

MySpeedTest: Active and Passive Measurements of Cellular Data Network Performance

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Motivation

- To study the effect of several possible parameters on performance
- Understand if and how network performance affects user behavior on other applications

Help applications developers and service providers identify key quality metrics and areas for improvement

Google



Measurement details

- Active measurements

- Ping times to 5 servers

Only on user request

- TCP throughput

- Loss

Once every 2 hours

- Inter-packet delay variation (IPDV)

- Passive measurements

- Network usage data per installed application

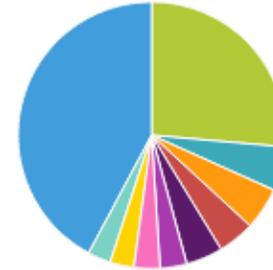
- Metadata

- Device specific information, battery information, cellular network information, time, location - ?? (maybe)

Statistics of Deployment



	YOUR APP	
<input checked="" type="checkbox"/> Android 4.0.3 - 4.0.4	356	39.64%
<input checked="" type="checkbox"/> Android 2.3.3 - 2.3.7	219	24.39%
<input checked="" type="checkbox"/> Android 4.1	205	22.83%
<input type="checkbox"/> Android 4.2	44	4.90%
<input type="checkbox"/> Android 3.2	34	3.79%
<input type="checkbox"/> Android 2.2	32	3.56%
<input type="checkbox"/> Android 3.1	6	0.67%
<input type="checkbox"/> Android 2.3	2	0.22%



	YOUR APP	
<input checked="" type="checkbox"/> United States	237	26.39%
<input checked="" type="checkbox"/> Italy	48	5.35%
<input checked="" type="checkbox"/> Germany	46	5.12%
<input type="checkbox"/> United Kingdom	40	4.45%
<input type="checkbox"/> India	40	4.45%
<input type="checkbox"/> France	29	3.23%
<input type="checkbox"/> Russia	28	3.12%
<input type="checkbox"/> South Korea	26	2.90%
<input type="checkbox"/> Malaysia	25	2.78%
<input type="checkbox"/> Others	379	42.20%

4000 total installs 900 Active Installs 115 countries

1.5 million+ measurements

STATISTICS

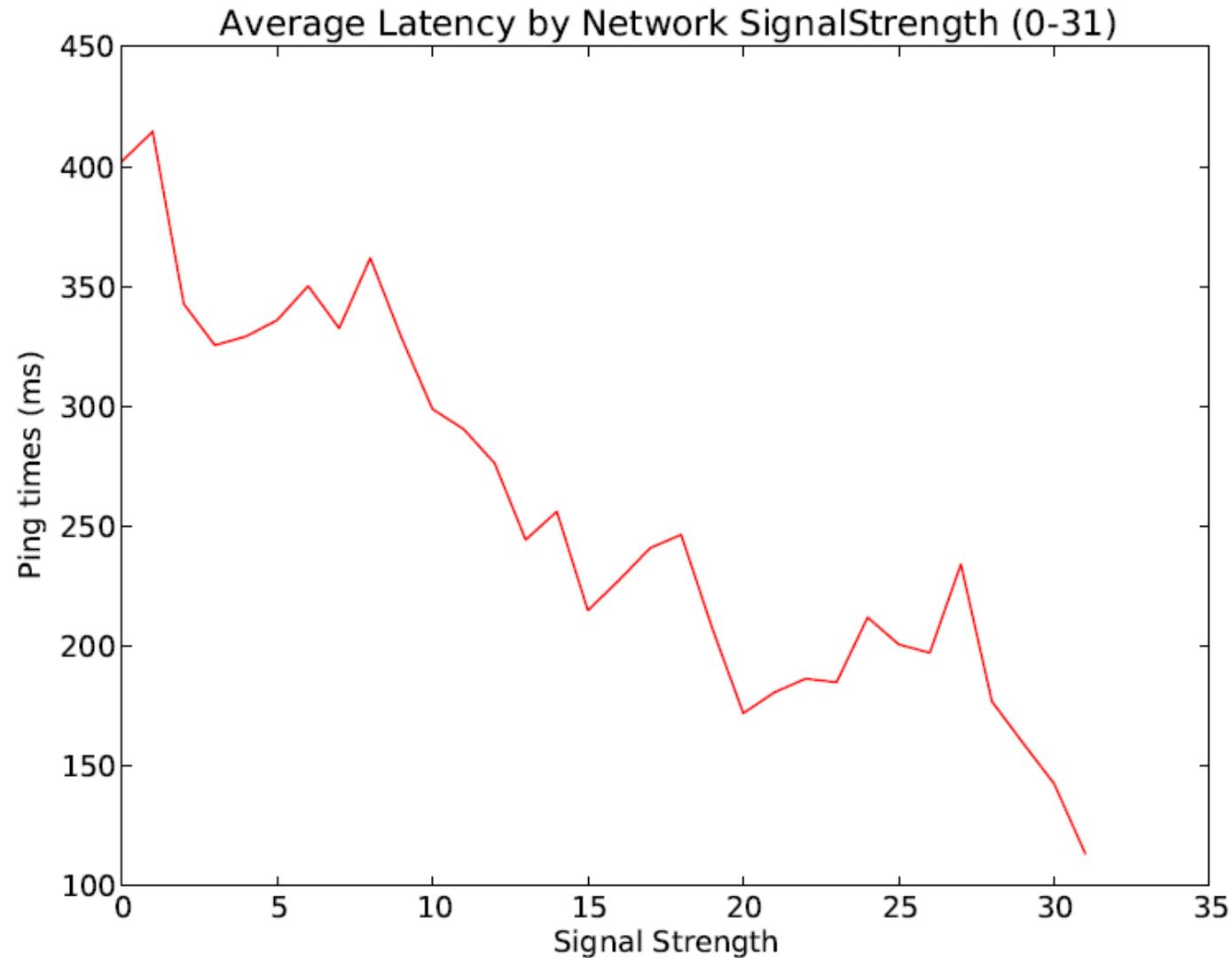
Active device installs



for Jan 5, 2013 - Feb 5, 2013

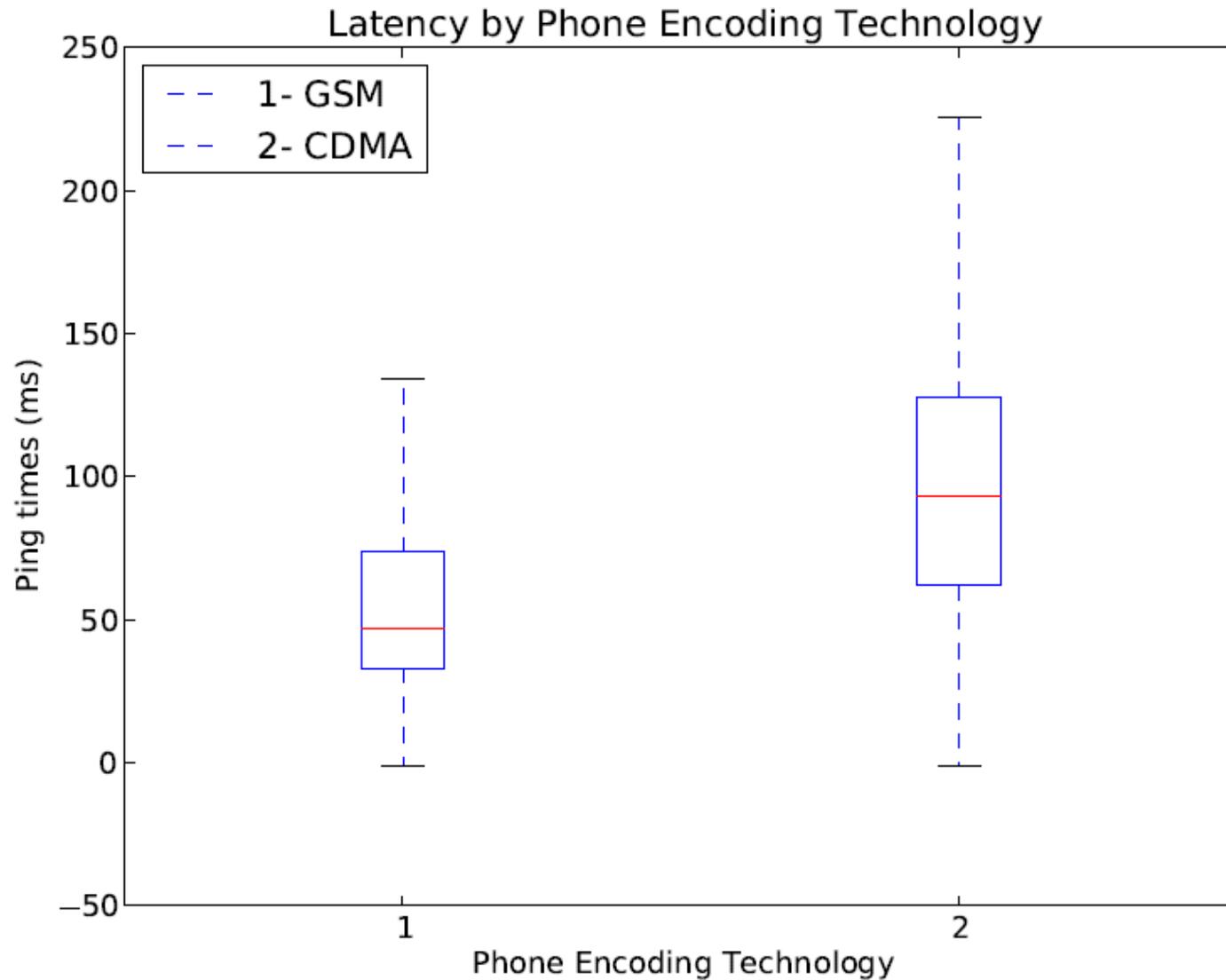


Ping times by signal strength



Network Latency decreases as Signal Strength increases

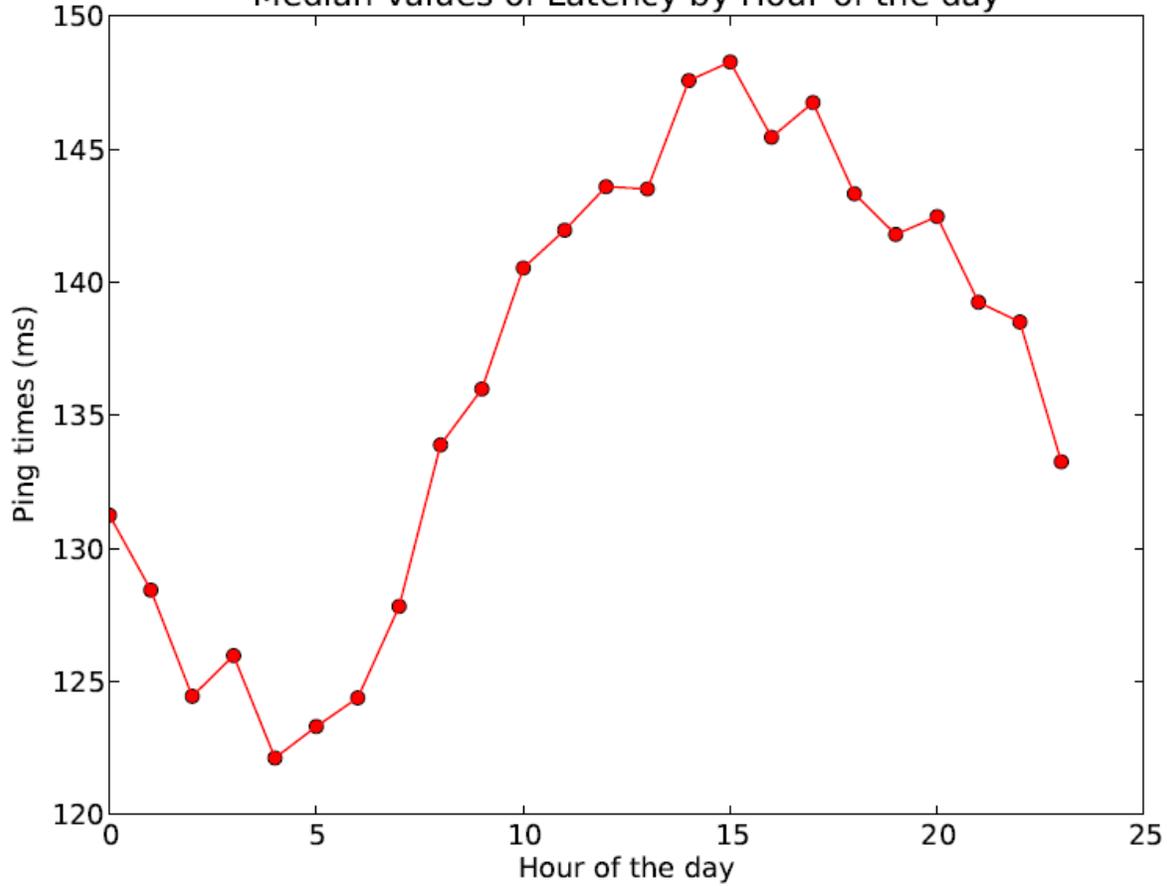
Ping times by Phone encoding technology



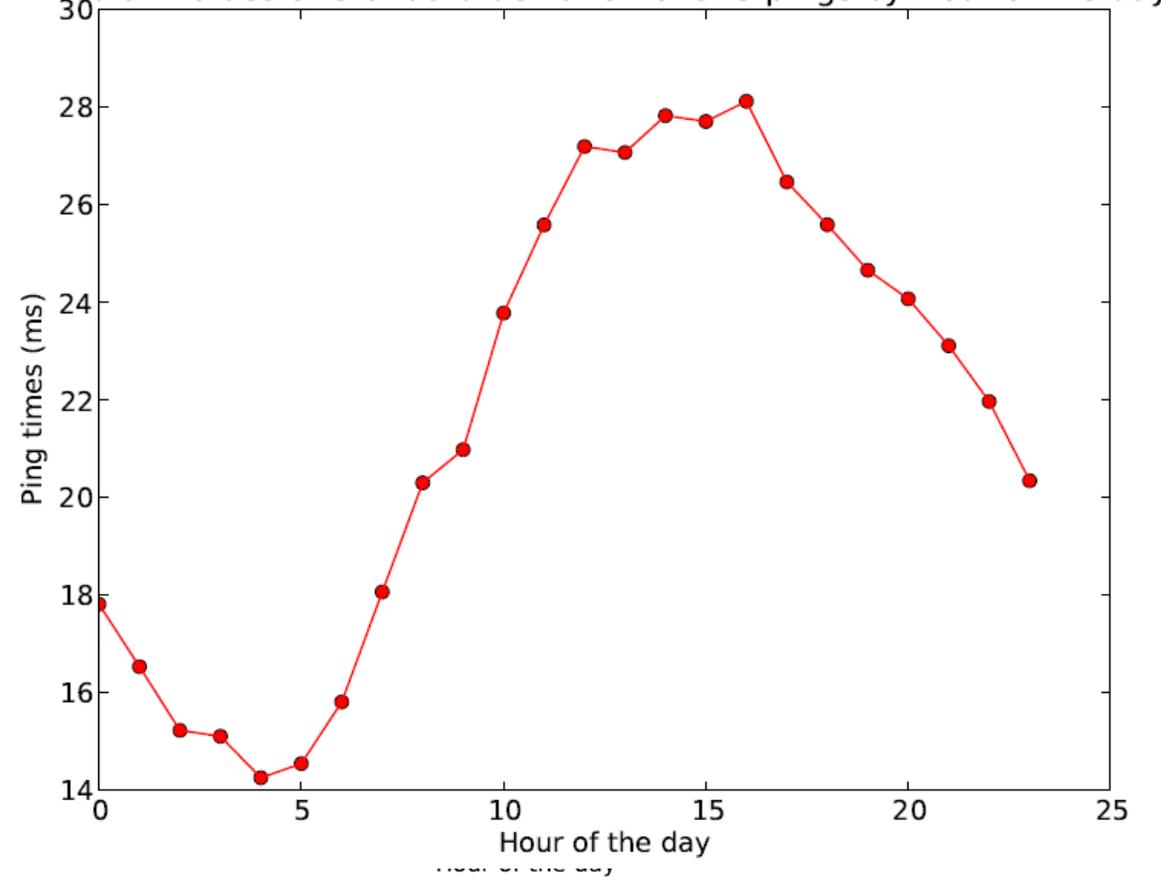
GSM seems to out perform CDMA in terms of network latency

Ping times by time of day

Median values of Latency by Hour of the day



Median values of Standard deviation over 5 pings by Hour of the day



Open issues

- Sharing data
 - We're working with M-Lab to make the data publicly available. The issue is what subset of the data should be publicly available
- User privacy
 - What combination of information could potentially serve to identify users. What level of anonymization and/or aggregation is a good idea
- Validating measurements
 - Absence of standard tools such as iperf for estimation of TCP throughput
- What other tests would you like to see?

Questions and Suggestions

- Please try the app – My Speed Test on Google play store
- Work in progress so for any suggestions, bugs or general feedback please send me an email–

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