Pantheon Report

Data path: India ppp0 ppp0 (remote) →AWS India 1 Ethernet (local).
Repeated the test of 17 congestion control schemes 3 times.
Each test lasted for 30 seconds running 3 flows with 10-second interval between two flows.
NTP offsets were measured against nets.org.sg and have been applied to correct the timestamps in logs.

System info:
Linux 4.15.0-1017-aws
net.core.default_qdisc = fq_codel
net.core.rmem_default = 16777216
net.core.rmem_max = 33554432
net.core.wmem_default = 212992
net.core.wmem_max = 212992
net.ipv4.tcp_rmem = 4096 87380 6291456
net.ipv4.tcp_wmem = 4096 16384 4194304

Git summary:
branch: master @ 7719b900495aa706f8452ab7d4a94dd562e9296e
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436bd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbfe58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0edbf90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/pantheon-tunnel @ 6f038ed31259d366f9840f65b82cbe8f464b1b39
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8ac0d8f92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cfff2
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3f8b2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939ff9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2ba86211435ae071a32f96b7d8c504587f5d7f4
third_party/webtcc @ 3f0cc2a9061a41b6f9ddee4735770d143a1fa2851
test from India ppp0 to AWS India 1, 3 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)
<table>
<thead>
<tr>
<th>scheme</th>
<th># runs</th>
<th>mean avg tput (Mbit/s)</th>
<th>mean 95th-%ile delay (ms)</th>
<th>mean loss rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP BBR</td>
<td>3</td>
<td>0.52 0.28 0.27</td>
<td>364.72 370.39 372.39</td>
<td>14.91 28.77 34.81</td>
</tr>
<tr>
<td>Copa</td>
<td>3</td>
<td>0.44 0.25 0.27</td>
<td>342.88 351.70 355.79</td>
<td>3.78 8.29 14.33</td>
</tr>
<tr>
<td>TCP Cubic</td>
<td>3</td>
<td>0.49 0.28 0.21</td>
<td>357.18 357.67 362.13</td>
<td>3.80 8.18 12.31</td>
</tr>
<tr>
<td>FillP</td>
<td>3</td>
<td>0.44 0.25 0.24</td>
<td>377.37 371.01 374.59</td>
<td>63.78 54.55 60.54</td>
</tr>
<tr>
<td>FillP-Sheep</td>
<td>3</td>
<td>0.49 0.22 0.20</td>
<td>371.63 373.78 373.86</td>
<td>54.71 73.30 81.99</td>
</tr>
<tr>
<td>Indigo</td>
<td>3</td>
<td>0.31 0.31 0.25</td>
<td>288.60 325.20 327.13</td>
<td>2.98 6.61 15.18</td>
</tr>
<tr>
<td>LEDBAT</td>
<td>3</td>
<td>0.31 0.31 0.48</td>
<td>271.38 311.15 298.44</td>
<td>0.13 1.33 2.82</td>
</tr>
<tr>
<td>PCC-Allegro</td>
<td>3</td>
<td>0.52 0.28 0.00</td>
<td>449.25 600.44 350.59</td>
<td>81.61 90.33 92.31</td>
</tr>
<tr>
<td>PCC-Expr</td>
<td>0</td>
<td>N/A N/A N/A</td>
<td>N/A N/A N/A</td>
<td>N/A N/A N/A</td>
</tr>
<tr>
<td>QUIC Cubic</td>
<td>3</td>
<td>0.39 0.30 0.24</td>
<td>366.19 369.44 371.75</td>
<td>18.62 26.45 40.22</td>
</tr>
<tr>
<td>SCReAM</td>
<td>3</td>
<td>0.17 0.17 0.20</td>
<td>113.89 118.49 136.29</td>
<td>0.19 0.48 1.02</td>
</tr>
<tr>
<td>Sprout</td>
<td>3</td>
<td>0.21 0.21 0.20</td>
<td>172.42 190.38 199.85</td>
<td>1.78 2.21 2.90</td>
</tr>
<tr>
<td>TaoVA-100x</td>
<td>3</td>
<td>0.46 0.22 0.21</td>
<td>370.19 386.21 372.42</td>
<td>49.84 71.22 67.53</td>
</tr>
<tr>
<td>TCP Vegas</td>
<td>3</td>
<td>0.41 0.35 0.38</td>
<td>320.03 334.92 342.97</td>
<td>2.09 3.25 5.31</td>
</tr>
<tr>
<td>Verus</td>
<td>3</td>
<td>0.59 0.16 0.06</td>
<td>368.44 369.51 367.47</td>
<td>32.39 56.06 70.55</td>
</tr>
<tr>
<td>PCC-Vivace</td>
<td>3</td>
<td>0.52 0.25 0.28</td>
<td>377.81 370.25 373.61</td>
<td>61.74 72.60 76.19</td>
</tr>
<tr>
<td>WebRTC media</td>
<td>3</td>
<td>0.17 0.16 0.11</td>
<td>353.10 357.52 355.06</td>
<td>10.35 14.72 15.03</td>
</tr>
</tbody>
</table>
Run 1: Statistics of TCP BBR

Start at: 2018-08-22 17:39:05
End at: 2018-08-22 17:39:35
Local clock offset: 0.699 ms
Remote clock offset: -64.849 ms

# Below is generated by plot.py at 2018-08-22 18:26:40
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 367.606 ms
Loss rate: 22.38%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 364.913 ms
Loss rate: 15.38%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 370.601 ms
Loss rate: 31.62%
-- Flow 3:
Average throughput: 0.22 Mbit/s
95th percentile per-packet one-way delay: 374.231 ms
Loss rate: 44.93%
Run 1: Report of TCP BBR — Data Link
Run 2: Statistics of TCP BBR

Start at: 2018-08-22 17:57:35
End at: 2018-08-22 17:58:05
Local clock offset: 2.388 ms
Remote clock offset: -66.14 ms

# Below is generated by plot.py at 2018-08-22 18:26:40
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.66 Mbit/s
  95th percentile per-packet one-way delay: 369.876 ms
  Loss rate: 22.99%
-- Flow 1:
  Average throughput: 0.45 Mbit/s
  95th percentile per-packet one-way delay: 366.269 ms
  Loss rate: 17.03%
-- Flow 2:
  Average throughput: 0.21 Mbit/s
  95th percentile per-packet one-way delay: 371.798 ms
  Loss rate: 31.66%
-- Flow 3:
  Average throughput: 0.23 Mbit/s
  95th percentile per-packet one-way delay: 375.964 ms
  Loss rate: 36.38%
Run 2: Report of TCP BBR — Data Link

![Graph 1: Throughput vs Time](image1)

- Flow 1 ingress (mean 0.55 Mbit/s)
- Flow 1 egress (mean 0.45 Mbit/s)
- Flow 2 ingress (mean 0.30 Mbit/s)
- Flow 2 egress (mean 0.21 Mbit/s)
- Flow 3 ingress (mean 0.34 Mbit/s)
- Flow 3 egress (mean 0.23 Mbit/s)

![Graph 2: Per-packet one way delay vs Time](image2)

- Flow 1 (95th percentile 366.27 ms)
- Flow 2 (95th percentile 371.80 ms)
- Flow 3 (95th percentile 375.96 ms)
Run 3: Statistics of TCP BBR

Start at: 2018-08-22 18:16:11
End at: 2018-08-22 18:16:41
Local clock offset: 2.585 ms
Remote clock offset: -64.234 ms

# Below is generated by plot.py at 2018-08-22 18:26:41
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.92 Mbit/s
  95th percentile per-packet one-way delay: 366.001 ms
  Loss rate: 17.13%
-- Flow 1:
  Average throughput: 0.54 Mbit/s
  95th percentile per-packet one-way delay: 362.976 ms
  Loss rate: 12.33%
-- Flow 2:
  Average throughput: 0.42 Mbit/s
  95th percentile per-packet one-way delay: 368.772 ms
  Loss rate: 23.03%
-- Flow 3:
  Average throughput: 0.35 Mbit/s
  95th percentile per-packet one-way delay: 366.964 ms
  Loss rate: 23.13%
Run 3: Report of TCP BBR — Data Link

![Graph 1: Throughput (Mbps) vs Time (s)]

![Graph 2: Per-packet one-way delay (ms) vs Time (s)]

Legend:
- Flow 1 ingress (mean 0.61 Mbps)
- Flow 1 egress (mean 0.54 Mbps)
- Flow 2 ingress (mean 0.54 Mbps)
- Flow 2 egress (mean 0.42 Mbps)
- Flow 3 ingress (mean 0.40 Mbps)
- Flow 3 egress (mean 0.35 Mbps)
Run 1: Statistics of Copa

Start at: 2018-08-22 17:36:55
End at: 2018-08-22 17:37:25
Local clock offset: 2.11 ms
Remote clock offset: -64.105 ms

# Below is generated by plot.py at 2018-08-22 18:26:41
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.62 Mbit/s
  95th percentile per-packet one-way delay: 351.452 ms
  Loss rate: 6.89%
-- Flow 1:
  Average throughput: 0.41 Mbit/s
  95th percentile per-packet one-way delay: 346.636 ms
  Loss rate: 5.25%
-- Flow 2:
  Average throughput: 0.24 Mbit/s
  95th percentile per-packet one-way delay: 356.178 ms
  Loss rate: 8.41%
-- Flow 3:
  Average throughput: 0.22 Mbit/s
  95th percentile per-packet one-way delay: 355.379 ms
  Loss rate: 12.01%
Run 1: Report of Copa — Data Link
Run 2: Statistics of Copa

Start at: 2018-08-22 17:55:25
End at: 2018-08-22 17:55:55
Local clock offset: -2.54 ms
Remote clock offset: -65.101 ms

# Below is generated by plot.py at 2018-08-22 18:26:41
# Datalink statistics
-- Total of 3 flows:
Avg. throughp.: 0.61 Mbit/s
95th percentile per-packet one-way delay: 344.836 ms
Loss rate: 7.49%
-- Flow 1:
Avg. throughp.: 0.43 Mbit/s
95th percentile per-packet one-way delay: 339.301 ms
Loss rate: 4.13%
-- Flow 2:
Avg. throughp.: 0.21 Mbit/s
95th percentile per-packet one-way delay: 351.323 ms
Loss rate: 11.45%
-- Flow 3:
Avg. throughp.: 0.16 Mbit/s
95th percentile per-packet one-way delay: 353.883 ms
Loss rate: 22.01%
Run 2: Report of Copa — Data Link
Run 3: Statistics of Copa

Start at: 2018-08-22 18:14:01
End at: 2018-08-22 18:14:31
Local clock offset: 3.148 ms
Remote clock offset: -63.699 ms

# Below is generated by plot.py at 2018-08-22 18:26:41
# Datalink statistics
-- Total of 3 flows:
   Average throughput: 0.82 Mbit/s
   95th percentile per-packet one-way delay: 347.792 ms
   Loss rate: 3.98%
-- Flow 1:
   Average throughput: 0.48 Mbit/s
   95th percentile per-packet one-way delay: 342.717 ms
   Loss rate: 1.95%
-- Flow 2:
   Average throughput: 0.31 Mbit/s
   95th percentile per-packet one-way delay: 347.588 ms
   Loss rate: 5.00%
-- Flow 3:
   Average throughput: 0.44 Mbit/s
   95th percentile per-packet one-way delay: 358.117 ms
   Loss rate: 8.97%
Run 3: Report of Copa — Data Link
Run 1: Statistics of TCP Cubic

Start at: 2018-08-22 17:42:21
End at: 2018-08-22 17:42:51
Local clock offset: 3.686 ms
Remote clock offset: -65.531 ms

# Below is generated by plot.py at 2018-08-22 18:26:41
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.88 Mbit/s
  95th percentile per-packet one-way delay: 357.326 ms
  Loss rate: 5.41%
-- Flow 1:
  Average throughput: 0.60 Mbit/s
  95th percentile per-packet one-way delay: 357.340 ms
  Loss rate: 3.67%
-- Flow 2:
  Average throughput: 0.32 Mbit/s
  95th percentile per-packet one-way delay: 352.657 ms
  Loss rate: 7.97%
-- Flow 3:
  Average throughput: 0.22 Mbit/s
  95th percentile per-packet one-way delay: 363.074 ms
  Loss rate: 11.49%
Run 1: Report of TCP Cubic — Data Link

![Throughput Graph](image1)

- Flow 1 ingress (mean 0.62 Mbit/s)
- Flow 1 egress (mean 0.60 Mbit/s)
- Flow 2 ingress (mean 0.35 Mbit/s)
- Flow 2 egress (mean 0.32 Mbit/s)
- Flow 3 ingress (mean 0.24 Mbit/s)
- Flow 3 egress (mean 0.22 Mbit/s)

![Ping Delay Graph](image2)

- Flow 1 (95th percentile 357.34 ms)
- Flow 2 (95th percentile 352.66 ms)
- Flow 3 (95th percentile 363.07 ms)
Run 2: Statistics of TCP Cubic

Start at: 2018-08-22 18:00:51
End at: 2018-08-22 18:01:21
Local clock offset: 1.913 ms
Remote clock offset: -66.751 ms

# Below is generated by plot.py at 2018-08-22 18:26:41
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.67 Mbit/s
  95th percentile per-packet one-way delay: 359.060 ms
  Loss rate: 6.00%
-- Flow 1:
  Average throughput: 0.38 Mbit/s
  95th percentile per-packet one-way delay: 358.248 ms
  Loss rate: 4.59%
-- Flow 2:
  Average throughput: 0.35 Mbit/s
  95th percentile per-packet one-way delay: 360.069 ms
  Loss rate: 6.01%
-- Flow 3:
  Average throughput: 0.20 Mbit/s
  95th percentile per-packet one-way delay: 363.227 ms
  Loss rate: 13.43%
Run 2: Report of TCP Cubic — Data Link

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**Throughput (Mbps)**

- **Flow 1 ingress** (mean 0.39 Mbps)
- **Flow 1 egress** (mean 0.38 Mbps)
- **Flow 2 ingress** (mean 0.37 Mbps)
- **Flow 2 egress** (mean 0.35 Mbps)
- **Flow 3 ingress** (mean 0.23 Mbps)
- **Flow 3 egress** (mean 0.20 Mbps)

**Per-packet end-to-end delay (ms)**

- **Flow 1** (95th percentile 358.25 ms)
- **Flow 2** (95th percentile 360.07 ms)
- **Flow 3** (95th percentile 363.23 ms)
Run 3: Statistics of TCP Cubic

Start at: 2018-08-22 18:19:28
End at: 2018-08-22 18:19:58
Local clock offset: 1.544 ms
Remote clock offset: -64.424 ms

# Below is generated by plot.py at 2018-08-22 18:26:43
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.66 Mbit/s
95th percentile per-packet one-way delay: 359.803 ms
Loss rate: 5.41%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 355.962 ms
Loss rate: 3.14%
-- Flow 2:
Average throughput: 0.17 Mbit/s
95th percentile per-packet one-way delay: 360.283 ms
Loss rate: 10.57%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 360.094 ms
Loss rate: 12.01%
Run 3: Report of TCP Cubic — Data Link

![Graph showing throughput and round-trip delay over time for different flow ingress and egress rates.]

- Flow 1 ingress (mean 0.50 Mbit/s)
- Flow 1 egress (mean 0.48 Mbit/s)
- Flow 2 ingress (mean 0.19 Mbit/s)
- Flow 2 egress (mean 0.17 Mbit/s)
- Flow 3 ingress (mean 0.22 Mbit/s)
- Flow 3 egress (mean 0.20 Mbit/s)

![Graph showing round-trip delay for different flow rates and quartiles.]

- Flow 1 (95th percentile 355.96 ms)
- Flow 2 (95th percentile 360.28 ms)
- Flow 3 (95th percentile 360.09 ms)
Run 1: Statistics of FillP

Start at: 2018-08-22 17:45:37
End at: 2018-08-22 17:46:07
Local clock offset: 1.475 ms
Remote clock offset: -65.644 ms

# Below is generated by plot.py at 2018-08-22 18:26:44
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.60 Mbit/s
  95th percentile per-packet one-way delay: 369.575 ms
  Loss rate: 52.21%
-- Flow 1:
  Average throughput: 0.37 Mbit/s
  95th percentile per-packet one-way delay: 369.506 ms
  Loss rate: 51.91%
-- Flow 2:
  Average throughput: 0.23 Mbit/s
  95th percentile per-packet one-way delay: 373.085 ms
  Loss rate: 50.21%
-- Flow 3:
  Average throughput: 0.27 Mbit/s
  95th percentile per-packet one-way delay: 369.760 ms
  Loss rate: 56.61%
Run 1: Report of FillP — Data Link
Run 2: Statistics of FillP

Start at: 2018-08-22 18:04:07
End at: 2018-08-22 18:04:37
Local clock offset: 3.298 ms
Remote clock offset: -66.524 ms

# Below is generated by plot.py at 2018-08-22 18:26:47
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.87 Mbit/s
  95th percentile per-packet one-way delay: 374.294 ms
  Loss rate: 60.67%
-- Flow 1:
  Average throughput: 0.58 Mbit/s
  95th percentile per-packet one-way delay: 381.518 ms
  Loss rate: 64.22%
-- Flow 2:
  Average throughput: 0.31 Mbit/s
  95th percentile per-packet one-way delay: 369.561 ms
  Loss rate: 46.93%
-- Flow 3:
  Average throughput: 0.30 Mbit/s
  95th percentile per-packet one-way delay: 368.155 ms
  Loss rate: 58.40%
Run 2: Report of FillP — Data Link
Run 3: Statistics of FillP

Start at: 2018-08-22 18:22:44
End at: 2018-08-22 18:23:14
Local clock offset: -1.061 ms
Remote clock offset: -63.732 ms

# Below is generated by plot.py at 2018-08-22 18:26:47
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 379.131 ms
Loss rate: 71.62%
-- Flow 1:
Average throughput: 0.37 Mbit/s
95th percentile per-packet one-way delay: 381.098 ms
Loss rate: 75.20%
-- Flow 2:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 370.398 ms
Loss rate: 57.51%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 385.849 ms
Loss rate: 66.61%
Run 3: Report of FillP — Data Link

![Graph 1: Throughput (Mbps/s) over Time (s)]

- Flow 1 ingress (mean 1.47 Mbps/s)
- Flow 1 egress (mean 0.37 Mbps/s)
- Flow 2 ingress (mean 0.49 Mbps/s)
- Flow 2 egress (mean 0.21 Mbps/s)
- Flow 3 ingress (mean 0.42 Mbps/s)
- Flow 3 egress (mean 0.15 Mbps/s)

![Graph 2: Per-packet one-way delay (ms) over Time (s)]

- Flow 1 (95th percentile 381.10 ms)
- Flow 2 (95th percentile 370.40 ms)
- Flow 3 (95th percentile 385.85 ms)
Run 1: Statistics of FillP-Sheep

Start at: 2018-08-22 17:43:26
End at: 2018-08-22 17:43:56
Local clock offset: 0.976 ms
Remote clock offset: -65.634 ms

# Below is generated by plot.py at 2018-08-22 18:26:48
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 371.934 ms
Loss rate: 65.27%
-- Flow 1:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 371.731 ms
Loss rate: 56.16%
-- Flow 2:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 372.788 ms
Loss rate: 78.44%
-- Flow 3:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 370.382 ms
Loss rate: 73.81%
Run 1: Report of FillP-Sheep — Data Link

![Graph 1: Throughput (Mbps) vs. Time (s)]

- **Flow 1 ingress** (mean 1.17 Mbps)
- **Flow 1 egress** (mean 0.52 Mbps)
- **Flow 2 ingress** (mean 0.87 Mbps)
- **Flow 2 egress** (mean 0.19 Mbps)
- **Flow 3 ingress** (mean 1.09 Mbps)
- **Flow 3 egress** (mean 0.31 Mbps)

![Graph 2: Per-packet delay (ms) vs. Time (s)]

- **Flow 1** (95th percentile 371.7 ms)
- **Flow 2** (95th percentile 372.79 ms)
- **Flow 3** (95th percentile 370.38 ms)
Run 2: Statistics of FillP-Sheep

Start at: 2018-08-22 18:01:56
End at: 2018-08-22 18:02:26
Local clock offset: 2.914 ms
Remote clock offset: -66.66 ms

# Below is generated by plot.py at 2018-08-22 18:26:48
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.75 Mbit/s
  95th percentile per-packet one-way delay: 370.988 ms
  Loss rate: 67.33%
-- Flow 1:
  Average throughput: 0.53 Mbit/s
  95th percentile per-packet one-way delay: 370.375 ms
  Loss rate: 51.72%
-- Flow 2:
  Average throughput: 0.22 Mbit/s
  95th percentile per-packet one-way delay: 372.947 ms
  Loss rate: 80.66%
-- Flow 3:
  Average throughput: 0.24 Mbit/s
  95th percentile per-packet one-way delay: 376.557 ms
  Loss rate: 83.14%
Run 2: Report of FillP-Sheep — Data Link
Run 3: Statistics of FillP-Sheep

Start at: 2018-08-22 18:20:33
End at: 2018-08-22 18:21:03
Local clock offset: -0.188 ms
Remote clock offset: -64.412 ms

# Below is generated by plot.py at 2018-08-22 18:26:48
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.62 Mbit/s
  95th percentile per-packet one-way delay: 372.924 ms
  Loss rate: 65.17%
-- Flow 1:
  Average throughput: 0.43 Mbit/s
  95th percentile per-packet one-way delay: 372.778 ms
  Loss rate: 56.26%
-- Flow 2:
  Average throughput: 0.25 Mbit/s
  95th percentile per-packet one-way delay: 375.607 ms
  Loss rate: 72.80%
-- Flow 3:
  Average throughput: 0.06 Mbit/s
  95th percentile per-packet one-way delay: 374.654 ms
  Loss rate: 89.03%
Run 3: Report of FillP-Sheep — Data Link

![Graph showing network throughput and packet delay over time]

Legend:
- Flow 1 ingress (mean 0.99 Mbit/s)
- Flow 1 egress (mean 0.43 Mbit/s)
- Flow 2 ingress (mean 0.90 Mbit/s)
- Flow 2 egress (mean 0.25 Mbit/s)
- Flow 3 ingress (mean 0.54 Mbit/s)
- Flow 3 egress (mean 0.06 Mbit/s)

Legend for packet delay:
- Flow 1 (95th percentile 372.78 ms)
- Flow 2 (95th percentile 375.61 ms)
- Flow 3 (95th percentile 374.65 ms)
Run 1: Statistics of Indigo

Start at: 2018-08-22 17:48:53
End at: 2018-08-22 17:49:23
Local clock offset: 2.53 ms
Remote clock offset: -65.555 ms

# Below is generated by plot.py at 2018-08-22 18:26:48
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.45 Mbit/s
  95th percentile per-packet one-way delay: 338.816 ms
  Loss rate: 8.25%
-- Flow 1:
  Average throughput: 0.27 Mbit/s
  95th percentile per-packet one-way delay: 327.651 ms
  Loss rate: 3.93%
-- Flow 2:
  Average throughput: 0.18 Mbit/s
  95th percentile per-packet one-way delay: 346.969 ms
  Loss rate: 9.94%
-- Flow 3:
  Average throughput: 0.20 Mbit/s
  95th percentile per-packet one-way delay: 344.637 ms
  Loss rate: 20.00%
Run 1: Report of Indigo — Data Link

![Graph showing throughput and delay over time for different flows]

- Flow 1 ingress (mean 0.28 Mbit/s)
- Flow 1 egress (mean 0.27 Mbit/s)
- Flow 2 ingress (mean 0.20 Mbit/s)
- Flow 2 egress (mean 0.18 Mbit/s)
- Flow 3 ingress (mean 0.25 Mbit/s)
- Flow 3 egress (mean 0.20 Mbit/s)

![Graph showing per-packet one-way delay over time for different flows]

- Flow 1 (95th percentile 327.65 ms)
- Flow 2 (95th percentile 346.97 ms)
- Flow 3 (95th percentile 344.64 ms)
Run 2: Statistics of Indigo

Start at: 2018-08-22 18:07:24
End at: 2018-08-22 18:07:54
Local clock offset: 2.317 ms
Remote clock offset: -64.854 ms

# Below is generated by plot.py at 2018-08-22 18:26:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 291.879 ms
Loss rate: 4.01%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 251.951 ms
Loss rate: 2.09%
-- Flow 2:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 302.837 ms
Loss rate: 4.06%
-- Flow 3:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 311.629 ms
Loss rate: 10.34%
Run 2: Report of Indigo — Data Link

[Graph showing throughput and packet one-way delay over time for different flows, with the following legend:
- Flow 1 ingress (mean 0.37 Mbit/s)
- Flow 1 egress (mean 0.36 Mbit/s)
- Flow 2 ingress (mean 0.45 Mbit/s)
- Flow 2 egress (mean 0.43 Mbit/s)
- Flow 3 ingress (mean 0.33 Mbit/s)
- Flow 3 egress (mean 0.30 Mbit/s)
Run 3: Statistics of Indigo

Start at: 2018-08-22 18:26:01
End at: 2018-08-22 18:26:31
Local clock offset: 2.28 ms
Remote clock offset: -64.104 ms

# Below is generated by plot.py at 2018-08-22 18:26:49
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 309.744 ms
Loss rate: 5.78%
-- Flow 1:
Average throughput: 0.31 Mbit/s
95th percentile per-packet one-way delay: 286.211 ms
Loss rate: 2.92%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 325.802 ms
Loss rate: 5.84%
-- Flow 3:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 325.121 ms
Loss rate: 15.19%
Run 3: Report of Indigo — Data Link
Run 1: Statistics of LEDBAT

Start at: 2018-08-22 17:38:00
End at: 2018-08-22 17:38:30
Local clock offset: 0.327 ms
Remote clock offset: -64.825 ms

# Below is generated by plot.py at 2018-08-22 18:26:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 293.848 ms
Loss rate: 1.08%
-- Flow 1:
Average throughput: 0.30 Mbit/s
95th percentile per-packet one-way delay: 269.758 ms
Loss rate: 0.13%
-- Flow 2:
Average throughput: 0.23 Mbit/s
95th percentile per-packet one-way delay: 309.545 ms
Loss rate: 1.55%
-- Flow 3:
Average throughput: 0.52 Mbit/s
95th percentile per-packet one-way delay: 300.576 ms
Loss rate: 2.24%
Run 1: Report of LEDBAT — Data Link

![Graph showing throughput and packet delay over time for different flows.]

- Flow 1 ingress (mean 0.29 Mbit/s)
- Flow 1 egress (mean 0.30 Mbit/s)
- Flow 2 ingress (mean 0.23 Mbit/s)
- Flow 2 egress (mean 0.23 Mbit/s)
- Flow 3 ingress (mean 0.53 Mbit/s)
- Flow 3 egress (mean 0.52 Mbit/s)
Run 2: Statistics of LEDBAT

Start at: 2018-08-22 17:56:30
End at: 2018-08-22 17:57:00
Local clock offset: 1.86 ms
Remote clock offset: -66.244 ms

# Below is generated by plot.py at 2018-08-22 18:26:50
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.63 Mbit/s
  95th percentile per-packet one-way delay: 325.867 ms
  Loss rate: 1.17%
-- Flow 1:
  Average throughput: 0.35 Mbit/s
  95th percentile per-packet one-way delay: 309.826 ms
  Loss rate: 0.11%
-- Flow 2:
  Average throughput: 0.21 Mbit/s
  95th percentile per-packet one-way delay: 319.058 ms
  Loss rate: 1.12%
-- Flow 3:
  Average throughput: 0.43 Mbit/s
  95th percentile per-packet one-way delay: 345.511 ms
  Loss rate: 3.77%
Run 2: Report of LEDBAT — Data Link

![Graph showing throughput vs. time for different flows with mean ingress and egress rates.](image1)

![Graph showing per-packet one-way delay vs. time for different flows with 95th percentile delay.](image2)
Run 3: Statistics of LEDBAT

Start at: 2018-08-22 18:15:06
End at: 2018-08-22 18:15:36
Local clock offset: 0.607 ms
Remote clock offset: -63.571 ms

# Below is generated by plot.py at 2018-08-22 18:26:50
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.74 Mbit/s
95th percentile per-packet one-way delay: 288.935 ms
Loss rate: 1.15%
-- Flow 1:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 234.546 ms
Loss rate: 0.15%
-- Flow 2:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 304.841 ms
Loss rate: 1.31%
-- Flow 3:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 249.231 ms
Loss rate: 2.46%
Run 3: Report of LEDBAT — Data Link
Run 1: Statistics of PCC-Allegro

Start at: 2018-08-22 17:44:32
End at: 2018-08-22 17:45:02
Local clock offset: 0.719 ms
Remote clock offset: -65.688 ms

# Below is generated by plot.py at 2018-08-22 18:26:54
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.75 Mbit/s
95th percentile per-packet one-way delay: 440.327 ms
Loss rate: 84.00%
-- Flow 1:
Average throughput: 0.49 Mbit/s
95th percentile per-packet one-way delay: 380.030 ms
Loss rate: 78.25%
-- Flow 2:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 751.534 ms
Loss rate: 89.28%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 341.056 ms
Loss rate: 92.31%
Run 1: Report of PCC-Allegro — Data Link
Run 2: Statistics of PCC-Allegro

Start at: 2018-08-22 18:03:01
End at: 2018-08-22 18:03:31
Local clock offset: 3.32 ms
Remote clock offset: -65.926 ms

# Below is generated by plot.py at 2018-08-22 18:26:54
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.72 Mbit/s
  95th percentile per-packet one-way delay: 682.754 ms
  Loss rate: 86.98%
-- Flow 1:
  Average throughput: 0.47 Mbit/s
  95th percentile per-packet one-way delay: 579.455 ms
  Loss rate: 85.18%
-- Flow 2:
  Average throughput: 0.40 Mbit/s
  95th percentile per-packet one-way delay: 707.062 ms
  Loss rate: 89.39%
-- Flow 3:
  Average throughput: 0.00 Mbit/s
  95th percentile per-packet one-way delay: 357.687 ms
  Loss rate: 92.31%
Run 2: Report of PCC-Allegro — Data Link

![Graph showing throughput and latency over time for different flows.]

- **Throughput (Mbps):**
  - **Flow 1 ingress** (mean 3.18 Mbps)
  - **Flow 1 egress** (mean 0.47 Mbps)
  - **Flow 2 ingress** (mean 3.36 Mbps)
  - **Flow 2 egress** (mean 0.40 Mbps)
  - **Flow 3 ingress** (mean 0.00 Mbps)
  - **Flow 3 egress** (mean 0.00 Mbps)

- **Per-packet one-way delay (ms):**
  - **Flow 1** (95th percentile 578.46 ms)
  - **Flow 2** (95th percentile 707.86 ms)
  - **Flow 3** (95th percentile 357.69 ms)
Run 3: Statistics of PCC-Allegro

Start at: 2018-08-22 18:21:39
End at: 2018-08-22 18:22:09
Local clock offset: -0.3 ms
Remote clock offset: -64.608 ms

# Below is generated by plot.py at 2018-08-22 18:26:54
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 388.260 ms
Loss rate: 81.40%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 388.260 ms
Loss rate: 81.39%
-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 342.725 ms
Loss rate: 92.31%
-- Flow 3:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 353.030 ms
Loss rate: 92.31%
Run 3: Report of PCC-Allegro — Data Link

![Graph showing throughput and per-packet one-way delay over time for different flows.](image-url)
Run 1: Statistics of PCC-Expr

Start at: 2018-08-22 17:33:38
End at: 2018-08-22 17:34:08
Local clock offset: -0.735 ms
Remote clock offset: -64.653 ms
Run 1: Report of PCC-Expr — Data Link

![Graph of throughput vs. time with legends showing different flows and their ingress and egress speeds.]

![Graph of per packet one way delay vs. time with legends showing the 95th percentile delay for different flows.]
Run 2: Statistics of PCC-Expr

Start at: 2018-08-22 17:52:08
End at: 2018-08-22 17:52:38
Local clock offset: 3.444 ms
Remote clock offset: -65.258 ms
Run 2: Report of PCC-Expr — Data Link

![Graph 1](image1)

![Graph 2](image2)
Run 3: Statistics of PCC-Expr

Start at: 2018-08-22 18:10:40
End at: 2018-08-22 18:11:10
Local clock offset: 1.0 ms
Remote clock offset: -64.128 ms
Run 3: Report of PCC-Expr — Data Link

![Graph showing throughput and round-trip time over time for different flows.]

- Flow 1 ingress (mean 7.59 Mb/s) and egress (mean 0.53 Mb/s)
- Flow 2 ingress (mean 10.62 Mb/s) and egress (mean 0.45 Mb/s)
- Flow 3 ingress (mean 0.08 Mb/s) and egress (mean 0.00 Mb/s)

![Graph showing round-trip time for different flows over time.]

- Flow 1 95th percentile is 379.41 ms
- Flow 2 95th percentile is 555.74 ms
Run 1: Statistics of QUIC Cubic

Start at: 2018-08-22 17:32:32
End at: 2018-08-22 17:33:03
Local clock offset: 0.864 ms
Remote clock offset: -63.576 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.60 Mbit/s
  95th percentile per-packet one-way delay: 369.983 ms
  Loss rate: 26.57%
-- Flow 1:
  Average throughput: 0.36 Mbit/s
  95th percentile per-packet one-way delay: 369.527 ms
  Loss rate: 22.15%
-- Flow 2:
  Average throughput: 0.27 Mbit/s
  95th percentile per-packet one-way delay: 366.744 ms
  Loss rate: 25.85%
-- Flow 3:
  Average throughput: 0.18 Mbit/s
  95th percentile per-packet one-way delay: 372.597 ms
  Loss rate: 47.33%
Run 1: Report of QUIC Cubic — Data Link
Run 2: Statistics of QUIC Cubic

Start at: 2018-08-22 17:51:03
End at: 2018-08-22 17:51:33
Local clock offset: 2.168 ms
Remote clock offset: -65.394 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.59 Mbit/s
95th percentile per-packet one-way delay: 371.650 ms
Loss rate: 28.22%
-- Flow 1:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 369.067 ms
Loss rate: 22.21%
-- Flow 2:
Average throughput: 0.25 Mbit/s
95th percentile per-packet one-way delay: 369.749 ms
Loss rate: 32.23%
-- Flow 3:
Average throughput: 0.26 Mbit/s
95th percentile per-packet one-way delay: 375.088 ms
Loss rate: 40.51%
Run 2: Report of QUIC Cubic — Data Link

![Graph showing throughput and packet round trip time over time for different flows.]

Throughput (Mbit/s) vs. Time (s)

- Flow 1 ingress (mean 0.44 Mbit/s)
- Flow 1 egress (mean 0.35 Mbit/s)
- Flow 2 ingress (mean 0.37 Mbit/s)
- Flow 2 egress (mean 0.25 Mbit/s)
- Flow 3 ingress (mean 0.42 Mbit/s)
- Flow 3 egress (mean 0.26 Mbit/s)

Packet round trip time (ms) vs. Time (s)

- Flow 1 (95th percentile 369.07 ms)
- Flow 2 (95th percentile 369.75 ms)
- Flow 3 (95th percentile 375.09 ms)
Run 3: Statistics of QUIC Cubic

Start at: 2018-08-22 18:09:35
End at: 2018-08-22 18:10:05
Local clock offset: 1.742 ms
Remote clock offset: -65.306 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.79 Mbit/s
95th percentile per-packet one-way delay: 366.908 ms
Loss rate: 17.64%
-- Flow 1:
Average throughput: 0.45 Mbit/s
95th percentile per-packet one-way delay: 359.962 ms
Loss rate: 11.50%
-- Flow 2:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 371.824 ms
Loss rate: 21.27%
-- Flow 3:
Average throughput: 0.27 Mbit/s
95th percentile per-packet one-way delay: 367.567 ms
Loss rate: 32.81%
Run 3: Report of QUIC Cubic — Data Link
Run 1: Statistics of SCReAM

Start at: 2018-08-22 17:34:44
End at: 2018-08-22 17:35:14
Local clock offset: 1.984 ms
Remote clock offset: -63.976 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.29 Mbit/s
95th percentile per-packet one-way delay: 147.930 ms
Loss rate: 0.53%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 137.845 ms
Loss rate: 0.24%
-- Flow 2:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 144.424 ms
Loss rate: 0.70%
-- Flow 3:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 175.567 ms
Loss rate: 1.00%
Run 1: Report of SCReAM — Data Link

Time (s)

Throughput (Mbps)
Run 2: Statistics of SCReAM

Start at: 2018-08-22 17:53:14
End at: 2018-08-22 17:53:44
Local clock offset: 3.221 ms
Remote clock offset: -65.3 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 113.449 ms
Loss rate: 0.42%
-- Flow 1:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 108.566 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 121.520 ms
Loss rate: 0.42%
-- Flow 3:
Average throughput: 0.21 Mbit/s
95th percentile per-packet one-way delay: 123.057 ms
Loss rate: 1.01%
Run 2: Report of SCReAM — Data Link
Run 3: Statistics of SCReAM

Start at: 2018-08-22 18:11:46
End at: 2018-08-22 18:12:16
Local clock offset: 0.004 ms
Remote clock offset: -64.222 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 95.133 ms
Loss rate: 0.36%
-- Flow 1:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 95.259 ms
Loss rate: 0.16%
-- Flow 2:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 89.518 ms
Loss rate: 0.32%
-- Flow 3:
Average throughput: 0.20 Mbit/s
95th percentile per-packet one-way delay: 110.233 ms
Loss rate: 1.05%
Run 3: Report of SCReAM — Data Link
Run 1: Statistics of Sprout

Start at: 2018-08-22 17:31:27
End at: 2018-08-22 17:31:57
Local clock offset: 2.655 ms
Remote clock offset: -64.06 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.42 Mbit/s
  95th percentile per-packet one-way delay: 173.827 ms
  Loss rate: 1.75%
-- Flow 1:
  Average throughput: 0.22 Mbit/s
  95th percentile per-packet one-way delay: 165.304 ms
  Loss rate: 1.29%
-- Flow 2:
  Average throughput: 0.21 Mbit/s
  95th percentile per-packet one-way delay: 173.827 ms
  Loss rate: 1.96%
-- Flow 3:
  Average throughput: 0.21 Mbit/s
  95th percentile per-packet one-way delay: 197.793 ms
  Loss rate: 2.71%
Run 1: Report of Sprout — Data Link
Run 2: Statistics of Sprout

Start at: 2018-08-22 17:49:58
End at: 2018-08-22 17:50:28
Local clock offset: 3.544 ms
Remote clock offset: -65.574 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.38 Mbit/s
  95th percentile per-packet one-way delay: 224.051 ms
  Loss rate: 3.06%
-- Flow 1:
  Average throughput: 0.19 Mbit/s
  95th percentile per-packet one-way delay: 210.981 ms
  Loss rate: 3.51%
-- Flow 2:
  Average throughput: 0.19 Mbit/s
  95th percentile per-packet one-way delay: 231.882 ms
  Loss rate: 1.27%
-- Flow 3:
  Average throughput: 0.17 Mbit/s
  95th percentile per-packet one-way delay: 239.579 ms
  Loss rate: 5.44%
Run 2: Report of Sprout — Data Link

![Graph of throughput and one-way delay for different flows over time.]

- Flow 1 ingress (mean 0.20 Mbit/s)
- Flow 1 egress (mean 0.19 Mbit/s)
- Flow 2 ingress (mean 0.20 Mbit/s)
- Flow 2 egress (mean 0.19 Mbit/s)
- Flow 3 ingress (mean 0.18 Mbit/s)
- Flow 3 egress (mean 0.17 Mbit/s)
Run 3: Statistics of Sprout

Start at: 2018-08-22 18:08:29
End at: 2018-08-22 18:08:59
Local clock offset: 1.653 ms
Remote clock offset: -65.378 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.46 Mbit/s
  95th percentile per-packet one-way delay: 153.941 ms
  Loss rate: 1.53%
-- Flow 1:
  Average throughput: 0.23 Mbit/s
  95th percentile per-packet one-way delay: 140.974 ms
  Loss rate: 0.54%
-- Flow 2:
  Average throughput: 0.23 Mbit/s
  95th percentile per-packet one-way delay: 165.426 ms
  Loss rate: 3.41%
-- Flow 3:
  Average throughput: 0.23 Mbit/s
  95th percentile per-packet one-way delay: 162.170 ms
  Loss rate: 0.55%
Run 3: Report of Sprout — Data Link

![Graph showing throughput and round-trip delay over time]

Legend:
- Flow 1 ingress (mean 0.23 Mbit/s)
- Flow 1 egress (mean 0.23 Mbit/s)
- Flow 2 ingress (mean 0.24 Mbit/s)
- Flow 2 egress (mean 0.23 Mbit/s)
- Flow 3 ingress (mean 0.23 Mbit/s)
- Flow 3 egress (mean 0.23 Mbit/s)

![Graph showing round-trip delay over time]

Legend:
- Flow 1 (95th percentile 140.97 ms)
- Flow 2 (95th percentile 165.43 ms)
- Flow 3 (95th percentile 162.17 ms)
Run 1: Statistics of TaoVA-100x

Start at: 2018-08-22 17:35:49
End at: 2018-08-22 17:36:19
Local clock offset: 2.424 ms
Remote clock offset: ~64.085 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.40 Mbit/s
  95th percentile per-packet one-way delay: 376.958 ms
  Loss rate: 70.31%
-- Flow 1:
  Average throughput: 0.27 Mbit/s
  95th percentile per-packet one-way delay: 379.995 ms
  Loss rate: 66.40%
-- Flow 2:
  Average throughput: 0.13 Mbit/s
  95th percentile per-packet one-way delay: 380.120 ms
  Loss rate: 80.17%
-- Flow 3:
  Average throughput: 0.18 Mbit/s
  95th percentile per-packet one-way delay: 371.043 ms
  Loss rate: 64.83%
Run 1: Report of TaoVA-100x — Data Link
Run 2: Statistics of TaoVA-100x

Start at: 2018-08-22 17:54:20
End at: 2018-08-22 17:54:50
Local clock offset: 2.347 ms
Remote clock offset: -69.01 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.71 Mbit/s
95th percentile per-packet one-way delay: 368.180 ms
Loss rate: 51.43%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 367.229 ms
Loss rate: 51.04%
-- Flow 2:
Average throughput: 0.46 Mbit/s
95th percentile per-packet one-way delay: 367.154 ms
Loss rate: 45.45%
-- Flow 3:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 375.427 ms
Loss rate: 68.58%
Run 2: Report of TaoVA-100x — Data Link
Run 3: Statistics of TaoVA-100x

Start at: 2018-08-22 18:12:51
End at: 2018-08-22 18:13:21
Local clock offset: 2.134 ms
Remote clock offset: -65.022 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
  Average throughput: 0.84 Mbit/s
  95th percentile per-packet one-way delay: 365.267 ms
  Loss rate: 50.69%
-- Flow 1:
  Average throughput: 0.74 Mbit/s
  95th percentile per-packet one-way delay: 363.357 ms
  Loss rate: 32.07%
-- Flow 2:
  Average throughput: 0.08 Mbit/s
  95th percentile per-packet one-way delay: 411.360 ms
  Loss rate: 88.04%
-- Flow 3:
  Average throughput: 0.27 Mbit/s
  95th percentile per-packet one-way delay: 370.792 ms
  Loss rate: 69.19%
Run 3: Report of TaoVA-100x — Data Link

![Graph showing throughput and delay over time for different flows.]

- Flow 1 ingress (mean 1.10 Mbit/s)
- Flow 1 egress (mean 0.74 Mbit/s)
- Flow 2 ingress (mean 0.64 Mbit/s)
- Flow 2 egress (mean 0.08 Mbit/s)
- Flow 3 ingress (mean 0.85 Mbit/s)
- Flow 3 egress (mean 0.27 Mbit/s)

![Graph showing packet delay distribution over time for different flows.]

- Flow 1 (95th percentile 363.36 ms)
- Flow 2 (95th percentile 411.36 ms)
- Flow 3 (95th percentile 370.79 ms)
Run 1: Statistics of TCP Vegas

Start at: 2018-08-22 17:40:10
End at: 2018-08-22 17:40:40
Local clock offset: 0.276 ms
Remote clock offset: -65.006 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.83 Mbit/s
95th percentile per-packet one-way delay: 339.018 ms
Loss rate: 3.48%
-- Flow 1:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 319.818 ms
Loss rate: 2.06%
-- Flow 2:
Average throughput: 0.39 Mbit/s
95th percentile per-packet one-way delay: 339.993 ms
Loss rate: 4.41%
-- Flow 3:
Average throughput: 0.44 Mbit/s
95th percentile per-packet one-way delay: 348.762 ms
Loss rate: 6.03%
Run 1: Report of TCP Vegas — Data Link

Graph 1: Throughput (Mbps) vs. Time (s)

Graph 2: Percent one-way delay (ms) vs. Time (s)
Run 2: Statistics of TCP Vegas

Start at: 2018-08-22 17:58:40
End at: 2018-08-22 17:59:10
Local clock offset: 1.024 ms
Remote clock offset: -66.005 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.67 Mbit/s
95th percentile per-packet one-way delay: 343.326 ms
Loss rate: 3.91%
-- Flow 1:
Average throughput: 0.36 Mbit/s
95th percentile per-packet one-way delay: 337.993 ms
Loss rate: 3.35%
-- Flow 2:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 347.117 ms
Loss rate: 3.12%
-- Flow 3:
Average throughput: 0.32 Mbit/s
95th percentile per-packet one-way delay: 352.358 ms
Loss rate: 7.38%
Run 2: Report of TCP Vegas — Data Link

![Graph showing throughput and packet delay over time for different flows.]

- **Flow 1 ingress (mean 0.37 Mbit/s)**
- **Flow 1 egress (mean 0.36 Mbit/s)**
- **Flow 2 ingress (mean 0.33 Mbit/s)**
- **Flow 2 egress (mean 0.32 Mbit/s)**
- **Flow 3 ingress (mean 0.33 Mbit/s)**
- **Flow 3 egress (mean 0.32 Mbit/s)**
Run 3: Statistics of TCP Vegas

Start at: 2018-08-22 18:17:17  
End at: 2018-08-22 18:17:47  
Local clock offset: 0.843 ms  
Remote clock offset: -63.671 ms

# Below is generated by plot.py at 2018-08-22 18:27:12  
# Datalink statistics  
-- Total of 3 flows:  
  Average throughput: 0.77 Mbit/s  
  95th percentile per-packet one-way delay: 317.466 ms  
  Loss rate: 1.54%  
-- Flow 1:  
  Average throughput: 0.42 Mbit/s  
  95th percentile per-packet one-way delay: 302.271 ms  
  Loss rate: 0.86%  
-- Flow 2:  
  Average throughput: 0.35 Mbit/s  
  95th percentile per-packet one-way delay: 317.654 ms  
  Loss rate: 2.22%  
-- Flow 3:  
  Average throughput: 0.38 Mbit/s  
  95th percentile per-packet one-way delay: 327.787 ms  
  Loss rate: 2.51%
Run 3: Report of TCP Vegas — Data Link

![Graphs showing throughput and one-way delay over time for different flows.](image_url)
Run 1: Statistics of Verus

Start at: 2018-08-22 17:46:42
End at: 2018-08-22 17:47:12
Local clock offset: 0.095 ms
Remote clock offset: -64.458 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 366.732 ms
Loss rate: 35.79%
-- Flow 1:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 365.927 ms
Loss rate: 29.02%
-- Flow 2:
Average throughput: 0.08 Mbit/s
95th percentile per-packet one-way delay: 371.606 ms
Loss rate: 67.46%
-- Flow 3:
Average throughput: 0.03 Mbit/s
95th percentile per-packet one-way delay: 365.088 ms
Loss rate: 60.34%
Run 1: Report of Verus — Data Link

![Graph showing throughput and latency over time for different flows.]

- **Throughput (Mbps):**
  - Flow 1 ingress (mean 0.86 Mbps)
  - Flow 2 ingress (mean 0.26 Mbps)
  - Flow 3 ingress (mean 0.07 Mbps)

- **Latency (ms):**
  - Flow 1 (95th percentile 365.93 ms)
  - Flow 2 (95th percentile 371.61 ms)
  - Flow 3 (95th percentile 365.09 ms)
Run 2: Statistics of Verus

Start at: 2018-08-22 18:05:13
End at: 2018-08-22 18:05:43
Local clock offset: 4.231 ms
Remote clock offset: -65.326 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 369.865 ms
Loss rate: 40.75%
-- Flow 1:
Average throughput: 0.55 Mbit/s
95th percentile per-packet one-way delay: 369.592 ms
Loss rate: 37.88%
-- Flow 2:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 369.982 ms
Loss rate: 46.37%
-- Flow 3:
Average throughput: 0.01 Mbit/s
95th percentile per-packet one-way delay: 358.560 ms
Loss rate: 68.18%
Run 2: Report of Verus — Data Link
Run 3: Statistics of Verus

Start at: 2018-08-22 18:23:50
End at: 2018-08-22 18:24:20
Local clock offset: 0.447 ms
Remote clock offset: -64.164 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.68 Mbit/s
95th percentile per-packet one-way delay: 371.112 ms
Loss rate: 44.22%
-- Flow 1:
Average throughput: 0.60 Mbit/s
95th percentile per-packet one-way delay: 369.805 ms
Loss rate: 30.26%
-- Flow 2:
Average throughput: 0.06 Mbit/s
95th percentile per-packet one-way delay: 366.945 ms
Loss rate: 54.36%
-- Flow 3:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 378.755 ms
Loss rate: 83.13%
Run 3: Report of Verus — Data Link

![Graph showing network performance metrics]

- **Throughput (Mbps):**
  - Flow 1 ingress (mean 0.85 Mbps)
  - Flow 1 egress (mean 0.60 Mbps)
  - Flow 2 ingress (mean 0.12 Mbps)
  - Flow 2 egress (mean 0.06 Mbps)
  - Flow 3 ingress (mean 0.86 Mbps)
  - Flow 3 egress (mean 0.15 Mbps)

- **Per-packet one-way delay (ms):**
  - Flow 1 (95th percentile 369.81 ms)
  - Flow 2 (95th percentile 366.94 ms)
  - Flow 3 (95th percentile 378.75 ms)
Run 1: Statistics of PCC-Vivace

Start at: 2018-08-22 17:47:48
End at: 2018-08-22 17:48:18
Local clock offset: 3.278 ms
Remote clock offset: -65.615 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.61 Mbit/s
95th percentile per-packet one-way delay: 379.253 ms
Loss rate: 64.08%

-- Flow 1:
Average throughput: 0.50 Mbit/s
95th percentile per-packet one-way delay: 379.619 ms
Loss rate: 61.68%

-- Flow 2:
Average throughput: 0.00 Mbit/s
95th percentile per-packet one-way delay: 359.406 ms
Loss rate: 74.38%

-- Flow 3:
Average throughput: 0.33 Mbit/s
95th percentile per-packet one-way delay: 376.308 ms
Loss rate: 72.66%
Run 1: Report of PCC-Vivace — Data Link

![Graph 1: Throughput (Mbps) vs. Time (s)]

- Flow 1 ingress (mean 1.31 Mbps)
- Flow 1 egress (mean 0.50 Mbps)
- Flow 2 ingress (mean 0.00 Mbps)
- Flow 2 egress (mean 0.00 Mbps)
- Flow 3 ingress (mean 1.11 Mbps)
- Flow 3 egress (mean 0.33 Mbps)

![Graph 2: Per-packet one-way delay (ms) vs. Time (s)]

- Flow 1 (95th percentile 379.62 ms)
- Flow 2 (95th percentile 359.41 ms)
- Flow 3 (95th percentile 376.31 ms)
Run 2: Statistics of PCC-Vivace

Start at: 2018-08-22 18:06:19
End at: 2018-08-22 18:06:49
Local clock offset: 3.775 ms
Remote clock offset: -65.4 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.91 Mbit/s
95th percentile per-packet one-way delay: 376.248 ms
Loss rate: 64.90%
-- Flow 1:
Average throughput: 0.57 Mbit/s
95th percentile per-packet one-way delay: 376.248 ms
Loss rate: 58.47%
-- Flow 2:
Average throughput: 0.40 Mbit/s
95th percentile per-packet one-way delay: 377.515 ms
Loss rate: 69.84%
-- Flow 3:
Average throughput: 0.28 Mbit/s
95th percentile per-packet one-way delay: 373.758 ms
Loss rate: 76.89%
Run 2: Report of PCC-Vivace — Data Link
Run 3: Statistics of PCC-Vivace

Start at: 2018-08-22 18:24:56
End at: 2018-08-22 18:25:26
Local clock offset: -1.101 ms
Remote clock offset: -64.114 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.77 Mbit/s
95th percentile per-packet one-way delay: 376.104 ms
Loss rate: 69.79%
-- Flow 1:
Average throughput: 0.48 Mbit/s
95th percentile per-packet one-way delay: 377.574 ms
Loss rate: 65.08%
-- Flow 2:
Average throughput: 0.35 Mbit/s
95th percentile per-packet one-way delay: 373.834 ms
Loss rate: 73.59%
-- Flow 3:
Average throughput: 0.24 Mbit/s
95th percentile per-packet one-way delay: 370.750 ms
Loss rate: 79.03%
Run 3: Report of PCC-Vivace — Data Link

![Throughput Graph](image1)

![Delay Graph](image2)
Run 1: Statistics of WebRTC media

Start at: 2018-08-22 17:41:16
End at: 2018-08-22 17:41:46
Local clock offset: 3.183 ms
Remote clock offset: -64.845 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.42 Mbit/s
95th percentile per-packet one-way delay: 345.142 ms
Loss rate: 8.84%
-- Flow 1:
Average throughput: 0.14 Mbit/s
95th percentile per-packet one-way delay: 343.046 ms
Loss rate: 6.85%
-- Flow 2:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 346.690 ms
Loss rate: 7.68%
-- Flow 3:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 351.168 ms
Loss rate: 13.35%
Run 1: Report of WebRTC media — Data Link
Run 2: Statistics of WebRTC media

Start at: 2018-08-22 17:59:45
End at: 2018-08-22 18:00:15
Local clock offset: 3.723 ms
Remote clock offset: -65.996 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.43 Mbit/s
95th percentile per-packet one-way delay: 365.035 ms
Loss rate: 18.05%
-- Flow 1:
Average throughput: 0.18 Mbit/s
95th percentile per-packet one-way delay: 363.252 ms
Loss rate: 14.82%
-- Flow 2:
Average throughput: 0.16 Mbit/s
95th percentile per-packet one-way delay: 366.319 ms
Loss rate: 20.68%
-- Flow 3:
Average throughput: 0.10 Mbit/s
95th percentile per-packet one-way delay: 362.089 ms
Loss rate: 19.30%
Run 2: Report of WebRTC media — Data Link

![Graph showing throughput and packet latency over time for different flows.]

- **Throughput (Mbps):**
  - Flow 1 ingress (mean 0.21 Mbit/s)
  - Flow 1 egress (mean 0.18 Mbit/s)
  - Flow 2 ingress (mean 0.20 Mbit/s)
  - Flow 2 egress (mean 0.16 Mbit/s)
  - Flow 3 ingress (mean 0.12 Mbit/s)
  - Flow 3 egress (mean 0.10 Mbit/s)

- **Packet one-way delay (ms):**
  - Flow 1 (95th percentile 363.25 ms)
  - Flow 2 (95th percentile 366.32 ms)
  - Flow 3 (95th percentile 362.09 ms)
Run 3: Statistics of WebRTC media

Start at: 2018-08-22 18:18:22
End at: 2018-08-22 18:18:52
Local clock offset: 0.633 ms
Remote clock offset: -64.151 ms

# Below is generated by plot.py at 2018-08-22 18:27:12
# Datalink statistics
-- Total of 3 flows:
Average throughput: 0.47 Mbit/s
95th percentile per-packet one-way delay: 354.752 ms
Loss rate: 12.35%
-- Flow 1:
Average throughput: 0.19 Mbit/s
95th percentile per-packet one-way delay: 353.013 ms
Loss rate: 9.39%
-- Flow 2:
Average throughput: 0.15 Mbit/s
95th percentile per-packet one-way delay: 359.545 ms
Loss rate: 15.79%
-- Flow 3:
Average throughput: 0.13 Mbit/s
95th percentile per-packet one-way delay: 351.935 ms
Loss rate: 12.44%
Run 3: Report of WebRTC media — Data Link