Pantheon Report

Data path: Stanford cellular on ppp0 (remote) → AWS California 1 on ens5 (local).
Repeated the test of 21 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 time.stanford.edu and have been applied to correct the timestamps in logs.

System info:
Linux 4.15.0-1031-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912

Git summary:
branch: muses @ 0b8e9a949603c3842368430acfdaf4e3b941f9f
third_party/fillp @ d6da145932ffcee56963885d7e5ba17e6a324519
third_party/fillp-sheep @ 0e6bb722943abed2b09d2d64fd45e12e93f9
third_party/genericCC @ d0153f8e594a89e93b032143cedb45e58e5624f
third_party/indigo @ 2601c92e4aa9d58d38dc4de0edbf90c77e64d
third_party/libutp @ b3465b4942e282f2b179eaab4a906ce6bb7c3f3c
third_party/muses @ 0c465e3a3091330aca25ec1d05ab2db634d5c40d
third_party/pantheon-tunnel @ f866d3f58d27af942717625e3a354cc2e802bd
third_party/pcc @ 1afc958fa0d66d18b623c091a55f8c872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M receiver/src/core.h
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc @ cd43e34e3f5f5613e8ac0d89e92f4eb24eb974ab
third_party/proto-quic @ 77961f1a82733a8eb42f1bc85043ebc978f3c2f
third_party/scream-reproduce @ f099118d421a3131f11ff1964974e1da3bb
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a6d18c74f9415f19a26
M src/examples/collectsim.cc
M src/examples/sproutbt2.cc
M src/network/sproutconn.cc
third_party/verus @ d4bb4f7ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9ddee4735770d143a1fa2851
test from Stanford cellular to AWS California 1, 3 runs of 30s each per scheme
3 flows with 10s interval between flows (mean of all runs by scheme)

---

test from Stanford cellular to AWS California 1, 3 runs of 30s each per scheme
3 flows with 10s interval between flows
<table>
<thead>
<tr>
<th>scheme</th>
<th># runs</th>
<th>mean avg tput (Mbit/s) flow 1</th>
<th>mean 95th-%ile delay (ms) flow 1</th>
<th>mean loss rate (%) flow 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP BBR</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Copa</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TCP Cubic</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>FillP</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>FillP-Sheep</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Indigo</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Indigo-MusesC3</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
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<td>Indigo-MusesC5</td>
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<td>N/A</td>
<td>N/A</td>
</tr>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Indigo-MusesT</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>LEDBAT</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PCC-Allegro</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PCC-Expr</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>QUIC Cubic</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>SCReAM</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sprout</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>TaoVA-100x</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>TCP Vegas</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Verus</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PCC-Vivace</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>WebRTC media</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Run 1: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/bbr_stats_run1.log does not exist
Run 1: Report of TCP BBR — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/bbr_stats_run2.log does not exist
Run 2: Report of TCP BBR — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of TCP BBR

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/bbr_stats_run3.log does not exist
Run 3: Report of TCP BBR — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Copa

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/copa_stats_run1.log does not exist
Run 1: Report of Copa — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Copa

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/
Run 2: Report of Copa — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Copa

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flo
Run 3: Report of Copa — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/cubic_stats_run1.log does not exist
Run 1: Report of TCP Cubic — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/cubic_stats_run2.log does not exist
Run 2: Report of TCP Cubic — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of TCP Cubic

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/cubic_stats_run3.log does not exist
Run 3: Report of TCP Cubic — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of FillP

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/fillp_stats_run1.log does not exist
Run 1: Report of FillP — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of FillP

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/fillp_stats_run2.log does not exist
Run 2: Report of FillP — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of FillP

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows
Run 3: Report of FillP — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/fillp_sheep_stats_run1.log does not exist
Run 1: Report of FillP-Sheep — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/fillp_sheep_stats_run2.log does not exist
Run 2: Report of FillP-Sheep — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of FillP-Sheep

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/fillp_sheep_stats_run3.log does not exist
Run 3: Report of FillP-Sheep — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_stats_run1.log does not exist
Run 1: Report of Indigo — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_stats_run2.log does not exist
Run 2: Report of Indigo — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Indigo

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_stats_run3.log does not exist
Run 3: Report of Indigo — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesc3_stats_run1.log does not exist
Run 1: Report of Indigo-MusesC3 — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesc3_stats_run2.log does not exist
Run 2: Report of Indigo-MusesC3 — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Indigo-MusesC3

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesc3_stats_run3.log does not exist
Run 3: Report of Indigo-MusesC3 — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows
Run 1: Report of Indigo-MusesC5 — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesc5_stats_run2.log does not exist
Run 2: Report of Indigo-MusesC5 — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Indigo-MusesC5

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows
Run 3: Report of Indigo-MusesC5 — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesd_stats_run1.log does not exist
Run 1: Report of Indigo-MusesD — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesd_stats_run2.log does not exist
Run 2: Report of Indigo-MusesD — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Indigo-MusesD

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/indigo_musesd_stats_run3.log does not exist
Run 3: Report of Indigo-MusesD — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows
Run 1: Report of Indigo-MusesT — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows
Run 2: Report of Indigo-MusesT — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Indigo-MusesT

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-
Run 3: Report of Indigo-MusesT — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/ledbat_stats_run1.log does not exist
Run 1: Report of LEDBAT — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/ledbat_stats_run2.log does not exist
Run 2: Report of LEDBAT — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of LEDBAT

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/ledbat_stats_run3.log does not exist
Run 3: Report of LEDBAT — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/pcc_stats_run1.log does not exist
Run 1: Report of PCC-Allegro — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/pcc_stats_run2.log does not exist
Run 2: Report of PCC-Allegro — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of PCC-Allegro

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/pcc_stats_run3.log does not exist
Run 3: Report of PCC-Allegro — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of PCC-Expr

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-
Run 1: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of PCC-Expr

Run 2: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of PCC-Expr

Run 3: Report of PCC-Expr — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/quic_stats_run1.log does not exist
Run 1: Report of QUIC Cubic — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/quic_stats_run2.log does not exist
Run 2: Report of QUIC Cubic — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of QUIC Cubic

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/quic_stats_run3.log does not exist
Run 3: Report of QUIC Cubic — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/scream_stats_run1.log does not exist
Run 1: Report of SCReAM — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/scream_stats_run2.log does not exist
Run 2: Report of SCReAM — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of SCReAM

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/scream_stats_run3.log does not exist
Run 3: Report of SCReAM — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/sprout_stats_run1.log does not exist
Run 1: Report of Sprout — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/
Run 2: Report of Sprout — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Sprout

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/sprout_stats_run3.log does not exist
Run 3: Report of Sprout — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/taova_stats_run1.log does not exist
Run 2: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows
Run 2: Report of TaoVA-100x — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of TaoVA-100x

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/taova_stats_run3.log does not exist
Run 3: Report of TaoVA-100x — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/vegas_stats_run1.log does not exist
Run 1: Report of TCP Vegas — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/vegas_stats_run2.log does not exist
Run 2: Report of TCP Vegas — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of TCP Vegas

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-effects-vegas
Run 3: Report of TCP Vegas — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of Verus

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/verus_stats_run1.log does not exist
Run 1: Report of Verus — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of Verus

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/

115
Run 2: Report of Verus — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of Verus

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/verus_stats_run3.log does not exist
Run 3: Report of Verus — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/vivace_stats_run1.log does not exist
Run 1: Report of PCC-Vivace — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/vivace_stats_run2.log does not exist
Run 2: Report of PCC-Vivace — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of PCC-Vivace

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/vivace_stats_run3.log does not exist
Run 3: Report of PCC-Vivace — Data Link

Figure is missing

Figure is missing
Run 1: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/webrtc_stats_run1.log does not exist
Run 1: Report of WebRTC media — Data Link

Figure is missing

Figure is missing
Run 2: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flo
Run 2: Report of WebRTC media — Data Link

Figure is missing

Figure is missing
Run 3: Statistics of WebRTC media

/home/ubuntu/pantheon/data/2019-01-25T17-26-Stanford-cellular-to-AWS-California-1-3-runs-3-flows/webrtc_stats_run3.log does not exist
Run 3: Report of WebRTC media — Data Link

Figure is missing

Figure is missing