

Pantheon Report

Generated at 2019-01-03 04:16:17 (UTC).
Data path: India cellular on ppp0 (*remote*) → AWS India 1 on ens5 (*local*).
Repeated the test of 19 congestion control schemes 3 times.
Each test lasted for 30 seconds running 1 flow.
NTP offsets were measured against nets.org.sg and have been applied to correct the timestamps in logs.

System info:

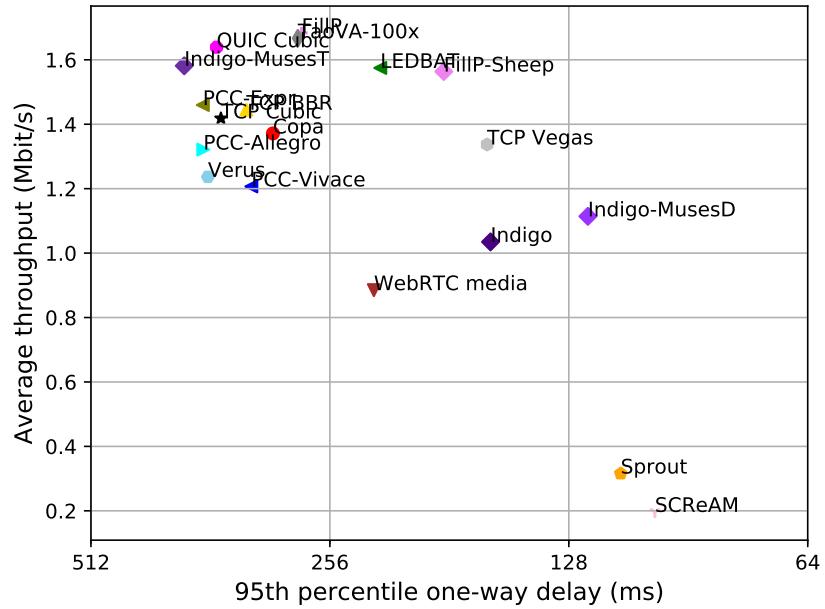
```
Linux 4.15.0-1029-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

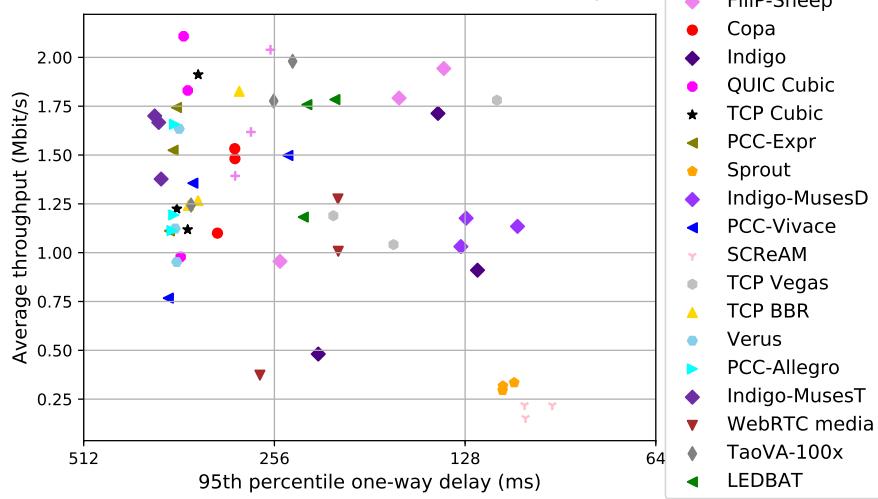
```
branch: muses @ c654af0b7d59d4ef4b914cfac404e1fc2e96dc68
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fc45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ 65ac1b19bbfed0c6349ae986009b4fa8643c40a
third_party/muses-refactored @ 31f8f0ba8ef8b1da76c2bc0cd0a7850c33ff64fb
third_party/pantheon-tunnel @ f866d3f58d27af942717625ee3a354cc2e802bd
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-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
M src/examples/cellsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
```

third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851

test from India cellular to AWS India 1, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from India cellular to AWS India 1, 3 runs of 30s each per scheme



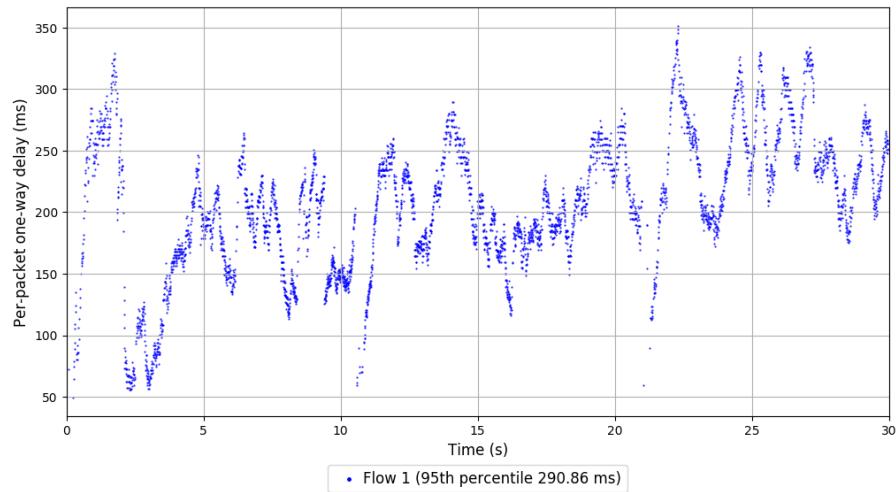
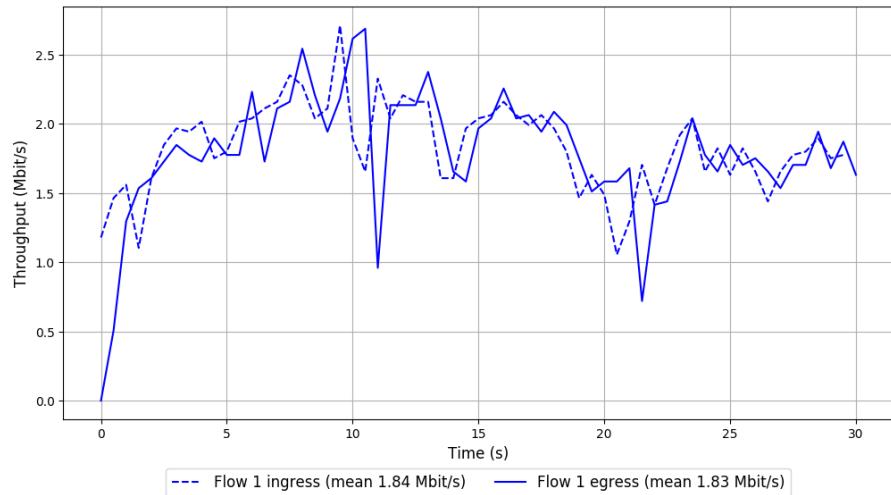
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	1.45	326.18	1.57
Copa	3	1.37	302.01	0.67
TCP Cubic	3	1.42	351.18	3.24
FillP	3	1.68	277.89	1.22
FillP-Sheep	3	1.56	183.96	1.04
Indigo	3	1.03	160.64	1.41
Indigo-MusesD	3	1.11	121.10	0.86
Indigo-MusesT	3	1.58	390.57	66.88
LEDBAT	3	1.57	221.18	0.62
PCC-Allegro	3	1.32	369.54	55.37
PCC-Expr	3	1.46	370.14	82.69
QUIC Cubic	3	1.64	355.61	6.76
SCReAM	3	0.20	99.72	0.25
Sprout	3	0.32	110.11	0.21
TaoVA-100x	3	1.67	280.95	5.27
TCP Vegas	3	1.34	162.24	0.32
Verus	3	1.23	364.70	18.18
PCC-Vivace	3	1.21	321.52	15.67
WebRTC media	3	0.88	225.33	0.72

Run 1: Statistics of TCP BBR

```
Start at: 2019-01-03 03:23:35
End at: 2019-01-03 03:24:05
Local clock offset: 0.05 ms
Remote clock offset: -1.954 ms

# Below is generated by plot.py at 2019-01-03 04:15:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 290.862 ms
Loss rate: 0.91%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 290.862 ms
Loss rate: 0.91%
```

Run 1: Report of TCP BBR — Data Link

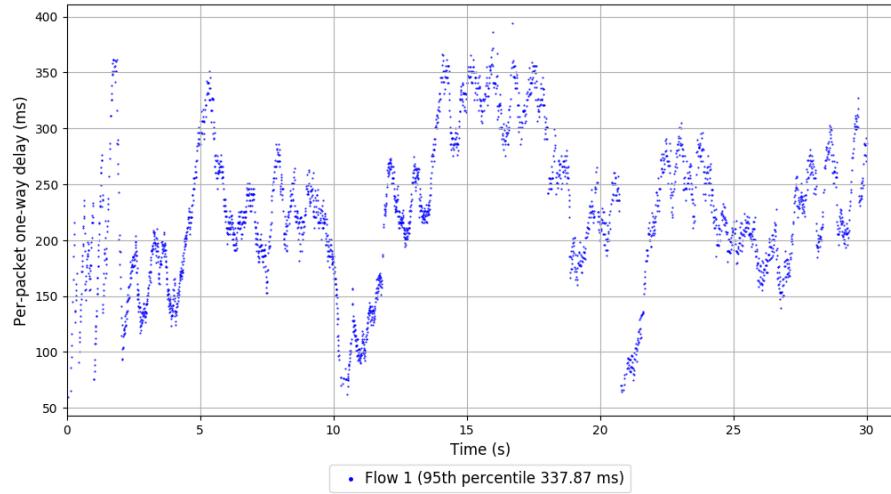
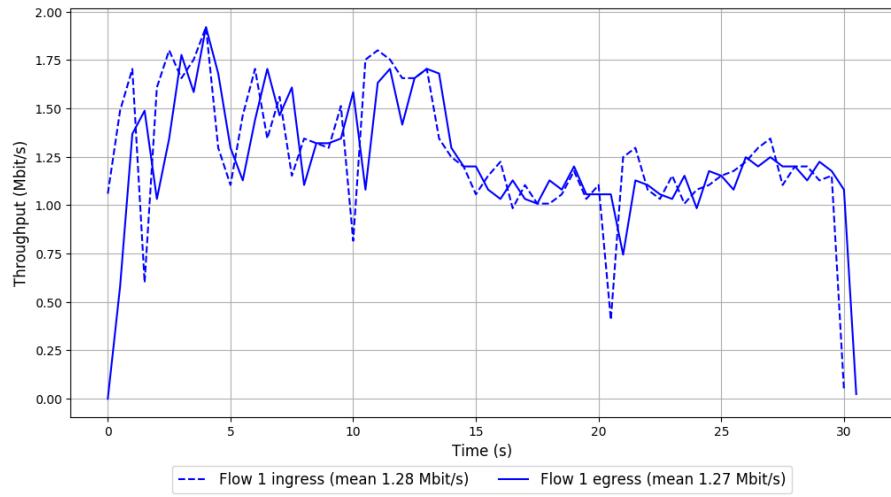


Run 2: Statistics of TCP BBR

```
Start at: 2019-01-03 03:44:48
End at: 2019-01-03 03:45:18
Local clock offset: 2.032 ms
Remote clock offset: -4.295 ms

# Below is generated by plot.py at 2019-01-03 04:15:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 337.874 ms
Loss rate: 1.43%
-- Flow 1:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 337.874 ms
Loss rate: 1.43%
```

Run 2: Report of TCP BBR — Data Link

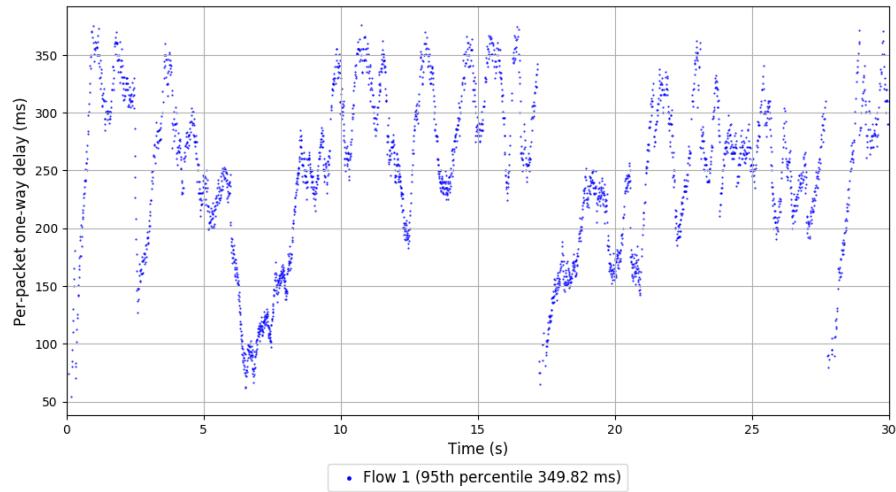
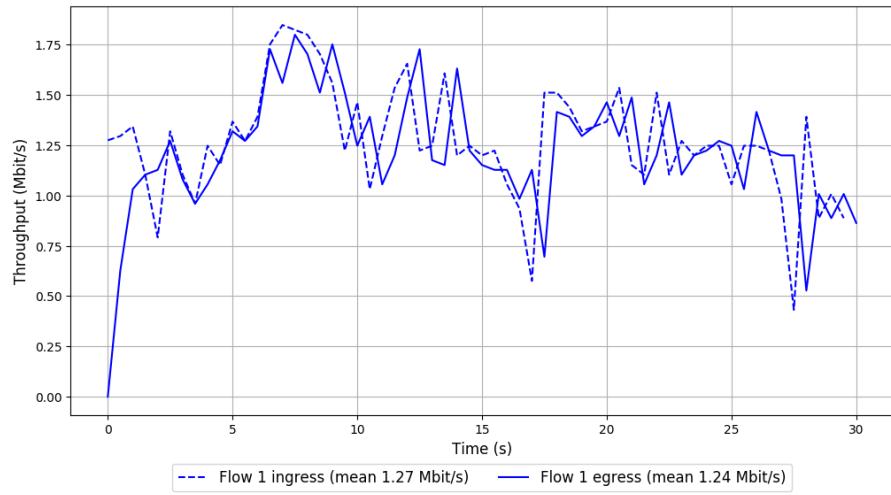


Run 3: Statistics of TCP BBR

```
Start at: 2019-01-03 04:06:05
End at: 2019-01-03 04:06:35
Local clock offset: 2.178 ms
Remote clock offset: -6.952 ms

# Below is generated by plot.py at 2019-01-03 04:15:40
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 349.816 ms
Loss rate: 2.37%
-- Flow 1:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 349.816 ms
Loss rate: 2.37%
```

Run 3: Report of TCP BBR — Data Link

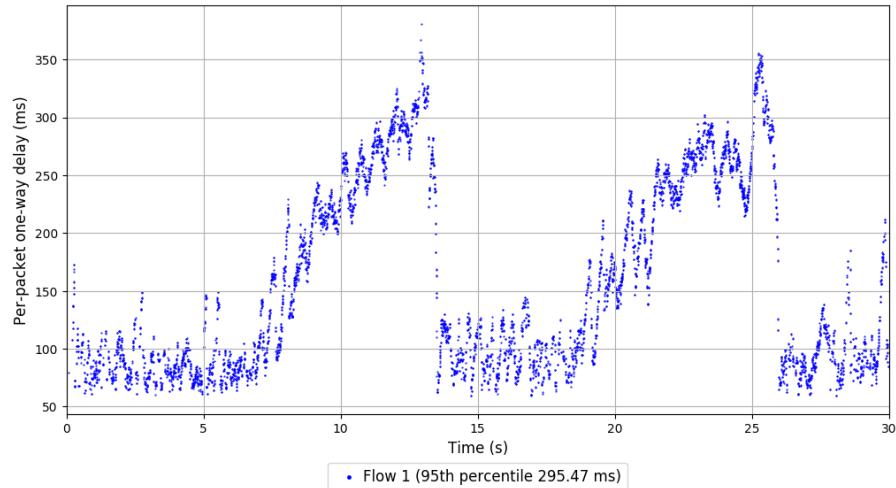
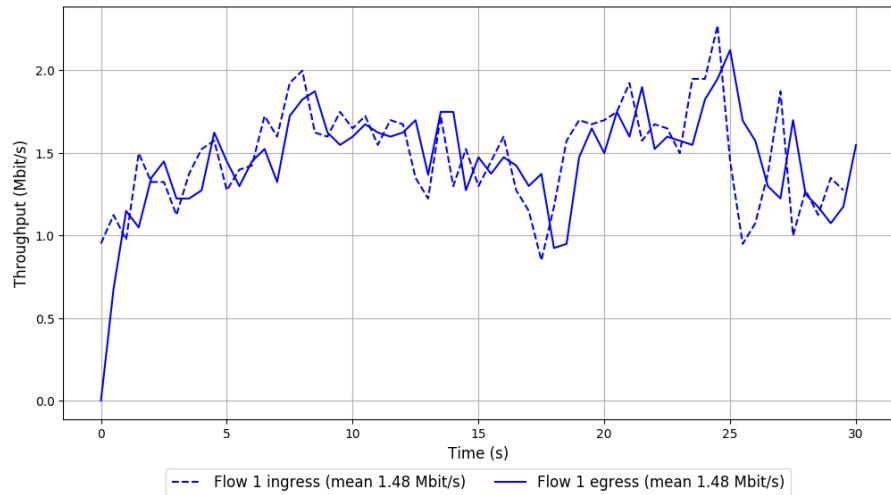


Run 1: Statistics of Copa

```
Start at: 2019-01-03 03:25:54
End at: 2019-01-03 03:26:24
Local clock offset: 3.431 ms
Remote clock offset: -2.059 ms

# Below is generated by plot.py at 2019-01-03 04:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 295.471 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 1.48 Mbit/s
95th percentile per-packet one-way delay: 295.471 ms
Loss rate: 0.35%
```

Run 1: Report of Copa — Data Link

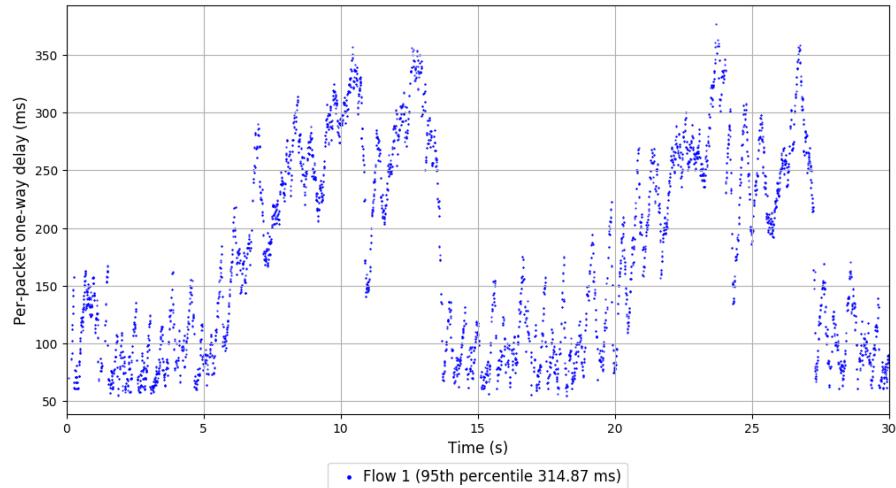
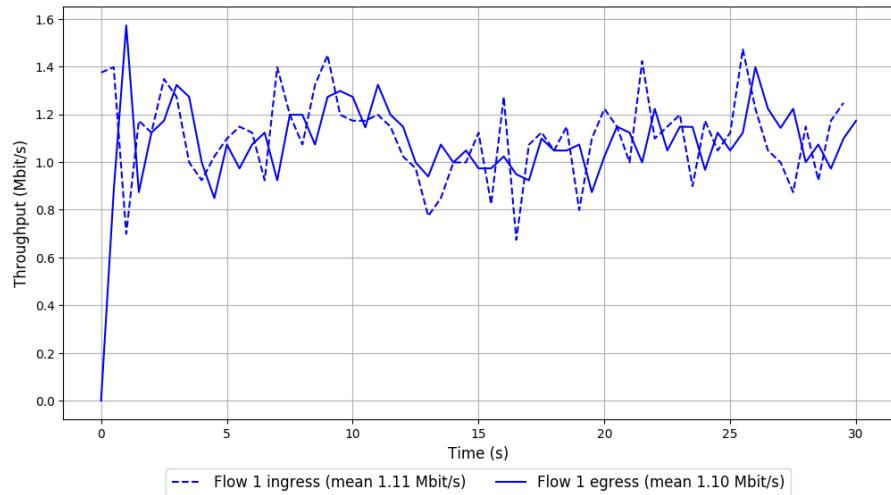


Run 2: Statistics of Copa

```
Start at: 2019-01-03 03:47:10
End at: 2019-01-03 03:47:40
Local clock offset: -1.123 ms
Remote clock offset: -3.305 ms

# Below is generated by plot.py at 2019-01-03 04:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 314.872 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 1.10 Mbit/s
95th percentile per-packet one-way delay: 314.872 ms
Loss rate: 0.79%
```

Run 2: Report of Copa — Data Link

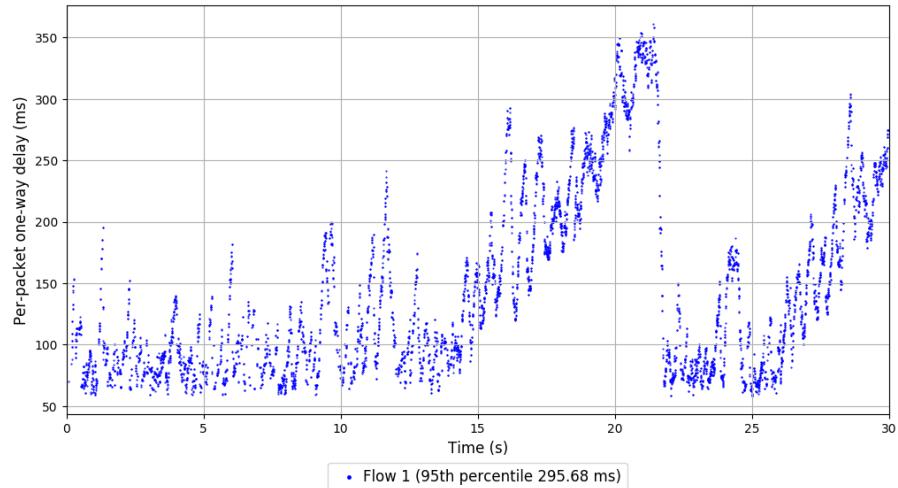
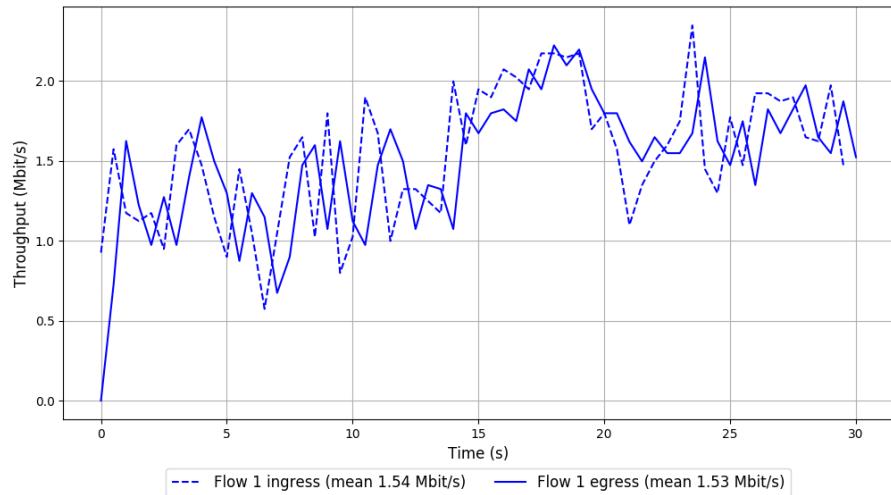


Run 3: Statistics of Copa

```
Start at: 2019-01-03 04:08:22
End at: 2019-01-03 04:08:52
Local clock offset: 1.273 ms
Remote clock offset: -5.535 ms

# Below is generated by plot.py at 2019-01-03 04:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 295.683 ms
Loss rate: 0.87%
-- Flow 1:
Average throughput: 1.53 Mbit/s
95th percentile per-packet one-way delay: 295.683 ms
Loss rate: 0.87%
```

Run 3: Report of Copa — Data Link

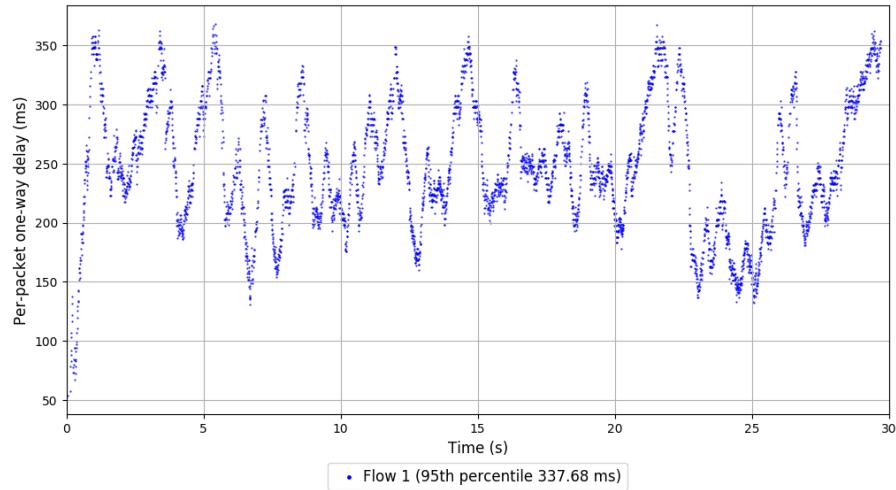
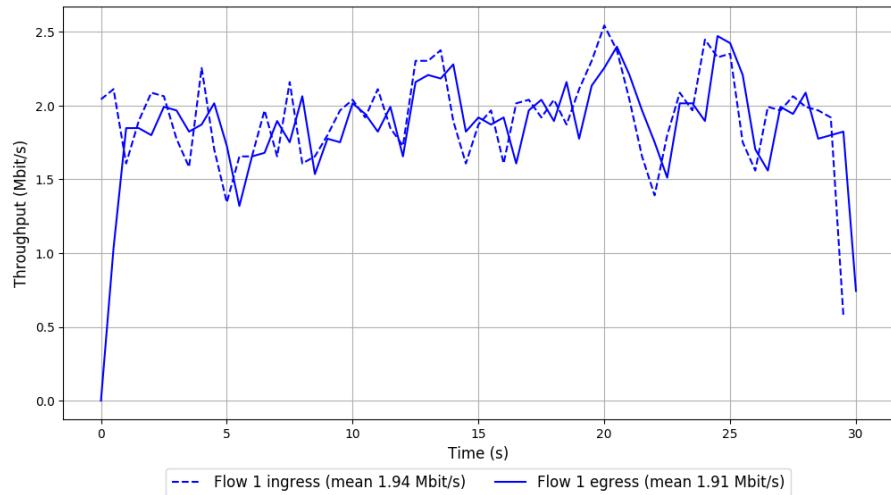


```
Run 1: Statistics of TCP Cubic
```

```
Start at: 2019-01-03 03:30:20
End at: 2019-01-03 03:30:50
Local clock offset: 1.122 ms
Remote clock offset: -2.351 ms

# Below is generated by plot.py at 2019-01-03 04:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 337.683 ms
Loss rate: 1.71%
-- Flow 1:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 337.683 ms
Loss rate: 1.71%
```

Run 1: Report of TCP Cubic — Data Link

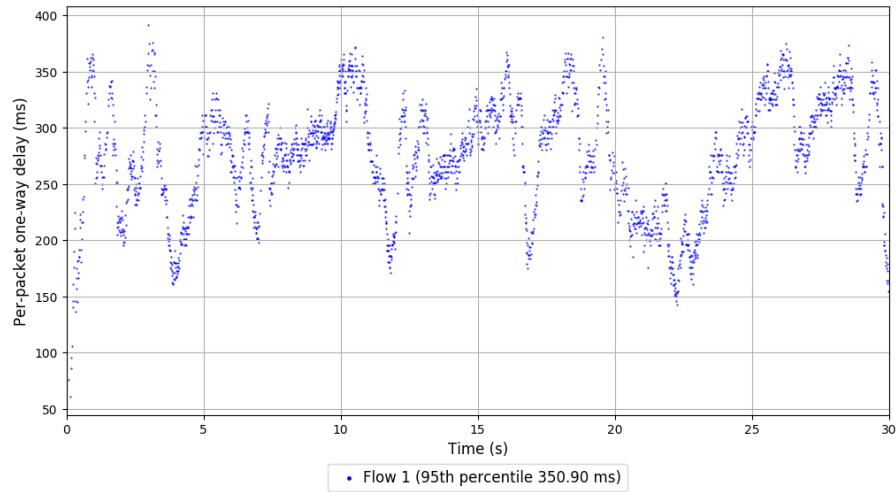
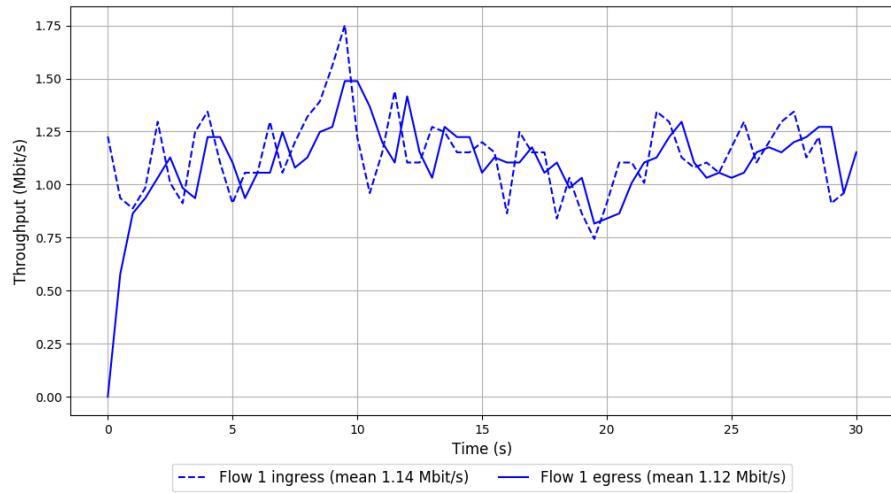


Run 2: Statistics of TCP Cubic

```
Start at: 2019-01-03 03:51:36
End at: 2019-01-03 03:52:06
Local clock offset: 0.892 ms
Remote clock offset: -5.528 ms

# Below is generated by plot.py at 2019-01-03 04:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 350.900 ms
Loss rate: 2.21%
-- Flow 1:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 350.900 ms
Loss rate: 2.21%
```

Run 2: Report of TCP Cubic — Data Link

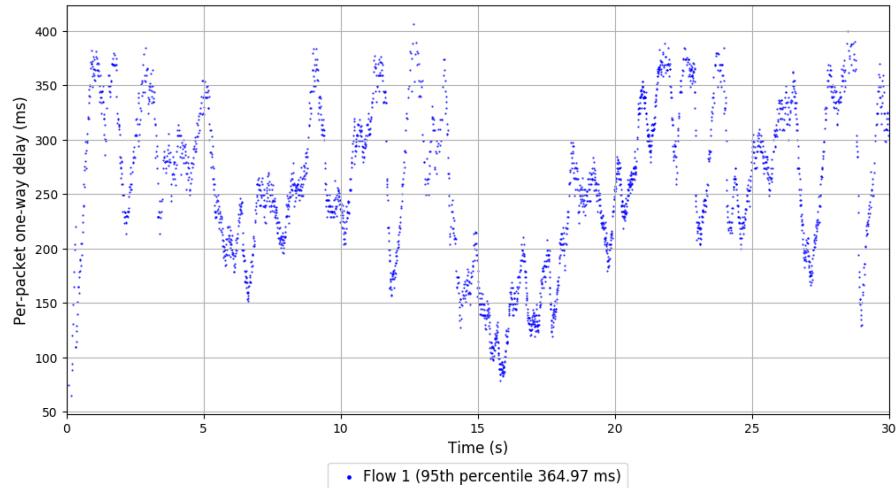
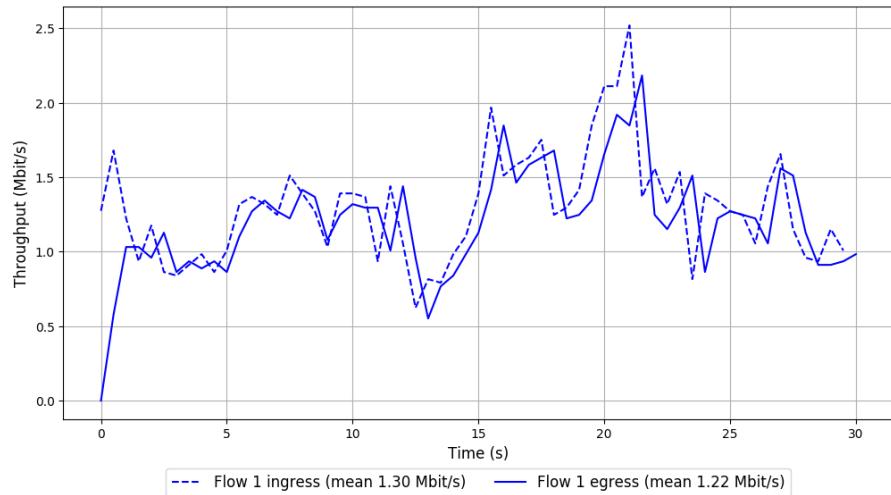


Run 3: Statistics of TCP Cubic

```
Start at: 2019-01-03 04:12:47
End at: 2019-01-03 04:13:17
Local clock offset: 3.633 ms
Remote clock offset: -6.494 ms

# Below is generated by plot.py at 2019-01-03 04:15:42
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 364.969 ms
Loss rate: 5.80%
-- Flow 1:
Average throughput: 1.22 Mbit/s
95th percentile per-packet one-way delay: 364.969 ms
Loss rate: 5.80%
```

Run 3: Report of TCP Cubic — Data Link

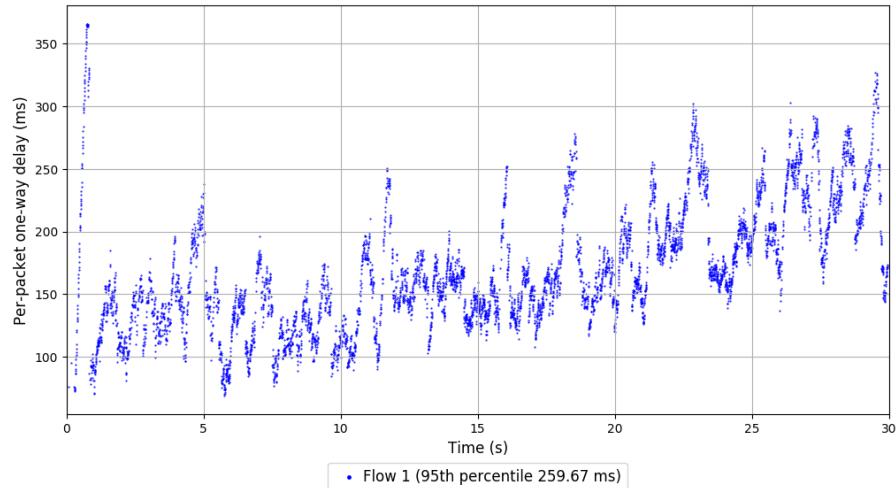
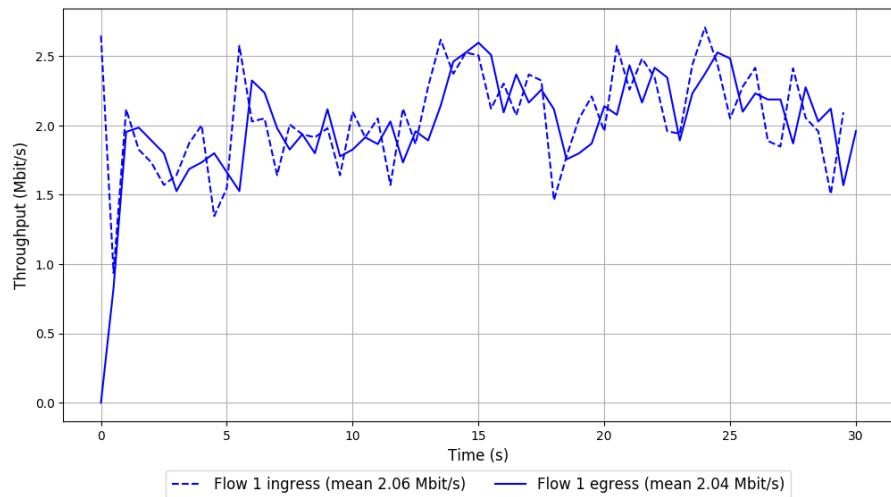


```
Run 1: Statistics of FillP

Start at: 2019-01-03 03:16:54
End at: 2019-01-03 03:17:24
Local clock offset: 2.753 ms
Remote clock offset: -1.079 ms

# Below is generated by plot.py at 2019-01-03 04:15:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 259.671 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 259.671 ms
Loss rate: 1.09%
```

Run 1: Report of FillP — Data Link

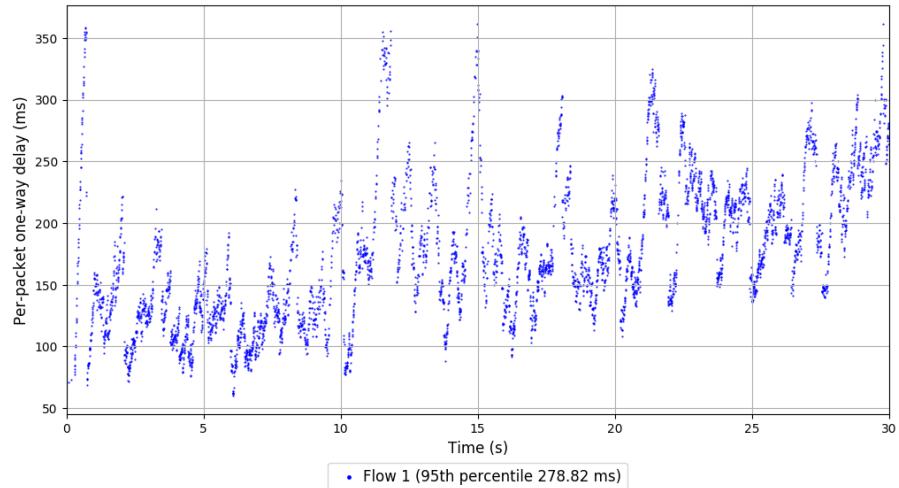
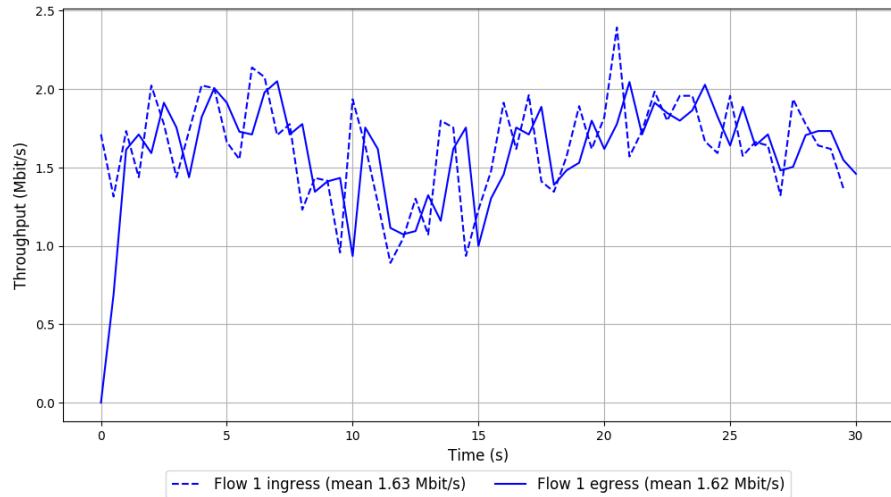


Run 2: Statistics of FillP

```
Start at: 2019-01-03 03:38:05
End at: 2019-01-03 03:38:35
Local clock offset: 2.562 ms
Remote clock offset: -4.572 ms

# Below is generated by plot.py at 2019-01-03 04:15:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 278.816 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 1.62 Mbit/s
95th percentile per-packet one-way delay: 278.816 ms
Loss rate: 1.00%
```

Run 2: Report of FillP — Data Link

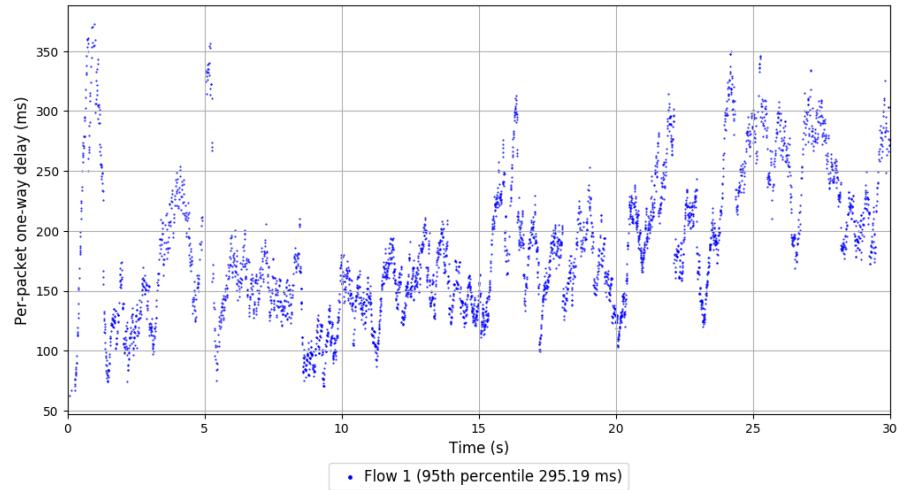
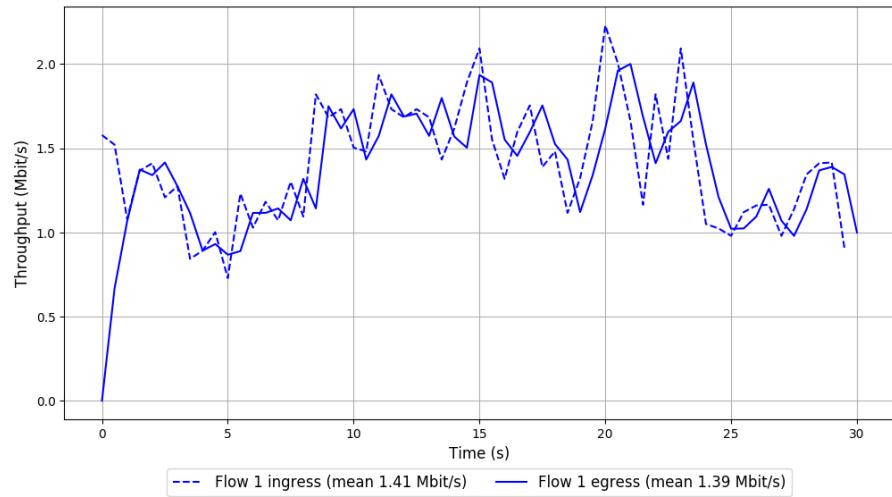


```
Run 3: Statistics of FillP
```

```
Start at: 2019-01-03 03:59:19
End at: 2019-01-03 03:59:49
Local clock offset: 2.372 ms
Remote clock offset: -5.829 ms

# Below is generated by plot.py at 2019-01-03 04:15:46
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 295.188 ms
Loss rate: 1.57%
-- Flow 1:
Average throughput: 1.39 Mbit/s
95th percentile per-packet one-way delay: 295.188 ms
Loss rate: 1.57%
```

Run 3: Report of FillP — Data Link

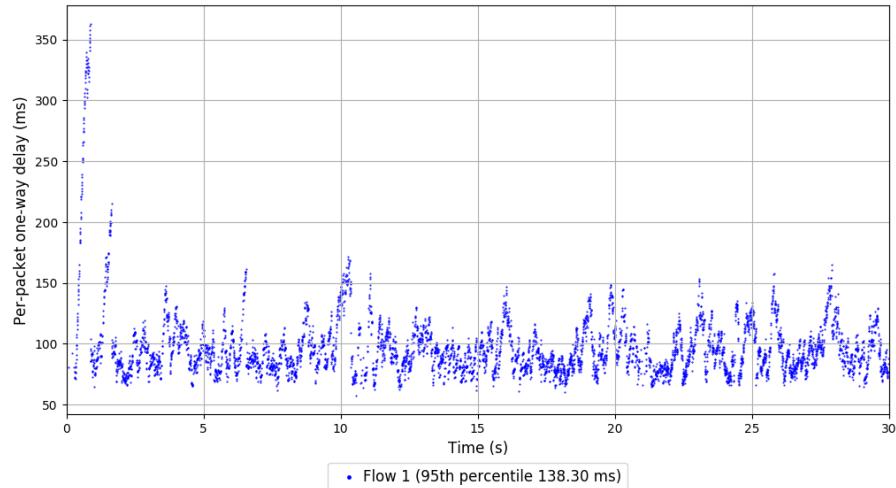
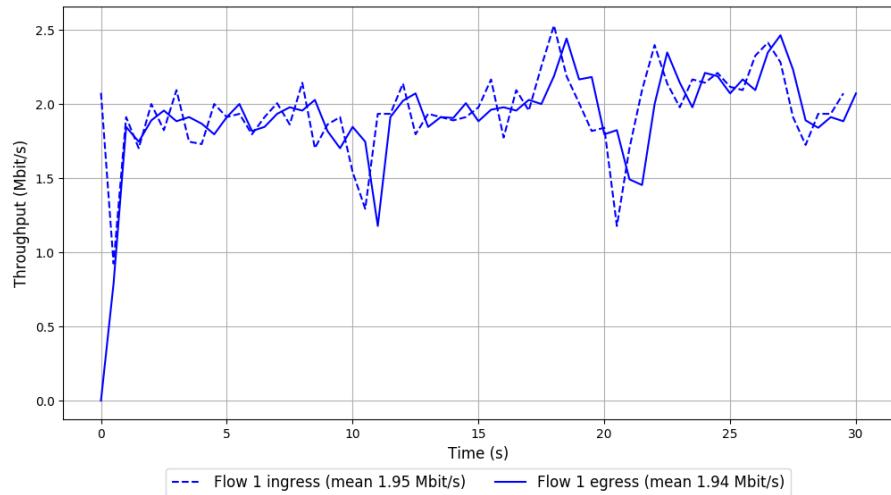


```
Run 1: Statistics of FillP-Sheep
```

```
Start at: 2019-01-03 03:13:33
End at: 2019-01-03 03:14:03
Local clock offset: -0.379 ms
Remote clock offset: -0.585 ms

# Below is generated by plot.py at 2019-01-03 04:15:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 138.304 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 138.304 ms
Loss rate: 0.37%
```

Run 1: Report of FillP-Sheep — Data Link

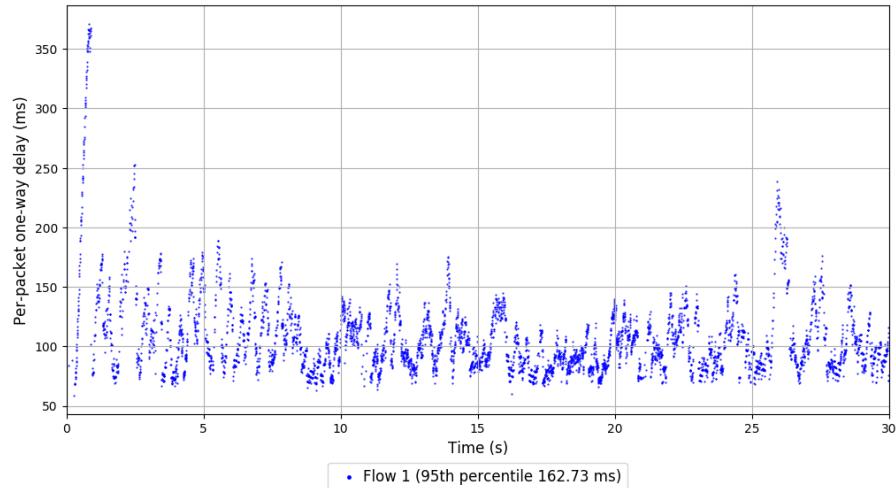
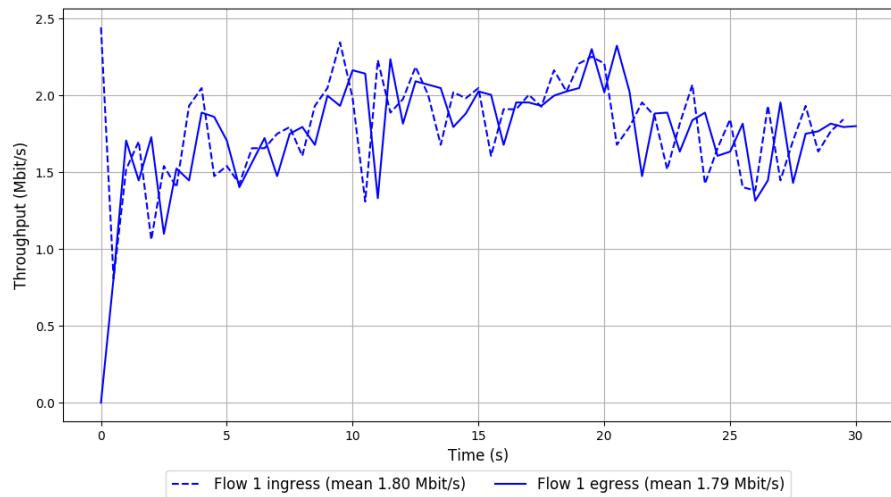


Run 2: Statistics of FillP-Sheep

```
Start at: 2019-01-03 03:34:46
End at: 2019-01-03 03:35:16
Local clock offset: 0.818 ms
Remote clock offset: -3.483 ms

# Below is generated by plot.py at 2019-01-03 04:15:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 162.733 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 1.79 Mbit/s
95th percentile per-packet one-way delay: 162.733 ms
Loss rate: 0.68%
```

Run 2: Report of FillP-Sheep — Data Link

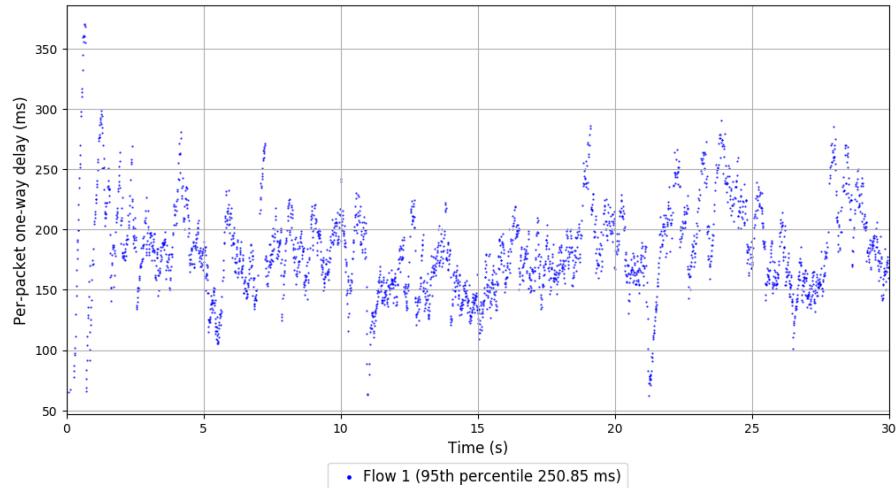
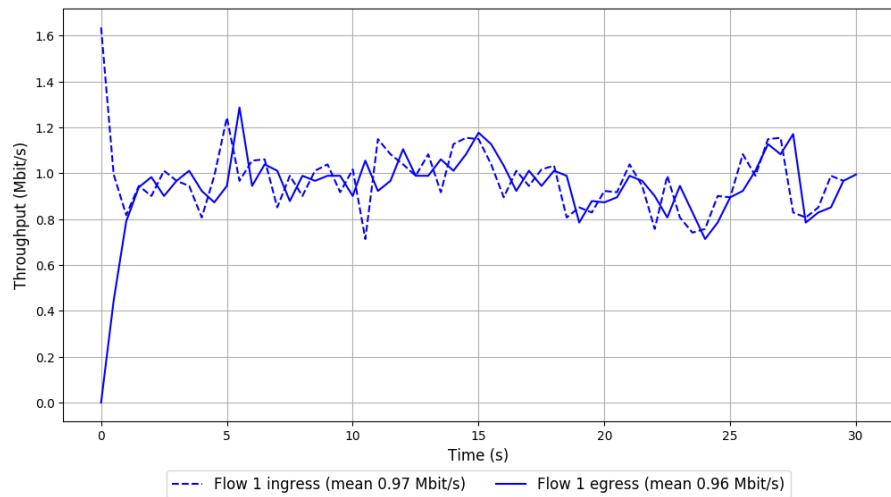


Run 3: Statistics of FillP-Sheep

```
Start at: 2019-01-03 03:56:01
End at: 2019-01-03 03:56:31
Local clock offset: -0.228 ms
Remote clock offset: -5.951 ms

# Below is generated by plot.py at 2019-01-03 04:15:47
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 250.853 ms
Loss rate: 2.07%
-- Flow 1:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 250.853 ms
Loss rate: 2.07%
```

Run 3: Report of FillP-Sheep — Data Link

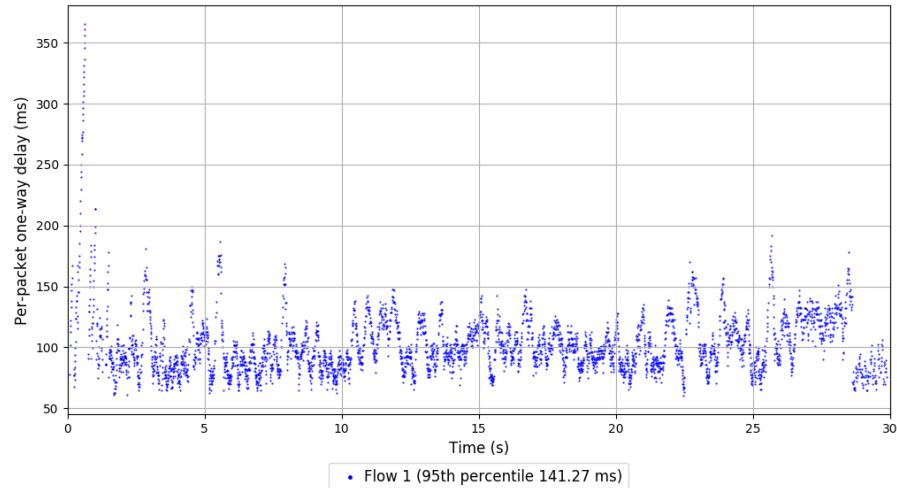
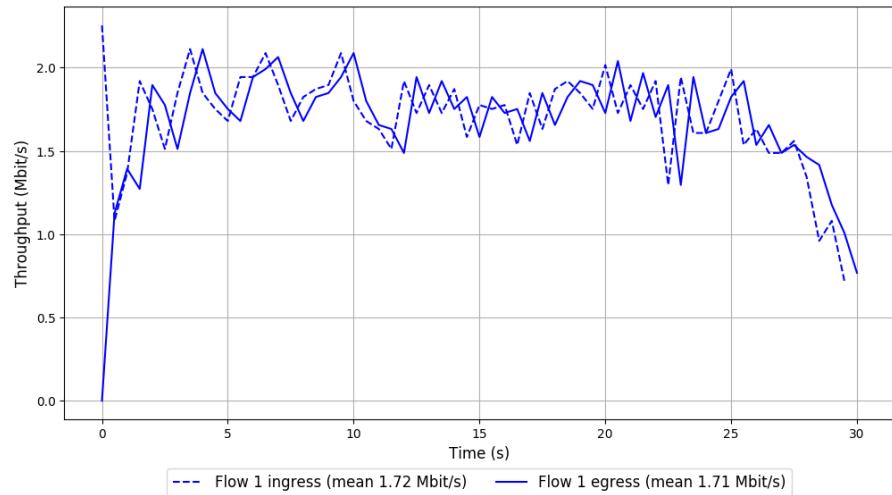


Run 1: Statistics of Indigo

```
Start at: 2019-01-03 03:29:14
End at: 2019-01-03 03:29:44
Local clock offset: 2.651 ms
Remote clock offset: -3.168 ms

# Below is generated by plot.py at 2019-01-03 04:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 141.271 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 1.71 Mbit/s
95th percentile per-packet one-way delay: 141.271 ms
Loss rate: 0.70%
```

Run 1: Report of Indigo — Data Link

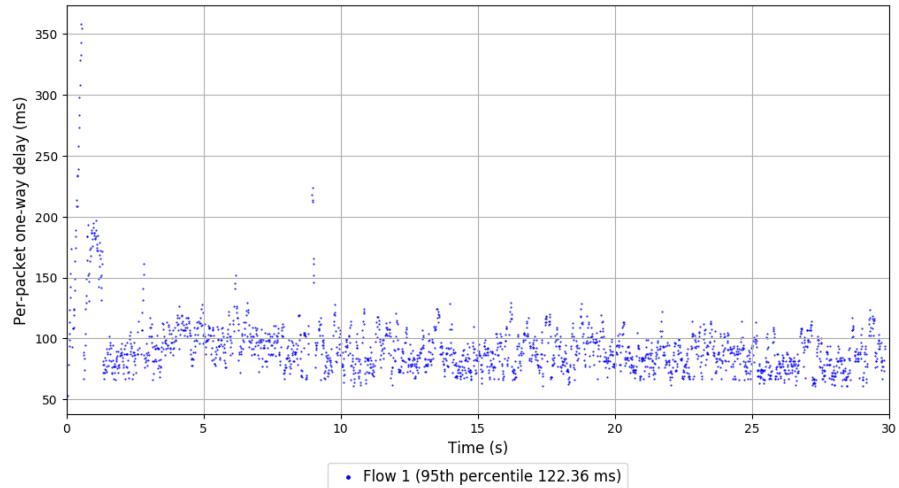
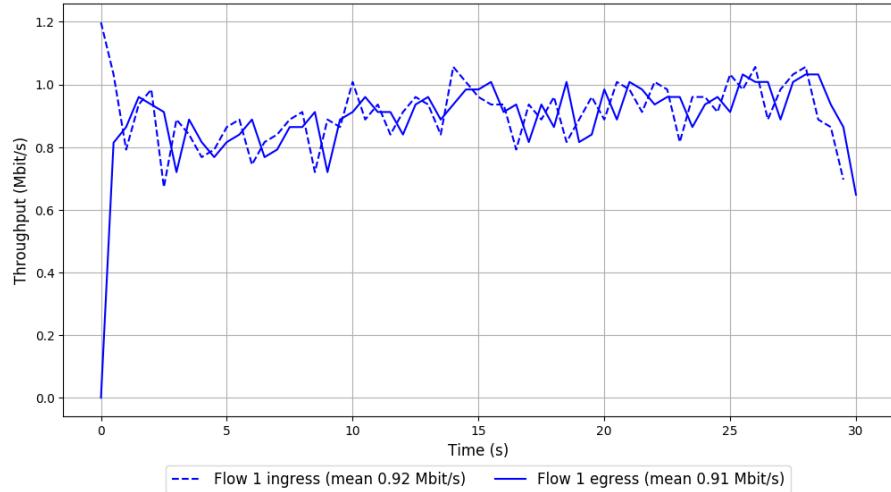


Run 2: Statistics of Indigo

```
Start at: 2019-01-03 03:50:29
End at: 2019-01-03 03:50:59
Local clock offset: 0.06 ms
Remote clock offset: -5.226 ms

# Below is generated by plot.py at 2019-01-03 04:15:48
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 122.365 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 122.365 ms
Loss rate: 0.83%
```

Run 2: Report of Indigo — Data Link

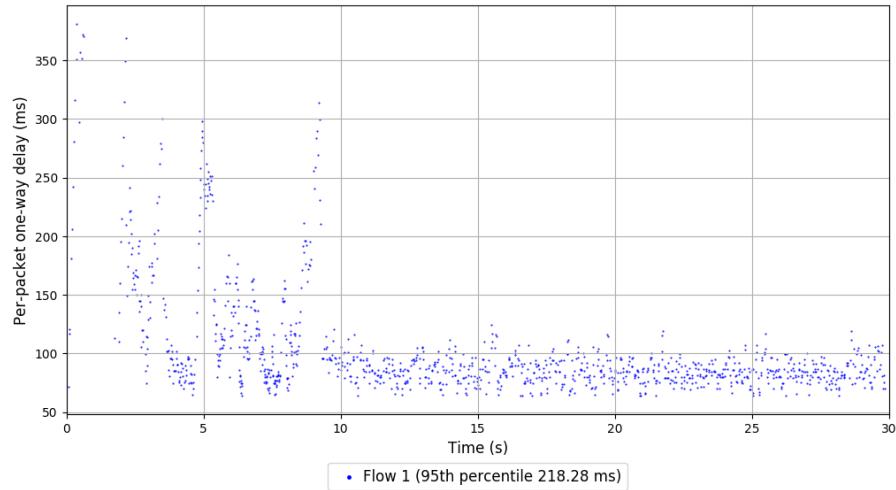
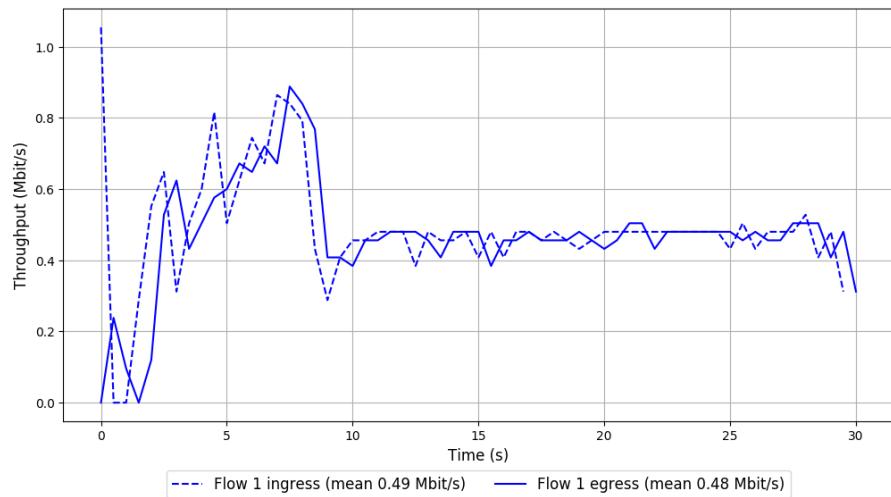


Run 3: Statistics of Indigo

```
Start at: 2019-01-03 04:11:41
End at: 2019-01-03 04:12:11
Local clock offset: 1.601 ms
Remote clock offset: -6.554 ms

# Below is generated by plot.py at 2019-01-03 04:15:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 218.278 ms
Loss rate: 2.69%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 218.278 ms
Loss rate: 2.69%
```

Run 3: Report of Indigo — Data Link

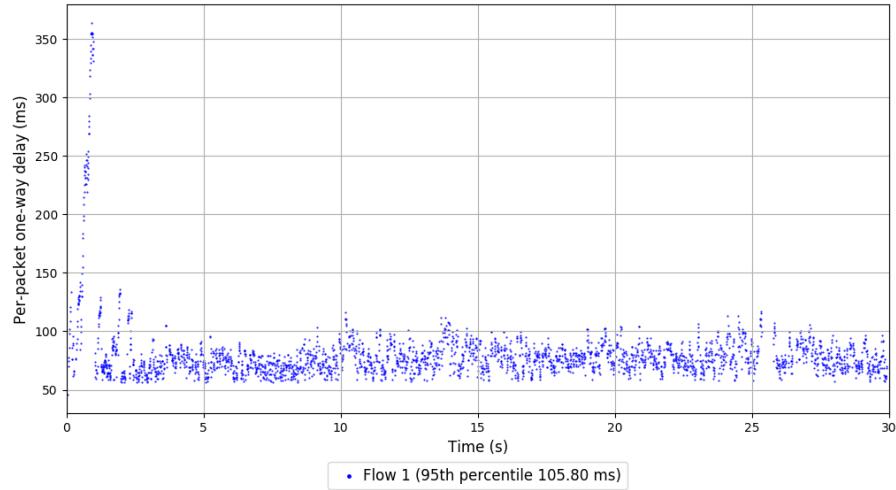
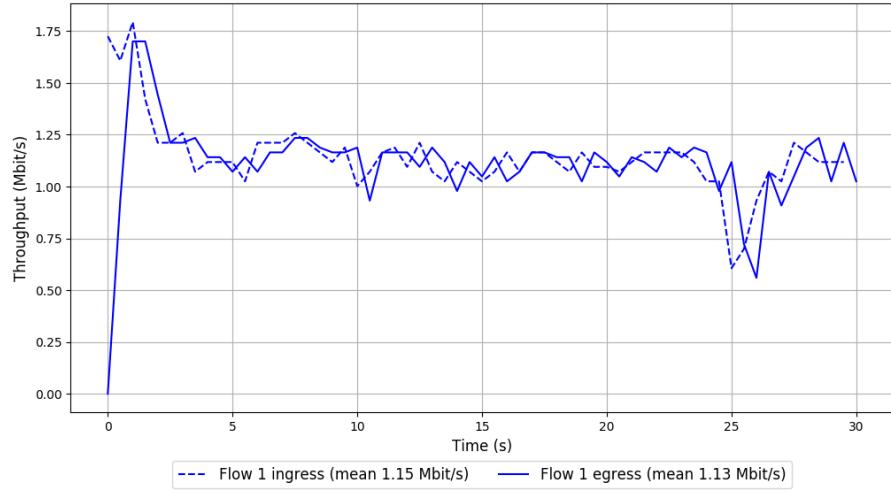


```
Run 1: Statistics of Indigo-MusesD
```

```
Start at: 2019-01-03 03:18:00
End at: 2019-01-03 03:18:30
Local clock offset: 2.569 ms
Remote clock offset: -0.679 ms

# Below is generated by plot.py at 2019-01-03 04:15:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 105.803 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 105.803 ms
Loss rate: 1.12%
```

Run 1: Report of Indigo-MusesD — Data Link

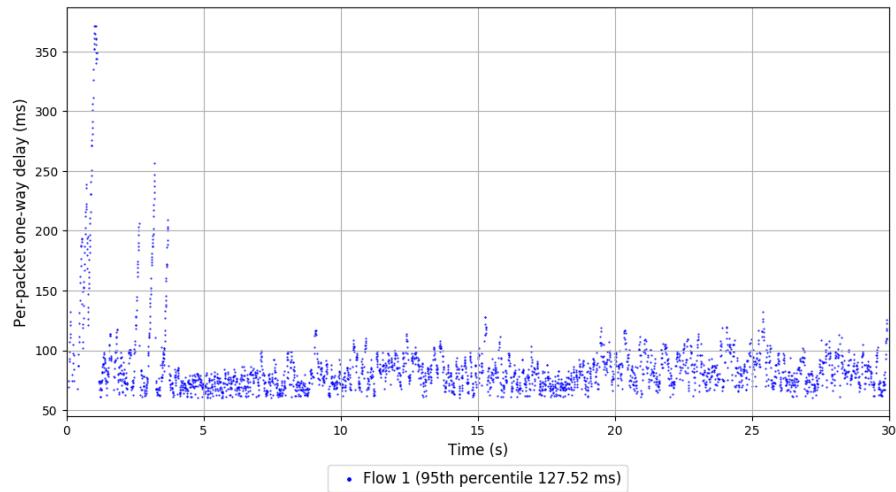
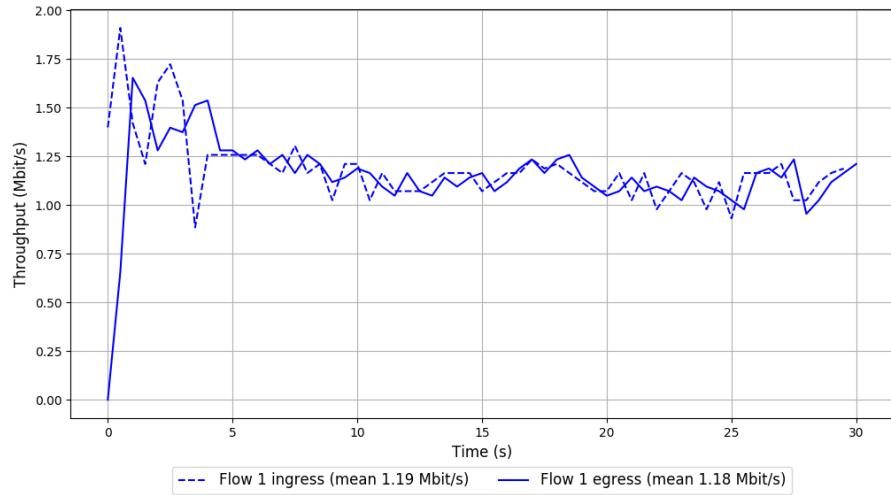


Run 2: Statistics of Indigo-MusesD

```
Start at: 2019-01-03 03:39:11
End at: 2019-01-03 03:39:41
Local clock offset: 1.239 ms
Remote clock offset: -4.588 ms

# Below is generated by plot.py at 2019-01-03 04:15:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 127.523 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 127.523 ms
Loss rate: 1.11%
```

Run 2: Report of Indigo-MusesD — Data Link

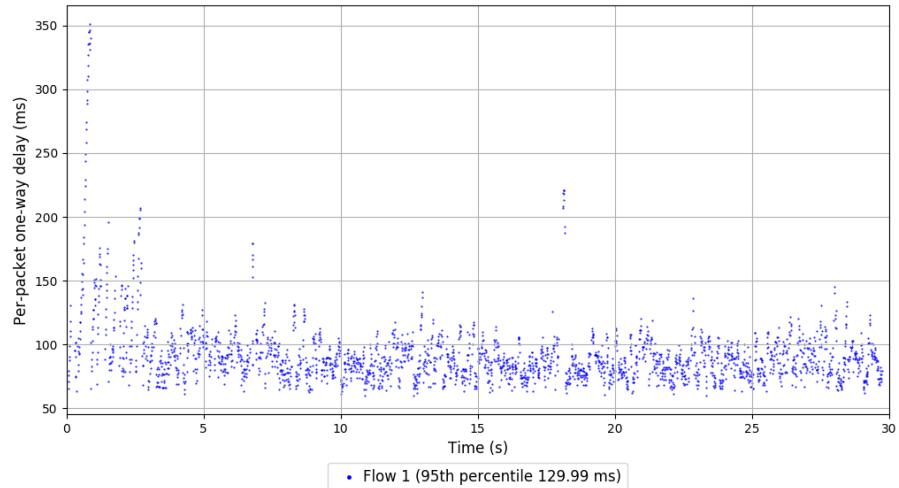
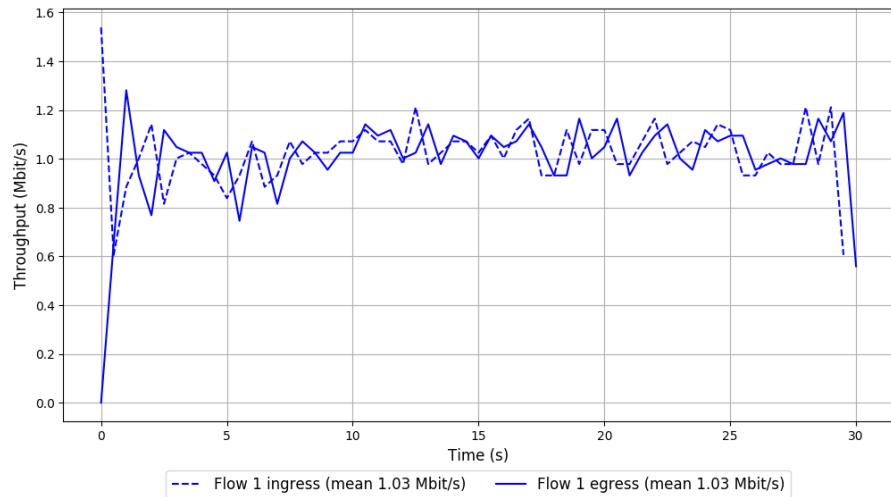


Run 3: Statistics of Indigo-MusesD

```
Start at: 2019-01-03 04:00:26
End at: 2019-01-03 04:00:56
Local clock offset: 2.13 ms
Remote clock offset: -5.568 ms

# Below is generated by plot.py at 2019-01-03 04:15:50
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 129.985 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 129.985 ms
Loss rate: 0.34%
```

Run 3: Report of Indigo-MusesD — Data Link

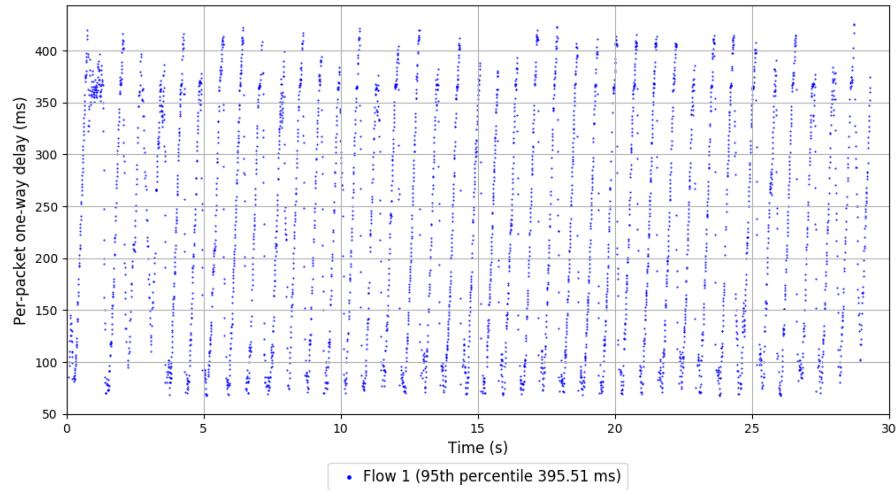
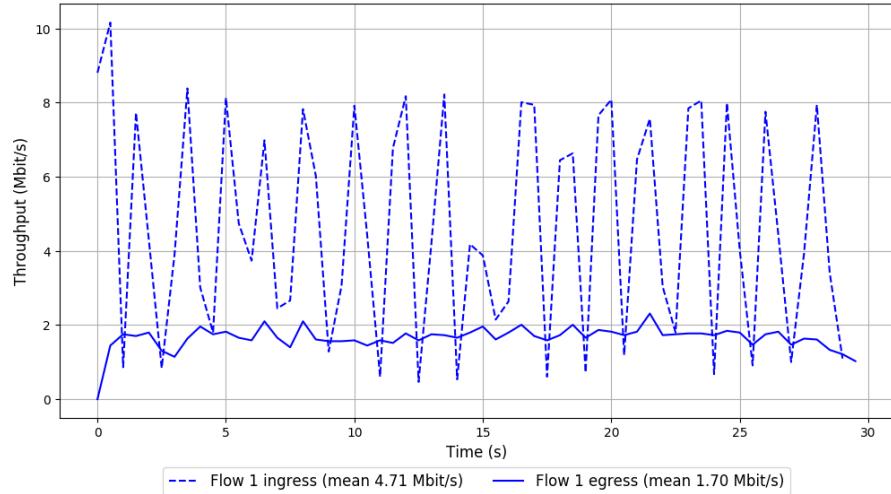


```
Run 1: Statistics of Indigo-MusesT
```

```
Start at: 2019-01-03 03:19:06
End at: 2019-01-03 03:19:36
Local clock offset: 1.622 ms
Remote clock offset: -1.707 ms

# Below is generated by plot.py at 2019-01-03 04:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 395.515 ms
Loss rate: 64.01%
-- Flow 1:
Average throughput: 1.70 Mbit/s
95th percentile per-packet one-way delay: 395.515 ms
Loss rate: 64.01%
```

Run 1: Report of Indigo-MusesT — Data Link

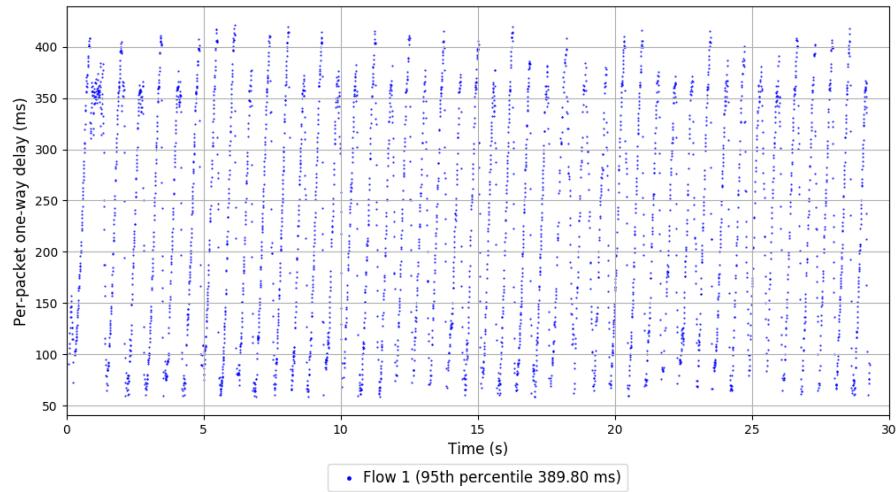
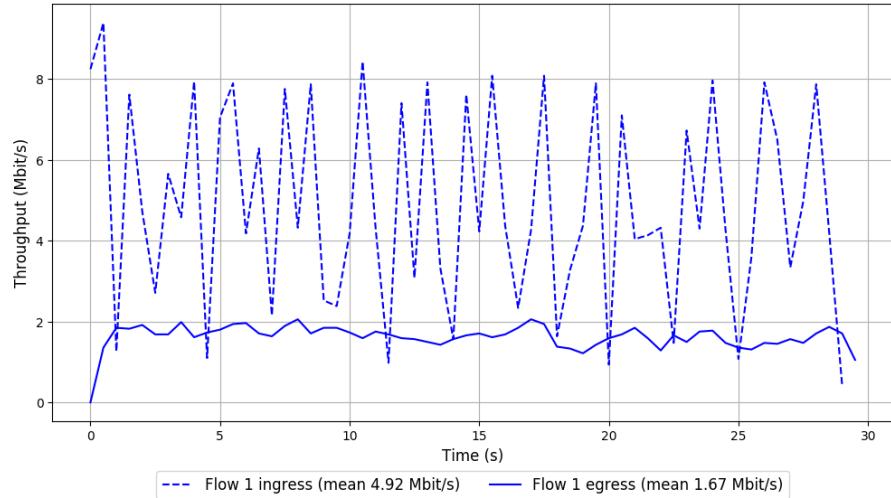


Run 2: Statistics of Indigo-MusesT

```
Start at: 2019-01-03 03:40:22
End at: 2019-01-03 03:40:52
Local clock offset: 1.202 ms
Remote clock offset: -4.912 ms

# Below is generated by plot.py at 2019-01-03 04:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 389.804 ms
Loss rate: 66.22%
-- Flow 1:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 389.804 ms
Loss rate: 66.22%
```

Run 2: Report of Indigo-MusesT — Data Link

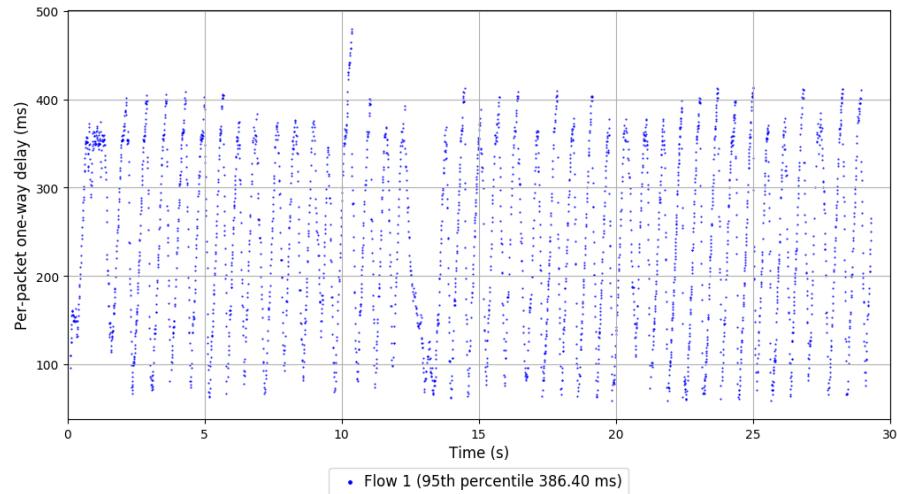
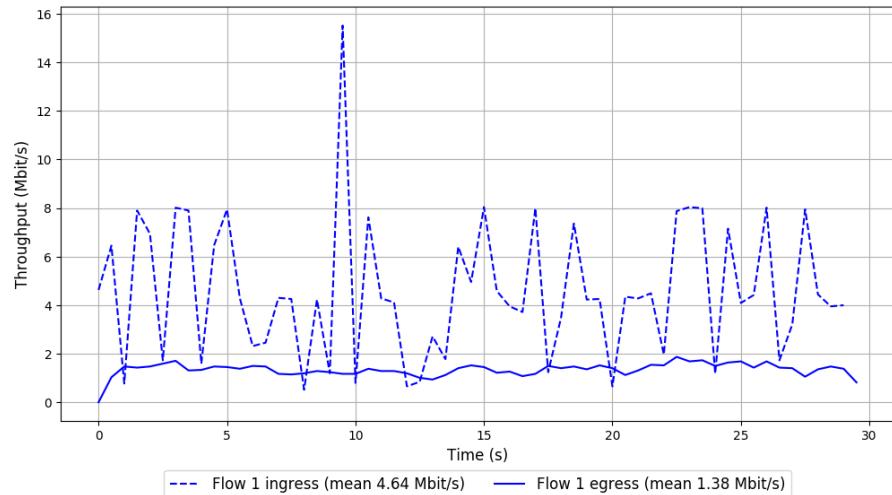


Run 3: Statistics of Indigo-MusesT

```
Start at: 2019-01-03 04:01:32
End at: 2019-01-03 04:02:02
Local clock offset: 2.095 ms
Remote clock offset: -4.981 ms

# Below is generated by plot.py at 2019-01-03 04:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 386.401 ms
Loss rate: 70.41%
-- Flow 1:
Average throughput: 1.38 Mbit/s
95th percentile per-packet one-way delay: 386.401 ms
Loss rate: 70.41%
```

Run 3: Report of Indigo-MusesT — Data Link

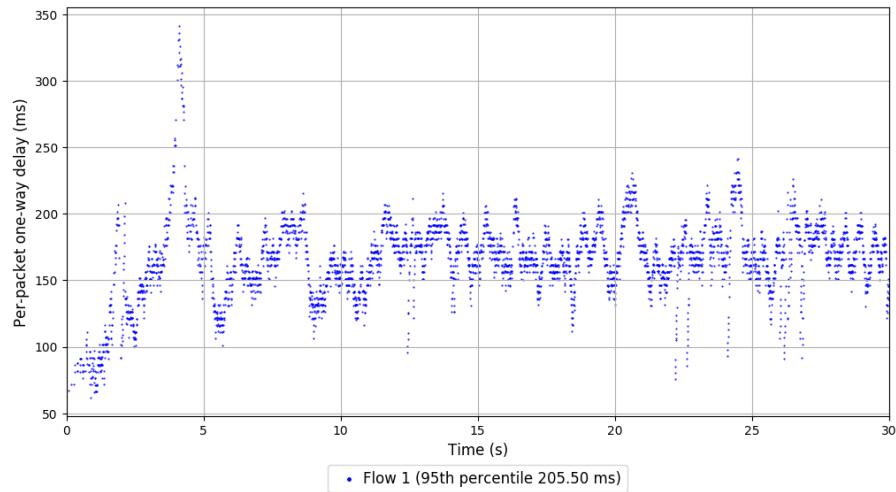
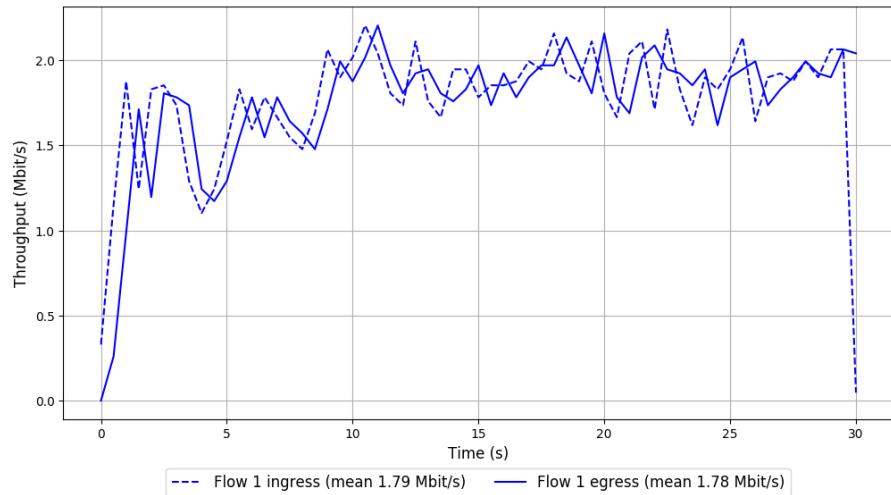


```
Run 1: Statistics of LEDBAT
```

```
Start at: 2019-01-03 03:21:21
End at: 2019-01-03 03:21:51
Local clock offset: 3.241 ms
Remote clock offset: -1.123 ms

# Below is generated by plot.py at 2019-01-03 04:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 205.503 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 205.503 ms
Loss rate: 0.68%
```

Run 1: Report of LEDBAT — Data Link

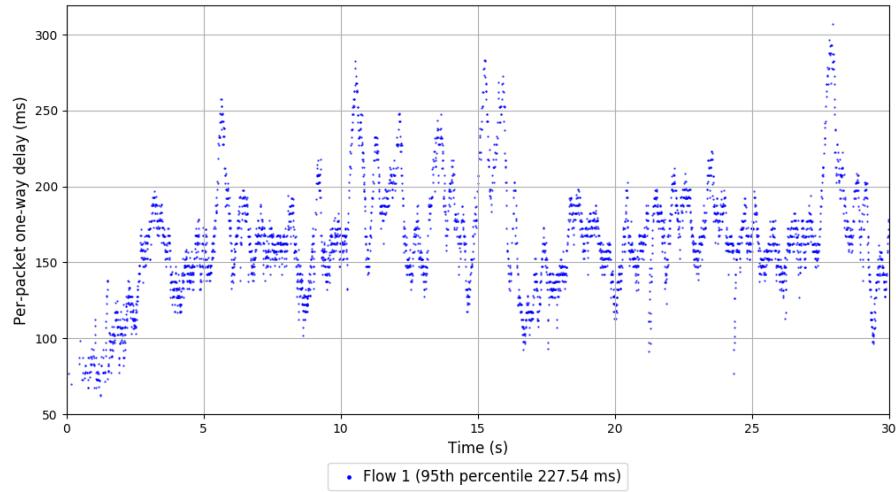
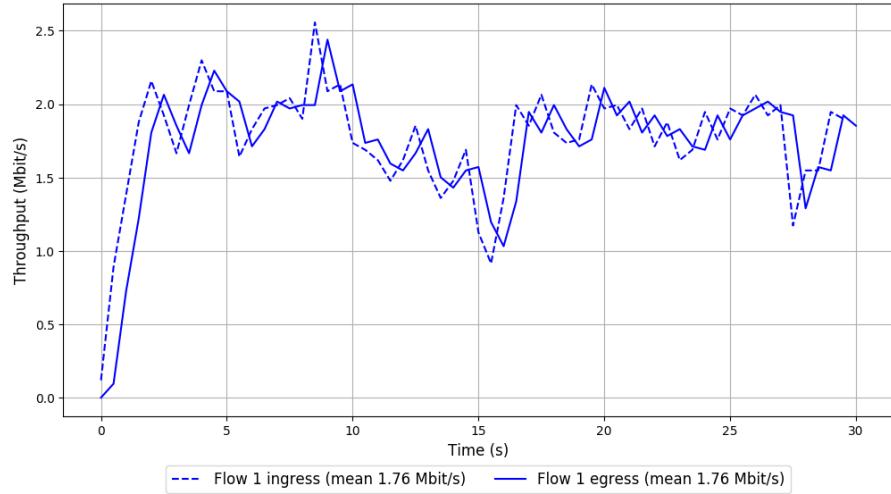


Run 2: Statistics of LEDBAT

```
Start at: 2019-01-03 03:42:35
End at: 2019-01-03 03:43:05
Local clock offset: 0.405 ms
Remote clock offset: -4.811 ms

# Below is generated by plot.py at 2019-01-03 04:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 227.537 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 1.76 Mbit/s
95th percentile per-packet one-way delay: 227.537 ms
Loss rate: 0.60%
```

Run 2: Report of LEDBAT — Data Link

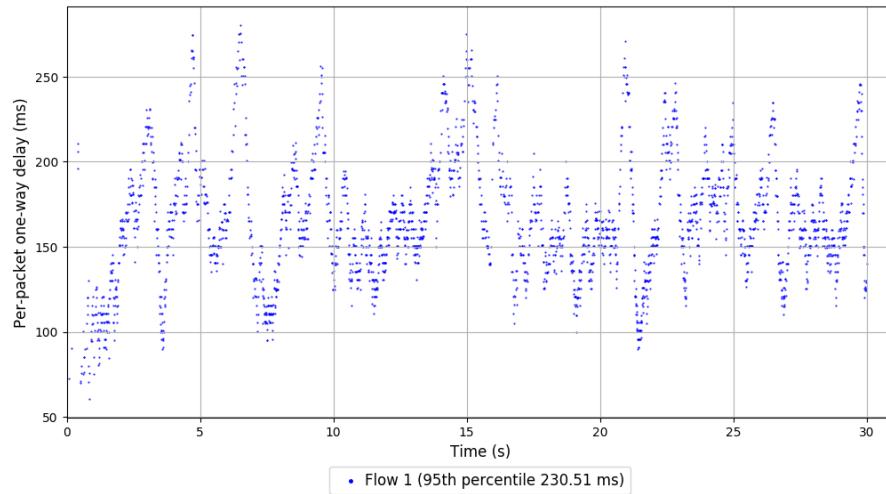
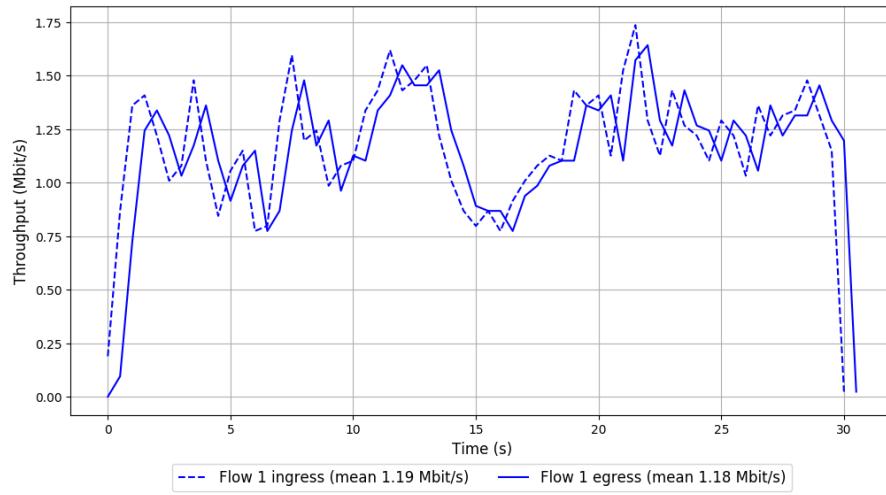


```
Run 3: Statistics of LEDBAT
```

```
Start at: 2019-01-03 04:03:51
End at: 2019-01-03 04:04:21
Local clock offset: 3.088 ms
Remote clock offset: -5.687 ms

# Below is generated by plot.py at 2019-01-03 04:15:55
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 230.508 ms
Loss rate: 0.59%
-- Flow 1:
Average throughput: 1.18 Mbit/s
95th percentile per-packet one-way delay: 230.508 ms
Loss rate: 0.59%
```

Run 3: Report of LEDBAT — Data Link

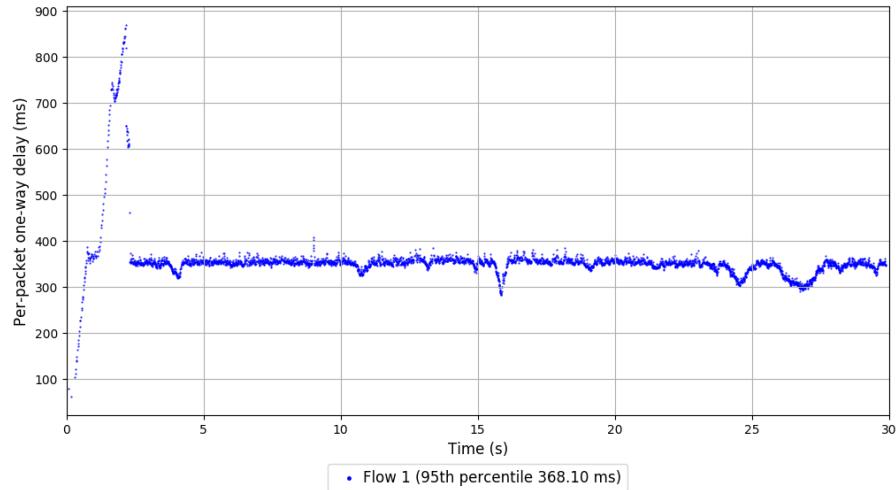
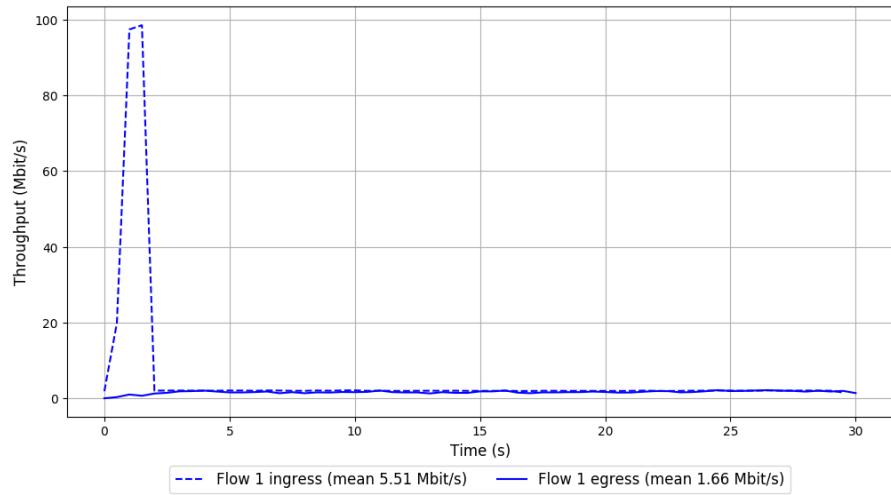


```
Run 1: Statistics of PCC-Allegro
```

```
Start at: 2019-01-03 03:27:01
End at: 2019-01-03 03:27:31
Local clock offset: 2.429 ms
Remote clock offset: -2.916 ms

# Below is generated by plot.py at 2019-01-03 04:15:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 368.097 ms
Loss rate: 70.02%
-- Flow 1:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 368.097 ms
Loss rate: 70.02%
```

Run 1: Report of PCC-Allegro — Data Link

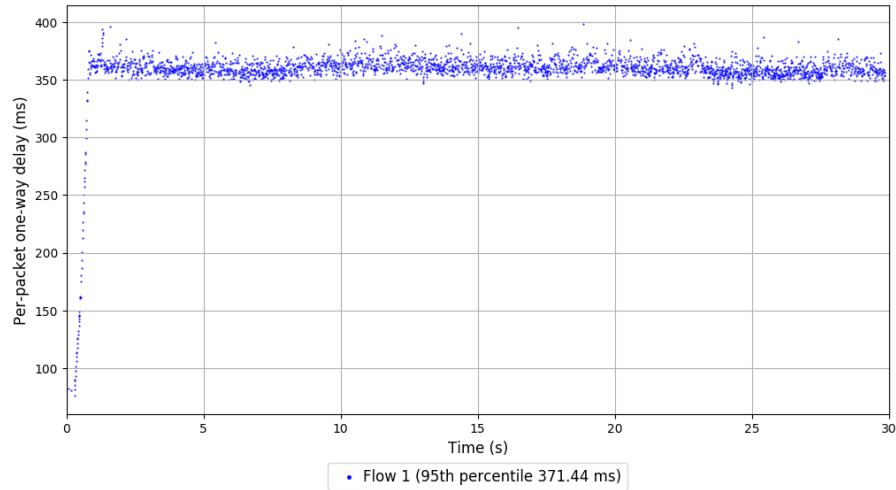
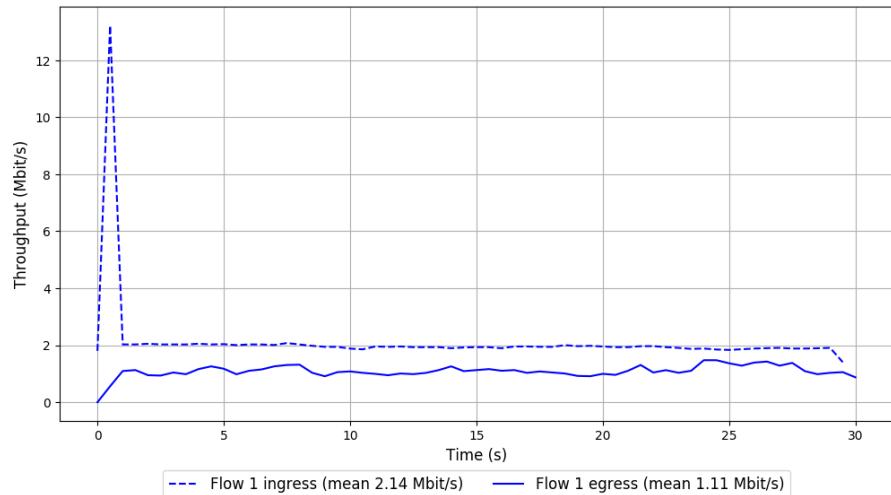


Run 2: Statistics of PCC-Allegro

```
Start at: 2019-01-03 03:48:16
End at: 2019-01-03 03:48:46
Local clock offset: 1.062 ms
Remote clock offset: -5.381 ms

# Below is generated by plot.py at 2019-01-03 04:15:56
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 371.444 ms
Loss rate: 48.07%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 371.444 ms
Loss rate: 48.07%
```

Run 2: Report of PCC-Allegro — Data Link

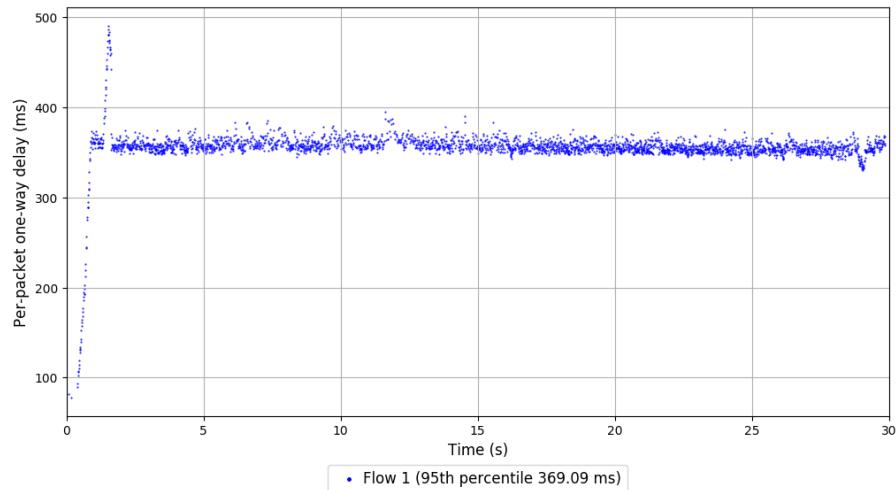
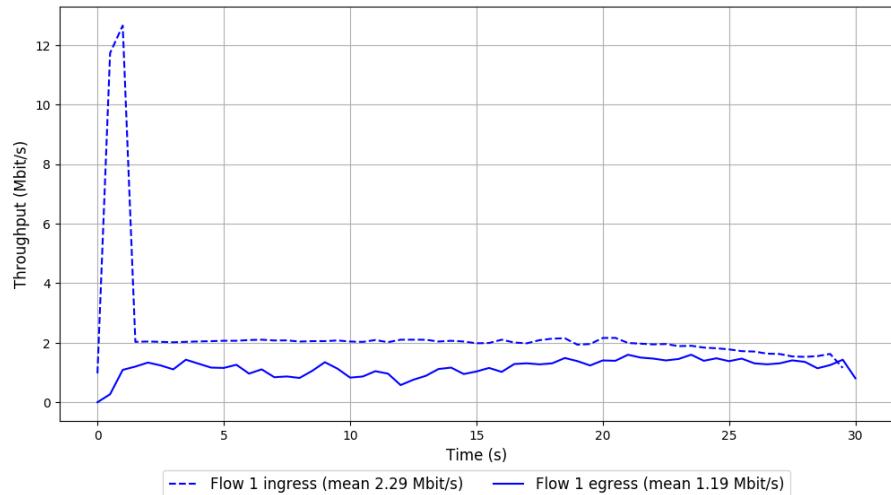


Run 3: Statistics of PCC-Allegro

```
Start at: 2019-01-03 04:09:29
End at: 2019-01-03 04:09:59
Local clock offset: 1.667 ms
Remote clock offset: -6.826 ms

# Below is generated by plot.py at 2019-01-03 04:15:57
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 369.093 ms
Loss rate: 48.01%
-- Flow 1:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 369.093 ms
Loss rate: 48.01%
```

Run 3: Report of PCC-Allegro — Data Link

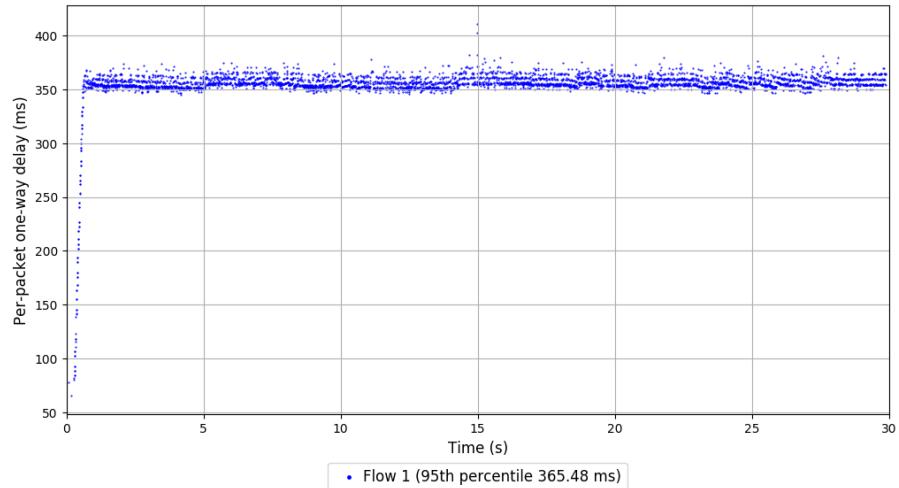
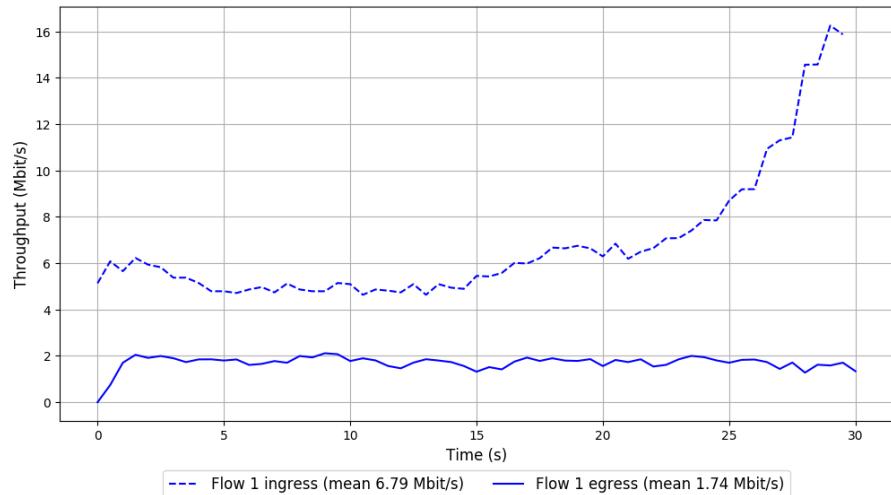


```
Run 1: Statistics of PCC-Expr
```

```
Start at: 2019-01-03 03:24:41
End at: 2019-01-03 03:25:11
Local clock offset: 3.113 ms
Remote clock offset: -1.465 ms

# Below is generated by plot.py at 2019-01-03 04:16:04
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 365.481 ms
Loss rate: 74.41%
-- Flow 1:
Average throughput: 1.74 Mbit/s
95th percentile per-packet one-way delay: 365.481 ms
Loss rate: 74.41%
```

Run 1: Report of PCC-Expr — Data Link

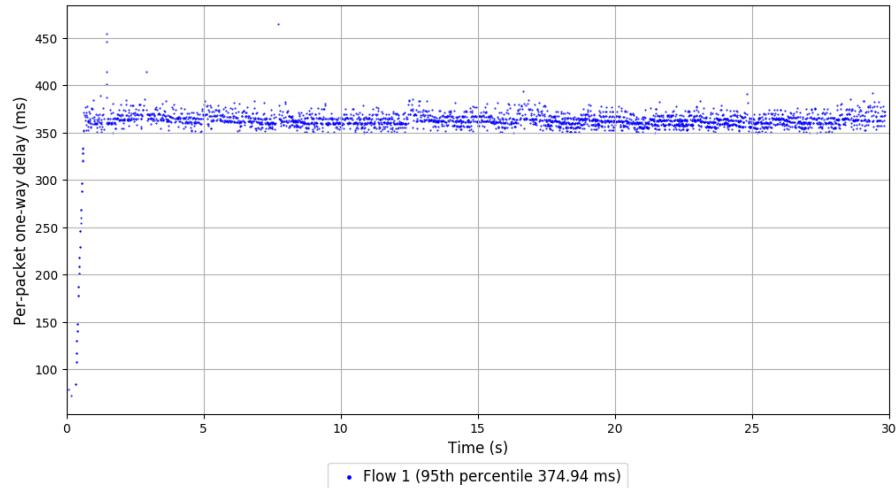
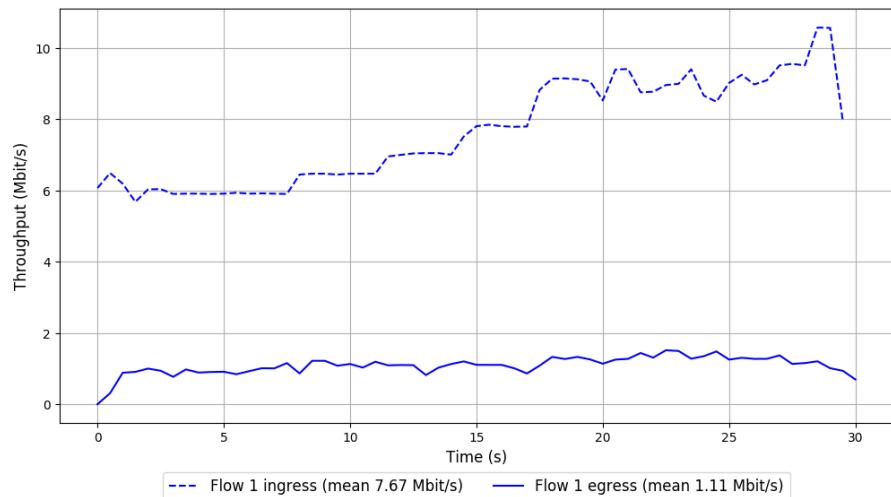


Run 2: Statistics of PCC-Expr

```
Start at: 2019-01-03 03:45:56
End at: 2019-01-03 03:46:26
Local clock offset: 0.99 ms
Remote clock offset: -5.252 ms

# Below is generated by plot.py at 2019-01-03 04:16:05
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 374.944 ms
Loss rate: 85.55%
-- Flow 1:
Average throughput: 1.11 Mbit/s
95th percentile per-packet one-way delay: 374.944 ms
Loss rate: 85.55%
```

Run 2: Report of PCC-Expr — Data Link

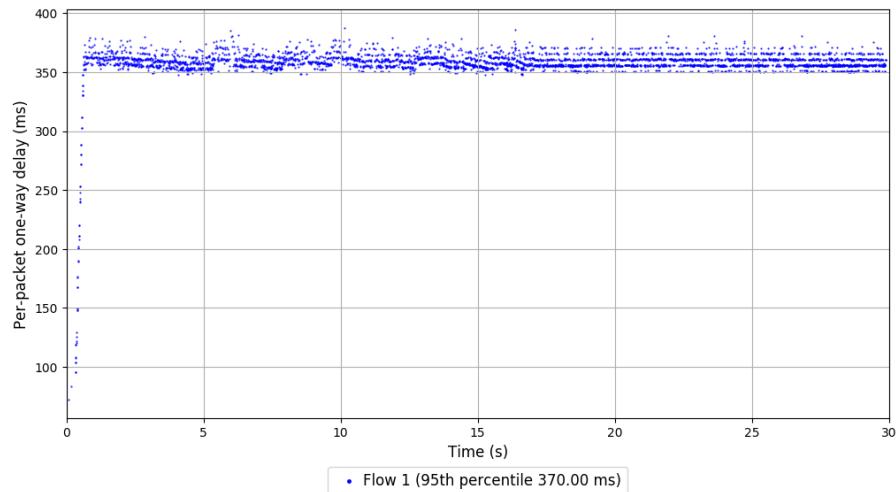
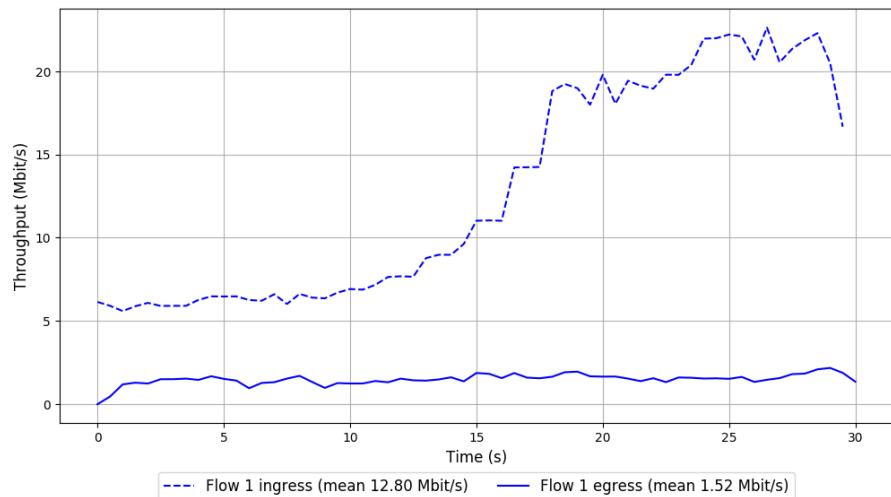


Run 3: Statistics of PCC-Expr

```
Start at: 2019-01-03 04:07:12
End at: 2019-01-03 04:07:42
Local clock offset: 2.516 ms
Remote clock offset: -5.964 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 370.004 ms
Loss rate: 88.12%
-- Flow 1:
Average throughput: 1.52 Mbit/s
95th percentile per-packet one-way delay: 370.004 ms
Loss rate: 88.12%
```

Run 3: Report of PCC-Expr — Data Link

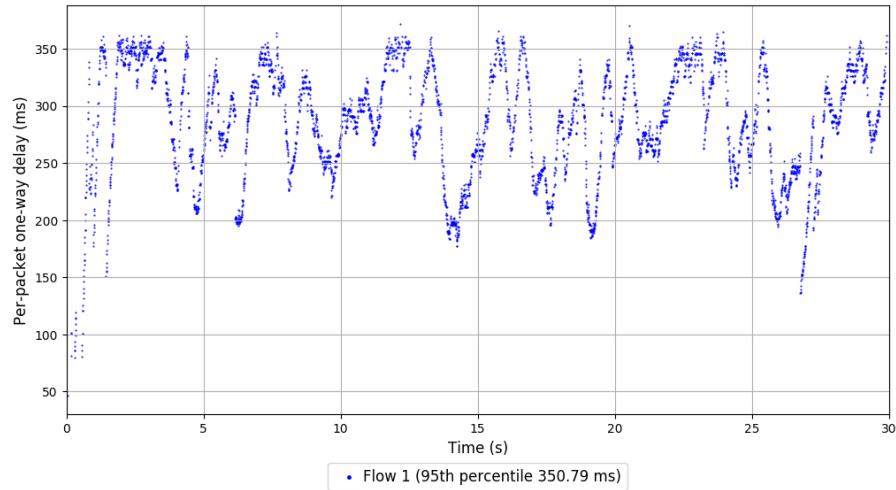
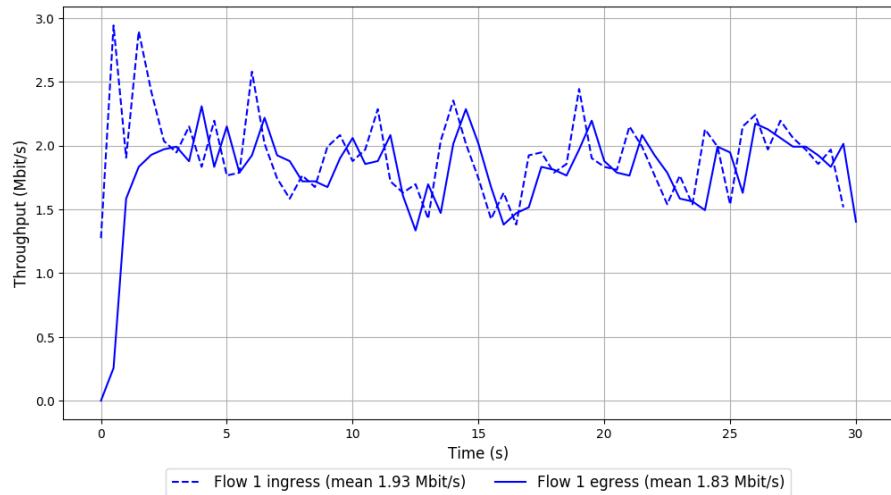


```
Run 1: Statistics of QUIC Cubic

Start at: 2019-01-03 03:14:40
End at: 2019-01-03 03:15:10
Local clock offset: 0.175 ms
Remote clock offset: -0.842 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 350.787 ms
Loss rate: 5.42%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 350.787 ms
Loss rate: 5.42%
```

Run 1: Report of QUIC Cubic — Data Link

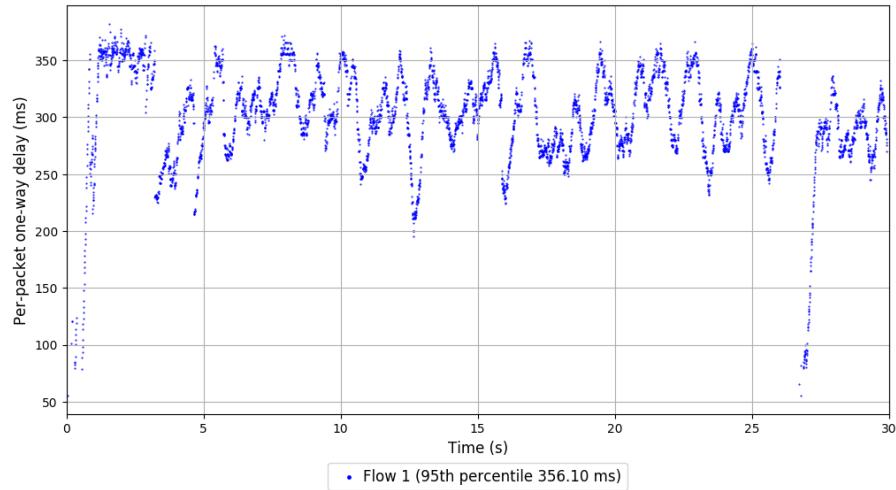
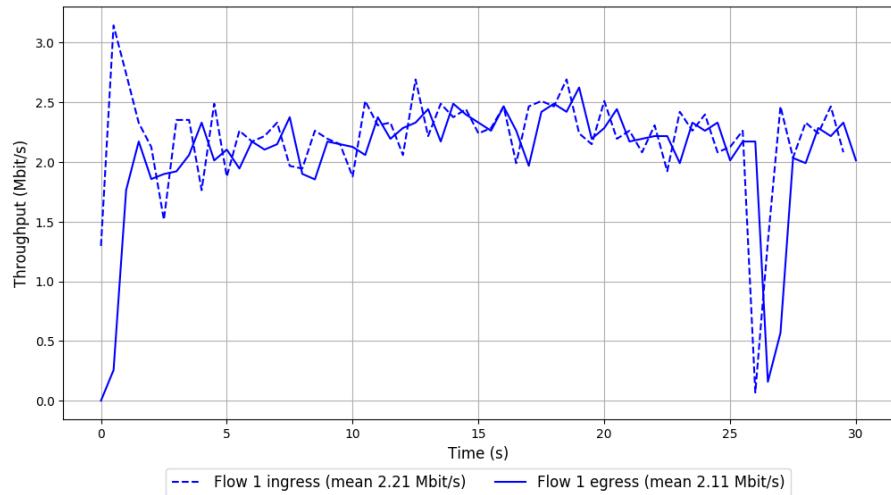


Run 2: Statistics of QUIC Cubic

```
Start at: 2019-01-03 03:35:52
End at: 2019-01-03 03:36:22
Local clock offset: 3.236 ms
Remote clock offset: -3.173 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 356.095 ms
Loss rate: 4.72%
-- Flow 1:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 356.095 ms
Loss rate: 4.72%
```

Run 2: Report of QUIC Cubic — Data Link

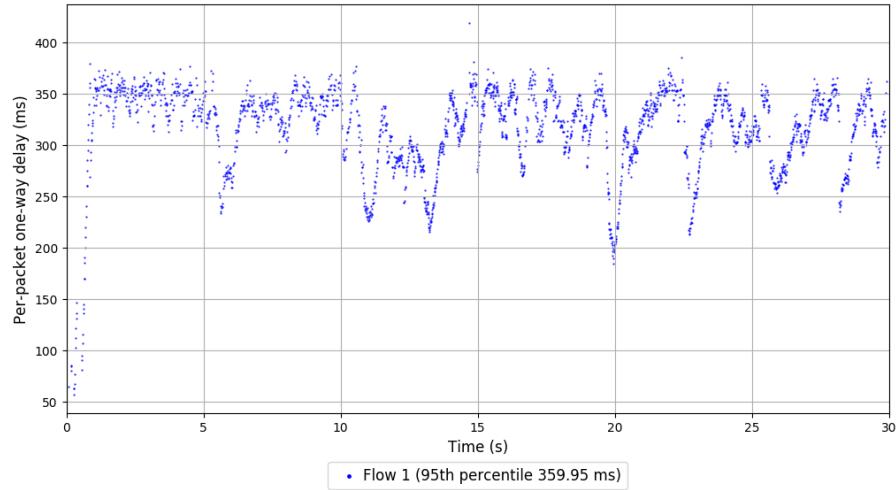
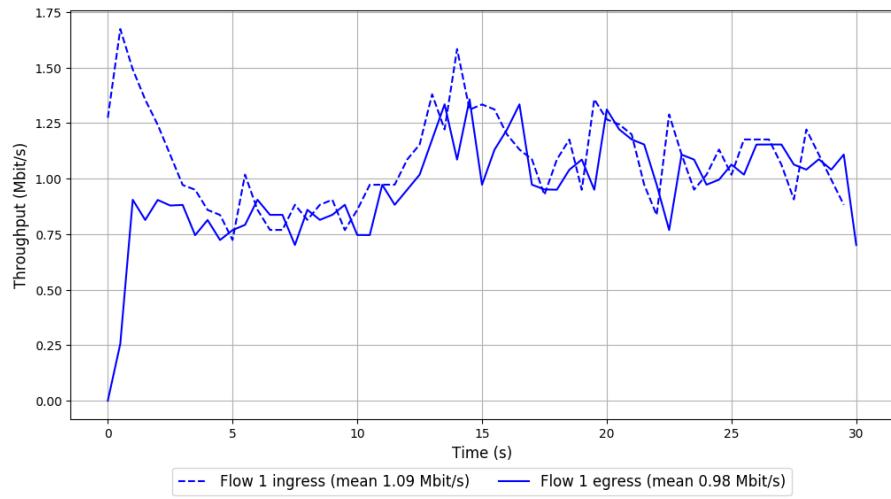


Run 3: Statistics of QUIC Cubic

```
Start at: 2019-01-03 03:57:07
End at: 2019-01-03 03:57:37
Local clock offset: -1.154 ms
Remote clock offset: -5.916 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 359.949 ms
Loss rate: 10.13%
-- Flow 1:
Average throughput: 0.98 Mbit/s
95th percentile per-packet one-way delay: 359.949 ms
Loss rate: 10.13%
```

Run 3: Report of QUIC Cubic — Data Link

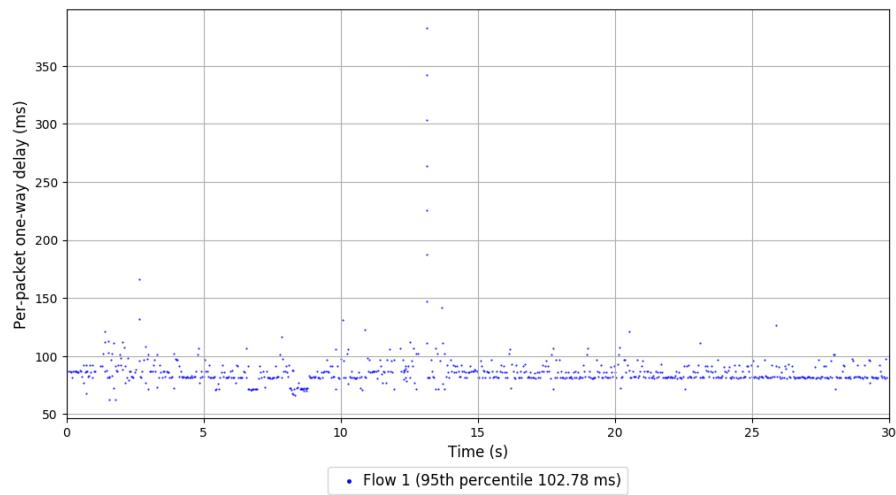
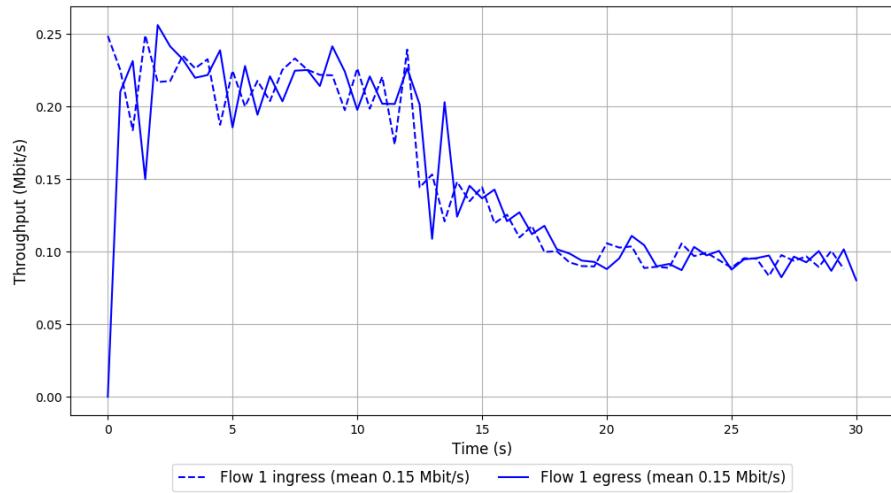


```
Run 1: Statistics of SCReAM
```

```
Start at: 2019-01-03 03:22:28
End at: 2019-01-03 03:22:58
Local clock offset: 2.485 ms
Remote clock offset: -1.842 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 102.777 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 102.777 ms
Loss rate: 0.24%
```

Run 1: Report of SCReAM — Data Link

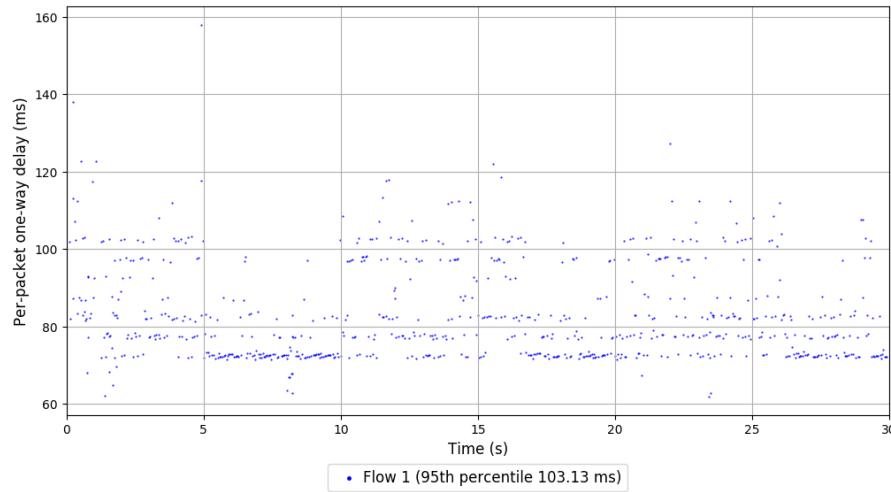
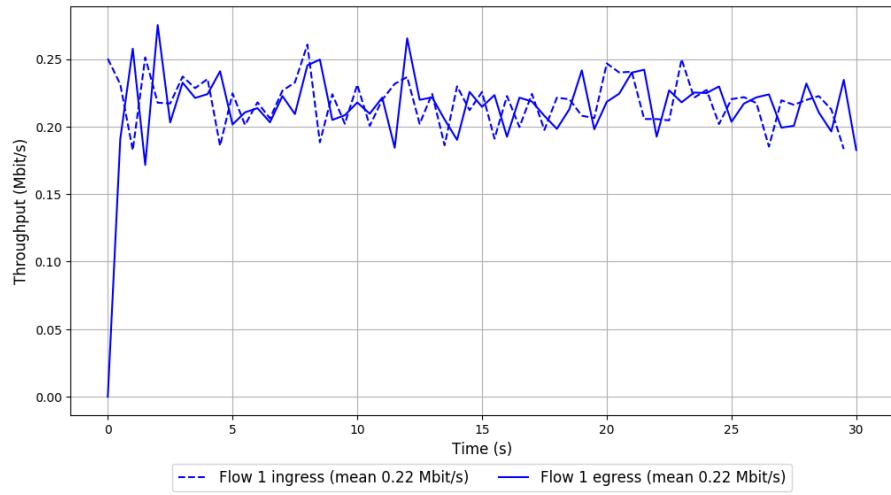


Run 2: Statistics of SCReAM

```
Start at: 2019-01-03 03:43:42
End at: 2019-01-03 03:44:12
Local clock offset: 1.843 ms
Remote clock offset: -5.126 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 103.133 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 103.133 ms
Loss rate: 0.26%
```

Run 2: Report of SCReAM — Data Link

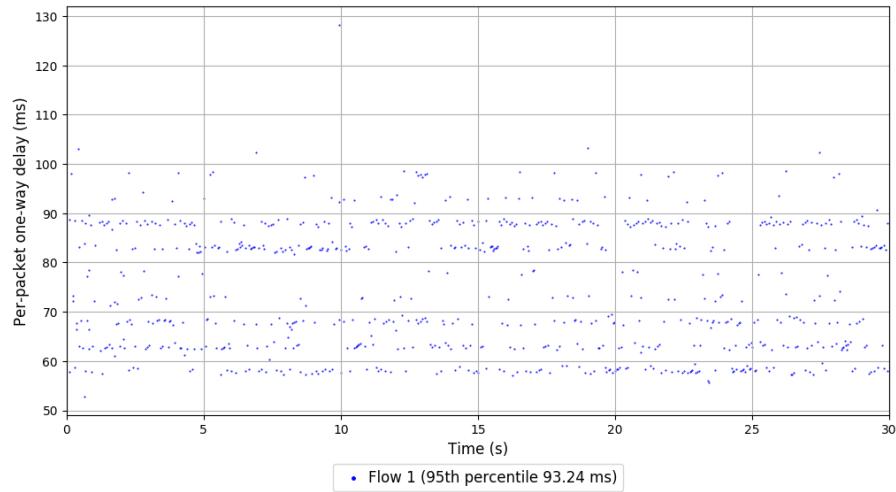
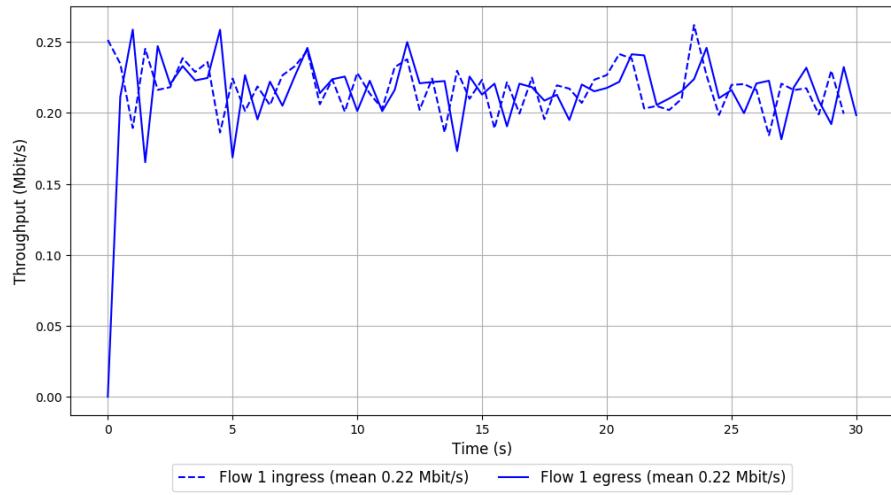


Run 3: Statistics of SCReAM

```
Start at: 2019-01-03 04:04:58
End at: 2019-01-03 04:05:28
Local clock offset: -0.176 ms
Remote clock offset: -6.756 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 93.239 ms
Loss rate: 0.26%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 93.239 ms
Loss rate: 0.26%
```

Run 3: Report of SCReAM — Data Link

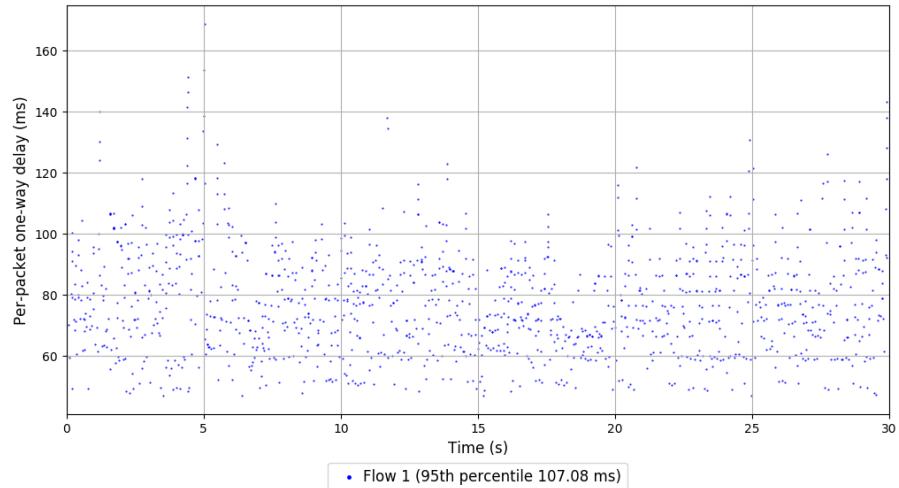
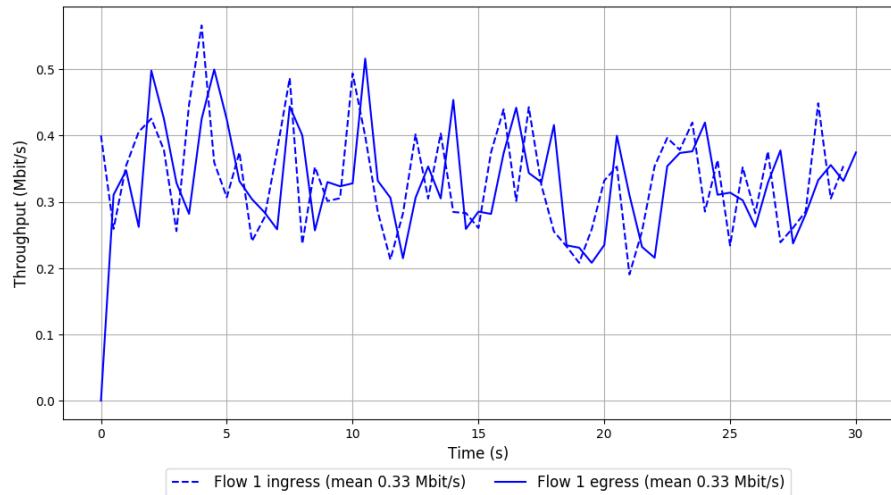


Run 1: Statistics of Sprout

```
Start at: 2019-01-03 03:31:27
End at: 2019-01-03 03:31:57
Local clock offset: -0.194 ms
Remote clock offset: -3.567 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 107.079 ms
Loss rate: 0.24%
-- Flow 1:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 107.079 ms
Loss rate: 0.24%
```

Run 1: Report of Sprout — Data Link

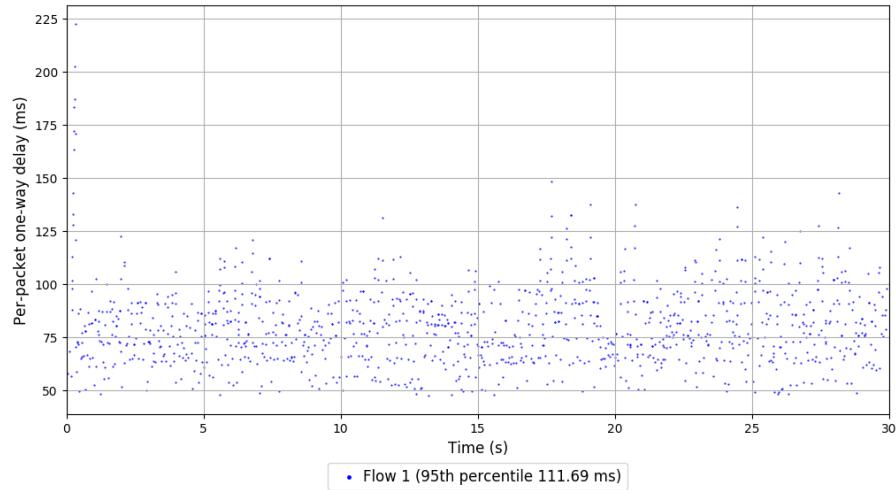
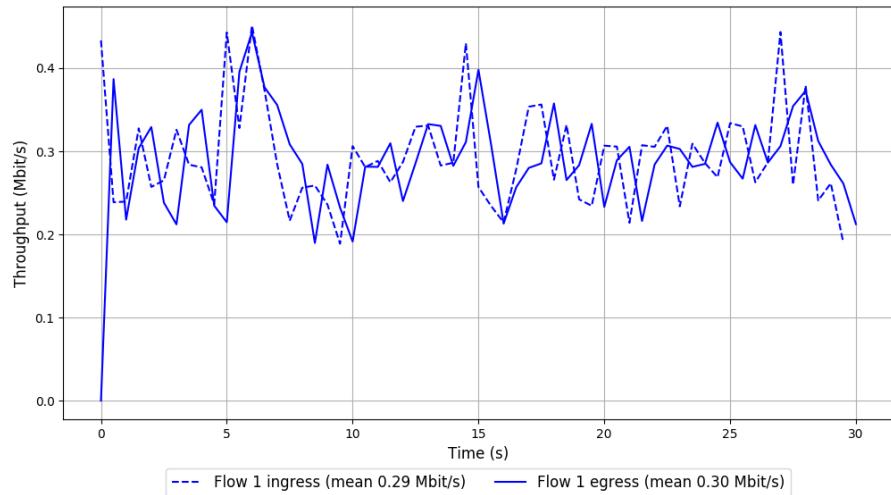


Run 2: Statistics of Sprout

```
Start at: 2019-01-03 03:52:42
End at: 2019-01-03 03:53:12
Local clock offset: -0.448 ms
Remote clock offset: -4.819 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 111.694 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 111.694 ms
Loss rate: 0.02%
```

Run 2: Report of Sprout — Data Link

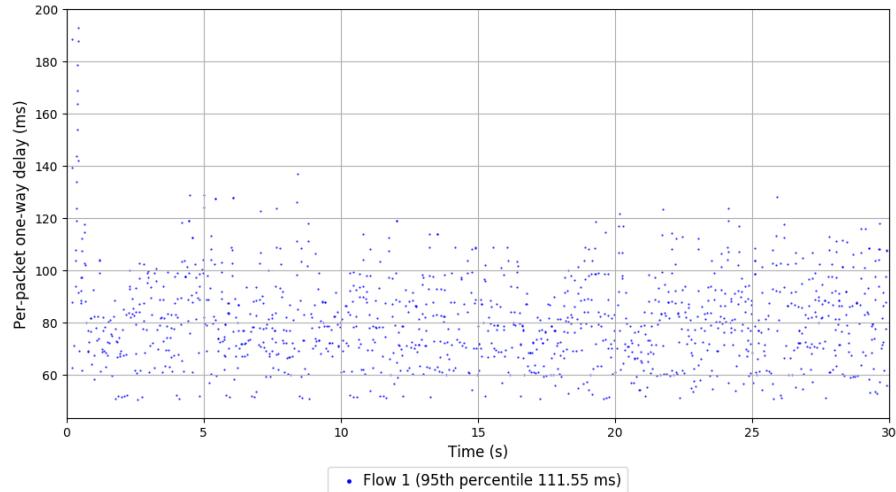
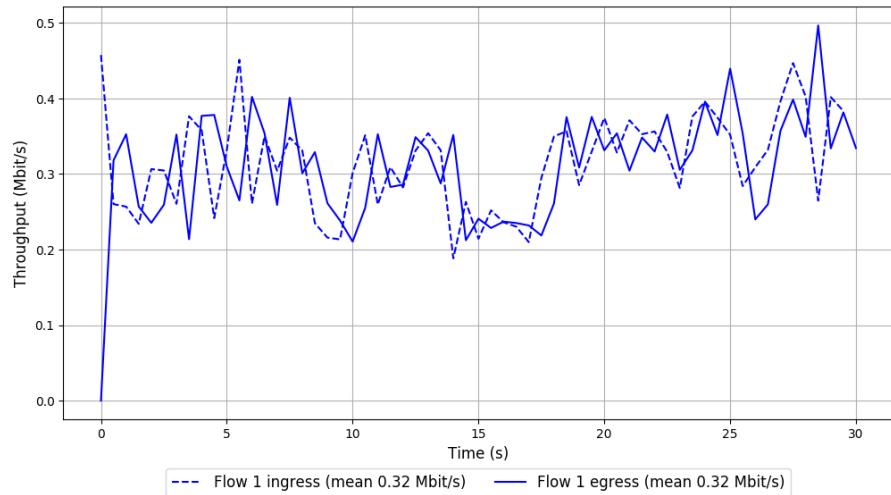


Run 3: Statistics of Sprout

```
Start at: 2019-01-03 04:13:53
End at: 2019-01-03 04:14:23
Local clock offset: 3.982 ms
Remote clock offset: -7.242 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 111.554 ms
Loss rate: 0.37%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 111.554 ms
Loss rate: 0.37%
```

Run 3: Report of Sprout — Data Link

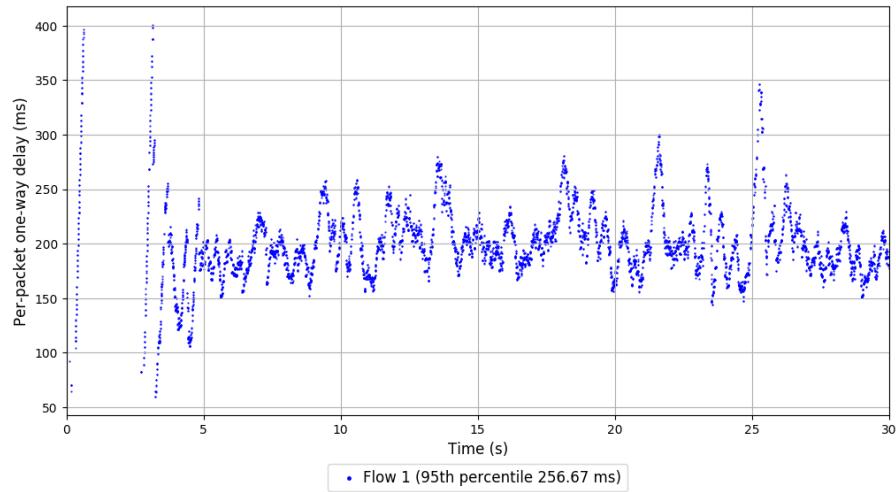
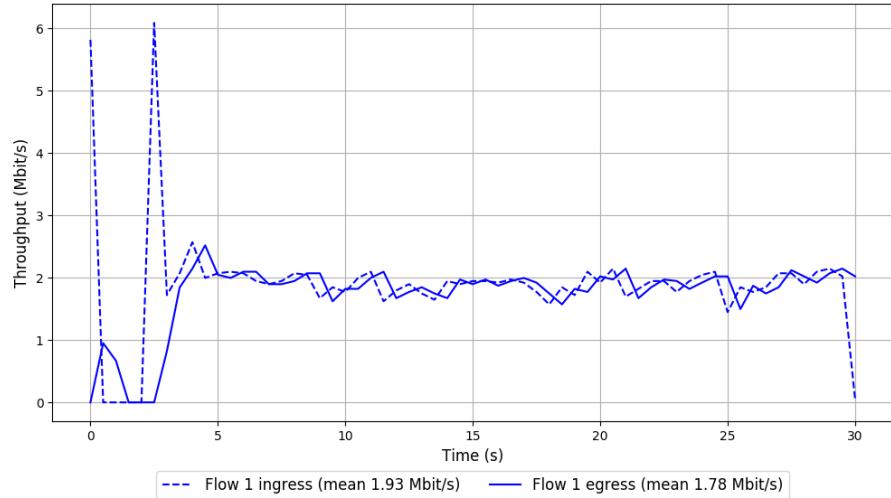


Run 1: Statistics of TaoVA-100x

```
Start at: 2019-01-03 03:20:14
End at: 2019-01-03 03:20:44
Local clock offset: 1.017 ms
Remote clock offset: -1.041 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 256.672 ms
Loss rate: 8.14%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 256.672 ms
Loss rate: 8.14%
```

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

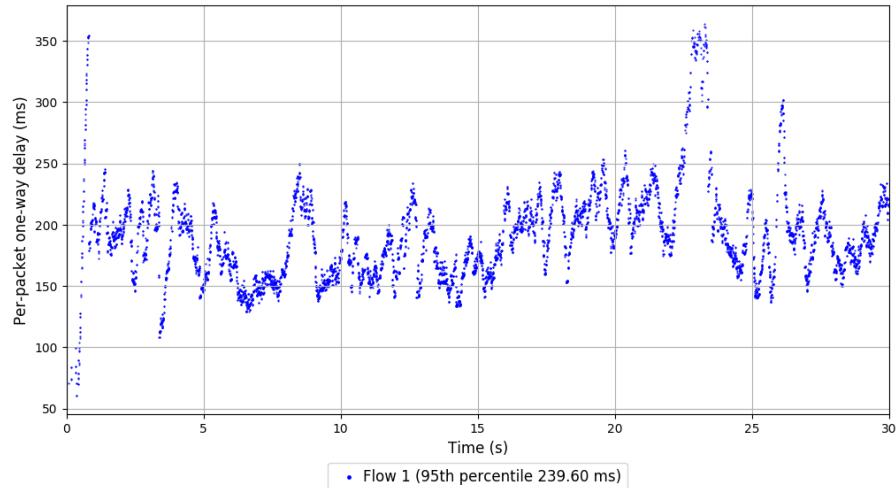
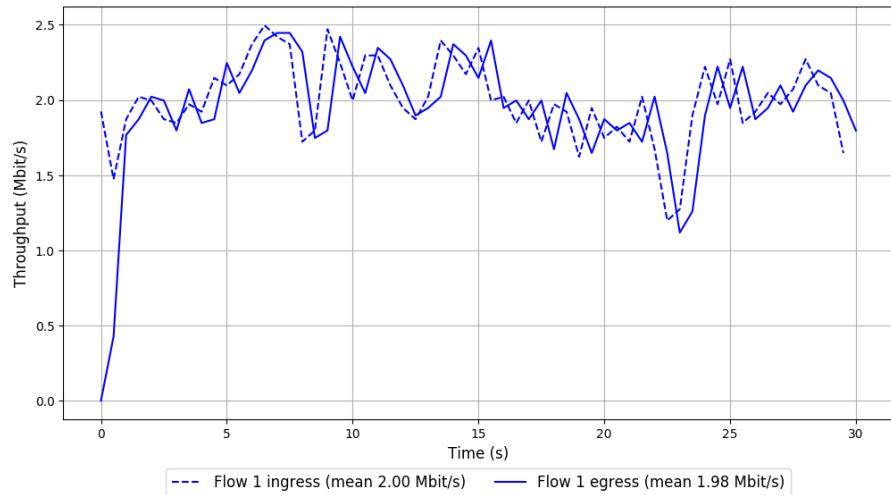


Run 2: Statistics of TaoVA-100x

```
Start at: 2019-01-03 03:41:29
End at: 2019-01-03 03:41:59
Local clock offset: -1.013 ms
Remote clock offset: -4.344 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 239.601 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 1.98 Mbit/s
95th percentile per-packet one-way delay: 239.601 ms
Loss rate: 1.04%
```

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

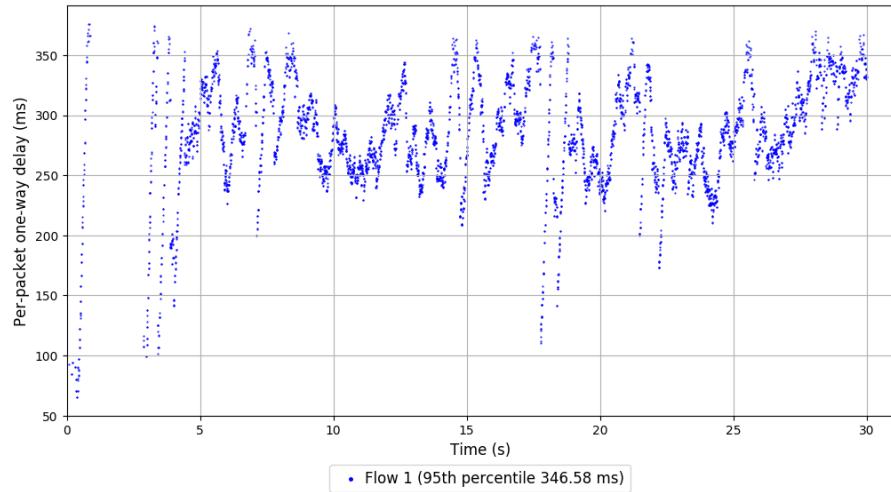
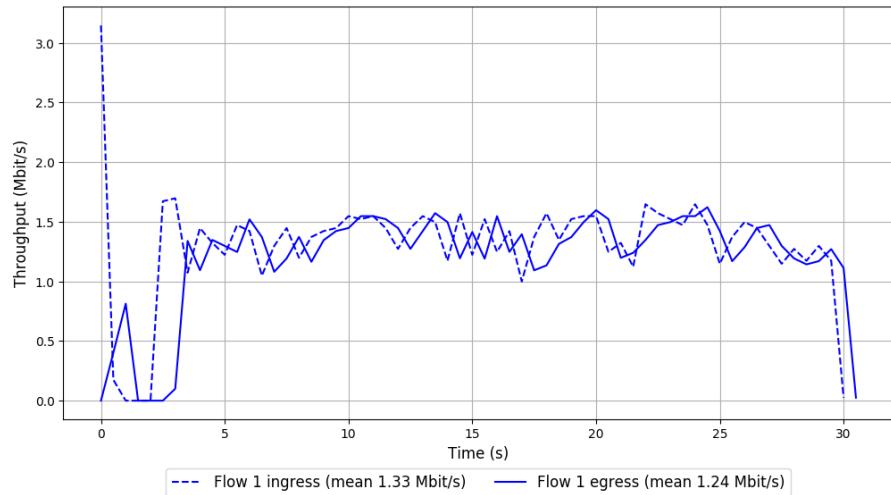


Run 3: Statistics of TaoVA-100x

```
Start at: 2019-01-03 04:02:44
End at: 2019-01-03 04:03:14
Local clock offset: 2.749 ms
Remote clock offset: -4.751 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 346.580 ms
Loss rate: 6.62%
-- Flow 1:
Average throughput: 1.24 Mbit/s
95th percentile per-packet one-way delay: 346.580 ms
Loss rate: 6.62%
```

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

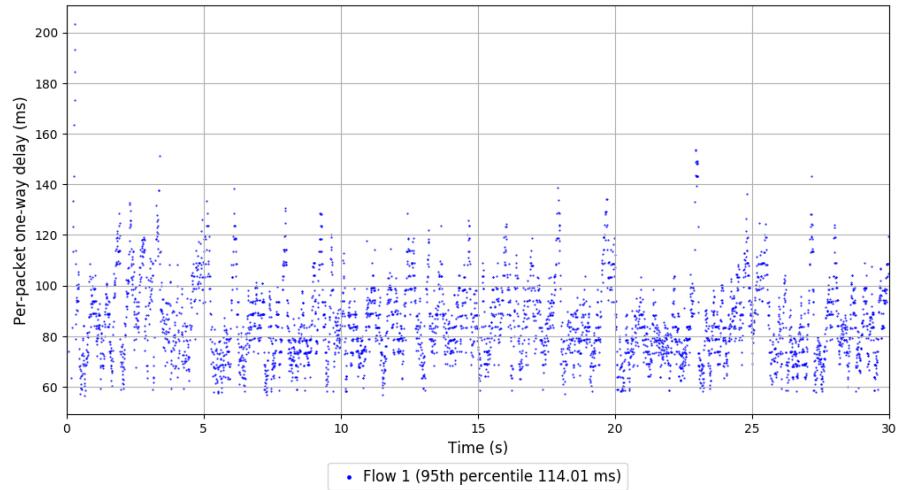
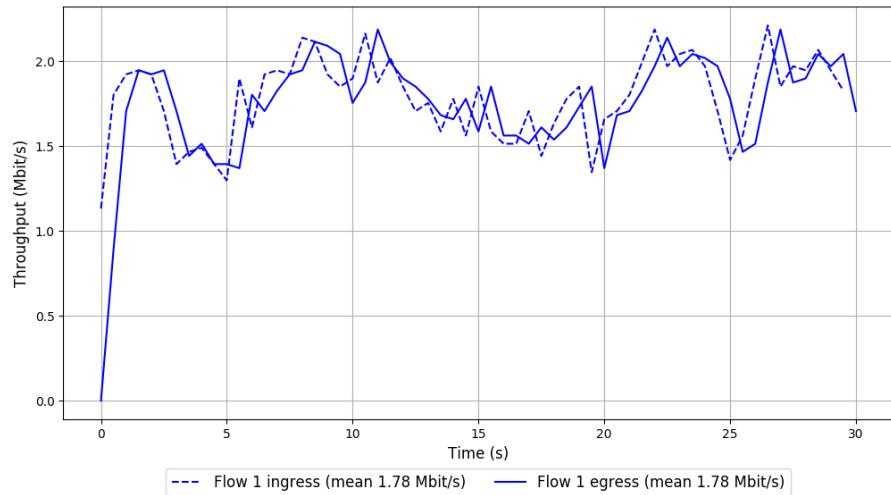


Run 1: Statistics of TCP Vegas

```
Start at: 2019-01-03 03:28:07
End at: 2019-01-03 03:28:37
Local clock offset: 1.393 ms
Remote clock offset: -1.993 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 114.014 ms
Loss rate: 0.38%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 114.014 ms
Loss rate: 0.38%
```

Run 1: Report of TCP Vegas — Data Link

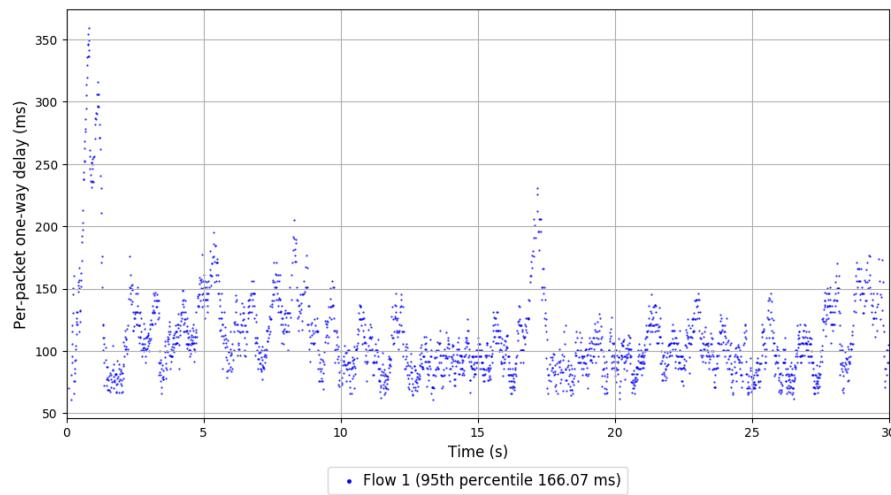
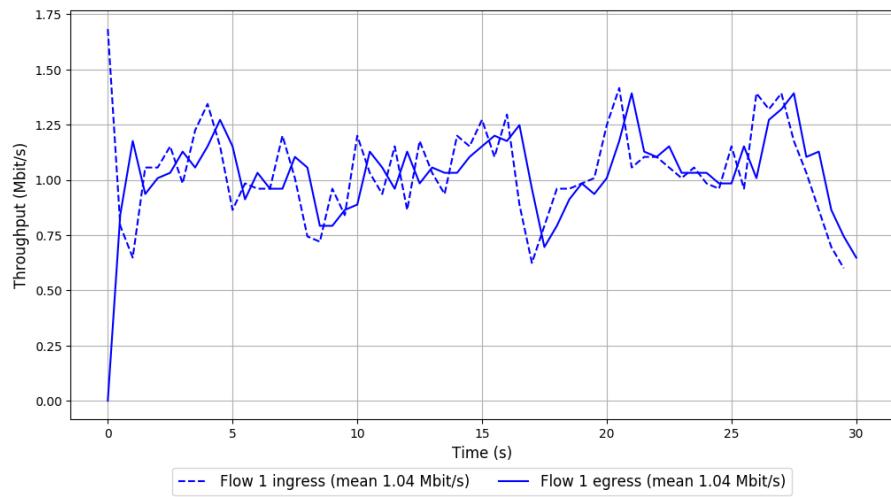


Run 2: Statistics of TCP Vegas

```
Start at: 2019-01-03 03:49:22
End at: 2019-01-03 03:49:52
Local clock offset: 1.377 ms
Remote clock offset: -5.221 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 166.067 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 166.067 ms
Loss rate: 0.27%
```

Run 2: Report of TCP Vegas — Data Link

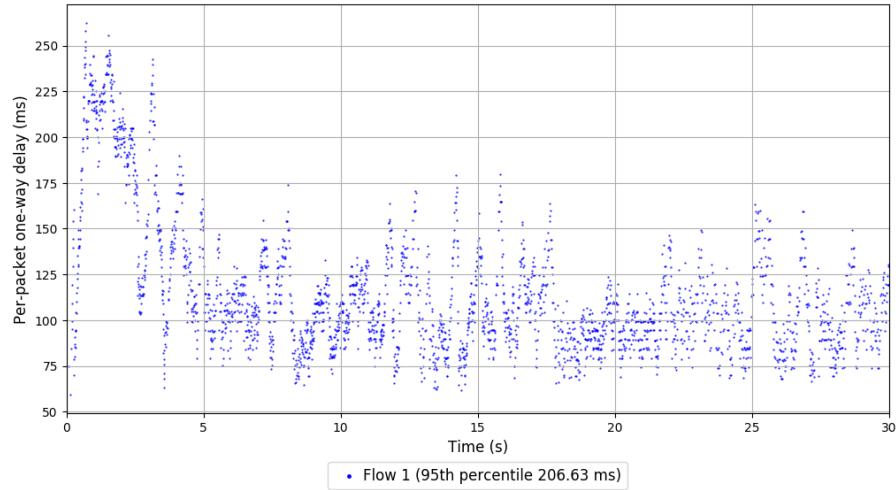
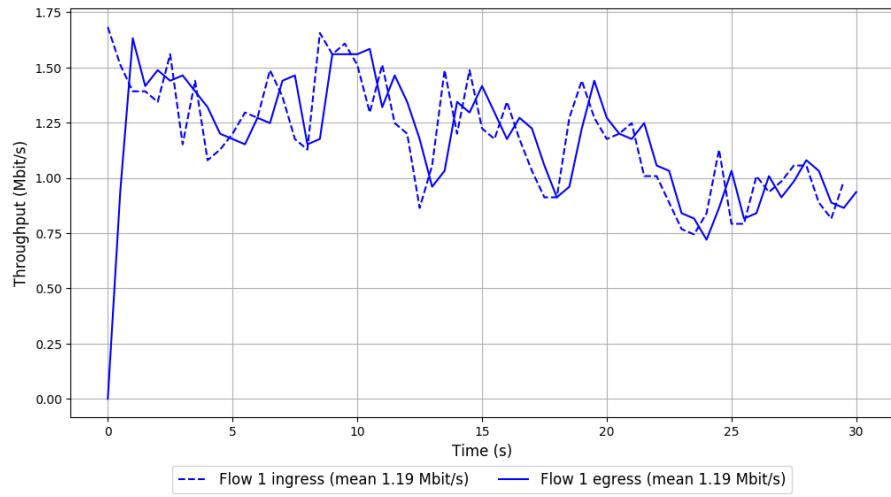


Run 3: Statistics of TCP Vegas

```
Start at: 2019-01-03 04:10:35
End at: 2019-01-03 04:11:05
Local clock offset: 3.403 ms
Remote clock offset: -6.639 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 206.630 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 1.19 Mbit/s
95th percentile per-packet one-way delay: 206.630 ms
Loss rate: 0.30%
```

Run 3: Report of TCP Vegas — Data Link

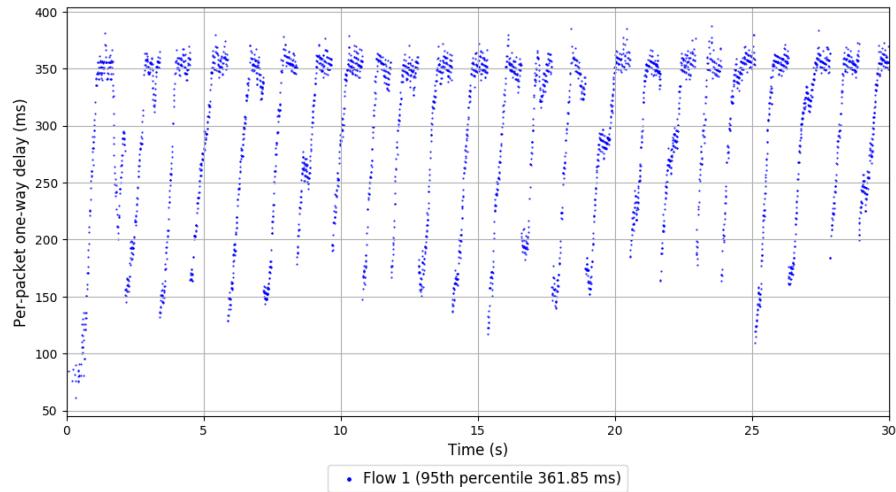
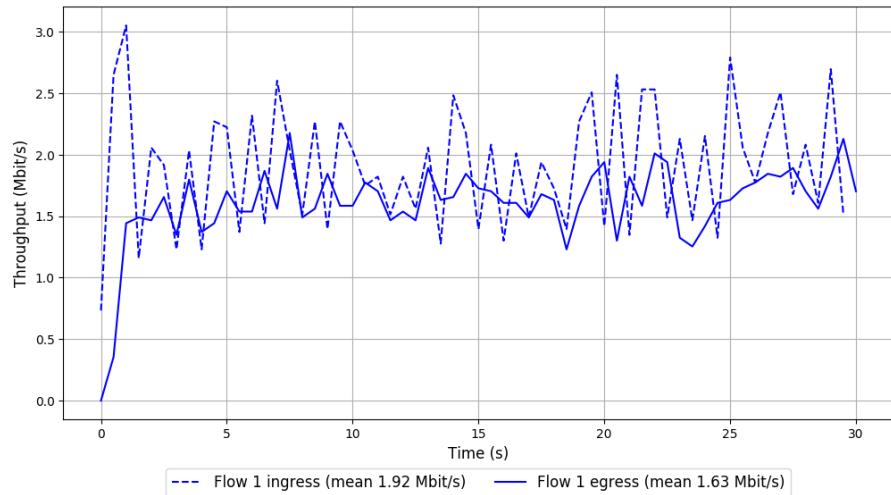


Run 1: Statistics of Verus

```
Start at: 2019-01-03 03:32:33
End at: 2019-01-03 03:33:03
Local clock offset: 2.115 ms
Remote clock offset: -4.443 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 361.853 ms
Loss rate: 14.55%
-- Flow 1:
Average throughput: 1.63 Mbit/s
95th percentile per-packet one-way delay: 361.853 ms
Loss rate: 14.55%
```

Run 1: Report of Verus — Data Link

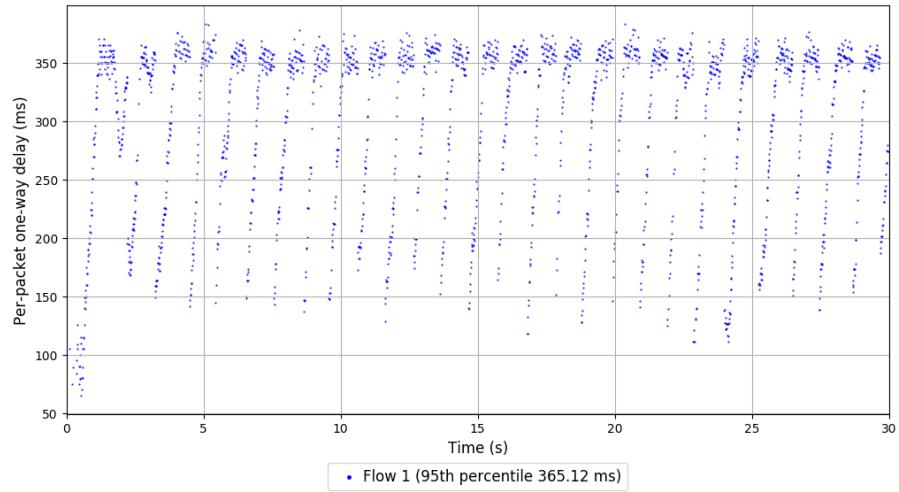
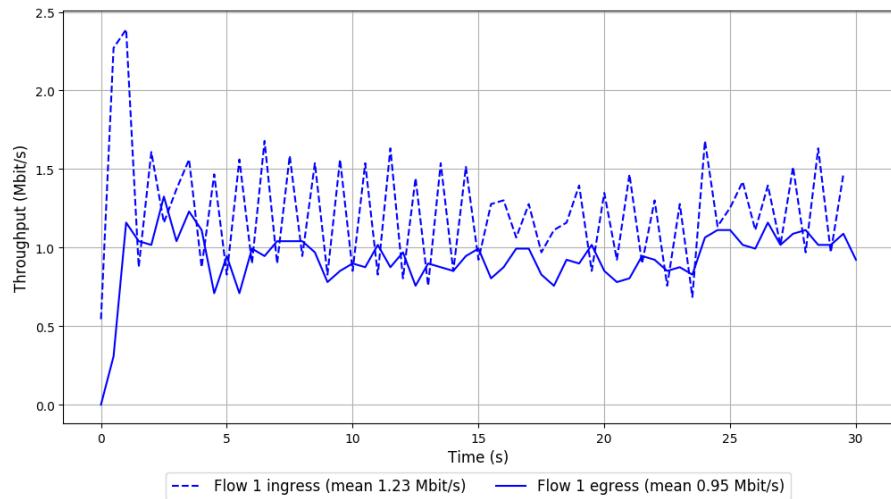


Run 2: Statistics of Verus

```
Start at: 2019-01-03 03:53:48
End at: 2019-01-03 03:54:18
Local clock offset: -1.024 ms
Remote clock offset: -3.997 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 365.119 ms
Loss rate: 22.87%
-- Flow 1:
Average throughput: 0.95 Mbit/s
95th percentile per-packet one-way delay: 365.119 ms
Loss rate: 22.87%
```

Run 2: Report of Verus — Data Link

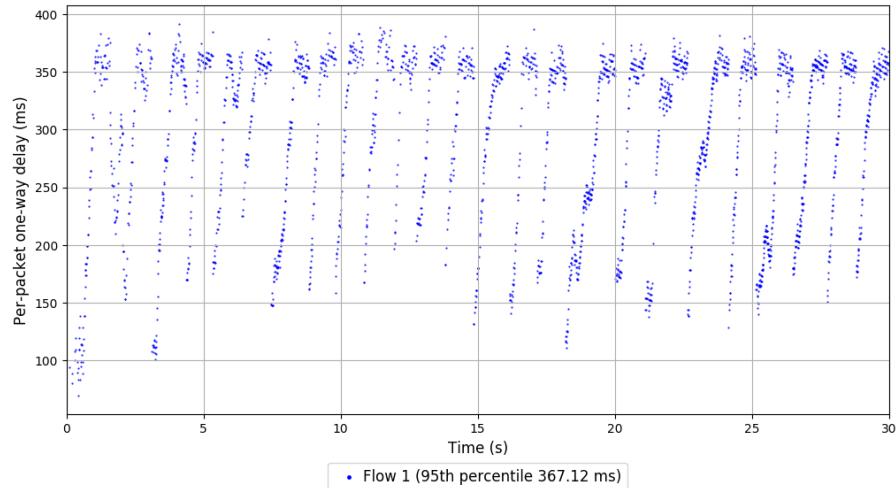
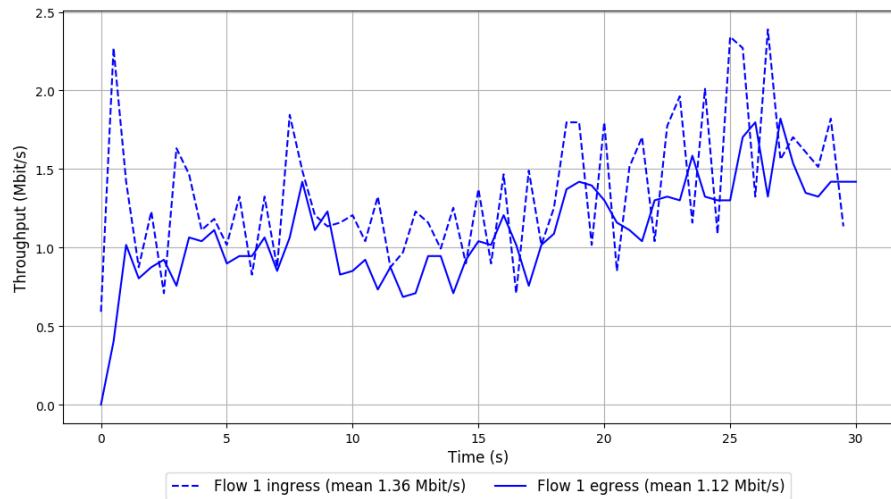


Run 3: Statistics of Verus

```
Start at: 2019-01-03 04:15:00
End at: 2019-01-03 04:15:30
Local clock offset: 3.246 ms
Remote clock offset: -7.268 ms

# Below is generated by plot.py at 2019-01-03 04:16:13
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 367.117 ms
Loss rate: 17.13%
-- Flow 1:
Average throughput: 1.12 Mbit/s
95th percentile per-packet one-way delay: 367.117 ms
Loss rate: 17.13%
```

Run 3: Report of Verus — Data Link

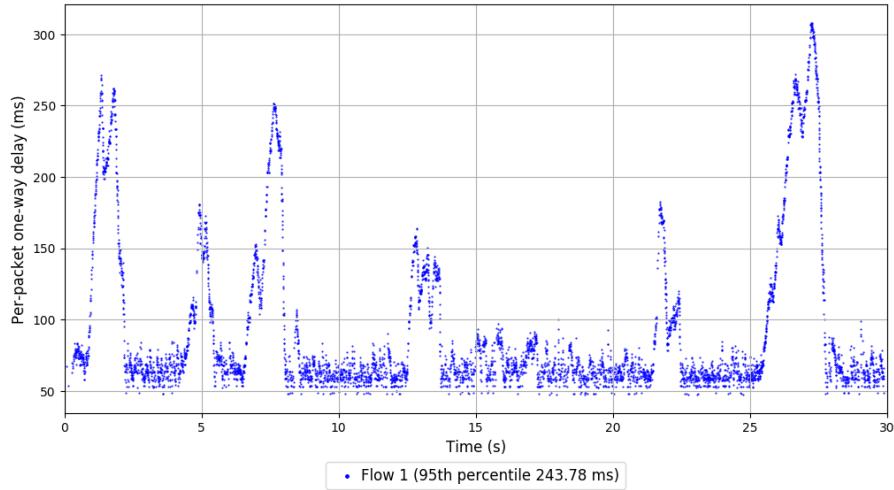
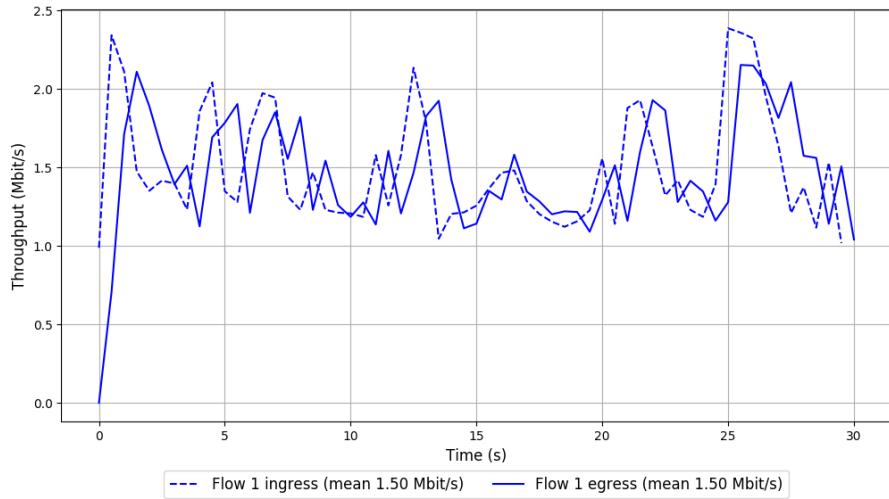


```
Run 1: Statistics of PCC-Vivace
```

```
Start at: 2019-01-03 03:12:25
End at: 2019-01-03 03:12:55
Local clock offset: -0.043 ms
Remote clock offset: -0.926 ms

# Below is generated by plot.py at 2019-01-03 04:16:14
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 243.779 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 1.50 Mbit/s
95th percentile per-packet one-way delay: 243.779 ms
Loss rate: 0.13%
```

Run 1: Report of PCC-Vivace — Data Link

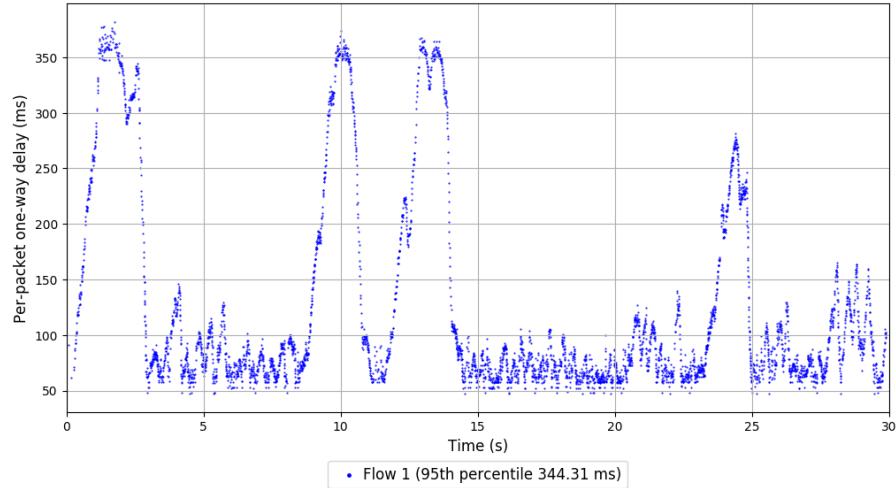
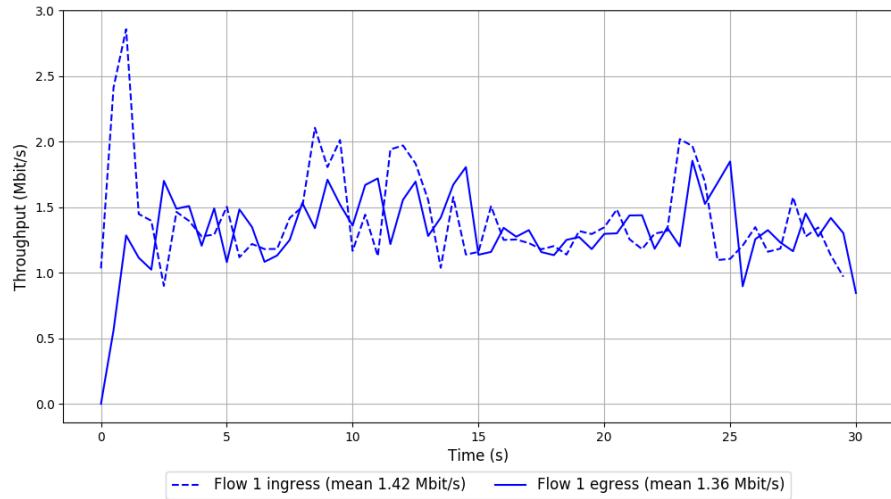


Run 2: Statistics of PCC-Vivace

```
Start at: 2019-01-03 03:33:39
End at: 2019-01-03 03:34:09
Local clock offset: -1.189 ms
Remote clock offset: -4.042 ms

# Below is generated by plot.py at 2019-01-03 04:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 344.315 ms
Loss rate: 4.76%
-- Flow 1:
Average throughput: 1.36 Mbit/s
95th percentile per-packet one-way delay: 344.315 ms
Loss rate: 4.76%
```

Run 2: Report of PCC-Vivace — Data Link

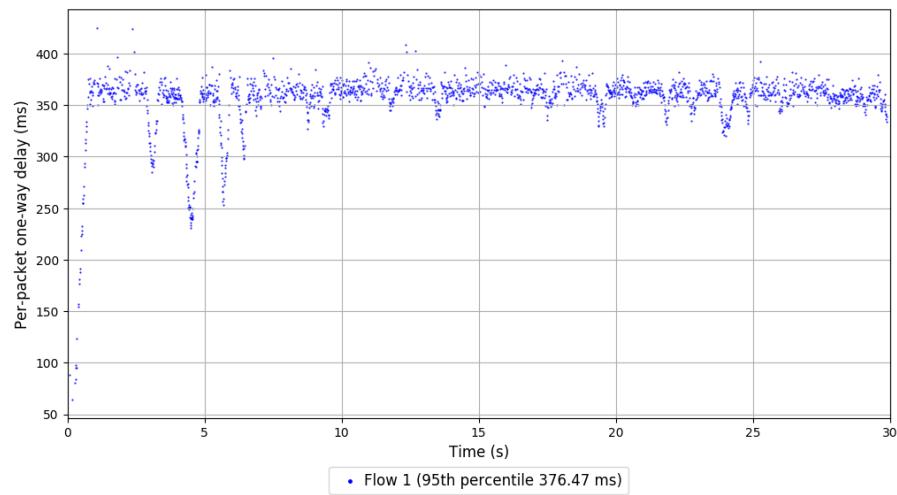
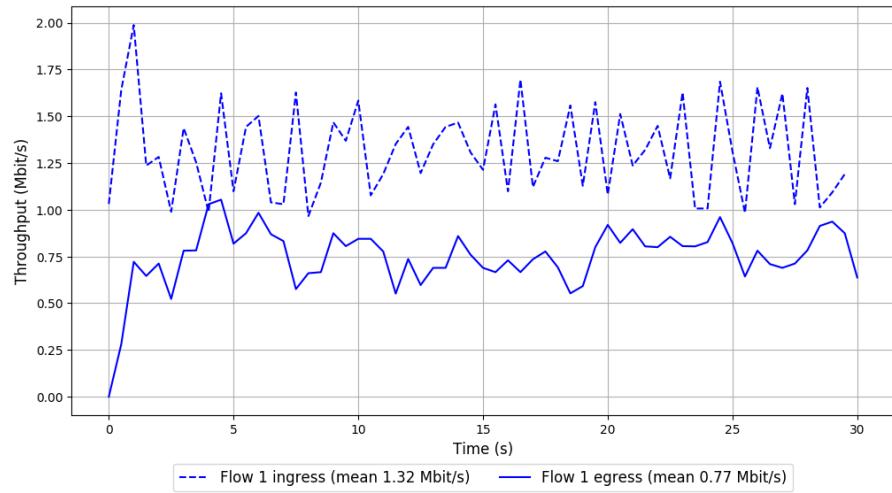


Run 3: Statistics of PCC-Vivace

```
Start at: 2019-01-03 03:54:55
End at: 2019-01-03 03:55:25
Local clock offset: -0.029 ms
Remote clock offset: -6.566 ms

# Below is generated by plot.py at 2019-01-03 04:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 376.468 ms
Loss rate: 42.13%
-- Flow 1:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 376.468 ms
Loss rate: 42.13%
```

Run 3: Report of PCC-Vivace — Data Link

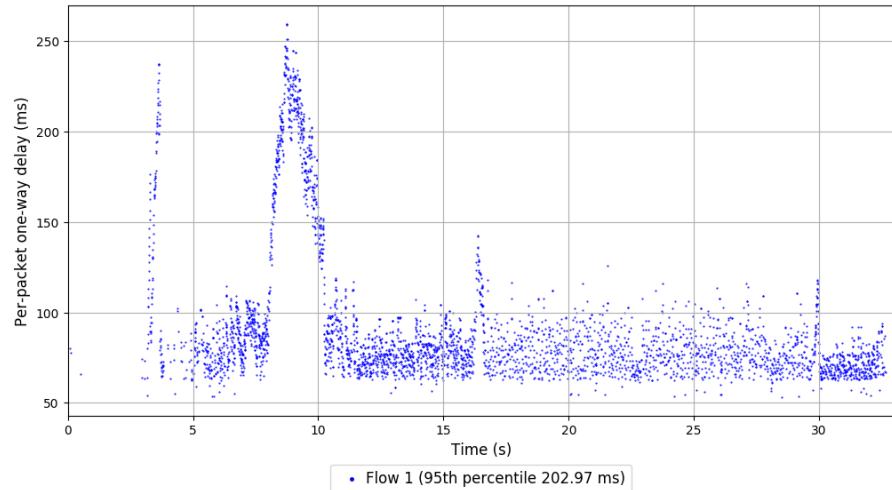
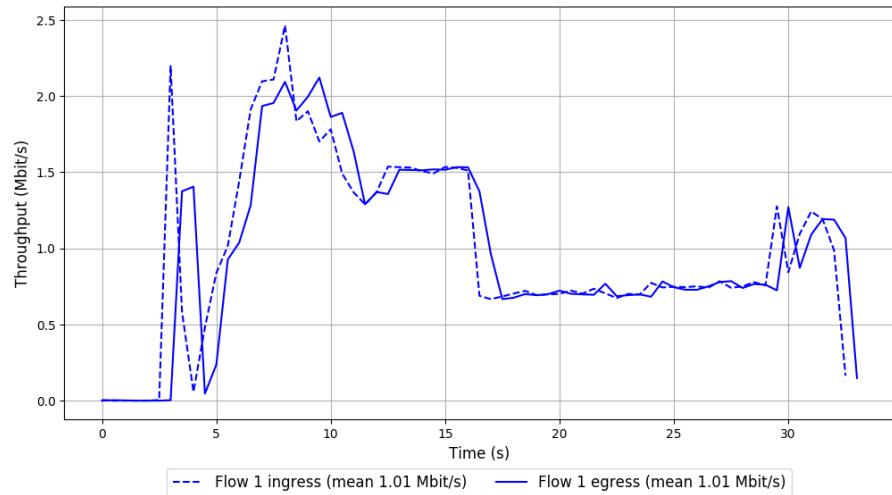


```
Run 1: Statistics of WebRTC media

Start at: 2019-01-03 03:15:48
End at: 2019-01-03 03:16:18
Local clock offset: -5.576 ms
Remote clock offset: -4.609 ms

# Below is generated by plot.py at 2019-01-03 04:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 202.968 ms
Loss rate: 0.16%
-- Flow 1:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 202.968 ms
Loss rate: 0.16%
```

Run 1: Report of WebRTC media — Data Link

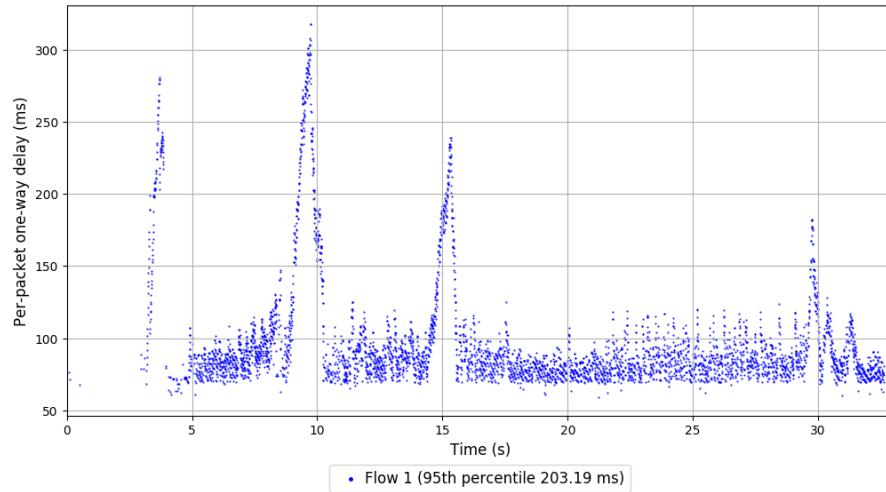
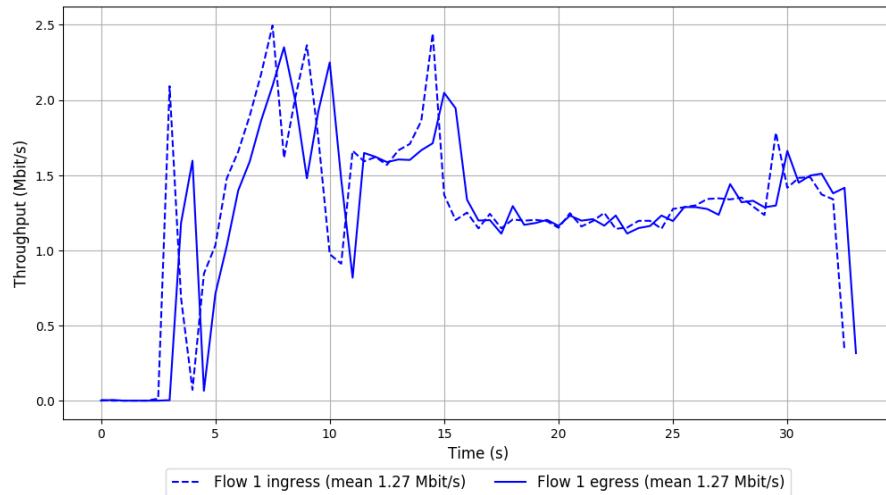


Run 2: Statistics of WebRTC media

```
Start at: 2019-01-03 03:36:58
End at: 2019-01-03 03:37:28
Local clock offset: 0.171 ms
Remote clock offset: -4.519 ms

# Below is generated by plot.py at 2019-01-03 04:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 203.189 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 1.27 Mbit/s
95th percentile per-packet one-way delay: 203.189 ms
Loss rate: 0.20%
```

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

```
Start at: 2019-01-03 03:58:13
End at: 2019-01-03 03:58:43
Local clock offset: 2.624 ms
Remote clock offset: -6.749 ms

# Below is generated by plot.py at 2019-01-03 04:16:15
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 269.846 ms
Loss rate: 1.79%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 269.846 ms
Loss rate: 1.79%
```

Run 3: Report of WebRTC media — Data Link

