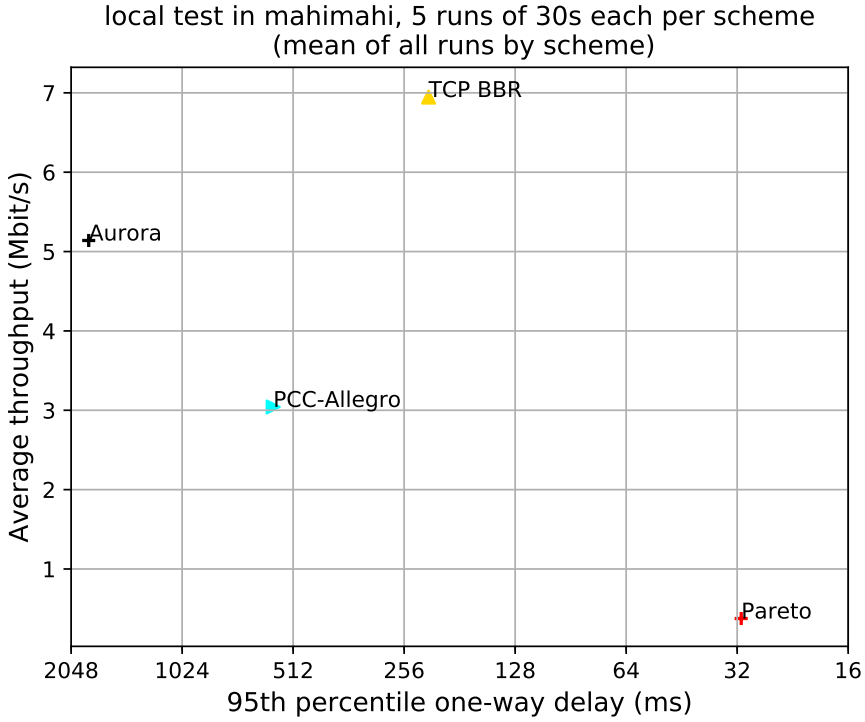
Pantheon Report

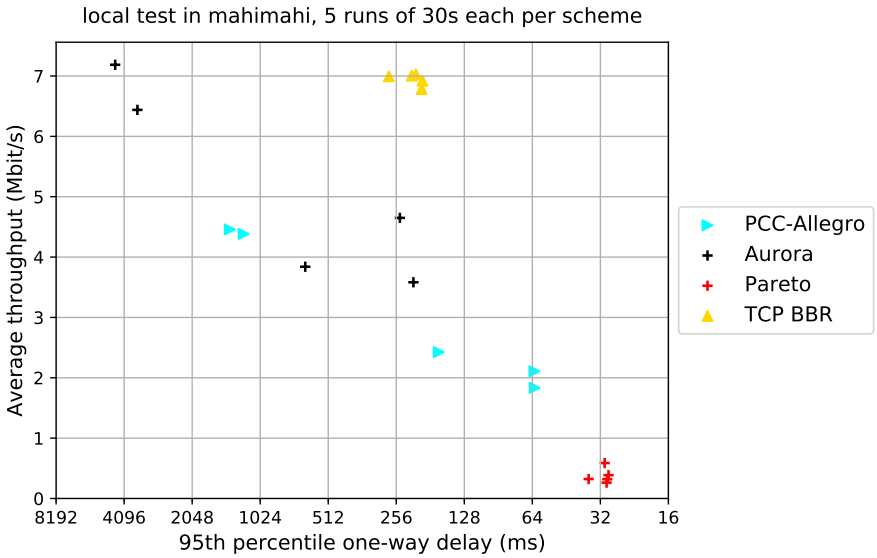
Generated at 2020-05-31 22:13:04 (UTC).
Tested in mahimahi: `mm-delay 20 mm-link Verizon-LTE-short.up Verizon-LTE-short.down`
Repeated the test of 4 congestion control schemes 5 times.
Each test lasted for 30 seconds running 1 flow.

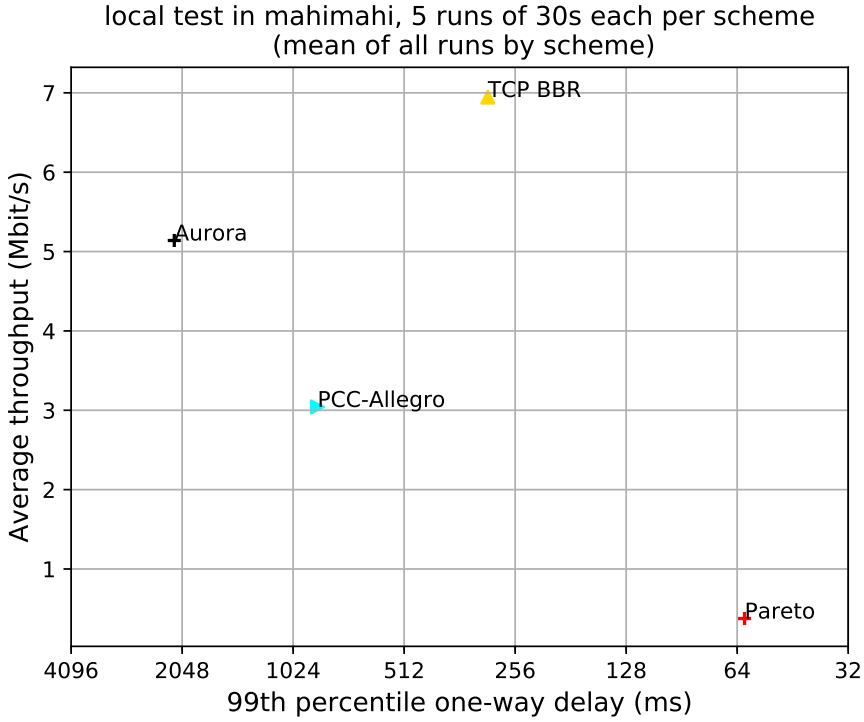
```
System info:
Linux 4.15.0-99-generic
net.core.default_qdisc = fq
net.core.rmem_default = 212992
net.core.rmem_max = 212992
net.core.wmem_default = 212992
net.core.wmem_max = 212992
net.ipv4.tcp_rmem = 4096 131072 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304

Git summary:
branch: master @ 41853f413d552a56e167bd490519108775585ef8
third_party/aurora @ f3e943d61015b39960854ba6391797e0c7984d74
third_party/aurora-model @ e292c316c23fb837255c4e142e40590d154bbe95
third_party/eagle-plus @ 002dbacbf6c6afd010225209c6749ab958b1aee3
 M net-em/net-em/net_em/__pycache__/__init__.cpython-36.pyc
 M net-em/net-em/net_em/envs/__pycache__/__init__.cpython-36.pyc
 M net-em/net-em/net_em/envs/__pycache__/helpers.cpython-36.pyc
 M net-em/net-em/net_em/envs/__pycache__/project_root.cpython-36.pyc
 M net-em/net-em/net_em/envs/__pycache__/receiver.cpython-36.pyc
third_party/eagle-v1 @ c68d985e042be5c30704c0aee48c363861951a95
third_party/eagle-v2 @ c8a1737b3c84d7d49eada5b8785045d272a70120
third_party/eagle-v3 @ 50d676bd6e47e3e29a3ce914a6e50b2c6f15136b
third_party/fillp @ d6da1459332fcee56963885d7eba17e6a32d4519
third_party/fillp-sheep @ 0e5bb722943babcd2b090d2c64fcd45e12e923f9
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecdbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
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, 5 runs of 30s each per scheme
(mean of all runs by scheme)
TCP BBR
Aurora
PCC-Allegro
Pareto
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
7
6
5
4
3
2
1
2048
1024
512
256
128
64
32
16


local test in mahimahi, 5 runs of 30s each per scheme
Average throughput (Mbit/s)
95th percentile one-way delay (ms)
PCC-Allegro
Aurora
Pareto
TCP BBR
0
1
2
3
4
5
6
7
8192
4096
2048
1024
512
256
128
64
32
16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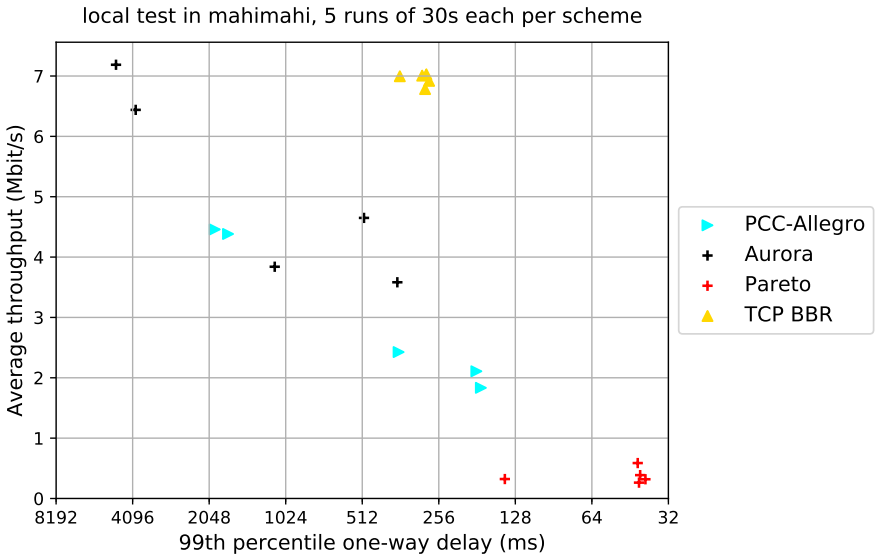
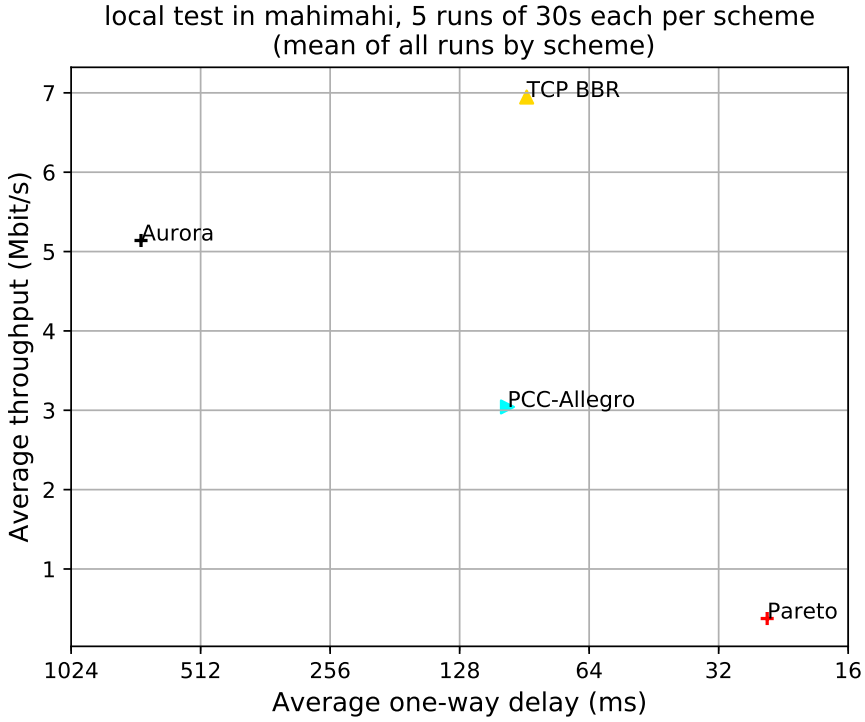
(mean of all runs by scheme)
TCP BBR
Aurora
PCC-Allegro
Pareto
Average throughput (Mbit/s)
99th percentile one-way delay (ms)
7
6
5
4
3
2
1
4096
2048
1024
512
256
128
64
32


local test in mahimahi, 5 runs of 30s each per scheme
Average throughput (Mbit/s)
99th percentile one-way delay (ms)
PCC-Allegro
Aurora
Pareto
TCP BBR
0
1
2
3
4
5
6
7
8192
4096
2048
1024
512
256
128
64
32


local test in mahimahi, 5 runs of 30s each per scheme
(mean of all runs by scheme)
TCP BBR
Aurora
PCC-Allegro
Pareto
Average throughput (Mbit/s)
Average one-way delay (ms)
7
6
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4
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1024
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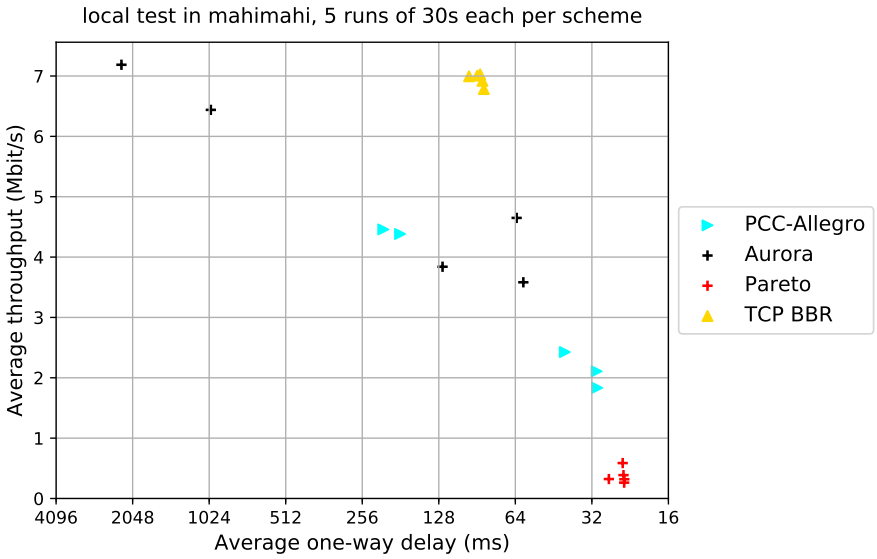
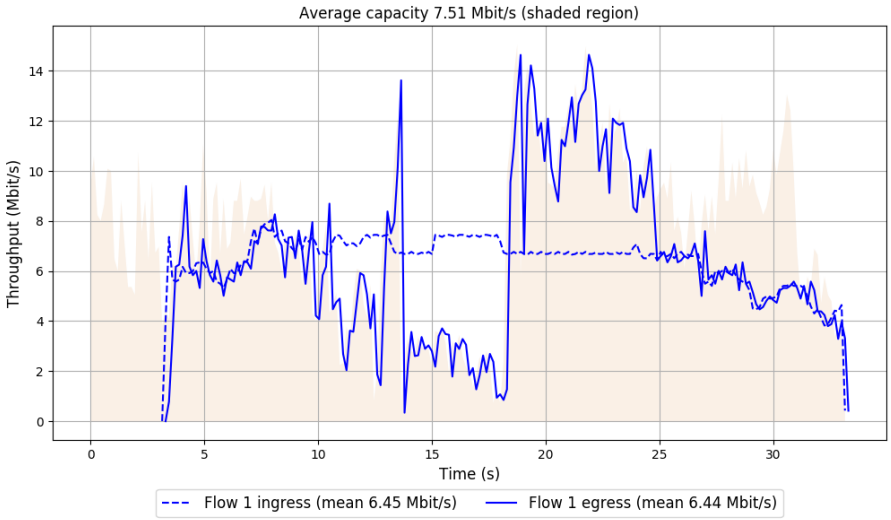
64
32
16

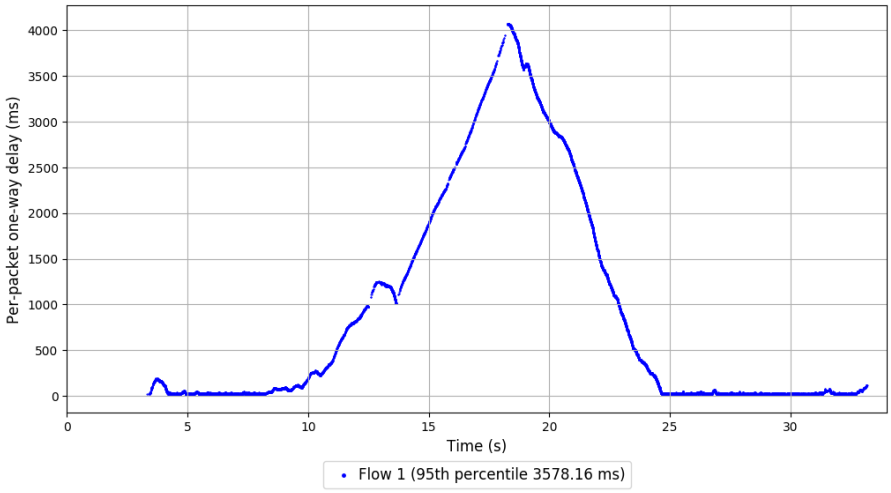

local test in mahimahi, 5 runs of 30s each per scheme
PCC-Allegro
Aurora
Pareto
TCP BBR
Average throughput (Mbit/s)
Average one-way delay (ms)
0
1
2
3
4
5
6
7
4096
2048
1024
512
256
128
64
32
16

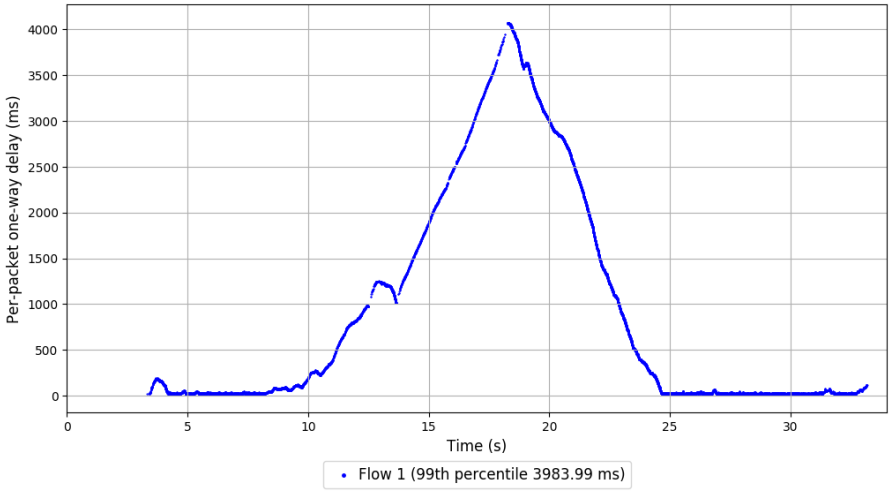
scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean 99th-%ile delay (ms) flow 1	mean avg delay (ms) flow 1	mean loss rate (%) flow 1
Aurora	5	5.14	1834.88	2150.70	704.37	3.57
TCP BBR	5	6.95	219.75	303.55	89.42	0.38
Pareto	5	0.38	31.20	61.10	24.68	0.06
PCC-Allegro	5	3.04	579.75	879.55	99.09	0.26

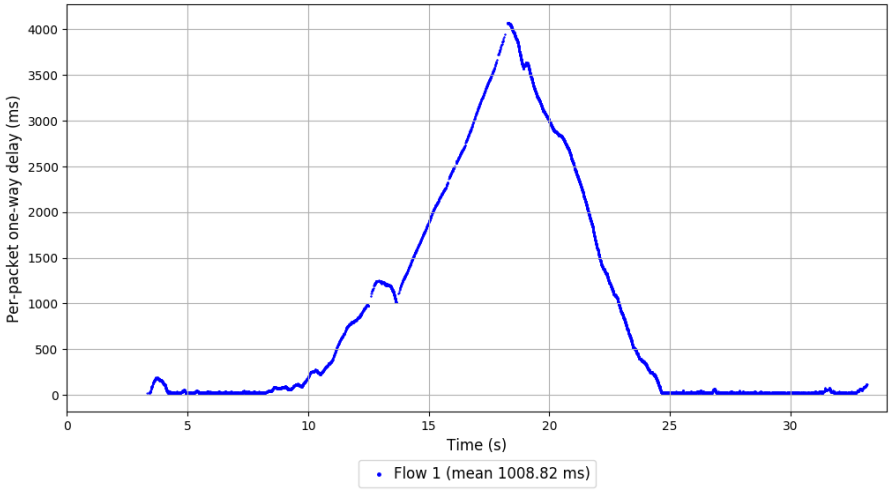
```
Run 1: Statistics of Aurora

Start at: 2020-05-31 08:50:17
End at: 2020-05-31 08:50:47

# Below is generated by plot.py at 2020-05-31 22:12:39
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 6.44 Mbit/s (85.7% utilization)
95th percentile per-packet one-way delay: 3578.156 ms
99th percentile per-packet one-way delay: 3983.987 ms
mean per-packet one-way delay: 1008.819 ms
Loss rate: 0.27%
-- Flow 1:
Average throughput: 6.44 Mbit/s
95th percentile per-packet one-way delay: 3578.156 ms
99th percentile per-packet one-way delay: 3983.987 ms
Average per-packet one-way delay: 1008.819 ms
Loss rate: 0.27%
```

Run 1: Report of Aurora — Data Link



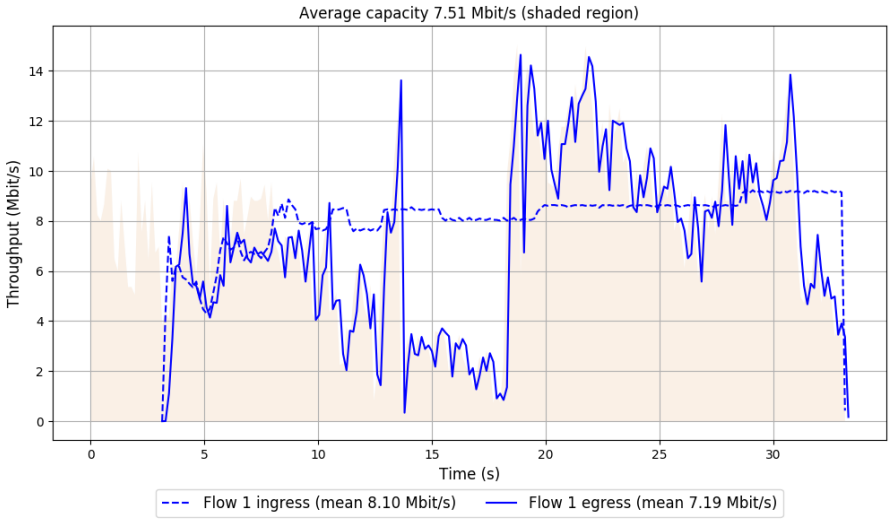


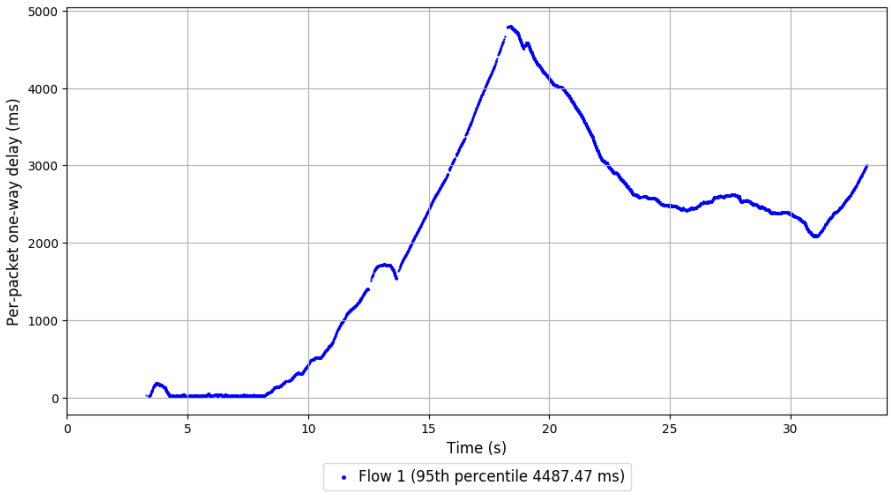

Per-packet one-way delay (ms)
Time (s)
Flow 1 (99th percentile 3983.99 ms)

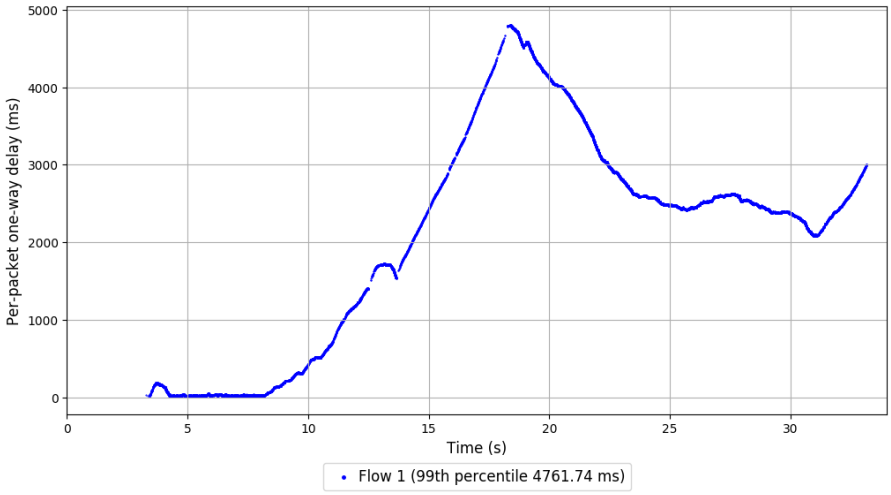

Per-packet one-way delay (ms)
Time (s)
Flow 1 (mean 1008.82 ms)

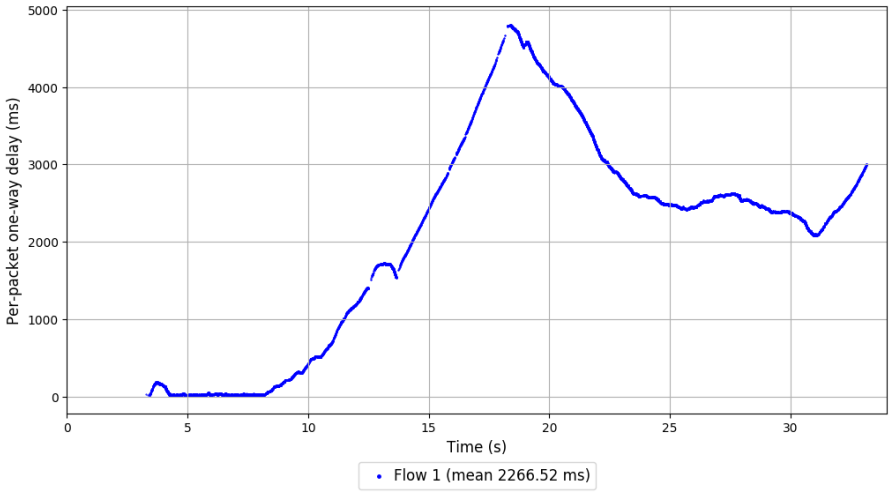
```
Run 2: Statistics of Aurora

Start at: 2020-05-31 08:52:34
End at: 2020-05-31 08:53:04

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 7.19 Mbit/s (95.6% utilization)
95th percentile per-packet one-way delay: 4487.472 ms
99th percentile per-packet one-way delay: 4761.737 ms
mean per-packet one-way delay: 2266.525 ms
Loss rate: 11.37%
-- Flow 1:
Average throughput: 7.19 Mbit/s
95th percentile per-packet one-way delay: 4487.472 ms
99th percentile per-packet one-way delay: 4761.737 ms
Average per-packet one-way delay: 2266.525 ms
Loss rate: 11.37%
```

Run 2: Report of Aurora — Data Link



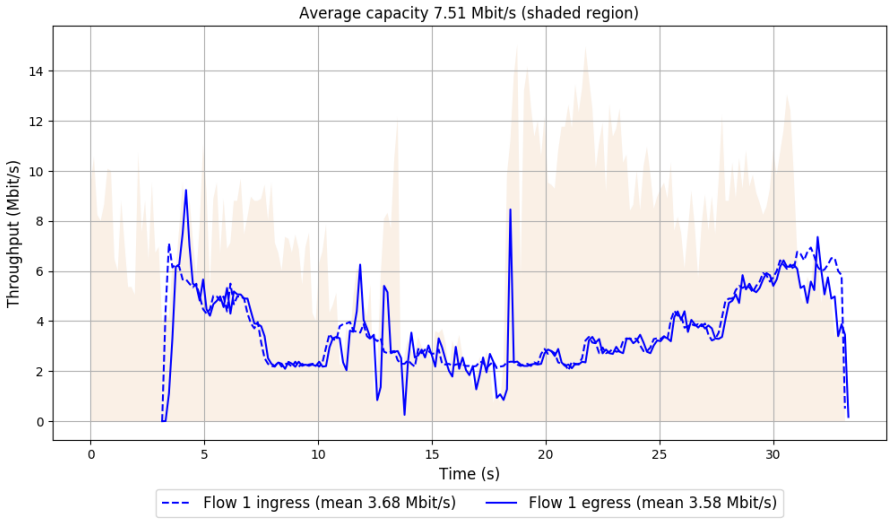


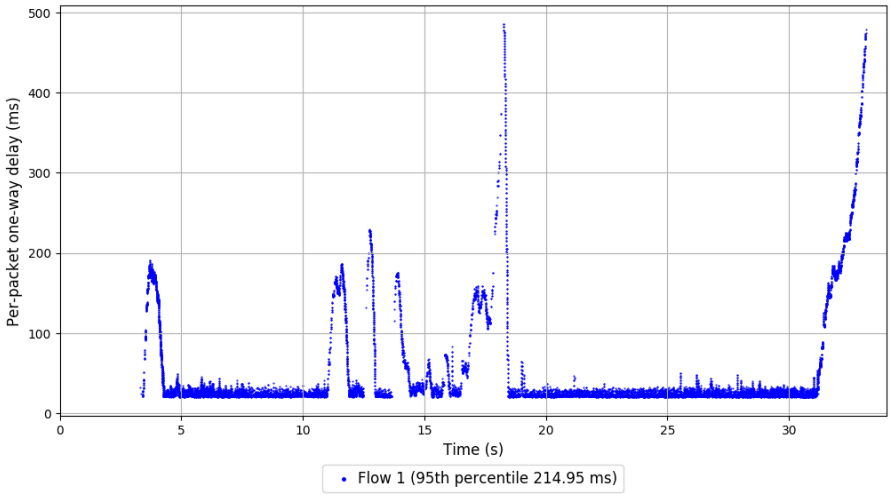

Per-packet one-way delay (ms)
Time (s)
Flow 1 (99th percentile 4761.74 ms)

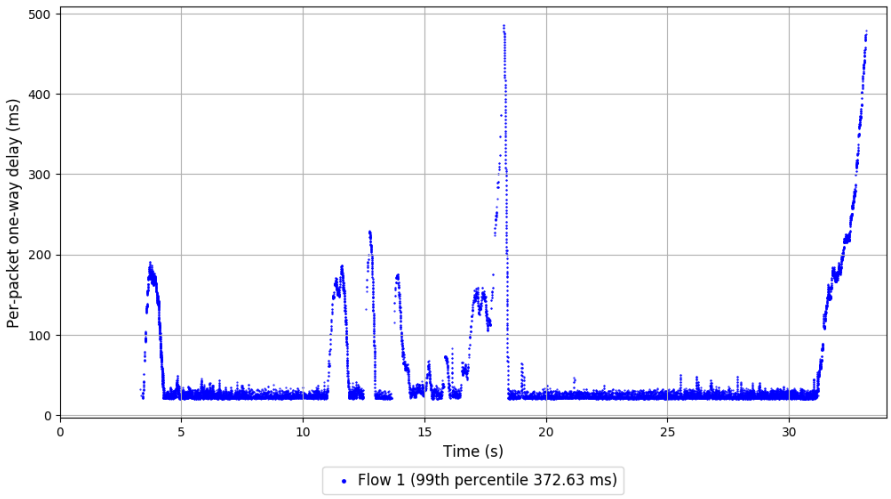

Per-packet one-way delay (ms)
Time (s)
Flow 1 (mean 2266.52 ms)

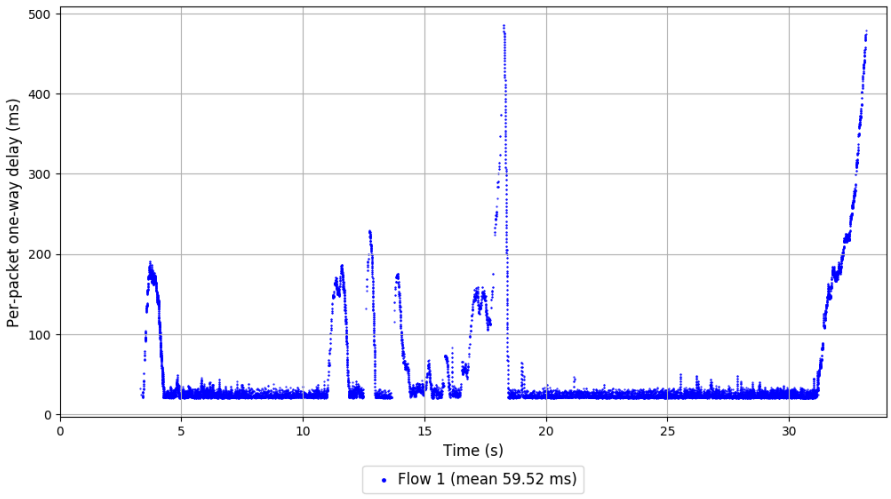
```
Run 3: Statistics of Aurora

Start at: 2020-05-31 08:54:50
End at: 2020-05-31 08:55:21

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 3.58 Mbit/s (47.7% utilization)
95th percentile per-packet one-way delay: 214.952 ms
99th percentile per-packet one-way delay: 372.632 ms
mean per-packet one-way delay: 59.523 ms
Loss rate: 2.67%
-- Flow 1:
Average throughput: 3.58 Mbit/s
95th percentile per-packet one-way delay: 214.952 ms
99th percentile per-packet one-way delay: 372.632 ms
Average per-packet one-way delay: 59.523 ms
Loss rate: 2.67%
```

Run 3: Report of Aurora — Data Link



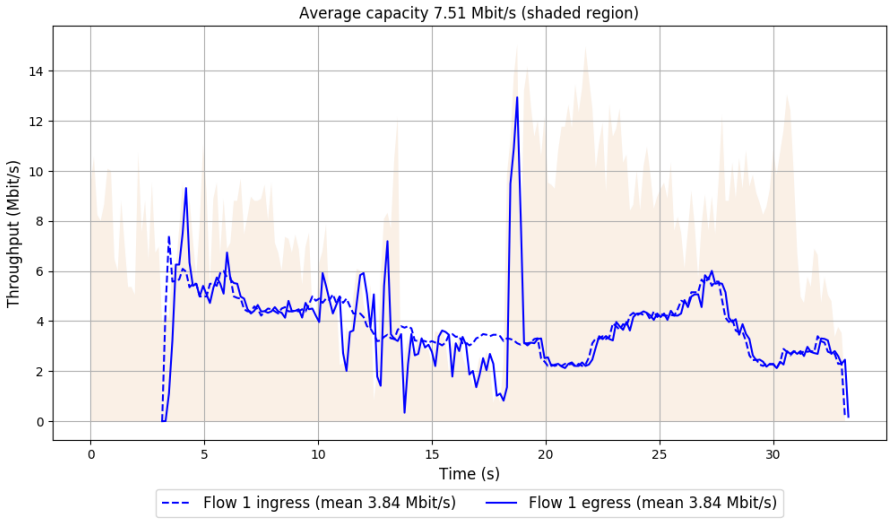


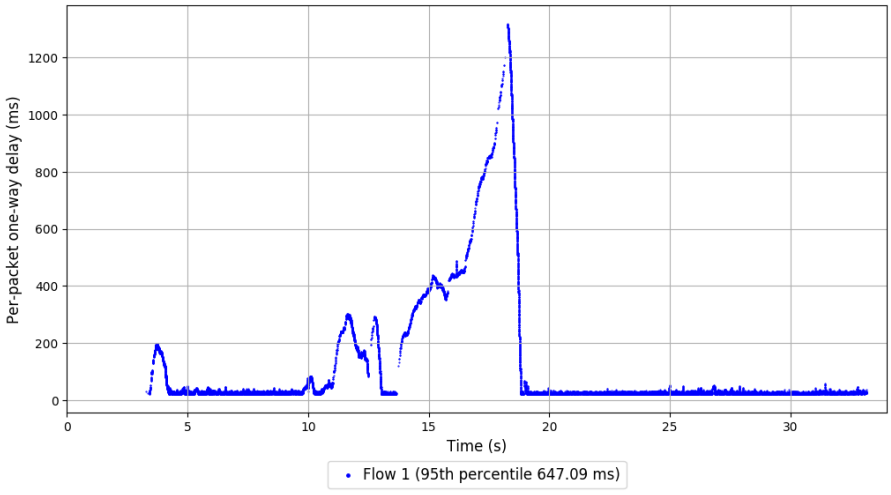

Per-packet one-way delay (ms)
Time (s)
Flow 1 (99th percentile 372.63 ms)

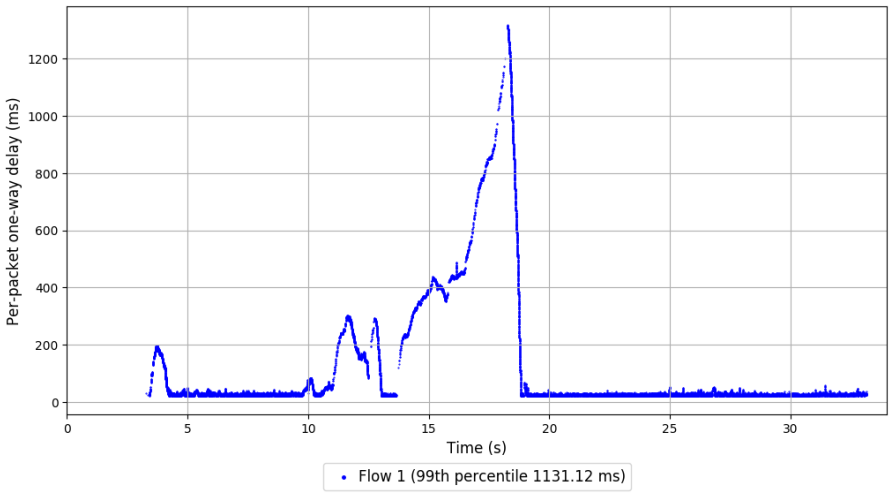

Per-packet one-way delay (ms)
Time (s)
Flow 1 (mean 59.52 ms)

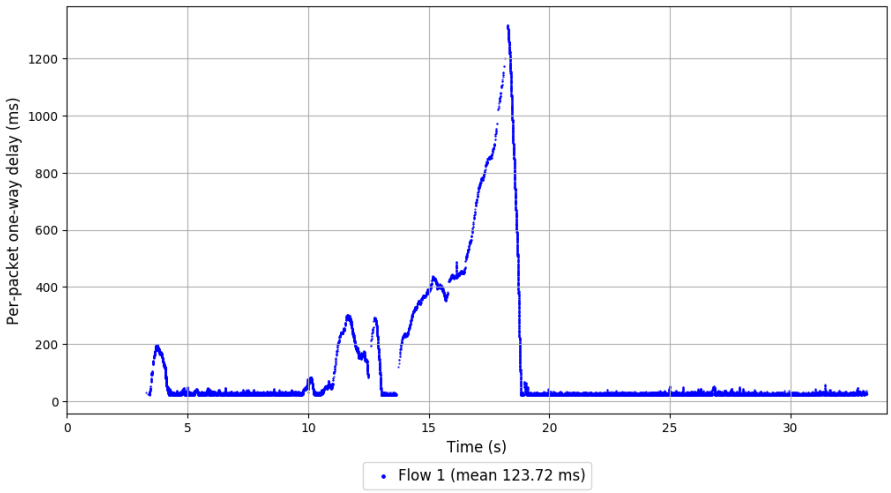
```
Run 4: Statistics of Aurora

Start at: 2020-05-31 08:57:07
End at: 2020-05-31 08:57:37

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 3.84 Mbit/s (51.1% utilization)
95th percentile per-packet one-way delay: 647.088 ms
99th percentile per-packet one-way delay: 1131.124 ms
mean per-packet one-way delay: 123.722 ms
Loss rate: 0.04%
-- Flow 1:
Average throughput: 3.84 Mbit/s
95th percentile per-packet one-way delay: 647.088 ms
99th percentile per-packet one-way delay: 1131.124 ms
Average per-packet one-way delay: 123.722 ms
Loss rate: 0.04%
```

Run 4: Report of Aurora — Data Link



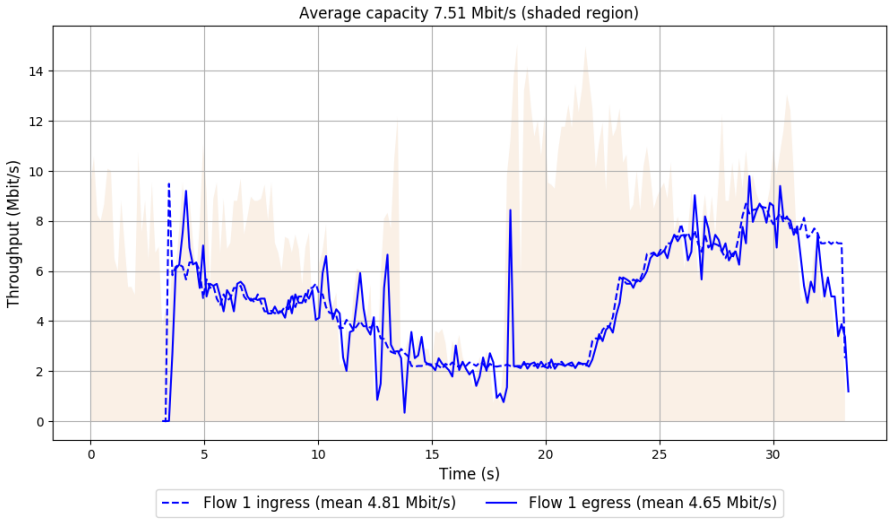


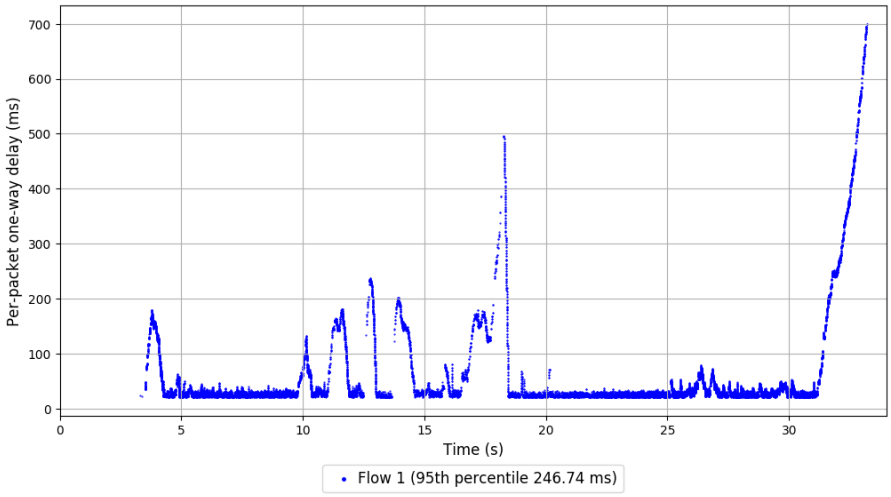

Per-packet one-way delay (ms)
0
200
400
600
800
1000
1200
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 1131.12 ms)

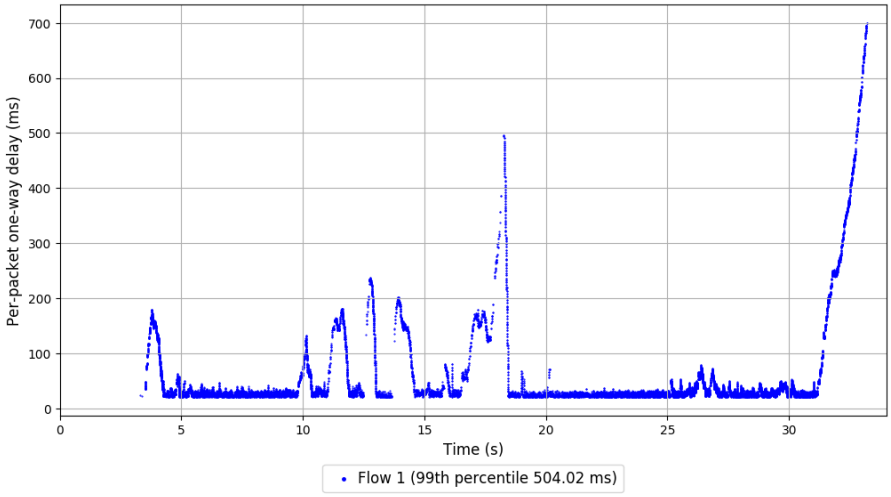

Per-packet one-way delay (ms)
0
200
400
600
800
1000
1200
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 123.72 ms)

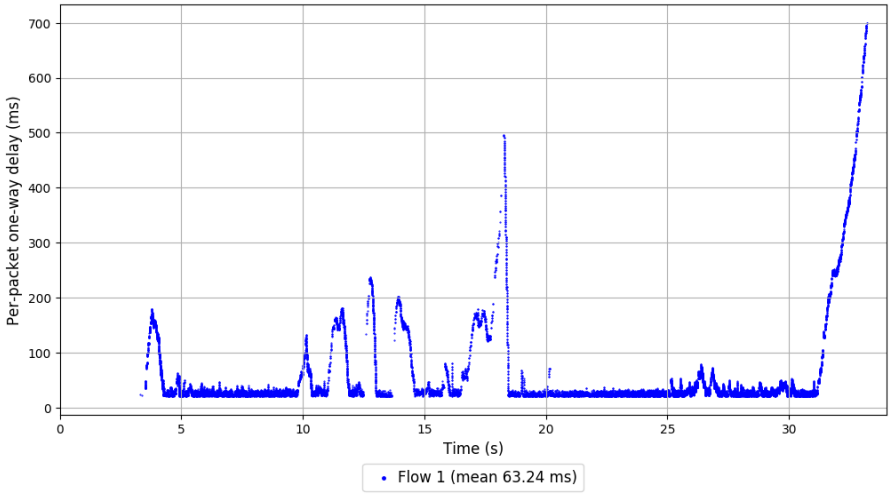
```
Run 5: Statistics of Aurora

Start at: 2020-05-31 08:59:24
End at: 2020-05-31 08:59:54

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 4.65 Mbit/s (61.9% utilization)
95th percentile per-packet one-way delay: 246.738 ms
99th percentile per-packet one-way delay: 504.023 ms
mean per-packet one-way delay: 63.237 ms
Loss rate: 3.50%
-- Flow 1:
Average throughput: 4.65 Mbit/s
95th percentile per-packet one-way delay: 246.738 ms
99th percentile per-packet one-way delay: 504.023 ms
Average per-packet one-way delay: 63.237 ms
Loss rate: 3.50%
```

Run 5: Report of Aurora — Data Link



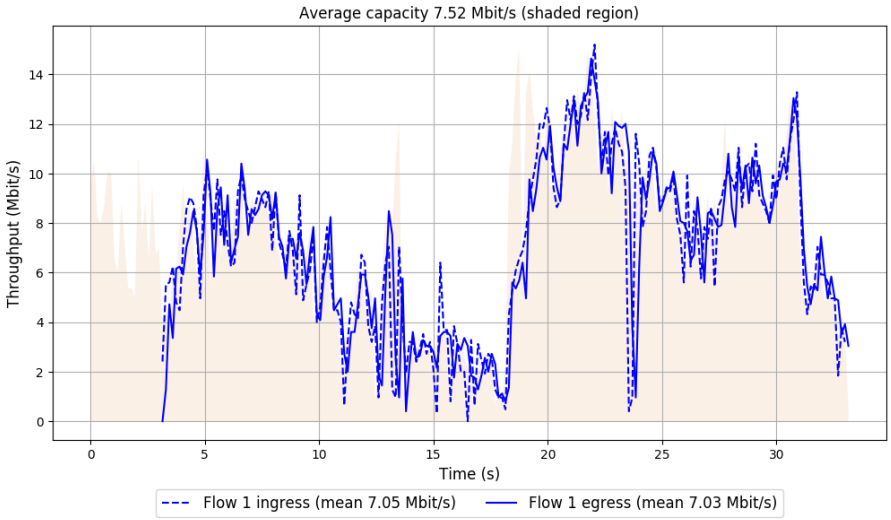


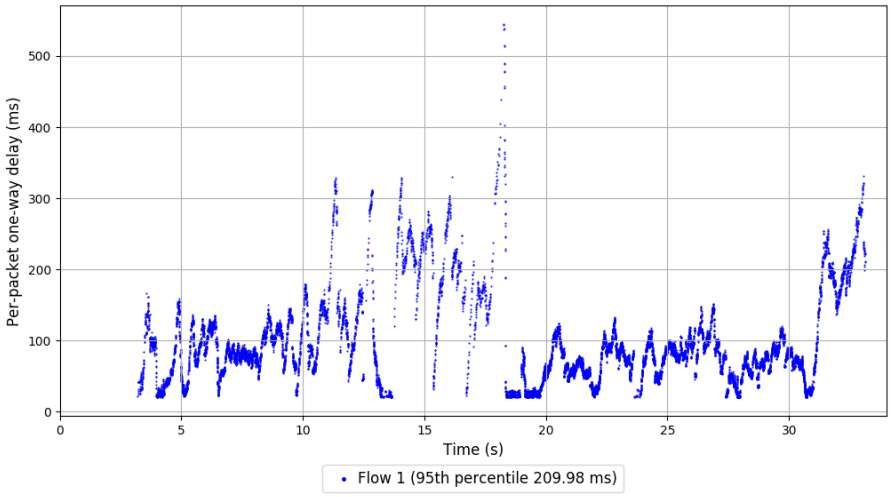

Per-packet one-way delay (ms)
Time (s)
Flow 1 (99th percentile 504.02 ms)

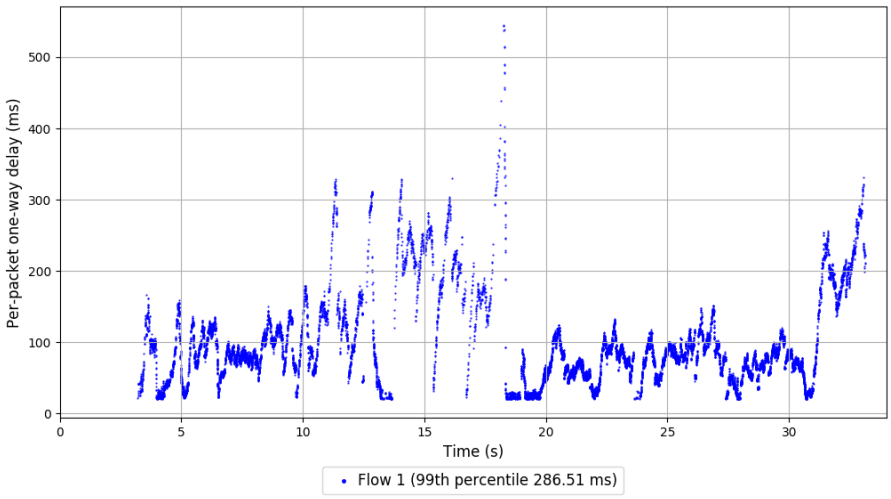

Per-packet one-way delay (ms)
Time (s)
Flow 1 (mean 63.24 ms)

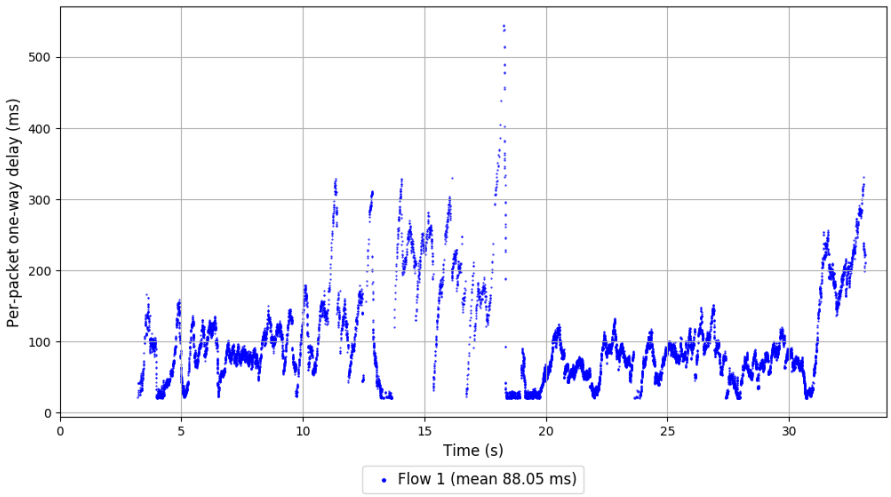
```
Run 1: Statistics of TCP BBR

Start at: 2020-05-31 08:50:51
End at: 2020-05-31 08:51:21

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.52 Mbit/s
Average throughput: 7.03 Mbit/s (93.5% utilization)
95th percentile per-packet one-way delay: 209.981 ms
99th percentile per-packet one-way delay: 286.515 ms
mean per-packet one-way delay: 88.047 ms
Loss rate: 0.41%
-- Flow 1:
Average throughput: 7.03 Mbit/s
95th percentile per-packet one-way delay: 209.981 ms
99th percentile per-packet one-way delay: 286.515 ms
Average per-packet one-way delay: 88.047 ms
Loss rate: 0.41%
```

Run 1: Report of TCP BBR — Data Link



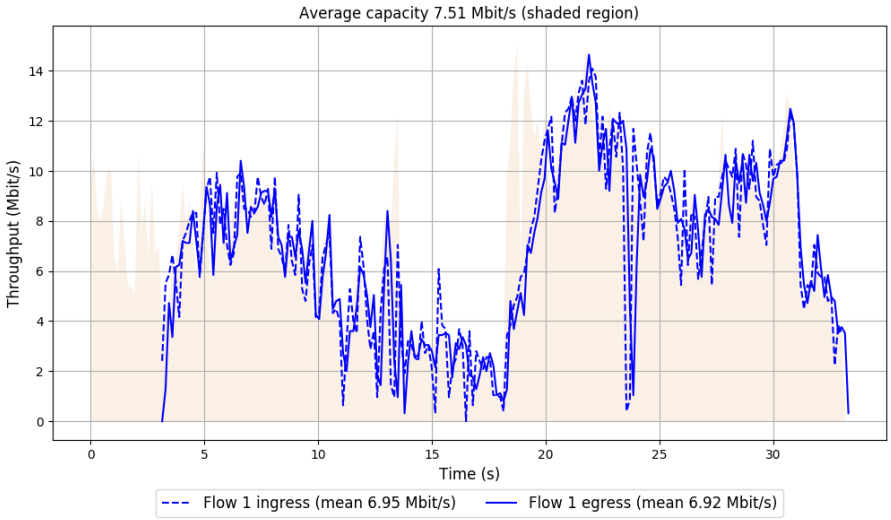


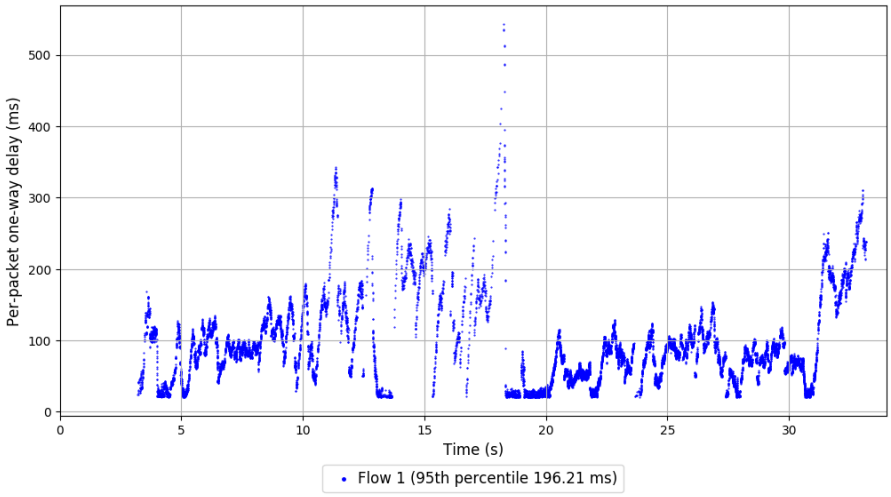

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 286.51 ms)

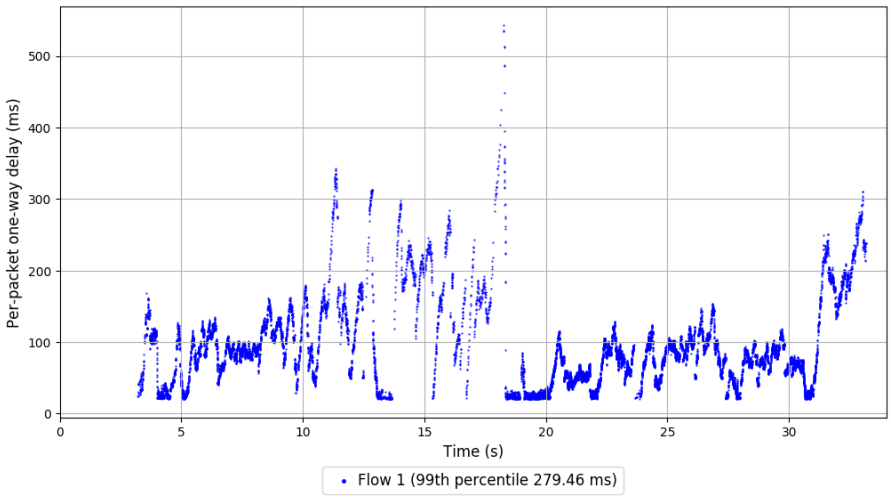

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 88.05 ms)

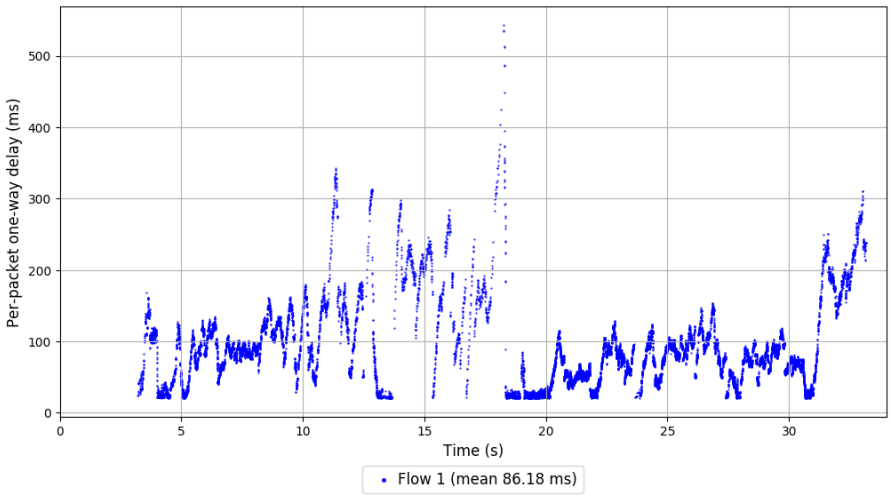
```
Run 2: Statistics of TCP BBR

Start at: 2020-05-31 08:53:08
End at: 2020-05-31 08:53:38

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 6.92 Mbit/s (92.1% utilization)
95th percentile per-packet one-way delay: 196.209 ms
99th percentile per-packet one-way delay: 279.465 ms
mean per-packet one-way delay: 86.183 ms
Loss rate: 0.40%
-- Flow 1:
Average throughput: 6.92 Mbit/s
95th percentile per-packet one-way delay: 196.209 ms
99th percentile per-packet one-way delay: 279.465 ms
Average per-packet one-way delay: 86.183 ms
Loss rate: 0.40%
```

Run 2: Report of TCP BBR — Data Link



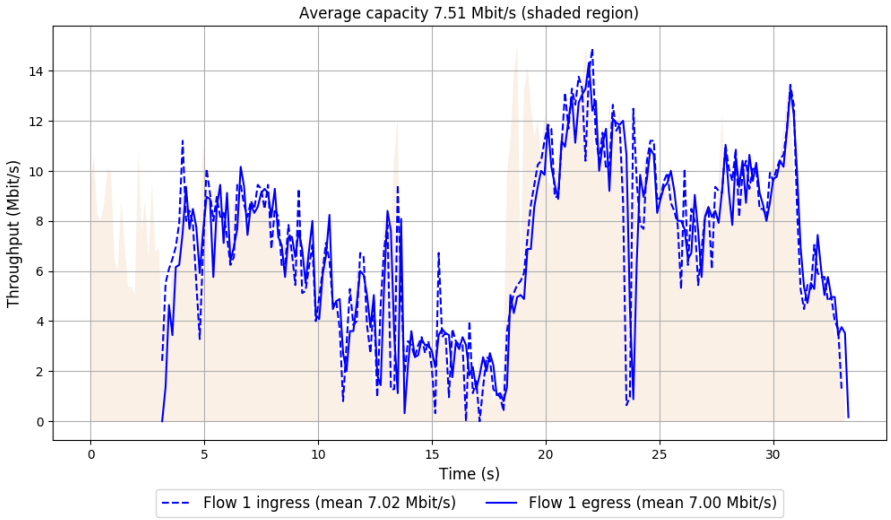


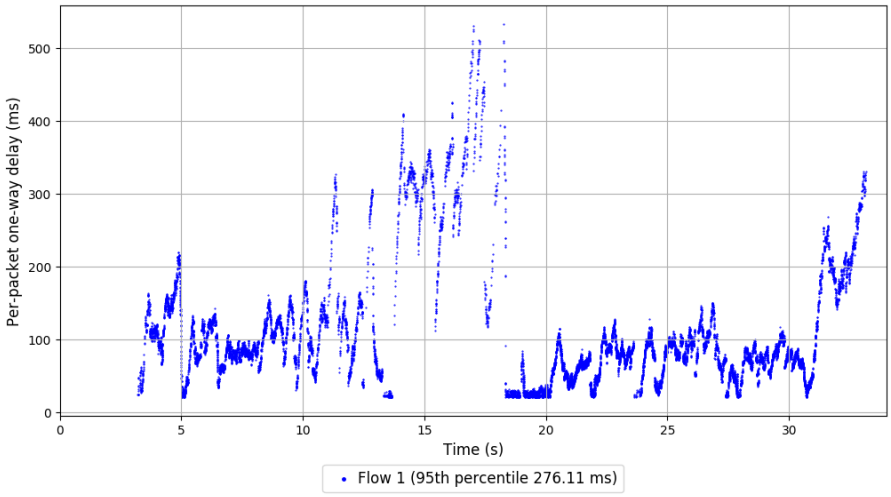

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 279.46 ms)

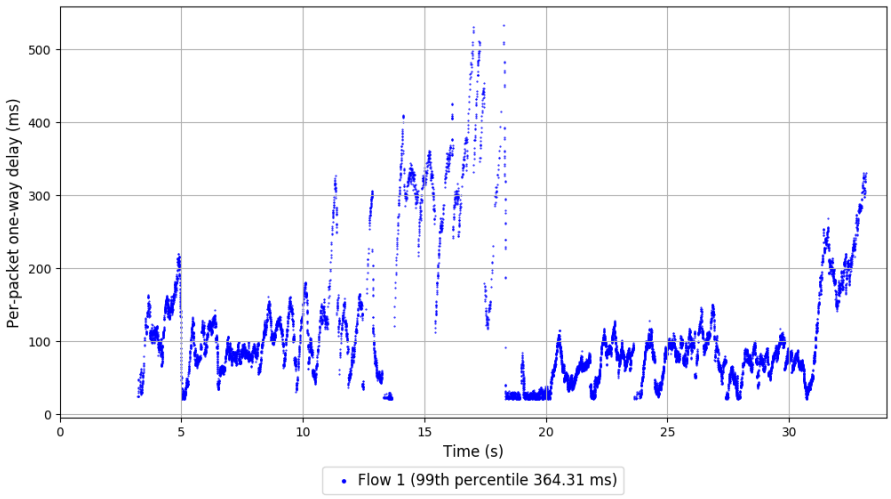

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 86.18 ms)

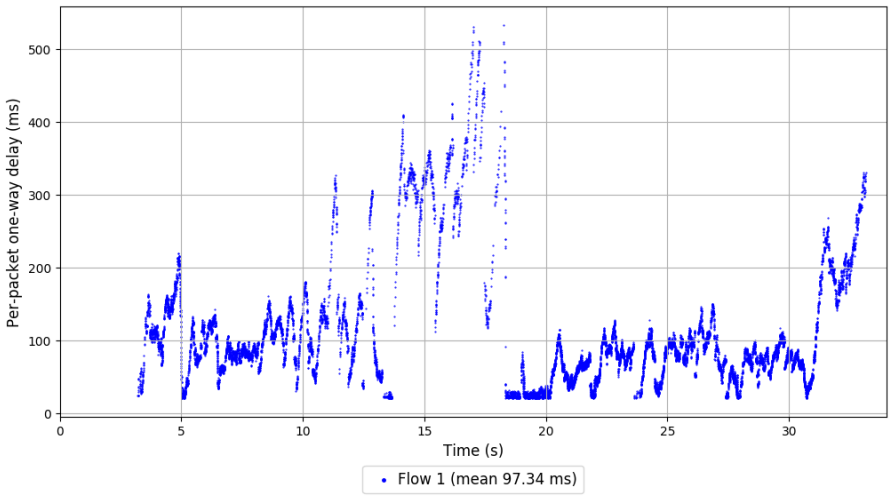
```
Run 3: Statistics of TCP BBR

Start at: 2020-05-31 08:55:25
End at: 2020-05-31 08:55:55

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 7.00 Mbit/s (93.1% utilization)
95th percentile per-packet one-way delay: 276.107 ms
99th percentile per-packet one-way delay: 364.305 ms
mean per-packet one-way delay: 97.339 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 7.00 Mbit/s
95th percentile per-packet one-way delay: 276.107 ms
99th percentile per-packet one-way delay: 364.305 ms
Average per-packet one-way delay: 97.339 ms
Loss rate: 0.39%
```

Run 3: Report of TCP BBR — Data Link



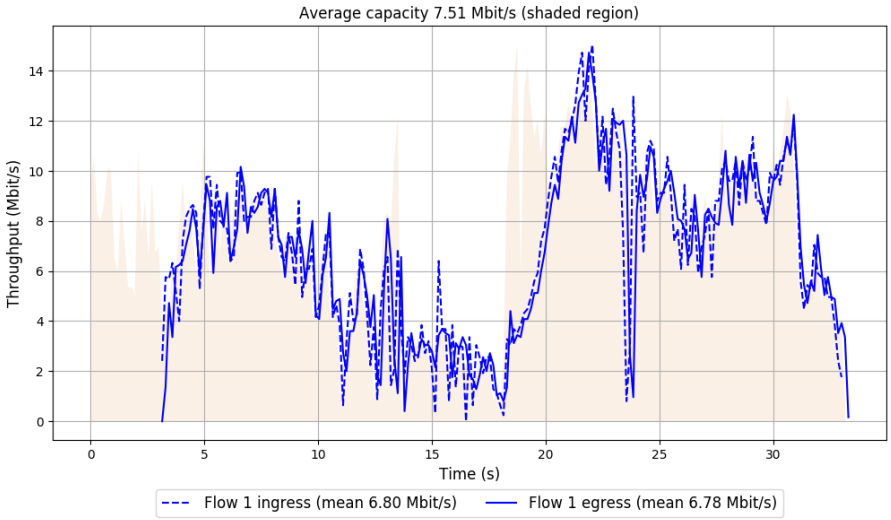


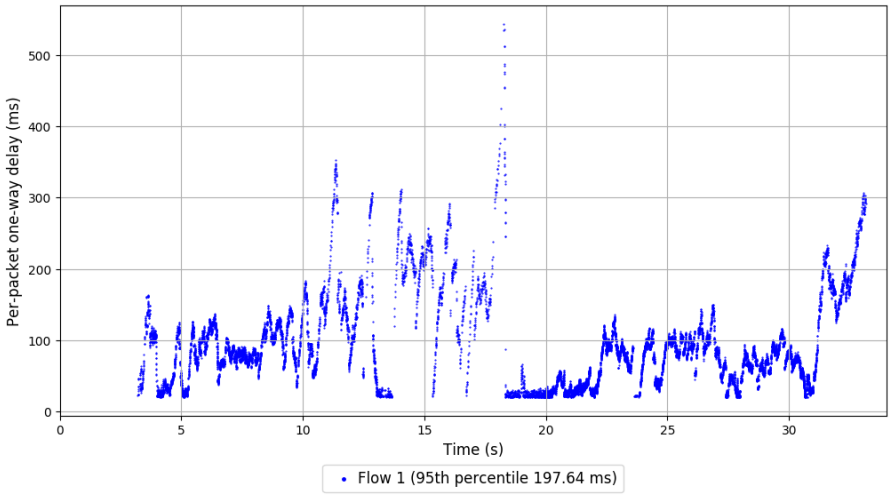

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 364.31 ms)

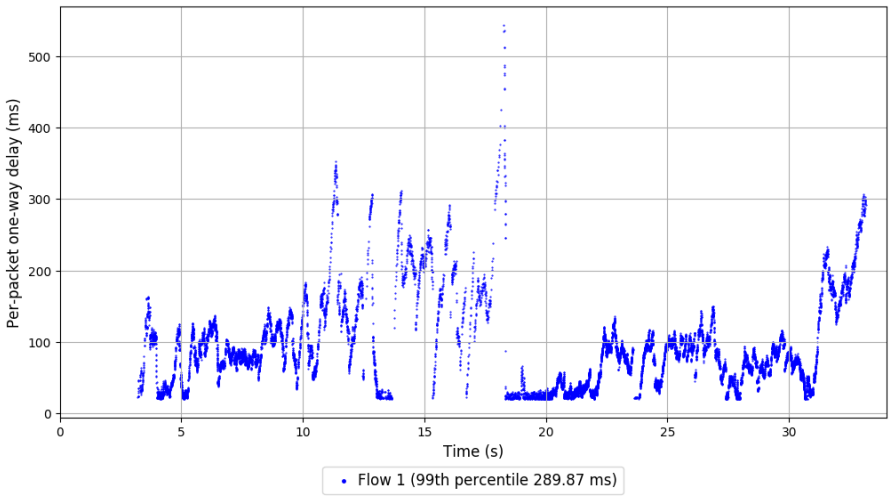

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 97.34 ms)

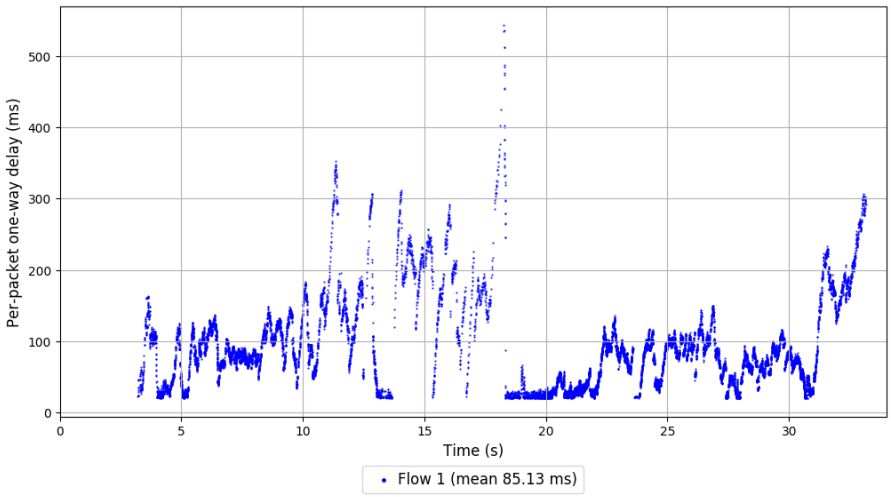
```
Run 4: Statistics of TCP BBR

Start at: 2020-05-31 08:57:41
End at: 2020-05-31 08:58:11

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 6.78 Mbit/s (90.3% utilization)
95th percentile per-packet one-way delay: 197.643 ms
99th percentile per-packet one-way delay: 289.865 ms
mean per-packet one-way delay: 85.127 ms
Loss rate: 0.29%
-- Flow 1:
Average throughput: 6.78 Mbit/s
95th percentile per-packet one-way delay: 197.643 ms
99th percentile per-packet one-way delay: 289.865 ms
Average per-packet one-way delay: 85.127 ms
Loss rate: 0.29%
```

Run 4: Report of TCP BBR — Data Link



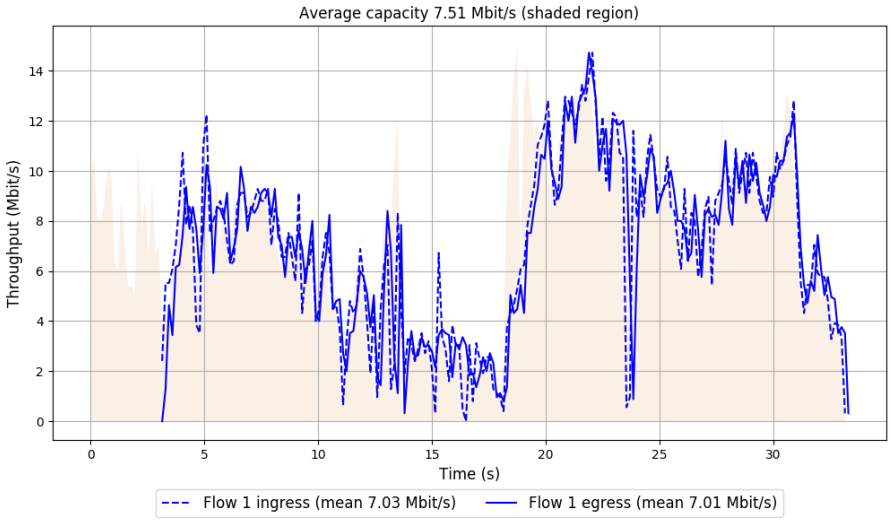


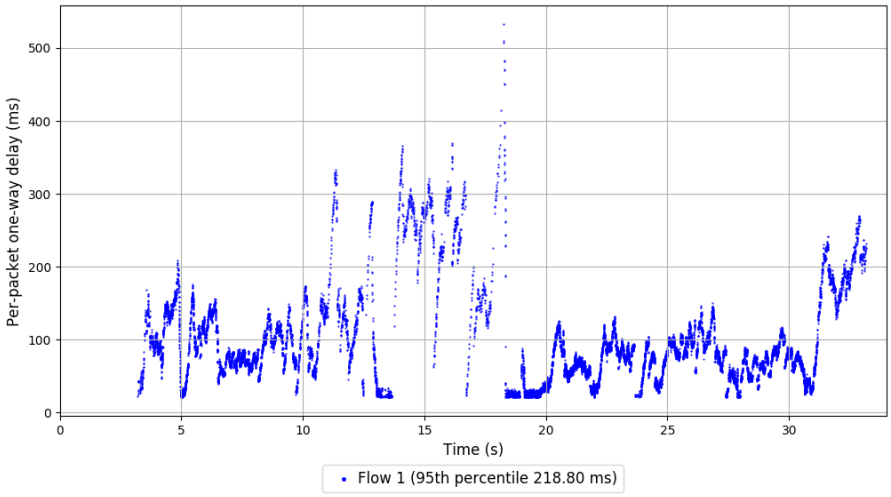

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 289.87 ms)

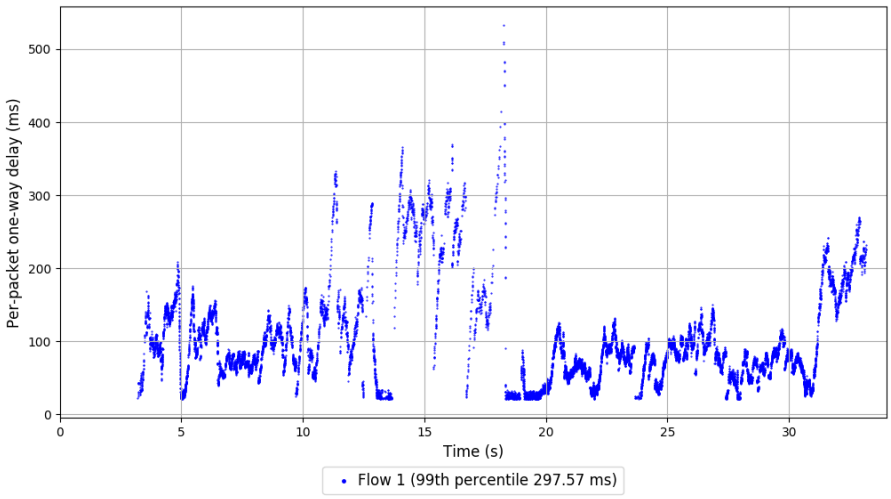

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 85.13 ms)

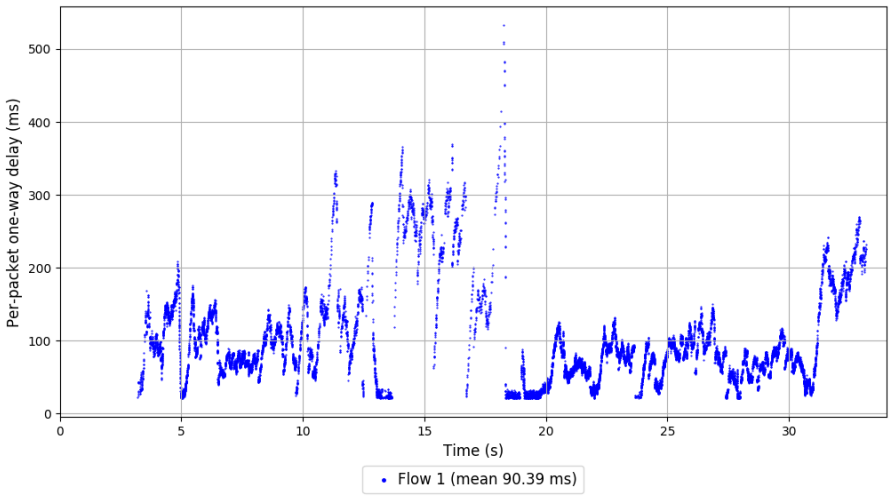
```
Run 5: Statistics of TCP BBR

Start at: 2020-05-31 08:59:58
End at: 2020-05-31 09:00:28

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 7.01 Mbit/s (93.3% utilization)
95th percentile per-packet one-way delay: 218.801 ms
99th percentile per-packet one-way delay: 297.575 ms
mean per-packet one-way delay: 90.385 ms
Loss rate: 0.39%
-- Flow 1:
Average throughput: 7.01 Mbit/s
95th percentile per-packet one-way delay: 218.801 ms
99th percentile per-packet one-way delay: 297.575 ms
Average per-packet one-way delay: 90.385 ms
Loss rate: 0.39%
```

Run 5: Report of TCP BBR — Data Link



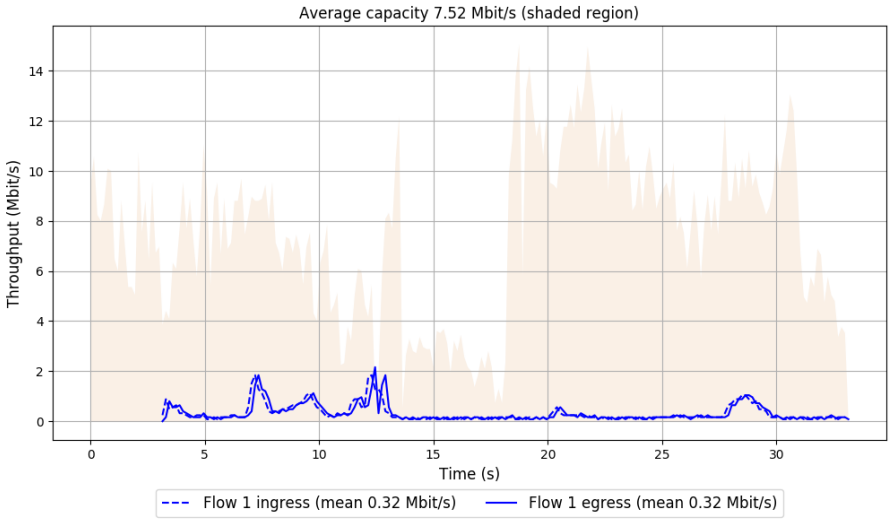


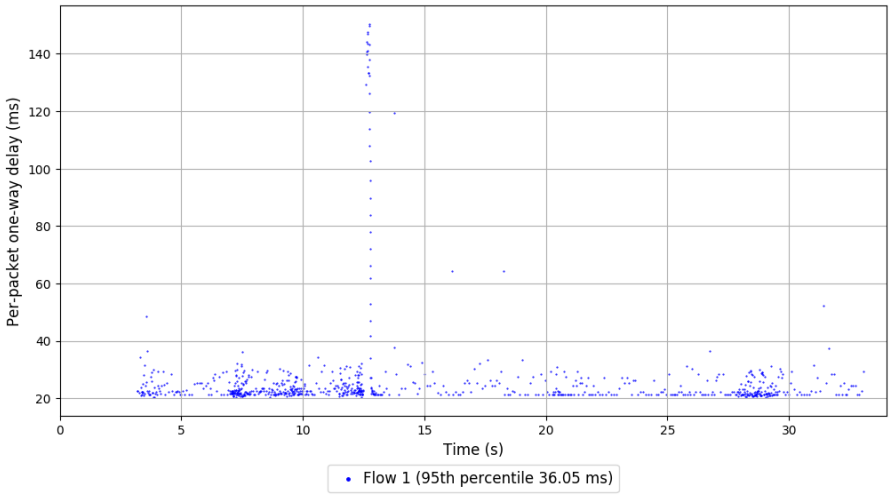

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 297.57 ms)

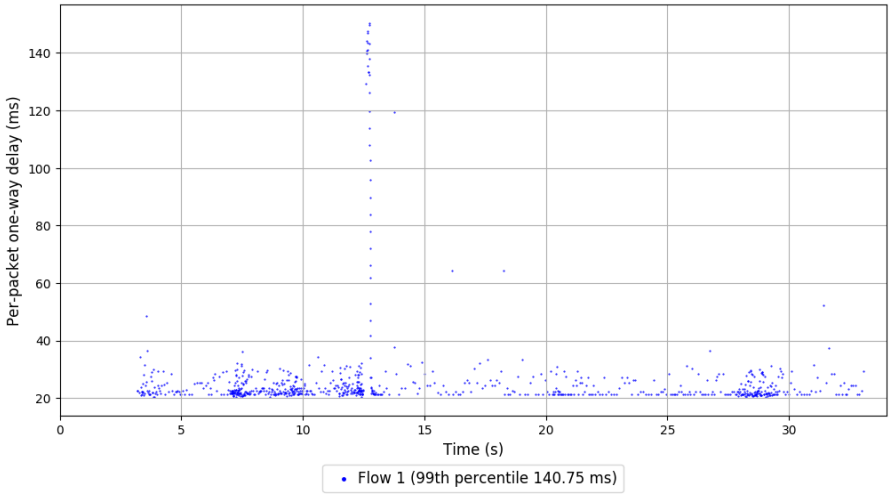

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 90.39 ms)

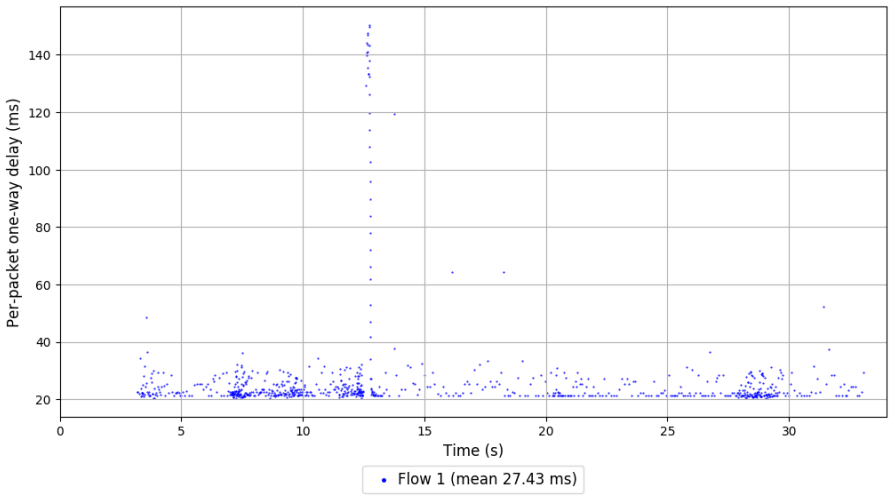
```
Run 1: Statistics of Pareto

Start at: 2020-05-31 08:52:00
End at: 2020-05-31 08:52:30

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.52 Mbit/s
Average throughput: 0.32 Mbit/s (4.3% utilization)
95th percentile per-packet one-way delay: 36.055 ms
99th percentile per-packet one-way delay: 140.750 ms
mean per-packet one-way delay: 27.434 ms
Loss rate: 0.12%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 36.055 ms
99th percentile per-packet one-way delay: 140.750 ms
Average per-packet one-way delay: 27.434 ms
Loss rate: 0.12%
```

Run 1: Report of Pareto — Data Link



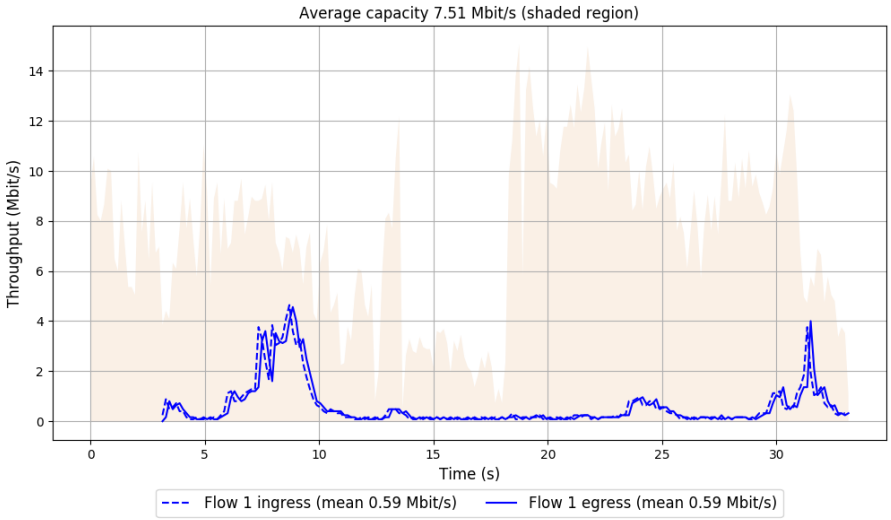


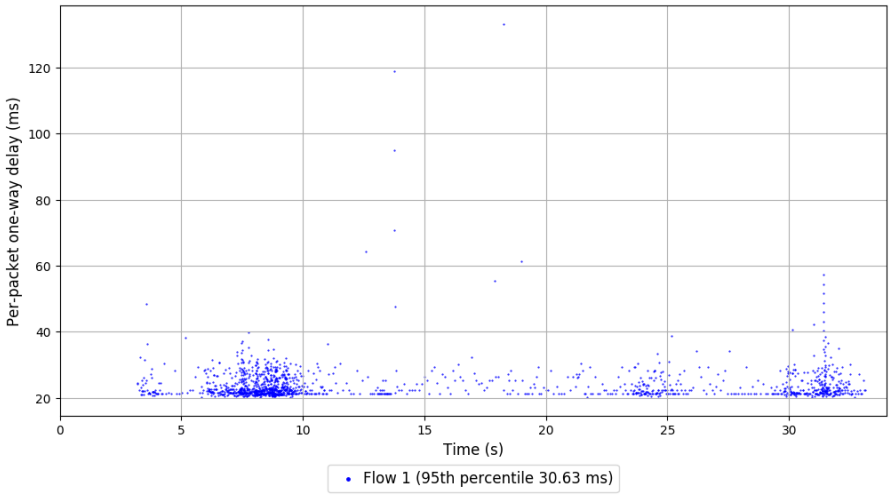

Per-packet one-way delay (ms)
140
120
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 140.75 ms)

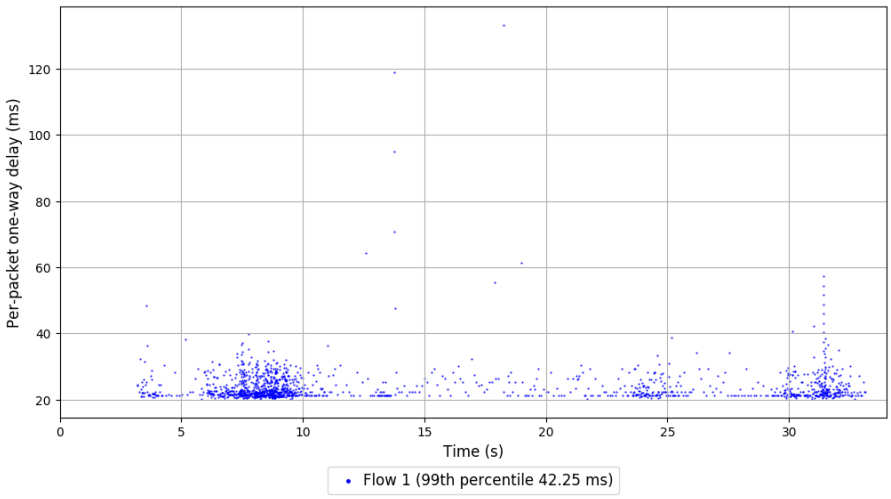

Per-packet one-way delay (ms)
140
120
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 27.43 ms)

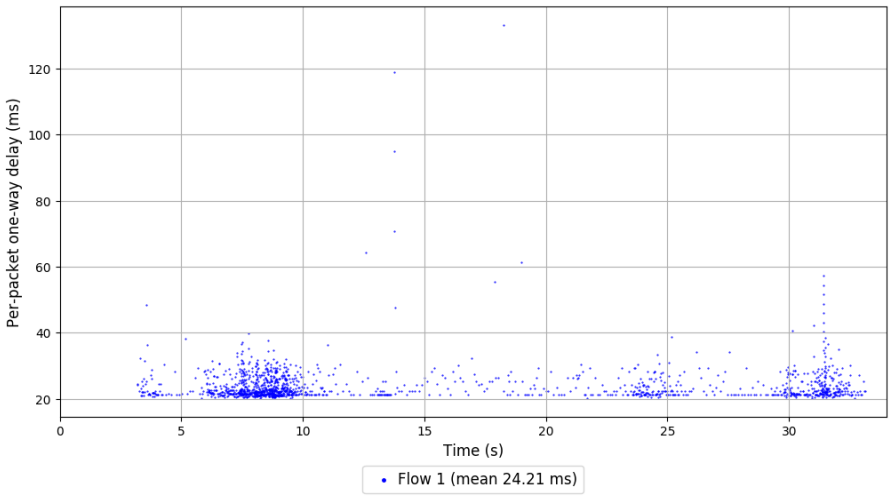
```
Run 2: Statistics of Pareto

Start at: 2020-05-31 08:54:17
End at: 2020-05-31 08:54:47

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 0.59 Mbit/s (7.8% utilization)
95th percentile per-packet one-way delay: 30.628 ms
99th percentile per-packet one-way delay: 42.252 ms
mean per-packet one-way delay: 24.205 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 30.628 ms
99th percentile per-packet one-way delay: 42.252 ms
Average per-packet one-way delay: 24.205 ms
Loss rate: 0.07%
```

Run 2: Report of Pareto — Data Link



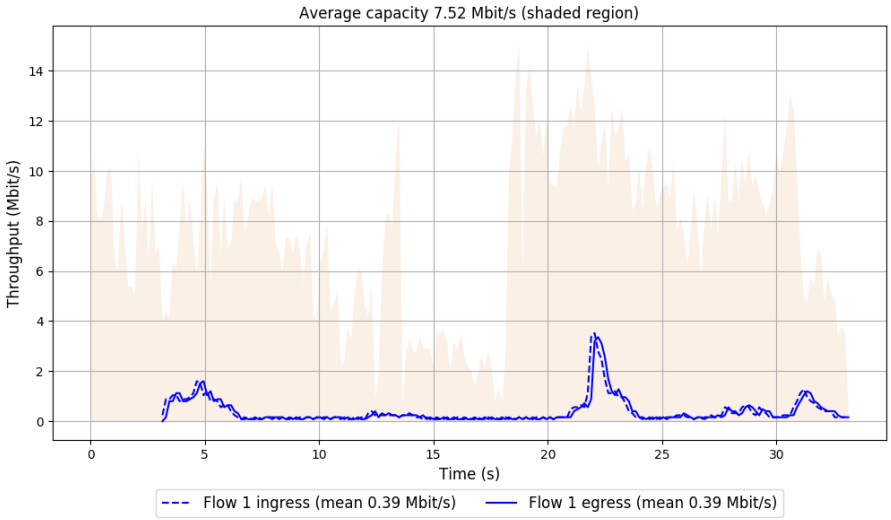


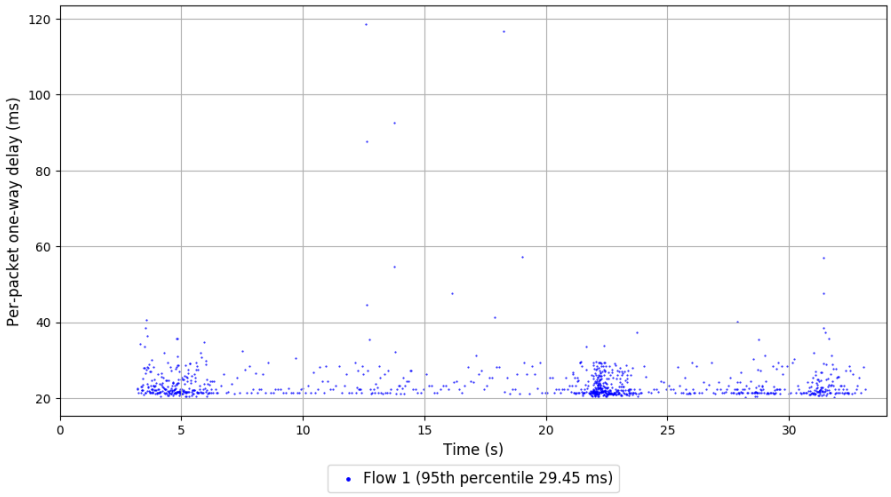

Per-packet one-way delay (ms)
120
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 42.25 ms)

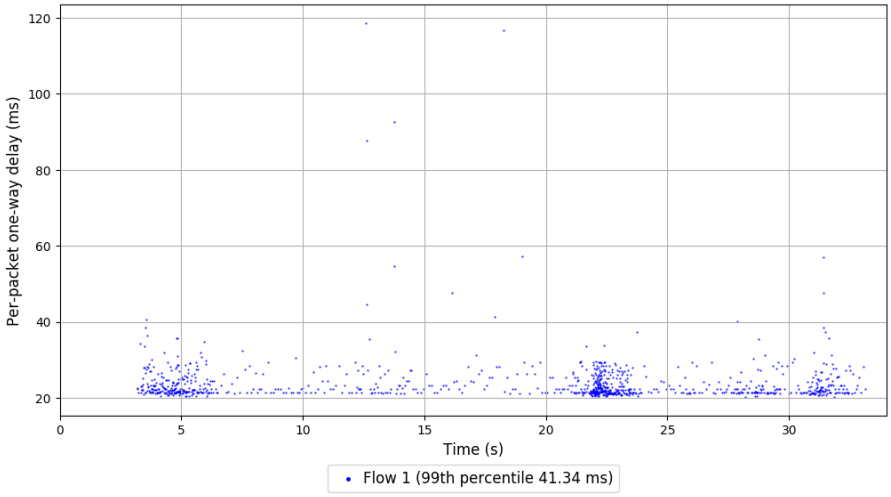

Per-packet one-way delay (ms)
120
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 24.21 ms)

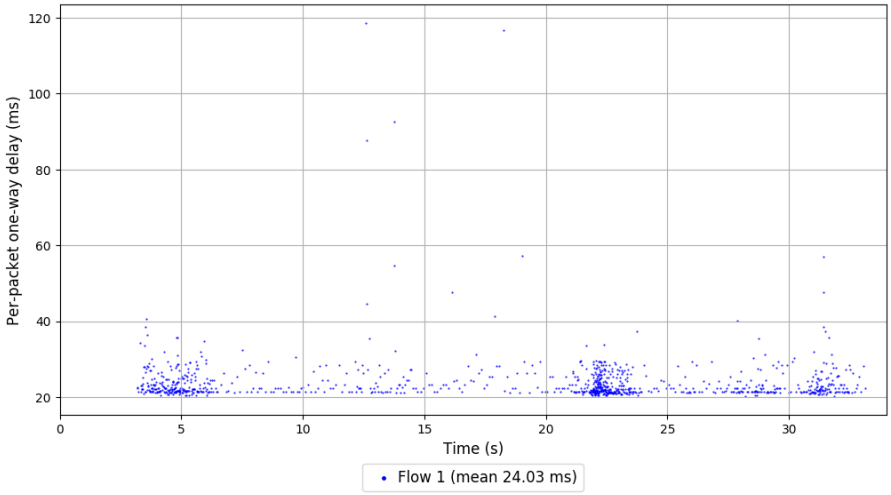
```
Run 3: Statistics of Pareto

Start at: 2020-05-31 08:56:33
End at: 2020-05-31 08:57:03

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.52 Mbit/s
Average throughput: 0.39 Mbit/s (5.2% utilization)
95th percentile per-packet one-way delay: 29.447 ms
99th percentile per-packet one-way delay: 41.336 ms
mean per-packet one-way delay: 24.033 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 29.447 ms
99th percentile per-packet one-way delay: 41.336 ms
Average per-packet one-way delay: 24.033 ms
Loss rate: 0.00%
```

Run 3: Report of Pareto — Data Link



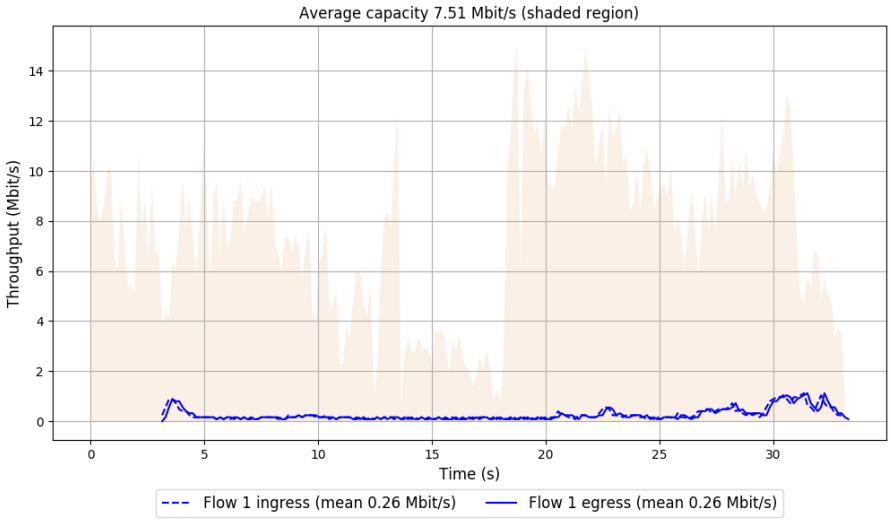


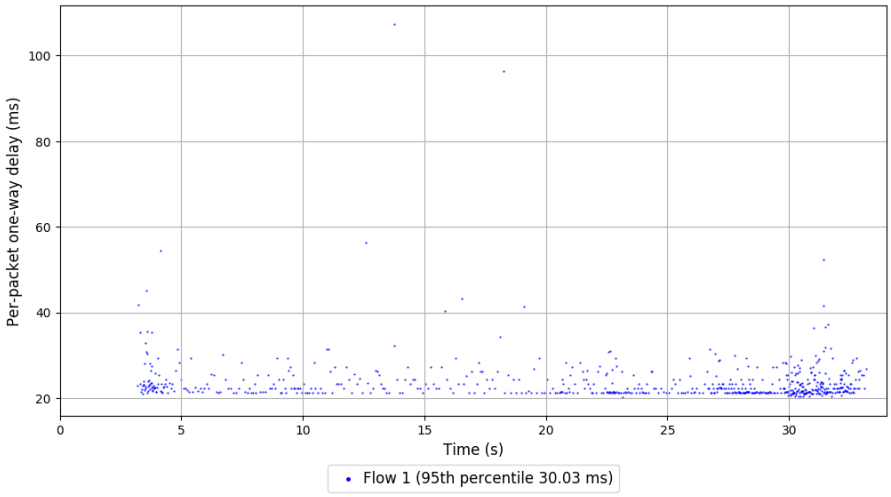

Per-packet one-way delay (ms)
120
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 41.34 ms)

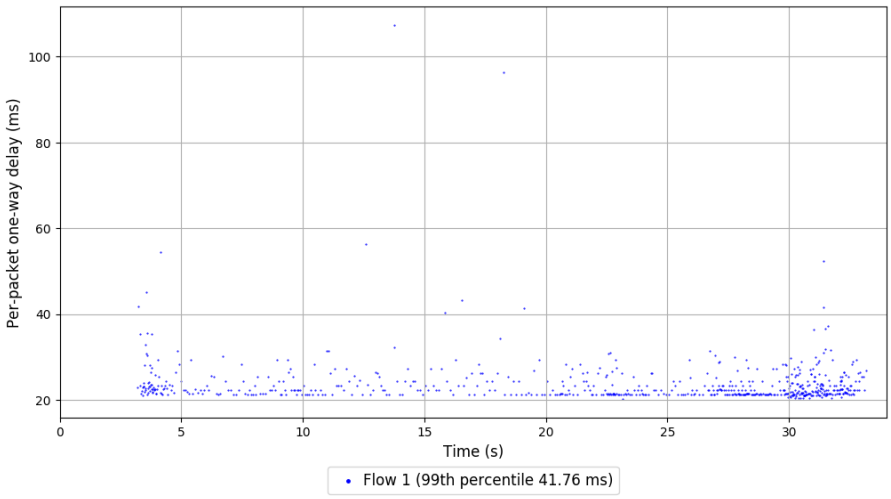

Per-packet one-way delay (ms)
120
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 24.03 ms)

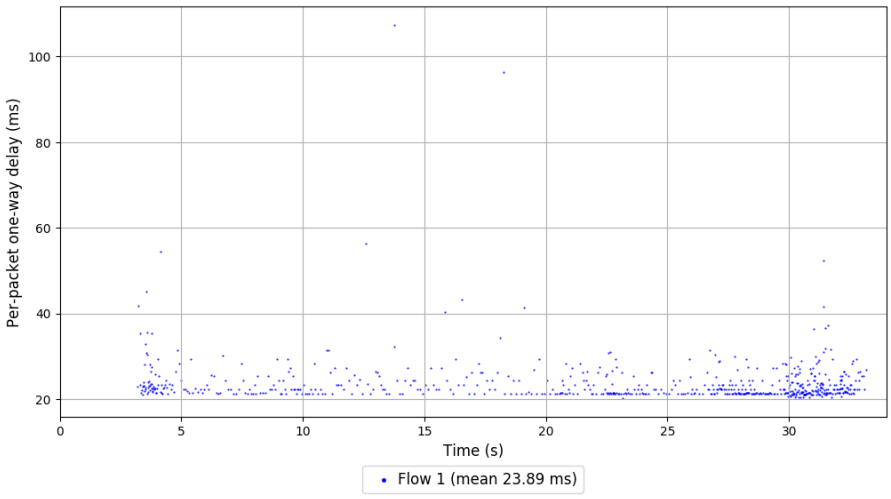
```
Run 4: Statistics of Pareto

Start at: 2020-05-31 08:58:49
End at: 2020-05-31 08:59:19

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 0.26 Mbit/s (3.5% utilization)
95th percentile per-packet one-way delay: 30.031 ms
99th percentile per-packet one-way delay: 41.764 ms
mean per-packet one-way delay: 23.886 ms
Loss rate: 0.00%
-- Flow 1:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 30.031 ms
99th percentile per-packet one-way delay: 41.764 ms
Average per-packet one-way delay: 23.886 ms
Loss rate: 0.00%
```

Run 4: Report of Pareto — Data Link



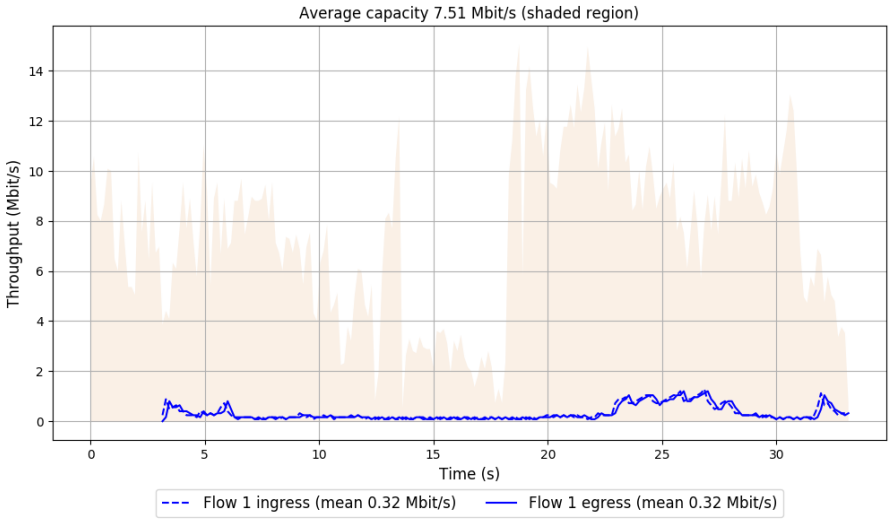


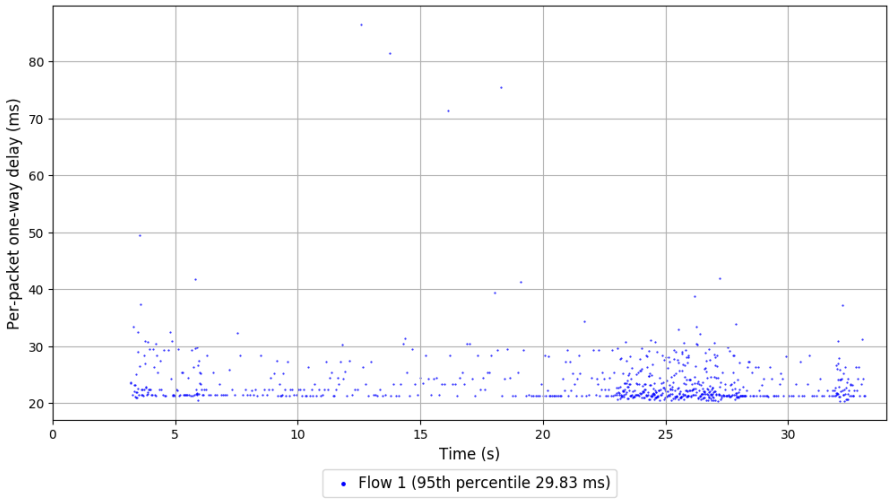

Per-packet one-way delay (ms)
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 41.76 ms)

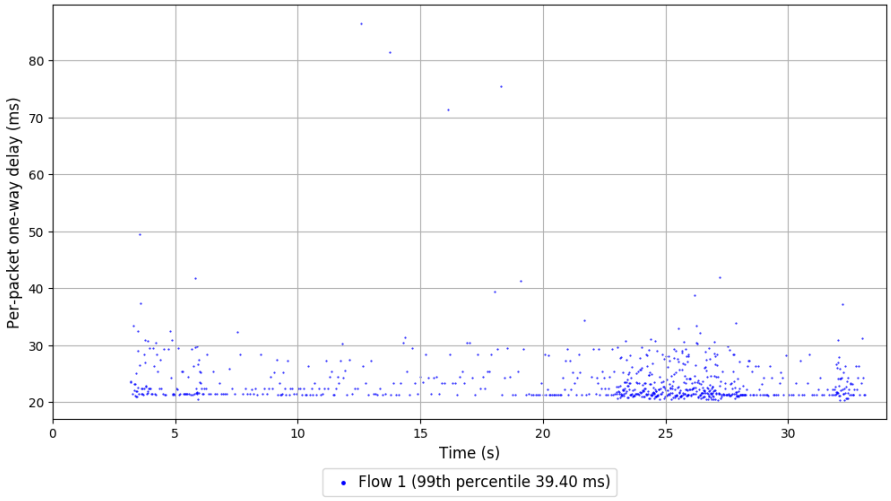

Per-packet one-way delay (ms)
100
80
60
40
20
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 23.89 ms)

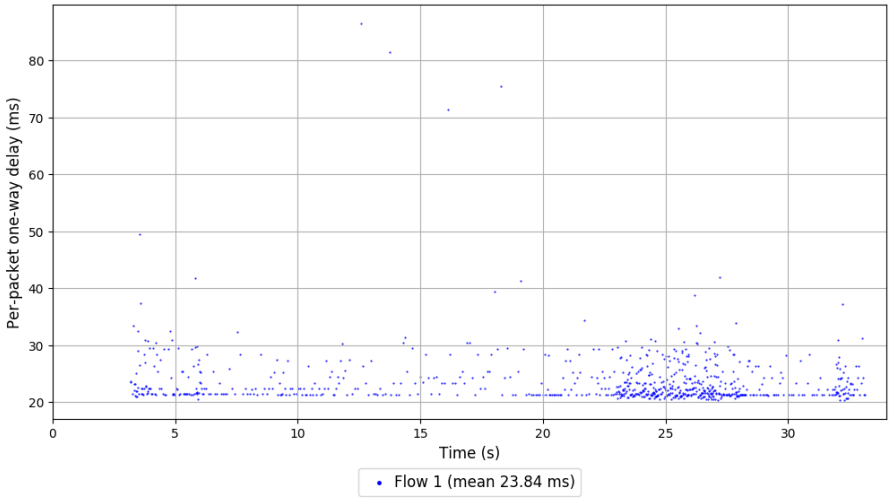
```
Run 5: Statistics of Pareto

Start at: 2020-05-31 09:01:06
End at: 2020-05-31 09:01:36

# Below is generated by plot.py at 2020-05-31 22:12:45
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 0.32 Mbit/s (4.2% utilization)
95th percentile per-packet one-way delay: 29.832 ms
99th percentile per-packet one-way delay: 39.404 ms
mean per-packet one-way delay: 23.843 ms
Loss rate: 0.13%
-- Flow 1:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 29.832 ms
99th percentile per-packet one-way delay: 39.404 ms
Average per-packet one-way delay: 23.843 ms
Loss rate: 0.13%
```

Run 5: Report of Pareto — Data Link



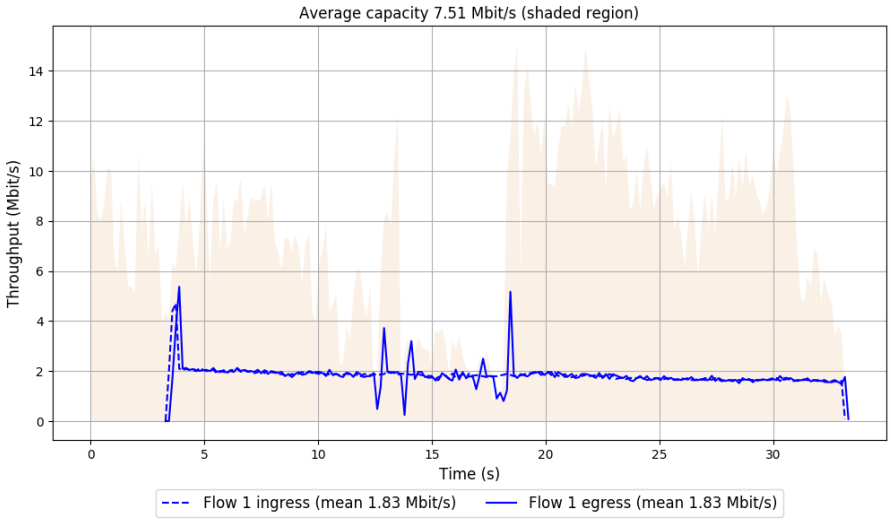


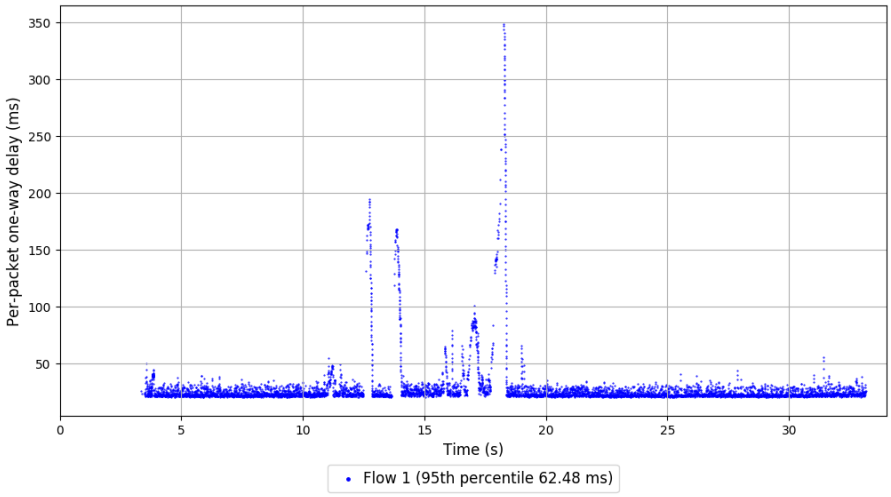

Per-packet one-way delay (ms)
Time (s)
Flow 1 (99th percentile 39.40 ms)

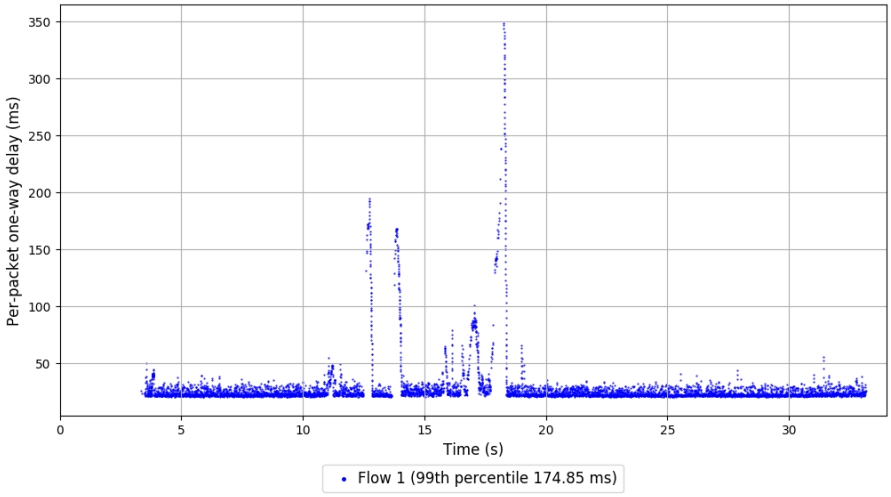

Per-packet one-way delay (ms)
Time (s)
Flow 1 (mean 23.84 ms)

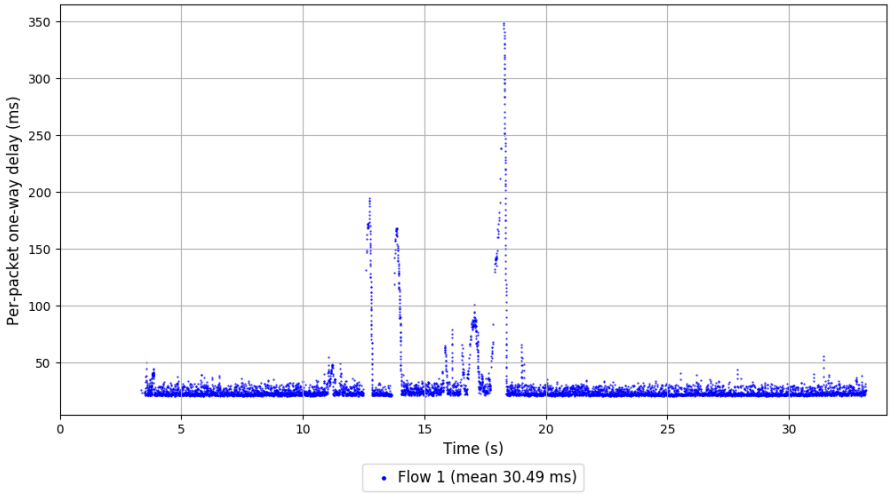
```
Run 1: Statistics of PCC-Allegro

Start at: 2020-05-31 08:51:26
End at: 2020-05-31 08:51:56

# Below is generated by plot.py at 2020-05-31 22:12:47
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 1.83 Mbit/s (24.4% utilization)
95th percentile per-packet one-way delay: 62.478 ms
99th percentile per-packet one-way delay: 174.848 ms
mean per-packet one-way delay: 30.487 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 1.83 Mbit/s
95th percentile per-packet one-way delay: 62.478 ms
99th percentile per-packet one-way delay: 174.848 ms
Average per-packet one-way delay: 30.487 ms
Loss rate: 0.07%
```

Run 1: Report of PCC-Allegro — Data Link



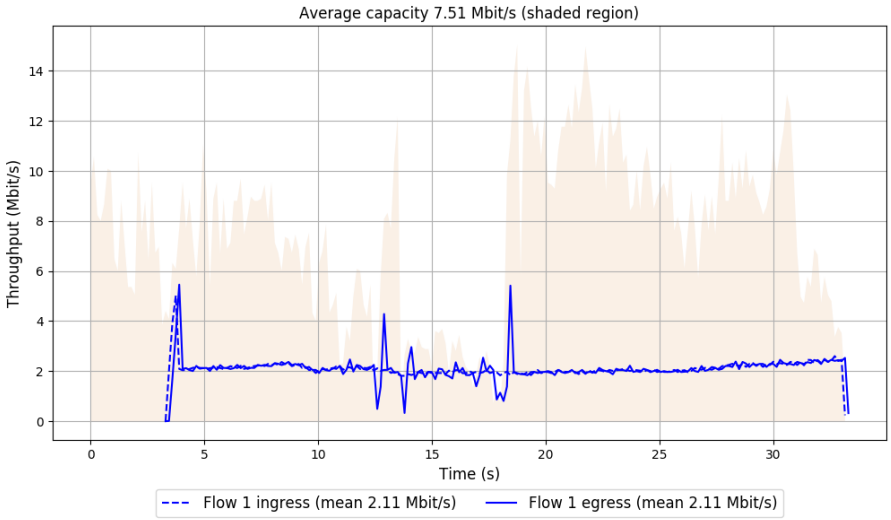


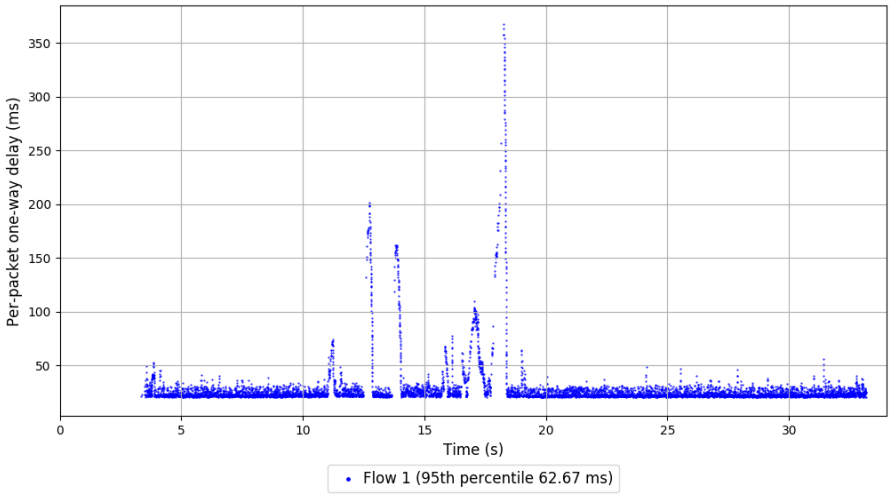

Per-packet one-way delay (ms)
350
300
250
200
150
100
50
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 174.85 ms)

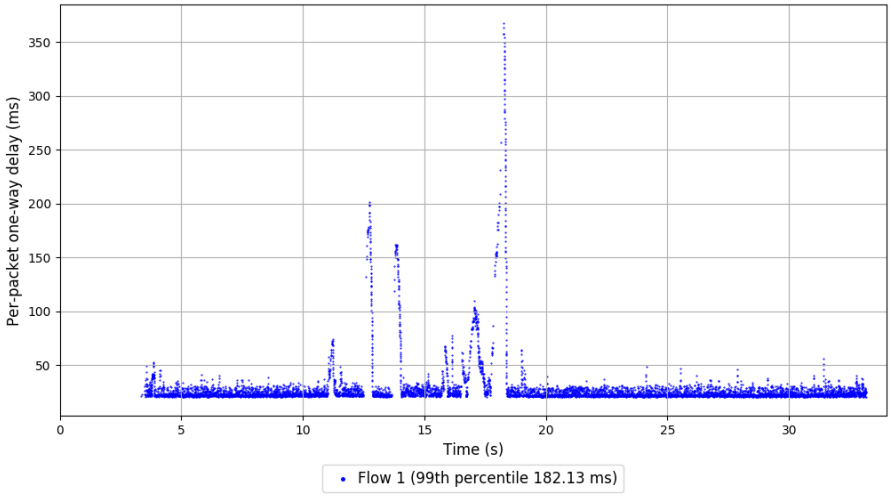

Per-packet one-way delay (ms)
350
300
250
200
150
100
50
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 30.49 ms)

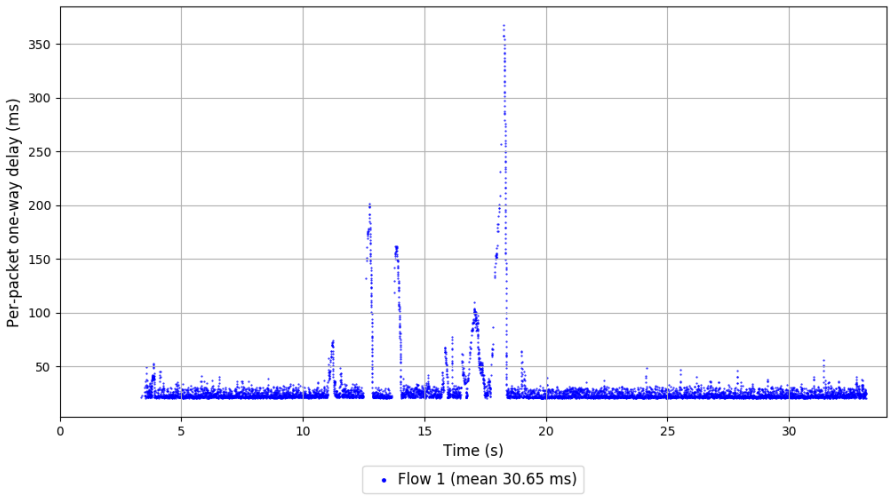
```
Run 2: Statistics of PCC-Allegro

Start at: 2020-05-31 08:53:43
End at: 2020-05-31 08:54:13

# Below is generated by plot.py at 2020-05-31 22:12:51
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 2.11 Mbit/s (28.1% utilization)
95th percentile per-packet one-way delay: 62.673 ms
99th percentile per-packet one-way delay: 182.133 ms
mean per-packet one-way delay: 30.654 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 2.11 Mbit/s
95th percentile per-packet one-way delay: 62.673 ms
99th percentile per-packet one-way delay: 182.133 ms
Average per-packet one-way delay: 30.654 ms
Loss rate: 0.08%
```

Run 2: Report of PCC-Allegro — Data Link



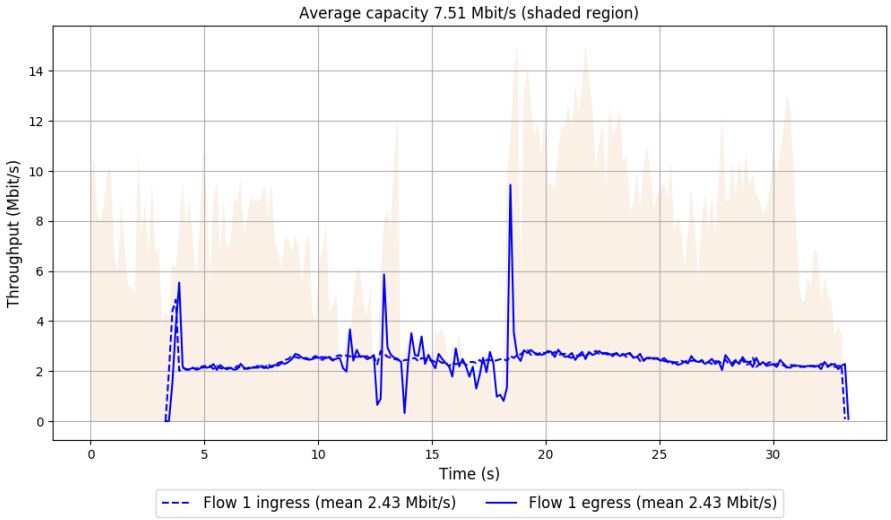


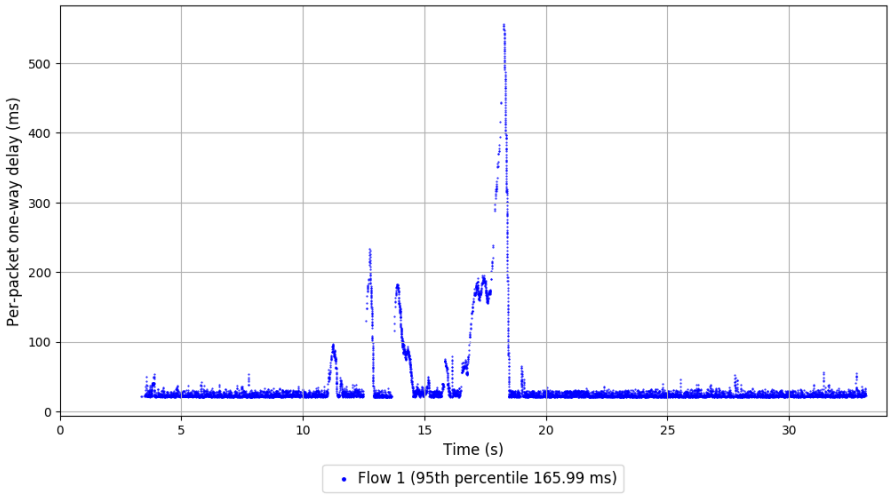

Per-packet one-way delay (ms)
350
300
250
200
150
100
50
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 182.13 ms)

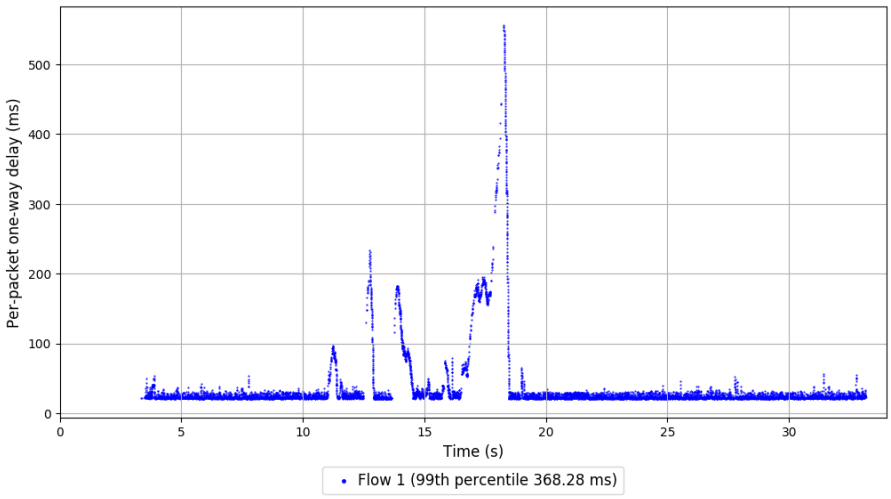

Per-packet one-way delay (ms)
350
300
250
200
150
100
50
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 30.65 ms)

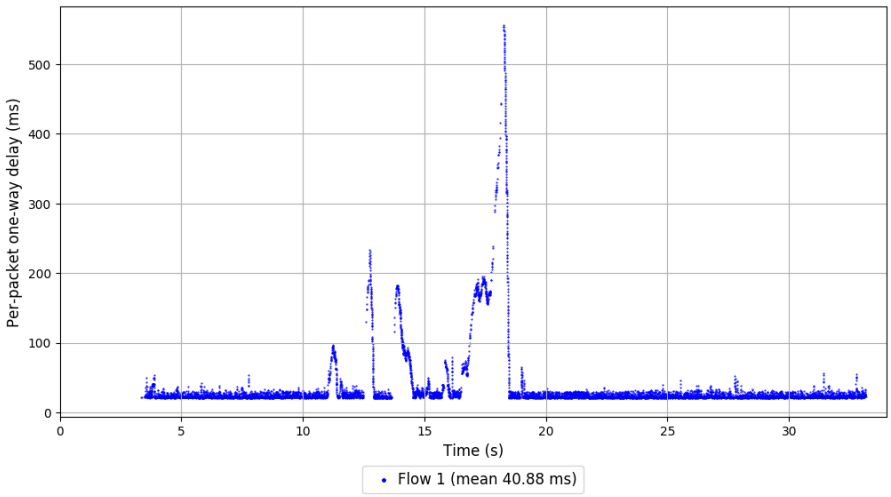
```
Run 3: Statistics of PCC-Allegro

Start at: 2020-05-31 08:55:59
End at: 2020-05-31 08:56:29

# Below is generated by plot.py at 2020-05-31 22:12:51
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 2.43 Mbit/s (32.3% utilization)
95th percentile per-packet one-way delay: 165.986 ms
99th percentile per-packet one-way delay: 368.280 ms
mean per-packet one-way delay: 40.880 ms
Loss rate: 0.07%
-- Flow 1:
Average throughput: 2.43 Mbit/s
95th percentile per-packet one-way delay: 165.986 ms
99th percentile per-packet one-way delay: 368.280 ms
Average per-packet one-way delay: 40.880 ms
Loss rate: 0.07%
```

Run 3: Report of PCC-Allegro — Data Link



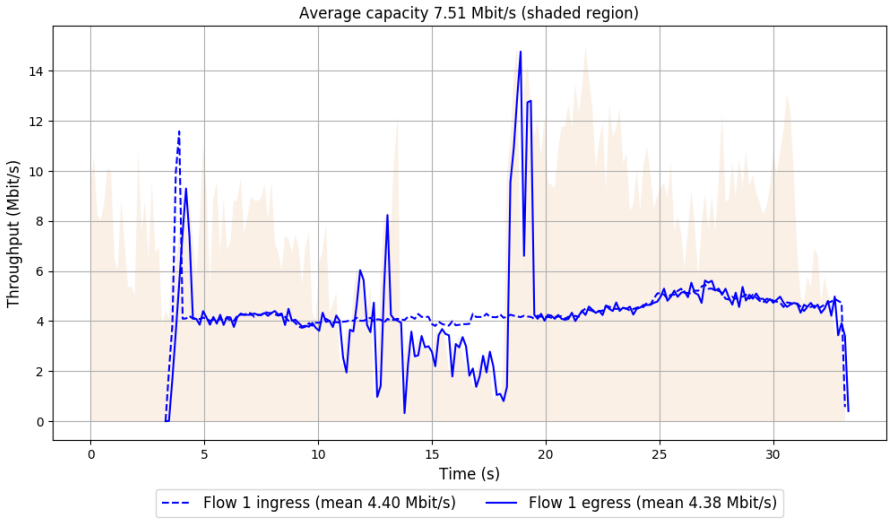


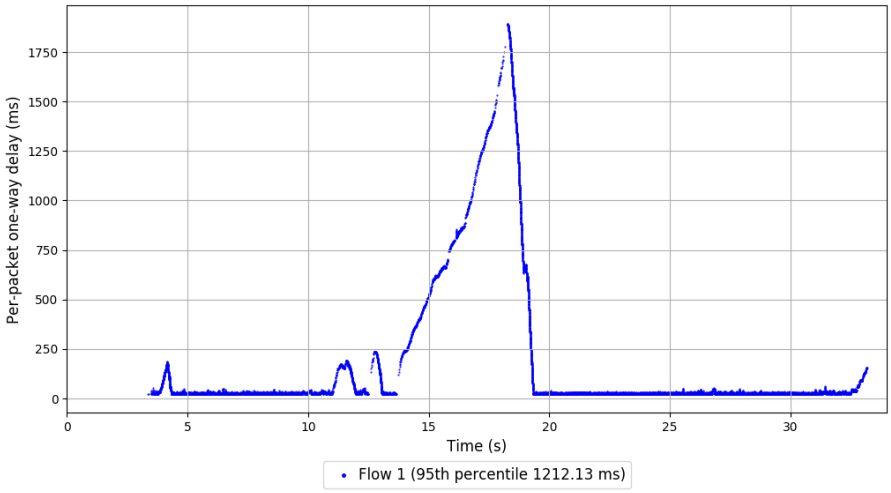

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 368.28 ms)

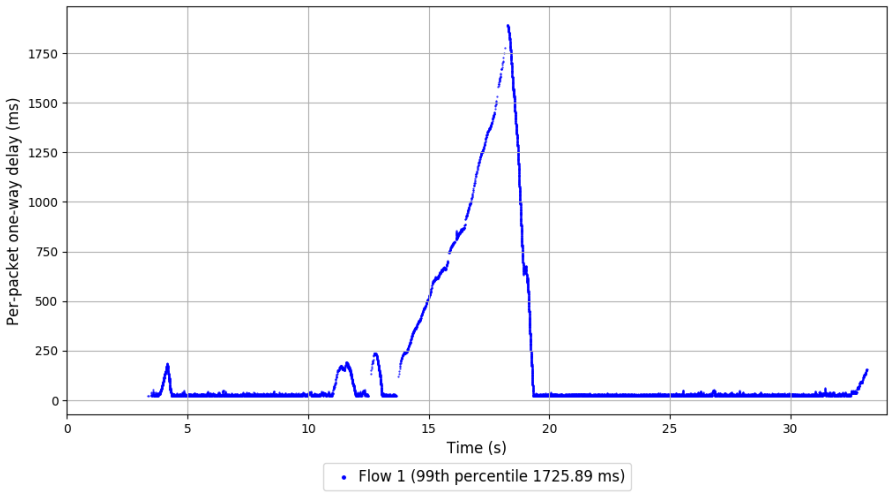

Per-packet one-way delay (ms)
0
100
200
300
400
500
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 40.88 ms)

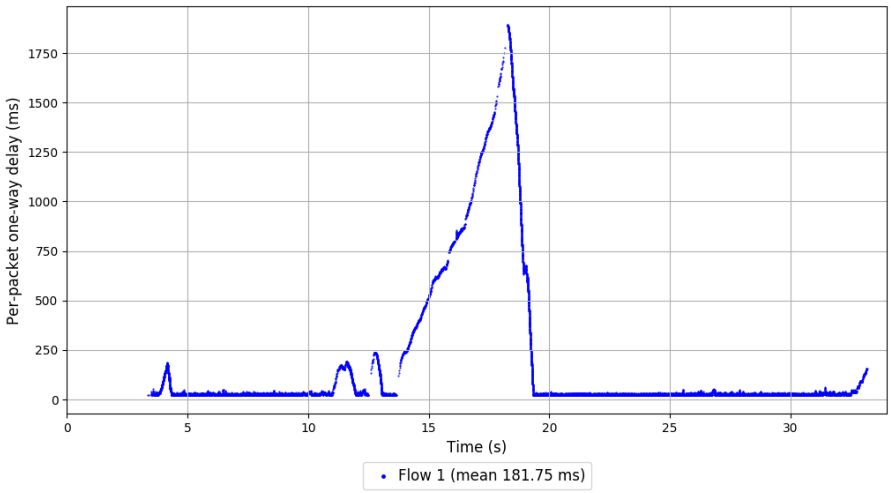
```
Run 4: Statistics of PCC-Allegro

Start at: 2020-05-31 08:58:15
End at: 2020-05-31 08:58:45

# Below is generated by plot.py at 2020-05-31 22:12:54
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 4.38 Mbit/s (58.3% utilization)
95th percentile per-packet one-way delay: 1212.126 ms
99th percentile per-packet one-way delay: 1725.895 ms
mean per-packet one-way delay: 181.753 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 4.38 Mbit/s
95th percentile per-packet one-way delay: 1212.126 ms
99th percentile per-packet one-way delay: 1725.895 ms
Average per-packet one-way delay: 181.753 ms
Loss rate: 0.56%
```

Run 4: Report of PCC-Allegro — Data Link



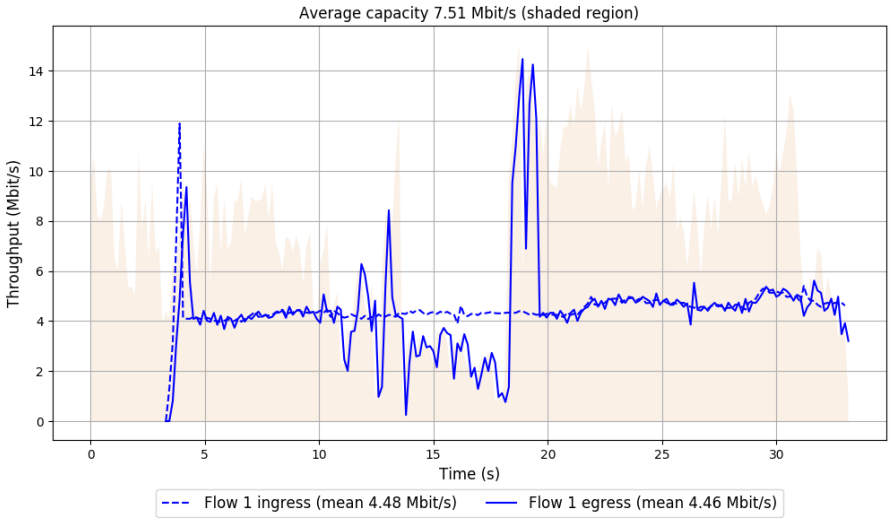


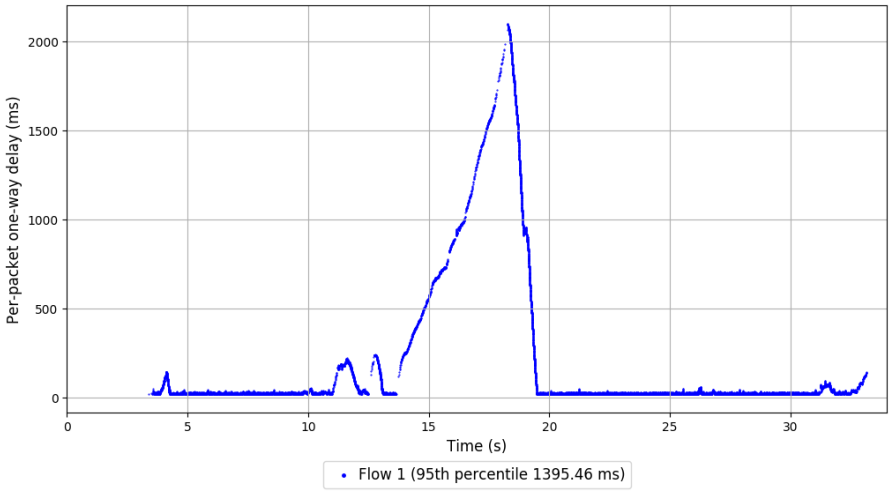

Per-packet one-way delay (ms)
0
250
500
750
1000
1250
1500
1750
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 1725.89 ms)

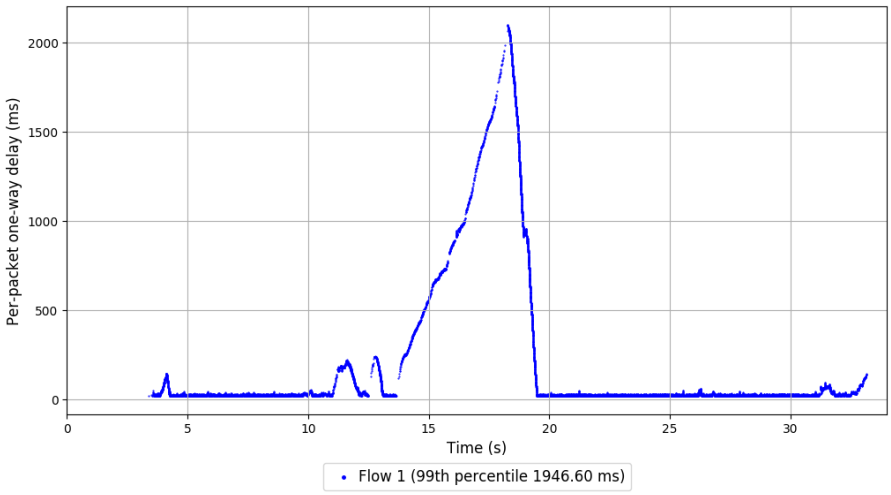

Per-packet one-way delay (ms)
0
250
500
750
1000
1250
1500
1750
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 181.75 ms)

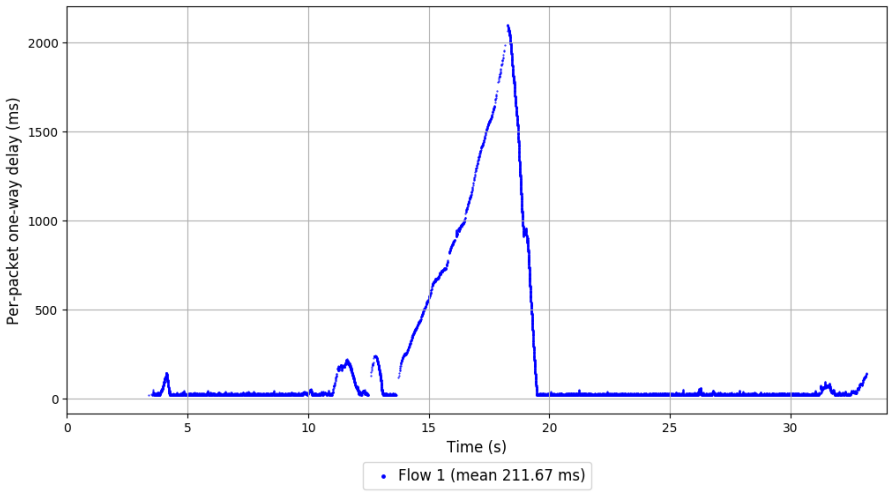
```
Run 5: Statistics of PCC-Allegro

Start at: 2020-05-31 09:00:32
End at: 2020-05-31 09:01:02

# Below is generated by plot.py at 2020-05-31 22:12:54
# Datalink statistics
-- Total of 1 flow:
Average capacity: 7.51 Mbit/s
Average throughput: 4.46 Mbit/s (59.3% utilization)
95th percentile per-packet one-way delay: 1395.463 ms
99th percentile per-packet one-way delay: 1946.595 ms
mean per-packet one-way delay: 211.673 ms
Loss rate: 0.50%
-- Flow 1:
Average throughput: 4.46 Mbit/s
95th percentile per-packet one-way delay: 1395.463 ms
99th percentile per-packet one-way delay: 1946.595 ms
Average per-packet one-way delay: 211.673 ms
Loss rate: 0.50%
```

Run 5: Report of PCC-Allegro — Data Link






Per-packet one-way delay (ms)
0
500
1000
1500
2000
0
5
10
15
20
25
30
Time (s)
Flow 1 (99th percentile 1946.60 ms)


Per-packet one-way delay (ms)
0
500
1000
1500
2000
0
5
10
15
20
25
30
Time (s)
Flow 1 (mean 211.67 ms)