Pantheon Report

Generated at 2017-09-18 21:41:33 (UTC).

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

Repeated the test of 10 congestion control schemes 10 times.

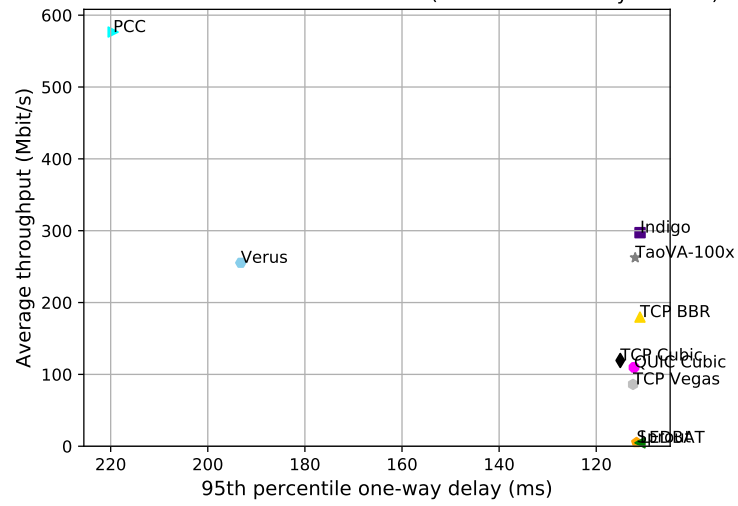Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.

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

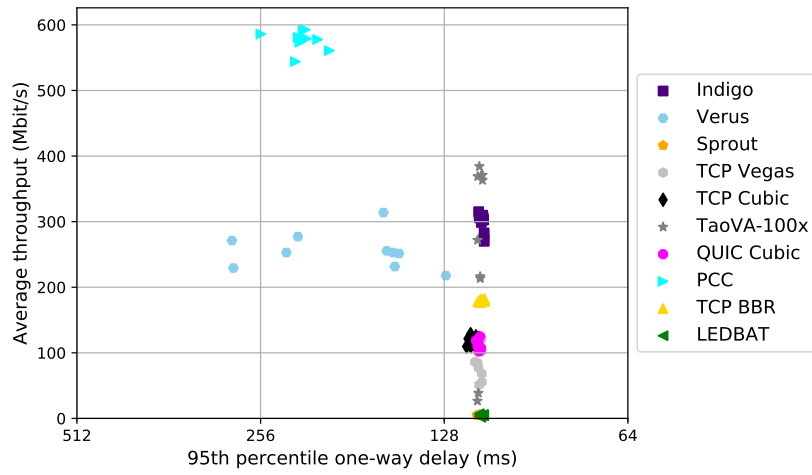Tested BBR with qdisc of Fair Queuing (`fq`), and other schemes with the default Linux qdisc (`pfifo_fast`).

```
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 London 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 London Ethernet, 10 runs of 30s each per scheme
3 flows with 10s interval between flows

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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	93.00	89.96	83.30	110.97	110.98	110.86	0.81	1.25	2.74
TCP Cubic	10	64.34	57.17	52.65	114.34	114.59	116.29	0.78	1.32	2.51
Indigo	10	159.36	148.70	122.66	110.65	111.17	112.49	0.67	1.13	2.69
LEDBAT	10	2.85	2.16	1.39	110.96	111.05	110.95	2.01	2.24	4.69
PCC	10	520.31	66.87	36.94	222.90	212.73	208.19	2.41	2.07	3.51
QUIC Cubic	10	57.11	57.68	44.41	111.07	111.37	111.99	0.72	0.74	3.05
Sprout	10	2.87	2.75	1.92	111.65	111.81	112.40	0.86	1.62	3.50
TaoVA-100x	10	137.72	145.89	114.18	111.73	111.96	113.97	1.33	1.19	3.49
TCP Vegas	10	47.85	40.97	33.93	111.90	113.11	112.73	0.67	1.15	2.61
Verus	10	156.09	115.86	67.67	176.13	184.72	174.35	1.88	2.25	5.20

```
Run 1: Statistics of TCP BBR

Start at: 2017-09-18 17:23:21
End at: 2017-09-18 17:23:51

# Below is generated by plot.py at 2017-09-18 21:00:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 179.94 Mbit/s
95th percentile per-packet one-way delay: 111.885 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 92.12 Mbit/s
95th percentile per-packet one-way delay: 111.791 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 89.96 Mbit/s
95th percentile per-packet one-way delay: 111.833 ms
Loss rate: 1.35%
-- Flow 3:
Average throughput: 87.60 Mbit/s
95th percentile per-packet one-way delay: 112.068 ms
Loss rate: 2.84%
```
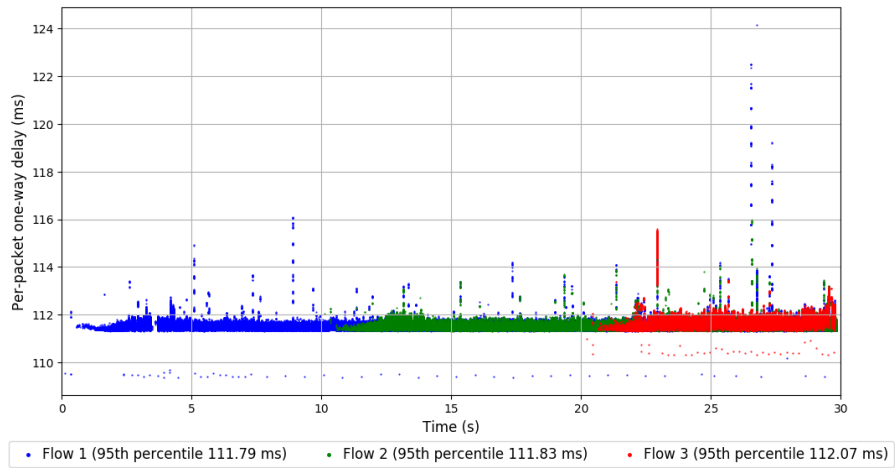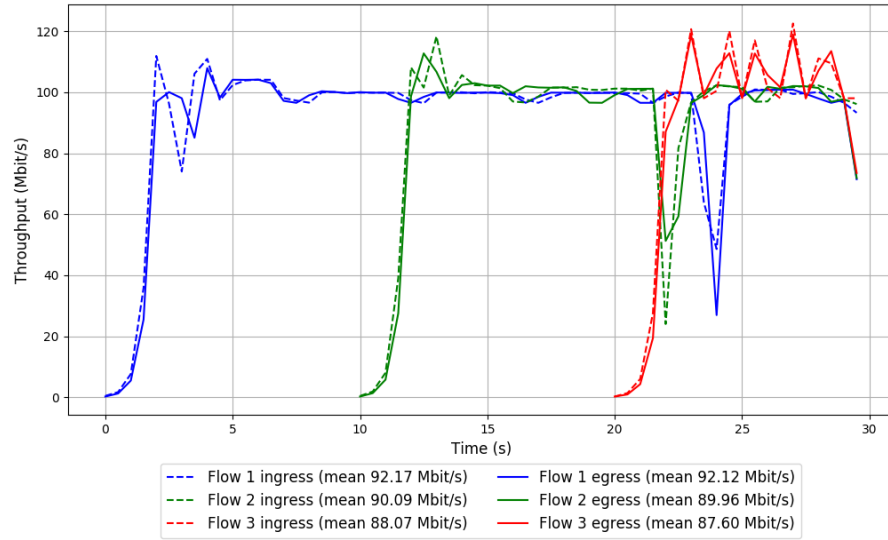
Run 1: Report of TCP BBR — Data Link

Flow 1 ingress (mean 92.17 Mbit/s) — Flow 1 egress (mean 92.12 Mbit/s)
Flow 2 ingress (mean 90.09 Mbit/s) — Flow 2 egress (mean 89.96 Mbit/s)
Flow 3 ingress (mean 88.07 Mbit/s) — Flow 3 egress (mean 87.60 Mbit/s)

Flow 1 (95th percentile 111.79 ms) — Flow 2 (95th percentile 111.83 ms) — Flow 3 (95th percentile 112.07 ms)

```
Run 2: Statistics of TCP BBR

Start at: 2017-09-18 17:33:33
End at: 2017-09-18 17:34:03

# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 182.32 Mbit/s
95th percentile per-packet one-way delay: 111.559 ms
Loss rate: 1.24%
-- Flow 1:
Average throughput: 95.55 Mbit/s
95th percentile per-packet one-way delay: 111.586 ms
Loss rate: 0.77%
-- Flow 2:
Average throughput: 89.95 Mbit/s
95th percentile per-packet one-way delay: 111.512 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 83.10 Mbit/s
95th percentile per-packet one-way delay: 111.567 ms
Loss rate: 2.91%
```
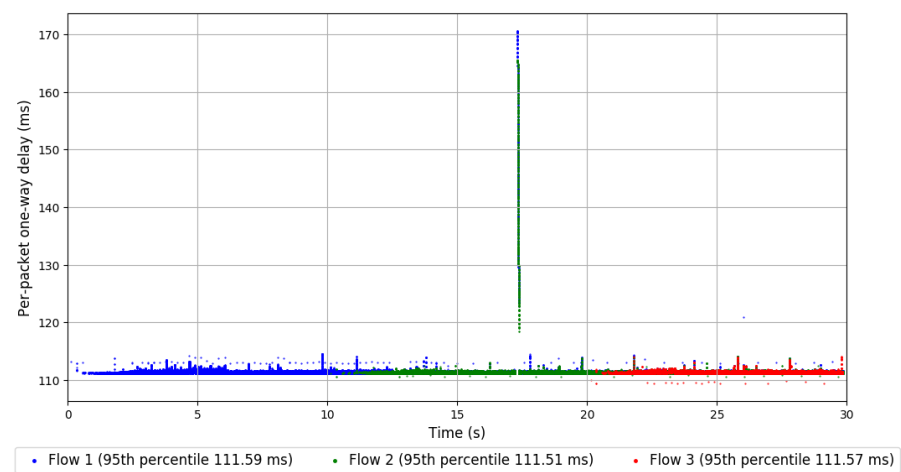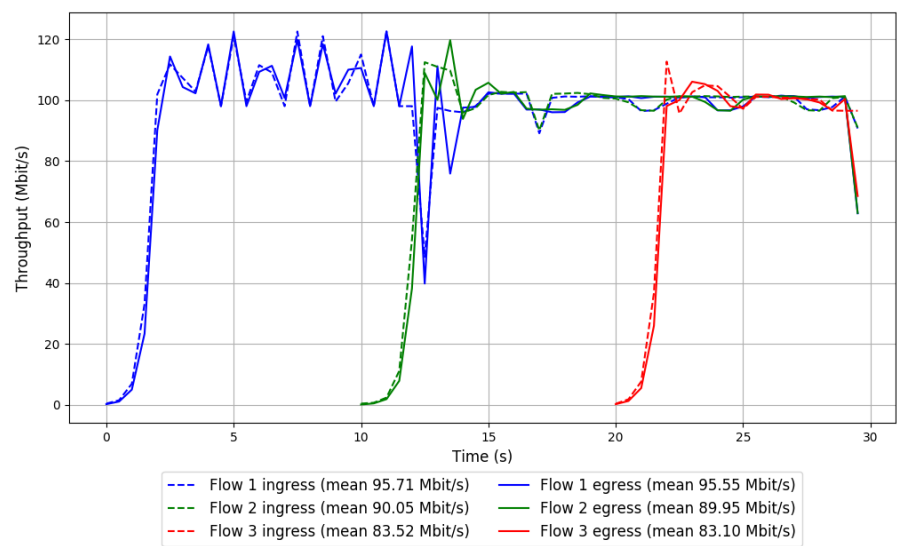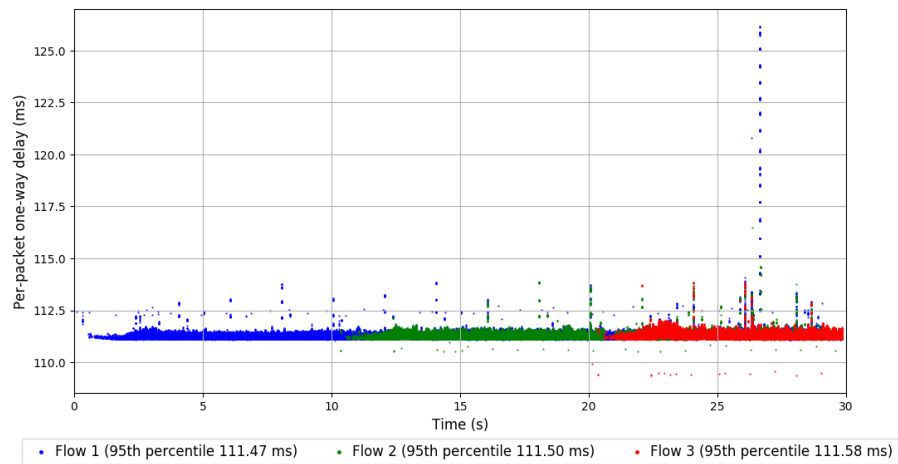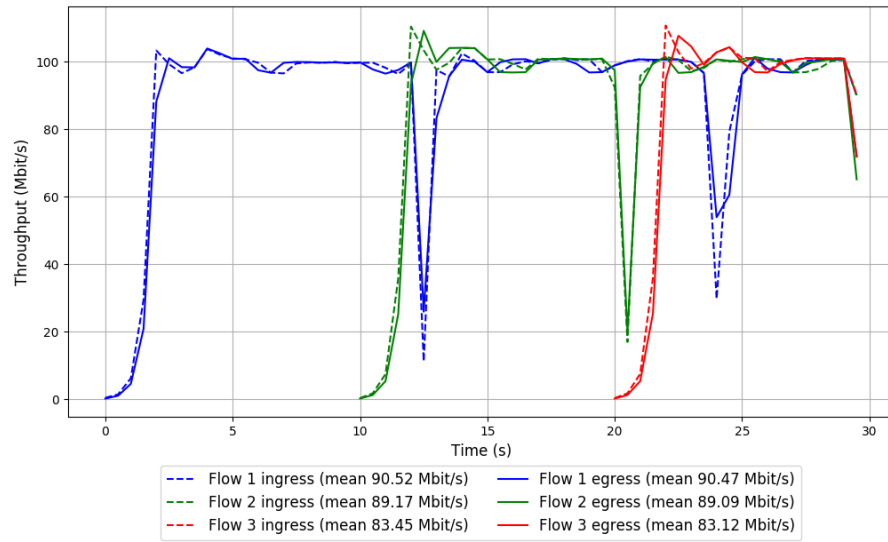
Run 2: Report of TCP BBR — Data Link

Flow 1 ingress (mean 95.71 Mbit/s) — — —   Flow 1 egress (mean 95.55 Mbit/s) ———
Flow 2 ingress (mean 90.05 Mbit/s) — — —   Flow 2 egress (mean 89.95 Mbit/s) ———
Flow 3 ingress (mean 83.52 Mbit/s) — — —   Flow 3 egress (mean 83.10 Mbit/s) ———

• Flow 1 (95th percentile 111.59 ms)   • Flow 2 (95th percentile 111.51 ms)   • Flow 3 (95th percentile 111.57 ms)

```
Run 3: Statistics of TCP BBR

Start at: 2017-09-18 17:43:43
End at: 2017-09-18 17:44:13

# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 176.72 Mbit/s
95th percentile per-packet one-way delay: 111.502 ms
Loss rate: 1.23%
-- Flow 1:
Average throughput: 90.47 Mbit/s
95th percentile per-packet one-way delay: 111.471 ms
Loss rate: 0.80%
-- Flow 2:
Average throughput: 89.09 Mbit/s
95th percentile per-packet one-way delay: 111.500 ms
Loss rate: 1.22%
-- Flow 3:
Average throughput: 83.12 Mbit/s
95th percentile per-packet one-way delay: 111.582 ms
Loss rate: 2.62%
```
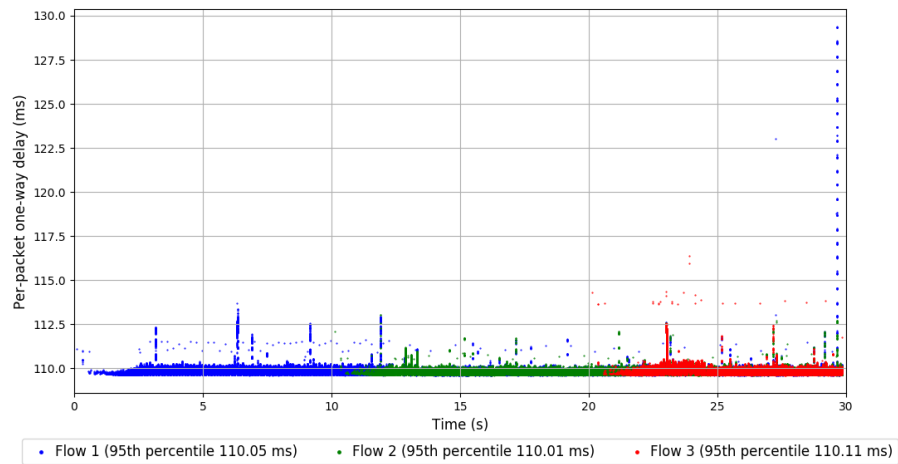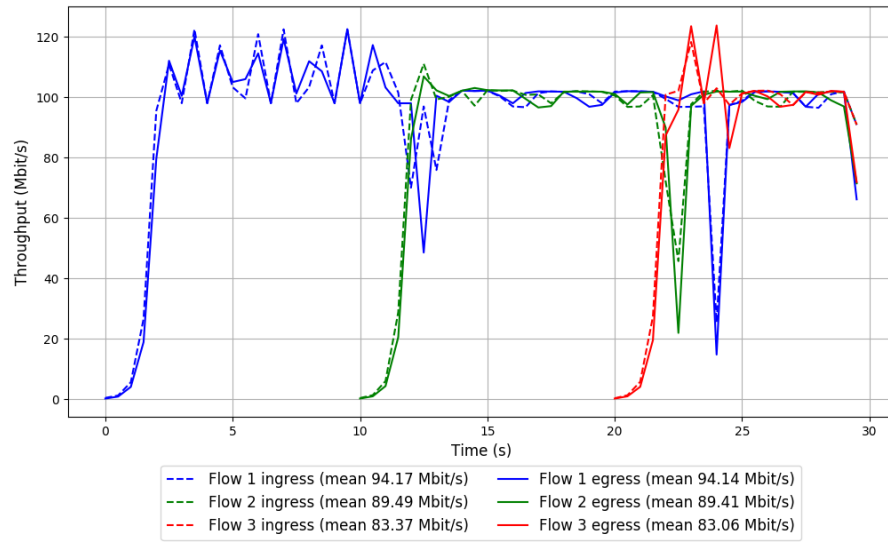
Run 3: Report of TCP BBR — Data Link

```
Run 4: Statistics of TCP BBR

Start at: 2017-09-18 17:53:32
End at: 2017-09-18 17:54:02

# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 180.56 Mbit/s
95th percentile per-packet one-way delay: 110.047 ms
Loss rate: 1.20%
-- Flow 1:
Average throughput: 94.14 Mbit/s
95th percentile per-packet one-way delay: 110.047 ms
Loss rate: 0.77%
-- Flow 2:
Average throughput: 89.41 Mbit/s
95th percentile per-packet one-way delay: 110.013 ms
Loss rate: 1.22%
-- Flow 3:
Average throughput: 83.06 Mbit/s
95th percentile per-packet one-way delay: 110.110 ms
Loss rate: 2.63%
```
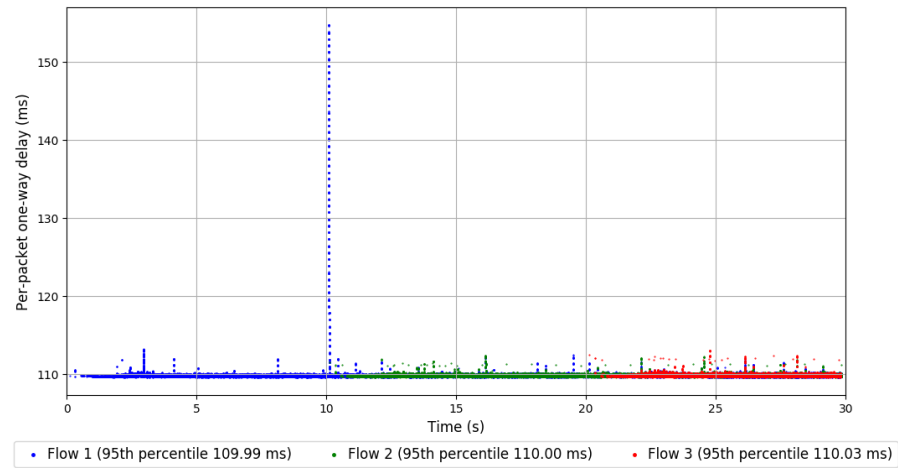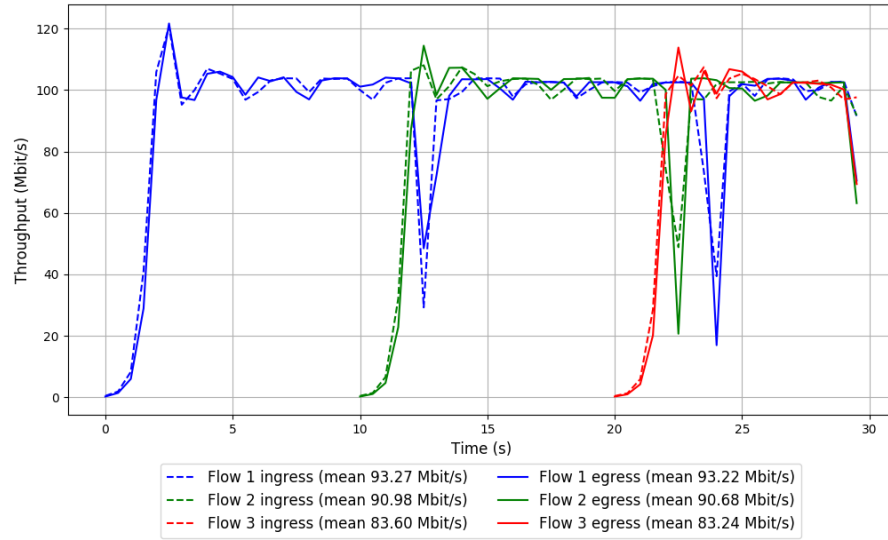
Run 4: Report of TCP BBR — Data Link

Flow 1 ingress (mean 94.17 Mbit/s) --- Flow 1 egress (mean 94.14 Mbit/s)
Flow 2 ingress (mean 89.49 Mbit/s) --- Flow 2 egress (mean 89.41 Mbit/s)
Flow 3 ingress (mean 83.37 Mbit/s) --- Flow 3 egress (mean 83.06 Mbit/s)

Flow 1 (95th percentile 110.05 ms)   Flow 2 (95th percentile 110.01 ms)   Flow 3 (95th percentile 110.11 ms)

```
Run 5: Statistics of TCP BBR

Start at: 2017-09-18 18:03:39
End at: 2017-09-18 18:04:09

# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 180.49 Mbit/s
95th percentile per-packet one-way delay: 110.000 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 93.22 Mbit/s
95th percentile per-packet one-way delay: 109.993 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 90.68 Mbit/s
95th percentile per-packet one-way delay: 109.995 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 83.24 Mbit/s
95th percentile per-packet one-way delay: 110.033 ms
Loss rate: 2.97%
```
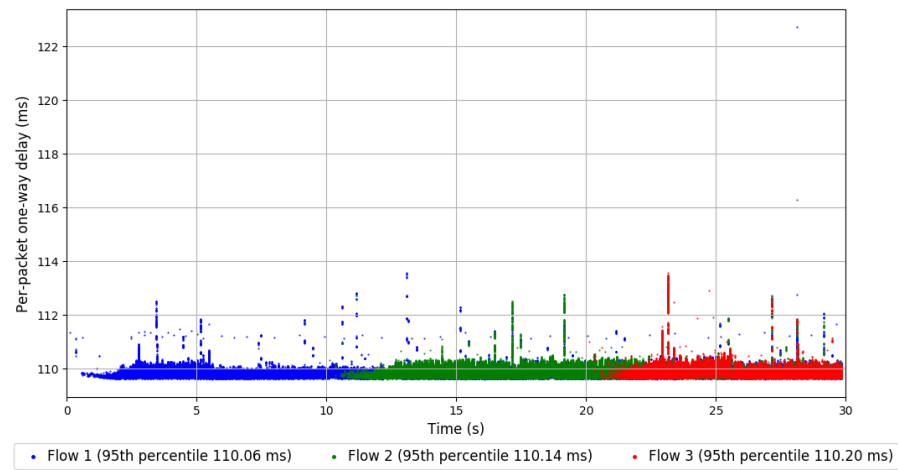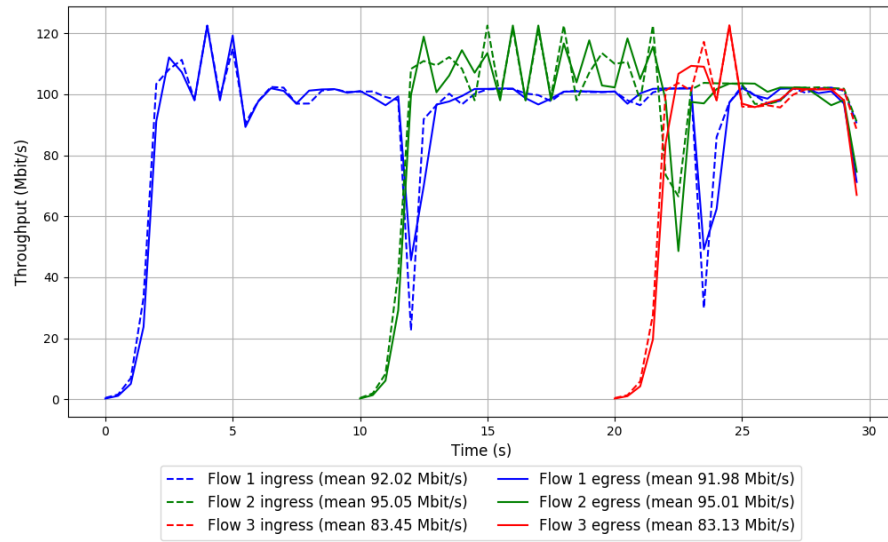
Run 5: Report of TCP BBR — Data Link

Flow 1 ingress (mean 93.27 Mbit/s) --- Flow 1 egress (mean 93.22 Mbit/s)
Flow 2 ingress (mean 90.98 Mbit/s) --- Flow 2 egress (mean 90.68 Mbit/s)
Flow 3 ingress (mean 83.60 Mbit/s) --- Flow 3 egress (mean 83.24 Mbit/s)

Flow 1 (95th percentile 109.99 ms)   Flow 2 (95th percentile 110.00 ms)   Flow 3 (95th percentile 110.03 ms)

```
Run 6: Statistics of TCP BBR

Start at: 2017-09-18 18:13:52
End at: 2017-09-18 18:14:22

# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 182.16 Mbit/s
95th percentile per-packet one-way delay: 110.115 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 91.98 Mbit/s
95th percentile per-packet one-way delay: 110.057 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 95.01 Mbit/s
95th percentile per-packet one-way delay: 110.141 ms
Loss rate: 1.16%
-- Flow 3:
Average throughput: 83.13 Mbit/s
95th percentile per-packet one-way delay: 110.196 ms
Loss rate: 2.62%
```
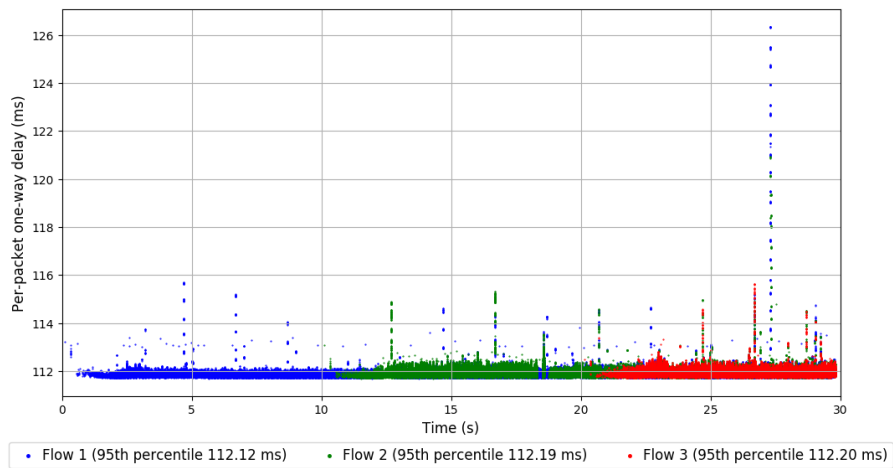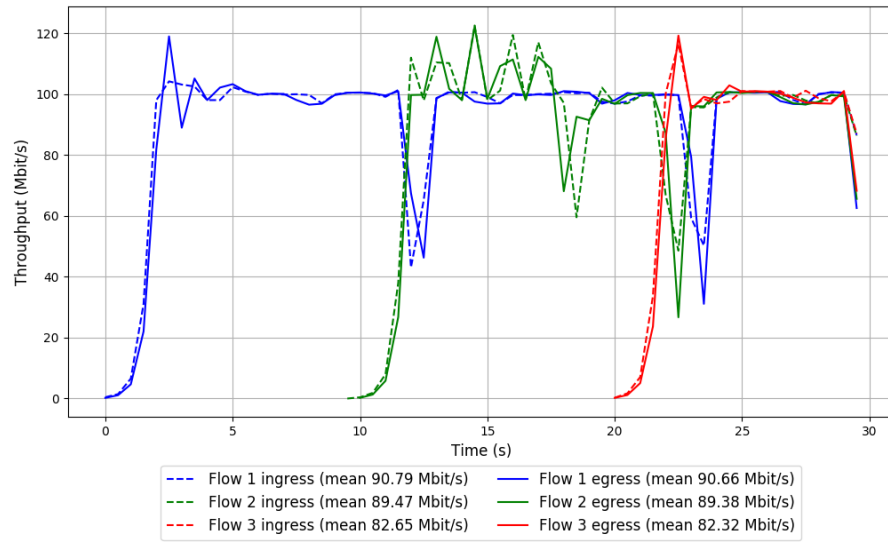
Run 6: Report of TCP BBR — Data Link

```
Run 7: Statistics of TCP BBR

Start at: 2017-09-18 18:23:32
End at: 2017-09-18 18:24:02


# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 176.77 Mbit/s
95th percentile per-packet one-way delay: 112.165 ms
Loss rate: 1.28%
-- Flow 1:
Average throughput: 90.66 Mbit/s
95th percentile per-packet one-way delay: 112.122 ms
Loss rate: 0.89%
-- Flow 2:
Average throughput: 89.38 Mbit/s
95th percentile per-packet one-way delay: 112.194 ms
Loss rate: 1.25%
-- Flow 3:
Average throughput: 82.32 Mbit/s
95th percentile per-packet one-way delay: 112.205 ms
Loss rate: 2.66%
```
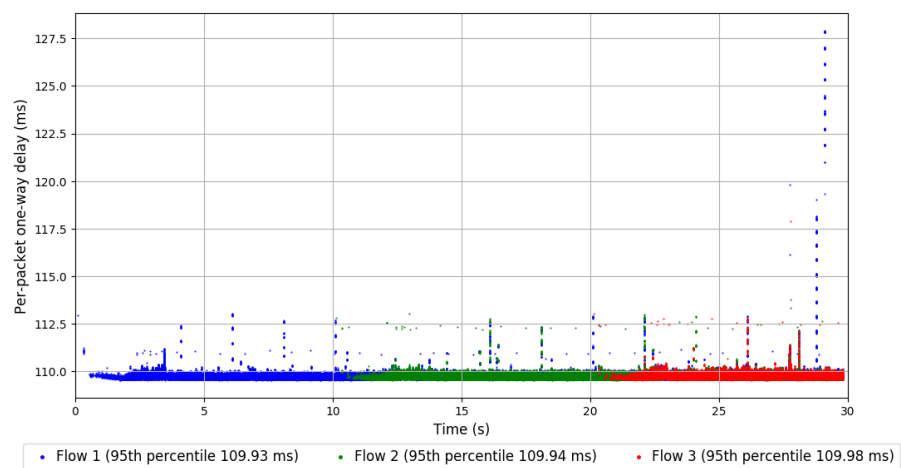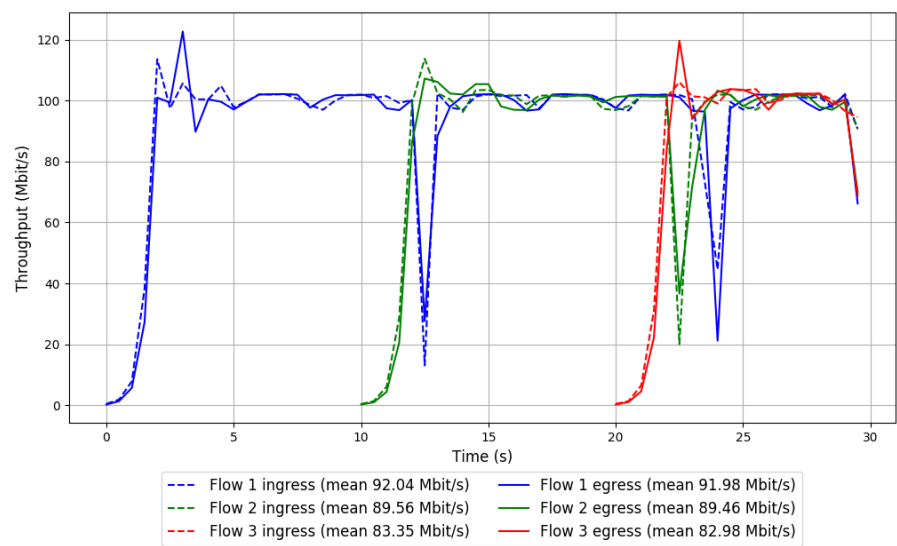
Run 7: Report of TCP BBR — Data Link

Flow 1 ingress (mean 90.79 Mbit/s) --- Flow 1 egress (mean 90.66 Mbit/s)
Flow 2 ingress (mean 89.47 Mbit/s) --- Flow 2 egress (mean 89.38 Mbit/s)
Flow 3 ingress (mean 82.65 Mbit/s) --- Flow 3 egress (mean 82.32 Mbit/s)

Flow 1 (95th percentile 112.12 ms)   Flow 2 (95th percentile 112.19 ms)   Flow 3 (95th percentile 112.20 ms)

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```
Run 8: Statistics of TCP BBR

Start at: 2017-09-18 18:33:01
End at: 2017-09-18 18:33:31


# Below is generated by plot.py at 2017-09-18 21:00:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 178.36 Mbit/s
95th percentile per-packet one-way delay: 109.942 ms
Loss rate: 1.31%
-- Flow 1:
Average throughput: 91.98 Mbit/s
95th percentile per-packet one-way delay: 109.928 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 89.46 Mbit/s
95th percentile per-packet one-way delay: 109.942 ms
Loss rate: 1.28%
-- Flow 3:
Average throughput: 82.98 Mbit/s
95th percentile per-packet one-way delay: 109.982 ms
Loss rate: 2.80%
```
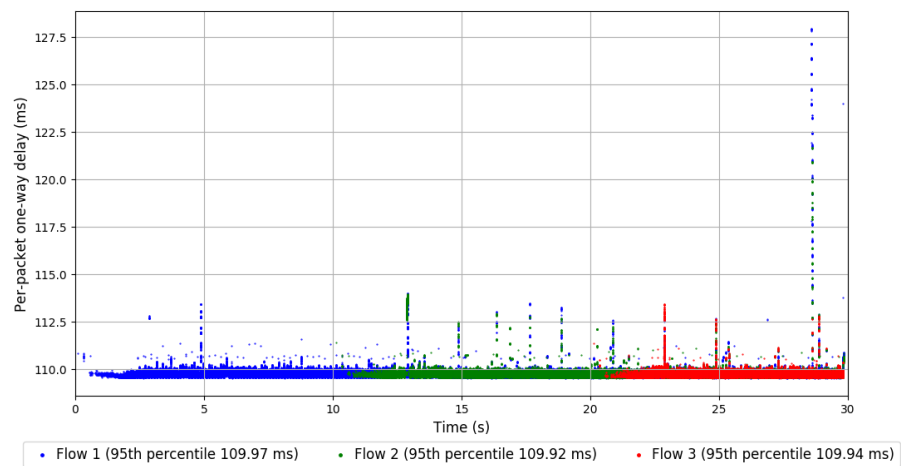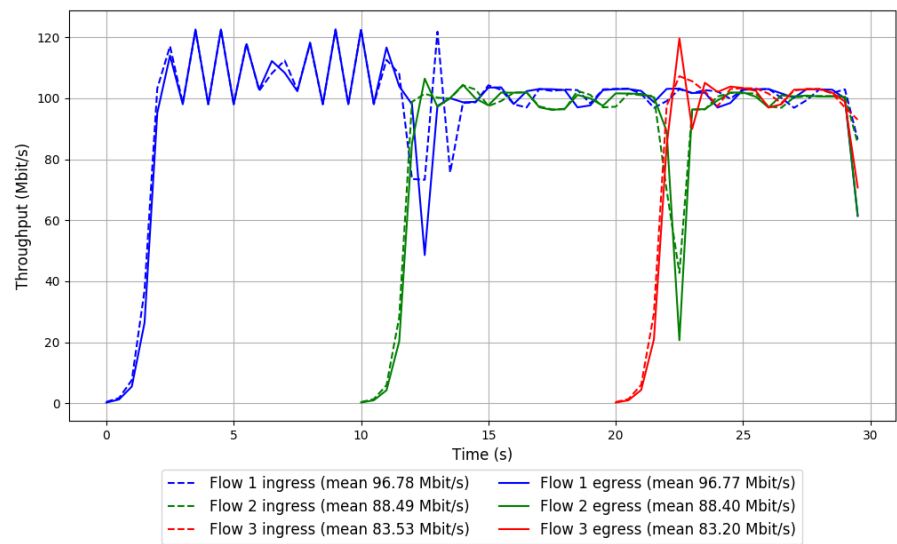
Run 8: Report of TCP BBR — Data Link

Flow 1 ingress (mean 92.04 Mbit/s)   Flow 1 egress (mean 91.98 Mbit/s)
Flow 2 ingress (mean 89.56 Mbit/s)   Flow 2 egress (mean 89.46 Mbit/s)
Flow 3 ingress (mean 83.35 Mbit/s)   Flow 3 egress (mean 82.98 Mbit/s)

Flow 1 (95th percentile 109.93 ms)   Flow 2 (95th percentile 109.94 ms)   Flow 3 (95th percentile 109.98 ms)

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```
Run 9: Statistics of TCP BBR

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

# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 182.51 Mbit/s
95th percentile per-packet one-way delay: 109.955 ms
Loss rate: 1.21%
-- Flow 1:
Average throughput: 96.77 Mbit/s
95th percentile per-packet one-way delay: 109.973 ms
Loss rate: 0.77%
-- Flow 2:
Average throughput: 88.40 Mbit/s
95th percentile per-packet one-way delay: 109.922 ms
Loss rate: 1.24%
-- Flow 3:
Average throughput: 83.20 Mbit/s
95th percentile per-packet one-way delay: 109.945 ms
Loss rate: 2.69%
```
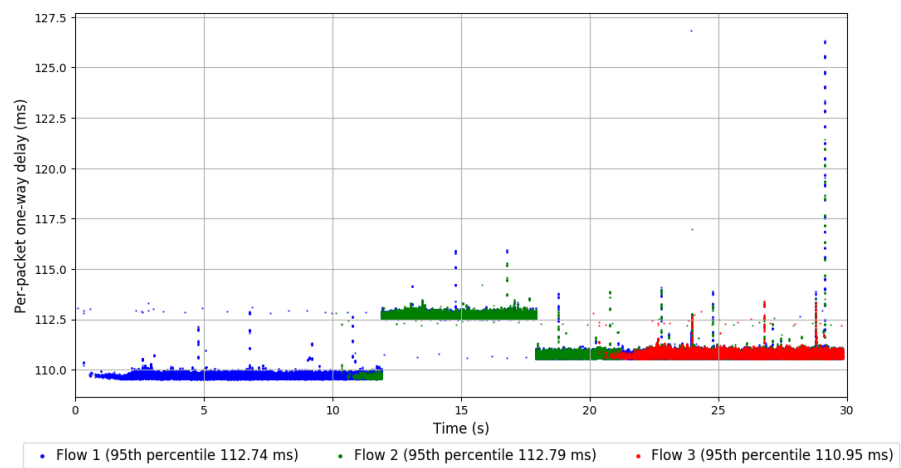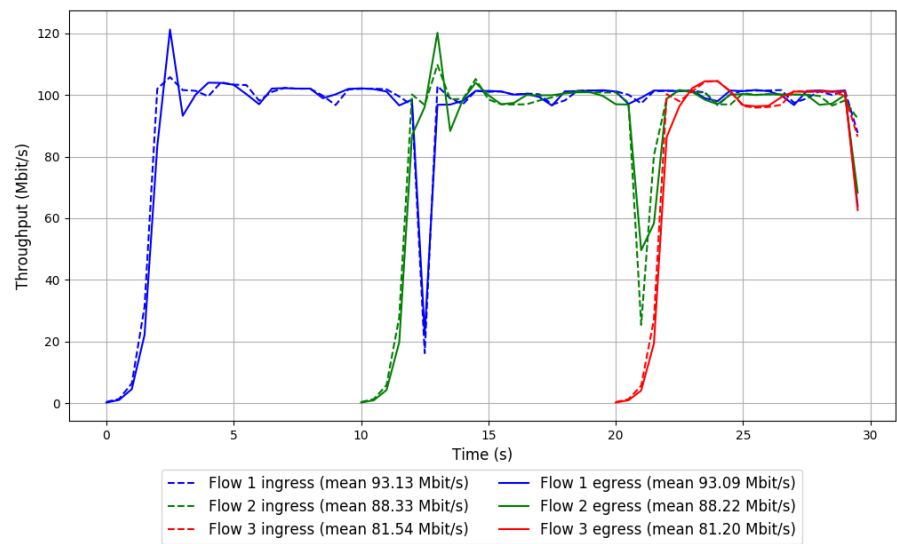
Run 9: Report of TCP BBR — Data Link

- Flow 1 ingress (mean 96.78 Mbit/s)
- Flow 1 egress (mean 96.77 Mbit/s)
- Flow 2 ingress (mean 88.49 Mbit/s)
- Flow 2 egress (mean 88.40 Mbit/s)
- Flow 3 ingress (mean 83.53 Mbit/s)
- Flow 3 egress (mean 83.20 Mbit/s)

- Flow 1 (95th percentile 109.97 ms)
- Flow 2 (95th percentile 109.92 ms)
- Flow 3 (95th percentile 109.94 ms)

```
Run 10: Statistics of TCP BBR

Start at: 2017-09-18 18:52:50
End at: 2017-09-18 18:53:20

# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 178.09 Mbit/s
95th percentile per-packet one-way delay: 112.744 ms
Loss rate: 1.24%
-- Flow 1:
Average throughput: 93.09 Mbit/s
95th percentile per-packet one-way delay: 112.736 ms
Loss rate: 0.79%
-- Flow 2:
Average throughput: 88.22 Mbit/s
95th percentile per-packet one-way delay: 112.786 ms
Loss rate: 1.30%
-- Flow 3:
Average throughput: 81.20 Mbit/s
95th percentile per-packet one-way delay: 110.952 ms
Loss rate: 2.68%
```
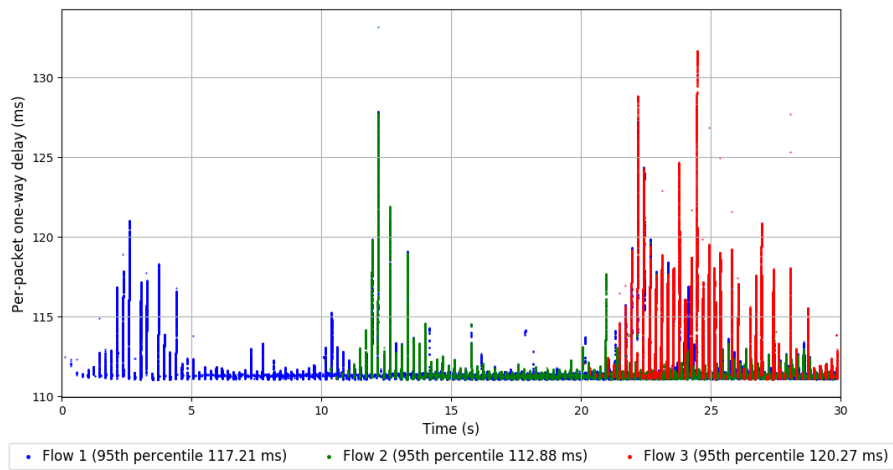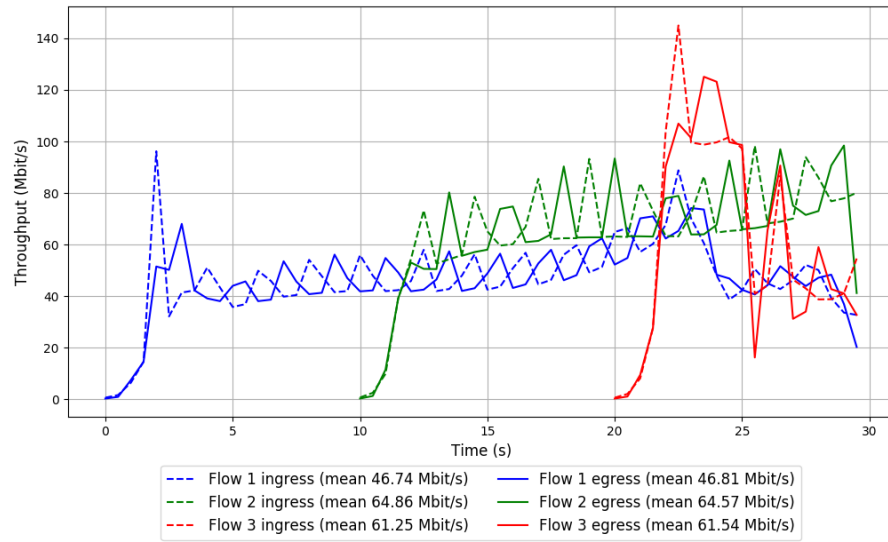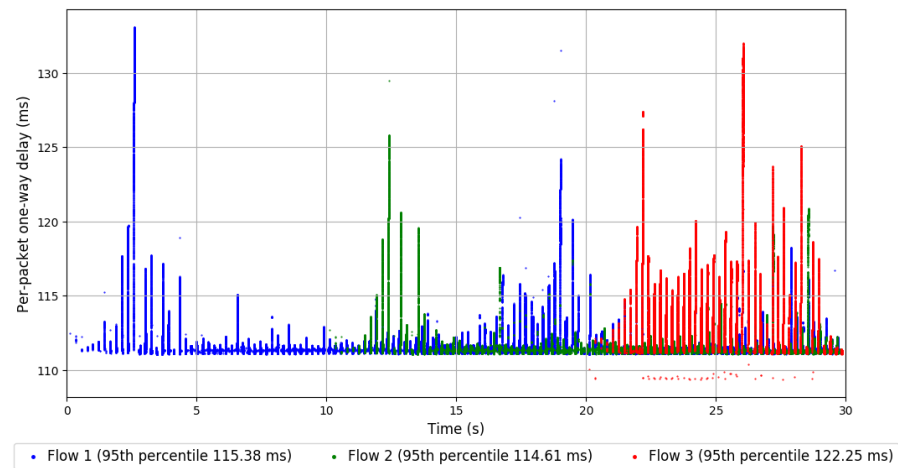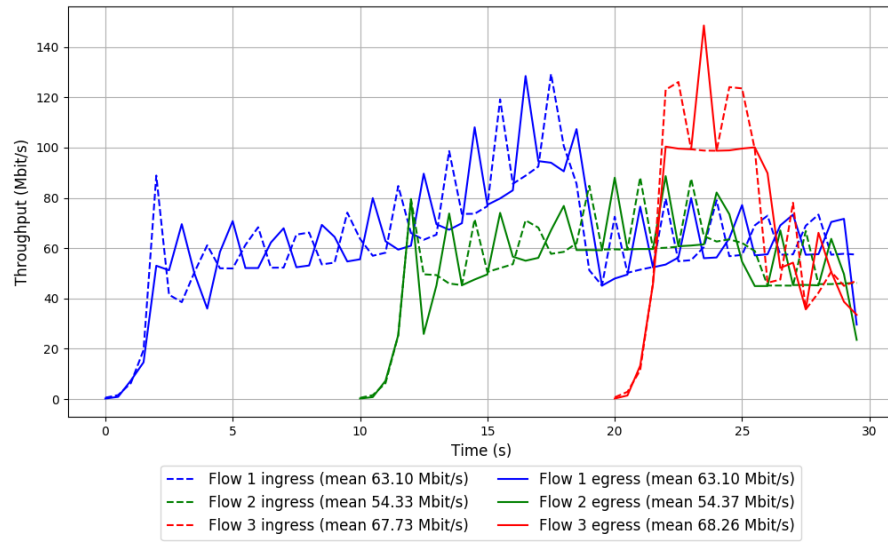
Run 10: Report of TCP BBR — Data Link

Flow 1 ingress (mean 93.13 Mbit/s) ---- Flow 1 egress (mean 93.09 Mbit/s)
Flow 2 ingress (mean 88.33 Mbit/s) ---- Flow 2 egress (mean 88.22 Mbit/s)
Flow 3 ingress (mean 81.54 Mbit/s) ---- Flow 3 egress (mean 81.20 Mbit/s)

Flow 1 (95th percentile 112.74 ms)   Flow 2 (95th percentile 112.79 ms)   Flow 3 (95th percentile 110.95 ms)

```
Run 1: Statistics of TCP Cubic

Start at: 2017-09-18 17:30:27
End at: 2017-09-18 17:30:57

# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 109.69 Mbit/s
95th percentile per-packet one-way delay: 117.627 ms
Loss rate: 1.19%
-- Flow 1:
Average throughput: 46.81 Mbit/s
95th percentile per-packet one-way delay: 117.211 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 64.57 Mbit/s
95th percentile per-packet one-way delay: 112.881 ms
Loss rate: 1.56%
-- Flow 3:
Average throughput: 61.54 Mbit/s
95th percentile per-packet one-way delay: 120.274 ms
Loss rate: 1.80%
```
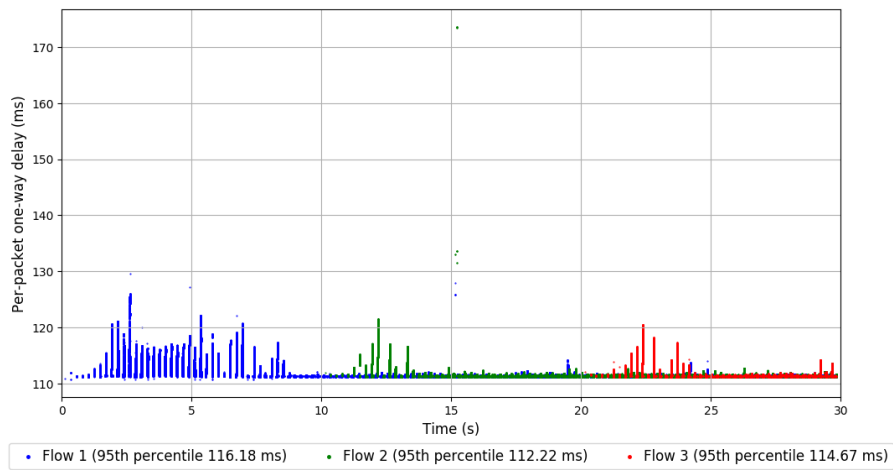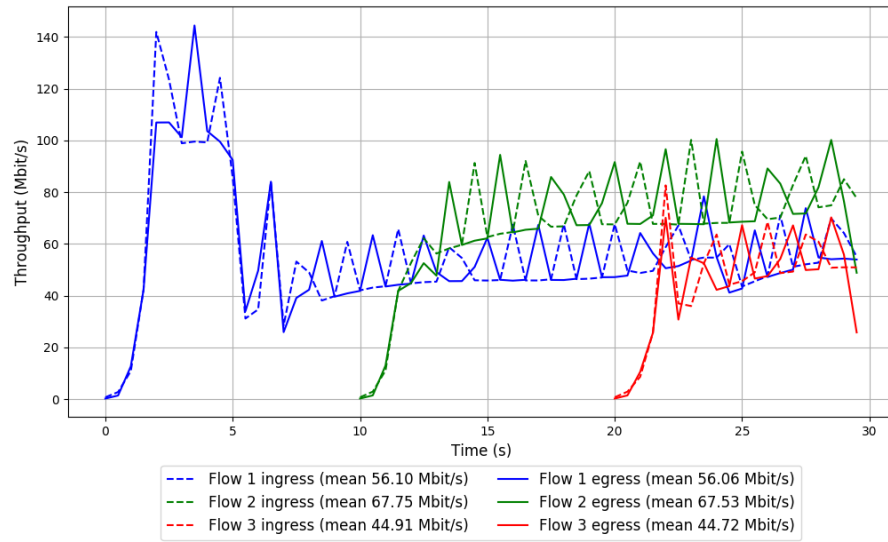
Run 1: Report of TCP Cubic — Data Link

Throughput (Mbit/s) vs Time (s)

- – – – Flow 1 ingress (mean 46.74 Mbit/s)
- —— Flow 1 egress (mean 46.81 Mbit/s)
- – – – Flow 2 ingress (mean 64.86 Mbit/s)
- —— Flow 2 egress (mean 64.57 Mbit/s)
- – – – Flow 3 ingress (mean 61.25 Mbit/s)
- —— Flow 3 egress (mean 61.54 Mbit/s)

Per-packet one-way delay (ms) vs Time (s)

- • Flow 1 (95th percentile 117.21 ms)
- • Flow 2 (95th percentile 112.88 ms)
- • Flow 3 (95th percentile 120.27 ms)

```
Run 2: Statistics of TCP Cubic

Start at: 2017-09-18 17:40:35
End at: 2017-09-18 17:41:05


# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 121.44 Mbit/s
95th percentile per-packet one-way delay: 117.015 ms
Loss rate: 0.98%
-- Flow 1:
Average throughput: 63.10 Mbit/s
95th percentile per-packet one-way delay: 115.380 ms
Loss rate: 0.76%
-- Flow 2:
Average throughput: 54.37 Mbit/s
95th percentile per-packet one-way delay: 114.607 ms
Loss rate: 1.07%
-- Flow 3:
Average throughput: 68.26 Mbit/s
95th percentile per-packet one-way delay: 122.254 ms
Loss rate: 1.48%
```
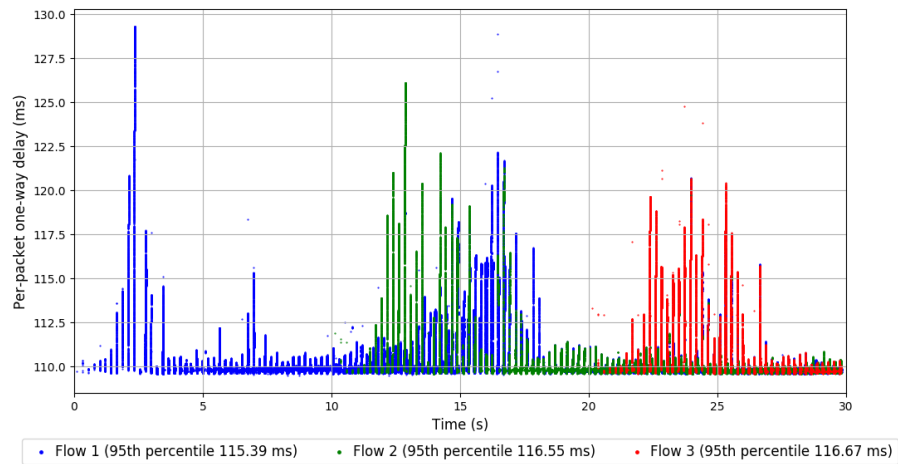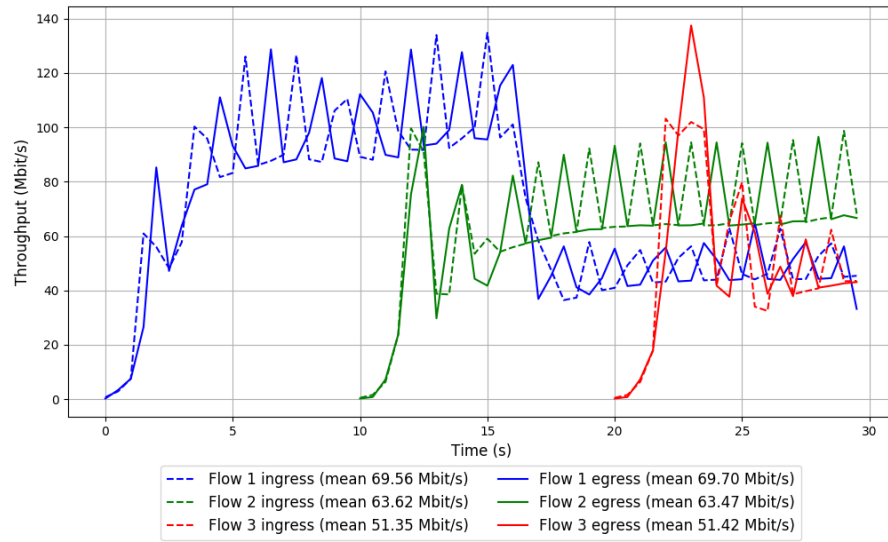
Run 2: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 63.10 Mbit/s) --- Flow 1 egress (mean 63.10 Mbit/s)
Flow 2 ingress (mean 54.33 Mbit/s) --- Flow 2 egress (mean 54.37 Mbit/s)
Flow 3 ingress (mean 67.73 Mbit/s) --- Flow 3 egress (mean 68.26 Mbit/s)

Flow 1 (95th percentile 115.38 ms)   Flow 2 (95th percentile 114.61 ms)   Flow 3 (95th percentile 122.25 ms)

27

```
Run 3: Statistics of TCP Cubic

Start at: 2017-09-18 17:50:41
End at: 2017-09-18 17:51:11

# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 115.40 Mbit/s
95th percentile per-packet one-way delay: 115.204 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 56.06 Mbit/s
95th percentile per-packet one-way delay: 116.184 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 67.53 Mbit/s
95th percentile per-packet one-way delay: 112.222 ms
Loss rate: 1.45%
-- Flow 3:
Average throughput: 44.72 Mbit/s
95th percentile per-packet one-way delay: 114.670 ms
Loss rate: 2.86%
```
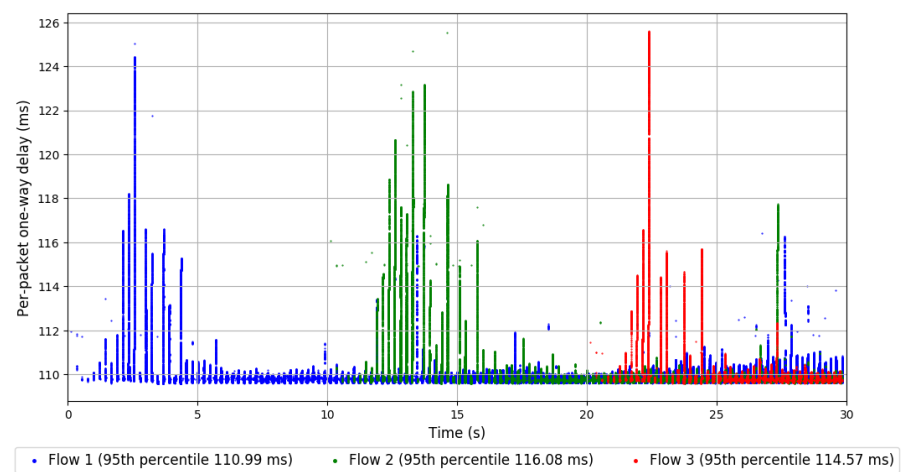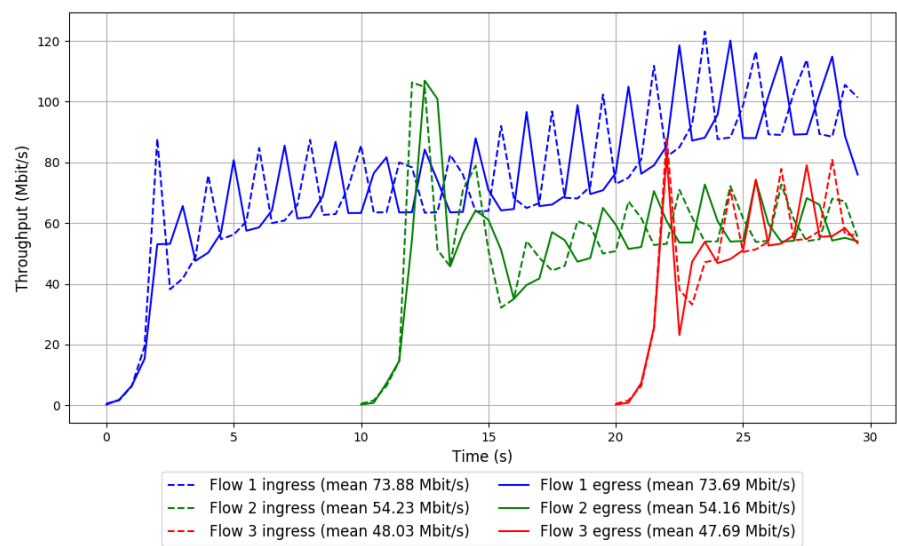
Run 3: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 56.10 Mbit/s)   Flow 1 egress (mean 56.06 Mbit/s)
Flow 2 ingress (mean 67.75 Mbit/s)   Flow 2 egress (mean 67.53 Mbit/s)
Flow 3 ingress (mean 44.91 Mbit/s)   Flow 3 egress (mean 44.72 Mbit/s)

Flow 1 (95th percentile 116.18 ms)   Flow 2 (95th percentile 112.22 ms)   Flow 3 (95th percentile 114.67 ms)

```
Run 4: Statistics of TCP Cubic

Start at: 2017-09-18 18:00:32
End at: 2017-09-18 18:01:02

# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 128.44 Mbit/s
95th percentile per-packet one-way delay: 115.892 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 69.70 Mbit/s
95th percentile per-packet one-way delay: 115.393 ms
Loss rate: 0.54%
-- Flow 2:
Average throughput: 63.47 Mbit/s
95th percentile per-packet one-way delay: 116.553 ms
Loss rate: 1.35%
-- Flow 3:
Average throughput: 51.42 Mbit/s
95th percentile per-packet one-way delay: 116.669 ms
Loss rate: 2.15%
```
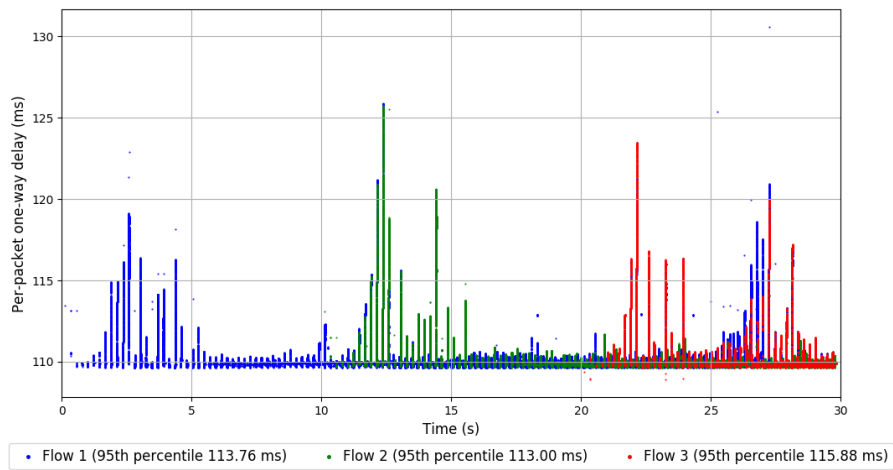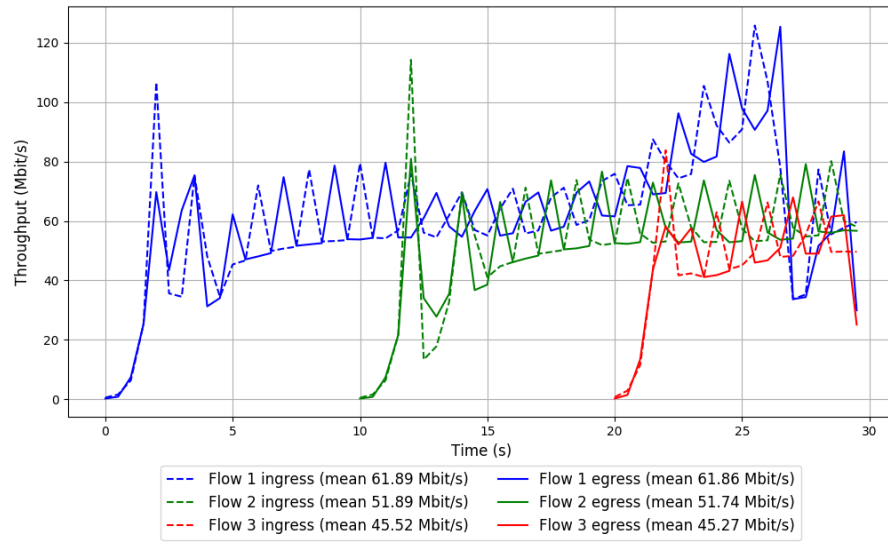
Run 4: Report of TCP Cubic — Data Link

```
Run 5: Statistics of TCP Cubic

Start at: 2017-09-18 18:10:44
End at: 2017-09-18 18:11:14


# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 125.14 Mbit/s
95th percentile per-packet one-way delay: 113.564 ms
Loss rate: 1.32%
-- Flow 1:
Average throughput: 73.69 Mbit/s
95th percentile per-packet one-way delay: 110.988 ms
Loss rate: 0.99%
-- Flow 2:
Average throughput: 54.16 Mbit/s
95th percentile per-packet one-way delay: 116.081 ms
Loss rate: 1.28%
-- Flow 3:
Average throughput: 47.69 Mbit/s
95th percentile per-packet one-way delay: 114.568 ms
Loss rate: 2.94%
```
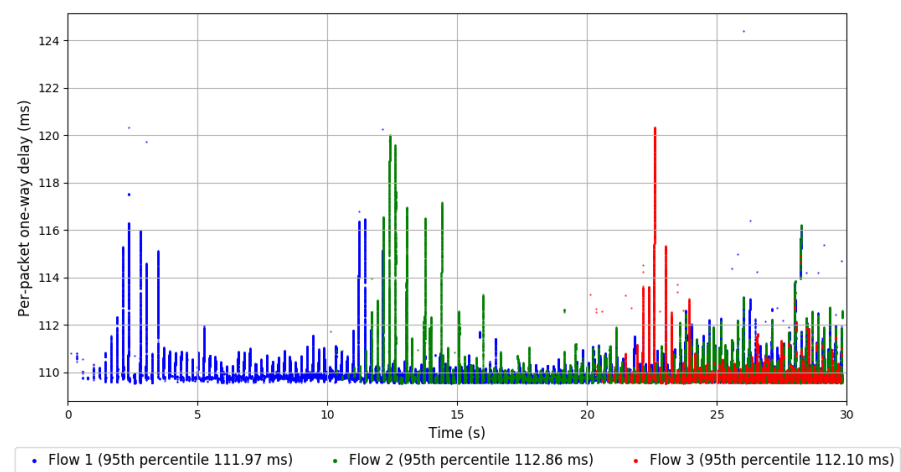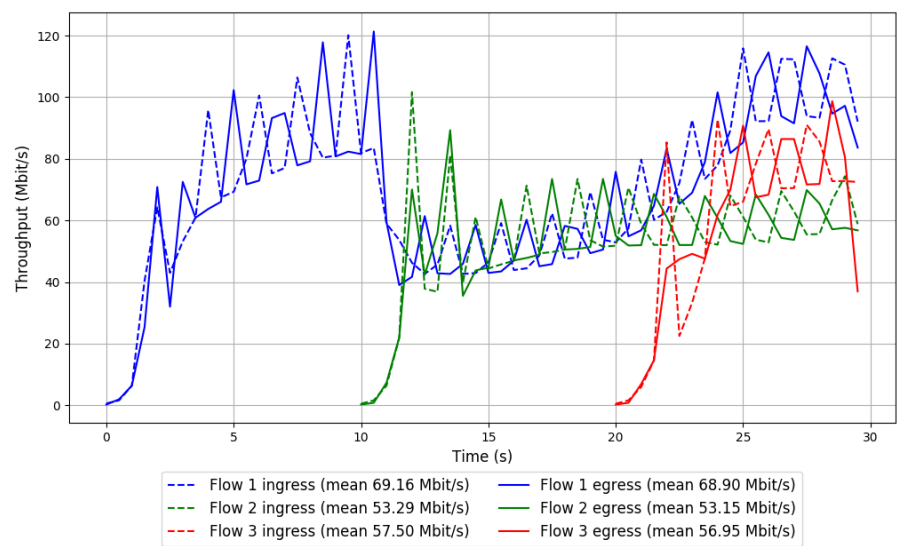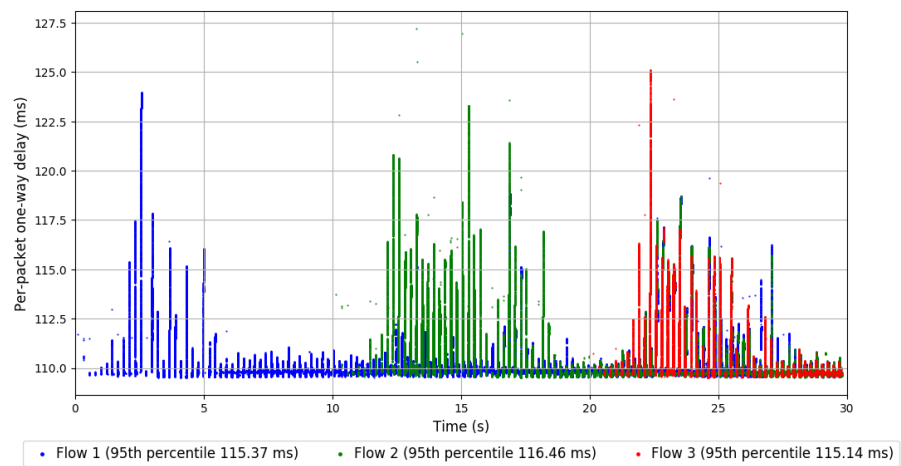
Run 5: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 73.88 Mbit/s) - - - - Flow 1 egress (mean 73.69 Mbit/s)
Flow 2 ingress (mean 54.23 Mbit/s) - - - - Flow 2 egress (mean 54.16 Mbit/s)
Flow 3 ingress (mean 48.03 Mbit/s) - - - - Flow 3 egress (mean 47.69 Mbit/s)

Flow 1 (95th percentile 110.99 ms)   Flow 2 (95th percentile 116.08 ms)   Flow 3 (95th percentile 114.57 ms)

33

```
Run 6: Statistics of TCP Cubic

Start at: 2017-09-18 18:21:00
End at: 2017-09-18 18:21:30


# Below is generated by plot.py at 2017-09-18 21:03:55
# Datalink statistics
-- Total of 3 flows:
Average throughput: 110.93 Mbit/s
95th percentile per-packet one-way delay: 113.954 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 61.86 Mbit/s
95th percentile per-packet one-way delay: 113.758 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 51.74 Mbit/s
95th percentile per-packet one-way delay: 112.995 ms
Loss rate: 1.41%
-- Flow 3:
Average throughput: 45.27 Mbit/s
95th percentile per-packet one-way delay: 115.876 ms
Loss rate: 2.75%
```
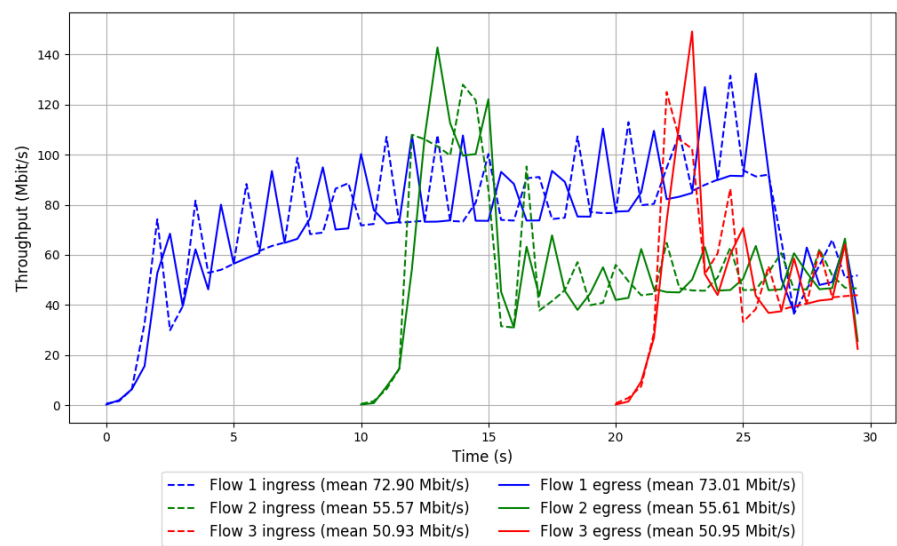
Run 6: Report of TCP Cubic — Data Link

Flow 1 ingress (mean 61.89 Mbit/s) --- Flow 1 egress (mean 61.86 Mbit/s)
Flow 2 ingress (mean 51.89 Mbit/s) --- Flow 2 egress (mean 51.74 Mbit/s)
Flow 3 ingress (mean 45.52 Mbit/s) --- Flow 3 egress (mean 45.27 Mbit/s)

Flow 1 (95th percentile 113.76 ms)　　Flow 2 (95th percentile 113.00 ms)　　Flow 3 (95th percentile 115.88 ms)

```
Run 7: Statistics of TCP Cubic

Start at: 2017-09-18 18:30:30
End at: 2017-09-18 18:31:00


# Below is generated by plot.py at 2017-09-18 21:04:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 122.63 Mbit/s
95th percentile per-packet one-way delay: 112.153 ms
Loss rate: 1.51%
-- Flow 1:
Average throughput: 68.90 Mbit/s
95th percentile per-packet one-way delay: 111.965 ms
Loss rate: 1.11%
-- Flow 2:
Average throughput: 53.15 Mbit/s
95th percentile per-packet one-way delay: 112.859 ms
Loss rate: 1.39%
-- Flow 3:
Average throughput: 56.95 Mbit/s
95th percentile per-packet one-way delay: 112.104 ms
Loss rate: 3.19%
```
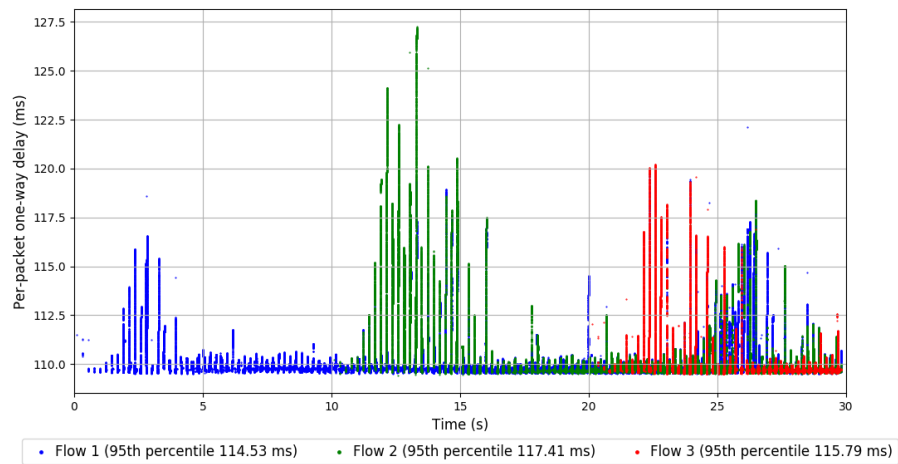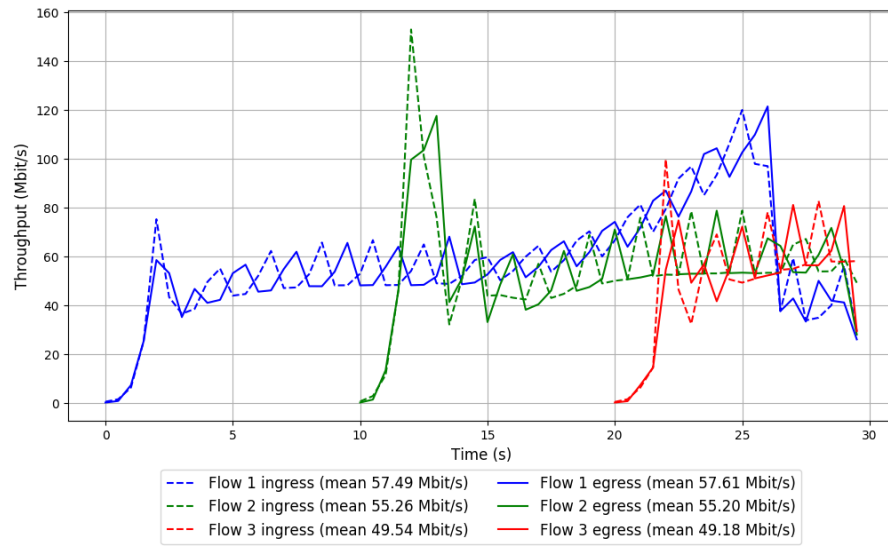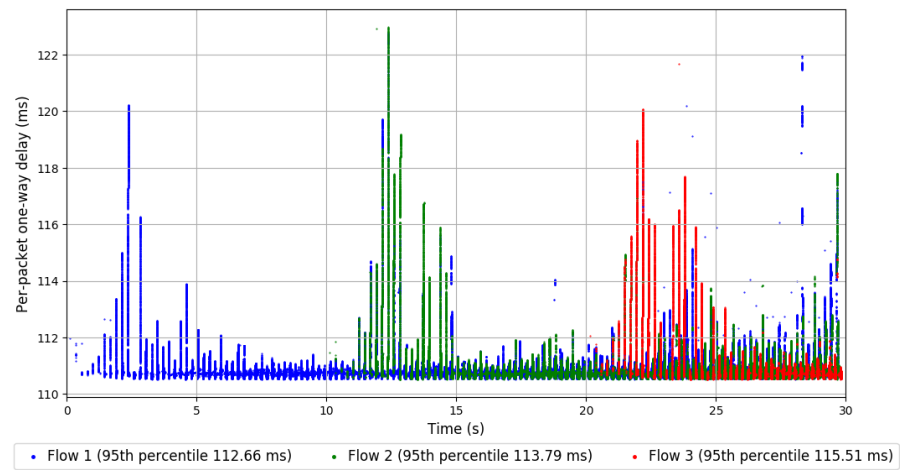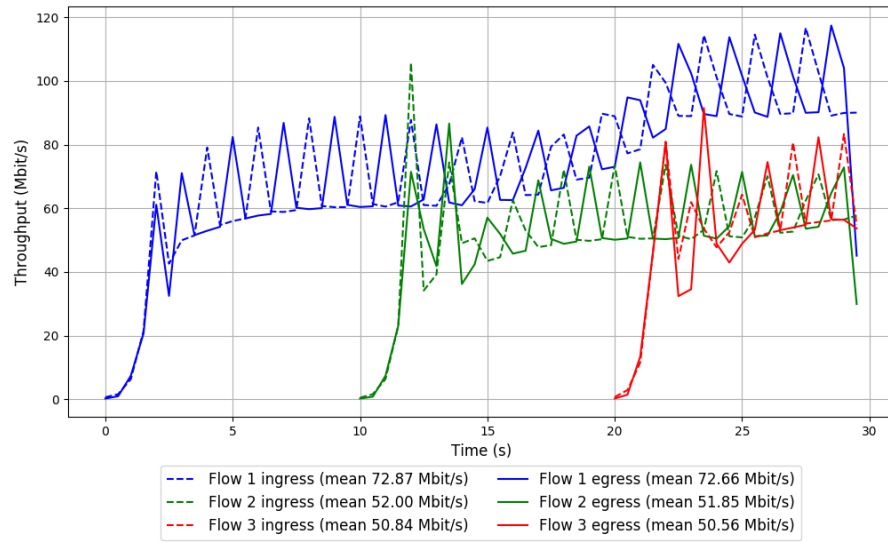
Run 7: Report of TCP Cubic — Data Link

```
Run 8: Statistics of TCP Cubic

Start at: 2017-09-18 18:39:57
End at: 2017-09-18 18:40:27


# Below is generated by plot.py at 2017-09-18 21:04:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 126.48 Mbit/s
95th percentile per-packet one-way delay: 115.766 ms
Loss rate: 0.94%
-- Flow 1:
Average throughput: 73.01 Mbit/s
95th percentile per-packet one-way delay: 115.374 ms
Loss rate: 0.60%
-- Flow 2:
Average throughput: 55.61 Mbit/s
95th percentile per-packet one-way delay: 116.459 ms
Loss rate: 1.06%
-- Flow 3:
Average throughput: 50.95 Mbit/s
95th percentile per-packet one-way delay: 115.145 ms
Loss rate: 2.18%
```
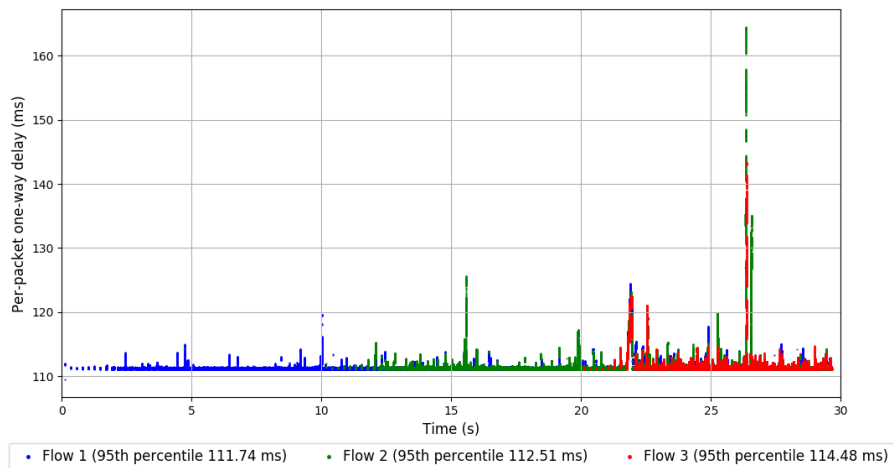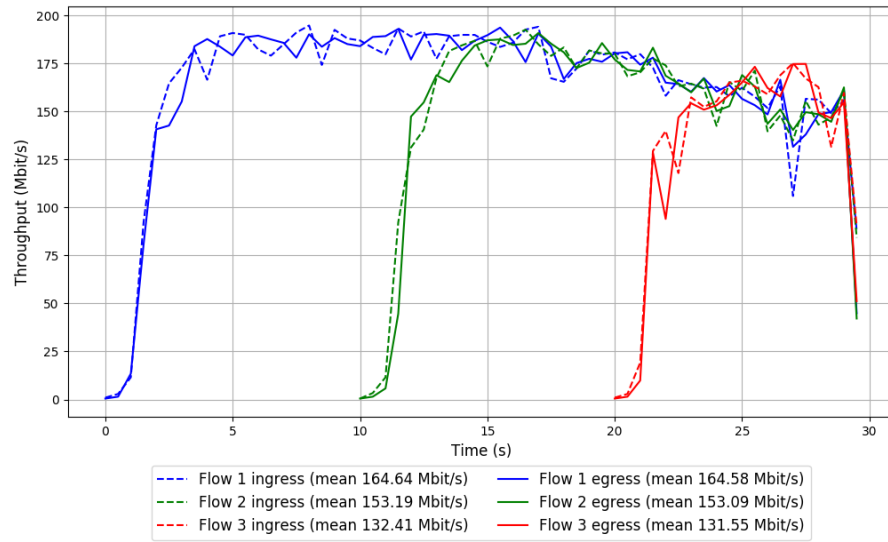
Run 8: Report of TCP Cubic — Data Link

```
Run 9: Statistics of TCP Cubic

Start at: 2017-09-18 18:49:45
End at: 2017-09-18 18:50:15


# Below is generated by plot.py at 2017-09-18 21:04:41
# Datalink statistics
-- Total of 3 flows:
Average throughput: 110.22 Mbit/s
95th percentile per-packet one-way delay: 115.779 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 57.61 Mbit/s
95th percentile per-packet one-way delay: 114.525 ms
Loss rate: 0.54%
-- Flow 2:
Average throughput: 55.20 Mbit/s
95th percentile per-packet one-way delay: 117.409 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 49.18 Mbit/s
95th percentile per-packet one-way delay: 115.790 ms
Loss rate: 2.97%
```

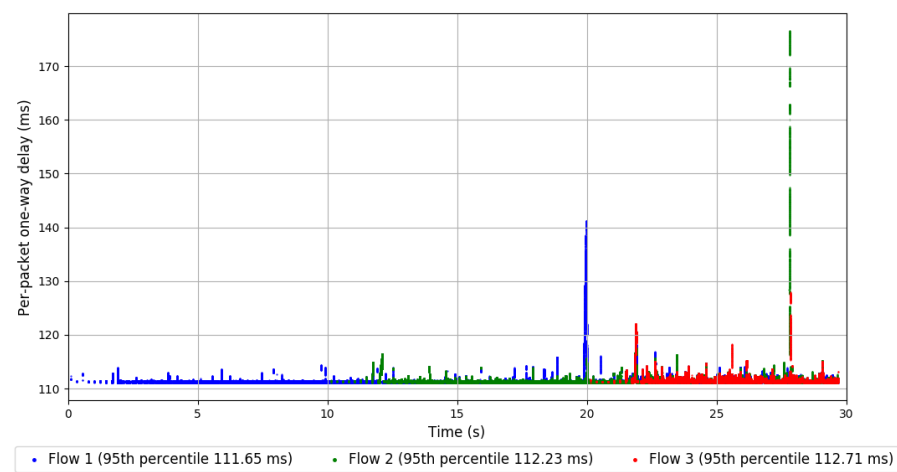Run 9: Report of TCP Cubic — Data Link

```
Run 10: Statistics of TCP Cubic

Start at: 2017-09-18 18:59:54
End at: 2017-09-18 19:00:24


# Below is generated by plot.py at 2017-09-18 21:04:45
# Datalink statistics
-- Total of 3 flows:
Average throughput: 123.43 Mbit/s
95th percentile per-packet one-way delay: 113.536 ms
Loss rate: 1.38%
-- Flow 1:
Average throughput: 72.66 Mbit/s
95th percentile per-packet one-way delay: 112.658 ms
Loss rate: 1.04%
-- Flow 2:
Average throughput: 51.85 Mbit/s
95th percentile per-packet one-way delay: 113.792 ms
Loss rate: 1.40%
-- Flow 3:
Average throughput: 50.56 Mbit/s
95th percentile per-packet one-way delay: 115.513 ms
Loss rate: 2.81%
```

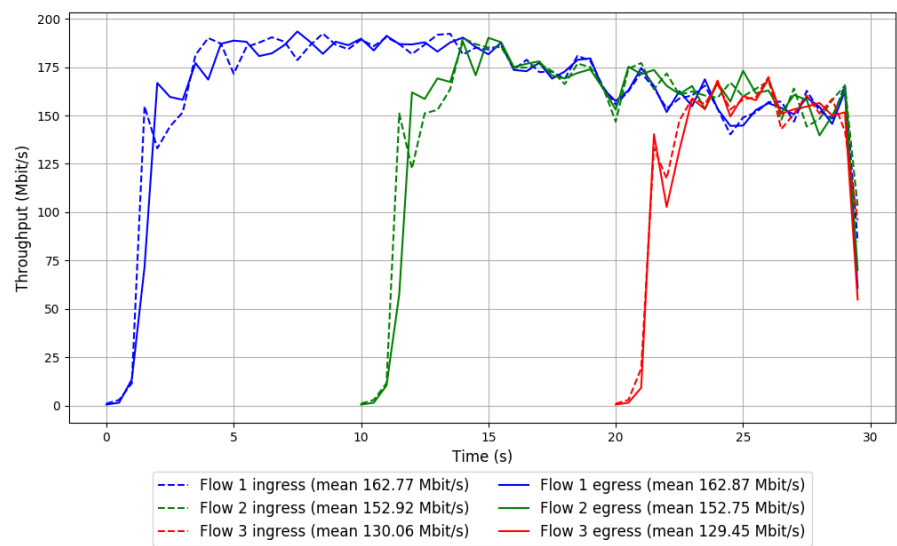Run 10: Report of TCP Cubic — Data Link

```
Run 1: Statistics of Indigo

Start at: 2017-09-18 17:26:26
End at: 2017-09-18 17:26:56

# Below is generated by plot.py at 2017-09-18 21:08:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 307.96 Mbit/s
95th percentile per-packet one-way delay: 112.198 ms
Loss rate: 1.22%
-- Flow 1:
Average throughput: 164.58 Mbit/s
95th percentile per-packet one-way delay: 111.744 ms
Loss rate: 0.78%
-- Flow 2:
Average throughput: 153.09 Mbit/s
95th percentile per-packet one-way delay: 112.512 ms
Loss rate: 1.21%
-- Flow 3:
Average throughput: 131.55 Mbit/s
95th percentile per-packet one-way delay: 114.476 ms
Loss rate: 2.93%
```
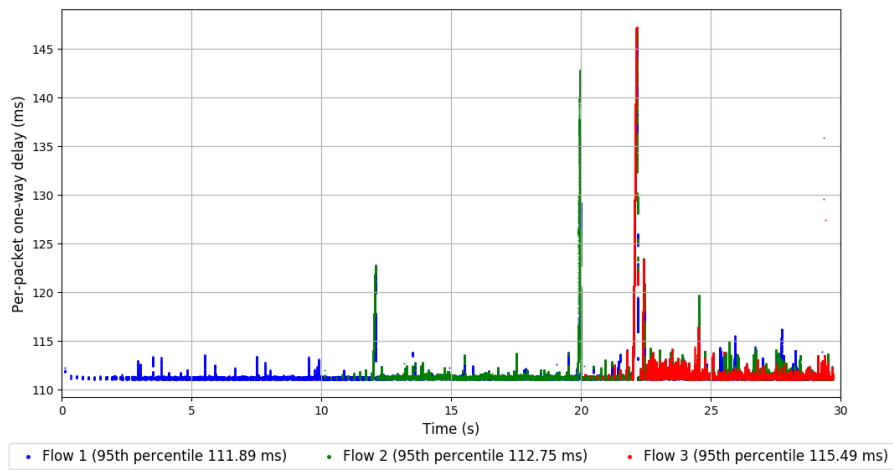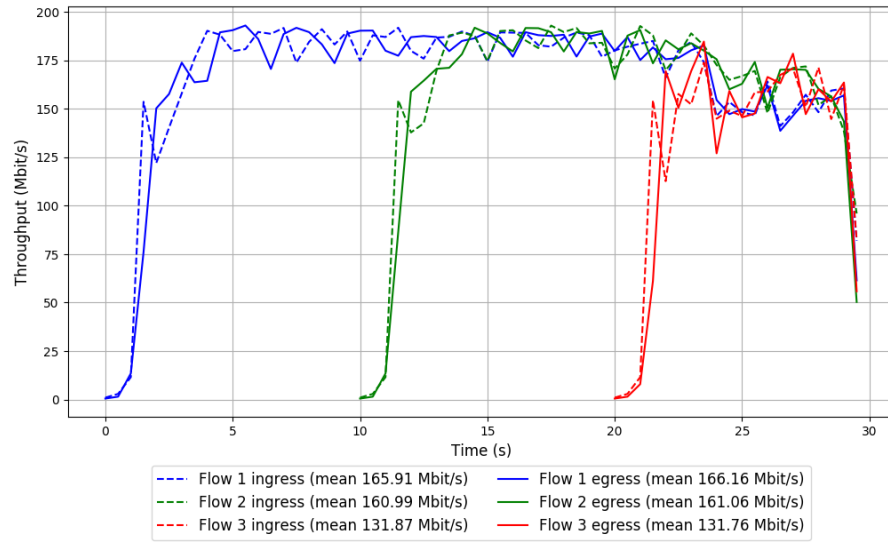
Run 1: Report of Indigo — Data Link

```
Run 2: Statistics of Indigo

Start at: 2017-09-18 17:36:33
End at: 2017-09-18 17:37:03


# Below is generated by plot.py at 2017-09-18 21:08:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 305.70 Mbit/s
95th percentile per-packet one-way delay: 112.008 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 162.87 Mbit/s
95th percentile per-packet one-way delay: 111.651 ms
Loss rate: 0.70%
-- Flow 2:
Average throughput: 152.75 Mbit/s
95th percentile per-packet one-way delay: 112.233 ms
Loss rate: 1.24%
-- Flow 3:
Average throughput: 129.45 Mbit/s
95th percentile per-packet one-way delay: 112.712 ms
Loss rate: 2.75%
```

Run 2: Report of Indigo — Data Link

```
Run 3: Statistics of Indigo

Start at: 2017-09-18 17:46:39
End at: 2017-09-18 17:47:09

# Below is generated by plot.py at 2017-09-18 21:09:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 315.22 Mbit/s
95th percentile per-packet one-way delay: 112.412 ms
Loss rate: 1.01%
-- Flow 1:
Average throughput: 166.16 Mbit/s
95th percentile per-packet one-way delay: 111.887 ms
Loss rate: 0.61%
-- Flow 2:
Average throughput: 161.06 Mbit/s
95th percentile per-packet one-way delay: 112.749 ms
Loss rate: 1.09%
-- Flow 3:
Average throughput: 131.76 Mbit/s
95th percentile per-packet one-way delay: 115.493 ms
Loss rate: 2.37%
```
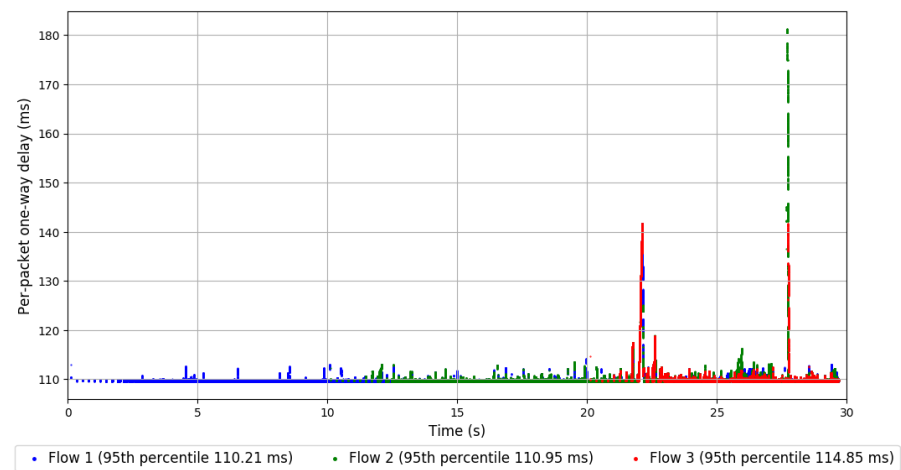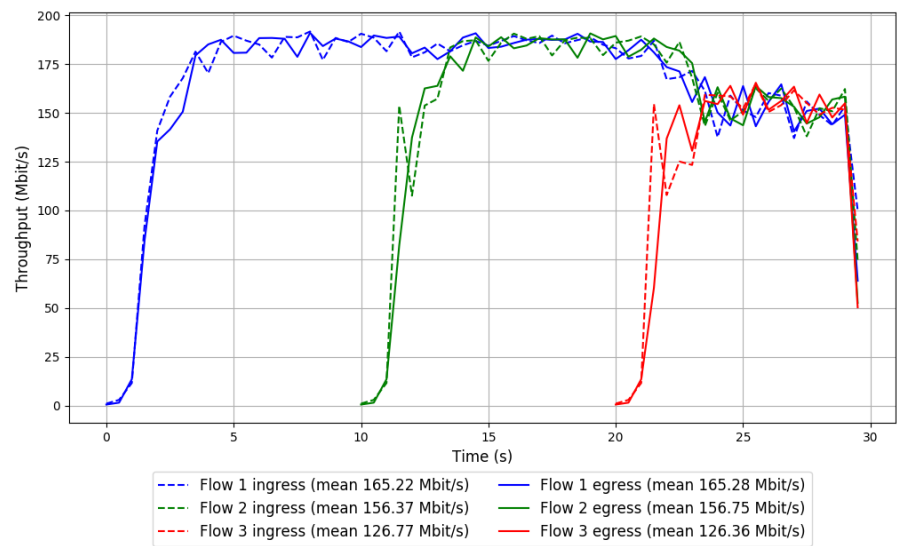
Run 3: Report of Indigo — Data Link

Flow 1 ingress (mean 165.91 Mbit/s) — — — Flow 1 egress (mean 166.16 Mbit/s)
Flow 2 ingress (mean 160.99 Mbit/s) — — — Flow 2 egress (mean 161.06 Mbit/s)
Flow 3 ingress (mean 131.87 Mbit/s) — — — Flow 3 egress (mean 131.76 Mbit/s)

Flow 1 (95th percentile 111.89 ms) • Flow 2 (95th percentile 112.75 ms) • Flow 3 (95th percentile 115.49 ms)

```
Run 4: Statistics of Indigo

Start at: 2017-09-18 17:56:28
End at: 2017-09-18 17:56:58


# Below is generated by plot.py at 2017-09-18 21:09:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 309.82 Mbit/s
95th percentile per-packet one-way delay: 110.710 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 165.28 Mbit/s
95th percentile per-packet one-way delay: 110.211 ms
Loss rate: 0.71%
-- Flow 2:
Average throughput: 156.75 Mbit/s
95th percentile per-packet one-way delay: 110.949 ms
Loss rate: 0.90%
-- Flow 3:
Average throughput: 126.36 Mbit/s
95th percentile per-packet one-way delay: 114.849 ms
Loss rate: 2.59%
```
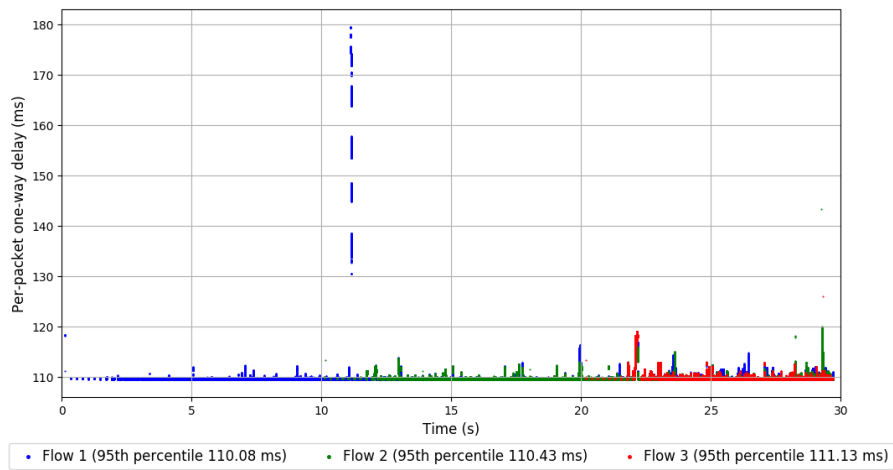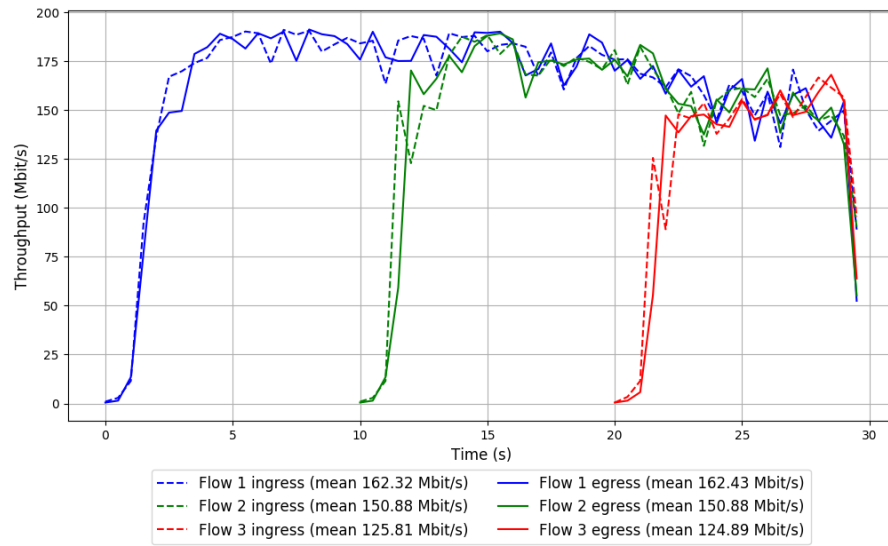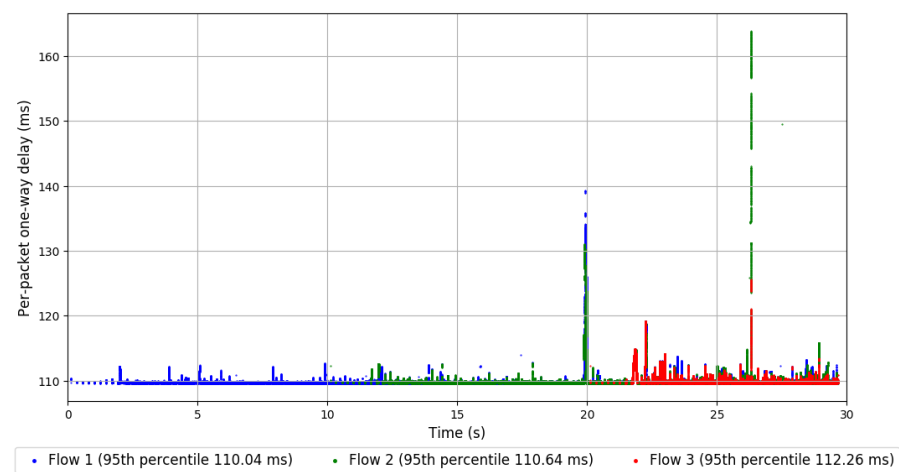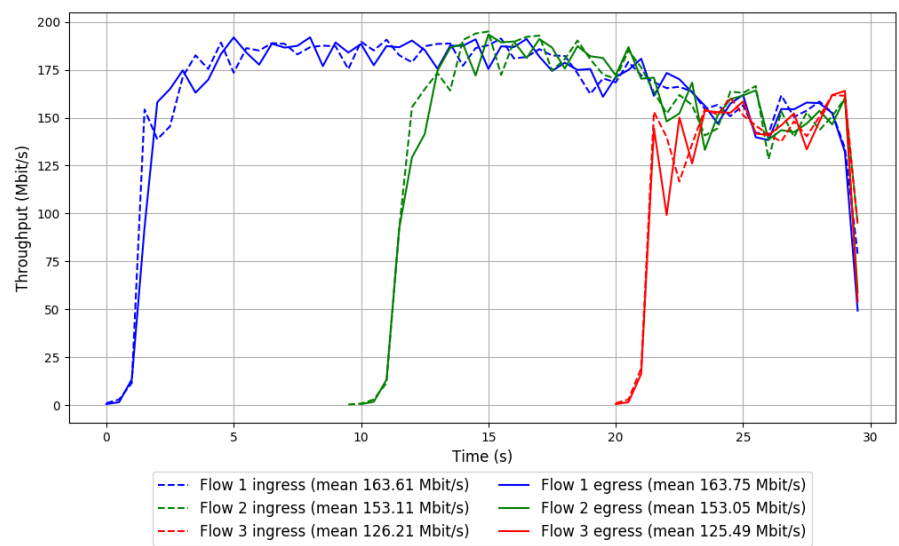
Run 4: Report of Indigo — Data Link

Flow 1 ingress (mean 165.22 Mbit/s) —— Flow 1 egress (mean 165.28 Mbit/s)
Flow 2 ingress (mean 156.37 Mbit/s) —— Flow 2 egress (mean 156.75 Mbit/s)
Flow 3 ingress (mean 126.77 Mbit/s) —— Flow 3 egress (mean 126.36 Mbit/s)

Flow 1 (95th percentile 110.21 ms)   Flow 2 (95th percentile 110.95 ms)   Flow 3 (95th percentile 114.85 ms)

51

```
Run 5: Statistics of Indigo

Start at: 2017-09-18 18:06:40
End at: 2017-09-18 18:07:10


# Below is generated by plot.py at 2017-09-18 21:09:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 302.42 Mbit/s
95th percentile per-packet one-way delay: 110.332 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 162.43 Mbit/s
95th percentile per-packet one-way delay: 110.078 ms
Loss rate: 0.69%
-- Flow 2:
Average throughput: 150.88 Mbit/s
95th percentile per-packet one-way delay: 110.429 ms
Loss rate: 1.13%
-- Flow 3:
Average throughput: 124.89 Mbit/s
95th percentile per-packet one-way delay: 111.126 ms
Loss rate: 2.99%
```
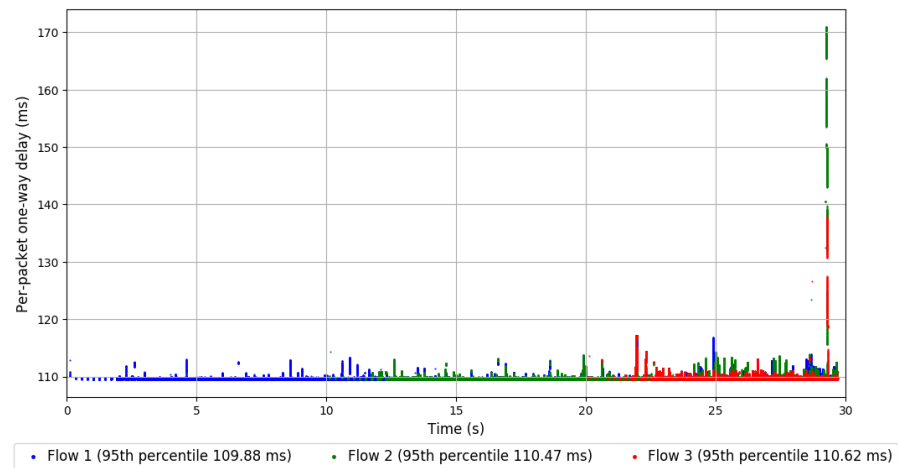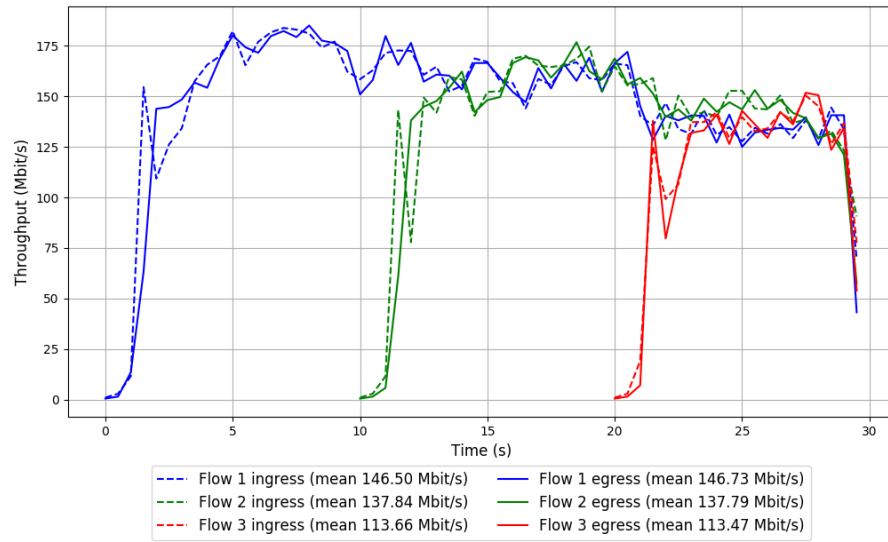
Run 5: Report of Indigo — Data Link

- - - - Flow 1 ingress (mean 162.32 Mbit/s)   —— Flow 1 egress (mean 162.43 Mbit/s)
- - - - Flow 2 ingress (mean 150.88 Mbit/s)   —— Flow 2 egress (mean 150.88 Mbit/s)
- - - - Flow 3 ingress (mean 125.81 Mbit/s)   —— Flow 3 egress (mean 124.89 Mbit/s)

• Flow 1 (95th percentile 110.08 ms)   • Flow 2 (95th percentile 110.43 ms)   • Flow 3 (95th percentile 111.13 ms)

53

```
Run 6: Statistics of Indigo

Start at: 2017-09-18 18:16:57
End at: 2017-09-18 18:17:27


# Below is generated by plot.py at 2017-09-18 21:09:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 305.56 Mbit/s
95th percentile per-packet one-way delay: 110.471 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 163.75 Mbit/s
95th percentile per-packet one-way delay: 110.038 ms
Loss rate: 0.67%
-- Flow 2:
Average throughput: 153.05 Mbit/s
95th percentile per-packet one-way delay: 110.638 ms
Loss rate: 1.18%
-- Flow 3:
Average throughput: 125.49 Mbit/s
95th percentile per-packet one-way delay: 112.258 ms
Loss rate: 2.83%
```
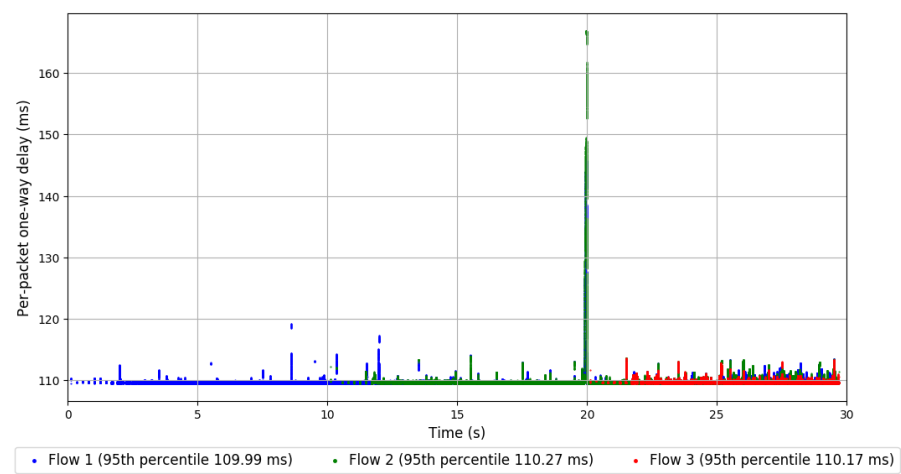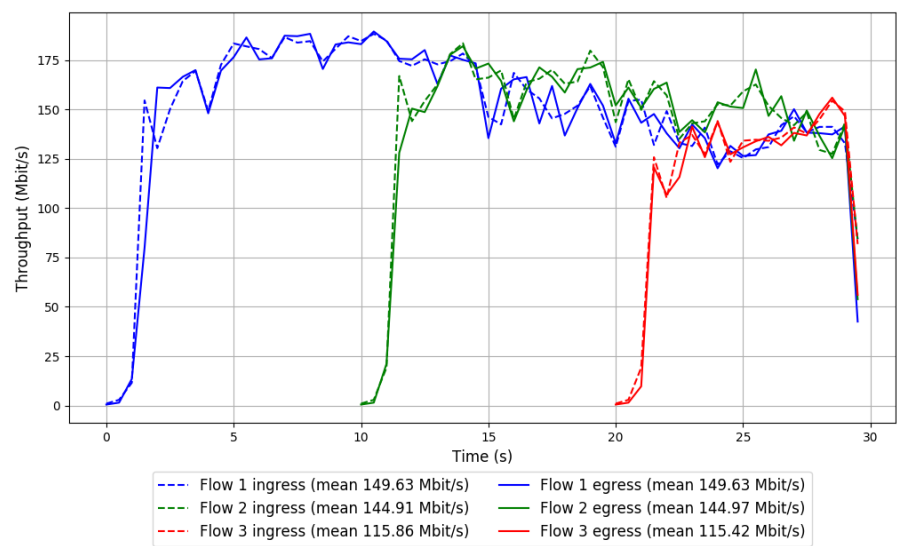
Run 6: Report of Indigo — Data Link

Flow 1 ingress (mean 163.61 Mbit/s) ---- Flow 1 egress (mean 163.75 Mbit/s) ——
Flow 2 ingress (mean 153.11 Mbit/s) ---- Flow 2 egress (mean 153.05 Mbit/s) ——
Flow 3 ingress (mean 126.21 Mbit/s) ---- Flow 3 egress (mean 125.49 Mbit/s) ——

Flow 1 (95th percentile 110.04 ms)   Flow 2 (95th percentile 110.64 ms)   Flow 3 (95th percentile 112.26 ms)

```
Run 7: Statistics of Indigo

Start at: 2017-09-18 18:26:30
End at: 2017-09-18 18:27:00


# Below is generated by plot.py at 2017-09-18 21:09:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 274.45 Mbit/s
95th percentile per-packet one-way delay: 110.189 ms
Loss rate: 1.04%
-- Flow 1:
Average throughput: 146.73 Mbit/s
95th percentile per-packet one-way delay: 109.875 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 137.79 Mbit/s
95th percentile per-packet one-way delay: 110.468 ms
Loss rate: 1.18%
-- Flow 3:
Average throughput: 113.47 Mbit/s
95th percentile per-packet one-way delay: 110.617 ms
Loss rate: 2.43%
```
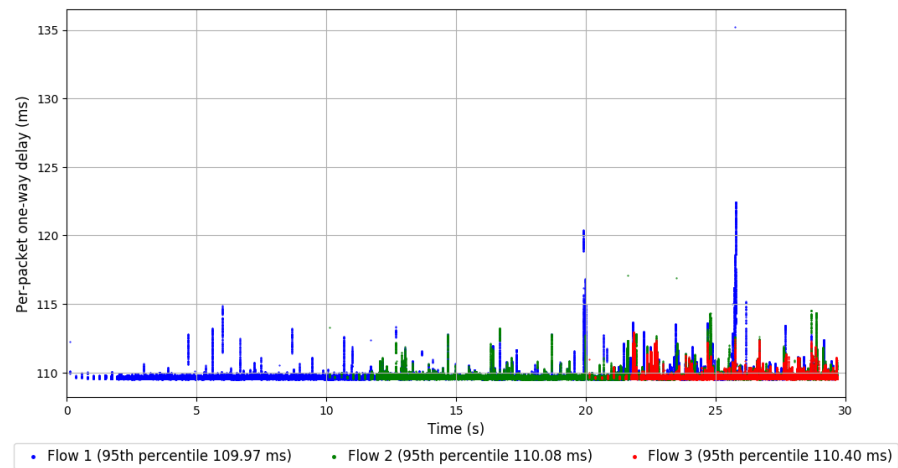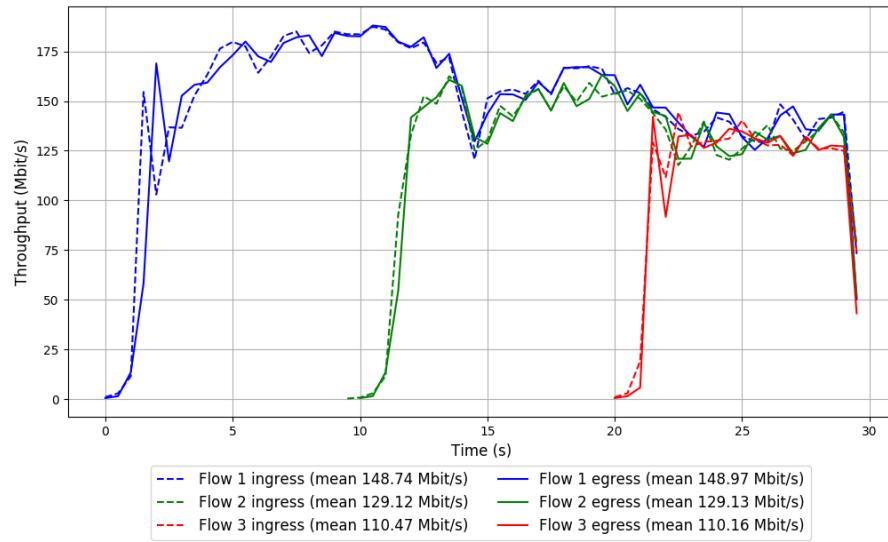
Run 7: Report of Indigo — Data Link

```
Run 8: Statistics of Indigo

Start at: 2017-09-18 18:35:57
End at: 2017-09-18 18:36:27

# Below is generated by plot.py at 2017-09-18 21:09:44
# Datalink statistics
-- Total of 3 flows:
Average throughput: 282.86 Mbit/s
95th percentile per-packet one-way delay: 110.109 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 149.63 Mbit/s
95th percentile per-packet one-way delay: 109.988 ms
Loss rate: 0.75%
-- Flow 2:
Average throughput: 144.97 Mbit/s
95th percentile per-packet one-way delay: 110.267 ms
Loss rate: 1.07%
-- Flow 3:
Average throughput: 115.42 Mbit/s
95th percentile per-packet one-way delay: 110.168 ms
Loss rate: 2.64%
```
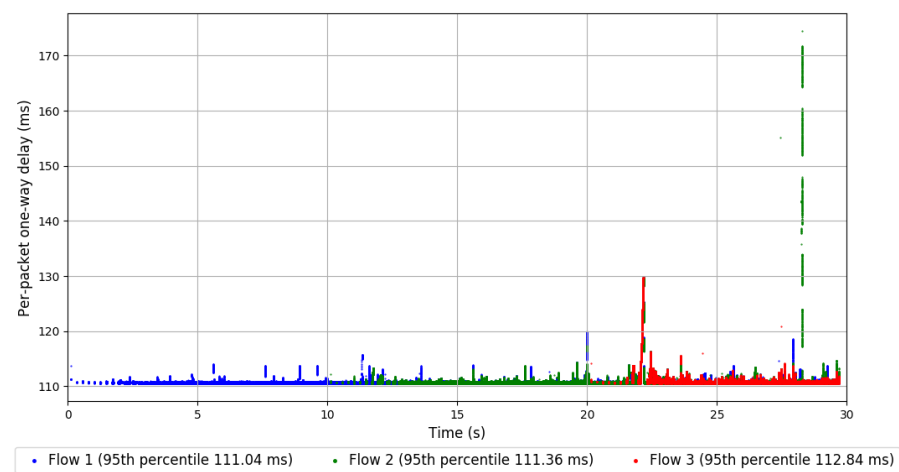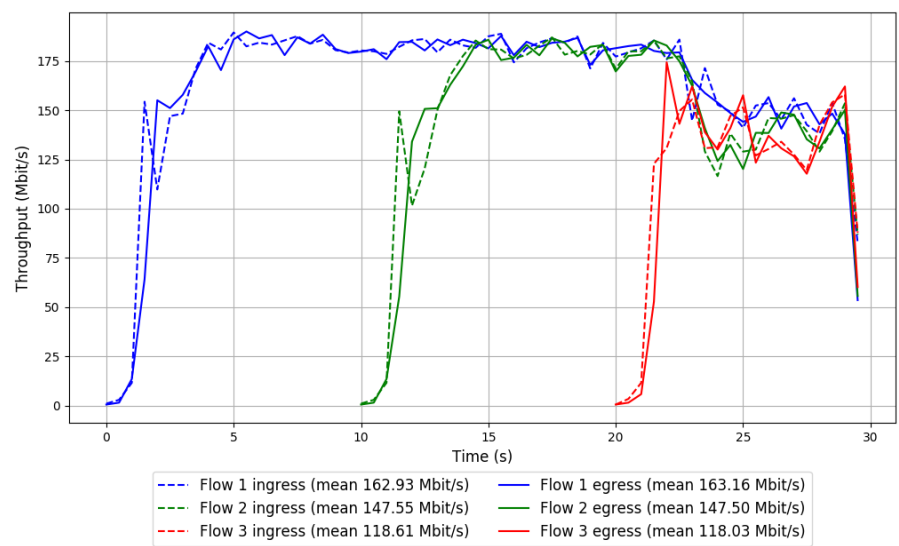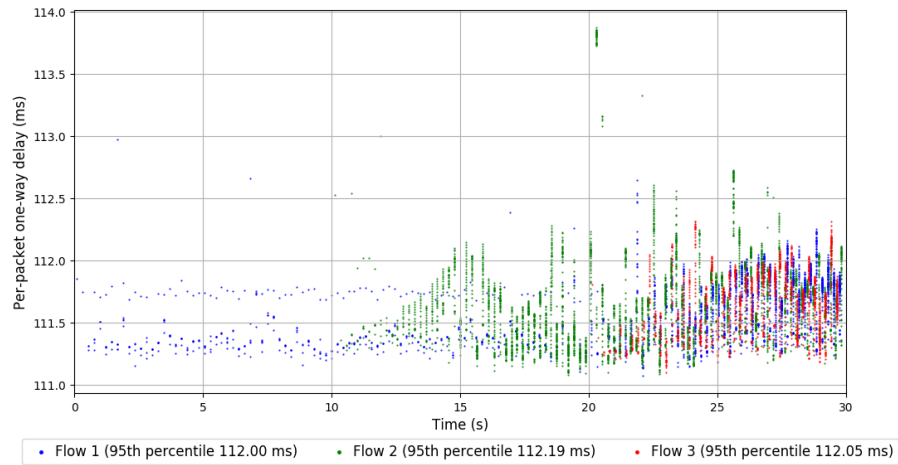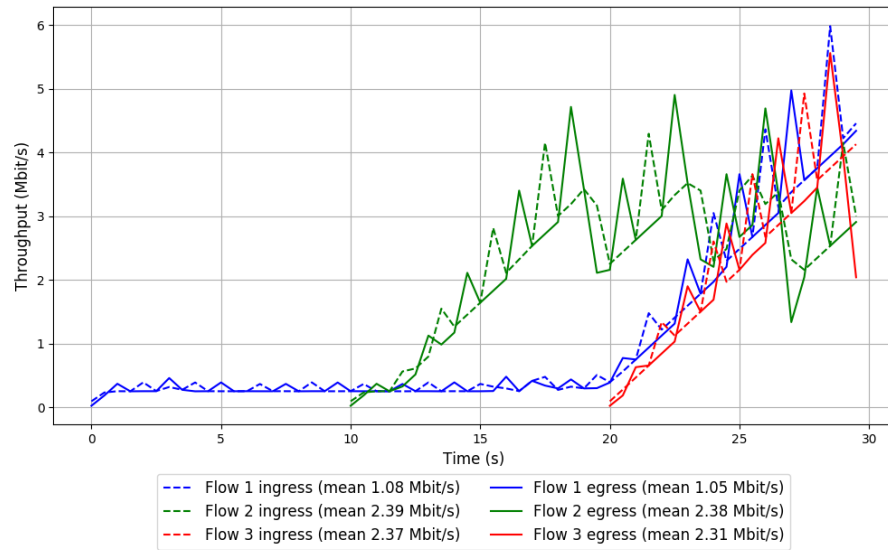
Run 8: Report of Indigo — Data Link

- - - - Flow 1 ingress (mean 149.63 Mbit/s)   ——— Flow 1 egress (mean 149.63 Mbit/s)
- - - - Flow 2 ingress (mean 144.91 Mbit/s)   ——— Flow 2 egress (mean 144.97 Mbit/s)
- - - - Flow 3 ingress (mean 115.86 Mbit/s)   ——— Flow 3 egress (mean 115.42 Mbit/s)

• Flow 1 (95th percentile 109.99 ms)   • Flow 2 (95th percentile 110.27 ms)   • Flow 3 (95th percentile 110.17 ms)

```
Run 9: Statistics of Indigo

Start at: 2017-09-18 18:45:46
End at: 2017-09-18 18:46:16


# Below is generated by plot.py at 2017-09-18 21:12:15
# Datalink statistics
-- Total of 3 flows:
Average throughput: 270.00 Mbit/s
95th percentile per-packet one-way delay: 110.069 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 148.97 Mbit/s
95th percentile per-packet one-way delay: 109.975 ms
Loss rate: 0.59%
-- Flow 2:
Average throughput: 129.13 Mbit/s
95th percentile per-packet one-way delay: 110.075 ms
Loss rate: 1.13%
-- Flow 3:
Average throughput: 110.16 Mbit/s
95th percentile per-packet one-way delay: 110.400 ms
Loss rate: 2.56%
```
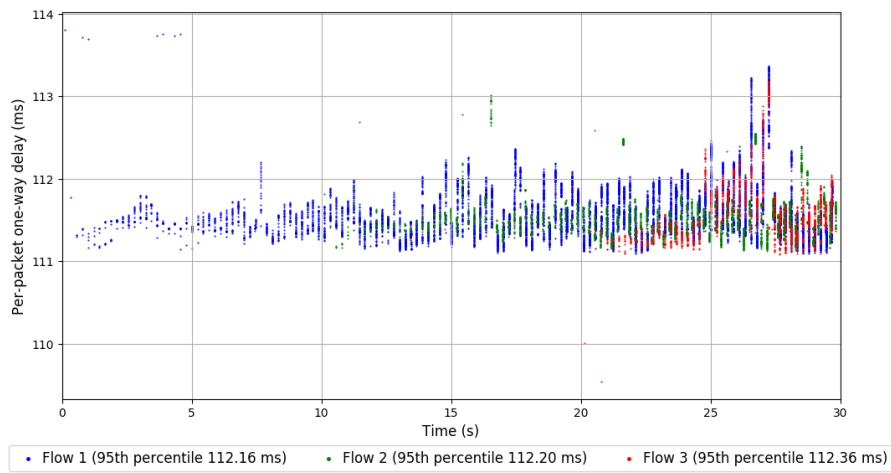
Run 9: Report of Indigo — Data Link

Flow 1 ingress (mean 148.74 Mbit/s) --- Flow 1 egress (mean 148.97 Mbit/s)
Flow 2 ingress (mean 129.12 Mbit/s) --- Flow 2 egress (mean 129.13 Mbit/s)
Flow 3 ingress (mean 110.47 Mbit/s) --- Flow 3 egress (mean 110.16 Mbit/s)

Flow 1 (95th percentile 109.97 ms)   Flow 2 (95th percentile 110.08 ms)   Flow 3 (95th percentile 110.40 ms)

```
Run 10: Statistics of Indigo

Start at: 2017-09-18 18:55:51
End at: 2017-09-18 18:56:21

# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 298.79 Mbit/s
95th percentile per-packet one-way delay: 111.273 ms
Loss rate: 1.07%
-- Flow 1:
Average throughput: 163.16 Mbit/s
95th percentile per-packet one-way delay: 111.037 ms
Loss rate: 0.61%
-- Flow 2:
Average throughput: 147.50 Mbit/s
95th percentile per-packet one-way delay: 111.355 ms
Loss rate: 1.15%
-- Flow 3:
Average throughput: 118.03 Mbit/s
95th percentile per-packet one-way delay: 112.840 ms
Loss rate: 2.77%
```
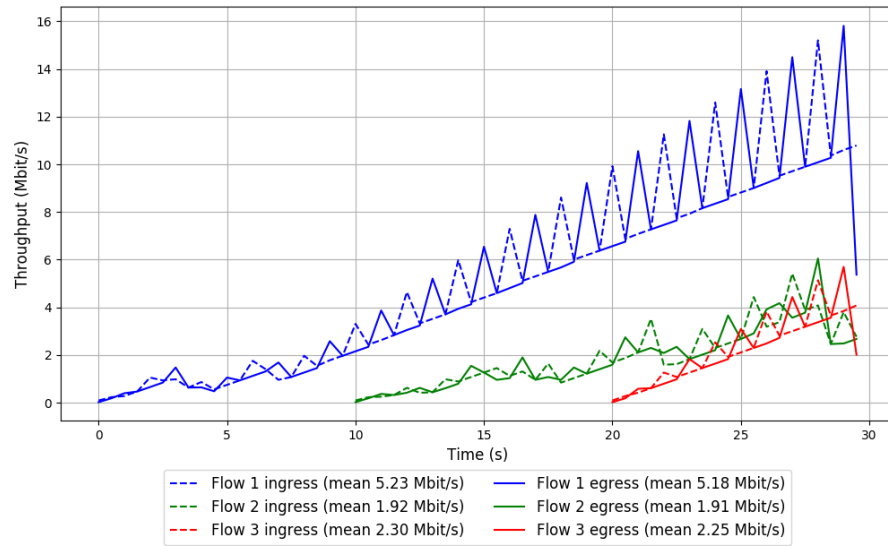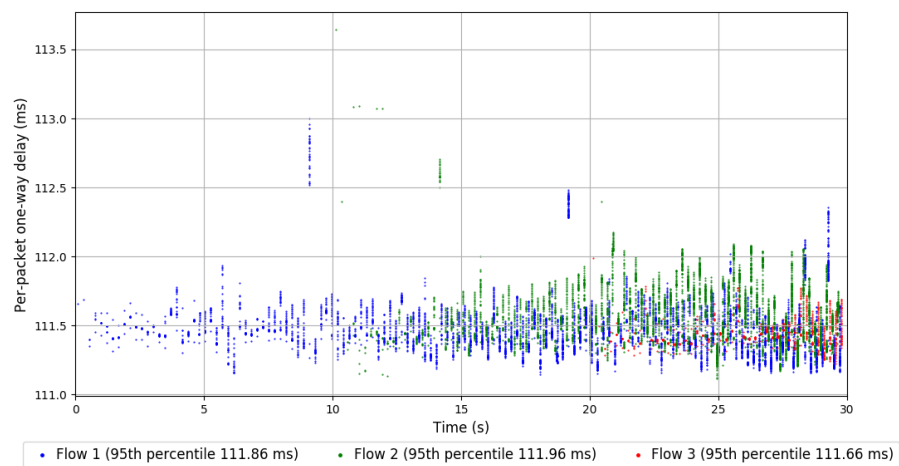
Run 10: Report of Indigo — Data Link

```
Run 1: Statistics of LEDBAT

Start at: 2017-09-18 17:27:38
End at: 2017-09-18 17:28:08

# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 3.36 Mbit/s
95th percentile per-packet one-way delay: 112.087 ms
Loss rate: 2.86%
-- Flow 1:
Average throughput: 1.05 Mbit/s
95th percentile per-packet one-way delay: 111.997 ms
Loss rate: 3.50%
-- Flow 2:
Average throughput: 2.38 Mbit/s
95th percentile per-packet one-way delay: 112.195 ms
Loss rate: 1.62%
-- Flow 3:
Average throughput: 2.31 Mbit/s
95th percentile per-packet one-way delay: 112.046 ms
Loss rate: 4.53%
```
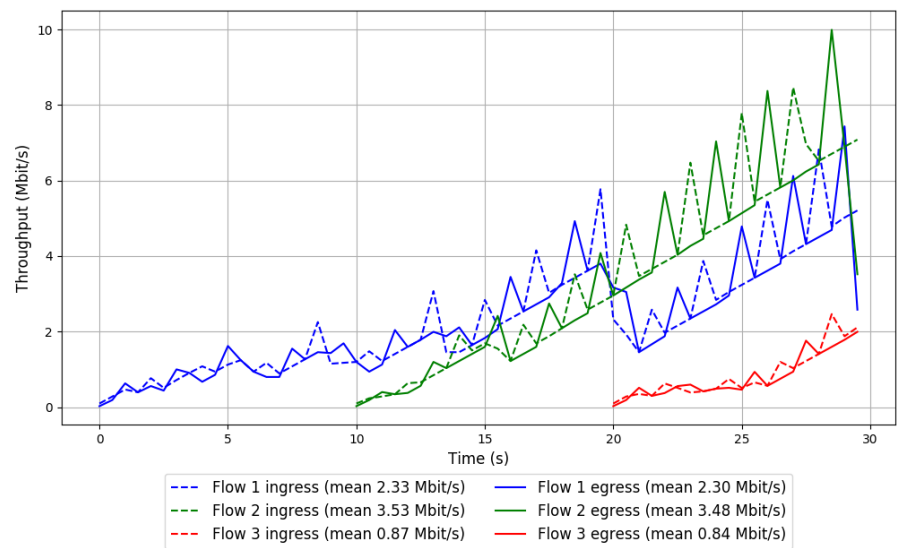
Run 1: Report of LEDBAT — Data Link

```
Run 2: Statistics of LEDBAT

Start at: 2017-09-18 17:37:44
End at: 2017-09-18 17:38:14


# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 7.14 Mbit/s
95th percentile per-packet one-way delay: 112.180 ms
Loss rate: 2.05%
-- Flow 1:
Average throughput: 5.18 Mbit/s
95th percentile per-packet one-way delay: 112.162 ms
Loss rate: 1.74%
-- Flow 2:
Average throughput: 1.91 Mbit/s
95th percentile per-packet one-way delay: 112.197 ms
Loss rate: 1.84%
-- Flow 3:
Average throughput: 2.25 Mbit/s
95th percentile per-packet one-way delay: 112.363 ms
Loss rate: 4.60%
```
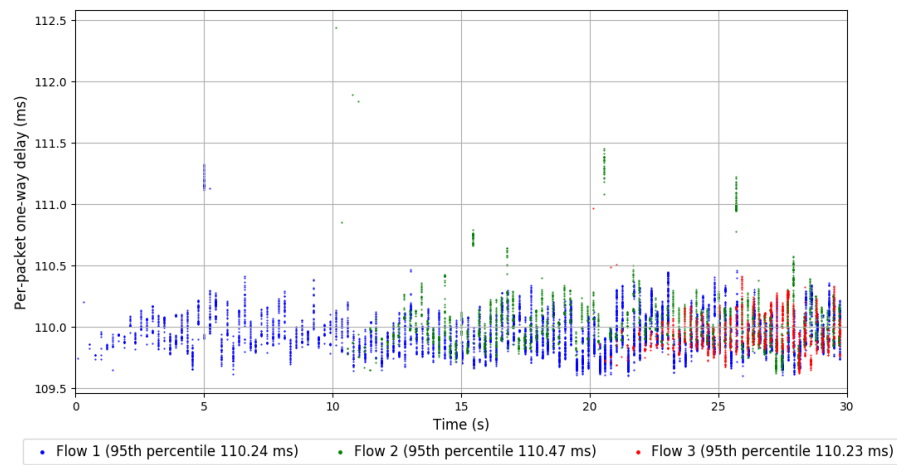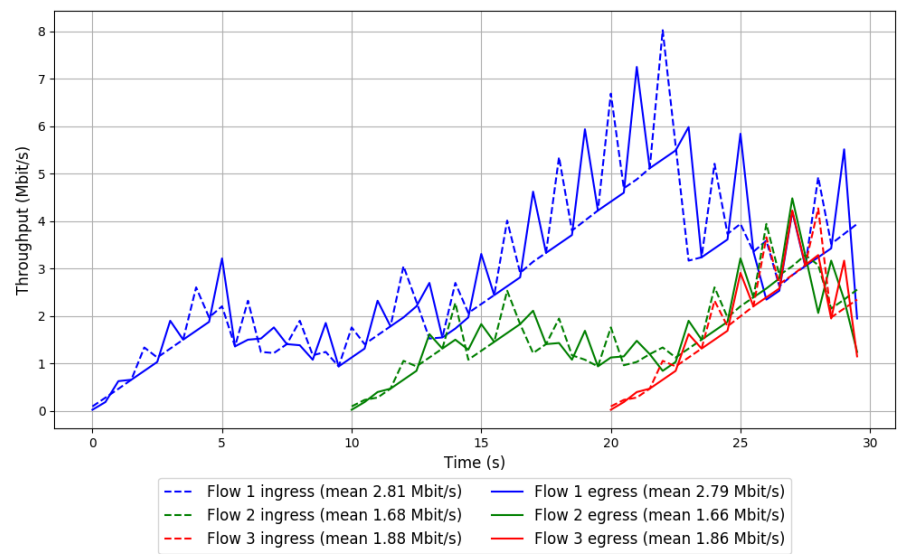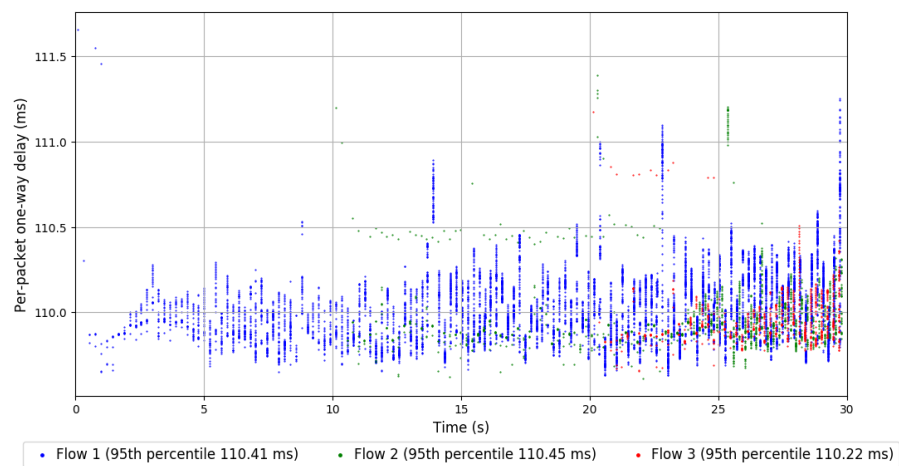
Run 2: Report of LEDBAT — Data Link

Flow 1 ingress (mean 5.23 Mbit/s) ---- Flow 1 egress (mean 5.18 Mbit/s) ——
Flow 2 ingress (mean 1.92 Mbit/s) ---- Flow 2 egress (mean 1.91 Mbit/s) ——
Flow 3 ingress (mean 2.30 Mbit/s) ---- Flow 3 egress (mean 2.25 Mbit/s) ——

Flow 1 (95th percentile 112.16 ms) • Flow 2 (95th percentile 112.20 ms) • Flow 3 (95th percentile 112.36 ms)

```
Run 3: Statistics of LEDBAT

Start at: 2017-09-18 17:47:52
End at: 2017-09-18 17:48:22


# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.86 Mbit/s
95th percentile per-packet one-way delay: 111.919 ms
Loss rate: 2.46%
-- Flow 1:
Average throughput: 2.30 Mbit/s
95th percentile per-packet one-way delay: 111.858 ms
Loss rate: 1.89%
-- Flow 2:
Average throughput: 3.48 Mbit/s
95th percentile per-packet one-way delay: 111.958 ms
Loss rate: 2.56%
-- Flow 3:
Average throughput: 0.84 Mbit/s
95th percentile per-packet one-way delay: 111.655 ms
Loss rate: 6.27%
```
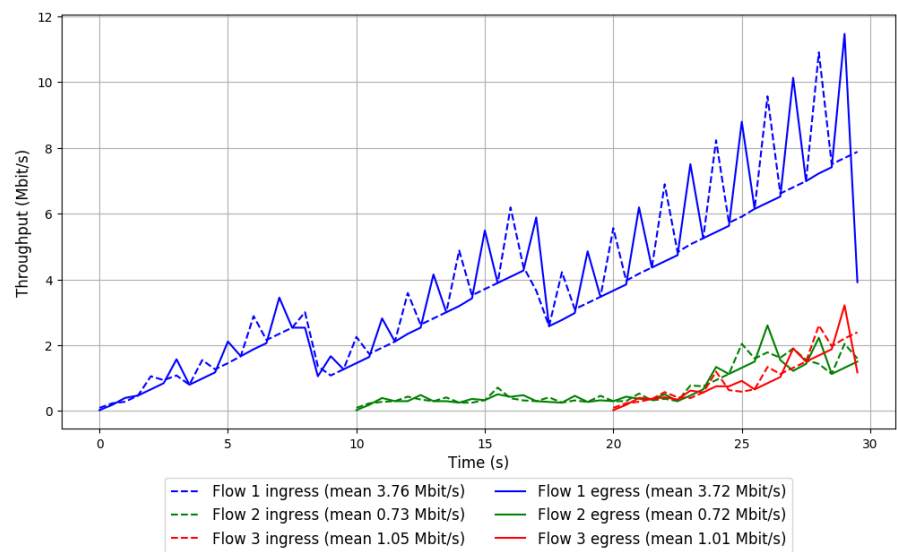
Run 3: Report of LEDBAT — Data Link

```
Run 4: Statistics of LEDBAT

Start at: 2017-09-18 17:57:40
End at: 2017-09-18 17:58:10


# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.49 Mbit/s
95th percentile per-packet one-way delay: 110.268 ms
Loss rate: 1.66%
-- Flow 1:
Average throughput: 2.79 Mbit/s
95th percentile per-packet one-way delay: 110.241 ms
Loss rate: 1.19%
-- Flow 2:
Average throughput: 1.66 Mbit/s
95th percentile per-packet one-way delay: 110.466 ms
Loss rate: 1.98%
-- Flow 3:
Average throughput: 1.86 Mbit/s
95th percentile per-packet one-way delay: 110.230 ms
Loss rate: 3.25%
```
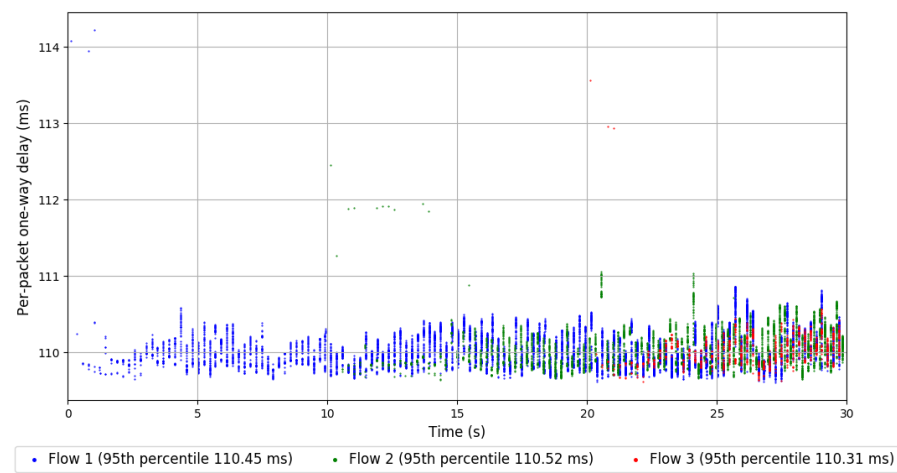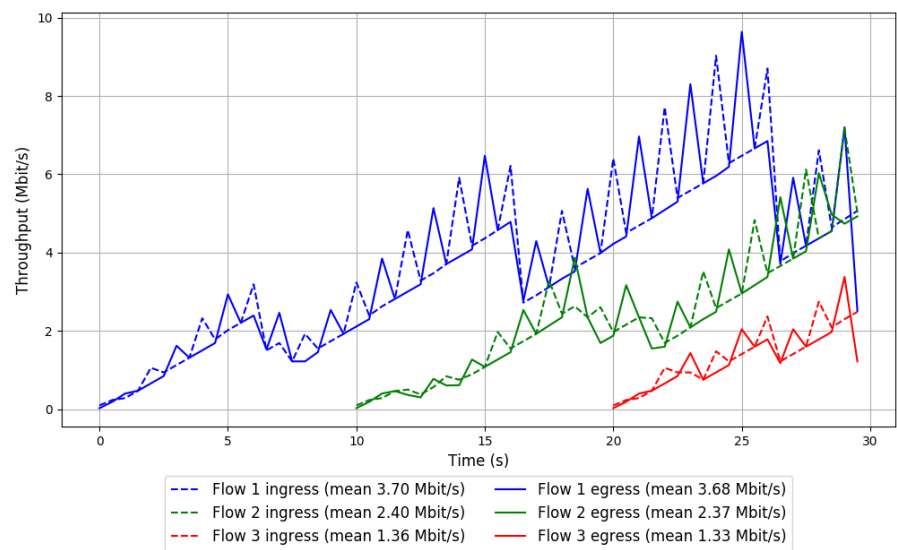
Run 4: Report of LEDBAT — Data Link

```
Run 5: Statistics of LEDBAT

Start at: 2017-09-18 18:07:51
End at: 2017-09-18 18:08:21


# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.51 Mbit/s
95th percentile per-packet one-way delay: 110.407 ms
Loss rate: 2.29%
-- Flow 1:
Average throughput: 3.72 Mbit/s
95th percentile per-packet one-way delay: 110.407 ms
Loss rate: 1.85%
-- Flow 2:
Average throughput: 0.72 Mbit/s
95th percentile per-packet one-way delay: 110.453 ms
Loss rate: 3.07%
-- Flow 3:
Average throughput: 1.01 Mbit/s
95th percentile per-packet one-way delay: 110.217 ms
Loss rate: 5.97%
```
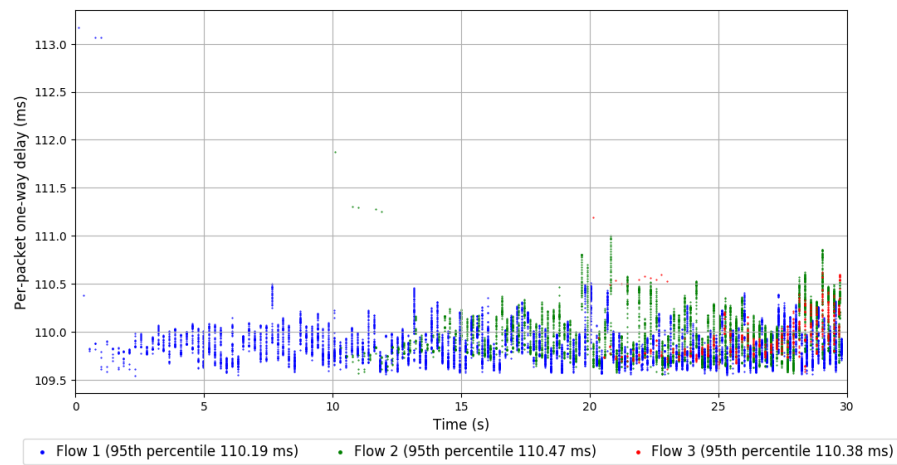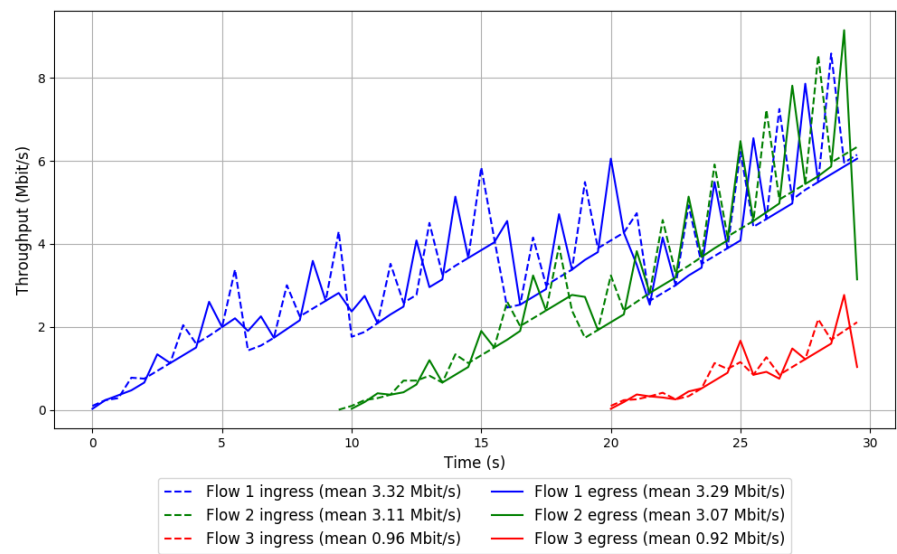
Run 5: Report of LEDBAT — Data Link

```
Run 6: Statistics of LEDBAT

Start at: 2017-09-18 18:18:08
End at: 2017-09-18 18:18:38

# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.66 Mbit/s
95th percentile per-packet one-way delay: 110.465 ms
Loss rate: 1.85%
-- Flow 1:
Average throughput: 3.68 Mbit/s
95th percentile per-packet one-way delay: 110.450 ms
Loss rate: 1.16%
-- Flow 2:
Average throughput: 2.37 Mbit/s
95th percentile per-packet one-way delay: 110.524 ms
Loss rate: 2.64%
-- Flow 3:
Average throughput: 1.33 Mbit/s
95th percentile per-packet one-way delay: 110.309 ms
Loss rate: 4.75%
```
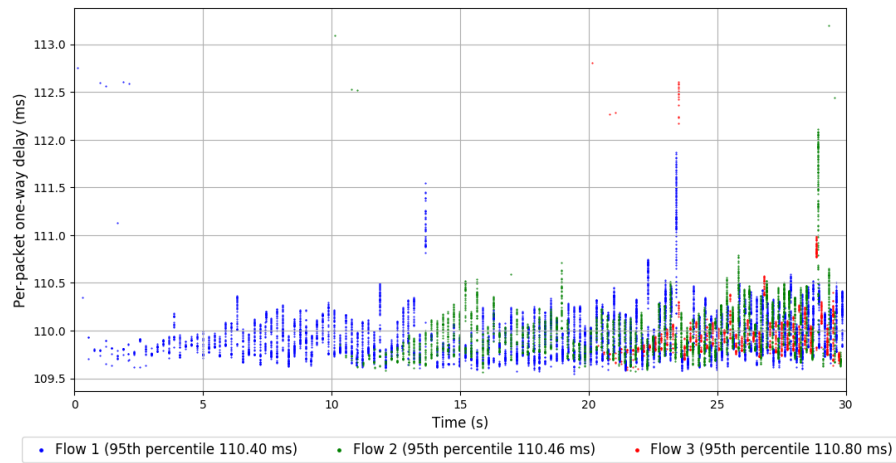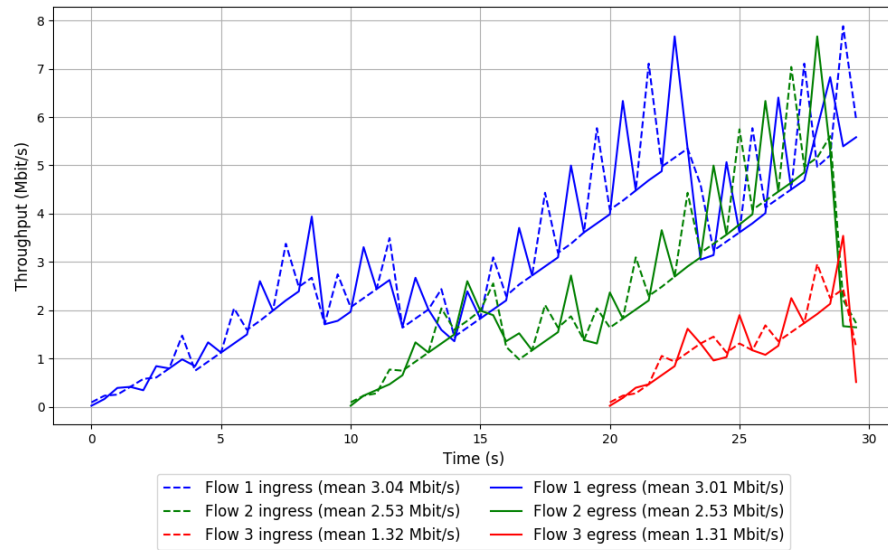
Run 6: Report of LEDBAT — Data Link

```
Run 7: Statistics of LEDBAT

Start at: 2017-09-18 18:27:39
End at: 2017-09-18 18:28:09

# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.62 Mbit/s
95th percentile per-packet one-way delay: 110.359 ms
Loss rate: 2.16%
-- Flow 1:
Average throughput: 3.29 Mbit/s
95th percentile per-packet one-way delay: 110.189 ms
Loss rate: 1.56%
-- Flow 2:
Average throughput: 3.07 Mbit/s
95th percentile per-packet one-way delay: 110.473 ms
Loss rate: 2.59%
-- Flow 3:
Average throughput: 0.92 Mbit/s
95th percentile per-packet one-way delay: 110.380 ms
Loss rate: 5.75%
```
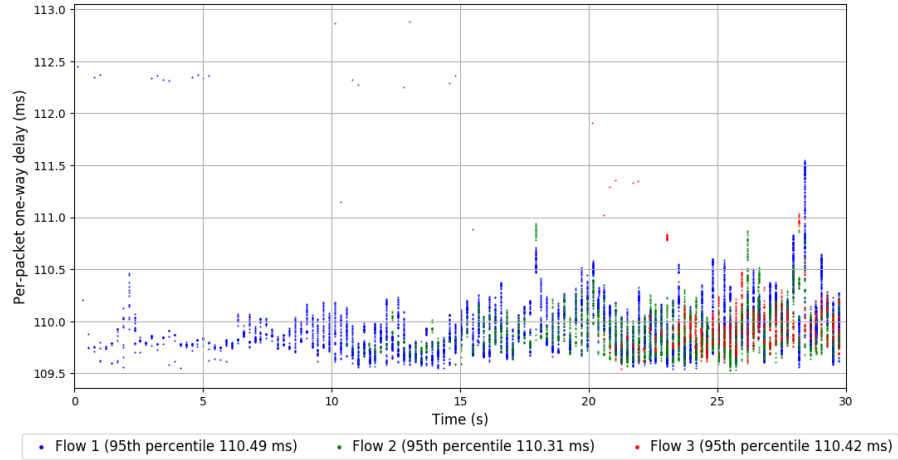
Run 7: Report of LEDBAT — Data Link

```
Run 8: Statistics of LEDBAT

Start at: 2017-09-18 18:37:07
End at: 2017-09-18 18:37:37


# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.11 Mbit/s
95th percentile per-packet one-way delay: 110.430 ms
Loss rate: 1.54%
-- Flow 1:
Average throughput: 3.01 Mbit/s
95th percentile per-packet one-way delay: 110.400 ms
Loss rate: 1.68%
-- Flow 2:
Average throughput: 2.53 Mbit/s
95th percentile per-packet one-way delay: 110.461 ms
Loss rate: 0.93%
-- Flow 3:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 110.795 ms
Loss rate: 3.00%
```
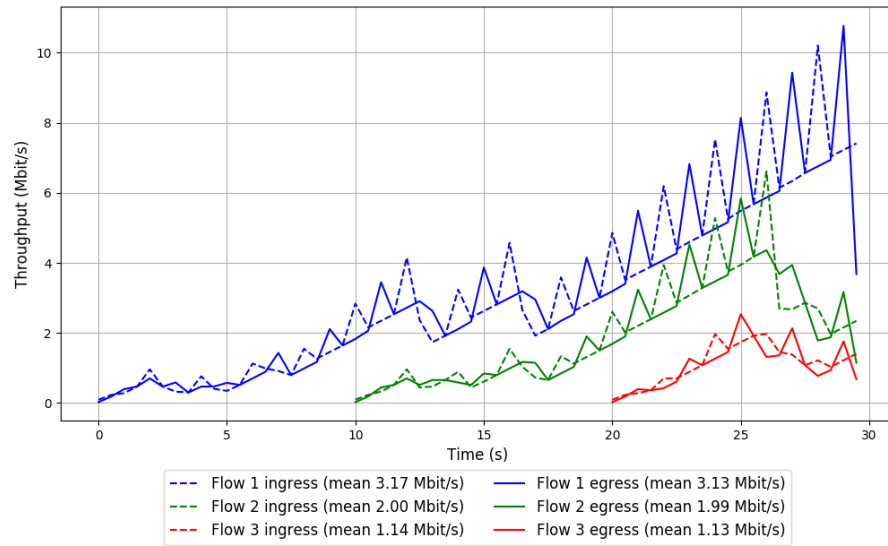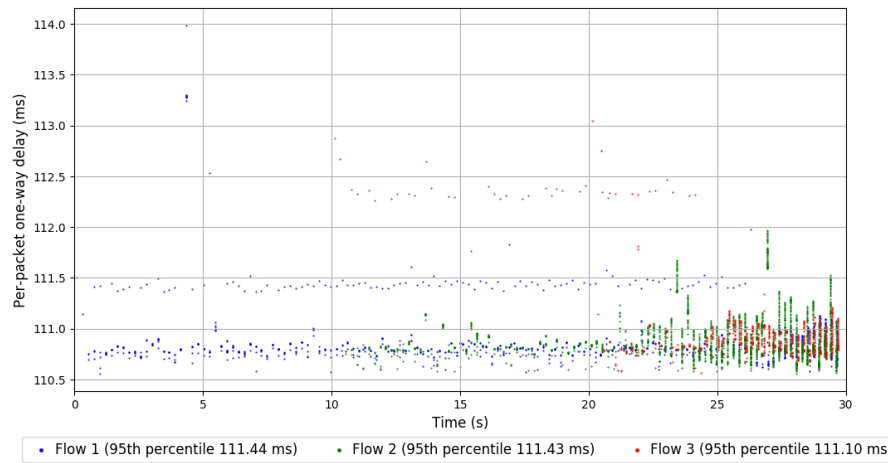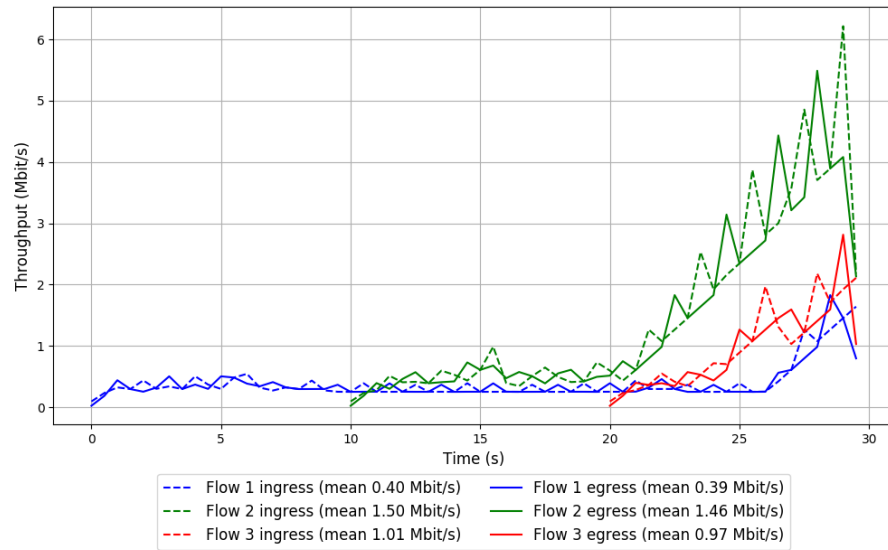
Run 8: Report of LEDBAT — Data Link

```
Run 9: Statistics of LEDBAT

Start at: 2017-09-18 18:46:55
End at: 2017-09-18 18:47:25


# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.81 Mbit/s
95th percentile per-packet one-way delay: 110.443 ms
Loss rate: 1.95%
-- Flow 1:
Average throughput: 3.13 Mbit/s
95th percentile per-packet one-way delay: 110.493 ms
Loss rate: 1.97%
-- Flow 2:
Average throughput: 1.99 Mbit/s
95th percentile per-packet one-way delay: 110.306 ms
Loss rate: 1.51%
-- Flow 3:
Average throughput: 1.13 Mbit/s
95th percentile per-packet one-way delay: 110.418 ms
Loss rate: 3.26%
```
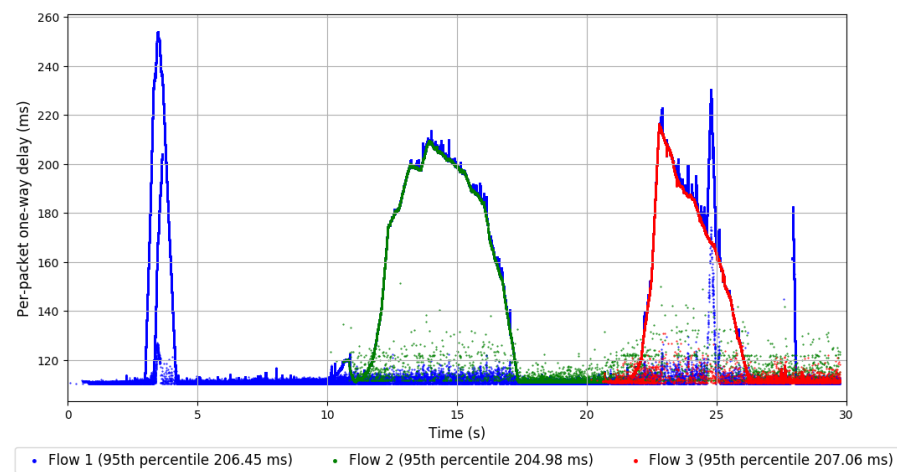
Run 9: Report of LEDBAT — Data Link

```
Run 10: Statistics of LEDBAT

Start at: 2017-09-18 18:57:02
End at: 2017-09-18 18:57:32

# Below is generated by plot.py at 2017-09-18 21:12:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 1.67 Mbit/s
95th percentile per-packet one-way delay: 111.422 ms
Loss rate: 3.99%
-- Flow 1:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 111.442 ms
Loss rate: 3.52%
-- Flow 2:
Average throughput: 1.46 Mbit/s
95th percentile per-packet one-way delay: 111.433 ms
Loss rate: 3.68%
-- Flow 3:
Average throughput: 0.97 Mbit/s
95th percentile per-packet one-way delay: 111.103 ms
Loss rate: 5.48%
```
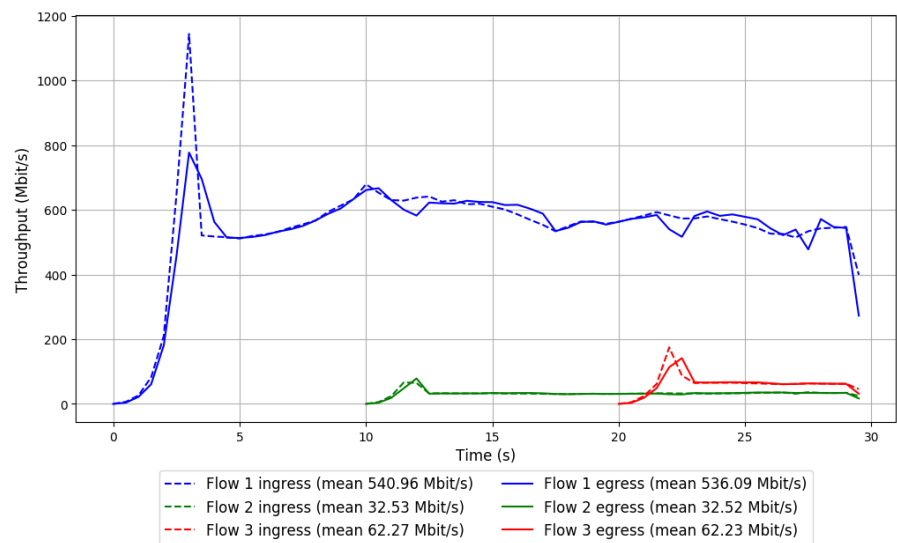
Run 10: Report of LEDBAT — Data Link

```
Run 1: Statistics of PCC

Start at: 2017-09-18 17:29:14
End at: 2017-09-18 17:29:44


# Below is generated by plot.py at 2017-09-18 21:19:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 577.75 Mbit/s
95th percentile per-packet one-way delay: 206.399 ms
Loss rate: 1.66%
-- Flow 1:
Average throughput: 536.09 Mbit/s
95th percentile per-packet one-way delay: 206.451 ms
Loss rate: 1.65%
-- Flow 2:
Average throughput: 32.52 Mbit/s
95th percentile per-packet one-way delay: 204.983 ms
Loss rate: 1.21%
-- Flow 3:
Average throughput: 62.23 Mbit/s
95th percentile per-packet one-way delay: 207.060 ms
Loss rate: 2.35%
```
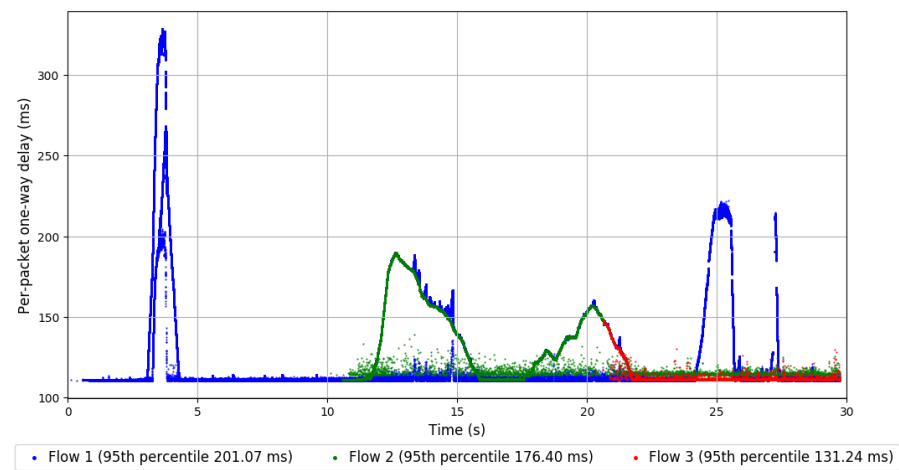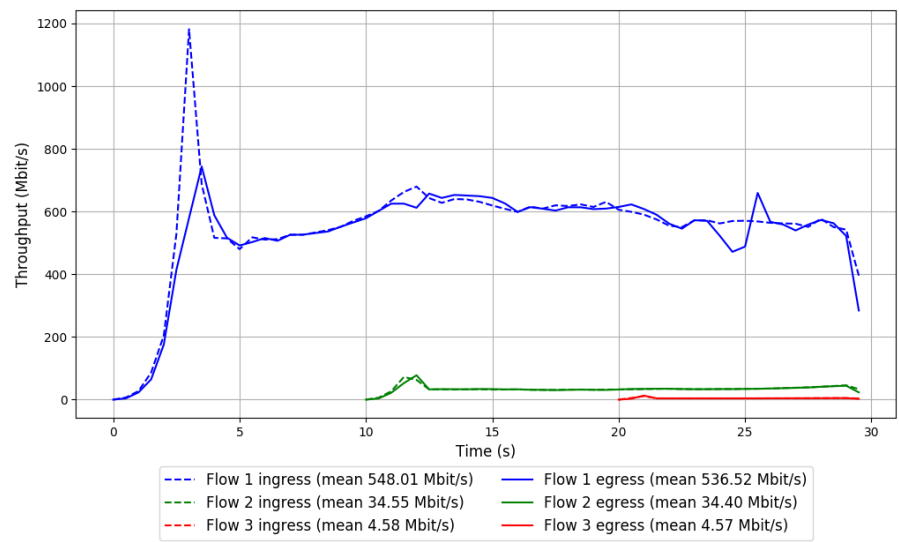
Run 1: Report of PCC — Data Link

```
Run 2: Statistics of PCC

Start at: 2017-09-18 17:39:23
End at: 2017-09-18 17:39:53

# Below is generated by plot.py at 2017-09-18 21:19:00
# Datalink statistics
-- Total of 3 flows:
Average throughput: 560.77 Mbit/s
95th percentile per-packet one-way delay: 197.480 ms
Loss rate: 2.78%
-- Flow 1:
Average throughput: 536.52 Mbit/s
95th percentile per-packet one-way delay: 201.066 ms
Loss rate: 2.83%
-- Flow 2:
Average throughput: 34.40 Mbit/s
95th percentile per-packet one-way delay: 176.397 ms
Loss rate: 1.55%
-- Flow 3:
Average throughput: 4.57 Mbit/s
95th percentile per-packet one-way delay: 131.236 ms
Loss rate: 2.66%
```
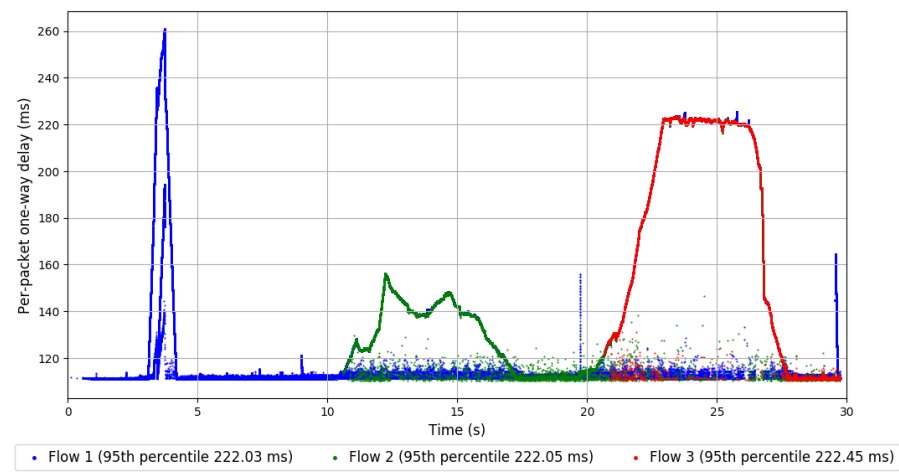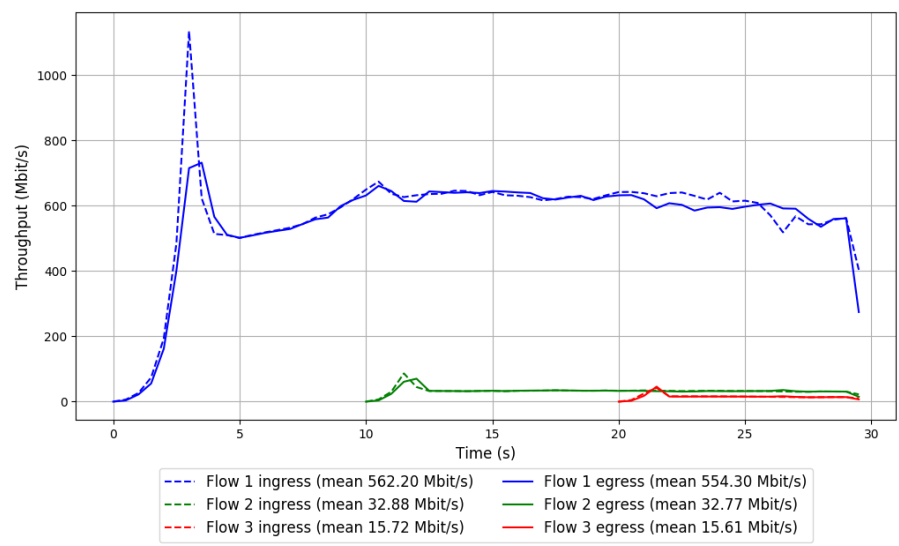
Run 2: Report of PCC — Data Link

- - - Flow 1 ingress (mean 548.01 Mbit/s)   —— Flow 1 egress (mean 536.52 Mbit/s)
- - - Flow 2 ingress (mean 34.55 Mbit/s)   —— Flow 2 egress (mean 34.40 Mbit/s)
- - - Flow 3 ingress (mean 4.58 Mbit/s)   —— Flow 3 egress (mean 4.57 Mbit/s)

- Flow 1 (95th percentile 201.07 ms)   • Flow 2 (95th percentile 176.40 ms)   • Flow 3 (95th percentile 131.24 ms)

```
Run 3: Statistics of PCC

Start at: 2017-09-18 17:49:30
End at: 2017-09-18 17:50:00


# Below is generated by plot.py at 2017-09-18 21:19:06
# Datalink statistics
-- Total of 3 flows:
Average throughput: 581.04 Mbit/s
95th percentile per-packet one-way delay: 222.045 ms
Loss rate: 2.13%
-- Flow 1:
Average throughput: 554.30 Mbit/s
95th percentile per-packet one-way delay: 222.033 ms
Loss rate: 2.15%
-- Flow 2:
Average throughput: 32.77 Mbit/s
95th percentile per-packet one-way delay: 222.053 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 15.61 Mbit/s
95th percentile per-packet one-way delay: 222.449 ms
Loss rate: 2.99%
```
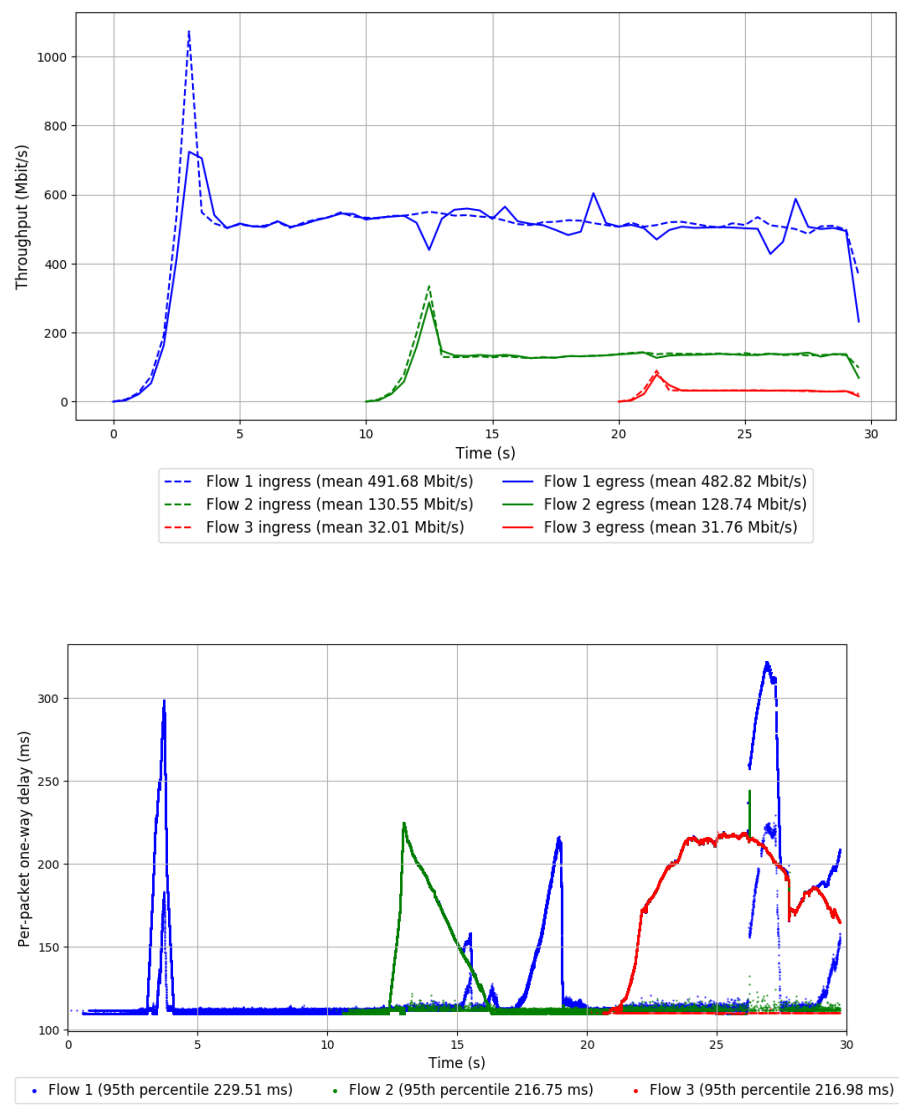
Run 3: Report of PCC — Data Link

```
Run 4: Statistics of PCC

Start at: 2017-09-18 17:59:20
End at: 2017-09-18 17:59:50


# Below is generated by plot.py at 2017-09-18 21:19:09
# Datalink statistics
-- Total of 3 flows:
Average throughput: 578.35 Mbit/s
95th percentile per-packet one-way delay: 218.483 ms
Loss rate: 2.54%
-- Flow 1:
Average throughput: 482.82 Mbit/s
95th percentile per-packet one-way delay: 229.506 ms
Loss rate: 2.54%
-- Flow 2:
Average throughput: 128.74 Mbit/s
95th percentile per-packet one-way delay: 216.749 ms
Loss rate: 2.51%
-- Flow 3:
Average throughput: 31.76 Mbit/s
95th percentile per-packet one-way delay: 216.981 ms
Loss rate: 3.03%
```
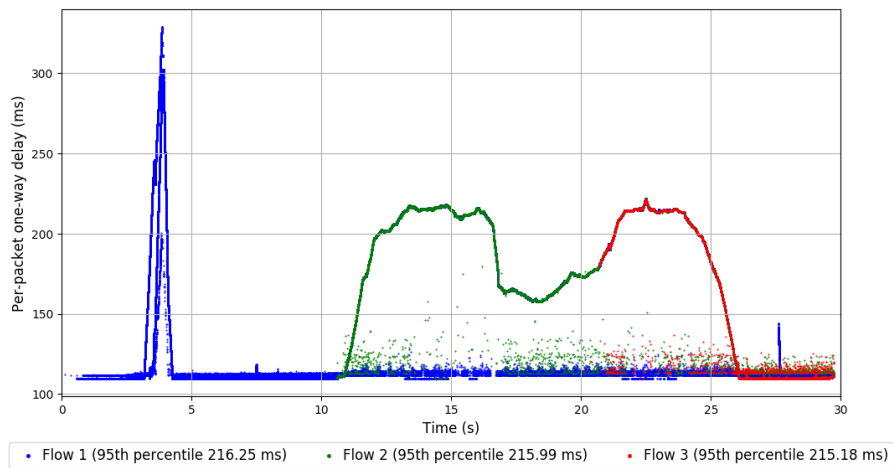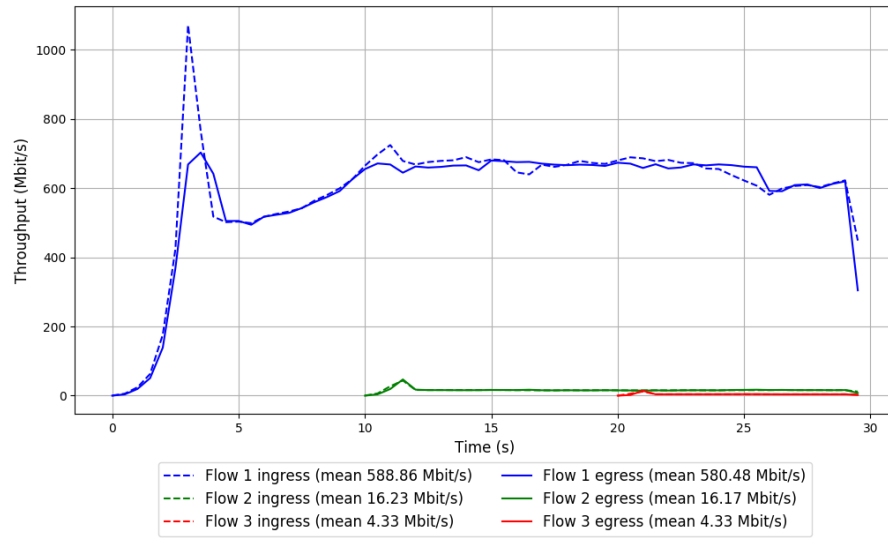
Run 4: Report of PCC — Data Link

- Flow 1 ingress (mean 491.68 Mbit/s)
- Flow 2 ingress (mean 130.55 Mbit/s)
- Flow 3 ingress (mean 32.01 Mbit/s)
- Flow 1 egress (mean 482.82 Mbit/s)
- Flow 2 egress (mean 128.74 Mbit/s)
- Flow 3 egress (mean 31.76 Mbit/s)

- Flow 1 (95th percentile 229.51 ms)
- Flow 2 (95th percentile 216.75 ms)
- Flow 3 (95th percentile 216.98 ms)

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```
Run 5: Statistics of PCC

Start at: 2017-09-18 18:09:32
End at: 2017-09-18 18:10:02

# Below is generated by plot.py at 2017-09-18 21:19:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 592.59 Mbit/s
95th percentile per-packet one-way delay: 216.238 ms
Loss rate: 2.15%
-- Flow 1:
Average throughput: 580.48 Mbit/s
95th percentile per-packet one-way delay: 216.246 ms
Loss rate: 2.17%
-- Flow 2:
Average throughput: 16.17 Mbit/s
95th percentile per-packet one-way delay: 215.994 ms
Loss rate: 1.47%
-- Flow 3:
Average throughput: 4.33 Mbit/s
95th percentile per-packet one-way delay: 215.180 ms
Loss rate: 2.33%
```
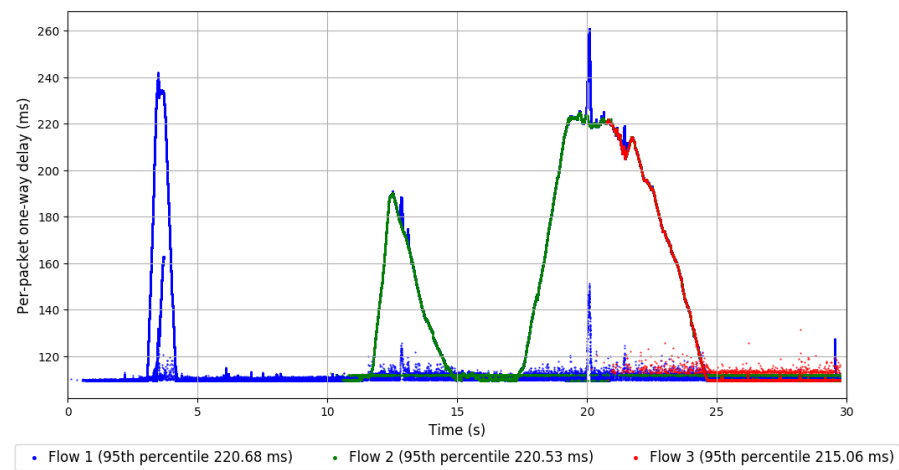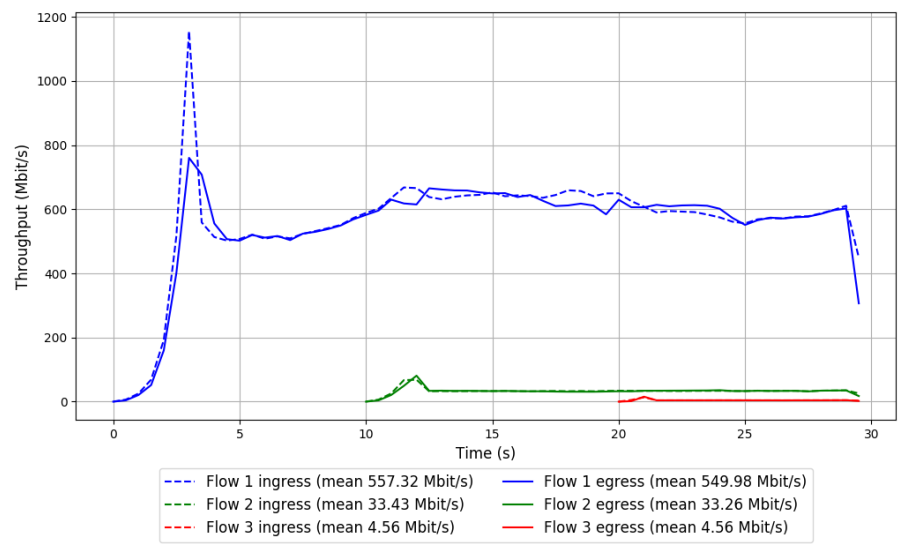
Run 5: Report of PCC — Data Link

```
Run 6: Statistics of PCC

Start at: 2017-09-18 18:19:48
End at: 2017-09-18 18:20:18

# Below is generated by plot.py at 2017-09-18 21:19:30
# Datalink statistics
-- Total of 3 flows:
Average throughput: 573.46 Mbit/s
95th percentile per-packet one-way delay: 220.670 ms
Loss rate: 2.04%
-- Flow 1:
Average throughput: 549.98 Mbit/s
95th percentile per-packet one-way delay: 220.684 ms
Loss rate: 2.06%
-- Flow 2:
Average throughput: 33.26 Mbit/s
95th percentile per-packet one-way delay: 220.529 ms
Loss rate: 1.64%
-- Flow 3:
Average throughput: 4.56 Mbit/s
95th percentile per-packet one-way delay: 215.063 ms
Loss rate: 2.35%
```
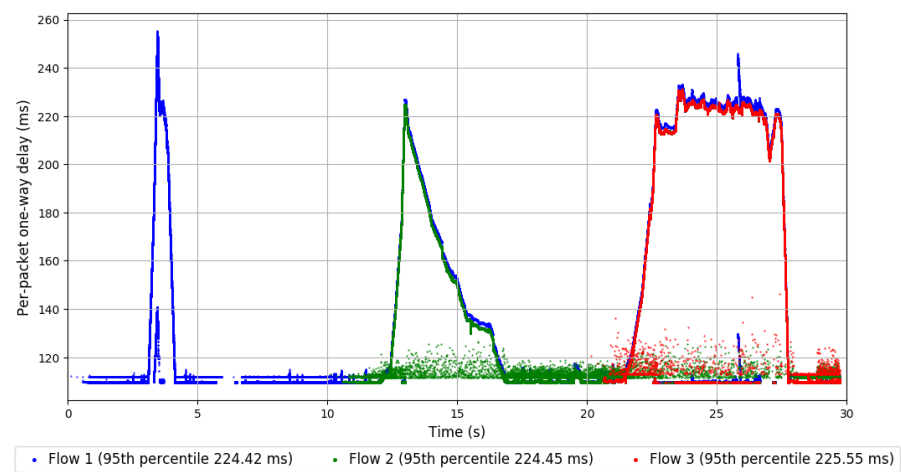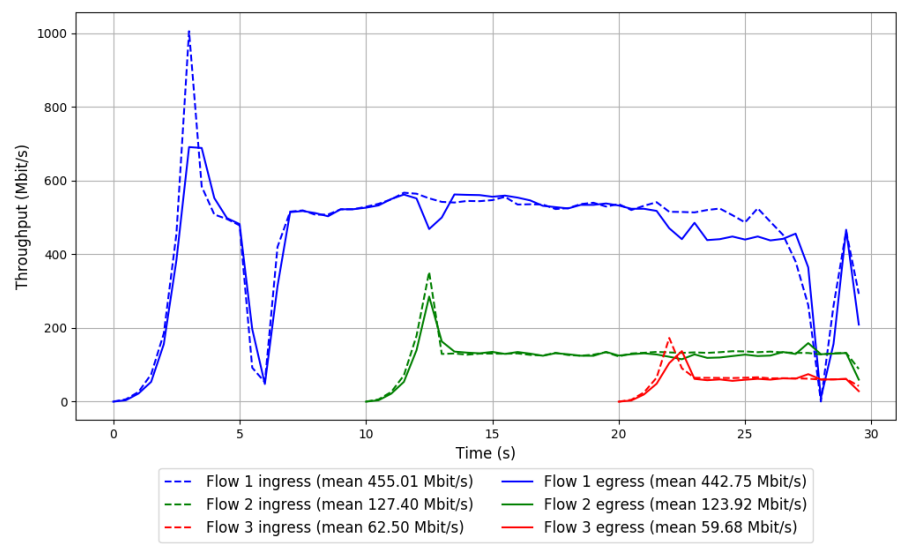
Run 6: Report of PCC — Data Link

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```
Run 7: Statistics of PCC

Start at: 2017-09-18 18:29:18
End at: 2017-09-18 18:29:48


# Below is generated by plot.py at 2017-09-18 21:22:10
# Datalink statistics
-- Total of 3 flows:
Average throughput: 544.02 Mbit/s
95th percentile per-packet one-way delay: 224.483 ms
Loss rate: 3.61%
-- Flow 1:
Average throughput: 442.75 Mbit/s
95th percentile per-packet one-way delay: 224.419 ms
Loss rate: 3.43%
-- Flow 2:
Average throughput: 123.92 Mbit/s
95th percentile per-packet one-way delay: 224.450 ms
Loss rate: 3.84%
-- Flow 3:
Average throughput: 59.68 Mbit/s
95th percentile per-packet one-way delay: 225.549 ms
Loss rate: 6.75%
```
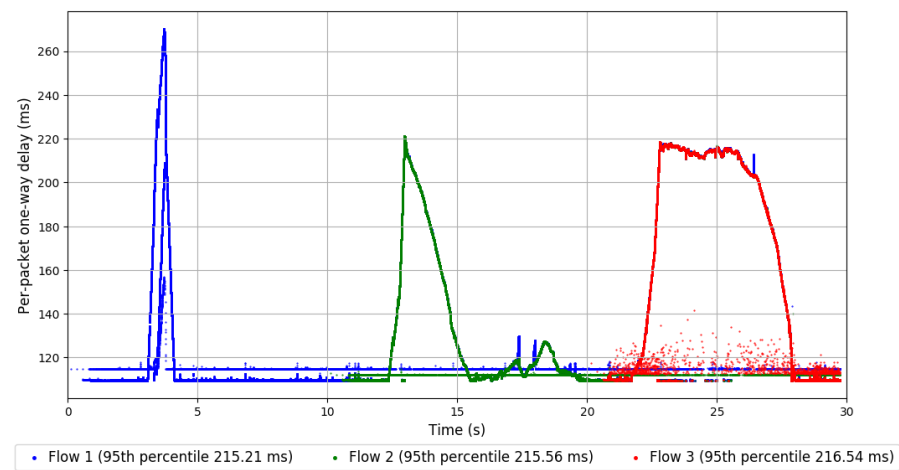
Run 7: Report of PCC — Data Link

```
Run 8: Statistics of PCC

Start at: 2017-09-18 18:38:44
End at: 2017-09-18 18:39:14


# Below is generated by plot.py at 2017-09-18 21:23:22
# Datalink statistics
-- Total of 3 flows:
Average throughput: 579.02 Mbit/s
95th percentile per-packet one-way delay: 215.354 ms
Loss rate: 2.22%
-- Flow 1:
Average throughput: 478.50 Mbit/s
95th percentile per-packet one-way delay: 215.208 ms
Loss rate: 2.18%
-- Flow 2:
Average throughput: 121.29 Mbit/s
95th percentile per-packet one-way delay: 215.559 ms
Loss rate: 2.11%
-- Flow 3:
Average throughput: 62.46 Mbit/s
95th percentile per-packet one-way delay: 216.539 ms
Loss rate: 3.67%
```
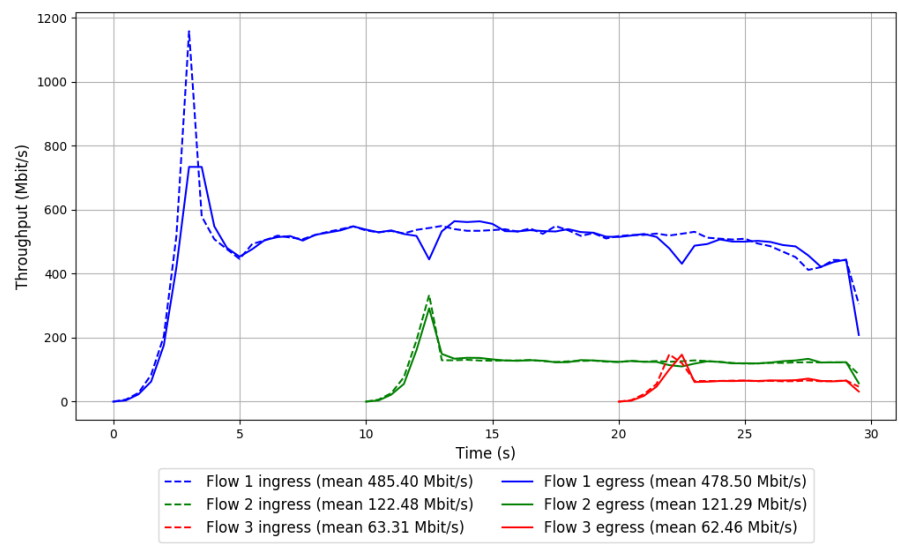
Run 8: Report of PCC — Data Link

- Flow 1 ingress (mean 485.40 Mbit/s) --- Flow 1 egress (mean 478.50 Mbit/s)
- Flow 2 ingress (mean 122.48 Mbit/s) --- Flow 2 egress (mean 121.29 Mbit/s)
- Flow 3 ingress (mean 63.31 Mbit/s) --- Flow 3 egress (mean 62.46 Mbit/s)

- Flow 1 (95th percentile 215.21 ms)
- Flow 2 (95th percentile 215.56 ms)
- Flow 3 (95th percentile 216.54 ms)

```
Run 9: Statistics of PCC

Start at: 2017-09-18 18:48:32
End at: 2017-09-18 18:49:02

# Below is generated by plot.py at 2017-09-18 21:28:37
# Datalink statistics
-- Total of 3 flows:
Average throughput: 585.94 Mbit/s
95th percentile per-packet one-way delay: 255.673 ms
Loss rate: 2.50%
-- Flow 1:
Average throughput: 480.98 Mbit/s
95th percentile per-packet one-way delay: 275.438 ms
Loss rate: 2.34%
-- Flow 2:
Average throughput: 128.87 Mbit/s
95th percentile per-packet one-way delay: 212.541 ms
Loss rate: 2.96%
-- Flow 3:
Average throughput: 61.00 Mbit/s
95th percentile per-packet one-way delay: 212.747 ms
Loss rate: 4.20%
```
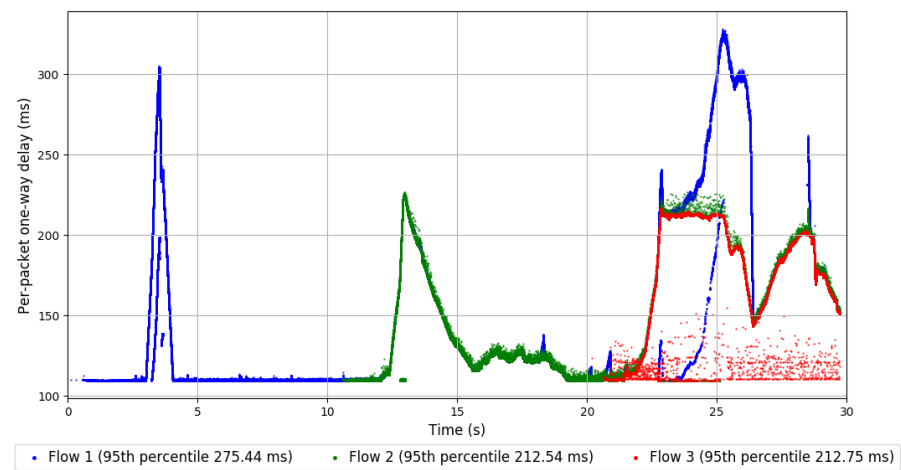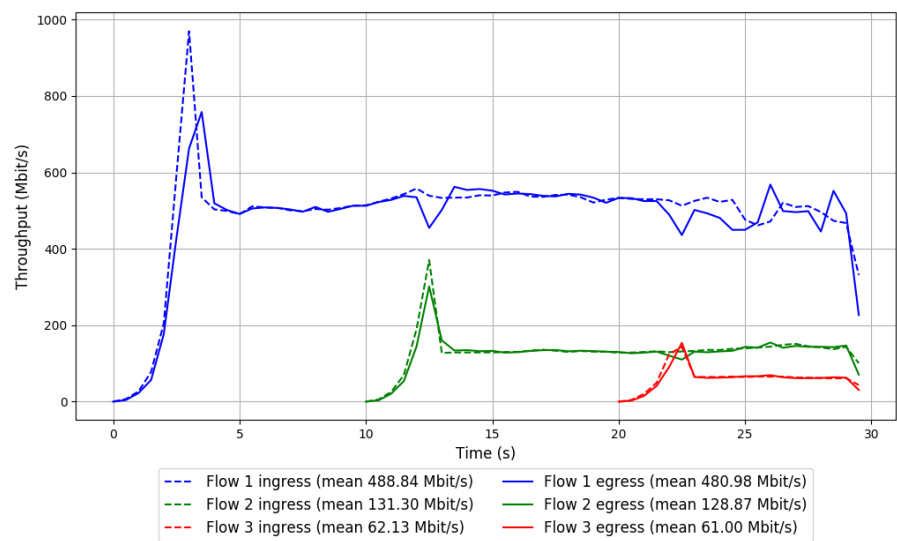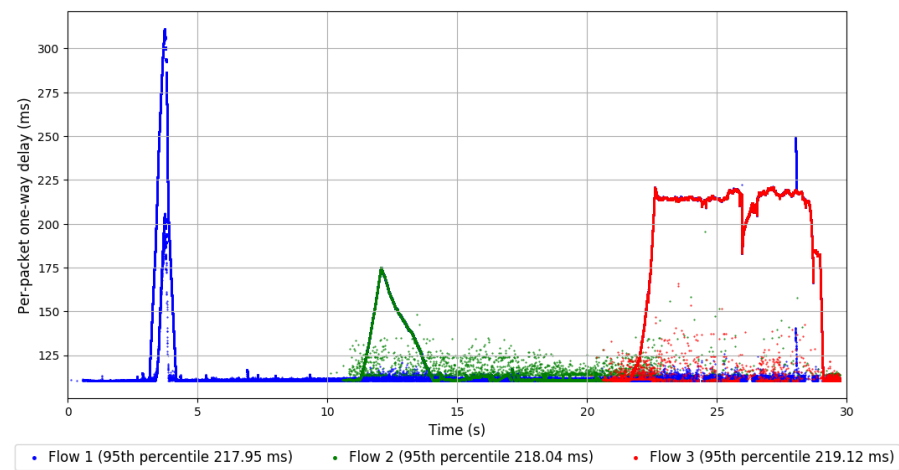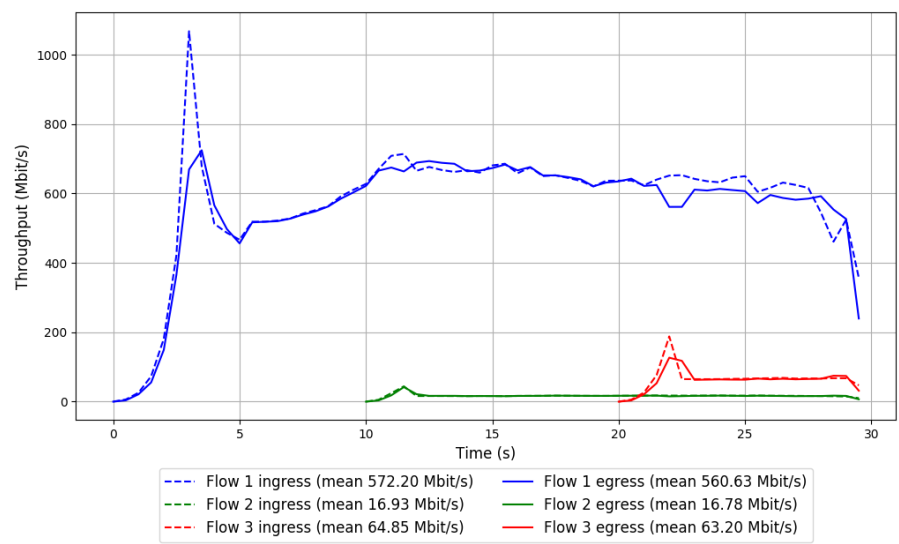
Run 9: Report of PCC — Data Link

```
Run 10: Statistics of PCC

Start at: 2017-09-18 18:58:41
End at: 2017-09-18 18:59:11


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 592.18 Mbit/s
95th percentile per-packet one-way delay: 218.054 ms
Loss rate: 2.81%
-- Flow 1:
Average throughput: 560.63 Mbit/s
95th percentile per-packet one-way delay: 217.950 ms
Loss rate: 2.76%
-- Flow 2:
Average throughput: 16.78 Mbit/s
95th percentile per-packet one-way delay: 218.041 ms
Loss rate: 1.98%
-- Flow 3:
Average throughput: 63.20 Mbit/s
95th percentile per-packet one-way delay: 219.125 ms
Loss rate: 4.77%
```
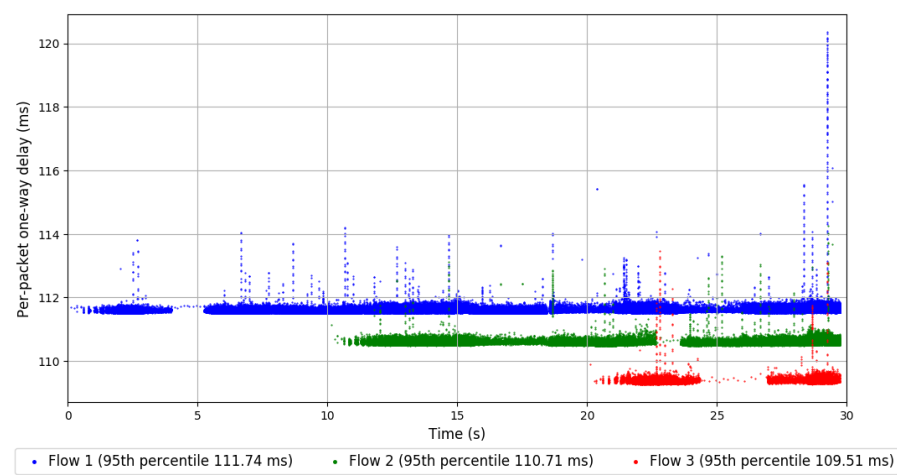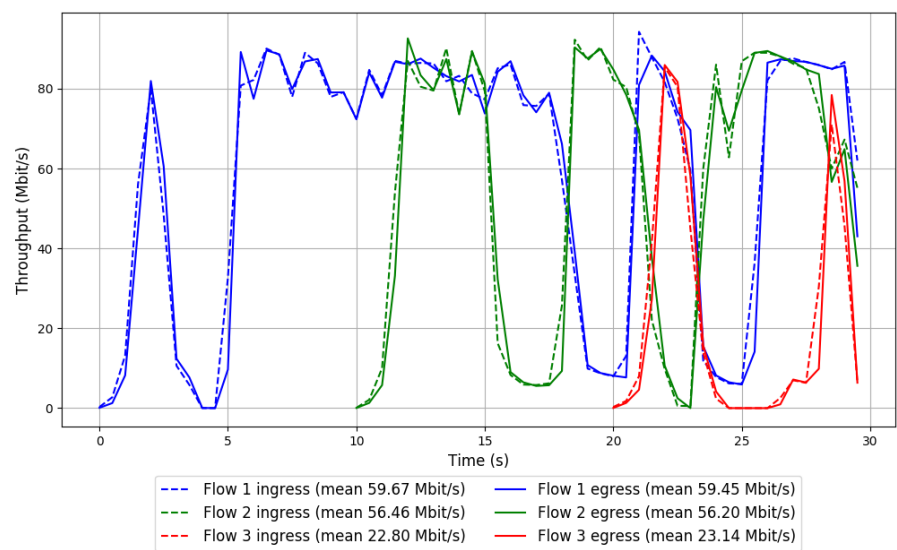
Run 10: Report of PCC — Data Link

Flow 1 ingress (mean 572.20 Mbit/s) — Flow 1 egress (mean 560.63 Mbit/s)
Flow 2 ingress (mean 16.93 Mbit/s) — Flow 2 egress (mean 16.78 Mbit/s)
Flow 3 ingress (mean 64.85 Mbit/s) — Flow 3 egress (mean 63.20 Mbit/s)

Flow 1 (95th percentile 217.95 ms) • Flow 2 (95th percentile 218.04 ms) • Flow 3 (95th percentile 219.12 ms)

103

```
Run 1: Statistics of QUIC Cubic

Start at: 2017-09-18 17:25:32
End at: 2017-09-18 17:26:02


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 104.13 Mbit/s
95th percentile per-packet one-way delay: 111.700 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 59.45 Mbit/s
95th percentile per-packet one-way delay: 111.737 ms
Loss rate: 1.10%
-- Flow 2:
Average throughput: 56.20 Mbit/s
95th percentile per-packet one-way delay: 110.707 ms
Loss rate: 1.60%
-- Flow 3:
Average throughput: 23.14 Mbit/s
95th percentile per-packet one-way delay: 109.512 ms
Loss rate: 0.80%
```
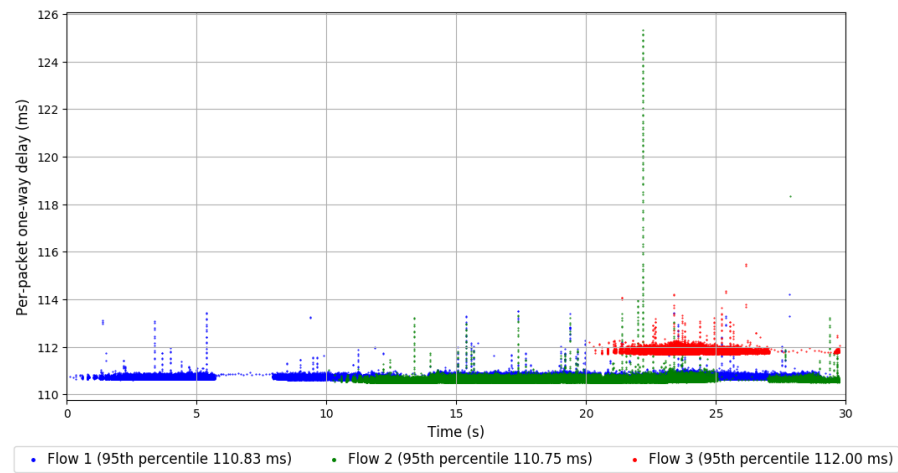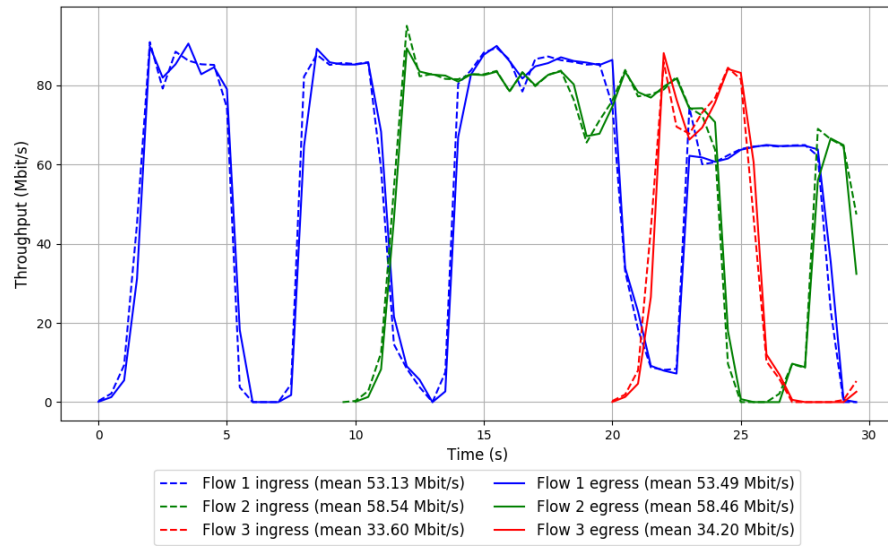
Run 1: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 59.67 Mbit/s) --- Flow 1 egress (mean 59.45 Mbit/s)
Flow 2 ingress (mean 56.46 Mbit/s) --- Flow 2 egress (mean 56.20 Mbit/s)
Flow 3 ingress (mean 22.80 Mbit/s) --- Flow 3 egress (mean 23.14 Mbit/s)

Flow 1 (95th percentile 111.74 ms) • Flow 2 (95th percentile 110.71 ms) • Flow 3 (95th percentile 109.51 ms)

```
Run 2: Statistics of QUIC Cubic

Start at: 2017-09-18 17:35:39
End at: 2017-09-18 17:36:09


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.25 Mbit/s
95th percentile per-packet one-way delay: 111.806 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 53.49 Mbit/s
95th percentile per-packet one-way delay: 110.827 ms
Loss rate: 0.00%
-- Flow 2:
Average throughput: 58.46 Mbit/s
95th percentile per-packet one-way delay: 110.749 ms
Loss rate: 1.26%
-- Flow 3:
Average throughput: 34.20 Mbit/s
95th percentile per-packet one-way delay: 112.001 ms
Loss rate: 0.49%
```
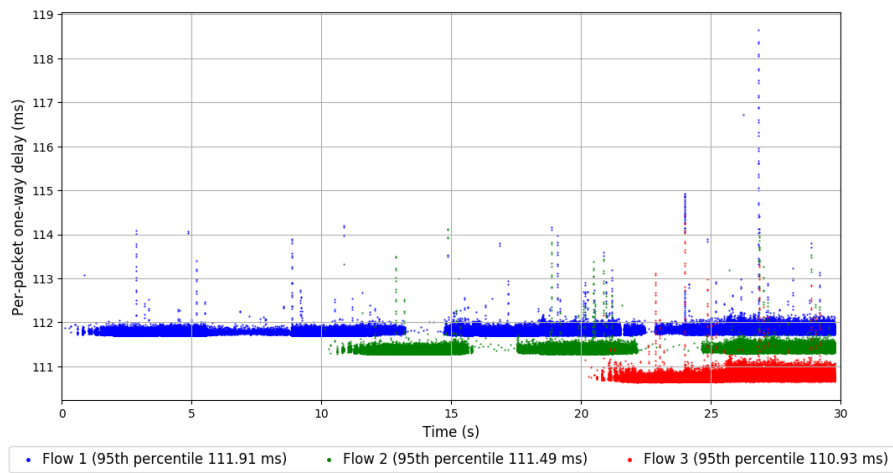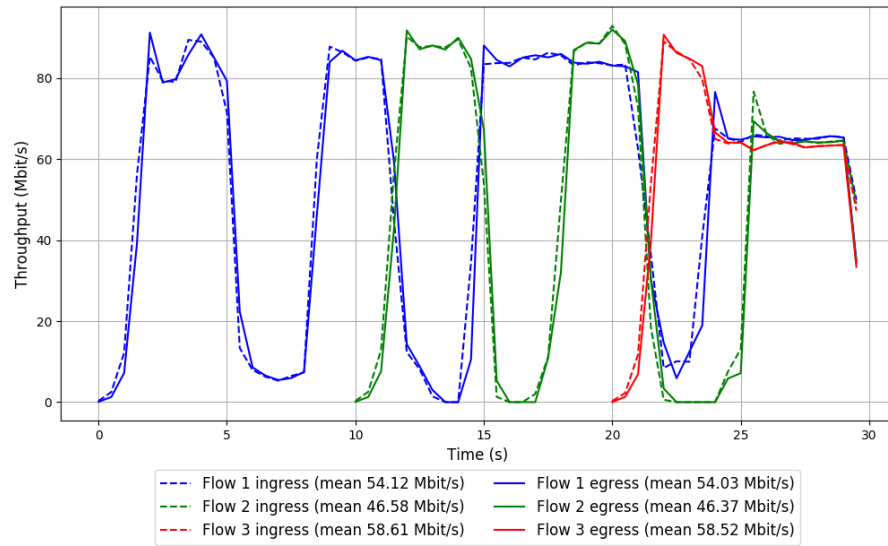
Run 2: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 53.13 Mbit/s)   Flow 1 egress (mean 53.49 Mbit/s)
Flow 2 ingress (mean 58.54 Mbit/s)   Flow 2 egress (mean 58.46 Mbit/s)
Flow 3 ingress (mean 33.60 Mbit/s)   Flow 3 egress (mean 34.20 Mbit/s)

• Flow 1 (95th percentile 110.83 ms)   • Flow 2 (95th percentile 110.75 ms)   • Flow 3 (95th percentile 112.00 ms)

107

```
Run 3: Statistics of QUIC Cubic

Start at: 2017-09-18 17:45:46
End at: 2017-09-18 17:46:16


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.77 Mbit/s
95th percentile per-packet one-way delay: 111.876 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 54.03 Mbit/s
95th percentile per-packet one-way delay: 111.913 ms
Loss rate: 0.92%
-- Flow 2:
Average throughput: 46.37 Mbit/s
95th percentile per-packet one-way delay: 111.487 ms
Loss rate: 1.56%
-- Flow 3:
Average throughput: 58.52 Mbit/s
95th percentile per-packet one-way delay: 110.932 ms
Loss rate: 2.42%
```
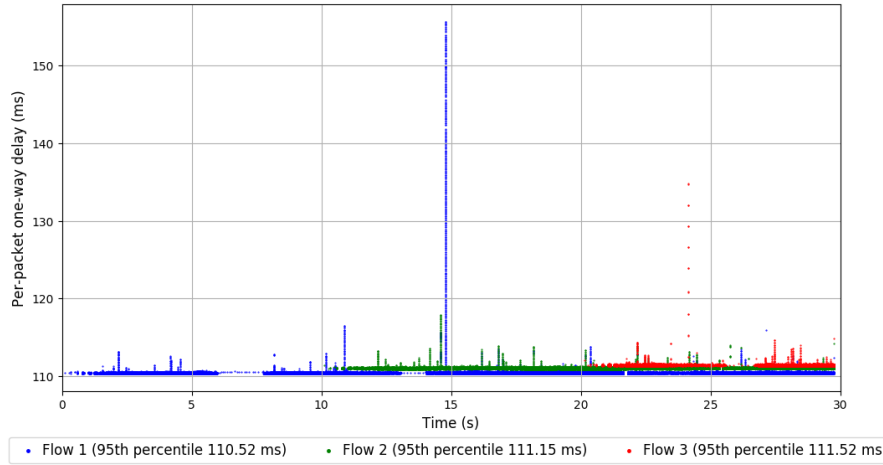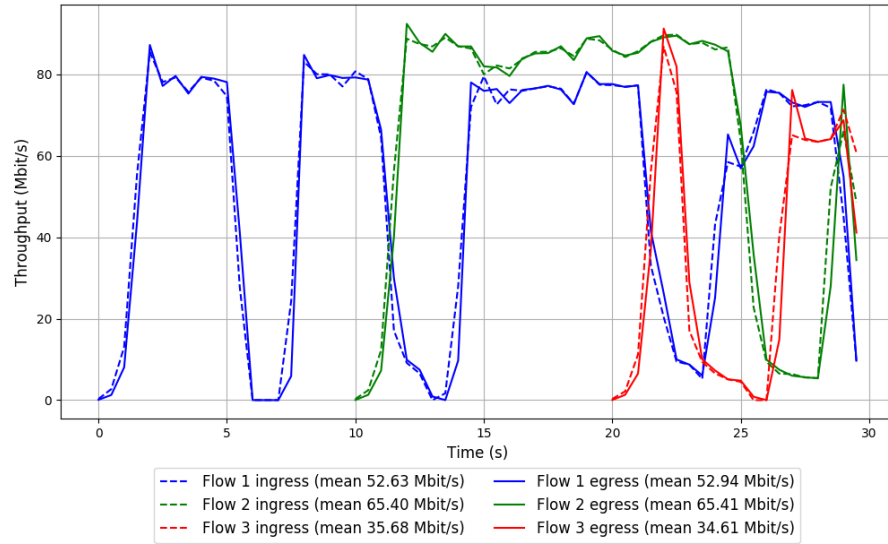
Run 3: Report of QUIC Cubic — Data Link

```
Run 4: Statistics of QUIC Cubic

Start at: 2017-09-18 17:55:35
End at: 2017-09-18 17:56:05

# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 107.51 Mbit/s
95th percentile per-packet one-way delay: 111.409 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 52.94 Mbit/s
95th percentile per-packet one-way delay: 110.523 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 65.41 Mbit/s
95th percentile per-packet one-way delay: 111.146 ms
Loss rate: 1.09%
-- Flow 3:
Average throughput: 34.61 Mbit/s
95th percentile per-packet one-way delay: 111.523 ms
Loss rate: 5.17%
```
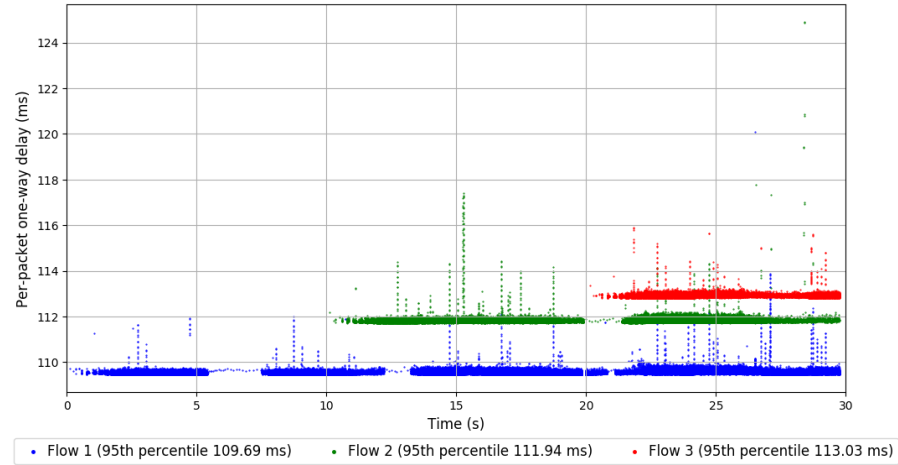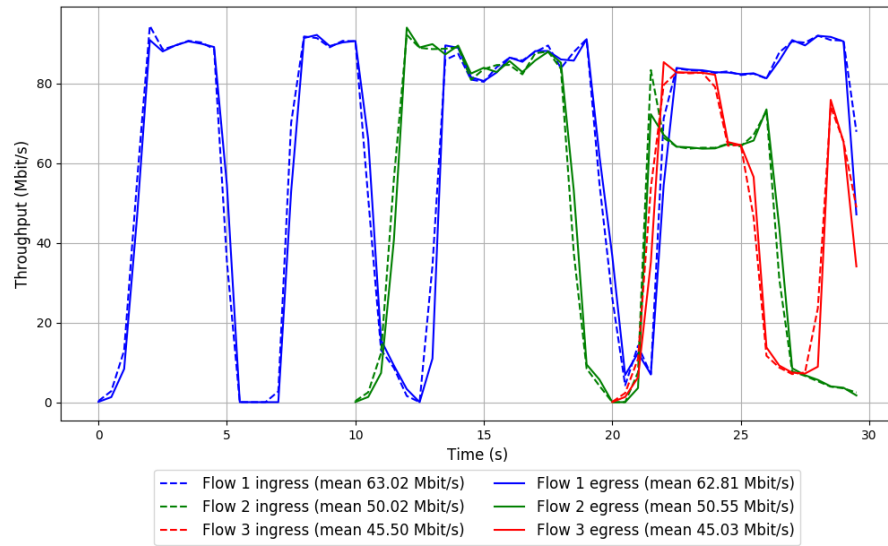
Run 4: Report of QUIC Cubic — Data Link

```
Run 5: Statistics of QUIC Cubic

Start at: 2017-09-18 18:05:46
End at: 2017-09-18 18:06:16


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 110.90 Mbit/s
95th percentile per-packet one-way delay: 112.918 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 62.81 Mbit/s
95th percentile per-packet one-way delay: 109.690 ms
Loss rate: 1.07%
-- Flow 2:
Average throughput: 50.55 Mbit/s
95th percentile per-packet one-way delay: 111.938 ms
Loss rate: 0.07%
-- Flow 3:
Average throughput: 45.03 Mbit/s
95th percentile per-packet one-way delay: 113.032 ms
Loss rate: 3.31%
```
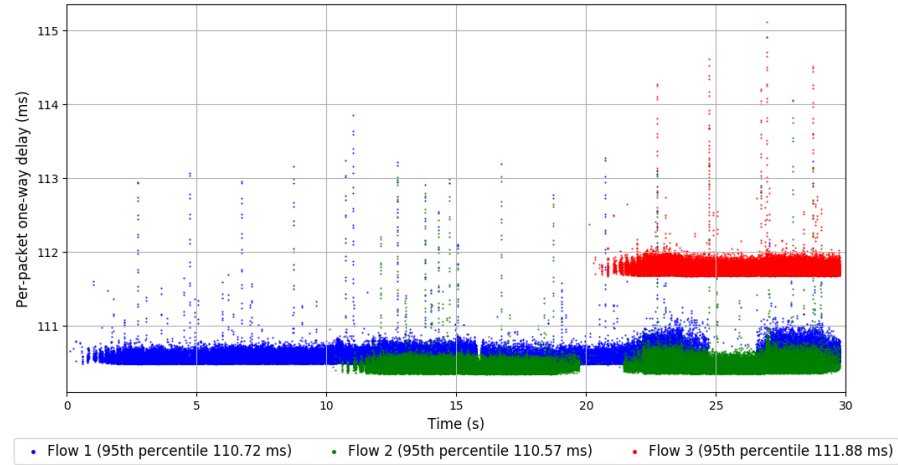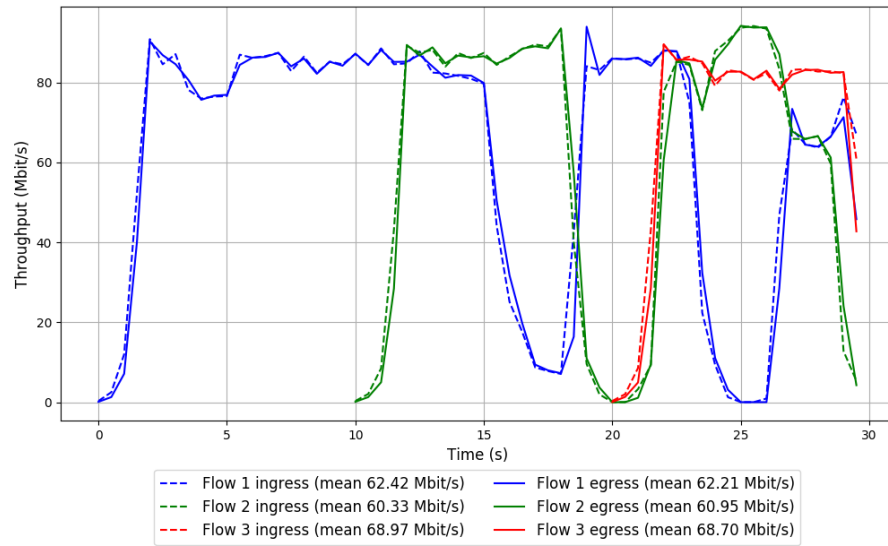
Run 5: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 63.02 Mbit/s) --- Flow 1 egress (mean 62.81 Mbit/s)
Flow 2 ingress (mean 50.02 Mbit/s) --- Flow 2 egress (mean 50.55 Mbit/s)
Flow 3 ingress (mean 45.50 Mbit/s) --- Flow 3 egress (mean 45.03 Mbit/s)

Flow 1 (95th percentile 109.69 ms)   Flow 2 (95th percentile 111.94 ms)   Flow 3 (95th percentile 113.03 ms)

113

```
Run 6: Statistics of QUIC Cubic

Start at: 2017-09-18 18:16:02
End at: 2017-09-18 18:16:32


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 124.93 Mbit/s
95th percentile per-packet one-way delay: 111.785 ms
Loss rate: 1.06%
-- Flow 1:
Average throughput: 62.21 Mbit/s
95th percentile per-packet one-way delay: 110.723 ms
Loss rate: 1.08%
-- Flow 2:
Average throughput: 60.95 Mbit/s
95th percentile per-packet one-way delay: 110.567 ms
Loss rate: 0.12%
-- Flow 3:
Average throughput: 68.70 Mbit/s
95th percentile per-packet one-way delay: 111.875 ms
Loss rate: 2.67%
```
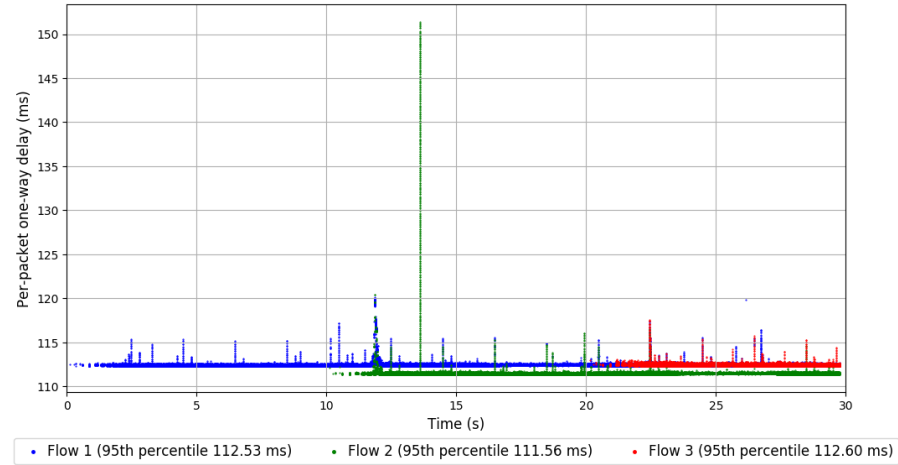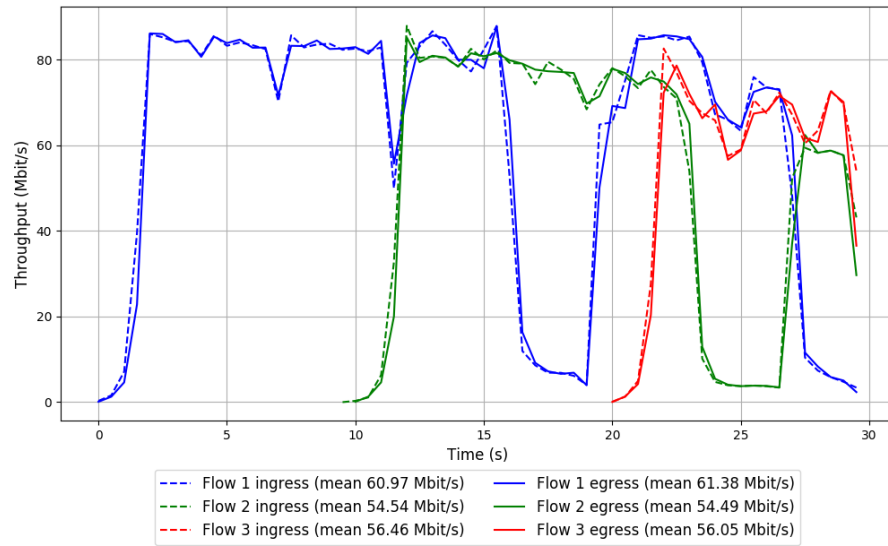
Run 6: Report of QUIC Cubic — Data Link

```
Run 7: Statistics of QUIC Cubic

Start at: 2017-09-18 18:25:36
End at: 2017-09-18 18:26:06


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 115.67 Mbit/s
95th percentile per-packet one-way delay: 112.529 ms
Loss rate: 0.89%
-- Flow 1:
Average throughput: 61.38 Mbit/s
95th percentile per-packet one-way delay: 112.534 ms
Loss rate: 0.06%
-- Flow 2:
Average throughput: 54.49 Mbit/s
95th percentile per-packet one-way delay: 111.564 ms
Loss rate: 1.22%
-- Flow 3:
Average throughput: 56.05 Mbit/s
95th percentile per-packet one-way delay: 112.600 ms
Loss rate: 3.01%
```
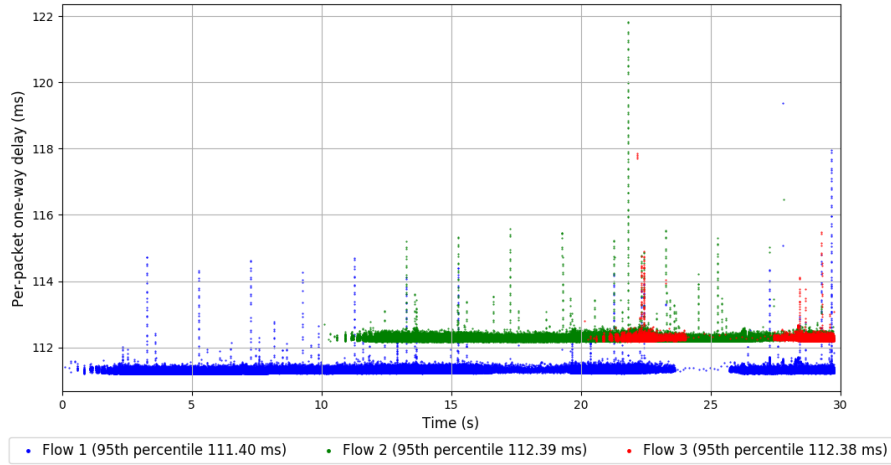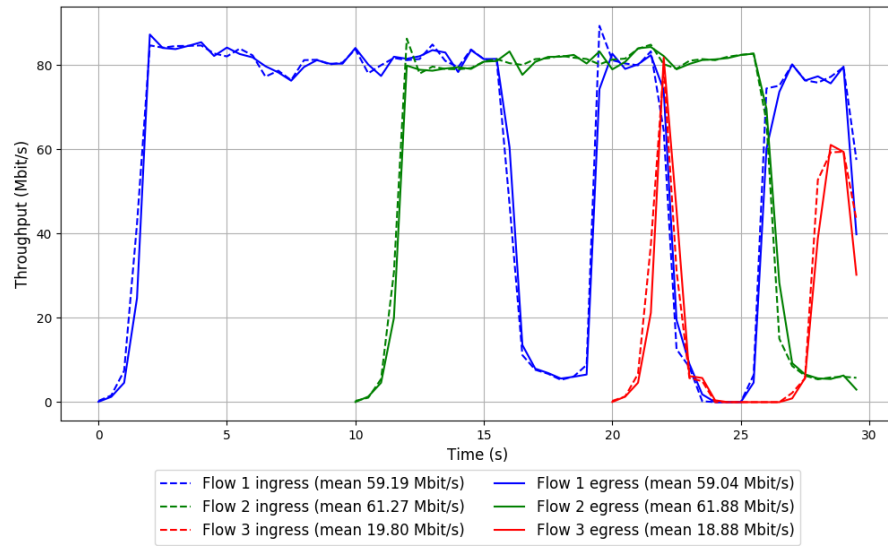
Run 7: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 60.97 Mbit/s) --- Flow 1 egress (mean 61.38 Mbit/s)
Flow 2 ingress (mean 54.54 Mbit/s) --- Flow 2 egress (mean 54.49 Mbit/s)
Flow 3 ingress (mean 56.46 Mbit/s) --- Flow 3 egress (mean 56.05 Mbit/s)

Flow 1 (95th percentile 112.53 ms)   Flow 2 (95th percentile 111.56 ms)   Flow 3 (95th percentile 112.60 ms)

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```
Run 8: Statistics of QUIC Cubic

Start at: 2017-09-18 18:35:03
End at: 2017-09-18 18:35:33


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 106.14 Mbit/s
95th percentile per-packet one-way delay: 112.340 ms
Loss rate: 1.03%
-- Flow 1:
Average throughput: 59.04 Mbit/s
95th percentile per-packet one-way delay: 111.396 ms
Loss rate: 1.00%
-- Flow 2:
Average throughput: 61.88 Mbit/s
95th percentile per-packet one-way delay: 112.386 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 18.88 Mbit/s
95th percentile per-packet one-way delay: 112.381 ms
Loss rate: 6.81%
```
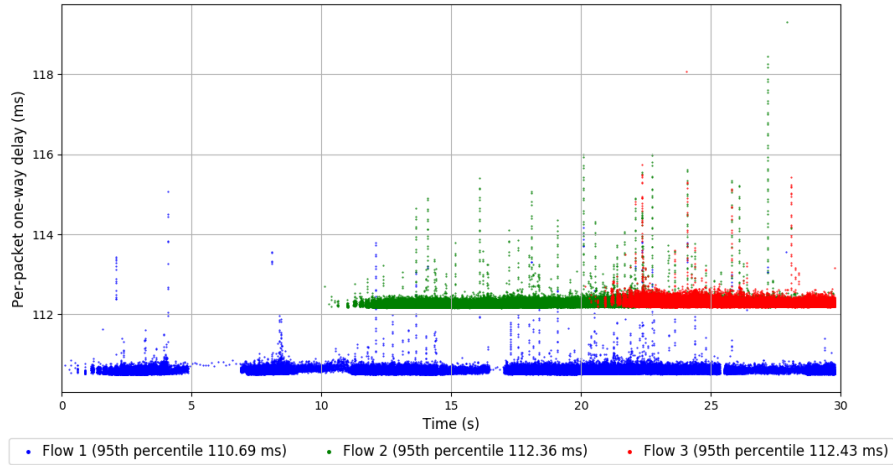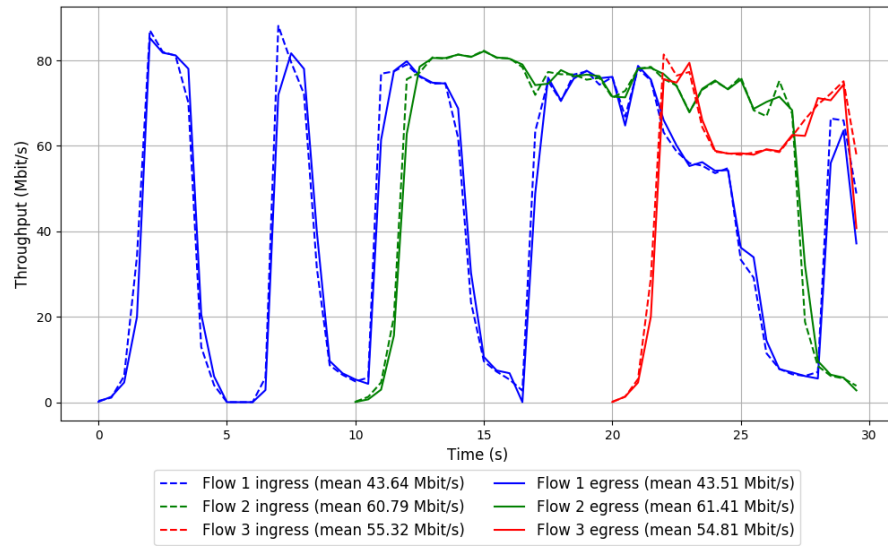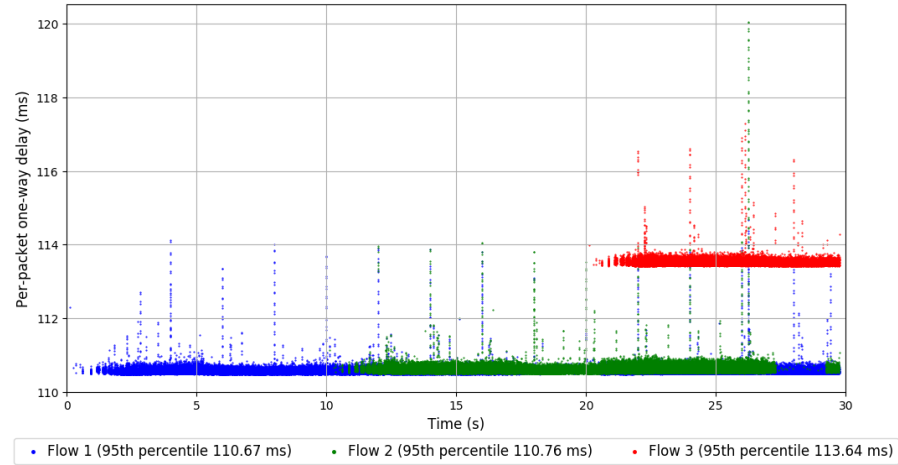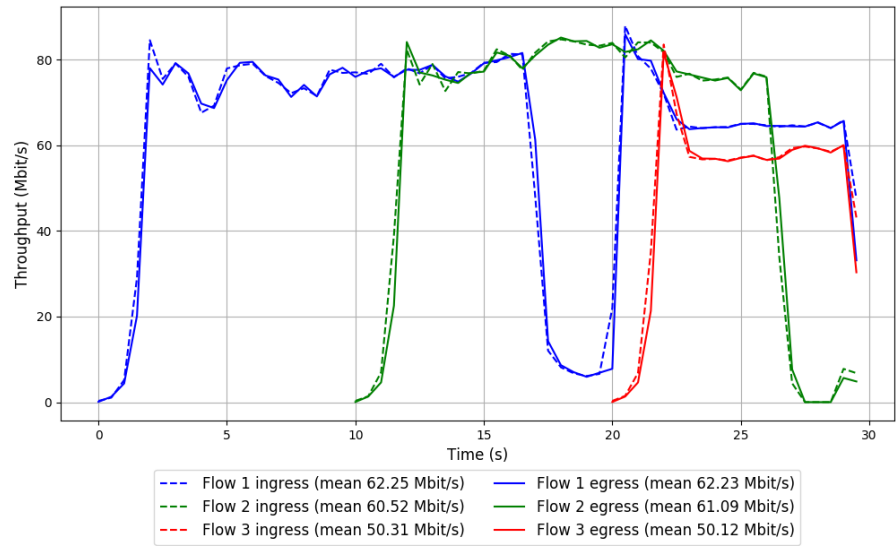
Run 8: Report of QUIC Cubic — Data Link

```
Run 9: Statistics of QUIC Cubic

Start at: 2017-09-18 18:44:53
End at: 2017-09-18 18:45:23


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 101.96 Mbit/s
95th percentile per-packet one-way delay: 112.355 ms
Loss rate: 1.05%
-- Flow 1:
Average throughput: 43.51 Mbit/s
95th percentile per-packet one-way delay: 110.693 ms
Loss rate: 1.05%
-- Flow 2:
Average throughput: 61.41 Mbit/s
95th percentile per-packet one-way delay: 112.365 ms
Loss rate: 0.09%
-- Flow 3:
Average throughput: 54.81 Mbit/s
95th percentile per-packet one-way delay: 112.427 ms
Loss rate: 3.18%
```
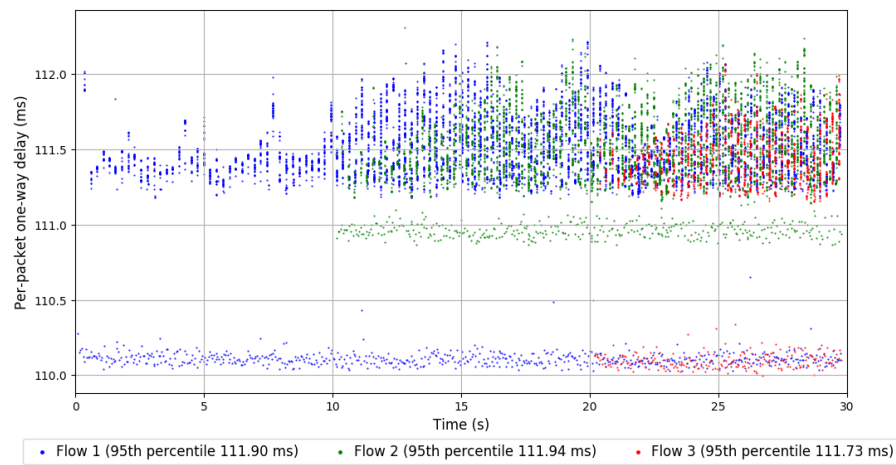
Run 9: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 43.64 Mbit/s)   Flow 1 egress (mean 43.51 Mbit/s)
Flow 2 ingress (mean 60.79 Mbit/s)   Flow 2 egress (mean 61.41 Mbit/s)
Flow 3 ingress (mean 55.32 Mbit/s)   Flow 3 egress (mean 54.81 Mbit/s)

Flow 1 (95th percentile 110.69 ms)   Flow 2 (95th percentile 112.36 ms)   Flow 3 (95th percentile 112.43 ms)

```
Run 10: Statistics of QUIC Cubic

Start at: 2017-09-18 18:54:57
End at: 2017-09-18 18:55:27


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 118.95 Mbit/s
95th percentile per-packet one-way delay: 113.525 ms
Loss rate: 0.84%
-- Flow 1:
Average throughput: 62.23 Mbit/s
95th percentile per-packet one-way delay: 110.671 ms
Loss rate: 0.78%
-- Flow 2:
Average throughput: 61.09 Mbit/s
95th percentile per-packet one-way delay: 110.762 ms
Loss rate: 0.17%
-- Flow 3:
Average throughput: 50.12 Mbit/s
95th percentile per-packet one-way delay: 113.641 ms
Loss rate: 2.67%
```

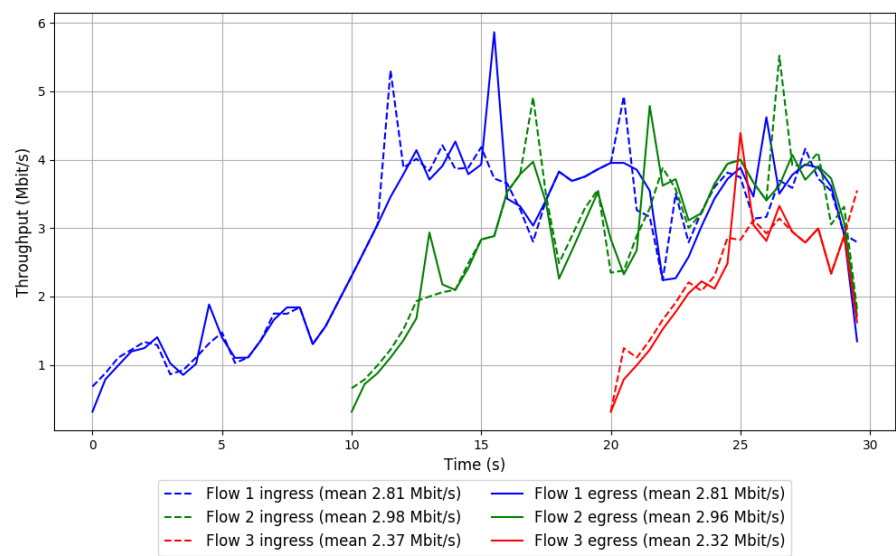# Run 10: Report of QUIC Cubic — Data Link

Flow 1 ingress (mean 62.25 Mbit/s) Flow 1 egress (mean 62.23 Mbit/s)
Flow 2 ingress (mean 60.52 Mbit/s) Flow 2 egress (mean 61.09 Mbit/s)
Flow 3 ingress (mean 50.31 Mbit/s) Flow 3 egress (mean 50.12 Mbit/s)

Flow 1 (95th percentile 110.67 ms) Flow 2 (95th percentile 110.76 ms) Flow 3 (95th percentile 113.64 ms)

```
Run 1: Statistics of Sprout

Start at: 2017-09-18 17:31:21
End at: 2017-09-18 17:31:51

# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.52 Mbit/s
95th percentile per-packet one-way delay: 111.902 ms
Loss rate: 1.58%
-- Flow 1:
Average throughput: 2.81 Mbit/s
95th percentile per-packet one-way delay: 111.898 ms
Loss rate: 0.87%
-- Flow 2:
Average throughput: 2.96 Mbit/s
95th percentile per-packet one-way delay: 111.936 ms
Loss rate: 1.59%
-- Flow 3:
Average throughput: 2.32 Mbit/s
95th percentile per-packet one-way delay: 111.733 ms
Loss rate: 4.15%
```
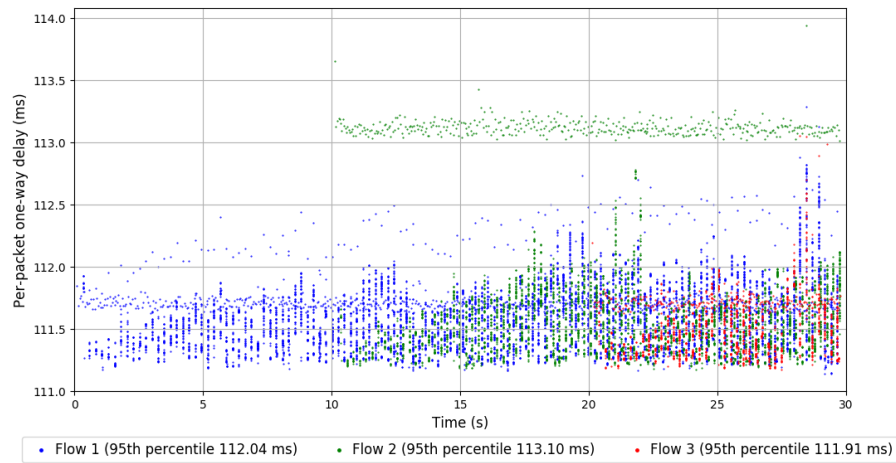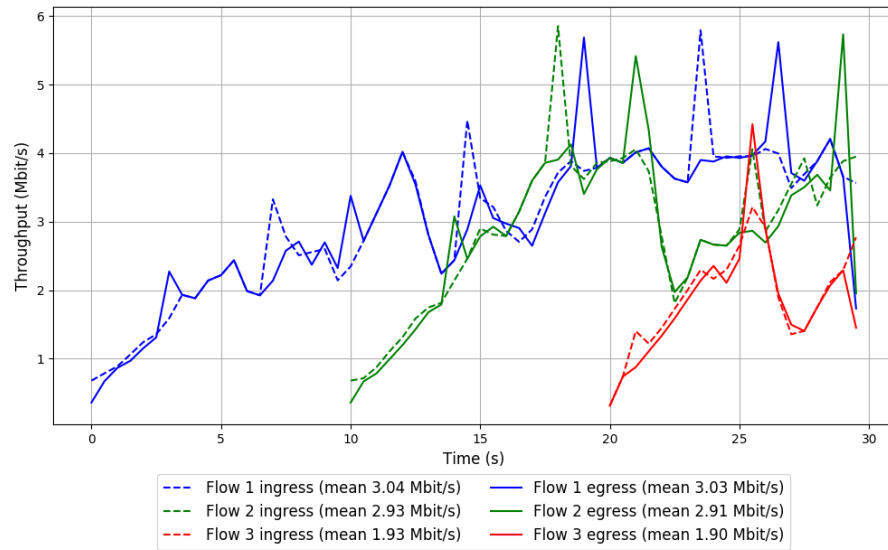
Run 1: Report of Sprout — Data Link

```
Run 2: Statistics of Sprout

Start at: 2017-09-18 17:41:29
End at: 2017-09-18 17:41:59


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.58 Mbit/s
95th percentile per-packet one-way delay: 112.180 ms
Loss rate: 1.65%
-- Flow 1:
Average throughput: 3.03 Mbit/s
95th percentile per-packet one-way delay: 112.041 ms
Loss rate: 1.13%
-- Flow 2:
Average throughput: 2.91 Mbit/s
95th percentile per-packet one-way delay: 113.100 ms
Loss rate: 1.82%
-- Flow 3:
Average throughput: 1.90 Mbit/s
95th percentile per-packet one-way delay: 111.912 ms
Loss rate: 3.61%
```
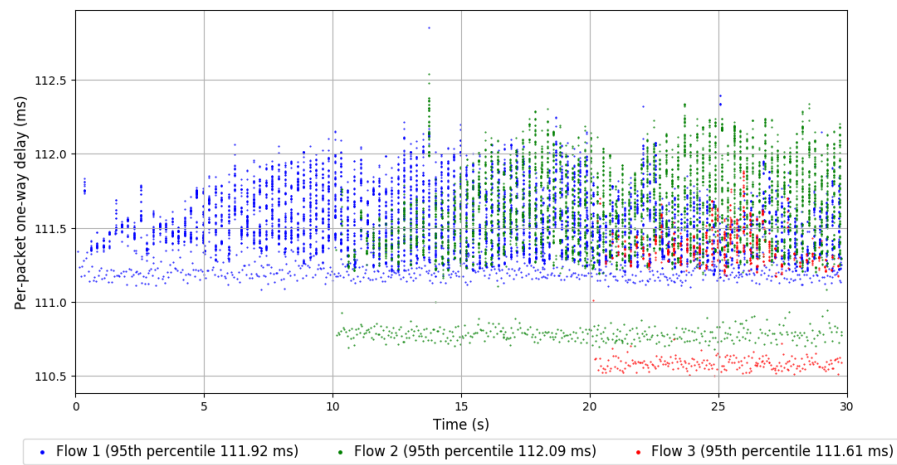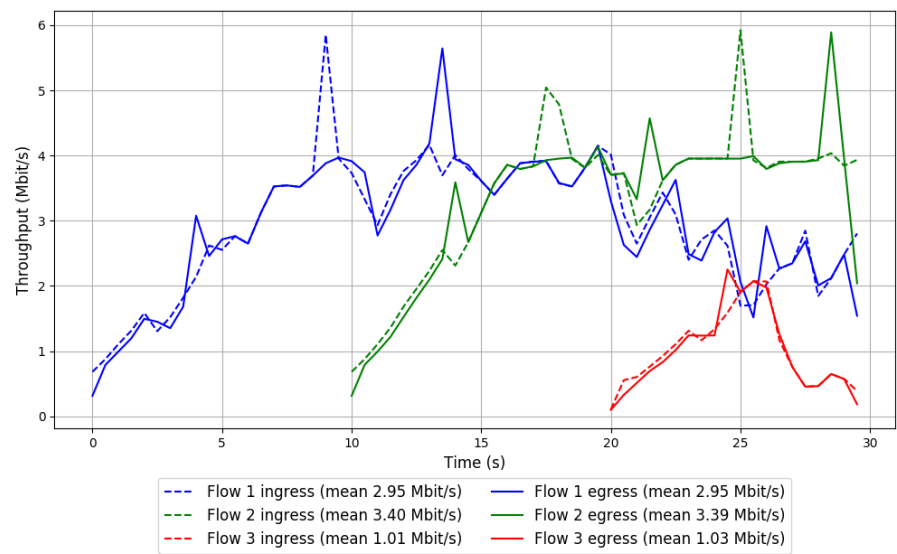
Run 2: Report of Sprout — Data Link

```
Run 3: Statistics of Sprout

Start at: 2017-09-18 17:51:35
End at: 2017-09-18 17:52:05


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.53 Mbit/s
95th percentile per-packet one-way delay: 112.005 ms
Loss rate: 1.02%
-- Flow 1:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 111.922 ms
Loss rate: 0.72%
-- Flow 2:
Average throughput: 3.39 Mbit/s
95th percentile per-packet one-way delay: 112.093 ms
Loss rate: 1.41%
-- Flow 3:
Average throughput: 1.03 Mbit/s
95th percentile per-packet one-way delay: 111.615 ms
Loss rate: 1.04%
```
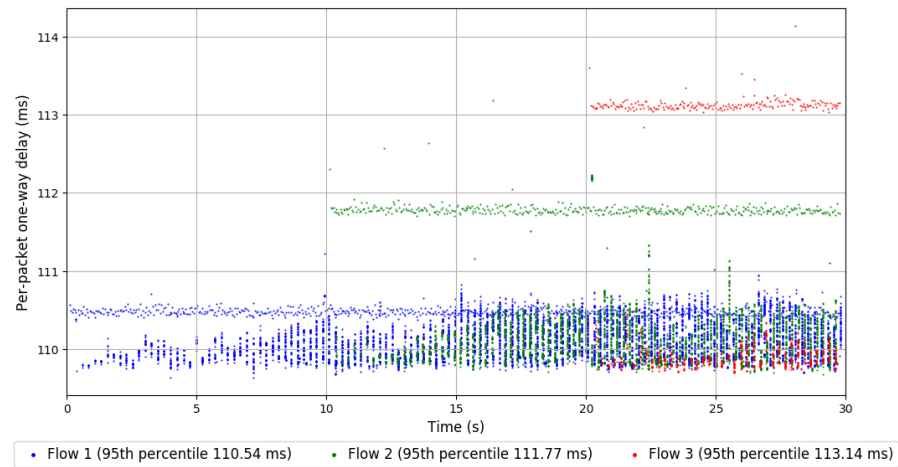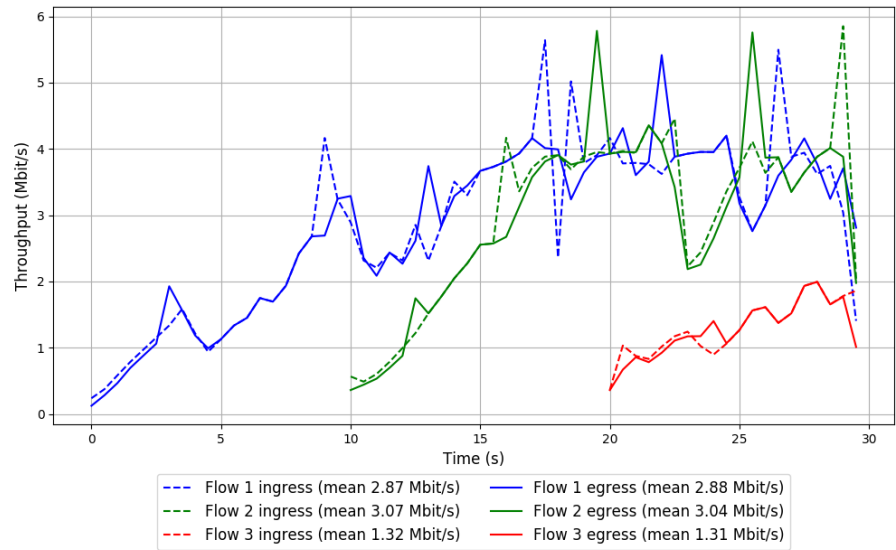
Run 3: Report of Sprout — Data Link

Flow 1 ingress (mean 2.95 Mbit/s)   Flow 1 egress (mean 2.95 Mbit/s)
Flow 2 ingress (mean 3.40 Mbit/s)   Flow 2 egress (mean 3.39 Mbit/s)
Flow 3 ingress (mean 1.01 Mbit/s)   Flow 3 egress (mean 1.03 Mbit/s)

Flow 1 (95th percentile 111.92 ms)   Flow 2 (95th percentile 112.09 ms)   Flow 3 (95th percentile 111.61 ms)

```
Run 4: Statistics of Sprout

Start at: 2017-09-18 18:01:27
End at: 2017-09-18 18:01:57


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.32 Mbit/s
95th percentile per-packet one-way delay: 110.939 ms
Loss rate: 1.00%
-- Flow 1:
Average throughput: 2.88 Mbit/s
95th percentile per-packet one-way delay: 110.538 ms
Loss rate: 0.10%
-- Flow 2:
Average throughput: 3.04 Mbit/s
95th percentile per-packet one-way delay: 111.773 ms
Loss rate: 1.77%
-- Flow 3:
Average throughput: 1.31 Mbit/s
95th percentile per-packet one-way delay: 113.141 ms
Loss rate: 3.32%
```
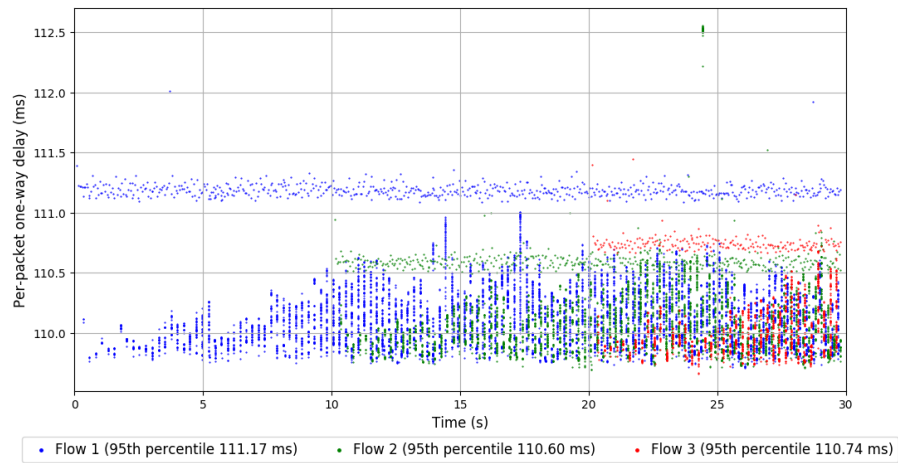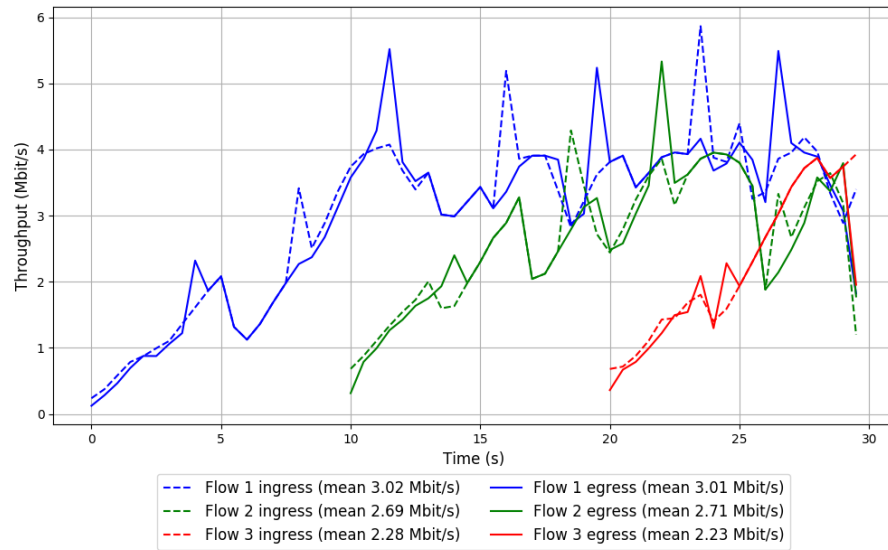
Run 4: Report of Sprout — Data Link

```
Run 5: Statistics of Sprout

Start at: 2017-09-18 18:11:39
End at: 2017-09-18 18:12:09


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.53 Mbit/s
95th percentile per-packet one-way delay: 110.826 ms
Loss rate: 1.26%
-- Flow 1:
Average throughput: 3.01 Mbit/s
95th percentile per-packet one-way delay: 111.169 ms
Loss rate: 0.88%
-- Flow 2:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 110.604 ms
Loss rate: 0.60%
-- Flow 3:
Average throughput: 2.23 Mbit/s
95th percentile per-packet one-way delay: 110.741 ms
Loss rate: 4.40%
```
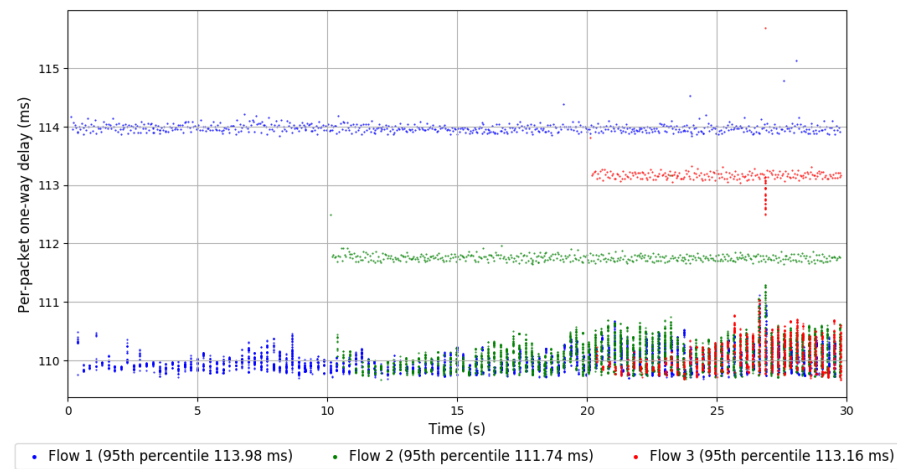
Run 5: Report of Sprout — Data Link

```
Run 6: Statistics of Sprout

Start at: 2017-09-18 18:21:54
End at: 2017-09-18 18:22:24


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.99 Mbit/s
95th percentile per-packet one-way delay: 113.227 ms
Loss rate: 1.57%
-- Flow 1:
Average throughput: 2.22 Mbit/s
95th percentile per-packet one-way delay: 113.976 ms
Loss rate: 1.09%
-- Flow 2:
Average throughput: 2.87 Mbit/s
95th percentile per-packet one-way delay: 111.740 ms
Loss rate: 1.81%
-- Flow 3:
Average throughput: 2.71 Mbit/s
95th percentile per-packet one-way delay: 113.158 ms
Loss rate: 2.28%
```
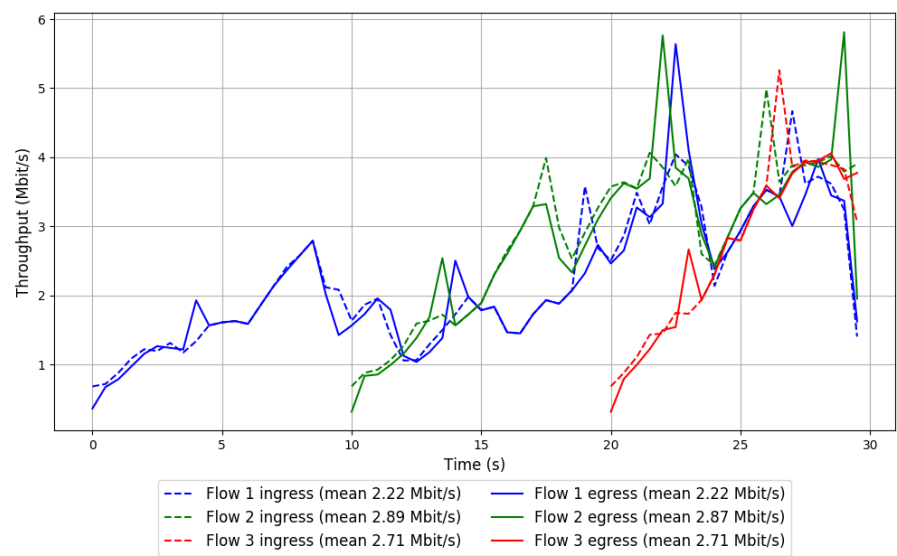
Run 6: Report of Sprout — Data Link

```
Run 7: Statistics of Sprout

Start at: 2017-09-18 18:31:24
End at: 2017-09-18 18:31:54


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.55 Mbit/s
95th percentile per-packet one-way delay: 110.360 ms
Loss rate: 1.44%
-- Flow 1:
Average throughput: 3.09 Mbit/s
95th percentile per-packet one-way delay: 110.310 ms
Loss rate: 0.55%
-- Flow 2:
Average throughput: 2.72 Mbit/s
95th percentile per-packet one-way delay: 110.333 ms
Loss rate: 1.81%
-- Flow 3:
Average throughput: 2.04 Mbit/s
95th percentile per-packet one-way delay: 113.118 ms
Loss rate: 4.46%
```
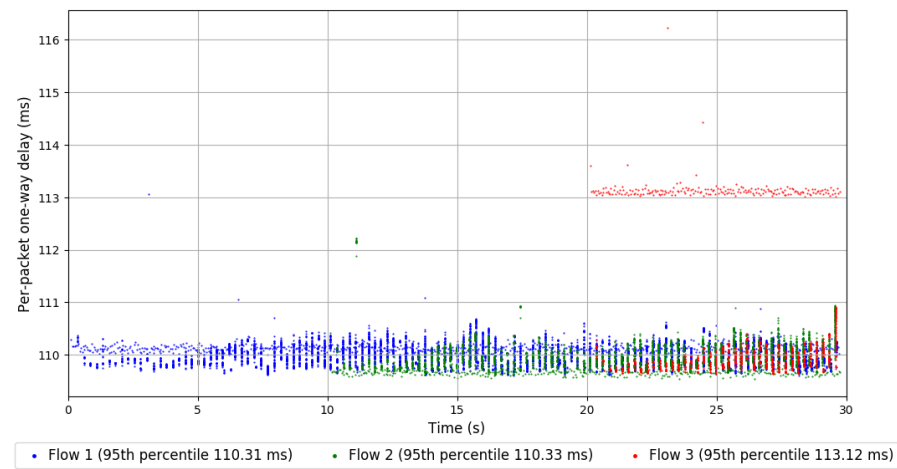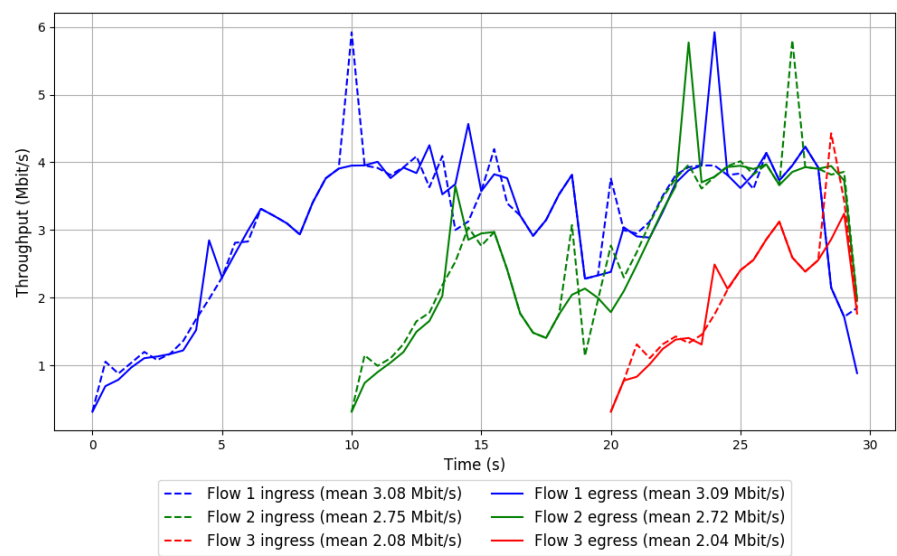
Run 7: Report of Sprout — Data Link

```
Run 8: Statistics of Sprout

Start at: 2017-09-18 18:40:51
End at: 2017-09-18 18:41:21


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.00 Mbit/s
95th percentile per-packet one-way delay: 113.030 ms
Loss rate: 1.58%
-- Flow 1:
Average throughput: 2.80 Mbit/s
95th percentile per-packet one-way delay: 112.991 ms
Loss rate: 0.93%
-- Flow 2:
Average throughput: 2.45 Mbit/s
95th percentile per-packet one-way delay: 113.107 ms
Loss rate: 1.50%
-- Flow 3:
Average throughput: 1.81 Mbit/s
95th percentile per-packet one-way delay: 111.963 ms
Loss rate: 4.77%
```
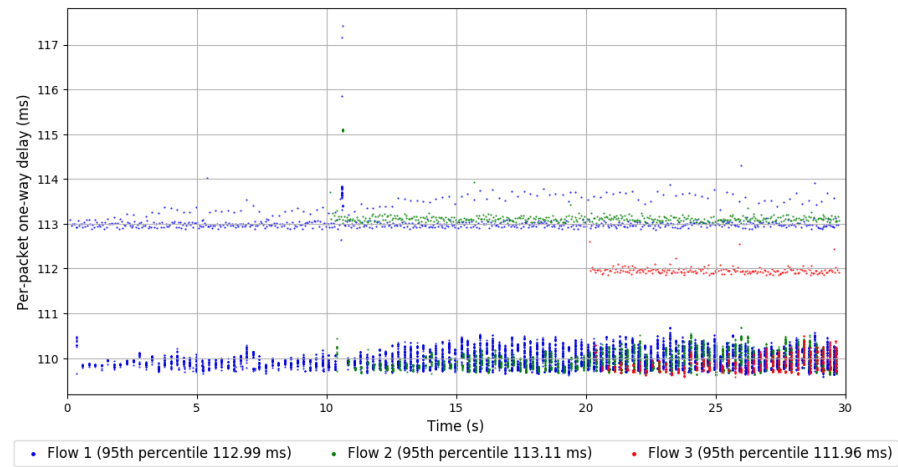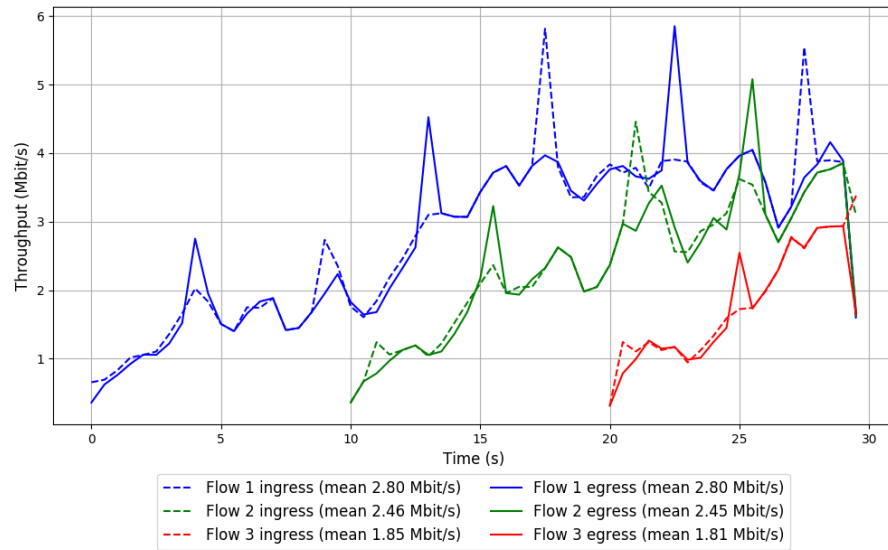
Run 8: Report of Sprout — Data Link

```
Run 9: Statistics of Sprout

Start at: 2017-09-18 18:50:38
End at: 2017-09-18 18:51:08


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 5.20 Mbit/s
95th percentile per-packet one-way delay: 110.588 ms
Loss rate: 1.69%
-- Flow 1:
Average throughput: 2.95 Mbit/s
95th percentile per-packet one-way delay: 110.354 ms
Loss rate: 1.12%
-- Flow 2:
Average throughput: 2.24 Mbit/s
95th percentile per-packet one-way delay: 110.671 ms
Loss rate: 1.73%
-- Flow 3:
Average throughput: 2.35 Mbit/s
95th percentile per-packet one-way delay: 112.837 ms
Loss rate: 3.74%
```
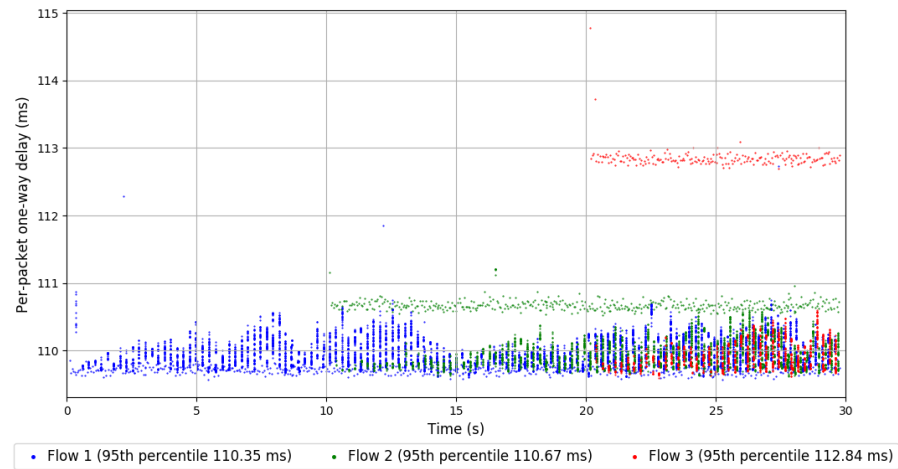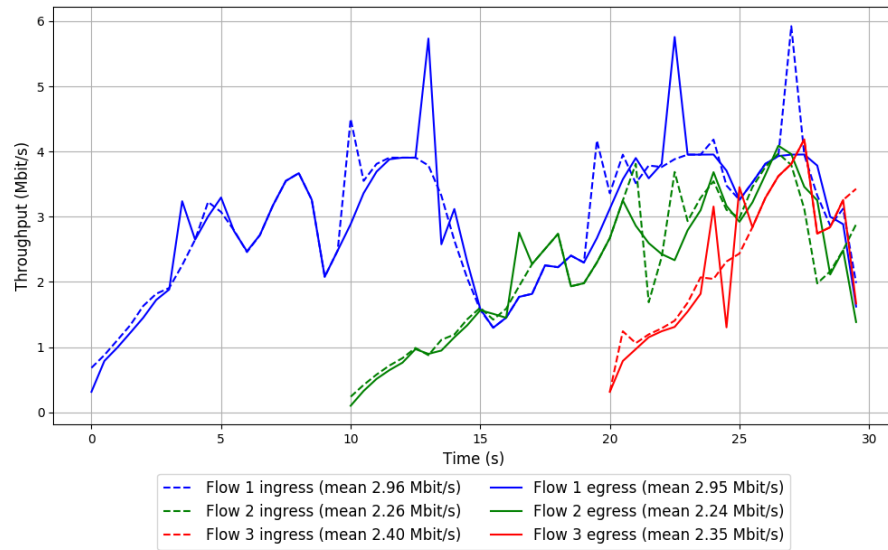
Run 9: Report of Sprout — Data Link

```
Run 10: Statistics of Sprout

Start at: 2017-09-18 19:00:49
End at: 2017-09-18 19:01:19


# Below is generated by plot.py at 2017-09-18 21:28:53
# Datalink statistics
-- Total of 3 flows:
Average throughput: 4.90 Mbit/s
95th percentile per-packet one-way delay: 111.936 ms
Loss rate: 1.69%
-- Flow 1:
Average throughput: 2.98 Mbit/s
95th percentile per-packet one-way delay: 111.341 ms
Loss rate: 1.23%
-- Flow 2:
Average throughput: 2.18 Mbit/s
95th percentile per-packet one-way delay: 112.716 ms
Loss rate: 2.13%
-- Flow 3:
Average throughput: 1.47 Mbit/s
95th percentile per-packet one-way delay: 113.742 ms
Loss rate: 3.20%
```
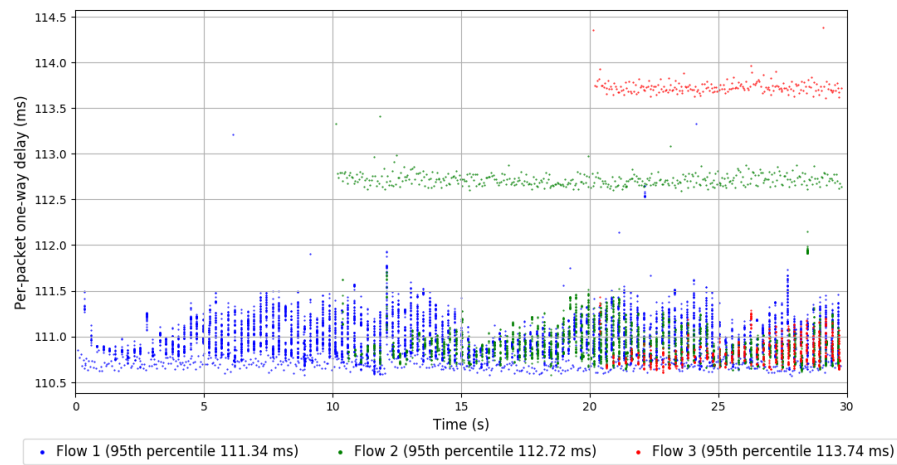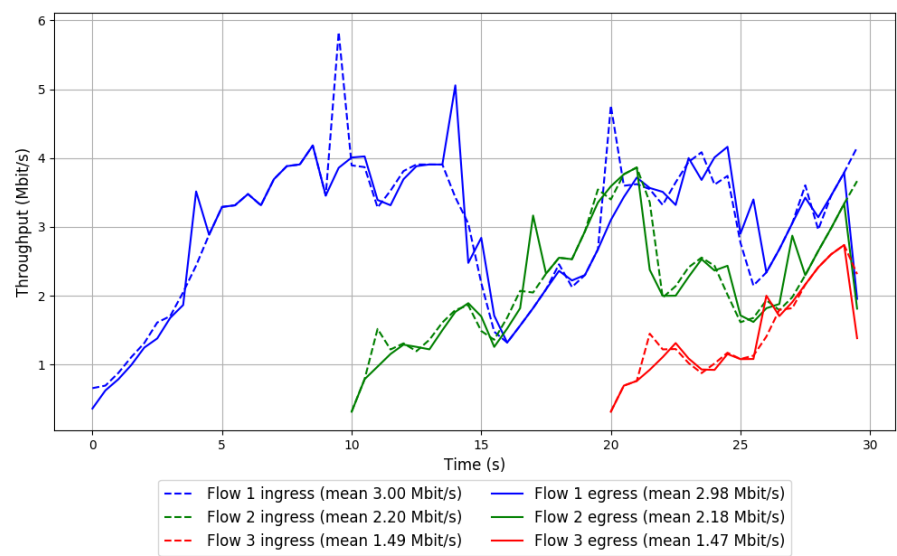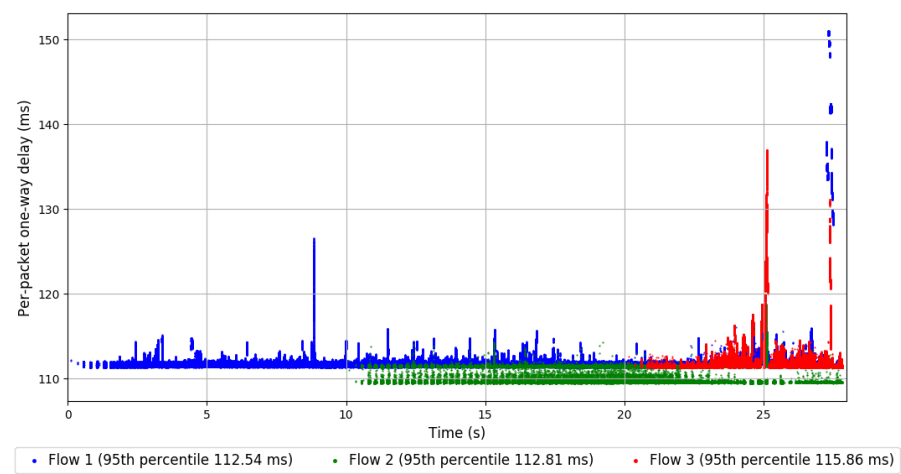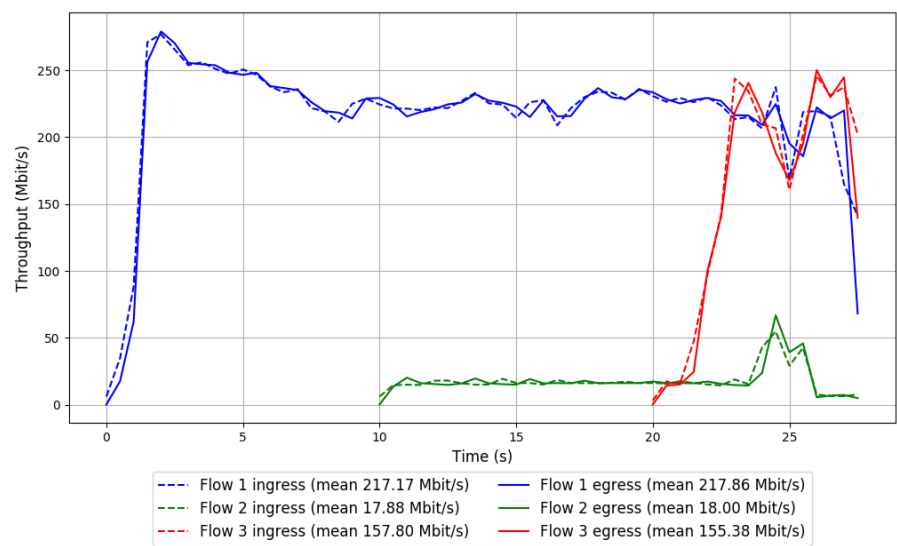
Run 10: Report of Sprout — Data Link

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

Start at: 2017-09-18 17:22:06
End at: 2017-09-18 17:22:36

# Below is generated by plot.py at 2017-09-18 21:31:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 271.87 Mbit/s
95th percentile per-packet one-way delay: 112.874 ms
Loss rate: 1.25%
-- Flow 1:
Average throughput: 217.86 Mbit/s
95th percentile per-packet one-way delay: 112.537 ms
Loss rate: 0.63%
-- Flow 2:
Average throughput: 18.00 Mbit/s
95th percentile per-packet one-way delay: 112.812 ms
Loss rate: 0.56%
-- Flow 3:
Average throughput: 155.38 Mbit/s
95th percentile per-packet one-way delay: 115.857 ms
Loss rate: 4.40%
```

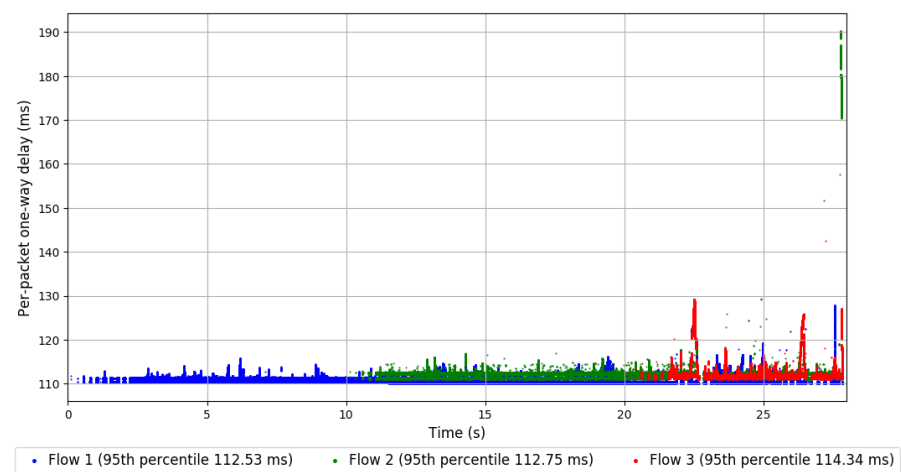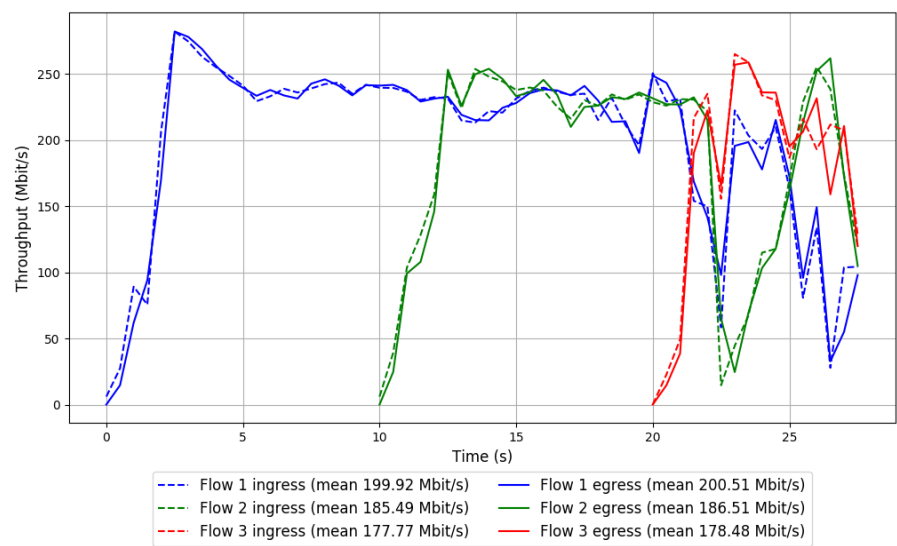# Run 1: Report of TaoVA-100x — Data Link

```
Run 2: Statistics of TaoVA-100x

Start at: 2017-09-18 17:32:08
End at: 2017-09-18 17:32:38

# Below is generated by plot.py at 2017-09-18 21:34:05
# Datalink statistics
-- Total of 3 flows:
Average throughput: 368.94 Mbit/s
95th percentile per-packet one-way delay: 112.824 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 200.51 Mbit/s
95th percentile per-packet one-way delay: 112.529 ms
Loss rate: 0.50%
-- Flow 2:
Average throughput: 186.51 Mbit/s
95th percentile per-packet one-way delay: 112.749 ms
Loss rate: 0.84%
-- Flow 3:
Average throughput: 178.48 Mbit/s
95th percentile per-packet one-way delay: 114.344 ms
Loss rate: 2.45%
```

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

Flow 1 ingress (mean 199.92 Mbit/s)   Flow 1 egress (mean 200.51 Mbit/s)
Flow 2 ingress (mean 185.49 Mbit/s)   Flow 2 egress (mean 186.51 Mbit/s)
Flow 3 ingress (mean 177.77 Mbit/s)   Flow 3 egress (mean 178.48 Mbit/s)

Flow 1 (95th percentile 112.53 ms)   Flow 2 (95th percentile 112.75 ms)   Flow 3 (95th percentile 114.34 ms)

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

Start at: 2017-09-18 17:42:16
End at: 2017-09-18 17:42:46

# Below is generated by plot.py at 2017-09-18 21:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 384.22 Mbit/s
95th percentile per-packet one-way delay: 112.107 ms
Loss rate: 1.13%
-- Flow 1:
Average throughput: 206.64 Mbit/s
95th percentile per-packet one-way delay: 111.458 ms
Loss rate: 0.44%
-- Flow 2:
Average throughput: 203.65 Mbit/s
95th percentile per-packet one-way delay: 112.974 ms
Loss rate: 1.18%
-- Flow 3:
Average throughput: 171.56 Mbit/s
95th percentile per-packet one-way delay: 112.574 ms
Loss rate: 3.94%
```
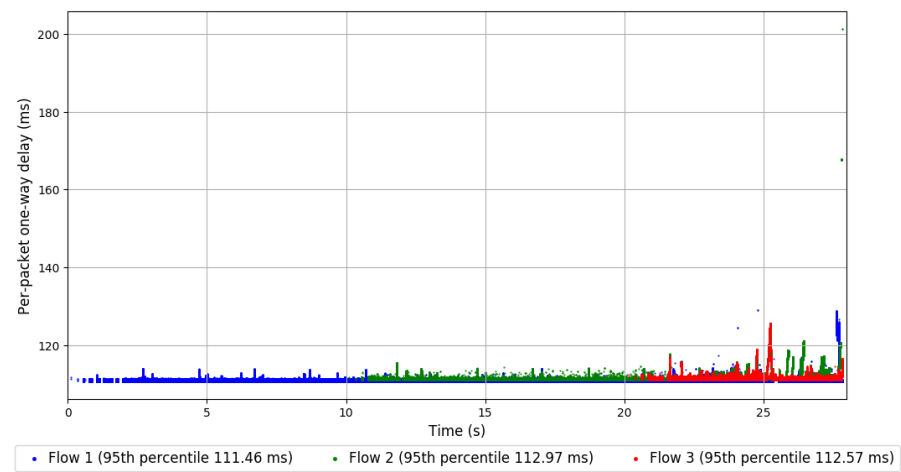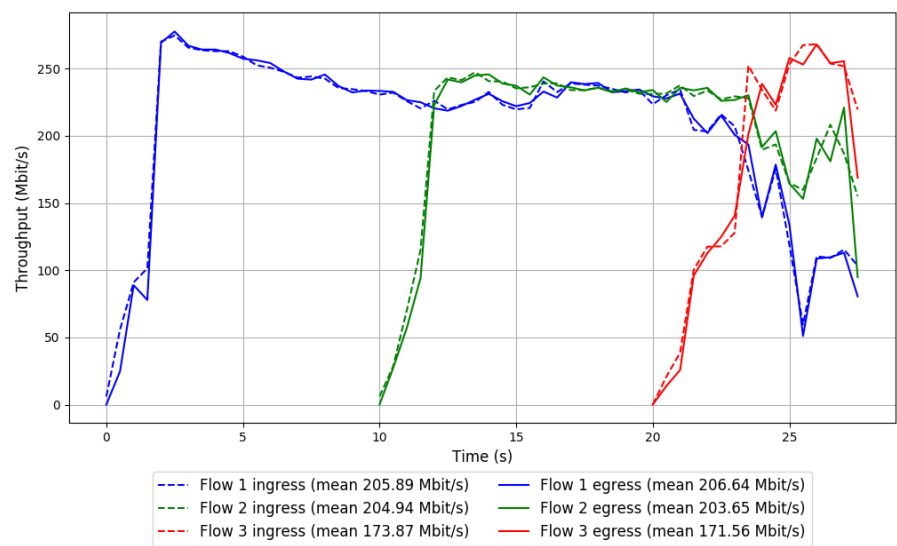
Run 3: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 205.89 Mbit/s)   Flow 1 egress (mean 206.64 Mbit/s)
Flow 2 ingress (mean 204.94 Mbit/s)   Flow 2 egress (mean 203.65 Mbit/s)
Flow 3 ingress (mean 173.87 Mbit/s)   Flow 3 egress (mean 171.56 Mbit/s)

Flow 1 (95th percentile 111.46 ms)   Flow 2 (95th percentile 112.97 ms)   Flow 3 (95th percentile 112.57 ms)
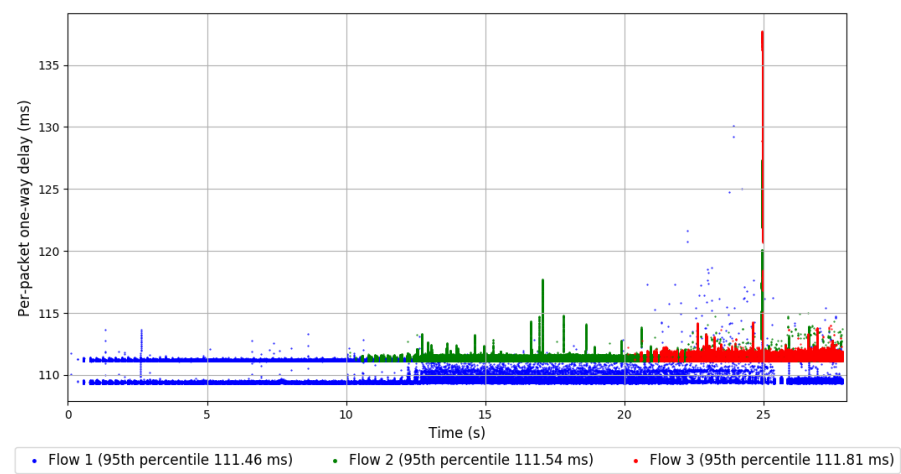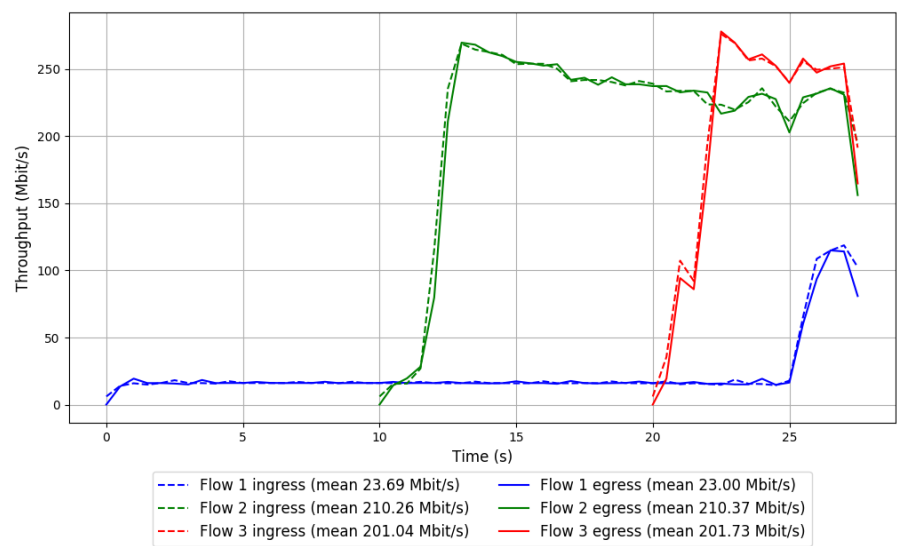
```
Run 4: Statistics of TaoVA-100x

Start at: 2017-09-18 17:52:22
End at: 2017-09-18 17:52:52

# Below is generated by plot.py at 2017-09-18 21:34:33
# Datalink statistics
-- Total of 3 flows:
Average throughput: 213.43 Mbit/s
95th percentile per-packet one-way delay: 111.740 ms
Loss rate: 1.80%
-- Flow 1:
Average throughput: 23.00 Mbit/s
95th percentile per-packet one-way delay: 111.458 ms
Loss rate: 3.69%
-- Flow 2:
Average throughput: 210.37 Mbit/s
95th percentile per-packet one-way delay: 111.538 ms
Loss rate: 1.18%
-- Flow 3:
Average throughput: 201.73 Mbit/s
95th percentile per-packet one-way delay: 111.815 ms
Loss rate: 2.48%
```

Run 4: Report of TaoVA-100x — Data Link

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

Start at: 2017-09-18 18:02:14
End at: 2017-09-18 18:02:44

# Below is generated by plot.py at 2017-09-18 21:34:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 370.01 Mbit/s
95th percentile per-packet one-way delay: 111.365 ms
Loss rate: 1.27%
-- Flow 1:
Average throughput: 219.81 Mbit/s
95th percentile per-packet one-way delay: 110.844 ms
Loss rate: 0.91%
-- Flow 2:
Average throughput: 191.34 Mbit/s
95th percentile per-packet one-way delay: 112.755 ms
Loss rate: 1.30%
-- Flow 3:
Average throughput: 102.07 Mbit/s
95th percentile per-packet one-way delay: 125.869 ms
Loss rate: 3.91%
```
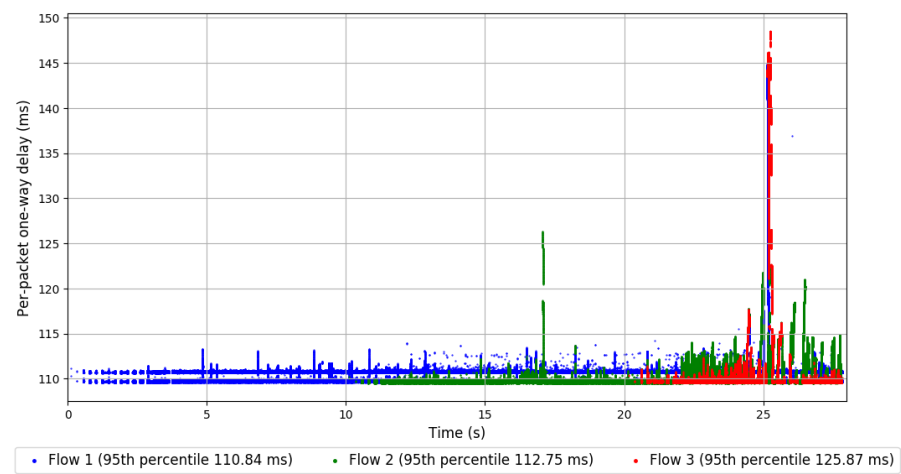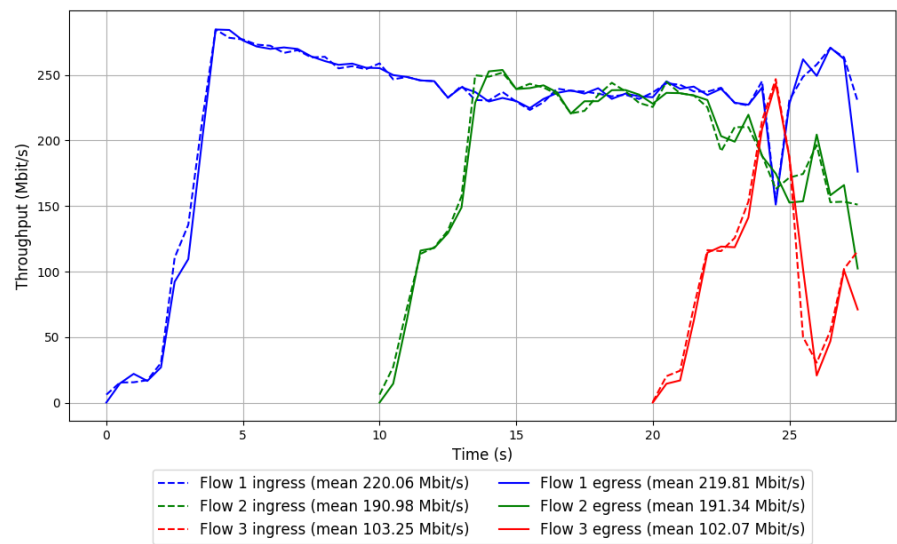
Run 5: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 220.06 Mbit/s) --- Flow 1 egress (mean 219.81 Mbit/s)
Flow 2 ingress (mean 190.98 Mbit/s) --- Flow 2 egress (mean 191.34 Mbit/s)
Flow 3 ingress (mean 103.25 Mbit/s) --- Flow 3 egress (mean 102.07 Mbit/s)

Flow 1 (95th percentile 110.84 ms) • Flow 2 (95th percentile 112.75 ms) • Flow 3 (95th percentile 125.87 ms)

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

Start at: 2017-09-18 18:12:26
End at: 2017-09-18 18:12:56


# Below is generated by plot.py at 2017-09-18 21:35:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 371.10 Mbit/s
95th percentile per-packet one-way delay: 110.815 ms
Loss rate: 1.36%
-- Flow 1:
Average throughput: 205.89 Mbit/s
95th percentile per-packet one-way delay: 111.085 ms
Loss rate: 0.46%
-- Flow 2:
Average throughput: 206.89 Mbit/s
95th percentile per-packet one-way delay: 110.163 ms
Loss rate: 1.57%
-- Flow 3:
Average throughput: 118.88 Mbit/s
95th percentile per-packet one-way delay: 111.455 ms
Loss rate: 5.91%
```
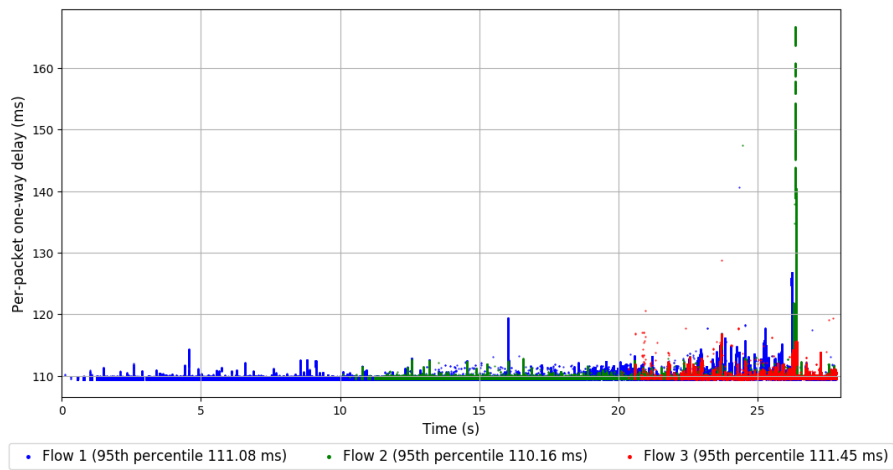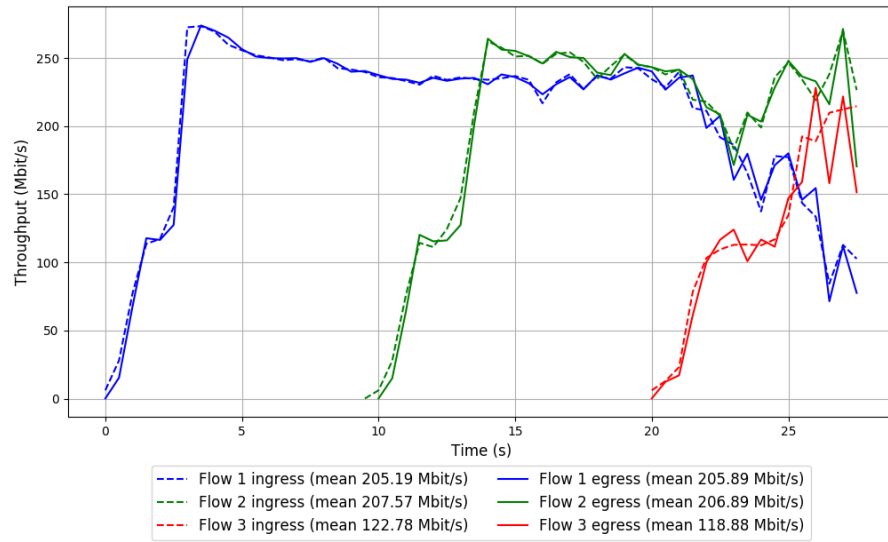
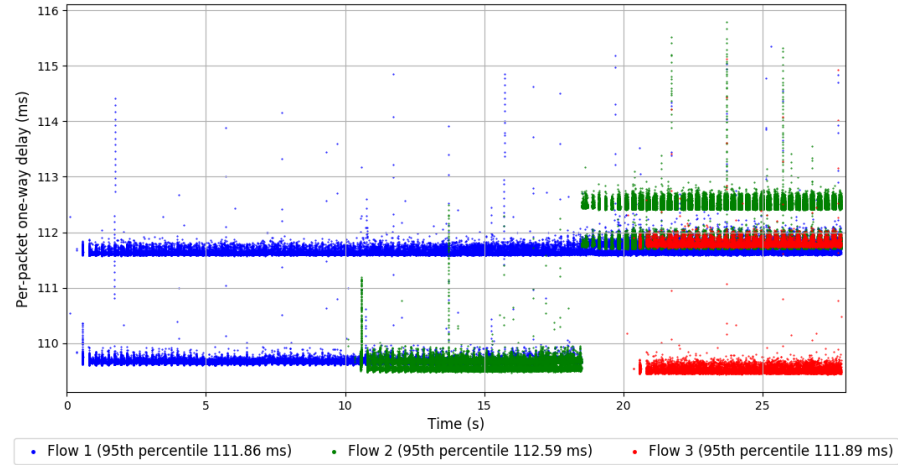# Run 6: Report of TaoVA-100x — Data Link

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

Start at: 2017-09-18 18:22:41
End at: 2017-09-18 18:23:11


# Below is generated by plot.py at 2017-09-18 21:35:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 38.73 Mbit/s
95th percentile per-packet one-way delay: 112.548 ms
Loss rate: 1.48%
-- Flow 1:
Average throughput: 16.00 Mbit/s
95th percentile per-packet one-way delay: 111.856 ms
Loss rate: 0.81%
-- Flow 2:
Average throughput: 29.96 Mbit/s
95th percentile per-packet one-way delay: 112.590 ms
Loss rate: 1.73%
-- Flow 3:
Average throughput: 12.98 Mbit/s
95th percentile per-packet one-way delay: 111.894 ms
Loss rate: 3.06%
```

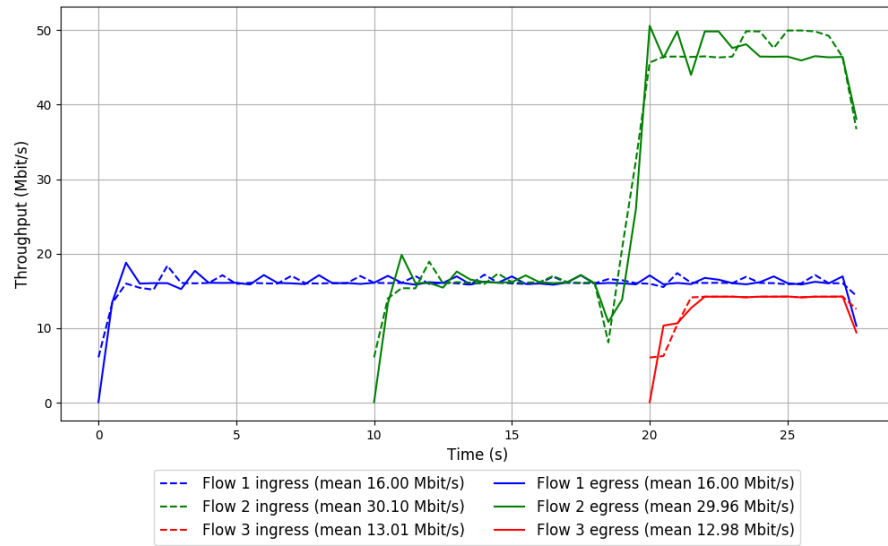# Run 7: Report of TaoVA-100x — Data Link

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

Start at: 2017-09-18 18:32:11
End at: 2017-09-18 18:32:41

# Below is generated by plot.py at 2017-09-18 21:35:46
# Datalink statistics
-- Total of 3 flows:
Average throughput: 26.76 Mbit/s
95th percentile per-packet one-way delay: 112.918 ms
Loss rate: 1.33%
-- Flow 1:
Average throughput: 14.56 Mbit/s
95th percentile per-packet one-way delay: 112.956 ms
Loss rate: 0.89%
-- Flow 2:
Average throughput: 13.48 Mbit/s
95th percentile per-packet one-way delay: 112.340 ms
Loss rate: 1.31%
-- Flow 3:
Average throughput: 12.91 Mbit/s
95th percentile per-packet one-way delay: 112.529 ms
Loss rate: 3.08%
```
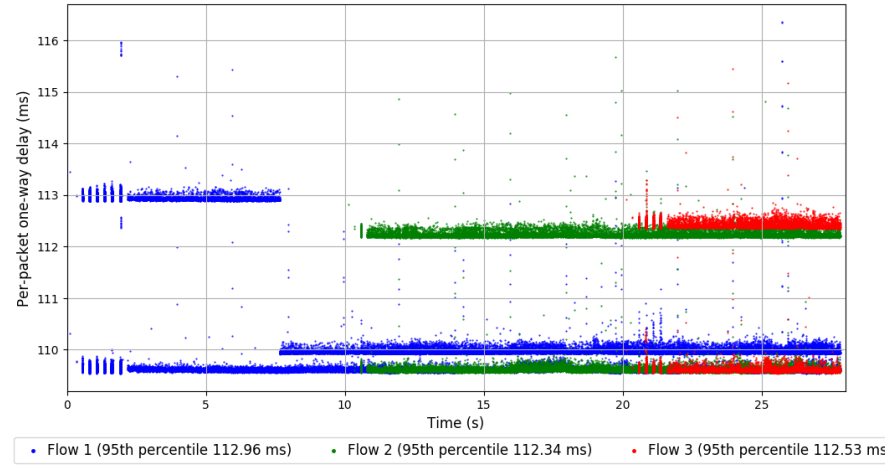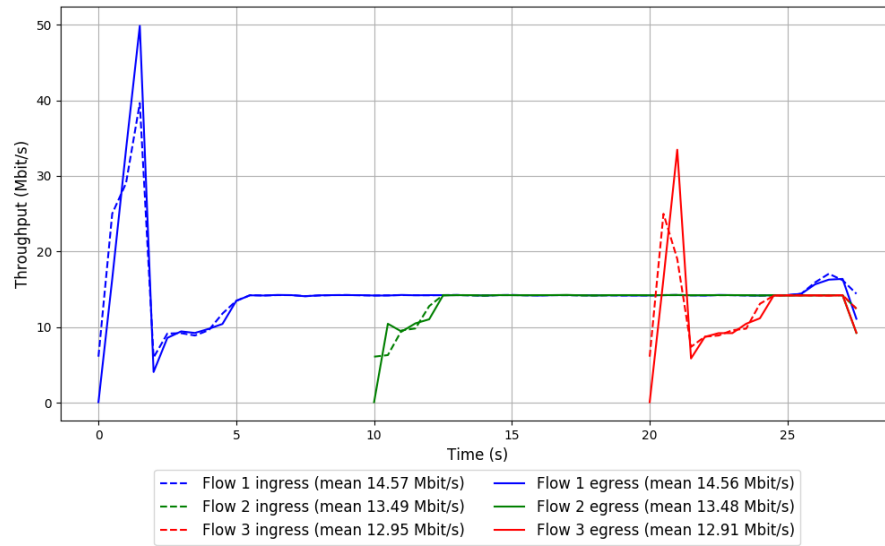
Run 8: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 14.57 Mbit/s) --- Flow 1 egress (mean 14.56 Mbit/s)
Flow 2 ingress (mean 13.49 Mbit/s) --- Flow 2 egress (mean 13.48 Mbit/s)
Flow 3 ingress (mean 12.95 Mbit/s) --- Flow 3 egress (mean 12.91 Mbit/s)

Flow 1 (95th percentile 112.96 ms)   Flow 2 (95th percentile 112.34 ms)   Flow 3 (95th percentile 112.53 ms)
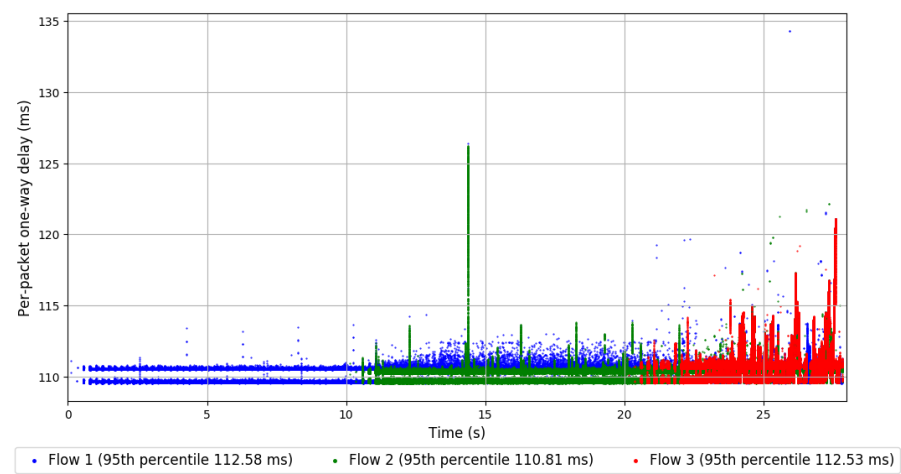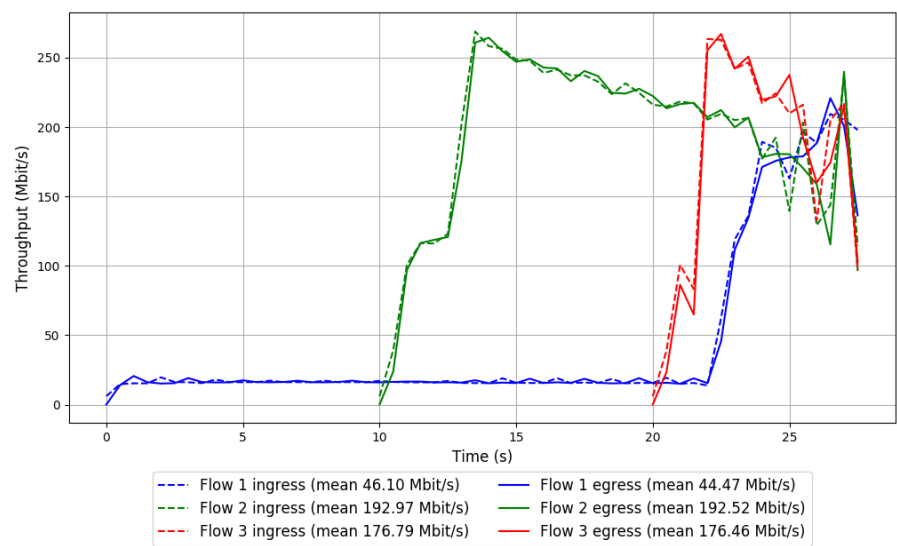
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```
Run 9: Statistics of TaoVA-100x

Start at: 2017-09-18 18:41:38
End at: 2017-09-18 18:42:08

# Below is generated by plot.py at 2017-09-18 21:36:03
# Datalink statistics
-- Total of 3 flows:
Average throughput: 216.31 Mbit/s
95th percentile per-packet one-way delay: 111.754 ms
Loss rate: 1.82%
-- Flow 1:
Average throughput: 44.47 Mbit/s
95th percentile per-packet one-way delay: 112.576 ms
Loss rate: 4.30%
-- Flow 2:
Average throughput: 192.52 Mbit/s
95th percentile per-packet one-way delay: 110.807 ms
Loss rate: 0.93%
-- Flow 3:
Average throughput: 176.46 Mbit/s
95th percentile per-packet one-way delay: 112.533 ms
Loss rate: 1.76%
```

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

- --- Flow 1 ingress (mean 46.10 Mbit/s) — Flow 1 egress (mean 44.47 Mbit/s)
- --- Flow 2 ingress (mean 192.97 Mbit/s) — Flow 2 egress (mean 192.52 Mbit/s)
- --- Flow 3 ingress (mean 176.79 Mbit/s) — Flow 3 egress (mean 176.46 Mbit/s)

- Flow 1 (95th percentile 112.58 ms) • Flow 2 (95th percentile 110.81 ms) • Flow 3 (95th percentile 112.53 ms)
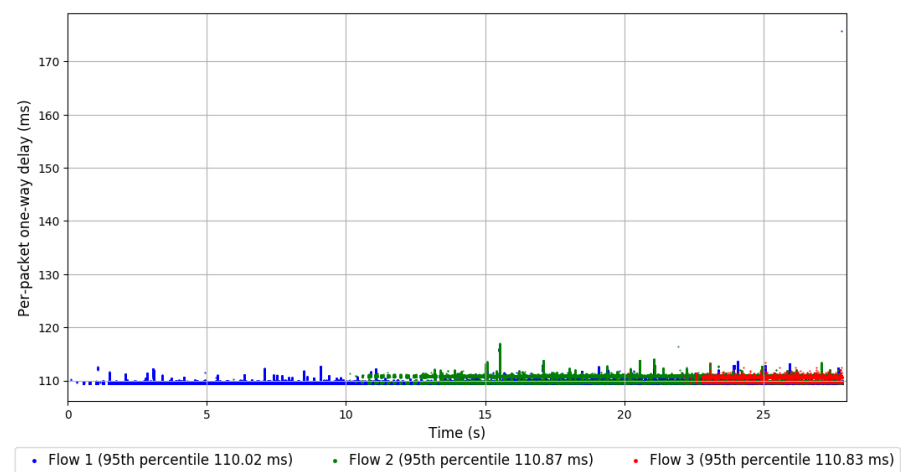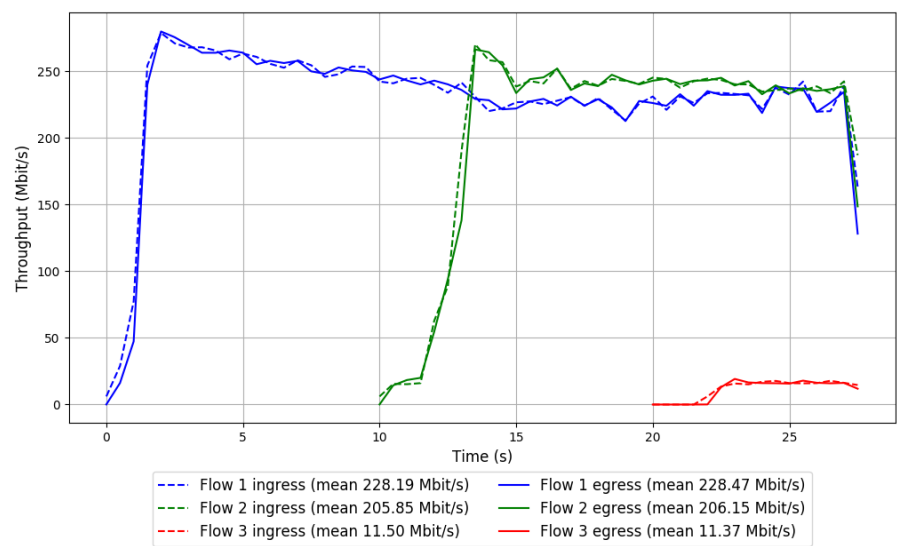
161

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

Start at: 2017-09-18 18:51:26
End at: 2017-09-18 18:51:56


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 363.09 Mbit/s
95th percentile per-packet one-way delay: 110.813 ms
Loss rate: 0.92%
-- Flow 1:
Average throughput: 228.47 Mbit/s
95th percentile per-packet one-way delay: 110.018 ms
Loss rate: 0.68%
-- Flow 2:
Average throughput: 206.15 Mbit/s
95th percentile per-packet one-way delay: 110.866 ms
Loss rate: 1.27%
-- Flow 3:
Average throughput: 11.37 Mbit/s
95th percentile per-packet one-way delay: 110.831 ms
Loss rate: 3.93%
```

Run 10: Report of TaoVA-100x — Data Link

Flow 1 ingress (mean 228.19 Mbit/s) ----- Flow 1 egress (mean 228.47 Mbit/s)
Flow 2 ingress (mean 205.85 Mbit/s) ----- Flow 2 egress (mean 206.15 Mbit/s)
Flow 3 ingress (mean 11.50 Mbit/s) ----- Flow 3 egress (mean 11.37 Mbit/s)

Flow 1 (95th percentile 110.02 ms)   Flow 2 (95th percentile 110.87 ms)   Flow 3 (95th percentile 110.83 ms)

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```
Run 1: Statistics of TCP Vegas

Start at: 2017-09-18 17:28:25
End at: 2017-09-18 17:28:55


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 51.11 Mbit/s
95th percentile per-packet one-way delay: 112.196 ms
Loss rate: 0.86%
-- Flow 1:
Average throughput: 33.12 Mbit/s
95th percentile per-packet one-way delay: 112.214 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 19.57 Mbit/s
95th percentile per-packet one-way delay: 111.955 ms
Loss rate: 1.19%
-- Flow 3:
Average throughput: 15.38 Mbit/s
95th percentile per-packet one-way delay: 112.568 ms
Loss rate: 2.51%
```
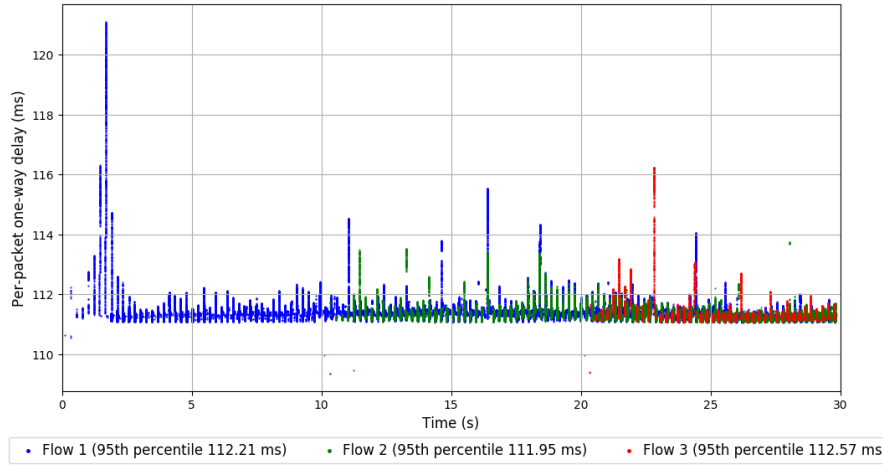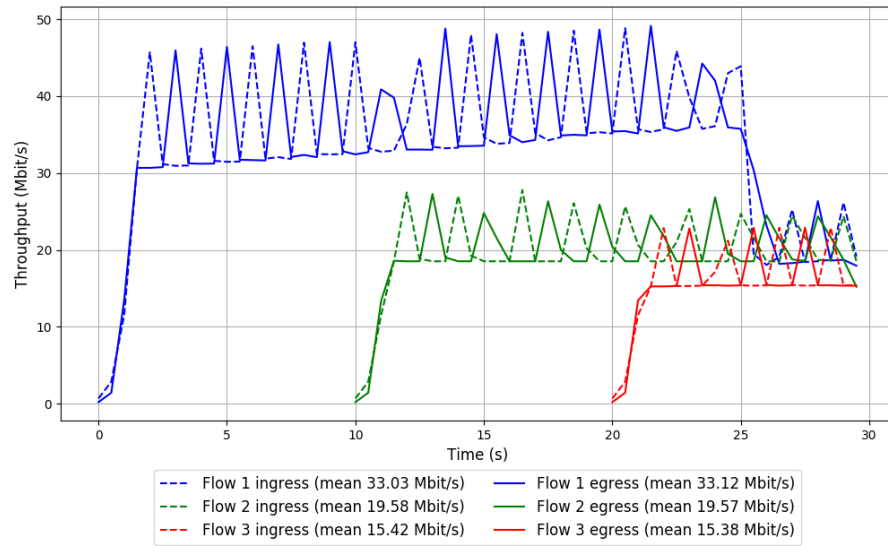
Run 1: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 33.03 Mbit/s)   Flow 1 egress (mean 33.12 Mbit/s)
Flow 2 ingress (mean 19.58 Mbit/s)   Flow 2 egress (mean 19.57 Mbit/s)
Flow 3 ingress (mean 15.42 Mbit/s)   Flow 3 egress (mean 15.38 Mbit/s)

Flow 1 (95th percentile 112.21 ms)   Flow 2 (95th percentile 111.95 ms)   Flow 3 (95th percentile 112.57 ms)

```
Run 2: Statistics of TCP Vegas

Start at: 2017-09-18 17:38:31
End at: 2017-09-18 17:39:01

# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 85.91 Mbit/s
95th percentile per-packet one-way delay: 114.001 ms
Loss rate: 0.77%
-- Flow 1:
Average throughput: 58.91 Mbit/s
95th percentile per-packet one-way delay: 112.223 ms
Loss rate: 0.43%
-- Flow 2:
Average throughput: 27.62 Mbit/s
95th percentile per-packet one-way delay: 118.865 ms
Loss rate: 1.00%
-- Flow 3:
Average throughput: 26.86 Mbit/s
95th percentile per-packet one-way delay: 112.695 ms
Loss rate: 2.56%
```
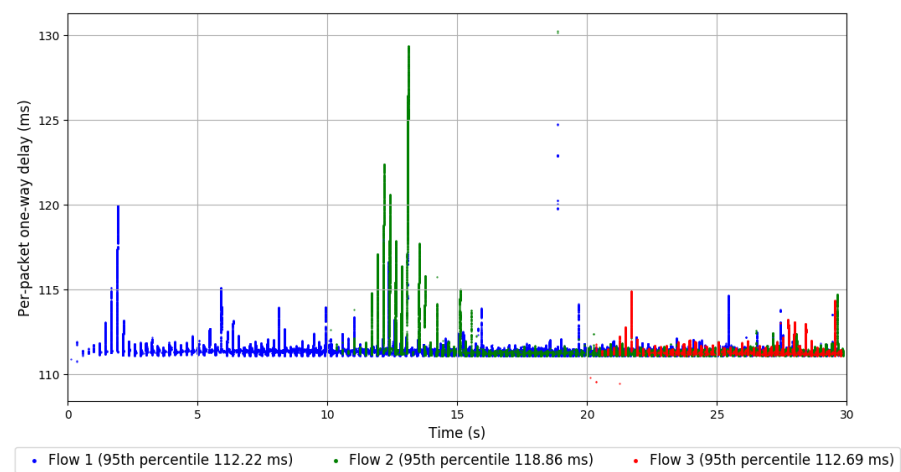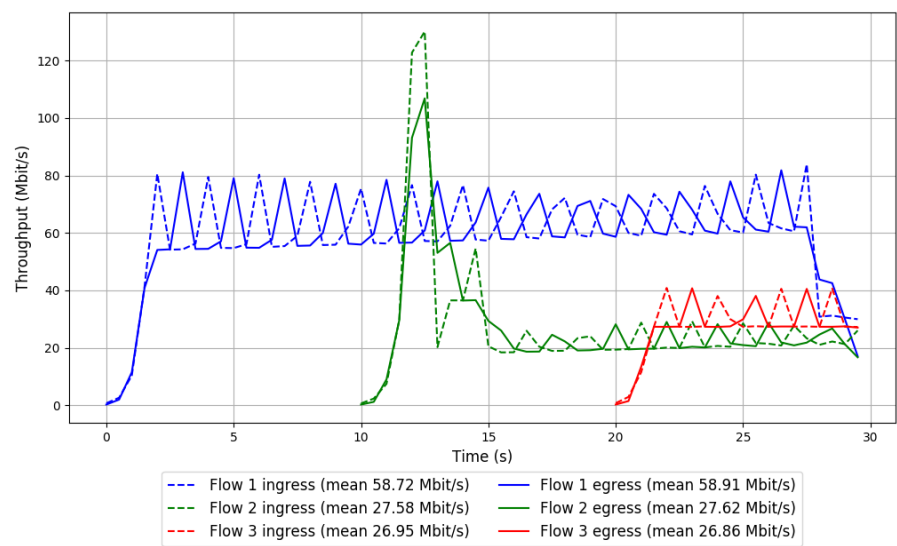
Run 2: Report of TCP Vegas — Data Link

```
Run 3: Statistics of TCP Vegas

Start at: 2017-09-18 17:48:38
End at: 2017-09-18 17:49:08


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 77.04 Mbit/s
95th percentile per-packet one-way delay: 112.512 ms
Loss rate: 1.16%
-- Flow 1:
Average throughput: 41.60 Mbit/s
95th percentile per-packet one-way delay: 112.595 ms
Loss rate: 0.80%
-- Flow 2:
Average throughput: 38.78 Mbit/s
95th percentile per-packet one-way delay: 112.362 ms
Loss rate: 1.20%
-- Flow 3:
Average throughput: 29.92 Mbit/s
95th percentile per-packet one-way delay: 112.533 ms
Loss rate: 2.57%
```
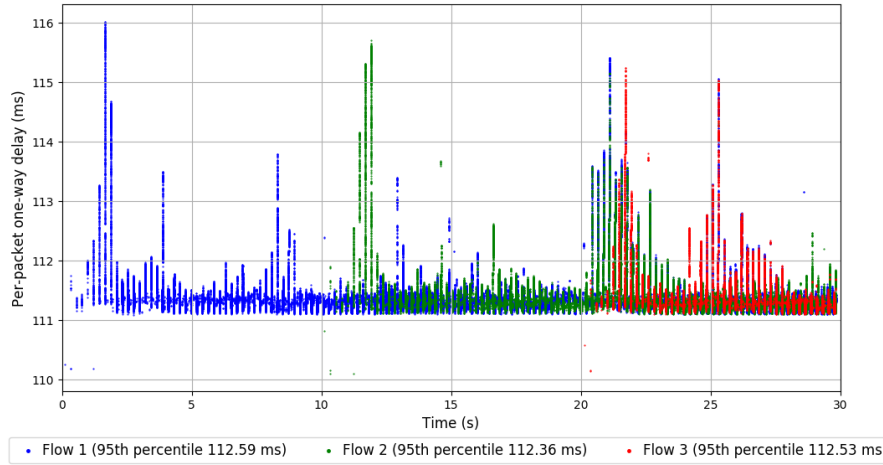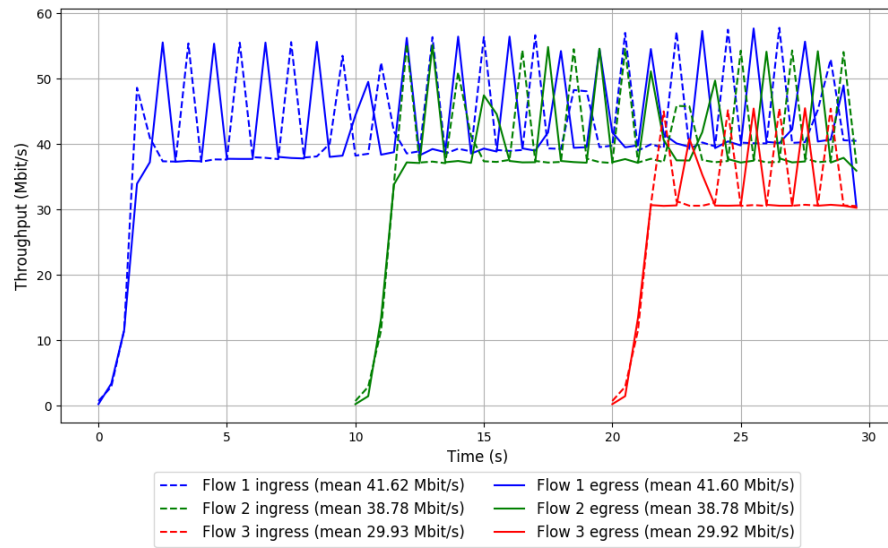
Run 3: Report of TCP Vegas — Data Link

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```
Run 4: Statistics of TCP Vegas

Start at: 2017-09-18 17:58:27
End at: 2017-09-18 17:58:57

# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 102.74 Mbit/s
95th percentile per-packet one-way delay: 111.045 ms
Loss rate: 1.18%
-- Flow 1:
Average throughput: 65.81 Mbit/s
95th percentile per-packet one-way delay: 110.709 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 33.97 Mbit/s
95th percentile per-packet one-way delay: 111.356 ms
Loss rate: 1.24%
-- Flow 3:
Average throughput: 44.12 Mbit/s
95th percentile per-packet one-way delay: 112.089 ms
Loss rate: 2.64%
```
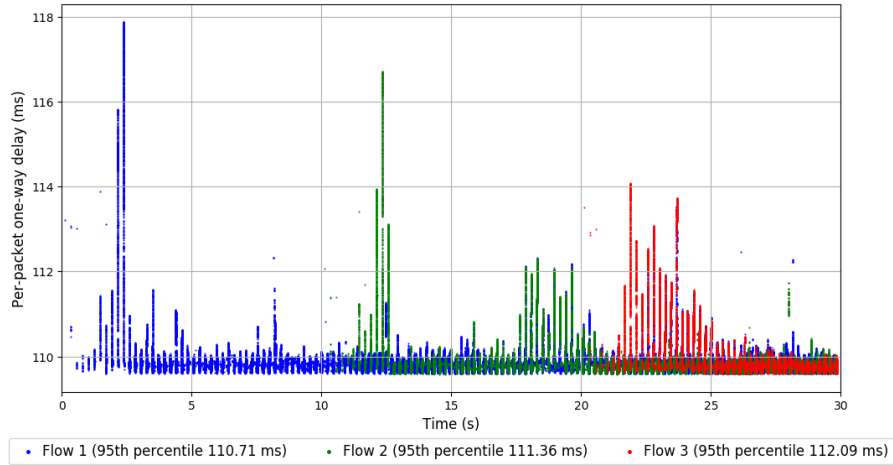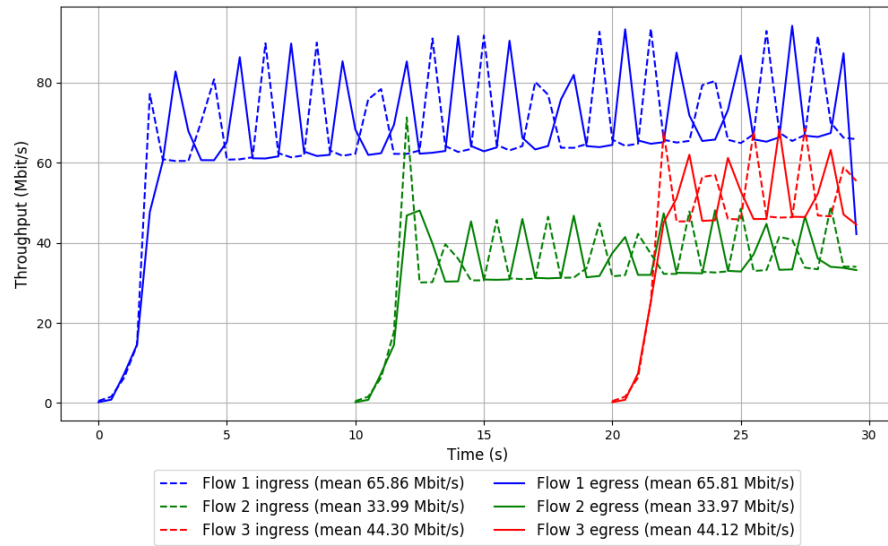
Run 4: Report of TCP Vegas — Data Link

```
Run 5: Statistics of TCP Vegas

Start at: 2017-09-18 18:08:37
End at: 2017-09-18 18:09:07


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 120.77 Mbit/s
95th percentile per-packet one-way delay: 111.186 ms
Loss rate: 1.23%
-- Flow 1:
Average throughput: 63.55 Mbit/s
95th percentile per-packet one-way delay: 110.695 ms
Loss rate: 0.82%
-- Flow 2:
Average throughput: 62.13 Mbit/s
95th percentile per-packet one-way delay: 112.009 ms
Loss rate: 1.25%
-- Flow 3:
Average throughput: 49.27 Mbit/s
95th percentile per-packet one-way delay: 111.177 ms
Loss rate: 2.73%
```
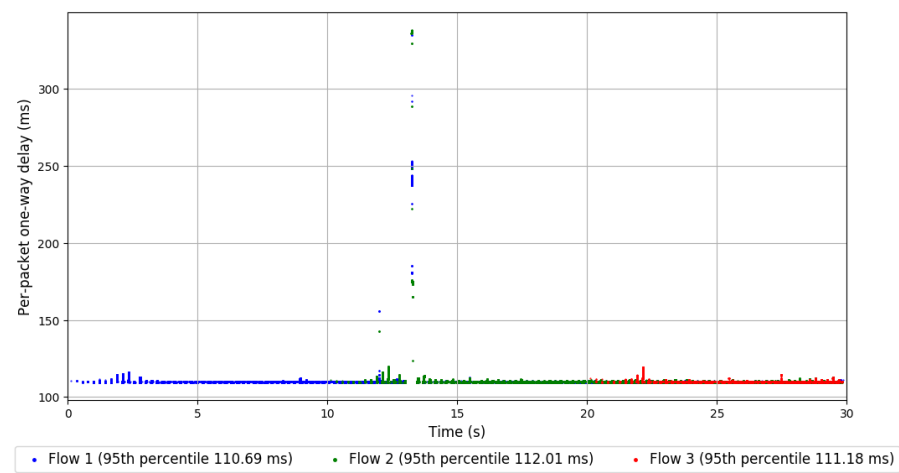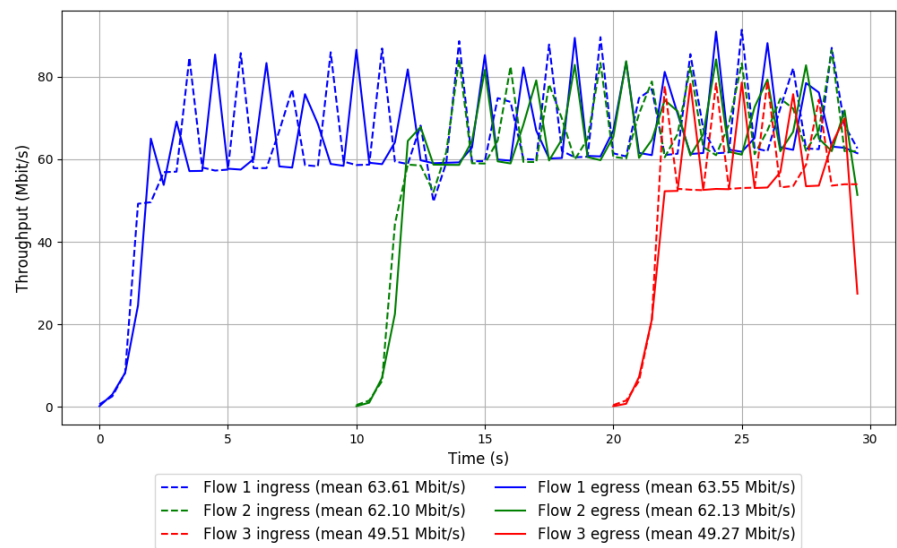
Run 5: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 63.61 Mbit/s) — Flow 1 egress (mean 63.55 Mbit/s)
Flow 2 ingress (mean 62.10 Mbit/s) — Flow 2 egress (mean 62.13 Mbit/s)
Flow 3 ingress (mean 49.51 Mbit/s) — Flow 3 egress (mean 49.27 Mbit/s)

Flow 1 (95th percentile 110.69 ms) • Flow 2 (95th percentile 112.01 ms) • Flow 3 (95th percentile 111.18 ms)

```
Run 6: Statistics of TCP Vegas

Start at: 2017-09-18 18:18:55
End at: 2017-09-18 18:19:25

# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 110.59 Mbit/s
95th percentile per-packet one-way delay: 116.309 ms
Loss rate: 0.88%
-- Flow 1:
Average throughput: 65.94 Mbit/s
95th percentile per-packet one-way delay: 115.494 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 33.35 Mbit/s
95th percentile per-packet one-way delay: 117.361 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 69.00 Mbit/s
95th percentile per-packet one-way delay: 117.570 ms
Loss rate: 0.68%
```
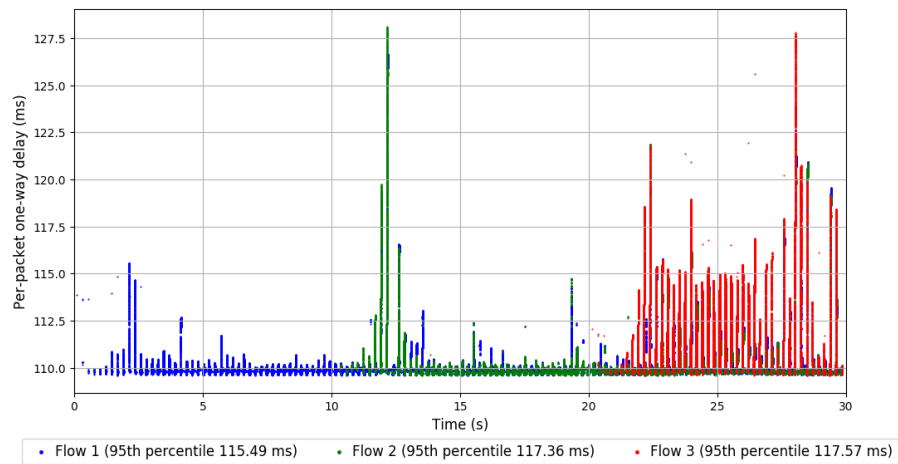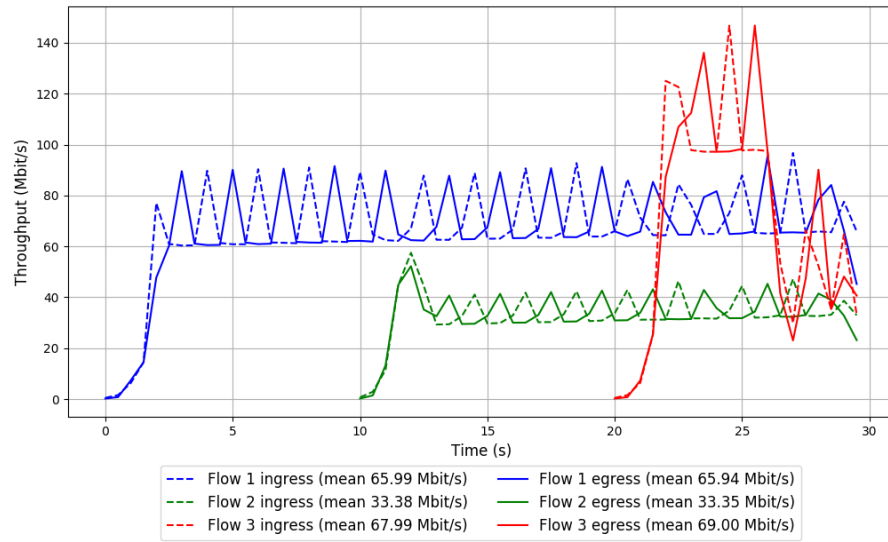
Run 6: Report of TCP Vegas — Data Link

- --- Flow 1 ingress (mean 65.99 Mbit/s)
- Flow 1 egress (mean 65.94 Mbit/s)
- --- Flow 2 ingress (mean 33.38 Mbit/s)
- Flow 2 egress (mean 33.35 Mbit/s)
- --- Flow 3 ingress (mean 67.99 Mbit/s)
- Flow 3 egress (mean 69.00 Mbit/s)

- Flow 1 (95th percentile 115.49 ms)
- Flow 2 (95th percentile 117.36 ms)
- Flow 3 (95th percentile 117.57 ms)

```
Run 7: Statistics of TCP Vegas

Start at: 2017-09-18 18:28:26
End at: 2017-09-18 18:28:56

# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 84.77 Mbit/s
95th percentile per-packet one-way delay: 112.899 ms
Loss rate: 1.39%
-- Flow 1:
Average throughput: 23.88 Mbit/s
95th percentile per-packet one-way delay: 112.679 ms
Loss rate: 0.78%
-- Flow 2:
Average throughput: 65.69 Mbit/s
95th percentile per-packet one-way delay: 111.329 ms
Loss rate: 1.26%
-- Flow 3:
Average throughput: 53.04 Mbit/s
95th percentile per-packet one-way delay: 114.292 ms
Loss rate: 2.56%
```
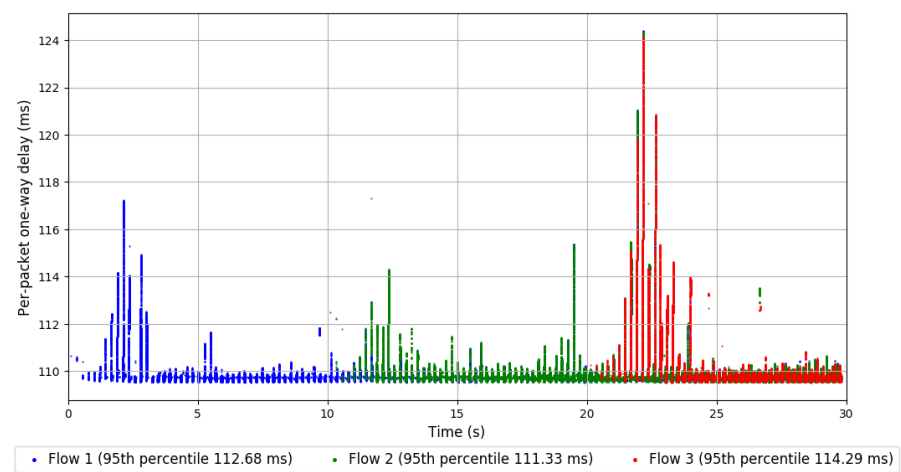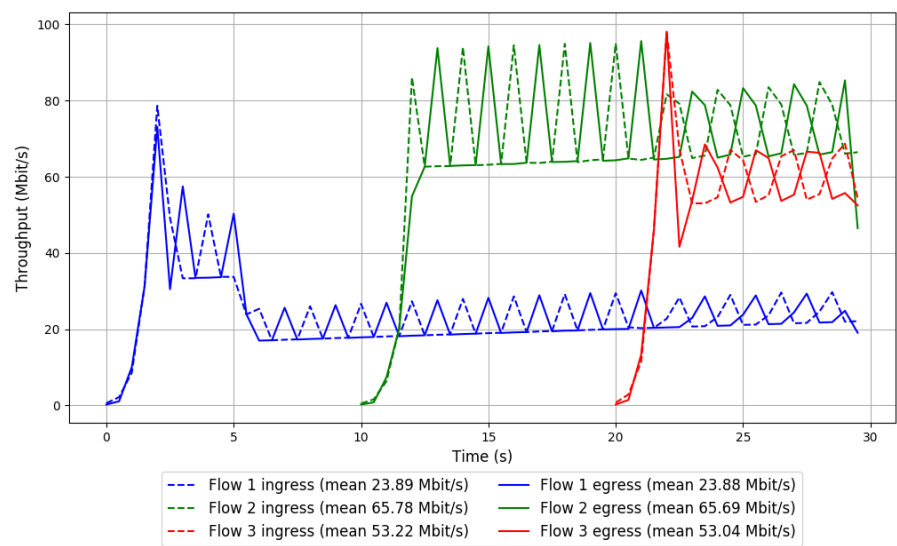
Run 7: Report of TCP Vegas — Data Link

```
Run 8: Statistics of TCP Vegas

Start at: 2017-09-18 18:37:54
End at: 2017-09-18 18:38:24


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 55.48 Mbit/s
95th percentile per-packet one-way delay: 111.043 ms
Loss rate: 0.99%
-- Flow 1:
Average throughput: 37.04 Mbit/s
95th percentile per-packet one-way delay: 110.532 ms
Loss rate: 0.83%
-- Flow 2:
Average throughput: 27.10 Mbit/s
95th percentile per-packet one-way delay: 112.313 ms
Loss rate: 1.23%
-- Flow 3:
Average throughput: 1.44 Mbit/s
95th percentile per-packet one-way delay: 109.901 ms
Loss rate: 4.11%
```
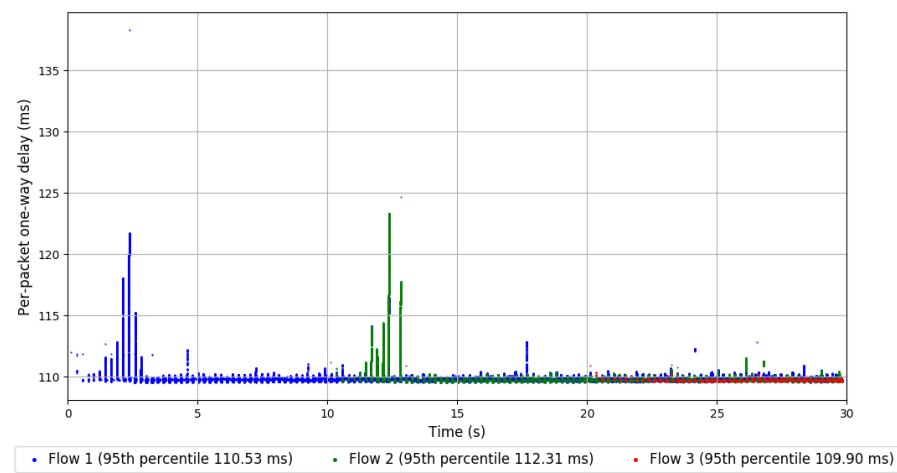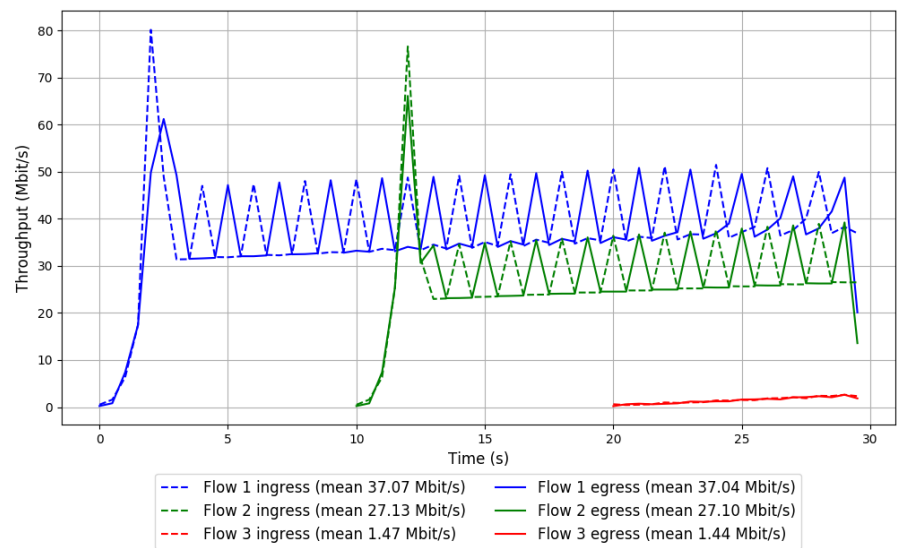
Run 8: Report of TCP Vegas — Data Link

```
Run 9: Statistics of TCP Vegas

Start at: 2017-09-18 18:47:41
End at: 2017-09-18 18:48:11


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 68.35 Mbit/s
95th percentile per-packet one-way delay: 111.081 ms
Loss rate: 0.95%
-- Flow 1:
Average throughput: 33.65 Mbit/s
95th percentile per-packet one-way delay: 110.093 ms
Loss rate: 0.40%
-- Flow 2:
Average throughput: 45.84 Mbit/s
95th percentile per-packet one-way delay: 111.743 ms
Loss rate: 1.22%
-- Flow 3:
Average throughput: 13.36 Mbit/s
95th percentile per-packet one-way delay: 110.239 ms
Loss rate: 3.16%
```
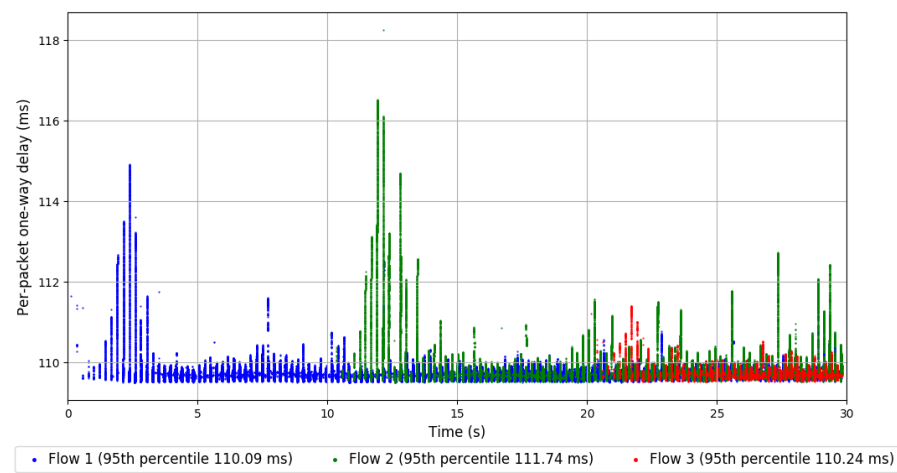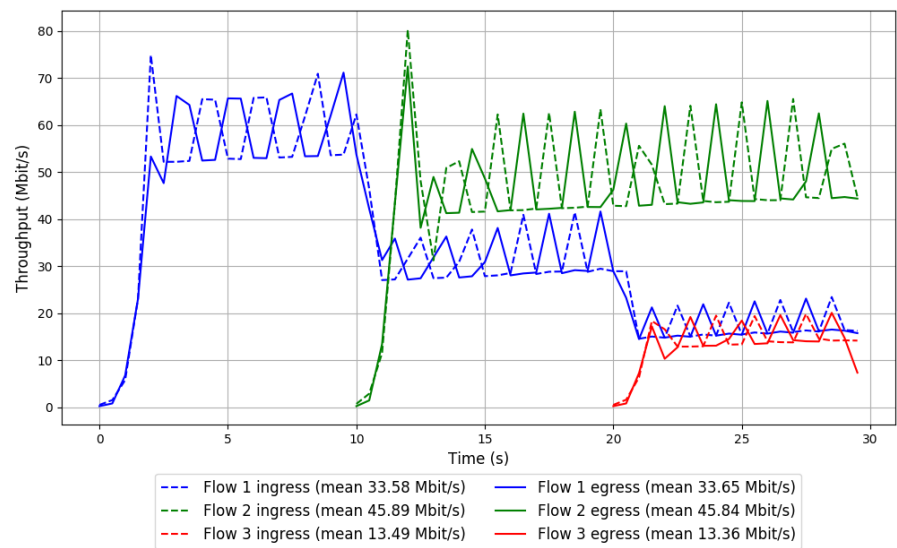
Run 9: Report of TCP Vegas — Data Link

```
Run 10: Statistics of TCP Vegas

Start at: 2017-09-18 18:57:49
End at: 2017-09-18 18:58:19


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 103.94 Mbit/s
95th percentile per-packet one-way delay: 111.935 ms
Loss rate: 0.78%
-- Flow 1:
Average throughput: 55.00 Mbit/s
95th percentile per-packet one-way delay: 111.808 ms
Loss rate: 0.47%
-- Flow 2:
Average throughput: 55.67 Mbit/s
95th percentile per-packet one-way delay: 111.778 ms
Loss rate: 0.65%
-- Flow 3:
Average throughput: 36.92 Mbit/s
95th percentile per-packet one-way delay: 114.276 ms
Loss rate: 2.56%
```
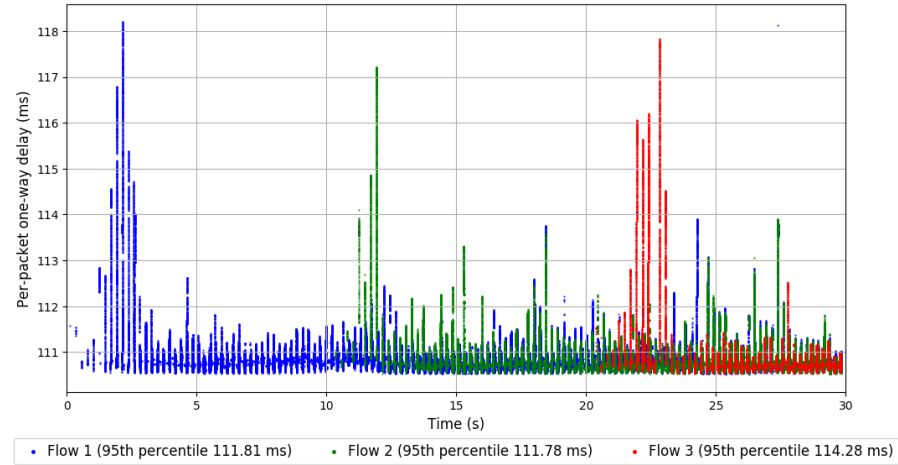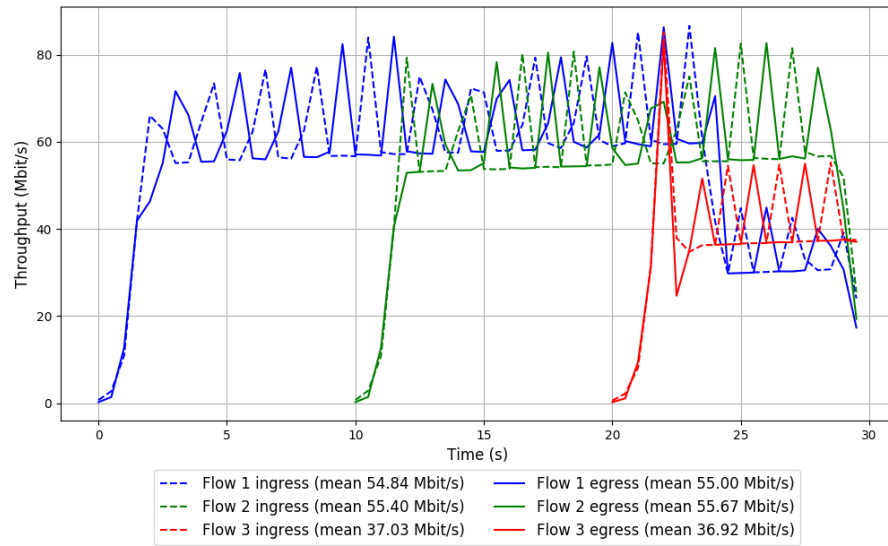
Run 10: Report of TCP Vegas — Data Link

Flow 1 ingress (mean 54.84 Mbit/s) Flow 1 egress (mean 55.00 Mbit/s)
Flow 2 ingress (mean 55.40 Mbit/s) Flow 2 egress (mean 55.67 Mbit/s)
Flow 3 ingress (mean 37.03 Mbit/s) Flow 3 egress (mean 36.92 Mbit/s)

Flow 1 (95th percentile 111.81 ms)   Flow 2 (95th percentile 111.78 ms)   Flow 3 (95th percentile 114.28 ms)

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```
Run 1: Statistics of Verus

Start at: 2017-09-18 17:24:21
End at: 2017-09-18 17:24:51

# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 252.93 Mbit/s
95th percentile per-packet one-way delay: 155.356 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 78.45 Mbit/s
95th percentile per-packet one-way delay: 125.242 ms
Loss rate: 1.35%
-- Flow 2:
Average throughput: 194.40 Mbit/s
95th percentile per-packet one-way delay: 160.869 ms
Loss rate: 0.87%
-- Flow 3:
Average throughput: 139.60 Mbit/s
95th percentile per-packet one-way delay: 163.108 ms
Loss rate: 5.94%
```
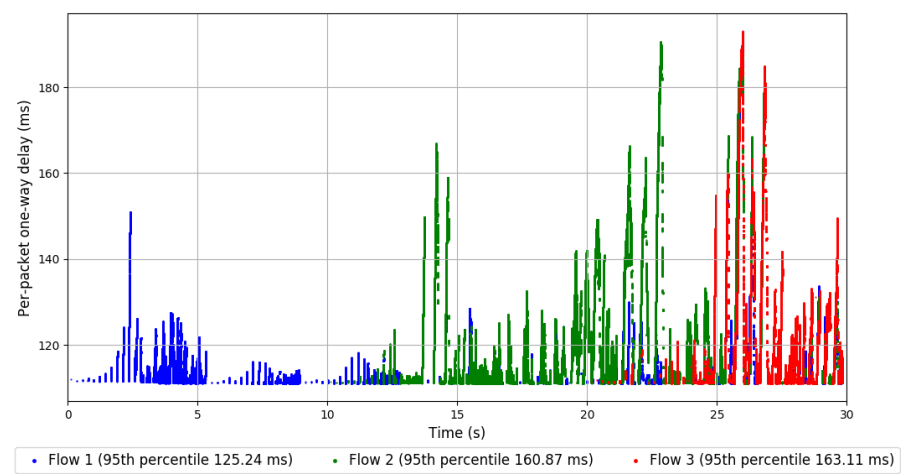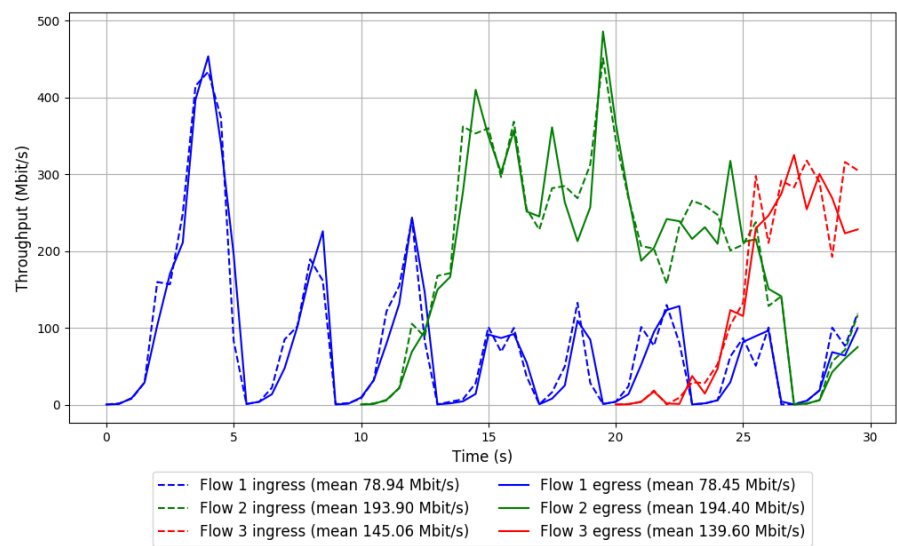
Run 1: Report of Verus — Data Link

```
Run 2: Statistics of Verus

Start at: 2017-09-18 17:34:31
End at: 2017-09-18 17:35:01


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 251.38 Mbit/s
95th percentile per-packet one-way delay: 151.820 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 141.62 Mbit/s
95th percentile per-packet one-way delay: 163.456 ms
Loss rate: 0.85%
-- Flow 2:
Average throughput: 138.46 Mbit/s
95th percentile per-packet one-way delay: 143.630 ms
Loss rate: 1.53%
-- Flow 3:
Average throughput: 54.88 Mbit/s
95th percentile per-packet one-way delay: 122.142 ms
Loss rate: 1.06%
```
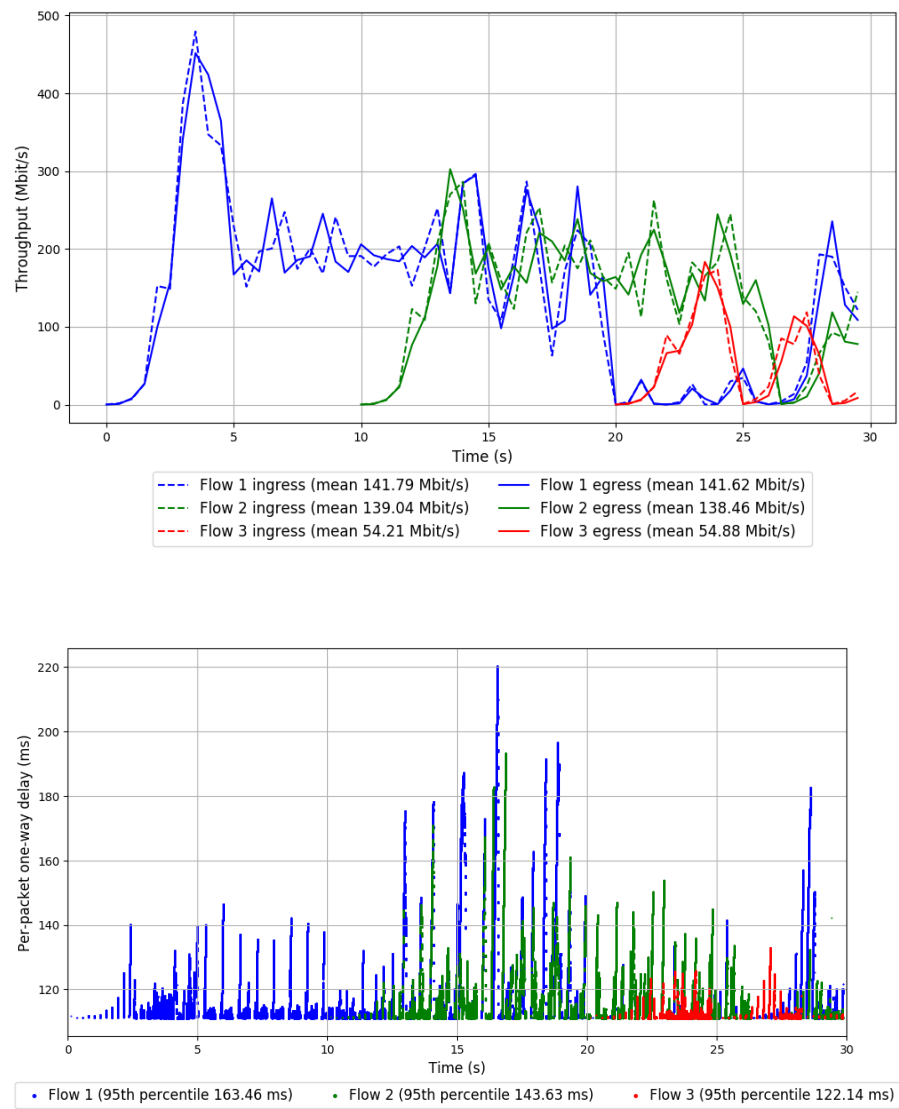
Run 2: Report of Verus — Data Link

- --- Flow 1 ingress (mean 141.79 Mbit/s) —— Flow 1 egress (mean 141.62 Mbit/s)
- --- Flow 2 ingress (mean 139.04 Mbit/s) —— Flow 2 egress (mean 138.46 Mbit/s)
- --- Flow 3 ingress (mean 54.21 Mbit/s) —— Flow 3 egress (mean 54.88 Mbit/s)

- Flow 1 (95th percentile 163.46 ms)   • Flow 2 (95th percentile 143.63 ms)   • Flow 3 (95th percentile 122.14 ms)

```
Run 3: Statistics of Verus

Start at: 2017-09-18 17:44:40
End at: 2017-09-18 17:45:10


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 231.59 Mbit/s
95th percentile per-packet one-way delay: 154.222 ms
Loss rate: 1.11%
-- Flow 1:
Average throughput: 178.45 Mbit/s
95th percentile per-packet one-way delay: 159.705 ms
Loss rate: 1.43%
-- Flow 2:
Average throughput: 58.14 Mbit/s
95th percentile per-packet one-way delay: 134.751 ms
Loss rate: 0.00%
-- Flow 3:
Average throughput: 47.09 Mbit/s
95th percentile per-packet one-way delay: 124.474 ms
Loss rate: 0.08%
```
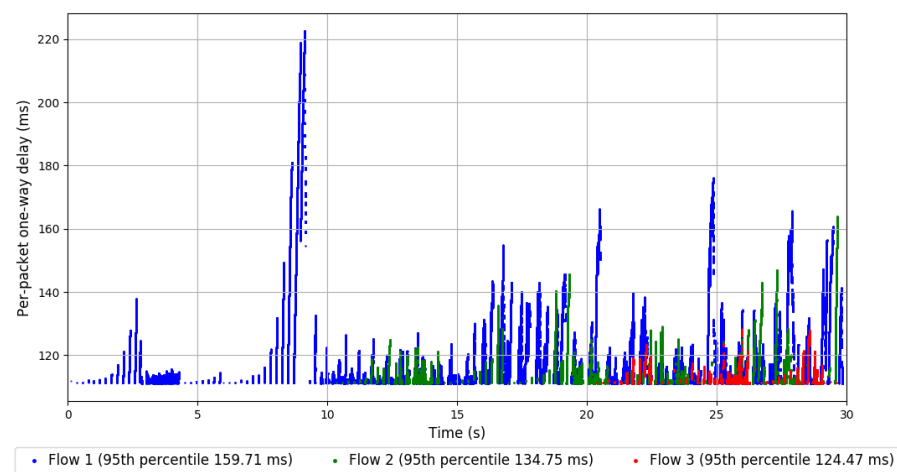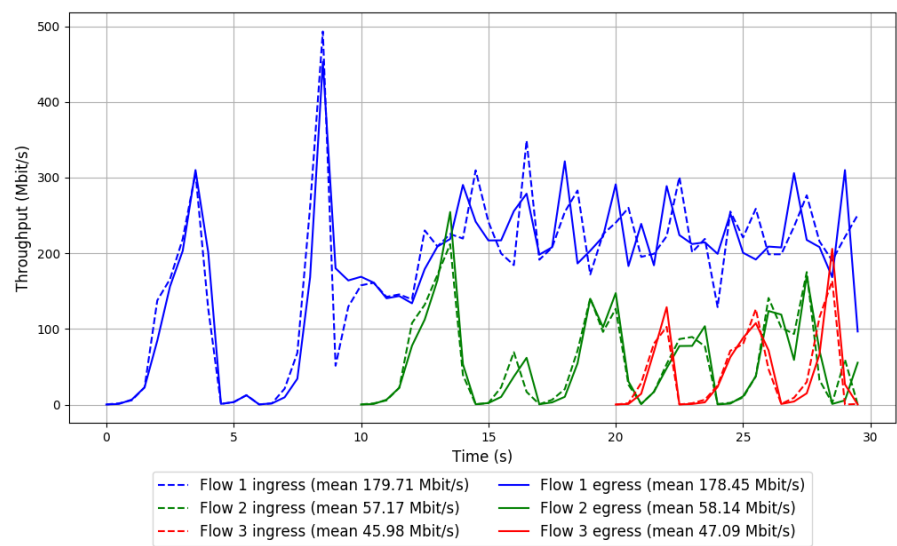
Run 3: Report of Verus — Data Link

- --- Flow 1 ingress (mean 179.71 Mbit/s)   —— Flow 1 egress (mean 178.45 Mbit/s)
- --- Flow 2 ingress (mean 57.17 Mbit/s)   —— Flow 2 egress (mean 58.14 Mbit/s)
- --- Flow 3 ingress (mean 45.98 Mbit/s)   —— Flow 3 egress (mean 47.09 Mbit/s)

- Flow 1 (95th percentile 159.71 ms)   • Flow 2 (95th percentile 134.75 ms)   • Flow 3 (95th percentile 124.47 ms)

189

```
Run 4: Statistics of Verus

Start at: 2017-09-18 17:54:30
End at: 2017-09-18 17:55:00

# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 217.79 Mbit/s
95th percentile per-packet one-way delay: 127.200 ms
Loss rate: 1.01%
-- Flow 1:
Average throughput: 129.49 Mbit/s
95th percentile per-packet one-way delay: 126.281 ms
Loss rate: 0.07%
-- Flow 2:
Average throughput: 100.25 Mbit/s
95th percentile per-packet one-way delay: 128.850 ms
Loss rate: 2.23%
-- Flow 3:
Average throughput: 68.87 Mbit/s
95th percentile per-packet one-way delay: 130.980 ms
Loss rate: 2.65%
```
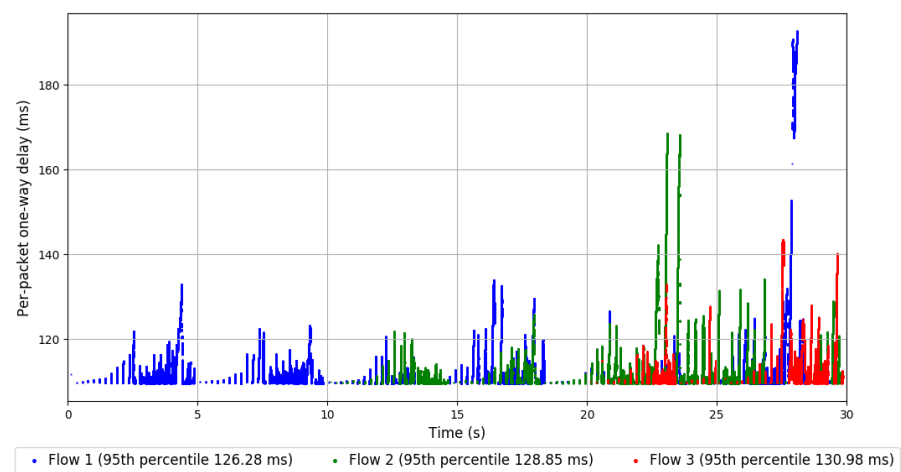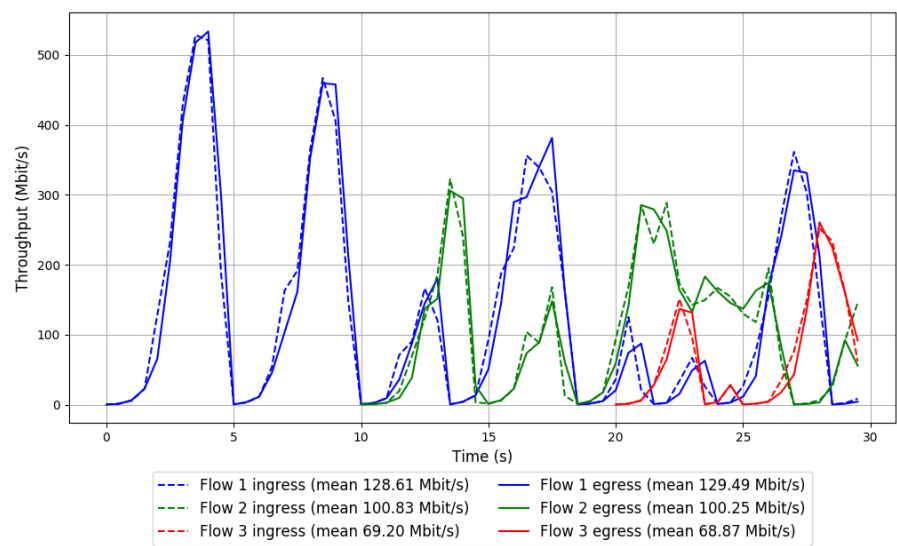
Run 4: Report of Verus — Data Link

```
Run 5: Statistics of Verus

Start at: 2017-09-18 18:04:37
End at: 2017-09-18 18:05:07


# Below is generated by plot.py at 2017-09-18 21:40:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 277.16 Mbit/s
95th percentile per-packet one-way delay: 222.401 ms
Loss rate: 1.97%
-- Flow 1:
Average throughput: 187.36 Mbit/s
95th percentile per-packet one-way delay: 165.879 ms
Loss rate: 1.17%
-- Flow 2:
Average throughput: 96.99 Mbit/s
95th percentile per-packet one-way delay: 275.907 ms
Loss rate: 3.38%
-- Flow 3:
Average throughput: 91.31 Mbit/s
95th percentile per-packet one-way delay: 200.078 ms
Loss rate: 3.99%
```
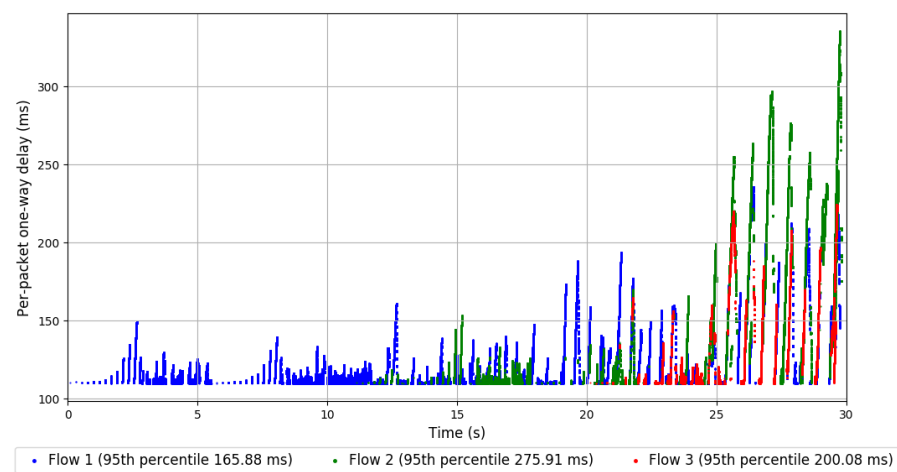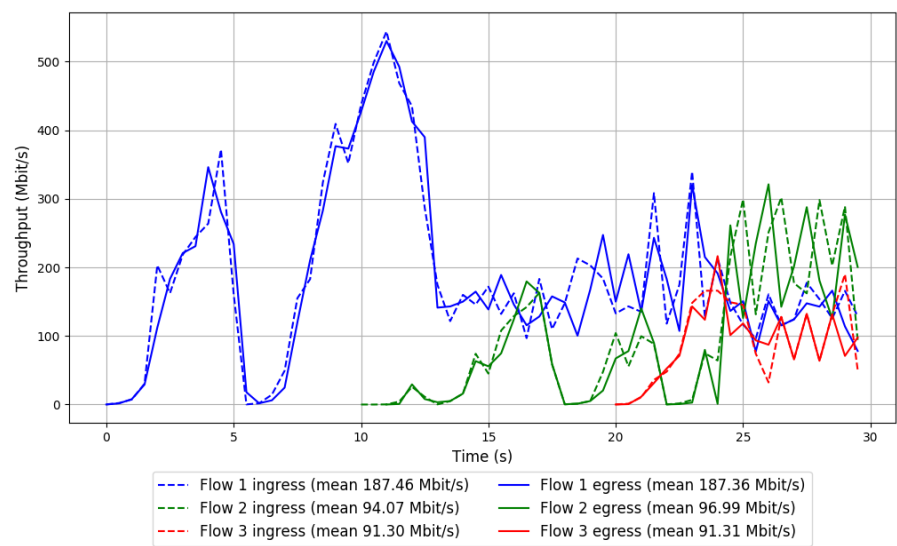
Run 5: Report of Verus — Data Link

Flow 1 ingress (mean 187.46 Mbit/s)   Flow 1 egress (mean 187.36 Mbit/s)
Flow 2 ingress (mean 94.07 Mbit/s)   Flow 2 egress (mean 96.99 Mbit/s)
Flow 3 ingress (mean 91.30 Mbit/s)   Flow 3 egress (mean 91.31 Mbit/s)

Flow 1 (95th percentile 165.88 ms)   Flow 2 (95th percentile 275.91 ms)   Flow 3 (95th percentile 200.08 ms)

193

```
Run 6: Statistics of Verus

Start at: 2017-09-18 18:14:50
End at: 2017-09-18 18:15:20


# Below is generated by plot.py at 2017-09-18 21:40:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 313.83 Mbit/s
95th percentile per-packet one-way delay: 160.987 ms
Loss rate: 1.95%
-- Flow 1:
Average throughput: 163.19 Mbit/s
95th percentile per-packet one-way delay: 168.901 ms
Loss rate: 2.02%
-- Flow 2:
Average throughput: 208.83 Mbit/s
95th percentile per-packet one-way delay: 149.258 ms
Loss rate: 1.46%
-- Flow 3:
Average throughput: 37.16 Mbit/s
95th percentile per-packet one-way delay: 229.623 ms
Loss rate: 6.48%
```
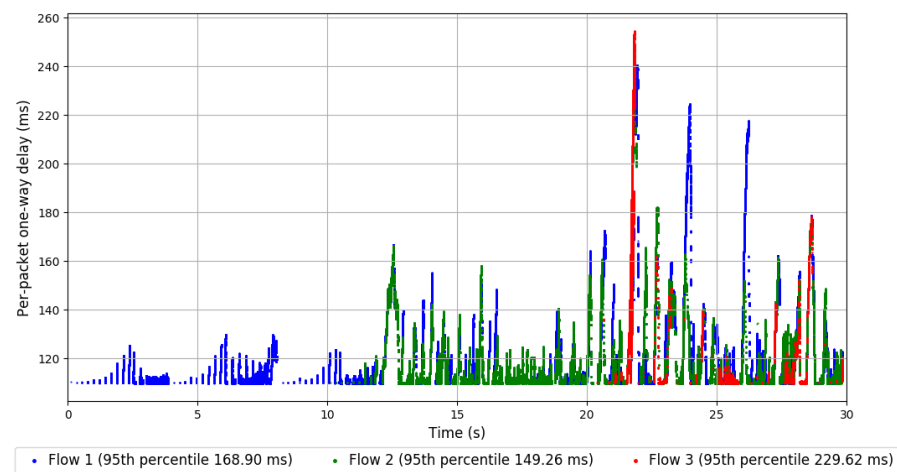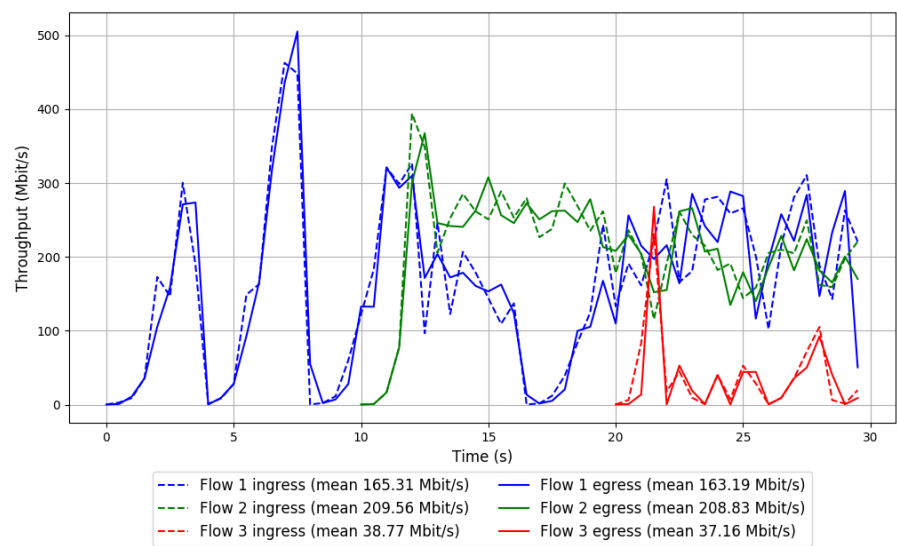
Run 6: Report of Verus — Data Link

```
Run 7: Statistics of Verus

Start at: 2017-09-18 18:24:30
End at: 2017-09-18 18:25:00


# Below is generated by plot.py at 2017-09-18 21:40:56
# Datalink statistics
-- Total of 3 flows:
Average throughput: 255.43 Mbit/s
95th percentile per-packet one-way delay: 159.022 ms
Loss rate: 2.15%
-- Flow 1:
Average throughput: 156.75 Mbit/s
95th percentile per-packet one-way delay: 148.271 ms
Loss rate: 2.42%
-- Flow 2:
Average throughput: 107.19 Mbit/s
95th percentile per-packet one-way delay: 157.410 ms
Loss rate: 1.65%
-- Flow 3:
Average throughput: 56.68 Mbit/s
95th percentile per-packet one-way delay: 217.579 ms
Loss rate: 2.05%
```
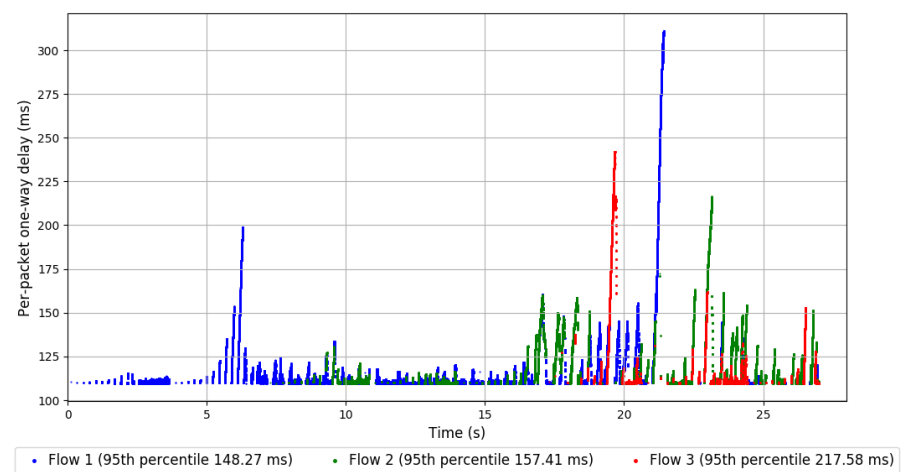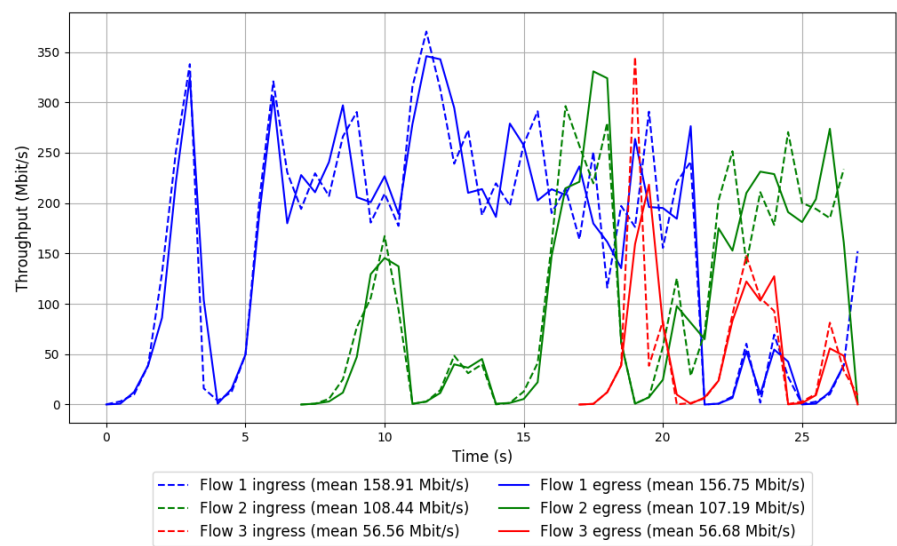
Run 7: Report of Verus — Data Link

Flow 1 ingress (mean 158.91 Mbit/s)   Flow 1 egress (mean 156.75 Mbit/s)
Flow 2 ingress (mean 108.44 Mbit/s)   Flow 2 egress (mean 107.19 Mbit/s)
Flow 3 ingress (mean 56.56 Mbit/s)   Flow 3 egress (mean 56.68 Mbit/s)

Flow 1 (95th percentile 148.27 ms)   Flow 2 (95th percentile 157.41 ms)   Flow 3 (95th percentile 217.58 ms)

```
Run 8: Statistics of Verus

Start at: 2017-09-18 18:33:59
End at: 2017-09-18 18:34:29


# Below is generated by plot.py at 2017-09-18 21:41:27
# Datalink statistics
-- Total of 3 flows:
Average throughput: 252.88 Mbit/s
95th percentile per-packet one-way delay: 232.188 ms
Loss rate: 3.06%
-- Flow 1:
Average throughput: 216.35 Mbit/s
95th percentile per-packet one-way delay: 245.272 ms
Loss rate: 2.92%
-- Flow 2:
Average throughput: 32.93 Mbit/s
95th percentile per-packet one-way delay: 196.693 ms
Loss rate: 2.46%
-- Flow 3:
Average throughput: 34.89 Mbit/s
95th percentile per-packet one-way delay: 130.786 ms
Loss rate: 6.39%
```
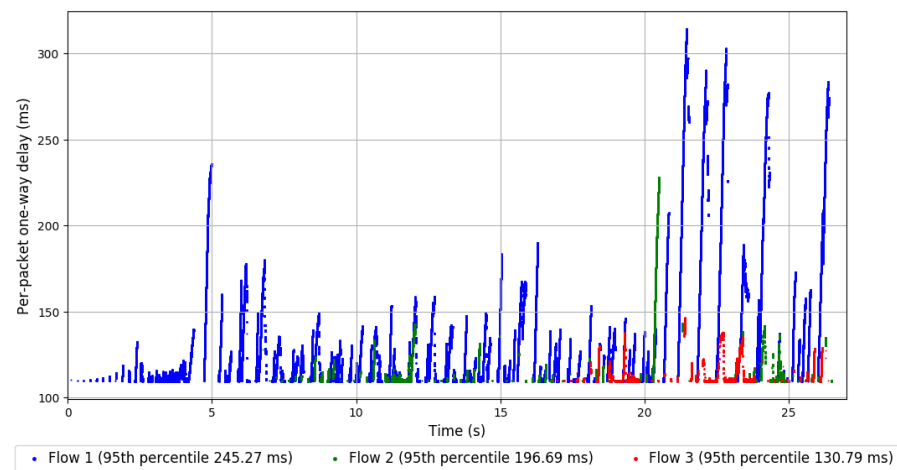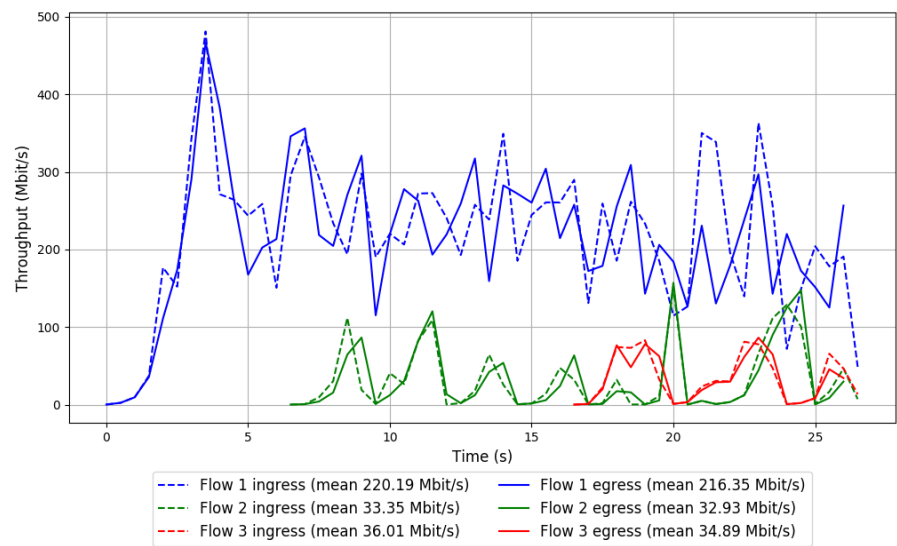
Run 8: Report of Verus — Data Link

```
Run 9: Statistics of Verus

Start at: 2017-09-18 18:43:46
End at: 2017-09-18 18:44:16


# Below is generated by plot.py at 2017-09-18 21:41:29
# Datalink statistics
-- Total of 3 flows:
Average throughput: 229.22 Mbit/s
95th percentile per-packet one-way delay: 283.634 ms
Loss rate: 5.48%
-- Flow 1:
Average throughput: 93.83 Mbit/s
95th percentile per-packet one-way delay: 161.863 ms
Loss rate: 1.27%
-- Flow 2:
Average throughput: 173.26 Mbit/s
95th percentile per-packet one-way delay: 299.836 ms
Loss rate: 6.37%
-- Flow 3:
Average throughput: 69.95 Mbit/s
95th percentile per-packet one-way delay: 195.333 ms
Loss rate: 17.21%
```
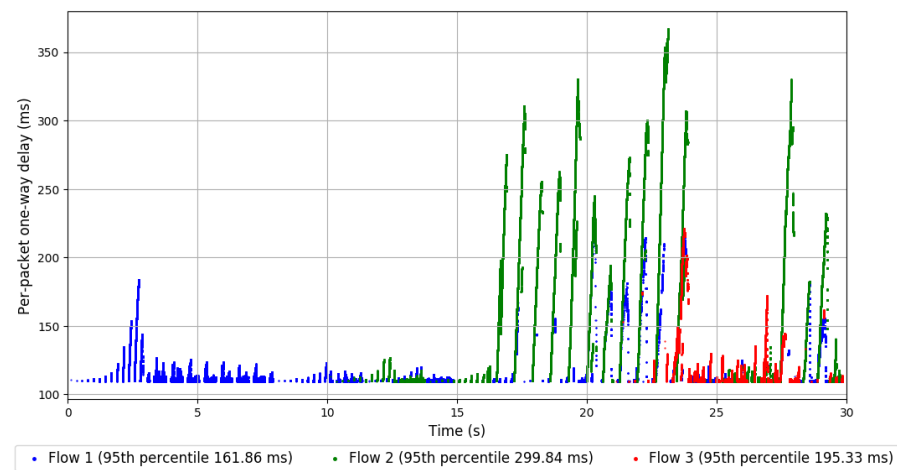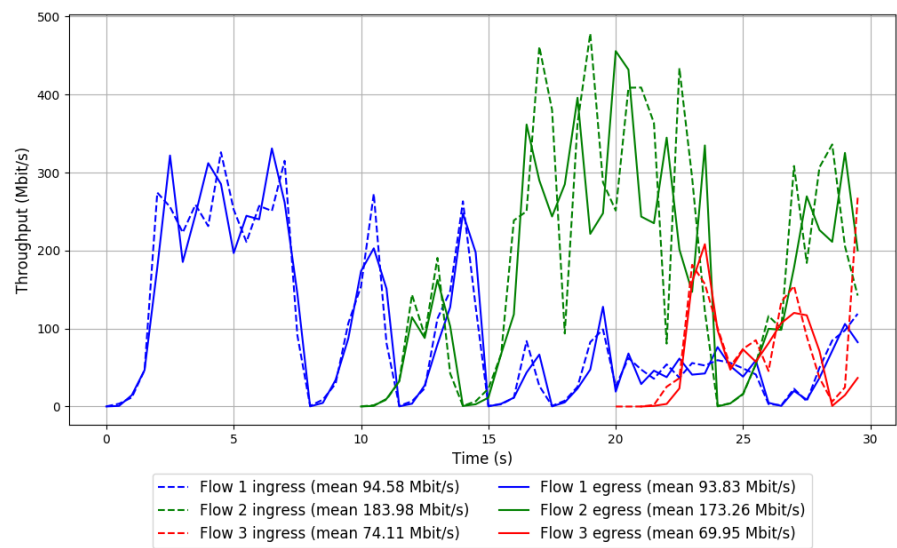
Run 9: Report of Verus — Data Link

```
Run 10: Statistics of Verus

Start at: 2017-09-18 18:53:48
End at: 2017-09-18 18:54:18

# Below is generated by plot.py at 2017-09-18 21:41:32
# Datalink statistics
-- Total of 3 flows:
Average throughput: 271.15 Mbit/s
95th percentile per-packet one-way delay: 285.264 ms
Loss rate: 5.08%
-- Flow 1:
Average throughput: 215.39 Mbit/s
95th percentile per-packet one-way delay: 296.413 ms
Loss rate: 5.33%
-- Flow 2:
Average throughput: 48.19 Mbit/s
95th percentile per-packet one-way delay: 199.988 ms
Loss rate: 2.53%
-- Flow 3:
Average throughput: 76.22 Mbit/s
95th percentile per-packet one-way delay: 229.408 ms
Loss rate: 6.11%
```

Run 10: Report of Verus — Data Link