



Report on Monitoring the Implementation of Regulation 2015/2120 in Relation to Open Internet Access in Poland

Warsaw, 26 June 2019

Conclusions

We would like to present the third report of the President of UKE on conformity of Polish market practices with the Regulation (EU) 2015/2120 of the European Parliament and of the Council with regard to open Internet access¹ in the period between 1 May 2018 and 30 April 2019.

In the past year, we looked at how the ISPs provide subscribers with information on the quality of services provided, in particular information on the speed and limits of the services offered. We also verified the terms of service provision, in particular the traffic management measures applied, as well as specialised services and the terms of providing them. We also analysed end-user complaints regarding the rights and obligations pursuant to Article 3 and Article 4 (1) of the Regulation.

We are also presenting UKE activities regarding the development and launch of a certified quality monitoring tool and data on the quality of the Internet access service in Poland.

The analysis of the market situation has shown that:

- ISPs comply with the obligation to publish information referred to in Article 4 (1) of the Regulation, primarily by publishing appropriate contract models, in particular rules and regulations and price lists on the relevant subpages of websites,
- ISPs providing services on mobile networks explain how data volume limits (data packet limits) affect the use of different types of content, applications and services, in particular by indicating the consequences of reaching a certain limit,
- the majority of ISPs indicate that the most important quality parameters - except for speed - that can affect the Internet access service and the use of content are: latency, jitter and packet loss,
- the majority of ISPs indicate the same specialised services as in previous reporting periods; the most frequently indicated services were: VoIP, IPTV, data transmission, VPN and VoLTE; the only new specialised services that have been indicated in the questionnaire are: private APN, NB-IoT and VPBX,
- there was one case of traffic management practice that was not compliant with the principles of net neutrality set out in the Regulation,
- the results of service quality measurements indicate a constant (relative to previous years covered by the monitoring) increase in data transmission speed, which is confirmed by the increase in the number of measurements whose download speed results are in the ranges above 30 Mb/s and above 100 Mb/s.

Since 1 December 2018, a mechanism for quality control of services has been made available by the President of UKE to the end-users using the Internet; it enables certified measurements of services on fixed networks. The mechanism is available free of charge at www.pro.speedtest.pl.

¹ Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open Internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services and Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union

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1. List of acts and abbreviations

- **Digital Agenda** – the Digital Agenda for Europe is an ICT sector development plan adopted by the European Union to be accomplished until 2020. Its aim is to improve access to broadband Internet;
- **Certified mechanism** – a measurement system used, among other things, for measuring the speed of data transmission in both directions for the Internet access service offered on public fixed-line telecommunications networks. The system is composed of, inter alia, a website and a native measuring application for computers with the Windows operating system (e.g. desktop, laptop);
- **Telecommunications Act (TA)** - Telecommunications Act of 16 July 2004 (consolidated text: Journal of Laws of 2018, item 1954, as amended);
- **Regulation** – Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 in the part related to laying down measures concerning open Internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services;
- **Act of 10 May 2018** on the protection of personal data (Journal of Laws of 2018 item 1000, as amended);
- **Act of 19 November 2009** on gambling (consolidated text: Journal of Laws of 2019 item 847, as amended);
- **Act on competition and consumer protection** of 16 February 2007 (consolidated text: Journal of Laws 2019, item 369);
- **BEREC Guidelines** – BEREC Guidelines on the Implementation by National Regulators of European Net Neutrality Rules – BoR (16) 127;
- **ACL Access Control List** – a set of rules for filtering Internet traffic;
- **APN Access Point Name** - the name or address of the gateway between the operator's mobile network and the external computer network, enabling, among others, routing packets between the networks;
- **BEREC** – Body of European Regulators in Electronic Communications;
- **IAS** – Internet Access Service;
- **ICT Information and Communication Technologies** – a notion encompassing technologies used for processing, collecting and transmitting information in the electronic form;
- **IPTV Internet Protocol Television** - a method used for delivery of television content over Internet Protocol (IP) broadband networks;
- **ISP** – Internet Service Provider;
- **NAT Network Address Translation** – a technique for sending network traffic through a router that involves changing the source or destination IP addresses, usually also TCP / UDP port numbers;
- **LTE (Long Term Evolution) or 4G** – a 3GPP standard for high-speed wireless communication which replaced the 3rd generation systems;

- **LTE Advanced** Long Term Evolution Advanced – a mobile Internet technology with a speed up to 300 Mb/s;
- **NB-IoT** Narrowband Internet of Things – a radio technology standard that allows implementation of, among others, M2M services (*Machine to Machine*) in a wide-area wireless network with low power consumption and low data rates,;
- **PSTN** – Public Switched Telephone Network;
- **President of UKE** – President of the Office of Electronic Communications;
- **President of UOKiK** – President of the Office of Competition and Customer Protection;
- **QoS** – Quality of Services;
- **TCP** – Transmission Control Protocol;
- **UMTS or 3G** Universal Mobile Telecommunications System - 3rd generation mobile telephony standard;
- **VDSL** Very High Speed DSL – xDSL technology for fast data transmission over a twisted pair of copper wires;
- **VOD** Video on Demand – a service that allows you to watch broadcast footage or listen to a sound recording at a time selected by someone later than the broadcast time;
- **VoLTE** Voice over Long Term Evolution – voice transmission using the LTE technology;
- **VoWiFi** Voice over WiFi – technology allowing for audio conversations via wireless local networks;
- **VPBX** Virtual Private Branch Exchange – virtual subscriber exchange, ensuring the implementation of voice calls over the IP network as a solution operating in the cloud.

2. Introduction

Article 5 (1) subparagraph 2 of the Regulation imposes on the President of UKE, as the national regulatory authority in the field of telecommunications services market, the obligation to publish annual reports on monitoring the market situation in the field of open Internet and activities taken in this regard, and to submit them to the Commission and BEREC. The Regulation introduced uniform principles of equal access to open Internet in the European Union as well as related rights of end-users and obligations of Internet access service providers.

The report presents information on:

- IAS quality parameters for end-users, the publication of information and complaints from end-users regarding the rights and obligations set out in Article 3 and Article 4 (1) of the Regulation,
- traffic management monitoring,
- monitoring and evaluation of the rules for the provision of specialised services and their impact on the overall quality of the IAS,
- the operation of the IAS quality monitoring mechanism,
- data on the quality of the Internet access service.

The report covers the period from 1 May 2018 to 30 April 2019.

3. Regulatory authorities

Pursuant to Article 5 (1) of the Regulation, the national regulatory authority is the authority responsible for monitoring and ensuring compliance of the market conditions with Article 3 and 4 of the Regulation, and supporting the availability of non-discriminatory Internet access services at levels of quality that reflect advances in technology. In Poland, pursuant to Article 190 of the Telecommunications Act of 16 July 2004, this authority is the President of the Office of Electronic Communications.

In addition, part of the market practices, in particular those regarding advertising related to Internet access services, which, if the conditions outlined in the Act of 16 February 2007 on competition and consumer protection² are met, constitute an infringement of the Regulation, may be regarded as a practice infringing collective consumer interests. Pursuant to the provisions of the Act of 16 February 2007 on competition and consumer protection, proceedings in the matter of practices infringing collective consumer interests shall be conducted by the President of the Office of Competition and Consumer Protection.

In situations where traffic management measures require personal data processing, such practices may be subject to analysis and evaluation with regard to the compliance of data processing rules with the provisions of law. The authority responsible for these issues from 25 May 2018, in connection with the entry into force of the Act on the Protection of Personal Data, is the President of the Office for Personal Data Protection³.

4. Regulation monitoring based on Article 5 (2) of the Regulation

In monitoring compliance with the obligations set out in Article 3 and 4 of the Regulation pursuant to Article 5 (2) of the Regulation, the President of UKE requested 27 ISPs to answer questions included in a questionnaire prepared by UKE in the following areas:

- relevant measures for traffic management;
- evaluation of terms and conditions for the provision of specialised services and impact of specialised services on the overall quality of Internet access services;
- transparency requirements concerning ISPs, the quality of Internet access services for end-users and the publication of information in accordance with the Regulation,
- complaint handling procedures.

The following providers were requested by the President of UKE to answer the questionnaire: P4 sp. z o.o., Orange Polska S.A., Polkomtel sp. z o.o., T-Mobile Polska S.A., Cyfrowy Polsat S.A.,

² Pursuant to Article 24 (1) and (2) of the Act of 16 February 2007 on competition and consumer protection, practices infringing collective consumer interests are prohibited. A practice infringing collective consumer interests shall mean any activity of an undertaking which is unlawful, contrary to established custom, and detrimental to such interests, in particular: a breach of the obligation to provide consumers with reliable, true and complete information; unfair commercial practices or acts of unfair competition.

³ Article 34 (1) and (2) of the Act of 10 May 2018 on the protection of personal data.

Inea S.A., Multimedia Polska S.A., Netia S.A., Internetia sp.z o.o., Sileman sp. z o.o., Aero2 sp. z o.o., Toya sp. z o.o., UPC Polska sp. z o.o., Vectra S.A., Virgin Mobile Polska sp. z o.o., Asta-Net S.A., FM Group Mobile sp. z o.o., Klucz Telekomunikacja sp. z o.o., Marcin Sebastian Ziółtek running a business called MATCOM Marcin Sebastian Ziółtek, Michał Szczygłowski running a business called Spidernet Szczygłowski Michał, Supermedia sp. z o.o., Zicom Next sp. z o.o., East and West sp. z o.o., Fiberlink sp. z o.o., TIMPLUS B.Dudek R.Walentowski sp. j. and Satpol sp. z o.o. and Starnet Telecom sp. z o.o.

All of the invited ISPs responded to the questionnaire of the President of UKE.

The criterion for selecting the Internet access service providers was based on the percentage share in terms of the number of users and area of Poland where the services are provided.

The selected Internet access service providers provide services to 70% users of the Internet access services provided over fixed-line networks, and for almost 100% of users of the Internet access service provided over mobile networks.

4.1. Traffic management measures

The President of UKE examined whether the traffic management measures applied by ISPs are compliant with the requirements set out in Article 3 (3) of the Regulation.

Pursuant to the provision of Article 3 (3) of the Regulation, ISPs cannot use traffic management measures that go beyond the reasonable measures specified in Article 3 (3) subparagraph 2 of the Regulation, in particular they cannot block, slow down, alter, restrict, interfere with, degrade or discriminate between specific content, applications or services, or specific categories thereof, except in the cases specified in Article 3 (3), subparagraph 3, points a-c of the Regulation.

The analysis of information received this year from 27 ISPs did not reveal traffic management practices violating the principles of network neutrality, as specified in Article 3 (3) of the Regulation.

From the information provided, it results that ISPs apply traffic management measures allowed in exceptional situations specified in Article 3 (3) points a-c of the Regulation.

The practices include:

- blocking traffic due to obligations resulting from the provision of Article 15f (5) of the Act of 19 November 2009 on gambling ⁴(point a);
- traffic management performed to maintain integrity, network security and services provided via the networks and terminal equipment of end-users (point b);
- traffic management to prevent network congestion (point c).

⁴ Article 15f (5) of the Gambling Act - a telecommunications undertaking providing Internet access services is obliged to: 1) prevent access to websites using Internet domain names entered in the Register, free of charge, by removing them from IT systems of telecommunications undertakings, used to convert Internet domain names to IP addresses, not later than within 48 hours of making an entry in the Register; 2) free of charge redirection of connections referring to Internet domain names entered in the Register to the website maintained by the minister responsible for public finances, containing a message addressed to recipients of Internet access services, including in particular information on the location of the Registry, entering the domain name searched for in this Register, a list of entities legally offering gambling games on the territory of the Republic of Poland, as well as a notification about the imminent criminal liability of a participant of games organized in contravention of the provisions of the Act; 3) enabling, free of charge, access to websites using domain names removed from the Registry, not later than within 48 hours from deleting the Internet domain name from the Register.

In order to maintain the integrity and security of the networks, services and terminal equipment of end-users, ISPs use identification and mechanisms responding to emerging threats, among others, anti-spam solutions, security systems, such as: firewall, ACL, IDS/IPS, scripts analysing and limiting the volume of unwanted Internet traffic, access control mechanisms, sinkhole, blackhole, honeypot solutions. The above-mentioned traffic management measures work in the background continuously, but become active only in situations where a particular security threat is detected. Seven ISPs reported the use of TCP/UDP port blocking practices. The following ports are blocked for traffic incoming from the Internet network: 67, 123, 22 (tcp), 23 (tcp), 80 (tcp), 443 (tcp), 8080 (tcp), 9494 (tcp), 35300 (tcp), 135, 139, 445 and others considered dangerous, listed and updated pursuant to expert portals. The ISPs' explanation also shows that the use of the NAT mechanism affects the restriction of the availability of open TCP/UDP ports as part of an active session. One ISP reported that it blocks UDP ports. Ports used to manage the network and devices for voice support are also blocked. Two ISPs reported that they block all ports for incoming Internet traffic. One of them explained that exceptions are ports open for services with appropriate certificates, enabling secure communication between the ISP terminal equipment. In the case of port 25 (tcp), traffic outgoing to the Internet network is blocked. The blockade of this port is performed in connection with sending unsolicited information (SPAM) by end-users. The conducted analysis also shows that the use of the NAT mechanism is a practice that may have a negative impact on the ability of end-users to use their right to access unlimited Internet. Two ISPs informed about the use of NAT in their networks.

In the period covered by this Report, the President of UKE has completed explanatory work on the practice to prioritize traffic generated by end-users of business Internet access services, in the situation of network congestion, over other Internet traffic. The practice was applied by a provider of fixed-line Internet access. Due to the fact that the traffic management measure was not based on the equal treatment of equivalent types of data transfer (and was used due to the service provided to business clients and consumers), it was found that it infringes the provision of Article 3 (3) of the Regulation. The ISP was informed of the non-compliance and obliged to provide the President of UKE with information on the measures taken in this regard. The ISP informed about discontinuation of the above-mentioned practice.

What is more, during the reporting period, the President of UKE conducted two administrative proceedings regarding ISP's non-compliance in 2017 with the obligations set out in Article 3 (3) of the Regulation. ISPs used practices that block/restrict end-users from accessing content on www.bet-at-home.com, before the entry into force of the provision of Article 15f (5) of the Act of November 19, 2009 on gambling. In both cases, the President of UKE issued administrative decisions withdrawing from imposing the penalty referred to in Article 209 (1) point 29a of the TA, due to the insignificant importance of the violation. ISPs were instructed about their obligations resulting from the provision of Article 3 (3) of the Regulation. Description of administrative proceedings conducted in the above mentioned cases is included on page 23 in section 5.2 Penalty proceedings.

4.2. Specialised services

The monitoring by the President of UKE of compliance of the practices and services with the provisions of Article 3 and 4 of the Regulation covers the assessment of the terms of providing

specialised services.

The study conducted on the basis of the UKE questionnaire was aimed at determining whether:

- 1) the specialised services listed meet the requirements of free offering in accordance with Article 3 (5), subparagraph 1 of the Regulation, in particular whether:
 - they are services other than IAS services,
 - they are optimized for specific content, applications or services, or a combination thereof,
 - the optimization is objectively necessary to meet the requirements for a specific level of quality;
- 2) the conditions for the establishment and provision of specialised services are in line with Article 3 (5) subparagraph 2 of the Regulation, i.e.:
 - the network capacity is sufficient to provide a specialised service in addition to any Internet access service provided,
 - specialised services cannot be used or offered as a substitute for an Internet access service,
 - specialised services do not limit accessibility or do not degrade the overall quality of the Internet access service for end-users;
- 3) the given specialised service is not used to circumvent the rules on traffic management measures that apply to the Internet access service.

The information and conclusions from the study are presented below:

- 1) 12 ISPs confirmed the fact that the following specialised services are provided on their networks:
 - VoIP (8 ISPs), IPTV (8 ISPs), data transmission (2 ISPs), VPN (3 ISPs), VoLTE (2 ISPs), telemetry (1 ISP), MMS (1 ISP), VoWiFi (1 ISP), private APN (1 ISP), NB-IoT (1 ISP), VPBX (1 ISP), VOD (1 ISP);
- 2) 5 ISPs also indicated that they act as intermediaries in offering the following specialised services on behalf of and for the benefit of another entity:
 - VPN (2 ISPs), IPTV (1 ISP), VOD (1 ISP), IPTV + VOD (1 ISP), optical fibre TV (1 ISP) and data transmission (2 ISPs).

The most frequently indicated by ISPs specialised services were: VoIP telephony, IPTV television and VPN.

While the BEREC Guidelines in point 113 indicate that linear IPTV television services, along with VoLTE, are typical examples of a specialised service (as long as they meet the requirements of the Regulation, in particular Article 3 (5) subparagraph 1, the VoIP service is not mentioned in the BEREC Guidelines in this context. The ISPs pointing to VoIP as a specialised service claim that it cannot be provided as part of the IAS, among others, due to the risk of degradation of this service in conditions of the link overload. The need for ISPs to provide quality comparable to the quality of voice services in the PSTN network is an important issue, however. At the same time, it seems that this is not about optimizing the digital channel's bitrate for this service, where the

requirements are not large and are possible to be met as part of the IAS, and more about optimization regarding such parameters as latency and jitter which can be subject to major changes in IP networks, objectively affecting the quality of the service. In the case of the VoIP service, in order to ensure optimization, ISPs primarily use separation at the data link layer (L2) using VLAN technology. One ISP indicated that it applied traffic separation at the lowest level of the network, i.e. at the physical layer (L1) by separating a separate physical port for the service at the terminal device.

Most ISPs indicated that they do not use a specialised service to provide IAS. In the case of VPN for business services, the IAS service is shown as an additional option. The ISP informs that the parameters of this access do not differ from the access parameters offered under general terms. It should be pointed out that in accordance with point 115 of BEREC Guidelines, to the extent that such corporate services as VPN also provide access to the Internet, the provision of such access should comply with Article 3 (1) to (4).

The President of UKE's doubts are, however, raised by the following information:

- one ISP indicating that in some cases Internet access provided under general terms is the basis for a specialised service,
- indicating the MMS service as a specialised service.

Access to the Internet network is also possible in the case of Private APN and IP VPN services. The President of UKE will examine ISPs' offers in terms of the conditions of offering this access and its possible differentiation in terms of the purpose, i.e. the target user category (business market and mass market).

Most ISPs indicated the same specialised services as in previous reporting periods. The only new specialised services that have been indicated in the questionnaire include: Private APN, NB-IoT and VPBX.

In terms of assessing the impact of the provision of a specialised service on IAS, ISPs provide the following methods:

- bandwidth control and access quality analysis,
- setting the upper band limit in the network when providing specialised services,
- preventing overload and monitoring of a given area of the network,
- monitoring packet loss at network interfaces,
- conducting technical surveys during which the technical capabilities of the service are determined taking account of the Fair Usage Policy.

Some ISPs stated that they did not assess the impact of specialised services on IAS due to the negligible use of their network resources by specialised services or due to the way of separation of traffic for IAS and specialised services (at various network levels).

Among preventive actions used by ISP, the following can be distinguished:

- construction of a backbone network with excess capacity to cover demand for bandwidth,
- infrastructure upgrade aimed at increasing network capacity when certain bandwidth levels are exceeded, e.g. 80%,
- dividing the area into smaller areas to reduce utilization of access links.

The verification of information provided in the questionnaire regarding the possible negative impact of the provision of specialised services on the quality level of IAS is difficult due to the lack of appropriate measurement tools.

4.3. Transparency of contracts

ISPs are obliged, pursuant to Article 4 (1) points (a) to (e) of the Regulation, to provide a clear and comprehensible explanation in the contract of:

- how traffic management measures applied by the provider could impact on the quality of the Internet access services, on the privacy of end-users and on the protection of their personal data.
- How any data volume limitation, speed and other quality of service parameters may in practice, have an impact on Internet access services, and in particular on the use of content, applications and services;
- how any of the specialised services⁵ to which the end-user subscribes might in practice have an impact on the Internet access services provided to that end-user;
- the minimum, normally available, maximum and advertised download and upload speeds of the Internet access services in the case of fixed networks, or the estimated maximum and advertised download and upload speeds of the Internet access services in the case of mobile networks, and how significant deviations from the respective advertised download and upload speeds could impact the exercise of the end-users' rights to open Internet⁶, the remedies available to the consumer in accordance with national law in the event of any continuous or recurring discrepancy between the actual performance of the Internet access service regarding speed or other quality of service parameters and the performance of it. All of the above information and explanations must be included in the contract and published.

In the previous reporting period, the President of UKE verified the transparency of rules and regulations, price lists and other applicable contractual models in terms of the provisions regarding the quality of the Internet access service⁷. Compliance with information obligations on the quality of the Internet access service by providers is always analysed on a case-by-case basis when receiving signals from end-users.

The President of UKE analysed in 2019 how ISPs explain how data limits, speeds and other quality parameters can in practice affect the Internet access service, and in particular the use of content, applications and services.

The ISPs verified by the President of UKE indicate in their contracts with clients information on how data limits, speeds and other quality parameters can in practice affect the Internet access service, and in particular the use of content, applications and services.

One of the providers indicated that it is in the process of implementing the relevant contractual provisions in this area. The ISPs in mobile networks explain how **data volume limits** (data packet

⁵ As referred to in Article 3 (5) of the Regulation.

⁶ Specified in Article 3 (1) of the Regulation.

⁷ Report on monitoring the implementation of the Regulation 2015/2120 regarding the open Internet in Poland, UKE 2018, p. 14
https://www.uke.gov.pl/download/gfx/uke/en/defaultaktualnosci/36/90/1/sprawozdanie_nn_27.pdf.

limits) affect the use of different types of content, applications and services, in particular by indicating the consequences of reaching a certain limit. Such a situation may be related to: blocking the Internet access service, significant limitation of the maximum speed (imposing a so-called funnel by the provider that may hinder or prevent access to specific content) or charging additional fees.

Some ISPs include in contracts general information on how access to the sample type of content, services or applications (e.g. downloading a video file in 480p, 720p or mp3 format) consumes data transfer within the available limit, at the assumed connection speed.

In addition to the data volume limit, qualitative parameters are important in the context of access to content. Most ISPs indicate that the most important quality parameters - except for speed - that can affect the Internet access service and the use of content are primarily: latency, jitter and packet loss⁸.

Nearly half of undertakings indicate the recommended minimum values of speed parameters for individual content categories. Some providers also point to the upper limit of the jitter parameter. The speed values recommended by providers for one terminal device of the end-user (e.g. computer, TV, smartphone, tablet) are:

- 64 kb/s download and upload, latency up to 150 ms for using VoIP,
- 1 Mb/s download, latency up to 200 ms for web browsing,
- 2 Mb/s download, latency up to 200 ms for watching SD video,
- 6 Mb/s download and latency up to 200 ms for watching HD video,
- 18 Mb/s download, latency up to 200 ms for watching 4K video,
- 5 Mb/s download and upload, latency up to 150 ms for HD calls,
- 2 Mb/s download and 1.5 Mb/s upload, latency up to 30 ms for using real-time online games,
- 1 Mb/s download and upload, latency up to 200 ms for using online games other than real time.

Some providers also indicate the time of downloading files with specific volumes (e.g. 100, 500 megabytes) for services at different speeds.

Some providers explain the impact of quality parameters from the perspective of end-user experience in using specific types of content, services and applications. According to the information, deterioration of such quality parameters as speed, latency or jitter can result in online games jamming, interruptions and latency in voice communication or interruption of video content playback. The decrease in the speed of loading web pages, the deterioration of image or sound quality for video transmission and telephone calls in VoIP technology may be signs of a decrease in the quality parameters of the service.

Two ISPs established a four-level scale⁹ determining how important the individual parameters of the service are: data volume, download/upload speeds, latency from and to the network, jitter and packet loss, and how they affect 10 types of content, services and applications specified by the provider:

⁸ The definition and method of measuring latency parameters, jitter and packet loss are included in the Recommendation of the International Telecommunications Union - ITU-T Y.2617.

⁹ ***a very important parameter, ** significant, * negligible, - irrelevant.

- mail and discussion groups,
- www (http and https),
- VoD, video streaming, IPTV,
- AoD, Audio streaming,
- chat and text messaging,
- Peer to Peer,
- VoIP telephony,
- video conferencing,
- interactive games,
- FTP file transfer.

There are also explanations on the market describing what services the end-user can use by subscribing to the services in the indicated speed range (e.g. ISPs provide information that the download speed of 1-2 Mb/s allows the use of most applications and services, including, e.g. watching a video in medium quality, but not access to high quality videos or live content). Several providers merely provide end-users with general information about the impact of various factors on the quality of the Internet access service provided, indicating that detailed information on the required values of the service parameters are provided by the content provider.

4.4. Publication of information

ISPs comply with the obligation to publish information referred to in Article 4 (1) of the Regulation, by publishing appropriate contract models, in particular rules and regulations and price lists on the relevant subpages of websites, in particular in the "Documents", "Download" tabs or subpages for individual offers. Access to published models, depending on the provider, requires the use of two to five referrals (clicks) of the page.

Some ISPs additionally publish information that goes beyond the contract models. The providers include information and explanations relevant from the end-user perspective also in the following tabs: "Help", "FAQ", "Instructions", "News", "Net neutrality".

4.5. Quality of Internet access services

The President of UKE undertakes activities in the area of monitoring the quality of services. The data on the quality of IAS are presented below in terms of download and upload speed and packet latency (ping). In order to present the current market situation, the analysed data comes from April 2019 and in order to observe the trend of changes over four years, it has been compared to the data from April 2018, 2017 and 2016. The data was collected on the basis of measurements made by the widely-available measurement applications offered by V-SPEED sp. z o.o popular in Poland:

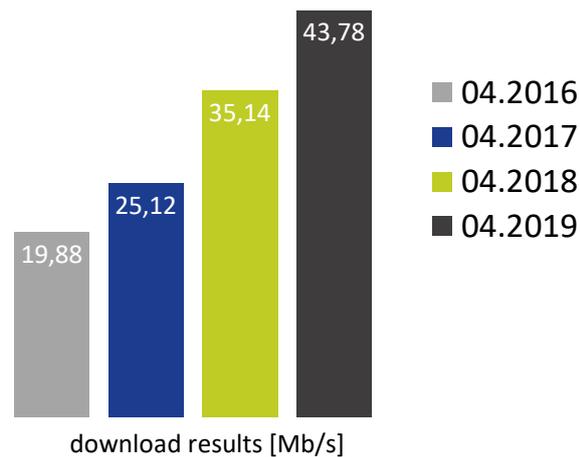
- the application is available from the web browser at www.speedtest.pl, the results cover all access technologies in fixed and mobile networks (approx. 1.7 million tests were carried out in April 2018, and approx. 2.0 million tests were carried out in April 2019);

- the *Internet Speed Test* application available for mobile devices; the results cover all access technologies in mobile networks (approx. 250,000 tests were carried out in April 2018, and approx. 530,000 tests were carried out in April 2019).

A large number of measurements allows for the formulation of general conclusions, especially in the context of the trends. It should be borne in mind that the measurements were carried out independently by end-users, i.e. Internet users, and are affected by their terminal equipment, tariff plans limitations, the use of Wi-Fi technology in home networks, the number of simultaneously active devices, radio wave propagation conditions, etc. This way, the obtained data is helpful in getting to know the perceived quality of the service used by end-users, and to a lesser extent technical possibilities of providing services by an ISP.

Chart 1

Average download speed for a browser application - all providers

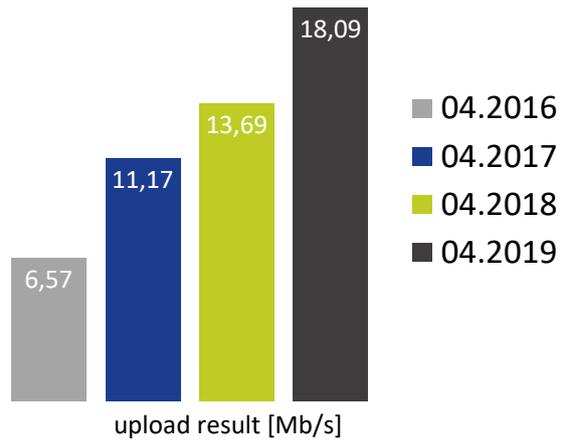


Source: UKE

In the space of four years, a clear upward trend in the average data download speed is noticeable.

Chart 2

Average upload speed for a browser application - all providers

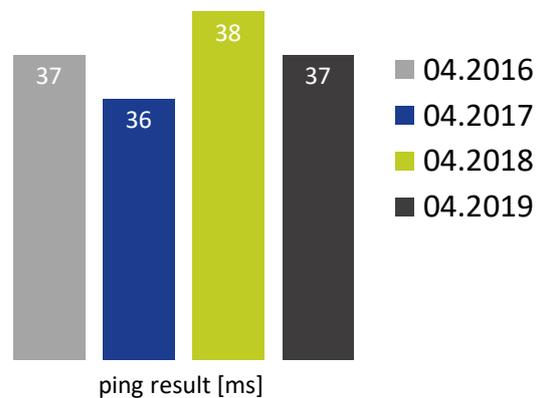


Source: UKE

Over four years, a clear upward trend in the average upload speed is noticeable.

Chart 3

Average latency for measurements from a browser application - all providers

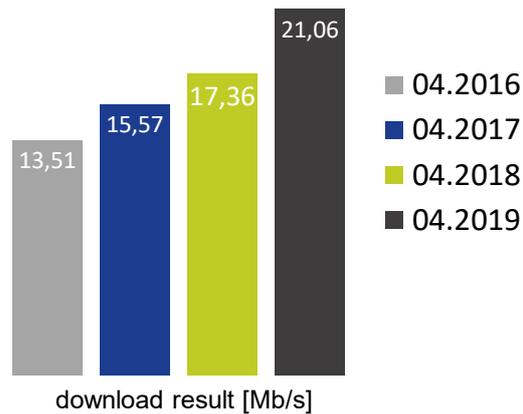


Source: UKE

Over four years, the average latency values are at similar levels.

Chart 4

Average download speed for a mobile application - all mobile providers

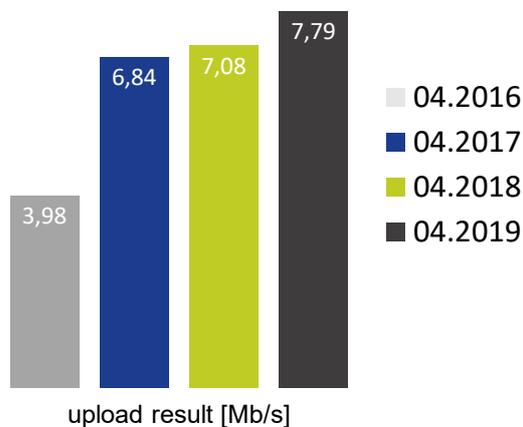


Source: UKE

Over four years in mobile networks, the majority of IAS providers observed an upward trend in average data download speeds.

Chart 5

Average upload speed for a mobile application - all mobile providers

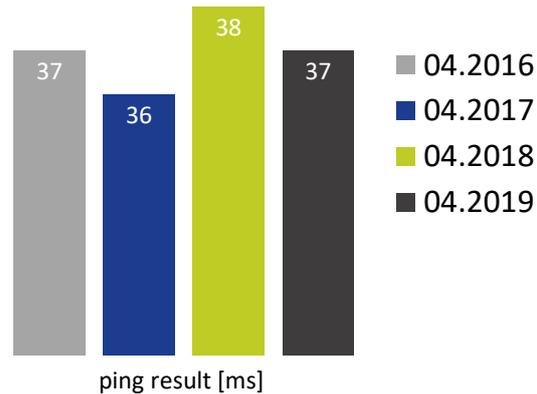


Source: UKE

Over four years in mobile networks, the majority of IAS providers observed an upward trend in average data upload speeds.

Chart 6

Average latency for measurements from a mobile application - all mobile providers

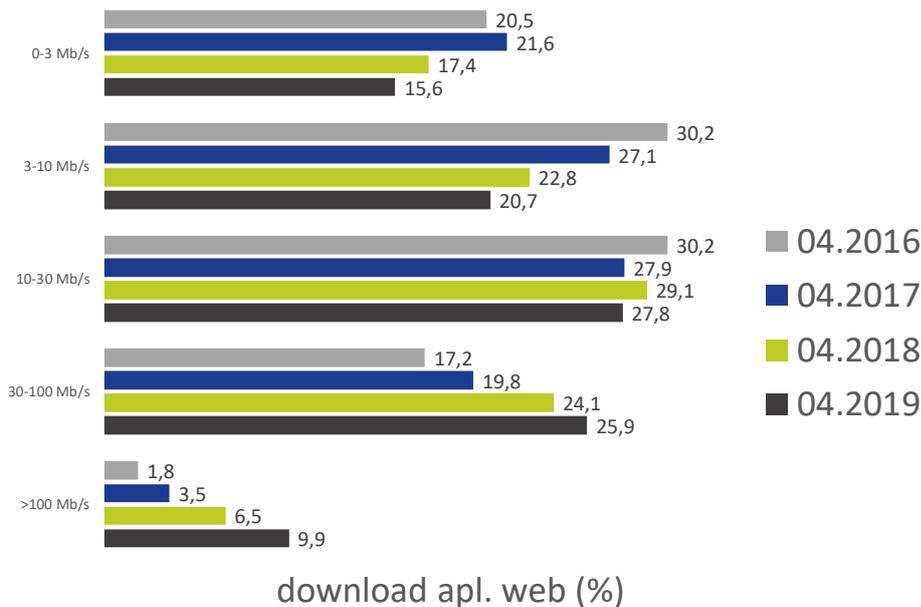


Source: UKE

The average latency fluctuates around 46 ms. When using services in LTE technology alone, the average latency value fluctuates around 41 ms.

Chart 7

Distribution of the number of download speed measurements in brackets - all providers (%)

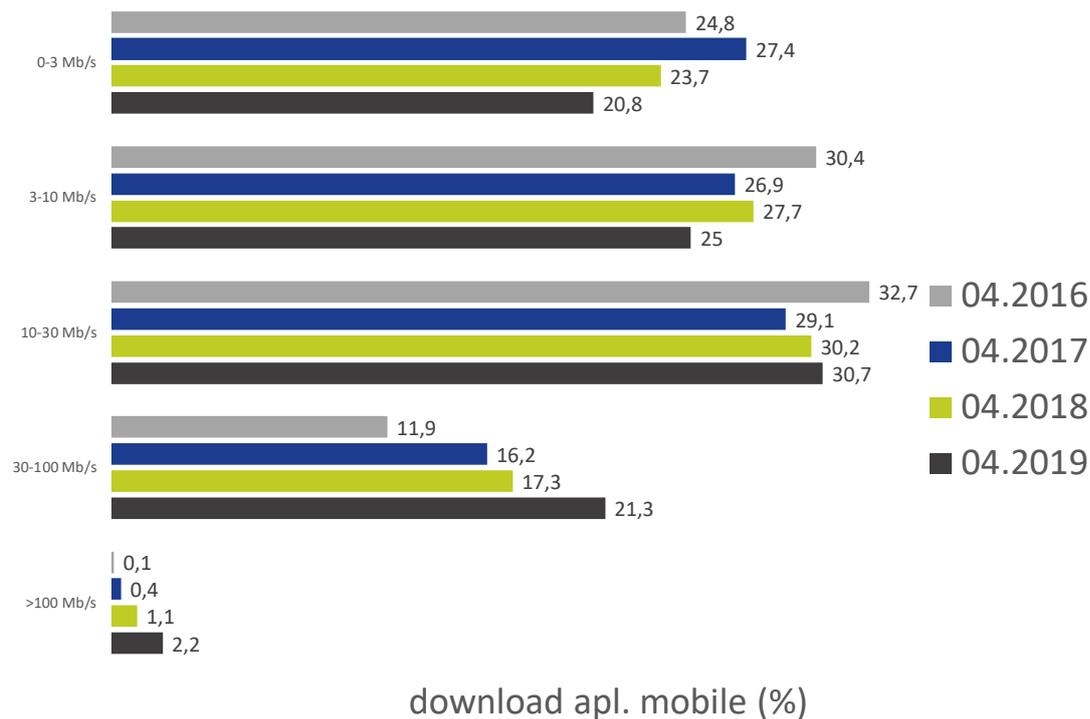


Source: UKE

In the case of measurements carried out using a browser for download, the results obtained indicate that over the four years there was a marked increase in the download speed from the 30-100 Mb/s range and over 100Mb/s. The direction of change is in line with the increase in the share of fibre optic technology in fixed networks.

Chart 8

Distribution of the number of download speed measurements in brackets - all mobile providers (%)



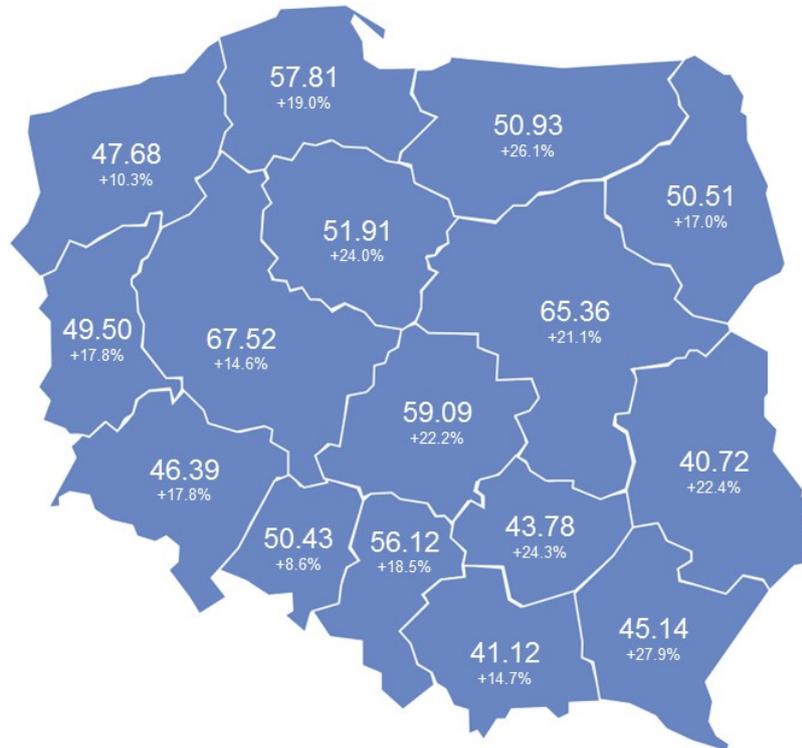
Source: UKE

Similar trends were noted in the case of measurements carried out using applications in mobile networks. The direction of change is in line with the increase in the share of LTE technology in mobile networks. This is a positive signal in the context of the implementation of the *Digital Agenda 2020* in Poland¹⁰.

¹⁰ The Digital Agenda 2020 assumes that Europe needs fast and ultra-fast Internet access which is widely available and competitive in terms of prices. The programme is aimed at ensuring that until 2010 all Europeans will have access to broadband Internet with capacity exceeding 30 Mb/s, and that at least half of the European households will have access to connections with capacity exceeding 100 Mb/s.

Map 1

Average download speed and y/y change for a browser application for fixed-line providers
Result: download [Mb/s] providers: Providers in total



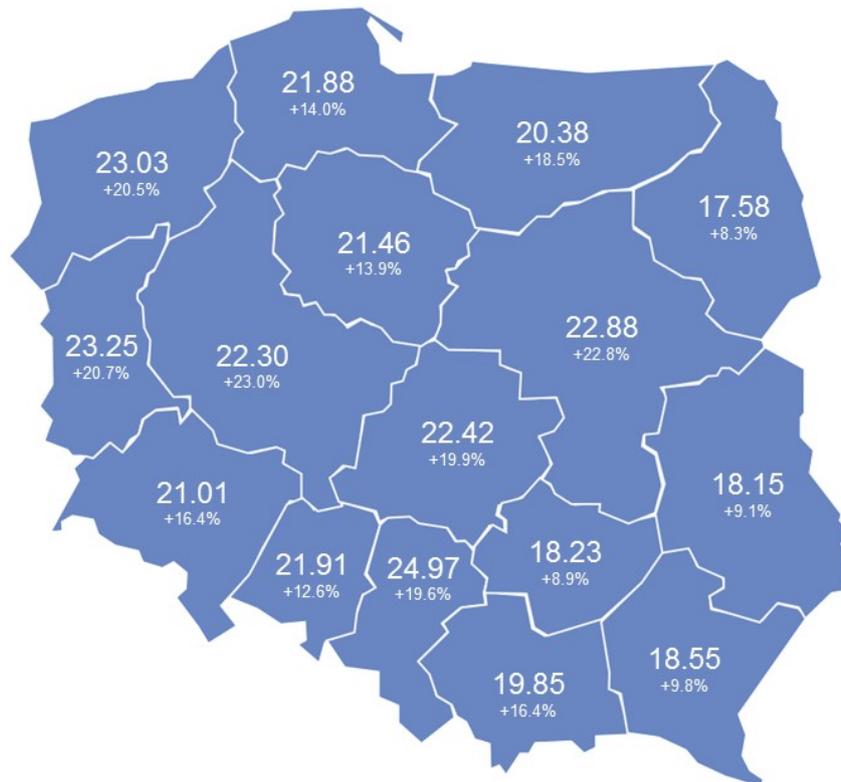
Source: UKE

The average download data rates in fixed networks across the country are similar. In April this year in relation to the same period of the previous year, all voivodeships recorded an increase in the average download speed (8-28%). The largest increase in the average data download speed was achieved in the Podkarpackie Voivodeship. A similar tendency was recorded in all voivodeships regarding the average data upload speed (8-23%). What is more, in most of the voivodeships there was a slight decrease in the average data streams latency value (2-11%), with the exception of the Pomorskie, Dolnośląskie and Świętokrzyskie Voivodeships.

Map 2

Average download speed and y/y change for a mobile application

Result: download [Mb/s] providers: Providers in total



Source: UKE

The average data download speeds in mobile networks across the country are similar. As compared to April 2018, almost all voivodeships recorded a significant increase in the average data download speed from 8.3% to 23%. The largest increase in the average download speed was achieved in the Greater Poland Voivodeship. For sending, the increases in speed are less pronounced and range from 0.4% to 17.4%, with the exception of the following voivodeships: Kuyavian-Pomeranian (-1.1%) and Podlaskie (-7.1%). In the majority of voivodeships, there was a decrease in the average data streams latency value from -6.3% to -3.9%, with the exception of the following voivodeships: Pomeranian (+ 4.4%) and Kuyavian-Pomeranian (+ 4.4%), where the average data streams latency value increased.

In April 2019, the share of measurements carried out in LTE technology was 84% of all of the measurements carried out in mobile networks using a mobile application. In April 2018, the share was 74%, in April 2017 it was 69%, and in April 2016 it was 56%. This may indicate an increase in the use of LTE technology for data transmission in mobile networks, which translates directly into an increase in the quality of services.

5. Activities of the President of UKE

5.1. Complaints of end-users

The quality of Internet access services was the main subject of complaints related to the right to open Internet addressed to the President of UKE. End-users provided information about service speeds lower than prescribed by the contract, and complained about high values of latency and packet loss. These complaints constituted approx. 3% of all complaints submitted to the Office of Electronic Communications in the period from 1 May 2018 to 30 April 2019. More than two-thirds of quality-related complaints were about services provided in mobile networks. The remaining ones referred to services provided in fixed-line networks.

Only a dozen complaints concerned other issues covered by the provisions of the Regulation. They included complaints related to:

- transparency of contracts in the field of service quality, in particular: non-specification of speed parameters by the provider; incomprehensible or incomplete explanation to the end-user of the IPTV linear service impact on the Internet access service,
- blocking of ports, which prevents the use of a different service,
- blocking access to foreign websites,
- traffic discrimination dependent on the content recipient.

A similar pattern was noticed in the information on the complaints addressed by subscribers to the ISPs regarding the Internet access. According to the information provided by ISPs to the President of UKE, complaints related to the open Internet access addressed by end-users to providers in the period up to 1 May 2018 to 15 April 2019 were mainly related to the quality of services - lower speed of services, disconnection and interruptions in access to the service. ISPs identified individual complaints related to other aspects of the right to the open Internet. They concerned the suspicion of blocking access to content, services or applications and discriminating or favouring traffic dependent on the type of content or recipient. Some ISPs in their responses to the questionnaire of the President of UKE stated that due to the number of complaints or the adopted manner of their qualification, they cannot indicate a precise number of complaints relating to the obligations set out in Article 3 and 4 of the Regulation.

5.2. Penalty proceedings

Pursuant to Article 209 (1) point 29a of the TA, penalty shall be imposed on anyone who fails to fulfil the obligations set forth in Article 3, 4 and 5 (2) of the Regulation. The President of UKE imposes a penalty by decision after conducting administrative proceedings. The amount of the penalty may be up to 3% of the revenue of the punished entity for the previous calendar year. The President of UKE in setting the amount of the penalty takes into account the scope of the violation, the hitherto activity of the entity and its financial capabilities.

In the reporting period, the President of UKE conducted two administrative proceedings in connection with non-compliance with the obligations set out in Article 3 of the Regulation, as well as began administrative proceedings against one ISP for the violation specified in Article 4 (1) point (d) of the Regulation.

On 9 August 2018, proceedings were started ex officio to impose penalty on Vectra S.A. in the subject of blocking or restricting access to content published on the website www.bet-at-home.com from April 1 to June 30, 2017.

The proceedings ended with the issuance on 31 December 2018 of an administrative decision withdrawing from the imposition on Vectra S.A. of the penalty referred to in Article 209 (1) point 29a of the TA in connection with non-compliance with the obligations as set out in Article 3 of the Regulation and an instruction to fulfil the obligations as set out in Article 3 (3) of the Regulation, consisting, among others in: prohibition of the use of traffic management measures beyond the appropriate traffic management measures within the meaning of Article 3 (3) subparagraph 2 of the Regulation, in particular the prohibition of blocking specific content, applications or services, or specific categories thereof, or interfering with them, except where it is necessary, and only as long as it is necessary to ensure compliance with Union legislative acts or provisions of the Polish law that Vectra S.A. is subject to.

Admittedly, the violation referred to in Article 209(1) point 29a of the TA consisting in the failure to fulfil the obligations specified in Article 3 (3) of the Regulation was the case and it is subject to a financial penalty imposed in accordance with Article 210 (1) of the TA by way of a decision by the President of UKE. However, taking into account the fact that the violation of the law committed by Vectra S.A. lasted only for 7 days and Vectra S.A. ceased the violation after that short period of time, and the actions taken by Vectra S.A. were inevitable, although delayed in time, the President of UKE found that the violation by Vectra S.A. was of negligible weight. At the same time, it should be emphasized that Vectra S.A. ceased violating the law on 11 May 2017, and therefore much earlier than introduced changes in the form of adding the provisions of Article 15f (5) of the Gambling Act on the use of mechanisms that prevent access to websites entered in the Register, which should be applied by telecommunications undertakings, i.e. from 1 July 2017. Thus, the condition of cessation of infringement of the law has been met.

The second proceeding concerned P4 sp. z o.o. and was also initiated in connection with failure to fulfil the obligations set out in Article 3 of the Regulation consisting in blocking or restricting access to content published at www.bet-at-home.com in the period from April 1 to June 30, 2017.

The proceedings ended with the issuance on 31 December 2018 of an administrative decision withdrawing from the imposition on P4 sp. z o.o. of the penalty referred to in Article 209 (1) point 29a of the TA in connection with non-compliance with the obligations as set out in Article 3 of the Regulation and an instruction to fulfil the obligations as set out in Article 3 (3) of the Regulation, consisting, among others, in: prohibition of the use of traffic management measures beyond the appropriate traffic management measures within the meaning of Article 3(3) subparagraph 2 of the Regulation, in particular the prohibition of blocking specific content, applications or services, or specific categories thereof, or interfering with them, except where it is necessary, and only as long as it is necessary to ensure compliance with Union legislative acts or provisions of Polish law that P4 sp. z o.o. is subject to.

Admittedly, the violation referred to in Article 209(1) point 29a of the TA consisting in a failure to fulfil the obligations specified in Article 3(3) of the Regulation was the case and it is subject to a

financial penalty imposed in accordance with Article 210 (1) of the TA by way of a decision by the President of UKE. However, taking into account the fact that the violation of the law committed by P4 sp. z o.o. lasted only 19 days, and the actions taken by P4 sp. z o.o. were inevitable, although delayed, the President of UKE found that the violation of the law by P4 sp. z o.o. was of negligible weight. At the same time, it should be emphasized that P4 sp. z o.o. ceased to infringe the law on 1 July 2017, i.e. on the date of entry into force of the provision of Article 15f (5) of the Gambling Act (at that time it was already authorized to block the website www.bet-at-home.com). Thus, the condition of ceasing to infringe the law has been met.

On 8 March 2019, an administrative proceeding was instituted against one of ISPs with regard to the imposition of penalty for the infringement of the obligation specified in Article 4(1) point (d) of the Regulation to include in the Internet access service contract a clear and comprehensible explanation of the minimum, normally available, maximum and advertised download and upload speeds of the fixed-line Internet access services. The proceedings were started due to a complaint of one of the subscribers of this ISP and have not been completed until now.

5.3. Certified mechanism for monitoring the quality of IAS

The President of UKE, acting pursuant to Article 4 (4) of the Regulation, with a view to support the end-users' rights as well as create market conditions that support ISP activities in improving the quality of telecommunications services, decided to create and make the IAS quality measurement tool (a certified IAS quality monitoring mechanism) available to end-users.

To this end, the President of UKE in the first quarter of 2018 selected, within a competitive procedure, an expert entity that developed and created a measurement tool for end-users under the supervision of the President of UKE. In Poland, the mechanism for monitoring IAS quality parameters was introduced in two stages. In the first stage, implemented in the third quarter of 2018, the mechanism was subjected to a pilot implementation, during which an independent expert carried out a series of audits to check accuracy of the measurements. At this stage, the measurement tool was provided to both the ISP and end-users in order to conduct test measurements. 230 undertakings and over 1600 end-users took part in the tests, they carried out more than 7,500 measurements. In December 2018, after security audits and verification of the facilities for the visually impaired, the mechanism was certified by the President of UKE and finally made available to end-users.

Since 1 December 2018, IAS end-users can use the quality control mechanism of services certified by the President of UKE. The mechanism is available free of charge at www.pro.speedtest.pl. It consists of a certified application for computers and additional (not certified by the President of UKE) websites, such as a WEB application or mobile applications, operating on Android and iOS systems and enabling measurements in networks using radio technologies.

The certified mechanism is designed to measure the quality of IAS provided in public fixed-line telecommunications networks. The technical capabilities of the system do not exclude measurements in mobile networks via a shared web application or dedicated applications for mobile systems - however, the measurements are informative and as such they are not certified by the President of UKE.

The available measurement mechanism enables IAS users in the fixed-line networks to demonstrate continuous or regularly recurring discrepancies between the actual quality of service and the quality indicated in the contract by the IAS provider. Pursuant to Article 4 of the Regulation, the measurement made in fixed-line networks using the mechanism allows the user to determine non-conformity of performance of the contract and effective enforcement of the consumer's claims against the service provider. Measurements carried out in accordance with the adopted methodology indicate results that enable consumers to pursue claims in the form of complaint or court proceedings. A user who has performed a series of measurements and generates a certified report on the quality of services will be able to use it in any dispute with the given ISP.

The certified measurements consist of two daily cycles, which must be performed within a time interval of no more than 6 days. The daily cycle means a minimum of 6 certified measurements performed within one day (from 00:00:00 to 23:59:59) at a minimum interval of 30 minutes between successive measurements. Certified measurements are measurements that meet all of the following conditions:

- they are carried out in the Windows application on the Ethernet cable connection in full-duplex mode,
- the network interface connection speed is 1000 Mb/s; in the case of the maximum speed read from the contract below 80 Mb/s, it is permissible to have a connection with the 100 Mb/s network interface,
- CPU load before measurement is below 20%,
- data transfer speed from other applications is not greater than 1 Mb/s in each direction before measurement,
- CPU load during measurement is below 85%,
- no virtual private network (VPN) connections are active,
- there is no active Internet sharing on the user's terminal device,
- no other devices except the router and user's computer on the network,
- measurements are carried out on a fixed-line operator's connection.

What is more, during the measurements, a certified tool verifies what were the measurement conditions. It verifies, among others, elements such as the processor load, type of a network card, presence of active VPN connections, intensity of traffic generated in the background, number of devices in the user's home network.

Due to legal and technical conditions, the results of measurements obtained using the WEB application and mobile applications in mobile networks are only informative.

From 1 December 2018 until the end of May 2019, users carried out more than 17,000 certified measurements on their computers, and generated more than 300 reports that can be used in the complaint proceedings.

Currently, the President of UKE carries out monitoring activities to assess the significance of the impact of the certified tool on enhancing end-users' rights and improving the quality of services. The market impact of the certified tool will be possible to assess in 2020.

The data from the period of operation of the certified mechanism in the reporting period, i.e. from 1 December 2018 to 30 April 2019, is presented below.

Category	Data for the period from 12.2018 to 04.2019
Certified measurements - Windows application	16046
Uncertified measurements - Windows application	40533
Uncertified measurements - Web application	6708
Uncertified measurements - Android application	151689
Uncertified measurements - iOS application	22028
Generated reports	284
Registered users	23419

The categories indicated in the table mean:

Certified measurements (Windows application) - Measurements carried out in the application on computers with a Windows system that meet certain requirements, available at https://pro.speedtest.pl/pomiar_certyfikowany_i_niecertyfikowany

Uncertified measurements (Windows application) - Measurements carried out in the application on computers with a Windows system that do not meet certain requirements, available at https://pro.speedtest.pl/pomiar_certyfikowany_i_niecertyfikowany

Uncertified measurements (Web application) - Measurements carried out by the measurement system made in HTML5 technology for browsers (Web)

Uncertified measurements (Android application) - Measurements made in an application prepared for mobile devices with the Android system

Uncertified measurements (iOS application) - Measurements made in an application prepared for mobile devices with the iOS system

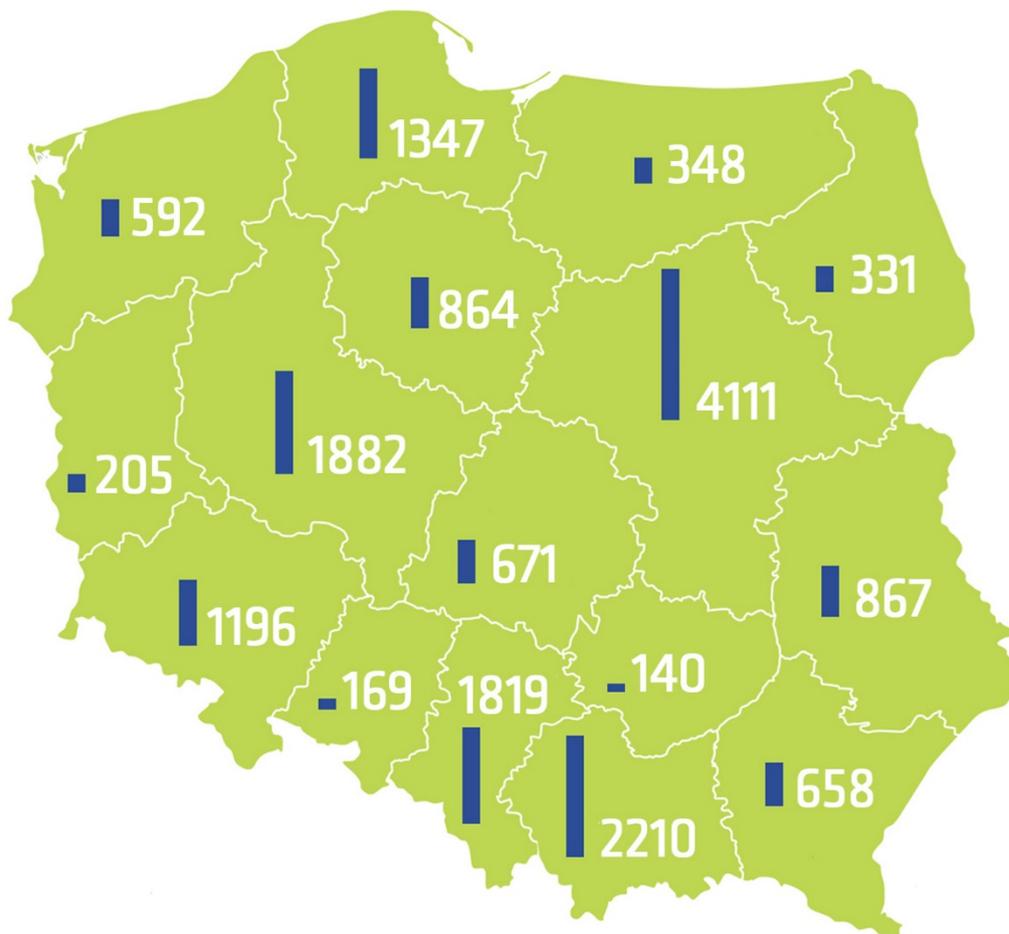
Generated reports - Reports for use in the complaint procedure prepared in accordance with the instructions at https://pro.speedtest.pl/generowanie_raportow_z_certyfikowanych_pomiarow

Registered users - Newly registered users in the system according to the information available on the website at https://pro.speedtest.pl/rejestracja_konta_uzytkownika

What is more, on 18 June 2019, the President of UKE published information on a certified mechanism for monitoring Internet access for a six-month period of its operation. During this period, the number of measurements was 17,410.

Map 3

Number of measurements certified per voivodeships during the six months of the operation of the mechanism



A detailed overview can be found at <https://www.uke.gov.pl/akt/certyfikowany-mechanizm-monitorowania-internetu,217.html>

Office of Electronic Communications

Control Department

T +48 22 534 9158

F +48 22 534 9162

sekretariat.dk@uke.gov.pl

Technology Department

T +48 22 534 9320

F +48 22 534 9327

sekretariat.dt@uke.gov.pl

Consumer Policy Department

T +48 22 534 9225

F +48 22 534 9162

sekretariat.dpk@uke.gov.pl

www.uke.gov.pl