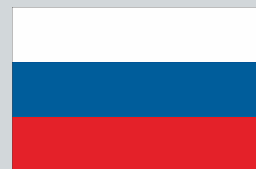


Barometer of fixed internet connections in Russia

Second half of 2018



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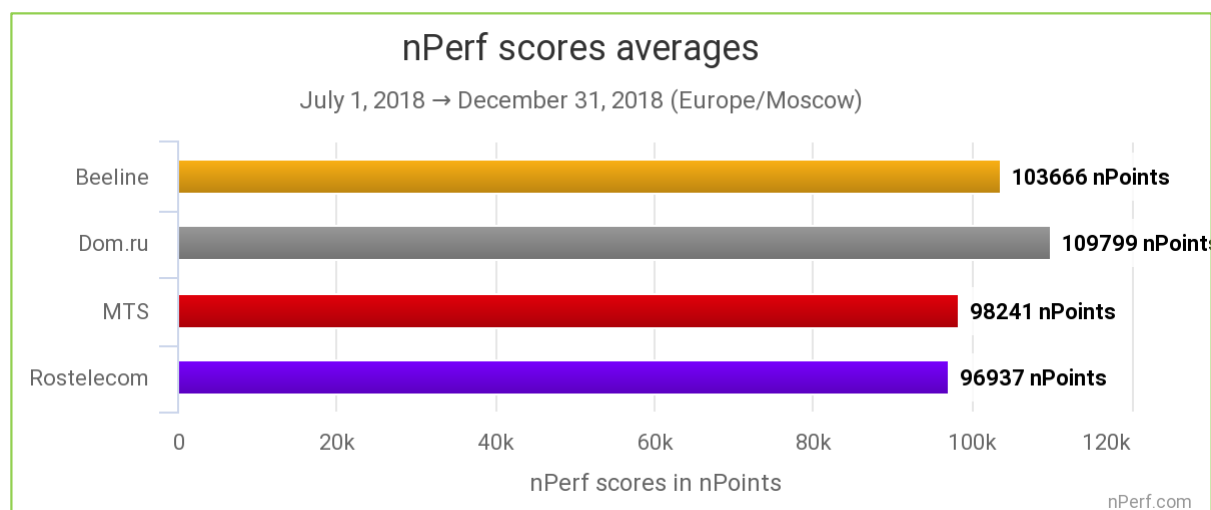


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1 Summary of global results (H2 2018)

1.1 nPerf score, all technologies combined



The highest value is the best.

Dom.ru, the best fixed Internet network in the second half of 2018.

1.2 Our analysis

In the second half of 2018, nPerf users conducted 333 539 connection tests on Russia's four largest Internet Service Providers. Dom.ru dominates the market in terms of performance of fixed Internet connections by being first on download and upload speed tests and latency tests.

It should be noted that Dom.ru represents less than 13% of our market share, which suggests a little used network. It is the same for the second, Beeline, and the third one, MTS.

In comparison, Rostelecom, in 4th place, alone accounts for about 65% of our tests and showed great performances close to the top two, except for latency.

MTS and Rostelecom are sharing parts of their optical fiber networks, which could explain their similar performances and trends over the second half of 2018.

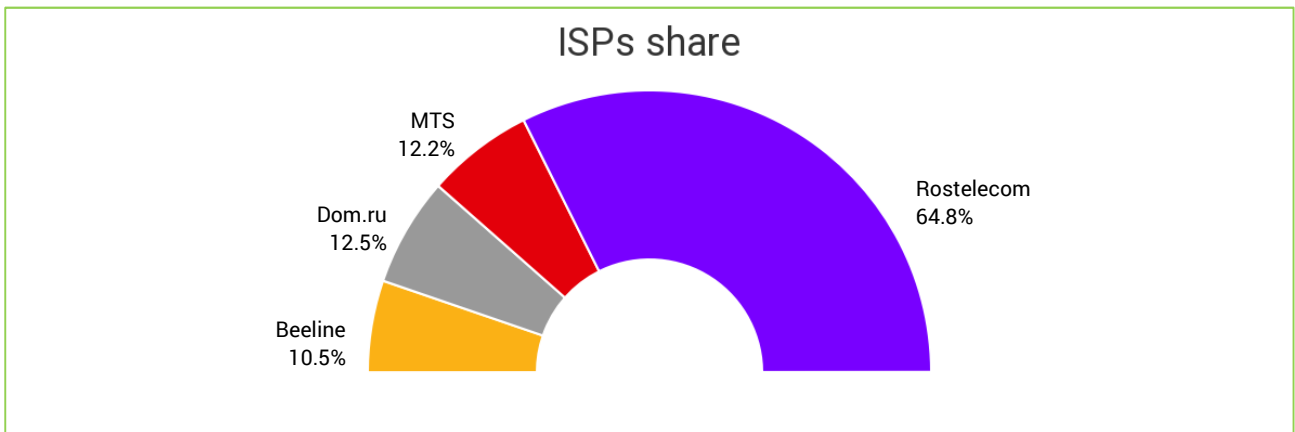
2 Overall results, all technologies combined

2.1 Data amount and distribution

From **July 1, 2018** to **December 31, 2018** we counted **333 539 tests**, distributed after filtering as follows:

Country	Tests
Russia	302 959

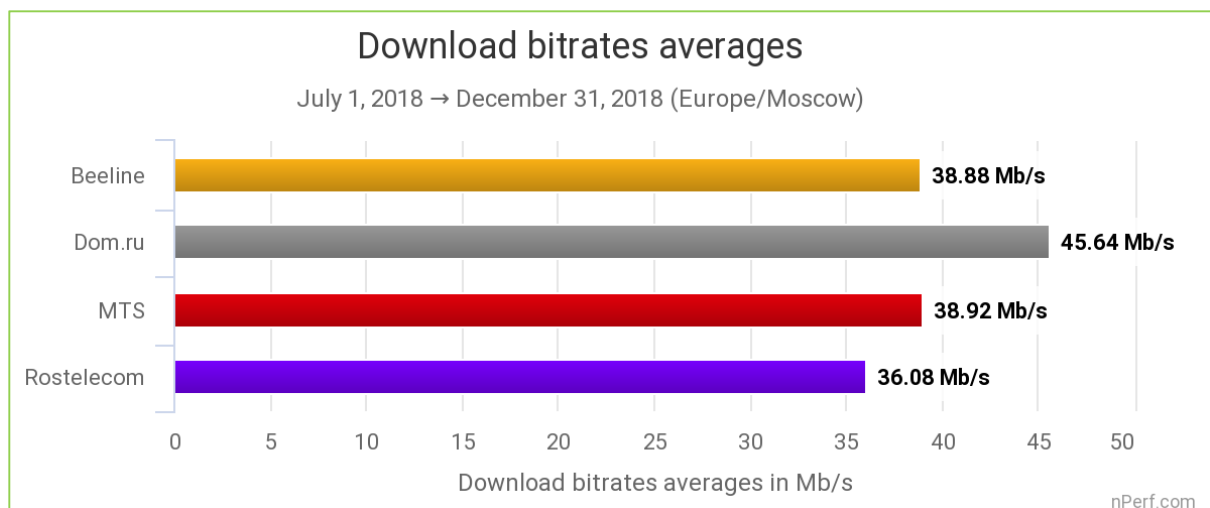
Breakdown of tests by provider



Around 65% of our tests were conducted on only one ISP, Rostelecom.

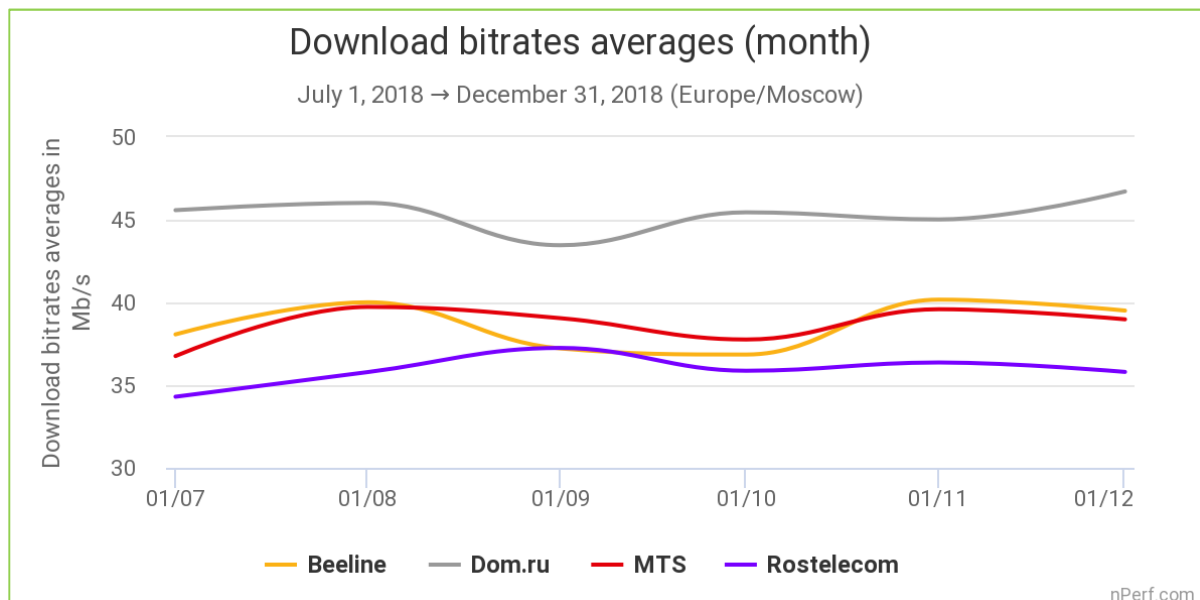
2.2 Download speed

In the second half of 2018, the average download speed in Russia was 38 Mb/s.



The highest value is the best.

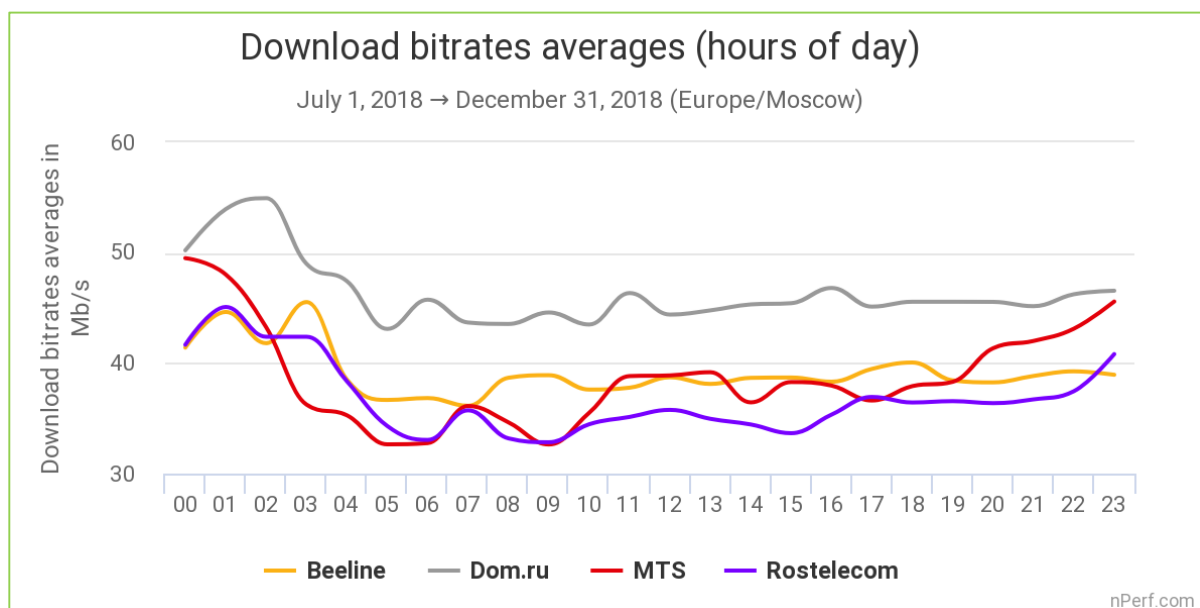
All technologies combined, Dom.ru has offered the best download speed to its subscribers in the second half of 2018.



The highest value is the best.

Above graph illustrates the ability of providers to maintain a constant download speed over the period regardless of network load (number of connected clients).

Globally, all ISPs provided fairly stable performance throughout the year.

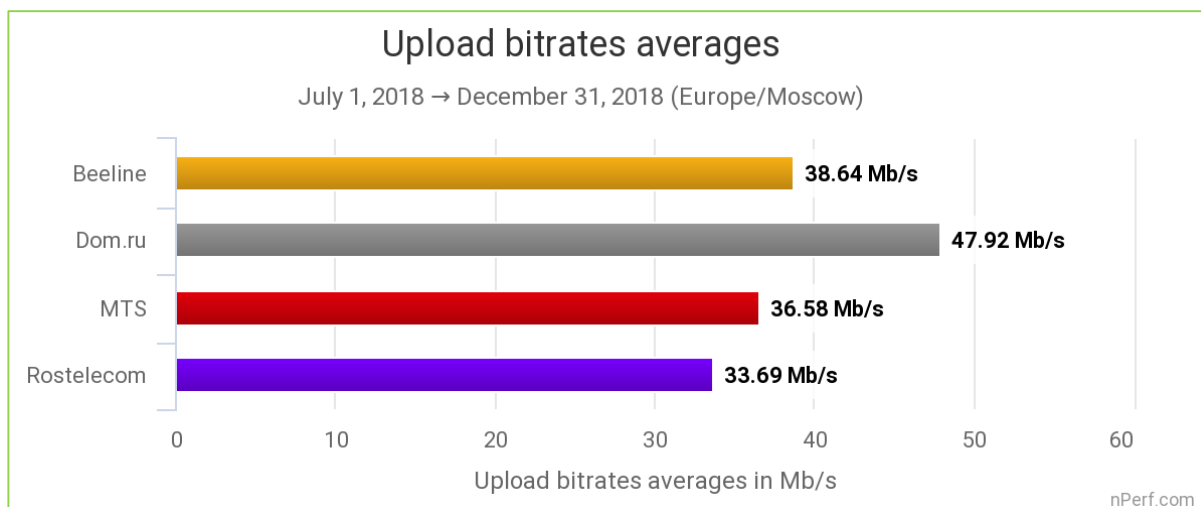


The highest value is the best.

This graph illustrates the ability of providers to ensure a constant download speed throughout the day, regardless of network load (number of connected clients). We note that there is no decline of the throughput during the busy hours. This is probably due to the fact that many networks are bundled and therefore offer a very wide bandwidth.

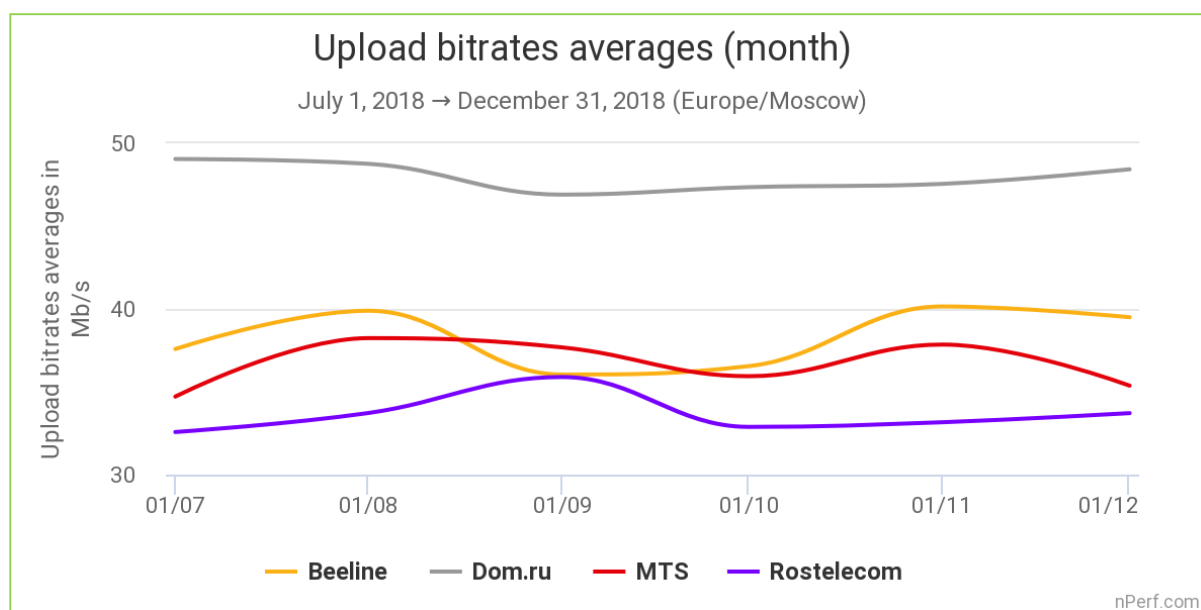
2.3 Upload speed

In the second half of 2018, the average upload speed in Russia was 36 Mb/s.



The highest value is the best.

All technologies combined, Dom.ru has offered the best upload speed to its subscribers in the second half of 2018.



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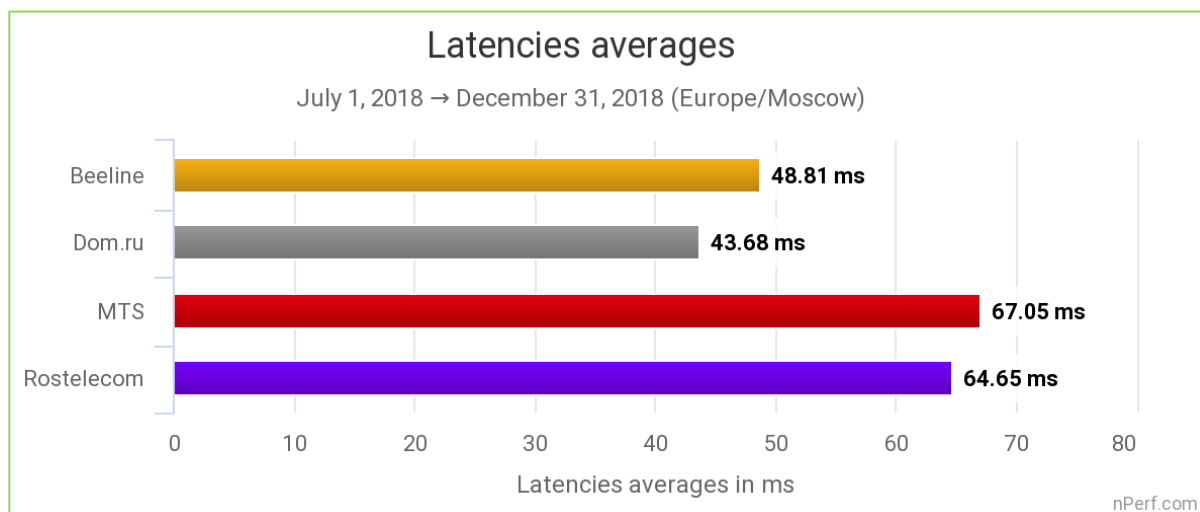
The highest value is the best.

Above graph illustrates the ability of providers to maintain a constant upload speed over the period regardless of network load (number of connected clients).

Globally, all ISPs provided fairly stable performance throughout the year.

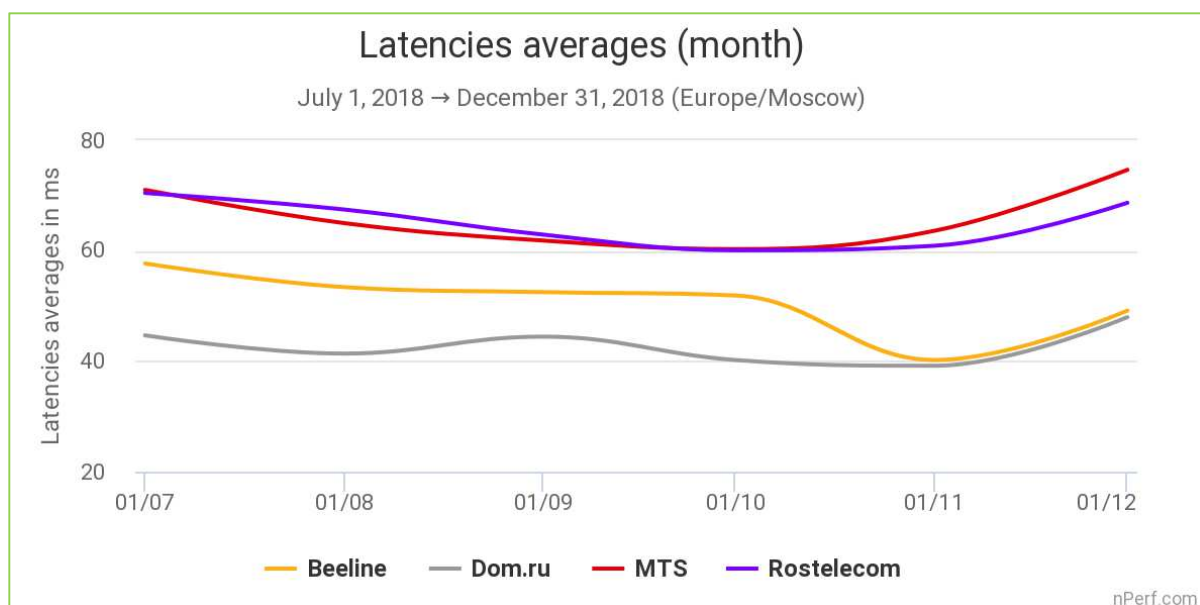
2.4 Latency

In the second half of 2018, the average latency in Russia was 61 ms.



The lowest value is the best.

All technologies combined, Dom.ru has offered the best average latency to its subscribers in the second half of 2018.



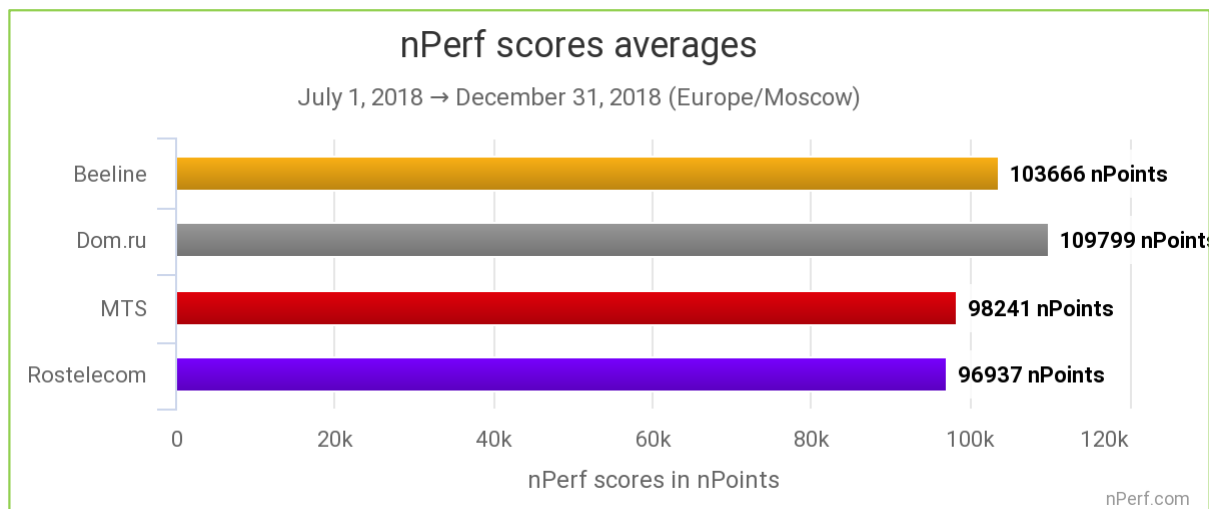
The lowest value is the best.

This graph illustrates the ability of providers to maintain a constant latency during the period, regardless of network load (number of connected clients). We note that Beeline and Dom.ru have a bit improved their latency during the second half of 2018 but not MTS and Rostelecom whom degraded their latency in December.

2.5 nPerf score, all technologies combined

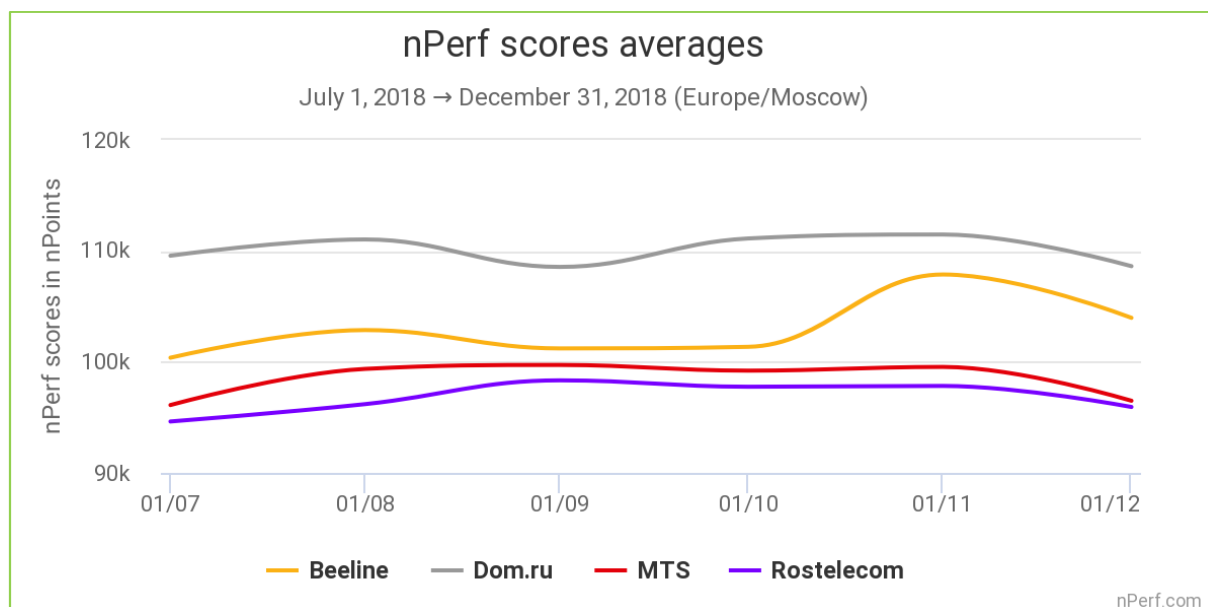
The nPerf score, expressed in nPoints, gives an overall picture of the quality of a connection. It takes into account measured bitrates (2/3 Download + 1/3 Upload) and latency. These values are calculated on a logarithmic scale to better represent the perception of the user.

Thus, this score reflects the overall quality of the connection for mainstream consumer use.



The highest value is the best.

Dom.ru, the best fixed Internet network in the second half of 2018.



The highest value is the best.

The individual scores did not change much over the period.

3 Methodology

3.1 The panel

nPerf offers an Internet speed test application, which can be used for free at www.nPerf.com.

Everyone is free to use nPerf to measure the speed of their Internet connection. All users of the nPerf application form the panel of this study.

In addition, the results from the nPerf speed tests integrated on our partner websites are also included in the panel.

Thus, the nPerf study is based on thousands of tests, making it the study with the largest panel in Russia.

3.2 Speed and latency tests

3.2.1 Objectives and operation of the speed and latency test

The purpose of the nPerf Speed Test is to measure the maximum capacity of the data connection in terms of data rates and latency.

To achieve this, nPerf establishes multiple connections simultaneously to saturate the bandwidth to accurately measure it. The speed used for the barometer is the average speed measured by the application.

Speed measurements thus reflect the maximum capacity of the data connection. This rate may not be representative of the user experience experienced during normal use of the Internet, as it is measured only on nPerf servers.

The measured bit rate can be impacted by the quality of the user's local network, especially since the expected flow is high. Thus, for an optical fiber internet connection, a local WiFi or Power-Line connection can greatly reduce performance. However, since these constraints are identical to all market operators, they do not bias the comparison. In addition, the user is made aware of these constraints and invited to use a wired local connection for testing very high speed.

3.2.2 nPerf servers

To ensure maximum user bandwidth at all times, nPerf relies on a network of servers dedicated to this task.

These servers are located with hosts in Russia abroad.

Local Internet providers are welcome to install nPerf servers, that's free!

The total bandwidth available for Russia is greater than 4 Gb/s.

3.3 Filtering of test results

The results obtained are subject to automatic and manual checks to avoid duplication and to rule out possible abusive or fraudulent use (massive tests, robots ...).

Tests performed on cellular connections (2G, 3G, 4G) are also excluded from this barometer.

4 You too, participate in the nPerf panel!

To participate in the panel, simply test your connection on the website www.nperf.com. For mobile Internet, you can also use the nPerf app, available for free on the Apple AppStore for iPhone and iPad, on Google Play for Android devices and on the Windows Store for Windows Phone and Windows Mobile devices.

5 Custom analysis & contact

Do you need further study or want to get the raw data, punctually or automatically, to compile it yourself?

You can contact nPerf via www.nPerf.com "Contact Us" section or directly from the mobile app.

Phone contact: +33 482 53 34 11

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