

Pantheon Report

Generated at 2018-04-16 22:47:59 (UTC).

Data path: Colombia ppp0 (*remote*) → AWS Brazil 2 Ethernet (*local*).

Repeated the test of 16 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

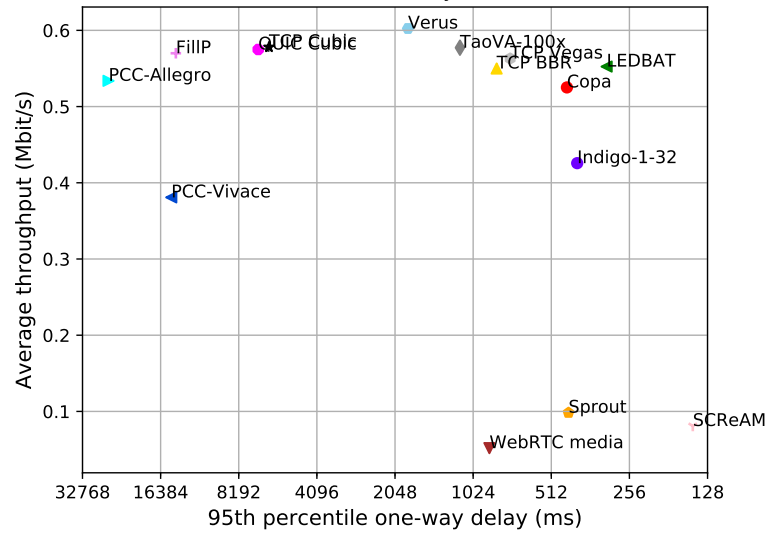
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).

NTP offsets were measured against **gps.ntp.br** and have been applied to correct the timestamps in logs.

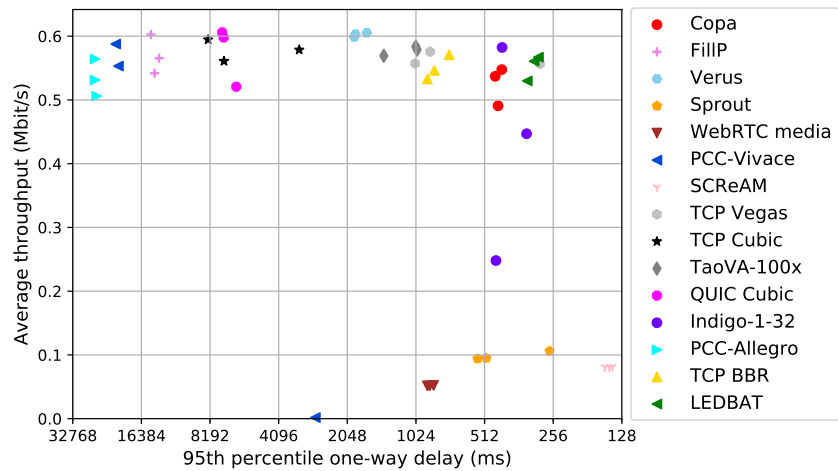
Git summary:

```
branch: master @ 4ed32c0e22b4dd733f97c1d3aaab2e5bb16f66b4
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
third_party/genericCC @ d223989828276fa83a807da6e0341dc0c7b89aec
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
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-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  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 @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webrtc @ f271183af822eee5d0031620f4bebf38aedc5581
```

test from Colombia ppp0 to AWS Brazil 2 Ethernet, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from Colombia ppp0 to AWS Brazil 2 Ethernet, 3 runs of 30s each per scheme



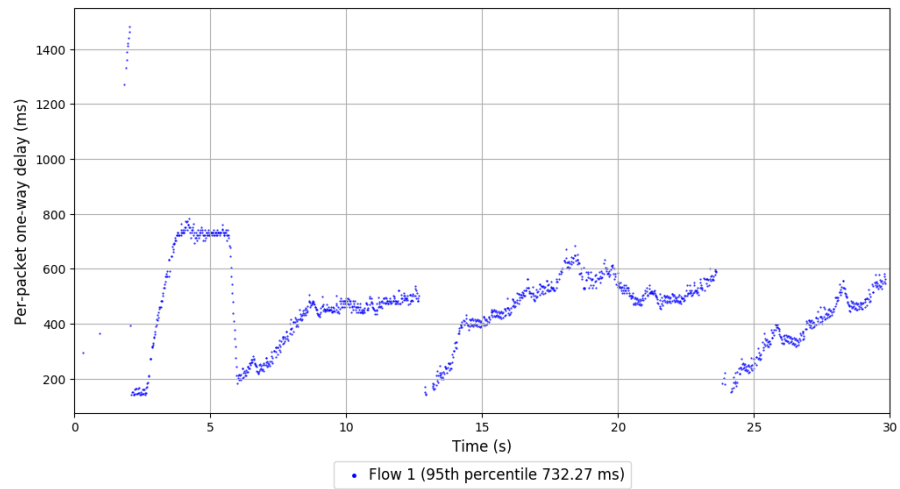
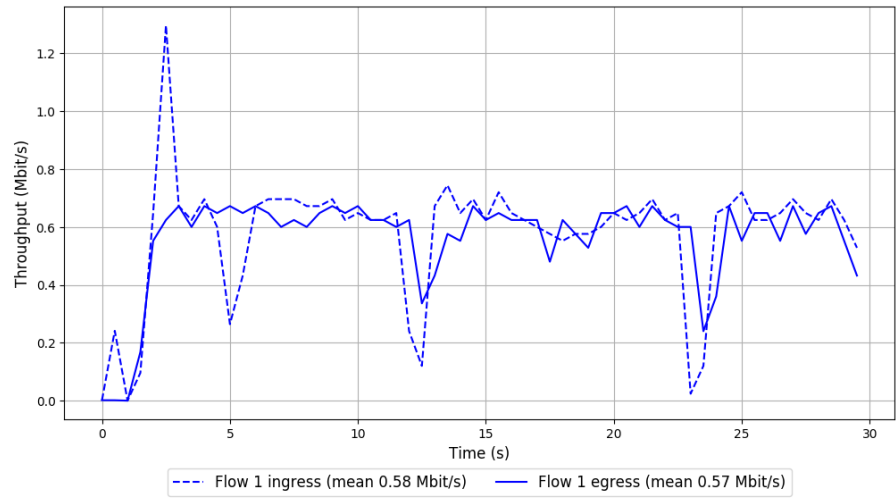
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	0.55	831.32	2.26
TCP Cubic	3	0.58	6266.02	24.15
LEDBAT	3	0.55	313.50	1.32
PCC-Allegro	3	0.53	26006.11	98.36
QUIC Cubic	3	0.58	6892.14	29.39
SCReAM	3	0.08	145.89	0.79
WebRTC media	3	0.05	886.60	0.03
Sprout	3	0.10	439.51	1.91
TaoVA-100x	3	0.58	1151.31	2.69
TCP Vegas	3	0.57	737.22	1.22
Verus	3	0.60	1826.06	4.73
Copa	3	0.53	445.69	3.77
FillP	3	0.57	14312.37	40.51
Indigo-1-32	3	0.43	406.88	1.55
PCC-Vivace	3	0.38	14910.77	46.64
PCC-Expr	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

Start at: 2018-04-16 21:00:17
End at: 2018-04-16 21:00:47
Local clock offset: -14.213 ms
Remote clock offset: 11.482 ms

Below is generated by plot.py at 2018-04-16 22:47:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 732.274 ms
Loss rate: 2.36%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 732.274 ms
Loss rate: 2.36%

Run 1: Report of TCP BBR — Data Link

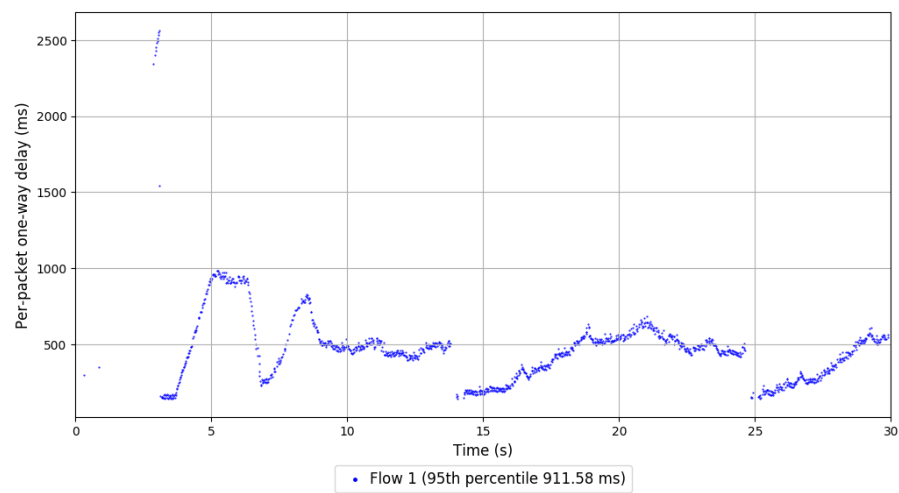
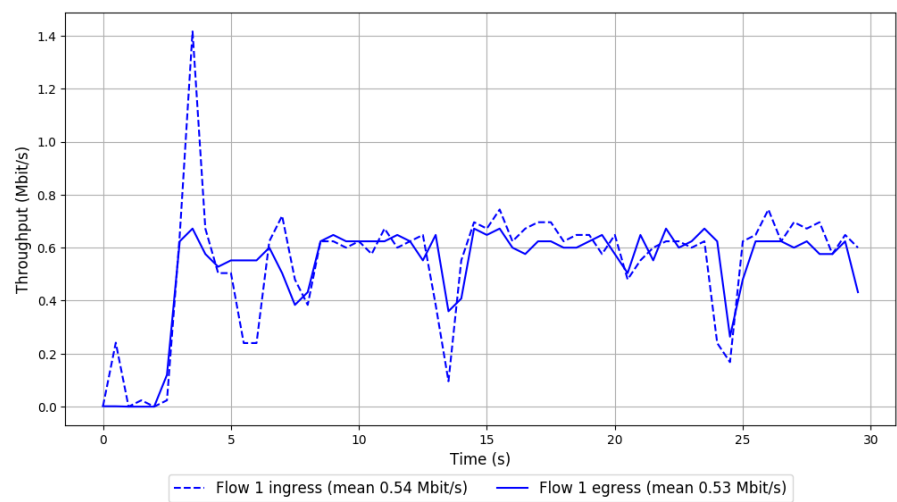


Run 2: Statistics of TCP BBR

Start at: 2018-04-16 21:20:22
End at: 2018-04-16 21:20:52
Local clock offset: -10.775 ms
Remote clock offset: 11.689 ms

Below is generated by plot.py at 2018-04-16 22:47:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 911.581 ms
Loss rate: 2.52%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 911.581 ms
Loss rate: 2.52%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-04-16 21:40:30

End at: 2018-04-16 21:41:00

Local clock offset: -7.51 ms

Remote clock offset: 5.77 ms

Below is generated by plot.py at 2018-04-16 22:47:29

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 850.119 ms

Loss rate: 1.89%

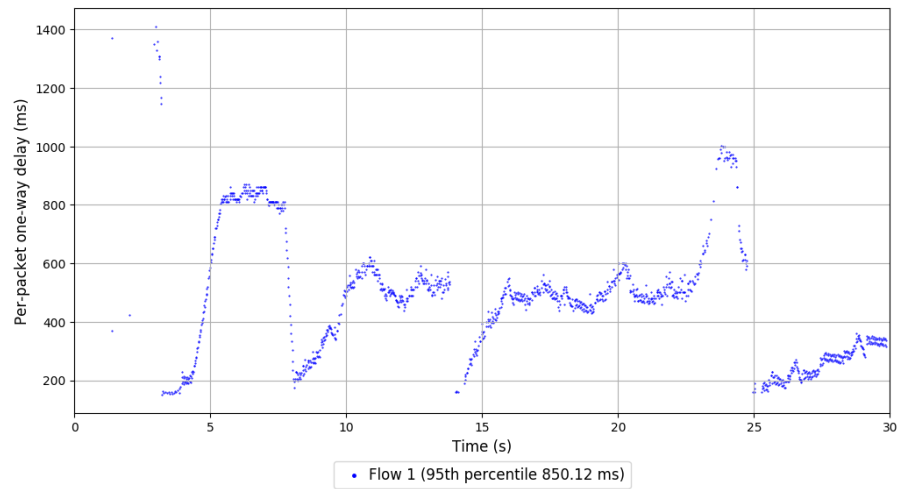
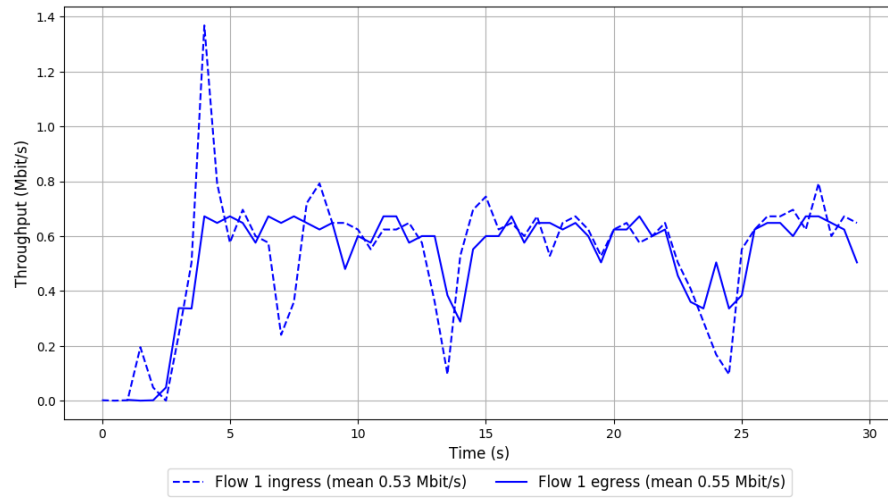
-- Flow 1:

Average throughput: 0.55 Mbit/s

95th percentile per-packet one-way delay: 850.119 ms

Loss rate: 1.89%

Run 3: Report of TCP BBR — Data Link

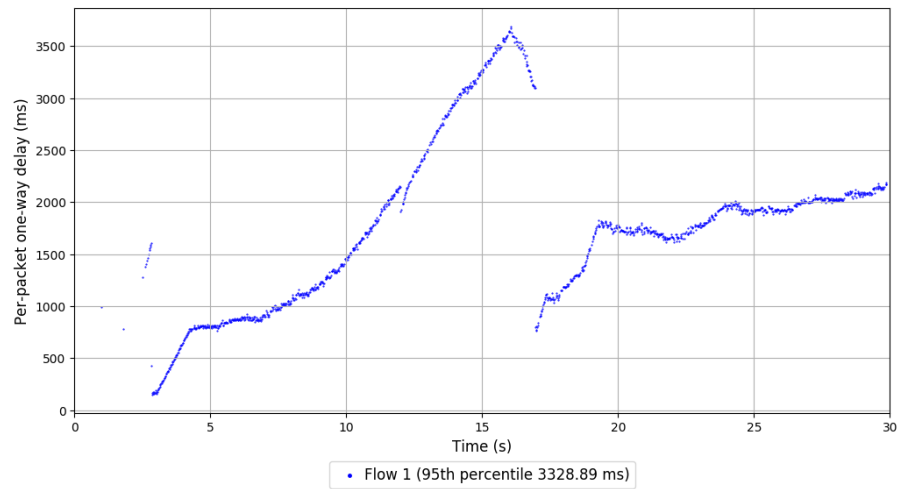
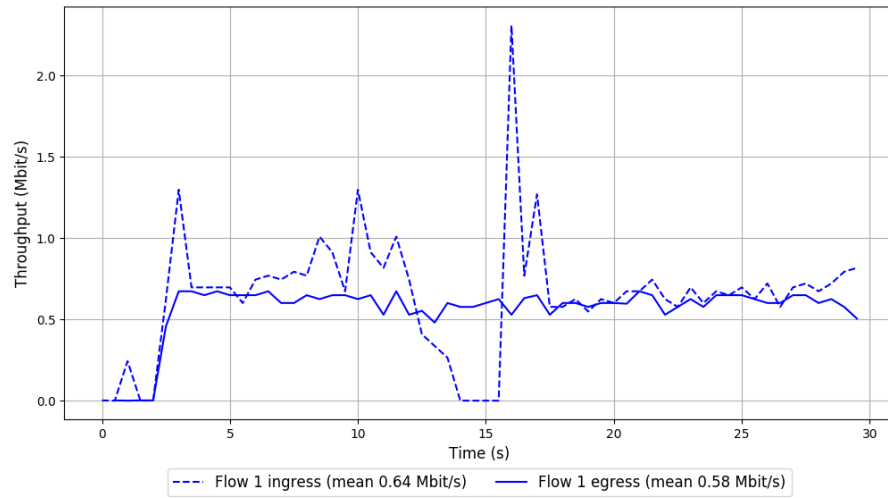


Run 1: Statistics of TCP Cubic

Start at: 2018-04-16 20:56:44
End at: 2018-04-16 20:57:14
Local clock offset: -16.271 ms
Remote clock offset: 6.755 ms

Below is generated by plot.py at 2018-04-16 22:47:29
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3328.895 ms
Loss rate: 13.36%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 3328.895 ms
Loss rate: 13.36%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2018-04-16 21:16:49

End at: 2018-04-16 21:17:19

Local clock offset: -10.29 ms

Remote clock offset: 5.932 ms

Below is generated by plot.py at 2018-04-16 22:47:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 8353.055 ms

Loss rate: 30.90%

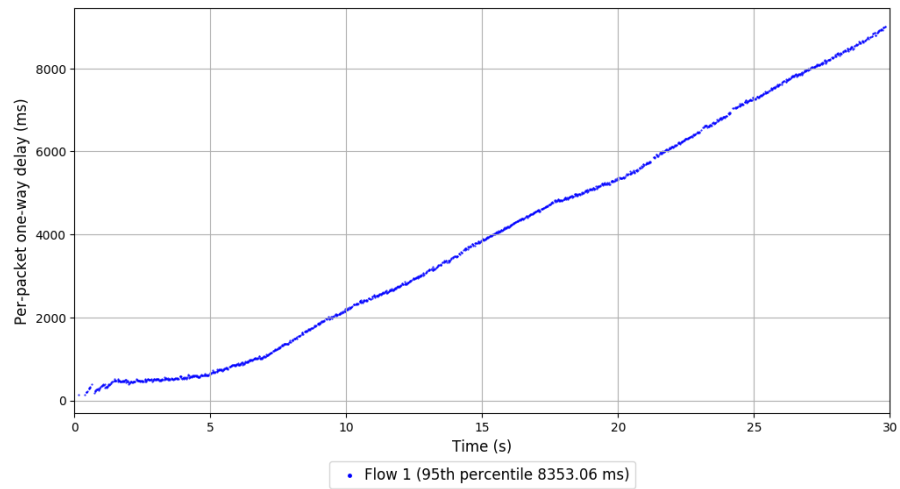
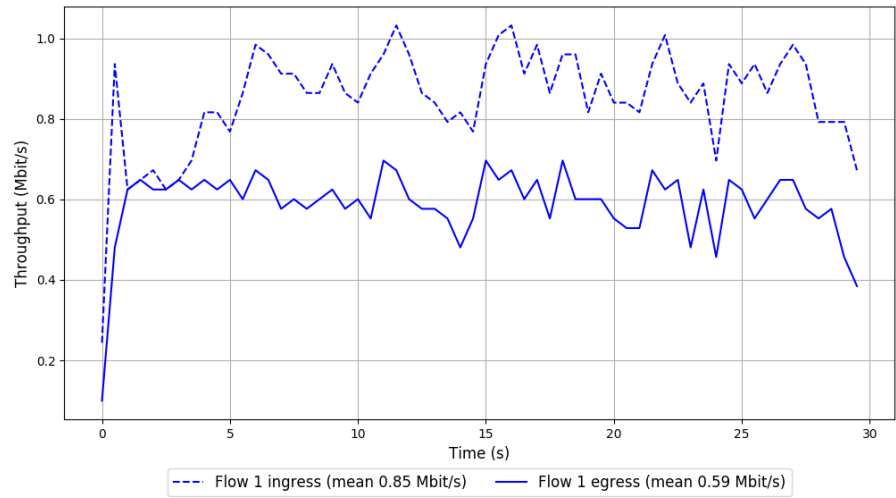
-- Flow 1:

Average throughput: 0.59 Mbit/s

95th percentile per-packet one-way delay: 8353.055 ms

Loss rate: 30.90%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2018-04-16 21:36:57

End at: 2018-04-16 21:37:27

Local clock offset: -8.683 ms

Remote clock offset: 5.721 ms

Below is generated by plot.py at 2018-04-16 22:47:30

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 7116.122 ms

Loss rate: 28.19%

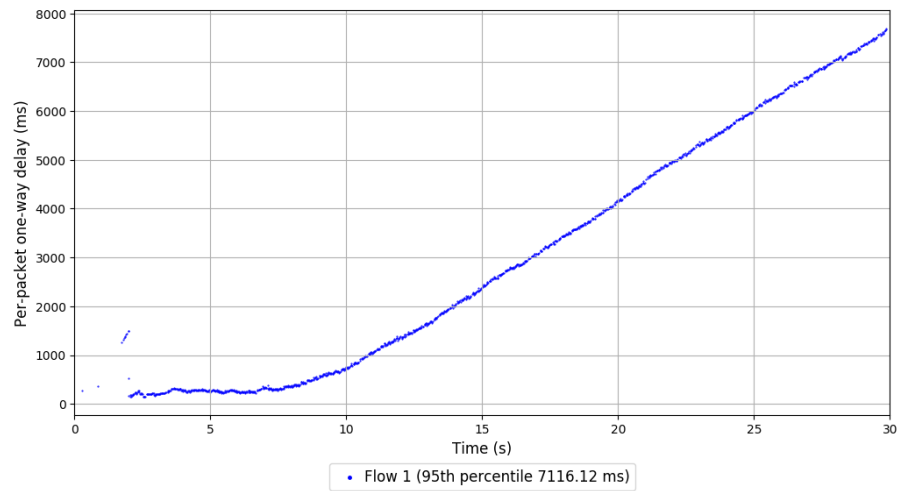
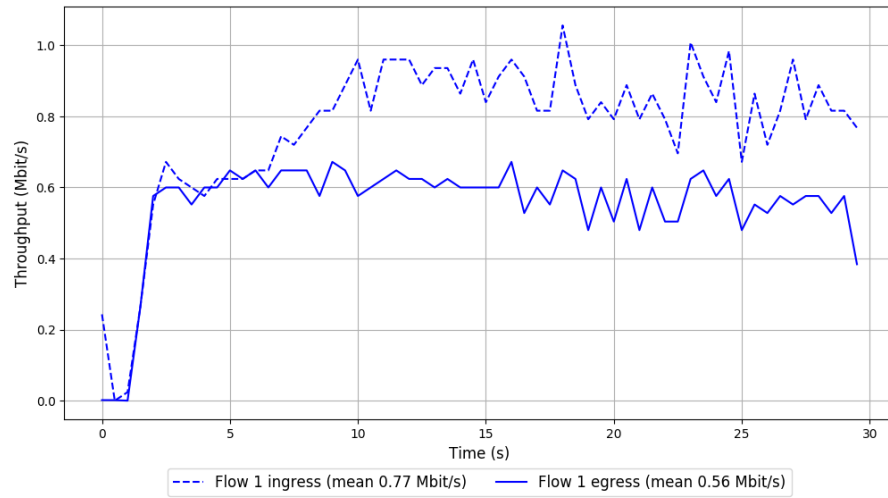
-- Flow 1:

Average throughput: 0.56 Mbit/s

95th percentile per-packet one-way delay: 7116.122 ms

Loss rate: 28.19%

Run 3: Report of TCP Cubic — Data Link

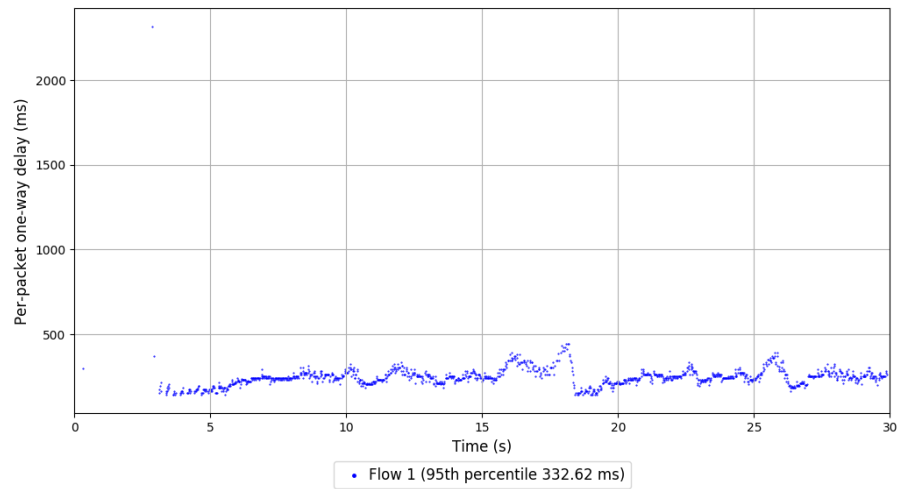
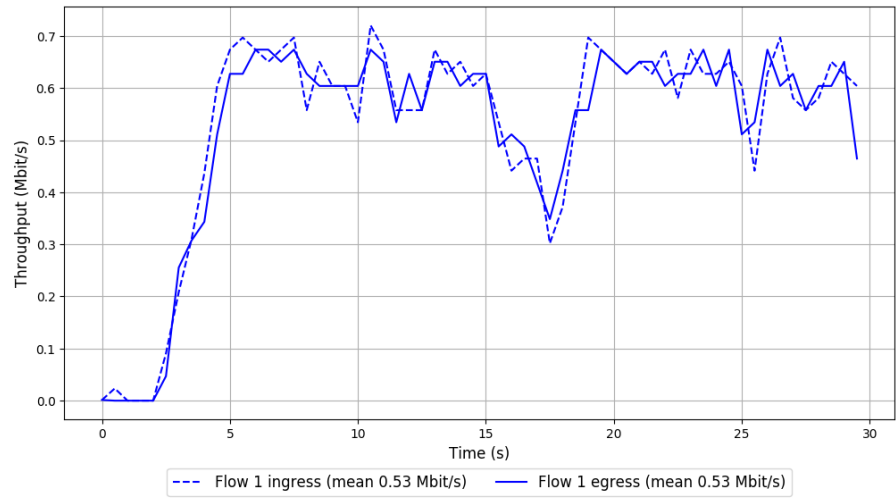


```
Run 1: Statistics of LEDBAT

Start at: 2018-04-16 20:53:12
End at: 2018-04-16 20:53:42
Local clock offset: -20.359 ms
Remote clock offset: 6.749 ms

# Below is generated by plot.py at 2018-04-16 22:47:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 332.621 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 332.621 ms
Loss rate: 1.39%
```


Run 1: Report of LEDBAT — Data Link

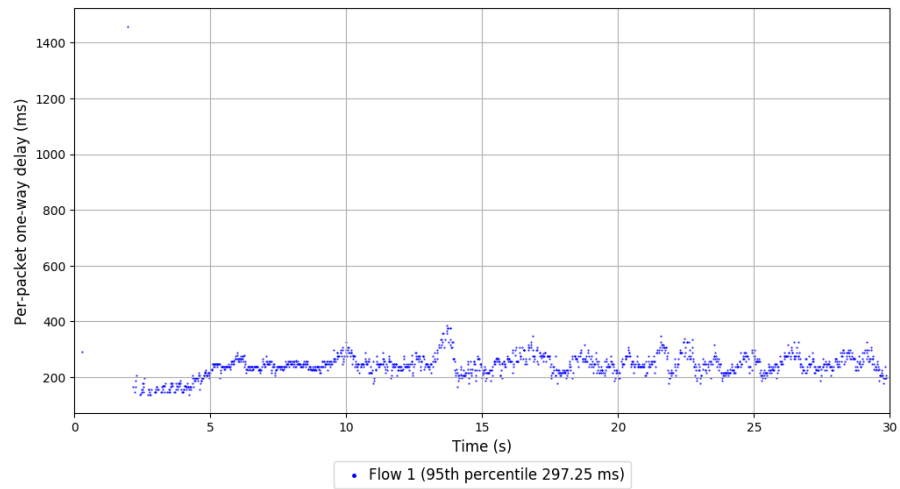
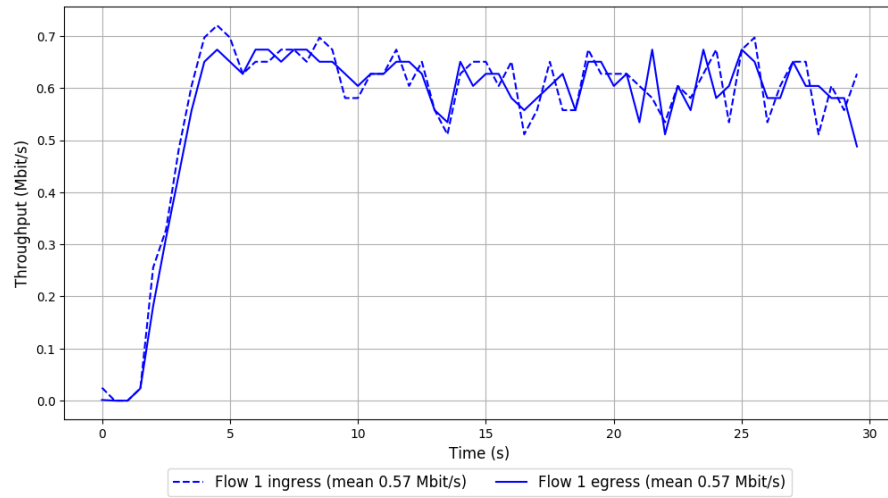


Run 2: Statistics of LEDBAT

Start at: 2018-04-16 21:13:17
End at: 2018-04-16 21:13:47
Local clock offset: -10.77 ms
Remote clock offset: 11.561 ms

Below is generated by plot.py at 2018-04-16 22:47:30
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 297.250 ms
Loss rate: 1.23%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 297.250 ms
Loss rate: 1.23%

Run 2: Report of LEDBAT — Data Link

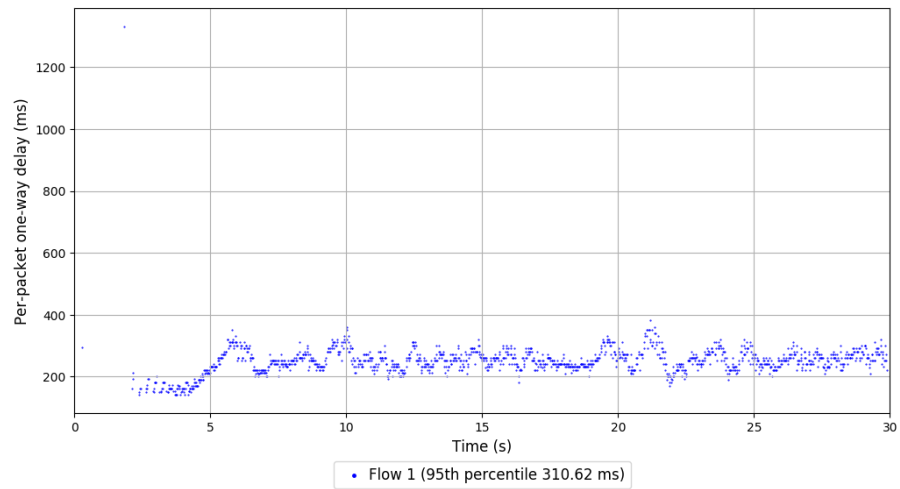
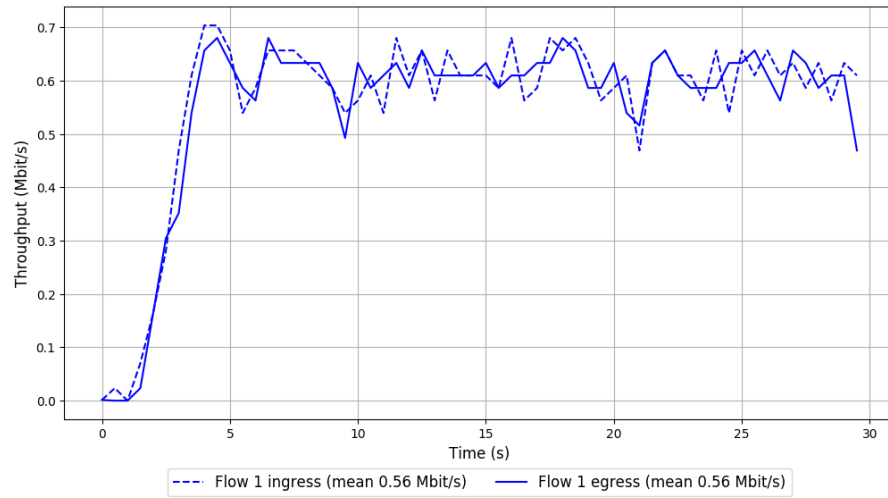


Run 3: Statistics of LEDBAT

Start at: 2018-04-16 21:33:26
End at: 2018-04-16 21:33:56
Local clock offset: -8.047 ms
Remote clock offset: 11.426 ms

Below is generated by plot.py at 2018-04-16 22:47:32
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 310.624 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 310.624 ms
Loss rate: 1.33%

Run 3: Report of LEDBAT — Data Link

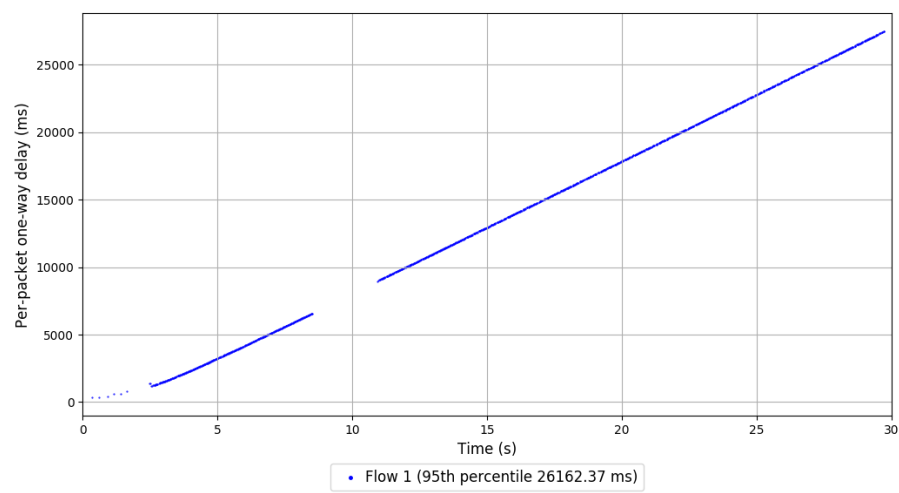
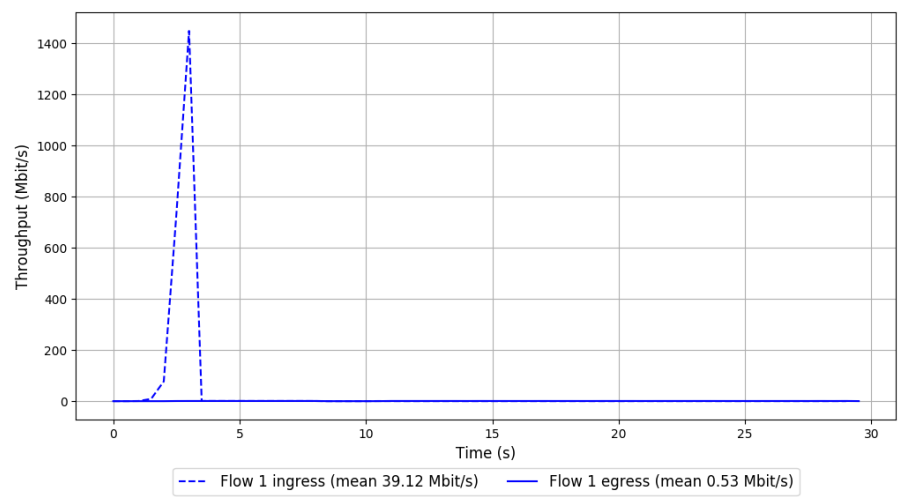


Run 1: Statistics of PCC-Allegro

Start at: 2018-04-16 21:05:00
End at: 2018-04-16 21:05:30
Local clock offset: -11.433 ms
Remote clock offset: 10.636 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 26162.370 ms
Loss rate: 98.63%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 26162.370 ms
Loss rate: 98.63%

Run 1: Report of PCC-Allegro — Data Link

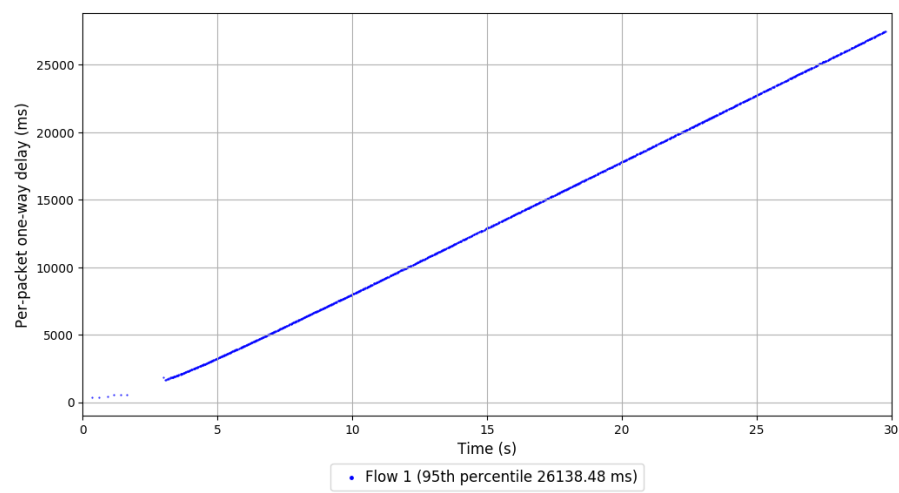
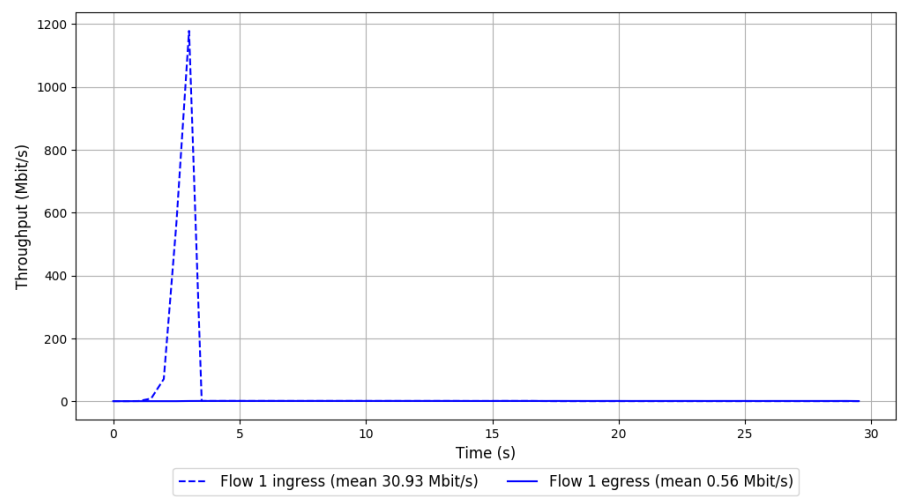


Run 2: Statistics of PCC-Allegro

Start at: 2018-04-16 21:25:07
End at: 2018-04-16 21:25:37
Local clock offset: -11.567 ms
Remote clock offset: 10.798 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26138.480 ms
Loss rate: 98.20%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 26138.480 ms
Loss rate: 98.20%

Run 2: Report of PCC-Allegro — Data Link

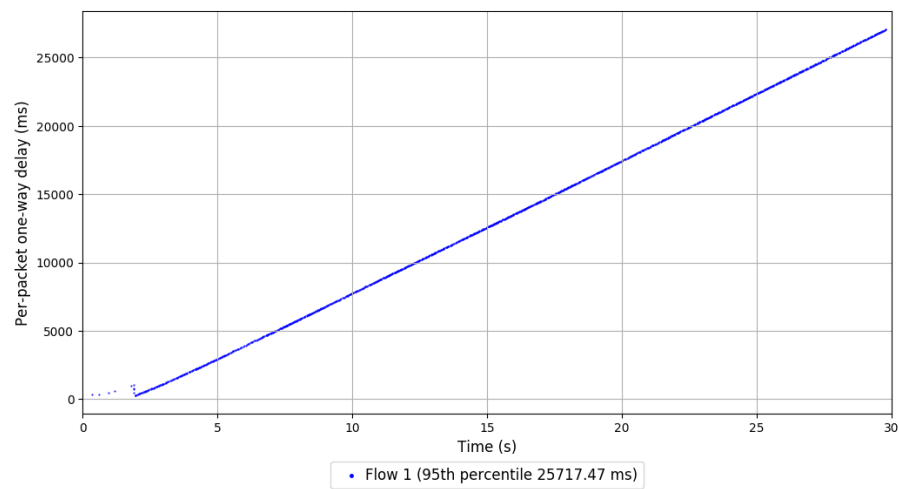
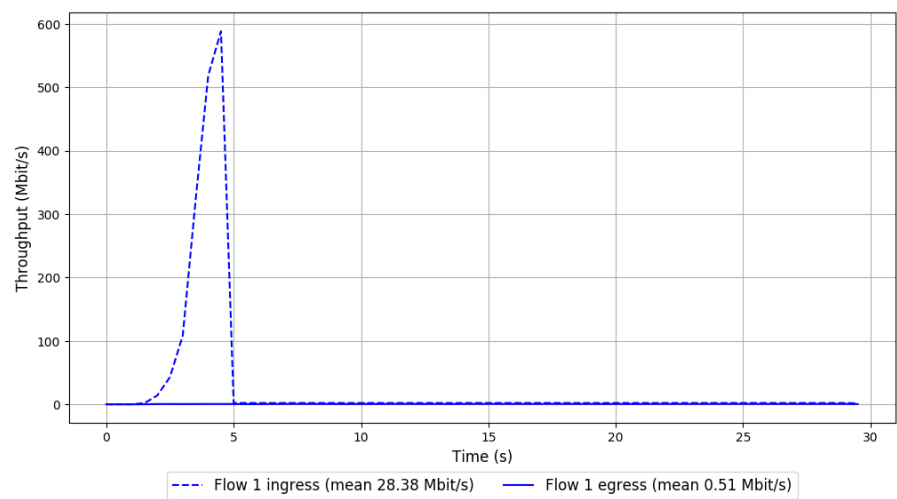


Run 3: Statistics of PCC-Allegro

Start at: 2018-04-16 21:45:13
End at: 2018-04-16 21:45:43
Local clock offset: -7.133 ms
Remote clock offset: 10.488 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 25717.468 ms
Loss rate: 98.24%
-- Flow 1:
Average throughput: 0.51 Mbit/s
95th percentile per-packet one-way delay: 25717.468 ms
Loss rate: 98.24%

Run 3: Report of PCC-Allegro — Data Link

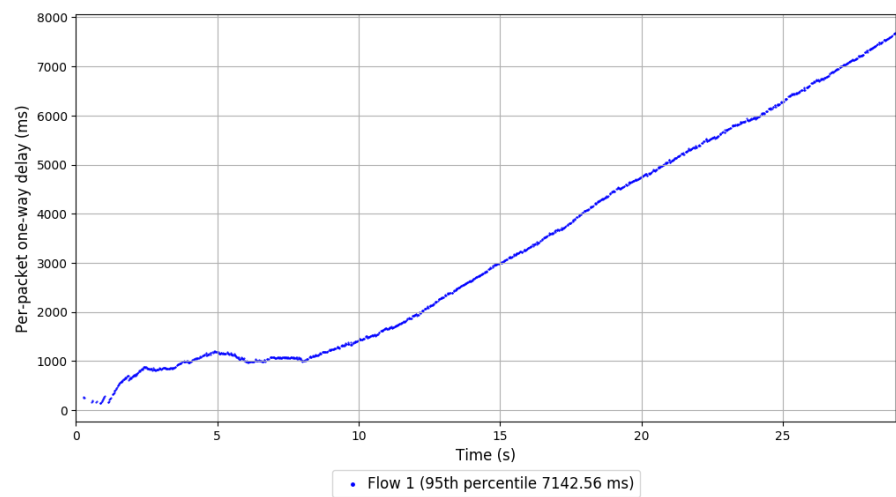
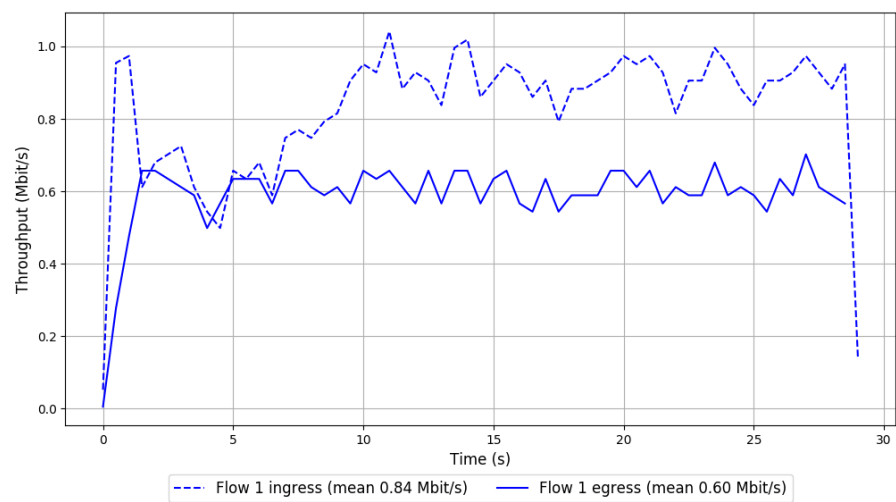


Run 1: Statistics of QUIC Cubic

Start at: 2018-04-16 20:52:01
End at: 2018-04-16 20:52:31
Local clock offset: -22.943 ms
Remote clock offset: 11.634 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7142.562 ms
Loss rate: 29.52%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7142.562 ms
Loss rate: 29.52%

Run 1: Report of QUIC Cubic — Data Link

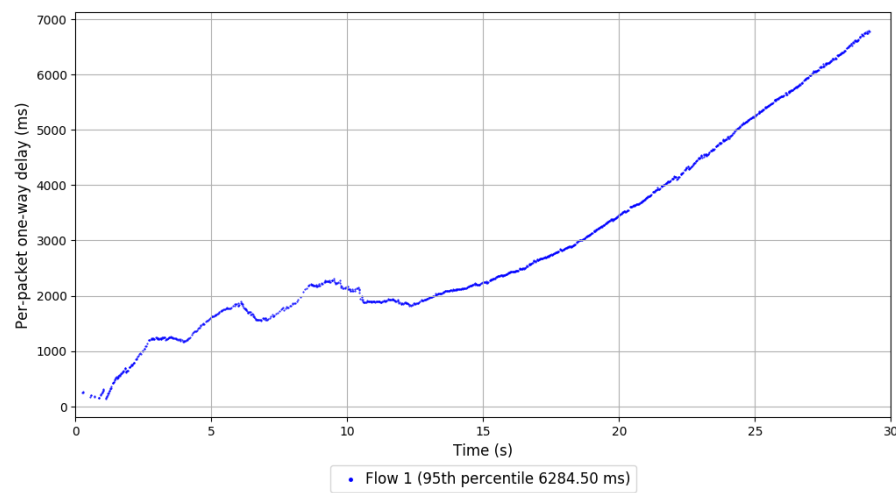
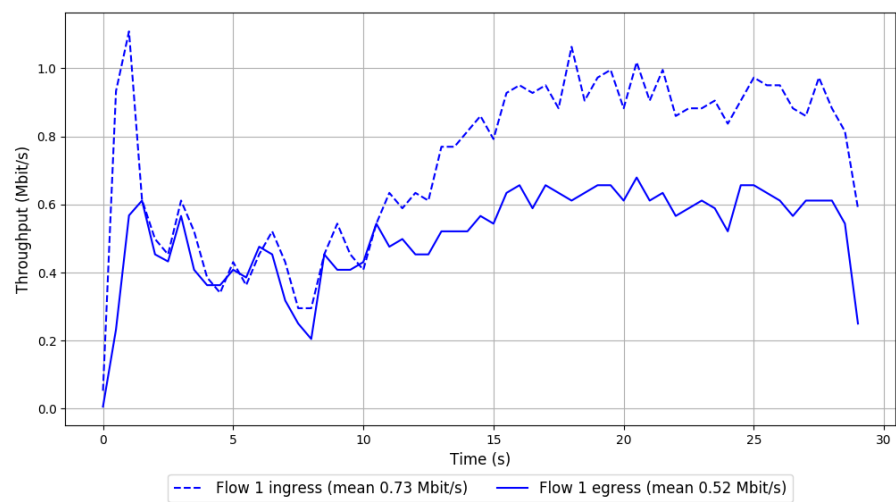


Run 2: Statistics of QUIC Cubic

Start at: 2018-04-16 21:12:06
End at: 2018-04-16 21:12:36
Local clock offset: -10.724 ms
Remote clock offset: 11.543 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 6284.504 ms
Loss rate: 29.37%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 6284.504 ms
Loss rate: 29.37%

Run 2: Report of QUIC Cubic — Data Link

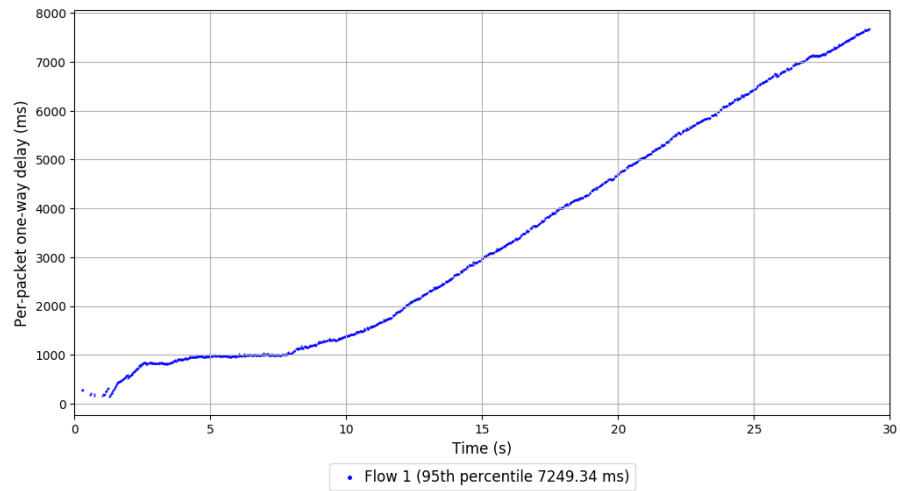
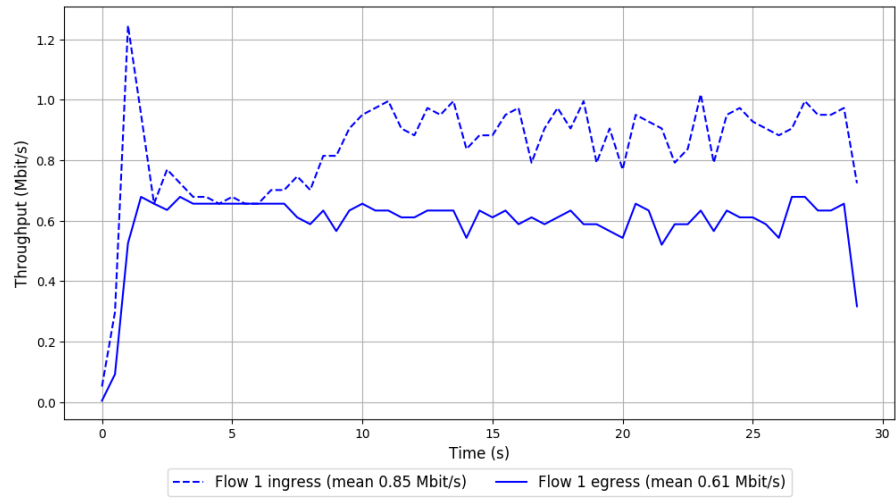


Run 3: Statistics of QUIC Cubic

Start at: 2018-04-16 21:32:15
End at: 2018-04-16 21:32:45
Local clock offset: -10.046 ms
Remote clock offset: 6.656 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 7249.342 ms
Loss rate: 29.27%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 7249.342 ms
Loss rate: 29.27%

Run 3: Report of QUIC Cubic — Data Link

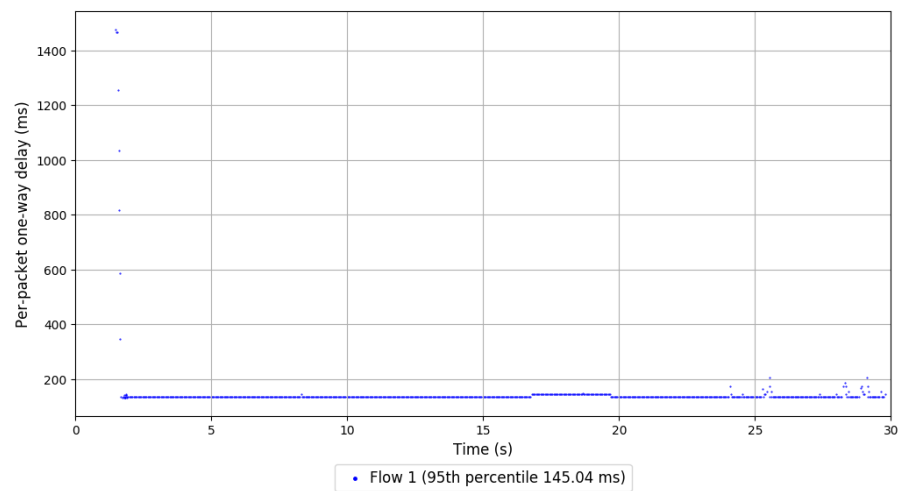
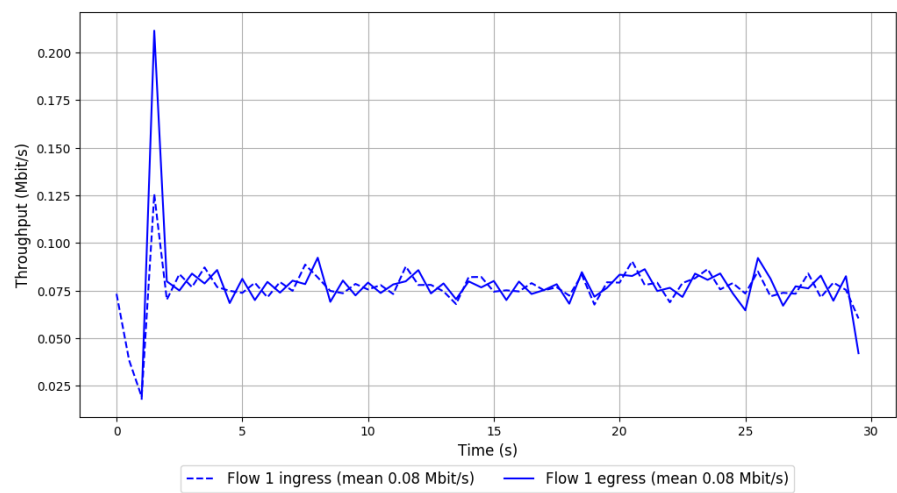


Run 1: Statistics of SCReAM

Start at: 2018-04-16 21:03:49
End at: 2018-04-16 21:04:19
Local clock offset: -12.537 ms
Remote clock offset: 6.663 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 145.040 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 145.040 ms
Loss rate: 0.79%

Run 1: Report of SReAM — Data Link

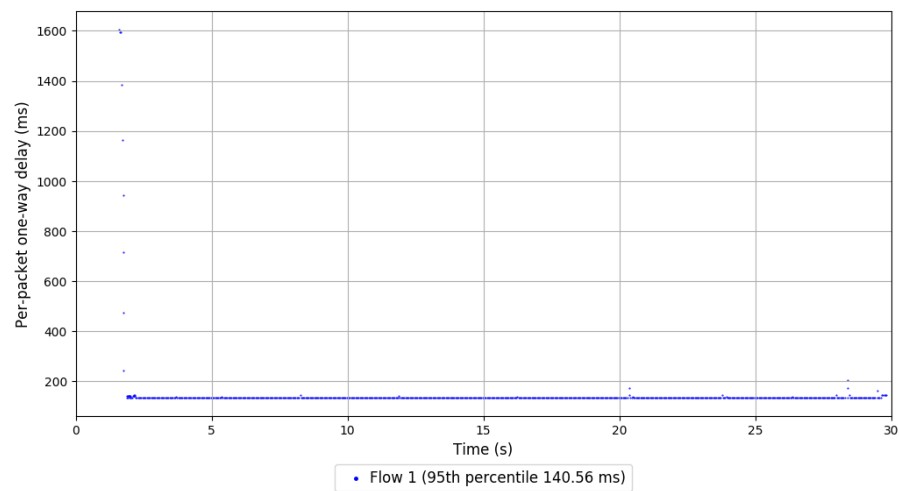
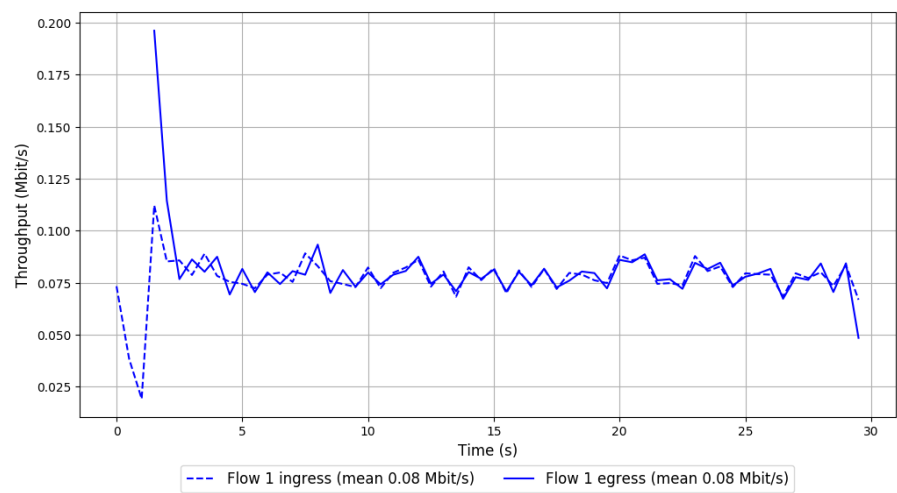


Run 2: Statistics of SCReAM

Start at: 2018-04-16 21:23:54
End at: 2018-04-16 21:24:24
Local clock offset: -12.105 ms
Remote clock offset: 6.112 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 140.558 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 140.558 ms
Loss rate: 0.79%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-04-16 21:44:02

End at: 2018-04-16 21:44:32

Local clock offset: -6.446 ms

Remote clock offset: 11.38 ms

Below is generated by plot.py at 2018-04-16 22:47:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 152.083 ms

Loss rate: 0.79%

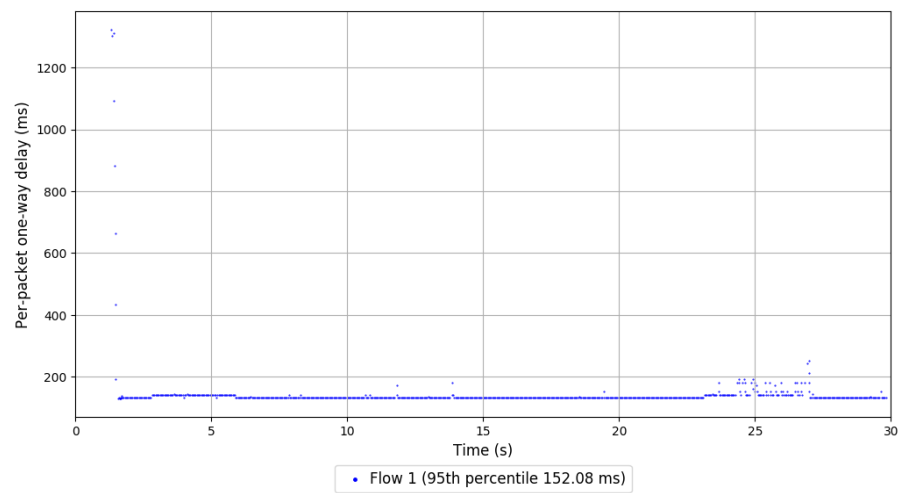
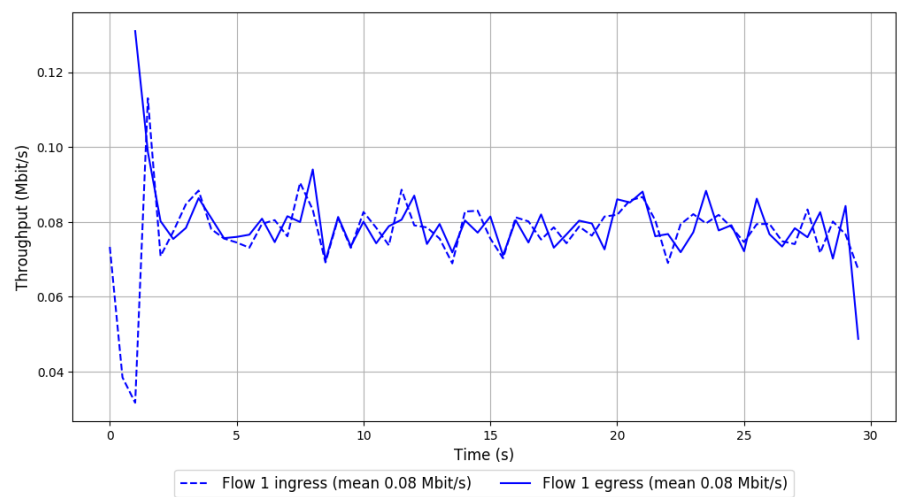
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 152.083 ms

Loss rate: 0.79%

Run 3: Report of SCRaM — Data Link

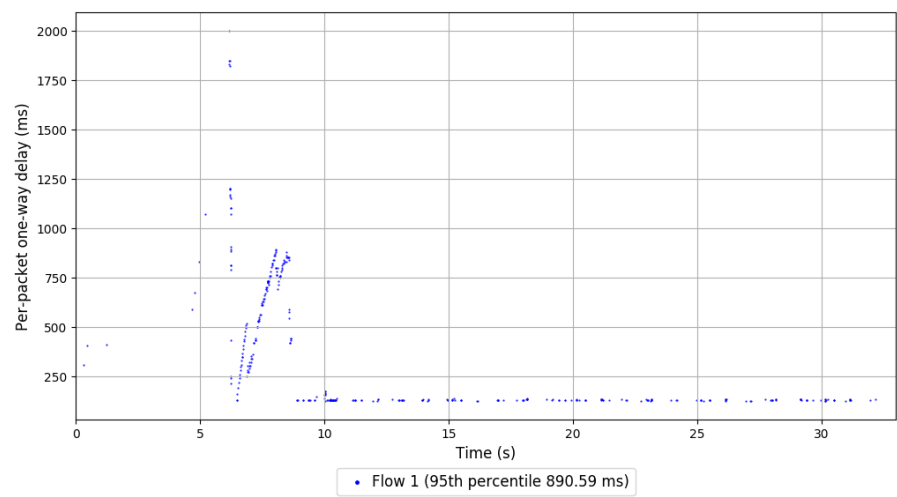
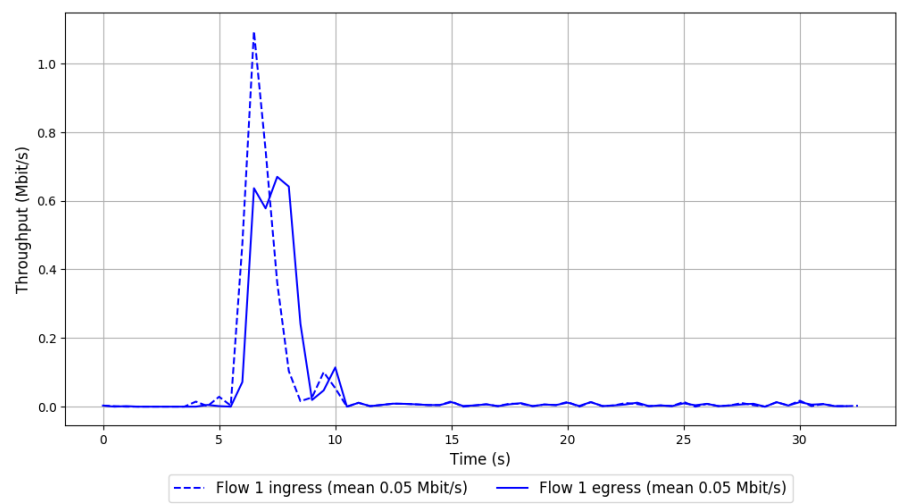


```
Run 1: Statistics of WebRTC media

Start at: 2018-04-16 20:54:23
End at: 2018-04-16 20:54:53
Local clock offset: -19.31 ms
Remote clock offset: 10.738 ms

# Below is generated by plot.py at 2018-04-16 22:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 890.594 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 890.594 ms
Loss rate: 0.08%
```


Run 1: Report of WebRTC media — Data Link

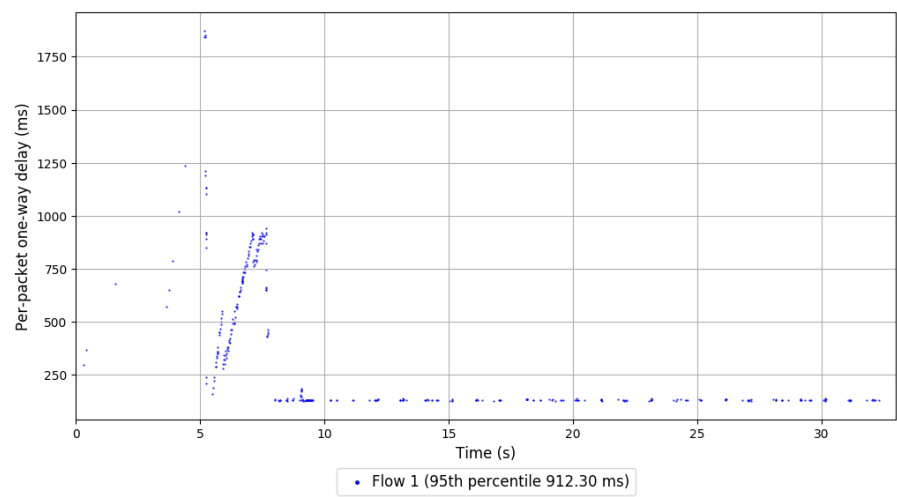
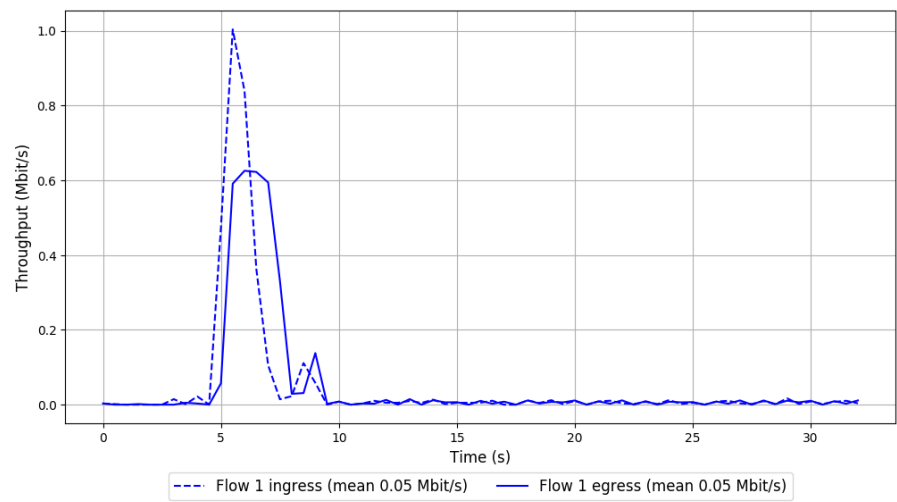


Run 2: Statistics of WebRTC media

Start at: 2018-04-16 21:14:28
End at: 2018-04-16 21:14:58
Local clock offset: -10.865 ms
Remote clock offset: 10.758 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 912.299 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 912.299 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-04-16 21:34:37

End at: 2018-04-16 21:35:07

Local clock offset: -7.713 ms

Remote clock offset: 5.738 ms

Below is generated by plot.py at 2018-04-16 22:47:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 856.920 ms

Loss rate: 0.00%

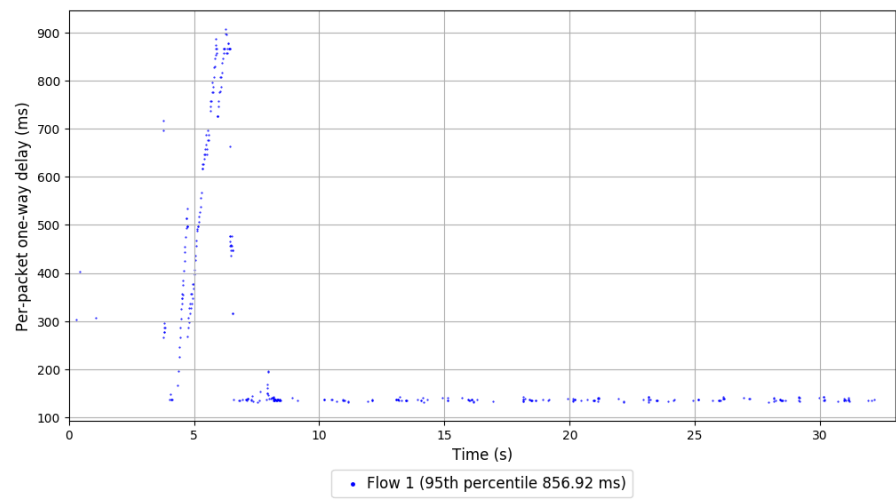
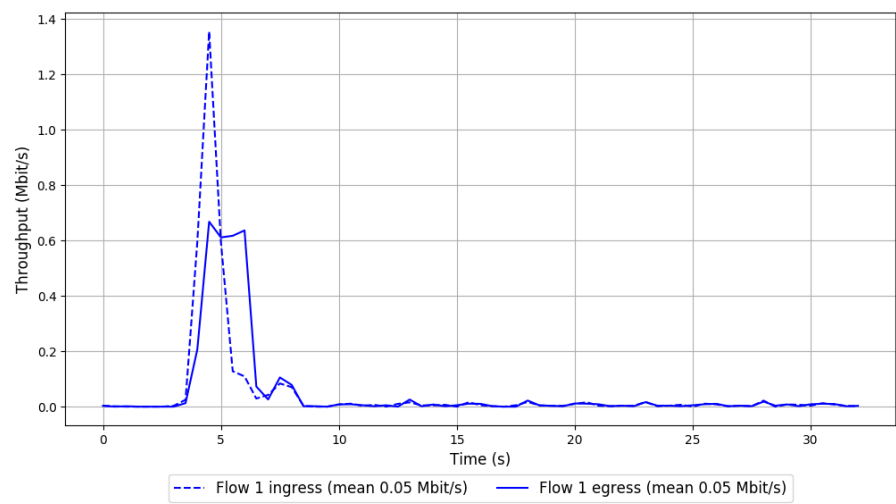
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 856.920 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

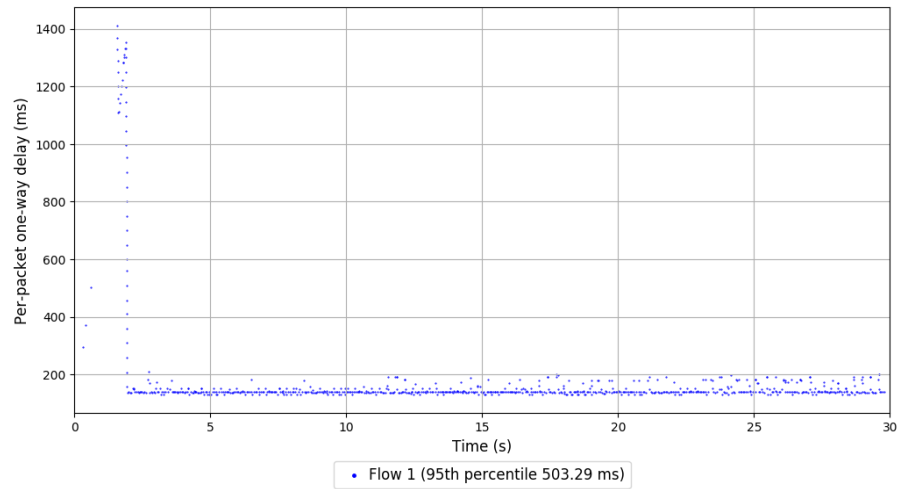
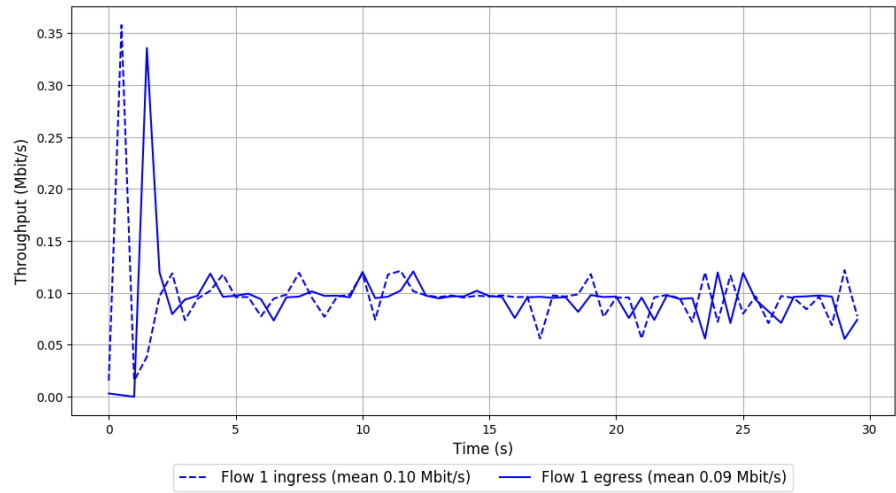


Run 1: Statistics of Sprout

Start at: 2018-04-16 20:47:06
End at: 2018-04-16 20:47:36
Local clock offset: -20.828 ms
Remote clock offset: 6.779 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 503.292 ms
Loss rate: 2.31%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 503.292 ms
Loss rate: 2.31%

Run 1: Report of Sprout — Data Link

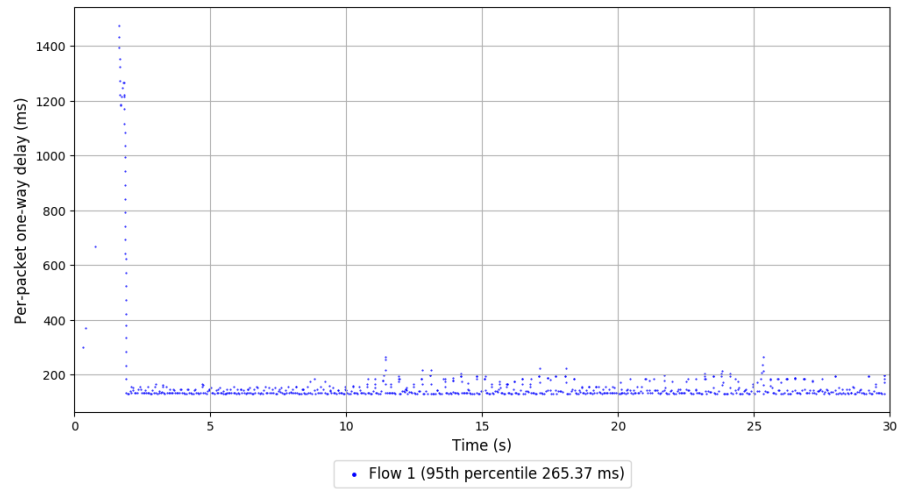
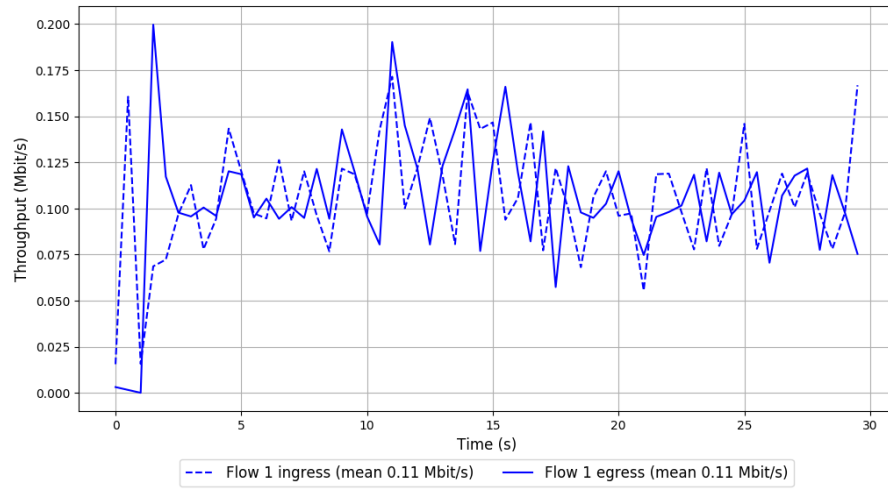


Run 2: Statistics of Sprout

Start at: 2018-04-16 21:07:23
End at: 2018-04-16 21:07:53
Local clock offset: -11.775 ms
Remote clock offset: 5.808 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 265.372 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 0.11 Mbit/s
95th percentile per-packet one-way delay: 265.372 ms
Loss rate: 1.51%

Run 2: Report of Sprout — Data Link

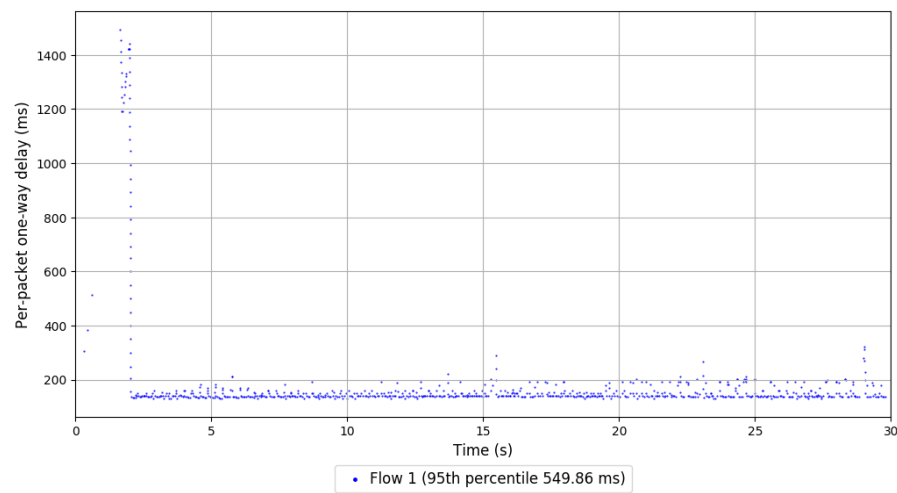
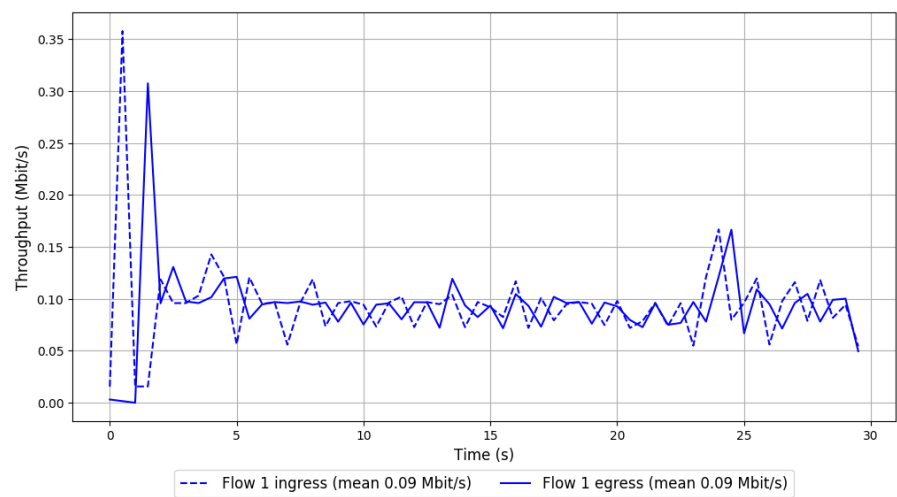


Run 3: Statistics of Sprout

Start at: 2018-04-16 21:27:32
End at: 2018-04-16 21:28:02
Local clock offset: -10.934 ms
Remote clock offset: 5.907 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 549.855 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 549.855 ms
Loss rate: 1.90%

Run 3: Report of Sprout — Data Link

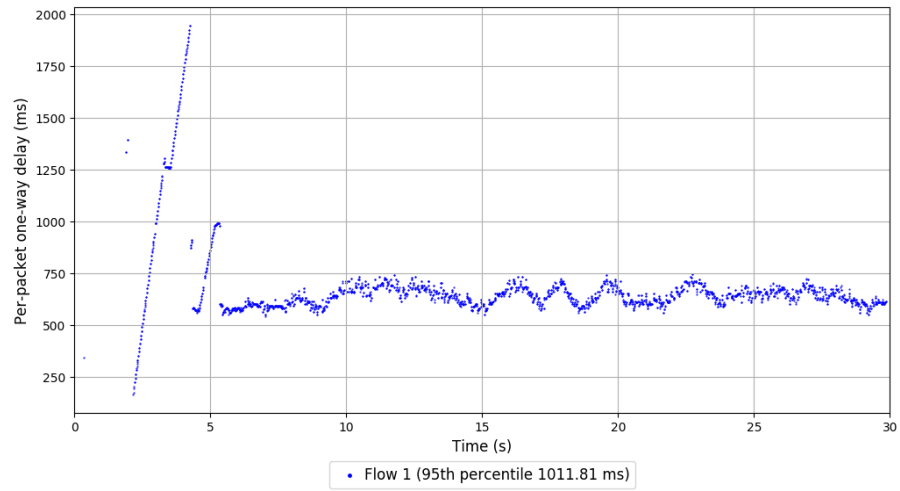
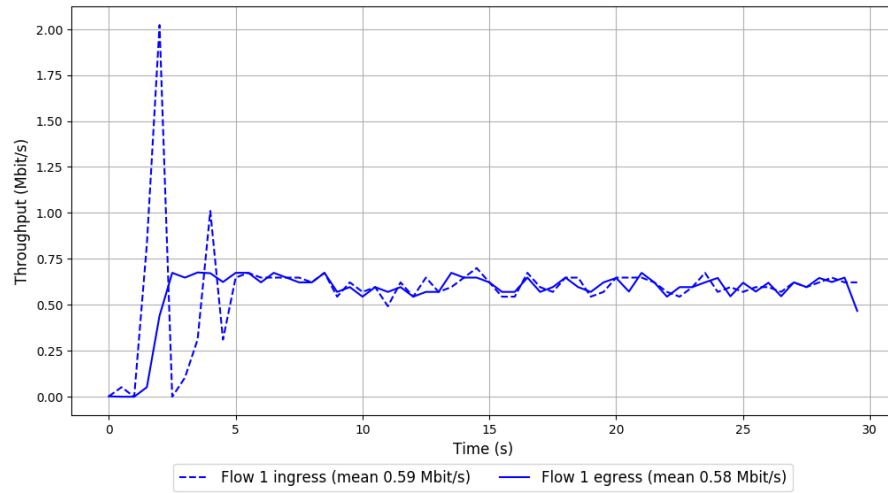


```
Run 1: Statistics of TaoVA-100x

Start at: 2018-04-16 20:59:05
End at: 2018-04-16 20:59:35
Local clock offset: -14.343 ms
Remote clock offset: 11.518 ms

# Below is generated by plot.py at 2018-04-16 22:47:54
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1011.807 ms
Loss rate: 2.80%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1011.807 ms
Loss rate: 2.80%
```

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



Run 2: Statistics of TaoVA-100x

Start at: 2018-04-16 21:19:10

End at: 2018-04-16 21:19:40

Local clock offset: -10.6 ms

Remote clock offset: 6.831 ms

Below is generated by plot.py at 2018-04-16 22:47:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1025.071 ms

Loss rate: 2.57%

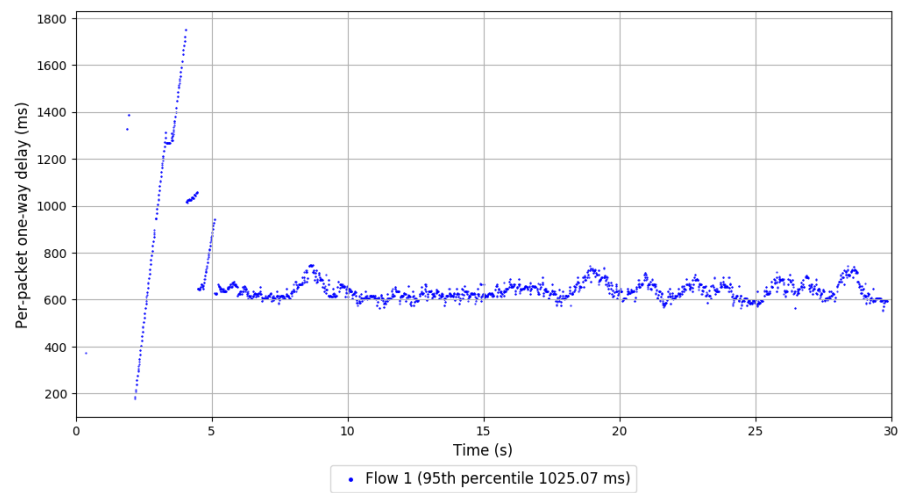
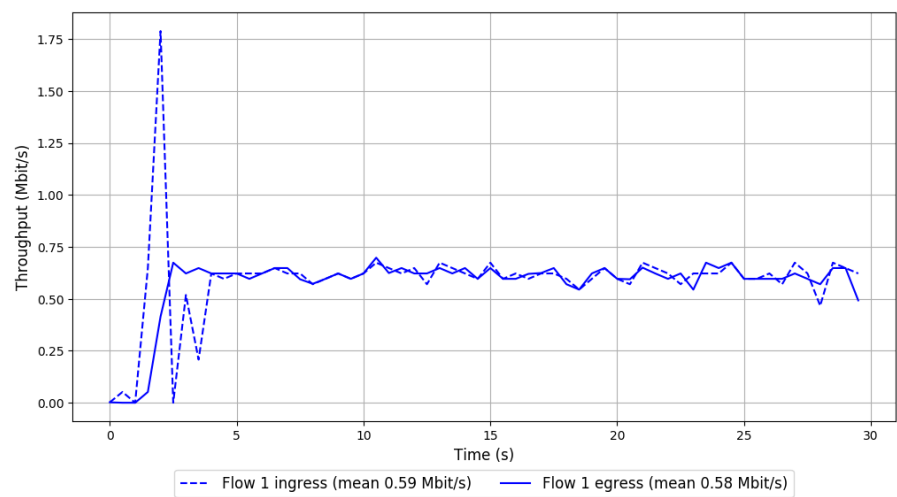
-- Flow 1:

Average throughput: 0.58 Mbit/s

95th percentile per-packet one-way delay: 1025.071 ms

Loss rate: 2.57%

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

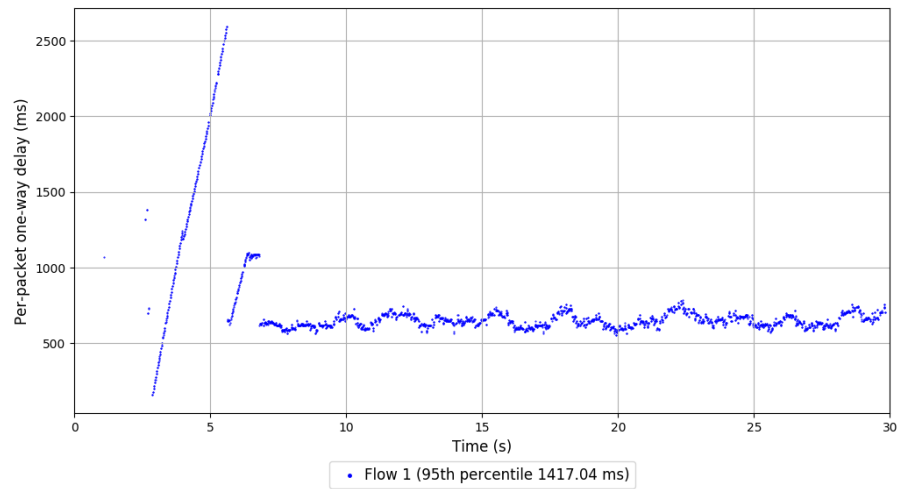
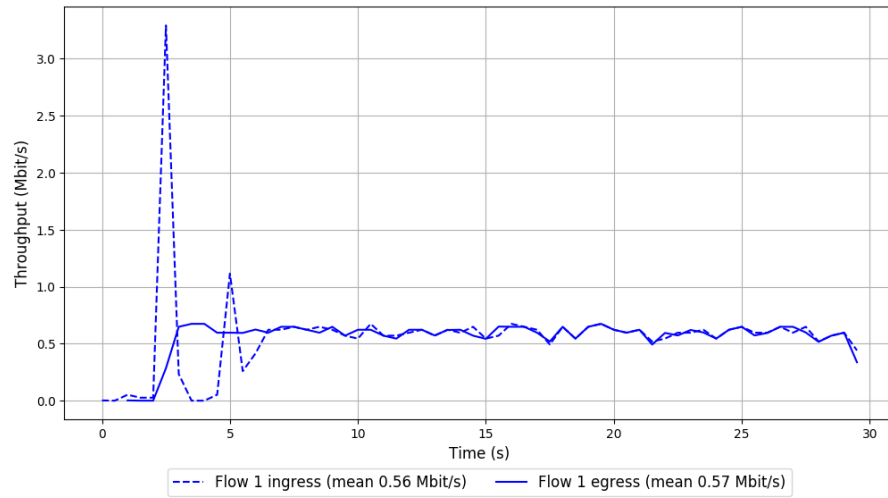


Run 3: Statistics of TaoVA-100x

Start at: 2018-04-16 21:39:19
End at: 2018-04-16 21:39:49
Local clock offset: -7.515 ms
Remote clock offset: 11.399 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1417.041 ms
Loss rate: 2.70%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 1417.041 ms
Loss rate: 2.70%

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

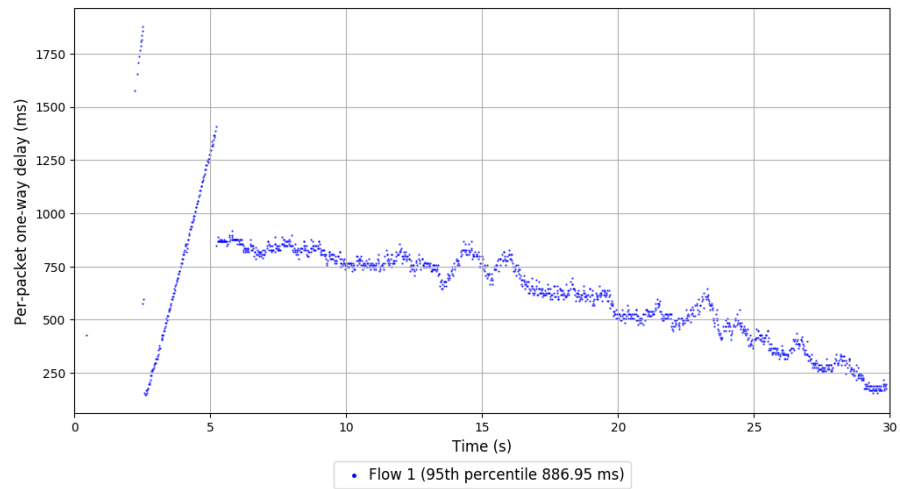
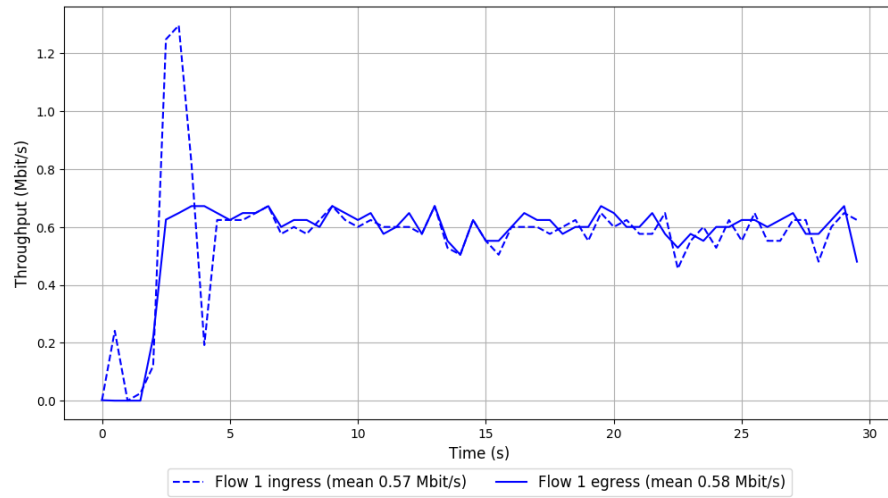


Run 1: Statistics of TCP Vegas

Start at: 2018-04-16 20:50:50
End at: 2018-04-16 20:51:20
Local clock offset: -22.346 ms
Remote clock offset: 11.687 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 886.954 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 886.954 ms
Loss rate: 1.12%

Run 1: Report of TCP Vegas — Data Link

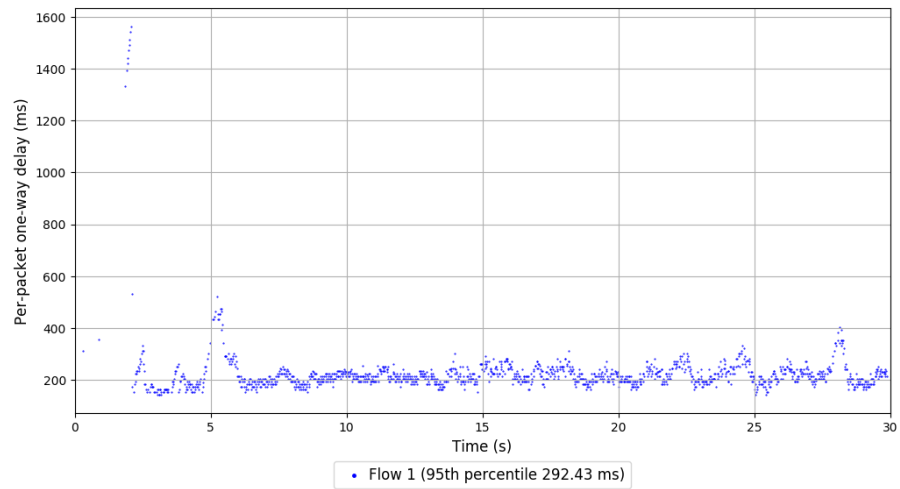
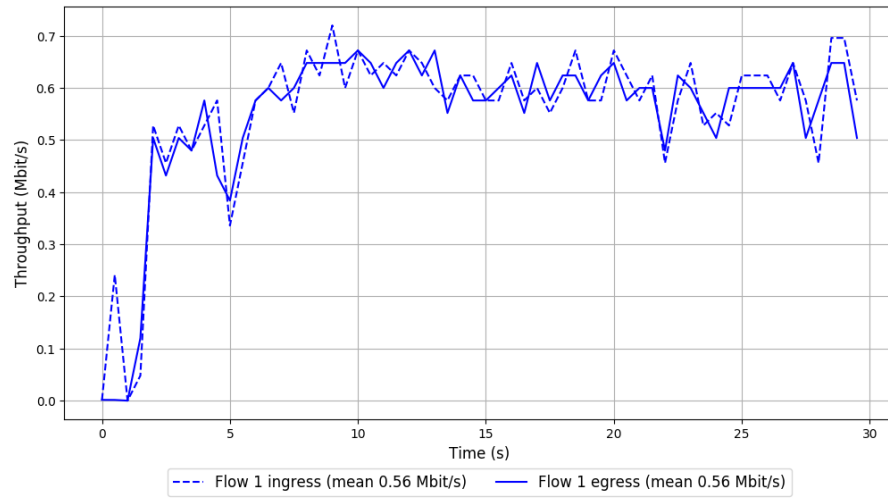


Run 2: Statistics of TCP Vegas

Start at: 2018-04-16 21:10:55
End at: 2018-04-16 21:11:25
Local clock offset: -10.789 ms
Remote clock offset: 10.73 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 292.432 ms
Loss rate: 1.22%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 292.432 ms
Loss rate: 1.22%

Run 2: Report of TCP Vegas — Data Link

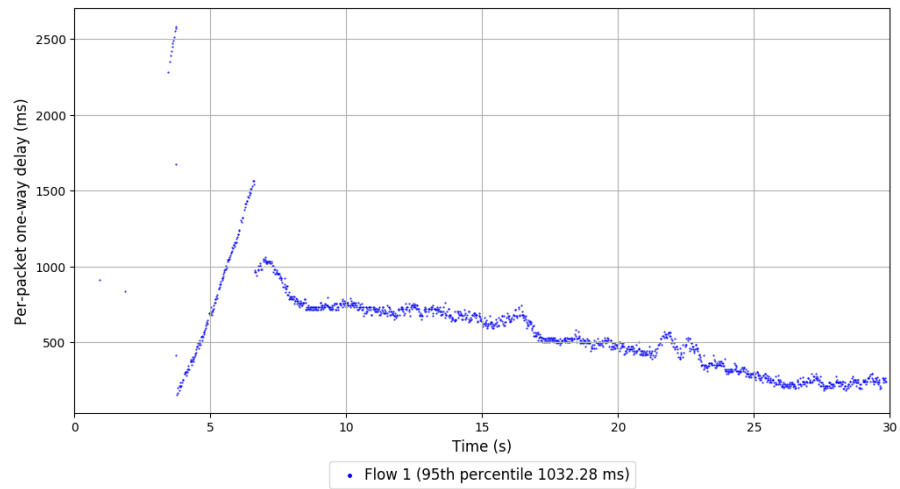
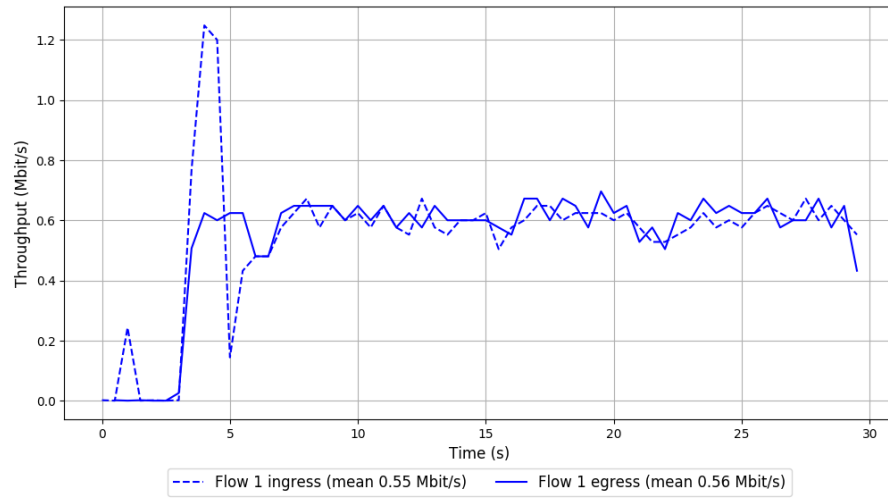


Run 3: Statistics of TCP Vegas

Start at: 2018-04-16 21:31:04
End at: 2018-04-16 21:31:35
Local clock offset: -8.94 ms
Remote clock offset: 11.488 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 1032.275 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 1032.275 ms
Loss rate: 1.32%

Run 3: Report of TCP Vegas — Data Link

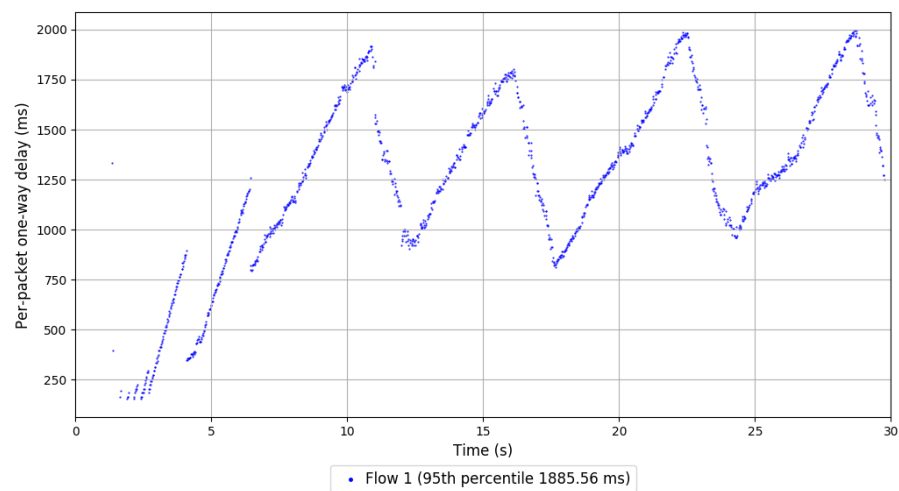
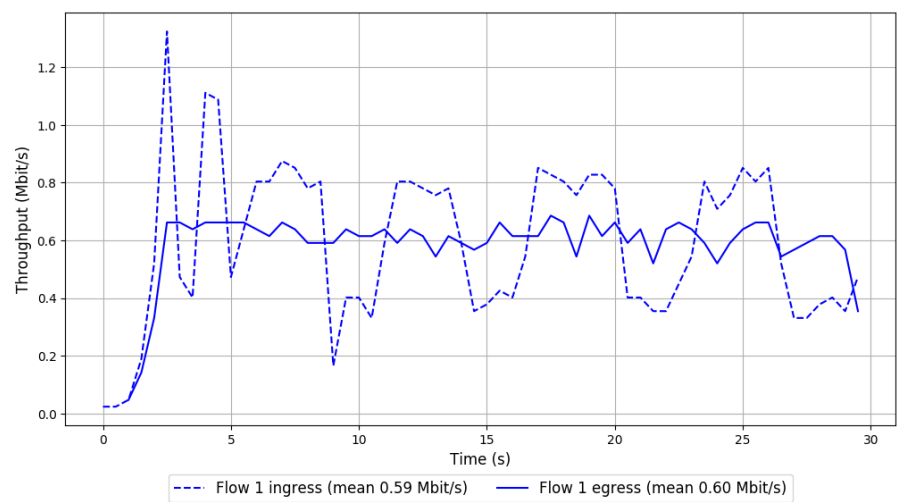


Run 1: Statistics of Verus

Start at: 2018-04-16 21:01:28
End at: 2018-04-16 21:01:58
Local clock offset: -13.486 ms
Remote clock offset: 6.705 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1885.559 ms
Loss rate: 3.40%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1885.559 ms
Loss rate: 3.40%

Run 1: Report of Verus — Data Link

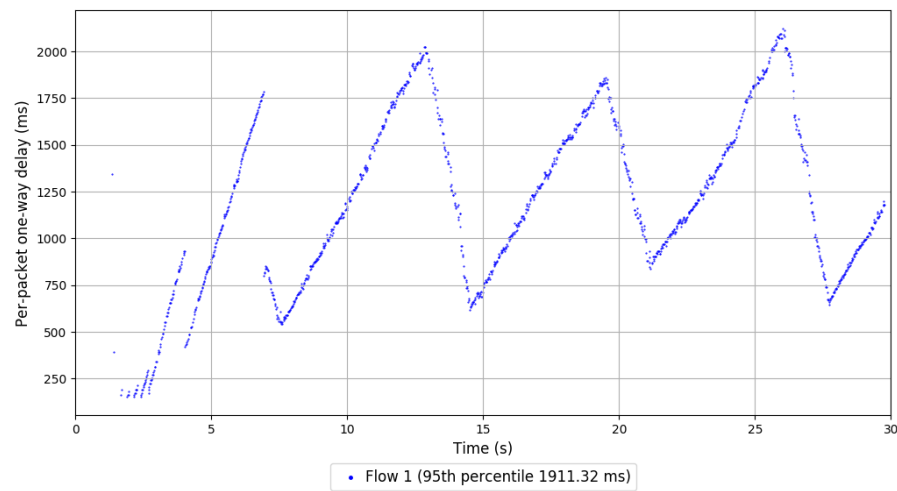
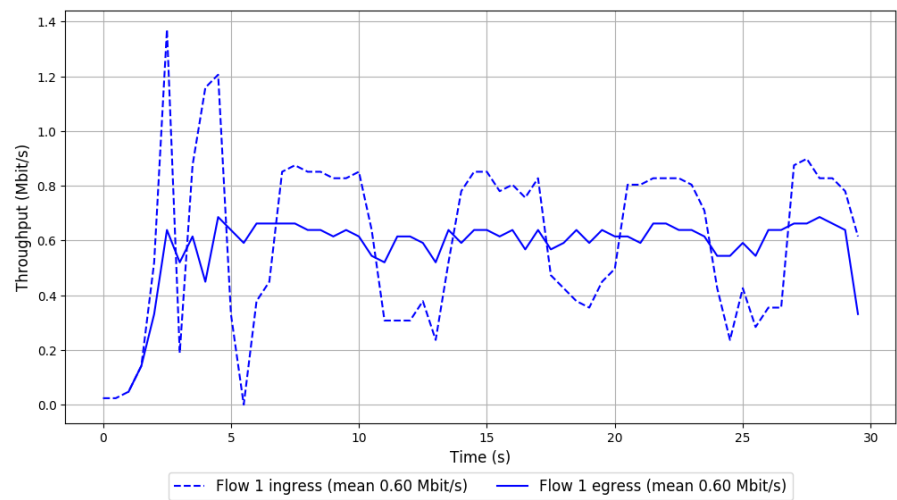


Run 2: Statistics of Verus

Start at: 2018-04-16 21:21:33
End at: 2018-04-16 21:22:03
Local clock offset: -11.785 ms
Remote clock offset: 11.687 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1911.317 ms
Loss rate: 5.70%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1911.317 ms
Loss rate: 5.70%

Run 2: Report of Verus — Data Link

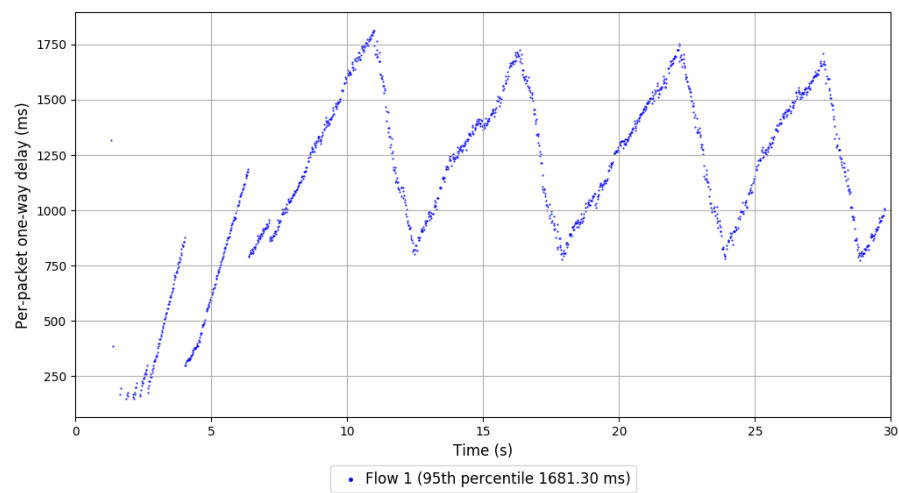
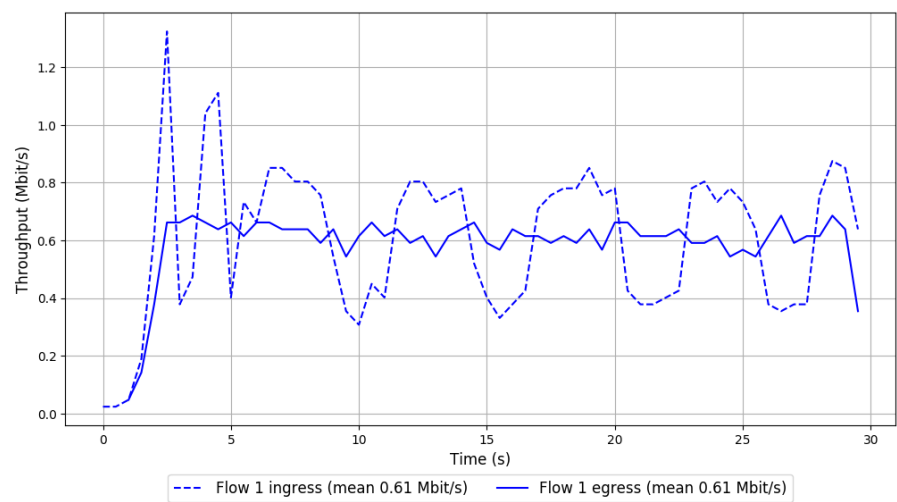


Run 3: Statistics of Verus

Start at: 2018-04-16 21:41:41
End at: 2018-04-16 21:42:11
Local clock offset: -7.276 ms
Remote clock offset: 11.384 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1681.295 ms
Loss rate: 5.08%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1681.295 ms
Loss rate: 5.08%

Run 3: Report of Verus — Data Link

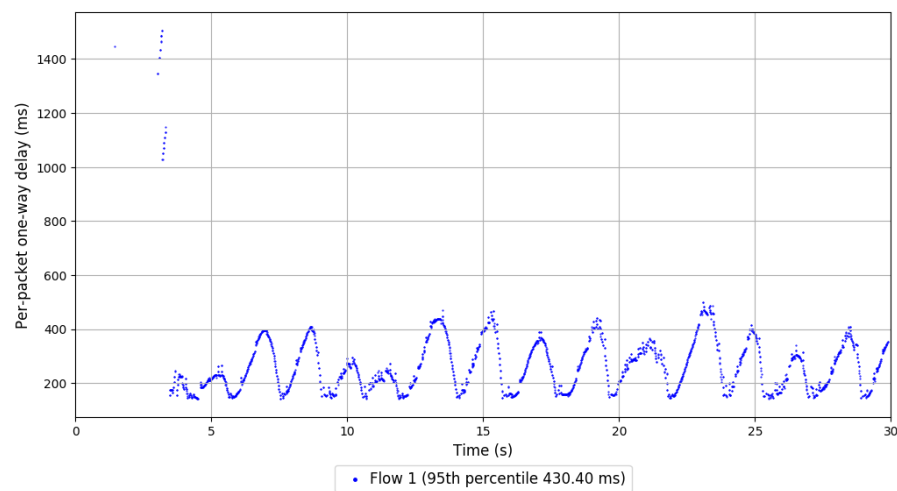
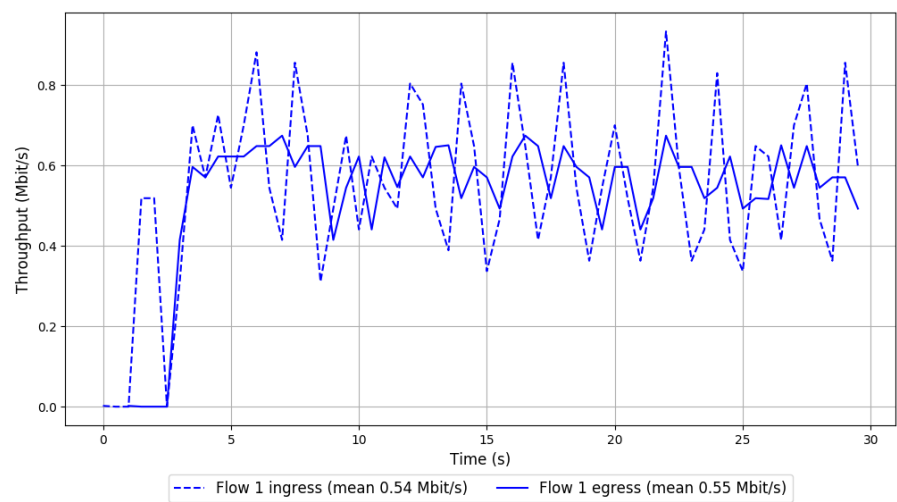


Run 1: Statistics of Copa

Start at: 2018-04-16 20:57:55
End at: 2018-04-16 20:58:25
Local clock offset: -15.243 ms
Remote clock offset: 5.808 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 430.399 ms
Loss rate: 4.30%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 430.399 ms
Loss rate: 4.30%

Run 1: Report of Copa — Data Link

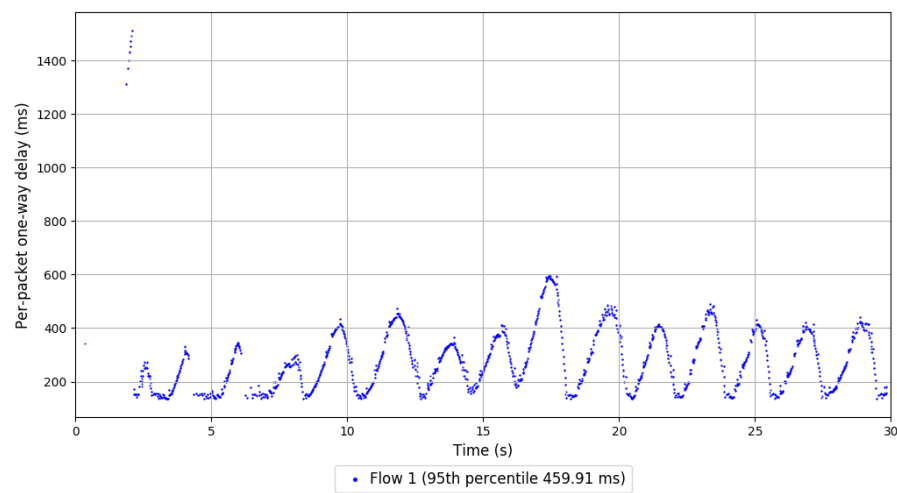
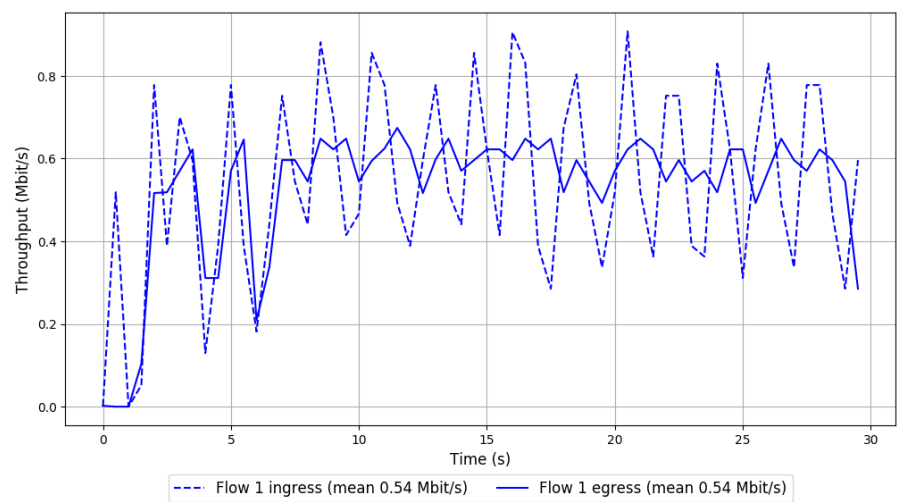


Run 2: Statistics of Copa

Start at: 2018-04-16 21:17:59
End at: 2018-04-16 21:18:29
Local clock offset: -10.441 ms
Remote clock offset: 11.641 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 459.909 ms
Loss rate: 2.56%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 459.909 ms
Loss rate: 2.56%

Run 2: Report of Copa — Data Link

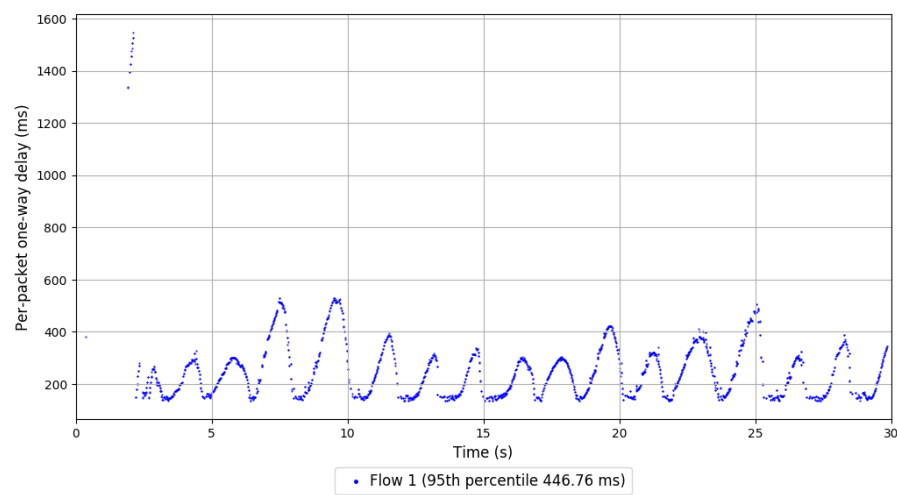
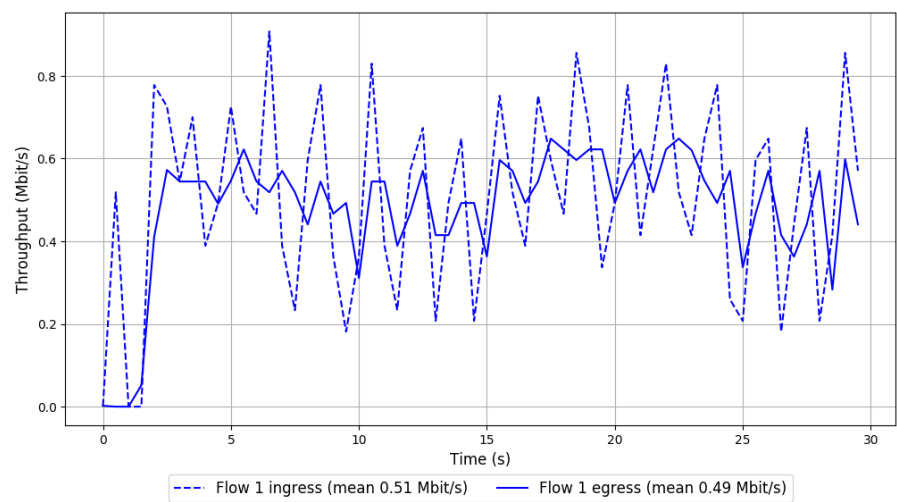


Run 3: Statistics of Copa

Start at: 2018-04-16 21:38:08
End at: 2018-04-16 21:38:38
Local clock offset: -7.755 ms
Remote clock offset: 11.381 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 446.758 ms
Loss rate: 4.46%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 446.758 ms
Loss rate: 4.46%

Run 3: Report of Copa — Data Link

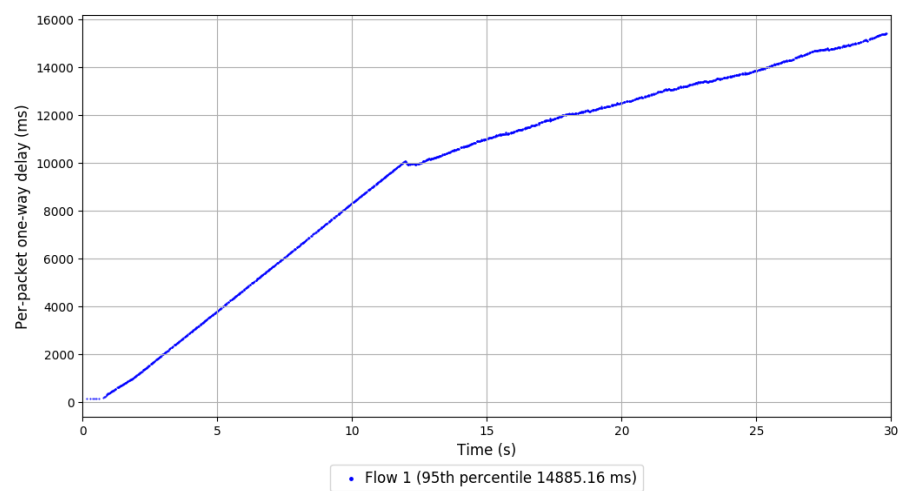
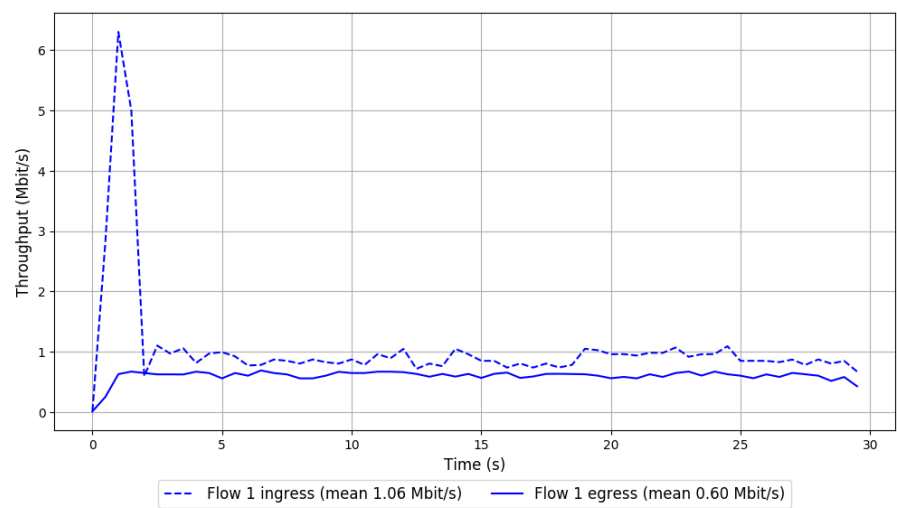


Run 1: Statistics of FillP

Start at: 2018-04-16 20:49:30
End at: 2018-04-16 20:50:00
Local clock offset: -22.59 ms
Remote clock offset: 11.654 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 14885.157 ms
Loss rate: 43.42%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 14885.157 ms
Loss rate: 43.42%

Run 1: Report of FillP — Data Link

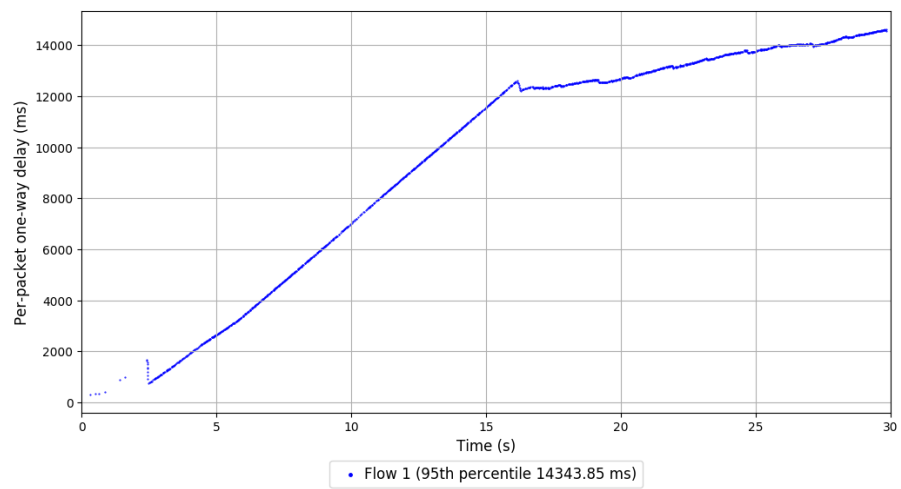
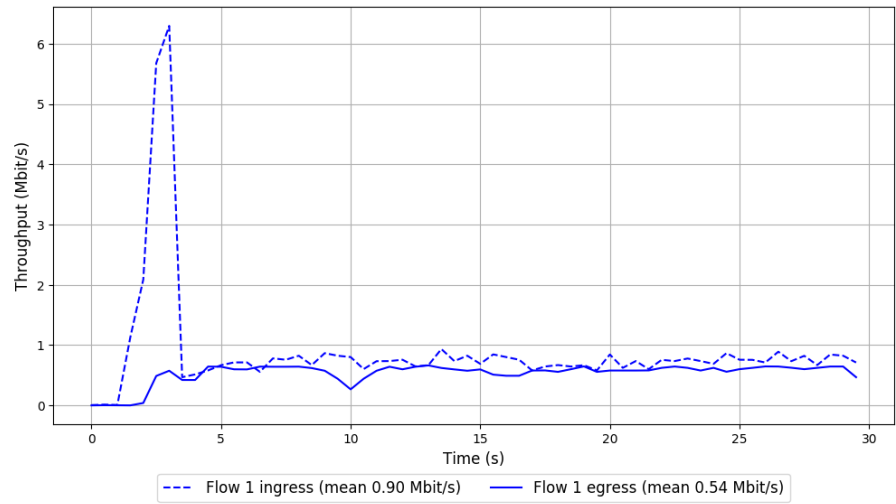


Run 2: Statistics of FillP

Start at: 2018-04-16 21:09:44
End at: 2018-04-16 21:10:14
Local clock offset: -10.755 ms
Remote clock offset: 6.763 ms

Below is generated by plot.py at 2018-04-16 22:47:54
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 14343.850 ms
Loss rate: 40.28%
-- Flow 1:
Average throughput: 0.54 Mbit/s
95th percentile per-packet one-way delay: 14343.850 ms
Loss rate: 40.28%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-04-16 21:29:54

End at: 2018-04-16 21:30:24

Local clock offset: -9.514 ms

Remote clock offset: 6.615 ms

Below is generated by plot.py at 2018-04-16 22:47:54

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 13708.112 ms

Loss rate: 37.84%

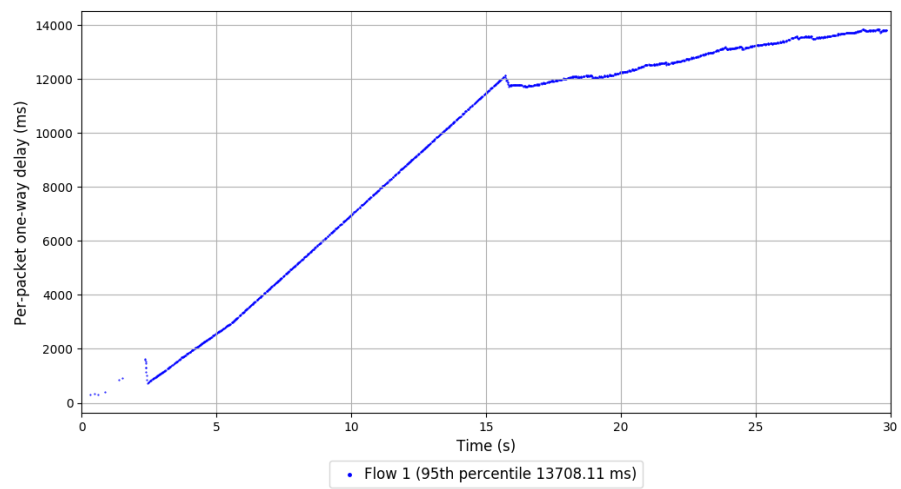
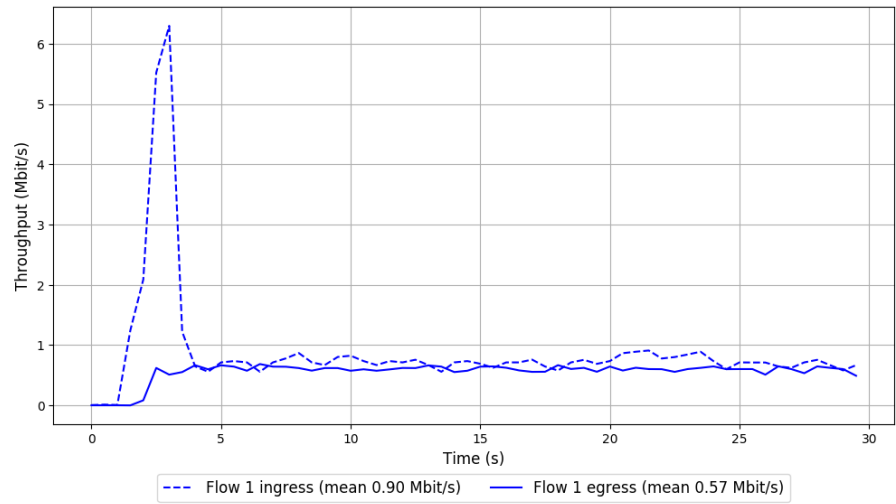
-- Flow 1:

Average throughput: 0.57 Mbit/s

95th percentile per-packet one-way delay: 13708.112 ms

Loss rate: 37.84%

Run 3: Report of FillP — Data Link

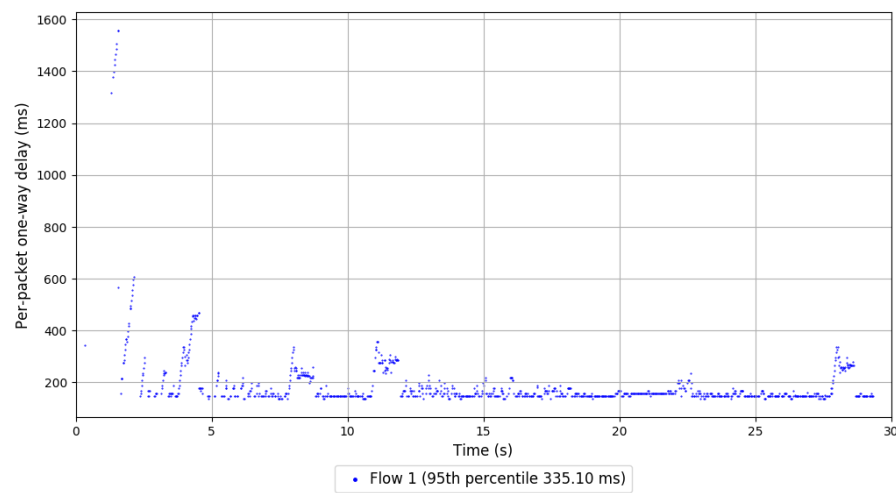
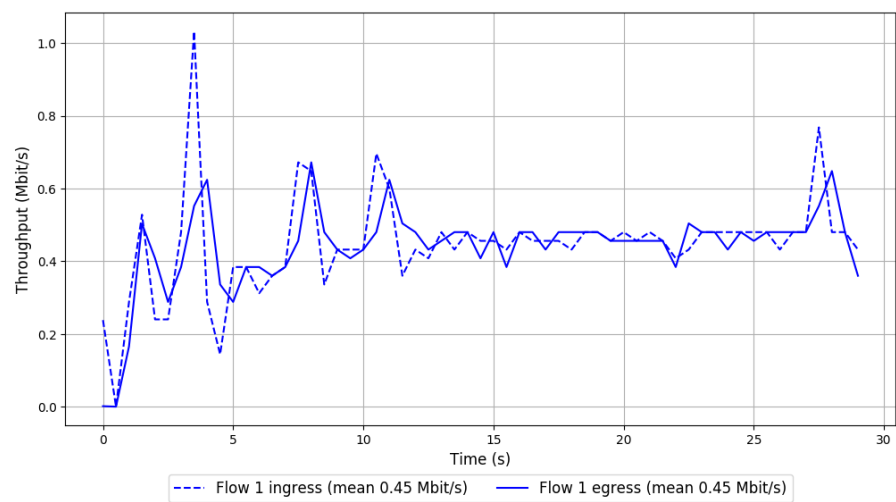


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-04-16 20:48:17
End at: 2018-04-16 20:48:47
Local clock offset: -21.376 ms
Remote clock offset: 11.634 ms

# Below is generated by plot.py at 2018-04-16 22:47:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 335.098 ms
Loss rate: 1.55%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 335.098 ms
Loss rate: 1.55%
```

Run 1: Report of Indigo-1-32 — Data Link

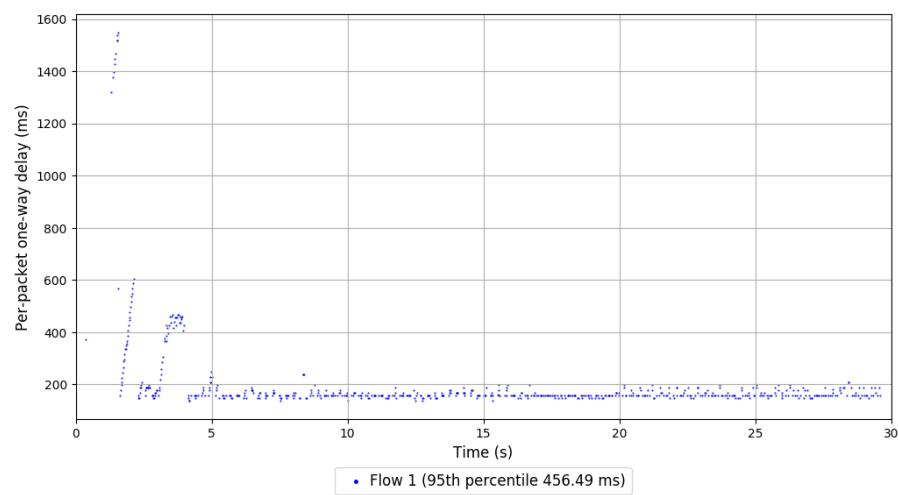
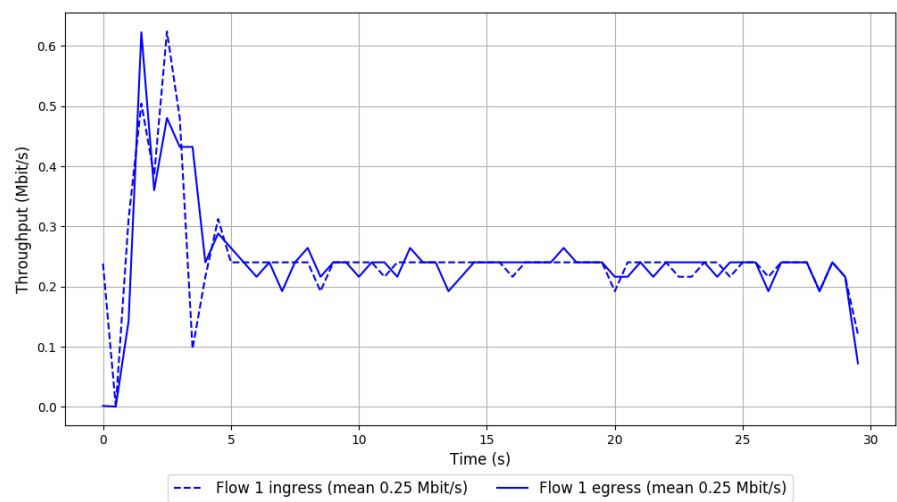


Run 2: Statistics of Indigo-1-32

Start at: 2018-04-16 21:08:33
End at: 2018-04-16 21:09:04
Local clock offset: -11.605 ms
Remote clock offset: 10.702 ms

Below is generated by plot.py at 2018-04-16 22:47:55
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 456.485 ms
Loss rate: 1.63%
-- Flow 1:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 456.485 ms
Loss rate: 1.63%

Run 2: Report of Indigo-1-32 — Data Link

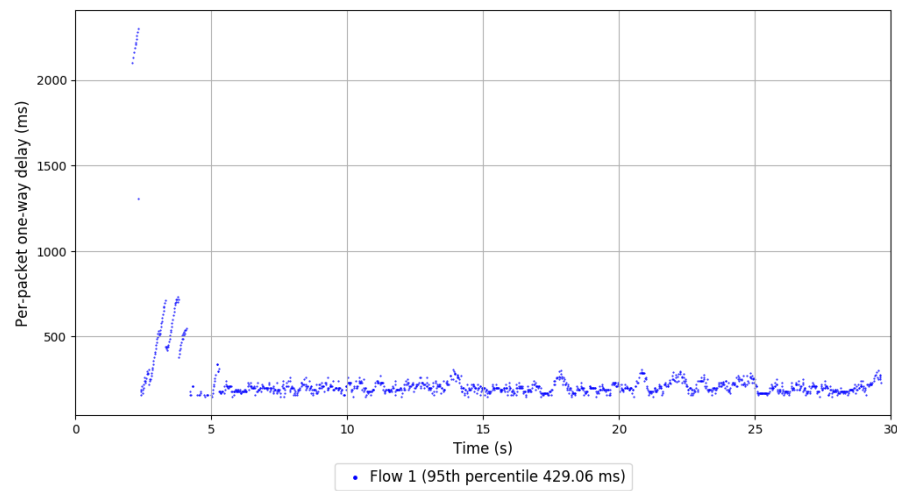
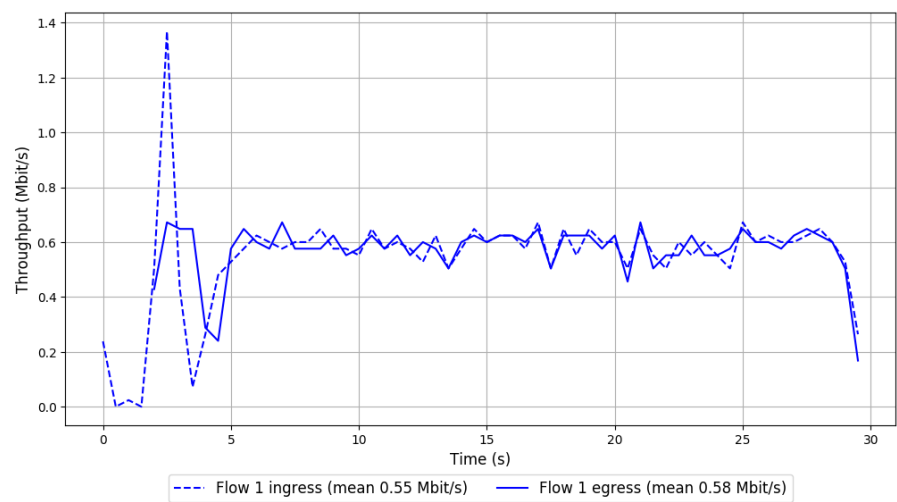


Run 3: Statistics of Indigo-1-32

Start at: 2018-04-16 21:28:42
End at: 2018-04-16 21:29:13
Local clock offset: -10.932 ms
Remote clock offset: 5.928 ms

Below is generated by plot.py at 2018-04-16 22:47:56
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 429.064 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 429.064 ms
Loss rate: 1.48%

Run 3: Report of Indigo-1-32 — Data Link

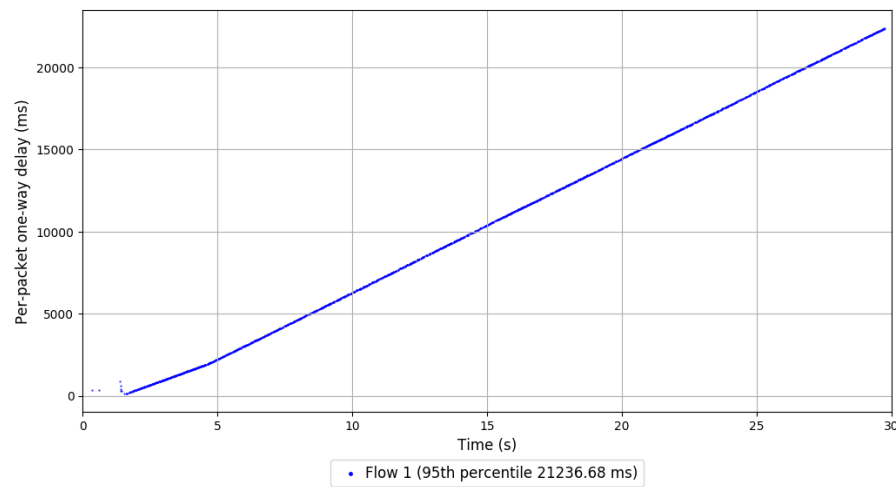
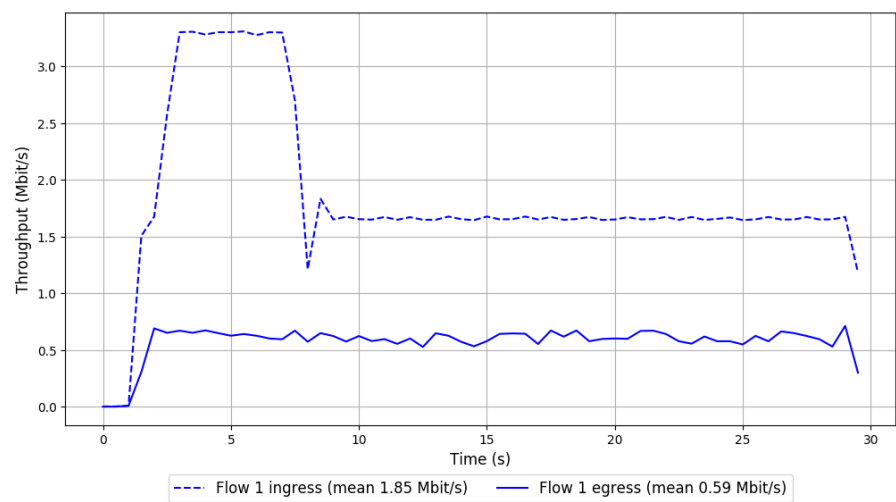


Run 1: Statistics of PCC-Vivace

Start at: 2018-04-16 20:55:34
End at: 2018-04-16 20:56:04
Local clock offset: -17.652 ms
Remote clock offset: 11.456 ms

Below is generated by plot.py at 2018-04-16 22:47:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 21236.680 ms
Loss rate: 68.73%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 21236.680 ms
Loss rate: 68.73%

Run 1: Report of PCC-Vivace — Data Link

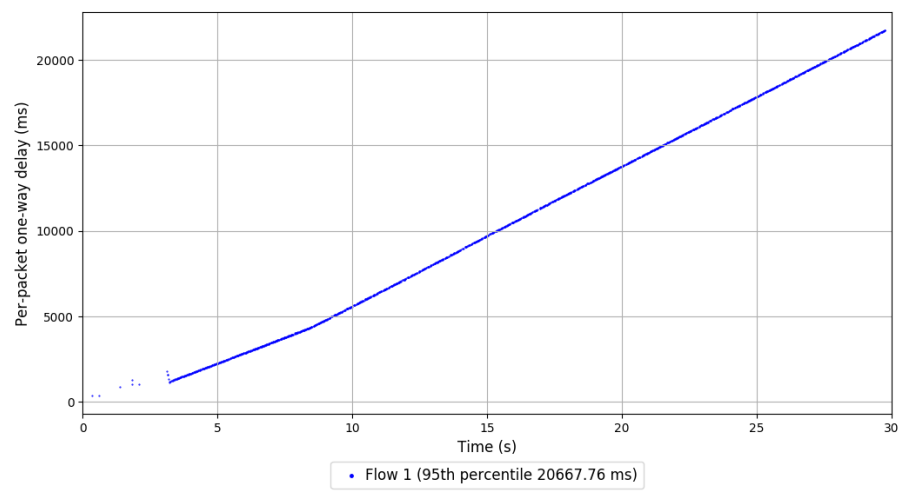
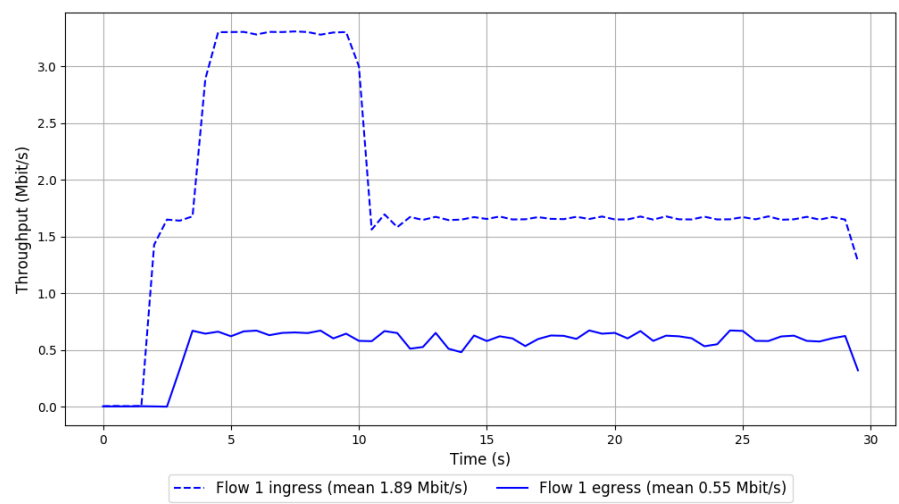


Run 2: Statistics of PCC-Vivace

Start at: 2018-04-16 21:15:38
End at: 2018-04-16 21:16:08
Local clock offset: -10.194 ms
Remote clock offset: 6.849 ms

Below is generated by plot.py at 2018-04-16 22:47:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 20667.756 ms
Loss rate: 71.18%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 20667.756 ms
Loss rate: 71.18%

Run 2: Report of PCC-Vivace — Data Link

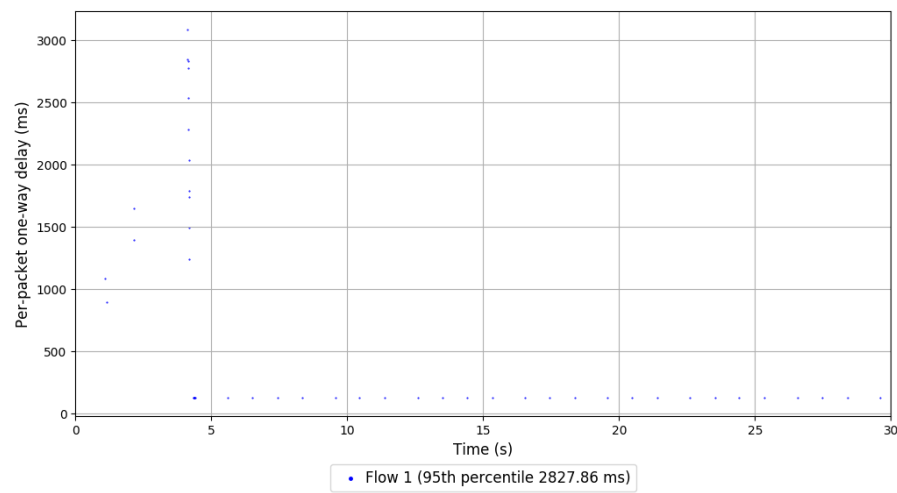
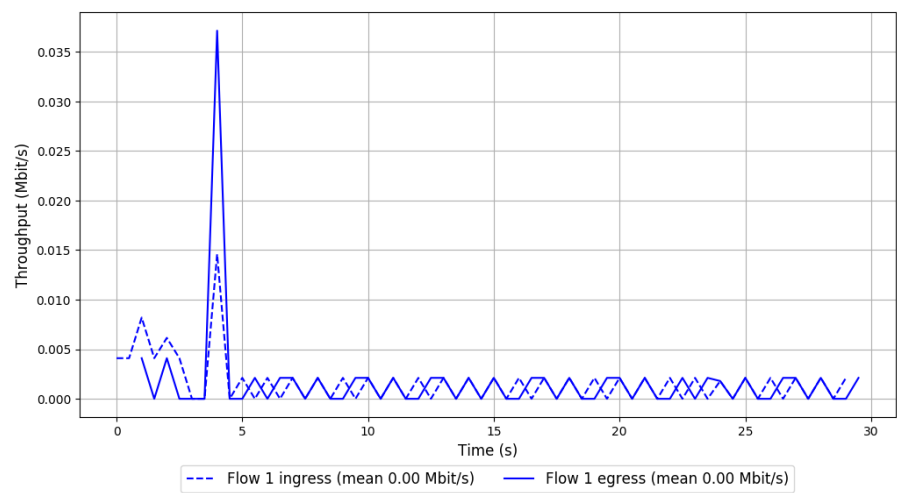


Run 3: Statistics of PCC-Vivace

Start at: 2018-04-16 21:35:47
End at: 2018-04-16 21:36:17
Local clock offset: -8.238 ms
Remote clock offset: 10.568 ms

Below is generated by plot.py at 2018-04-16 22:47:57
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 2827.861 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 2827.861 ms
Loss rate: 0.00%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2018-04-16 21:06:12
End at: 2018-04-16 21:06:42
Local clock offset: -11.168 ms
Remote clock offset: 11.549 ms

Run 1: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of PCC-Expr

Start at: 2018-04-16 21:26:21

End at: 2018-04-16 21:26:51

Local clock offset: -12.547 ms

Remote clock offset: 5.954 ms

Run 2: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of PCC-Expr

Start at: 2018-04-16 21:46:28

End at: 2018-04-16 21:46:58

Local clock offset: -7.107 ms

Remote clock offset: 11.288 ms

Run 3: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing