

Pantheon Report

Generated at 2019-01-17 05:48:54 (UTC).

Tested in mahimahi: mm-delay 88 mm-link 2.64mbps-poisson.trace 2.64mbps-poisson.trace
--uplink-queue=droptail --uplink-queue-args=packets=130

Repeated the test of 21 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

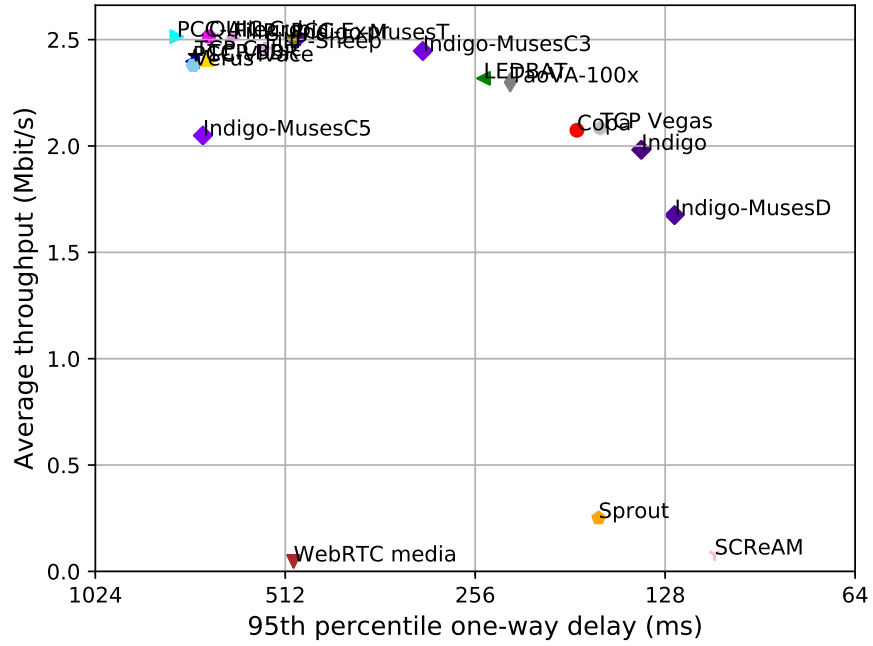
System info:

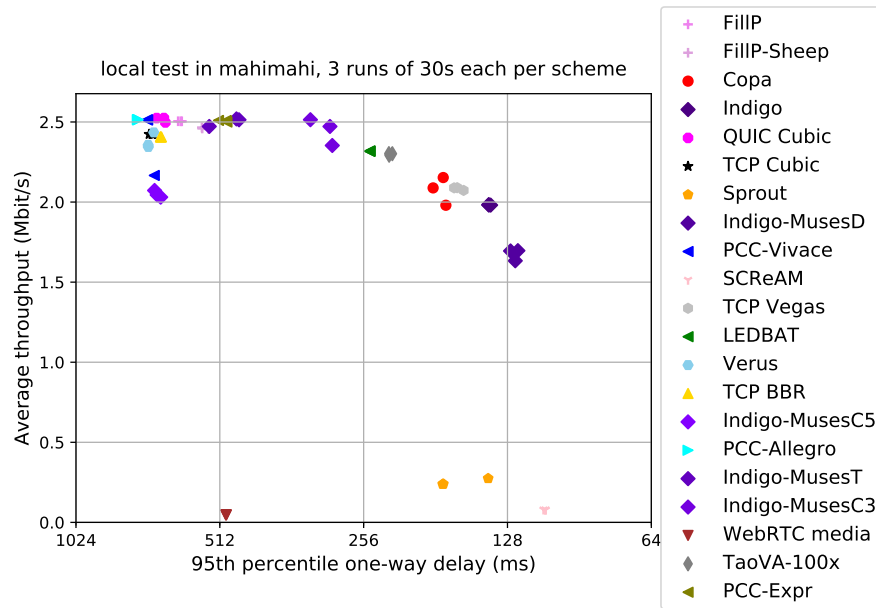
```
Linux 4.15.0-1026-gcp
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
```

Git summary:

```
branch: muses @ c80a283586bf7b0cc1fe08c69c8f60d56498f81c
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
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-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
```

local test in mahimahi, 3 runs of 30s each per scheme
 (mean of all runs by scheme)





scheme	# runs	mean avg tput (Mbit/s)	mean 95th-%ile delay (ms)	mean loss rate (%)
		flow 1	flow 1	flow 1
TCP BBR	3	2.41	680.29	2.20
Copa	3	2.07	176.63	0.43
TCP Cubic	3	2.42	711.87	3.27
FillP	3	2.50	619.79	17.82
FillP-Sheep	3	2.46	551.90	10.02
Indigo	3	1.98	139.66	0.32
Indigo-MusesC3	3	2.44	309.93	1.07
Indigo-MusesC5	3	2.05	691.47	46.77
Indigo-MusesD	3	1.67	123.72	0.32
Indigo-MusesT	3	2.50	492.68	1.57
LEDBAT	3	2.32	248.37	0.67
PCC-Allegro	3	2.51	760.49	86.92
PCC-Expr	3	2.51	502.21	44.41
QUIC Cubic	3	2.51	676.67	3.92
SReAM	3	0.08	106.90	0.34
Sprout	3	0.25	163.25	0.59
TaoVA-100x	3	2.30	225.34	1.15
TCP Vegas	3	2.08	162.27	0.45
Verus	3	2.38	716.56	8.29
PCC-Vivace	3	2.40	717.87	24.35
WebRTC media	3	0.05	496.78	0.00

Run 1: Statistics of TCP BBR

Start at: 2019-01-17 05:12:15

End at: 2019-01-17 05:12:45

Below is generated by plot.py at 2019-01-17 05:47:38

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.41 Mbit/s (105.9% utilization)

95th percentile per-packet one-way delay: 680.839 ms

Loss rate: 2.19%

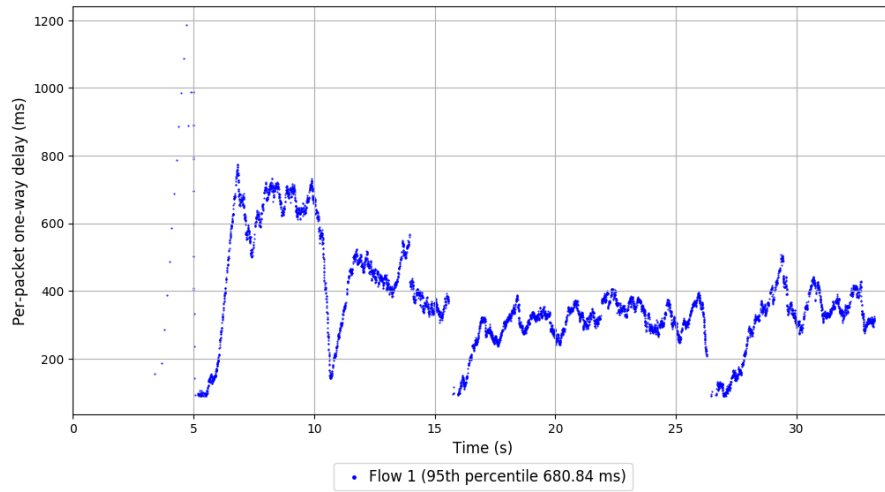
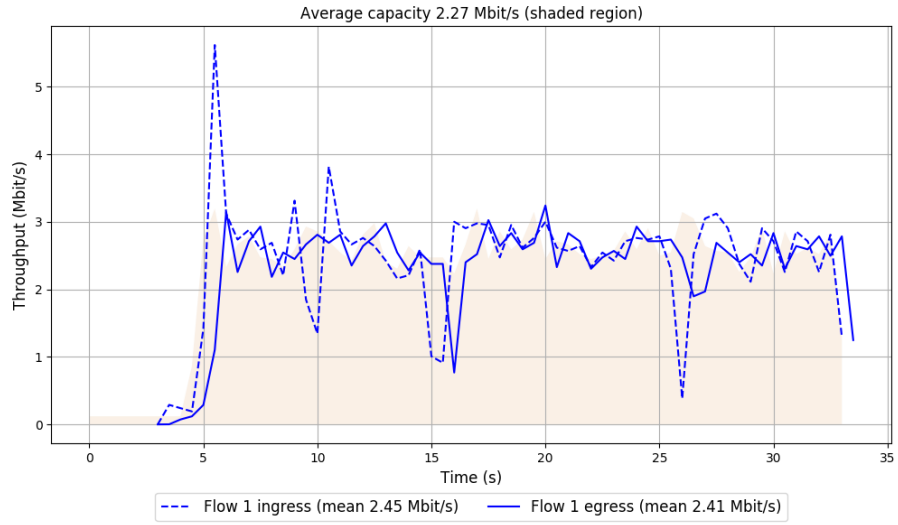
-- Flow 1:

Average throughput: 2.41 Mbit/s

95th percentile per-packet one-way delay: 680.839 ms

Loss rate: 2.19%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-01-17 05:24:34

End at: 2019-01-17 05:25:04

Below is generated by plot.py at 2019-01-17 05:47:38

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.41 Mbit/s (106.0% utilization)

95th percentile per-packet one-way delay: 681.593 ms

Loss rate: 2.14%

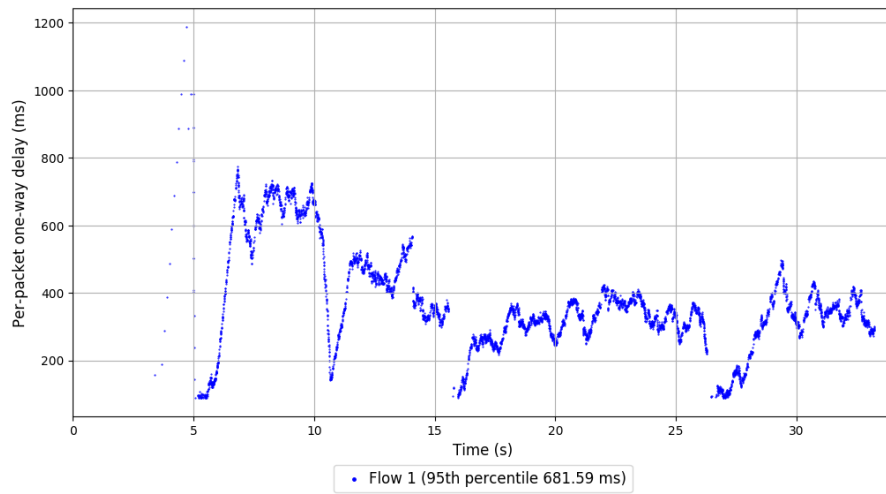
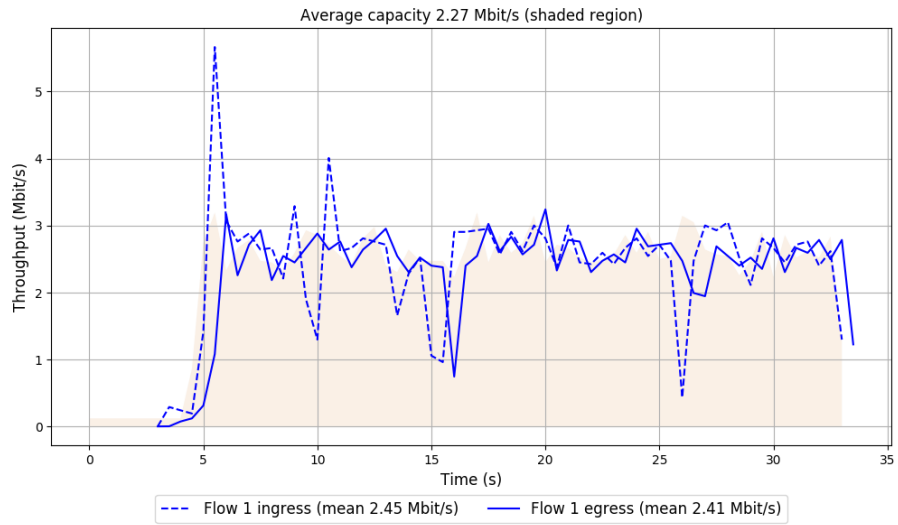
-- Flow 1:

Average throughput: 2.41 Mbit/s

95th percentile per-packet one-way delay: 681.593 ms

Loss rate: 2.14%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-01-17 05:36:53

End at: 2019-01-17 05:37:23

Below is generated by plot.py at 2019-01-17 05:47:38

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.41 Mbit/s (105.9% utilization)

95th percentile per-packet one-way delay: 678.450 ms

Loss rate: 2.27%

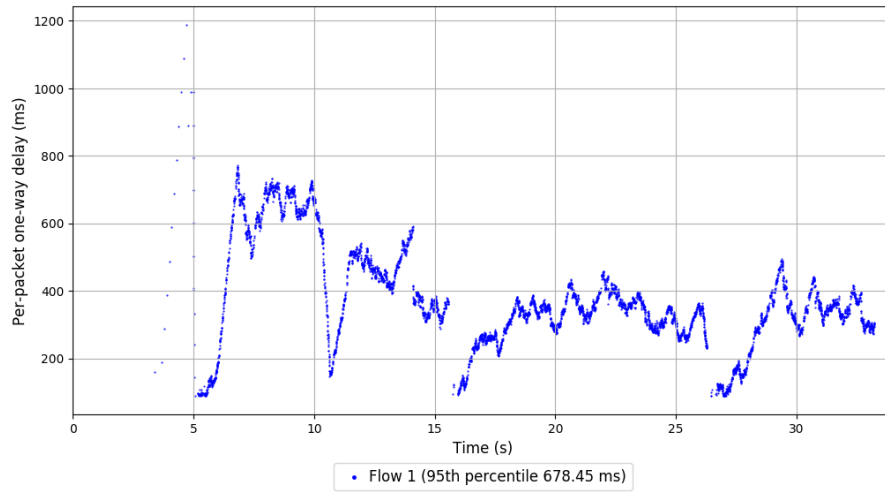
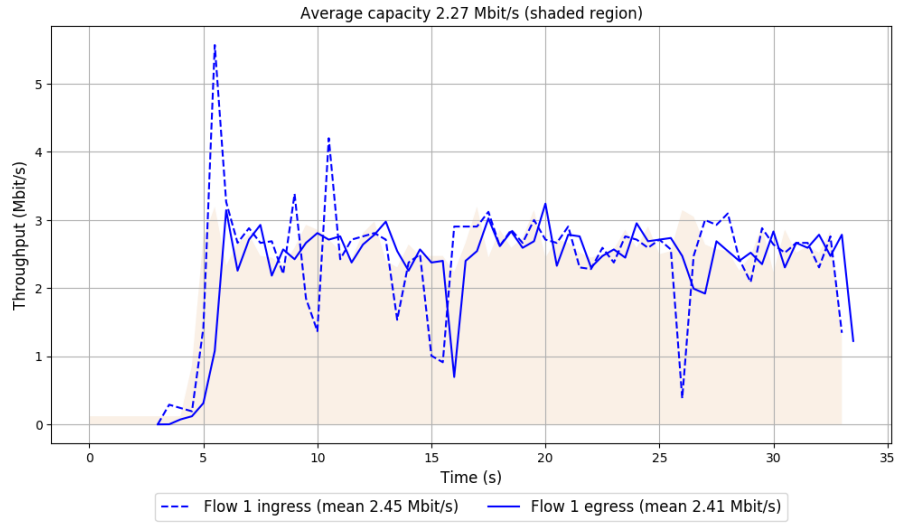
-- Flow 1:

Average throughput: 2.41 Mbit/s

95th percentile per-packet one-way delay: 678.450 ms

Loss rate: 2.27%

Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2019-01-17 05:11:05

End at: 2019-01-17 05:11:35

Below is generated by plot.py at 2019-01-17 05:47:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.15 Mbit/s (94.8% utilization)

95th percentile per-packet one-way delay: 174.461 ms

Loss rate: 0.25%

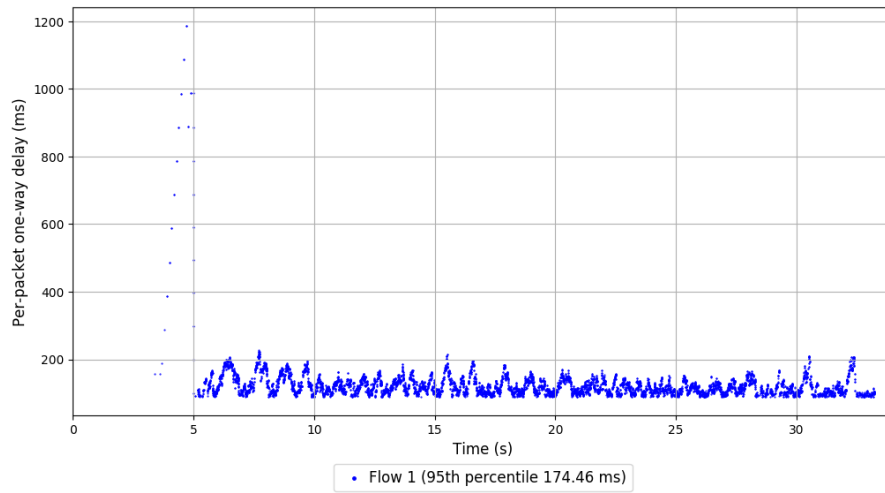
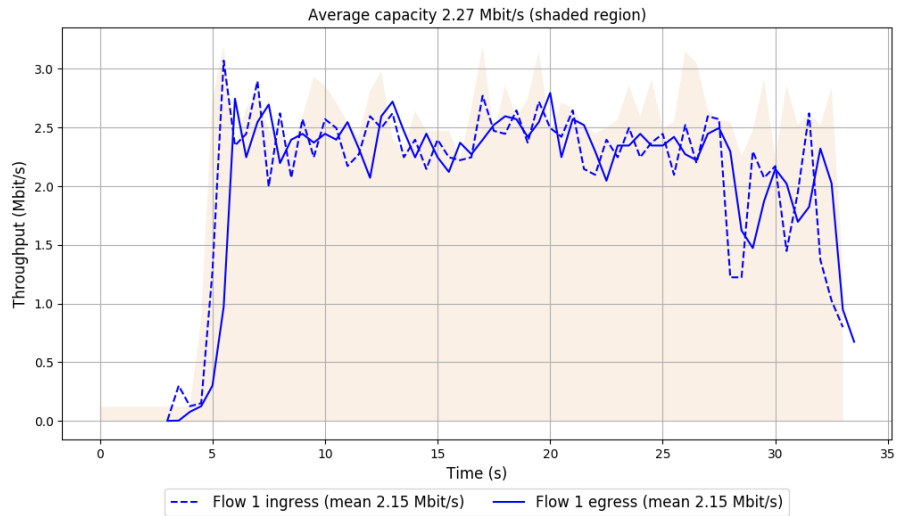
-- Flow 1:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 174.461 ms

Loss rate: 0.25%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2019-01-17 05:23:24

End at: 2019-01-17 05:23:54

Below is generated by plot.py at 2019-01-17 05:47:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.98 Mbit/s (87.1% utilization)

95th percentile per-packet one-way delay: 172.245 ms

Loss rate: 0.55%

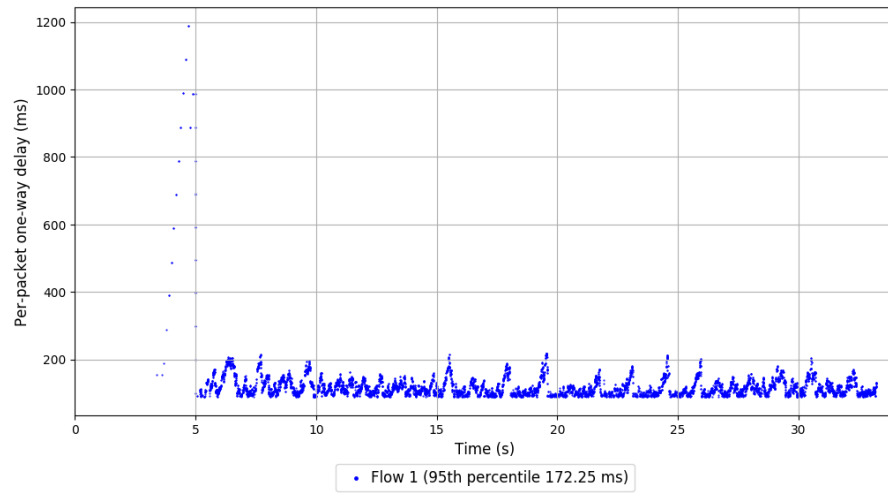
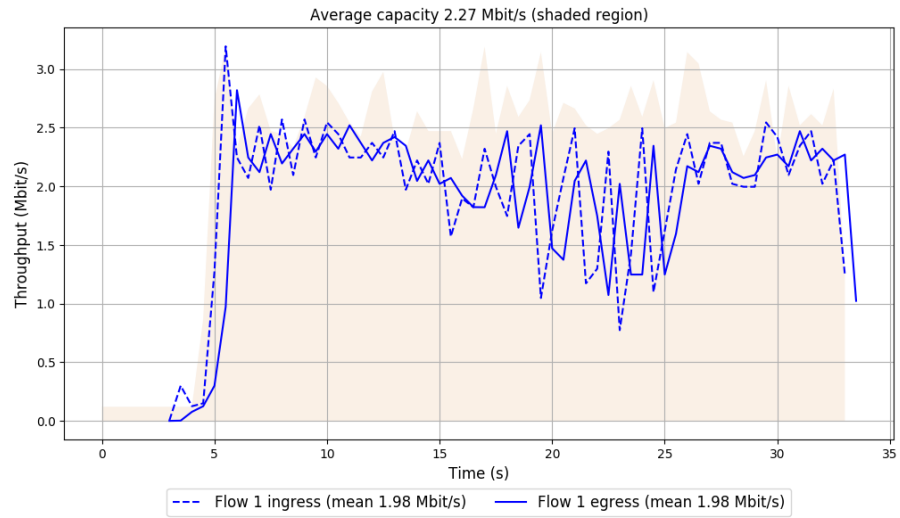
-- Flow 1:

Average throughput: 1.98 Mbit/s

95th percentile per-packet one-way delay: 172.245 ms

Loss rate: 0.55%

Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2019-01-17 05:35:42

End at: 2019-01-17 05:36:12

Below is generated by plot.py at 2019-01-17 05:47:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.09 Mbit/s (91.9% utilization)

95th percentile per-packet one-way delay: 183.173 ms

Loss rate: 0.50%

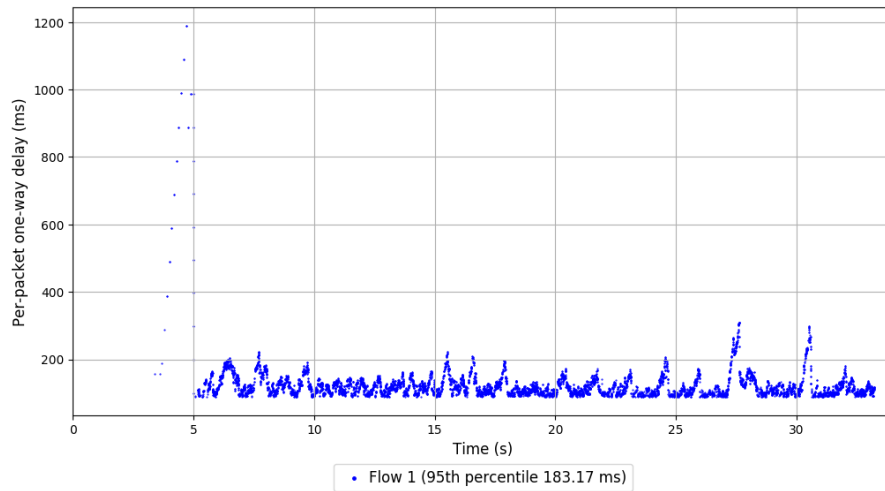
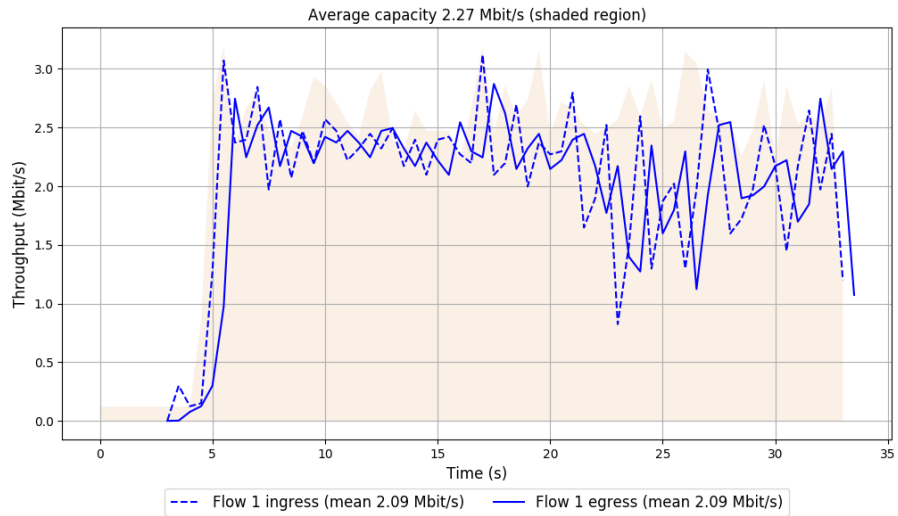
-- Flow 1:

Average throughput: 2.09 Mbit/s

95th percentile per-packet one-way delay: 183.173 ms

Loss rate: 0.50%

Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-01-17 05:19:18

End at: 2019-01-17 05:19:48

Below is generated by plot.py at 2019-01-17 05:47:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.42 Mbit/s (106.6% utilization)

95th percentile per-packet one-way delay: 709.668 ms

Loss rate: 3.03%

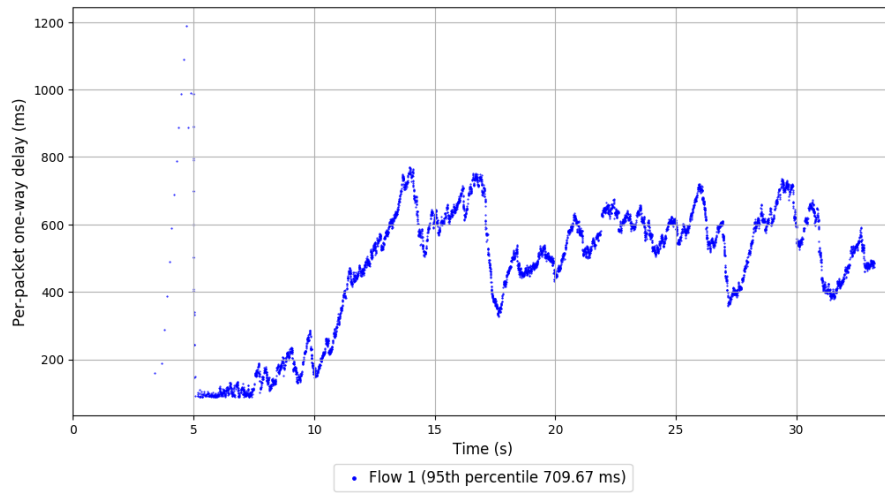
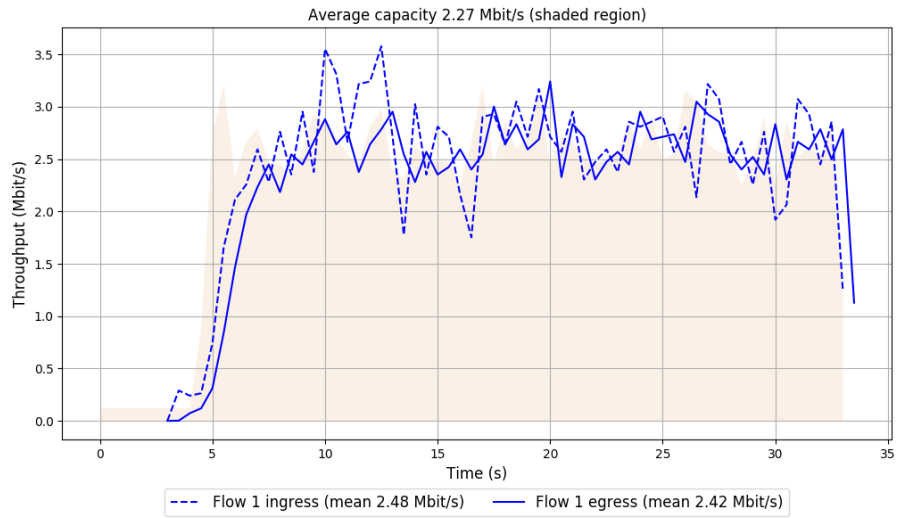
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 709.668 ms

Loss rate: 3.03%

Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2019-01-17 05:31:36

End at: 2019-01-17 05:32:06

Below is generated by plot.py at 2019-01-17 05:47:40

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.42 Mbit/s (106.6% utilization)

95th percentile per-packet one-way delay: 706.252 ms

Loss rate: 3.12%

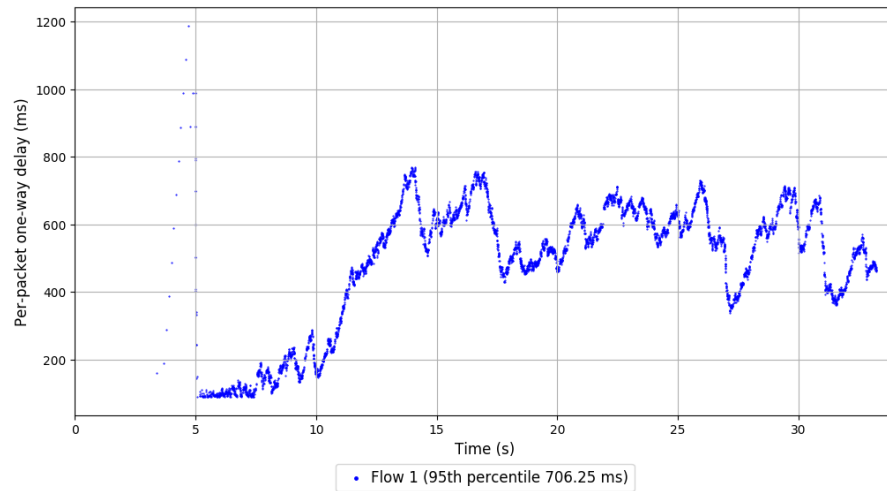
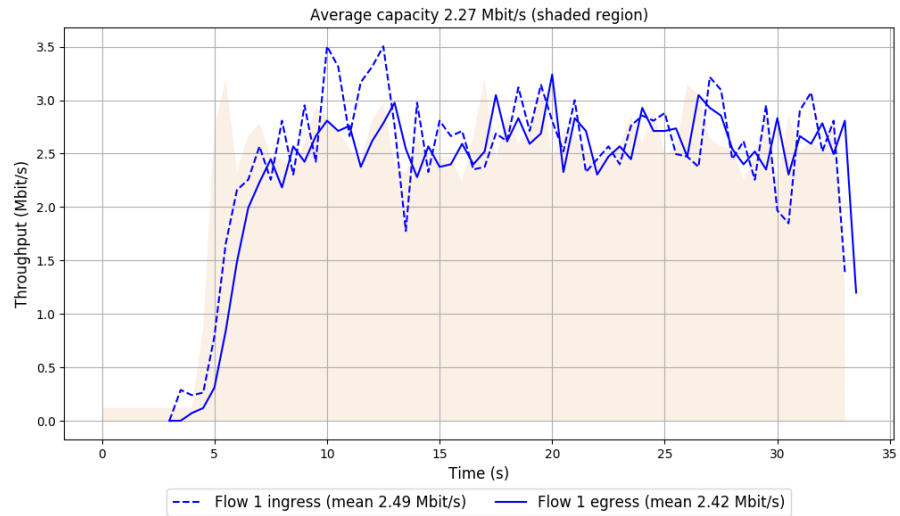
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 706.252 ms

Loss rate: 3.12%

Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2019-01-17 05:43:55

End at: 2019-01-17 05:44:25

Below is generated by plot.py at 2019-01-17 05:47:46

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.42 Mbit/s (106.7% utilization)

95th percentile per-packet one-way delay: 719.701 ms

Loss rate: 3.65%

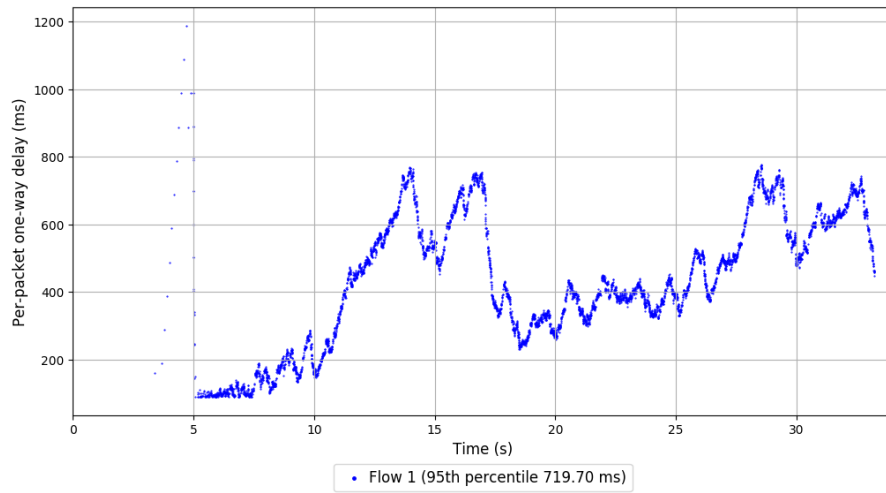
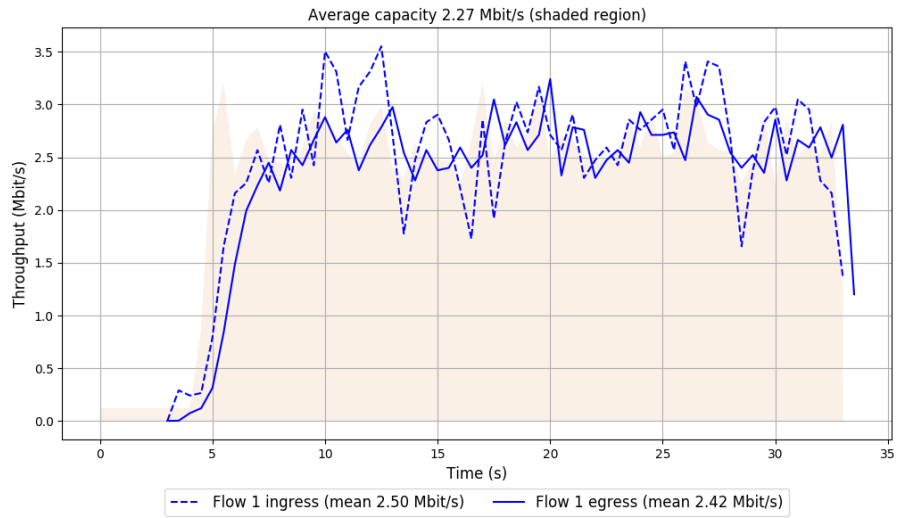
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 719.701 ms

Loss rate: 3.65%

Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-01-17 05:14:01

End at: 2019-01-17 05:14:31

Below is generated by plot.py at 2019-01-17 05:47:48

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.50 Mbit/s (110.2% utilization)

95th percentile per-packet one-way delay: 614.801 ms

Loss rate: 18.32%

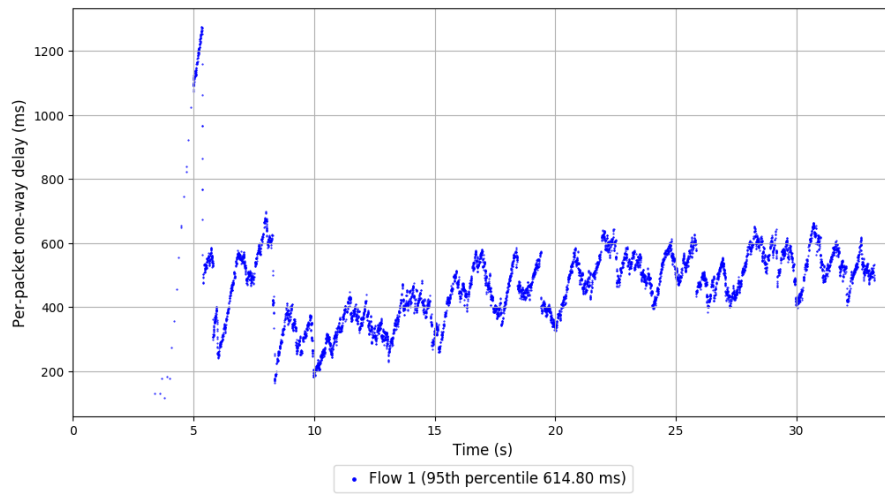
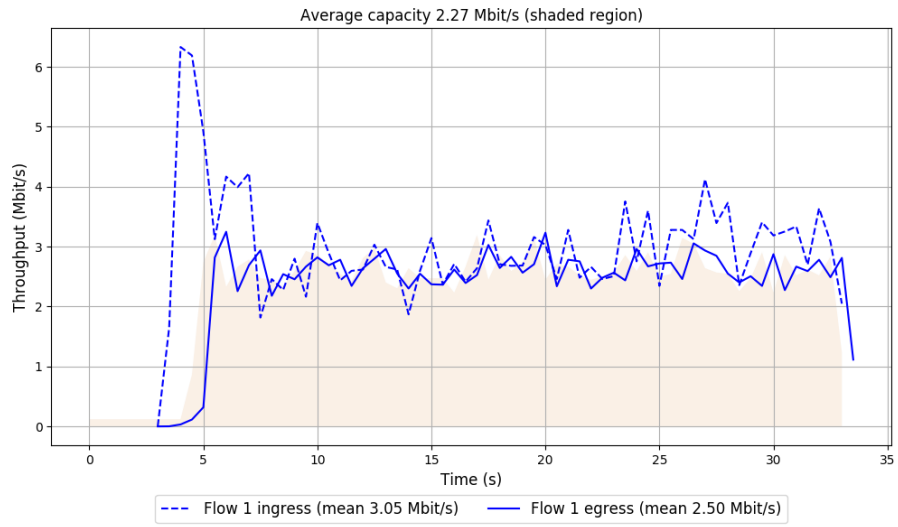
-- Flow 1:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 614.801 ms

Loss rate: 18.32%

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-01-17 05:26:19

End at: 2019-01-17 05:26:49

Below is generated by plot.py at 2019-01-17 05:47:49

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.50 Mbit/s (110.2% utilization)

95th percentile per-packet one-way delay: 618.478 ms

Loss rate: 16.88%

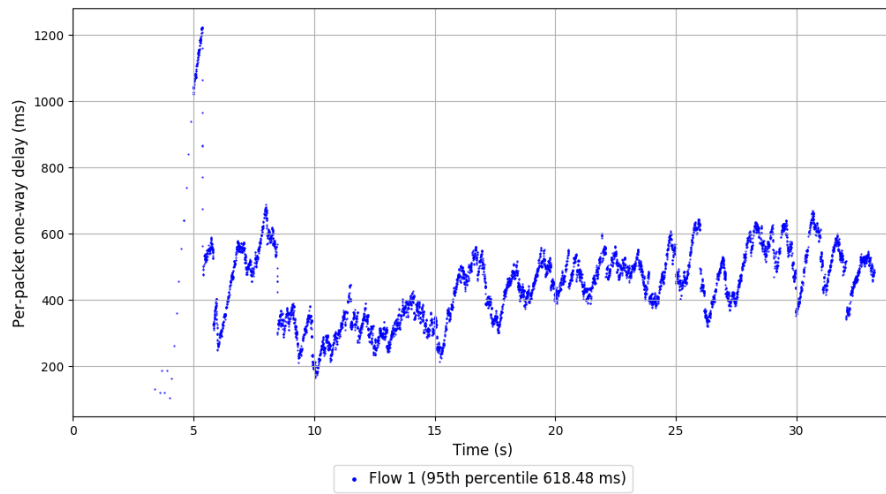
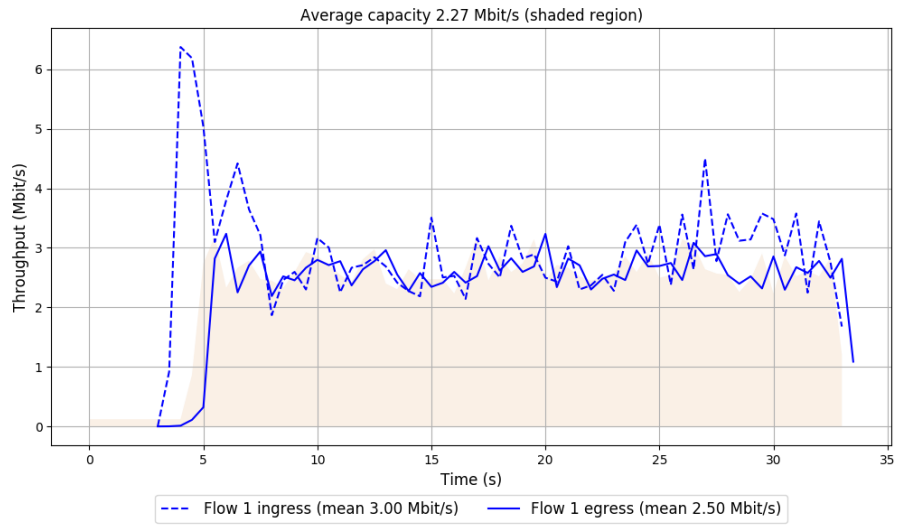
-- Flow 1:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 618.478 ms

Loss rate: 16.88%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2019-01-17 05:38:38

End at: 2019-01-17 05:39:08

Below is generated by plot.py at 2019-01-17 05:47:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.50 Mbit/s (110.2% utilization)

95th percentile per-packet one-way delay: 626.084 ms

Loss rate: 18.26%

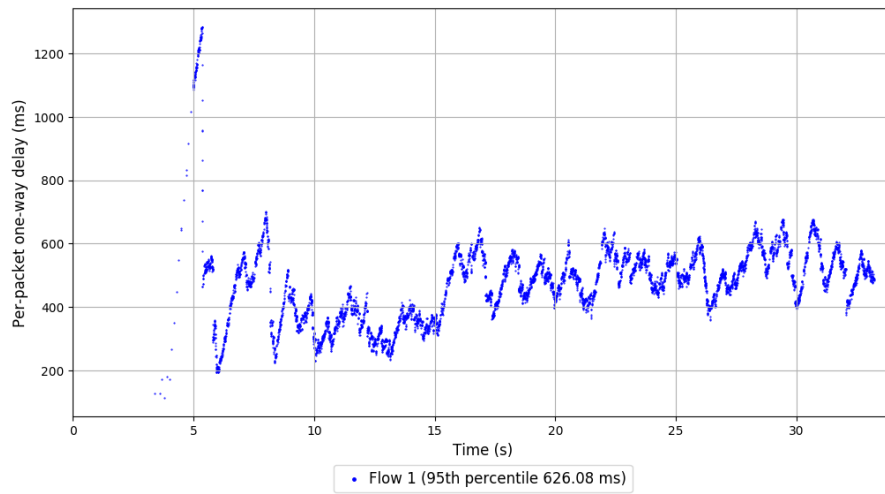
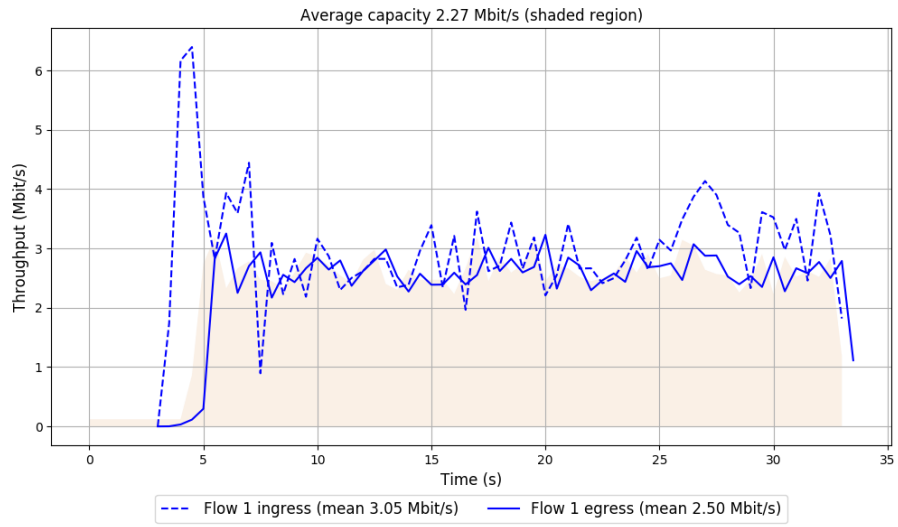
-- Flow 1:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 626.084 ms

Loss rate: 18.26%

Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-17 05:15:46

End at: 2019-01-17 05:16:16

Below is generated by plot.py at 2019-01-17 05:47:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.46 Mbit/s (108.1% utilization)

95th percentile per-packet one-way delay: 540.213 ms

Loss rate: 9.88%

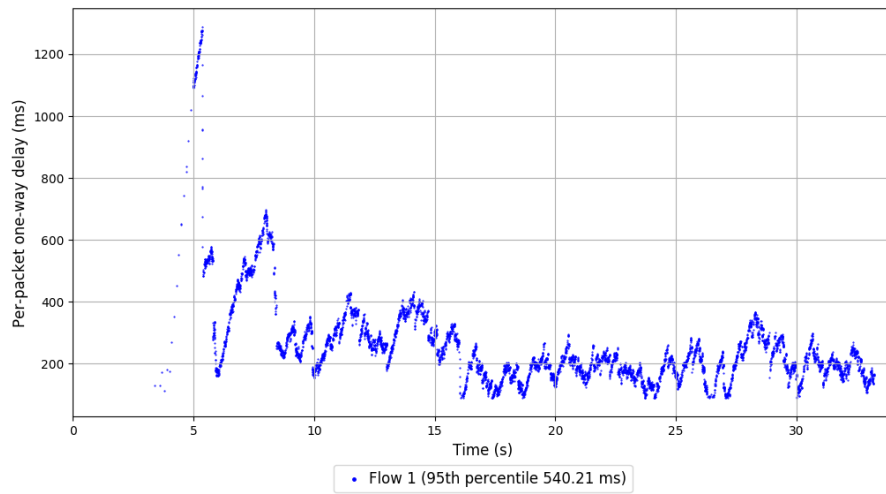
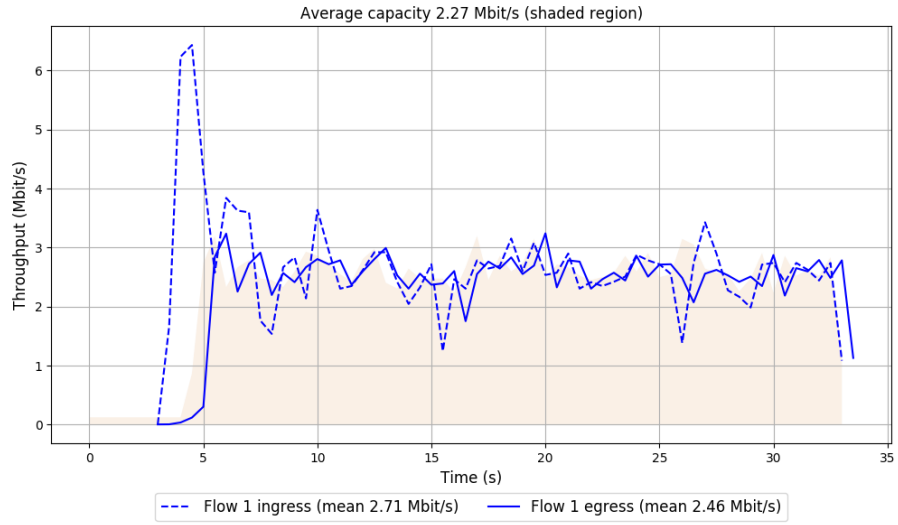
-- Flow 1:

Average throughput: 2.46 Mbit/s

95th percentile per-packet one-way delay: 540.213 ms

Loss rate: 9.88%

Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-01-17 05:28:05

End at: 2019-01-17 05:28:35

Below is generated by plot.py at 2019-01-17 05:47:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.46 Mbit/s (108.2% utilization)

95th percentile per-packet one-way delay: 557.281 ms

Loss rate: 10.02%

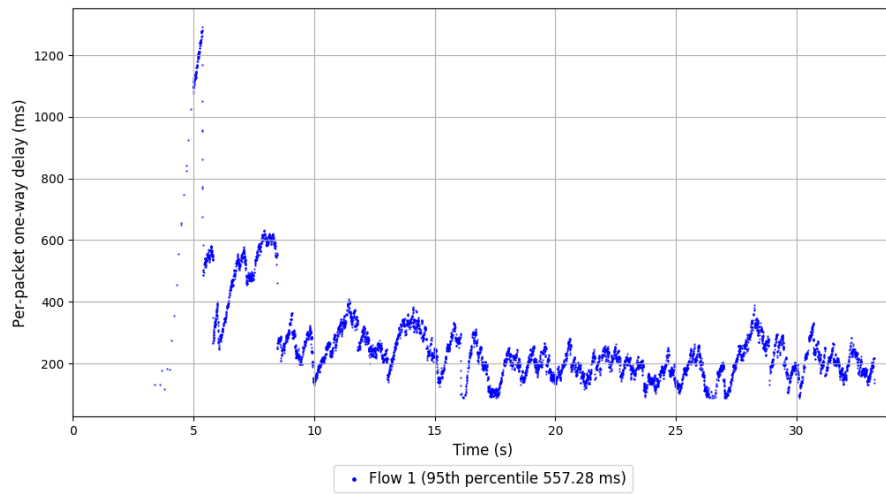
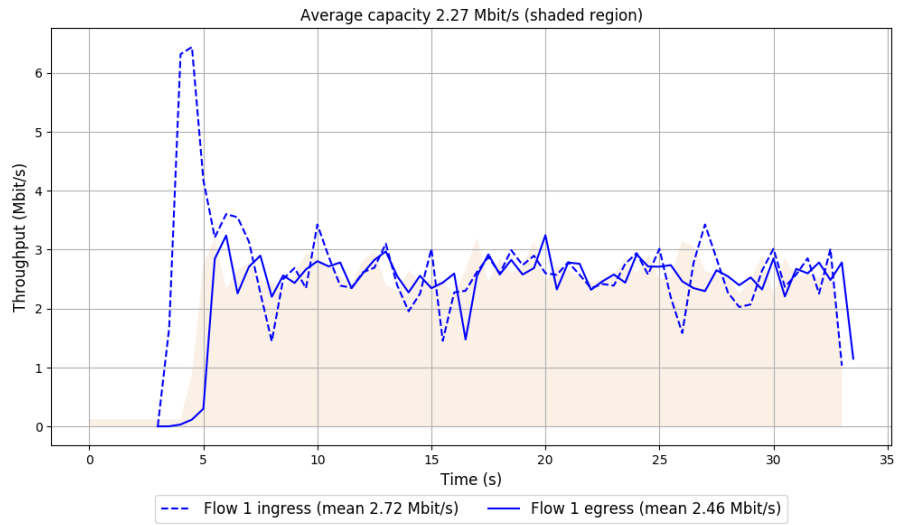
-- Flow 1:

Average throughput: 2.46 Mbit/s

95th percentile per-packet one-way delay: 557.281 ms

Loss rate: 10.02%

Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-01-17 05:40:24

End at: 2019-01-17 05:40:54

Below is generated by plot.py at 2019-01-17 05:47:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.47 Mbit/s (108.5% utilization)

95th percentile per-packet one-way delay: 558.194 ms

Loss rate: 10.17%

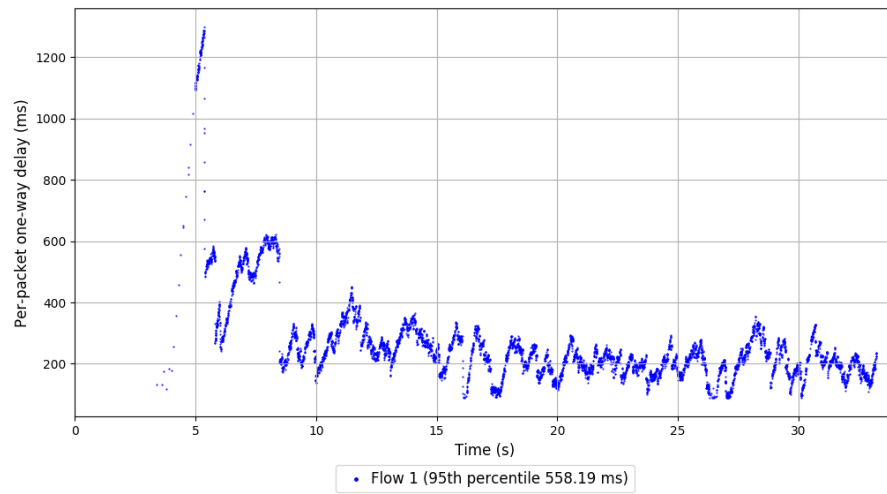
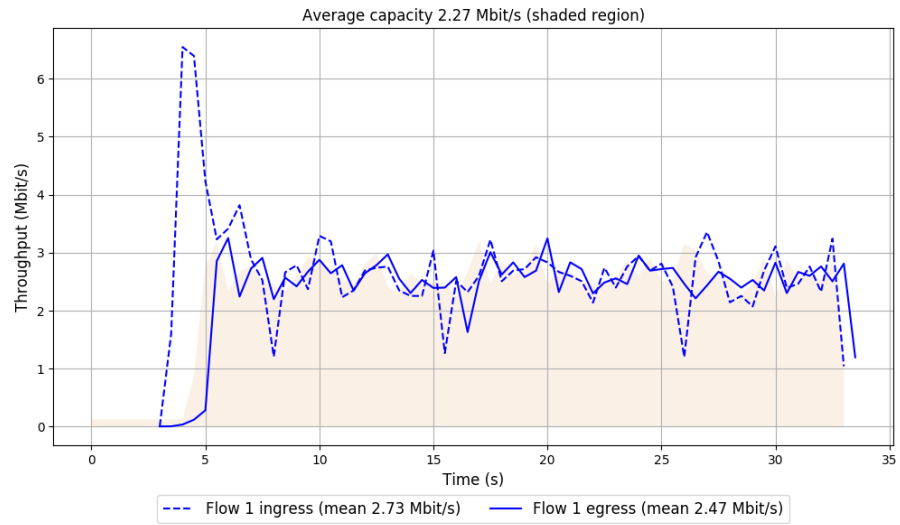
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 558.194 ms

Loss rate: 10.17%

Run 3: Report of FillP-Sheep — Data Link



Run 1: Statistics of Indigo

Start at: 2019-01-17 05:21:03

End at: 2019-01-17 05:21:33

Below is generated by plot.py at 2019-01-17 05:47:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.98 Mbit/s (87.2% utilization)

95th percentile per-packet one-way delay: 138.834 ms

Loss rate: 0.25%

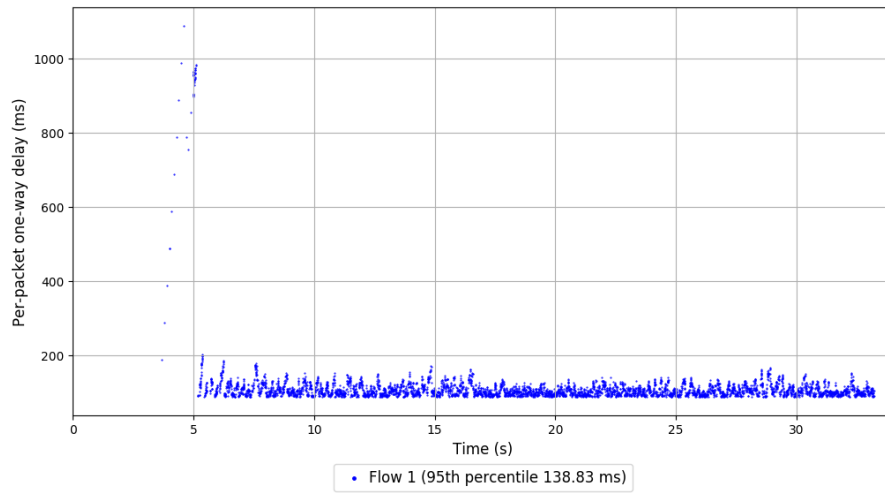
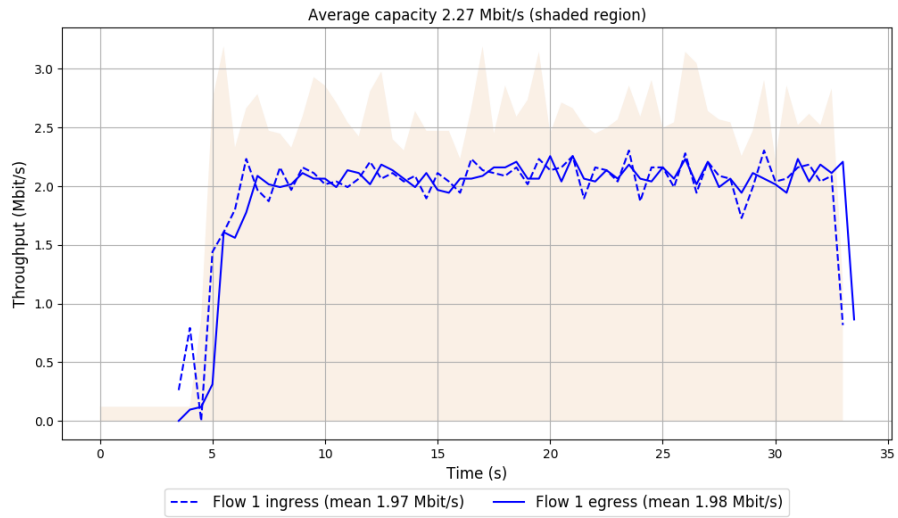
-- Flow 1:

Average throughput: 1.98 Mbit/s

95th percentile per-packet one-way delay: 138.834 ms

Loss rate: 0.25%

Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-01-17 05:33:22

End at: 2019-01-17 05:33:52

Below is generated by plot.py at 2019-01-17 05:47:53

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.98 Mbit/s (87.2% utilization)

95th percentile per-packet one-way delay: 140.044 ms

Loss rate: 0.37%

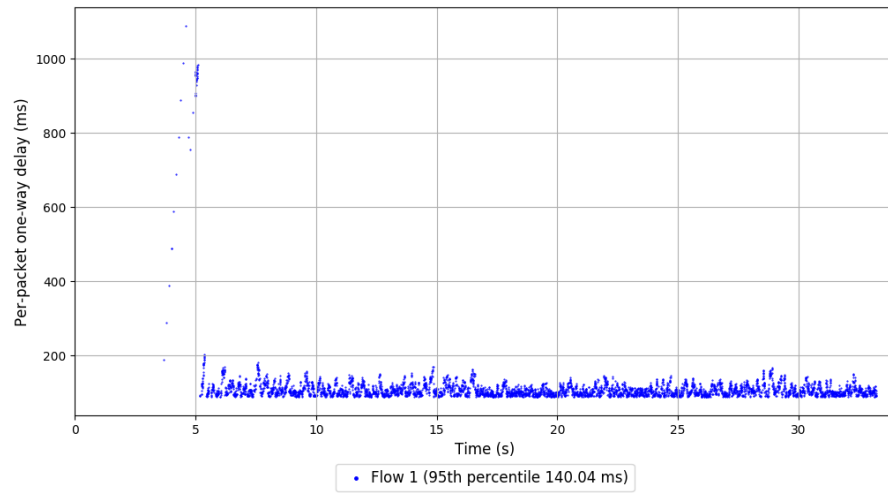
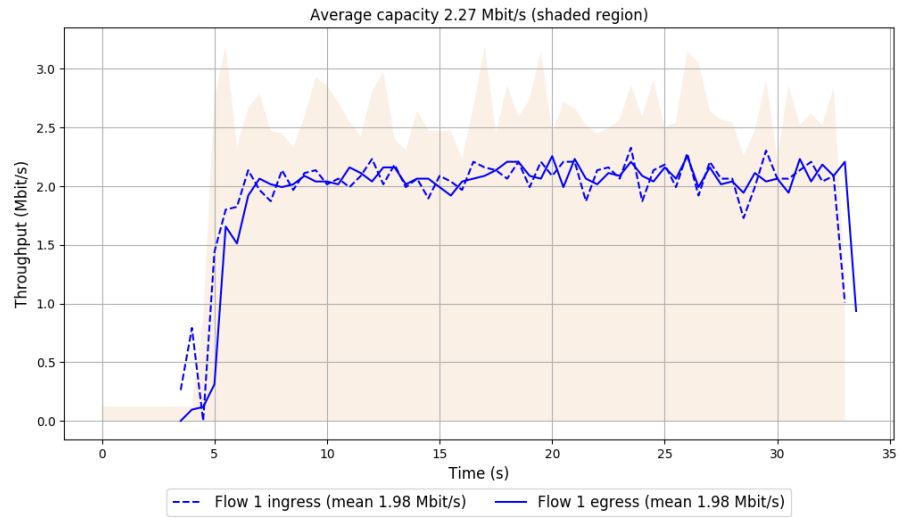
-- Flow 1:

Average throughput: 1.98 Mbit/s

95th percentile per-packet one-way delay: 140.044 ms

Loss rate: 0.37%

Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2019-01-17 05:45:41

End at: 2019-01-17 05:46:11

Below is generated by plot.py at 2019-01-17 05:47:56

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.98 Mbit/s (87.3% utilization)

95th percentile per-packet one-way delay: 140.096 ms

Loss rate: 0.35%

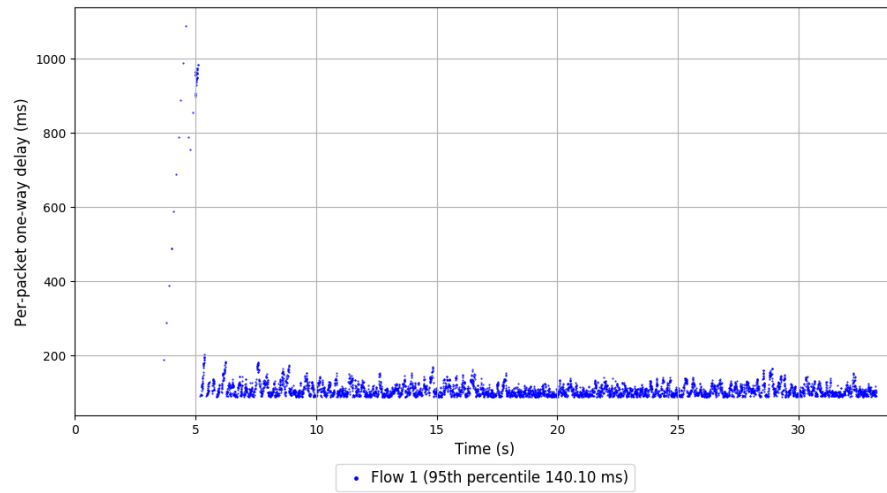
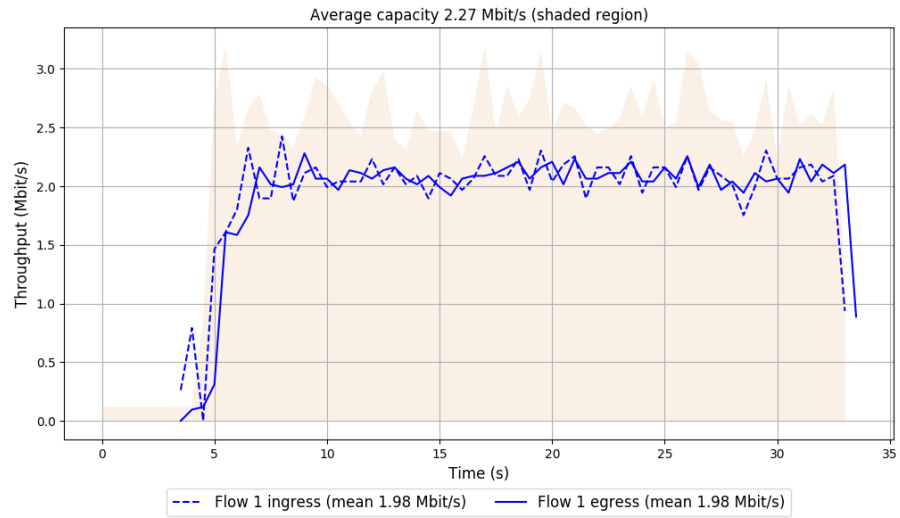
-- Flow 1:

Average throughput: 1.98 Mbit/s

95th percentile per-packet one-way delay: 140.096 ms

Loss rate: 0.35%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:18:07

End at: 2019-01-17 05:18:37

Below is generated by plot.py at 2019-01-17 05:47:58

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.47 Mbit/s (108.8% utilization)

95th percentile per-packet one-way delay: 301.111 ms

Loss rate: 0.56%

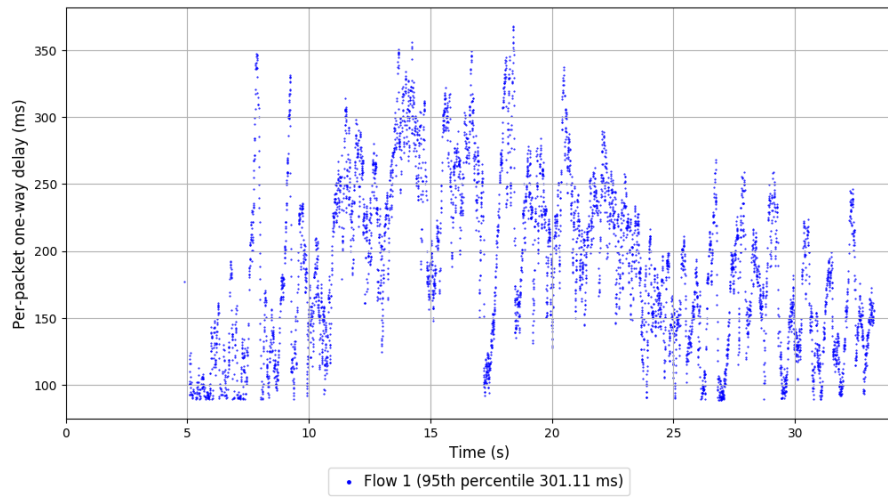
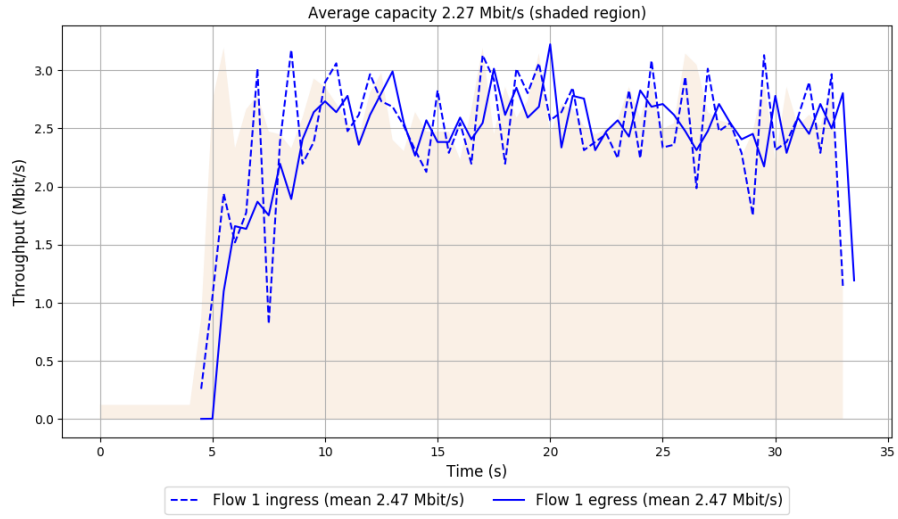
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 301.111 ms

Loss rate: 0.56%

Run 1: Report of Indigo-MusesC3 — Data Link



Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:30:26

End at: 2019-01-17 05:30:56

Below is generated by plot.py at 2019-01-17 05:47:58

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.7% utilization)

95th percentile per-packet one-way delay: 330.887 ms

Loss rate: 0.88%

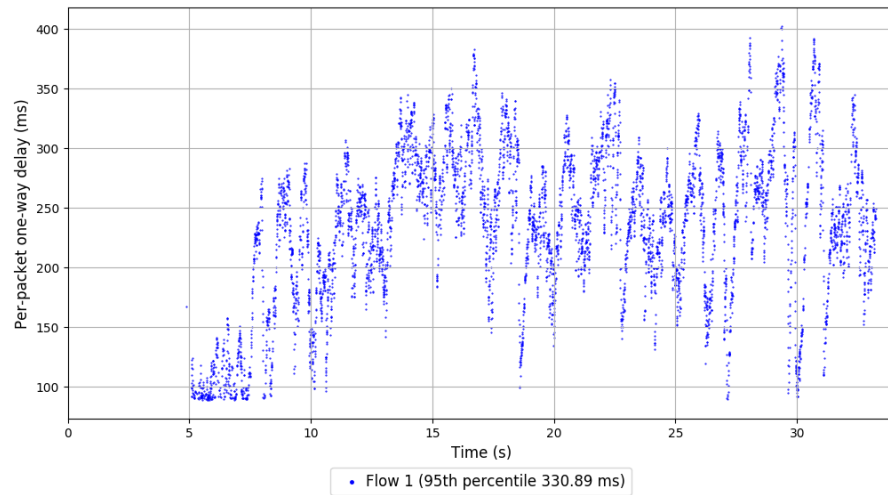
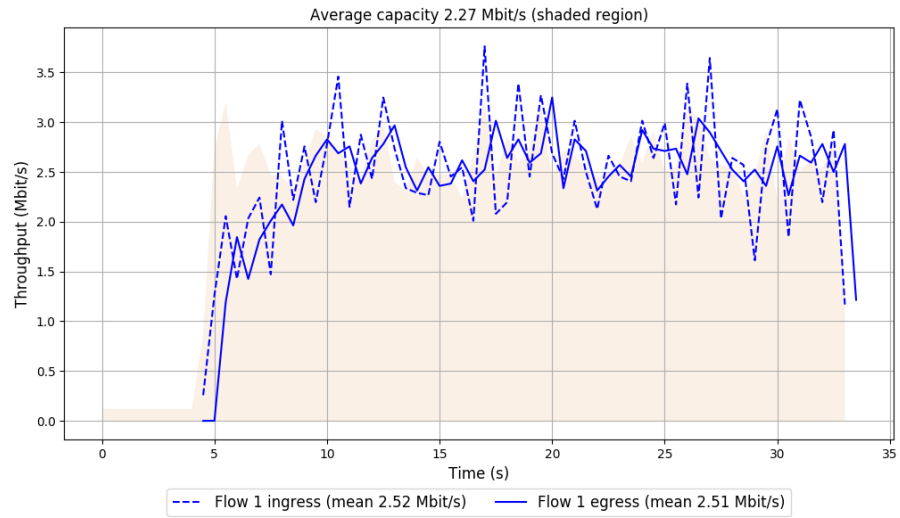
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 330.887 ms

Loss rate: 0.88%

Run 2: Report of Indigo-MusesC3 — Data Link



Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:42:44

End at: 2019-01-17 05:43:14

Below is generated by plot.py at 2019-01-17 05:48:00

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.35 Mbit/s (103.6% utilization)

95th percentile per-packet one-way delay: 297.780 ms

Loss rate: 1.77%

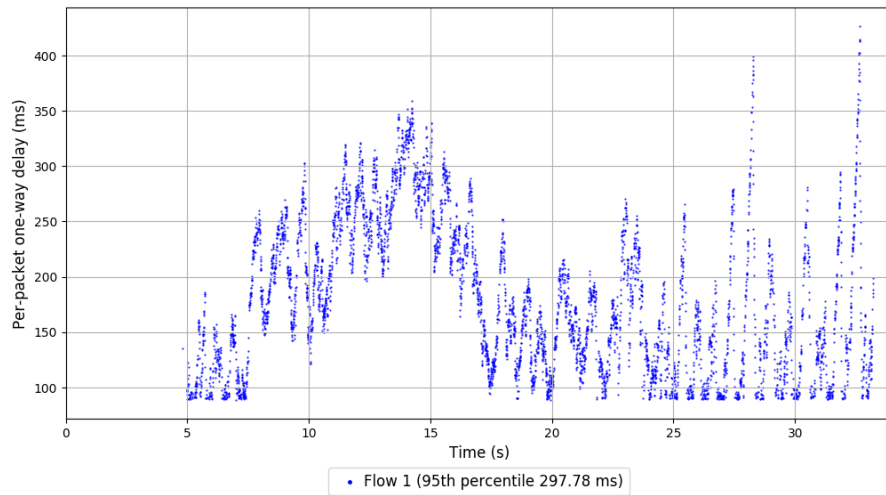
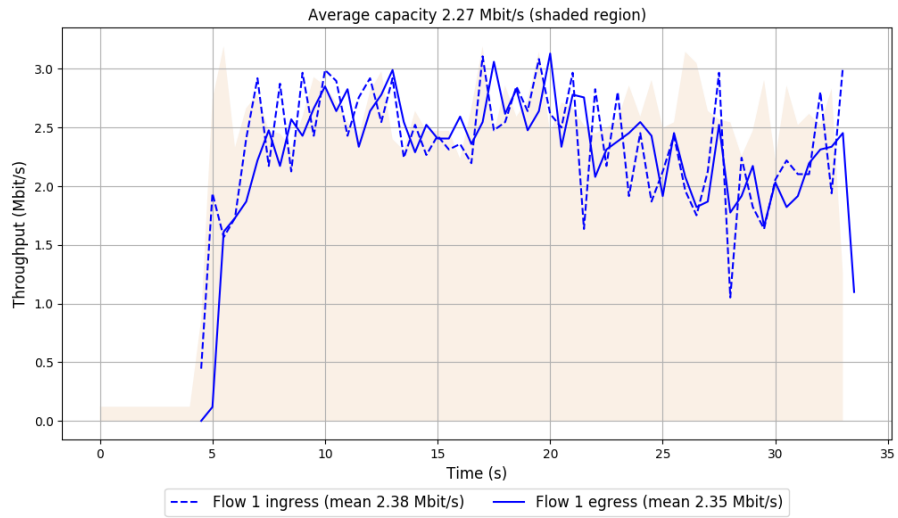
-- Flow 1:

Average throughput: 2.35 Mbit/s

95th percentile per-packet one-way delay: 297.780 ms

Loss rate: 1.77%

Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:16:22

End at: 2019-01-17 05:16:52

Below is generated by plot.py at 2019-01-17 05:48:01

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.04 Mbit/s (90.0% utilization)

95th percentile per-packet one-way delay: 692.437 ms

Loss rate: 45.15%

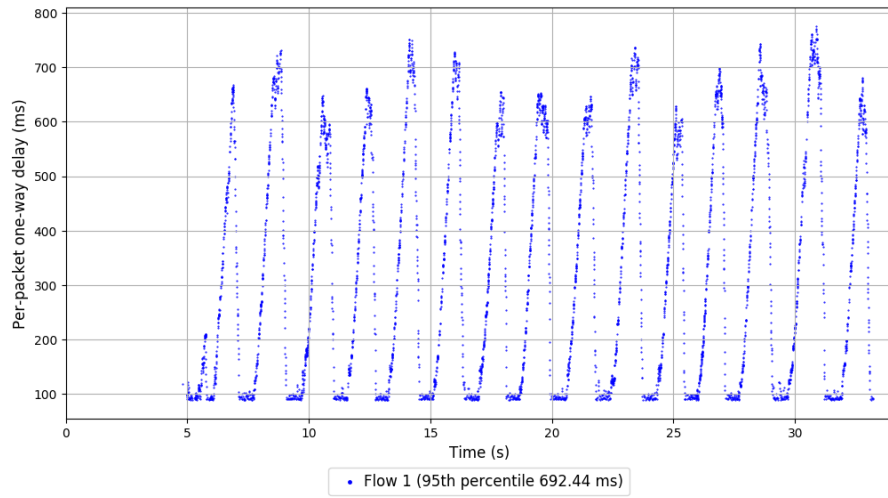
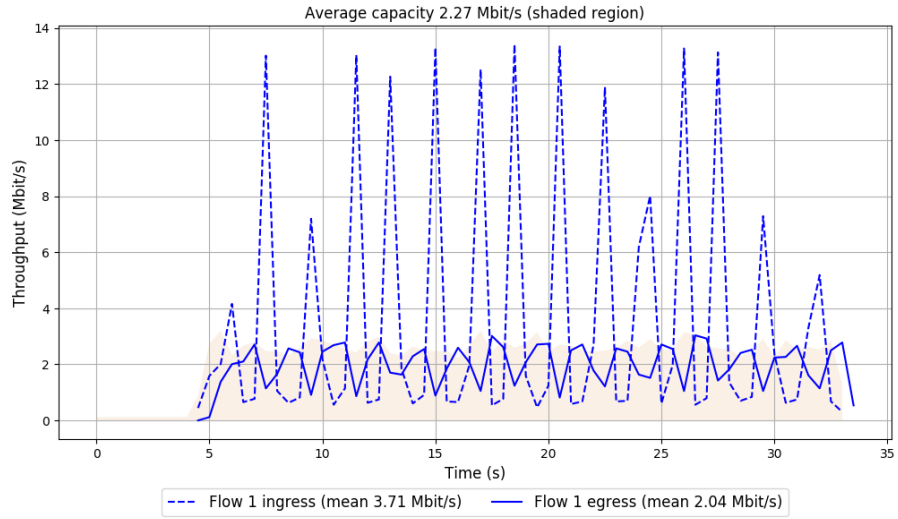
-- Flow 1:

Average throughput: 2.04 Mbit/s

95th percentile per-packet one-way delay: 692.437 ms

Loss rate: 45.15%

Run 1: Report of Indigo-MusesC5 — Data Link



Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:28:40

End at: 2019-01-17 05:29:10

Below is generated by plot.py at 2019-01-17 05:48:02

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.07 Mbit/s (91.2% utilization)

95th percentile per-packet one-way delay: 701.141 ms

Loss rate: 47.51%

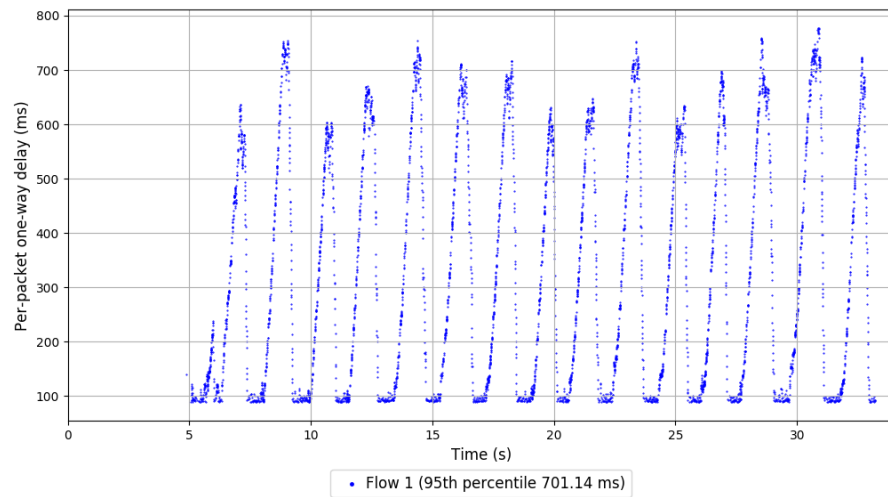
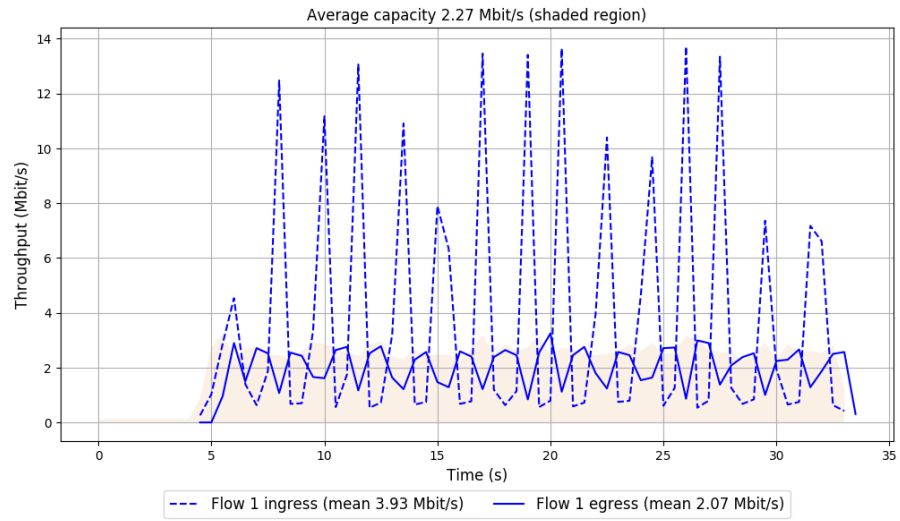
-- Flow 1:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 701.141 ms

Loss rate: 47.51%

Run 2: Report of Indigo-MusesC5 — Data Link



Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:40:59

End at: 2019-01-17 05:41:29

Below is generated by plot.py at 2019-01-17 05:48:02

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.03 Mbit/s (89.4% utilization)

95th percentile per-packet one-way delay: 680.831 ms

Loss rate: 47.66%

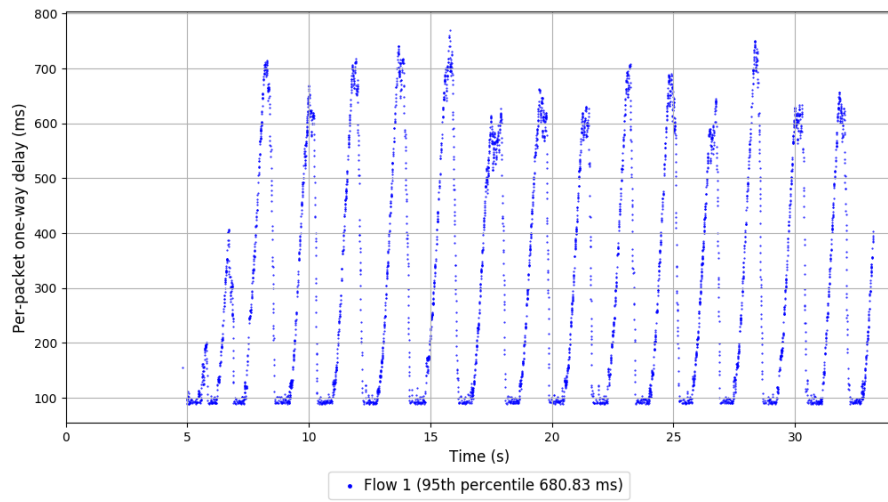
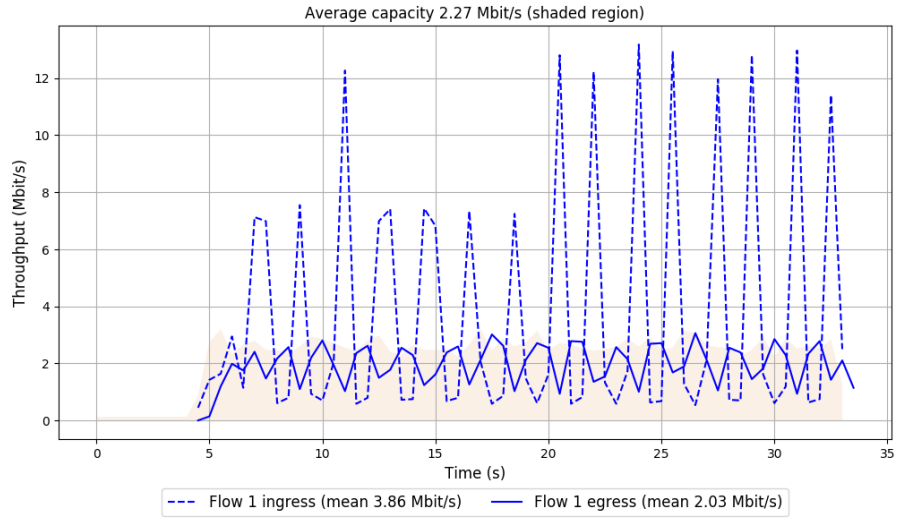
-- Flow 1:

Average throughput: 2.03 Mbit/s

95th percentile per-packet one-way delay: 680.831 ms

Loss rate: 47.66%

Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:21:38

End at: 2019-01-17 05:22:08

Below is generated by plot.py at 2019-01-17 05:48:03

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.70 Mbit/s (74.7% utilization)

95th percentile per-packet one-way delay: 121.738 ms

Loss rate: 0.31%

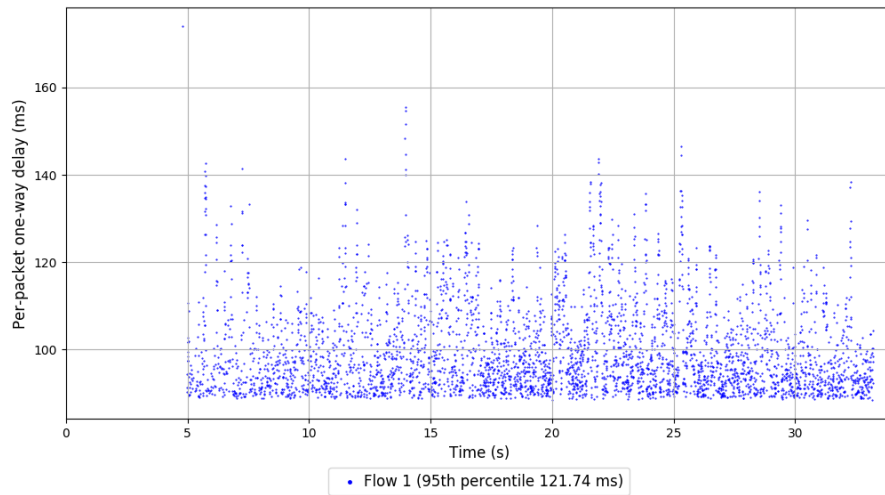
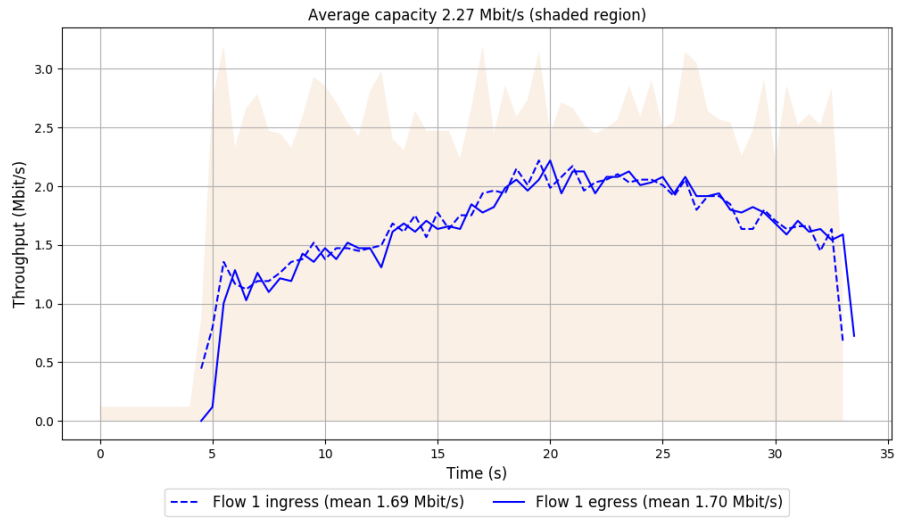
-- Flow 1:

Average throughput: 1.70 Mbit/s

95th percentile per-packet one-way delay: 121.738 ms

Loss rate: 0.31%

Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:33:57

End at: 2019-01-17 05:34:27

Below is generated by plot.py at 2019-01-17 05:48:03

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.63 Mbit/s (71.9% utilization)

95th percentile per-packet one-way delay: 123.285 ms

Loss rate: 0.33%

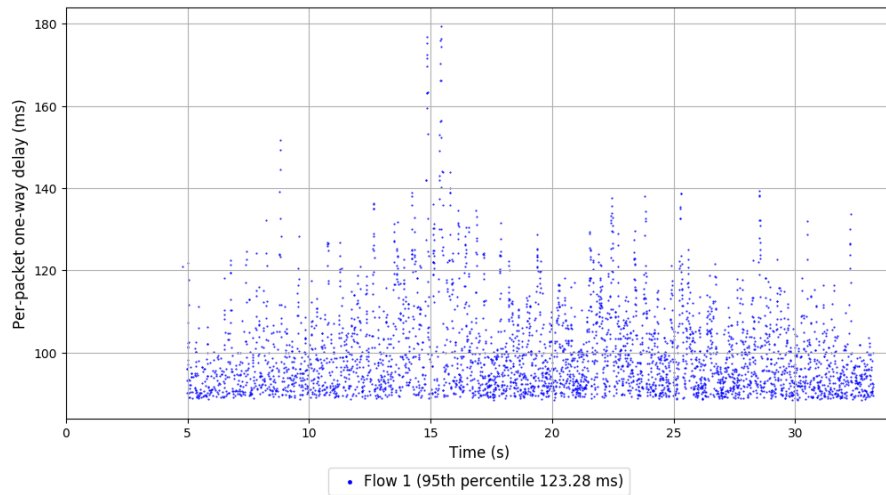
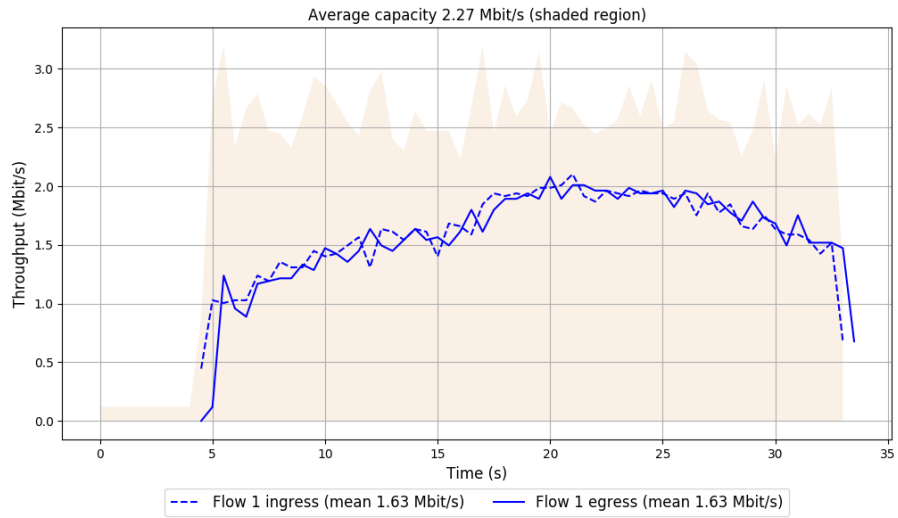
-- Flow 1:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 123.285 ms

Loss rate: 0.33%

Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:46:16

End at: 2019-01-17 05:46:46

Below is generated by plot.py at 2019-01-17 05:48:06

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 1.69 Mbit/s (74.6% utilization)

95th percentile per-packet one-way delay: 126.124 ms

Loss rate: 0.31%

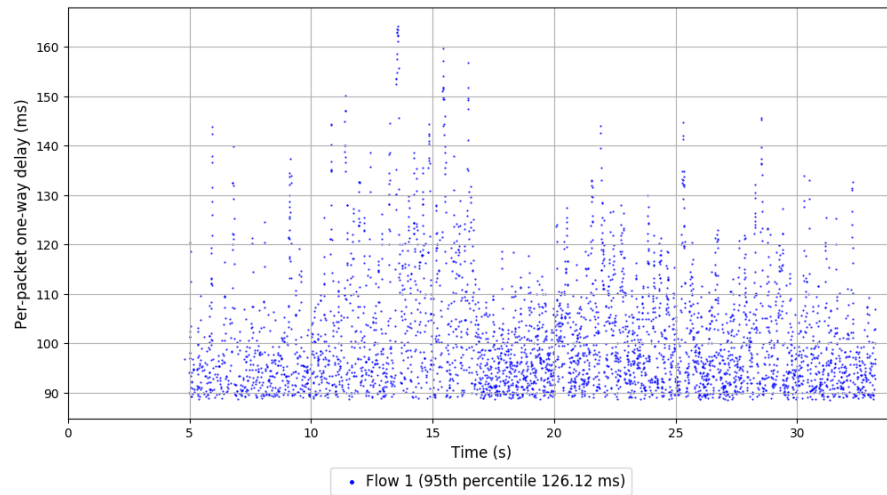
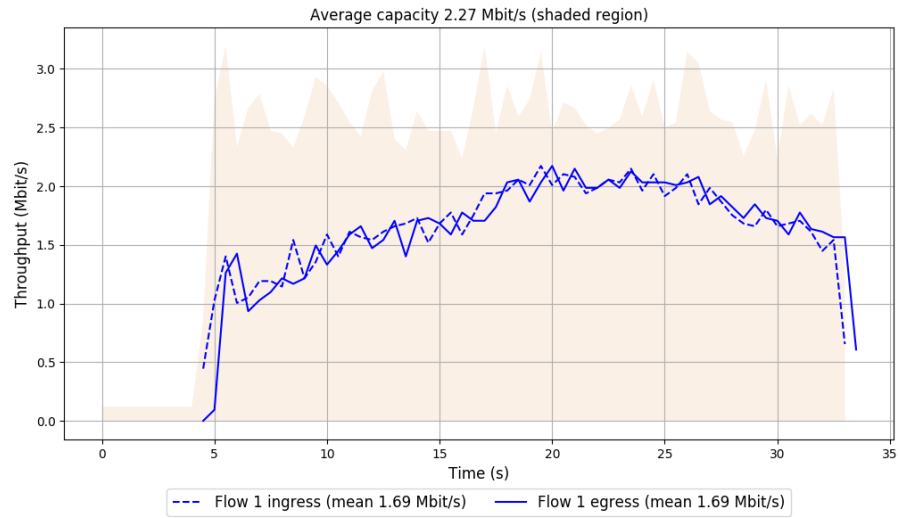
-- Flow 1:

Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 126.124 ms

Loss rate: 0.31%

Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MuseST

Start at: 2019-01-17 05:16:57

End at: 2019-01-17 05:17:27

Below is generated by plot.py at 2019-01-17 05:48:08

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.47 Mbit/s (108.8% utilization)

95th percentile per-packet one-way delay: 538.692 ms

Loss rate: 1.54%

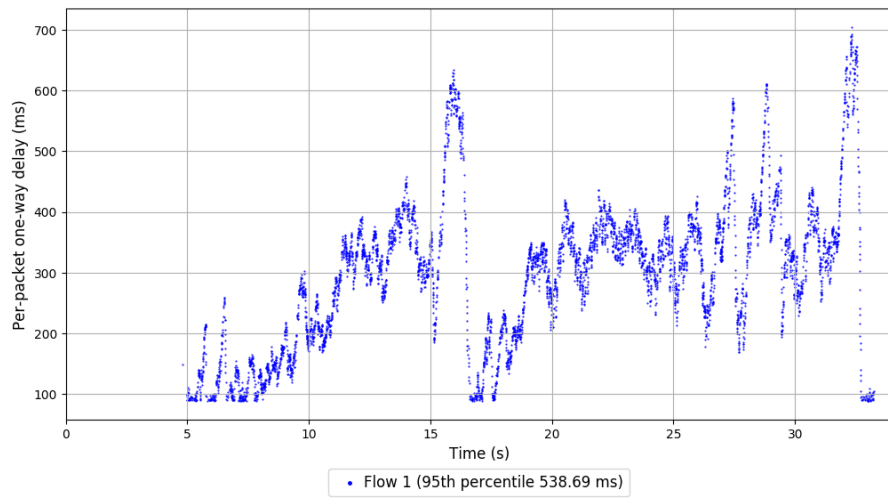
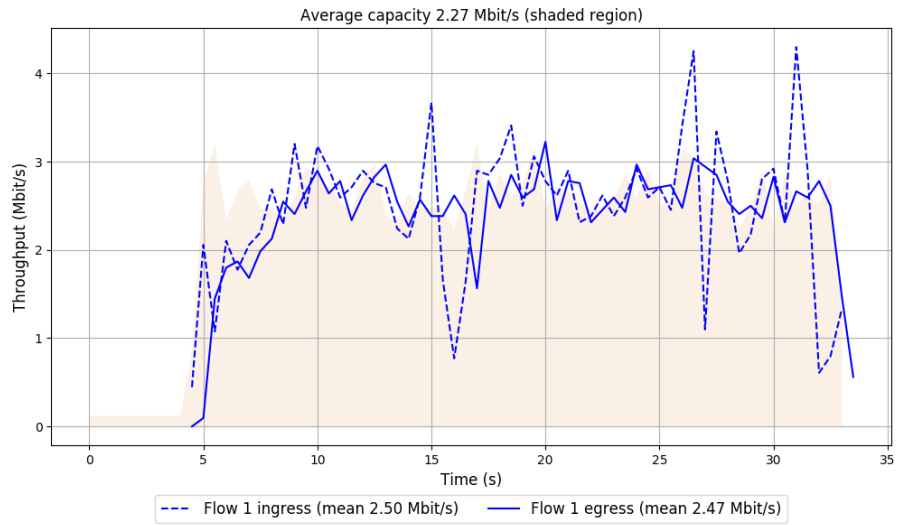
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 538.692 ms

Loss rate: 1.54%

Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MuseST

Start at: 2019-01-17 05:29:15

End at: 2019-01-17 05:29:45

Below is generated by plot.py at 2019-01-17 05:48:11

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.52 Mbit/s (110.9% utilization)

95th percentile per-packet one-way delay: 472.594 ms

Loss rate: 1.54%

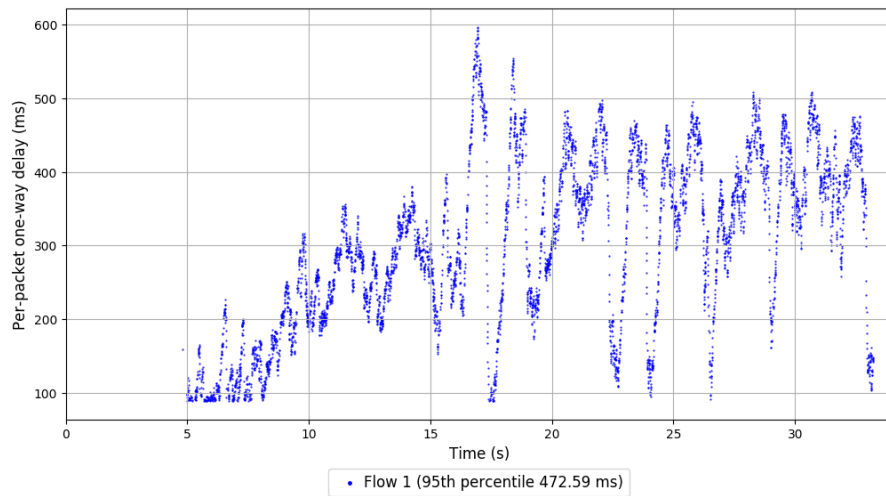
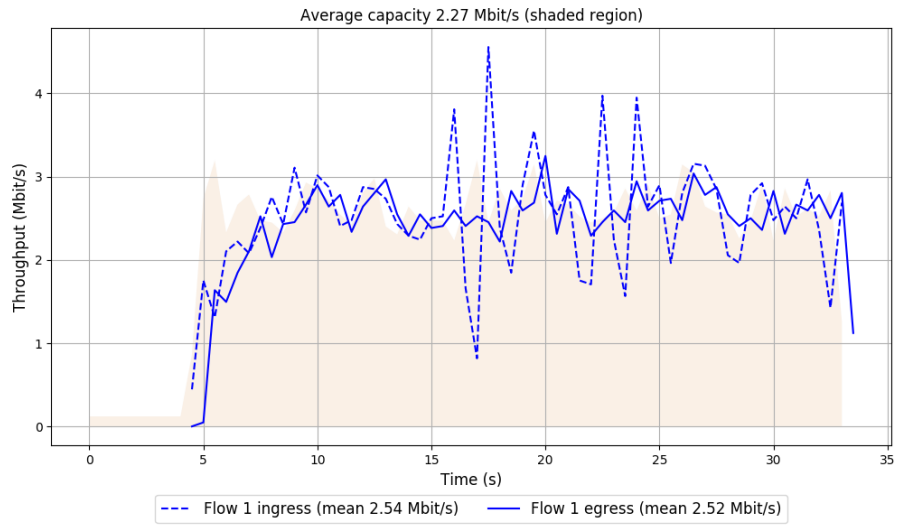
-- Flow 1:

Average throughput: 2.52 Mbit/s

95th percentile per-packet one-way delay: 472.594 ms

Loss rate: 1.54%

Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MuseST

Start at: 2019-01-17 05:41:34

End at: 2019-01-17 05:42:04

Below is generated by plot.py at 2019-01-17 05:48:11

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.6% utilization)

95th percentile per-packet one-way delay: 466.755 ms

Loss rate: 1.64%

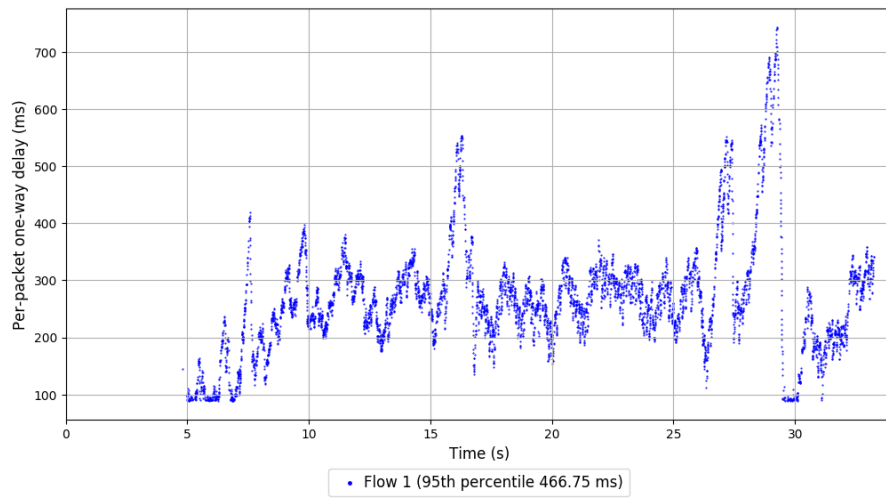
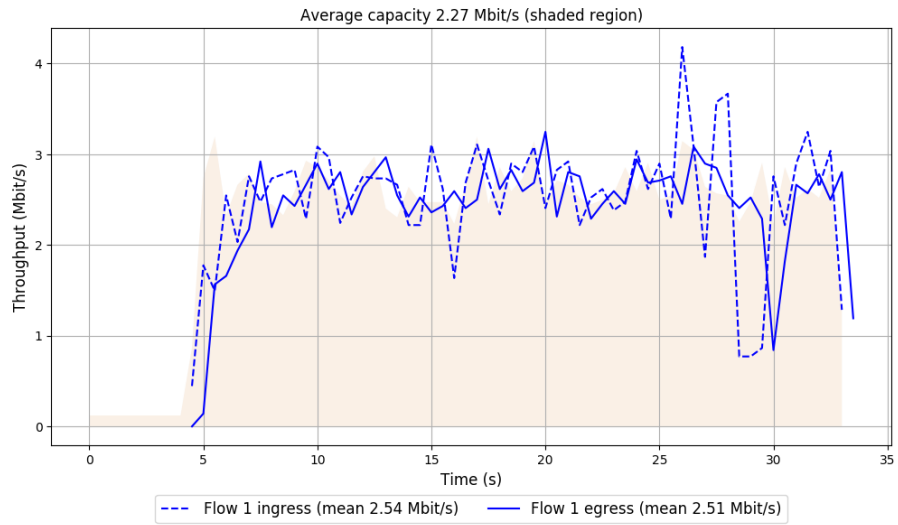
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 466.755 ms

Loss rate: 1.64%

Run 3: Report of Indigo-MusesT — Data Link



Run 1: Statistics of LEDBAT

Start at: 2019-01-17 05:10:30

End at: 2019-01-17 05:11:00

Below is generated by plot.py at 2019-01-17 05:48:12

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.32 Mbit/s (102.1% utilization)

95th percentile per-packet one-way delay: 248.299 ms

Loss rate: 0.69%

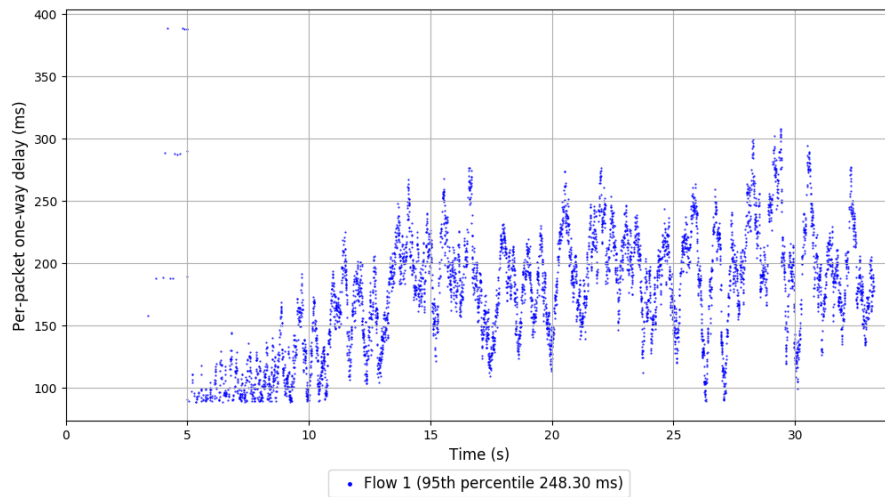
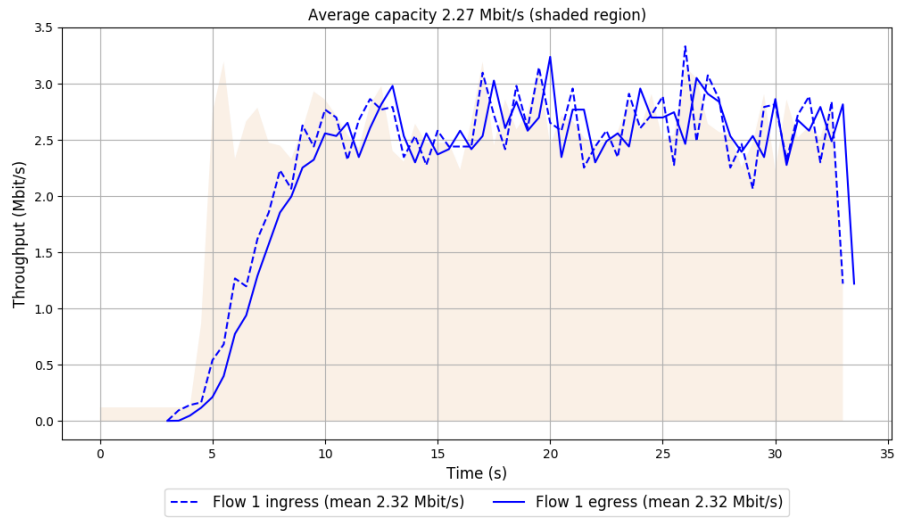
-- Flow 1:

Average throughput: 2.32 Mbit/s

95th percentile per-packet one-way delay: 248.299 ms

Loss rate: 0.69%

Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2019-01-17 05:22:48

End at: 2019-01-17 05:23:18

Below is generated by plot.py at 2019-01-17 05:48:12

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.32 Mbit/s (102.0% utilization)

95th percentile per-packet one-way delay: 248.531 ms

Loss rate: 0.64%

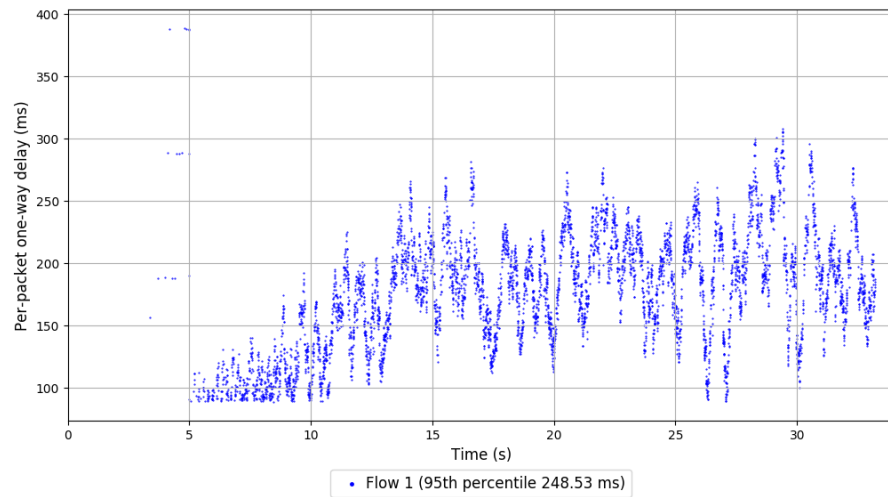
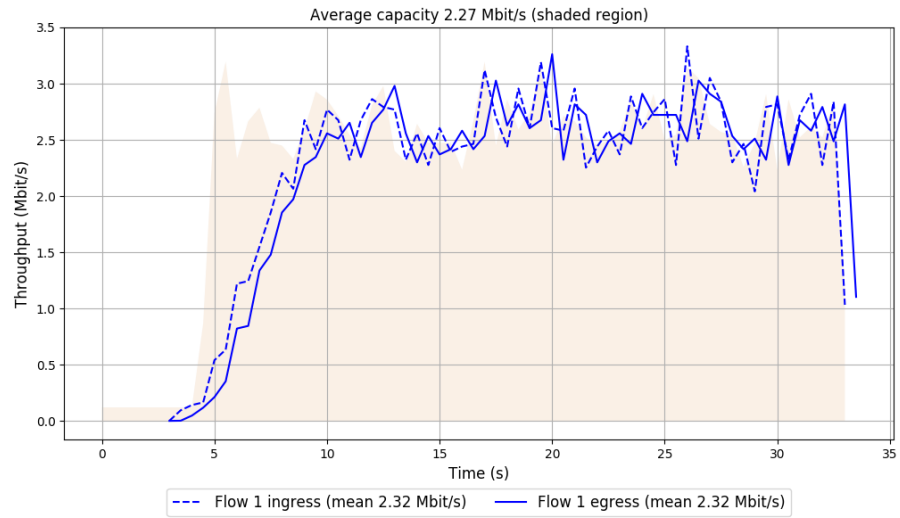
-- Flow 1:

Average throughput: 2.32 Mbit/s

95th percentile per-packet one-way delay: 248.531 ms

Loss rate: 0.64%

Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2019-01-17 05:35:07

End at: 2019-01-17 05:35:37

Below is generated by plot.py at 2019-01-17 05:48:13

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.32 Mbit/s (101.9% utilization)

95th percentile per-packet one-way delay: 248.279 ms

Loss rate: 0.69%

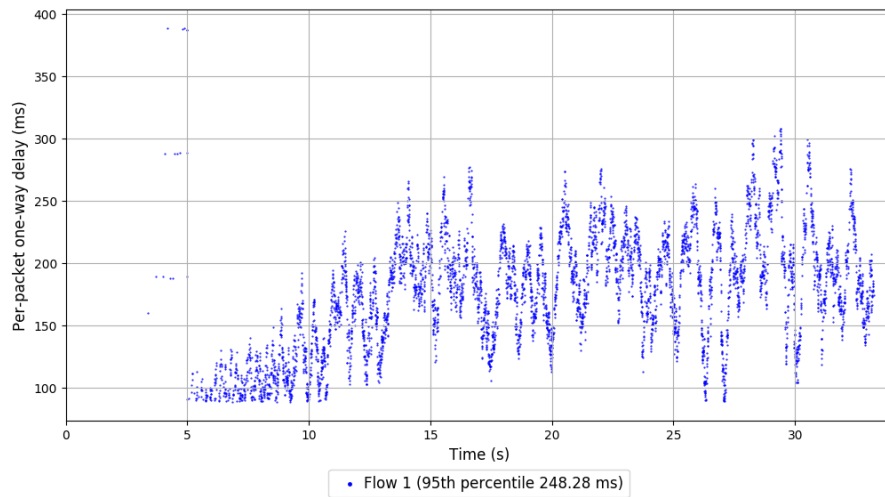
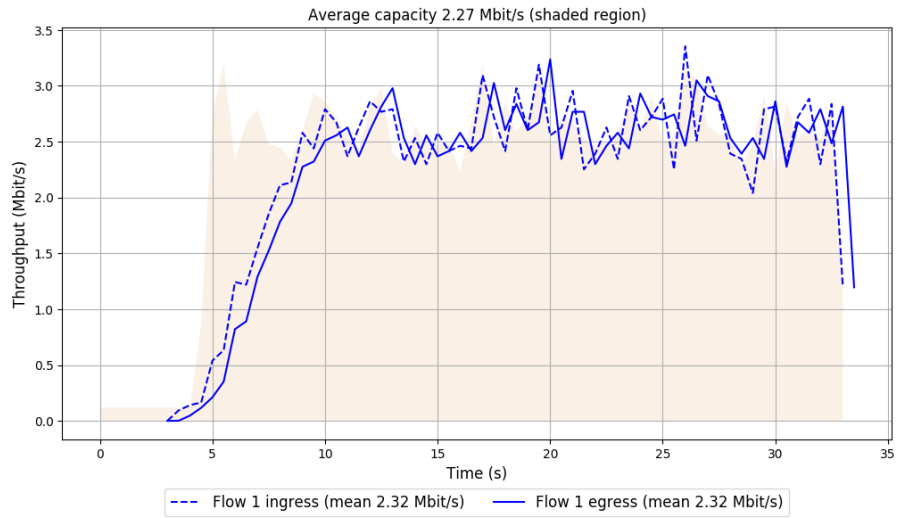
-- Flow 1:

Average throughput: 2.32 Mbit/s

95th percentile per-packet one-way delay: 248.279 ms

Loss rate: 0.69%

Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-17 05:18:42

End at: 2019-01-17 05:19:12

Below is generated by plot.py at 2019-01-17 05:48:21

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.7% utilization)

95th percentile per-packet one-way delay: 758.756 ms

Loss rate: 85.33%

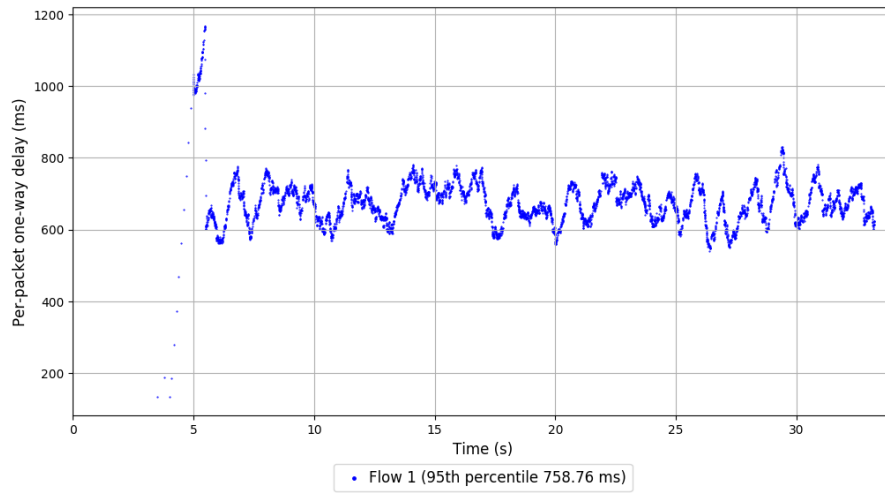
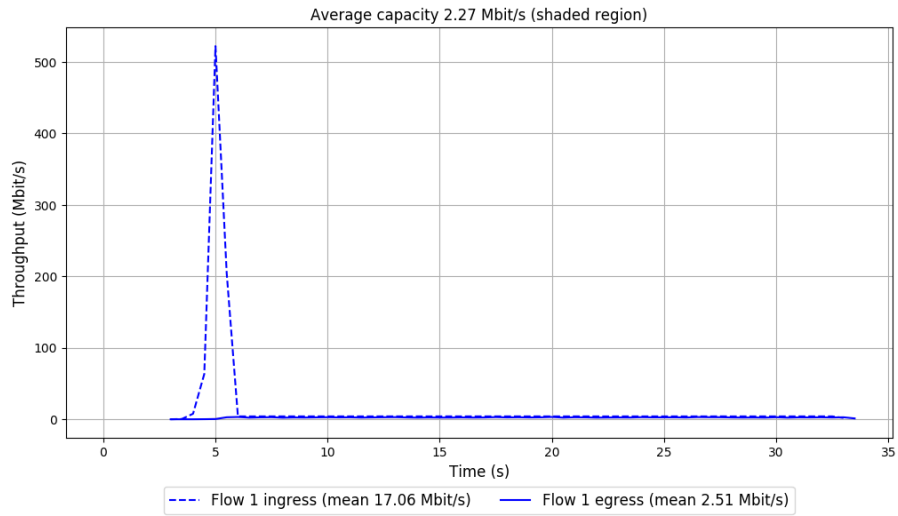
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 758.756 ms

Loss rate: 85.33%

Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

Start at: 2019-01-17 05:31:01

End at: 2019-01-17 05:31:31

Below is generated by plot.py at 2019-01-17 05:48:29

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.7% utilization)

95th percentile per-packet one-way delay: 760.779 ms

Loss rate: 88.05%

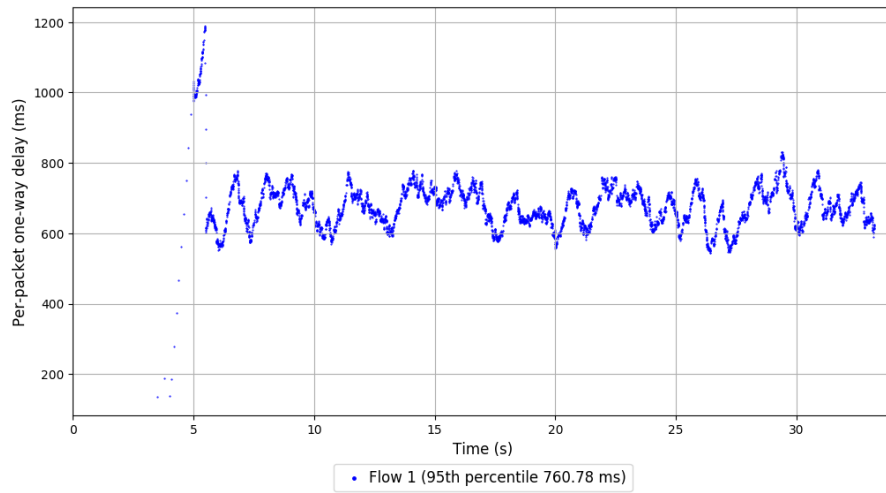
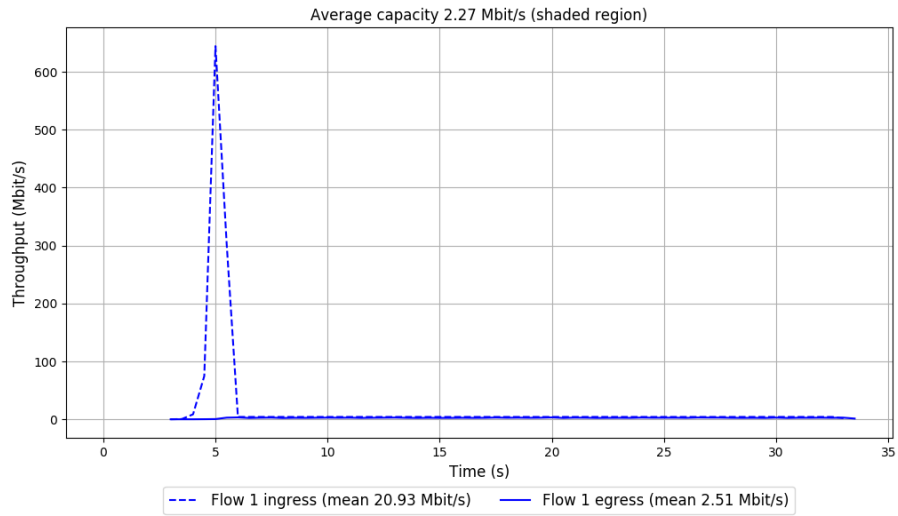
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 760.779 ms

Loss rate: 88.05%

Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-17 05:43:20

End at: 2019-01-17 05:43:50

Below is generated by plot.py at 2019-01-17 05:48:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.6% utilization)

95th percentile per-packet one-way delay: 761.928 ms

Loss rate: 87.38%

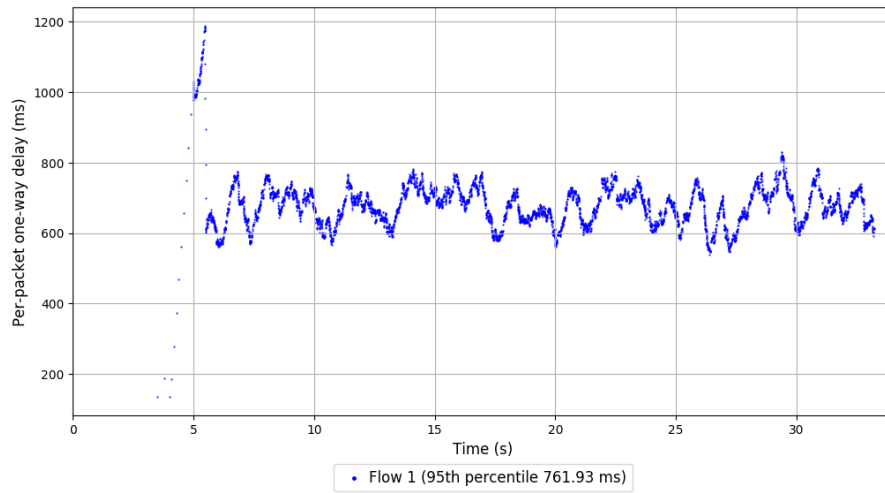
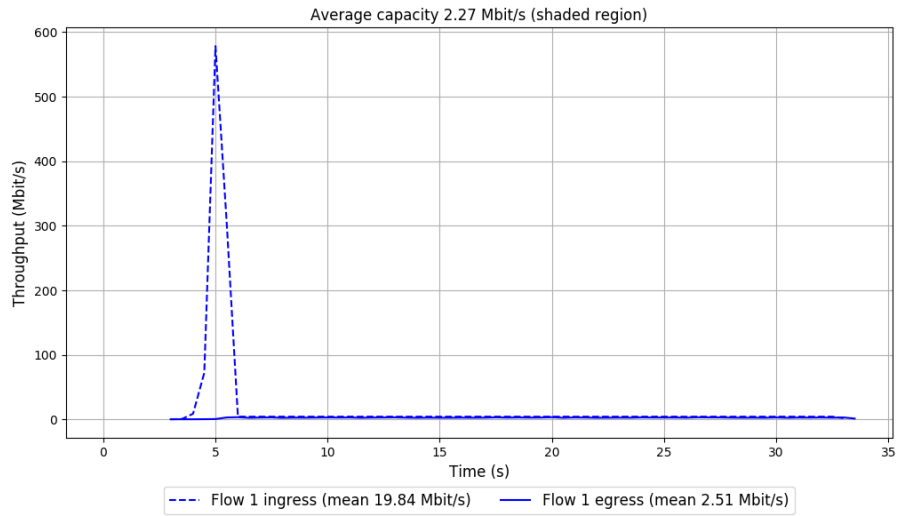
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 761.928 ms

Loss rate: 87.38%

Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

Start at: 2019-01-17 05:20:28

End at: 2019-01-17 05:20:58

Below is generated by plot.py at 2019-01-17 05:48:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.50 Mbit/s (110.0% utilization)

95th percentile per-packet one-way delay: 494.786 ms

Loss rate: 38.61%

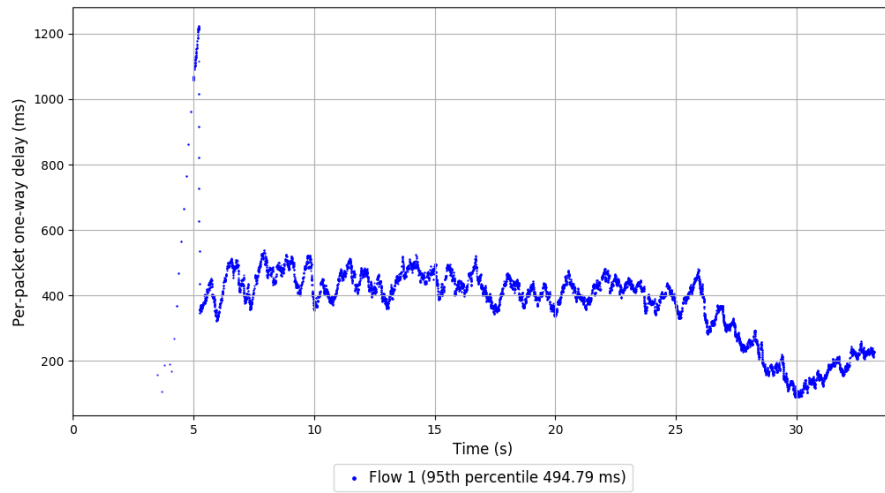
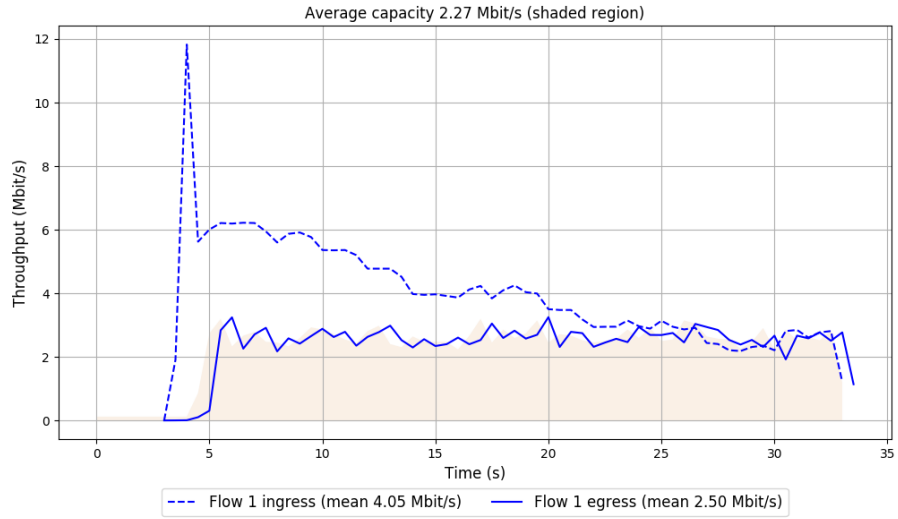
-- Flow 1:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 494.786 ms

Loss rate: 38.61%

Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2019-01-17 05:32:46

End at: 2019-01-17 05:33:17

Below is generated by plot.py at 2019-01-17 05:48:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.5% utilization)

95th percentile per-packet one-way delay: 515.294 ms

Loss rate: 56.24%

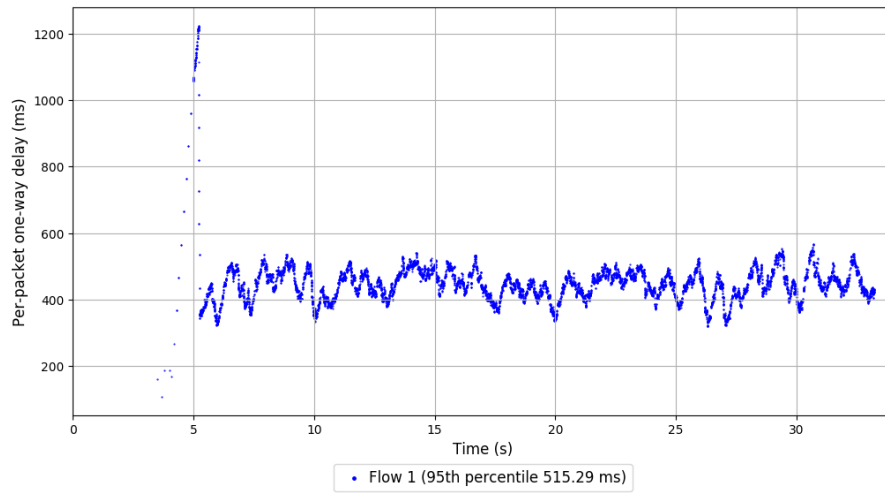
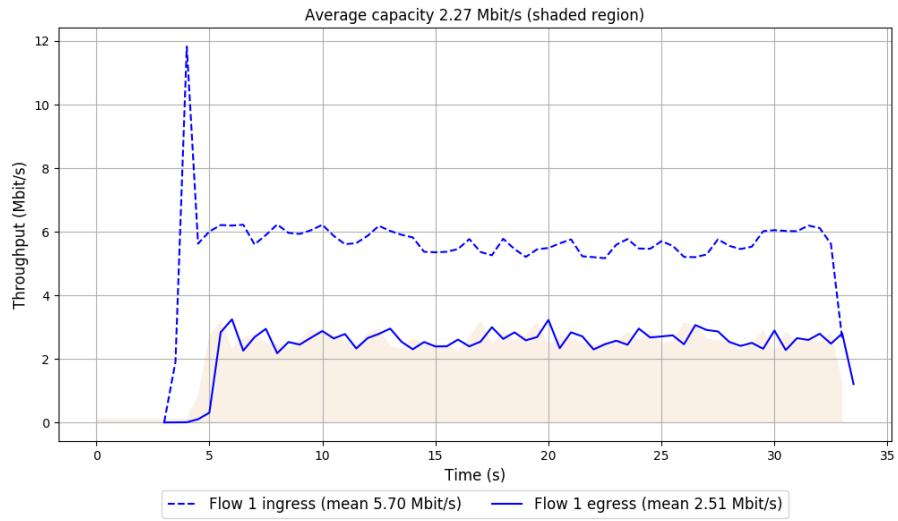
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 515.294 ms

Loss rate: 56.24%

Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

Start at: 2019-01-17 05:45:06

End at: 2019-01-17 05:45:36

Below is generated by plot.py at 2019-01-17 05:48:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.4% utilization)

95th percentile per-packet one-way delay: 496.551 ms

Loss rate: 38.38%

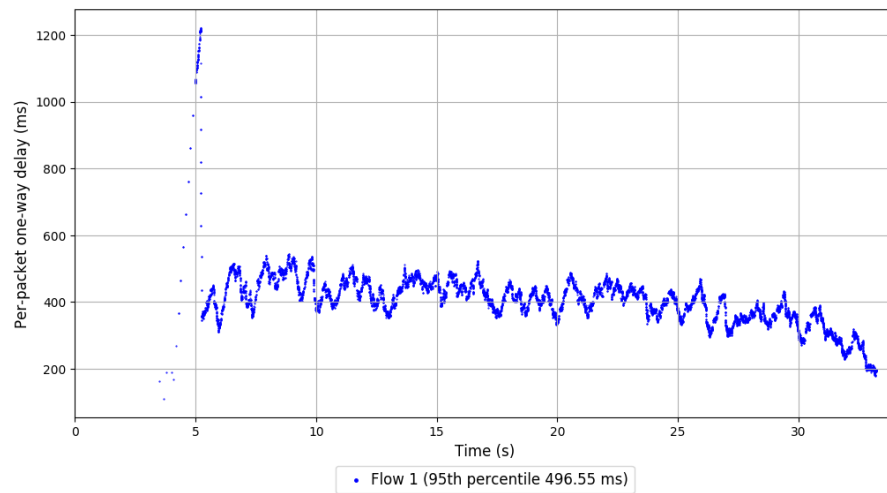
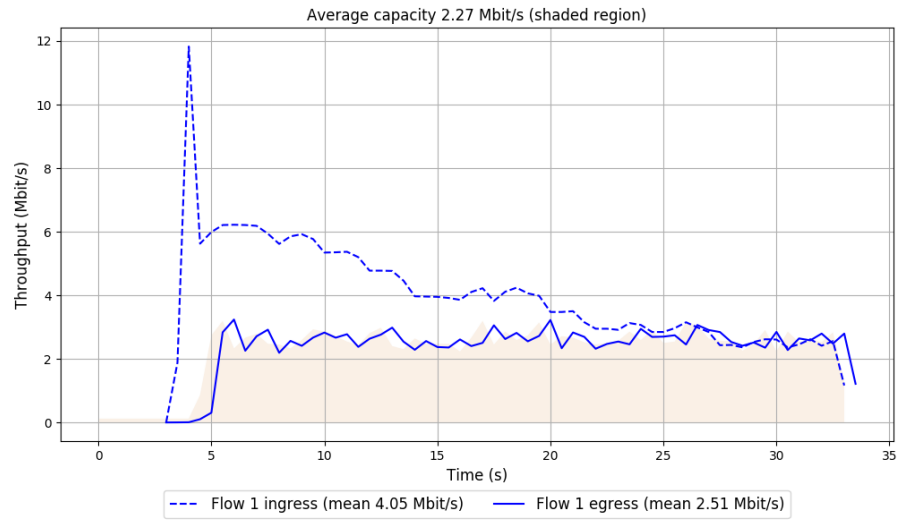
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 496.551 ms

Loss rate: 38.38%

Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

Start at: 2019-01-17 05:13:26

End at: 2019-01-17 05:13:56

Below is generated by plot.py at 2019-01-17 05:48:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.52 Mbit/s (111.1% utilization)

95th percentile per-packet one-way delay: 694.097 ms

Loss rate: 4.90%

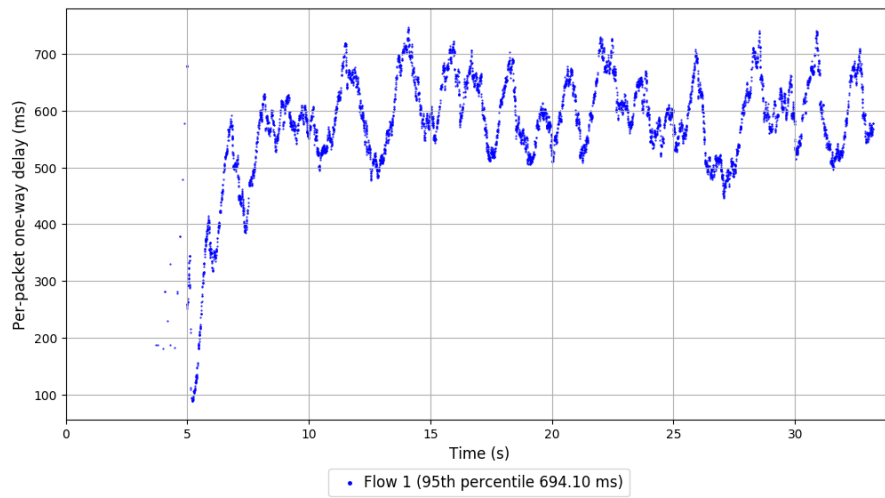
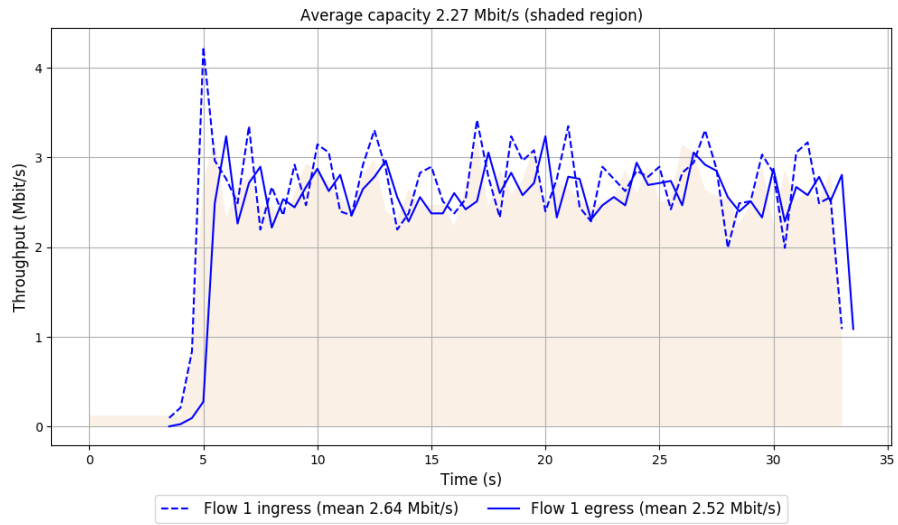
-- Flow 1:

Average throughput: 2.52 Mbit/s

95th percentile per-packet one-way delay: 694.097 ms

Loss rate: 4.90%

Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-17 05:25:44

End at: 2019-01-17 05:26:14

Below is generated by plot.py at 2019-01-17 05:48:31

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.50 Mbit/s (109.9% utilization)

95th percentile per-packet one-way delay: 665.585 ms

Loss rate: 3.08%

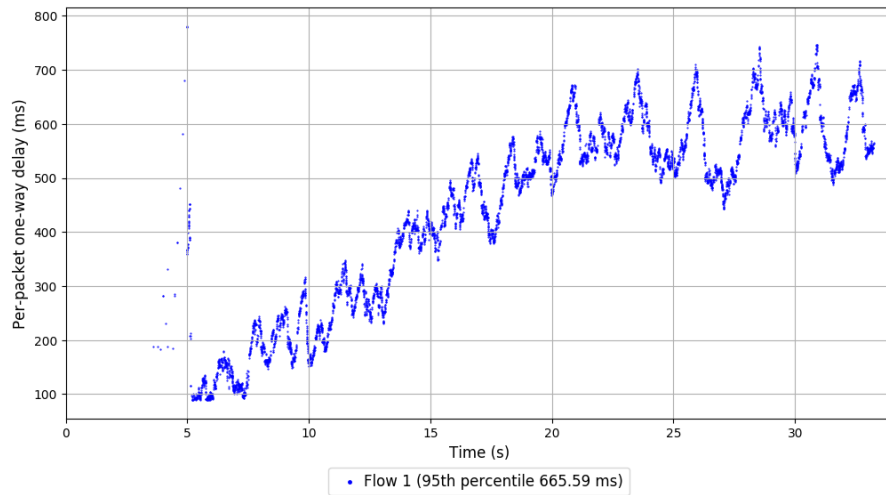
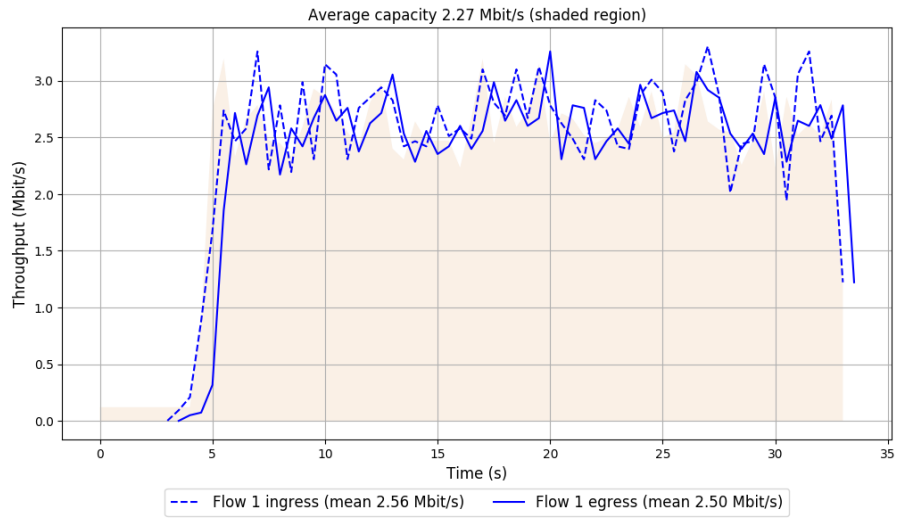
-- Flow 1:

Average throughput: 2.50 Mbit/s

95th percentile per-packet one-way delay: 665.585 ms

Loss rate: 3.08%

Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-17 05:38:03

End at: 2019-01-17 05:38:33

Below is generated by plot.py at 2019-01-17 05:48:32

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.52 Mbit/s (111.1% utilization)

95th percentile per-packet one-way delay: 670.315 ms

Loss rate: 3.78%

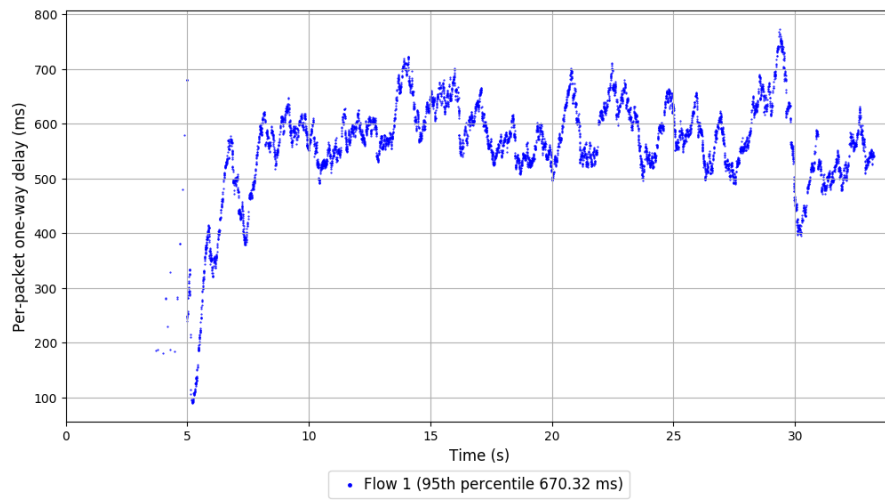
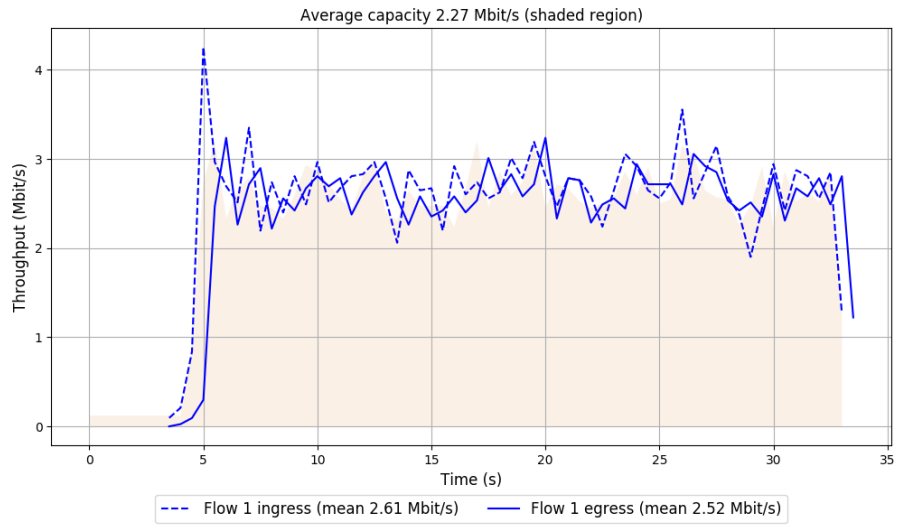
-- Flow 1:

Average throughput: 2.52 Mbit/s

95th percentile per-packet one-way delay: 670.315 ms

Loss rate: 3.78%

Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2019-01-17 05:14:36

End at: 2019-01-17 05:15:06

Below is generated by plot.py at 2019-01-17 05:48:32

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.08 Mbit/s (3.5% utilization)

95th percentile per-packet one-way delay: 106.622 ms

Loss rate: 0.38%

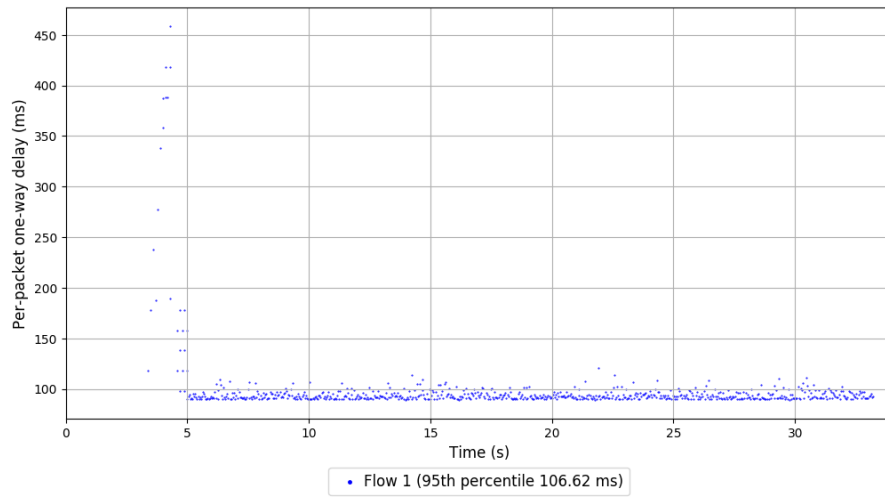
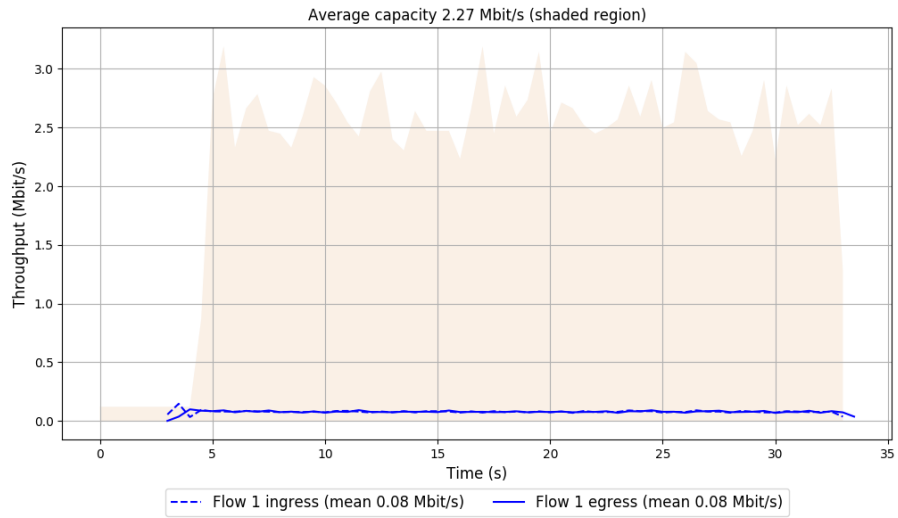
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 106.622 ms

Loss rate: 0.38%

Run 1: Report of SCReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2019-01-17 05:26:55

End at: 2019-01-17 05:27:25

Below is generated by plot.py at 2019-01-17 05:48:32

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.08 Mbit/s (3.5% utilization)

95th percentile per-packet one-way delay: 106.470 ms

Loss rate: 0.38%

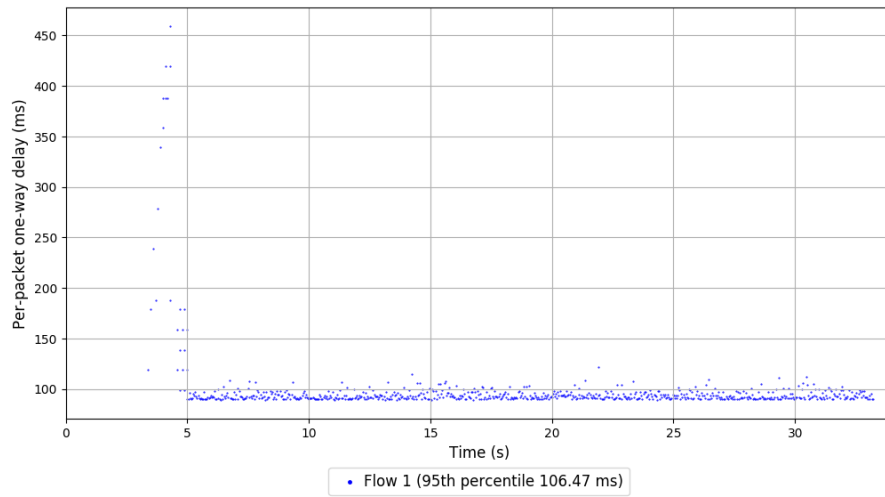
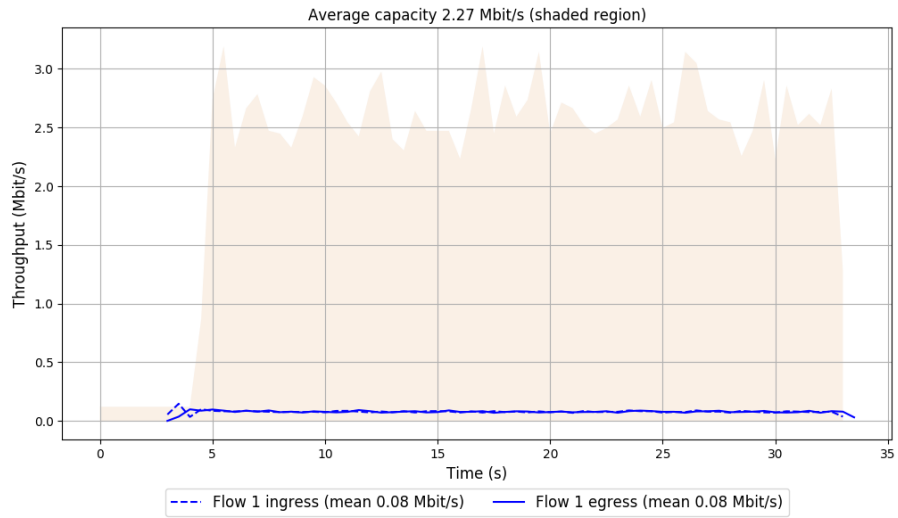
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 106.470 ms

Loss rate: 0.38%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2019-01-17 05:39:13

End at: 2019-01-17 05:39:43

Below is generated by plot.py at 2019-01-17 05:48:32

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.08 Mbit/s (3.5% utilization)

95th percentile per-packet one-way delay: 107.618 ms

Loss rate: 0.25%

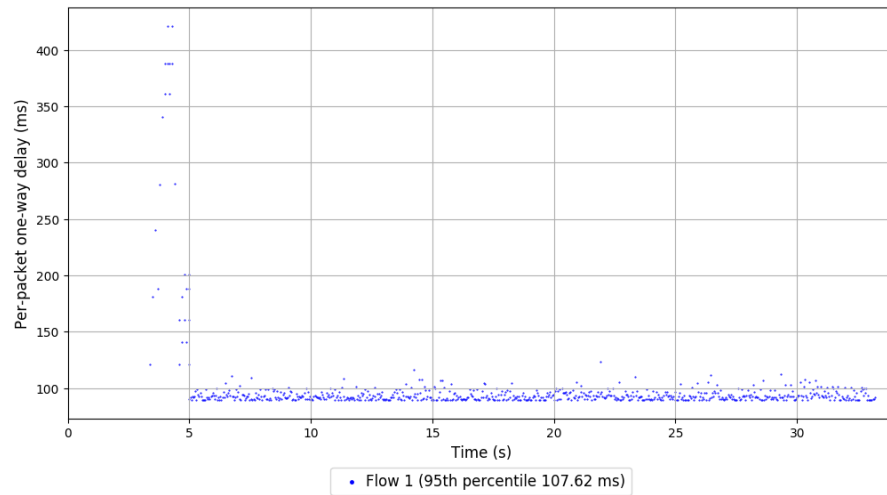
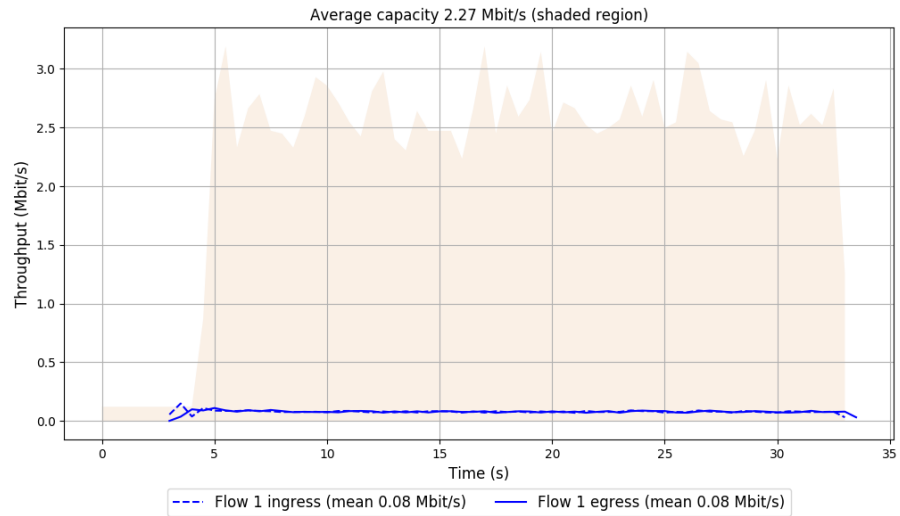
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 107.618 ms

Loss rate: 0.25%

Run 3: Report of SCReAM — Data Link



Run 1: Statistics of Sprout

Start at: 2019-01-17 05:22:13

End at: 2019-01-17 05:22:43

Below is generated by plot.py at 2019-01-17 05:48:33

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.24 Mbit/s (10.5% utilization)

95th percentile per-packet one-way delay: 174.909 ms

Loss rate: 0.02%

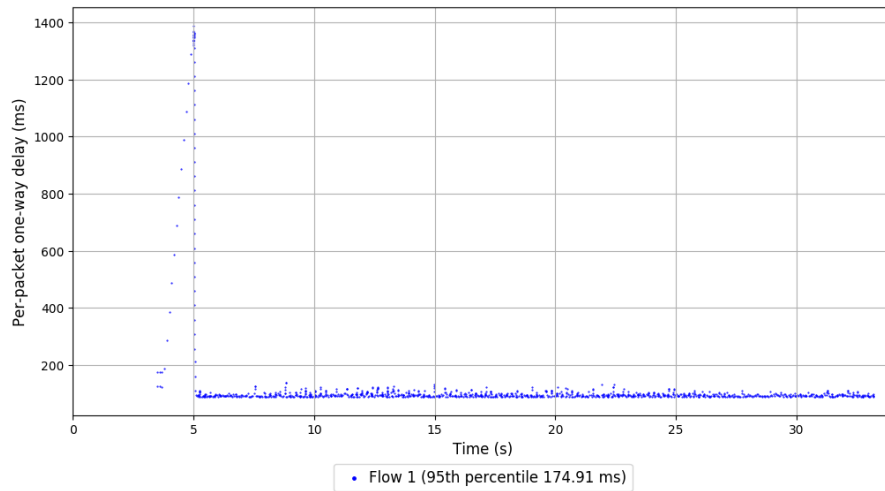
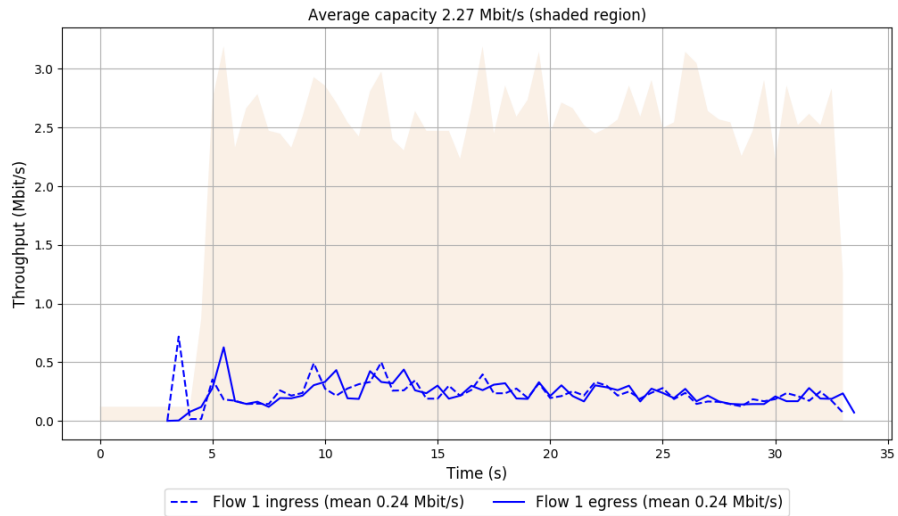
-- Flow 1:

Average throughput: 0.24 Mbit/s

95th percentile per-packet one-way delay: 174.909 ms

Loss rate: 0.02%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2019-01-17 05:34:32

End at: 2019-01-17 05:35:02

Below is generated by plot.py at 2019-01-17 05:48:33

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.24 Mbit/s (10.6% utilization)

95th percentile per-packet one-way delay: 174.358 ms

Loss rate: 0.78%

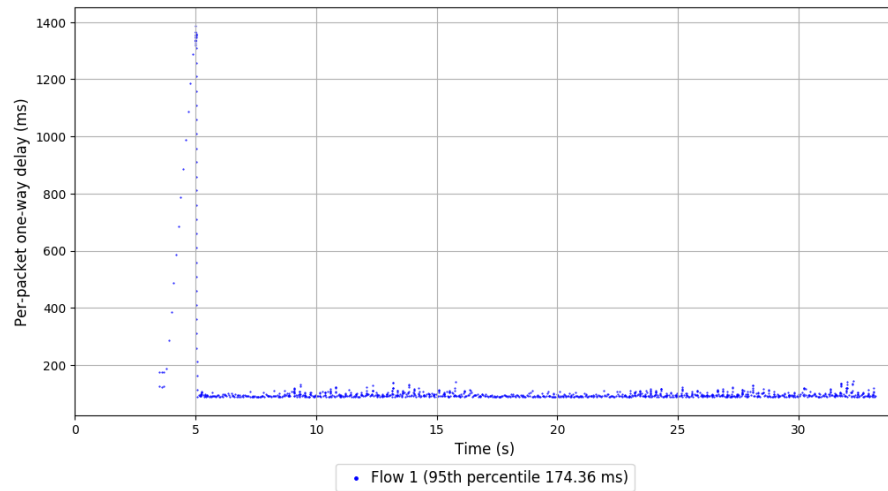
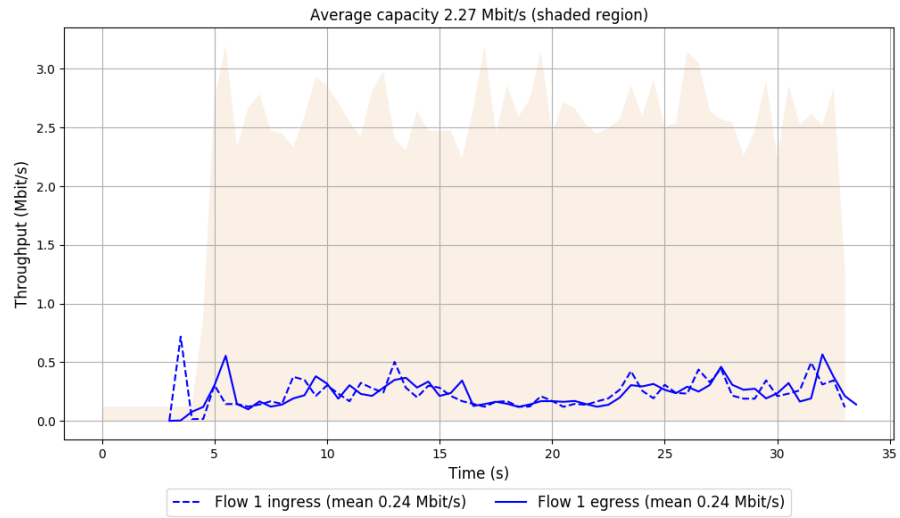
-- Flow 1:

Average throughput: 0.24 Mbit/s

95th percentile per-packet one-way delay: 174.358 ms

Loss rate: 0.78%

Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2019-01-17 05:46:51

End at: 2019-01-17 05:47:21

Below is generated by plot.py at 2019-01-17 05:48:34

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.27 Mbit/s (12.1% utilization)

95th percentile per-packet one-way delay: 140.483 ms

Loss rate: 0.97%

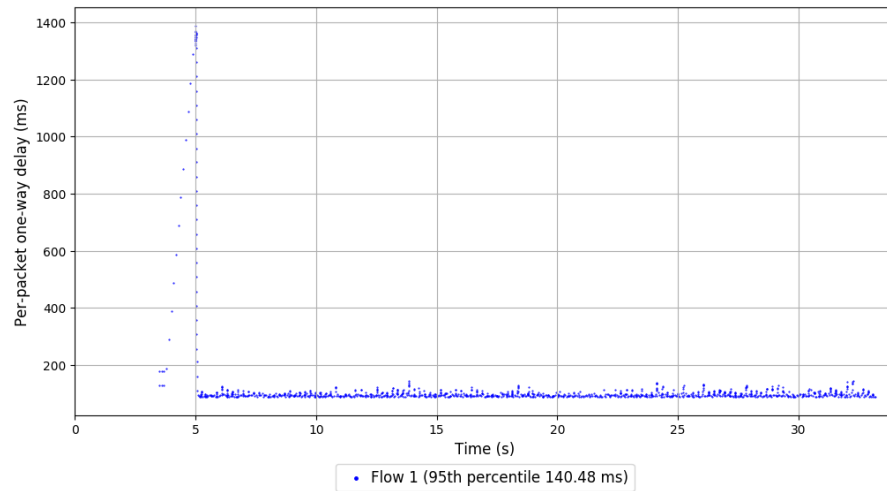
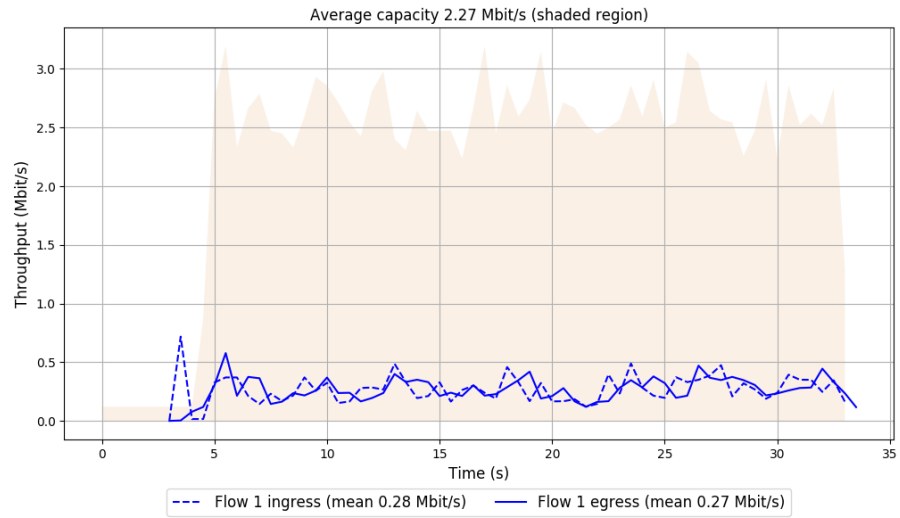
-- Flow 1:

Average throughput: 0.27 Mbit/s

95th percentile per-packet one-way delay: 140.483 ms

Loss rate: 0.97%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-01-17 05:15:11

End at: 2019-01-17 05:15:41

Below is generated by plot.py at 2019-01-17 05:48:43

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.29 Mbit/s (100.9% utilization)

95th percentile per-packet one-way delay: 226.405 ms

Loss rate: 1.10%

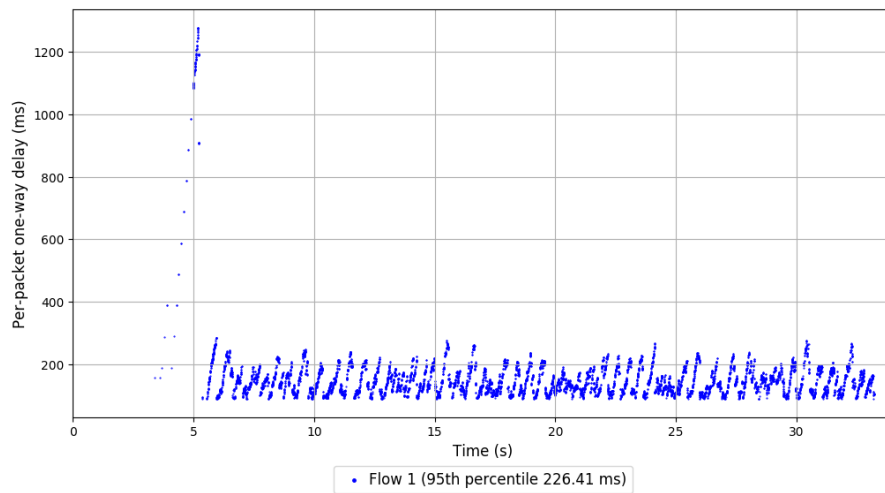
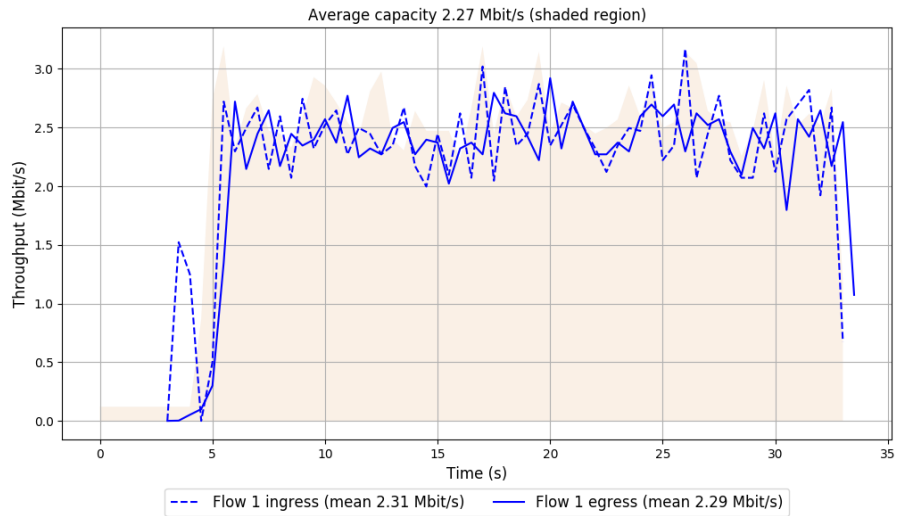
-- Flow 1:

Average throughput: 2.29 Mbit/s

95th percentile per-packet one-way delay: 226.405 ms

Loss rate: 1.10%

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-01-17 05:27:30

End at: 2019-01-17 05:28:00

Below is generated by plot.py at 2019-01-17 05:48:44

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.30 Mbit/s (101.3% utilization)

95th percentile per-packet one-way delay: 222.936 ms

Loss rate: 1.22%

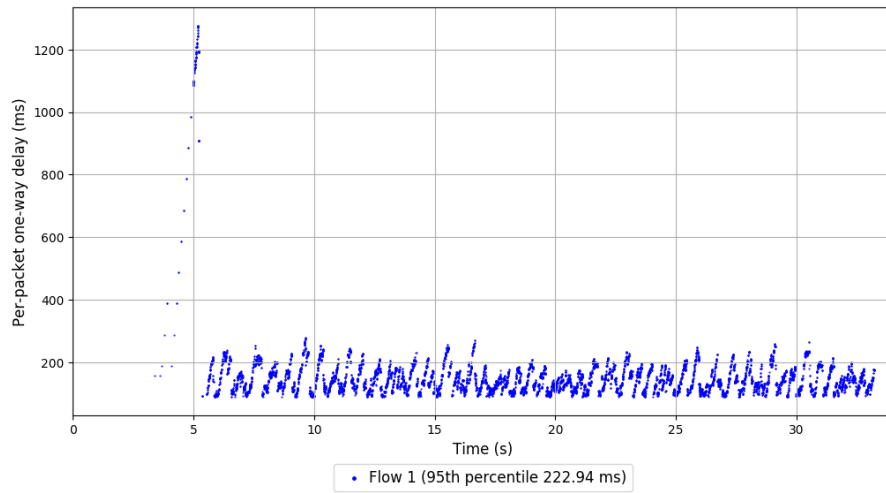
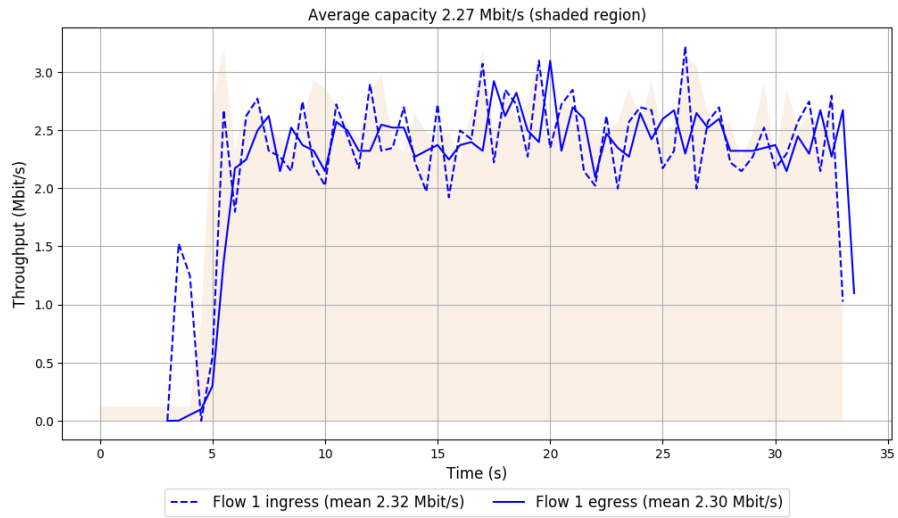
-- Flow 1:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 222.936 ms

Loss rate: 1.22%

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



Run 3: Statistics of TaoVA-100x

Start at: 2019-01-17 05:39:48

End at: 2019-01-17 05:40:18

Below is generated by plot.py at 2019-01-17 05:48:45

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.30 Mbit/s (101.3% utilization)

95th percentile per-packet one-way delay: 226.671 ms

Loss rate: 1.13%

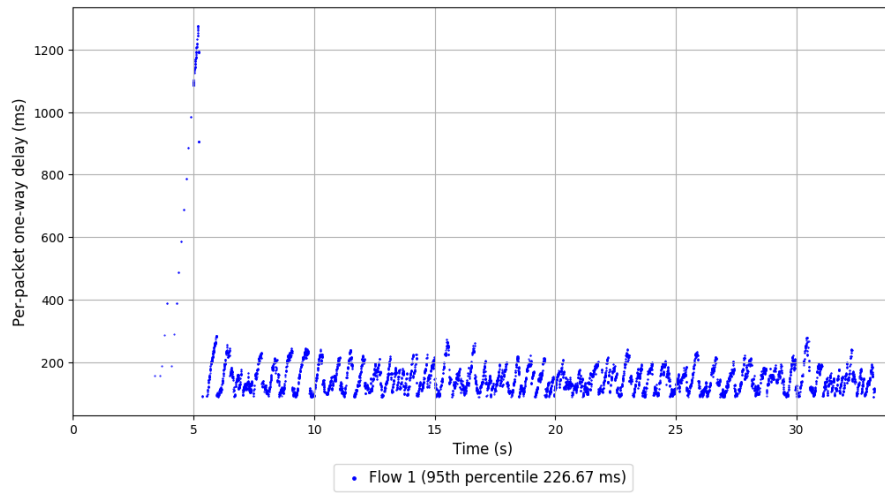
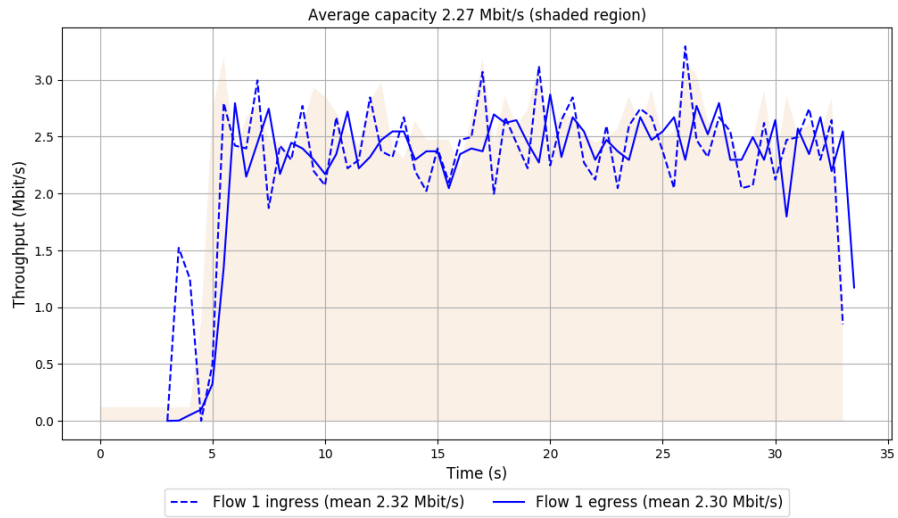
-- Flow 1:

Average throughput: 2.30 Mbit/s

95th percentile per-packet one-way delay: 226.671 ms

Loss rate: 1.13%

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



Run 1: Statistics of TCP Vegas

Start at: 2019-01-17 05:17:32

End at: 2019-01-17 05:18:02

Below is generated by plot.py at 2019-01-17 05:48:45

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.09 Mbit/s (91.9% utilization)

95th percentile per-packet one-way delay: 165.555 ms

Loss rate: 0.44%

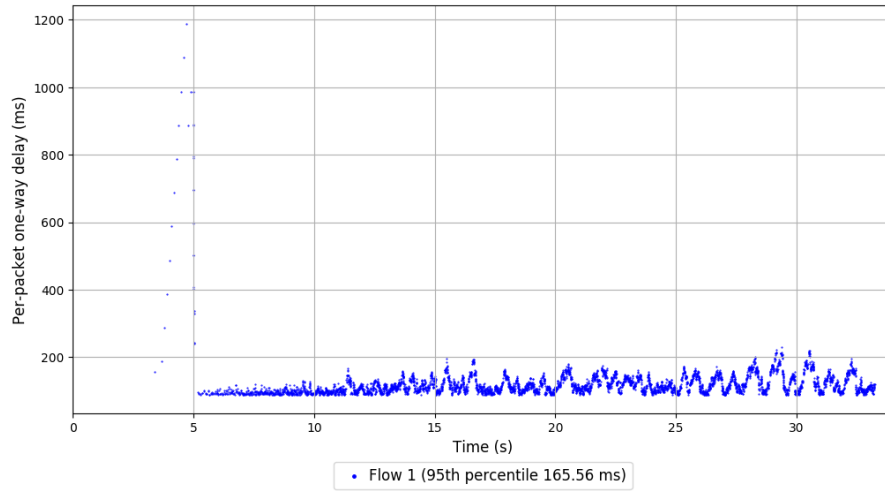
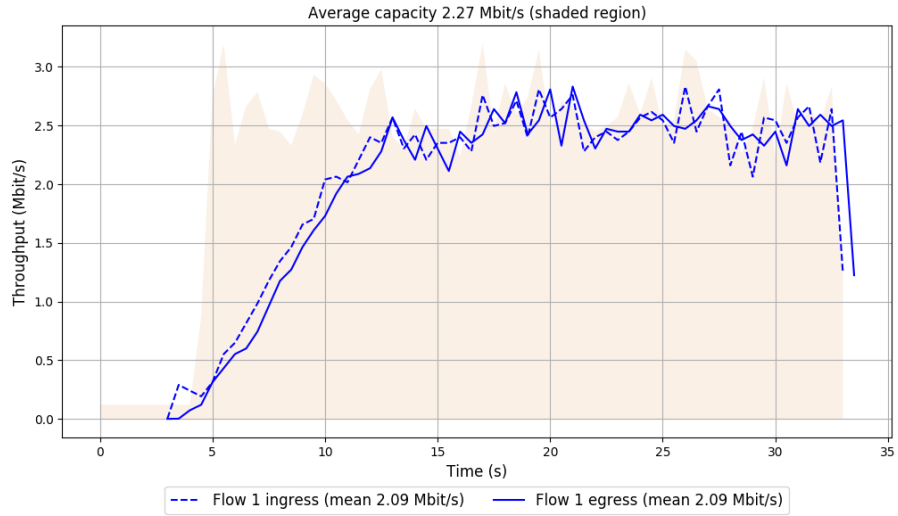
-- Flow 1:

Average throughput: 2.09 Mbit/s

95th percentile per-packet one-way delay: 165.555 ms

Loss rate: 0.44%

Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2019-01-17 05:29:50

End at: 2019-01-17 05:30:21

Below is generated by plot.py at 2019-01-17 05:48:45

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.09 Mbit/s (92.0% utilization)

95th percentile per-packet one-way delay: 163.097 ms

Loss rate: 0.46%

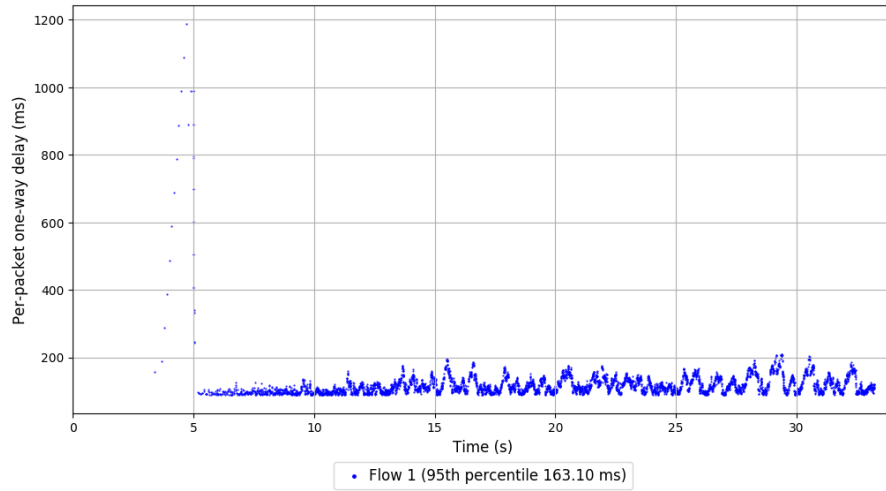
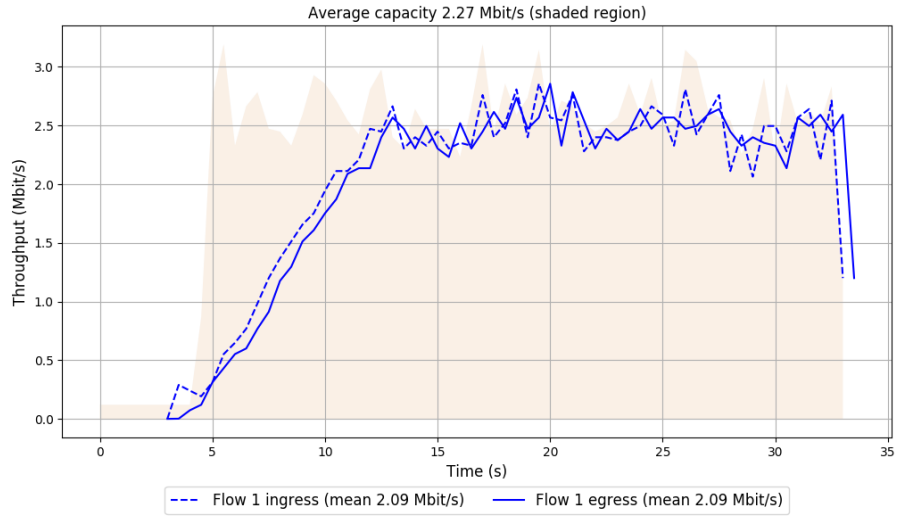
-- Flow 1:

Average throughput: 2.09 Mbit/s

95th percentile per-packet one-way delay: 163.097 ms

Loss rate: 0.46%

Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

Start at: 2019-01-17 05:42:09

End at: 2019-01-17 05:42:39

Below is generated by plot.py at 2019-01-17 05:48:45

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.07 Mbit/s (91.2% utilization)

95th percentile per-packet one-way delay: 158.147 ms

Loss rate: 0.46%

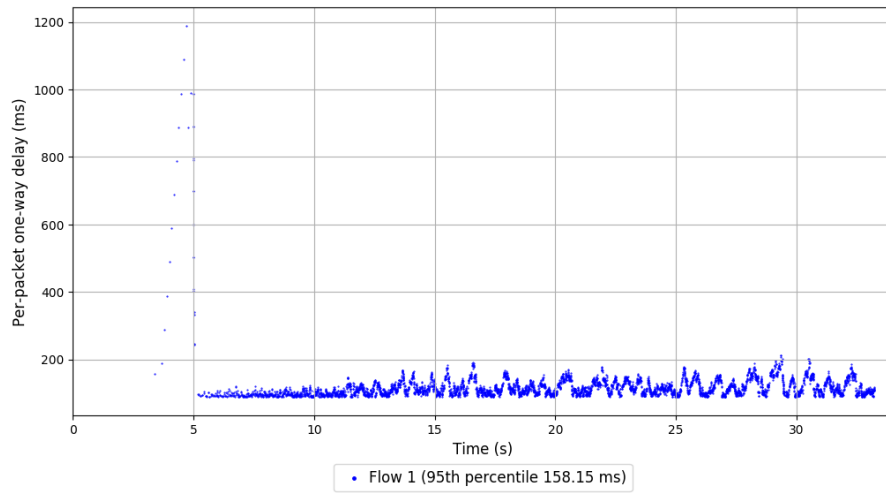
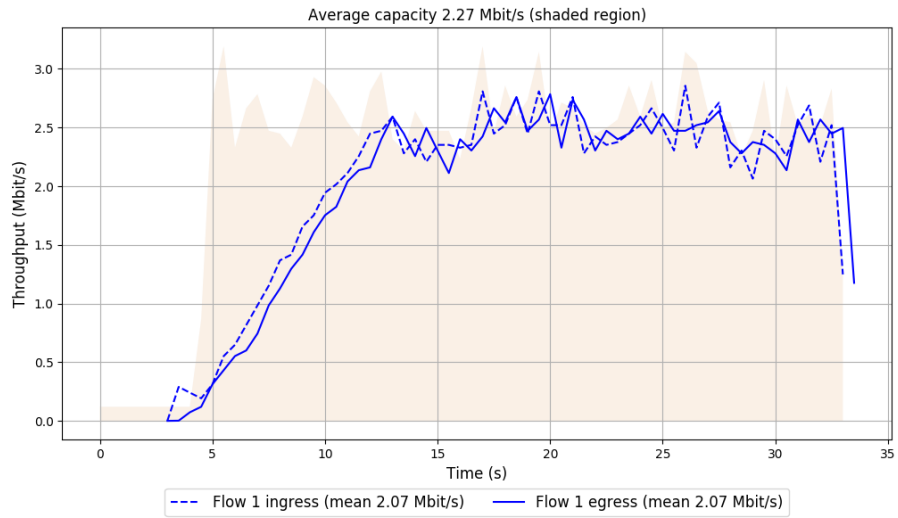
-- Flow 1:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 158.147 ms

Loss rate: 0.46%

Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

Start at: 2019-01-17 05:19:53

End at: 2019-01-17 05:20:23

Below is generated by plot.py at 2019-01-17 05:48:45

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.36 Mbit/s (103.7% utilization)

95th percentile per-packet one-way delay: 723.114 ms

Loss rate: 8.25%

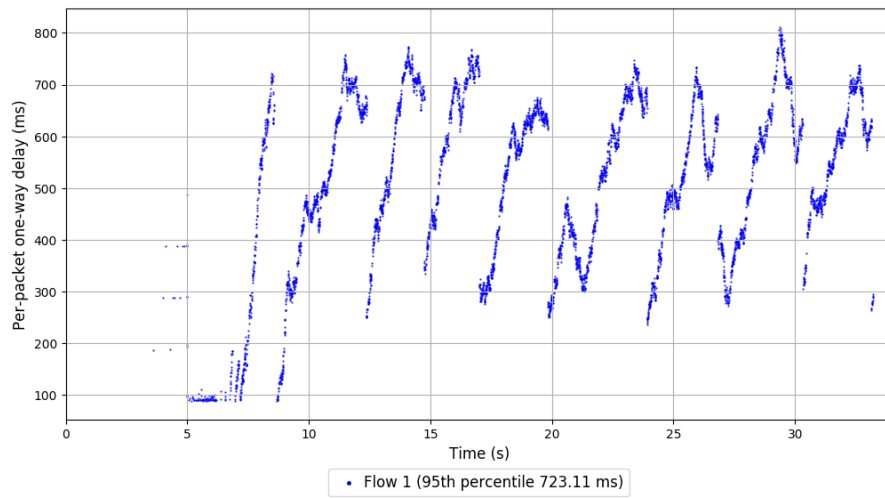
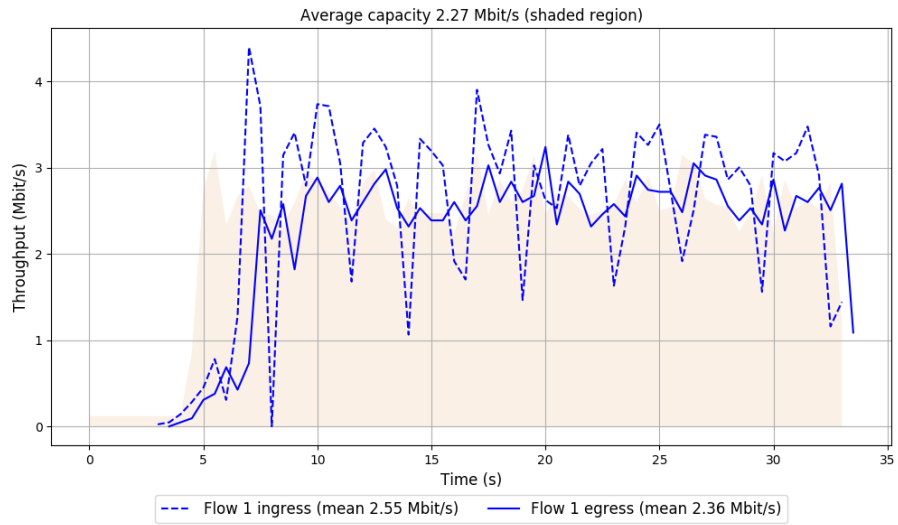
-- Flow 1:

Average throughput: 2.36 Mbit/s

95th percentile per-packet one-way delay: 723.114 ms

Loss rate: 8.25%

Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-01-17 05:32:11

End at: 2019-01-17 05:32:41

Below is generated by plot.py at 2019-01-17 05:48:45

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.43 Mbit/s (107.2% utilization)

95th percentile per-packet one-way delay: 703.926 ms

Loss rate: 7.45%

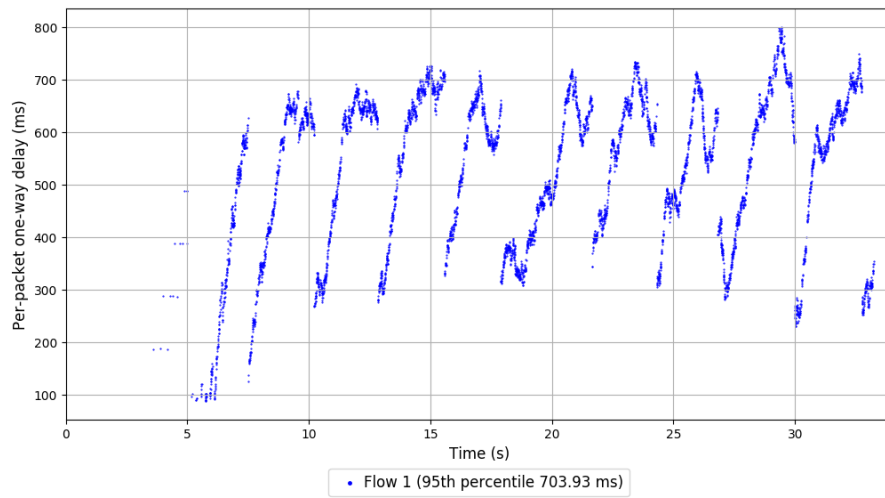
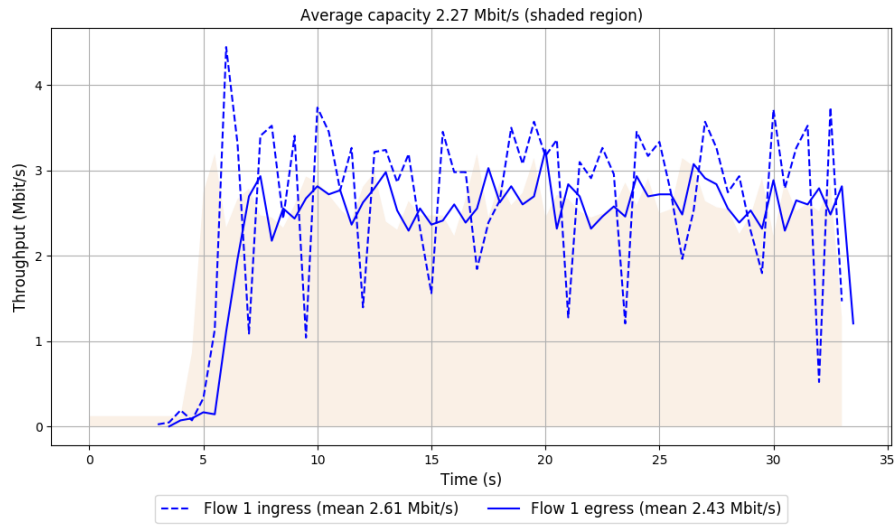
-- Flow 1:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 703.926 ms

Loss rate: 7.45%

Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2019-01-17 05:44:30

End at: 2019-01-17 05:45:00

Below is generated by plot.py at 2019-01-17 05:48:50

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.34 Mbit/s (103.2% utilization)

95th percentile per-packet one-way delay: 722.654 ms

Loss rate: 9.17%

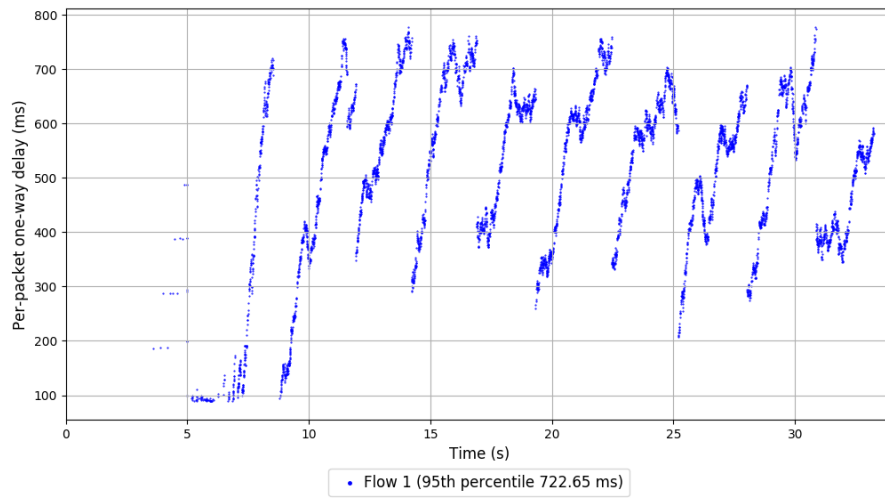
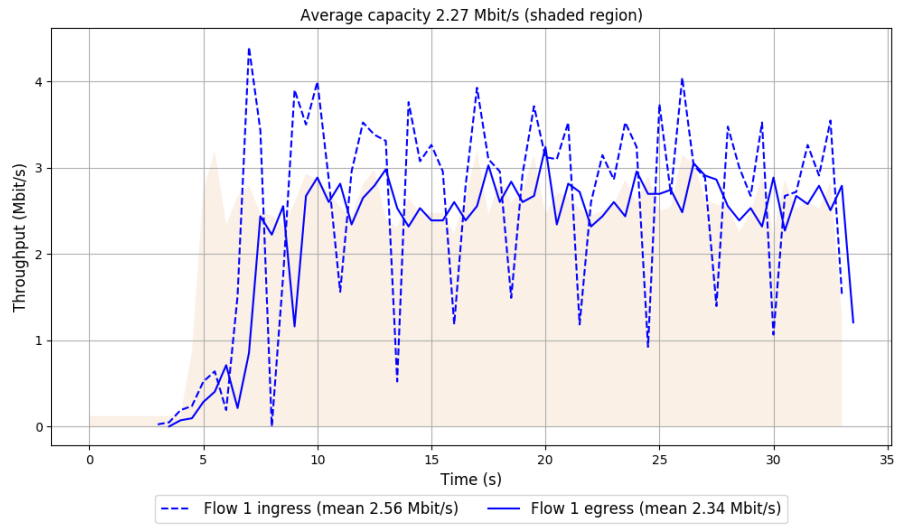
-- Flow 1:

Average throughput: 2.34 Mbit/s

95th percentile per-packet one-way delay: 722.654 ms

Loss rate: 9.17%

Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-01-17 05:12:51

End at: 2019-01-17 05:13:21

Below is generated by plot.py at 2019-01-17 05:48:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.6% utilization)

95th percentile per-packet one-way delay: 724.872 ms

Loss rate: 29.17%

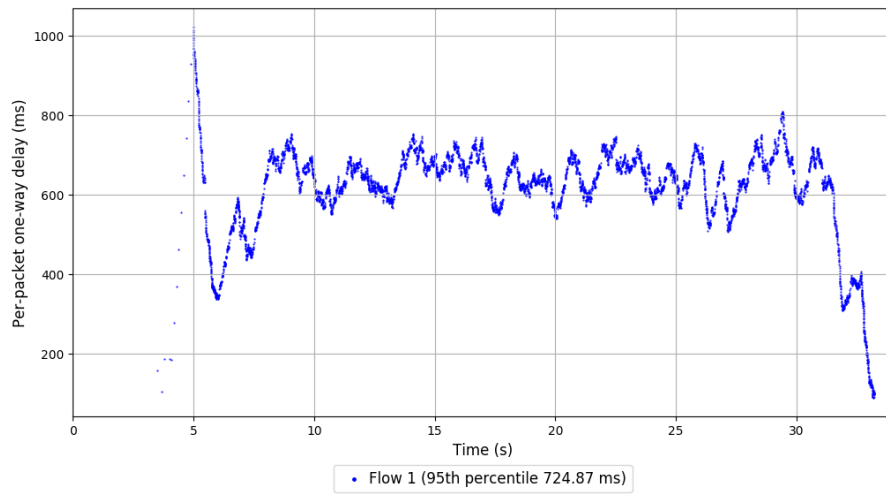
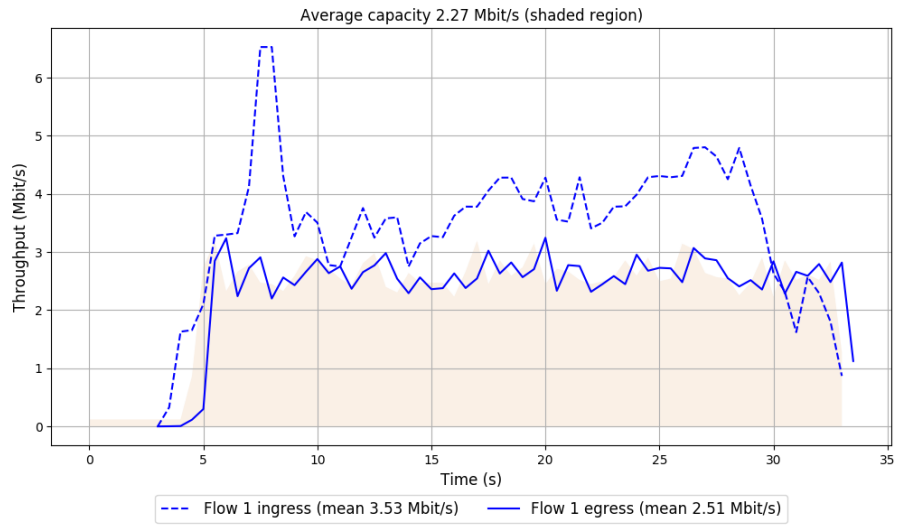
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 724.872 ms

Loss rate: 29.17%

Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-01-17 05:25:09

End at: 2019-01-17 05:25:39

Below is generated by plot.py at 2019-01-17 05:48:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.17 Mbit/s (95.3% utilization)

95th percentile per-packet one-way delay: 702.253 ms

Loss rate: 13.41%

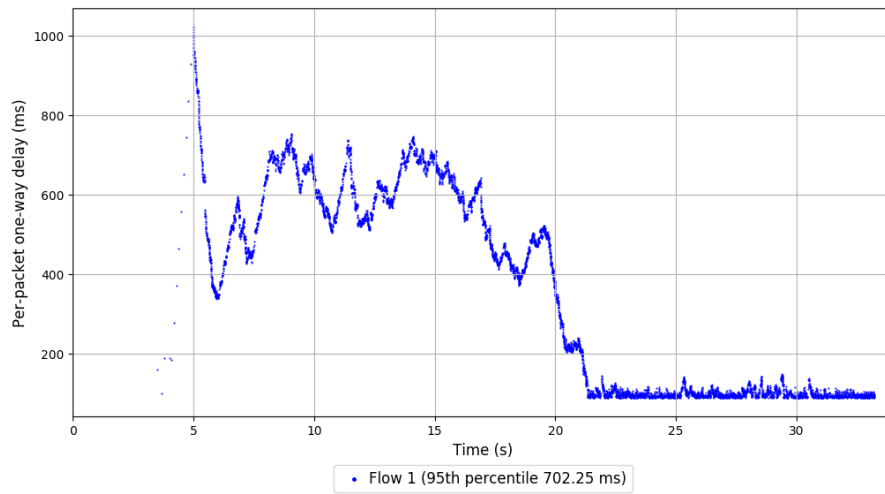
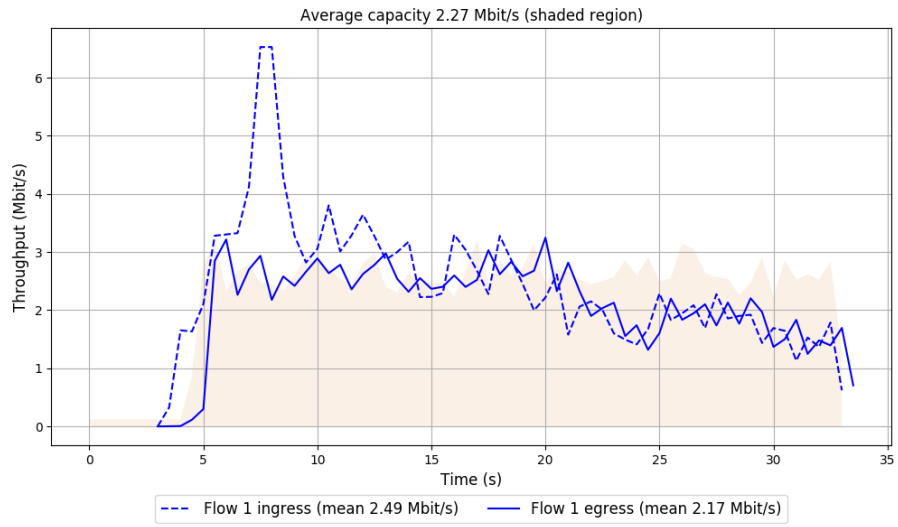
-- Flow 1:

Average throughput: 2.17 Mbit/s

95th percentile per-packet one-way delay: 702.253 ms

Loss rate: 13.41%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-01-17 05:37:28

End at: 2019-01-17 05:37:58

Below is generated by plot.py at 2019-01-17 05:48:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 2.51 Mbit/s (110.6% utilization)

95th percentile per-packet one-way delay: 726.470 ms

Loss rate: 30.48%

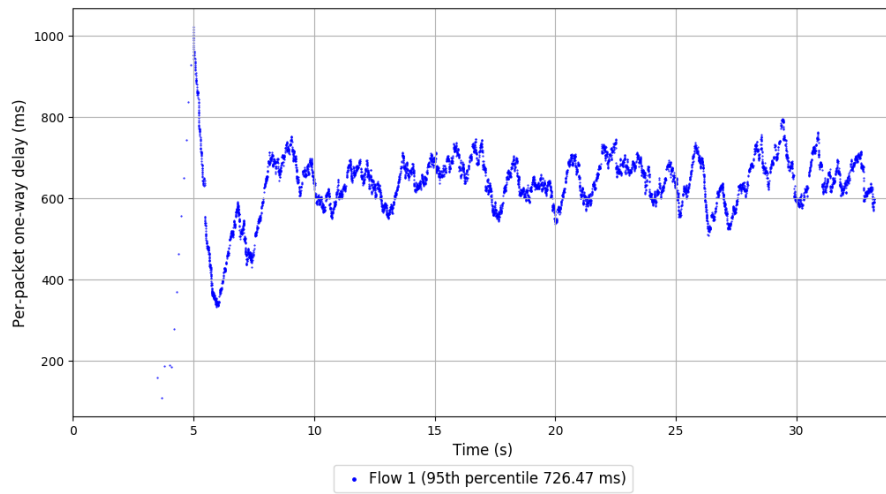
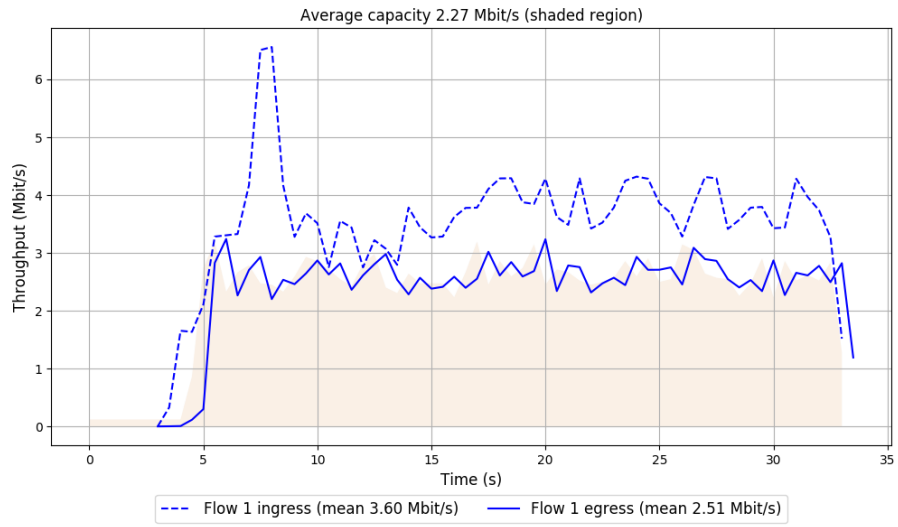
-- Flow 1:

Average throughput: 2.51 Mbit/s

95th percentile per-packet one-way delay: 726.470 ms

Loss rate: 30.48%

Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

Start at: 2019-01-17 05:11:40

End at: 2019-01-17 05:12:10

Below is generated by plot.py at 2019-01-17 05:48:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.05 Mbit/s (2.1% utilization)

95th percentile per-packet one-way delay: 496.849 ms

Loss rate: 0.00%

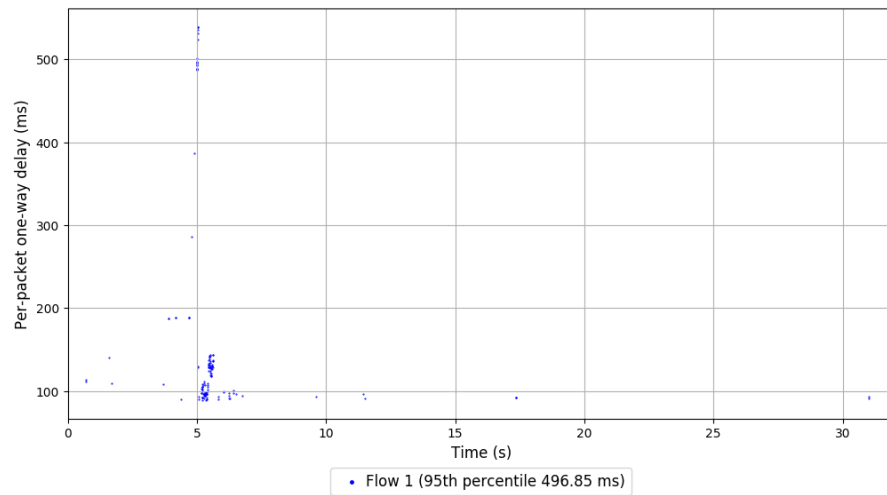
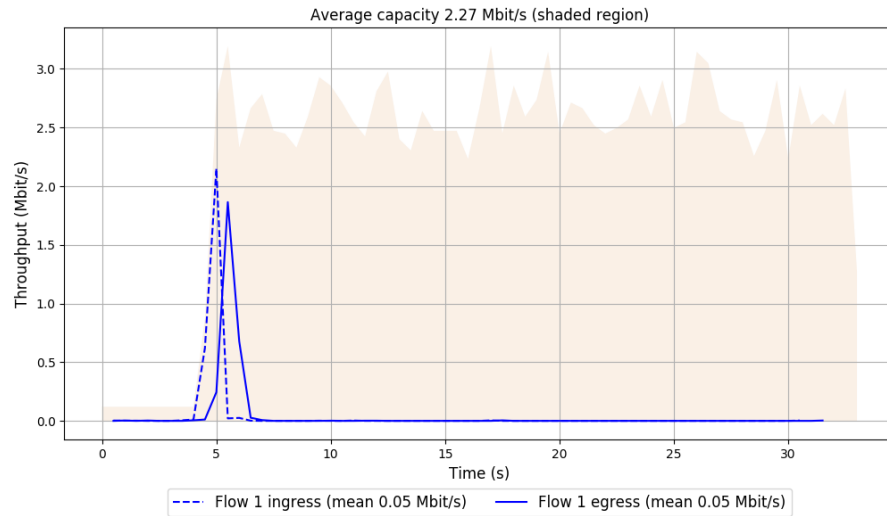
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 496.849 ms

Loss rate: 0.00%

Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2019-01-17 05:23:59

End at: 2019-01-17 05:24:29

Below is generated by plot.py at 2019-01-17 05:48:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.05 Mbit/s (2.1% utilization)

95th percentile per-packet one-way delay: 497.288 ms

Loss rate: 0.00%

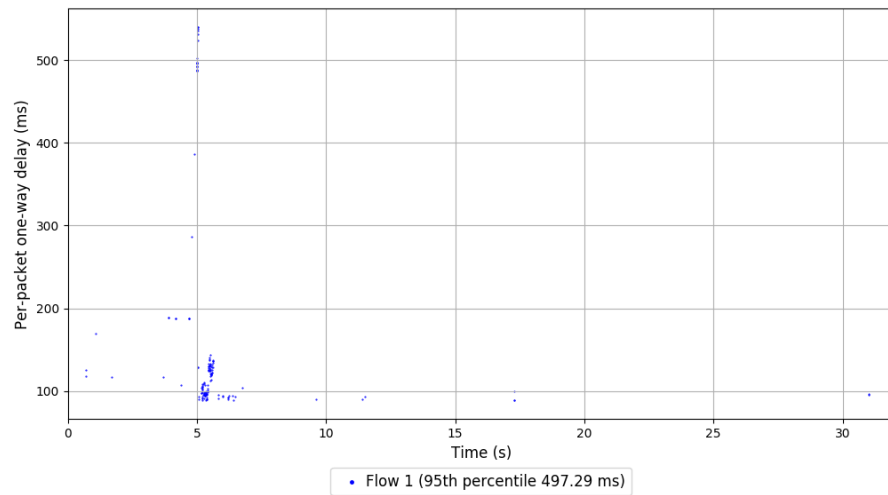
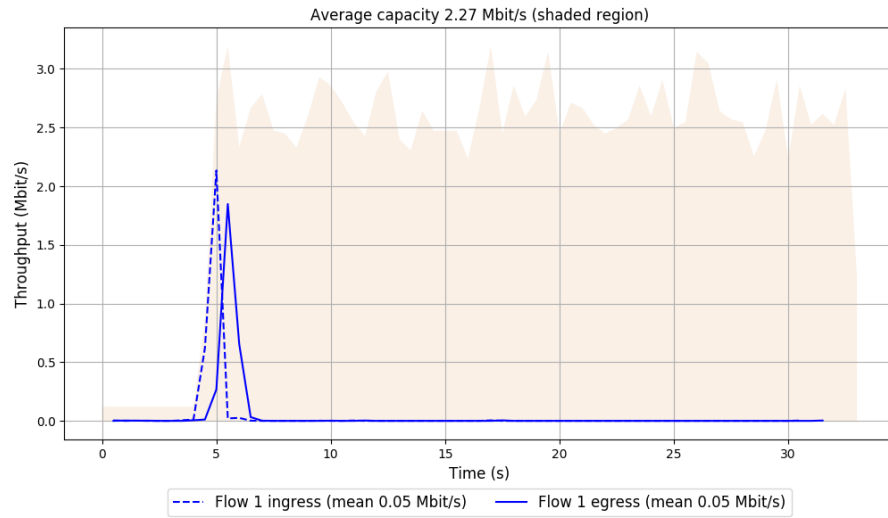
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 497.288 ms

Loss rate: 0.00%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-17 05:36:18

End at: 2019-01-17 05:36:48

Below is generated by plot.py at 2019-01-17 05:48:52

Datalink statistics

-- Total of 1 flow:

Average capacity: 2.27 Mbit/s

Average throughput: 0.05 Mbit/s (2.1% utilization)

95th percentile per-packet one-way delay: 496.197 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 496.197 ms

Loss rate: 0.00%

Run 3: Report of WebRTC media — Data Link

