

## Pantheon Report

Generated at 2018-01-31 09:32:22 (UTC).

Data path: China ppp0 (*remote*) → AWS Korea Ethernet (*local*).

Repeated the test of 17 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

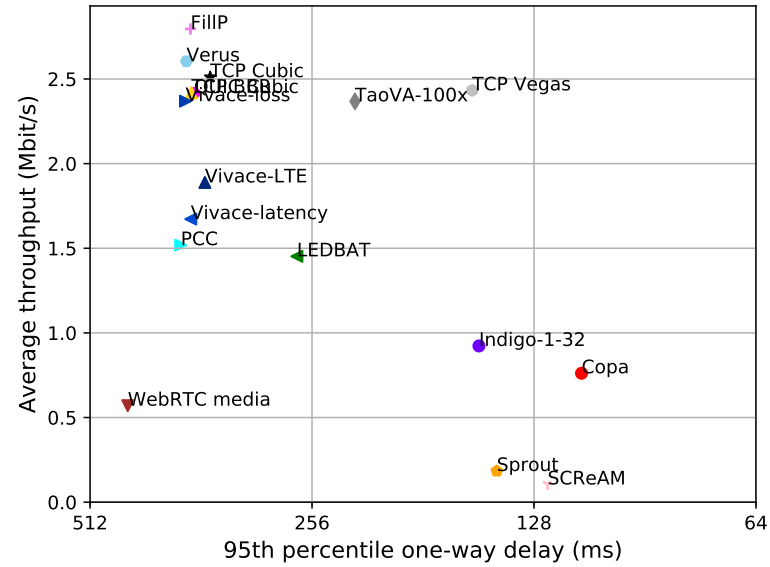
Tested BBR with qdisc of Fair Queuing (**fq**), and other schemes with the default Linux qdisc (**pfifo\_fast**).

NTP offsets were measured against `ntp.nict.jp` and have been applied to correct the timestamps in logs.

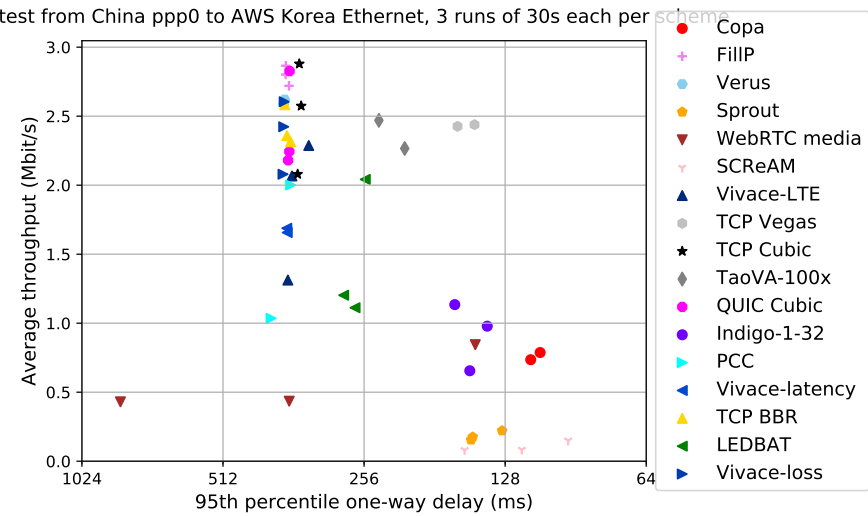
Git summary:

```
branch: master @ 70217998b3c9a7166a95460a70c0854d1326e100
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
  M datagrump/sender.cc
third_party/fillp @ fb9c9ab842e5614ad52911a76fb9bd1c1b0dca86
third_party/genericCC @ 80b516c448f795fd6e9675f7177b69c622f07da8
third_party/indigo @ a9b2060d39e4da2e8987e893e3eca2a6c7cd0ab9
third_party/indigo-1-layer-128-unit @ 3ae9e4ef4230db7484501f82ce8b377695f2f66d
third_party/indigo-1-layer-32-unit @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/indigo-1-layer-32-unit-no-calib @ 1f3a7f75b41135ed5b540c0fd3505939528e2a5f
third_party/indigo-no-calib @ 7224f2202e8a044d8306fa0b983ad84360c53d89
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
  M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ fb1053193c2861da659ba9013db26744ccfcf993
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
  M receiver/src/buffer.h
  M receiver/src/core.cpp
  M sender/src/buffer.h
  M sender/src/core.cpp
third_party/proto-quick @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eae30b267cde681
third_party/sprout @ 6f2efe6e088d91066a9f023df375eee2665089ce
  M src/examples/cellsim.cc
  M src/examples/sproutbt2.cc
  M src/network/sproutconn.cc
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
  M src/verus.hpp
  M tools/plot.py
third_party/vivace @ 7a4ba531e75b4a6f66f5c4580192120401784ce3
third_party/webRTC @ a488197ddd041ace68a42849b2540ad834825f42
```

test from China ppp0 to AWS Korea Ethernet, 3 runs of 30s each per scheme  
(mean of all runs by scheme)



test from China ppp0 to AWS Korea Ethernet, 3 runs of 30s each per



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	2.42	373.08	7.88
TCP Cubic	3	2.51	351.83	2.47
LEDBAT	3	1.45	268.40	1.60
PCC	2	1.52	385.72	55.62
QUIC Cubic	3	2.42	370.18	4.81
SCReAM	3	0.10	122.69	1.24
WebRTC media	3	0.57	455.12	9.60
Sprout	3	0.18	143.78	0.67
TaoVA-100x	2	2.37	223.84	2.92
TCP Vegas	2	2.44	155.27	0.52
Verus	2	2.60	378.95	22.00
Copa	2	0.77	110.34	1.06
FillP	3	2.80	374.15	15.91
Indigo-1-32	3	0.92	152.00	1.94
Vivace-latency	2	1.67	373.87	11.54
Vivace-loss	3	2.37	380.04	20.46
Vivace-LTE	3	1.89	357.72	7.76

Run 1: Statistics of TCP BBR

Start at: 2018-01-31 07:03:46

End at: 2018-01-31 07:04:16

Local clock offset: -0.909 ms

Remote clock offset: 2.792 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.58 Mbit/s

95th percentile per-packet one-way delay: 377.882 ms

Loss rate: 11.08%

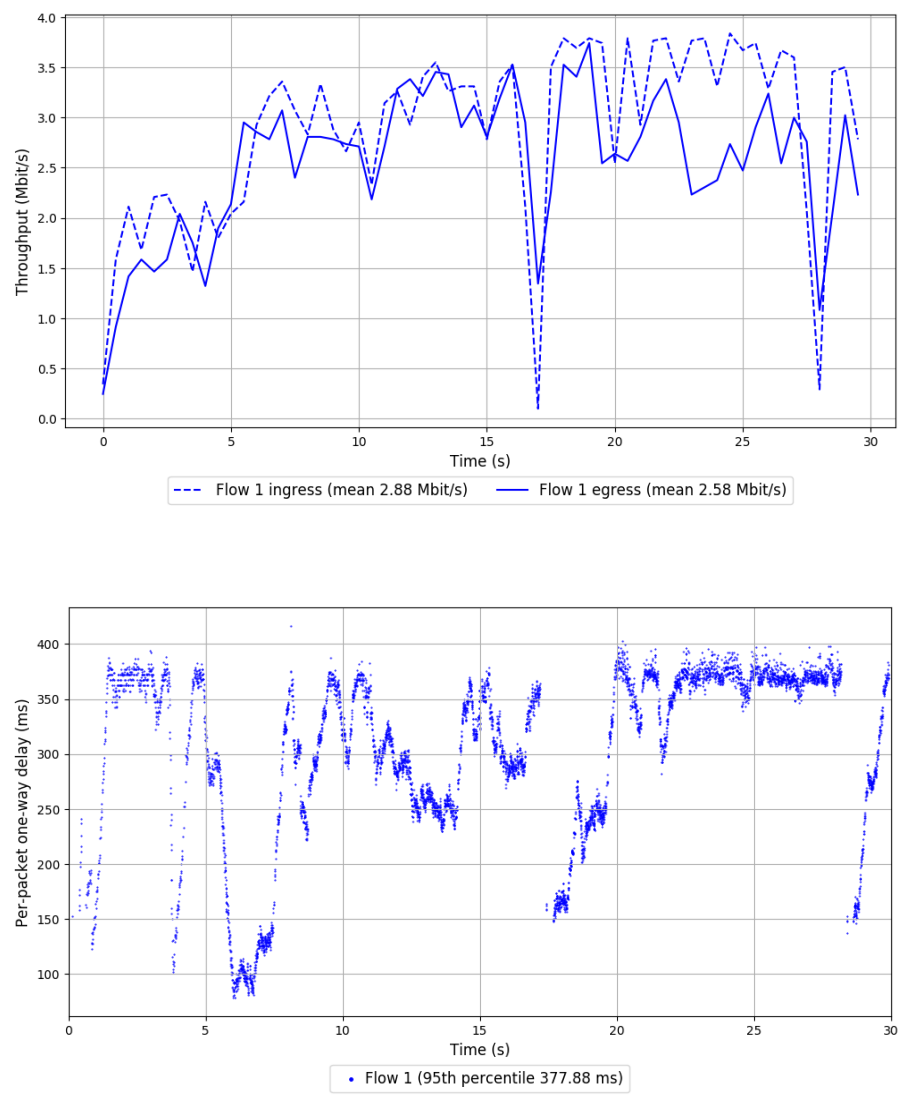
-- Flow 1:

Average throughput: 2.58 Mbit/s

95th percentile per-packet one-way delay: 377.882 ms

Loss rate: 11.08%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-01-31 07:30:34

End at: 2018-01-31 07:31:04

Local clock offset: -1.077 ms

Remote clock offset: 2.018 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.36 Mbit/s

95th percentile per-packet one-way delay: 373.964 ms

Loss rate: 7.82%

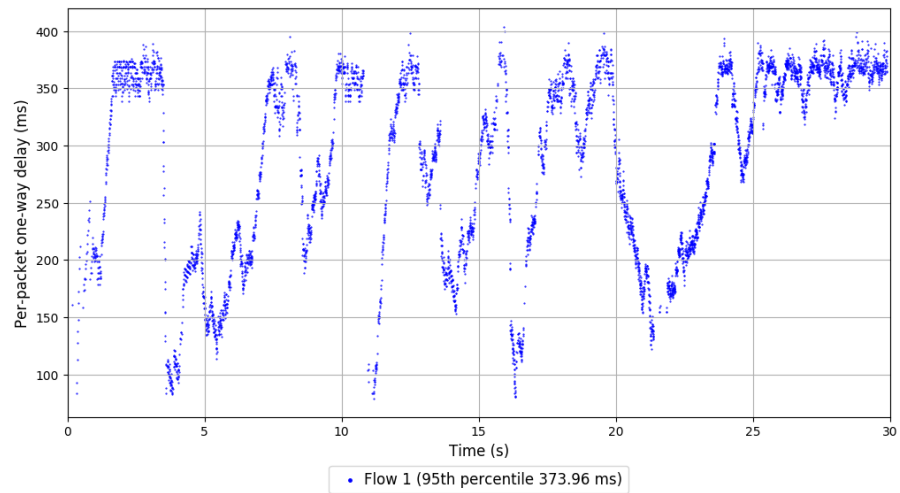
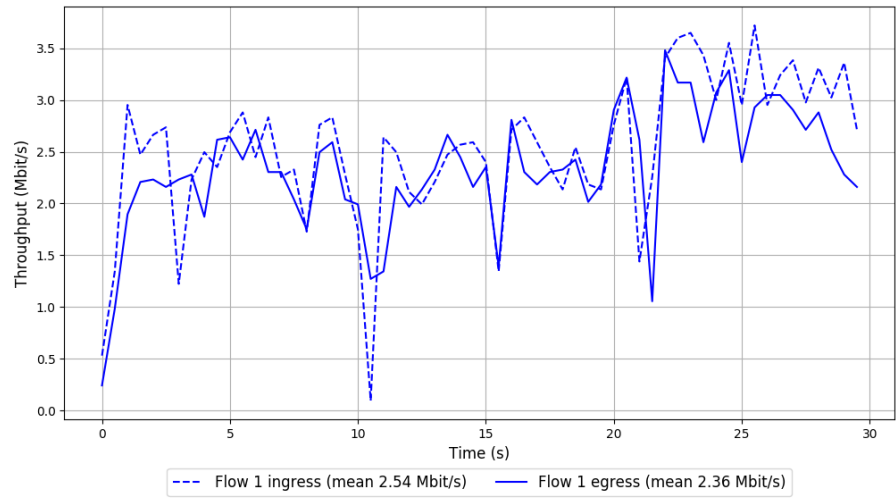
-- Flow 1:

Average throughput: 2.36 Mbit/s

95th percentile per-packet one-way delay: 373.964 ms

Loss rate: 7.82%

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



Run 3: Statistics of TCP BBR

Start at: 2018-01-31 07:58:02

End at: 2018-01-31 07:58:32

Local clock offset: -1.119 ms

Remote clock offset: 3.837 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.31 Mbit/s

95th percentile per-packet one-way delay: 367.398 ms

Loss rate: 4.75%

-- Flow 1:

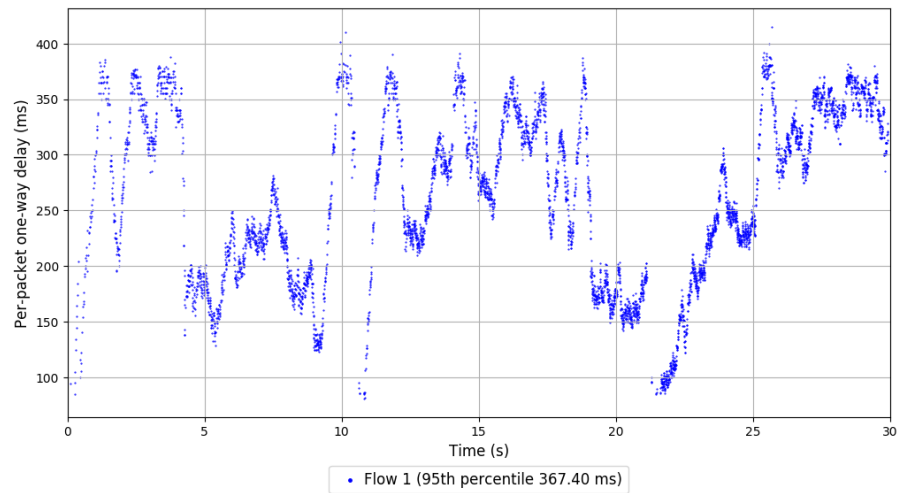
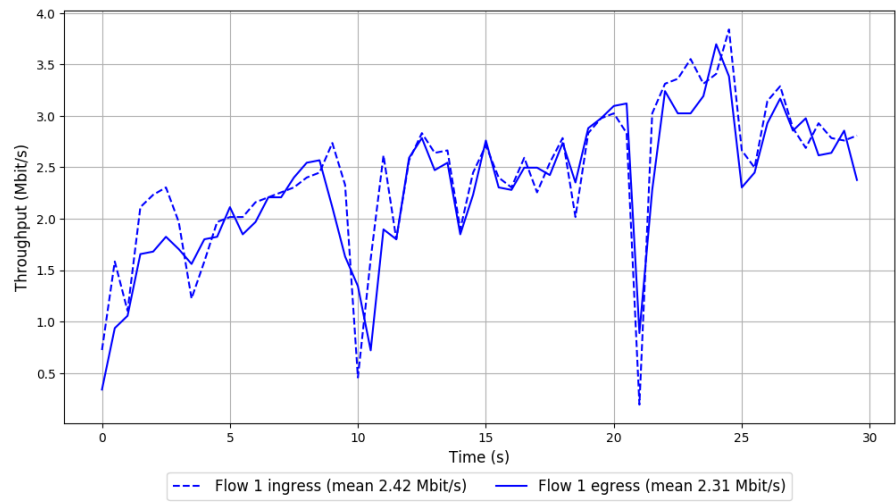
Average throughput: 2.31 Mbit/s

95th percentile per-packet one-way delay: 367.398 ms

Loss rate: 4.75%



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



Run 1: Statistics of TCP Cubic

Start at: 2018-01-31 07:09:01

End at: 2018-01-31 07:09:31

Local clock offset: -0.598 ms

Remote clock offset: 1.925 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.08 Mbit/s

95th percentile per-packet one-way delay: 354.841 ms

Loss rate: 2.88%

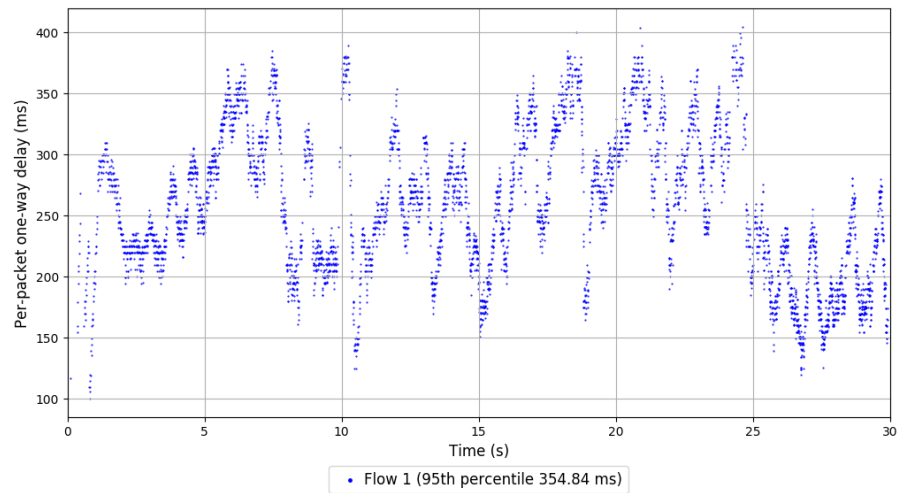
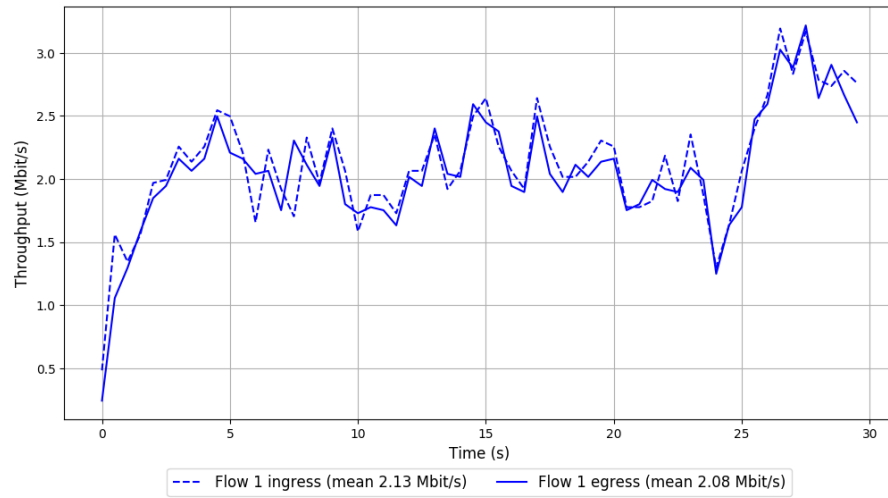
-- Flow 1:

Average throughput: 2.08 Mbit/s

95th percentile per-packet one-way delay: 354.841 ms

Loss rate: 2.88%

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



Run 2: Statistics of TCP Cubic

Start at: 2018-01-31 07:36:43

End at: 2018-01-31 07:37:13

Local clock offset: -0.806 ms

Remote clock offset: 2.543 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.88 Mbit/s

95th percentile per-packet one-way delay: 351.918 ms

Loss rate: 2.01%

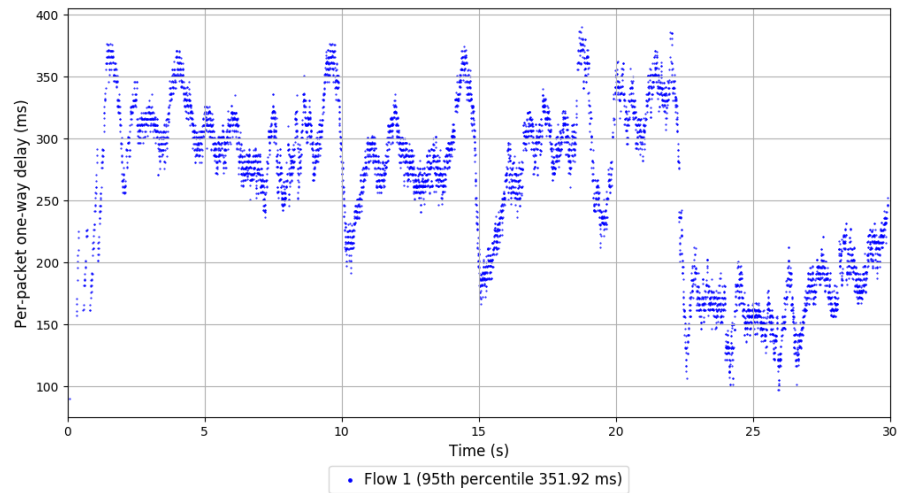
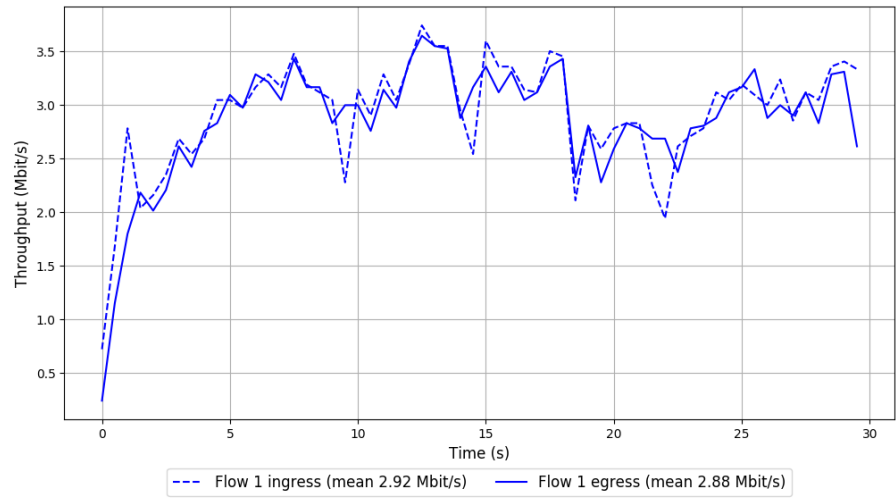
-- Flow 1:

Average throughput: 2.88 Mbit/s

95th percentile per-packet one-way delay: 351.918 ms

Loss rate: 2.01%

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



Run 3: Statistics of TCP Cubic

Start at: 2018-01-31 08:03:29

End at: 2018-01-31 08:03:59

Local clock offset: -0.343 ms

Remote clock offset: 4.502 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.57 Mbit/s

95th percentile per-packet one-way delay: 348.725 ms

Loss rate: 2.52%

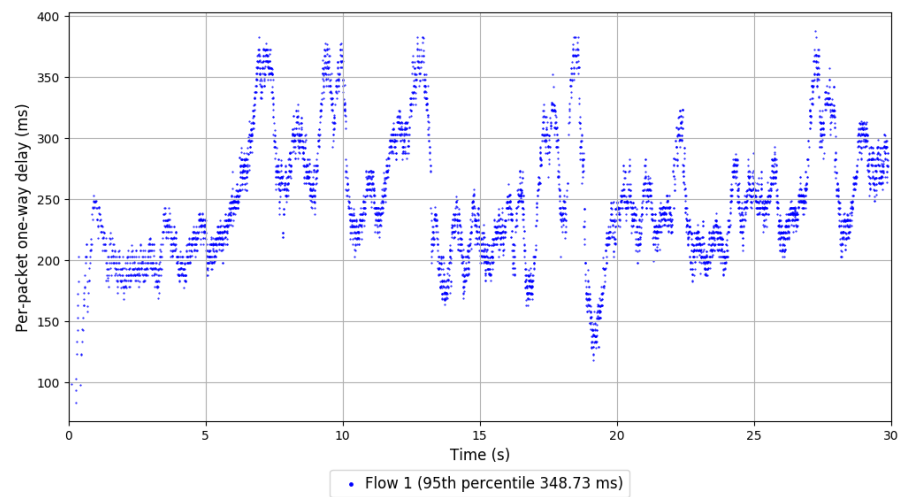
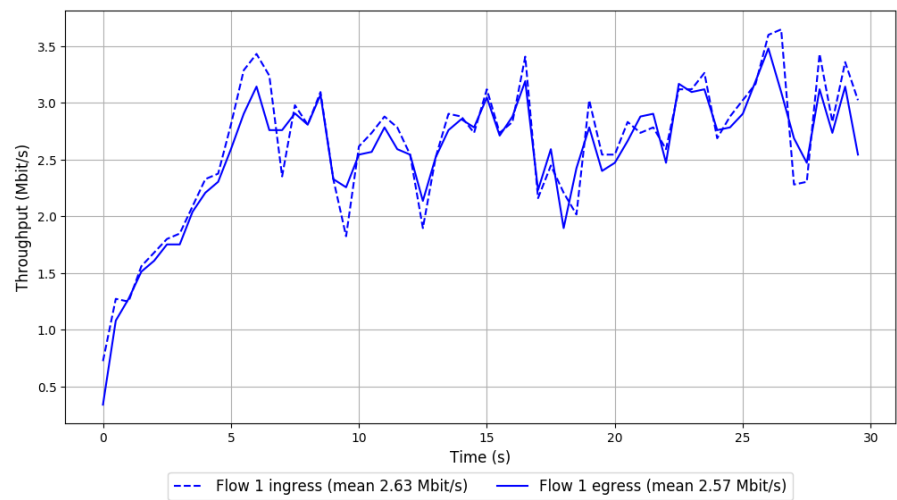
-- Flow 1:

Average throughput: 2.57 Mbit/s

95th percentile per-packet one-way delay: 348.725 ms

Loss rate: 2.52%

Run 3: Report of TCP Cubic — Data Link



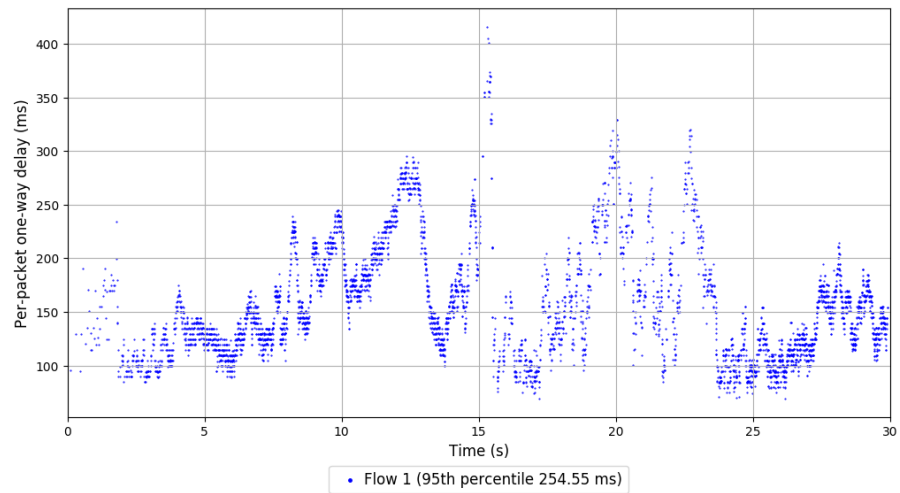
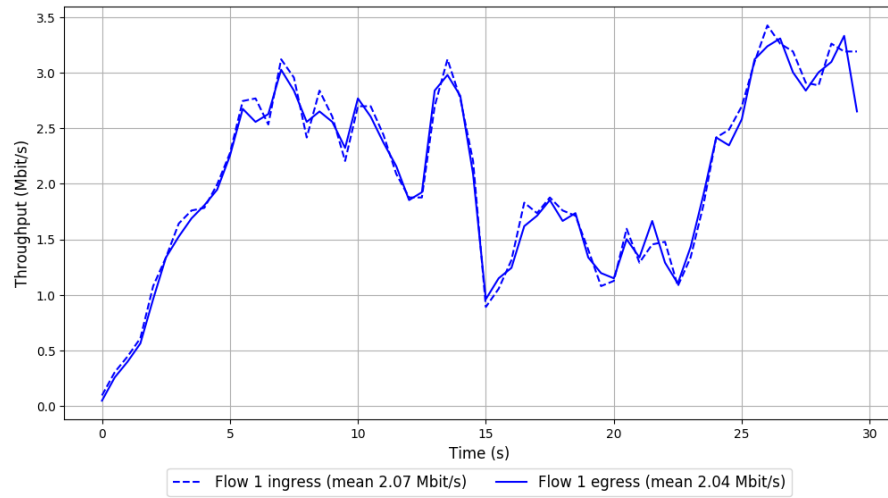
```
Run 1: Statistics of LEDBAT

Start at: 2018-01-31 06:53:15
End at: 2018-01-31 06:53:45
Local clock offset: -0.309 ms
Remote clock offset: 1.549 ms

# Below is generated by plot.py at 2018-01-31 09:31:49
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 254.554 ms
Loss rate: 1.67%
-- Flow 1:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 254.554 ms
Loss rate: 1.67%
```



# Run 1: Report of LEDBAT — Data Link



Run 2: Statistics of LEDBAT

Start at: 2018-01-31 07:16:53

End at: 2018-01-31 07:17:23

Local clock offset: -0.714 ms

Remote clock offset: 1.619 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.20 Mbit/s

95th percentile per-packet one-way delay: 282.995 ms

Loss rate: 2.09%

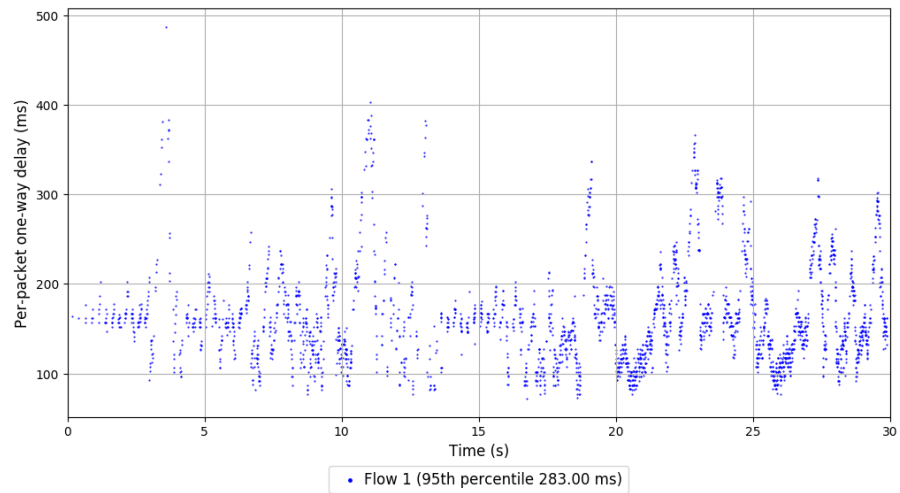
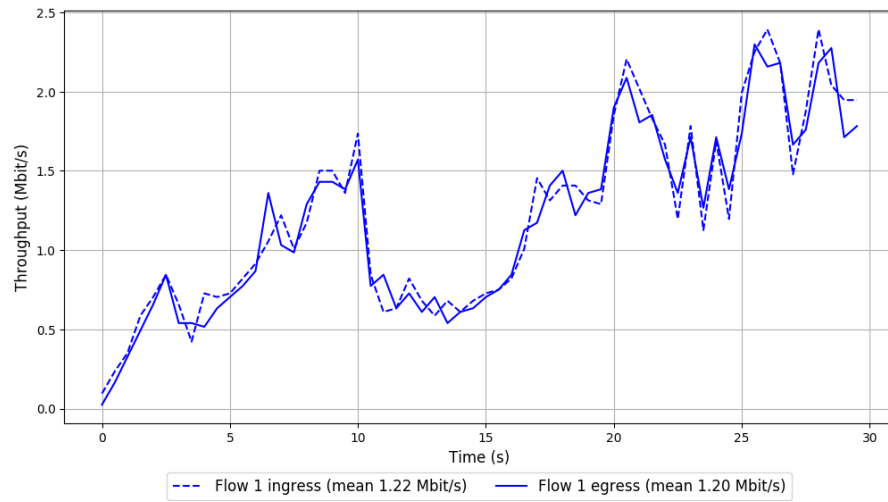
-- Flow 1:

Average throughput: 1.20 Mbit/s

95th percentile per-packet one-way delay: 282.995 ms

Loss rate: 2.09%

## Run 2: Report of LEDBAT — Data Link



Run 3: Statistics of LEDBAT

Start at: 2018-01-31 07:47:06

End at: 2018-01-31 07:47:36

Local clock offset: -0.801 ms

Remote clock offset: 2.93 ms

# Below is generated by plot.py at 2018-01-31 09:31:49

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 267.638 ms

Loss rate: 1.05%

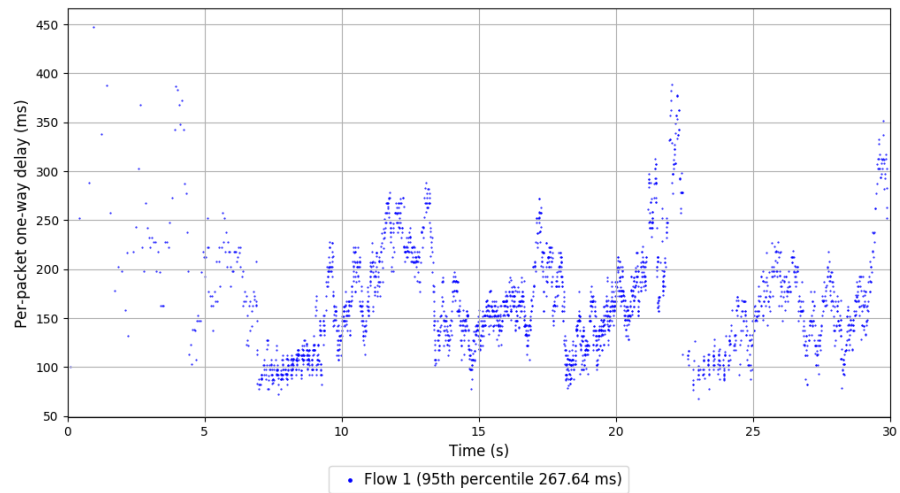
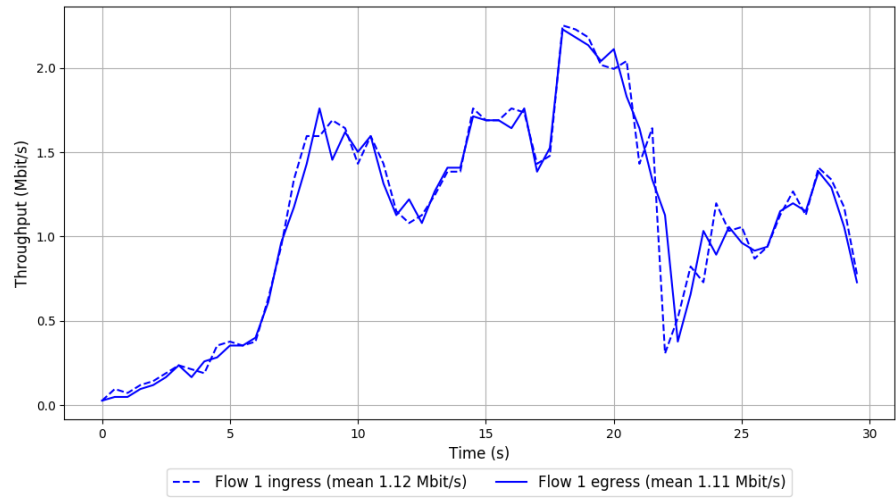
-- Flow 1:

Average throughput: 1.11 Mbit/s

95th percentile per-packet one-way delay: 267.638 ms

Loss rate: 1.05%

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



Run 1: Statistics of PCC

Start at: 2018-01-31 06:50:38

End at: 2018-01-31 06:51:08

Local clock offset: -3.494 ms

Remote clock offset: 1.545 ms

# Below is generated by plot.py at 2018-01-31 09:31:57

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.00 Mbit/s

95th percentile per-packet one-way delay: 367.242 ms

Loss rate: 34.64%

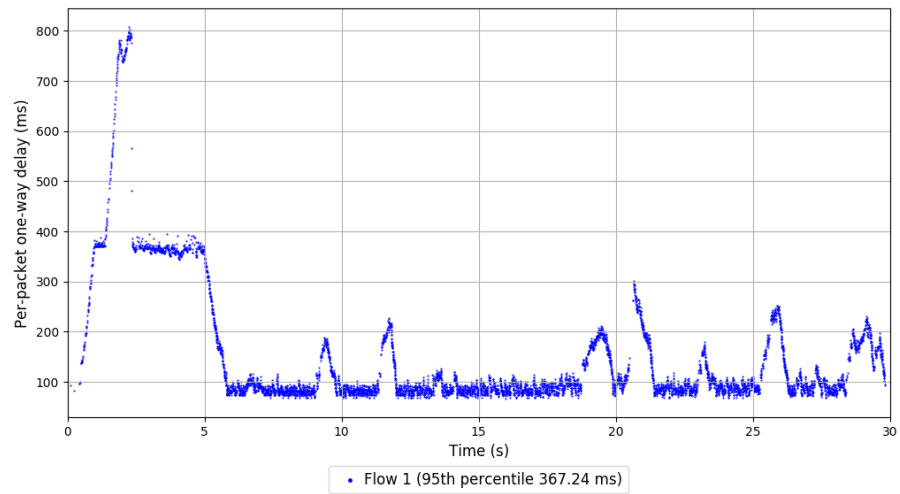
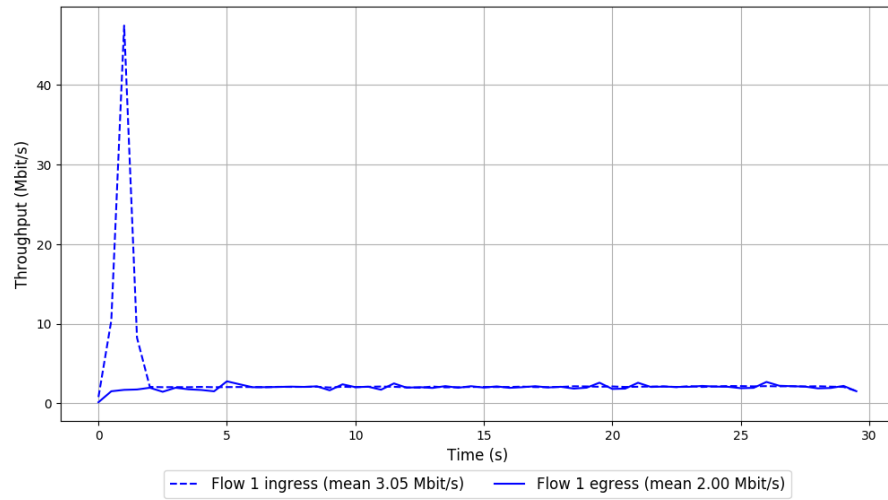
-- Flow 1:

Average throughput: 2.00 Mbit/s

95th percentile per-packet one-way delay: 367.242 ms

Loss rate: 34.64%

### Run 1: Report of PCC — Data Link



Run 2: Statistics of PCC

Start at: 2018-01-31 07:14:16

End at: 2018-01-31 07:14:46

Local clock offset: -0.582 ms

Remote clock offset: 1.653 ms

# Below is generated by plot.py at 2018-01-31 09:31:57

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 404.192 ms

Loss rate: 76.61%

-- Flow 1:

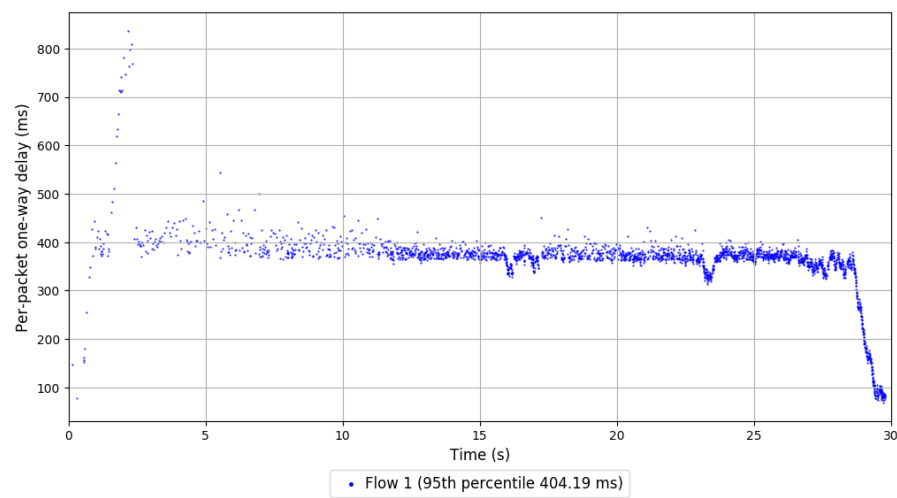
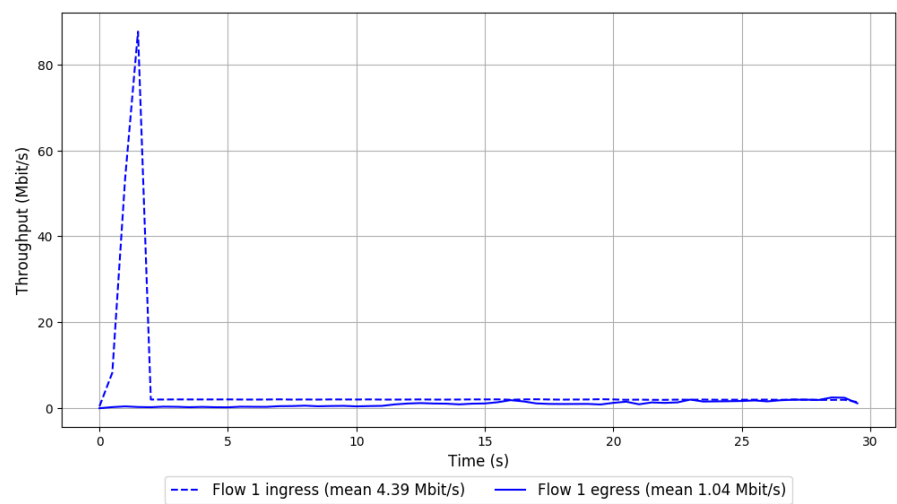
Average throughput: 1.04 Mbit/s

95th percentile per-packet one-way delay: 404.192 ms

Loss rate: 76.61%



Run 2: Report of PCC — Data Link



Run 3: Statistics of PCC

/home/ubuntu/pantheon\_data/2018-01-31T06-47-China-ppp0-to-AWS-Korea-3-runs/pcc\_stats\_run3.1

### Run 3: Report of PCC — Data Link

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Run 1: Statistics of QUIC Cubic

Start at: 2018-01-31 07:06:23

End at: 2018-01-31 07:06:53

Local clock offset: -0.679 ms

Remote clock offset: 2.394 ms

# Below is generated by plot.py at 2018-01-31 09:31:57

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.18 Mbit/s

95th percentile per-packet one-way delay: 371.797 ms

Loss rate: 4.63%

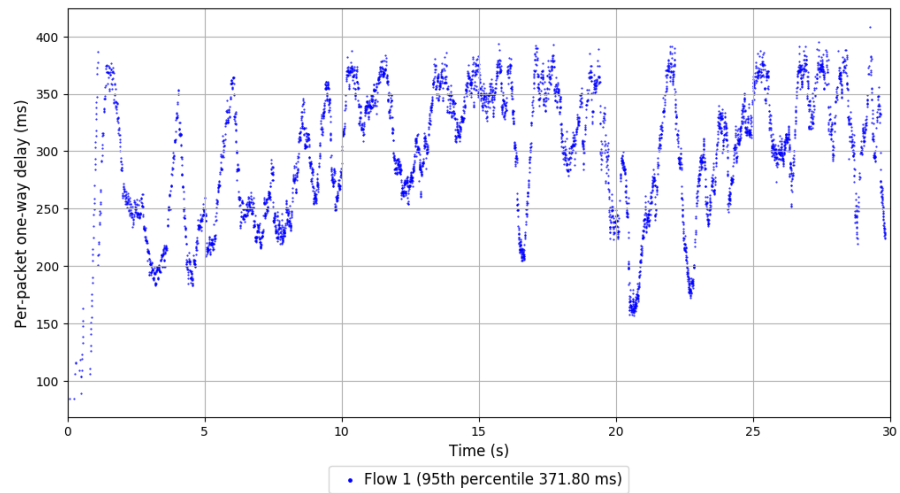
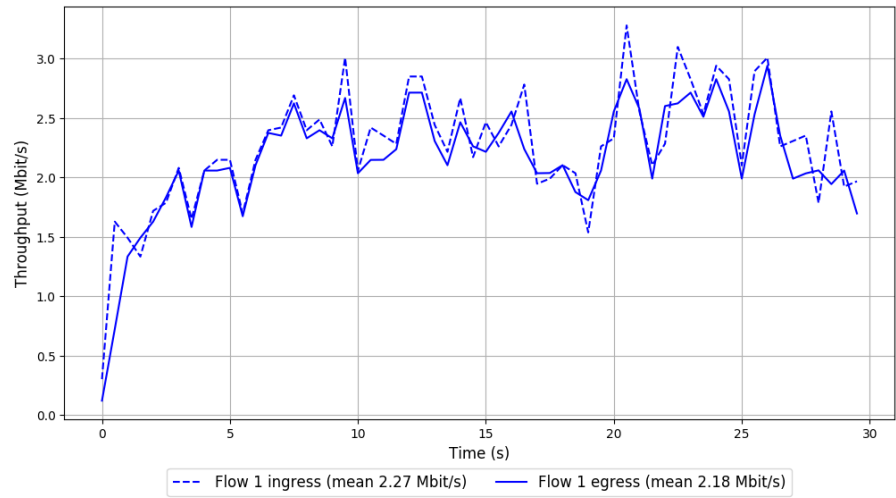
-- Flow 1:

Average throughput: 2.18 Mbit/s

95th percentile per-packet one-way delay: 371.797 ms

Loss rate: 4.63%

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



Run 2: Statistics of QUIC Cubic

Start at: 2018-01-31 07:33:43

End at: 2018-01-31 07:34:13

Local clock offset: -0.76 ms

Remote clock offset: 2.371 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.83 Mbit/s

95th percentile per-packet one-way delay: 369.111 ms

Loss rate: 4.04%

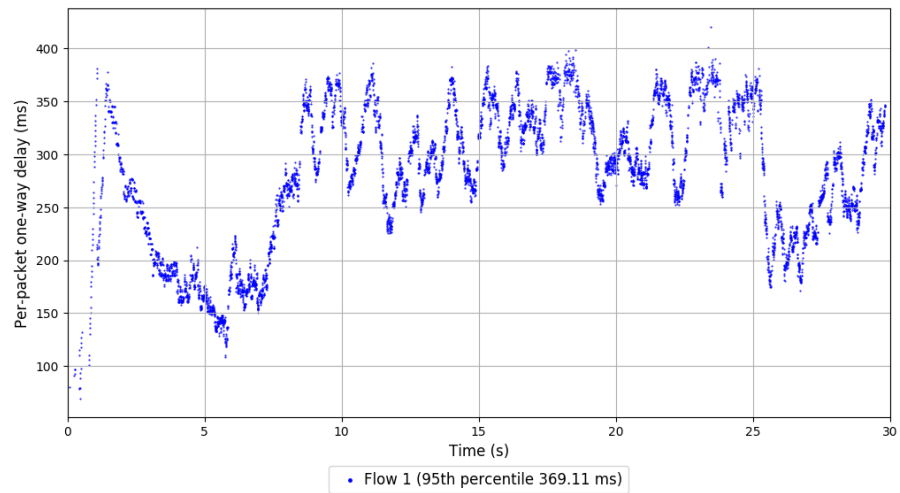
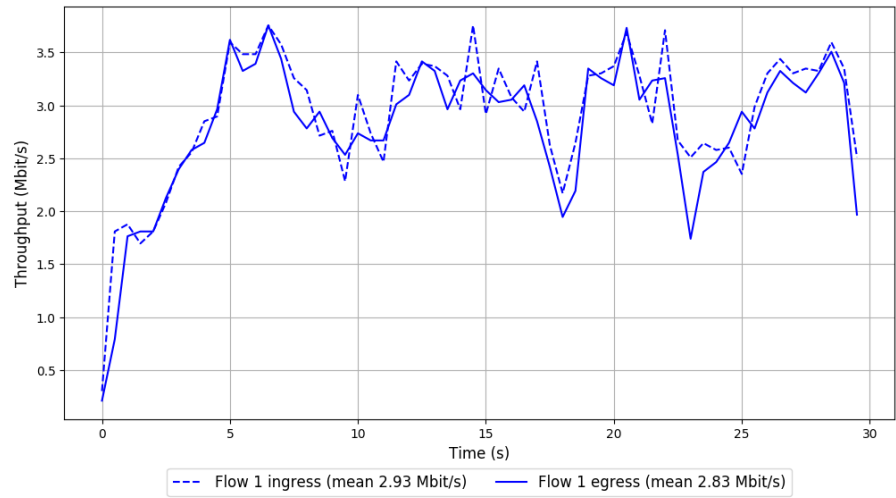
-- Flow 1:

Average throughput: 2.83 Mbit/s

95th percentile per-packet one-way delay: 369.111 ms

Loss rate: 4.04%

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



Run 3: Statistics of QUIC Cubic

Start at: 2018-01-31 08:00:46

End at: 2018-01-31 08:01:16

Local clock offset: -0.15 ms

Remote clock offset: 4.159 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.24 Mbit/s

95th percentile per-packet one-way delay: 369.625 ms

Loss rate: 5.75%

-- Flow 1:

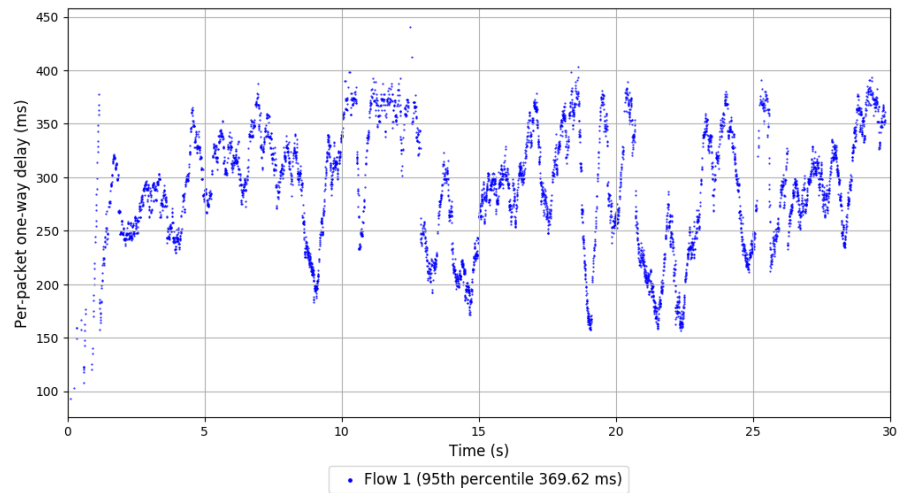
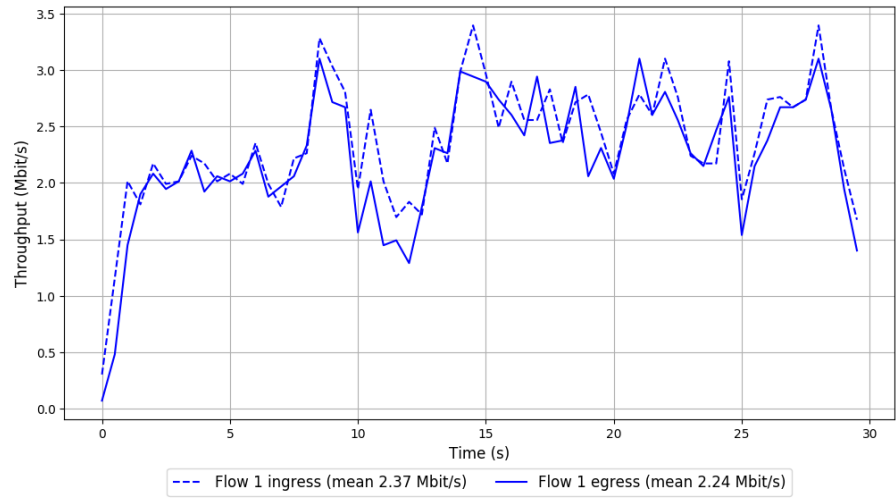
Average throughput: 2.24 Mbit/s

95th percentile per-packet one-way delay: 369.625 ms

Loss rate: 5.75%



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

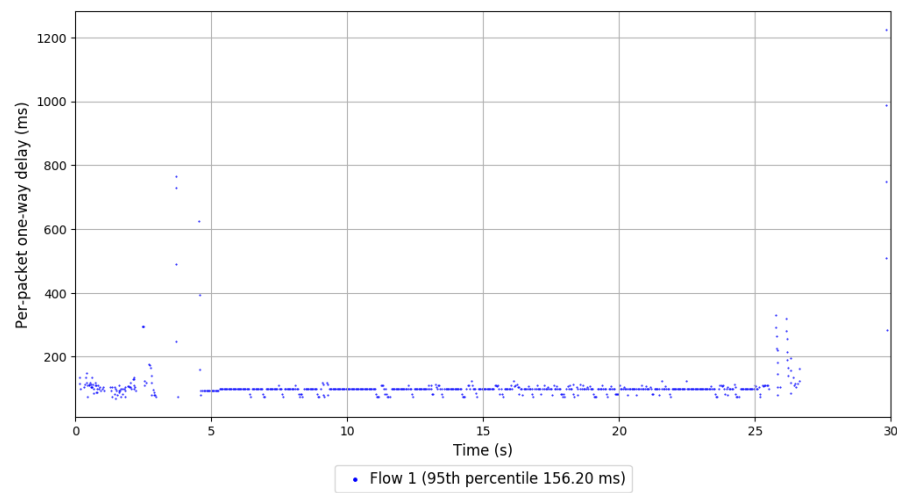
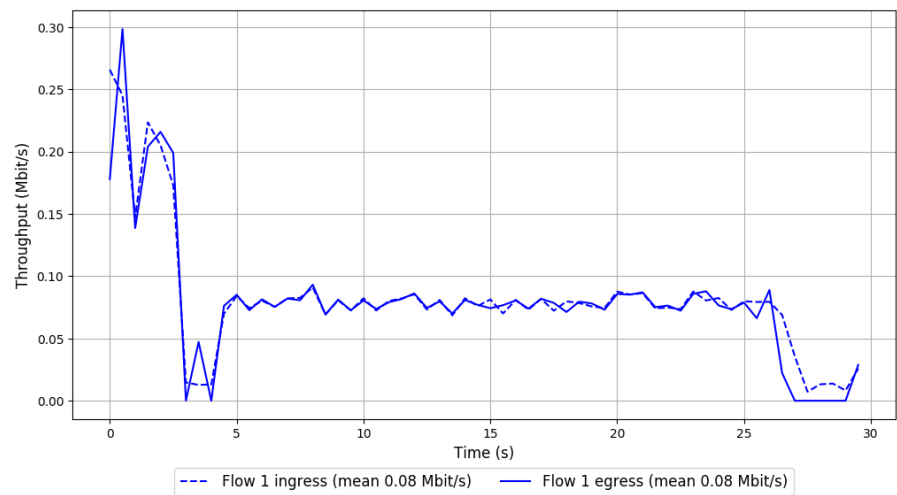


```
Run 1: Statistics of SCReAM

Start at: 2018-01-31 07:07:43
End at: 2018-01-31 07:08:13
Local clock offset: -0.803 ms
Remote clock offset: 2.107 ms

# Below is generated by plot.py at 2018-01-31 09:31:58
# Datalink statistics
-- Total of 1 flow:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 156.204 ms
Loss rate: 2.81%
-- Flow 1:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 156.204 ms
Loss rate: 2.81%
```

Run 1: Report of SReAM — Data Link



Run 2: Statistics of SCReAM

Start at: 2018-01-31 07:35:13

End at: 2018-01-31 07:35:43

Local clock offset: -0.852 ms

Remote clock offset: 2.442 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 117.943 ms

Loss rate: 0.49%

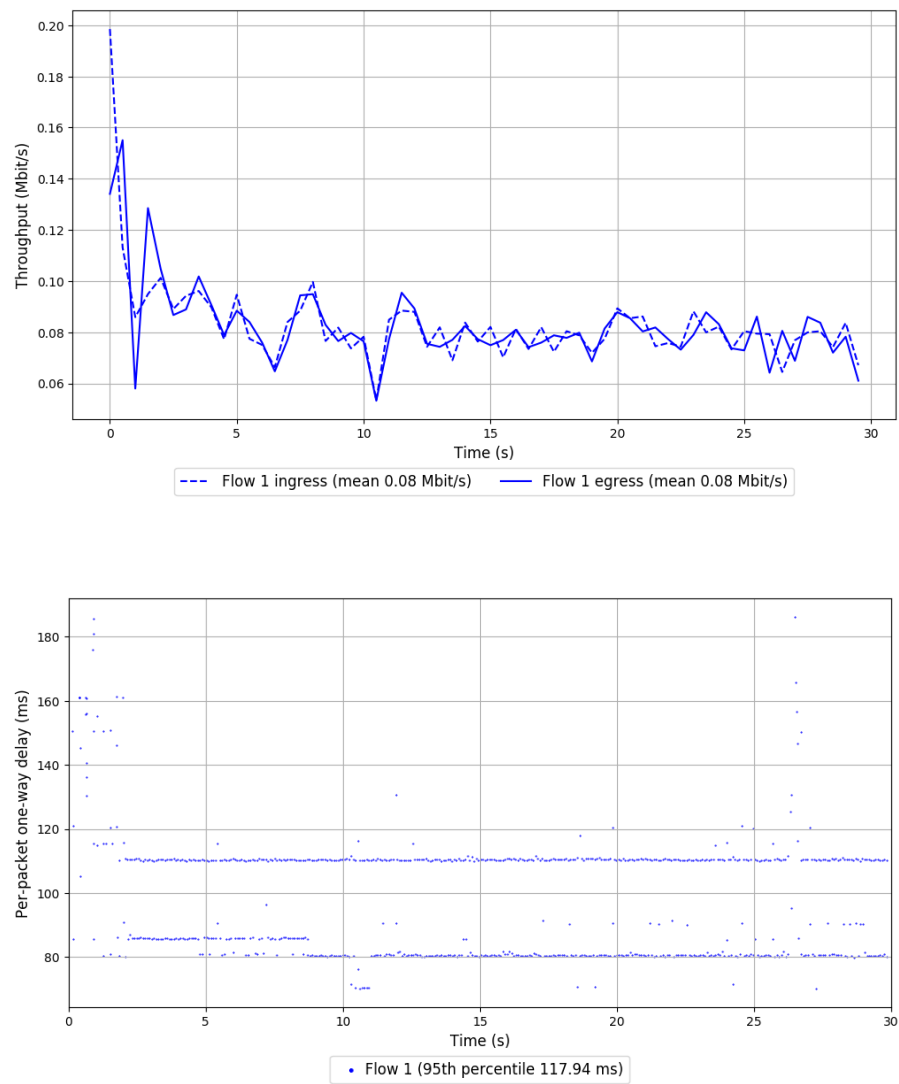
-- Flow 1:

Average throughput: 0.08 Mbit/s

95th percentile per-packet one-way delay: 117.943 ms

Loss rate: 0.49%

Run 2: Report of SReAM — Data Link



Run 3: Statistics of SCReAM

Start at: 2018-01-31 08:02:09

End at: 2018-01-31 08:02:39

Local clock offset: -0.236 ms

Remote clock offset: 4.386 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 93.916 ms

Loss rate: 0.43%

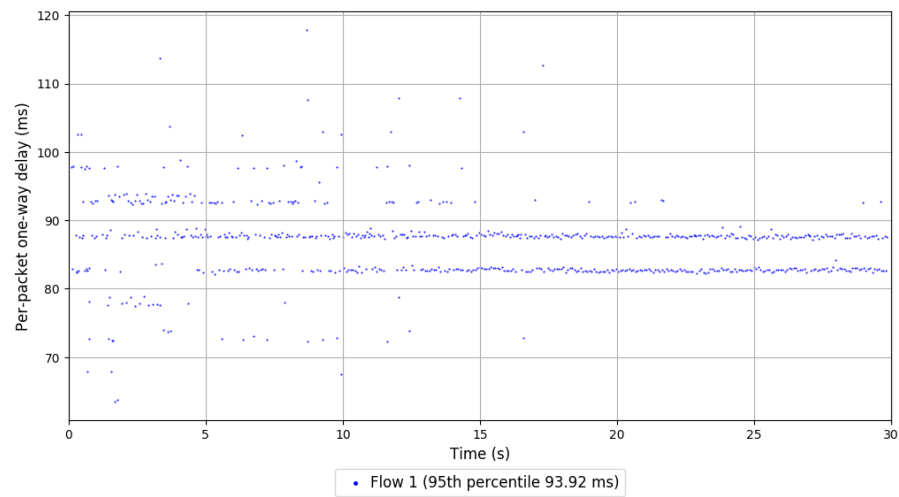
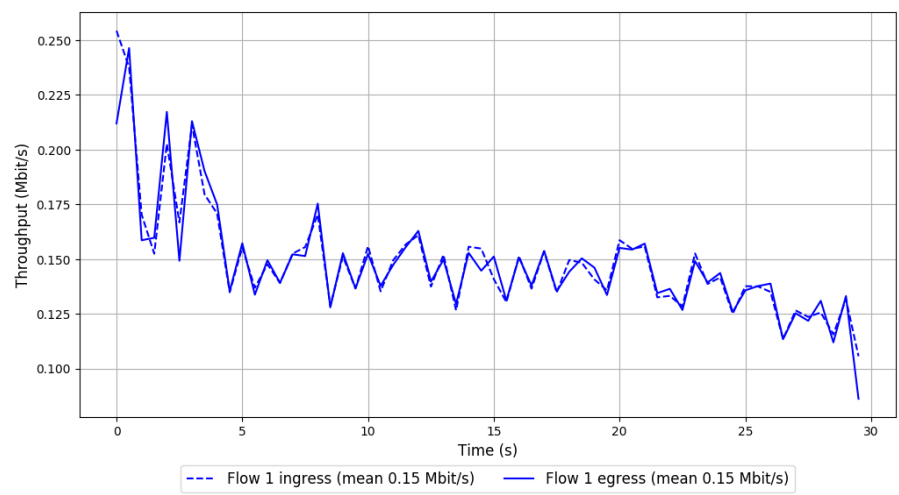
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 93.916 ms

Loss rate: 0.43%

Run 3: Report of SReAM — Data Link



Run 1: Statistics of WebRTC media

Start at: 2018-01-31 07:05:04

End at: 2018-01-31 07:05:34

Local clock offset: -0.631 ms

Remote clock offset: 2.61 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 847.376 ms

Loss rate: 18.63%

-- Flow 1:

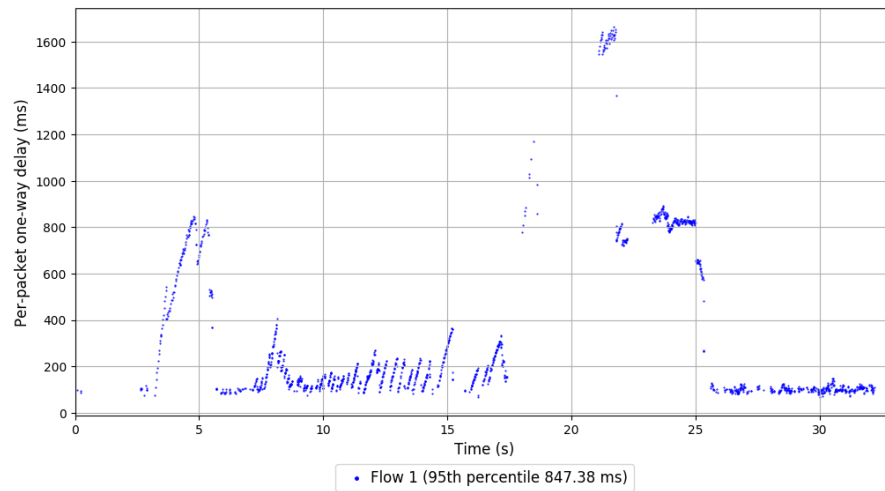
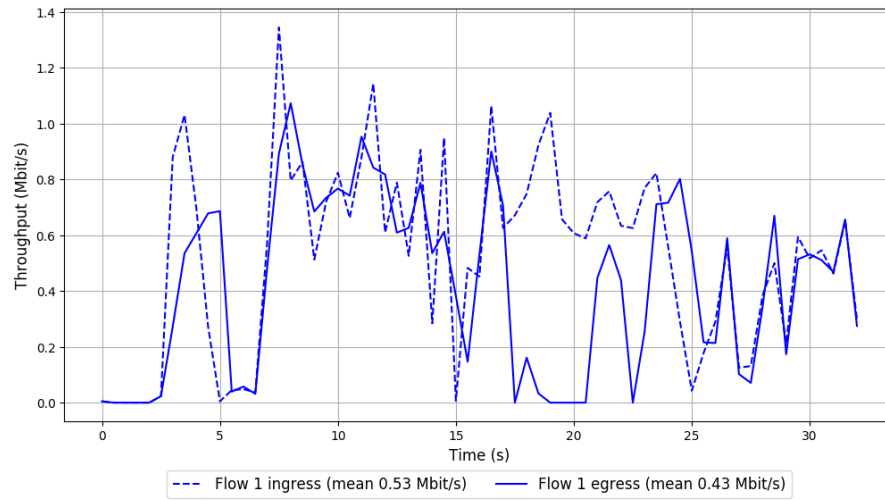
Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 847.376 ms

Loss rate: 18.63%



# Run 1: Report of WebRTC media — Data Link



Run 2: Statistics of WebRTC media

Start at: 2018-01-31 07:32:09

End at: 2018-01-31 07:32:39

Local clock offset: -0.336 ms

Remote clock offset: 2.162 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 369.768 ms

Loss rate: 9.07%

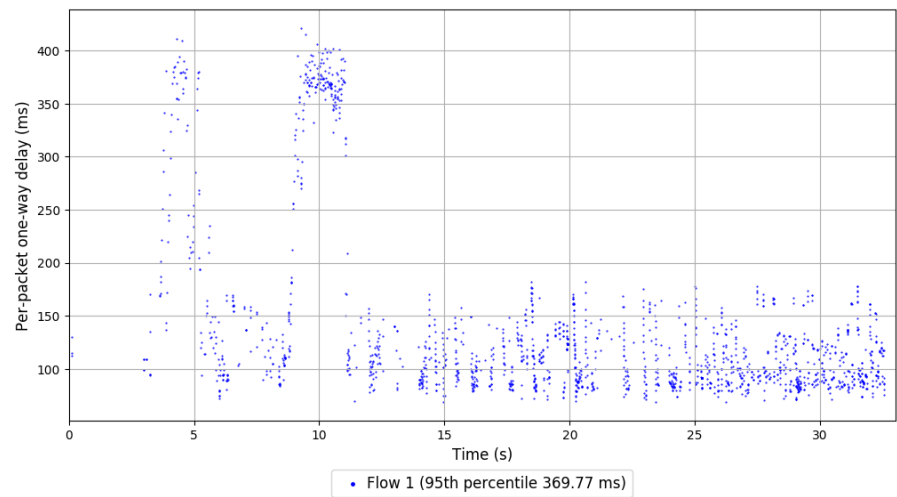
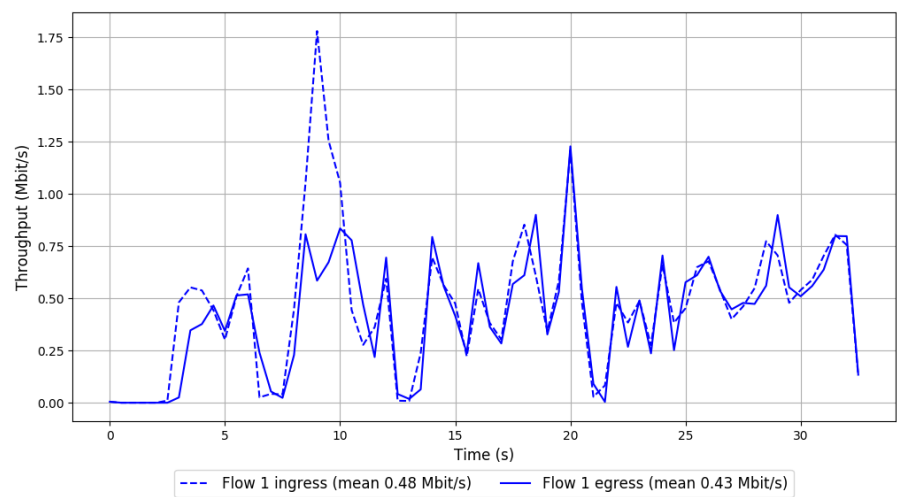
-- Flow 1:

Average throughput: 0.43 Mbit/s

95th percentile per-packet one-way delay: 369.768 ms

Loss rate: 9.07%

Run 2: Report of WebRTC media — Data Link



Run 3: Statistics of WebRTC media

Start at: 2018-01-31 07:59:25

End at: 2018-01-31 07:59:55

Local clock offset: -3.216 ms

Remote clock offset: 3.994 ms

# Below is generated by plot.py at 2018-01-31 09:31:58

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 148.221 ms

Loss rate: 1.11%

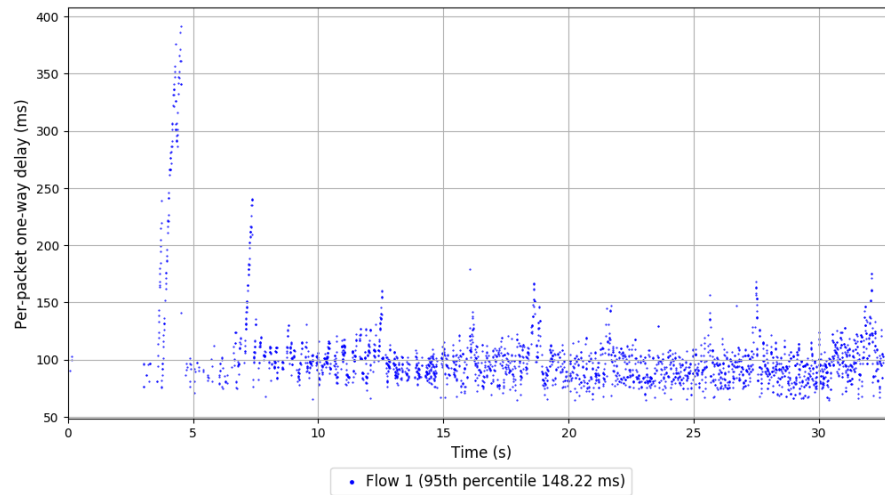
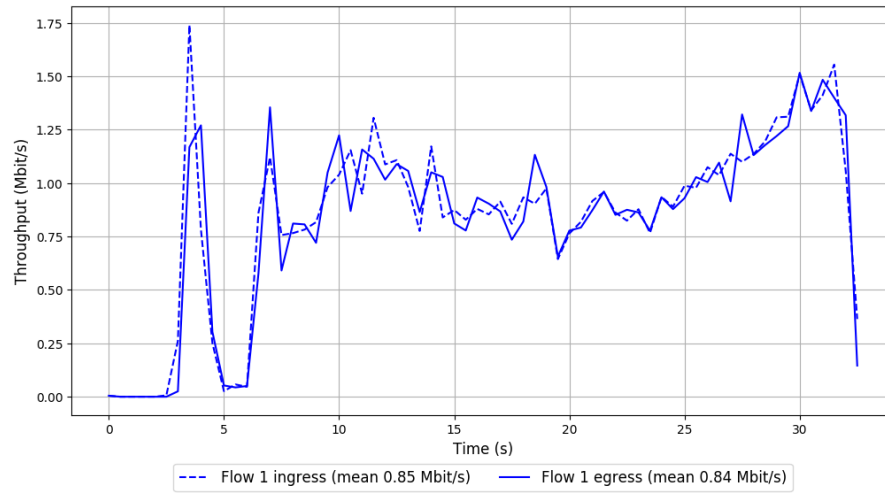
-- Flow 1:

Average throughput: 0.84 Mbit/s

95th percentile per-packet one-way delay: 148.221 ms

Loss rate: 1.11%

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



Run 1: Statistics of Sprout

Start at: 2018-01-31 06:51:57

End at: 2018-01-31 06:52:27

Local clock offset: -0.71 ms

Remote clock offset: 1.514 ms

# Below is generated by plot.py at 2018-01-31 09:31:59

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 151.298 ms

Loss rate: 0.52%

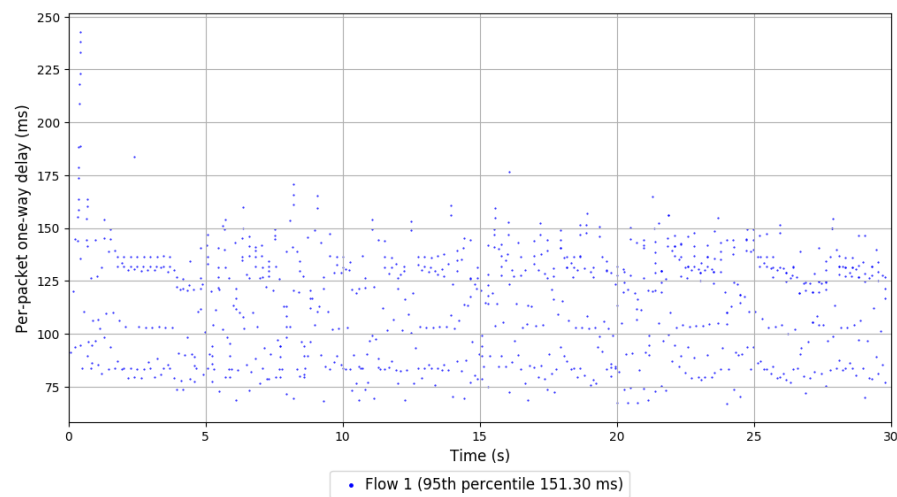
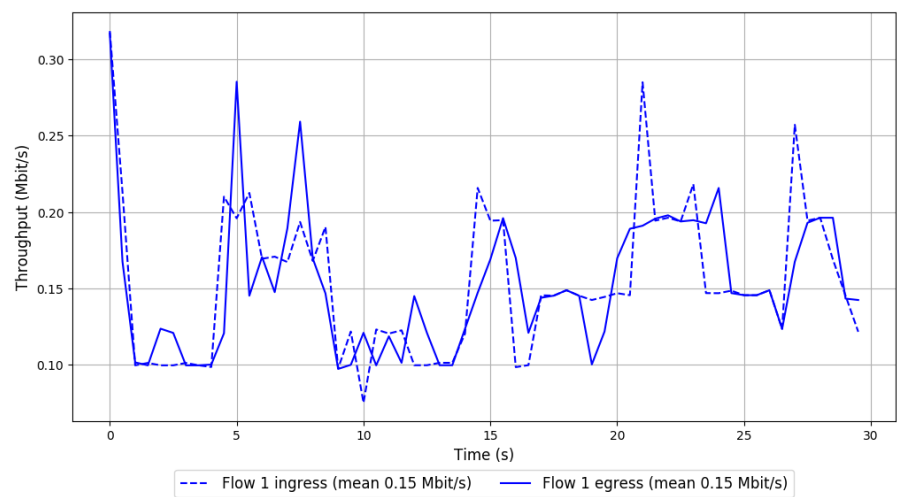
-- Flow 1:

Average throughput: 0.15 Mbit/s

95th percentile per-packet one-way delay: 151.298 ms

Loss rate: 0.52%

Run 1: Report of Sprout — Data Link



Run 2: Statistics of Sprout

Start at: 2018-01-31 07:15:35

End at: 2018-01-31 07:16:05

Local clock offset: -0.554 ms

Remote clock offset: 1.611 ms

# Below is generated by plot.py at 2018-01-31 09:31:59

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 129.917 ms

Loss rate: 1.06%

-- Flow 1:

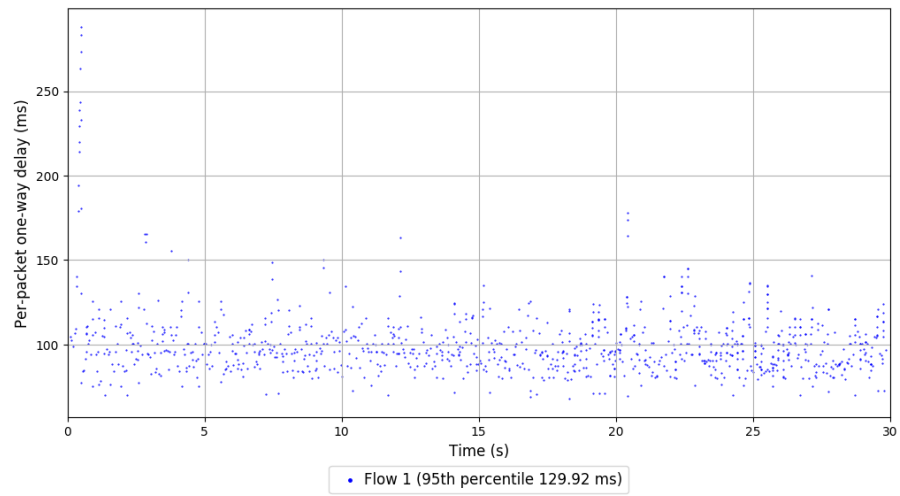
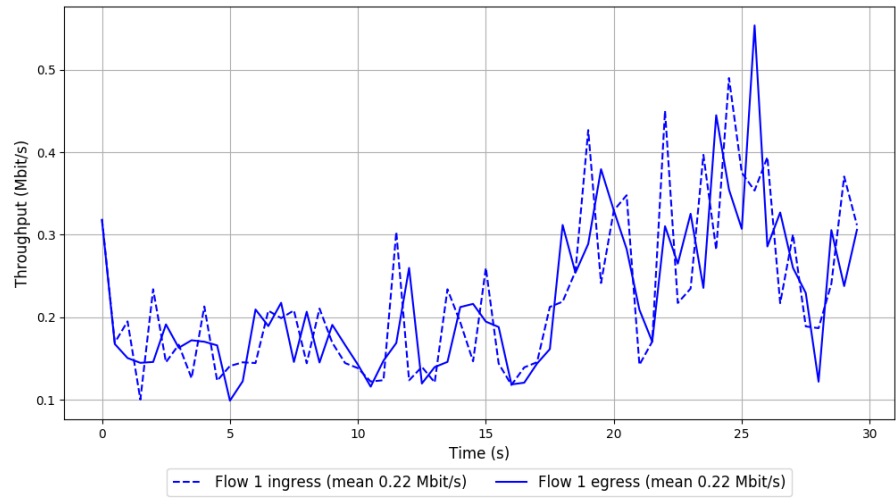
Average throughput: 0.22 Mbit/s

95th percentile per-packet one-way delay: 129.917 ms

Loss rate: 1.06%



## Run 2: Report of Sprout — Data Link



Run 3: Statistics of Sprout

Start at: 2018-01-31 07:45:45

End at: 2018-01-31 07:46:15

Local clock offset: -0.436 ms

Remote clock offset: 2.866 ms

# Below is generated by plot.py at 2018-01-31 09:31:59

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 150.116 ms

Loss rate: 0.44%

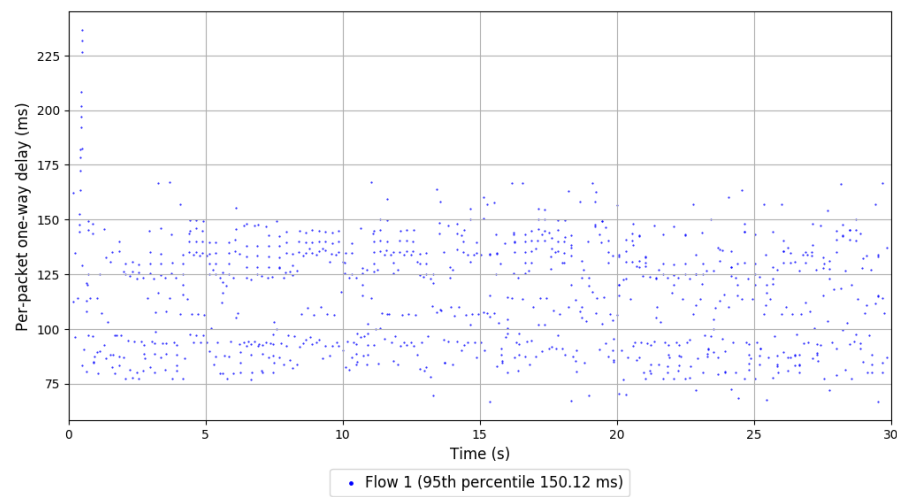
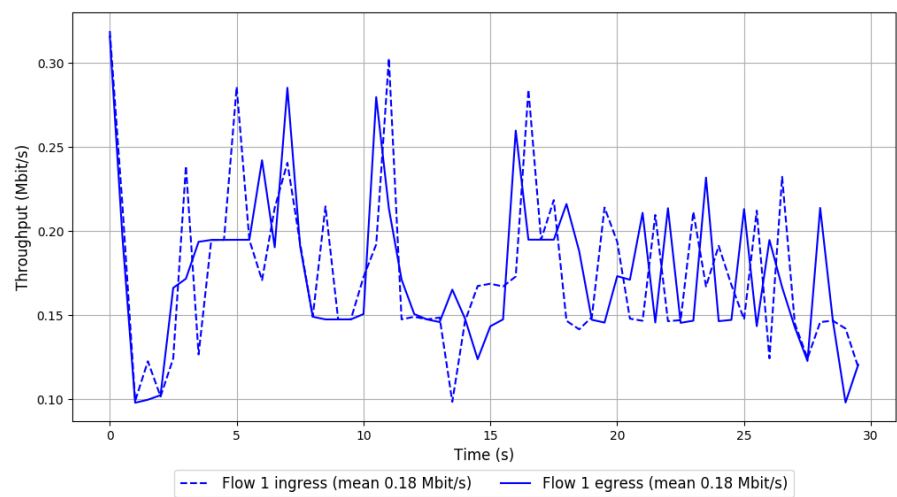
-- Flow 1:

Average throughput: 0.18 Mbit/s

95th percentile per-packet one-way delay: 150.116 ms

Loss rate: 0.44%

Run 3: Report of Sprout — Data Link



Run 1: Statistics of TaoVA-100x

Start at: 2018-01-31 06:55:52

End at: 2018-01-31 06:56:22

Local clock offset: -0.688 ms

Remote clock offset: 1.693 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 238.031 ms

Loss rate: 2.18%

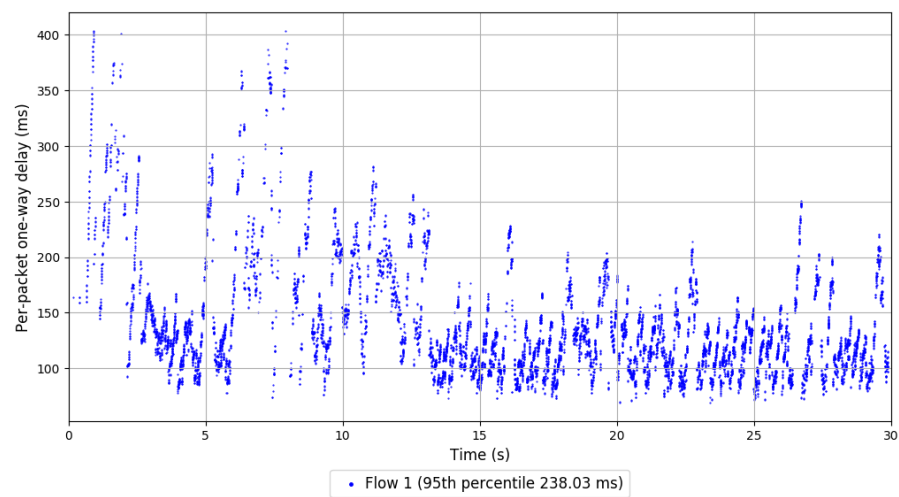
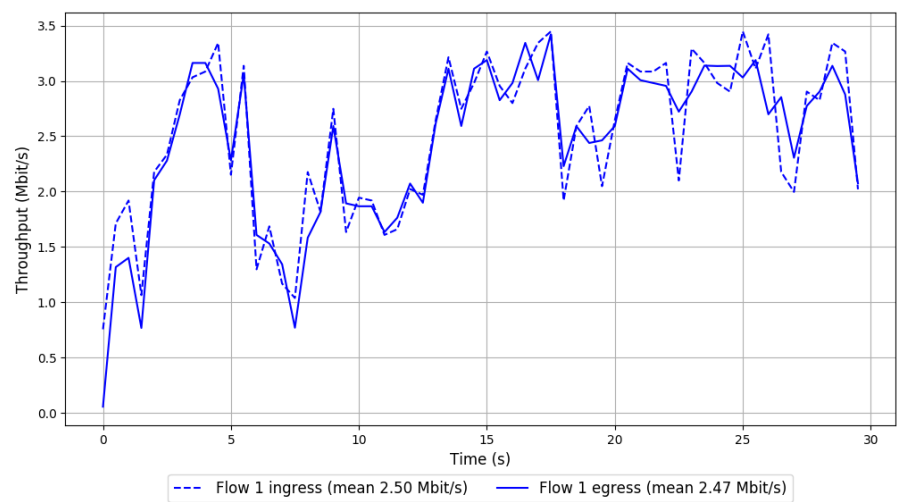
-- Flow 1:

Average throughput: 2.47 Mbit/s

95th percentile per-packet one-way delay: 238.031 ms

Loss rate: 2.18%

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



Run 2: Statistics of TaoVA-100x

/home/ubuntu/pantheon\_data/2018-01-31T06-47-China-ppp0-to-AWS-Korea-3-runs/taova\_stats\_run2.

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

Figure is missing

Figure is missing

Run 3: Statistics of TaoVA-100x

Start at: 2018-01-31 07:49:48

End at: 2018-01-31 07:50:18

Local clock offset: -0.545 ms

Remote clock offset: 3.085 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.27 Mbit/s

95th percentile per-packet one-way delay: 209.659 ms

Loss rate: 3.67%

-- Flow 1:

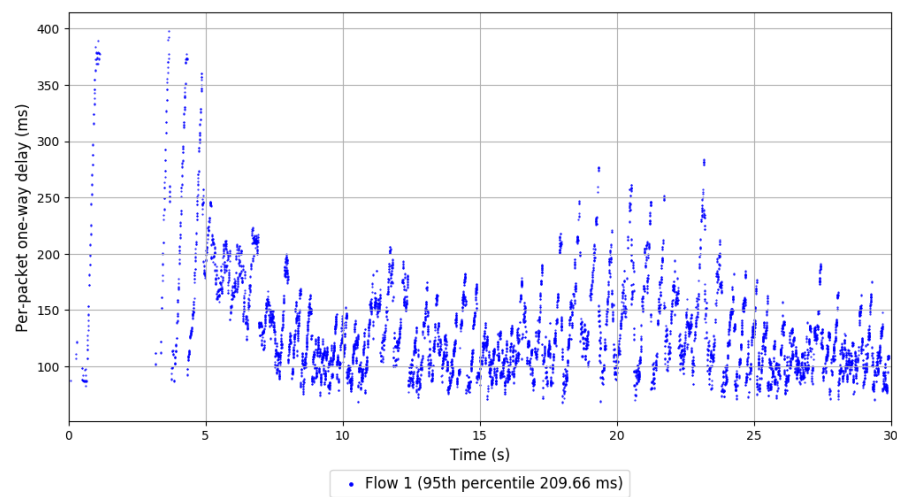
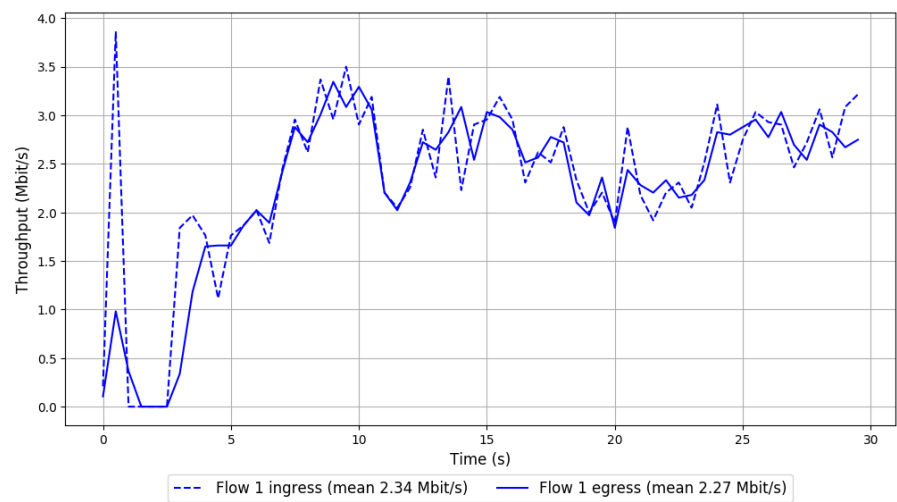
Average throughput: 2.27 Mbit/s

95th percentile per-packet one-way delay: 209.659 ms

Loss rate: 3.67%



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



Run 1: Statistics of TCP Vegas

Start at: 2018-01-31 06:58:30

End at: 2018-01-31 06:59:00

Local clock offset: -3.379 ms

Remote clock offset: 1.977 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 161.744 ms

Loss rate: 0.50%

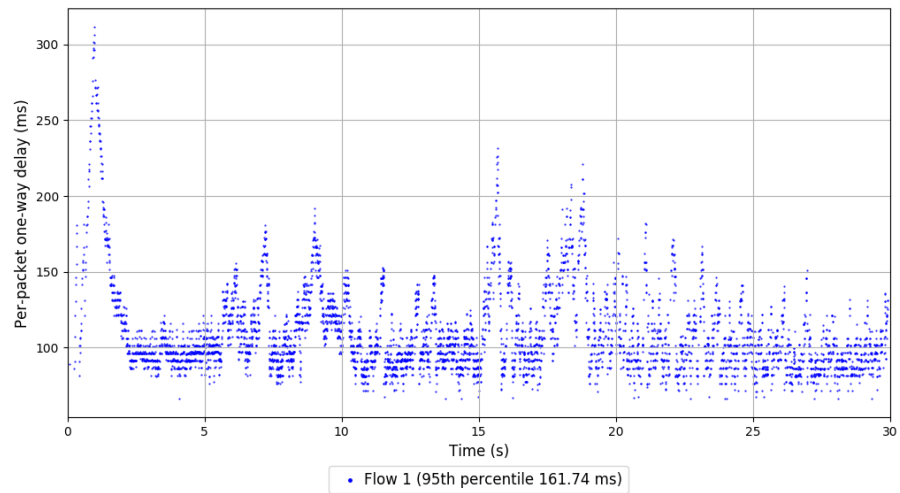
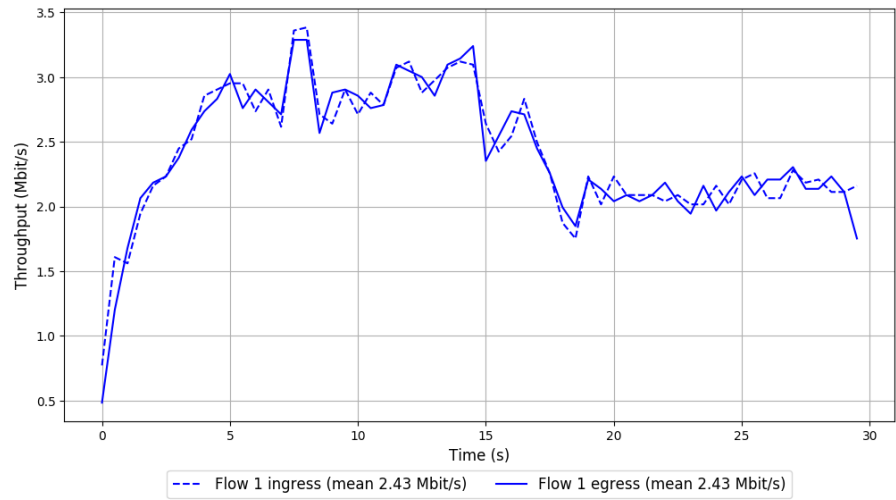
-- Flow 1:

Average throughput: 2.43 Mbit/s

95th percentile per-packet one-way delay: 161.744 ms

Loss rate: 0.50%

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



Run 2: Statistics of TCP Vegas

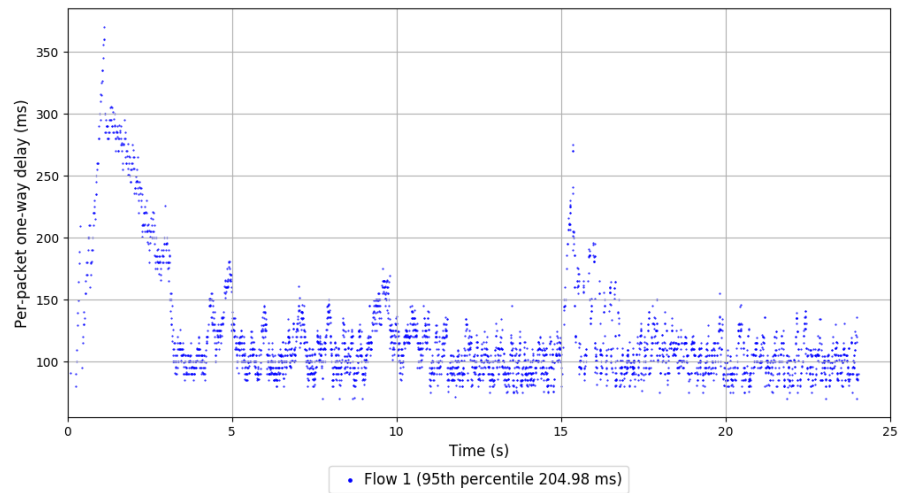
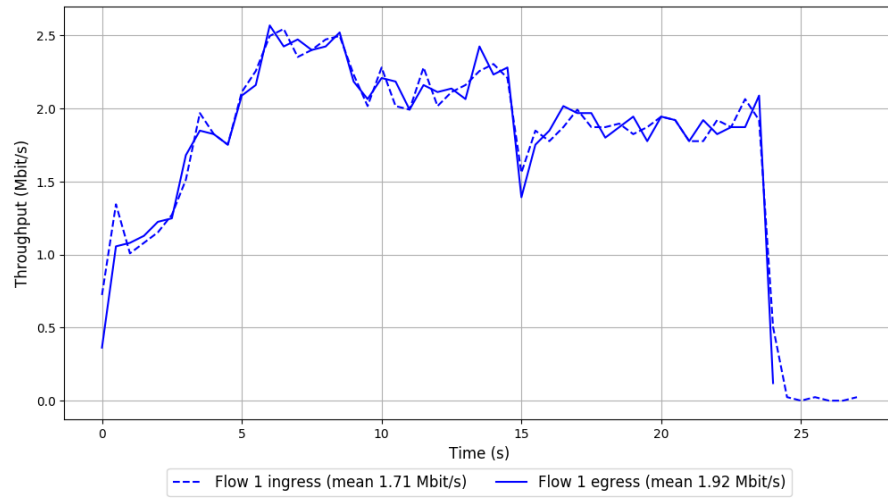
Start at: 2018-01-31 07:23:27

End at: 2018-01-31 07:23:57

Local clock offset: -0.778 ms

Remote clock offset: 1.705 ms

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



Run 3: Statistics of TCP Vegas

Start at: 2018-01-31 07:52:34

End at: 2018-01-31 07:53:04

Local clock offset: -0.4 ms

Remote clock offset: 3.247 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.44 Mbit/s

95th percentile per-packet one-way delay: 148.790 ms

Loss rate: 0.53%

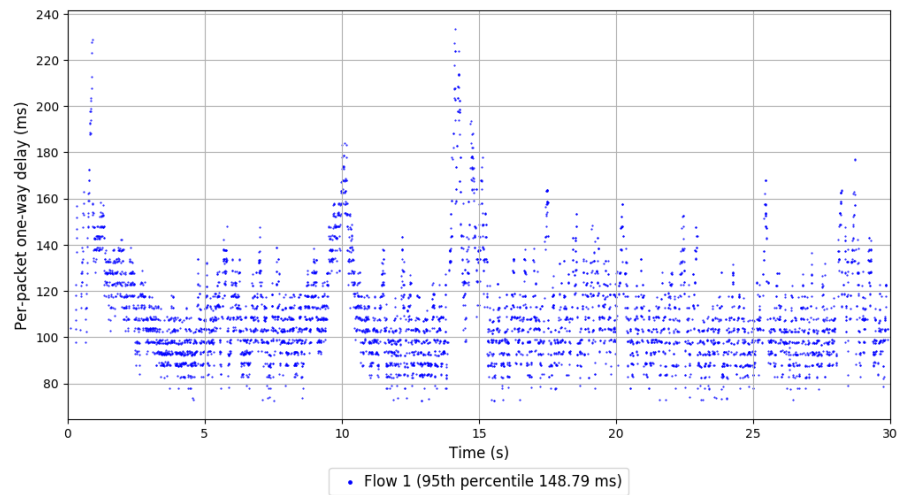
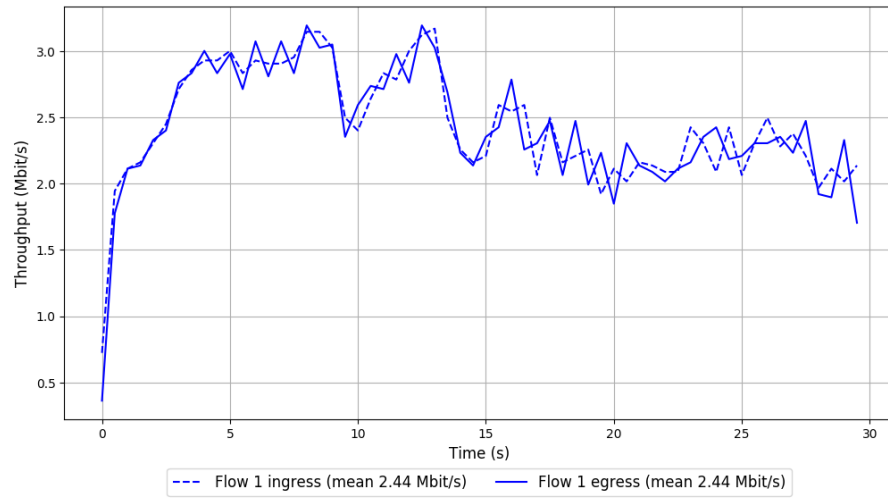
-- Flow 1:

Average throughput: 2.44 Mbit/s

95th percentile per-packet one-way delay: 148.790 ms

Loss rate: 0.53%

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



Run 1: Statistics of Verus

Start at: 2018-01-31 06:59:49

End at: 2018-01-31 07:00:19

Local clock offset: -0.848 ms

Remote clock offset: 2.135 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.59 Mbit/s

95th percentile per-packet one-way delay: 379.940 ms

Loss rate: 21.82%

-- Flow 1:

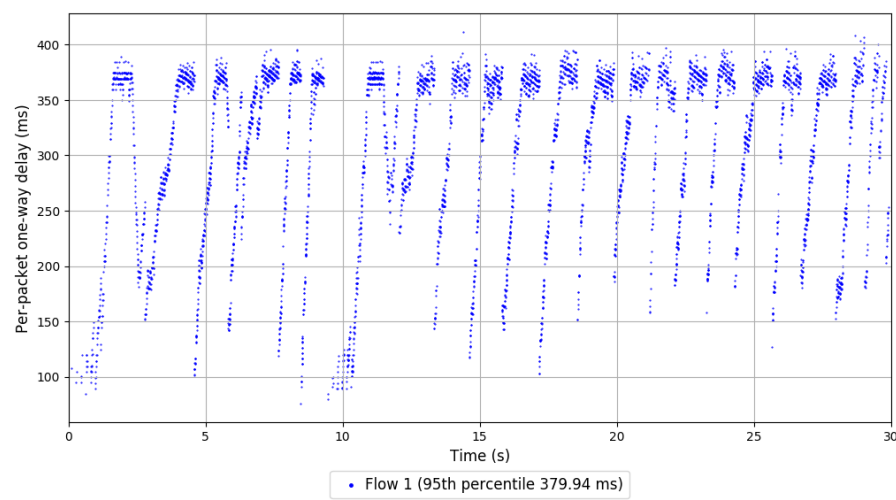
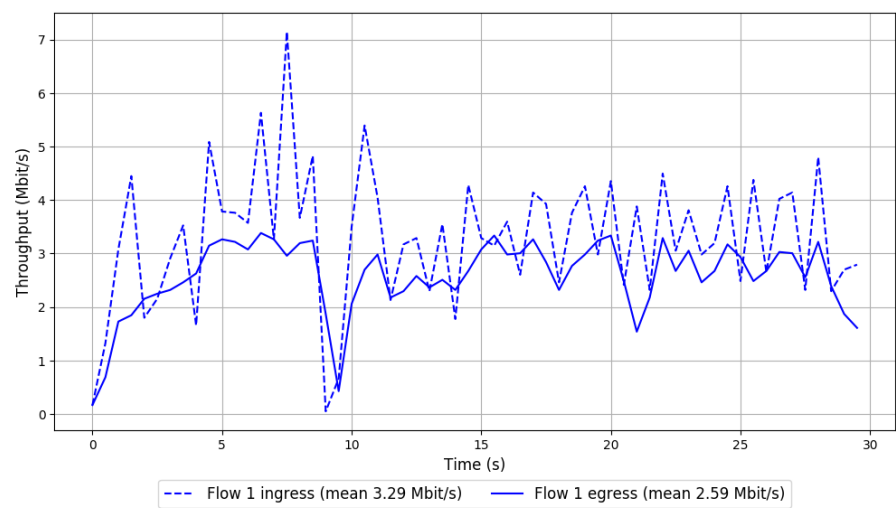
Average throughput: 2.59 Mbit/s

95th percentile per-packet one-way delay: 379.940 ms

Loss rate: 21.82%



Run 1: Report of Verus — Data Link



Run 2: Statistics of Verus

/home/ubuntu/pantheon\_data/2018-01-31T06-47-China-ppp0-to-AWS-Korea-3-runs/verus\_stats\_run2.

Run 2: Report of Verus — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of Verus

Start at: 2018-01-31 07:53:56

End at: 2018-01-31 07:54:26

Local clock offset: -0.18 ms

Remote clock offset: 3.336 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.62 Mbit/s

95th percentile per-packet one-way delay: 377.964 ms

Loss rate: 22.18%

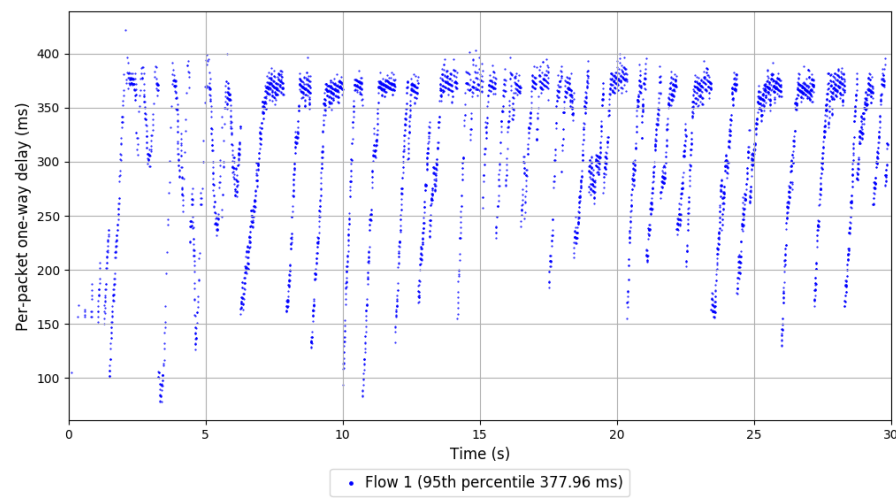
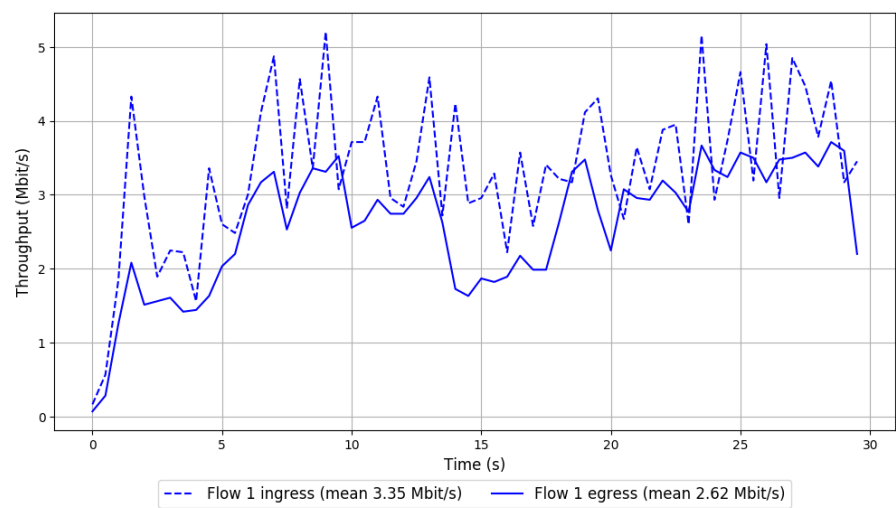
-- Flow 1:

Average throughput: 2.62 Mbit/s

95th percentile per-packet one-way delay: 377.964 ms

Loss rate: 22.18%

Run 3: Report of Verus — Data Link



Run 1: Statistics of Copa

Start at: 2018-01-31 07:02:27

End at: 2018-01-31 07:02:57

Local clock offset: -0.906 ms

Remote clock offset: 2.535 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.79 Mbit/s

95th percentile per-packet one-way delay: 107.792 ms

Loss rate: 0.72%

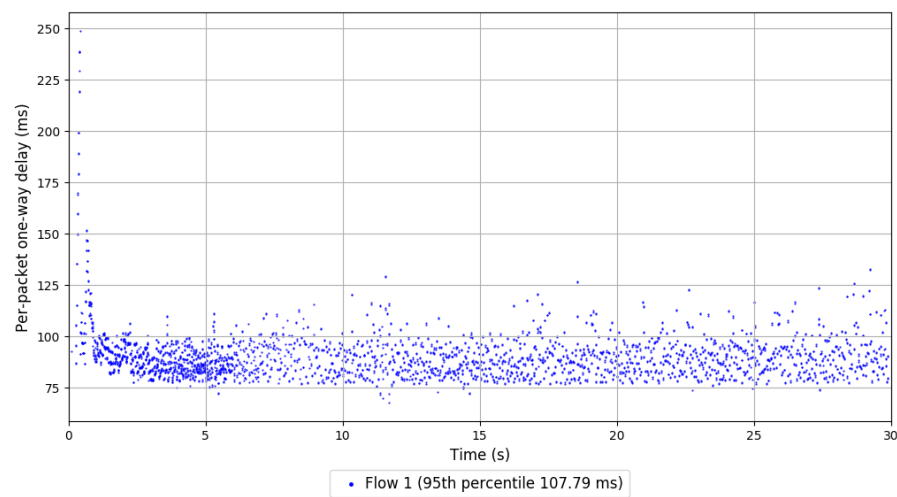
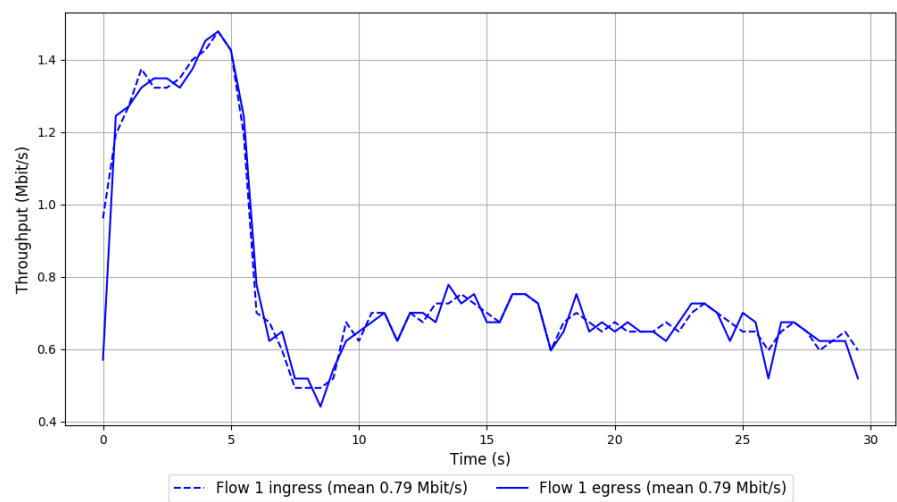
-- Flow 1:

Average throughput: 0.79 Mbit/s

95th percentile per-packet one-way delay: 107.792 ms

Loss rate: 0.72%

Run 1: Report of Copa — Data Link



Run 2: Statistics of Copa

/home/ubuntu/pantheon\_data/2018-01-31T06-47-China-ppp0-to-AWS-Korea-3-runs/copa\_stats\_run2.1



Run 2: Report of Copa — Data Link

Figure is missing

Figure is missing

Run 3: Statistics of Copa

Start at: 2018-01-31 07:56:40

End at: 2018-01-31 07:57:10

Local clock offset: -0.377 ms

Remote clock offset: 3.716 ms

# Below is generated by plot.py at 2018-01-31 09:32:08

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.74 Mbit/s

95th percentile per-packet one-way delay: 112.888 ms

Loss rate: 1.41%

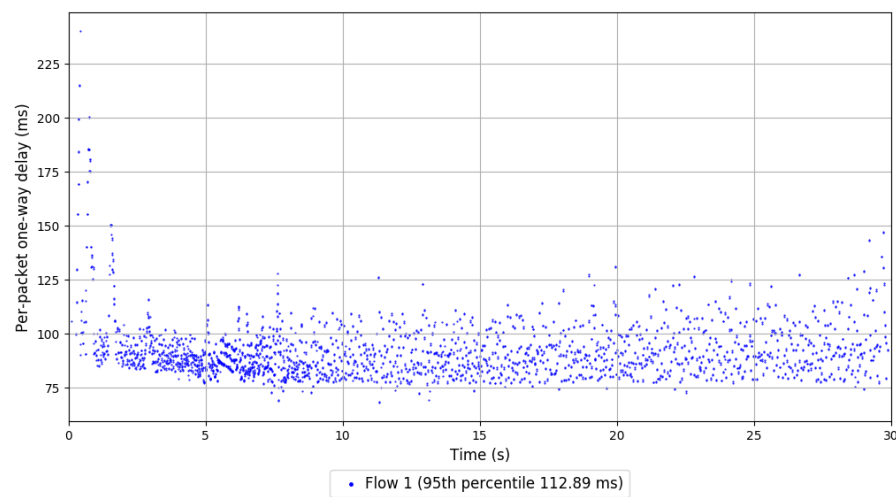
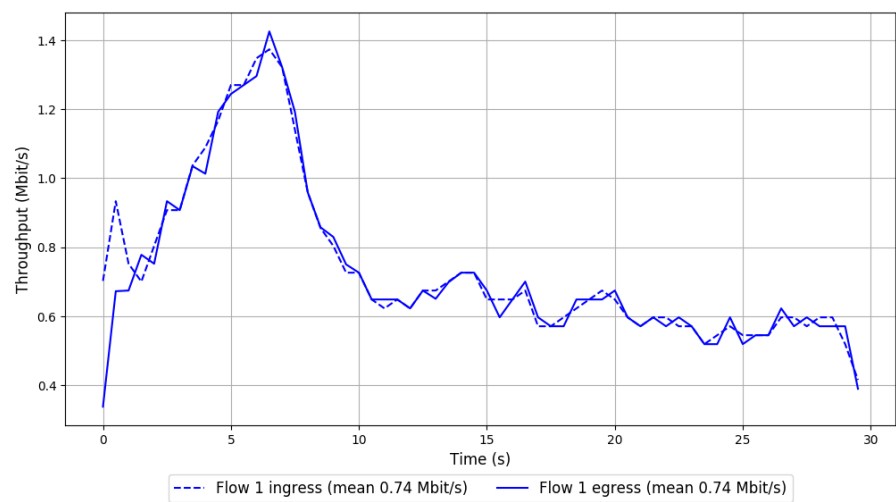
-- Flow 1:

Average throughput: 0.74 Mbit/s

95th percentile per-packet one-way delay: 112.888 ms

Loss rate: 1.41%

Run 3: Report of Copa — Data Link

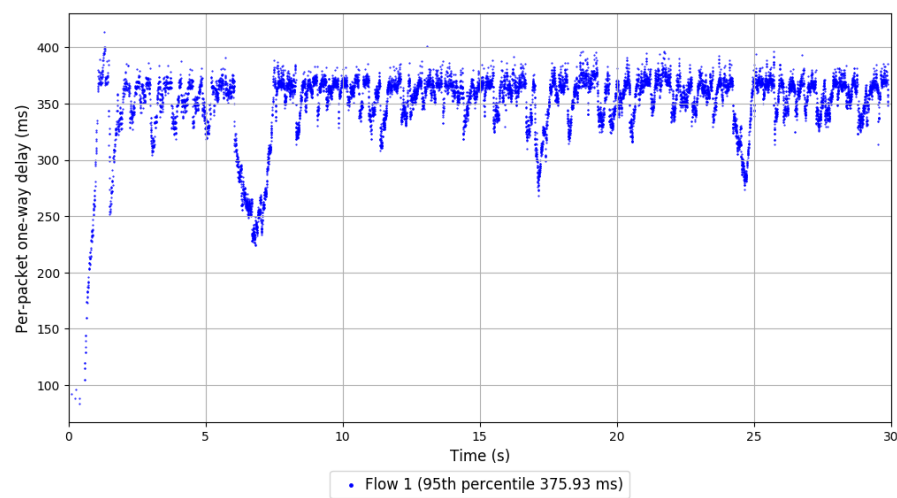
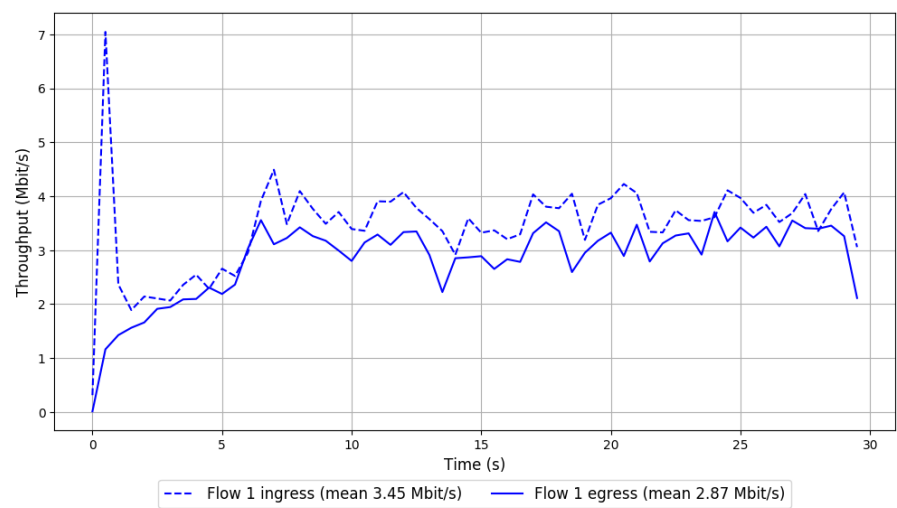


```
Run 1: Statistics of FillP

Start at: 2018-01-31 07:10:20
End at: 2018-01-31 07:10:50
Local clock offset: -0.761 ms
Remote clock offset: 1.844 ms

# Below is generated by plot.py at 2018-01-31 09:32:16
# Datalink statistics
-- Total of 1 flow:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 375.928 ms
Loss rate: 17.28%
-- Flow 1:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 375.928 ms
Loss rate: 17.28%
```

Run 1: Report of FillP — Data Link



Run 2: Statistics of FillP

Start at: 2018-01-31 07:38:28

End at: 2018-01-31 07:38:58

Local clock offset: -0.729 ms

Remote clock offset: 2.79 ms

# Below is generated by plot.py at 2018-01-31 09:32:17

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 376.324 ms

Loss rate: 14.92%

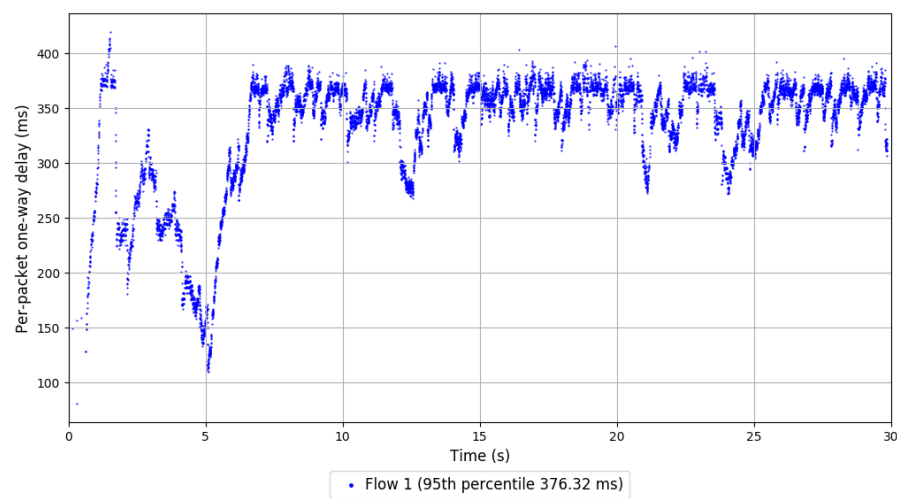
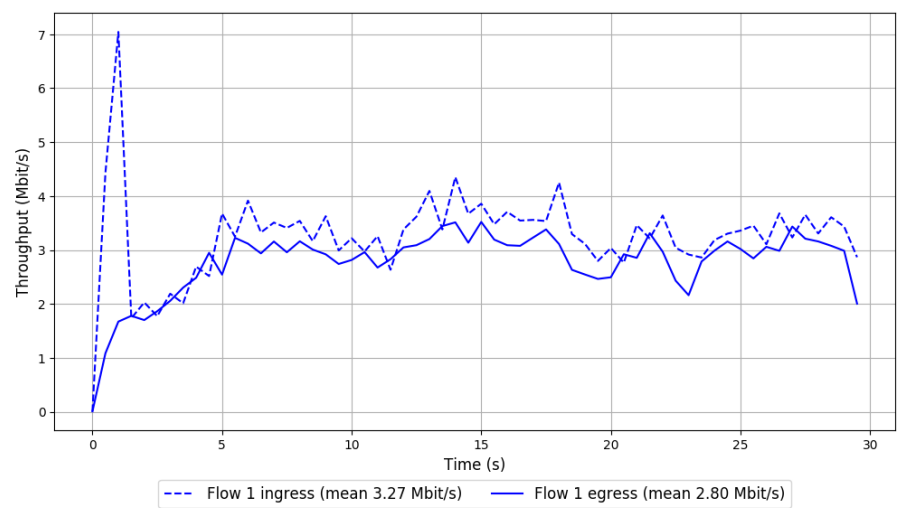
-- Flow 1:

Average throughput: 2.80 Mbit/s

95th percentile per-packet one-way delay: 376.324 ms

Loss rate: 14.92%

Run 2: Report of FillP — Data Link



Run 3: Statistics of FillP

Start at: 2018-01-31 08:04:53

End at: 2018-01-31 08:05:23

Local clock offset: -0.396 ms

Remote clock offset: 4.715 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.72 Mbit/s

95th percentile per-packet one-way delay: 370.212 ms

Loss rate: 15.54%

-- Flow 1:

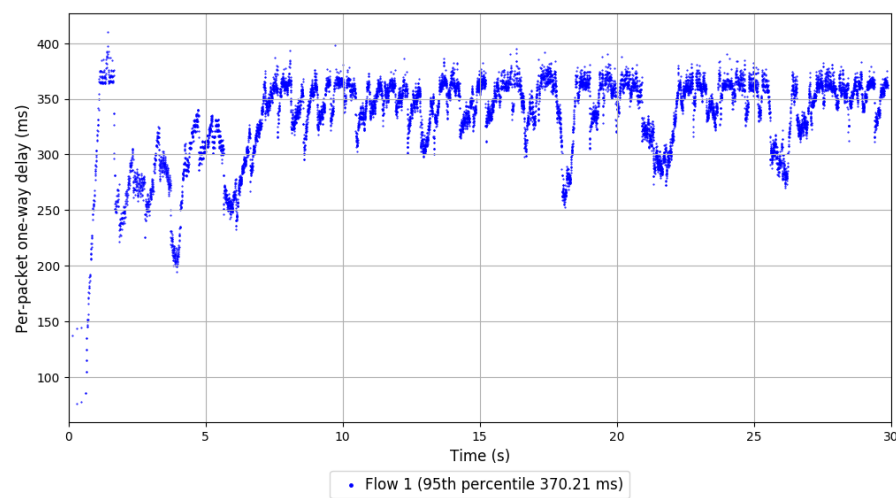
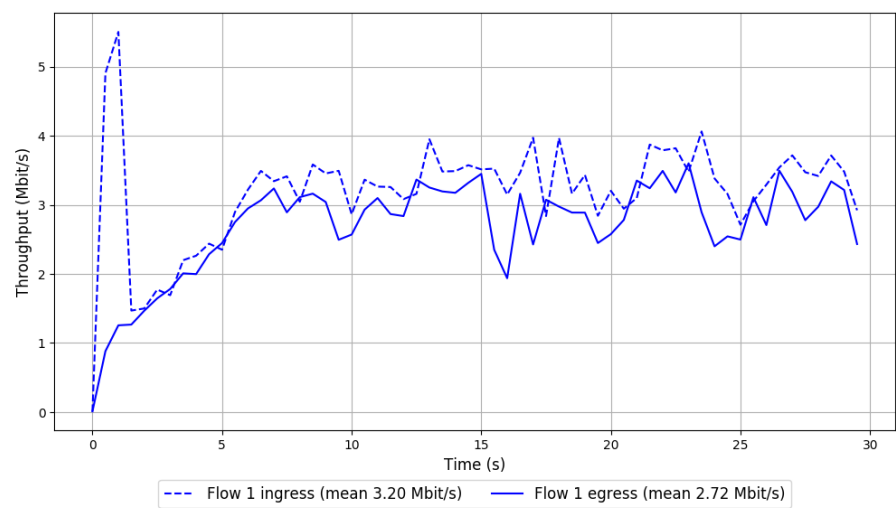
Average throughput: 2.72 Mbit/s

95th percentile per-packet one-way delay: 370.212 ms

Loss rate: 15.54%



Run 3: Report of FillP — Data Link

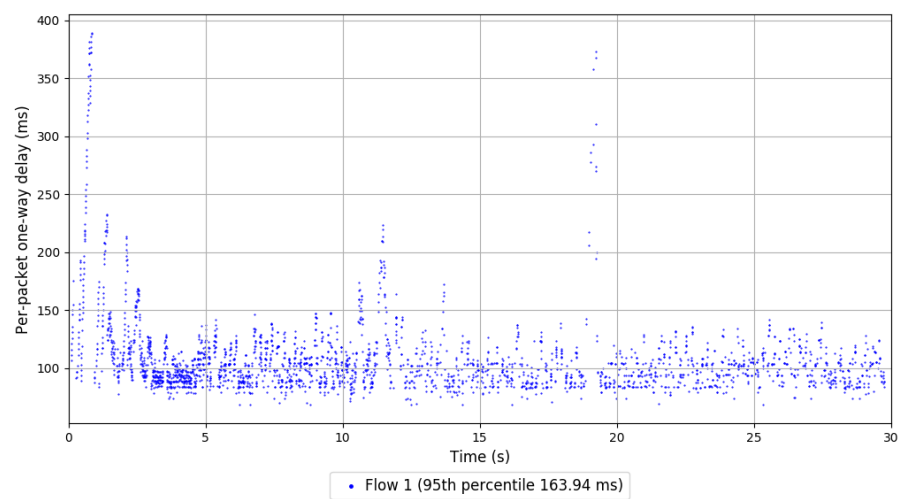
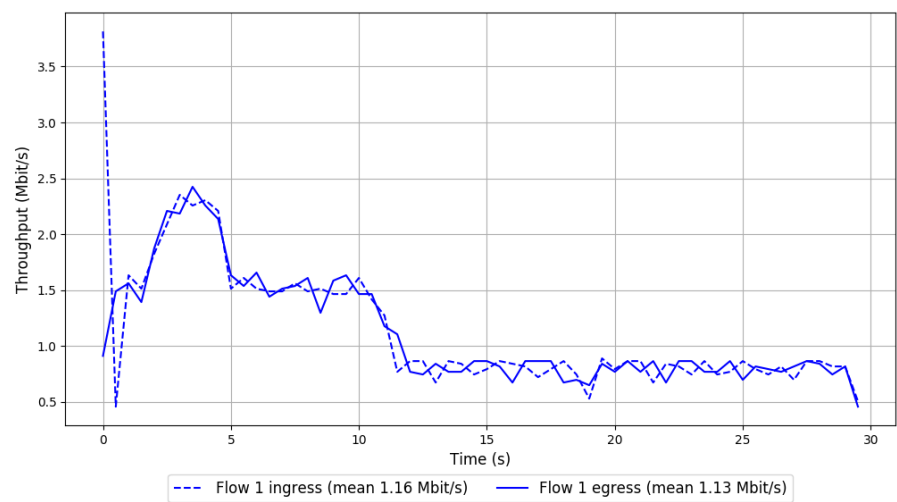


```
Run 1: Statistics of Indigo-1-32

Start at: 2018-01-31 06:48:00
End at: 2018-01-31 06:48:30
Local clock offset: -0.599 ms
Remote clock offset: 1.192 ms

# Below is generated by plot.py at 2018-01-31 09:32:18
# Datalink statistics
-- Total of 1 flow:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 163.941 ms
Loss rate: 2.54%
-- Flow 1:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 163.941 ms
Loss rate: 2.54%
```

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



Run 2: Statistics of Indigo-1-32

Start at: 2018-01-31 07:11:39

End at: 2018-01-31 07:12:09

Local clock offset: -0.602 ms

Remote clock offset: 1.725 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.66 Mbit/s

95th percentile per-packet one-way delay: 152.291 ms

Loss rate: 2.17%

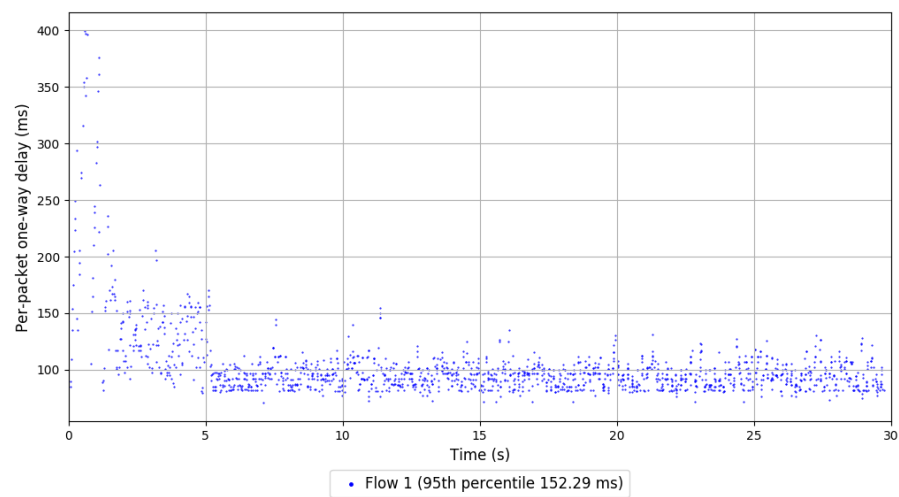
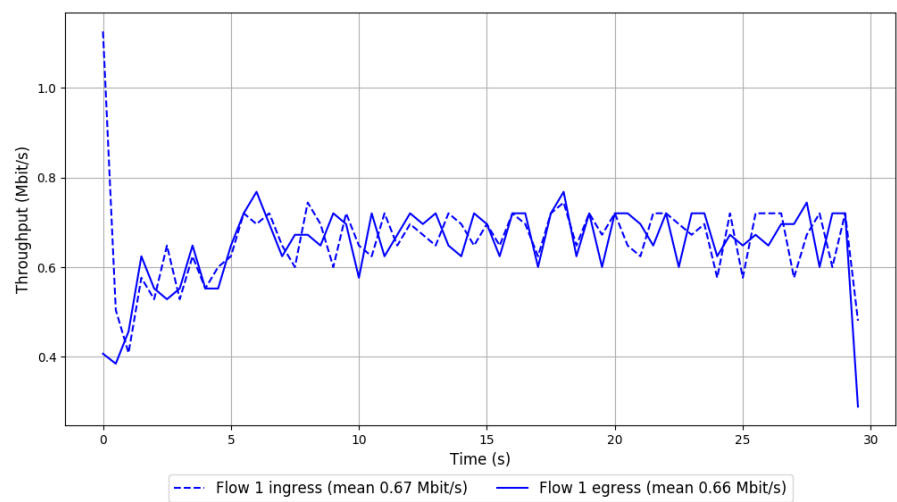
-- Flow 1:

Average throughput: 0.66 Mbit/s

95th percentile per-packet one-way delay: 152.291 ms

Loss rate: 2.17%

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



Run 3: Statistics of Indigo-1-32

Start at: 2018-01-31 07:40:11

End at: 2018-01-31 07:40:41

Local clock offset: -0.666 ms

Remote clock offset: 2.795 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 139.762 ms

Loss rate: 1.10%

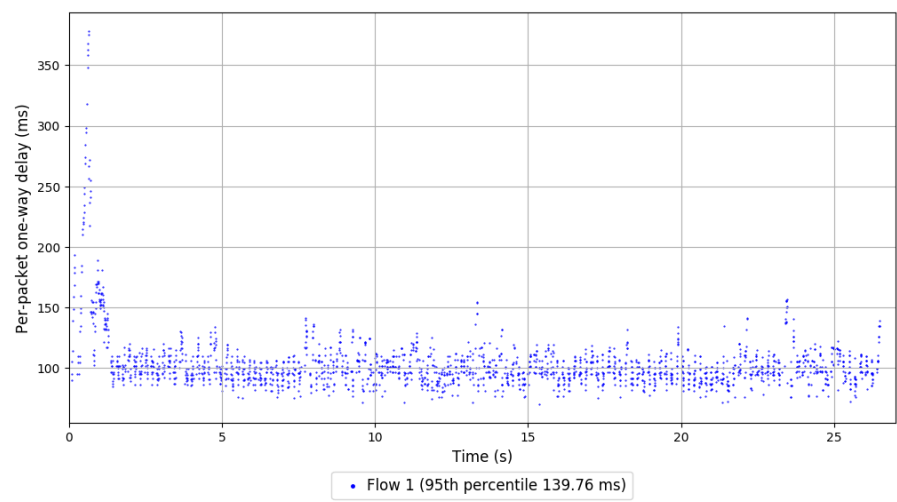
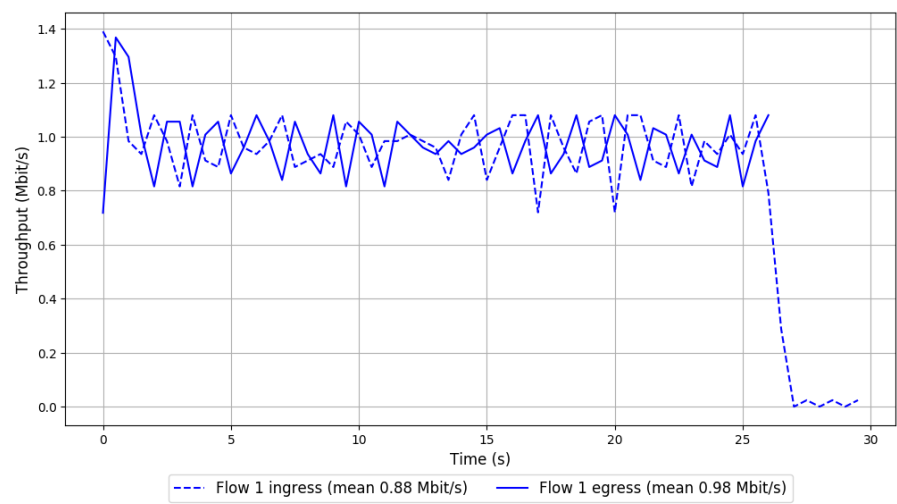
-- Flow 1:

Average throughput: 0.98 Mbit/s

95th percentile per-packet one-way delay: 139.762 ms

Loss rate: 1.10%

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



Run 1: Statistics of Vivace-latency

Start at: 2018-01-31 06:49:19

End at: 2018-01-31 06:49:49

Local clock offset: -0.451 ms

Remote clock offset: 1.341 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 374.270 ms

Loss rate: 16.22%

-- Flow 1:

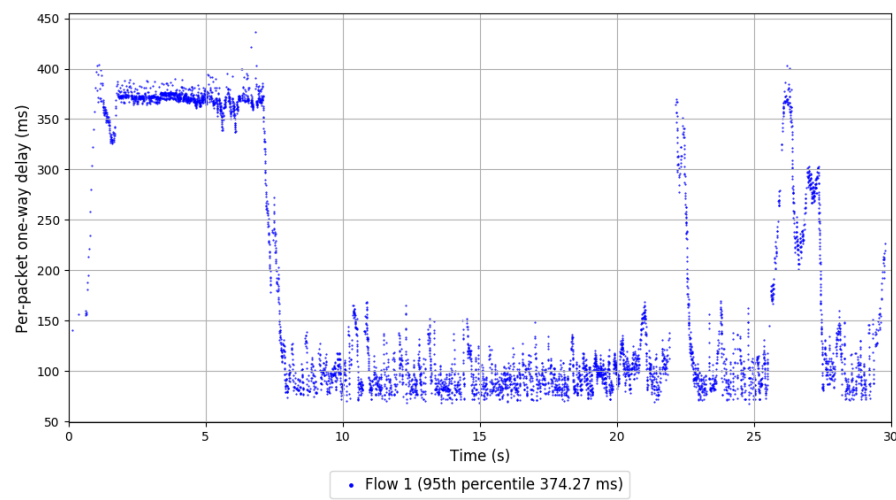
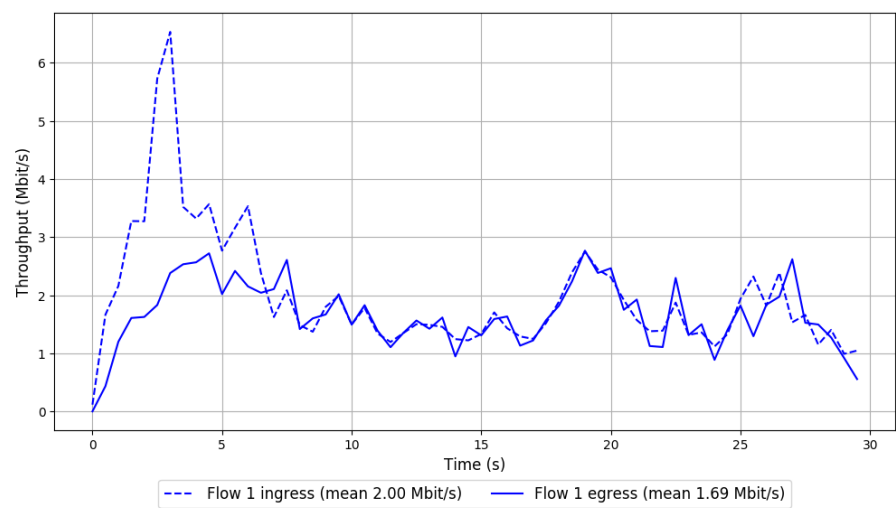
Average throughput: 1.69 Mbit/s

95th percentile per-packet one-way delay: 374.270 ms

Loss rate: 16.22%



Run 1: Report of Vivace-latency — Data Link



Run 2: Statistics of Vivace-latency

Start at: 2018-01-31 07:12:58

End at: 2018-01-31 07:13:28

Local clock offset: -0.614 ms

Remote clock offset: 1.72 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 373.471 ms

Loss rate: 6.85%

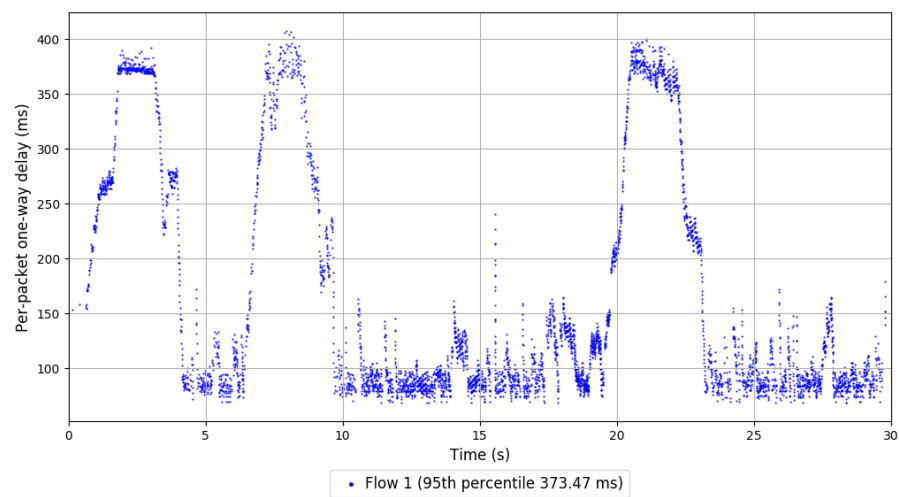
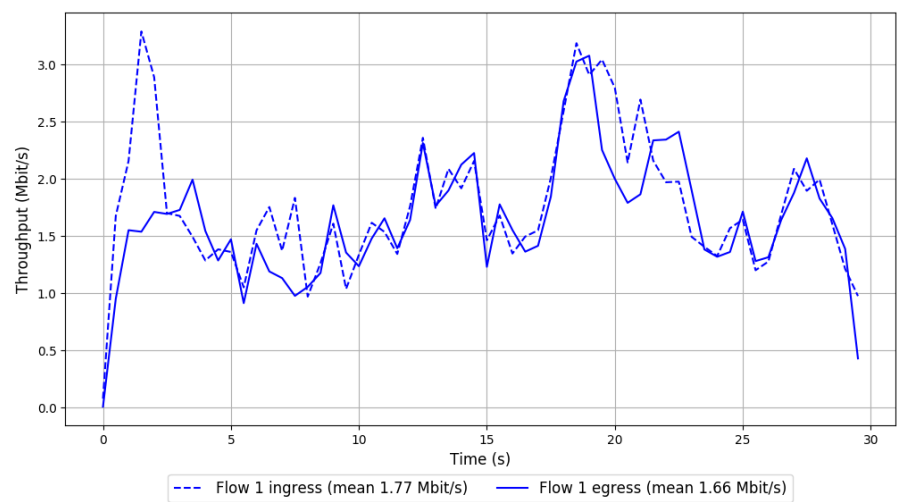
-- Flow 1:

Average throughput: 1.66 Mbit/s

95th percentile per-packet one-way delay: 373.471 ms

Loss rate: 6.85%

Run 2: Report of Vivace-latency — Data Link



Run 3: Statistics of Vivace-latency

/home/ubuntu/pantheon\_data/2018-01-31T06-47-China-ppp0-to-AWS-Korea-3-runs/vivace\_latency\_st

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

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Run 1: Statistics of Vivace-loss

Start at: 2018-01-31 06:57:11

End at: 2018-01-31 06:57:41

Local clock offset: -0.712 ms

Remote clock offset: 1.767 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 379.902 ms

Loss rate: 18.81%

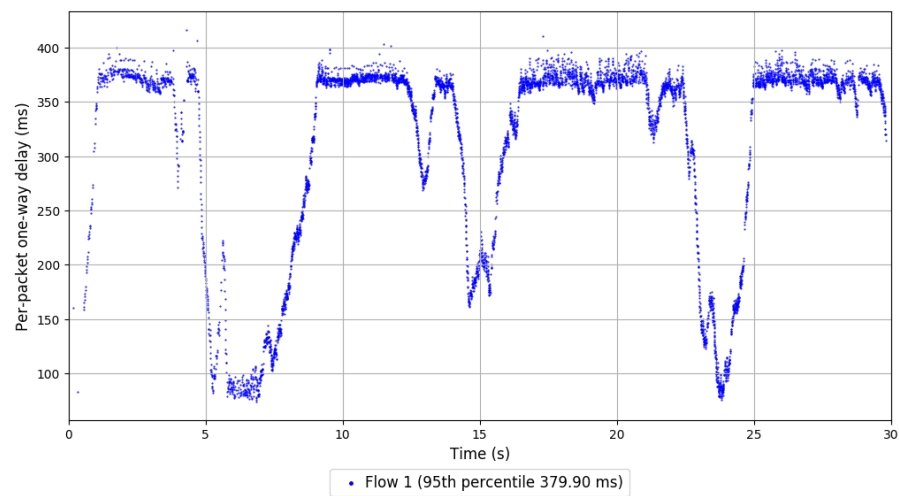
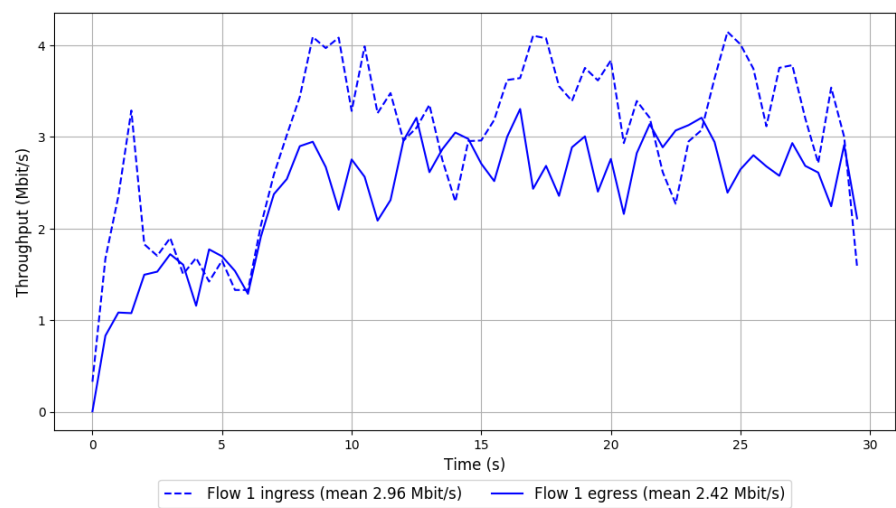
-- Flow 1:

Average throughput: 2.42 Mbit/s

95th percentile per-packet one-way delay: 379.902 ms

Loss rate: 18.81%

Run 1: Report of Vivace-loss — Data Link



Run 2: Statistics of Vivace-loss

Start at: 2018-01-31 07:21:56

End at: 2018-01-31 07:22:26

Local clock offset: -0.715 ms

Remote clock offset: 1.694 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.08 Mbit/s

95th percentile per-packet one-way delay: 381.216 ms

Loss rate: 21.98%

-- Flow 1:

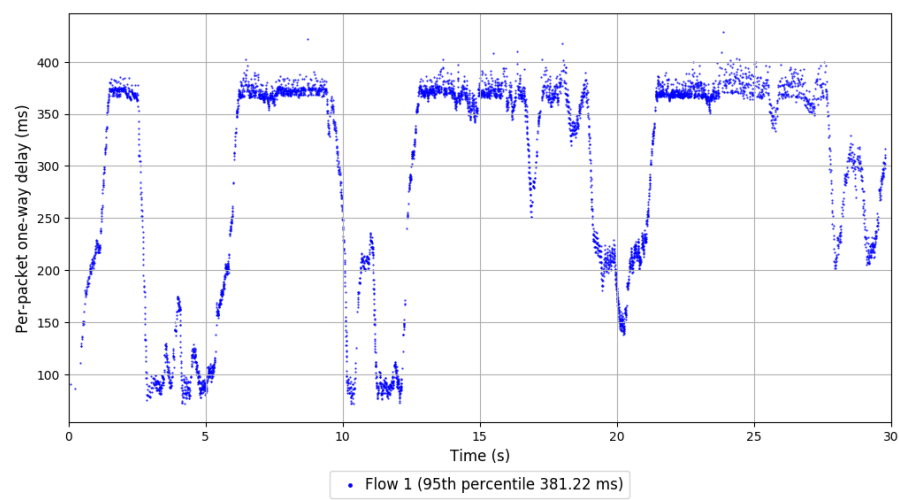
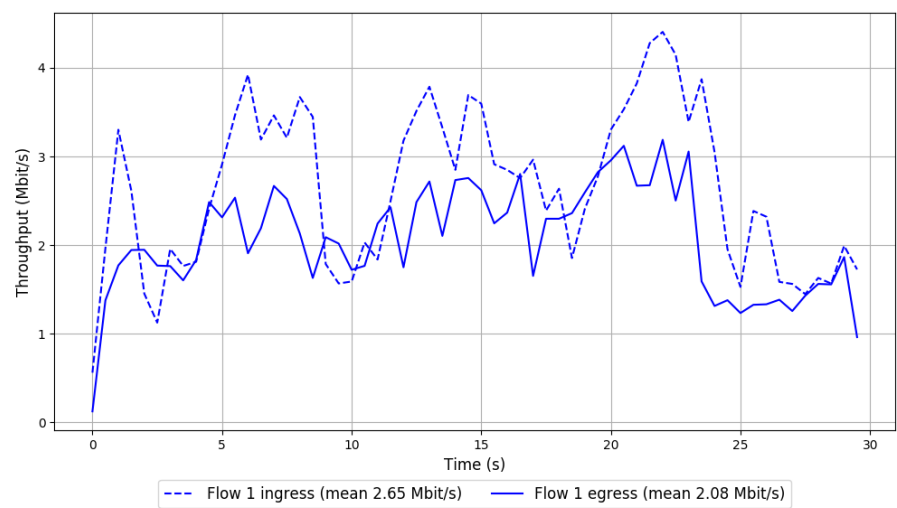
Average throughput: 2.08 Mbit/s

95th percentile per-packet one-way delay: 381.216 ms

Loss rate: 21.98%



Run 2: Report of Vivace-loss — Data Link



Run 3: Statistics of Vivace-loss

Start at: 2018-01-31 07:51:11

End at: 2018-01-31 07:51:41

Local clock offset: -0.351 ms

Remote clock offset: 3.184 ms

# Below is generated by plot.py at 2018-01-31 09:32:18

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.60 Mbit/s

95th percentile per-packet one-way delay: 379.003 ms

Loss rate: 20.58%

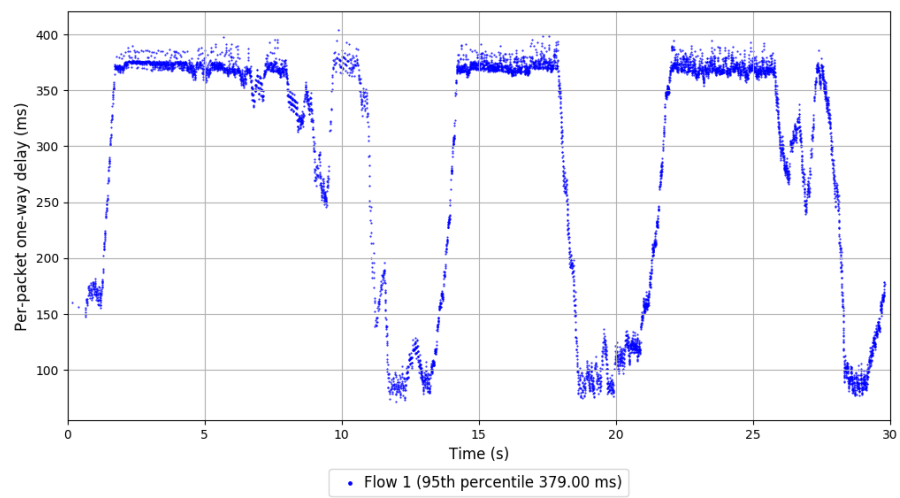
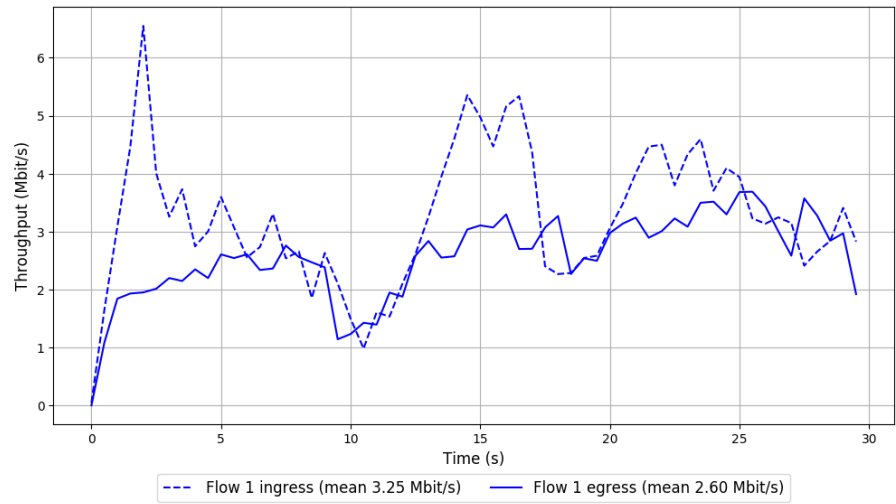
-- Flow 1:

Average throughput: 2.60 Mbit/s

95th percentile per-packet one-way delay: 379.003 ms

Loss rate: 20.58%

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



Run 1: Statistics of Vivace-LTE

Start at: 2018-01-31 07:01:08

End at: 2018-01-31 07:01:38

Local clock offset: -0.475 ms

Remote clock offset: 2.353 ms

# Below is generated by plot.py at 2018-01-31 09:32:19

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 364.889 ms

Loss rate: 4.61%

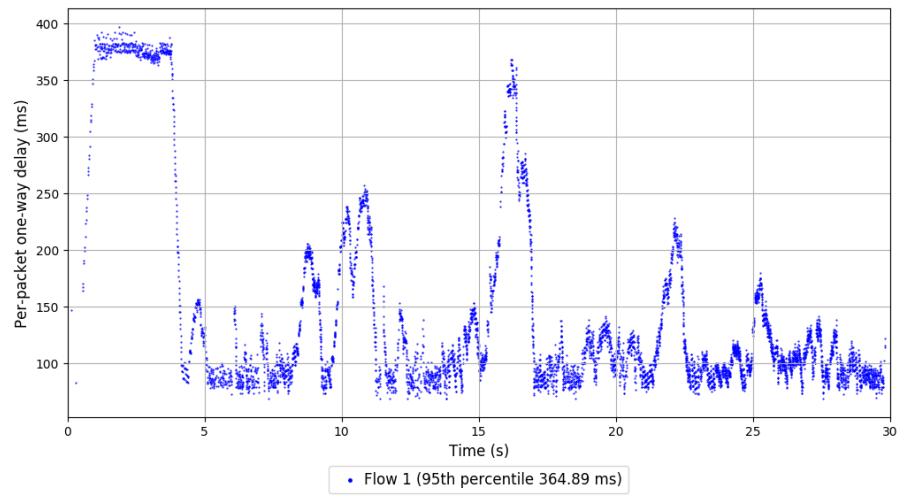
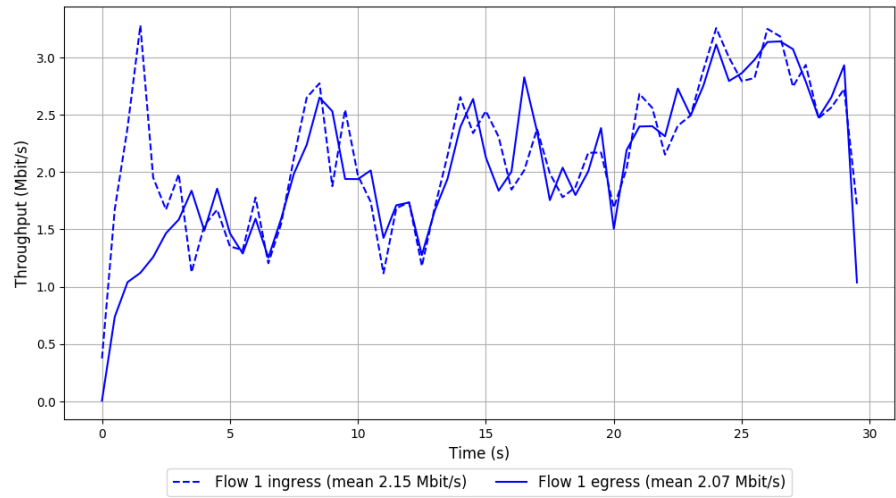
-- Flow 1:

Average throughput: 2.07 Mbit/s

95th percentile per-packet one-way delay: 364.889 ms

Loss rate: 4.61%

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



Run 2: Statistics of Vivace-LTE

Start at: 2018-01-31 07:26:54

End at: 2018-01-31 07:27:24

Local clock offset: -0.887 ms

Remote clock offset: 1.829 ms

# Below is generated by plot.py at 2018-01-31 09:32:19

# Datalink statistics

-- Total of 1 flow:

Average throughput: 1.31 Mbit/s

95th percentile per-packet one-way delay: 372.263 ms

Loss rate: 15.75%

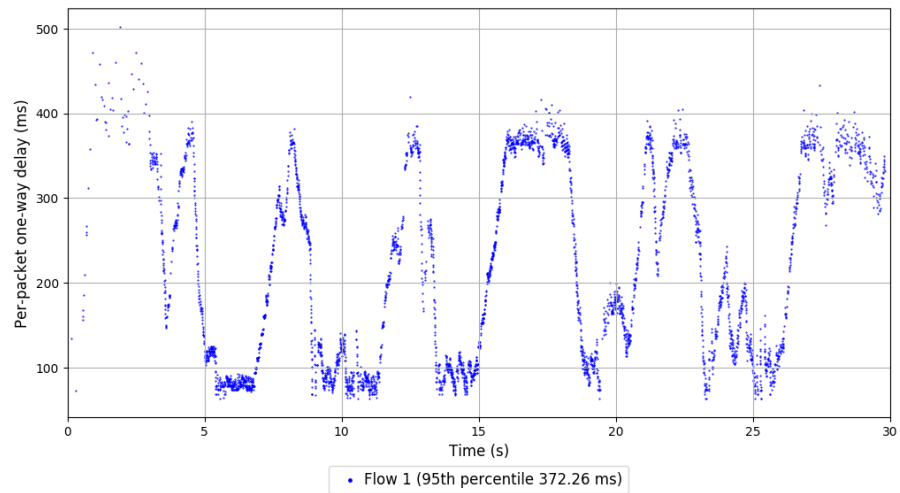
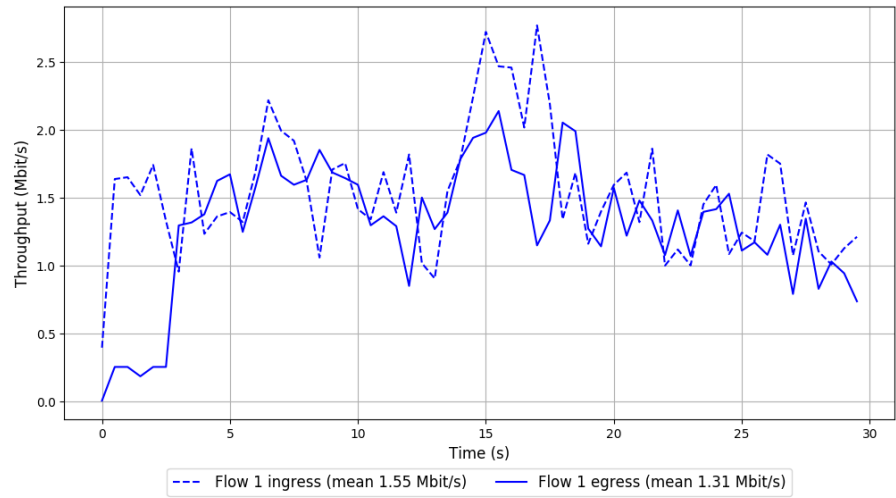
-- Flow 1:

Average throughput: 1.31 Mbit/s

95th percentile per-packet one-way delay: 372.263 ms

Loss rate: 15.75%

## Run 2: Report of Vivace-LTE — Data Link



Run 3: Statistics of Vivace-LTE

Start at: 2018-01-31 07:55:18

End at: 2018-01-31 07:55:48

Local clock offset: -0.898 ms

Remote clock offset: 3.552 ms

# Below is generated by plot.py at 2018-01-31 09:32:20

# Datalink statistics

-- Total of 1 flow:

Average throughput: 2.29 Mbit/s

95th percentile per-packet one-way delay: 336.004 ms

Loss rate: 2.92%

-- Flow 1:

Average throughput: 2.29 Mbit/s

95th percentile per-packet one-way delay: 336.004 ms

Loss rate: 2.92%



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

