

The State of the Internet and Digital Rights in Estonia (2019–2025)

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1. General Information

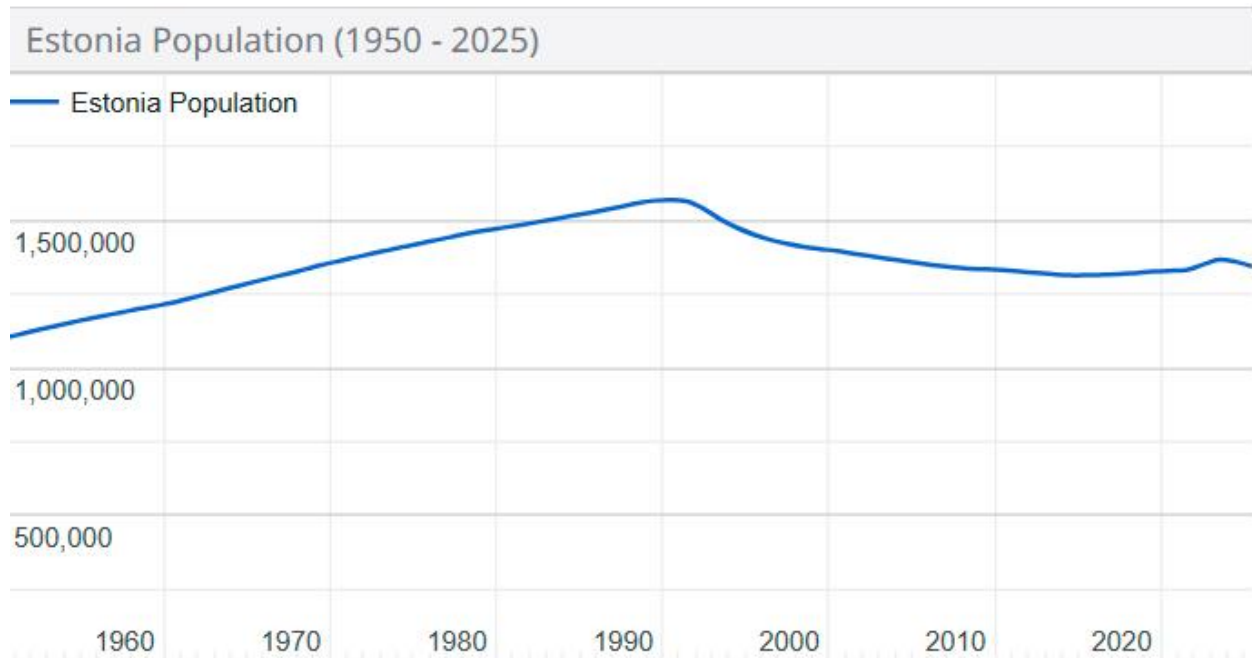
1.1. Geographical Location

Estonia is a state located in North-Eastern Europe. The country has access to the Baltic Sea, which washes it from the north and west. To the east, Estonia borders the Russian Federation; the border runs mainly along the Narva River and Lakes Peipus (Chudskoye), Tyoploye, and Pskovskoye. Estonia's southern neighbour is Latvia.¹ The total area of the country is 45,227 km², including 2,222 islands and islets.² Estonia's geographical position, at the junction of the Baltic region and Eastern Europe, proximity to Russia and Latvia, as well as maritime closeness to Finland and Sweden¹, historically and strategically influences its development, including priorities in digital infrastructure and cybersecurity. Forest areas cover more than half of the country's territory.²

1.2. Population

Estonia's population is characterised by one of the lowest densities in the European Union — 31.6 people per square kilometre as of 2024, which is almost four times lower than the EU average.² According to preliminary data from the Statistics Estonia, as of 1 January 2025 the population was 1,369,285 people. This figure was 5,402 people lower than on the same date the previous year.³ In the ethnic composition in 2024, Estonians predominated (67.8%), followed by Russians (21.6%) and representatives of other nationalities (10.0%).³

The demographic situation in Estonia in the period from 2019 to 2025 was characterised by two main trends: persistent natural population decline (excess of deaths over births) and positive migration balance, which compensated for this decline and ensured overall population growth until 2024.³ Thus, in 2023 the natural decline was 5,053 people, while the migration gain reached 13,856 people.³ However, in 2024 a change in this trend emerged: there was a decrease both in the number of births (9,646 versus 10,949 in 2023) and in the number of immigrants (13,826 arrivals versus 13,856 the previous year).³ This led to a slight reduction in the total population by the beginning of 2025.³ Such sensitivity of demographic dynamics to migration flows underlines the importance of migration policy and external factors (economic, geopolitical) for maintaining the country's population. Life expectancy at birth in 2023 was 74.5 years for men and 83.1 years for women.³

Graph 1: Dynamics of the Population of Estonia (1950–2025)

Source: *worldometers.info*

1.3. Gross Domestic Product (GDP)

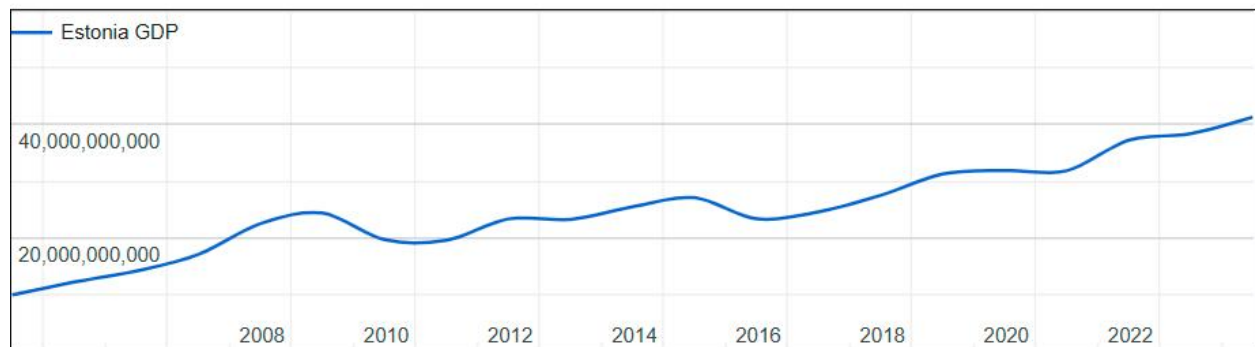
Estonia belongs to the group of countries with a developed economy and high income level according to the classification of the World Bank and IMF.⁸ Gross domestic product (GDP) per capita, calculated at purchasing power parity (PPP), in 2023 was estimated in the range of 45,236 to 49,000 US dollars⁷, placing Estonia above many Central and Eastern European countries but somewhat below Southern European indicators such as Spain.⁸ Nominal GDP of the country in 2023 was about 41.3 billion US dollars.⁹

In the period from 2019 to 2024, Estonia's economy experienced significant fluctuations. After confident growth in 2021 (real GDP increased by 7.2%¹¹), there followed a period of stagnation and decline. In 2022, real GDP growth was minimal (+0.1%¹¹), and in 2023 the economy entered recession, showing a fall of 3.0%.⁹ The main reasons for the decline were disruptions in international trade, weakening of external demand for Estonian products, high inflation (9.1% in 2023⁸) and

tightening of monetary policy by the European Central Bank.¹³ Forecasts for 2024 also predicted negative growth (from -0.3% to -0.9% ¹¹), however quarterly data by the end of 2024–beginning of 2025 indicated a slowdown in the decline and the emergence of signs of stabilisation.¹⁵ Gradual recovery of economic growth is expected in 2025 (forecasts vary from $+0.7\%$ to $+1.7\%$ ¹⁰) and its acceleration in 2026 ($+2.3\%$ to $+2.7\%$ ¹⁰), which should be facilitated by improvement in financial conditions, growth in external demand and increase in public investment.¹³ The significant discrepancy between the dynamics of nominal GDP, which grew due to high prices, and the reduction of real GDP in 2022–2023⁹ clearly illustrates the strong impact of the inflationary shock on the economy and living standards. This factor likely affected the affordability of ICT services and equipment for the population and business, potentially slowing the transition to higher-speed broadband tariffs despite infrastructure development.²¹

Graph 2: Dynamics of Nominal GDP of Estonia (1993–2023)

Estonia GDP (Nominal, \$USD) 2003-2023



Source: *worldometers.info*

1.4. Main Economic Characteristics

In recent years, Estonia's economy has faced serious challenges, having gone through recession in 2023 (GDP fall of 3.0% ⁹) and expected, albeit smaller, contraction in 2024.¹¹ The main factors of the decline were external shocks: disruptions in international trade, weakening of export demand from key partners (especially Nordic countries³³), high inflation caused by the energy crisis, and tightening of monetary conditions in the eurozone.¹³ Growth recovery of growth is forecast for 2025–2026, supported by improvement in external conditions and growth in domestic demand.¹⁰

The structure of Estonia's economy is characterised by the dominance of the services sector, which accounts for about 64–68% of GDP and 70–77% of employment.⁸ Information and communication

technologies (ICT) and financial services play a particularly important role.⁸ The industrial sector accounts for 22–29% of GDP⁸; key industries are mechanical engineering, electronics, wood processing and textile industry.⁸ Agriculture contributes a relatively small share to GDP (about 2–3%⁸). Despite successes in digitalisation and high income level, Estonia faces structural problems. Labour productivity and GDP per capita still lag behind OECD averages.¹³ There is a shortage of skilled labour⁸, exacerbated by emigration of young specialists to Western European countries.⁸ The dependence of the energy sector on oil shale mining and combustion creates environmental problems and risks to energy security.⁸ Although Estonia's digital sector³⁶ may show greater resilience to economic downturns compared to traditional industries, its further growth and contribution to economic recovery may be limited precisely by the lack of qualified personnel⁸, which creates a contradiction between the country's digital ambitions and its human resources potential.

1.5. General Political Situation

Estonia is a parliamentary republic with a democratic form of government.⁴⁰ According to the 1992 Constitution⁴¹, the head of state is the President, who is elected by parliament (Riigikogu) for a five-year term and performs mainly representative functions.⁴⁰ Since 11 October 2021 the post of President has been held by Alar Karis, elected as an independent candidate.⁷ The main executive power is concentrated in the hands of the Government of the Republic, headed by the Prime Minister, who is appointed by the President and approved by the Riigikogu.⁴⁰

Legislative power belongs to the unicameral parliament – the Riigikogu, consisting of 101 deputies.⁴⁰ Deputies are elected for a four-year term by direct universal elections under a proportional system.⁴⁰ The latest parliamentary elections took place on 5 March 2023.⁴⁰ The Speaker of the Riigikogu of the XV convocation since 10 April 2023 is Lauri Hussar, representing the Eesti 200 party.⁴¹

Estonia's political system is multi-party.⁴² Following the 2023 elections, six parties entered the Riigikogu: the Reform Party (Reformierakond), the Conservative People's Party of Estonia (EKRE), the Centre Party (Keskerakond), Eesti 200, the Social Democratic Party (SDE) and Isamaa.⁴⁶ Government coalitions are formed according to the election results and can change during the parliamentary term. Initially after the 2023 elections, a coalition was formed from the Reform Party, Eesti 200 and the Social Democratic Party.³³ However, in March 2025 the social democrats were excluded from the coalition due to disagreements, and a new government was formed on the basis of the Reform Party and Eesti 200 coalition.³³ Since 23 July 2024 the Prime Minister has been Kristen Michal (Reform Party).⁵⁰ Despite changes in government coalitions, there is a certain continuity in

the strategic directions of the country’s development, especially in digitalisation. The key political forces generally share commitment to the development of a digital state, which is reflected in long-term strategies such as “Estonia 2035” and “Digital Agenda 2030”.⁵³ This creates the basis for stability of digital policy, although specific emphases and implementation rates may vary depending on the composition of the government.³³

Administratively, Estonia is divided into 15 counties (maakond), which in turn are divided into 79 local governments (municipalities) with local autonomy.⁷ The capital and largest city is Tallinn.⁷

2. Internet

2.1. National Domain

The national top-level domain (ccTLD) for Estonia is .ee.³⁶ It was delegated to the country on 3 June 1992, soon after the restoration of independence.³⁶ Initially, the domain was managed by the Estonian Educational and Research Network (EENet), and registration was free but strictly limited: as a rule, one domain name per legal entity, and registration of additional names for trademark protection was not allowed.⁵⁵

A key moment in the history of the domain was the 2010 reform, when management of the .ee zone was transferred to the specially created Estonian Internet Foundation (Eesti Interneti Sihtasutus, EIS).⁵⁵ This reform radically changed the rules: the one-domain-per-organisation policy was abolished, registration became available to both legal entities and individuals, including foreigners, without quantitative restrictions.⁵⁵ At the same time, a fee for registration and renewal of domain names was introduced, and the registration procedure itself began to be carried out through a network of accredited registrars.⁵⁵ This liberalisation created a competitive market for registrar services and contributed to significant growth in the number of registered domains – by August 2023 there were more than 160 thousand.⁵⁵ Further development included technical improvements: since 2011 support for Estonian diacritics (õ, ä, ö, ü, š, ž) was added, since 2013 registration for two or three years became possible, and since 2014 the DNSSEC technology was implemented to increase security.⁵⁵ In addition to direct second-level registration (.ee), registration at the third level under some common second-level domains remains possible, for example .med.ee for medical institutions.⁵⁷ Disputes related to .ee domain names are handled by a specialised Domain Disputes Committee.⁵⁵

2.2. Number of Users

Estonia consistently shows one of the highest internet penetration rates in the world. According to various sources, in 2023–2025 the share of the population using the internet was about 93%.⁵⁸ In absolute terms, at the beginning of 2025 this corresponded to 1.26 million internet users.⁵⁸ Statistics Estonia data confirm this trend, showing that the share of households with internet access at home reached 92.9% in 2024.⁵⁹ The Freedom House report for 2020 also indicated 90% of households with network access²¹, and Eurostat recorded the level of access at 92.89% in 2024.⁶²

Analysis of internet use shows high engagement of the young and middle-aged generation: 98% of people aged 16–44 used the internet daily or almost daily already in 2020.²¹ However, a noticeable digital divide associated with age remains: among people aged 65–74 the share of internet users was significantly lower (59.9% in 2019²¹). This indicates that, despite almost universal infrastructure availability, there are barriers to full participation of the older generation in digital life, possibly related to lack of skills, motivation or complexity of digital services. At the same time, there are no significant differences in internet access between urban and rural areas (90.8% of urban households had access in 2019 versus 89.6% rural²¹), which testifies to successes in overcoming the geographical digital divide.

2.2.1. Fixed Internet

Fixed broadband access (BBA) remains the main way of connecting to the internet for most households in Estonia. The share of households with this type of connection was 82.6% in 2019, 82.7% in 2020 and 83.2% in 2021.⁵⁹ The absolute number of fixed BBA subscribers, according to estimates based on regulator (TTJA) data by connection technologies, was about 590,000 at the end of 2023.⁶³ In 2024 there was a slight decrease in this indicator by 0.09%.⁶⁴

The fixed BBA market in Estonia is characterised by a high degree of concentration. The dominant position is occupied by two largest operators: Elisa Eesti AS and Telia Eesti AS. According to the regulator TTJA at the end of 2023, their market shares by number of subscribers were approximately 36% and 32.5% respectively.⁶³ The third significant player, STV AS, occupied about 4.5% of the market.⁶³ In total, these three providers accounted for about 92% of all fixed BBA subscribers in 2023–2024.⁶³ Such high market concentration prompted the regulator (TTJA) to recognise Telia as an operator with significant market power (SMP) and impose on the company obligations to provide non-discriminatory access to its network infrastructure (cable ducts, fibre-optic lines) to other operators, especially in areas with low competition.⁶⁵ This regulatory approach is aimed at stimulating competition at the service level using the existing infrastructure of the dominant player, which is especially relevant for achieving the goals of providing high-speed access throughout the country, as provided for by the “Digital Agenda 2030”.⁶⁷

Largest fixed internet providers (links and market shares at the end of 2023/beginning of 2024):

- **Elisa Eesti AS:** <https://www.elisa.ee/> (~36%, share growing⁶³)
- **Telia Eesti AS:** <https://www.telia.ee/> (~32.5–34%, share declining⁶³)
- **STV AS:** <https://stv.ee/> (~4.5–6%, share declining⁶³)

2.2.2. Mobile Internet

Mobile internet plays a key role in ensuring ubiquitous network access in Estonia. The mobile broadband penetration level is traditionally high: the DESI report for 2019 indicated a figure of 152%²¹, which testifies to the widespread use of several SIM cards per person or use of mobile internet in devices (M2M). Later DESI data for 2021 showed penetration at the level of 87% of households.⁶⁸ Statistics Estonia recorded the share of households using mobile internet connection at 80.5% in 2019, but this indicator decreased to 75.2% by 2021⁵⁹ (later data on this specific metric are absent). At the beginning of 2025 the total number of active mobile connections in the country reached 1.91 million, equivalent to 141% of the population, with 97.1% of these connections classified as broadband (3G, 4G or 5G).⁵⁸ The number of users for whom mobile internet is the main access method (for example, “internet in computer” via mobile network) was about 246,000 in 2023⁶³ and covered 33% of all internet users in 2024.⁶⁴

Estonia’s mobile communications market is also highly concentrated and divided among three main operators: Telia Eesti AS, Elisa Eesti AS and Tele2 Eesti AS. Data on their market shares vary somewhat depending on the source and period. The regulator TTJA report for 2023 indicated the following shares by number of subscribers: Telia – 44%, Elisa – 32%, Tele2 – 24%.⁶³ At the same time, the TowerXchange review, referring to 2022/2023 data, gave different figures: Elisa – 42%, Telia – 35%, Tele2 – 23%.³⁹ These discrepancies may be related to differences in counting methodology (for example, accounting for M2M, active subscribers) or real market changes. Nevertheless, both sources confirm the dominance of the three listed players.

Largest mobile internet providers (links):

- **Telia Eesti AS:** <https://www.telia.ee/>

- **Elisa Eesti AS:** <https://www.elisa.ee/>
- **Tele2 Eesti AS:** <https://tele2.ee/>

2.3. Internet Access Speed and Quality of Services Provided

Estonia demonstrates high indicators of internet access speed and quality, although with some nuances. According to international measurements, average speeds for both fixed and mobile BBA show positive dynamics. If in 2020 the average fixed internet download speed was 70.9 Mbit/s²¹, then by the beginning of 2024 median speeds, according to Ookla, grew to 78.73 Mbit/s for fixed and 79.88 Mbit/s for mobile internet, showing annual growth of more than 34% for both types of connection.⁶⁹

Independent tests confirm the high level of services from leading providers. The nPerf study for 2023 revealed the leadership of Infonet in overall fixed BBA quality, especially in upload speed (84.42 Mbit/s) and minimal latency (16.2 ms), while Elisa showed the highest median download speed (89.38 Mbit/s).⁷⁰ Telia also demonstrated competitive results (78.04 Mbit/s download / 49.28 Mbit/s upload / 33.25 ms latency), while Tele2 noticeably lagged in all parameters.⁷⁰ The nPerf report for 2024 confirmed Infonet's leadership, showing further speed growth (100.3 Mbit/s download / 100.4 Mbit/s upload) and latency reduction (14.3 ms).⁷¹ In the mobile segment, according to Speedchecker in July 2024, Telia led in download speed (89.58 Mbit/s), Elisa had the lowest latency (23 ms), and Tele2 showed more modest speeds.⁷²

Despite infrastructure development, including deployment of very high capacity networks (VHCN) covering 57% of households already in 2020²¹, actual use of such high-speed connections (>100 Mbit/s or 1 Gbit/s) remained relatively low (14% of households in 2020²¹), lagging behind EU averages.²¹ This indicates a possible gap between infrastructure availability and its actual use, which may be due to price factors (high-speed tariffs may be more expensive²²), insufficient user awareness of the benefits or lack of mass need for ultra-high speeds for everyday tasks. The national strategy “Digital Agenda 2030” aims to overcome this gap, ensuring by 2030 all residents have access to speeds of at least 100 Mbit/s with the possibility of upgrade to 1 Gbit/s.⁶⁷

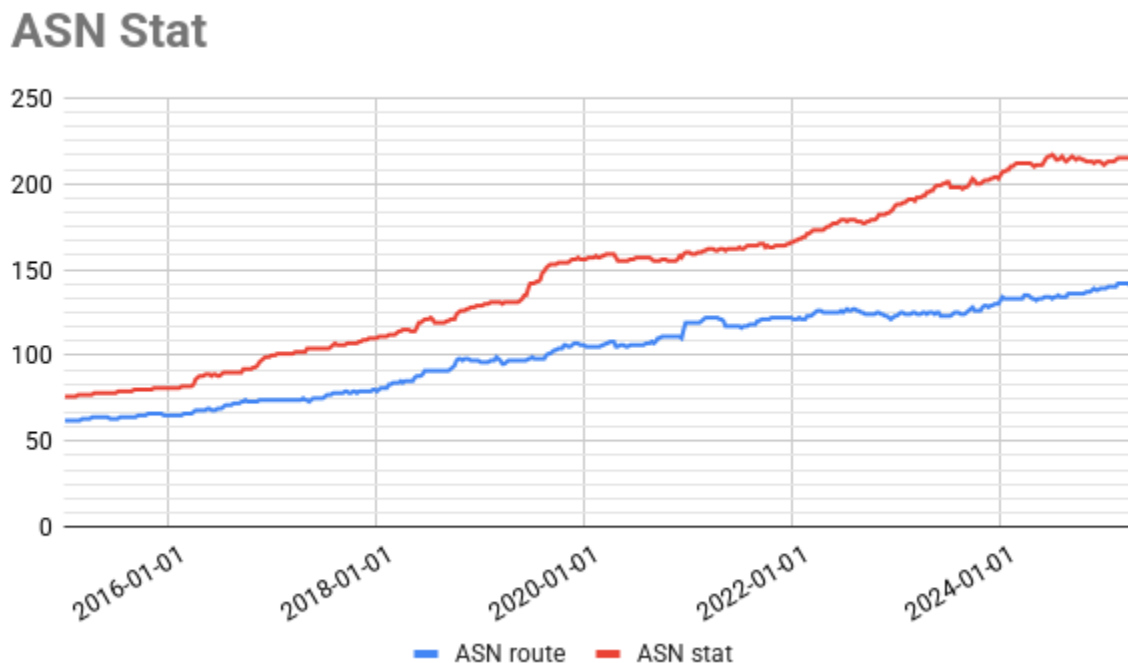
2.4. Development of Providers and Autonomous Systems

Estonia's telecommunications market is characterised by the presence of a large number of operators (more than 200, including 6 mobile providers²²), although the dominant position in the main segments (fixed and mobile BBA) is occupied by three companies (Telia, Elisa, Tele2/STV).³⁹ Management of internet resources (IP addresses and Autonomous System Numbers – ASN) for

Estonia, like for the entire Europe, Middle East and Central Asia region, is carried out by the regional internet registry RIPE NCC.⁷³

An Autonomous System (AS) is a set of IP networks and routers managed by one or more operators having a single routing policy. The number of ASN in a country reflects the level of development and decentralisation of internet infrastructure. According to RIPE NCC data as of March–May 2025, 121 Autonomous Systems were delegated to Estonia (country code EE).⁷⁵ The RIPEstat tool provided by RIPE NCC allows analysis of various data related to ASN and IP addresses, including routing history and prefix distribution.⁷⁶ However, obtaining exact aggregated data on the dynamics of the number of registered and actually announcing their routes ASN in Estonia for the period 2019–2024 requires specific requests to the RIPEstat API or analysis of historical resource delegation data, since ready-made annual reports with such country breakdown are absent in the provided materials.⁷⁷

Graph 3: Dynamics of Autonomous Systems in Estonia (2015–2025)



The dynamics of the number of Autonomous Systems in Estonia show:

Stable and confident growth: The graph demonstrates continuous growth in the number of autonomous systems (AS) in Estonia over a decade. Both the number of registered systems (ASN stat, red line) and the number of systems actively routing on the internet (ASN route, blue line)

steadily increased. This testifies to the constant development of internet infrastructure in the country.

Development of the internet market: The growth in the number of AS indicates the emergence of new internet providers, hosting companies, large corporate and academic networks that independently manage their network policy. This speaks of diversification and increased competition in the telecommunications services market.

Gap between registration and use: The number of registered AS (ASN stat, about 215 by 2025) significantly exceeds the number of routed ones (ASN route, about 140 by 2025). This is a normal situation: not all registered systems are active in the global routing table. Some may be reserved for future projects, used in internal networks or for specific needs that do not require global announcement.

In terms of AS per million inhabitants, Estonia ranks among the leading countries. Thus, at the beginning of 2025 Estonia's population was ~1.37 million people, accounting for 215 registered AS, which is 157 AS per million. For comparison, in the Netherlands this ratio is 84 AS per million people, in Finland – 64, in Germany – 34.

Table 1: Top 10 Largest Autonomous Systems in Estonia

#	Number of AS	Name	Web Site	Foreign neighbour count	Local neighbour count	Total neighbour count	Foreign neighbours share
1	3204	XTOM-V-PS	https://v.ps/	102	2	104	98%
2	3249	Telia Eesti	http://www.telia.ee	7	51	58	12%
3	3920	ESTOXY-OU	https://www.estoxy.com/	51	1	52	98%
4	8728	Infonet	https://infonetdc.com/en/	25	8	33	76%
5	2586	Elisa Eesti	http://www.elisa.ee	5	25	30	17%
6	206804	Estonian Network Operations Centre	https://www.estnoc.ee	20	0	20	100%
7	214413	SecureLink		19	0	19	100%
8	215955	ALTEASYSTEMS Fixed Line ISP	https://www.alteasystems.com	17	0	17	100%
9	61307	AS STV	https://www.stv.ee	17	0	17	100%
10	209554	ISIF Network	https://isif.net	15	1	16	94%

The table ranking the largest AS by total number of "neighbours" (peering connections) reveals a clear division of key players into two main types:

- **National leaders** (focused on the domestic market):

Telia Eesti (AS3249) and Elisa Eesti (AS2586) are classic examples. They have a predominance of local neighbours (Local neighbour count). Telia has 51 local connections and only 7 foreign ones. Elisa has 25 local and 5 foreign.

These are major internet providers and mobile operators whose main task is to provide internet access to end users and businesses within Estonia. A large number of local peerings is critically important for them to ensure low latency and high speed of traffic exchange within the country.

- **International gateways** (focused on the external market):

XTOM-V-PS (AS3204), ESTOXY-OU (AS3920), Estonian Network Operations Centre (AS206804) and several others have an overwhelming majority (94–100%) of foreign neighbours (Foreign neighbour count).

These companies are not traditional providers for the population. They are most likely data centres, hosting providers, transit traffic operators and DDoS protection service providers. Their business model is built on providing services to global clients and ensuring Estonia's connection to the rest of the world. They serve as "bridges" or "gateways" for international traffic.

Thus, Estonia has developed a balanced and mature ecosystem: The internet in Estonia has a healthy and balanced structure. It is not dependent on one or two monopolists. There are both strong players for the domestic market and many independent companies ensuring competitive access to the international arena.

Rich international connectivity: The presence in the top of several large international gateways (XTOM, ESTOXY and others) speaks of an excellent level of international connectivity. This ensures resilience (if one operator has problems, traffic will go through others) and competitive prices for international traffic, which is vital for a digital economy exporting IT services.

Estonia as an international digital hub: The large number of players focused on 100% foreign connections (Estonian Network Operations Centre, SecureLink, ALTEASYSTEMS) confirms that

Estonia is not just a consumer of internet services, but an important digital hub. International companies place their infrastructure here, taking advantage of high-quality connectivity, favourable business climate and skilled specialists.

Confirmation of conclusions about decentralisation: The data from the table clearly illustrate what the graph and the AS per capita indicator spoke about. The high density of AS is not just a number, but a real diversity of players with different business models that together create one of the most developed and competitive internet ecosystems in the world.

2.5. IPv6 Penetration

The transition to the IPv6 protocol is a global necessity due to the exhaustion of IPv4 address space. Estonia demonstrates significant progress in this direction. According to various measurement platforms, about half of the internet traffic in the country already passes via the IPv6 protocol.

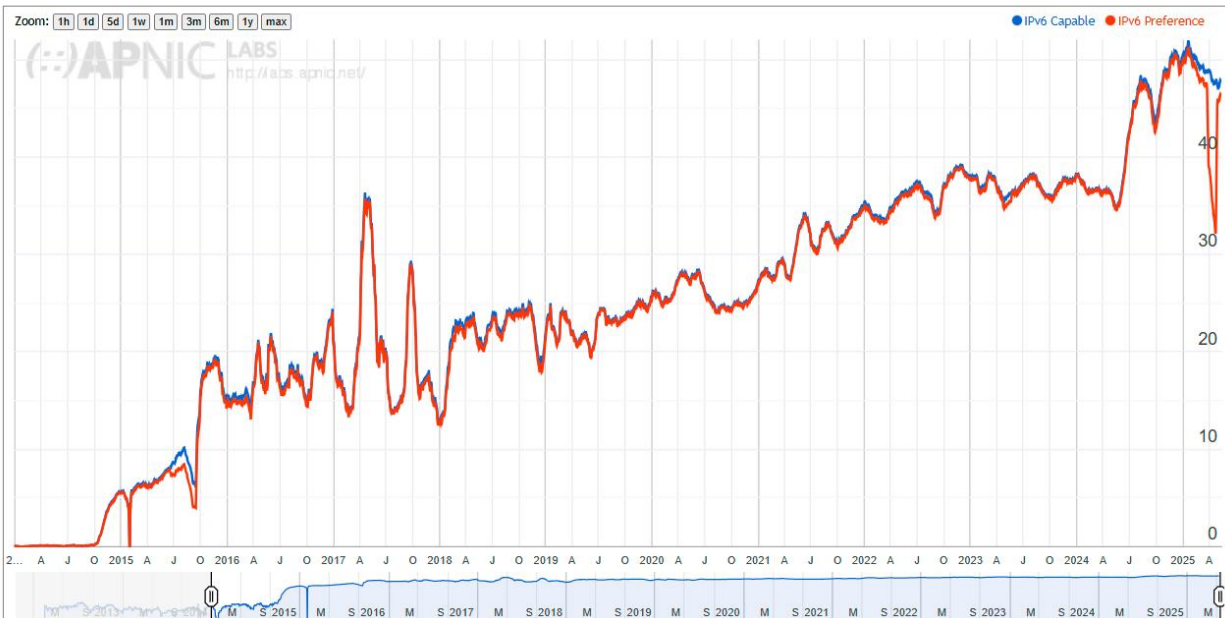
APNIC Labs recorded the level of IPv6 compatibility (share of users able to establish IPv6 connection) at 47.5% – 50.5% at the end of 2024 – mid-2025, while the share of users preferring IPv6 (when both IPv4 and IPv6 are available) was only slightly lower (46.1% – 49.3%).⁷⁹

Google statistics for 2024 showed a similar adoption level – 49.32%, which placed Estonia in 23rd place in the Google world ranking.⁸¹

Achieving an IPv6 penetration level of about 50% is an important milestone, indicating that a significant part of the network infrastructure, providers and content resources support the new protocol. This places Estonia among the countries with a relatively high level of IPv6 adoption.⁸¹ However, this indicator also means that the transition is far from complete. Approximately half of users and networks still rely on the outdated IPv4 protocol or use transitional mechanisms (dual-stack). For full utilisation of IPv6 advantages, such as simplification of network architecture (abandoning NAT) and ensuring the ability to connect a huge number of new devices (Internet of Things), further expansion of IPv6 support by all participants in the internet ecosystem is necessary.

Graph 4: Dynamics of IPv6 Penetration in Estonia (2019–2025)

Use of IPv6 for Estonia (EE)



Source: stats.labs.apnic.net

2.6. Connectivity Index

To assess the level of integration of Estonia's internet segment, two key indicators are used, based on the analysis of pairwise connections (peerings) between Autonomous Systems (ASN).

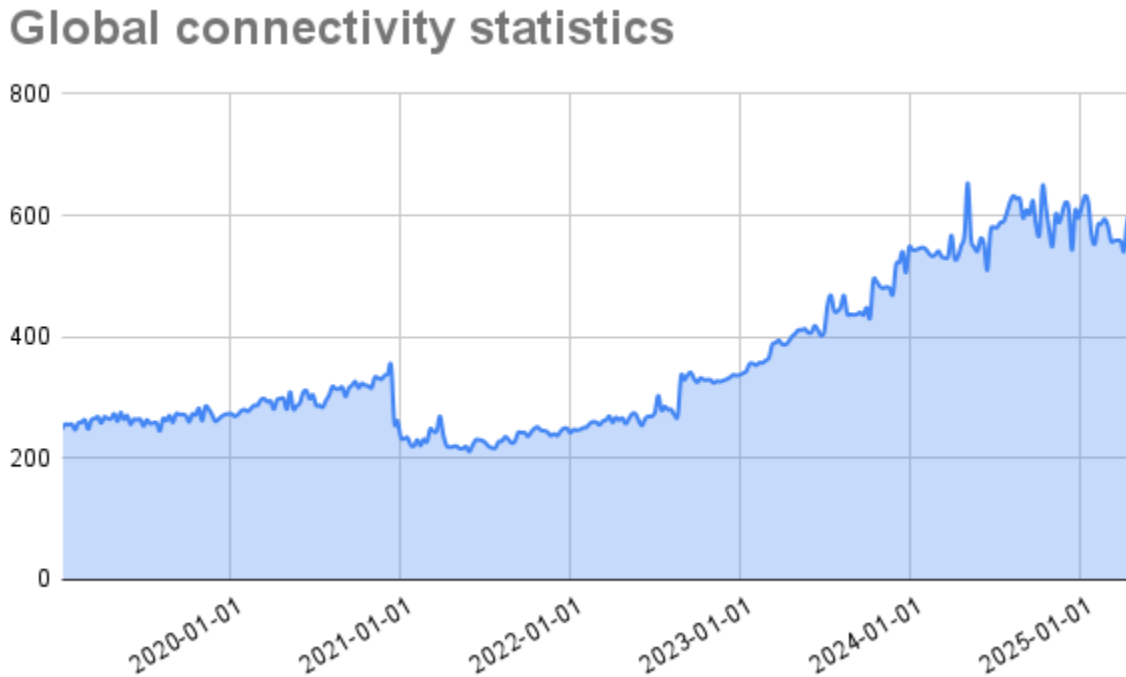
Global Connectivity Index: This index represents the total number of unique connections between each Estonian ASN and each external (foreign) ASN. Essentially, it measures how widely and diversely Estonia's internet segment is connected to the rest of the world. The higher this indicator, the more "windows" the country has to the global network.

Local Connectivity Index: This index is calculated as the total number of unique connections between different Estonian ASNs. It reflects the intensity and complexity of the domestic internet market, in particular the activity at internet exchange points (IXP). A high indicator speaks of a developed internal ecosystem that allows efficient exchange of traffic within the country, minimising delays and dependence on external channels for local data.

Analysis of the ratio of these two indices allows understanding the strategic orientation of the national network: whether it is predominantly self-sufficient or deeply integrated into global infrastructure. As the previous analysis showed, Estonia demonstrates high values of both indices,

which speaks of balanced development of both the internal internet ecosystem and its powerful integration into the global network.

Graph 5: Dynamics of Global Connectivity of Autonomous Systems in Estonia (2019–2025)

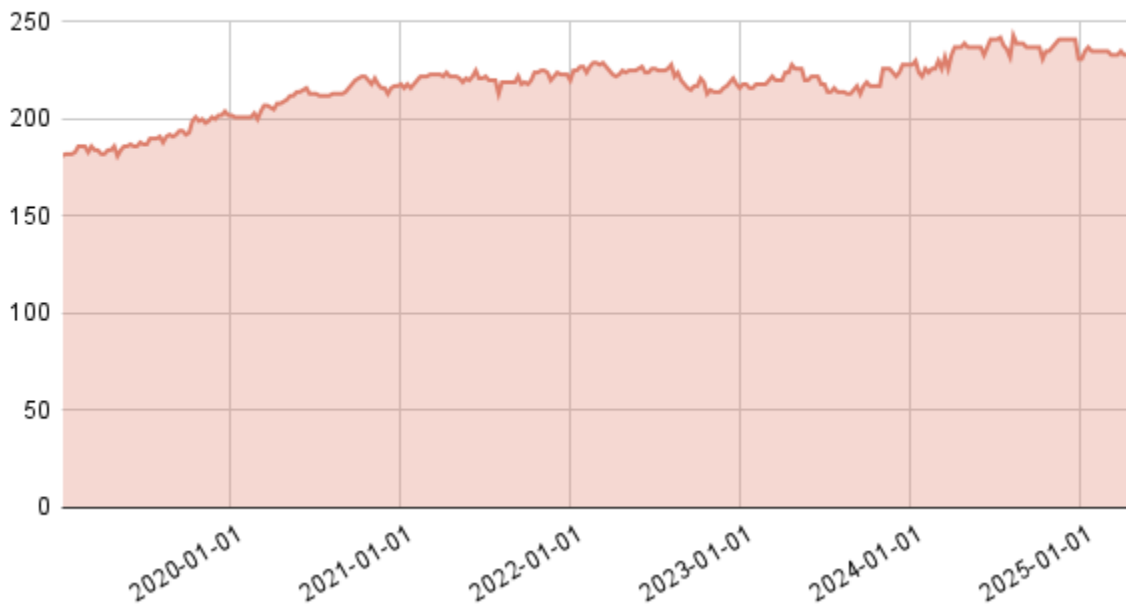


The graph illustrates a significant strengthening of the integration of Estonia's internet segment into the global network in recent years. Starting from 2022, there is a sharp and sustained growth in the number of unique connections between Estonian and foreign autonomous systems. The number of such connections has more than doubled — from approximately 250 to 600, which testifies to large-scale expansion of international channels and peering agreements.

Such dynamics speaks of a purposeful strategy to strengthen international connectivity. This may be due to the growth in the number of data centres, hosting providers and other IT companies oriented towards the global market. Increasing "windows to the world" enhances the resilience of the national network and creates a competitive environment for international transit, which is the foundation for the development of the digital economy.

Graph 6: Dynamics of Local Connectivity of Autonomous Systems in Estonia (2019–2025)

Local connectivity statistics

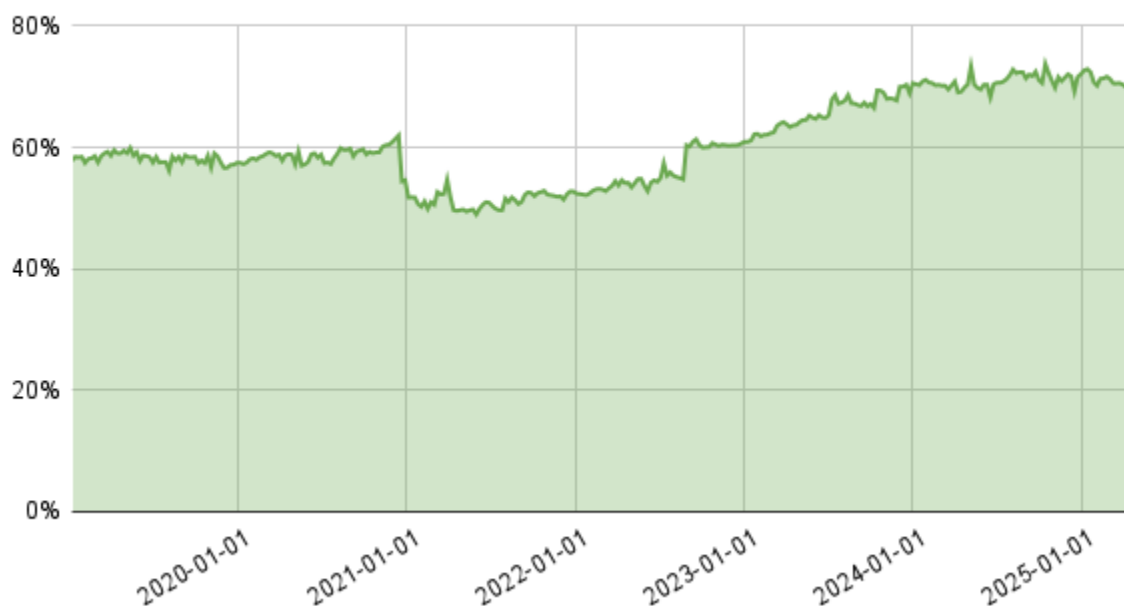


The local connectivity graph demonstrates a picture of a mature and steadily developing domestic internet market. Unlike the explosive growth of global connections, the number of unique connections between Estonian autonomous systems increased smoothly and organically, rising from 180 to 240 over the period under review. The absence of sharp jumps or falls indicates the stability and predictability of the internal peering ecosystem.

This moderate but constant growth reflects the ongoing development of internet exchange points (IXP) and strengthening of ties between local internet providers. The established infrastructure effectively handles traffic exchange within the country, ensuring low delays for users. The stable growth shows that the market continues to saturate and become more complex, but does so in an evolutionary, not revolutionary, way.

Graph 7: Dynamics of the Ratio of Global and Local Connectivity of Autonomous Systems in Estonia (2015–2025)

Total connectivity share



The share of global connections in the overall connectivity structure has grown since 2022. If previously a relative parity was observed, then by 2025 the share of international connections exceeded 70%, which indicates a clear strategic shift.

Such dynamics unequivocally speaks of the fact that Estonia's internet segment is actively transforming from a predominantly self-sufficient system into a powerful, outward-oriented international hub. While maintaining strong internal connectivity, the emphasis has shifted to maximum integration with the global network. This confirms the conclusions about the growth of digital services exports and strengthening of Estonia's role as an important node in the global internet infrastructure.

3. Internet Legislation

3.1. Principles of Internet Governance

Estonia positions itself as a supporter of a free, open and secure model of internet governance, based on a multistakeholder approach.⁸⁵ This means recognising the role not only of the state, but also of the private sector, technical community, academic circles and civil society in shaping rules and norms of network functioning. Estonia actively participates in international platforms such as the Internet Governance Forum (IGF), and is one of the founders of the Freedom Online Coalition (FOC), promoting the protection of human rights in digital space.⁸⁵

A fundamental principle of Estonia's approach is the recognition of digital rights — such as freedom of access to information, freedom of expression online, the right to privacy — as an integral part of human rights.⁸⁵ This is reflected in the country's high positions in international internet freedom rankings.⁸⁵ Another important principle underlying Estonia's model of e-state is the “once-only principle”, according to which a citizen must provide the same information to state authorities only once, after which it is reused through the secure X-Road data exchange system, which increases the efficiency and convenience of interaction with the state.³⁷ At the same time, commitment to an open internet in Estonia coexists with heightened attention to cybersecurity issues, which is due to both the high level of digitalisation of society and the country's geopolitical position.⁵³ This creates a certain tension between the desire for maximum internet freedom and the need to take measures to protect against cyber threats, disinformation and ensuring national security, which manifests itself, for example, in legislation on emergency situations or blocking of propaganda resources.⁶⁸

3.1.1. Regulation

The legal framework regulating the internet and electronic communications sector in Estonia consists of national laws that are largely harmonised with European Union legislation.⁹¹ Key acts are the Electronic Communications Act (*Elektroonilise side seadus*), the Information Society Services Act (*Infoühiskonna teenuse seadus*) and the Cybersecurity Act (*Küberturvalisuse seadus*).⁶⁷ These laws establish rules for communications operators, online service providers, define the powers of regulators, and measures to ensure network and data security.

The strategic direction of digital sphere development is set by national programmatic documents. The “Estonian Digital Society Development Plan 2030” (*Eesti digiühiskonna arengukava 2030*), adopted in 2021, defines ambitious goals, including ensuring ubiquitous access to high-speed internet (minimum 100 Mbit/s with the possibility of expansion to 1 Gbit/s), development of 5G networks and preparation for 6G, further improvement of e-government and increasing the level of cybersecurity.⁵³ Specific measures to achieve these goals are detailed in the Broadband

Development Plan to 2030 (published in 2023)⁶⁷ and the Cybersecurity Strategy for 2024–2030 (“Cyber-aware Estonia”).⁸⁹ Significant influence on Estonian regulation is exerted by EU legislation: directives and regulations (for example, GDPR, EU Electronic Communications Code, NIS Directive, Digital Services Act (DSA), Audiovisual Media Services Directive (AVMSD), eIDAS regulation) are directly implemented or taken into account when developing national norms.⁶⁷ This ensures a high level of harmonisation with European standards, but also means that regulatory approaches in Estonia are often determined by pan-European goals and compromises.

3.1.2. Regulatory Agencies and Responsible Persons

Estonia’s state system for regulating the internet and digital sphere includes several key agencies:

1. **Ministry of Justice and Digital Affairs (Justiits- ja Digiministeerium):** From 1 January 2025 this ministry became the central body responsible for shaping state policy in the field of digital society, development of electronic services, cybersecurity and telecommunications. These functions were transferred from the Ministry of Economic Affairs and Communications in order to better integrate legal and digital aspects of governance.⁶⁷
 - **Minister:** Liisa-Ly Pakosta (Eesti 200 party).⁵²
 - Official website: <https://www.justdigi.ee/>⁹⁶
2. **Consumer Protection and Technical Regulatory Authority (Tarbijakaitse ja Tehnilise Järelevalve Amet, TTJA):** This authority is the main technical regulator of the electronic communications market. Its tasks include supervision of communications operators, management of radio spectrum use (including issuance of 5G licences), ensuring network and service security, consumer rights protection in the communications sphere, as well as performing the functions of the national digital services coordinator (DSC) in accordance with the EU Digital Services Act (DSA).⁶⁵
 - **Director General:** Kristi Talving.¹⁰⁰
 - Official website: <https://www.ttja.ee/>⁹⁸
3. **State Information System Authority (Riigi Infosüsteemi Amet, RIA):** Under the Ministry of Justice and Digital Affairs.⁹⁶ RIA is responsible for the development, management and security of key components of Estonia’s e-state, such as the X-tee data exchange platform, the eesti.ee state portal, the electronic voting system. RIA also performs the functions of the National Cybersecurity Centre (NCSC-EE) and the Computer Incident Response Team (CERT-EE).¹⁰²
 - **Director General:** Joonas Heiter (from 1 March 2024).¹⁰⁵ (Previously this position was held by Margus Noormaa¹⁰⁴).
 - Official website: <https://www.ria.ee/>¹⁰²

4. **Data Protection Inspectorate (Andmekaitse Inspektsioon, AKI):** An independent body exercising supervision over compliance with personal data protection legislation, including GDPR.⁹³
 - Director General: Pille Lehis.¹⁰⁷
 - Official website: <https://www.aki.ee/>¹⁰⁸
5. **Competition Authority (Konkurentsiamet):** The body responsible for supervision over compliance with the Competition Act, prevention and investigation of anti-competitive practices, including abuse of dominant position in the market.¹⁰⁹ Although the telecommunications sector falls under its jurisdiction, specific investigations in this area were not covered in the available materials for 2023.¹⁰⁹
 - Official website: <https://www.konkurentsiamet.ee/>¹⁰⁹

The recent reorganisation, as a result of which digital policy functions were transferred to the Ministry of Justice⁹⁶, testifies to the desire for greater centralisation and coordination in managing Estonia's digital sphere.

3.2. Market Monopolisation

Estonian competition legislation (Konkurentsiseadus) prohibits abuse of dominant position and conclusion of agreements restricting competition.¹¹⁰ There are no special laws that would create or legalise monopolies in the electronic communications or internet sector. State policy is aimed at developing free and fair competition.⁶⁸

However, the actual situation in key markets is characterised by a high degree of concentration. In the fixed broadband access market, Telia Eesti AS and Elisa Eesti AS dominate, jointly with STV AS controlling about 92% of the subscriber base.⁶³ A similar situation is observed in the mobile communications market, where the main players are Telia, Elisa and Tele2 Eesti AS.³⁹

Recognising the risks associated with such concentration, the regulator (TTJA) applies antitrust regulation tools. In particular, Telia was recognised as an undertaking with significant market power (SMP) in the markets for access to cable infrastructure and wholesale network access services.⁶⁵ In this regard, Telia was imposed special obligations (SMP obligations), including the obligation to provide competitors with non-discriminatory access to its infrastructure (for example, cable ducts, copper and fibre-optic lines) on regulated terms.⁶⁵ The purpose of these measures is to reduce barriers to market entry for alternative operators and stimulate competition at the retail services level, especially in areas where building parallel networks is economically unfeasible. The regulatory

approach thus focuses on ensuring access to existing infrastructure, rather than structural separation of dominant companies.

3.3. Internet Shutdowns on Government Orders

Estonian legislation provides for the possibility of temporary restriction or suspension of networks and communications services in exceptional circumstances. The main document regulating such measures is the Emergency Act (Hädaolukorra seadus).¹¹² According to article 33 of this law, during a declared emergency situation (eriolukord), the emergency leader (eriolukorra juht) has the right to issue a prescription (ettekirjutus) to the communications operator (sideettevõtja) to restrict the provision of communications services or access to the communications network for the end user (lõppkasutaja), if this is necessary to resolve the emergency situation.⁹⁰ An emergency situation may be declared by the government in the event of a natural disaster, catastrophe or to prevent the spread of a dangerous infectious disease.¹¹²

In addition, the Cybersecurity Act (Küberturvalisuse seadus) provides the government with limited powers to temporarily restrict the use of or access to information systems in the event of a serious cyber incident threatening national security or the functioning of critical services.⁶⁸

The procedure for restricting communications during an emergency involves issuing a written prescription from the emergency leader to the communications operator.¹¹³ The law does not specify specific technical methods for implementing such restrictions (for example, complete shutdown, blocking of certain protocols or services, throttling). It is important to note that, despite the existence of these legislative provisions, in the period from 2019 to 2025 there were no recorded cases of their application for complete or large-scale shutdown of internet access in Estonia.⁶⁸ Even during such crises as the COVID-19 pandemic or heightened geopolitical tension after Russia's full-scale invasion of Ukraine, the authorities did not resort to shutdowns. This testifies to a high threshold for applying such measures and, likely, to a strong commitment to the principles of an open internet, despite the existence of legal grounds for restrictions in extraordinary conditions.

3.4. Legislation on "Words on the Internet"

In Estonia, there is no separate law dedicated exclusively to regulating "fake news" or disinformation on the internet. Liability for online statements is regulated by general norms of legislation concerning freedom of speech, its restrictions (for example, protection of reputation, prohibition on inciting enmity), as well as provisions of the Penal Code (Karistusseadustik).

A key article of the Penal Code relevant to online statements is Article 151 "Incitement to enmity" (Vaenu õhutamine).¹¹⁴ In the edition in force until 2023, it provided for liability for public calls to hatred, violence or discrimination on various grounds (nationality, race, colour, sex, language, origin, religion, sexual orientation, political beliefs, financial or social status) only if such actions created a real danger to the life, health or property of a person.¹¹⁴

In 2023, significant amendments were made to the Penal Code, expanding the scope of liability for statements.¹¹⁶ First, the wording of Article 151 was changed: the requirement for the presence of direct danger to life, health or property was removed. Instead, liability was introduced for incitement to enmity if it is committed "in a manner that may threaten public order" (manner likely to threaten public order).¹¹⁶ Second, a new article 151¹ "Support and justification of international crime" (Rahvusvahelise kuriteo toetamine ja õigustamine) was added.¹¹⁷ This article criminalises public support or justification of an act of aggression, genocide, crime against humanity or war crime, as well as public denial or gross trivialisation of such crimes.¹¹⁷

These amendments were motivated by the need to combat dangerous rhetoric and propaganda, especially in the context of the war in Ukraine, but raised concerns about possible restriction of freedom of speech.¹¹⁶ The new norms were applied already at the end of 2023, when proceedings were initiated against five participants in a demonstration in support of Palestine under article 151¹ for using the slogan "From the river to the sea Palestine will be free", which the authorities considered justification of aggression.¹¹⁶ This case demonstrated a lowering of the threshold for applying liability for statements and caused public discussion about the boundaries of permissible expression of opinion.¹¹⁶

In addition to criminal legislation, the regulation of content in Estonia is influenced by EU norms, in particular the Digital Services Act (DSA), which establishes rules for online platforms to combat illegal content and disinformation.⁹⁰ Bills aimed at restricting broadcasting of foreign state propaganda channels, especially from Russia and Belarus, were also discussed (but not adopted in the original form).⁹⁵

3.5. Legislation on Internet Blocking

In Estonia, there is no single comprehensive law that would regulate all aspects of blocking internet resources. The practice of blocking is based on provisions of several different legislative acts, applied depending on the type of content or activity subject to restriction. The main areas where the possibility of blocking is legally enshrined are illegal gambling and, recently, implementation of

EU sanctions and regulator decisions in the field of national security. Blocking for copyright infringement is also actively discussed.

3.5.1. Legislation

- **Gambling Act (Hasartmänguseadus):** Article 56 of this law directly obliges internet service providers (ISP) to block access to websites offering gambling to Estonian users without the corresponding licence issued by the Tax and Customs Board (Maksu- ja Tolliamet, MTA). The MTA maintains and provides providers with a list of such illegal resources.¹¹⁸
- **Electronic Communications Act (Elektroonilise side seadus):** The law itself does not contain general provisions on blocking content based on its content. However, it establishes general obligations for communications operators to comply with lawful prescriptions of the regulator — the Consumer Protection and Technical Regulatory Authority (TTJA).⁹² It is on the basis of these powers and in the context of implementing EU sanctions, as well as national security considerations, that TTJA issued prescriptions to block Russian state media after February 2022.⁶⁸ Amendments to the law that came into force in 2022 also introduced a procedure for obtaining permission from TTJA for the use of certain equipment and software in communications networks, which theoretically could be used to prohibit technologies deemed unsafe.⁶⁸
- **Copyright Act (Autoriõiguse seadus):** In the current edition, the law does not provide for a mechanism for blocking websites as a means of combating copyright infringement. However, in 2023–2024 the Ministry of Justice initiated the development of amendments that would give TTJA the right to require providers to block access to sites systematically infringing copyright, upon application from copyright holders.¹²² This initiative caused significant criticism from organisations protecting digital rights, fearing excessive expansion of blocking practices and threats to freedom of information.¹²²

3.5.2. Blocking Procedures

Procedures for blocking internet resources in Estonia vary depending on the grounds:

- **Blocking of illegal gambling sites:** The Tax and Customs Board (MTA) forms and updates a list of domain names subject to blocking. This list is transmitted to internet providers, who are obliged to technically restrict access to the specified URLs. After that, the law does not

specify the technical blocking method, but in practice DNS blocking (redirecting the request) or IP blocking (prohibiting access to the server IP address) are often used.¹¹⁸

- **Blocking by TTJA decision:** TTJA, acting within its powers (for example, to ensure implementation of EU sanctions or protection of national security), issues an administrative order (order) to specific or all internet providers in the country requiring blocking of access to certain websites or online broadcasts.⁶⁸ Providers are obliged to comply with this order.
- **Proposed procedure for blocking for copyright infringement:** According to the discussed amendments¹²², the procedure would involve the following steps: 1) The copyright holder notifies the infringing site owner of the infringement and demands to stop it. 2) If the infringement continues, the copyright holder applies to TTJA. 3) TTJA, having considered the application, may issue an order to internet providers to block access to the infringing site. Failure to comply with the order by the provider could entail a fine. This procedure has not yet been put into effect.

Expansion of grounds for blocking, especially after 2022 (blocking of Russian media⁶⁸) and discussion of blocking for copyright infringement¹²², indicates a trend towards more active use of this tool for regulating online content. This causes concerns among digital rights defenders regarding possible "sliding" to censorship and restrictions on access to legal information.¹²²

3.5.3. Registries of Blocked Internet Resources

Transparency of blocking procedures is ensured by the presence or absence of public registries of blocked resources. In Estonia, the situation with registries is ambiguous:

- **Registry of illegal gambling sites:** The Tax and Customs Board (MTA) maintains a **public and open** list of websites to which access must be blocked by providers in accordance with the Gambling Act.¹¹⁸ This list is available for review to anyone interested. Moreover, there are unofficial, community-maintained machine-readable versions of this list (for example on GitHub¹²⁴), which ensures a high level of transparency and allows the use of the list in automated content filtering systems. As of March 2024, this list contained more than 1800 URLs.⁹⁰
- **Registry of resources blocked on other grounds (for example by TTJA decision):** Unlike the list of gambling sites, there is **no official, single and publicly available registry** of sites blocked by TTJA prescriptions (for example on the basis of EU sanctions or national security considerations). Information about such blocking appears fragmentarily in TTJA press releases⁶⁸ or in reports of international organisations such as Freedom House.⁶⁸ The absence of such a centralised and public registry creates a transparency deficit in relation to blocking

not related to gambling. This makes it difficult for public control, independent analysis of the scale and validity of such blocking, especially given the potential expansion of grounds for their application.¹²²

- **Official list of blocked gambling sites:** The link to the official list on the Tax and Customs Board website (MTA) was not found in the provided materials. It should be searched directly on the MTA website (<https://www.emta.ee/>).
- **Unofficial machine-readable list of blocked gambling sites:**
 - GitHub repository: (<https://github.com/elliottwutingfeng/Estonia-Blocked-Gambling-Websites>).¹²⁴ This resource aggregates data from the official MTA list and presents them in formats convenient for use in content filtering systems.
- Lists of resources blocked by TTJA:
 - There is no official public registry. Information should be searched in the news sections of the TTJA website (<https://www.ttja.ee/>) or in reports of independent organisations such as Freedom House (<https://freedomhouse.org/>).⁶⁸

3.5.4. Development of Blocking

Data from the Open Observatory of Network Interference (OONI), which specialises in measuring internet censorship worldwide, for Estonia are limited and do not allow unambiguous conclusions about the dynamics of blocking.¹²⁵ Although OONI has recorded more than 2 million measurements from Estonia since 2015, their volume and distribution over time and networks are insufficient to build representative graphs of blocking by site categories or specific domains in recent years.¹²⁵ No specialised country reports from OONI on Estonia have been published.¹²⁵

Nevertheless, reports from other organisations, in particular Freedom House, confirm that prior to 2022 blocking practice in Estonia was quite limited and applied almost exclusively to unlicensed gambling sites in accordance with the Gambling Act.²² The situation changed dramatically after Russia's full-scale invasion of Ukraine in February 2022. In response to this event and in accordance with European Union sanctions, the Estonian regulator TTJA ordered providers to block access to a significant number (more than 50 websites and more than 40 TV channels by the end of 2022) of Russian and pro-Kremlin media resources, regarded as tools of propaganda and disinformation.⁶⁸ This measure became unprecedented in scale for Estonia.

In addition, ongoing discussions on amendments to the Copyright Act to introduce a mechanism for blocking sites infringing copyright¹²² testify to a potential trend towards further expansion of grounds and practice of blocking in the country.

Conclusion: The practice of blocking internet resources in Estonia underwent significant changes in the period 2022–2023, evolving from a narrowly focused measure against illegal gambling to a tool actively used in the context of geopolitical crisis to counter foreign propaganda. There is legislative and political initiative to further expand the application of blocking (protection of copyright). However, the lack of systematic data from independent monitoring projects (OONI) and the absence of an official public registry of blocked resources (except gambling sites) make it difficult to fully assess the current scale of internet censorship and its impact on freedom of information in Estonia.

4. Human Rights Violations on the Internet

Estonia is generally characterised by a high level of human rights protection in the digital environment and enjoys a reputation as a country with free internet.⁶⁸ In Freedom House "Freedom on the Net" reports, Estonia consistently receives a "Free" rating⁶⁸, occupying leading positions in world internet freedom rankings.⁸⁵ The state's constitution and legislation guarantee basic rights and freedoms, including freedom of speech and privacy, which extend to the online sphere.⁸⁷

Nevertheless, in the period under review, individual incidents were recorded and potential risks to digital rights were identified. These include large-scale blocking of Russian media websites undertaken after 2022⁶⁸, which, although justified by EU sanctions and security considerations, represent a restriction on access to information. Concerns are also raised by the expansion of legislation on liability for statements.¹¹⁶ There are also concerns related to possible use of surveillance technologies by the state.²² In addition, the precedent decision of the European Court of Human Rights in the case "Delfi AS v Estonia"¹²⁷ established liability of online platforms for user comments, which may have a chilling effect on freedom of discussion in the network.

4.1. Internet Shutdowns on Government Orders

In the period from 2019 to 2025, there were no recorded cases in Estonia of intentional shutdown of internet access (shutdowns) or large-scale restrictions on communications networks by order of state authorities.⁶⁸

Although national legislation, in particular the Emergency Act (Hädaolukorra seadus), theoretically provides the government with powers to restrict communications networks in a declared emergency situation⁶⁸, in practice these powers have not been used to shut down the internet. Even during the massive cyberattacks of 2007, which led to temporary unavailability of many Estonian websites, internet shutdown was not carried out; the disruptions were caused by the attacks

themselves (mainly DDoS).¹³⁰ The absence of practice of applying shutdowns confirms Estonia's commitment to maintaining open and continuous access to the network.

4.2. Criminalisation of Statements on the Internet

Cases of bringing to legal liability (administrative or potentially criminal) for statements on the internet in Estonia have taken place, although they were not mass in nature.

The most notable example in recent times was the **case related to a demonstration in support of Palestine in Tallinn in November 2023**. After this action, the police initiated administrative offence proceedings (misdemeanor proceedings) against five people.¹¹⁶ The grounds were the use of the slogan "From the river to the sea, Palestine will be free", which the authorities interpreted as falling under the action of the new article 151¹ of the Penal Code ("Support and justification of international crime").¹¹⁶ This became the first resonant application of the 2023 amendments, which expanded the composition of crimes related to incitement to enmity and justification of aggression, removing the requirement for direct danger and adding the criterion of threat to public order (§151) and liability for justification of international crimes (§151¹).¹¹⁶ The participants faced a fine of up to 1200 euros or administrative arrest for up to 30 days.¹¹⁶ This case demonstrated a lowering of the threshold for applying liability for statements and caused public discussion about the boundaries of permissible expression of opinion.¹¹⁶

Another important, although not criminal, case that influenced the regulation of online statements was **the decision of the European Court of Human Rights (ECtHR) in the case "Delfi AS v Estonia" (2015)**.¹²⁷ The ECtHR confirmed the decision of Estonian courts to hold the news portal Delfi to civil liability for insulting and hate-inciting comments left by anonymous users under one of the articles. The court considered that the portal, as a commercial enterprise providing a platform for comments, bears "duties and responsibilities" and should have taken more effective measures to prevent publication and promptly remove illegal content, even without prior notification.¹²⁹ Although this case did not concern direct persecution of statement authors, it established a precedent for liability of internet intermediaries in Europe and influenced content moderation policy.

In an earlier period, **Dmitry Galushkevich was fined in 2008** for participating in a DDoS attack on the Reform Party website during the 2007 cyberattacks.¹³⁰ This case relates rather to cybercrime than to persecution for the content of statements, but illustrates the application of sanctions for actions in the network.

Overall, for the period 2019–2025, the focus of law enforcement in relation to online statements, judging by available data, shifted towards countering incitement to hatred and justification of

aggression, which is largely related to the aggravation of the international situation after 2022 and corresponding changes in the Penal Code.

4.3. Persecution of Media and NGOs

Based on the analysed materials, no specific cases of criminal or administrative persecution of media or non-governmental organisations (NGOs) registered in Estonia directly for the content of their online materials in the period from 2019 to 2025 were identified.¹³⁵ Human rights reports and other sources do not contain information about such cases.¹³⁶

Nevertheless, there are factors indicating the presence of potential risks and pressure on the media environment:

1. **Political pressure and rhetoric:** International organisations such as Reporters Without Borders (RSF) noted cases of threats and pressure on journalists from politicians, which may create a "chilling effect" and contribute to self-censorship.⁸⁷
2. **Liability for user content:** The Delfi v Estonia precedent¹²⁷ imposes significant liability on online platforms for user content, which may lead to excessive moderation and removal of legal statements.
3. **Legislative initiatives:** Bills were discussed that could strengthen control over the media space. For example, the initial version of amendments to the media law aimed at combating propaganda caused criticism due to potential interference in editorial independence.⁹⁵ The proposal to introduce blocking of sites for copyright infringement is also seen as a potential threat to freedom of access to information.¹²² Although these initiatives were either softened or are at the discussion stage, they create an atmosphere of uncertainty.
4. **Blocking of foreign media:** The large-scale blocking of Russian state media after February 2022⁶⁸, although aimed at external sources of propaganda, creates a precedent for restricting access to media content on security grounds.

Thus, although direct persecutions of Estonian media and NGOs for their online publications are not recorded, there are indirect factors of pressure and potential legislative risks that may influence media freedom in the country. Strategic lawsuits against public participation (SLAPP), although a problem in Europe¹³⁷, specific examples of such lawsuits against Estonian online media are not mentioned in the provided materials.¹³⁸

5. Civil Society in the Field of Internet Governance

Estonia's civil society plays an active role in shaping the digital environment and discussing issues related to internet governance and digital rights. This corresponds to the multistakeholder model of internet governance adopted in the country, which assumes participation of all stakeholders – state, business, technical community and NGOs – in developing policy and standards.⁸⁵

Estonian NGOs and activists engage in a wide range of activities: from educational programmes on cybersecurity, media literacy and data protection to monitoring legislation and advocating internet freedoms.¹³⁹ They participate in public discussions of legislative initiatives concerning the internet, expressing their position and concerns, as this was, for example, with proposals for blocking sites for copyright infringement¹²² or metadata regulation.¹⁴⁰ There are organisations purposefully working on improving digital literacy and security of various population groups, including youth, elderly and people with special needs.¹³⁹

5.1. Organisations

Several organisations operate in Estonia dealing with digital rights, internet freedoms and digital literacy:

- **Estonian Human Rights Centre (Eesti Inimõiguste Keskus):** Estonia's leading human rights organisation, which also deals with digital rights issues within its overall mission. The Centre implements educational projects, for example the "Cybergram" platform, designed to raise awareness among youth and teachers about data protection, cybersecurity and information technologies.¹³⁹ The organisation also publishes annual reports on the state of human rights in Estonia, including a section on freedom of speech, where internet freedom issues are addressed.⁸⁷
 - Website: <https://humanrights.ee/en/>
- **Internet Society Estonia Chapter (MTÜ Netikogukond / ISOC-EE):** Estonian branch of the international organisation Internet Society. The mission of ISOC-EE is to promote and protect internet freedoms and rights in Estonia under the slogan "Internet is a human right!".¹⁴⁰ The organisation actively opposes measures that may restrict freedom of expression online, such as mass metadata collection or excessive content regulation.¹⁴⁰ ISOC-EE participates in discussions of national and European legislation concerning the internet and seeks to raise public awareness of these issues.¹⁴⁰
 - Website: <http://isoc.ee/>¹⁴²
- **MTÜ Videoõps:** A non-profit organisation creating educational video materials. In 2025 it received a grant from the Estonian Internet Foundation (EIS) to create a series of short videos

on cybersecurity and safe behaviour on the internet, intended for both schoolchildren and adults.¹³⁹

- Website: (not specified in snippets, possibly related to educational platforms)
- **NGO VitaTiim:** An organisation working with youth, including in Narva. Received an EIS grant in 2025 for the "CyberSafe" project aimed at teaching youth to recognise cyber threats (spam, trolling) and internet freedom issues.¹³⁹ The organisation also participates in European Solidarity Corps programmes, focusing on empowering youth through digitalisation and sustainable development.¹⁴³
 - Website: <https://www.vitatiim.ee/>¹⁴³
- **Other organisations:** The Estonian Internet Foundation (EIS) also supports projects of various schools (Vivere School, Toila Gymnasium, Kurtina School, Tallinn French Lyceum), NGOs (Kristler-Risto Estonia Foundation, Hacker Room NGO, MTÜ Kostivere Huvikeskus, Perekodu/Jaagu School, MTÜ Kübertalentide), aimed at improving digital literacy, media literacy, cyber hygiene and security among schoolchildren, teachers, parents and people with special needs.¹³⁹

Note: MTÜ Institute of Digital Rights¹⁴⁵ and HAMLEH- THE CENTER FOR PROMOTION OF DIGITAL RIGHTS MTÜ¹⁴⁶ are mentioned in registries, but the first organisation was liquidated in 2017, and the second was registered in 2023 and information about their active activities in the field of protecting digital rights in Estonia is absent in the provided materials.

5.2. VPN and Blocking Circumvention Tools

The use of VPN (Virtual Private Network) and other blocking circumvention tools is legal in Estonia.¹⁴⁷ The country adheres to the principles of internet freedom and does not impose restrictions on the use of such technologies for privacy protection or access to geo-restricted content.¹¹⁹ Estonia recognises access to the internet as a human right and does not hinder the use of tools that ensure anonymity and bypassing of restrictions.¹¹⁹

However, as in any other country, the use of VPN for committing illegal actions (for example, copyright infringement, cybercrimes) remains unlawful.¹⁴⁹ Blocking of certain resources (illegal gambling, Russian propaganda sites) is carried out at the level of internet providers by order of the authorities (MTA or TTJA)⁶⁸, and VPN is one of the ways to bypass such blocking.

5.2.1. Status of VPN Services

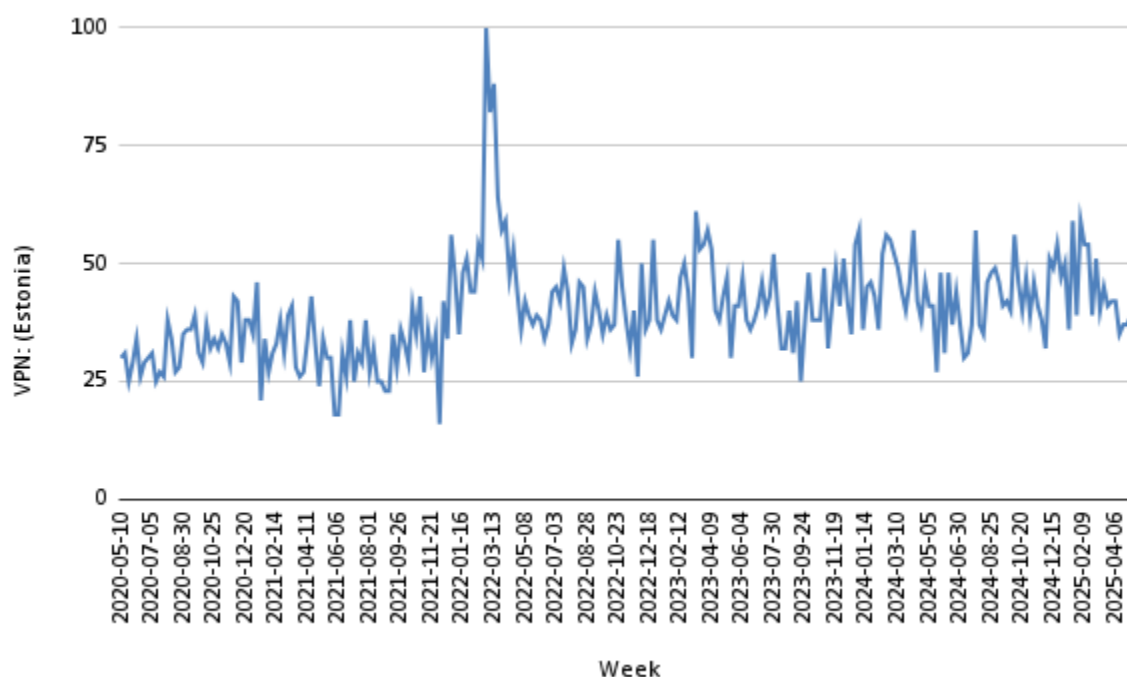
The use of VPN in Estonia is **fully legal**.¹⁴⁷ There are no special laws that would prohibit or restrict the use, advertising or sale of VPN services for ordinary users. Estonia is characterised as a country with a high level of internet freedom, where the government does not interfere in the use of such tools.¹¹⁹

Legislation regulating the internet sphere (for example, the Electronic Communications Act, the Information Society Services Act) does not contain provisions directed against VPN. On the contrary, the principles of data protection (GDPR, Estonian Personal Data Protection Act⁹³) and the right to privacy indirectly support the use of tools that enhance online privacy.

5.2.2. Number of VPN Users

The provided materials **lack** specific statistical data or tables showing the dynamics of the number of VPN users in Estonia for the period from 2019 to 2025.¹⁵¹ General reports on global VPN use mention Estonia as a country with a high level of internet freedom, where VPN use is not restricted¹⁵², but do not provide specific figures on the penetration of VPN services among the population.

Graph 8: Dynamics of Search Queries for VPN in Estonia (2020–2025)



Source: *trends.google.com*

The graph demonstrates relatively stable, although fluctuating, interest in VPN services throughout the entire period, which is the norm for any country. However, against this background, one anomalous and unprecedented peak stands out, reaching the maximum value of 100 points at the end of February – beginning of March 2022.

This surge is directly related to the events that followed the start of Russia's full-scale invasion of Ukraine. On 25 February 2022, the Estonian Consumer Protection and Technical Regulatory Authority (TTJA) issued an order obliging telecommunications companies to block access to a number of Russian and Belarusian sites that were recognised as distributors of military propaganda and disinformation. The blocking created an instant demand for tools to bypass it. VPN, as the main method for masking one's location and accessing blocked resources, became the most sought-after solution, which was reflected in the search statistics.

5.2.3. Blocking of VPN Services:

At present, there is **no evidence** that the Estonian authorities are purposefully blocking access to VPN services themselves or their websites.¹⁵⁵ Reports from Freedom House and other organisations do not mention Estonia among the countries practising VPN blocking.¹⁵⁵

Although the regulator TTJA has the technical capability to order blocking of IP addresses or domains⁶⁸, this capability is used to block specific illegal resources (gambling, propaganda), and not VPN infrastructure as such. Theoretically, providers can block known IP addresses of VPN servers or use Deep Packet Inspection (DPI) to identify and block VPN traffic¹⁵⁷, but there are no data on the application of such methods in Estonia by order of the authorities.

5.2.4. Cases of Persecution for Using VPN

The provided materials contain no information about cases of criminal or administrative persecution of citizens or organisations in Estonia for the very fact of using VPN services.¹⁵⁸ Since the use of VPN is legal¹⁴⁹, persecution is possible only if VPN is used as a tool for committing another offence (for example, cybercrimes, copyright infringement, access to child pornography).

The case of the Apotheka database hack¹⁵⁹ mentions the use of VPN as one of the measures to protect corporate systems, but not as an object of persecution. The international operation against the DoubleVPN service¹⁵⁸, which was used by cybercriminals, was coordinated by Europol and affected infrastructure in different countries, but does not contain mentions of persecution of users specifically in Estonia. The Estonian Penal Code provides for liability for illegal access to computer systems (§ 217) or interference in their operation (§ 207)¹⁶⁰, but these articles concern the criminal act itself, and not the tool (VPN) that could have been used in doing so.

5.2.5. Monitoring of Blocking

There are several international resources that monitor blocking of internet resources and censorship worldwide, and their data can be used to monitor the situation in Estonia:

- **OONI (Open Observatory of Network Interference):** A project collecting data on internet censorship using its OONI Probe software. Provides open data and tools for their analysis.¹²⁵ However, as noted above, data for Estonia are limited.¹²⁵
 - Website: <https://ooni.org/>, data for Estonia: <https://explorer.ooni.org/country/EE>¹²⁵

- **Freedom House (Freedom on the Net):** Annual reports analysing the level of internet freedom in different countries, including information on blocking, censorship and violations of user rights.²¹ Reports on Estonia are available on their website.
 - Website: <https://freedomhouse.org/>²¹
- **NetBlocks:** An organisation monitoring internet shutdowns and platform blocking in real time worldwide using its own measurement methods.¹⁶² Publishes reports on incidents.
 - Website: <https://netblocks.org/>¹⁶²
- **Censored Planet:** Another observatory monitoring the availability of websites worldwide and providing open data.¹⁶⁴
 - Website: (not specified in the snippets, but easily found by search)
- **MTA Registry:** Official public list of blocked illegal gambling sites in Estonia.¹¹⁸
 - Website: (on the website of the Estonian Tax and Customs Board)

Digest of messages about blocking in Estonia (2019–2025):

- **Before 2022:** Main blocking concerned unlicensed gambling sites according to the MTA list.²² The number of sites in the list gradually grew, exceeding 1600 by the beginning of 2021²² and 1800 by March 2024.⁹⁰ Other types of blocking were extremely rare.
- **February–March 2022:** In response to Russia's invasion of Ukraine and in accordance with EU sanctions, the regulator TTJA ordered providers to block access to a number of Russian state TV channels (RTR-Planeta, RTVI, Rossiya 24, NTV Mir and others) and news sites (ntv.ru, ren.tv, 1tv.com, lenta.ru, tass.ru, Sputnik, RT and others).⁶⁸ The total number of blocked resources (TV and web) exceeded 50.⁶⁸
- **2023:** Blocking of Russian media introduced in 2022 continued to operate. Freedom House reported almost 200 blocked sites as of the report period.¹²⁰ Discussions began on legislative amendments allowing blocking of sites for copyright infringement by TTJA order.¹²²
- **2024–2025:** Discussion of blocking for copyright infringement continues.¹²² No new large-scale blocking comparable to the blocking of Russian media has been reported.

6. Conclusion

Analysis of the state of the internet and digital rights in Estonia for the period from 2019 to 2025 shows a complex picture combining leadership in digitalisation and a high level of internet freedom with growing challenges in the field of security and content regulation.

Compliance with human rights in the field of access to information:

Overall, the right to access information and freedom of expression online in Estonia are **observed at a high level**. Internet infrastructure is well developed, access is widely spread in both fixed and mobile segments, and the cost of services is relatively affordable.²¹ The state actively promotes digital services and adheres to the principles of open internet and multistakeholder governance.³⁷ Cases of direct state censorship of editorial content of Estonian media or persecution of NGOs for their online activities are not recorded.¹³⁶ The use of VPN and blocking circumvention tools is legal and not persecuted.¹¹⁹

However, there are **alarming trends and potential risks**:

1. **Expansion of blocking practice:** Large-scale blocking of Russian media from 2022⁶⁸, although justified by extraordinary circumstances and EU sanctions, created a precedent for restricting access to information on security grounds. The discussed introduction of blocking for copyright infringement¹²² may further expand this practice, potentially affecting legal content as well. The opacity of blocking procedures (absence of a single public registry for non-gambling sites⁶⁸) exacerbates these risks.
2. **Tightening of legislation on statements:** Amendments of 2023 to the Penal Code (§151, §151¹)¹¹⁶, lowering the threshold for persecution for incitement to enmity and justification of aggression, create potential for a “chilling effect” on freedom of speech, especially in relation to acute political topics, as shown by the case of the pro-Palestinian demonstration.¹¹⁶
3. **Liability of intermediaries:** The Delfi v. Estonia precedent¹²⁷ imposes significant liability on online platforms for user content, which may lead to excessive moderation and removal of legal statements.
4. **Potential surveillance risks:** Reports of Estonia’s possible acquisition of surveillance technologies²² raise concerns about the protection of citizens’ privacy, despite existing legislative guarantees.

Forecast of events development:

- **Neutral scenario:** Estonia will maintain a high overall level of internet freedom and continue development of the digital state. Blocking practice will remain limited to the most serious cases (illegal gambling, sanctioned resources, possibly mass copyright infringement if the law is adopted). Legislation on statements will be applied selectively, mainly in the context of explicit incitement to hatred or justification of aggression. The level of digital rights overall will remain stable, but tension between freedom and security will persist.
- **Positive scenario (liberalisation):** The authorities will show restraint in applying blocking, possibly introduce more transparent procedures and registries for non-gambling blocking. A

clear and narrow enforcement practice will be developed for articles on incitement to enmity, minimising risks to freedom of speech. Public and parliamentary control over the activities of special services in the digital sphere will be strengthened. Development of digital services will continue with emphasis on convenience and protection of user rights.

- **Negative scenario (strengthening of censorship and control):** Against the background of ongoing geopolitical tension or under the pretext of combating disinformation and cyber threats, blocking practice may expand, including through adoption of the law on blocking for copyright infringement and its broad interpretation. Application of articles on incitement to enmity may become more frequent and affect a wider range of statements. Attempts may be made to restrict anonymity on the network or strengthen control over communication platforms (for example, through registration requirements or cooperation with authorities). Possible strengthening of covert surveillance. This will lead to gradual narrowing of the space for free expression of opinion and increased risks to citizens' digital rights. The neutral scenario with elements of the negative one seems most likely, since the geopolitical situation and the need to comply with pan-European regulatory requirements (for example, DSA) will push towards maintaining and potential expansion of control and blocking measures, while strong democratic institutions and commitment to digital freedoms will restrain excessive tightening.

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