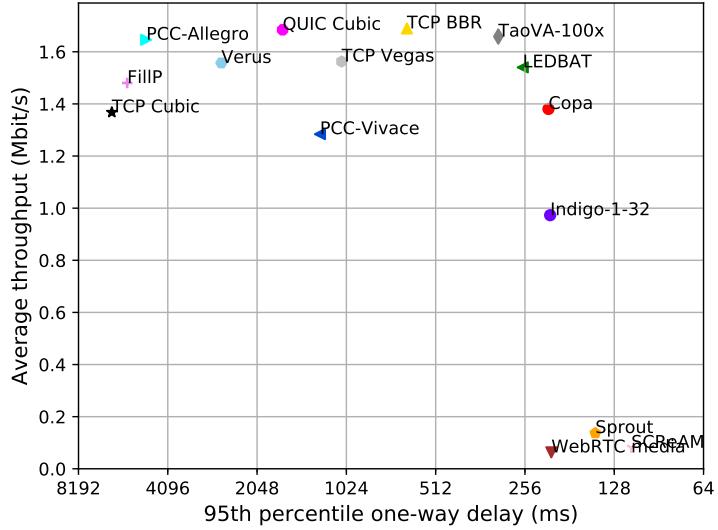


Pantheon Report

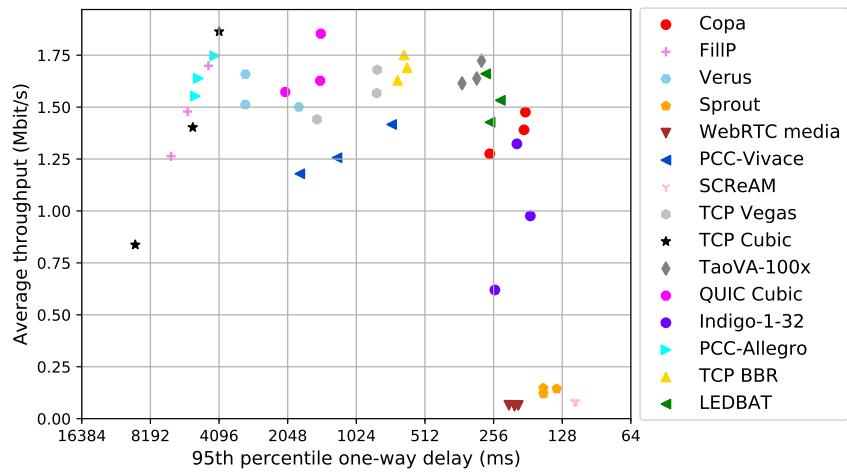
Generated at 2018-04-16 22:48:44 (UTC).
Data path: AWS Brazil 2 Ethernet (*local*) → Colombia ppp0 (*remote*).
Repeated the test of 16 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo_fast**).
NTP offsets were measured against **gps.ntp.br** and have been applied to correct the timestamps in logs.

```
Git summary:  
branch: master @ 4ed32c0e22b4dd733f97c1d3aaab2e5bb16f66b4  
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50  
M datagrump/sender.cc  
third_party/fillp @ 11f8c46a2bf1dc797253db7e8ca04076272b2a44  
third_party/genericCC @ d223989828276fa83a807da6e0341dc0c7b89aec  
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9  
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d  
third_party/indigo-1-layer-32-unit @ 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/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab  
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 AWS Brazil 2 Ethernet to Colombia ppp0, 3 runs of 30s each per scheme
(mean of all runs by scheme)



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



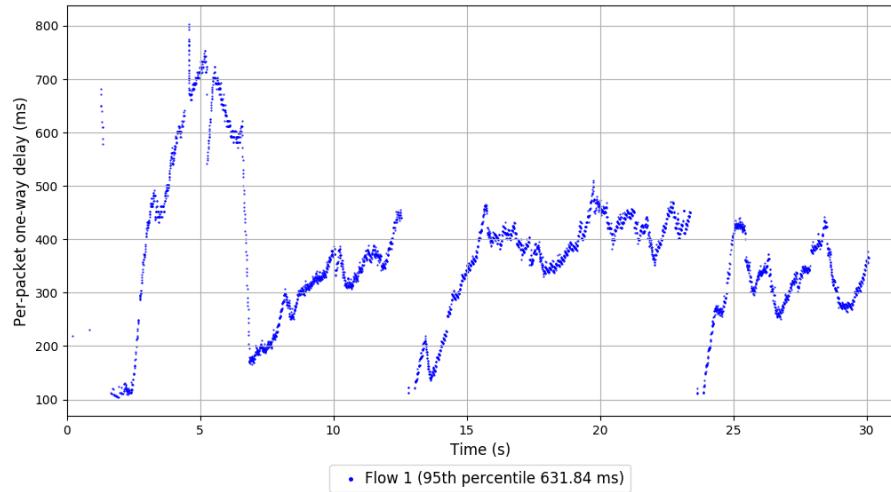
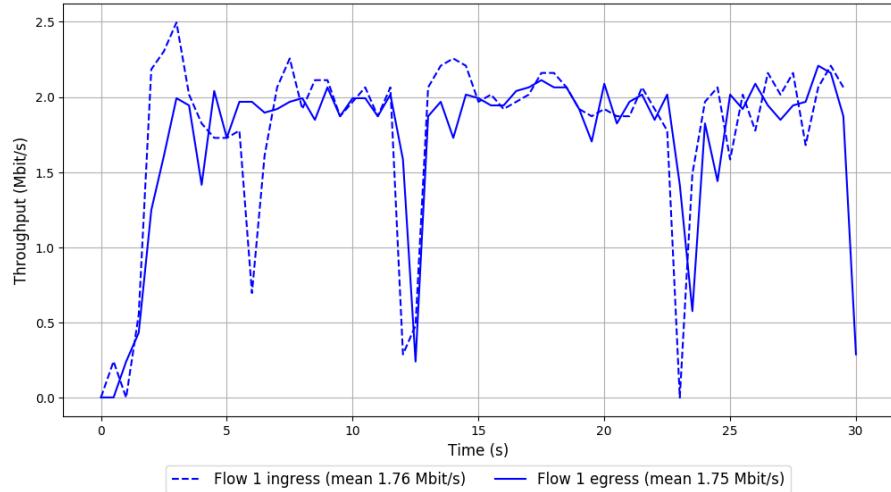
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.69	639.88	0.93
TCP Cubic	3	1.37	6324.54	20.79
LEDBAT	3	1.54	260.50	0.58
PCC-Allegro	3	1.65	4842.44	62.99
QUIC Cubic	3	1.68	1679.65	4.43
SCReAM	3	0.08	112.19	0.00
WebRTC media	3	0.06	208.63	0.00
Sprout	3	0.14	148.28	0.00
TaoVA-100x	3	1.66	314.84	0.35
TCP Vegas	3	1.56	1062.21	1.45
Verus	3	1.56	2702.74	3.22
Copa	3	1.38	213.28	0.06
FillP	3	1.48	5613.00	31.28
Indigo-1-32	3	0.97	210.53	0.04
PCC-Vivace	3	1.29	1257.49	5.72
PCC-Expr	0	N/A	N/A	N/A

Run 1: Statistics of TCP BBR

```
Start at: 2018-04-16 21:51:13
End at: 2018-04-16 21:51:43
Local clock offset: -7.928 ms
Remote clock offset: 10.427 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 631.837 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 631.837 ms
Loss rate: 1.09%
```

Run 1: Report of TCP BBR — Data Link

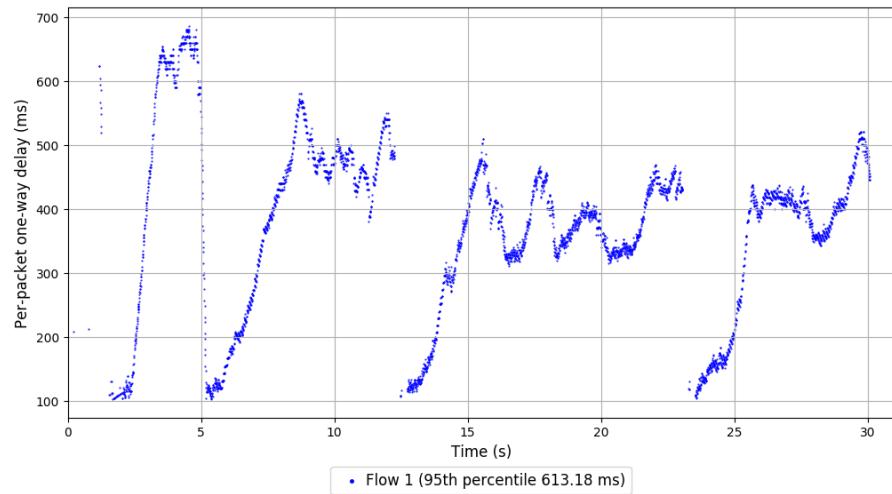
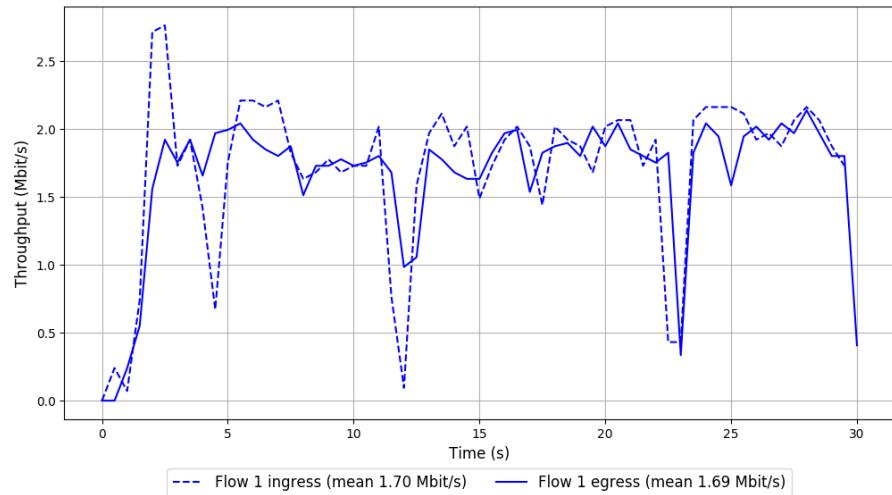


Run 2: Statistics of TCP BBR

```
Start at: 2018-04-16 22:11:19
End at: 2018-04-16 22:11:49
Local clock offset: -5.838 ms
Remote clock offset: 12.38 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 613.184 ms
Loss rate: 1.22%
-- Flow 1:
Average throughput: 1.69 Mbit/s
95th percentile per-packet one-way delay: 613.184 ms
Loss rate: 1.22%
```

Run 2: Report of TCP BBR — Data Link

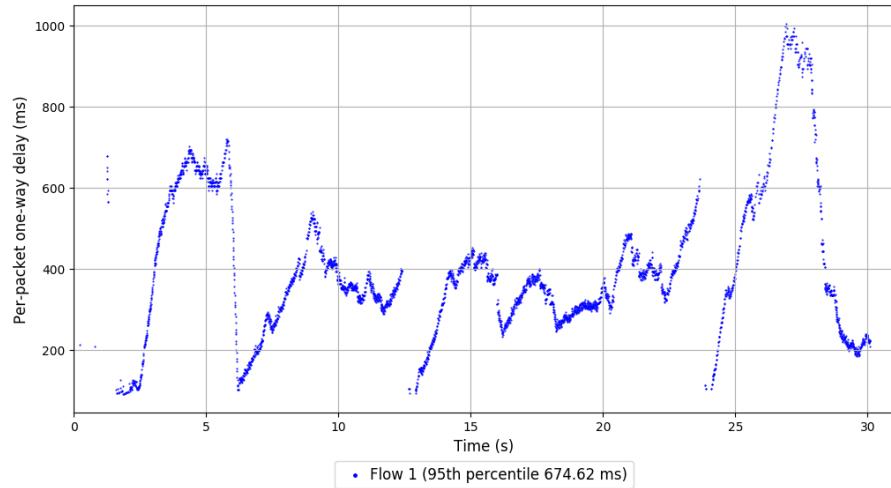
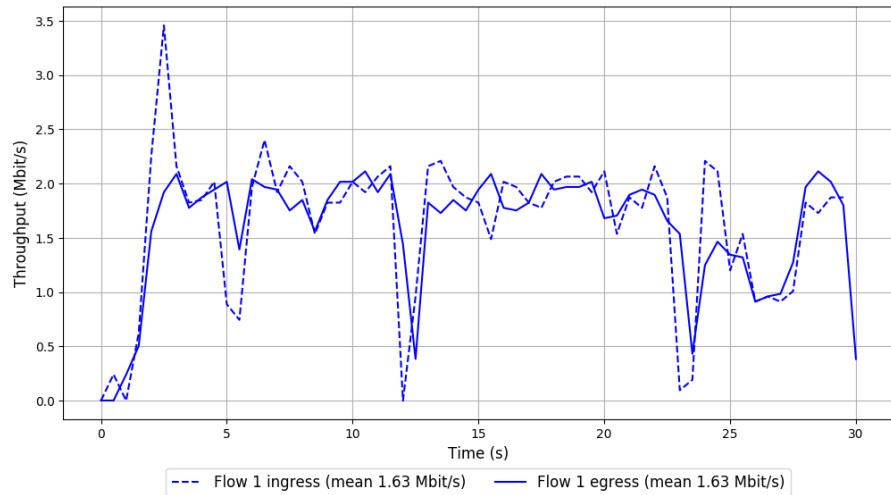


Run 3: Statistics of TCP BBR

```
Start at: 2018-04-16 22:31:26
End at: 2018-04-16 22:31:56
Local clock offset: -6.21 ms
Remote clock offset: 6.893 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 674.616 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 674.616 ms
Loss rate: 0.47%
```

Run 3: Report of TCP BBR — Data Link

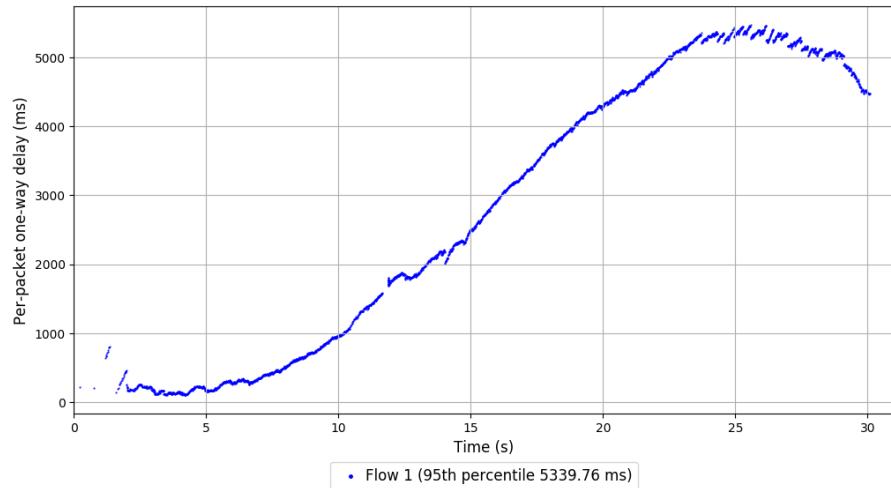
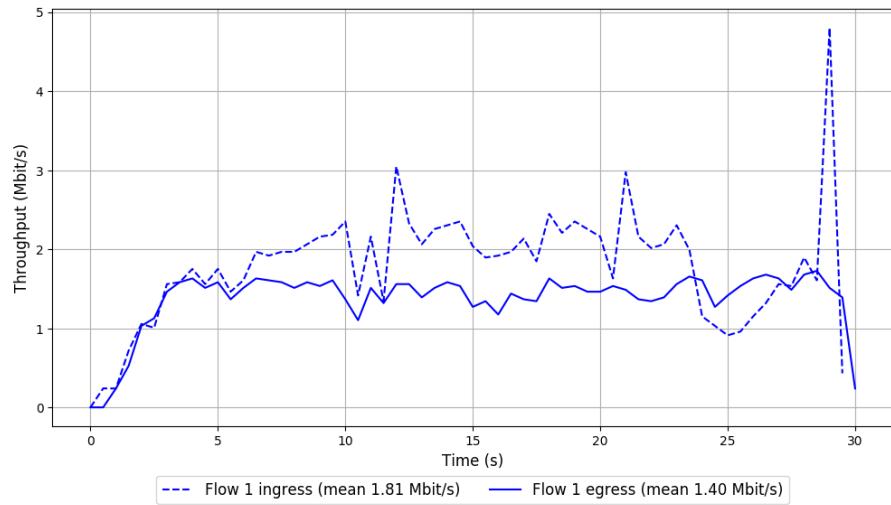


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2018-04-16 22:06:35
End at: 2018-04-16 22:07:05
Local clock offset: -6.806 ms
Remote clock offset: 5.833 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 5339.761 ms
Loss rate: 21.77%
-- Flow 1:
Average throughput: 1.40 Mbit/s
95th percentile per-packet one-way delay: 5339.761 ms
Loss rate: 21.77%
```

Run 1: Report of TCP Cubic — Data Link

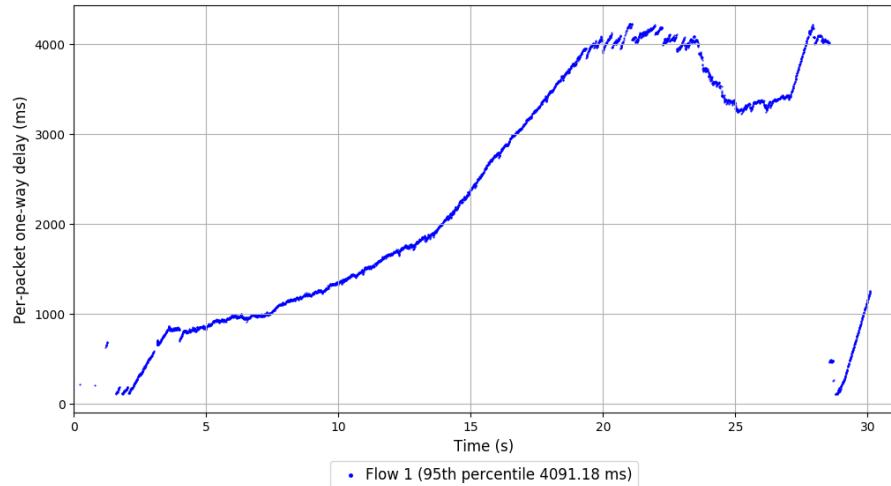
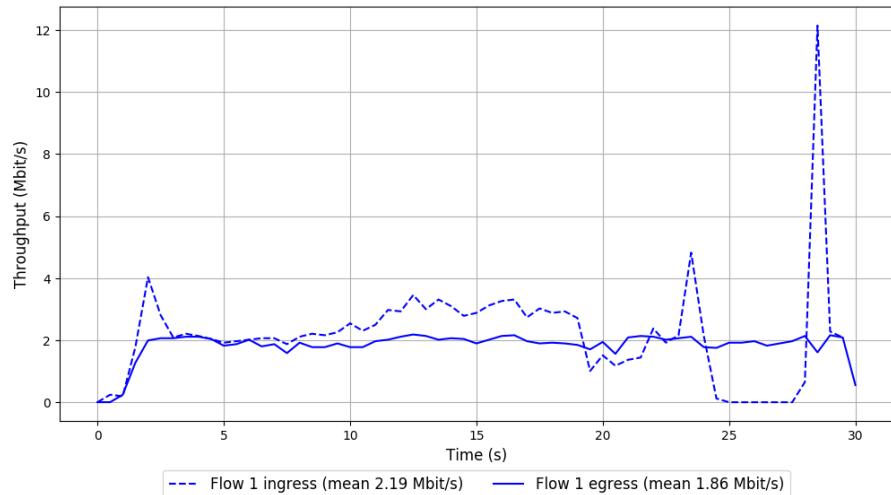


Run 2: Statistics of TCP Cubic

```
Start at: 2018-04-16 22:26:41
End at: 2018-04-16 22:27:11
Local clock offset: -7.652 ms
Remote clock offset: 11.719 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 4091.176 ms
Loss rate: 15.06%
-- Flow 1:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 4091.176 ms
Loss rate: 15.06%
```

Run 2: Report of TCP Cubic — Data Link

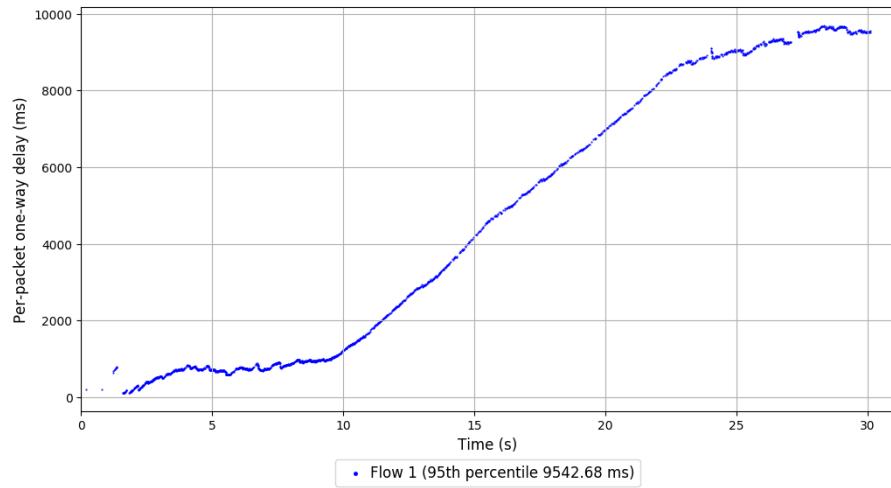
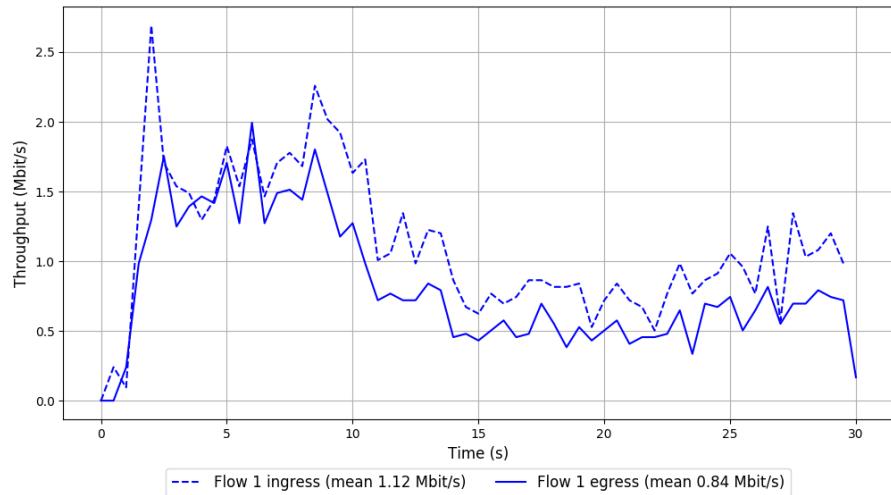


Run 3: Statistics of TCP Cubic

```
Start at: 2018-04-16 22:46:48
End at: 2018-04-16 22:47:18
Local clock offset: -4.466 ms
Remote clock offset: 6.192 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 9542.685 ms
Loss rate: 25.53%
-- Flow 1:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 9542.685 ms
Loss rate: 25.53%
```

Run 3: Report of TCP Cubic — Data Link

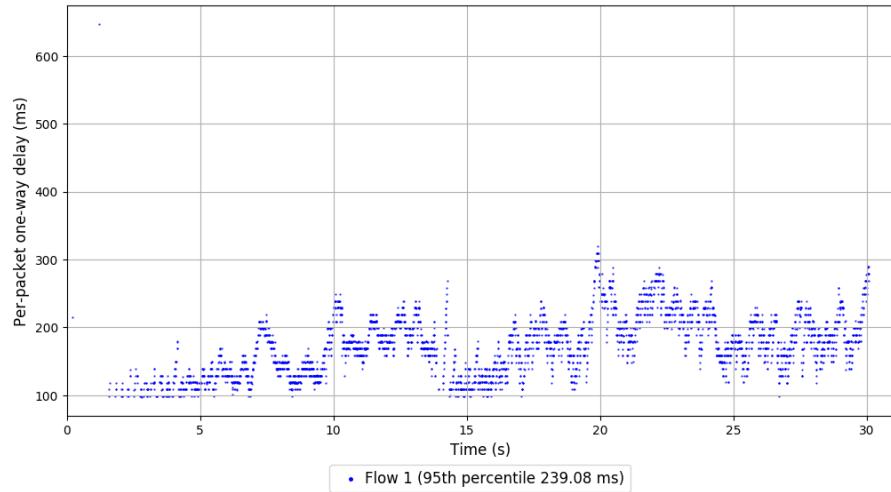
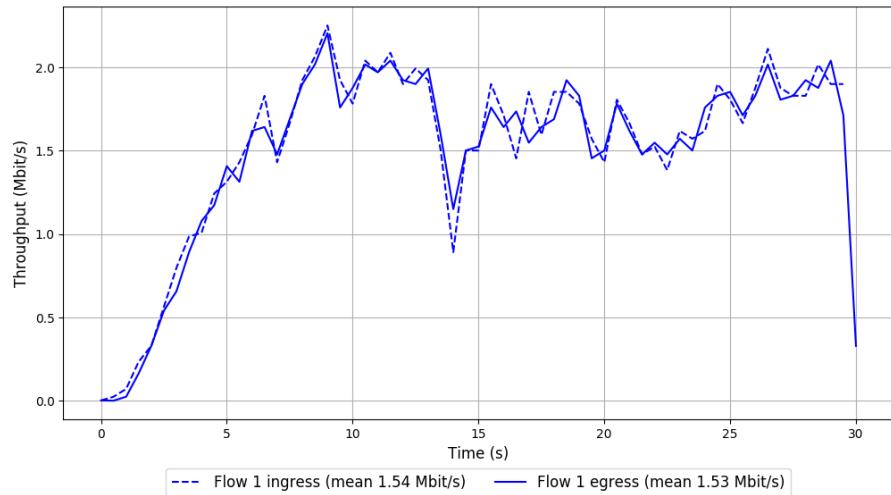


```
Run 1: Statistics of LEDBAT

Start at: 2018-04-16 21:57:07
End at: 2018-04-16 21:57:37
Local clock offset: -7.387 ms
Remote clock offset: 6.436 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 239.082 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 239.082 ms
Loss rate: 0.61%
```

Run 1: Report of LEDBAT — Data Link

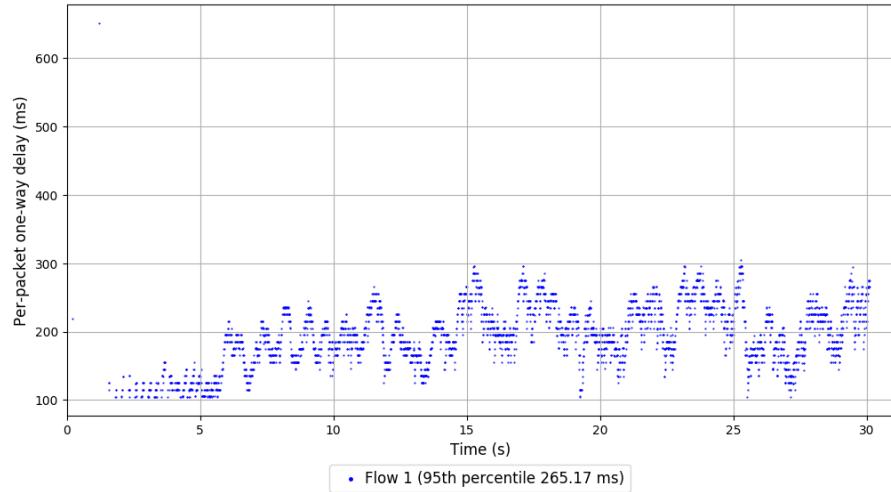
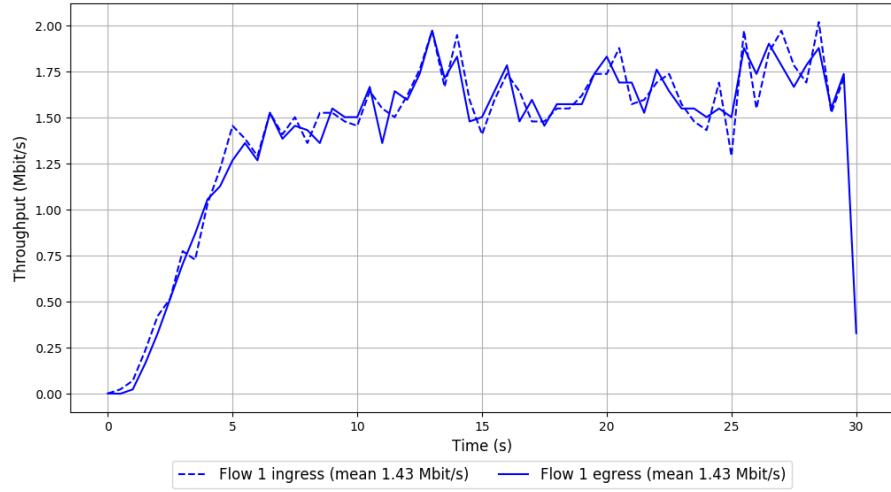


Run 2: Statistics of LEDBAT

```
Start at: 2018-04-16 22:17:14
End at: 2018-04-16 22:17:44
Local clock offset: -6.616 ms
Remote clock offset: 10.791 ms

# Below is generated by plot.py at 2018-04-16 22:48:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 265.167 ms
Loss rate: 0.47%
-- Flow 1:
Average throughput: 1.43 Mbit/s
95th percentile per-packet one-way delay: 265.167 ms
Loss rate: 0.47%
```

Run 2: Report of LEDBAT — Data Link

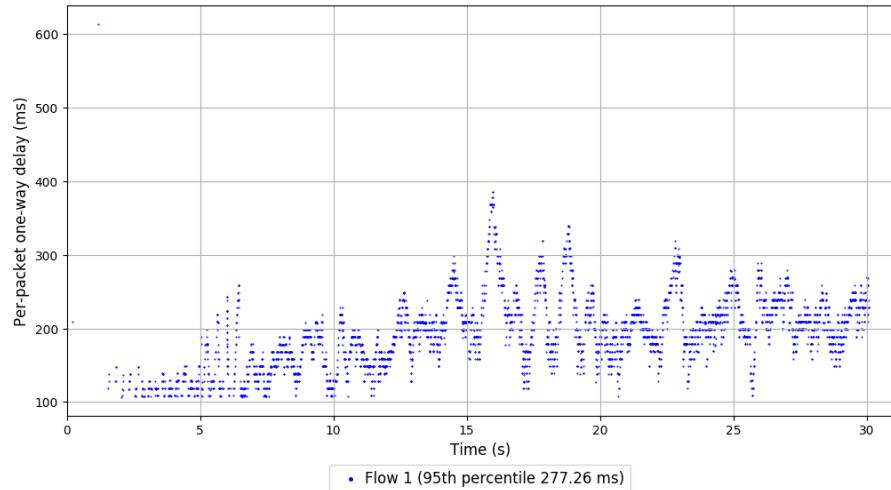
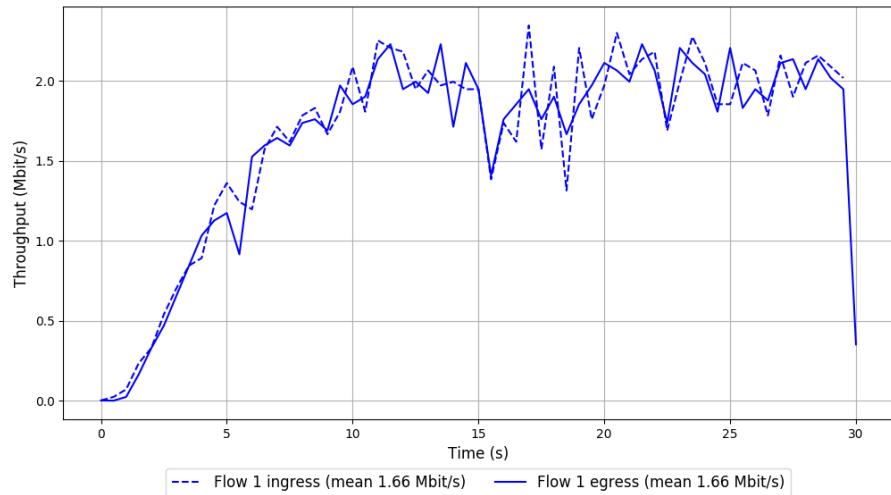


Run 3: Statistics of LEDBAT

```
Start at: 2018-04-16 22:37:20
End at: 2018-04-16 22:37:50
Local clock offset: -6.437 ms
Remote clock offset: 11.832 ms

# Below is generated by plot.py at 2018-04-16 22:48:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 277.256 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 277.256 ms
Loss rate: 0.66%
```

Run 3: Report of LEDBAT — Data Link

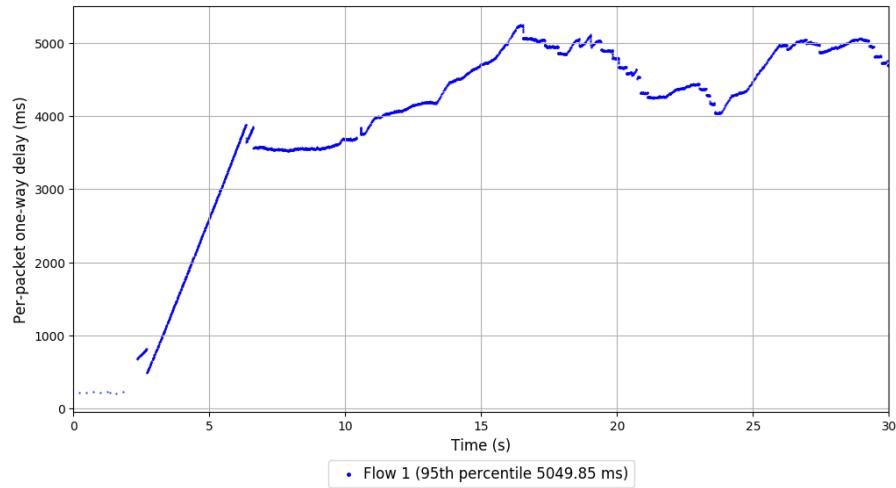
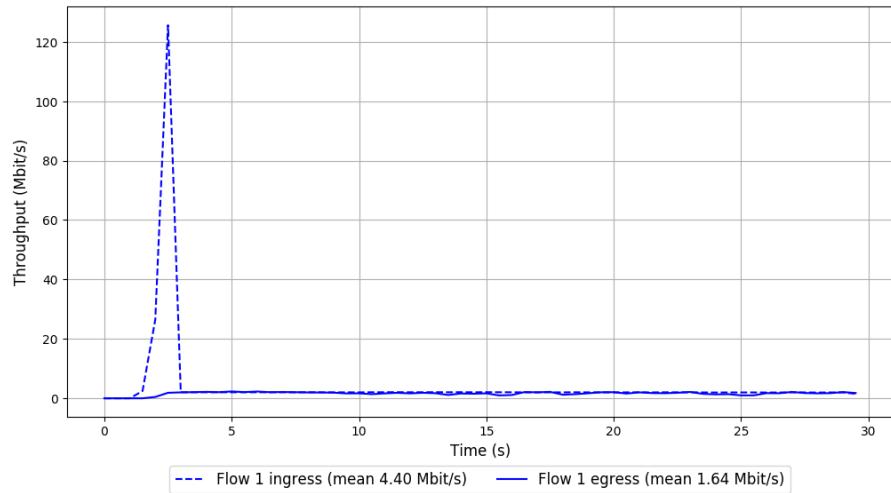


```
Run 1: Statistics of PCC-Allegro
```

```
Start at: 2018-04-16 21:54:46
End at: 2018-04-16 21:55:16
Local clock offset: -7.268 ms
Remote clock offset: 6.451 ms

# Below is generated by plot.py at 2018-04-16 22:48:20
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 5049.845 ms
Loss rate: 62.88%
-- Flow 1:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 5049.845 ms
Loss rate: 62.88%
```

Run 1: Report of PCC-Allegro — Data Link

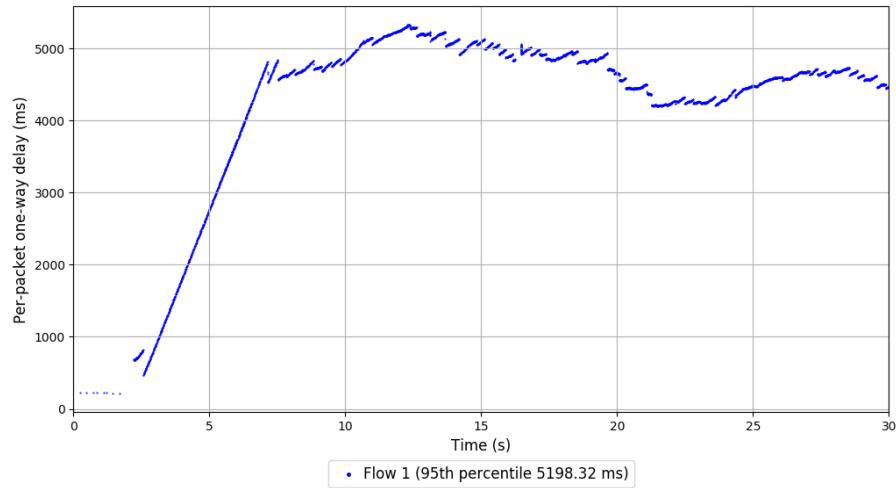
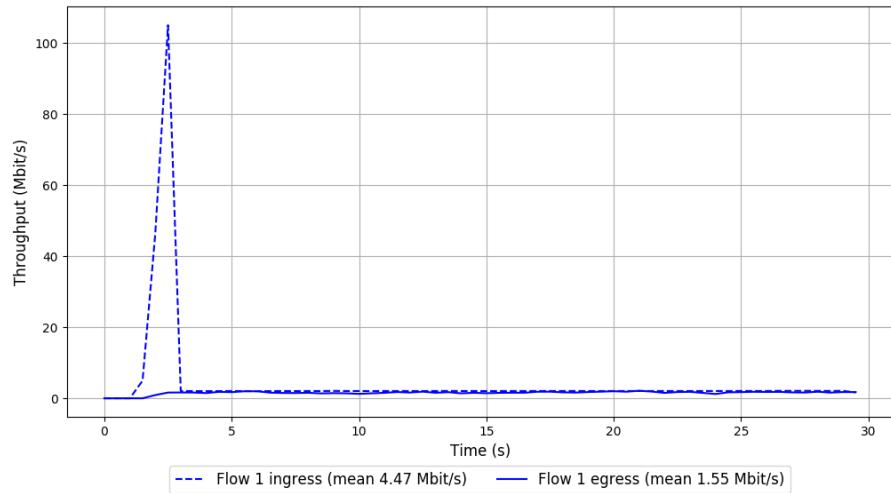


Run 2: Statistics of PCC-Allegro

```
Start at: 2018-04-16 22:14:52
End at: 2018-04-16 22:15:22
Local clock offset: -7.415 ms
Remote clock offset: 11.682 ms

# Below is generated by plot.py at 2018-04-16 22:48:21
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 5198.316 ms
Loss rate: 65.37%
-- Flow 1:
Average throughput: 1.55 Mbit/s
95th percentile per-packet one-way delay: 5198.316 ms
Loss rate: 65.37%
```

Run 2: Report of PCC-Allegro — Data Link

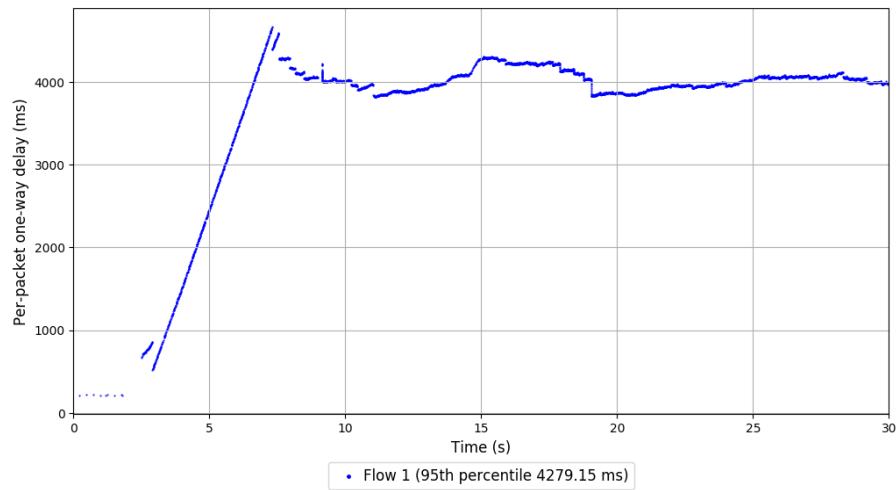
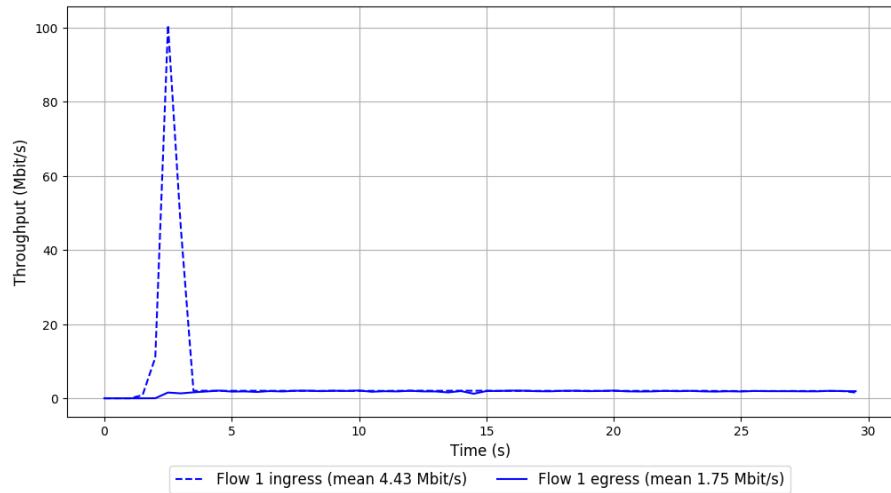


```
Run 3: Statistics of PCC-Allegro
```

```
Start at: 2018-04-16 22:34:58
End at: 2018-04-16 22:35:28
Local clock offset: -7.006 ms
Remote clock offset: 11.74 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 4279.148 ms
Loss rate: 60.71%
-- Flow 1:
Average throughput: 1.75 Mbit/s
95th percentile per-packet one-way delay: 4279.148 ms
Loss rate: 60.71%
```

Run 3: Report of PCC-Allegro — Data Link

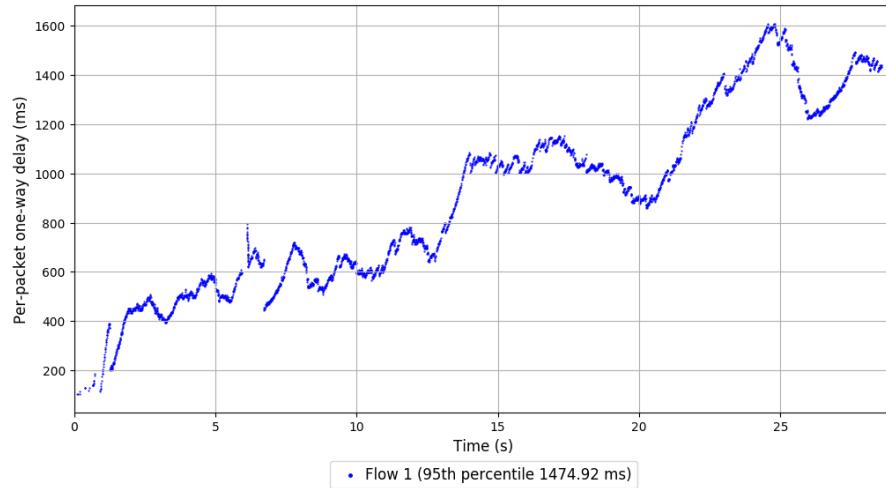
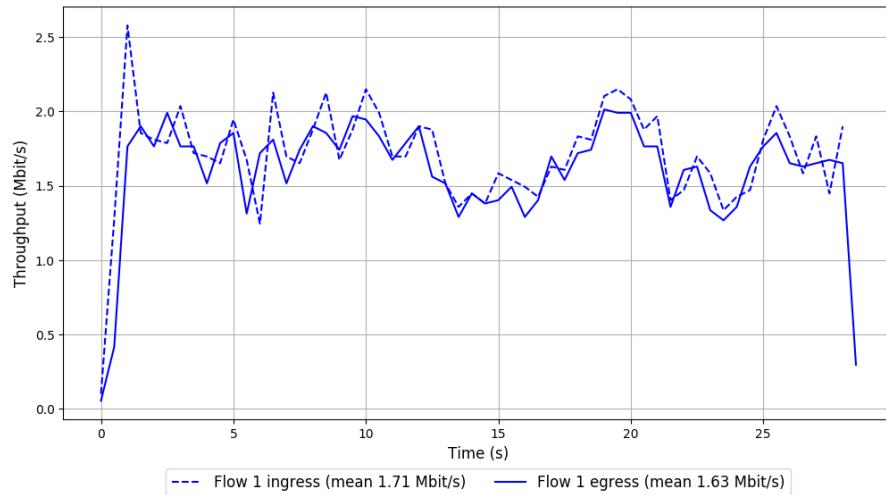


```
Run 1: Statistics of QUIC Cubic
```

```
Start at: 2018-04-16 22:03:03
End at: 2018-04-16 22:03:33
Local clock offset: -7.091 ms
Remote clock offset: 12.315 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 1474.916 ms
Loss rate: 4.83%
-- Flow 1:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 1474.916 ms
Loss rate: 4.83%
```

Run 1: Report of QUIC Cubic — Data Link

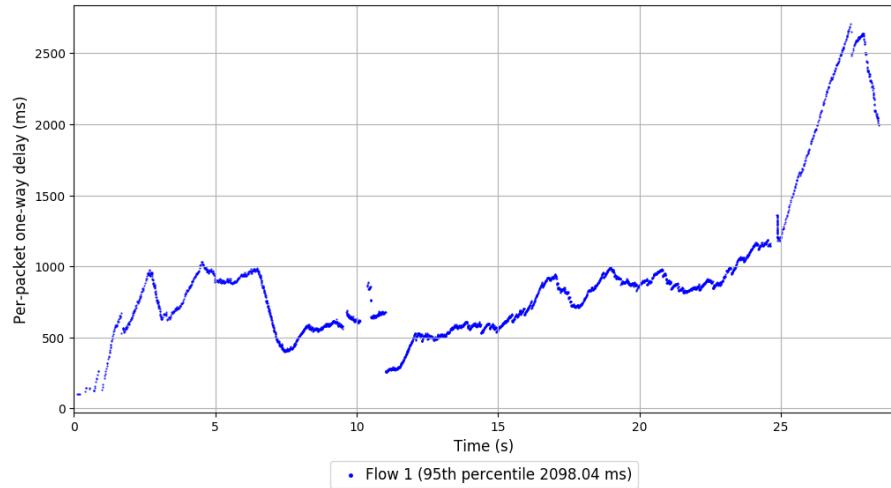
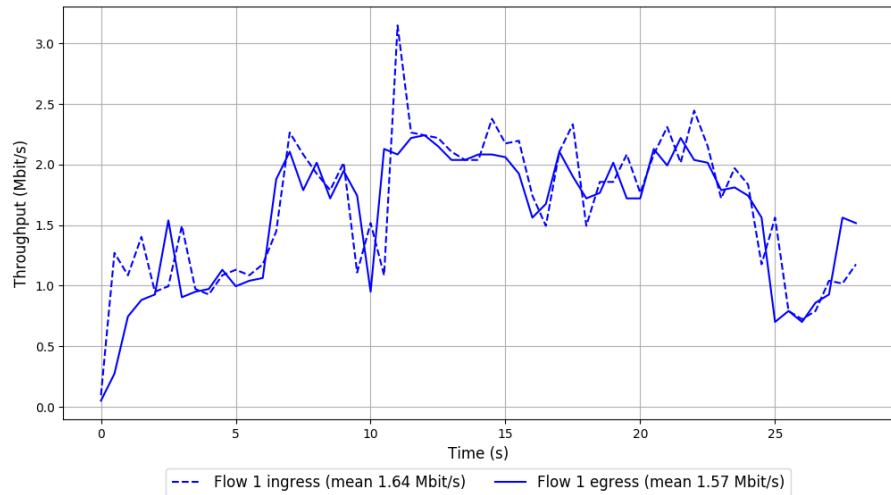


Run 2: Statistics of QUIC Cubic

```
Start at: 2018-04-16 22:23:08
End at: 2018-04-16 22:23:38
Local clock offset: -6.748 ms
Remote clock offset: 6.049 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 2098.037 ms
Loss rate: 4.32%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 2098.037 ms
Loss rate: 4.32%
```

Run 2: Report of QUIC Cubic — Data Link

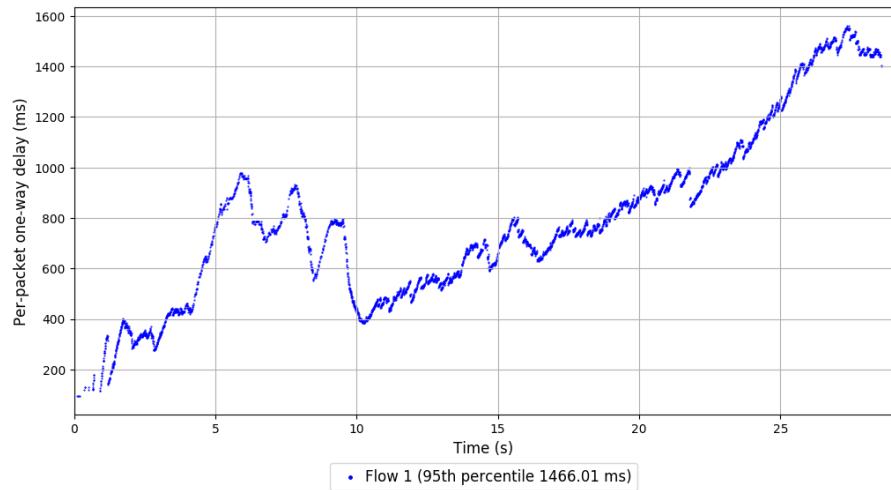
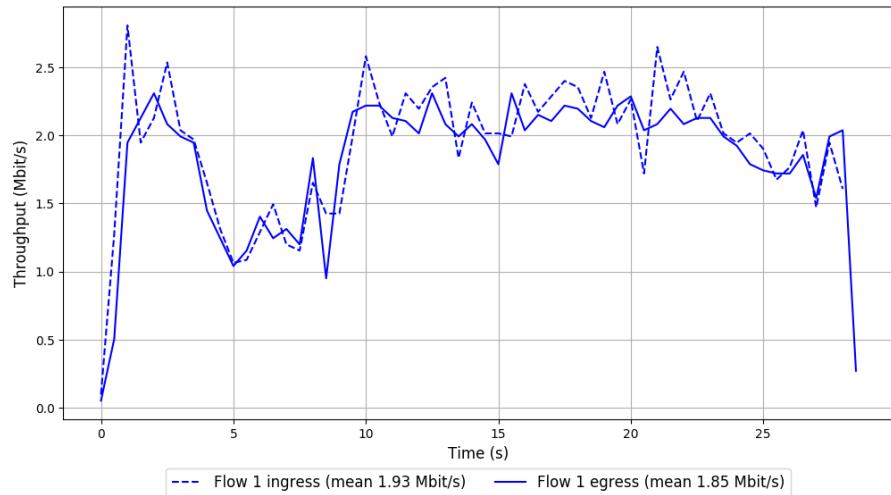


Run 3: Statistics of QUIC Cubic

```
Start at: 2018-04-16 22:43:15
End at: 2018-04-16 22:43:45
Local clock offset: -5.565 ms
Remote clock offset: 12.645 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 1466.011 ms
Loss rate: 4.15%
-- Flow 1:
Average throughput: 1.85 Mbit/s
95th percentile per-packet one-way delay: 1466.011 ms
Loss rate: 4.15%
```

Run 3: Report of QUIC Cubic — Data Link

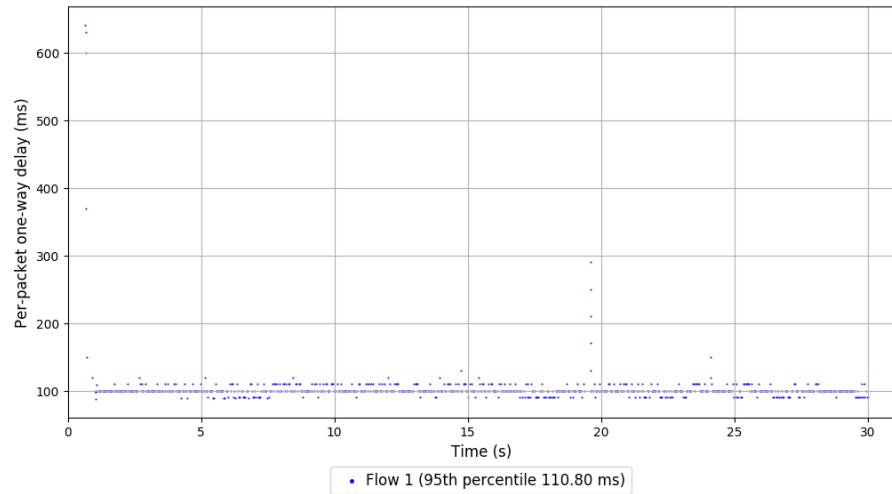
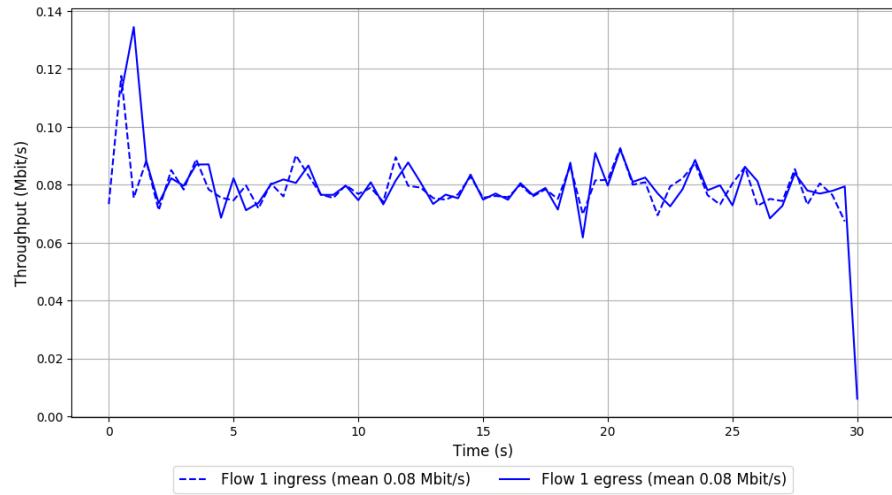


```
Run 1: Statistics of SCReAM

Start at: 2018-04-16 22:05:25
End at: 2018-04-16 22:05:55
Local clock offset: -6.84 ms
Remote clock offset: 5.755 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 110.797 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 110.797 ms
Loss rate: 0.00%
```

Run 1: Report of SCReAM — Data Link

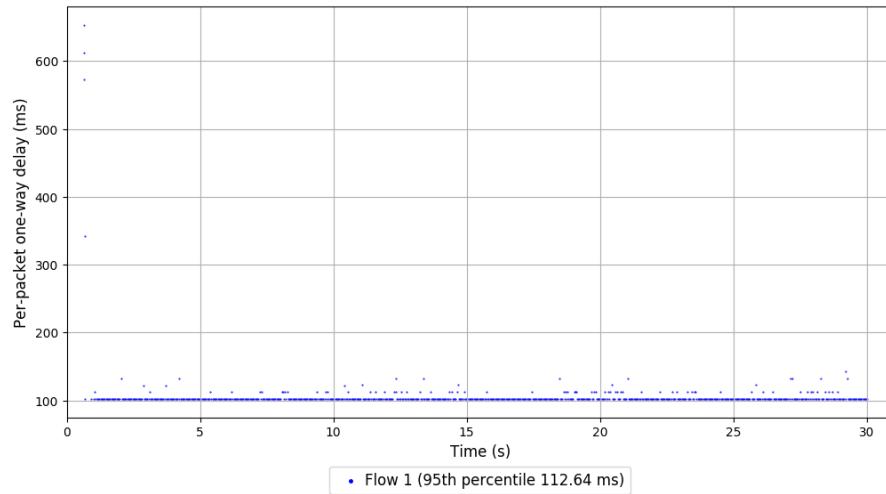
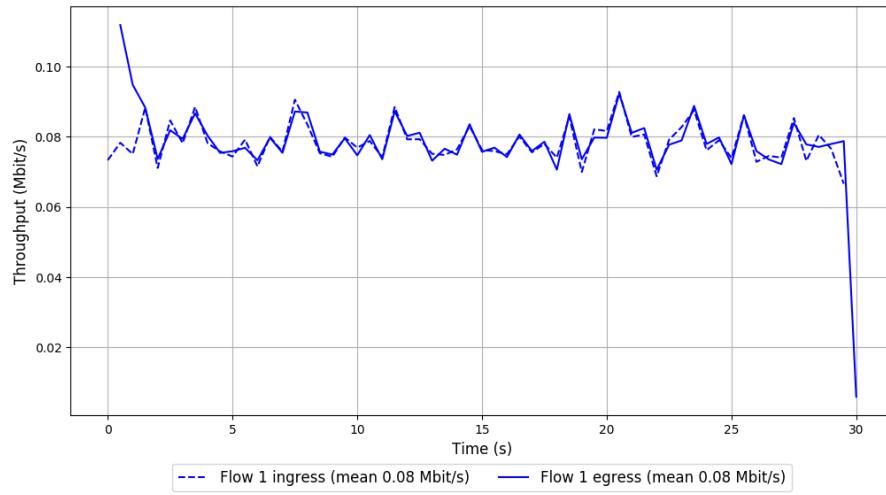


Run 2: Statistics of SCReAM

```
Start at: 2018-04-16 22:25:30
End at: 2018-04-16 22:26:00
Local clock offset: -6.835 ms
Remote clock offset: 6.066 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 112.635 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 112.635 ms
Loss rate: 0.00%
```

Run 2: Report of SCReAM — Data Link

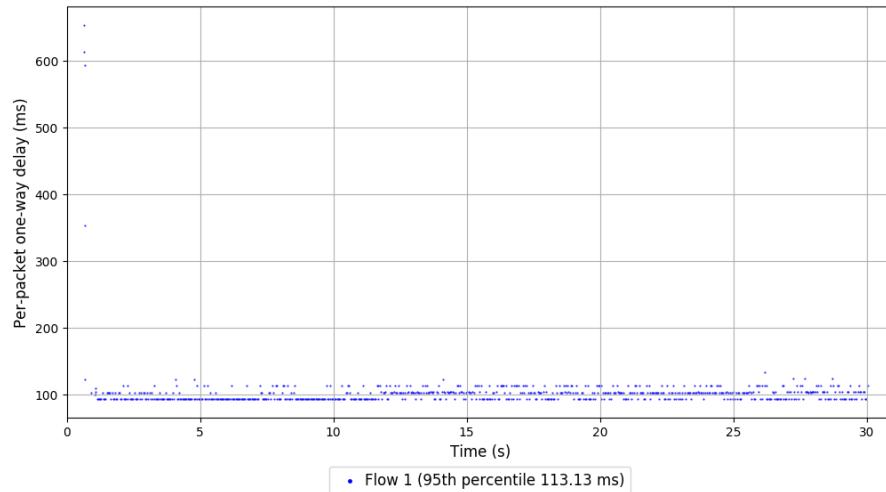
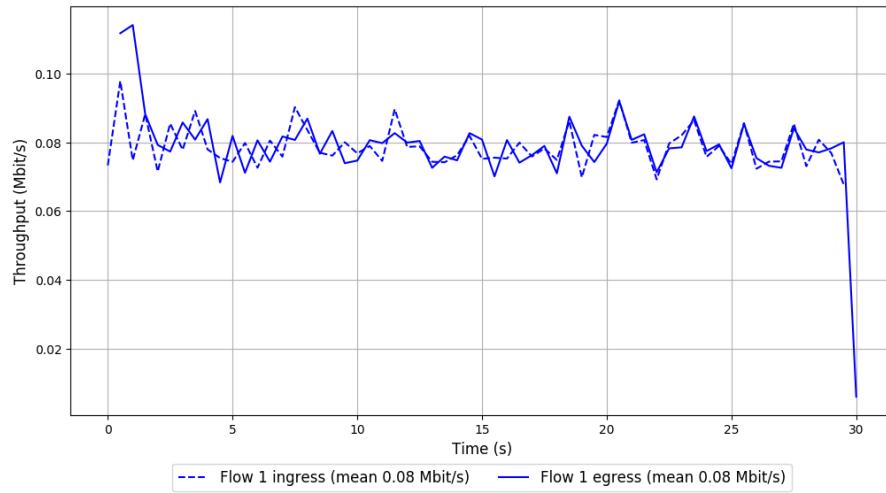


Run 3: Statistics of SCReAM

```
Start at: 2018-04-16 22:45:38
End at: 2018-04-16 22:46:08
Local clock offset: -5.309 ms
Remote clock offset: 6.255 ms

# Below is generated by plot.py at 2018-04-16 22:48:22
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 113.134 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 113.134 ms
Loss rate: 0.00%
```

Run 3: Report of SCReAM — Data Link

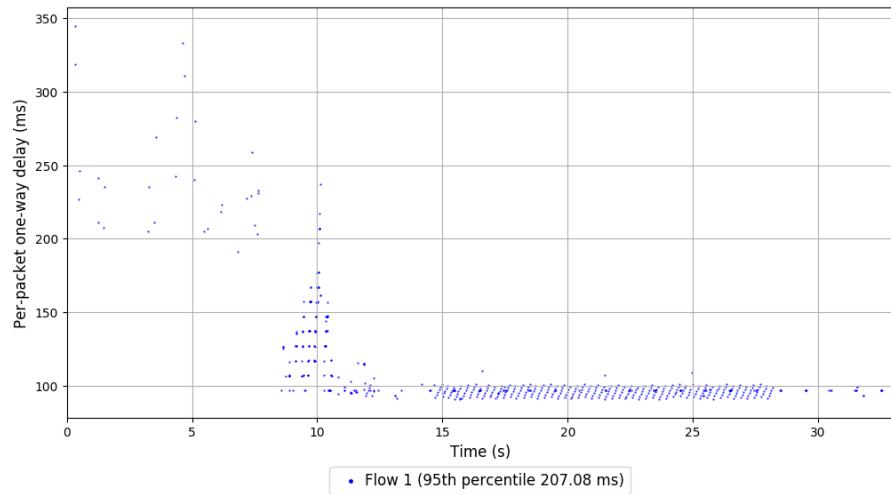
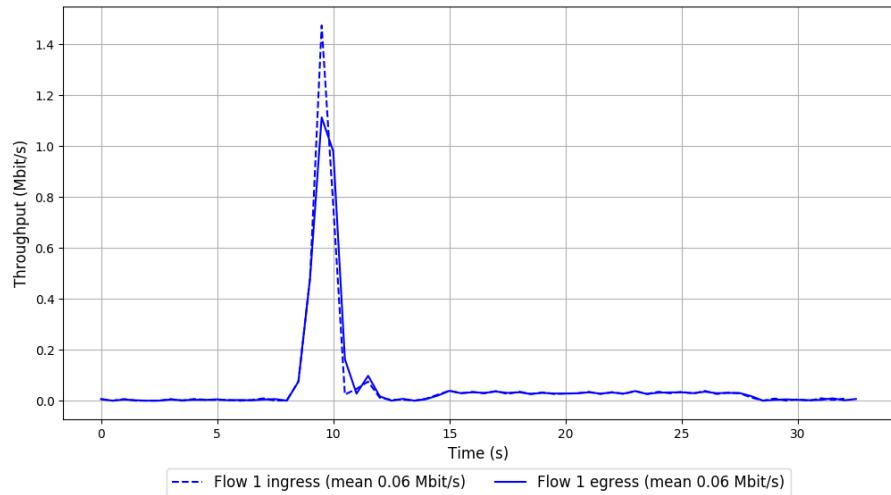


```
Run 1: Statistics of WebRTC media

Start at: 2018-04-16 21:55:57
End at: 2018-04-16 21:56:27
Local clock offset: -7.221 ms
Remote clock offset: 5.62 ms

# Below is generated by plot.py at 2018-04-16 22:48:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 207.079 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 207.079 ms
Loss rate: 0.00%
```

Run 1: Report of WebRTC media — Data Link

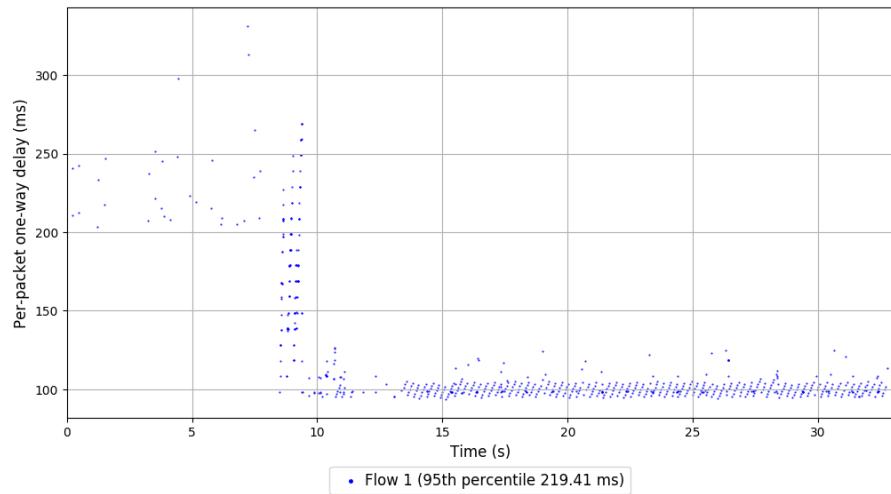
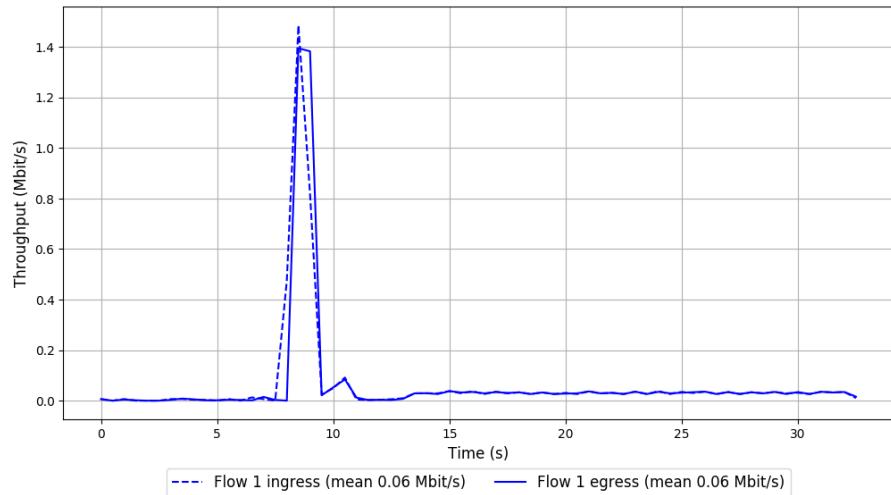


Run 2: Statistics of WebRTC media

```
Start at: 2018-04-16 22:16:03
End at: 2018-04-16 22:16:33
Local clock offset: -7.395 ms
Remote clock offset: 11.599 ms

# Below is generated by plot.py at 2018-04-16 22:48:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 219.412 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 219.412 ms
Loss rate: 0.00%
```

Run 2: Report of WebRTC media — Data Link

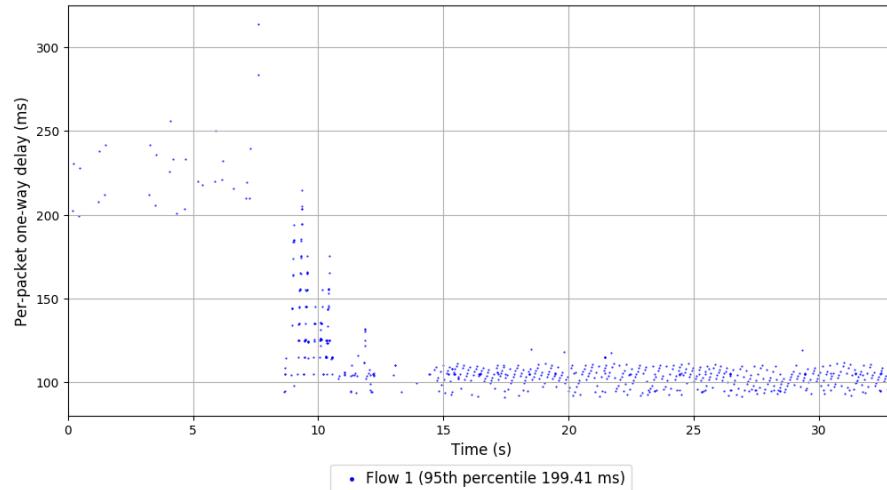
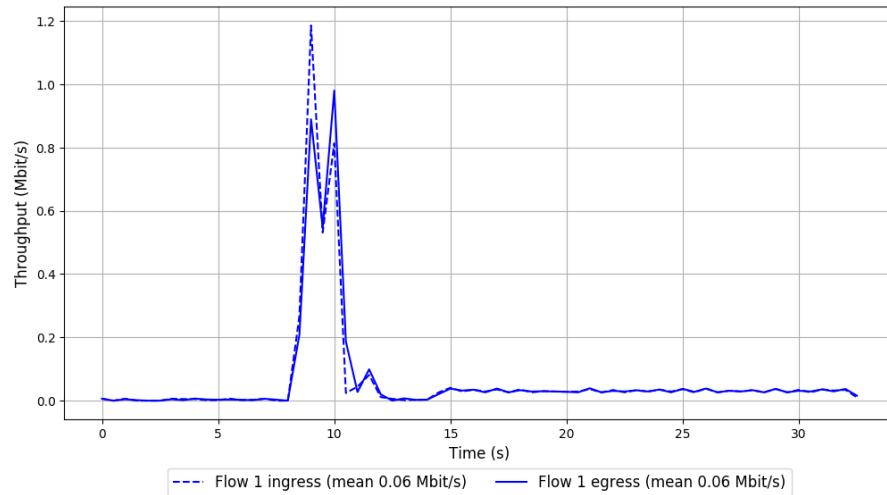


Run 3: Statistics of WebRTC media

```
Start at: 2018-04-16 22:36:09
End at: 2018-04-16 22:36:39
Local clock offset: -6.795 ms
Remote clock offset: 12.65 ms

# Below is generated by plot.py at 2018-04-16 22:48:24
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 199.406 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 199.406 ms
Loss rate: 0.00%
```

Run 3: Report of WebRTC media — Data Link

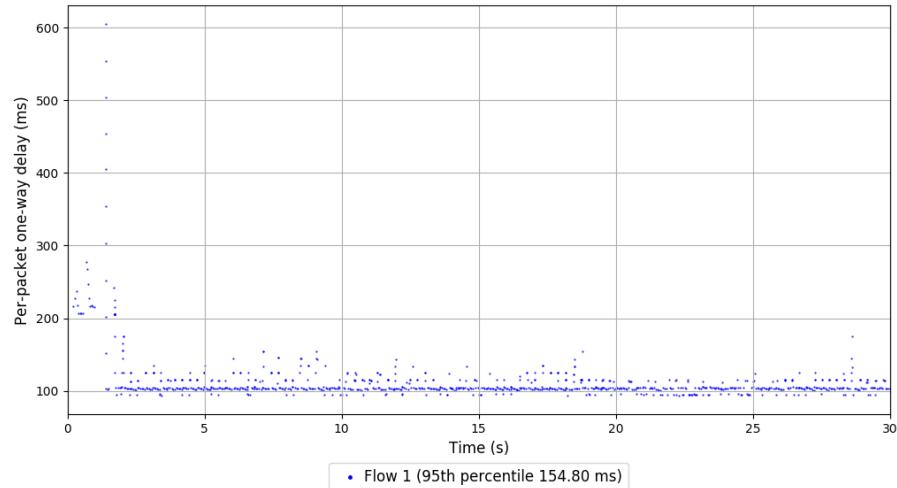
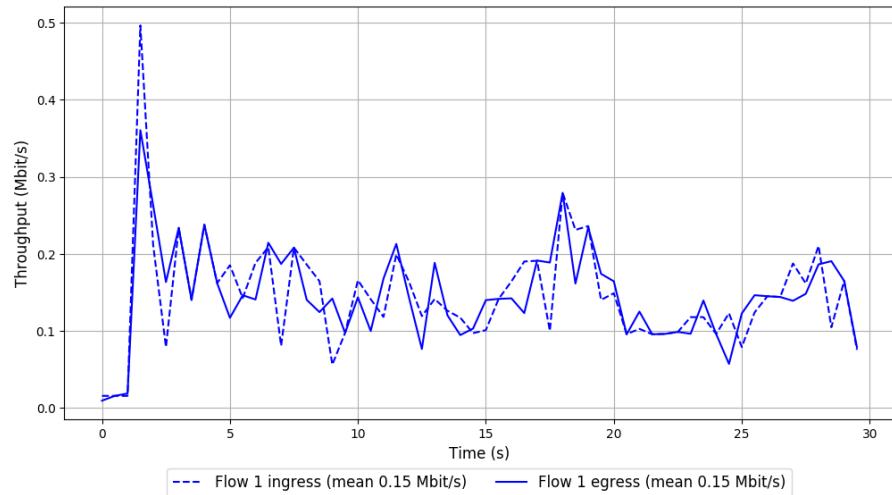


Run 1: Statistics of Sprout

```
Start at: 2018-04-16 21:58:18
End at: 2018-04-16 21:58:48
Local clock offset: -8.111 ms
Remote clock offset: 6.507 ms

# Below is generated by plot.py at 2018-04-16 22:48:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 154.804 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 154.804 ms
Loss rate: 0.00%
```

Run 1: Report of Sprout — Data Link

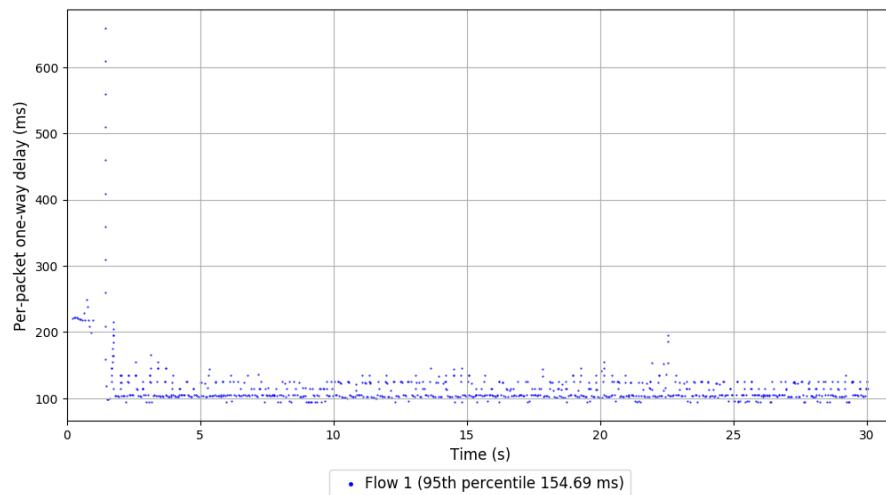
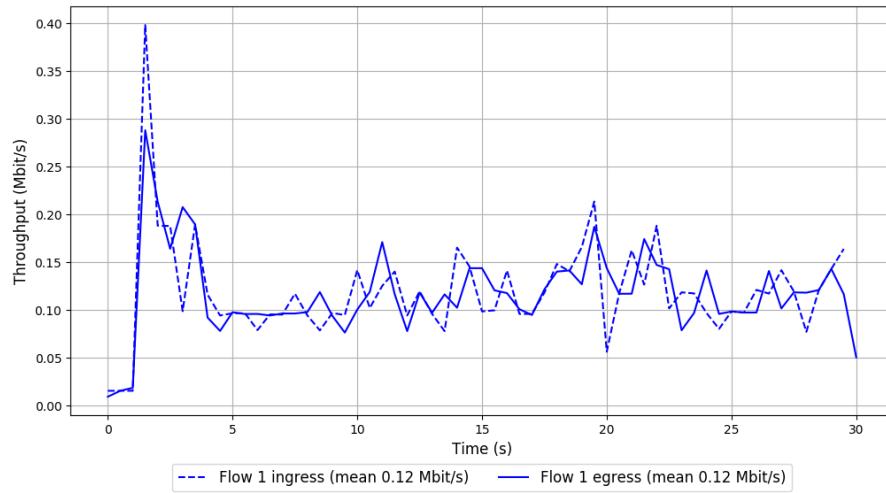


Run 2: Statistics of Sprout

```
Start at: 2018-04-16 22:18:24
End at: 2018-04-16 22:18:54
Local clock offset: -7.438 ms
Remote clock offset: 11.669 ms

# Below is generated by plot.py at 2018-04-16 22:48:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 154.690 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.12 Mbit/s
95th percentile per-packet one-way delay: 154.690 ms
Loss rate: 0.00%
```

Run 2: Report of Sprout — Data Link

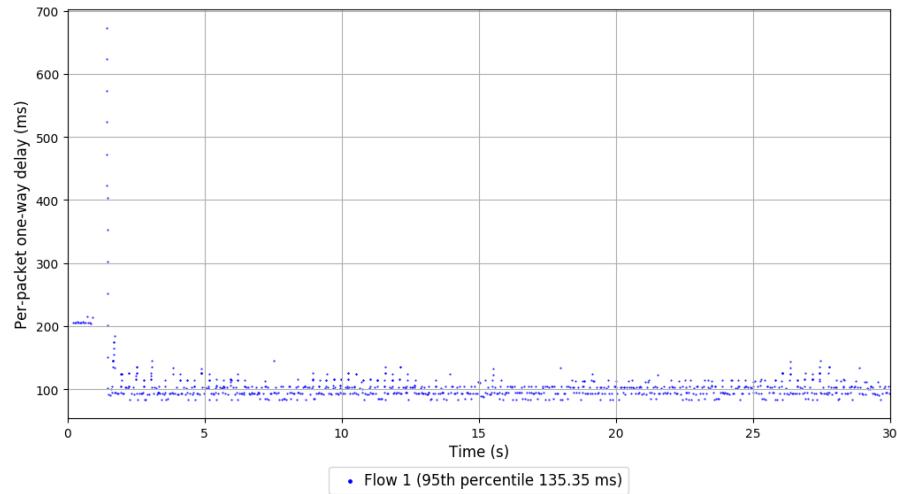
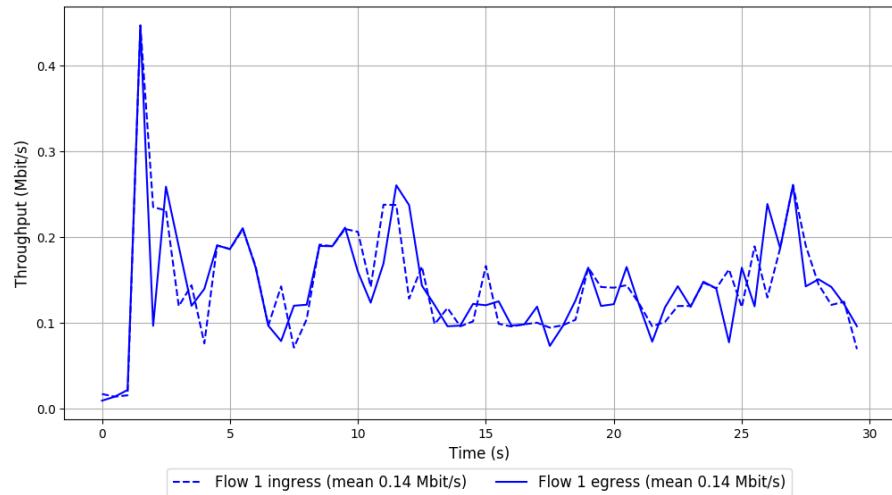


Run 3: Statistics of Sprout

```
Start at: 2018-04-16 22:38:32
End at: 2018-04-16 22:39:02
Local clock offset: -5.436 ms
Remote clock offset: 7.004 ms

# Below is generated by plot.py at 2018-04-16 22:48:25
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 135.346 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 135.346 ms
Loss rate: 0.00%
```

Run 3: Report of Sprout — Data Link

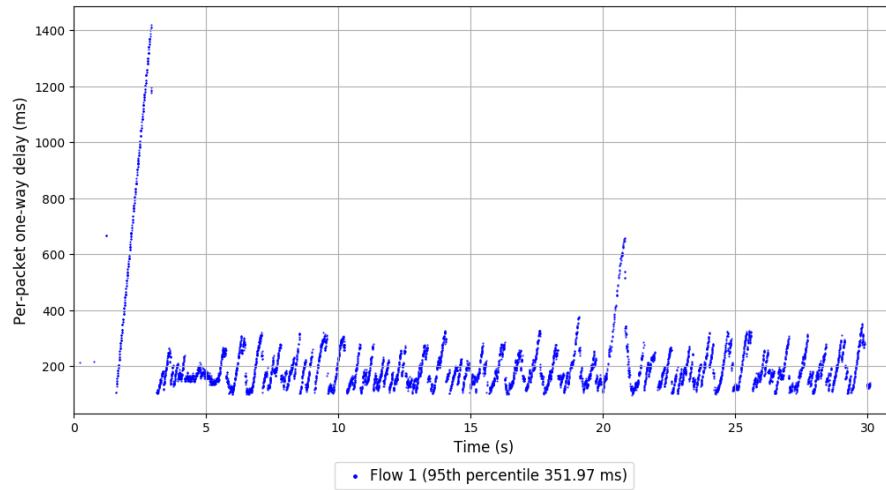
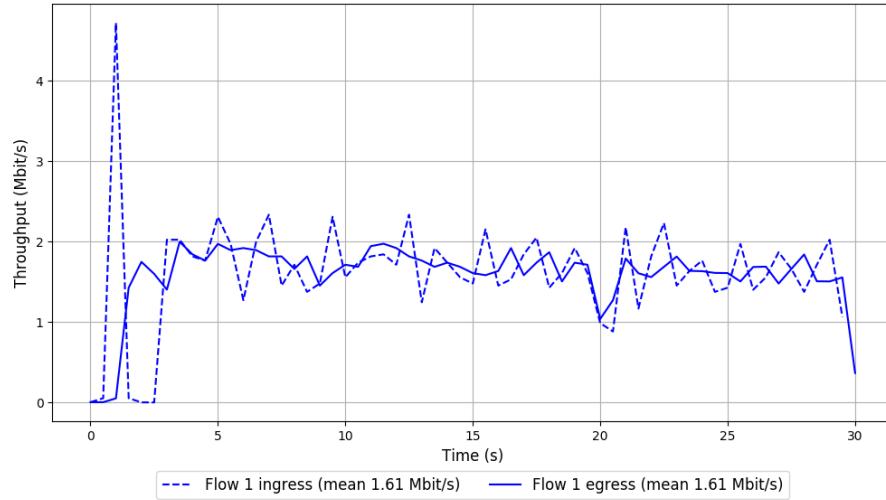


Run 1: Statistics of TaoVA-100x

```
Start at: 2018-04-16 22:04:14
End at: 2018-04-16 22:04:44
Local clock offset: -6.987 ms
Remote clock offset: 10.585 ms

# Below is generated by plot.py at 2018-04-16 22:48:29
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 351.974 ms
Loss rate: 0.21%
-- Flow 1:
Average throughput: 1.61 Mbit/s
95th percentile per-packet one-way delay: 351.974 ms
Loss rate: 0.21%
```

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

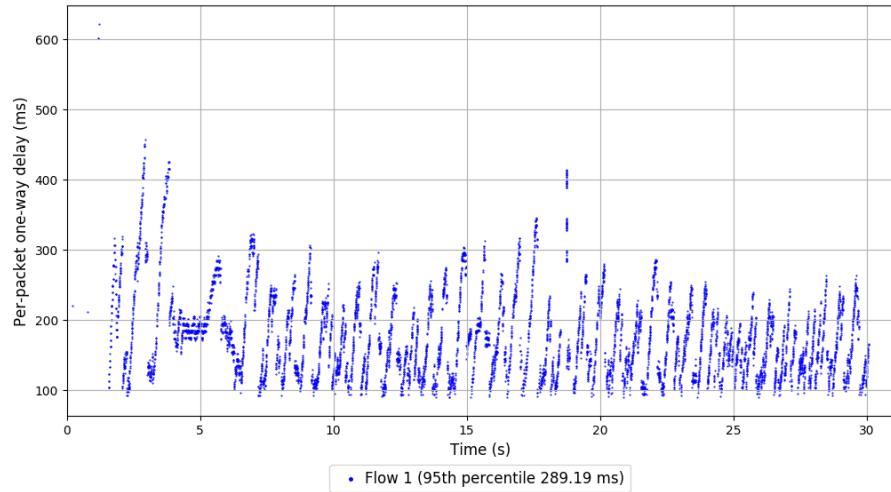
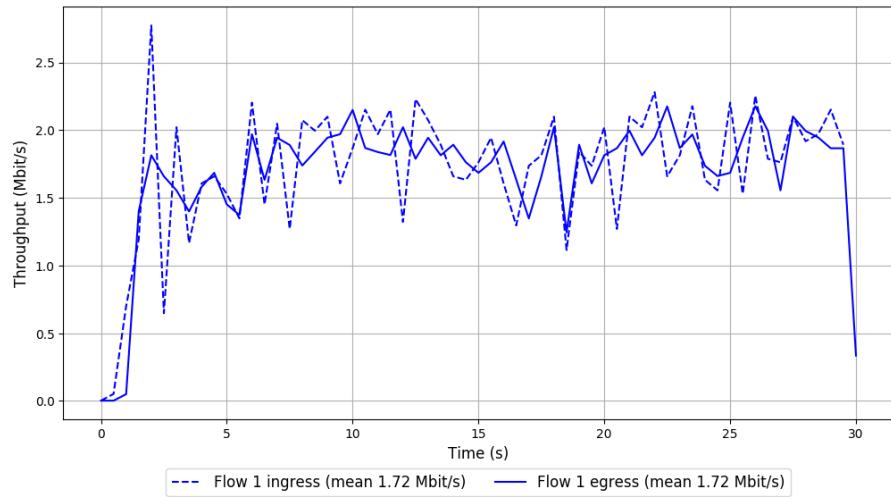


Run 2: Statistics of TaoVA-100x

```
Start at: 2018-04-16 22:24:19
End at: 2018-04-16 22:24:49
Local clock offset: -5.966 ms
Remote clock offset: 6.879 ms

# Below is generated by plot.py at 2018-04-16 22:48:30
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 289.190 ms
Loss rate: 0.55%
-- Flow 1:
Average throughput: 1.72 Mbit/s
95th percentile per-packet one-way delay: 289.190 ms
Loss rate: 0.55%
```

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

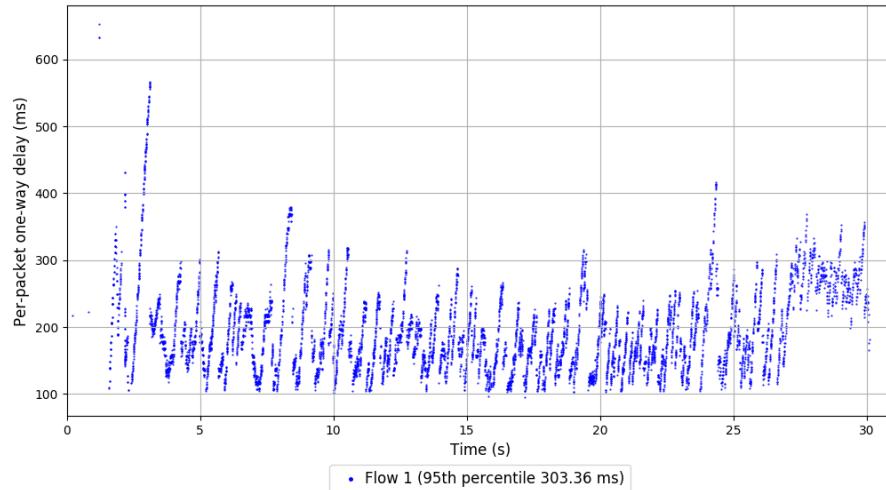
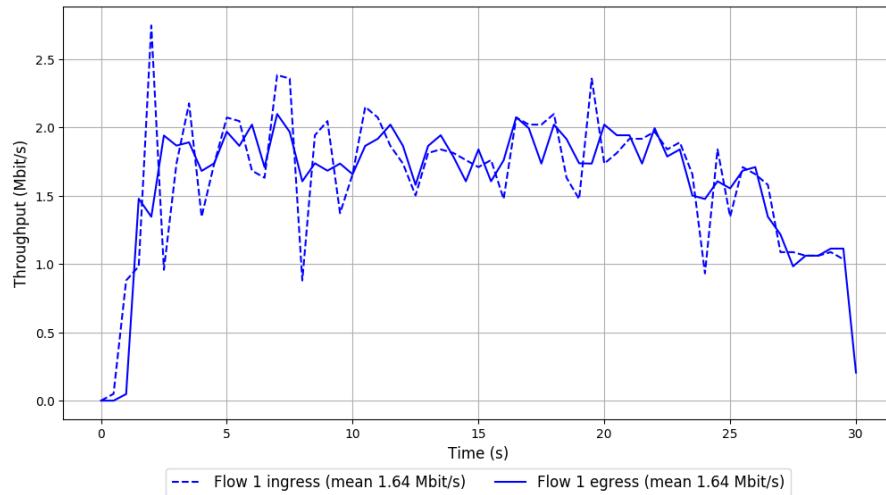


Run 3: Statistics of TaoVA-100x

```
Start at: 2018-04-16 22:44:26
End at: 2018-04-16 22:44:56
Local clock offset: -5.463 ms
Remote clock offset: 12.714 ms

# Below is generated by plot.py at 2018-04-16 22:48:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 303.358 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 1.64 Mbit/s
95th percentile per-packet one-way delay: 303.358 ms
Loss rate: 0.29%
```

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

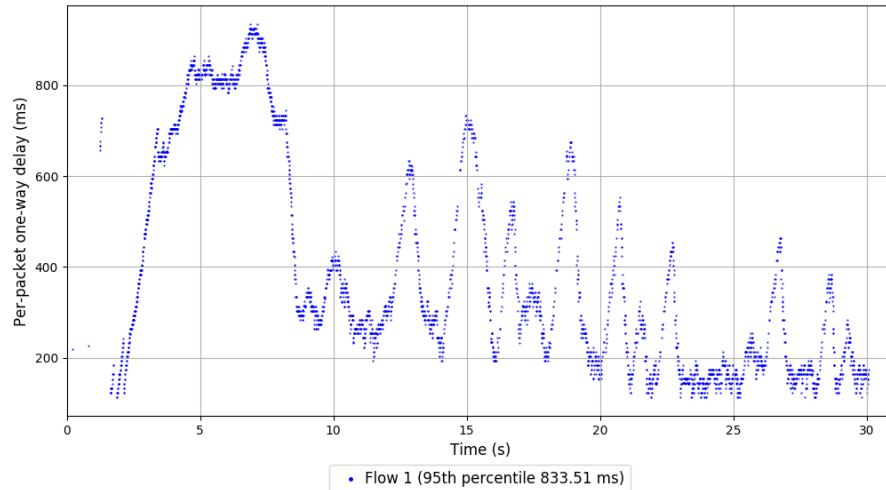
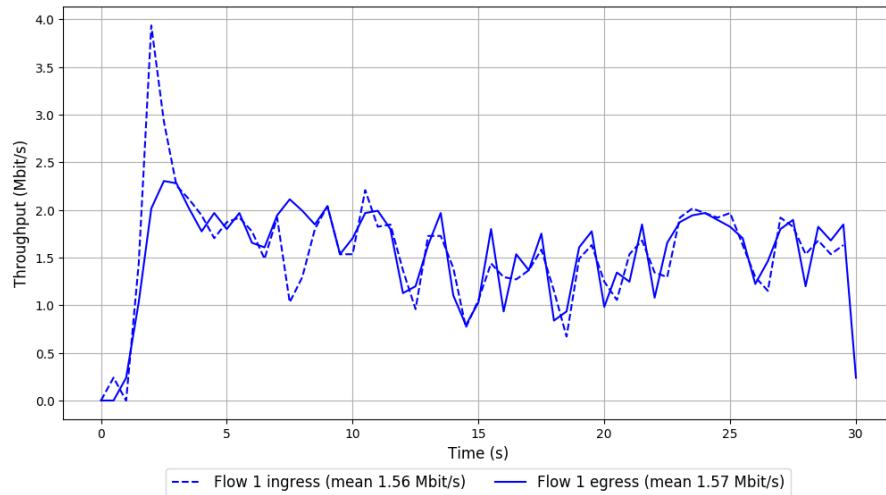


Run 1: Statistics of TCP Vegas

```
Start at: 2018-04-16 21:52:24
End at: 2018-04-16 21:52:54
Local clock offset: -7.2 ms
Remote clock offset: 10.472 ms

# Below is generated by plot.py at 2018-04-16 22:48:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 833.507 ms
Loss rate: 0.18%
-- Flow 1:
Average throughput: 1.57 Mbit/s
95th percentile per-packet one-way delay: 833.507 ms
Loss rate: 0.18%
```

Run 1: Report of TCP Vegas — Data Link

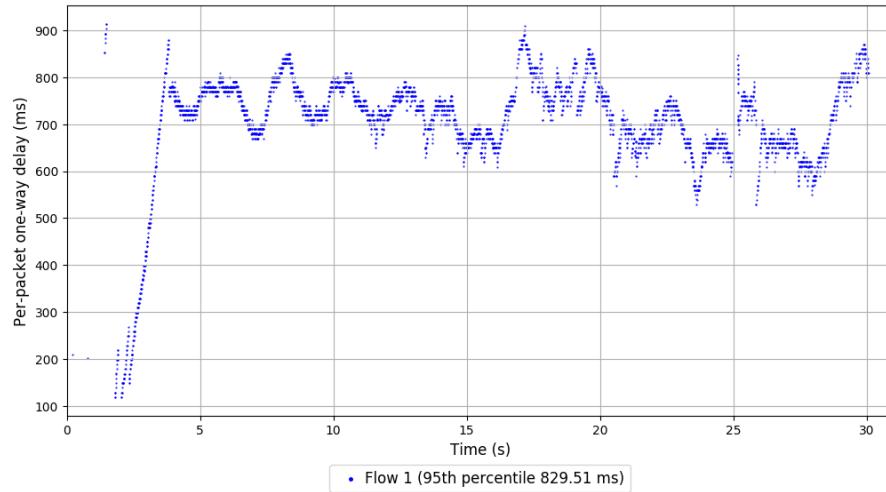
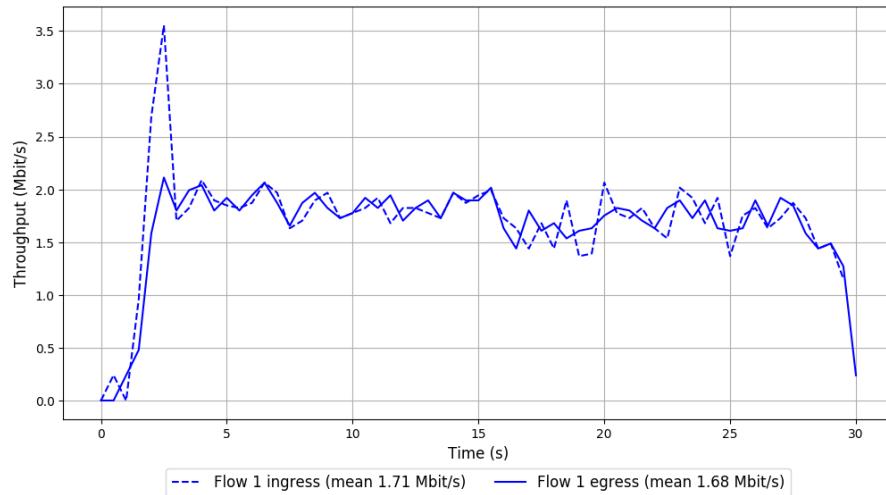


Run 2: Statistics of TCP Vegas

```
Start at: 2018-04-16 22:12:30
End at: 2018-04-16 22:13:00
Local clock offset: -7.362 ms
Remote clock offset: 11.531 ms

# Below is generated by plot.py at 2018-04-16 22:48:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 829.515 ms
Loss rate: 1.90%
-- Flow 1:
Average throughput: 1.68 Mbit/s
95th percentile per-packet one-way delay: 829.515 ms
Loss rate: 1.90%
```

Run 2: Report of TCP Vegas — Data Link

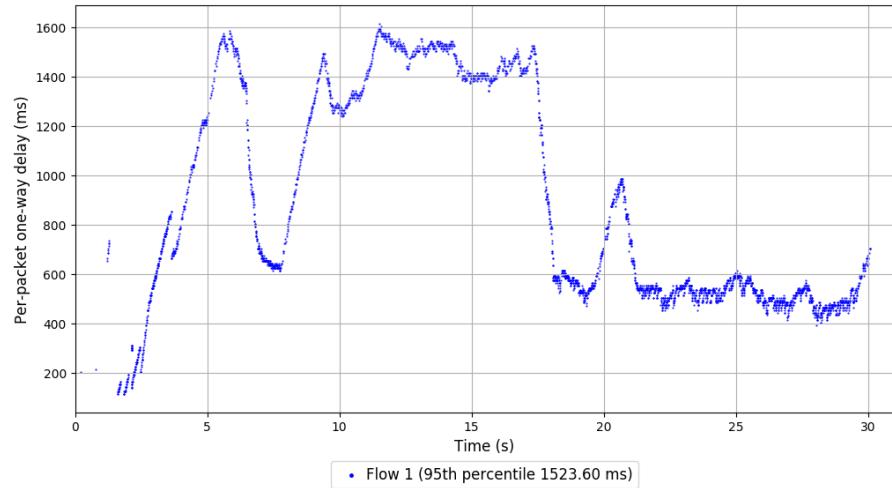
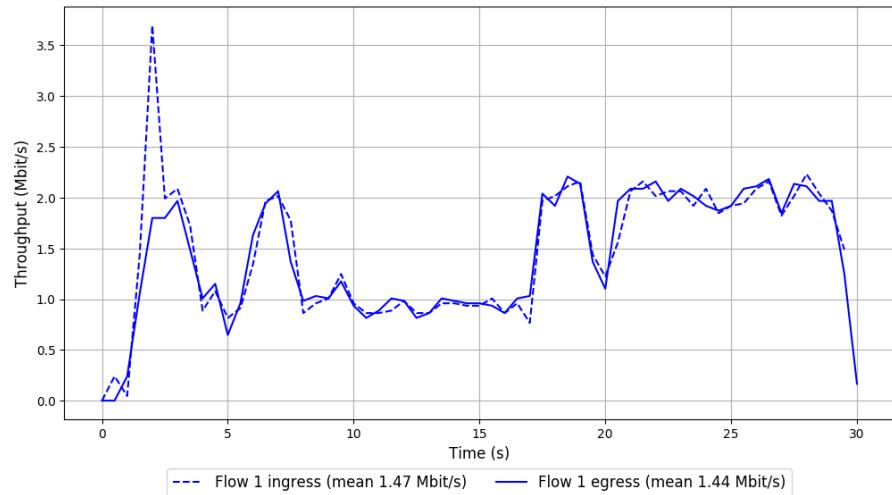


Run 3: Statistics of TCP Vegas

```
Start at: 2018-04-16 22:32:37
End at: 2018-04-16 22:33:07
Local clock offset: -7.011 ms
Remote clock offset: 7.012 ms

# Below is generated by plot.py at 2018-04-16 22:48:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 1523.600 ms
Loss rate: 2.26%
-- Flow 1:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 1523.600 ms
Loss rate: 2.26%
```

Run 3: Report of TCP Vegas — Data Link

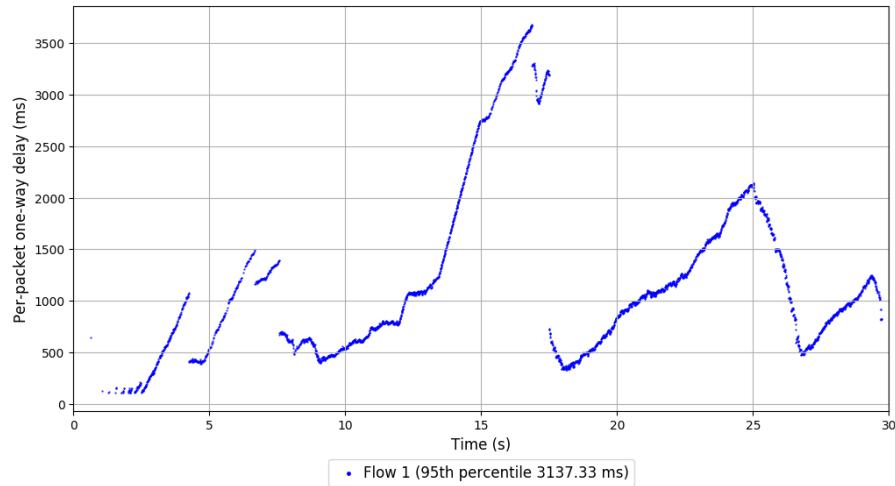
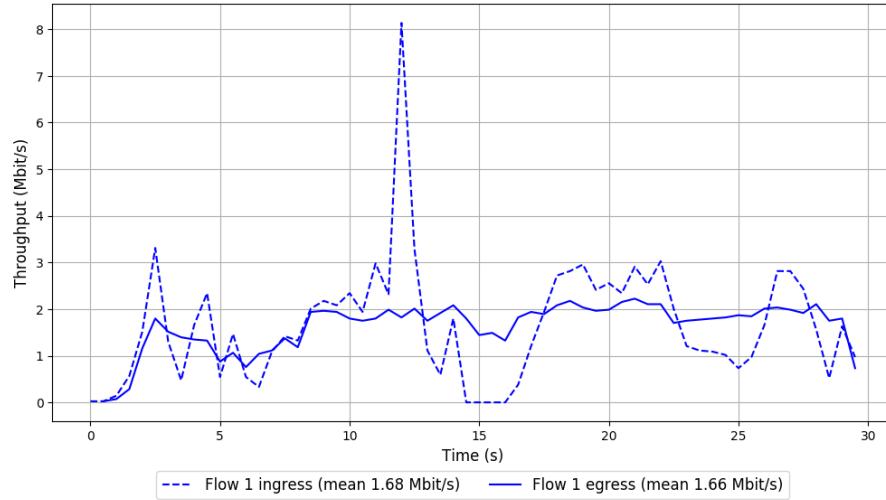


```
Run 1: Statistics of Verus
```

```
Start at: 2018-04-16 21:50:01
End at: 2018-04-16 21:50:31
Local clock offset: -7.889 ms
Remote clock offset: 6.421 ms

# Below is generated by plot.py at 2018-04-16 22:48:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 3137.329 ms
Loss rate: 2.69%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 3137.329 ms
Loss rate: 2.69%
```

Run 1: Report of Verus — Data Link

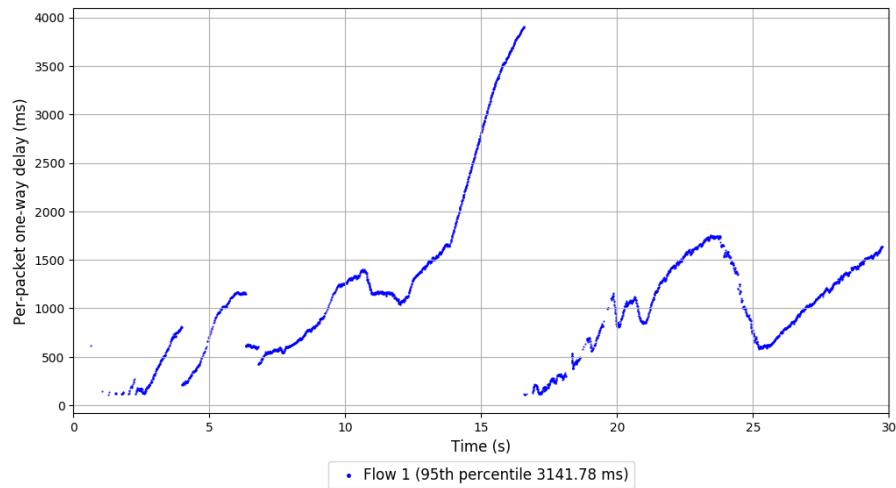
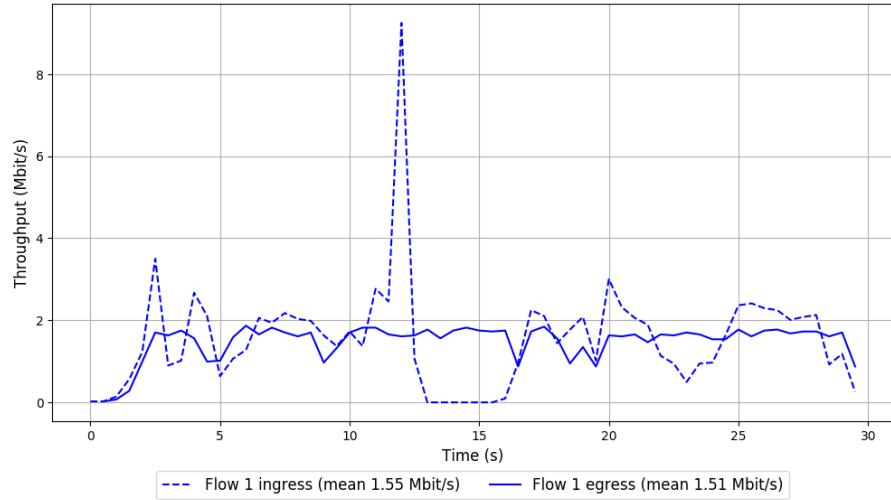


Run 2: Statistics of Verus

```
Start at: 2018-04-16 22:10:08
End at: 2018-04-16 22:10:38
Local clock offset: -6.644 ms
Remote clock offset: 10.641 ms

# Below is generated by plot.py at 2018-04-16 22:48:32
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 3141.785 ms
Loss rate: 4.24%
-- Flow 1:
Average throughput: 1.51 Mbit/s
95th percentile per-packet one-way delay: 3141.785 ms
Loss rate: 4.24%
```

Run 2: Report of Verus — Data Link

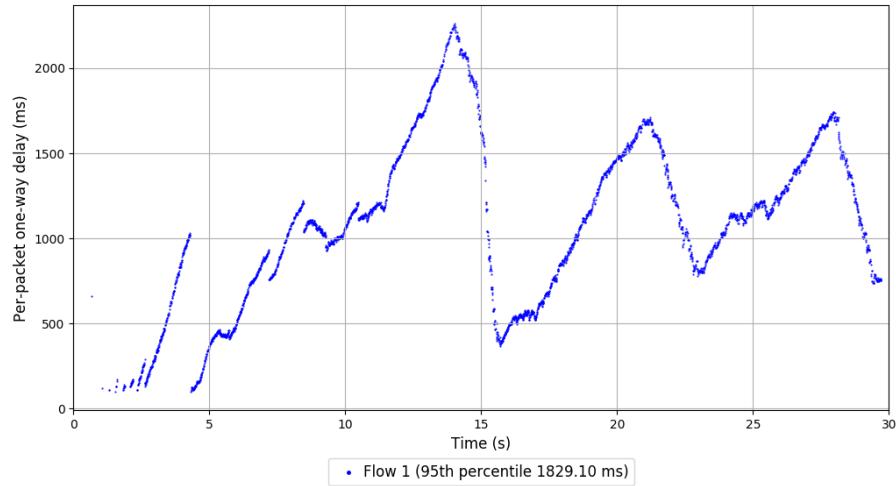
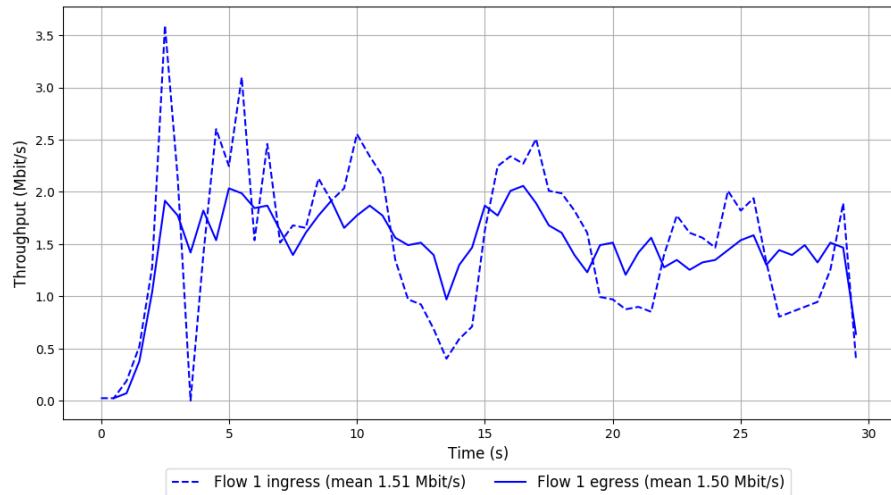


Run 3: Statistics of Verus

```
Start at: 2018-04-16 22:30:14
End at: 2018-04-16 22:30:44
Local clock offset: -7.014 ms
Remote clock offset: 6.067 ms

# Below is generated by plot.py at 2018-04-16 22:48:33
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1829.095 ms
Loss rate: 2.74%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 1829.095 ms
Loss rate: 2.74%
```

Run 3: Report of Verus — Data Link

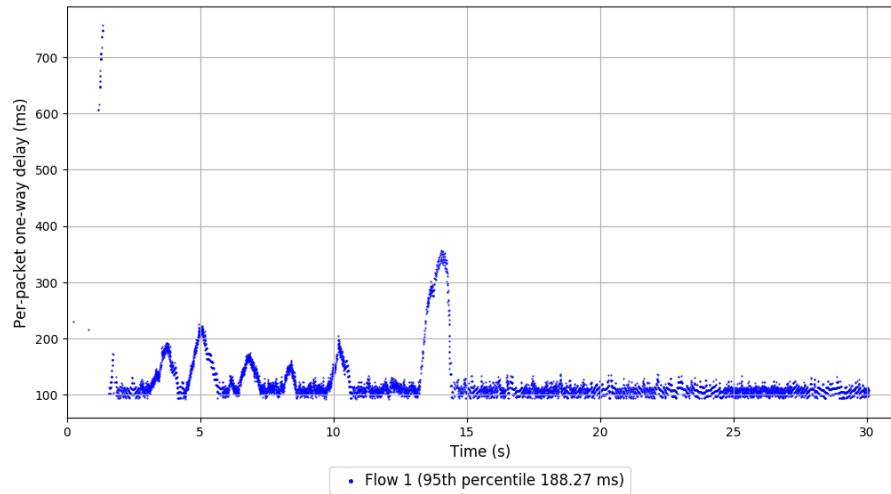
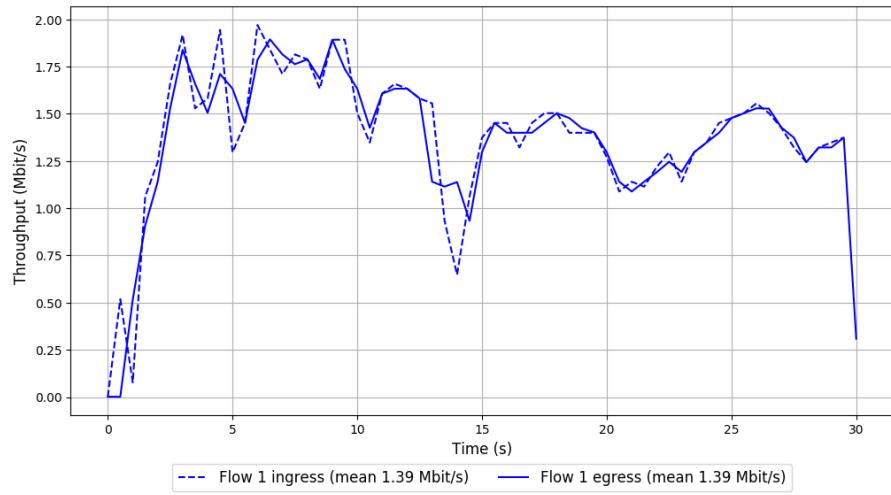


Run 1: Statistics of Copa

```
Start at: 2018-04-16 22:01:52
End at: 2018-04-16 22:02:22
Local clock offset: -8.031 ms
Remote clock offset: 6.6 ms

# Below is generated by plot.py at 2018-04-16 22:48:37
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 188.270 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 188.270 ms
Loss rate: 0.00%
```

Run 1: Report of Copa — Data Link

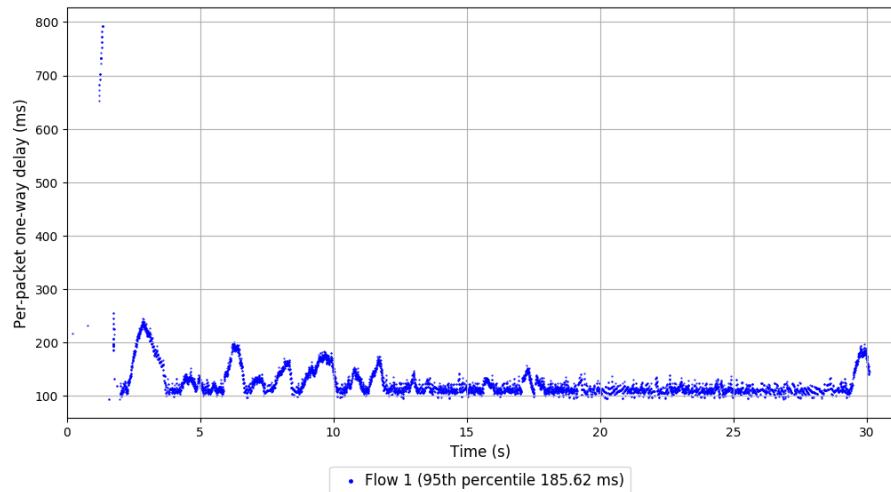
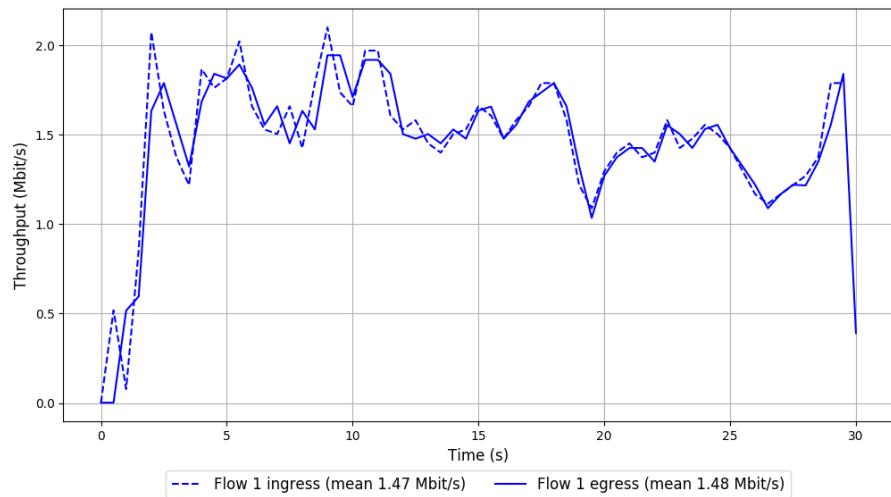


Run 2: Statistics of Copa

```
Start at: 2018-04-16 22:21:57
End at: 2018-04-16 22:22:27
Local clock offset: -6.742 ms
Remote clock offset: 10.791 ms

# Below is generated by plot.py at 2018-04-16 22:48:38
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 185.623 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 185.623 ms
Loss rate: 0.14%
```

Run 2: Report of Copa — Data Link

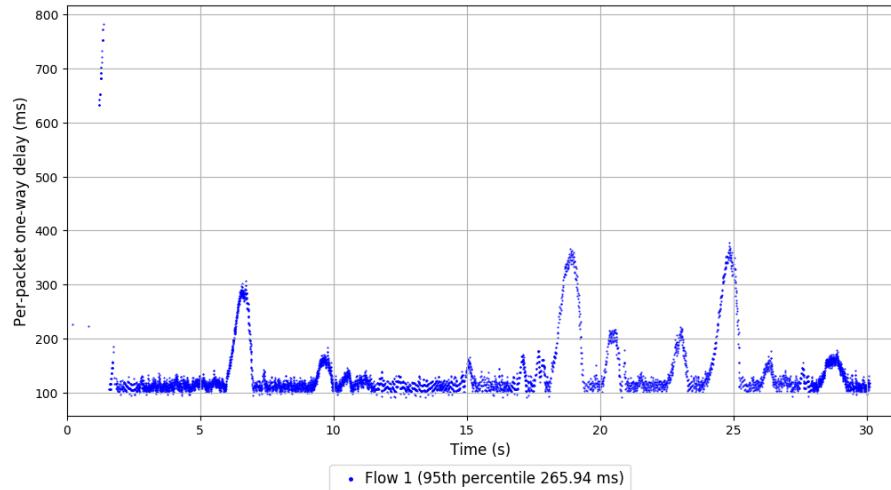
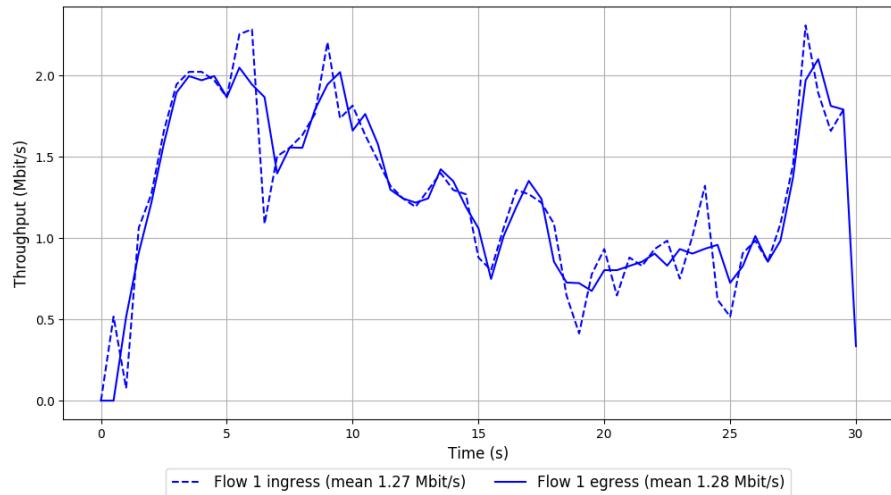


Run 3: Statistics of Copa

```
Start at: 2018-04-16 22:42:04
End at: 2018-04-16 22:42:34
Local clock offset: -4.888 ms
Remote clock offset: 12.628 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 265.943 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 1.28 Mbit/s
95th percentile per-packet one-way delay: 265.943 ms
Loss rate: 0.03%
```

Run 3: Report of Copa — Data Link

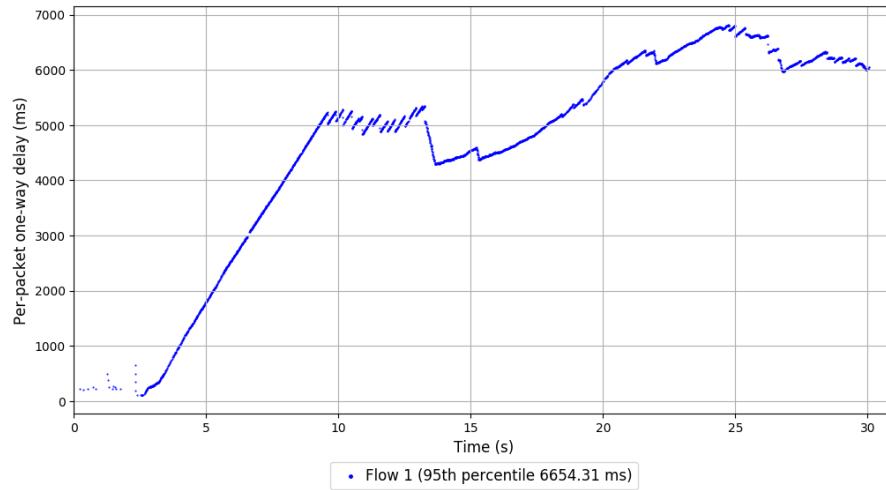
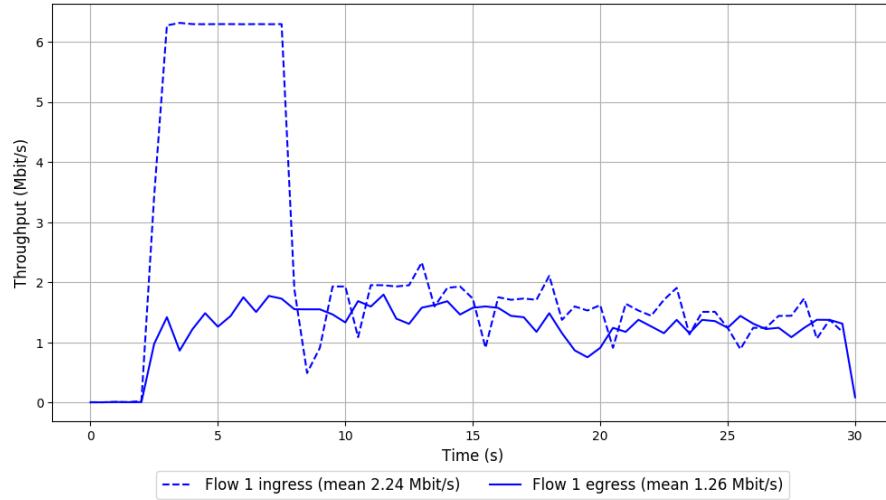


```
Run 1: Statistics of FillP

Start at: 2018-04-16 22:00:40
End at: 2018-04-16 22:01:10
Local clock offset: -8.153 ms
Remote clock offset: 11.396 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 6654.310 ms
Loss rate: 43.77%
-- Flow 1:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 6654.310 ms
Loss rate: 43.77%
```

Run 1: Report of FillP — Data Link

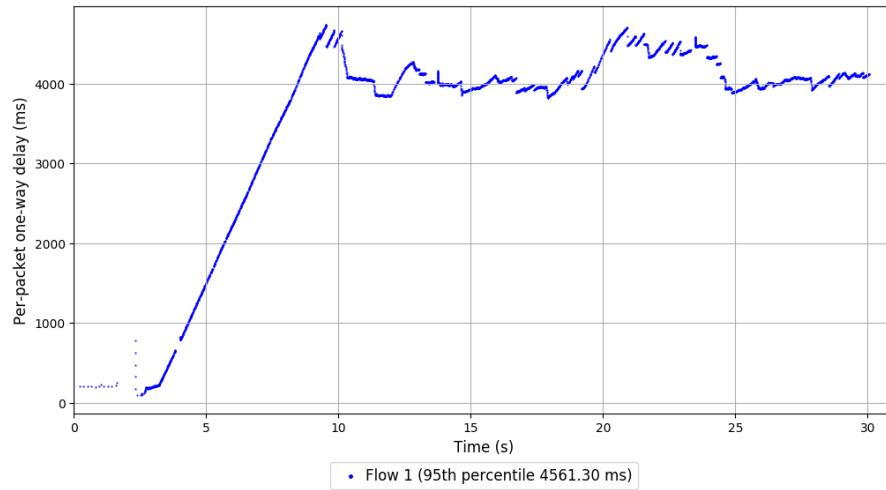
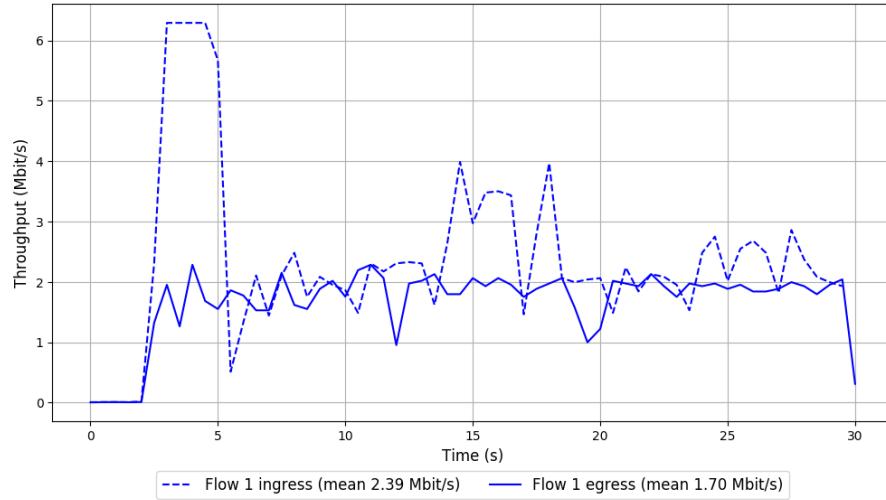


Run 2: Statistics of FillP

```
Start at: 2018-04-16 22:20:46
End at: 2018-04-16 22:21:16
Local clock offset: -6.658 ms
Remote clock offset: 11.699 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 4561.298 ms
Loss rate: 29.07%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 4561.298 ms
Loss rate: 29.07%
```

Run 2: Report of FillP — Data Link

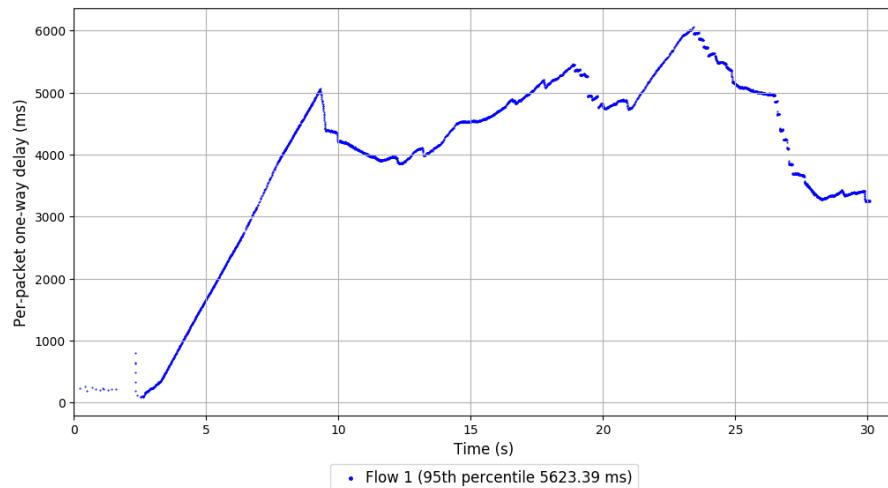
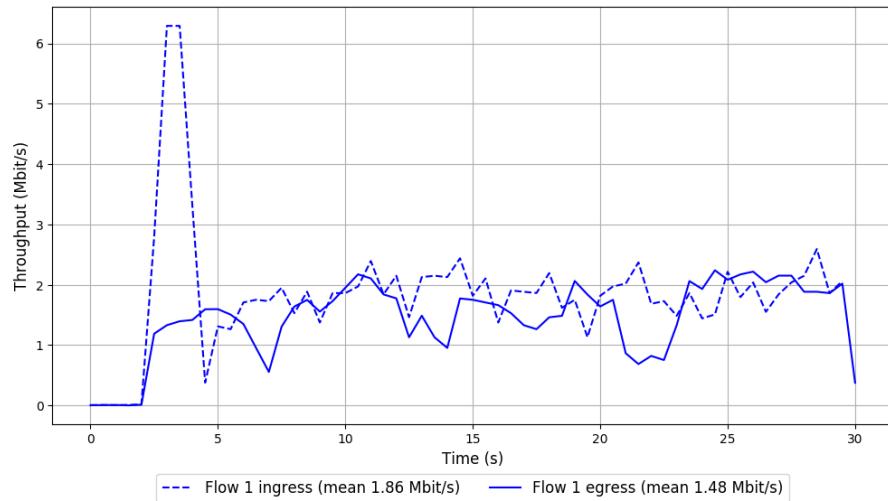


```
Run 3: Statistics of FillP
```

```
Start at: 2018-04-16 22:40:53
End at: 2018-04-16 22:41:23
Local clock offset: -6.547 ms
Remote clock offset: 6.996 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 5623.392 ms
Loss rate: 20.99%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 5623.392 ms
Loss rate: 20.99%
```

Run 3: Report of FillP — Data Link

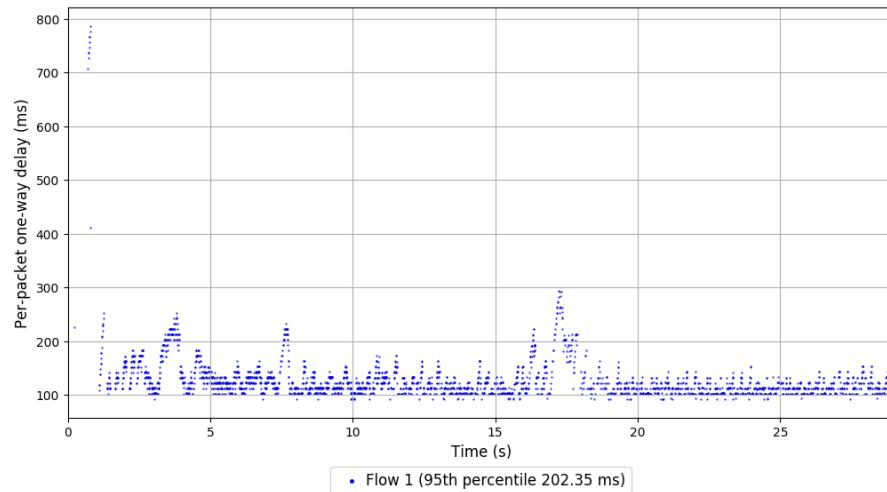
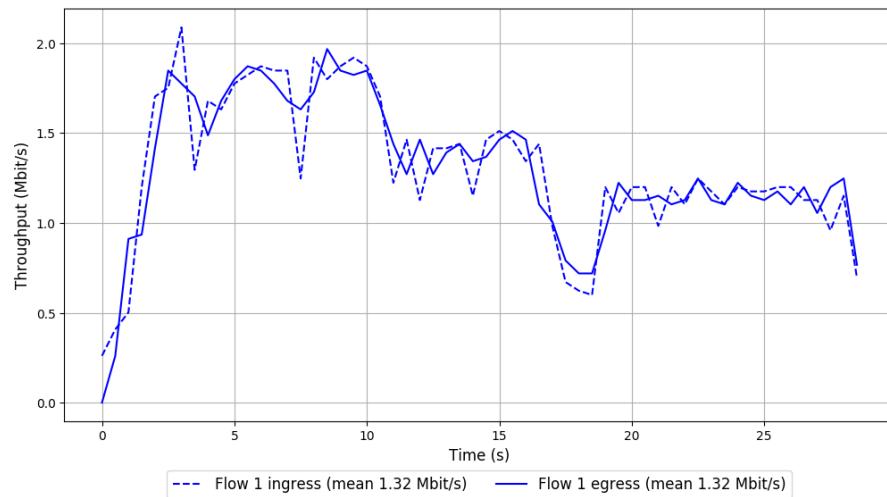


Run 1: Statistics of Indigo-1-32

```
Start at: 2018-04-16 21:53:35
End at: 2018-04-16 21:54:05
Local clock offset: -7.161 ms
Remote clock offset: 6.45 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 202.355 ms
Loss rate: 0.03%
-- Flow 1:
Average throughput: 1.32 Mbit/s
95th percentile per-packet one-way delay: 202.355 ms
Loss rate: 0.03%
```

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

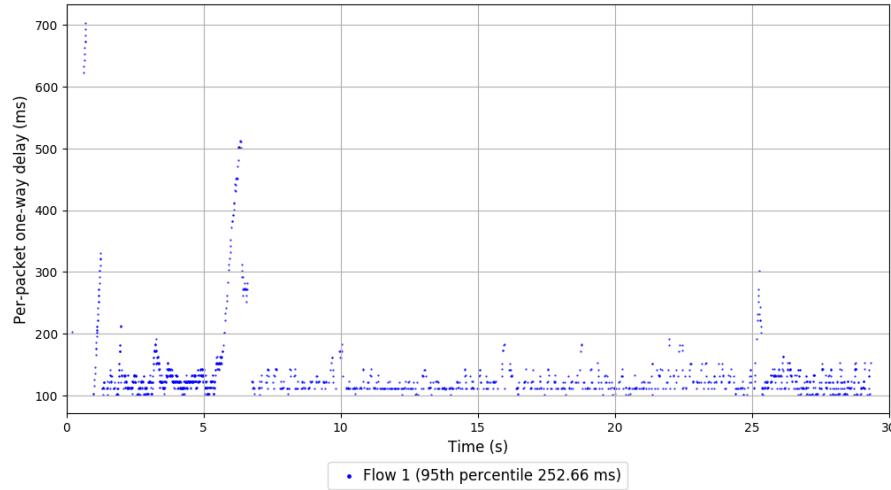
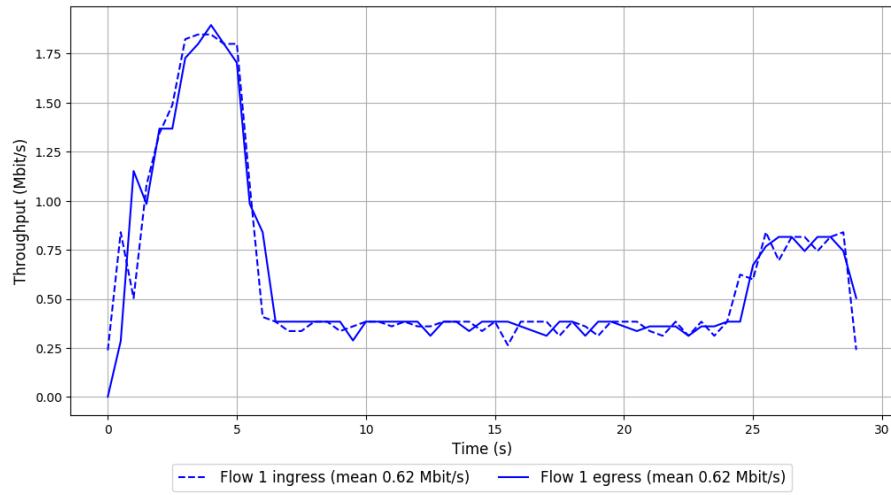


Run 2: Statistics of Indigo-1-32

```
Start at: 2018-04-16 22:13:41
End at: 2018-04-16 22:14:11
Local clock offset: -7.359 ms
Remote clock offset: 6.786 ms

# Below is generated by plot.py at 2018-04-16 22:48:39
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 252.664 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.62 Mbit/s
95th percentile per-packet one-way delay: 252.664 ms
Loss rate: 0.00%
```

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

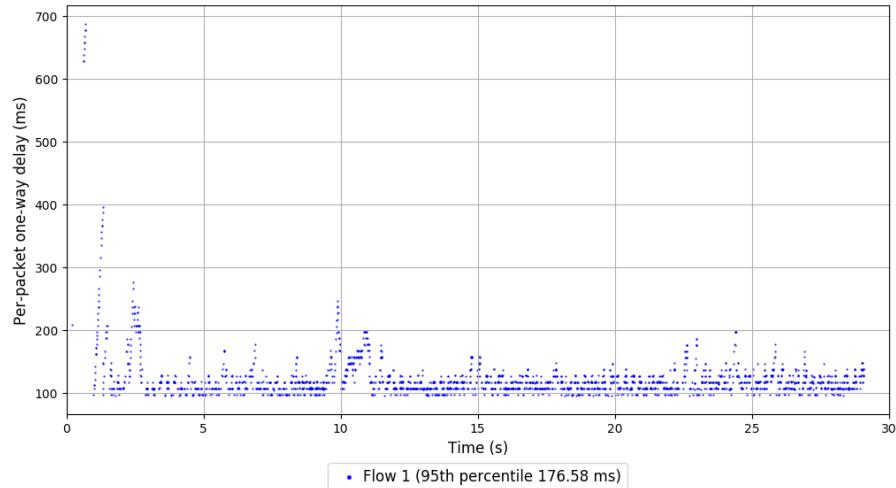
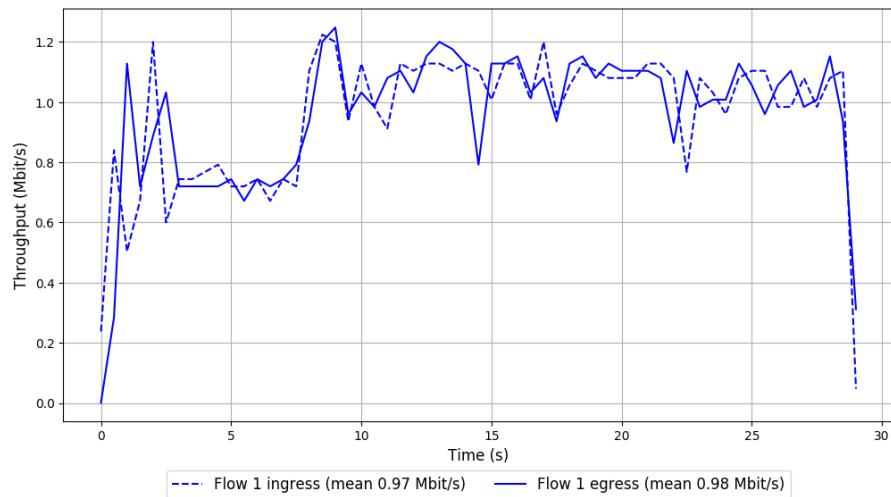


Run 3: Statistics of Indigo-1-32

```
Start at: 2018-04-16 22:33:47
End at: 2018-04-16 22:34:18
Local clock offset: -7.05 ms
Remote clock offset: 6.148 ms

# Below is generated by plot.py at 2018-04-16 22:48:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 176.576 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 176.576 ms
Loss rate: 0.09%
```

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

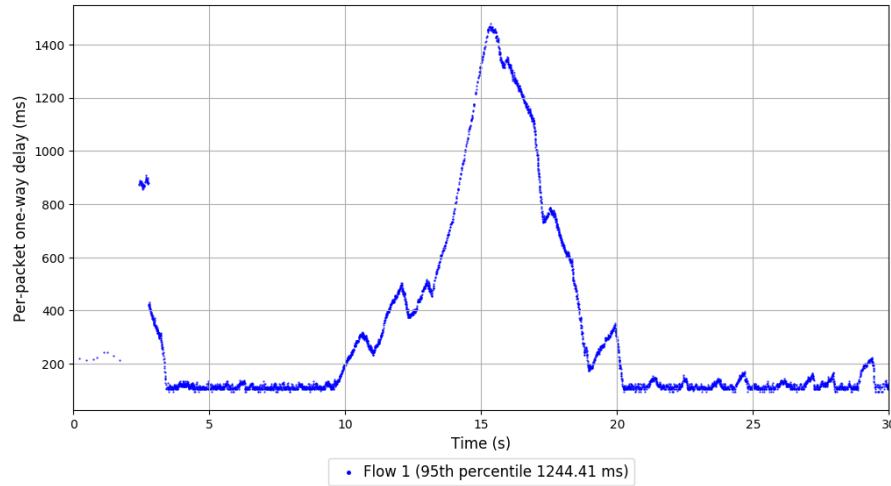
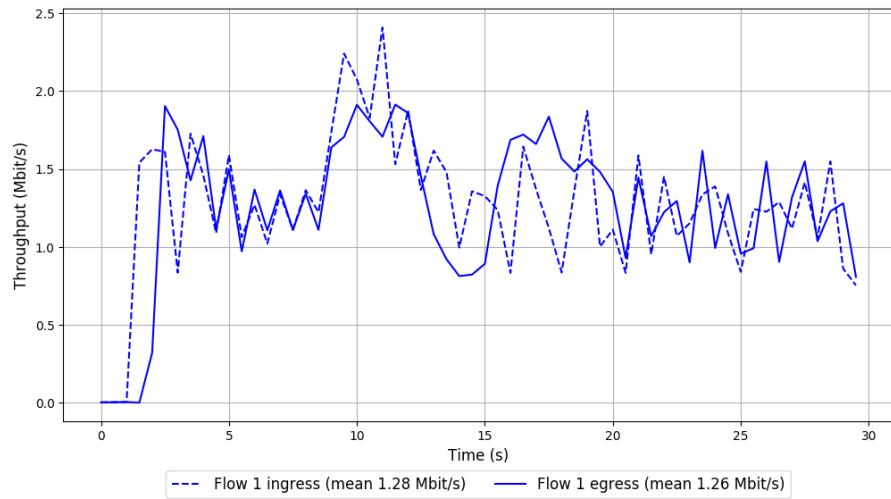


```
Run 1: Statistics of PCC-Vivace
```

```
Start at: 2018-04-16 21:48:50
End at: 2018-04-16 21:49:20
Local clock offset: -7.901 ms
Remote clock offset: 5.657 ms

# Below is generated by plot.py at 2018-04-16 22:48:41
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 1244.412 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 1.26 Mbit/s
95th percentile per-packet one-way delay: 1244.412 ms
Loss rate: 1.97%
```

Run 1: Report of PCC-Vivace — Data Link

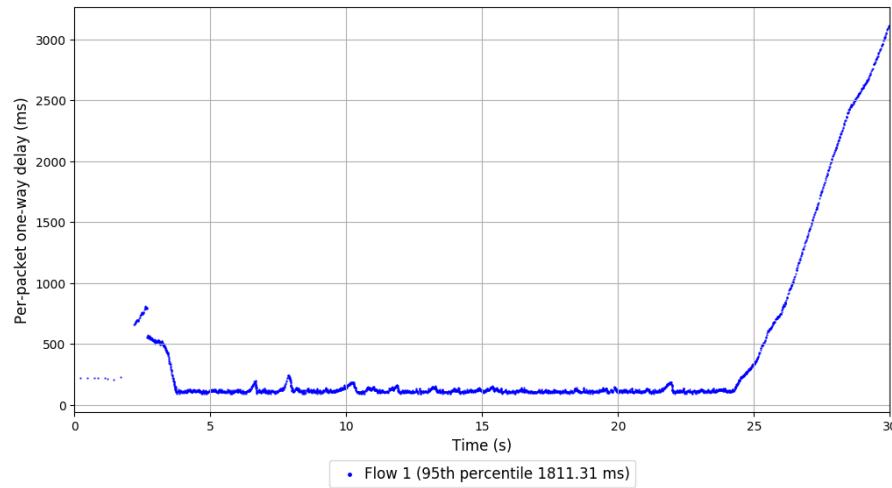
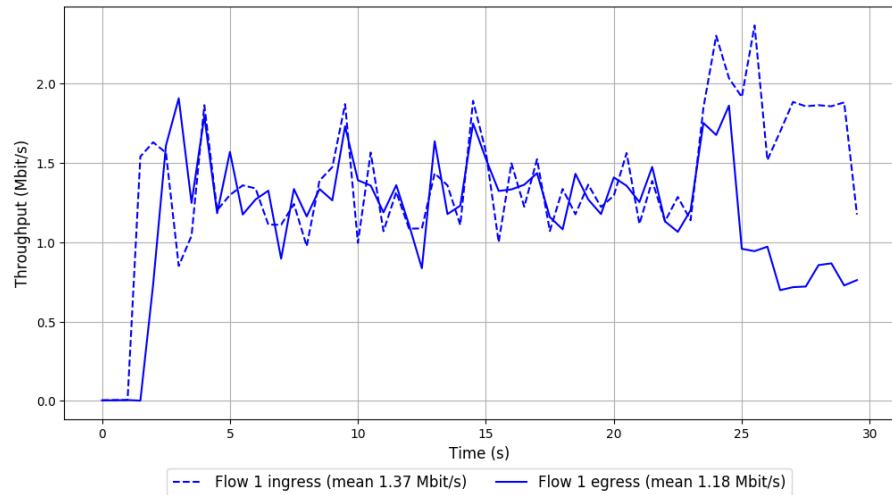


Run 2: Statistics of PCC-Vivace

```
Start at: 2018-04-16 22:08:57
End at: 2018-04-16 22:09:27
Local clock offset: -5.917 ms
Remote clock offset: 6.775 ms

# Below is generated by plot.py at 2018-04-16 22:48:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 1811.308 ms
Loss rate: 14.39%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 1811.308 ms
Loss rate: 14.39%
```

Run 2: Report of PCC-Vivace — Data Link

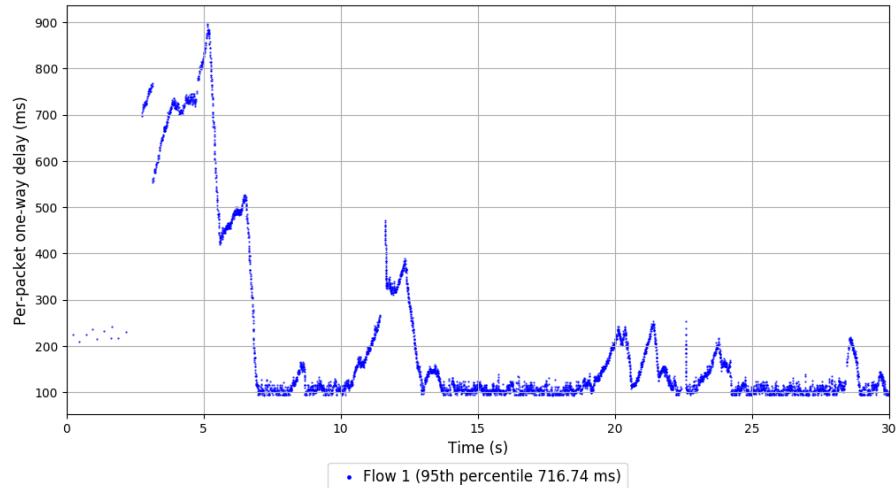
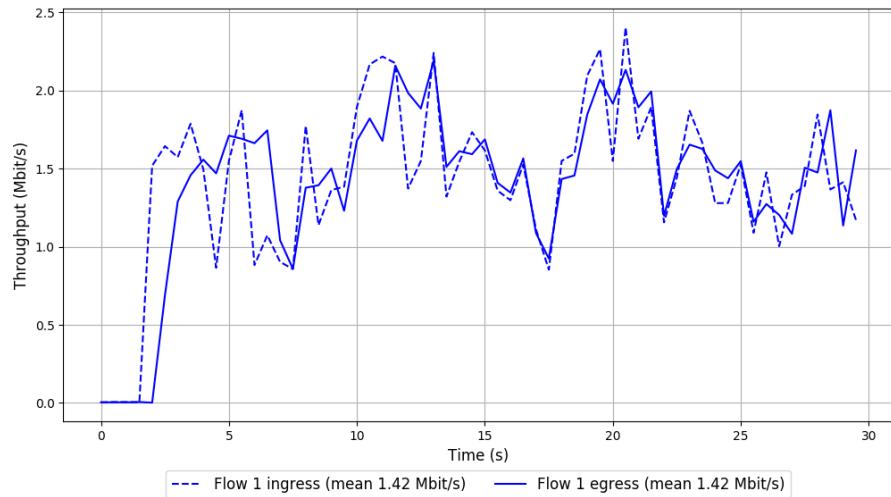


Run 3: Statistics of PCC-Vivace

```
Start at: 2018-04-16 22:29:03
End at: 2018-04-16 22:29:33
Local clock offset: -6.905 ms
Remote clock offset: 6.901 ms

# Below is generated by plot.py at 2018-04-16 22:48:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 716.737 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 1.42 Mbit/s
95th percentile per-packet one-way delay: 716.737 ms
Loss rate: 0.80%
```

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2018-04-16 21:47:40

End at: 2018-04-16 21:48:10

Local clock offset: -7.879 ms

Remote clock offset: 12.096 ms

Run 1: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 2: Statistics of PCC-Expr

Start at: 2018-04-16 22:07:47

End at: 2018-04-16 22:08:17

Local clock offset: -6.732 ms

Remote clock offset: 5.829 ms

Run 2: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of PCC-Expr

Start at: 2018-04-16 22:27:52

End at: 2018-04-16 22:28:22

Local clock offset: -6.846 ms

Remote clock offset: 12.567 ms

Run 3: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing