

Pantheon Report

Generated at 2018-12-10 21:42:05 (UTC).

Data path: AWS Brazil 2 on `ens5` (*local*) → Colombia 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 `gps.ntp.br` and have been applied to correct the timestamps in logs.

System info:

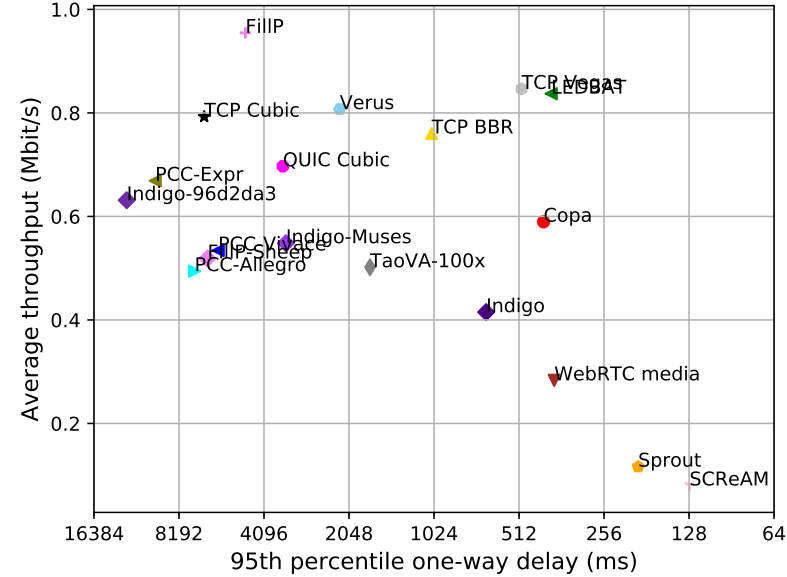
```
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

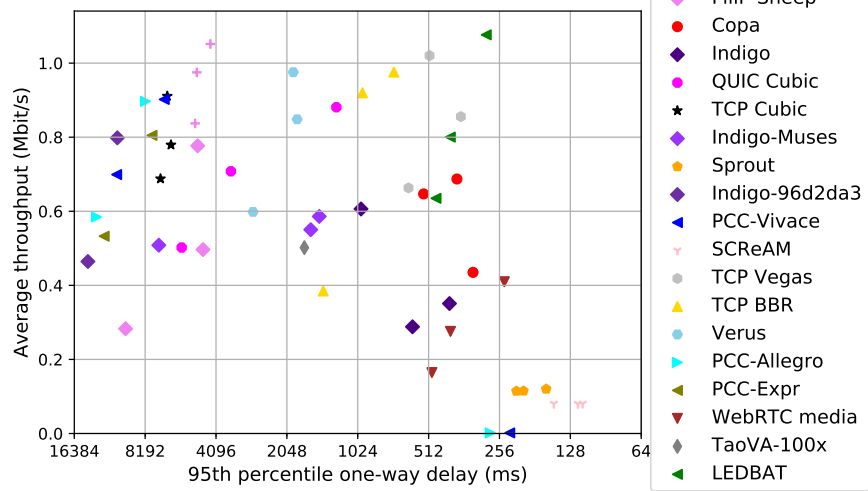
```
branch: muses @ c6268d7c473682290bfe9901ef81a6b6a1e51d3c
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf5e58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/indigo-96d2da3 @ 8413272d46f8aa0bcb967ed7048b6a8f994abb95
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbefed0c6349ae986009b4fa8643c40a
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 Brazil 2 to Colombia cellular, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS Brazil 2 to Colombia 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	0.76	1043.93	1.86
Copa	3	0.59	419.12	0.24
TCP Cubic	3	0.79	6670.09	24.11
FillP	3	0.96	4764.41	12.20
FillP-Sheep	3	0.52	6490.93	17.65
Indigo	3	0.42	669.57	0.09
Indigo-96d2da3	2	0.63	12546.90	95.41
LEDBAT	3	0.84	394.10	0.47
Indigo-Muses	3	0.55	3426.78	5.73
PCC-Allegro	3	0.49	7212.88	53.86
PCC-Expr	2	0.67	9949.20	88.12
QUIC Cubic	3	0.70	3512.25	10.76
SCReAM	3	0.08	127.59	0.13
Sprout	3	0.12	193.83	0.29
TaoVA-100x	1	0.50	1725.50	5.75
TCP Vegas	3	0.85	501.35	0.16
Verus	3	0.81	2208.98	3.85
PCC-Vivace	3	0.53	5953.22	25.29
WebRTC media	3	0.28	384.41	0.13

Run 1: Statistics of TCP BBR

Start at: 2018-12-10 20:57:33

End at: 2018-12-10 20:58:03

Local clock offset: -3.69 ms

Remote clock offset: 46.974 ms

Below is generated by plot.py at 2018-12-10 21:41:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 719.169 ms

Loss rate: 1.14%

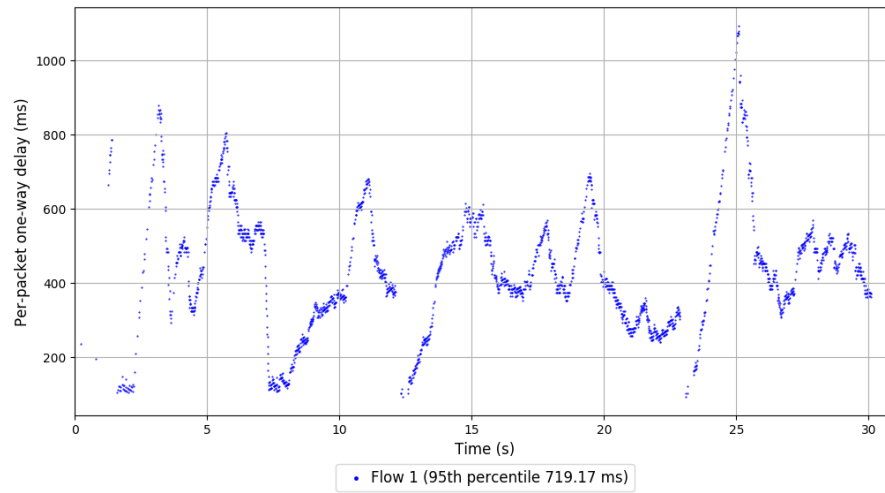
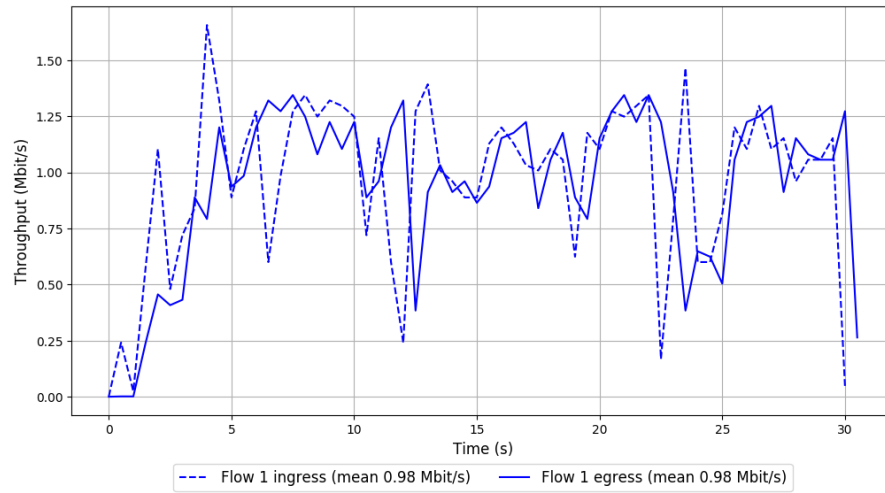
-- Flow 1:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 719.169 ms

Loss rate: 1.14%

Run 1: Report of TCP BBR — Data Link

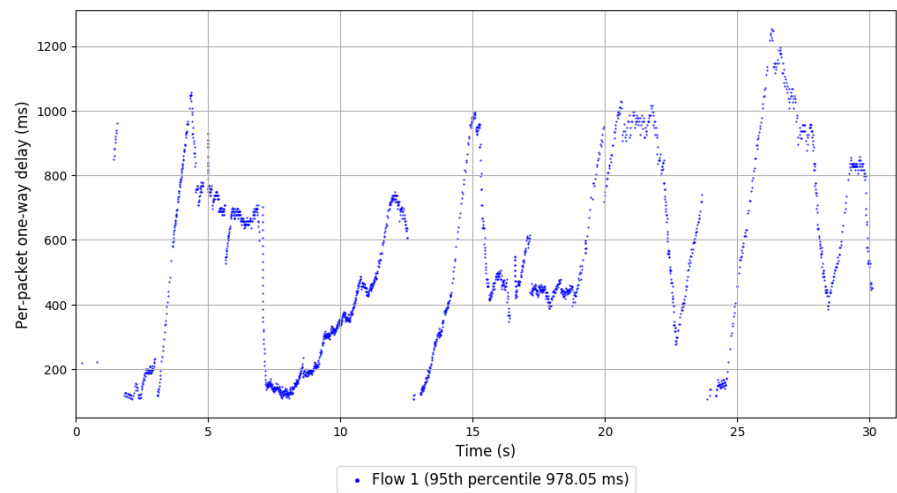
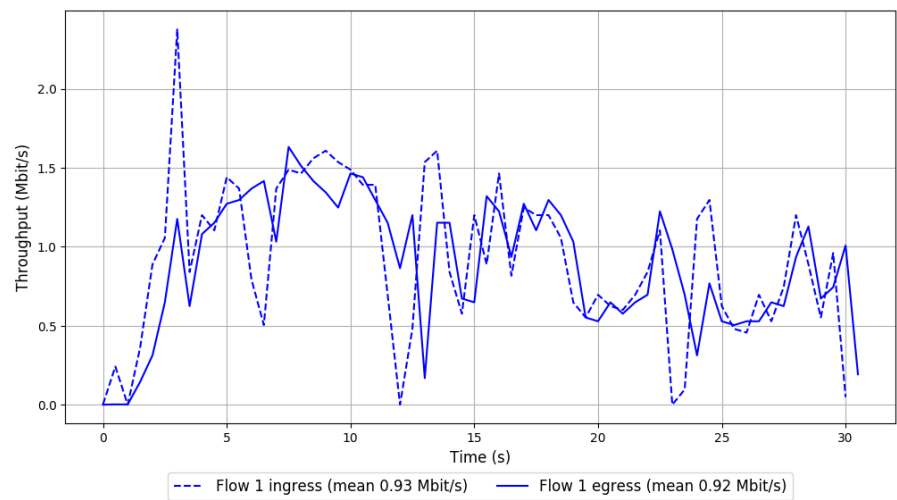


Run 2: Statistics of TCP BBR

Start at: 2018-12-10 21:19:12
End at: 2018-12-10 21:19:42
Local clock offset: -0.29 ms
Remote clock offset: 134.638 ms

Below is generated by plot.py at 2018-12-10 21:41:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 978.046 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 978.046 ms
Loss rate: 1.51%

Run 2: Report of TCP BBR — Data Link

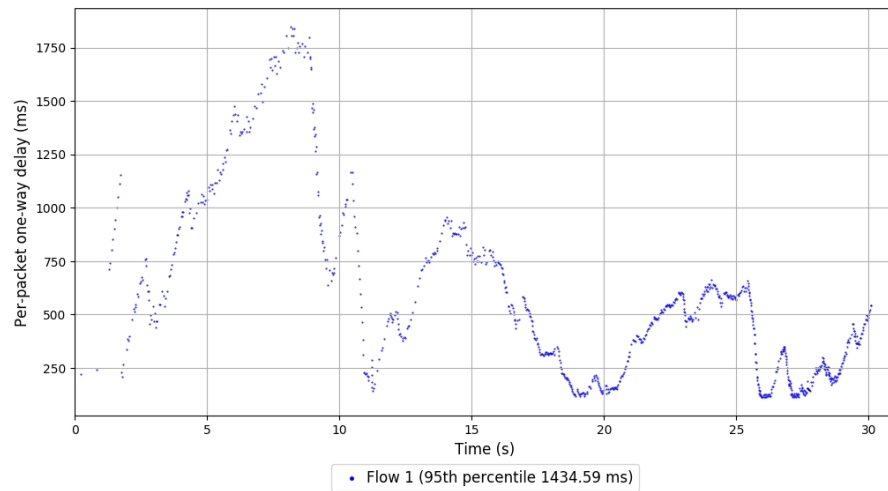
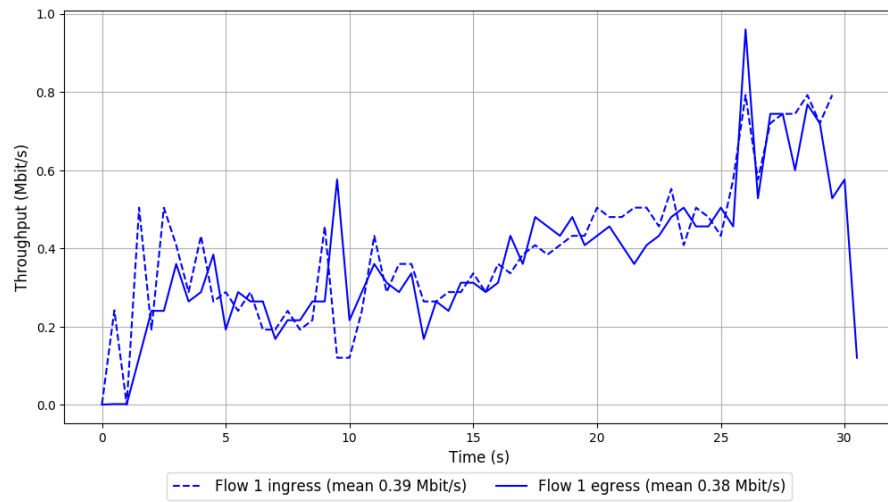


Run 3: Statistics of TCP BBR

Start at: 2018-12-10 21:40:53
End at: 2018-12-10 21:41:23
Local clock offset: 3.957 ms
Remote clock offset: 212.576 ms

Below is generated by plot.py at 2018-12-10 21:41:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1434.589 ms
Loss rate: 2.94%
-- Flow 1:
Average throughput: 0.38 Mbit/s
95th percentile per-packet one-way delay: 1434.589 ms
Loss rate: 2.94%

Run 3: Report of TCP BBR — Data Link

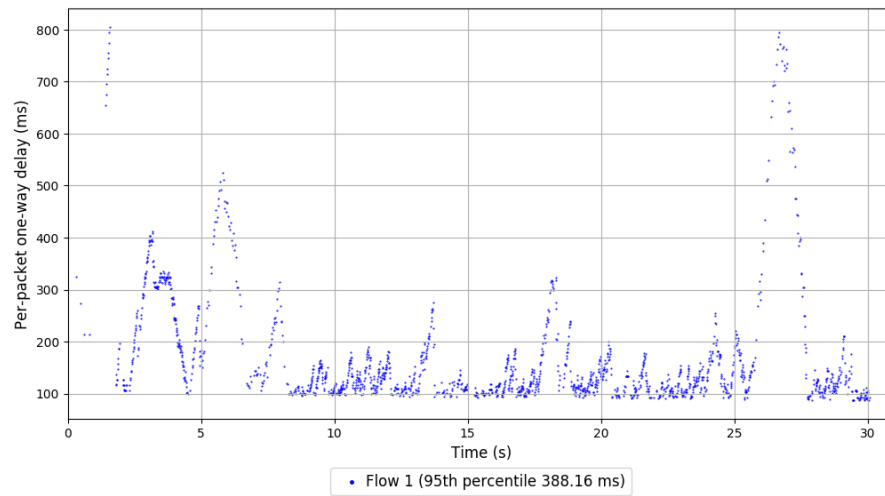
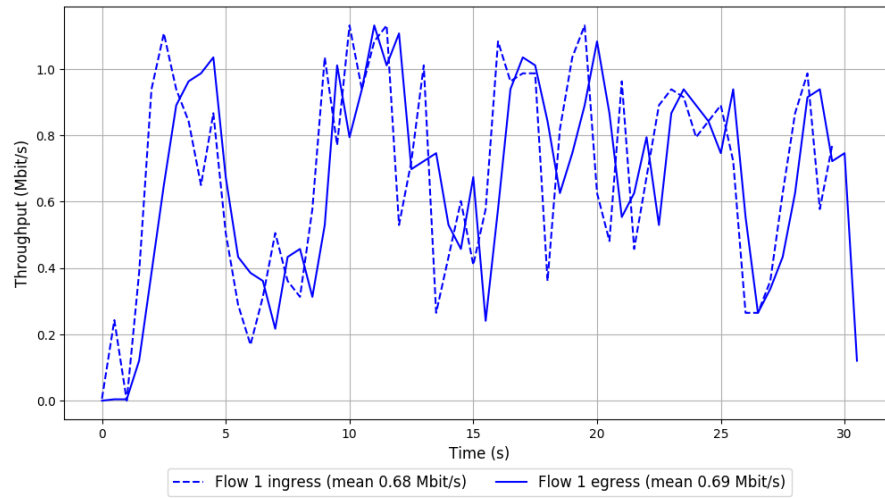


Run 1: Statistics of Copa

Start at: 2018-12-10 20:45:01
End at: 2018-12-10 20:45:31
Local clock offset: -4.682 ms
Remote clock offset: -97.286 ms

Below is generated by plot.py at 2018-12-10 21:41:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 388.158 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 0.69 Mbit/s
95th percentile per-packet one-way delay: 388.158 ms
Loss rate: 0.06%

Run 1: Report of Copa — Data Link

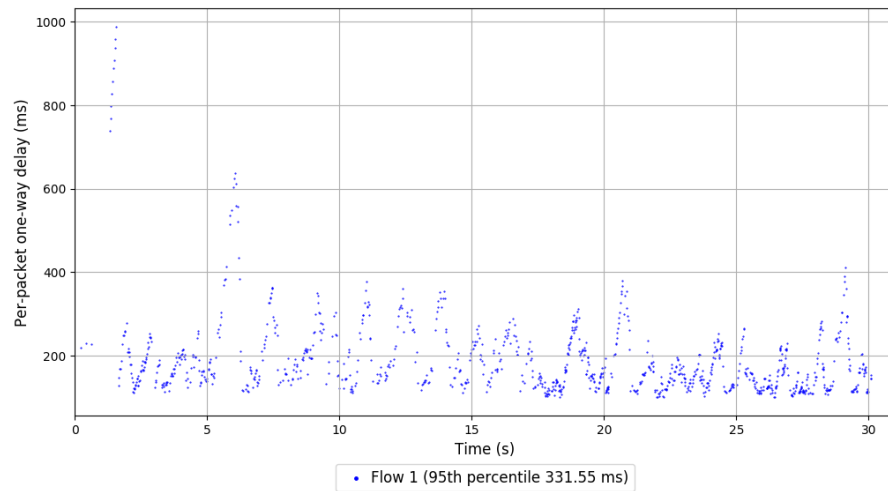
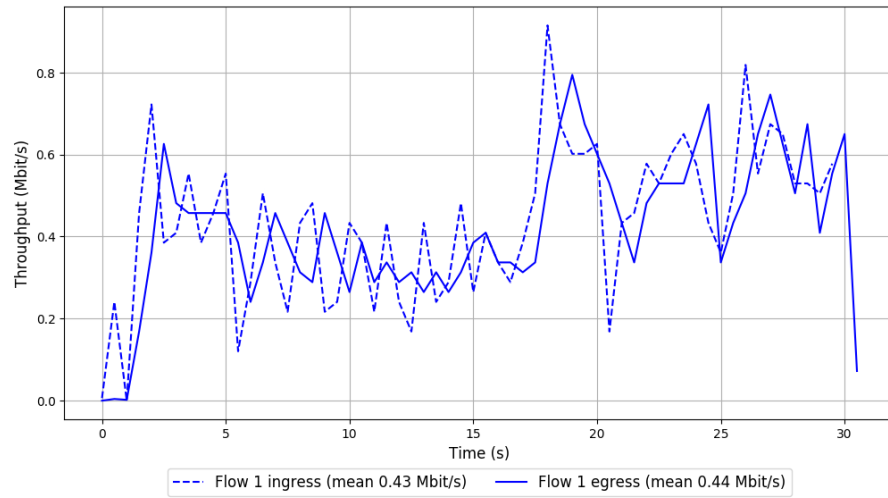


Run 2: Statistics of Copa

Start at: 2018-12-10 21:06:40
End at: 2018-12-10 21:07:10
Local clock offset: -1.87 ms
Remote clock offset: 89.821 ms

Below is generated by plot.py at 2018-12-10 21:41:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 331.549 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 331.549 ms
Loss rate: 0.28%

Run 2: Report of Copa — Data Link

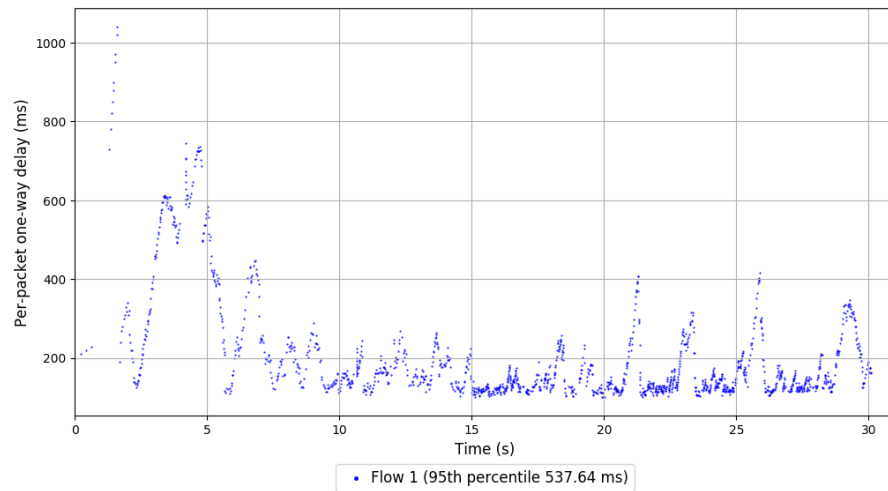
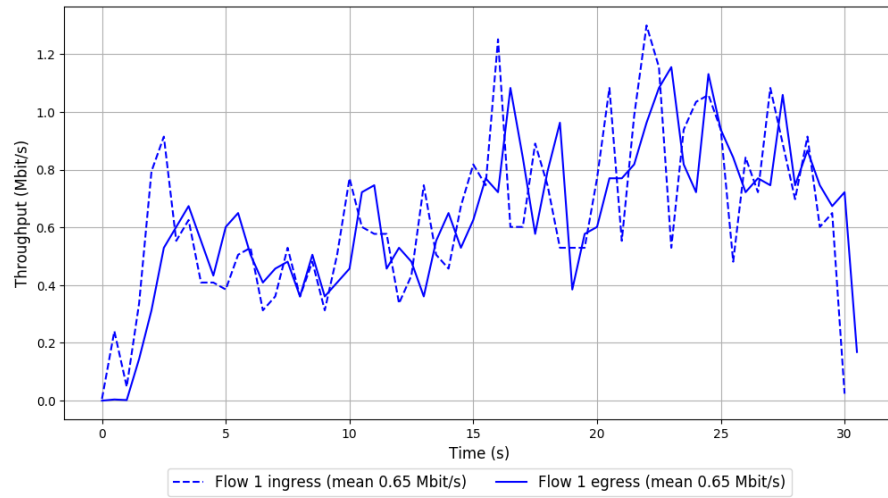


Run 3: Statistics of Copa

Start at: 2018-12-10 21:28:20
End at: 2018-12-10 21:28:50
Local clock offset: 1.48 ms
Remote clock offset: 167.895 ms

Below is generated by plot.py at 2018-12-10 21:41:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 537.644 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 0.65 Mbit/s
95th percentile per-packet one-way delay: 537.644 ms
Loss rate: 0.37%

Run 3: Report of Copa — Data Link

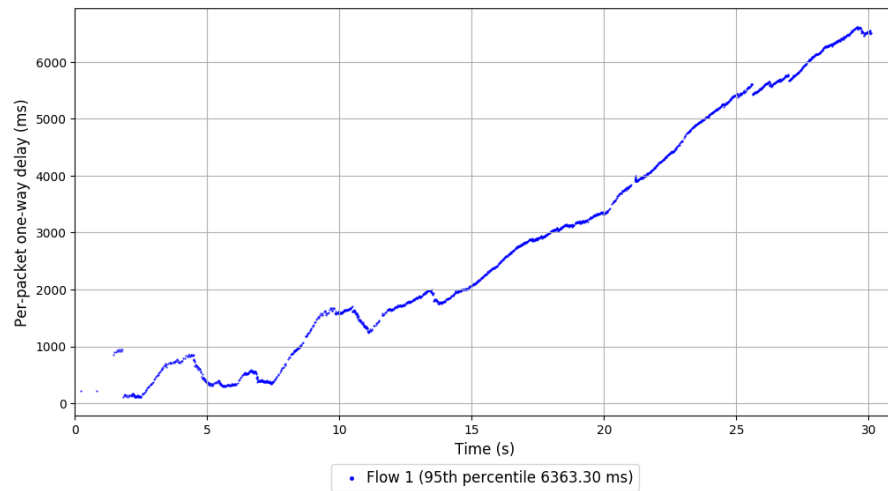
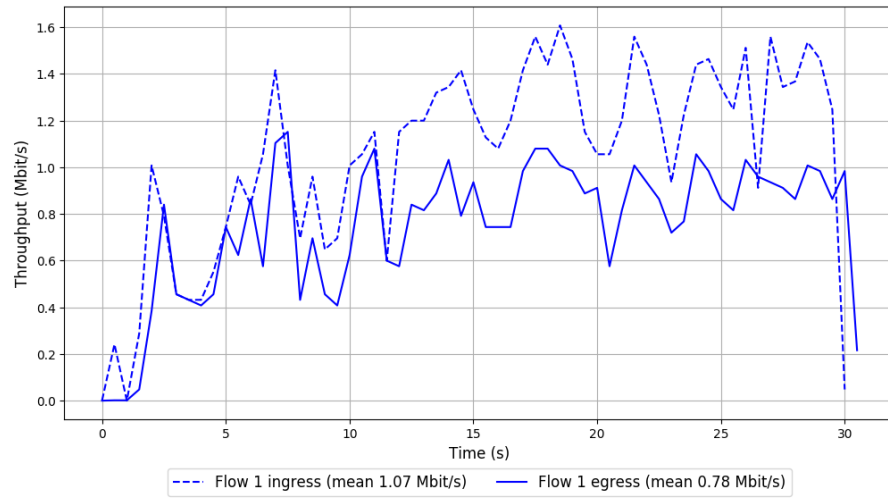


Run 1: Statistics of TCP Cubic

Start at: 2018-12-10 20:50:43
End at: 2018-12-10 20:51:13
Local clock offset: -4.653 ms
Remote clock offset: -1.841 ms

Below is generated by plot.py at 2018-12-10 21:41:34
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 6363.297 ms
Loss rate: 27.42%
-- Flow 1:
Average throughput: 0.78 Mbit/s
95th percentile per-packet one-way delay: 6363.297 ms
Loss rate: 27.42%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-12-10 21:12:22

End at: 2018-12-10 21:12:52

Local clock offset: -0.792 ms

Remote clock offset: 105.0 ms

Below is generated by plot.py at 2018-12-10 21:41:34

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.69 Mbit/s

95th percentile per-packet one-way delay: 7049.648 ms

Loss rate: 23.76%

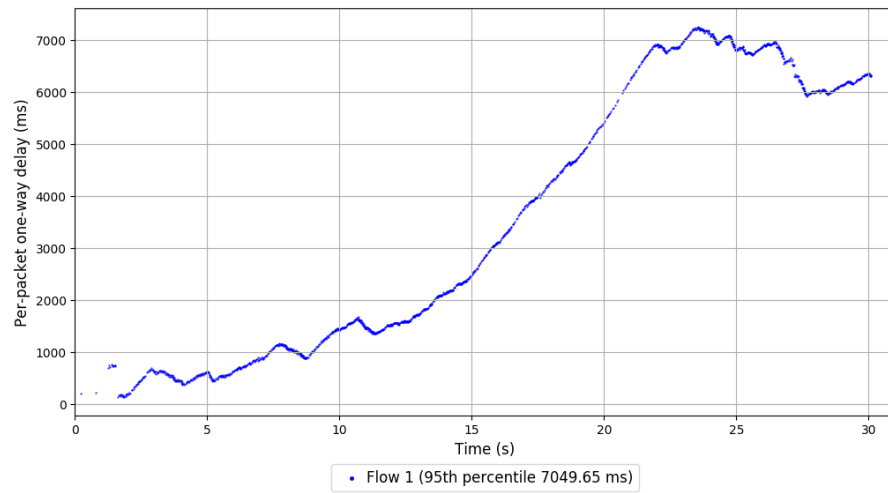
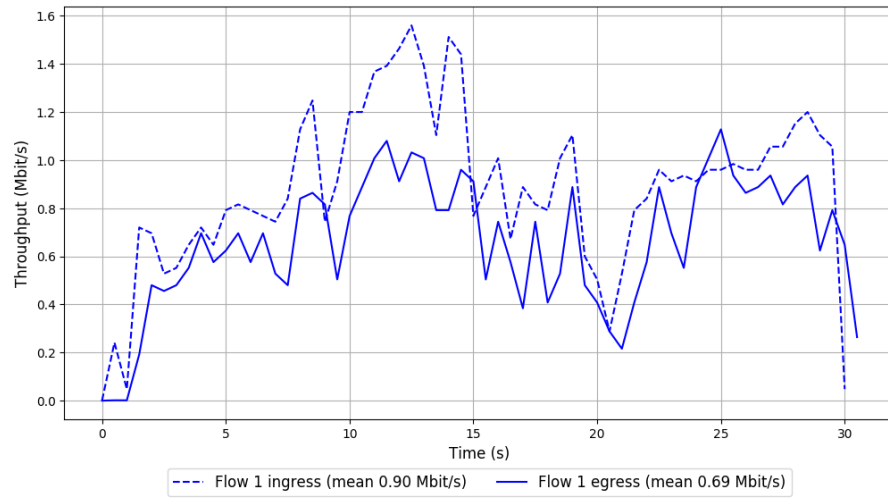
-- Flow 1:

Average throughput: 0.69 Mbit/s

95th percentile per-packet one-way delay: 7049.648 ms

Loss rate: 23.76%

Run 2: Report of TCP Cubic — Data Link

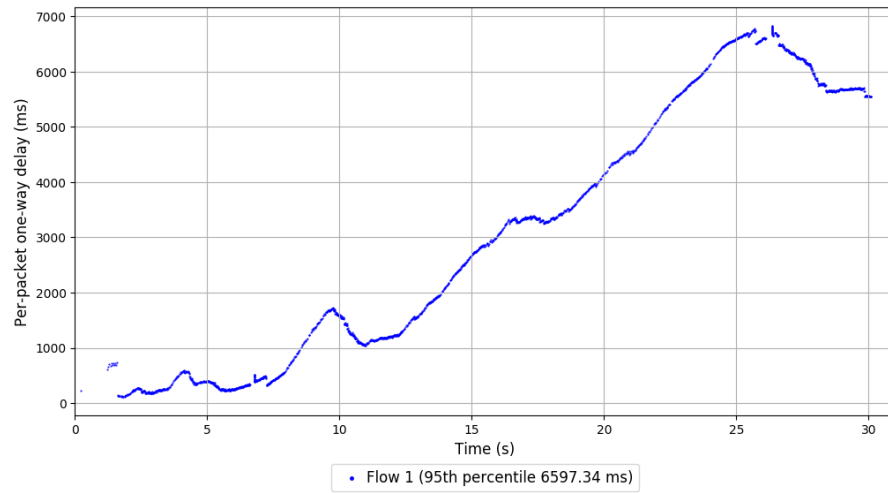
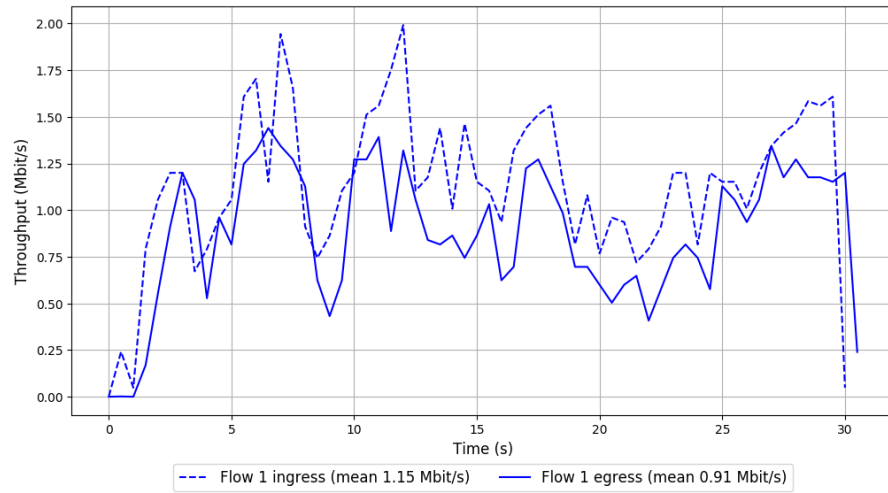


Run 3: Statistics of TCP Cubic

Start at: 2018-12-10 21:34:02
End at: 2018-12-10 21:34:32
Local clock offset: 2.642 ms
Remote clock offset: 188.986 ms

Below is generated by plot.py at 2018-12-10 21:41:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 6597.339 ms
Loss rate: 21.14%
-- Flow 1:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 6597.339 ms
Loss rate: 21.14%

Run 3: Report of TCP Cubic — Data Link

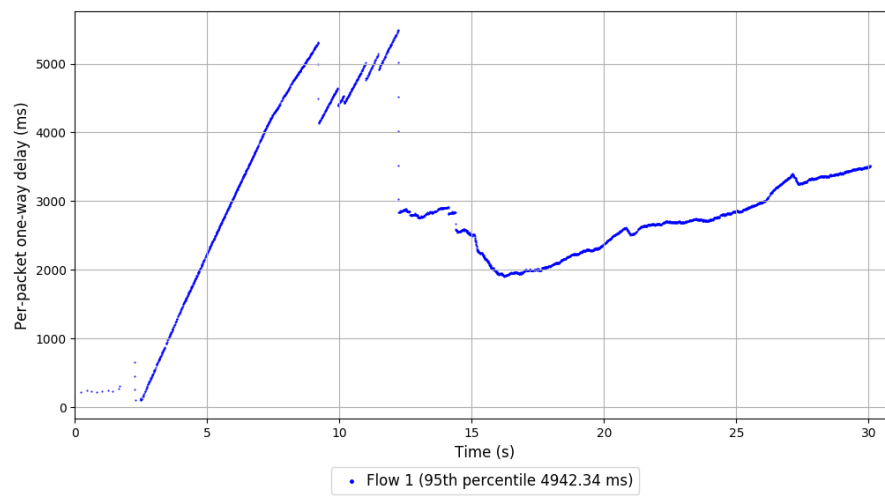
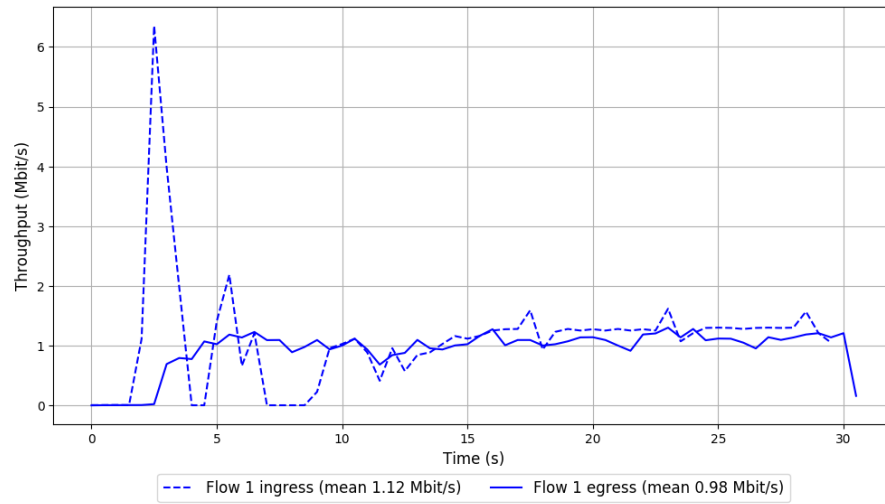


Run 1: Statistics of FillP

Start at: 2018-12-10 20:43:53
End at: 2018-12-10 20:44:23
Local clock offset: -5.625 ms
Remote clock offset: -132.591 ms

Below is generated by plot.py at 2018-12-10 21:41:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 4942.337 ms
Loss rate: 13.19%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 4942.337 ms
Loss rate: 13.19%

Run 1: Report of FillP — Data Link

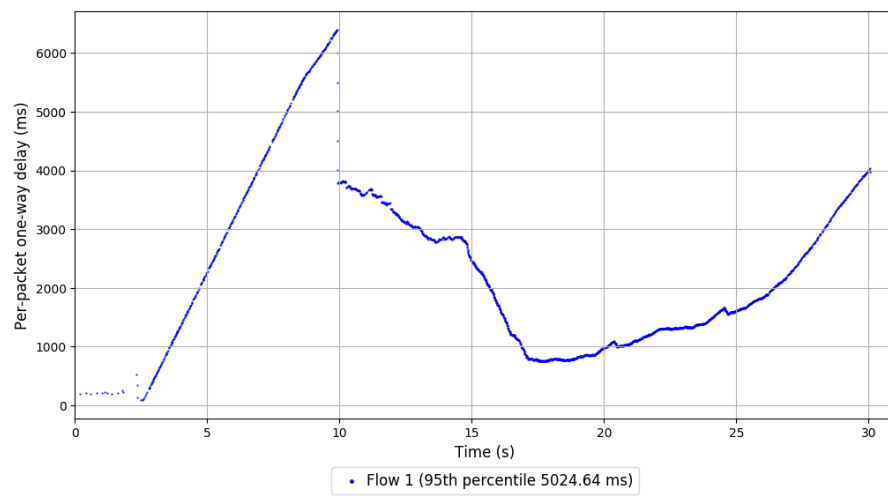
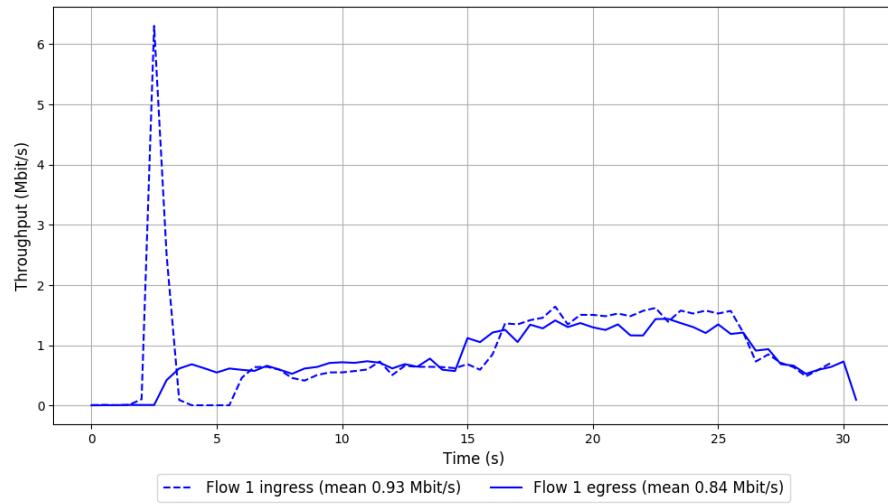


Run 2: Statistics of FillP

Start at: 2018-12-10 21:05:31
End at: 2018-12-10 21:06:01
Local clock offset: -2.112 ms
Remote clock offset: 81.072 ms

Below is generated by plot.py at 2018-12-10 21:41:37
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 5024.641 ms
Loss rate: 10.45%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 5024.641 ms
Loss rate: 10.45%

Run 2: Report of FillP — Data Link

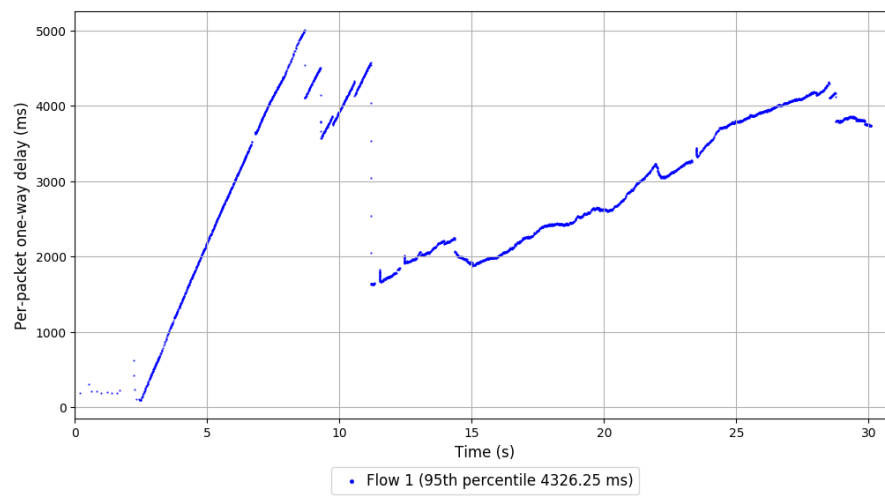
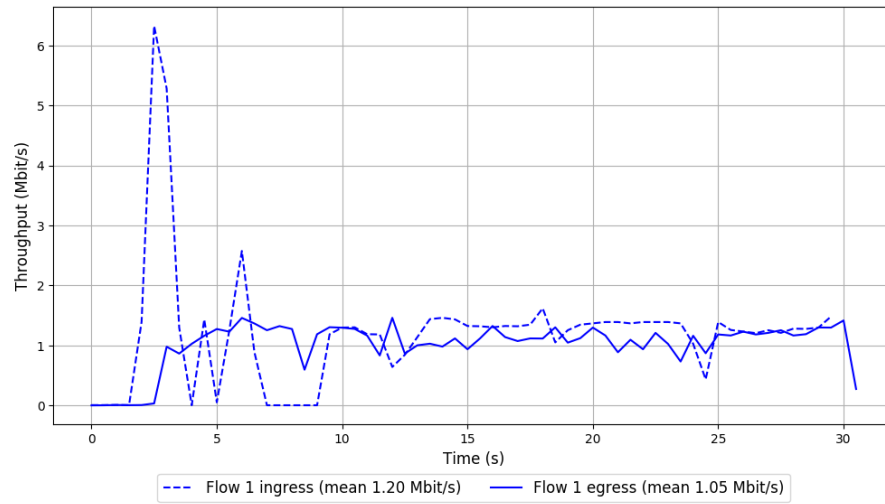


Run 3: Statistics of FillP

Start at: 2018-12-10 21:27:12
End at: 2018-12-10 21:27:42
Local clock offset: 2.145 ms
Remote clock offset: 158.102 ms

Below is generated by plot.py at 2018-12-10 21:41:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 4326.248 ms
Loss rate: 12.97%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 4326.248 ms
Loss rate: 12.97%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2018-12-10 20:56:24

End at: 2018-12-10 20:56:54

Local clock offset: -4.788 ms

Remote clock offset: 44.87 ms

Below is generated by plot.py at 2018-12-10 21:41:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.78 Mbit/s

95th percentile per-packet one-way delay: 4901.322 ms

Loss rate: 6.72%

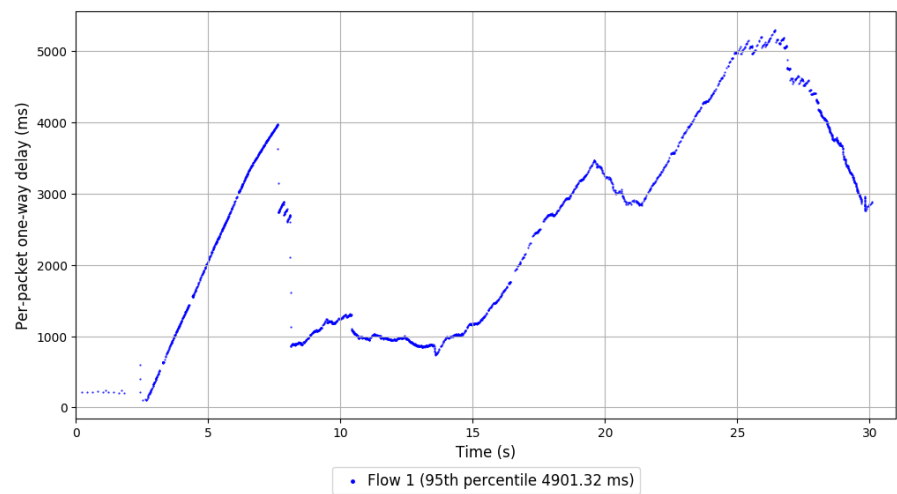
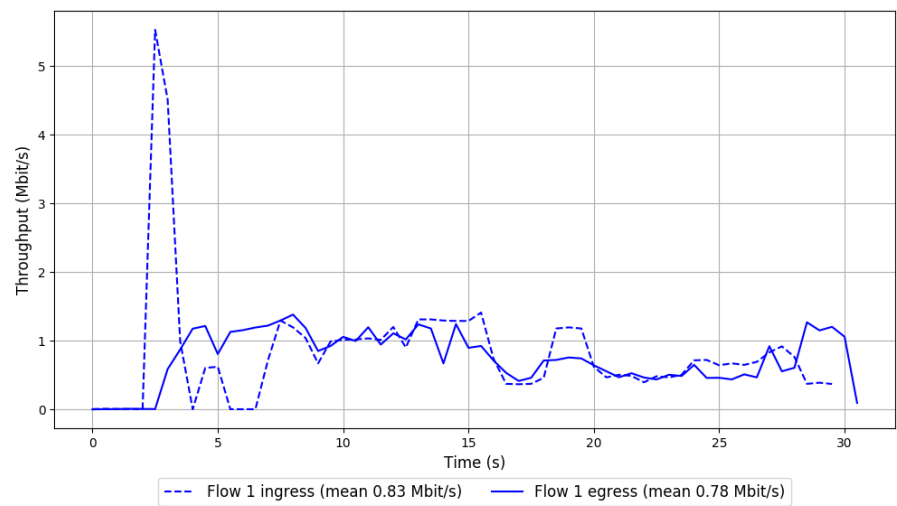
-- Flow 1:

Average throughput: 0.78 Mbit/s

95th percentile per-packet one-way delay: 4901.322 ms

Loss rate: 6.72%

Run 1: Report of FillP-Sheep — Data Link

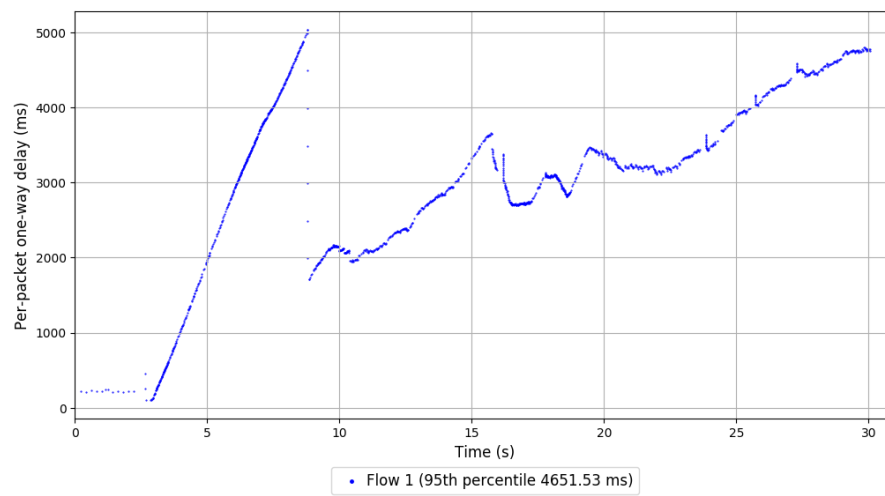
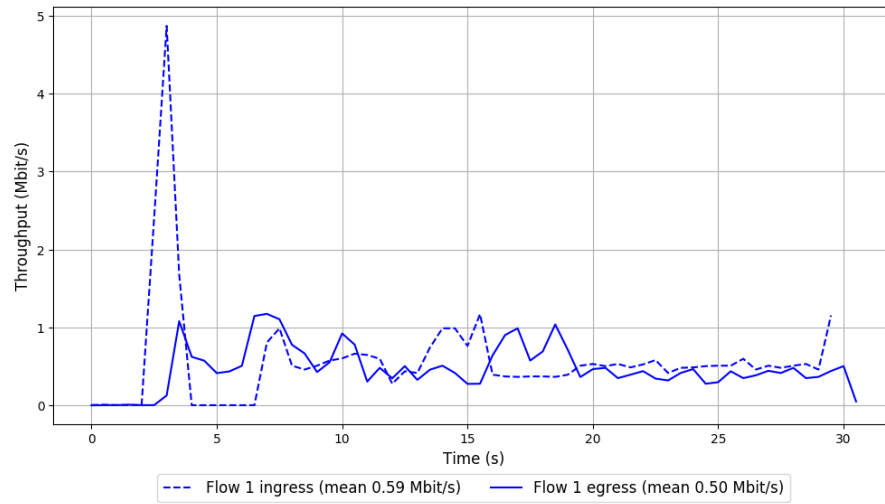


Run 2: Statistics of FillP-Sheep

Start at: 2018-12-10 21:18:04
End at: 2018-12-10 21:18:34
Local clock offset: -0.512 ms
Remote clock offset: 130.314 ms

Below is generated by plot.py at 2018-12-10 21:41:39
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 4651.533 ms
Loss rate: 15.46%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 4651.533 ms
Loss rate: 15.46%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2018-12-10 21:39:45

End at: 2018-12-10 21:40:15

Local clock offset: 3.8 ms

Remote clock offset: 206.54 ms

Below is generated by plot.py at 2018-12-10 21:41:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.28 Mbit/s

95th percentile per-packet one-way delay: 9919.932 ms

Loss rate: 30.76%

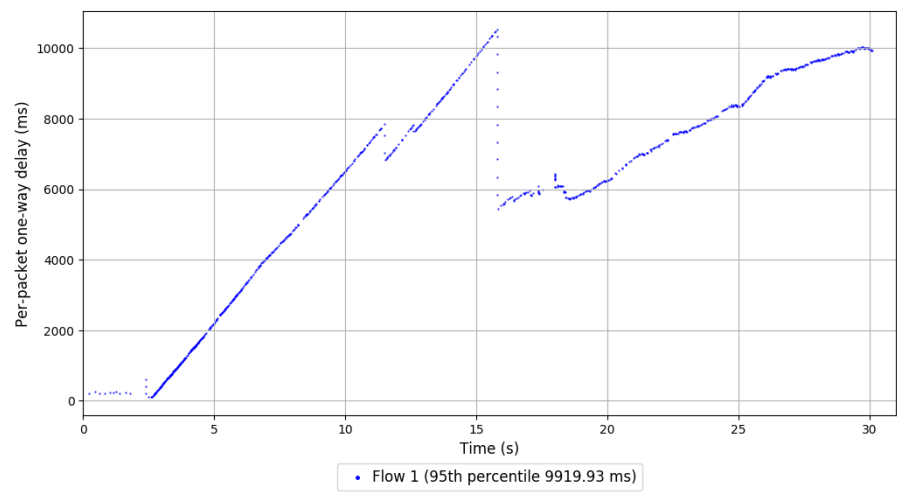
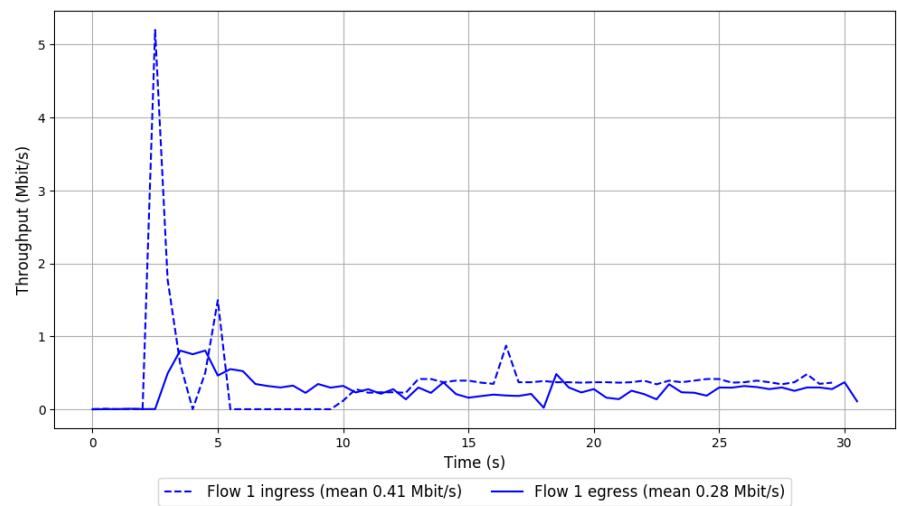
-- Flow 1:

Average throughput: 0.28 Mbit/s

95th percentile per-packet one-way delay: 9919.932 ms

Loss rate: 30.76%

Run 3: Report of FillP-Sheep — Data Link

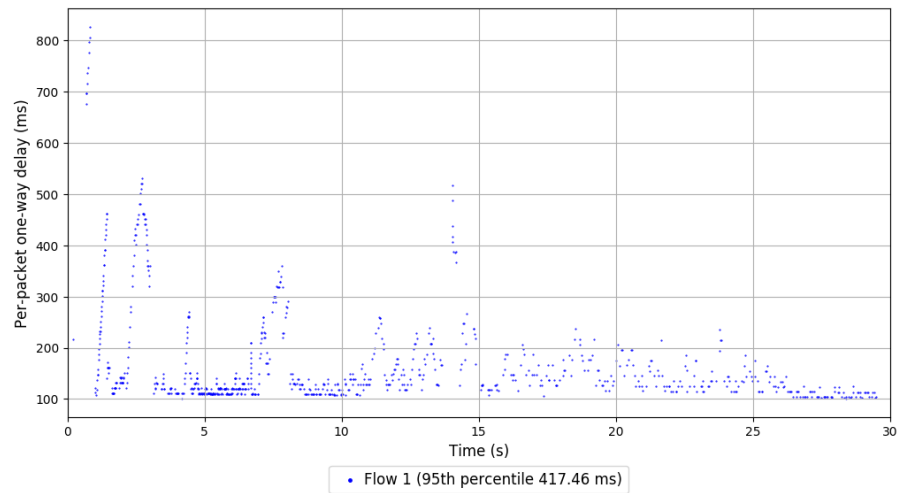
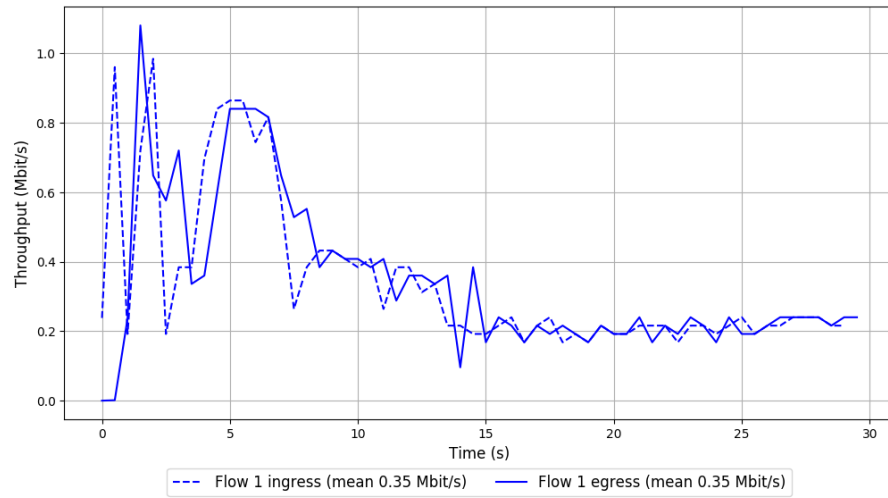


```
Run 1: Statistics of Indigo

Start at: 2018-12-10 20:47:18
End at: 2018-12-10 20:47:48
Local clock offset: -5.695 ms
Remote clock offset: -49.334 ms

# Below is generated by plot.py at 2018-12-10 21:41:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 417.462 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 417.462 ms
Loss rate: 0.00%
```

Run 1: Report of Indigo — Data Link

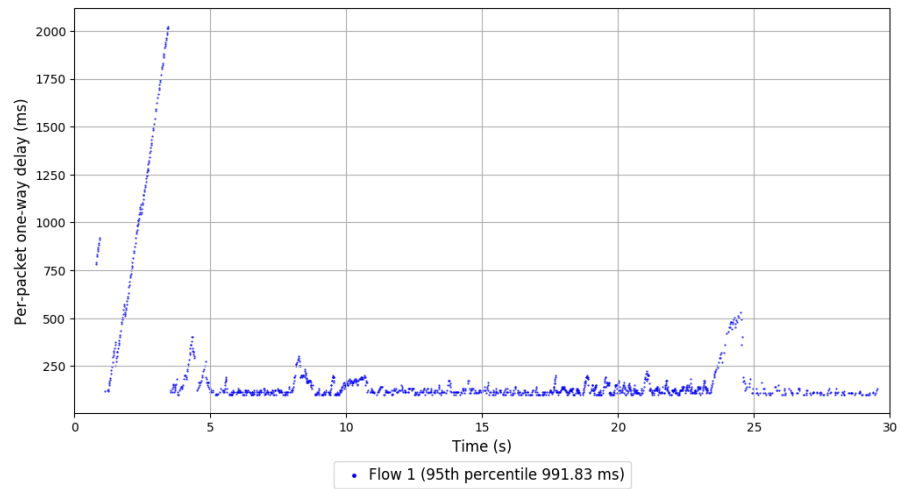
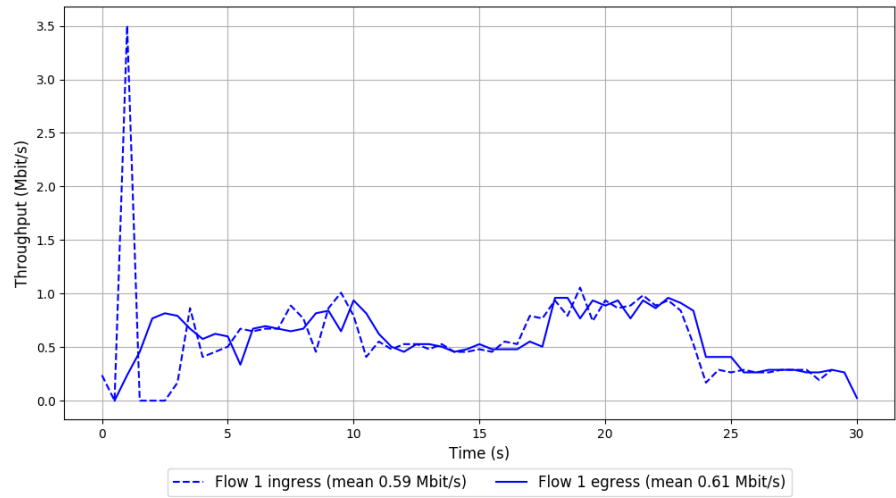


Run 2: Statistics of Indigo

Start at: 2018-12-10 21:08:56
End at: 2018-12-10 21:09:26
Local clock offset: -1.439 ms
Remote clock offset: 93.944 ms

Below is generated by plot.py at 2018-12-10 21:41:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 991.834 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 991.834 ms
Loss rate: 0.00%

Run 2: Report of Indigo — Data Link

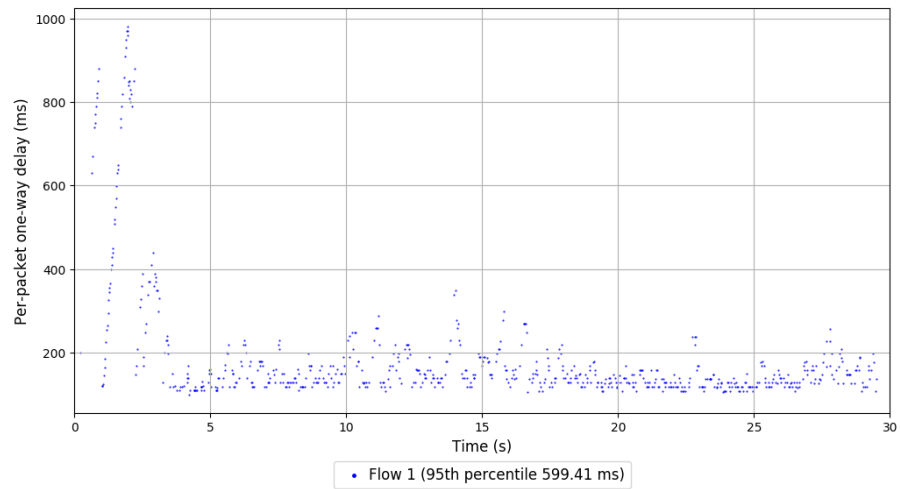
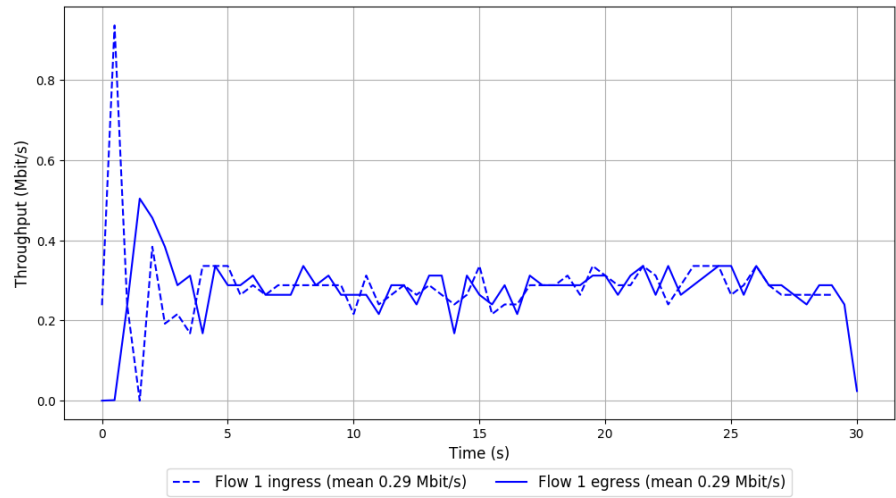


Run 3: Statistics of Indigo

Start at: 2018-12-10 21:30:37
End at: 2018-12-10 21:31:07
Local clock offset: 2.901 ms
Remote clock offset: 171.537 ms

Below is generated by plot.py at 2018-12-10 21:41:40
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 599.409 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 599.409 ms
Loss rate: 0.28%

Run 3: Report of Indigo — Data Link

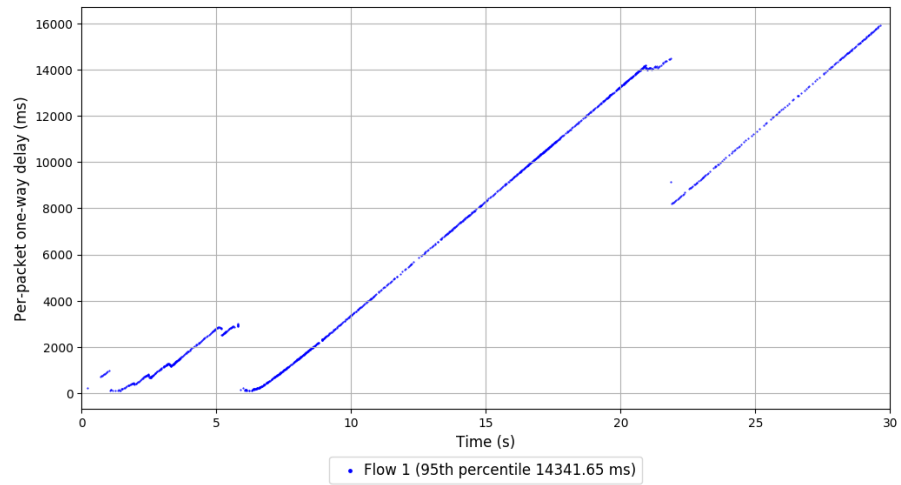
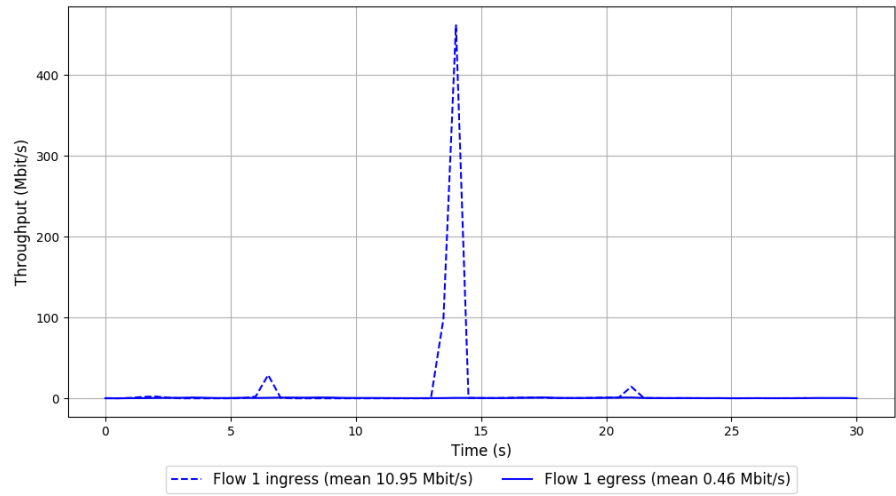


Run 1: Statistics of Indigo-96d2da3

Start at: 2018-12-10 20:49:34
End at: 2018-12-10 20:50:04
Local clock offset: -5.646 ms
Remote clock offset: -7.984 ms

Below is generated by plot.py at 2018-12-10 21:41:46
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 14341.648 ms
Loss rate: 95.61%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 14341.648 ms
Loss rate: 95.61%

Run 1: Report of Indigo-96d2da3 — Data Link

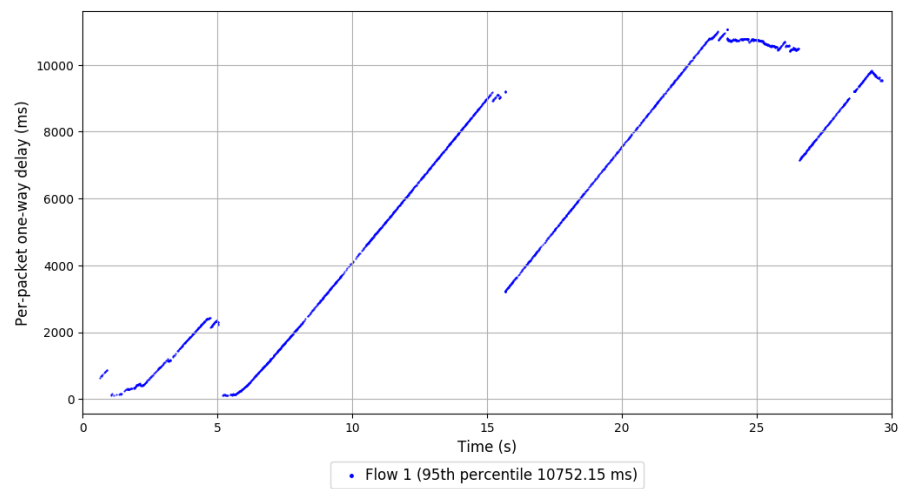
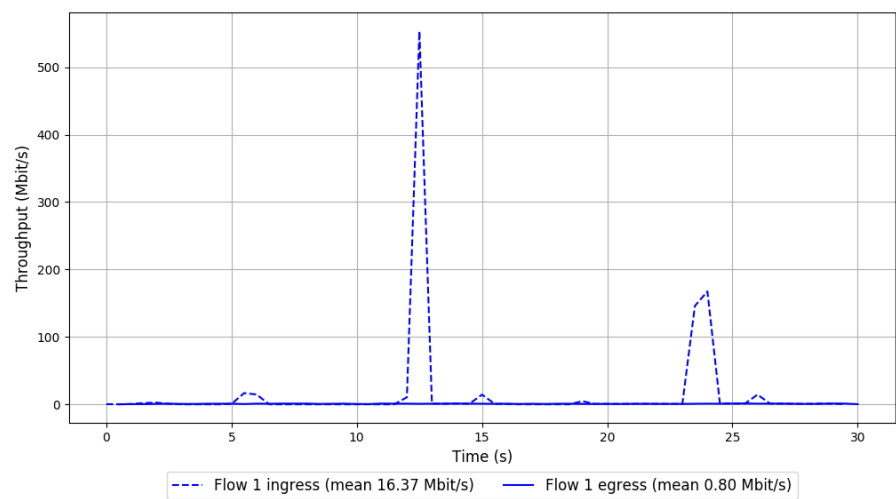


Run 2: Statistics of Indigo-96d2da3

Start at: 2018-12-10 21:11:13
End at: 2018-12-10 21:11:43
Local clock offset: -1.894 ms
Remote clock offset: 107.359 ms

Below is generated by plot.py at 2018-12-10 21:41:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 10752.151 ms
Loss rate: 95.21%
-- Flow 1:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 10752.151 ms
Loss rate: 95.21%

Run 2: Report of Indigo-96d2da3 — Data Link



Run 3: Statistics of Indigo-96d2da3

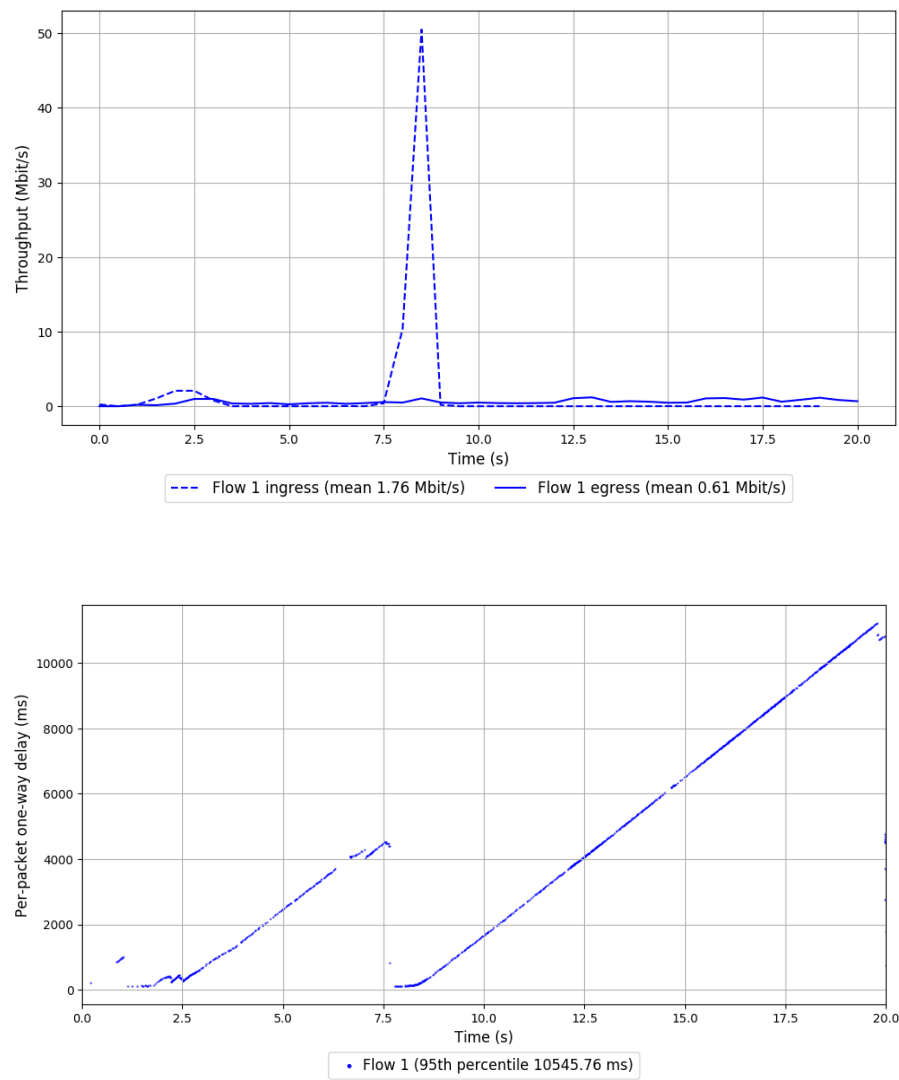
Start at: 2018-12-10 21:32:53

End at: 2018-12-10 21:33:23

Local clock offset: 3.337 ms

Remote clock offset: 182.943 ms

Run 3: Report of Indigo-96d2da3 — Data Link

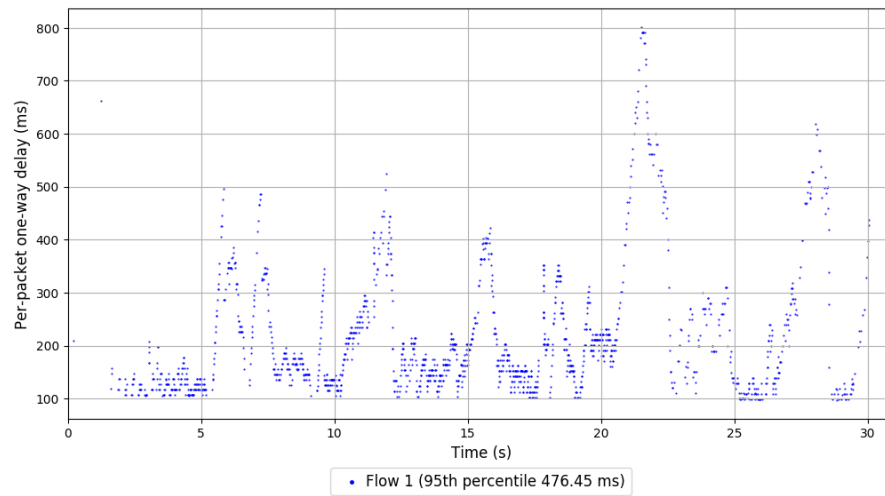
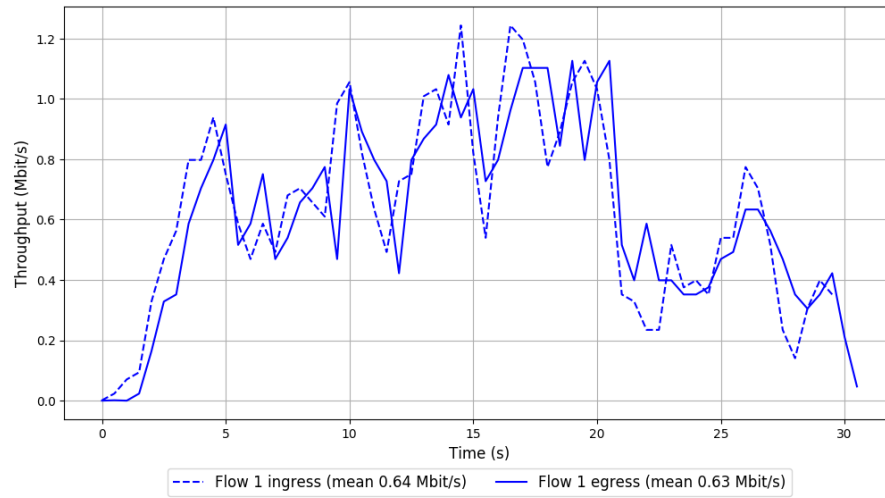


Run 1: Statistics of LEDBAT

Start at: 2018-12-10 20:46:09
End at: 2018-12-10 20:46:39
Local clock offset: -5.716 ms
Remote clock offset: -75.226 ms

Below is generated by plot.py at 2018-12-10 21:41:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 476.446 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 0.63 Mbit/s
95th percentile per-packet one-way delay: 476.446 ms
Loss rate: 0.37%

Run 1: Report of LEDBAT — Data Link

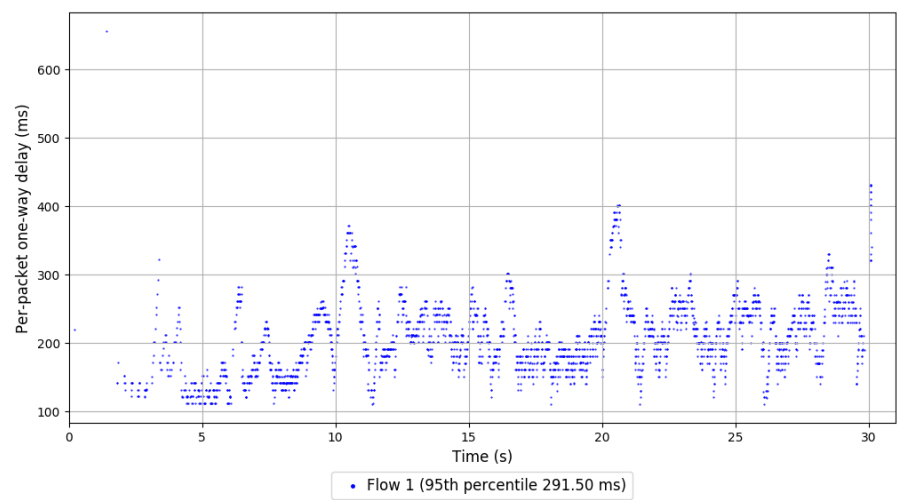
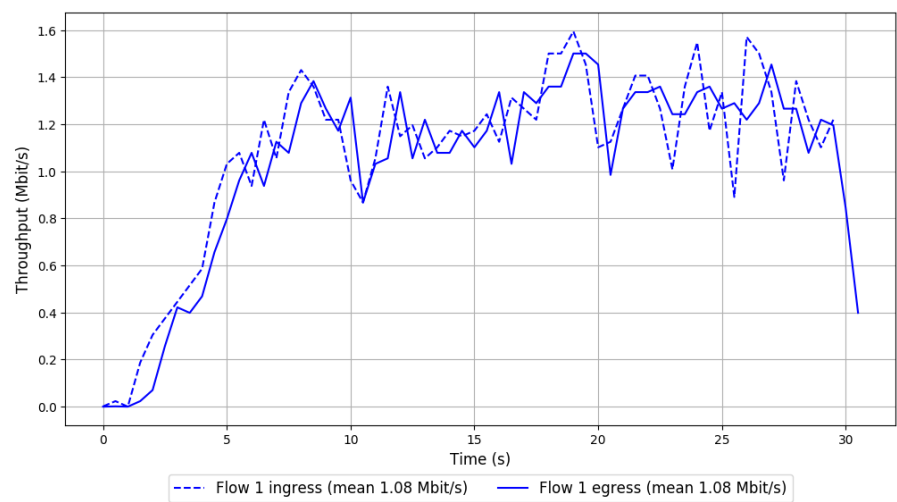


Run 2: Statistics of LEDBAT

Start at: 2018-12-10 21:07:48
End at: 2018-12-10 21:08:18
Local clock offset: -1.682 ms
Remote clock offset: 92.787 ms

Below is generated by plot.py at 2018-12-10 21:41:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 291.498 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 1.08 Mbit/s
95th percentile per-packet one-way delay: 291.498 ms
Loss rate: 0.83%

Run 2: Report of LEDBAT — Data Link

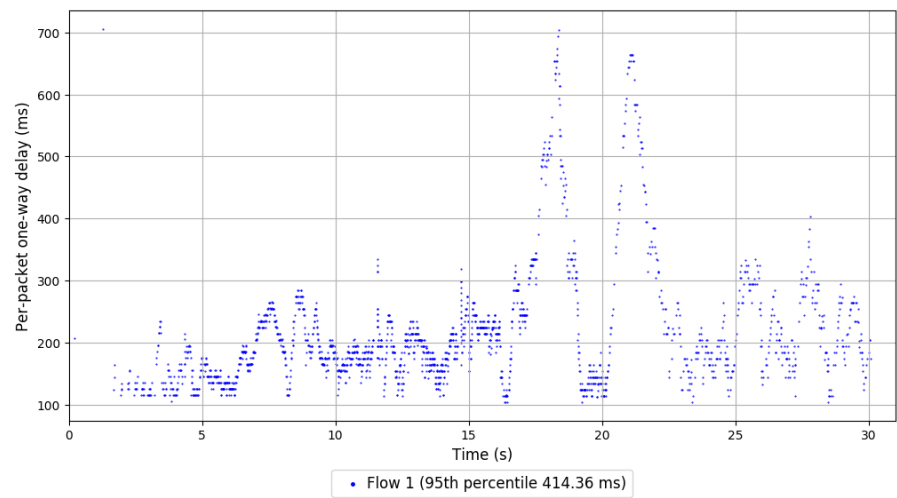
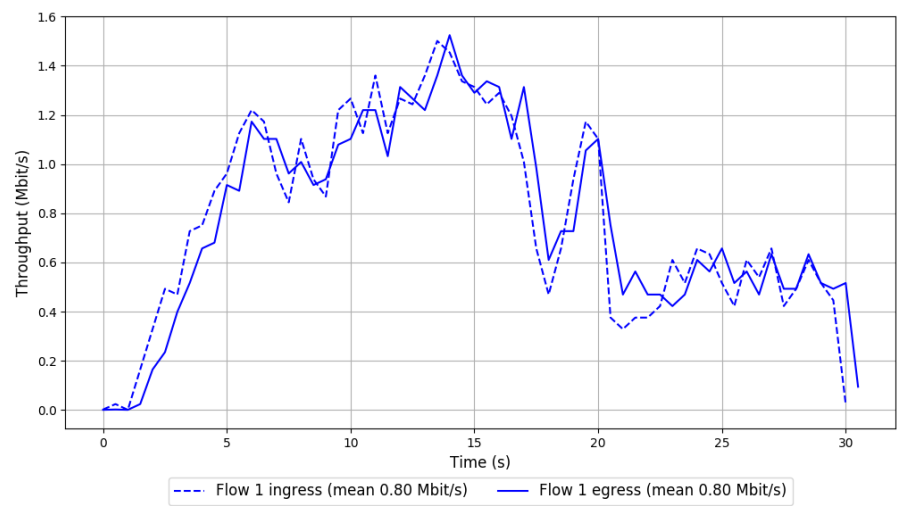


Run 3: Statistics of LEDBAT

Start at: 2018-12-10 21:29:28
End at: 2018-12-10 21:29:58
Local clock offset: 2.66 ms
Remote clock offset: 167.65 ms

Below is generated by plot.py at 2018-12-10 21:41:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 414.358 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 414.358 ms
Loss rate: 0.20%

Run 3: Report of LEDBAT — Data Link

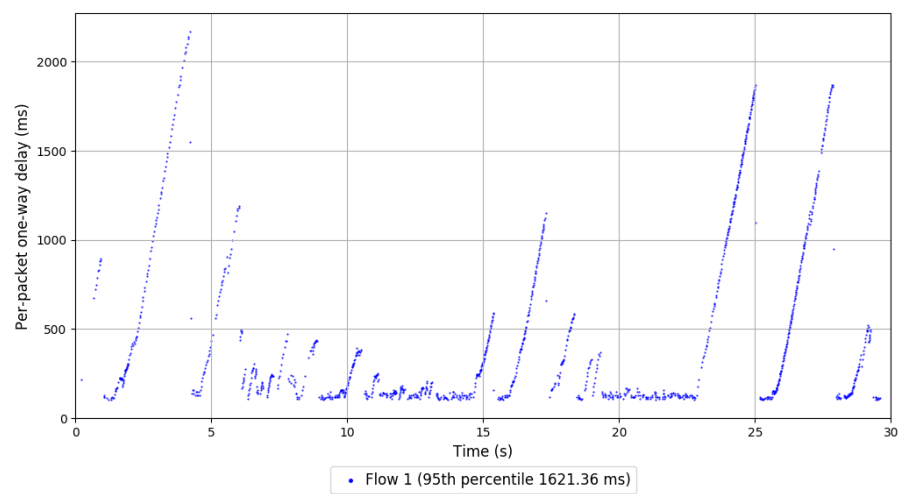
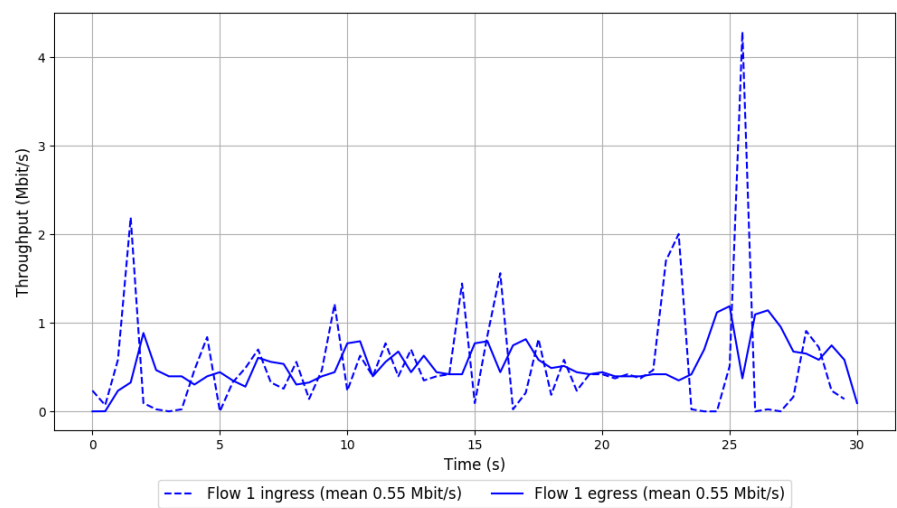


```
Run 1: Statistics of Indigo-Muses

Start at: 2018-12-10 20:38:11
End at: 2018-12-10 20:38:41
Local clock offset: -6.523 ms
Remote clock offset: -150.66 ms

# Below is generated by plot.py at 2018-12-10 21:41:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 1621.361 ms
Loss rate: 0.43%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 1621.361 ms
Loss rate: 0.43%
```

Run 1: Report of Indigo-Muses — Data Link

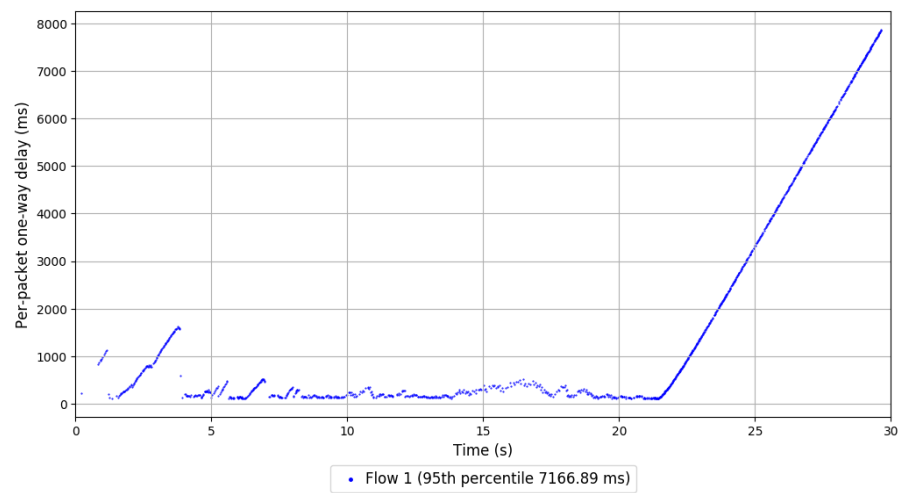
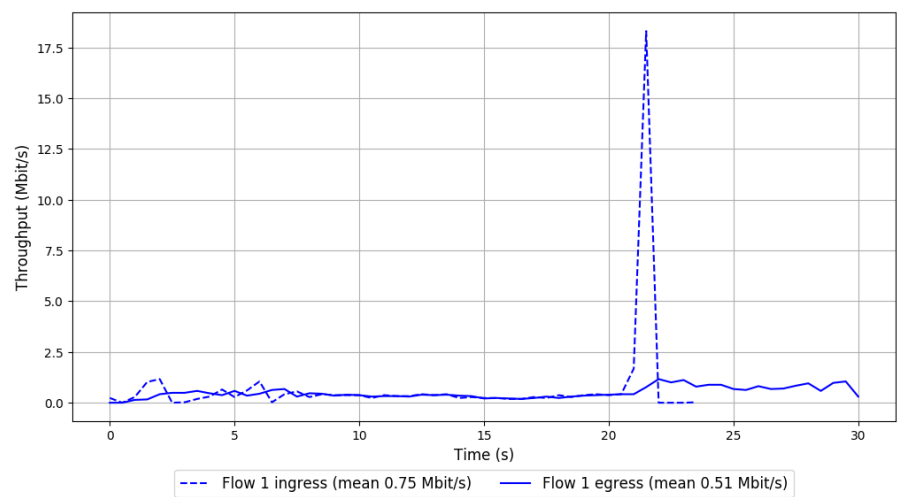


Run 2: Statistics of Indigo-Muses

Start at: 2018-12-10 20:59:49
End at: 2018-12-10 21:00:19
Local clock offset: -4.107 ms
Remote clock offset: 56.962 ms

Below is generated by plot.py at 2018-12-10 21:41:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 7166.888 ms
Loss rate: 15.02%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 7166.888 ms
Loss rate: 15.02%

Run 2: Report of Indigo-Muses — Data Link

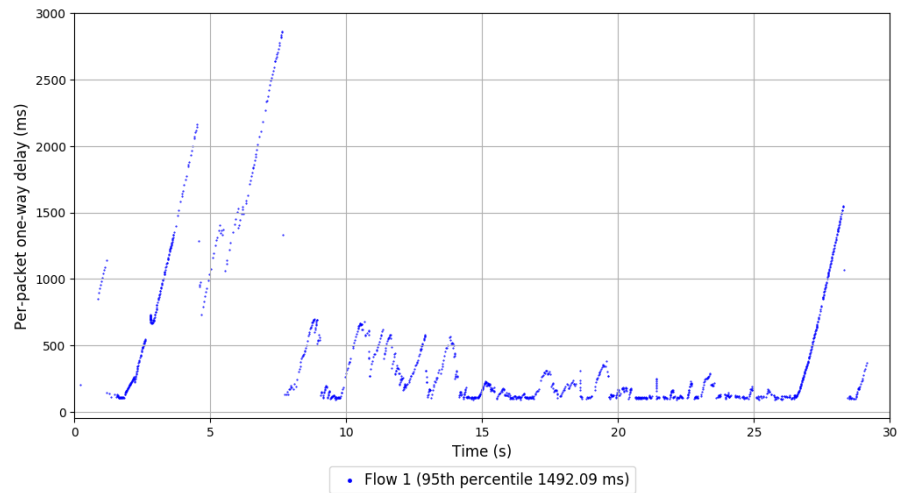
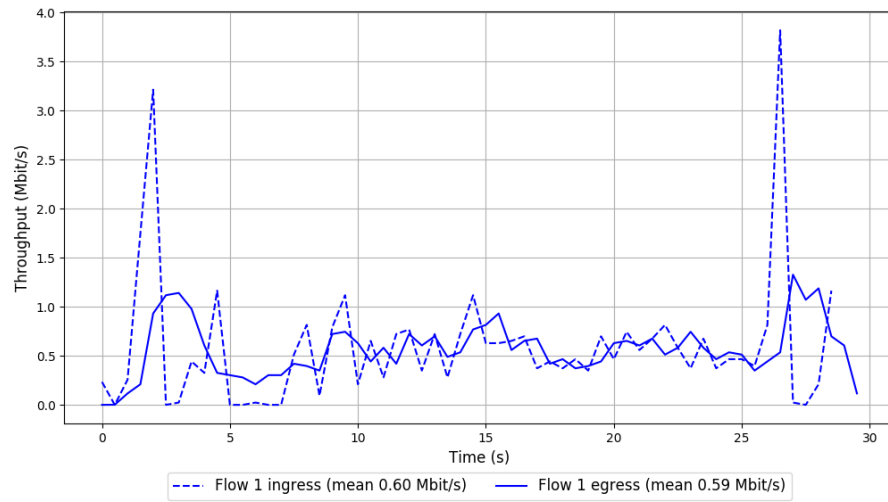


Run 3: Statistics of Indigo-Muses

Start at: 2018-12-10 21:21:28
End at: 2018-12-10 21:21:58
Local clock offset: 0.134 ms
Remote clock offset: 137.638 ms

Below is generated by plot.py at 2018-12-10 21:41:51
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1492.094 ms
Loss rate: 1.75%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1492.094 ms
Loss rate: 1.75%

Run 3: Report of Indigo-Muses — Data Link

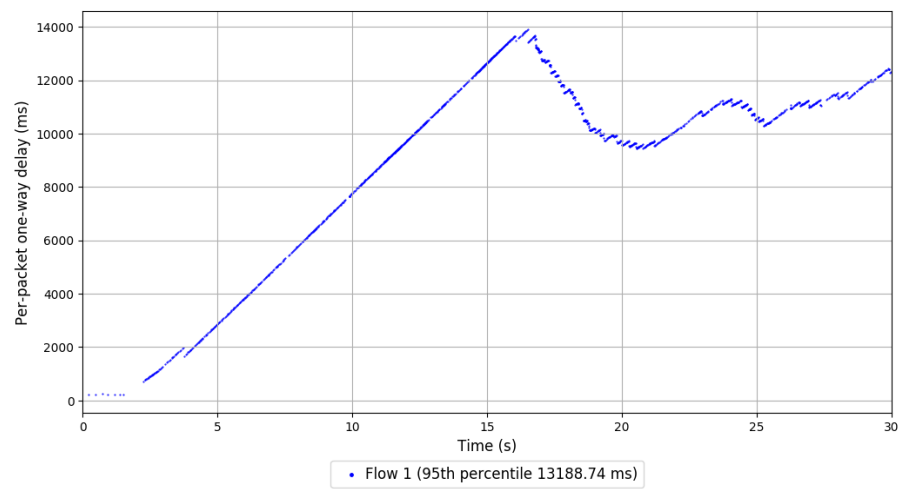
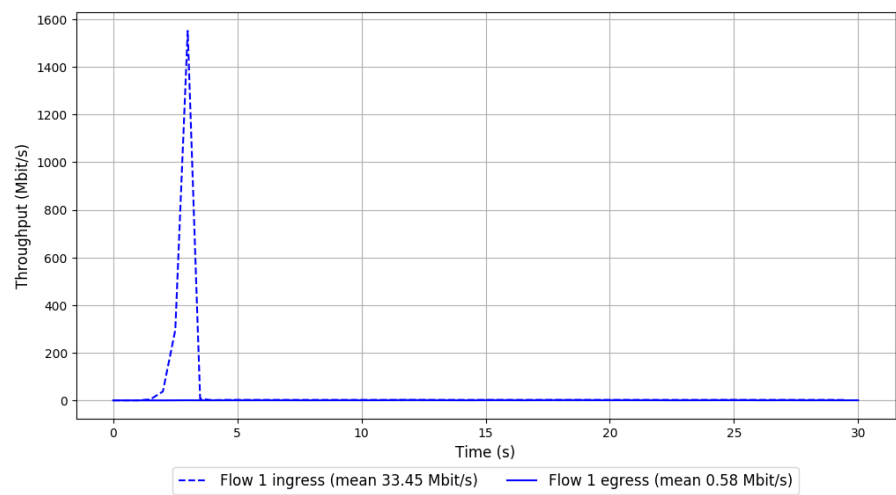


Run 1: Statistics of PCC-Allegro

Start at: 2018-12-10 20:40:28
End at: 2018-12-10 20:40:58
Local clock offset: -6.244 ms
Remote clock offset: -154.459 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 13188.737 ms
Loss rate: 98.26%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 13188.737 ms
Loss rate: 98.26%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2018-12-10 21:02:06

End at: 2018-12-10 21:02:36

Local clock offset: -3.676 ms

Remote clock offset: 70.509 ms

Below is generated by plot.py at 2018-12-10 21:42:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.90 Mbit/s

95th percentile per-packet one-way delay: 8169.741 ms

Loss rate: 63.31%

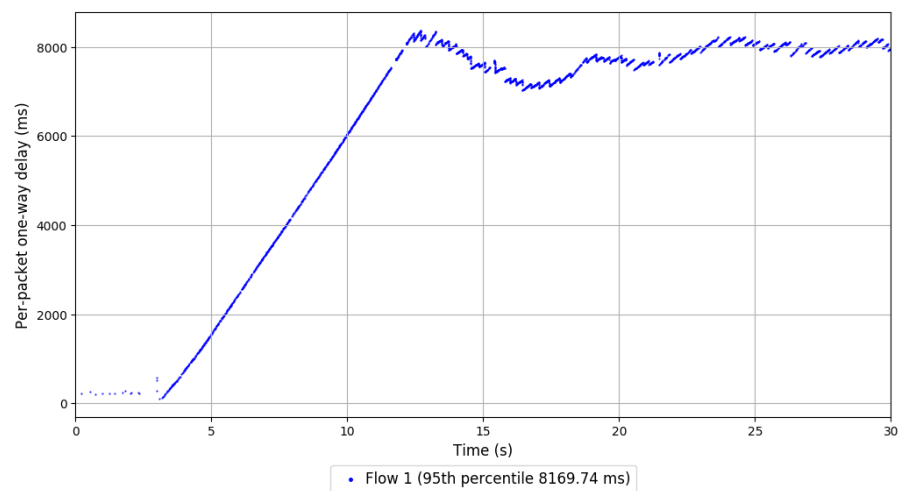
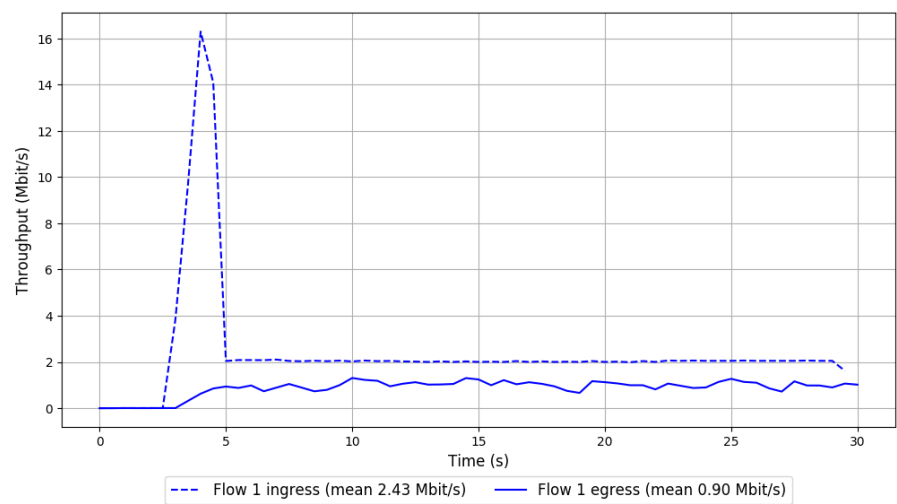
-- Flow 1:

Average throughput: 0.90 Mbit/s

95th percentile per-packet one-way delay: 8169.741 ms

Loss rate: 63.31%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2018-12-10 21:23:47

End at: 2018-12-10 21:24:17

Local clock offset: 1.537 ms

Remote clock offset: 147.274 ms

Below is generated by plot.py at 2018-12-10 21:42:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 280.172 ms

Loss rate: 0.00%

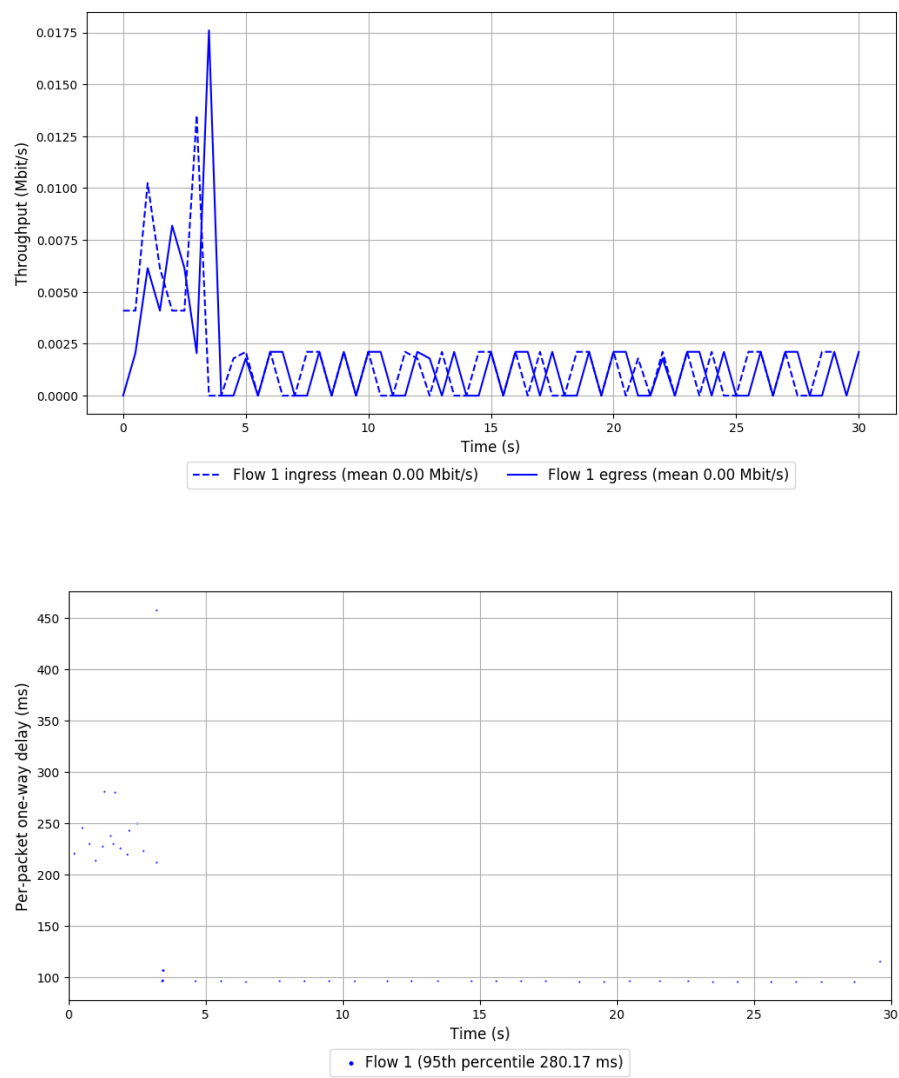
-- Flow 1:

Average throughput: 0.00 Mbit/s

95th percentile per-packet one-way delay: 280.172 ms

Loss rate: 0.00%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

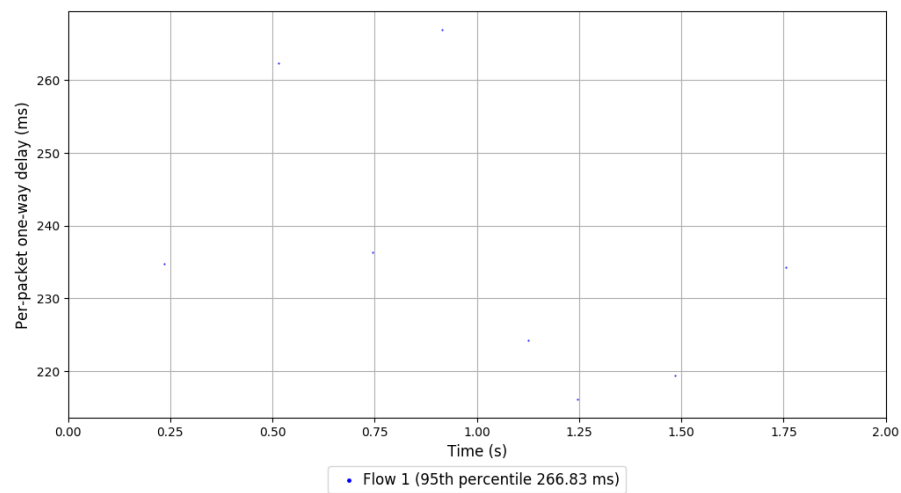
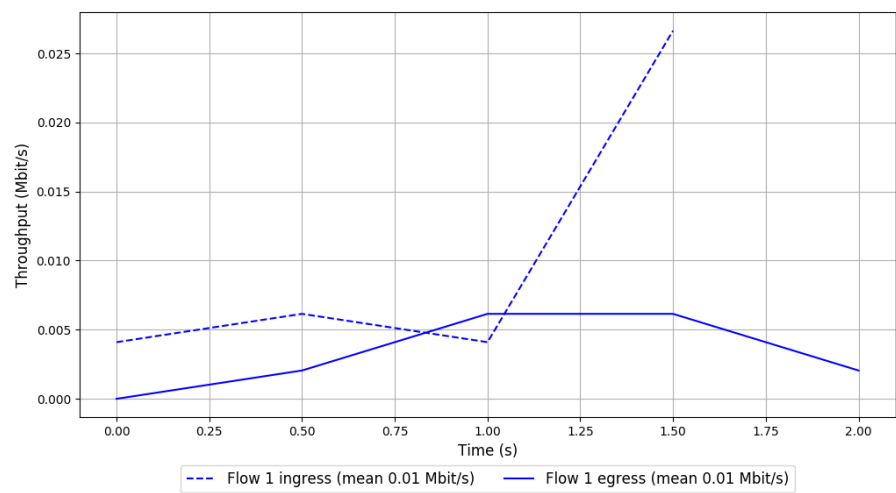
Start at: 2018-12-10 20:42:45

End at: 2018-12-10 20:43:15

Local clock offset: -4.994 ms

Remote clock offset: -158.068 ms

Run 1: Report of PCC-Expr — Data Link

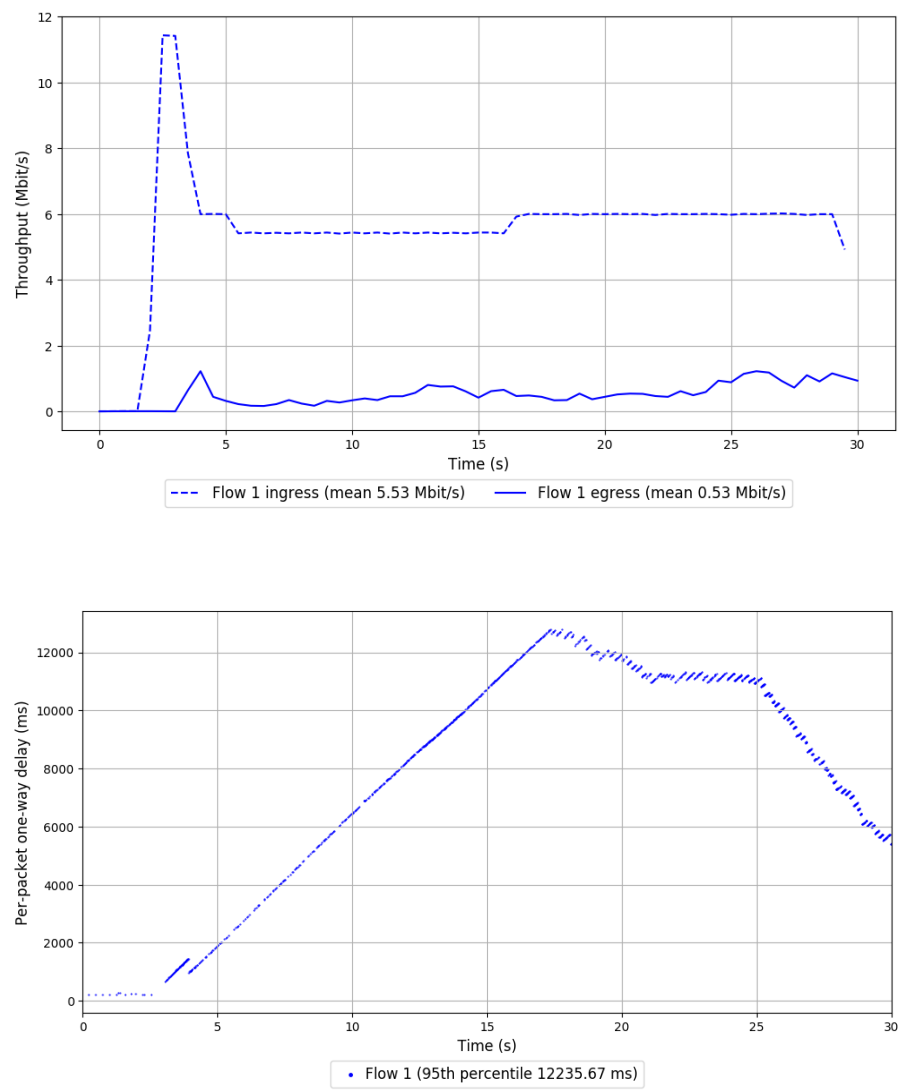


Run 2: Statistics of PCC-Expr

Start at: 2018-12-10 21:04:22
End at: 2018-12-10 21:04:52
Local clock offset: -3.201 ms
Remote clock offset: 80.923 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 12235.667 ms
Loss rate: 90.42%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 12235.667 ms
Loss rate: 90.42%

Run 2: Report of PCC-Expr — Data Link

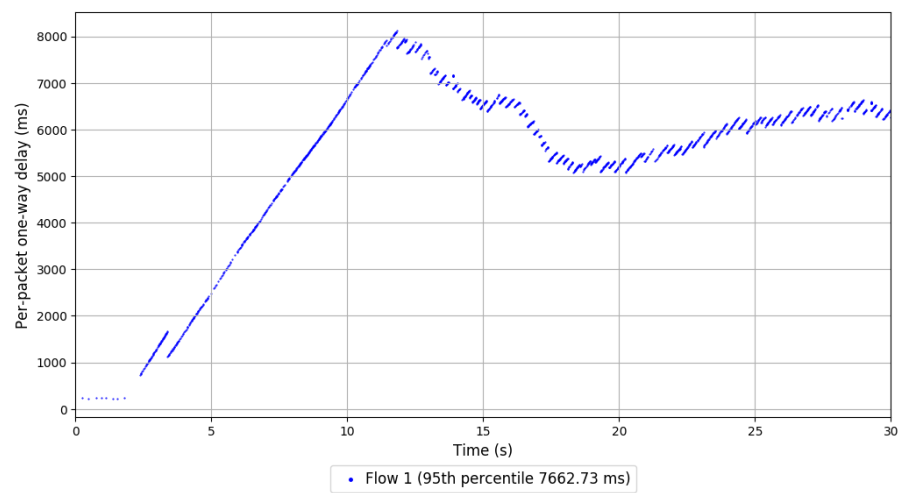
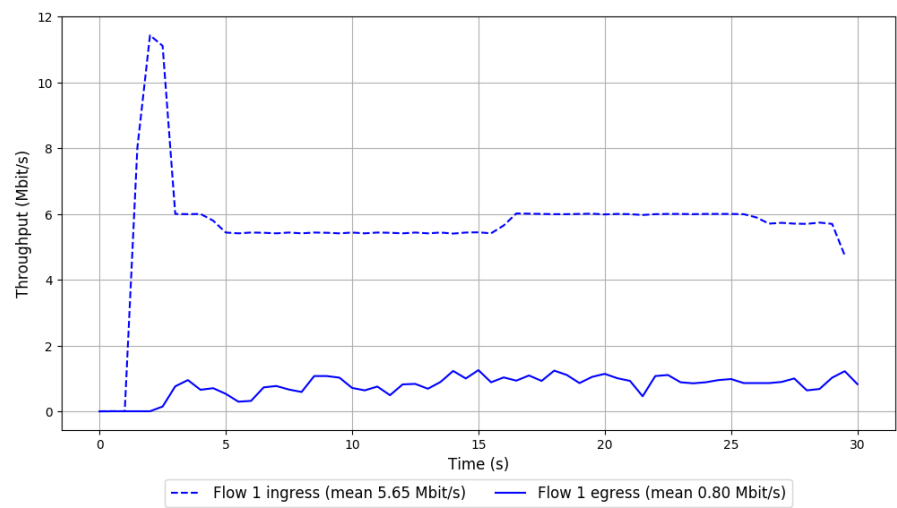


Run 3: Statistics of PCC-Expr

Start at: 2018-12-10 21:26:04
End at: 2018-12-10 21:26:34
Local clock offset: 1.008 ms
Remote clock offset: 159.135 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 7662.734 ms
Loss rate: 85.83%
-- Flow 1:
Average throughput: 0.80 Mbit/s
95th percentile per-packet one-way delay: 7662.734 ms
Loss rate: 85.83%

Run 3: Report of PCC-Expr — Data Link

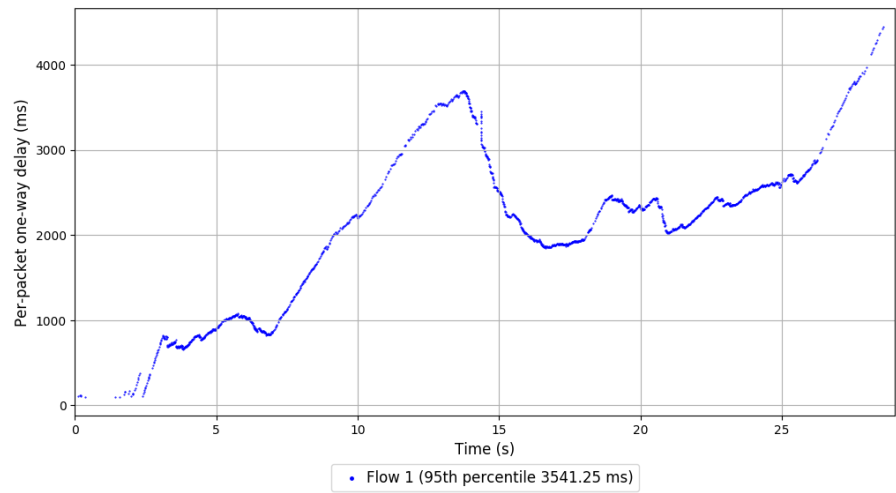
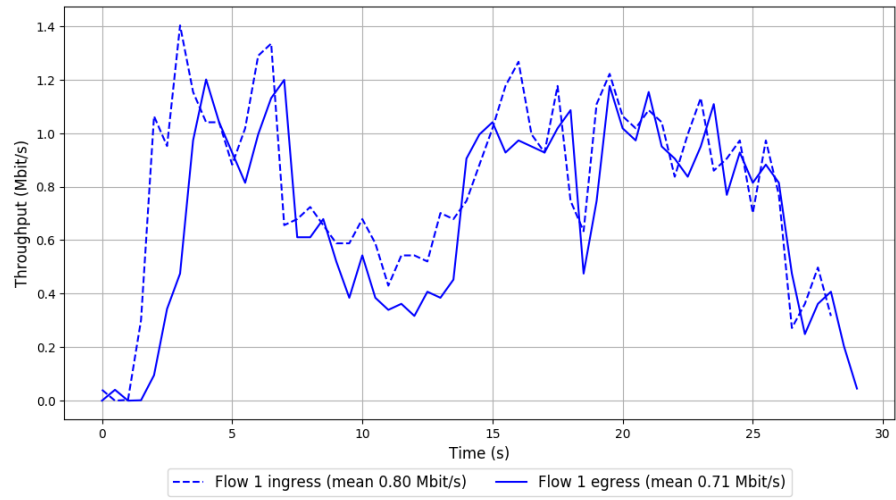


Run 1: Statistics of QUIC Cubic

Start at: 2018-12-10 20:48:26
End at: 2018-12-10 20:48:56
Local clock offset: -4.878 ms
Remote clock offset: -29.669 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 3541.253 ms
Loss rate: 12.00%
-- Flow 1:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 3541.253 ms
Loss rate: 12.00%

Run 1: Report of QUIC Cubic — Data Link

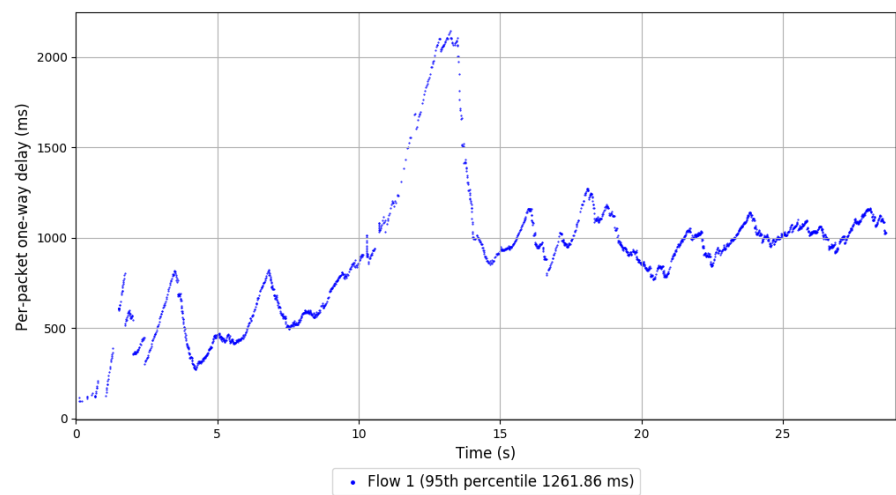
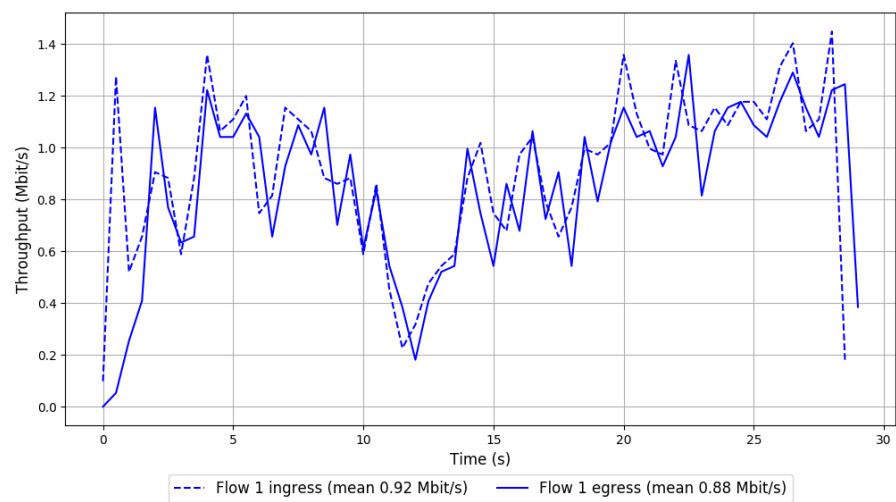


Run 2: Statistics of QUIC Cubic

Start at: 2018-12-10 21:10:05
End at: 2018-12-10 21:10:35
Local clock offset: -2.135 ms
Remote clock offset: 98.214 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 1261.858 ms
Loss rate: 4.84%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 1261.858 ms
Loss rate: 4.84%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2018-12-10 21:31:45

End at: 2018-12-10 21:32:15

Local clock offset: 2.209 ms

Remote clock offset: 179.03 ms

Below is generated by plot.py at 2018-12-10 21:42:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 5733.650 ms

Loss rate: 15.44%

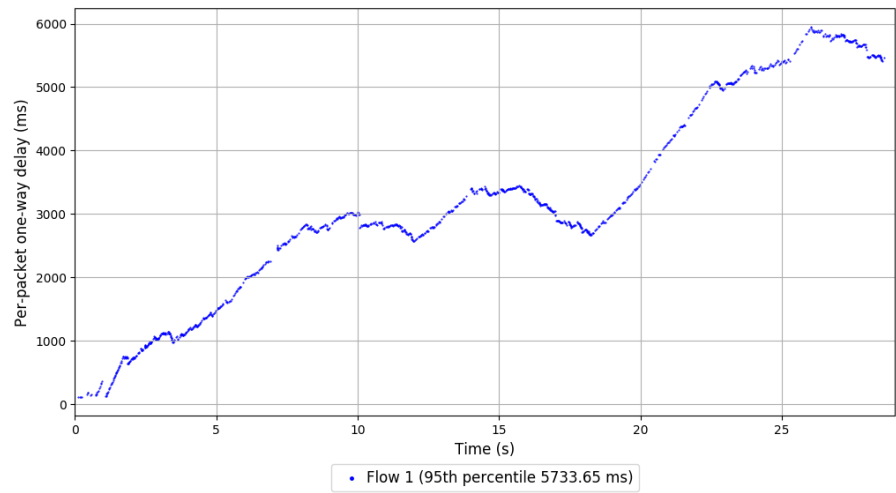
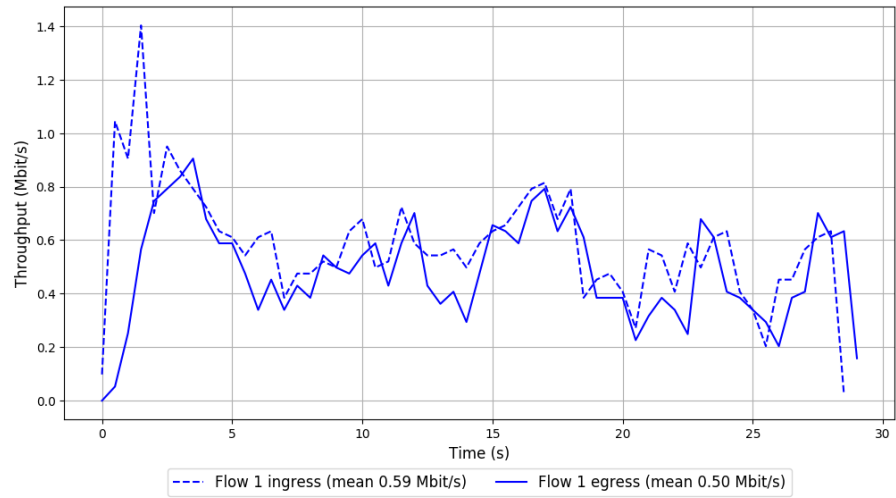
-- Flow 1:

Average throughput: 0.50 Mbit/s

95th percentile per-packet one-way delay: 5733.650 ms

Loss rate: 15.44%

Run 3: Report of QUIC Cubic — Data Link

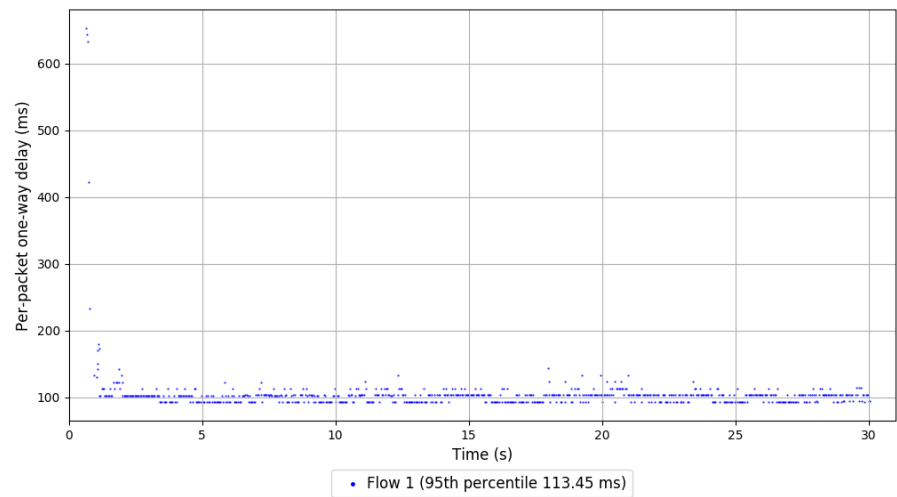
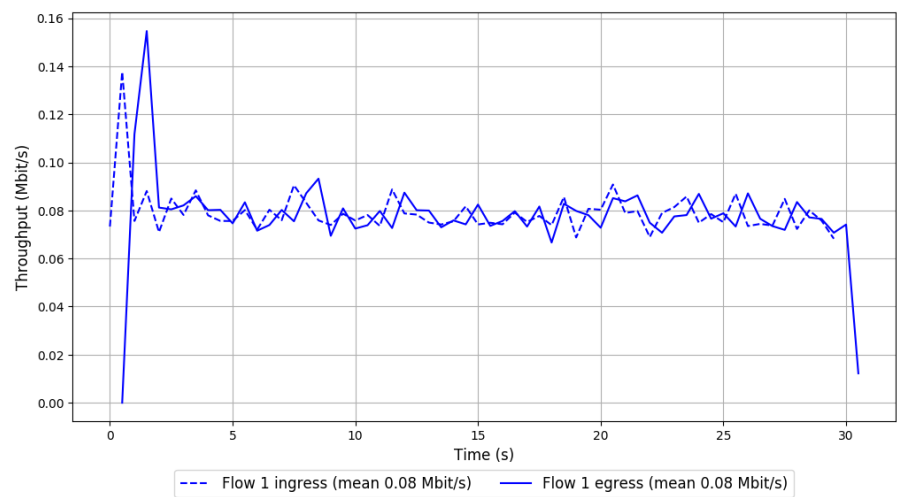


Run 1: Statistics of SCReAM

Start at: 2018-12-10 20:39:19
End at: 2018-12-10 20:39:49
Local clock offset: -5.533 ms
Remote clock offset: -152.212 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 113.448 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 113.448 ms
Loss rate: 0.13%

Run 1: Report of SReAM — Data Link

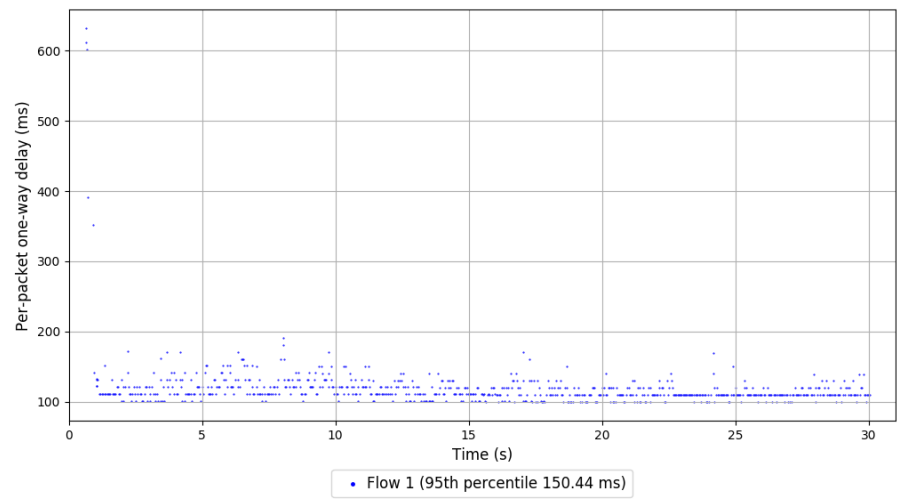
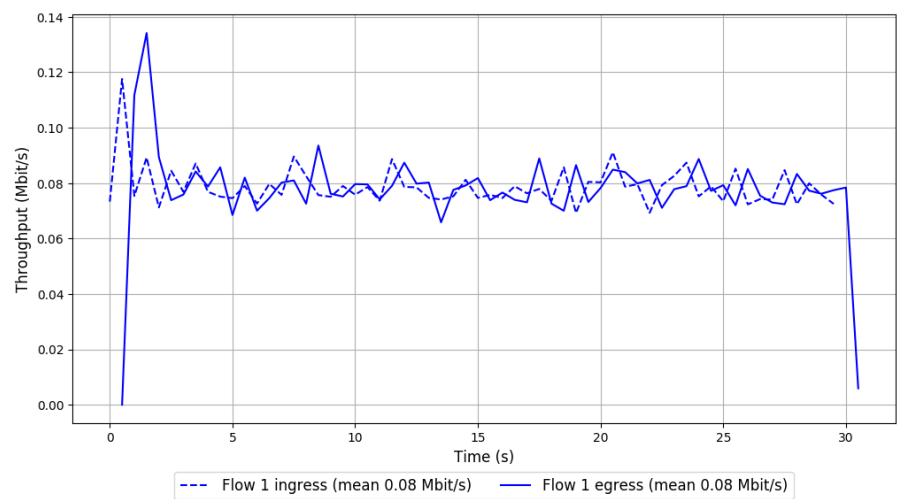


Run 2: Statistics of SCReAM

Start at: 2018-12-10 21:00:57
End at: 2018-12-10 21:01:27
Local clock offset: -3.91 ms
Remote clock offset: 67.248 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 150.437 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 150.437 ms
Loss rate: 0.13%

Run 2: Report of SReAM — Data Link

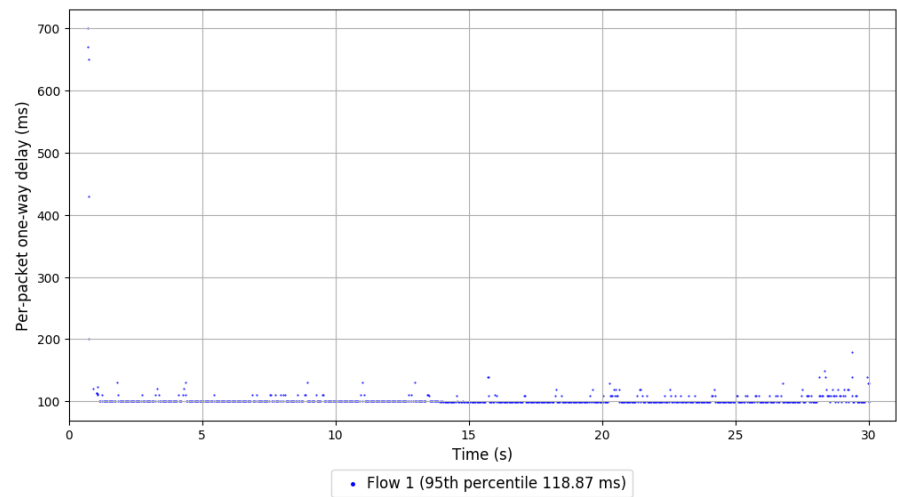
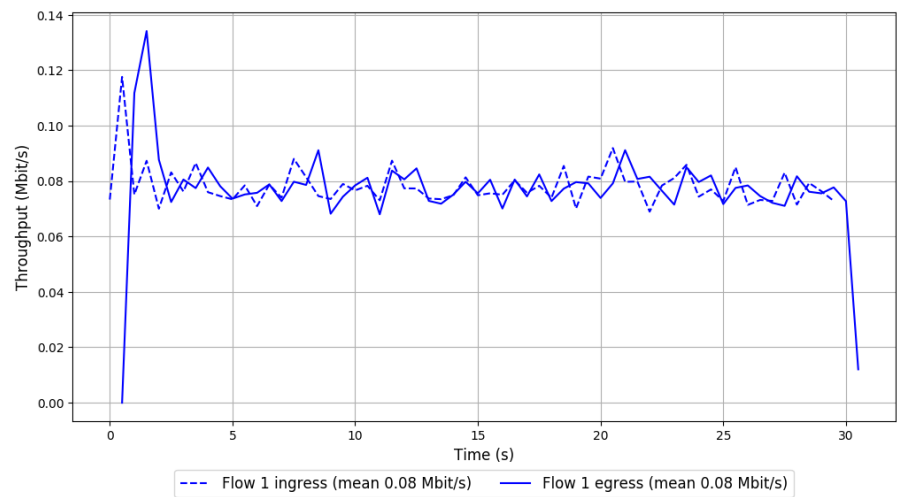


Run 3: Statistics of SCReAM

Start at: 2018-12-10 21:22:38
End at: 2018-12-10 21:23:08
Local clock offset: 1.257 ms
Remote clock offset: 147.658 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 118.874 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 118.874 ms
Loss rate: 0.13%

Run 3: Report of SReAM — Data Link

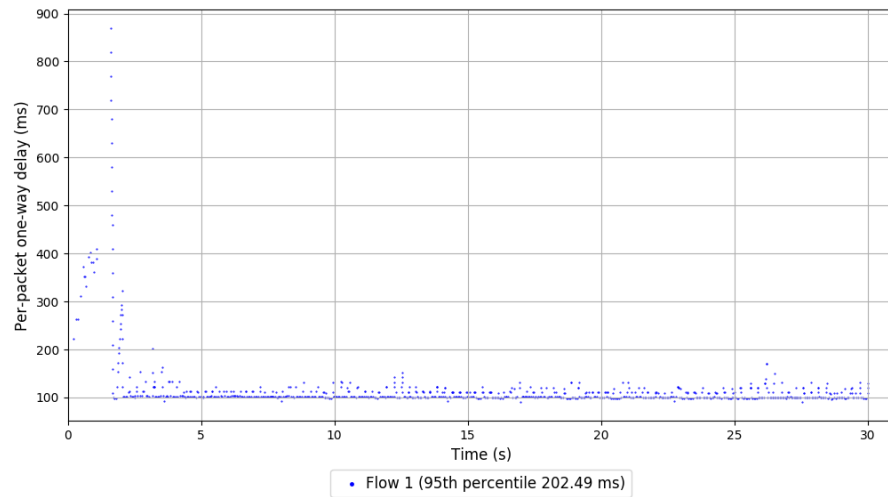
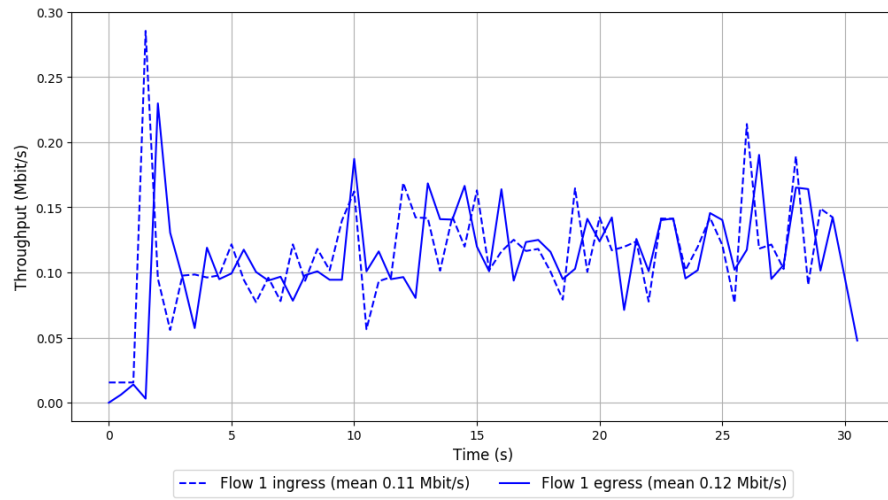


Run 1: Statistics of Sprout

Start at: 2018-12-10 20:54:08
End at: 2018-12-10 20:54:38
Local clock offset: -4.197 ms
Remote clock offset: 28.444 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 202.486 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 202.486 ms
Loss rate: 0.34%

Run 1: Report of Sprout — Data Link

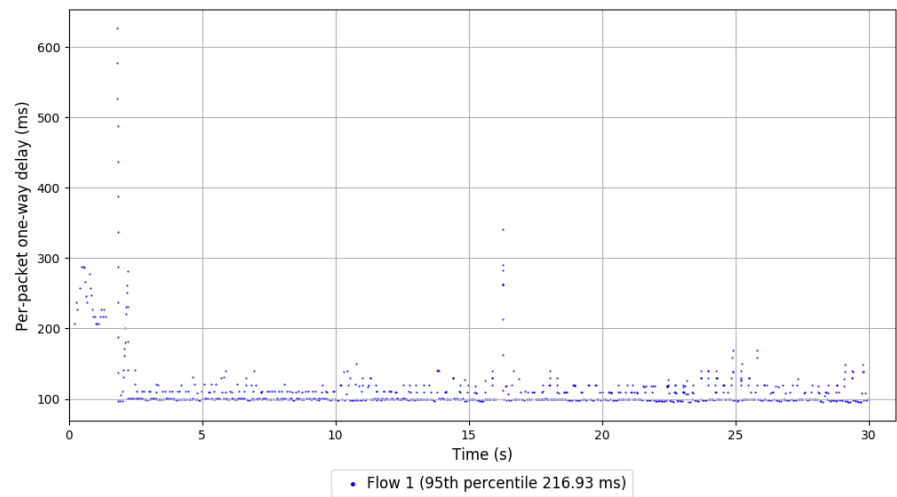
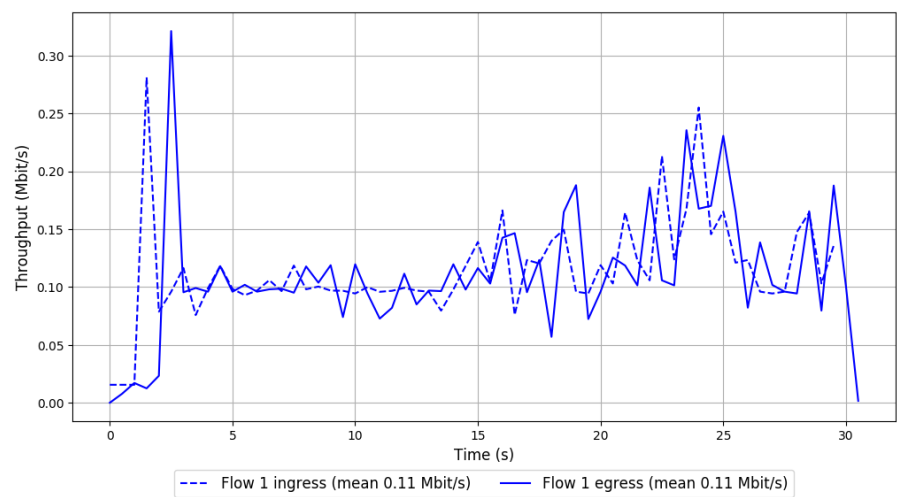


Run 2: Statistics of Sprout

Start at: 2018-12-10 21:15:47
End at: 2018-12-10 21:16:17
Local clock offset: -0.942 ms
Remote clock offset: 122.33 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 216.931 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 216.931 ms
Loss rate: 0.54%

Run 2: Report of Sprout — Data Link

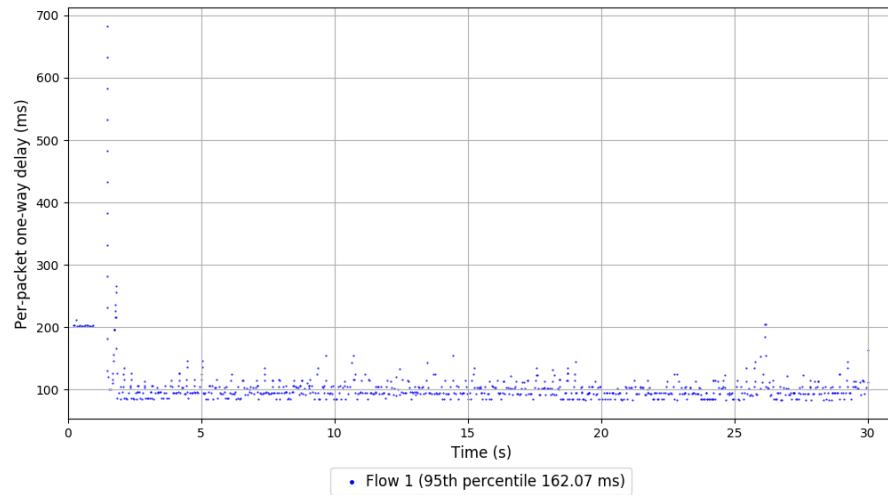
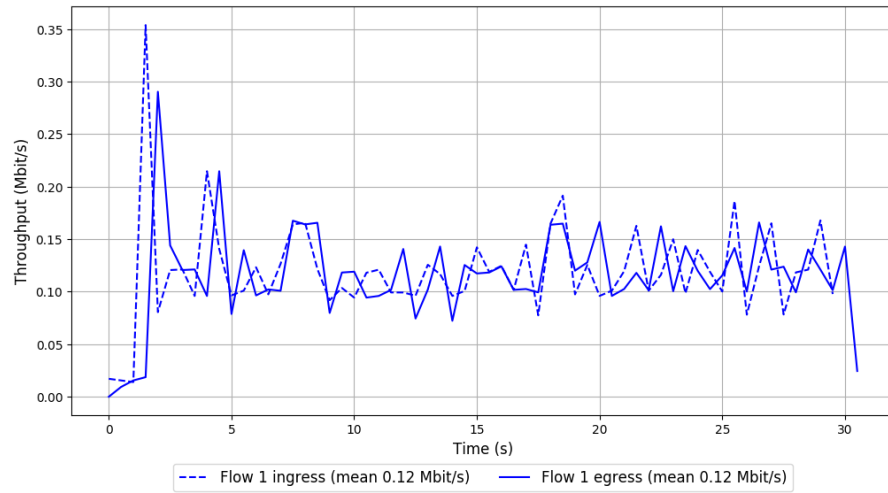


Run 3: Statistics of Sprout

Start at: 2018-12-10 21:37:27
End at: 2018-12-10 21:37:57
Local clock offset: 4.252 ms
Remote clock offset: 194.745 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 162.075 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 162.075 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link

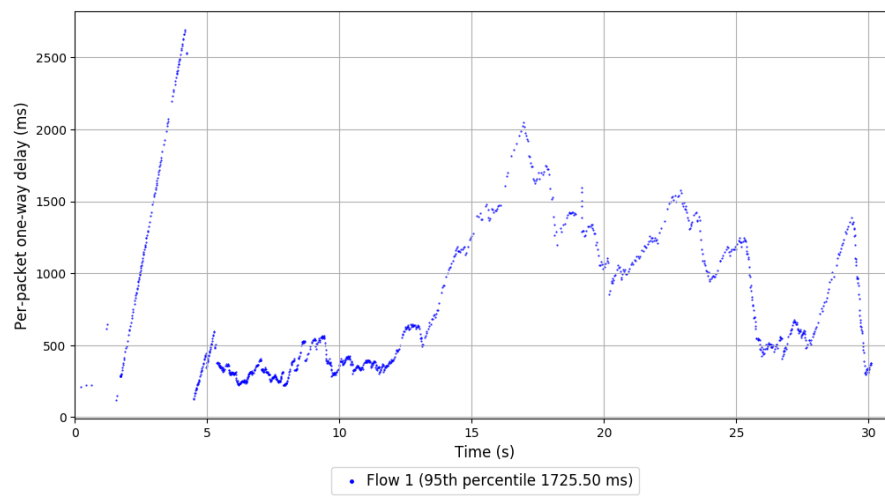
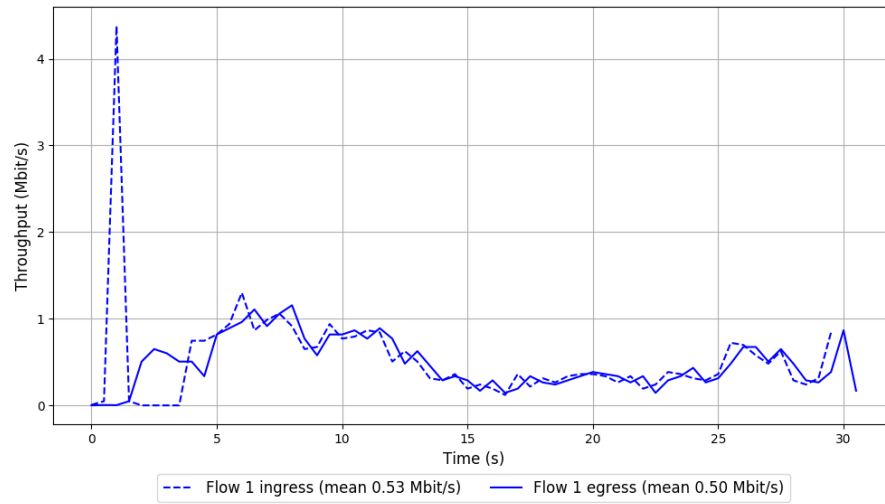


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-12-10 20:37:03
End at: 2018-12-10 20:37:33
Local clock offset: -6.448 ms
Remote clock offset: -148.909 ms

# Below is generated by plot.py at 2018-12-10 21:42:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 1725.503 ms
Loss rate: 5.75%
-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 1725.503 ms
Loss rate: 5.75%
```

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



Run 2: Statistics of TaoVA-100x

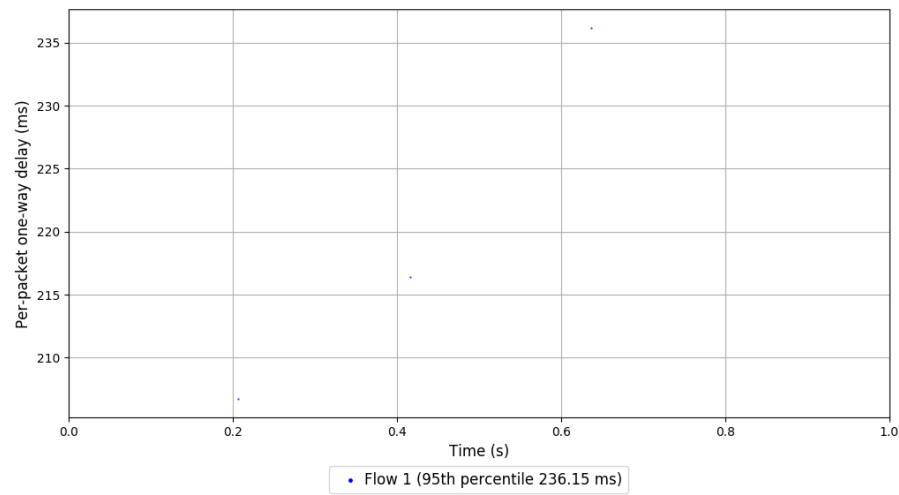
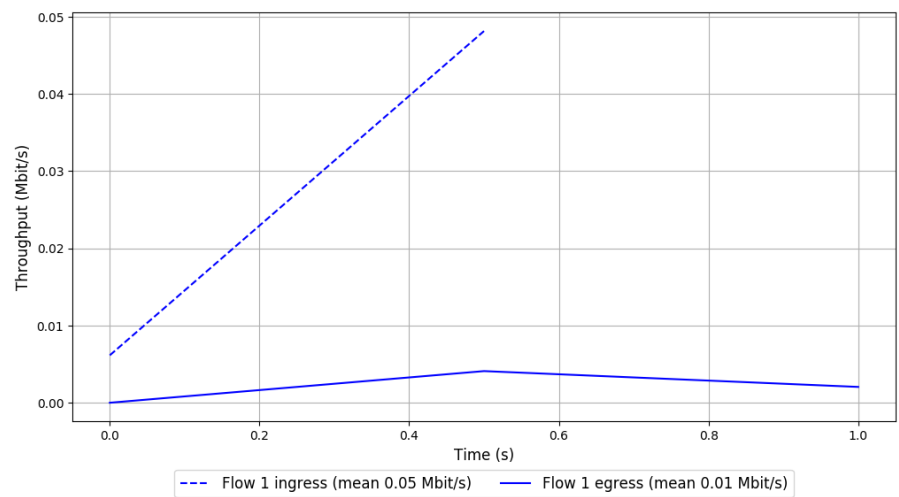
Start at: 2018-12-10 20:58:41

End at: 2018-12-10 20:59:11

Local clock offset: -3.449 ms

Remote clock offset: 56.962 ms

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



Run 3: Statistics of TaoVA-100x

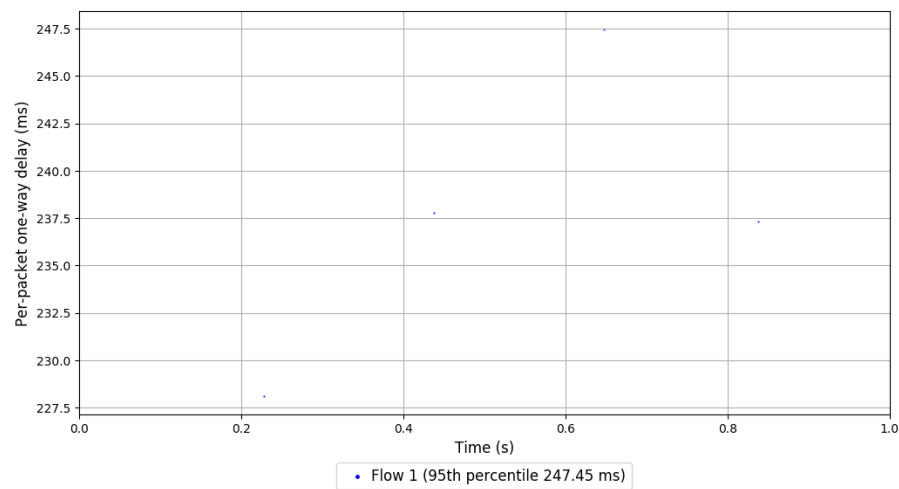
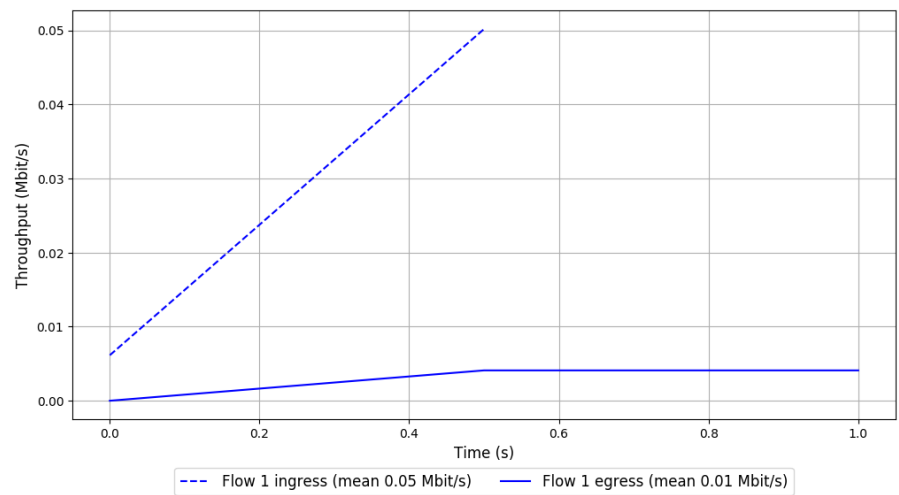
Start at: 2018-12-10 21:20:20

End at: 2018-12-10 21:20:50

Local clock offset: -0.08 ms

Remote clock offset: 137.965 ms

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

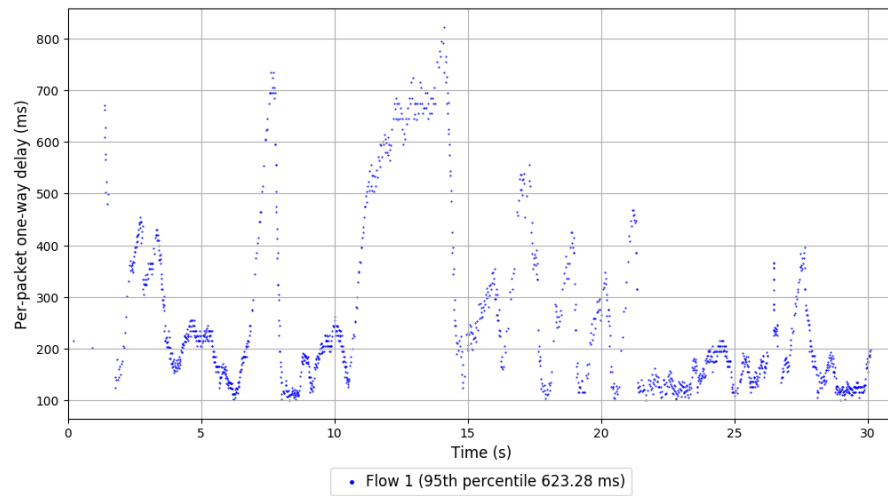
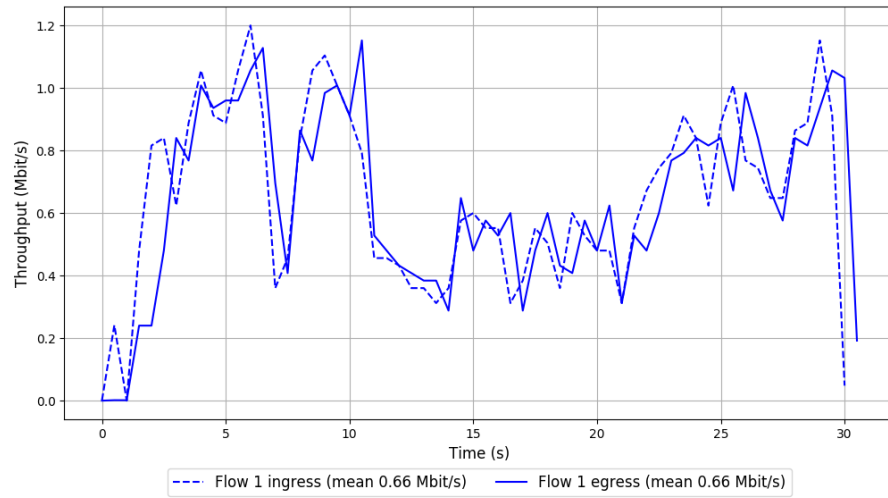


Run 1: Statistics of TCP Vegas

Start at: 2018-12-10 20:41:36
End at: 2018-12-10 20:42:06
Local clock offset: -6.124 ms
Remote clock offset: -157.028 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 623.277 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 623.277 ms
Loss rate: 0.12%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2018-12-10 21:03:14

End at: 2018-12-10 21:03:44

Local clock offset: -3.443 ms

Remote clock offset: 70.89 ms

Below is generated by plot.py at 2018-12-10 21:42:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.02 Mbit/s

95th percentile per-packet one-way delay: 507.289 ms

Loss rate: 0.08%

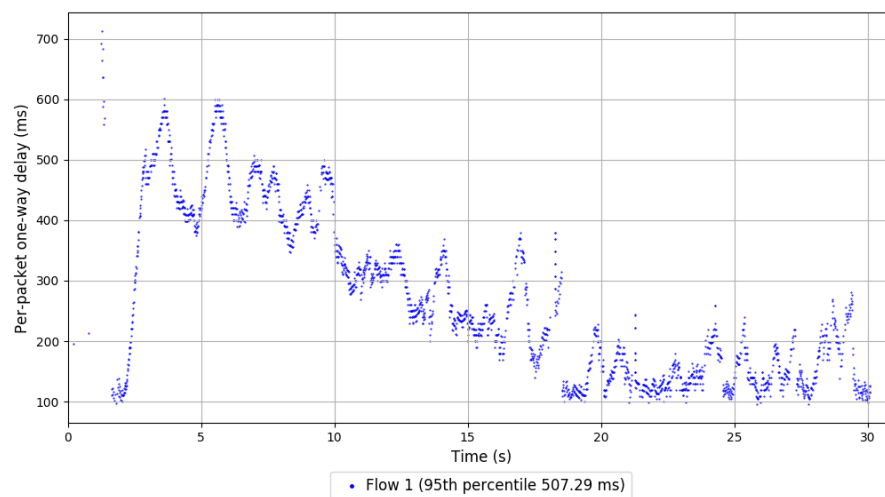
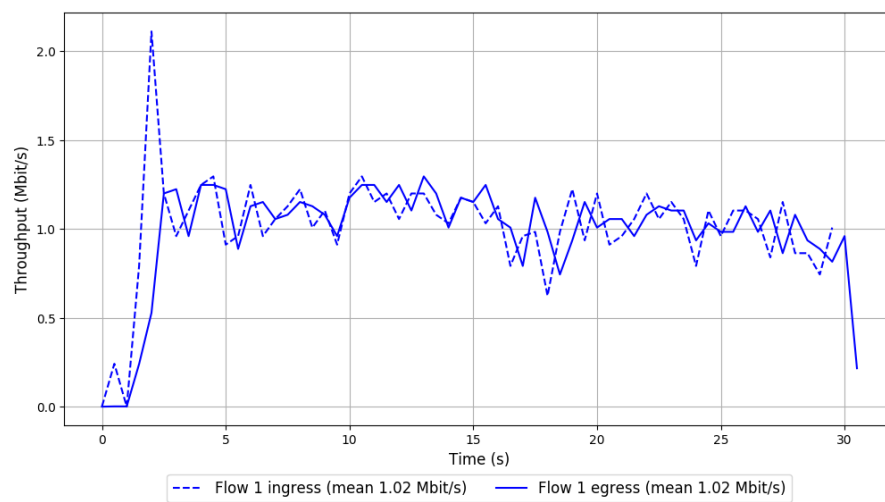
-- Flow 1:

Average throughput: 1.02 Mbit/s

95th percentile per-packet one-way delay: 507.289 ms

Loss rate: 0.08%

Run 2: Report of TCP Vegas — Data Link

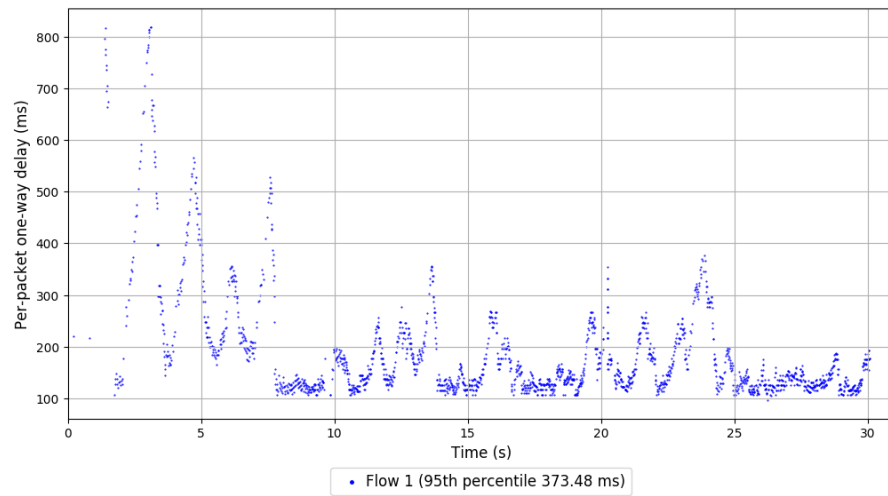
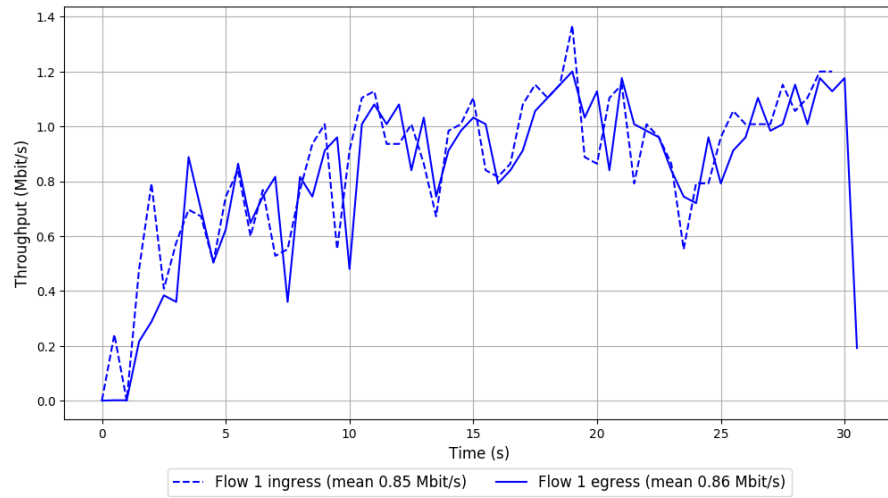


Run 3: Statistics of TCP Vegas

Start at: 2018-12-10 21:24:55
End at: 2018-12-10 21:25:25
Local clock offset: 0.815 ms
Remote clock offset: 155.504 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 373.484 ms
Loss rate: 0.28%
-- Flow 1:
Average throughput: 0.86 Mbit/s
95th percentile per-packet one-way delay: 373.484 ms
Loss rate: 0.28%

Run 3: Report of TCP Vegas — Data Link

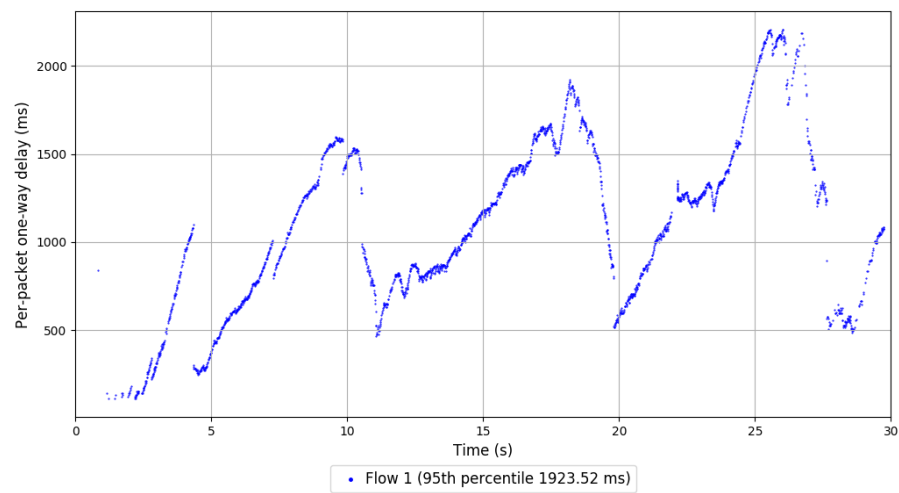
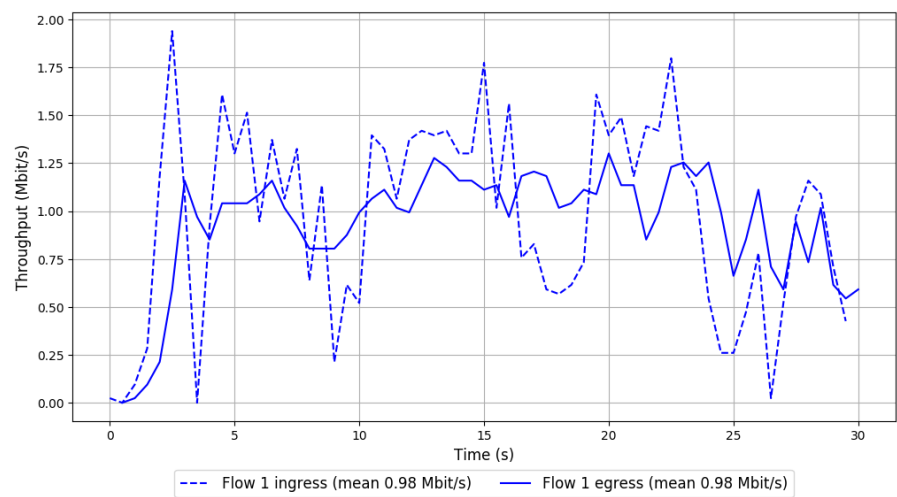


Run 1: Statistics of Verus

Start at: 2018-12-10 20:55:16
End at: 2018-12-10 20:55:46
Local clock offset: -4.032 ms
Remote clock offset: 38.515 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 1923.517 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 1923.517 ms
Loss rate: 2.97%

Run 1: Report of Verus — Data Link

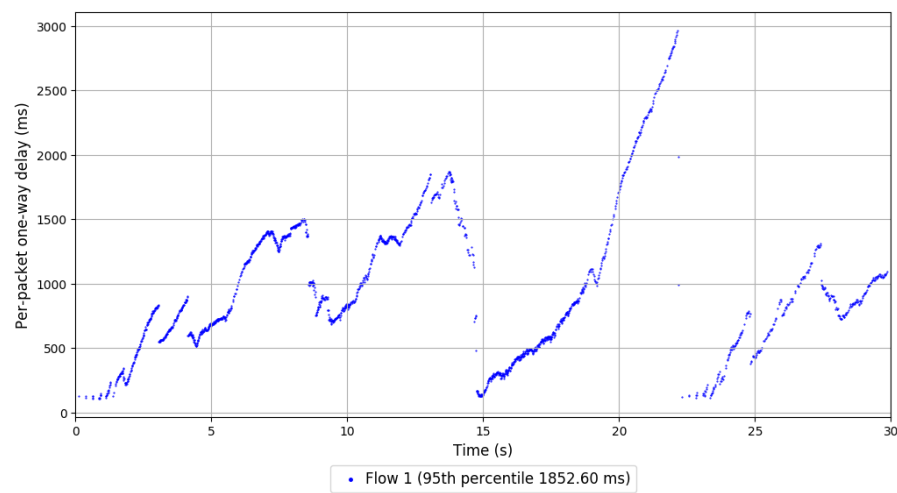
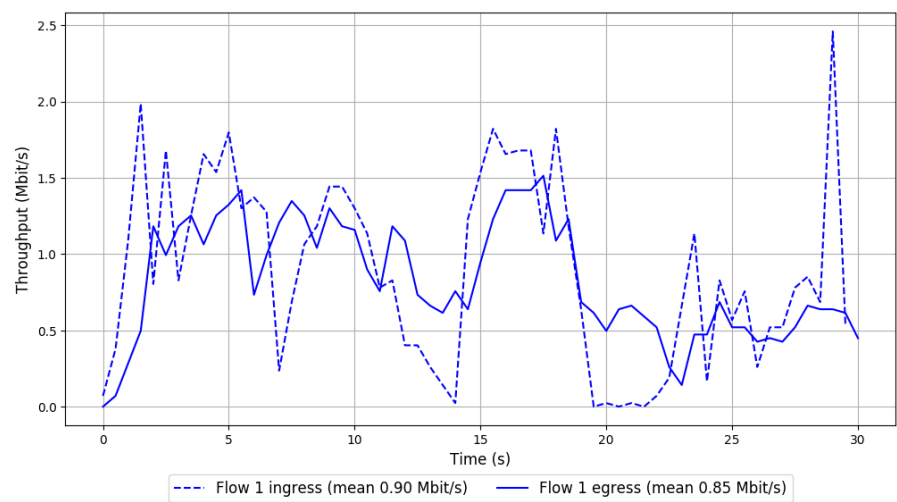


Run 2: Statistics of Verus

Start at: 2018-12-10 21:16:55
End at: 2018-12-10 21:17:25
Local clock offset: -0.782 ms
Remote clock offset: 125.449 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 1852.604 ms
Loss rate: 6.20%
-- Flow 1:
Average throughput: 0.85 Mbit/s
95th percentile per-packet one-way delay: 1852.604 ms
Loss rate: 6.20%

Run 2: Report of Verus — Data Link

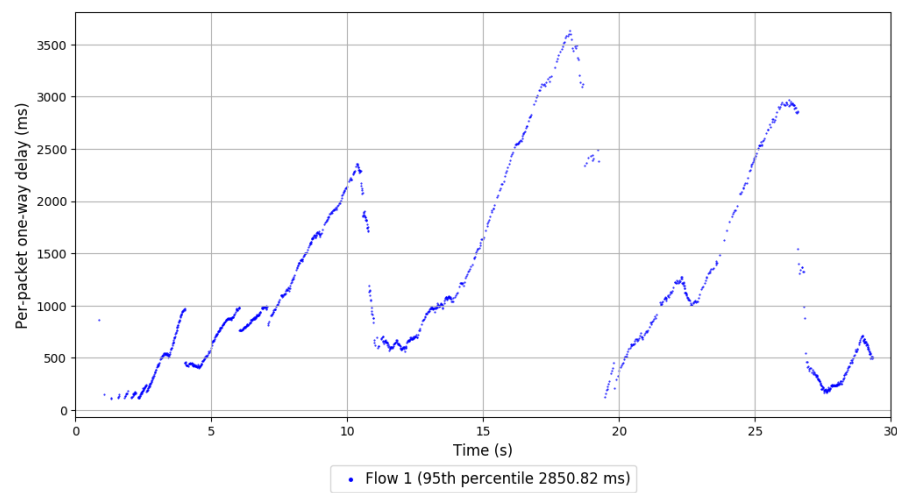
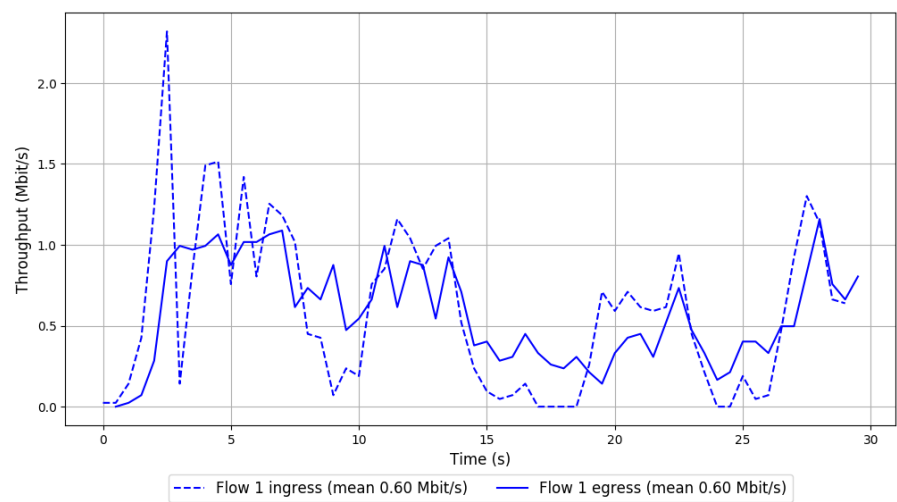


Run 3: Statistics of Verus

Start at: 2018-12-10 21:38:36
End at: 2018-12-10 21:39:06
Local clock offset: 4.389 ms
Remote clock offset: 199.307 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 2850.815 ms
Loss rate: 2.37%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 2850.815 ms
Loss rate: 2.37%

Run 3: Report of Verus — Data Link

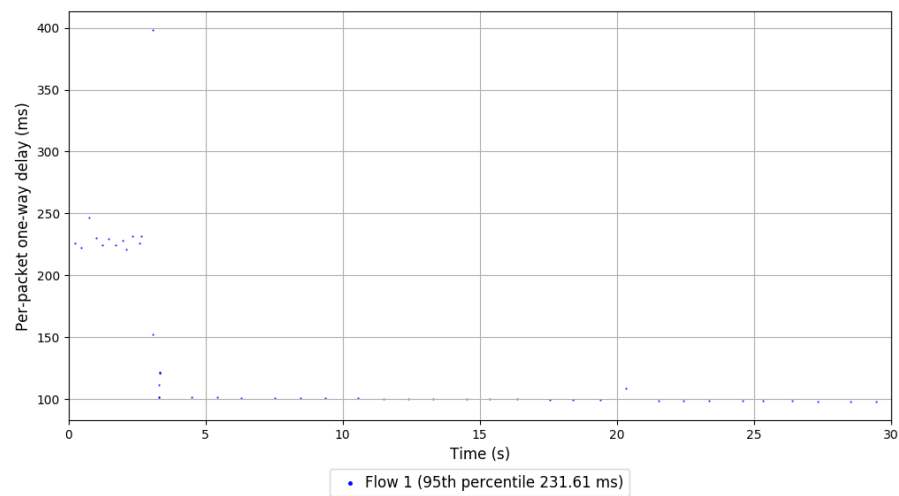
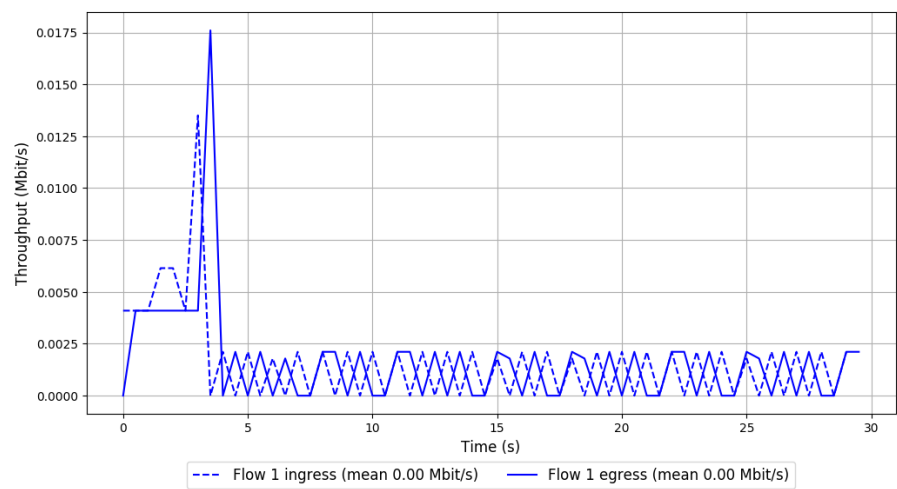


Run 1: Statistics of PCC-Vivace

Start at: 2018-12-10 20:51:51
End at: 2018-12-10 20:52:21
Local clock offset: -5.436 ms
Remote clock offset: 15.624 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 231.610 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 231.610 ms
Loss rate: 0.00%

Run 1: Report of PCC-Vivace — Data Link

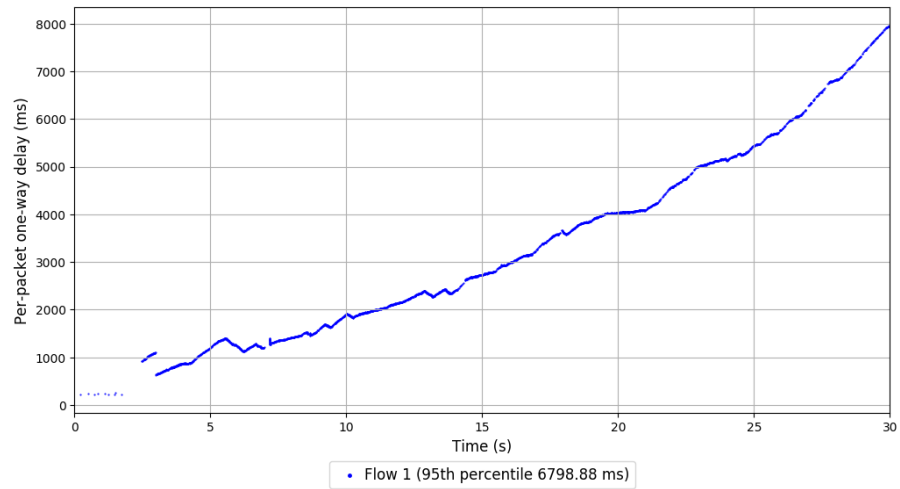
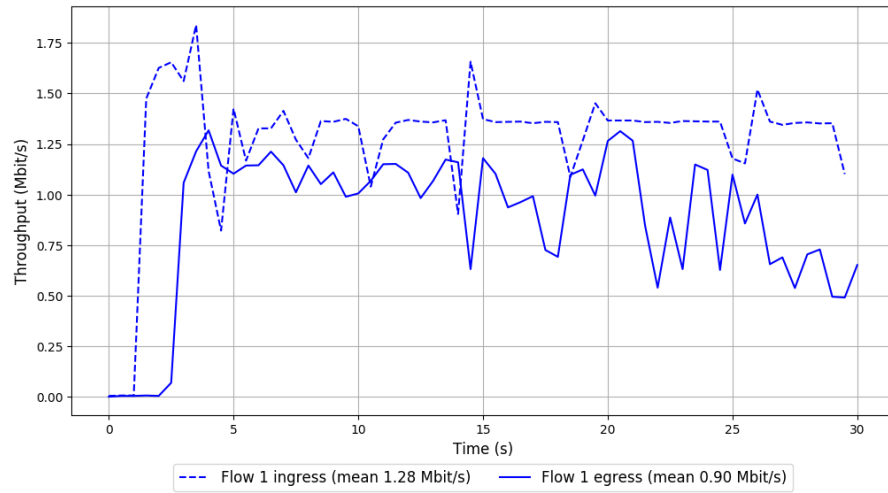


Run 2: Statistics of PCC-Vivace

Start at: 2018-12-10 21:13:30
End at: 2018-12-10 21:14:00
Local clock offset: -0.555 ms
Remote clock offset: 114.153 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 6798.881 ms
Loss rate: 29.64%
-- Flow 1:
Average throughput: 0.90 Mbit/s
95th percentile per-packet one-way delay: 6798.881 ms
Loss rate: 29.64%

Run 2: Report of PCC-Vivace — Data Link

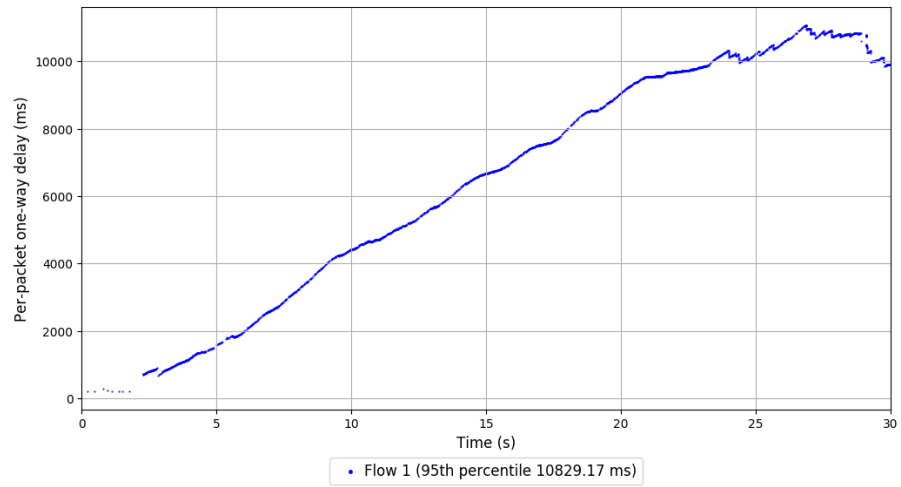
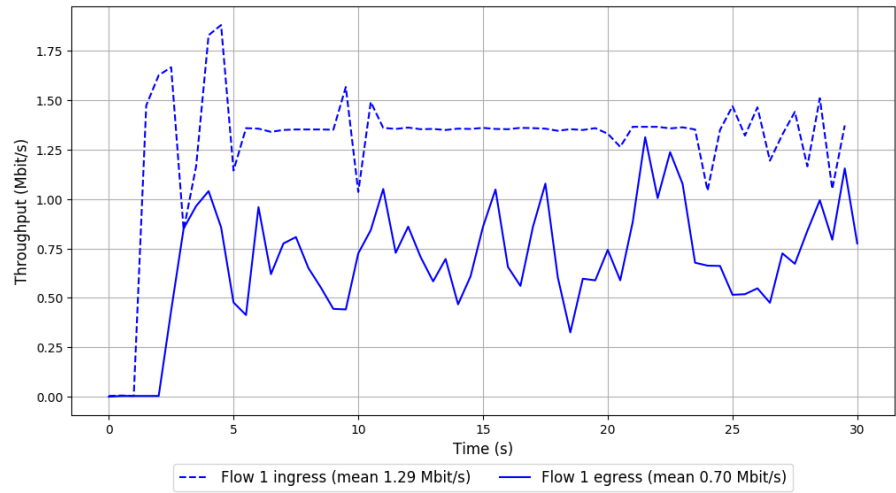


Run 3: Statistics of PCC-Vivace

Start at: 2018-12-10 21:35:10
End at: 2018-12-10 21:35:40
Local clock offset: 3.781 ms
Remote clock offset: 191.502 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 10829.169 ms
Loss rate: 46.24%
-- Flow 1:
Average throughput: 0.70 Mbit/s
95th percentile per-packet one-way delay: 10829.169 ms
Loss rate: 46.24%

Run 3: Report of PCC-Vivace — Data Link

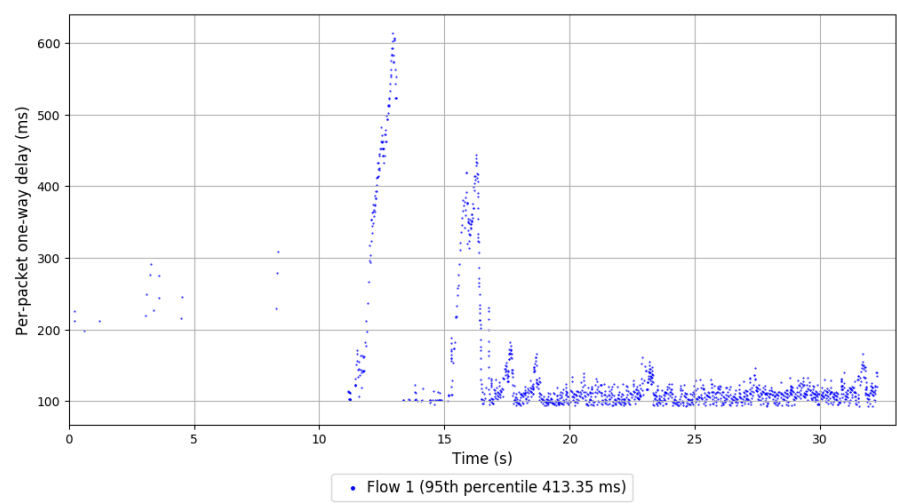
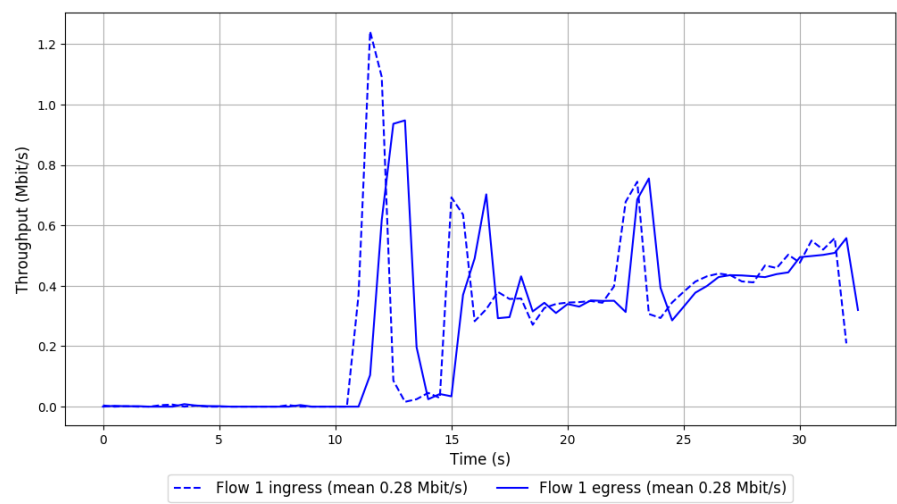


```
Run 1: Statistics of WebRTC media

Start at: 2018-12-10 20:53:00
End at: 2018-12-10 20:53:30
Local clock offset: -5.276 ms
Remote clock offset: 22.11 ms

# Below is generated by plot.py at 2018-12-10 21:42:03
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 413.350 ms
Loss rate: 0.25%
-- Flow 1:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 413.350 ms
Loss rate: 0.25%
```

Run 1: Report of WebRTC media — Data Link

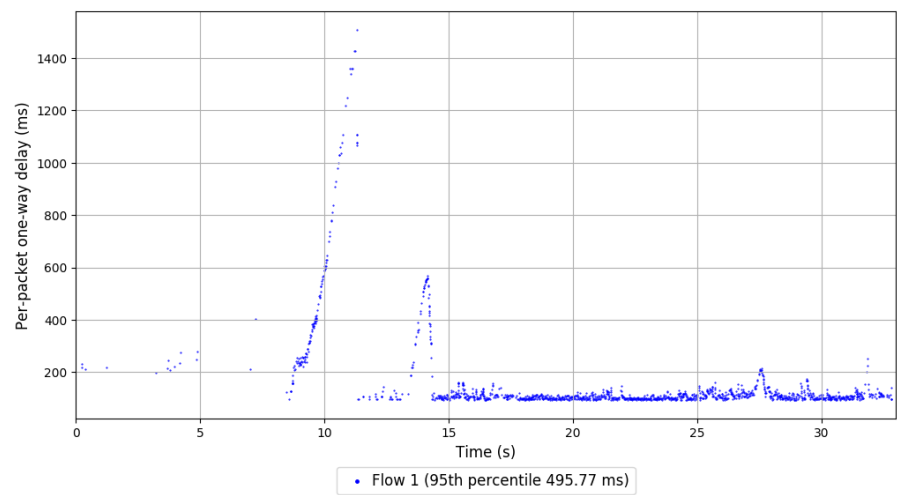
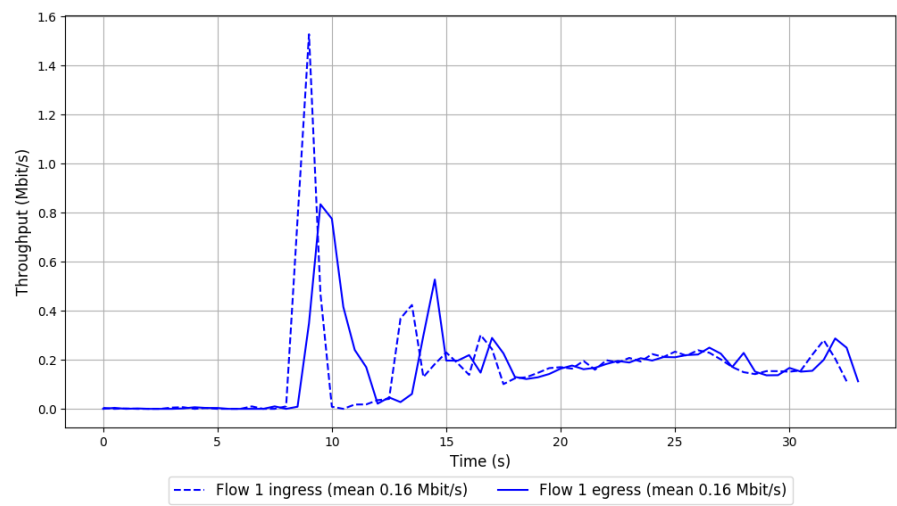


Run 2: Statistics of WebRTC media

Start at: 2018-12-10 21:14:39
End at: 2018-12-10 21:15:09
Local clock offset: -0.326 ms
Remote clock offset: 118.315 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 495.772 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 495.772 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-12-10 21:36:19
End at: 2018-12-10 21:36:49
Local clock offset: 3.121 ms
Remote clock offset: 191.279 ms

Below is generated by plot.py at 2018-12-10 21:42:03
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 244.121 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.41 Mbit/s
95th percentile per-packet one-way delay: 244.121 ms
Loss rate: 0.13%

Run 3: Report of WebRTC media — Data Link

