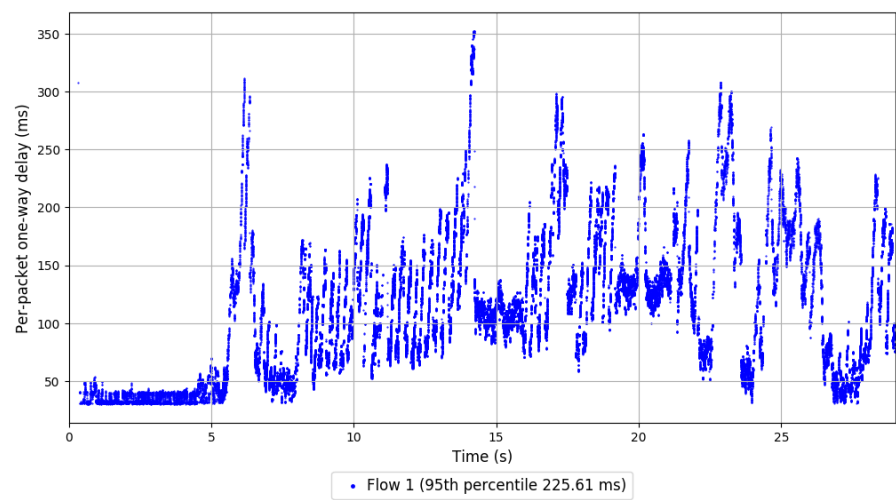
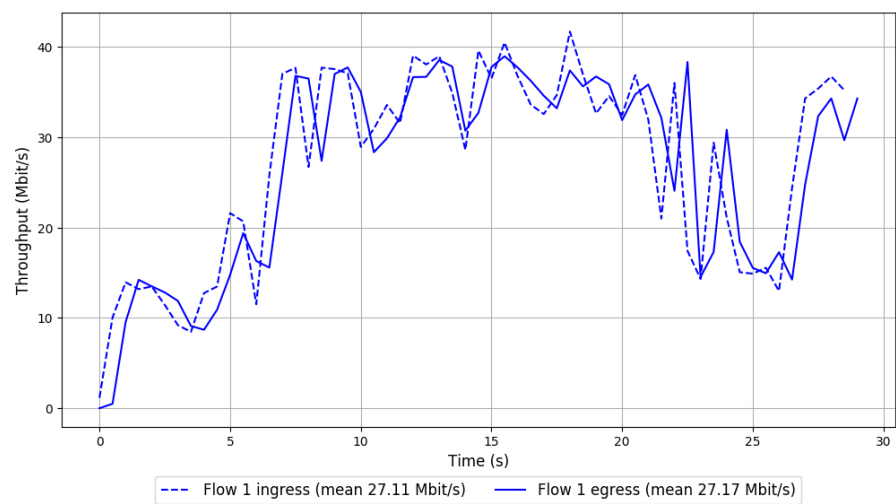


Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-17 06:12:31
End at: 2019-01-17 06:13:01
Local clock offset: 3.619 ms
Remote clock offset: -1.208 ms

Below is generated by plot.py at 2019-01-17 06:29:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 27.17 Mbit/s
95th percentile per-packet one-way delay: 225.607 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 27.17 Mbit/s
95th percentile per-packet one-way delay: 225.607 ms
Loss rate: 0.84%

Run 3: Report of Indigo-MusesT — Data Link

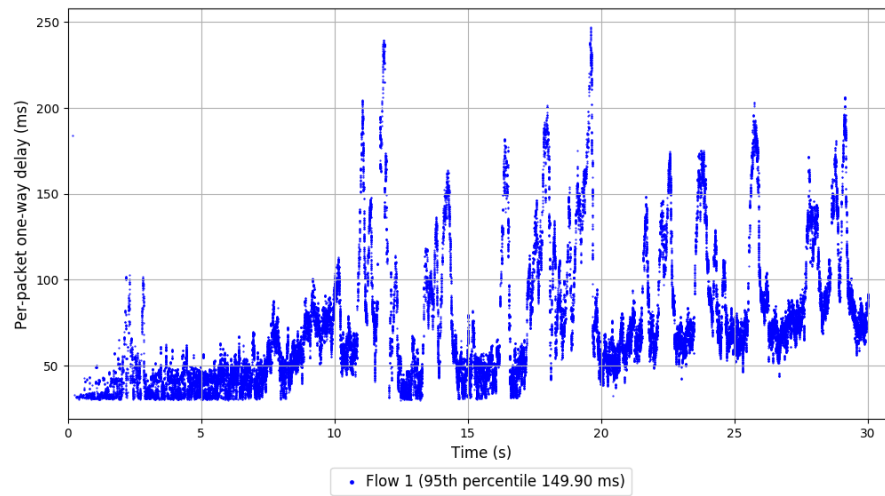
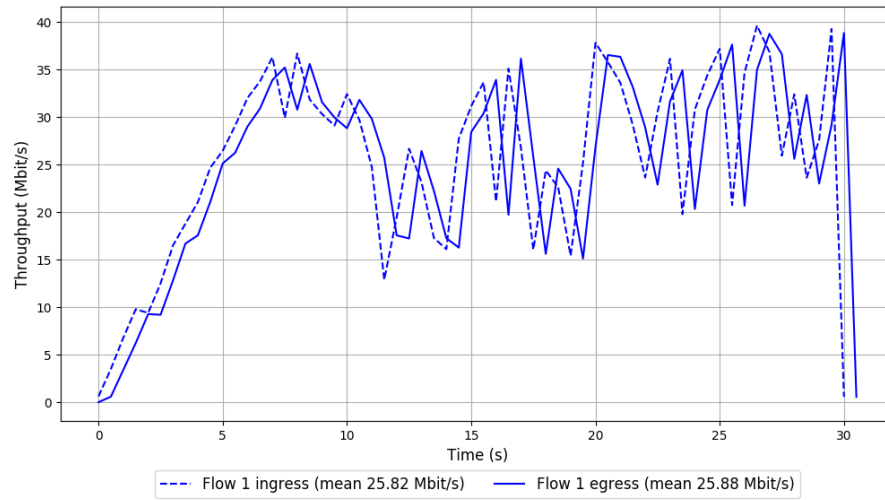



```
Run 1: Statistics of LEDBAT

Start at: 2019-01-17 05:22:21
End at: 2019-01-17 05:22:51
Local clock offset: -2.367 ms
Remote clock offset: 2.863 ms

# Below is generated by plot.py at 2019-01-17 06:29:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 25.88 Mbit/s
95th percentile per-packet one-way delay: 149.895 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 25.88 Mbit/s
95th percentile per-packet one-way delay: 149.895 ms
Loss rate: 0.39%
```

Run 1: Report of LEDBAT — Data Link

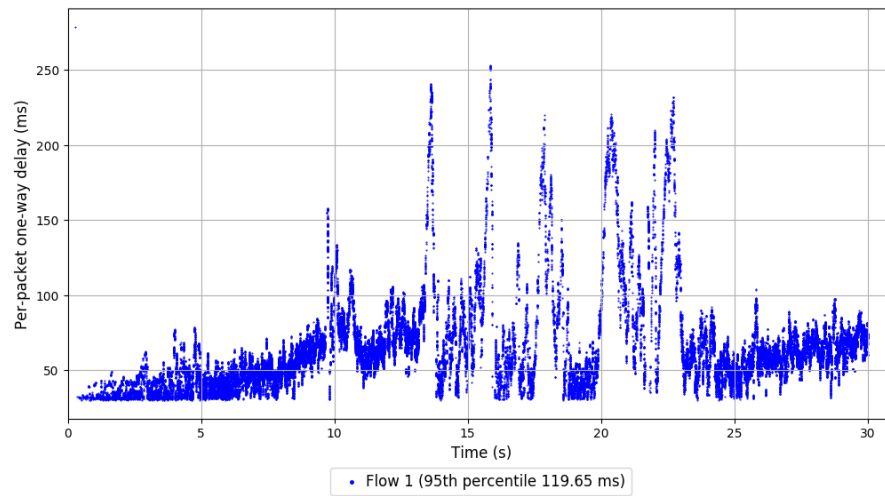
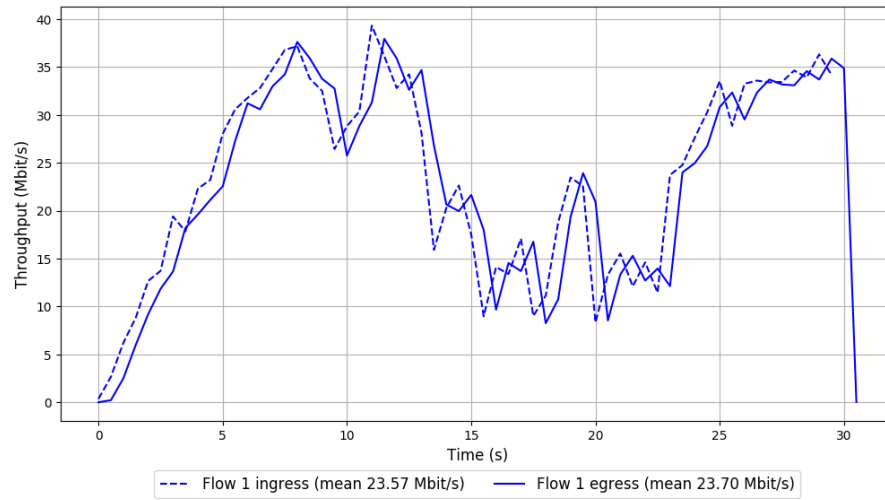


Run 2: Statistics of LEDBAT

Start at: 2019-01-17 05:48:03
End at: 2019-01-17 05:48:33
Local clock offset: 4.029 ms
Remote clock offset: -1.124 ms

Below is generated by plot.py at 2019-01-17 06:29:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 23.70 Mbit/s
95th percentile per-packet one-way delay: 119.651 ms
Loss rate: 0.32%
-- Flow 1:
Average throughput: 23.70 Mbit/s
95th percentile per-packet one-way delay: 119.651 ms
Loss rate: 0.32%

Run 2: Report of LEDBAT — Data Link

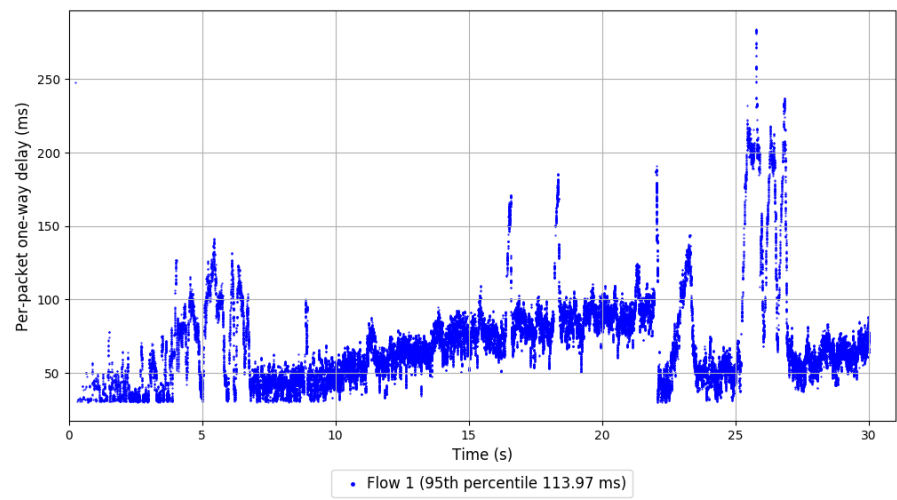
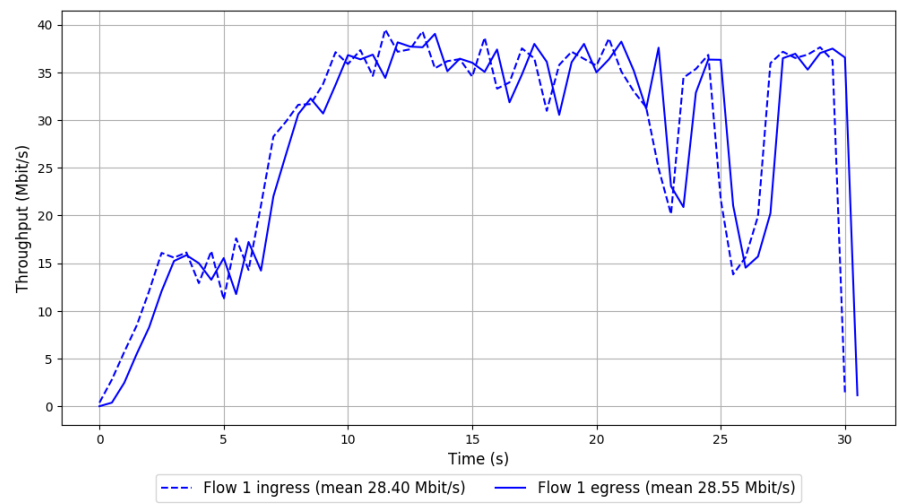


Run 3: Statistics of LEDBAT

Start at: 2019-01-17 06:13:45
End at: 2019-01-17 06:14:15
Local clock offset: 3.642 ms
Remote clock offset: -1.179 ms

Below is generated by plot.py at 2019-01-17 06:29:26
Datalink statistics
-- Total of 1 flow:
Average throughput: 28.55 Mbit/s
95th percentile per-packet one-way delay: 113.973 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 28.55 Mbit/s
95th percentile per-packet one-way delay: 113.973 ms
Loss rate: 0.28%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-17 05:27:16

End at: 2019-01-17 05:27:46

Local clock offset: 0.18 ms

Remote clock offset: 2.989 ms

Below is generated by plot.py at 2019-01-17 06:29:26

Datalink statistics

-- Total of 1 flow:

Average throughput: 19.34 Mbit/s

95th percentile per-packet one-way delay: 492.786 ms

Loss rate: 1.52%

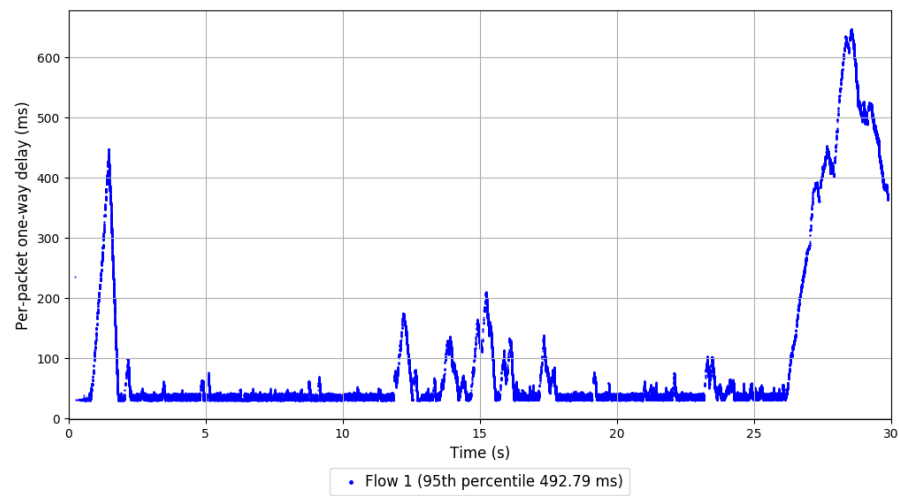
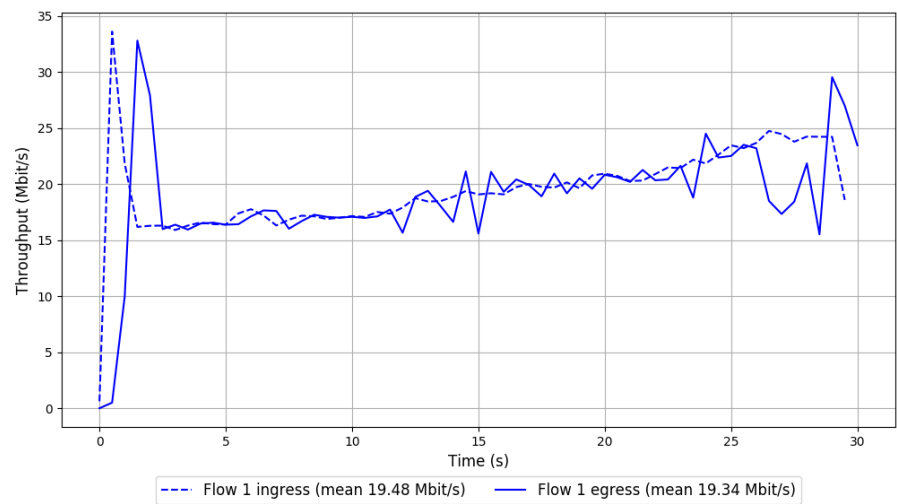
-- Flow 1:

Average throughput: 19.34 Mbit/s

95th percentile per-packet one-way delay: 492.786 ms

Loss rate: 1.52%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-01-17 05:52:58

End at: 2019-01-17 05:53:28

Local clock offset: 3.915 ms

Remote clock offset: -1.61 ms

Below is generated by plot.py at 2019-01-17 06:29:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 30.14 Mbit/s

95th percentile per-packet one-way delay: 887.432 ms

Loss rate: 6.46%

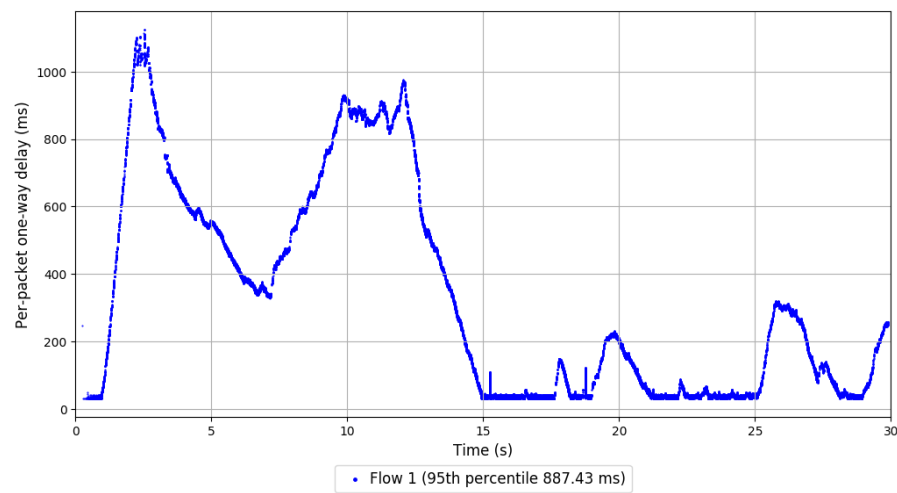
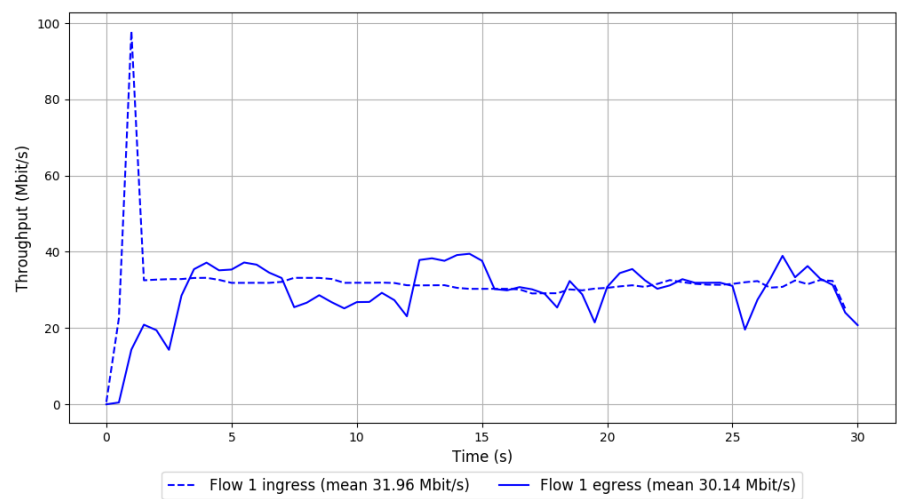
-- Flow 1:

Average throughput: 30.14 Mbit/s

95th percentile per-packet one-way delay: 887.432 ms

Loss rate: 6.46%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-17 06:18:40

End at: 2019-01-17 06:19:10

Local clock offset: 3.768 ms

Remote clock offset: -1.113 ms

Below is generated by plot.py at 2019-01-17 06:29:37

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.92 Mbit/s

95th percentile per-packet one-way delay: 125.899 ms

Loss rate: 0.11%

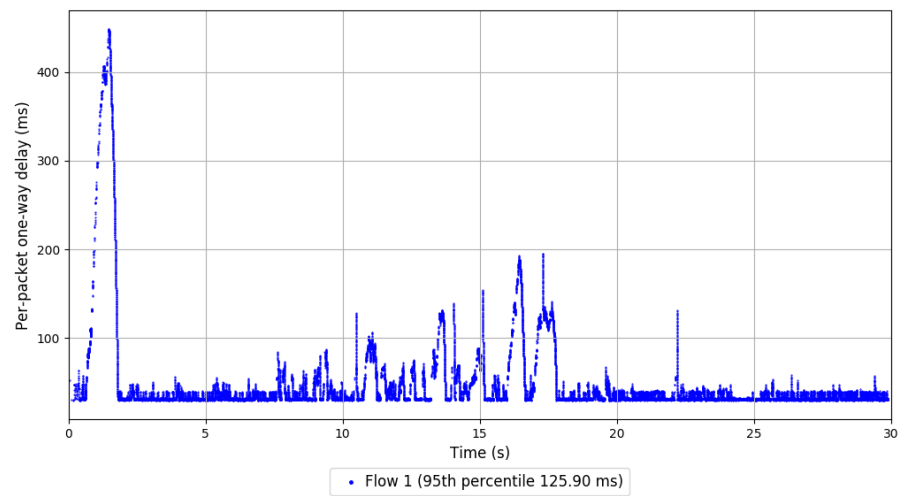
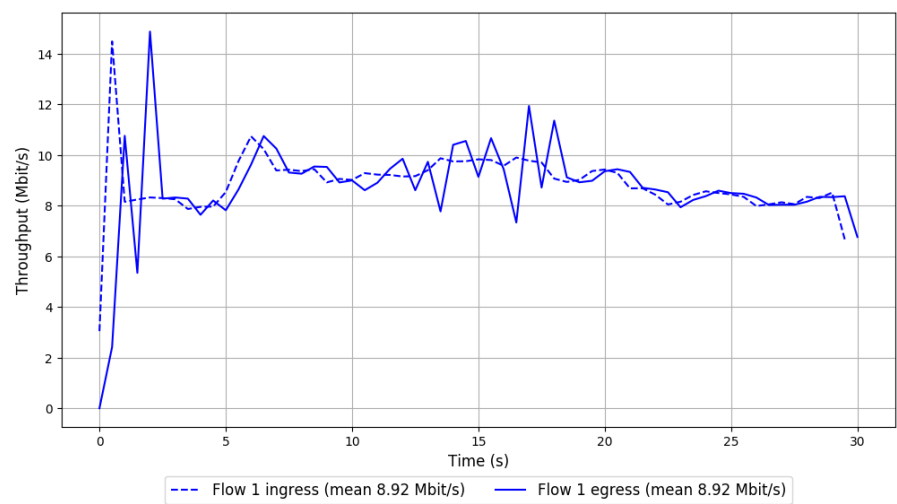
-- Flow 1:

Average throughput: 8.92 Mbit/s

95th percentile per-packet one-way delay: 125.899 ms

Loss rate: 0.11%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

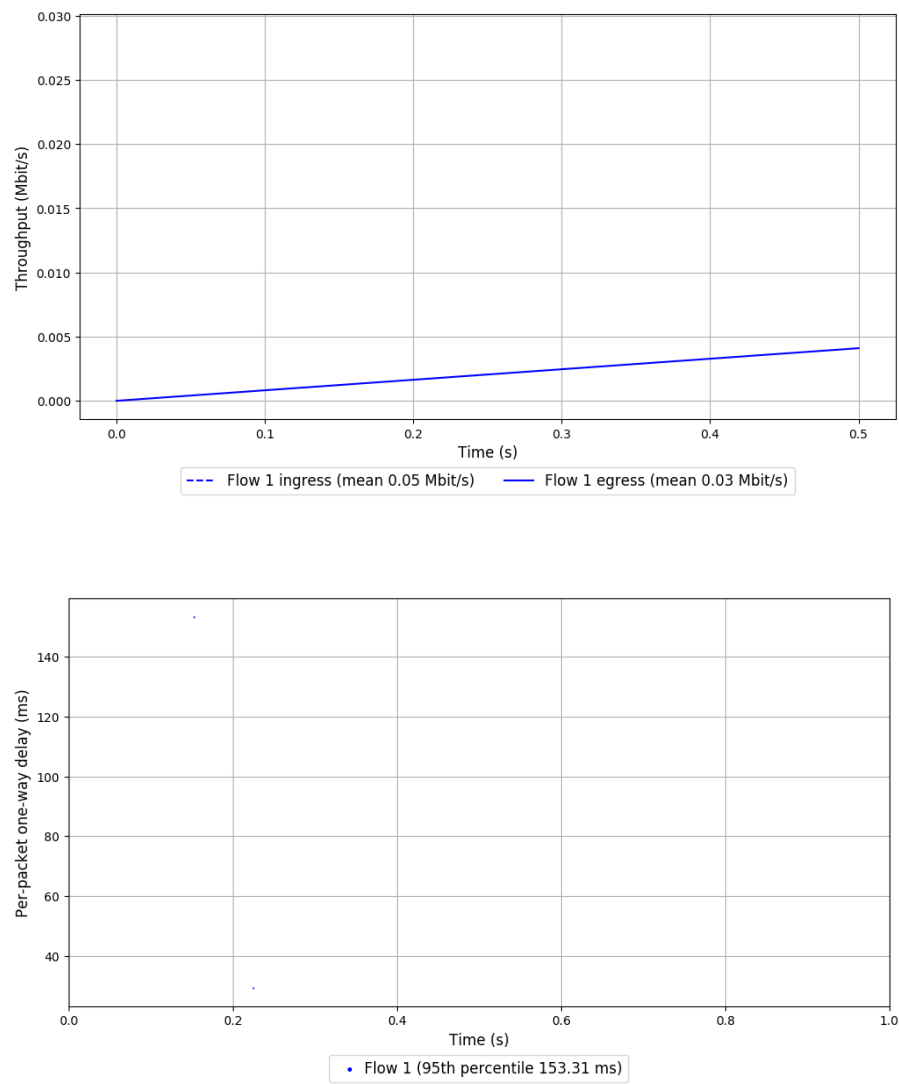
Start at: 2019-01-17 05:17:28

End at: 2019-01-17 05:17:58

Local clock offset: -3.938 ms

Remote clock offset: 2.727 ms

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

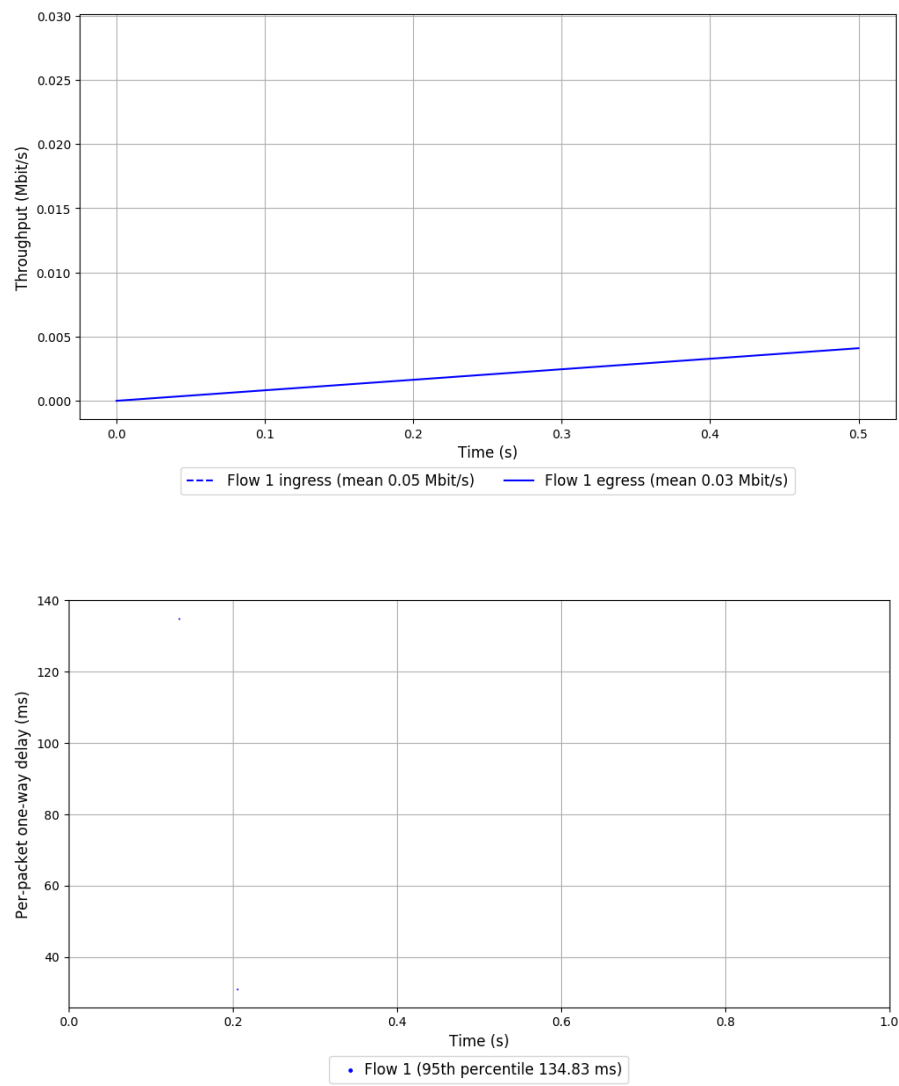
Start at: 2019-01-17 05:43:10

End at: 2019-01-17 05:43:40

Local clock offset: 3.575 ms

Remote clock offset: -0.602 ms

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

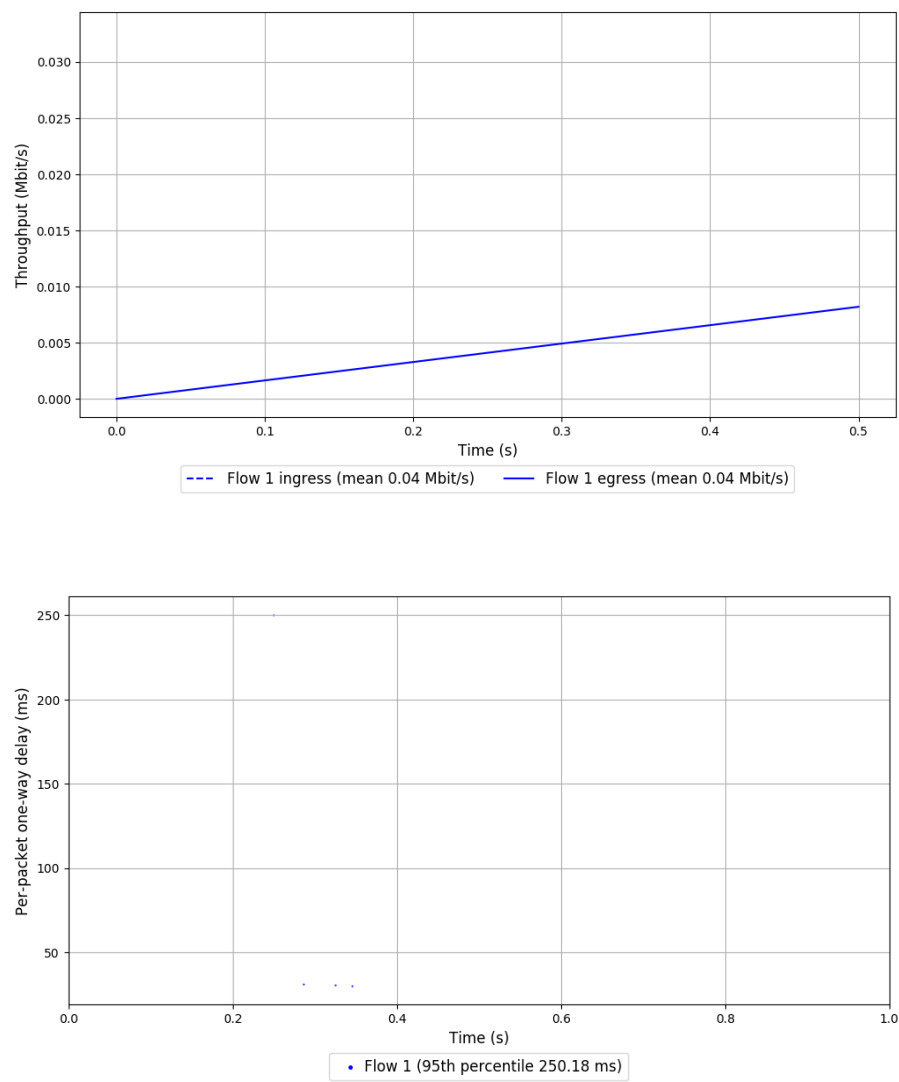
Start at: 2019-01-17 06:08:52

End at: 2019-01-17 06:09:22

Local clock offset: 3.562 ms

Remote clock offset: -1.428 ms

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-01-17 05:15:00

End at: 2019-01-17 05:15:30

Local clock offset: -3.783 ms

Remote clock offset: 2.613 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 34.16 Mbit/s

95th percentile per-packet one-way delay: 217.092 ms

Loss rate: 0.74%

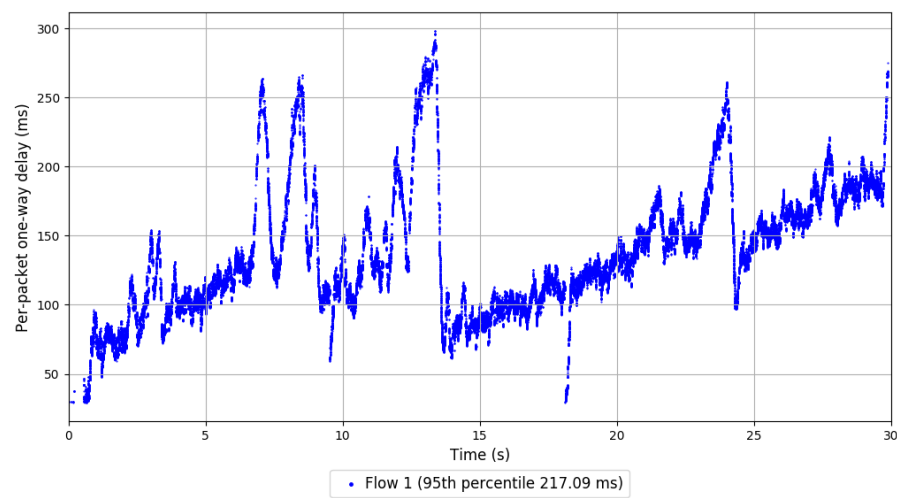
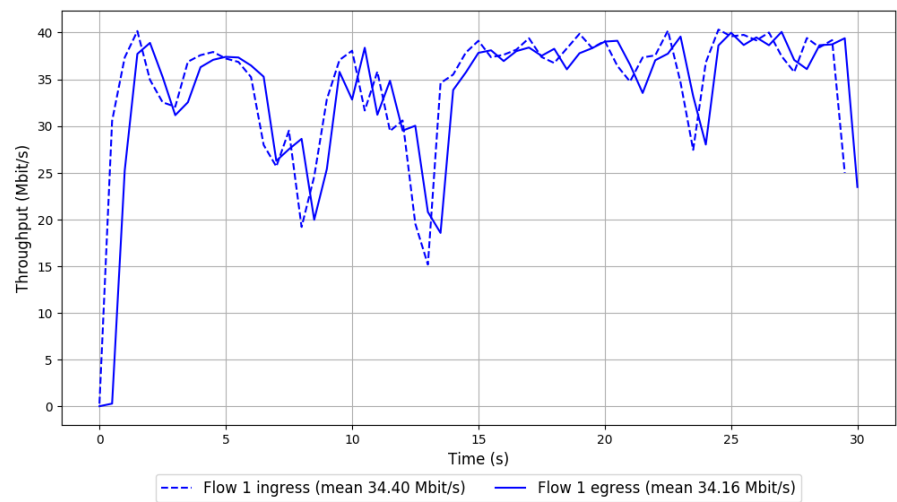
-- Flow 1:

Average throughput: 34.16 Mbit/s

95th percentile per-packet one-way delay: 217.092 ms

Loss rate: 0.74%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-17 05:40:42

End at: 2019-01-17 05:41:12

Local clock offset: 3.287 ms

Remote clock offset: -0.354 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 32.80 Mbit/s

95th percentile per-packet one-way delay: 229.542 ms

Loss rate: 0.46%

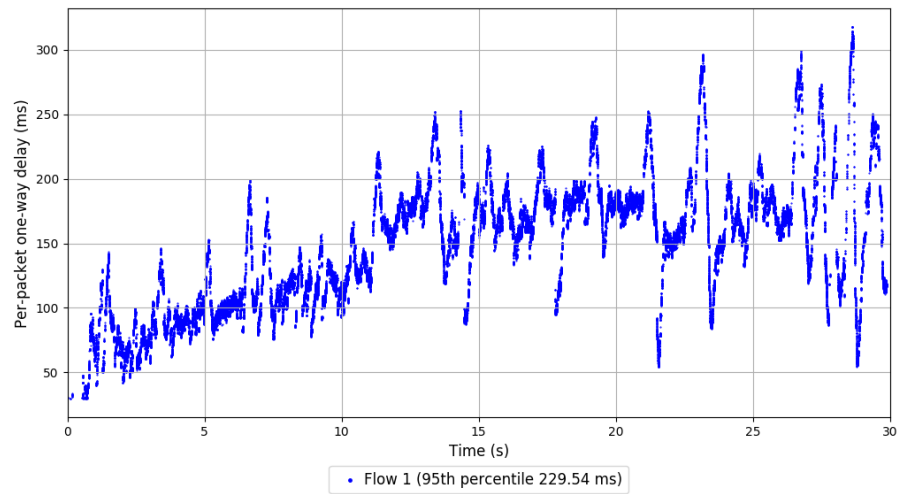
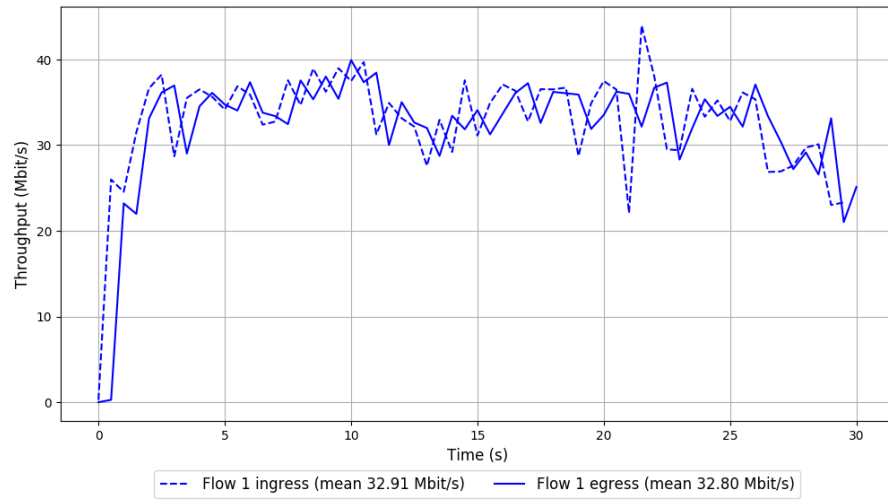
-- Flow 1:

Average throughput: 32.80 Mbit/s

95th percentile per-packet one-way delay: 229.542 ms

Loss rate: 0.46%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-17 06:06:24

End at: 2019-01-17 06:06:54

Local clock offset: 3.54 ms

Remote clock offset: -1.701 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 32.13 Mbit/s

95th percentile per-packet one-way delay: 190.447 ms

Loss rate: 0.61%

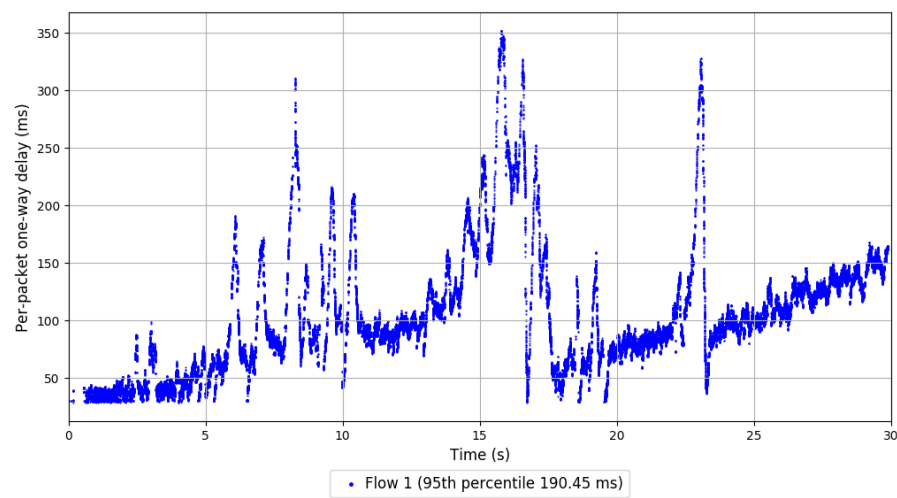
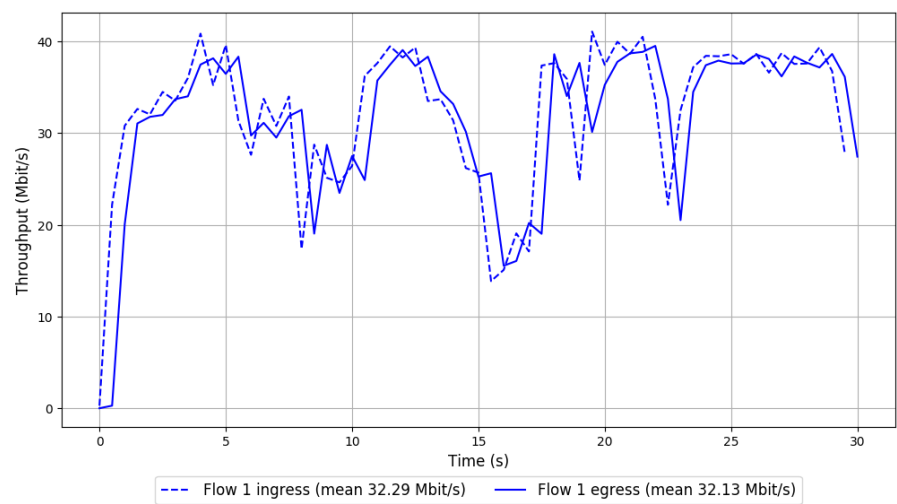
-- Flow 1:

Average throughput: 32.13 Mbit/s

95th percentile per-packet one-way delay: 190.447 ms

Loss rate: 0.61%

Run 3: Report of QUIC Cubic — Data Link

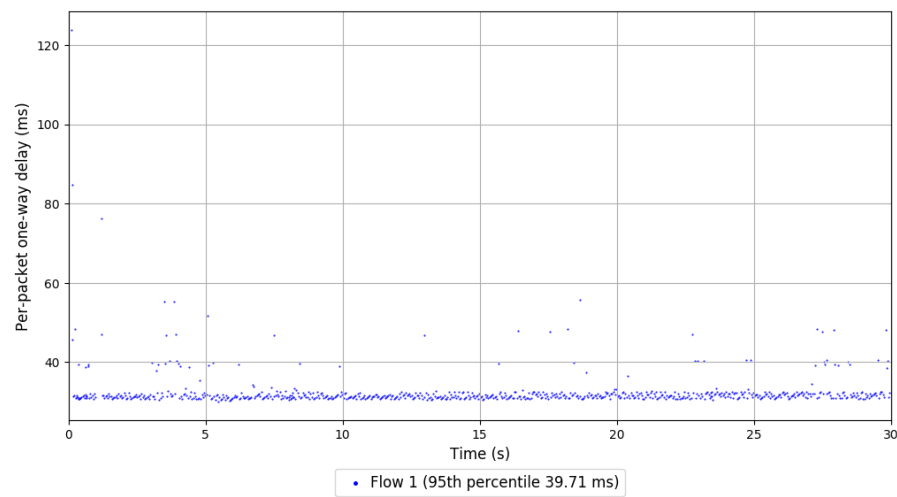
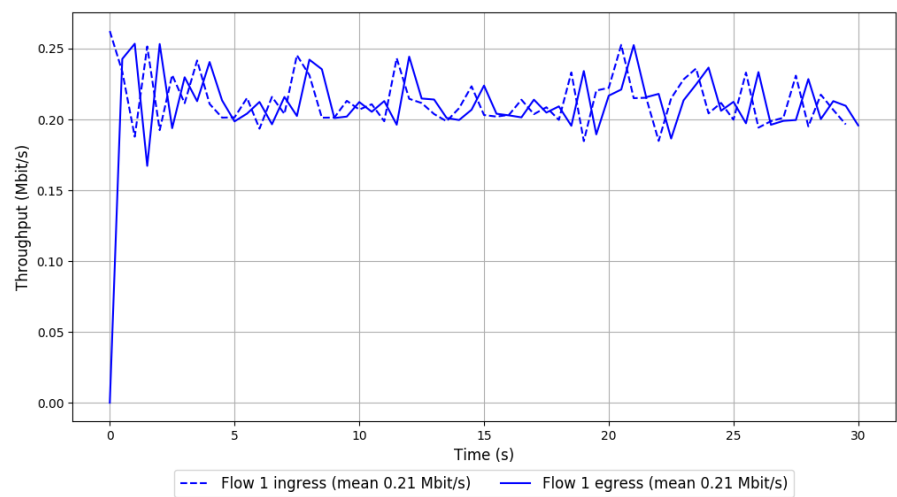



```
Run 1: Statistics of SCReAM

Start at: 2019-01-17 05:19:54
End at: 2019-01-17 05:20:24
Local clock offset: -4.074 ms
Remote clock offset: 2.841 ms

# Below is generated by plot.py at 2019-01-17 06:29:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 39.713 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 39.713 ms
Loss rate: 0.13%
```

Run 1: Report of SReAM — Data Link

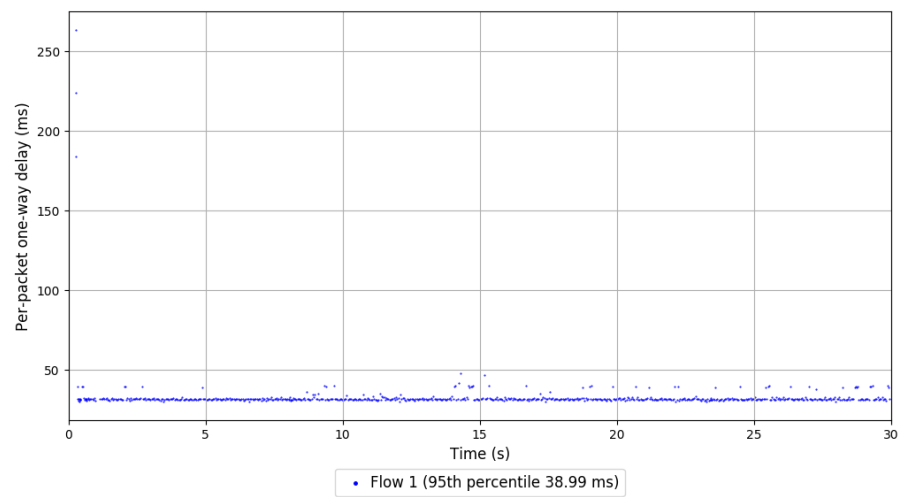
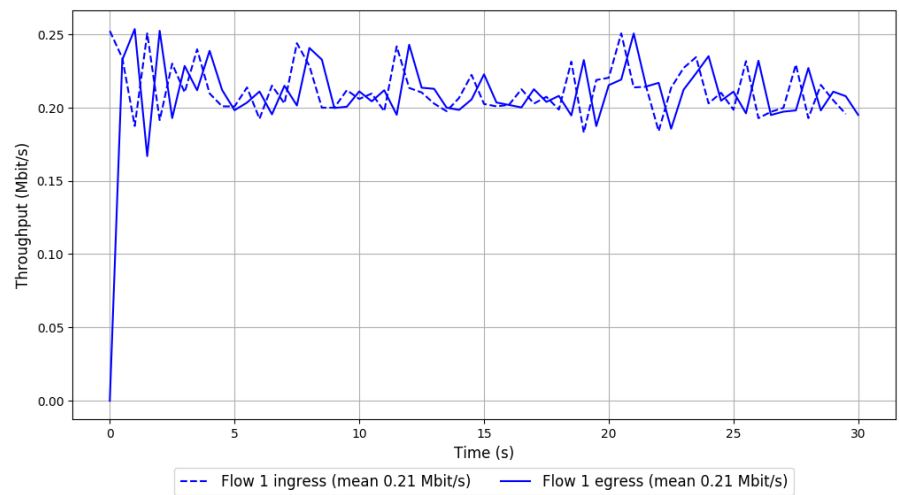


Run 2: Statistics of SCReAM

Start at: 2019-01-17 05:45:36
End at: 2019-01-17 05:46:06
Local clock offset: 3.815 ms
Remote clock offset: -0.891 ms

Below is generated by plot.py at 2019-01-17 06:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 38.993 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 38.993 ms
Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

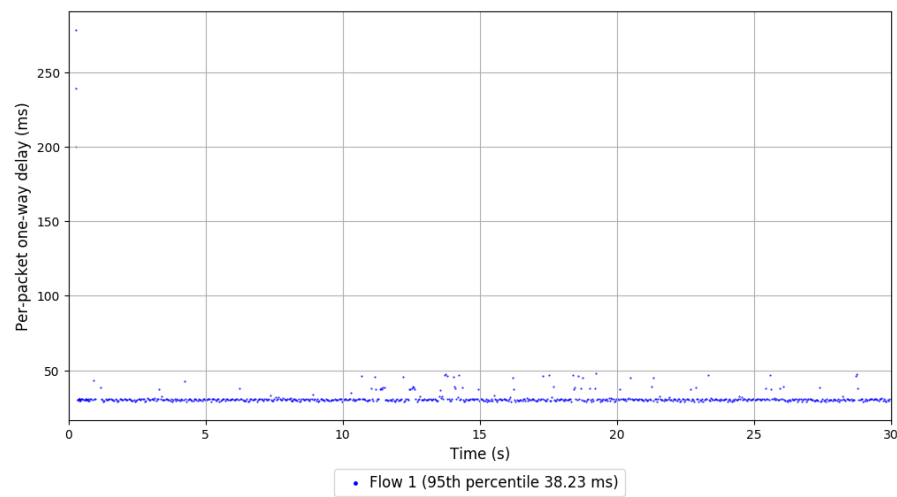
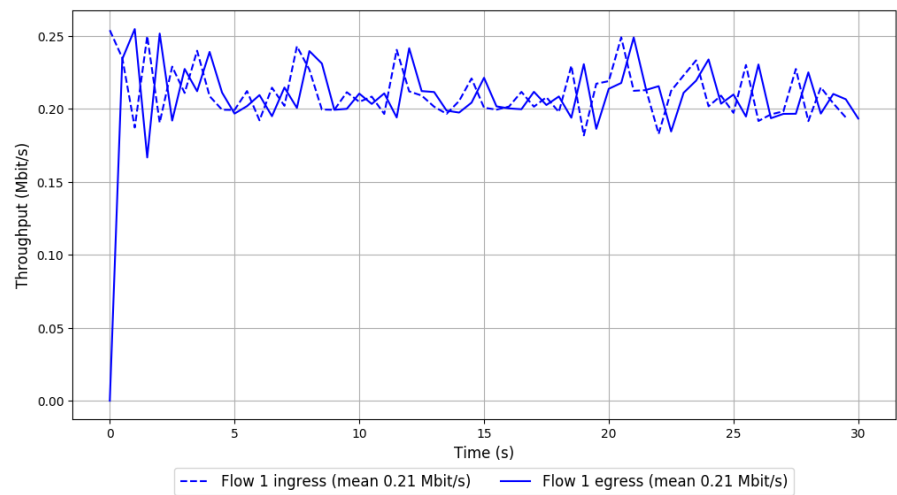


Run 3: Statistics of SCReAM

Start at: 2019-01-17 06:11:18
End at: 2019-01-17 06:11:48
Local clock offset: 3.577 ms
Remote clock offset: -1.171 ms

Below is generated by plot.py at 2019-01-17 06:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 38.230 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 38.230 ms
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-01-17 05:18:41

End at: 2019-01-17 05:19:11

Local clock offset: -4.014 ms

Remote clock offset: 2.78 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 13.58 Mbit/s

95th percentile per-packet one-way delay: 54.278 ms

Loss rate: 0.15%

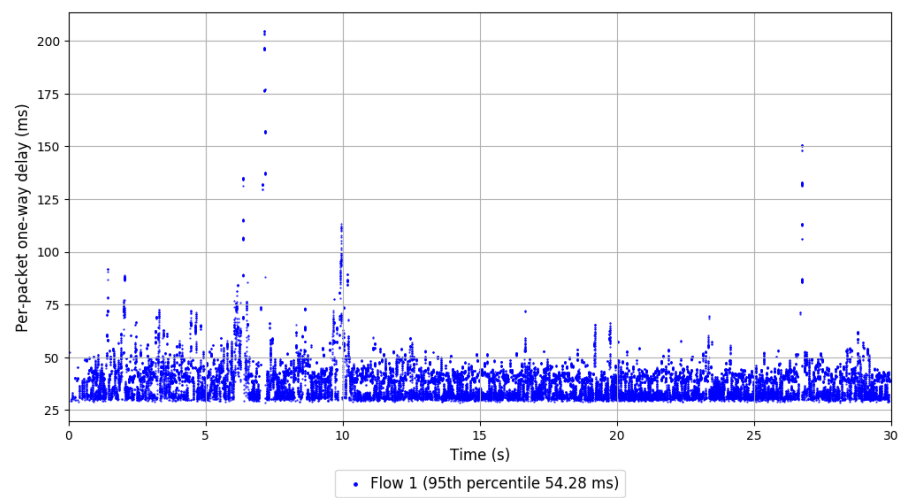
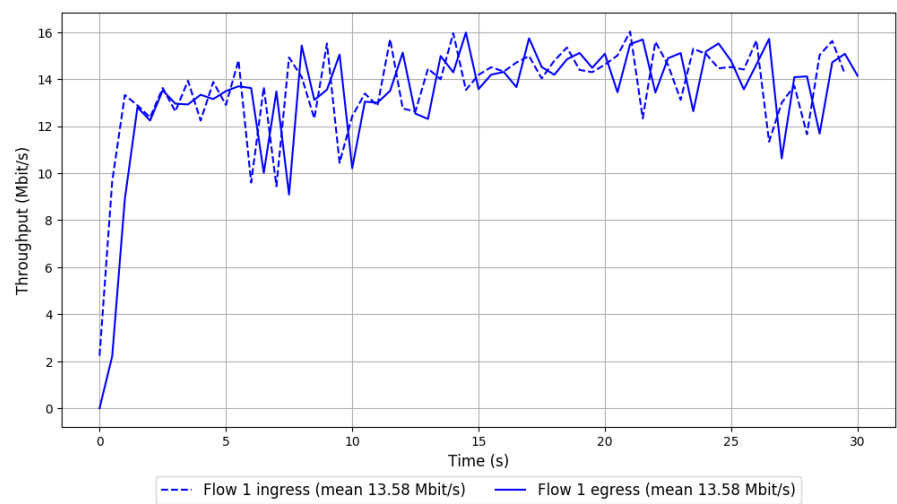
-- Flow 1:

Average throughput: 13.58 Mbit/s

95th percentile per-packet one-way delay: 54.278 ms

Loss rate: 0.15%

Run 1: Report of Sprout — Data Link

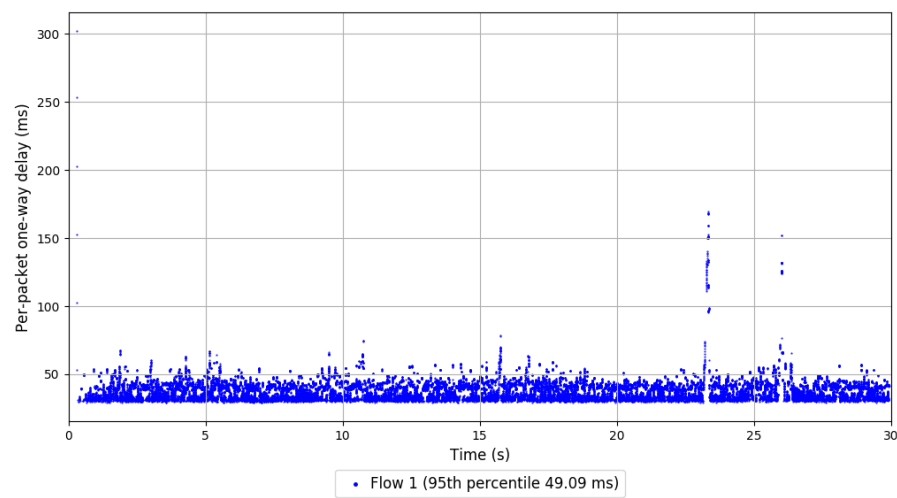
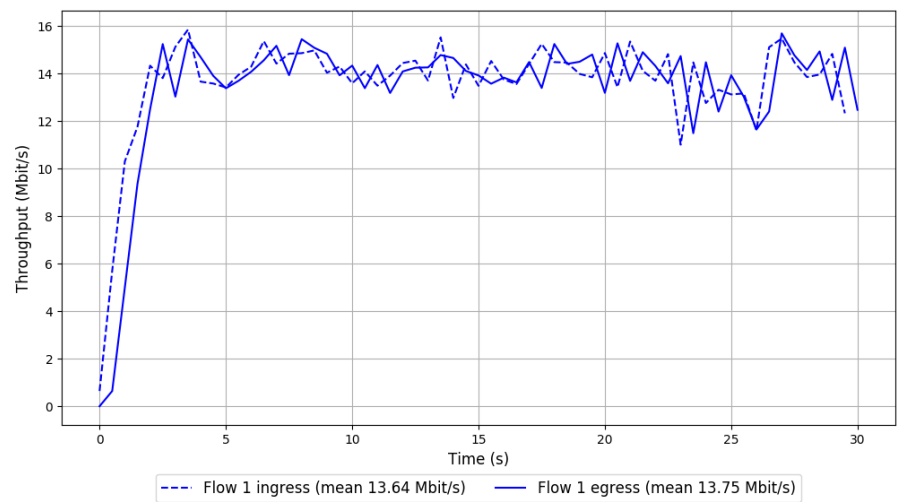


Run 2: Statistics of Sprout

Start at: 2019-01-17 05:44:23
End at: 2019-01-17 05:44:53
Local clock offset: 3.702 ms
Remote clock offset: -0.744 ms

Below is generated by plot.py at 2019-01-17 06:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.75 Mbit/s
95th percentile per-packet one-way delay: 49.087 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 13.75 Mbit/s
95th percentile per-packet one-way delay: 49.087 ms
Loss rate: 0.15%

Run 2: Report of Sprout — Data Link

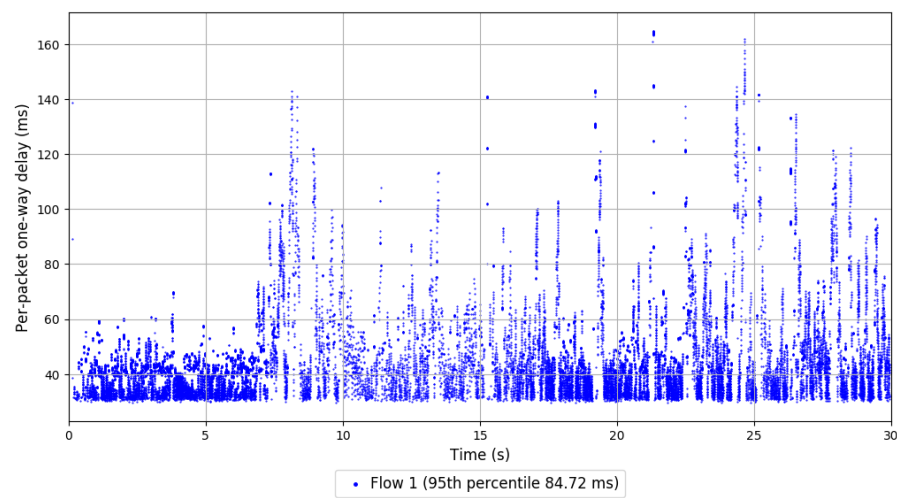
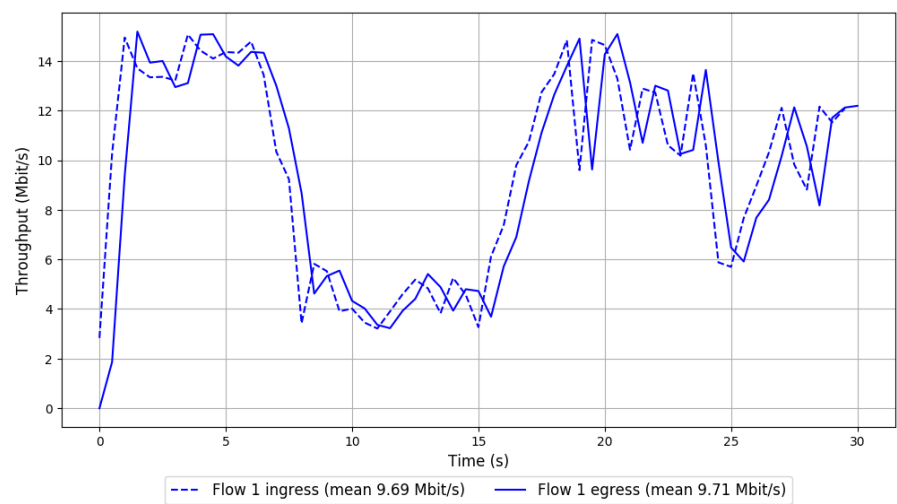


Run 3: Statistics of Sprout

Start at: 2019-01-17 06:10:05
End at: 2019-01-17 06:10:35
Local clock offset: 3.578 ms
Remote clock offset: -1.341 ms

Below is generated by plot.py at 2019-01-17 06:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.71 Mbit/s
95th percentile per-packet one-way delay: 84.717 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 9.71 Mbit/s
95th percentile per-packet one-way delay: 84.717 ms
Loss rate: 0.16%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-01-17 05:33:22

End at: 2019-01-17 05:33:52

Local clock offset: 2.044 ms

Remote clock offset: 1.202 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.00 Mbit/s

95th percentile per-packet one-way delay: 40.328 ms

Loss rate: 39.34%

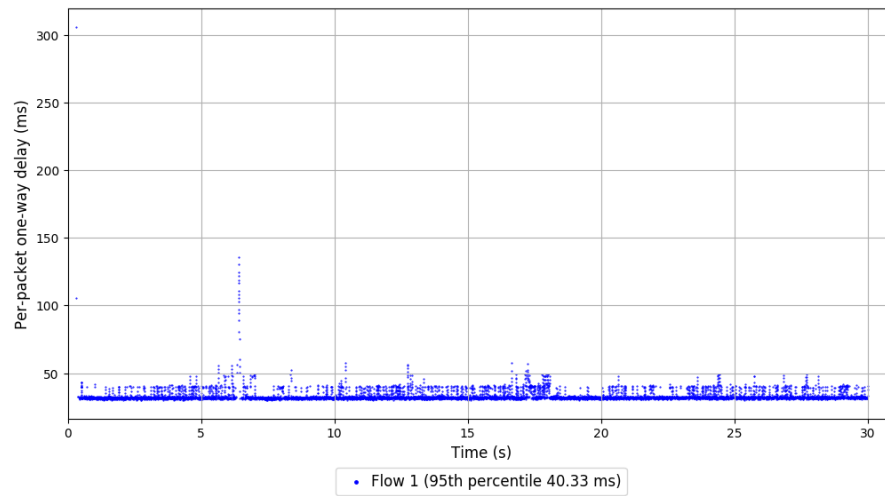
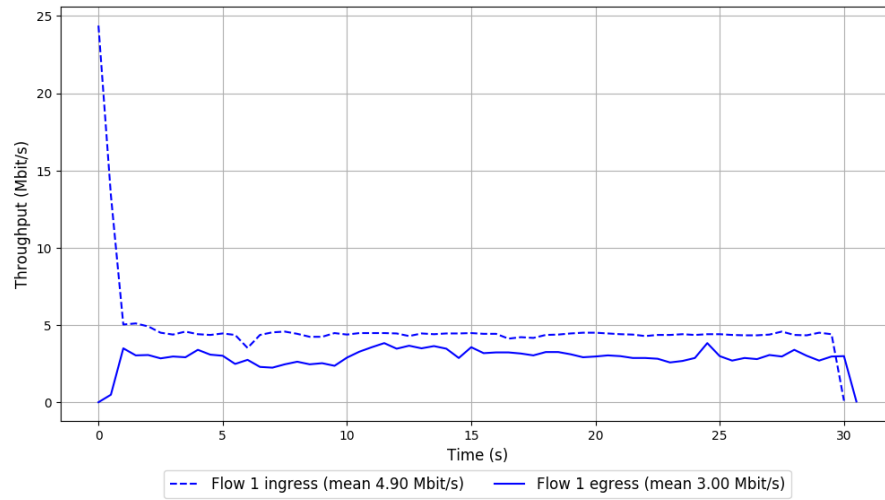
-- Flow 1:

Average throughput: 3.00 Mbit/s

95th percentile per-packet one-way delay: 40.328 ms

Loss rate: 39.34%

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-01-17 05:59:04

End at: 2019-01-17 05:59:34

Local clock offset: 3.587 ms

Remote clock offset: -2.143 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.49 Mbit/s

95th percentile per-packet one-way delay: 40.665 ms

Loss rate: 24.52%

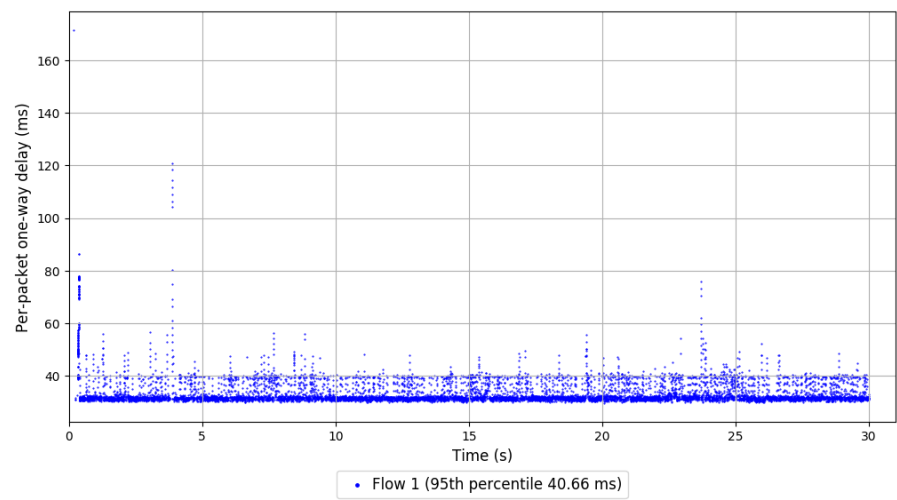
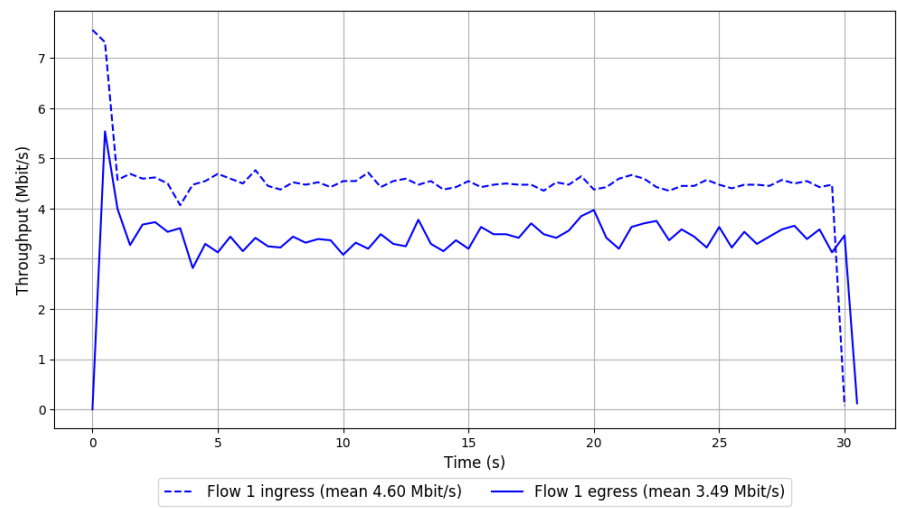
-- Flow 1:

Average throughput: 3.49 Mbit/s

95th percentile per-packet one-way delay: 40.665 ms

Loss rate: 24.52%

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



Run 3: Statistics of TaoVA-100x

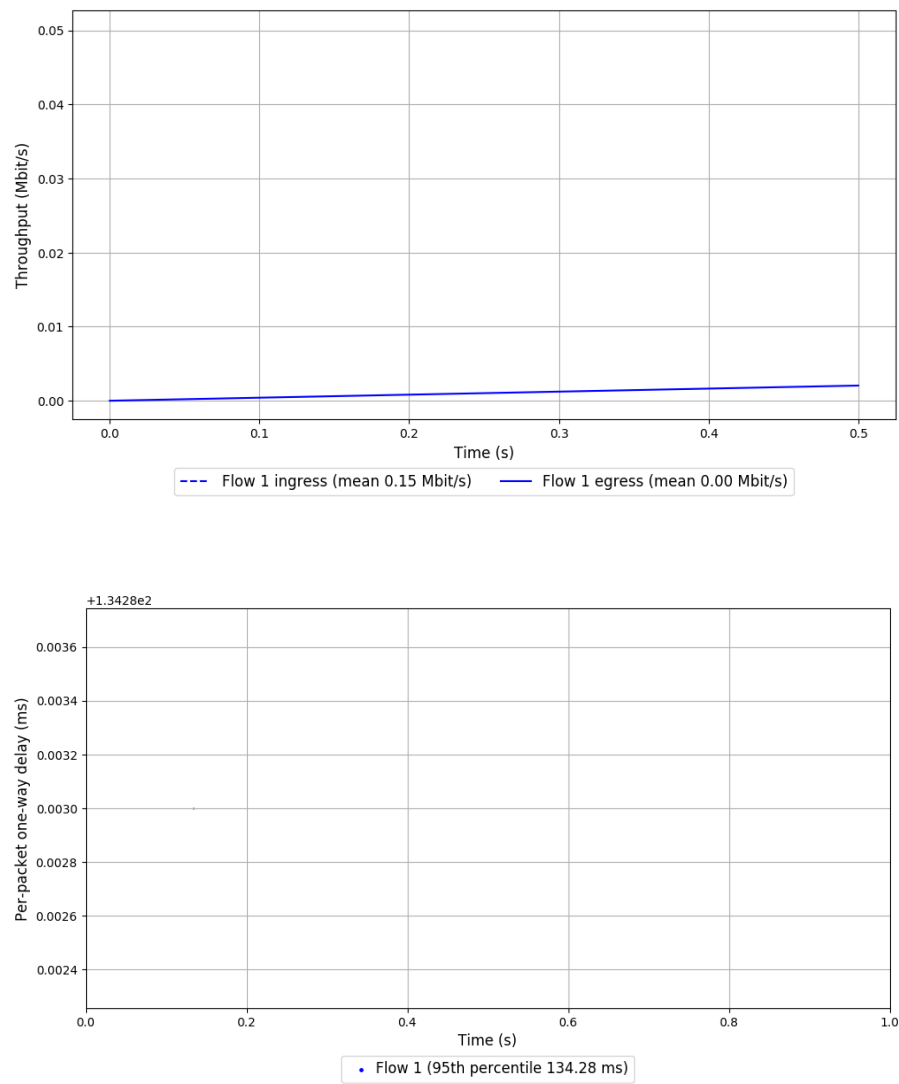
Start at: 2019-01-17 06:24:46

End at: 2019-01-17 06:25:16

Local clock offset: 2.069 ms

Remote clock offset: -1.067 ms

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



Run 1: Statistics of TCP Vegas

Start at: 2019-01-17 05:32:09

End at: 2019-01-17 05:32:39

Local clock offset: 1.74 ms

Remote clock offset: 1.369 ms

Below is generated by plot.py at 2019-01-17 06:29:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 15.12 Mbit/s

95th percentile per-packet one-way delay: 61.537 ms

Loss rate: 0.02%

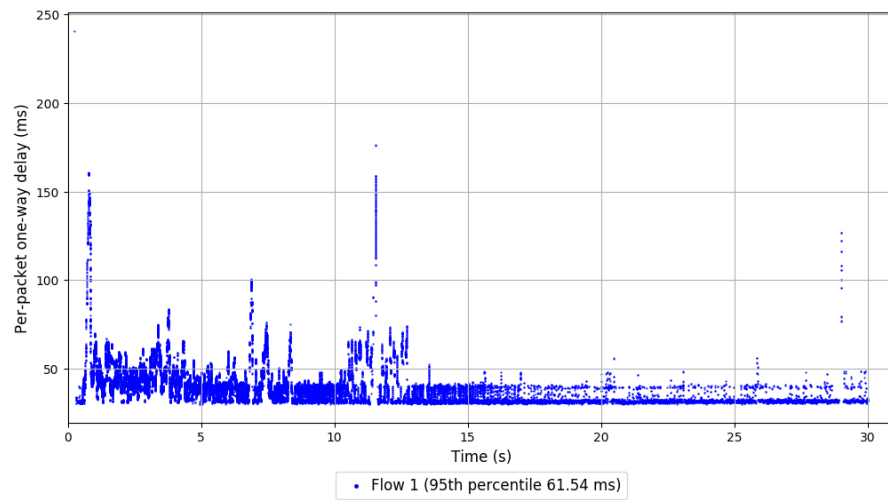
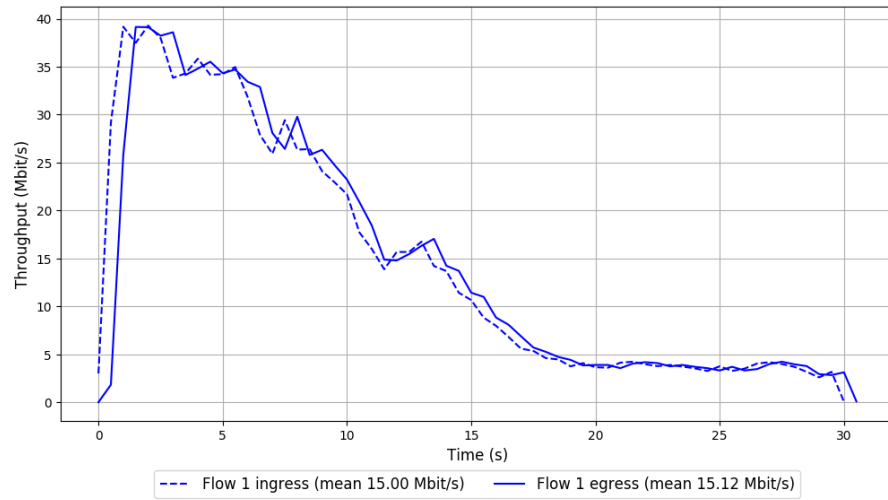
-- Flow 1:

Average throughput: 15.12 Mbit/s

95th percentile per-packet one-way delay: 61.537 ms

Loss rate: 0.02%

Run 1: Report of TCP Vegas — Data Link

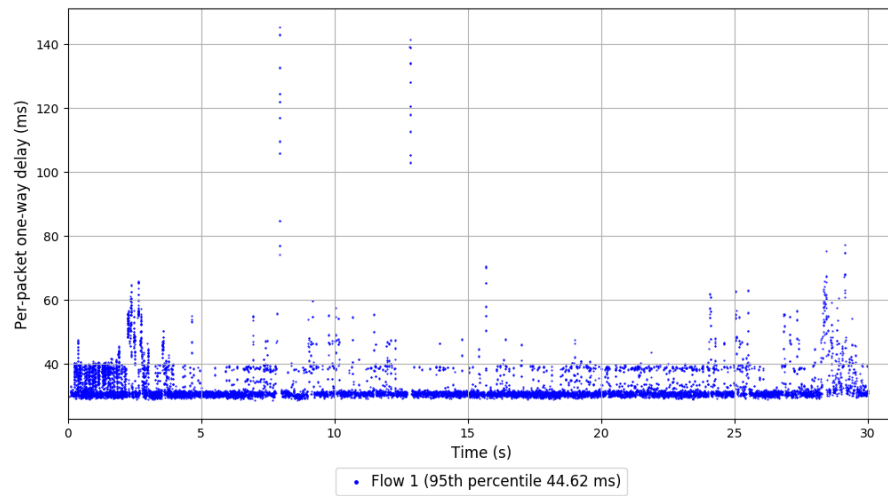
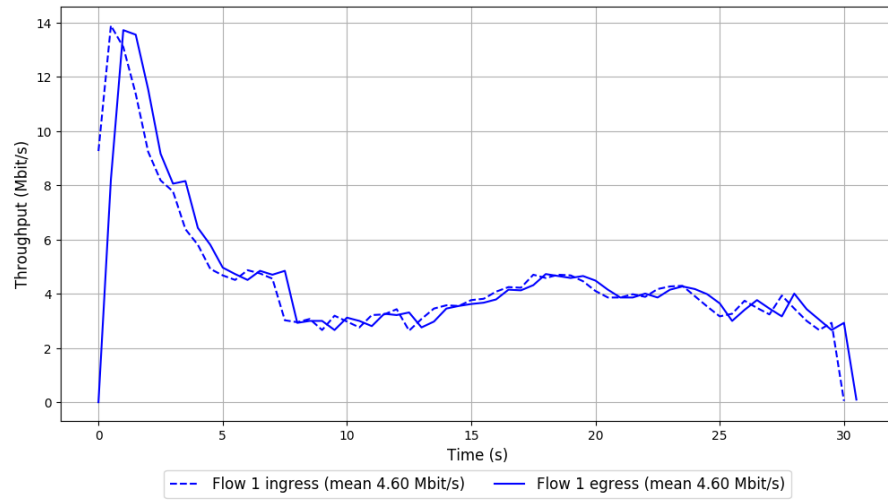


Run 2: Statistics of TCP Vegas

Start at: 2019-01-17 05:57:51
End at: 2019-01-17 05:58:21
Local clock offset: 3.63 ms
Remote clock offset: -2.098 ms

Below is generated by plot.py at 2019-01-17 06:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.60 Mbit/s
95th percentile per-packet one-way delay: 44.616 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 4.60 Mbit/s
95th percentile per-packet one-way delay: 44.616 ms
Loss rate: 0.05%

Run 2: Report of TCP Vegas — Data Link

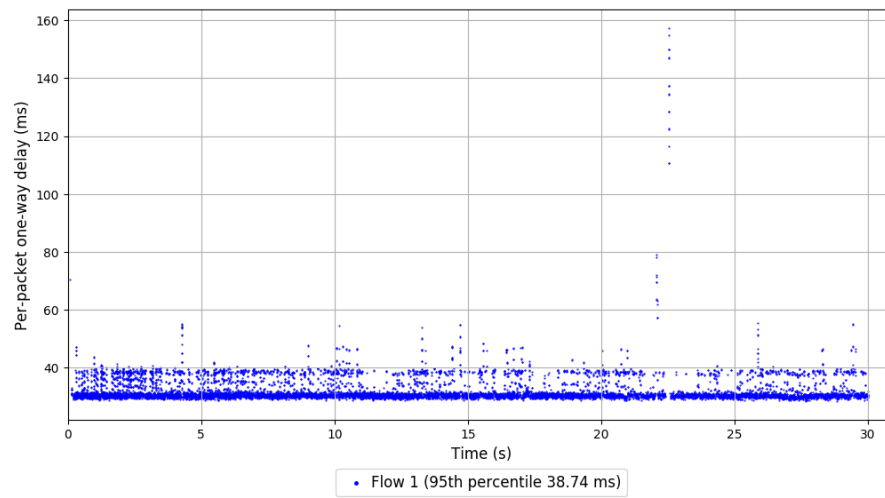
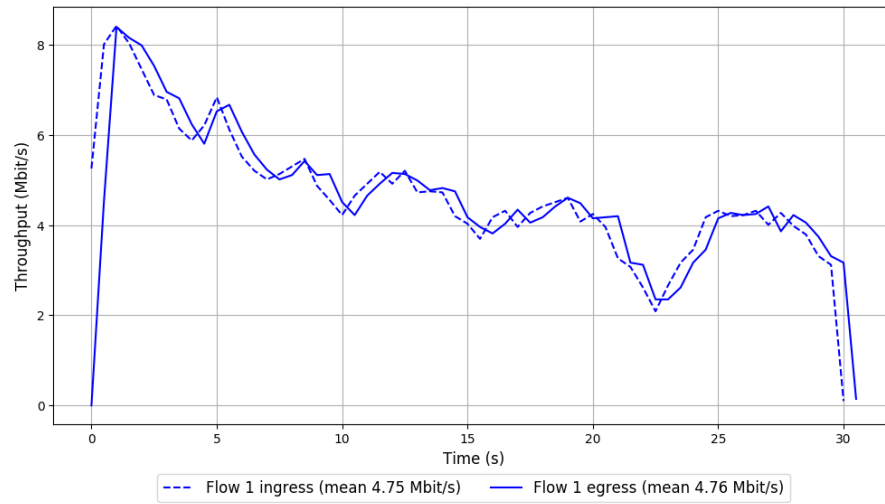


Run 3: Statistics of TCP Vegas

Start at: 2019-01-17 06:23:33
End at: 2019-01-17 06:24:03
Local clock offset: 2.483 ms
Remote clock offset: -1.069 ms

Below is generated by plot.py at 2019-01-17 06:29:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.76 Mbit/s
95th percentile per-packet one-way delay: 38.738 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 4.76 Mbit/s
95th percentile per-packet one-way delay: 38.738 ms
Loss rate: 0.07%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-01-17 05:23:35

End at: 2019-01-17 05:24:05

Local clock offset: -1.725 ms

Remote clock offset: 2.977 ms

Below is generated by plot.py at 2019-01-17 06:29:57

Datalink statistics

-- Total of 1 flow:

Average throughput: 29.34 Mbit/s

95th percentile per-packet one-way delay: 352.517 ms

Loss rate: 1.80%

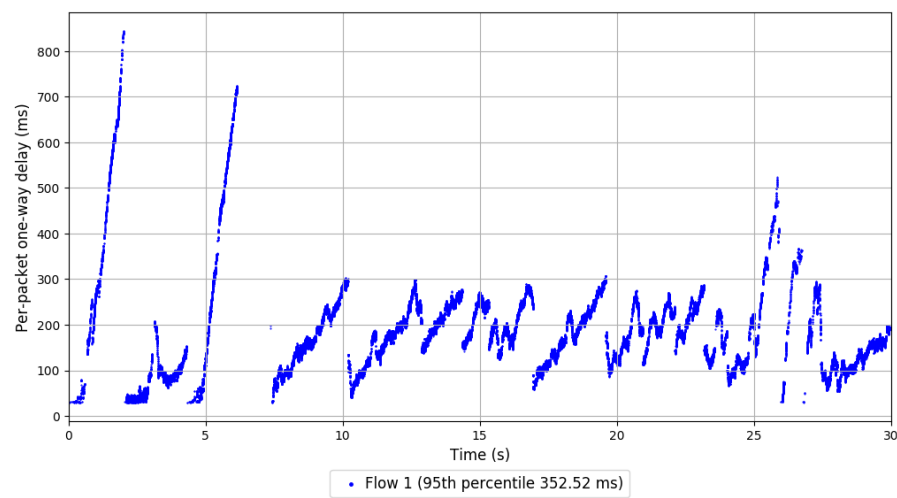
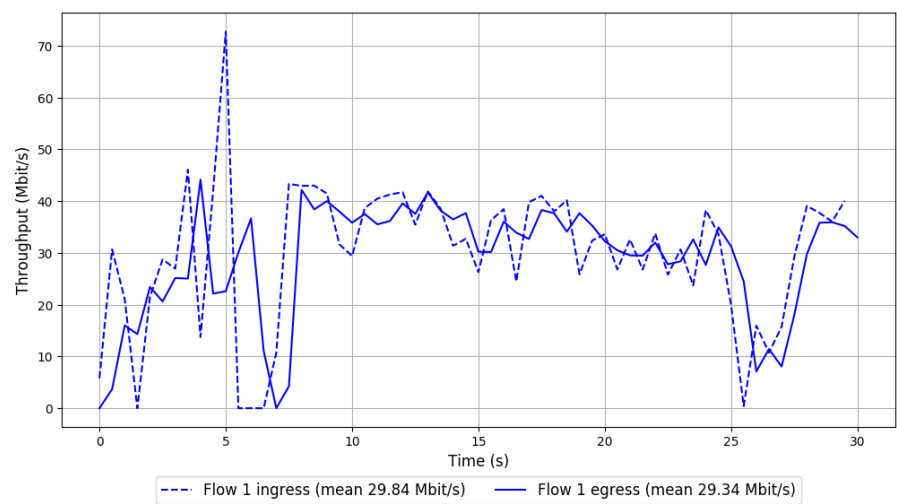
-- Flow 1:

Average throughput: 29.34 Mbit/s

95th percentile per-packet one-way delay: 352.517 ms

Loss rate: 1.80%

Run 1: Report of Verus — Data Link

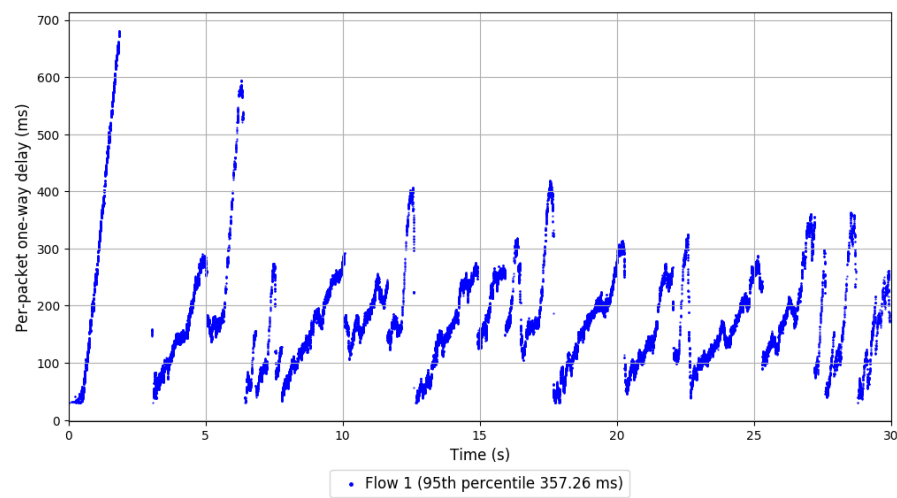
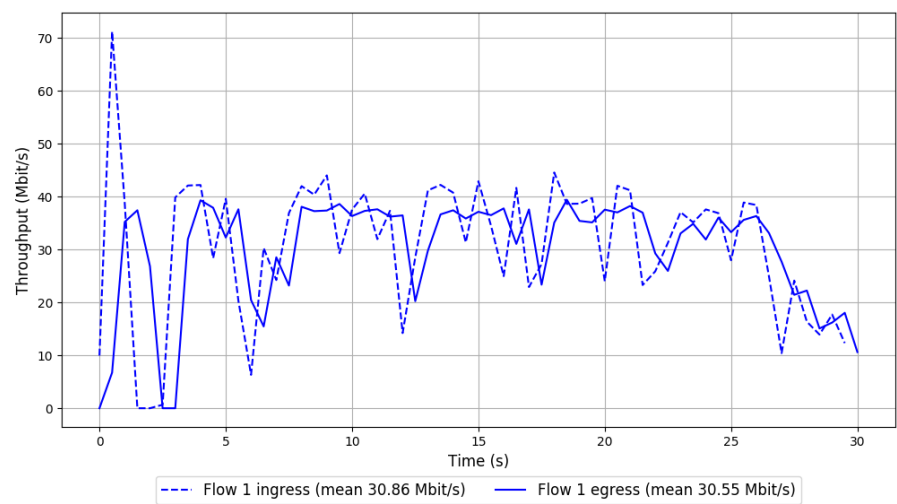


Run 2: Statistics of Verus

Start at: 2019-01-17 05:49:17
End at: 2019-01-17 05:49:47
Local clock offset: 4.13 ms
Remote clock offset: -1.344 ms

Below is generated by plot.py at 2019-01-17 06:29:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 30.55 Mbit/s
95th percentile per-packet one-way delay: 357.265 ms
Loss rate: 1.10%
-- Flow 1:
Average throughput: 30.55 Mbit/s
95th percentile per-packet one-way delay: 357.265 ms
Loss rate: 1.10%

Run 2: Report of Verus — Data Link

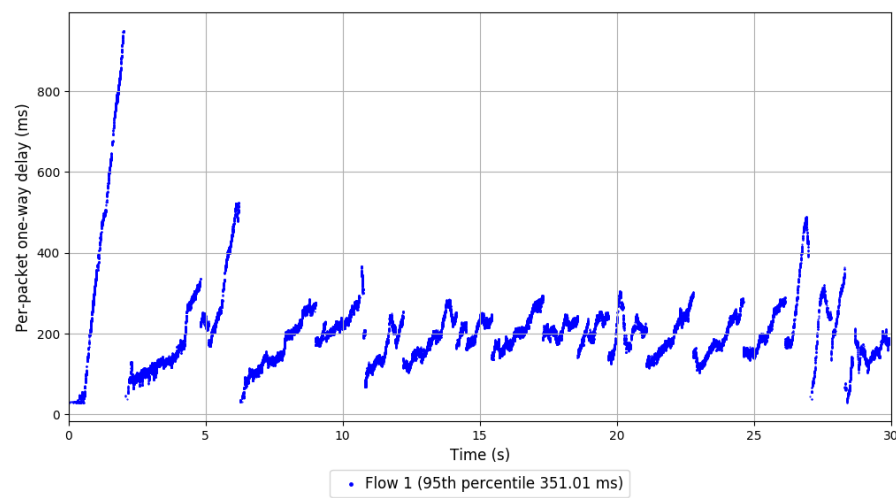
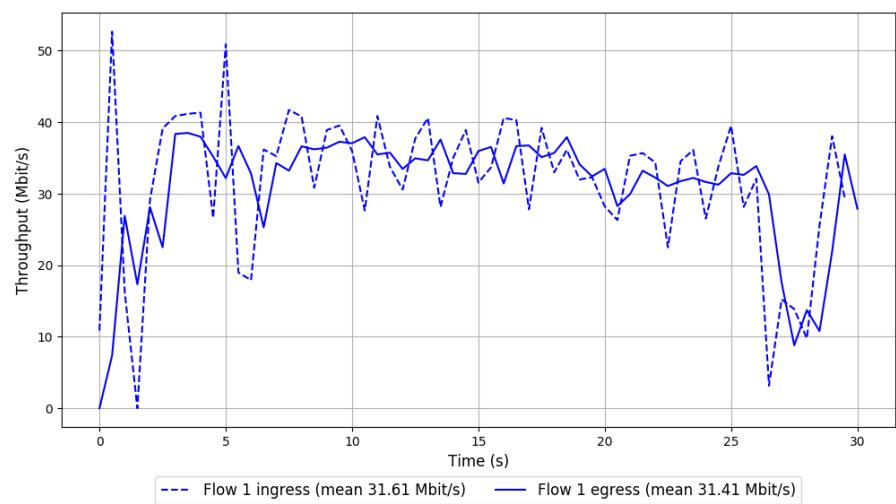


Run 3: Statistics of Verus

Start at: 2019-01-17 06:14:59
End at: 2019-01-17 06:15:29
Local clock offset: 3.689 ms
Remote clock offset: -1.076 ms

Below is generated by plot.py at 2019-01-17 06:29:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 31.41 Mbit/s
95th percentile per-packet one-way delay: 351.007 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 31.41 Mbit/s
95th percentile per-packet one-way delay: 351.007 ms
Loss rate: 0.74%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-01-17 05:34:35

End at: 2019-01-17 05:35:05

Local clock offset: 2.322 ms

Remote clock offset: 0.827 ms

Below is generated by plot.py at 2019-01-17 06:29:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.72 Mbit/s

95th percentile per-packet one-way delay: 38.304 ms

Loss rate: 0.07%

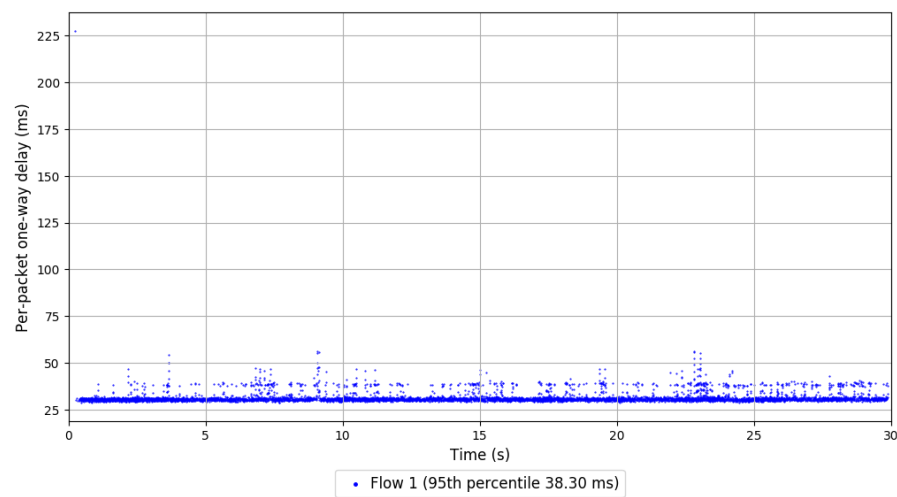
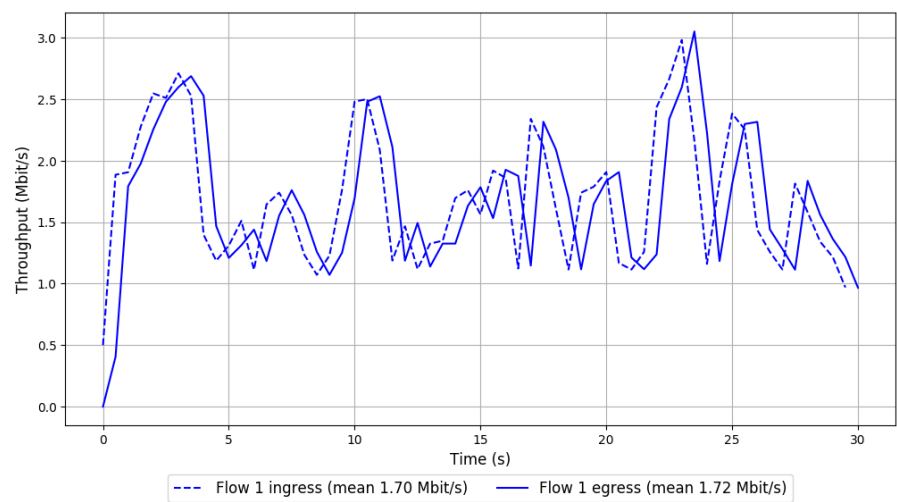
-- Flow 1:

Average throughput: 1.72 Mbit/s

95th percentile per-packet one-way delay: 38.304 ms

Loss rate: 0.07%

Run 1: Report of PCC-Vivace — Data Link

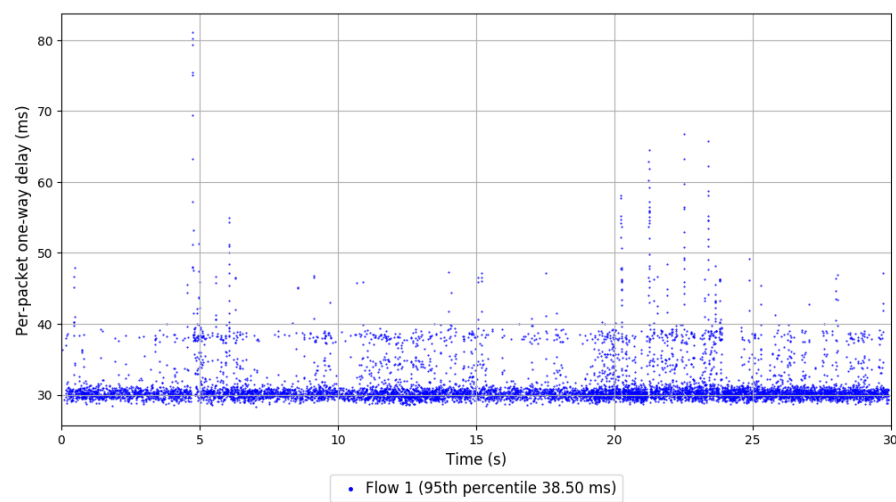
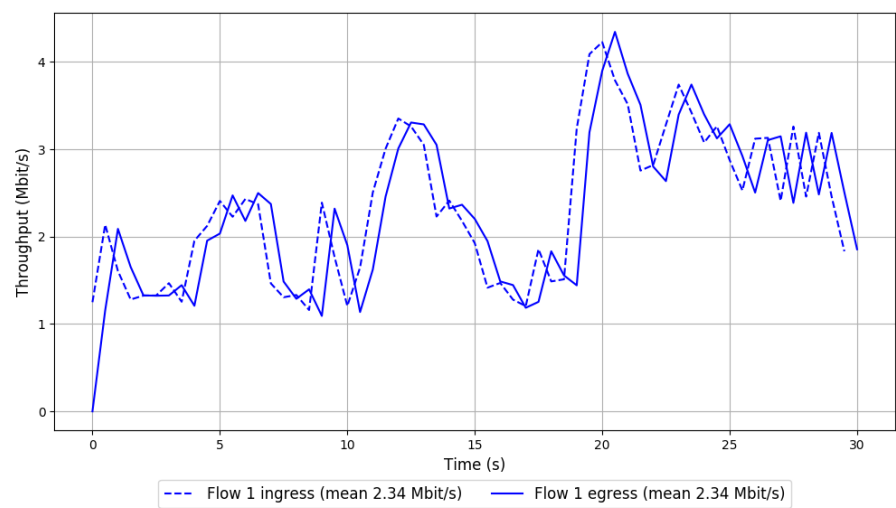


Run 2: Statistics of PCC-Vivace

Start at: 2019-01-17 06:00:17
End at: 2019-01-17 06:00:47
Local clock offset: 3.578 ms
Remote clock offset: -2.294 ms

Below is generated by plot.py at 2019-01-17 06:29:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 38.504 ms
Loss rate: 0.10%
-- Flow 1:
Average throughput: 2.34 Mbit/s
95th percentile per-packet one-way delay: 38.504 ms
Loss rate: 0.10%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-01-17 06:25:58

End at: 2019-01-17 06:26:28

Local clock offset: 1.74 ms

Remote clock offset: -1.228 ms

Below is generated by plot.py at 2019-01-17 06:29:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.15 Mbit/s

95th percentile per-packet one-way delay: 38.648 ms

Loss rate: 0.16%

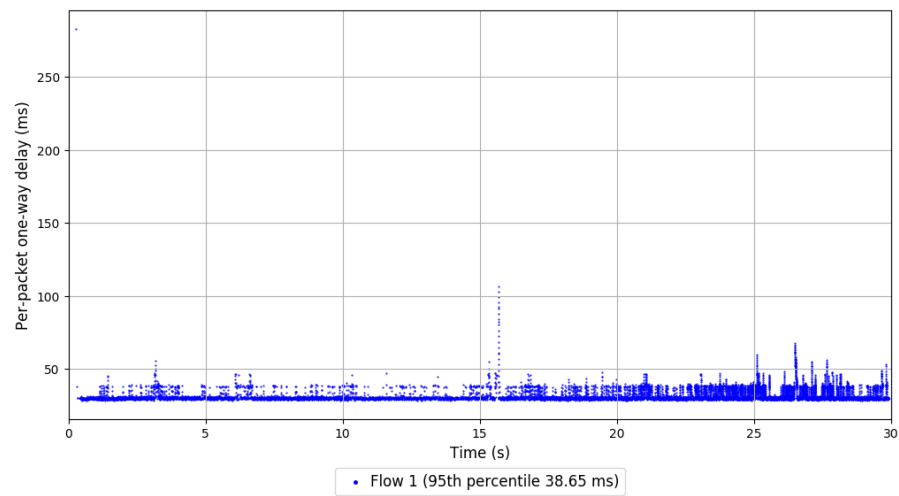
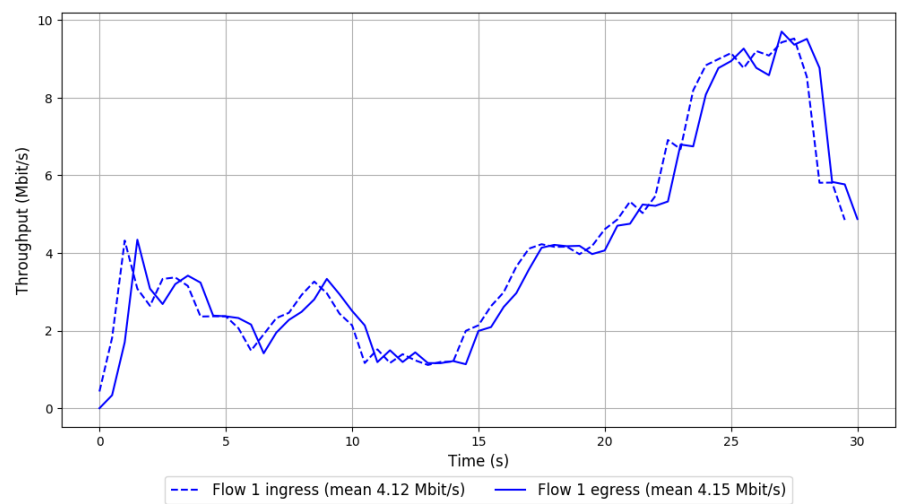
-- Flow 1:

Average throughput: 4.15 Mbit/s

95th percentile per-packet one-way delay: 38.648 ms

Loss rate: 0.16%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-01-17 05:29:43

End at: 2019-01-17 05:30:13

Local clock offset: 1.103 ms

Remote clock offset: 2.385 ms

Below is generated by plot.py at 2019-01-17 06:29:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 40.900 ms

Loss rate: 0.00%

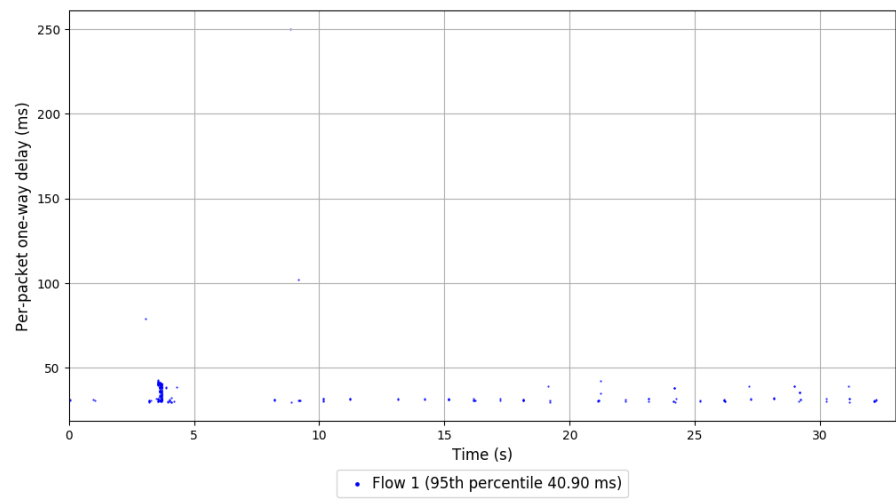
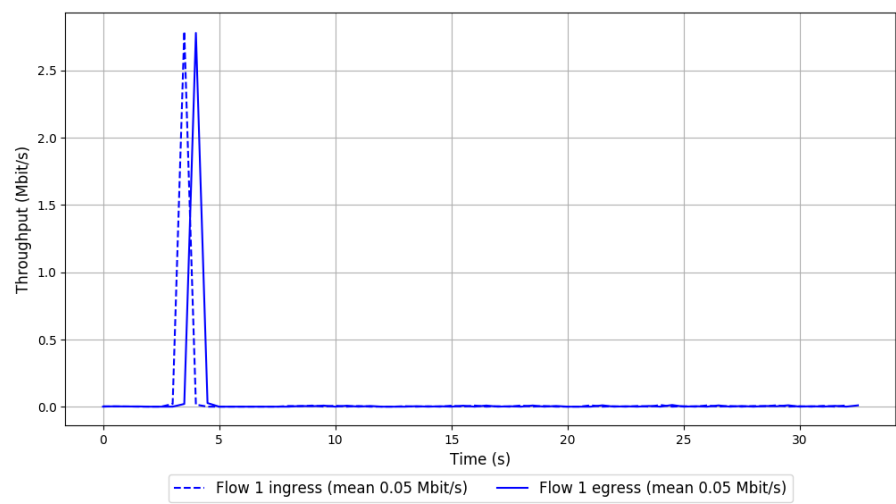
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 40.900 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

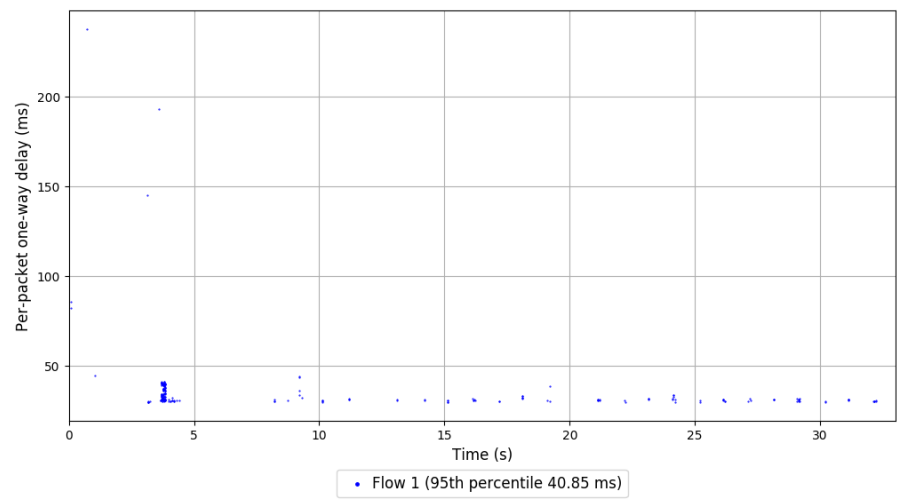
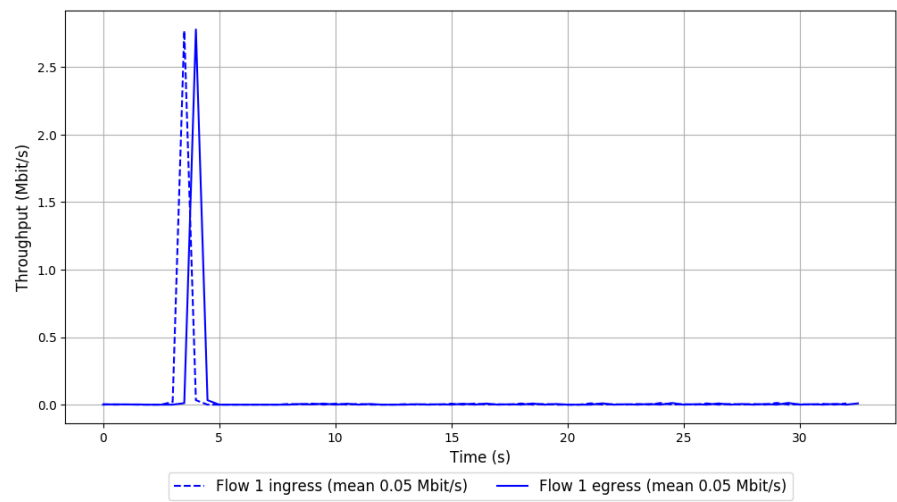


Run 2: Statistics of WebRTC media

Start at: 2019-01-17 05:55:25
End at: 2019-01-17 05:55:55
Local clock offset: 3.749 ms
Remote clock offset: -1.864 ms

Below is generated by plot.py at 2019-01-17 06:29:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 40.848 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 40.848 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-17 06:21:07

End at: 2019-01-17 06:21:37

Local clock offset: 3.368 ms

Remote clock offset: -1.01 ms

Below is generated by plot.py at 2019-01-17 06:29:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 52.477 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 52.477 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

