2024 broadband speed comparison

1. Overview

Cable.co.uk has once again worked with data provided by M-Lab – M-Lab. Measurement Lab is led by teams based at Code for Science & Society; Google Inc; and supported by partners around the world.

Analysts at Cable.co.uk have analysed speed test data in 229 countries to create a global league table. The sample period for this research is the 12-month period preceding 30/06/2024. (M-Lab NDT Data Set https://measurementlab.net/tests/ndt).

Previously, Cable.co.uk has produced internationally cited reports on global broadband speeds, global broadband speeds during COVID lockdown periods, global mobile data pricing, and global fixed-line broadband package pricing.

To understand the data, one must first understand the methodology and analysis (Cable.co.uk) applied to the source data (M-Lab).

1.1 About the M-Lab speed test data

Here are some things to consider when understanding speed test data in general, and some concerning the M-Lab data set in particular.

Speed test data in general

A single speed test is not a direct measure of the maximum speed available to a household router. Rather, it is the speed available to a device via the router. This is an important distinction because...

1. A speed test conducted over wifi, due to local signal interference and/or the capabilities of the router and/or the capabilities of the device being used to take the measurement, can be significantly slower than the same

connection directly over a LAN cable. Speed test data tend to consist partially of measurements made over wifi, reflecting real-world use. However, since every country's average will suffer this flaw – innate to speed tests without compensatory weighting – comparative average speeds between different countries are sound

2. Speed test data tend to show a negativity bias – people are more likely to measure their speed if there is something wrong or if they aren't getting the speed they need. To mitigate this, we filter out tests where a fault or problem is evident

Ofcom, the UK telecoms regulator, uses physical equipment to constantly measure the maximum speed available on particular lines across a long period of time, and it is from this it derives its averages. This is very different to the way a regular speed test 'snapshot' is captured, and explains why Ofcom's average speeds measured in the UK are likely to be higher than those measured in our tests.

The M-Lab data, and therefore the averages presented in this report, should be regarded as a realistic reflection of real-world user experience, and of consumer choice, rather than an absolute measurement of available bandwidth. Moreover, the focus of this study is comparative in nature, not absolute – how countries compare to one another, not how fast or slow a constituency is in absolute terms. Any measurement of absolute national network speed is beyond the capability of any set of broadband speed test data.

The tests themselves

The download part of Measurement Lab's Network Diagnostic Tool (NDT) application measures the throughput of a single TCP connection, attempting to transfer as much data as possible for a period of at least ten seconds. This data set has been queried for tests between 1 July 2023 and 30 June 2024 (12 months).

Any tests that have not managed to 'stress' the connection by creating congestion between the client and server machines have been excluded from our analysis. Likewise any tests that ran for less than nine seconds, or lasted over 15 seconds, have been excluded. Any tests that transferred less than 8 KB of data, or that did not properly establish a connection between server and client, were also excluded.

Where multiple tests have been run by a single IP address, the average speed has been used for that address. Here are some further notes on NDT, courtesy

of M-Lab:

1. **Off-net vs. on-net measurement:** All of M-Lab's measurement services, including NDT, are hosted on our off-net platform. "On-net" refers to measurement performed on the same network as the network it is measuring, such as an Internet Service Provider (ISP) measuring itself. It only captures one segment of any path that data is likely to be traversing. In contrast, "off-net" measurements extend beyond a user's access provider's network to measure the complete path across the Internet from user to content including interconnections. By definition, on-net measurement can not even detect the effects of any performance limitations at interconnects between ISPs. All of the measurement services hosted by M-Lab inherit the off-net platform methodology for nearly all users (there are a few commercial users on the same networks as M-Lab).

2. **Link capacity vs. bulk transport:** When using NDT tests specifically, Internet users are sometimes confused when their individual results don't confirm the speeds promised by their Internet service provider. "Speed" is often associated with "link capacity," which is the maximum bitrate of a link; in other words, the best performance possible. However, NDT measures "bulk transport capacity" -- the rate that TCP can deliver data across the end-to-end path; in other words, the reliability of that connection. It is important to note that many link problems (such as low level packet loss and reordering) typically adversely impact both M-Lab measurements and real application performance. These two ways of measuring performance, link capacity and bulk transport capacity, are different and are often conflated when both concepts are referred to as "Internet speed." When using NDT data to discuss speed, it is important to clarify these terms to have more effective conversations about Internet speed.

3. **Single-stream vs. multi-stream tests:** NDT measures the single-stream performance of bulk transport capacity. While modern web browsers will use multiple streams of data, testing for multiple streams can compensate for data delivery problems that are exposed by a single stream. A multi-stream test can return measurements closer to link capacity but it would not represent the adverse performance impact of low-level packet loss. By testing for single-stream performance, NDT is an effective baseline for measuring a user's Internet performance.

Reasons for tests being excluded

- Transmission of < 8 KB of data

- Test duration of < 9 seconds
- Test duration of > 15 seconds
- TCP congestion has not been reported
- Country has fewer than 100 distinct IPs tested
- TCP three-way handshake has not been completed
- Test has been in a congestion limited state for less than 80% of the test duration
- Congestion has been caused by the client device for more than 20% of the test duration
- Test has not been run between 1 July 2023 and 30 June 2024

2. The data table explained

2.1 Table columns

The bulk of the data can be found in the 'Constituencies' tab. Here the average for every constituency can be found, bar those substantially redrawn in the 2023 shake-up of constituency boundaries. Here is what you can find in each column:

A. Position: Global rank according to average speed from fastest to slowest
B. **Country:** The name of the country or territory
C. **Country code:** The two-letter ISO abbreviation for the country or territory
D. **Region:** The global region in which the country or territory sits
E. **Country download speed in Mbps:** The average download speed received by the population, based on a simple average of all valid tests
F. **Number of distinct IPs tested:** Only one test per IP address has been allowed. This shows the total number of tests that form the average download speed
G. **Total tests:** The total number of tests carried out in the country or teritory
H. **Time to download 5GB:** The amount of time taken to download a 5GB movie according to the average speed measured in the country or territory

3. Should you require further information

3.1 What we will and will not respond to

When we release data of this kind, we tend to receive requests for deeper insight into the situation. In this case, that would be qualitative data as to why X is faster or slower than Y.

We invite any organisation or person interested in our compiled data set to use it as they please, provided they cite Cable.co.uk. However, if you require detailed, qualitative insight into a specific country, that is not a service we are able to provide. We offer the what, but do not offer the why.

Our studies are typically used...

- As news of the day
- By educational resources – across the years various universities and other educational bodies have included our data set either for reference or as the main focus of published work
- By government bodies and lobbyists – there were instances where our data were used to demonstrate the need for change
- By NGOs and other international stakeholder bodies – NGOs such as the World Economic Forum have written both coverage and critique of our research, and we welcome both

If you have any questions about the technicalities of the data or require further insight into how it was gathered or how our averages were reached, beyond the information contained in this document, please contact dan.howdle@existent.co.uk