State of Mobile Networks: India (April 2017)

OpenSignal's third public report for India comes at an opportune time. The launch of Reliance Jio and its inexpensive all-inclusive service plans has shaken up the Indian mobile market, triggering a deluge of mobile data usage in a market that is still adjusting to mobile broadband services. Calling on 1.3 billion measurements collected between December 2016 and February 2017 OpenSignal took its first close look at the dynamics of mobile data in India, comparing the 3G and 4G experience of our 93,464 Indian smartphone users on the country's major operators.

Airtel tops all of OpenSignal's speed rankings

Airtel didn't just win our 4G speed award, it wound up on top of our 3G and overall rankings as well. We measured Airtel's average LTE download speed at 11.6 Mbps, which was 3 Mbps faster than the results we measured on its nearest rivals Vodafone and Idea.

4G speeds in India are still slow

While India's operators are competing heavily on speed, in the global scheme of things, India's 4G speeds are still quite low. In our speed analysis, all of India's operators fell well short of the 17.4 Mbps global average for 4G download speed.

Jio runs away with our LTE availability award

Jio May have only launched its LTE in September, but its 4G services appears impressively pervasive. Our testers on Jio's network were able to find a 4G signal 91.8% of the time they were connected to it, measurement by our global standard, in comparison, no other operator scored higher than 90% in our availability tests.

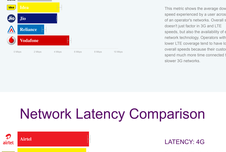
A tight race for 4G dominance in four circles

OpenSignal took a closer look at four of India's most economically important regions to see how 4G services stacked up. We found Airtel, Vodafone and Jio all performed well in those select circles, though in different metrics.

REPORT FACTS

Report Location	India
Data Sample Size	1,306,045,242
User Sample Size	93,464
Sample Period	Dec 1st 2016 - Feb 28th 2017

Overall Network Comparison



THE OPENSIGNAL APP: TESTING NETWORK PERFORMANCE ON MILLIONS OF PHONES GLOBALLY

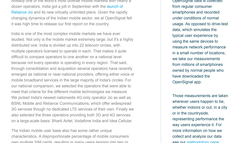
Our app continually runs tests to measure the real world experience users receive. Instead of relying on user-initiated or timed-test simulations, we are able to gather a more accurate picture of network performance by running our tests at a random moment in time, when the app is running in the background on millions of active OpenSignal users. The app has been downloaded over 15 million times collecting billions of measurements.

Network Availability Comparison

AVAILABILITY: 4G

This metric shows the proportion of time LTE subscribers on each network have a 4G (LTE) connection available to them. It's a measure of the proportion of time users have a 4G signal on a network rather than a measure of geographic or population coverage.

Network Speed Comparison



DOWNLOAD SPEED: 4G

This metric shows the average download speed on each network on 4G (LTE) connections.

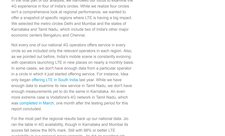
DOWNLOAD SPEED: 3G

This metric shows the average download speed on each network on 3G connections.

DOWNLOAD SPEED: OVERALL

This metric shows the average download speed experienced by a user across all their 3G and 4G connections. It combines each network's download speed, the network's LTE speeds, but also the availability of each network technology. Operators with lower LTE coverage tend to have lower overall speeds because their customers spend much more time connected to slower 3G networks.

Network Latency Comparison



LATENCY: 4G

This metric shows the average latency on each network on 4G (LTE) connections. Latency, measured in milliseconds, is the delay data experiences as it travels between points in the network. A lower score in this metric is a sign of a more responsive network.

LATENCY: 3G

This metric shows the average latency on each network on 3G connections. Latency, measured in milliseconds, is the delay data experiences as it travels between points in the network. A lower score in this metric is a sign of a more responsive network.

Regional results

This chart shows the regional winners in each category OpenSignal measures. Click on the icons to see a more detailed graph showing each operator's performance.

Analysis

To say competition is heating up India would be understatement. Reliance Jio's launch in September has shaken up the country's mobile data market, kicking off a deluge of data usage in a market that is still adjusting to mobile broadband services. Calling on 1.3 billion measurements collected between December 2016 and February 2017 OpenSignal took its first close look at the dynamics of mobile data in India, comparing the 3G and 4G experience of our 93,464 Indian smartphone users on the country's major operators.

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Reliance Jio and its free services are an opportune time. The launch of Reliance Jio and its inexpensive all-inclusive service plans has shaken up the Indian mobile market, triggering a deluge of mobile data usage in a market that is still adjusting to mobile broadband services. Calling on 1.3 billion measurements collected between December 2016 and February 2017 OpenSignal took its first close look at the dynamics of mobile data in India, comparing the 3G and 4G experience of our 93,464 Indian smartphone users on the country's major operators.

METHODOLOGY NOTES

OpenSignal data is collected from regular consumer smartphones and recorded under conditions of normal usage. As opposed to drive-test data, which simulates the typical user experience by testing in a car, we only measure network performance in a small number of locations, we take our measurements from millions of smartphones and from normal people who have downloaded the OpenSignal app.

Those measurements are taken whenever users happen to be, whether indoors or out, in a city or in the countryside – regardless of whether they are in a voice call or using a data connection. For more information on how we collect and analyze our data see our methodology page.

For this particular report, 1,306,045,242 datapoints were collected on Indian networks during the period, Dec 1st 2016 - Feb 28th 2017.

All data has been collected from users of the OpenSignal mobile app for Android or iOS.

For every metric we've calculated a 95% confidence interval and plotted this on all of the graphs. When confidence intervals overlap for a certain metric we can't actually be sure which of the overlapping operators has the best performance.

For this reason some metrics have multiple operator winners when we've judged that the data is too close to call a victory.

Reach vs. Power

The first metric we examined was 4G availability, which is a measure of how often our users were able to find an LTE signal on the various operators' networks. In this category, Jio stood well ahead of the pack, with our testers able to find a 4G signal on Jio's network 91.8% of the time nationally. That availability score will prove impressive to India's more than 20 percentage points ahead of Jio's rivals — but it's an exceptional score on the global level. Only a handful of operators have crossed the 90% availability threshold, showing that Jio has lived up to its promises to build a far-reaching 4G service in a relatively low amount of time.

None of the three other 4G operators passed the 60% availability mark in our tests. Idea and Vodafone connected the second spot in our availability rankings, with Vodafone's 4G connection being a bit faster ranked in last place. Our users were able to make an Airtel LTE connection only 54.7% of the time. Though LTE availability in many countries is well ahead of what we saw from these three operators, it's important to remember India has regulatory and competitive dynamics that don't exist in most other countries. Spectrum holdings are fragmented across dozens of different LTE bands and across India's 22 circles. As this report is published, new LTE networks are just launching commercially in new cities and circles, while others are in earlier stages of deployment. Still, it's clear at this stage Airtel, Idea and Vodafone are still leaving heavily on their 3G networks to run the 4G stack.

Next we'll look at 4G availability's counterpart, 4G speed. Here we see our rankings reversed. Airtel excelled in our 4G speed tests, winning our LTE speed award with an average download connection of 11.6 Mbps. There was another close race between Vodafone and Idea in our speed measurements, with Vodafone's 4G edge a bit more substantial. Meanwhile, Jio came in at the bottom of our rankings with an average measured download speed of 5.9 Mbps (For more details on the specific methodology we used for India see this blog post).

Ironically the limited speeds we find in our Jio tests can be explained by Jio's success. Networks are shared resources with a limited amount of capacity. The more users connecting to a network, the more individual connection speeds suffer. Jio garnered 100 million subscribers in a space of six months, and it goes those customers a lot more data than any other operator in India. It's not surprising that a contingent of 4G data users pushed into any network, no matter how powerful.

In the larger global picture, India's 4G speeds are still relatively slow. Our results for all four national 4G operators fell well below the global LTE download average of 17.4 Mbps, as measured in our last State of LTE report.

The impact of 3G

When we examine our 3G data, we get a first look at BSNL and Reliance Communications, though neither make an isolated impact. Reliance came in last in our rankings, averaging 3G download speeds of 1.7 Mbps, which was 0.4 Mbps behind the next slowest 3G network, Jio. Jio's 3G speed, which was a measured average download of 2.1 Mbps, Airtel and Vodafone took our top slots for 3G speed, and their best averages of 4.7 Mbps and 3.5Mbps were actually higher than the average 4G speed we measured on Jio.

Airtel's 3G speed was a factor in it also being our overall speed award, as it helped it overcome its low score in LTE availability. Overall speed tracks the typical download connection a user sees across an operator's 3G and 4G networks (We exclude 2G as 2G results vary so much based on how users are using their phones that it provides no bandwidth for an adequate mobile data experience). Our testers may have only been able to access an Airtel LTE signal roughly half the time, but when they fell back to the 3G network they enjoyed impressive connection speeds. Coupled with its leading 4G speed results, Airtel's 3G speed helped it overcome its low LTE availability average of 54.7 Mbps. 3G also moved Vodafone into second place in the overall rankings with an average download of 5.1 Mbps. Jio's overall speed score was the same as its 4G speed score, pulling it roughly even with Idea in the category. Meanwhile BSNL and Reliance — which didn't have the benefit of LTE to pull up their scores — rounded out the bottom of our overall speed rankings.

The final metric we examined was latency, which is effectively a measure of a network's reaction time. The lower the latency, or ping, the faster a network will feel when connecting to websites, services like Skype or VoLTE and the more quickly web pages start loading. Vodafone earned our 4G latency award in Delhi and averaging 54.3 milliseconds in our 4G ping tests and 83.7ms in our 3G ping tests.

A 4G look at 4 circles

In the first part of our analysis, we narrowed our focus to examine the overall experience in four of India's circles. While we realize four circles isn't a comprehensive look at regional performance, we wanted to highlight some important trends in India's mobile market. To do so we chose the selected the metro circles Delhi and Mumbai and the states of Karnataka and Tamil Nadu, which include two of India's other major economic centers Bangalore and Chennai.

Not every one of our national 4G operators offers service in every circle as we included only the relevant operators in each region. Also, as we pointed out before, India's mobile scene is constantly evolving with operators launching LTE in new places on nearly a monthly basis. In some cases, we don't have enough data from a particular operator in a region to report on its performance with confidence. Reliance only began offering LTE in South India last year. We expect that we have enough data to examine its new service in Tamil Nadu, we don't have enough confidence to put its the same in Karnataka. An even more extreme case is Vodafone's 4G network in Tamil Nadu, which was completed in March, one month after the testing period for this report concluded.

For the most part the regional results back up our national data. Jio ran the table in 4G availability, though in Karnataka and Mumbai its availability was only a few percentage points ahead of Airtel's. In our 4G speed measurements, Jio did not an encore, providing signal to our smartphone users. In almost every case, the other operators in each circle proved upon their national availability scores, though not enough to significantly close the gap with Jio.

In 4G speed, Airtel again asserted its strength in our tests. Airtel won our 4G speed in all circles except Tamil Nadu where it tied with Idea. Vodafone in particular was notable in our results as we measured significantly faster speeds for Airtel and Jio than we did in the country overall. Vodafone's 4G speed was the fastest we measured in Mumbai to its 6.5 Mbps. 60% faster than its national score. In India's financial capital, operators seem to be doing a better job providing more consistently fast speeds. Our regional 4G latency results were not more fast. Vodafone won our 4G latency award in Delhi and Mumbai, and in Karnataka it tied with Airtel, but in Tamil Nadu, Airtel emerged as the state latency winner.

India is a fascinating market that will only continue to get more intriguing. What was a patchwork of different regional operators is now a patchwork of different regional operators with different 4G network technology in the world who are different in India, from FDD to TDD LTE and WiMAX to TD-LTE. And while the total number of operators is shrinking through consolidation, India's mobile market still has a surprising number of options (as opposed to the three or four operators in most countries). Even new operators like Jio are emerging and they're having no small impact.

These dynamics will only keep OpenSignal on its toes. With this first report we plan to introduce more coverage of India both through future reports and our blog. It's not everyday that you see a mobile industry recreate itself.