Pantheon Report

Generated at 2017-09-19 08:19:06 (UTC).

Data path: GCE Tokyo Ethernet (*remote*) →GCE Iowa Ethernet (*local*).

Repeated the test of 10 congestion control schemes 10 times.

Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.
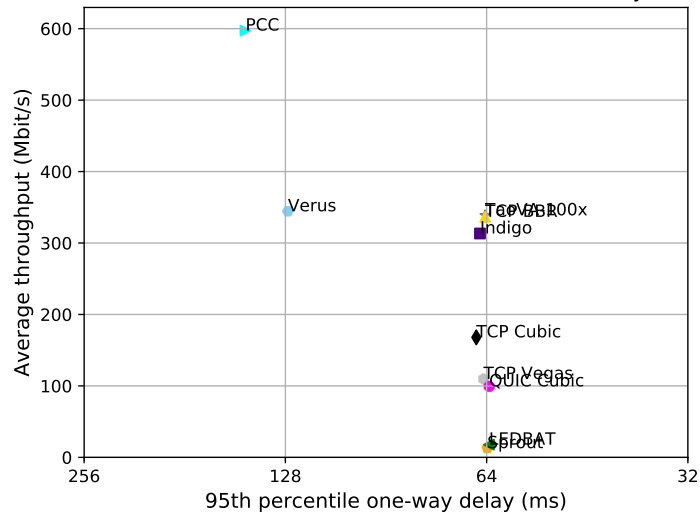
Increased UDP receive buffer to 16 MB (default) and 32 MB (max).

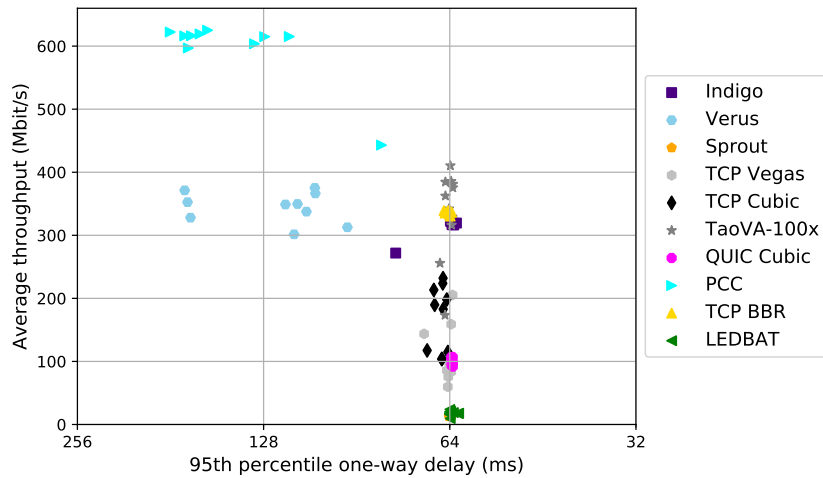Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

```
Git summary:
branch: master @ 57453dc11f8da93a2e03eea75289fea01b816298
third_party/calibrated_koho @ 3cb73c0d1c0322cdfae446ea37a522e53227db50
 M datagrump/sender.cc
third_party/genericCC @ f7ca42f251bf49b432bb71de6d13fa903515c366
third_party/indigo @ b19f3730105f9aa95452552af924e3719b03cc55
third_party/koho_cc @ f0f2e693303aee82ea808e6928eac4f1083a6681
 M datagrump/sender.cc
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ baf443516dea3eeddeccaf9b916cc313273ca4f4
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-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream @ c3370fd7bd17265a79aeb34e4016ad23f5965885
third_party/sourdough @ f1a14bffe749737437f61b1eaeeb30b267cde681
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/webrtc @ a488197ddd041ace68a42849b2540ad834825f42
```

test from GCE Tokyo Ethernet to GCE Iowa Ethernet, 10 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)

test from GCE Tokyo Ethernet to GCE Iowa Ethernet, 10 runs of 30s each per scheme
3 flows with 10s interval between flows

scheme	# runs	mean avg tput (Mbit/s)			mean 95th-%ile delay (ms)			mean loss rate (%)		
		flow 1	flow 2	flow 3	flow 1	flow 2	flow 3	flow 1	flow 2	flow 3
TCP BBR	10	171.23	169.18	161.28	63.92	64.40	65.58	0.44	0.69	1.46
TCP Cubic	10	65.34	109.39	90.04	541.28	65.89	67.43	0.27	0.71	1.45
Indigo	7	169.31	152.62	131.99	65.00	65.60	66.22	0.38	0.57	1.40
LEDBAT	10	9.65	9.52	5.54	63.49	63.44	63.30	0.85	0.98	2.38
PCC	10	518.32	92.35	32.98	655.64	137.69	128.68	1.32	1.29	2.65
QUIC Cubic	10	54.19	50.37	35.92	63.39	63.42	63.18	0.50	0.85	1.84
Sprout	10	6.53	6.48	6.27	63.88	63.83	63.67	0.50	0.53	1.59
TaoVA-100x	10	173.50	195.55	129.51	64.66	64.22	64.49	0.41	0.74	1.71
TCP Vegas	10	46.26	63.71	54.66	64.37	64.56	65.45	0.45	0.74	1.28
Verus	10	213.58	149.30	98.98	115.09	133.18	139.01	0.62	1.65	1.49

```
Run 1: Statistics of TCP BBR

Start at: 2017-09-19 04:02:29
End at: 2017-09-19 04:02:59

# Below is generated by plot.py at 2017-09-19 07:31:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 339.07 Mbit/s
95th percentile per-packet one-way delay: 64.058 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 172.60 Mbit/s
95th percentile per-packet one-way delay: 63.770 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 171.79 Mbit/s
95th percentile per-packet one-way delay: 64.202 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 159.25 Mbit/s
95th percentile per-packet one-way delay: 65.070 ms
Loss rate: 1.43%
```
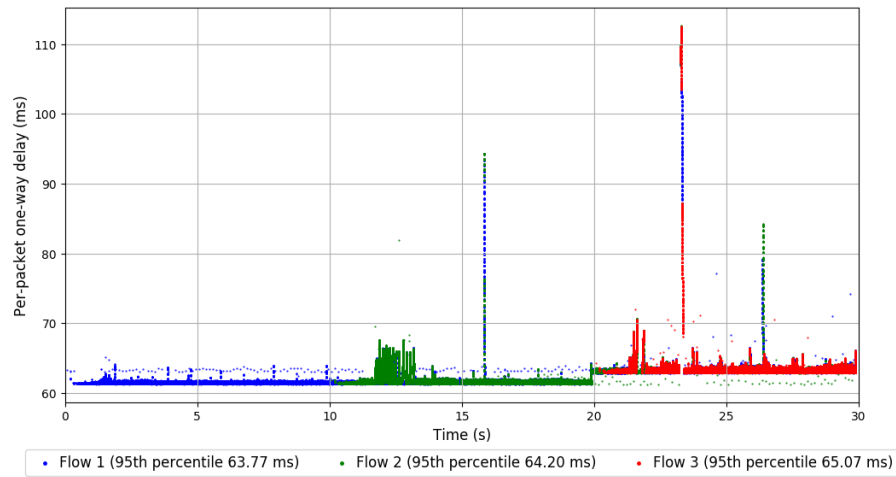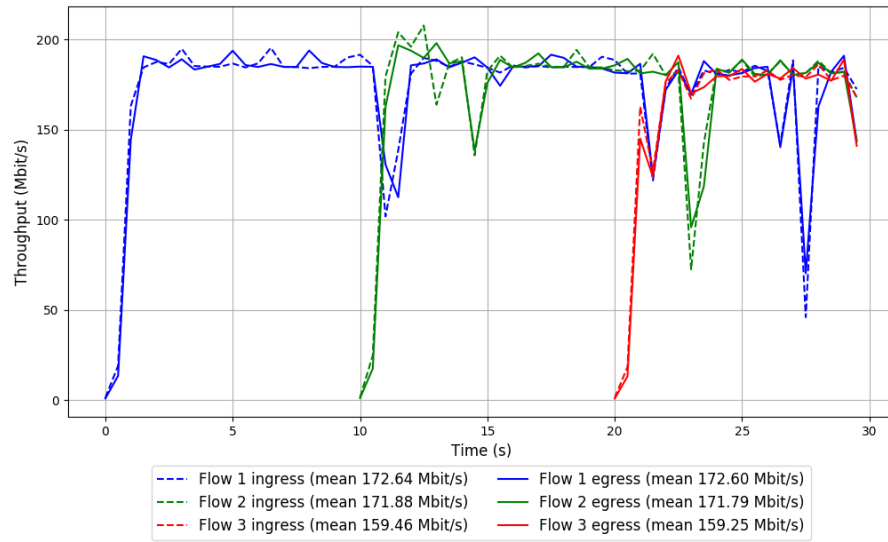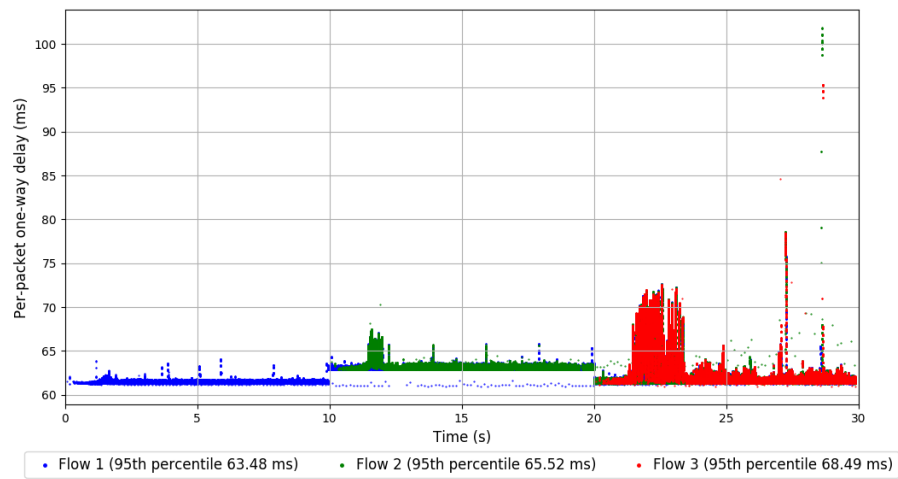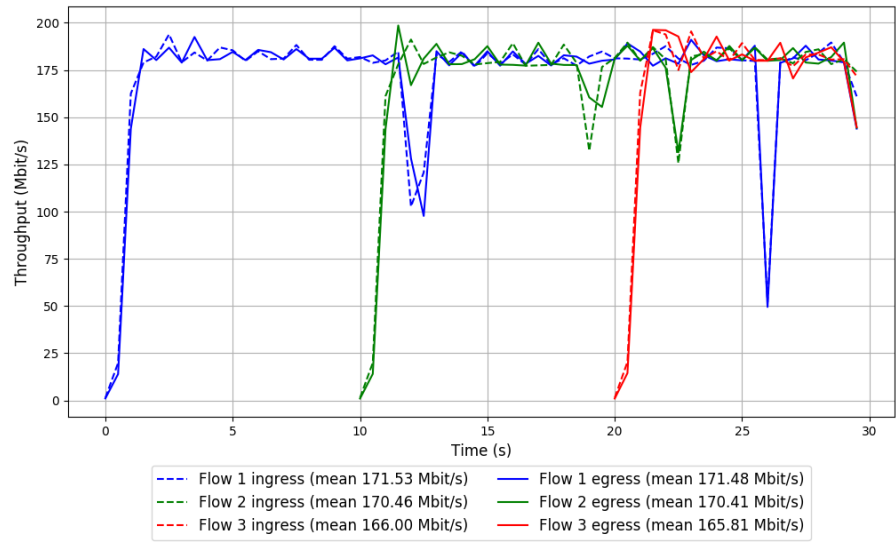
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 172.64 Mbit/s)   Flow 1 egress (mean 172.60 Mbit/s)
Flow 2 ingress (mean 171.88 Mbit/s)   Flow 2 egress (mean 171.79 Mbit/s)
Flow 3 ingress (mean 159.46 Mbit/s)   Flow 3 egress (mean 159.25 Mbit/s)

Flow 1 (95th percentile 63.77 ms)   Flow 2 (95th percentile 64.20 ms)   Flow 3 (95th percentile 65.07 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2017-09-19 04:11:39
End at: 2017-09-19 04:12:09


# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 339.20 Mbit/s
95th percentile per-packet one-way delay: 65.399 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 171.48 Mbit/s
95th percentile per-packet one-way delay: 63.482 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 170.41 Mbit/s
95th percentile per-packet one-way delay: 65.518 ms
Loss rate: 0.68%
-- Flow 3:
Average throughput: 165.81 Mbit/s
95th percentile per-packet one-way delay: 68.490 ms
Loss rate: 1.39%
```
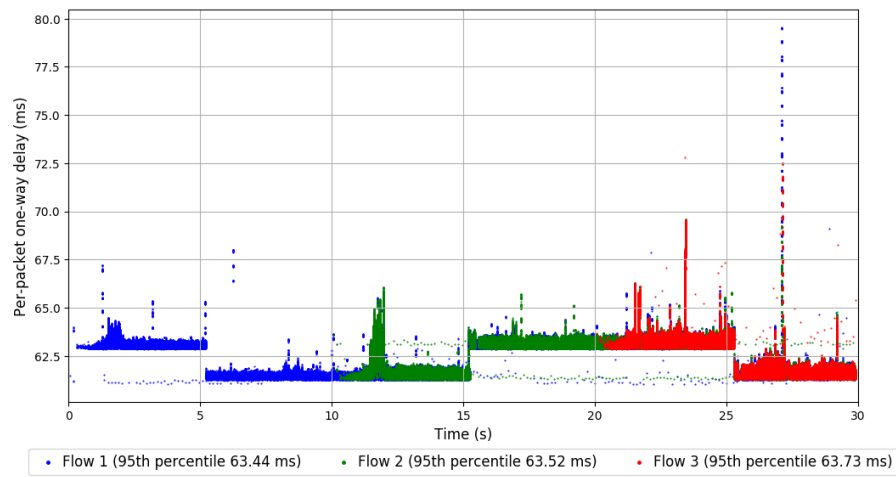
Run 2: Report of TCP BBR — Data Link

```
Run 3: Statistics of TCP BBR

Start at: 2017-09-19 04:20:54
End at: 2017-09-19 04:21:24


# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 336.47 Mbit/s
95th percentile per-packet one-way delay: 63.518 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 170.90 Mbit/s
95th percentile per-packet one-way delay: 63.440 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 168.68 Mbit/s
95th percentile per-packet one-way delay: 63.520 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 163.04 Mbit/s
95th percentile per-packet one-way delay: 63.731 ms
Loss rate: 1.43%
```
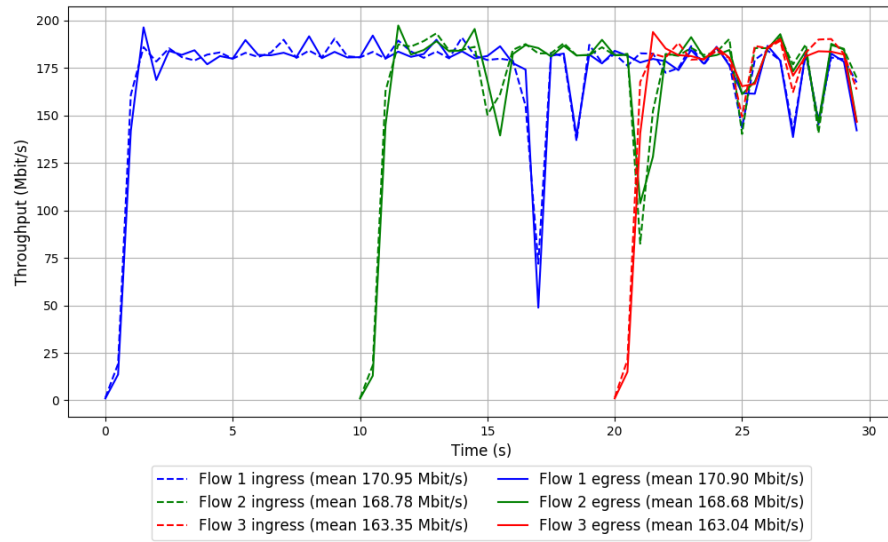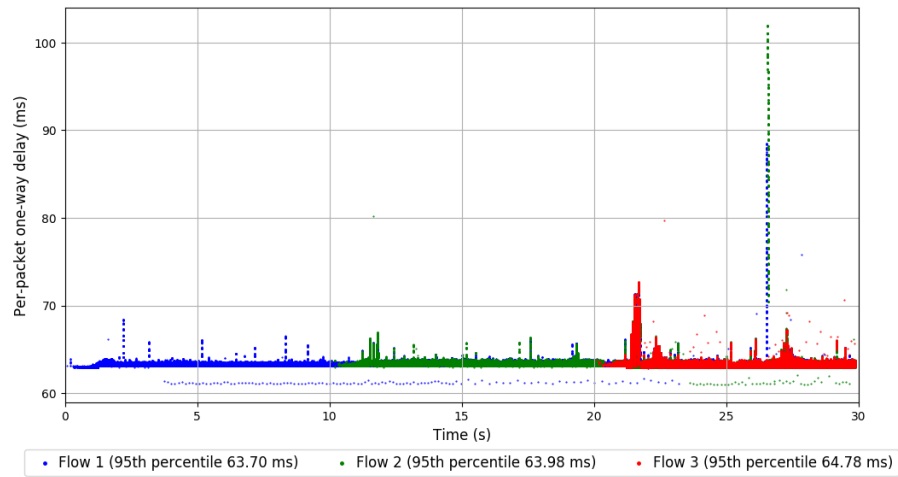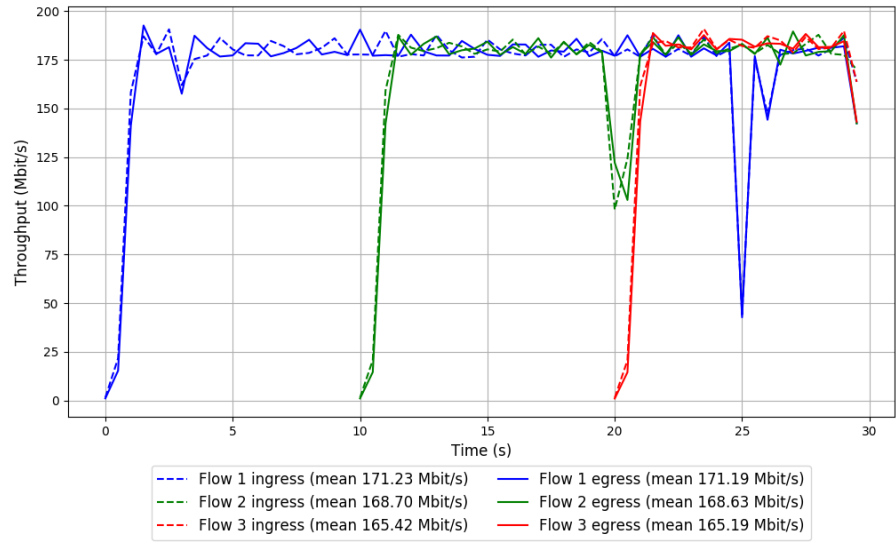
Run 3: Report of TCP BBR — Data Link

Flow 1 ingress (mean 170.95 Mbit/s) --- Flow 1 egress (mean 170.90 Mbit/s)
Flow 2 ingress (mean 168.78 Mbit/s) --- Flow 2 egress (mean 168.68 Mbit/s)
Flow 3 ingress (mean 163.35 Mbit/s) --- Flow 3 egress (mean 163.04 Mbit/s)

Flow 1 (95th percentile 63.44 ms) Flow 2 (95th percentile 63.52 ms) Flow 3 (95th percentile 63.73 ms)

9

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Run 4: Statistics of TCP BBR

Start at: 2017-09-19 04:30:18
End at: 2017-09-19 04:30:48

# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 337.56 Mbit/s
95th percentile per-packet one-way delay: 63.883 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 171.19 Mbit/s
95th percentile per-packet one-way delay: 63.698 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 168.63 Mbit/s
95th percentile per-packet one-way delay: 63.980 ms
Loss rate: 0.68%
-- Flow 3:
Average throughput: 165.19 Mbit/s
95th percentile per-packet one-way delay: 64.777 ms
Loss rate: 1.43%
```
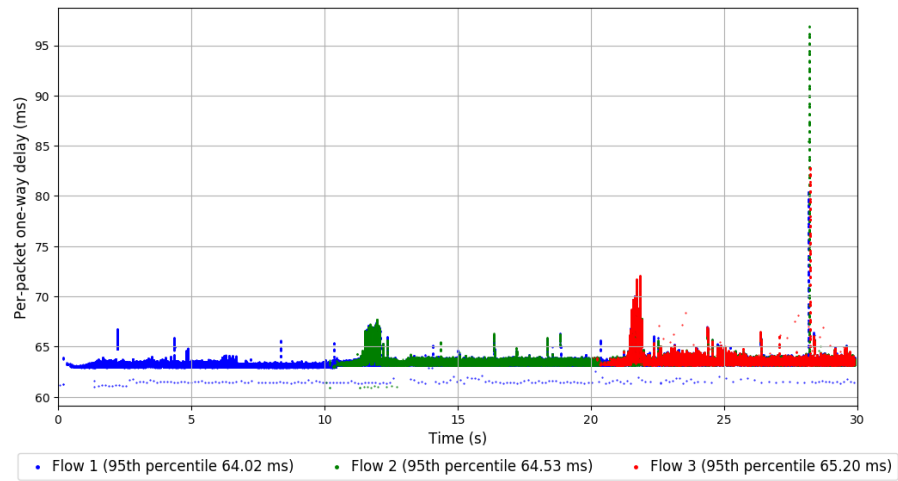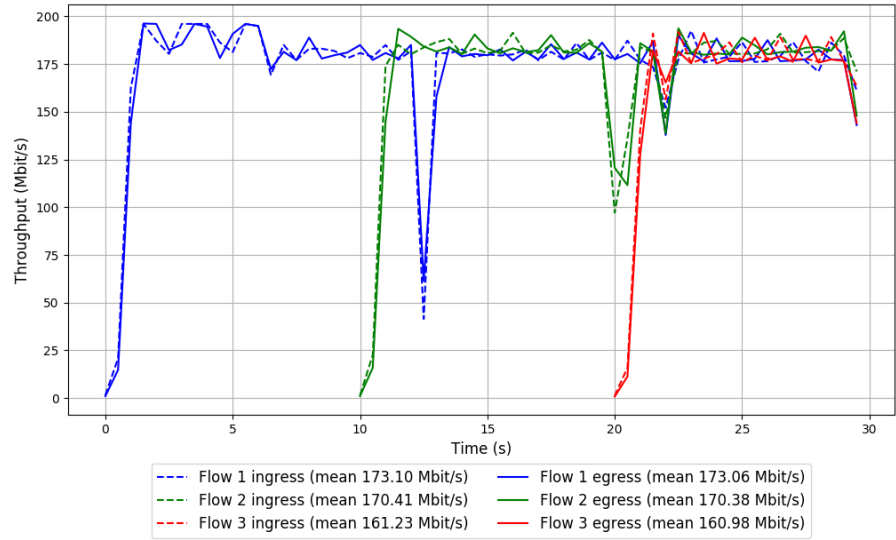
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 171.23 Mbit/s)   Flow 1 egress (mean 171.19 Mbit/s)
Flow 2 ingress (mean 168.70 Mbit/s)   Flow 2 egress (mean 168.63 Mbit/s)
Flow 3 ingress (mean 165.42 Mbit/s)   Flow 3 egress (mean 165.19 Mbit/s)

Flow 1 (95th percentile 63.70 ms)   Flow 2 (95th percentile 63.98 ms)   Flow 3 (95th percentile 64.78 ms)

11

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Run 5: Statistics of TCP BBR

Start at: 2017-09-19 04:39:28
End at: 2017-09-19 04:39:58

# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 339.08 Mbit/s
95th percentile per-packet one-way delay: 64.327 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 173.06 Mbit/s
95th percentile per-packet one-way delay: 64.019 ms
Loss rate: 0.44%
-- Flow 2:
Average throughput: 170.38 Mbit/s
95th percentile per-packet one-way delay: 64.533 ms
Loss rate: 0.65%
-- Flow 3:
Average throughput: 160.98 Mbit/s
95th percentile per-packet one-way delay: 65.205 ms
Loss rate: 1.50%
```
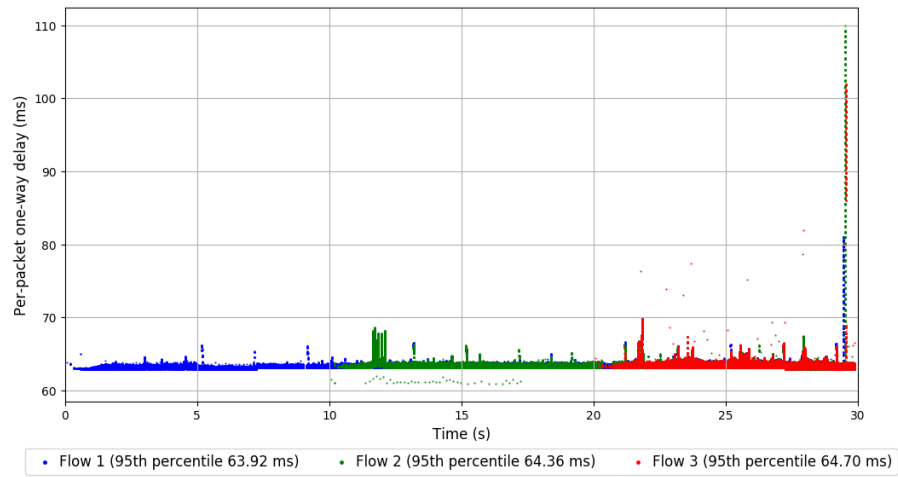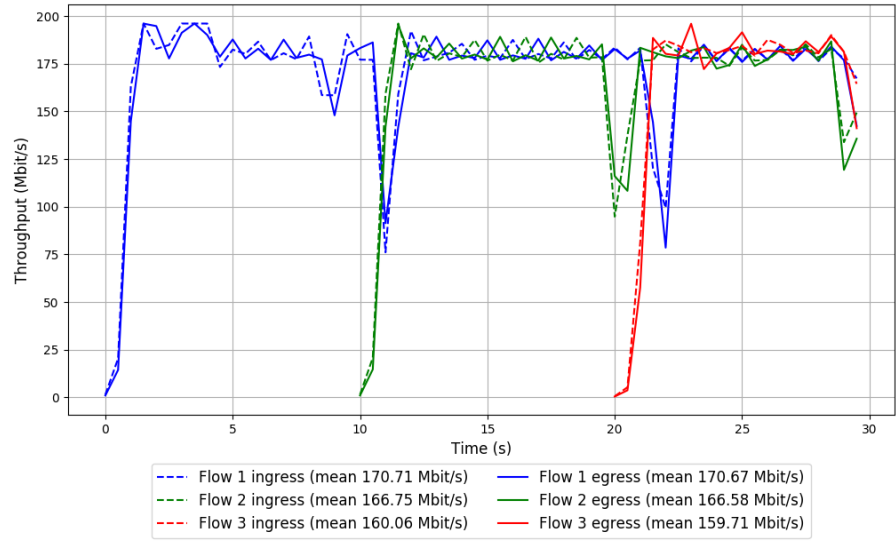
Run 5: Report of TCP BBR — Data Link

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Run 6: Statistics of TCP BBR

Start at: 2017-09-19 04:48:42
End at: 2017-09-19 04:49:12

# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 333.85 Mbit/s
95th percentile per-packet one-way delay: 64.169 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 170.67 Mbit/s
95th percentile per-packet one-way delay: 63.924 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 166.58 Mbit/s
95th percentile per-packet one-way delay: 64.356 ms
Loss rate: 0.73%
-- Flow 3:
Average throughput: 159.71 Mbit/s
95th percentile per-packet one-way delay: 64.698 ms
Loss rate: 1.47%
```
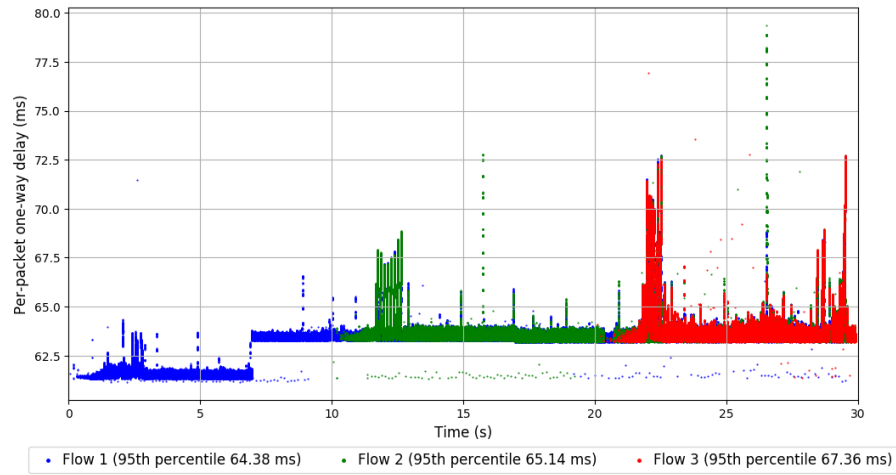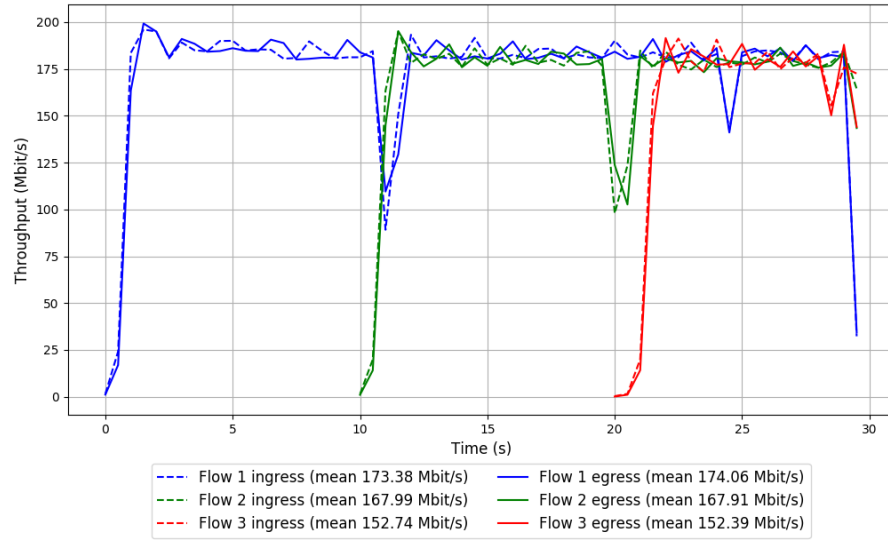
Run 6: Report of TCP BBR — Data Link

Flow 1 ingress (mean 170.71 Mbit/s) —— Flow 1 egress (mean 170.67 Mbit/s)
Flow 2 ingress (mean 166.75 Mbit/s) —— Flow 2 egress (mean 166.58 Mbit/s)
Flow 3 ingress (mean 160.06 Mbit/s) —— Flow 3 egress (mean 159.71 Mbit/s)

Flow 1 (95th percentile 63.92 ms)   Flow 2 (95th percentile 64.36 ms)   Flow 3 (95th percentile 64.70 ms)

15

```
Run 7: Statistics of TCP BBR

Start at: 2017-09-19 04:57:52
End at: 2017-09-19 04:58:22


# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 335.34 Mbit/s
95th percentile per-packet one-way delay: 65.151 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 174.06 Mbit/s
95th percentile per-packet one-way delay: 64.384 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 167.91 Mbit/s
95th percentile per-packet one-way delay: 65.143 ms
Loss rate: 0.68%
-- Flow 3:
Average throughput: 152.39 Mbit/s
95th percentile per-packet one-way delay: 67.362 ms
Loss rate: 1.51%
```
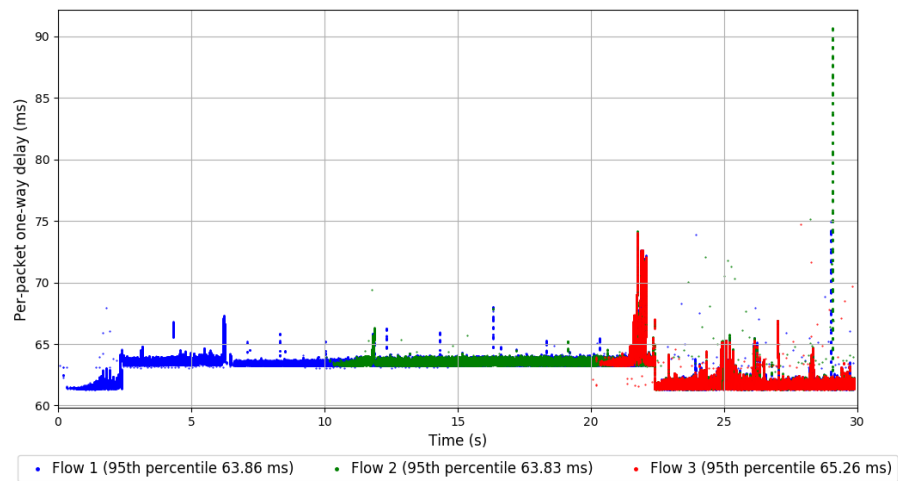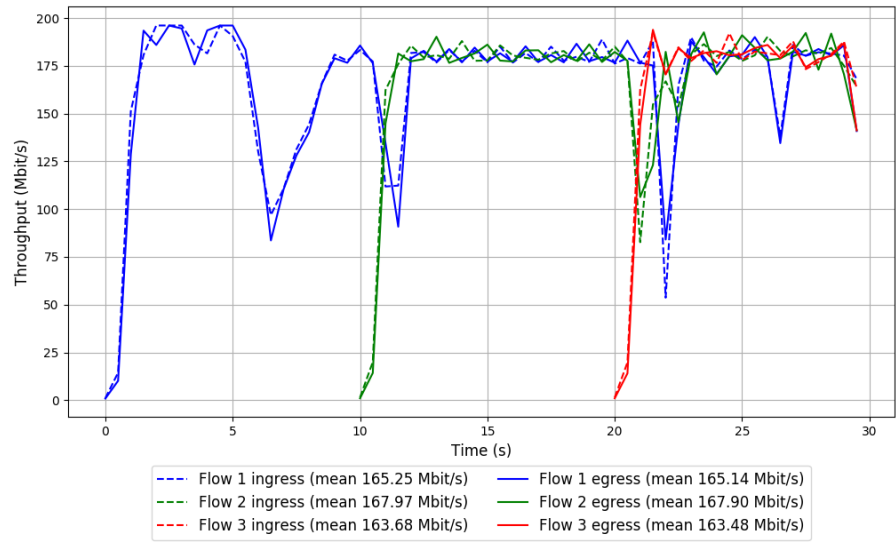
Run 7: Report of TCP BBR — Data Link

Flow 1 ingress (mean 173.38 Mbit/s) --- Flow 1 egress (mean 174.06 Mbit/s)
Flow 2 ingress (mean 167.99 Mbit/s) --- Flow 2 egress (mean 167.91 Mbit/s)
Flow 3 ingress (mean 152.74 Mbit/s) --- Flow 3 egress (mean 152.39 Mbit/s)

Flow 1 (95th percentile 64.38 ms) • Flow 2 (95th percentile 65.14 ms) • Flow 3 (95th percentile 67.36 ms)

```
Run 8: Statistics of TCP BBR

Start at: 2017-09-19 05:06:56
End at: 2017-09-19 05:07:26

# Below is generated by plot.py at 2017-09-19 07:31:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 330.47 Mbit/s
95th percentile per-packet one-way delay: 63.894 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 165.14 Mbit/s
95th percentile per-packet one-way delay: 63.858 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 167.90 Mbit/s
95th percentile per-packet one-way delay: 63.832 ms
Loss rate: 0.68%
-- Flow 3:
Average throughput: 163.48 Mbit/s
95th percentile per-packet one-way delay: 65.258 ms
Loss rate: 1.39%
```
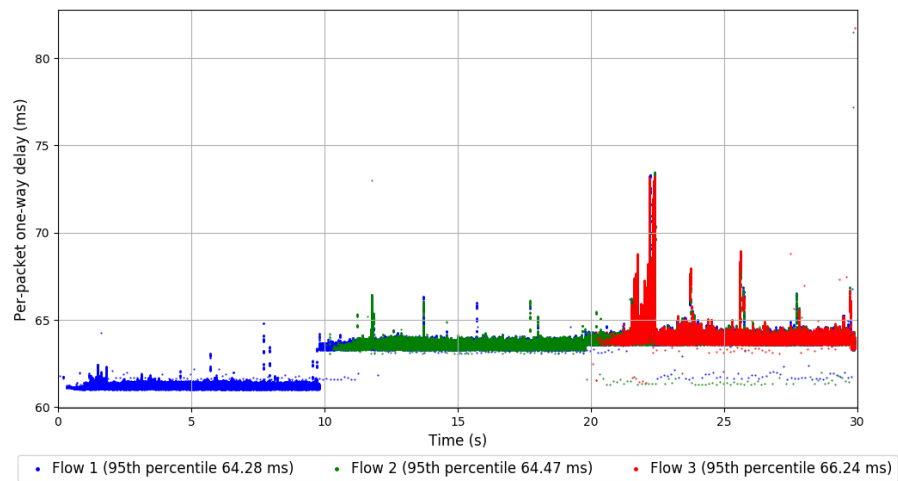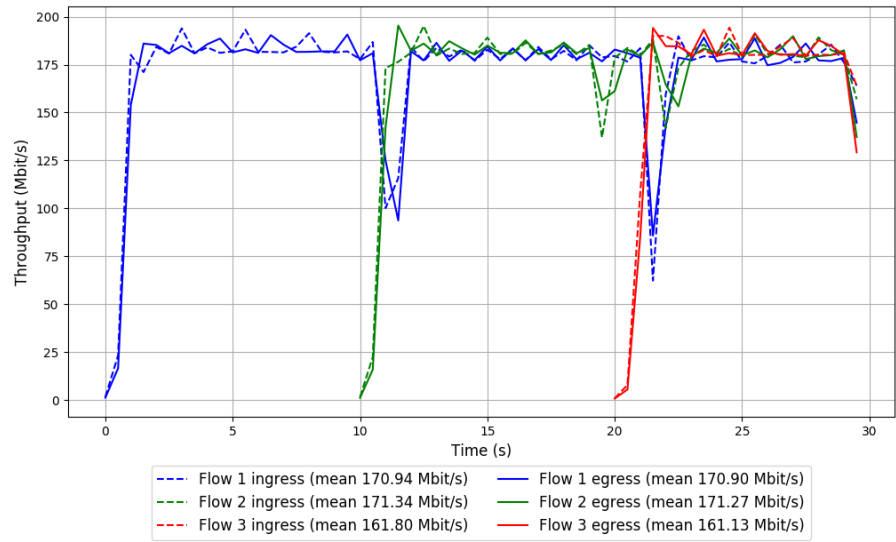
Run 8: Report of TCP BBR — Data Link

- - - Flow 1 ingress (mean 165.25 Mbit/s) —— Flow 1 egress (mean 165.14 Mbit/s)
- - - Flow 2 ingress (mean 167.97 Mbit/s) —— Flow 2 egress (mean 167.90 Mbit/s)
- - - Flow 3 ingress (mean 163.68 Mbit/s) —— Flow 3 egress (mean 163.48 Mbit/s)

• Flow 1 (95th percentile 63.86 ms)   • Flow 2 (95th percentile 63.83 ms)   • Flow 3 (95th percentile 65.26 ms)

```
Run 9: Statistics of TCP BBR

Start at: 2017-09-19 05:16:19
End at: 2017-09-19 05:16:49

# Below is generated by plot.py at 2017-09-19 07:37:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 337.74 Mbit/s
95th percentile per-packet one-way delay: 64.542 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 170.90 Mbit/s
95th percentile per-packet one-way delay: 64.285 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 171.27 Mbit/s
95th percentile per-packet one-way delay: 64.472 ms
Loss rate: 0.68%
-- Flow 3:
Average throughput: 161.13 Mbit/s
95th percentile per-packet one-way delay: 66.240 ms
Loss rate: 1.65%
```
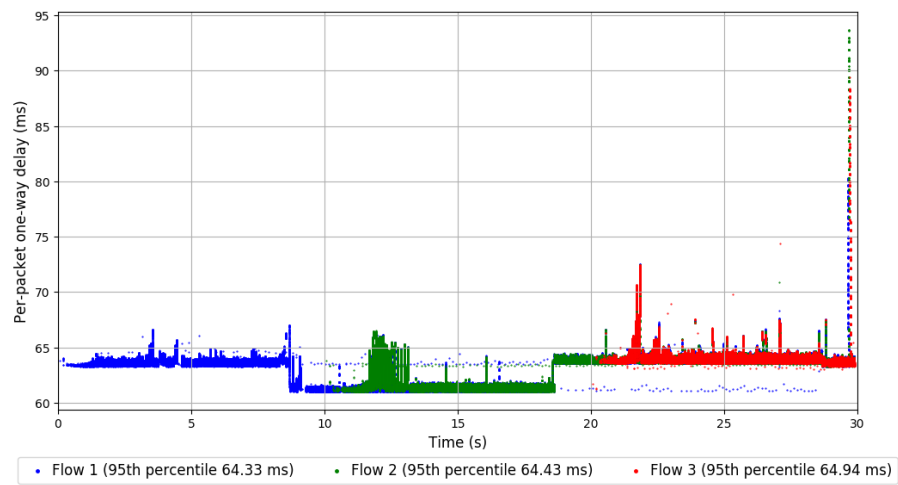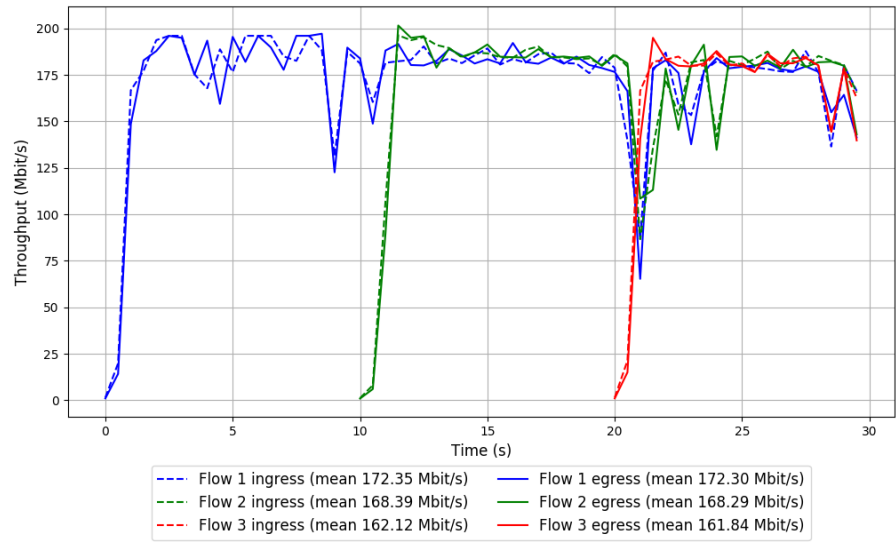
Run 9: Report of TCP BBR — Data Link

```
Run 10: Statistics of TCP BBR

Start at: 2017-09-19 05:25:10
End at: 2017-09-19 05:25:40

# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 337.19 Mbit/s
95th percentile per-packet one-way delay: 64.444 ms
Loss rate: 0.71%
-- Flow 1:
Average throughput: 172.30 Mbit/s
95th percentile per-packet one-way delay: 64.335 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 168.29 Mbit/s
95th percentile per-packet one-way delay: 64.429 ms
Loss rate: 0.71%
-- Flow 3:
Average throughput: 161.84 Mbit/s
95th percentile per-packet one-way delay: 64.936 ms
Loss rate: 1.44%
```
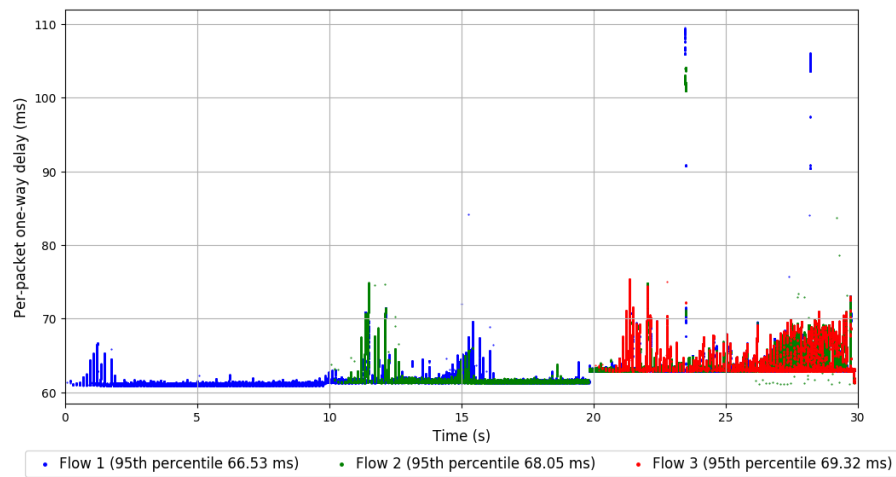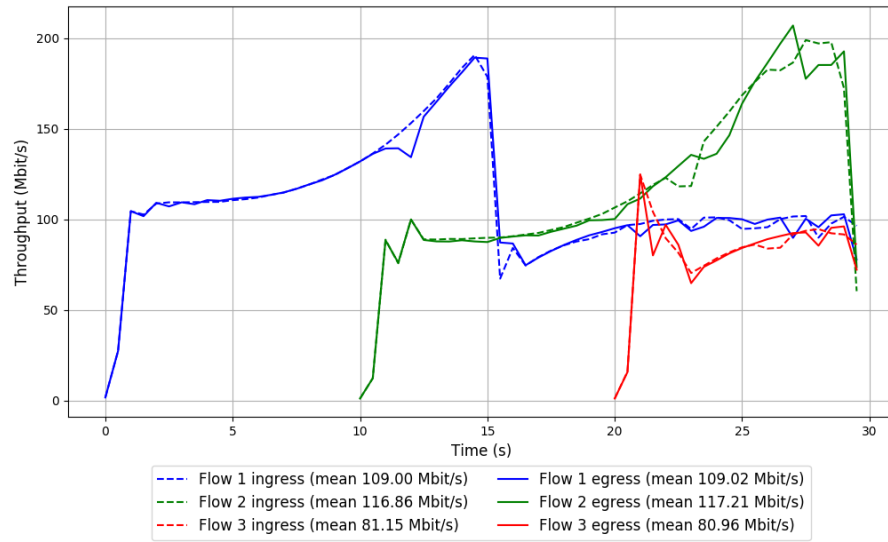
Run 10: Report of TCP BBR — Data Link

Flow 1 ingress (mean 172.35 Mbit/s) --- Flow 1 egress (mean 172.30 Mbit/s) —
Flow 2 ingress (mean 168.39 Mbit/s) --- Flow 2 egress (mean 168.29 Mbit/s) —
Flow 3 ingress (mean 162.12 Mbit/s) --- Flow 3 egress (mean 161.84 Mbit/s) —

Flow 1 (95th percentile 64.33 ms) • Flow 2 (95th percentile 64.43 ms) • Flow 3 (95th percentile 64.94 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2017-09-19 04:03:29
End at: 2017-09-19 04:03:59


# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 213.33 Mbit/s
95th percentile per-packet one-way delay: 67.920 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 109.02 Mbit/s
95th percentile per-packet one-way delay: 66.525 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 117.21 Mbit/s
95th percentile per-packet one-way delay: 68.053 ms
Loss rate: 0.34%
-- Flow 3:
Average throughput: 80.96 Mbit/s
95th percentile per-packet one-way delay: 69.316 ms
Loss rate: 1.49%
```
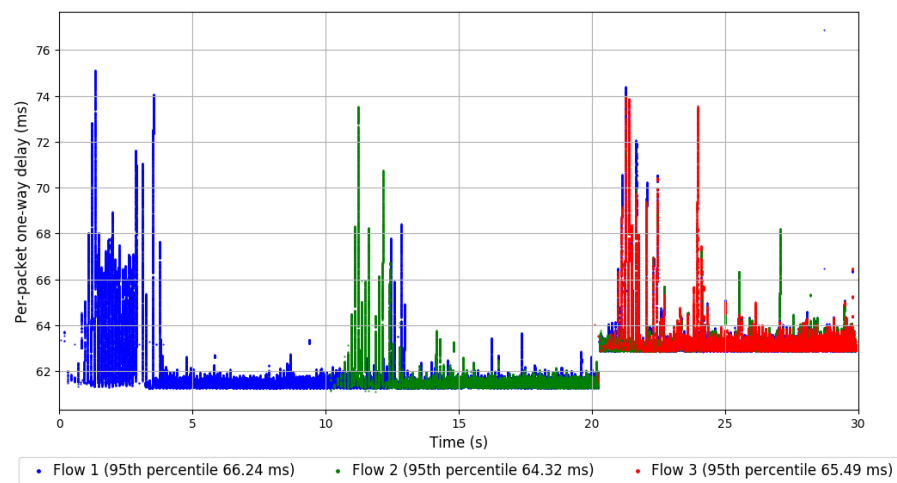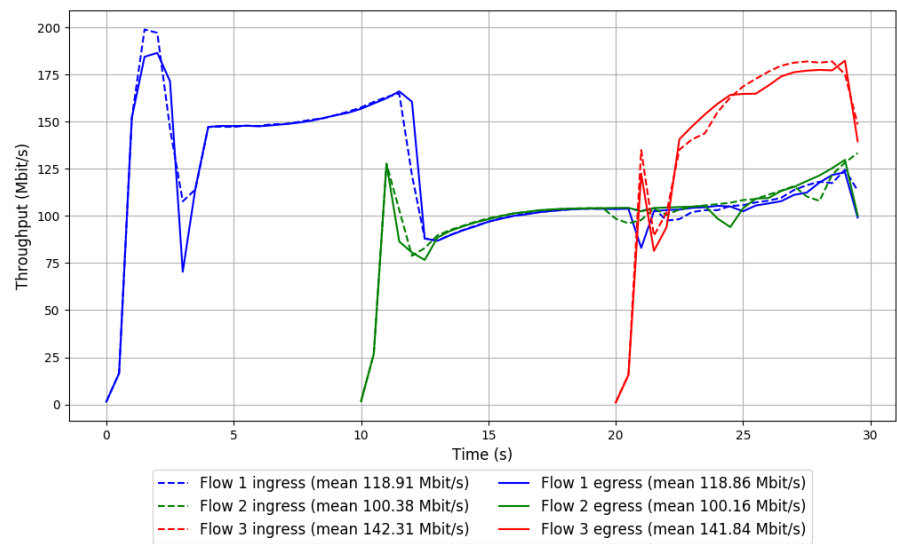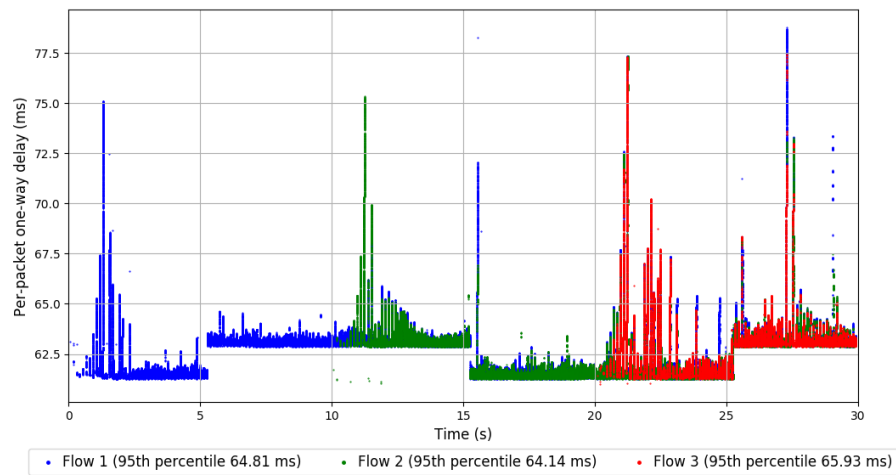
Run 1: Report of TCP Cubic — Data Link

```
Run 2: Statistics of TCP Cubic

Start at: 2017-09-19 04:12:39
End at: 2017-09-19 04:13:09

# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 232.00 Mbit/s
95th percentile per-packet one-way delay: 65.623 ms
Loss rate: 0.81%
-- Flow 1:
Average throughput: 118.86 Mbit/s
95th percentile per-packet one-way delay: 66.244 ms
Loss rate: 0.46%
-- Flow 2:
Average throughput: 100.16 Mbit/s
95th percentile per-packet one-way delay: 64.317 ms
Loss rate: 0.85%
-- Flow 3:
Average throughput: 141.84 Mbit/s
95th percentile per-packet one-way delay: 65.487 ms
Loss rate: 1.61%
```
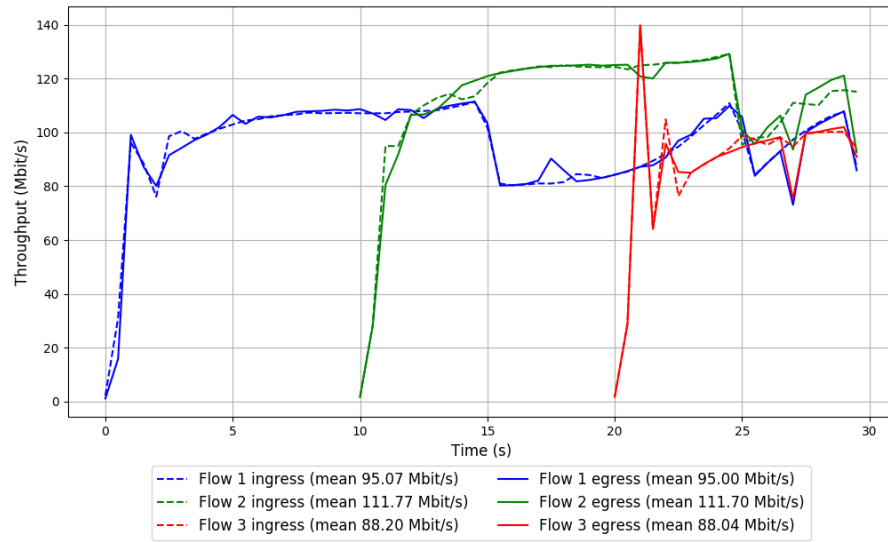
Run 2: Report of TCP Cubic — Data Link

```
Run 3: Statistics of TCP Cubic

Start at: 2017-09-19 04:21:54
End at: 2017-09-19 04:22:24

# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 198.11 Mbit/s
95th percentile per-packet one-way delay: 64.727 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 95.00 Mbit/s
95th percentile per-packet one-way delay: 64.805 ms
Loss rate: 0.49%
-- Flow 2:
Average throughput: 111.70 Mbit/s
95th percentile per-packet one-way delay: 64.141 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 88.04 Mbit/s
95th percentile per-packet one-way delay: 65.930 ms
Loss rate: 1.42%
```
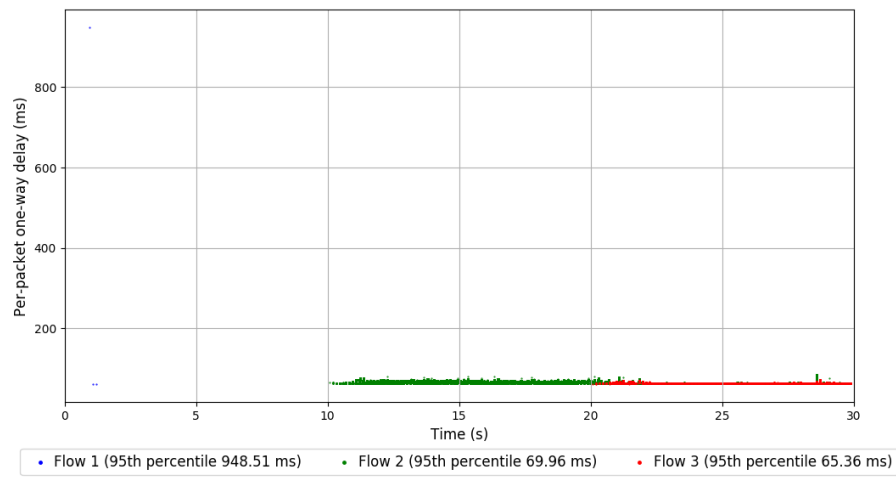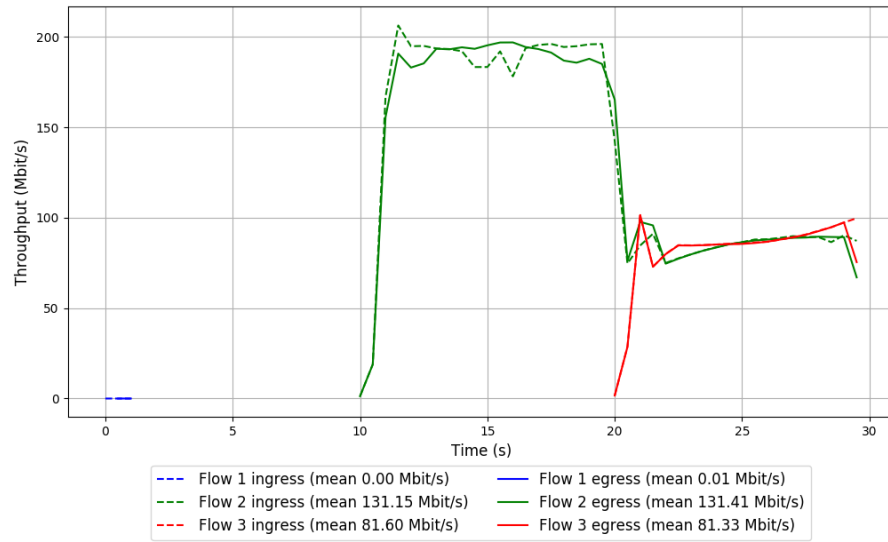
Run 3: Report of TCP Cubic — Data Link

```
Run 4: Statistics of TCP Cubic

Start at: 2017-09-19 04:31:17
End at: 2017-09-19 04:31:47


# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 117.46 Mbit/s
95th percentile per-packet one-way delay: 69.625 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 948.507 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 131.41 Mbit/s
95th percentile per-packet one-way delay: 69.964 ms
Loss rate: 0.43%
-- Flow 3:
Average throughput: 81.33 Mbit/s
95th percentile per-packet one-way delay: 65.358 ms
Loss rate: 1.57%
```
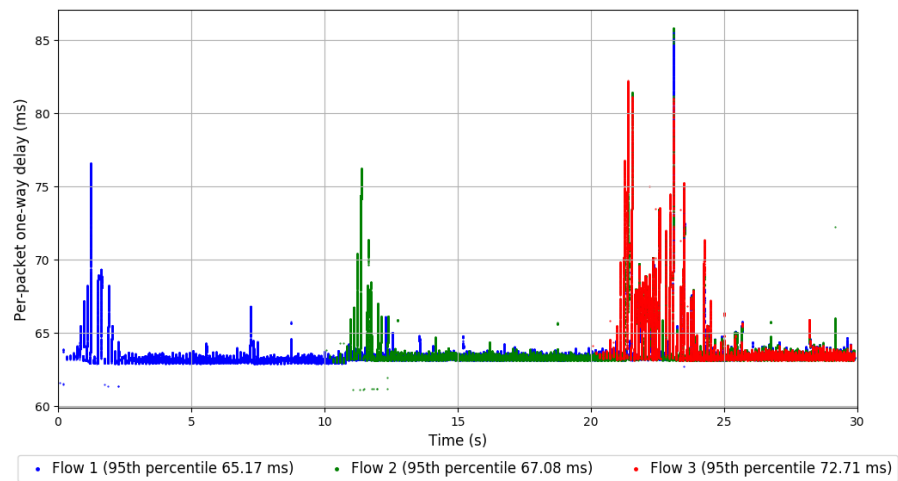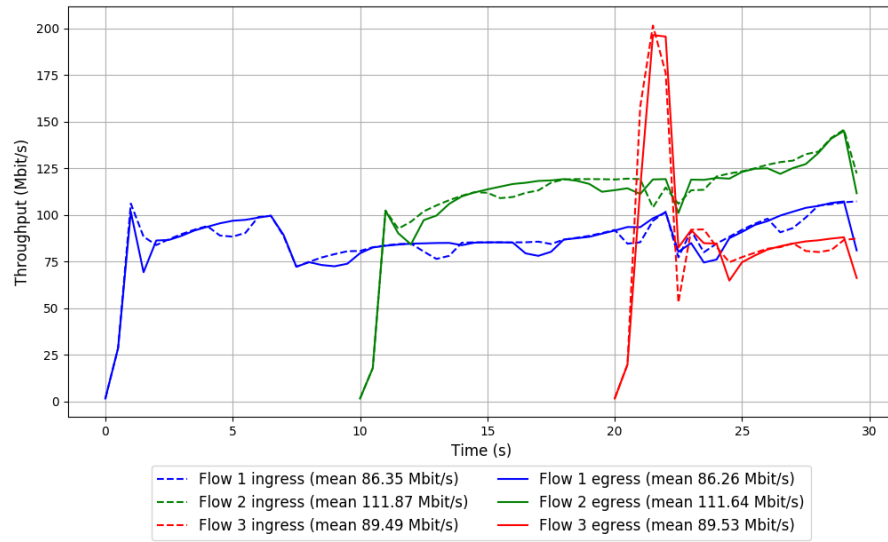
Run 4: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.00 Mbit/s) --- Flow 1 egress (mean 0.01 Mbit/s)
Flow 2 ingress (mean 131.15 Mbit/s) --- Flow 2 egress (mean 131.41 Mbit/s)
Flow 3 ingress (mean 81.60 Mbit/s) --- Flow 3 egress (mean 81.33 Mbit/s)

Flow 1 (95th percentile 948.51 ms) • Flow 2 (95th percentile 69.96 ms) • Flow 3 (95th percentile 65.36 ms)

31

```
Run 5: Statistics of TCP Cubic

Start at: 2017-09-19 04:40:28
End at: 2017-09-19 04:40:58


# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 189.75 Mbit/s
95th percentile per-packet one-way delay: 67.699 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 86.26 Mbit/s
95th percentile per-packet one-way delay: 65.173 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 111.64 Mbit/s
95th percentile per-packet one-way delay: 67.076 ms
Loss rate: 0.85%
-- Flow 3:
Average throughput: 89.53 Mbit/s
95th percentile per-packet one-way delay: 72.710 ms
Loss rate: 1.24%
```
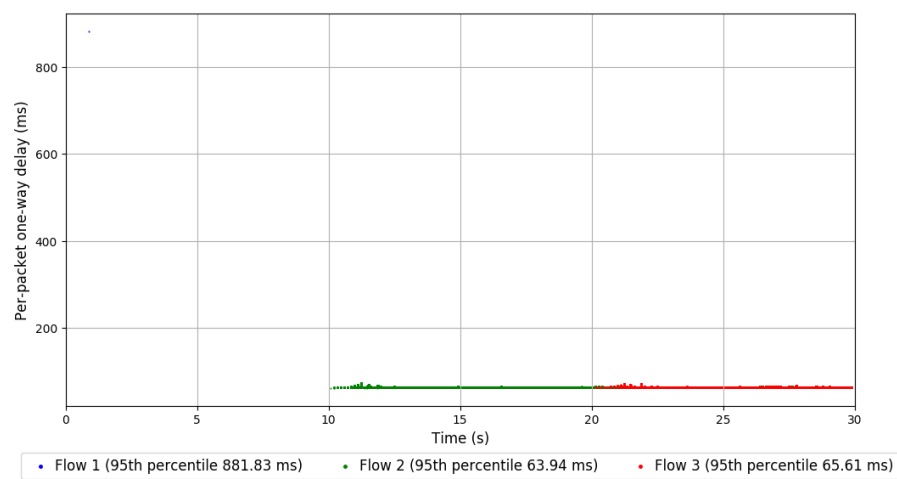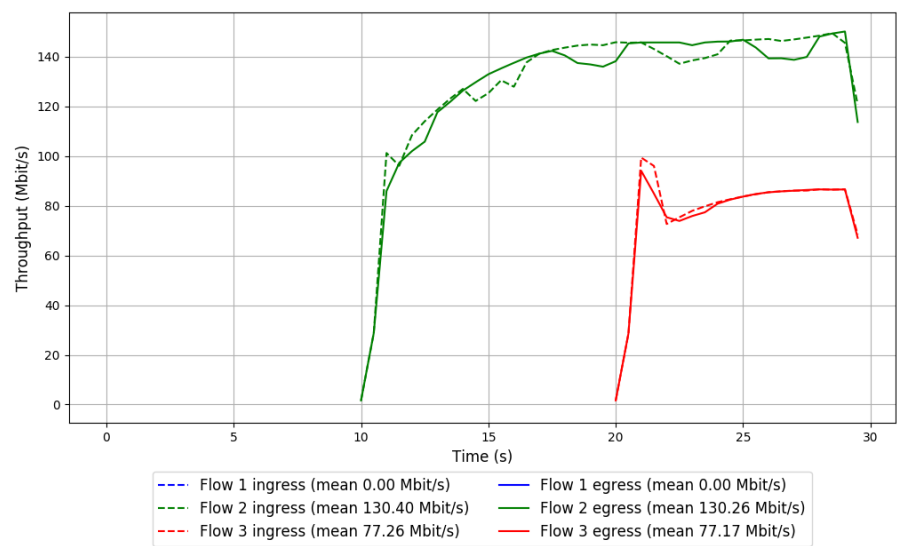
Run 5: Report of TCP Cubic — Data Link

```
Run 6: Statistics of TCP Cubic

Start at: 2017-09-19 04:49:41
End at: 2017-09-19 04:50:11


# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 114.93 Mbit/s
95th percentile per-packet one-way delay: 64.463 ms
Loss rate: 0.89%
-- Flow 1:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 881.833 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 130.26 Mbit/s
95th percentile per-packet one-way delay: 63.941 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 77.17 Mbit/s
95th percentile per-packet one-way delay: 65.615 ms
Loss rate: 1.41%
```
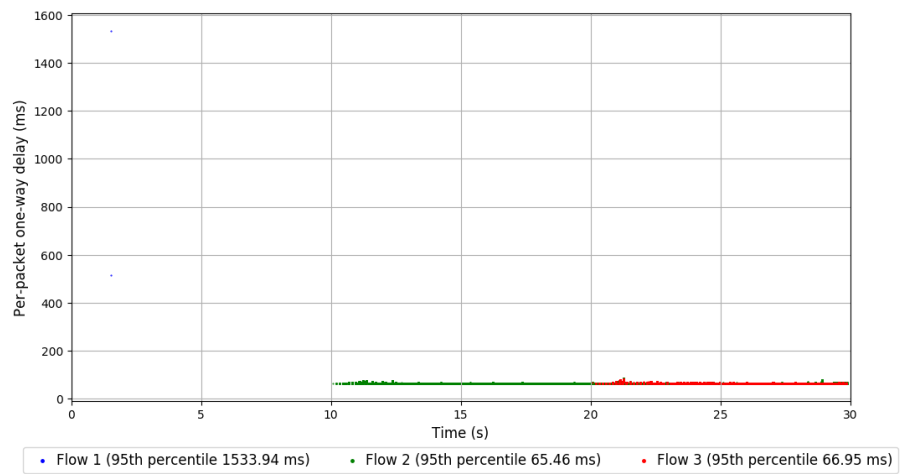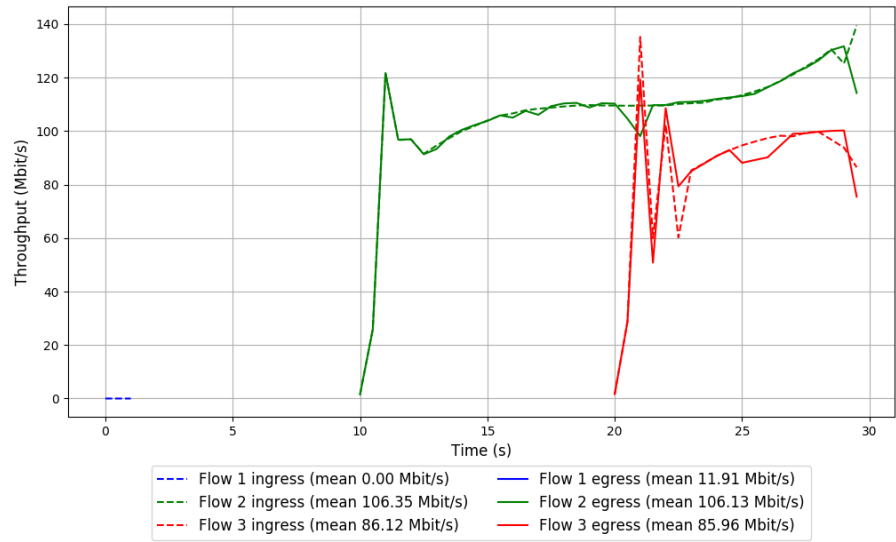
Run 6: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.00 Mbit/s) --- Flow 1 egress (mean 0.00 Mbit/s)
Flow 2 ingress (mean 130.40 Mbit/s) --- Flow 2 egress (mean 130.26 Mbit/s)
Flow 3 ingress (mean 77.26 Mbit/s) --- Flow 3 egress (mean 77.17 Mbit/s)

Flow 1 (95th percentile 881.83 ms) Flow 2 (95th percentile 63.94 ms) Flow 3 (95th percentile 65.61 ms)

```
Run 7: Statistics of TCP Cubic

Start at: 2017-09-19 04:58:51
End at: 2017-09-19 04:59:21


# Below is generated by plot.py at 2017-09-19 07:37:07
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.78 Mbit/s
95th percentile per-packet one-way delay: 65.916 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 11.91 Mbit/s
95th percentile per-packet one-way delay: 1533.941 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 106.13 Mbit/s
95th percentile per-packet one-way delay: 65.462 ms
Loss rate: 0.83%
-- Flow 3:
Average throughput: 85.96 Mbit/s
95th percentile per-packet one-way delay: 66.946 ms
Loss rate: 1.47%
```
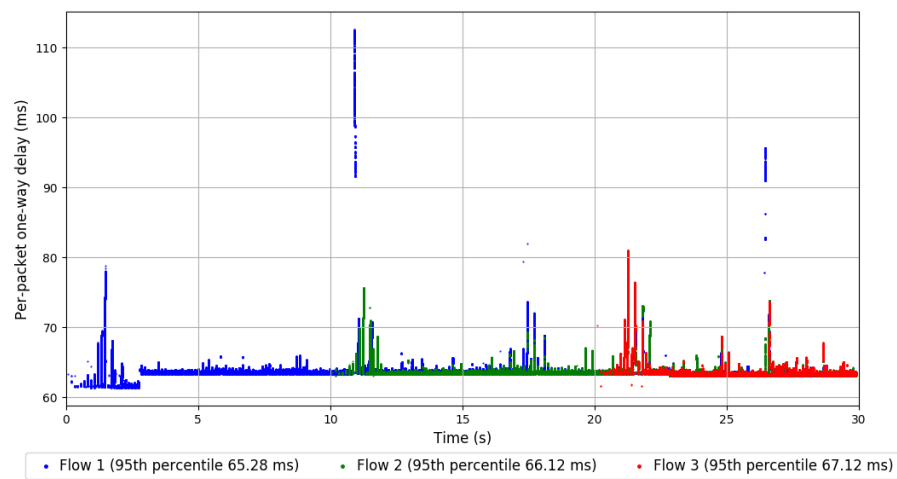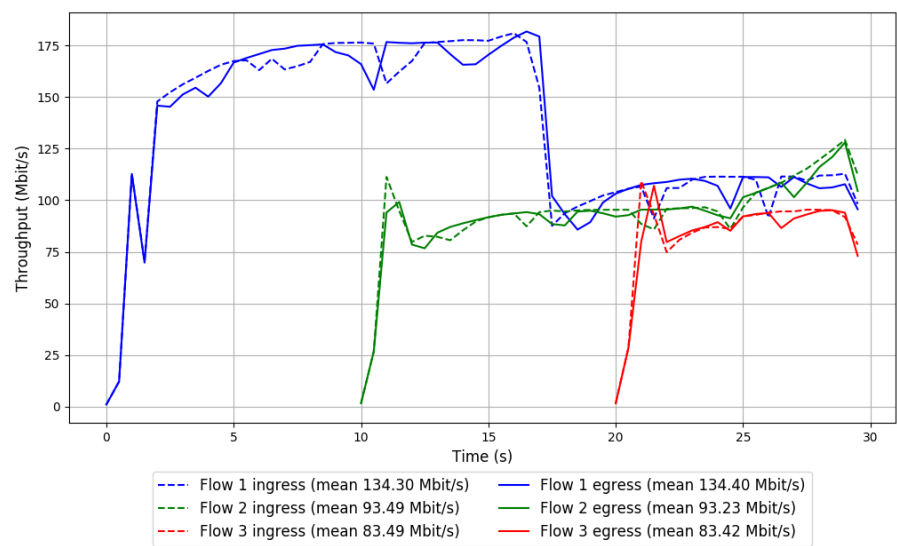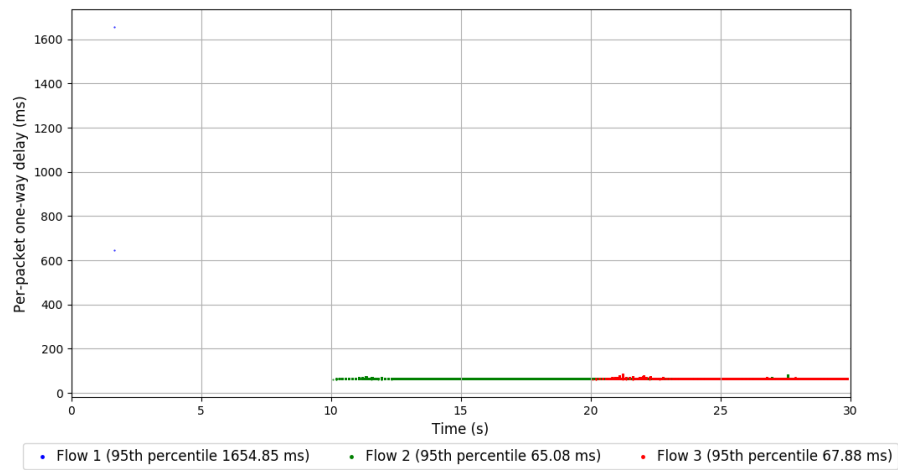
Run 7: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.00 Mbit/s) --- Flow 1 egress (mean 11.91 Mbit/s)
Flow 2 ingress (mean 106.35 Mbit/s) --- Flow 2 egress (mean 106.13 Mbit/s)
Flow 3 ingress (mean 86.12 Mbit/s) --- Flow 3 egress (mean 85.96 Mbit/s)

Flow 1 (95th percentile 1533.94 ms) · Flow 2 (95th percentile 65.46 ms) · Flow 3 (95th percentile 66.95 ms)

```
Run 8: Statistics of TCP Cubic

Start at: 2017-09-19 05:07:56
End at: 2017-09-19 05:08:26


# Below is generated by plot.py at 2017-09-19 07:37:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 223.71 Mbit/s
95th percentile per-packet one-way delay: 65.691 ms
Loss rate: 0.64%
-- Flow 1:
Average throughput: 134.40 Mbit/s
95th percentile per-packet one-way delay: 65.285 ms
Loss rate: 0.35%
-- Flow 2:
Average throughput: 93.23 Mbit/s
95th percentile per-packet one-way delay: 66.120 ms
Loss rate: 0.91%
-- Flow 3:
Average throughput: 83.42 Mbit/s
95th percentile per-packet one-way delay: 67.124 ms
Loss rate: 1.43%
```
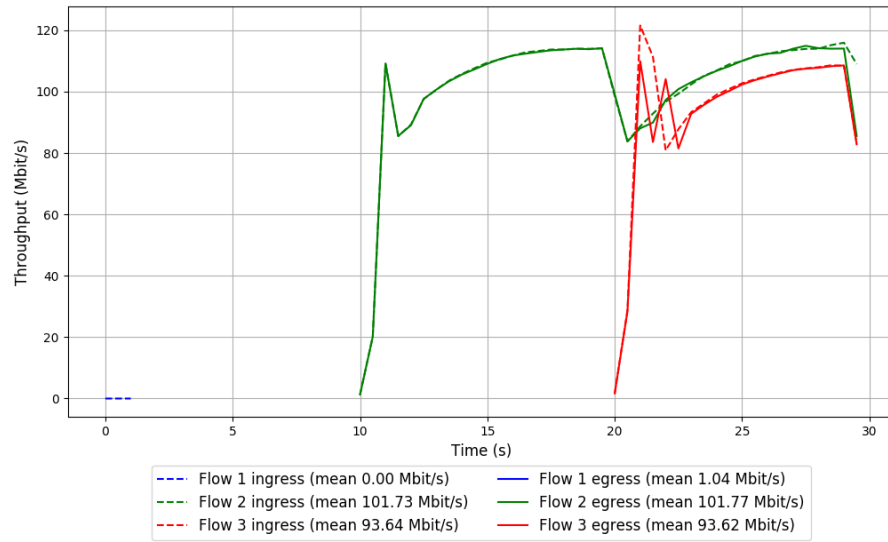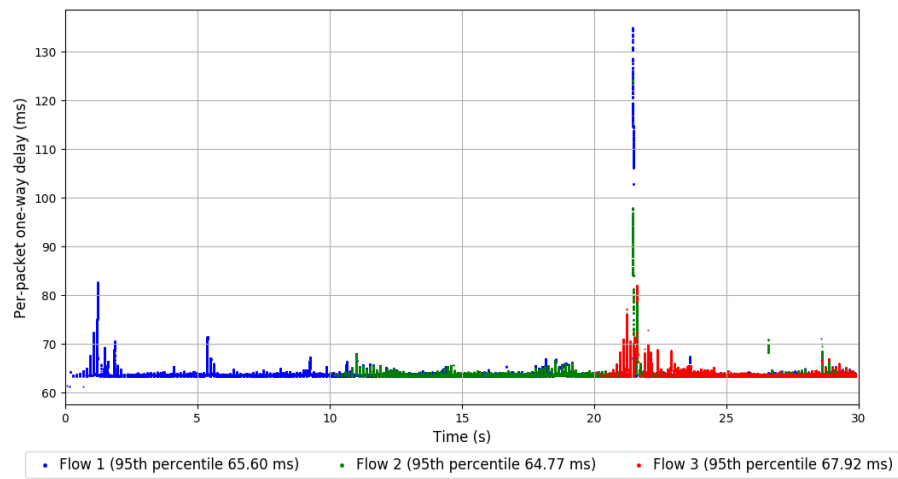
Run 8: Report of TCP Cubic — Data Link

```
Run 9: Statistics of TCP Cubic

Start at: 2017-09-19 05:17:19
End at: 2017-09-19 05:17:49


# Below is generated by plot.py at 2017-09-19 07:37:11
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.90 Mbit/s
95th percentile per-packet one-way delay: 65.928 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 1.04 Mbit/s
95th percentile per-packet one-way delay: 1654.846 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 101.77 Mbit/s
95th percentile per-packet one-way delay: 65.075 ms
Loss rate: 0.71%
-- Flow 3:
Average throughput: 93.62 Mbit/s
95th percentile per-packet one-way delay: 67.875 ms
Loss rate: 1.46%
```
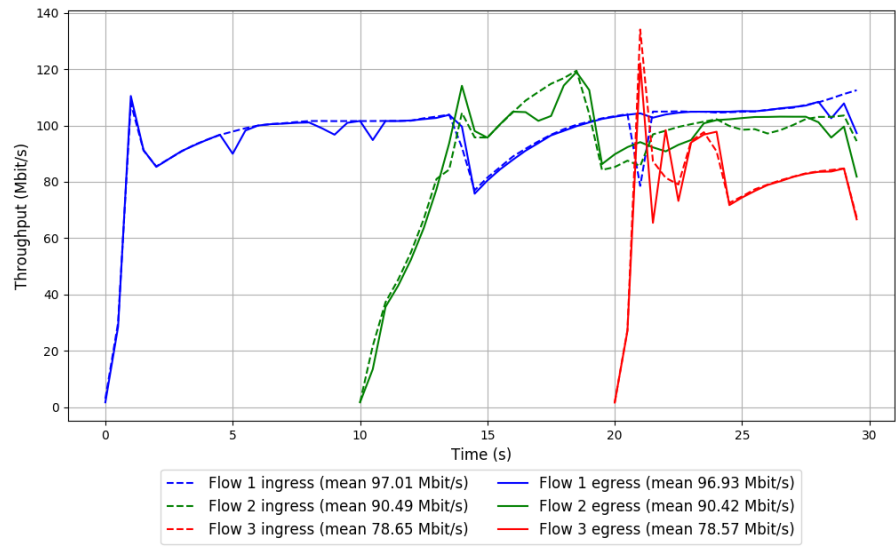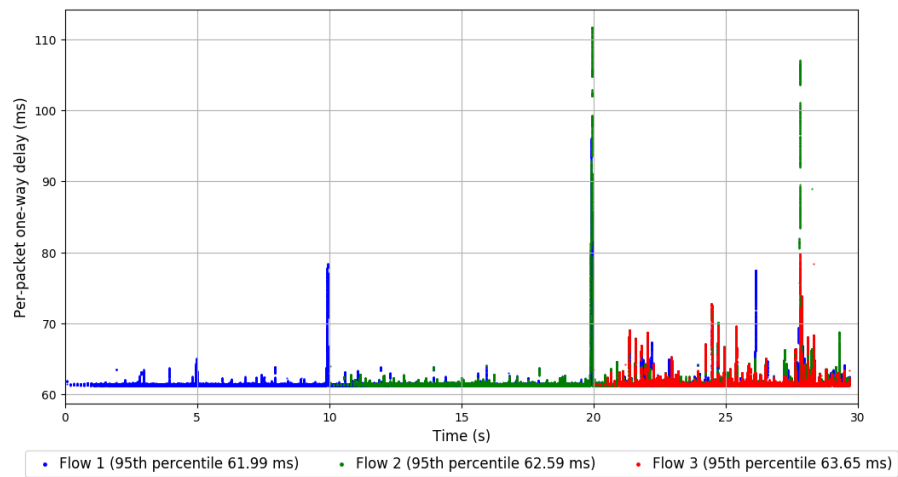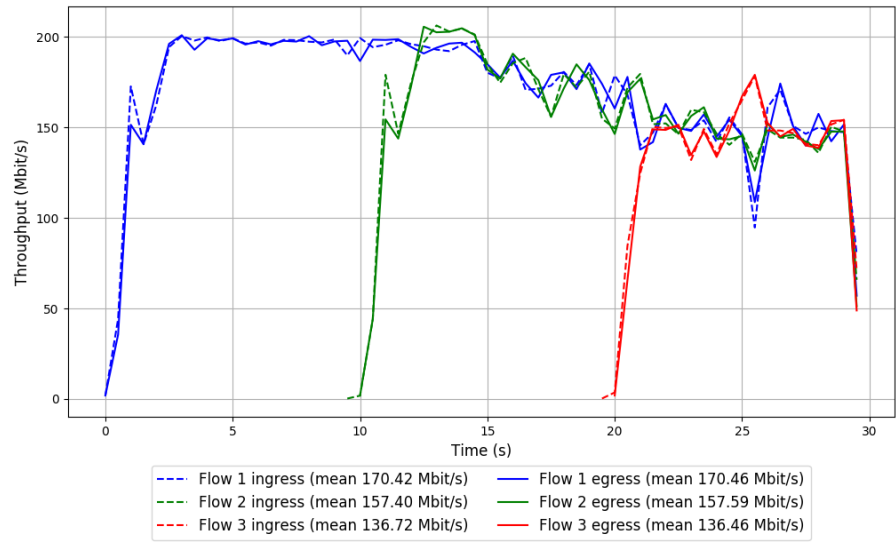
Run 9: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 0.00 Mbit/s) --- Flow 1 egress (mean 1.04 Mbit/s)
Flow 2 ingress (mean 101.73 Mbit/s) --- Flow 2 egress (mean 101.77 Mbit/s)
Flow 3 ingress (mean 93.64 Mbit/s) --- Flow 3 egress (mean 93.62 Mbit/s)

Flow 1 (95th percentile 1654.85 ms) • Flow 2 (95th percentile 65.08 ms) • Flow 3 (95th percentile 67.88 ms)

41

```
Run 10: Statistics of TCP Cubic

Start at: 2017-09-19 05:26:10
End at: 2017-09-19 05:26:40


# Below is generated by plot.py at 2017-09-19 07:37:57
# Datalink statistics
-- Total of 3 flows:
Average throughput: 182.81 Mbit/s
95th percentile per-packet one-way delay: 65.590 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 96.93 Mbit/s
95th percentile per-packet one-way delay: 65.604 ms
Loss rate: 0.49%
-- Flow 2:
Average throughput: 90.42 Mbit/s
95th percentile per-packet one-way delay: 64.770 ms
Loss rate: 0.72%
-- Flow 3:
Average throughput: 78.57 Mbit/s
95th percentile per-packet one-way delay: 67.925 ms
Loss rate: 1.37%
```
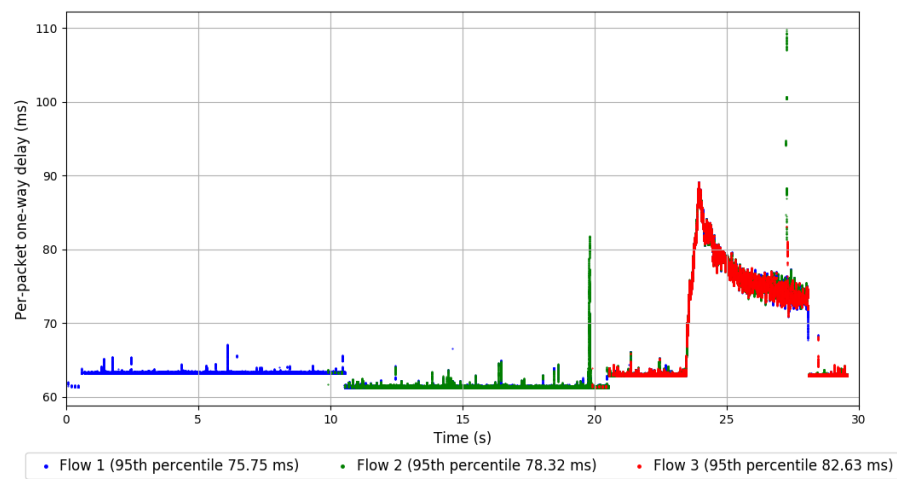
Run 10: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 97.01 Mbit/s)   Flow 1 egress (mean 96.93 Mbit/s)
Flow 2 ingress (mean 90.49 Mbit/s)   Flow 2 egress (mean 90.42 Mbit/s)
Flow 3 ingress (mean 78.65 Mbit/s)   Flow 3 egress (mean 78.57 Mbit/s)

Flow 1 (95th percentile 65.60 ms)   Flow 2 (95th percentile 64.77 ms)   Flow 3 (95th percentile 67.92 ms)

```
Run 1: Statistics of Indigo

Start at: 2017-09-19 04:01:25
End at: 2017-09-19 04:01:55


# Below is generated by plot.py at 2017-09-19 07:40:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 319.45 Mbit/s
95th percentile per-packet one-way delay: 62.434 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 170.46 Mbit/s
95th percentile per-packet one-way delay: 61.987 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 157.59 Mbit/s
95th percentile per-packet one-way delay: 62.589 ms
Loss rate: 0.53%
-- Flow 3:
Average throughput: 136.46 Mbit/s
95th percentile per-packet one-way delay: 63.651 ms
Loss rate: 1.49%
```
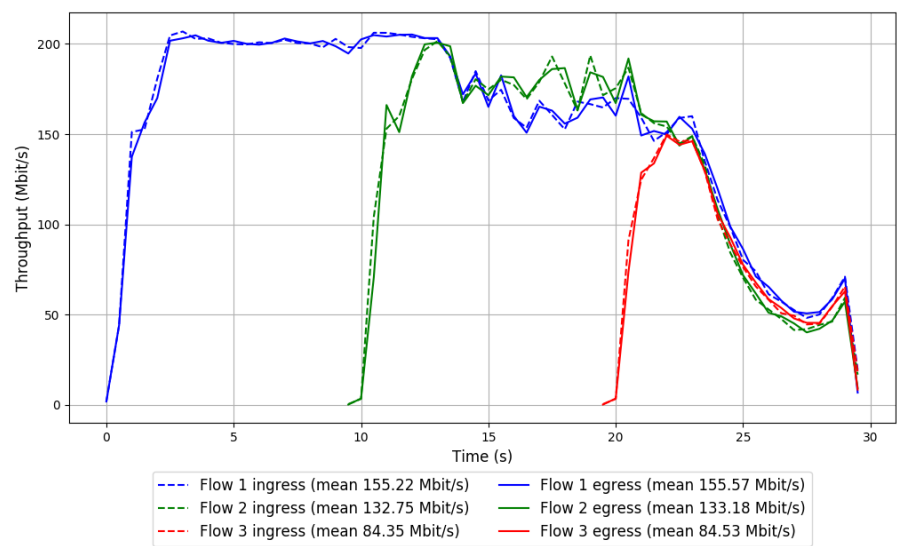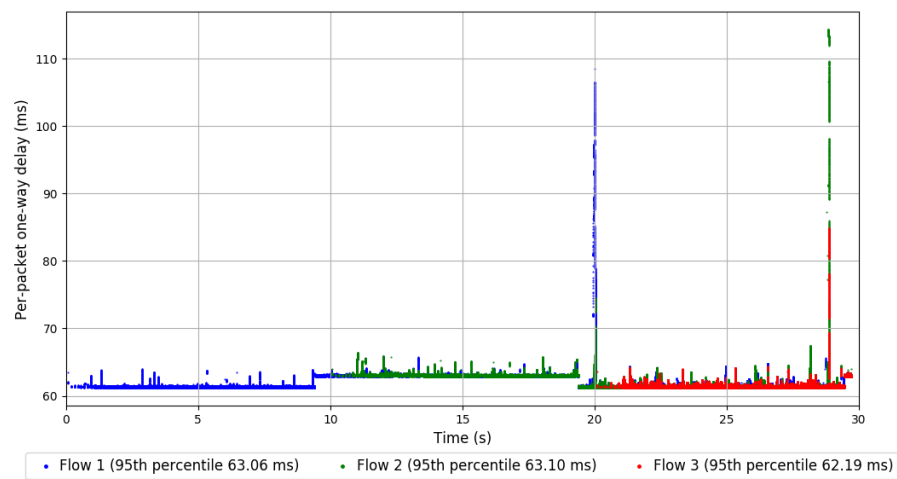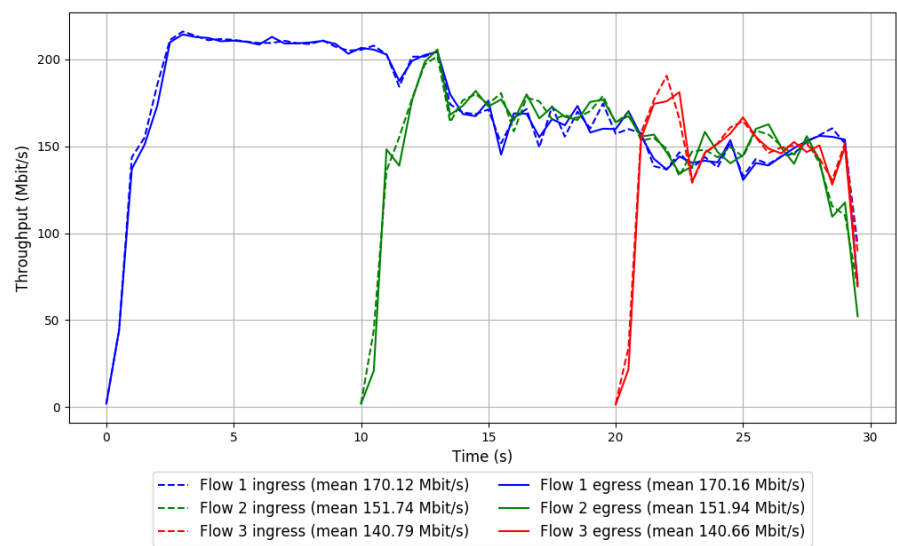
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-09-19 04:10:38
End at: 2017-09-19 04:11:08

# Below is generated by plot.py at 2017-09-19 07:40:13
# Datalink statistics
-- Total of 3 flows:
Average throughput: 271.83 Mbit/s
95th percentile per-packet one-way delay: 78.278 ms
Loss rate: 0.34%
-- Flow 1:
Average throughput: 155.57 Mbit/s
95th percentile per-packet one-way delay: 75.745 ms
Loss rate: 0.21%
-- Flow 2:
Average throughput: 133.18 Mbit/s
95th percentile per-packet one-way delay: 78.316 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 84.53 Mbit/s
95th percentile per-packet one-way delay: 82.632 ms
Loss rate: 1.11%
```
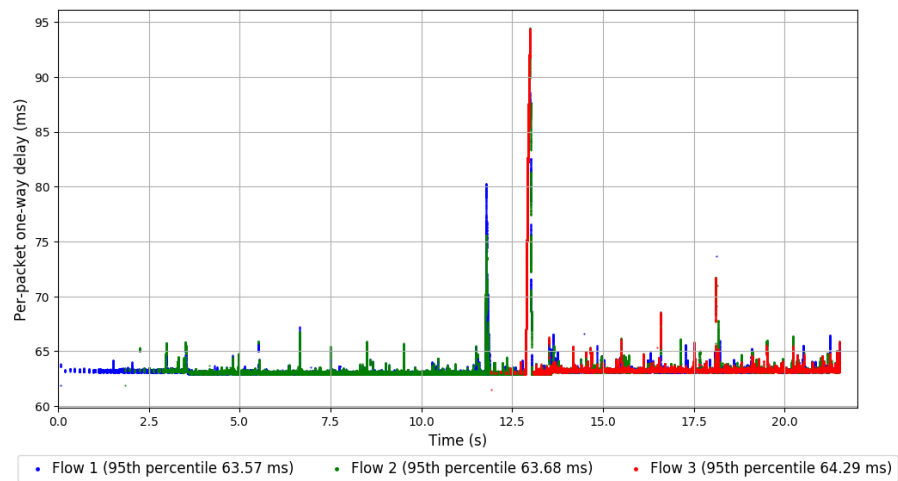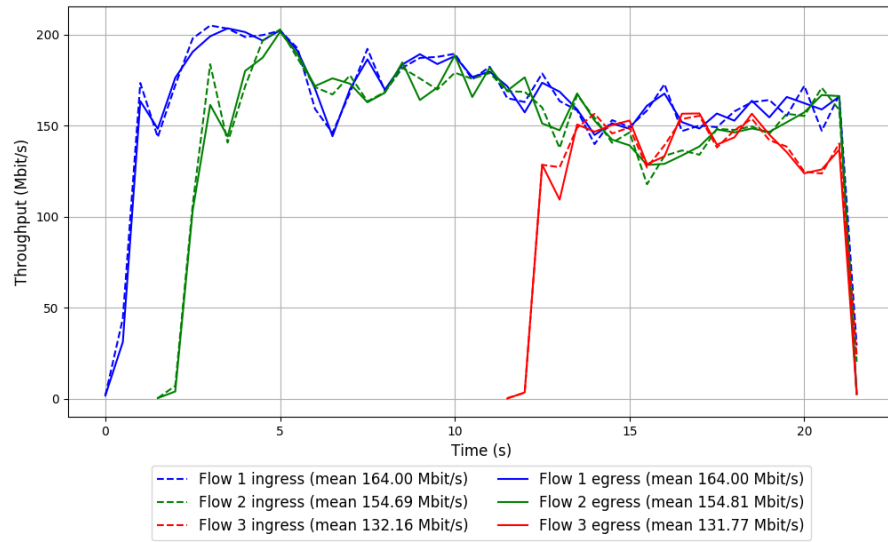
Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2017-09-19 04:19:49
End at: 2017-09-19 04:20:19


# Below is generated by plot.py at 2017-09-19 07:40:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 316.46 Mbit/s
95th percentile per-packet one-way delay: 63.066 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 170.16 Mbit/s
95th percentile per-packet one-way delay: 63.060 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 151.94 Mbit/s
95th percentile per-packet one-way delay: 63.096 ms
Loss rate: 0.51%
-- Flow 3:
Average throughput: 140.66 Mbit/s
95th percentile per-packet one-way delay: 62.185 ms
Loss rate: 1.38%
```
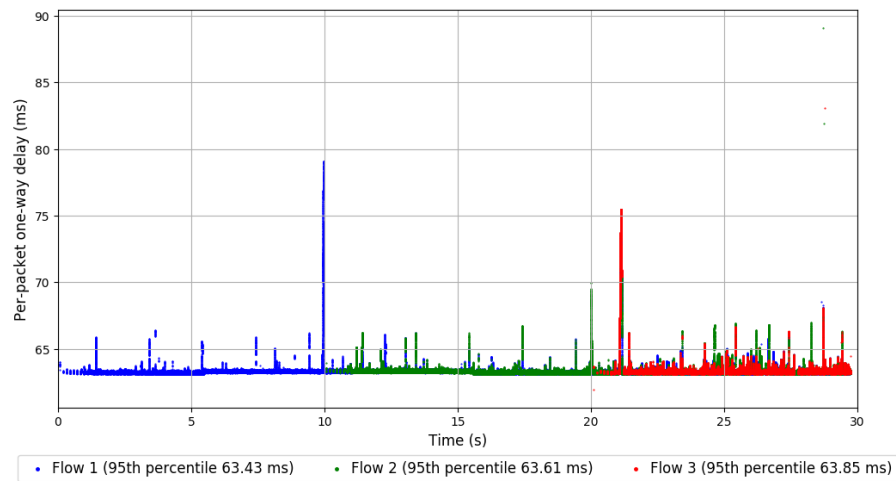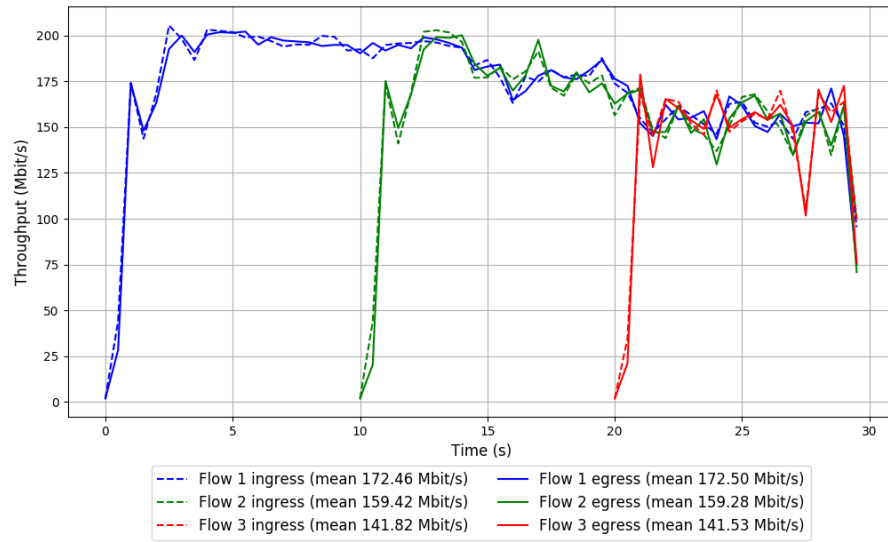
Run 3: Report of Indigo — Data Link

Run 4: Statistics of Indigo

Start at: 2017-09-19 04:29:17
End at: 2017-09-19 04:29:47

Run 4: Report of Indigo — Data Link

```
Run 5: Statistics of Indigo

Start at: 2017-09-19 04:38:23
End at: 2017-09-19 04:38:53


# Below is generated by plot.py at 2017-09-19 07:42:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 324.00 Mbit/s
95th percentile per-packet one-way delay: 63.534 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 172.50 Mbit/s
95th percentile per-packet one-way delay: 63.432 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 159.28 Mbit/s
95th percentile per-packet one-way delay: 63.612 ms
Loss rate: 0.73%
-- Flow 3:
Average throughput: 141.53 Mbit/s
95th percentile per-packet one-way delay: 63.851 ms
Loss rate: 1.50%
```
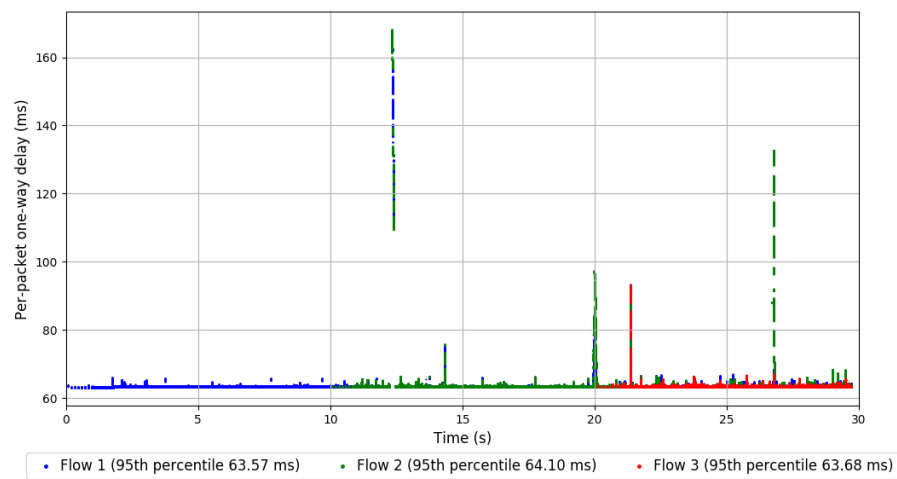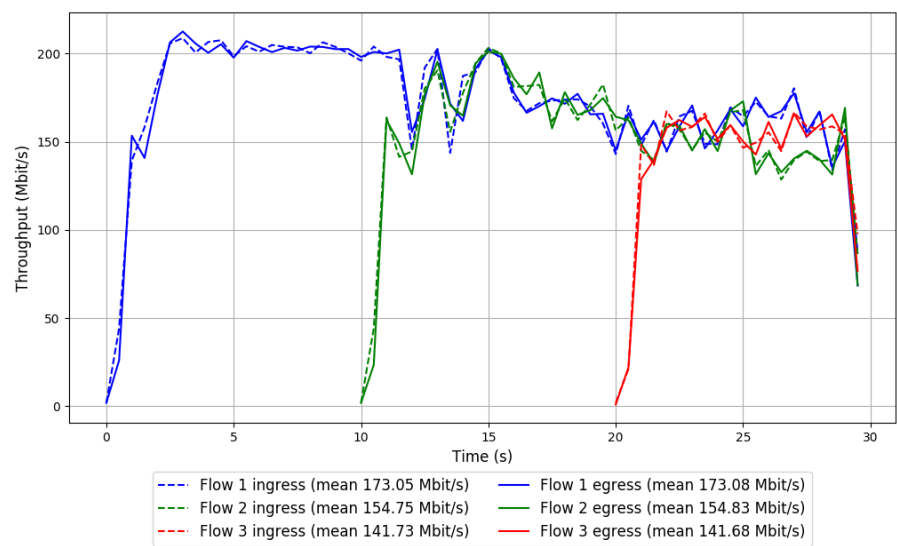
Run 5: Report of Indigo — Data Link

Legend:
- Flow 1 ingress (mean 172.46 Mbit/s) — Flow 1 egress (mean 172.50 Mbit/s)
- Flow 2 ingress (mean 159.42 Mbit/s) — Flow 2 egress (mean 159.28 Mbit/s)
- Flow 3 ingress (mean 141.82 Mbit/s) — Flow 3 egress (mean 141.53 Mbit/s)

Legend:
- Flow 1 (95th percentile 63.43 ms)
- Flow 2 (95th percentile 63.61 ms)
- Flow 3 (95th percentile 63.85 ms)

```
Run 6: Statistics of Indigo

Start at: 2017-09-19 04:47:37
End at: 2017-09-19 04:48:07

# Below is generated by plot.py at 2017-09-19 07:42:36
# Datalink statistics
-- Total of 3 flows:
Average throughput: 321.47 Mbit/s
95th percentile per-packet one-way delay: 63.728 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 173.08 Mbit/s
95th percentile per-packet one-way delay: 63.566 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 154.83 Mbit/s
95th percentile per-packet one-way delay: 64.103 ms
Loss rate: 0.58%
-- Flow 3:
Average throughput: 141.68 Mbit/s
95th percentile per-packet one-way delay: 63.682 ms
Loss rate: 1.35%
```
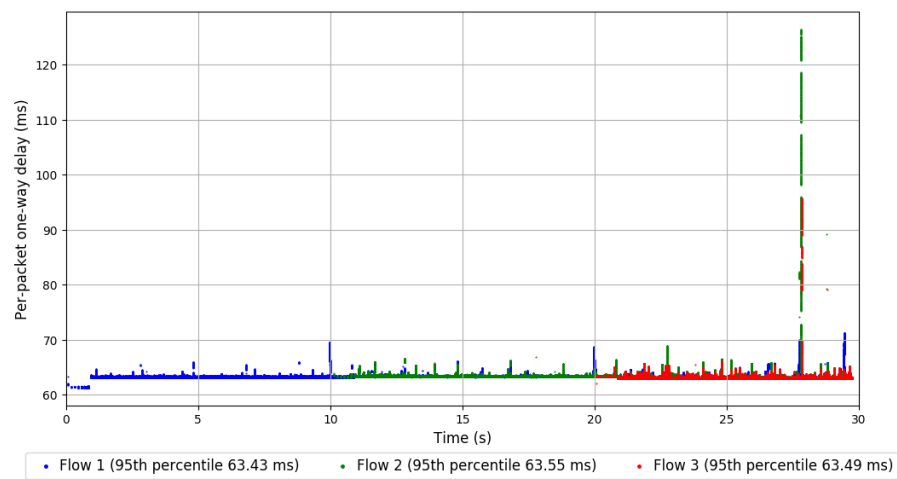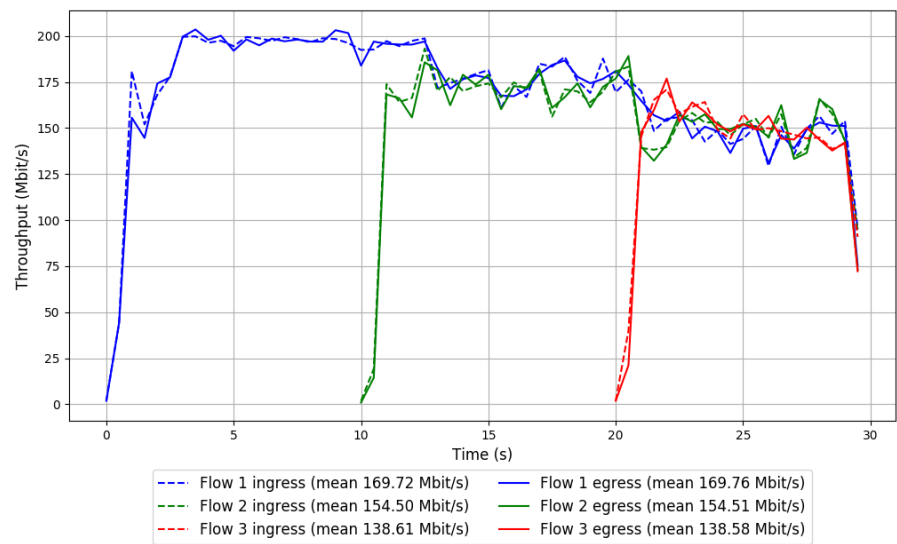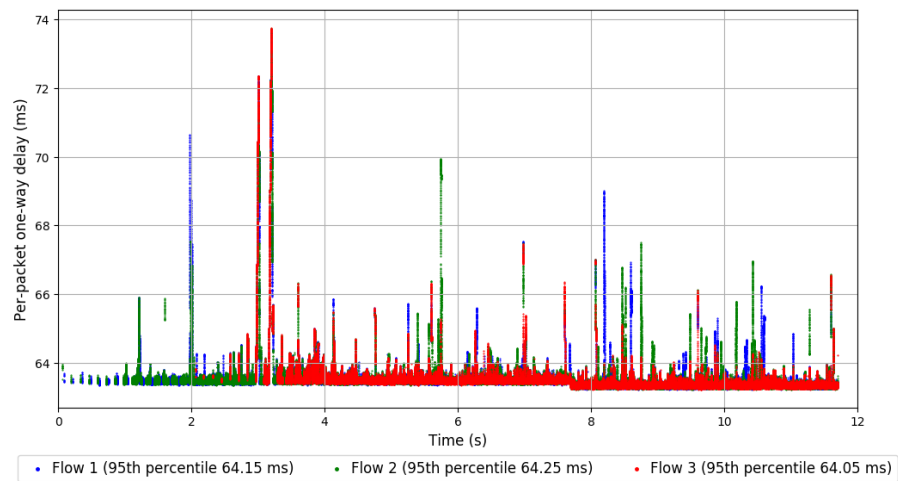
Run 6: Report of Indigo — Data Link

```
Run 7: Statistics of Indigo

Start at: 2017-09-19 04:56:48
End at: 2017-09-19 04:57:18


# Below is generated by plot.py at 2017-09-19 07:42:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 316.89 Mbit/s
95th percentile per-packet one-way delay: 63.465 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 169.76 Mbit/s
95th percentile per-packet one-way delay: 63.429 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 154.51 Mbit/s
95th percentile per-packet one-way delay: 63.550 ms
Loss rate: 0.64%
-- Flow 3:
Average throughput: 138.58 Mbit/s
95th percentile per-packet one-way delay: 63.493 ms
Loss rate: 1.32%
```
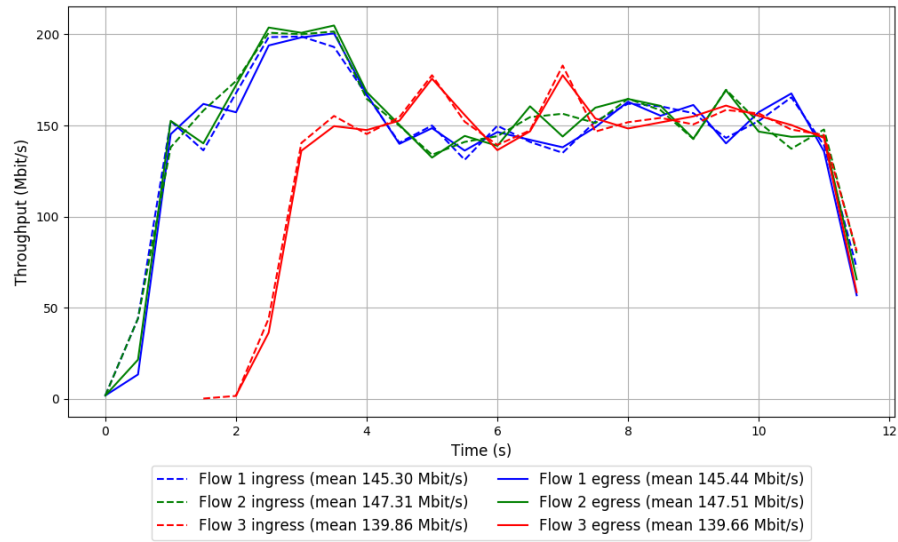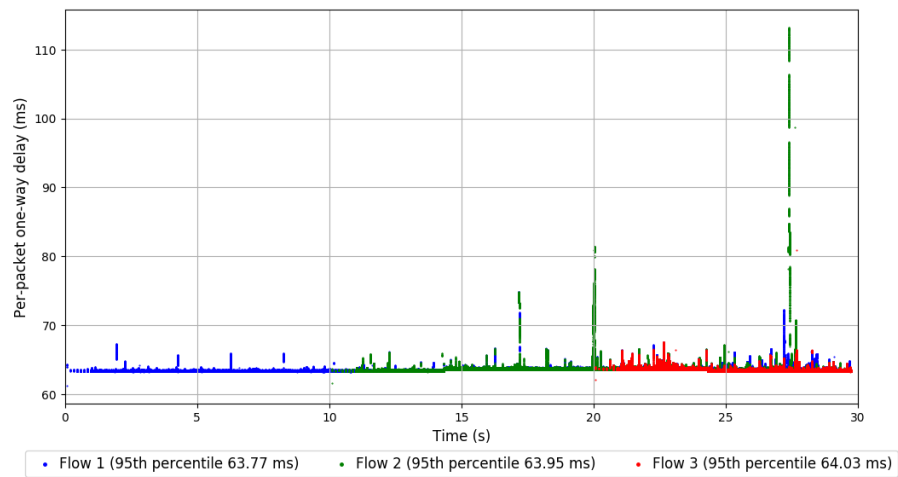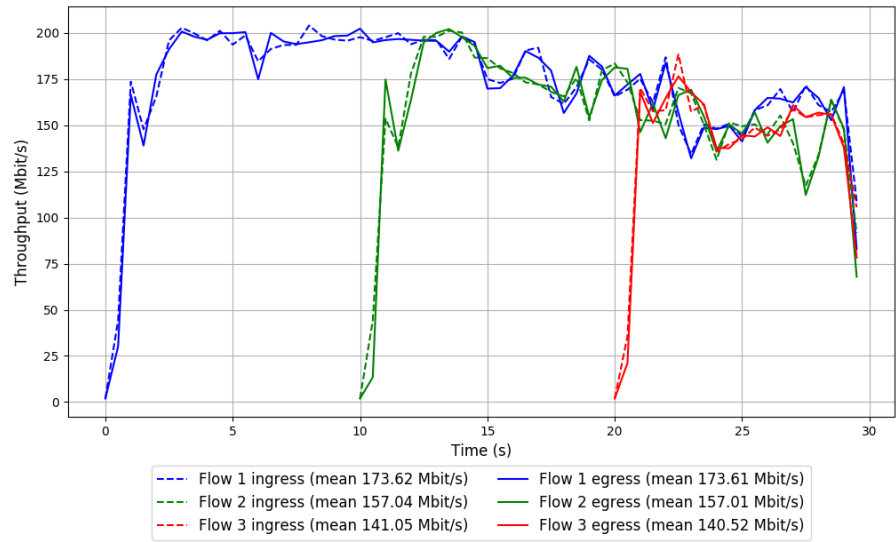
Run 7: Report of Indigo — Data Link

Flow 1 ingress (mean 169.72 Mbit/s) --- Flow 1 egress (mean 169.76 Mbit/s)
Flow 2 ingress (mean 154.50 Mbit/s) --- Flow 2 egress (mean 154.51 Mbit/s)
Flow 3 ingress (mean 138.61 Mbit/s) --- Flow 3 egress (mean 138.58 Mbit/s)

Flow 1 (95th percentile 63.43 ms)   Flow 2 (95th percentile 63.55 ms)   Flow 3 (95th percentile 63.49 ms)

Run 8: Statistics of Indigo

Start at: 2017-09-19 05:06:03
End at: 2017-09-19 05:06:33

Run 8: Report of Indigo — Data Link

```
Run 9: Statistics of Indigo

Start at: 2017-09-19 05:15:14
End at: 2017-09-19 05:15:44


# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 323.23 Mbit/s
95th percentile per-packet one-way delay: 63.856 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 173.61 Mbit/s
95th percentile per-packet one-way delay: 63.773 ms
Loss rate: 0.44%
-- Flow 2:
Average throughput: 157.01 Mbit/s
95th percentile per-packet one-way delay: 63.954 ms
Loss rate: 0.66%
-- Flow 3:
Average throughput: 140.52 Mbit/s
95th percentile per-packet one-way delay: 64.031 ms
Loss rate: 1.67%
```
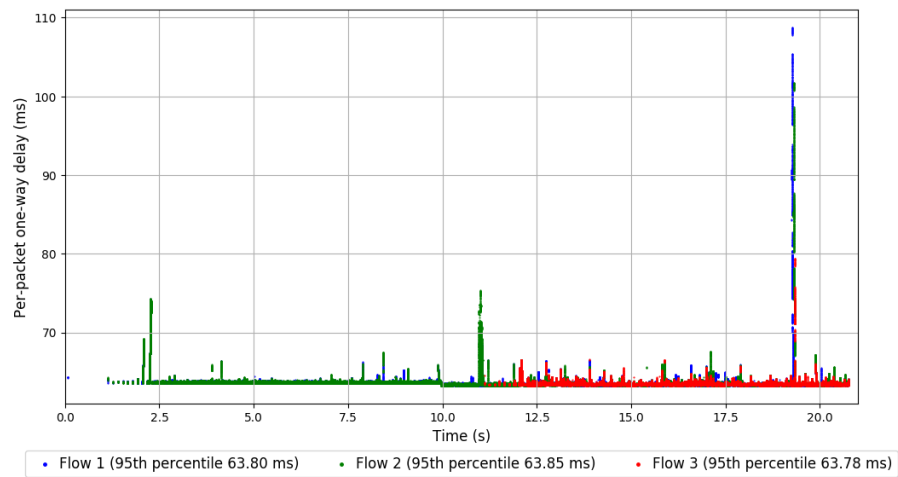
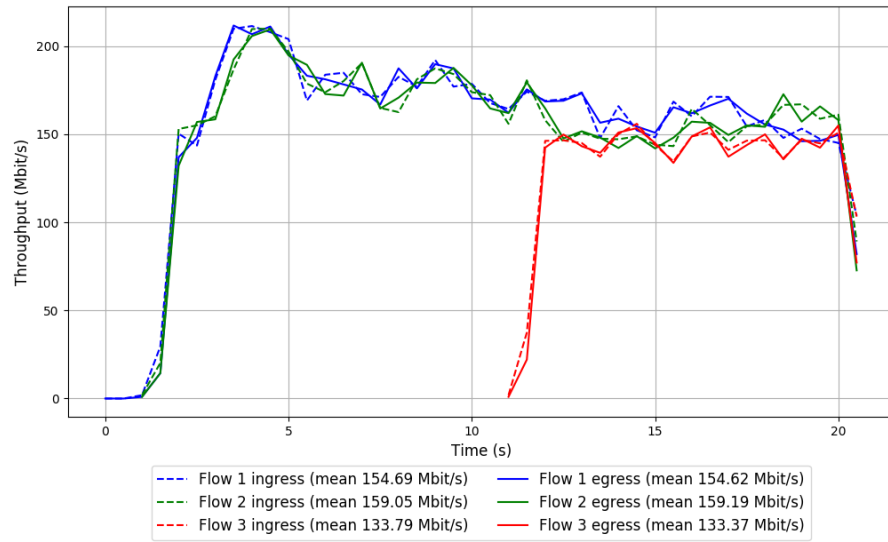Run 9: Report of Indigo — Data Link

Run 10: Statistics of Indigo

Start at: 2017-09-19 05:24:10
End at: 2017-09-19 05:24:40

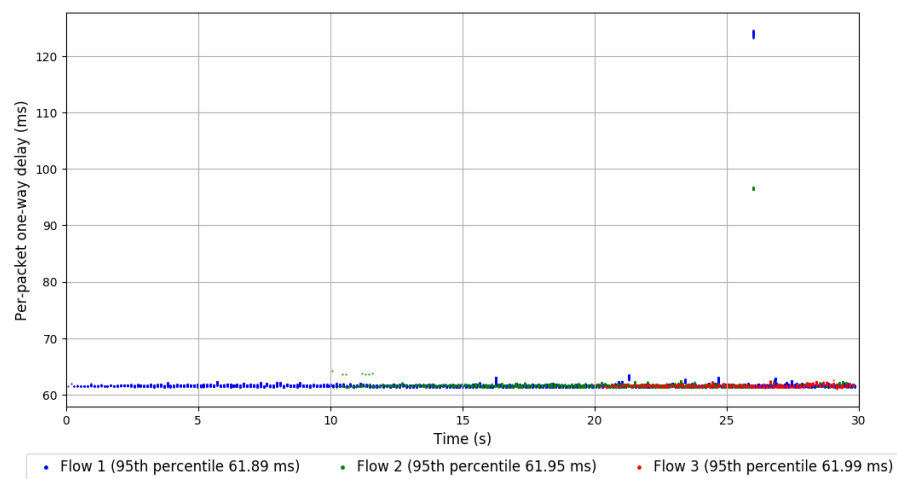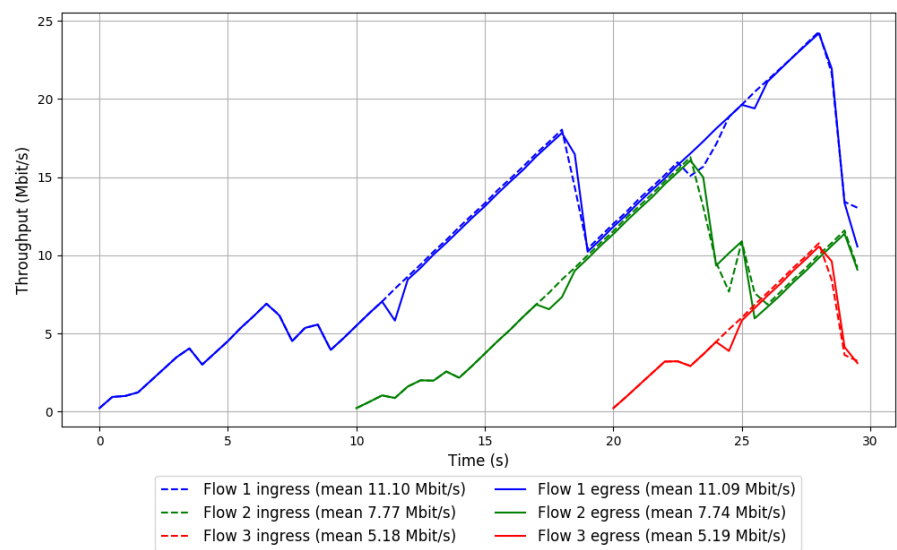## Run 10: Report of Indigo — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2017-09-19 03:59:26
End at: 2017-09-19 03:59:56

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 17.90 Mbit/s
95th percentile per-packet one-way delay: 61.926 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 11.09 Mbit/s
95th percentile per-packet one-way delay: 61.892 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 7.74 Mbit/s
95th percentile per-packet one-way delay: 61.947 ms
Loss rate: 1.01%
-- Flow 3:
Average throughput: 5.19 Mbit/s
95th percentile per-packet one-way delay: 61.994 ms
Loss rate: 1.17%
```

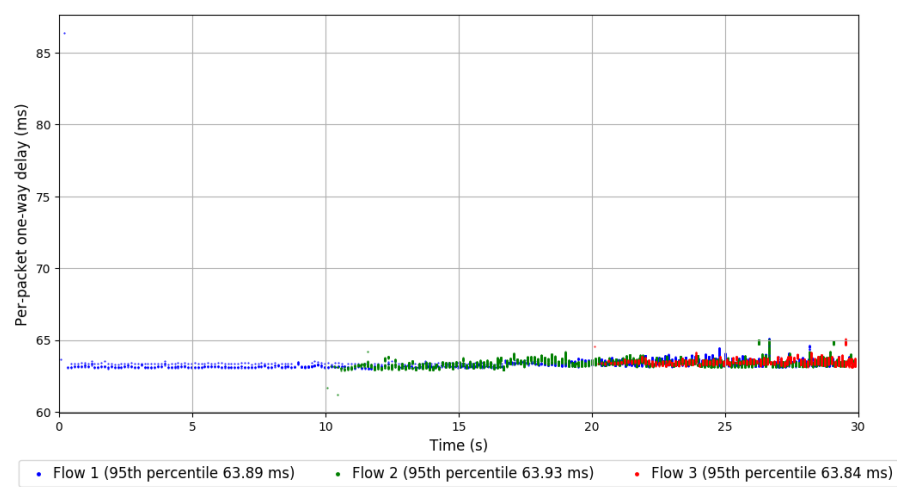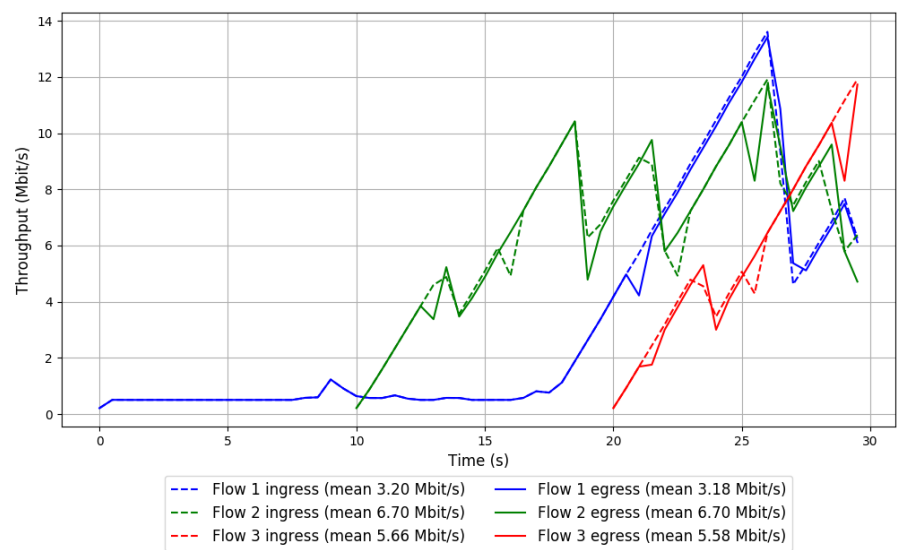Run 1: Report of LEDBAT — Data Link

65

```
Run 2: Statistics of LEDBAT

Start at: 2017-09-19 04:08:52
End at: 2017-09-19 04:09:22

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 9.44 Mbit/s
95th percentile per-packet one-way delay: 63.902 ms
Loss rate: 1.21%
-- Flow 1:
Average throughput: 3.18 Mbit/s
95th percentile per-packet one-way delay: 63.890 ms
Loss rate: 1.12%
-- Flow 2:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 63.931 ms
Loss rate: 0.62%
-- Flow 3:
Average throughput: 5.58 Mbit/s
95th percentile per-packet one-way delay: 63.842 ms
Loss rate: 2.75%
```

Run 2: Report of LEDBAT — Data Link

```
Run 3: Statistics of LEDBAT

Start at: 2017-09-19 04:17:57
End at: 2017-09-19 04:18:27


# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 18.90 Mbit/s
95th percentile per-packet one-way delay: 63.160 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 11.71 Mbit/s
95th percentile per-packet one-way delay: 63.234 ms
Loss rate: 1.07%
-- Flow 2:
Average throughput: 8.37 Mbit/s
95th percentile per-packet one-way delay: 62.275 ms
Loss rate: 0.84%
-- Flow 3:
Average throughput: 5.03 Mbit/s
95th percentile per-packet one-way delay: 62.021 ms
Loss rate: 2.76%
```
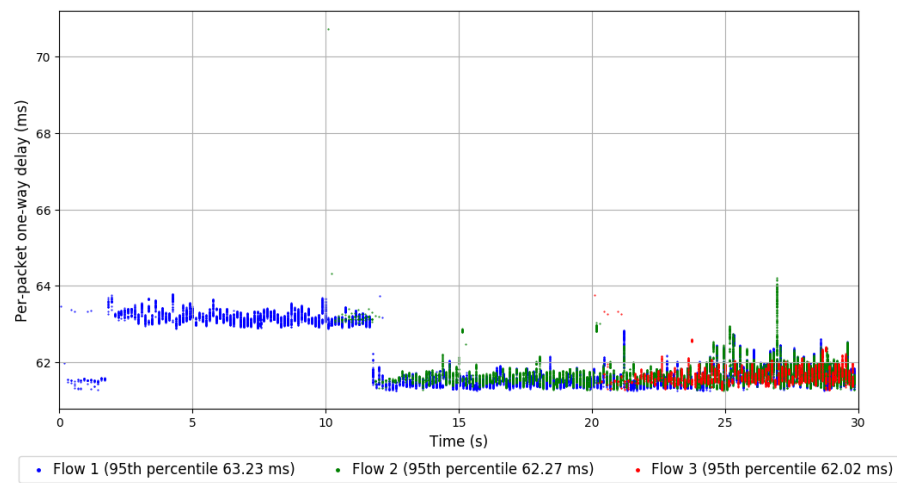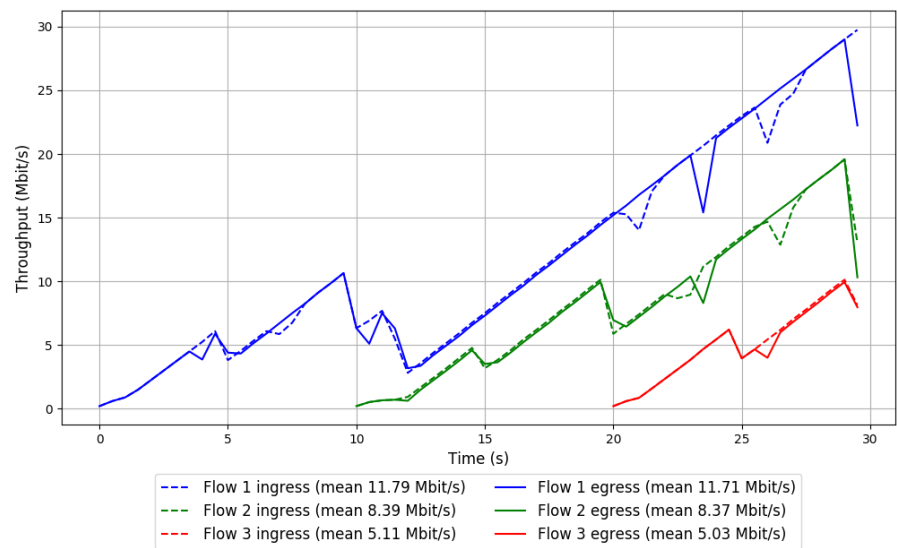
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2017-09-19 04:27:19
End at: 2017-09-19 04:27:49

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 17.29 Mbit/s
95th percentile per-packet one-way delay: 62.022 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 8.74 Mbit/s
95th percentile per-packet one-way delay: 62.059 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 10.33 Mbit/s
95th percentile per-packet one-way delay: 61.917 ms
Loss rate: 0.62%
-- Flow 3:
Average throughput: 5.20 Mbit/s
95th percentile per-packet one-way delay: 61.857 ms
Loss rate: 2.59%
```
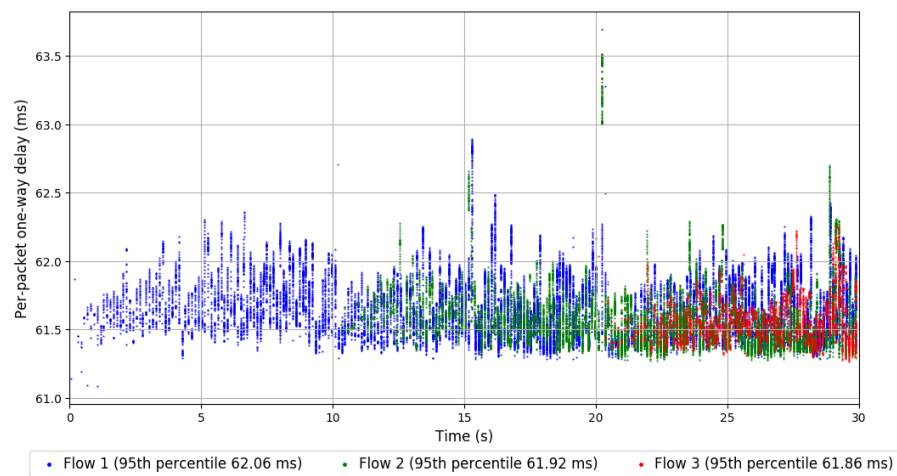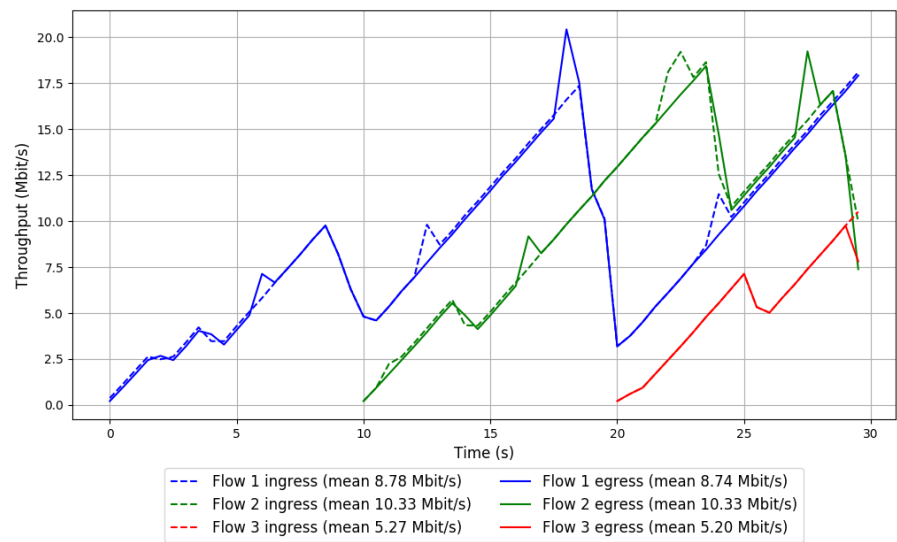
Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2017-09-19 04:36:32
End at: 2017-09-19 04:37:02

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 19.87 Mbit/s
95th percentile per-packet one-way delay: 64.096 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 11.02 Mbit/s
95th percentile per-packet one-way delay: 63.980 ms
Loss rate: 1.05%
-- Flow 2:
Average throughput: 11.09 Mbit/s
95th percentile per-packet one-way delay: 64.210 ms
Loss rate: 1.19%
-- Flow 3:
Average throughput: 4.56 Mbit/s
95th percentile per-packet one-way delay: 63.957 ms
Loss rate: 2.36%
```
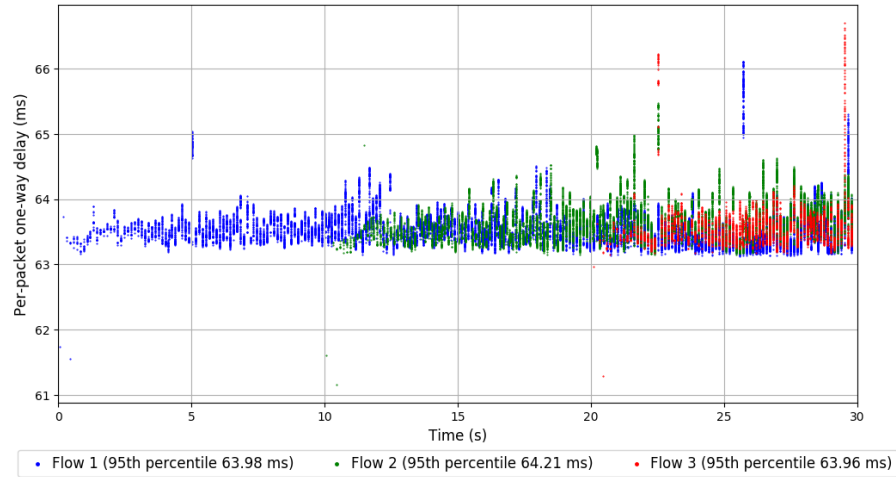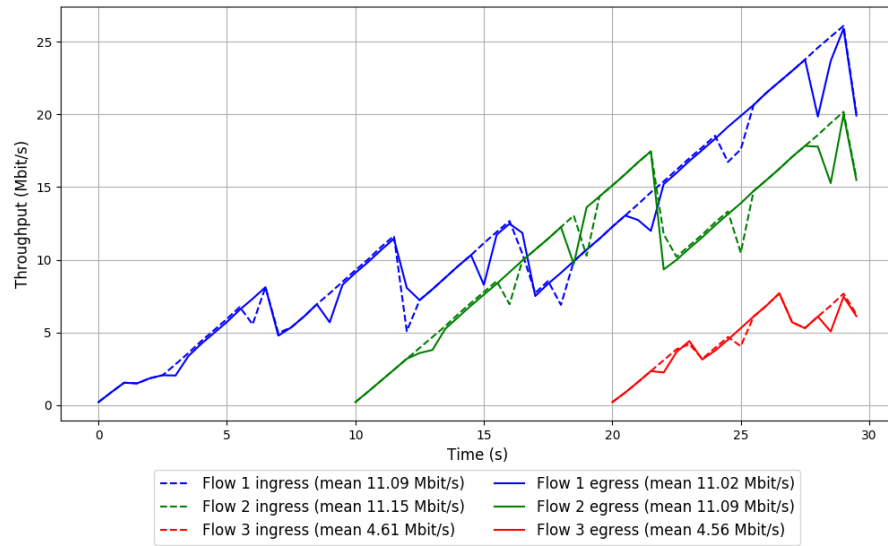
Run 5: Report of LEDBAT — Data Link

```
Run 6: Statistics of LEDBAT

Start at: 2017-09-19 04:45:40
End at: 2017-09-19 04:46:10

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 20.77 Mbit/s
95th percentile per-packet one-way delay: 63.783 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 9.13 Mbit/s
95th percentile per-packet one-way delay: 63.809 ms
Loss rate: 0.73%
-- Flow 2:
Average throughput: 14.47 Mbit/s
95th percentile per-packet one-way delay: 63.787 ms
Loss rate: 1.28%
-- Flow 3:
Average throughput: 6.26 Mbit/s
95th percentile per-packet one-way delay: 63.714 ms
Loss rate: 1.60%
```
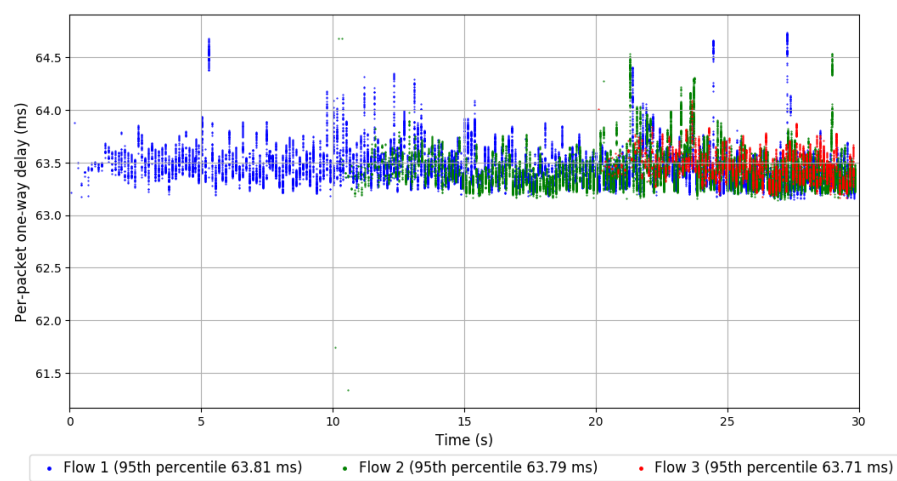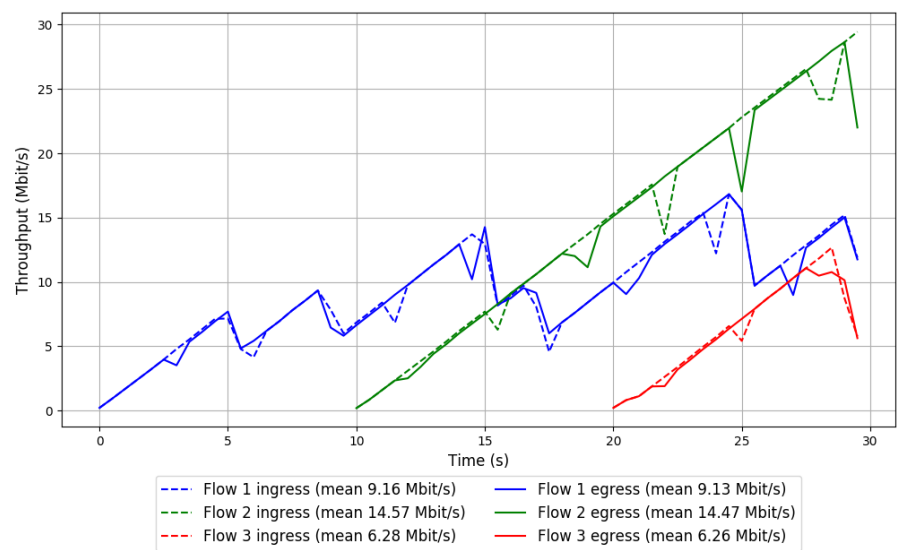
Run 6: Report of LEDBAT — Data Link

```
Run 7: Statistics of LEDBAT

Start at: 2017-09-19 04:54:55
End at: 2017-09-19 04:55:25


# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 16.33 Mbit/s
95th percentile per-packet one-way delay: 63.960 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 7.74 Mbit/s
95th percentile per-packet one-way delay: 63.989 ms
Loss rate: 0.42%
-- Flow 2:
Average throughput: 9.48 Mbit/s
95th percentile per-packet one-way delay: 63.975 ms
Loss rate: 1.14%
-- Flow 3:
Average throughput: 7.03 Mbit/s
95th percentile per-packet one-way delay: 63.724 ms
Loss rate: 2.49%
```
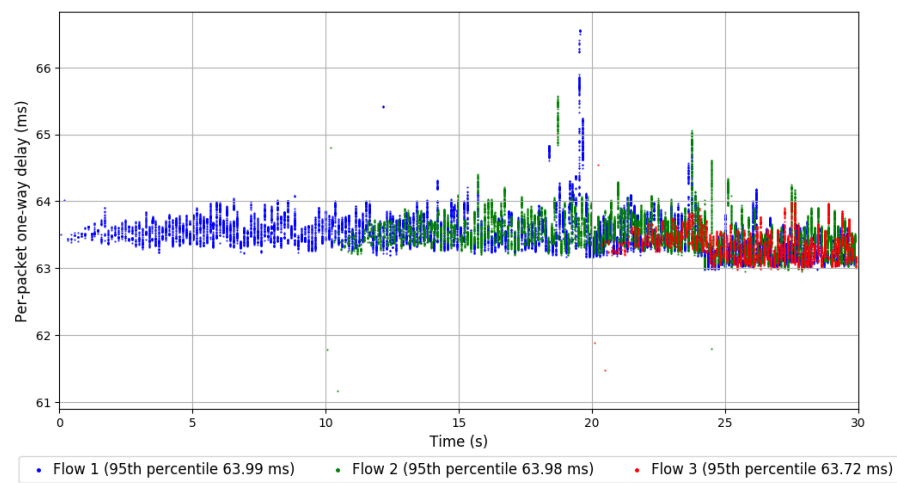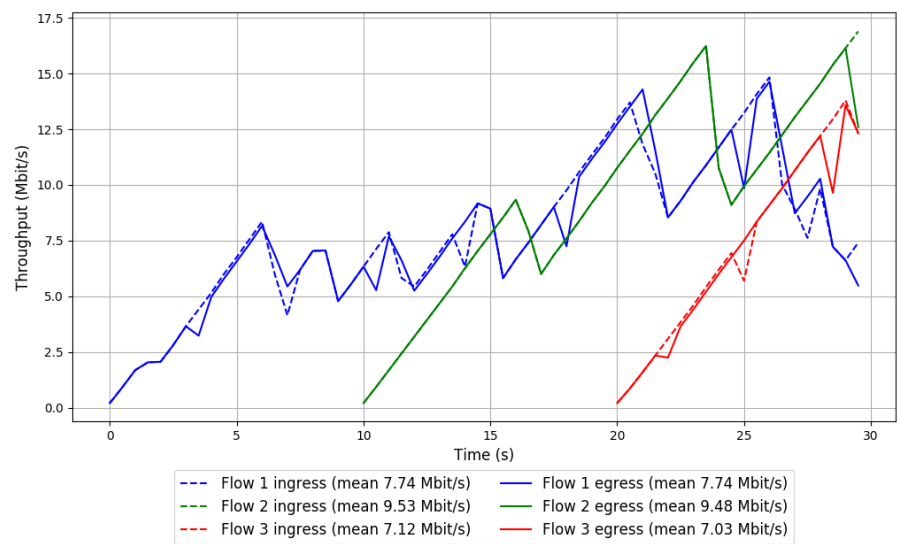
Run 7: Report of LEDBAT — Data Link

```
Run 8: Statistics of LEDBAT

Start at: 2017-09-19 05:04:07
End at: 2017-09-19 05:04:37

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 16.11 Mbit/s
95th percentile per-packet one-way delay: 64.039 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 8.39 Mbit/s
95th percentile per-packet one-way delay: 63.993 ms
Loss rate: 0.73%
-- Flow 2:
Average throughput: 8.92 Mbit/s
95th percentile per-packet one-way delay: 64.073 ms
Loss rate: 1.44%
-- Flow 3:
Average throughput: 5.52 Mbit/s
95th percentile per-packet one-way delay: 64.064 ms
Loss rate: 2.54%
```

Run 8: Report of LEDBAT — Data Link

Flow 1 ingress (mean 8.41 Mbit/s)   Flow 1 egress (mean 8.39 Mbit/s)
Flow 2 ingress (mean 8.99 Mbit/s)   Flow 2 egress (mean 8.92 Mbit/s)
Flow 3 ingress (mean 5.59 Mbit/s)   Flow 3 egress (mean 5.52 Mbit/s)

Flow 1 (95th percentile 63.99 ms)   Flow 2 (95th percentile 64.07 ms)   Flow 3 (95th percentile 64.06 ms)

```
Run 9: Statistics of LEDBAT

Start at: 2017-09-19 05:13:16
End at: 2017-09-19 05:13:46

# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 17.24 Mbit/s
95th percentile per-packet one-way delay: 64.077 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 8.06 Mbit/s
95th percentile per-packet one-way delay: 64.013 ms
Loss rate: 1.06%
-- Flow 2:
Average throughput: 11.23 Mbit/s
95th percentile per-packet one-way delay: 64.267 ms
Loss rate: 0.88%
-- Flow 3:
Average throughput: 5.28 Mbit/s
95th percentile per-packet one-way delay: 63.885 ms
Loss rate: 2.85%
```
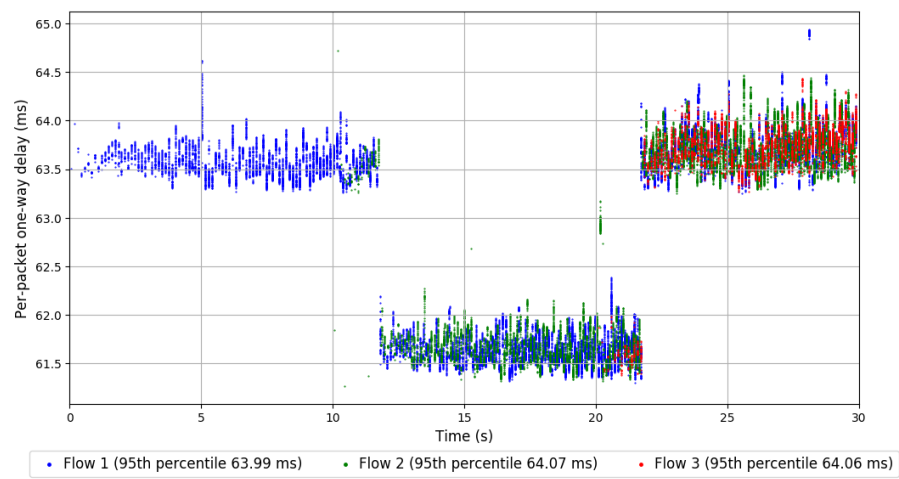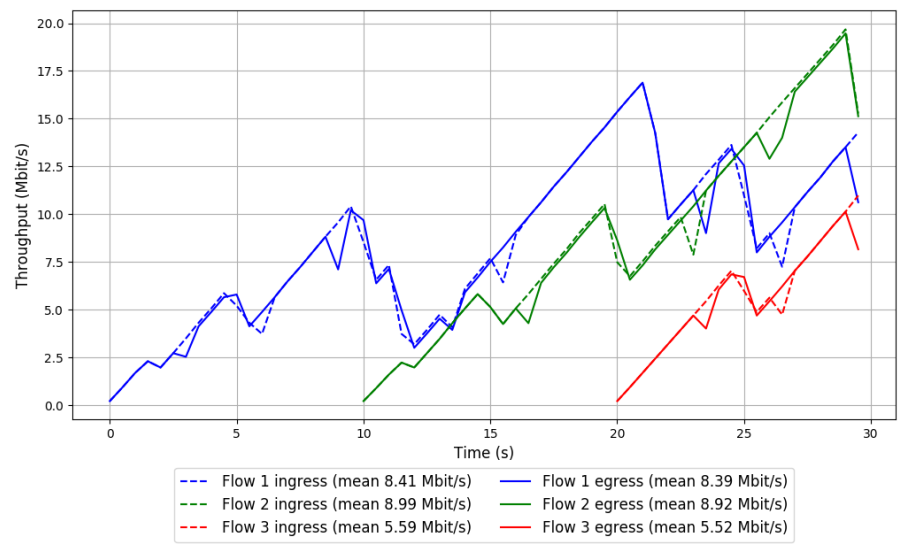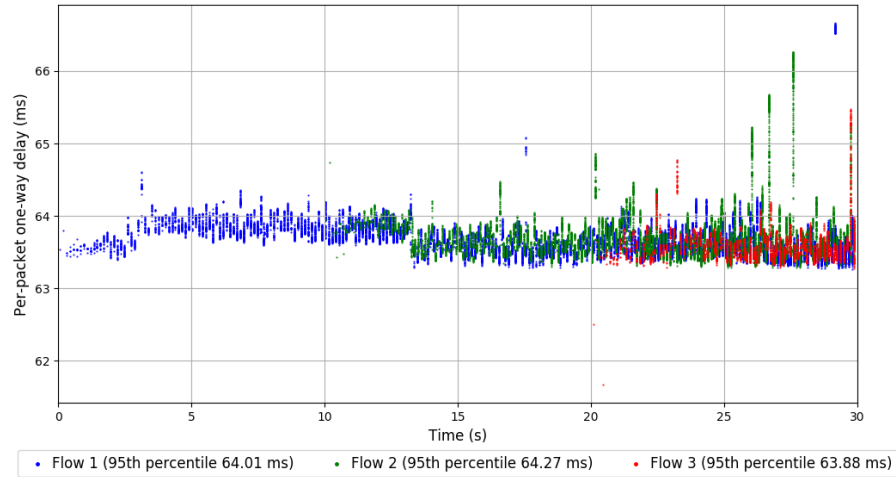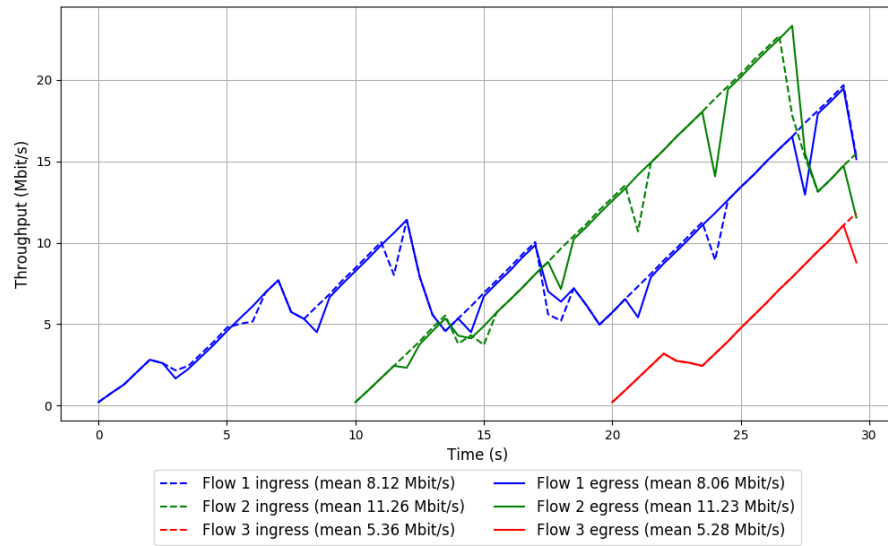
Run 9: Report of LEDBAT — Data Link

```
Run 10: Statistics of LEDBAT

Start at: 2017-09-19 05:22:30
End at: 2017-09-19 05:23:00


# Below is generated by plot.py at 2017-09-19 07:45:02
# Datalink statistics
-- Total of 3 flows:
Average throughput: 23.84 Mbit/s
95th percentile per-packet one-way delay: 63.999 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 17.40 Mbit/s
95th percentile per-packet one-way delay: 63.992 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 6.85 Mbit/s
95th percentile per-packet one-way delay: 64.063 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 5.78 Mbit/s
95th percentile per-packet one-way delay: 63.943 ms
Loss rate: 2.71%
```
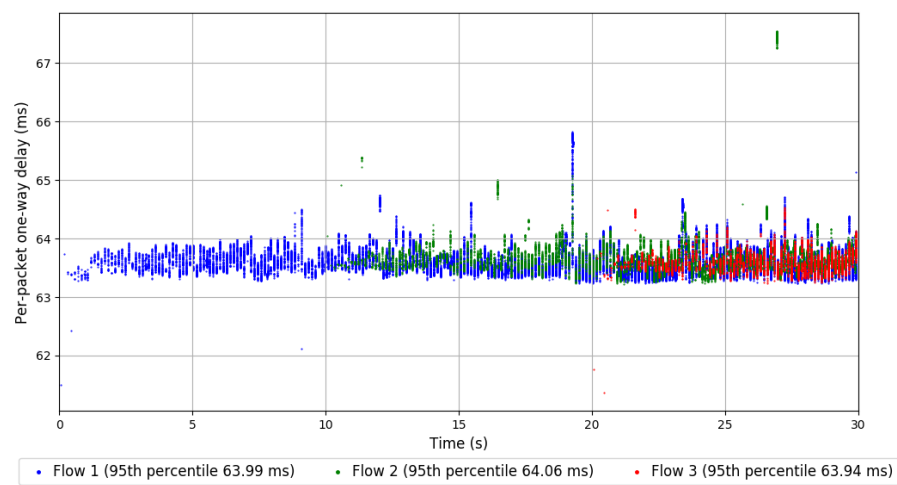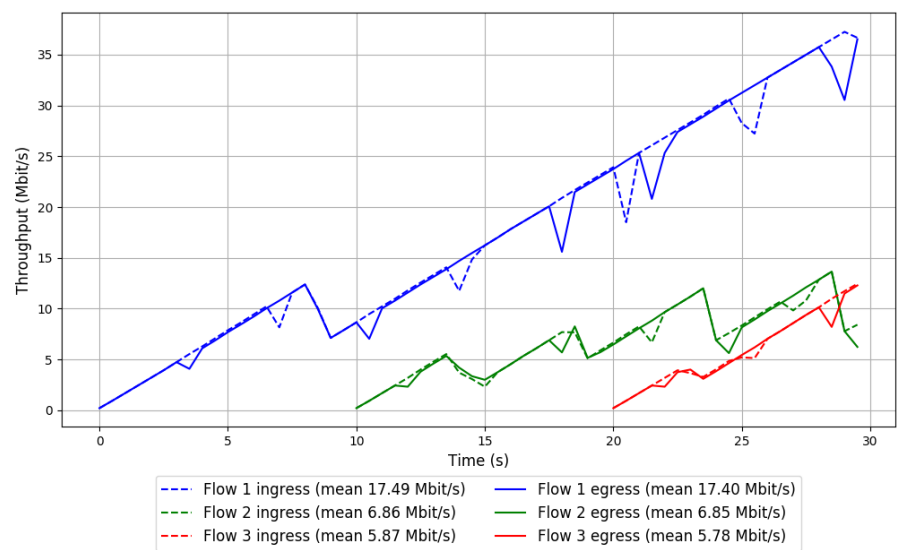
Run 10: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2017-09-19 04:05:51
End at: 2017-09-19 04:06:21

# Below is generated by plot.py at 2017-09-19 07:51:24
# Datalink statistics
-- Total of 3 flows:
Average throughput: 597.03 Mbit/s
95th percentile per-packet one-way delay: 169.396 ms
Loss rate: 1.64%
-- Flow 1:
Average throughput: 583.57 Mbit/s
95th percentile per-packet one-way delay: 169.425 ms
Loss rate: 1.65%
-- Flow 2:
Average throughput: 17.91 Mbit/s
95th percentile per-packet one-way delay: 167.873 ms
Loss rate: 0.95%
-- Flow 3:
Average throughput: 4.97 Mbit/s
95th percentile per-packet one-way delay: 166.650 ms
Loss rate: 1.56%
```

Run 1: Report of PCC — Data Link

- - - Flow 1 ingress (mean 590.84 Mbit/s) ——— Flow 1 egress (mean 583.57 Mbit/s)
- - - Flow 2 ingress (mean 17.93 Mbit/s) ——— Flow 2 egress (mean 17.91 Mbit/s)
- - - Flow 3 ingress (mean 4.98 Mbit/s) ——— Flow 3 egress (mean 4.97 Mbit/s)

• Flow 1 (95th percentile 169.43 ms) • Flow 2 (95th percentile 167.87 ms) • Flow 3 (95th percentile 166.65 ms)
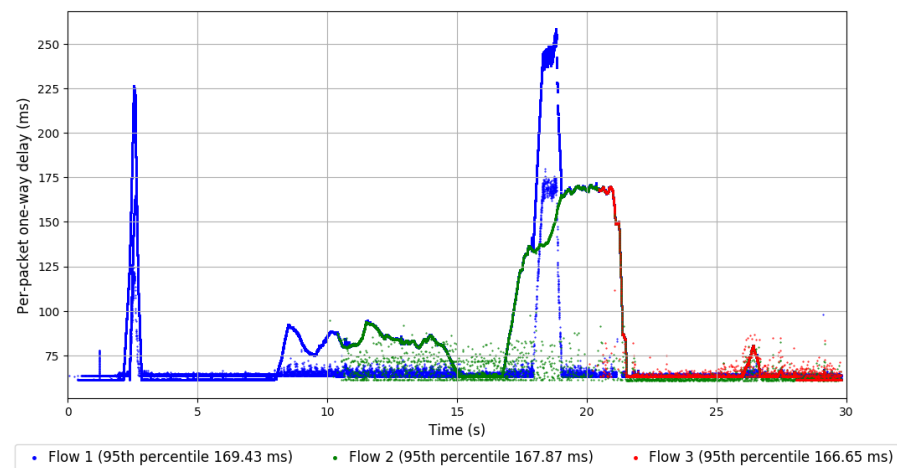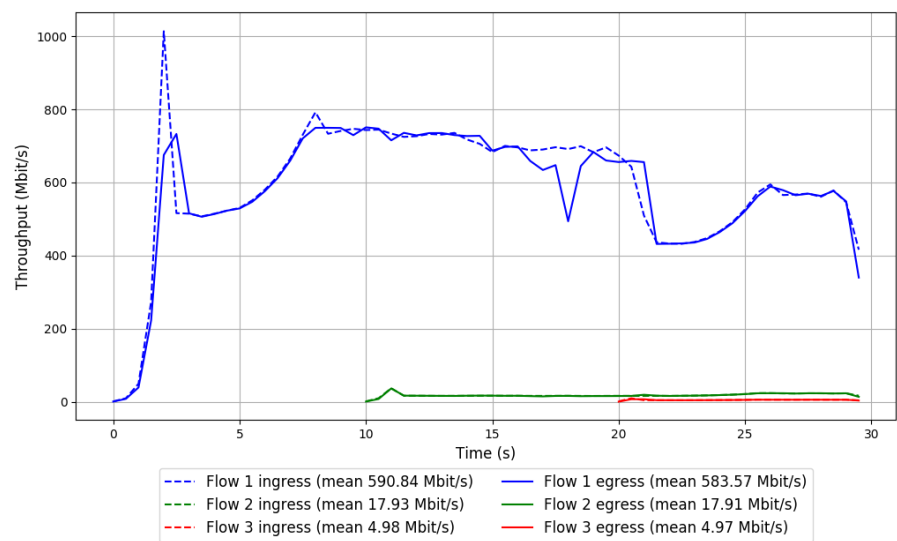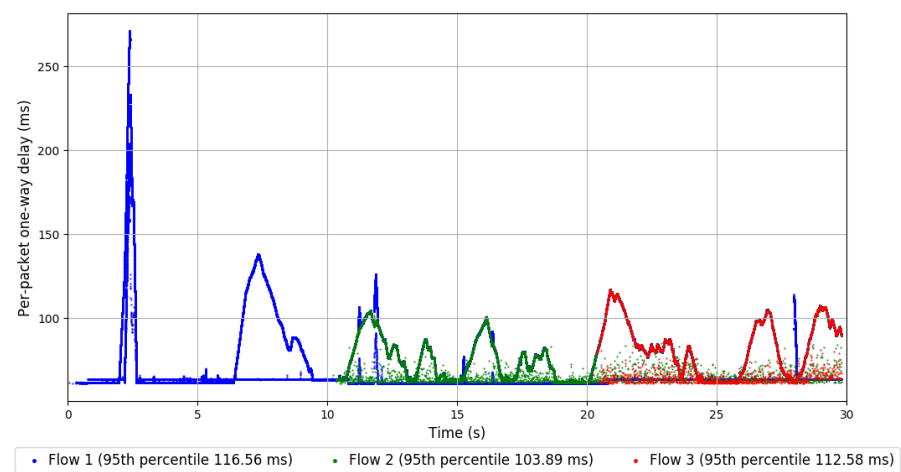
85

```
Run 2: Statistics of PCC

Start at: 2017-09-19 04:15:00
End at: 2017-09-19 04:15:30

# Below is generated by plot.py at 2017-09-19 07:52:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 615.16 Mbit/s
95th percentile per-packet one-way delay: 116.332 ms
Loss rate: 1.09%
-- Flow 1:
Average throughput: 608.22 Mbit/s
95th percentile per-packet one-way delay: 116.561 ms
Loss rate: 1.09%
-- Flow 2:
Average throughput: 8.35 Mbit/s
95th percentile per-packet one-way delay: 103.890 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 112.584 ms
Loss rate: 1.67%
```
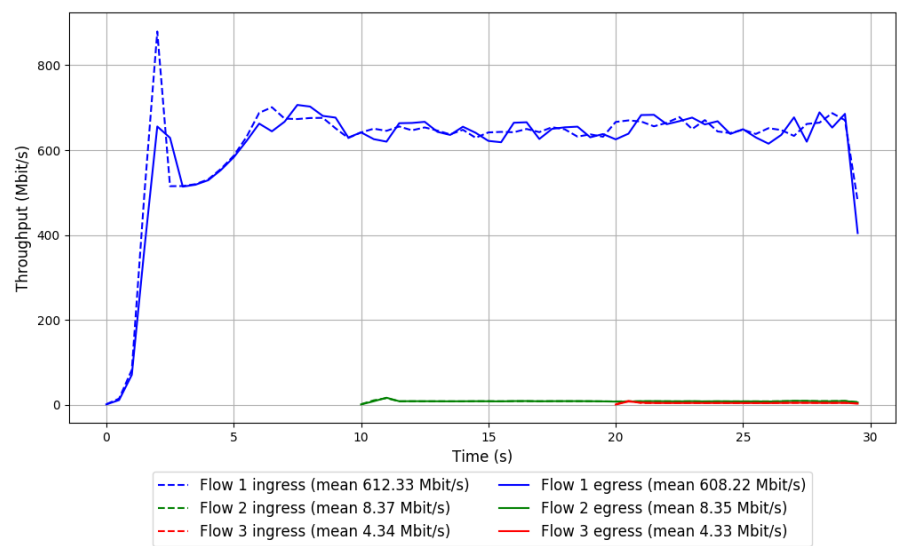
Run 2: Report of PCC — Data Link

Flow 1 ingress (mean 612.33 Mbit/s) --- Flow 1 egress (mean 608.22 Mbit/s)
Flow 2 ingress (mean 8.37 Mbit/s) --- Flow 2 egress (mean 8.35 Mbit/s)
Flow 3 ingress (mean 4.34 Mbit/s) --- Flow 3 egress (mean 4.33 Mbit/s)

Flow 1 (95th percentile 116.56 ms) • Flow 2 (95th percentile 103.89 ms) • Flow 3 (95th percentile 112.58 ms)

```
Run 3: Statistics of PCC

Start at: 2017-09-19 04:24:14
End at: 2017-09-19 04:24:44

# Below is generated by plot.py at 2017-09-19 07:52:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 614.95 Mbit/s
95th percentile per-packet one-way delay: 127.477 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 570.11 Mbit/s
95th percentile per-packet one-way delay: 127.457 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 65.56 Mbit/s
95th percentile per-packet one-way delay: 127.603 ms
Loss rate: 0.75%
-- Flow 3:
Average throughput: 4.30 Mbit/s
95th percentile per-packet one-way delay: 127.711 ms
Loss rate: 1.49%
```
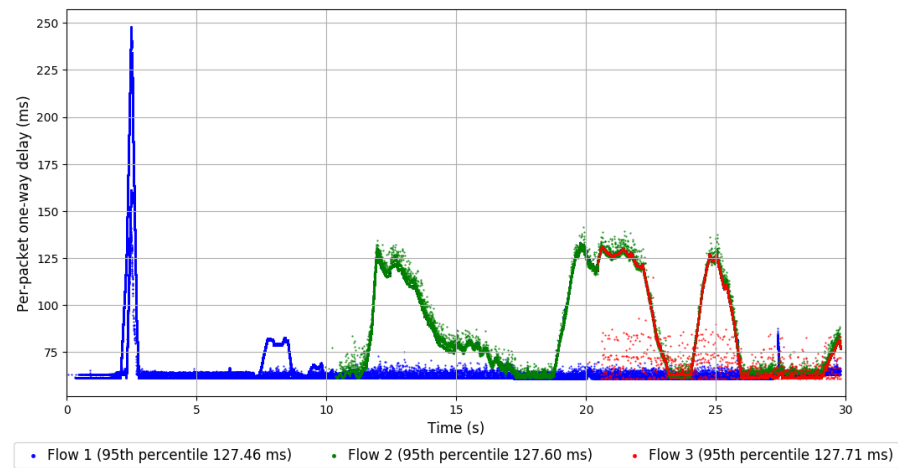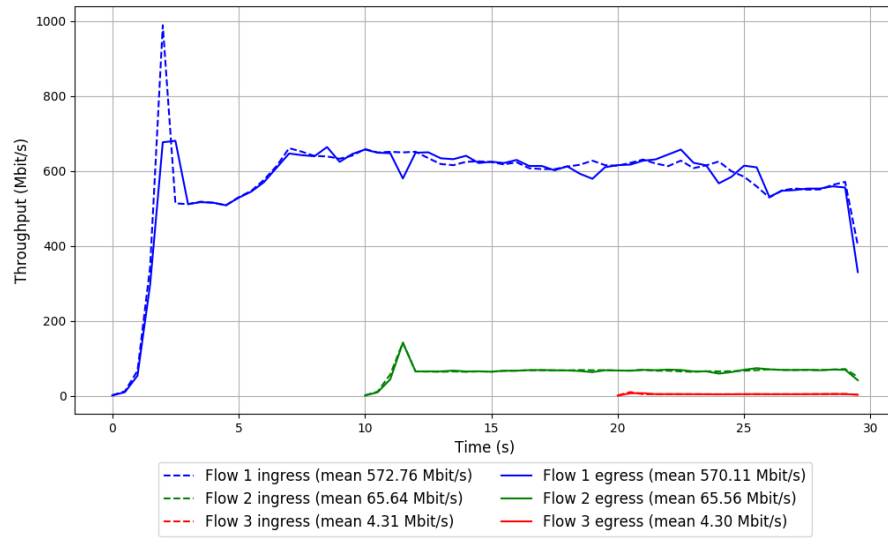
Run 3: Report of PCC — Data Link

Flow 1 ingress (mean 572.76 Mbit/s)   Flow 1 egress (mean 570.11 Mbit/s)
Flow 2 ingress (mean 65.64 Mbit/s)   Flow 2 egress (mean 65.56 Mbit/s)
Flow 3 ingress (mean 4.31 Mbit/s)   Flow 3 egress (mean 4.30 Mbit/s)

Flow 1 (95th percentile 127.46 ms)   Flow 2 (95th percentile 127.60 ms)   Flow 3 (95th percentile 127.71 ms)

```
Run 4: Statistics of PCC

Start at: 2017-09-19 04:33:33
End at: 2017-09-19 04:34:03

# Below is generated by plot.py at 2017-09-19 07:52:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 603.70 Mbit/s
95th percentile per-packet one-way delay: 132.434 ms
Loss rate: 1.73%
-- Flow 1:
Average throughput: 590.04 Mbit/s
95th percentile per-packet one-way delay: 133.230 ms
Loss rate: 1.69%
-- Flow 2:
Average throughput: 19.41 Mbit/s
95th percentile per-packet one-way delay: 72.174 ms
Loss rate: 3.00%
-- Flow 3:
Average throughput: 2.49 Mbit/s
95th percentile per-packet one-way delay: 75.591 ms
Loss rate: 7.64%
```
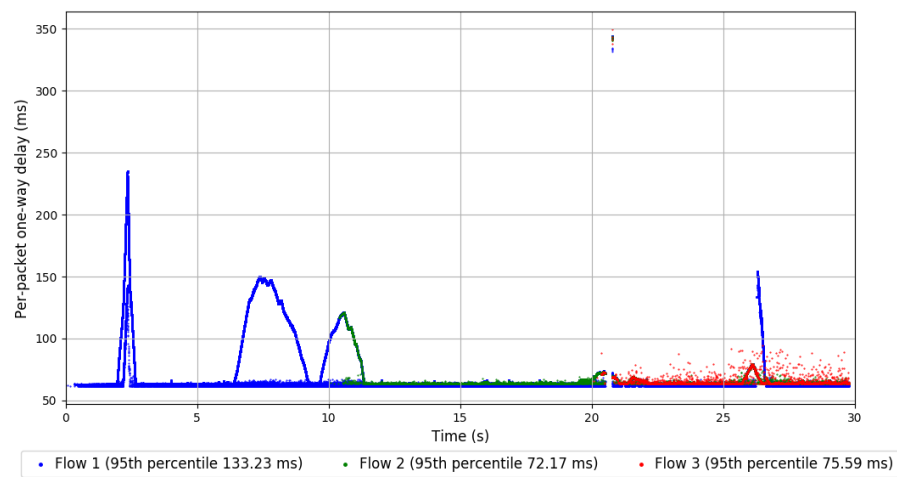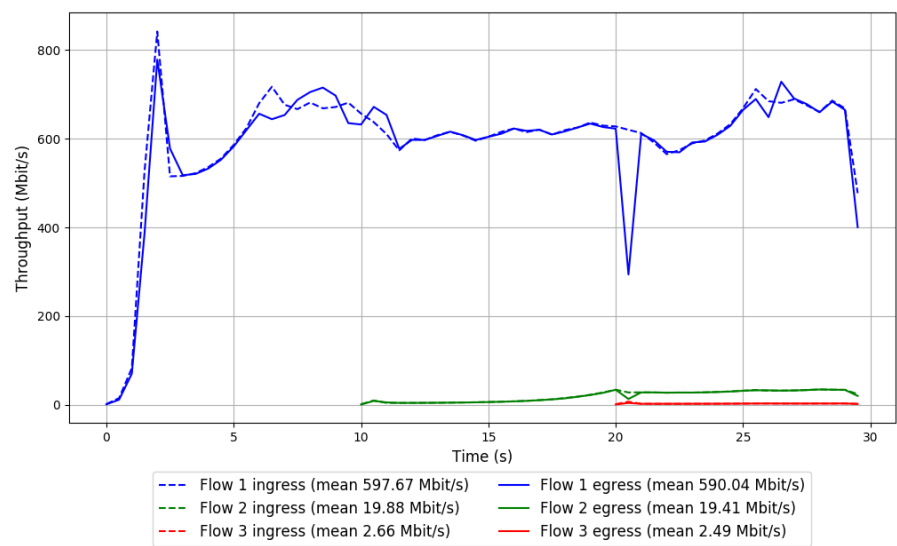
Run 4: Report of PCC — Data Link

```
Run 5: Statistics of PCC

Start at: 2017-09-19 04:42:48
End at: 2017-09-19 04:43:18

# Below is generated by plot.py at 2017-09-19 07:52:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 443.04 Mbit/s
95th percentile per-packet one-way delay: 82.519 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 9.78 Mbit/s
95th percentile per-packet one-way delay: 5167.579 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 543.30 Mbit/s
95th percentile per-packet one-way delay: 82.561 ms
Loss rate: 1.16%
-- Flow 3:
Average throughput: 8.52 Mbit/s
95th percentile per-packet one-way delay: 79.809 ms
Loss rate: 1.23%
```
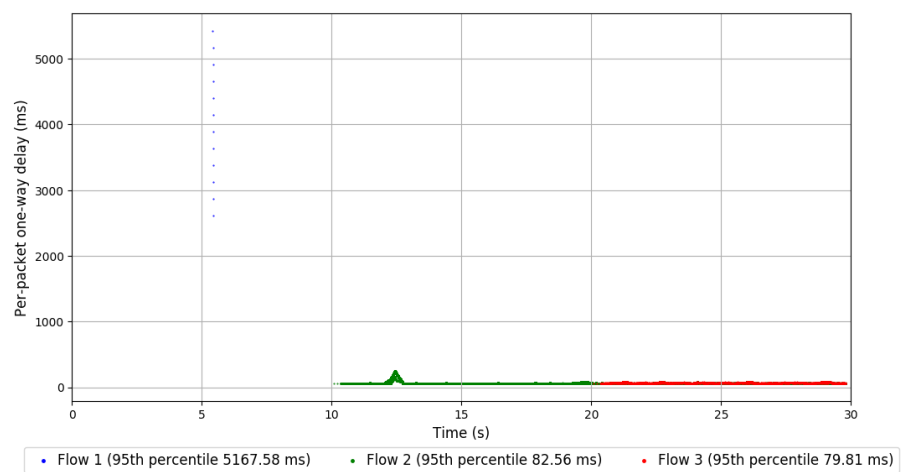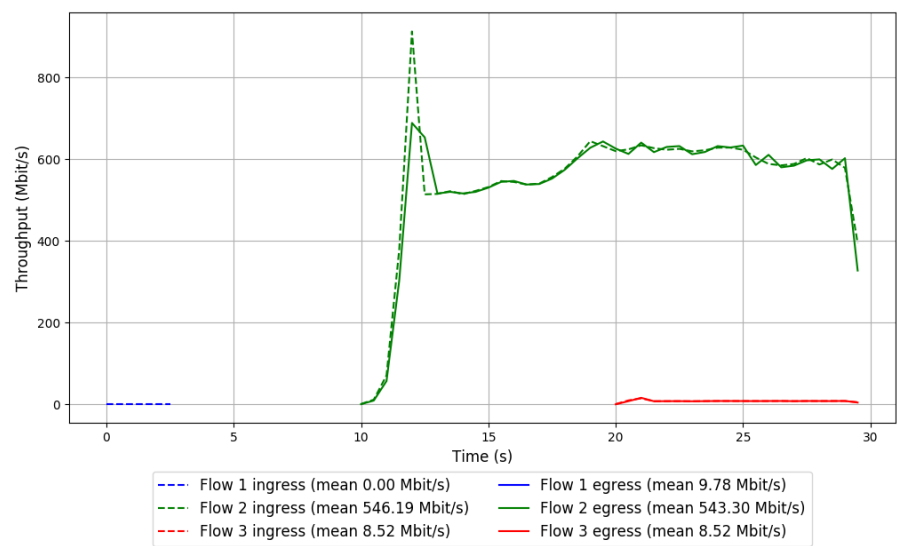
Run 5: Report of PCC — Data Link

- --- Flow 1 ingress (mean 0.00 Mbit/s) — Flow 1 egress (mean 9.78 Mbit/s)
- --- Flow 2 ingress (mean 546.19 Mbit/s) — Flow 2 egress (mean 543.30 Mbit/s)
- --- Flow 3 ingress (mean 8.52 Mbit/s) — Flow 3 egress (mean 8.52 Mbit/s)

- Flow 1 (95th percentile 5167.58 ms)
- Flow 2 (95th percentile 82.56 ms)
- Flow 3 (95th percentile 79.81 ms)

```
Run 6: Statistics of PCC

Start at: 2017-09-19 04:51:56
End at: 2017-09-19 04:52:26


# Below is generated by plot.py at 2017-09-19 07:53:23
# Datalink statistics
-- Total of 3 flows:
Average throughput: 622.32 Mbit/s
95th percentile per-packet one-way delay: 181.198 ms
Loss rate: 3.20%
-- Flow 1:
Average throughput: 573.35 Mbit/s
95th percentile per-packet one-way delay: 183.161 ms
Loss rate: 3.18%
-- Flow 2:
Average throughput: 17.01 Mbit/s
95th percentile per-packet one-way delay: 164.943 ms
Loss rate: 1.60%
-- Flow 3:
Average throughput: 115.54 Mbit/s
95th percentile per-packet one-way delay: 167.216 ms
Loss rate: 3.98%
```
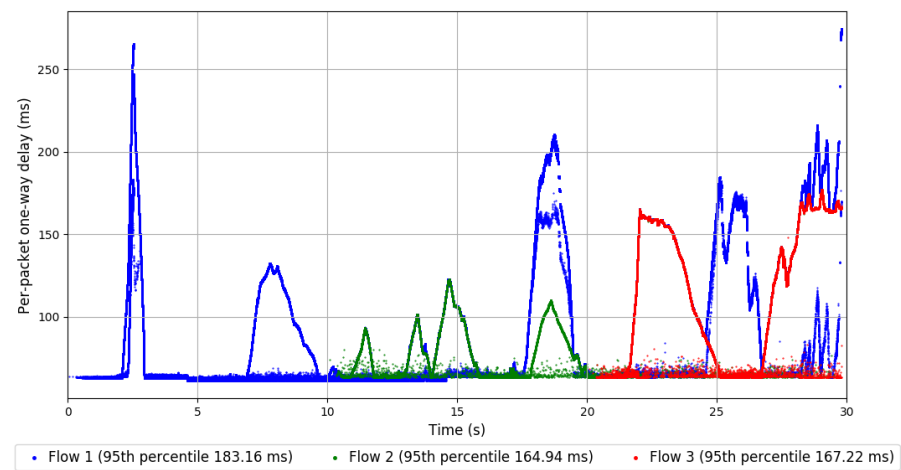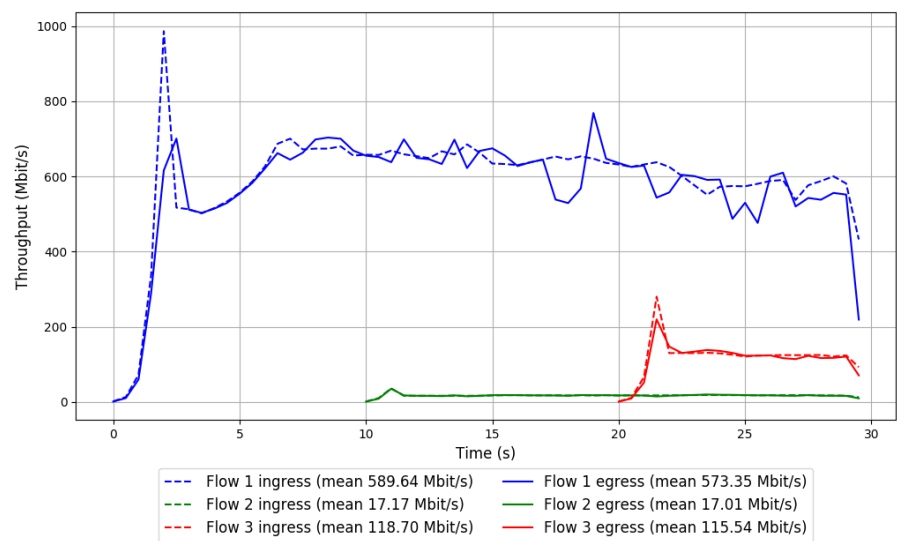
Run 6: Report of PCC — Data Link

- - - - Flow 1 ingress (mean 589.64 Mbit/s) —— Flow 1 egress (mean 573.35 Mbit/s)
- - - - Flow 2 ingress (mean 17.17 Mbit/s) —— Flow 2 egress (mean 17.01 Mbit/s)
- - - - Flow 3 ingress (mean 118.70 Mbit/s) —— Flow 3 egress (mean 115.54 Mbit/s)

- Flow 1 (95th percentile 183.16 ms) · Flow 2 (95th percentile 164.94 ms) · Flow 3 (95th percentile 167.22 ms)

```
Run 7: Statistics of PCC

Start at: 2017-09-19 05:01:07
End at: 2017-09-19 05:01:37


# Below is generated by plot.py at 2017-09-19 07:55:16
# Datalink statistics
-- Total of 3 flows:
Average throughput: 616.12 Mbit/s
95th percentile per-packet one-way delay: 171.697 ms
Loss rate: 1.91%
-- Flow 1:
Average throughput: 593.66 Mbit/s
95th percentile per-packet one-way delay: 171.622 ms
Loss rate: 1.87%
-- Flow 2:
Average throughput: 4.16 Mbit/s
95th percentile per-packet one-way delay: 171.493 ms
Loss rate: 1.74%
-- Flow 3:
Average throughput: 60.62 Mbit/s
95th percentile per-packet one-way delay: 172.551 ms
Loss rate: 3.29%
```
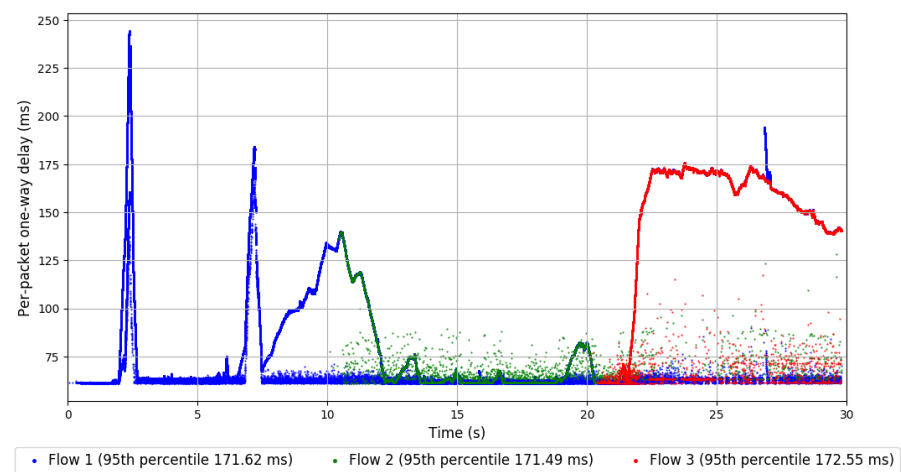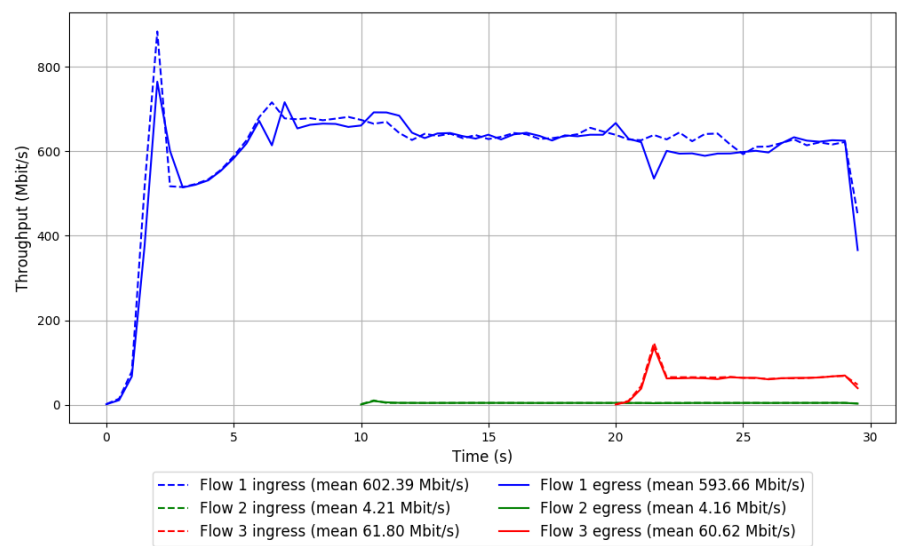
Run 7: Report of PCC — Data Link

```
Run 8: Statistics of PCC

Start at: 2017-09-19 05:10:18
End at: 2017-09-19 05:10:48

# Below is generated by plot.py at 2017-09-19 07:56:01
# Datalink statistics
-- Total of 3 flows:
Average throughput: 616.45 Mbit/s
95th percentile per-packet one-way delay: 167.450 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 570.22 Mbit/s
95th percentile per-packet one-way delay: 167.438 ms
Loss rate: 1.13%
-- Flow 2:
Average throughput: 65.52 Mbit/s
95th percentile per-packet one-way delay: 167.633 ms
Loss rate: 1.09%
-- Flow 3:
Average throughput: 8.55 Mbit/s
95th percentile per-packet one-way delay: 132.271 ms
Loss rate: 2.26%
```
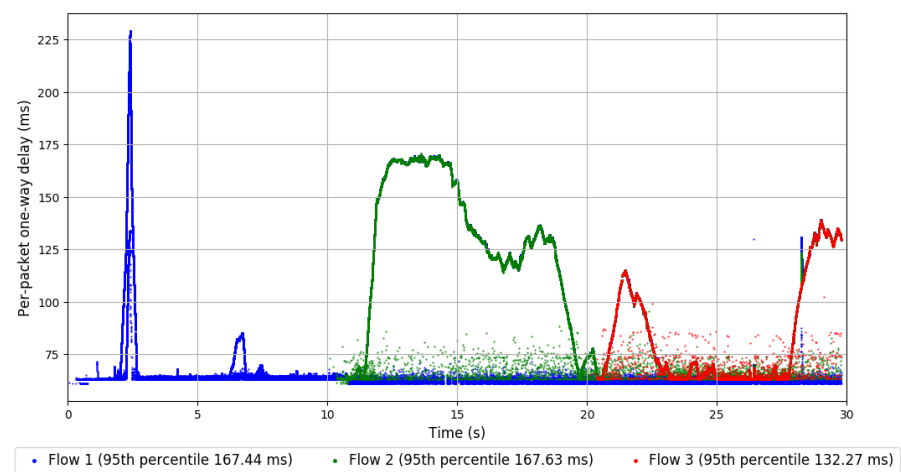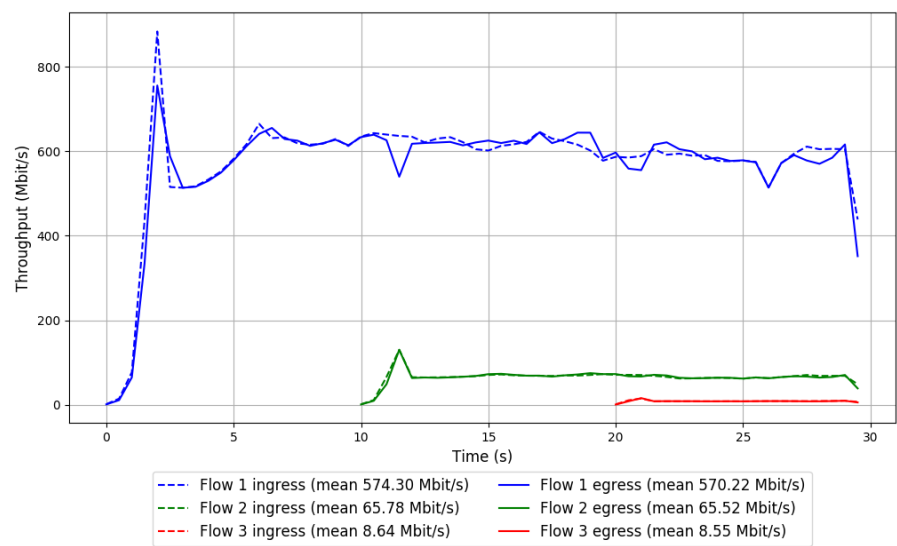
Run 8: Report of PCC — Data Link

- - - Flow 1 ingress (mean 574.30 Mbit/s) —— Flow 1 egress (mean 570.22 Mbit/s)
- - - Flow 2 ingress (mean 65.78 Mbit/s) —— Flow 2 egress (mean 65.52 Mbit/s)
- - - Flow 3 ingress (mean 8.64 Mbit/s) —— Flow 3 egress (mean 8.55 Mbit/s)

- Flow 1 (95th percentile 167.44 ms)   • Flow 2 (95th percentile 167.63 ms)   • Flow 3 (95th percentile 132.27 ms)

99

```
Run 9: Statistics of PCC

Start at: 2017-09-19 05:19:33
End at: 2017-09-19 05:20:03

# Below is generated by plot.py at 2017-09-19 07:59:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 619.31 Mbit/s
95th percentile per-packet one-way delay: 162.147 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 537.86 Mbit/s
95th percentile per-packet one-way delay: 162.512 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 67.81 Mbit/s
95th percentile per-packet one-way delay: 160.461 ms
Loss rate: 1.00%
-- Flow 3:
Average throughput: 111.75 Mbit/s
95th percentile per-packet one-way delay: 159.657 ms
Loss rate: 1.99%
```
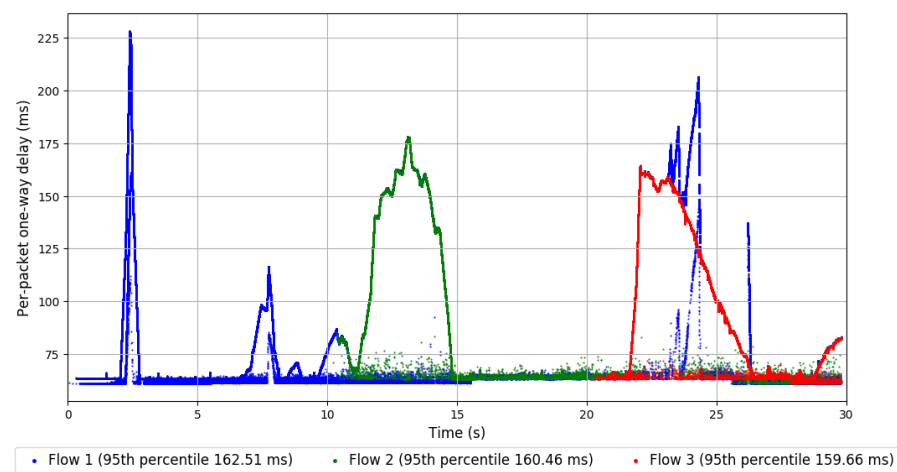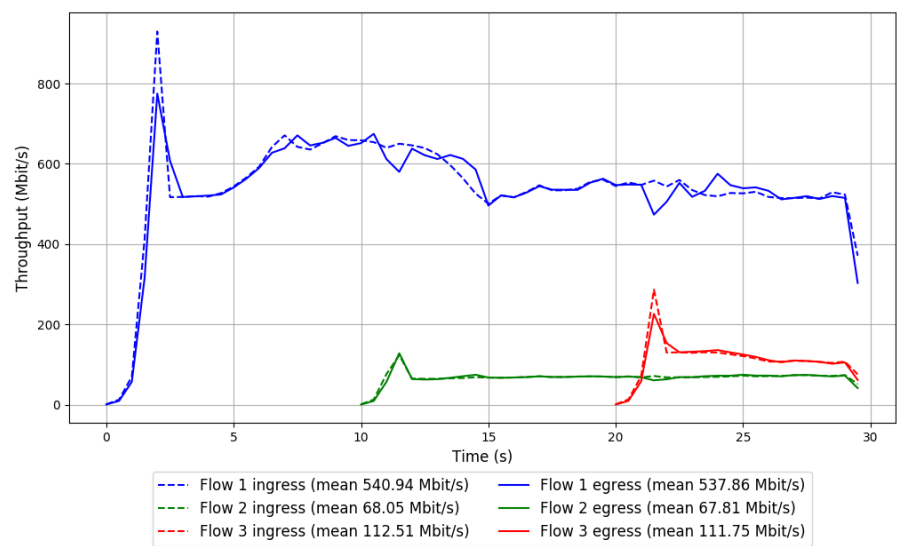
Run 9: Report of PCC — Data Link

Flow 1 ingress (mean 540.94 Mbit/s)   Flow 1 egress (mean 537.86 Mbit/s)
Flow 2 ingress (mean 68.05 Mbit/s)   Flow 2 egress (mean 67.81 Mbit/s)
Flow 3 ingress (mean 112.51 Mbit/s)   Flow 3 egress (mean 111.75 Mbit/s)

Flow 1 (95th percentile 162.51 ms)   Flow 2 (95th percentile 160.46 ms)   Flow 3 (95th percentile 159.66 ms)
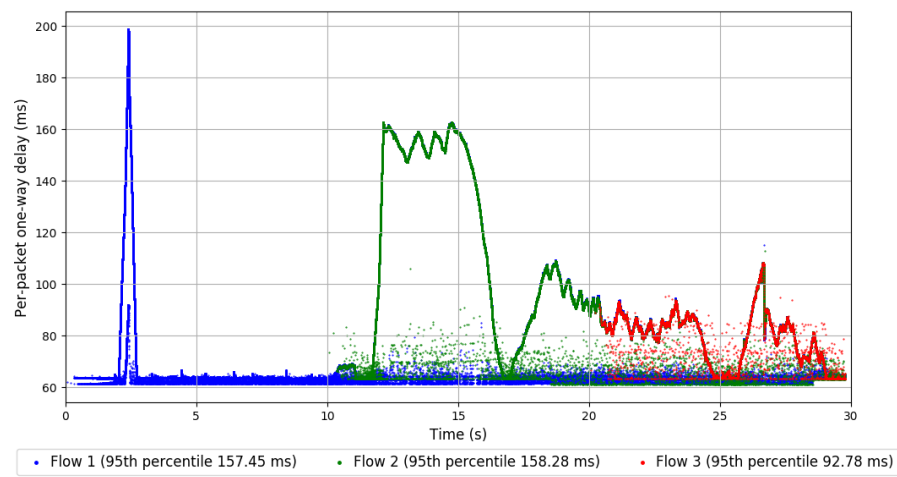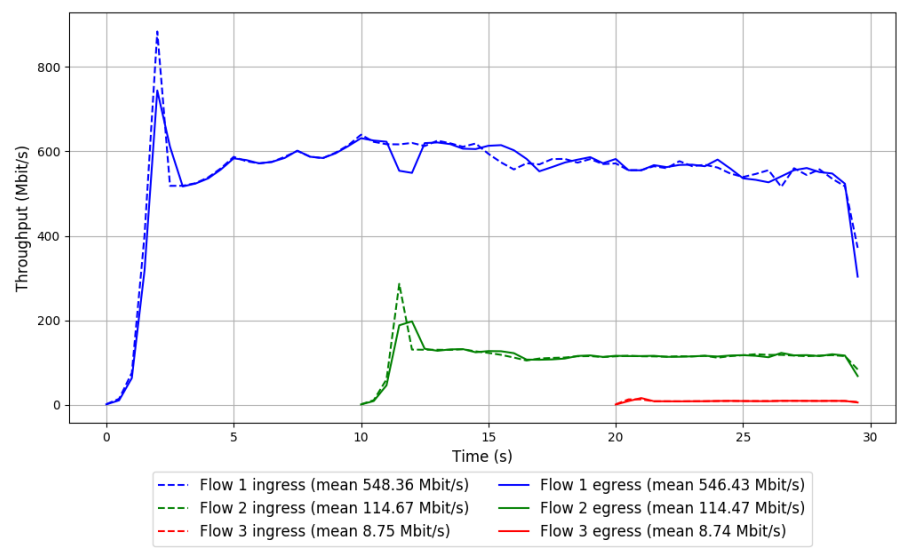
```
Run 10: Statistics of PCC

Start at: 2017-09-19 05:28:30
End at: 2017-09-19 05:29:00

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 625.16 Mbit/s
95th percentile per-packet one-way delay: 157.668 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 546.43 Mbit/s
95th percentile per-packet one-way delay: 157.447 ms
Loss rate: 0.77%
-- Flow 2:
Average throughput: 114.47 Mbit/s
95th percentile per-packet one-way delay: 158.277 ms
Loss rate: 0.86%
-- Flow 3:
Average throughput: 8.74 Mbit/s
95th percentile per-packet one-way delay: 92.776 ms
Loss rate: 1.37%
```

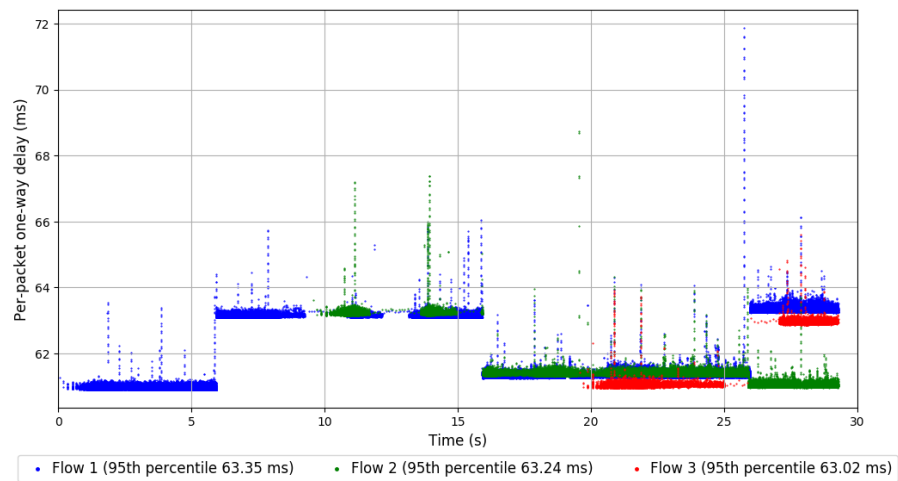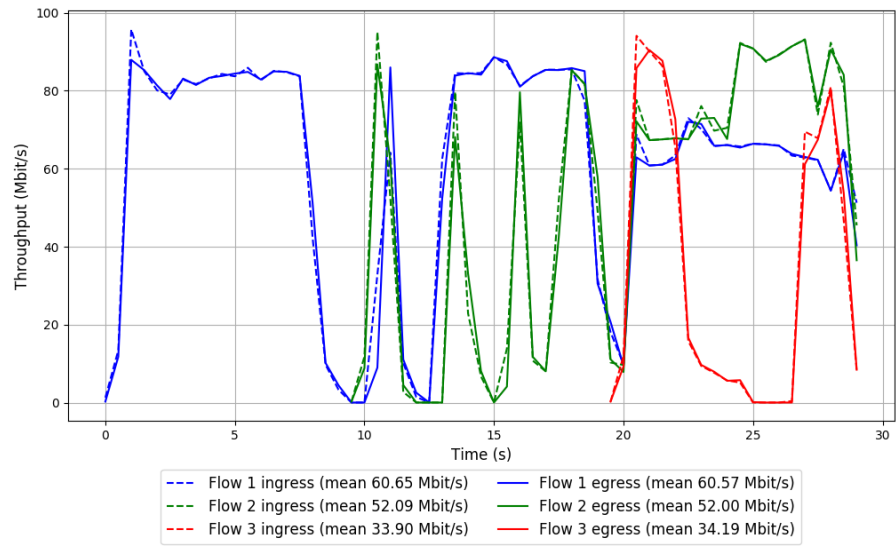Run 10: Report of PCC — Data Link

103

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-09-19 04:04:22
End at: 2017-09-19 04:04:52


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 106.97 Mbit/s
95th percentile per-packet one-way delay: 63.309 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 60.57 Mbit/s
95th percentile per-packet one-way delay: 63.352 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 52.00 Mbit/s
95th percentile per-packet one-way delay: 63.243 ms
Loss rate: 0.82%
-- Flow 3:
Average throughput: 34.19 Mbit/s
95th percentile per-packet one-way delay: 63.019 ms
Loss rate: 0.43%
```

Run 1: Report of QUIC Cubic — Data Link

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-09-19 04:13:33
End at: 2017-09-19 04:14:03

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 91.75 Mbit/s
95th percentile per-packet one-way delay: 63.293 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 41.12 Mbit/s
95th percentile per-packet one-way delay: 63.287 ms
Loss rate: 0.71%
-- Flow 2:
Average throughput: 66.02 Mbit/s
95th percentile per-packet one-way delay: 63.303 ms
Loss rate: 0.62%
-- Flow 3:
Average throughput: 21.00 Mbit/s
95th percentile per-packet one-way delay: 63.262 ms
Loss rate: 0.60%
```
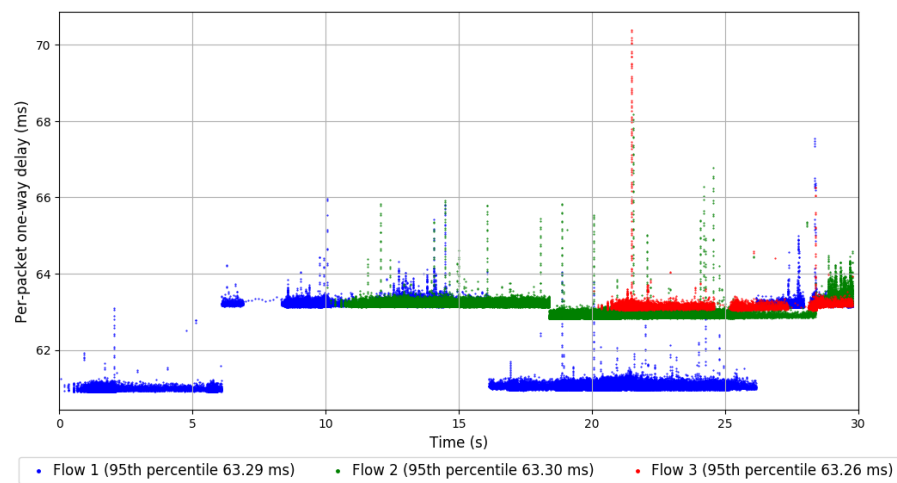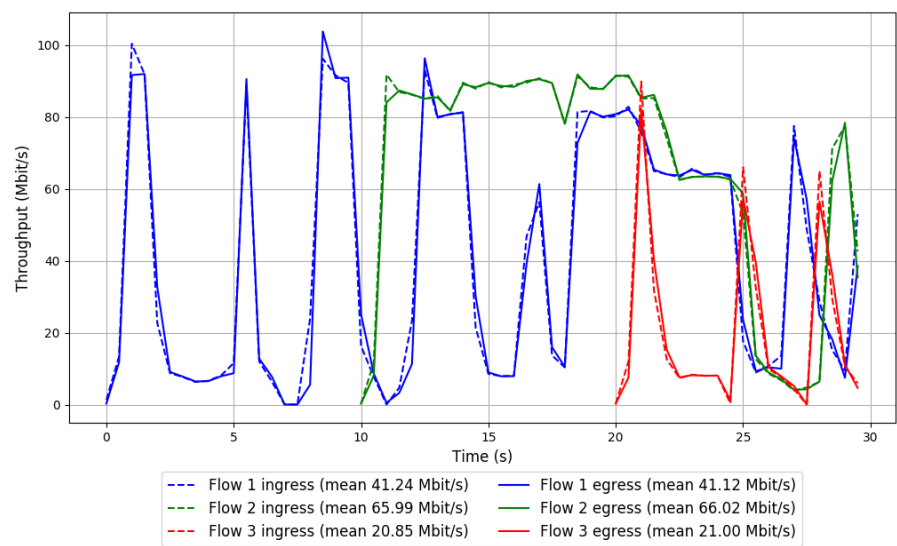
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 41.24 Mbit/s) --- Flow 1 egress (mean 41.12 Mbit/s)
Flow 2 ingress (mean 65.99 Mbit/s) --- Flow 2 egress (mean 66.02 Mbit/s)
Flow 3 ingress (mean 20.85 Mbit/s) --- Flow 3 egress (mean 21.00 Mbit/s)

Flow 1 (95th percentile 63.29 ms)   Flow 2 (95th percentile 63.30 ms)   Flow 3 (95th percentile 63.26 ms)

107

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-09-19 04:22:46
End at: 2017-09-19 04:23:16


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 93.70 Mbit/s
95th percentile per-packet one-way delay: 63.545 ms
Loss rate: 0.90%
-- Flow 1:
Average throughput: 44.50 Mbit/s
95th percentile per-packet one-way delay: 63.157 ms
Loss rate: 0.56%
-- Flow 2:
Average throughput: 38.43 Mbit/s
95th percentile per-packet one-way delay: 63.645 ms
Loss rate: 1.05%
-- Flow 3:
Average throughput: 72.55 Mbit/s
95th percentile per-packet one-way delay: 63.379 ms
Loss rate: 1.39%
```
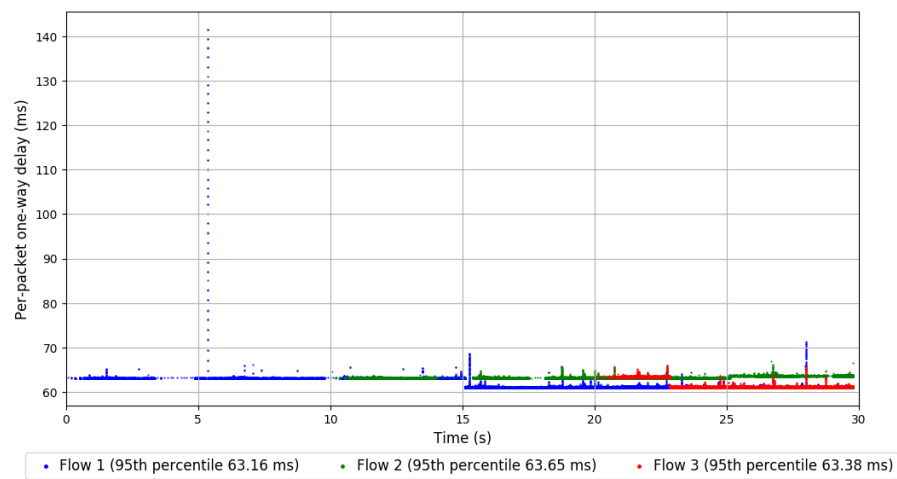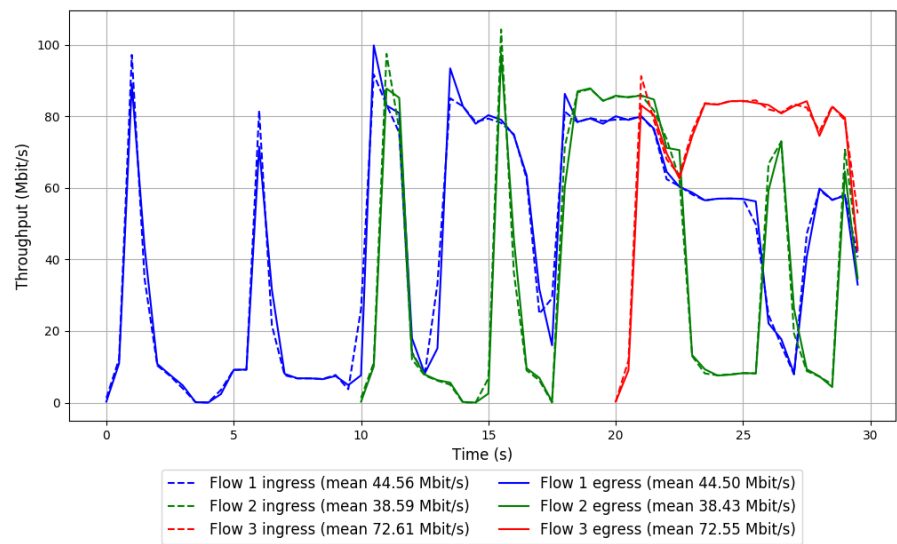
Run 3: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 44.56 Mbit/s) — Flow 1 egress (mean 44.50 Mbit/s)
Flow 2 ingress (mean 38.59 Mbit/s) — Flow 2 egress (mean 38.43 Mbit/s)
Flow 3 ingress (mean 72.61 Mbit/s) — Flow 3 egress (mean 72.55 Mbit/s)

Flow 1 (95th percentile 63.16 ms) Flow 2 (95th percentile 63.65 ms) Flow 3 (95th percentile 63.38 ms)

```
Run 4: Statistics of QUIC Cubic

Start at: 2017-09-19 04:32:05
End at: 2017-09-19 04:32:35


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 99.23 Mbit/s
95th percentile per-packet one-way delay: 63.343 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 53.92 Mbit/s
95th percentile per-packet one-way delay: 63.328 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 34.64 Mbit/s
95th percentile per-packet one-way delay: 63.236 ms
Loss rate: 1.16%
-- Flow 3:
Average throughput: 68.43 Mbit/s
95th percentile per-packet one-way delay: 63.395 ms
Loss rate: 1.67%
```
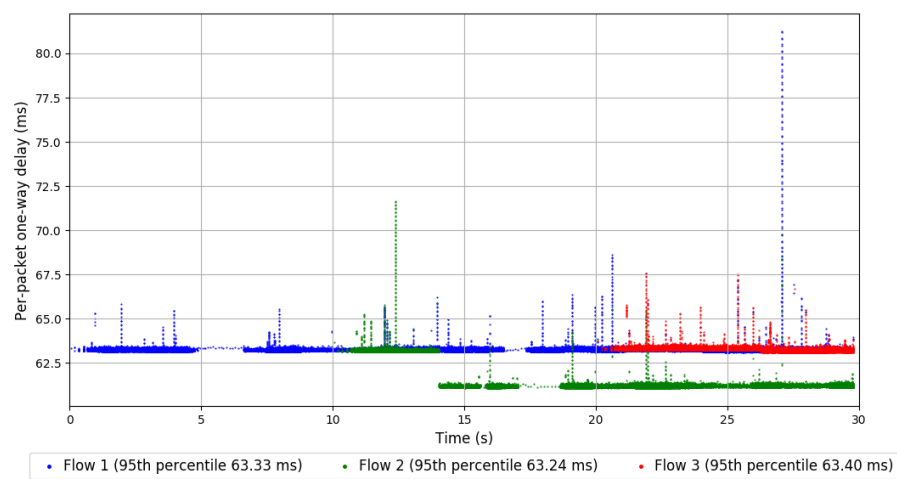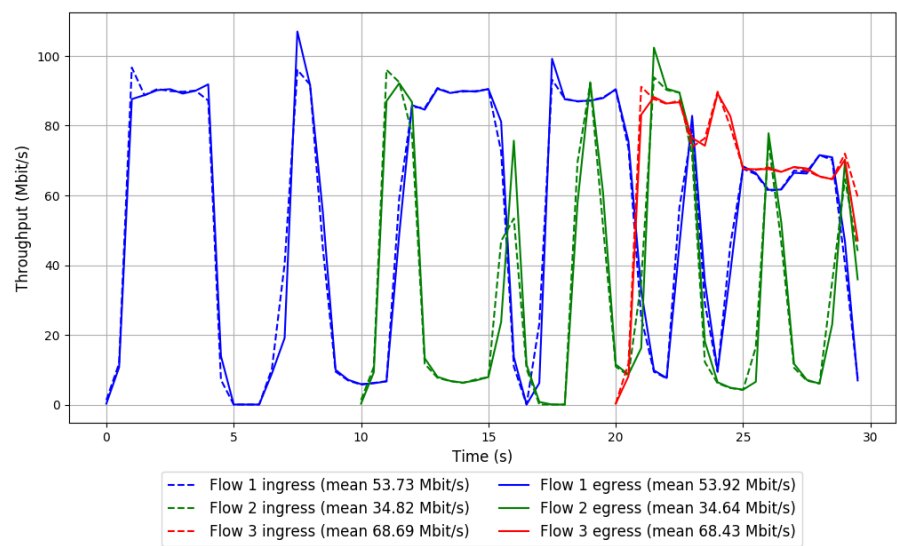
Run 4: Report of QUIC Cubic — Data Link

- - - - Flow 1 ingress (mean 53.73 Mbit/s) — Flow 1 egress (mean 53.92 Mbit/s)
- - - - Flow 2 ingress (mean 34.82 Mbit/s) — Flow 2 egress (mean 34.64 Mbit/s)
- - - - Flow 3 ingress (mean 68.69 Mbit/s) — Flow 3 egress (mean 68.43 Mbit/s)

- Flow 1 (95th percentile 63.33 ms)   - Flow 2 (95th percentile 63.24 ms)   - Flow 3 (95th percentile 63.40 ms)

```
Run 5: Statistics of QUIC Cubic

Start at: 2017-09-19 04:41:20
End at: 2017-09-19 04:41:50

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 98.15 Mbit/s
95th percentile per-packet one-way delay: 63.378 ms
Loss rate: 0.85%
-- Flow 1:
Average throughput: 57.04 Mbit/s
95th percentile per-packet one-way delay: 63.399 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 54.50 Mbit/s
95th percentile per-packet one-way delay: 63.329 ms
Loss rate: 0.80%
-- Flow 3:
Average throughput: 15.19 Mbit/s
95th percentile per-packet one-way delay: 63.210 ms
Loss rate: 5.28%
```
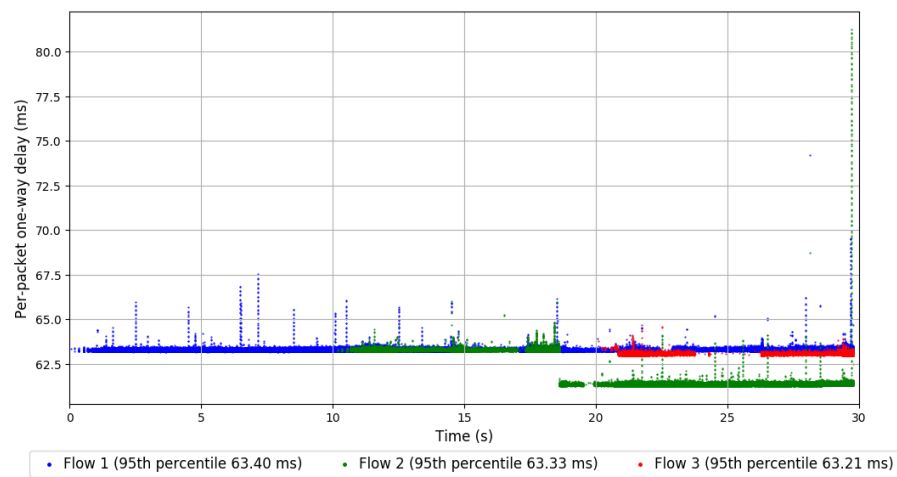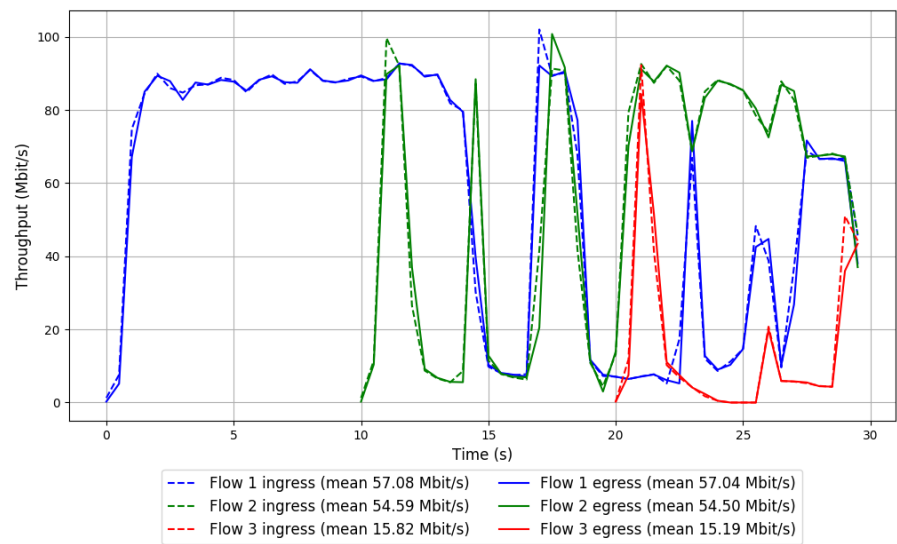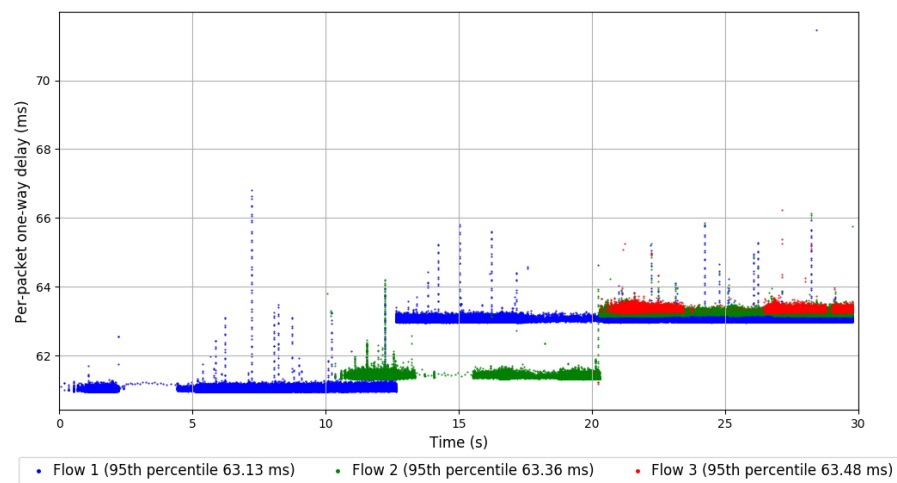
Run 5: Report of QUIC Cubic — Data Link

- - - - Flow 1 ingress (mean 57.08 Mbit/s)   —— Flow 1 egress (mean 57.04 Mbit/s)
- - - - Flow 2 ingress (mean 54.59 Mbit/s)   —— Flow 2 egress (mean 54.50 Mbit/s)
- - - - Flow 3 ingress (mean 15.82 Mbit/s)   —— Flow 3 egress (mean 15.19 Mbit/s)

- Flow 1 (95th percentile 63.40 ms)   • Flow 2 (95th percentile 63.33 ms)   • Flow 3 (95th percentile 63.21 ms)

113

```
Run 6: Statistics of QUIC Cubic

Start at: 2017-09-19 04:50:28
End at: 2017-09-19 04:50:58

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 98.54 Mbit/s
95th percentile per-packet one-way delay: 63.335 ms
Loss rate: 0.61%
-- Flow 1:
Average throughput: 63.72 Mbit/s
95th percentile per-packet one-way delay: 63.132 ms
Loss rate: 0.42%
-- Flow 2:
Average throughput: 44.89 Mbit/s
95th percentile per-packet one-way delay: 63.358 ms
Loss rate: 0.93%
-- Flow 3:
Average throughput: 15.47 Mbit/s
95th percentile per-packet one-way delay: 63.485 ms
Loss rate: 1.01%
```
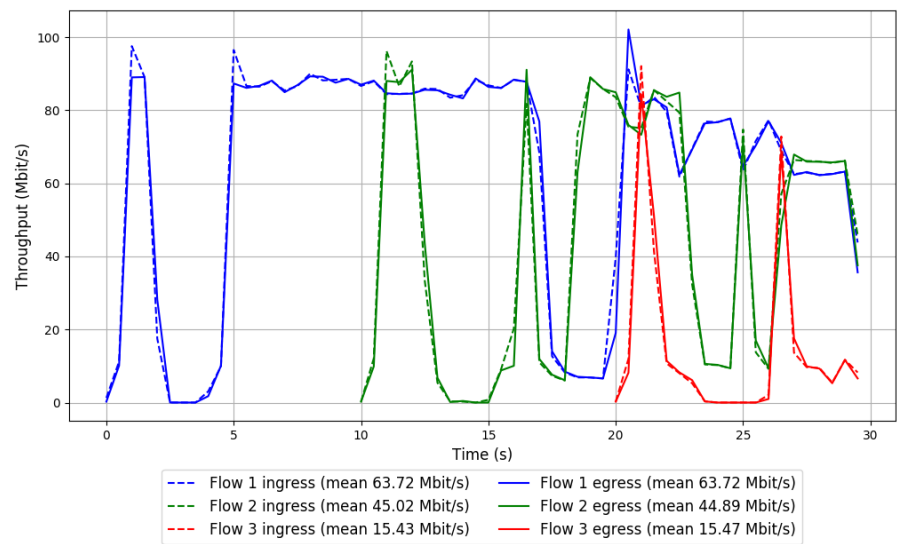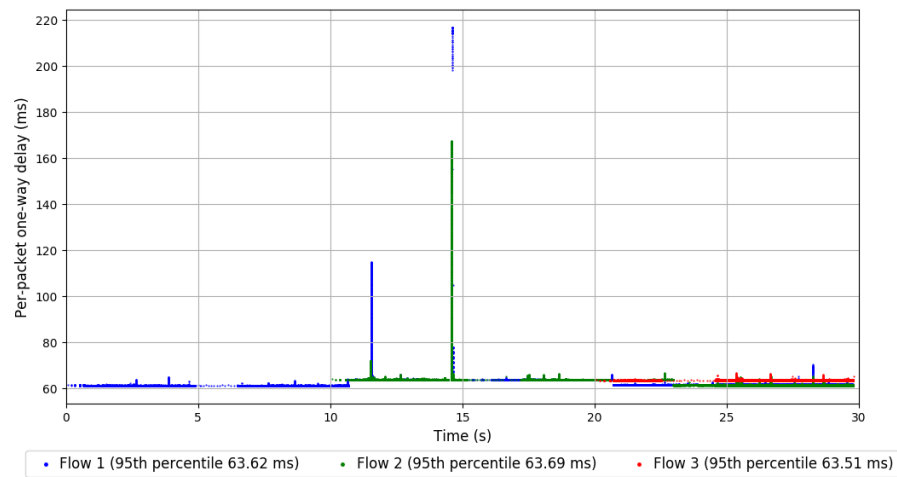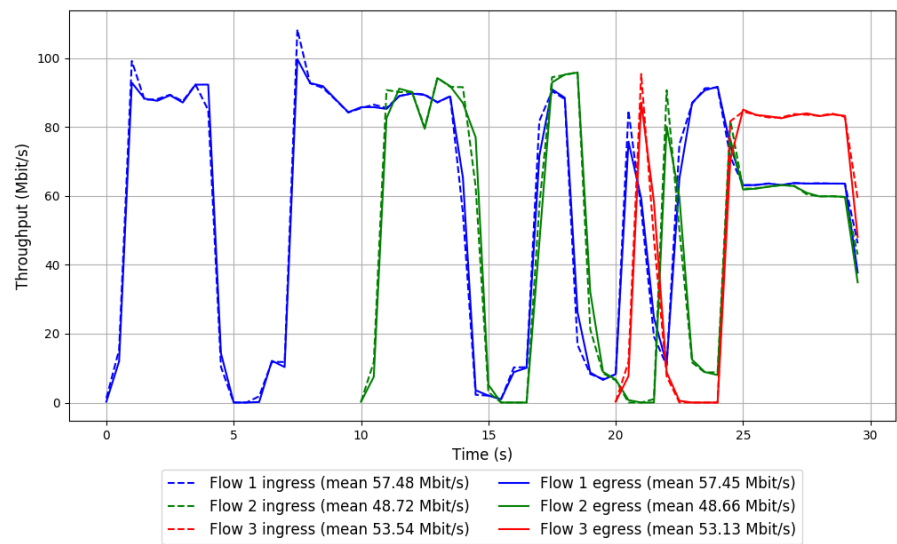
Run 6: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 63.72 Mbit/s)   Flow 1 egress (mean 63.72 Mbit/s)
Flow 2 ingress (mean 45.02 Mbit/s)   Flow 2 egress (mean 44.89 Mbit/s)
Flow 3 ingress (mean 15.43 Mbit/s)   Flow 3 egress (mean 15.47 Mbit/s)

Flow 1 (95th percentile 63.13 ms)   Flow 2 (95th percentile 63.36 ms)   Flow 3 (95th percentile 63.48 ms)

```
Run 7: Statistics of QUIC Cubic

Start at: 2017-09-19 04:59:38
End at: 2017-09-19 05:00:08

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 107.07 Mbit/s
95th percentile per-packet one-way delay: 63.642 ms
Loss rate: 0.83%
-- Flow 1:
Average throughput: 57.45 Mbit/s
95th percentile per-packet one-way delay: 63.616 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 48.66 Mbit/s
95th percentile per-packet one-way delay: 63.690 ms
Loss rate: 0.79%
-- Flow 3:
Average throughput: 53.13 Mbit/s
95th percentile per-packet one-way delay: 63.505 ms
Loss rate: 2.05%
```
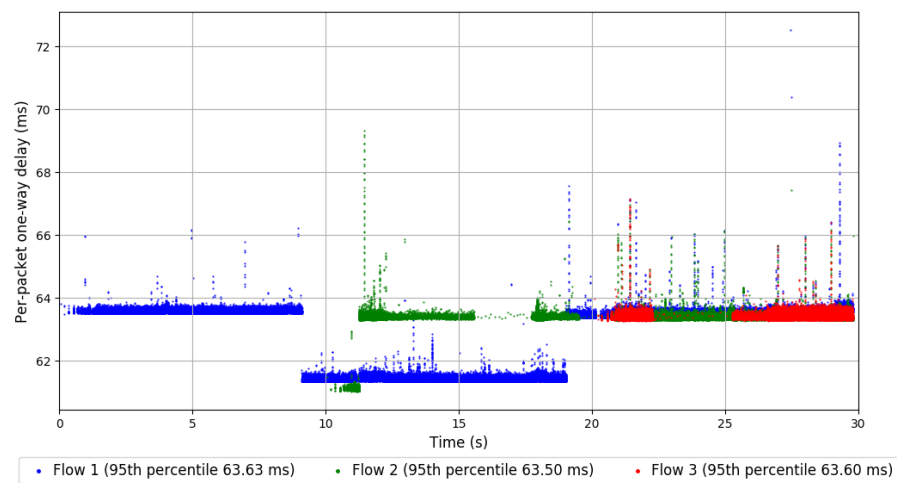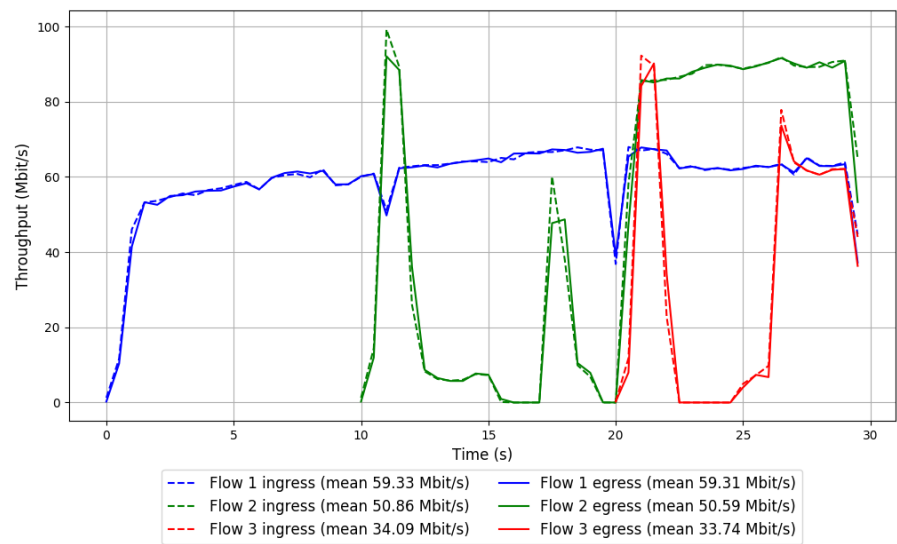
Run 7: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 57.48 Mbit/s) — — — Flow 1 egress (mean 57.45 Mbit/s)
Flow 2 ingress (mean 48.72 Mbit/s) — — — Flow 2 egress (mean 48.66 Mbit/s)
Flow 3 ingress (mean 53.54 Mbit/s) — — — Flow 3 egress (mean 53.13 Mbit/s)

Flow 1 (95th percentile 63.62 ms) • Flow 2 (95th percentile 63.69 ms) • Flow 3 (95th percentile 63.51 ms)

117

```
Run 8: Statistics of QUIC Cubic

Start at: 2017-09-19 05:08:50
End at: 2017-09-19 05:09:20

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.89 Mbit/s
95th percentile per-packet one-way delay: 63.604 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 59.31 Mbit/s
95th percentile per-packet one-way delay: 63.630 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 50.59 Mbit/s
95th percentile per-packet one-way delay: 63.501 ms
Loss rate: 1.15%
-- Flow 3:
Average throughput: 33.74 Mbit/s
95th percentile per-packet one-way delay: 63.597 ms
Loss rate: 2.32%
```
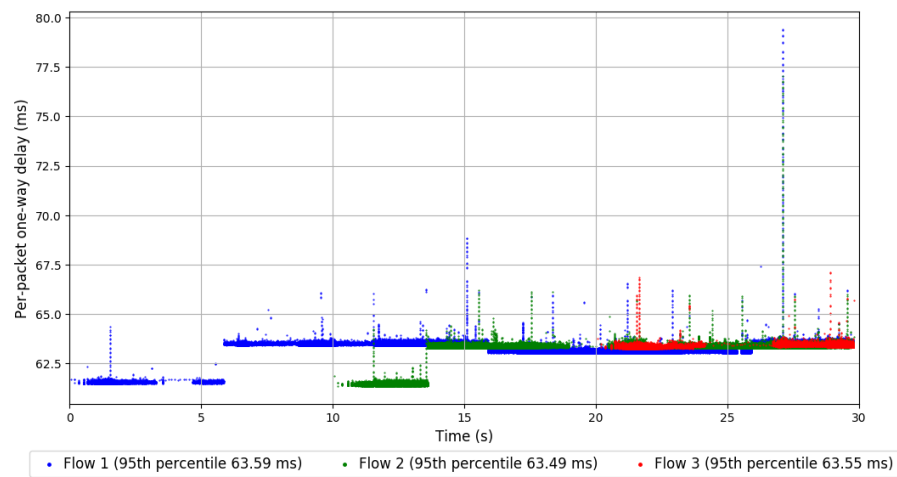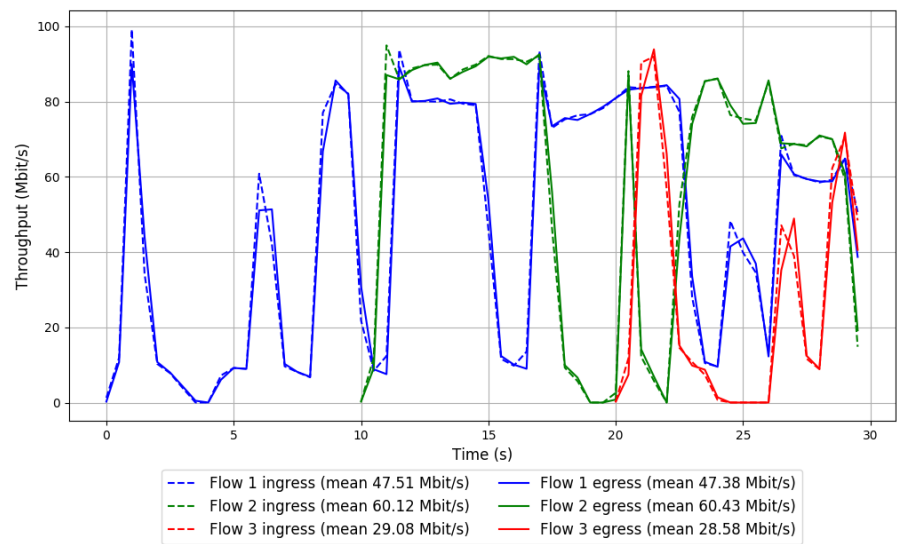
Run 8: Report of QUIC Cubic — Data Link

- - - Flow 1 ingress (mean 59.33 Mbit/s) —— Flow 1 egress (mean 59.31 Mbit/s)
- - - Flow 2 ingress (mean 50.86 Mbit/s) —— Flow 2 egress (mean 50.59 Mbit/s)
- - - Flow 3 ingress (mean 34.09 Mbit/s) —— Flow 3 egress (mean 33.74 Mbit/s)

• Flow 1 (95th percentile 63.63 ms)   • Flow 2 (95th percentile 63.50 ms)   • Flow 3 (95th percentile 63.60 ms)

```
Run 9: Statistics of QUIC Cubic

Start at: 2017-09-19 05:18:05
End at: 2017-09-19 05:18:35


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.79 Mbit/s
95th percentile per-packet one-way delay: 63.566 ms
Loss rate: 0.68%
-- Flow 1:
Average throughput: 47.38 Mbit/s
95th percentile per-packet one-way delay: 63.593 ms
Loss rate: 0.70%
-- Flow 2:
Average throughput: 60.43 Mbit/s
95th percentile per-packet one-way delay: 63.491 ms
Loss rate: 0.11%
-- Flow 3:
Average throughput: 28.58 Mbit/s
95th percentile per-packet one-way delay: 63.546 ms
Loss rate: 2.96%
```
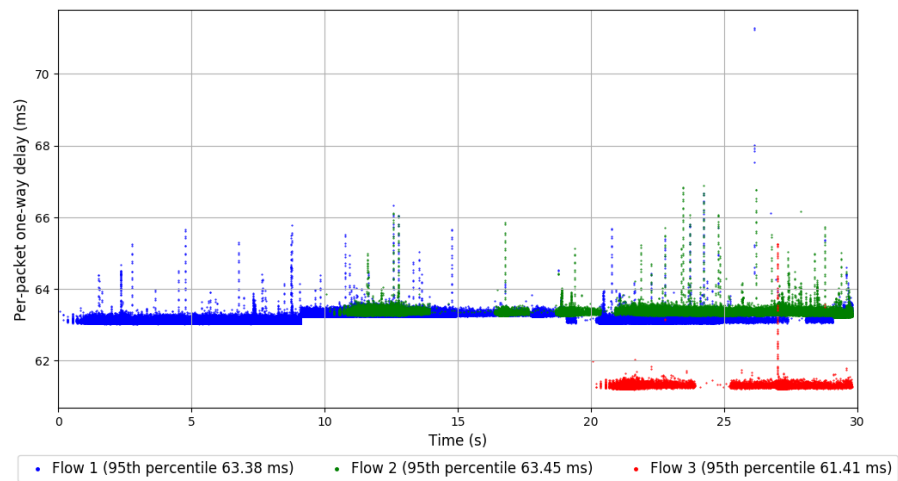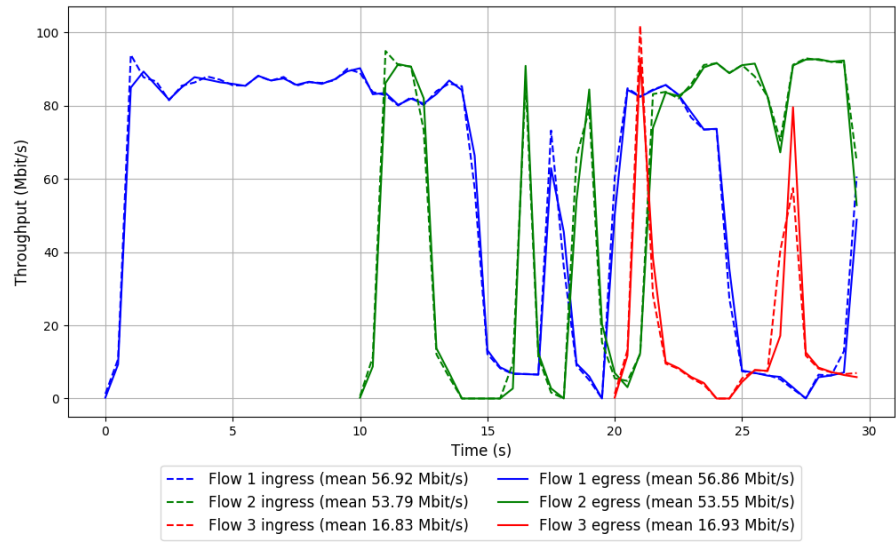
Run 9: Report of QUIC Cubic — Data Link

```
Run 10: Statistics of QUIC Cubic

Start at: 2017-09-19 05:27:02
End at: 2017-09-19 05:27:32


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 97.91 Mbit/s
95th percentile per-packet one-way delay: 63.418 ms
Loss rate: 0.75%
-- Flow 1:
Average throughput: 56.86 Mbit/s
95th percentile per-packet one-way delay: 63.378 ms
Loss rate: 0.54%
-- Flow 2:
Average throughput: 53.55 Mbit/s
95th percentile per-packet one-way delay: 63.453 ms
Loss rate: 1.09%
-- Flow 3:
Average throughput: 16.93 Mbit/s
95th percentile per-packet one-way delay: 61.415 ms
Loss rate: 0.66%
```
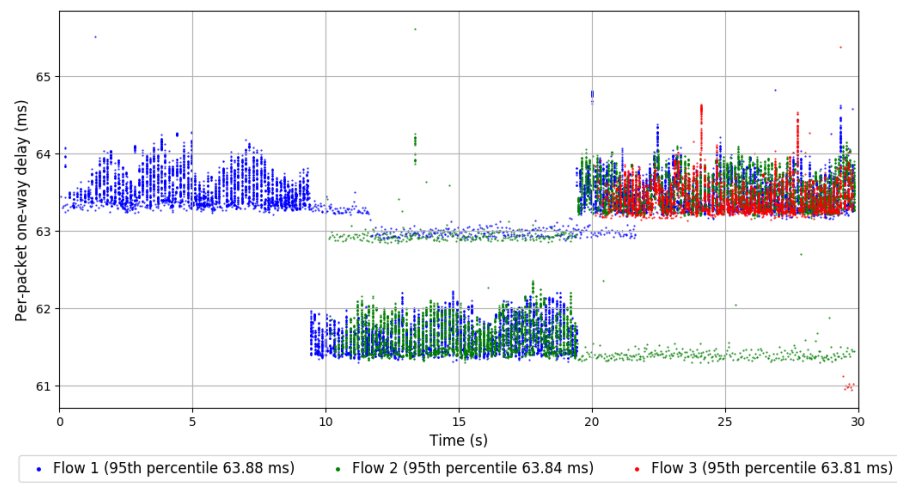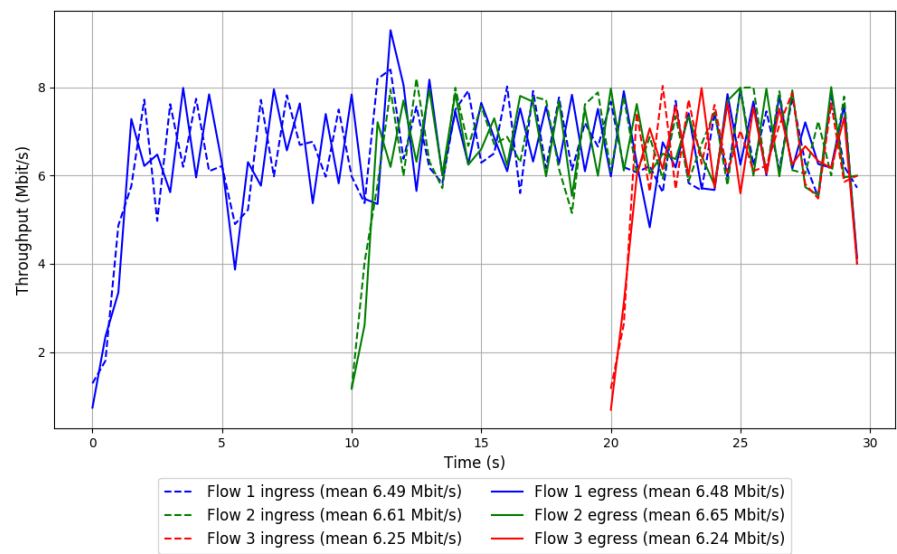
Run 10: Report of QUIC Cubic — Data Link

```
Run 1: Statistics of Sprout

Start at: 2017-09-19 04:05:09
End at: 2017-09-19 04:05:39


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.93 Mbit/s
95th percentile per-packet one-way delay: 63.852 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 63.875 ms
Loss rate: 0.51%
-- Flow 2:
Average throughput: 6.65 Mbit/s
95th percentile per-packet one-way delay: 63.838 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 6.24 Mbit/s
95th percentile per-packet one-way delay: 63.815 ms
Loss rate: 1.62%
```
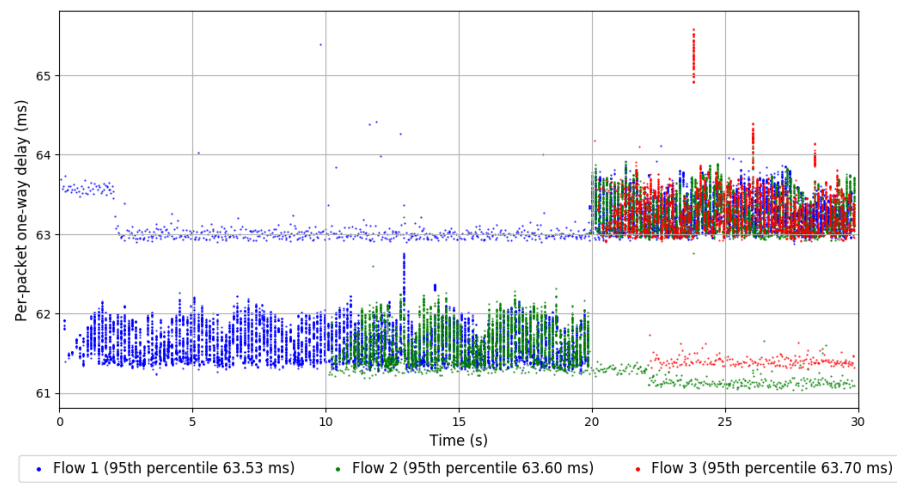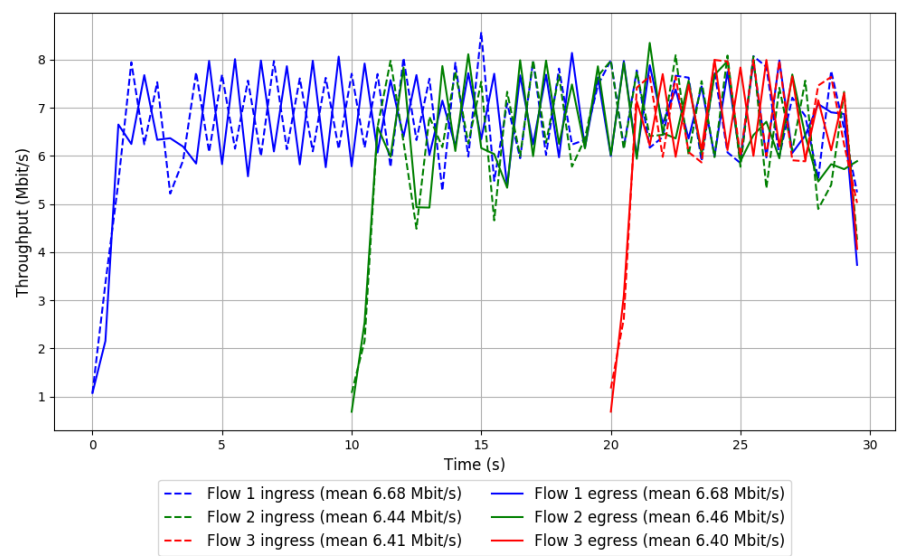
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-09-19 04:14:19
End at: 2017-09-19 04:14:49


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.06 Mbit/s
95th percentile per-packet one-way delay: 63.591 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 6.68 Mbit/s
95th percentile per-packet one-way delay: 63.527 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 6.46 Mbit/s
95th percentile per-packet one-way delay: 63.599 ms
Loss rate: 0.10%
-- Flow 3:
Average throughput: 6.40 Mbit/s
95th percentile per-packet one-way delay: 63.700 ms
Loss rate: 1.35%
```
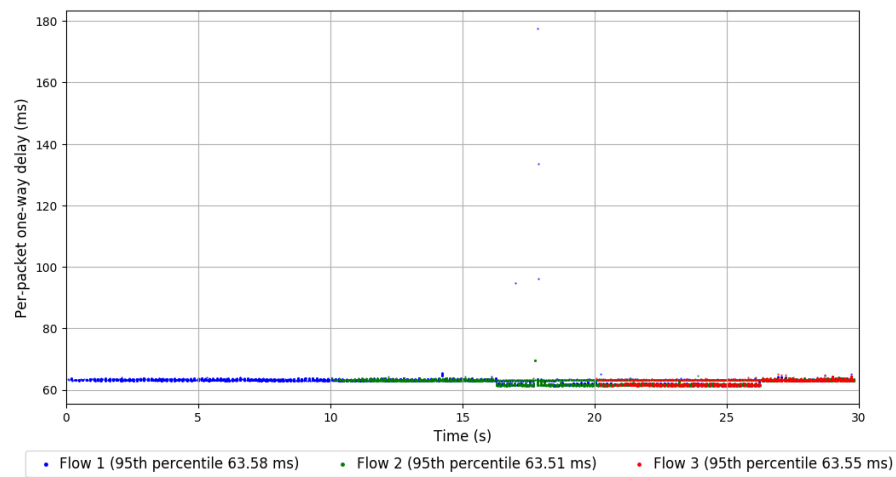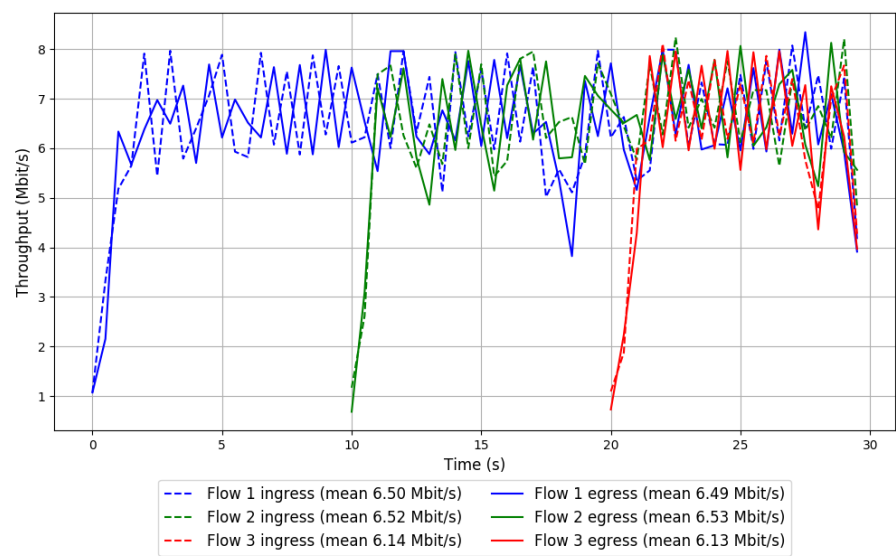
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-09-19 04:23:32
End at: 2017-09-19 04:24:02

# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.83 Mbit/s
95th percentile per-packet one-way delay: 63.554 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 6.49 Mbit/s
95th percentile per-packet one-way delay: 63.581 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 6.53 Mbit/s
95th percentile per-packet one-way delay: 63.509 ms
Loss rate: 0.60%
-- Flow 3:
Average throughput: 6.13 Mbit/s
95th percentile per-packet one-way delay: 63.551 ms
Loss rate: 1.66%
```
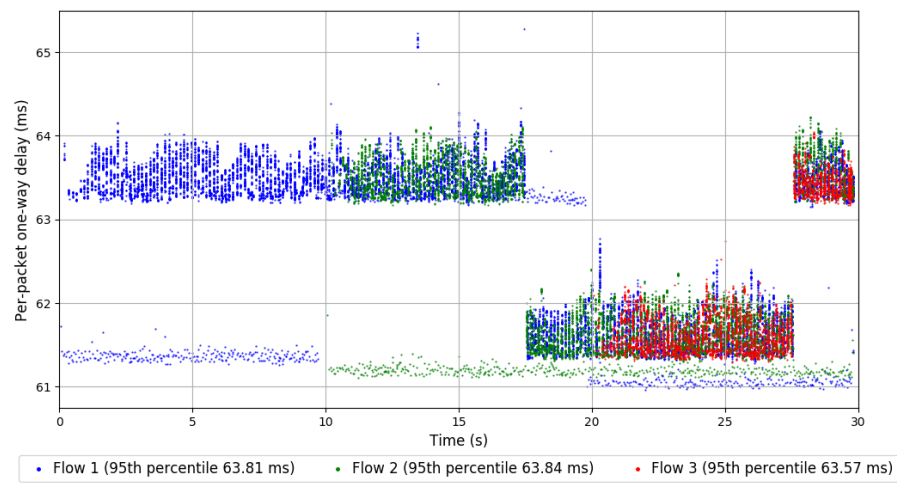
Run 3: Report of Sprout — Data Link

```
Run 4: Statistics of Sprout

Start at: 2017-09-19 04:32:51
End at: 2017-09-19 04:33:21


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.01 Mbit/s
95th percentile per-packet one-way delay: 63.802 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 6.66 Mbit/s
95th percentile per-packet one-way delay: 63.813 ms
Loss rate: 0.37%
-- Flow 2:
Average throughput: 6.54 Mbit/s
95th percentile per-packet one-way delay: 63.835 ms
Loss rate: 0.72%
-- Flow 3:
Average throughput: 6.20 Mbit/s
95th percentile per-packet one-way delay: 63.574 ms
Loss rate: 1.87%
```
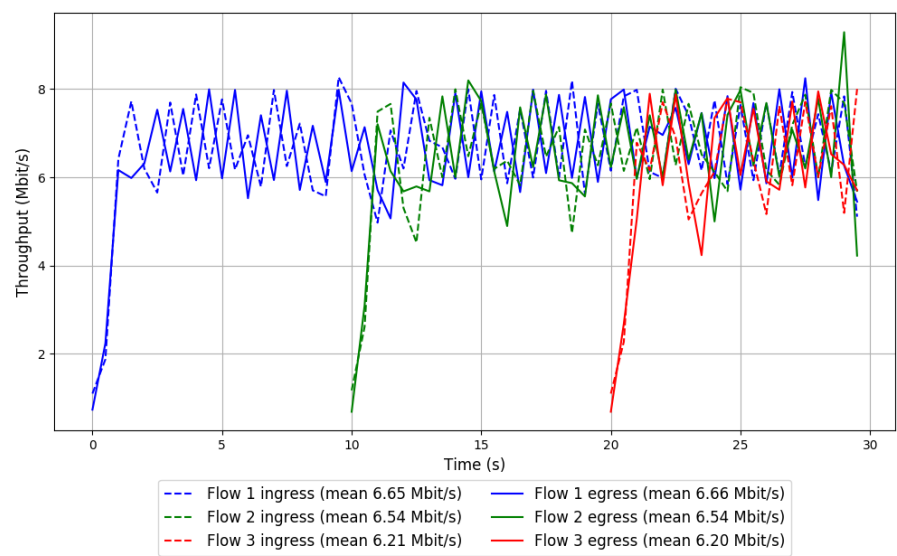
Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2017-09-19 04:42:07
End at: 2017-09-19 04:42:37


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.74 Mbit/s
95th percentile per-packet one-way delay: 63.812 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 6.48 Mbit/s
95th percentile per-packet one-way delay: 63.824 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 6.27 Mbit/s
95th percentile per-packet one-way delay: 63.742 ms
Loss rate: 0.73%
-- Flow 3:
Average throughput: 6.45 Mbit/s
95th percentile per-packet one-way delay: 63.879 ms
Loss rate: 1.50%
```
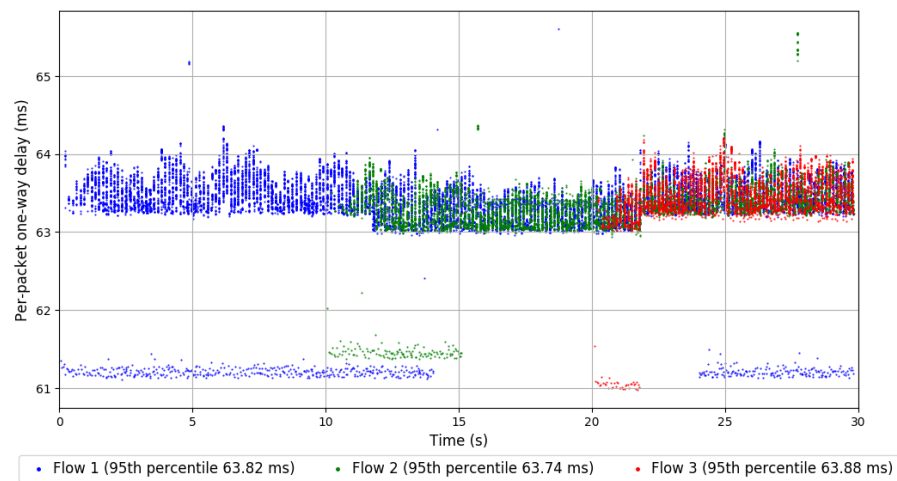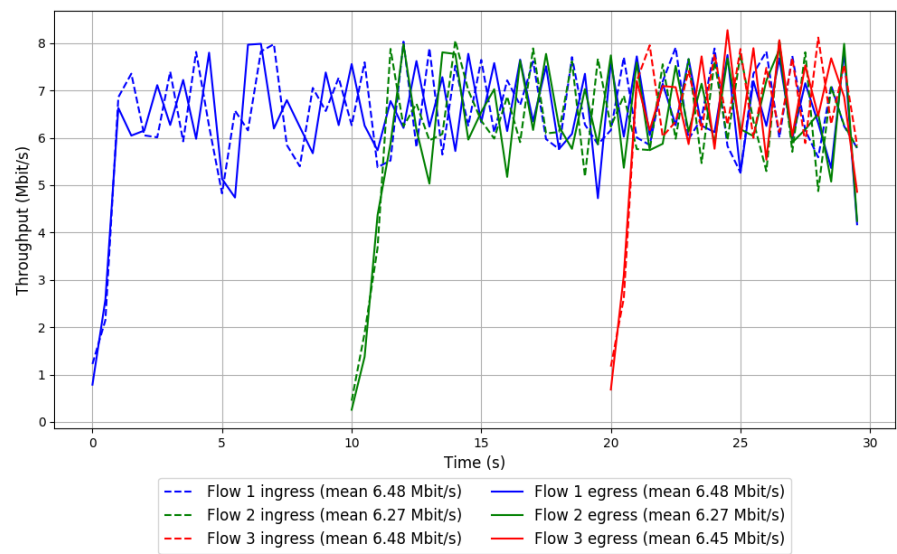
Run 5: Report of Sprout — Data Link

```
Run 6: Statistics of Sprout

Start at: 2017-09-19 04:51:15
End at: 2017-09-19 04:51:45


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.82 Mbit/s
95th percentile per-packet one-way delay: 63.851 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 6.56 Mbit/s
95th percentile per-packet one-way delay: 63.847 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 6.37 Mbit/s
95th percentile per-packet one-way delay: 63.841 ms
Loss rate: 0.76%
-- Flow 3:
Average throughput: 6.28 Mbit/s
95th percentile per-packet one-way delay: 63.894 ms
Loss rate: 1.53%
```
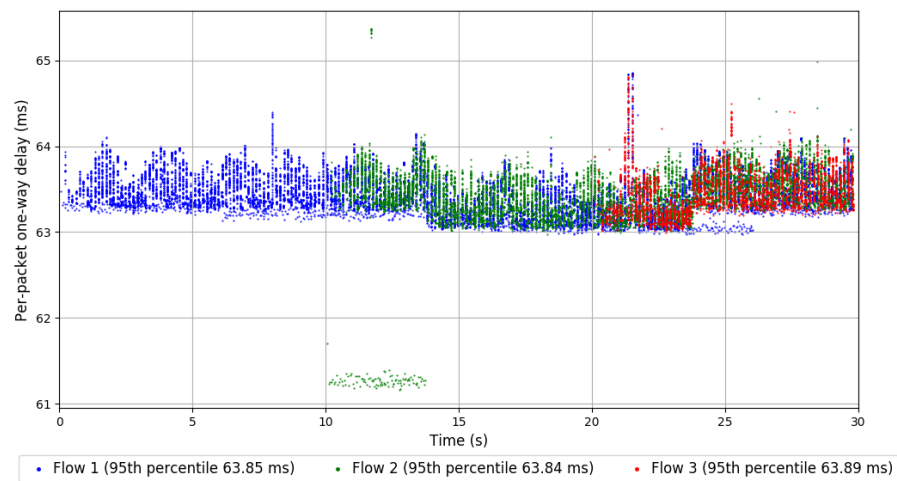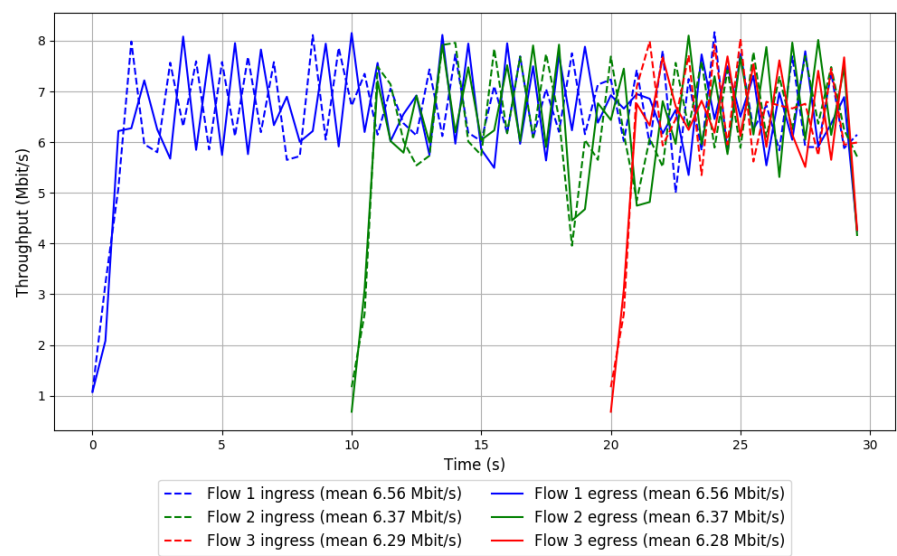
Run 6: Report of Sprout — Data Link

```
Run 7: Statistics of Sprout

Start at: 2017-09-19 05:00:25
End at: 2017-09-19 05:00:55


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 13.13 Mbit/s
95th percentile per-packet one-way delay: 63.905 ms
Loss rate: 0.79%
-- Flow 1:
Average throughput: 6.70 Mbit/s
95th percentile per-packet one-way delay: 64.017 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 6.58 Mbit/s
95th percentile per-packet one-way delay: 63.702 ms
Loss rate: 0.78%
-- Flow 3:
Average throughput: 6.32 Mbit/s
95th percentile per-packet one-way delay: 62.192 ms
Loss rate: 1.57%
```
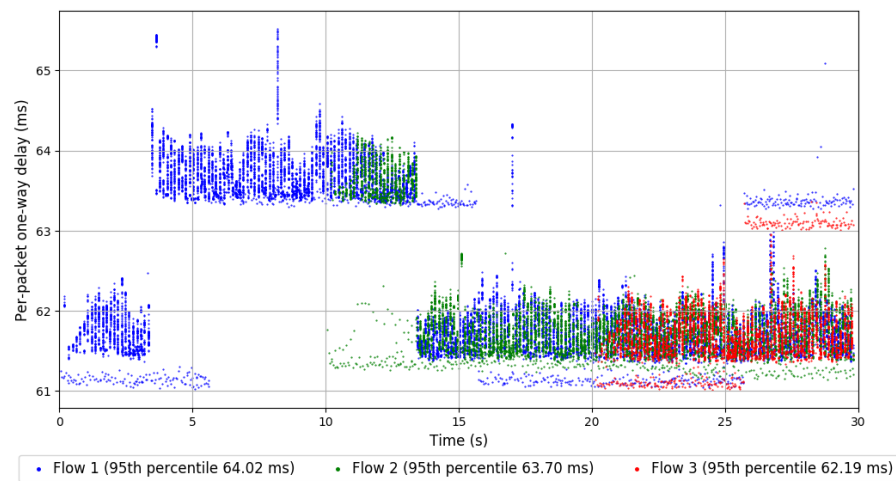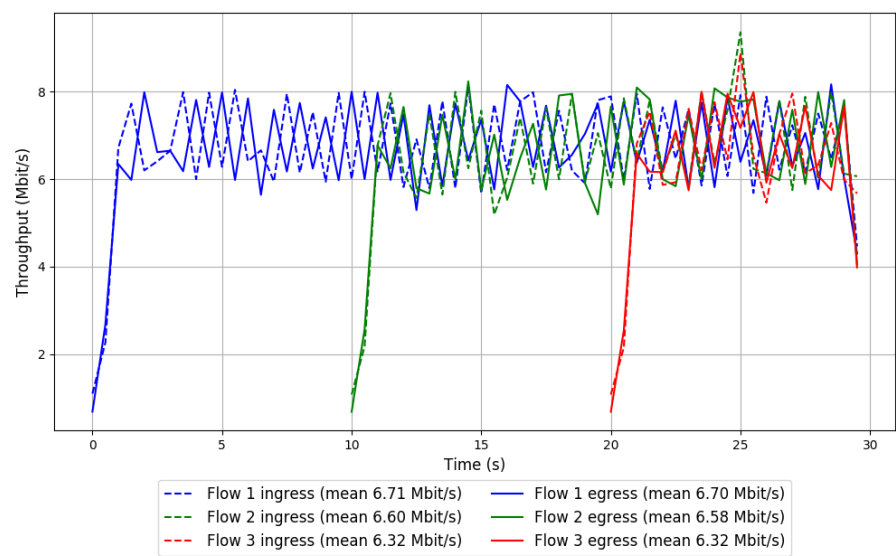
Run 7: Report of Sprout — Data Link

```
Run 8: Statistics of Sprout

Start at: 2017-09-19 05:09:37
End at: 2017-09-19 05:10:07


# Below is generated by plot.py at 2017-09-19 08:02:08
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.73 Mbit/s
95th percentile per-packet one-way delay: 63.935 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 6.39 Mbit/s
95th percentile per-packet one-way delay: 63.889 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 6.46 Mbit/s
95th percentile per-packet one-way delay: 63.962 ms
Loss rate: 0.08%
-- Flow 3:
Average throughput: 6.27 Mbit/s
95th percentile per-packet one-way delay: 63.976 ms
Loss rate: 2.00%
```
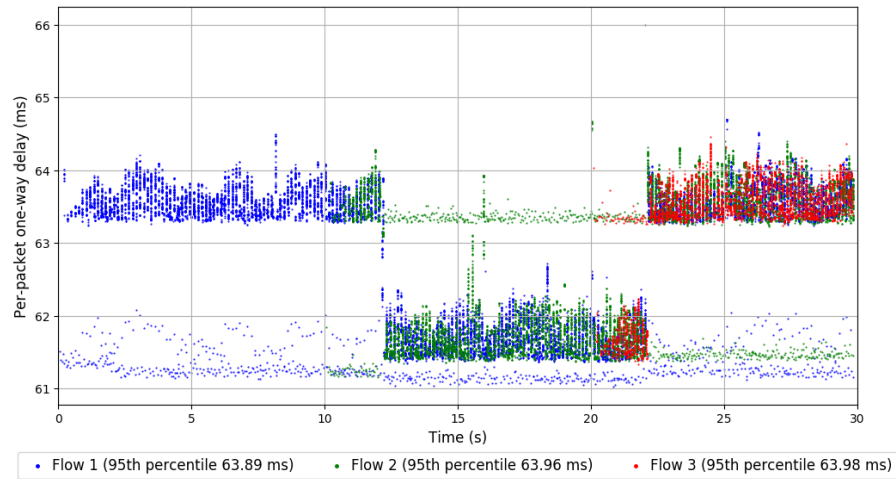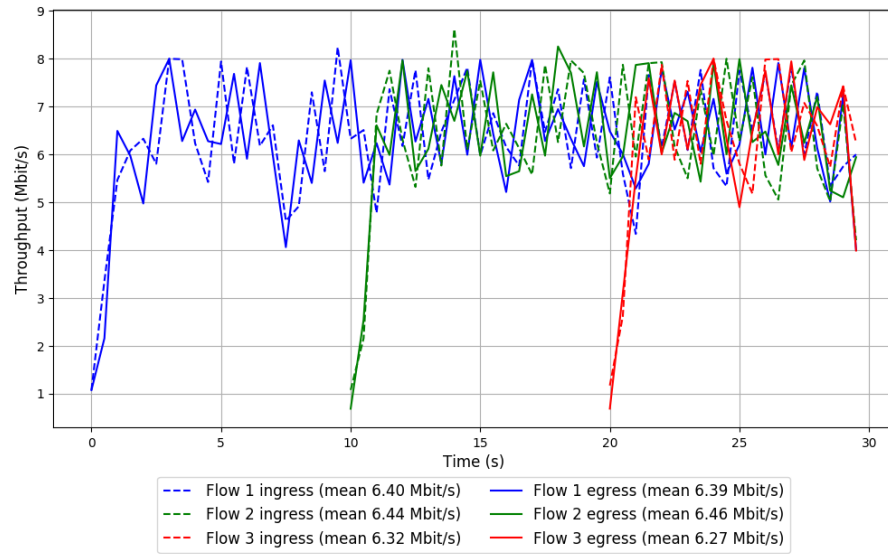
Run 8: Report of Sprout — Data Link

```
Run 9: Statistics of Sprout

Start at: 2017-09-19 05:18:52
End at: 2017-09-19 05:19:22


# Below is generated by plot.py at 2017-09-19 08:02:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.85 Mbit/s
95th percentile per-packet one-way delay: 64.204 ms
Loss rate: 0.70%
-- Flow 1:
Average throughput: 6.58 Mbit/s
95th percentile per-packet one-way delay: 64.227 ms
Loss rate: 0.49%
-- Flow 2:
Average throughput: 6.37 Mbit/s
95th percentile per-packet one-way delay: 64.195 ms
Loss rate: 0.75%
-- Flow 3:
Average throughput: 6.27 Mbit/s
95th percentile per-packet one-way delay: 63.978 ms
Loss rate: 1.23%
```
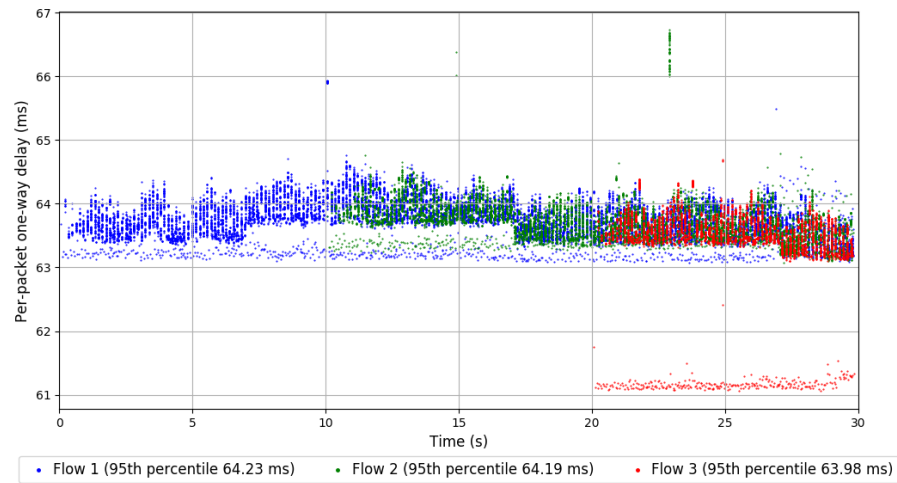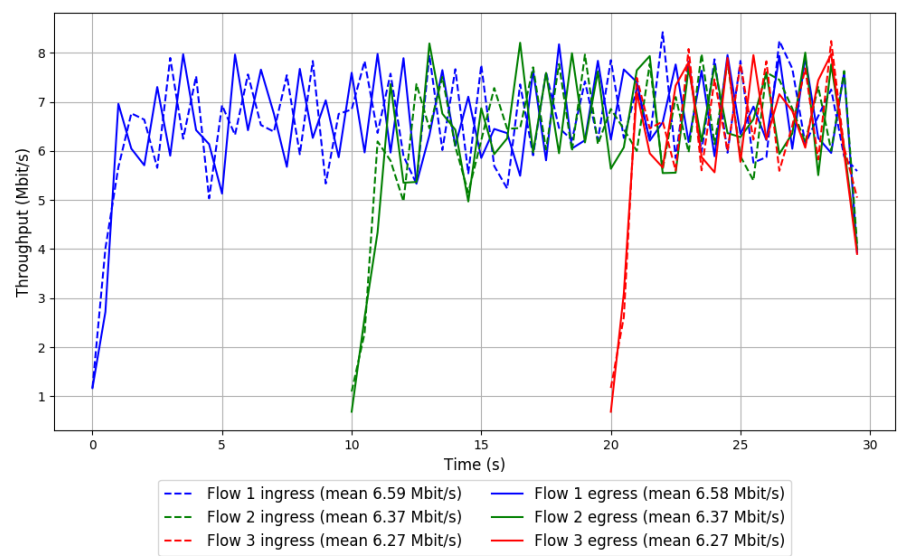
Run 9: Report of Sprout — Data Link

```
Run 10: Statistics of Sprout

Start at: 2017-09-19 05:27:49
End at: 2017-09-19 05:28:19


# Below is generated by plot.py at 2017-09-19 08:02:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 12.67 Mbit/s
95th percentile per-packet one-way delay: 64.158 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 6.32 Mbit/s
95th percentile per-packet one-way delay: 64.194 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 6.53 Mbit/s
95th percentile per-packet one-way delay: 64.100 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 6.17 Mbit/s
95th percentile per-packet one-way delay: 64.158 ms
Loss rate: 1.59%
```
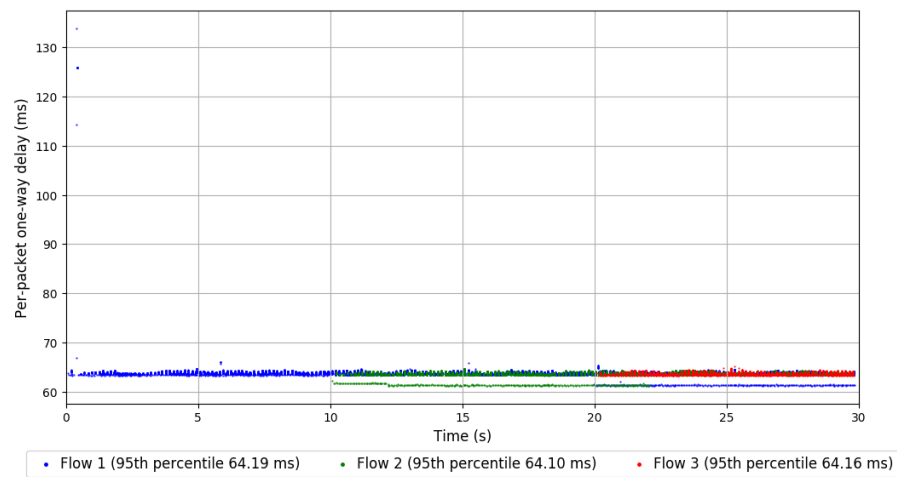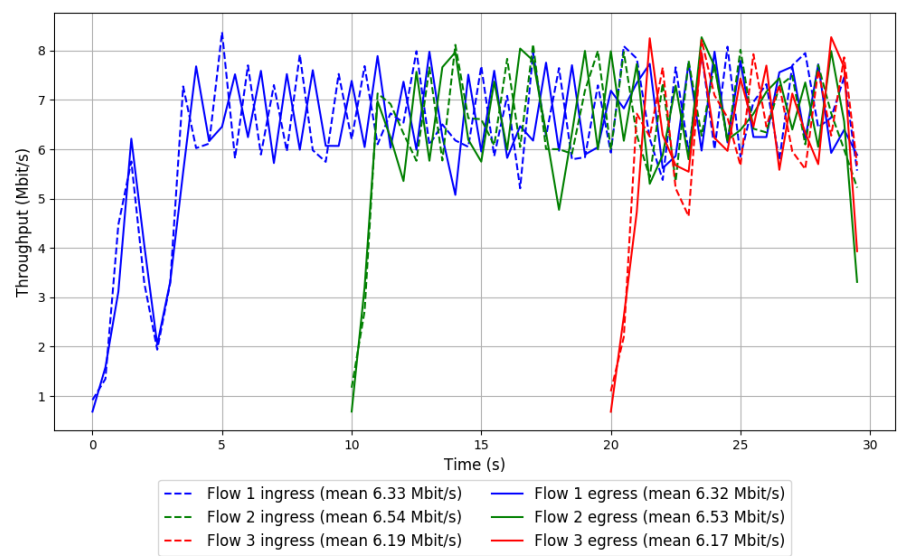
Run 10: Report of Sprout — Data Link

Flow 1 ingress (mean 6.33 Mbit/s) --- Flow 1 egress (mean 6.32 Mbit/s)
Flow 2 ingress (mean 6.54 Mbit/s) --- Flow 2 egress (mean 6.53 Mbit/s)
Flow 3 ingress (mean 6.19 Mbit/s) --- Flow 3 egress (mean 6.17 Mbit/s)

Flow 1 (95th percentile 64.19 ms)   Flow 2 (95th percentile 64.10 ms)   Flow 3 (95th percentile 64.16 ms)
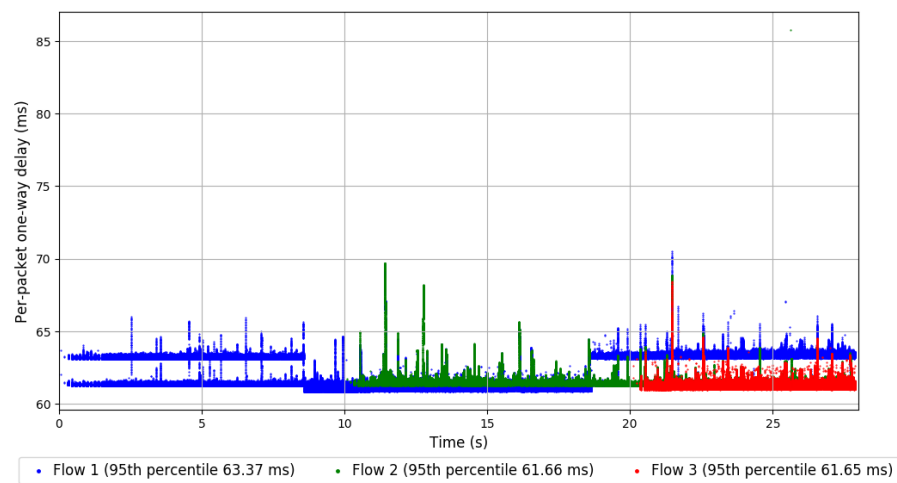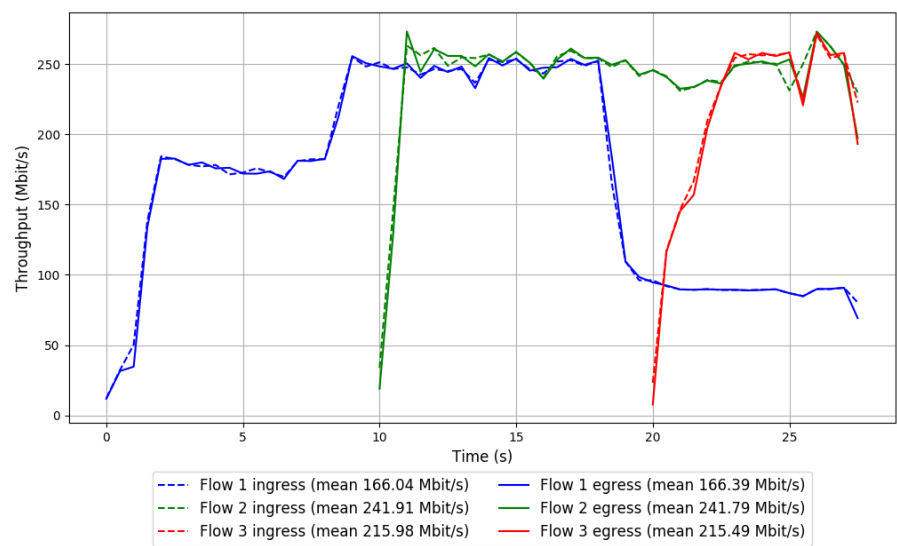
143

```
Run 1: Statistics of TaoVA-100x

Start at: 2017-09-19 04:00:08
End at: 2017-09-19 04:00:38

# Below is generated by plot.py at 2017-09-19 08:07:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 381.21 Mbit/s
95th percentile per-packet one-way delay: 63.255 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 166.39 Mbit/s
95th percentile per-packet one-way delay: 63.370 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 241.79 Mbit/s
95th percentile per-packet one-way delay: 61.658 ms
Loss rate: 0.74%
-- Flow 3:
Average throughput: 215.49 Mbit/s
95th percentile per-packet one-way delay: 61.651 ms
Loss rate: 1.78%
```

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

Flow 1 ingress (mean 166.04 Mbit/s) — — — Flow 1 egress (mean 166.39 Mbit/s)
Flow 2 ingress (mean 241.91 Mbit/s) — — — Flow 2 egress (mean 241.79 Mbit/s)
Flow 3 ingress (mean 215.98 Mbit/s) — — — Flow 3 egress (mean 215.49 Mbit/s)

Flow 1 (95th percentile 63.37 ms)   Flow 2 (95th percentile 61.66 ms)   Flow 3 (95th percentile 61.65 ms)
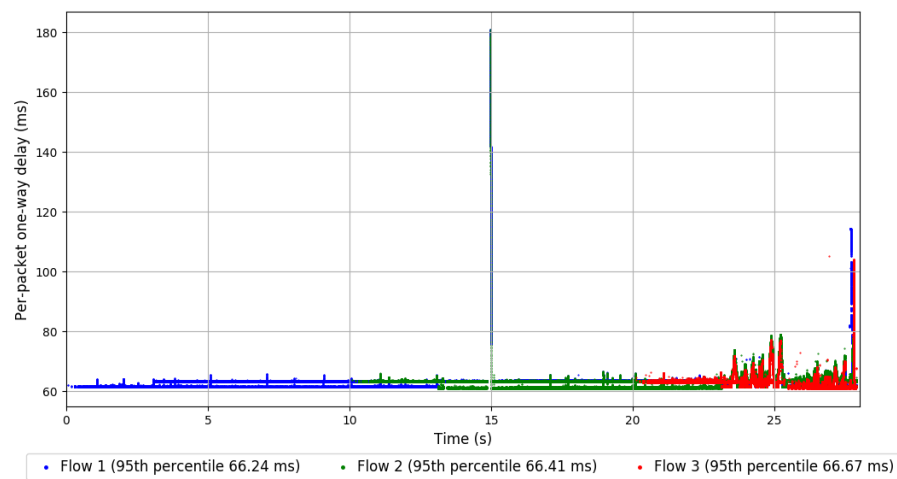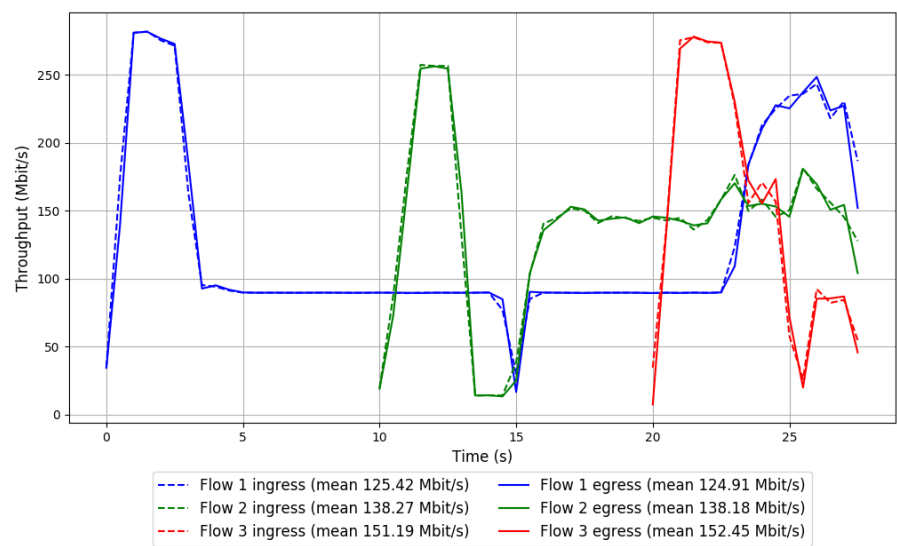
```
Run 2: Statistics of TaoVA-100x

Start at: 2017-09-19 04:09:34
End at: 2017-09-19 04:10:04

# Below is generated by plot.py at 2017-09-19 08:07:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 255.87 Mbit/s
95th percentile per-packet one-way delay: 66.376 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 124.91 Mbit/s
95th percentile per-packet one-way delay: 66.236 ms
Loss rate: 0.86%
-- Flow 2:
Average throughput: 138.18 Mbit/s
95th percentile per-packet one-way delay: 66.412 ms
Loss rate: 0.78%
-- Flow 3:
Average throughput: 152.45 Mbit/s
95th percentile per-packet one-way delay: 66.665 ms
Loss rate: 0.69%
```

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

147

```
Run 3: Statistics of TaoVA-100x

Start at: 2017-09-19 04:18:39
End at: 2017-09-19 04:19:09

# Below is generated by plot.py at 2017-09-19 08:07:19
# Datalink statistics
-- Total of 3 flows:
Average throughput: 362.51 Mbit/s
95th percentile per-packet one-way delay: 65.041 ms
Loss rate: 0.67%
-- Flow 1:
Average throughput: 178.55 Mbit/s
95th percentile per-packet one-way delay: 67.112 ms
Loss rate: 0.58%
-- Flow 2:
Average throughput: 187.21 Mbit/s
95th percentile per-packet one-way delay: 63.944 ms
Loss rate: 0.35%
-- Flow 3:
Average throughput: 171.39 Mbit/s
95th percentile per-packet one-way delay: 64.936 ms
Loss rate: 1.79%
```
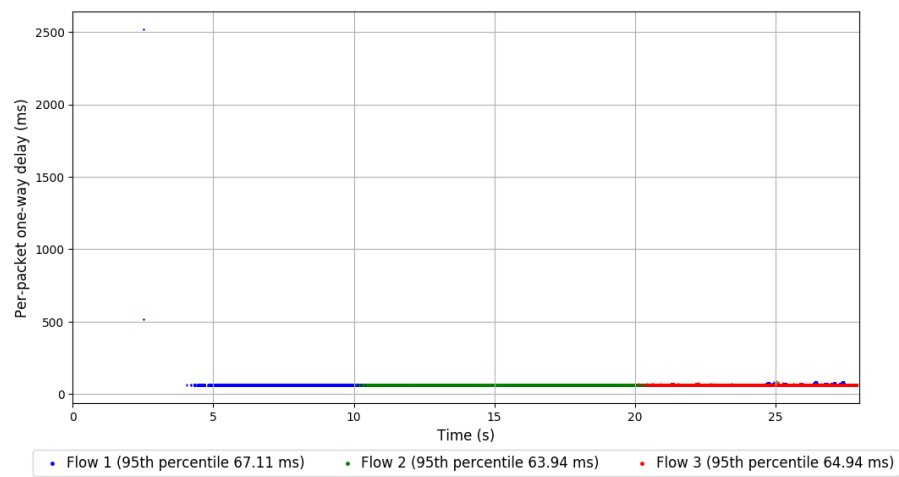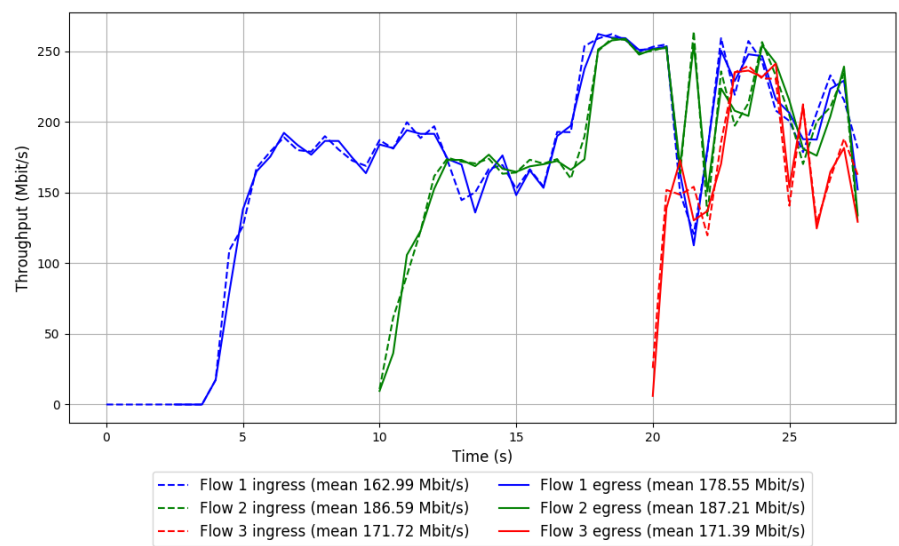
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 162.99 Mbit/s) --- Flow 1 egress (mean 178.55 Mbit/s)
Flow 2 ingress (mean 186.59 Mbit/s) --- Flow 2 egress (mean 187.21 Mbit/s)
Flow 3 ingress (mean 171.72 Mbit/s) --- Flow 3 egress (mean 171.39 Mbit/s)

Flow 1 (95th percentile 67.11 ms) · Flow 2 (95th percentile 63.94 ms) · Flow 3 (95th percentile 64.94 ms)

```
Run 4: Statistics of TaoVA-100x

Start at: 2017-09-19 04:28:01
End at: 2017-09-19 04:28:31

# Below is generated by plot.py at 2017-09-19 08:07:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 375.54 Mbit/s
95th percentile per-packet one-way delay: 63.277 ms
Loss rate: 0.80%
-- Flow 1:
Average throughput: 216.21 Mbit/s
95th percentile per-packet one-way delay: 63.132 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 145.70 Mbit/s
95th percentile per-packet one-way delay: 63.363 ms
Loss rate: 1.19%
-- Flow 3:
Average throughput: 235.28 Mbit/s
95th percentile per-packet one-way delay: 65.692 ms
Loss rate: 1.73%
```
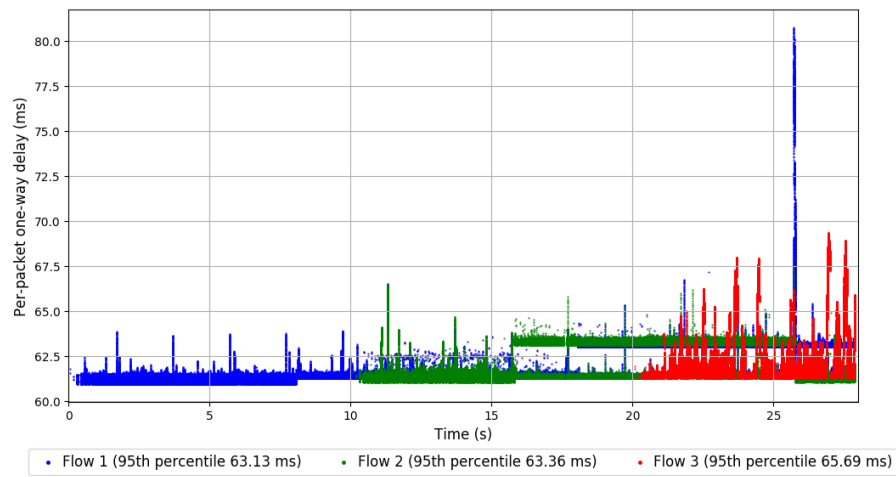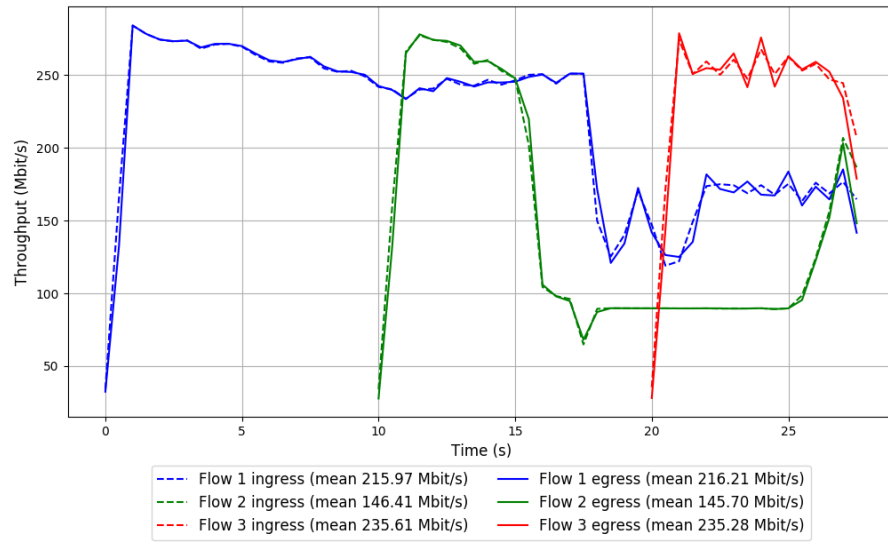
Run 4: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 215.97 Mbit/s) --- Flow 1 egress (mean 216.21 Mbit/s)
Flow 2 ingress (mean 146.41 Mbit/s) --- Flow 2 egress (mean 145.70 Mbit/s)
Flow 3 ingress (mean 235.61 Mbit/s) --- Flow 3 egress (mean 235.28 Mbit/s)

Flow 1 (95th percentile 63.13 ms) • Flow 2 (95th percentile 63.36 ms) • Flow 3 (95th percentile 65.69 ms)

```
Run 5: Statistics of TaoVA-100x

Start at: 2017-09-19 04:37:14
End at: 2017-09-19 04:37:44

# Below is generated by plot.py at 2017-09-19 08:07:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 316.38 Mbit/s
95th percentile per-packet one-way delay: 63.572 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 167.12 Mbit/s
95th percentile per-packet one-way delay: 63.267 ms
Loss rate: 0.38%
-- Flow 2:
Average throughput: 227.37 Mbit/s
95th percentile per-packet one-way delay: 63.609 ms
Loss rate: 0.82%
-- Flow 3:
Average throughput: 13.17 Mbit/s
95th percentile per-packet one-way delay: 64.156 ms
Loss rate: 1.62%
```
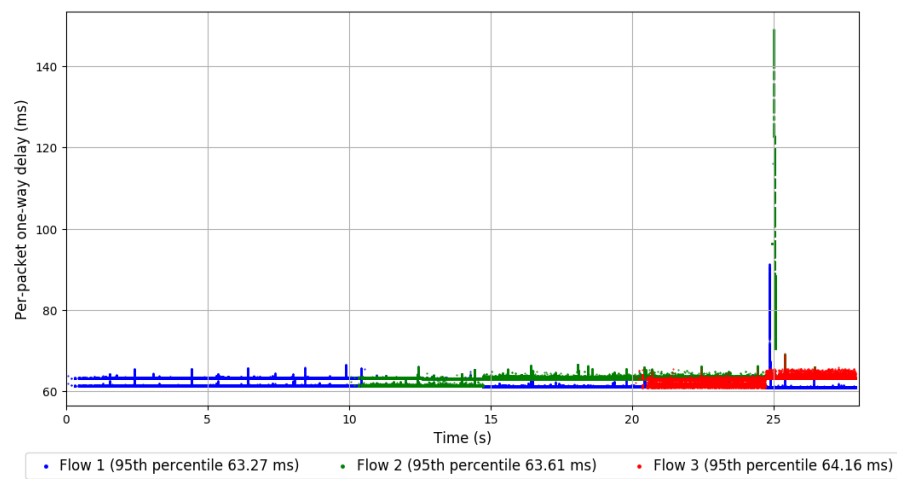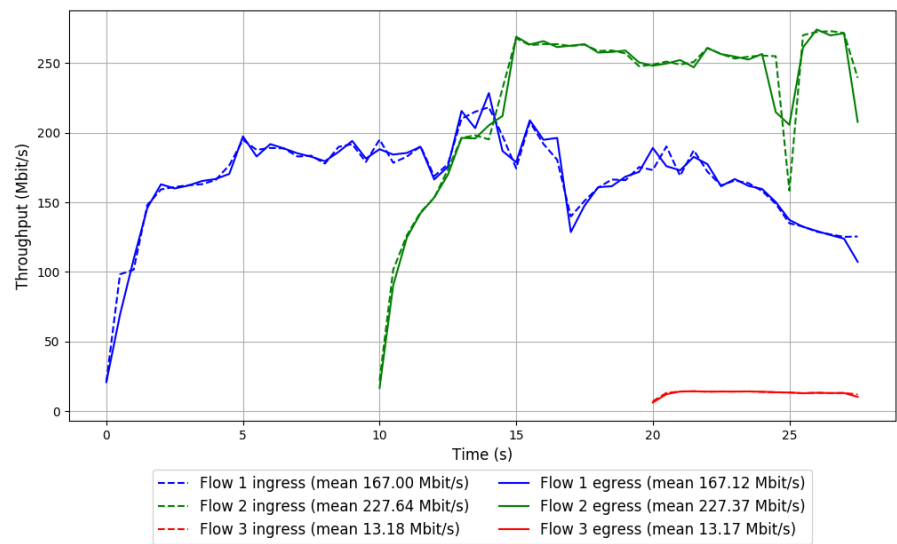
Run 5: Report of TaoVA-100x — Data Link

- --- Flow 1 ingress (mean 167.00 Mbit/s) —— Flow 1 egress (mean 167.12 Mbit/s)
- --- Flow 2 ingress (mean 227.64 Mbit/s) —— Flow 2 egress (mean 227.37 Mbit/s)
- --- Flow 3 ingress (mean 13.18 Mbit/s) —— Flow 3 egress (mean 13.17 Mbit/s)

- Flow 1 (95th percentile 63.27 ms) • Flow 2 (95th percentile 63.61 ms) • Flow 3 (95th percentile 64.16 ms)

```
Run 6: Statistics of TaoVA-100x

Start at: 2017-09-19 04:46:22
End at: 2017-09-19 04:46:52

# Below is generated by plot.py at 2017-09-19 08:07:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 410.45 Mbit/s
95th percentile per-packet one-way delay: 63.857 ms
Loss rate: 0.63%
-- Flow 1:
Average throughput: 230.81 Mbit/s
95th percentile per-packet one-way delay: 63.686 ms
Loss rate: 0.52%
-- Flow 2:
Average throughput: 220.78 Mbit/s
95th percentile per-packet one-way delay: 64.147 ms
Loss rate: 0.42%
-- Flow 3:
Average throughput: 77.46 Mbit/s
95th percentile per-packet one-way delay: 63.693 ms
Loss rate: 3.10%
```
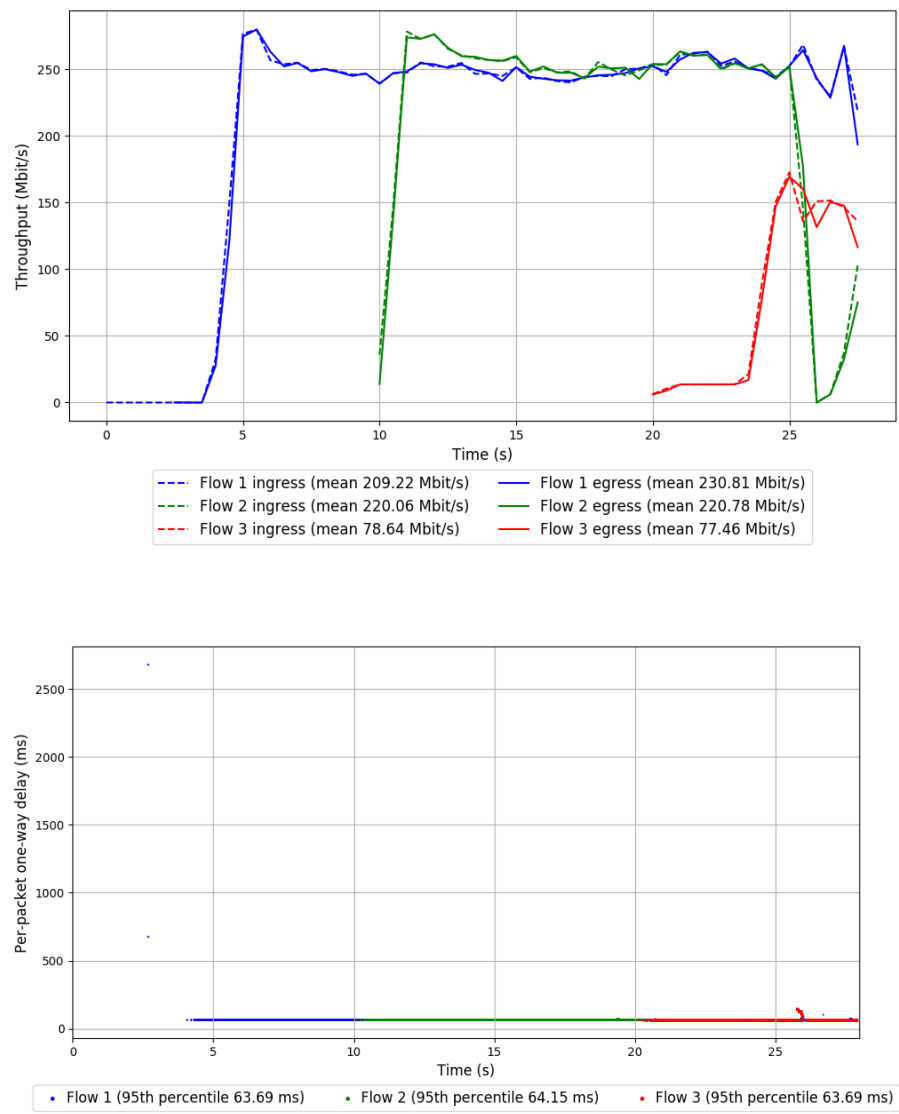
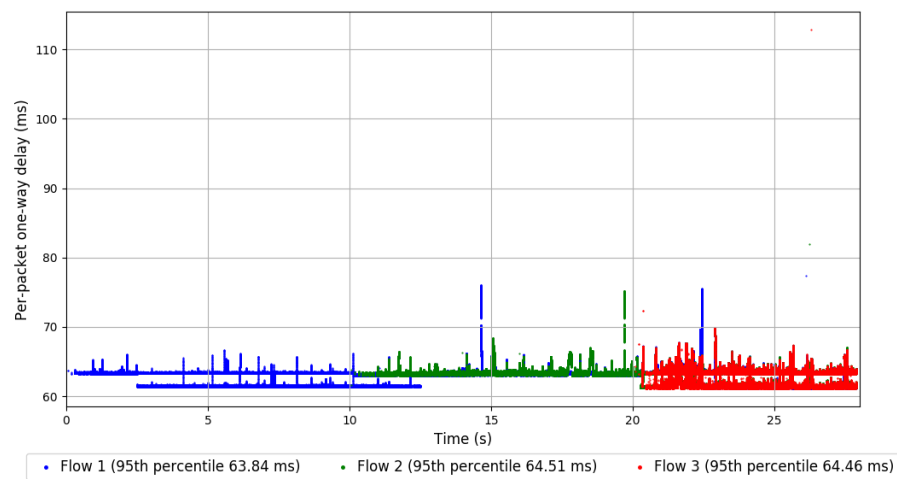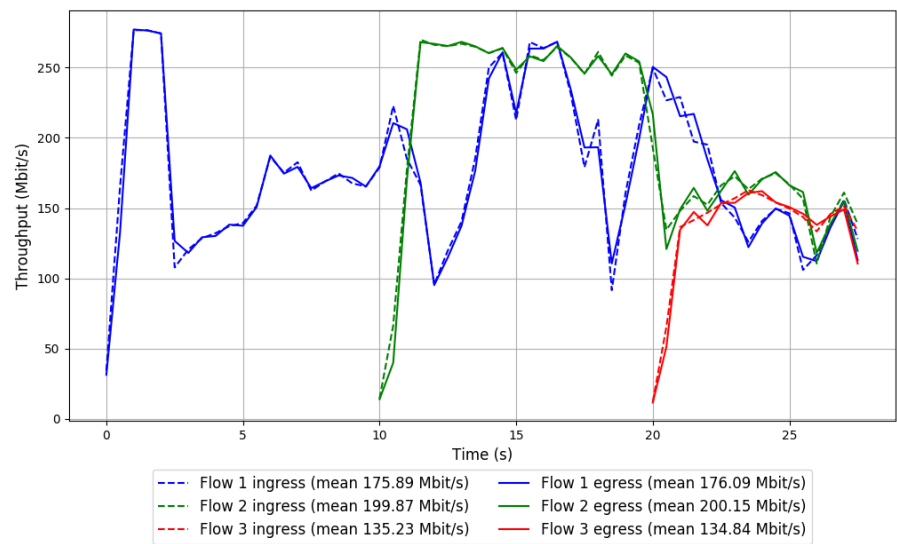Run 6: Report of TaoVA-100x — Data Link

155

```
Run 7: Statistics of TaoVA-100x

Start at: 2017-09-19 04:55:37
End at: 2017-09-19 04:56:07

# Below is generated by plot.py at 2017-09-19 08:10:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 342.08 Mbit/s
95th percentile per-packet one-way delay: 64.194 ms
Loss rate: 0.60%
-- Flow 1:
Average throughput: 176.09 Mbit/s
95th percentile per-packet one-way delay: 63.845 ms
Loss rate: 0.34%
-- Flow 2:
Average throughput: 200.15 Mbit/s
95th percentile per-packet one-way delay: 64.509 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 134.84 Mbit/s
95th percentile per-packet one-way delay: 64.459 ms
Loss rate: 1.89%
```

Run 7: Report of TaoVA-100x — Data Link

Legend:
- Flow 1 ingress (mean 175.89 Mbit/s)
- Flow 1 egress (mean 176.09 Mbit/s)
- Flow 2 ingress (mean 199.87 Mbit/s)
- Flow 2 egress (mean 200.15 Mbit/s)
- Flow 3 ingress (mean 135.23 Mbit/s)
- Flow 3 egress (mean 134.84 Mbit/s)

Legend:
- Flow 1 (95th percentile 63.84 ms)
- Flow 2 (95th percentile 64.51 ms)
- Flow 3 (95th percentile 64.46 ms)

```
Run 8: Statistics of TaoVA-100x

Start at: 2017-09-19 05:04:49
End at: 2017-09-19 05:05:19

# Below is generated by plot.py at 2017-09-19 08:13:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 384.62 Mbit/s
95th percentile per-packet one-way delay: 65.045 ms
Loss rate: 0.52%
-- Flow 1:
Average throughput: 193.79 Mbit/s
95th percentile per-packet one-way delay: 63.712 ms
Loss rate: 0.33%
-- Flow 2:
Average throughput: 229.66 Mbit/s
95th percentile per-packet one-way delay: 66.837 ms
Loss rate: 0.47%
-- Flow 3:
Average throughput: 118.90 Mbit/s
95th percentile per-packet one-way delay: 63.673 ms
Loss rate: 1.83%
```
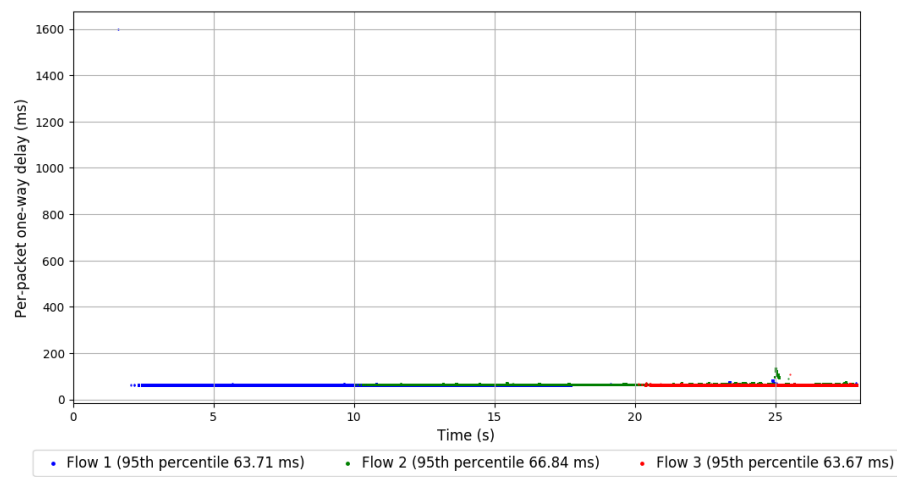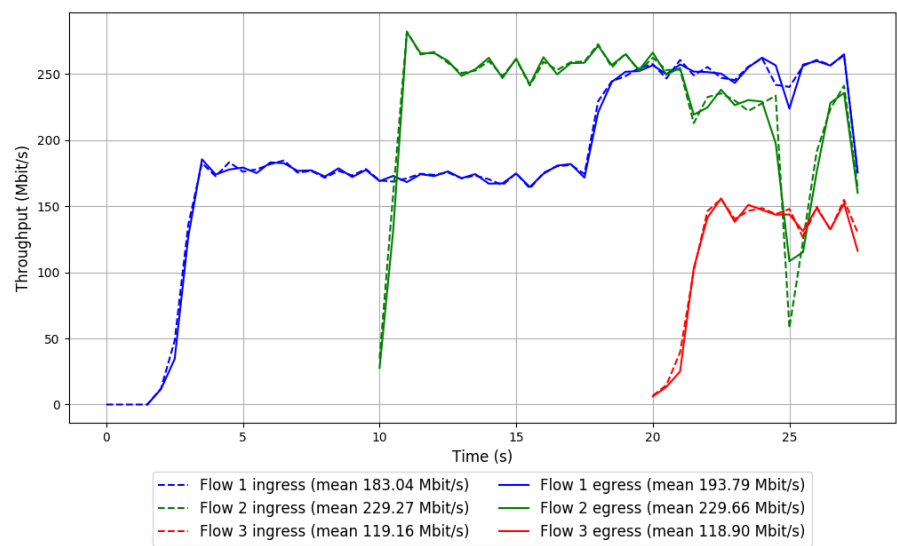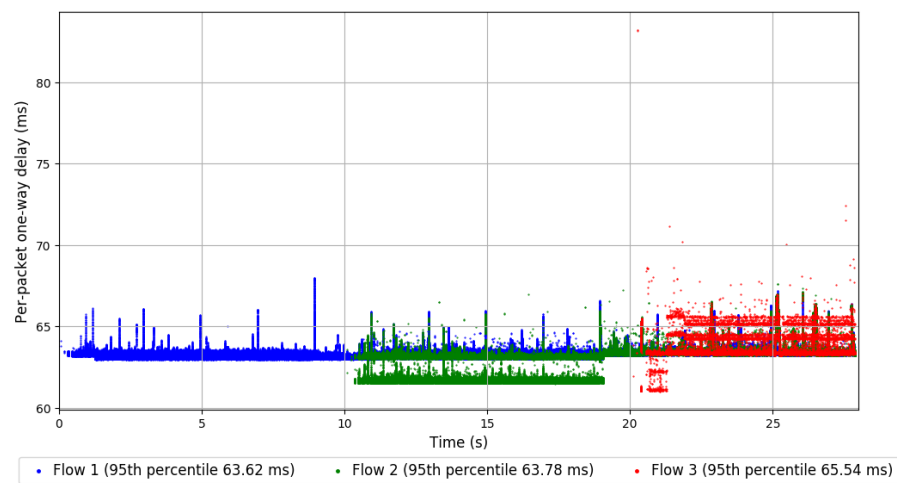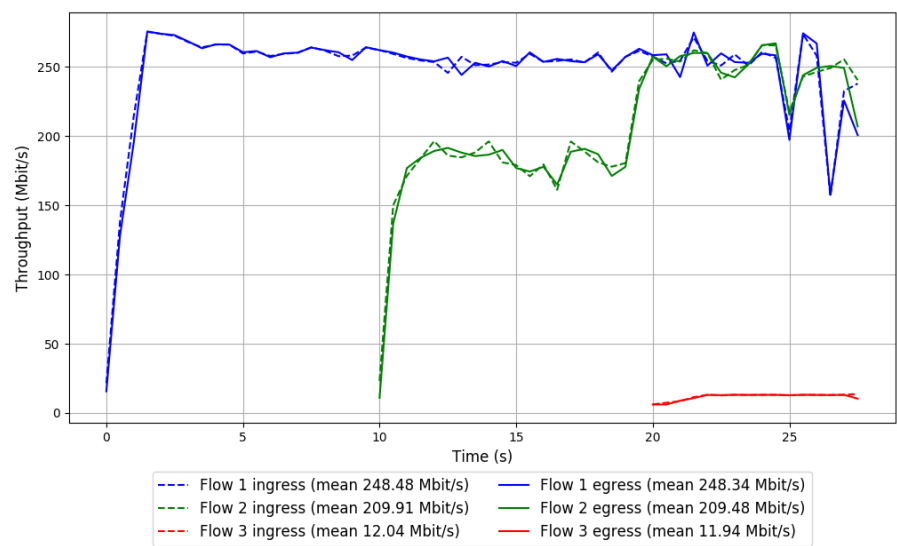
Run 8: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 183.04 Mbit/s) Flow 1 egress (mean 193.79 Mbit/s)
Flow 2 ingress (mean 229.27 Mbit/s) Flow 2 egress (mean 229.66 Mbit/s)
Flow 3 ingress (mean 119.16 Mbit/s) Flow 3 egress (mean 118.90 Mbit/s)

Flow 1 (95th percentile 63.71 ms)   Flow 2 (95th percentile 66.84 ms)   Flow 3 (95th percentile 63.67 ms)

159

```
Run 9: Statistics of TaoVA-100x

Start at: 2017-09-19 05:13:58
End at: 2017-09-19 05:14:28

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 385.63 Mbit/s
95th percentile per-packet one-way delay: 63.674 ms
Loss rate: 0.66%
-- Flow 1:
Average throughput: 248.34 Mbit/s
95th percentile per-packet one-way delay: 63.616 ms
Loss rate: 0.50%
-- Flow 2:
Average throughput: 209.48 Mbit/s
95th percentile per-packet one-way delay: 63.778 ms
Loss rate: 0.91%
-- Flow 3:
Average throughput: 11.94 Mbit/s
95th percentile per-packet one-way delay: 65.544 ms
Loss rate: 2.67%
```

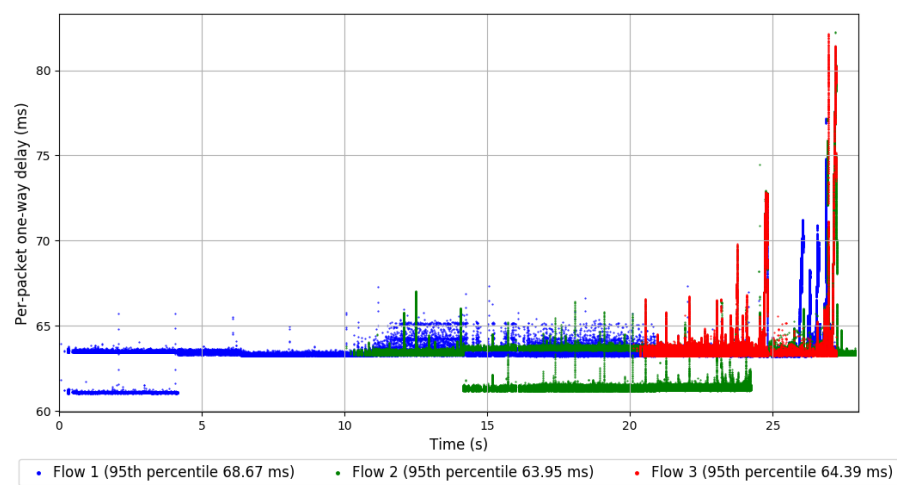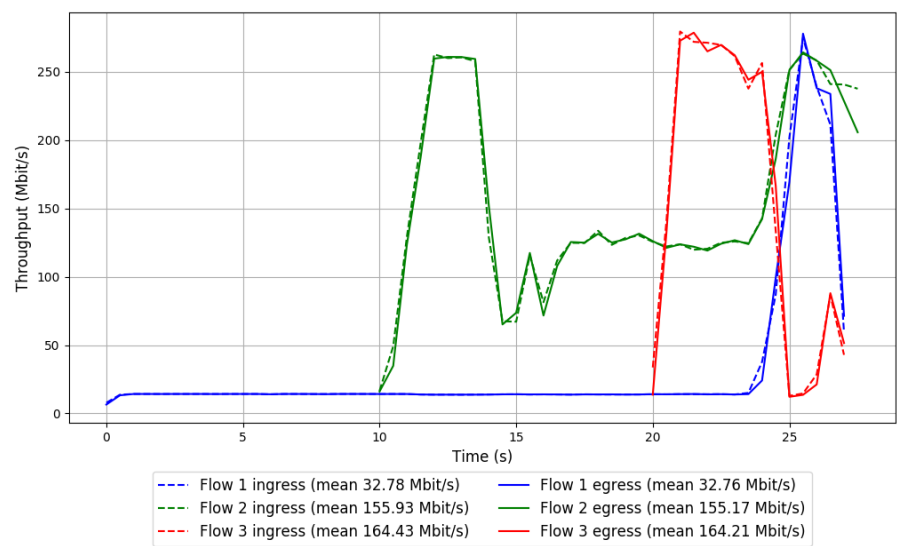Run 9: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 248.48 Mbit/s) --- Flow 1 egress (mean 248.34 Mbit/s)
Flow 2 ingress (mean 209.91 Mbit/s) --- Flow 2 egress (mean 209.48 Mbit/s)
Flow 3 ingress (mean 12.04 Mbit/s) --- Flow 3 egress (mean 11.94 Mbit/s)

Flow 1 (95th percentile 63.62 ms)   Flow 2 (95th percentile 63.78 ms)   Flow 3 (95th percentile 65.54 ms)

```
Run 10: Statistics of TaoVA-100x

Start at: 2017-09-19 05:23:13
End at: 2017-09-19 05:23:43

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 173.40 Mbit/s
95th percentile per-packet one-way delay: 65.139 ms
Loss rate: 0.69%
-- Flow 1:
Average throughput: 32.76 Mbit/s
95th percentile per-packet one-way delay: 68.673 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 155.17 Mbit/s
95th percentile per-packet one-way delay: 63.949 ms
Loss rate: 1.20%
-- Flow 3:
Average throughput: 164.21 Mbit/s
95th percentile per-packet one-way delay: 64.395 ms
Loss rate: 0.00%
```
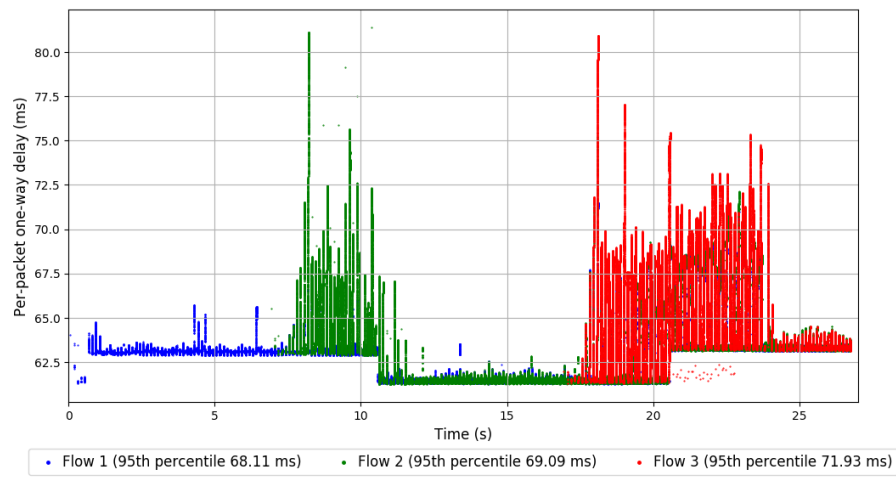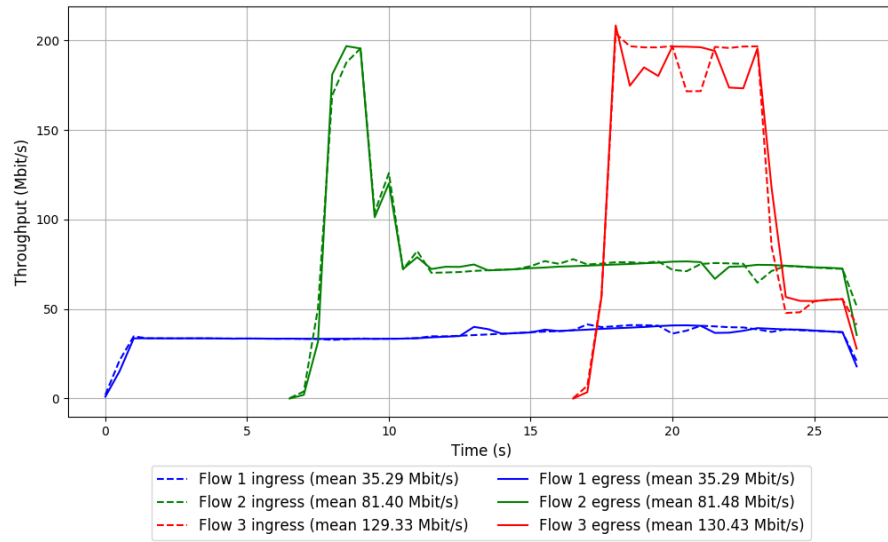
Run 10: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 32.78 Mbit/s)   Flow 1 egress (mean 32.76 Mbit/s)
Flow 2 ingress (mean 155.93 Mbit/s)   Flow 2 egress (mean 155.17 Mbit/s)
Flow 3 ingress (mean 164.43 Mbit/s)   Flow 3 egress (mean 164.21 Mbit/s)

Flow 1 (95th percentile 68.67 ms)   Flow 2 (95th percentile 63.95 ms)   Flow 3 (95th percentile 64.39 ms)

163

```
Run 1: Statistics of TCP Vegas

Start at: 2017-09-19 04:06:55
End at: 2017-09-19 04:07:25


# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 143.73 Mbit/s
95th percentile per-packet one-way delay: 70.415 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 35.29 Mbit/s
95th percentile per-packet one-way delay: 68.112 ms
Loss rate: 0.48%
-- Flow 2:
Average throughput: 81.48 Mbit/s
95th percentile per-packet one-way delay: 69.093 ms
Loss rate: 0.55%
-- Flow 3:
Average throughput: 130.43 Mbit/s
95th percentile per-packet one-way delay: 71.927 ms
Loss rate: 0.55%
```
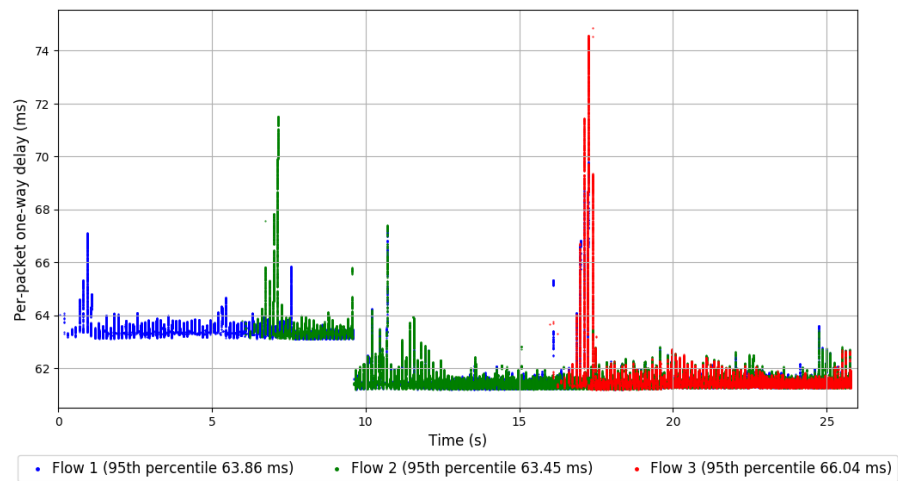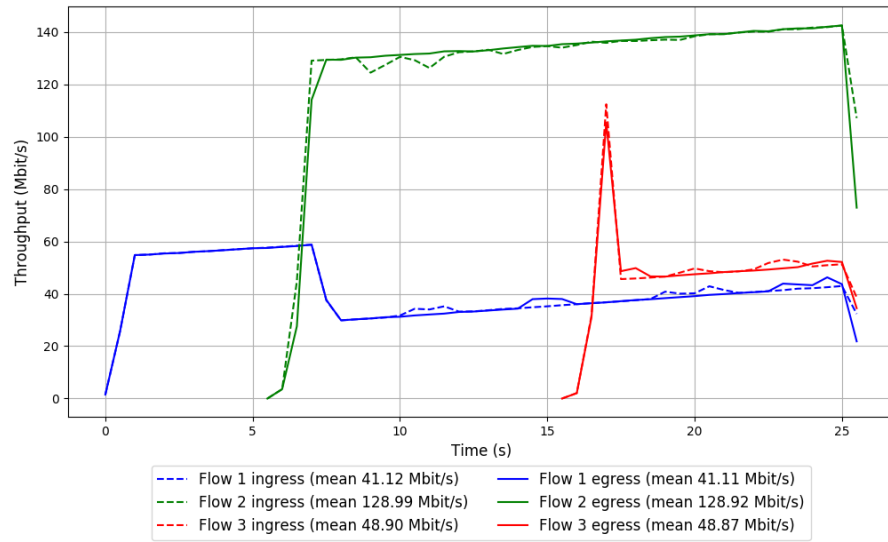
Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 35.29 Mbit/s) — Flow 1 egress (mean 35.29 Mbit/s)
Flow 2 ingress (mean 81.40 Mbit/s) — Flow 2 egress (mean 81.48 Mbit/s)
Flow 3 ingress (mean 129.33 Mbit/s) — Flow 3 egress (mean 130.43 Mbit/s)

Flow 1 (95th percentile 68.11 ms)   Flow 2 (95th percentile 69.09 ms)   Flow 3 (95th percentile 71.93 ms)

```
Run 2: Statistics of TCP Vegas

Start at: 2017-09-19 04:16:05
End at: 2017-09-19 04:16:35


# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 158.99 Mbit/s
95th percentile per-packet one-way delay: 63.668 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 41.11 Mbit/s
95th percentile per-packet one-way delay: 63.859 ms
Loss rate: 0.51%
-- Flow 2:
Average throughput: 128.92 Mbit/s
95th percentile per-packet one-way delay: 63.445 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 48.87 Mbit/s
95th percentile per-packet one-way delay: 66.040 ms
Loss rate: 1.32%
```
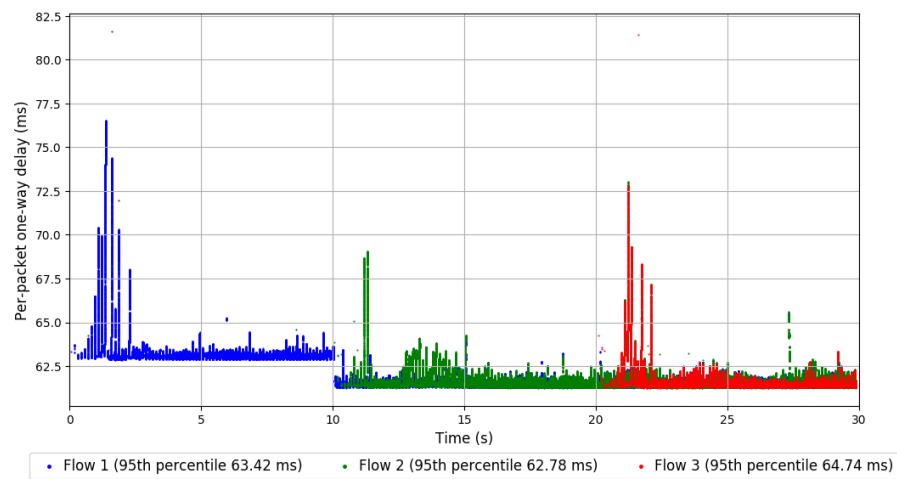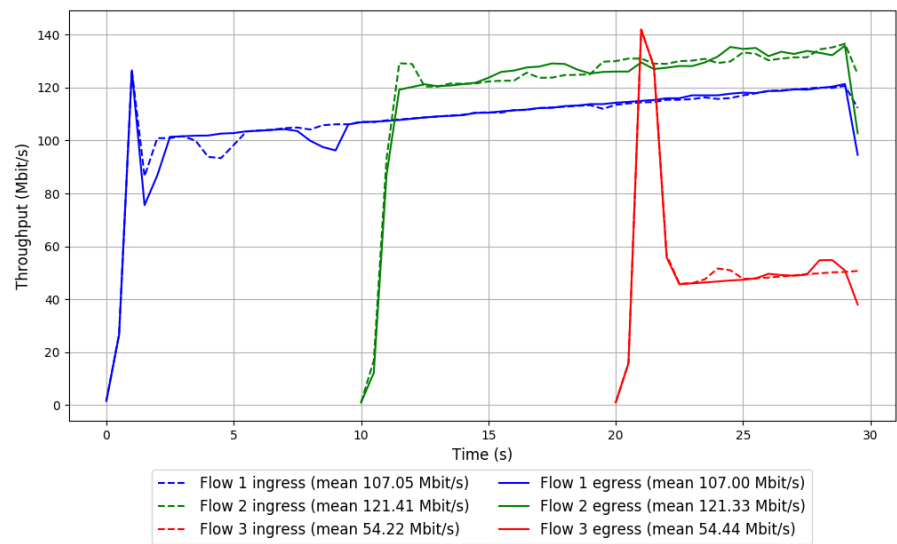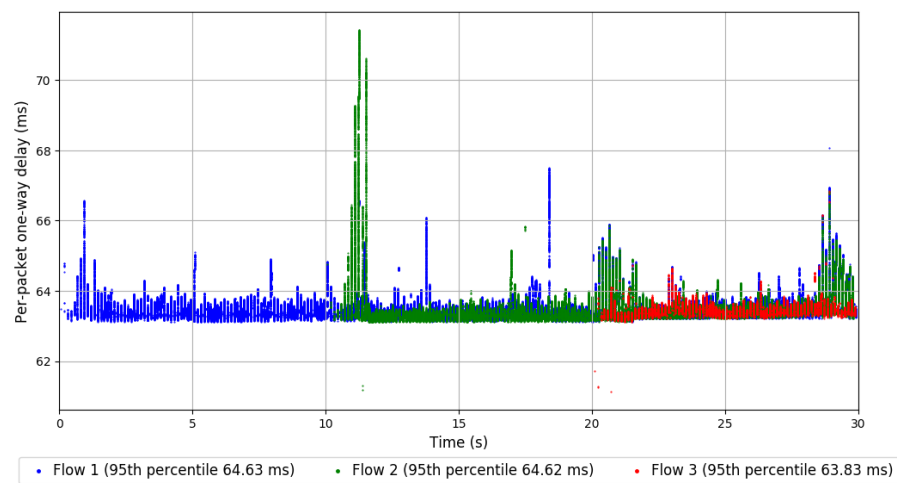
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2017-09-19 04:25:19
End at: 2017-09-19 04:25:49


# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 205.43 Mbit/s
95th percentile per-packet one-way delay: 63.331 ms
Loss rate: 0.62%
-- Flow 1:
Average throughput: 107.00 Mbit/s
95th percentile per-packet one-way delay: 63.421 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 121.33 Mbit/s
95th percentile per-packet one-way delay: 62.785 ms
Loss rate: 0.69%
-- Flow 3:
Average throughput: 54.44 Mbit/s
95th percentile per-packet one-way delay: 64.743 ms
Loss rate: 1.19%
```
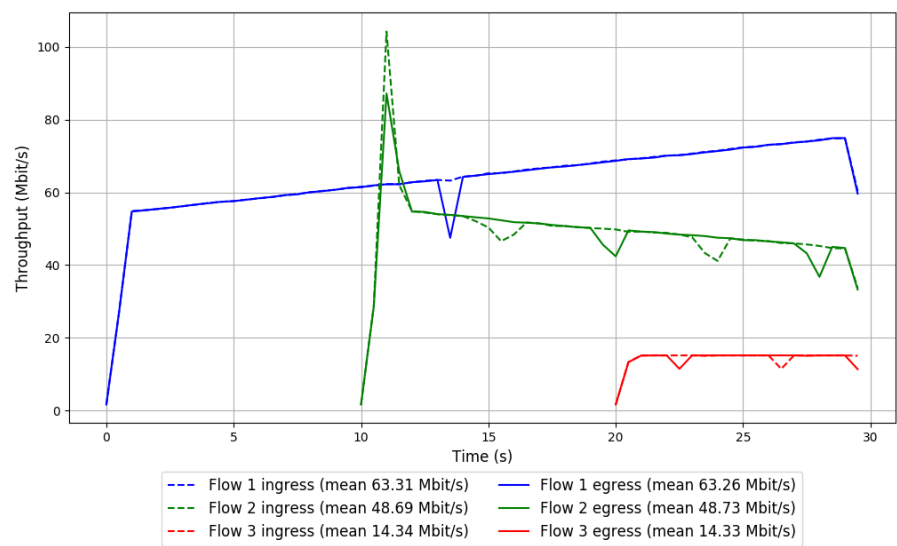
Run 3: Report of TCP Vegas — Data Link

```
Run 4: Statistics of TCP Vegas

Start at: 2017-09-19 04:34:37
End at: 2017-09-19 04:35:07


# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 100.28 Mbit/s
95th percentile per-packet one-way delay: 64.599 ms
Loss rate: 0.56%
-- Flow 1:
Average throughput: 63.26 Mbit/s
95th percentile per-packet one-way delay: 64.630 ms
Loss rate: 0.49%
-- Flow 2:
Average throughput: 48.73 Mbit/s
95th percentile per-packet one-way delay: 64.623 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 14.33 Mbit/s
95th percentile per-packet one-way delay: 63.825 ms
Loss rate: 1.33%
```
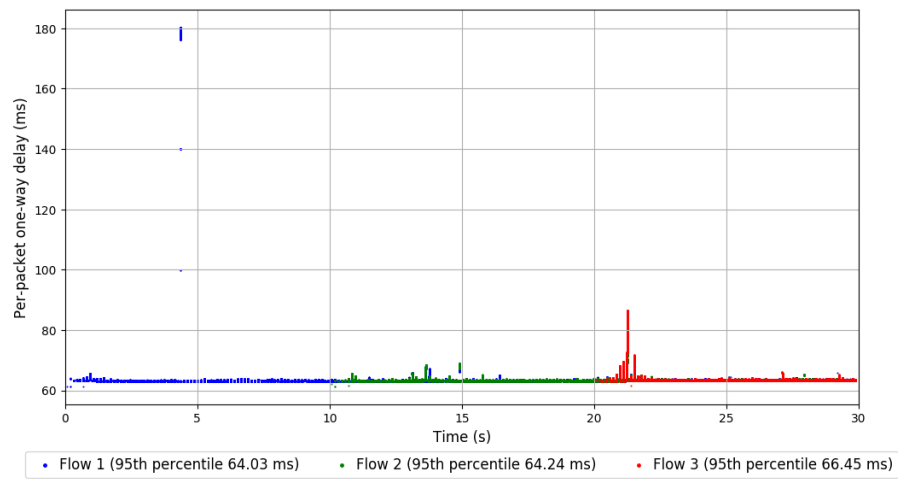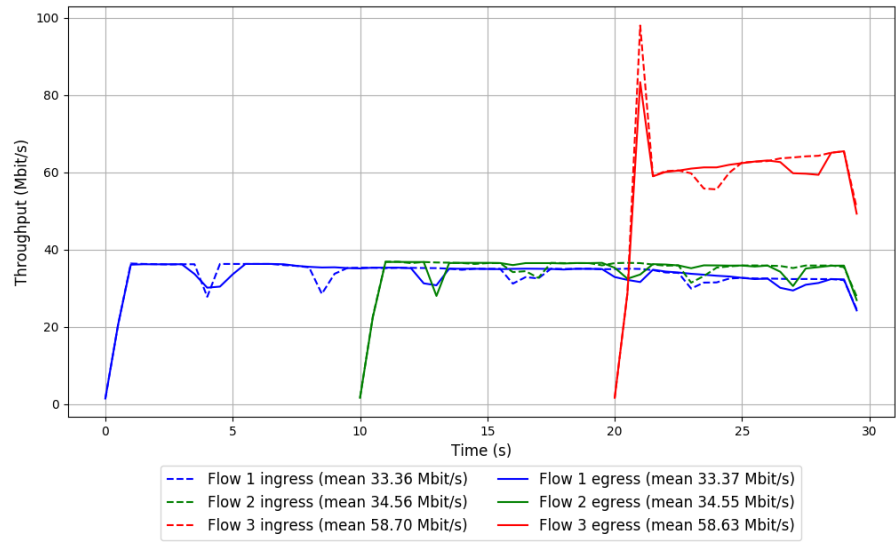
Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2017-09-19 04:43:48
End at: 2017-09-19 04:44:18

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 75.55 Mbit/s
95th percentile per-packet one-way delay: 64.362 ms
Loss rate: 0.74%
-- Flow 1:
Average throughput: 33.37 Mbit/s
95th percentile per-packet one-way delay: 64.034 ms
Loss rate: 0.41%
-- Flow 2:
Average throughput: 34.55 Mbit/s
95th percentile per-packet one-way delay: 64.242 ms
Loss rate: 0.65%
-- Flow 3:
Average throughput: 58.63 Mbit/s
95th percentile per-packet one-way delay: 66.453 ms
Loss rate: 1.41%
```
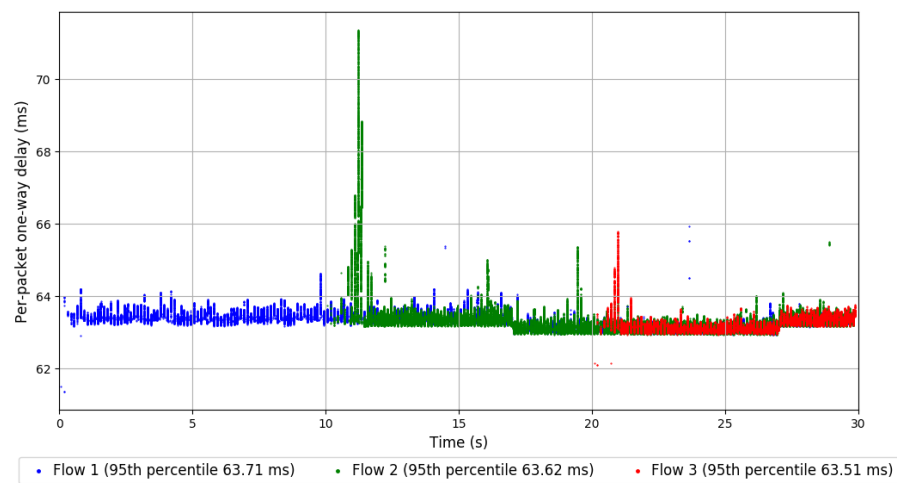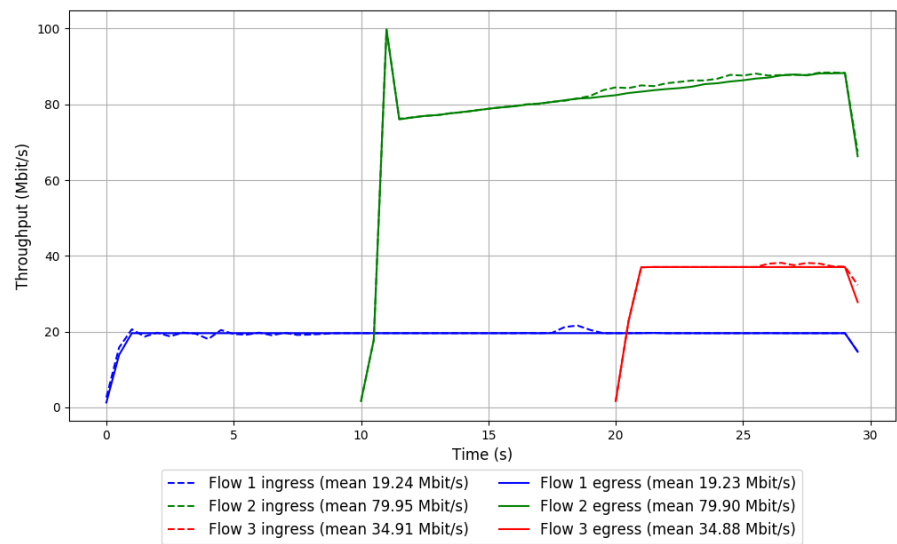
Run 5: Report of TCP Vegas — Data Link

```
Run 6: Statistics of TCP Vegas

Start at: 2017-09-19 04:53:02
End at: 2017-09-19 04:53:32

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 83.73 Mbit/s
95th percentile per-packet one-way delay: 63.658 ms
Loss rate: 0.72%
-- Flow 1:
Average throughput: 19.23 Mbit/s
95th percentile per-packet one-way delay: 63.713 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 79.90 Mbit/s
95th percentile per-packet one-way delay: 63.625 ms
Loss rate: 0.69%
-- Flow 3:
Average throughput: 34.88 Mbit/s
95th percentile per-packet one-way delay: 63.508 ms
Loss rate: 1.34%
```
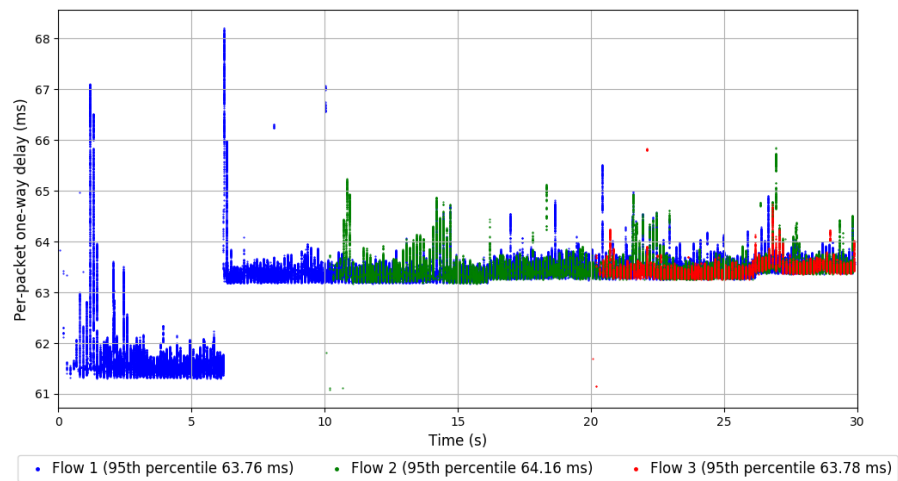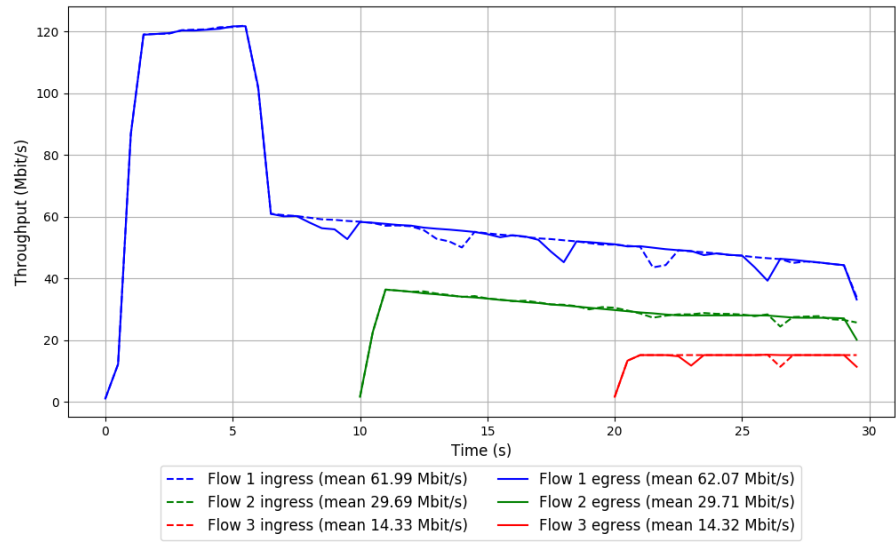
Run 6: Report of TCP Vegas — Data Link

```
Run 7: Statistics of TCP Vegas

Start at: 2017-09-19 05:02:13
End at: 2017-09-19 05:02:43

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 86.49 Mbit/s
95th percentile per-packet one-way delay: 63.854 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 62.07 Mbit/s
95th percentile per-packet one-way delay: 63.760 ms
Loss rate: 0.30%
-- Flow 2:
Average throughput: 29.71 Mbit/s
95th percentile per-packet one-way delay: 64.162 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 14.32 Mbit/s
95th percentile per-packet one-way delay: 63.785 ms
Loss rate: 1.33%
```
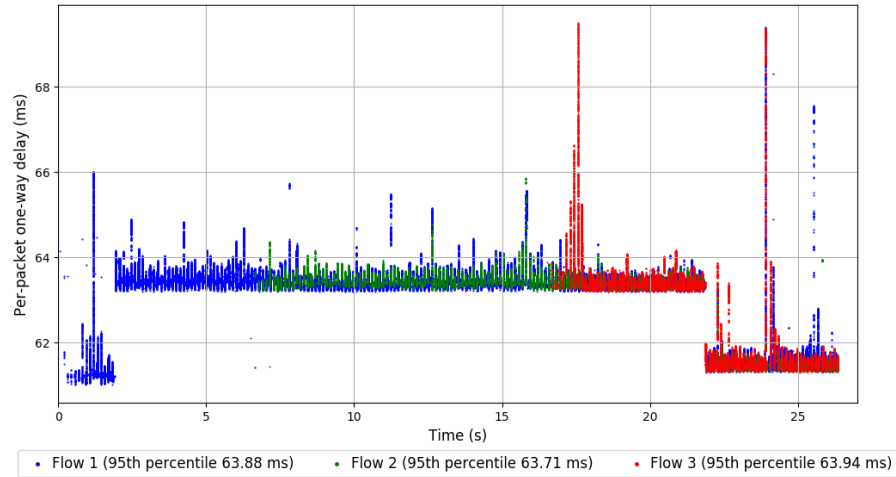
Run 7: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 61.99 Mbit/s) — Flow 1 egress (mean 62.07 Mbit/s)
Flow 2 ingress (mean 29.69 Mbit/s) — Flow 2 egress (mean 29.71 Mbit/s)
Flow 3 ingress (mean 14.33 Mbit/s) — Flow 3 egress (mean 14.32 Mbit/s)

Flow 1 (95th percentile 63.76 ms)   Flow 2 (95th percentile 64.16 ms)   Flow 3 (95th percentile 63.78 ms)

```
Run 8: Statistics of TCP Vegas

Start at: 2017-09-19 05:11:23
End at: 2017-09-19 05:11:53


# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 96.84 Mbit/s
95th percentile per-packet one-way delay: 63.861 ms
Loss rate: 0.73%
-- Flow 1:
Average throughput: 63.02 Mbit/s
95th percentile per-packet one-way delay: 63.880 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 15.18 Mbit/s
95th percentile per-packet one-way delay: 63.713 ms
Loss rate: 0.78%
-- Flow 3:
Average throughput: 60.00 Mbit/s
95th percentile per-packet one-way delay: 63.936 ms
Loss rate: 1.41%
```
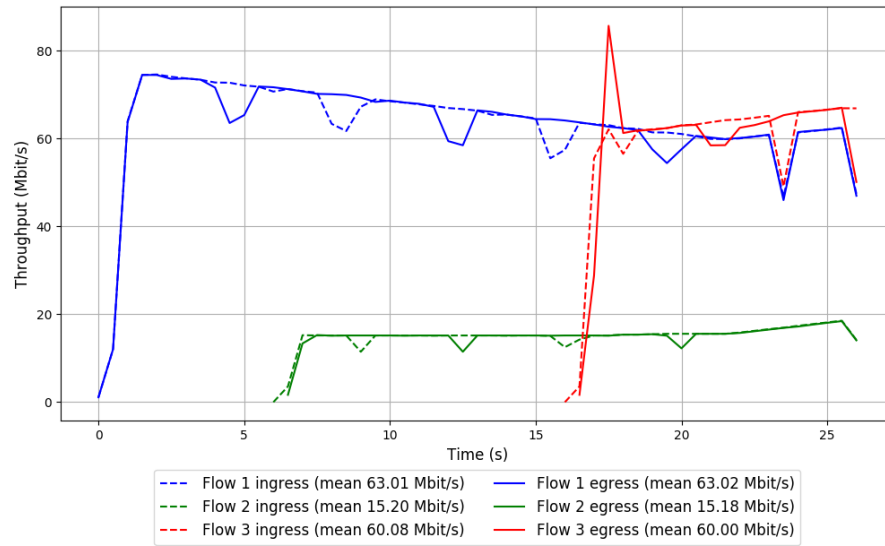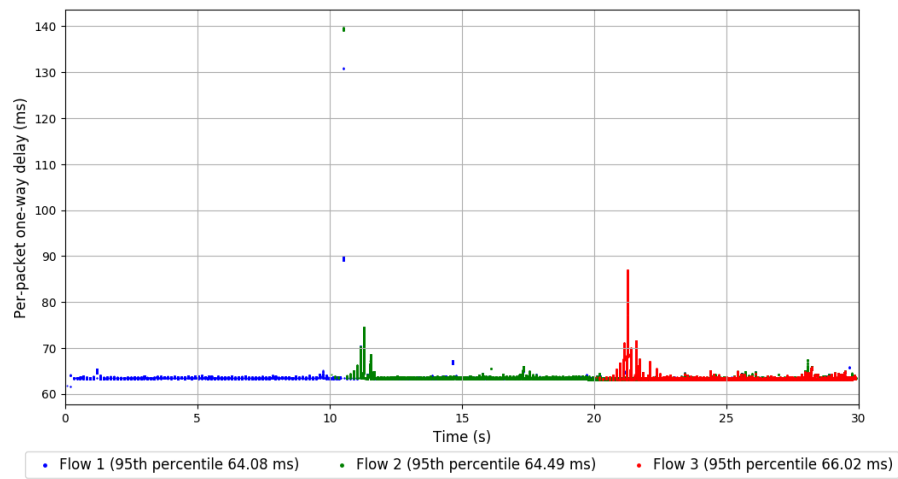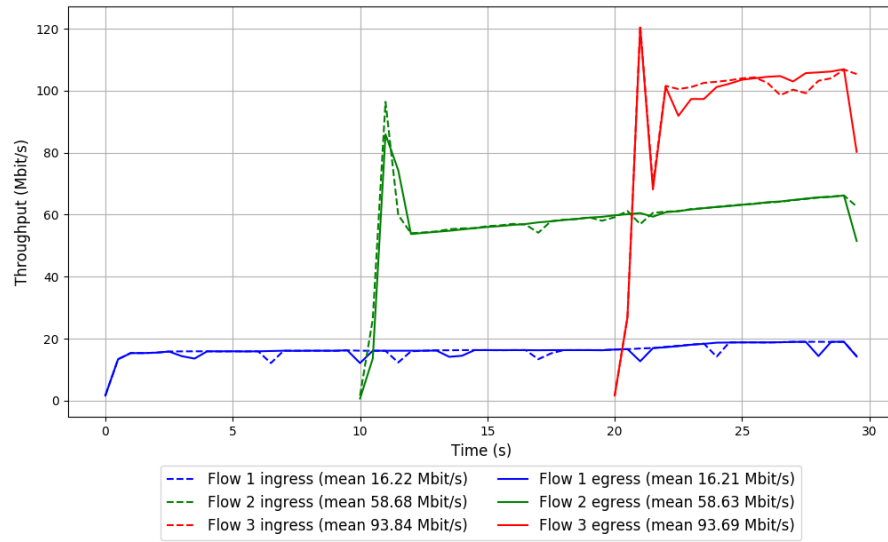
Run 8: Report of TCP Vegas — Data Link

```
Run 9: Statistics of TCP Vegas

Start at: 2017-09-19 05:20:39
End at: 2017-09-19 05:21:09

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 85.87 Mbit/s
95th percentile per-packet one-way delay: 64.693 ms
Loss rate: 0.93%
-- Flow 1:
Average throughput: 16.21 Mbit/s
95th percentile per-packet one-way delay: 64.081 ms
Loss rate: 0.49%
-- Flow 2:
Average throughput: 58.63 Mbit/s
95th percentile per-packet one-way delay: 64.486 ms
Loss rate: 0.71%
-- Flow 3:
Average throughput: 93.69 Mbit/s
95th percentile per-packet one-way delay: 66.021 ms
Loss rate: 1.44%
```
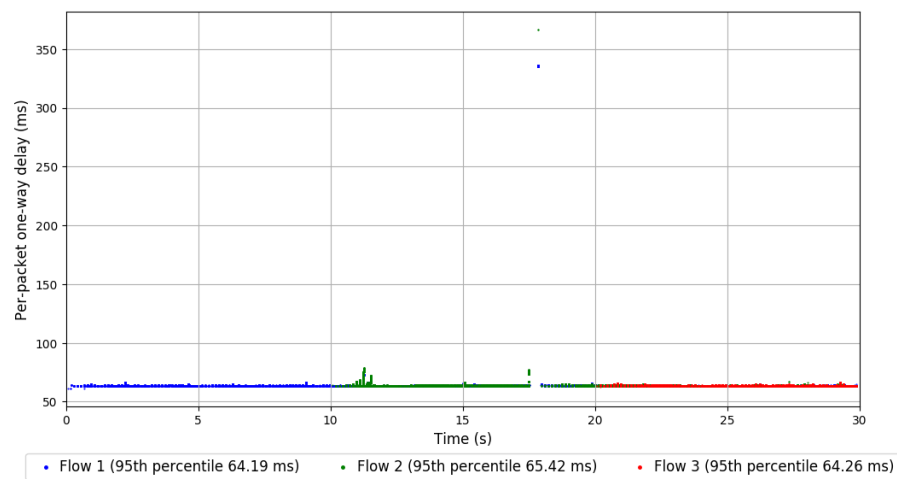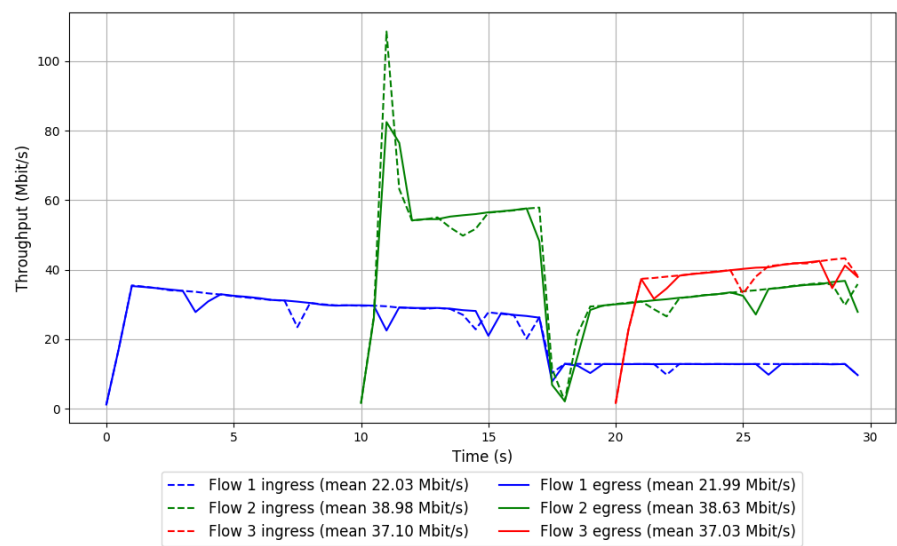
Run 9: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 16.22 Mbit/s) — Flow 1 egress (mean 16.21 Mbit/s)
Flow 2 ingress (mean 58.68 Mbit/s) — Flow 2 egress (mean 58.63 Mbit/s)
Flow 3 ingress (mean 93.84 Mbit/s) — Flow 3 egress (mean 93.69 Mbit/s)

Flow 1 (95th percentile 64.08 ms) • Flow 2 (95th percentile 64.49 ms) • Flow 3 (95th percentile 66.02 ms)

```
Run 10: Statistics of TCP Vegas

Start at: 2017-09-19 05:29:36
End at: 2017-09-19 05:30:06

# Below is generated by plot.py at 2017-09-19 08:16:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 59.79 Mbit/s
95th percentile per-packet one-way delay: 64.472 ms
Loss rate: 1.12%
-- Flow 1:
Average throughput: 21.99 Mbit/s
95th percentile per-packet one-way delay: 64.186 ms
Loss rate: 0.45%
-- Flow 2:
Average throughput: 38.63 Mbit/s
95th percentile per-packet one-way delay: 65.415 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 37.03 Mbit/s
95th percentile per-packet one-way delay: 64.260 ms
Loss rate: 1.47%
```
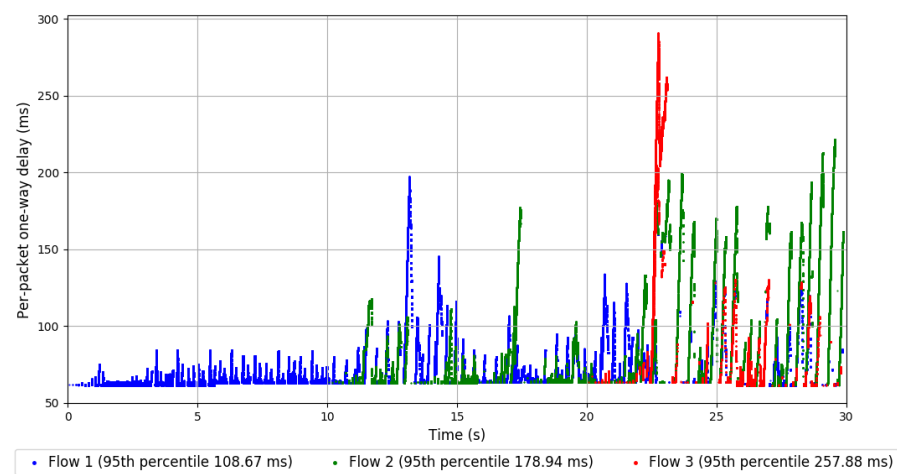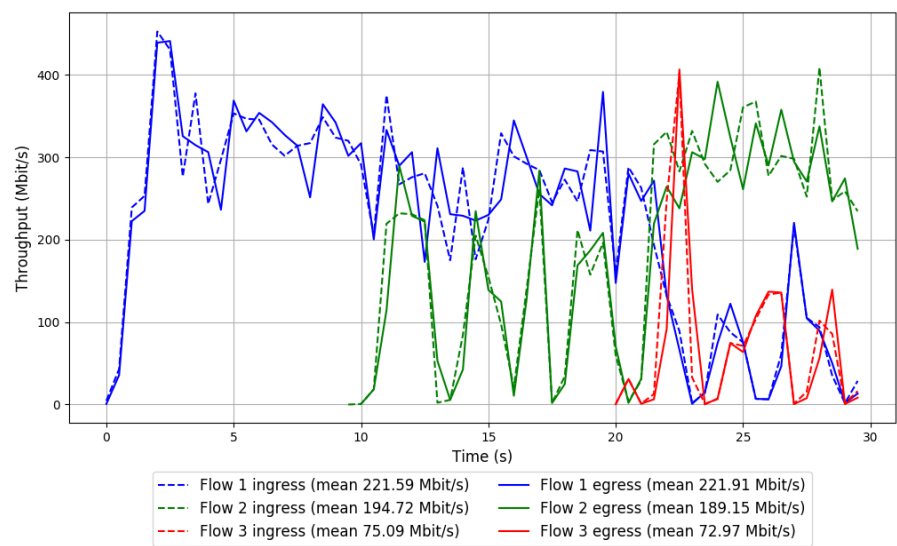
Run 10: Report of TCP Vegas — Data Link

183

```
Run 1: Statistics of Verus

Start at: 2017-09-19 04:07:43
End at: 2017-09-19 04:08:13


# Below is generated by plot.py at 2017-09-19 08:17:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 371.30 Mbit/s
95th percentile per-packet one-way delay: 171.718 ms
Loss rate: 1.38%
-- Flow 1:
Average throughput: 221.91 Mbit/s
95th percentile per-packet one-way delay: 108.675 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 189.15 Mbit/s
95th percentile per-packet one-way delay: 178.945 ms
Loss rate: 2.73%
-- Flow 3:
Average throughput: 72.97 Mbit/s
95th percentile per-packet one-way delay: 257.877 ms
Loss rate: 4.07%
```
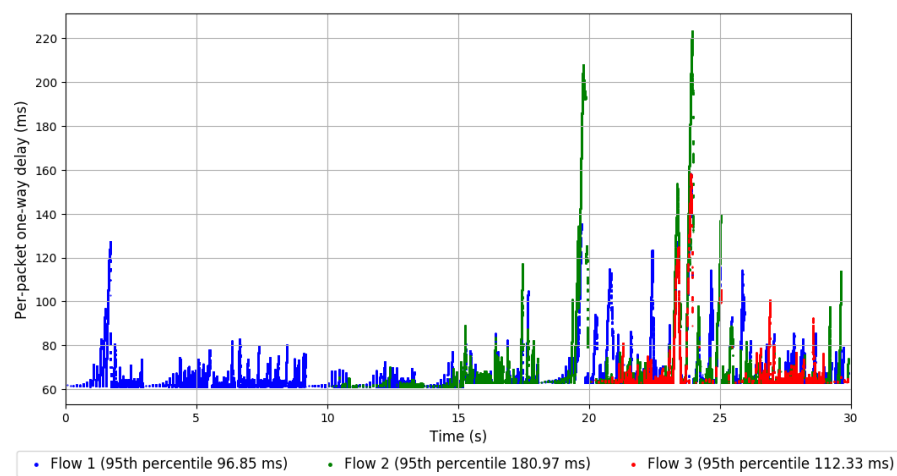
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-09-19 04:16:54
End at: 2017-09-19 04:17:24


# Below is generated by plot.py at 2017-09-19 08:17:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 301.55 Mbit/s
95th percentile per-packet one-way delay: 114.260 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 192.73 Mbit/s
95th percentile per-packet one-way delay: 96.852 ms
Loss rate: 0.70%
-- Flow 2:
Average throughput: 125.44 Mbit/s
95th percentile per-packet one-way delay: 180.969 ms
Loss rate: 1.60%
-- Flow 3:
Average throughput: 77.77 Mbit/s
95th percentile per-packet one-way delay: 112.326 ms
Loss rate: 0.49%
```
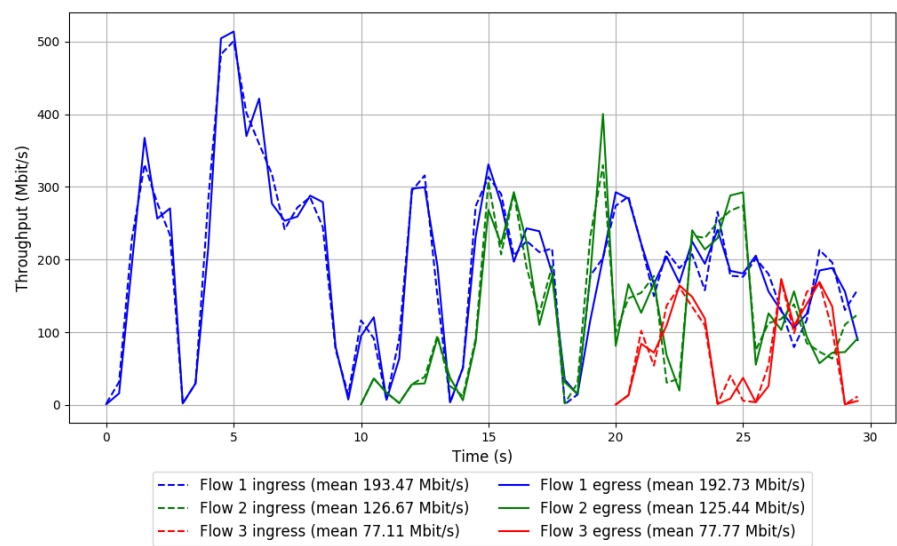
Run 2: Report of Verus — Data Link

```
Run 3: Statistics of Verus

Start at: 2017-09-19 04:26:12
End at: 2017-09-19 04:26:42

# Below is generated by plot.py at 2017-09-19 08:17:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 348.90 Mbit/s
95th percentile per-packet one-way delay: 118.001 ms
Loss rate: 0.35%
-- Flow 1:
Average throughput: 191.61 Mbit/s
95th percentile per-packet one-way delay: 120.922 ms
Loss rate: 0.38%
-- Flow 2:
Average throughput: 176.45 Mbit/s
95th percentile per-packet one-way delay: 106.434 ms
Loss rate: 0.41%
-- Flow 3:
Average throughput: 125.20 Mbit/s
95th percentile per-packet one-way delay: 125.923 ms
Loss rate: 0.07%
```
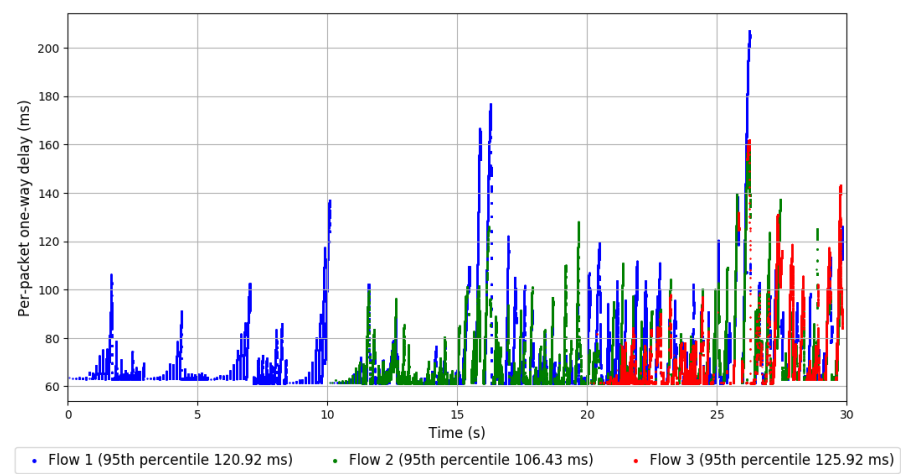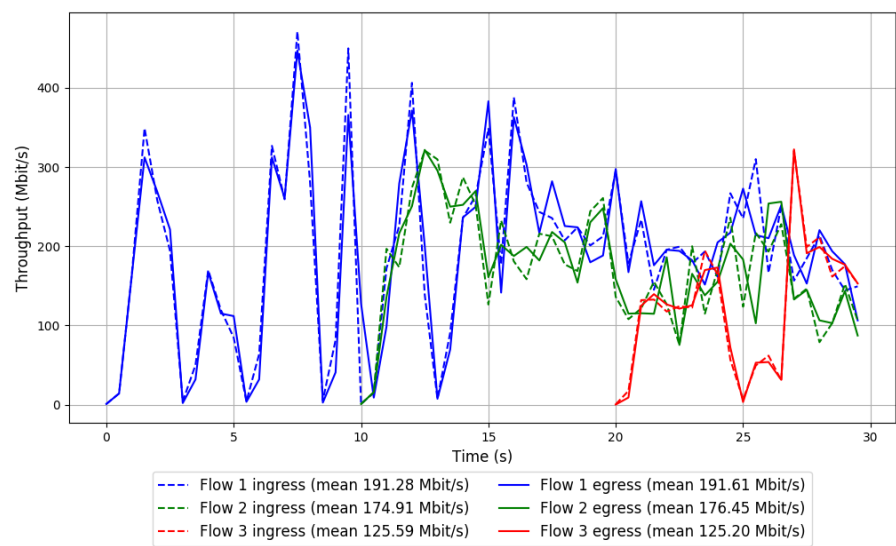
Run 3: Report of Verus — Data Link

Flow 1 ingress (mean 191.28 Mbit/s) --- Flow 1 egress (mean 191.61 Mbit/s)
Flow 2 ingress (mean 174.91 Mbit/s) --- Flow 2 egress (mean 176.45 Mbit/s)
Flow 3 ingress (mean 125.59 Mbit/s) --- Flow 3 egress (mean 125.20 Mbit/s)

Flow 1 (95th percentile 120.92 ms) Flow 2 (95th percentile 106.43 ms) Flow 3 (95th percentile 125.92 ms)

```
Run 4: Statistics of Verus

Start at: 2017-09-19 04:35:24
End at: 2017-09-19 04:35:54

# Below is generated by plot.py at 2017-09-19 08:17:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 366.48 Mbit/s
95th percentile per-packet one-way delay: 105.570 ms
Loss rate: 0.58%
-- Flow 1:
Average throughput: 253.45 Mbit/s
95th percentile per-packet one-way delay: 109.009 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 119.90 Mbit/s
95th percentile per-packet one-way delay: 96.909 ms
Loss rate: 0.01%
-- Flow 3:
Average throughput: 102.74 Mbit/s
95th percentile per-packet one-way delay: 106.751 ms
Loss rate: 0.03%
```
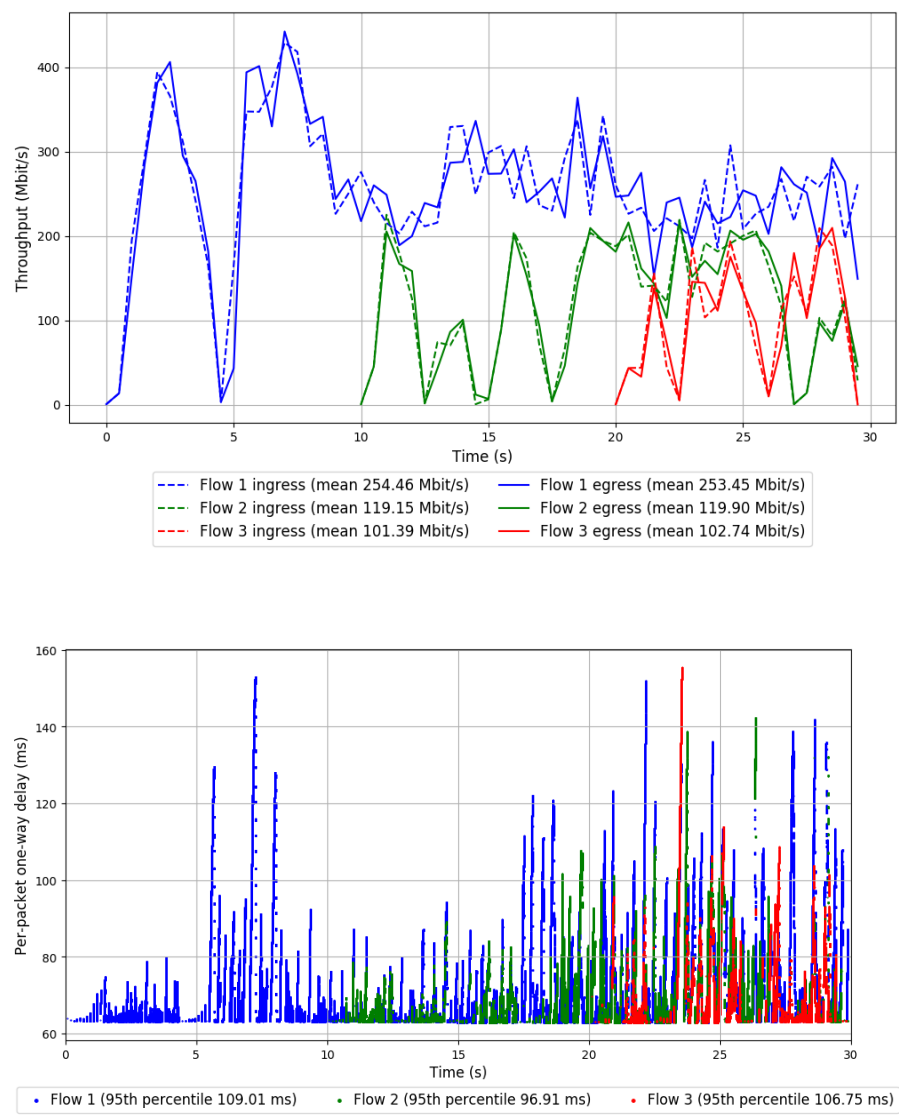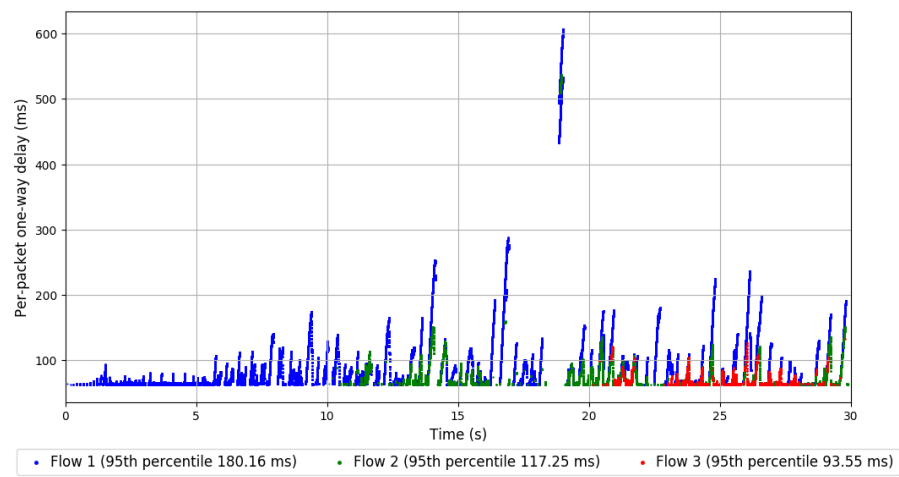
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2017-09-19 04:44:33
End at: 2017-09-19 04:45:03

# Below is generated by plot.py at 2017-09-19 08:17:28
# Datalink statistics
-- Total of 3 flows:
Average throughput: 327.95 Mbit/s
95th percentile per-packet one-way delay: 168.030 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 248.70 Mbit/s
95th percentile per-packet one-way delay: 180.164 ms
Loss rate: 1.20%
-- Flow 2:
Average throughput: 91.65 Mbit/s
95th percentile per-packet one-way delay: 117.250 ms
Loss rate: 1.48%
-- Flow 3:
Average throughput: 58.68 Mbit/s
95th percentile per-packet one-way delay: 93.552 ms
Loss rate: 0.01%
```
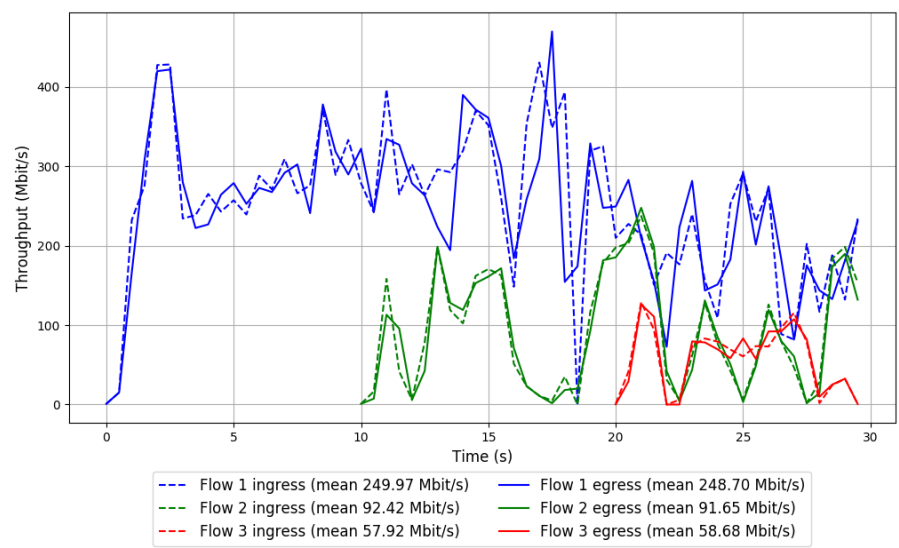
Run 5: Report of Verus — Data Link

```
Run 6: Statistics of Verus

Start at: 2017-09-19 04:53:47
End at: 2017-09-19 04:54:17


# Below is generated by plot.py at 2017-09-19 08:17:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 352.58 Mbit/s
95th percentile per-packet one-way delay: 169.906 ms
Loss rate: 1.91%
-- Flow 1:
Average throughput: 195.29 Mbit/s
95th percentile per-packet one-way delay: 162.056 ms
Loss rate: 1.37%
-- Flow 2:
Average throughput: 208.08 Mbit/s
95th percentile per-packet one-way delay: 203.007 ms
Loss rate: 2.72%
-- Flow 3:
Average throughput: 58.30 Mbit/s
95th percentile per-packet one-way delay: 157.692 ms
Loss rate: 1.49%
```
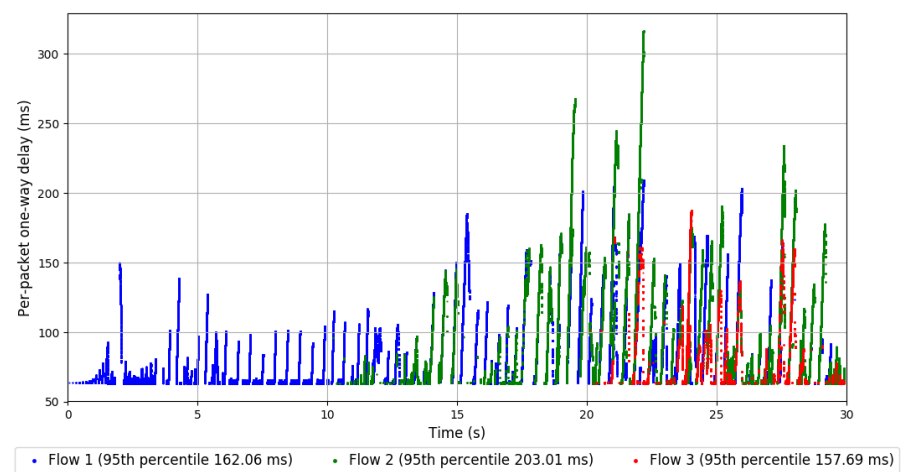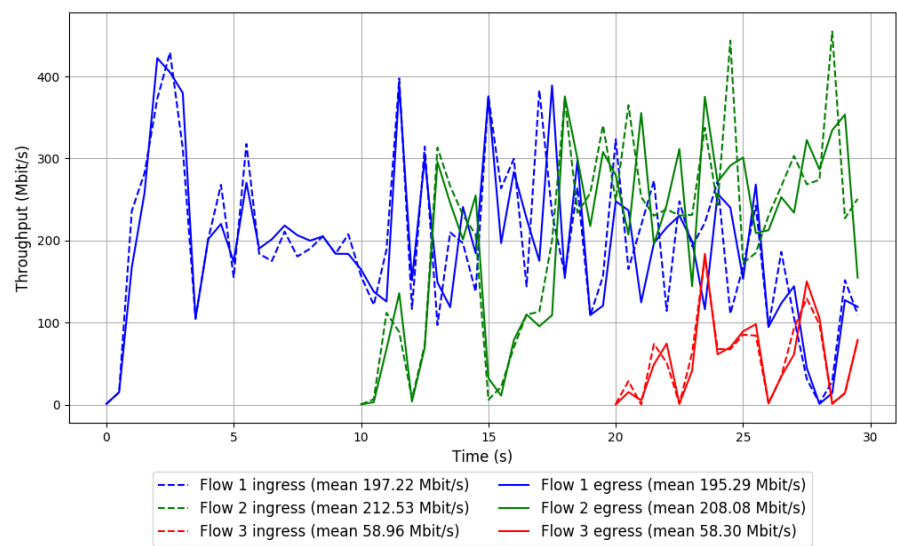
Run 6: Report of Verus — Data Link

Run 7: Statistics of Verus

Start at: 2017-09-19 05:02:58
End at: 2017-09-19 05:03:28

Below is generated by plot.py at 2017-09-19 08:18:35
Datalink statistics
-- Total of 3 flows:
Average throughput: 375.21 Mbit/s
95th percentile per-packet one-way delay: 105.774 ms
Loss rate: 0.54%
-- Flow 1:
Average throughput: 253.17 Mbit/s
95th percentile per-packet one-way delay: 98.586 ms
Loss rate: 0.32%
-- Flow 2:
Average throughput: 129.44 Mbit/s
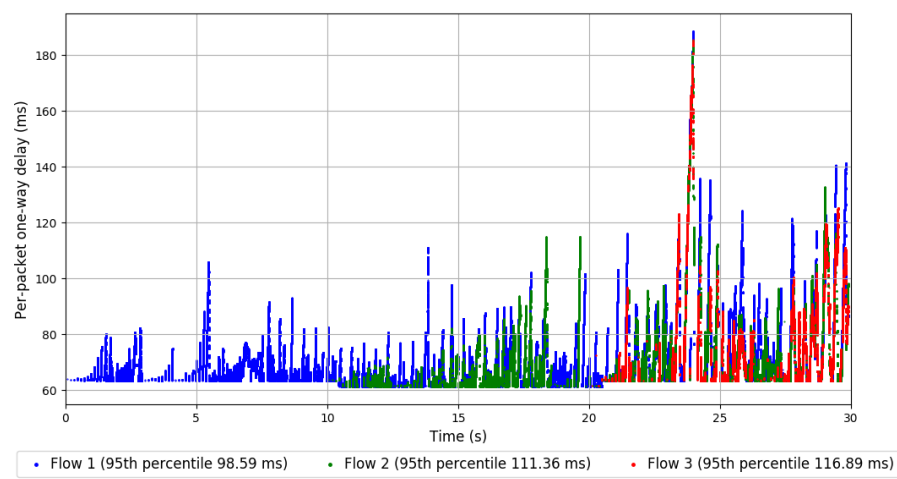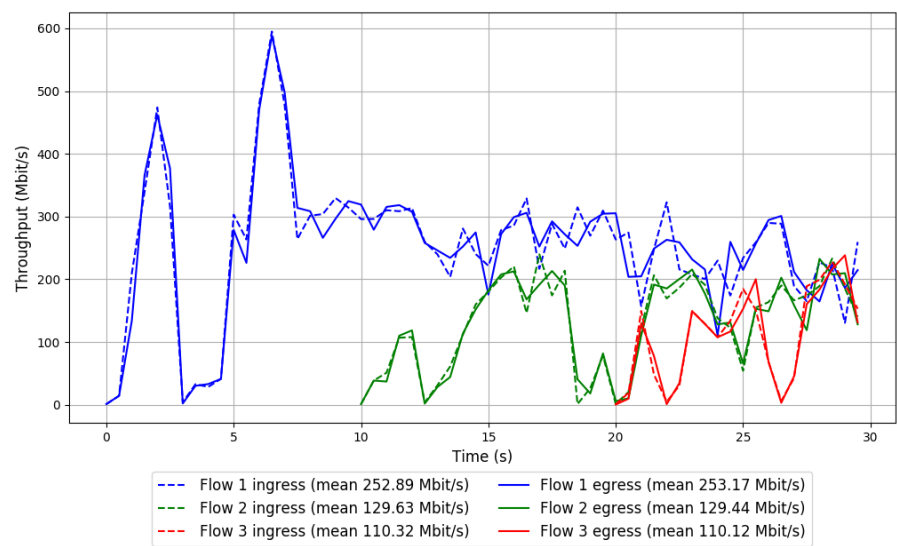95th percentile per-packet one-way delay: 111.364 ms
Loss rate: 0.79%
-- Flow 3:
Average throughput: 110.12 Mbit/s
95th percentile per-packet one-way delay: 116.890 ms
Loss rate: 1.45%

Run 7: Report of Verus — Data Link

```
Run 8: Statistics of Verus

Start at: 2017-09-19 05:12:09
End at: 2017-09-19 05:12:39

# Below is generated by plot.py at 2017-09-19 08:18:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 337.57 Mbit/s
95th percentile per-packet one-way delay: 109.125 ms
Loss rate: 2.10%
-- Flow 1:
Average throughput: 184.65 Mbit/s
95th percentile per-packet one-way delay: 92.493 ms
Loss rate: 0.29%
-- Flow 2:
Average throughput: 163.84 Mbit/s
95th percentile per-packet one-way delay: 112.990 ms
Loss rate: 4.92%
-- Flow 3:
Average throughput: 134.71 Mbit/s
95th percentile per-packet one-way delay: 158.054 ms
Loss rate: 2.40%
```
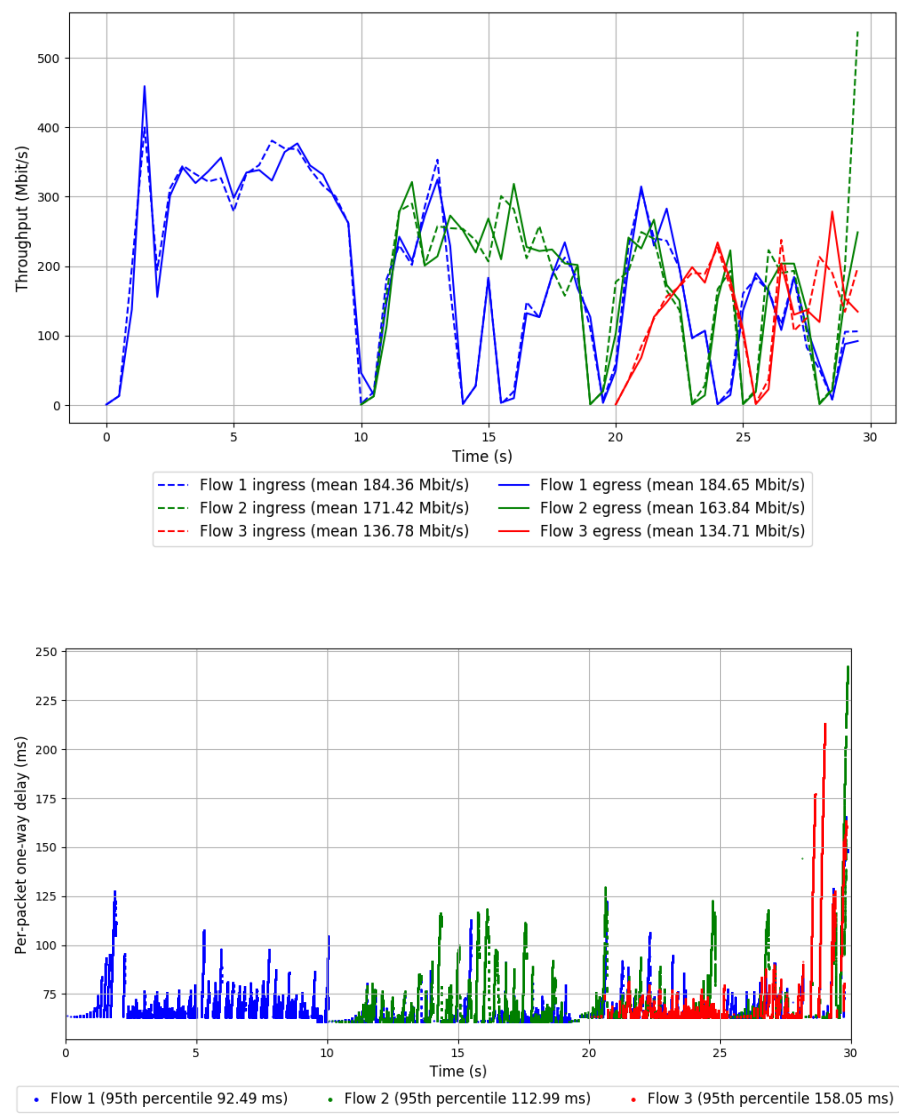
Run 8: Report of Verus — Data Link

```
Run 9: Statistics of Verus

Start at: 2017-09-19 05:21:25
End at: 2017-09-19 05:21:55


# Below is generated by plot.py at 2017-09-19 08:18:58
# Datalink statistics
-- Total of 3 flows:
Average throughput: 312.74 Mbit/s
95th percentile per-packet one-way delay: 93.702 ms
Loss rate: 0.76%
-- Flow 1:
Average throughput: 197.24 Mbit/s
95th percentile per-packet one-way delay: 94.421 ms
Loss rate: 0.73%
-- Flow 2:
Average throughput: 132.87 Mbit/s
95th percentile per-packet one-way delay: 93.912 ms
Loss rate: 0.57%
-- Flow 3:
Average throughput: 83.50 Mbit/s
95th percentile per-packet one-way delay: 90.119 ms
Loss rate: 1.58%
```
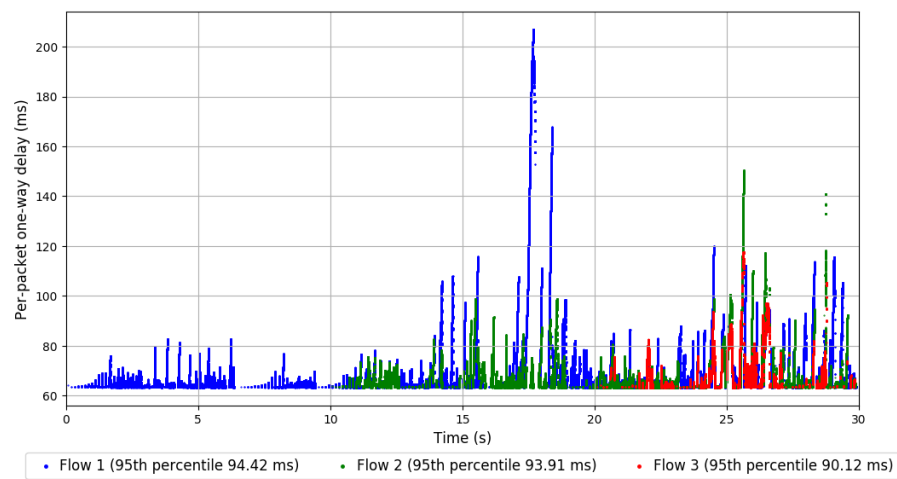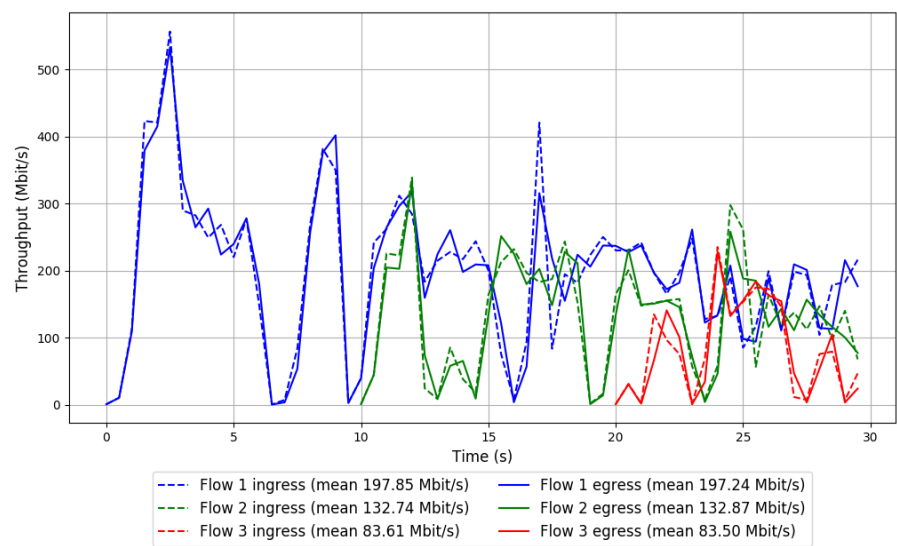
Run 9: Report of Verus — Data Link

```
Run 10: Statistics of Verus

Start at: 2017-09-19 05:30:20
End at: 2017-09-19 05:30:50


# Below is generated by plot.py at 2017-09-19 08:19:04
# Datalink statistics
-- Total of 3 flows:
Average throughput: 349.64 Mbit/s
95th percentile per-packet one-way delay: 112.805 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 197.04 Mbit/s
95th percentile per-packet one-way delay: 87.723 ms
Loss rate: 0.08%
-- Flow 2:
Average throughput: 156.15 Mbit/s
95th percentile per-packet one-way delay: 129.979 ms
Loss rate: 1.27%
-- Flow 3:
Average throughput: 165.81 Mbit/s
95th percentile per-packet one-way delay: 170.897 ms
Loss rate: 3.35%
```

Run 10: Report of Verus — Data Link