

Pantheon Report

Generated at 2019-03-08 21:01:32 (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:

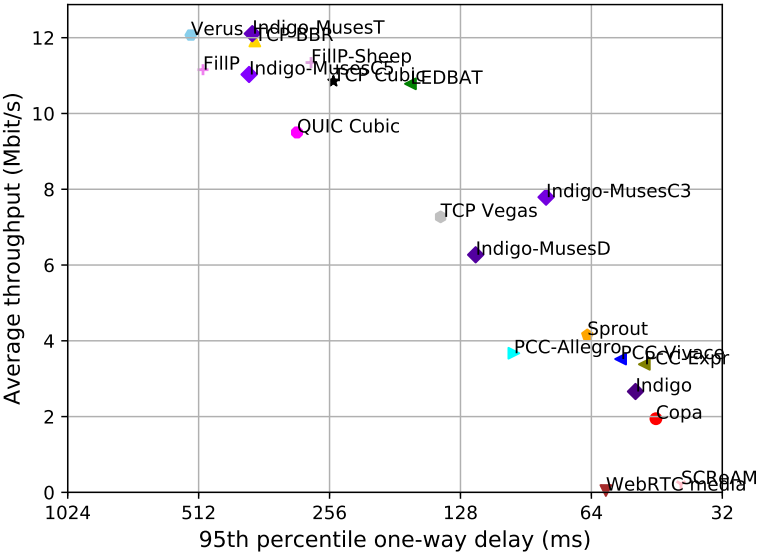
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

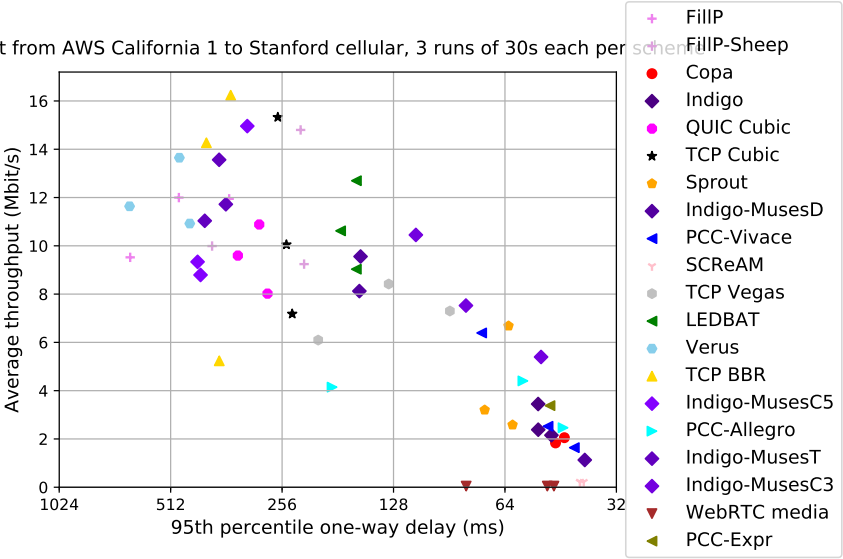
```
branch: muses @ 7a686f7c2ed0a333082c0bab1fa5c921ab47e6ee
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 5ce721187ad823da20955337730c746486ca4966
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	11.92	380.24	0.67
Copa	2	1.94	45.48	19.94
TCP Cubic	3	10.85	250.82	0.21
FillP	3	11.16	500.28	0.77
FillP-Sheep	3	11.34	282.34	1.48
Indigo	3	2.66	50.68	0.14
Indigo-MusesC3	3	7.79	81.37	0.18
Indigo-MusesC5	3	11.03	392.01	0.98
Indigo-MusesD	3	6.27	118.12	0.20
Indigo-MusesT	3	12.11	385.36	1.15
LEDBAT	3	10.78	166.85	0.35
PCC-Allegro	3	3.67	96.47	0.13
PCC-Expr	1	3.38	48.37	50.89
QUIC Cubic	3	9.50	304.16	0.51
SCReAM	3	0.22	39.83	0.09
Sprout	3	4.15	65.42	0.33
TaoVA-100x	0	N/A	N/A	N/A
TCP Vegas	3	7.27	142.19	0.07
Verus	3	12.07	533.49	1.83
PCC-Vivace	3	3.52	54.84	0.06
WebRTC media	3	0.05	59.28	0.00

Run 1: Statistics of TCP BBR

Start at: 2019-03-08 20:07:59

End at: 2019-03-08 20:08:29

Local clock offset: -2.812 ms

Remote clock offset: -1.6 ms

Below is generated by plot.py at 2019-03-08 21:00:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 16.24 Mbit/s

95th percentile per-packet one-way delay: 352.424 ms

Loss rate: 0.56%

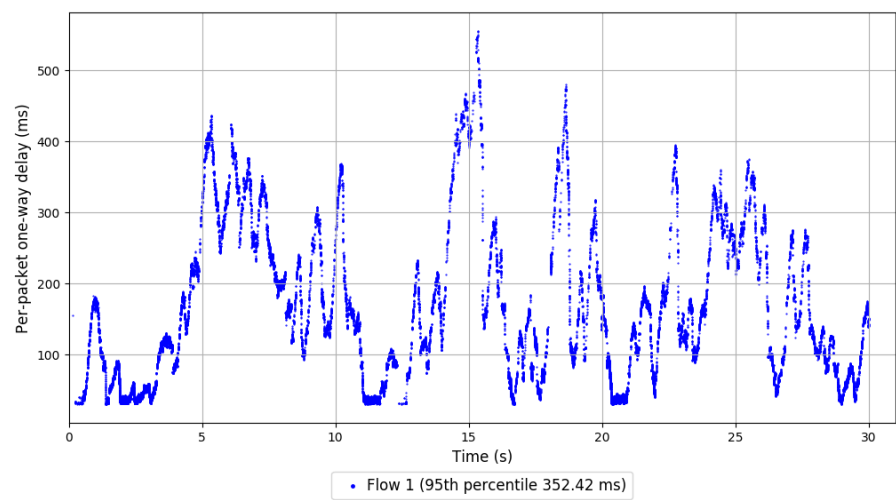
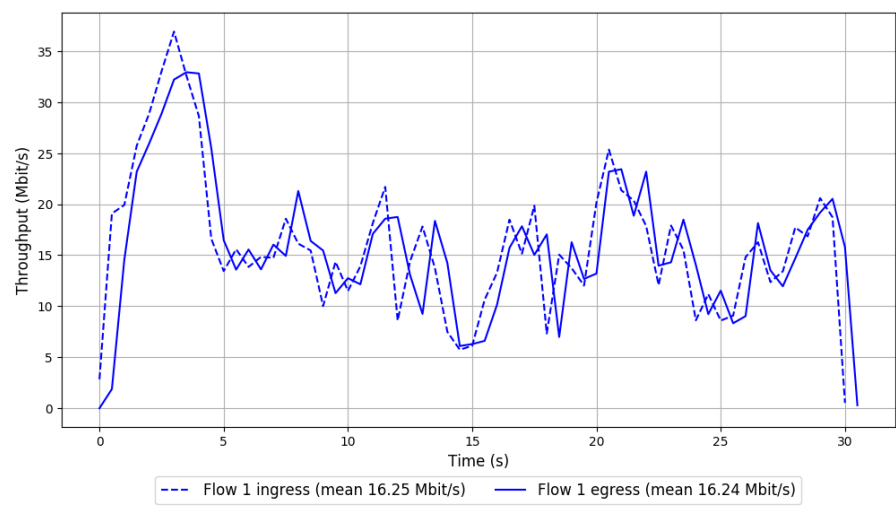
-- Flow 1:

Average throughput: 16.24 Mbit/s

95th percentile per-packet one-way delay: 352.424 ms

Loss rate: 0.56%

Run 1: Report of TCP BBR — Data Link

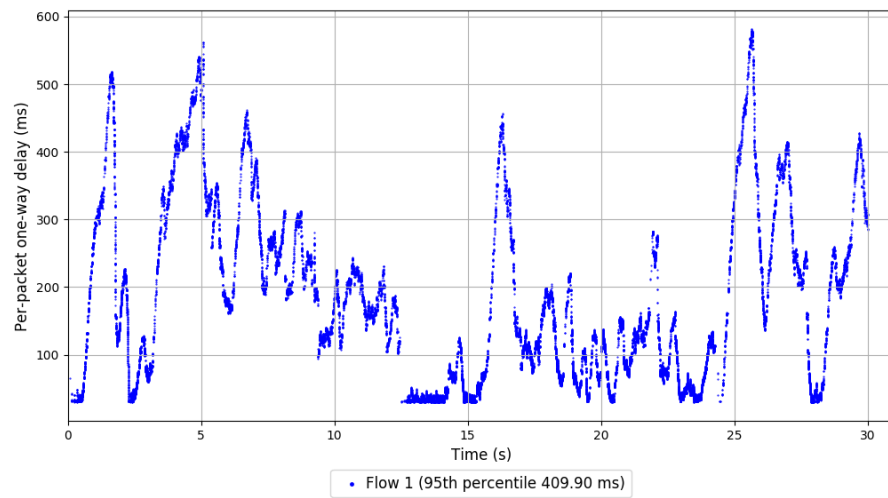
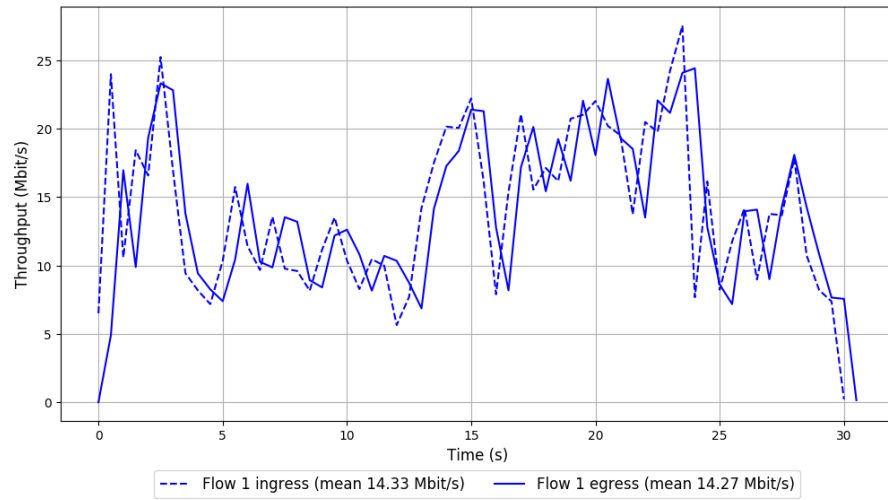


Run 2: Statistics of TCP BBR

Start at: 2019-03-08 20:33:49
End at: 2019-03-08 20:34:19
Local clock offset: -5.327 ms
Remote clock offset: -3.838 ms

Below is generated by plot.py at 2019-03-08 21:00:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.27 Mbit/s
95th percentile per-packet one-way delay: 409.899 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 14.27 Mbit/s
95th percentile per-packet one-way delay: 409.899 ms
Loss rate: 0.68%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-03-08 20:59:39

End at: 2019-03-08 21:00:09

Local clock offset: -6.28 ms

Remote clock offset: 0.558 ms

Below is generated by plot.py at 2019-03-08 21:00:33

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.24 Mbit/s

95th percentile per-packet one-way delay: 378.391 ms

Loss rate: 0.78%

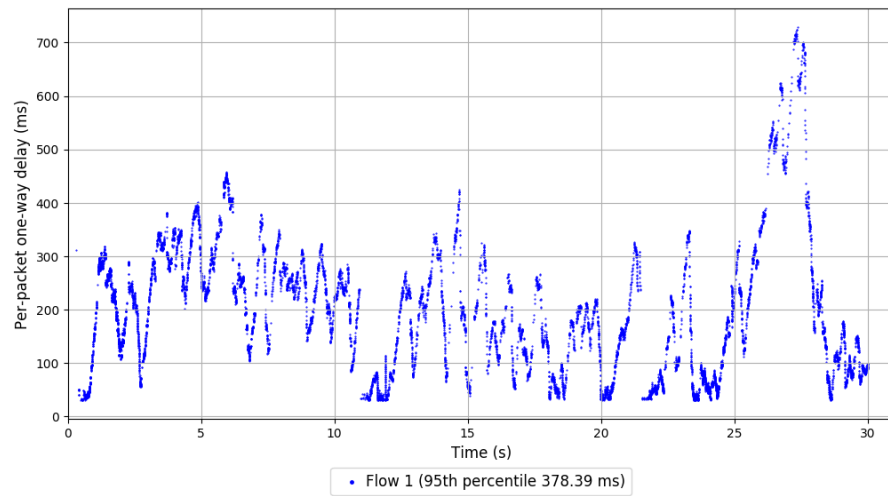
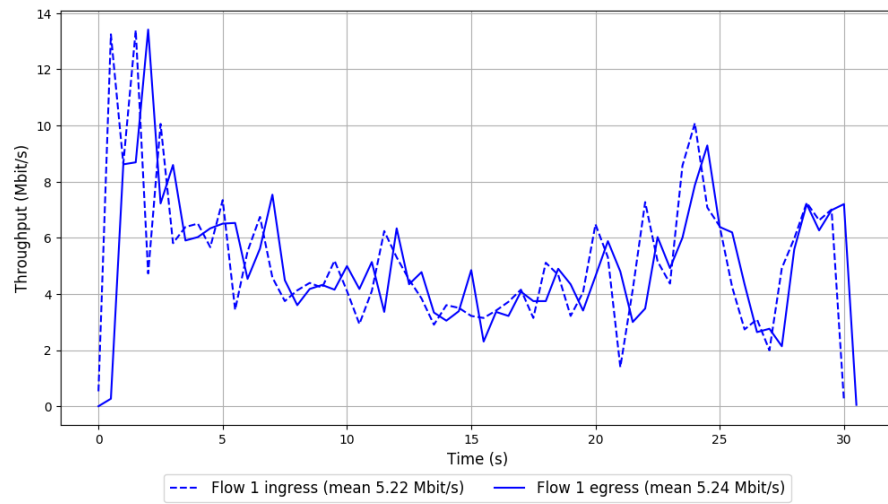
-- Flow 1:

Average throughput: 5.24 Mbit/s

95th percentile per-packet one-way delay: 378.391 ms

Loss rate: 0.78%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

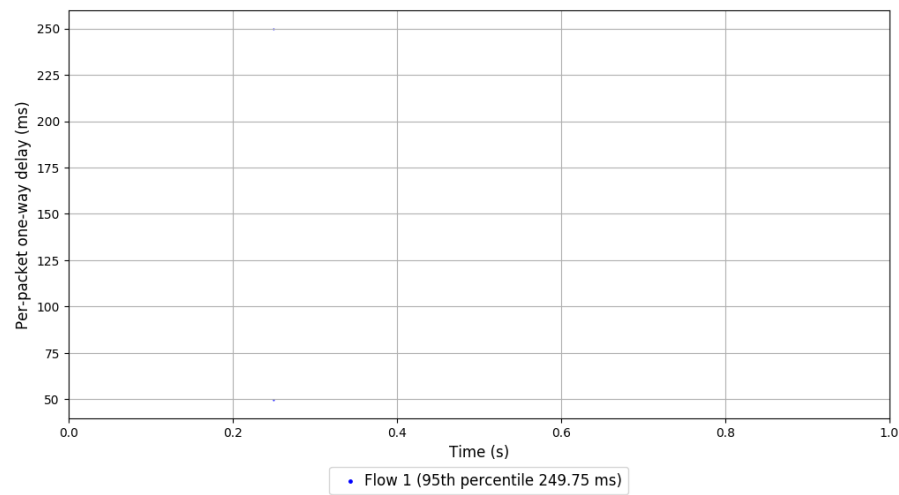
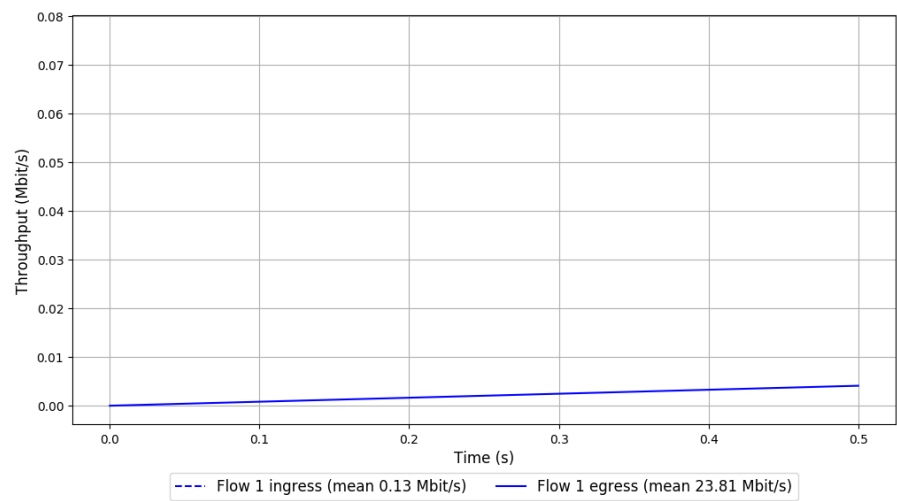
Start at: 2019-03-08 19:44:40

End at: 2019-03-08 19:45:10

Local clock offset: -3.947 ms

Remote clock offset: 1.438 ms

Run 1: Report of Copa — Data Link

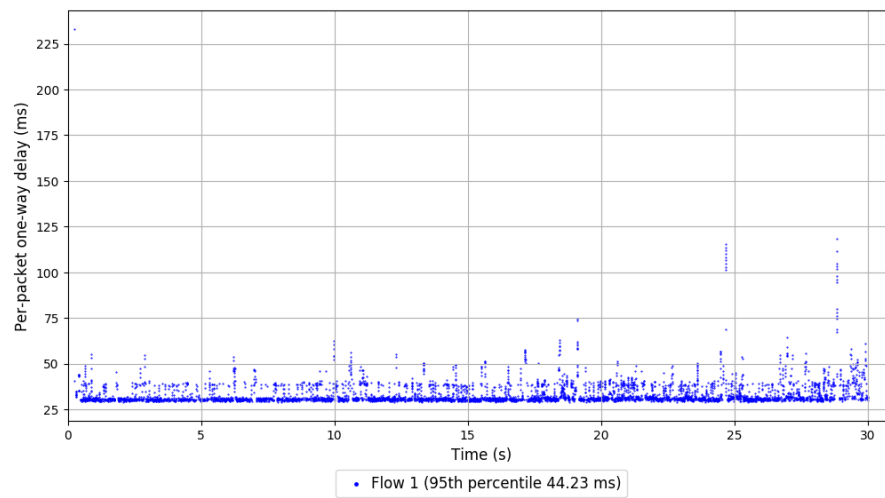
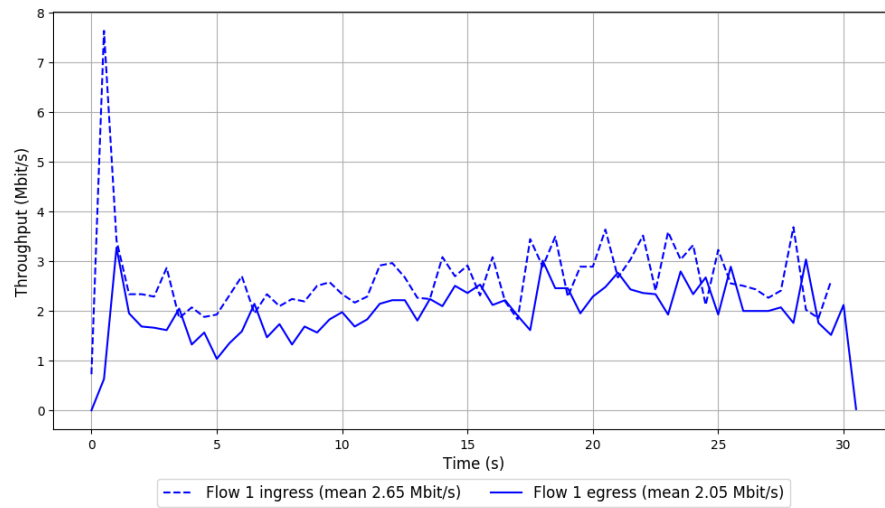


Run 2: Statistics of Copa

Start at: 2019-03-08 20:10:26
End at: 2019-03-08 20:10:56
Local clock offset: -3.245 ms
Remote clock offset: -1.799 ms

Below is generated by plot.py at 2019-03-08 21:00:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 44.225 ms
Loss rate: 23.07%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 44.225 ms
Loss rate: 23.07%

Run 2: Report of Copa — Data Link

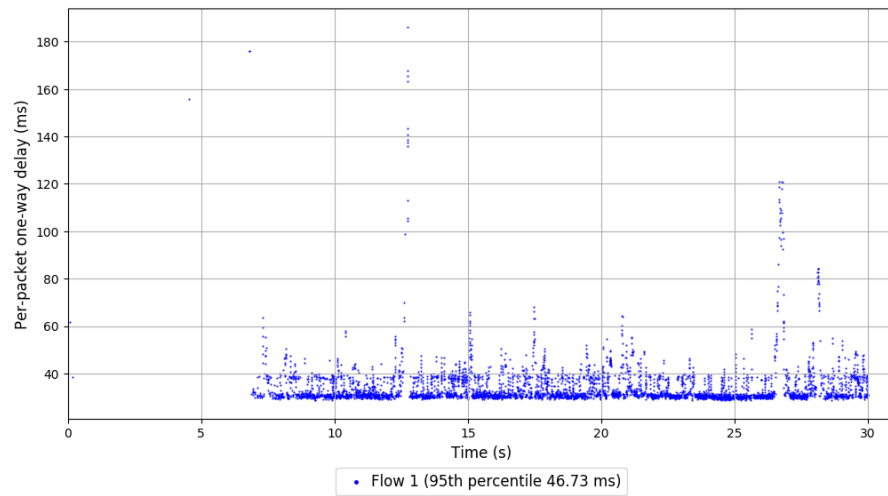
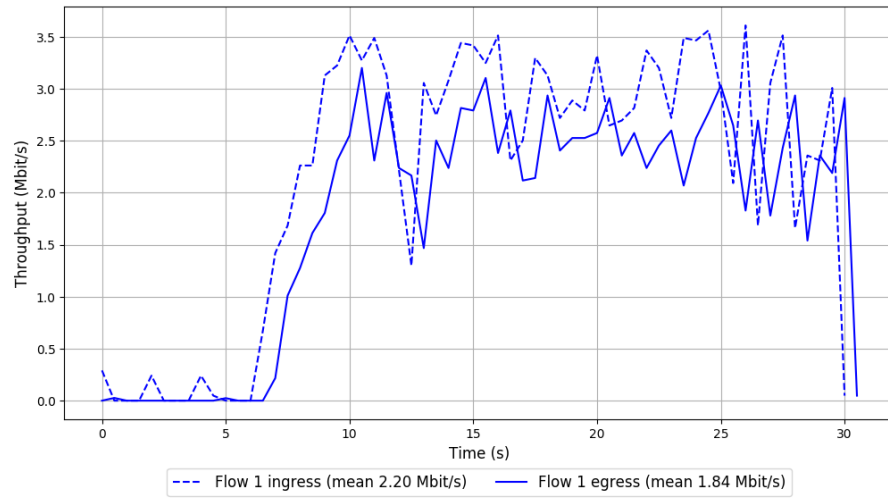


Run 3: Statistics of Copa

Start at: 2019-03-08 20:36:16
End at: 2019-03-08 20:36:46
Local clock offset: -5.842 ms
Remote clock offset: -4.147 ms

Below is generated by plot.py at 2019-03-08 21:00:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 46.726 ms
Loss rate: 16.81%
-- Flow 1:
Average throughput: 1.84 Mbit/s
95th percentile per-packet one-way delay: 46.726 ms
Loss rate: 16.81%

Run 3: Report of Copa — Data Link

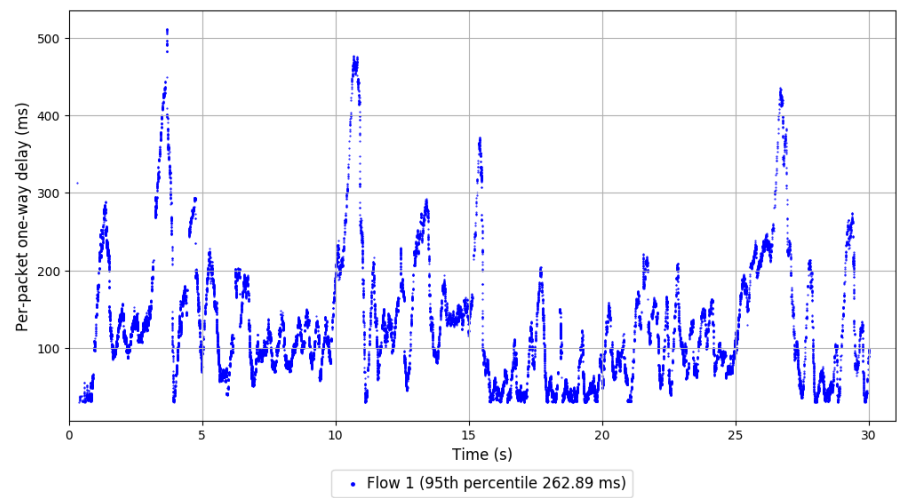
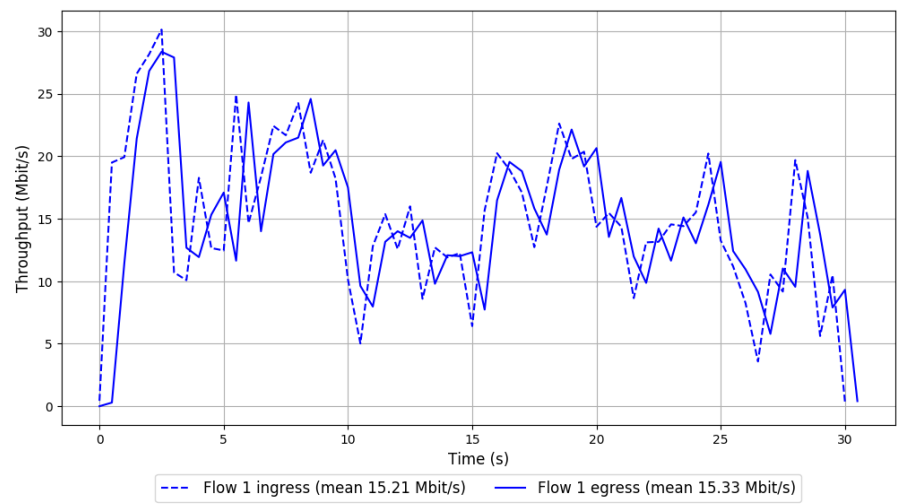


Run 1: Statistics of TCP Cubic

Start at: 2019-03-08 19:54:28
End at: 2019-03-08 19:54:58
Local clock offset: -1.671 ms
Remote clock offset: -0.175 ms

Below is generated by plot.py at 2019-03-08 21:00:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 15.33 Mbit/s
95th percentile per-packet one-way delay: 262.894 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 15.33 Mbit/s
95th percentile per-packet one-way delay: 262.894 ms
Loss rate: 0.25%

Run 1: Report of TCP Cubic — Data Link

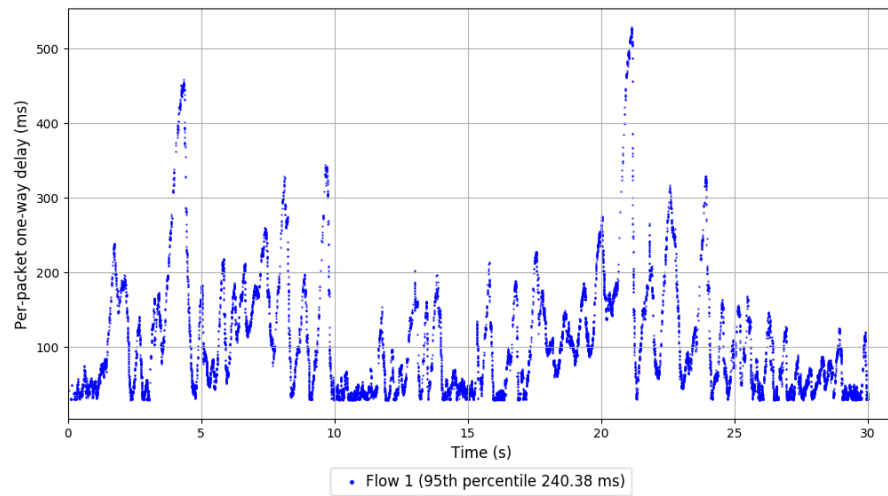
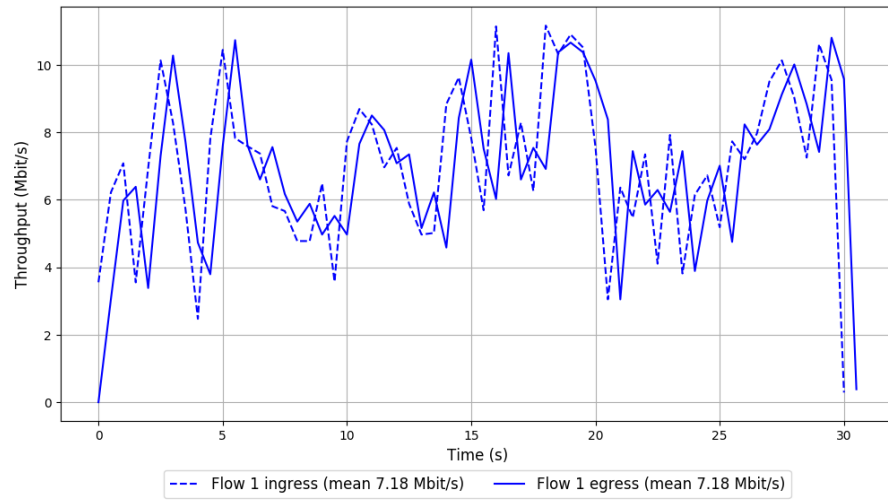


Run 2: Statistics of TCP Cubic

Start at: 2019-03-08 20:20:19
End at: 2019-03-08 20:20:49
Local clock offset: -3.667 ms
Remote clock offset: -2.732 ms

Below is generated by plot.py at 2019-03-08 21:00:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.18 Mbit/s
95th percentile per-packet one-way delay: 240.383 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 7.18 Mbit/s
95th percentile per-packet one-way delay: 240.383 ms
Loss rate: 0.20%

Run 2: Report of TCP Cubic — Data Link

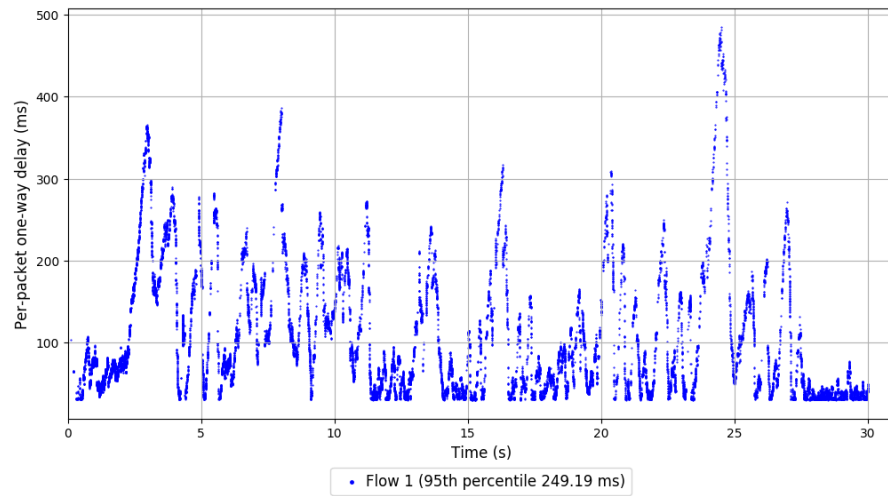
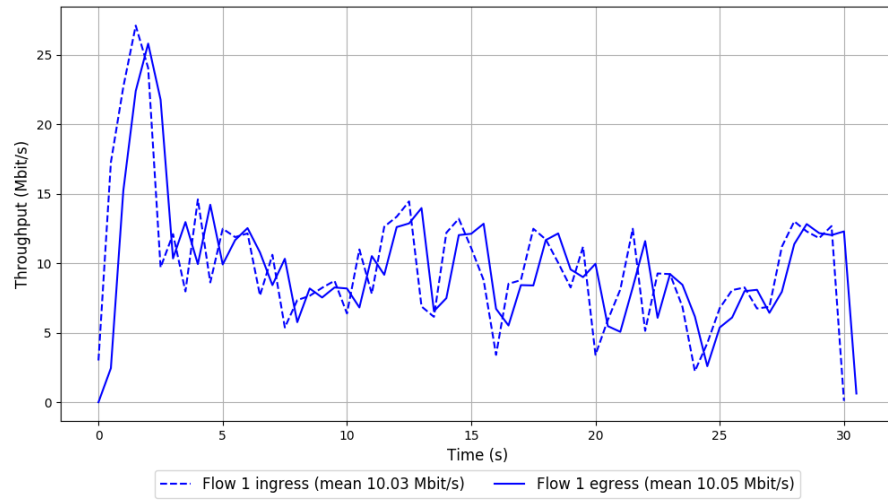


Run 3: Statistics of TCP Cubic

Start at: 2019-03-08 20:46:09
End at: 2019-03-08 20:46:39
Local clock offset: -7.291 ms
Remote clock offset: -1.301 ms

Below is generated by plot.py at 2019-03-08 21:00:33
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.05 Mbit/s
95th percentile per-packet one-way delay: 249.190 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 10.05 Mbit/s
95th percentile per-packet one-way delay: 249.190 ms
Loss rate: 0.17%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-03-08 19:58:09

End at: 2019-03-08 19:58:39

Local clock offset: -2.701 ms

Remote clock offset: -0.55 ms

Below is generated by plot.py at 2019-03-08 21:00:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 11.95 Mbit/s

95th percentile per-packet one-way delay: 355.803 ms

Loss rate: 0.66%

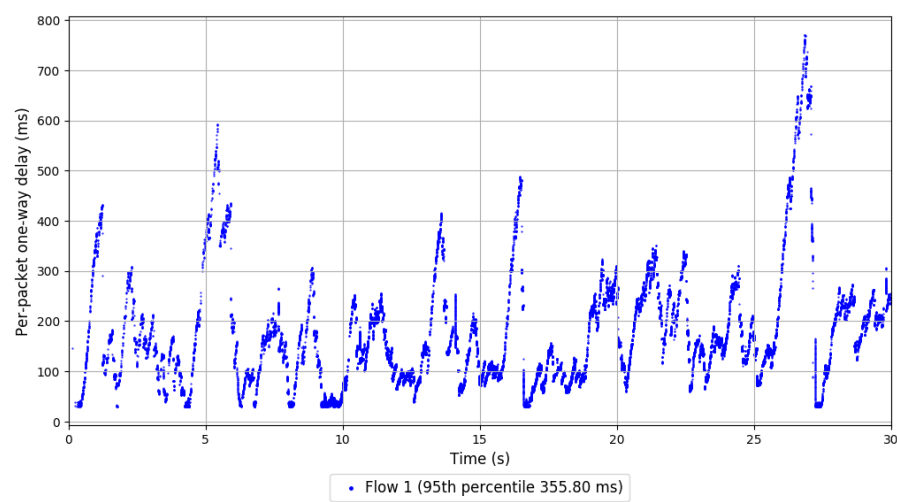
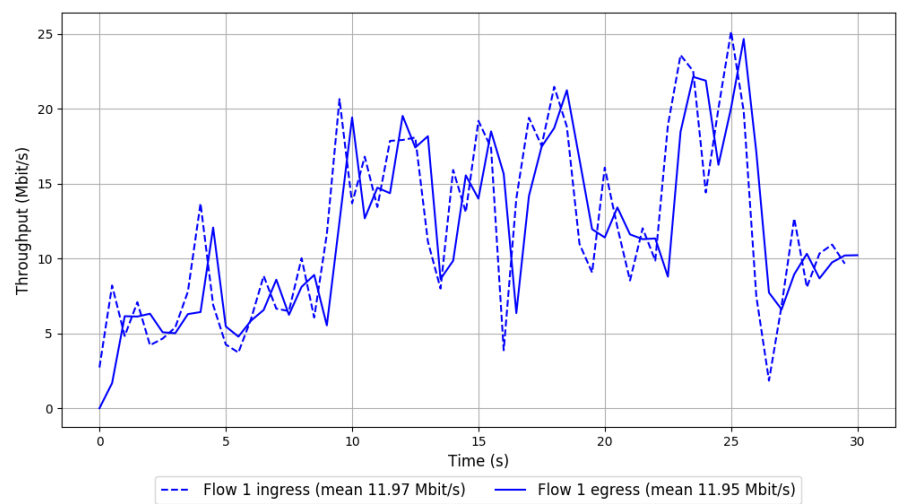
-- Flow 1:

Average throughput: 11.95 Mbit/s

95th percentile per-packet one-way delay: 355.803 ms

Loss rate: 0.66%

Run 1: Report of FillP — Data Link

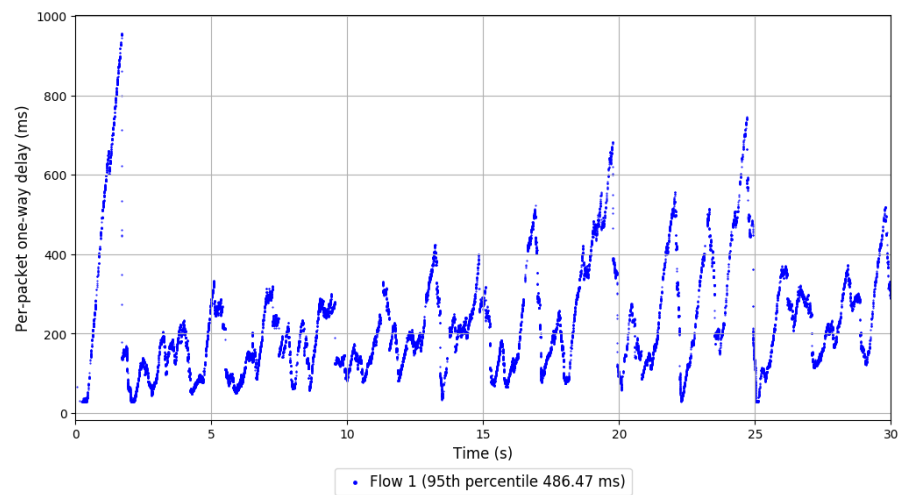
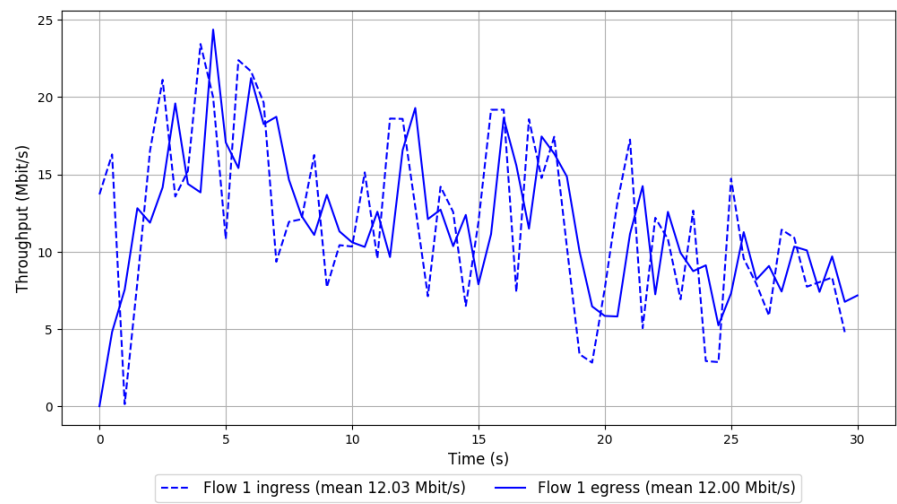


Run 2: Statistics of FillP

Start at: 2019-03-08 20:23:59
End at: 2019-03-08 20:24:30
Local clock offset: -3.77 ms
Remote clock offset: -3.058 ms

Below is generated by plot.py at 2019-03-08 21:00:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 12.00 Mbit/s
95th percentile per-packet one-way delay: 486.470 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 12.00 Mbit/s
95th percentile per-packet one-way delay: 486.470 ms
Loss rate: 0.46%

Run 2: Report of FillP — Data Link

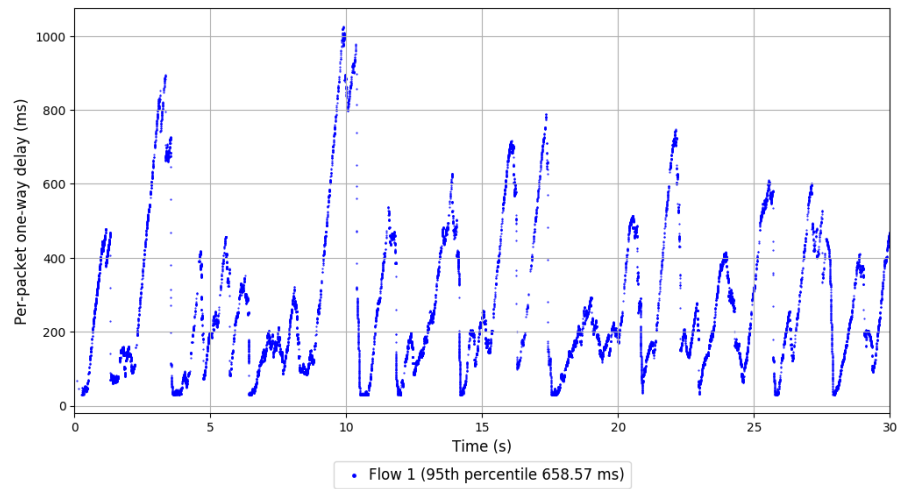
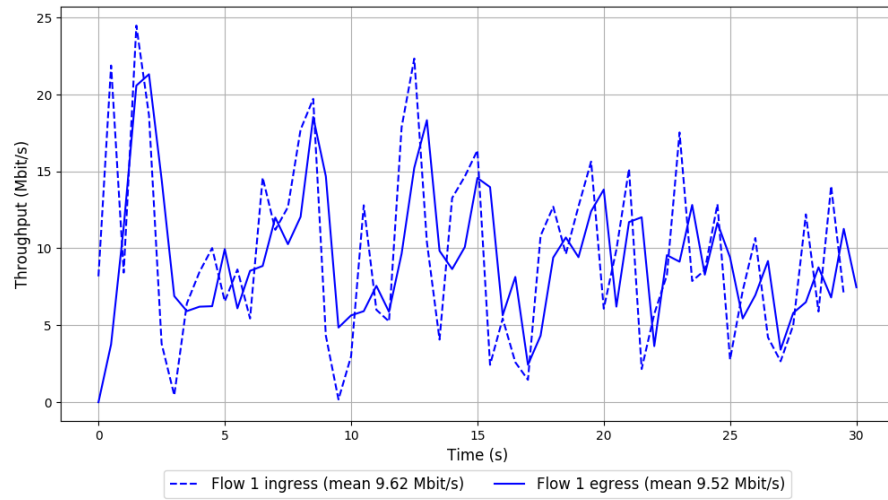


Run 3: Statistics of FillP

Start at: 2019-03-08 20:49:50
End at: 2019-03-08 20:50:20
Local clock offset: -6.393 ms
Remote clock offset: -0.448 ms

Below is generated by plot.py at 2019-03-08 21:00:35
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.52 Mbit/s
95th percentile per-packet one-way delay: 658.571 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 9.52 Mbit/s
95th percentile per-packet one-way delay: 658.571 ms
Loss rate: 1.18%

Run 3: Report of FillP — Data Link

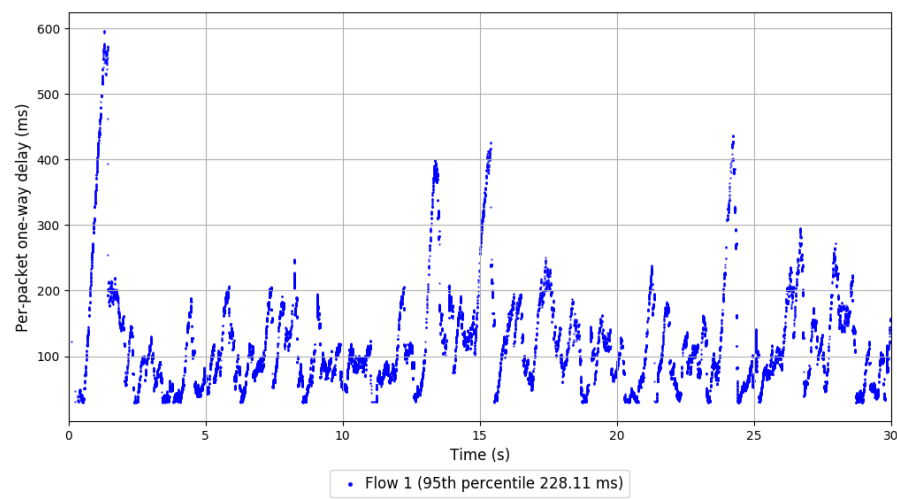
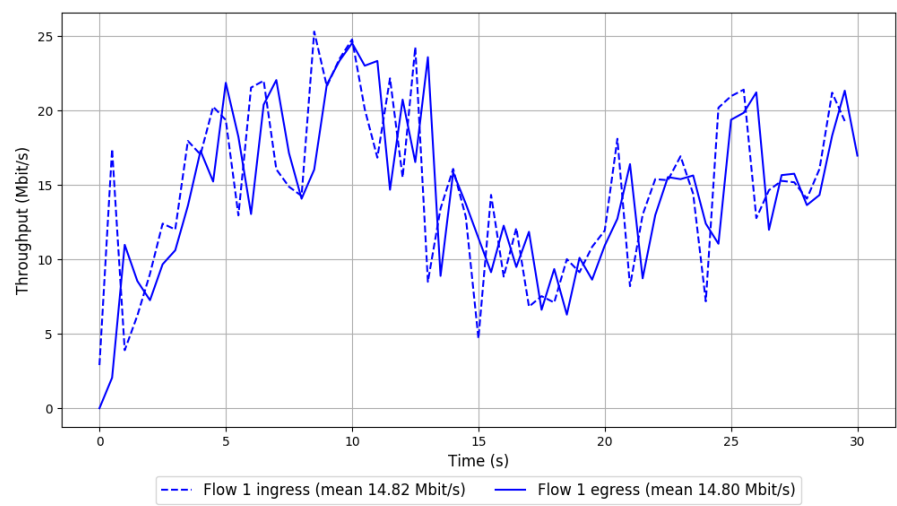


Run 1: Statistics of FillP-Sheep

Start at: 2019-03-08 20:05:31
End at: 2019-03-08 20:06:01
Local clock offset: -2.589 ms
Remote clock offset: -1.258 ms

Below is generated by plot.py at 2019-03-08 21:00:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 14.80 Mbit/s
95th percentile per-packet one-way delay: 228.112 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 14.80 Mbit/s
95th percentile per-packet one-way delay: 228.112 ms
Loss rate: 0.52%

Run 1: Report of FillP-Sheep — Data Link

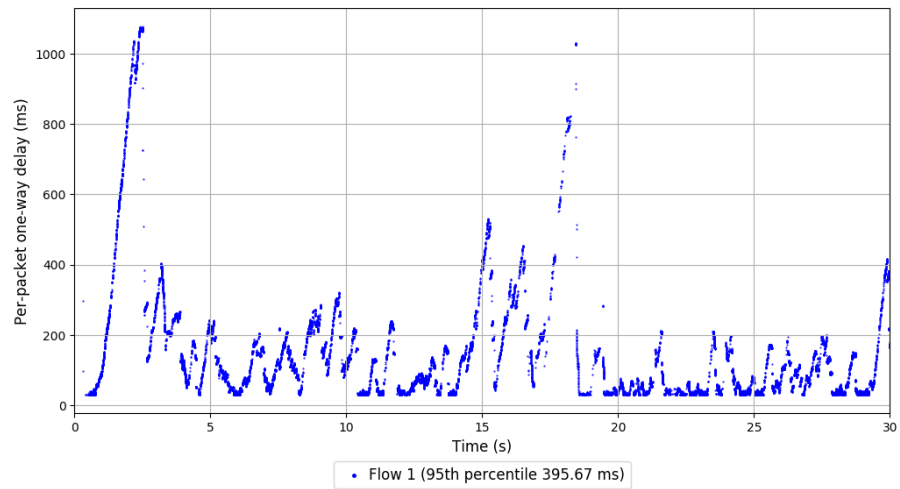
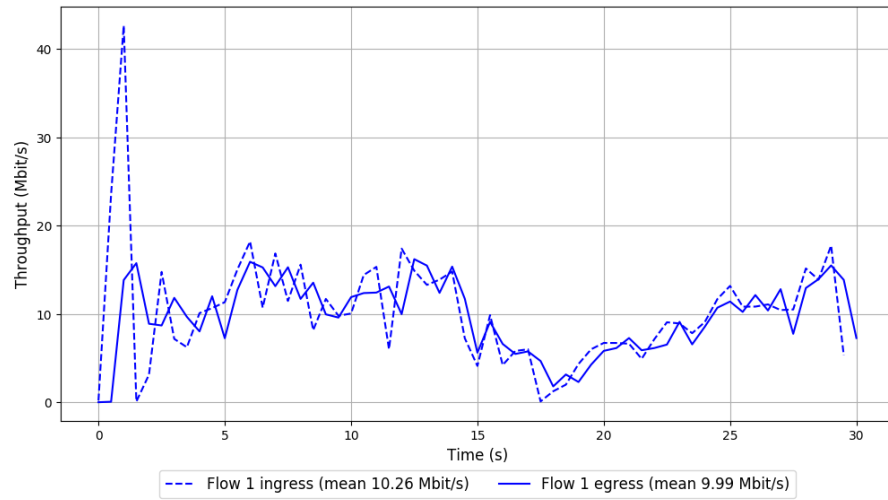


Run 2: Statistics of FillP-Sheep

Start at: 2019-03-08 20:31:21
End at: 2019-03-08 20:31:51
Local clock offset: -4.834 ms
Remote clock offset: -3.766 ms

Below is generated by plot.py at 2019-03-08 21:00:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.99 Mbit/s
95th percentile per-packet one-way delay: 395.669 ms
Loss rate: 3.62%
-- Flow 1:
Average throughput: 9.99 Mbit/s
95th percentile per-packet one-way delay: 395.669 ms
Loss rate: 3.62%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-03-08 20:57:11

End at: 2019-03-08 20:57:41

Local clock offset: -6.122 ms

Remote clock offset: 0.356 ms

Below is generated by plot.py at 2019-03-08 21:00:47

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.24 Mbit/s

95th percentile per-packet one-way delay: 223.245 ms

Loss rate: 0.30%

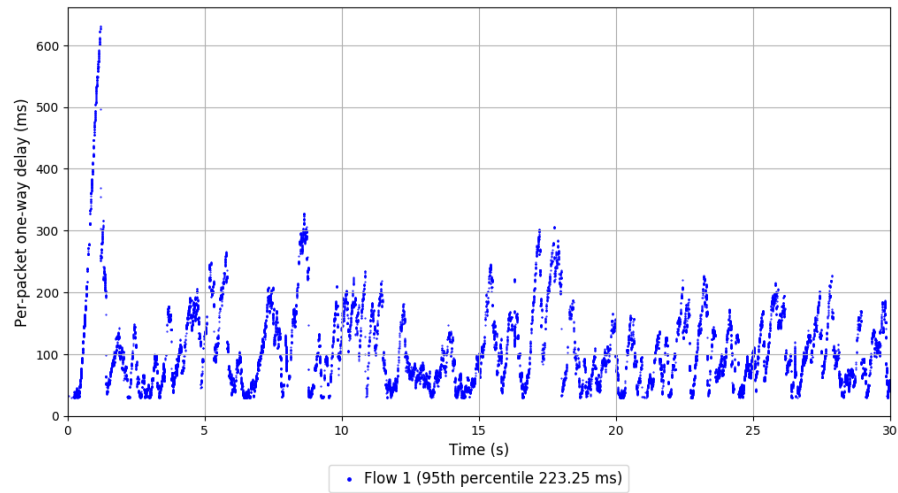
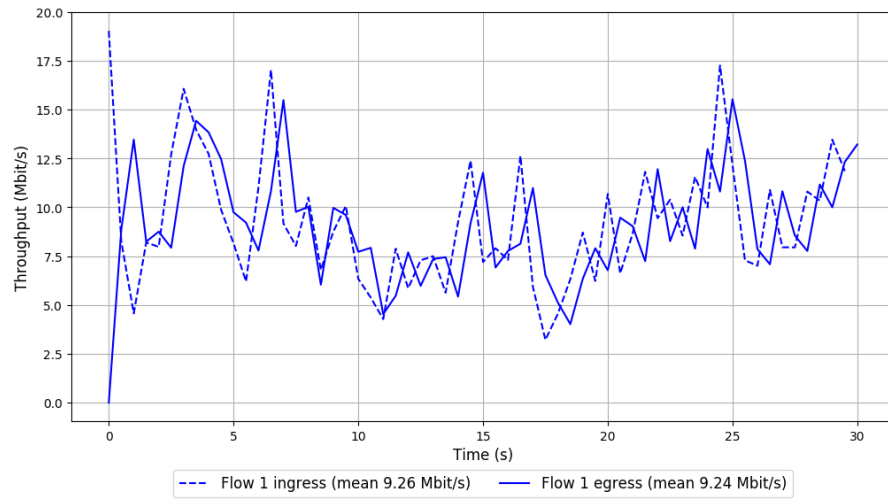
-- Flow 1:

Average throughput: 9.24 Mbit/s

95th percentile per-packet one-way delay: 223.245 ms

Loss rate: 0.30%

Run 3: Report of FillP-Sheep — Data Link

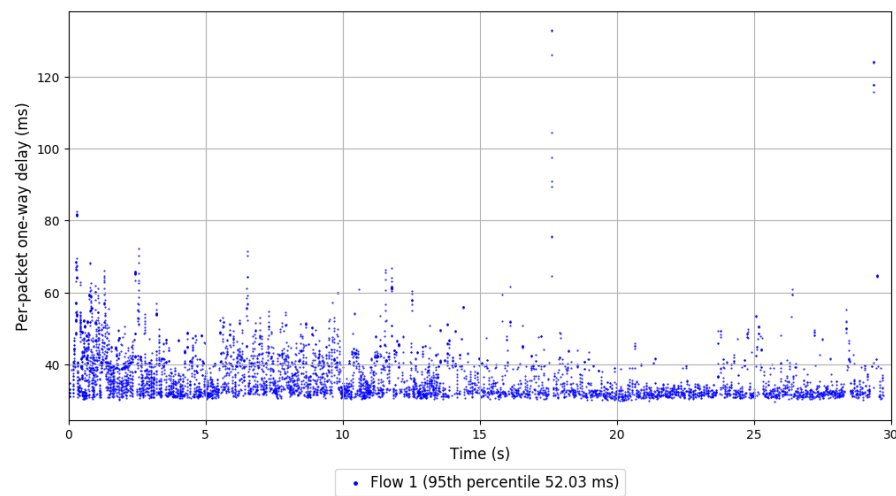
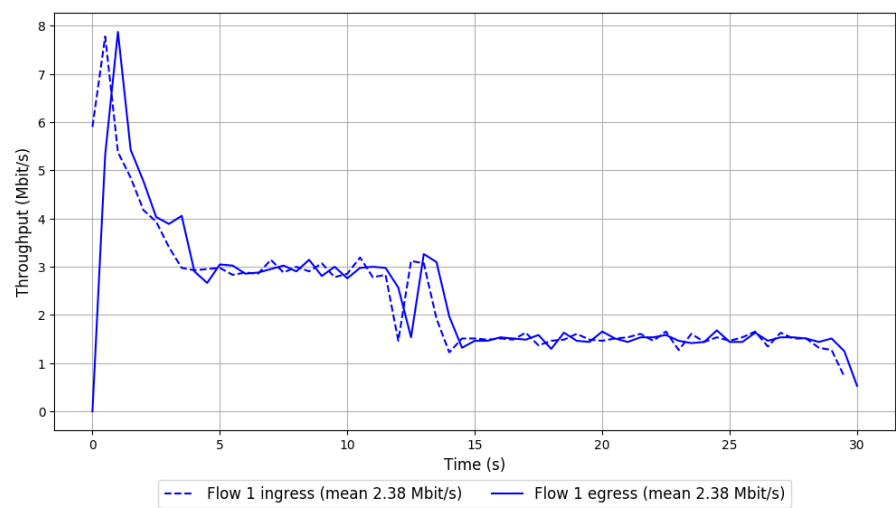


```
Run 1: Statistics of Indigo

Start at: 2019-03-08 19:48:21
End at: 2019-03-08 19:48:51
Local clock offset: -0.96 ms
Remote clock offset: 0.751 ms

# Below is generated by plot.py at 2019-03-08 21:00:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 52.035 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 52.035 ms
Loss rate: 0.15%
```

Run 1: Report of Indigo — Data Link

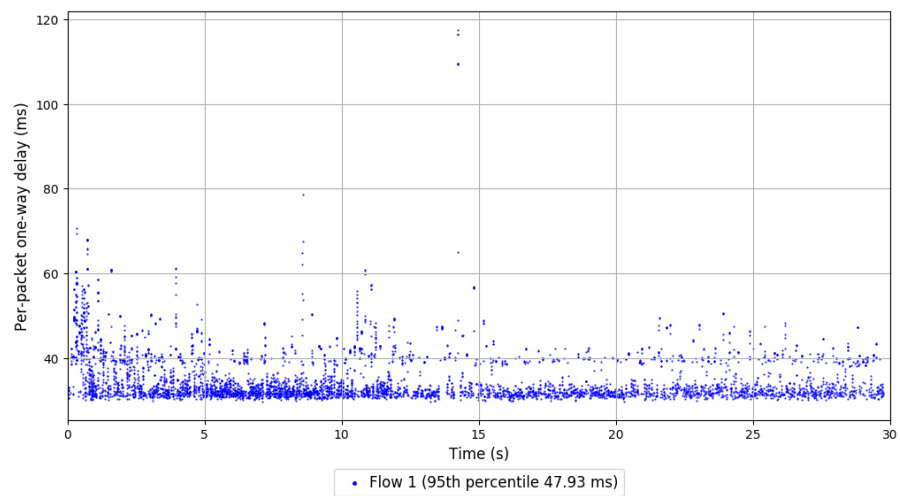
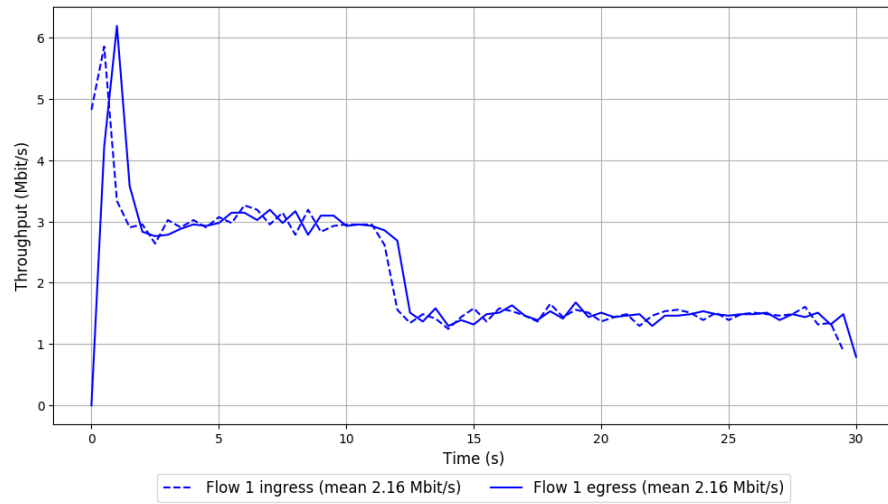


Run 2: Statistics of Indigo

Start at: 2019-03-08 20:14:12
End at: 2019-03-08 20:14:42
Local clock offset: -4.266 ms
Remote clock offset: -2.194 ms

Below is generated by plot.py at 2019-03-08 21:00:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 47.934 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 2.16 Mbit/s
95th percentile per-packet one-way delay: 47.934 ms
Loss rate: 0.13%

Run 2: Report of Indigo — Data Link

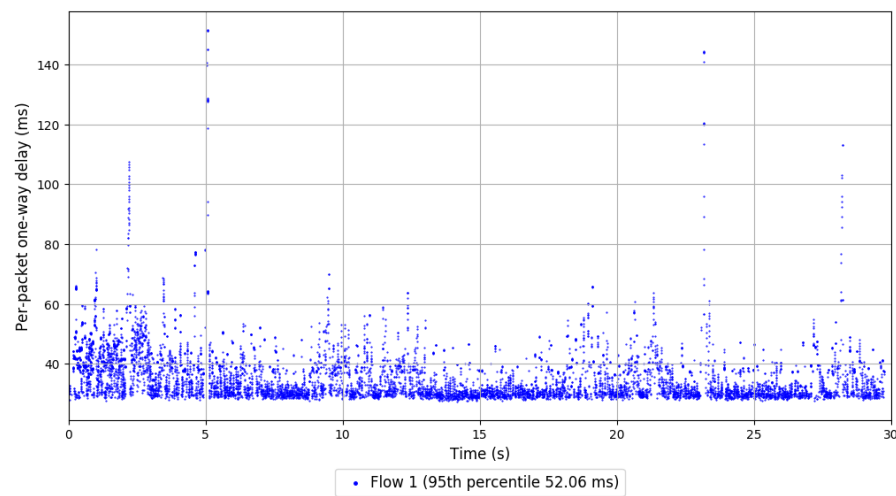
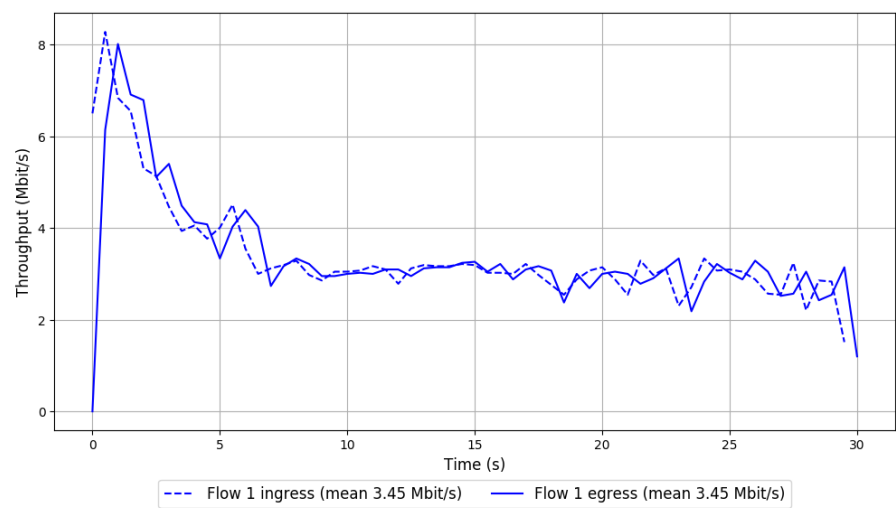


Run 3: Statistics of Indigo

Start at: 2019-03-08 20:39:57
End at: 2019-03-08 20:40:27
Local clock offset: -6.747 ms
Remote clock offset: -3.951 ms

Below is generated by plot.py at 2019-03-08 21:00:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.45 Mbit/s
95th percentile per-packet one-way delay: 52.060 ms
Loss rate: 0.15%
-- Flow 1:
Average throughput: 3.45 Mbit/s
95th percentile per-packet one-way delay: 52.060 ms
Loss rate: 0.15%

Run 3: Report of Indigo — Data Link

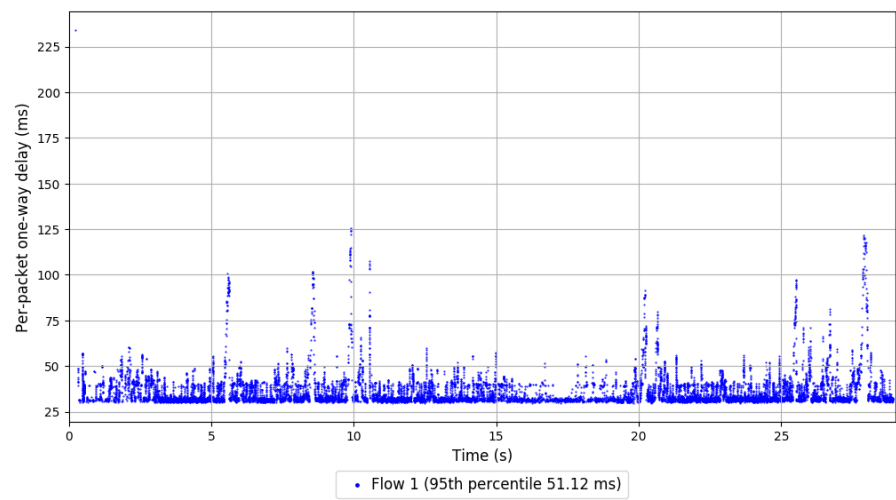
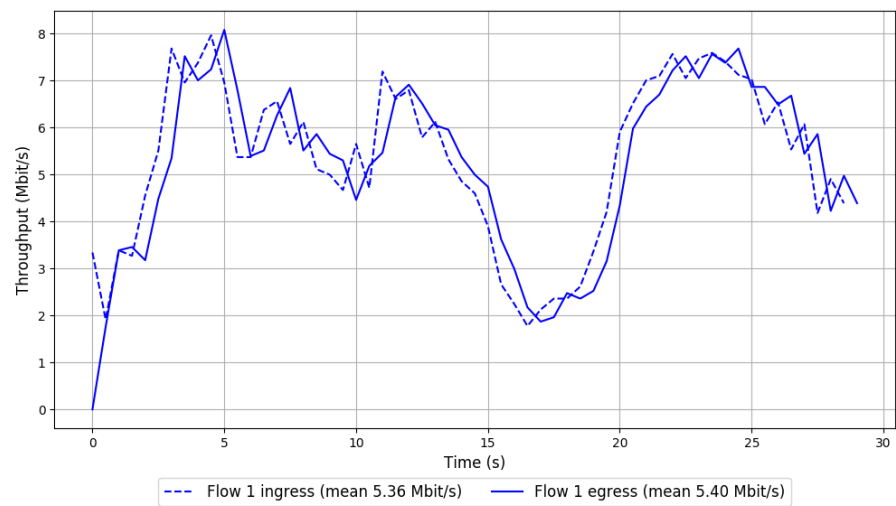


Run 1: Statistics of Indigo-MusesC3

Start at: 2019-03-08 20:01:50
End at: 2019-03-08 20:02:20
Local clock offset: -3.153 ms
Remote clock offset: -0.874 ms

Below is generated by plot.py at 2019-03-08 21:00:47
Datalink statistics
-- Total of 1 flow:
Average throughput: 5.40 Mbit/s
95th percentile per-packet one-way delay: 51.125 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 5.40 Mbit/s
95th percentile per-packet one-way delay: 51.125 ms
Loss rate: 0.13%

Run 1: Report of Indigo-MusesC3 — Data Link

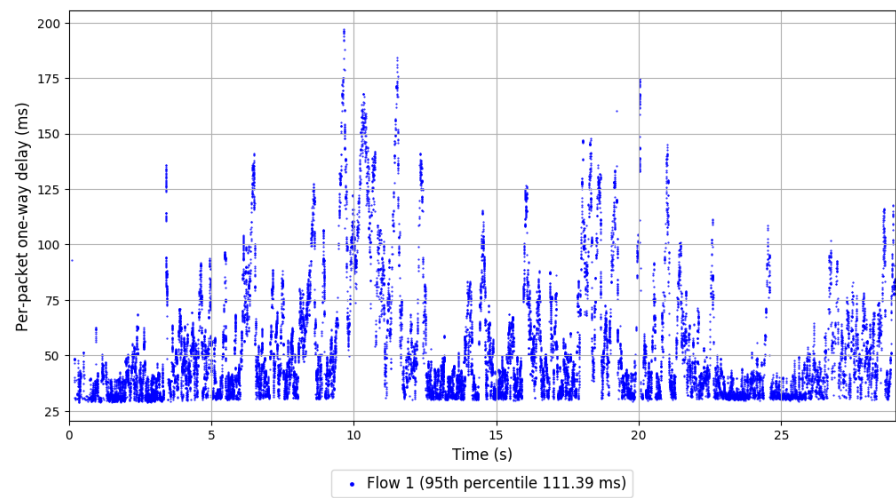
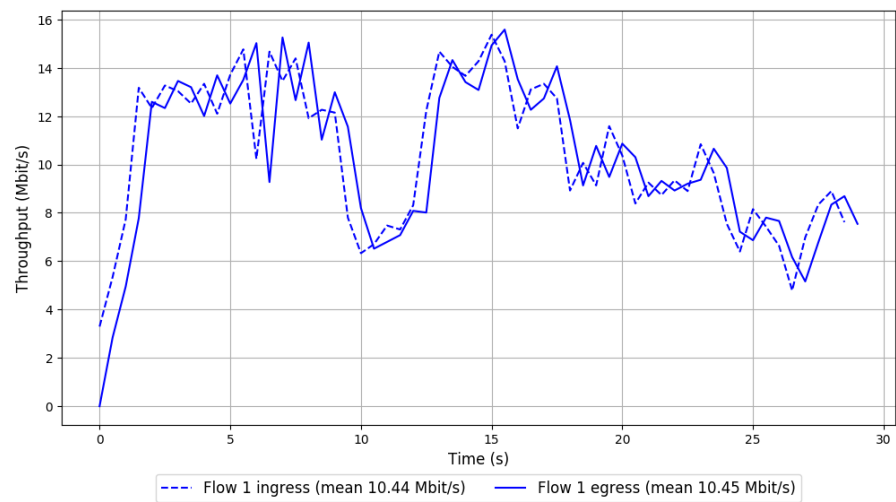


Run 2: Statistics of Indigo-MusesC3

Start at: 2019-03-08 20:27:41
End at: 2019-03-08 20:28:11
Local clock offset: -4.234 ms
Remote clock offset: -3.373 ms

Below is generated by plot.py at 2019-03-08 21:00:48
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.45 Mbit/s
95th percentile per-packet one-way delay: 111.391 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 10.45 Mbit/s
95th percentile per-packet one-way delay: 111.391 ms
Loss rate: 0.18%

Run 2: Report of Indigo-MusesC3 — Data Link



Run 3: Statistics of Indigo-MusesC3

Start at: 2019-03-08 20:53:31

End at: 2019-03-08 20:54:01

Local clock offset: -6.079 ms

Remote clock offset: 0.086 ms

Below is generated by plot.py at 2019-03-08 21:00:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 7.53 Mbit/s

95th percentile per-packet one-way delay: 81.580 ms

Loss rate: 0.23%

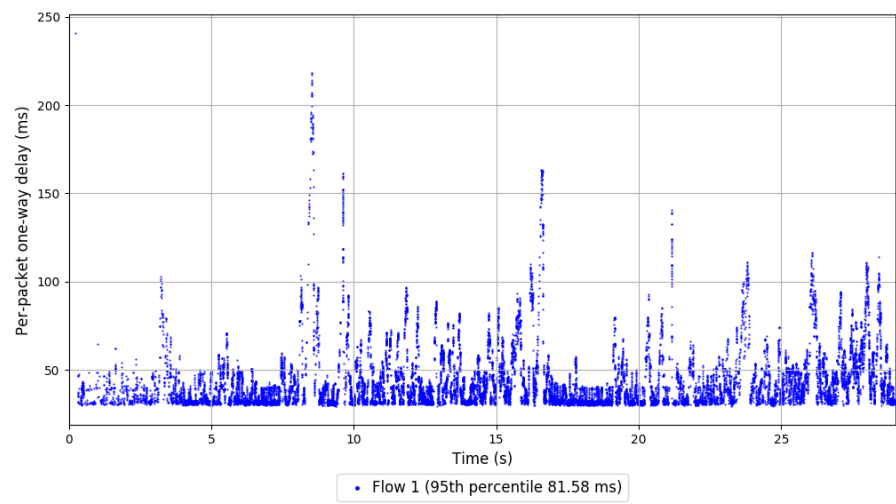
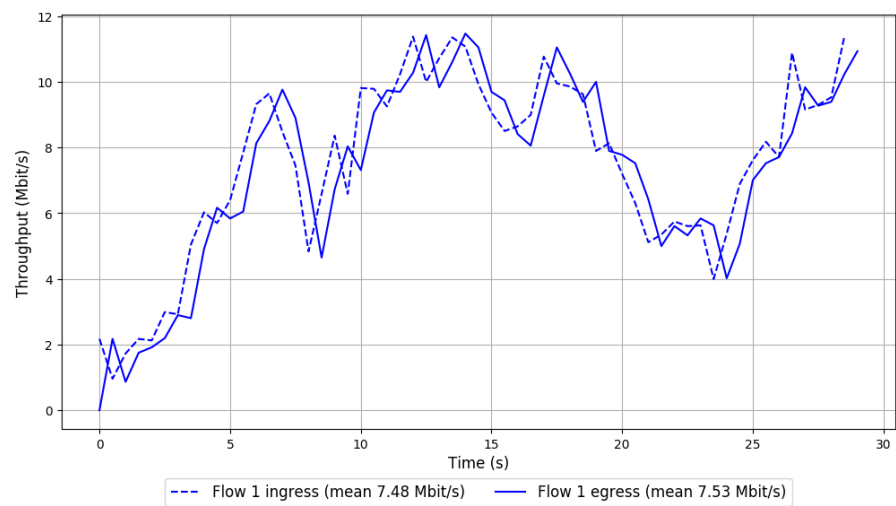
-- Flow 1:

Average throughput: 7.53 Mbit/s

95th percentile per-packet one-way delay: 81.580 ms

Loss rate: 0.23%

Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-03-08 19:47:07

End at: 2019-03-08 19:47:37

Local clock offset: -0.342 ms

Remote clock offset: 0.837 ms

Below is generated by plot.py at 2019-03-08 21:00:48

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.34 Mbit/s

95th percentile per-packet one-way delay: 433.046 ms

Loss rate: 0.63%

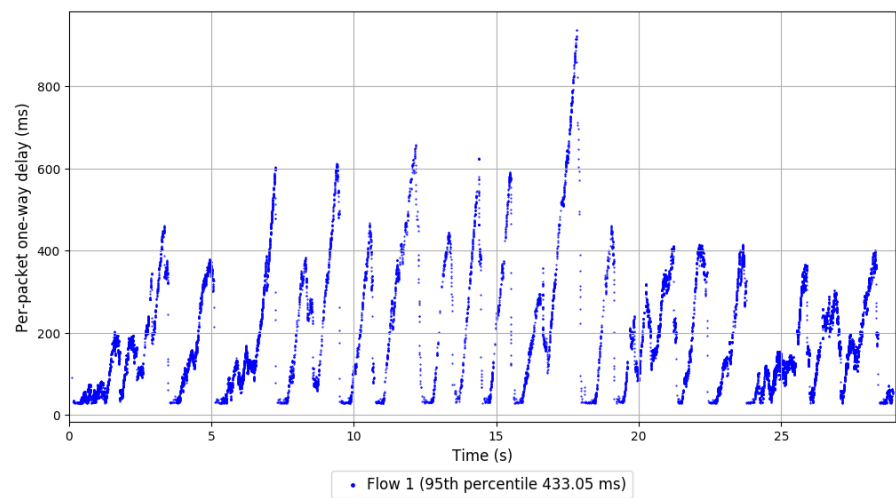
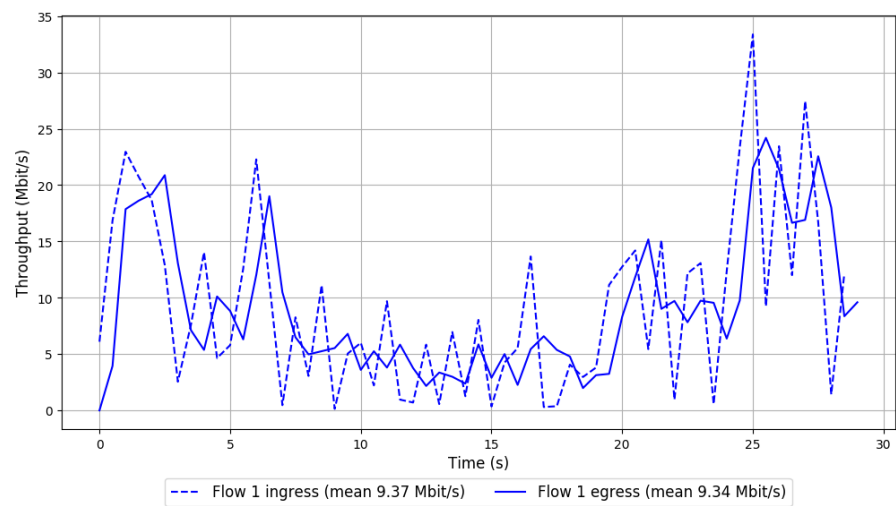
-- Flow 1:

Average throughput: 9.34 Mbit/s

95th percentile per-packet one-way delay: 433.046 ms

Loss rate: 0.63%

Run 1: Report of Indigo-MusesC5 — Data Link



Run 2: Statistics of Indigo-MusesC5

Start at: 2019-03-08 20:12:53

End at: 2019-03-08 20:13:23

Local clock offset: -3.874 ms

Remote clock offset: -2.09 ms

Below is generated by plot.py at 2019-03-08 21:00:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 14.96 Mbit/s

95th percentile per-packet one-way delay: 317.849 ms

Loss rate: 0.60%

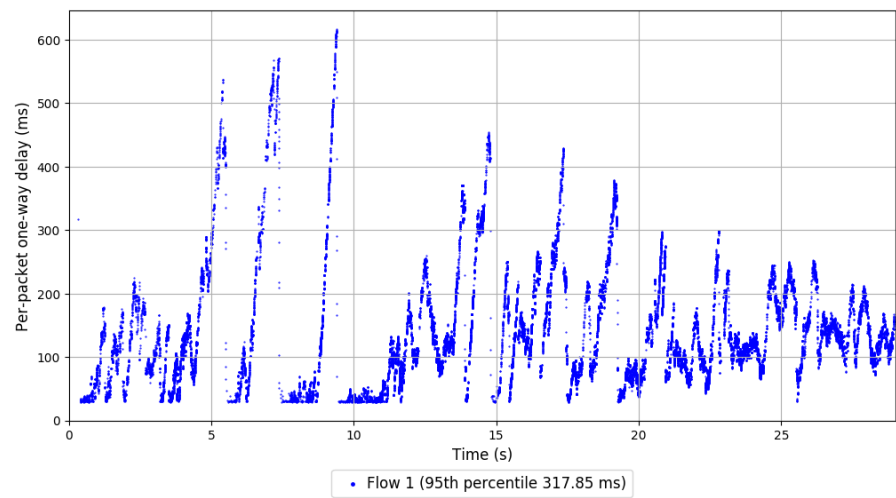
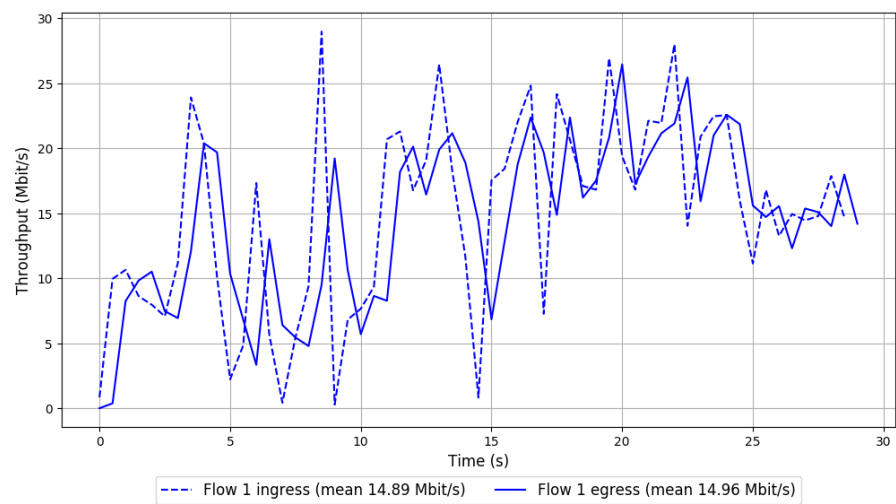
-- Flow 1:

Average throughput: 14.96 Mbit/s

95th percentile per-packet one-way delay: 317.849 ms

Loss rate: 0.60%

Run 2: Report of Indigo-MusesC5 — Data Link

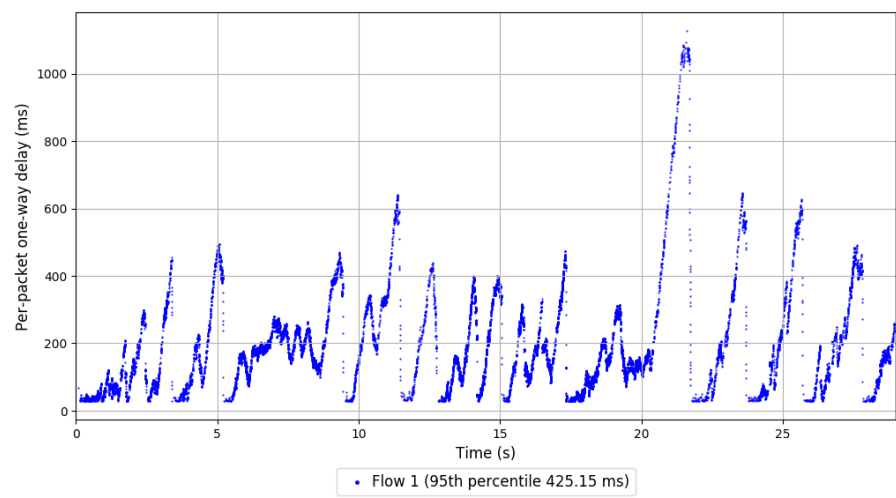
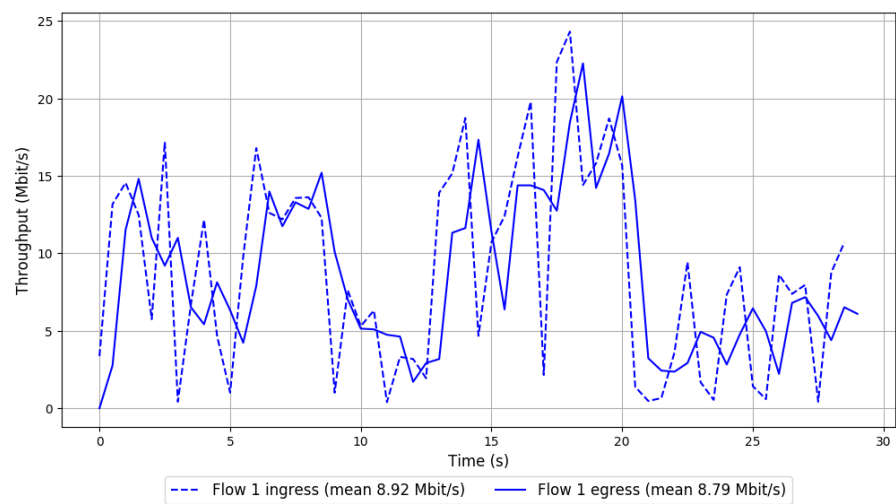


Run 3: Statistics of Indigo-MusesC5

Start at: 2019-03-08 20:38:43
End at: 2019-03-08 20:39:13
Local clock offset: -6.473 ms
Remote clock offset: -4.286 ms

Below is generated by plot.py at 2019-03-08 21:00:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.79 Mbit/s
95th percentile per-packet one-way delay: 425.149 ms
Loss rate: 1.71%
-- Flow 1:
Average throughput: 8.79 Mbit/s
95th percentile per-packet one-way delay: 425.149 ms
Loss rate: 1.71%

Run 3: Report of Indigo-MusesC5 — Data Link

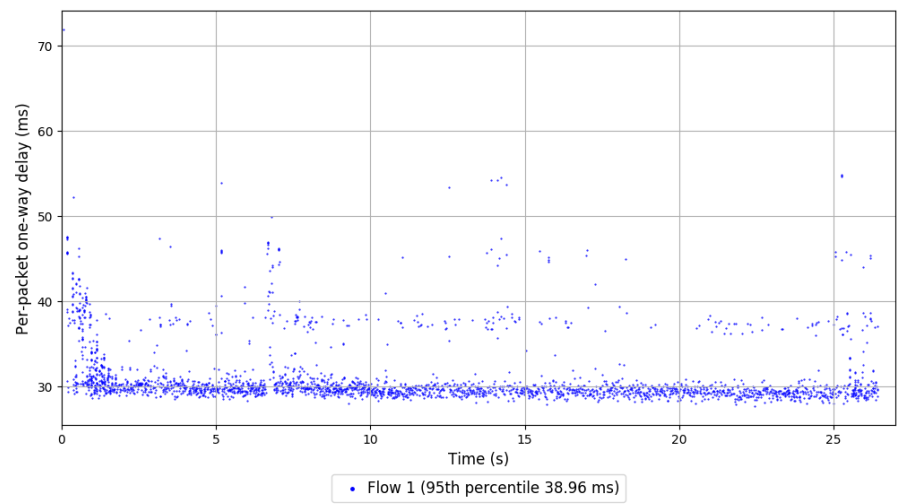
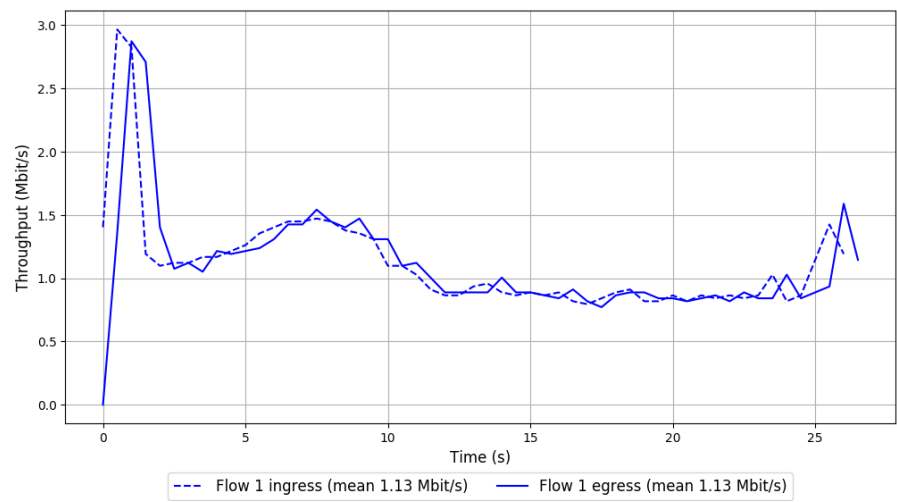


```
Run 1: Statistics of Indigo-MusesD

Start at: 2019-03-08 19:43:27
End at: 2019-03-08 19:43:57
Local clock offset: -2.026 ms
Remote clock offset: 1.609 ms

# Below is generated by plot.py at 2019-03-08 21:00:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 38.957 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 38.957 ms
Loss rate: 0.20%
```

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-03-08 20:09:12

End at: 2019-03-08 20:09:42

Local clock offset: -2.978 ms

Remote clock offset: -1.711 ms

Below is generated by plot.py at 2019-03-08 21:00:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.13 Mbit/s

95th percentile per-packet one-way delay: 158.291 ms

Loss rate: 0.23%

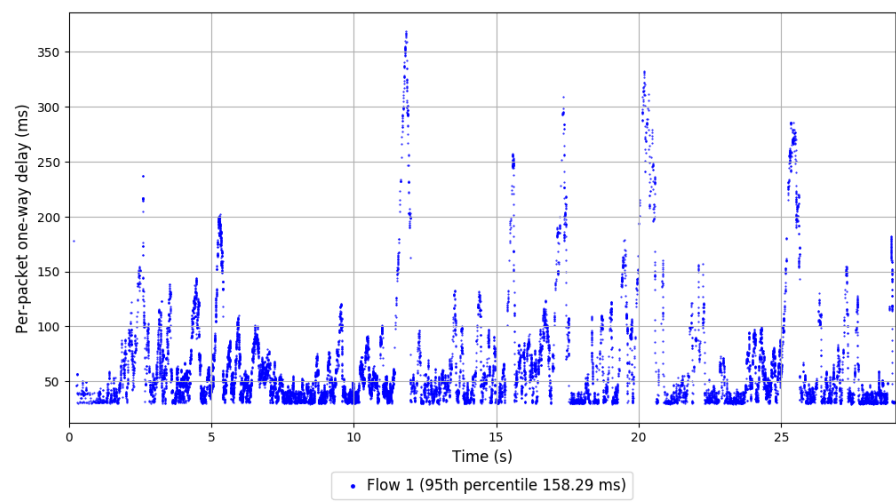
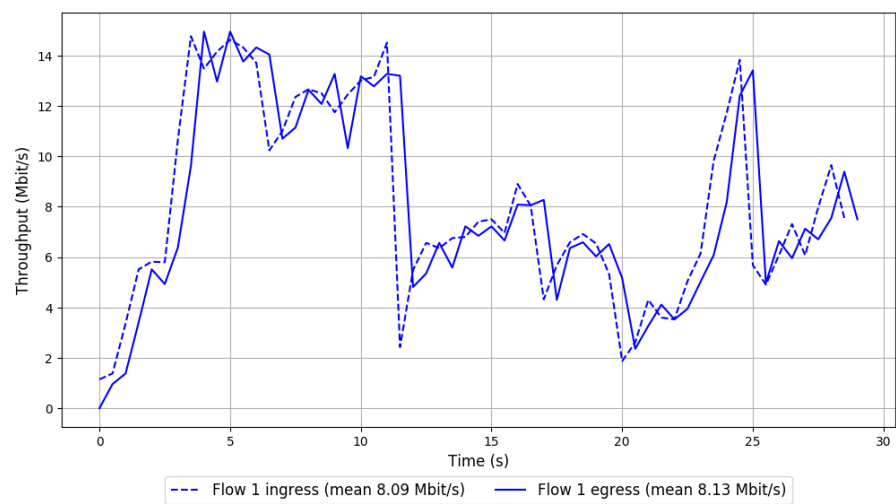
-- Flow 1:

Average throughput: 8.13 Mbit/s

95th percentile per-packet one-way delay: 158.291 ms

Loss rate: 0.23%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-03-08 20:35:03

End at: 2019-03-08 20:35:33

Local clock offset: -5.63 ms

Remote clock offset: -3.913 ms

Below is generated by plot.py at 2019-03-08 21:00:56

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.56 Mbit/s

95th percentile per-packet one-way delay: 157.124 ms

Loss rate: 0.17%

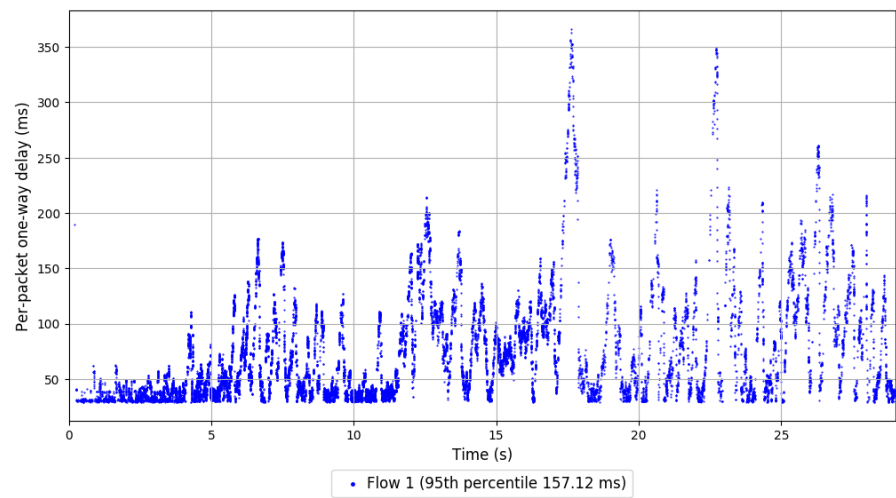
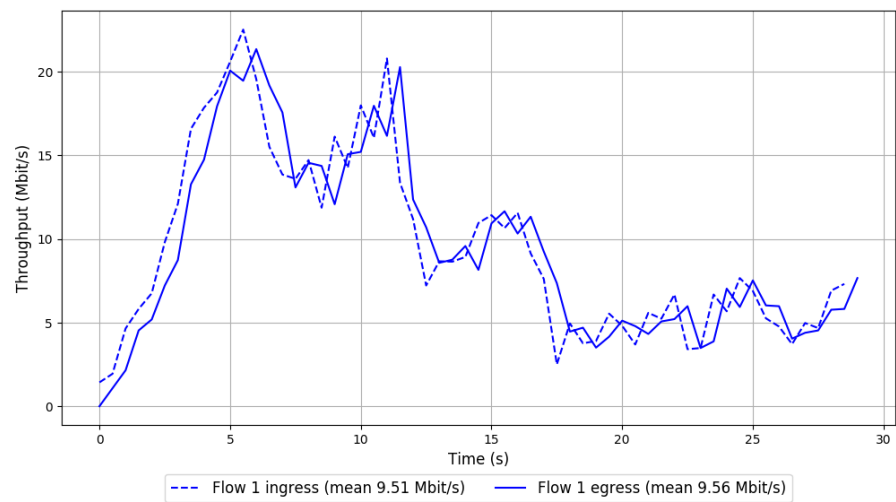
-- Flow 1:

Average throughput: 9.56 Mbit/s

95th percentile per-packet one-way delay: 157.124 ms

Loss rate: 0.17%

Run 3: Report of Indigo-MusesD — Data Link

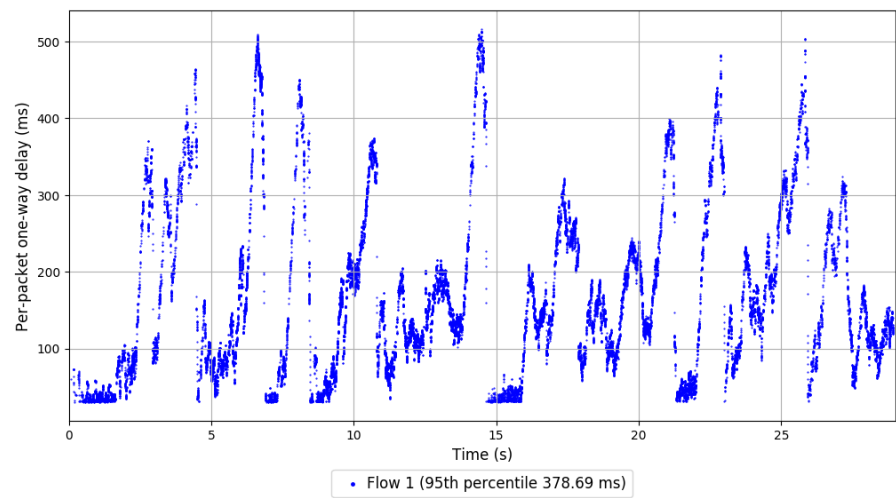
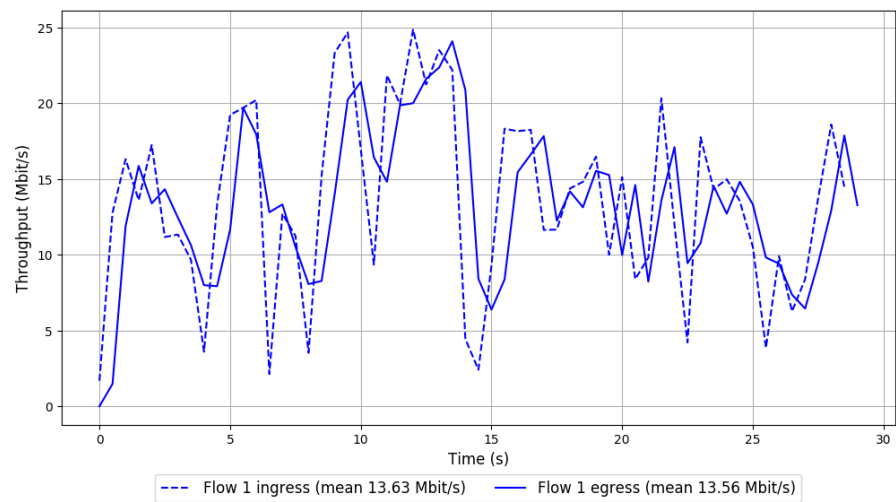


```
Run 1: Statistics of Indigo-MusesT

Start at: 2019-03-08 20:00:36
End at: 2019-03-08 20:01:06
Local clock offset: -3.712 ms
Remote clock offset: -0.751 ms

# Below is generated by plot.py at 2019-03-08 21:01:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 13.56 Mbit/s
95th percentile per-packet one-way delay: 378.686 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 13.56 Mbit/s
95th percentile per-packet one-way delay: 378.686 ms
Loss rate: 0.71%
```

Run 1: Report of Indigo-MusesT — Data Link

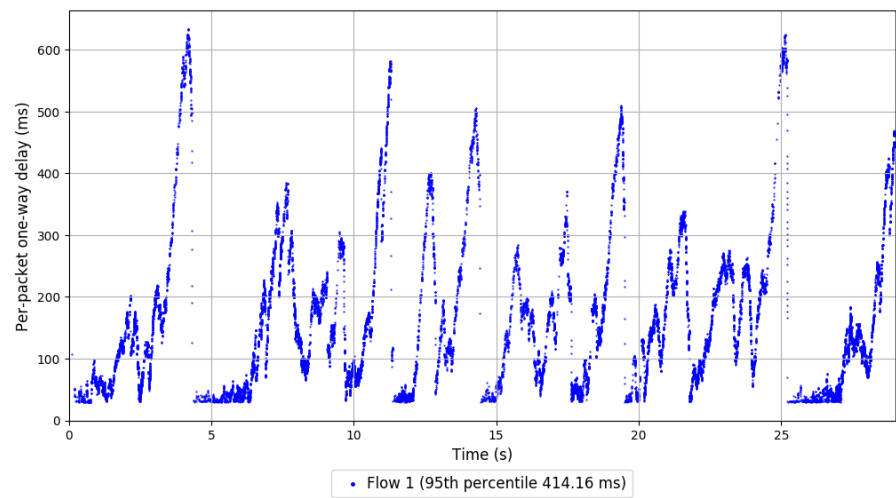
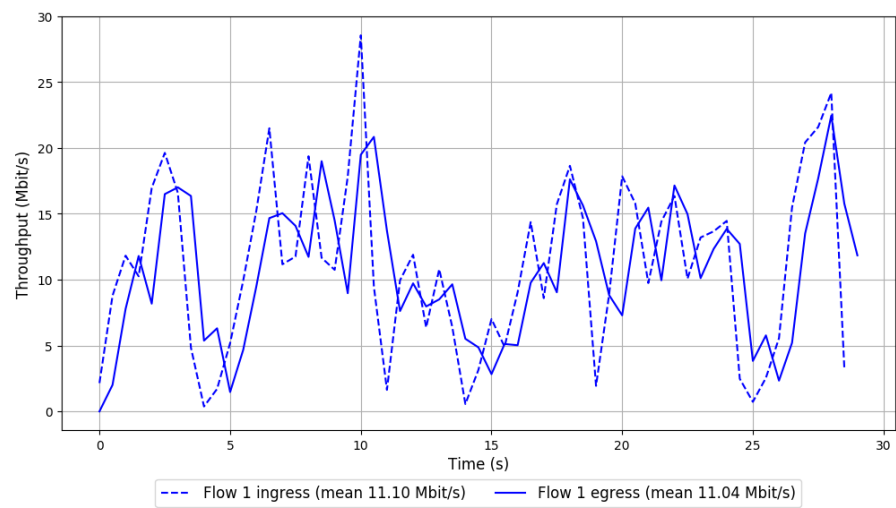


Run 2: Statistics of Indigo-MusesT

Start at: 2019-03-08 20:26:27
End at: 2019-03-08 20:26:57
Local clock offset: -4.033 ms
Remote clock offset: -3.352 ms

Below is generated by plot.py at 2019-03-08 21:01:02
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.04 Mbit/s
95th percentile per-packet one-way delay: 414.157 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 11.04 Mbit/s
95th percentile per-packet one-way delay: 414.157 ms
Loss rate: 0.76%

Run 2: Report of Indigo-MusesT — Data Link

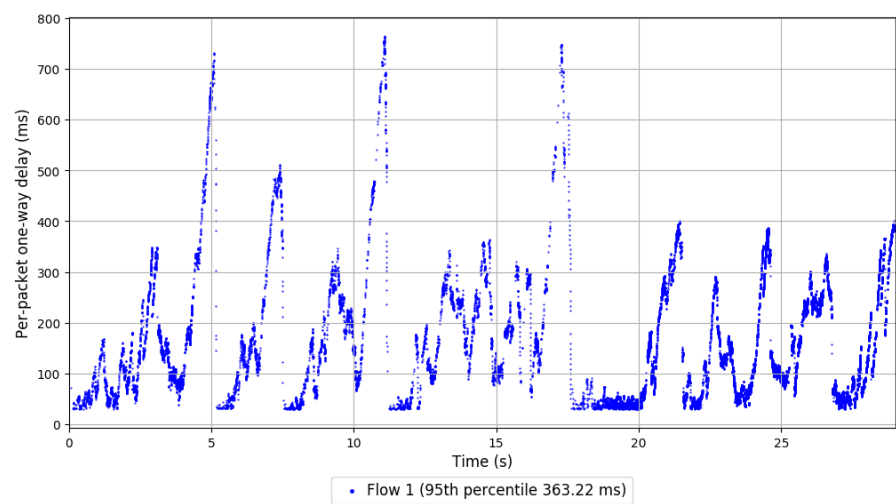
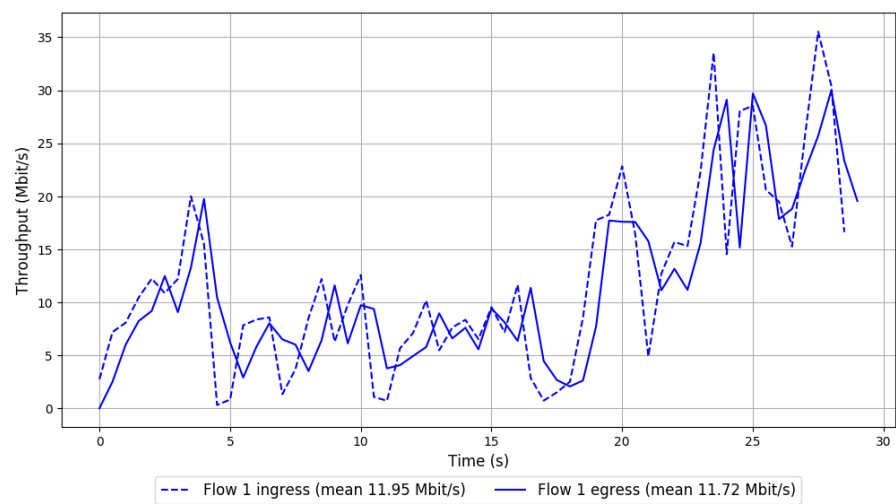


Run 3: Statistics of Indigo-MusesT

Start at: 2019-03-08 20:52:17
End at: 2019-03-08 20:52:47
Local clock offset: -6.14 ms
Remote clock offset: -0.012 ms

Below is generated by plot.py at 2019-03-08 21:01:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.72 Mbit/s
95th percentile per-packet one-way delay: 363.222 ms
Loss rate: 1.98%
-- Flow 1:
Average throughput: 11.72 Mbit/s
95th percentile per-packet one-way delay: 363.222 ms
Loss rate: 1.98%

Run 3: Report of Indigo-MusesT — Data Link

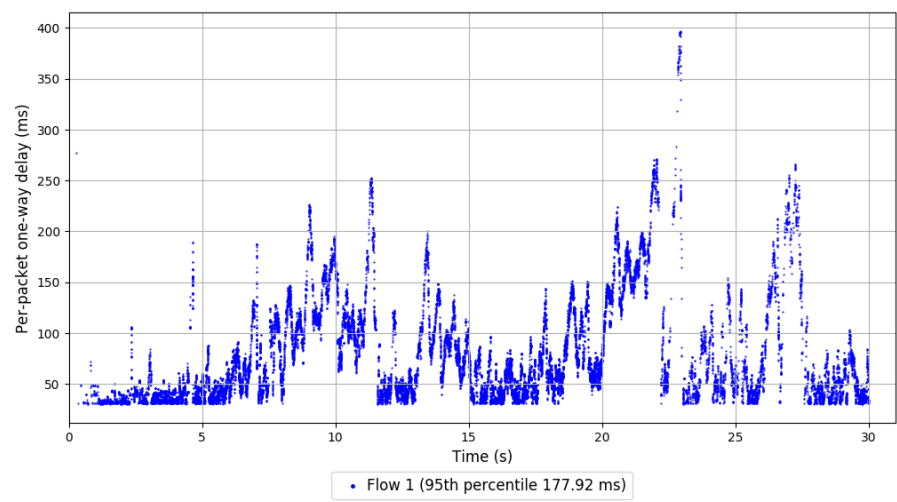
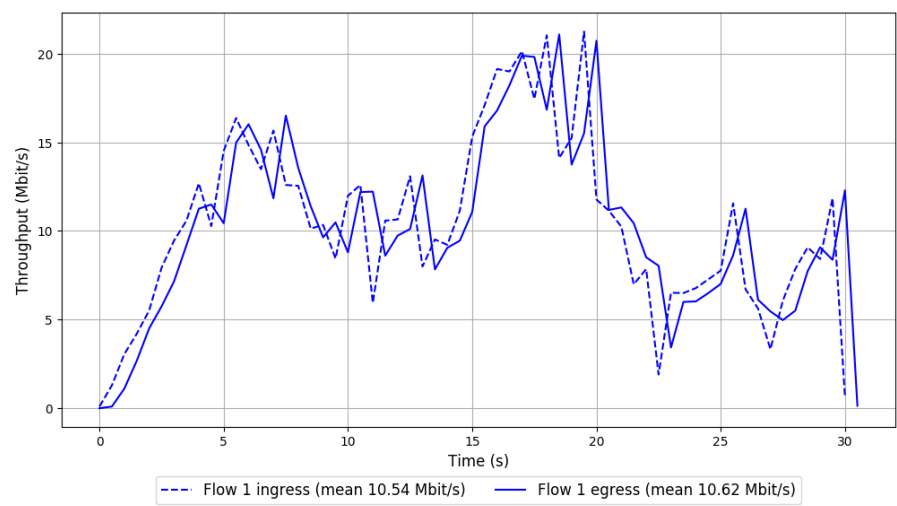



```
Run 1: Statistics of LEDBAT

Start at: 2019-03-08 20:04:17
End at: 2019-03-08 20:04:47
Local clock offset: -2.629 ms
Remote clock offset: -1.15 ms

# Below is generated by plot.py at 2019-03-08 21:01:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 10.62 Mbit/s
95th percentile per-packet one-way delay: 177.920 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 10.62 Mbit/s
95th percentile per-packet one-way delay: 177.920 ms
Loss rate: 0.14%
```

Run 1: Report of LEDBAT — Data Link

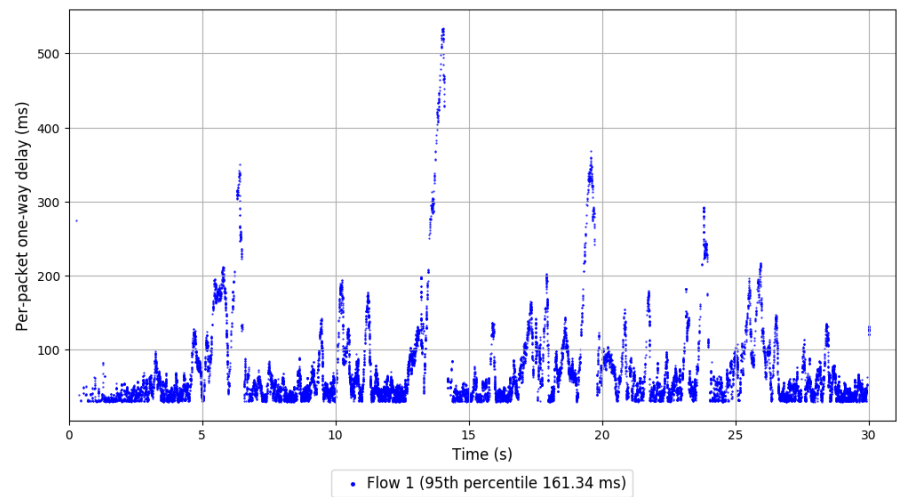
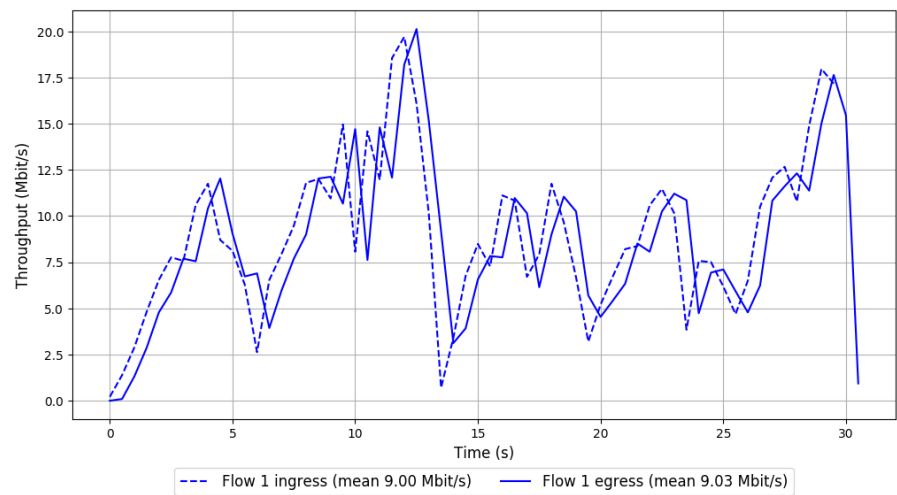


Run 2: Statistics of LEDBAT

Start at: 2019-03-08 20:30:08
End at: 2019-03-08 20:30:38
Local clock offset: -4.627 ms
Remote clock offset: -3.629 ms

Below is generated by plot.py at 2019-03-08 21:01:05
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.03 Mbit/s
95th percentile per-packet one-way delay: 161.340 ms
Loss rate: 0.46%
-- Flow 1:
Average throughput: 9.03 Mbit/s
95th percentile per-packet one-way delay: 161.340 ms
Loss rate: 0.46%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2019-03-08 20:55:57

End at: 2019-03-08 20:56:27

Local clock offset: -6.064 ms

Remote clock offset: 0.273 ms

Below is generated by plot.py at 2019-03-08 21:01:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 12.70 Mbit/s

95th percentile per-packet one-way delay: 161.277 ms

Loss rate: 0.46%

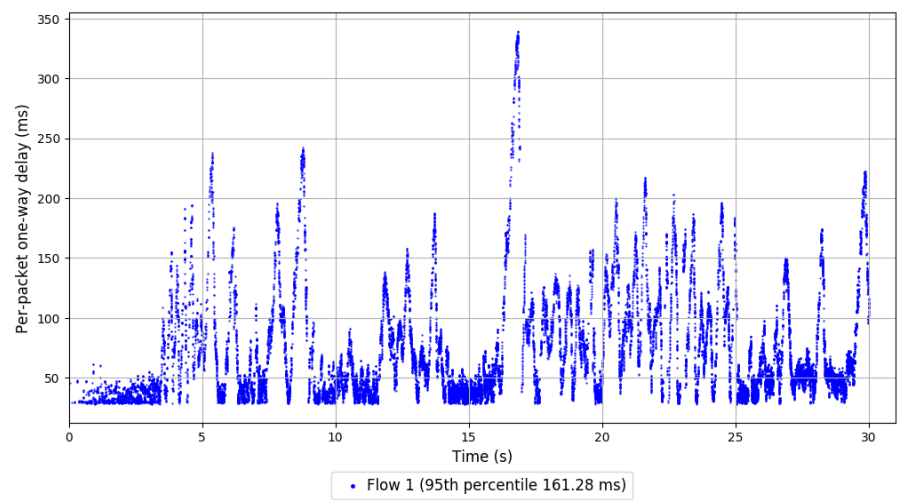
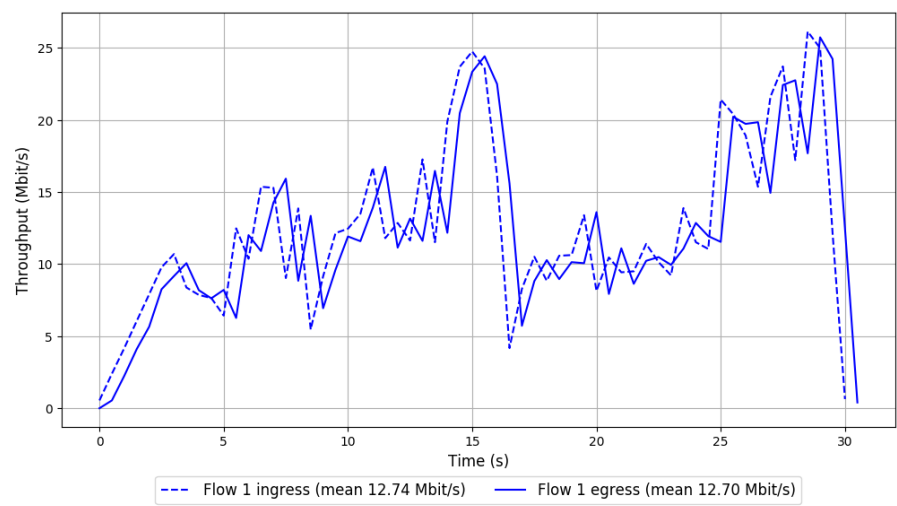
-- Flow 1:

Average throughput: 12.70 Mbit/s

95th percentile per-packet one-way delay: 161.277 ms

Loss rate: 0.46%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-03-08 19:49:34

End at: 2019-03-08 19:50:04

Local clock offset: -0.9 ms

Remote clock offset: 0.483 ms

Below is generated by plot.py at 2019-03-08 21:01:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 44.587 ms

Loss rate: 0.18%

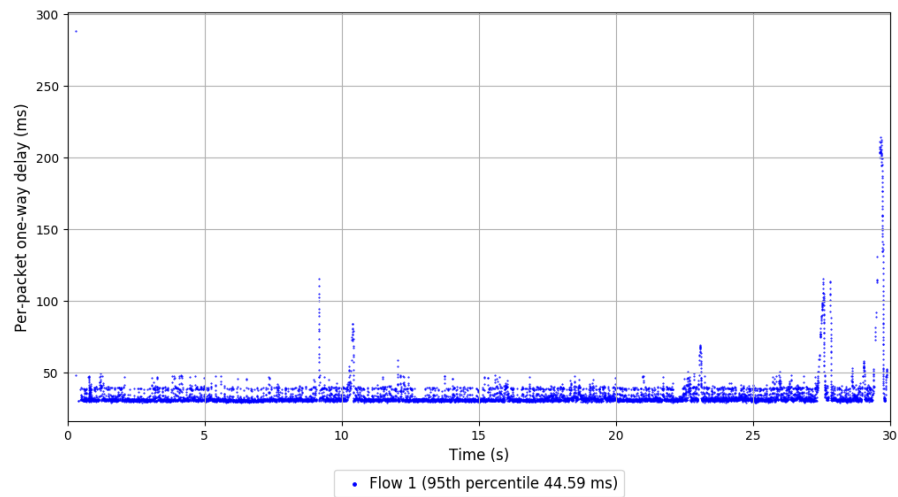
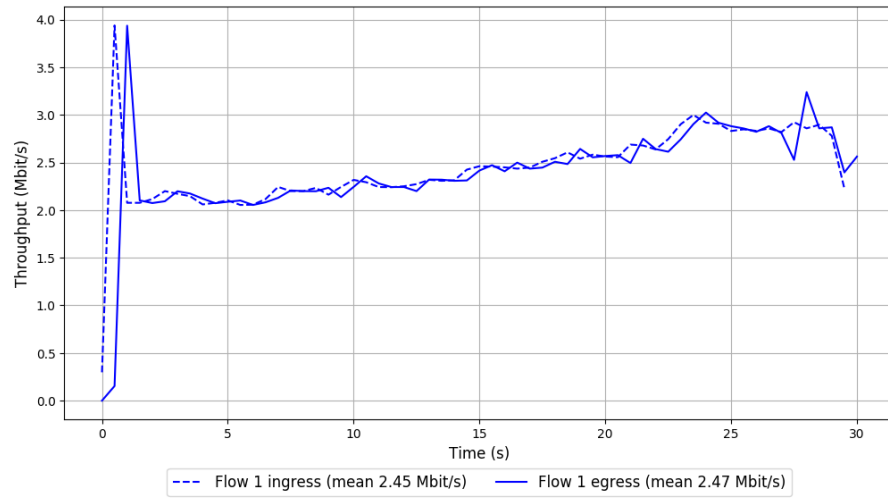
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 44.587 ms

Loss rate: 0.18%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-03-08 20:15:25

End at: 2019-03-08 20:15:55

Local clock offset: -4.163 ms

Remote clock offset: -2.351 ms

Below is generated by plot.py at 2019-03-08 21:01:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.40 Mbit/s

95th percentile per-packet one-way delay: 57.234 ms

Loss rate: 0.09%

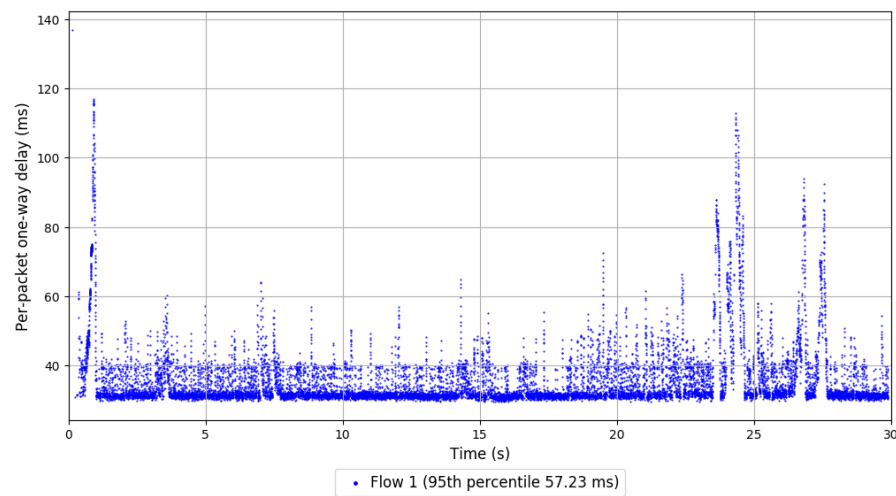
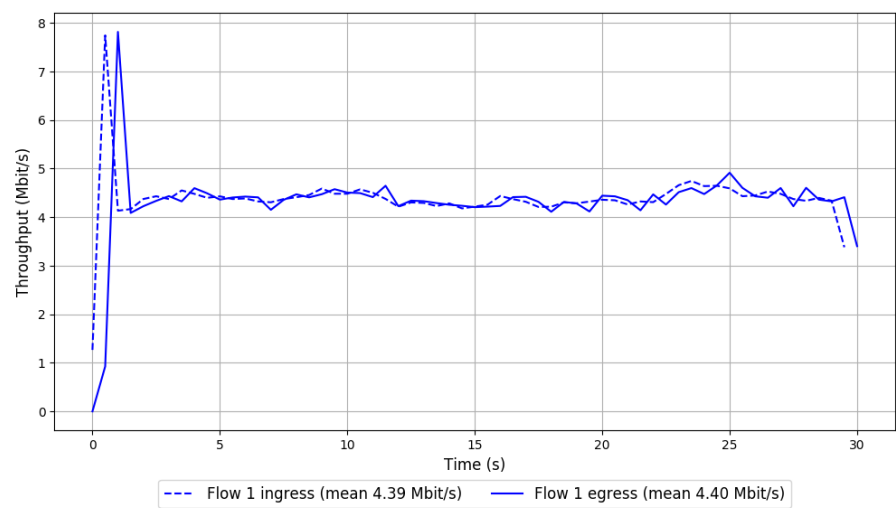
-- Flow 1:

Average throughput: 4.40 Mbit/s

95th percentile per-packet one-way delay: 57.234 ms

Loss rate: 0.09%

Run 2: Report of PCC-Allegro — Data Link

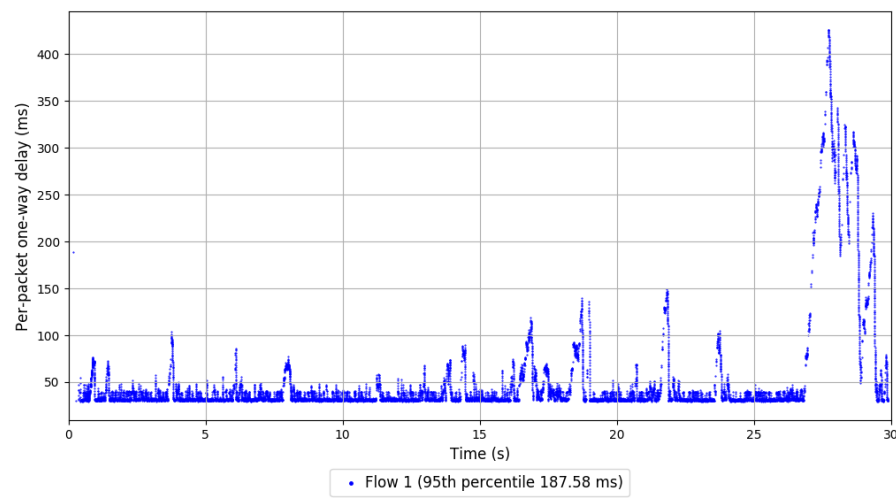
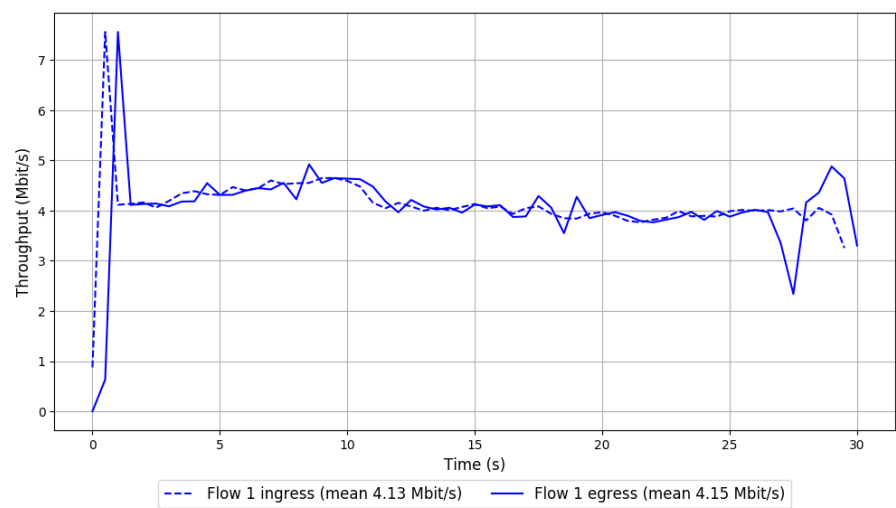


Run 3: Statistics of PCC-Allegro

Start at: 2019-03-08 20:41:10
End at: 2019-03-08 20:41:40
Local clock offset: -7.008 ms
Remote clock offset: -3.225 ms

Below is generated by plot.py at 2019-03-08 21:01:14
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 187.578 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 4.15 Mbit/s
95th percentile per-packet one-way delay: 187.578 ms
Loss rate: 0.12%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2019-03-08 19:50:48

End at: 2019-03-08 19:51:18

Local clock offset: -1.358 ms

Remote clock offset: 0.298 ms

Below is generated by plot.py at 2019-03-08 21:01:14

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.38 Mbit/s

95th percentile per-packet one-way delay: 48.367 ms

Loss rate: 50.89%

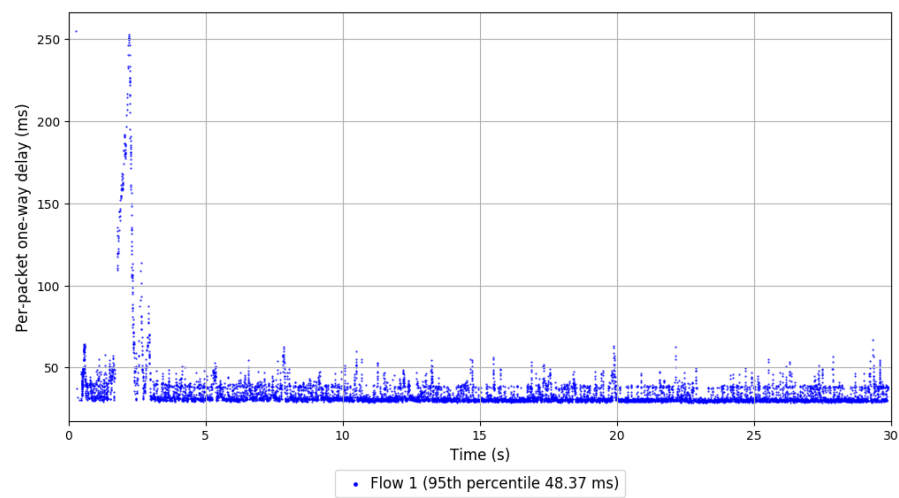
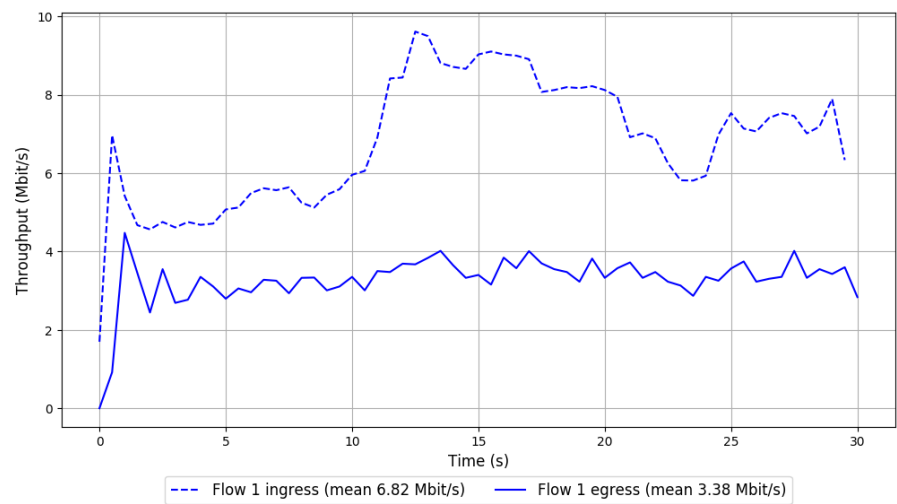
-- Flow 1:

Average throughput: 3.38 Mbit/s

95th percentile per-packet one-way delay: 48.367 ms

Loss rate: 50.89%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

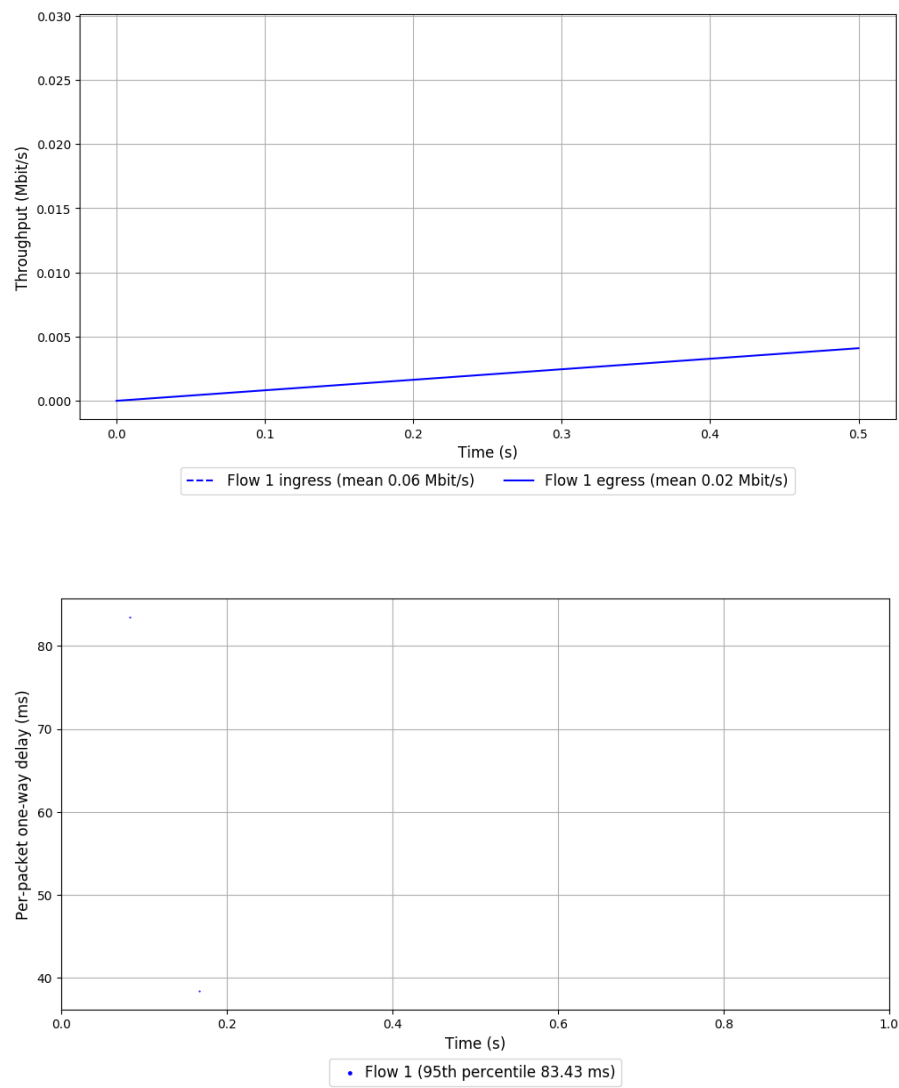
Start at: 2019-03-08 20:16:39

End at: 2019-03-08 20:17:09

Local clock offset: -3.927 ms

Remote clock offset: -2.444 ms

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

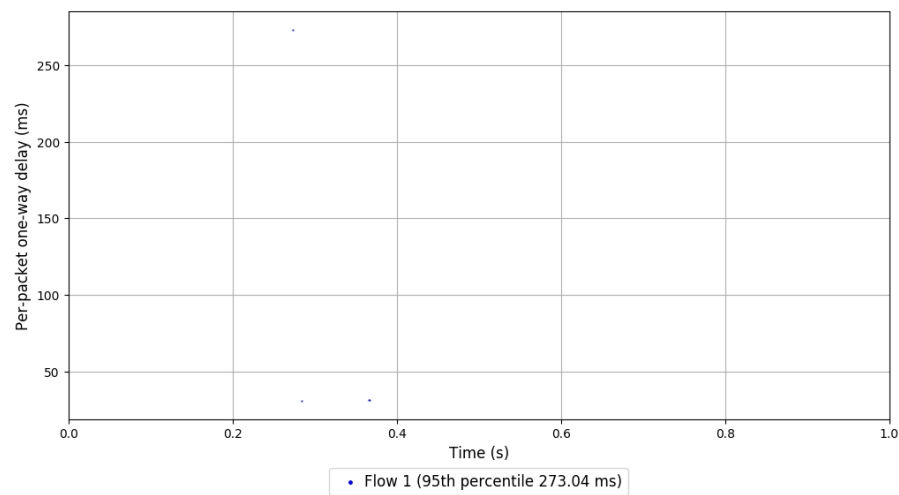
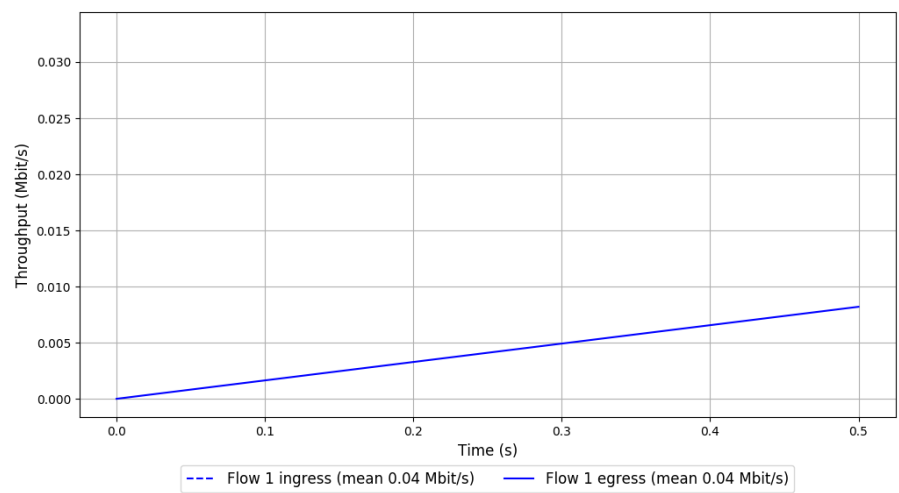
Start at: 2019-03-08 20:42:24

End at: 2019-03-08 20:42:54

Local clock offset: -7.304 ms

Remote clock offset: -2.622 ms

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-03-08 19:59:23

End at: 2019-03-08 19:59:53

Local clock offset: -3.171 ms

Remote clock offset: -0.686 ms

Below is generated by plot.py at 2019-03-08 21:01:17

Datalink statistics

-- Total of 1 flow:

Average throughput: 8.02 Mbit/s

95th percentile per-packet one-way delay: 280.290 ms

Loss rate: 0.39%

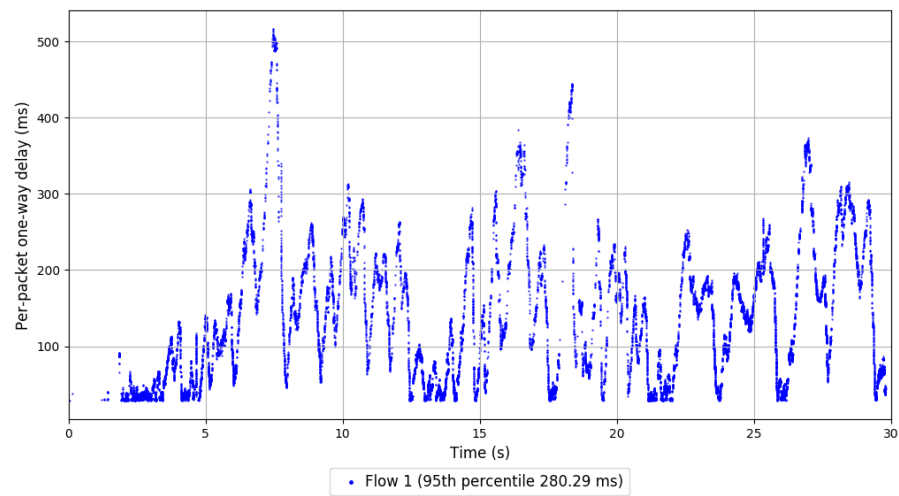
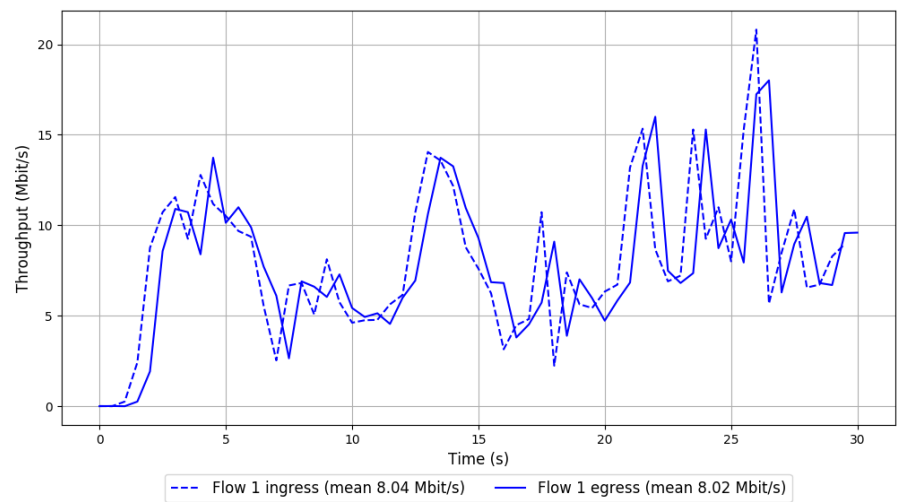
-- Flow 1:

Average throughput: 8.02 Mbit/s

95th percentile per-packet one-way delay: 280.290 ms

Loss rate: 0.39%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-03-08 20:25:13

End at: 2019-03-08 20:25:43

Local clock offset: -3.916 ms

Remote clock offset: -3.214 ms

Below is generated by plot.py at 2019-03-08 21:01:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 10.88 Mbit/s

95th percentile per-packet one-way delay: 295.098 ms

Loss rate: 0.50%

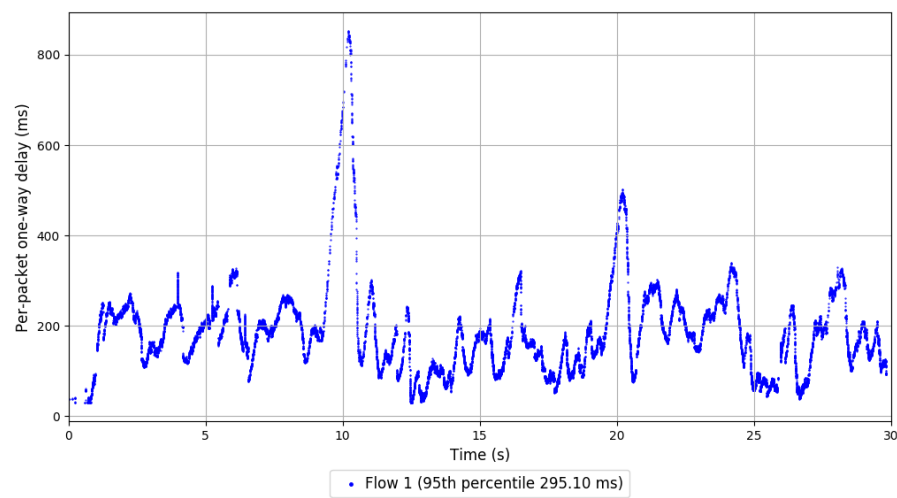
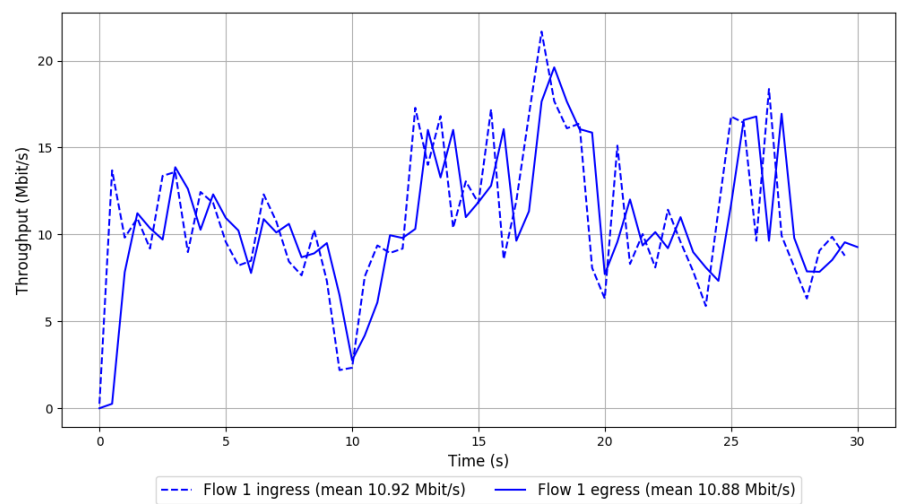
-- Flow 1:

Average throughput: 10.88 Mbit/s

95th percentile per-packet one-way delay: 295.098 ms

Loss rate: 0.50%

Run 2: Report of QUIC Cubic — Data Link

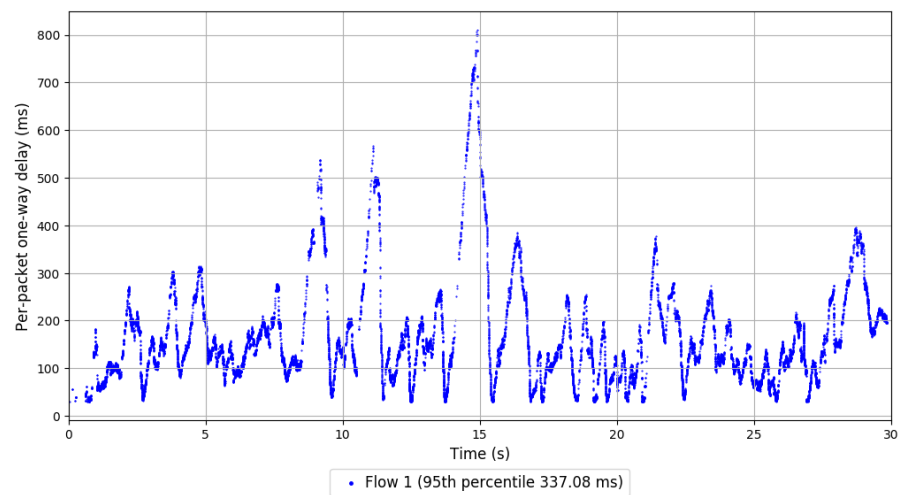
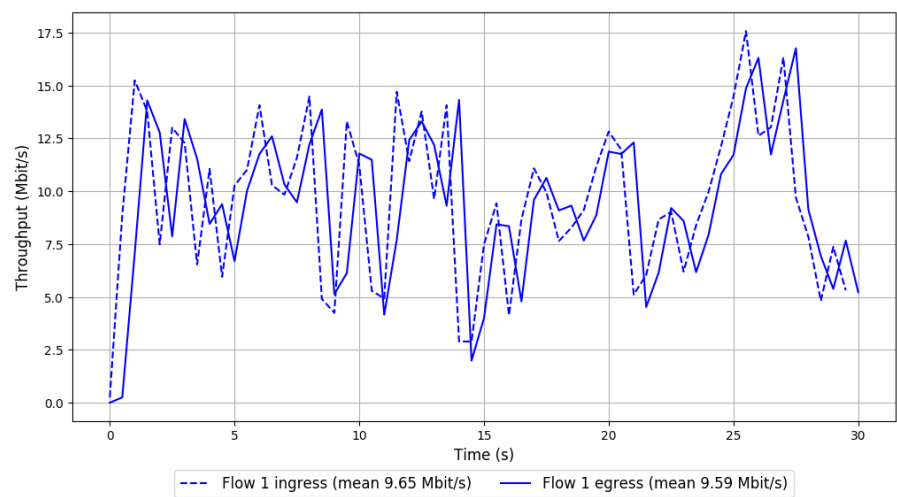


Run 3: Statistics of QUIC Cubic

Start at: 2019-03-08 20:51:03
End at: 2019-03-08 20:51:33
Local clock offset: -6.252 ms
Remote clock offset: -0.258 ms

Below is generated by plot.py at 2019-03-08 21:01:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.59 Mbit/s
95th percentile per-packet one-way delay: 337.080 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 9.59 Mbit/s
95th percentile per-packet one-way delay: 337.080 ms
Loss rate: 0.63%

Run 3: Report of QUIC Cubic — Data Link

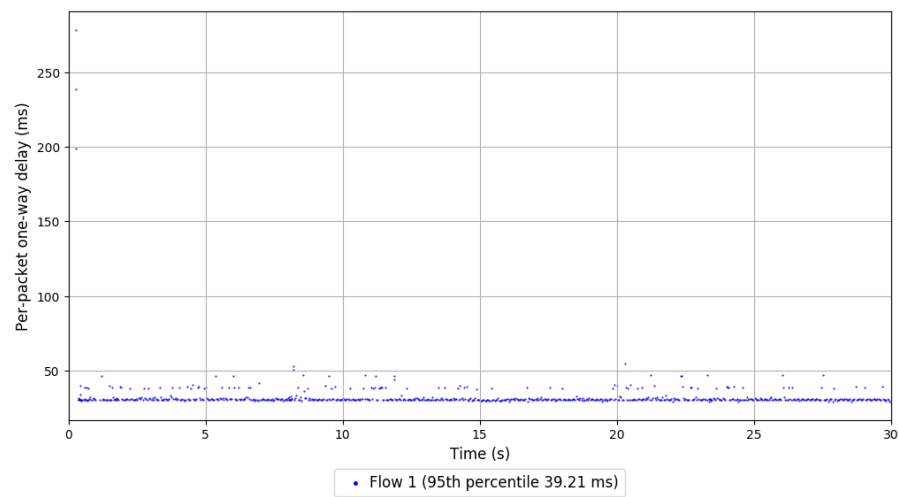
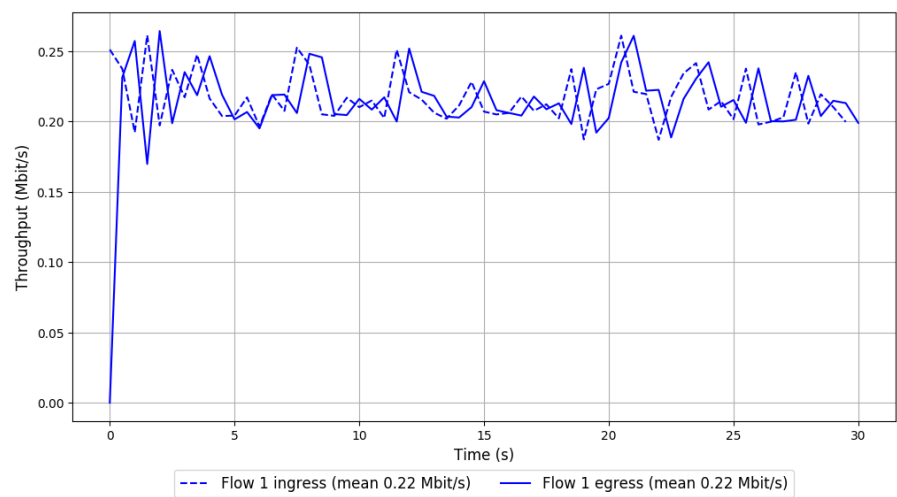


Run 1: Statistics of SCReAM

Start at: 2019-03-08 19:56:56
End at: 2019-03-08 19:57:26
Local clock offset: -2.273 ms
Remote clock offset: -0.432 ms

Below is generated by plot.py at 2019-03-08 21:01:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.212 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.212 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link

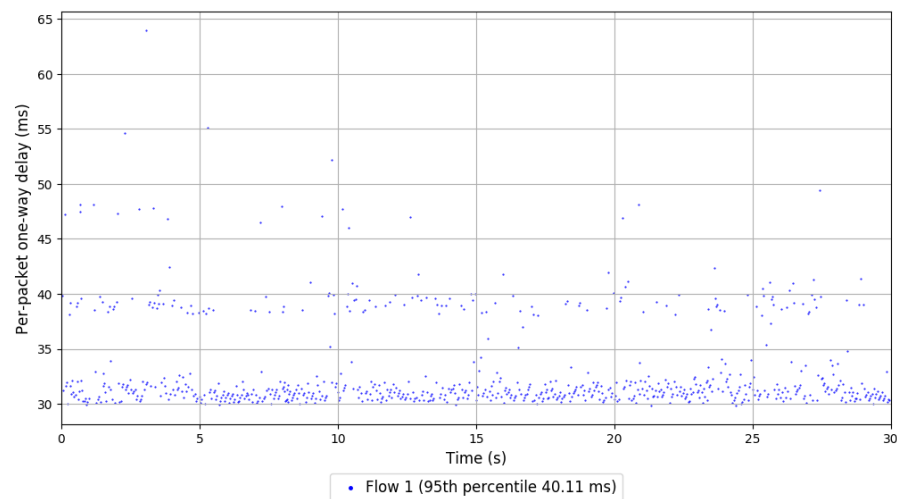
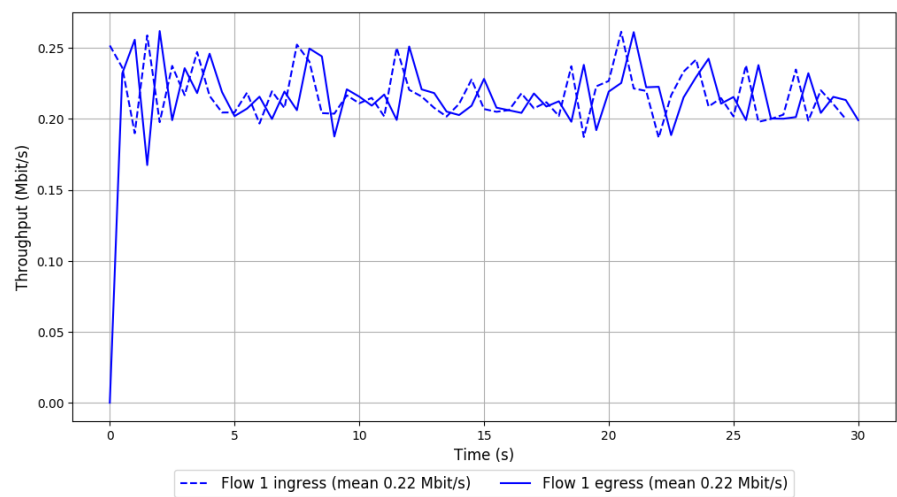


Run 2: Statistics of SCReAM

Start at: 2019-03-08 20:22:46
End at: 2019-03-08 20:23:16
Local clock offset: -3.691 ms
Remote clock offset: -2.977 ms

Below is generated by plot.py at 2019-03-08 21:01:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.106 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.106 ms
Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

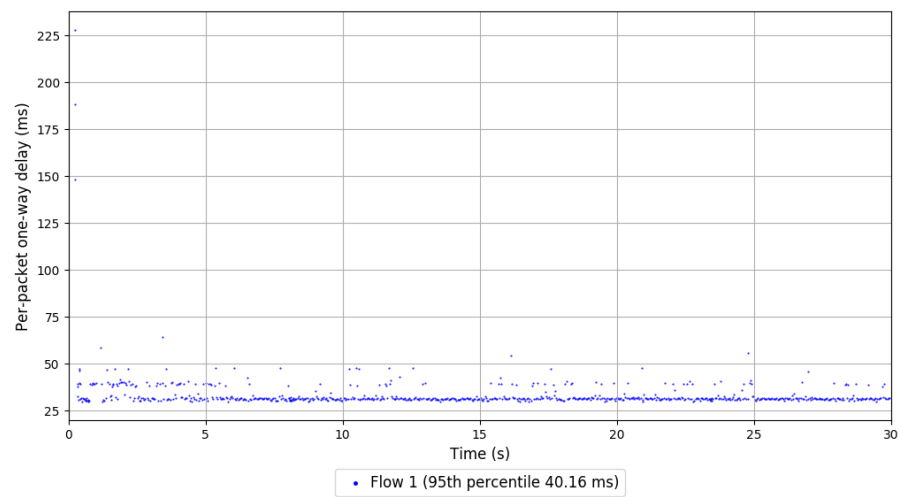
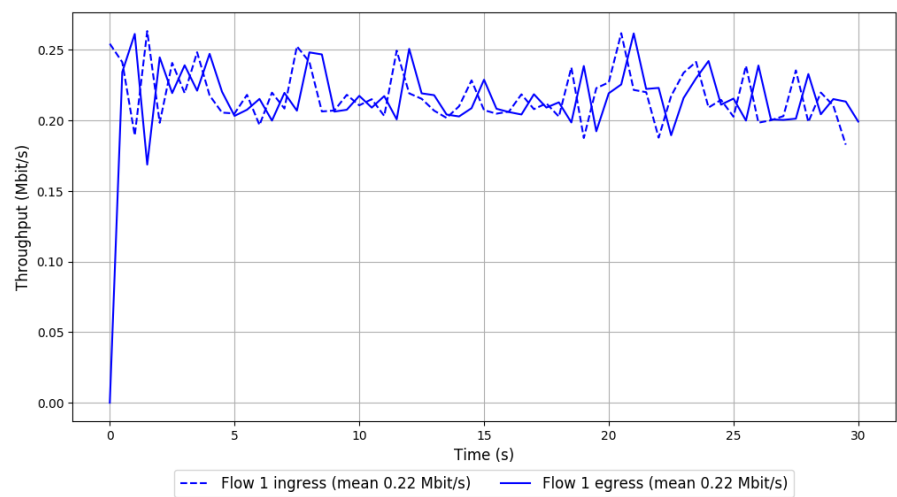


Run 3: Statistics of SCReAM

Start at: 2019-03-08 20:48:36
End at: 2019-03-08 20:49:06
Local clock offset: -6.652 ms
Remote clock offset: -0.708 ms

Below is generated by plot.py at 2019-03-08 21:01:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.160 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 40.160 ms
Loss rate: 0.00%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-03-08 19:45:54

End at: 2019-03-08 19:46:24

Local clock offset: 2.502 ms

Remote clock offset: 1.135 ms

Below is generated by plot.py at 2019-03-08 21:01:20

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.58 Mbit/s

95th percentile per-packet one-way delay: 61.044 ms

Loss rate: 0.37%

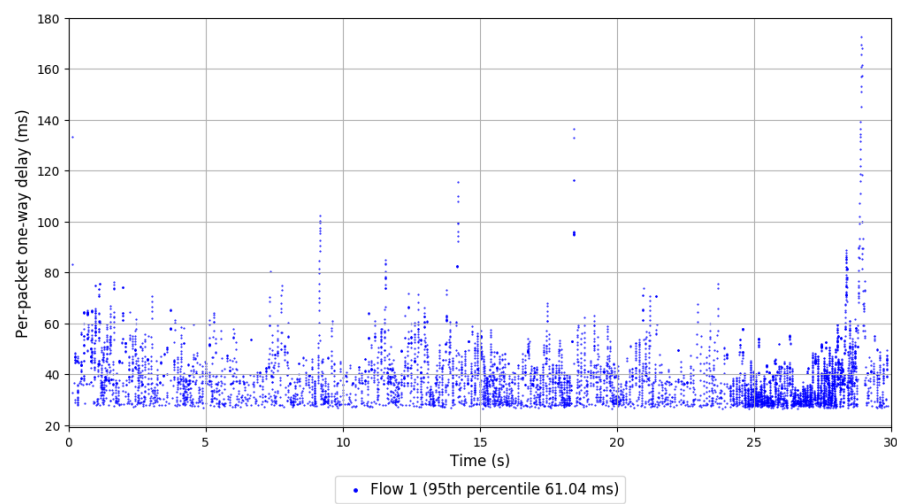
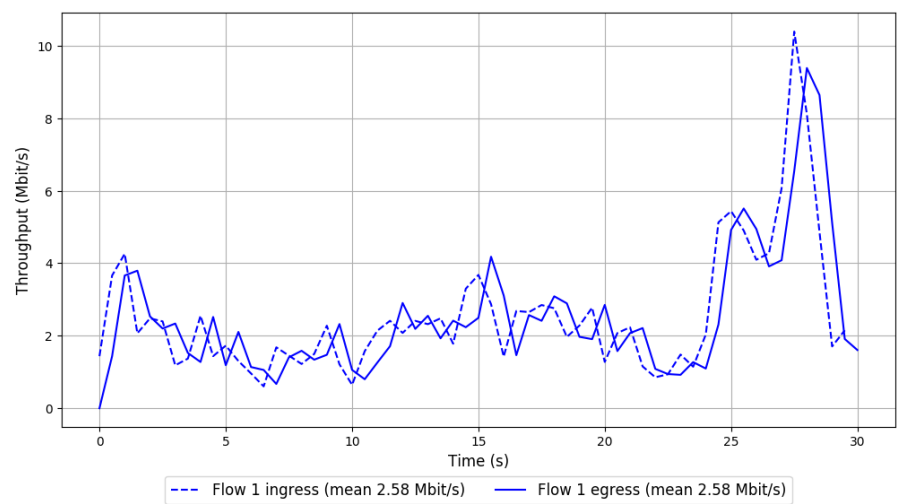
-- Flow 1:

Average throughput: 2.58 Mbit/s

95th percentile per-packet one-way delay: 61.044 ms

Loss rate: 0.37%

Run 1: Report of Sprout — Data Link

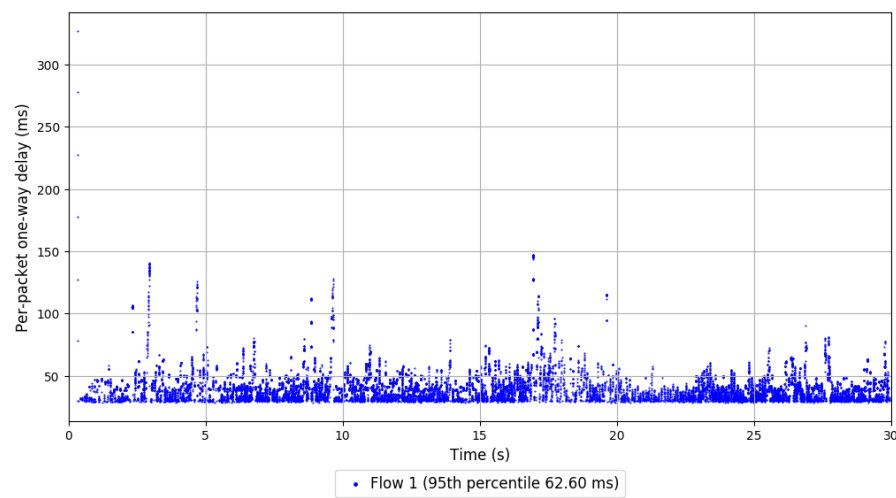
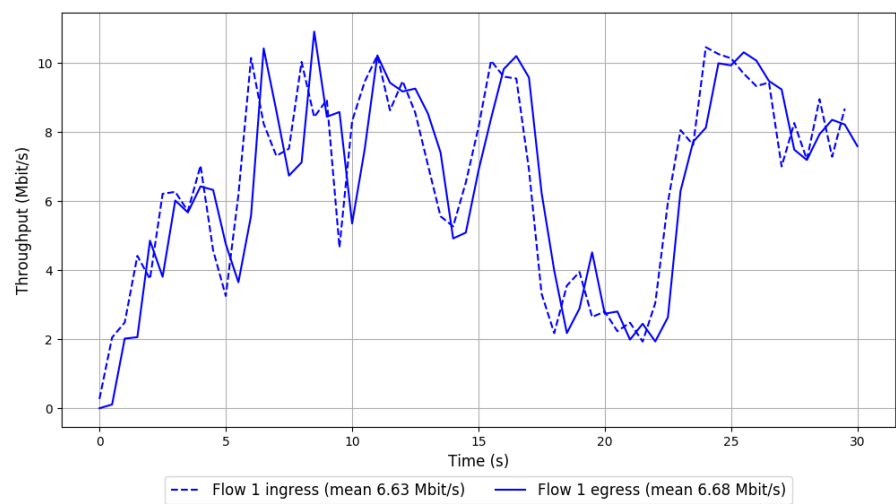


Run 2: Statistics of Sprout

Start at: 2019-03-08 20:11:40
End at: 2019-03-08 20:12:10
Local clock offset: -3.591 ms
Remote clock offset: -1.959 ms

Below is generated by plot.py at 2019-03-08 21:01:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.68 Mbit/s
95th percentile per-packet one-way delay: 62.596 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 6.68 Mbit/s
95th percentile per-packet one-way delay: 62.596 ms
Loss rate: 0.27%

Run 2: Report of Sprout — Data Link

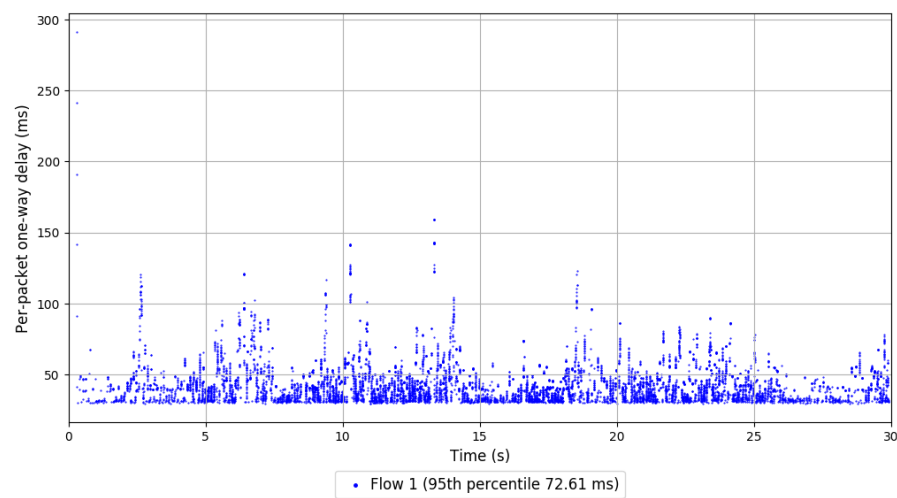
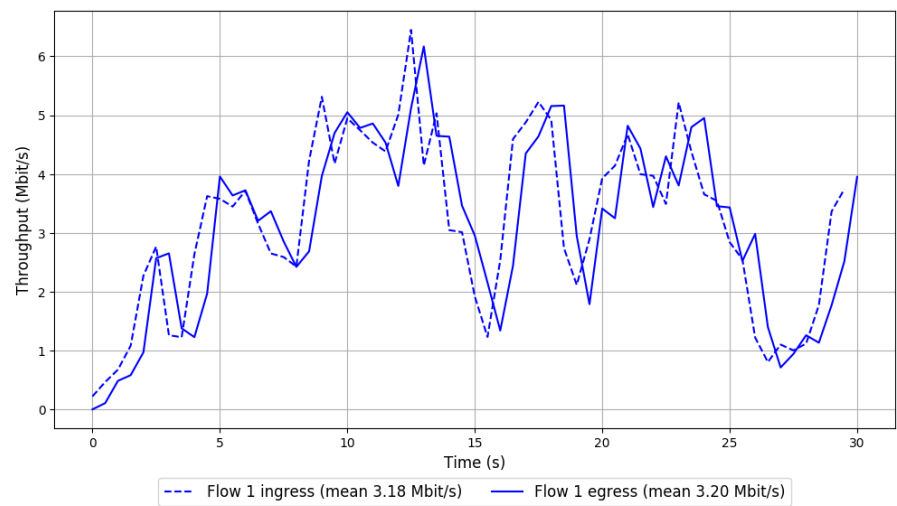


Run 3: Statistics of Sprout

Start at: 2019-03-08 20:37:30
End at: 2019-03-08 20:38:00
Local clock offset: -6.17 ms
Remote clock offset: -4.103 ms

Below is generated by plot.py at 2019-03-08 21:01:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 72.609 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 3.20 Mbit/s
95th percentile per-packet one-way delay: 72.609 ms
Loss rate: 0.34%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

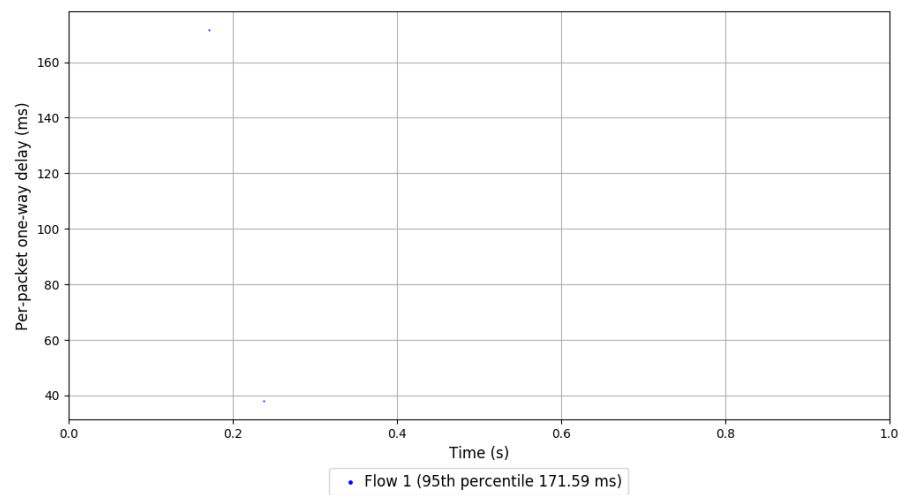
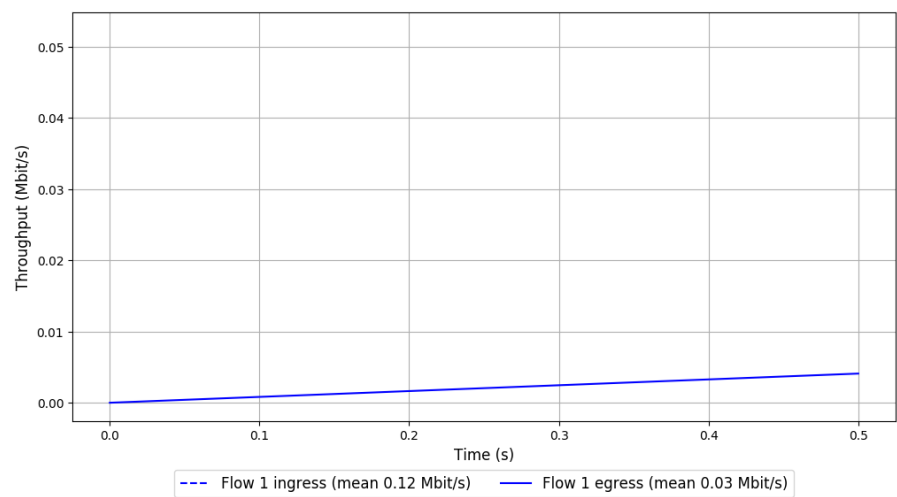
Start at: 2019-03-08 20:03:04

End at: 2019-03-08 20:03:34

Local clock offset: -2.845 ms

Remote clock offset: -1.055 ms

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



Run 2: Statistics of TaoVA-100x

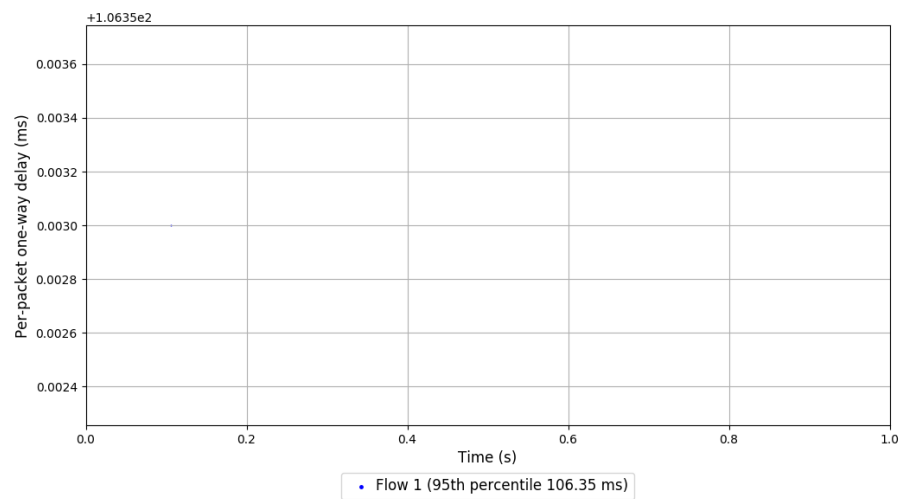
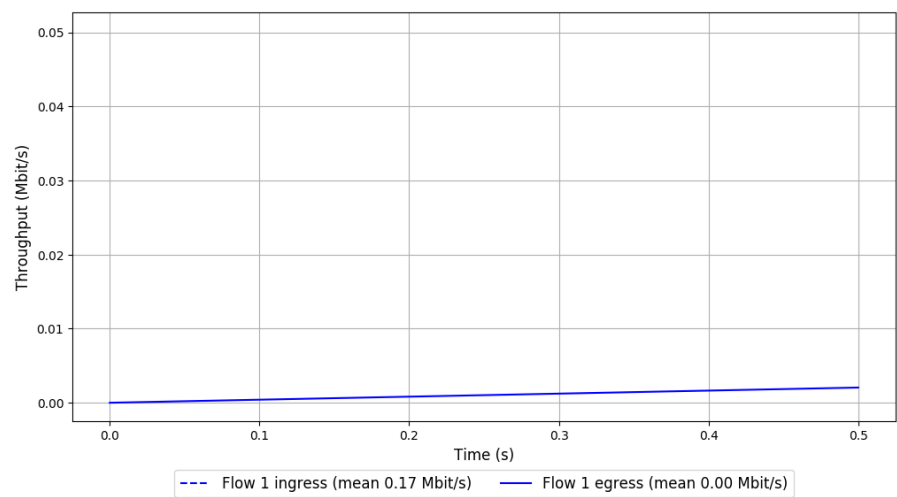
Start at: 2019-03-08 20:28:54

End at: 2019-03-08 20:29:24

Local clock offset: -4.409 ms

Remote clock offset: -3.426 ms

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



Run 3: Statistics of TaoVA-100x

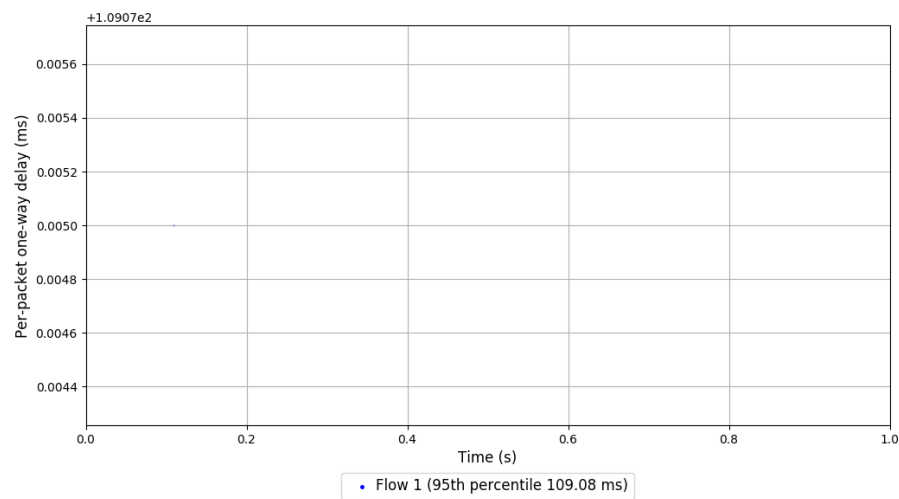
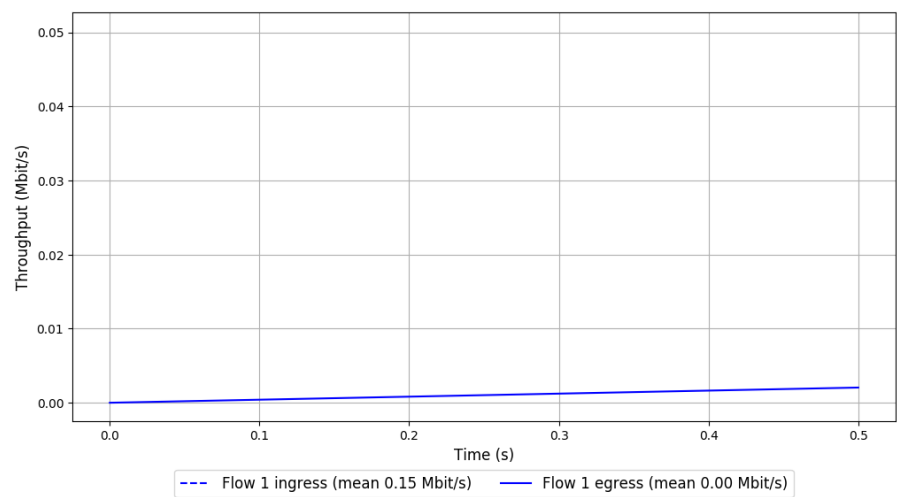
Start at: 2019-03-08 20:54:44

End at: 2019-03-08 20:55:14

Local clock offset: -6.063 ms

Remote clock offset: 0.247 ms

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



Run 1: Statistics of TCP Vegas

Start at: 2019-03-08 19:53:15

End at: 2019-03-08 19:53:45

Local clock offset: -1.776 ms

Remote clock offset: 0.043 ms

Below is generated by plot.py at 2019-03-08 21:01:22

Datalink statistics

-- Total of 1 flow:

Average throughput: 7.30 Mbit/s

95th percentile per-packet one-way delay: 90.152 ms

Loss rate: 0.06%

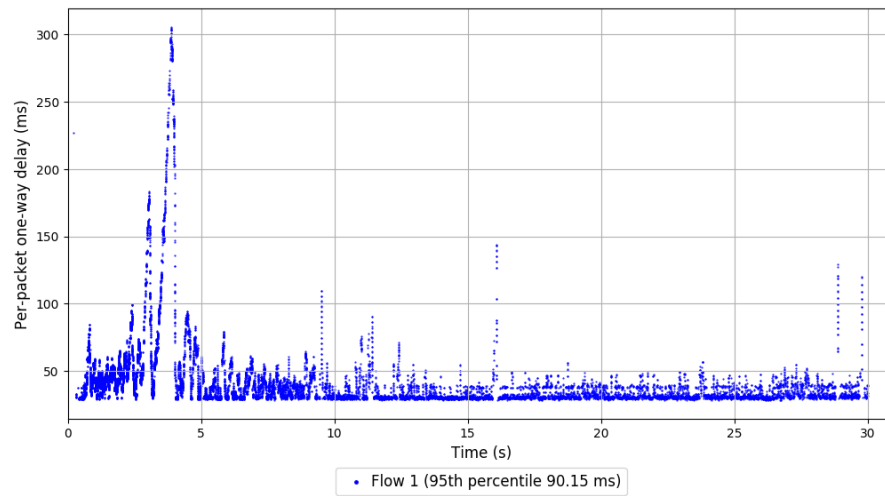
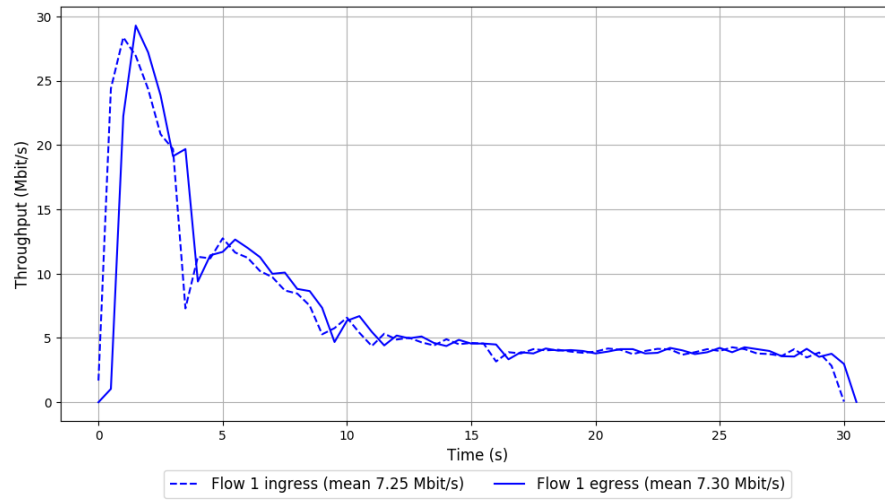
-- Flow 1:

Average throughput: 7.30 Mbit/s

95th percentile per-packet one-way delay: 90.152 ms

Loss rate: 0.06%

Run 1: Report of TCP Vegas — Data Link

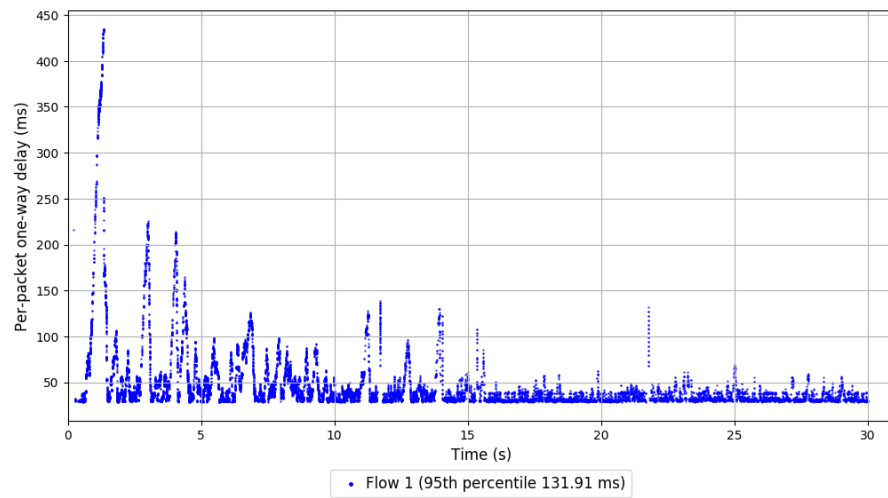
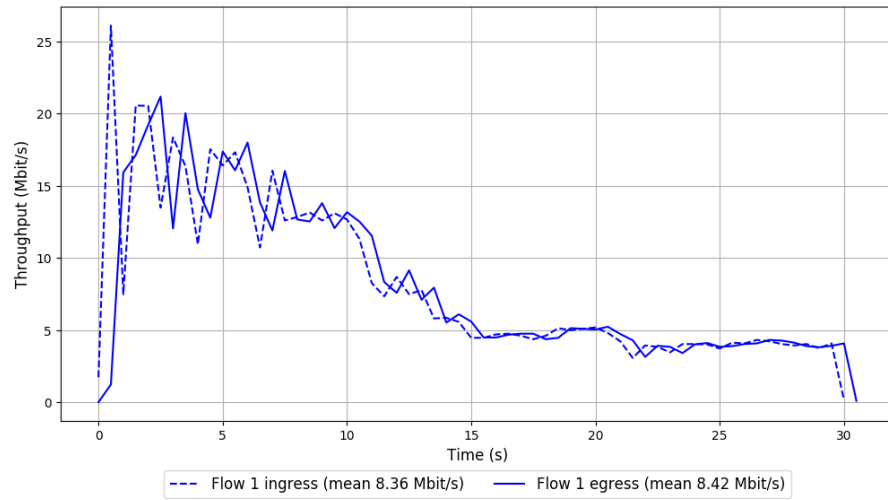


Run 2: Statistics of TCP Vegas

Start at: 2019-03-08 20:19:06
End at: 2019-03-08 20:19:36
Local clock offset: -3.682 ms
Remote clock offset: -2.628 ms

Below is generated by plot.py at 2019-03-08 21:01:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.42 Mbit/s
95th percentile per-packet one-way delay: 131.914 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 8.42 Mbit/s
95th percentile per-packet one-way delay: 131.914 ms
Loss rate: 0.07%

Run 2: Report of TCP Vegas — Data Link

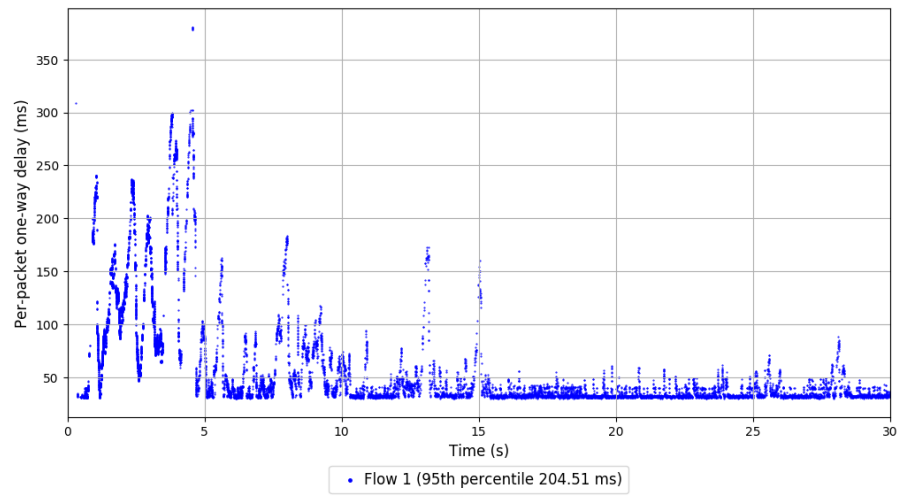
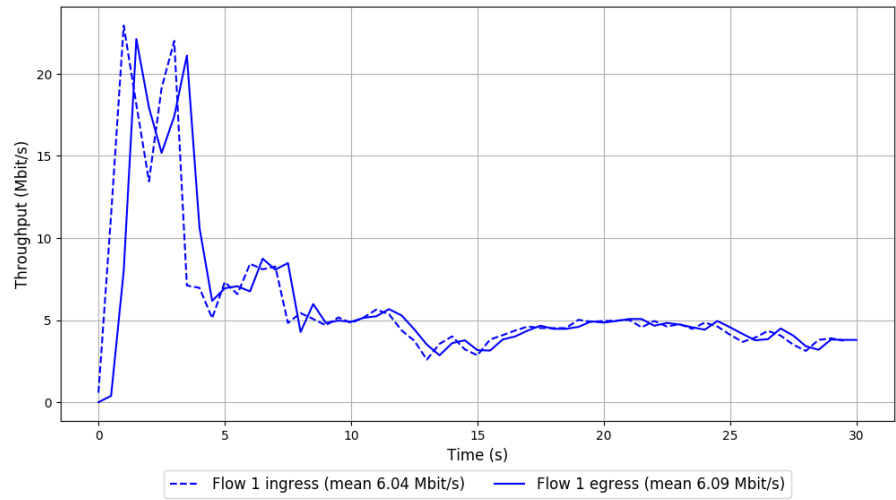


Run 3: Statistics of TCP Vegas

Start at: 2019-03-08 20:44:55
End at: 2019-03-08 20:45:25
Local clock offset: -7.803 ms
Remote clock offset: -1.731 ms

Below is generated by plot.py at 2019-03-08 21:01:24
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.09 Mbit/s
95th percentile per-packet one-way delay: 204.507 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 6.09 Mbit/s
95th percentile per-packet one-way delay: 204.507 ms
Loss rate: 0.08%

Run 3: Report of TCP Vegas — Data Link

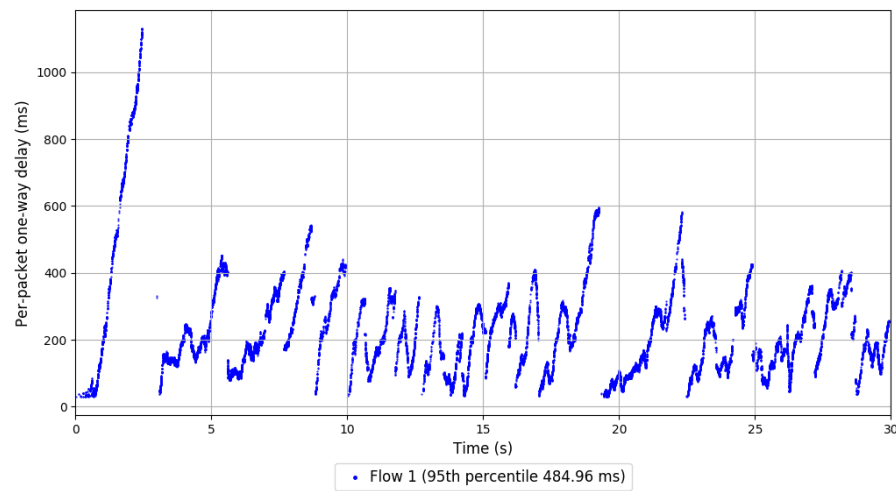
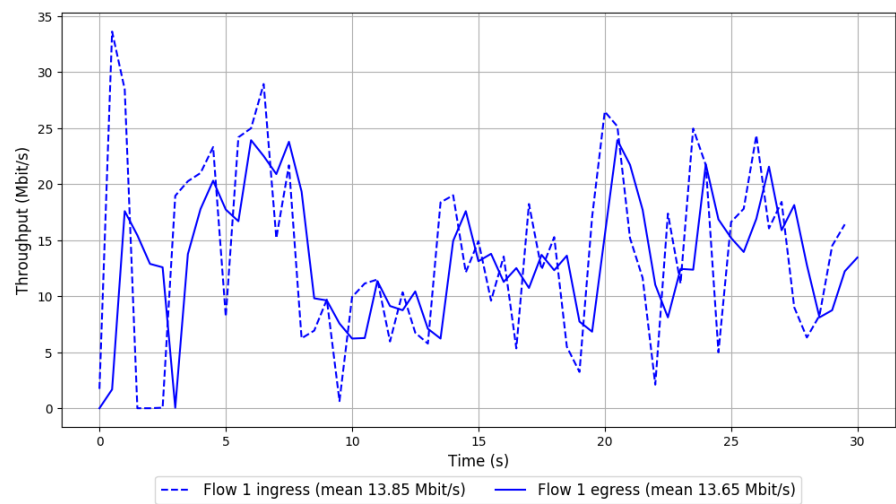


Run 1: Statistics of Verus

Start at: 2019-03-08 20:06:45
End at: 2019-03-08 20:07:15
Local clock offset: -2.641 ms
Remote clock offset: -1.365 ms

Below is generated by plot.py at 2019-03-08 21:01:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 13.65 Mbit/s
95th percentile per-packet one-way delay: 484.960 ms
Loss rate: 1.53%
-- Flow 1:
Average throughput: 13.65 Mbit/s
95th percentile per-packet one-way delay: 484.960 ms
Loss rate: 1.53%

Run 1: Report of Verus — Data Link

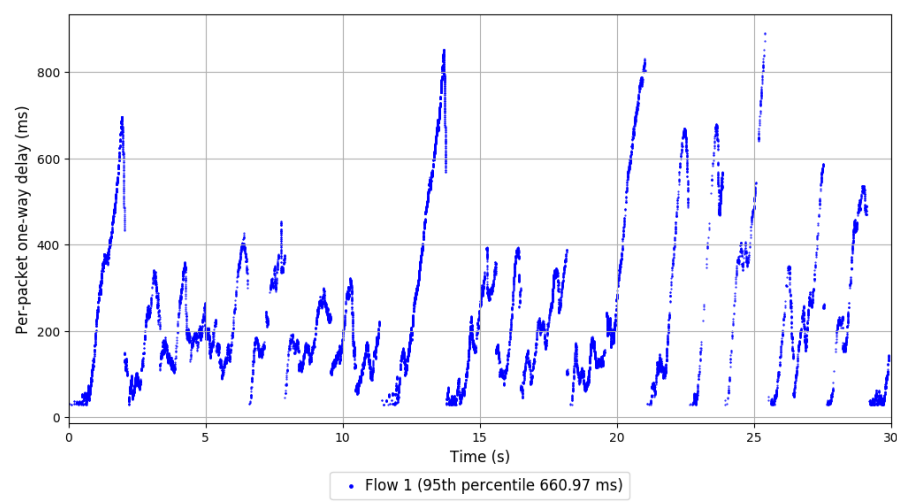
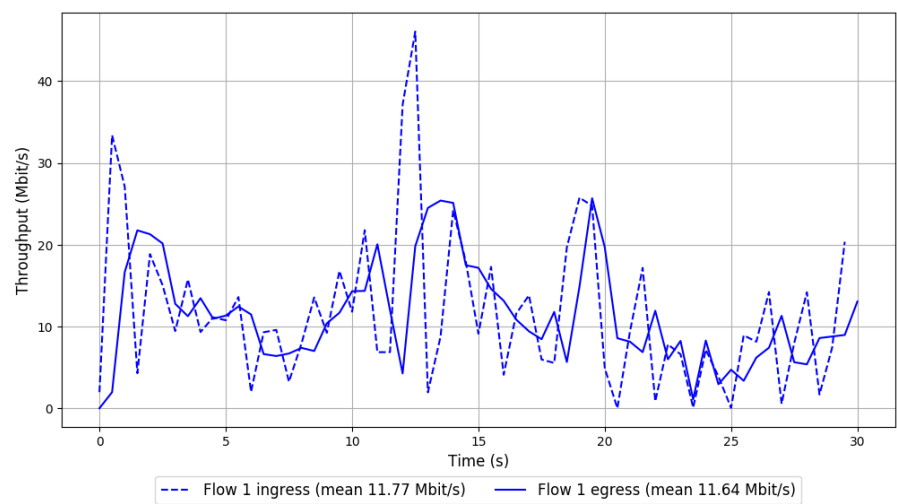


Run 2: Statistics of Verus

Start at: 2019-03-08 20:32:35
End at: 2019-03-08 20:33:05
Local clock offset: -5.068 ms
Remote clock offset: -3.866 ms

Below is generated by plot.py at 2019-03-08 21:01:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 11.64 Mbit/s
95th percentile per-packet one-way delay: 660.972 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 11.64 Mbit/s
95th percentile per-packet one-way delay: 660.972 ms
Loss rate: 1.27%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2019-03-08 20:58:25

End at: 2019-03-08 20:58:55

Local clock offset: -6.192 ms

Remote clock offset: 0.542 ms

Below is generated by plot.py at 2019-03-08 21:01:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 10.92 Mbit/s

95th percentile per-packet one-way delay: 454.550 ms

Loss rate: 2.68%

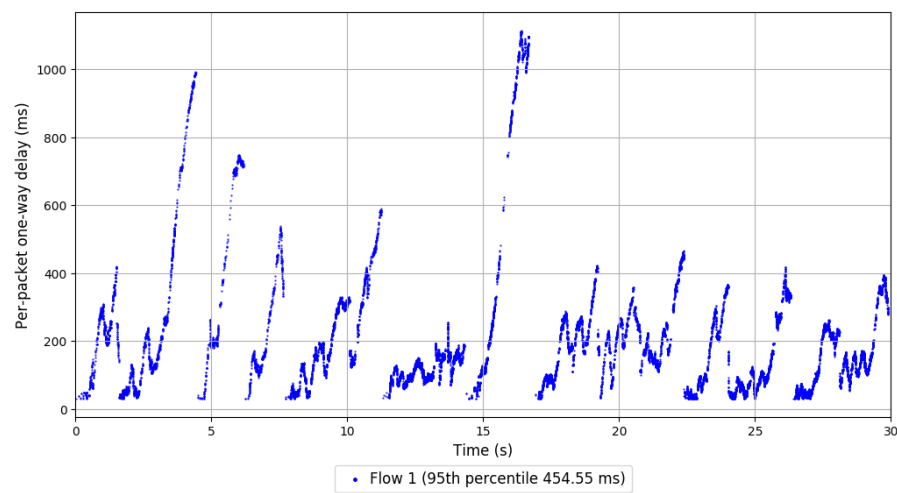
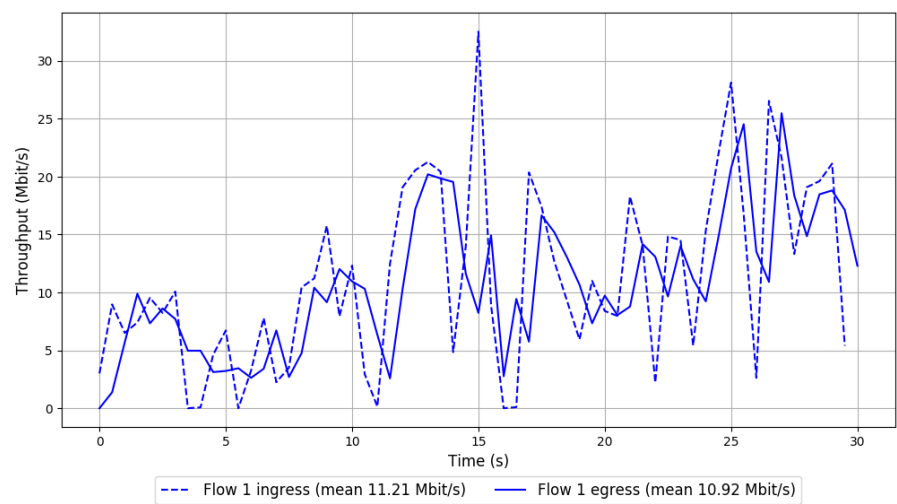
-- Flow 1:

Average throughput: 10.92 Mbit/s

95th percentile per-packet one-way delay: 454.550 ms

Loss rate: 2.68%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-03-08 19:55:42

End at: 2019-03-08 19:56:12

Local clock offset: -1.904 ms

Remote clock offset: -0.352 ms

Below is generated by plot.py at 2019-03-08 21:01:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 6.39 Mbit/s

95th percentile per-packet one-way delay: 73.988 ms

Loss rate: 0.07%

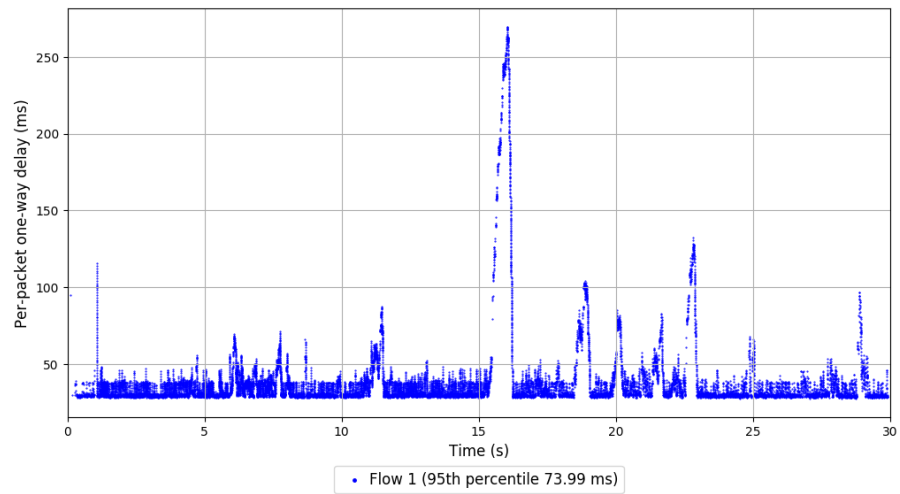
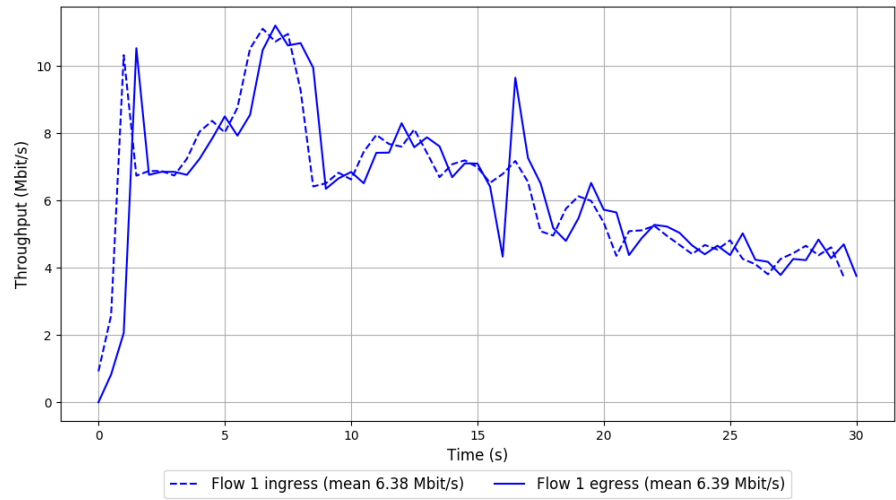
-- Flow 1:

Average throughput: 6.39 Mbit/s

95th percentile per-packet one-way delay: 73.988 ms

Loss rate: 0.07%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-03-08 20:21:33

End at: 2019-03-08 20:22:03

Local clock offset: -3.635 ms

Remote clock offset: -2.957 ms

Below is generated by plot.py at 2019-03-08 21:01:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 41.581 ms

Loss rate: 0.07%

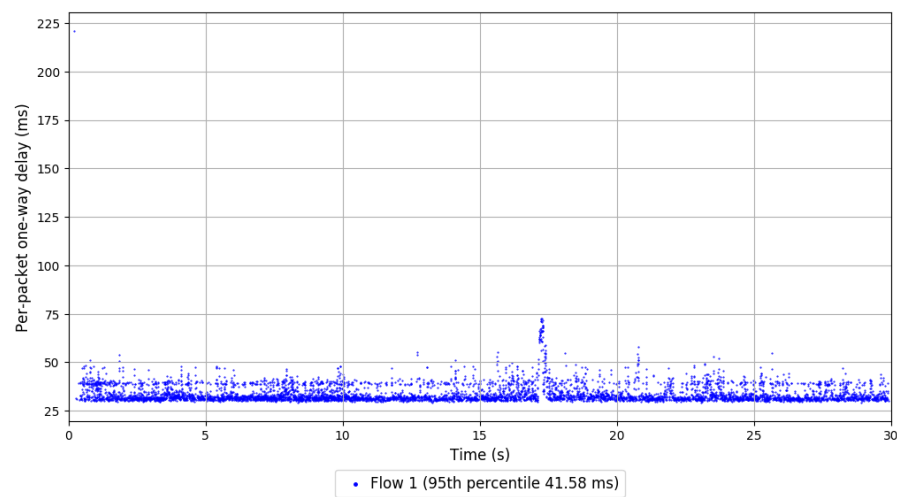
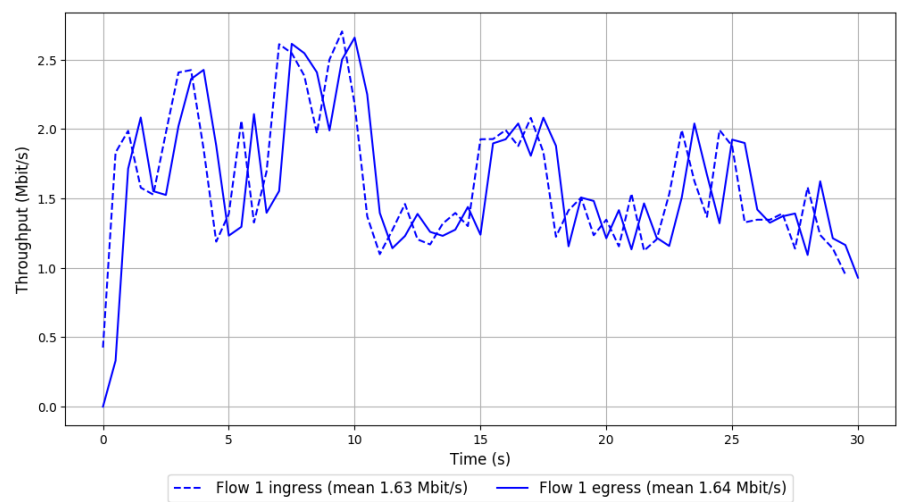
-- Flow 1:

Average throughput: 1.64 Mbit/s

95th percentile per-packet one-way delay: 41.581 ms

Loss rate: 0.07%

Run 2: Report of PCC-Vivace — Data Link

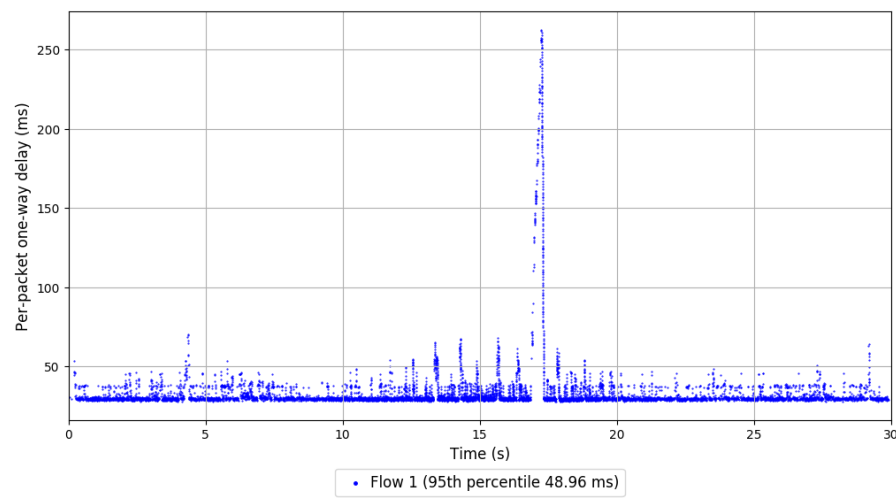
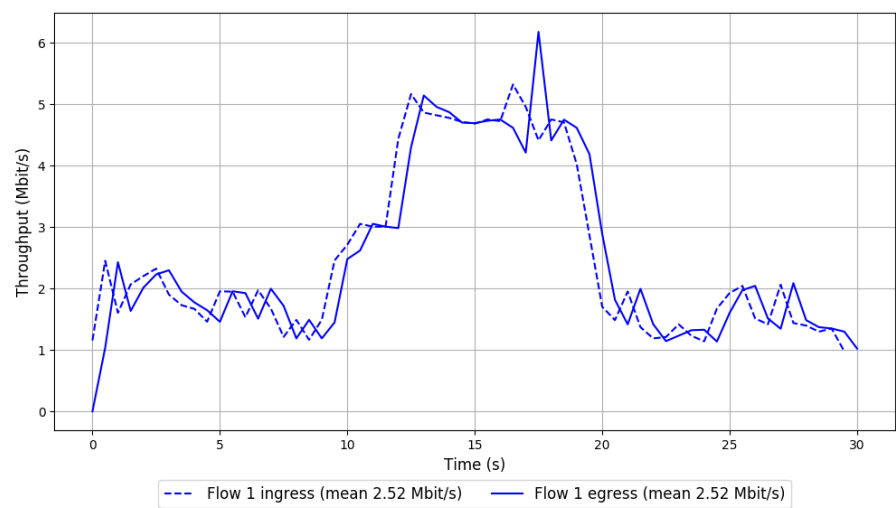


Run 3: Statistics of PCC-Vivace

Start at: 2019-03-08 20:47:23
End at: 2019-03-08 20:47:53
Local clock offset: -6.957 ms
Remote clock offset: -1.002 ms

Below is generated by plot.py at 2019-03-08 21:01:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.52 Mbit/s
95th percentile per-packet one-way delay: 48.957 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 2.52 Mbit/s
95th percentile per-packet one-way delay: 48.957 ms
Loss rate: 0.05%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-03-08 19:52:01

End at: 2019-03-08 19:52:31

Local clock offset: -2.078 ms

Remote clock offset: 0.147 ms

Below is generated by plot.py at 2019-03-08 21:01:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 49.175 ms

Loss rate: 0.00%

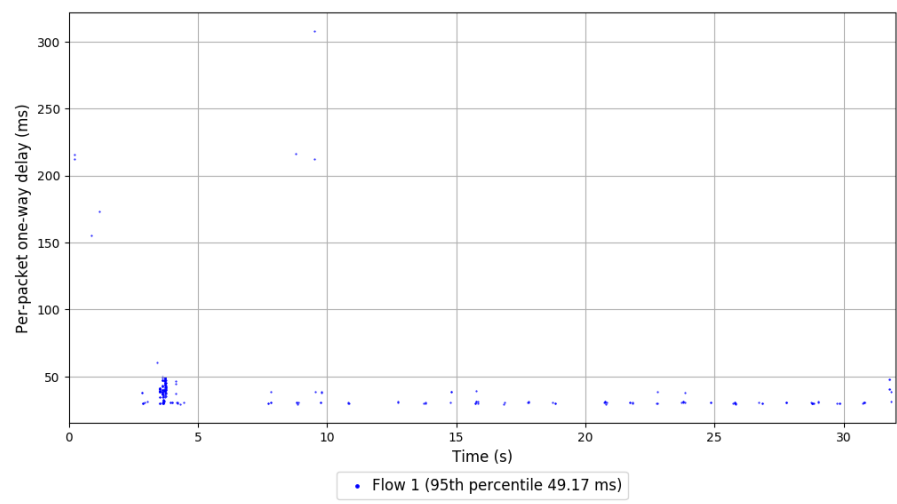
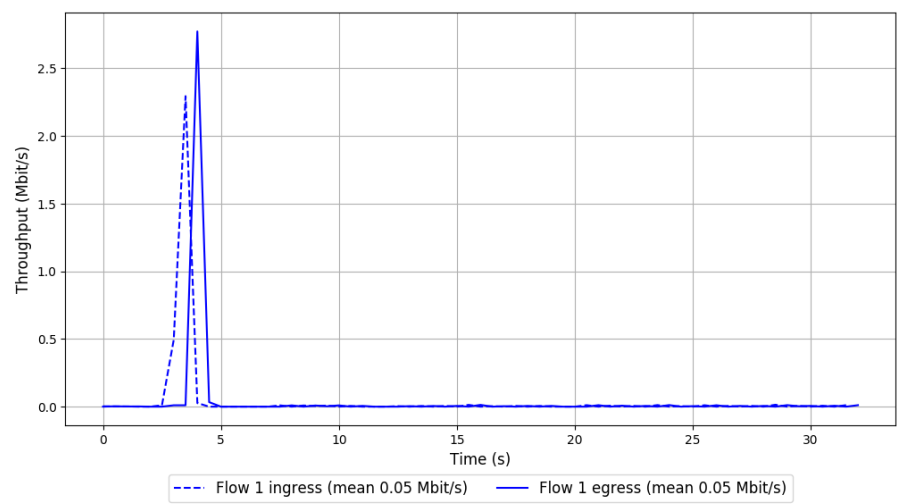
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 49.175 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

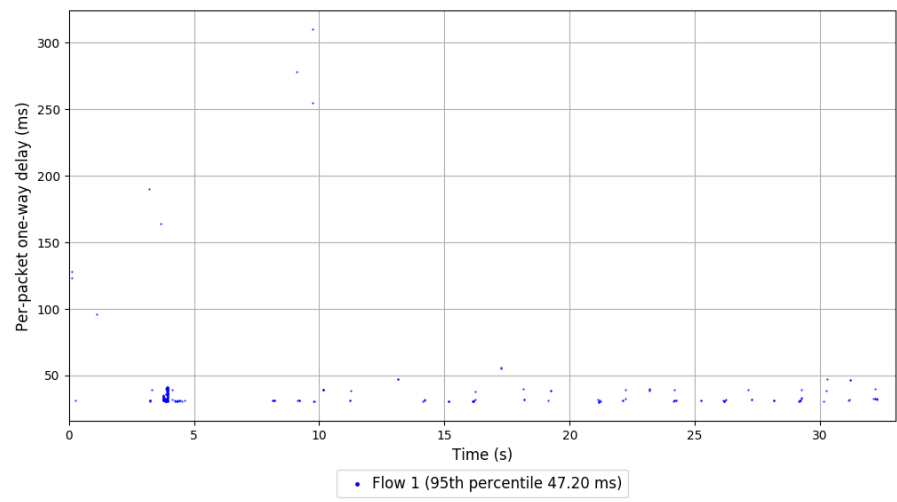
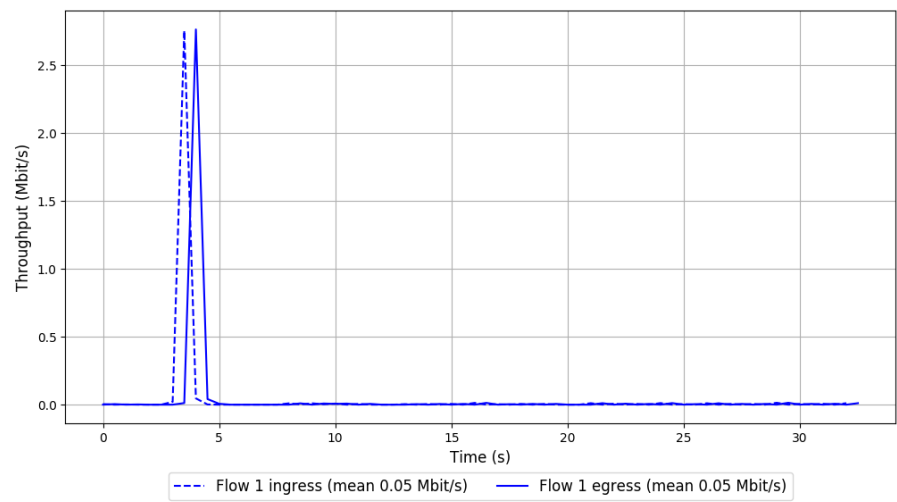


Run 2: Statistics of WebRTC media

Start at: 2019-03-08 20:17:52
End at: 2019-03-08 20:18:22
Local clock offset: -3.8 ms
Remote clock offset: -2.641 ms

Below is generated by plot.py at 2019-03-08 21:01:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 47.199 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 47.199 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-03-08 20:43:42
End at: 2019-03-08 20:44:12
Local clock offset: -7.681 ms
Remote clock offset: -2.187 ms

Below is generated by plot.py at 2019-03-08 21:01:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 81.457 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 81.457 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

