

## Pantheon Report

Generated at 2019-01-17 05:49:08 (UTC).

Tested in mahimahi: mm-delay 130 mm-link 3.04mbps-poisson.trace 3.04mbps-poisson.trace  
--uplink-queue=droptail --uplink-queue-args=packets=426

Repeated the test of 21 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

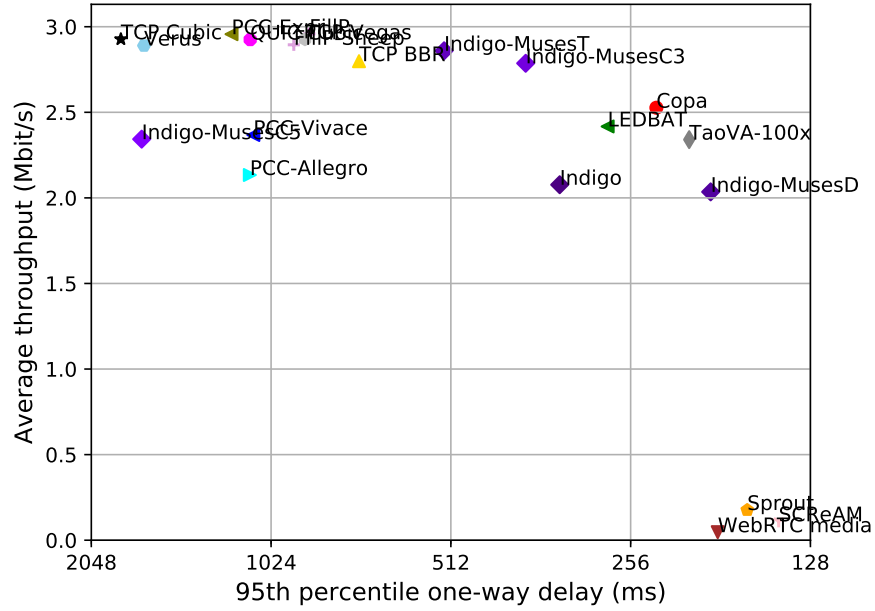
### System info:

```
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
```

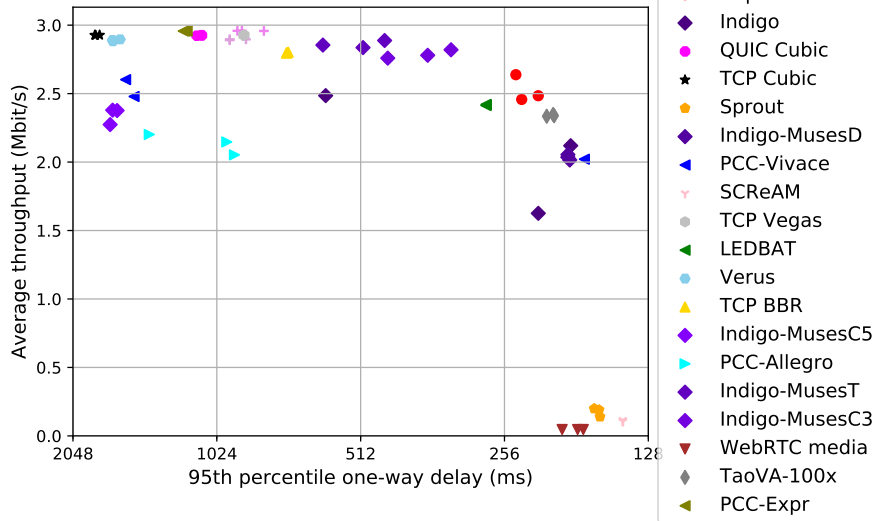
### Git summary:

```
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)



local test in mahimahi, 3 runs of 30s each per 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	2.80	729.59	1.58
Copa	3	2.53	231.83	0.76
TCP Cubic	3	2.93	1827.42	8.21
FillP	3	2.96	883.58	3.15
FillP-Sheep	3	2.90	938.11	0.98
Indigo	3	2.08	336.53	1.58
Indigo-MusesC3	3	2.79	383.72	0.79
Indigo-MusesC5	3	2.34	1686.50	8.41
Indigo-MusesD	3	2.04	188.05	0.68
Indigo-MusesT	3	2.86	525.52	1.62
LEDBAT	3	2.42	279.77	1.05
PCC-Allegro	3	2.13	1111.36	0.97
PCC-Expr	3	2.96	1192.82	48.36
QUIC Cubic	3	2.92	1109.90	4.09
SReAM	3	0.11	144.68	0.45
Sprout	3	0.18	163.32	0.13
TaoVA-100x	3	2.34	204.29	0.64
TCP Vegas	3	2.93	898.40	2.60
Verus	3	2.89	1671.30	4.67
PCC-Vivace	3	2.37	1096.53	2.74
WebRTC media	3	0.05	182.99	0.00

Run 1: Statistics of TCP BBR

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

End at: 2019-01-17 05:21:35

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.80 Mbit/s (103.9% utilization)

95th percentile per-packet one-way delay: 731.340 ms

Loss rate: 1.53%

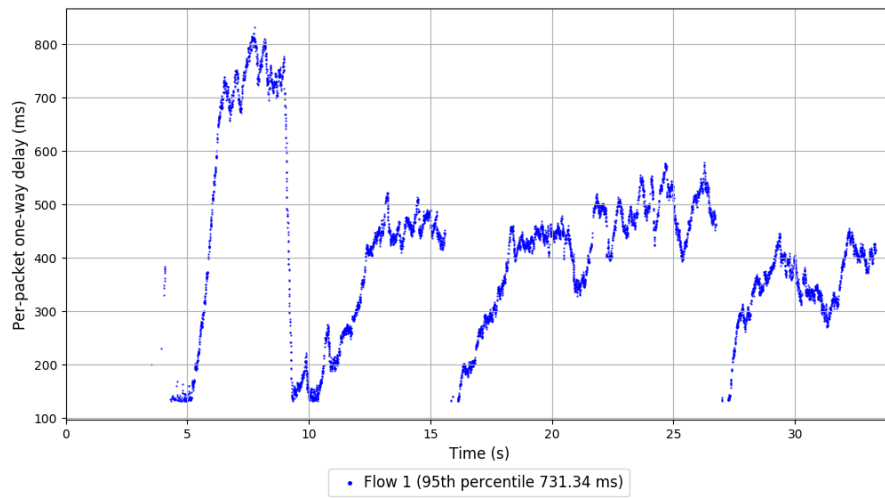
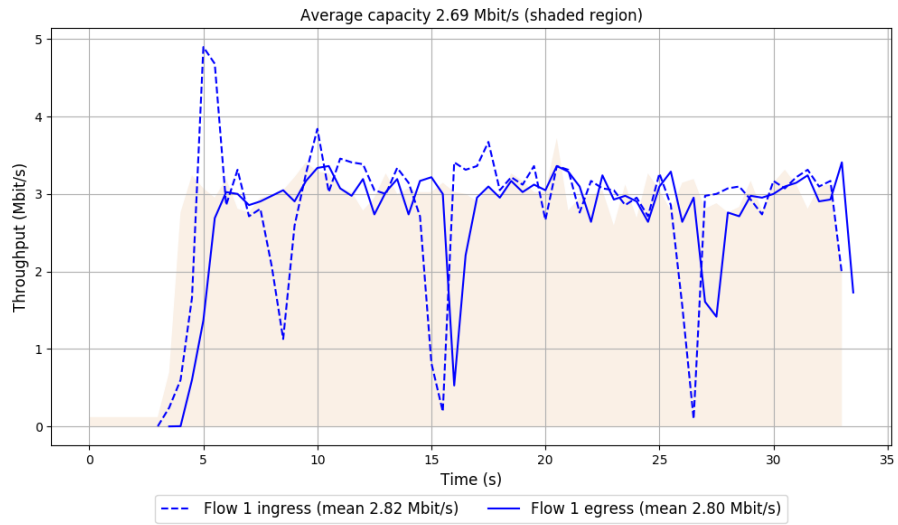
-- Flow 1:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 731.340 ms

Loss rate: 1.53%

# Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2019-01-17 05:33:27

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

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.80 Mbit/s (103.9% utilization)

95th percentile per-packet one-way delay: 731.501 ms

Loss rate: 1.63%

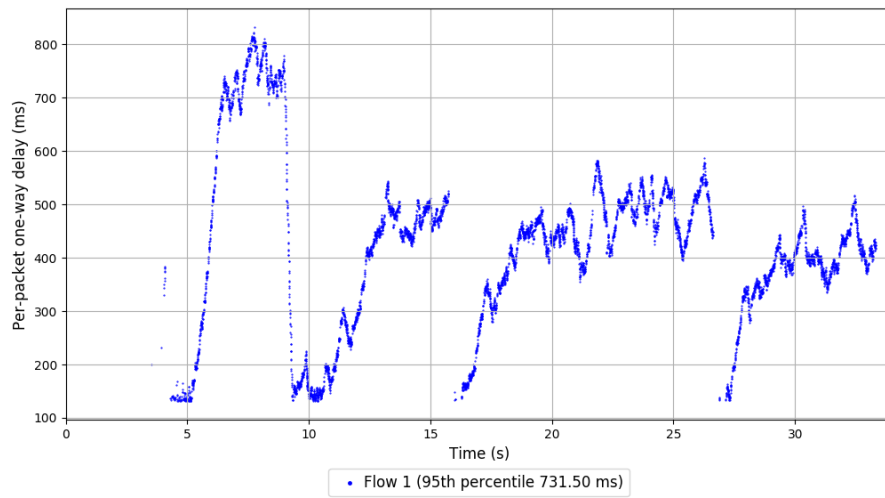
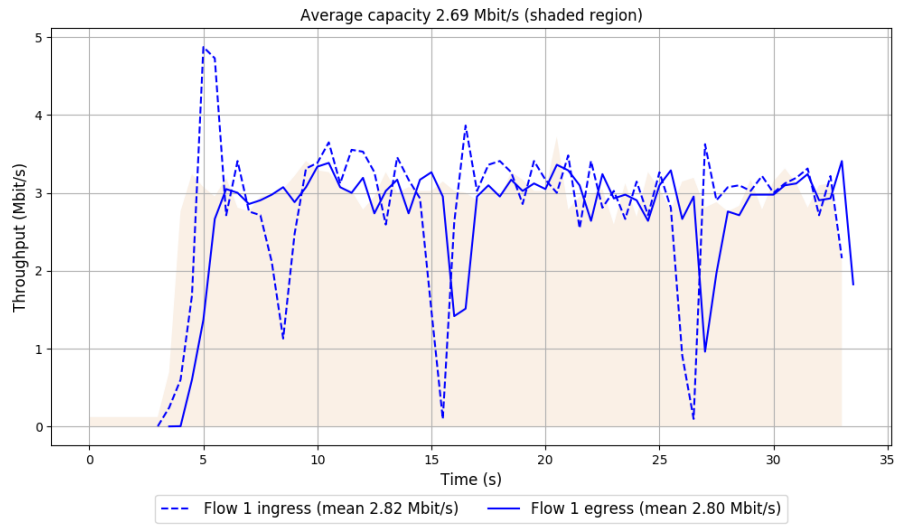
-- Flow 1:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 731.501 ms

Loss rate: 1.63%

## Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2019-01-17 05:45:49

End at: 2019-01-17 05:46:19

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.80 Mbit/s (104.1% utilization)

95th percentile per-packet one-way delay: 725.914 ms

Loss rate: 1.58%

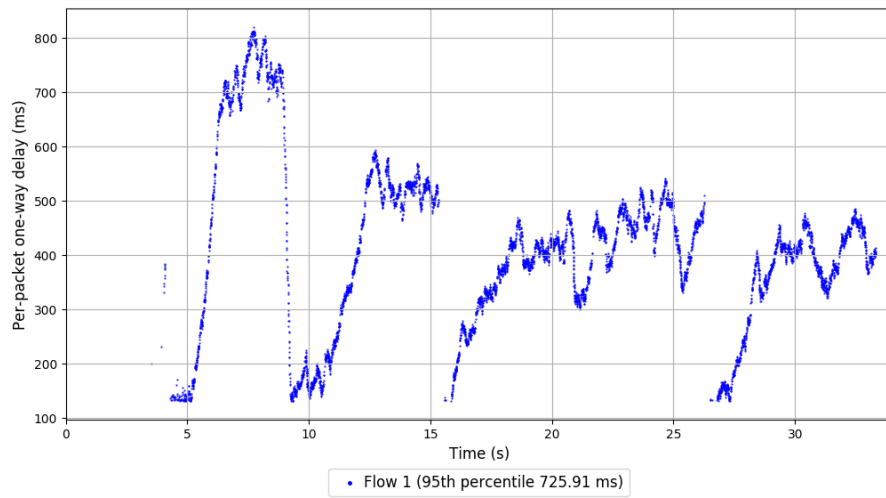
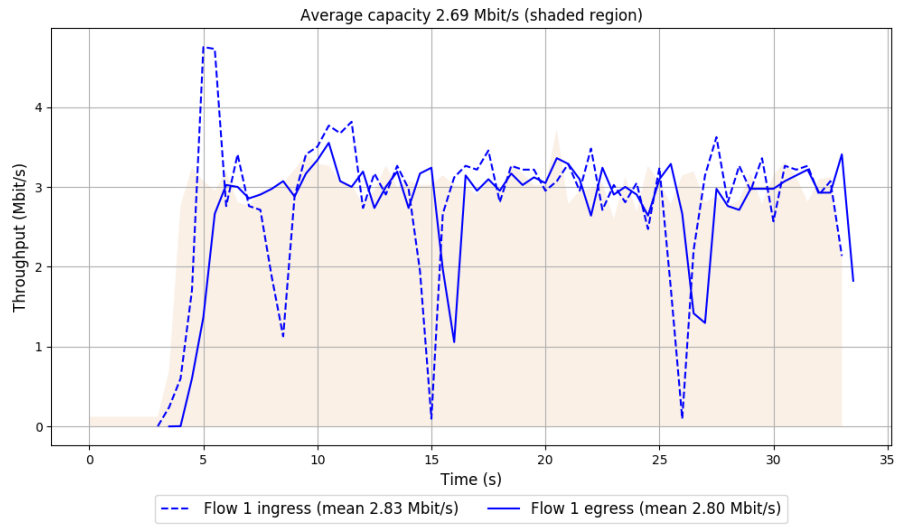
-- Flow 1:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 725.914 ms

Loss rate: 1.58%

### Run 3: Report of TCP BBR — Data Link



Run 1: Statistics of Copa

Start at: 2019-01-17 05:14:37

End at: 2019-01-17 05:15:07

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.64 Mbit/s (98.0% utilization)

95th percentile per-packet one-way delay: 242.344 ms

Loss rate: 0.74%

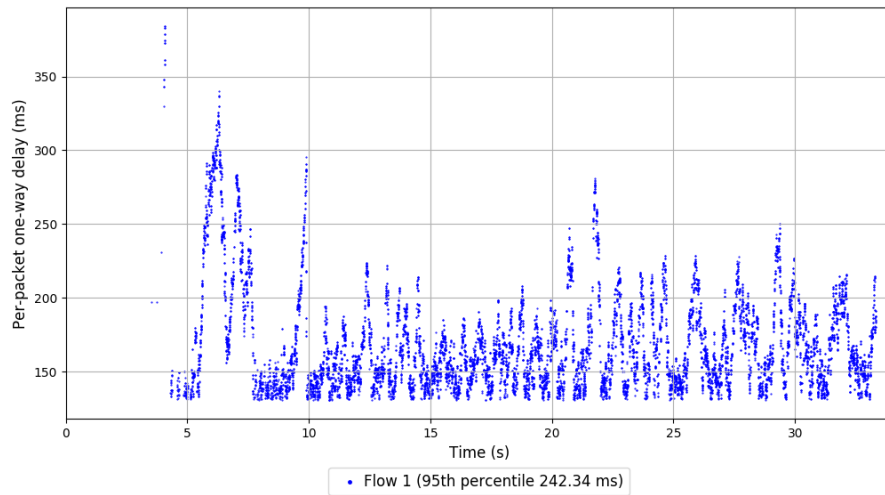
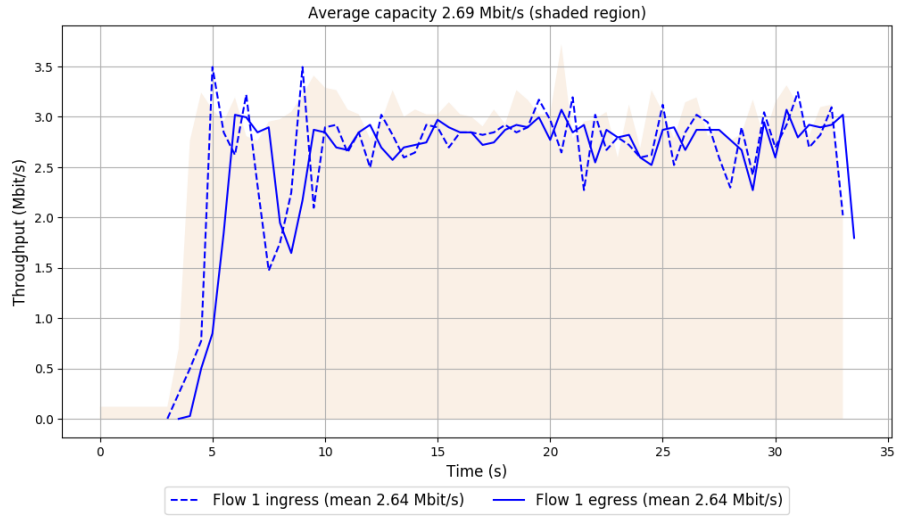
-- Flow 1:

Average throughput: 2.64 Mbit/s

95th percentile per-packet one-way delay: 242.344 ms

Loss rate: 0.74%

# Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

Start at: 2019-01-17 05:26:58

End at: 2019-01-17 05:27:28

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.48 Mbit/s (92.3% utilization)

95th percentile per-packet one-way delay: 217.534 ms

Loss rate: 0.67%

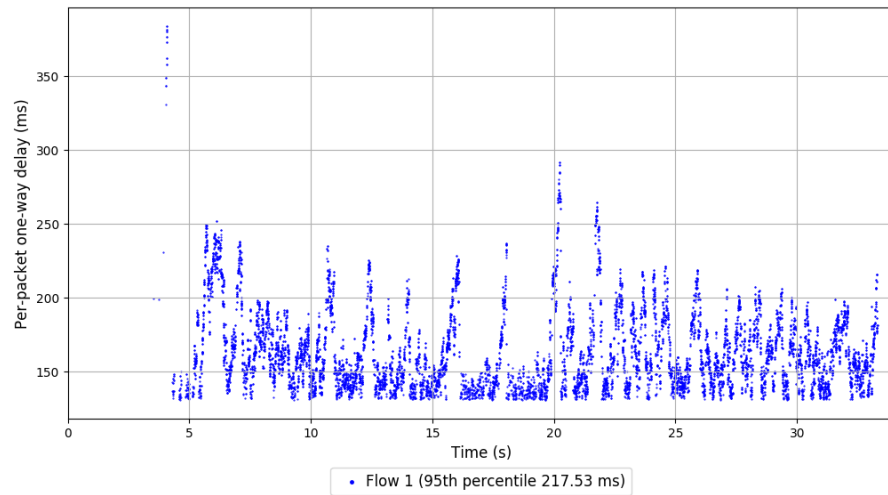
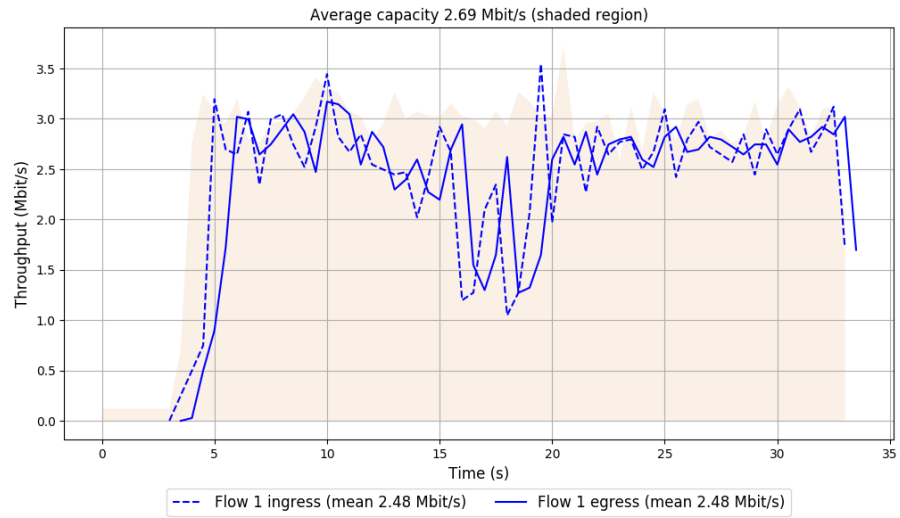
-- Flow 1:

Average throughput: 2.48 Mbit/s

95th percentile per-packet one-way delay: 217.534 ms

Loss rate: 0.67%

## Run 2: Report of Copa — Data Link



Run 3: Statistics of Copa

Start at: 2019-01-17 05:39:20

End at: 2019-01-17 05:39:50

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.46 Mbit/s (91.3% utilization)

95th percentile per-packet one-way delay: 235.617 ms

Loss rate: 0.86%

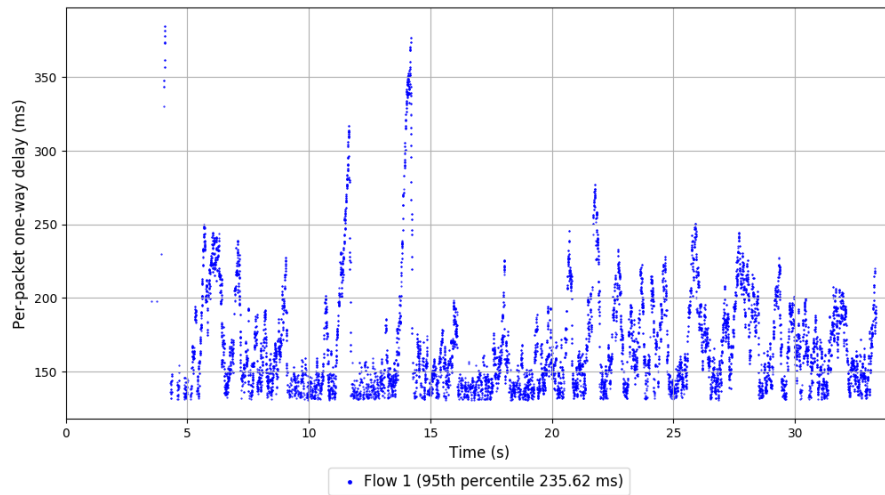
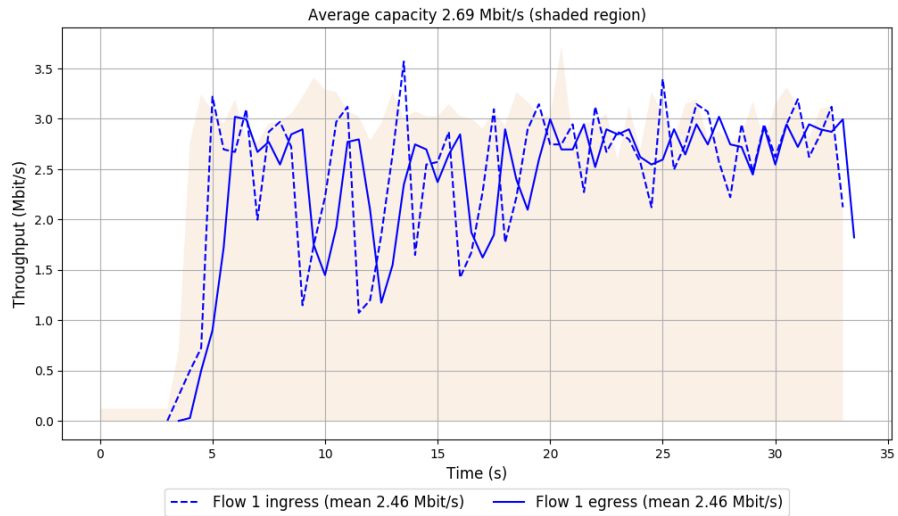
-- Flow 1:

Average throughput: 2.46 Mbit/s

95th percentile per-packet one-way delay: 235.617 ms

Loss rate: 0.86%

### Run 3: Report of Copa — Data Link



Run 1: Statistics of TCP Cubic

Start at: 2019-01-17 05:20:30

End at: 2019-01-17 05:21:00

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 1801.709 ms

Loss rate: 7.99%

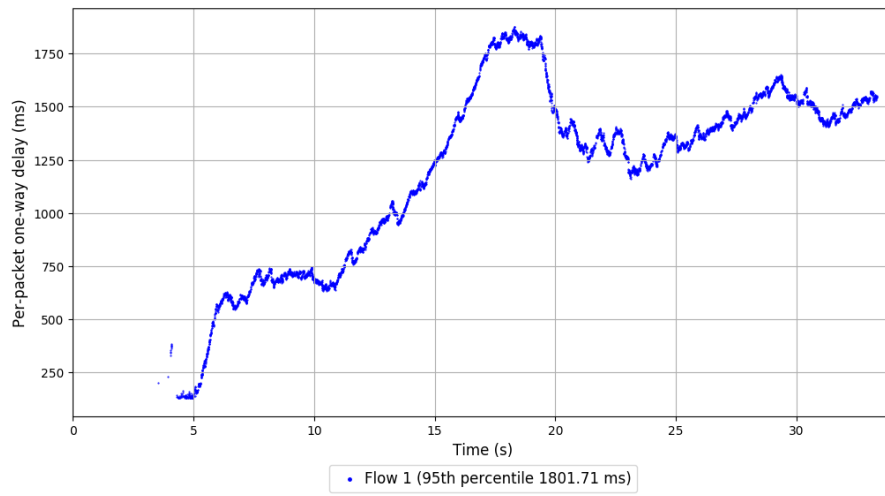
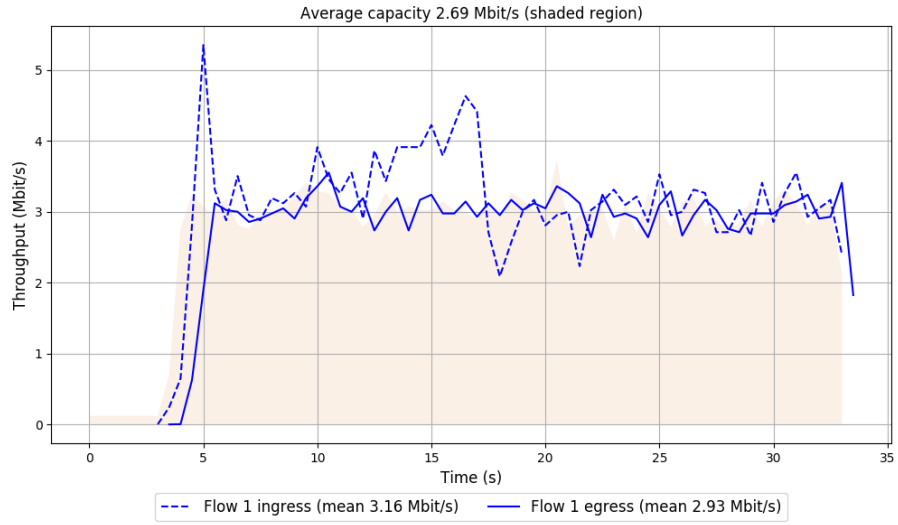
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 1801.709 ms

Loss rate: 7.99%

### Run 1: Report of TCP Cubic — Data Link



Run 2: Statistics of TCP Cubic

Start at: 2019-01-17 05:32:52

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

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 1843.736 ms

Loss rate: 8.37%

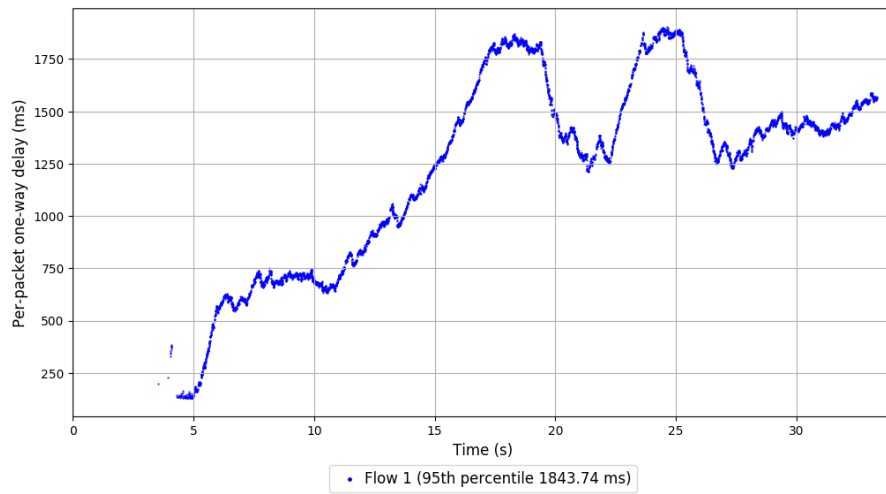
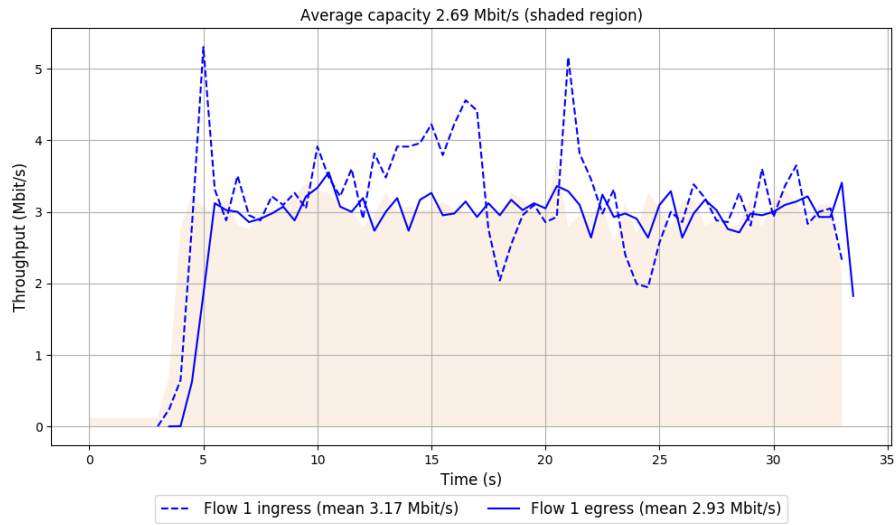
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 1843.736 ms

Loss rate: 8.37%

## Run 2: Report of TCP Cubic — Data Link



Run 3: Statistics of TCP Cubic

Start at: 2019-01-17 05:45:14

End at: 2019-01-17 05:45:44

# Below is generated by plot.py at 2019-01-17 05:47:55

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 1836.806 ms

Loss rate: 8.26%

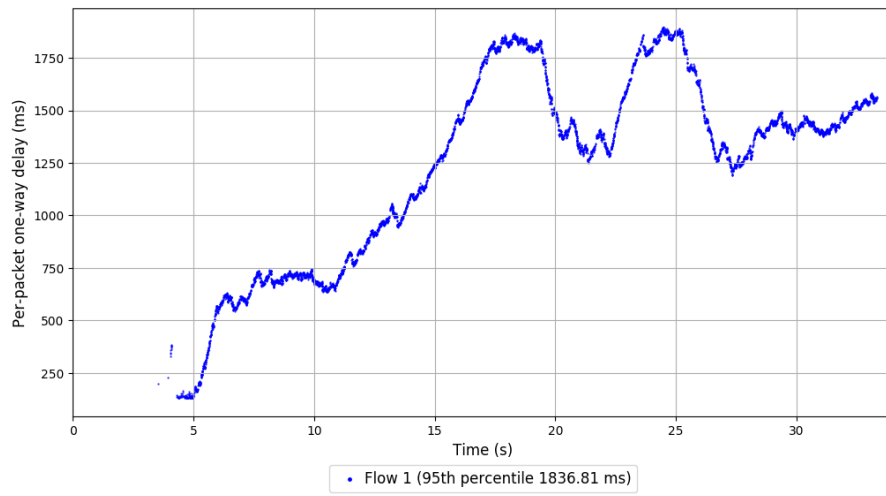
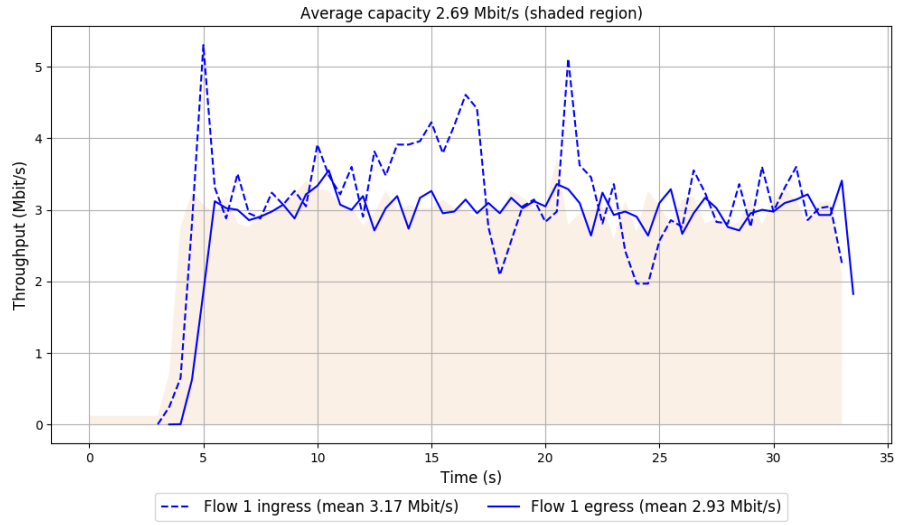
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 1836.806 ms

Loss rate: 8.26%

### Run 3: Report of TCP Cubic — Data Link



Run 1: Statistics of FillP

Start at: 2019-01-17 05:12:16

End at: 2019-01-17 05:12:46

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.96 Mbit/s (109.9% utilization)

95th percentile per-packet one-way delay: 907.293 ms

Loss rate: 3.47%

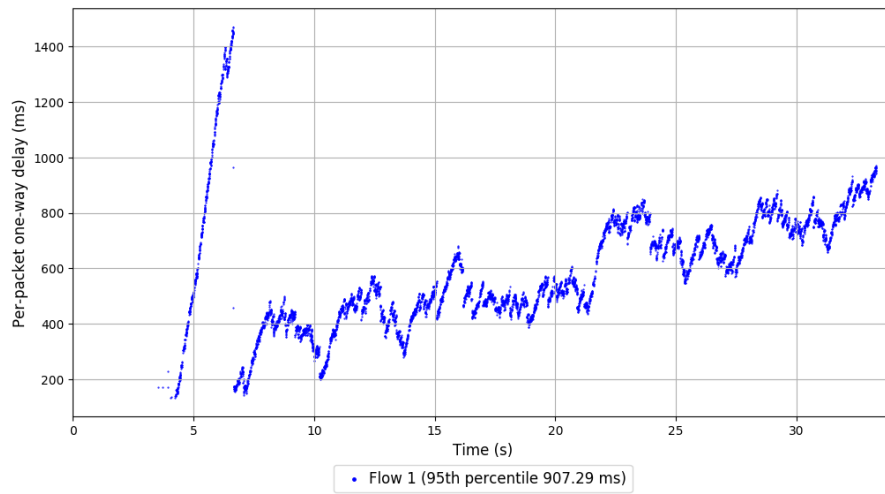
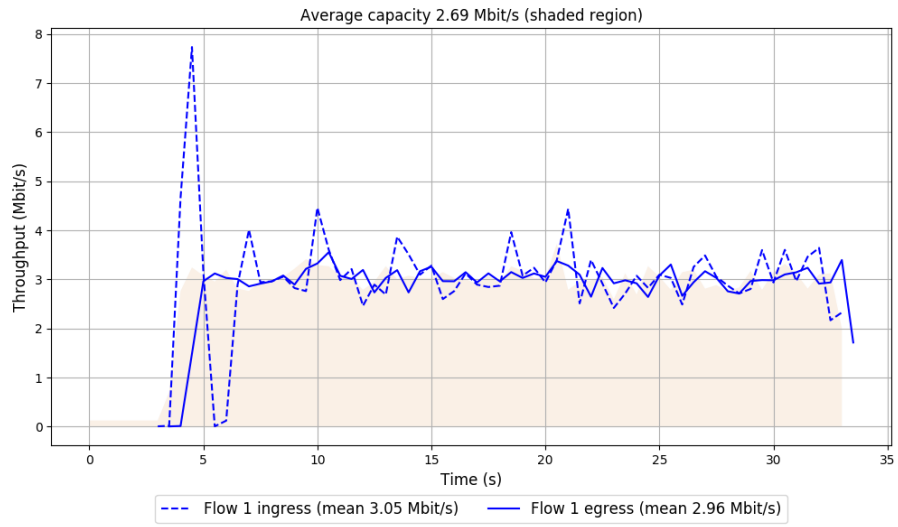
-- Flow 1:

Average throughput: 2.96 Mbit/s

95th percentile per-packet one-way delay: 907.293 ms

Loss rate: 3.47%

# Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2019-01-17 05:24:37

End at: 2019-01-17 05:25:07

# Below is generated by plot.py at 2019-01-17 05:47:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.96 Mbit/s (109.9% utilization)

95th percentile per-packet one-way delay: 816.122 ms

Loss rate: 2.95%

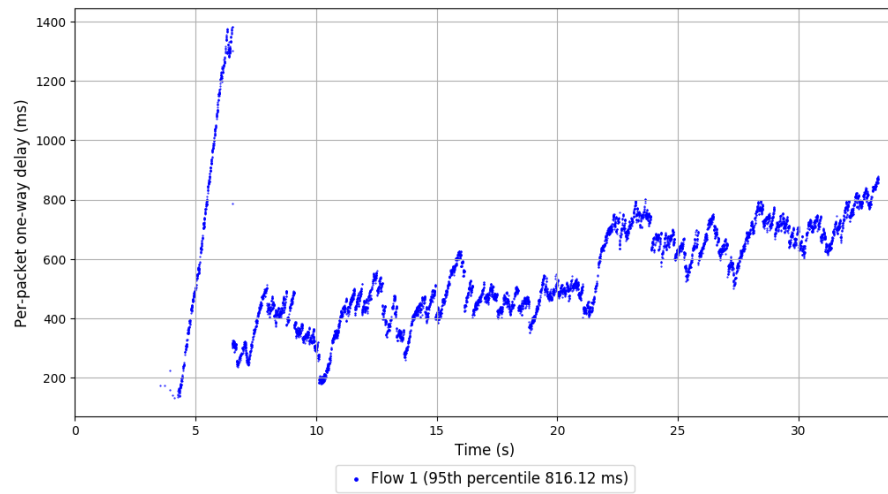
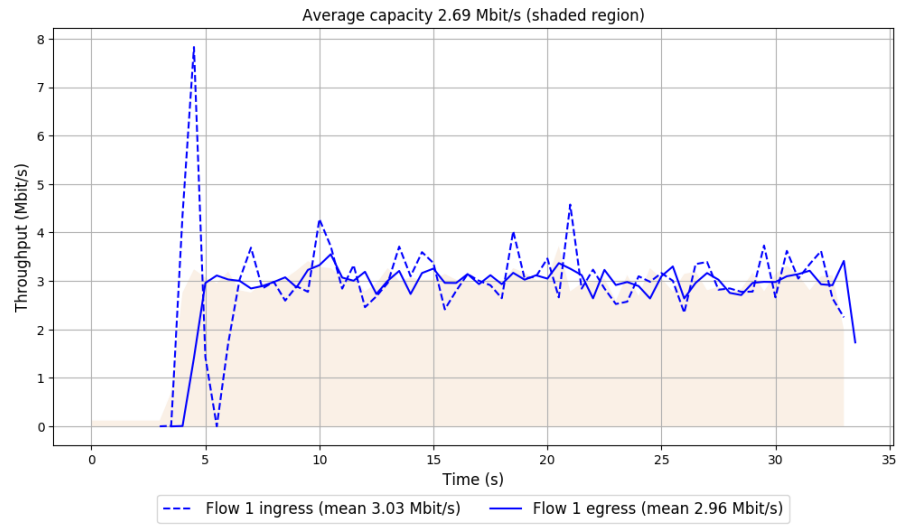
-- Flow 1:

Average throughput: 2.96 Mbit/s

95th percentile per-packet one-way delay: 816.122 ms

Loss rate: 2.95%

## Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2019-01-17 05:36:59

End at: 2019-01-17 05:37:29

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.96 Mbit/s (109.9% utilization)

95th percentile per-packet one-way delay: 927.312 ms

Loss rate: 3.02%

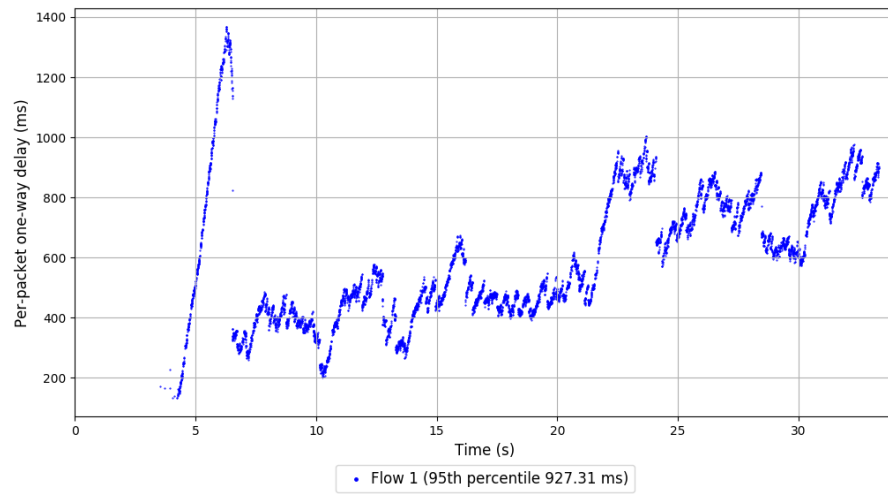
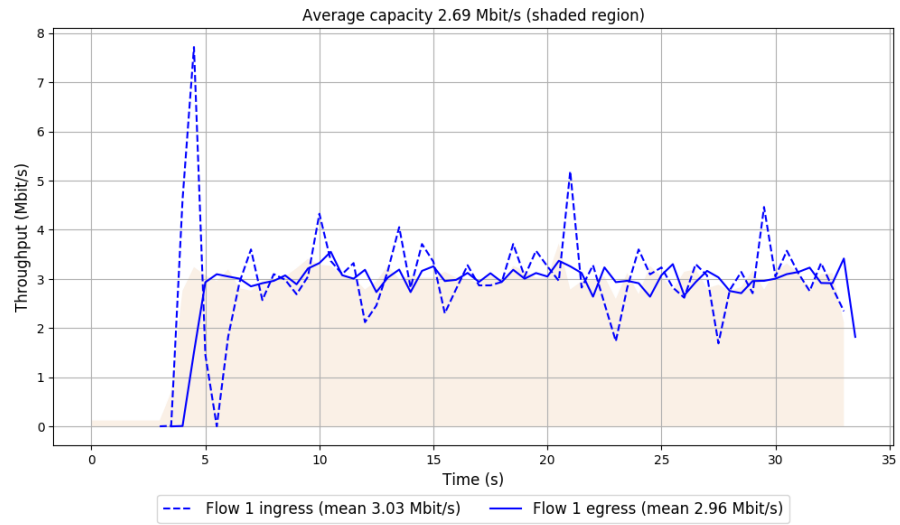
-- Flow 1:

Average throughput: 2.96 Mbit/s

95th percentile per-packet one-way delay: 927.312 ms

Loss rate: 3.02%

### Run 3: Report of FillP — Data Link



Run 1: Statistics of FillP-Sheep

Start at: 2019-01-17 05:14:02

End at: 2019-01-17 05:14:32

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.90 Mbit/s (107.6% utilization)

95th percentile per-packet one-way delay: 889.707 ms

Loss rate: 0.96%

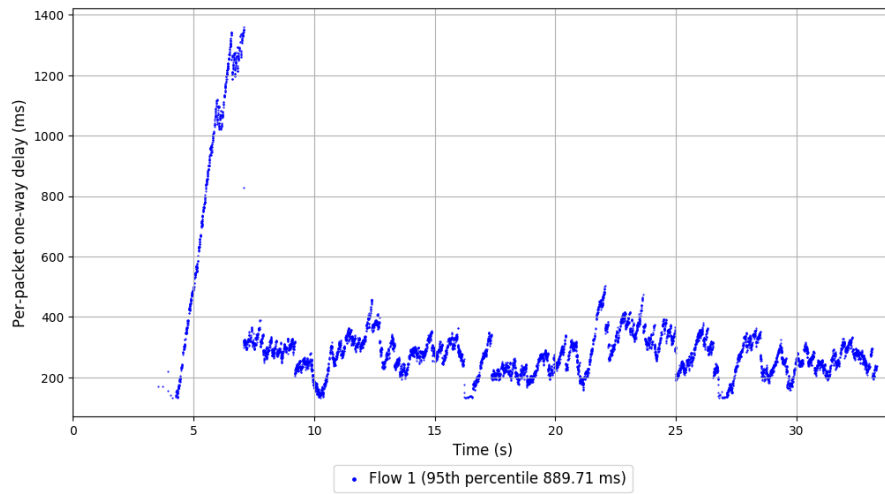
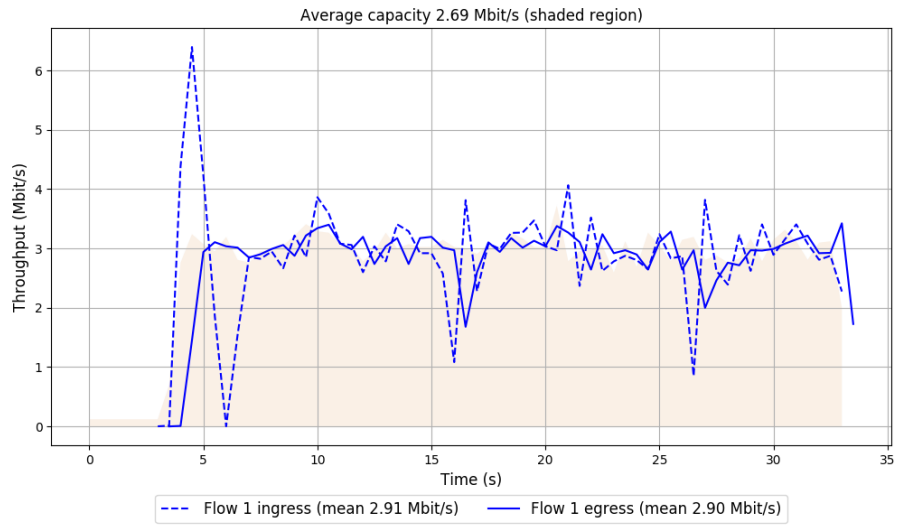
-- Flow 1:

Average throughput: 2.90 Mbit/s

95th percentile per-packet one-way delay: 889.707 ms

Loss rate: 0.96%

# Run 1: Report of FillP-Sheep — Data Link



Run 2: Statistics of FillP-Sheep

Start at: 2019-01-17 05:26:23

End at: 2019-01-17 05:26:53

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.90 Mbit/s (107.6% utilization)

95th percentile per-packet one-way delay: 962.117 ms

Loss rate: 1.05%

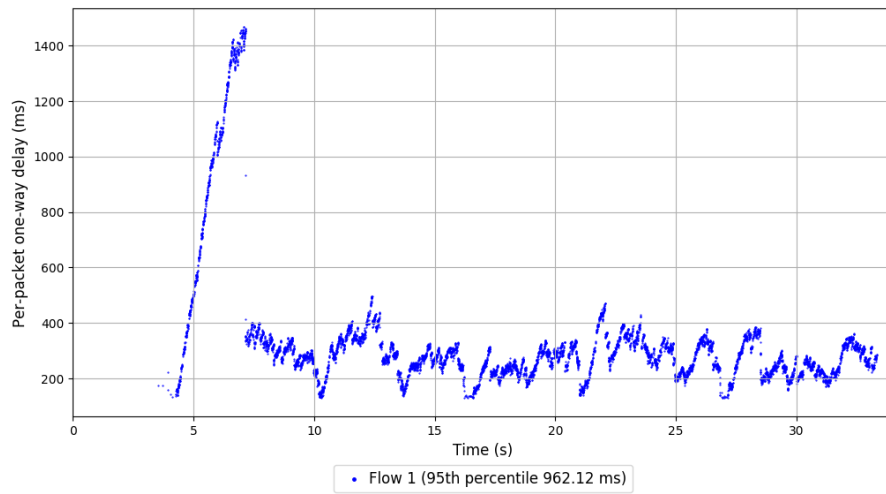
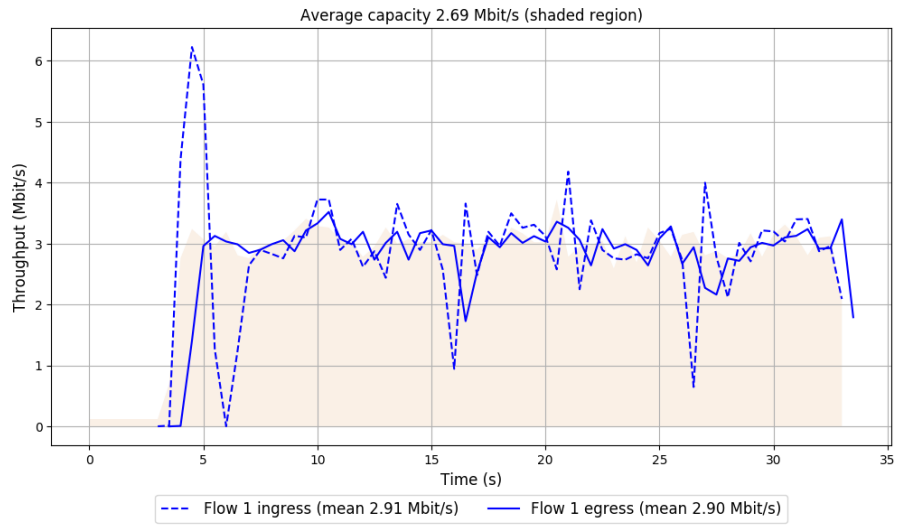
-- Flow 1:

Average throughput: 2.90 Mbit/s

95th percentile per-packet one-way delay: 962.117 ms

Loss rate: 1.05%

## Run 2: Report of FillP-Sheep — Data Link



Run 3: Statistics of FillP-Sheep

Start at: 2019-01-17 05:38:45

End at: 2019-01-17 05:39:15

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.89 Mbit/s (107.4% utilization)

95th percentile per-packet one-way delay: 962.509 ms

Loss rate: 0.93%

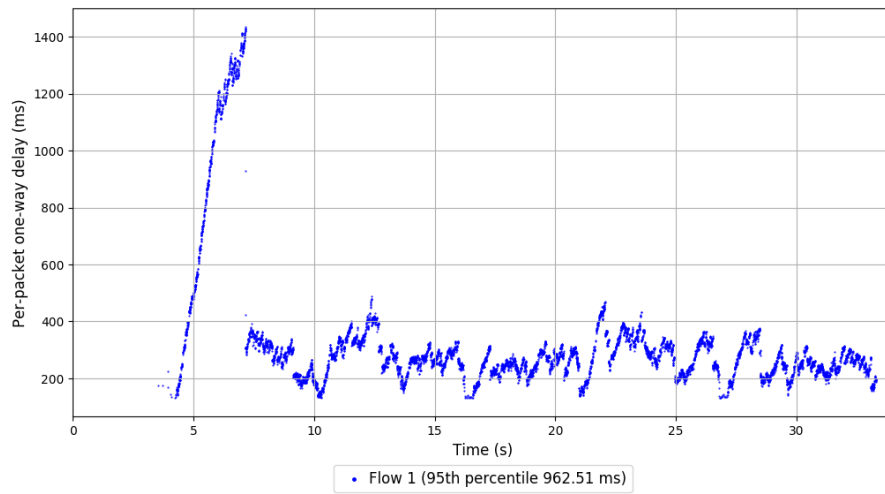
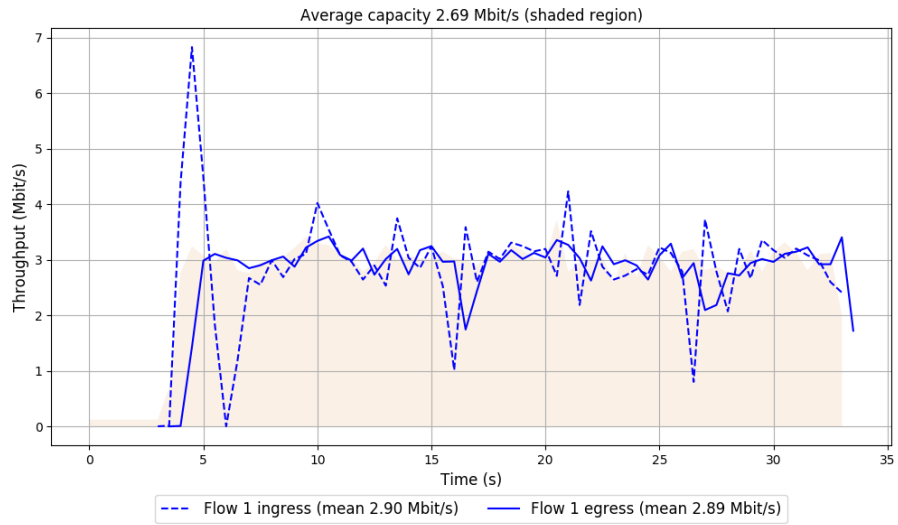
-- Flow 1:

Average throughput: 2.89 Mbit/s

95th percentile per-packet one-way delay: 962.509 ms

Loss rate: 0.93%

### Run 3: Report of FillP-Sheep — Data Link



Run 1: Statistics of Indigo

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 05:48:01

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.49 Mbit/s (92.3% utilization)

95th percentile per-packet one-way delay: 606.015 ms

Loss rate: 3.33%

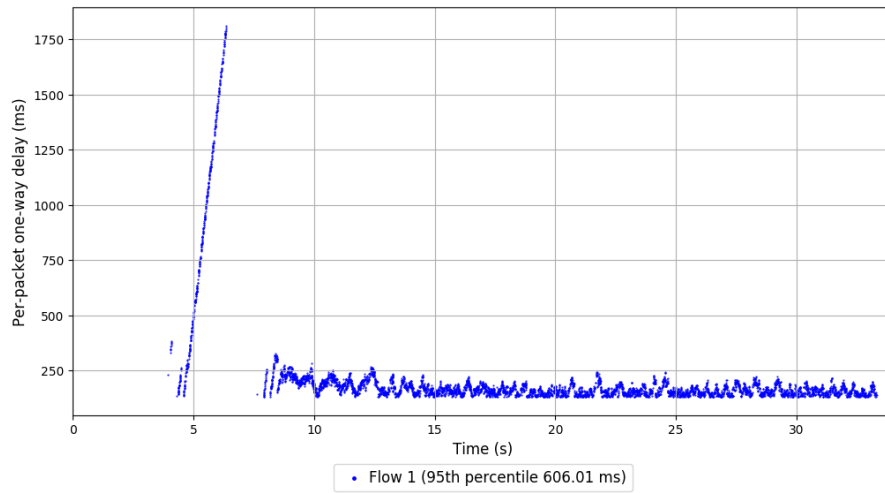
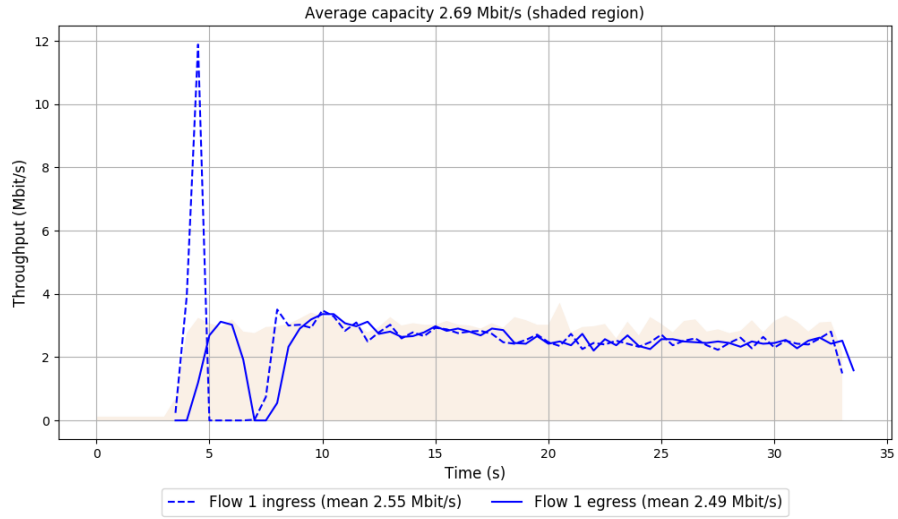
-- Flow 1:

Average throughput: 2.49 Mbit/s

95th percentile per-packet one-way delay: 606.015 ms

Loss rate: 3.33%

# Run 1: Report of Indigo — Data Link



Run 2: Statistics of Indigo

Start at: 2019-01-17 05:25:12

End at: 2019-01-17 05:25:42

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 1.63 Mbit/s (60.4% utilization)

95th percentile per-packet one-way delay: 217.510 ms

Loss rate: 0.62%

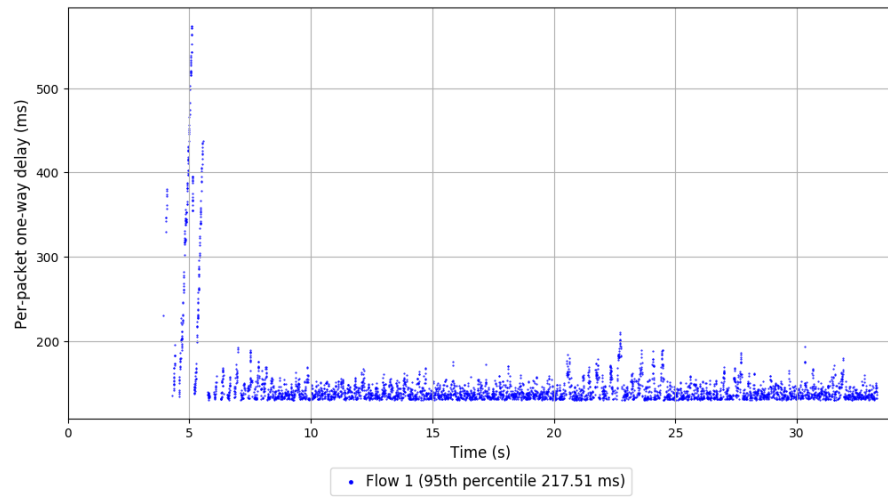
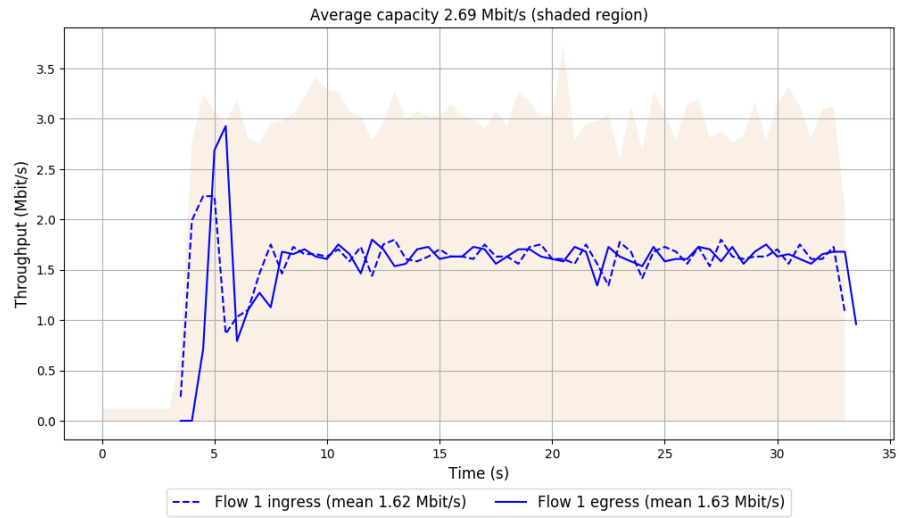
-- Flow 1:

Average throughput: 1.63 Mbit/s

95th percentile per-packet one-way delay: 217.510 ms

Loss rate: 0.62%

## Run 2: Report of Indigo — Data Link



Run 3: Statistics of Indigo

Start at: 2019-01-17 05:37:34

End at: 2019-01-17 05:38:04

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.12 Mbit/s (78.7% utilization)

95th percentile per-packet one-way delay: 186.055 ms

Loss rate: 0.80%

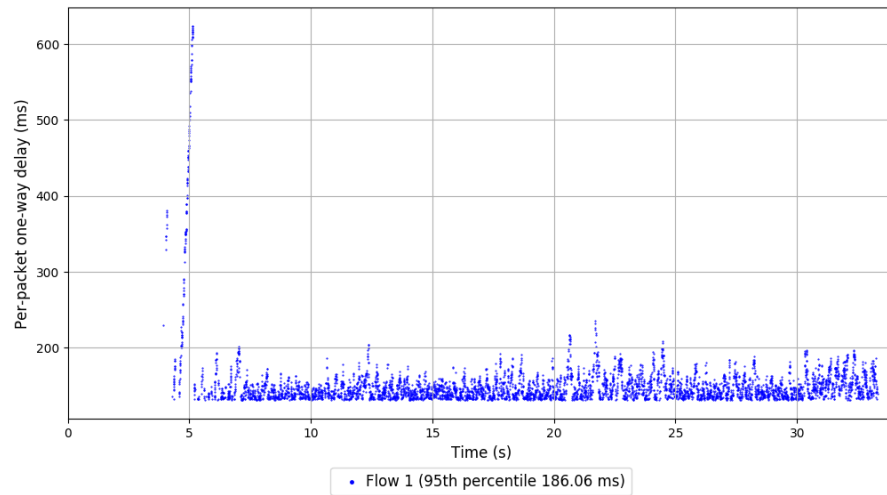
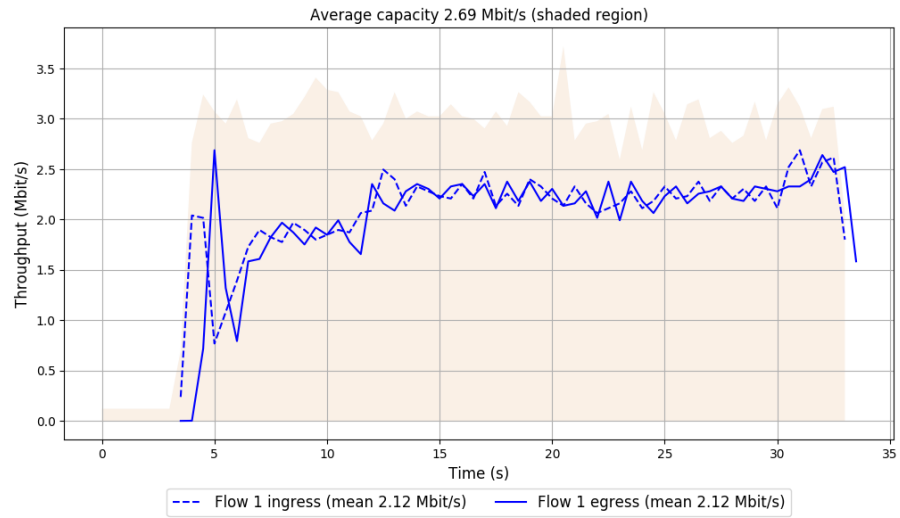
-- Flow 1:

Average throughput: 2.12 Mbit/s

95th percentile per-packet one-way delay: 186.055 ms

Loss rate: 0.80%

### Run 3: Report of Indigo — Data Link



Run 1: Statistics of Indigo-MusesC3

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

End at: 2019-01-17 05:22:46

# Below is generated by plot.py at 2019-01-17 05:48:10

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.78 Mbit/s (103.3% utilization)

95th percentile per-packet one-way delay: 370.659 ms

Loss rate: 1.00%

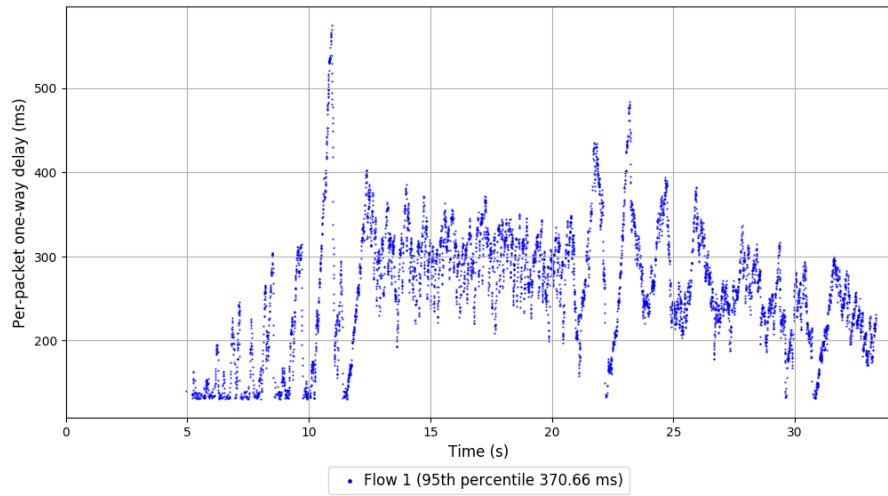
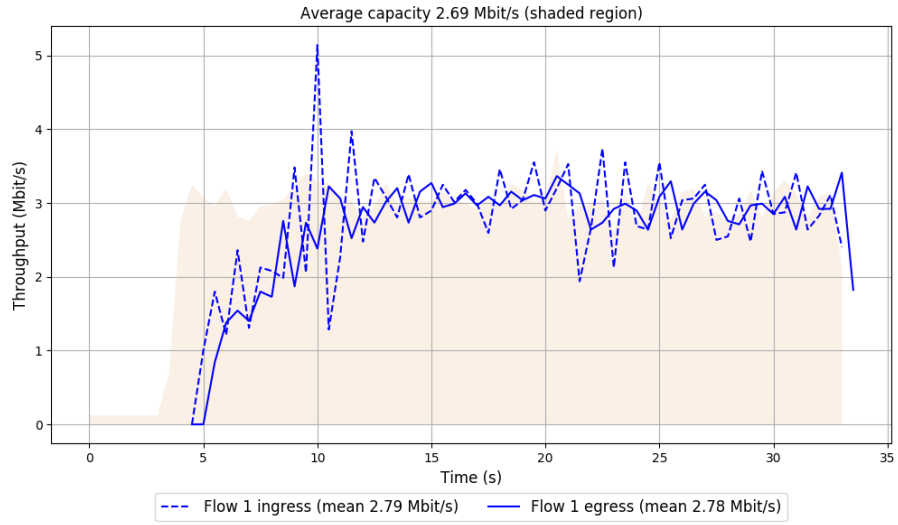
-- Flow 1:

Average throughput: 2.78 Mbit/s

95th percentile per-packet one-way delay: 370.659 ms

Loss rate: 1.00%

# Run 1: Report of Indigo-MusesC3 — Data Link



Run 2: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:34:38

End at: 2019-01-17 05:35:08

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.76 Mbit/s (102.5% utilization)

95th percentile per-packet one-way delay: 449.312 ms

Loss rate: 0.76%

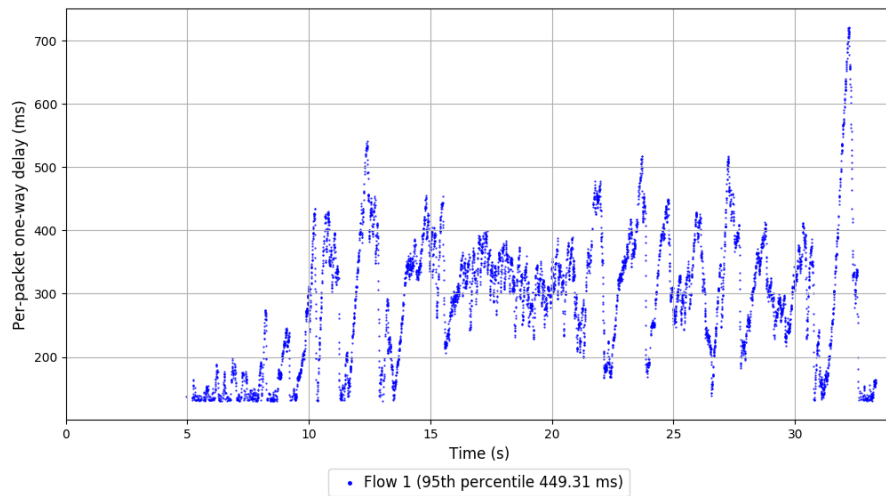
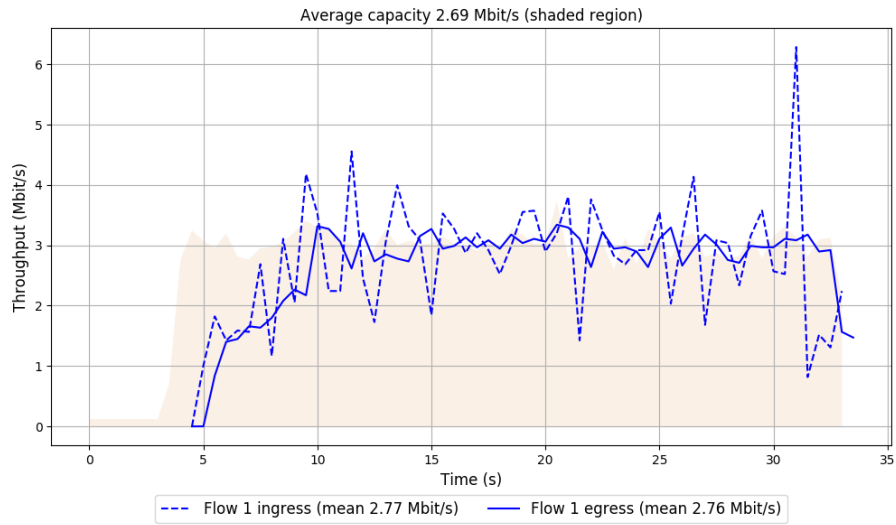
-- Flow 1:

Average throughput: 2.76 Mbit/s

95th percentile per-packet one-way delay: 449.312 ms

Loss rate: 0.76%

## Run 2: Report of Indigo-MusesC3 — Data Link



Run 3: Statistics of Indigo-MusesC3

Start at: 2019-01-17 05:47:00

End at: 2019-01-17 05:47:30

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.82 Mbit/s (104.8% utilization)

95th percentile per-packet one-way delay: 331.196 ms

Loss rate: 0.60%

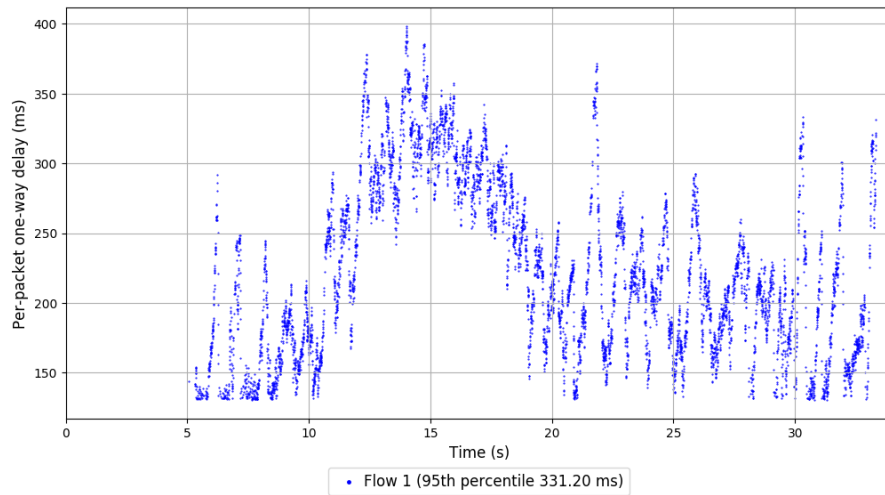
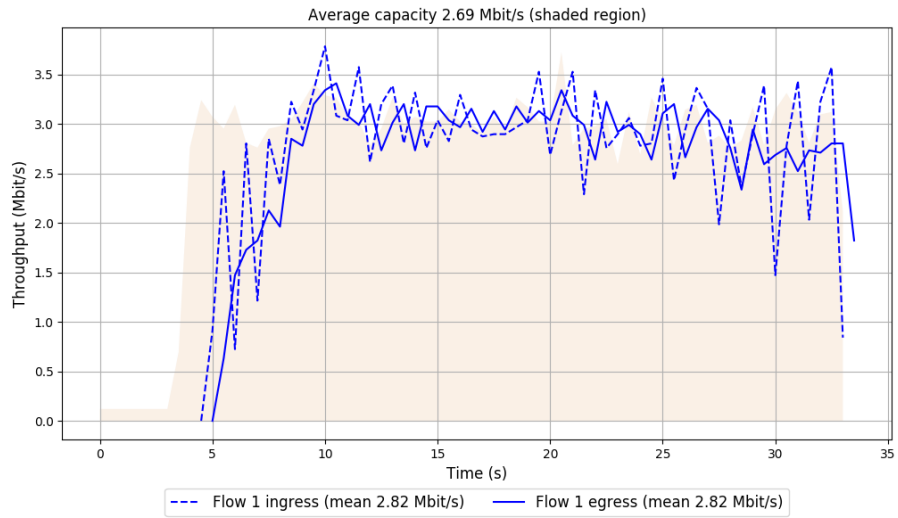
-- Flow 1:

Average throughput: 2.82 Mbit/s

95th percentile per-packet one-way delay: 331.196 ms

Loss rate: 0.60%

### Run 3: Report of Indigo-MusesC3 — Data Link



Run 1: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:15:48

End at: 2019-01-17 05:16:18

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.38 Mbit/s (88.3% utilization)

95th percentile per-packet one-way delay: 1655.669 ms

Loss rate: 2.94%

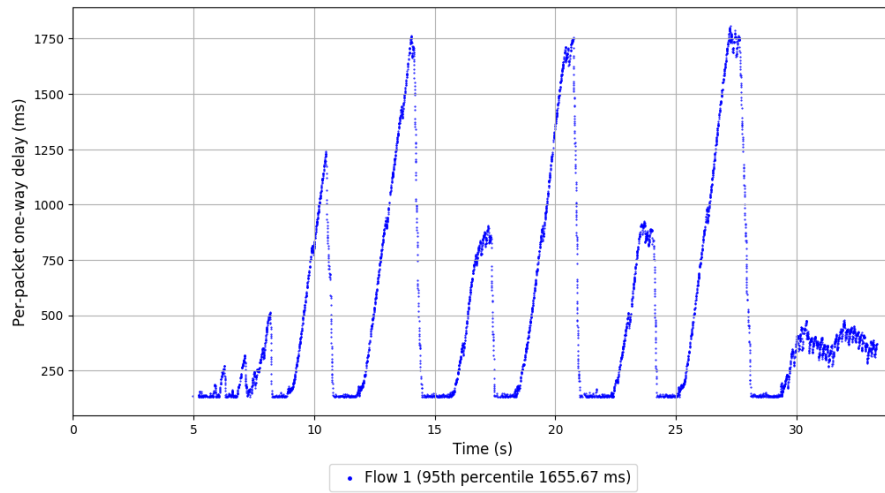
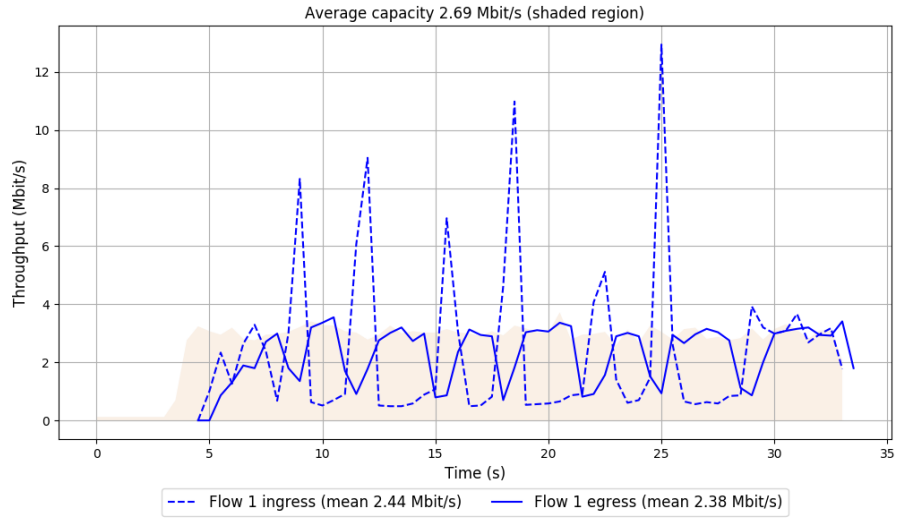
-- Flow 1:

Average throughput: 2.38 Mbit/s

95th percentile per-packet one-way delay: 1655.669 ms

Loss rate: 2.94%

# Run 1: Report of Indigo-MusesC5 — Data Link



Run 2: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:28:09

End at: 2019-01-17 05:28:39

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.38 Mbit/s (88.4% utilization)

95th percentile per-packet one-way delay: 1691.685 ms

Loss rate: 12.45%

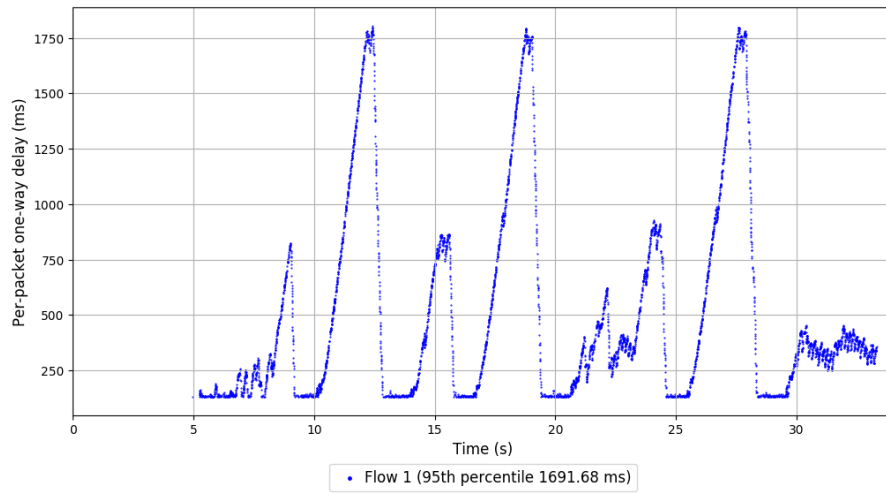
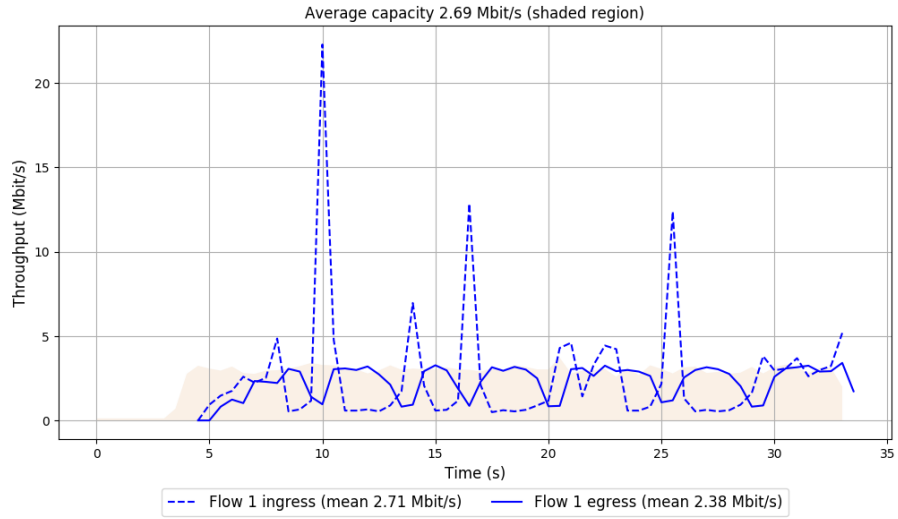
-- Flow 1:

Average throughput: 2.38 Mbit/s

95th percentile per-packet one-way delay: 1691.685 ms

Loss rate: 12.45%

## Run 2: Report of Indigo-MusesC5 — Data Link



Run 3: Statistics of Indigo-MusesC5

Start at: 2019-01-17 05:40:31

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

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.27 Mbit/s (84.5% utilization)

95th percentile per-packet one-way delay: 1712.140 ms

Loss rate: 9.85%

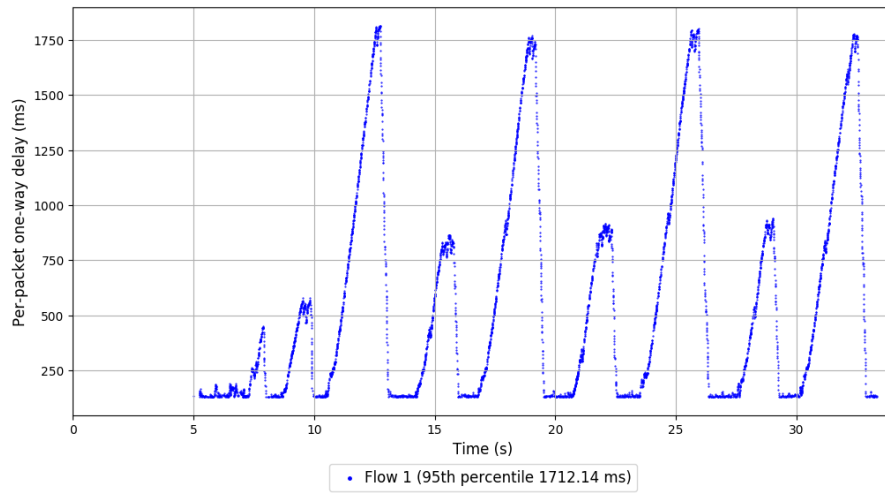
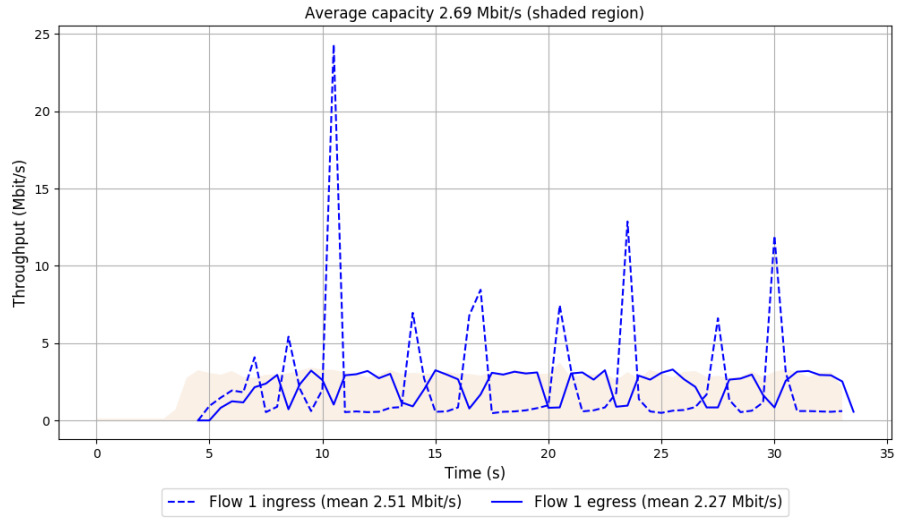
-- Flow 1:

Average throughput: 2.27 Mbit/s

95th percentile per-packet one-way delay: 1712.140 ms

Loss rate: 9.85%

### Run 3: Report of Indigo-MusesC5 — Data Link



Run 1: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:16:23

End at: 2019-01-17 05:16:53

# Below is generated by plot.py at 2019-01-17 05:48:14

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.02 Mbit/s (74.8% utilization)

95th percentile per-packet one-way delay: 186.920 ms

Loss rate: 0.63%

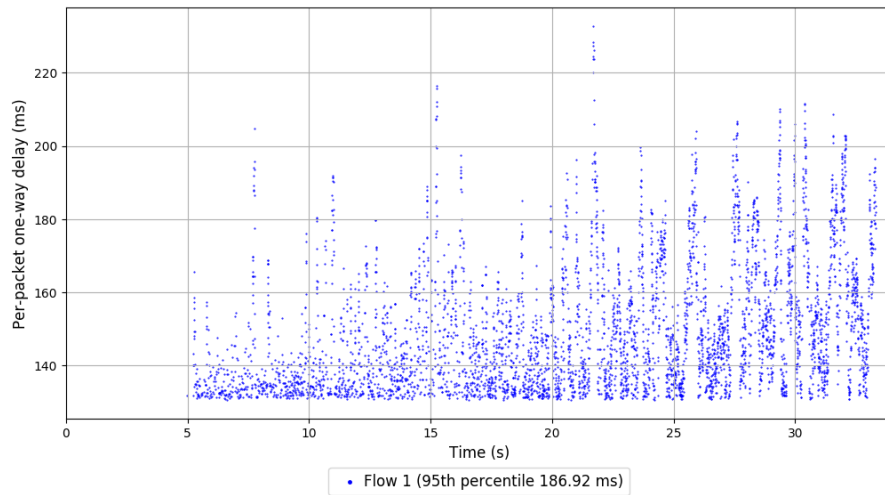
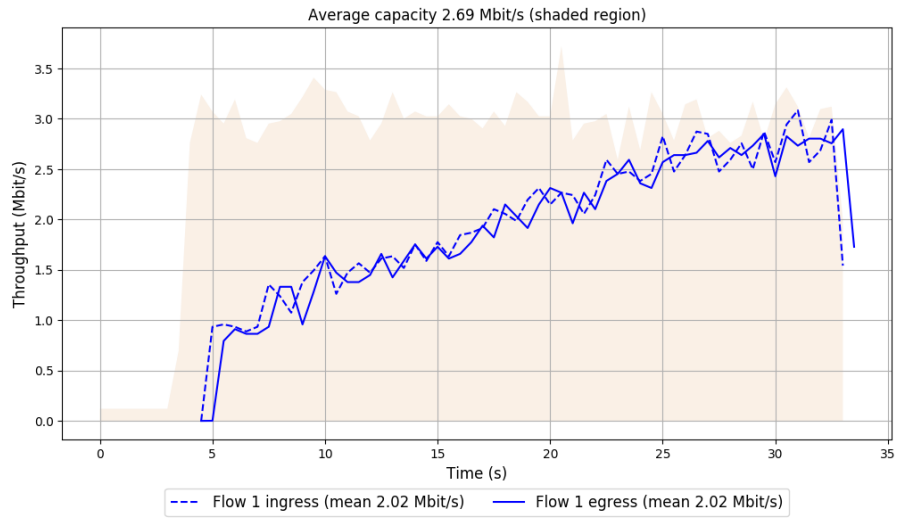
-- Flow 1:

Average throughput: 2.02 Mbit/s

95th percentile per-packet one-way delay: 186.920 ms

Loss rate: 0.63%

# Run 1: Report of Indigo-MusesD — Data Link



Run 2: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:28:44

End at: 2019-01-17 05:29:14

# Below is generated by plot.py at 2019-01-17 05:48:15

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.05 Mbit/s (76.3% utilization)

95th percentile per-packet one-way delay: 188.561 ms

Loss rate: 0.74%

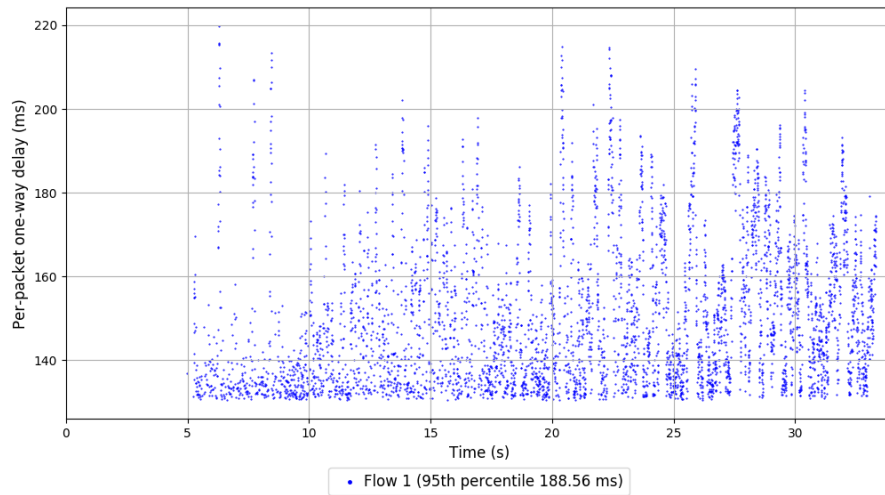
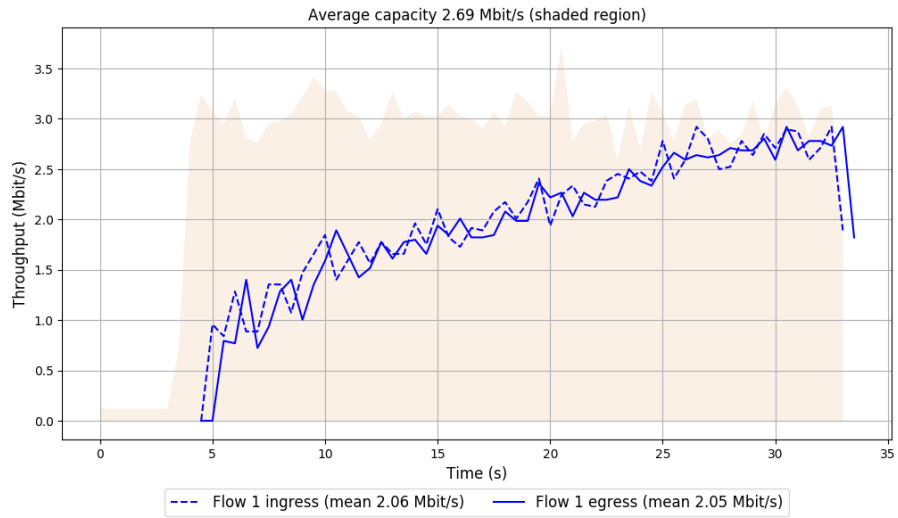
-- Flow 1:

Average throughput: 2.05 Mbit/s

95th percentile per-packet one-way delay: 188.561 ms

Loss rate: 0.74%

## Run 2: Report of Indigo-MusesD — Data Link



Run 3: Statistics of Indigo-MusesD

Start at: 2019-01-17 05:41:06

End at: 2019-01-17 05:41:36

# Below is generated by plot.py at 2019-01-17 05:48:18

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.04 Mbit/s (75.6% utilization)

95th percentile per-packet one-way delay: 188.659 ms

Loss rate: 0.68%

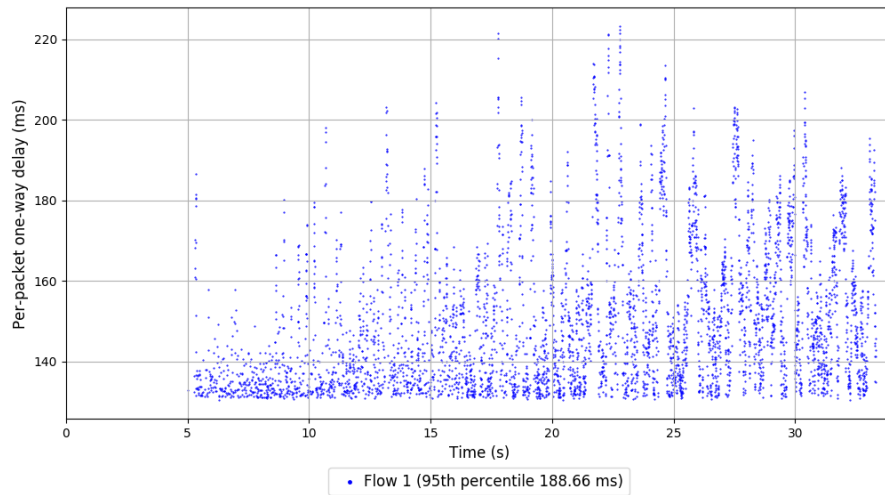
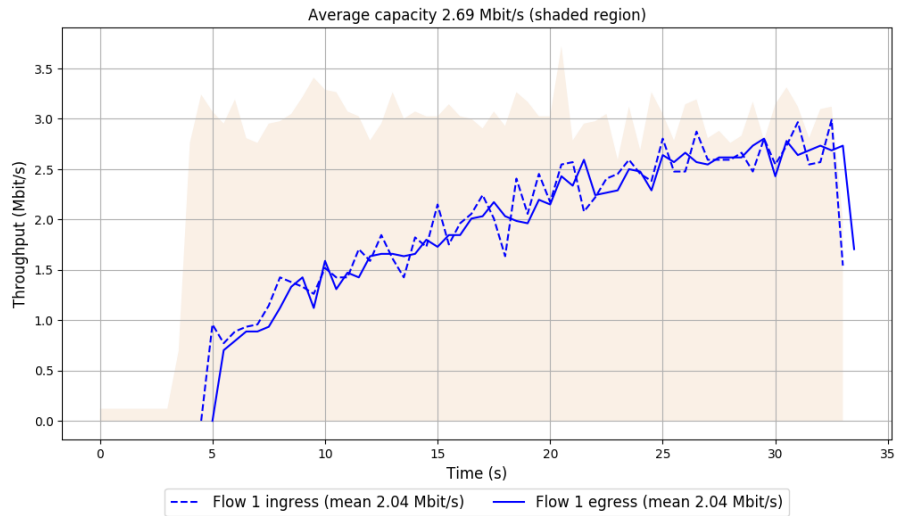
-- Flow 1:

Average throughput: 2.04 Mbit/s

95th percentile per-packet one-way delay: 188.659 ms

Loss rate: 0.68%

### Run 3: Report of Indigo-MusesD — Data Link



Run 1: Statistics of Indigo-MuseST

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 05:48:22

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.89 Mbit/s (107.3% utilization)

95th percentile per-packet one-way delay: 456.144 ms

Loss rate: 1.24%

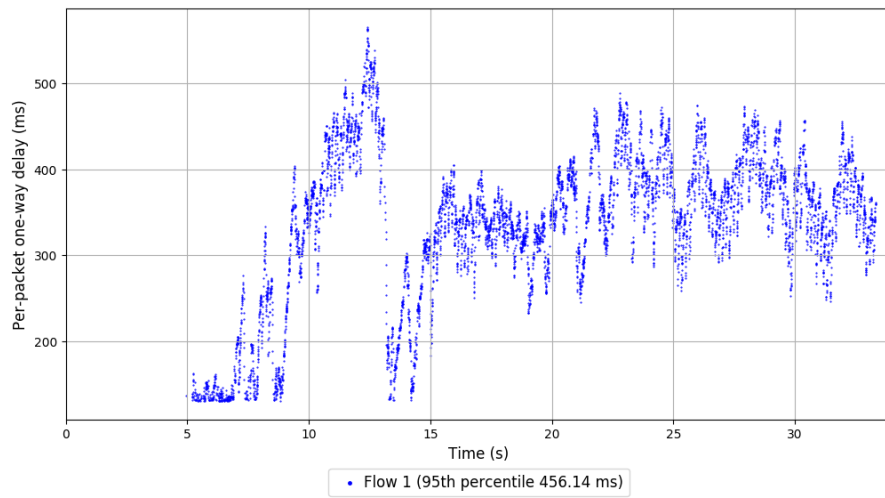
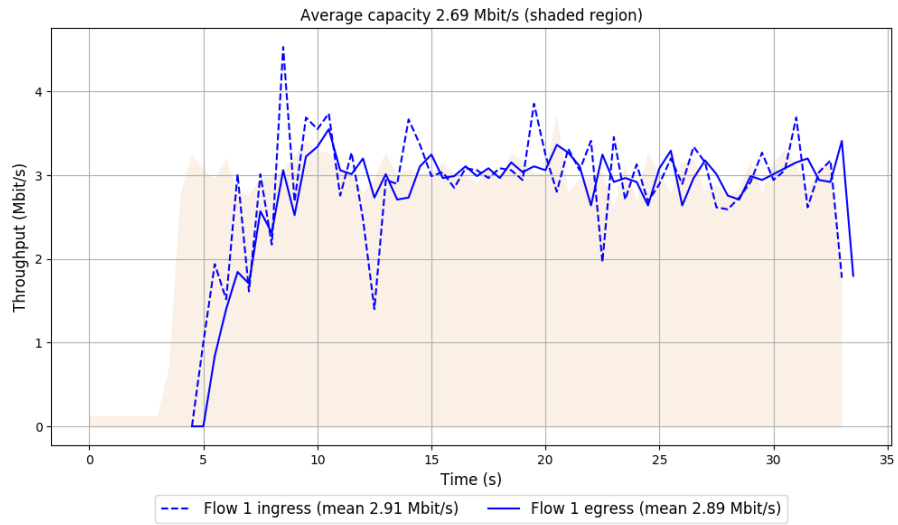
-- Flow 1:

Average throughput: 2.89 Mbit/s

95th percentile per-packet one-way delay: 456.144 ms

Loss rate: 1.24%

# Run 1: Report of Indigo-MusesT — Data Link



Run 2: Statistics of Indigo-MuseST

Start at: 2019-01-17 05:24:02

End at: 2019-01-17 05:24:32

# Below is generated by plot.py at 2019-01-17 05:48:25

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.85 Mbit/s (106.0% utilization)

95th percentile per-packet one-way delay: 614.212 ms

Loss rate: 1.85%

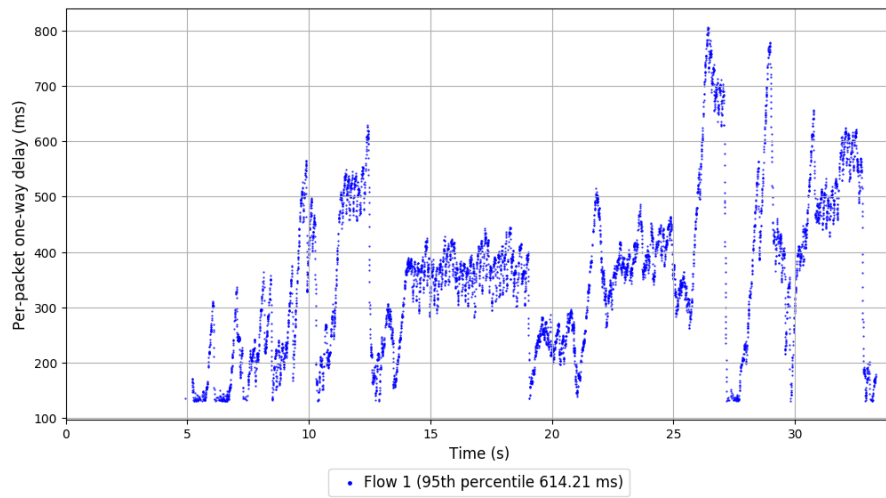
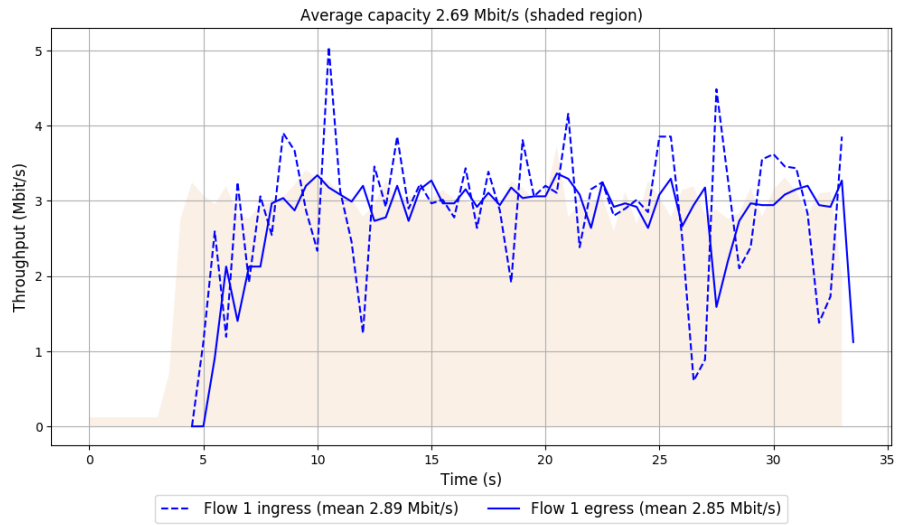
-- Flow 1:

Average throughput: 2.85 Mbit/s

95th percentile per-packet one-way delay: 614.212 ms

Loss rate: 1.85%

## Run 2: Report of Indigo-MusesT — Data Link



Run 3: Statistics of Indigo-MuseST

Start at: 2019-01-17 05:36:23

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

# Below is generated by plot.py at 2019-01-17 05:48:25

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.84 Mbit/s (105.3% utilization)

95th percentile per-packet one-way delay: 506.195 ms

Loss rate: 1.76%

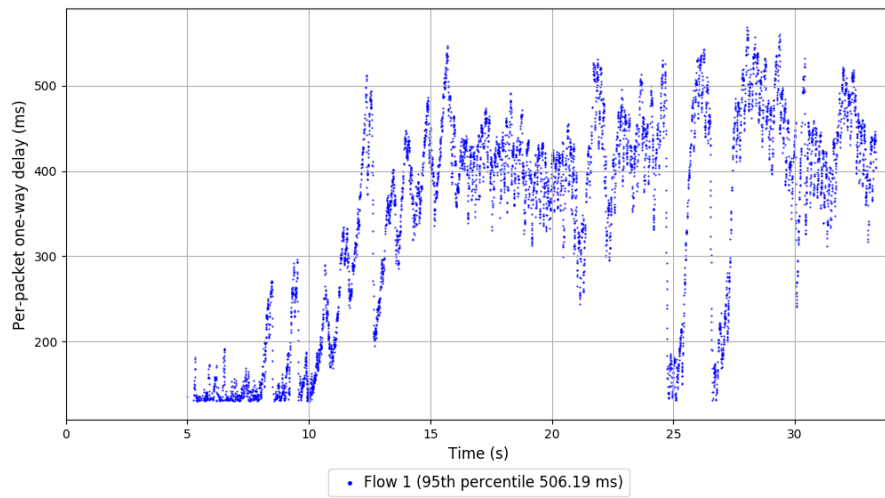
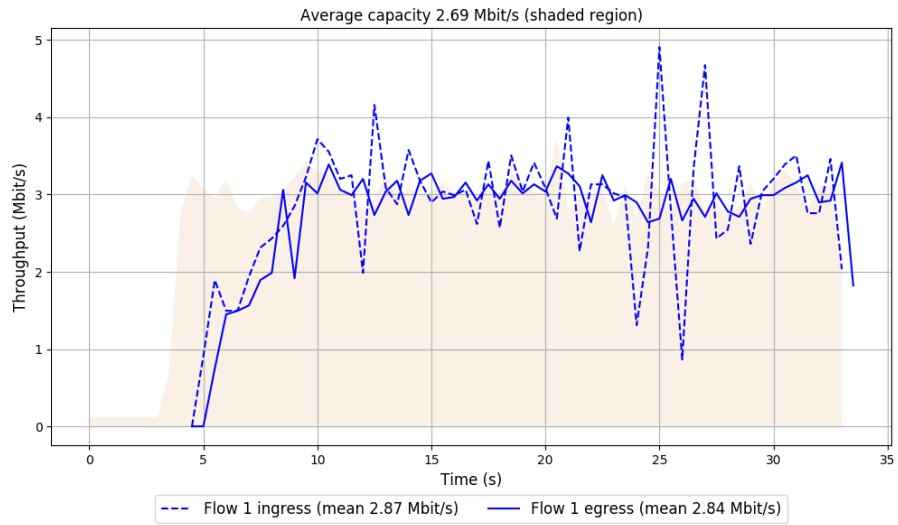
-- Flow 1:

Average throughput: 2.84 Mbit/s

95th percentile per-packet one-way delay: 506.195 ms

Loss rate: 1.76%

### Run 3: Report of Indigo-MusesT — Data Link



Run 1: Statistics of LEDBAT

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 05:48:25

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.42 Mbit/s (89.9% utilization)

95th percentile per-packet one-way delay: 279.791 ms

Loss rate: 1.03%

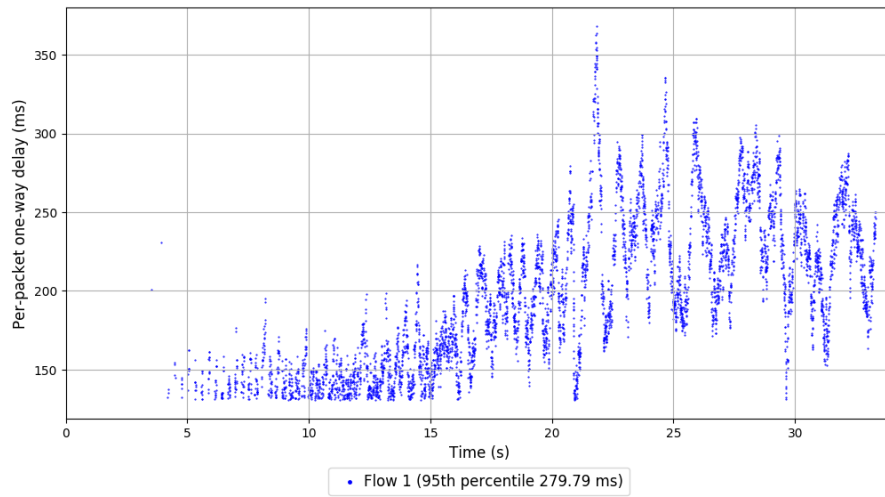
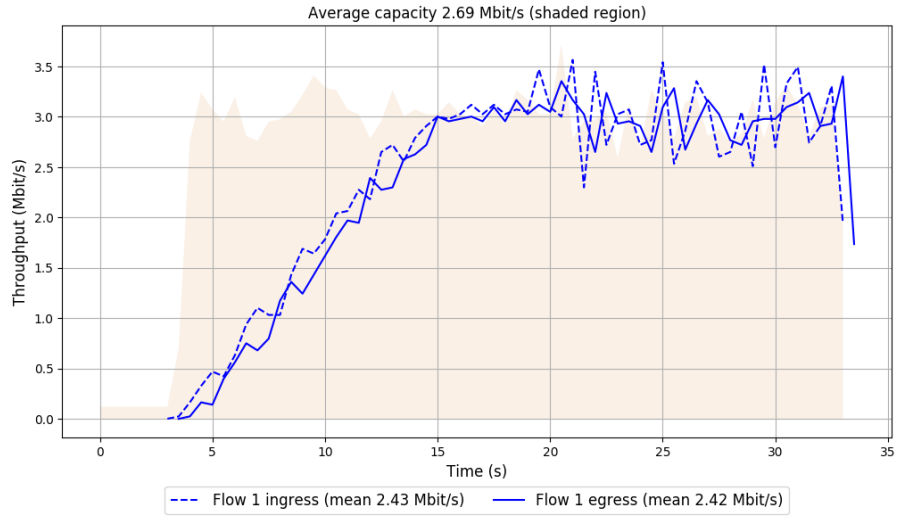
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 279.791 ms

Loss rate: 1.03%

# Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2019-01-17 05:25:47

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

# Below is generated by plot.py at 2019-01-17 05:48:25

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.42 Mbit/s (89.8% utilization)

95th percentile per-packet one-way delay: 279.488 ms

Loss rate: 1.06%

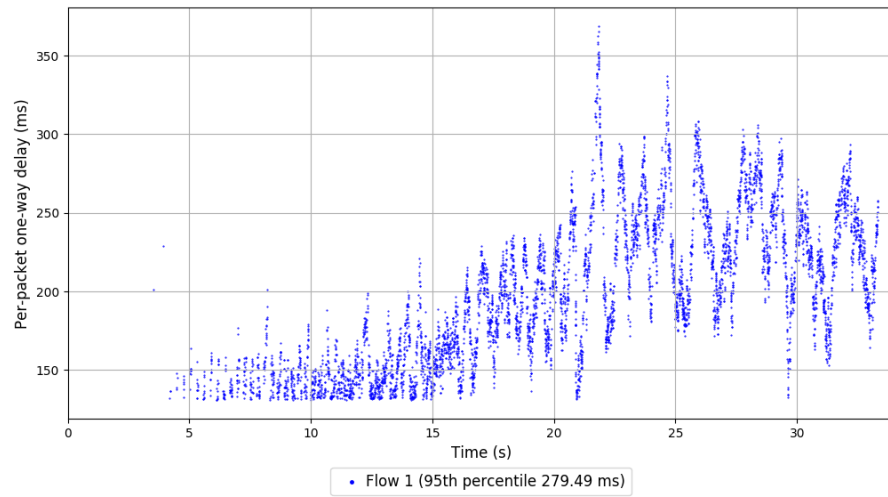
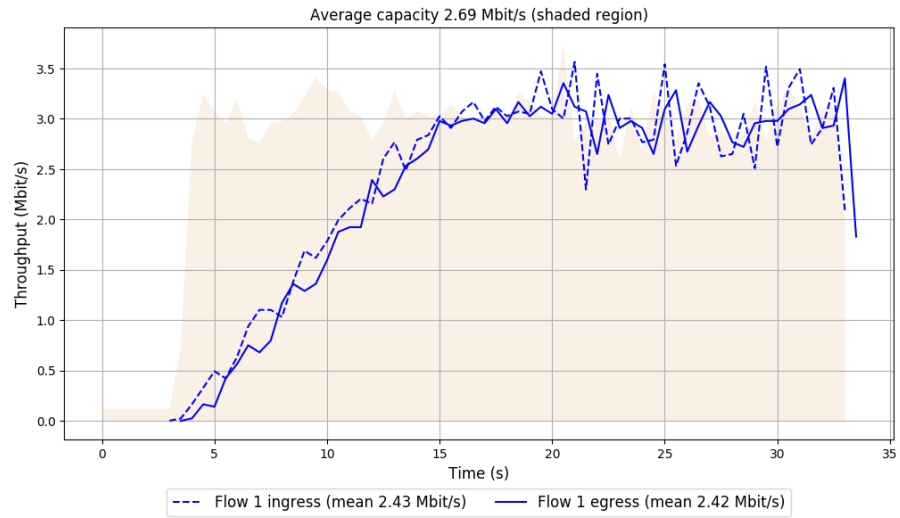
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 279.488 ms

Loss rate: 1.06%

## Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2019-01-17 05:38:09

End at: 2019-01-17 05:38:39

# Below is generated by plot.py at 2019-01-17 05:48:25

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.41 Mbit/s (89.6% utilization)

95th percentile per-packet one-way delay: 280.037 ms

Loss rate: 1.05%

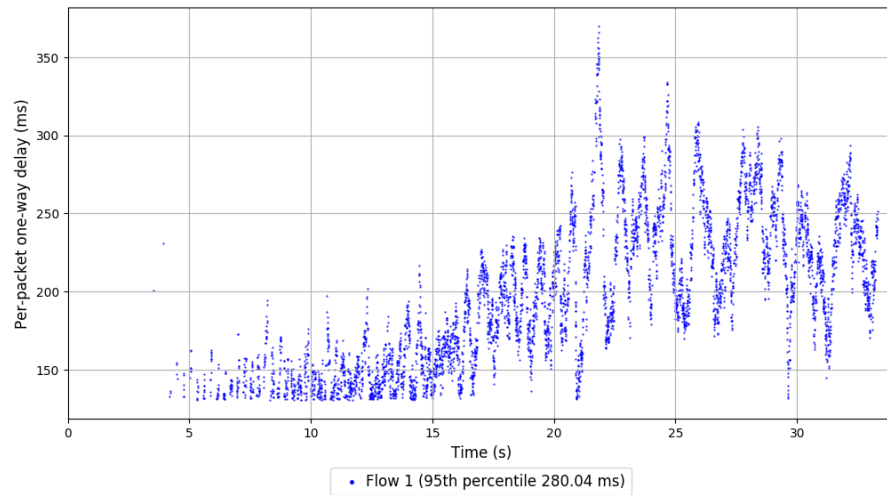
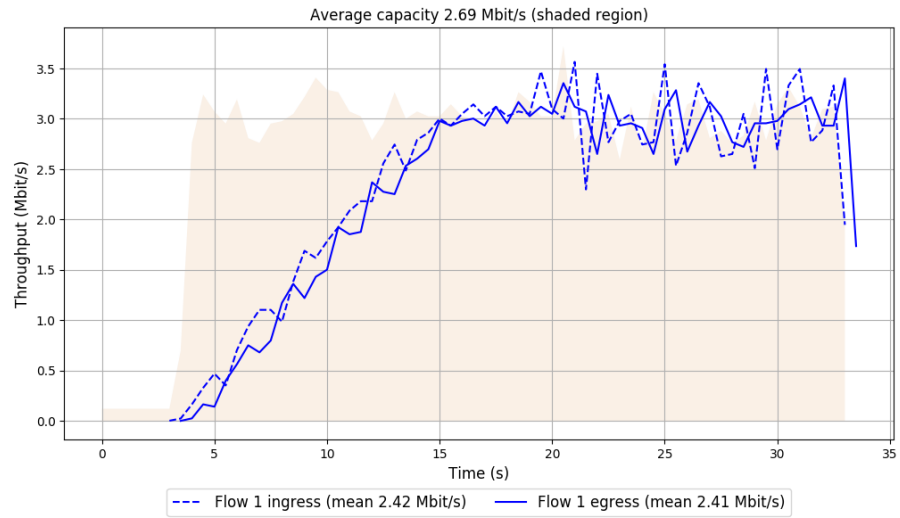
-- Flow 1:

Average throughput: 2.41 Mbit/s

95th percentile per-packet one-way delay: 280.037 ms

Loss rate: 1.05%

### Run 3: Report of LEDBAT — Data Link



Run 1: Statistics of PCC-Allegro

Start at: 2019-01-17 05:18:09

End at: 2019-01-17 05:18:39

# Below is generated by plot.py at 2019-01-17 05:48:26

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.15 Mbit/s (79.7% utilization)

95th percentile per-packet one-way delay: 975.851 ms

Loss rate: 0.43%

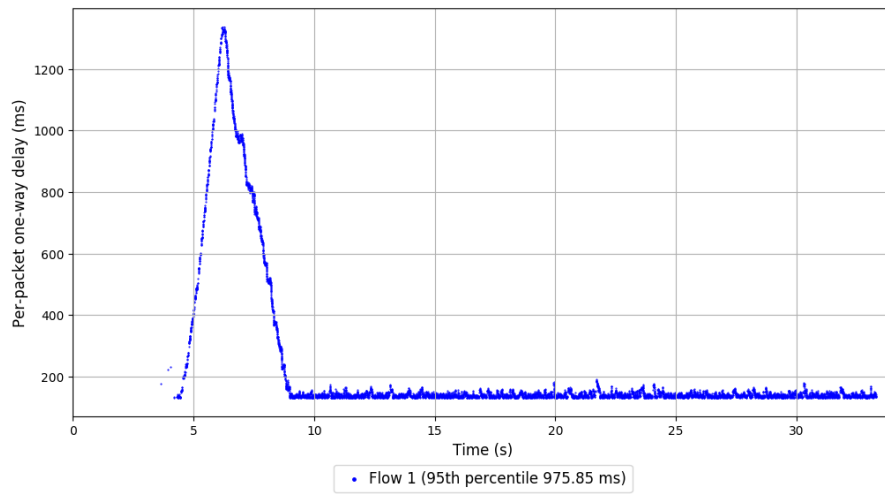
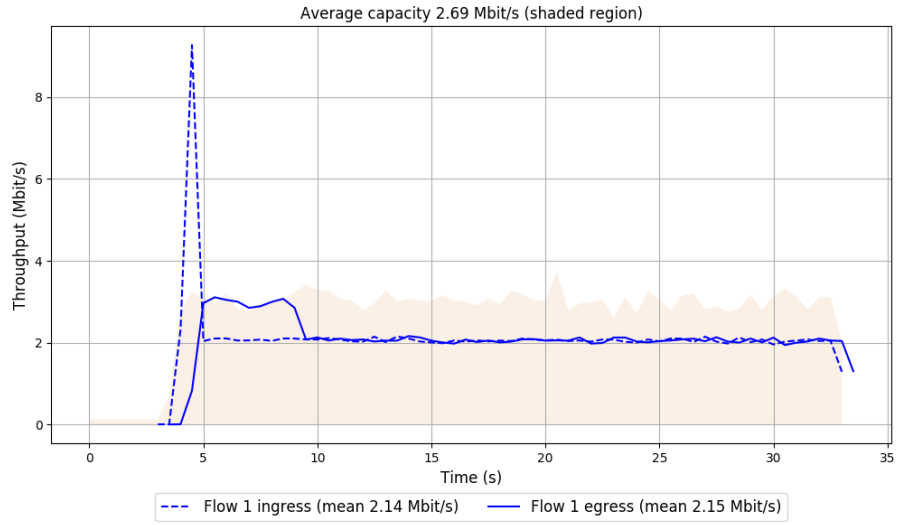
-- Flow 1:

Average throughput: 2.15 Mbit/s

95th percentile per-packet one-way delay: 975.851 ms

Loss rate: 0.43%

# Run 1: Report of PCC-Allegro — Data Link



Run 2: Statistics of PCC-Allegro

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

End at: 2019-01-17 05:31:00

# Below is generated by plot.py at 2019-01-17 05:48:28

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.05 Mbit/s (76.3% utilization)

95th percentile per-packet one-way delay: 940.555 ms

Loss rate: 0.36%

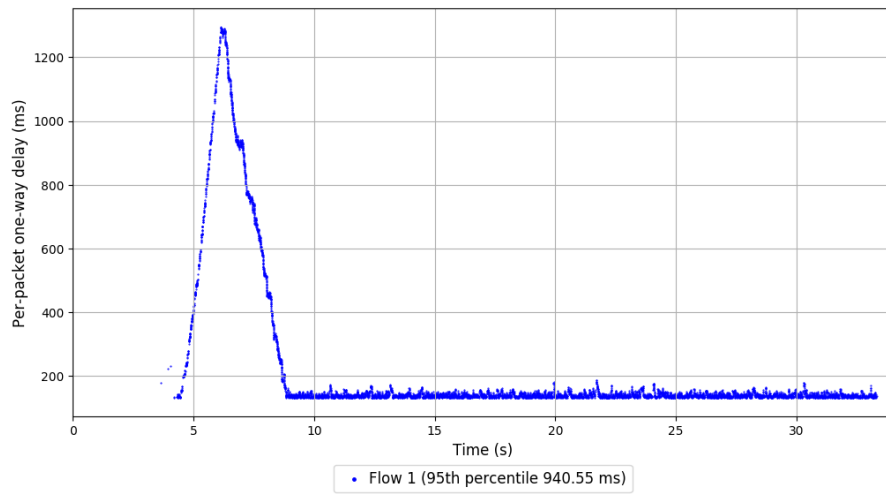
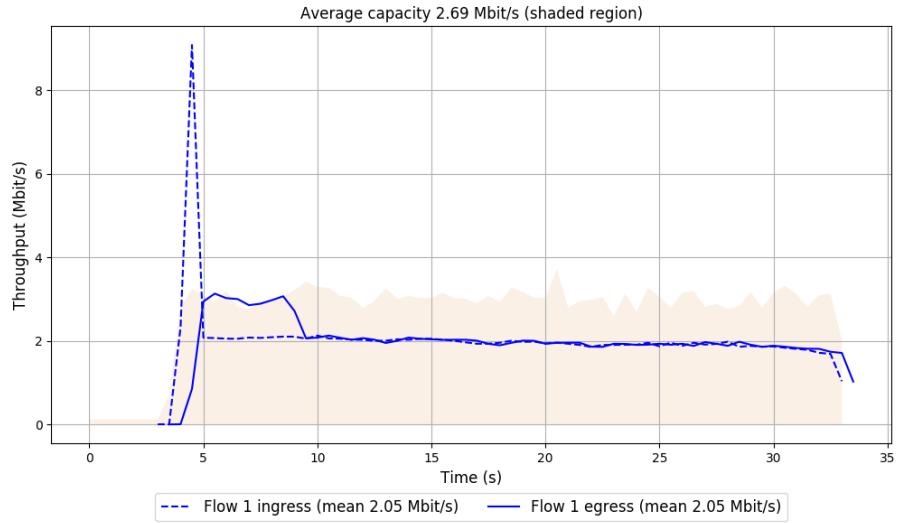
-- Flow 1:

Average throughput: 2.05 Mbit/s

95th percentile per-packet one-way delay: 940.555 ms

Loss rate: 0.36%

## Run 2: Report of PCC-Allegro — Data Link



Run 3: Statistics of PCC-Allegro

Start at: 2019-01-17 05:42:52

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

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.20 Mbit/s (81.8% utilization)

95th percentile per-packet one-way delay: 1417.661 ms

Loss rate: 2.11%

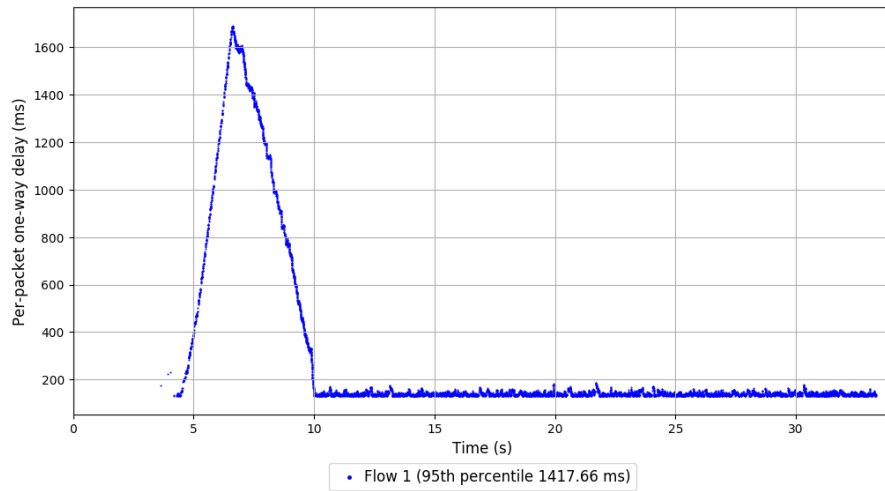
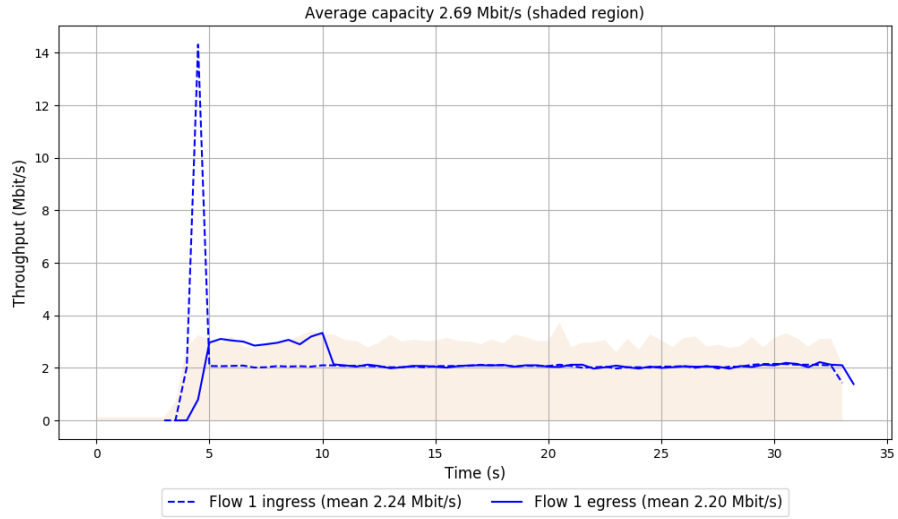
-- Flow 1:

Average throughput: 2.20 Mbit/s

95th percentile per-packet one-way delay: 1417.661 ms

Loss rate: 2.11%

### Run 3: Report of PCC-Allegro — Data Link



Run 1: Statistics of PCC-Expr

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

End at: 2019-01-17 05:18:03

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.96 Mbit/s (109.8% utilization)

95th percentile per-packet one-way delay: 1203.749 ms

Loss rate: 52.22%

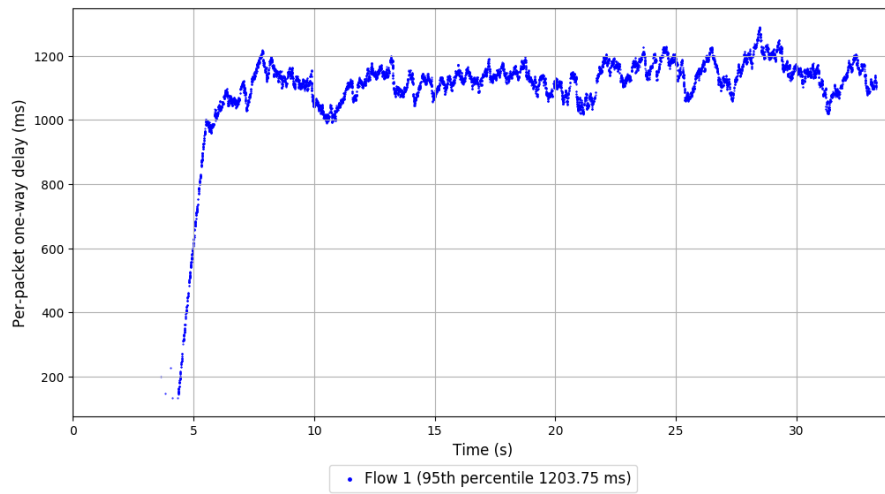
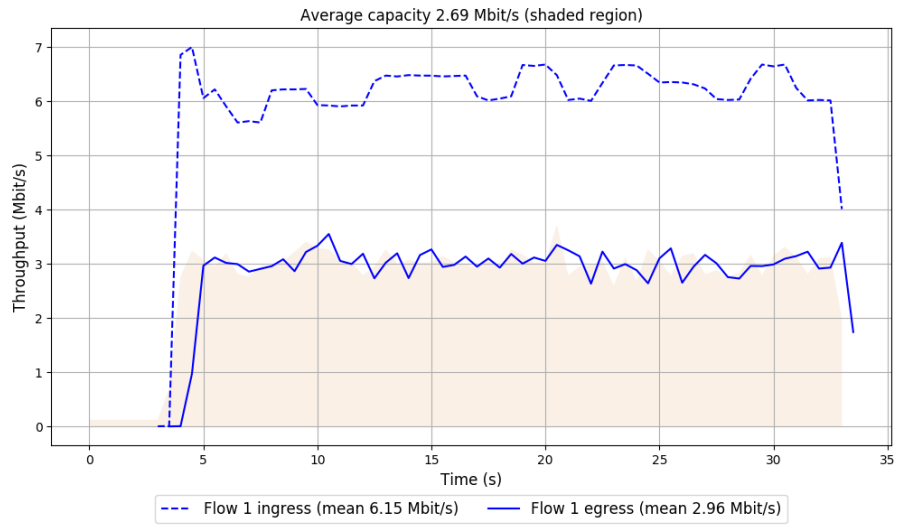
-- Flow 1:

Average throughput: 2.96 Mbit/s

95th percentile per-packet one-way delay: 1203.749 ms

Loss rate: 52.22%

# Run 1: Report of PCC-Expr — Data Link



Run 2: Statistics of PCC-Expr

Start at: 2019-01-17 05:29:55

End at: 2019-01-17 05:30:25

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.96 Mbit/s (109.8% utilization)

95th percentile per-packet one-way delay: 1181.516 ms

Loss rate: 46.29%

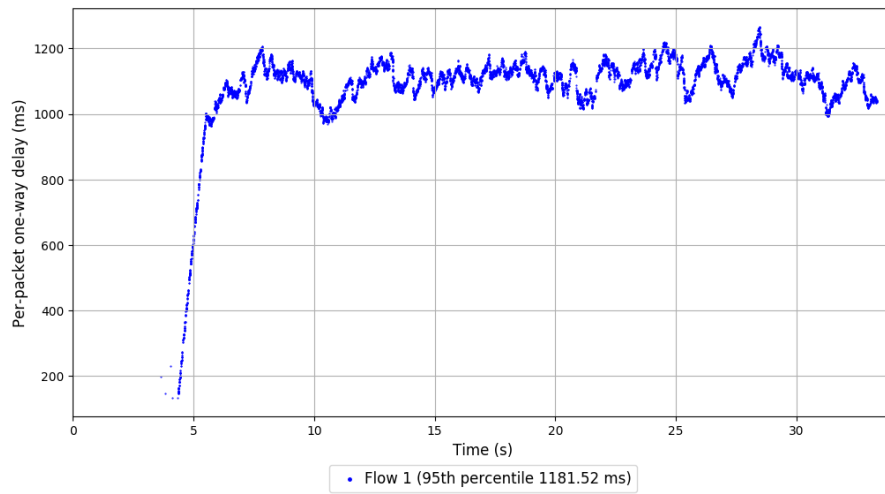
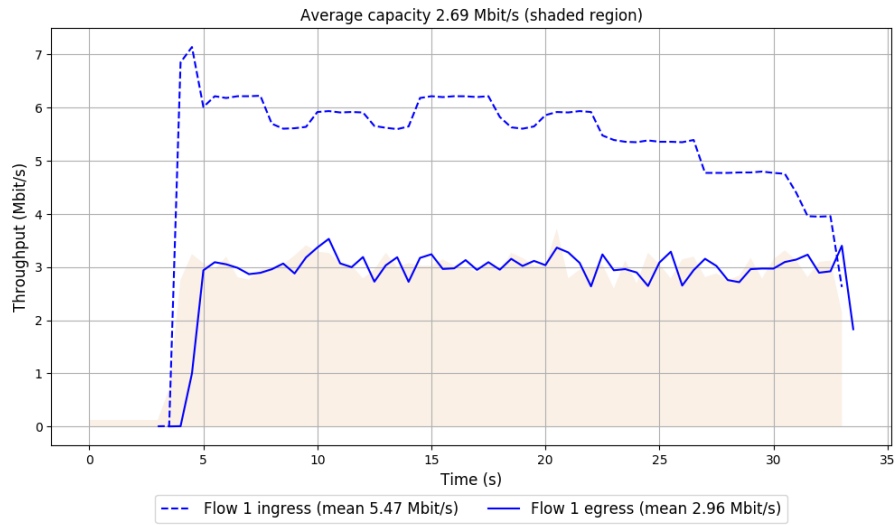
-- Flow 1:

Average throughput: 2.96 Mbit/s

95th percentile per-packet one-way delay: 1181.516 ms

Loss rate: 46.29%

## Run 2: Report of PCC-Expr — Data Link



Run 3: Statistics of PCC-Expr

Start at: 2019-01-17 05:42:16

End at: 2019-01-17 05:42:47

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.96 Mbit/s (109.8% utilization)

95th percentile per-packet one-way delay: 1193.193 ms

Loss rate: 46.58%

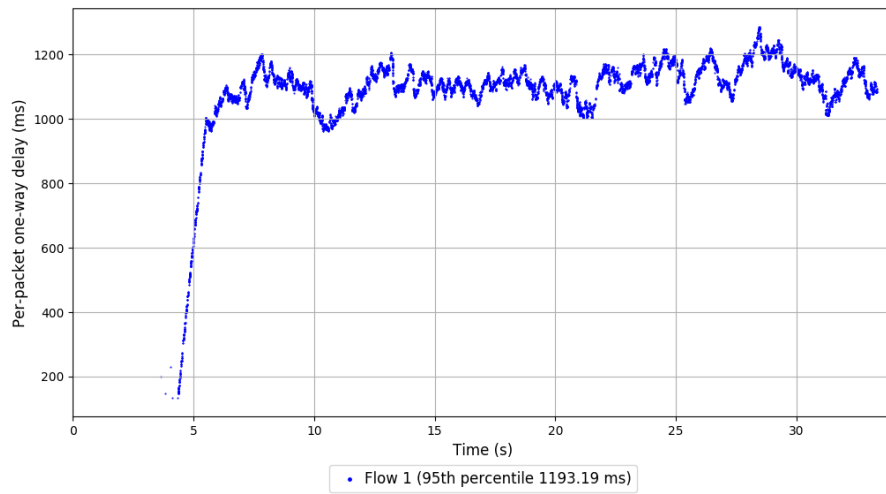
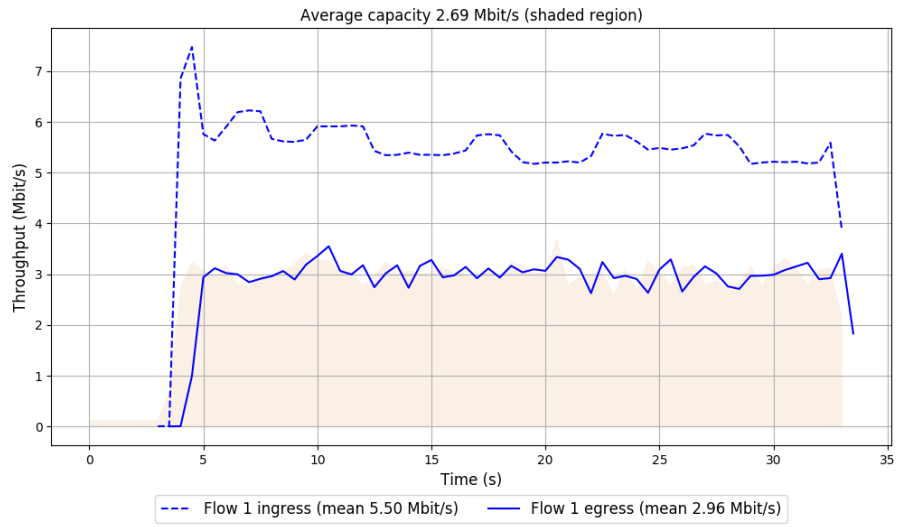
-- Flow 1:

Average throughput: 2.96 Mbit/s

95th percentile per-packet one-way delay: 1193.193 ms

Loss rate: 46.58%

### Run 3: Report of PCC-Expr — Data Link



Run 1: Statistics of QUIC Cubic

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

End at: 2019-01-17 05:15:42

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.92 Mbit/s (108.6% utilization)

95th percentile per-packet one-way delay: 1128.261 ms

Loss rate: 4.17%

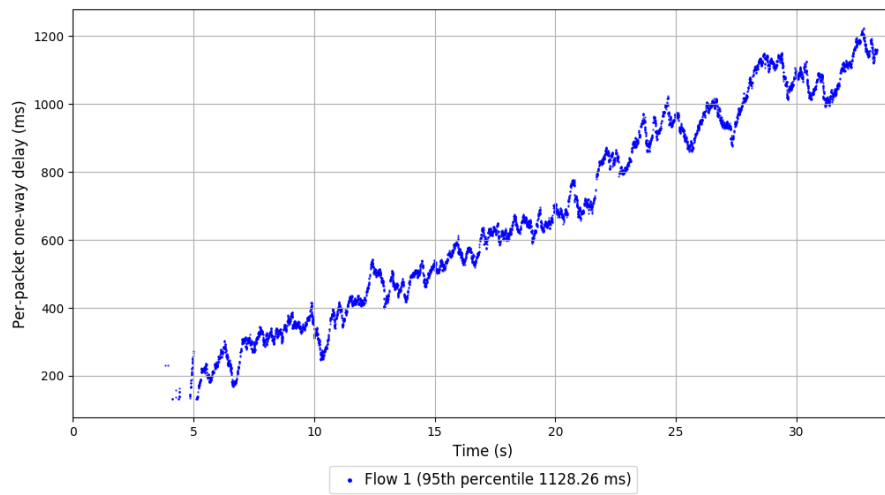
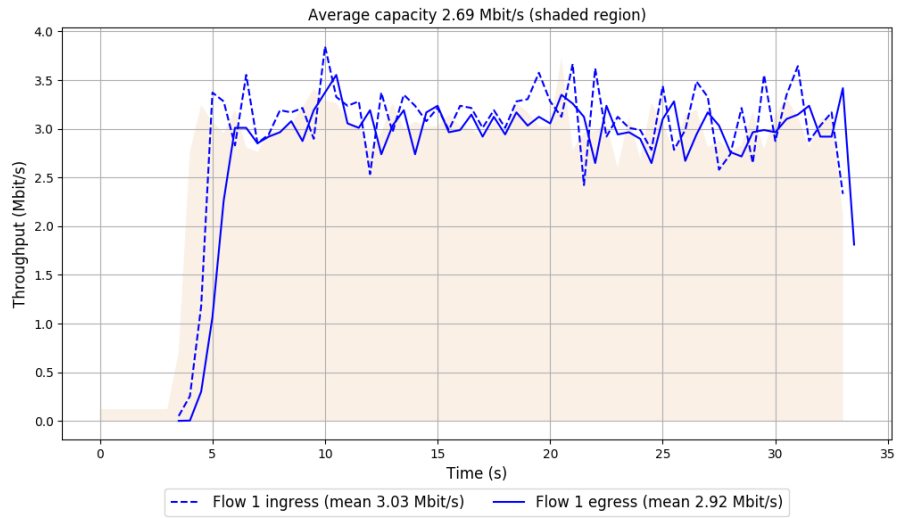
-- Flow 1:

Average throughput: 2.92 Mbit/s

95th percentile per-packet one-way delay: 1128.261 ms

Loss rate: 4.17%

# Run 1: Report of QUIC Cubic — Data Link



Run 2: Statistics of QUIC Cubic

Start at: 2019-01-17 05:27:33

End at: 2019-01-17 05:28:03

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 1101.457 ms

Loss rate: 4.05%

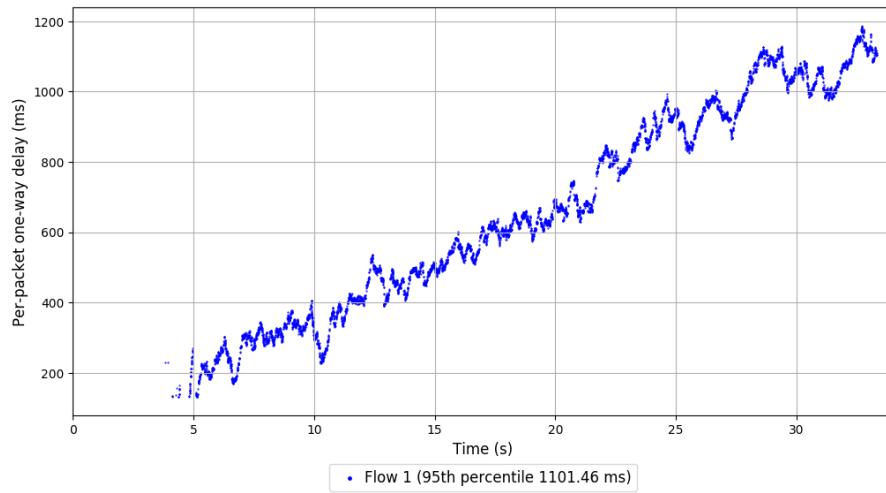
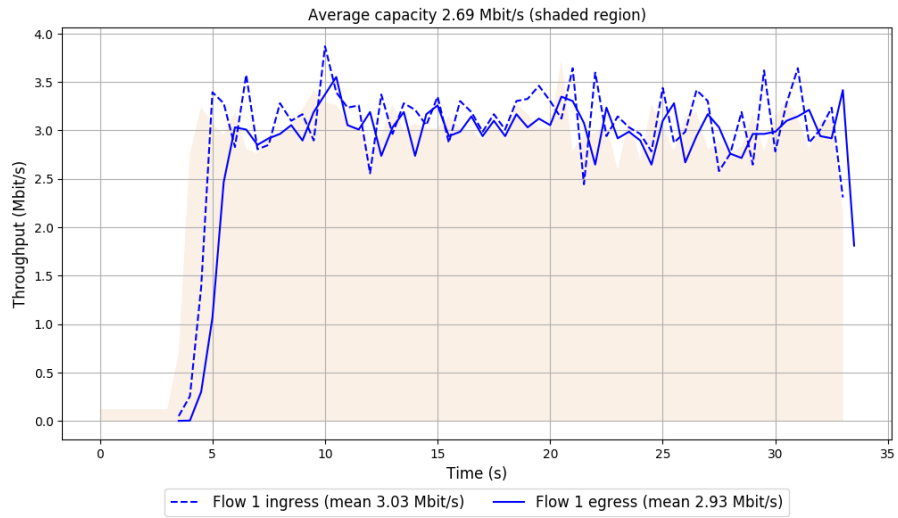
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 1101.457 ms

Loss rate: 4.05%

## Run 2: Report of QUIC Cubic — Data Link



Run 3: Statistics of QUIC Cubic

Start at: 2019-01-17 05:39:55

End at: 2019-01-17 05:40:25

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.92 Mbit/s (108.6% utilization)

95th percentile per-packet one-way delay: 1099.982 ms

Loss rate: 4.06%

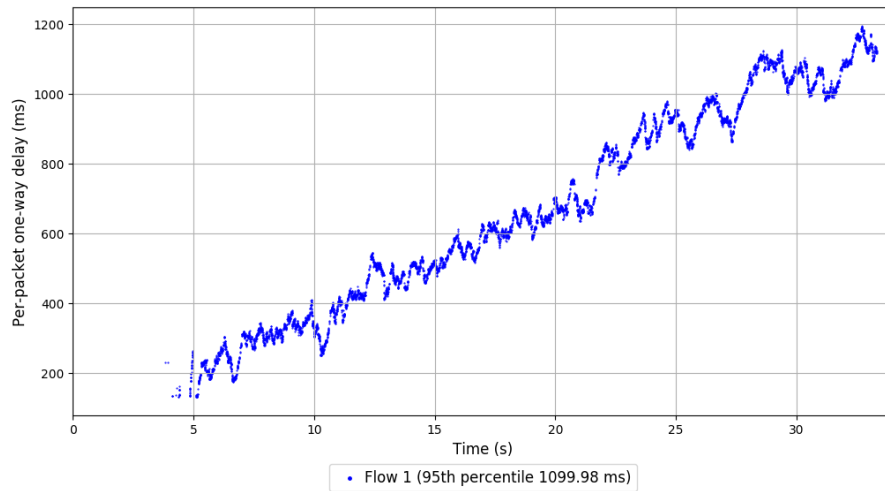
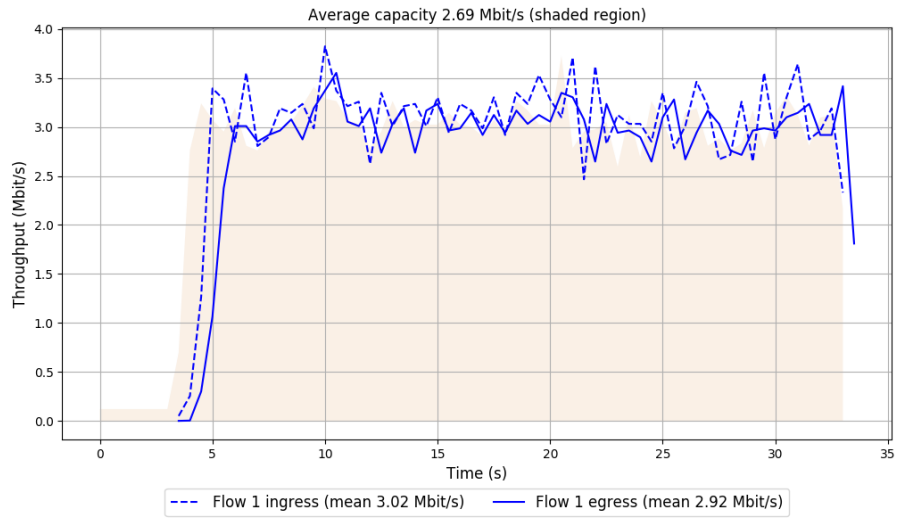
-- Flow 1:

Average throughput: 2.92 Mbit/s

95th percentile per-packet one-way delay: 1099.982 ms

Loss rate: 4.06%

### Run 3: Report of QUIC Cubic — Data Link



Run 1: Statistics of SCReAM

Start at: 2019-01-17 05:18:44

End at: 2019-01-17 05:19:14

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.11 Mbit/s (4.2% utilization)

95th percentile per-packet one-way delay: 144.642 ms

Loss rate: 0.49%

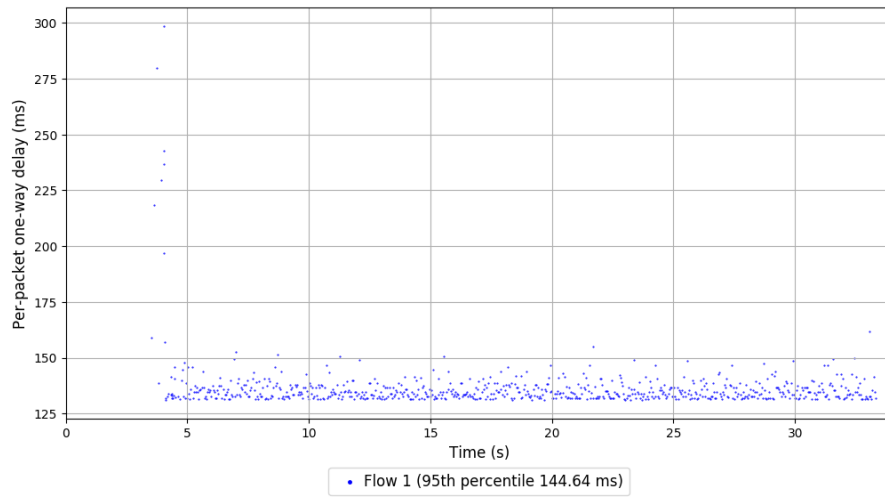
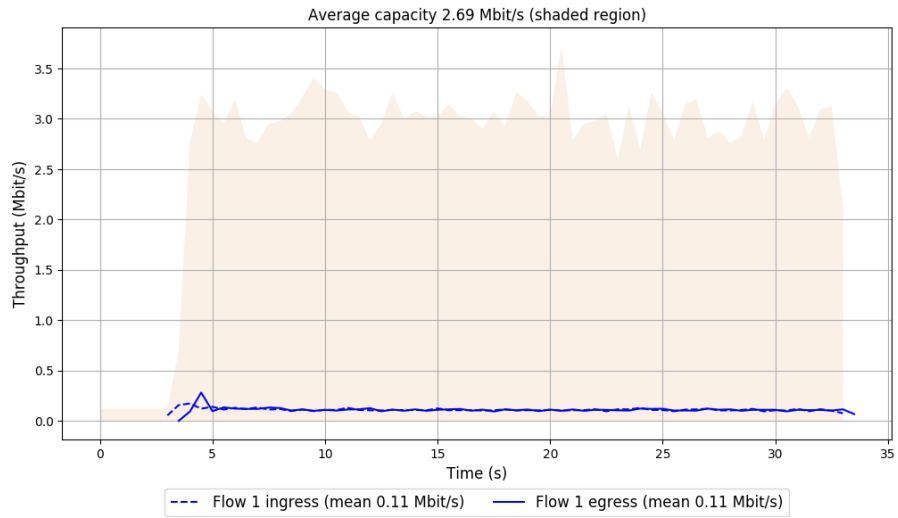
-- Flow 1:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 144.642 ms

Loss rate: 0.49%

# Run 1: Report of SCReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2019-01-17 05:31:06

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

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.10 Mbit/s (3.9% utilization)

95th percentile per-packet one-way delay: 144.672 ms

Loss rate: 0.49%

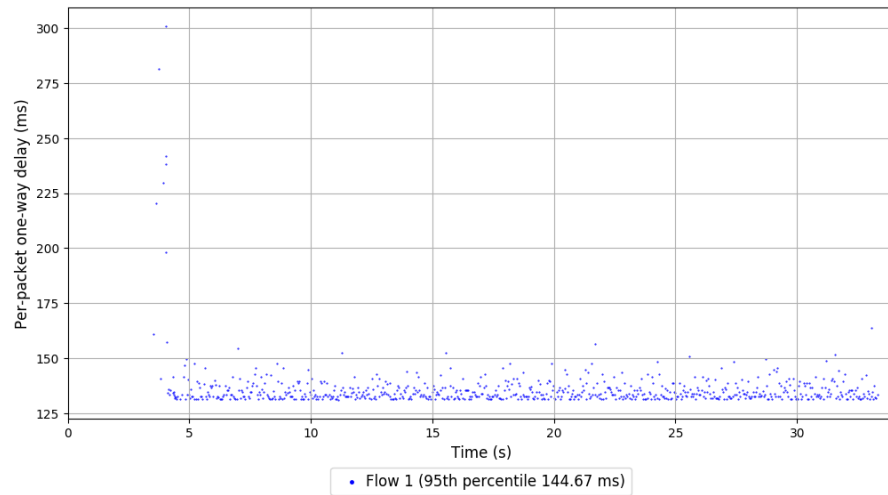
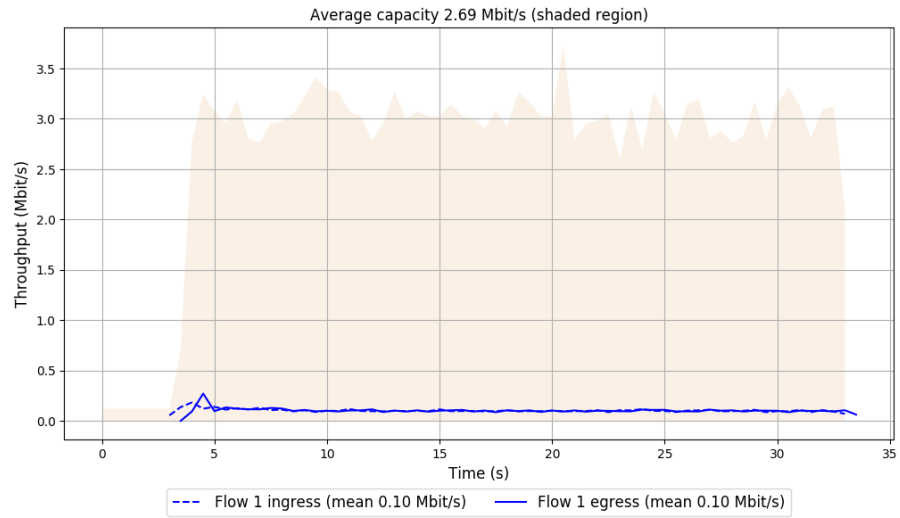
-- Flow 1:

Average throughput: 0.10 Mbit/s

95th percentile per-packet one-way delay: 144.672 ms

Loss rate: 0.49%

## Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2019-01-17 05:43:27

End at: 2019-01-17 05:43:57

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.11 Mbit/s (4.2% utilization)

95th percentile per-packet one-way delay: 144.729 ms

Loss rate: 0.37%

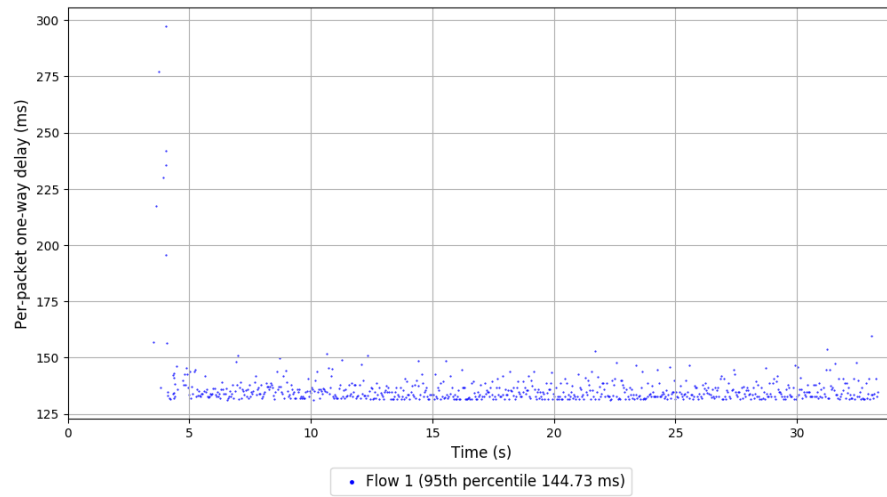
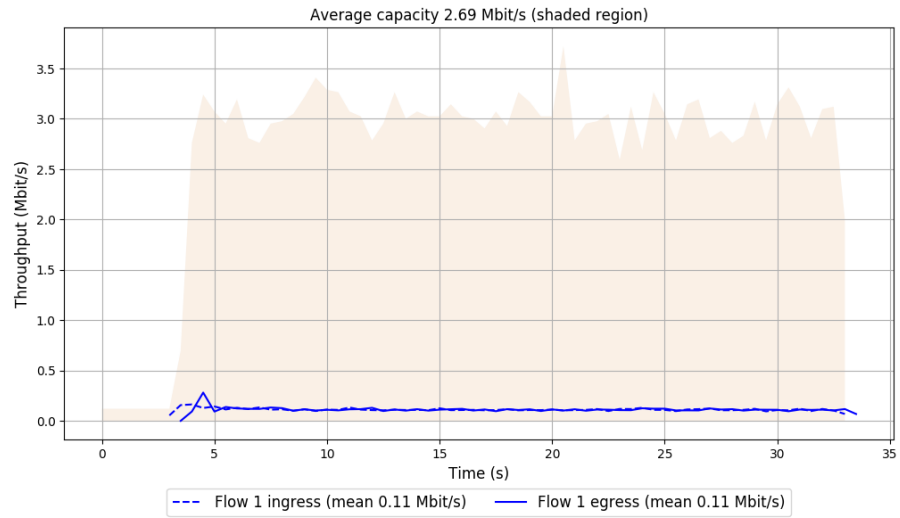
-- Flow 1:

Average throughput: 0.11 Mbit/s

95th percentile per-packet one-way delay: 144.729 ms

Loss rate: 0.37%

### Run 3: Report of SCReAM — Data Link



Run 1: Statistics of Sprout

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 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.20 Mbit/s (7.4% utilization)

95th percentile per-packet one-way delay: 166.101 ms

Loss rate: 0.04%

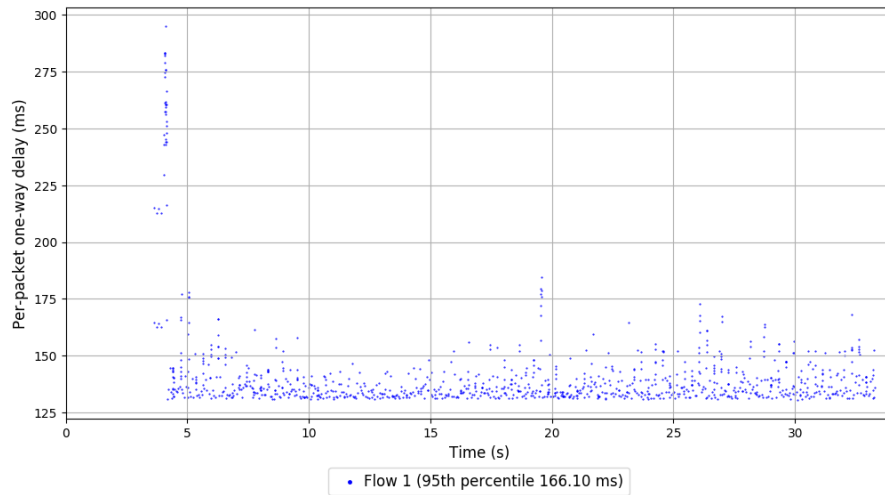
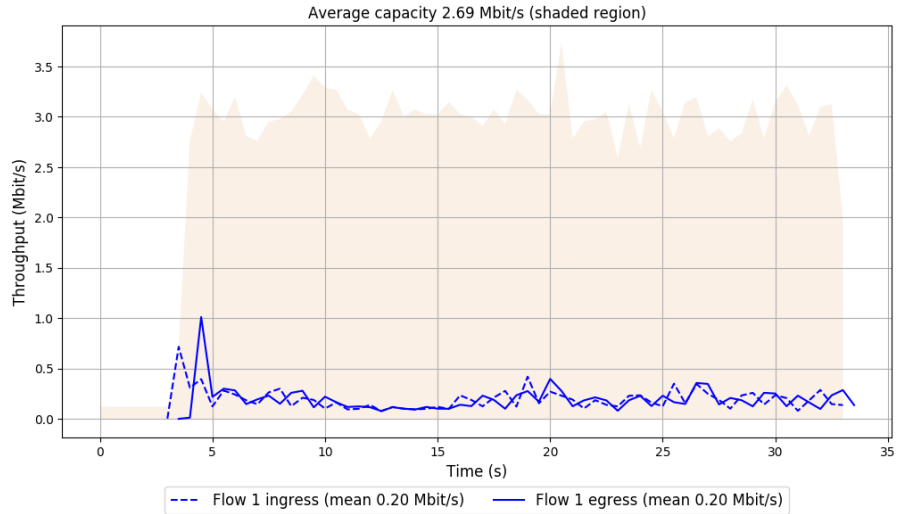
-- Flow 1:

Average throughput: 0.20 Mbit/s

95th percentile per-packet one-way delay: 166.101 ms

Loss rate: 0.04%

# Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2019-01-17 05:23:26

End at: 2019-01-17 05:23:56

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.14 Mbit/s (5.2% utilization)

95th percentile per-packet one-way delay: 161.563 ms

Loss rate: 0.32%

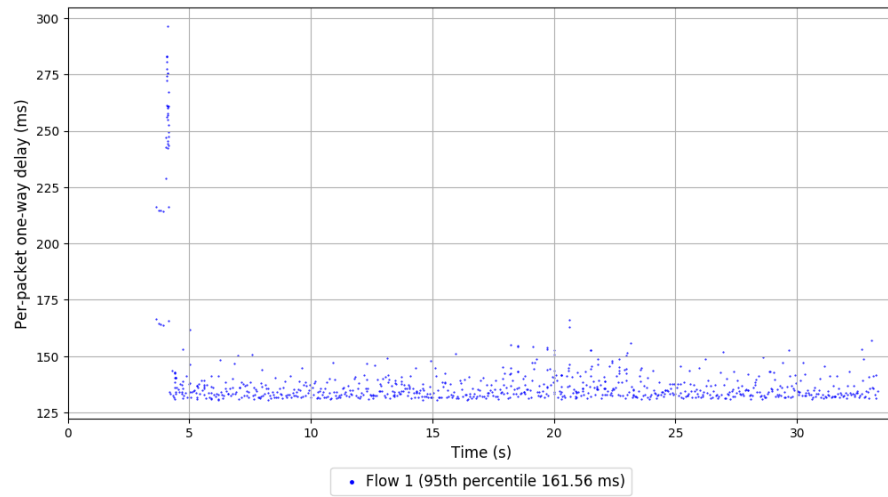
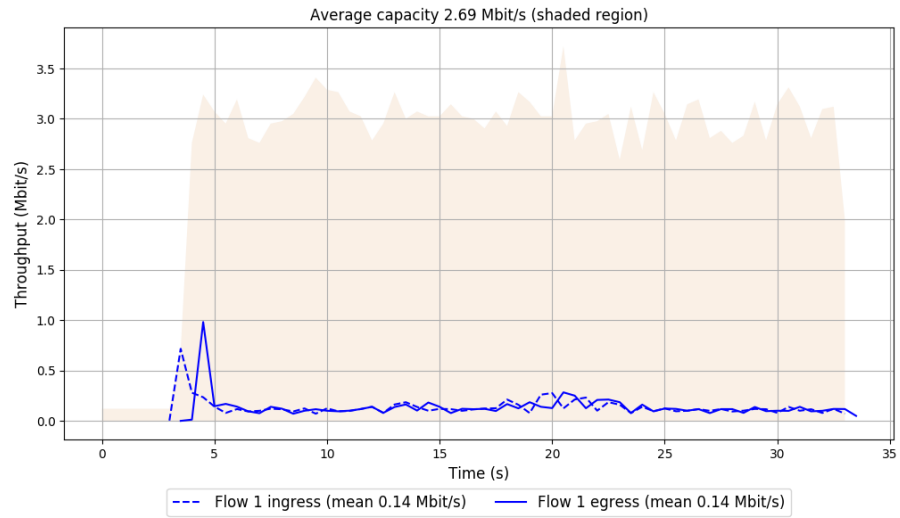
-- Flow 1:

Average throughput: 0.14 Mbit/s

95th percentile per-packet one-way delay: 161.563 ms

Loss rate: 0.32%

## Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2019-01-17 05:35:48

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

# Below is generated by plot.py at 2019-01-17 05:48:46

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.19 Mbit/s (7.1% utilization)

95th percentile per-packet one-way delay: 162.308 ms

Loss rate: 0.04%

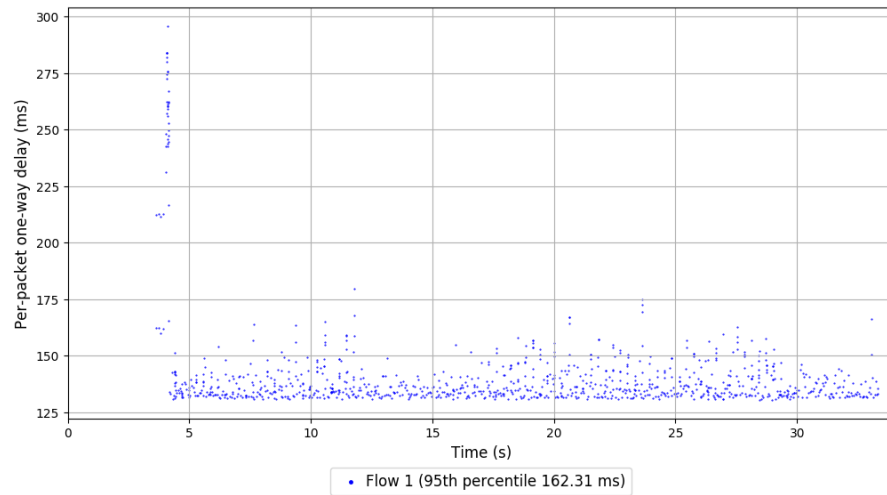
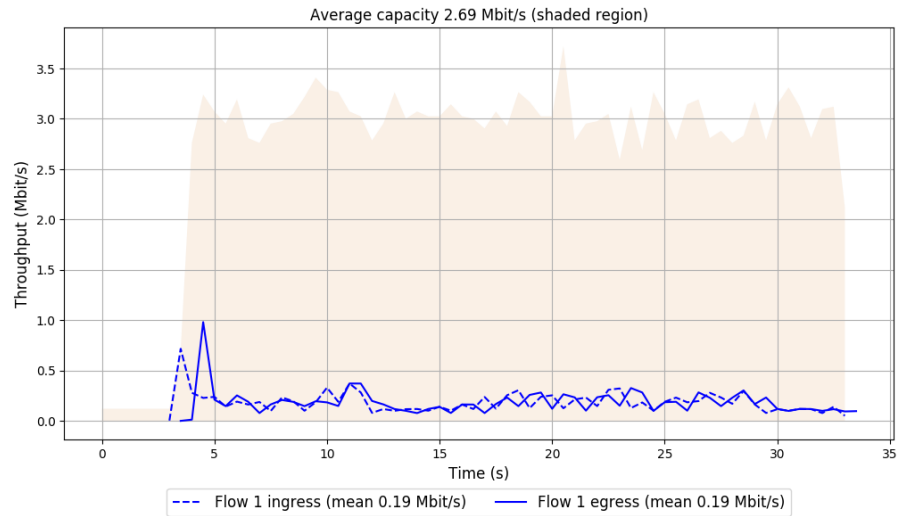
-- Flow 1:

Average throughput: 0.19 Mbit/s

95th percentile per-packet one-way delay: 162.308 ms

Loss rate: 0.04%

### Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2019-01-17 05:19:55

End at: 2019-01-17 05:20:25

# Below is generated by plot.py at 2019-01-17 05:48:51

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.33 Mbit/s (86.7% utilization)

95th percentile per-packet one-way delay: 208.863 ms

Loss rate: 0.64%

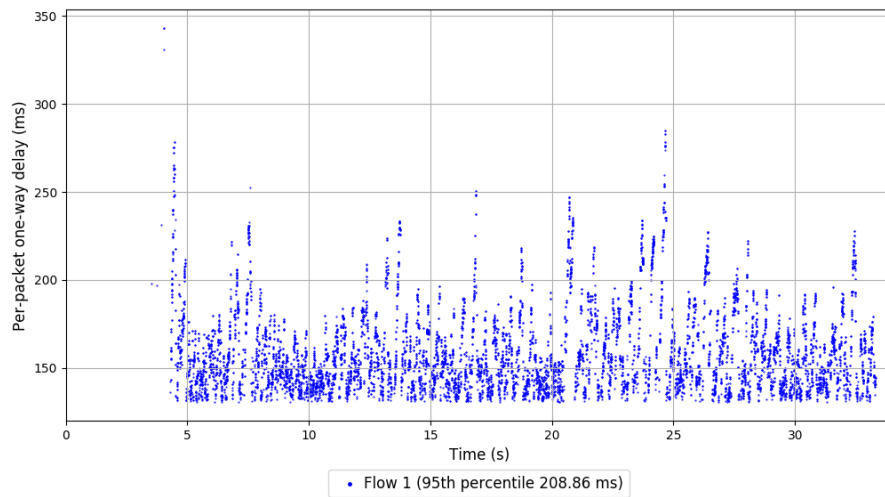
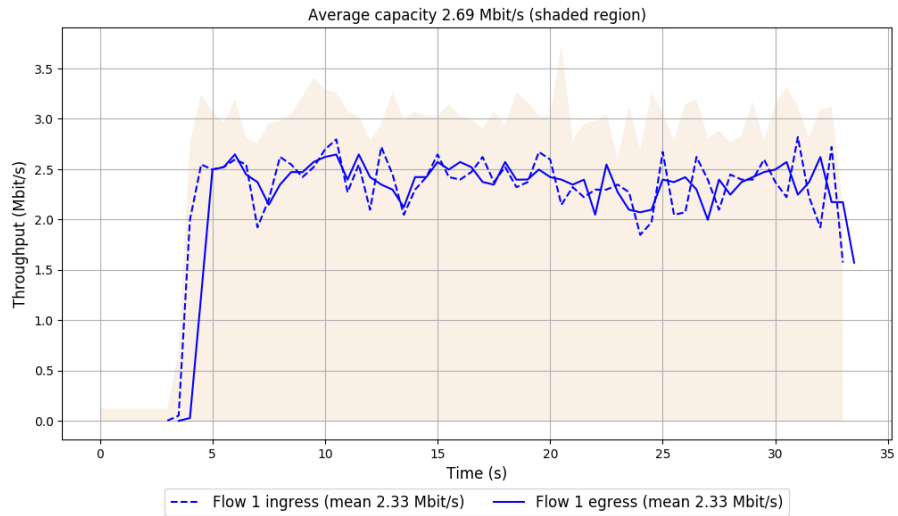
-- Flow 1:

Average throughput: 2.33 Mbit/s

95th percentile per-packet one-way delay: 208.863 ms

Loss rate: 0.64%

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



Run 2: Statistics of TaoVA-100x

Start at: 2019-01-17 05:32:16

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

# Below is generated by plot.py at 2019-01-17 05:48:55

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.34 Mbit/s (86.9% utilization)

95th percentile per-packet one-way delay: 201.494 ms

Loss rate: 0.62%

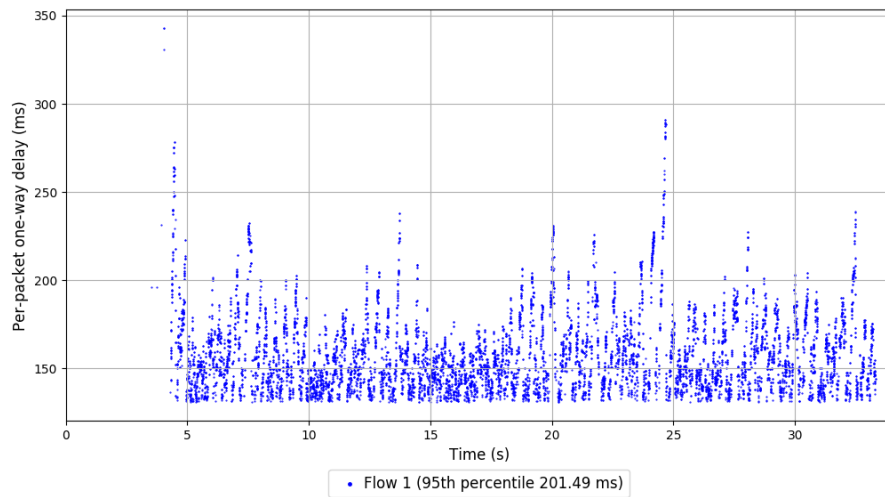
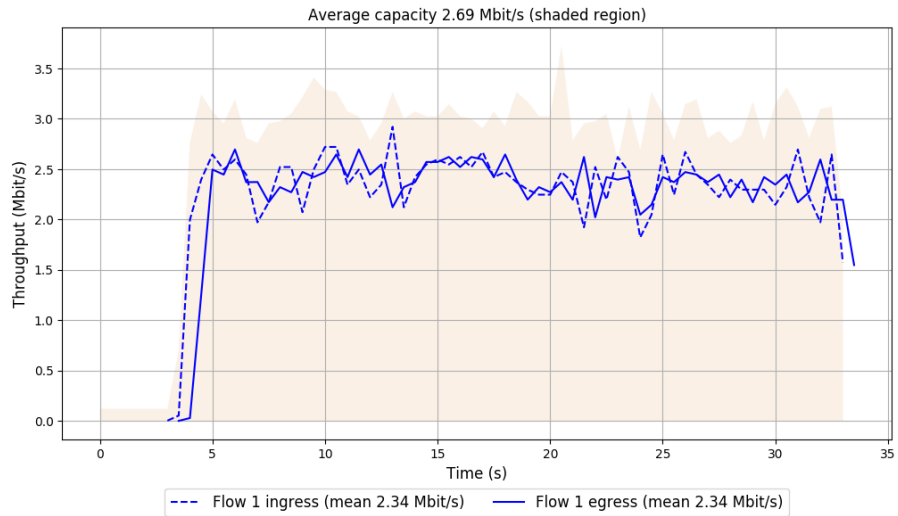
-- Flow 1:

Average throughput: 2.34 Mbit/s

95th percentile per-packet one-way delay: 201.494 ms

Loss rate: 0.62%

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



Run 3: Statistics of TaoVA-100x

Start at: 2019-01-17 05:44:38

End at: 2019-01-17 05:45:08

# Below is generated by plot.py at 2019-01-17 05:48:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.35 Mbit/s (87.2% utilization)

95th percentile per-packet one-way delay: 202.503 ms

Loss rate: 0.66%

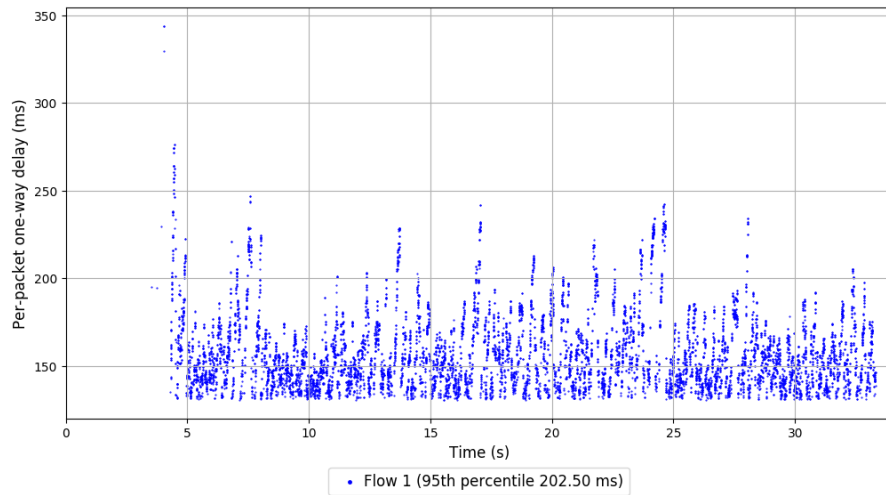
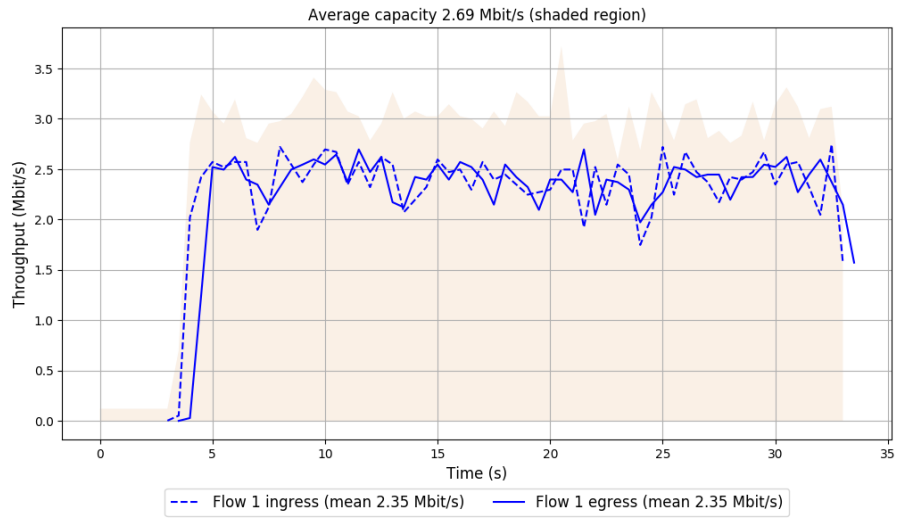
-- Flow 1:

Average throughput: 2.35 Mbit/s

95th percentile per-packet one-way delay: 202.503 ms

Loss rate: 0.66%

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



Run 1: Statistics of TCP Vegas

Start at: 2019-01-17 05:16:58

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

# Below is generated by plot.py at 2019-01-17 05:48:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 901.404 ms

Loss rate: 2.58%

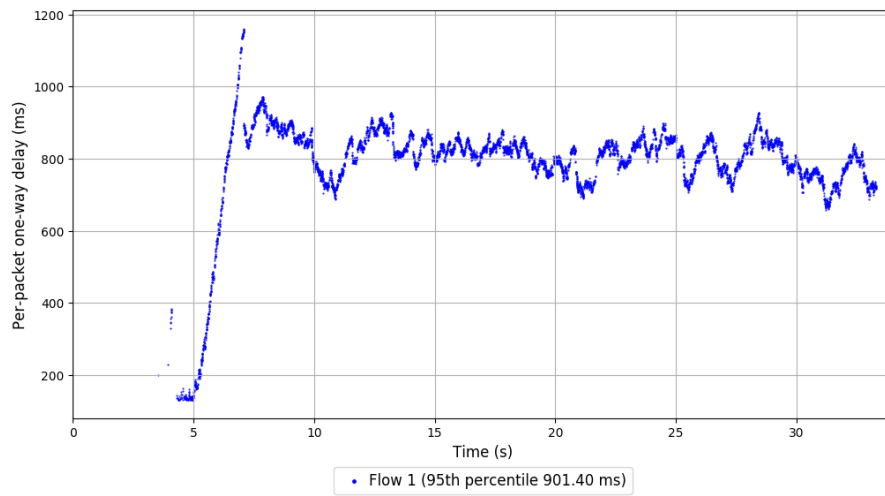
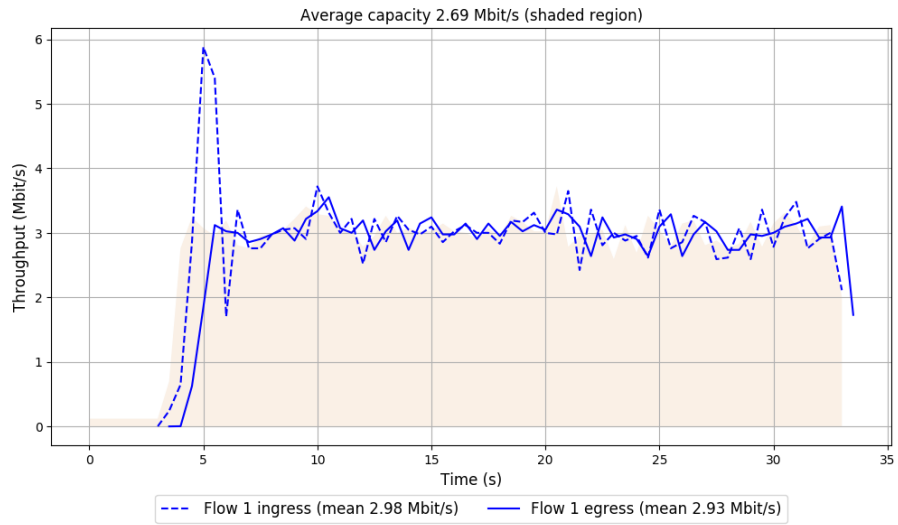
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 901.404 ms

Loss rate: 2.58%

### Run 1: Report of TCP Vegas — Data Link



Run 2: Statistics of TCP Vegas

Start at: 2019-01-17 05:29:20

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

# Below is generated by plot.py at 2019-01-17 05:48:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 896.045 ms

Loss rate: 2.59%

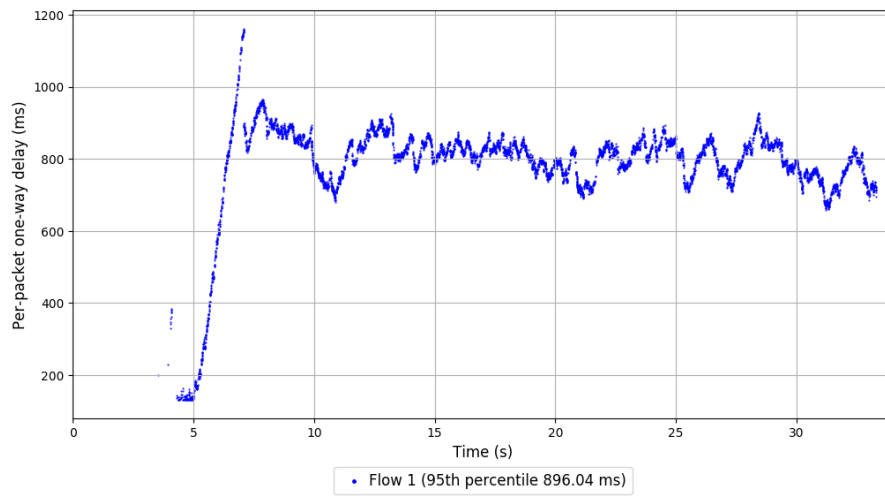
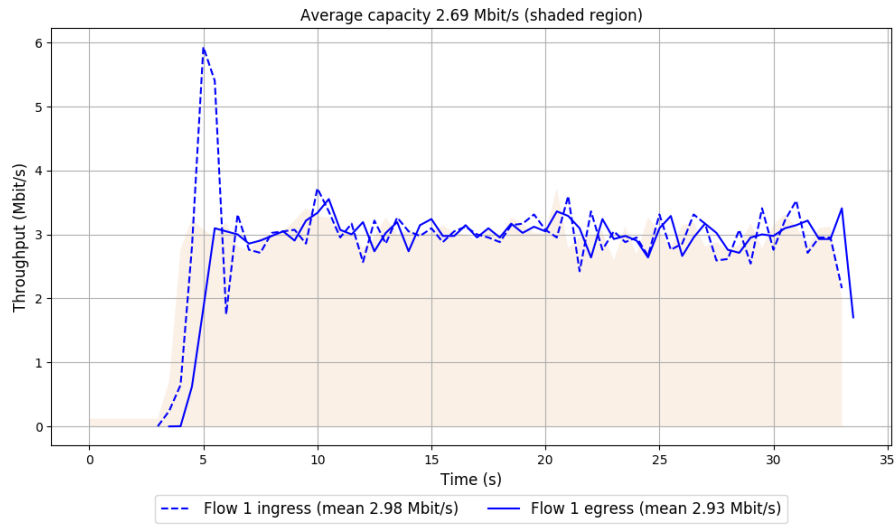
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 896.045 ms

Loss rate: 2.59%

## Run 2: Report of TCP Vegas — Data Link



Run 3: Statistics of TCP Vegas

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

End at: 2019-01-17 05:42:11

# Below is generated by plot.py at 2019-01-17 05:48:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.93 Mbit/s (108.7% utilization)

95th percentile per-packet one-way delay: 897.742 ms

Loss rate: 2.64%

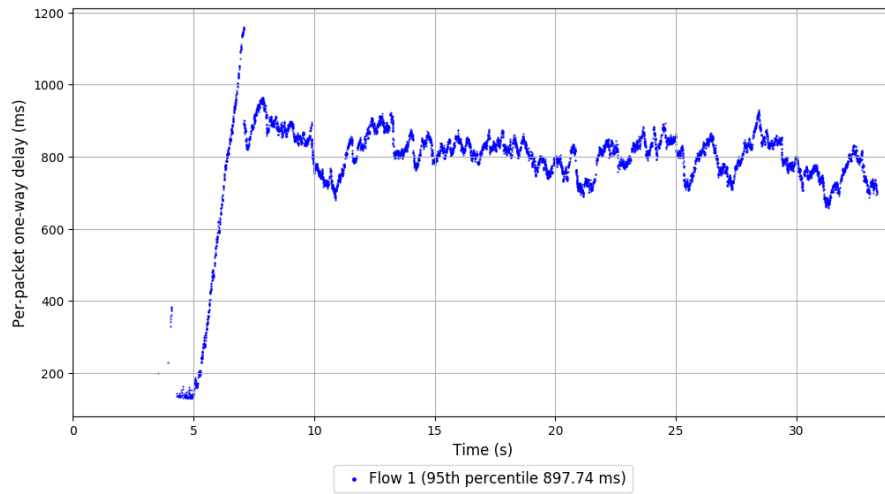
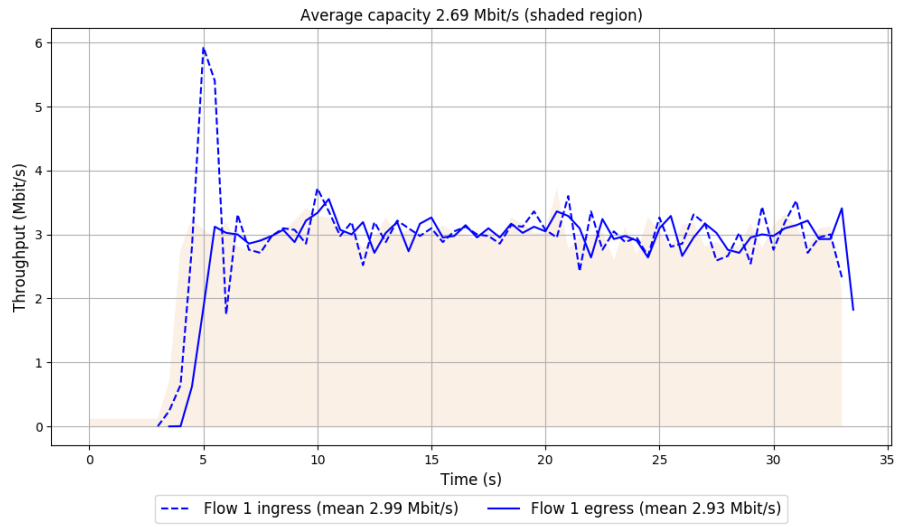
-- Flow 1:

Average throughput: 2.93 Mbit/s

95th percentile per-packet one-way delay: 897.742 ms

Loss rate: 2.64%

### Run 3: Report of TCP Vegas — Data Link



Run 1: Statistics of Verus

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

End at: 2019-01-17 05:19:49

# Below is generated by plot.py at 2019-01-17 05:48:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.90 Mbit/s (107.6% utilization)

95th percentile per-packet one-way delay: 1631.298 ms

Loss rate: 5.37%

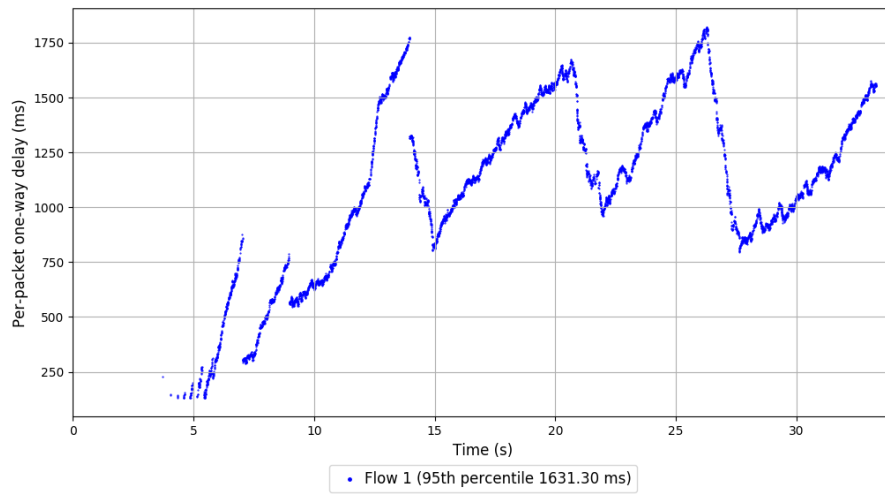
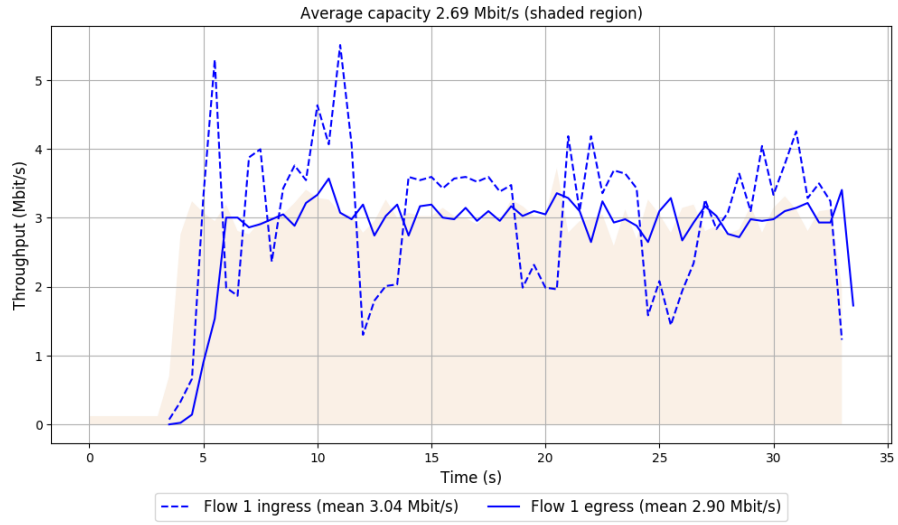
-- Flow 1:

Average throughput: 2.90 Mbit/s

95th percentile per-packet one-way delay: 1631.298 ms

Loss rate: 5.37%

# Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

Start at: 2019-01-17 05:31:41

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

# Below is generated by plot.py at 2019-01-17 05:48:59

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.88 Mbit/s (107.1% utilization)

95th percentile per-packet one-way delay: 1689.438 ms

Loss rate: 4.90%

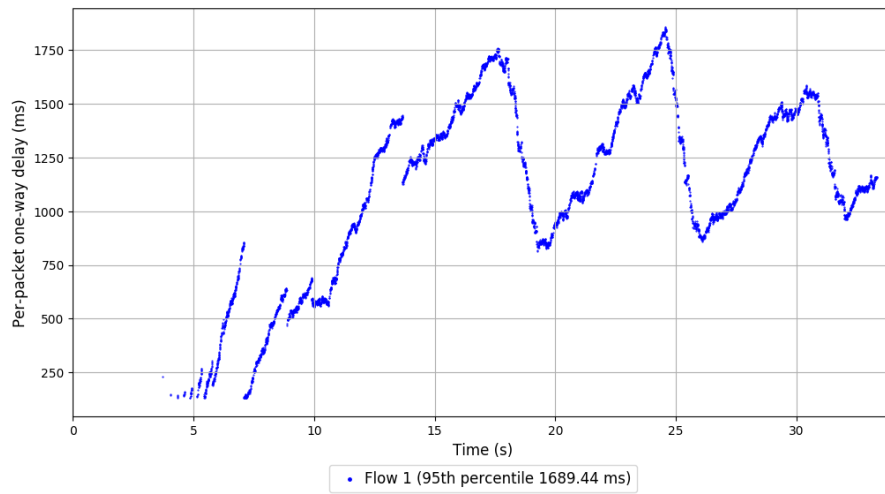
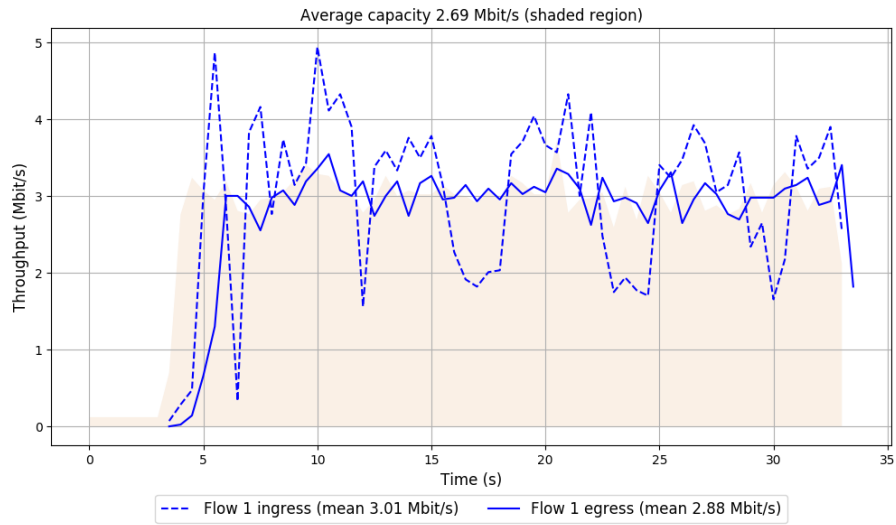
-- Flow 1:

Average throughput: 2.88 Mbit/s

95th percentile per-packet one-way delay: 1689.438 ms

Loss rate: 4.90%

## Run 2: Report of Verus — Data Link



Run 3: Statistics of Verus

Start at: 2019-01-17 05:44:03

End at: 2019-01-17 05:44:33

# Below is generated by plot.py at 2019-01-17 05:49:04

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.89 Mbit/s (107.4% utilization)

95th percentile per-packet one-way delay: 1693.162 ms

Loss rate: 3.75%

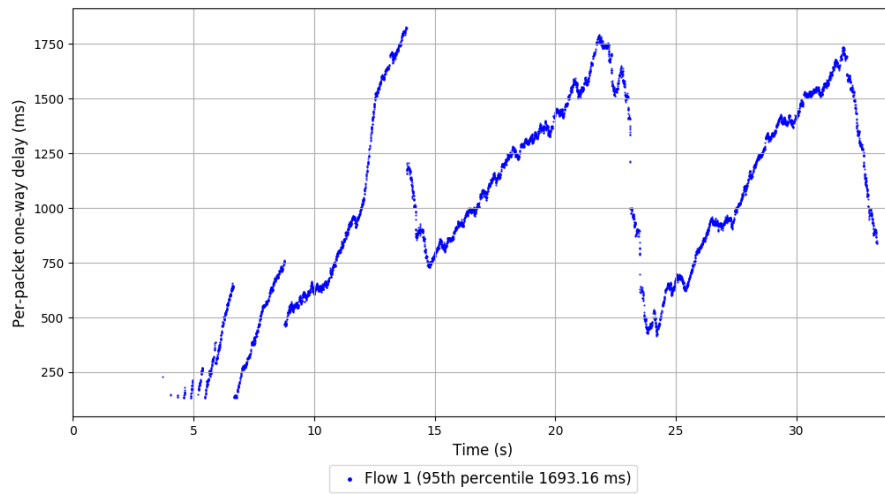
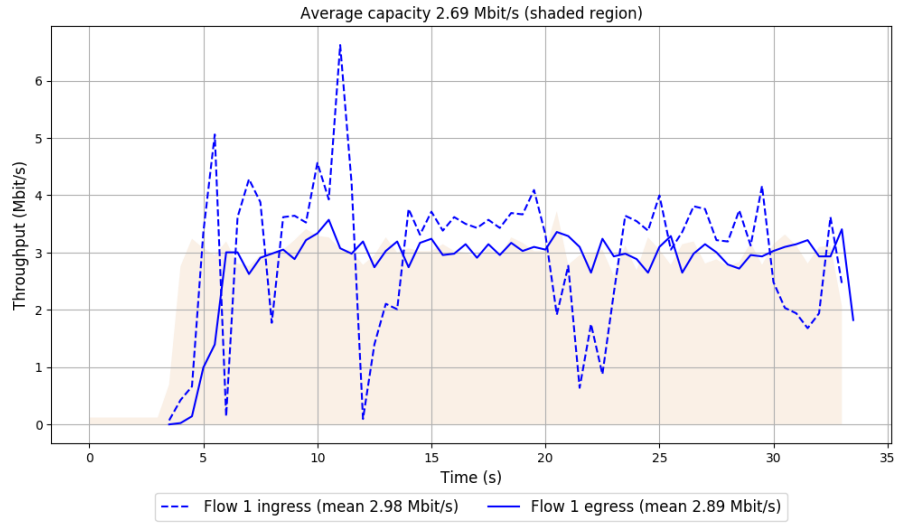
-- Flow 1:

Average throughput: 2.89 Mbit/s

95th percentile per-packet one-way delay: 1693.162 ms

Loss rate: 3.75%

### Run 3: Report of Verus — Data Link



Run 1: Statistics of PCC-Vivace

Start at: 2019-01-17 05:21:40

End at: 2019-01-17 05:22:10

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.48 Mbit/s (92.1% utilization)

95th percentile per-packet one-way delay: 1526.042 ms

Loss rate: 1.65%

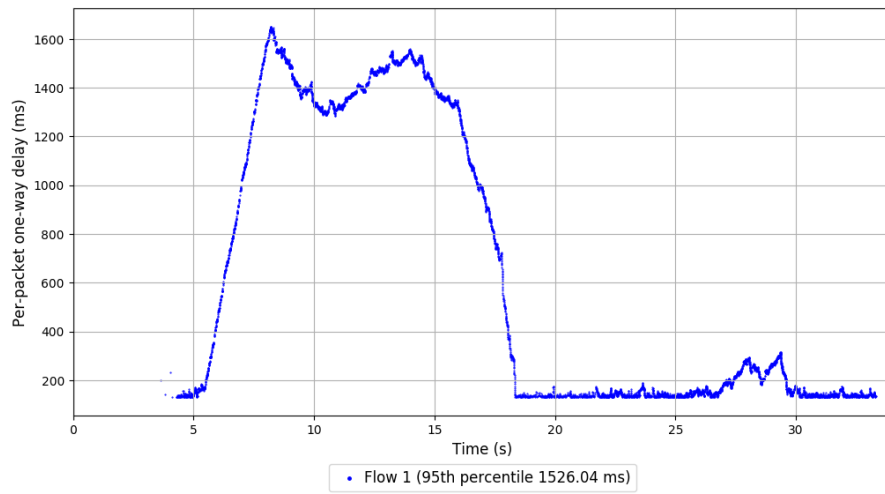
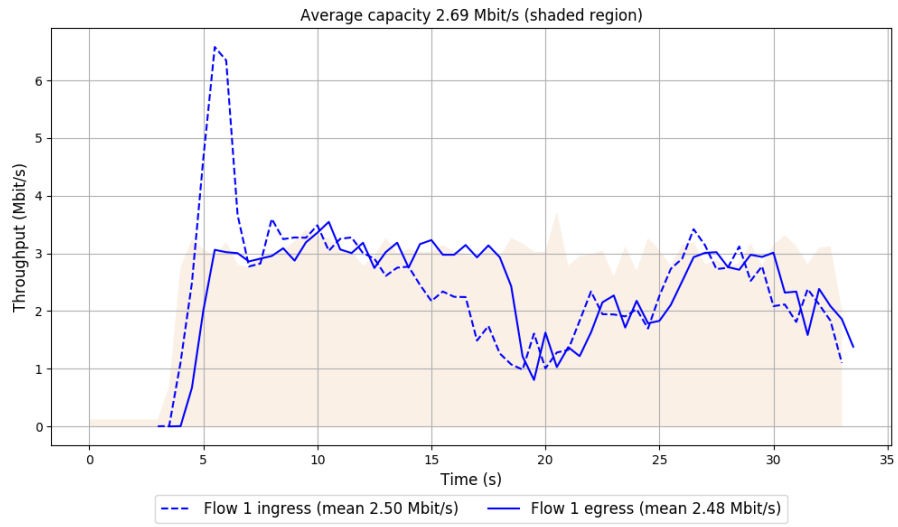
-- Flow 1:

Average throughput: 2.48 Mbit/s

95th percentile per-packet one-way delay: 1526.042 ms

Loss rate: 1.65%

# Run 1: Report of PCC-Vivace — Data Link



Run 2: Statistics of PCC-Vivace

Start at: 2019-01-17 05:34:02

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

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

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.02 Mbit/s (75.1% utilization)

95th percentile per-packet one-way delay: 174.197 ms

Loss rate: 0.56%

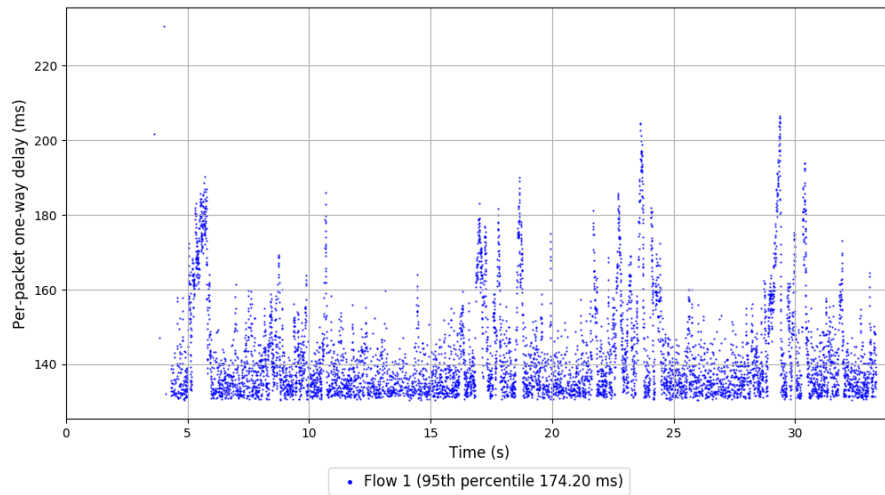
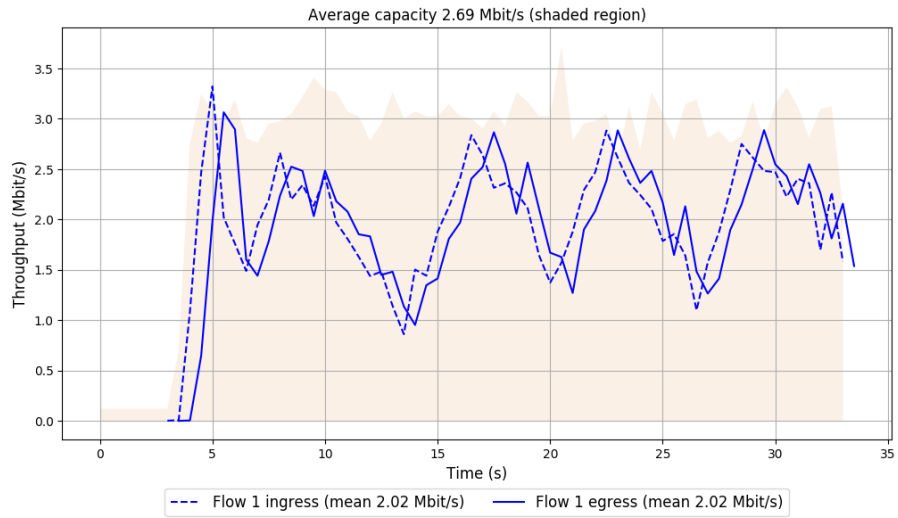
-- Flow 1:

Average throughput: 2.02 Mbit/s

95th percentile per-packet one-way delay: 174.197 ms

Loss rate: 0.56%

Run 2: Report of PCC-Vivace — Data Link



Run 3: Statistics of PCC-Vivace

Start at: 2019-01-17 05:46:24

End at: 2019-01-17 05:46:54

# Below is generated by plot.py at 2019-01-17 05:49:06

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 2.60 Mbit/s (96.7% utilization)

95th percentile per-packet one-way delay: 1589.351 ms

Loss rate: 6.02%

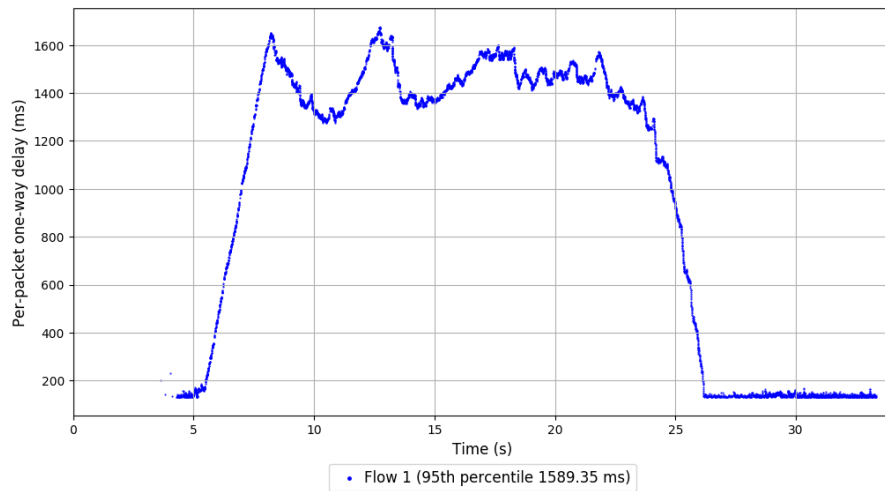
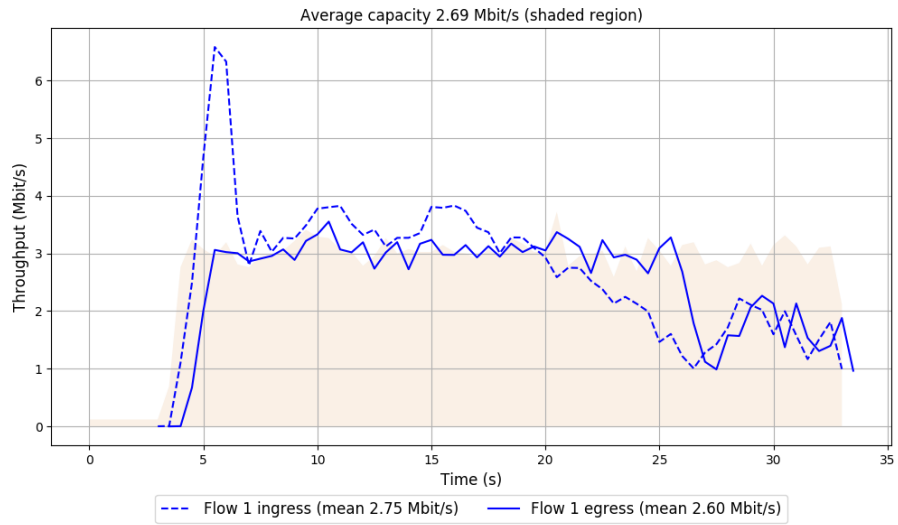
-- Flow 1:

Average throughput: 2.60 Mbit/s

95th percentile per-packet one-way delay: 1589.351 ms

Loss rate: 6.02%

### Run 3: Report of PCC-Vivace — Data Link



Run 1: Statistics of WebRTC media

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 05:49:06

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.05 Mbit/s (1.7% utilization)

95th percentile per-packet one-way delay: 179.956 ms

Loss rate: 0.00%

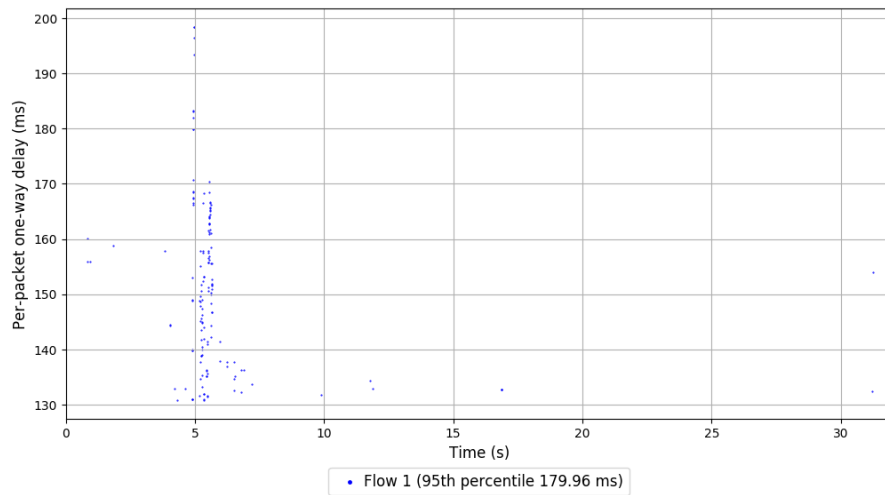
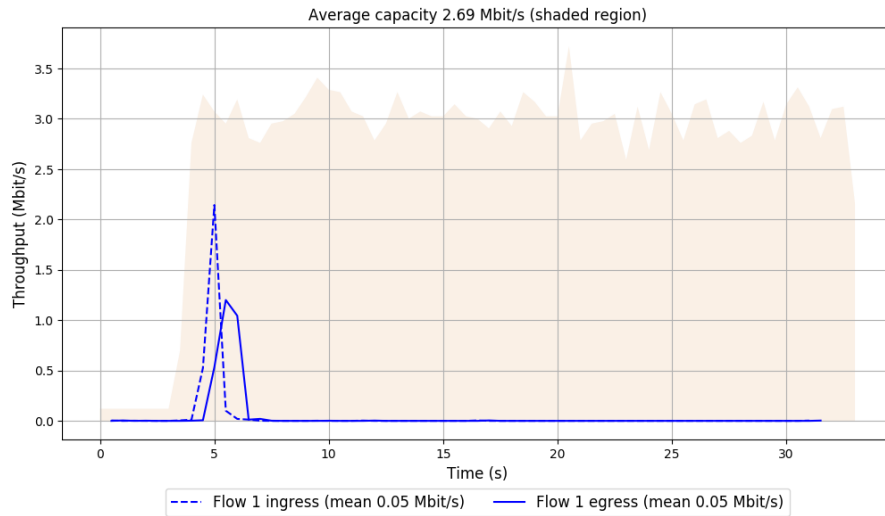
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 179.956 ms

Loss rate: 0.00%

# Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2019-01-17 05:22:51

End at: 2019-01-17 05:23:21

# Below is generated by plot.py at 2019-01-17 05:49:06

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.05 Mbit/s (1.7% utilization)

95th percentile per-packet one-way delay: 175.117 ms

Loss rate: 0.00%

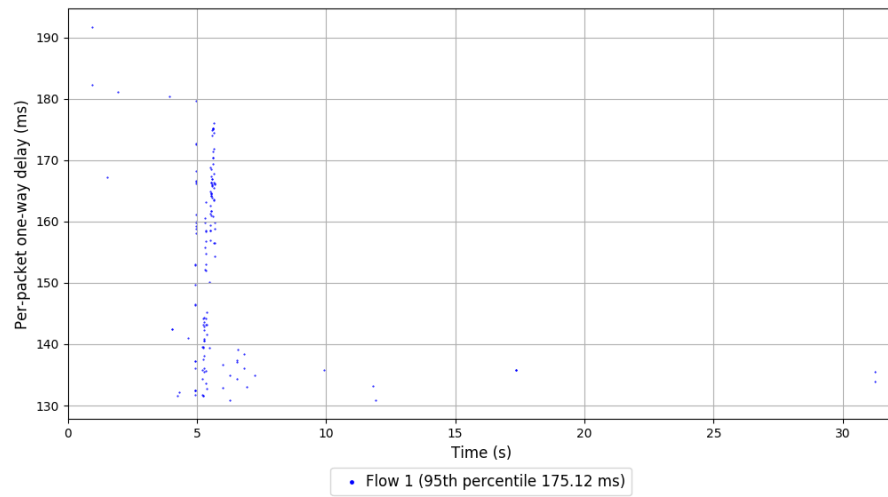
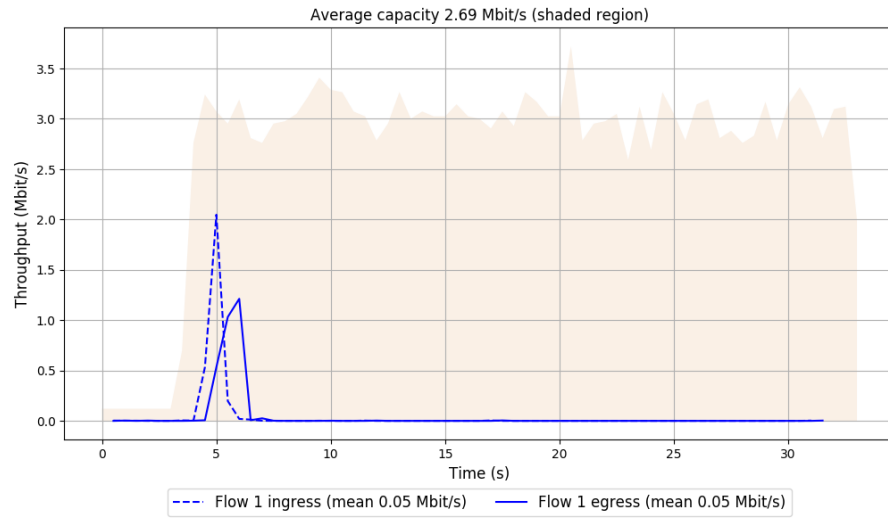
-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 175.117 ms

Loss rate: 0.00%

## Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2019-01-17 05:35:13

End at: 2019-01-17 05:35:43

# Below is generated by plot.py at 2019-01-17 05:49:06

# Datalink statistics

-- Total of 1 flow:

Average capacity: 2.69 Mbit/s

Average throughput: 0.05 Mbit/s (1.7% utilization)

95th percentile per-packet one-way delay: 193.890 ms

Loss rate: 0.00%

-- Flow 1:

Average throughput: 0.05 Mbit/s

95th percentile per-packet one-way delay: 193.890 ms

Loss rate: 0.00%

### Run 3: Report of WebRTC media — Data Link

