

Pantheon Report

Generated at 2019-01-18 18:42:02 (UTC).

Data path: AWS India 1 on `ens5` (*local*) → India cellular on `ppp0` (*remote*).

Repeated the test of 21 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:

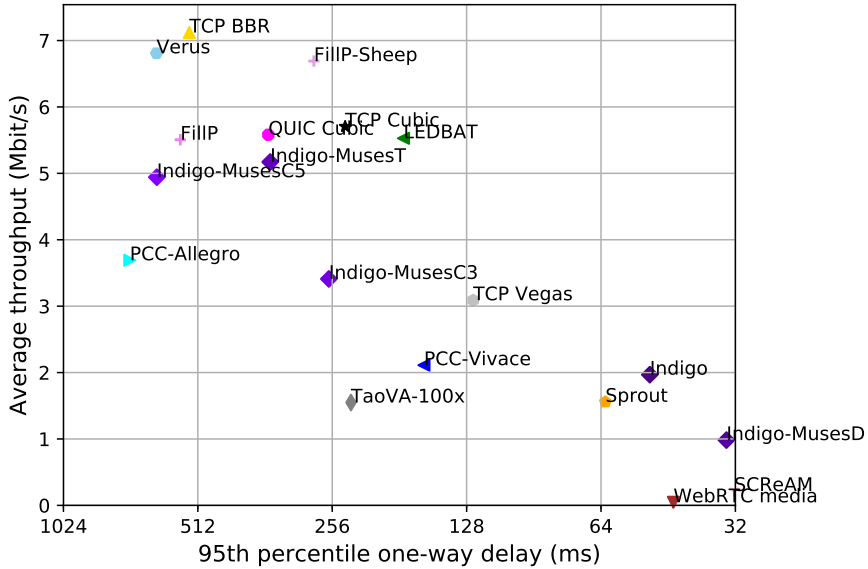
```
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

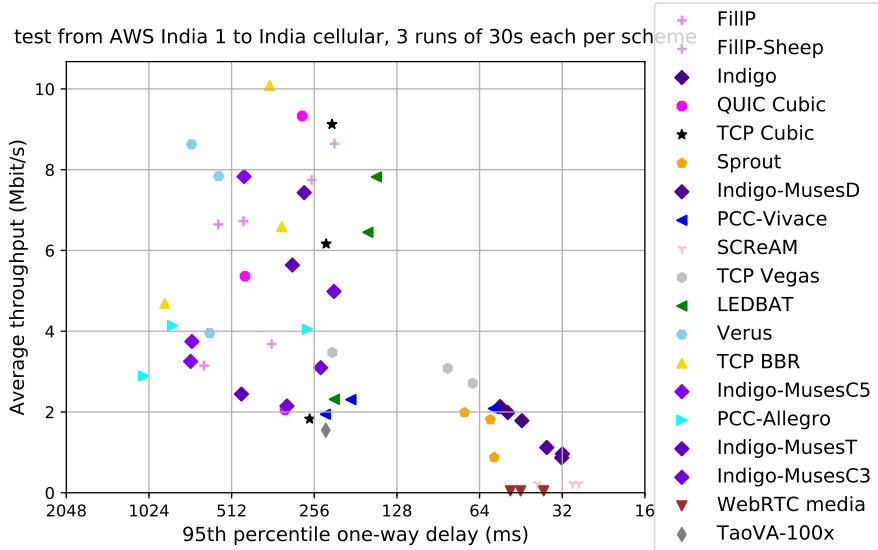
```
branch: muses @ c80a283586bf7b0cc1fe08c69c8f60d56498f81c
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ c3eee875824760ec5b2fd207fefe166e1afe2170
third_party/pantheon-tunnel @ f866d3f58d27afd942717625ee3a354cc2e802bd
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-quick @ 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 AWS India 1 to India cellular, 3 runs of 30s each per scheme
(mean of all runs by scheme)



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



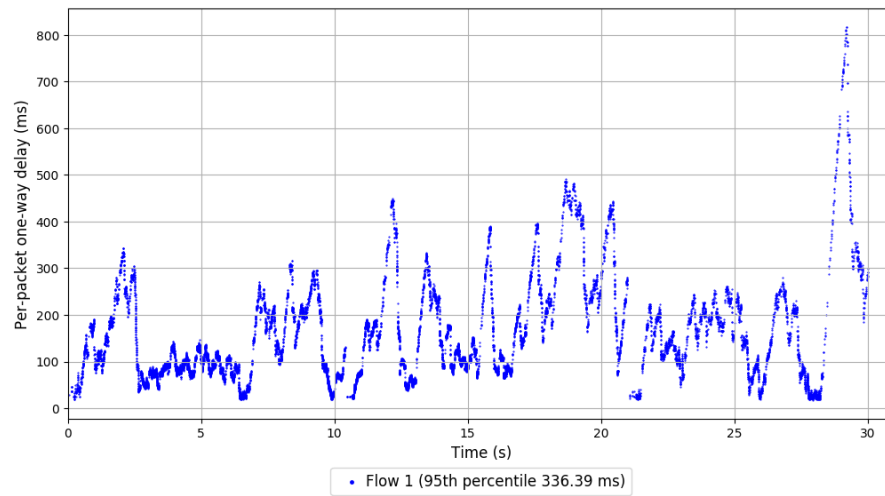
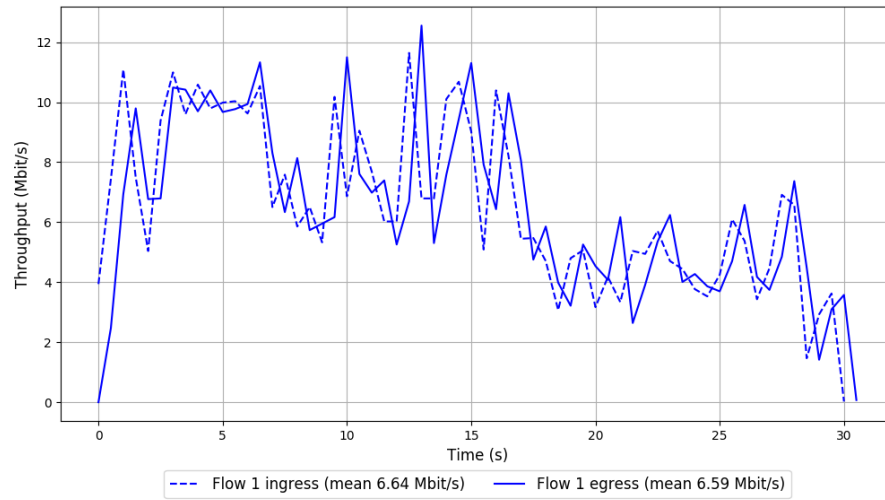
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	7.12	535.05	1.15
Copa	0	N/A	N/A	N/A
TCP Cubic	3	5.70	239.53	0.45
FillP	3	5.51	560.40	1.82
FillP-Sheep	3	6.69	281.39	0.94
Indigo	3	1.97	49.76	0.03
Indigo-MusesC3	3	3.41	260.51	0.56
Indigo-MusesC5	3	4.94	632.63	1.19
Indigo-MusesD	3	0.98	33.52	0.06
Indigo-MusesT	3	5.17	352.54	0.55
LEDBAT	3	5.53	177.26	0.41
PCC-Allegro	3	3.69	727.27	10.86
PCC-Expr	0	N/A	N/A	N/A
QUIC Cubic	3	5.58	355.98	1.34
SCReAM	3	0.22	32.20	0.04
Sprout	3	1.56	62.58	0.06
TaoVA-100x	1	1.55	232.44	40.91
TCP Vegas	3	3.09	123.79	0.07
Verus	3	6.81	633.78	0.80
PCC-Vivace	3	2.11	159.53	0.06
WebRTC media	3	0.05	44.06	0.00

Run 1: Statistics of TCP BBR

Start at: 2019-01-18 17:39:52
End at: 2019-01-18 17:40:22
Local clock offset: -1.097 ms
Remote clock offset: -1.635 ms

Below is generated by plot.py at 2019-01-18 18:41:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.59 Mbit/s
95th percentile per-packet one-way delay: 336.388 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 6.59 Mbit/s
95th percentile per-packet one-way delay: 336.388 ms
Loss rate: 0.77%

Run 1: Report of TCP BBR — Data Link

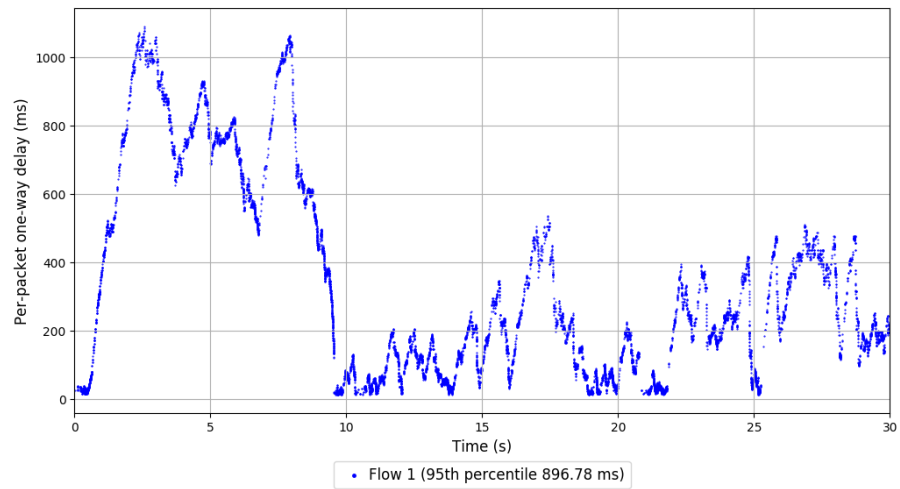
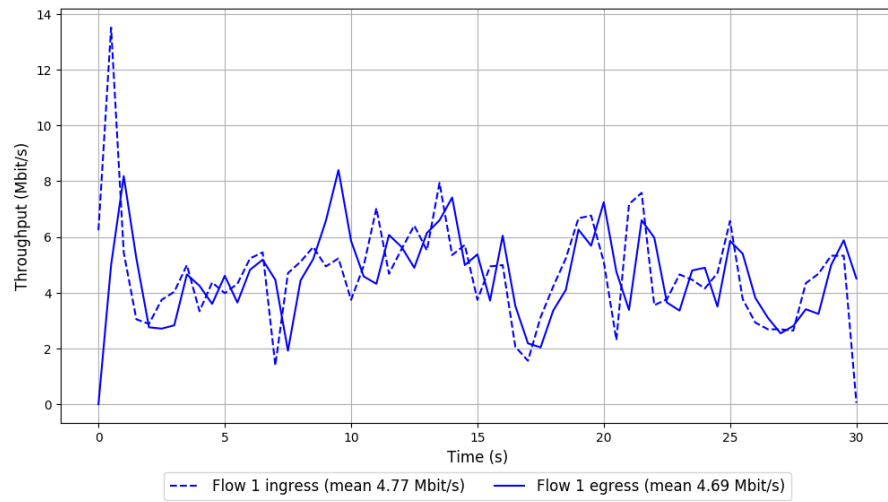


Run 2: Statistics of TCP BBR

Start at: 2019-01-18 18:03:21
End at: 2019-01-18 18:03:51
Local clock offset: -0.949 ms
Remote clock offset: -1.015 ms

Below is generated by plot.py at 2019-01-18 18:41:15
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.69 Mbit/s
95th percentile per-packet one-way delay: 896.784 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 4.69 Mbit/s
95th percentile per-packet one-way delay: 896.784 ms
Loss rate: 1.85%

Run 2: Report of TCP BBR — Data Link

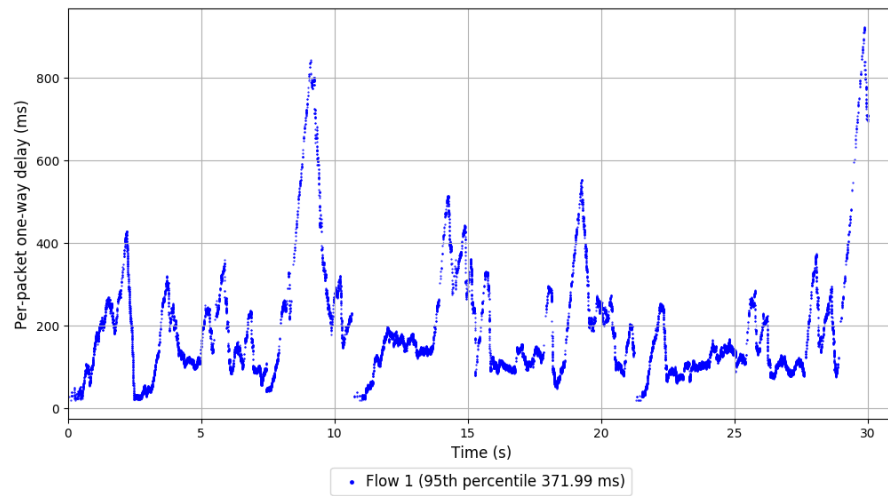
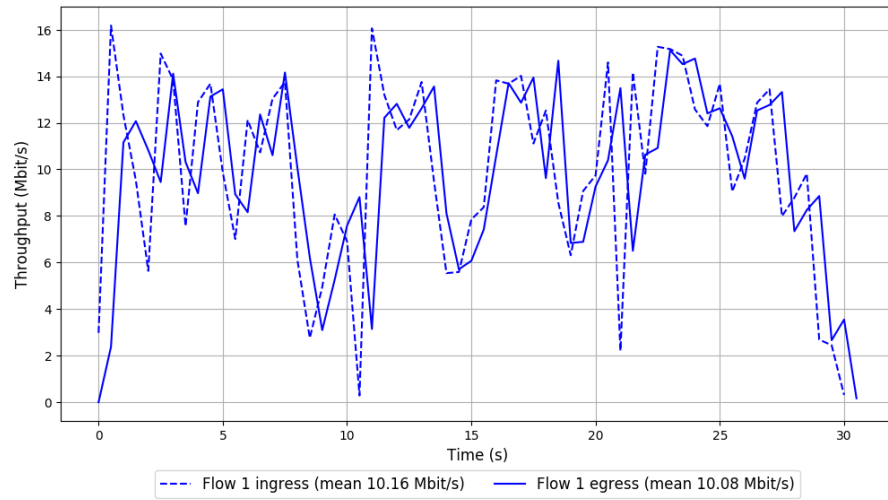


Run 3: Statistics of TCP BBR

Start at: 2019-01-18 18:26:51
End at: 2019-01-18 18:27:21
Local clock offset: -4.459 ms
Remote clock offset: -1.793 ms

Below is generated by plot.py at 2019-01-18 18:41:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.08 Mbit/s
95th percentile per-packet one-way delay: 371.987 ms
Loss rate: 0.82%
-- Flow 1:
Average throughput: 10.08 Mbit/s
95th percentile per-packet one-way delay: 371.987 ms
Loss rate: 0.82%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

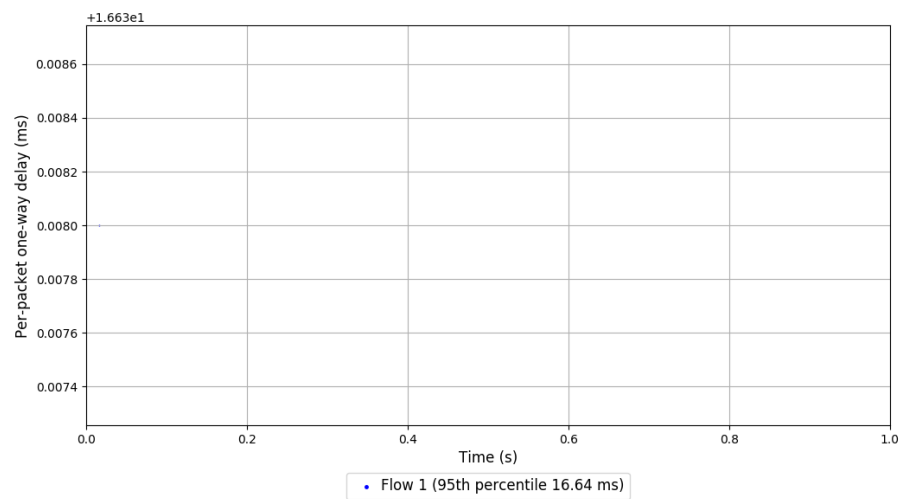
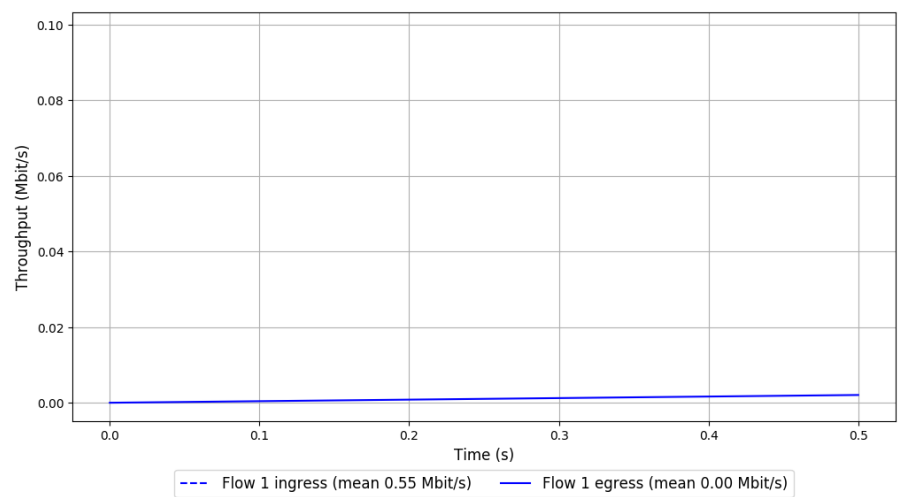
Start at: 2019-01-18 17:34:21

End at: 2019-01-18 17:34:51

Local clock offset: 0.152 ms

Remote clock offset: -0.912 ms

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

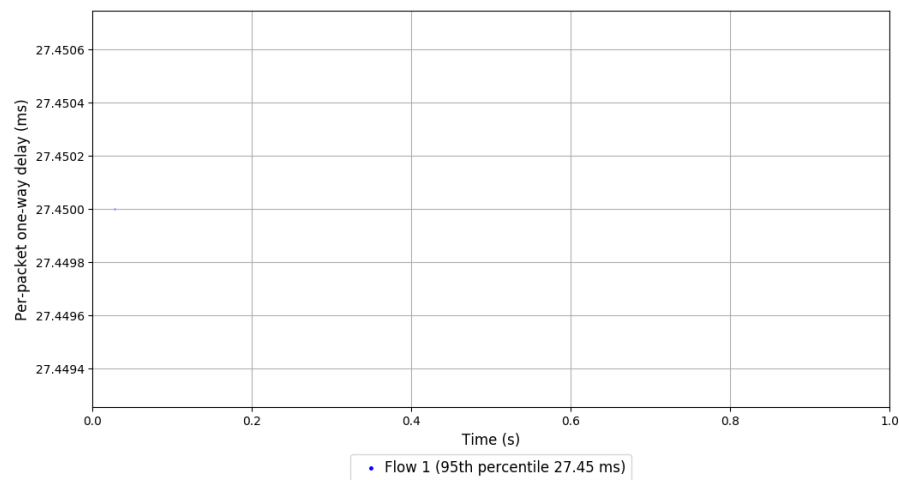
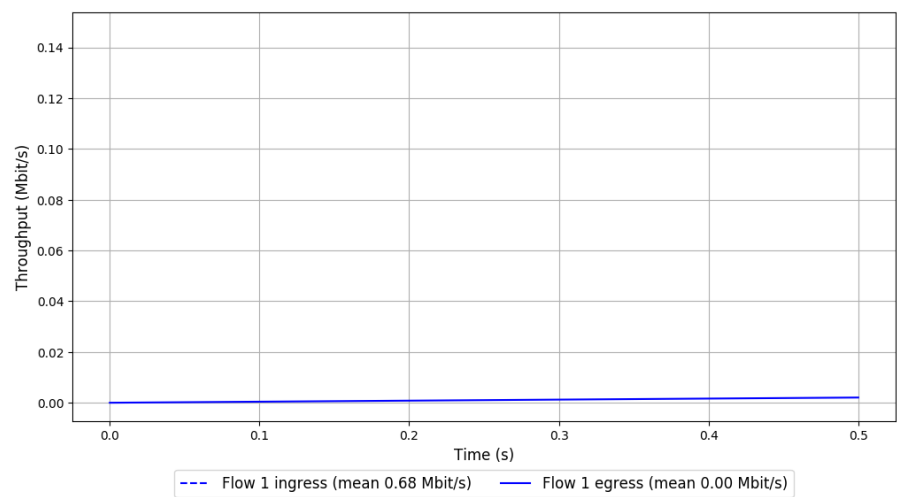
Start at: 2019-01-18 17:57:50

End at: 2019-01-18 17:58:20

Local clock offset: -2.264 ms

Remote clock offset: -0.737 ms

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

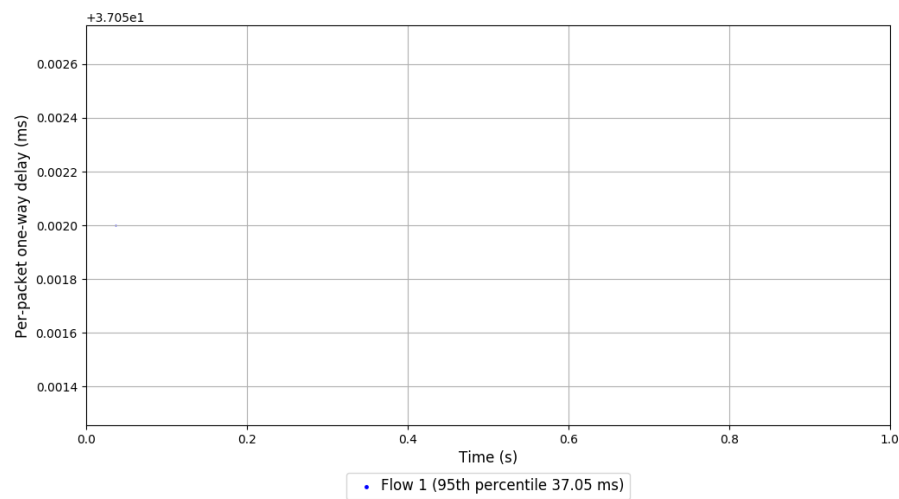
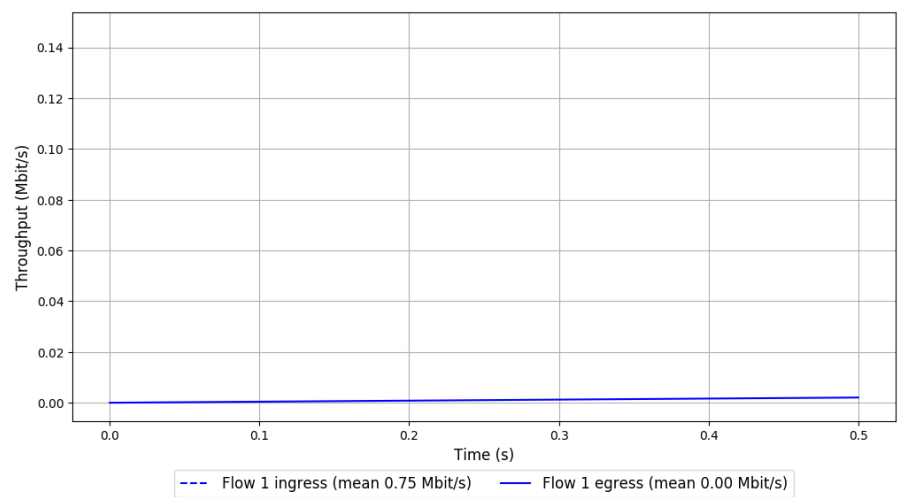
Start at: 2019-01-18 18:21:19

End at: 2019-01-18 18:21:49

Local clock offset: -3.009 ms

Remote clock offset: -0.92 ms

Run 3: Report of Copa — Data Link

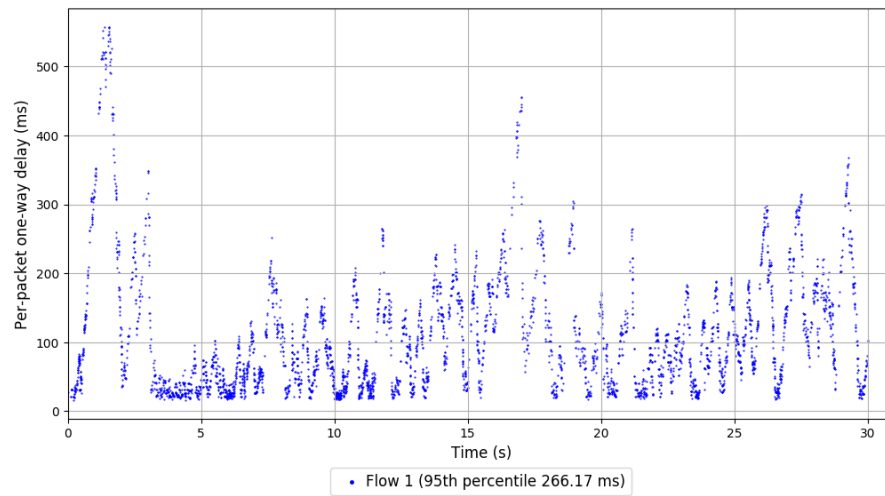
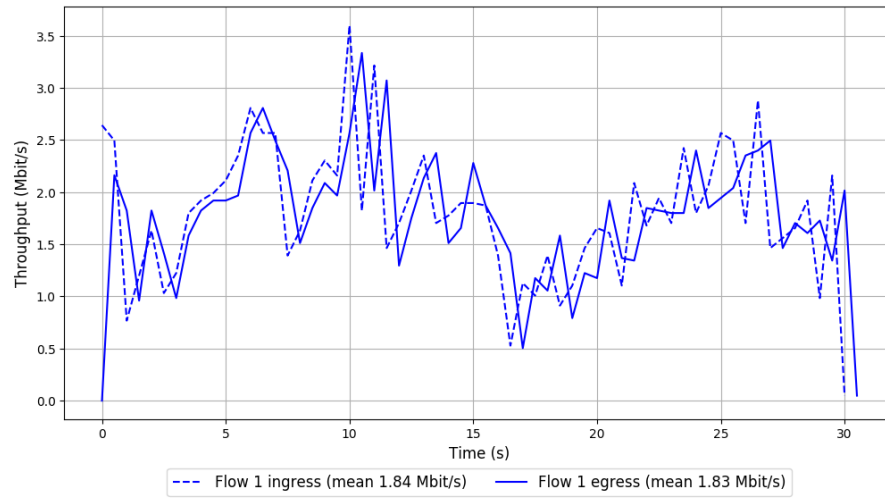


Run 1: Statistics of TCP Cubic

Start at: 2019-01-18 17:51:09
End at: 2019-01-18 17:51:39
Local clock offset: 0.194 ms
Remote clock offset: -1.175 ms

Below is generated by plot.py at 2019-01-18 18:41:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 266.172 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 266.172 ms
Loss rate: 0.76%

Run 1: Report of TCP Cubic — Data Link

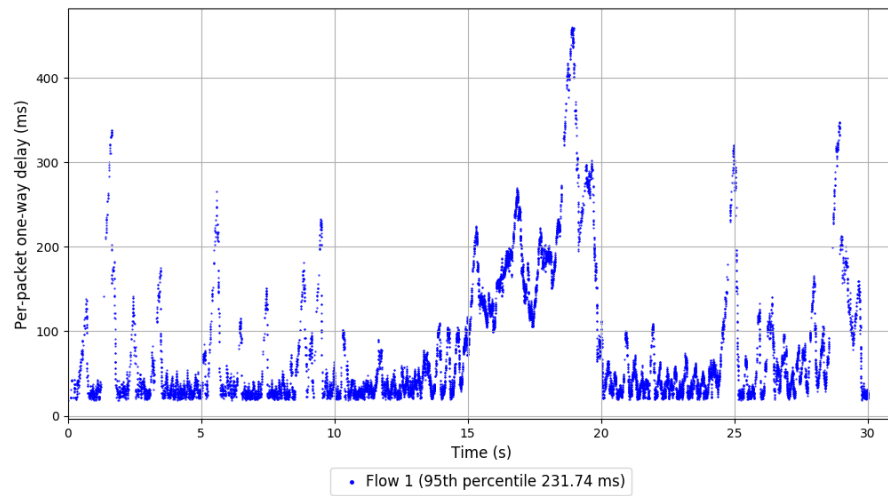
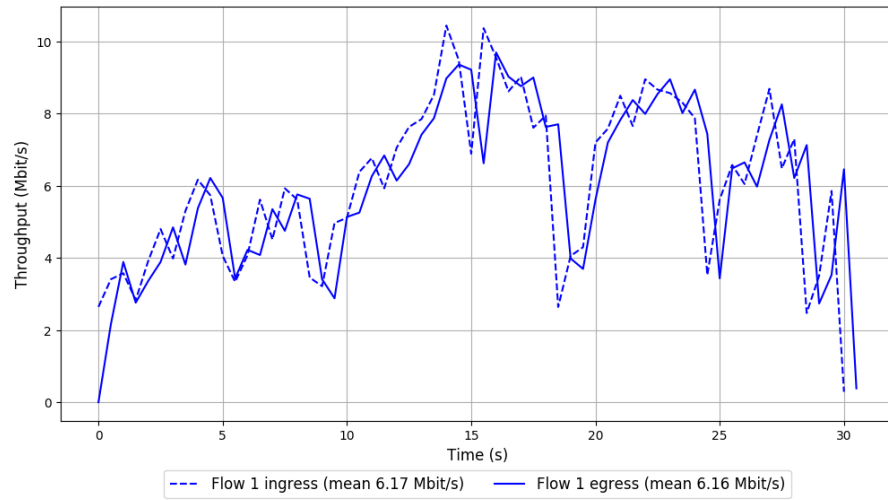


Run 2: Statistics of TCP Cubic

Start at: 2019-01-18 18:14:27
End at: 2019-01-18 18:14:57
Local clock offset: -2.828 ms
Remote clock offset: -1.499 ms

Below is generated by plot.py at 2019-01-18 18:41:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.16 Mbit/s
95th percentile per-packet one-way delay: 231.739 ms
Loss rate: 0.14%
-- Flow 1:
Average throughput: 6.16 Mbit/s
95th percentile per-packet one-way delay: 231.739 ms
Loss rate: 0.14%

Run 2: Report of TCP Cubic — Data Link

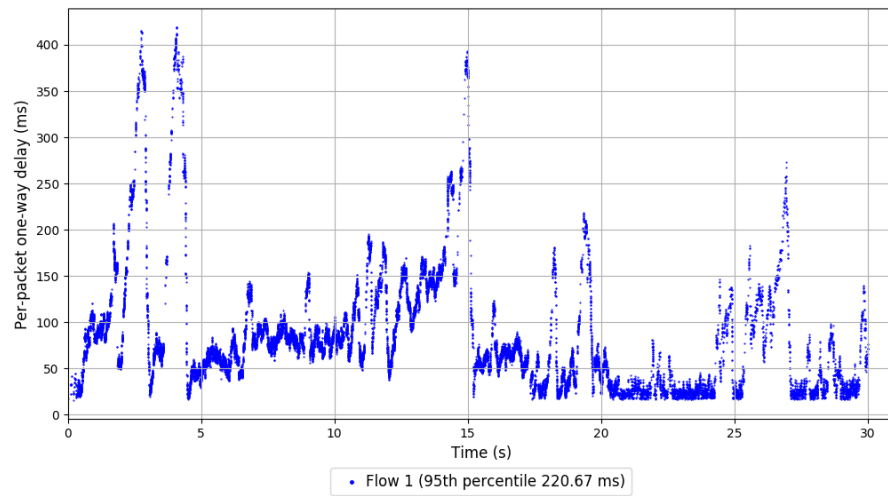
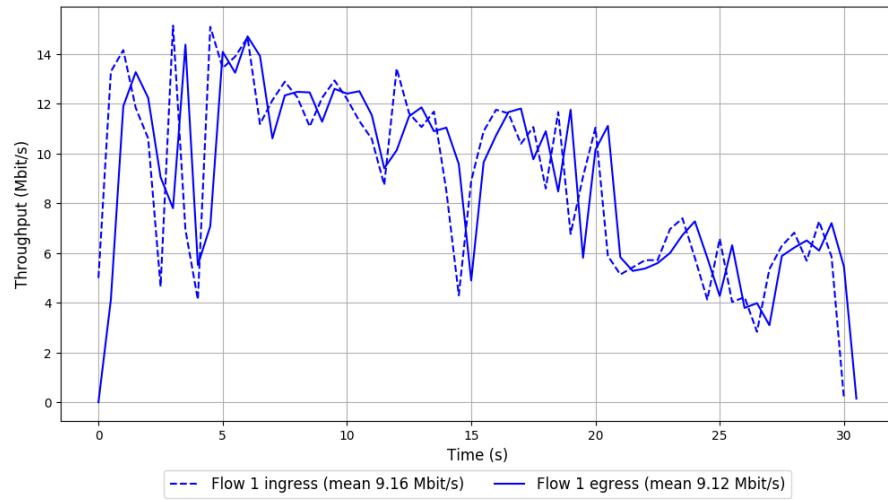


Run 3: Statistics of TCP Cubic

Start at: 2019-01-18 18:38:14
End at: 2019-01-18 18:38:44
Local clock offset: -2.522 ms
Remote clock offset: -1.478 ms

Below is generated by plot.py at 2019-01-18 18:41:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.12 Mbit/s
95th percentile per-packet one-way delay: 220.670 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 9.12 Mbit/s
95th percentile per-packet one-way delay: 220.670 ms
Loss rate: 0.45%

Run 3: Report of TCP Cubic — Data Link

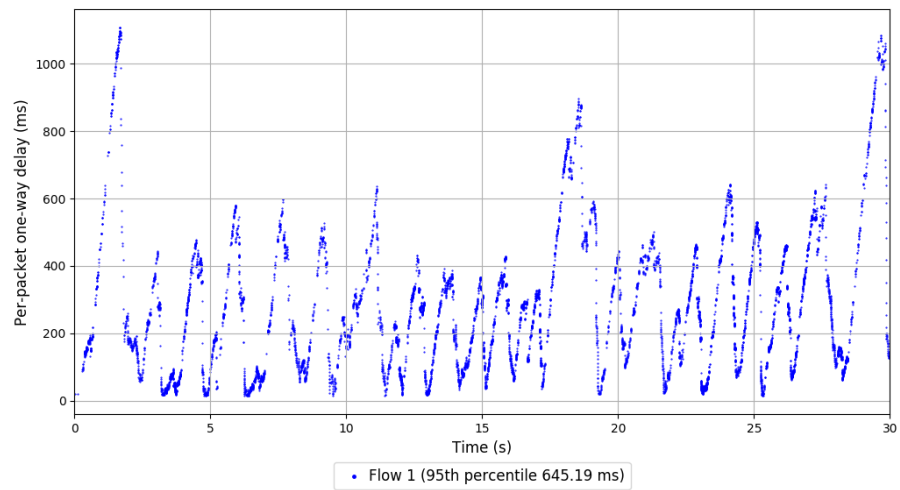
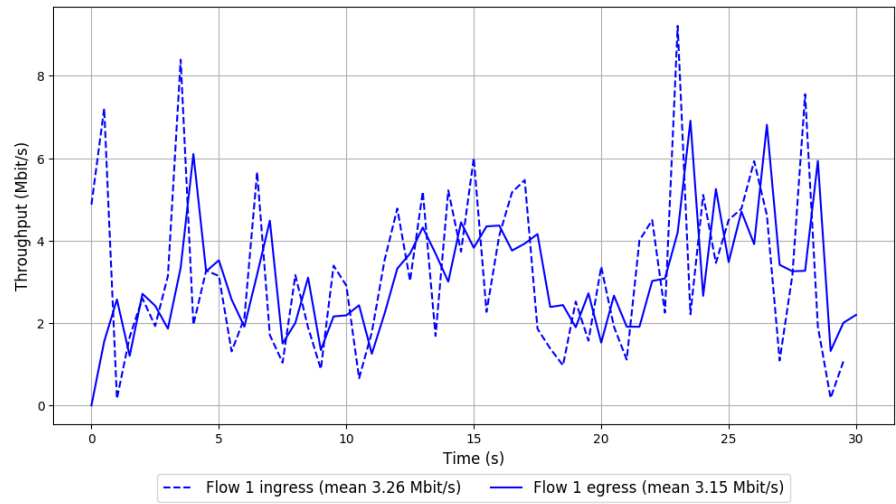


Run 1: Statistics of FillP

Start at: 2019-01-18 17:47:49
End at: 2019-01-18 17:48:19
Local clock offset: 0.678 ms
Remote clock offset: -0.832 ms

Below is generated by plot.py at 2019-01-18 18:41:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 645.193 ms
Loss rate: 3.41%
-- Flow 1:
Average throughput: 3.15 Mbit/s
95th percentile per-packet one-way delay: 645.193 ms
Loss rate: 3.41%

Run 1: Report of FillP — Data Link

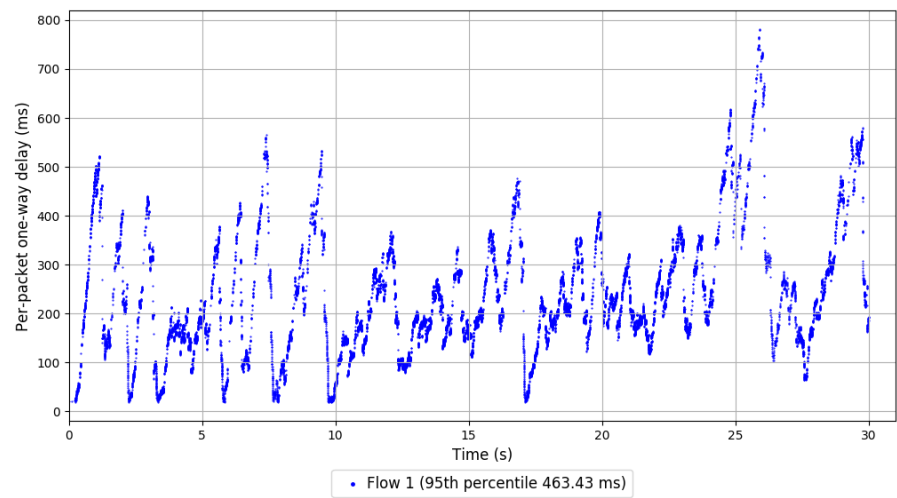
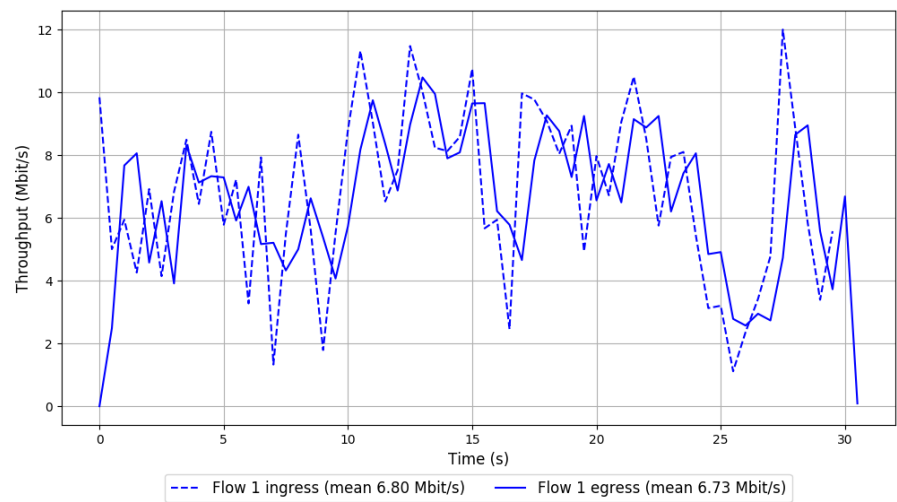


Run 2: Statistics of FillP

Start at: 2019-01-18 18:11:07
End at: 2019-01-18 18:11:37
Local clock offset: -1.81 ms
Remote clock offset: -0.632 ms

Below is generated by plot.py at 2019-01-18 18:41:20
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.73 Mbit/s
95th percentile per-packet one-way delay: 463.434 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 6.73 Mbit/s
95th percentile per-packet one-way delay: 463.434 ms
Loss rate: 1.12%

Run 2: Report of FillP — Data Link

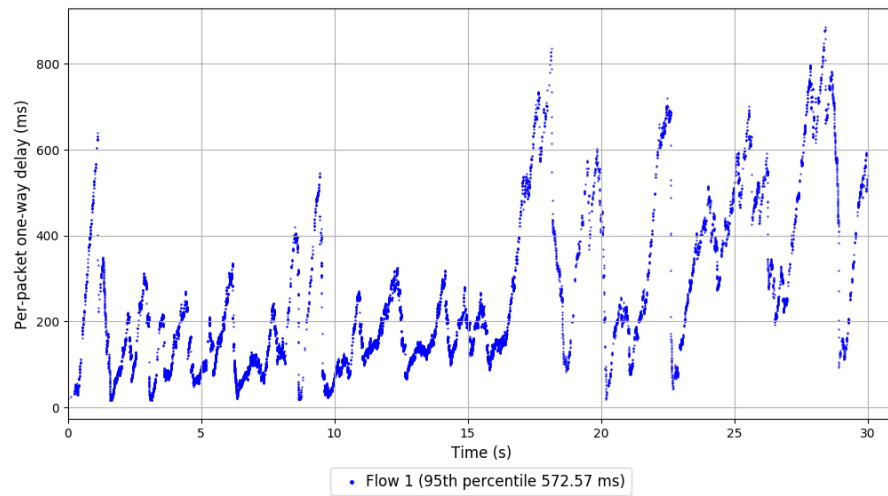
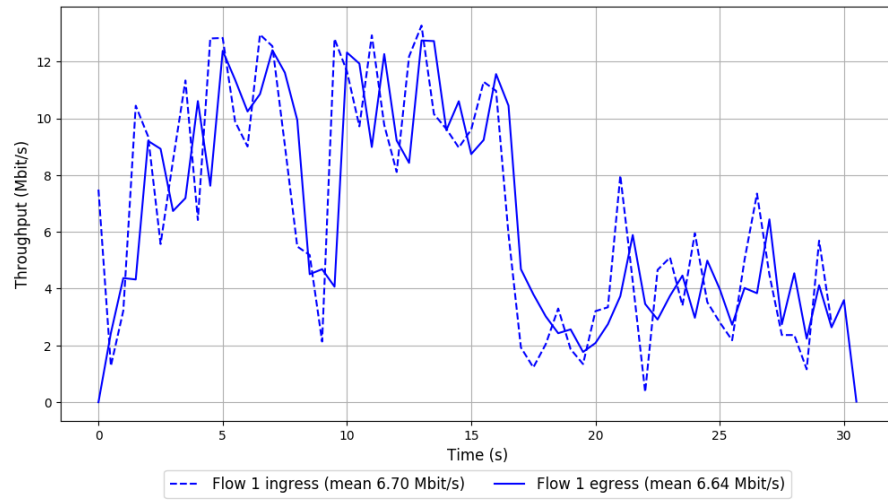


Run 3: Statistics of FillP

Start at: 2019-01-18 18:34:46
End at: 2019-01-18 18:35:16
Local clock offset: -2.413 ms
Remote clock offset: -1.037 ms

Below is generated by plot.py at 2019-01-18 18:41:21
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.64 Mbit/s
95th percentile per-packet one-way delay: 572.572 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 6.64 Mbit/s
95th percentile per-packet one-way delay: 572.572 ms
Loss rate: 0.92%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-18 17:43:16

End at: 2019-01-18 17:43:46

Local clock offset: 0.312 ms

Remote clock offset: -2.304 ms

Below is generated by plot.py at 2019-01-18 18:41:21

Datalink statistics

-- Total of 1 flow:

Average throughput: 3.68 Mbit/s

95th percentile per-packet one-way delay: 366.181 ms

Loss rate: 2.23%

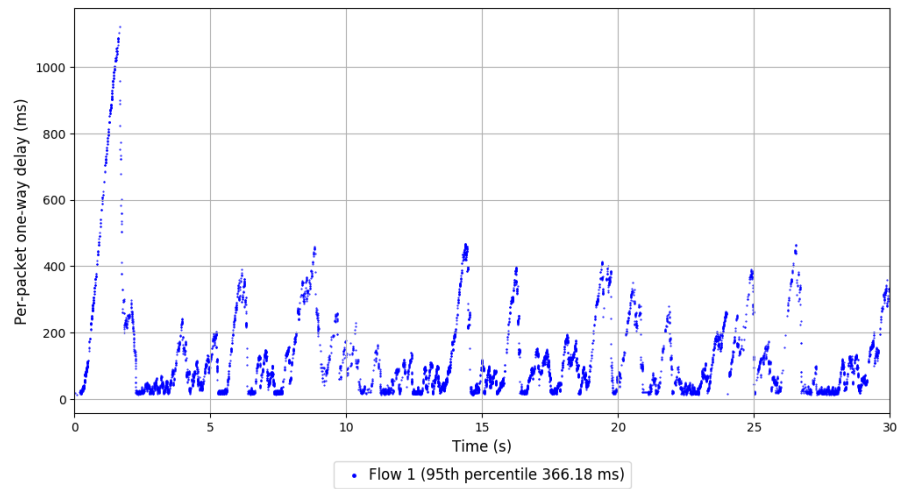
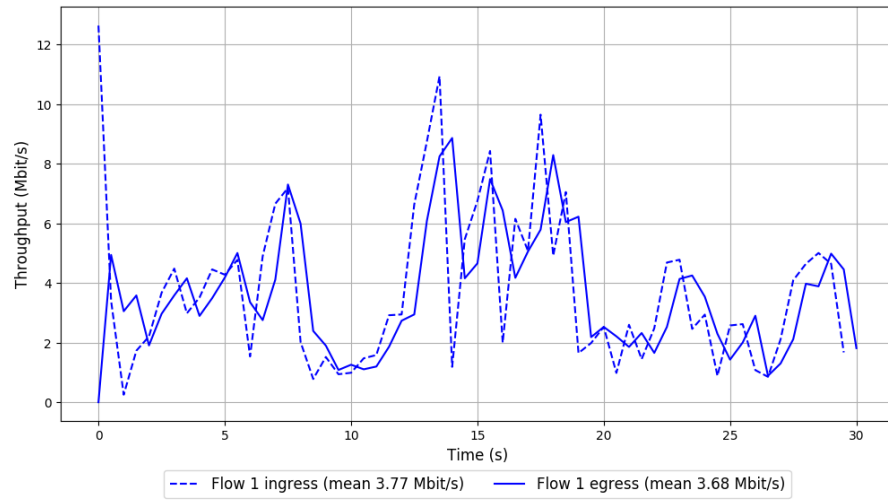
-- Flow 1:

Average throughput: 3.68 Mbit/s

95th percentile per-packet one-way delay: 366.181 ms

Loss rate: 2.23%

Run 1: Report of FillP-Sheep — Data Link

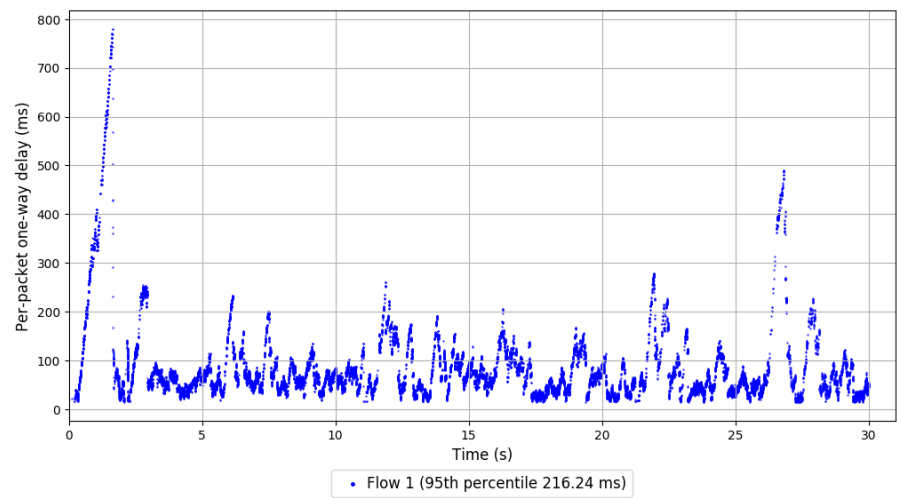
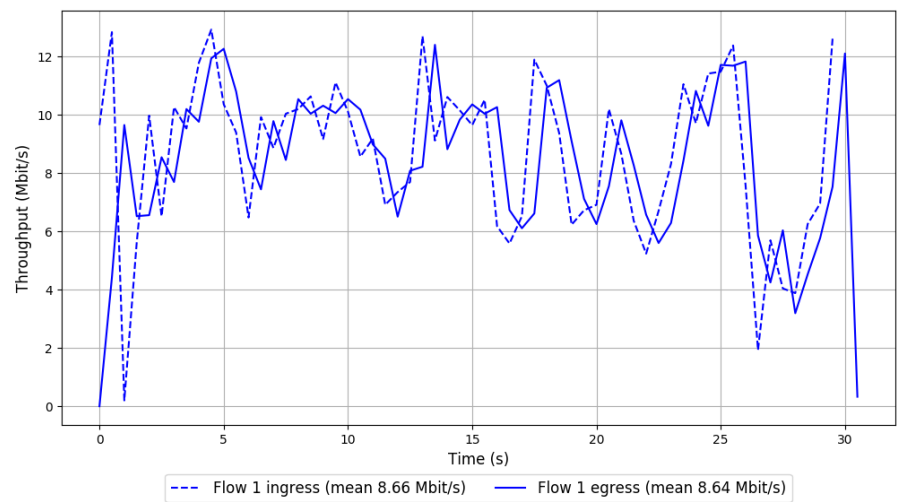


Run 2: Statistics of FillP-Sheep

Start at: 2019-01-18 18:06:42
End at: 2019-01-18 18:07:12
Local clock offset: -2.269 ms
Remote clock offset: -0.754 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.64 Mbit/s
95th percentile per-packet one-way delay: 216.243 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 8.64 Mbit/s
95th percentile per-packet one-way delay: 216.243 ms
Loss rate: 0.17%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-01-18 18:30:19

End at: 2019-01-18 18:30:49

Local clock offset: -3.582 ms

Remote clock offset: -1.16 ms

Below is generated by plot.py at 2019-01-18 18:41:31

Datalink statistics

-- Total of 1 flow:

Average throughput: 7.74 Mbit/s

95th percentile per-packet one-way delay: 261.755 ms

Loss rate: 0.42%

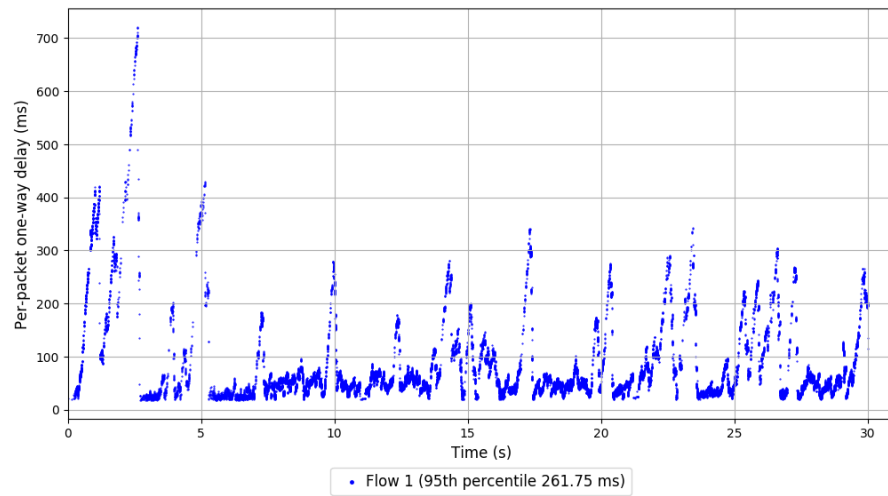
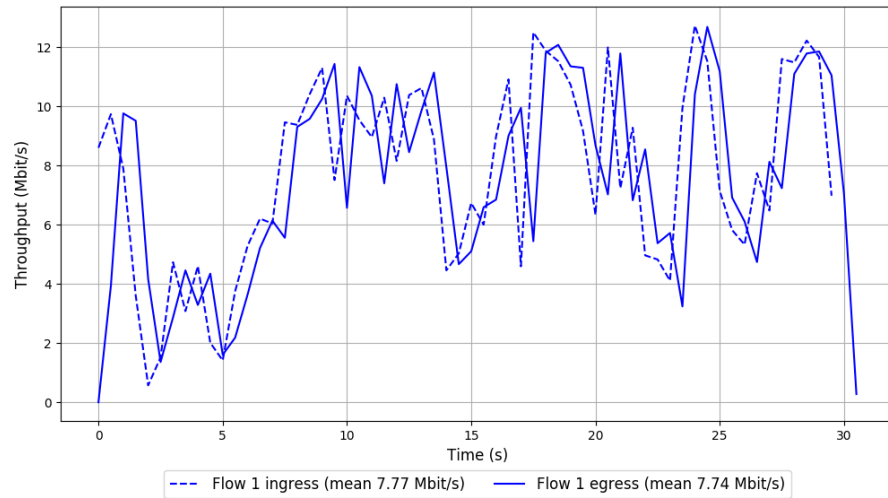
-- Flow 1:

Average throughput: 7.74 Mbit/s

95th percentile per-packet one-way delay: 261.755 ms

Loss rate: 0.42%

Run 3: Report of FillP-Sheep — Data Link

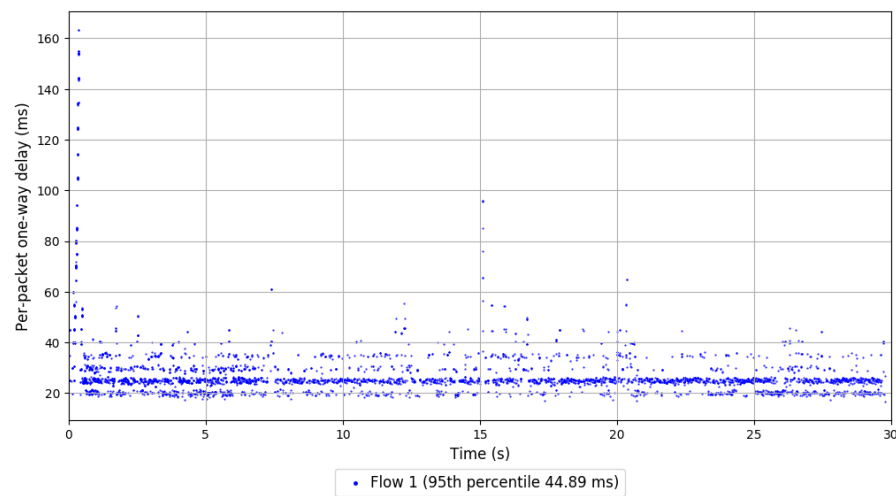
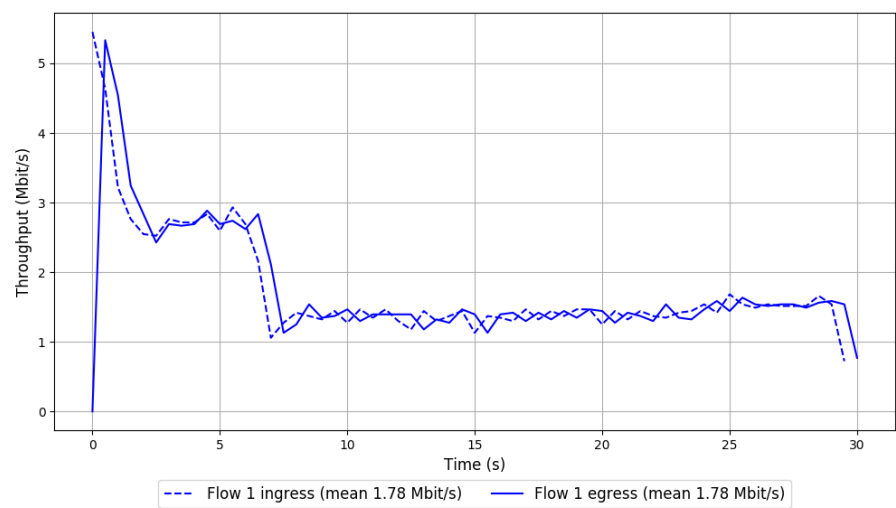


```
Run 1: Statistics of Indigo

Start at: 2019-01-18 17:41:02
End at: 2019-01-18 17:41:32
Local clock offset: -0.139 ms
Remote clock offset: -1.365 ms

# Below is generated by plot.py at 2019-01-18 18:41:31
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 44.893 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 1.78 Mbit/s
95th percentile per-packet one-way delay: 44.893 ms
Loss rate: 0.02%
```

Run 1: Report of Indigo — Data Link

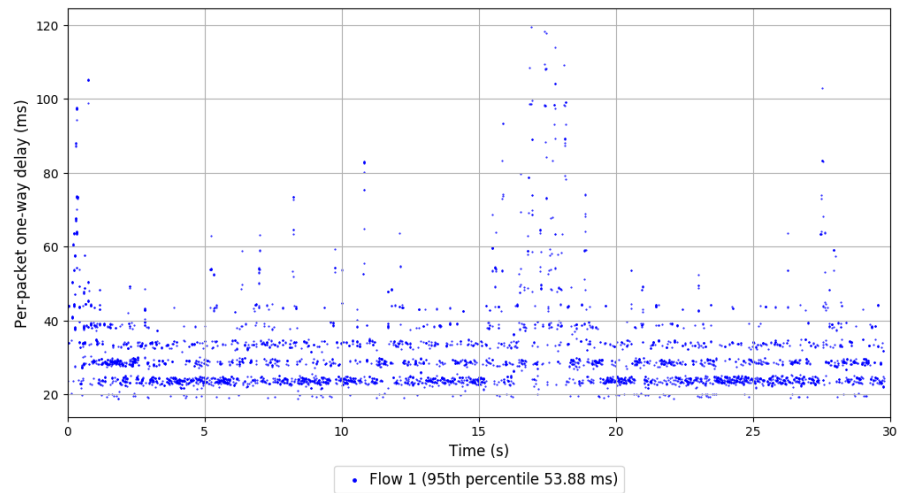
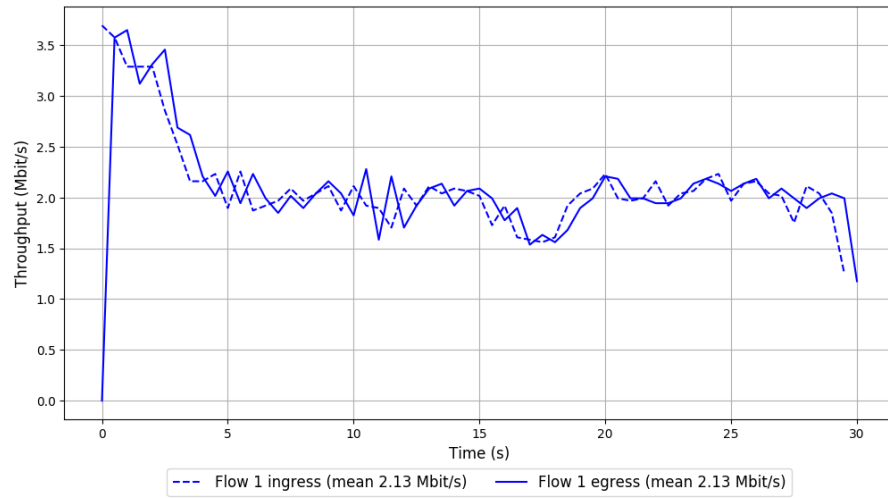


Run 2: Statistics of Indigo

Start at: 2019-01-18 18:04:28
End at: 2019-01-18 18:04:58
Local clock offset: -2.755 ms
Remote clock offset: -0.306 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 53.879 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 2.13 Mbit/s
95th percentile per-packet one-way delay: 53.879 ms
Loss rate: 0.06%

Run 2: Report of Indigo — Data Link

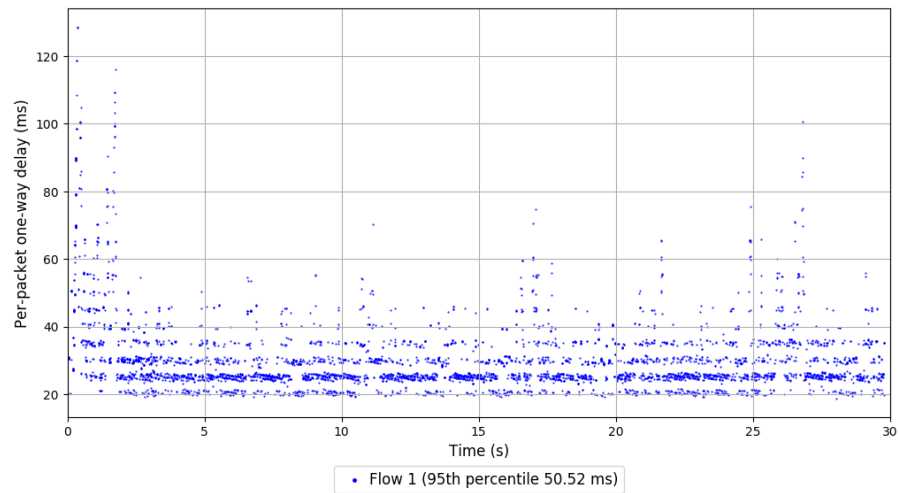
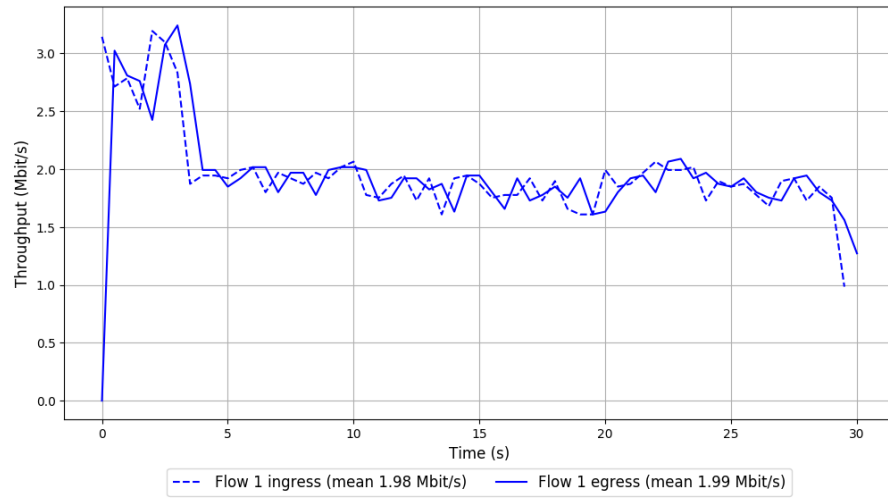


Run 3: Statistics of Indigo

Start at: 2019-01-18 18:27:59
End at: 2019-01-18 18:28:29
Local clock offset: -2.524 ms
Remote clock offset: -0.364 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 50.516 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 50.516 ms
Loss rate: 0.02%

Run 3: Report of Indigo — Data Link

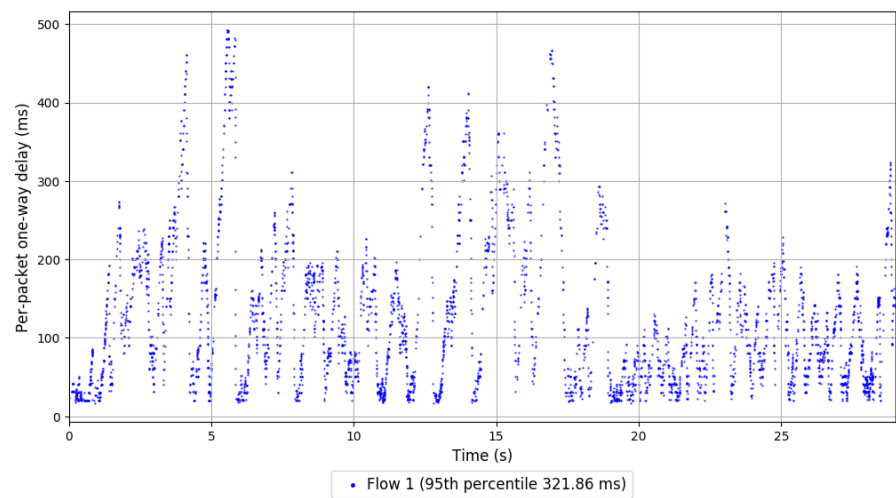
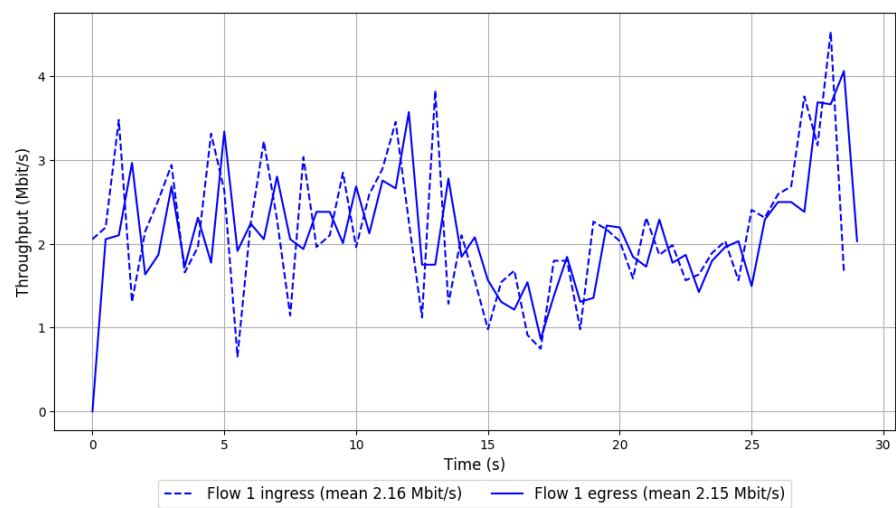


Run 1: Statistics of Indigo-MusesC3

Start at: 2019-01-18 17:53:23
End at: 2019-01-18 17:53:53
Local clock offset: -0.875 ms
Remote clock offset: -1.495 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 321.857 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 2.15 Mbit/s
95th percentile per-packet one-way delay: 321.857 ms
Loss rate: 0.71%

Run 1: Report of Indigo-MusesC3 — Data Link

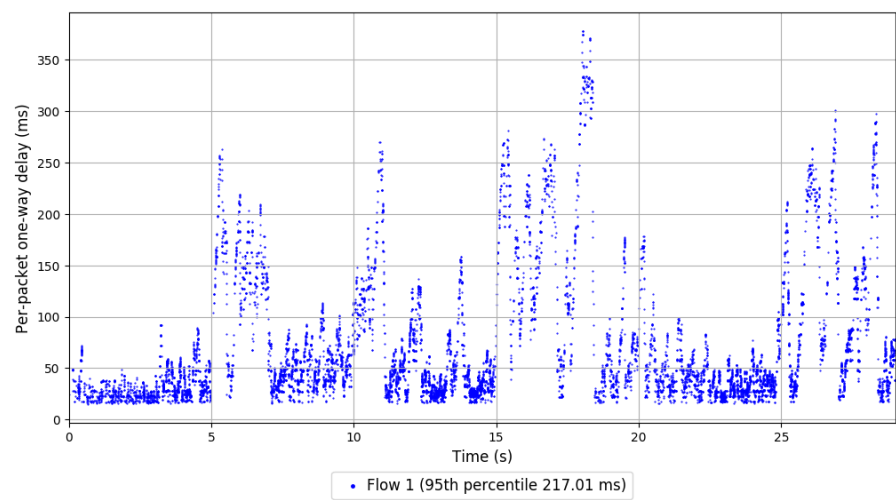
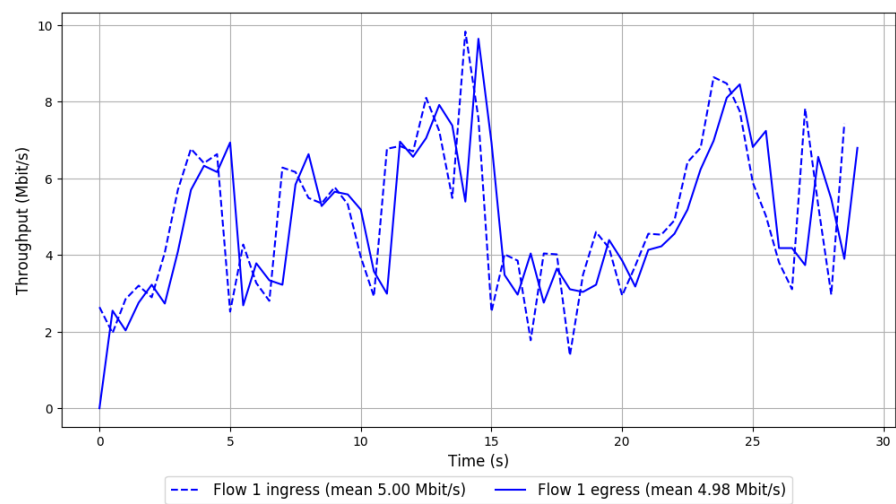


Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-18 18:16:48
End at: 2019-01-18 18:17:18
Local clock offset: -0.716 ms
Remote clock offset: -1.208 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 4.98 Mbit/s
95th percentile per-packet one-way delay: 217.012 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 4.98 Mbit/s
95th percentile per-packet one-way delay: 217.012 ms
Loss rate: 0.40%

Run 2: Report of Indigo-MusesC3 — Data Link

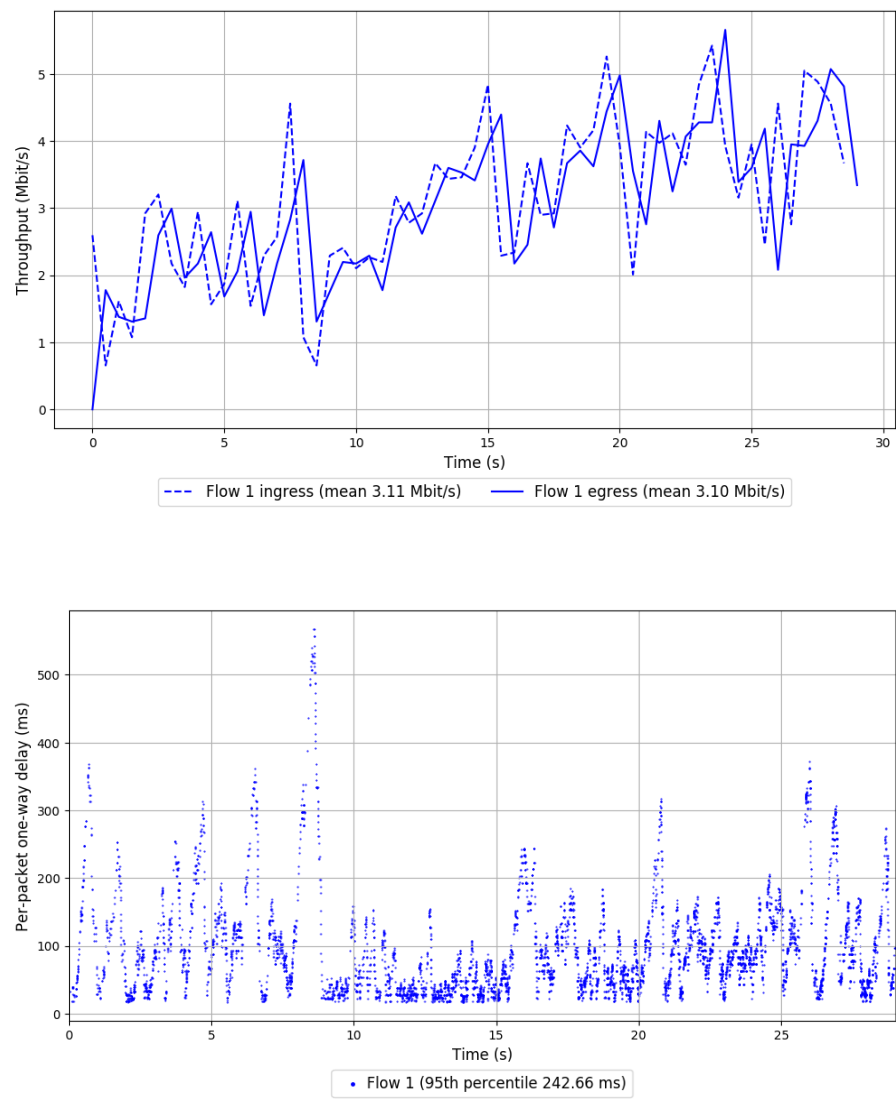


Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-18 18:40:29
End at: 2019-01-18 18:40:59
Local clock offset: -4.457 ms
Remote clock offset: -0.941 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.10 Mbit/s
95th percentile per-packet one-way delay: 242.662 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 3.10 Mbit/s
95th percentile per-packet one-way delay: 242.662 ms
Loss rate: 0.58%

Run 3: Report of Indigo-MusesC3 — Data Link

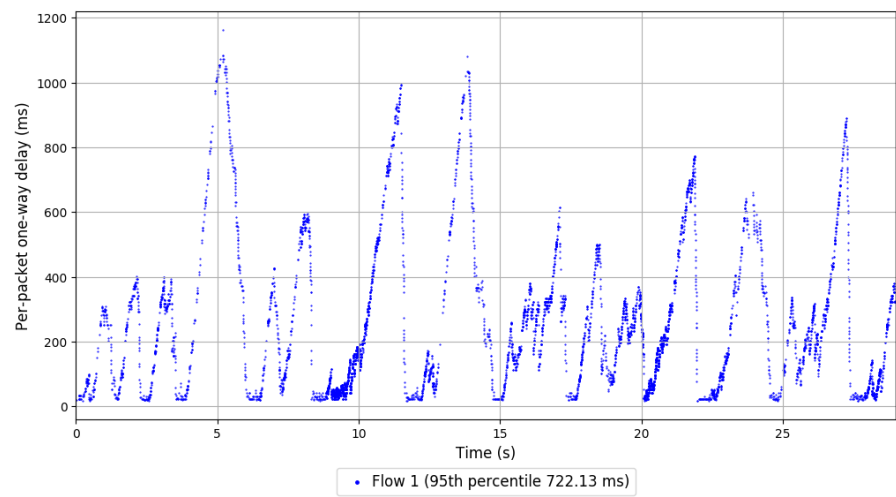
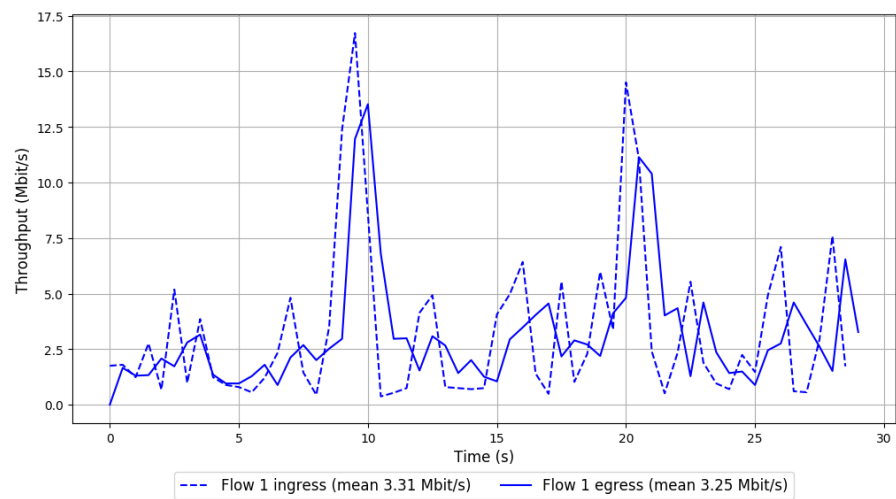


Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-18 17:32:06
End at: 2019-01-18 17:32:36
Local clock offset: -0.585 ms
Remote clock offset: -0.702 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 722.126 ms
Loss rate: 1.80%
-- Flow 1:
Average throughput: 3.25 Mbit/s
95th percentile per-packet one-way delay: 722.126 ms
Loss rate: 1.80%

Run 1: Report of Indigo-MusesC5 — Data Link

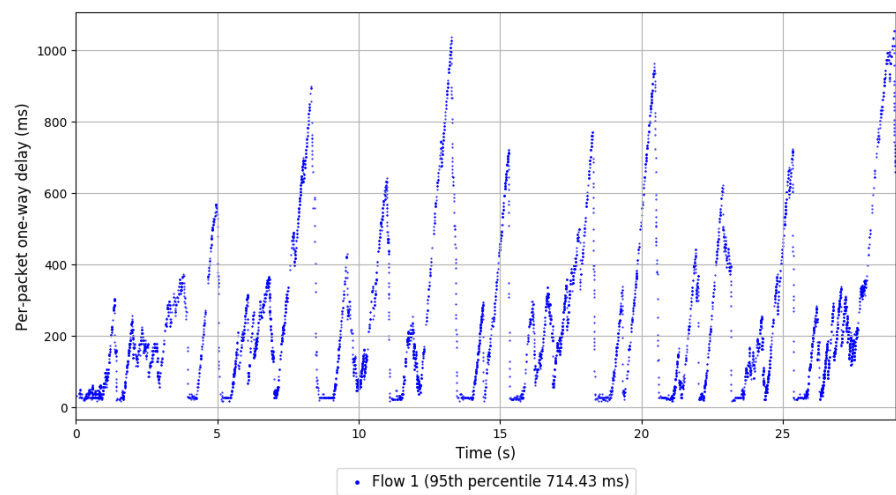
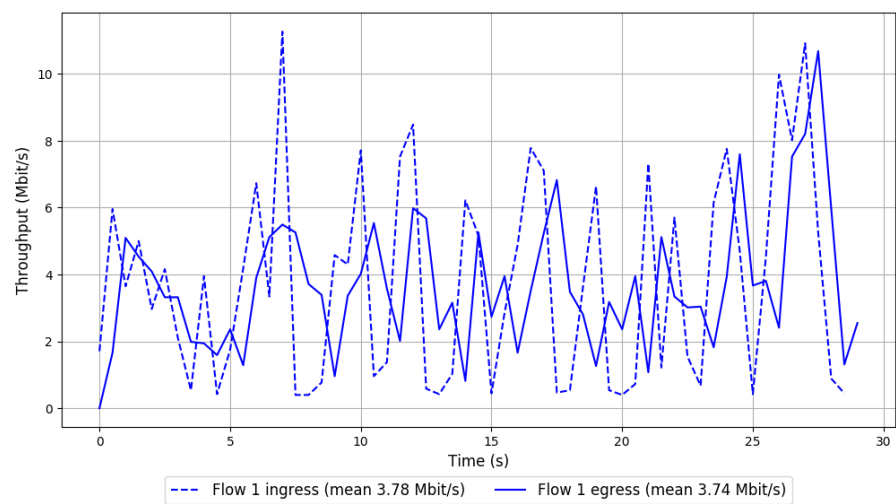


Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-18 17:55:37
End at: 2019-01-18 17:56:07
Local clock offset: -2.552 ms
Remote clock offset: -1.725 ms

Below is generated by plot.py at 2019-01-18 18:41:31
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.74 Mbit/s
95th percentile per-packet one-way delay: 714.431 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 3.74 Mbit/s
95th percentile per-packet one-way delay: 714.431 ms
Loss rate: 1.09%

Run 2: Report of Indigo-MusesC5 — Data Link

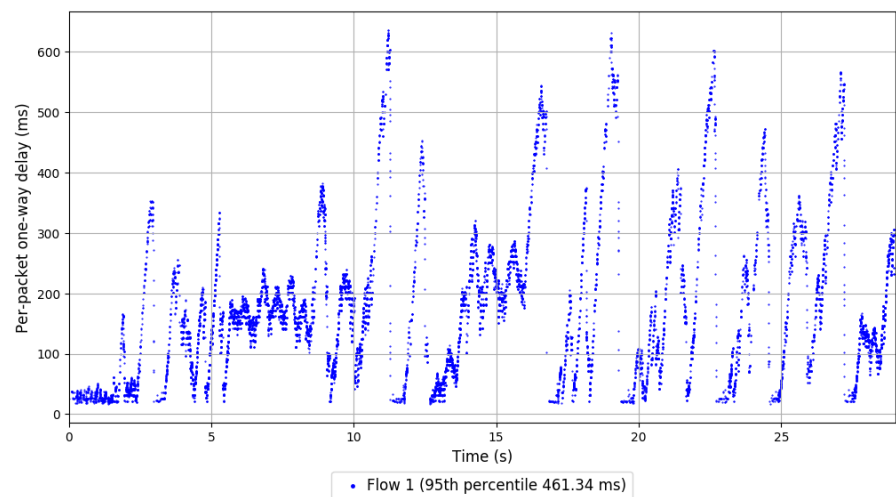
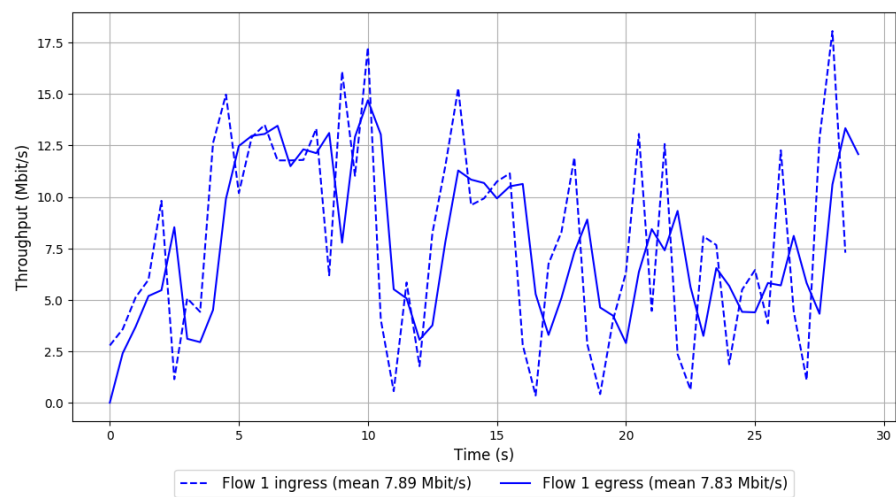


Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-18 18:19:03
End at: 2019-01-18 18:19:33
Local clock offset: -2.226 ms
Remote clock offset: -1.024 ms

Below is generated by plot.py at 2019-01-18 18:41:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.83 Mbit/s
95th percentile per-packet one-way delay: 461.344 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 7.83 Mbit/s
95th percentile per-packet one-way delay: 461.344 ms
Loss rate: 0.68%

Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-18 17:36:33

End at: 2019-01-18 17:37:03

Local clock offset: 1.085 ms

Remote clock offset: -1.398 ms

Below is generated by plot.py at 2019-01-18 18:41:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 36.434 ms

Loss rate: 0.04%

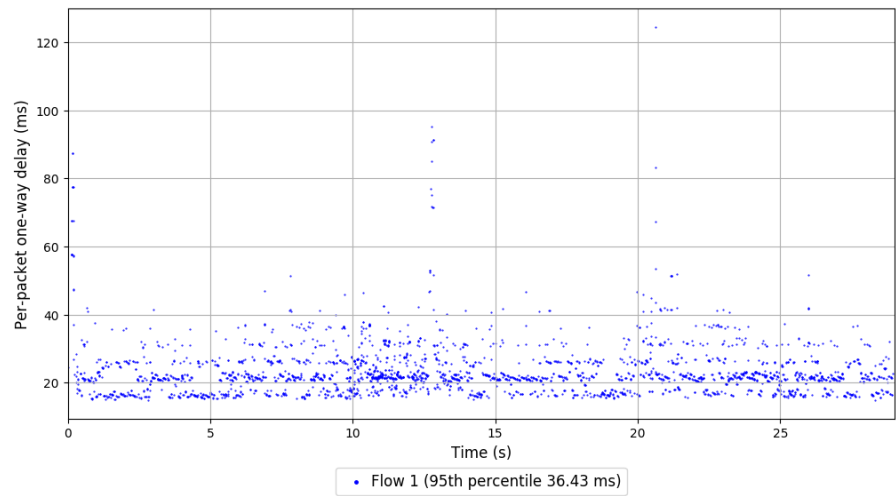
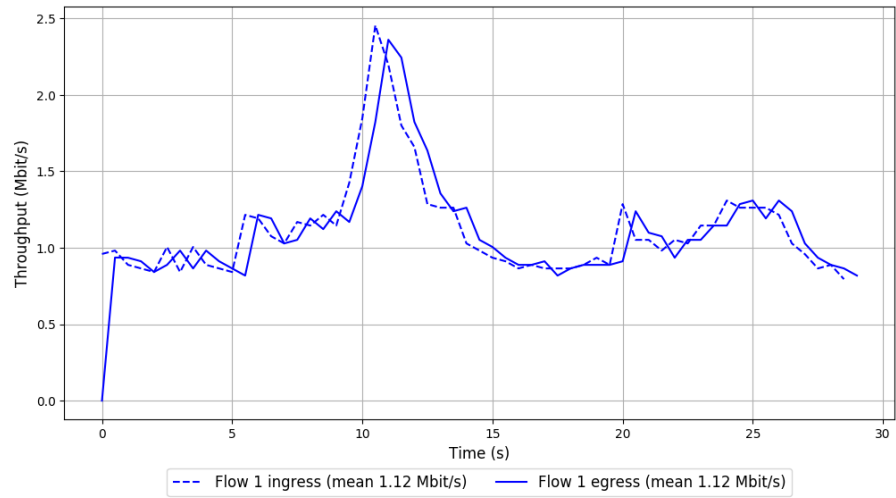
-- Flow 1:

Average throughput: 1.12 Mbit/s

95th percentile per-packet one-way delay: 36.434 ms

Loss rate: 0.04%

Run 1: Report of Indigo-MusesD — Data Link

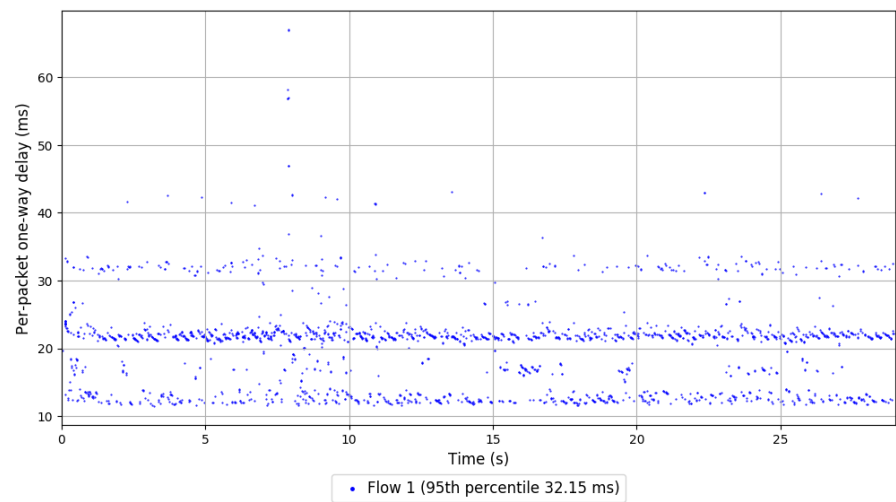
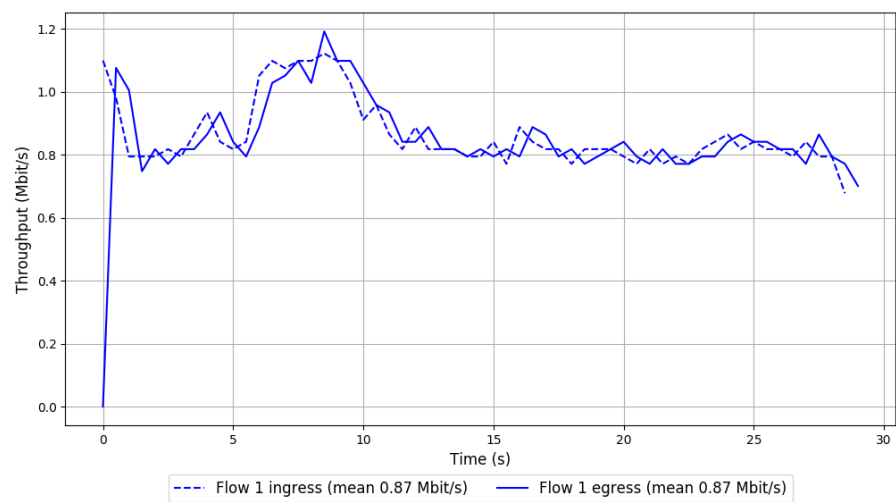


Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-18 18:00:02
End at: 2019-01-18 18:00:32
Local clock offset: -1.096 ms
Remote clock offset: -1.809 ms

Below is generated by plot.py at 2019-01-18 18:41:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 32.152 ms
Loss rate: 0.05%
-- Flow 1:
Average throughput: 0.87 Mbit/s
95th percentile per-packet one-way delay: 32.152 ms
Loss rate: 0.05%

Run 2: Report of Indigo-MusesD — Data Link

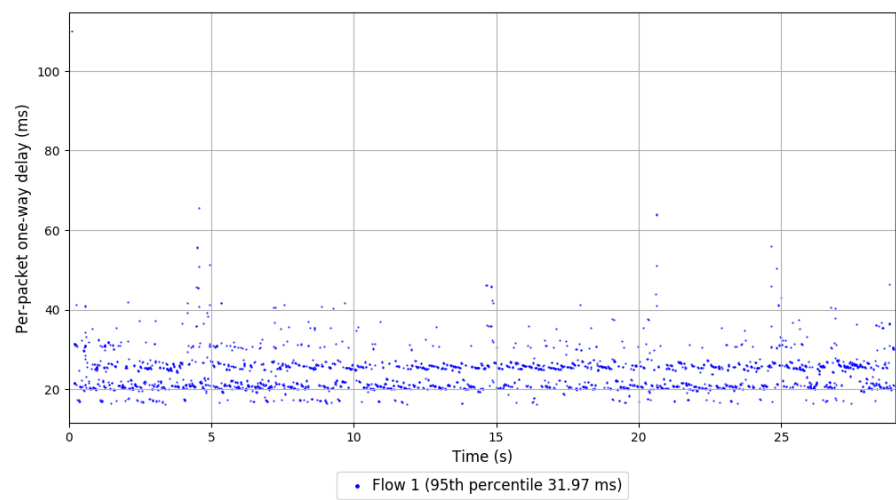
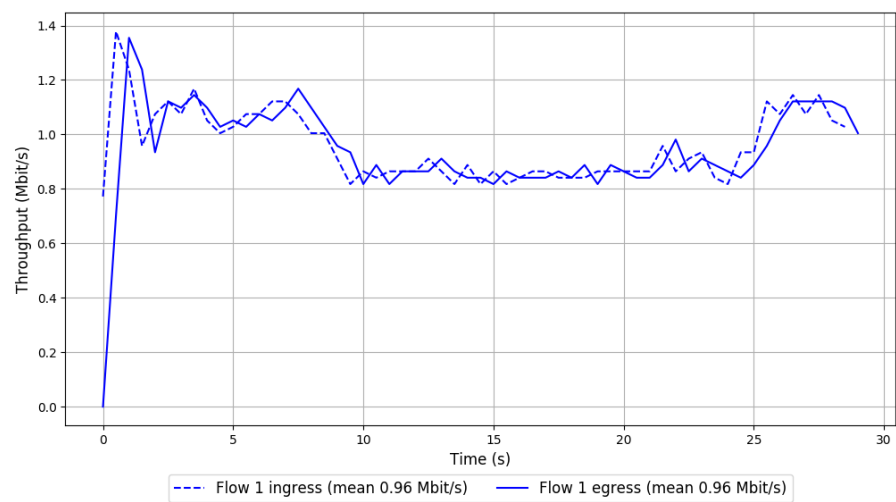


Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-18 18:23:31
End at: 2019-01-18 18:24:01
Local clock offset: -2.492 ms
Remote clock offset: -1.004 ms

Below is generated by plot.py at 2019-01-18 18:41:36
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 31.968 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 0.96 Mbit/s
95th percentile per-packet one-way delay: 31.968 ms
Loss rate: 0.08%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MusesT

Start at: 2019-01-18 17:44:24

End at: 2019-01-18 17:44:54

Local clock offset: -0.856 ms

Remote clock offset: -1.421 ms

Below is generated by plot.py at 2019-01-18 18:41:36

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.44 Mbit/s

95th percentile per-packet one-way delay: 471.544 ms

Loss rate: 0.57%

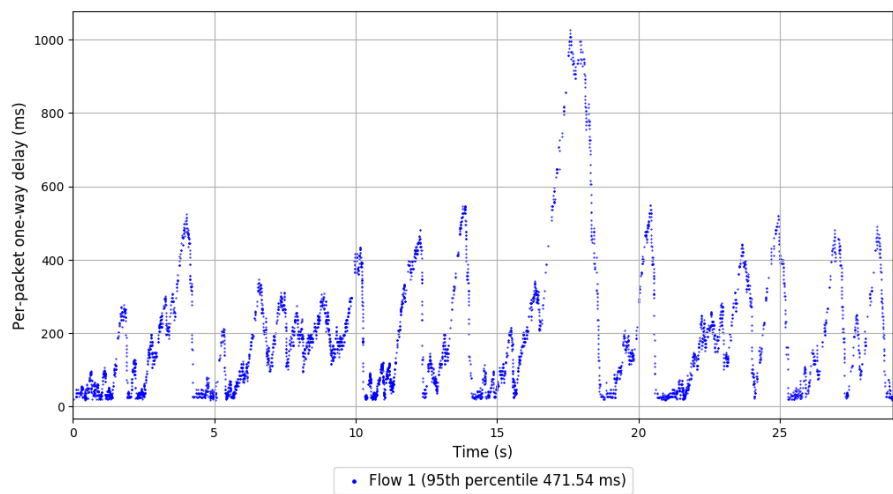
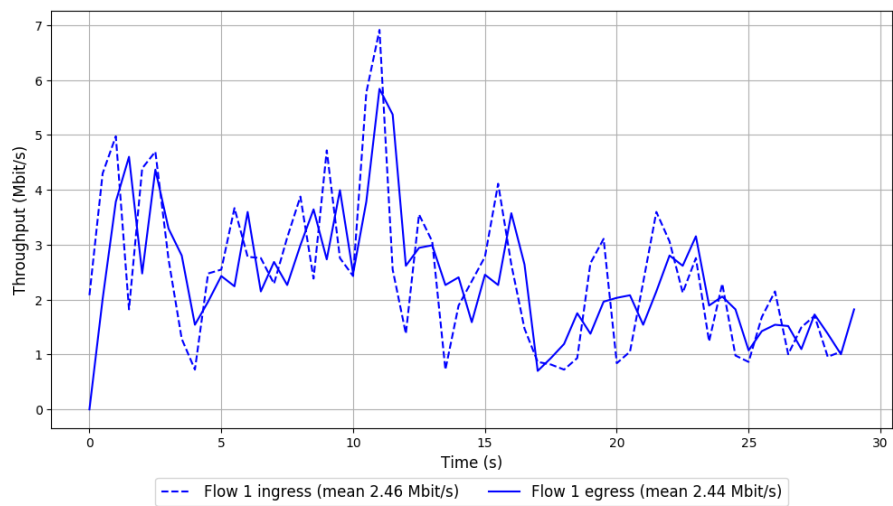
-- Flow 1:

Average throughput: 2.44 Mbit/s

95th percentile per-packet one-way delay: 471.544 ms

Loss rate: 0.57%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MusesT

Start at: 2019-01-18 18:07:48

End at: 2019-01-18 18:08:19

Local clock offset: -3.509 ms

Remote clock offset: -3.096 ms

Below is generated by plot.py at 2019-01-18 18:41:39

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.64 Mbit/s

95th percentile per-packet one-way delay: 307.587 ms

Loss rate: 0.19%

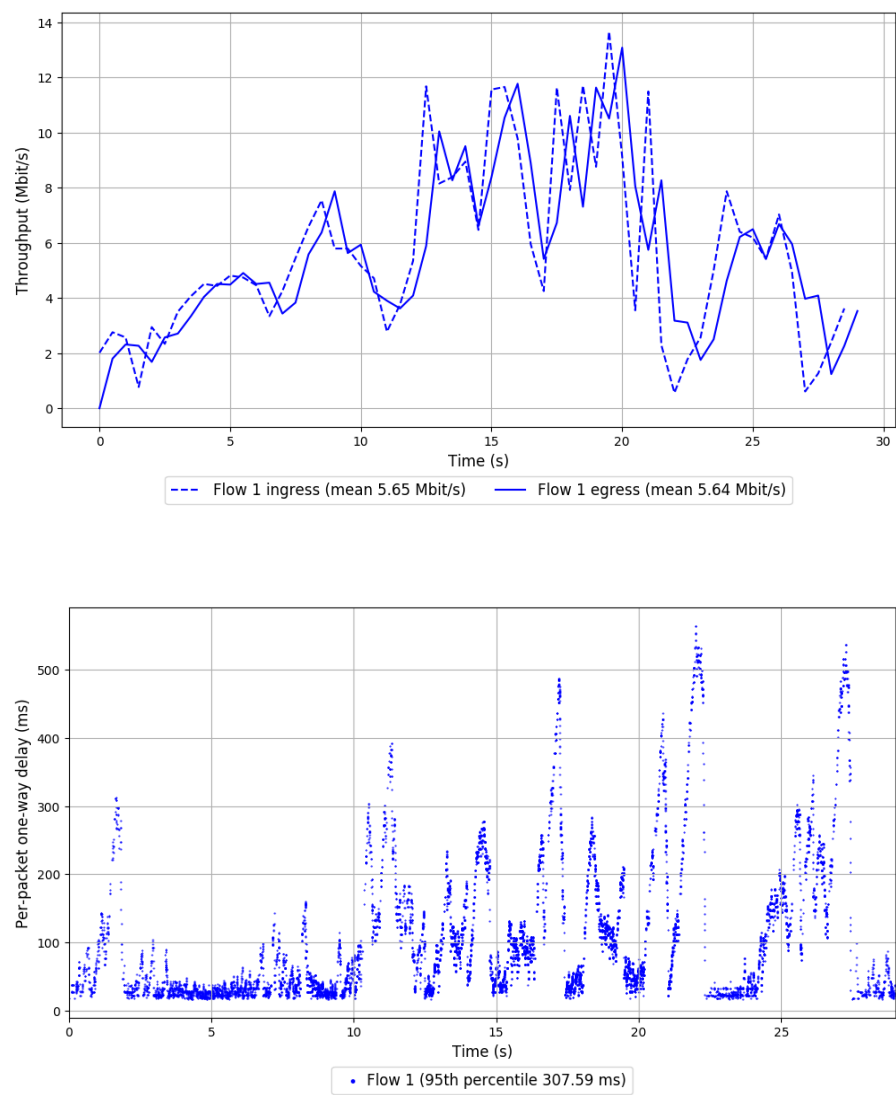
-- Flow 1:

Average throughput: 5.64 Mbit/s

95th percentile per-packet one-way delay: 307.587 ms

Loss rate: 0.19%

Run 2: Report of Indigo-MusesT — Data Link

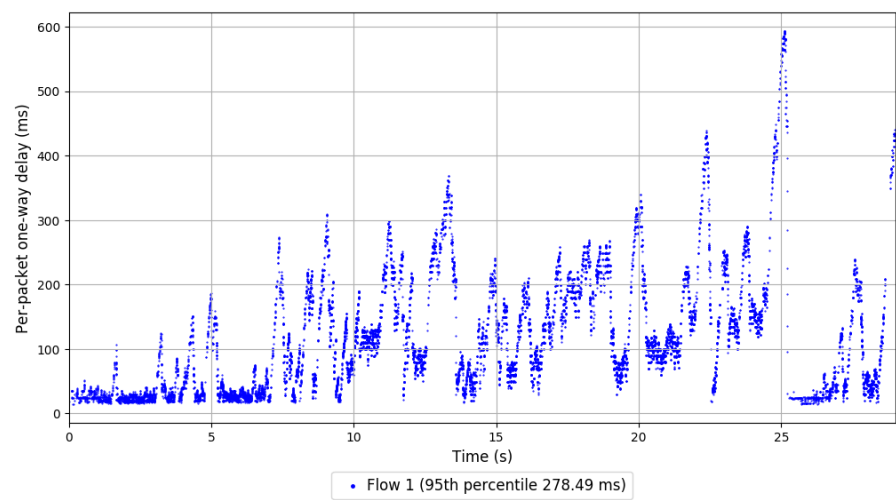
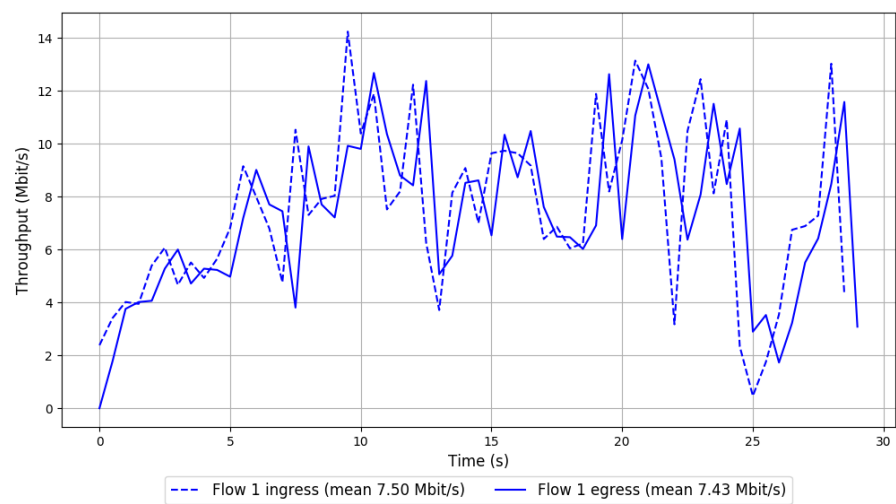


Run 3: Statistics of Indigo-MusesT

Start at: 2019-01-18 18:31:26
End at: 2019-01-18 18:31:56
Local clock offset: -4.23 ms
Remote clock offset: -1.487 ms

Below is generated by plot.py at 2019-01-18 18:41:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.43 Mbit/s
95th percentile per-packet one-way delay: 278.489 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 7.43 Mbit/s
95th percentile per-packet one-way delay: 278.489 ms
Loss rate: 0.90%

Run 3: Report of Indigo-MusesT — Data Link

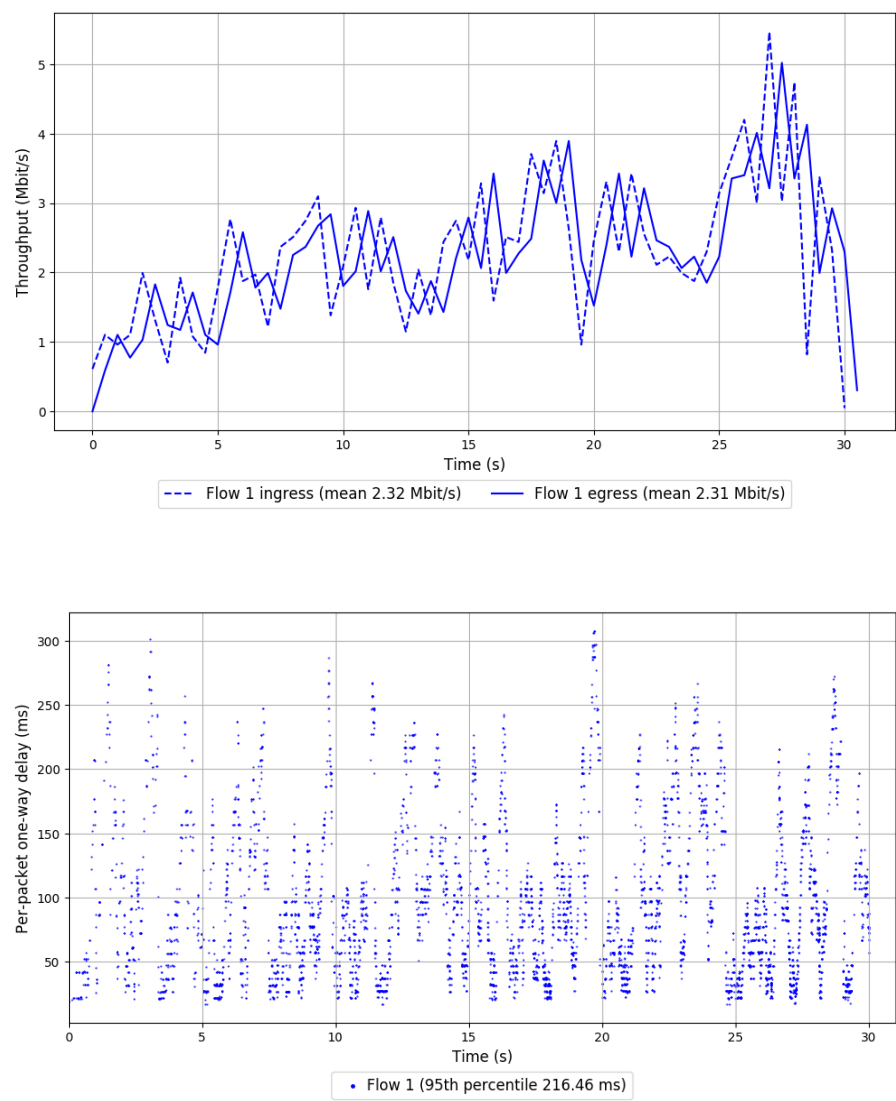


```
Run 1: Statistics of LEDBAT

Start at: 2019-01-18 17:42:09
End at: 2019-01-18 17:42:39
Local clock offset: -0.418 ms
Remote clock offset: -1.483 ms

# Below is generated by plot.py at 2019-01-18 18:41:43
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 216.459 ms
Loss rate: 0.30%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 216.459 ms
Loss rate: 0.30%
```

Run 1: Report of LEDBAT — Data Link

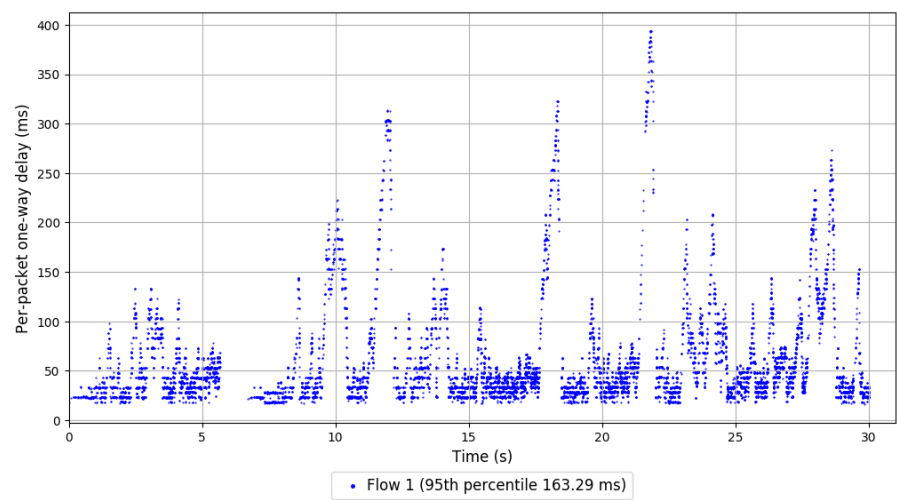
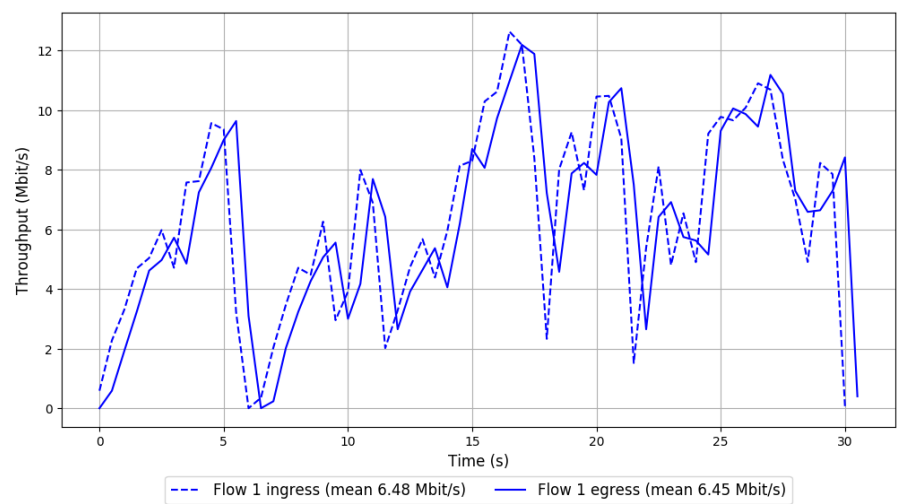


Run 2: Statistics of LEDBAT

Start at: 2019-01-18 18:05:35
End at: 2019-01-18 18:06:05
Local clock offset: -1.794 ms
Remote clock offset: -1.315 ms

Below is generated by plot.py at 2019-01-18 18:41:43
Datalink statistics
-- Total of 1 flow:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 163.287 ms
Loss rate: 0.45%
-- Flow 1:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 163.287 ms
Loss rate: 0.45%

Run 2: Report of LEDBAT — Data Link

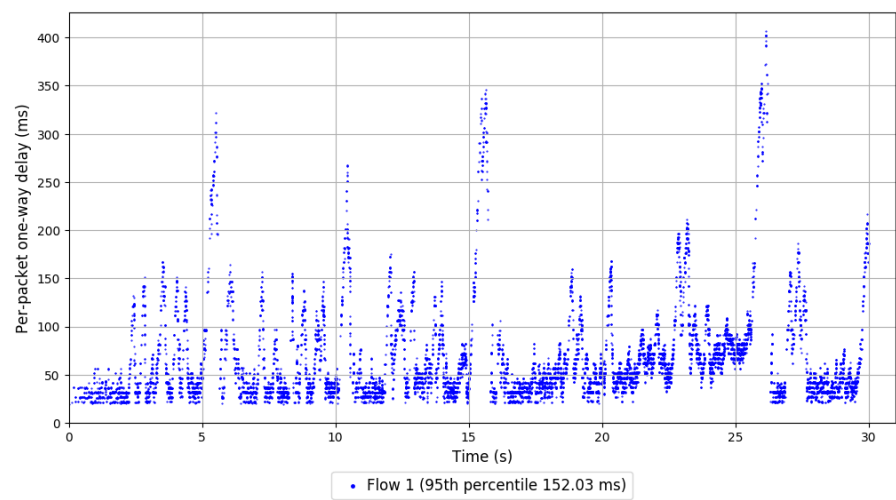
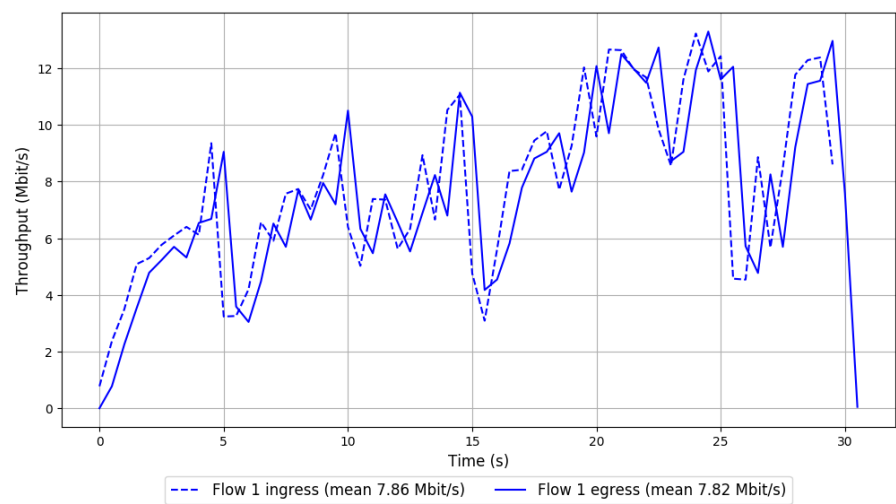


Run 3: Statistics of LEDBAT

Start at: 2019-01-18 18:29:06
End at: 2019-01-18 18:29:36
Local clock offset: -3.527 ms
Remote clock offset: -1.018 ms

Below is generated by plot.py at 2019-01-18 18:41:45
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.82 Mbit/s
95th percentile per-packet one-way delay: 152.027 ms
Loss rate: 0.48%
-- Flow 1:
Average throughput: 7.82 Mbit/s
95th percentile per-packet one-way delay: 152.027 ms
Loss rate: 0.48%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-18 17:50:02

End at: 2019-01-18 17:50:32

Local clock offset: 0.626 ms

Remote clock offset: -1.577 ms

Below is generated by plot.py at 2019-01-18 18:41:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 2.89 Mbit/s

95th percentile per-packet one-way delay: 1070.746 ms

Loss rate: 31.50%

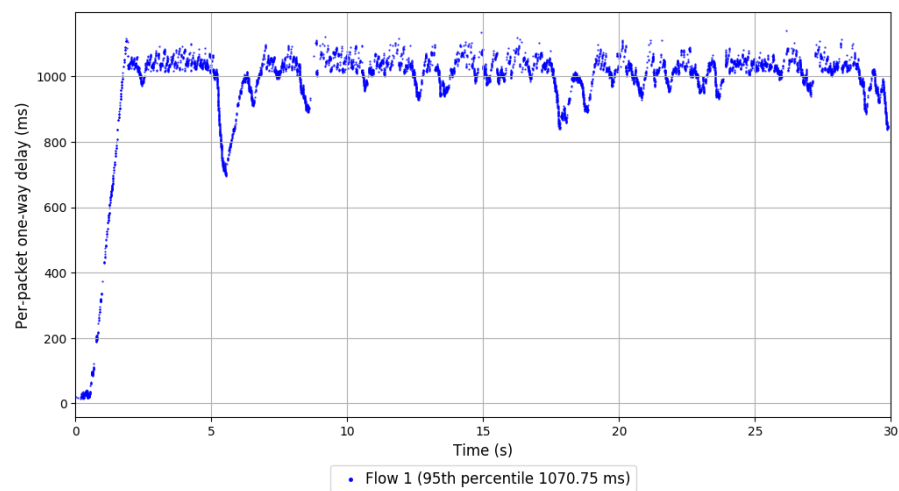
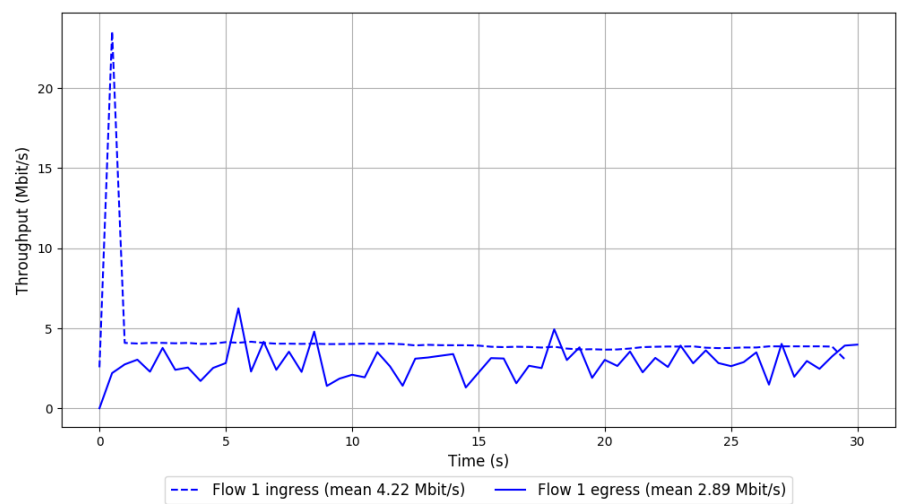
-- Flow 1:

Average throughput: 2.89 Mbit/s

95th percentile per-packet one-way delay: 1070.746 ms

Loss rate: 31.50%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-01-18 18:13:20

End at: 2019-01-18 18:13:50

Local clock offset: -2.355 ms

Remote clock offset: -1.578 ms

Below is generated by plot.py at 2019-01-18 18:41:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.14 Mbit/s

95th percentile per-packet one-way delay: 839.818 ms

Loss rate: 0.82%

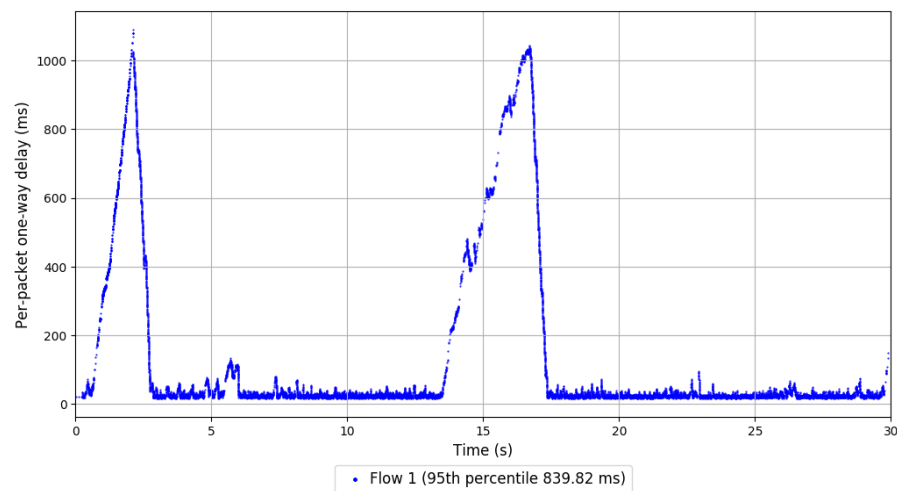
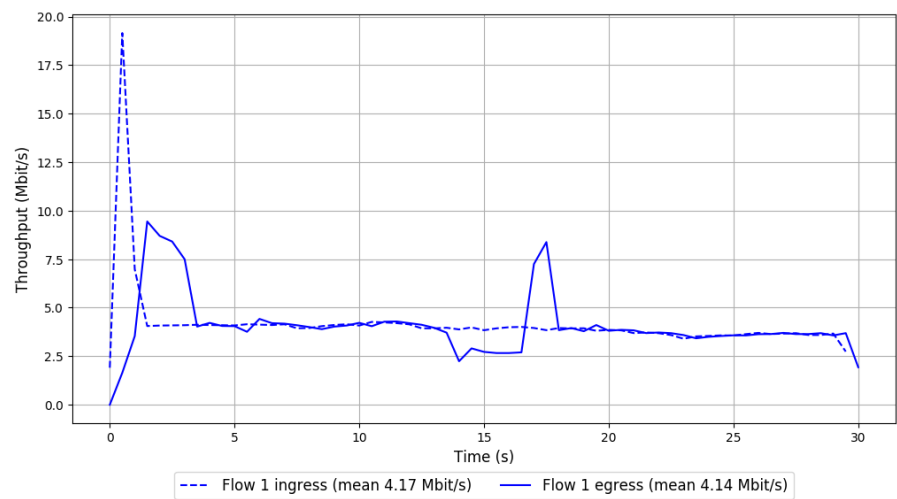
-- Flow 1:

Average throughput: 4.14 Mbit/s

95th percentile per-packet one-way delay: 839.818 ms

Loss rate: 0.82%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-18 18:37:02

End at: 2019-01-18 18:37:32

Local clock offset: -2.697 ms

Remote clock offset: -0.914 ms

Below is generated by plot.py at 2019-01-18 18:41:45

Datalink statistics

-- Total of 1 flow:

Average throughput: 4.05 Mbit/s

95th percentile per-packet one-way delay: 271.258 ms

Loss rate: 0.27%

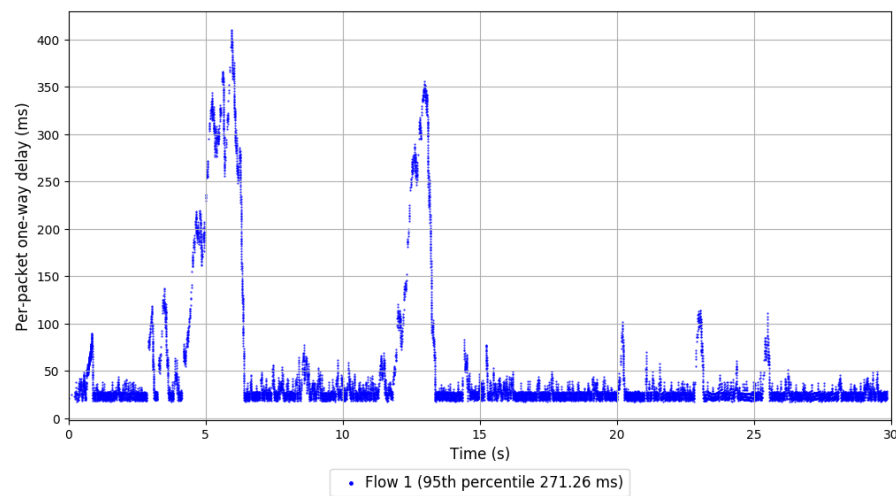
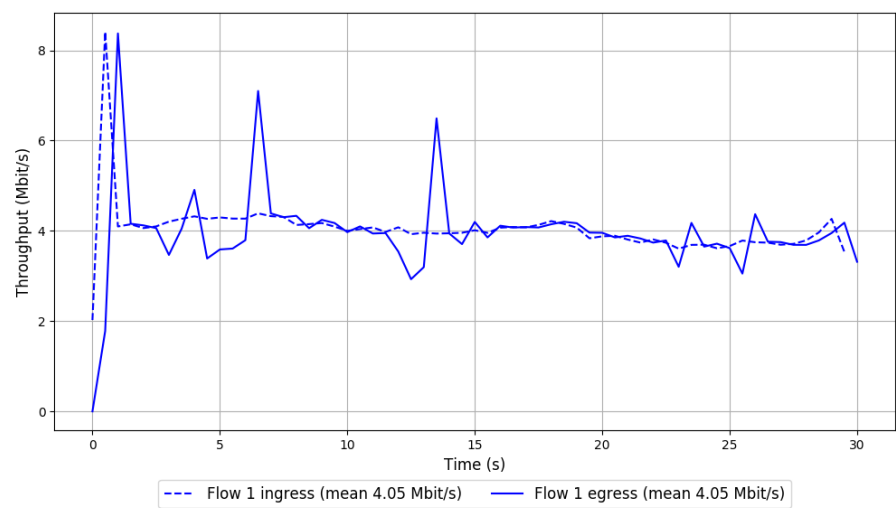
-- Flow 1:

Average throughput: 4.05 Mbit/s

95th percentile per-packet one-way delay: 271.258 ms

Loss rate: 0.27%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

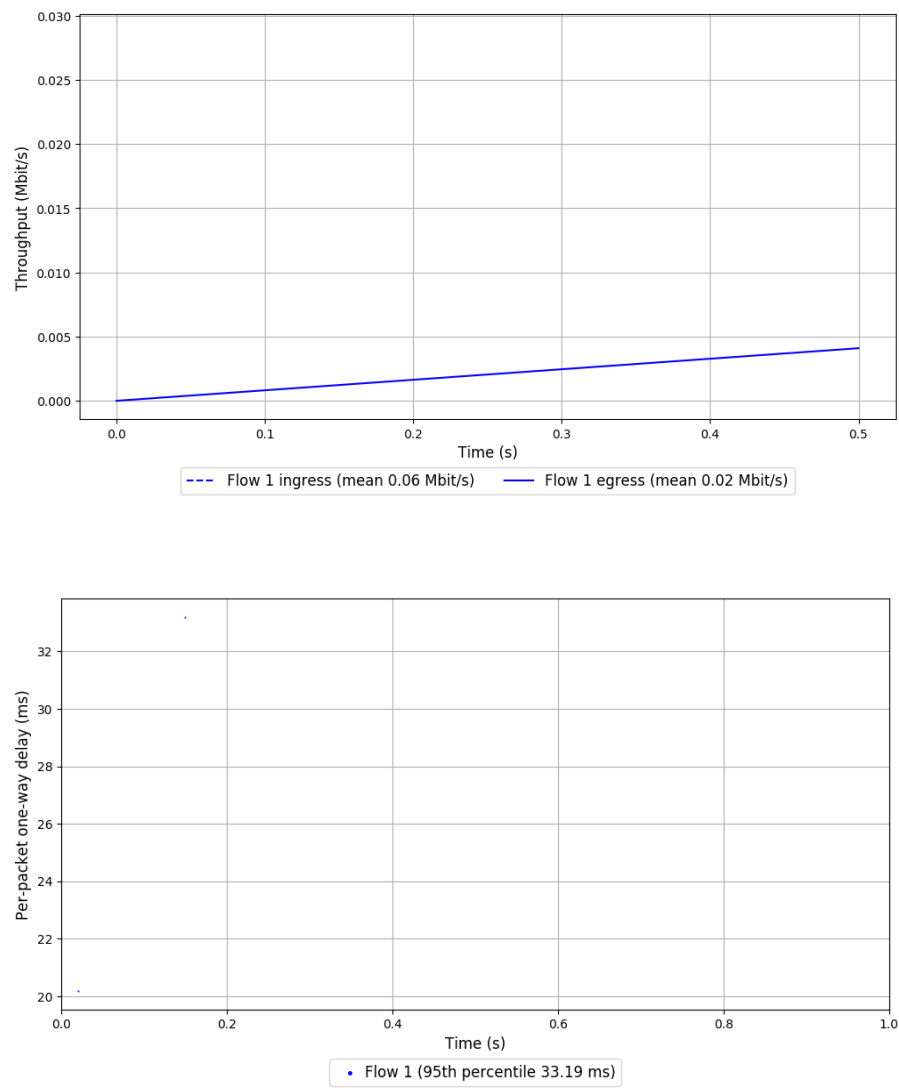
Start at: 2019-01-18 17:45:31

End at: 2019-01-18 17:46:01

Local clock offset: -0.314 ms

Remote clock offset: -0.57 ms

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

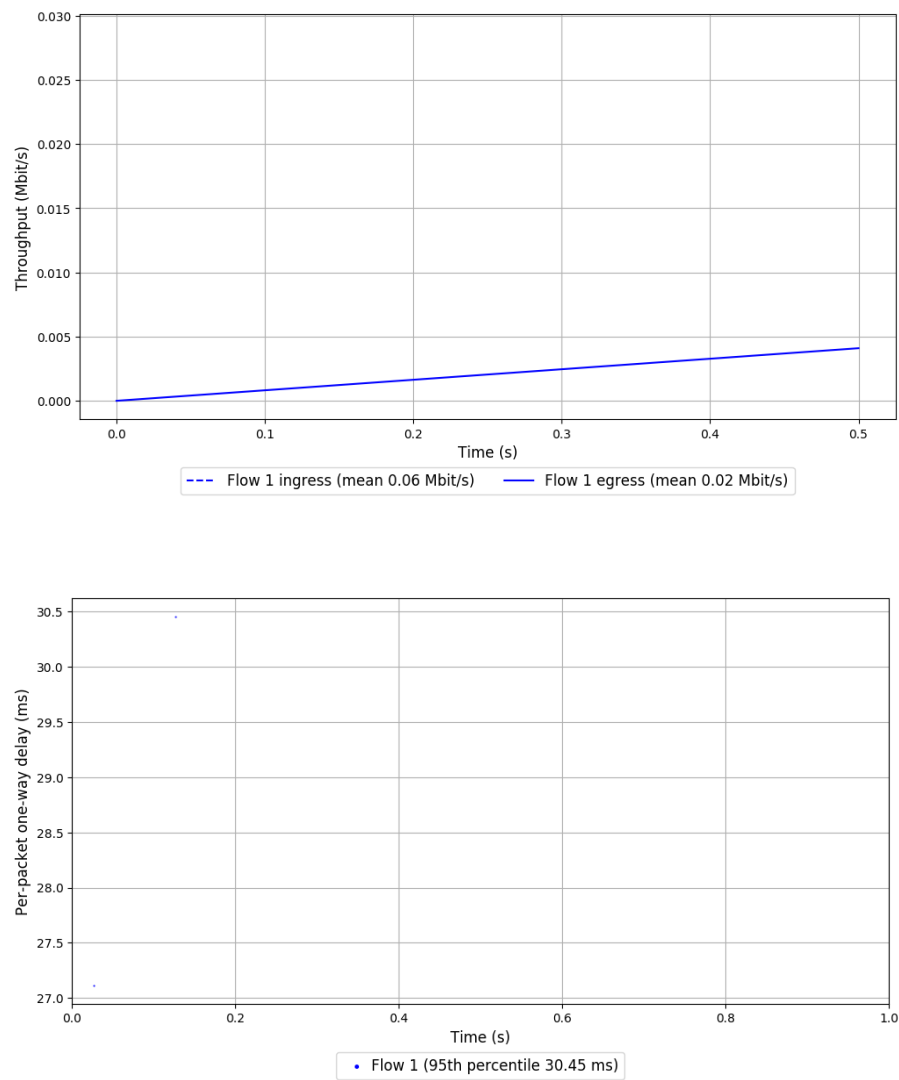
Start at: 2019-01-18 18:08:55

End at: 2019-01-18 18:09:25

Local clock offset: -10.977 ms

Remote clock offset: -2.02 ms

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

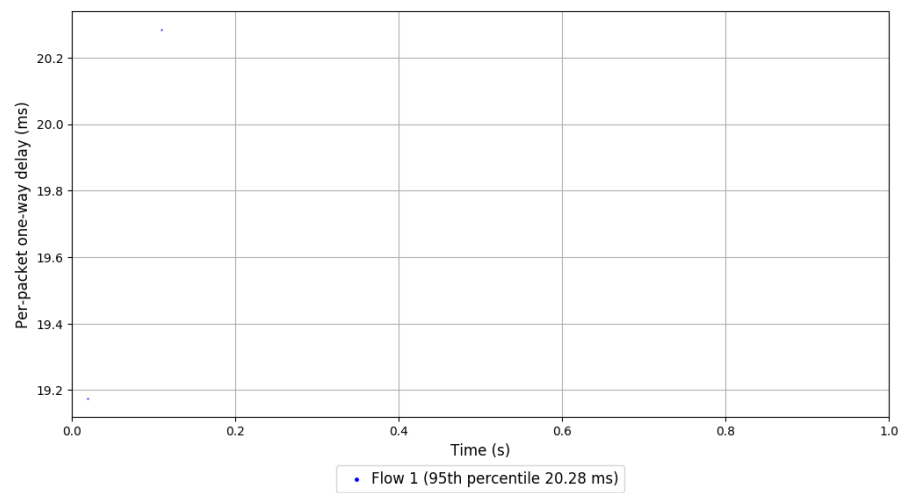
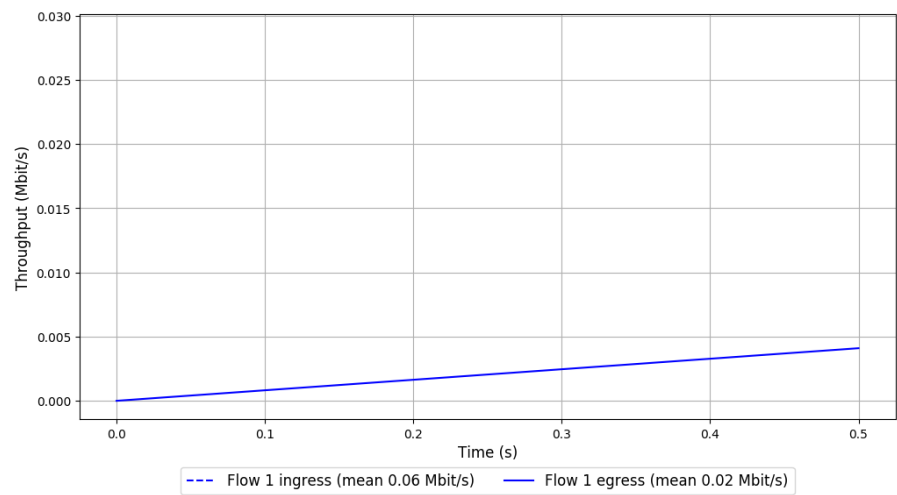
Start at: 2019-01-18 18:32:33

End at: 2019-01-18 18:33:03

Local clock offset: -2.847 ms

Remote clock offset: -1.132 ms

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-01-18 17:30:58

End at: 2019-01-18 17:31:28

Local clock offset: -0.46 ms

Remote clock offset: -0.66 ms

Below is generated by plot.py at 2019-01-18 18:41:50

Datalink statistics

-- Total of 1 flow:

Average throughput: 5.36 Mbit/s

95th percentile per-packet one-way delay: 457.689 ms

Loss rate: 1.67%

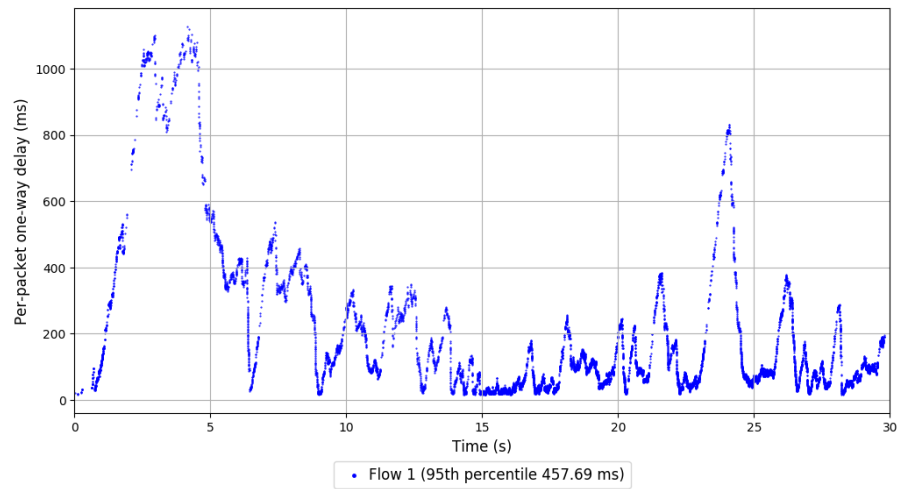
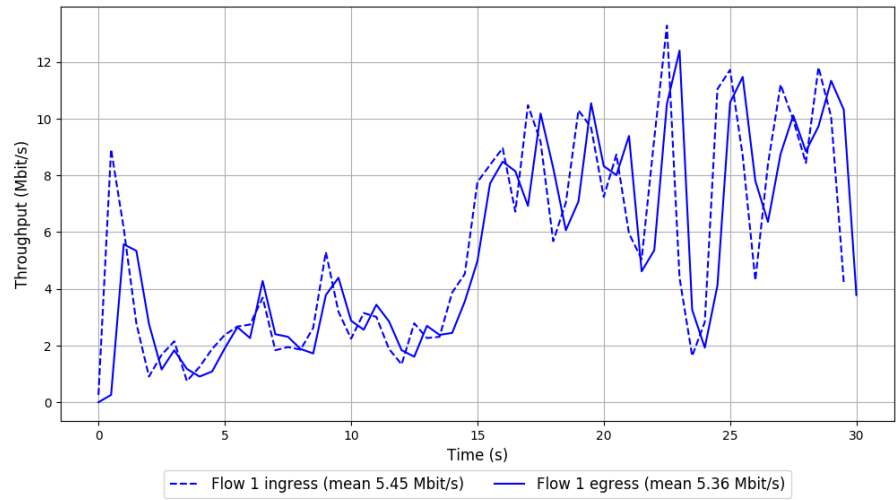
-- Flow 1:

Average throughput: 5.36 Mbit/s

95th percentile per-packet one-way delay: 457.689 ms

Loss rate: 1.67%

Run 1: Report of QUIC Cubic — Data Link

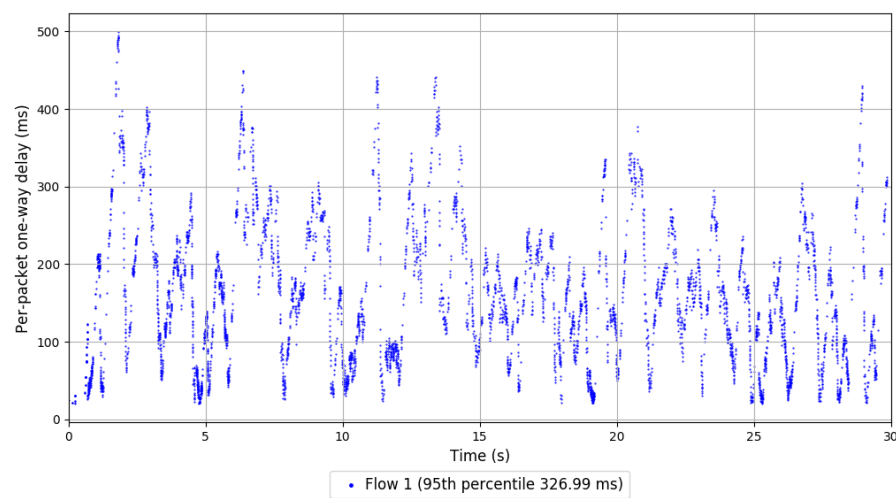
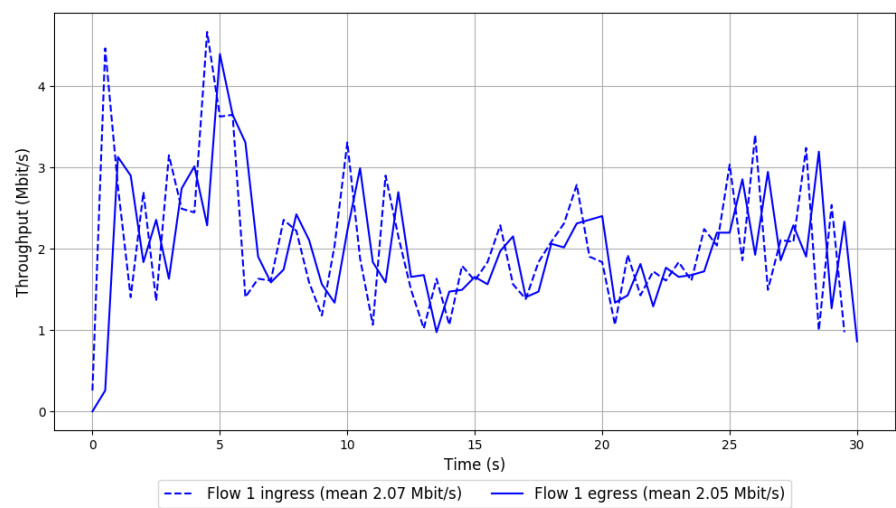


Run 2: Statistics of QUIC Cubic

Start at: 2019-01-18 17:54:29
End at: 2019-01-18 17:54:59
Local clock offset: -2.904 ms
Remote clock offset: -1.581 ms

Below is generated by plot.py at 2019-01-18 18:41:50
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 326.993 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 2.05 Mbit/s
95th percentile per-packet one-way delay: 326.993 ms
Loss rate: 1.04%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-18 18:17:55

End at: 2019-01-18 18:18:25

Local clock offset: -1.681 ms

Remote clock offset: -1.47 ms

Below is generated by plot.py at 2019-01-18 18:41:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 9.33 Mbit/s

95th percentile per-packet one-way delay: 283.246 ms

Loss rate: 1.31%

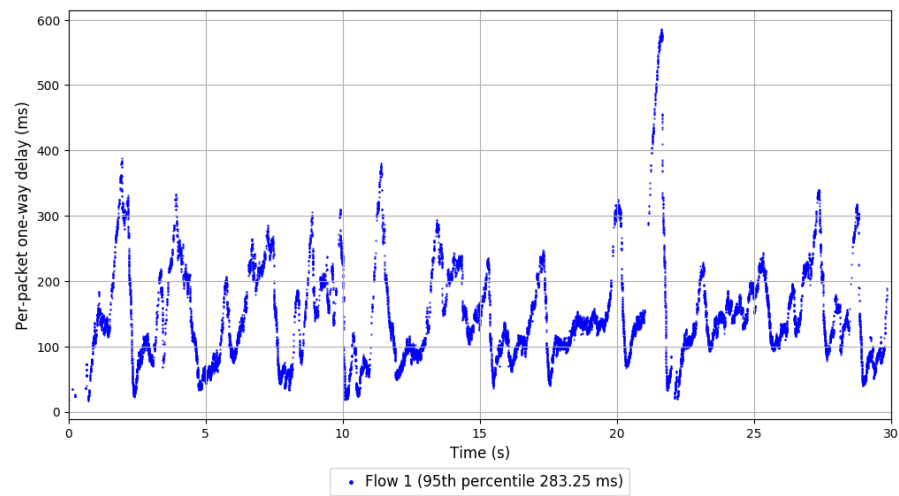
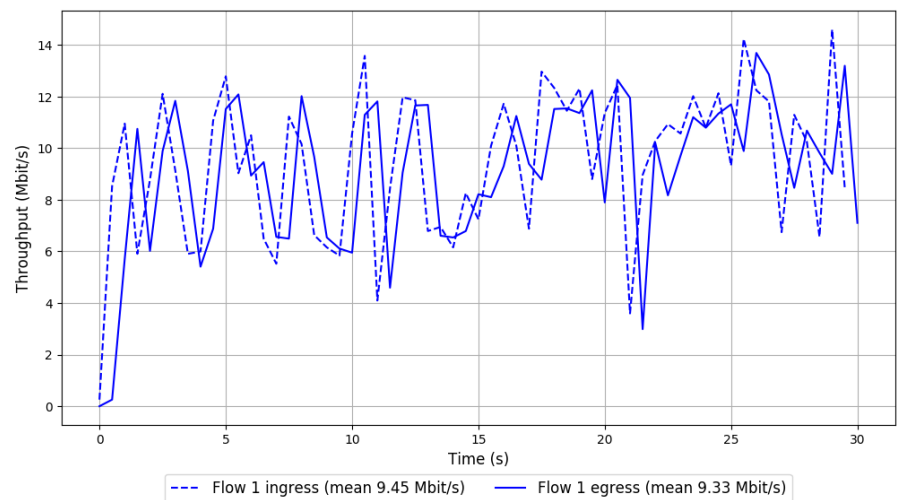
-- Flow 1:

Average throughput: 9.33 Mbit/s

95th percentile per-packet one-way delay: 283.246 ms

Loss rate: 1.31%

Run 3: Report of QUIC Cubic — Data Link

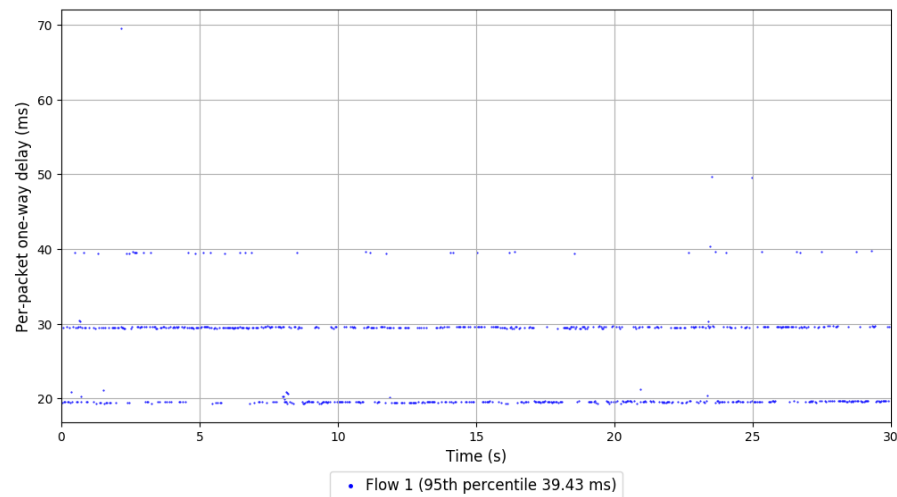
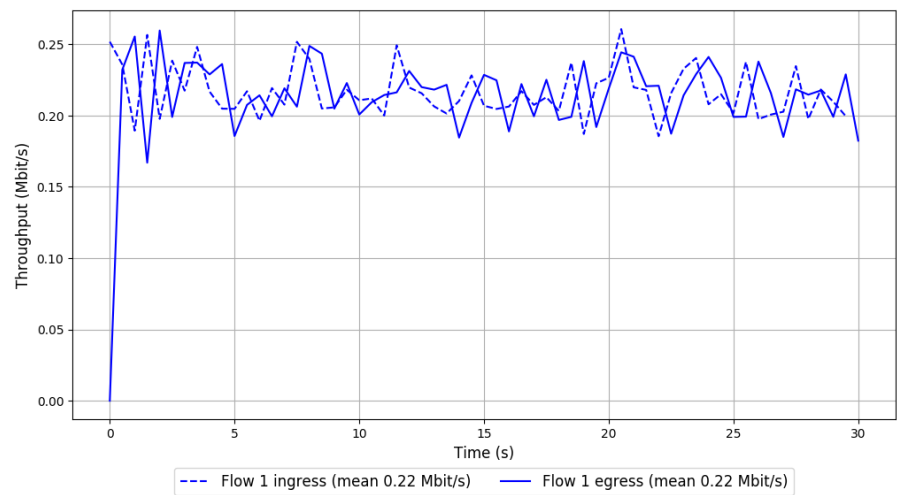


```
Run 1: Statistics of SCReAM

Start at: 2019-01-18 17:38:46
End at: 2019-01-18 17:39:16
Local clock offset: -0.732 ms
Remote clock offset: -0.93 ms

# Below is generated by plot.py at 2019-01-18 18:41:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.426 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 39.426 ms
Loss rate: 0.13%
```

Run 1: Report of SReAM — Data Link

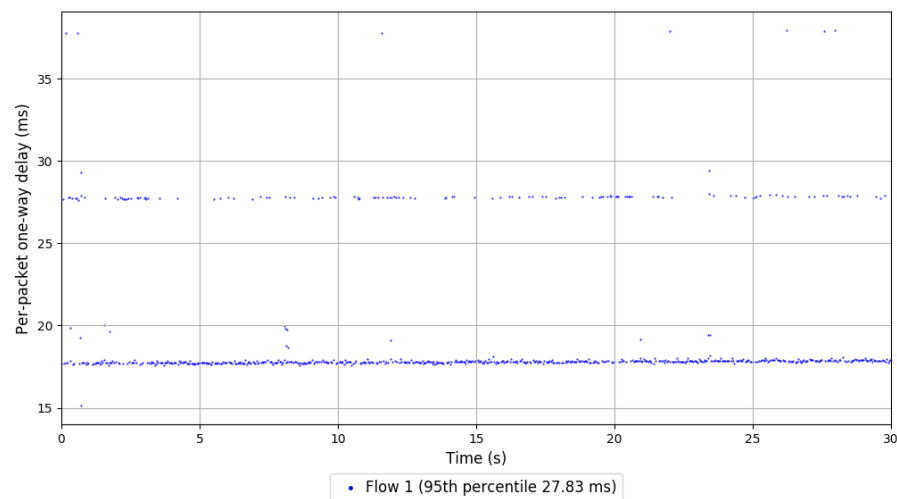
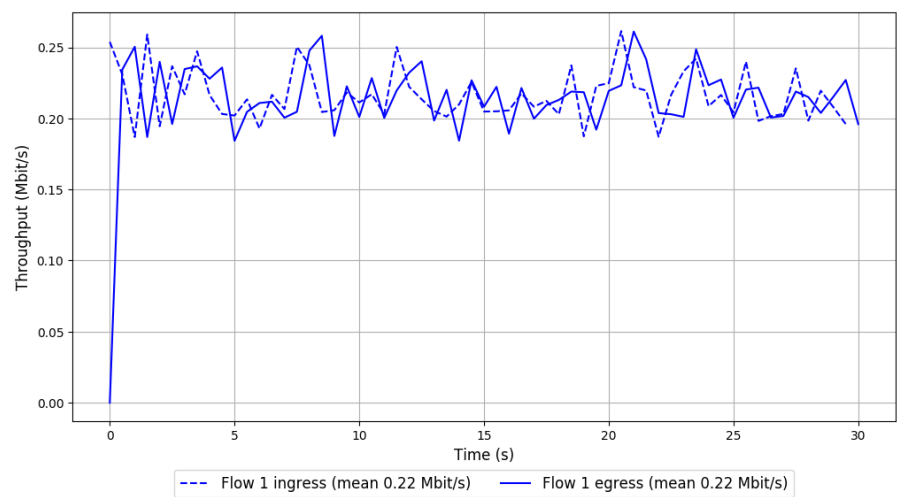


Run 2: Statistics of SCReAM

Start at: 2019-01-18 18:02:15
End at: 2019-01-18 18:02:45
Local clock offset: -1.941 ms
Remote clock offset: -1.705 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 27.833 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 27.833 ms
Loss rate: 0.00%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2019-01-18 18:25:45

End at: 2019-01-18 18:26:15

Local clock offset: -3.508 ms

Remote clock offset: -0.82 ms

Below is generated by plot.py at 2019-01-18 18:41:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 29.334 ms

Loss rate: 0.00%

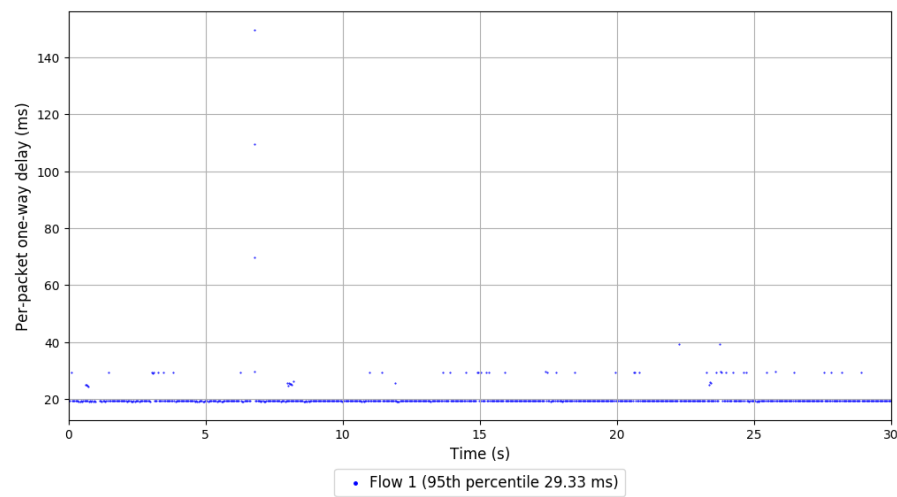
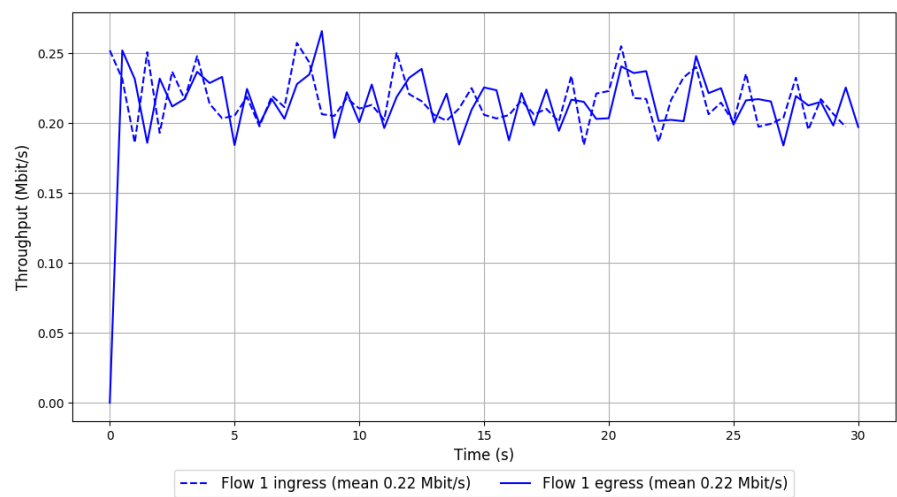
-- Flow 1:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 29.334 ms

Loss rate: 0.00%

Run 3: Report of SReAM — Data Link

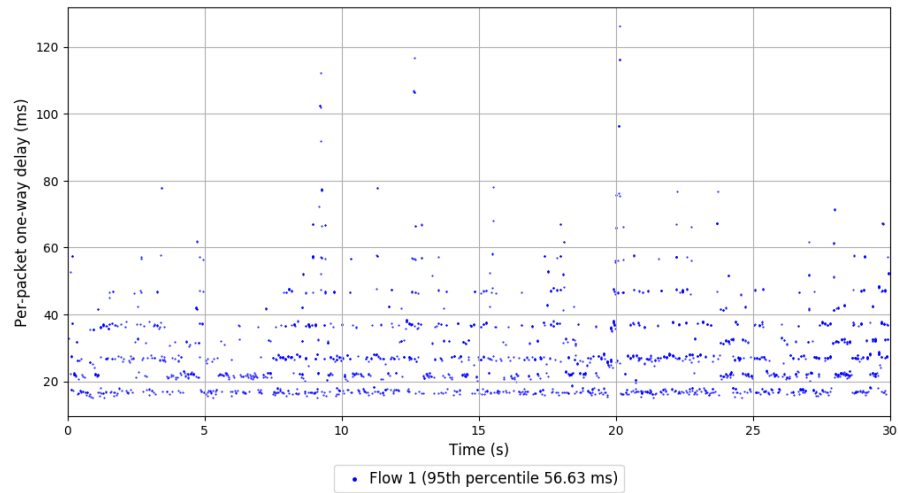
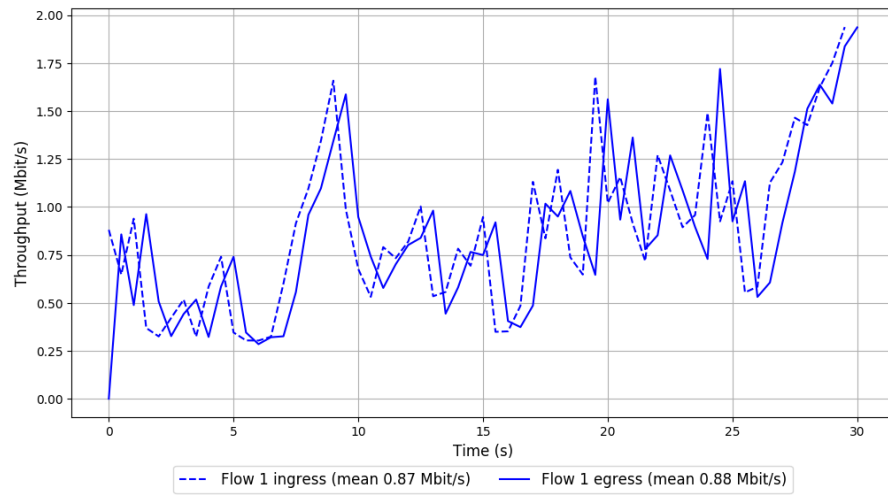


Run 1: Statistics of Sprout

Start at: 2019-01-18 17:48:56
End at: 2019-01-18 17:49:26
Local clock offset: 0.543 ms
Remote clock offset: -1.035 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 56.632 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.88 Mbit/s
95th percentile per-packet one-way delay: 56.632 ms
Loss rate: 0.00%

Run 1: Report of Sprout — Data Link

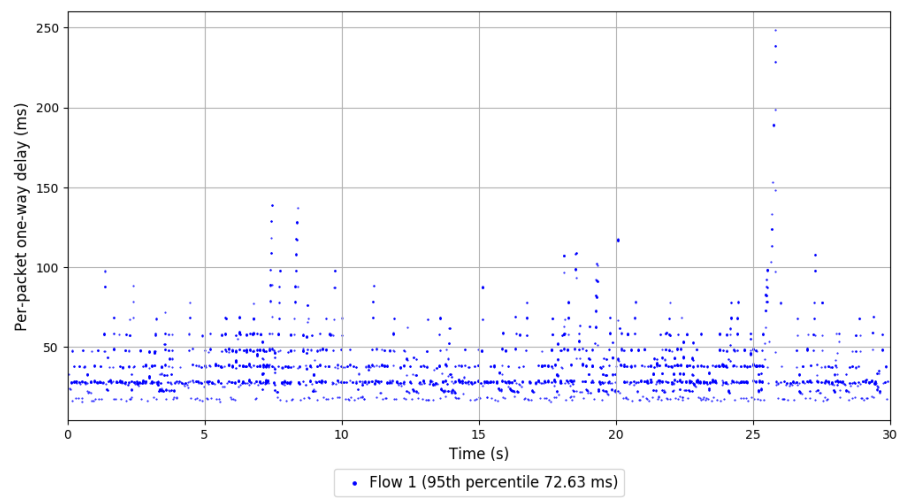
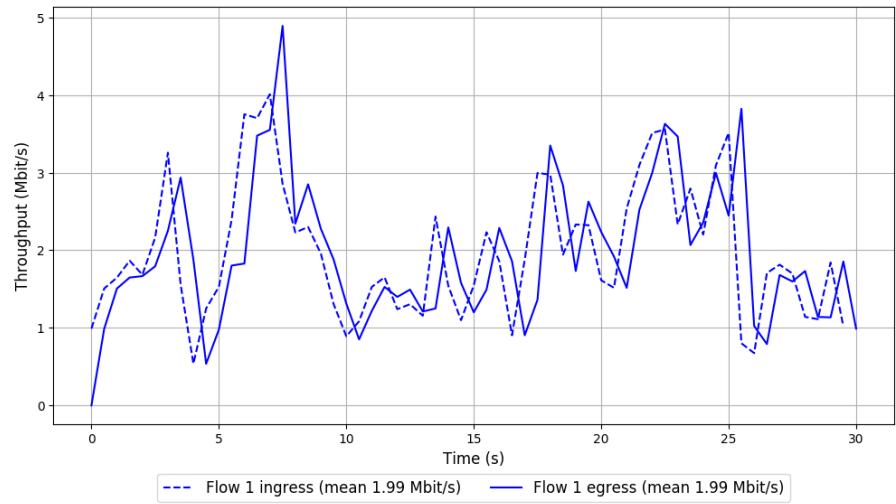


Run 2: Statistics of Sprout

Start at: 2019-01-18 18:12:14
End at: 2019-01-18 18:12:44
Local clock offset: -1.944 ms
Remote clock offset: -1.455 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 72.626 ms
Loss rate: 0.17%
-- Flow 1:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 72.626 ms
Loss rate: 0.17%

Run 2: Report of Sprout — Data Link

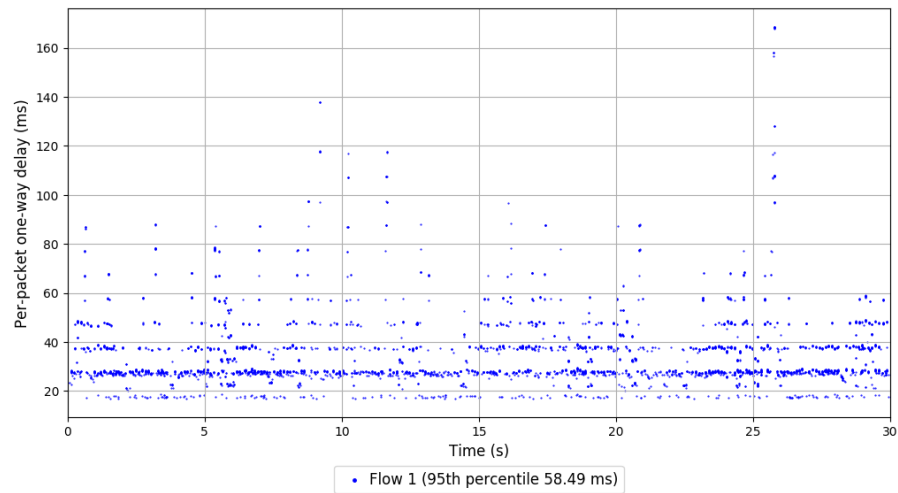
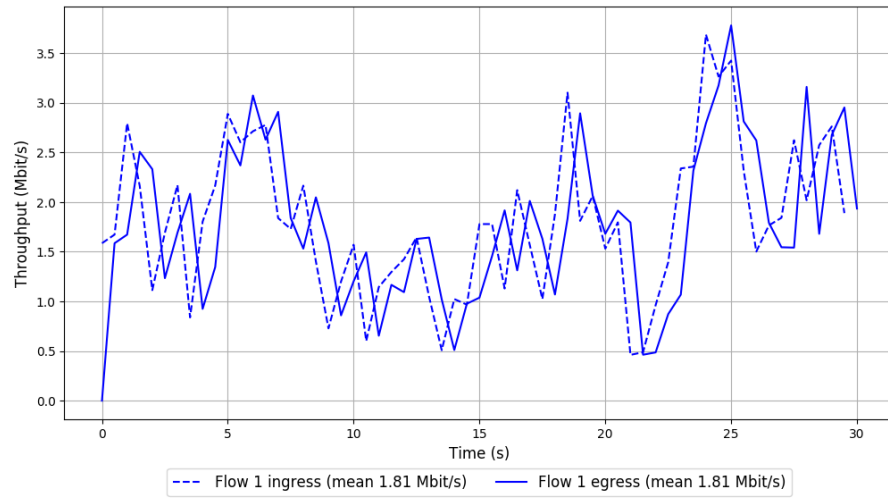


Run 3: Statistics of Sprout

Start at: 2019-01-18 18:35:55
End at: 2019-01-18 18:36:25
Local clock offset: -3.599 ms
Remote clock offset: -1.613 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.81 Mbit/s
95th percentile per-packet one-way delay: 58.491 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 1.81 Mbit/s
95th percentile per-packet one-way delay: 58.491 ms
Loss rate: 0.00%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-01-18 17:46:42

End at: 2019-01-18 17:47:12

Local clock offset: 0.584 ms

Remote clock offset: -1.43 ms

Below is generated by plot.py at 2019-01-18 18:41:58

Datalink statistics

-- Total of 1 flow:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 232.440 ms

Loss rate: 40.91%

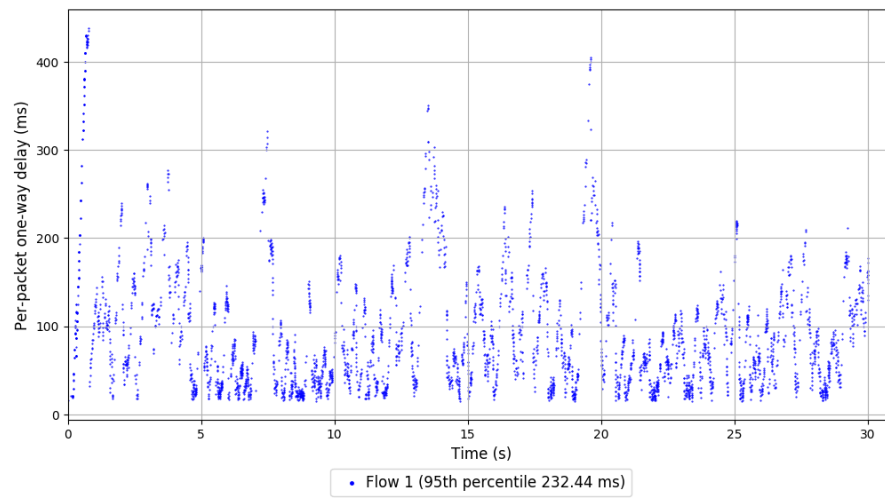
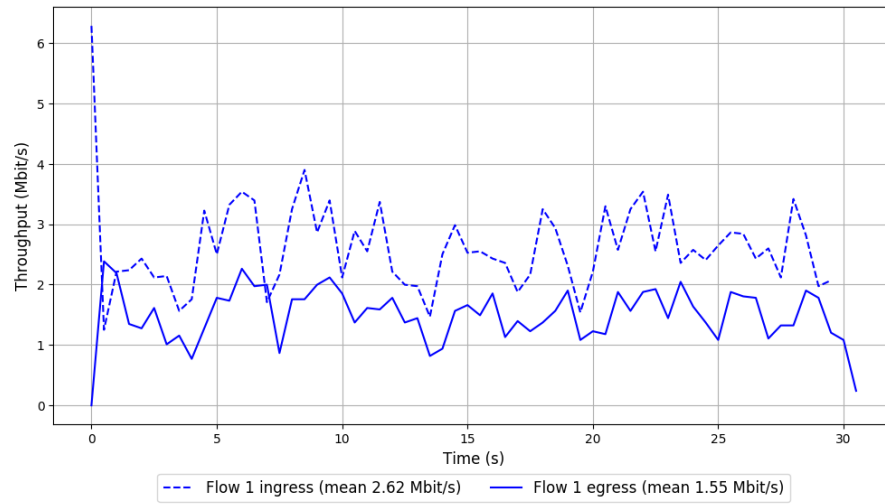
-- Flow 1:

Average throughput: 1.55 Mbit/s

95th percentile per-packet one-way delay: 232.440 ms

Loss rate: 40.91%

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



Run 2: Statistics of TaoVA-100x

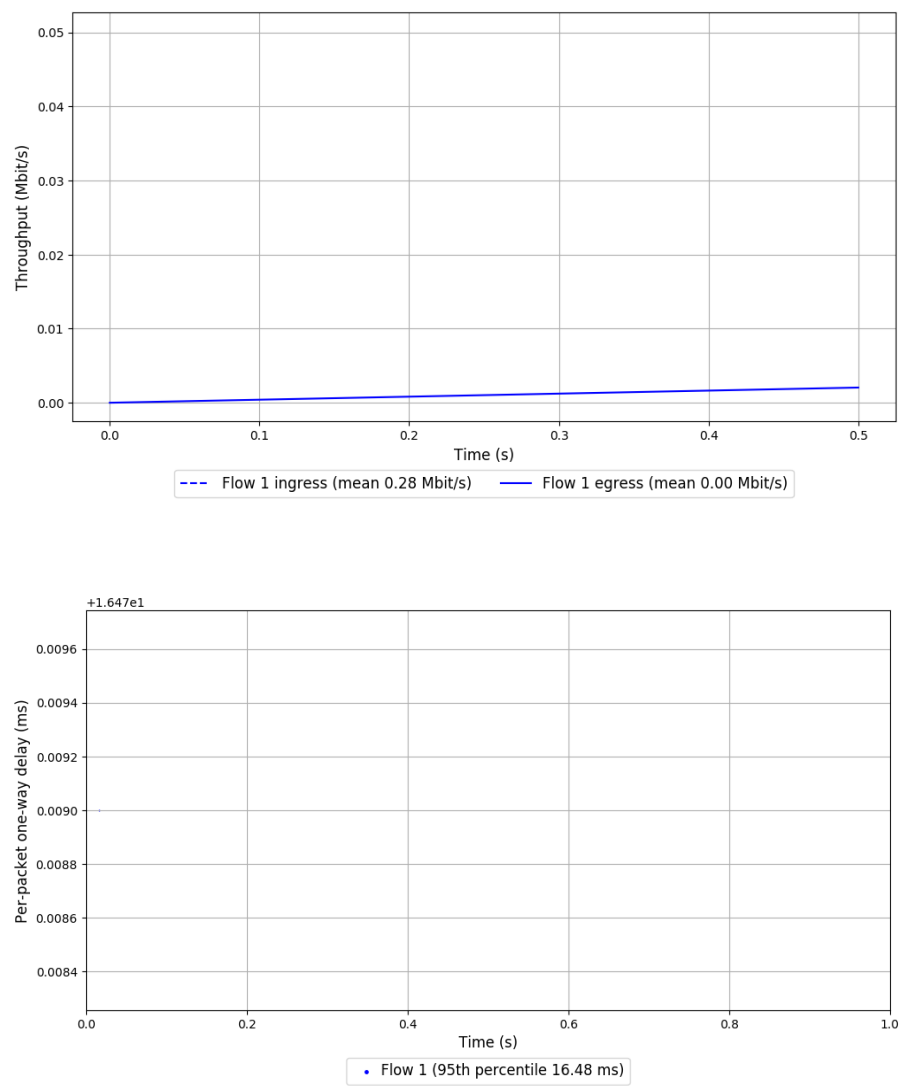
Start at: 2019-01-18 18:10:01

End at: 2019-01-18 18:10:31

Local clock offset: -2.902 ms

Remote clock offset: -1.358 ms

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



Run 3: Statistics of TaoVA-100x

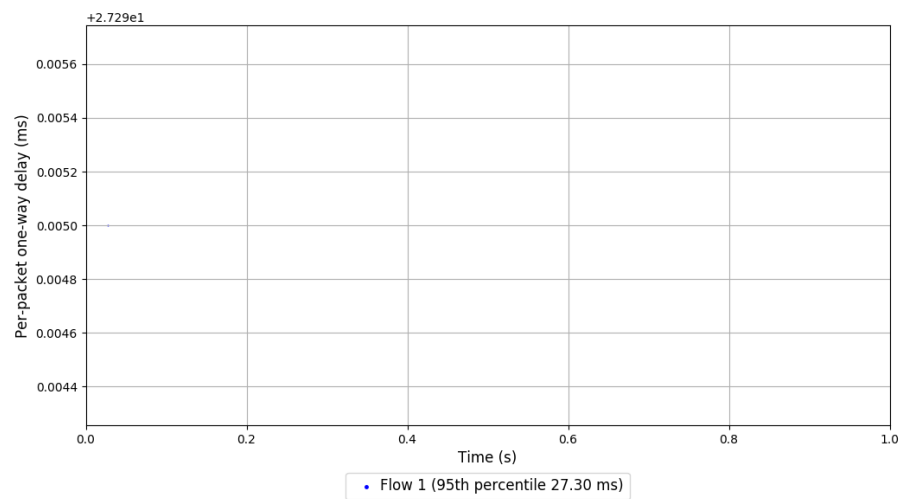
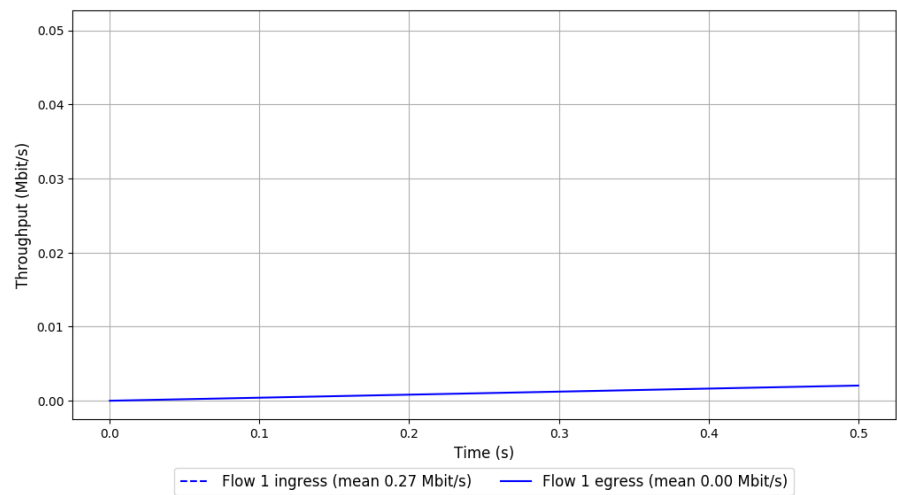
Start at: 2019-01-18 18:33:40

End at: 2019-01-18 18:34:10

Local clock offset: -4.083 ms

Remote clock offset: -1.102 ms

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

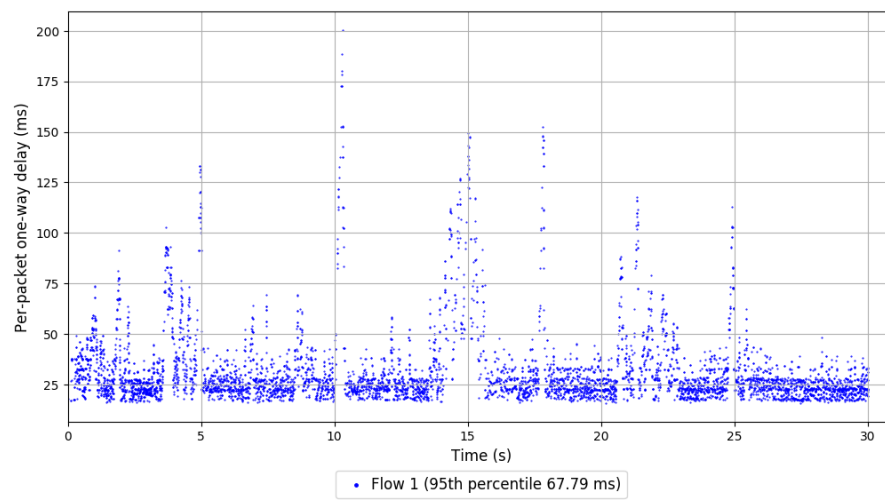
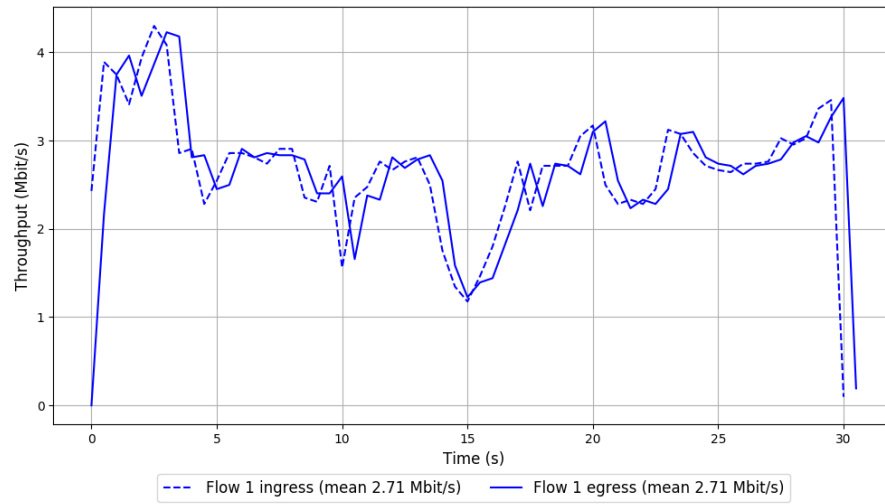


Run 1: Statistics of TCP Vegas

Start at: 2019-01-18 17:37:39
End at: 2019-01-18 17:38:09
Local clock offset: -0.061 ms
Remote clock offset: -1.716 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 67.794 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 67.794 ms
Loss rate: 0.06%

Run 1: Report of TCP Vegas — Data Link

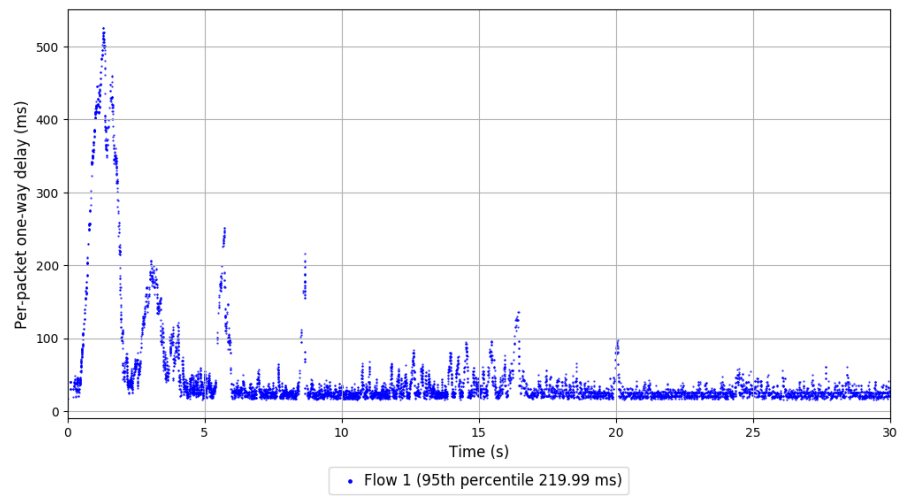
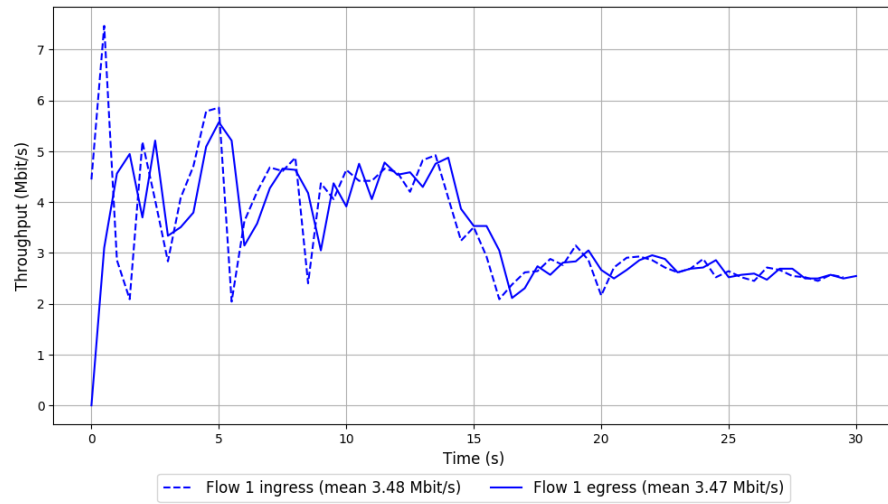


Run 2: Statistics of TCP Vegas

Start at: 2019-01-18 18:01:08
End at: 2019-01-18 18:01:38
Local clock offset: -0.087 ms
Remote clock offset: -1.151 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.47 Mbit/s
95th percentile per-packet one-way delay: 219.985 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 3.47 Mbit/s
95th percentile per-packet one-way delay: 219.985 ms
Loss rate: 0.09%

Run 2: Report of TCP Vegas — Data Link

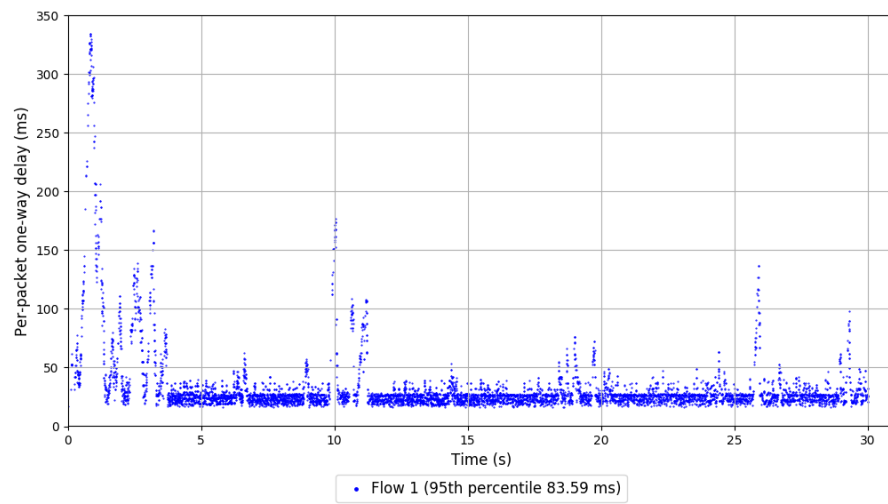
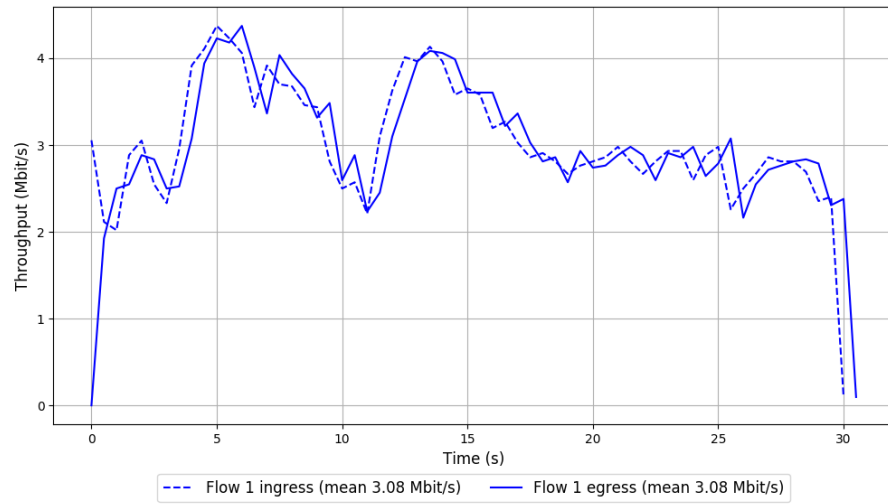


Run 3: Statistics of TCP Vegas

Start at: 2019-01-18 18:24:37
End at: 2019-01-18 18:25:07
Local clock offset: -2.424 ms
Remote clock offset: -1.867 ms

Below is generated by plot.py at 2019-01-18 18:41:58
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 83.591 ms
Loss rate: 0.06%
-- Flow 1:
Average throughput: 3.08 Mbit/s
95th percentile per-packet one-way delay: 83.591 ms
Loss rate: 0.06%

Run 3: Report of TCP Vegas — Data Link

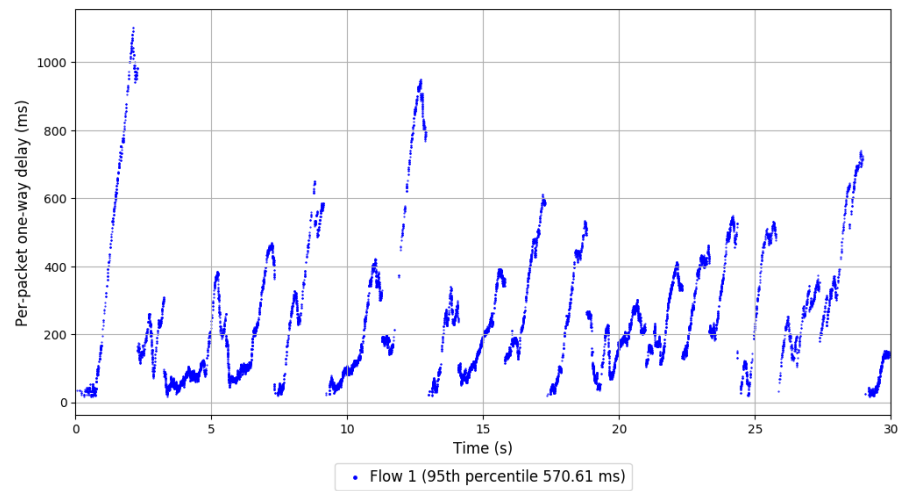
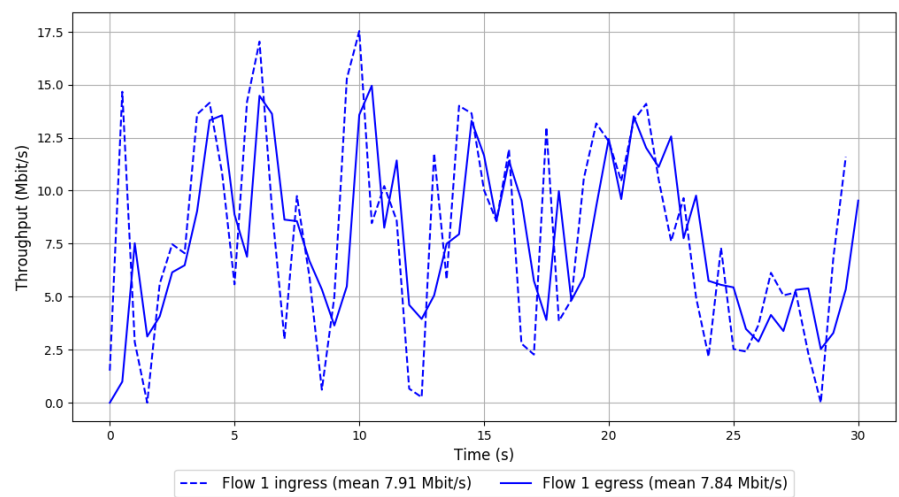


Run 1: Statistics of Verus

Start at: 2019-01-18 17:33:13
End at: 2019-01-18 17:33:43
Local clock offset: -0.5 ms
Remote clock offset: -1.104 ms

Below is generated by plot.py at 2019-01-18 18:42:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 7.84 Mbit/s
95th percentile per-packet one-way delay: 570.610 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 7.84 Mbit/s
95th percentile per-packet one-way delay: 570.610 ms
Loss rate: 1.00%

Run 1: Report of Verus — Data Link

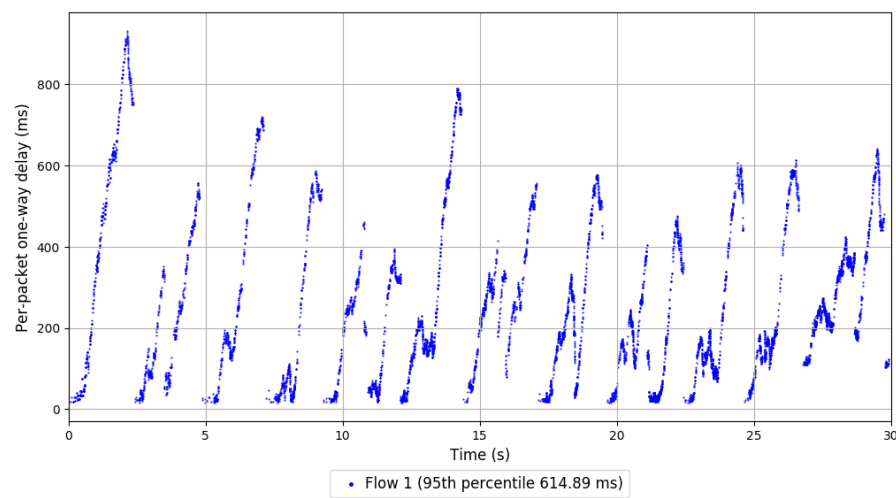
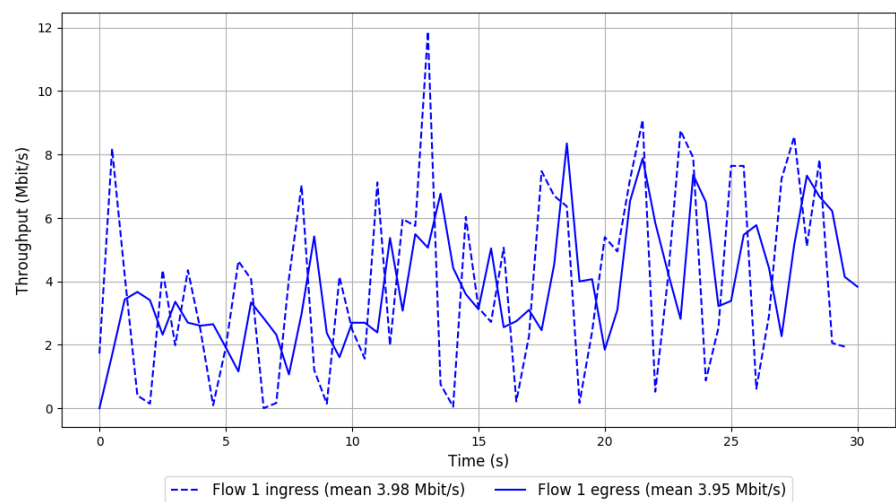


Run 2: Statistics of Verus

Start at: 2019-01-18 17:56:44
End at: 2019-01-18 17:57:14
Local clock offset: -1.004 ms
Remote clock offset: -1.621 ms

Below is generated by plot.py at 2019-01-18 18:42:00
Datalink statistics
-- Total of 1 flow:
Average throughput: 3.95 Mbit/s
95th percentile per-packet one-way delay: 614.895 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 3.95 Mbit/s
95th percentile per-packet one-way delay: 614.895 ms
Loss rate: 0.78%

Run 2: Report of Verus — Data Link

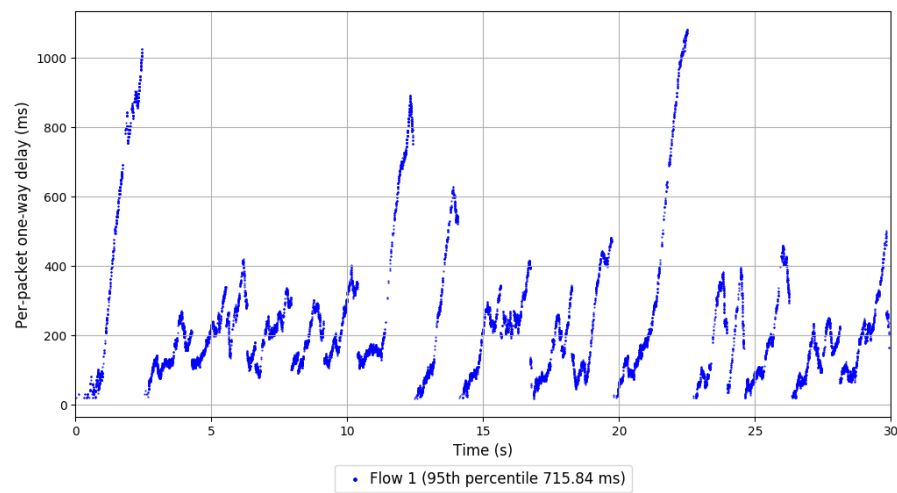
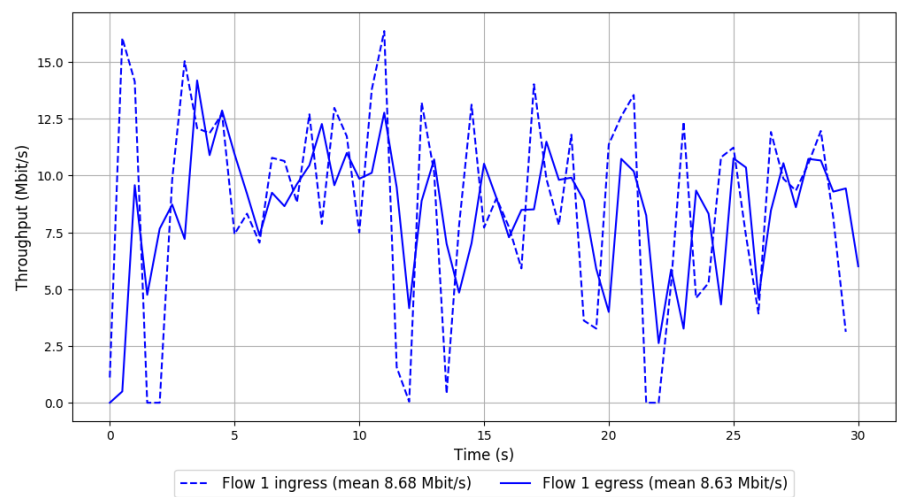


Run 3: Statistics of Verus

Start at: 2019-01-18 18:20:11
End at: 2019-01-18 18:20:41
Local clock offset: -3.975 ms
Remote clock offset: -1.368 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.63 Mbit/s
95th percentile per-packet one-way delay: 715.835 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 8.63 Mbit/s
95th percentile per-packet one-way delay: 715.835 ms
Loss rate: 0.62%

Run 3: Report of Verus — Data Link

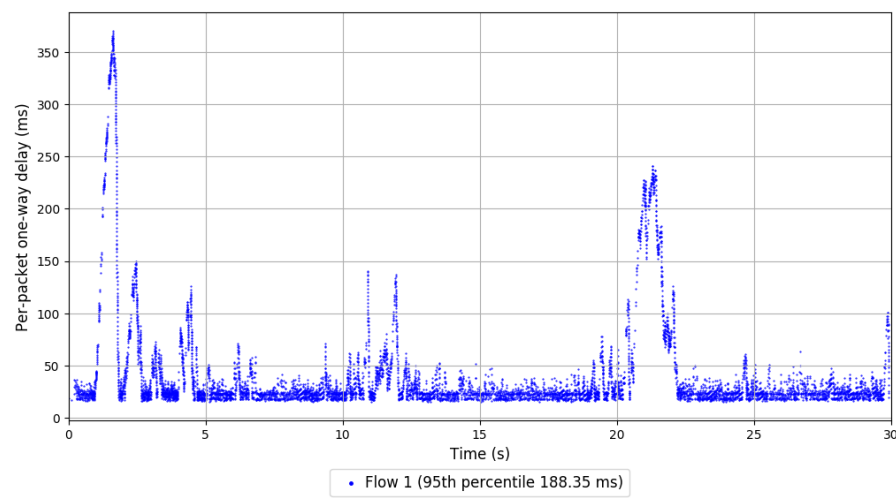
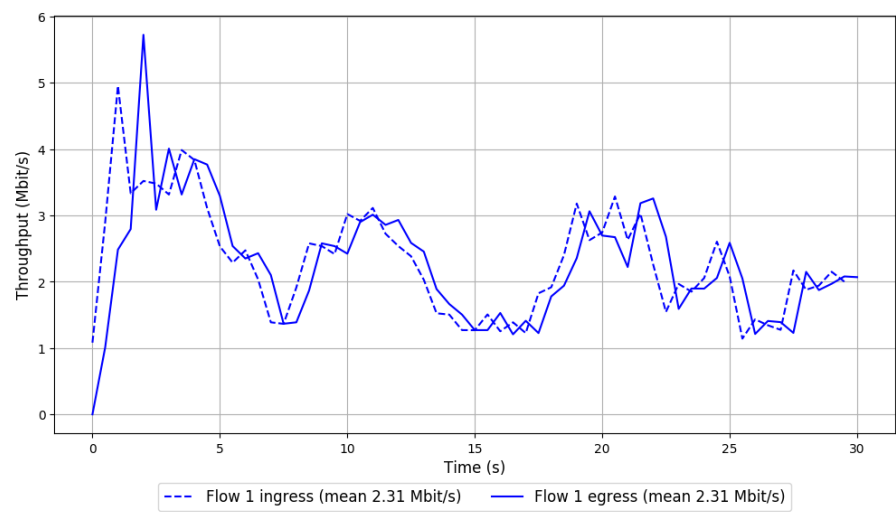


Run 1: Statistics of PCC-Vivace

Start at: 2019-01-18 17:52:15
End at: 2019-01-18 17:52:45
Local clock offset: -1.331 ms
Remote clock offset: -1.547 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 188.355 ms
Loss rate: 0.09%
-- Flow 1:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 188.355 ms
Loss rate: 0.09%

Run 1: Report of PCC-Vivace — Data Link

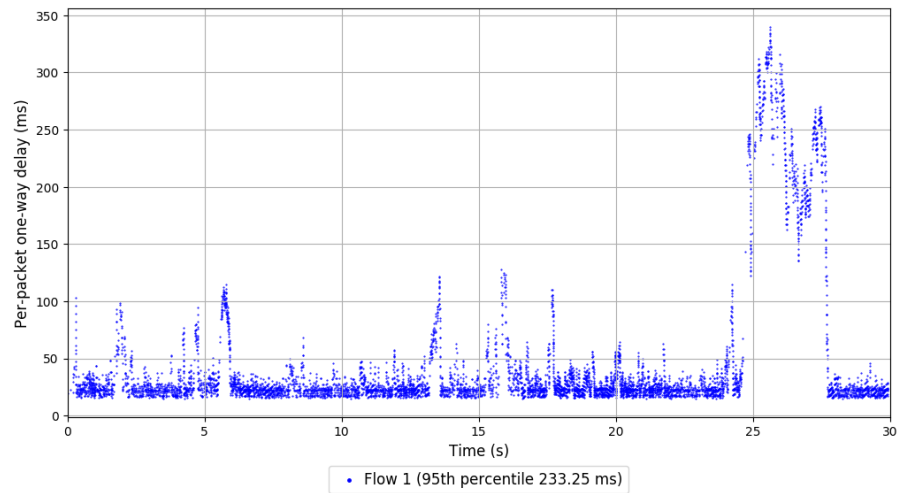
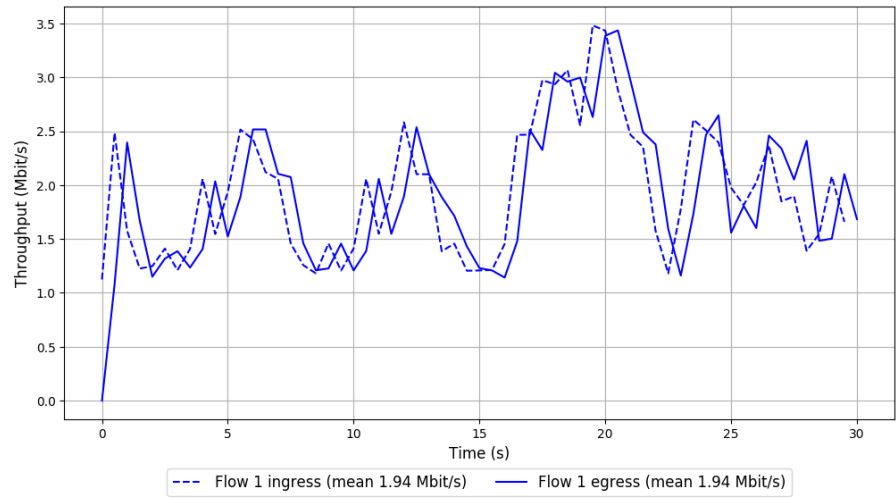


Run 2: Statistics of PCC-Vivace

Start at: 2019-01-18 18:15:40
End at: 2019-01-18 18:16:10
Local clock offset: -3.621 ms
Remote clock offset: -1.327 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 233.251 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 1.94 Mbit/s
95th percentile per-packet one-way delay: 233.251 ms
Loss rate: 0.08%

Run 2: Report of PCC-Vivace — Data Link

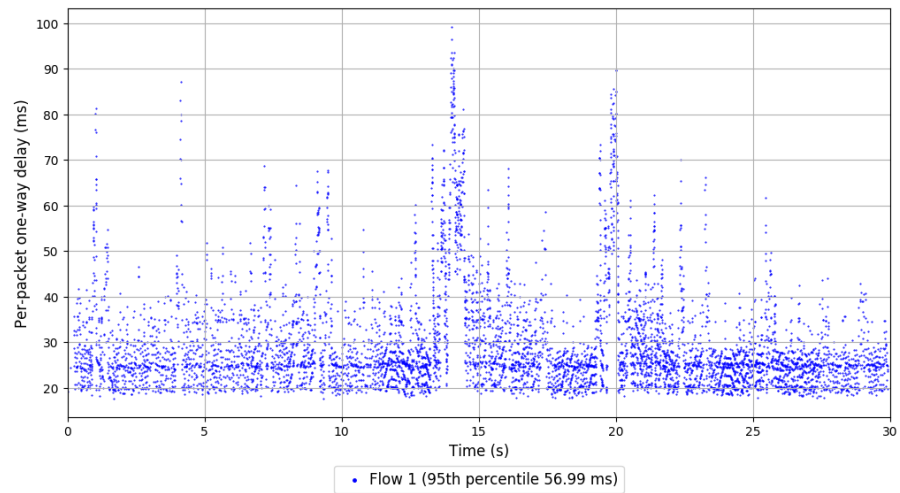
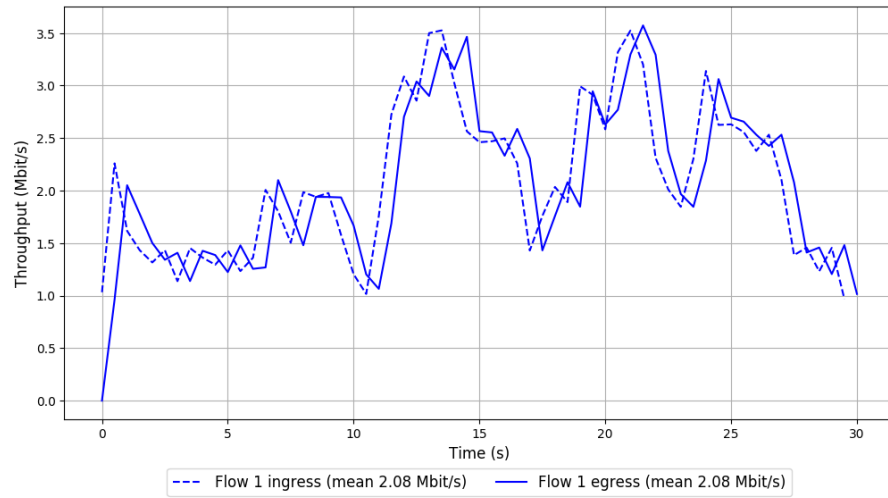


Run 3: Statistics of PCC-Vivace

Start at: 2019-01-18 18:39:23
End at: 2019-01-18 18:39:53
Local clock offset: -3.943 ms
Remote clock offset: -1.107 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 2.08 Mbit/s
95th percentile per-packet one-way delay: 56.992 ms
Loss rate: 0.02%
-- Flow 1:
Average throughput: 2.08 Mbit/s
95th percentile per-packet one-way delay: 56.992 ms
Loss rate: 0.02%

Run 3: Report of PCC-Vivace — Data Link

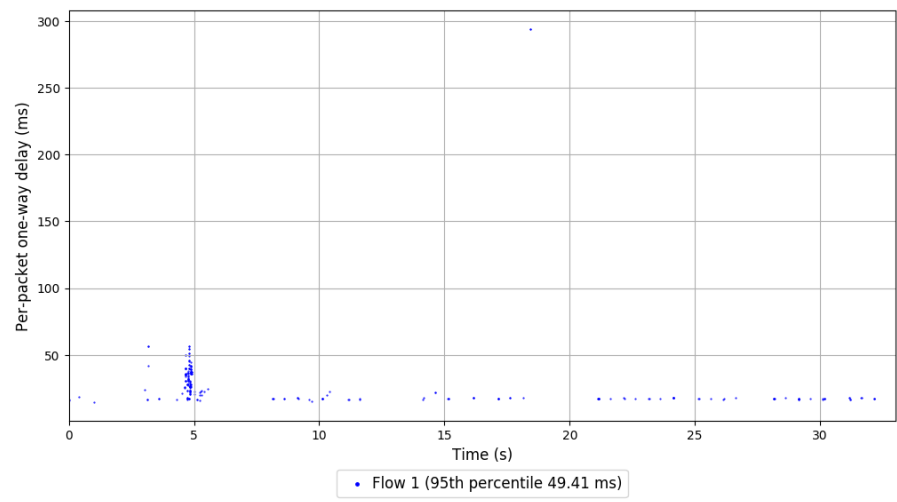
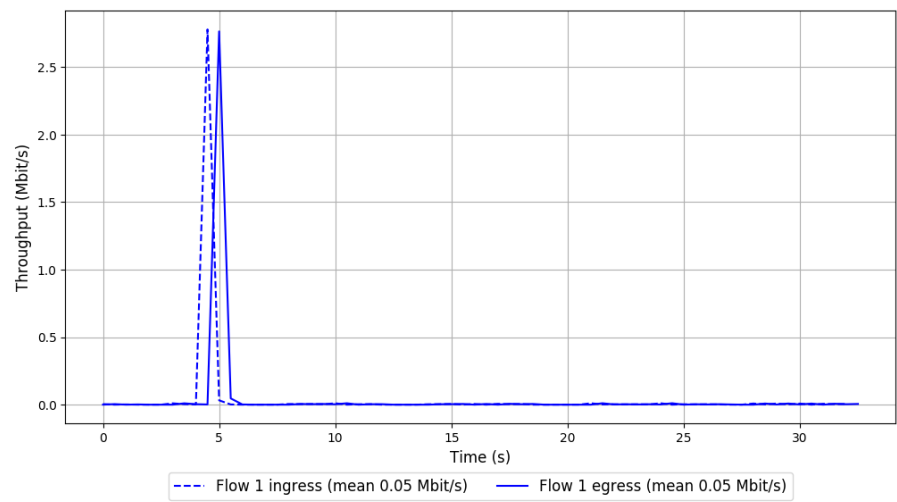


Run 1: Statistics of WebRTC media

Start at: 2019-01-18 17:35:27
End at: 2019-01-18 17:35:57
Local clock offset: 0.378 ms
Remote clock offset: -0.884 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 49.414 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 49.414 ms
Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link

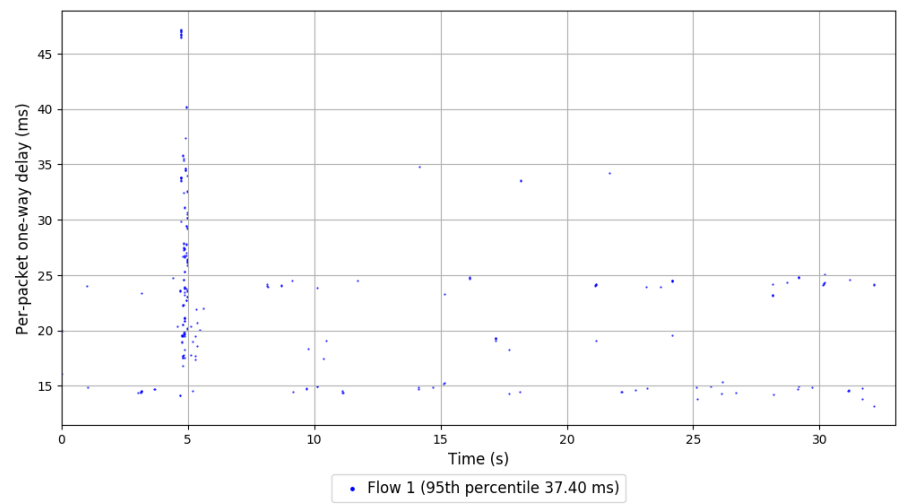
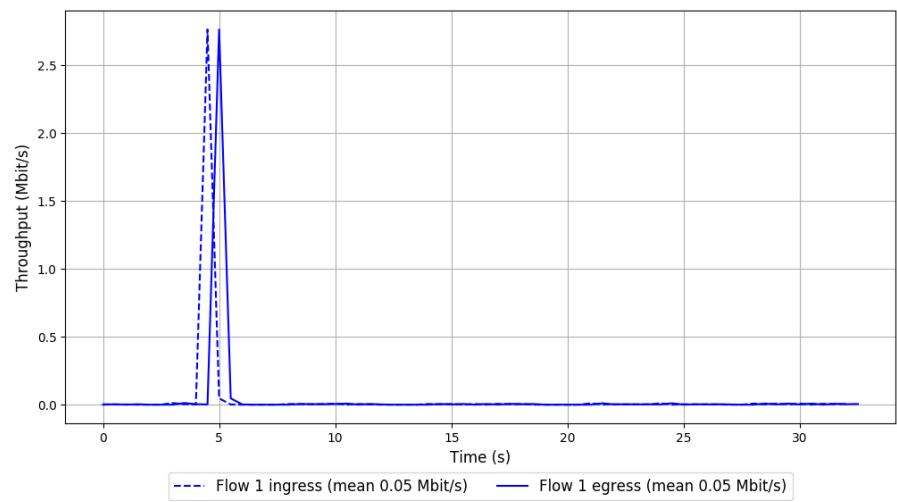


Run 2: Statistics of WebRTC media

Start at: 2019-01-18 17:58:56
End at: 2019-01-18 17:59:26
Local clock offset: -1.444 ms
Remote clock offset: -0.576 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 37.399 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 37.399 ms
Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-18 18:22:25
End at: 2019-01-18 18:22:55
Local clock offset: -3.775 ms
Remote clock offset: -1.222 ms

Below is generated by plot.py at 2019-01-18 18:42:01
Datalink statistics
-- Total of 1 flow:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 45.370 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.05 Mbit/s
95th percentile per-packet one-way delay: 45.370 ms
Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

