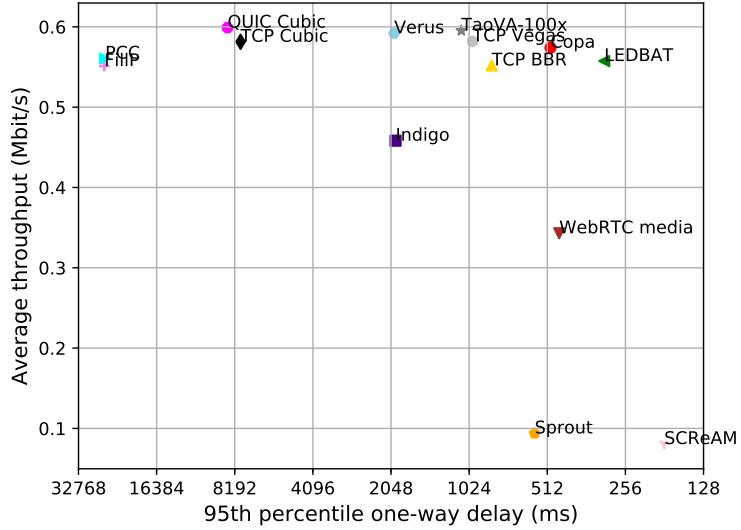


Pantheon Report

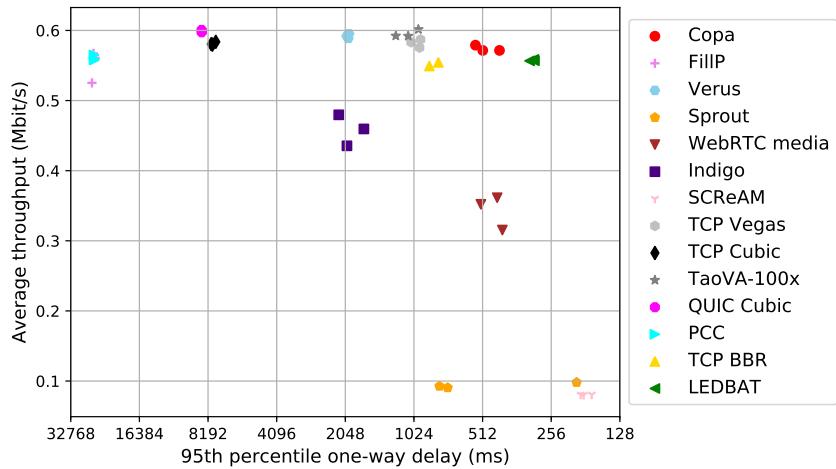
Generated at 2018-01-10 14:39:19 (UTC).
Data path: Colombia ppp0 (*remote*) → AWS Brazil 2 Ethernet (*local*).
Repeated the test of 14 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).
Tested BBR with qdisc 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 @ 56d1792c316a5efca3f2d21342905405fedffb48
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
M datagrump/sender.cc
third_party/fillp @ ec9585325218d5048c4d4152fa42240af54c6e67
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
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/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bfe749737437f61b1eaeeb30b267cde681
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/webrtc @ a488197ddd041ace68a42849b2540ad834825f42

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



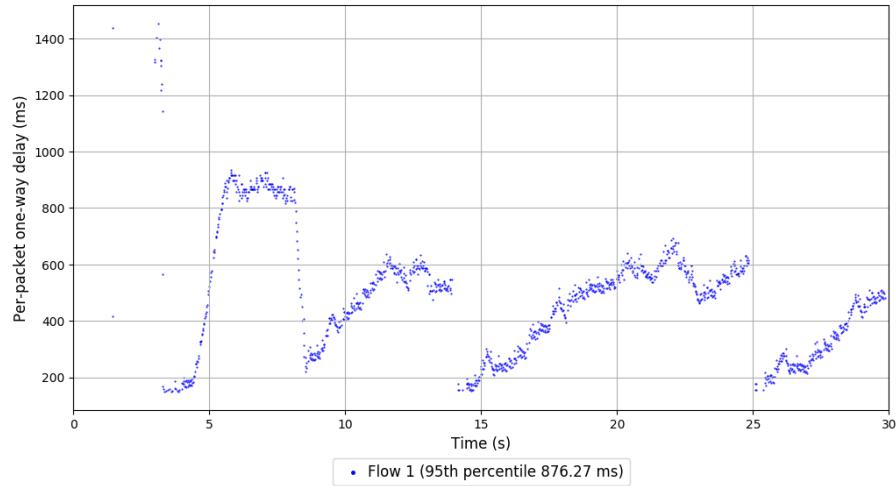
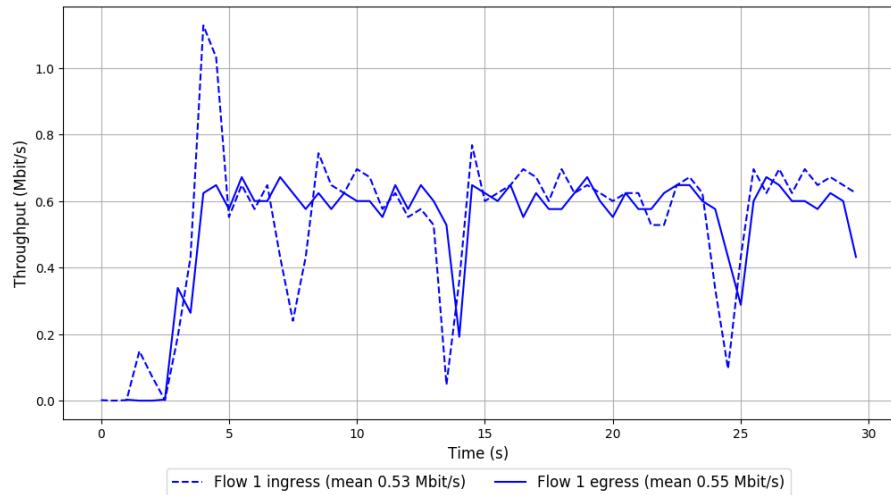
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	2	0.55	838.07	2.38
TCP Cubic	3	0.58	7779.32	30.85
LEDBAT	3	0.56	309.01	1.27
PCC	3	0.56	25867.79	57.44
QUIC Cubic	3	0.60	8733.76	31.89
SCReAM	3	0.08	181.51	0.66
WebRTC media	3	0.34	460.65	1.37
Sprout	3	0.09	572.57	1.07
TaoVA-100x	3	0.59	1098.13	2.71
TCP Vegas	3	0.58	993.45	1.49
Verus	3	0.59	1992.34	6.36
Copa	3	0.57	497.63	2.05
FillP	3	0.55	26051.26	64.28
Indigo	3	0.46	1967.05	3.60

Run 1: Statistics of TCP BBR

```
Start at: 2018-01-10 12:53:50
End at: 2018-01-10 12:54:20
Local clock offset: 2.481 ms
Remote clock offset: 0.161 ms

# Below is generated by plot.py at 2018-01-10 14:38:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 876.274 ms
Loss rate: 2.55%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 876.274 ms
Loss rate: 2.55%
```

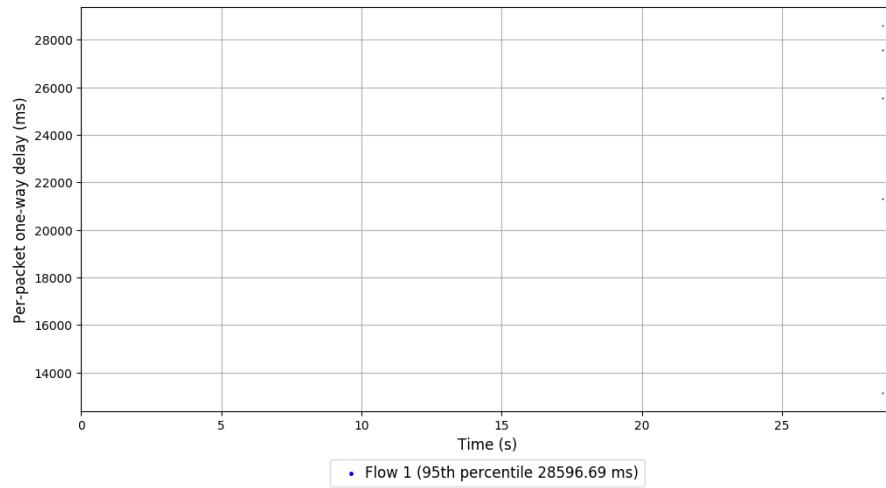
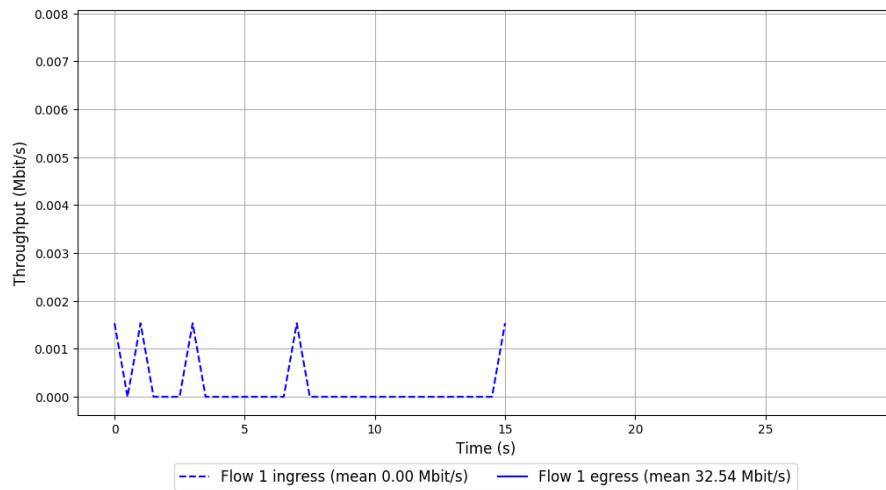
Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-01-10 13:11:26
End at: 2018-01-10 13:11:56
Local clock offset: 1.988 ms
Remote clock offset: -0.403 ms

Run 2: Report of TCP BBR — Data Link

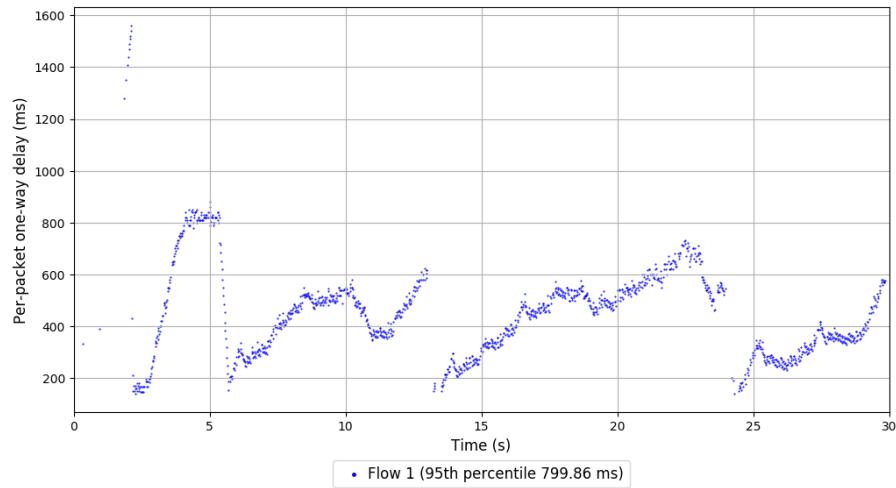
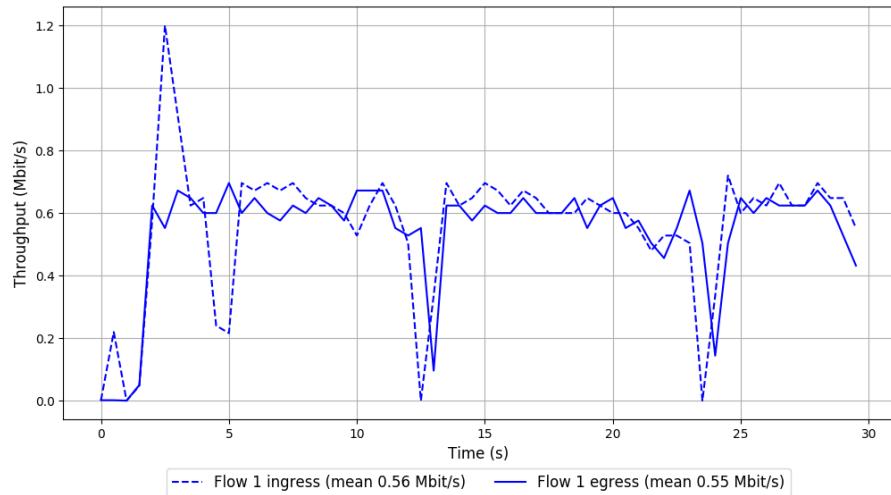


Run 3: Statistics of TCP BBR

```
Start at: 2018-01-10 13:28:59
End at: 2018-01-10 13:29:30
Local clock offset: 1.563 ms
Remote clock offset: -0.153 ms

# Below is generated by plot.py at 2018-01-10 14:38:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 799.860 ms
Loss rate: 2.22%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 799.860 ms
Loss rate: 2.22%
```

Run 3: Report of TCP BBR — Data Link

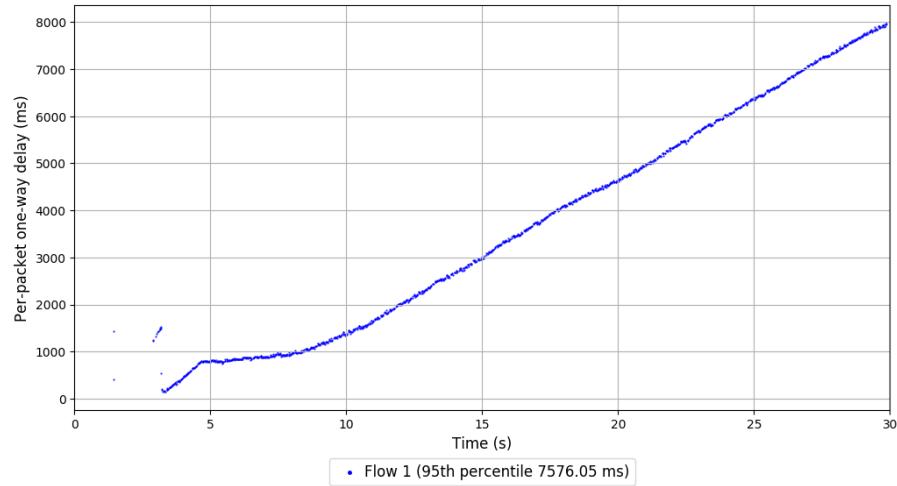
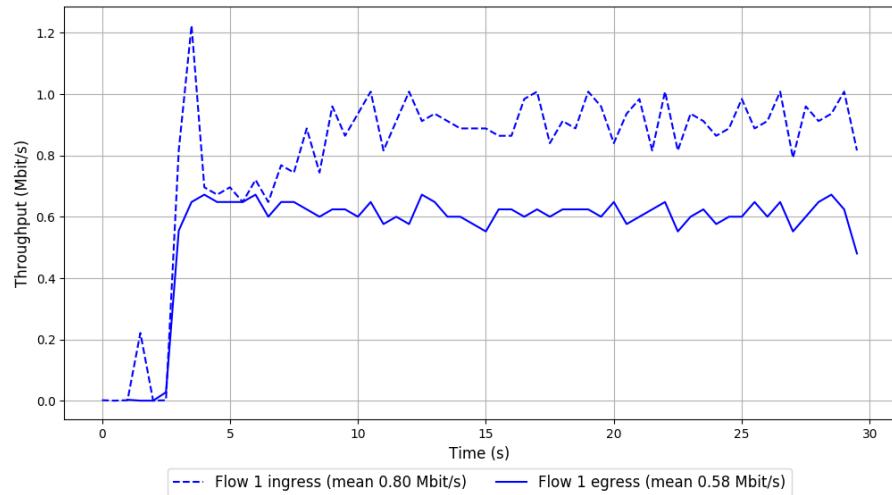


Run 1: Statistics of TCP Cubic

```
Start at: 2018-01-10 12:57:20
End at: 2018-01-10 12:57:50
Local clock offset: 2.44 ms
Remote clock offset: -5.755 ms

# Below is generated by plot.py at 2018-01-10 14:38:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 7576.046 ms
Loss rate: 30.77%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 7576.046 ms
Loss rate: 30.77%
```

Run 1: Report of TCP Cubic — Data Link

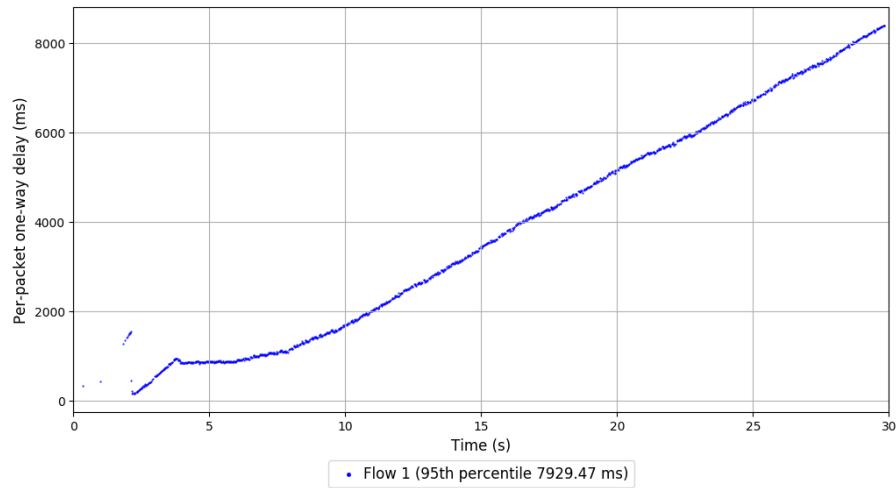
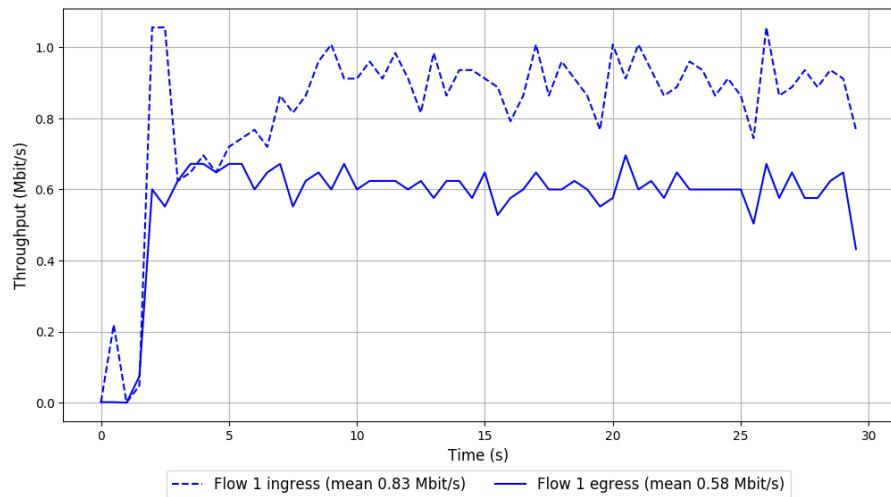


Run 2: Statistics of TCP Cubic

```
Start at: 2018-01-10 13:14:56
End at: 2018-01-10 13:15:26
Local clock offset: 1.892 ms
Remote clock offset: -5.269 ms

# Below is generated by plot.py at 2018-01-10 14:38:51
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 7929.466 ms
Loss rate: 30.89%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 7929.466 ms
Loss rate: 30.89%
```

Run 2: Report of TCP Cubic — Data Link

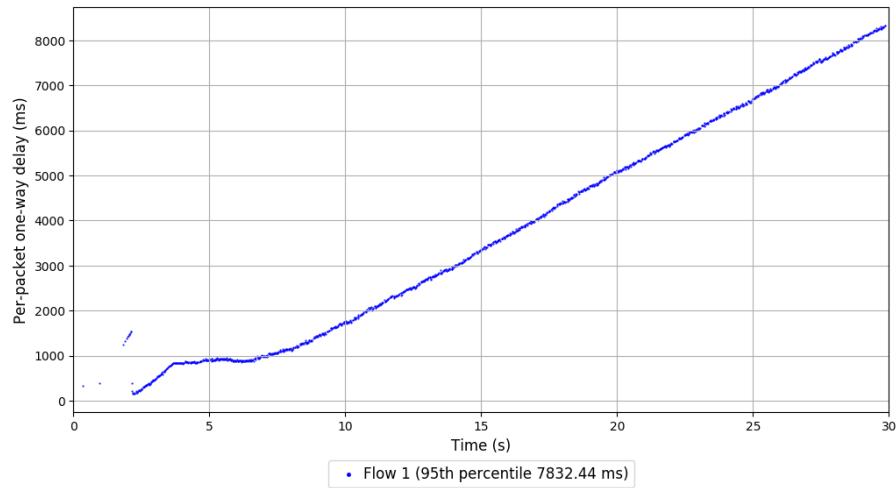
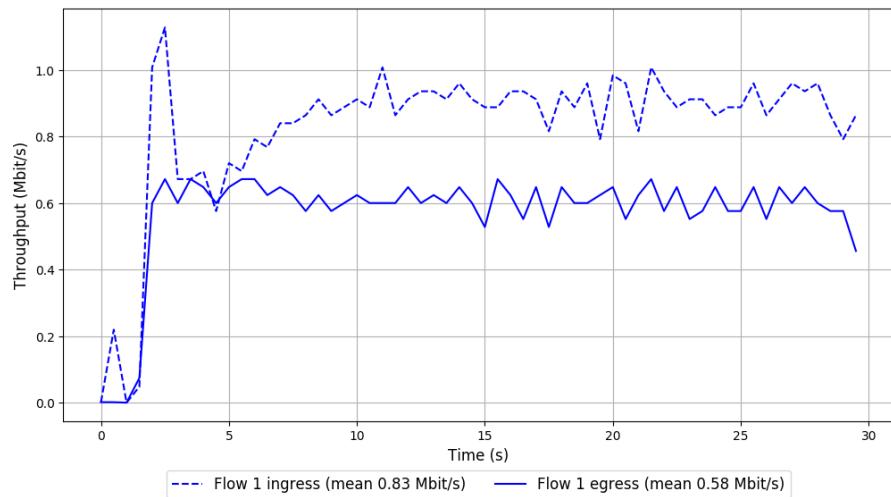


Run 3: Statistics of TCP Cubic

```
Start at: 2018-01-10 13:32:30
End at: 2018-01-10 13:33:00
Local clock offset: 1.494 ms
Remote clock offset: -0.451 ms

# Below is generated by plot.py at 2018-01-10 14:38:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 7832.436 ms
Loss rate: 30.89%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 7832.436 ms
Loss rate: 30.89%
```

Run 3: Report of TCP Cubic — Data Link

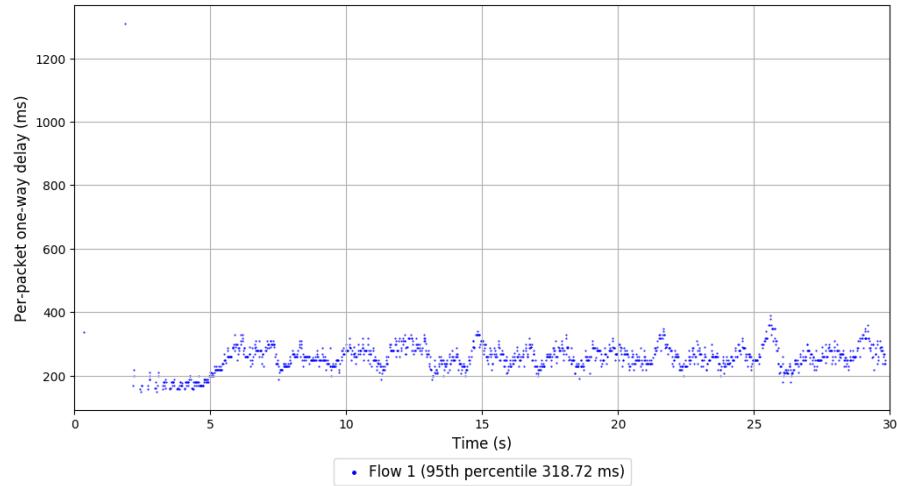
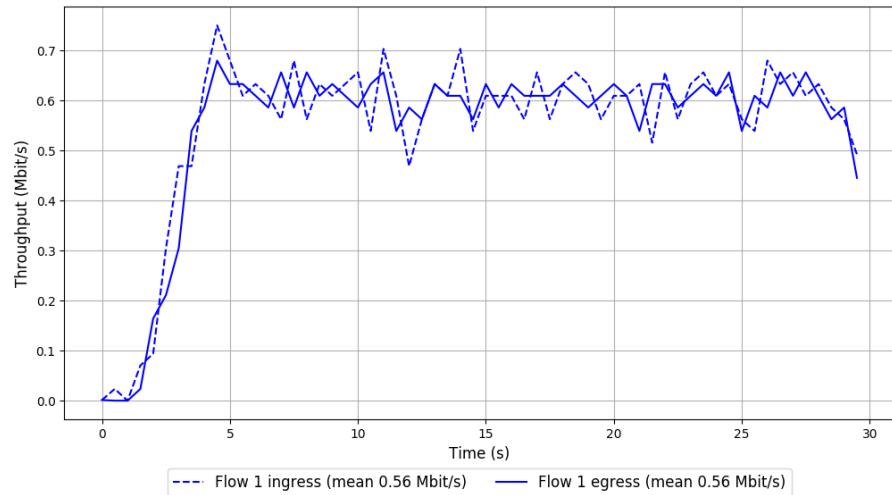


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-01-10 13:09:03
End at: 2018-01-10 13:09:33
Local clock offset: 2.061 ms
Remote clock offset: -5.243 ms

# Below is generated by plot.py at 2018-01-10 14:38:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 318.716 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 318.716 ms
Loss rate: 1.20%
```

Run 1: Report of LEDBAT — Data Link

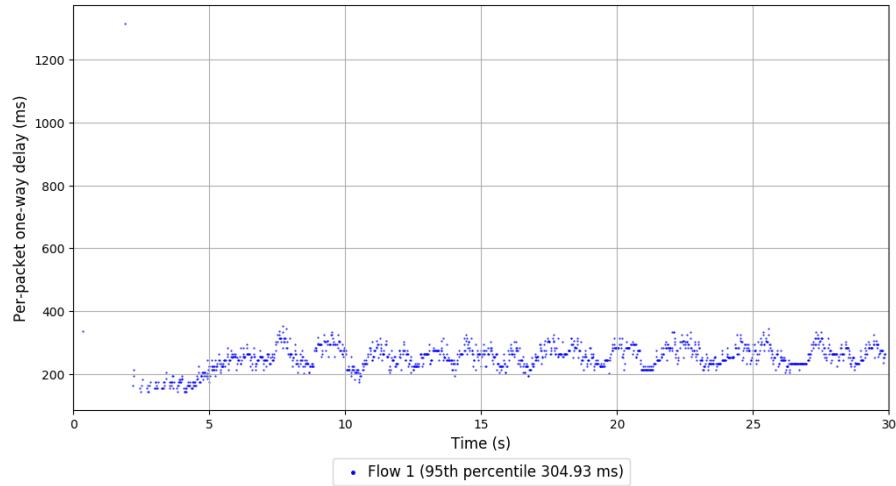
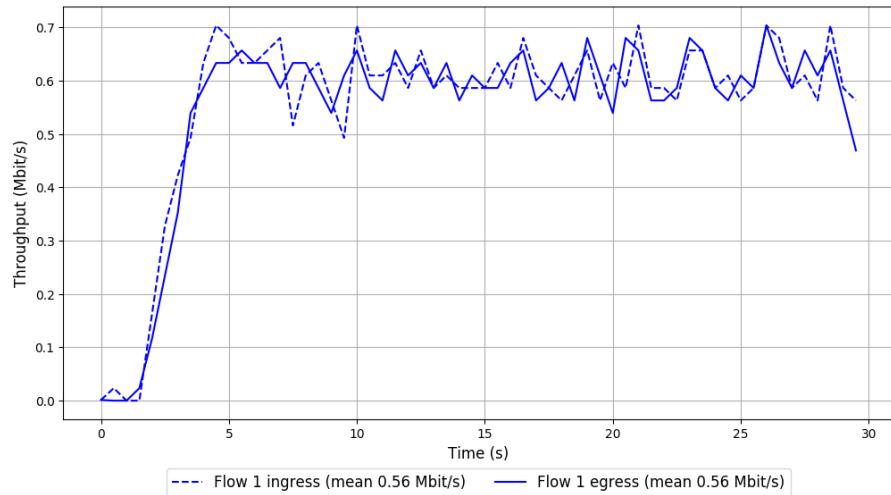


Run 2: Statistics of LEDBAT

```
Start at: 2018-01-10 13:26:39
End at: 2018-01-10 13:27:09
Local clock offset: 1.599 ms
Remote clock offset: -0.557 ms

# Below is generated by plot.py at 2018-01-10 14:38:52
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 304.927 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 304.927 ms
Loss rate: 1.33%
```

Run 2: Report of LEDBAT — Data Link

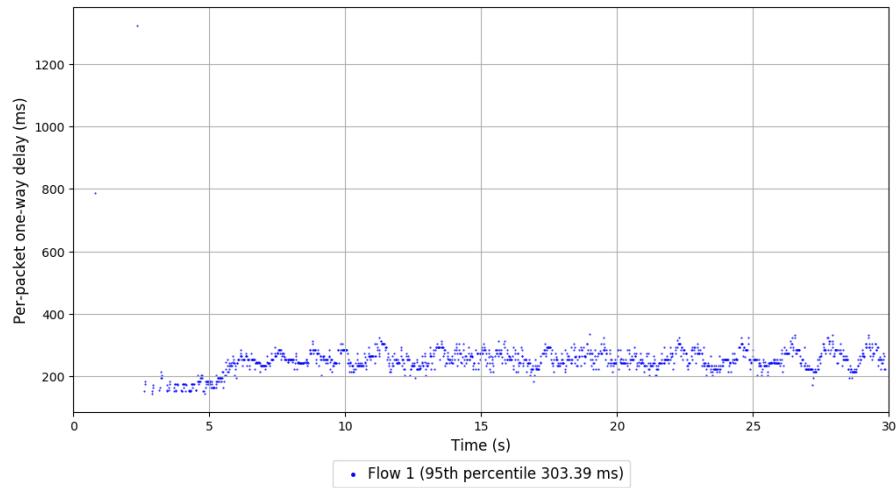
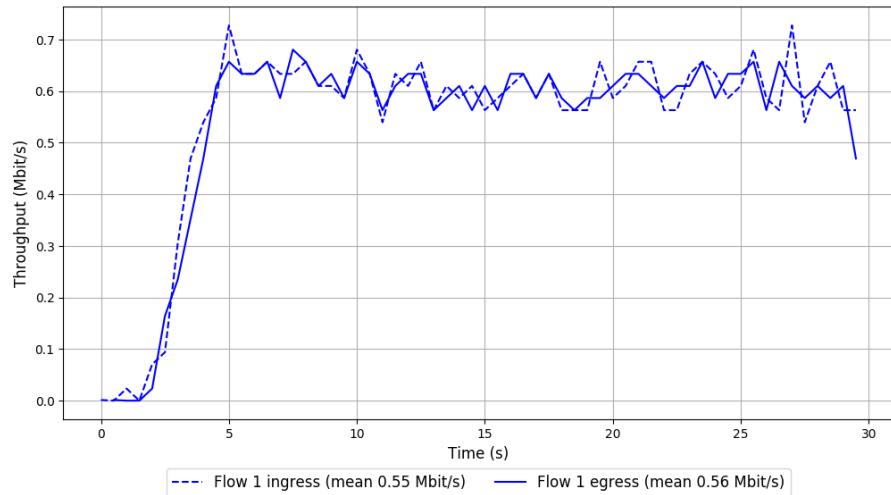


Run 3: Statistics of LEDBAT

```
Start at: 2018-01-10 13:44:13
End at: 2018-01-10 13:44:43
Local clock offset: 1.181 ms
Remote clock offset: -0.858 ms

# Below is generated by plot.py at 2018-01-10 14:38:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 303.389 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 303.389 ms
Loss rate: 1.29%
```

Run 3: Report of LEDBAT — Data Link

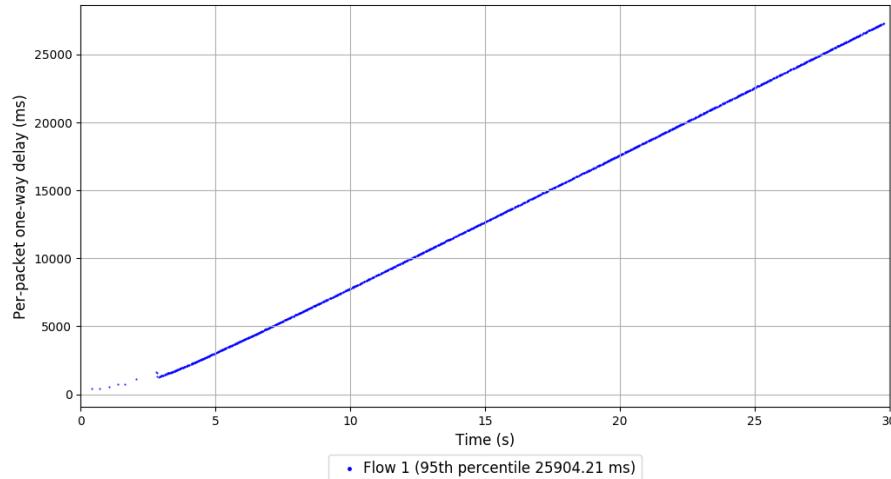
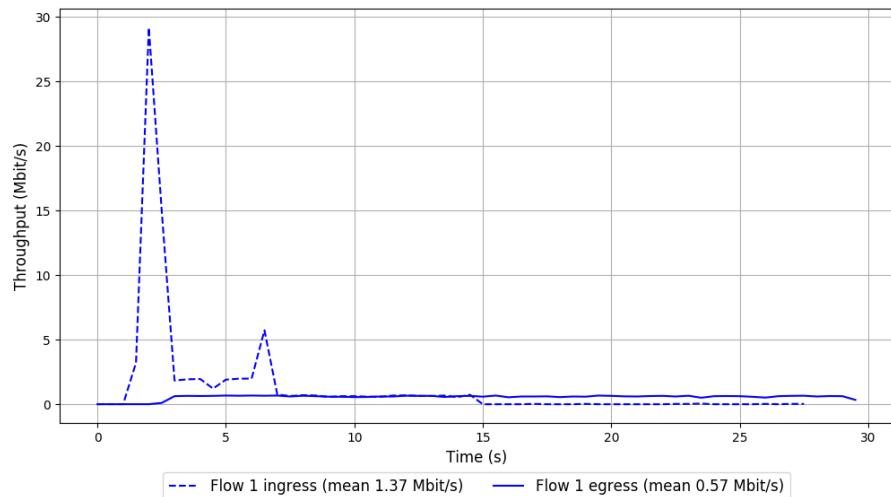


Run 1: Statistics of PCC

```
Start at: 2018-01-10 13:04:21
End at: 2018-01-10 13:04:51
Local clock offset: 2.204 ms
Remote clock offset: -0.039 ms

# Below is generated by plot.py at 2018-01-10 14:38:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 25904.205 ms
Loss rate: 56.64%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 25904.205 ms
Loss rate: 56.64%
```

Run 1: Report of PCC — Data Link

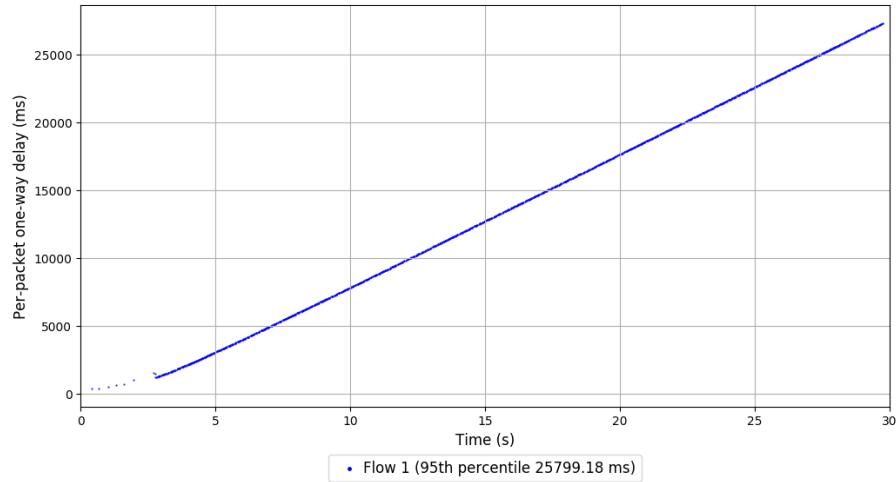
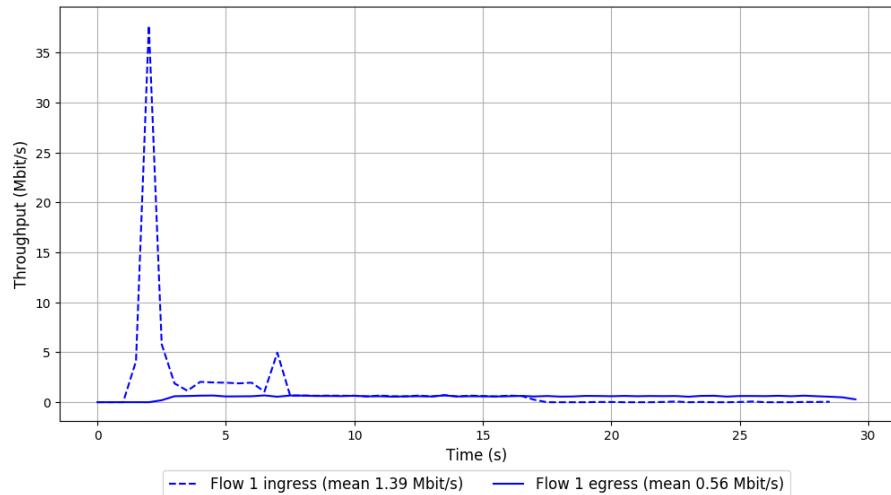


Run 2: Statistics of PCC

```
Start at: 2018-01-10 13:21:56
End at: 2018-01-10 13:22:26
Local clock offset: 1.716 ms
Remote clock offset: 0.659 ms

# Below is generated by plot.py at 2018-01-10 14:38:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 25799.178 ms
Loss rate: 58.65%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 25799.178 ms
Loss rate: 58.65%
```

Run 2: Report of PCC — Data Link

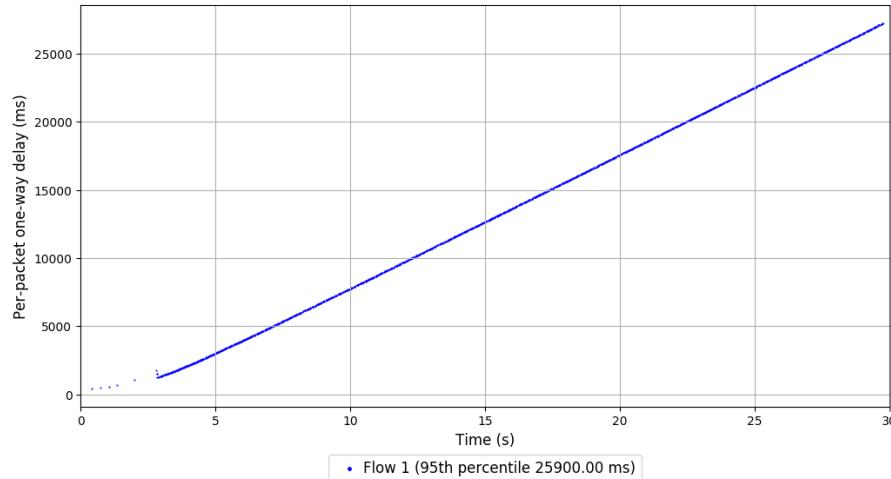
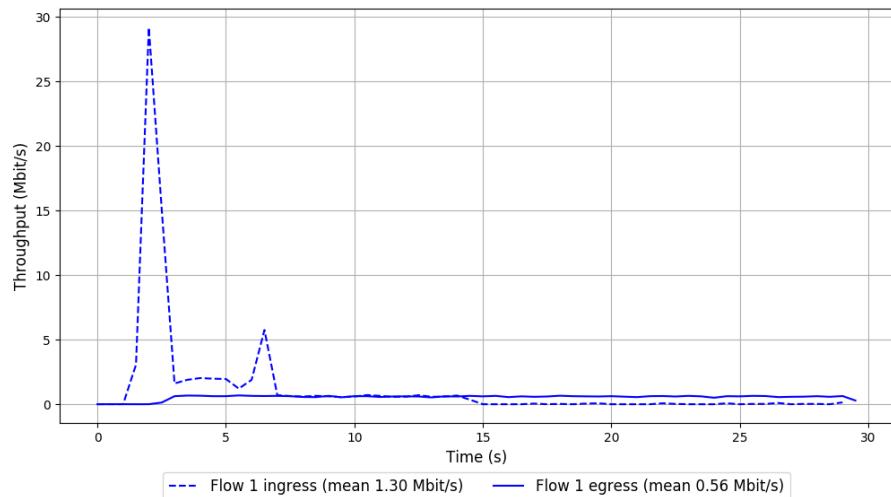


Run 3: Statistics of PCC

```
Start at: 2018-01-10 13:39:32
End at: 2018-01-10 13:40:02
Local clock offset: 1.289 ms
Remote clock offset: -0.064 ms

# Below is generated by plot.py at 2018-01-10 14:38:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 25900.000 ms
Loss rate: 57.04%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 25900.000 ms
Loss rate: 57.04%
```

Run 3: Report of PCC — Data Link

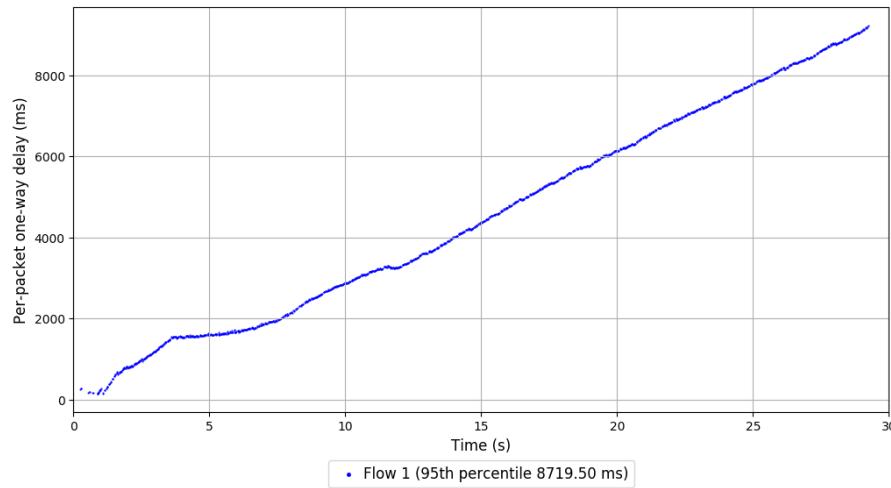
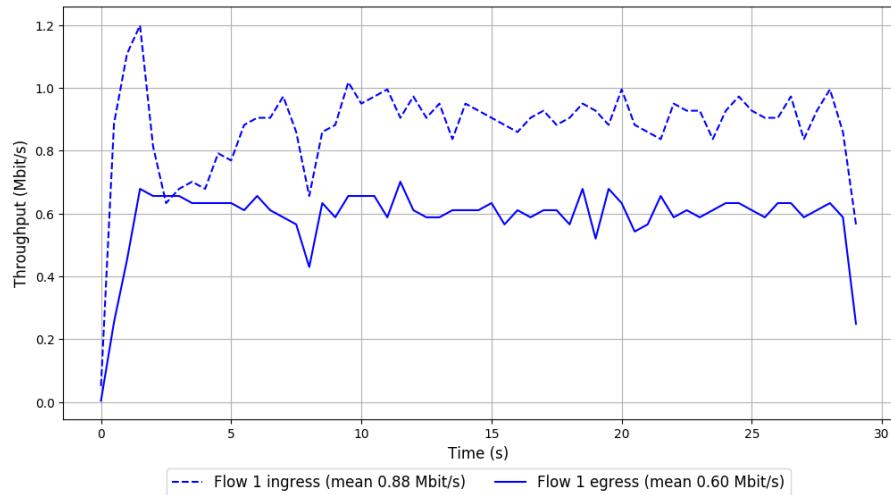


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-01-10 12:55:00
End at: 2018-01-10 12:55:30
Local clock offset: 2.512 ms
Remote clock offset: 0.213 ms

# Below is generated by plot.py at 2018-01-10 14:38:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8719.495 ms
Loss rate: 32.80%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8719.495 ms
Loss rate: 32.80%
```

Run 1: Report of QUIC Cubic — Data Link

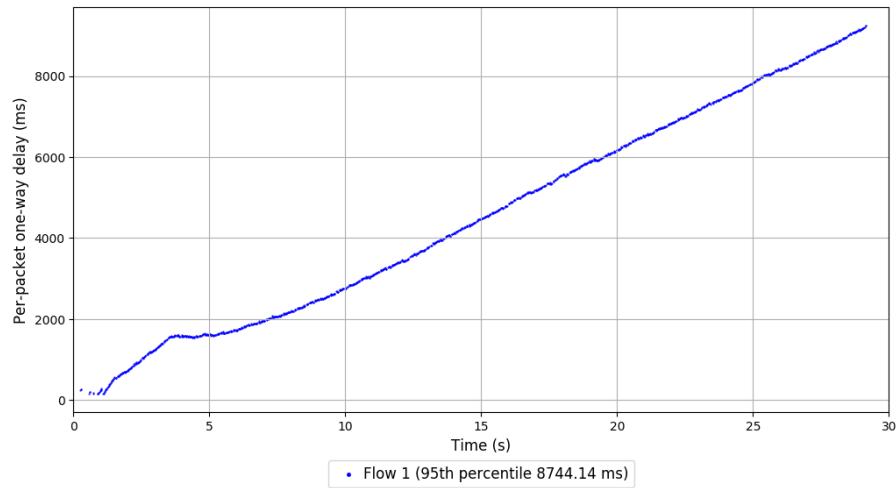
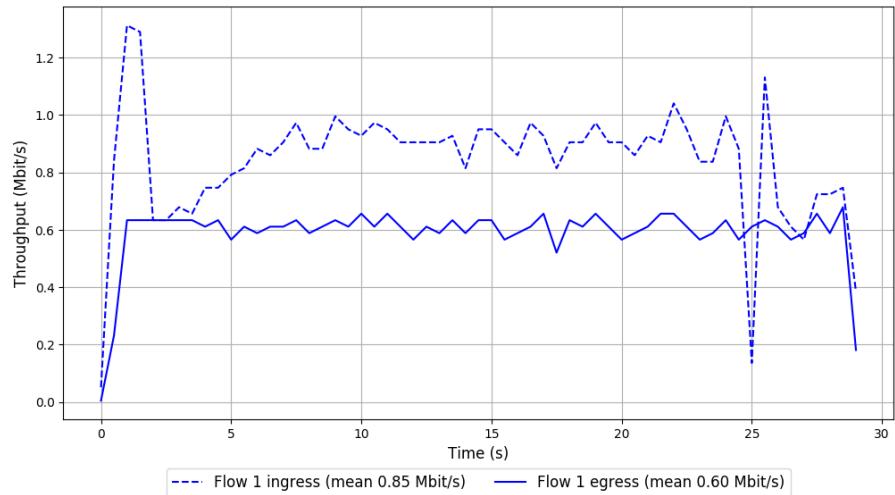


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-01-10 13:12:35
End at: 2018-01-10 13:13:05
Local clock offset: 1.968 ms
Remote clock offset: -0.492 ms

# Below is generated by plot.py at 2018-01-10 14:38:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8744.141 ms
Loss rate: 30.03%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8744.141 ms
Loss rate: 30.03%
```

Run 2: Report of QUIC Cubic — Data Link

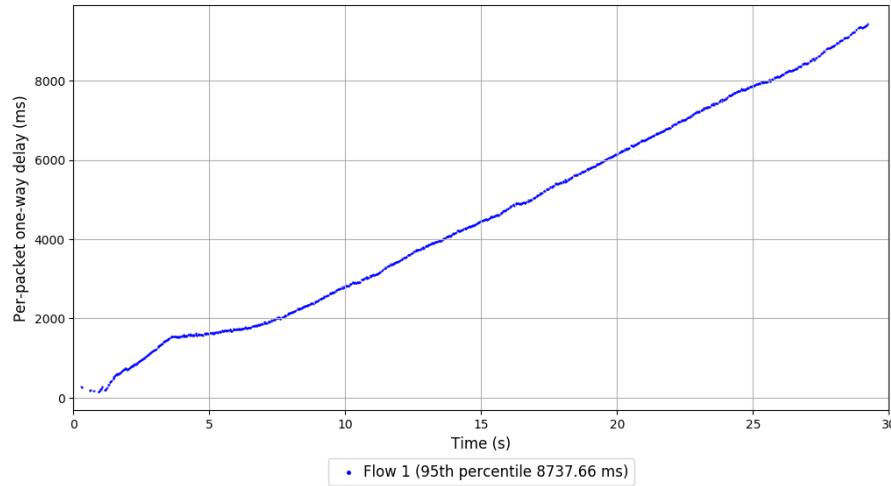
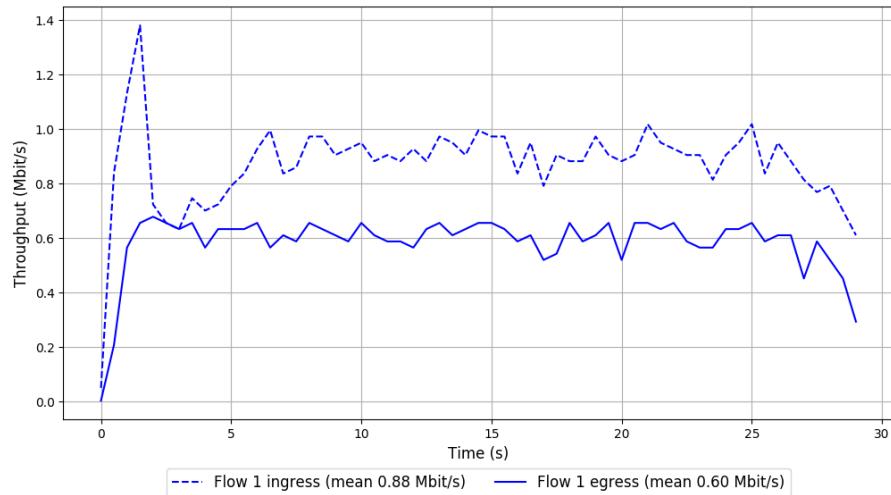


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-01-10 13:30:09
End at: 2018-01-10 13:30:40
Local clock offset: 1.529 ms
Remote clock offset: -6.17 ms

# Below is generated by plot.py at 2018-01-10 14:38:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8737.656 ms
Loss rate: 32.83%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 8737.656 ms
Loss rate: 32.83%
```

Run 3: Report of QUIC Cubic — Data Link

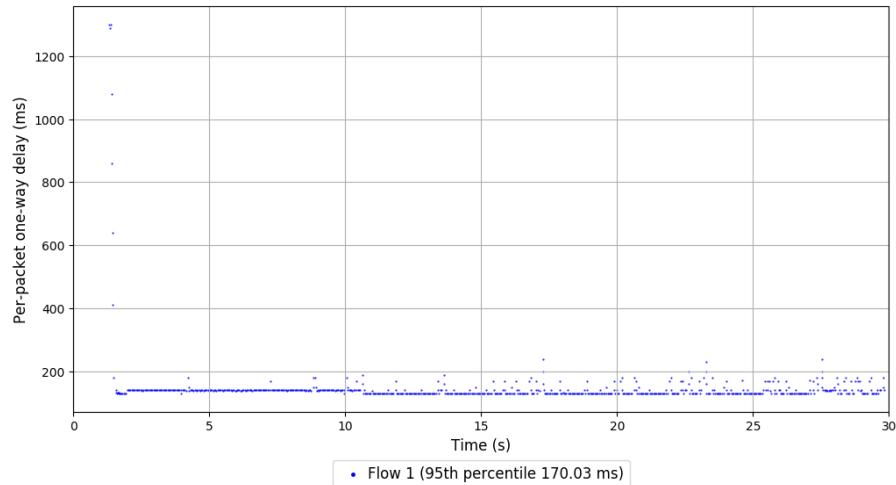
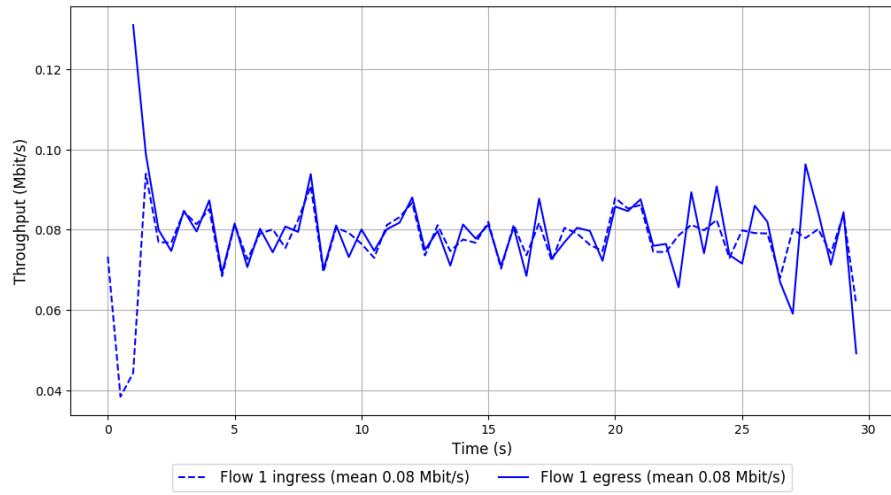


```
Run 1: Statistics of SCReAM
```

```
Start at: 2018-01-10 12:56:10
End at: 2018-01-10 12:56:40
Local clock offset: 2.479 ms
Remote clock offset: 0.763 ms

# Below is generated by plot.py at 2018-01-10 14:38:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 170.029 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 170.029 ms
Loss rate: 0.66%
```

Run 1: Report of SCReAM — Data Link

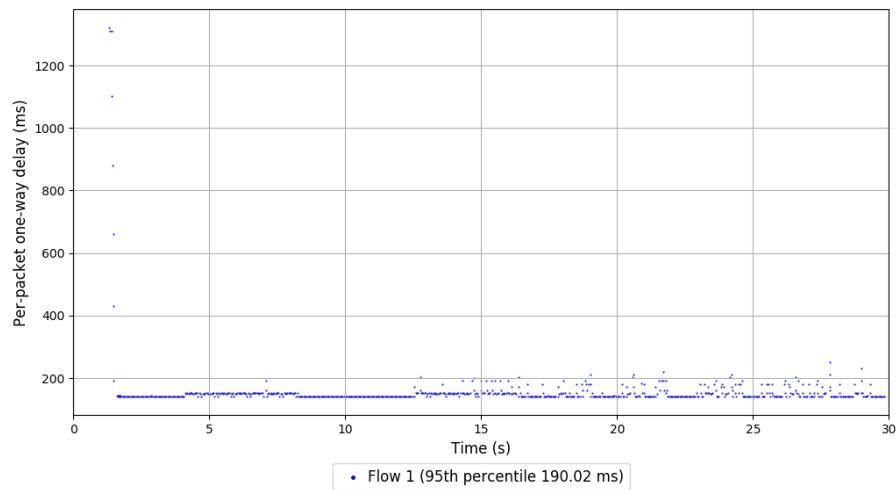
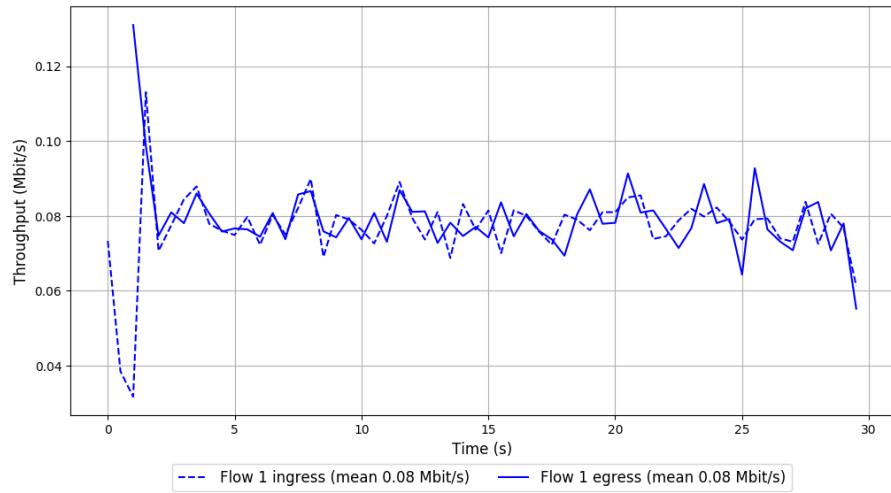


Run 2: Statistics of SCReAM

```
Start at: 2018-01-10 13:13:46
End at: 2018-01-10 13:14:16
Local clock offset: 1.871 ms
Remote clock offset: -5.596 ms

# Below is generated by plot.py at 2018-01-10 14:39:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 190.018 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 190.018 ms
Loss rate: 0.66%
```

Run 2: Report of SCReAM — Data Link

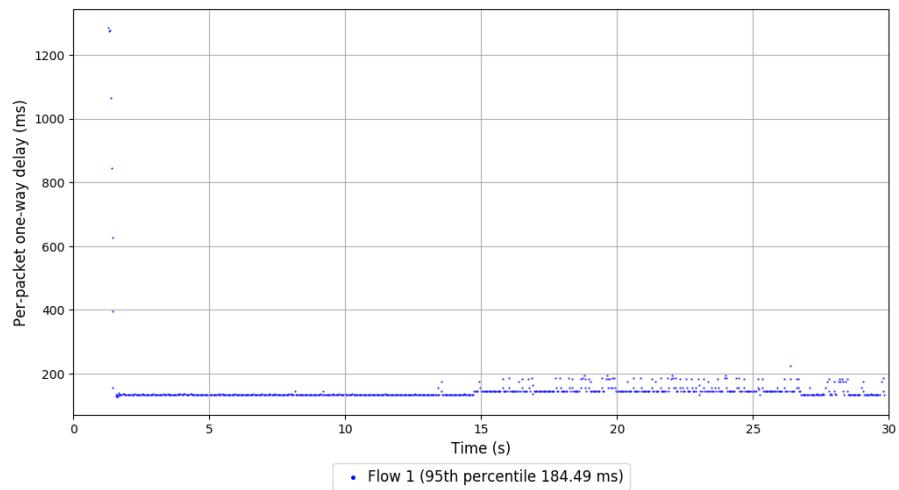
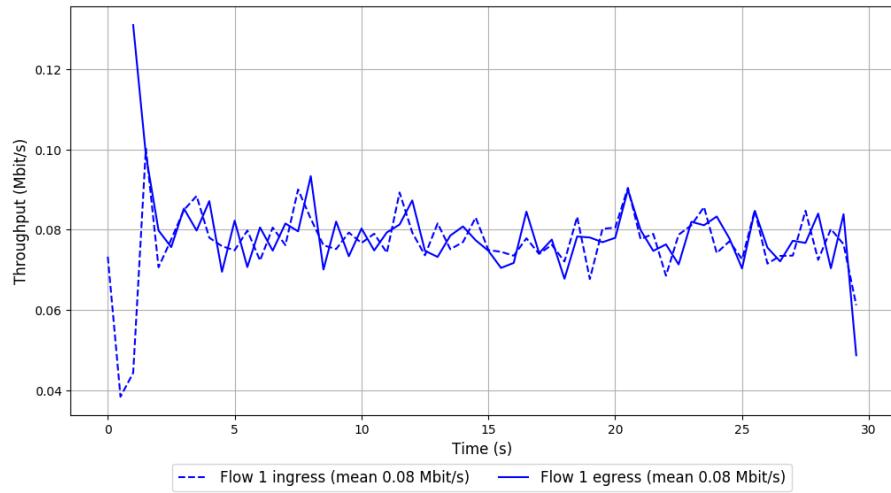


Run 3: Statistics of SCReAM

```
Start at: 2018-01-10 13:31:20
End at: 2018-01-10 13:31:50
Local clock offset: 1.433 ms
Remote clock offset: 0.724 ms

# Below is generated by plot.py at 2018-01-10 14:39:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 184.494 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 184.494 ms
Loss rate: 0.67%
```

Run 3: Report of SCReAM — Data Link

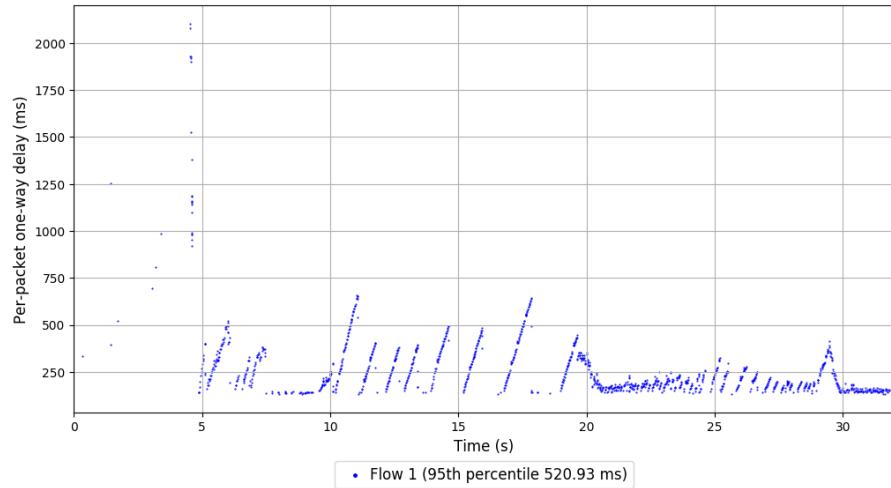
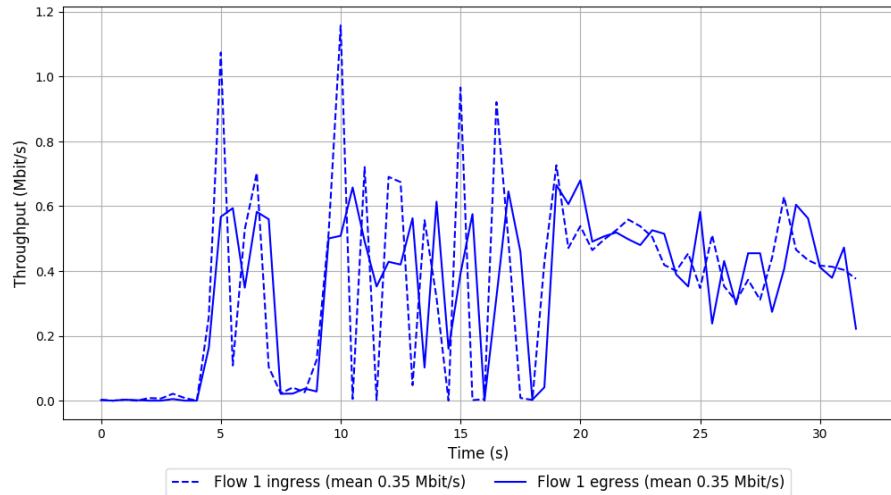


```
Run 1: Statistics of WebRTC media

Start at: 2018-01-10 13:05:31
End at: 2018-01-10 13:06:01
Local clock offset: 2.174 ms
Remote clock offset: -5.382 ms

# Below is generated by plot.py at 2018-01-10 14:39:02
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 520.930 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 520.930 ms
Loss rate: 1.11%
```

Run 1: Report of WebRTC media — Data Link

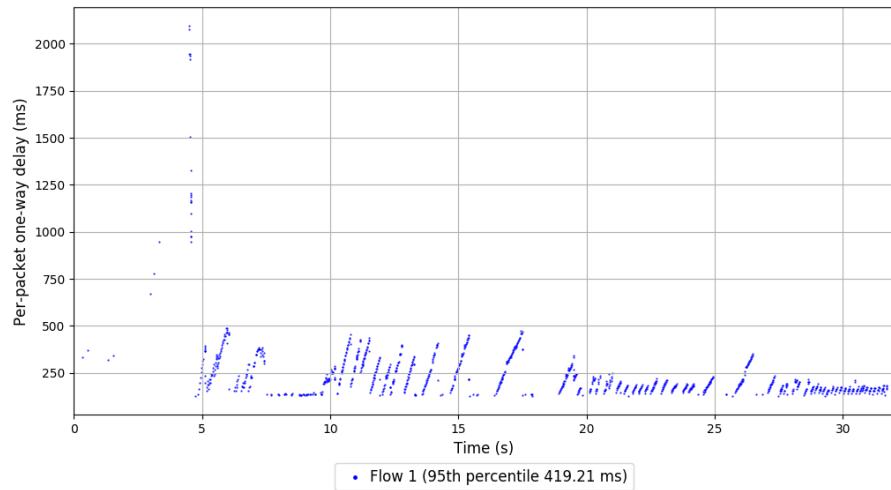
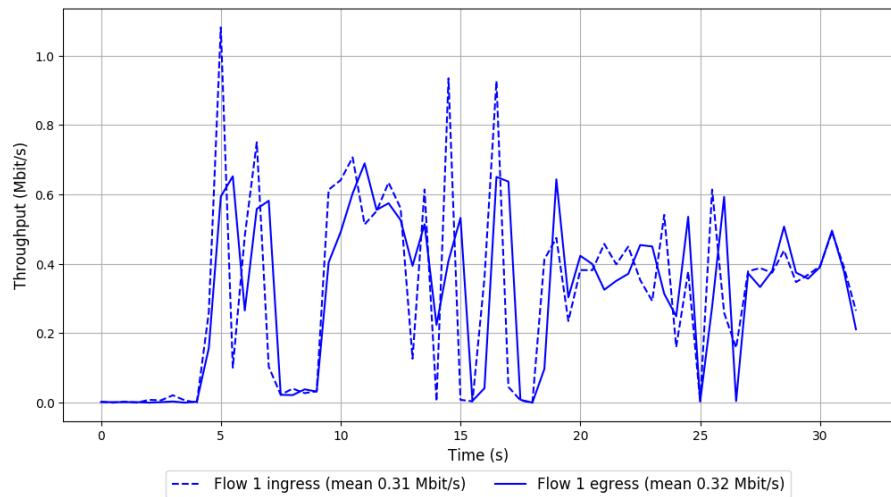


```
Run 2: Statistics of WebRTC media
```

```
Start at: 2018-01-10 13:23:07
End at: 2018-01-10 13:23:37
Local clock offset: 1.687 ms
Remote clock offset: 0.667 ms

# Below is generated by plot.py at 2018-01-10 14:39:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 419.206 ms
Loss rate: 0.96%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 419.206 ms
Loss rate: 0.96%
```

Run 2: Report of WebRTC media — Data Link

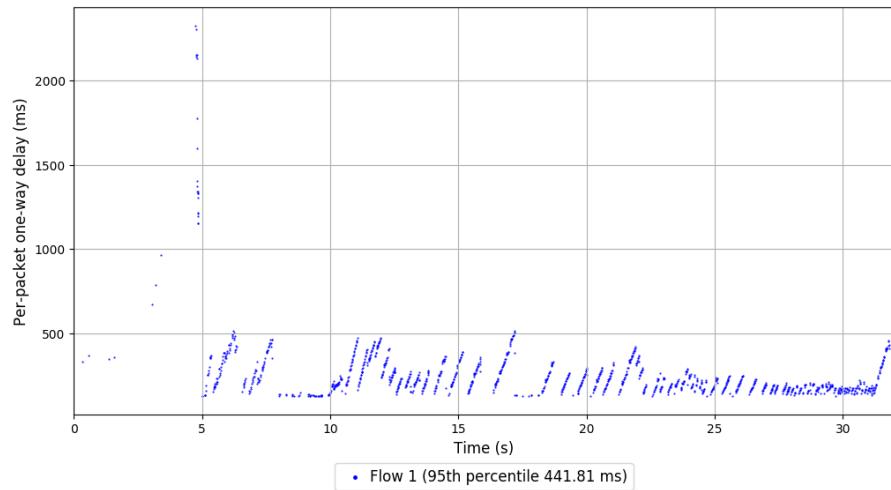
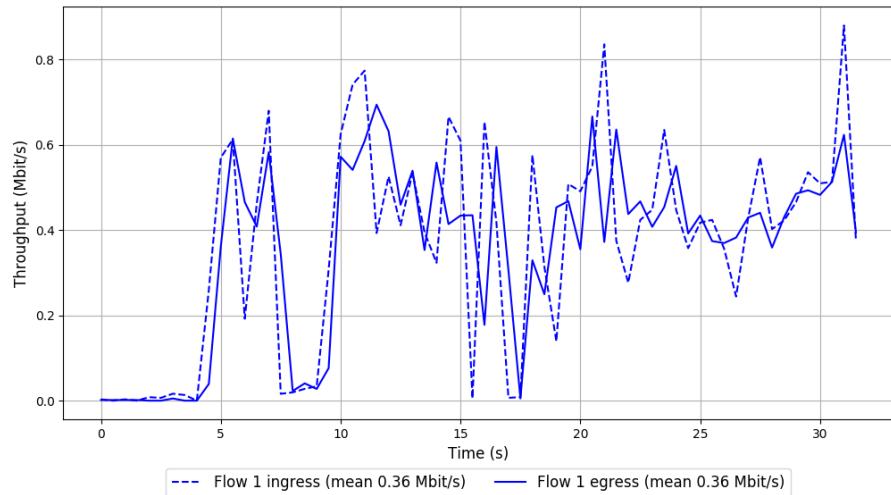


```
Run 3: Statistics of WebRTC media

Start at: 2018-01-10 13:40:42
End at: 2018-01-10 13:41:12
Local clock offset: 1.33 ms
Remote clock offset: 0.045 ms

# Below is generated by plot.py at 2018-01-10 14:39:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 441.815 ms
Loss rate: 2.03%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 441.815 ms
Loss rate: 2.03%
```

Run 3: Report of WebRTC media — Data Link

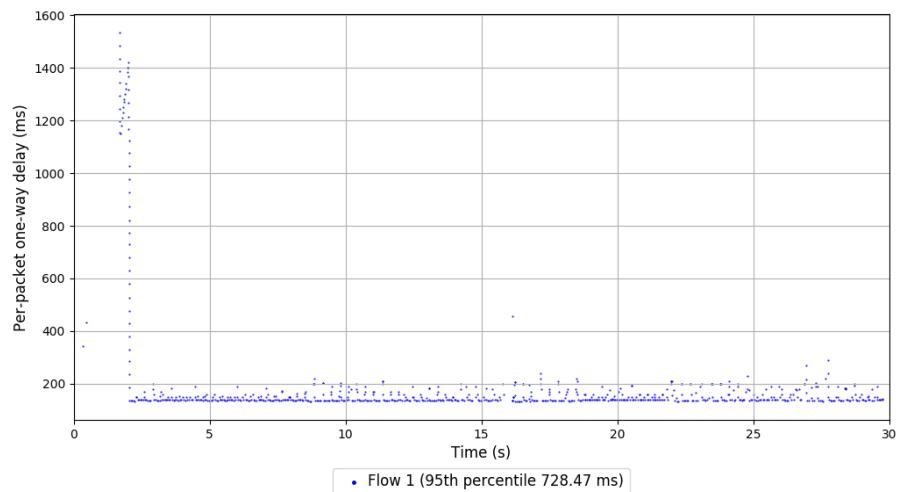
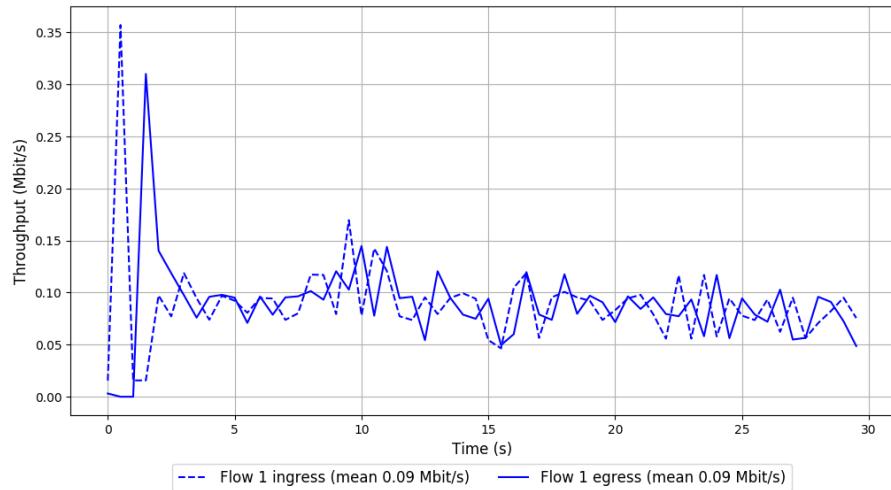


Run 1: Statistics of Sprout

```
Start at: 2018-01-10 13:02:00
End at: 2018-01-10 13:02:30
Local clock offset: 2.29 ms
Remote clock offset: -4.958 ms

# Below is generated by plot.py at 2018-01-10 14:39:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 728.466 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 728.466 ms
Loss rate: 1.12%
```

Run 1: Report of Sprout — Data Link

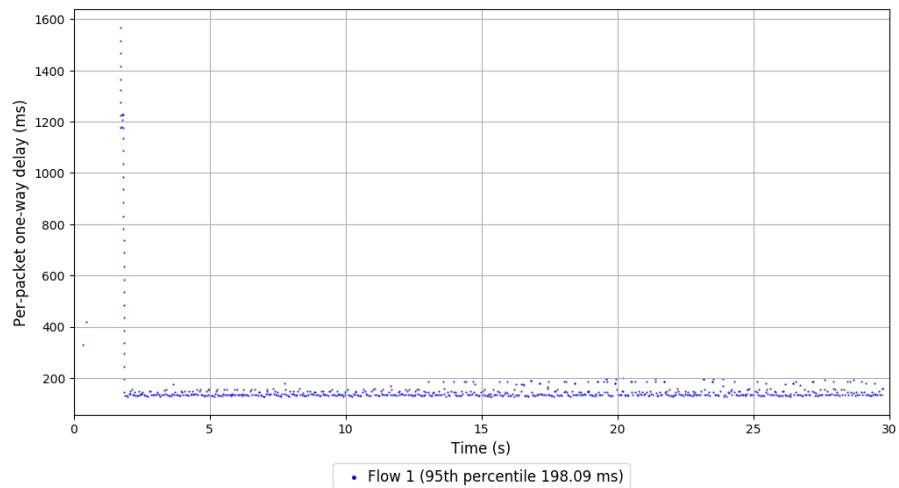
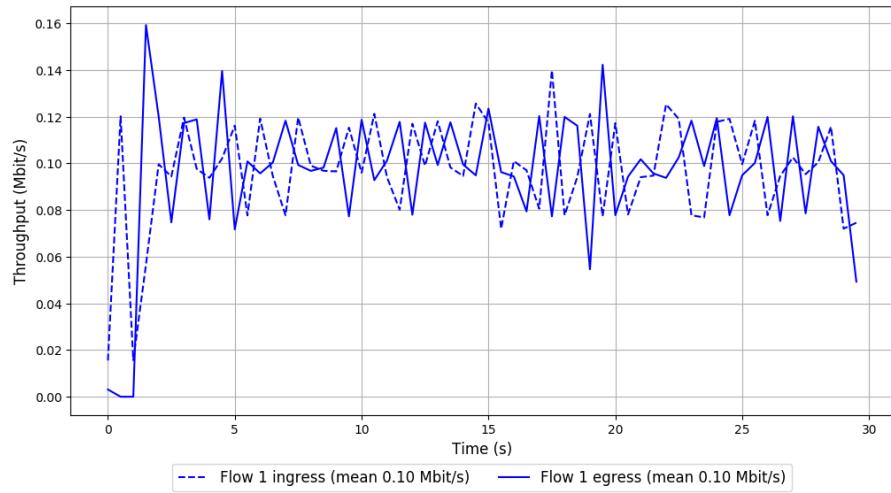


Run 2: Statistics of Sprout

```
Start at: 2018-01-10 13:19:36
End at: 2018-01-10 13:20:06
Local clock offset: 1.703 ms
Remote clock offset: -0.084 ms

# Below is generated by plot.py at 2018-01-10 14:39:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 198.086 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 198.086 ms
Loss rate: 0.81%
```

Run 2: Report of Sprout — Data Link

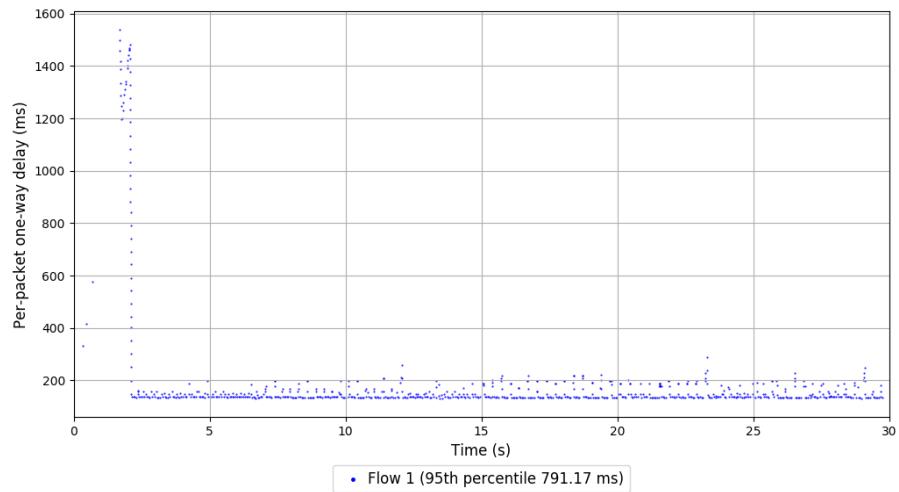
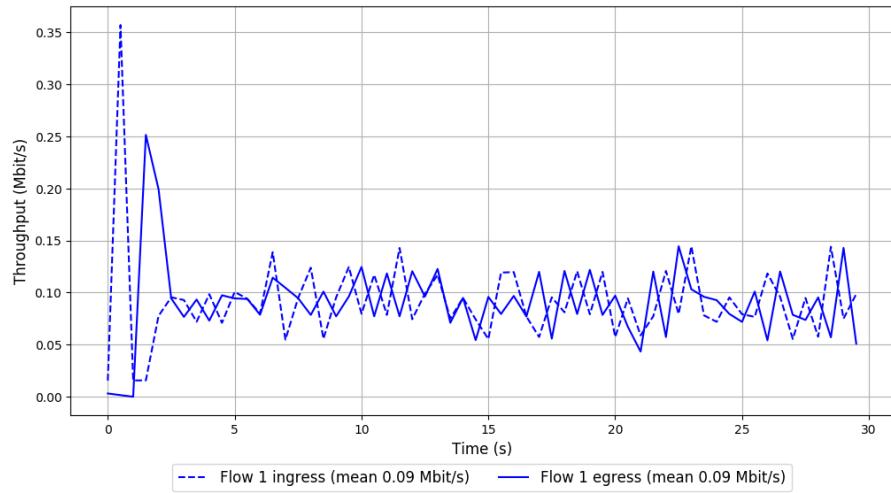


Run 3: Statistics of Sprout

```
Start at: 2018-01-10 13:37:11
End at: 2018-01-10 13:37:41
Local clock offset: 1.378 ms
Remote clock offset: 0.354 ms

# Below is generated by plot.py at 2018-01-10 14:39:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 791.172 ms
Loss rate: 1.29%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 791.172 ms
Loss rate: 1.29%
```

Run 3: Report of Sprout — Data Link

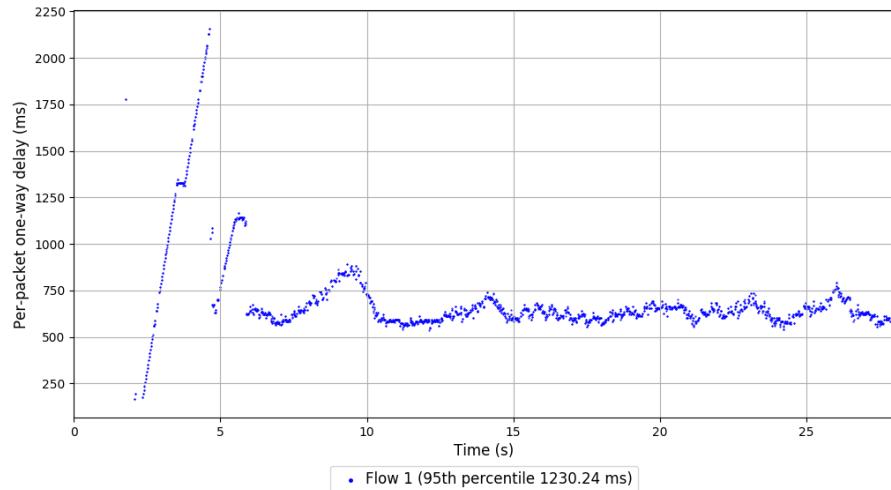
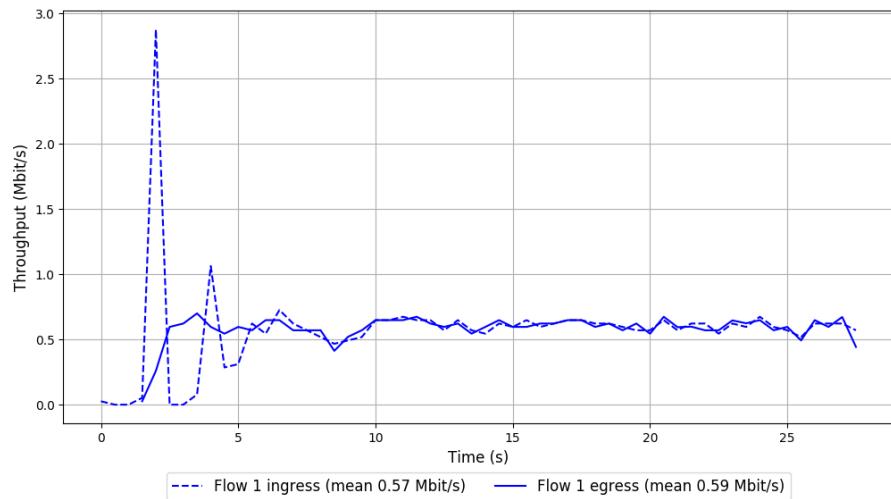


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-01-10 13:03:11
End at: 2018-01-10 13:03:41
Local clock offset: 2.189 ms
Remote clock offset: -5.754 ms

# Below is generated by plot.py at 2018-01-10 14:39:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1230.239 ms
Loss rate: 2.69%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1230.239 ms
Loss rate: 2.69%
```

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

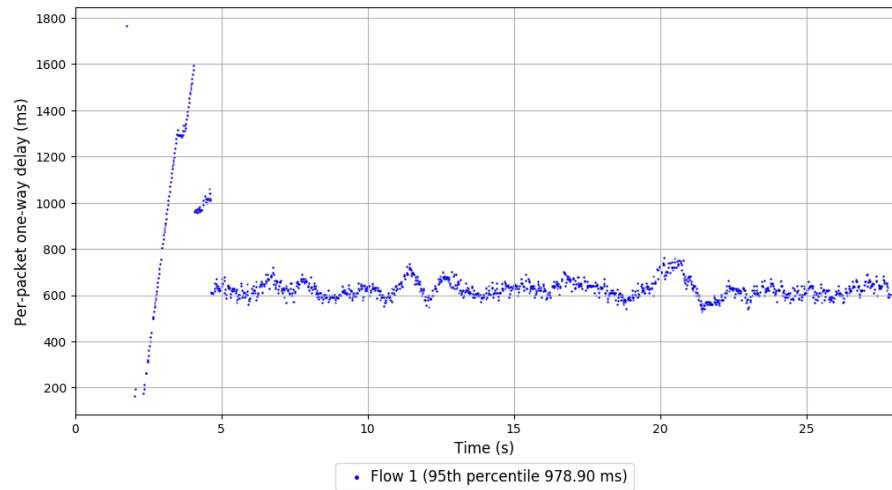
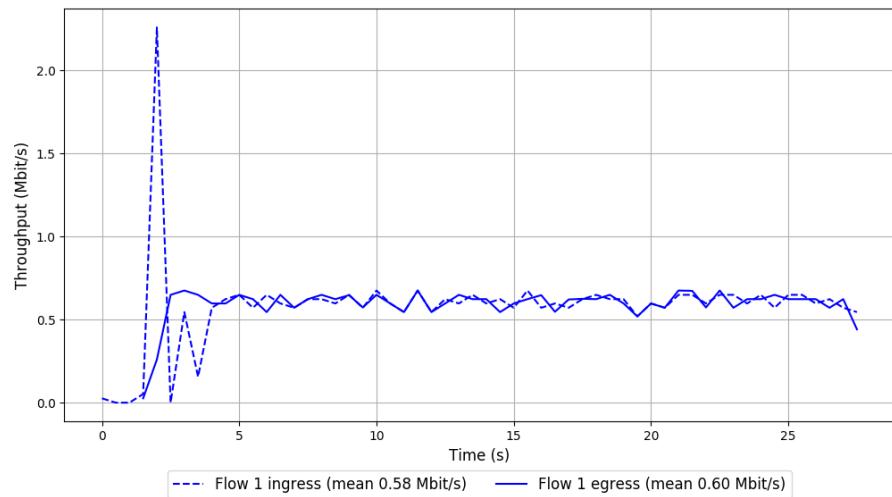


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-01-10 13:20:46
End at: 2018-01-10 13:21:16
Local clock offset: 1.743 ms
Remote clock offset: -0.619 ms

# Below is generated by plot.py at 2018-01-10 14:39:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 978.905 ms
Loss rate: 2.65%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 978.905 ms
Loss rate: 2.65%
```

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

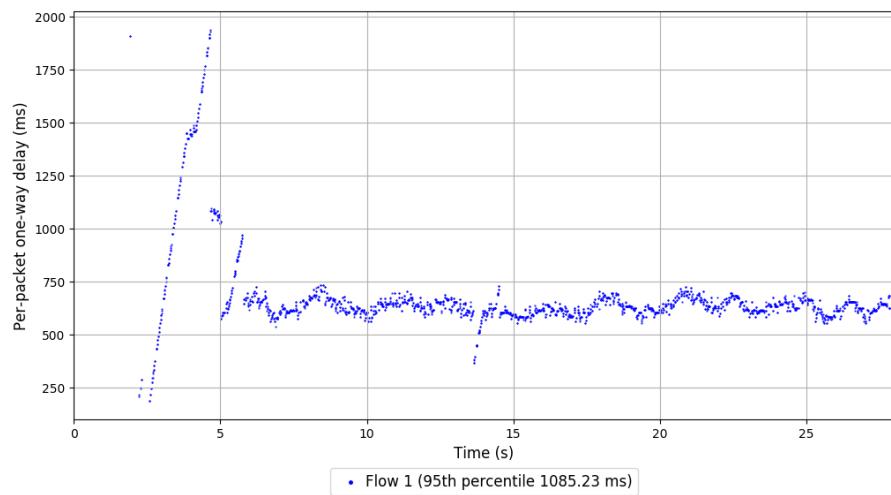
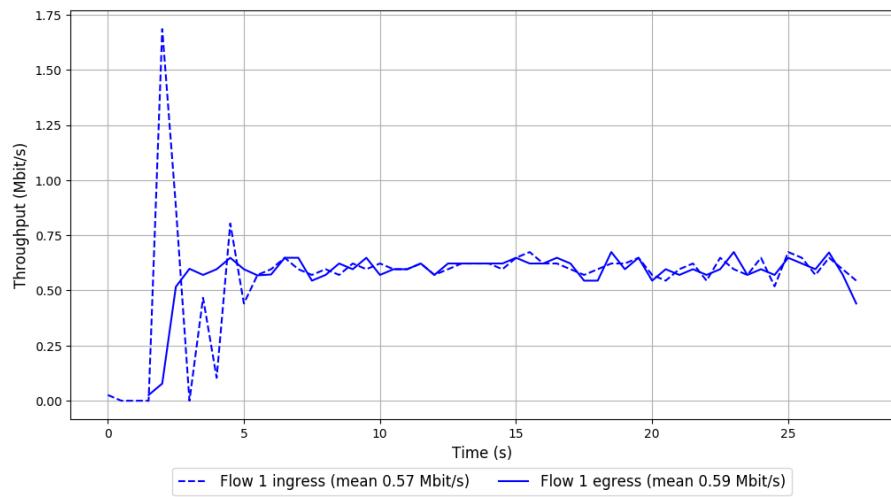


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-01-10 13:38:22
End at: 2018-01-10 13:38:52
Local clock offset: 1.306 ms
Remote clock offset: -6.045 ms

# Below is generated by plot.py at 2018-01-10 14:39:09
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1085.232 ms
Loss rate: 2.79%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1085.232 ms
Loss rate: 2.79%
```

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

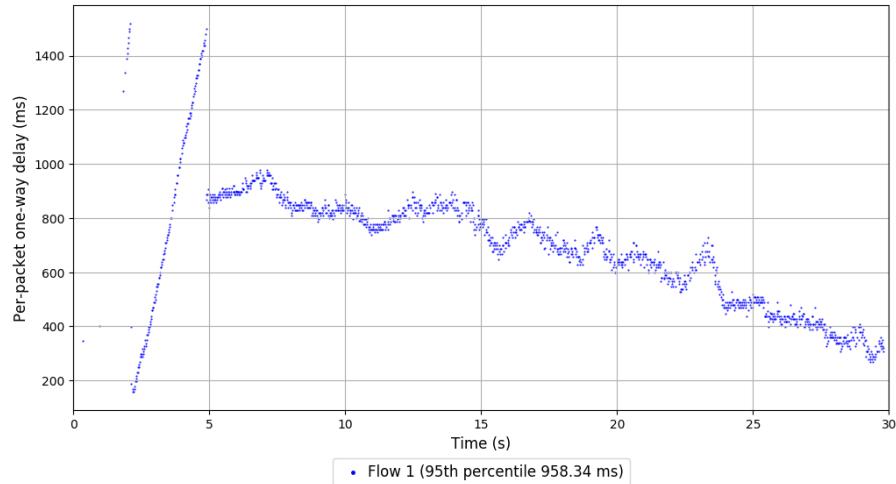
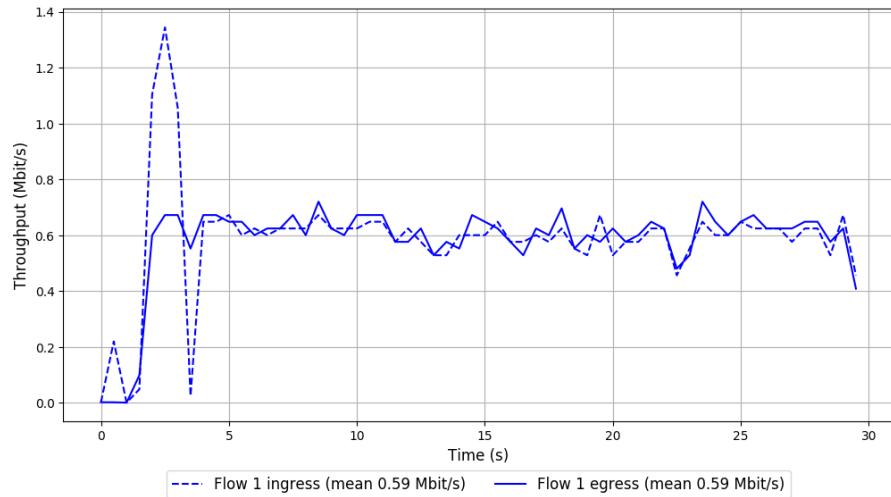


Run 1: Statistics of TCP Vegas

```
Start at: 2018-01-10 12:58:30
End at: 2018-01-10 12:59:00
Local clock offset: 2.336 ms
Remote clock offset: -5.709 ms

# Below is generated by plot.py at 2018-01-10 14:39:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 958.337 ms
Loss rate: 1.37%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 958.337 ms
Loss rate: 1.37%
```

Run 1: Report of TCP Vegas — Data Link

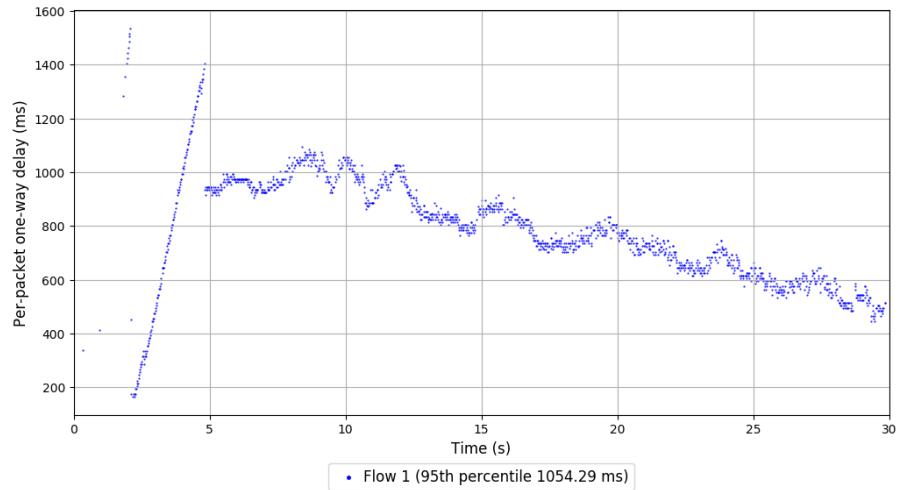
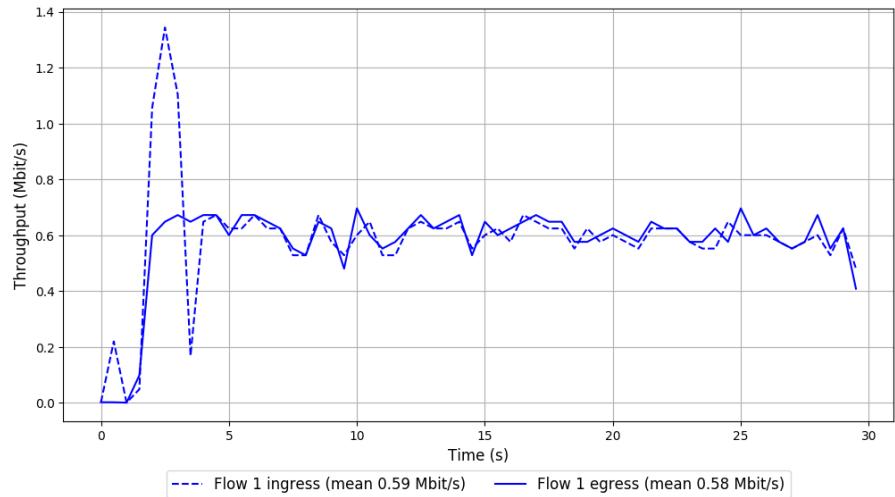


Run 2: Statistics of TCP Vegas

```
Start at: 2018-01-10 13:16:06
End at: 2018-01-10 13:16:36
Local clock offset: 1.779 ms
Remote clock offset: -4.923 ms

# Below is generated by plot.py at 2018-01-10 14:39:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1054.285 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1054.285 ms
Loss rate: 1.85%
```

Run 2: Report of TCP Vegas — Data Link

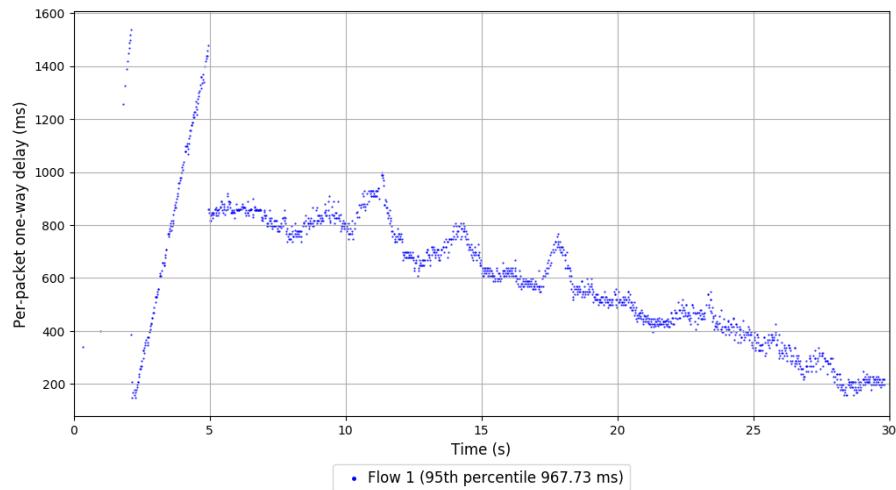
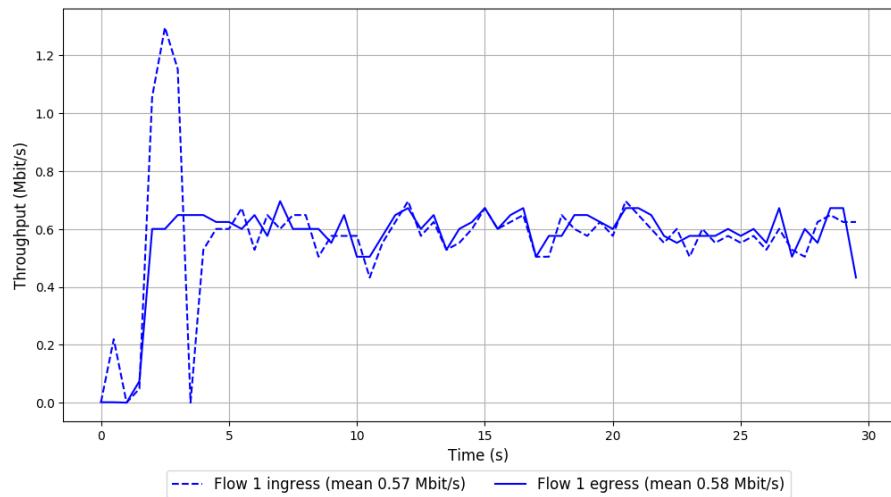


Run 3: Statistics of TCP Vegas

```
Start at: 2018-01-10 13:33:41
End at: 2018-01-10 13:34:11
Local clock offset: 1.391 ms
Remote clock offset: -5.808 ms

# Below is generated by plot.py at 2018-01-10 14:39:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 967.731 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 967.731 ms
Loss rate: 1.26%
```

Run 3: Report of TCP Vegas — Data Link

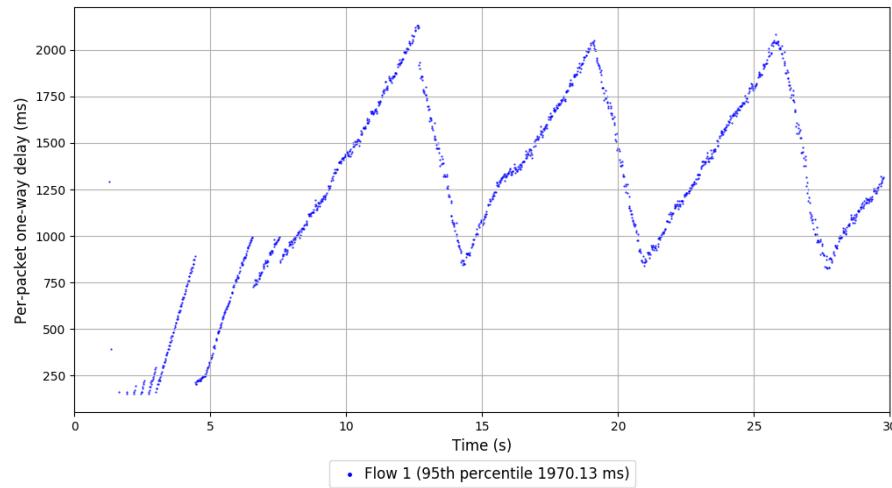
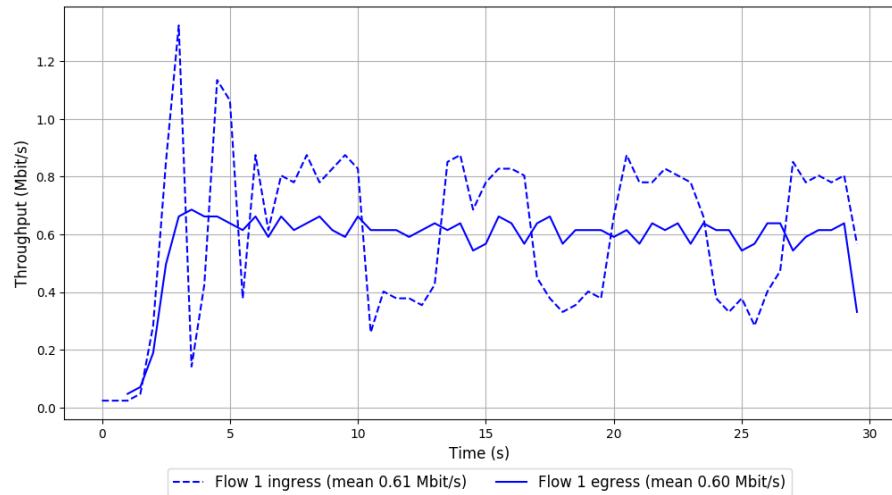


Run 1: Statistics of Verus

```
Start at: 2018-01-10 13:10:13
End at: 2018-01-10 13:10:43
Local clock offset: 2.025 ms
Remote clock offset: -0.271 ms

# Below is generated by plot.py at 2018-01-10 14:39:10
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1970.131 ms
Loss rate: 6.22%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1970.131 ms
Loss rate: 6.22%
```

Run 1: Report of Verus — Data Link

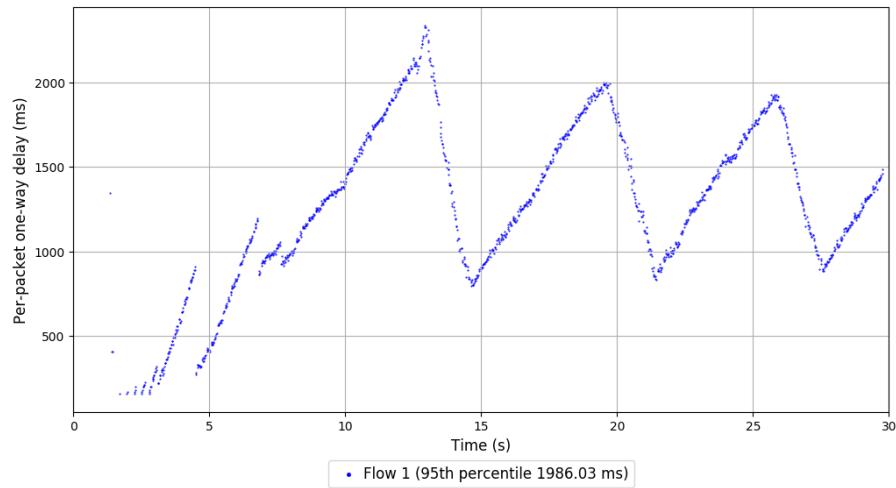
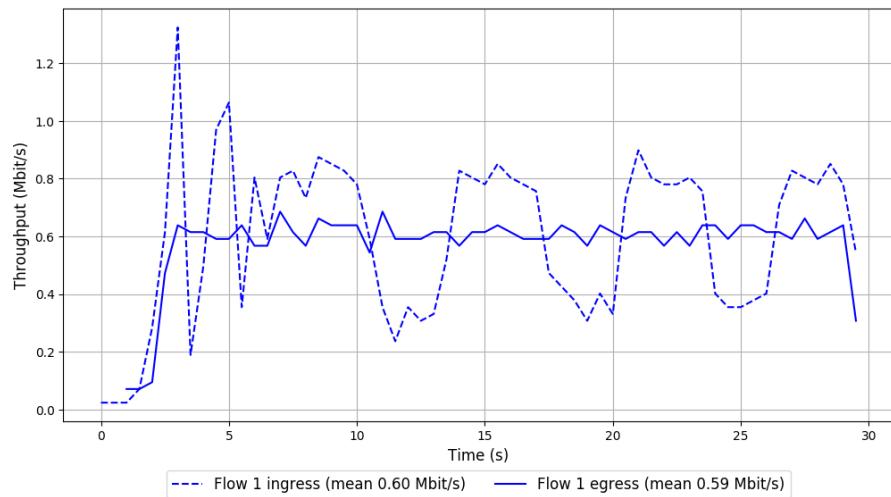


Run 2: Statistics of Verus

```
Start at: 2018-01-10 13:27:49
End at: 2018-01-10 13:28:19
Local clock offset: 1.597 ms
Remote clock offset: -6.231 ms

# Below is generated by plot.py at 2018-01-10 14:39:11
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1986.031 ms
Loss rate: 6.79%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 1986.031 ms
Loss rate: 6.79%
```

Run 2: Report of Verus — Data Link

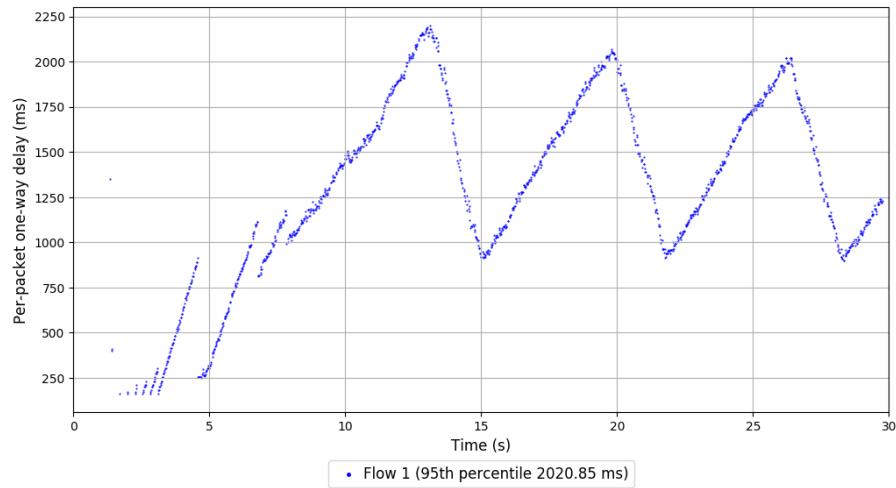
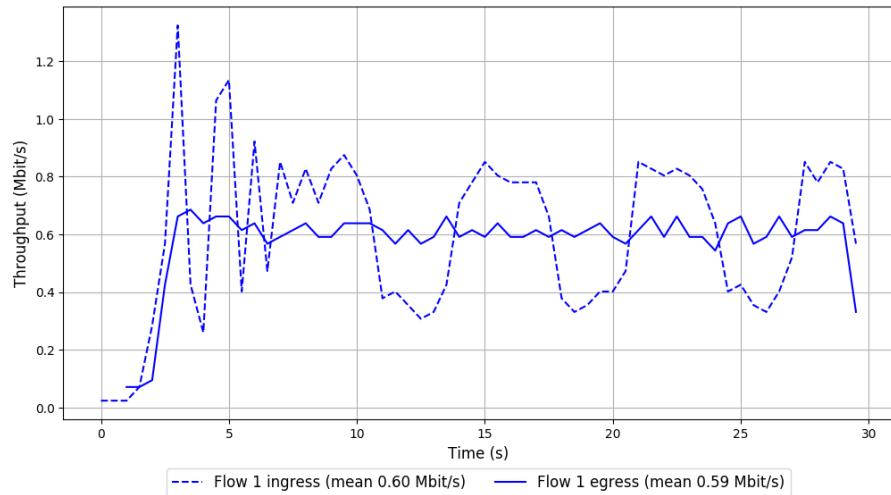


Run 3: Statistics of Verus

```
Start at: 2018-01-10 13:45:23
End at: 2018-01-10 13:45:53
Local clock offset: 1.258 ms
Remote clock offset: -5.601 ms

# Below is generated by plot.py at 2018-01-10 14:39:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 2020.849 ms
Loss rate: 6.08%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 2020.849 ms
Loss rate: 6.08%
```

Run 3: Report of Verus — Data Link

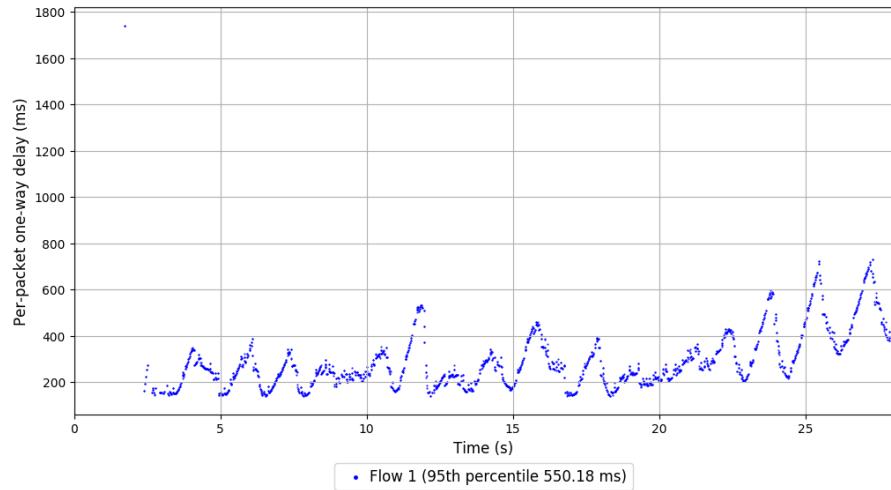
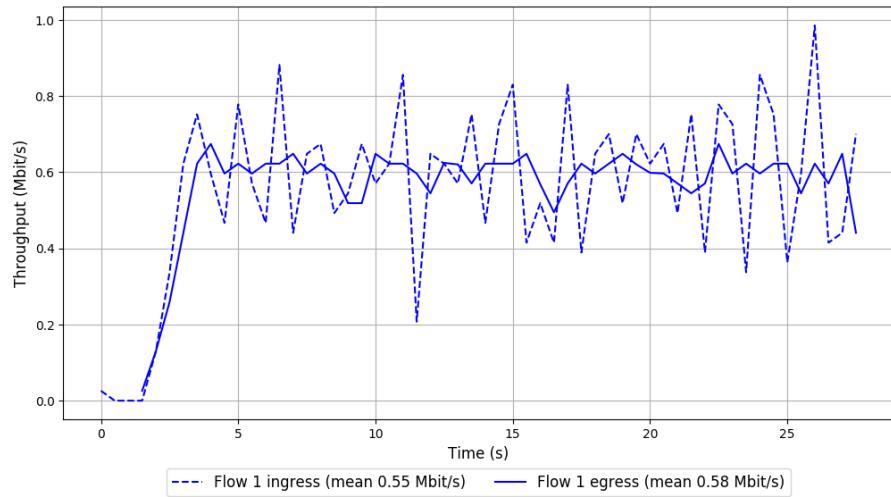


Run 1: Statistics of Copa

```
Start at: 2018-01-10 13:00:50
End at: 2018-01-10 13:01:20
Local clock offset: 2.327 ms
Remote clock offset: -1.305 ms

# Below is generated by plot.py at 2018-01-10 14:39:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 550.185 ms
Loss rate: 2.34%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 550.185 ms
Loss rate: 2.34%
```

Run 1: Report of Copa — Data Link

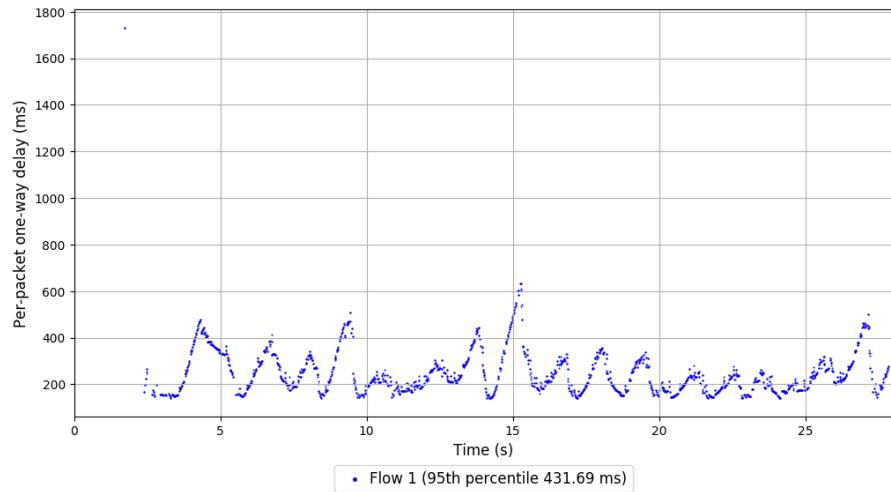
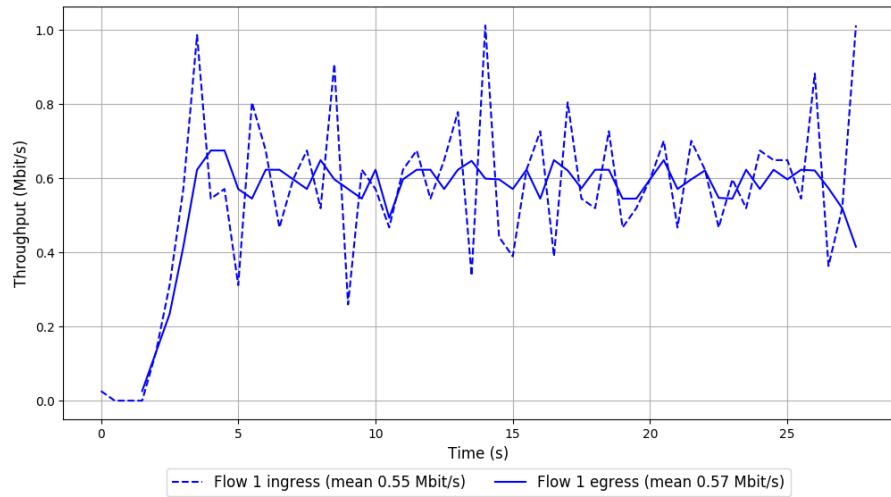


Run 2: Statistics of Copa

```
Start at: 2018-01-10 13:18:26
End at: 2018-01-10 13:18:56
Local clock offset: 1.805 ms
Remote clock offset: -0.399 ms

# Below is generated by plot.py at 2018-01-10 14:39:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 431.685 ms
Loss rate: 2.87%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 431.685 ms
Loss rate: 2.87%
```

Run 2: Report of Copa — Data Link

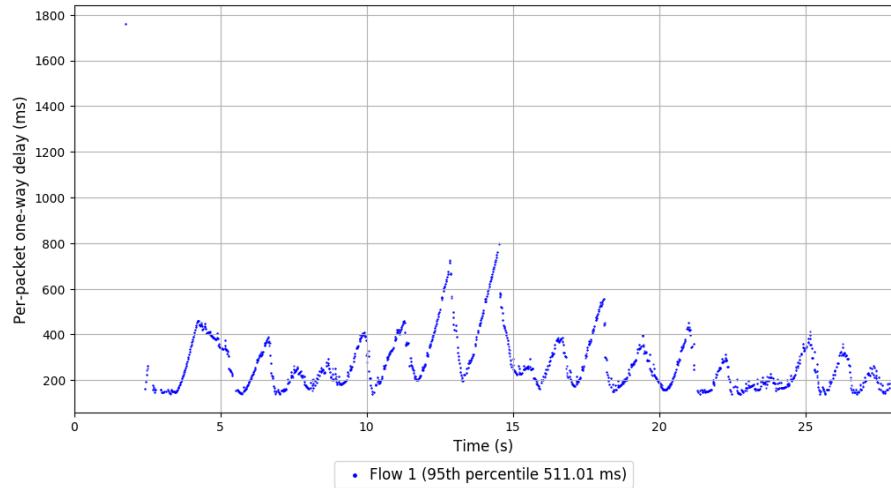
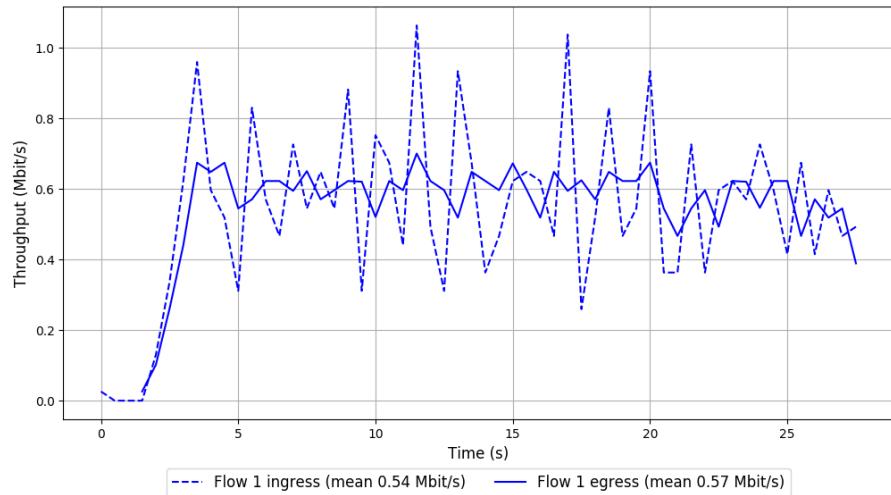


Run 3: Statistics of Copa

```
Start at: 2018-01-10 13:36:01
End at: 2018-01-10 13:36:31
Local clock offset: 1.341 ms
Remote clock offset: -0.148 ms

# Below is generated by plot.py at 2018-01-10 14:39:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 511.009 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 511.009 ms
Loss rate: 0.95%
```

Run 3: Report of Copa — Data Link

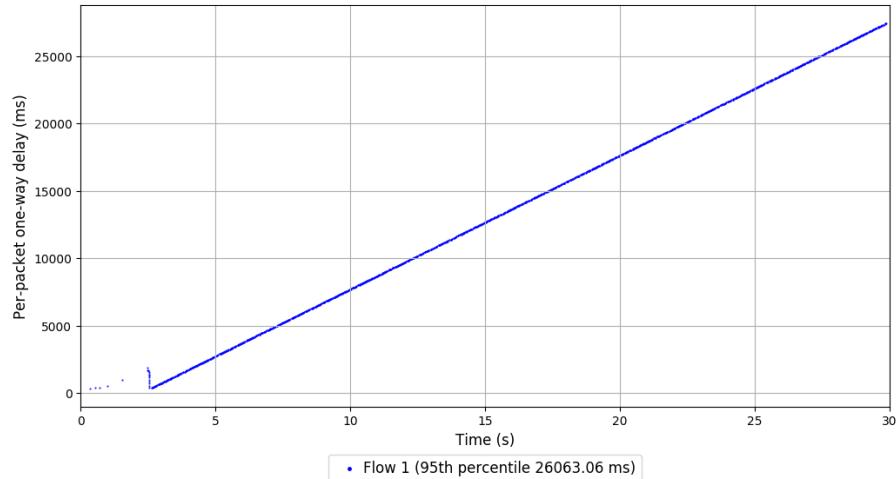
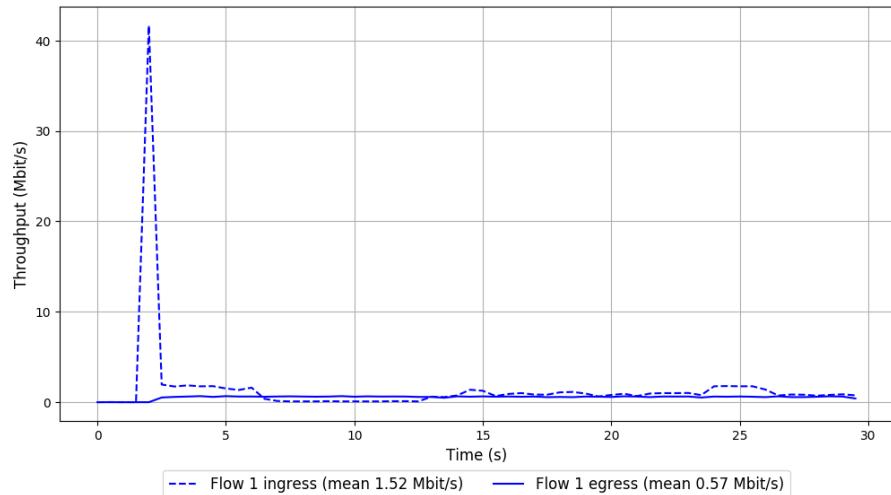


```
Run 1: Statistics of FillP
```

```
Start at: 2018-01-10 13:07:51
End at: 2018-01-10 13:08:21
Local clock offset: 2.112 ms
Remote clock offset: -5.216 ms

# Below is generated by plot.py at 2018-01-10 14:39:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26063.057 ms
Loss rate: 63.15%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26063.057 ms
Loss rate: 63.15%
```

Run 1: Report of FillP — Data Link

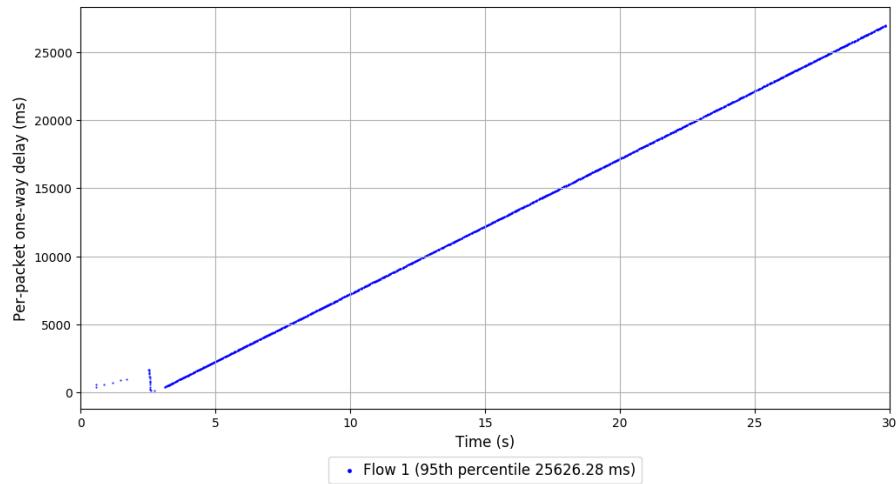
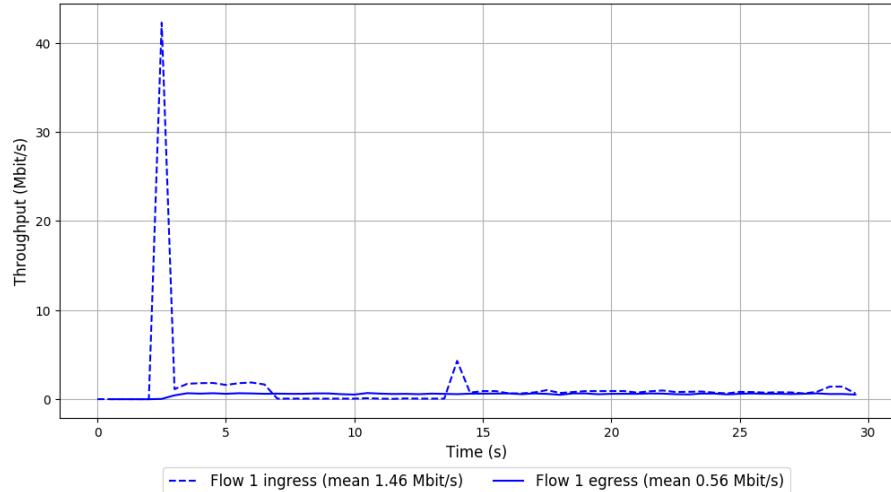


Run 2: Statistics of FillP

```
Start at: 2018-01-10 13:25:27
End at: 2018-01-10 13:25:57
Local clock offset: 1.556 ms
Remote clock offset: -5.009 ms

# Below is generated by plot.py at 2018-01-10 14:39:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 25626.276 ms
Loss rate: 62.39%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 25626.276 ms
Loss rate: 62.39%
```

Run 2: Report of FillP — Data Link

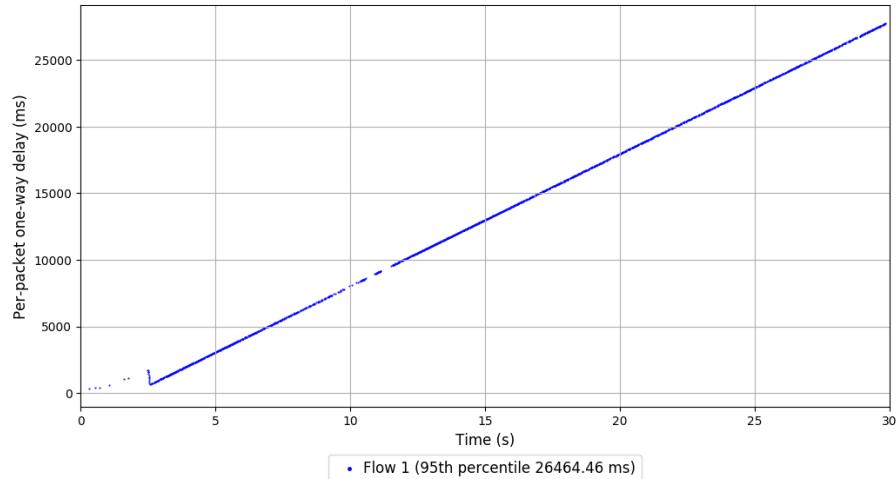
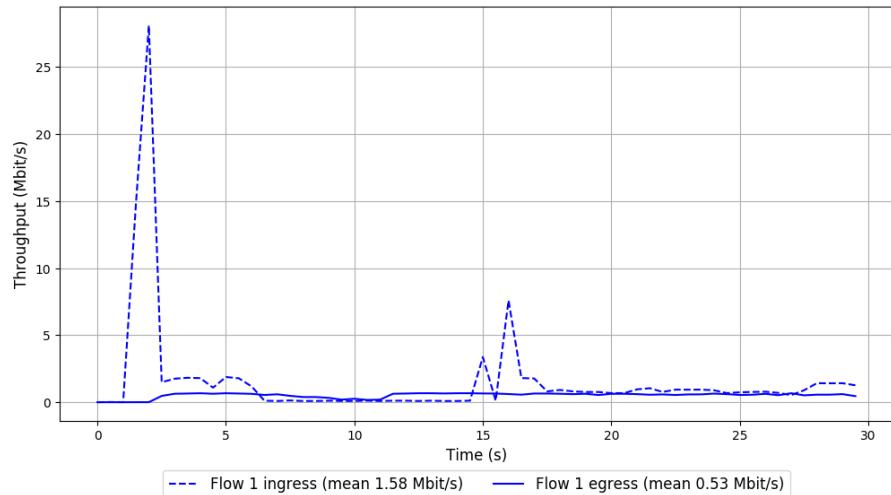


Run 3: Statistics of FillP

```
Start at: 2018-01-10 13:43:02
End at: 2018-01-10 13:43:32
Local clock offset: 1.278 ms
Remote clock offset: -5.365 ms

# Below is generated by plot.py at 2018-01-10 14:39:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 26464.460 ms
Loss rate: 67.30%
-- Flow 1:
Average throughput: 0.53 Mbit/s
95th percentile per-packet one-way delay: 26464.460 ms
Loss rate: 67.30%
```

Run 3: Report of FillP — Data Link

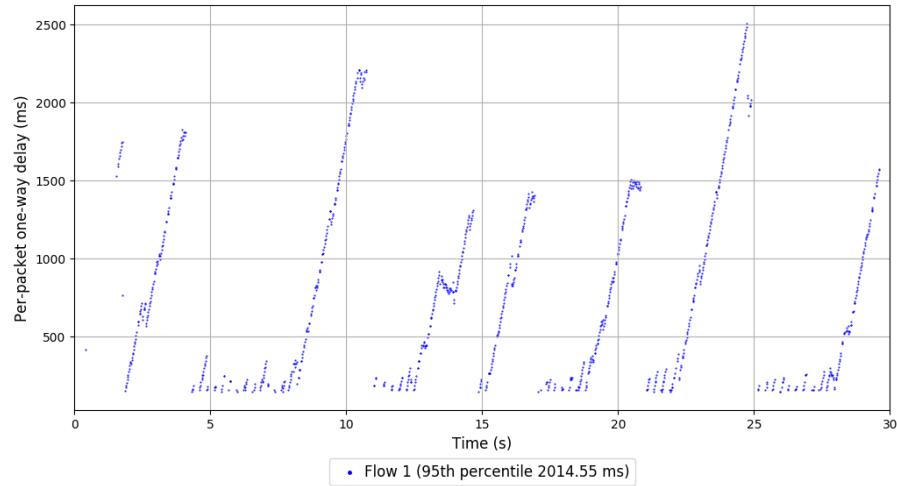
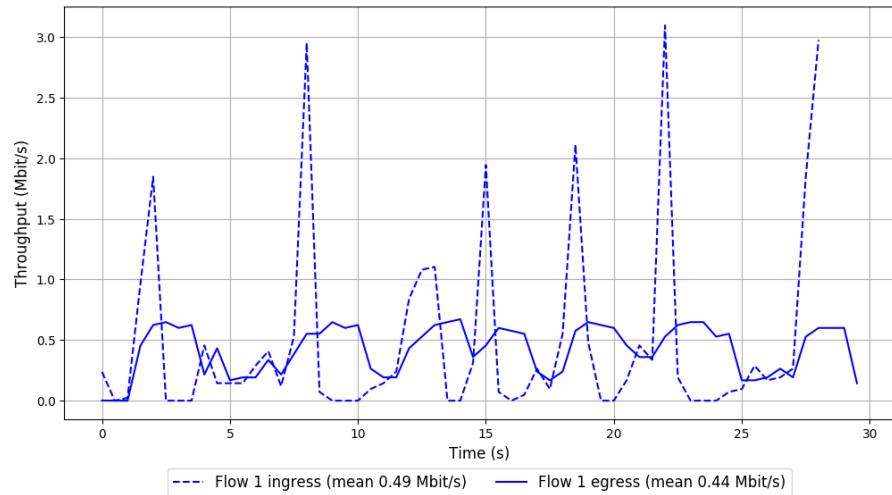


Run 1: Statistics of Indigo

```
Start at: 2018-01-10 12:59:40
End at: 2018-01-10 13:00:10
Local clock offset: 2.376 ms
Remote clock offset: -1.267 ms

# Below is generated by plot.py at 2018-01-10 14:39:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2014.548 ms
Loss rate: 8.79%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 2014.548 ms
Loss rate: 8.79%
```

Run 1: Report of Indigo — Data Link

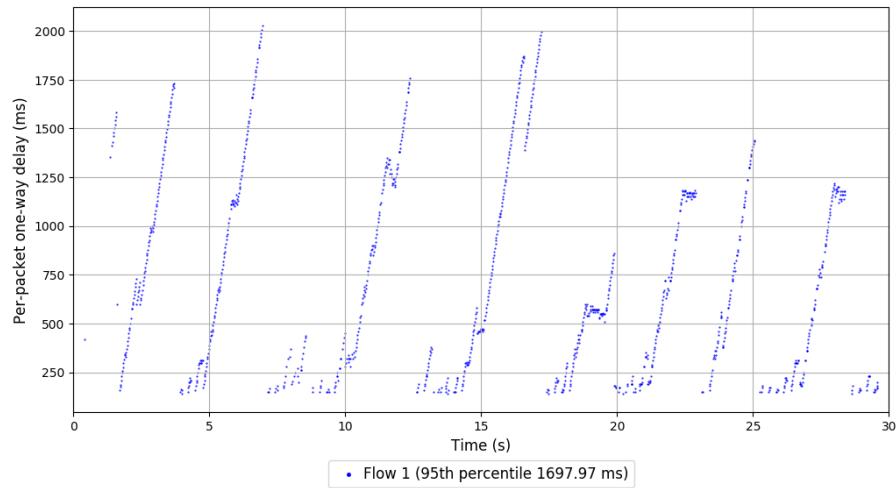
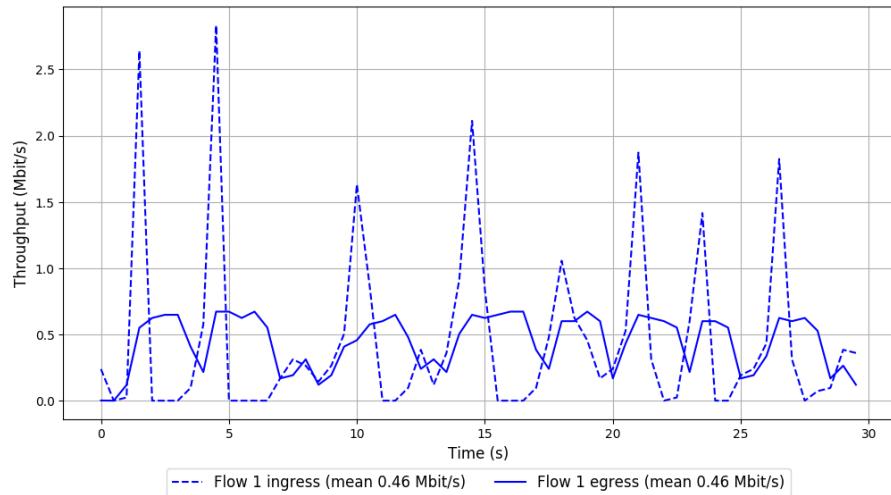


Run 2: Statistics of Indigo

```
Start at: 2018-01-10 13:17:16
End at: 2018-01-10 13:17:46
Local clock offset: 1.831 ms
Remote clock offset: -0.543 ms

# Below is generated by plot.py at 2018-01-10 14:39:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 1697.972 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 1697.972 ms
Loss rate: 1.33%
```

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

```
Start at: 2018-01-10 13:34:51
End at: 2018-01-10 13:35:21
Local clock offset: 1.39 ms
Remote clock offset: -0.145 ms

# Below is generated by plot.py at 2018-01-10 14:39:17
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 2188.642 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 2188.642 ms
Loss rate: 0.68%
```

Run 3: Report of Indigo — Data Link

