

Pantheon Report

Generated at 2019-01-02 19:22:24 (UTC).

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

Repeated the test of 19 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `time.stanford.edu` and have been applied to correct the timestamps in logs.

System info:

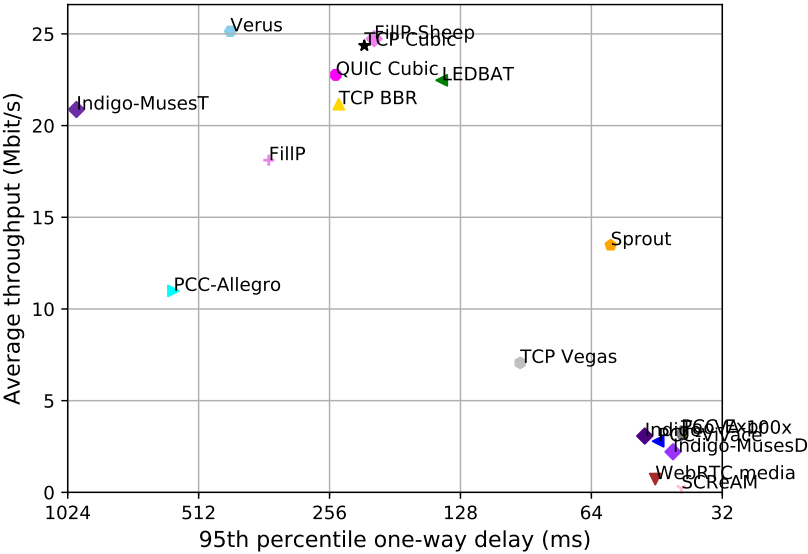
```
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

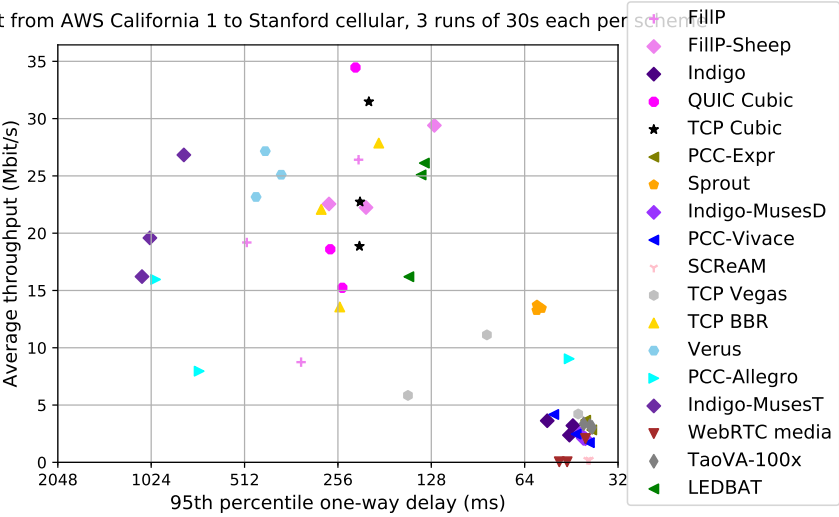
```
branch: muses @ c654af0b7d59d4ef4b914cfac404e1fc2e96dc68
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
third_party/muses-refactored @ 31f8f0ba8ef8b1da76c2bc0cd0a7850c33ff64fb
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
```

```
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from AWS 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



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	21.17	243.79	0.37
Copa	0	N/A	N/A	N/A
TCP Cubic	3	24.36	212.96	0.30
FillP	3	18.12	353.20	0.82
FillP-Sheep	3	24.73	202.16	0.17
Indigo	3	3.07	48.25	0.10
Indigo-MusesD	3	2.21	41.55	0.10
Indigo-MusesT	3	20.88	977.87	59.86
LEDBAT	3	22.47	141.36	0.34
PCC-Allegro	3	10.99	584.86	0.73
PCC-Expr	2	3.25	39.79	41.55
QUIC Cubic	3	22.76	247.84	0.64
SCReAM	3	0.22	39.76	0.13
Sprout	3	13.48	57.80	0.14
TaoVA-100x	3	3.20	39.84	30.02
TCP Vegas	3	7.06	93.31	0.08
Verus	3	25.14	432.97	1.27
PCC-Vivace	3	2.79	44.95	0.17
WebRTC media	3	0.72	45.64	0.04

Run 1: Statistics of TCP BBR

Start at: 2019-01-02 18:27:33

End at: 2019-01-02 18:28:04

Local clock offset: 12.67 ms

Remote clock offset: -0.937 ms

Below is generated by plot.py at 2019-01-02 19:21:02

Datalink statistics

-- Total of 1 flow:

Average throughput: 13.56 Mbit/s

95th percentile per-packet one-way delay: 252.540 ms

Loss rate: 0.46%

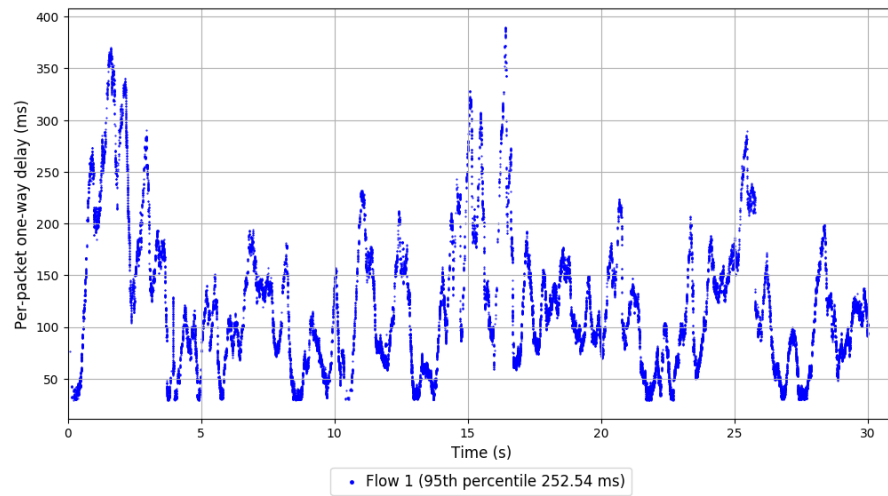
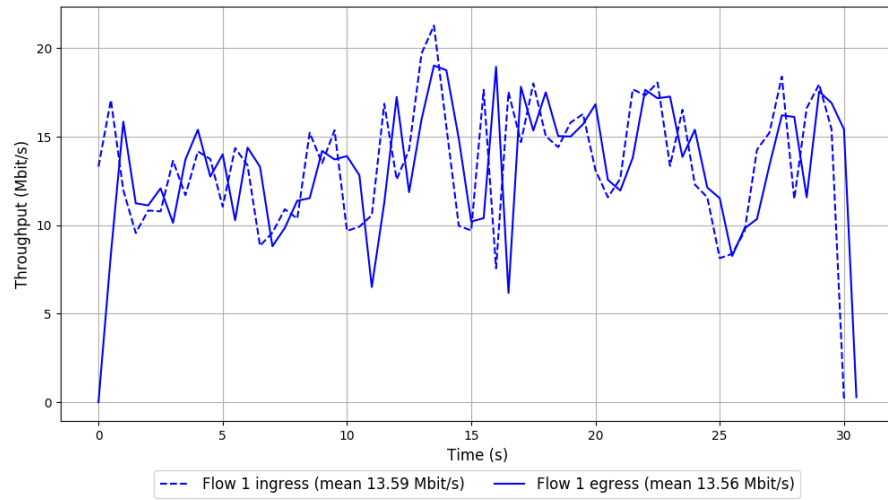
-- Flow 1:

Average throughput: 13.56 Mbit/s

95th percentile per-packet one-way delay: 252.540 ms

Loss rate: 0.46%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-01-02 18:50:51

End at: 2019-01-02 18:51:21

Local clock offset: 10.772 ms

Remote clock offset: -4.05 ms

Below is generated by plot.py at 2019-01-02 19:21:10

Datalink statistics

-- Total of 1 flow:

Average throughput: 22.08 Mbit/s

95th percentile per-packet one-way delay: 289.783 ms

Loss rate: 0.39%

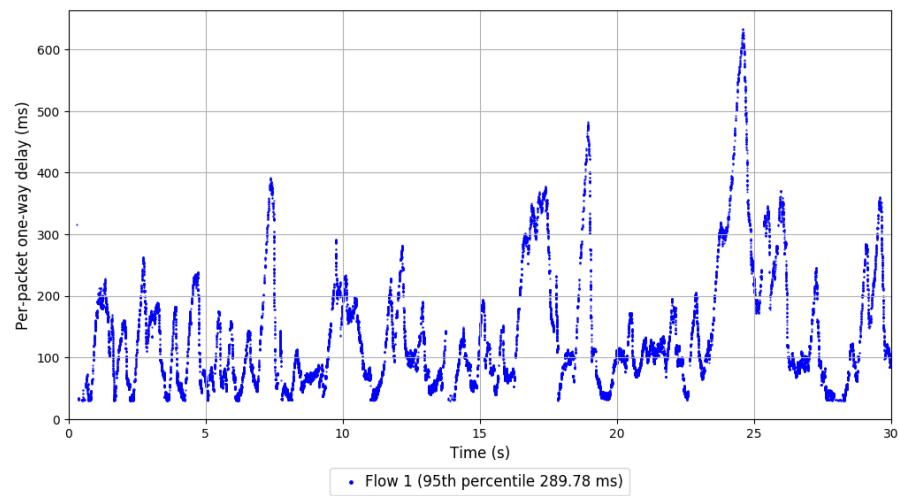
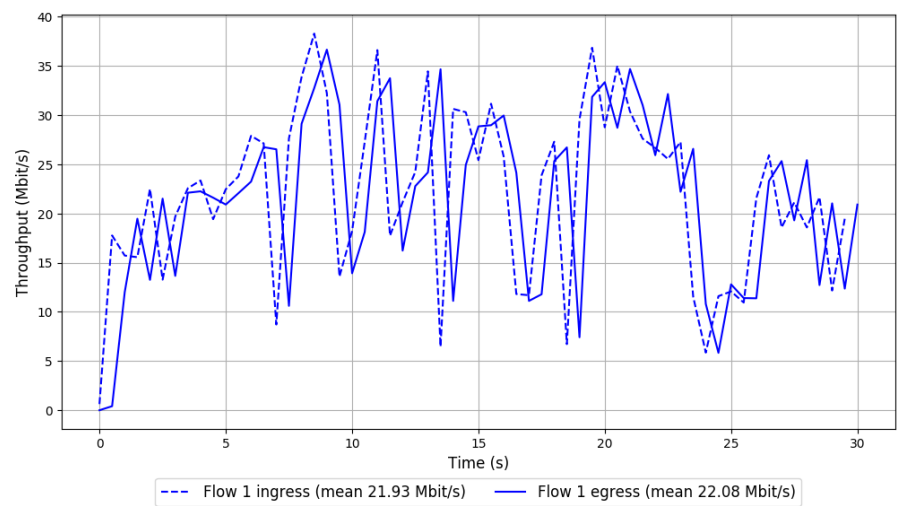
-- Flow 1:

Average throughput: 22.08 Mbit/s

95th percentile per-packet one-way delay: 289.783 ms

Loss rate: 0.39%

Run 2: Report of TCP BBR — Data Link

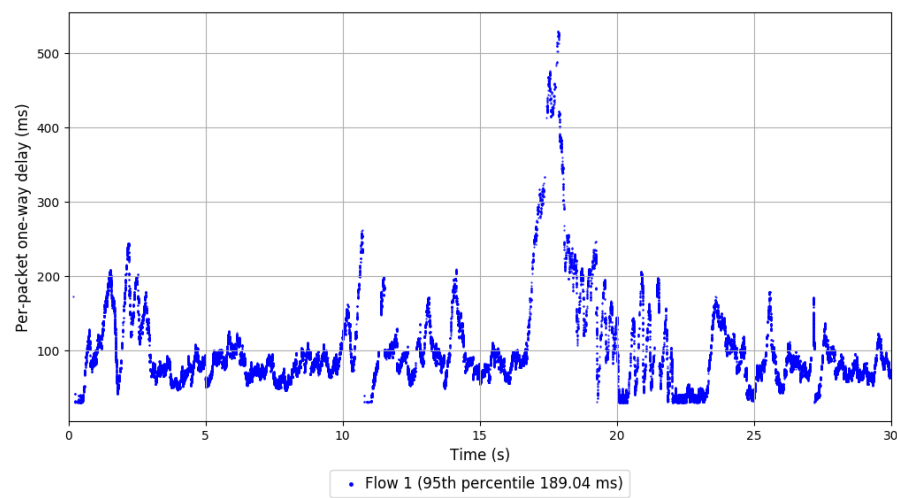
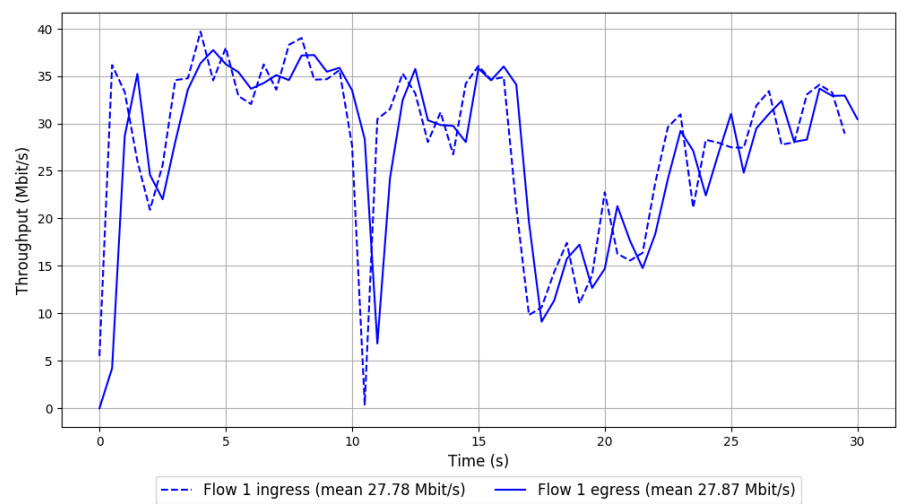


Run 3: Statistics of TCP BBR

Start at: 2019-01-02 19:14:04
End at: 2019-01-02 19:14:34
Local clock offset: 5.454 ms
Remote clock offset: -5.067 ms

Below is generated by plot.py at 2019-01-02 19:21:16
Datalink statistics
-- Total of 1 flow:
Average throughput: 27.87 Mbit/s
95th percentile per-packet one-way delay: 189.041 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 27.87 Mbit/s
95th percentile per-packet one-way delay: 189.041 ms
Loss rate: 0.27%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

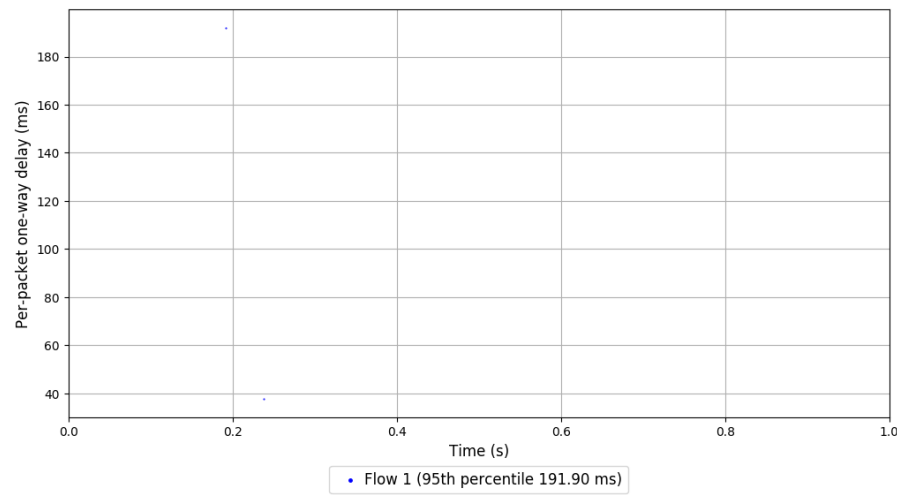
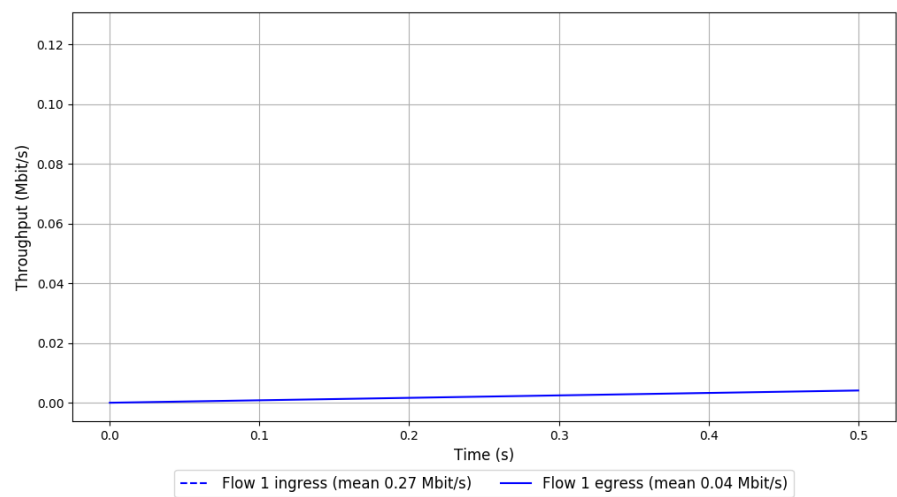
Start at: 2019-01-02 18:30:00

End at: 2019-01-02 18:30:30

Local clock offset: 10.716 ms

Remote clock offset: -1.589 ms

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

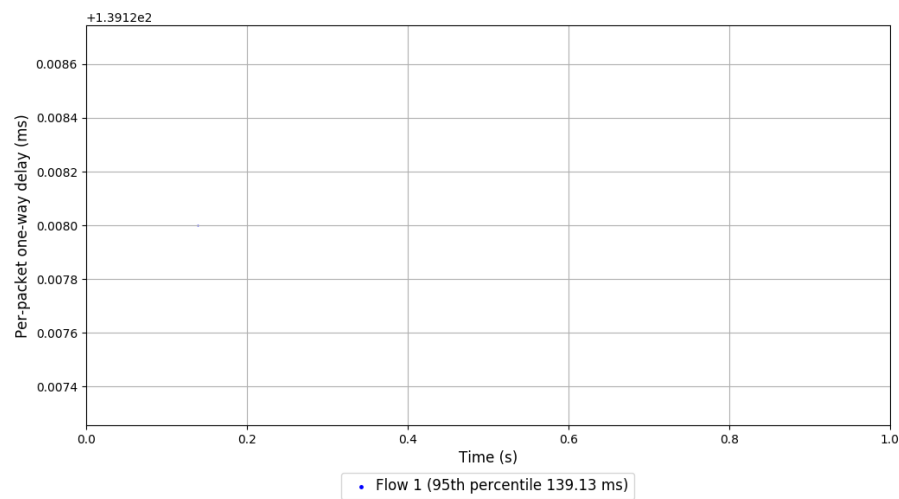
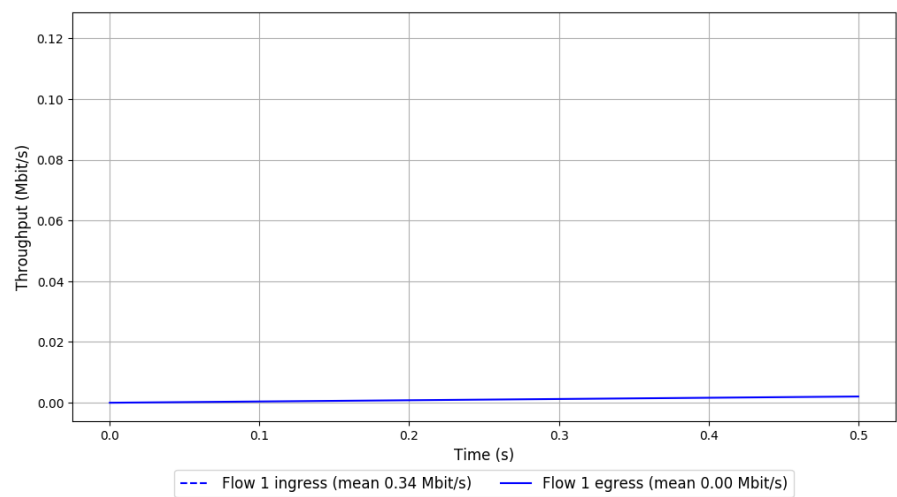
Start at: 2019-01-02 18:53:17

End at: 2019-01-02 18:53:47

Local clock offset: 11.584 ms

Remote clock offset: -4.211 ms

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

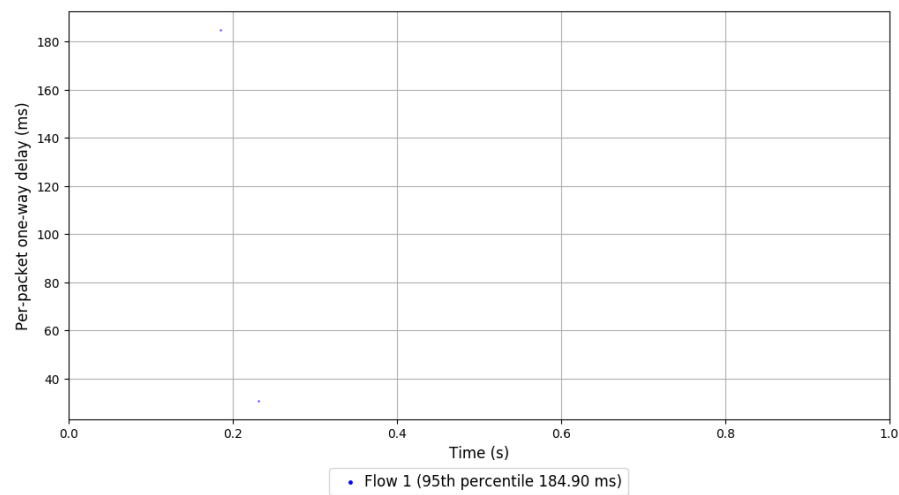
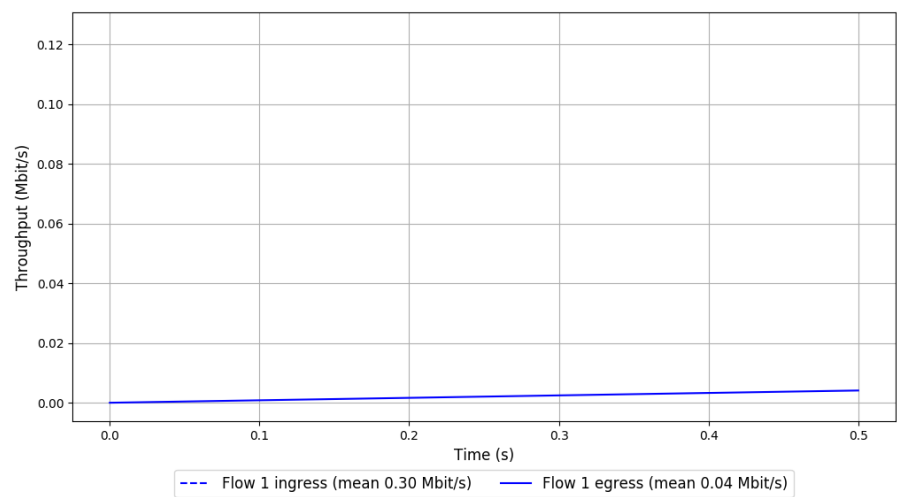
Start at: 2019-01-02 19:16:31

End at: 2019-01-02 19:17:01

Local clock offset: 5.698 ms

Remote clock offset: -5.125 ms

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-01-02 18:21:27

End at: 2019-01-02 18:21:57

Local clock offset: 14.027 ms

Remote clock offset: 0.956 ms

Below is generated by plot.py at 2019-01-02 19:21:16

Datalink statistics

-- Total of 1 flow:

Average throughput: 22.73 Mbit/s

95th percentile per-packet one-way delay: 217.233 ms

Loss rate: 0.21%

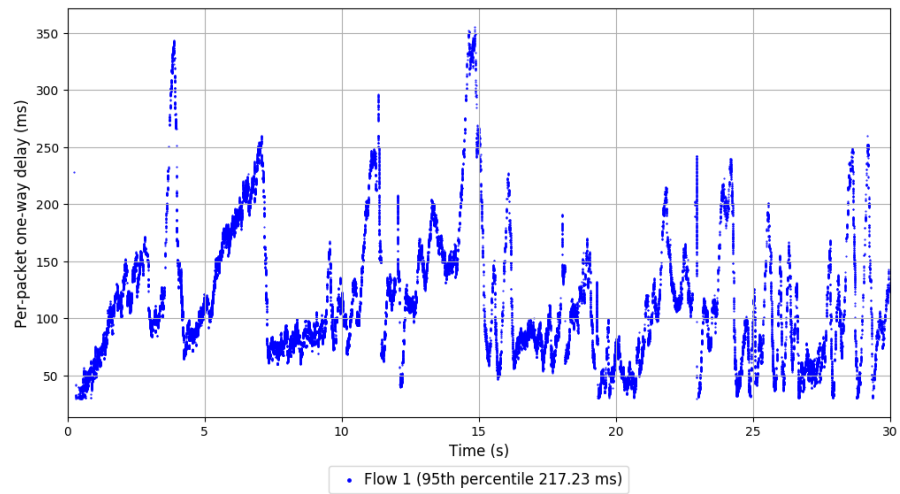
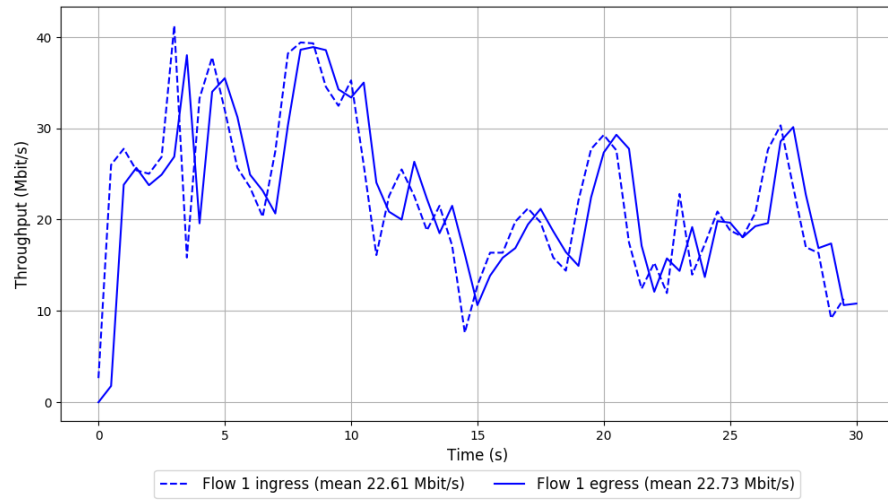
-- Flow 1:

Average throughput: 22.73 Mbit/s

95th percentile per-packet one-way delay: 217.233 ms

Loss rate: 0.21%

Run 1: Report of TCP Cubic — Data Link

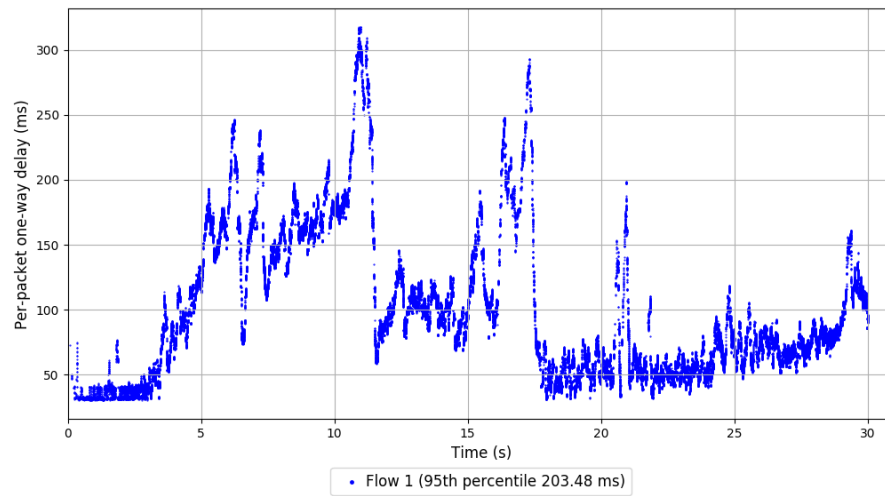
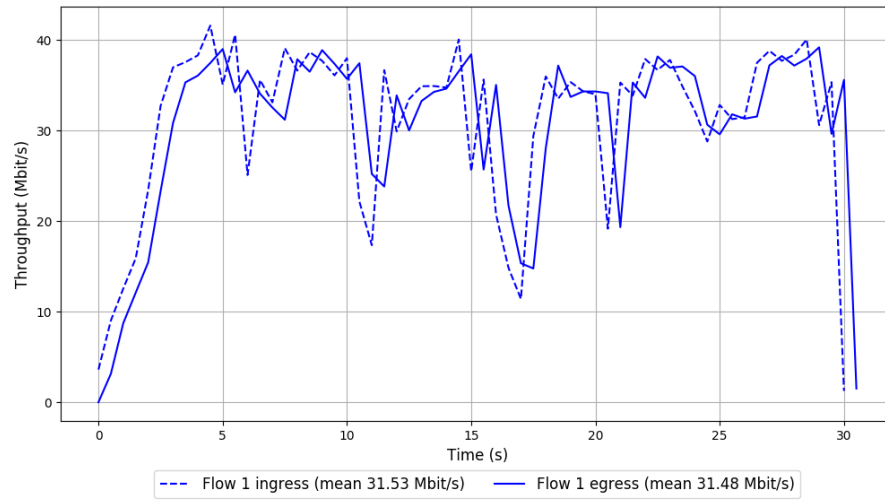


Run 2: Statistics of TCP Cubic

Start at: 2019-01-02 18:44:43
End at: 2019-01-02 18:45:13
Local clock offset: 9.262 ms
Remote clock offset: -3.641 ms

Below is generated by plot.py at 2019-01-02 19:21:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 31.48 Mbit/s
95th percentile per-packet one-way delay: 203.479 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 31.48 Mbit/s
95th percentile per-packet one-way delay: 203.479 ms
Loss rate: 0.41%

Run 2: Report of TCP Cubic — Data Link

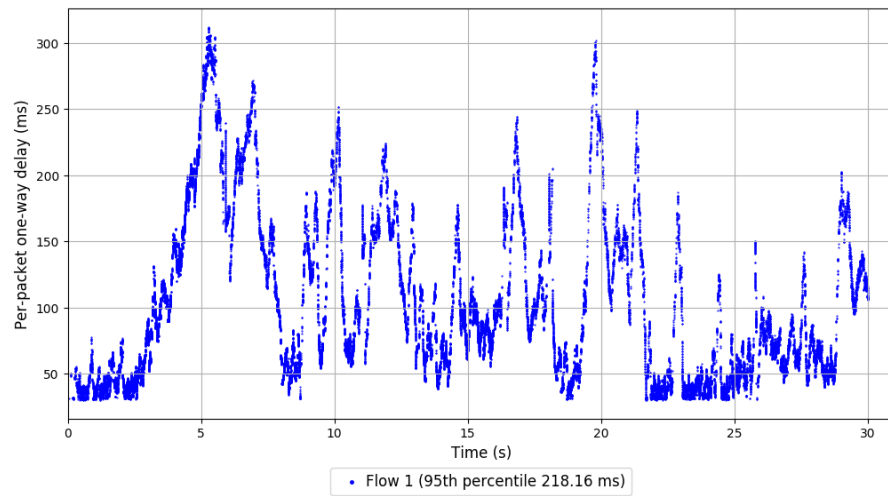
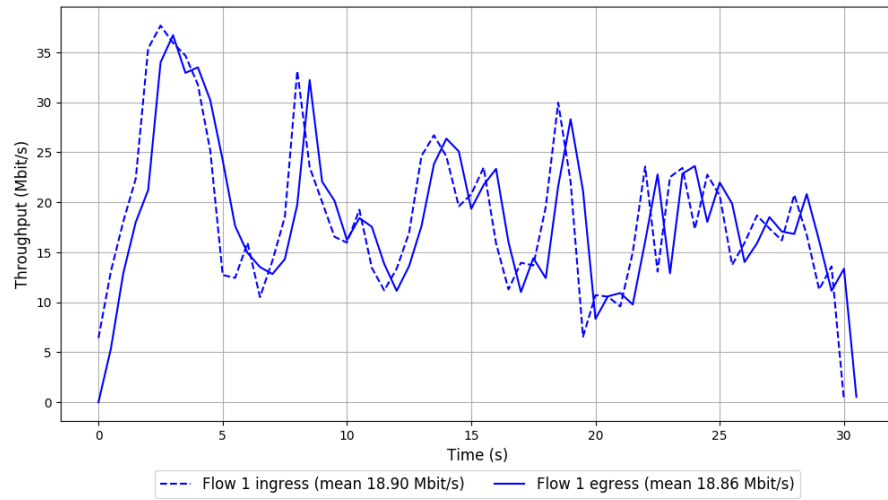


Run 3: Statistics of TCP Cubic

Start at: 2019-01-02 19:07:56
End at: 2019-01-02 19:08:26
Local clock offset: 5.452 ms
Remote clock offset: -4.847 ms

Below is generated by plot.py at 2019-01-02 19:21:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 18.86 Mbit/s
95th percentile per-packet one-way delay: 218.161 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 18.86 Mbit/s
95th percentile per-packet one-way delay: 218.161 ms
Loss rate: 0.27%

Run 3: Report of TCP Cubic — Data Link

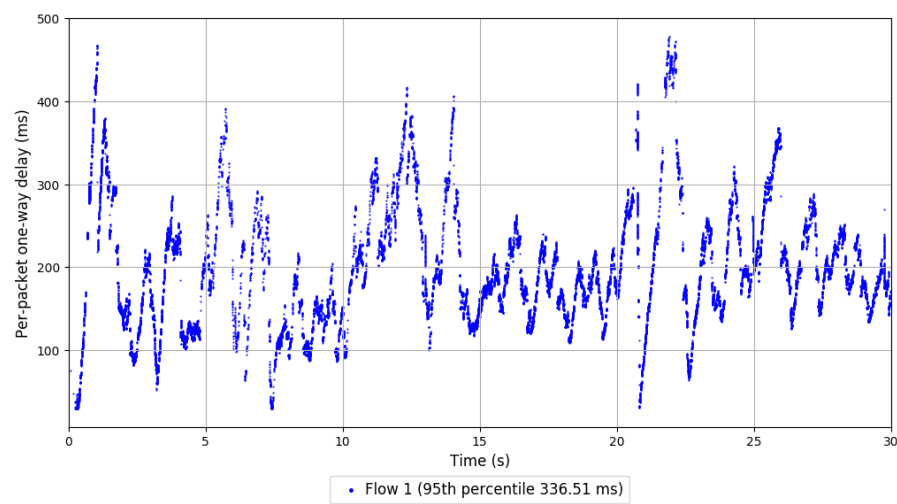
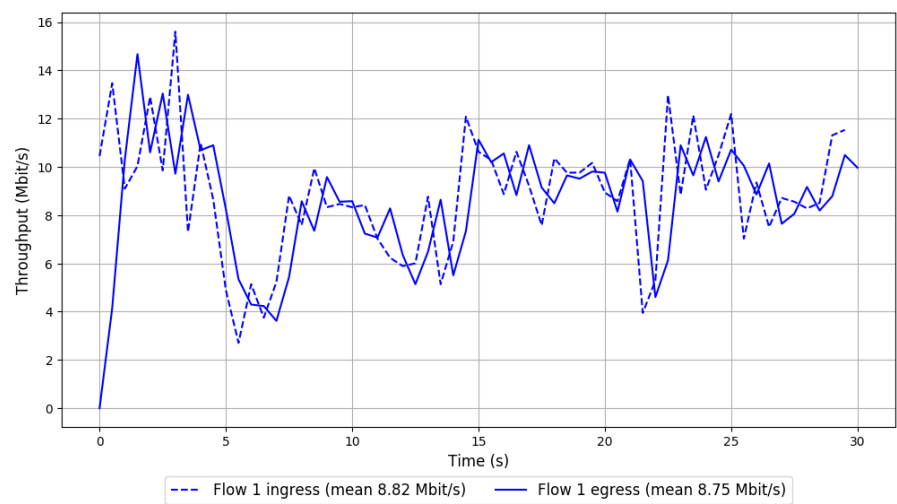


Run 1: Statistics of FillP

Start at: 2019-01-02 18:26:20
End at: 2019-01-02 18:26:50
Local clock offset: 13.866 ms
Remote clock offset: -0.358 ms

Below is generated by plot.py at 2019-01-02 19:21:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.75 Mbit/s
95th percentile per-packet one-way delay: 336.515 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 8.75 Mbit/s
95th percentile per-packet one-way delay: 336.515 ms
Loss rate: 1.15%

Run 1: Report of FillP — Data Link

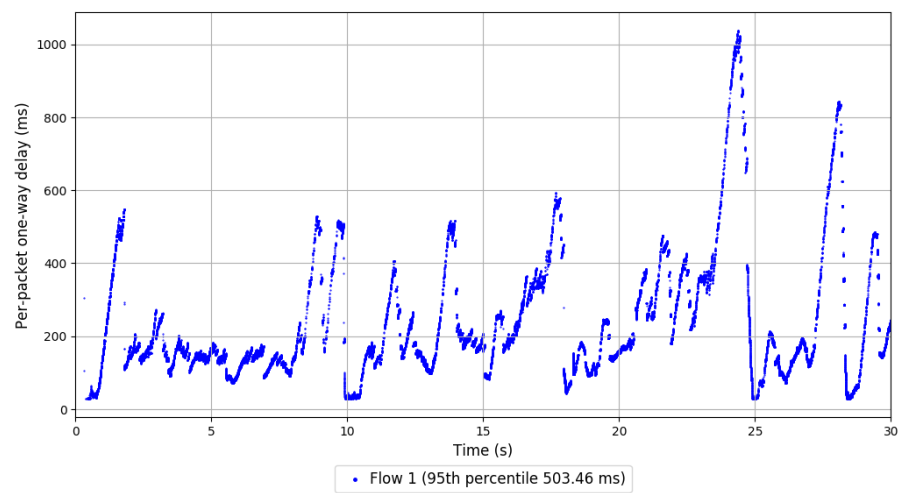
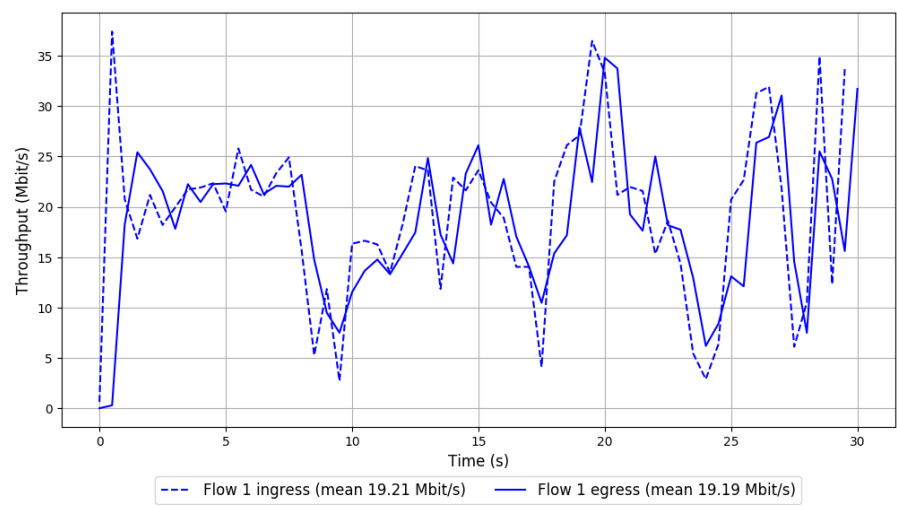


Run 2: Statistics of FillP

Start at: 2019-01-02 18:49:38
End at: 2019-01-02 18:50:08
Local clock offset: 10.453 ms
Remote clock offset: -4.051 ms

Below is generated by plot.py at 2019-01-02 19:21:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 19.19 Mbit/s
95th percentile per-packet one-way delay: 503.465 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 19.19 Mbit/s
95th percentile per-packet one-way delay: 503.465 ms
Loss rate: 1.12%

Run 2: Report of FillP — Data Link

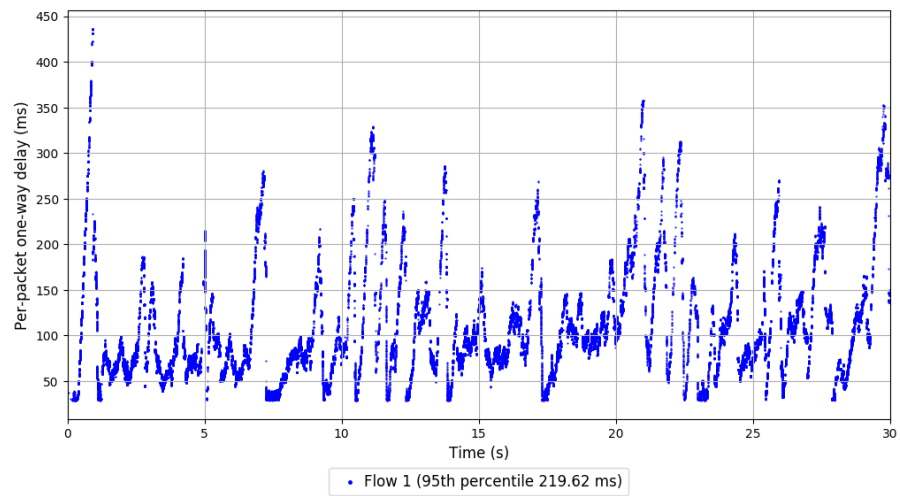
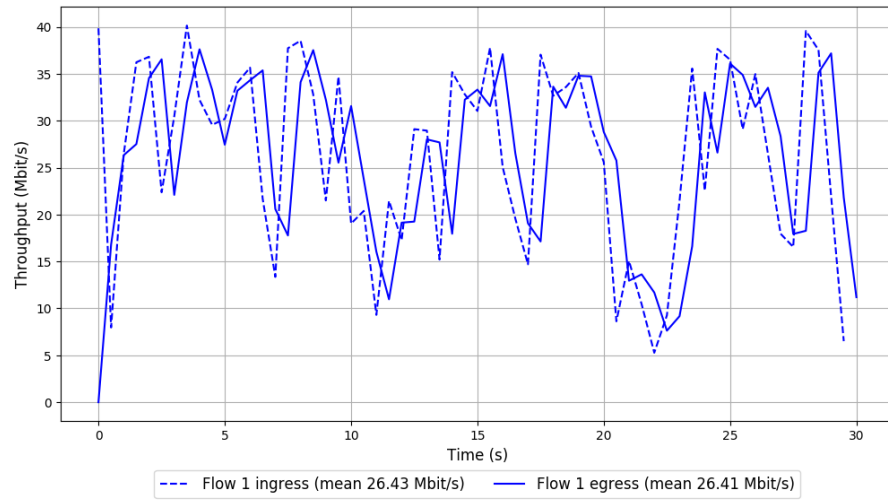


Run 3: Statistics of FillP

Start at: 2019-01-02 19:12:51
End at: 2019-01-02 19:13:21
Local clock offset: 5.372 ms
Remote clock offset: -5.138 ms

Below is generated by plot.py at 2019-01-02 19:21:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 26.41 Mbit/s
95th percentile per-packet one-way delay: 219.617 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 26.41 Mbit/s
95th percentile per-packet one-way delay: 219.617 ms
Loss rate: 0.20%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-02 18:15:21

End at: 2019-01-02 18:15:51

Local clock offset: 10.321 ms

Remote clock offset: 0.724 ms

Below is generated by plot.py at 2019-01-02 19:21:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 22.55 Mbit/s

95th percentile per-packet one-way delay: 273.543 ms

Loss rate: 0.19%

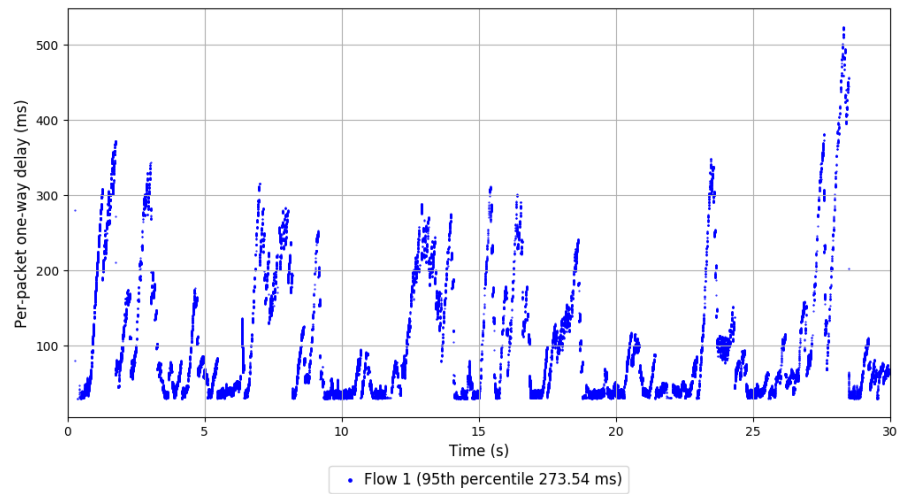
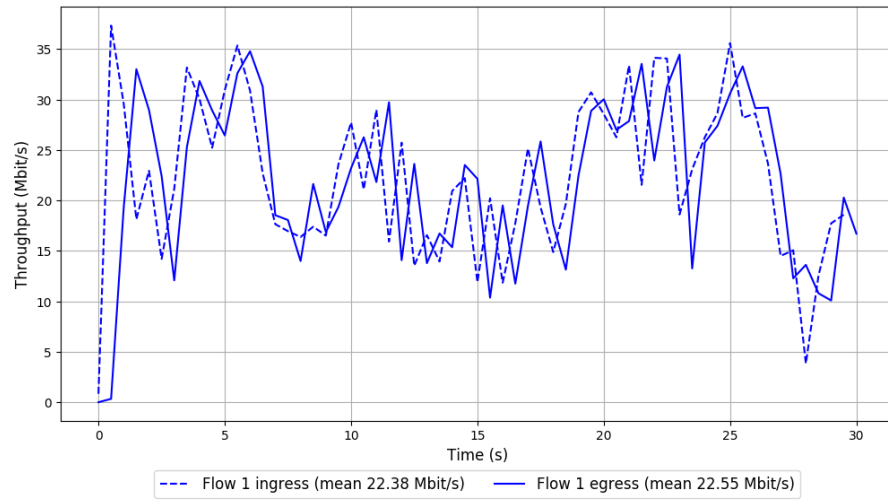
-- Flow 1:

Average throughput: 22.55 Mbit/s

95th percentile per-packet one-way delay: 273.543 ms

Loss rate: 0.19%

Run 1: Report of FillP-Sheep — Data Link

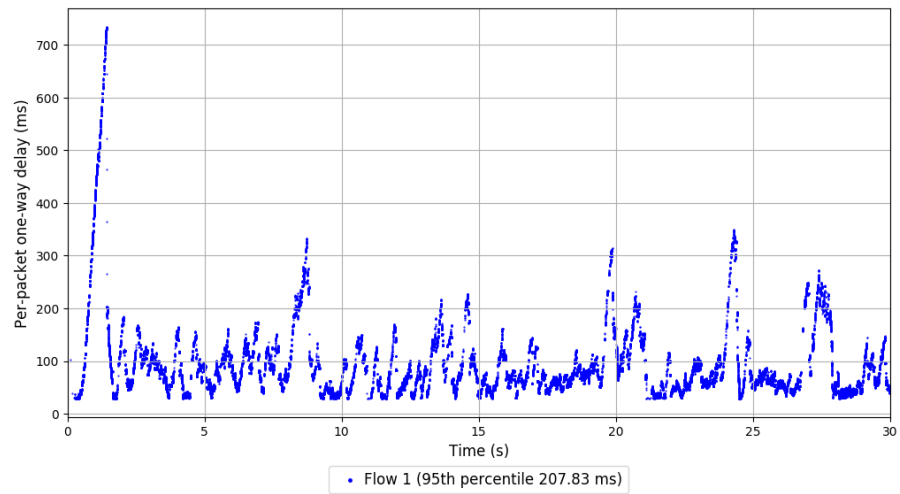
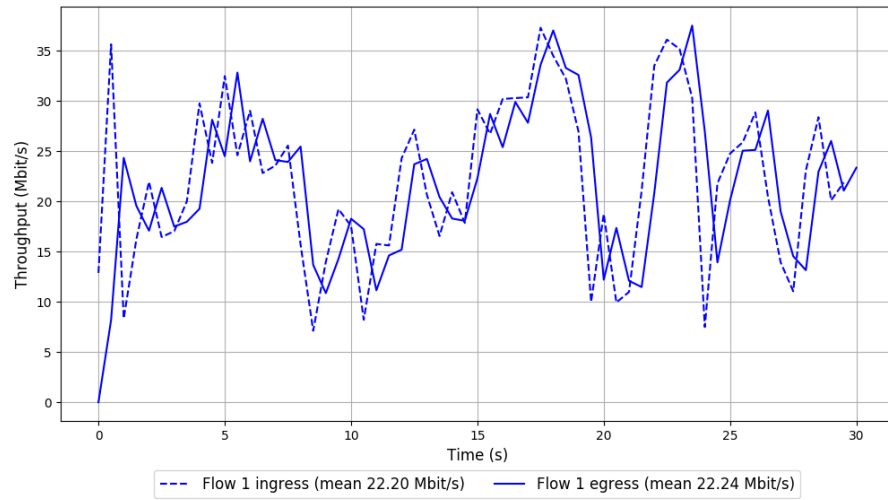


Run 2: Statistics of FillP-Sheep

Start at: 2019-01-02 18:38:37
End at: 2019-01-02 18:39:07
Local clock offset: 8.558 ms
Remote clock offset: -3.158 ms

Below is generated by plot.py at 2019-01-02 19:21:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 22.24 Mbit/s
95th percentile per-packet one-way delay: 207.829 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 22.24 Mbit/s
95th percentile per-packet one-way delay: 207.829 ms
Loss rate: 0.15%

Run 2: Report of FillP-Sheep — Data Link

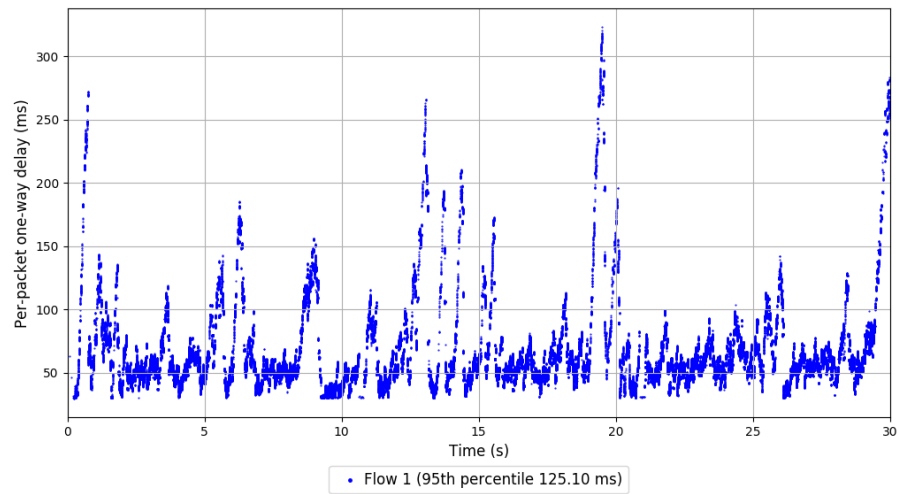
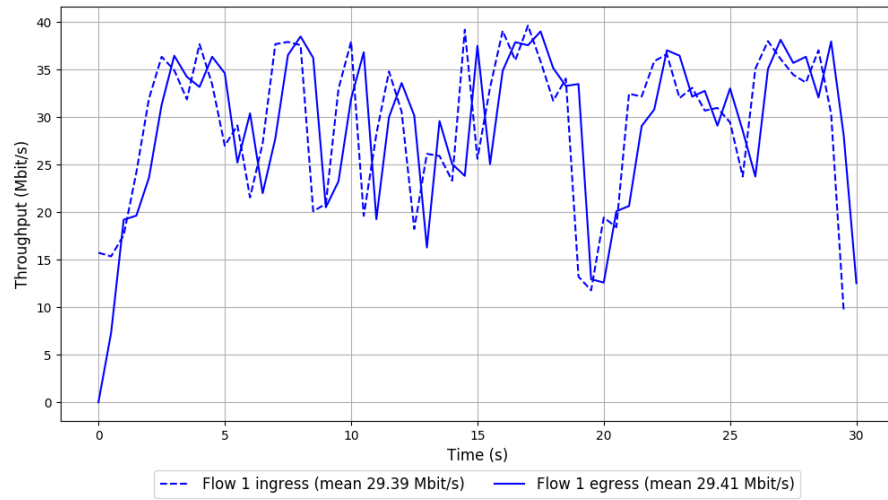


Run 3: Statistics of FillP-Sheep

Start at: 2019-01-02 19:01:50
End at: 2019-01-02 19:02:20
Local clock offset: 6.787 ms
Remote clock offset: -4.613 ms

Below is generated by plot.py at 2019-01-02 19:21:41
Datalink statistics
-- Total of 1 flow:
Average throughput: 29.41 Mbit/s
95th percentile per-packet one-way delay: 125.099 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 29.41 Mbit/s
95th percentile per-packet one-way delay: 125.099 ms
Loss rate: 0.16%

Run 3: Report of FillP-Sheep — Data Link

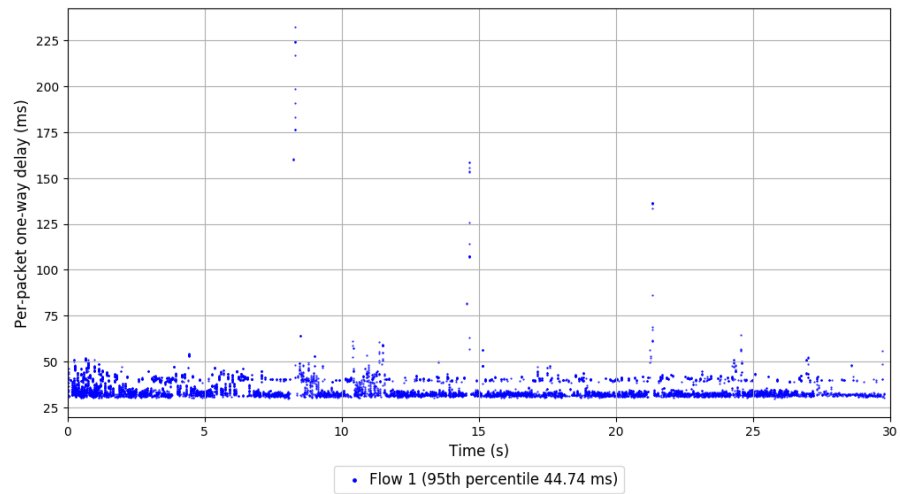
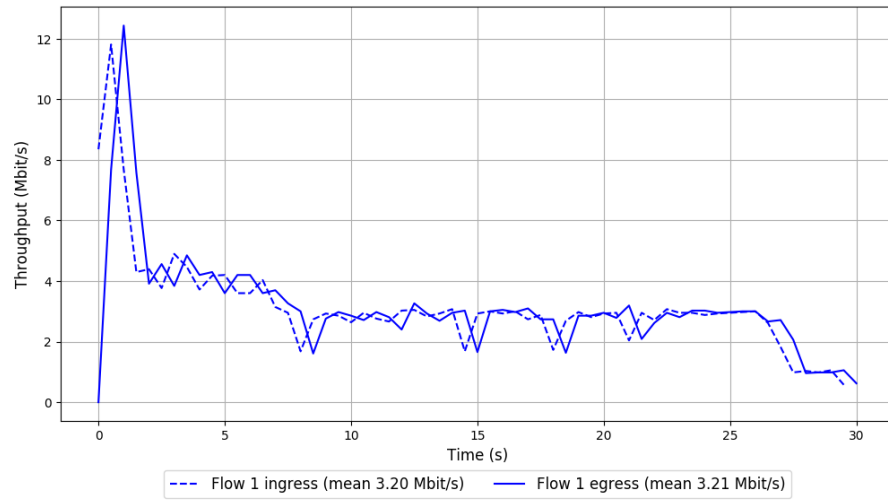


```
Run 1: Statistics of Indigo

Start at: 2019-01-02 18:11:42
End at: 2019-01-02 18:12:12
Local clock offset: 8.094 ms
Remote clock offset: 0.6 ms

# Below is generated by plot.py at 2019-01-02 19:21:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 44.738 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 3.21 Mbit/s
95th percentile per-packet one-way delay: 44.738 ms
Loss rate: 0.03%
```

Run 1: Report of Indigo — Data Link

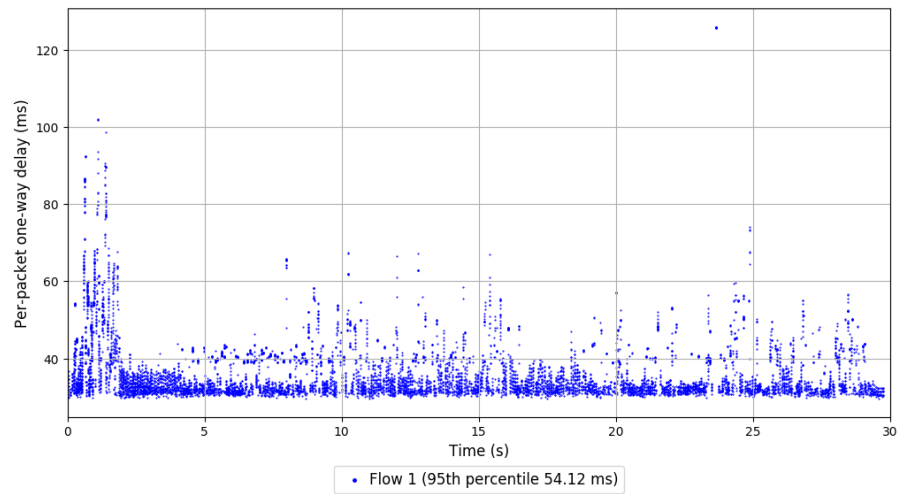
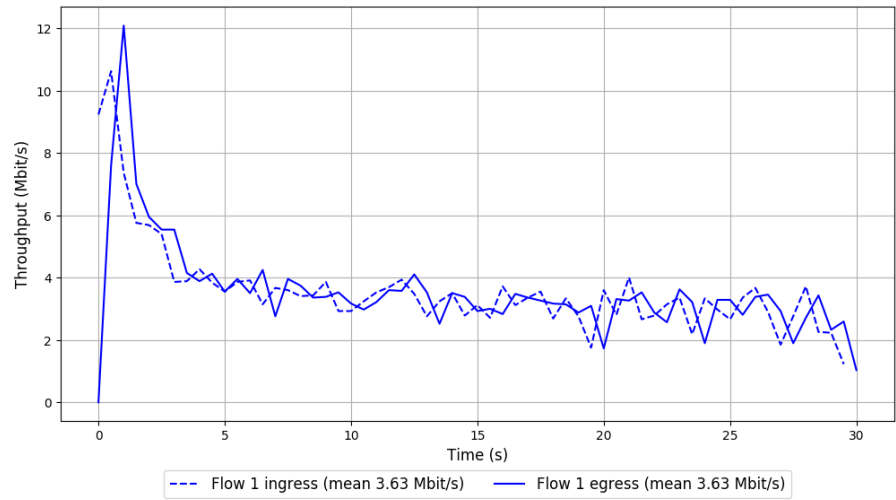


Run 2: Statistics of Indigo

Start at: 2019-01-02 18:34:53
End at: 2019-01-02 18:35:23
Local clock offset: 8.859 ms
Remote clock offset: -2.544 ms

Below is generated by plot.py at 2019-01-02 19:21:41
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.63 Mbit/s
95th percentile per-packet one-way delay: 54.125 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 3.63 Mbit/s
95th percentile per-packet one-way delay: 54.125 ms
Loss rate: 0.11%

Run 2: Report of Indigo — Data Link

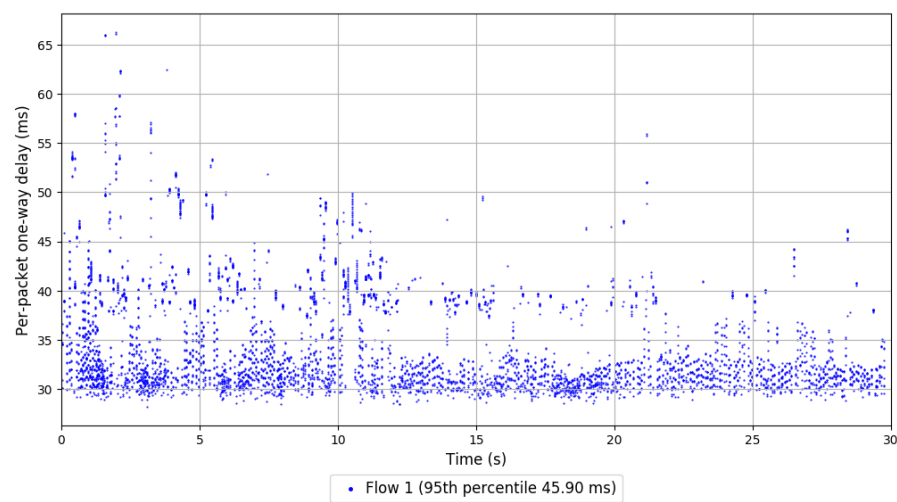
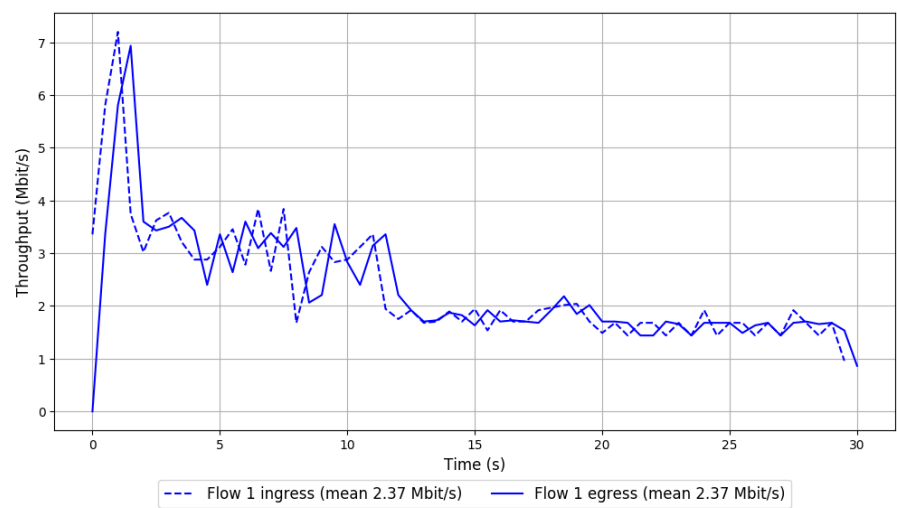


Run 3: Statistics of Indigo

Start at: 2019-01-02 18:58:11
End at: 2019-01-02 18:58:41
Local clock offset: 8.762 ms
Remote clock offset: -4.454 ms

Below is generated by plot.py at 2019-01-02 19:21:41
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 45.898 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 45.898 ms
Loss rate: 0.17%

Run 3: Report of Indigo — Data Link

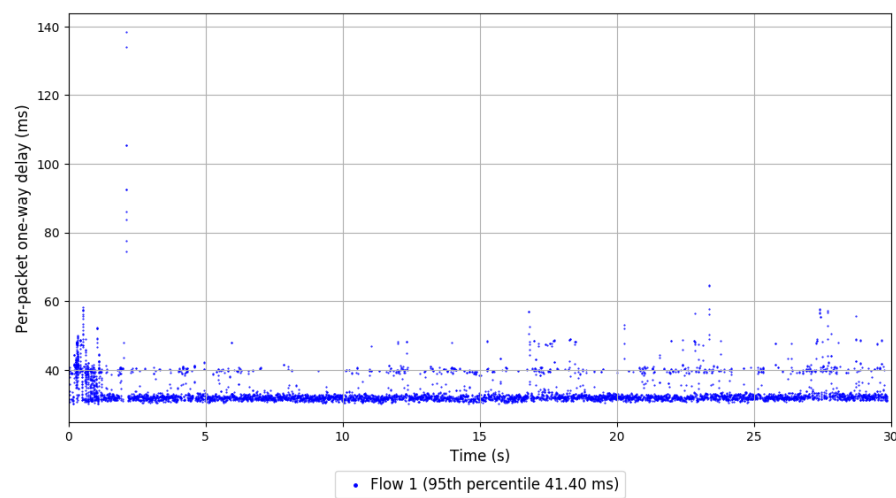
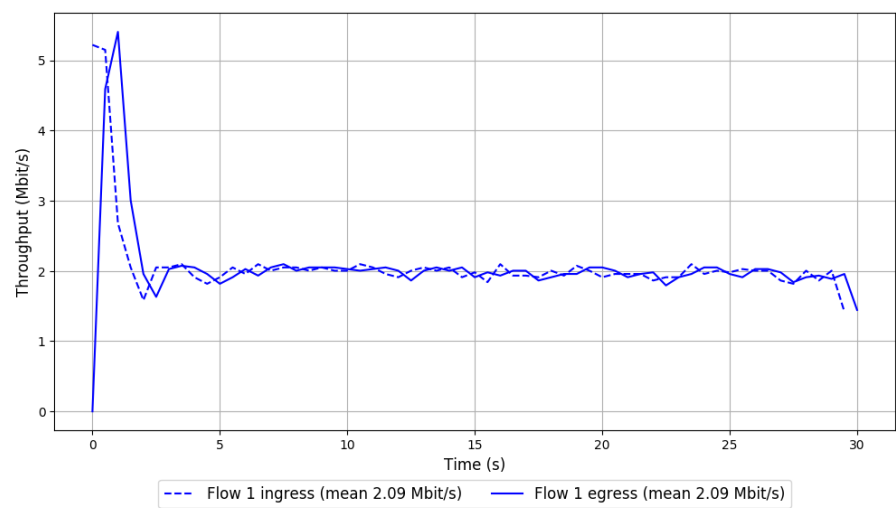



```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-02 18:14:08
End at: 2019-01-02 18:14:38
Local clock offset: 9.533 ms
Remote clock offset: 0.728 ms

# Below is generated by plot.py at 2019-01-02 19:21:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 41.399 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.09 Mbit/s
95th percentile per-packet one-way delay: 41.399 ms
Loss rate: 0.13%
```

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-02 18:37:19

End at: 2019-01-02 18:37:49

Local clock offset: 8.588 ms

Remote clock offset: -2.883 ms

Below is generated by plot.py at 2019-01-02 19:21:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.06 Mbit/s

95th percentile per-packet one-way delay: 40.778 ms

Loss rate: 0.09%

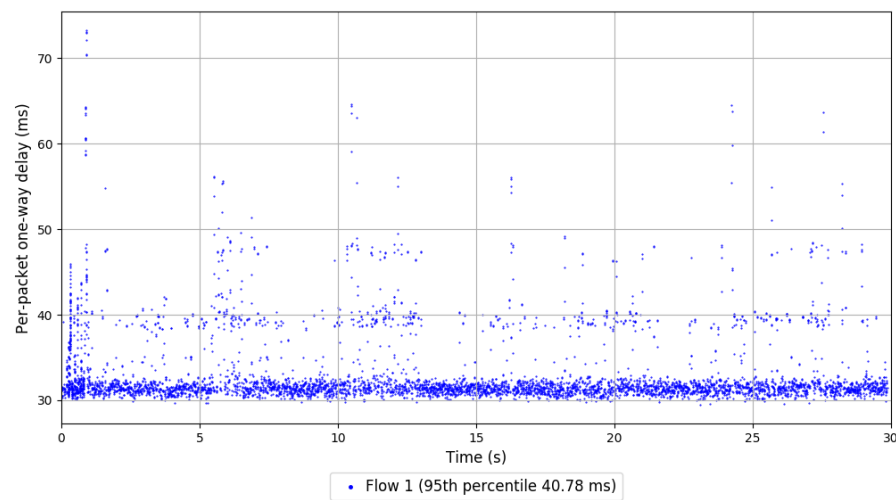
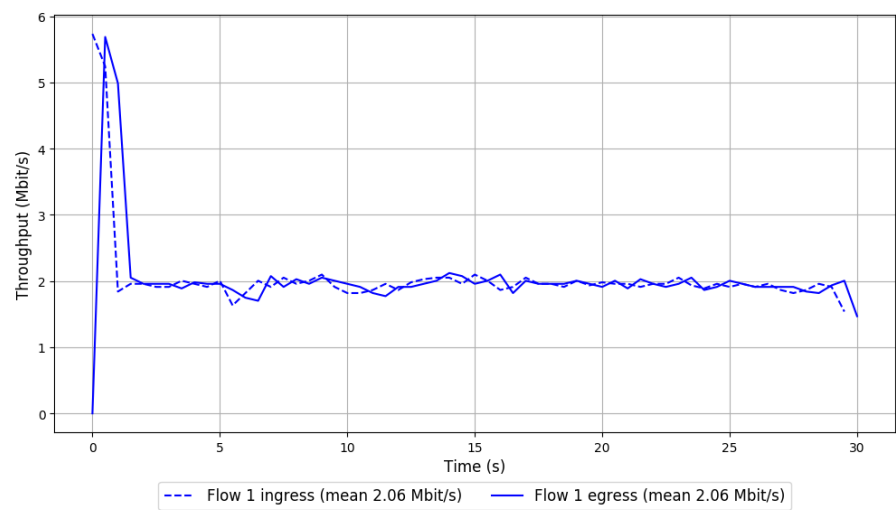
-- Flow 1:

Average throughput: 2.06 Mbit/s

95th percentile per-packet one-way delay: 40.778 ms

Loss rate: 0.09%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-02 19:00:37

End at: 2019-01-02 19:01:07

Local clock offset: 7.353 ms

Remote clock offset: -4.585 ms

Below is generated by plot.py at 2019-01-02 19:21:41

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.48 Mbit/s

95th percentile per-packet one-way delay: 42.479 ms

Loss rate: 0.08%

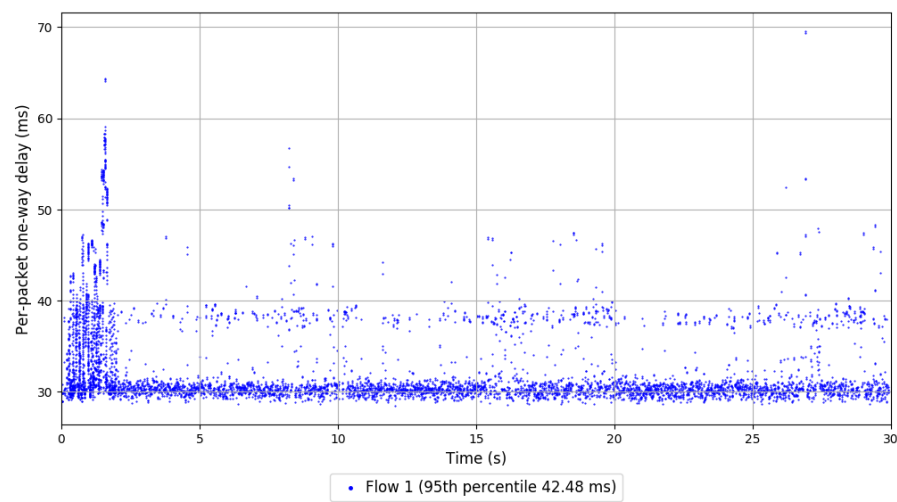
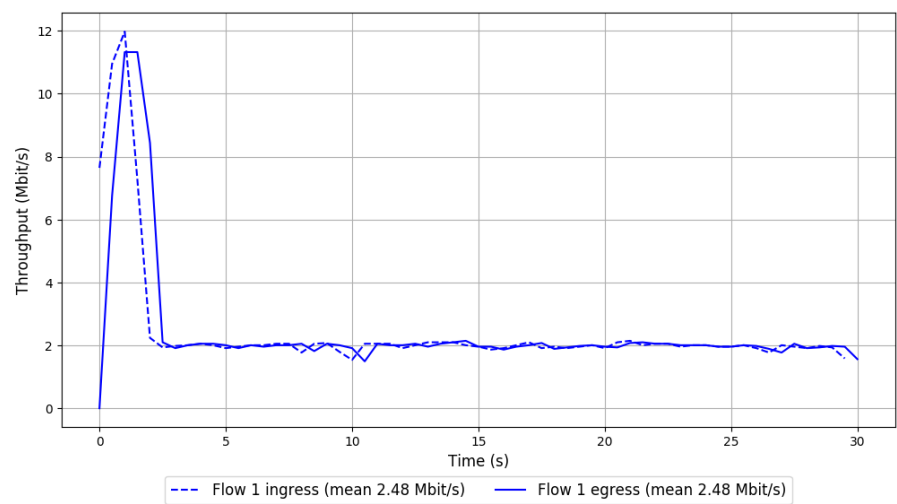
-- Flow 1:

Average throughput: 2.48 Mbit/s

95th percentile per-packet one-way delay: 42.479 ms

Loss rate: 0.08%

Run 3: Report of Indigo-MusesD — Data Link

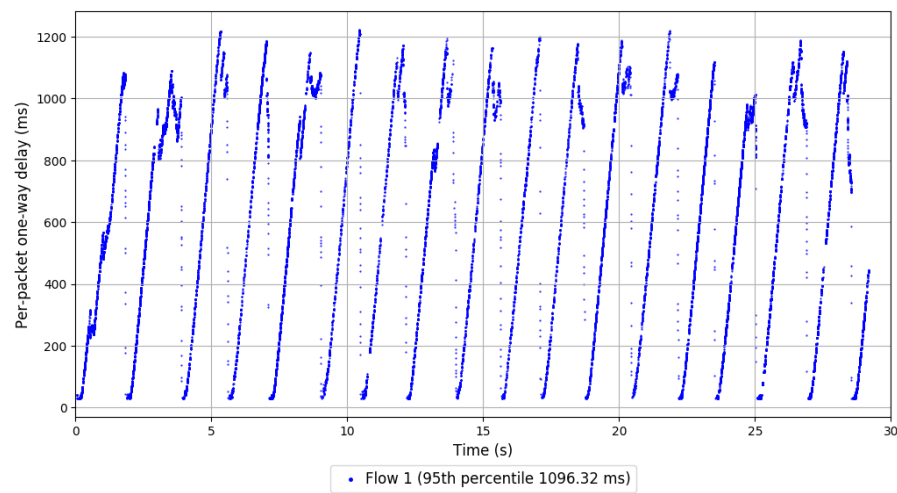
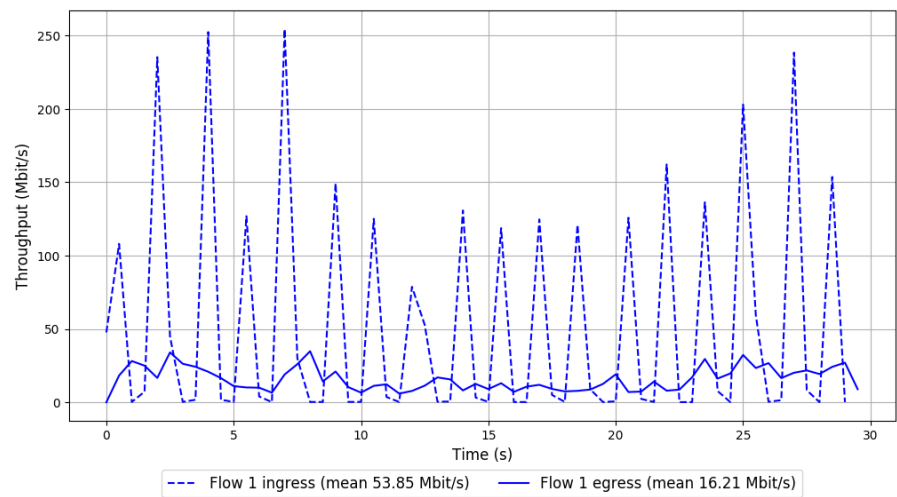


```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-02 18:32:26
End at: 2019-01-02 18:32:56
Local clock offset: 9.518 ms
Remote clock offset: -2.095 ms

# Below is generated by plot.py at 2019-01-02 19:21:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.21 Mbit/s
95th percentile per-packet one-way delay: 1096.319 ms
Loss rate: 69.90%
-- Flow 1:
Average throughput: 16.21 Mbit/s
95th percentile per-packet one-way delay: 1096.319 ms
Loss rate: 69.90%
```

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-02 18:55:43

End at: 2019-01-02 18:56:13

Local clock offset: 10.938 ms

Remote clock offset: -4.35 ms

Below is generated by plot.py at 2019-01-02 19:21:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 26.83 Mbit/s

95th percentile per-packet one-way delay: 803.461 ms

Loss rate: 45.13%

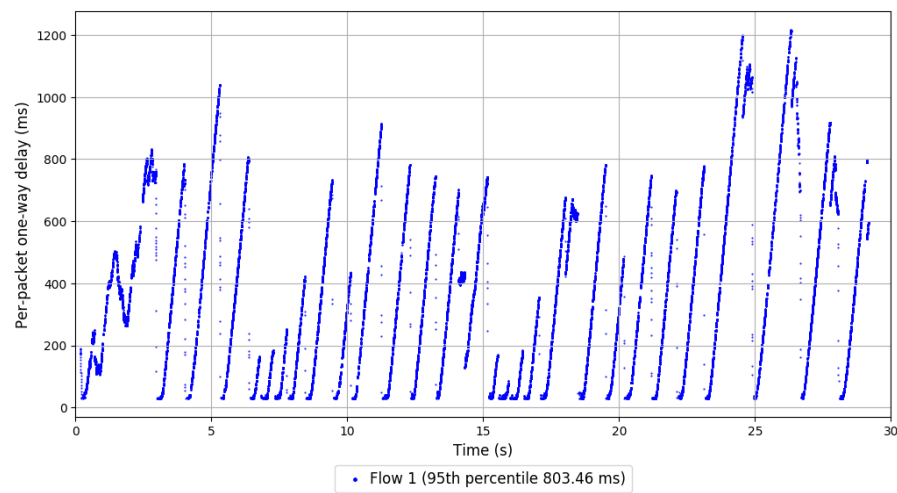
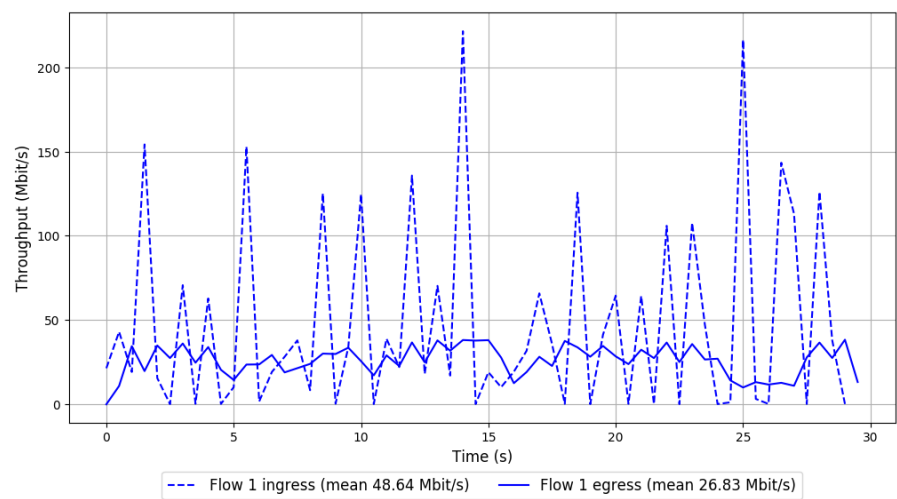
-- Flow 1:

Average throughput: 26.83 Mbit/s

95th percentile per-packet one-way delay: 803.461 ms

Loss rate: 45.13%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-02 19:18:57

End at: 2019-01-02 19:19:27

Local clock offset: 6.012 ms

Remote clock offset: -5.23 ms

Below is generated by plot.py at 2019-01-02 19:21:49

Datalink statistics

-- Total of 1 flow:

Average throughput: 19.59 Mbit/s

95th percentile per-packet one-way delay: 1033.833 ms

Loss rate: 64.56%

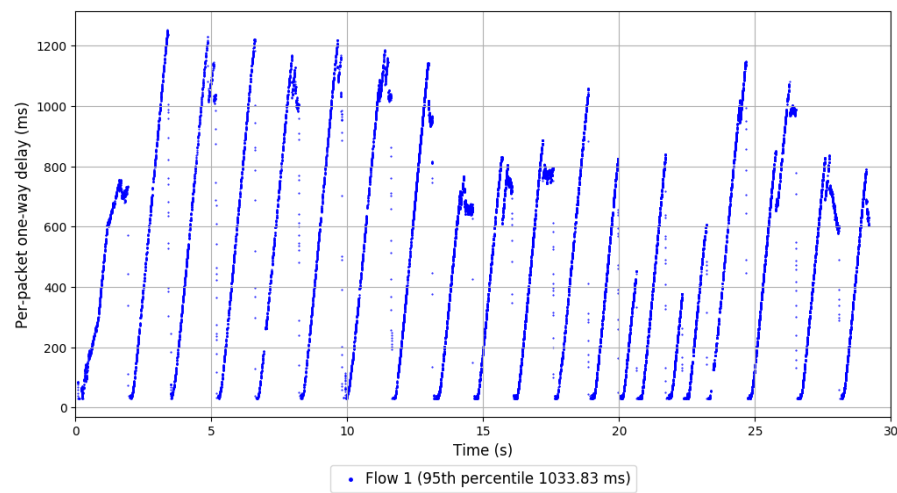
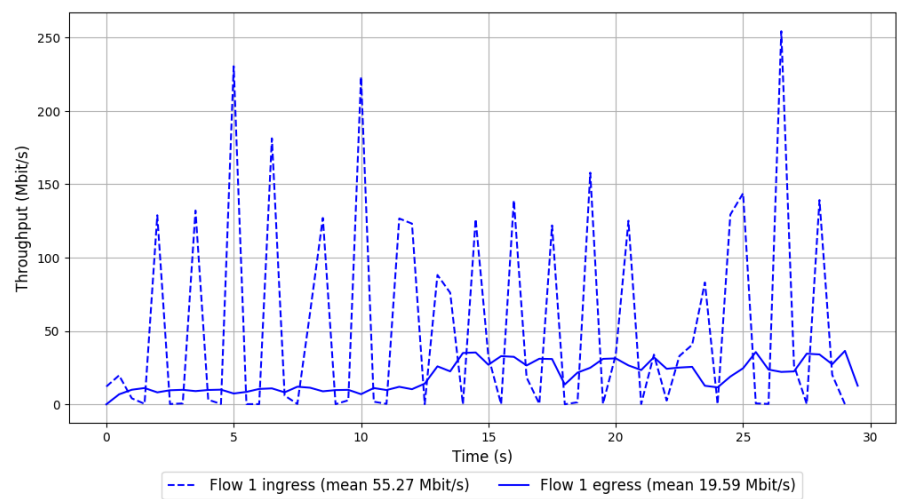
-- Flow 1:

Average throughput: 19.59 Mbit/s

95th percentile per-packet one-way delay: 1033.833 ms

Loss rate: 64.56%

Run 3: Report of Indigo-MusesT — Data Link

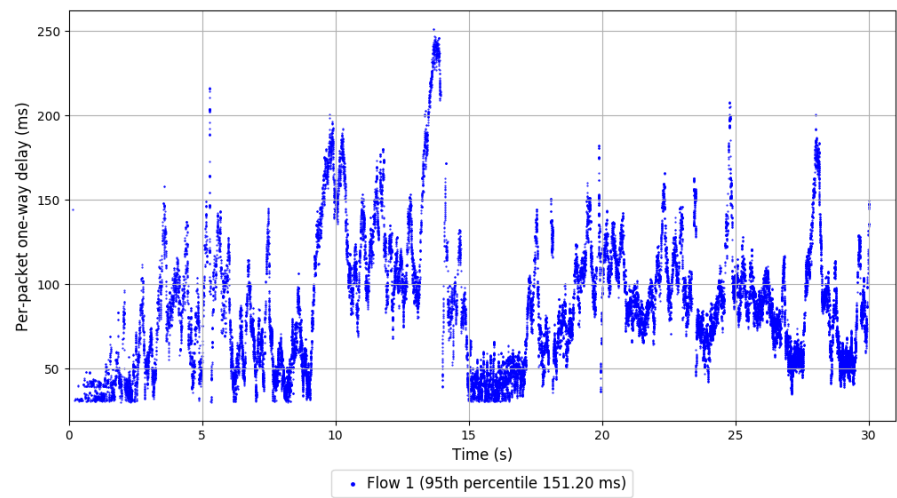
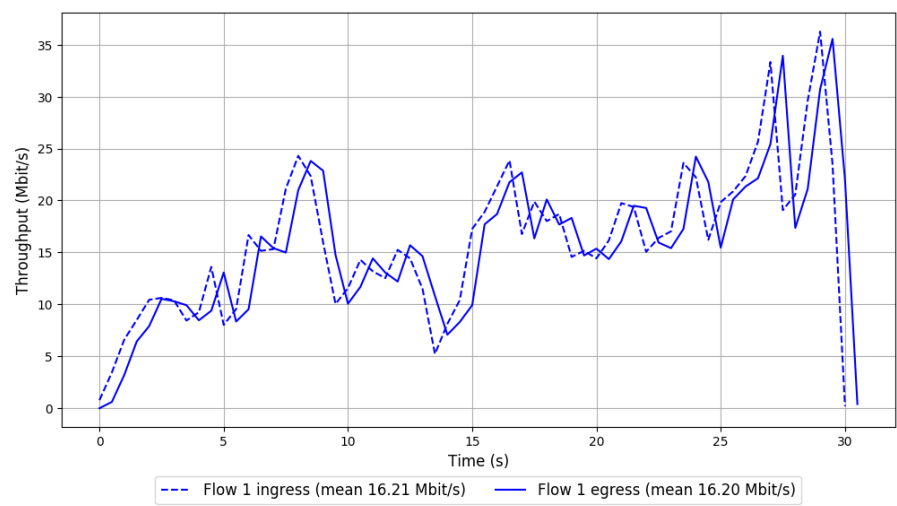


```
Run 1: Statistics of LEDBAT

Start at: 2019-01-02 18:19:00
End at: 2019-01-02 18:19:30
Local clock offset: 12.553 ms
Remote clock offset: 0.911 ms

# Below is generated by plot.py at 2019-01-02 19:21:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 16.20 Mbit/s
95th percentile per-packet one-way delay: 151.196 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 16.20 Mbit/s
95th percentile per-packet one-way delay: 151.196 ms
Loss rate: 0.54%
```

Run 1: Report of LEDBAT — Data Link

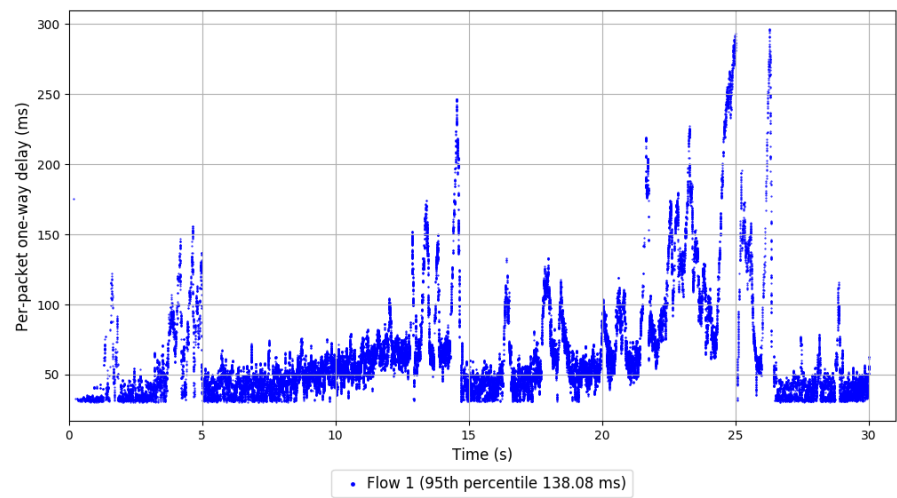
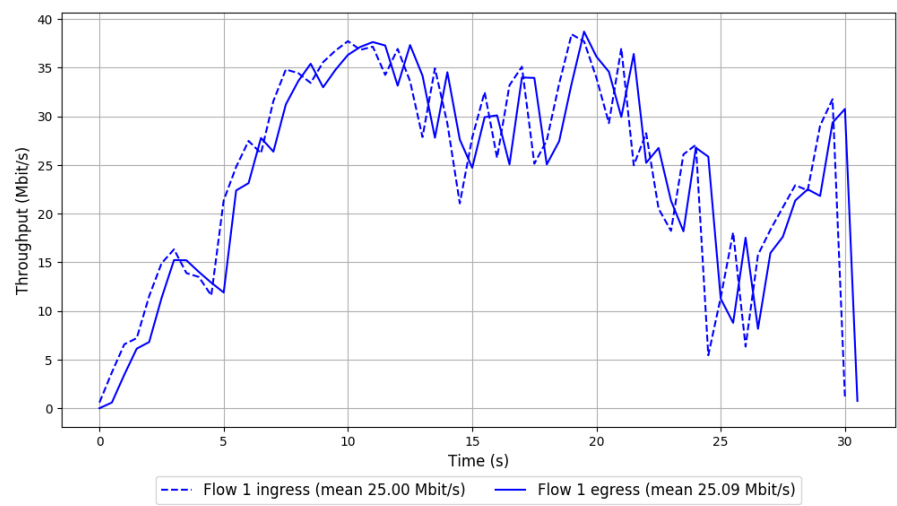


Run 2: Statistics of LEDBAT

Start at: 2019-01-02 18:42:16
End at: 2019-01-02 18:42:46
Local clock offset: 8.837 ms
Remote clock offset: -3.437 ms

Below is generated by plot.py at 2019-01-02 19:21:53
Datalink statistics
-- Total of 1 flow:
Average throughput: 25.09 Mbit/s
95th percentile per-packet one-way delay: 138.084 ms
Loss rate: 0.22%
-- Flow 1:
Average throughput: 25.09 Mbit/s
95th percentile per-packet one-way delay: 138.084 ms
Loss rate: 0.22%

Run 2: Report of LEDBAT — Data Link

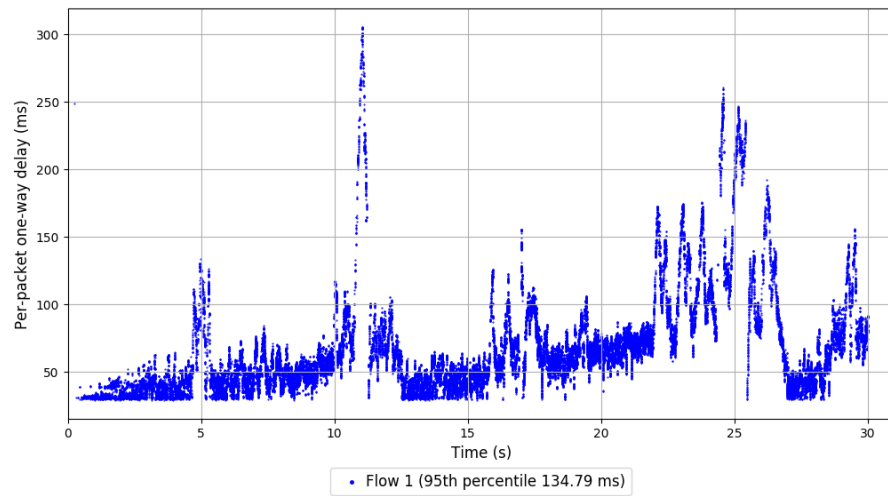
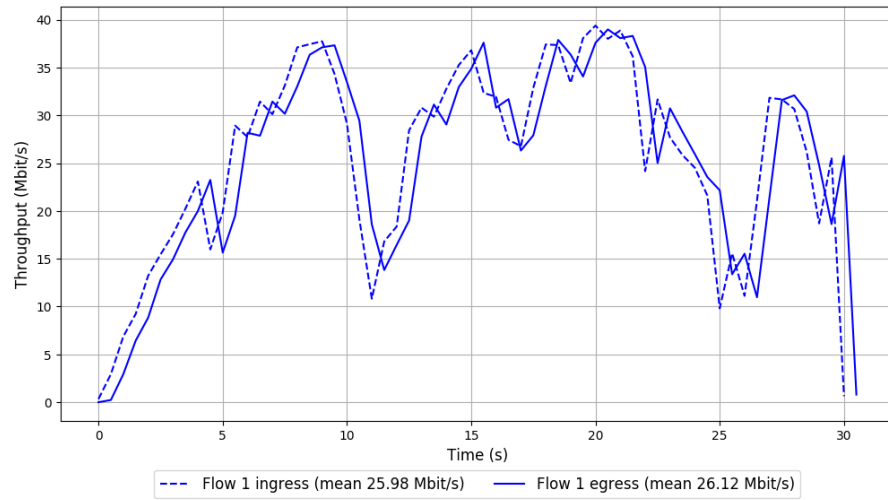


Run 3: Statistics of LEDBAT

Start at: 2019-01-02 19:05:29
End at: 2019-01-02 19:05:59
Local clock offset: 5.788 ms
Remote clock offset: -4.721 ms

Below is generated by plot.py at 2019-01-02 19:21:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 26.12 Mbit/s
95th percentile per-packet one-way delay: 134.788 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 26.12 Mbit/s
95th percentile per-packet one-way delay: 134.788 ms
Loss rate: 0.27%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-02 18:20:14

End at: 2019-01-02 18:20:44

Local clock offset: 13.342 ms

Remote clock offset: 0.907 ms

Below is generated by plot.py at 2019-01-02 19:21:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 7.96 Mbit/s

95th percentile per-packet one-way delay: 717.217 ms

Loss rate: 0.25%

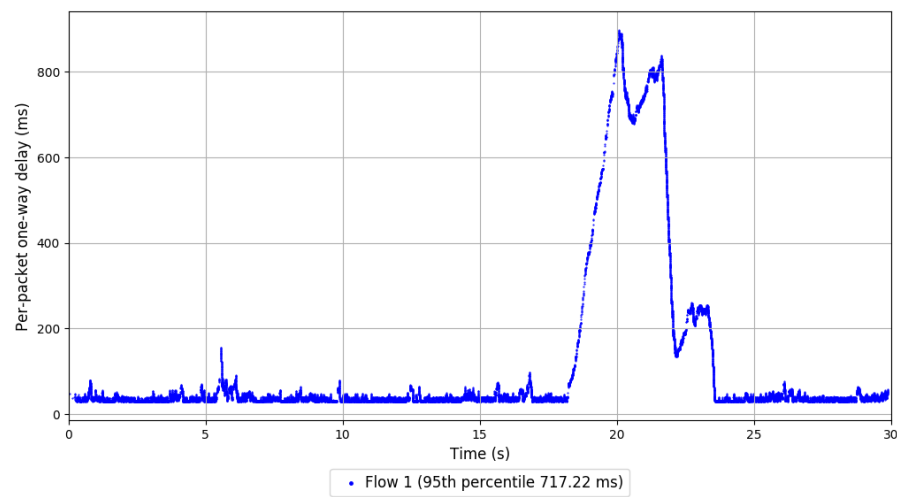
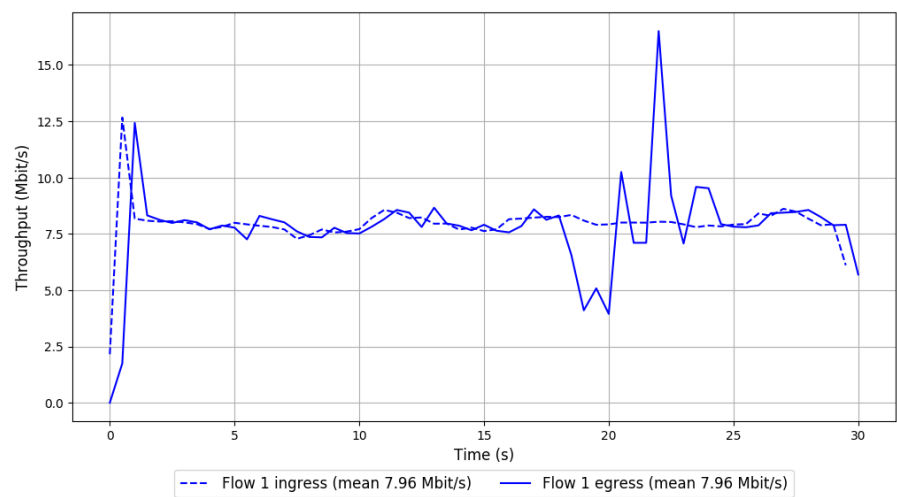
-- Flow 1:

Average throughput: 7.96 Mbit/s

95th percentile per-packet one-way delay: 717.217 ms

Loss rate: 0.25%

Run 1: Report of PCC-Allegro — Data Link

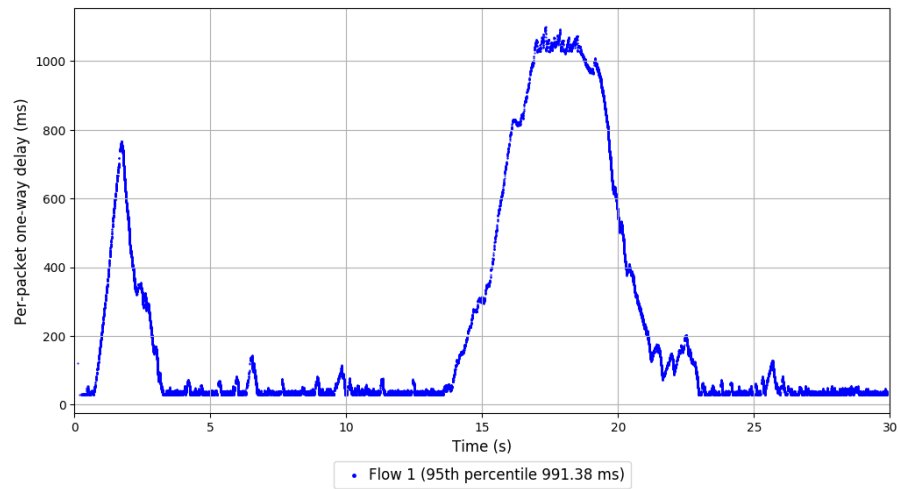
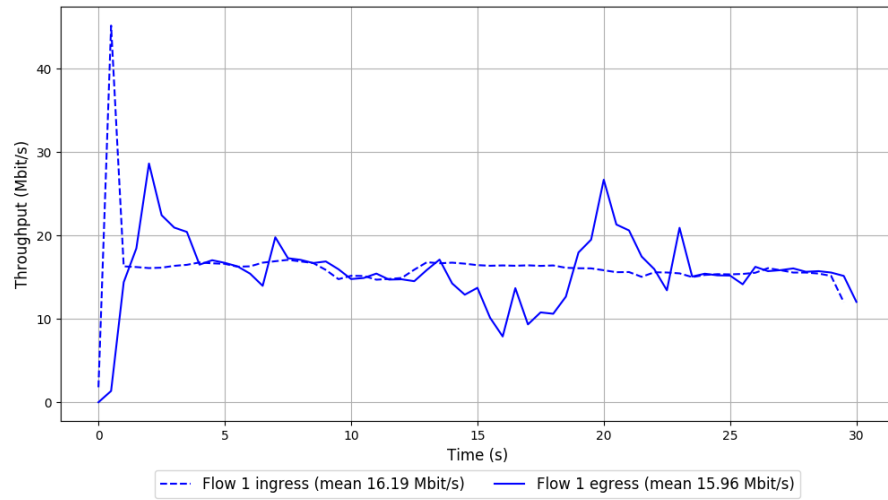


Run 2: Statistics of PCC-Allegro

Start at: 2019-01-02 18:43:30
End at: 2019-01-02 18:44:00
Local clock offset: 9.045 ms
Remote clock offset: -3.658 ms

Below is generated by plot.py at 2019-01-02 19:21:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.96 Mbit/s
95th percentile per-packet one-way delay: 991.378 ms
Loss rate: 1.81%
-- Flow 1:
Average throughput: 15.96 Mbit/s
95th percentile per-packet one-way delay: 991.378 ms
Loss rate: 1.81%

Run 2: Report of PCC-Allegro — Data Link

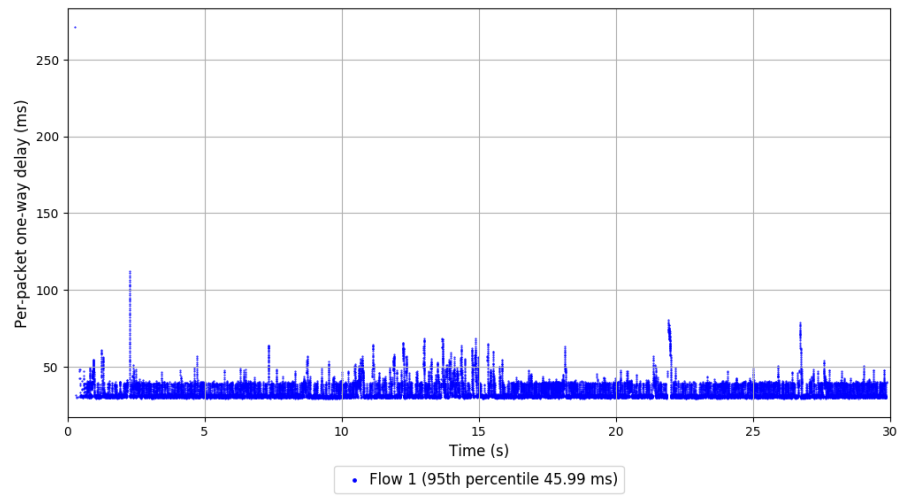
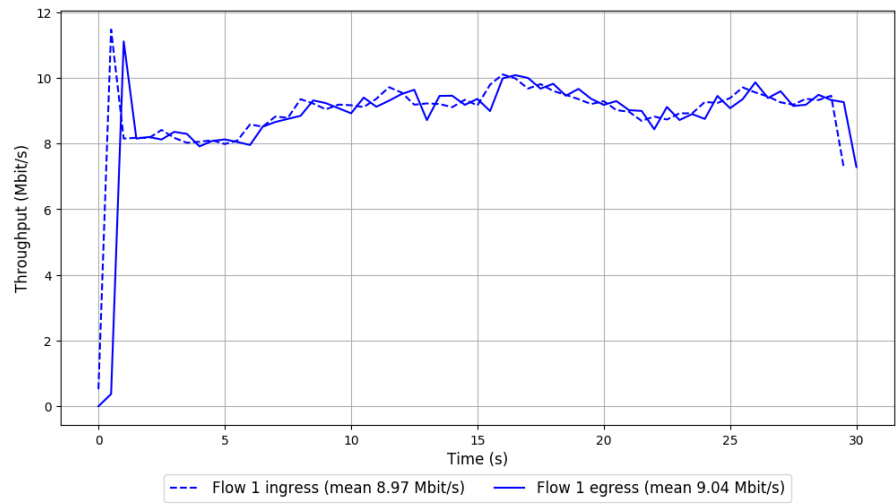


Run 3: Statistics of PCC-Allegro

Start at: 2019-01-02 19:06:43
End at: 2019-01-02 19:07:13
Local clock offset: 5.607 ms
Remote clock offset: -4.848 ms

Below is generated by plot.py at 2019-01-02 19:21:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.04 Mbit/s
95th percentile per-packet one-way delay: 45.992 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 9.04 Mbit/s
95th percentile per-packet one-way delay: 45.992 ms
Loss rate: 0.14%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

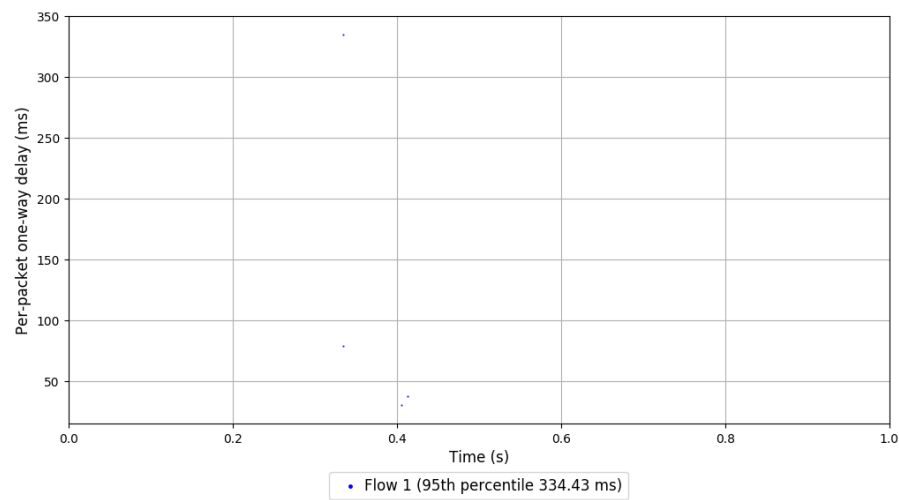
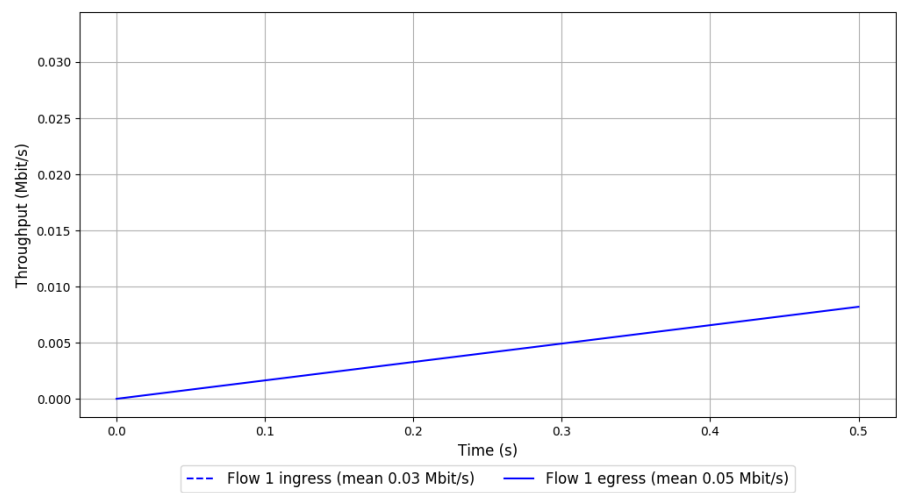
Start at: 2019-01-02 18:12:55

End at: 2019-01-02 18:13:25

Local clock offset: 8.813 ms

Remote clock offset: 0.629 ms

Run 1: Report of PCC-Expr — Data Link

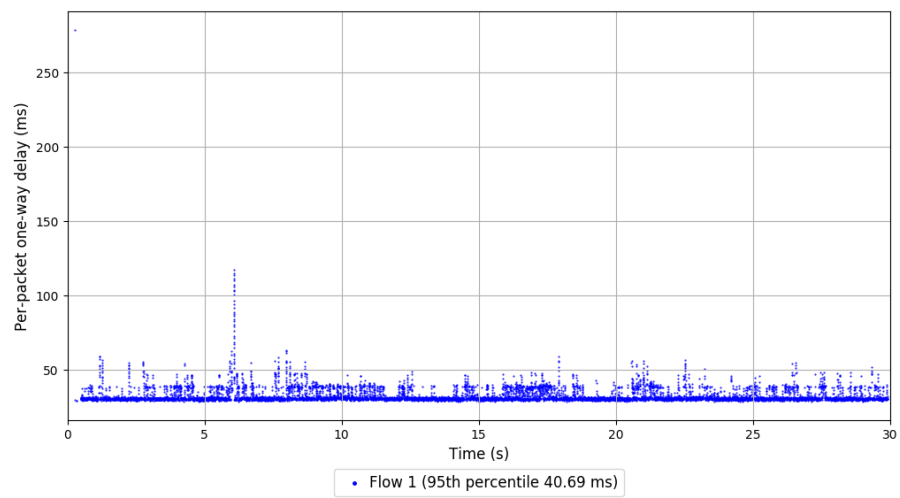
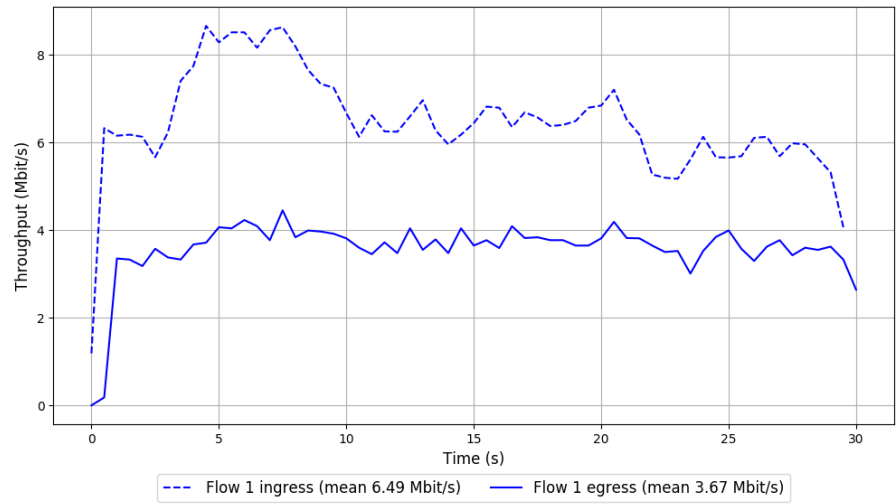


Run 2: Statistics of PCC-Expr

Start at: 2019-01-02 18:36:06
End at: 2019-01-02 18:36:36
Local clock offset: 8.661 ms
Remote clock offset: -2.664 ms

Below is generated by plot.py at 2019-01-02 19:21:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.67 Mbit/s
95th percentile per-packet one-way delay: 40.687 ms
Loss rate: 43.95%
-- Flow 1:
Average throughput: 3.67 Mbit/s
95th percentile per-packet one-way delay: 40.687 ms
Loss rate: 43.95%

Run 2: Report of PCC-Expr — Data Link

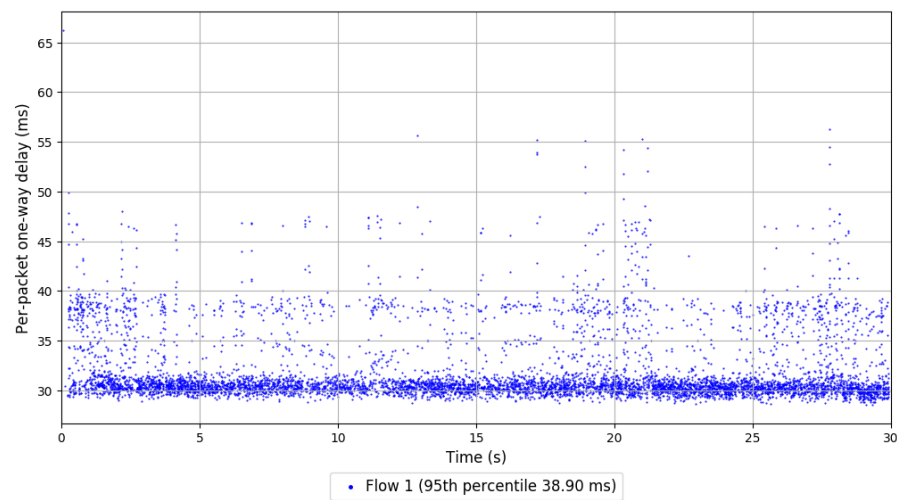
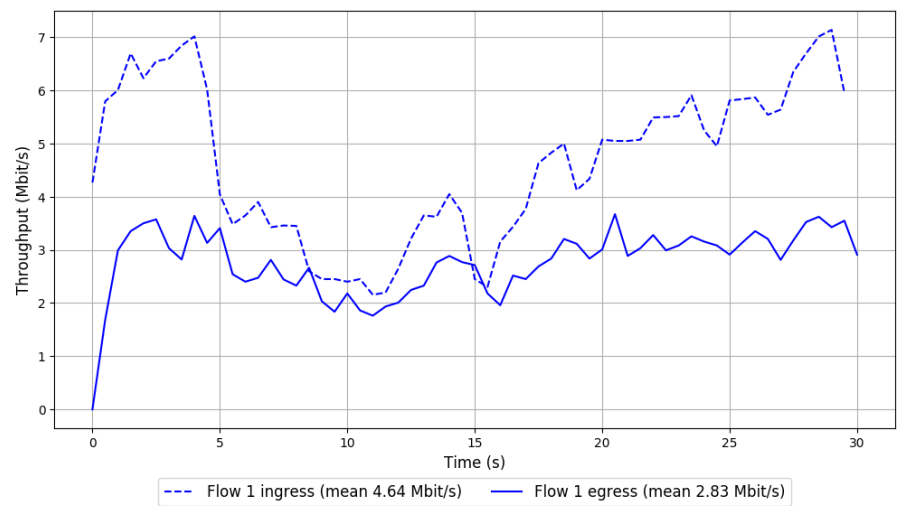


Run 3: Statistics of PCC-Expr

Start at: 2019-01-02 18:59:24
End at: 2019-01-02 18:59:54
Local clock offset: 7.909 ms
Remote clock offset: -4.528 ms

Below is generated by plot.py at 2019-01-02 19:21:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 38.901 ms
Loss rate: 39.15%
-- Flow 1:
Average throughput: 2.83 Mbit/s
95th percentile per-packet one-way delay: 38.901 ms
Loss rate: 39.15%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-01-02 18:25:07

End at: 2019-01-02 18:25:37

Local clock offset: 15.412 ms

Remote clock offset: 0.042 ms

Below is generated by plot.py at 2019-01-02 19:22:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 15.23 Mbit/s

95th percentile per-packet one-way delay: 247.805 ms

Loss rate: 0.74%

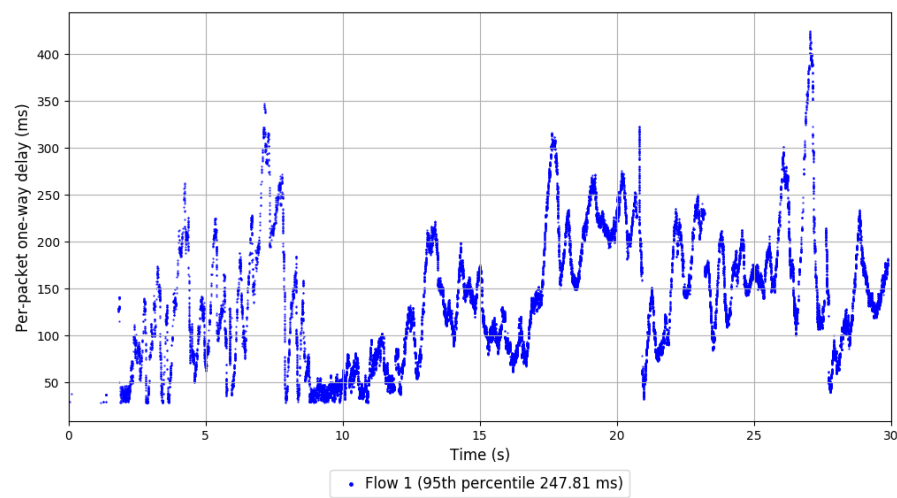
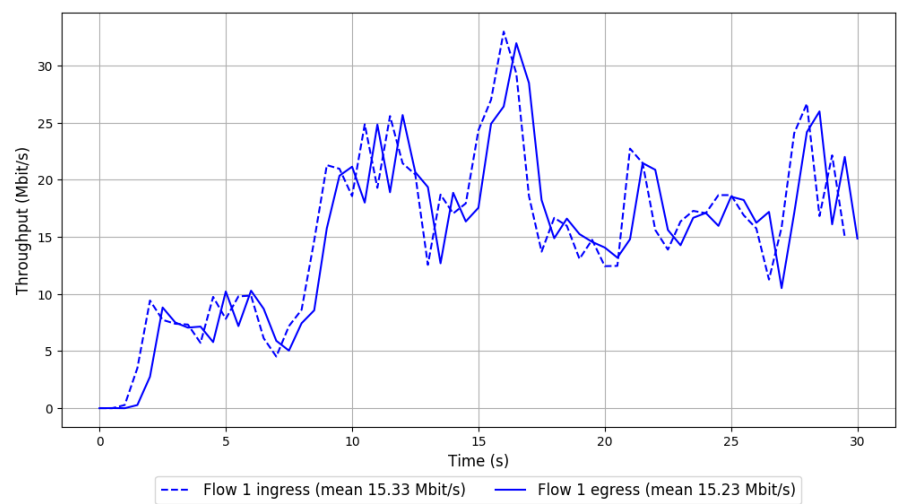
-- Flow 1:

Average throughput: 15.23 Mbit/s

95th percentile per-packet one-way delay: 247.805 ms

Loss rate: 0.74%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-02 18:48:24

End at: 2019-01-02 18:48:54

Local clock offset: 10.148 ms

Remote clock offset: -3.962 ms

Below is generated by plot.py at 2019-01-02 19:22:07

Datalink statistics

-- Total of 1 flow:

Average throughput: 18.60 Mbit/s

95th percentile per-packet one-way delay: 270.977 ms

Loss rate: 0.55%

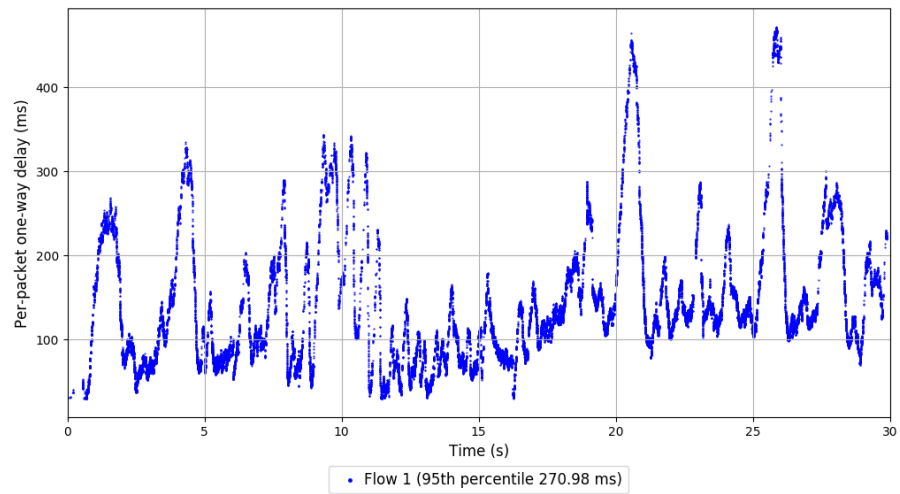
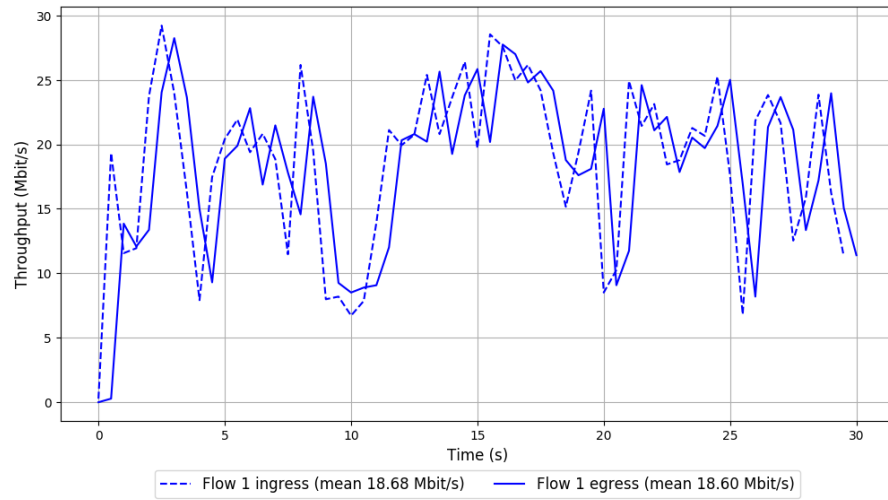
-- Flow 1:

Average throughput: 18.60 Mbit/s

95th percentile per-packet one-way delay: 270.977 ms

Loss rate: 0.55%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-02 19:11:36

End at: 2019-01-02 19:12:07

Local clock offset: 5.336 ms

Remote clock offset: -4.975 ms

Below is generated by plot.py at 2019-01-02 19:22:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 34.46 Mbit/s

95th percentile per-packet one-way delay: 224.724 ms

Loss rate: 0.62%

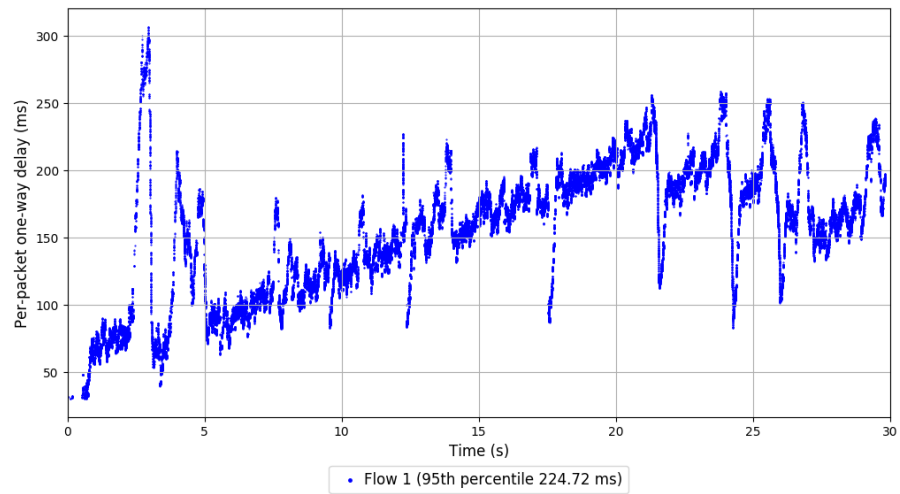
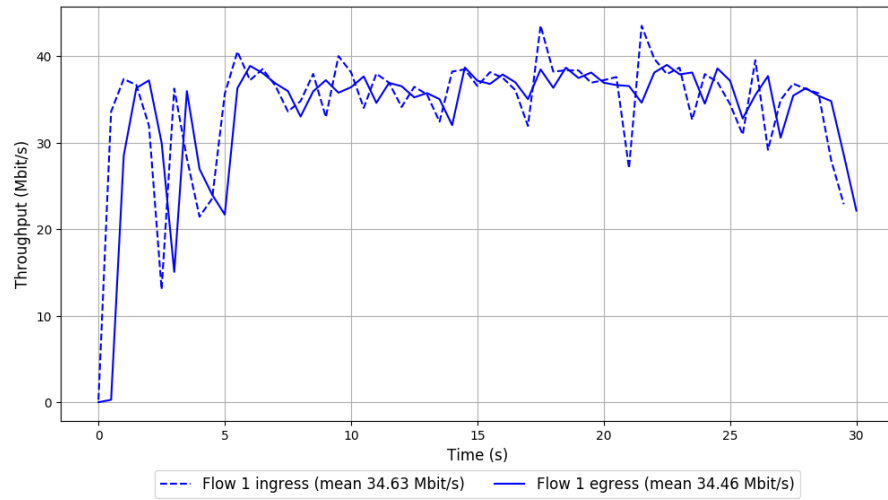
-- Flow 1:

Average throughput: 34.46 Mbit/s

95th percentile per-packet one-way delay: 224.724 ms

Loss rate: 0.62%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2019-01-02 18:23:54

End at: 2019-01-02 18:24:24

Local clock offset: 15.498 ms

Remote clock offset: 0.542 ms

Below is generated by plot.py at 2019-01-02 19:22:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 39.562 ms

Loss rate: 0.13%

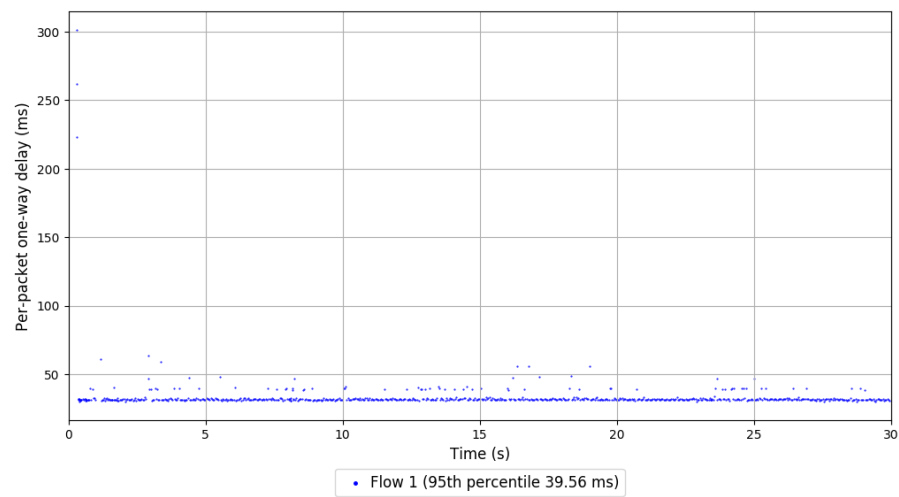
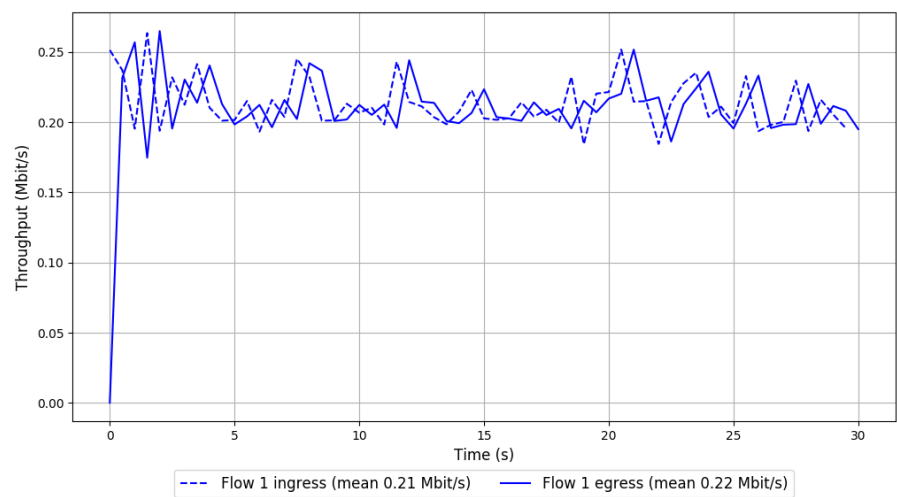
-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 39.562 ms

Loss rate: 0.13%

Run 1: Report of SReAM — Data Link

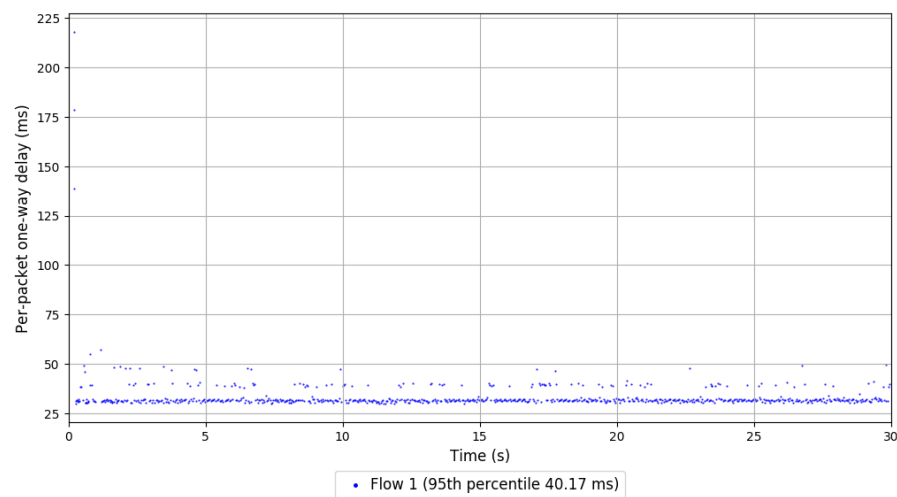
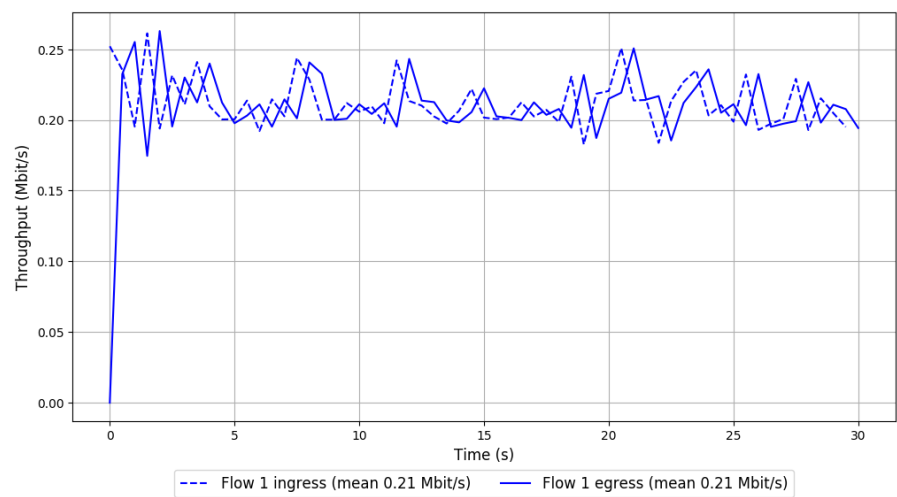


Run 2: Statistics of SCReAM

Start at: 2019-01-02 18:47:11
End at: 2019-01-02 18:47:41
Local clock offset: 9.806 ms
Remote clock offset: -3.779 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 40.168 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 40.168 ms
Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

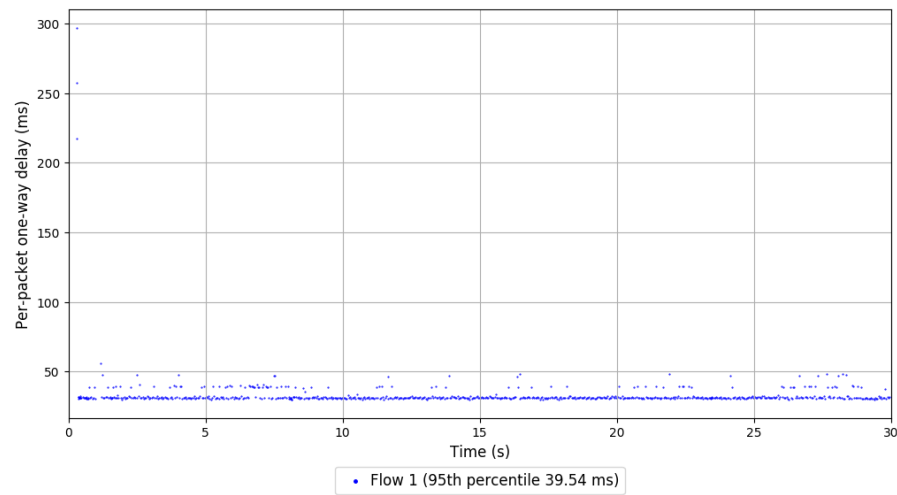
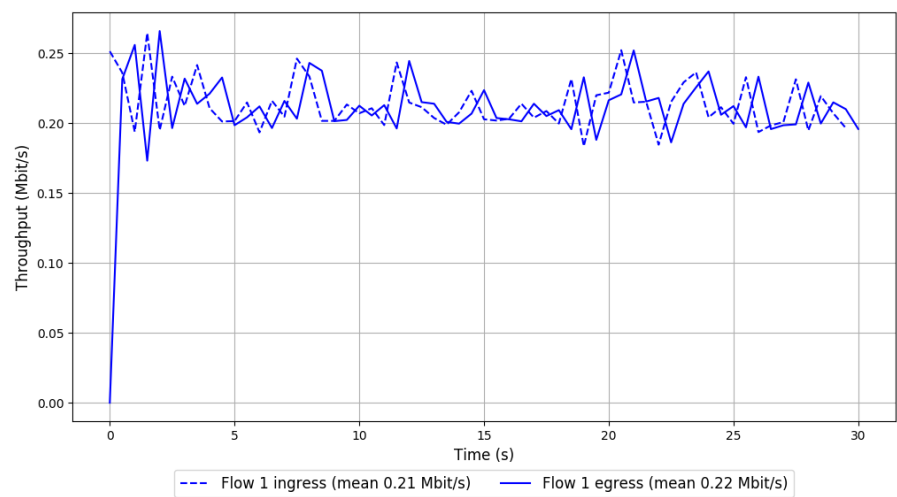


Run 3: Statistics of SCReAM

Start at: 2019-01-02 19:10:24
End at: 2019-01-02 19:10:54
Local clock offset: 5.344 ms
Remote clock offset: -5.048 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.539 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.539 ms
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

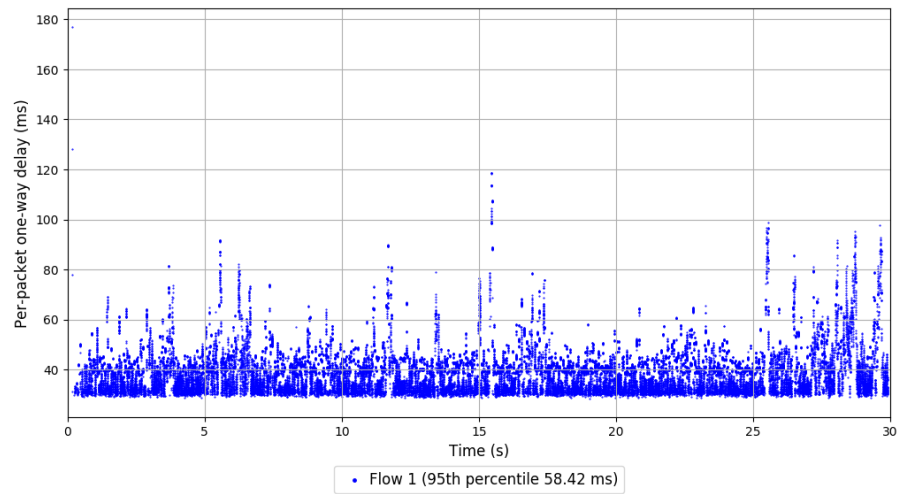
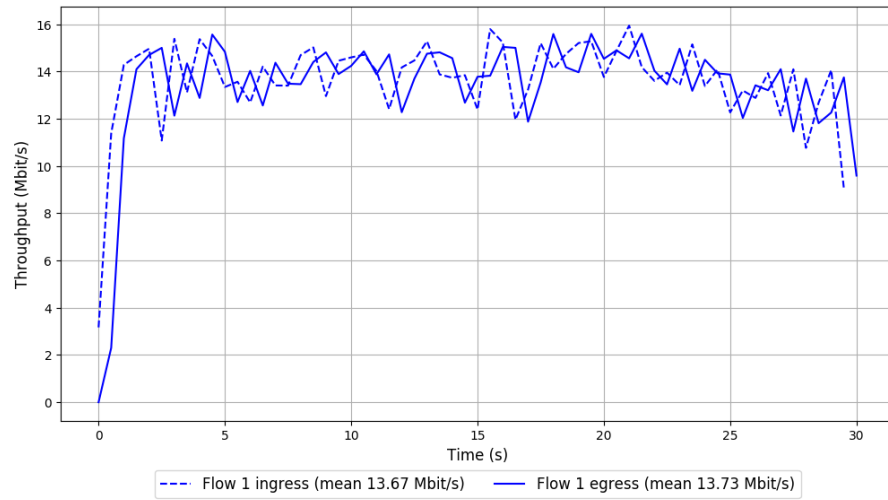


Run 1: Statistics of Sprout

Start at: 2019-01-02 18:33:40
End at: 2019-01-02 18:34:10
Local clock offset: 9.143 ms
Remote clock offset: -2.347 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.73 Mbit/s
95th percentile per-packet one-way delay: 58.420 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 13.73 Mbit/s
95th percentile per-packet one-way delay: 58.420 ms
Loss rate: 0.13%

Run 1: Report of Sprout — Data Link

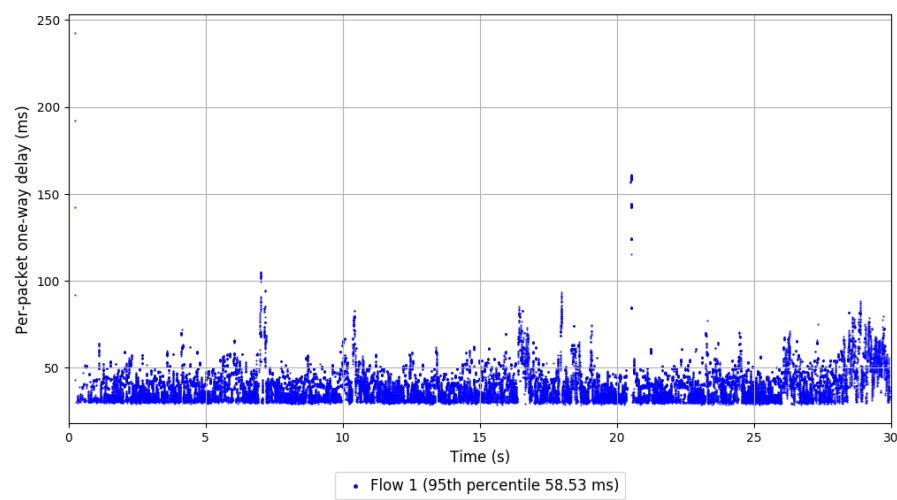
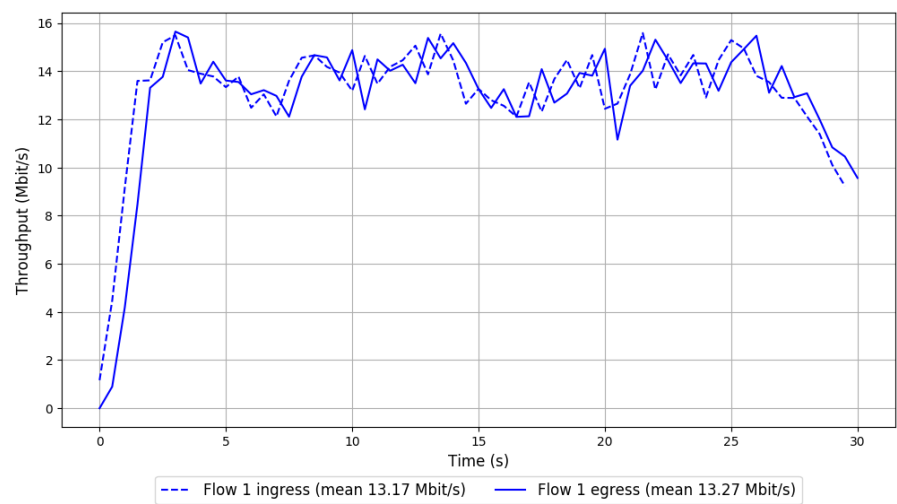


Run 2: Statistics of Sprout

Start at: 2019-01-02 18:56:57
End at: 2019-01-02 18:57:28
Local clock offset: 9.78 ms
Remote clock offset: -4.417 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.27 Mbit/s
95th percentile per-packet one-way delay: 58.530 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 13.27 Mbit/s
95th percentile per-packet one-way delay: 58.530 ms
Loss rate: 0.11%

Run 2: Report of Sprout — Data Link

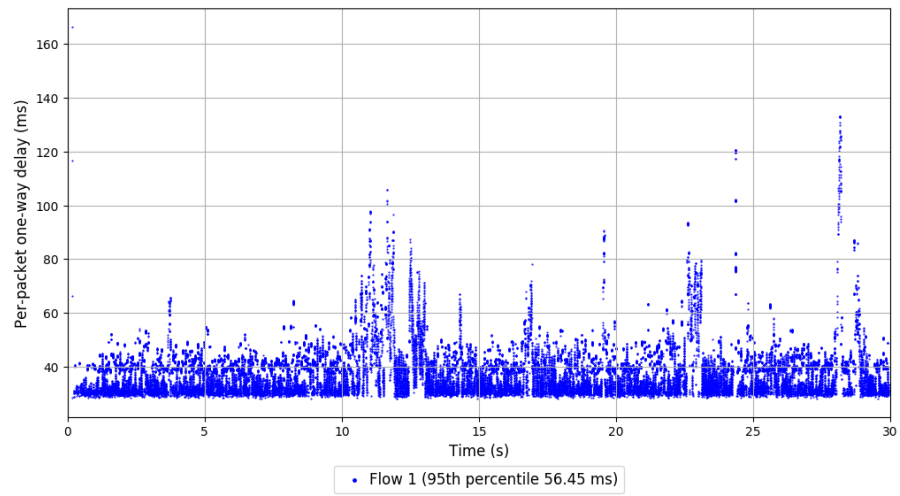
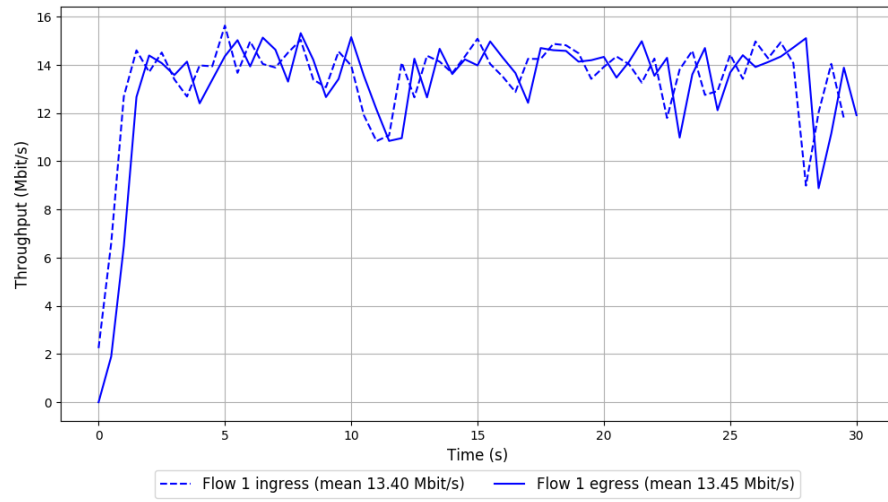


Run 3: Statistics of Sprout

Start at: 2019-01-02 19:20:11
End at: 2019-01-02 19:20:41
Local clock offset: 6.194 ms
Remote clock offset: -5.338 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.45 Mbit/s
95th percentile per-packet one-way delay: 56.450 ms
Loss rate: 0.19%
-- Flow 1:
Average throughput: 13.45 Mbit/s
95th percentile per-packet one-way delay: 56.450 ms
Loss rate: 0.19%

Run 3: Report of Sprout — Data Link

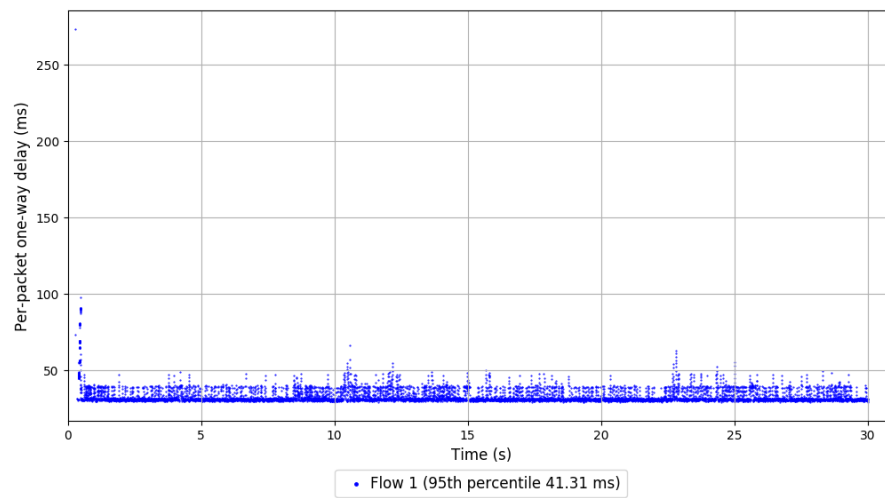
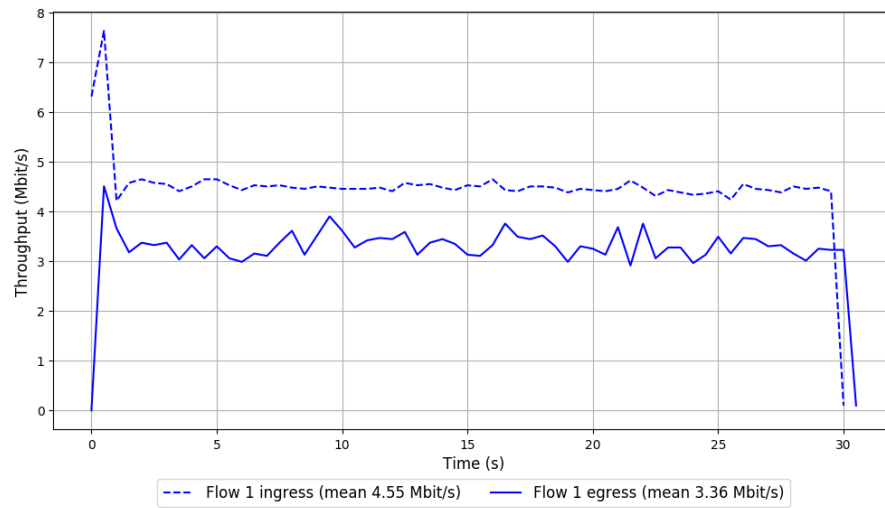


Run 1: Statistics of TaoVA-100x

Start at: 2019-01-02 18:31:13
End at: 2019-01-02 18:31:43
Local clock offset: 10.09 ms
Remote clock offset: -1.881 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.36 Mbit/s
95th percentile per-packet one-way delay: 41.309 ms
Loss rate: 26.85%
-- Flow 1:
Average throughput: 3.36 Mbit/s
95th percentile per-packet one-way delay: 41.309 ms
Loss rate: 26.85%

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

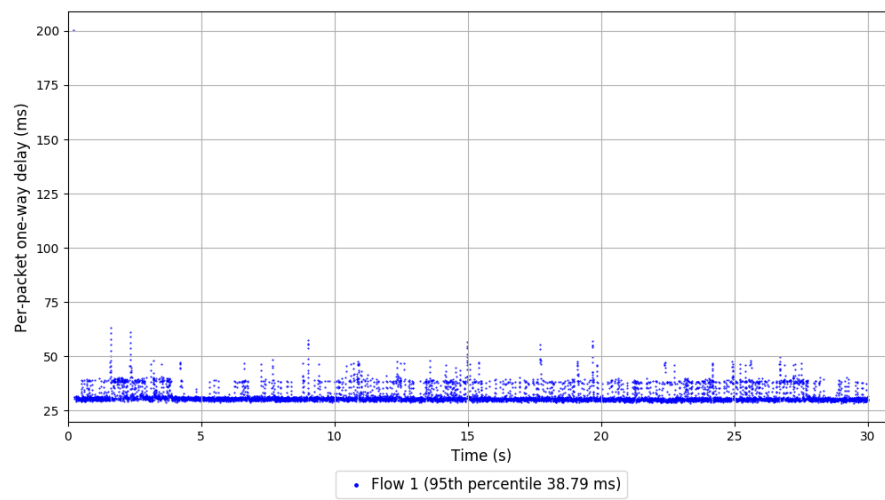
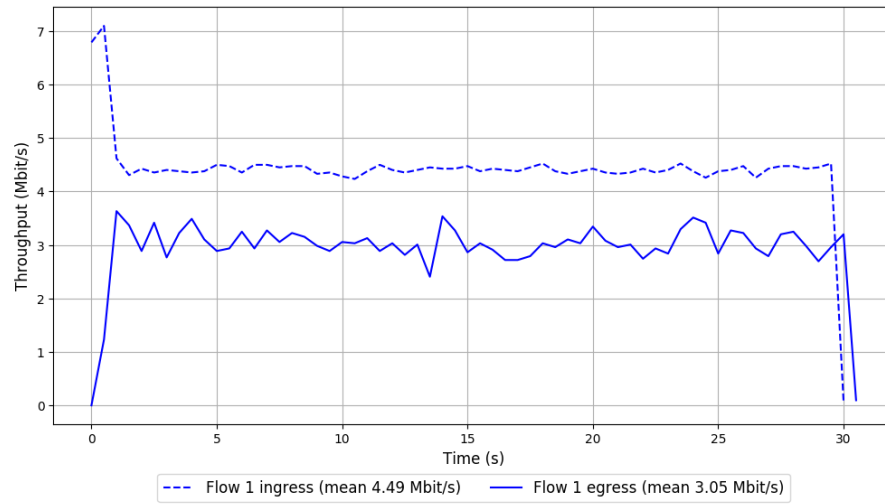


Run 2: Statistics of TaoVA-100x

Start at: 2019-01-02 18:54:30
End at: 2019-01-02 18:55:00
Local clock offset: 11.963 ms
Remote clock offset: -4.279 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.05 Mbit/s
95th percentile per-packet one-way delay: 38.786 ms
Loss rate: 32.66%
-- Flow 1:
Average throughput: 3.05 Mbit/s
95th percentile per-packet one-way delay: 38.786 ms
Loss rate: 32.66%

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



Run 3: Statistics of TaoVA-100x

Start at: 2019-01-02 19:17:44

End at: 2019-01-02 19:18:14

Local clock offset: 5.838 ms

Remote clock offset: -5.284 ms

Below is generated by plot.py at 2019-01-02 19:22:19

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.20 Mbit/s

95th percentile per-packet one-way delay: 39.430 ms

Loss rate: 30.56%

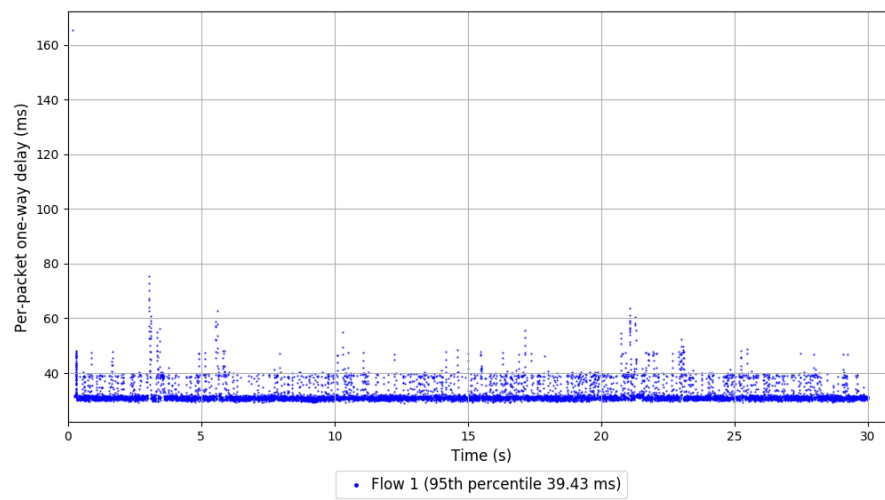
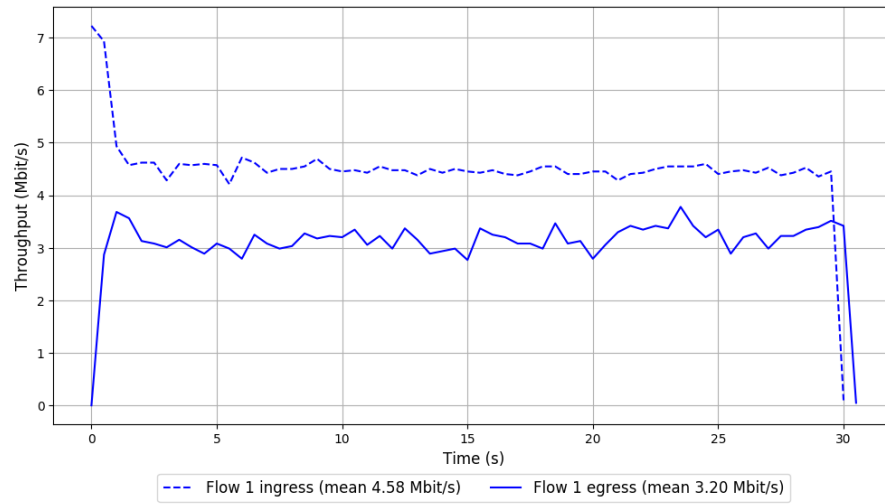
-- Flow 1:

Average throughput: 3.20 Mbit/s

95th percentile per-packet one-way delay: 39.430 ms

Loss rate: 30.56%

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

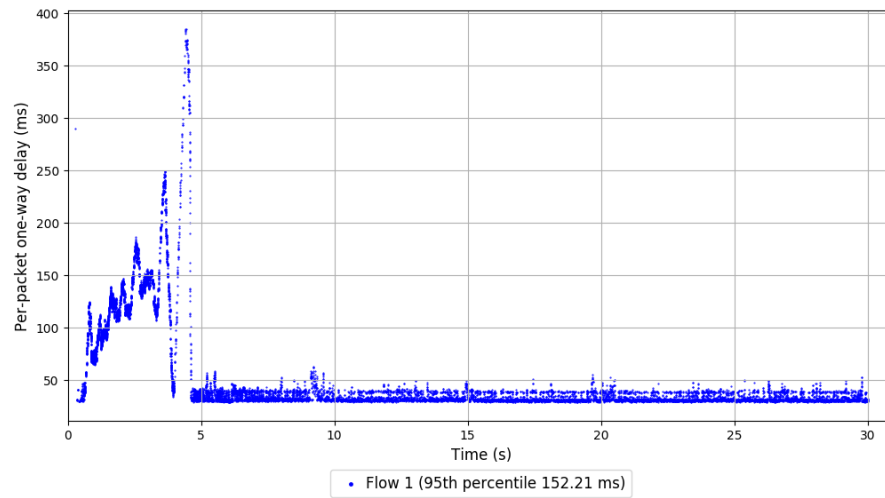
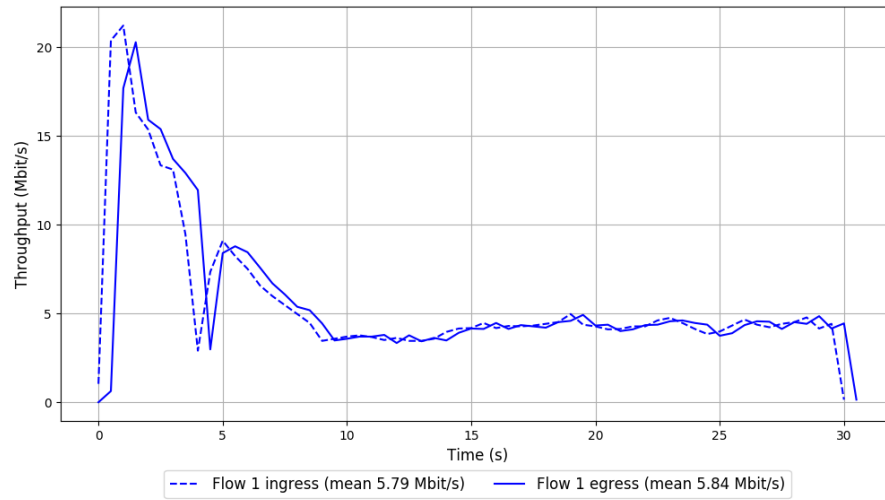


Run 1: Statistics of TCP Vegas

Start at: 2019-01-02 18:28:47
End at: 2019-01-02 18:29:17
Local clock offset: 11.55 ms
Remote clock offset: -1.311 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.84 Mbit/s
95th percentile per-packet one-way delay: 152.209 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 5.84 Mbit/s
95th percentile per-packet one-way delay: 152.209 ms
Loss rate: 0.08%

Run 1: Report of TCP Vegas — Data Link

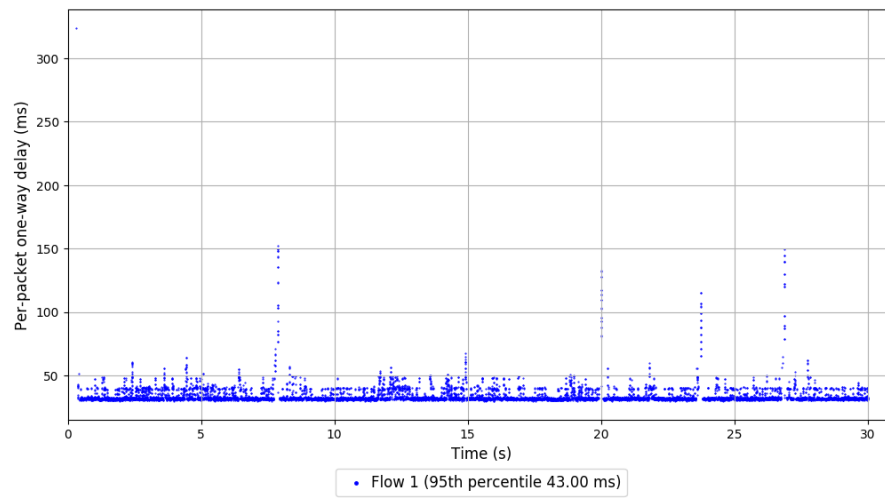
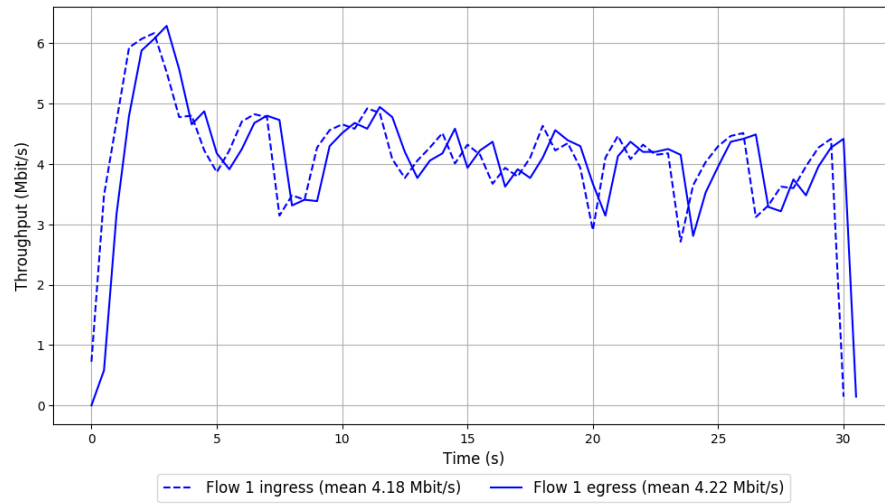


Run 2: Statistics of TCP Vegas

Start at: 2019-01-02 18:52:04
End at: 2019-01-02 18:52:34
Local clock offset: 11.22 ms
Remote clock offset: -4.089 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.22 Mbit/s
95th percentile per-packet one-way delay: 43.004 ms
Loss rate: 0.11%
-- Flow 1:
Average throughput: 4.22 Mbit/s
95th percentile per-packet one-way delay: 43.004 ms
Loss rate: 0.11%

Run 2: Report of TCP Vegas — Data Link

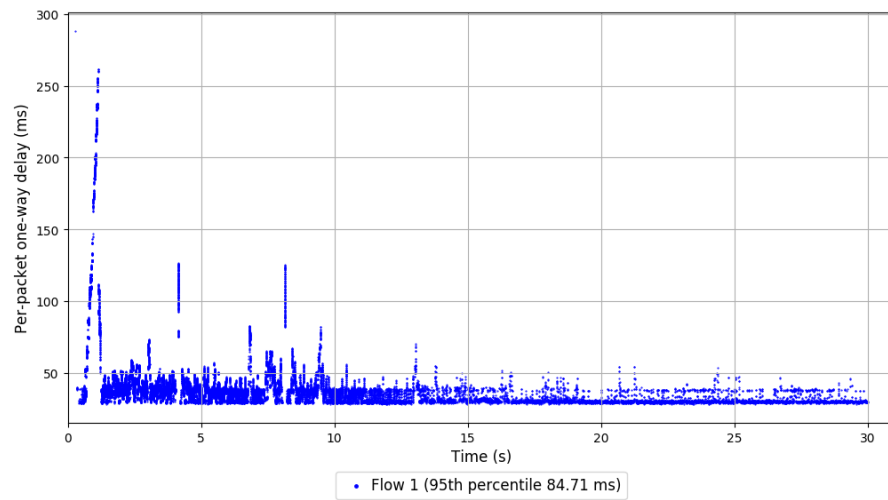
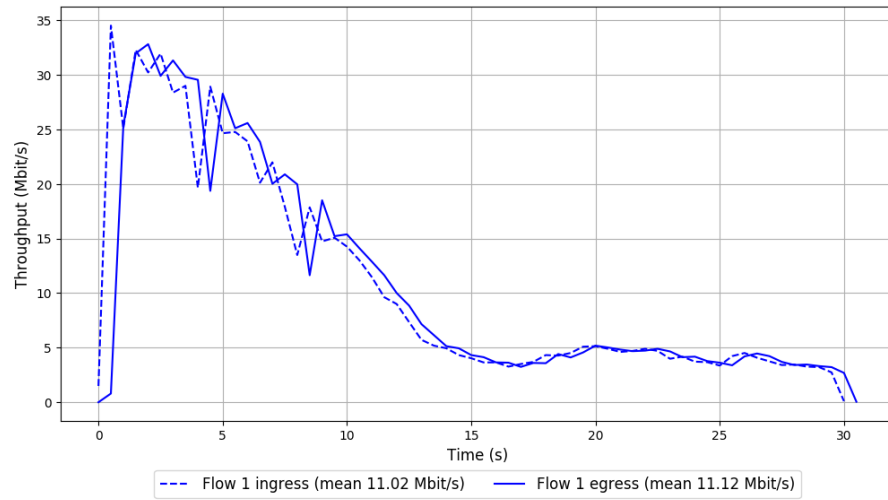


Run 3: Statistics of TCP Vegas

Start at: 2019-01-02 19:15:18
End at: 2019-01-02 19:15:48
Local clock offset: 5.563 ms
Remote clock offset: -5.201 ms

Below is generated by plot.py at 2019-01-02 19:22:19
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.12 Mbit/s
95th percentile per-packet one-way delay: 84.709 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 11.12 Mbit/s
95th percentile per-packet one-way delay: 84.709 ms
Loss rate: 0.04%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-01-02 18:22:40

End at: 2019-01-02 18:23:10

Local clock offset: 14.844 ms

Remote clock offset: 1.086 ms

Below is generated by plot.py at 2019-01-02 19:22:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 23.16 Mbit/s

95th percentile per-packet one-way delay: 470.026 ms

Loss rate: 1.67%

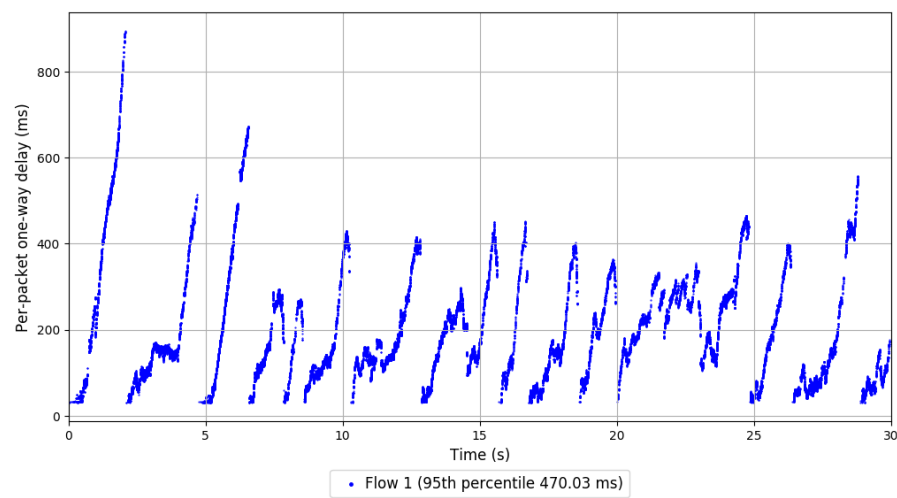
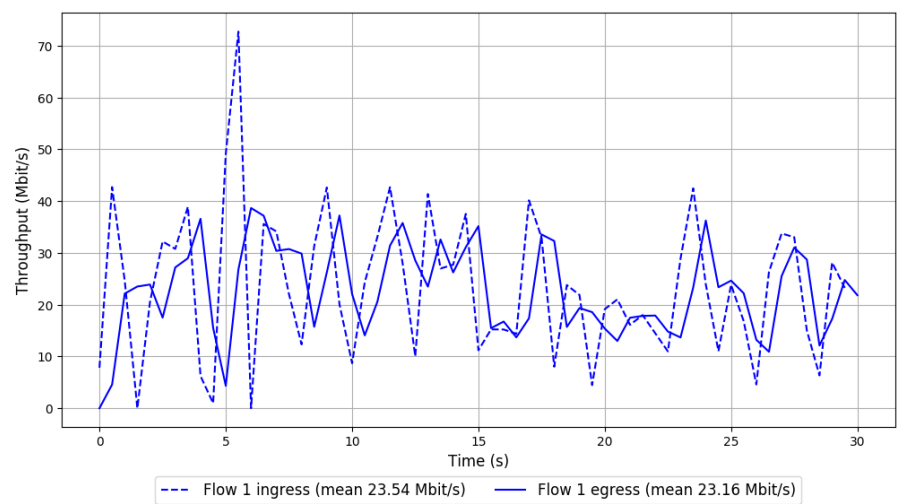
-- Flow 1:

Average throughput: 23.16 Mbit/s

95th percentile per-packet one-way delay: 470.026 ms

Loss rate: 1.67%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-01-02 18:45:57

End at: 2019-01-02 18:46:27

Local clock offset: 9.556 ms

Remote clock offset: -3.8 ms

Below is generated by plot.py at 2019-01-02 19:22:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 27.16 Mbit/s

95th percentile per-packet one-way delay: 439.001 ms

Loss rate: 0.79%

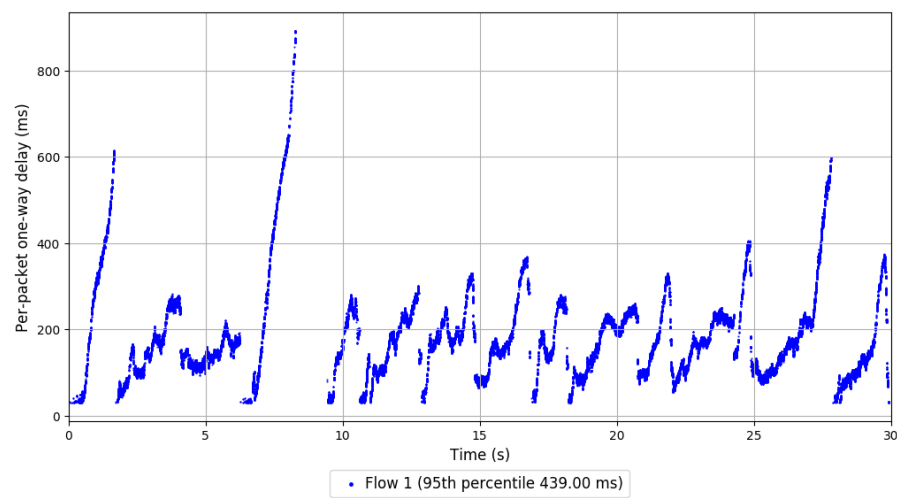
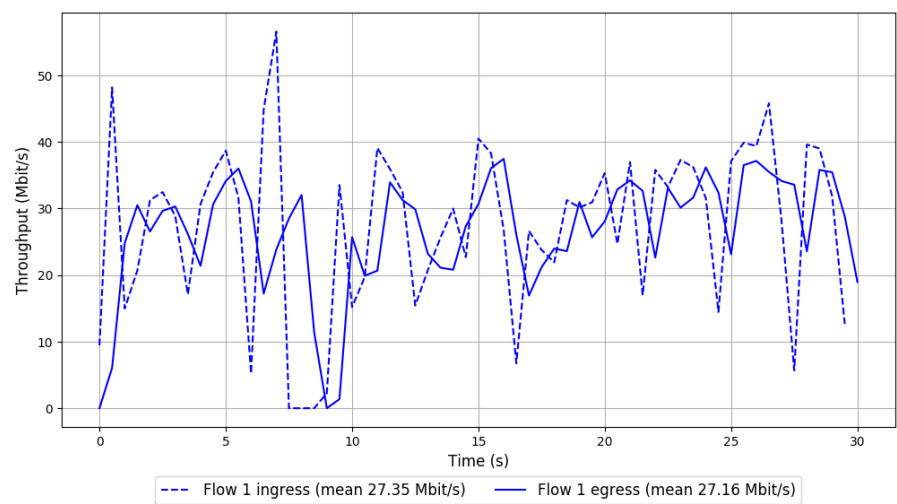
-- Flow 1:

Average throughput: 27.16 Mbit/s

95th percentile per-packet one-way delay: 439.001 ms

Loss rate: 0.79%

Run 2: Report of Verus — Data Link

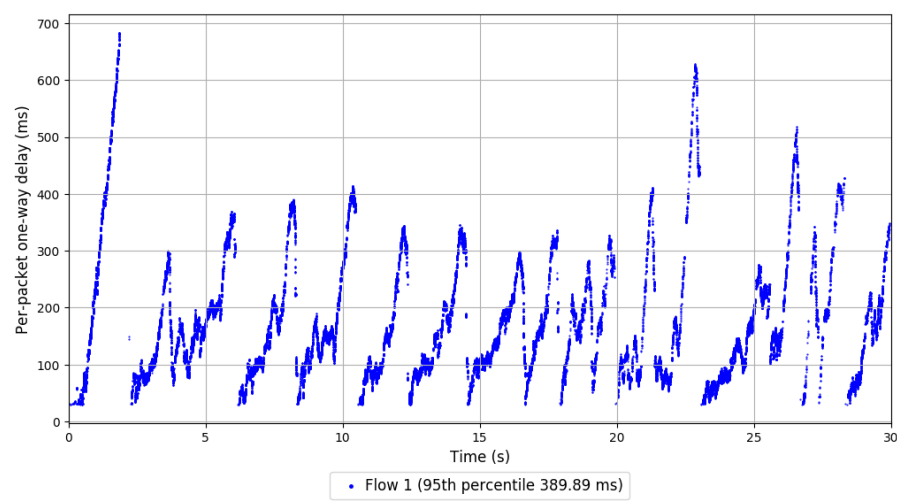
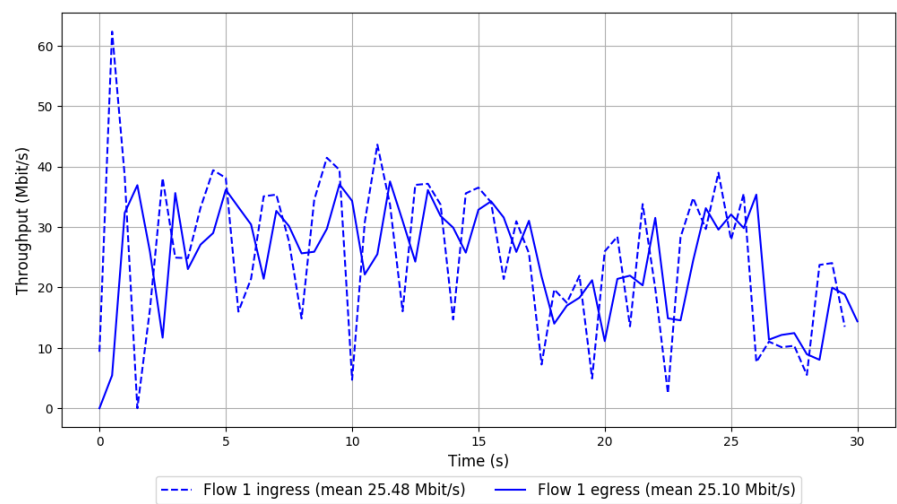


Run 3: Statistics of Verus

Start at: 2019-01-02 19:09:10
End at: 2019-01-02 19:09:40
Local clock offset: 5.374 ms
Remote clock offset: -4.934 ms

Below is generated by plot.py at 2019-01-02 19:22:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 25.10 Mbit/s
95th percentile per-packet one-way delay: 389.888 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 25.10 Mbit/s
95th percentile per-packet one-way delay: 389.888 ms
Loss rate: 1.36%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-01-02 18:17:47

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

Local clock offset: 11.86 ms

Remote clock offset: 0.833 ms

Below is generated by plot.py at 2019-01-02 19:22:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 43.676 ms

Loss rate: 0.11%

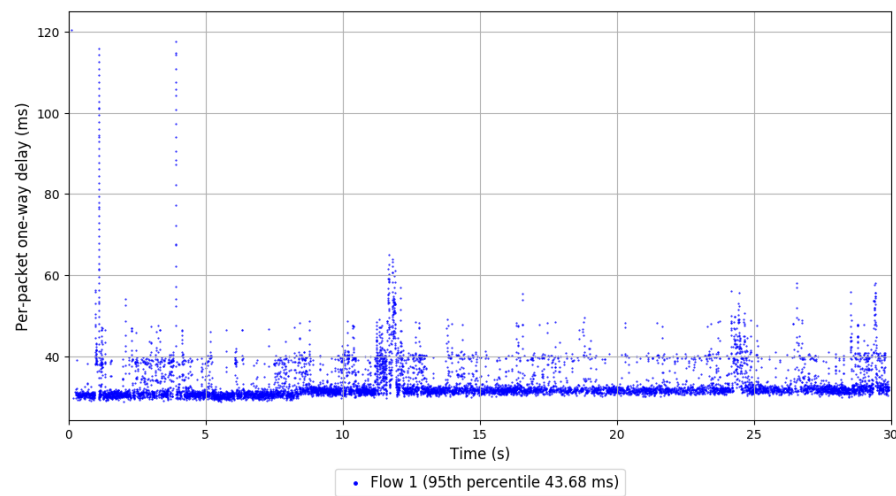
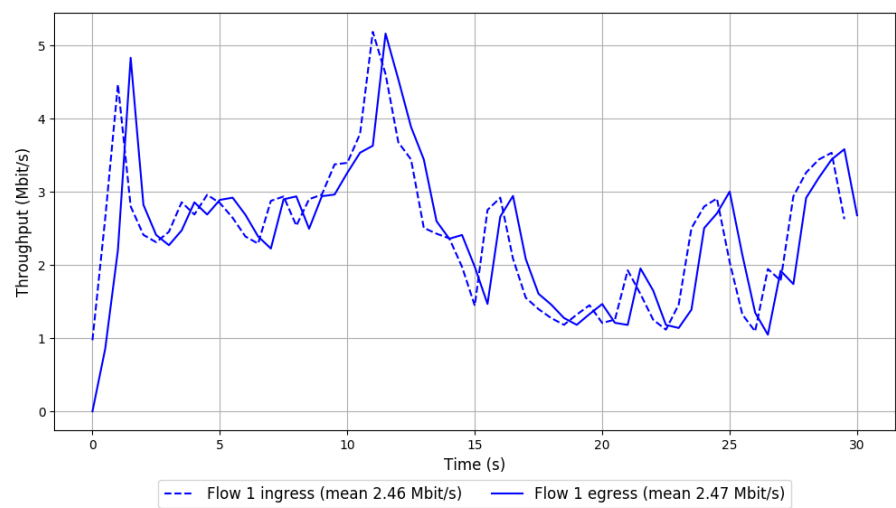
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 43.676 ms

Loss rate: 0.11%

Run 1: Report of PCC-Vivace — Data Link

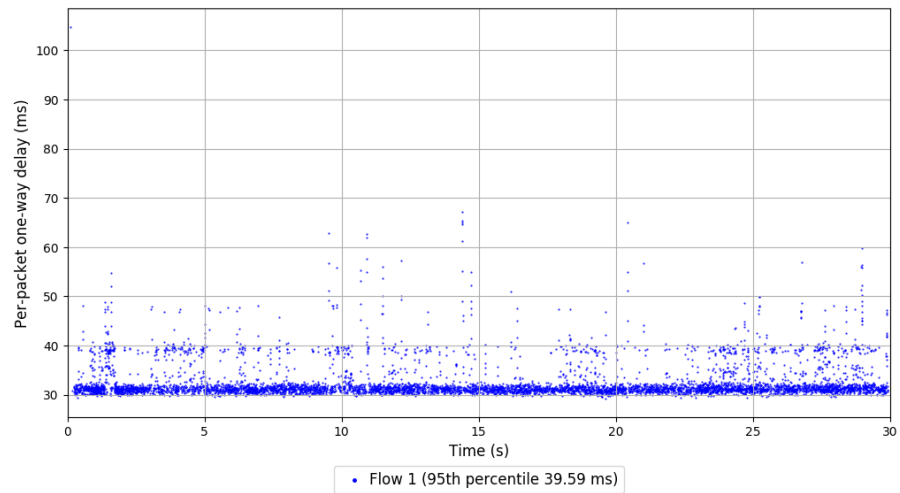
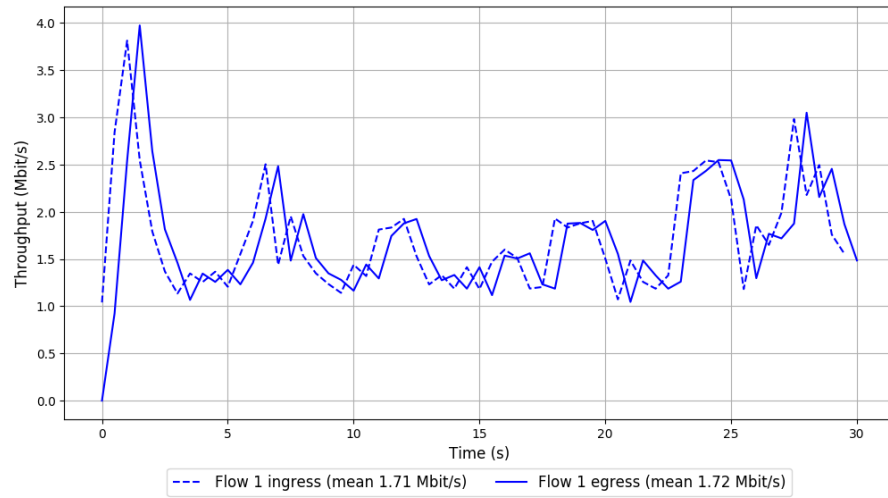


Run 2: Statistics of PCC-Vivace

Start at: 2019-01-02 18:41:03
End at: 2019-01-02 18:41:33
Local clock offset: 8.697 ms
Remote clock offset: -3.346 ms

Below is generated by plot.py at 2019-01-02 19:22:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 39.593 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 39.593 ms
Loss rate: 0.14%

Run 2: Report of PCC-Vivace — Data Link

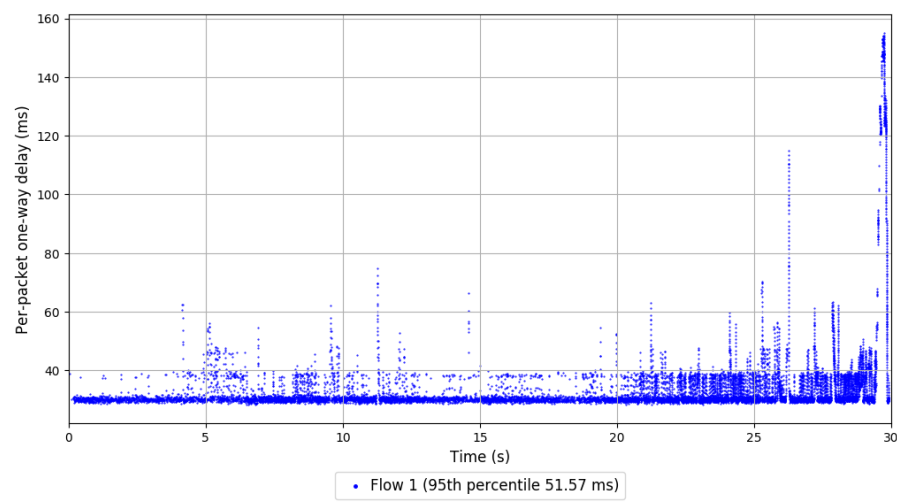
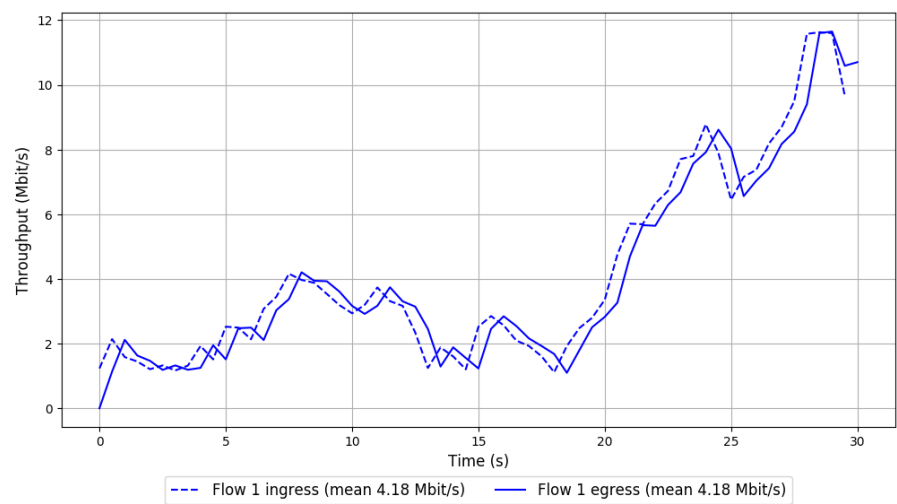


Run 3: Statistics of PCC-Vivace

Start at: 2019-01-02 19:04:16
End at: 2019-01-02 19:04:46
Local clock offset: 6.044 ms
Remote clock offset: -4.764 ms

Below is generated by plot.py at 2019-01-02 19:22:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.18 Mbit/s
95th percentile per-packet one-way delay: 51.567 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 4.18 Mbit/s
95th percentile per-packet one-way delay: 51.567 ms
Loss rate: 0.26%

Run 3: Report of PCC-Vivace — Data Link

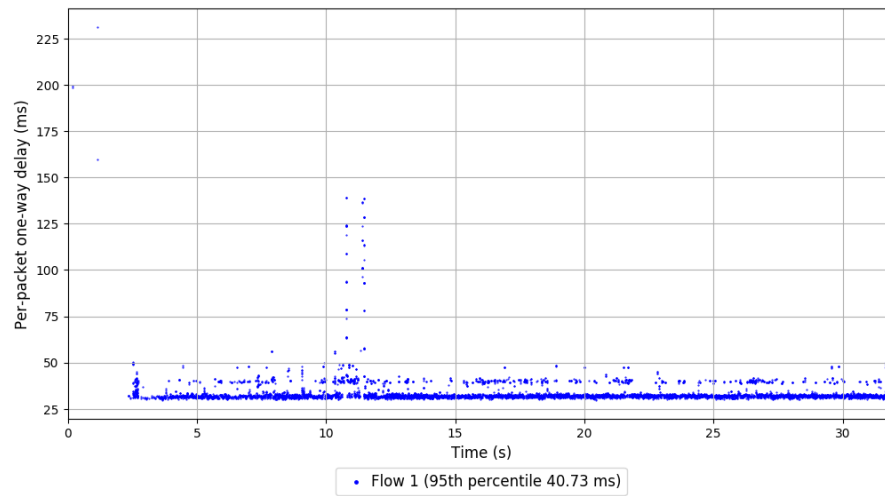
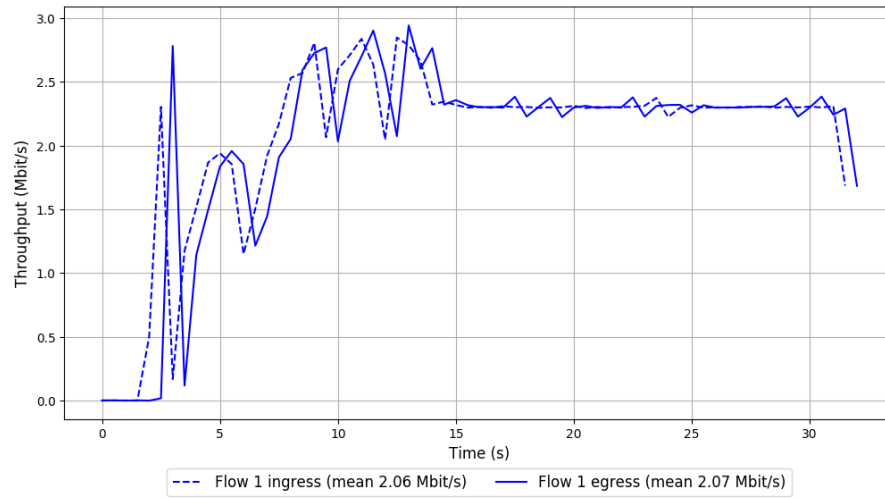



```
Run 1: Statistics of WebRTC media

Start at: 2019-01-02 18:16:34
End at: 2019-01-02 18:17:04
Local clock offset: 11.022 ms
Remote clock offset: 0.745 ms

# Below is generated by plot.py at 2019-01-02 19:22:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 40.733 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 2.07 Mbit/s
95th percentile per-packet one-way delay: 40.733 ms
Loss rate: 0.12%
```

Run 1: Report of WebRTC media — Data Link

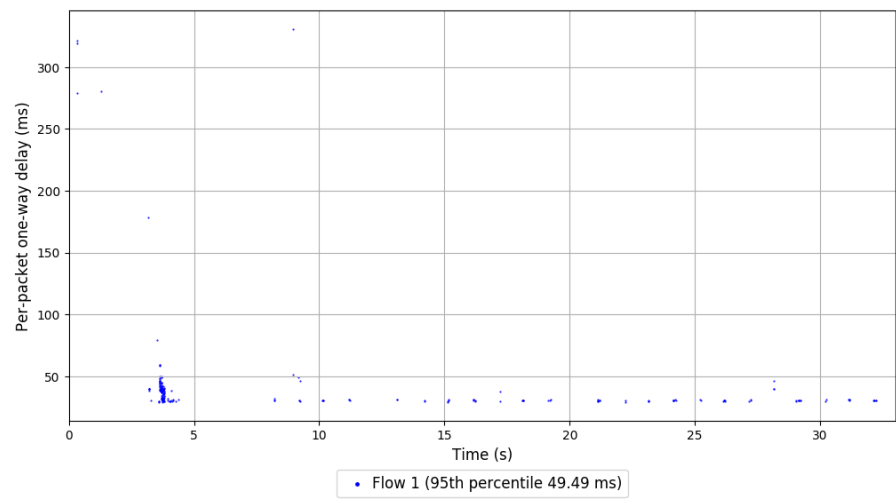
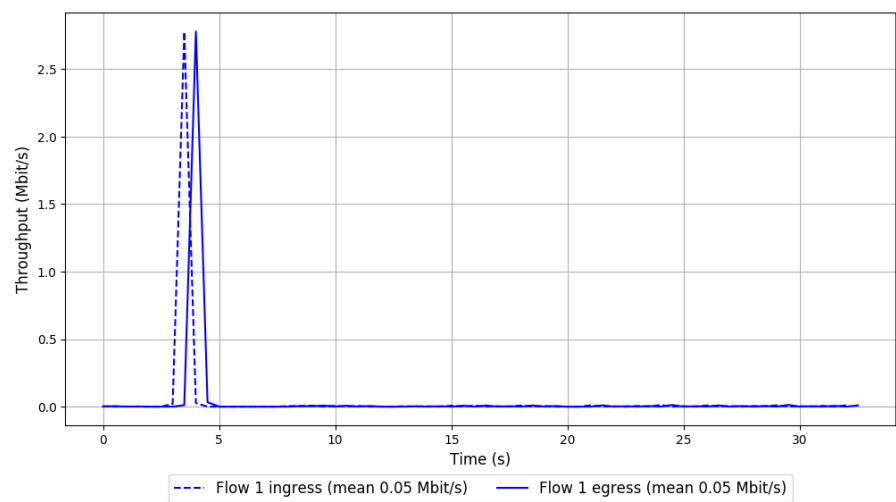


Run 2: Statistics of WebRTC media

Start at: 2019-01-02 18:39:50
End at: 2019-01-02 18:40:20
Local clock offset: 8.604 ms
Remote clock offset: -3.194 ms

Below is generated by plot.py at 2019-01-02 19:22:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 49.490 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 49.490 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-02 19:03:03
End at: 2019-01-02 19:03:33
Local clock offset: 6.394 ms
Remote clock offset: -4.665 ms

Below is generated by plot.py at 2019-01-02 19:22:22
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 46.691 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 46.691 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

