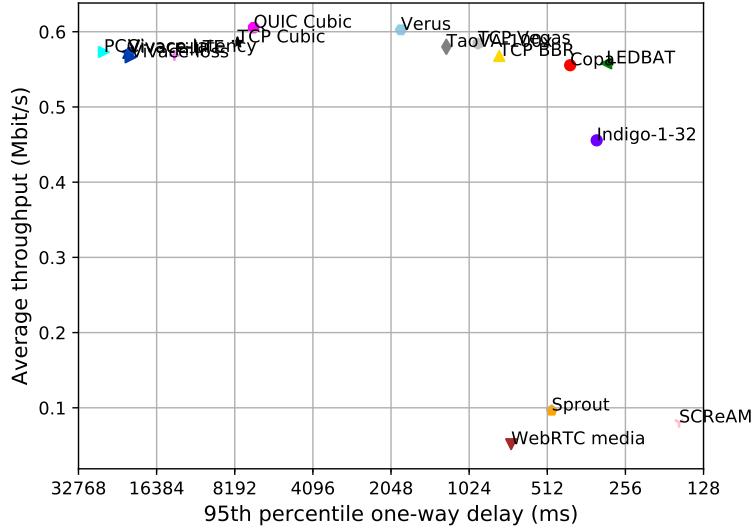


Pantheon Report

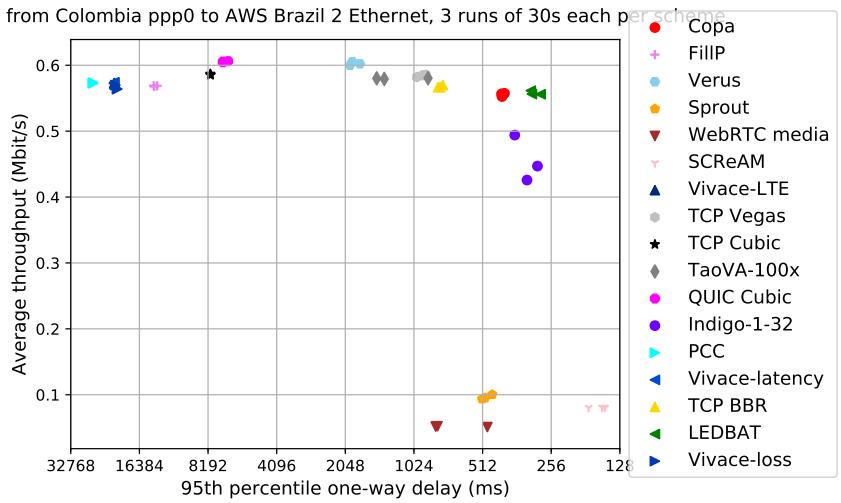
Generated at 2018-04-03 01:45:46 (UTC).
Data path: Colombia ppp0 (*remote*) → AWS Brazil 2 Ethernet (*local*).
Repeated the test of 17 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).
Tested BBR with qdisc 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 @ eb420b5be9bafcc22cf68b99ff5a2000462fc59
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
M datagrump/sender.cc
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44
third_party/genericCC @ 9249eea3238475c4d8cca1443d28df70bff6c4a2
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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 @ b3465b942e2826f2b179aab4a906ce6bb7cf3cf
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 @ f1a14bffe749737437f61b1eaeeb30b267cde681
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



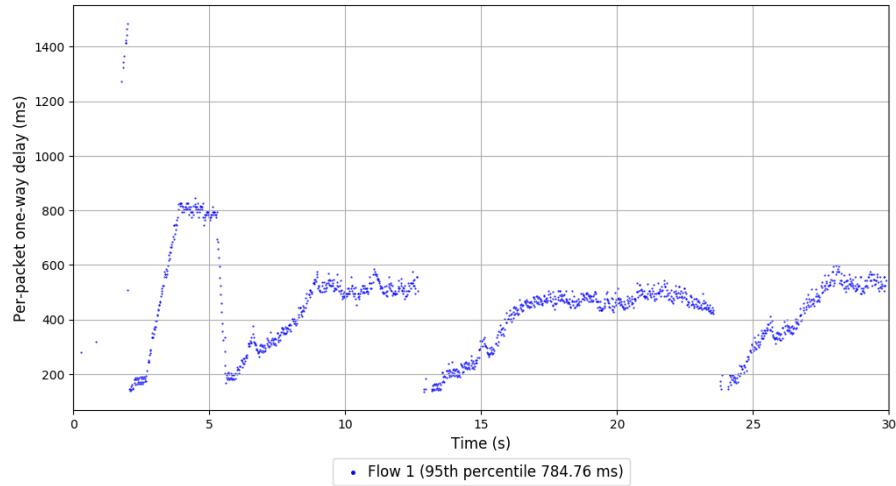
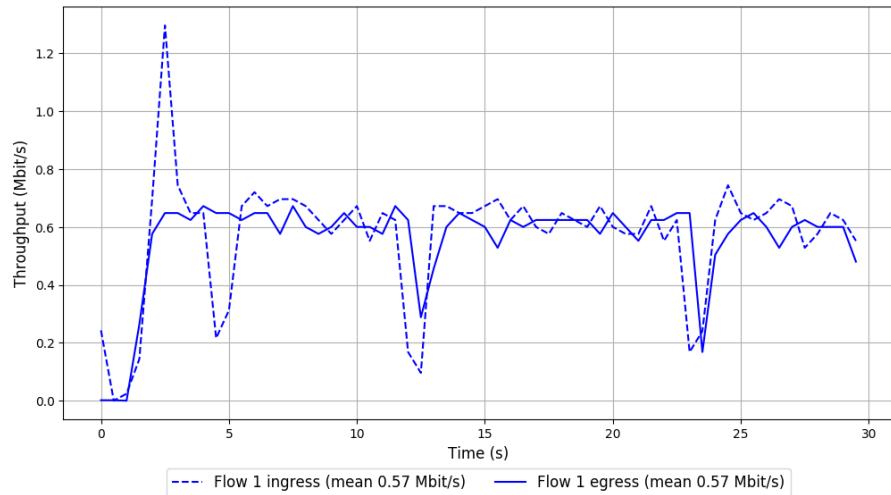
| scheme | # runs | mean avg tput (Mbit/s) flow 1 | mean 95th-%ile delay (ms) flow 1 | mean loss rate (%) flow 1 |
|----------------|--------|----------------------------------|-------------------------------------|------------------------------|
| TCP BBR | 3 | 0.57 | 783.77 | 2.24 |
| TCP Cubic | 3 | 0.59 | 7996.48 | 30.92 |
| LEDBAT | 3 | 0.56 | 303.60 | 1.36 |
| PCC | 3 | 0.57 | 26154.84 | 98.52 |
| QUIC Cubic | 3 | 0.61 | 6928.74 | 29.01 |
| SCReAM | 3 | 0.08 | 159.08 | 0.84 |
| WebRTC media | 3 | 0.05 | 705.54 | 0.03 |
| Sprout | 3 | 0.10 | 492.67 | 1.79 |
| TaoVA-100x | 3 | 0.58 | 1253.67 | 2.69 |
| TCP Vegas | 3 | 0.58 | 947.04 | 1.35 |
| Verus | 3 | 0.60 | 1876.74 | 5.58 |
| Copa | 3 | 0.56 | 418.03 | 2.91 |
| FillP | 3 | 0.57 | 13988.66 | 38.48 |
| Indigo-1-32 | 3 | 0.46 | 330.38 | 1.56 |
| Vivace-latency | 3 | 0.57 | 21159.43 | 70.43 |
| Vivace-loss | 3 | 0.56 | 20637.23 | 89.16 |
| Vivace-LTE | 3 | 0.57 | 21058.53 | 70.96 |

Run 1: Statistics of TCP BBR

```
Start at: 2018-04-02 23:43:59
End at: 2018-04-02 23:44:29
Local clock offset: -2.261 ms
Remote clock offset: 7.006 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 784.760 ms
Loss rate: 2.17%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 784.760 ms
Loss rate: 2.17%
```

Run 1: Report of TCP BBR — Data Link

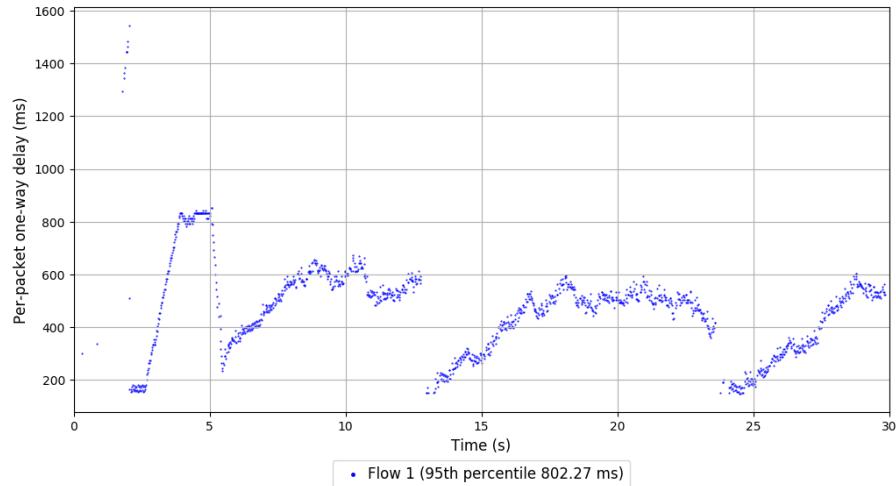
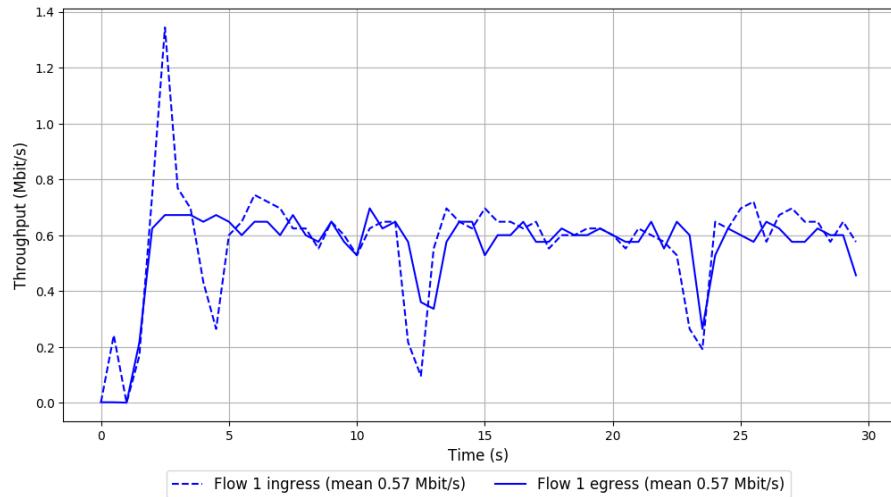


Run 2: Statistics of TCP BBR

```
Start at: 2018-04-03 00:05:13
End at: 2018-04-03 00:05:43
Local clock offset: 18.434 ms
Remote clock offset: 13.344 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 802.268 ms
Loss rate: 2.38%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 802.268 ms
Loss rate: 2.38%
```

Run 2: Report of TCP BBR — Data Link

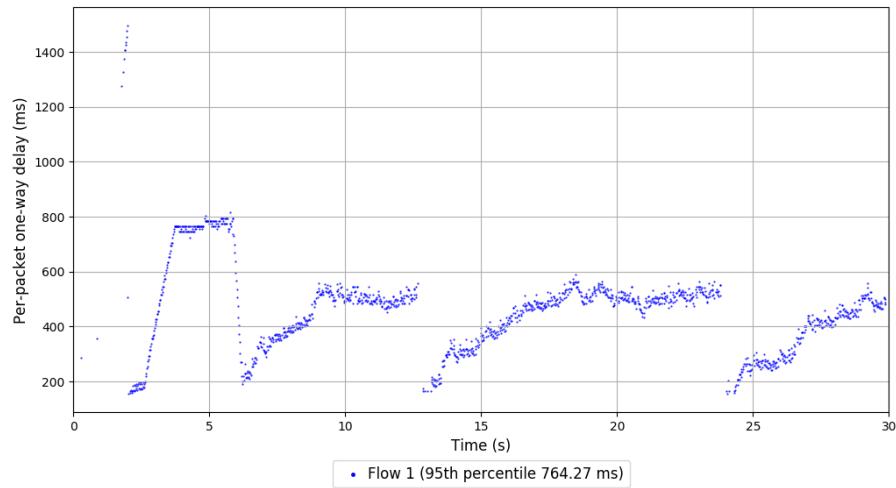
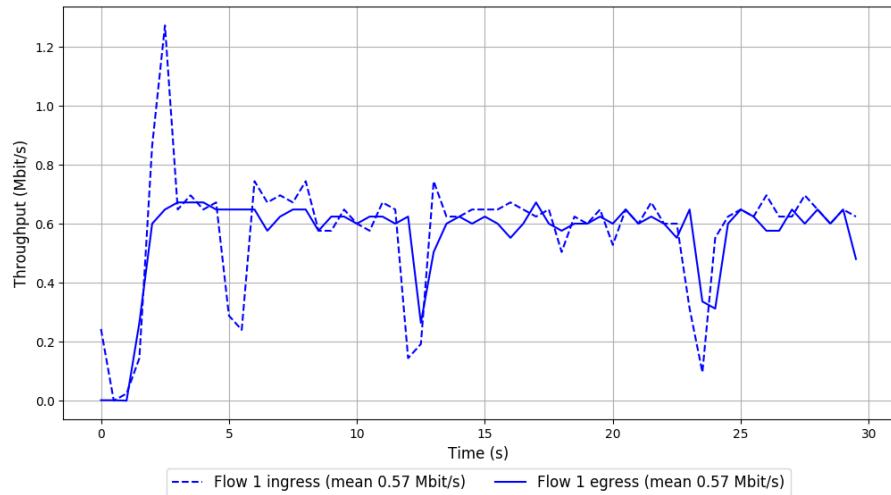


Run 3: Statistics of TCP BBR

```
Start at: 2018-04-03 00:26:27
End at: 2018-04-03 00:26:57
Local clock offset: 17.64 ms
Remote clock offset: 6.032 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 764.275 ms
Loss rate: 2.16%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 764.275 ms
Loss rate: 2.16%
```

Run 3: Report of TCP BBR — Data Link

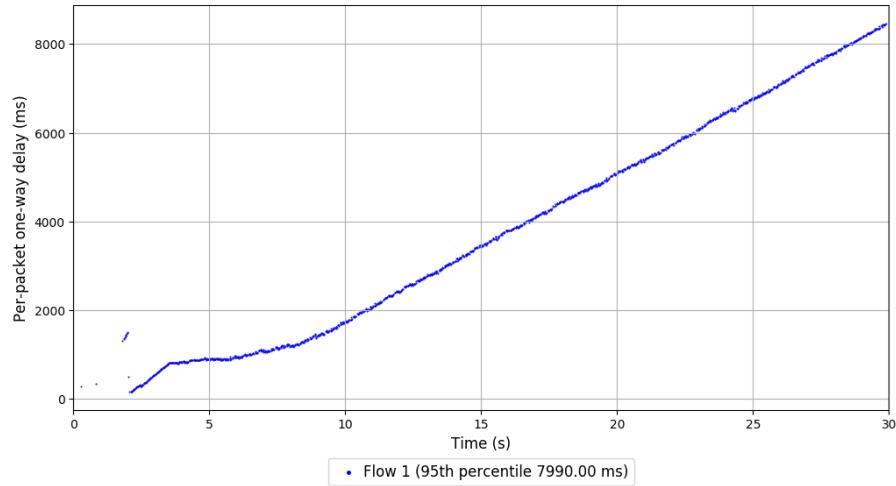
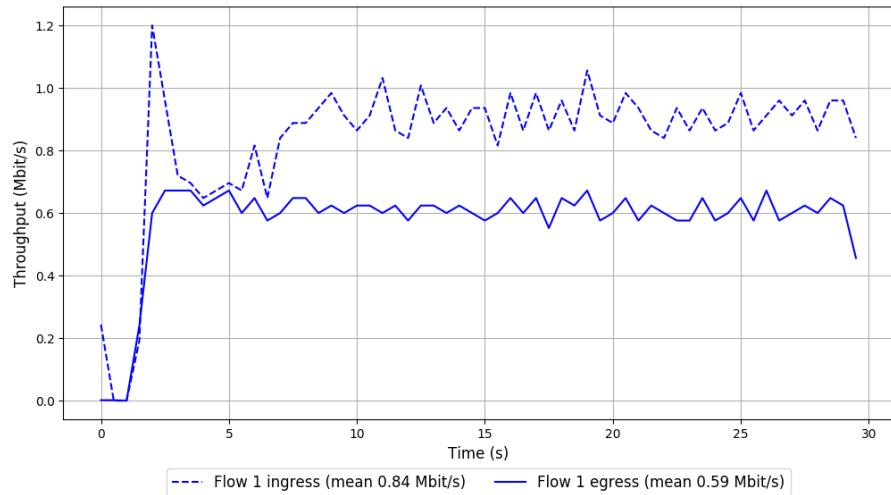


Run 1: Statistics of TCP Cubic

```
Start at: 2018-04-02 23:52:14
End at: 2018-04-02 23:52:44
Local clock offset: 14.007 ms
Remote clock offset: 7.402 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 7989.998 ms
Loss rate: 30.97%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 7989.998 ms
Loss rate: 30.97%
```

Run 1: Report of TCP Cubic — Data Link

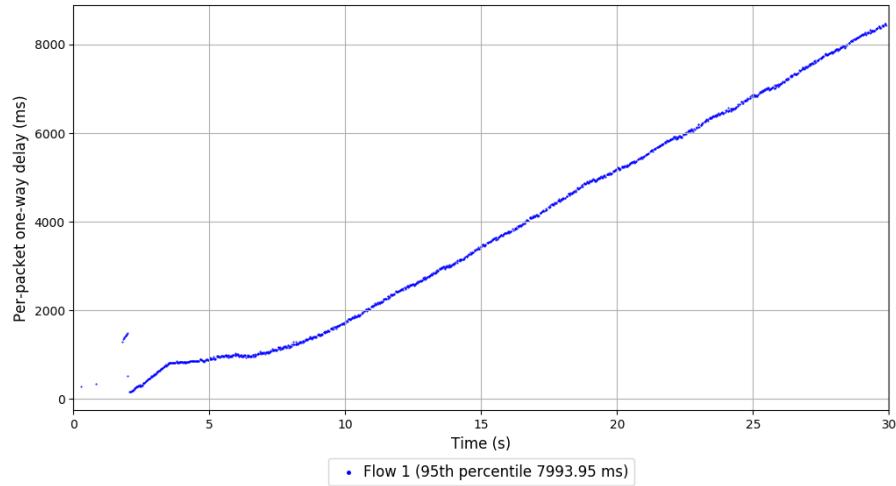
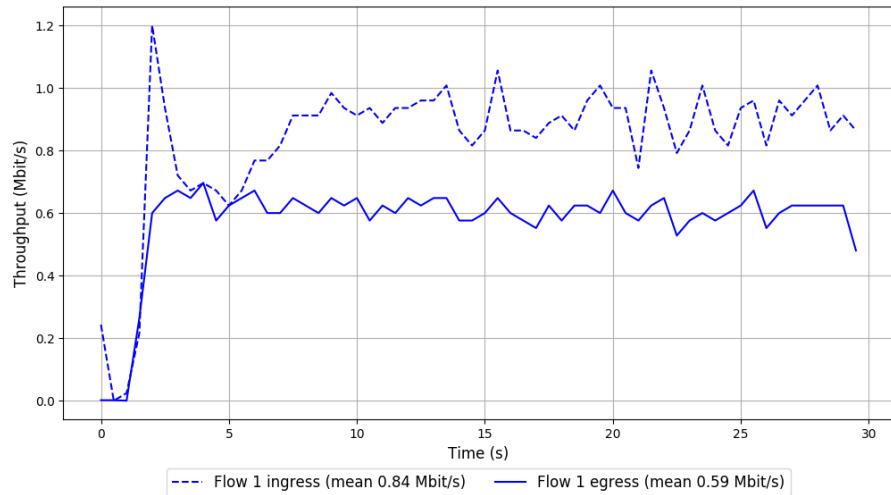


Run 2: Statistics of TCP Cubic

```
Start at: 2018-04-03 00:13:28
End at: 2018-04-03 00:13:58
Local clock offset: 20.635 ms
Remote clock offset: 13.729 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 7993.952 ms
Loss rate: 30.96%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 7993.952 ms
Loss rate: 30.96%
```

Run 2: Report of TCP Cubic — Data Link

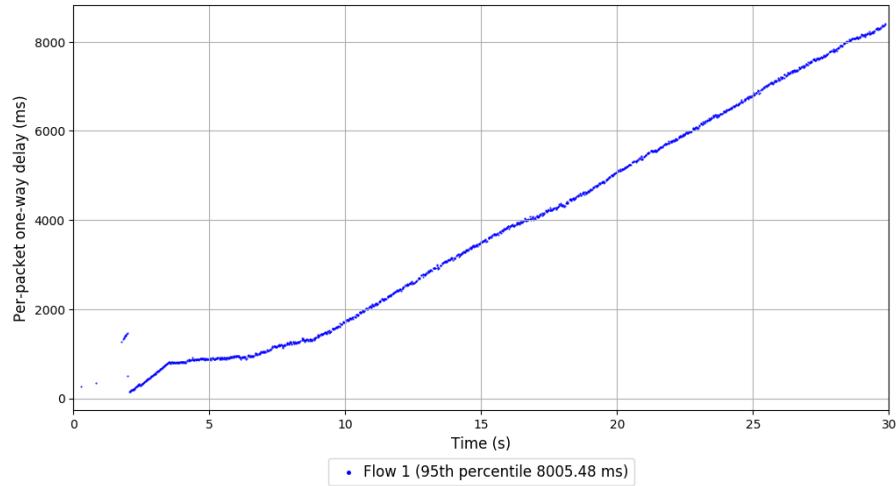
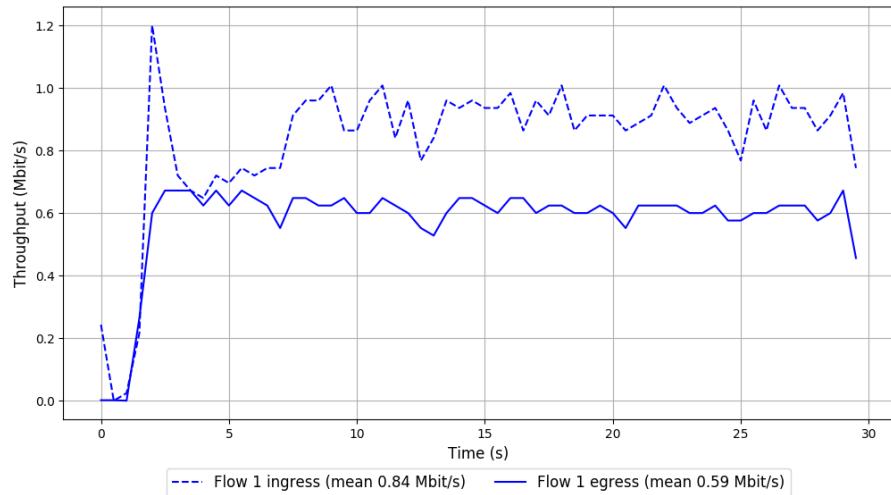


Run 3: Statistics of TCP Cubic

```
Start at: 2018-04-03 00:34:41
End at: 2018-04-03 00:35:11
Local clock offset: 9.739 ms
Remote clock offset: 12.482 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 8005.480 ms
Loss rate: 30.83%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 8005.480 ms
Loss rate: 30.83%
```

Run 3: Report of TCP Cubic — Data Link

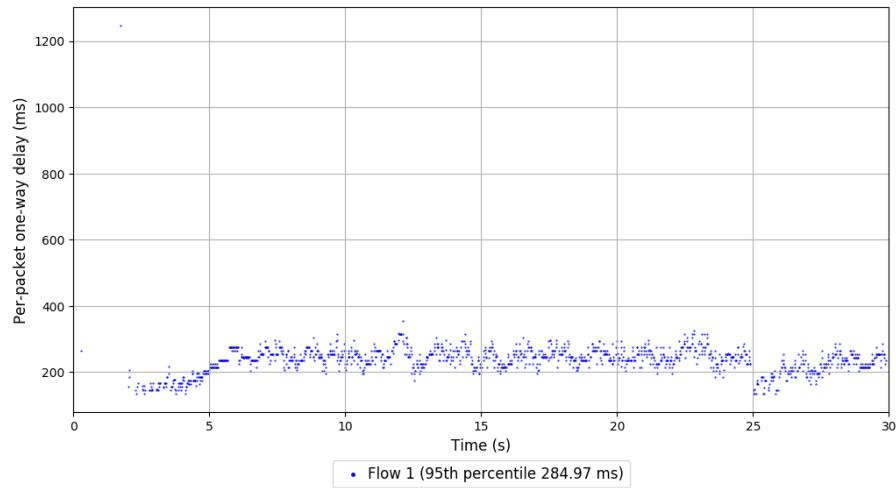
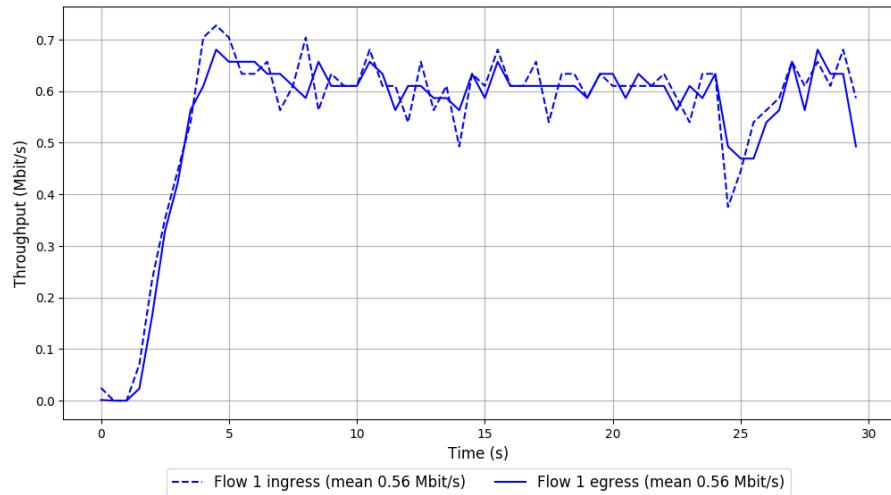


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2018-04-02 23:38:06
End at: 2018-04-02 23:38:36
Local clock offset: 4.865 ms
Remote clock offset: 10.87 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 284.969 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 284.969 ms
Loss rate: 1.34%
```

Run 1: Report of LEDBAT — Data Link

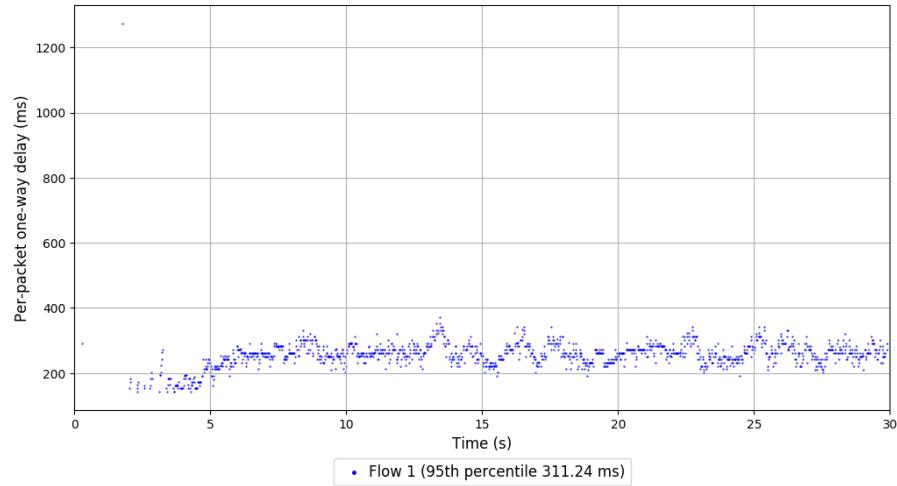
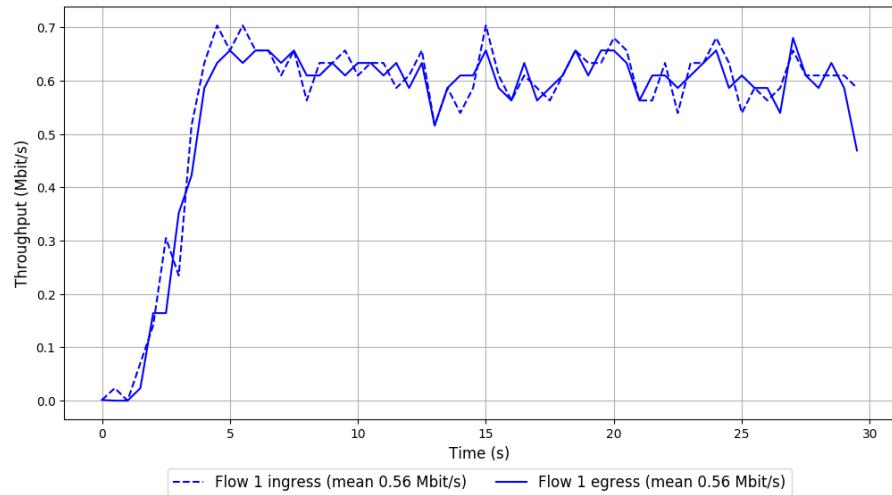


Run 2: Statistics of LEDBAT

```
Start at: 2018-04-02 23:59:19
End at: 2018-04-02 23:59:50
Local clock offset: 10.837 ms
Remote clock offset: 14.192 ms

# Below is generated by plot.py at 2018-04-03 01:45:12
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 311.242 ms
Loss rate: 1.34%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 311.242 ms
Loss rate: 1.34%
```

Run 2: Report of LEDBAT — Data Link

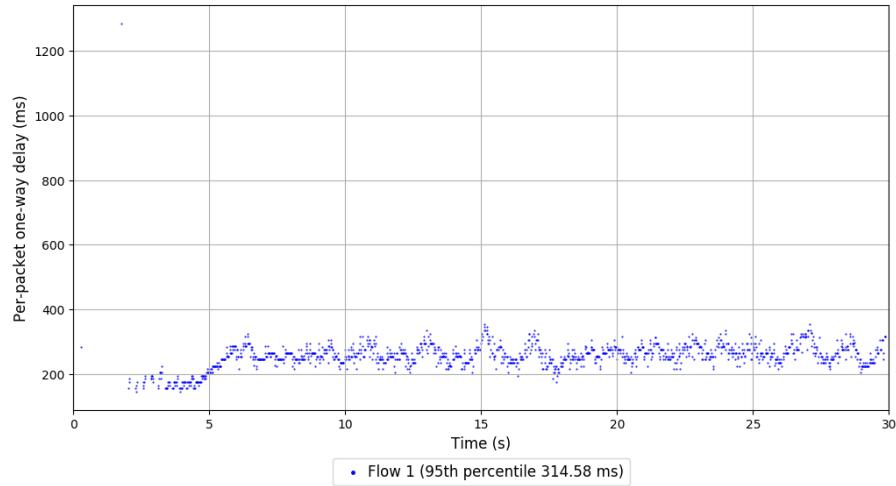
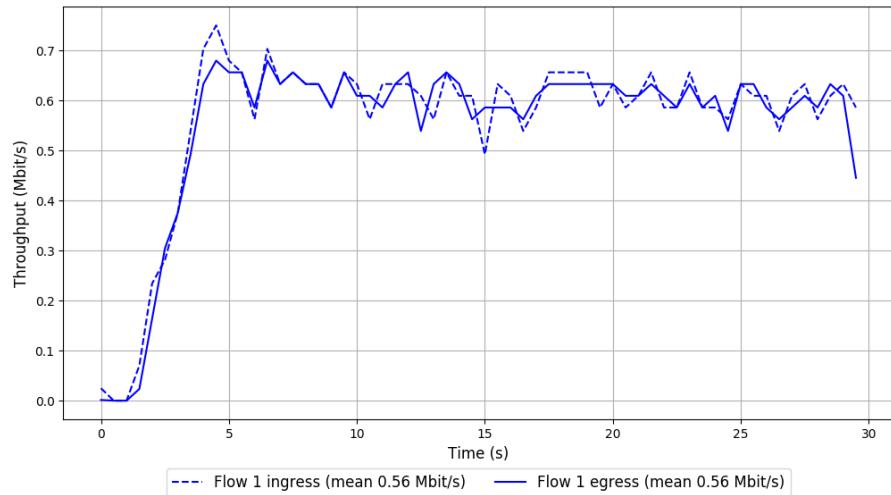


```
Run 3: Statistics of LEDBAT
```

```
Start at: 2018-04-03 00:20:33
End at: 2018-04-03 00:21:03
Local clock offset: 13.336 ms
Remote clock offset: 12.522 ms

# Below is generated by plot.py at 2018-04-03 01:45:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 314.585 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 314.585 ms
Loss rate: 1.39%
```

Run 3: Report of LEDBAT — Data Link



```
Run 1: Statistics of PCC
```

```
Start at: 2018-04-02 23:54:35
```

```
End at: 2018-04-02 23:55:05
```

```
Local clock offset: -2.107 ms
```

```
Remote clock offset: 12.947 ms
```

```
# Below is generated by plot.py at 2018-04-03 01:45:39
```

```
# Datalink statistics
```

```
-- Total of 1 flow:
```

```
Average throughput: 0.57 Mbit/s
```

```
95th percentile per-packet one-way delay: 26095.580 ms
```

```
Loss rate: 98.48%
```

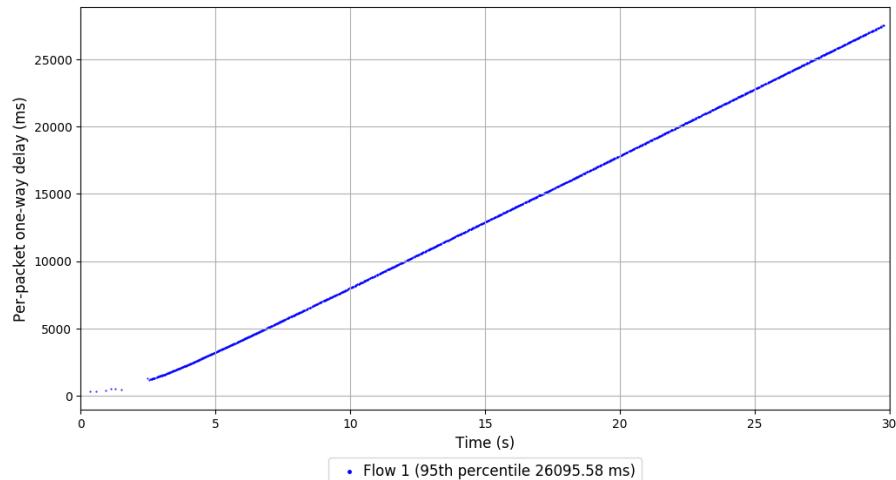
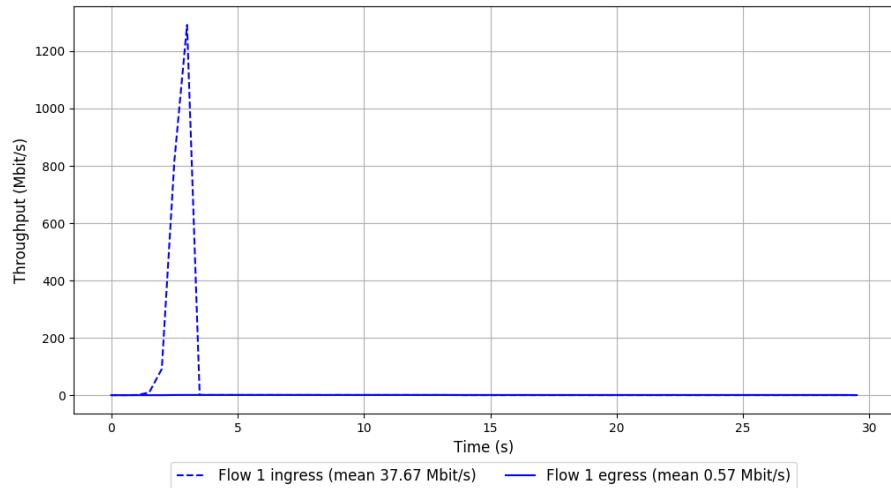
```
-- Flow 1:
```

```
Average throughput: 0.57 Mbit/s
```

```
95th percentile per-packet one-way delay: 26095.580 ms
```

```
Loss rate: 98.48%
```

Run 1: Report of PCC — Data Link

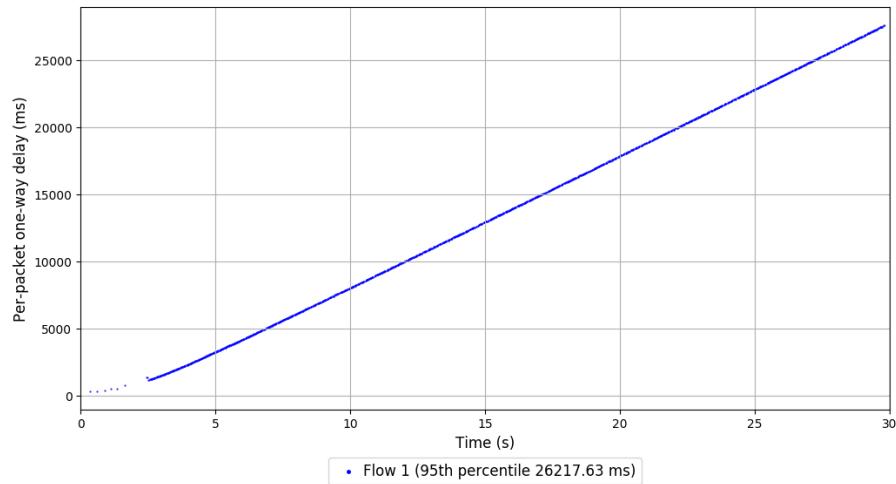
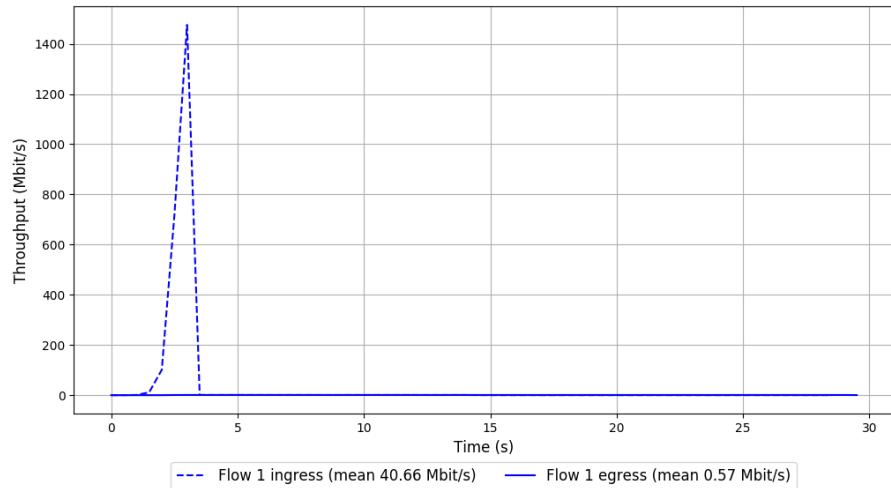


Run 2: Statistics of PCC

```
Start at: 2018-04-03 00:15:49
End at: 2018-04-03 00:16:19
Local clock offset: 14.279 ms
Remote clock offset: 6.183 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26217.633 ms
Loss rate: 98.55%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26217.633 ms
Loss rate: 98.55%
```

Run 2: Report of PCC — Data Link

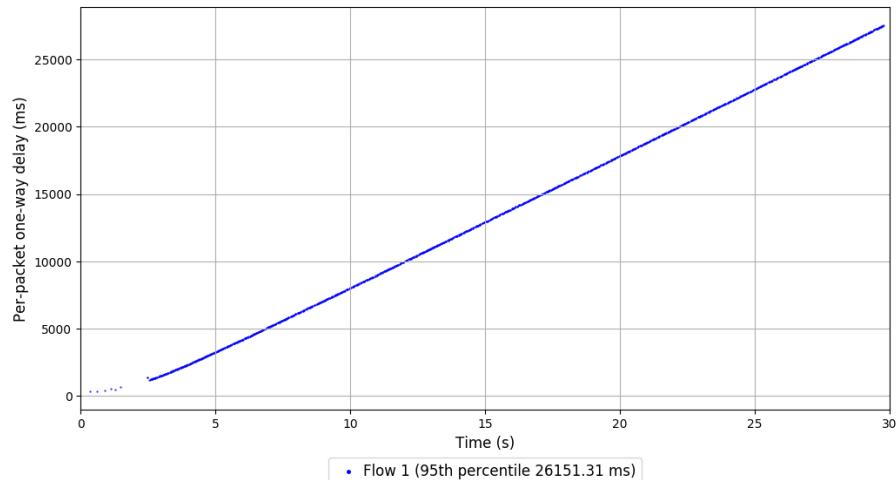
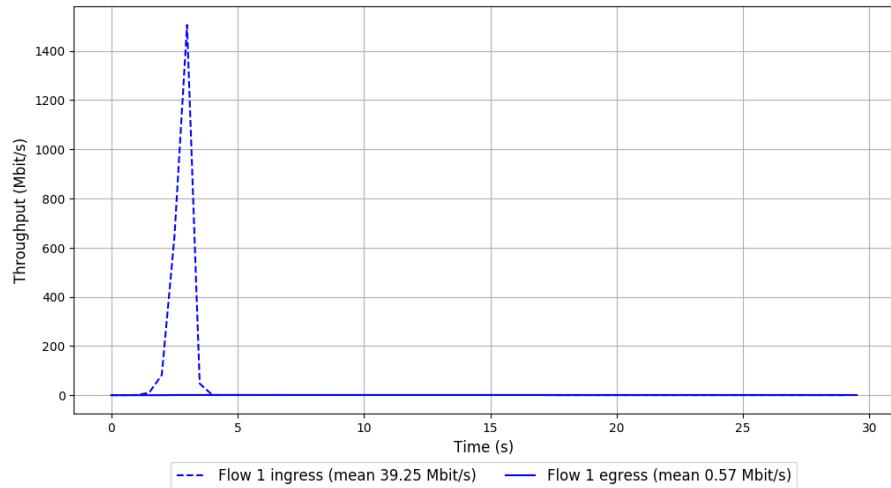


Run 3: Statistics of PCC

```
Start at: 2018-04-03 00:37:03
End at: 2018-04-03 00:37:33
Local clock offset: 19.159 ms
Remote clock offset: 12.461 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26151.307 ms
Loss rate: 98.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 26151.307 ms
Loss rate: 98.54%
```

Run 3: Report of PCC — Data Link

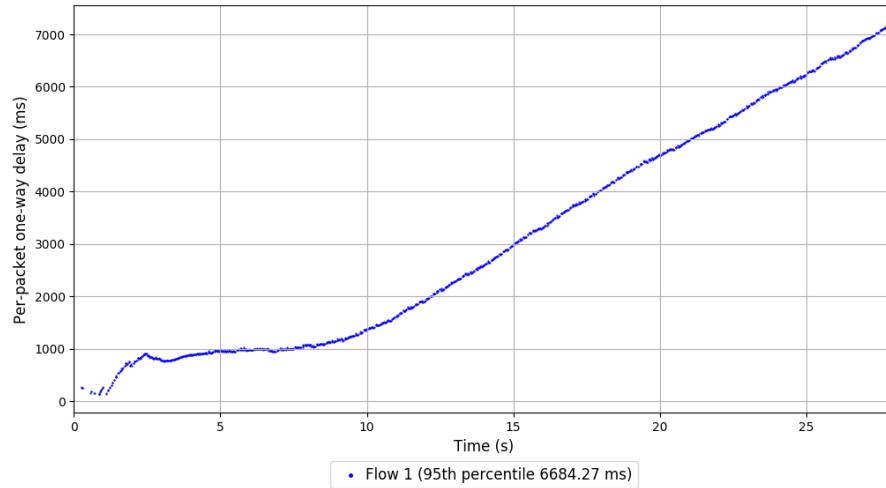
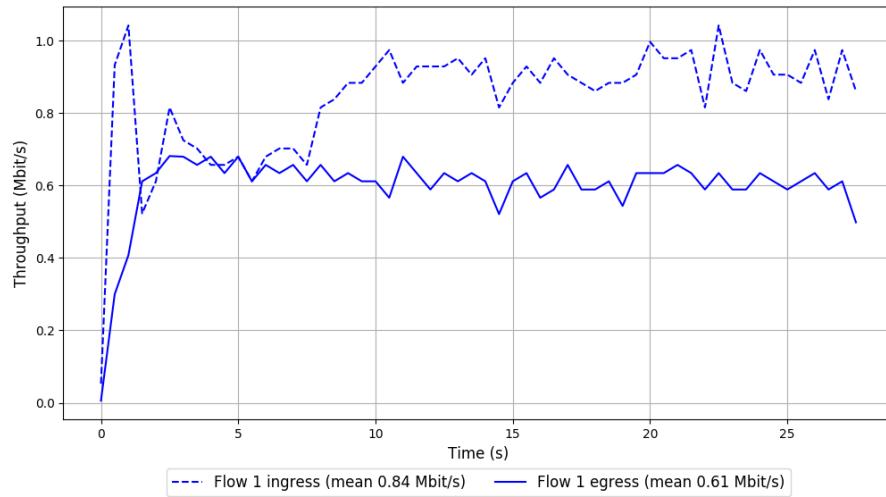


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-04-02 23:41:38
End at: 2018-04-02 23:42:08
Local clock offset: -2.433 ms
Remote clock offset: 11.173 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 6684.265 ms
Loss rate: 28.89%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 6684.265 ms
Loss rate: 28.89%
```

Run 1: Report of QUIC Cubic — Data Link

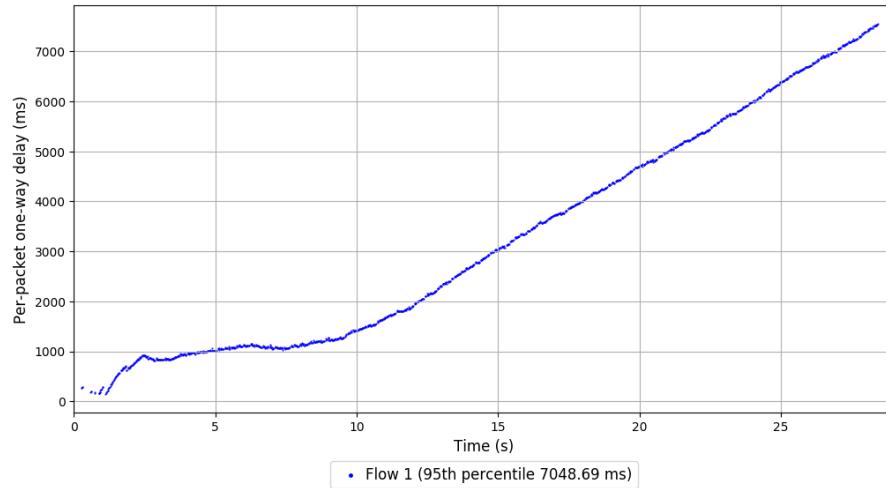
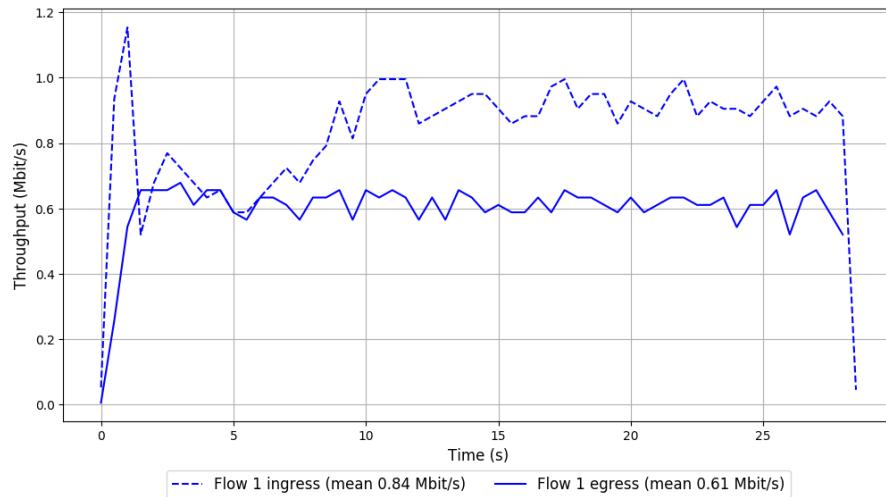


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-04-03 00:02:51
End at: 2018-04-03 00:03:21
Local clock offset: 17.871 ms
Remote clock offset: 6.94 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 7048.689 ms
Loss rate: 29.14%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 7048.689 ms
Loss rate: 29.14%
```

Run 2: Report of QUIC Cubic — Data Link

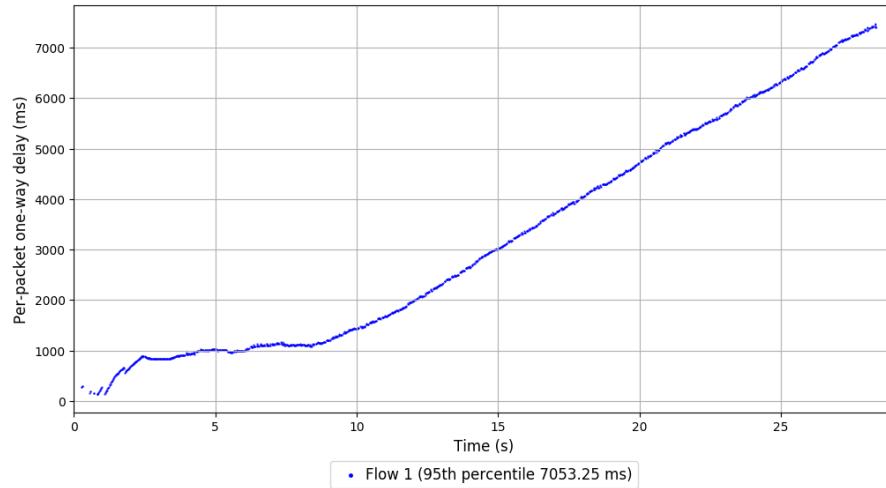
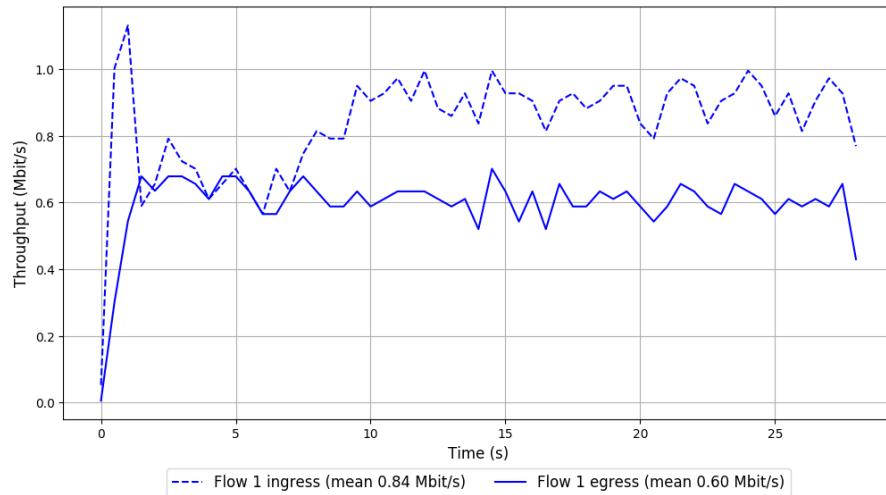


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-04-03 00:24:05
End at: 2018-04-03 00:24:35
Local clock offset: 10.904 ms
Remote clock offset: 13.5 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7053.254 ms
Loss rate: 29.00%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 7053.254 ms
Loss rate: 29.00%
```

Run 3: Report of QUIC Cubic — Data Link

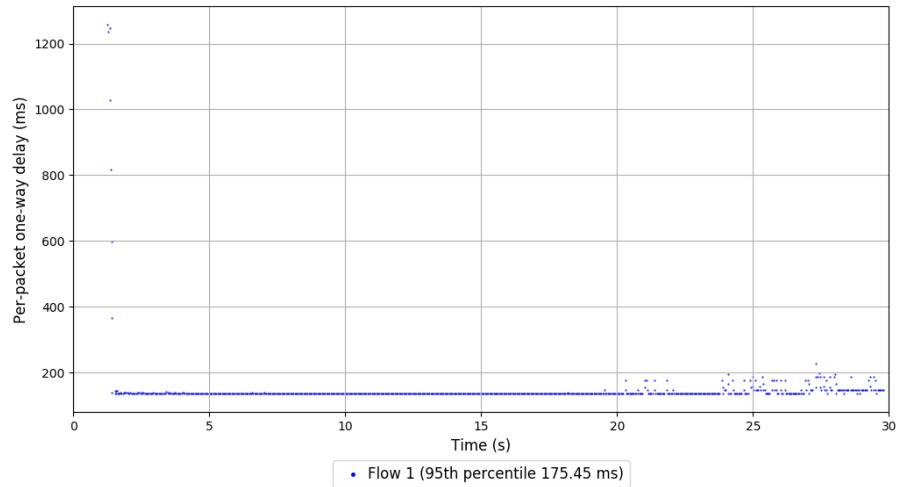
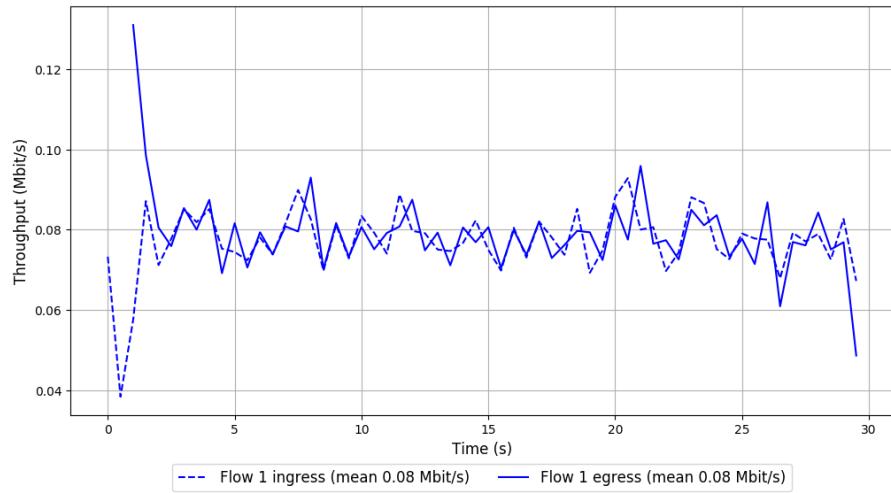


```
Run 1: Statistics of SCReAM
```

```
Start at: 2018-04-02 23:58:09
End at: 2018-04-02 23:58:39
Local clock offset: 15.983 ms
Remote clock offset: 12.126 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 175.454 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 175.454 ms
Loss rate: 0.93%
```

Run 1: Report of SCReAM — Data Link

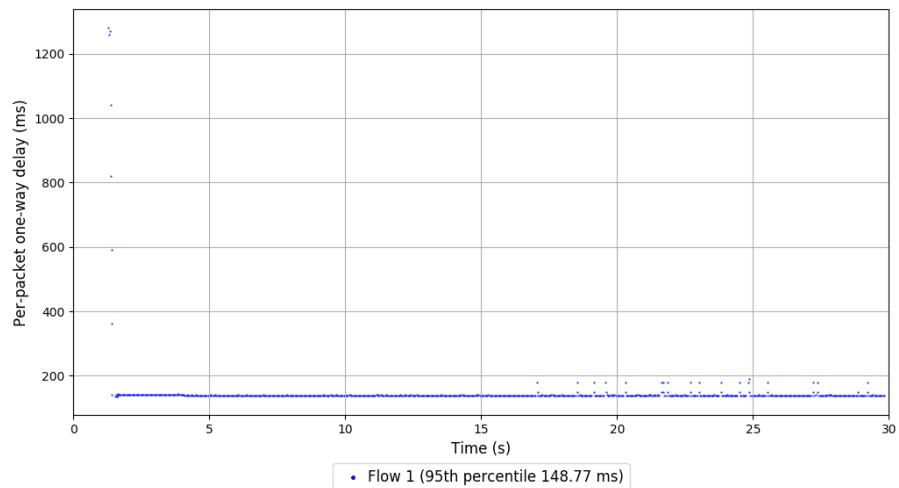
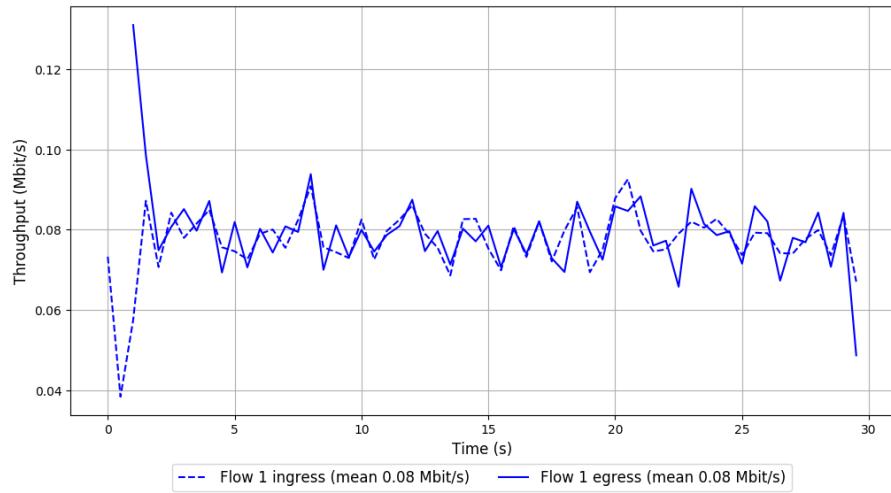


Run 2: Statistics of SCReAM

```
Start at: 2018-04-03 00:19:22
End at: 2018-04-03 00:19:52
Local clock offset: 14.153 ms
Remote clock offset: 12.468 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 148.771 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 148.771 ms
Loss rate: 0.79%
```

Run 2: Report of SCReAM — Data Link

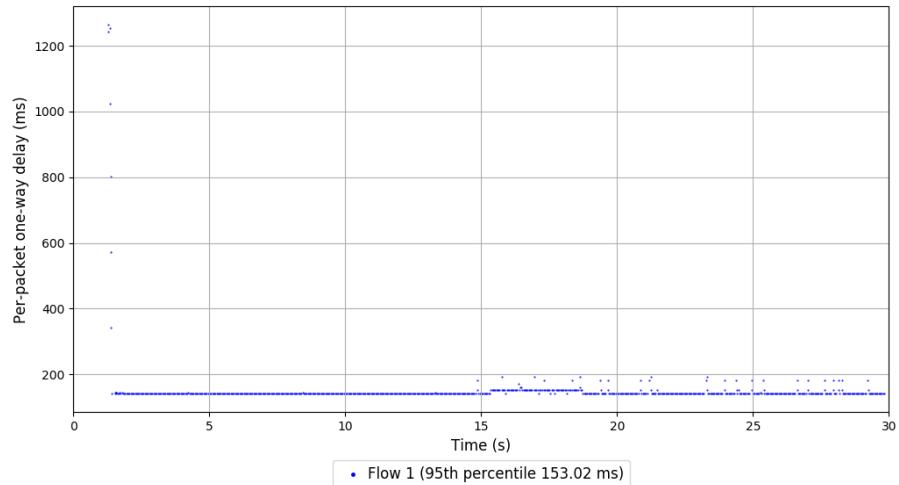
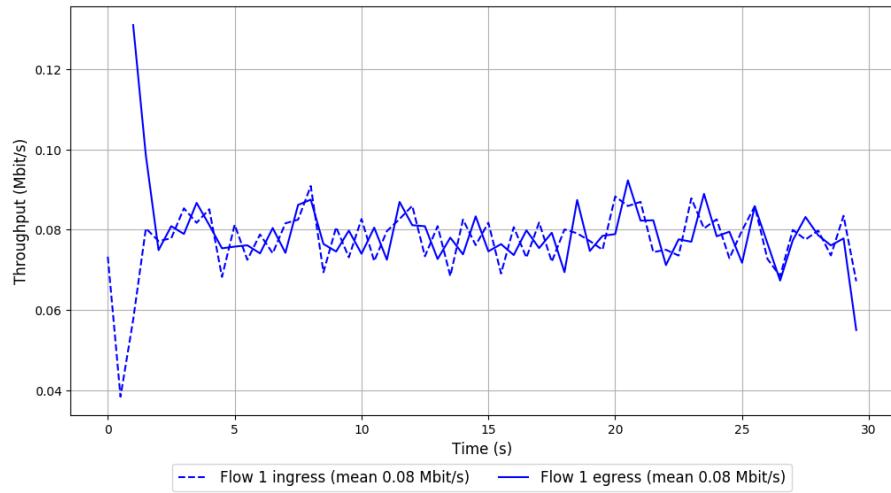


Run 3: Statistics of SCReAM

```
Start at: 2018-04-03 00:40:36
End at: 2018-04-03 00:41:06
Local clock offset: 16.605 ms
Remote clock offset: 5.995 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 153.021 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 153.021 ms
Loss rate: 0.79%
```

Run 3: Report of SCReAM — Data Link

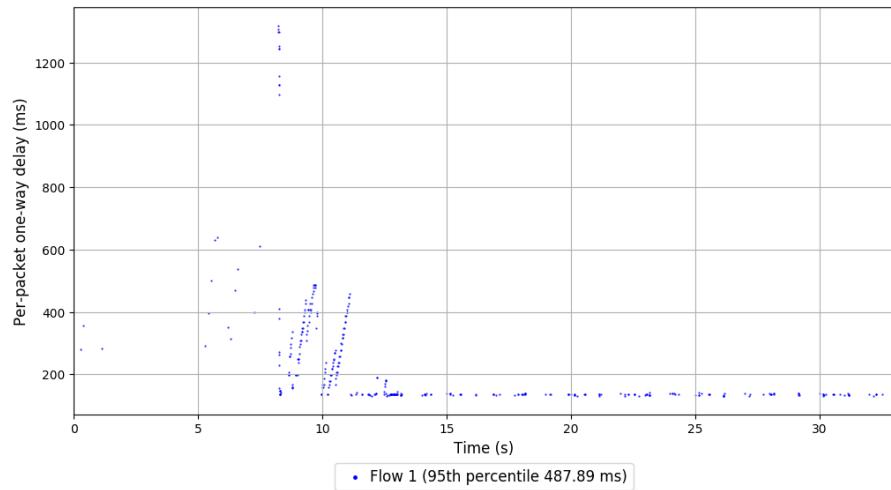
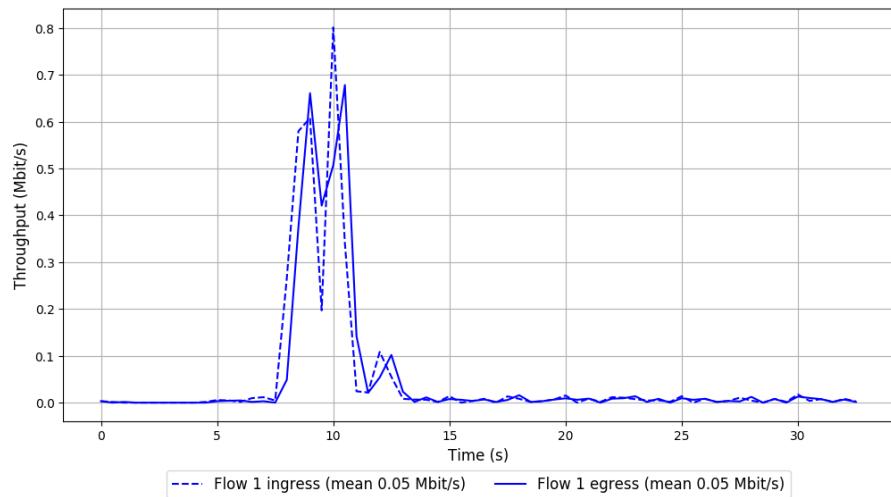


```
Run 1: Statistics of WebRTC media

Start at: 2018-04-02 23:55:48
End at: 2018-04-02 23:56:18
Local clock offset: 15.239 ms
Remote clock offset: 14.026 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 487.890 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 487.890 ms
Loss rate: 0.08%
```

Run 1: Report of WebRTC media — Data Link

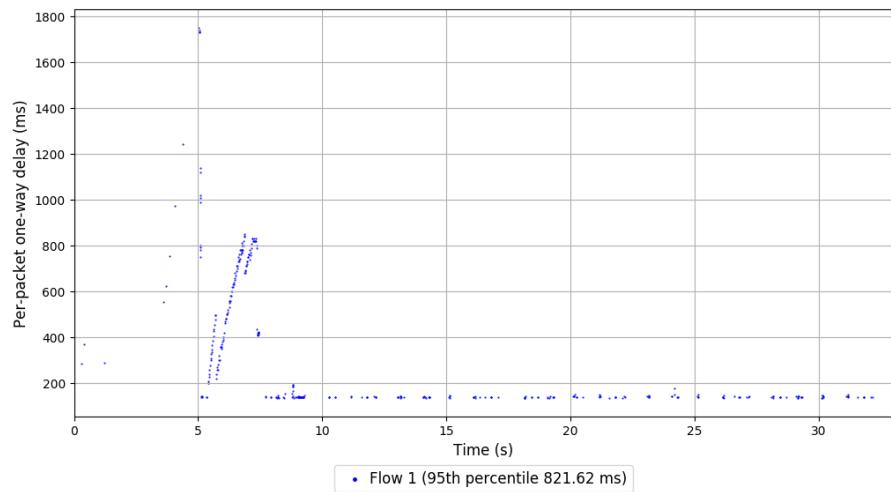
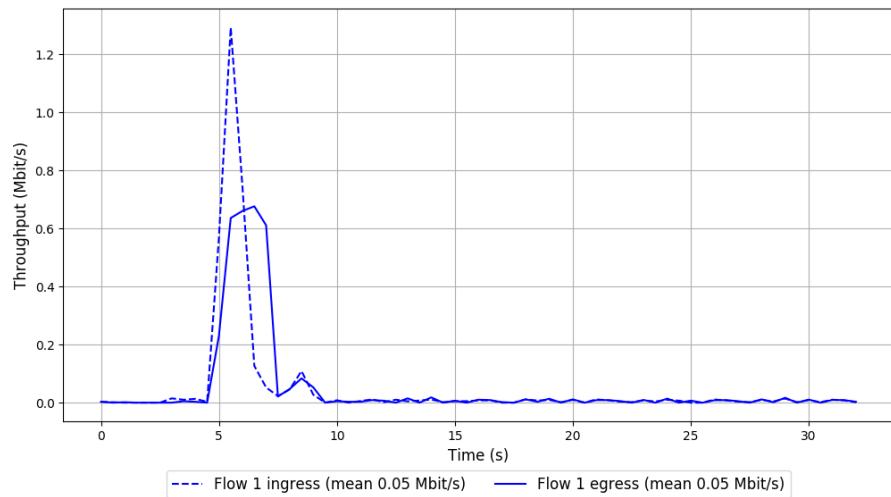


Run 2: Statistics of WebRTC media

```
Start at: 2018-04-03 00:17:01
End at: 2018-04-03 00:17:31
Local clock offset: 19.647 ms
Remote clock offset: 12.483 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 821.622 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 821.622 ms
Loss rate: 0.00%
```

Run 2: Report of WebRTC media — Data Link

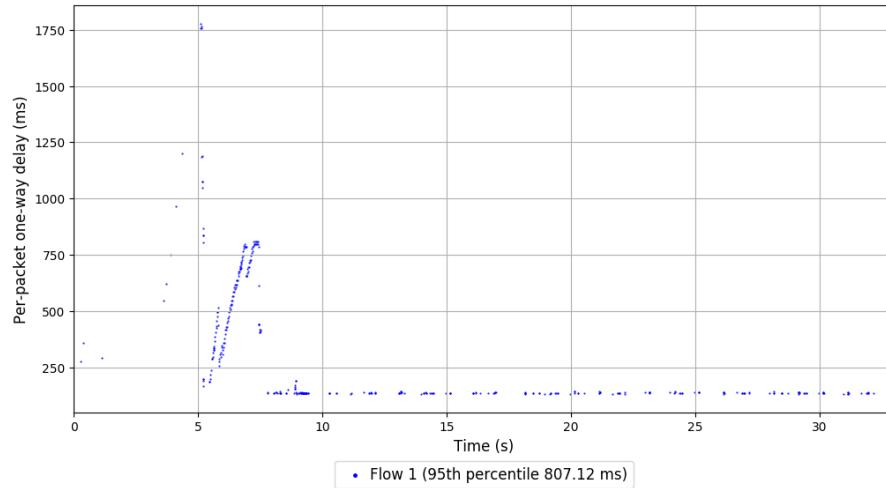
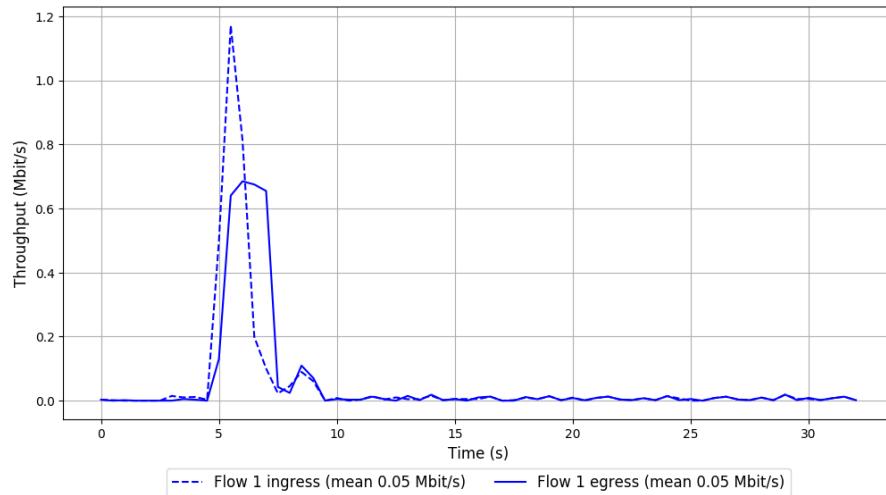


```
Run 3: Statistics of WebRTC media
```

```
Start at: 2018-04-03 00:38:15
End at: 2018-04-03 00:38:45
Local clock offset: 9.132 ms
Remote clock offset: 7.069 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 807.118 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 807.118 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

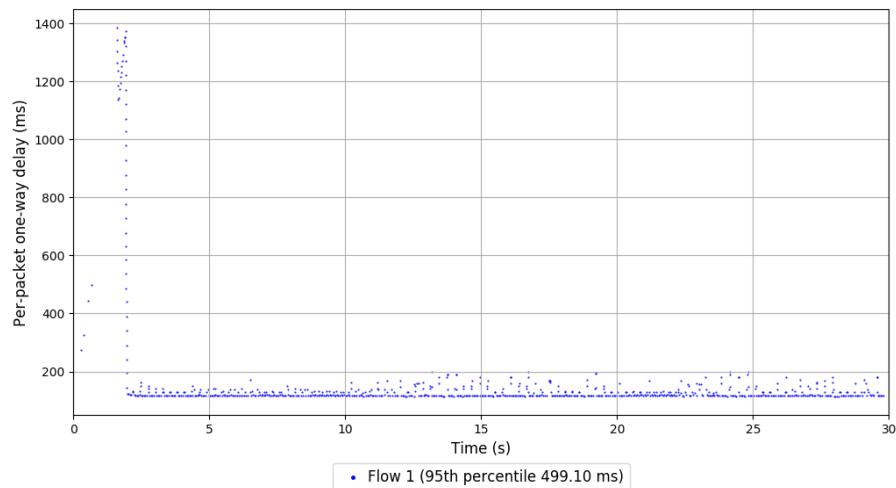
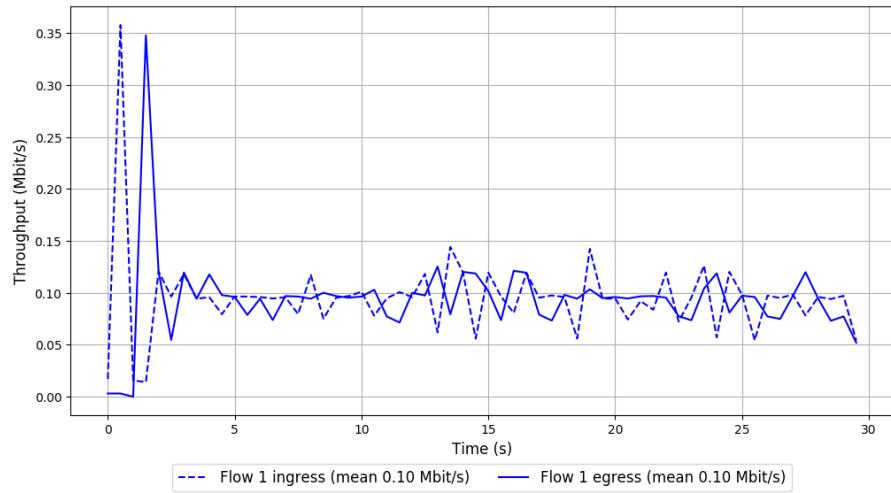


Run 1: Statistics of Sprout

```
Start at: 2018-04-02 23:42:48
End at: 2018-04-02 23:43:18
Local clock offset: -2.286 ms
Remote clock offset: 12.362 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 499.103 ms
Loss rate: 1.66%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 499.103 ms
Loss rate: 1.66%
```

Run 1: Report of Sprout — Data Link

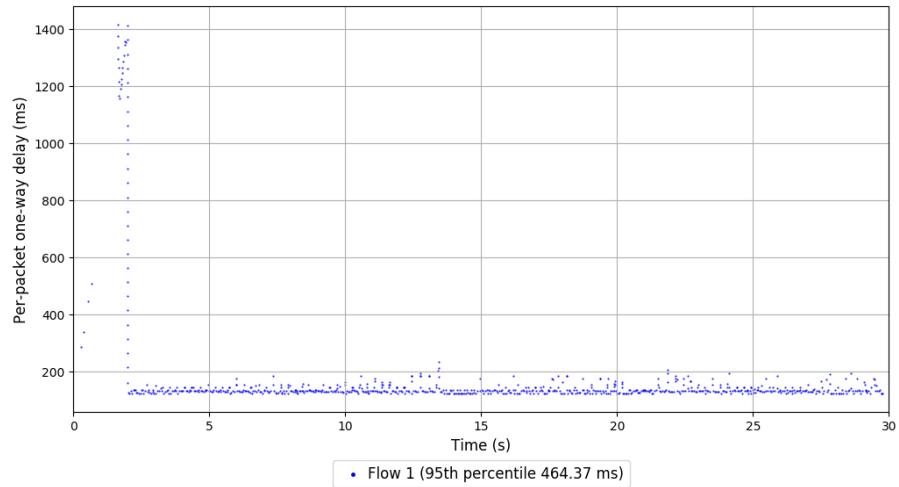
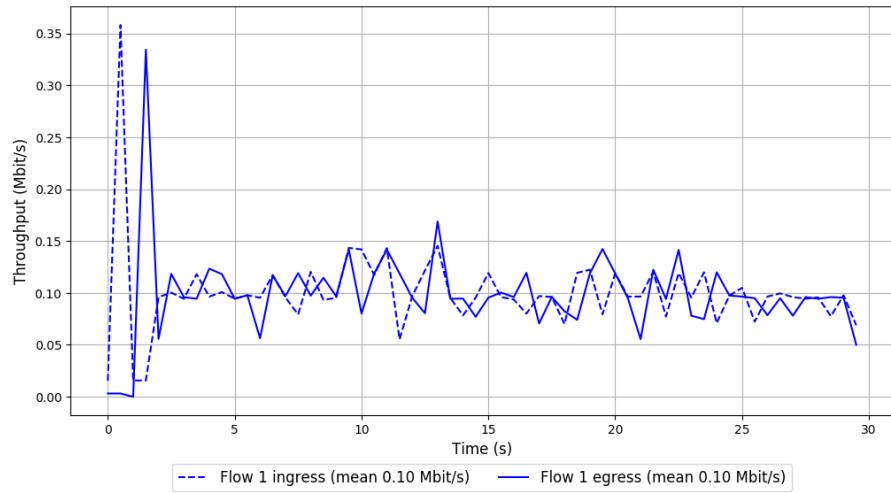


Run 2: Statistics of Sprout

```
Start at: 2018-04-03 00:04:02
End at: 2018-04-03 00:04:32
Local clock offset: 2.005 ms
Remote clock offset: 7.992 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 464.374 ms
Loss rate: 1.77%
-- Flow 1:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 464.374 ms
Loss rate: 1.77%
```

Run 2: Report of Sprout — Data Link

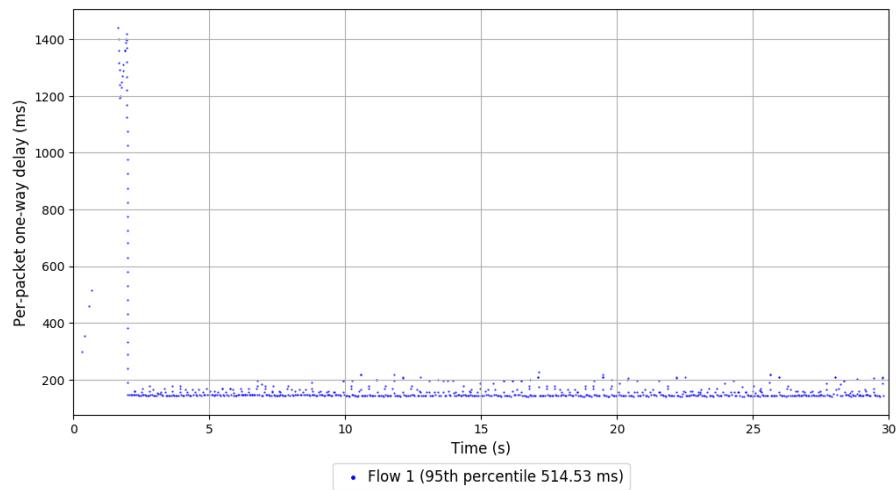
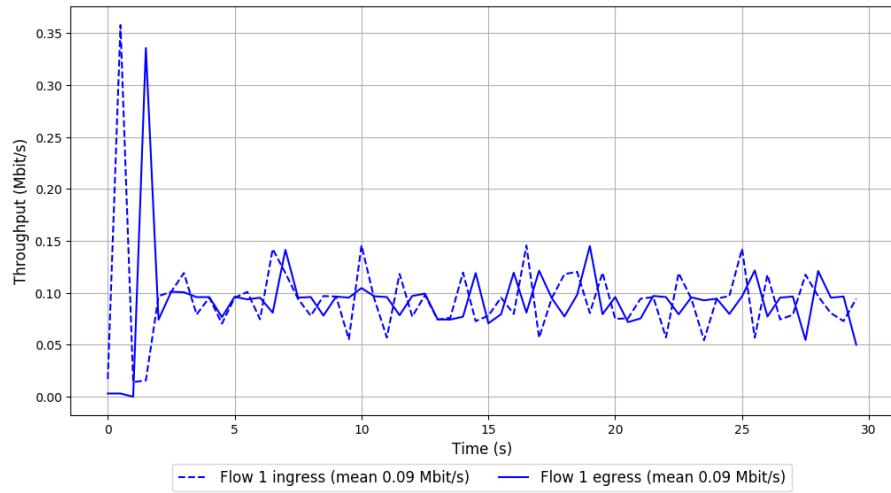


Run 3: Statistics of Sprout

```
Start at: 2018-04-03 00:25:16
End at: 2018-04-03 00:25:46
Local clock offset: 17.167 ms
Remote clock offset: 6.084 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 514.532 ms
Loss rate: 1.93%
-- Flow 1:
Average throughput: 0.09 Mbit/s
95th percentile per-packet one-way delay: 514.532 ms
Loss rate: 1.93%
```

Run 3: Report of Sprout — Data Link

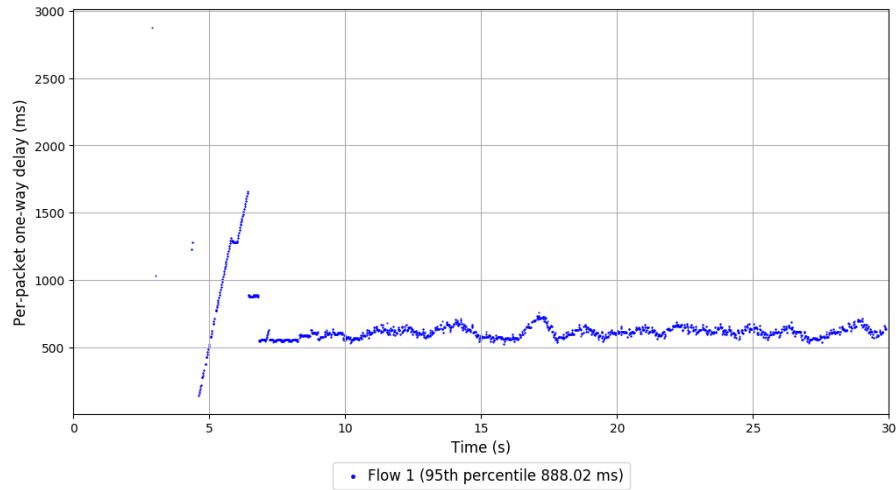
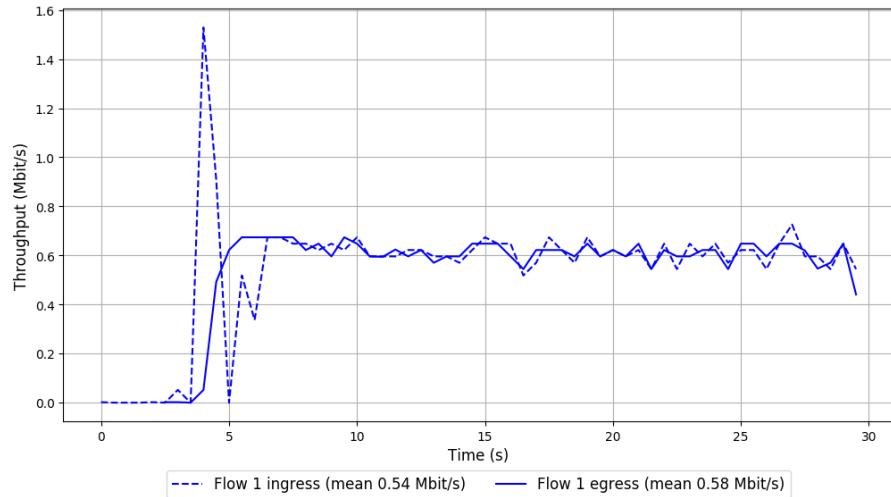


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-04-02 23:49:52
End at: 2018-04-02 23:50:22
Local clock offset: -1.98 ms
Remote clock offset: 12.787 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 888.019 ms
Loss rate: 2.97%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 888.019 ms
Loss rate: 2.97%
```

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

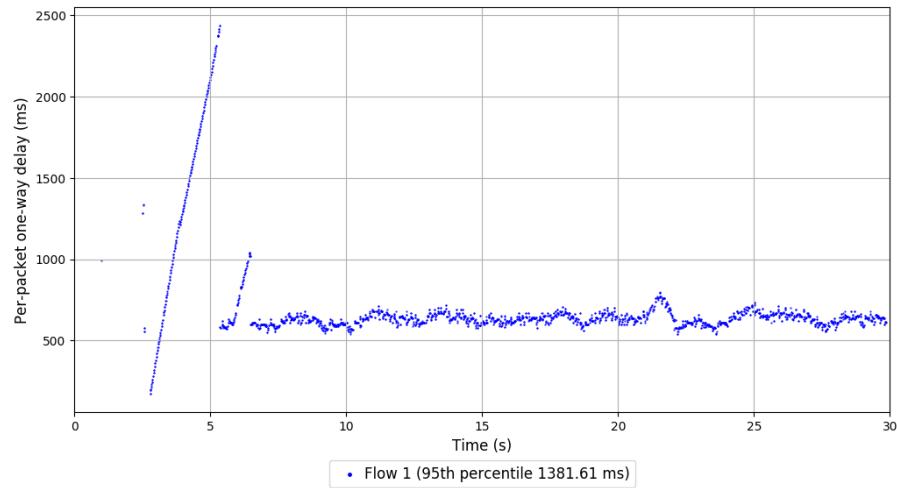
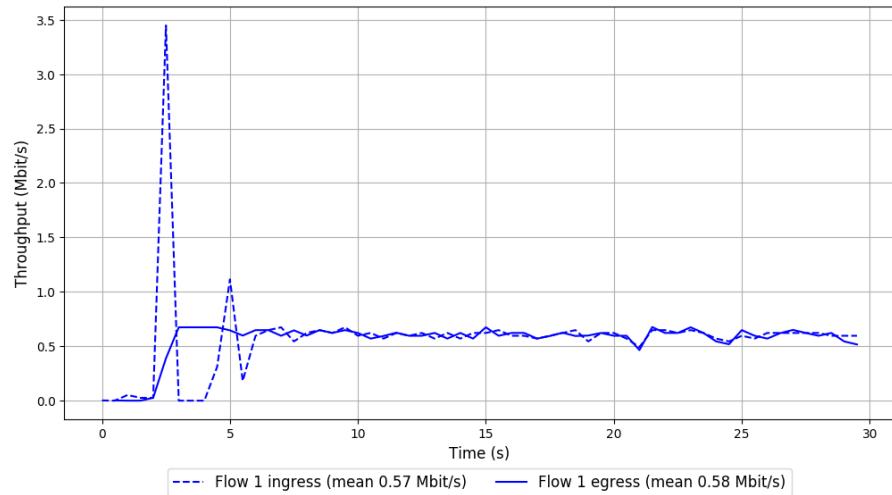


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-04-03 00:11:06
End at: 2018-04-03 00:11:36
Local clock offset: 5.44 ms
Remote clock offset: 7.4 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1381.613 ms
Loss rate: 2.57%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1381.613 ms
Loss rate: 2.57%
```

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

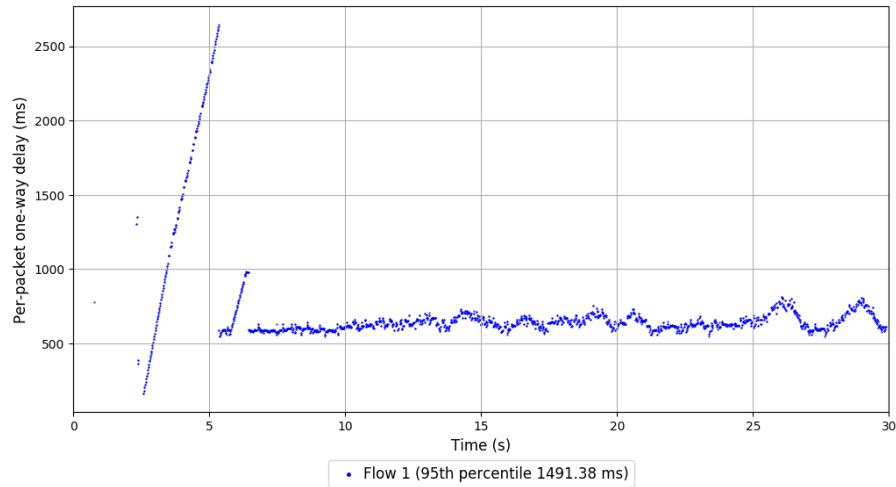
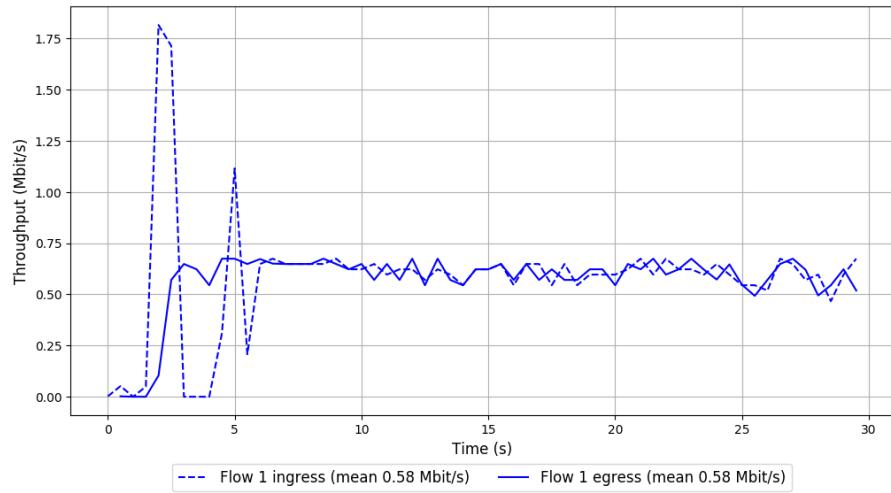


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-04-03 00:32:20
End at: 2018-04-03 00:32:50
Local clock offset: 19.359 ms
Remote clock offset: 12.407 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1491.385 ms
Loss rate: 2.54%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 1491.385 ms
Loss rate: 2.54%
```

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

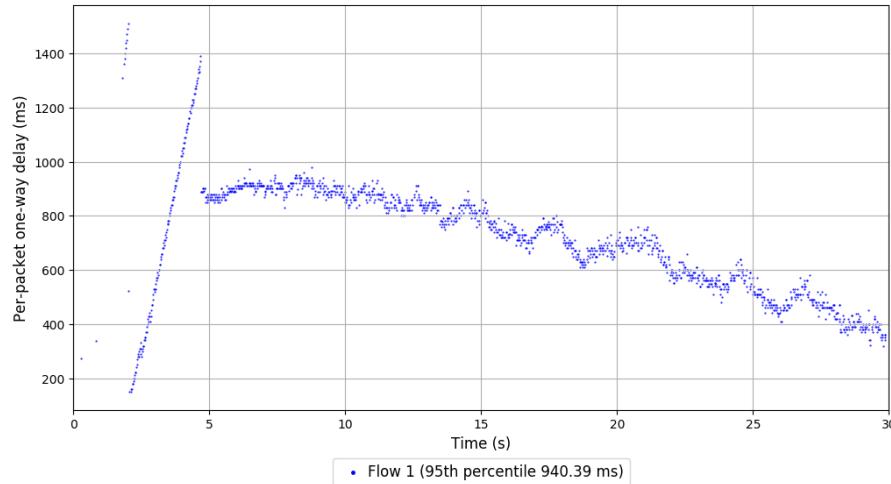
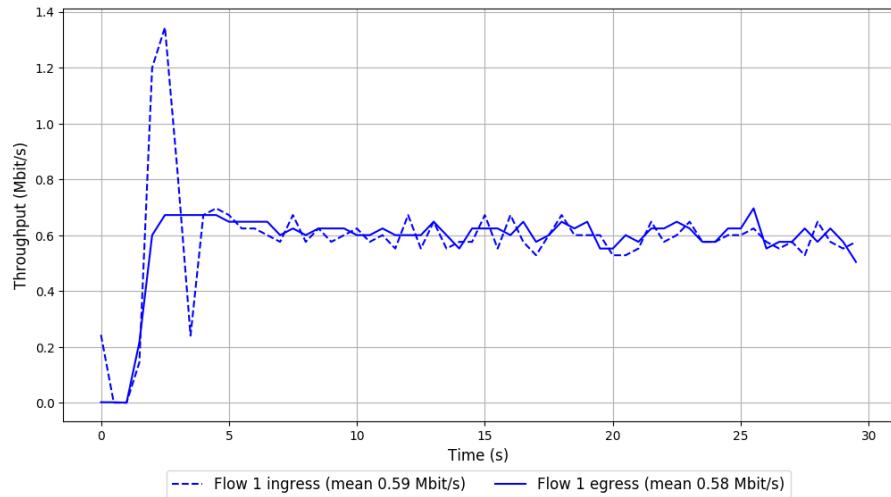


Run 1: Statistics of TCP Vegas

```
Start at: 2018-04-02 23:45:10
End at: 2018-04-02 23:45:40
Local clock offset: 8.124 ms
Remote clock offset: 7.089 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 940.395 ms
Loss rate: 1.50%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 940.395 ms
Loss rate: 1.50%
```

Run 1: Report of TCP Vegas — Data Link

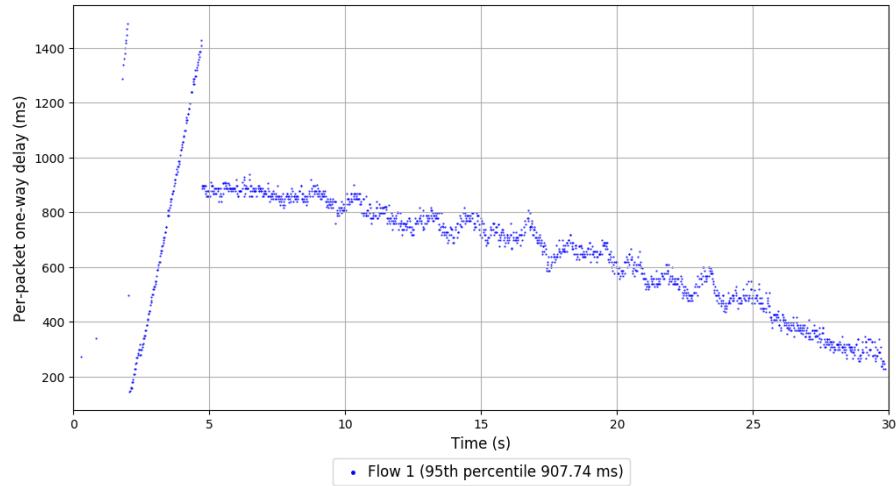
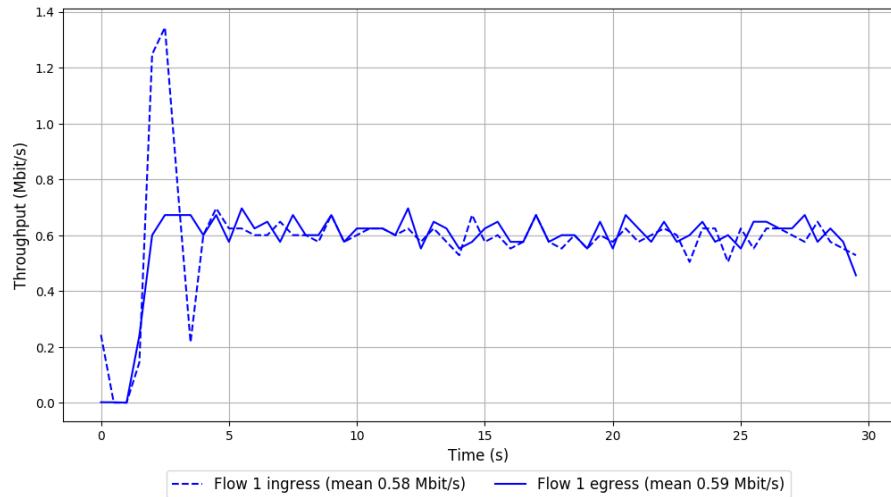


Run 2: Statistics of TCP Vegas

```
Start at: 2018-04-03 00:06:24
End at: 2018-04-03 00:06:54
Local clock offset: 6.369 ms
Remote clock offset: 14.15 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 907.743 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 907.743 ms
Loss rate: 1.16%
```

Run 2: Report of TCP Vegas — Data Link

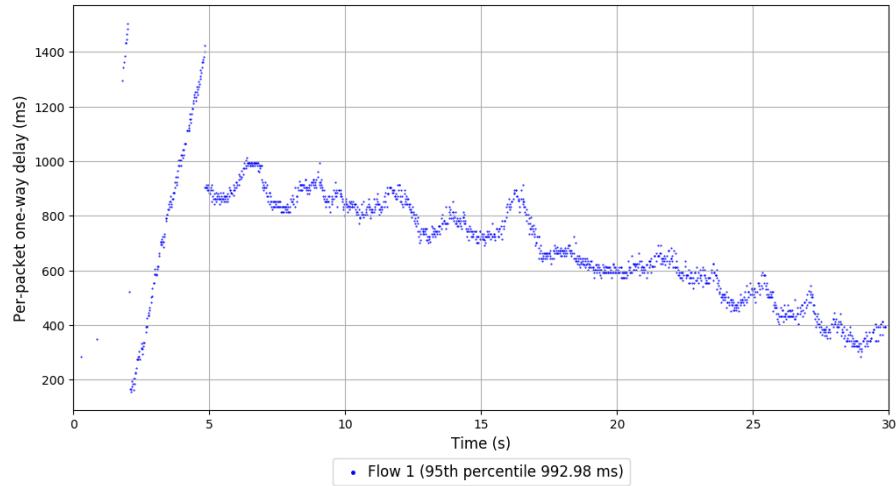
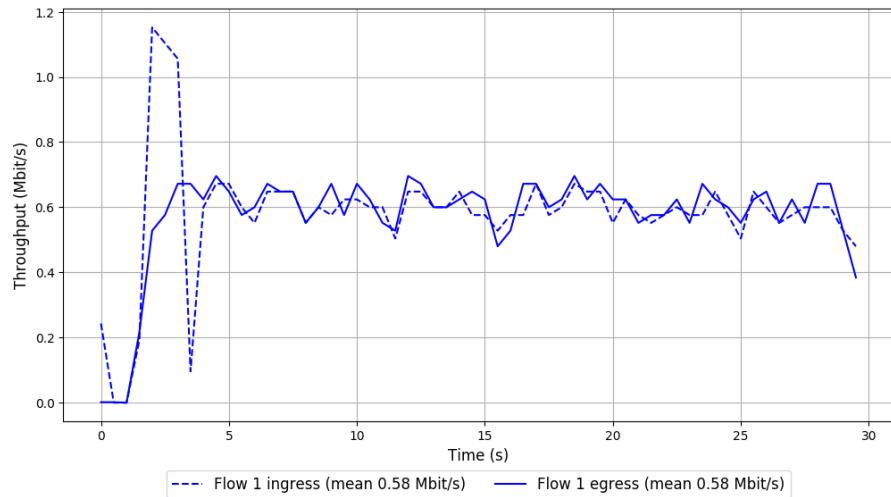


Run 3: Statistics of TCP Vegas

```
Start at: 2018-04-03 00:27:37
End at: 2018-04-03 00:28:07
Local clock offset: 8.31 ms
Remote clock offset: 6.06 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 992.981 ms
Loss rate: 1.38%
-- Flow 1:
Average throughput: 0.58 Mbit/s
95th percentile per-packet one-way delay: 992.981 ms
Loss rate: 1.38%
```

Run 3: Report of TCP Vegas — Data Link

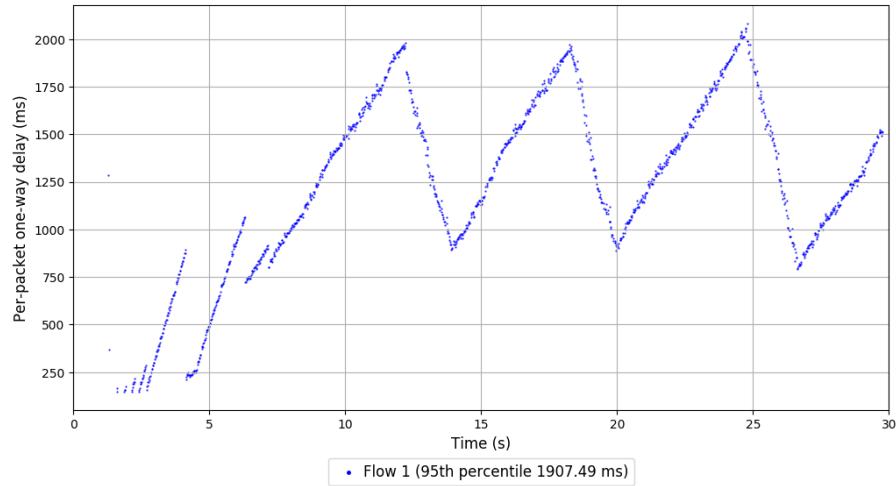
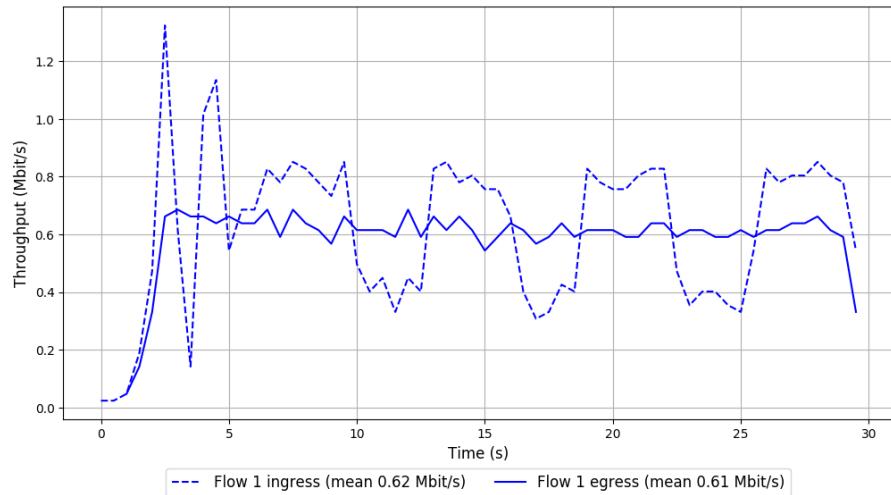


Run 1: Statistics of Verus

```
Start at: 2018-04-02 23:56:58
End at: 2018-04-02 23:57:28
Local clock offset: -1.862 ms
Remote clock offset: 12.043 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1907.490 ms
Loss rate: 6.90%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 1907.490 ms
Loss rate: 6.90%
```

Run 1: Report of Verus — Data Link

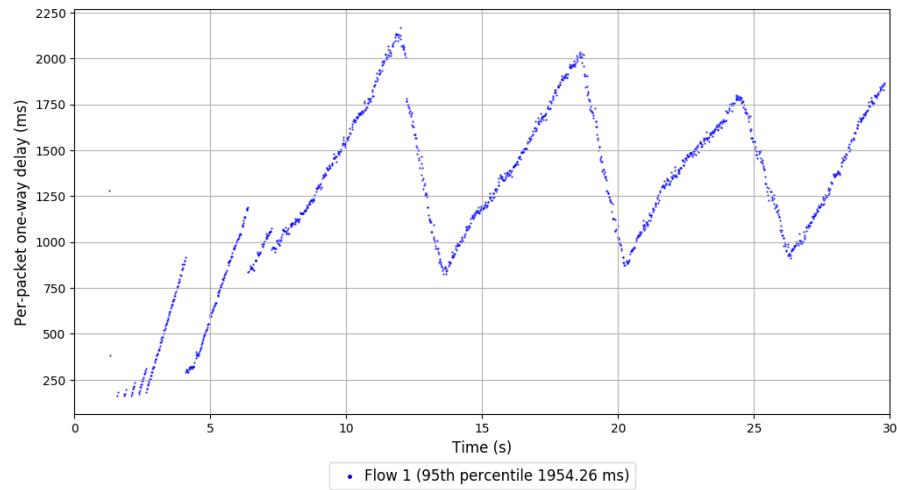
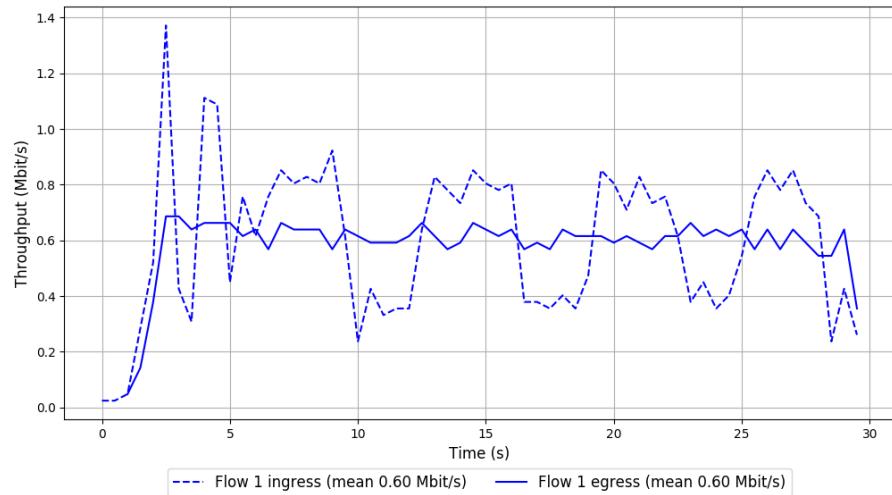


Run 2: Statistics of Verus

```
Start at: 2018-04-03 00:18:12
End at: 2018-04-03 00:18:42
Local clock offset: 16.668 ms
Remote clock offset: 7.069 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1954.256 ms
Loss rate: 4.61%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1954.256 ms
Loss rate: 4.61%
```

Run 2: Report of Verus — Data Link

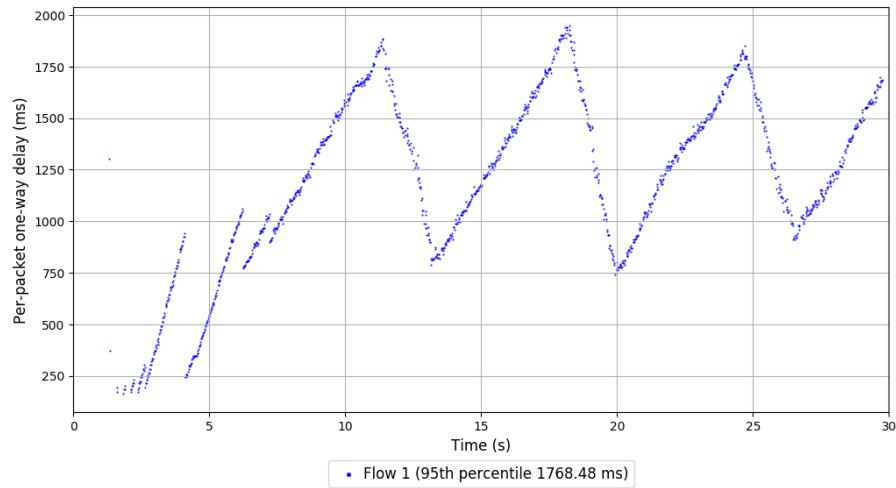
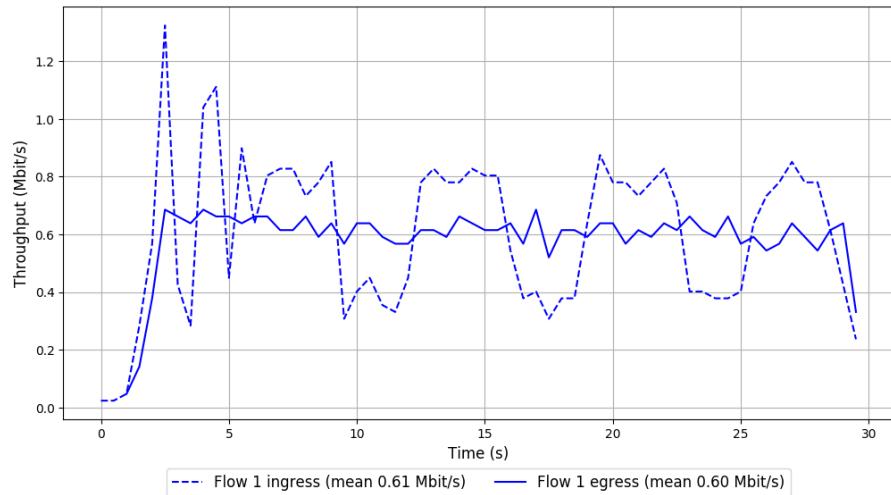


Run 3: Statistics of Verus

```
Start at: 2018-04-03 00:39:25
End at: 2018-04-03 00:39:55
Local clock offset: 20.362 ms
Remote clock offset: 7.07 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1768.476 ms
Loss rate: 5.23%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 1768.476 ms
Loss rate: 5.23%
```

Run 3: Report of Verus — Data Link

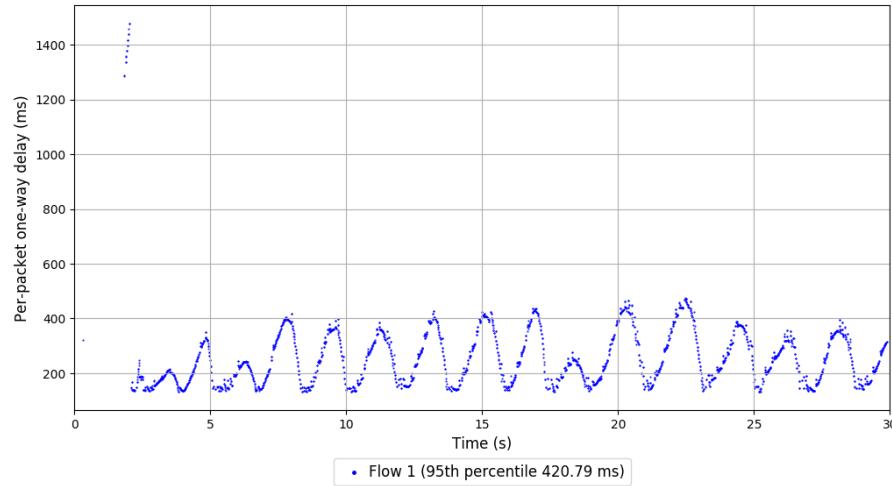
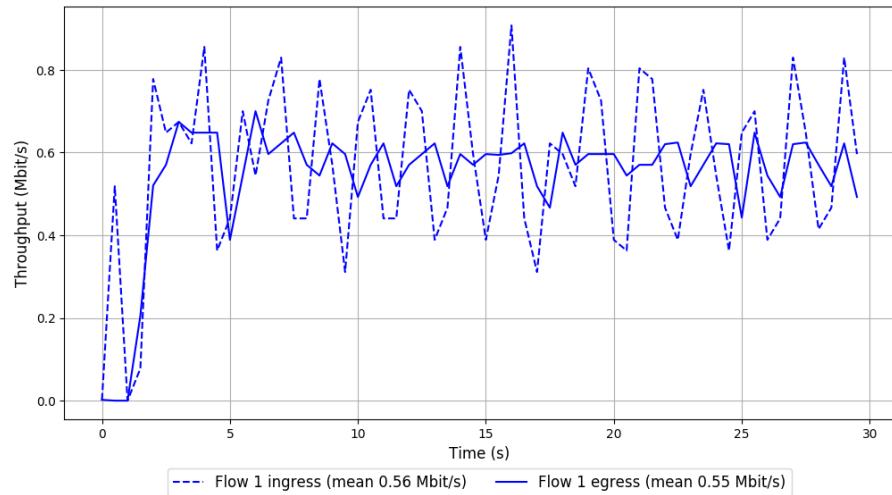


Run 1: Statistics of Copa

```
Start at: 2018-04-02 23:47:31
End at: 2018-04-02 23:48:01
Local clock offset: 7.665 ms
Remote clock offset: 13.588 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 420.786 ms
Loss rate: 2.93%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 420.786 ms
Loss rate: 2.93%
```

Run 1: Report of Copa — Data Link

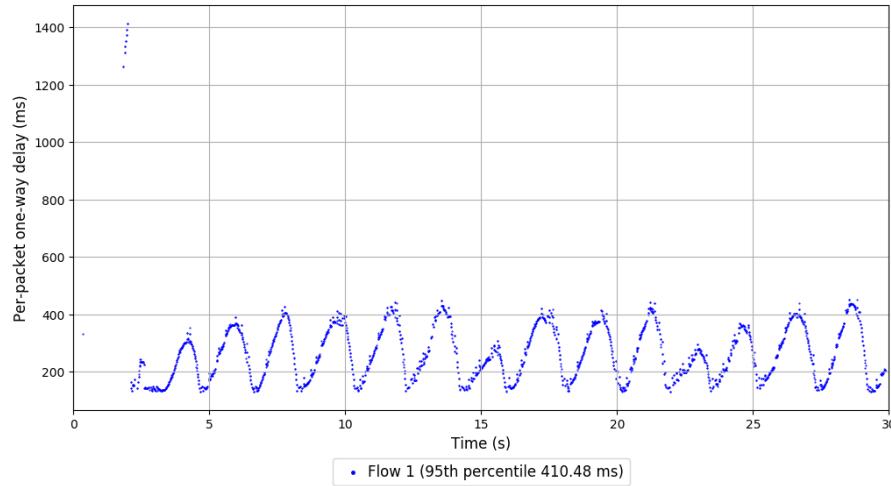
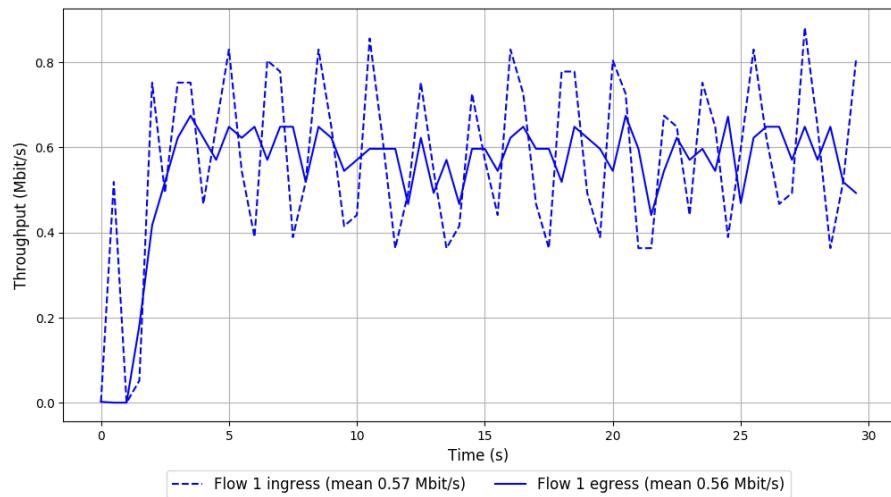


Run 2: Statistics of Copa

```
Start at: 2018-04-03 00:08:45
End at: 2018-04-03 00:09:15
Local clock offset: 5.29 ms
Remote clock offset: 13.903 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 410.477 ms
Loss rate: 3.20%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 410.477 ms
Loss rate: 3.20%
```

Run 2: Report of Copa — Data Link

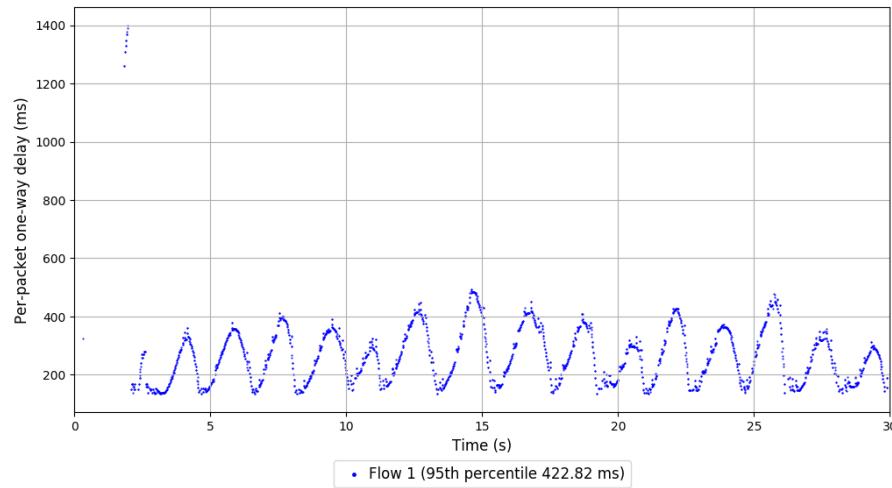
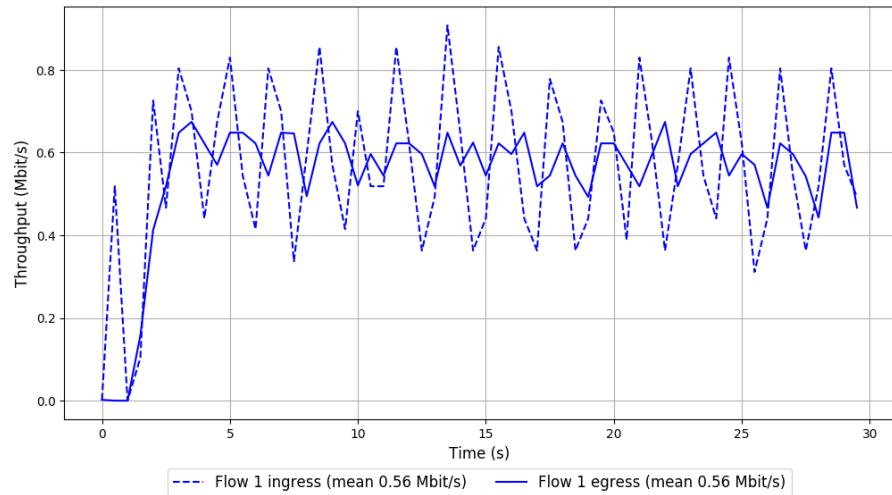


Run 3: Statistics of Copa

```
Start at: 2018-04-03 00:29:59
End at: 2018-04-03 00:30:29
Local clock offset: 7.53 ms
Remote clock offset: 12.548 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 422.822 ms
Loss rate: 2.60%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 422.822 ms
Loss rate: 2.60%
```

Run 3: Report of Copa — Data Link

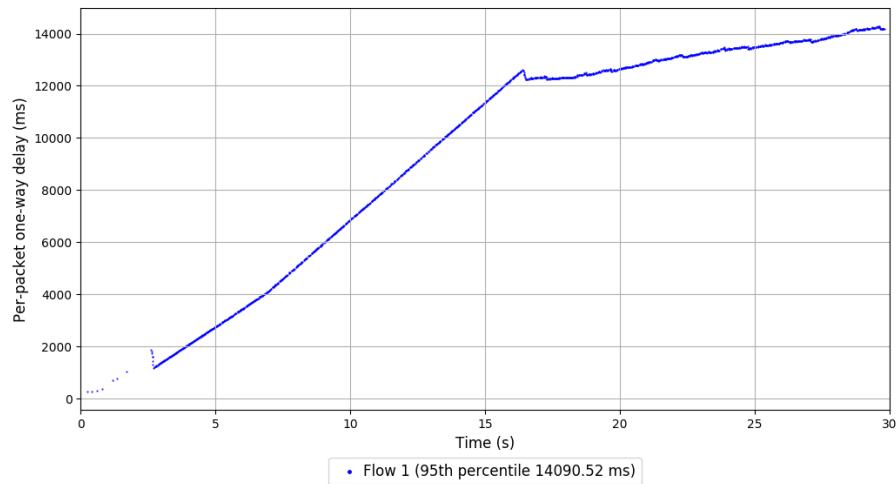
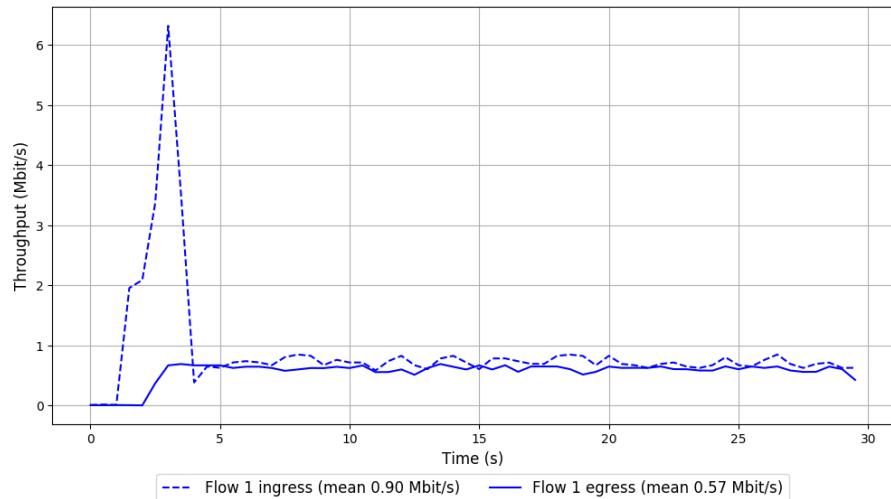


```
Run 1: Statistics of FillP
```

```
Start at: 2018-04-02 23:51:03
End at: 2018-04-02 23:51:33
Local clock offset: -1.819 ms
Remote clock offset: 13.885 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14090.523 ms
Loss rate: 37.95%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14090.523 ms
Loss rate: 37.95%
```

Run 1: Report of FillP — Data Link

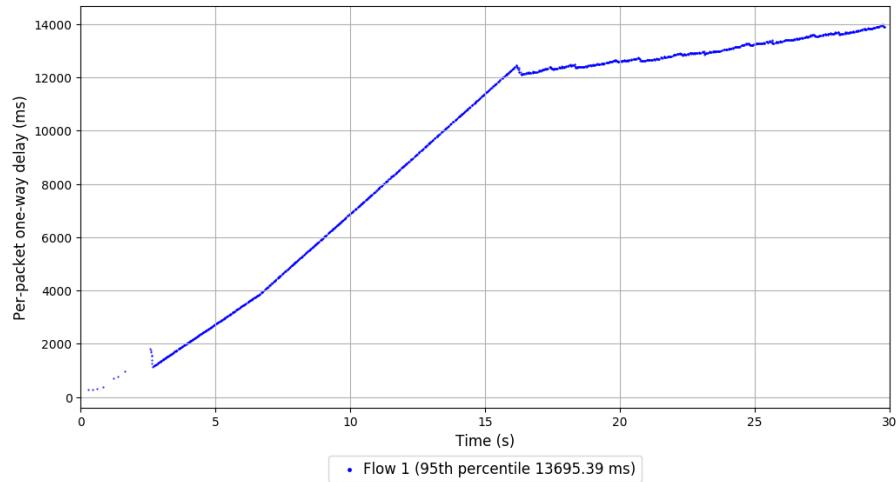
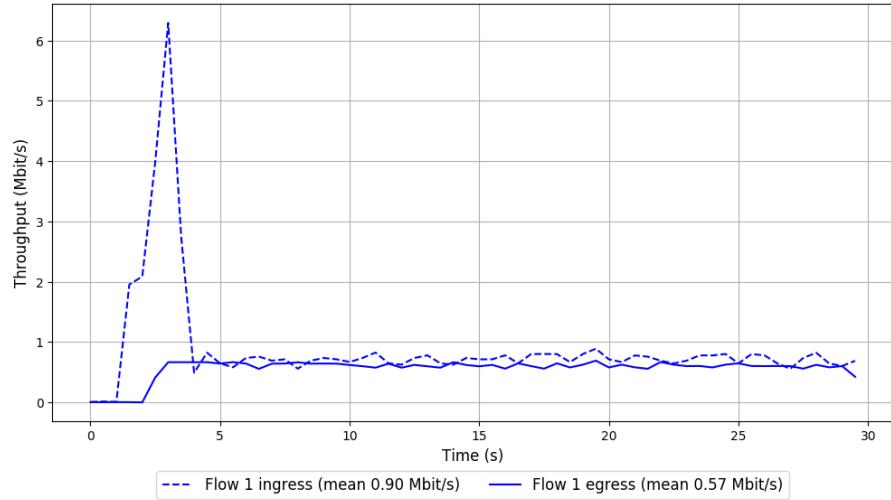


Run 2: Statistics of FillP

```
Start at: 2018-04-03 00:12:17
End at: 2018-04-03 00:12:47
Local clock offset: 5.145 ms
Remote clock offset: 6.349 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 13695.390 ms
Loss rate: 37.94%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 13695.390 ms
Loss rate: 37.94%
```

Run 2: Report of FillP — Data Link

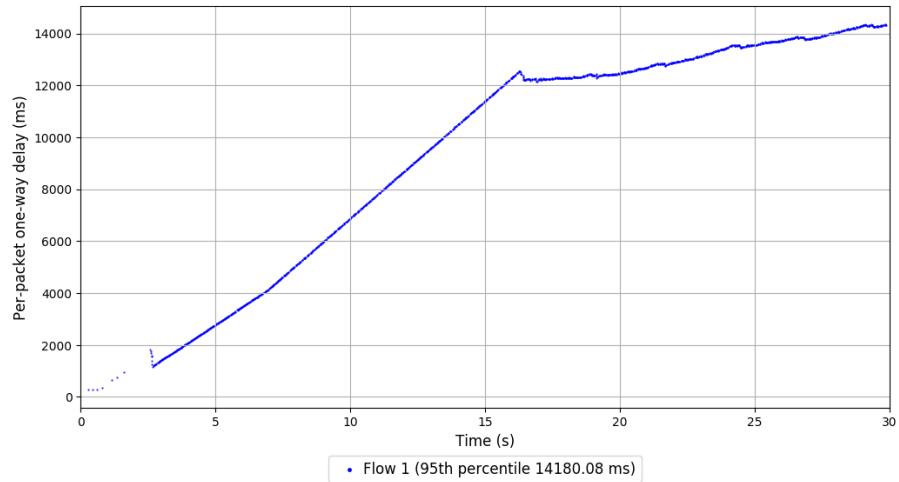
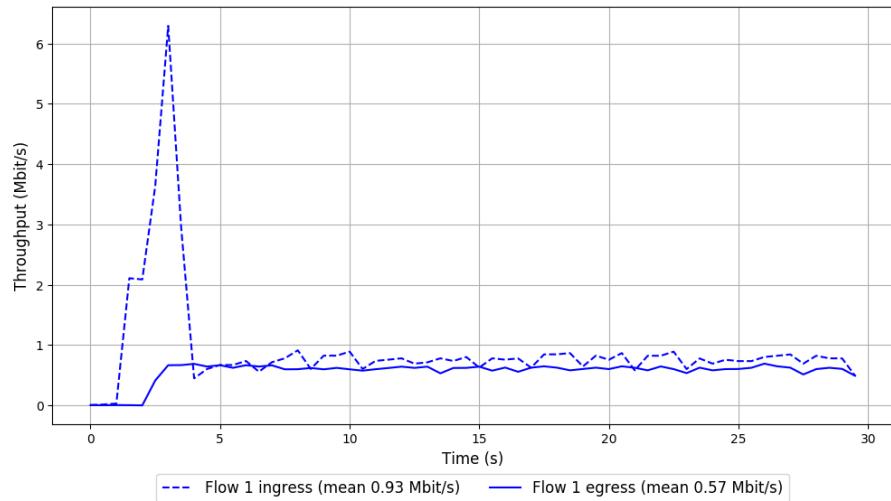


Run 3: Statistics of FillP

```
Start at: 2018-04-03 00:33:31
End at: 2018-04-03 00:34:01
Local clock offset: 14.949 ms
Remote clock offset: 12.464 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14180.080 ms
Loss rate: 39.54%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 14180.080 ms
Loss rate: 39.54%
```

Run 3: Report of FillP — Data Link

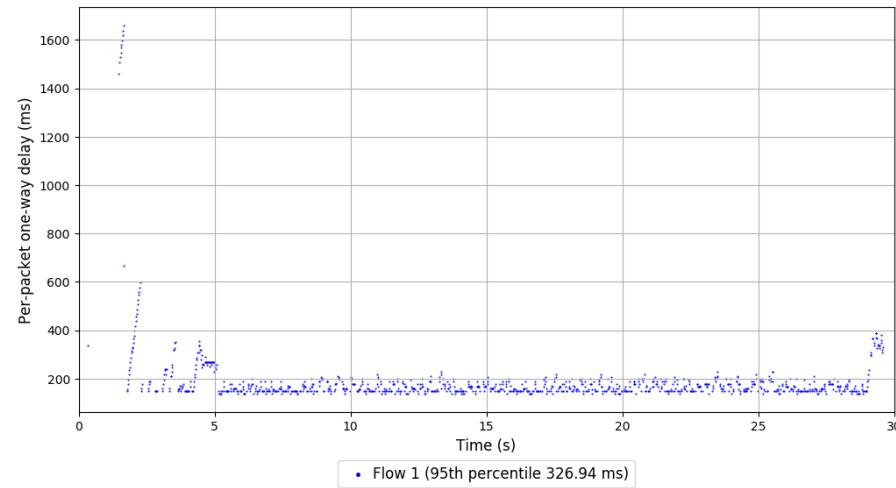
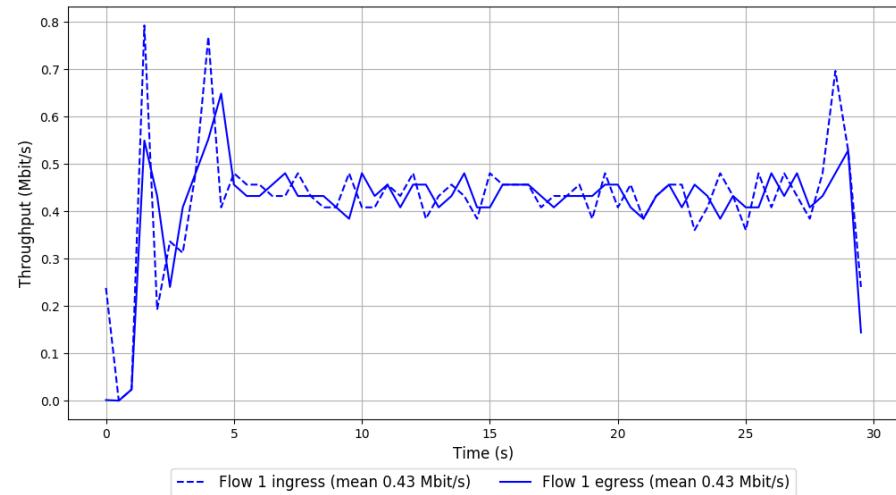


Run 1: Statistics of Indigo-1-32

```
Start at: 2018-04-02 23:53:25
End at: 2018-04-02 23:53:55
Local clock offset: 8.468 ms
Remote clock offset: 13.927 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 326.936 ms
Loss rate: 2.26%
-- Flow 1:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 326.936 ms
Loss rate: 2.26%
```

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

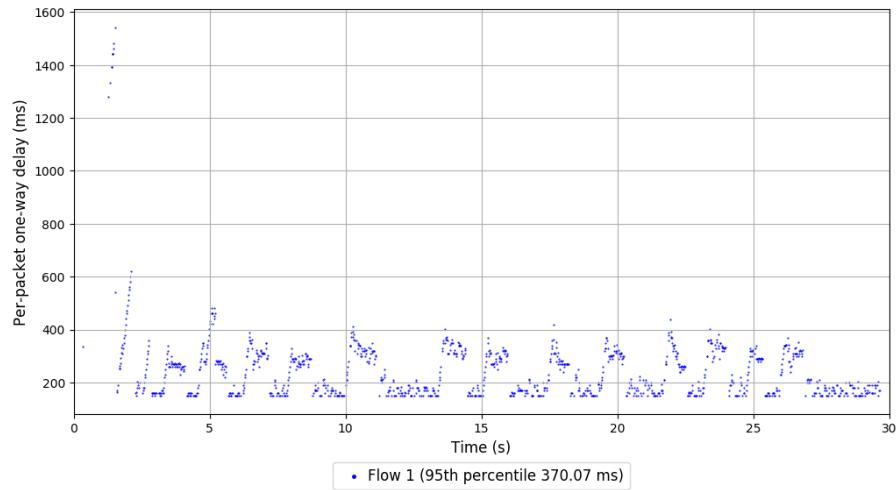
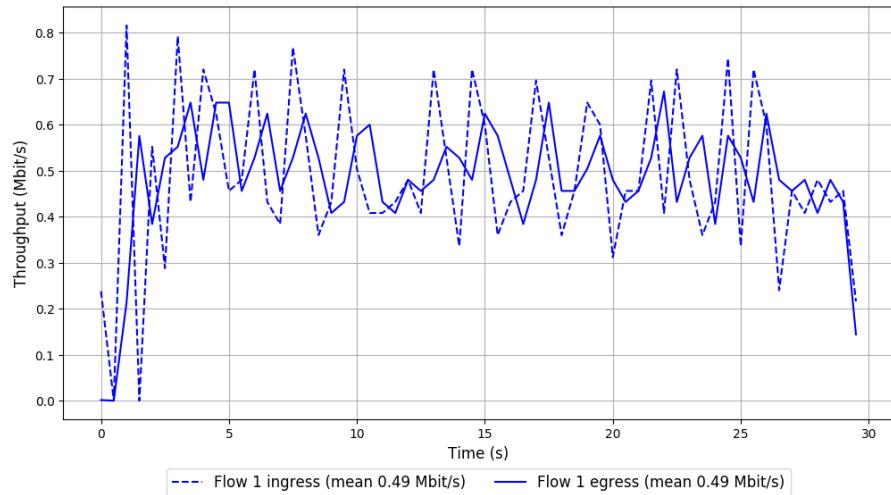


Run 2: Statistics of Indigo-1-32

```
Start at: 2018-04-03 00:14:38
End at: 2018-04-03 00:15:08
Local clock offset: 19.039 ms
Remote clock offset: 12.598 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 370.069 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 370.069 ms
Loss rate: 1.07%
```

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

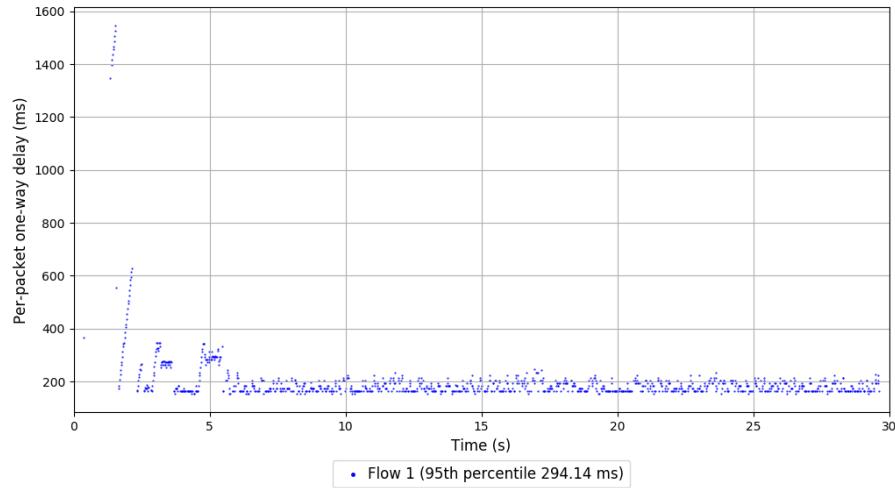
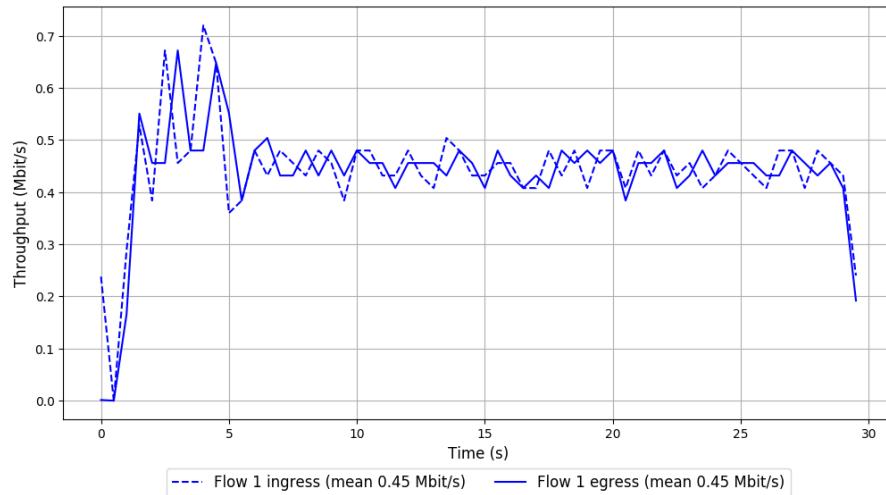


Run 3: Statistics of Indigo-1-32

```
Start at: 2018-04-03 00:35:52
End at: 2018-04-03 00:36:22
Local clock offset: 19.427 ms
Remote clock offset: 7.059 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 294.137 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 294.137 ms
Loss rate: 1.36%
```

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

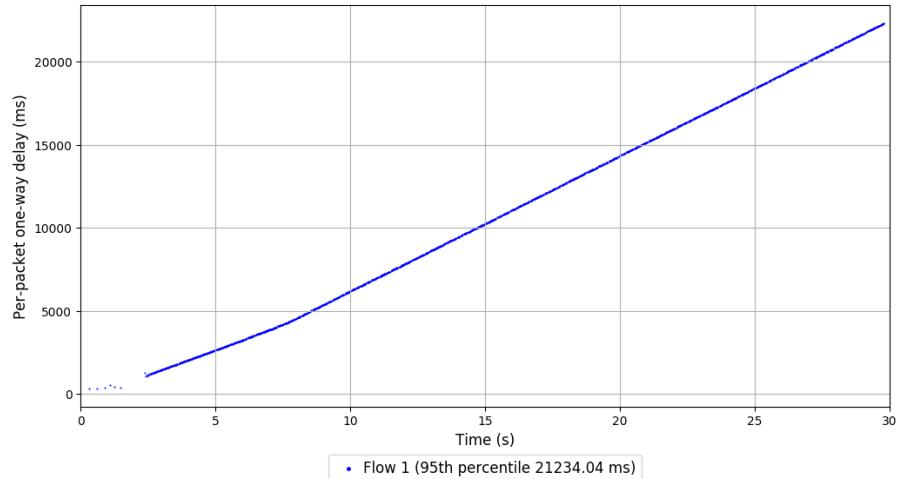
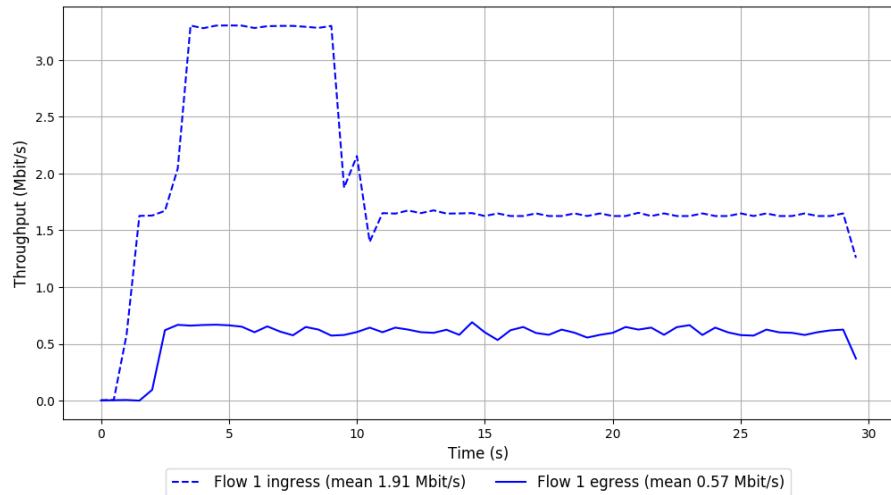


Run 1: Statistics of Vivace-latency

```
Start at: 2018-04-02 23:48:42
End at: 2018-04-02 23:49:12
Local clock offset: -2.069 ms
Remote clock offset: 7.295 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21234.045 ms
Loss rate: 70.53%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21234.045 ms
Loss rate: 70.53%
```

Run 1: Report of Vivace-latency — Data Link

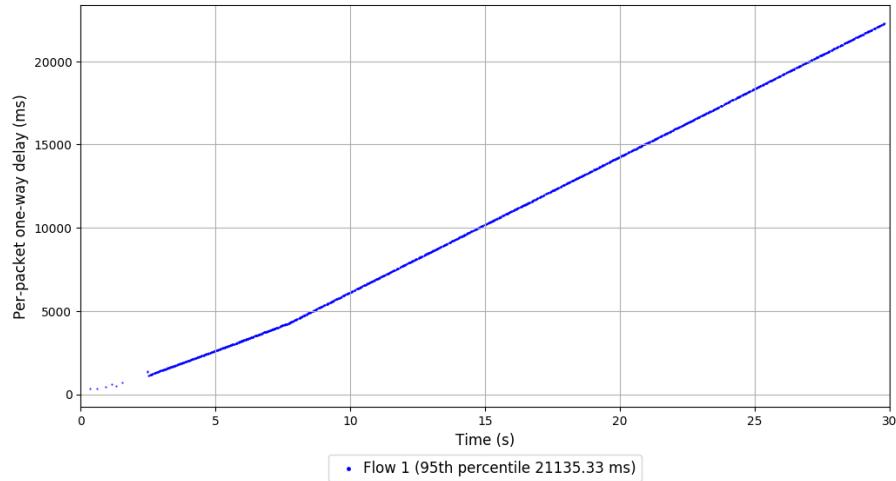
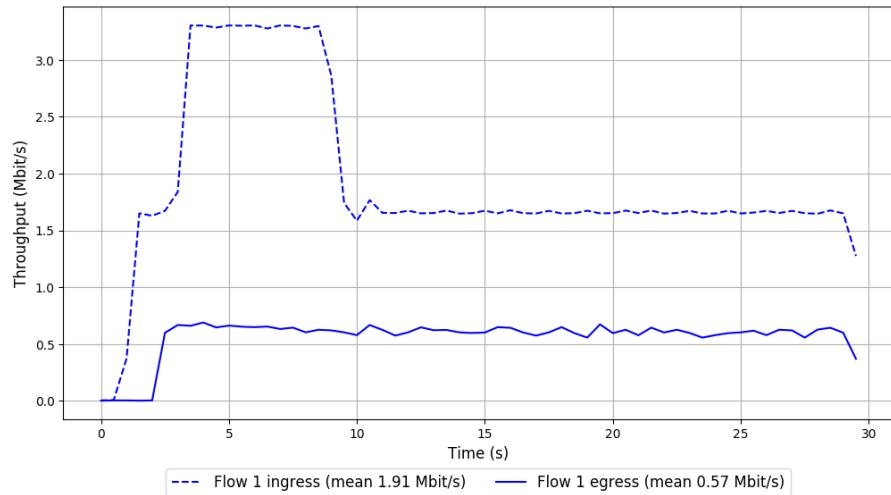


Run 2: Statistics of Vivace-latency

```
Start at: 2018-04-03 00:09:56
End at: 2018-04-03 00:10:26
Local clock offset: 19.605 ms
Remote clock offset: 6.477 ms

# Below is generated by plot.py at 2018-04-03 01:45:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21135.330 ms
Loss rate: 70.40%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21135.330 ms
Loss rate: 70.40%
```

Run 2: Report of Vivace-latency — Data Link

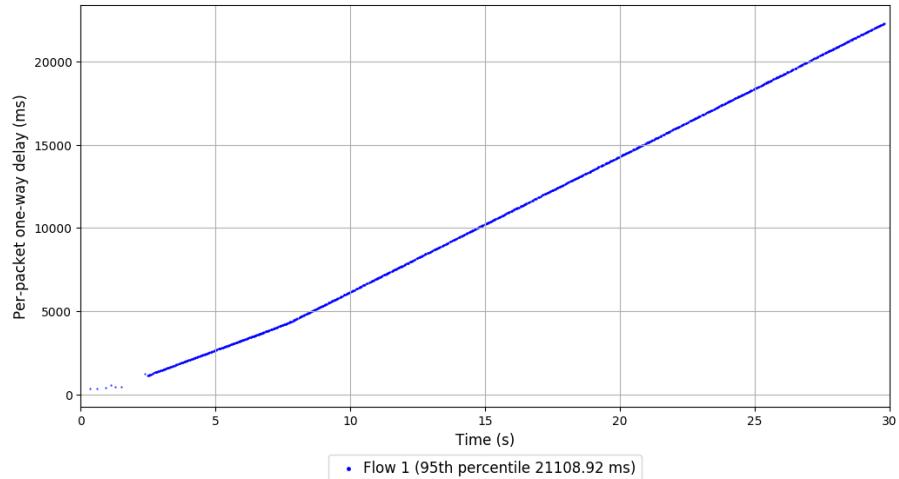
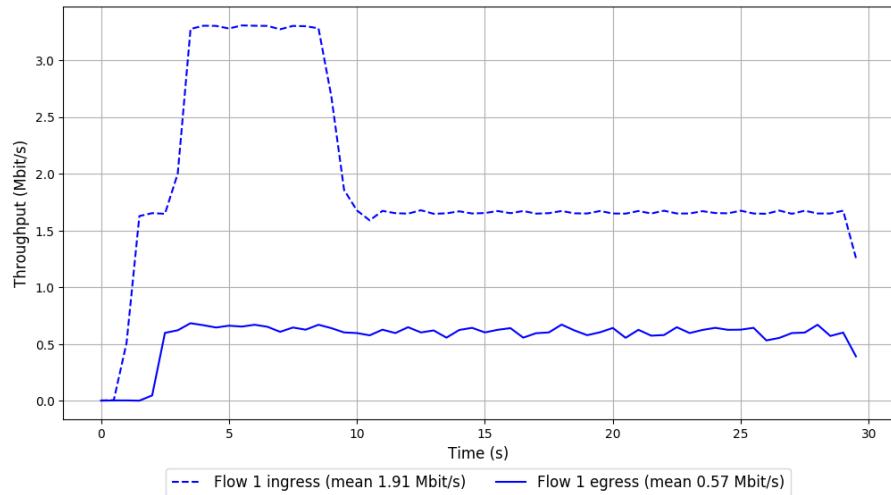


Run 3: Statistics of Vivace-latency

```
Start at: 2018-04-03 00:31:09
End at: 2018-04-03 00:31:39
Local clock offset: 12.506 ms
Remote clock offset: 6.069 ms

# Below is generated by plot.py at 2018-04-03 01:45:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21108.917 ms
Loss rate: 70.37%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21108.917 ms
Loss rate: 70.37%
```

Run 3: Report of Vivace-latency — Data Link

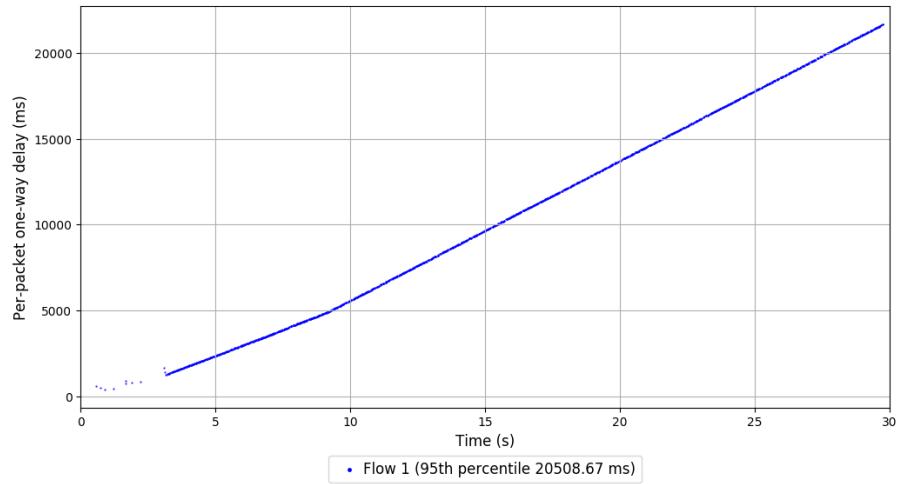
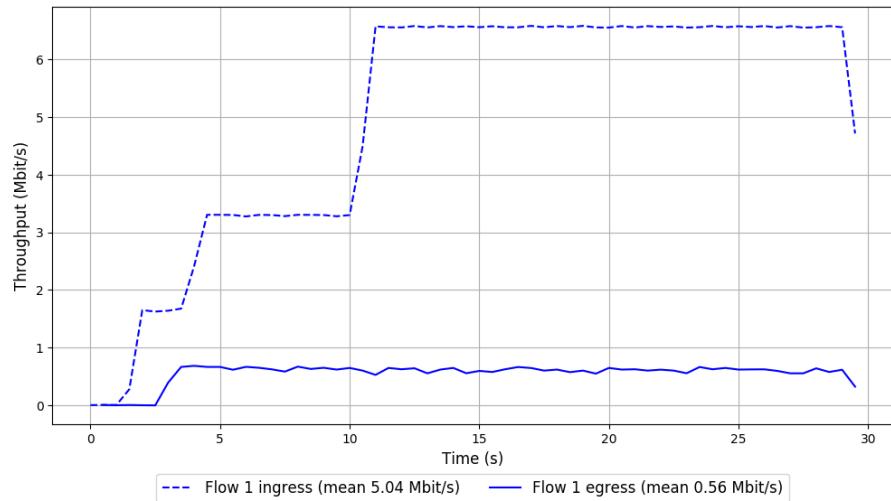


```
Run 1: Statistics of Vivace-loss
```

```
Start at: 2018-04-02 23:40:27
End at: 2018-04-02 23:40:57
Local clock offset: 2.093 ms
Remote clock offset: 13.092 ms

# Below is generated by plot.py at 2018-04-03 01:45:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20508.672 ms
Loss rate: 89.06%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20508.672 ms
Loss rate: 89.06%
```

Run 1: Report of Vivace-loss — Data Link

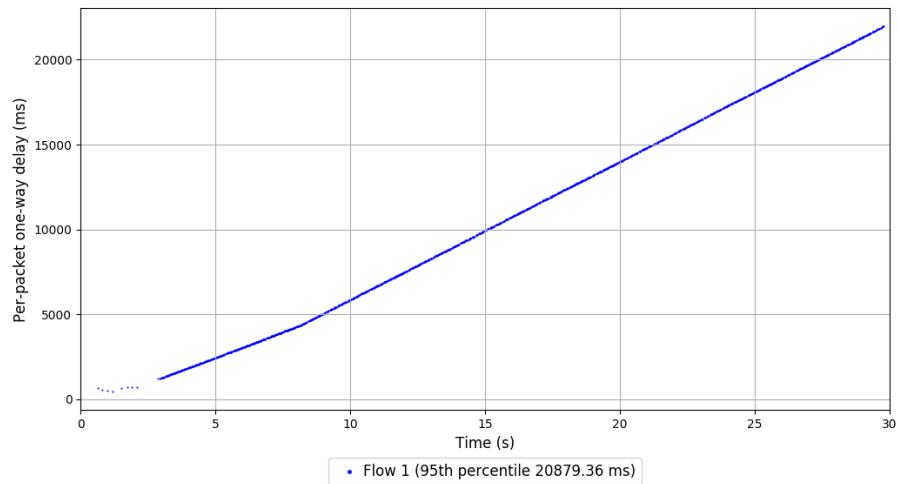
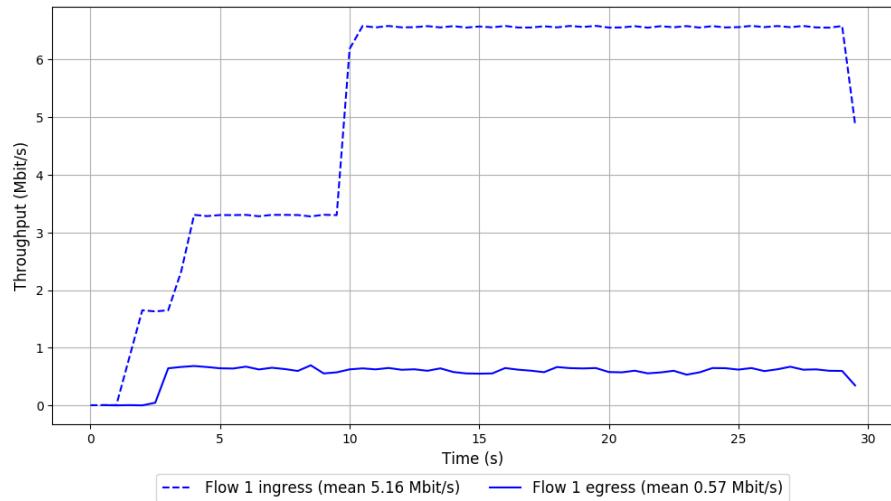


Run 2: Statistics of Vivace-loss

```
Start at: 2018-04-03 00:01:40
End at: 2018-04-03 00:02:11
Local clock offset: 13.248 ms
Remote clock offset: 13.29 ms

# Below is generated by plot.py at 2018-04-03 01:45:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 20879.357 ms
Loss rate: 89.22%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 20879.357 ms
Loss rate: 89.22%
```

Run 2: Report of Vivace-loss — Data Link

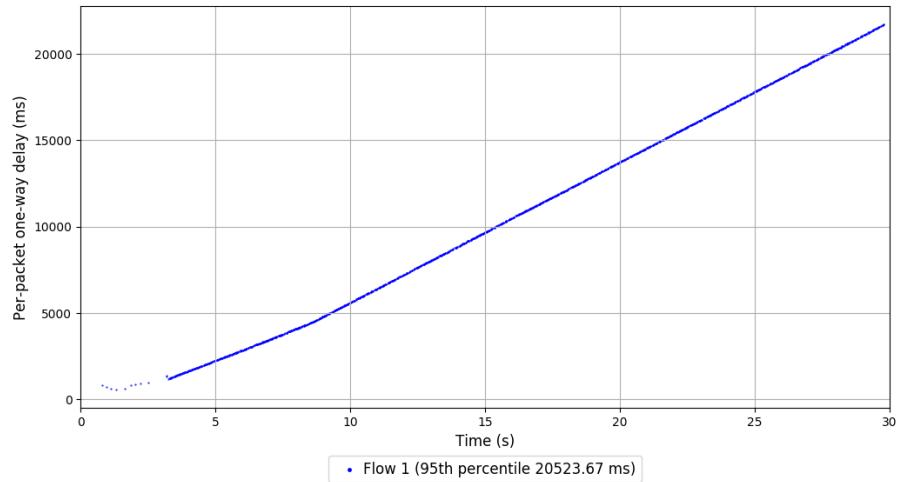
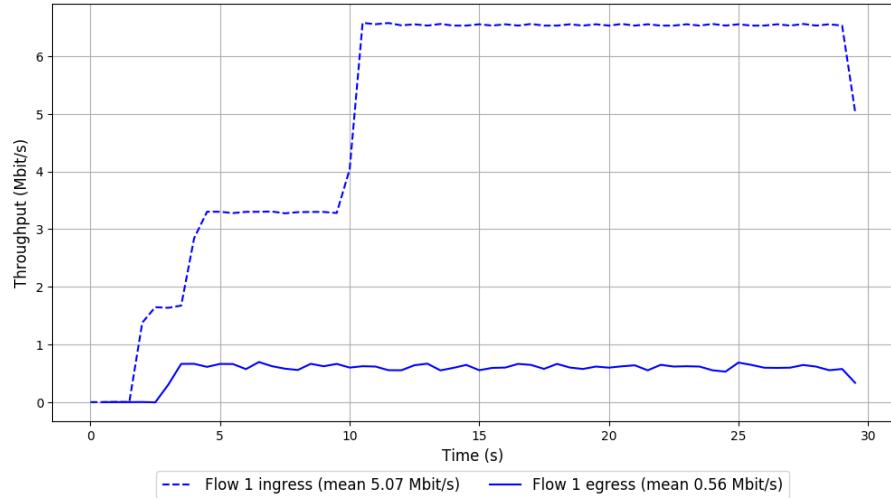


Run 3: Statistics of Vivace-loss

```
Start at: 2018-04-03 00:22:54
End at: 2018-04-03 00:23:24
Local clock offset: 13.462 ms
Remote clock offset: 12.375 ms

# Below is generated by plot.py at 2018-04-03 01:45:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20523.667 ms
Loss rate: 89.21%
-- Flow 1:
Average throughput: 0.56 Mbit/s
95th percentile per-packet one-way delay: 20523.667 ms
Loss rate: 89.21%
```

Run 3: Report of Vivace-loss — Data Link

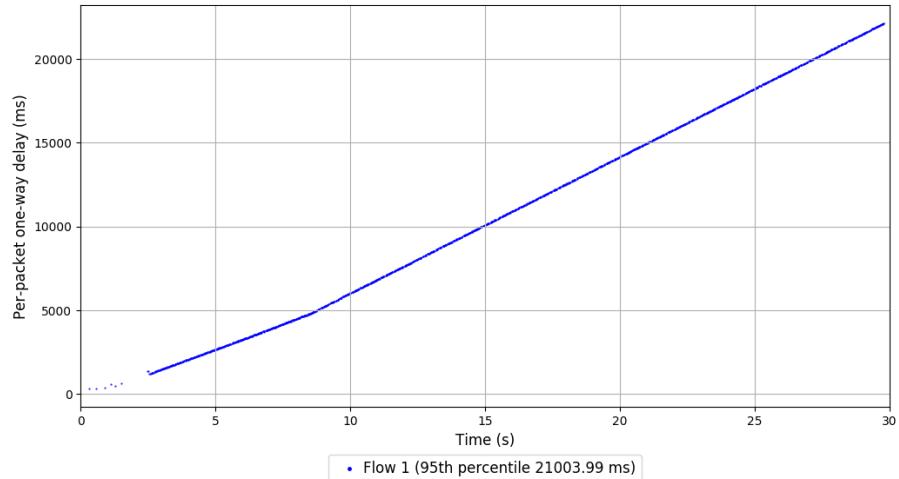
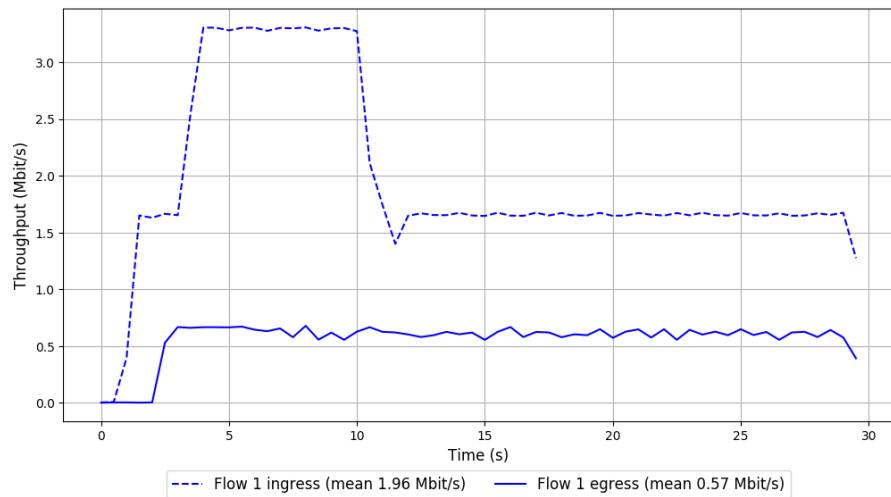


Run 1: Statistics of Vivace-LTE

```
Start at: 2018-04-02 23:39:16
End at: 2018-04-02 23:39:46
Local clock offset: 1.108 ms
Remote clock offset: 12.052 ms

# Below is generated by plot.py at 2018-04-03 01:45:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21003.990 ms
Loss rate: 71.19%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21003.990 ms
Loss rate: 71.19%
```

Run 1: Report of Vivace-LTE — Data Link

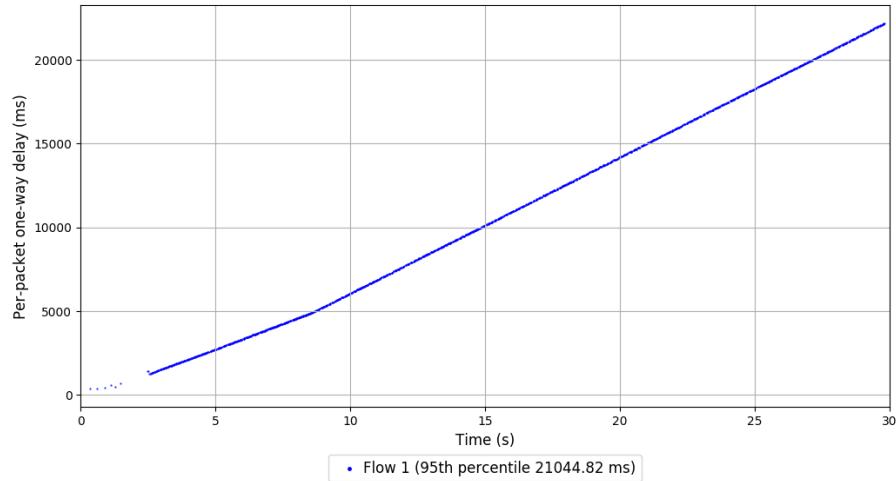
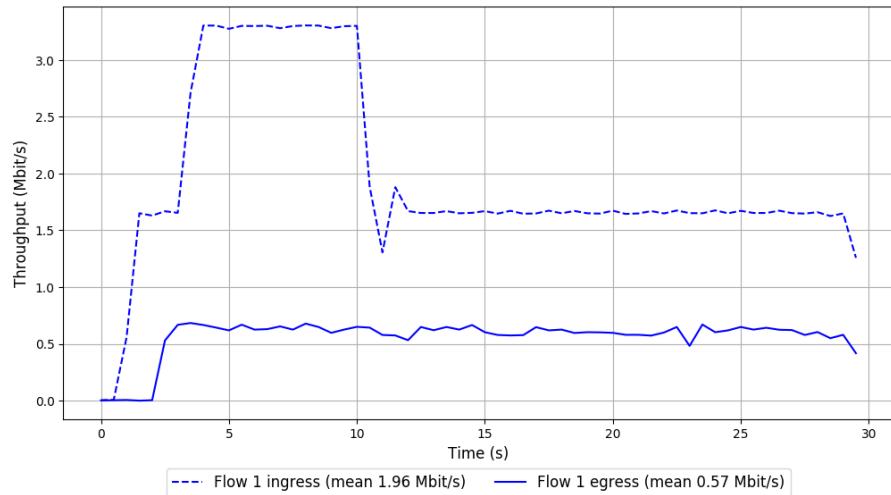


Run 2: Statistics of Vivace-LTE

```
Start at: 2018-04-03 00:00:30
End at: 2018-04-03 00:01:00
Local clock offset: 17.613 ms
Remote clock offset: 6.908 ms

# Below is generated by plot.py at 2018-04-03 01:45:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21044.818 ms
Loss rate: 71.26%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21044.818 ms
Loss rate: 71.26%
```

Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

```
Start at: 2018-04-03 00:21:44
End at: 2018-04-03 00:22:14
Local clock offset: 18.426 ms
Remote clock offset: 6.006 ms

# Below is generated by plot.py at 2018-04-03 01:45:44
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21126.775 ms
Loss rate: 70.44%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 21126.775 ms
Loss rate: 70.44%
```

Run 3: Report of Vivace-LTE — Data Link

