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ICT Providers

SURVEY ON THE INTERNET SERVICE PROVIDER SECTOR IN BRAZIL

2024

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Brazilian Network Information Center

ICT Providers

SURVEY ON THE INTERNET SERVICE PROVIDER SECTOR IN BRAZIL

2024

Brazilian Internet Steering Committee
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São Paulo
2025

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Foreword

A successor to Arpanet, the Internet was maintained in its first decades by research funds, such as the National Science Foundation (NSF) in the United States, and by the institutions connected to it. Throughout this period—which lasted until the mid-1990s—the Internet was used mainly for the communication of supercomputing centers and universities, without aiming for self-sustainability. With its widespread dissemination more than three decades later, we can say that the Internet has become mature, and is made up of a very complex ecosystem structured on layers of physical infrastructure, connection protocols, and a wide range of applications.

This maturation process, in addition to the search for Internet sustainability, has involved technical challenges of scalability and security, in addition to interaction with political and regulatory bodies. It has gone through many stages and an extensive multisectoral and international effort to define Internet governance arrangements that are capable of balancing diverse interests and guaranteeing stability, interoperability, and expansion. In the Brazilian case, the establishment of multisectoral, democratic, and collaborative governance was solidified with the creation of the Brazilian Internet Steering Committee (CGI.br) and the institutionalization of the Brazilian Network Information Center (NIC.br), which includes Registro.br, responsible since 1989 for registering domain names with the "last name" .br. In this way, it was possible to guarantee not only the Internet governance framework, already defined by Standard 4 of 1995, but also self-sufficiency in the technical management of names and numbers, making it possible to reinvest in the expansion and improvement of the Internet infrastructure in Brazil.

In addition to managing the registration and publication of .br domain names, and allocating autonomous system numbers (ASN) and Internet protocol (IP) addresses in versions 4 and 6, it carries out a number of other actions, all linked to the promotion of fundamental values for the Internet, such as integrity, interoperability, and accessibility.[1] These actions include supporting research centers with funds from Registro.br, holding national and international events, and promoting actions aimed at expanding the infrastructure and protecting users on the Internet, always with the goal of making the Internet increasingly accessible and safe. Another fundamental aspect is CGI.br's role in fostering constant and careful dialogue about the use of the Internet by individuals, enterprises, and the government.

[1] More information at https://principios.cgi.br/sobre

While technological advances bring countless possibilities, it is also true that new challenges need to be faced collectively if the Internet's guiding principles are to be preserved. In recent years, for example, the growing adoption of mobile devices and Artificial Intelligence (AI) technologies by individuals and organizations has brought to the fore issues such as privacy and data protection, the proliferation of false or misleading content, and the potentially harmful excessive use of digital devices by children. Several events promoted by NIC.br in 2024 addressed these issues, enabling multisectoral reflections anchored in data. Some examples are the 15th edition of the Seminar on Privacy and Personal Data Protection,[2] the 9th Symposium on Children and Adolescents on the Internet,[3] and the seminar launching the Brazilian Artificial Intelligence Observatory (OBIA),[4] which operates under NIC.br.[5]

It is also worth highlighting the participation of CGI.br and the collaboration of NIC.br in various G20 initiatives during Brazil's presidency in 2024. To contribute to the debate on the digital economy, the Regional Center for Studies on the Development of the Information Society (Cetic.br)—a department of NIC.br dedicated to the production of indicators and analyses—has been active in the production of three reports on topics considered to be priorities by the G20 that are fundamental to the dialogue on technology and society. These publications had important international organizations as partners: the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Telecommunication Union (ITU), and the Ministries of Science, Technology and Innovation (MCTI) and Communication (MCom). The first summarizes indicators on the state of AI development in the G20 countries,[6] while the second focuses on the adoption of AI in public services.[7] The third proposes a framework for the international measurement of meaningful connectivity.[8]

Cetic.br|NIC.br is also responsible for a series of other publications that provide a detailed overview of the use of information and communication technologies (ICT) by individuals and organizations in Brazil. In addition to publishing research on ICT adoption in different segments, such as households, enterprises, governments, education, and health, the Center conducts sectoral and cross-cutting studies with a national scope on topics such as meaningful connectivity, AI in health, privacy and data protection, and electronic waste.

In 2025, Cetic.br|NIC.br celebrates two decades of work dedicated to producing reliable indicators and analysis on the use of ICT in Brazil. Over these 20 years, it has established itself as a national and international benchmark in the generation of comparable data, which provides important input for policymaking, the development of academic research,

[2] More information at https://seminarioprivacidade.cgi.br/

[3] More information at https://criancaseadolescentesnainternet.nic.br/

[4] More information at https://seminarioobia.nic.br/

[5] More information at https://obia.nic.br/

[6] More information at https://cetic.br/pt/publicacao/toolkit-para-avaliacao-da-prontidao-e-da-capacidade-em-inteligencia-artificial/

[7] More information at https://cetic.br/pt/publicacao/mapeando-o-desenvolvimento-a-implantacao-e-a-adocao-de-ia-para-aprimorar-servicos-publicos-entre-os-membros-do-g20/

[8] More information at https://cetic.br/pt/publicacao/conectividade-universal-e-significativa-um-marco-referencial-para-indicadores-e-metricas/

and strengthening the multisector debate on digital transformation. Its commitment to methodological rigor and excellence in the production of knowledge has strengthened its position with international organizations, governments, and civil society, making it an important pillar in building a more inclusive and sustainable digital environment.

The publication you have before you is part of this trajectory and reflects the conceptual and methodological knowledge of Cetic.br|NIC.br. In it, you will find essential data and evidence to understand how Brazilian society has been appropriating these technologies over the last two decades, a period marked by significant advances and complex challenges emerging from the digital age. This celebration is not only an institutional milestone, but also an invitation to reflect together on the future of ICT research and the role of data in building policies and strategies for a connected and informed society.

Enjoy your reading!

Demi Getschko
Brazilian Network Information Center - NIC.br

Presentation

Throughout 2024, the Brazilian Internet Steering Committee (CGI.br), in conjunction with the Brazilian Network Information Center (NIC.br), actively participated in national and international debates on the challenges for the governance of the digital environment, reaffirming its commitment to an inclusive and sustainable future for Brazil and the world. In particular, it is worth highlighting the NetMundial+10 Conference,[1] held in April 2024 by CGI.br. The Conference has established itself as a multisectoral platform for dialog on the challenges of Internet governance in a scenario in which digital technologies profoundly transform social, economic, cultural, informational, and political relations. The meeting culminated in the document *NetMundial+10 Multistakeholder Statement: Strengthening Internet governance and digital policy processes*,[2] which has become a reference on global agendas.

Also in 2024, during its presidency of the G20, Brazil took on a leading role in promoting sustainable development, social inclusion, and the reform of global governance. With a focus on reducing inequalities and fighting hunger and poverty, the country promoted debates on the energy transition, climate change, and key issues related to the digital economy. Brazil's chosen priorities in the G20 Digital Economy Working Group (DEWG) also reflect its commitment to a more inclusive and sustainable digital economy, including topics such as meaningful universal connectivity, advancing digital government and digital public infrastructures, promoting information integrity and a more secure digital environment, and Artificial Intelligence (AI) for sustainable development and reducing inequalities.

With the prominent and collaborative work of the Ministries of Science, Technology and Innovation (MCTI), Communications (MCom), Management and Innovation in Public Services (MGI), and the Secretariat for Social Communication (Secom), these priorities were considered strategically, in line with the challenges of the digital economy. NIC.br and CGI.br played an important role in several of these activities, contributing their technical expertise and commitment to multisectoral Internet governance, such as the leadership of the Regional Center for Studies on the Development of the Information Society (Cetic.br), a department of NIC.br, in three publications related to the priority themes.[3]

[1] More information at https://netmundial.br/

[2] The Statement can be accessed at https://netmundial.br/pdf/NETmundial10-MultistakeholderStatement-2024.pdf

[3] *Toolkit for Artificial Intelligence Readiness and Capacity Assessment*; *AI for enhanced public services in the G20 members: Artificial Intelligence for inclusive sustainable development and inequalities reduction*; and *Universal and meaningful connectivity: A framework for indicators and metrics.*

At the same time as the international meetings, the 5th National Conference on Science, Technology and Innovation (CNCTI) was held in Brasilia. The meeting, which was open and participatory, was attended by more than 2,500 representatives from civil society, academia, the technical community, international organizations, and the Brazilian government, representing a space for social dialogue and proposing public policies. On that occasion, the Brazilian Artificial Intelligence Plan (PBIA) was launched,[4] which, under the coordination of the MCTI, aims to realize the Brazilian project of technological autonomy, increasing the competitiveness of the national economy, and stimulating the responsible use of AI. As one of their contributions to the issue, NIC.br and CGI.br organized the 1st Seminar of the Brazilian Artificial Intelligence Observatory (OBIA),[5] an integral part of the PBIA, which plays an essential role in producing and disseminating data and studies on the adoption and use of AI-based systems in the country.

To support these debates and monitor the achievement of the commitments made, the availability of data and indicators is essential to map the socioeconomic implications of the adoption of digital technologies by different sectors of society. With two decades of regular production of reliable and internationally comparable statistical data, as well as dissemination of studies and analyses on the impacts of digital technologies on society, Cetic.br|NIC.br has many reasons to celebrate. Its commitment to excellence and methodological rigor in the production of quality data has ensured recognition and influence among public policymakers and international organizations linked to the ecosystem of indicators and statistics. In addition, Cetic.br|NIC.br maintains ongoing cooperation with civil society, the academic community, national statistical offices, and important international organizations such as the Organisation for Economic Co-operation and Development (OECD), the International Telecommunication Union (ITU), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Conference on Trade and Development (UNCTAD), the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the United Nations Statistics Division (UNSD).

In this context, and in celebration of the 20th anniversary of Cetic.br|NIC.br, this publication offers valuable inputs for building accessible, relevant, and qualified knowledge, which is essential for informing debates and decisions on the country's digital transformation. Through the production of data and evidence as fundamental pillars, we seek not only to understand the challenges of the present, but also to pave the way for a more equitable and secure future for the next generations.

Renata Vicentini Mielli
Brazilian Internet Steering Committee – CGI.br

[4] More information about PBIA is available at https://www.gov.br/lncc/pt-br/assuntos/noticias/ultimas-noticias-1/plano-brasileiro-de-inteligencia-artificial-pbia-2024-2028

[5] OBIA can be accessed at https://obia.nic.br/

Executive Summary

ICT PROVIDERS SURVEY 2024

Executive Summary ICT Providers 2024

The sixth edition of ICT Providers indicated important changes in the ISP market in Brazil. This edition of the survey, conducted in 2024, reinforces the trend seen in the previous version, with stability in the total number of active enterprises and evidence of sector consolidation. The transformations in the ISP market in Brazil signal a new era, with significant impacts on enterprises' traditional operations. Since 2017, the provider's successful business model has been characterized by bringing initial connectivity to locations with little economic interest. Currently, it is necessary to go further, focusing on connection quality parameters and offering more diverse service packages to customers.

THE ICT PROVIDERS 2024 SURVEY ESTIMATED THAT THERE WERE 11,853 ENTERPRISES OPERATING IN THE COUNTRY

Quantity, size, and services offered

In 2024, the ICT Providers survey estimated that 11,853 enterprises were operating in the ISP market in Brazil. This edition of the survey consolidates some results presented in 2022. Regarding the types of clientele served by providers, the number of municipalities served reveals the maintenance of a characteristic of the sector: In 2024, 41% of enterprises operated in only one municipality, a proportion that was 47% in 2022. That same year, 46% of providers were microenterprises, a proportion that rose to 45% in 2024. The same trend towards stability occurred among medium-sized enterprises, following changes from the 2020 edition: While the proportion of medium-sized enterprises was 5% in 2020, it rose to 8% in 2022 and settled at 10% in 2024 (Chart 1). These results highlight the operational profile of a microenterprise market, characterized primarily by limited service to a single locality.

Another relevant piece of data regarding the performance of ISPs was the diversification of services offered compared to the 2022 edition. At a time when the main characteristic of market expansion—the opening of small enterprises in municipalities with little commercial interest for already established enterprises—seems to be showing signs of exhaustion, the results of this edition suggest that a provider's competitive advantage will be the ability to increase its customer base by offering services that complement Internet access.

In 2024, four types of services showed significant increases compared to 2022 (Chart 2): IP-based telephone service, which was offered by 23% of enterprises in 2022, rising to 35%; digital security, increasing from 24% to 32%; IP-based TV broadcasting, rising from 20% to 32%; and finally, applications (ASP), rising from 9% to 13%. The results indicate greater diversification, suggesting that this is a time of adaptation to a more competitive market.

IX.br and IPv6 access technologies

In 2024, 34% of ISPs participated in some IX.br, with the highest frequency among

enterprises in the Southeast region and those of medium or large size (Chart 3). It is important to emphasize that, once on IX.br, the provider can directly access the content most sought after by customers, especially that from streaming companies, ensuring faster and more stable connections.

According to the results of the ICT Providers 2024 survey, the reasons why ISP enterprises seek out IX.br are related to the features that provide a competitive advantage compared to enterprises that do not. For 34% of the providers participating in IX.br, their presence in the initiative is related to improving the quality of their Internet services. 32% stated that the reason for participating was to improve the organization of local Internet traffic. It is also worth highlighting that 28% of the providers on IX.br stated that the reason was to have access to a content delivery network (CDN), a crucial initiative for centralizing the main content accessed by Internet users, such as video calls and streaming services.

IN 2024, 72% OF PROVIDERS OFFERED IPV6 TO CUSTOMERS, A PROPORTION THAT WAS 64% IN 2022

Another important aspect for improving the quality of the connection offered to customers is the delivery of IPv6. The results of the ICT Providers 2024 survey demonstrate an effort to improve their performance, evidenced by the increased availability of IPv6: In 2020, 40% of ISPs offered IPv6 to their clients, a proportion that rose to 64% in 2022 and reached 72% in 2024. Although IPv6 adoption is increasing in the country, the high supply of IPv4 remains (Chart 4), indicating that providers have room to accelerate this transition. Among the most frequently reported difficulties, 13% were related to high investment costs, difficulties in creating an activation plan, and a lack of appropriate equipment.

Security and protection of personal data

Since providers can be both the victims and the means for various cyberattacks, it is important for enterprises to qualify themselves to manage digital security risks, both avoiding the compromise of their routine activities and reducing the chances of serving as a means of amplifying attacks. In 2024, 70% of providers used their network operations teams to handle cases of abuse or security incidents. In addition, but to a lesser extent, providers sought to internalize this expertise, with 57% maintaining persons or teams exclusively dedicated to handling cases of abuse or security incidents.

In the ICT Providers 2024 survey, the proportion of enterprises that suffered denial-of-service attacks also increased, from 23% in 2022 to 30% in 2024. This growth was influenced by the increase in the number of attack reports from providers in the Northeast region, rising from 14% in 2022 to 25% in 2024. One of the effects of denial-of-service attacks is precisely the congestion of the provider's network, which can cause slowness for end users. Therefore, this type of attack can compromise the quality of the enterprise's service, leading to complaints or even changes in the contracted provider. Among the ISPs that reported suffering attacks in 2024, 69% stated that they kept operating, but with greater delay; followed by quitting the service entirely (32%); and, less frequently, they reported being the victims of extortion (4%).

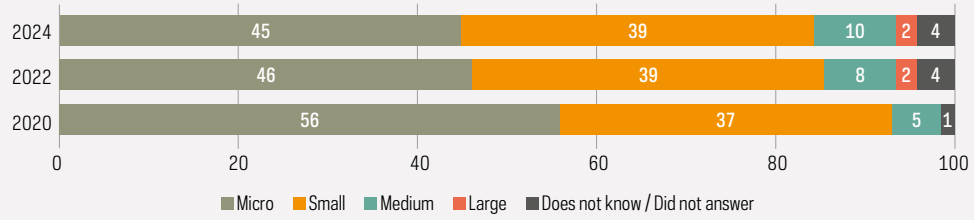
Furthermore, enterprises' compliance with the Brazilian General Data Protection Law (LGPD) has become increasingly crucial, both from a legal standpoint and in their relationships with clients. In 2024, 42% of providers had some kind of structure dedicated to protecting personal data, a proportion that was 40% in 2020.

CHART 1

—

ISPs by size (2020–2024)

Total number of ISPs (%)



70%

of providers used their network operations teams to handle cases of abuse or security incidents

66%

of providers reported having customers in rural areas

42%

of providers had some form of structure dedicated to protecting personal data

CHART 2

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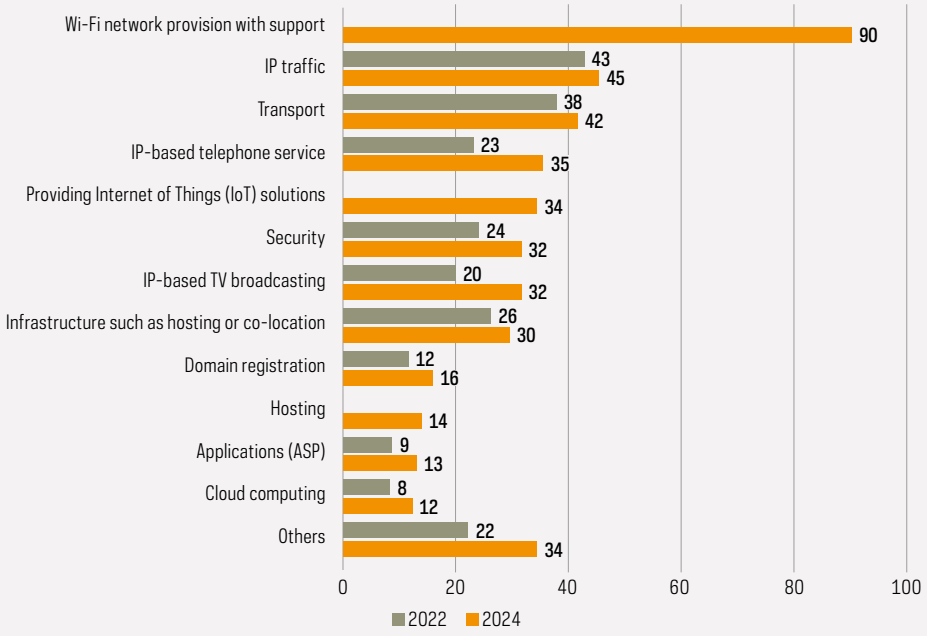
ISPs by type of service offered (2022–2024)

Total number of ISPs (%)



In both years, in most cases, those responsible for the topic came from enterprises' information technology (IT) areas (Chart 5).

Survey methodology and access to data

Conducted since 2011, the ICT Providers survey monitors the performance of the Internet access provider sector in Brazil. In its sixth edition, the initial sample registry was created based on the number of connections declared to the National Telecommunications Agency (Anatel) between August 2021 and July 2024, and the data was collected between September 2024 and April 2025, with 1,719 enterprises interviewed across the country. The information was collected through telephone interviews using a structured questionnaire. The results, including tables for proportions, totals, and margins of error, are available on Cetic.br's website (http://www.cetic.br). The "Methodological Report" and the "Data Collection Report" can be consulted in both the printed publication and on the website.

BOX 1

—

INTERNET INFRASTRUCTURE IN RURAL AREAS

For the first time, an indicator on the operating model of ISPs regarding customer service in rural areas was included in the ICT Providers survey. Among ISPs, 66% reported having clients in rural areas, with the highest proportion in the South region (80%). Furthermore, in terms of size, the profile shows a greater presence of medium-sized and large enterprises, indicating limitations in infrastructure and investment for smaller enterprises to reach areas further away from the municipal centers where they operate. Another new indicator in this edition of the survey is the service provided to corporate clients in rural areas: Approximately 4,278 ISPs serve this population, with most of them located in the South (73%) and Center-West (77%) regions.

CHART 3

—

ISPs by participation in IX.br (2024)

Total number of ISPs (%)

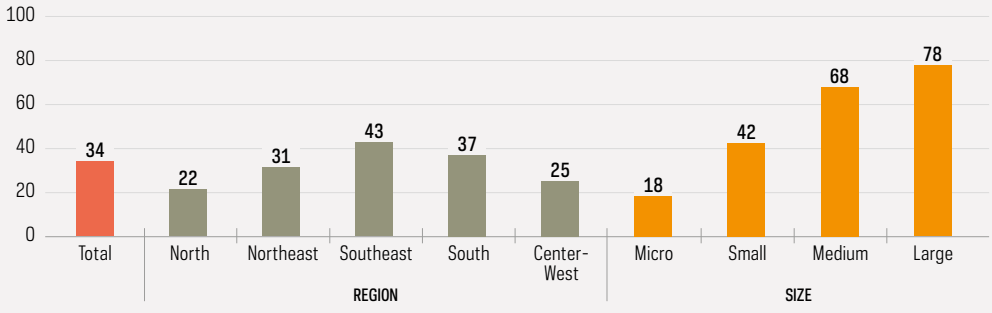


CHART 4

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ISPs by service delivery method (2020–2024)

Total number of ISPs (%)

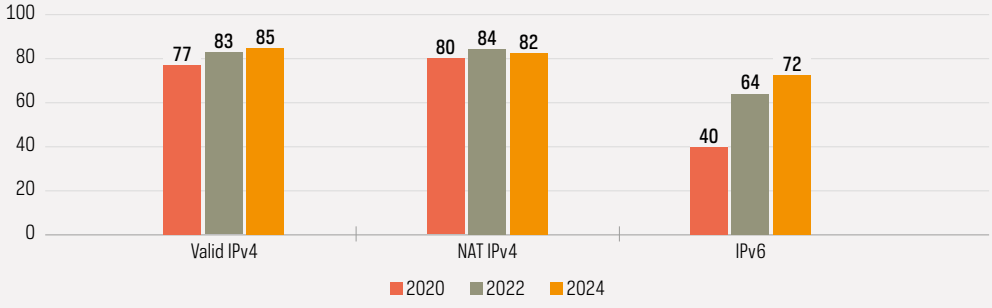

CHART 5

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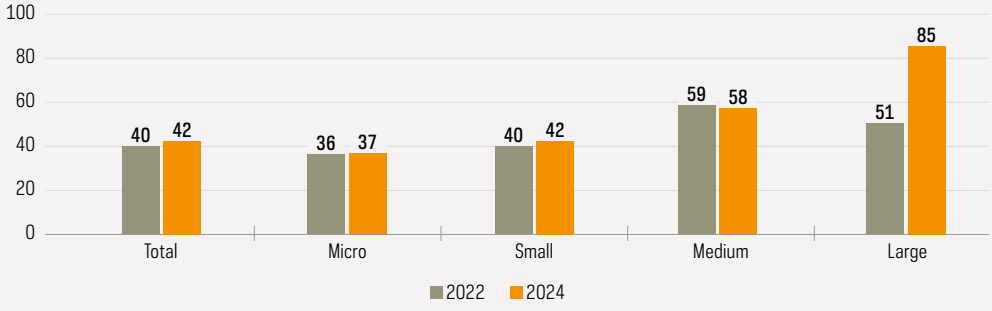
ISPs by presence of specific areas or persons responsible for the topic of personal data protection, by size (2022–2024)

Total number of ISPs (%)



Access the full survey data!

In addition to the results presented in this publication, further information is available on the Cetic.br|NIC.br website, such as indicator tables, the questionnaires, information on how to access the microdata, and a presentation of the launch event results, as well as other publications on the survey topic. The tables and results (https://www.cetic.br/en/pesquisa/provedores/indicadores/) are available for download in Portuguese, English, and Spanish. They present the statistics produced, including information about the data collected and cross-tabulations for variables investigated in the study. The information available in the tables follows the example below:

Code and indicator name

Population to which the results refer

E1A - ISPs THAT PARTICIPATED IN IX.BR

Total number of ISPs

PERCENTAGE (%)		YES	NO	DOES NOT KNOW	DID NOT ANSWER
TOTAL		34	55	11	0
REGION	North	22	68	11	0
	Northeast	31	59	10	1
	Southeast	43	48	9	0
	South	37	50	13	0
	Center-West	25	58	17	0
SIZE	Micro (up to 9 employed persons)	18	72	9	0
	Small (10 to 49 employed persons)	42	48	9	0
	Medium (50 to 249 employed persons)	68	21	11	0
	Large (250 or more employed persons)	78	12	10	0
	No information	35	26	38	1

Indicator responses

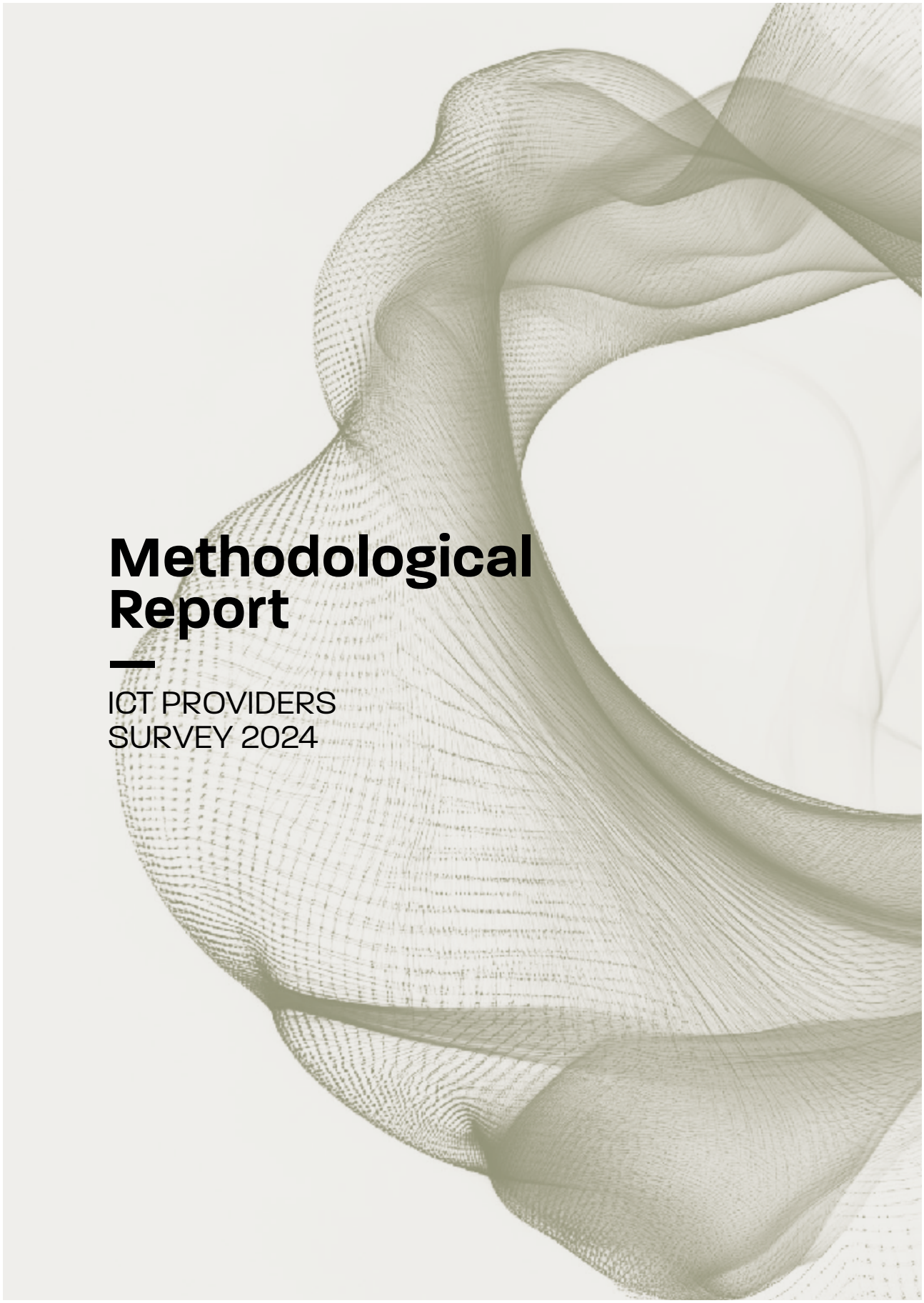
Results tabulation cut-outs: total (population as a whole) and characteristics of analysis (region, age group, etc.), different in each survey

Results: can be in % or totals

Source: Brazilian Network Information Center. (2025). *Survey on the Internet service provider sector in Brazil: ICT Providers 2024* [Tables].

How to reference the tables of indicators

This publication is also available in Portuguese on the Cetic.br|NIC.br website.



Methodological Report

ICT PROVIDERS SURVEY 2024

Methodological Report
ICT Providers 2024

The Brazilian Internet Steering Committee (CGI.br), through the Regional Center for Studies on the Development of the Information Society (Cetic.br), of the Brazilian Network Information Center (NIC.br), presents the "Methodological Report" of the ICT Providers survey.

The survey has been conducted since 2011, and its objective is to generate information that provides a broad view of the operation of the Internet service provider (ISP) sector in Brazil. Covering the entire Brazilian territory, the goal of the investigation is to measure the main characteristics of the operations of providers across Brazil and identify the needs and potentials of ISPs, covering issues divided into the following modules:

- **Module A:** General enterprise characteristics;
- **Module B:** Services offered and markets of operation;
- **Module C:** Model of operation;
- **Module D:** Infrastructure — technology and access speed;
- **Module E:** Internet Exchange Points (IXPs);
- **Module F:** Activating IPv6;
- **Module G:** Security and personal data protection.

The survey was based on collecting information for a sample of units in the survey frame. The aim is to estimate the number of ISPs and collect information on the services provided by them. The initial list was based on the information from the registry of enterprises with a multimedia communication services (SCM) license granted by the National Telecommunications Agency (Anatel), the connection records in Anatel's database, the NIC.br database of enterprises registered as having Autonomous Systems (AS), the Brazilian Federal Revenue's registry of enterprises, and the database of enterprises that were present in the Internet Exchange project in Brazil (IX.br). The support of associations and other public and private organizations linked to ISPs is essential for the survey to be carried out.

Survey objectives

The objective of the ICT Providers survey is to map the Internet access provision sector in Brazil. To this end, the survey established the characteristics of Internet service providers in terms of the services they offer, market operations, and technologies adopted.

Concepts and definitions

The initial survey frame was made up of three sources of information: the registry of enterprises that are granted permission to distribute SCM, Anatel's database of connection records, and the Brazilian Federal Revenue's registry. Information from the NIC.br database of registered AS and enterprises connected to the IX.br is also incorporated into these databases.

INTERNET AND MULTIMEDIA COMMUNICATION SERVICE PROVIDERS

To become an ISP in Brazil, enterprises must first be formally structured, i.e., have a National Registry of Legal Entities (CNPJ) and obtain permission from Anatel to provide SCM. According to the definition on Anatel's website (2021, para. 1), an SCM is:

> [...] a fixed telecommunications service of collective interest, provided nationally and internationally by private entities, that enables the offer of transmission, emission and reception capacity of multimedia information, also allowing the rendering of Internet connection, using any means, to Subscribers within a Service Area.

Once an enterprise is granted an SCM permission, it can distribute multimedia information, i.e., data. However, it cannot provide landlines (defined by the regulator as Switched Fixed Telephone Services [STFC]) or paid television services (defined by the regulator as Conditioned Access Services [SeAC]). Therefore, according to sector regulation, providers with an SCM license are allowed to distribute webpage content through their infrastructure, but they need additional licenses to transmit exclusive television channel content or enable telephone calls.

AUTONOMOUS SYSTEMS

An AS is defined as an "IP network or a group of IP networks under a single administration, which establishes how data packages are trafficked and distributed within these networks" (CGI.br, 2018, p. 6).

An IXP can be defined as:

> a service offered privately, which functions as a component of the Internet infrastructure, through which Independent AS, encompassing ISPs, Internet content providers, content distribution networks (CDNs), academic, financial, and government institutions, among other types of networks, can interconnect directly with the main purpose of exchanging Internet traffic (IPv6 and IPv4 traffic) with each other. (IX.br, s.d., para. 2)

TARGET POPULATION

The universe covered by the survey includes enterprises certified by Anatel to provide SCM and that are also ISPs in Brazil.

REFERENCE AND ANALYSIS UNIT

The unit of analysis is the ISP.

DOMAINS OF INTEREST FOR ANALYSIS AND DISSEMINATION

For the reference and analysis units, the results are disclosed for domains based on the variables and levels described below:

- **Region:** corresponds to the regional division of Brazil, according to the criteria of the Brazilian Institute of Geography and Statistics (IBGE), into the Center- West, Northeast, North, Southeast, and South macroregions.
- **Number of connections:** refers to the maximum number of monthly connections—which are the media through which Internet connection is established—as recorded in the last 12 months in the Anatel database.
- **Number of customers:** corresponds to the number of customers as reported by the ISP, aggregated into five ranges.
- **Size:** corresponds to the classification of ISPs according to the number of employees, excluding outsourced personnel.

Data collection instruments

INFORMATION ON DATA COLLECTION INSTRUMENTS

The survey was conducted using computer-assisted telephone interviewing (CATI) or computer-assisted web interviewing (CAWI), in case the respondent requested to complete it this way. The questionnaires were administered fully to all survey respondents. More information about the questionnaire is available in the "Data collection instruments" section of the "Data Collection Report".

SAMPLING PLAN

SURVEY FRAME AND SOURCES OF INFORMATION

The ICT Providers survey is assisted by several national associations of ISPs to promote the initiative. The survey frame was created based on data from the Brazilian Federal Revenue's registry, Anatel's databases on connection records and SCM, and the NIC.br registry of enterprises with AS, as well as those connected to an IXP of the IX.br. The ISP registry is obtained from Anatel — connection records and SCM databases. For the survey planning, this database of connection records is divided into two parts: enterprises with information about connections during a given period and enterprises with no records of connection in this period (results of this edition are available in the "Data Collection Report"). These two parts are combined with the information from the NIC.br databases of AS and IX.br.

The total set is divided into strata for sample planning according to the cross-referencing of the variables contained in Table 1. The frequencies of connection records of enterprises in each stratum are detailed in the "Data Collection Report".

TABLE 1
–
Information for the construction of strata used in the collection

Region	North
	Northeast
	Southeast
	South
	Center-West
Size	Not declared
	0 connections
	1 to 100
	101 to 1 000
	1 001 or more
AS	Yes
	No
IX.br	Yes
	No

The survey considered the strata separately, so that distinct data collection efforts are adopted, depending on the characteristics of the enterprises, to obtain responses to the survey. Thus, it was considered that those allocated to the stratum with no records of connection did not have the same probability of being active ISPs as those included in the other strata.

The largest nationwide providers according to Anatel's ranking are Claro, Vivo, TIM, Oi, and Sky/AT&T, which were not included in the survey because these enterprises present very different characteristics from the chosen population of providers. The data collection instrument adopted by the survey would be insufficient to capture the operations of these larger providers in all their complexity. Because they have few units, the exclusion of these large telecommunication operators does not compromise the estimates produced by the ICT Providers survey in terms of the number of enterprises and sector characteristics.

SAMPLING STAGES

The ICT Providers survey is carried out in two stages. In the first, a sample is selected from the survey frame to identify which of the enterprises selected are ISPs. Identifying providers involves confirming that they provide Internet access by contacting them by telephone, and searching for information on social networks and on the Internet. This stage is known as screening, a research technique used to identify which units of the population are of interest within a large survey frame.

The second stage of the survey involves contacting the enterprises identified in the first stage as ISPs in order to collect information on the various topics covered.

SAMPLE SELECTION

The survey sample is a simple random selection in strata determined according to the characteristics of the number of connections, AS, and presence on the IX.br. The definition of the strata *(L)* considered for selection is included in the "Data Collection Report" and may vary each year, according to the characteristics observed in the composition of the survey's initial frame. Sample size is defined based on the response rate in previous editions of the survey, and aims to ensure quality estimates for the domains of interest in the survey.

Field data collection

DATA COLLECTION METHOD

The enterprises were contacted by means of the computer-assisted telephone interviewing (CATI) technique. The questionnaire could be self-administered using a web questionnaire through a specific platform. This option was given to respondents who spontaneously asked to complete it via the Internet and to those who promptly refused to respond to the survey over the telephone.

A specific link was sent to these ISPs to access the questionnaire, allowing them to change their responses. Furthermore, through additional phone calls, the interviewers followed up on and attempted to sensitize those respondents who still had reservations about starting or completing the questionnaire.

In all the surveyed enterprises, the goal was to interview the person responsible for the informatics, information technology (IT), computer network management area, or an equivalent area. This corresponded to positions such as:

- Enterprise owner;
- Director of the information and technology division; or
- Business manager (senior vice-president, business vice-president, or director).

Data processing

The survey data was weighted in two stages: the first, relating to the screening process; and the second, relating to the respondents identified as providers in the first stage.

WEIGHTING PROCEDURES

WEIGHTING OF THE SURVEY'S FIRST STAGE

At this stage, an estimate was made of ISPs for the set of enterprises registered with Anatel's SCM. For each of the enterprises selected in the survey, after thorough information collection, there was an indicator variable, identifying whether or not it was an ISP.

Based on the basic weight for selecting an enterprise to participate in this screening stage, the weight of the enterprises providing Internet access for the second stage of the survey was determined. The sum of these weights was the estimate of Internet access providers in Brazil, as indicated in the "Data Collection Report". Formulas 1 and 2 show the weight calculation for the second stage of the survey.

FORMULA 1

$$p_{ih}^{1} = \frac{n_h}{N_h}$$

p_{ih}^{1} is the weight of enterprise i in stratum h in the first stage of the survey

n_h is the size of the sample of enterprises in stratum h

N_h is the total number of enterprises in stratum h

FORMULA 2

$$p_{ih}^{2} = p_{ih}^{1} \times I_{ih}$$

P_{ih}^{2} is the weight of enterprise i in stratum h in the second stage of the survey

p_{ih}^{1} is the weight of enterprise i in stratum h in the first stage of the survey

I_{ih} is an indicator variable that is scored 1 if enterprise i in stratum h has been identified as an Internet access provider; otherwise, it is scored 0

The estimated total number of ISPs is given by the sum of the weights defined in Formula 2 for all the enterprises in all the strata defined in the survey.

FORMULA 3

$$T = \sum_{h=1}^{L} \sum_{i=1}^{n_h} p_{ih}^{2}$$

WEIGHTING OF THE SURVEY'S SECOND STAGE

For enterprises identified as ISPs, the aim was to carry out a full interview, collecting information on the various topics covered by the survey. It was expected that some enterprises would refuse to answer the full questionnaire; in this case, adjustments for nonresponse were necessary.

Corrections for nonresponse to the second stage were made within each survey selection stratum. The formula for calculating the corrected weights for non-response is as follows.

FORMULA 4

$$p_{ih}^{r} = p_{ih}^{2} \times \frac{\sum_{i=1}^{n_h} p_{ih}^{2}}{\sum_{i=1}^{n_h} p_{ih}^{2} \times I_{h}^{r}}$$

p_{ih}^{r} is the weight of enterprise i in stratum h in the second stage of the survey, corrected for nonresponse

p_{ih}^{2} is the weight of enterprise i in stratum h in the second stage of the survey

I_{h}^{r} is an indicator variable that is scored 1 if enterprise i in stratum h answered the survey; otherwise, it is scored 0

SAMPLING ERRORS

Calculation of sampling error measurements or estimates for indicators of the ICT Providers survey takes into account the sampling plan by strata employed in the survey.

Using the estimated variances, sampling errors are expressed by the margin of error. The margins of error are calculated for a 95% confidence level. This means that, based on this sample, the results are considered precise within the interval defined by the margins of error. If the survey is repeated multiple times, in 95% of them the interval could contain the true population value. Other measurements derived from this variance estimate are usually presented, such as standard deviation, coefficient of variation, or confidence interval.

Calculation of margin of error is the product of standard error (square root of variance) by 1.96 (value of the normal sample distribution corresponding to the chosen confidence level of 95%). These calculations are made for each variable in the indicator tables, which ensured that all tables have margins of error associated with each estimate presented in each table cell.

Data dissemination

The results of the survey are presented according to the following crossed variables: region and class of number of connections, approximate number of customers informed by the respondent and size of the company in terms of employed persons.

In some results, rounding caused the sum of partial categories to be different from 100% in single-answer questions. The sum of frequencies in multiple-answer questions usually exceeds 100%. It is worth mentioning that, in the tables of results, a dash (–) is used to represent nonresponse. Since the results are presented without decimal places, cells with zero value mean that the answer to the item is explicitly greater than zero and less than one.

The results are published online on Cetic.br|NIC.br's website (www.cetic.br) and data visualization portal (http://data.cetic.br/). The tables of proportions, estimates and margins of error for each indicator are available for download in Portuguese, English and Spanish. More information on the documentation, metadata and microdata databases of the survey are available on the surveys "Methodology" page (https://cetic.br/en/pesquisa/provedores/microdados/).

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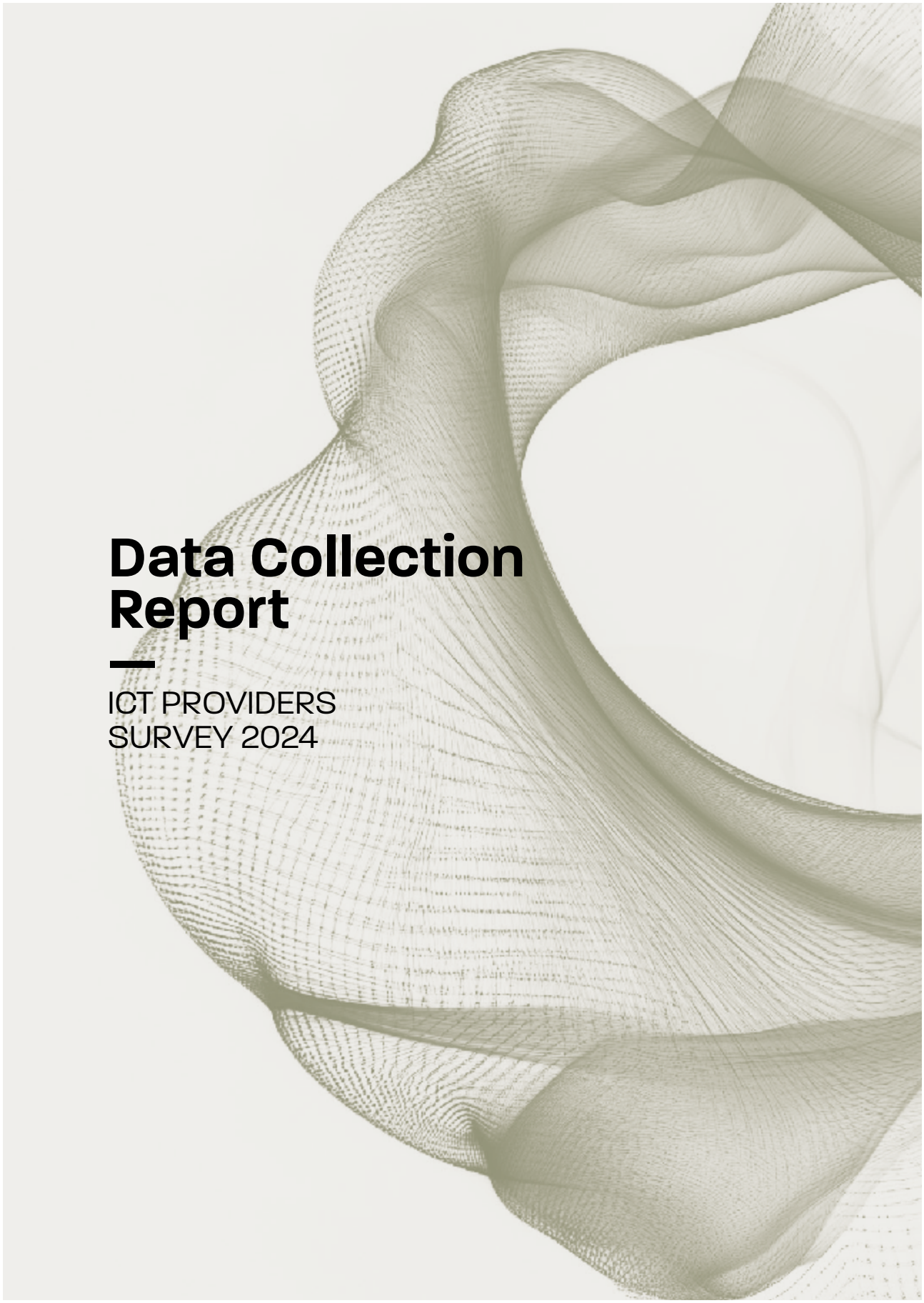


Data Collection Report

ICT PROVIDERS
SURVEY 2024

Data Collection Report
ICT Providers 2024

The Brazilian Internet Steering Committee (CGI.br), through the Regional Center for Studies on the Development of the Information Society (Cetic.br), a department of the Brazilian Network Information Center (NIC.br), presents the "Data Collection Report" for the ICT Providers 2024 survey. The objective of this report is to provide information about specific features of this edition of the survey, including response rates and changes made to the data collection instrument.

The complete survey methodology, including the objectives, main concepts, and characteristics of the sampling plan, is described in the "Methodological Report".

Stratification of the survey's target population

The Internet service providers (ISPs) were classified according to the maximum number of connections recorded on the platform of the National Telecommunications Agency (Anatel), between August 2021 and July 2024; the region of the enterprise's headquarters as registered on the multimedia communication services (SCM) database; the NIC.br database of enterprises registered as having autonomous systems (AS), and the NIC.br database of enterprises that were present in Internet Exchange Points (IXPs) of the Internet Exchange project in Brazil (IX.br). The survey's target population was built considering the combination of information from the four databases:

i) the enterprises' Brazilian region;

ii) whether they had an AS;

iii) being in an IXP of the IX.br; and

iv) size, according to the following five categories: (1) no declared connections; (2) 0 connections; (3) from 1 to 100 connections; (4) from 101 to 1,000 connections; and (5) 1,001 connections or more.

As highlighted in the "Methodological Report", the largest providers with nationwide reach, according to Anatel criteria (Claro, Vivo, TIM, Oi, and Sky/AT&T), were not included in the survey. These enterprises present characteristics that differ significantly from those of providers considered in the sample selection. A total of 20,813 enterprises were included in the survey frame.

Table 1 shows the classification of enterprises into strata by size, region, AS, and IX.br, along with the respective sample sizes. Of the 20,813 761 enterprises in the survey frame, 6,434 were selected for the sample.

TABLE 1
–
Strata and sample size to organize data collection

		Initial universe	Sample of the first stage
Region	North	1 840	533
	Northeast	6 423	1 783
	Southeast	7 482	2 346
	South	2 814	1 078
	Center-West	2 254	694
Size	Not declared connections	12 703	2 844
	0 connections	739	166
	1 to 100	5 084	1 137
	101 to 1,000	1 916	1 916
	1,001 or more	371	371
AS	Yes	7 302	3 001
	No	13 511	3 433
IX.br	Yes	1 879	925
	No	18 934	5 509

Data collection instruments

INFORMATION ON THE DATA COLLECTION INSTRUMENTS

The semi-structured questionnaire was answered by professionals qualified to provide information about information technology (IT) services, types of connections, speed range, and enterprise infrastructure. These professionals included directors, partners, CEOs, managers, and supervisors, both directly affiliated with the organization's IT area or not. The questionnaire was made up of the following thematic modules:

- **Module A** investigated the profile of enterprises, considering administrative information, such as number of employed persons. Furthermore, it covered the use and presence of enterprises on websites and social media, as well as the services and activities they provide.
- **Module B** addressed the enterprises' markets of operations, addressing the type of clients served and investigating those that carry out electronic commerce, as well as the total bandwidth contracted, and minimum and maximum access speeds offered.
- **Module C** investigated whether they had an AS and the reasons for not having it.
- **Module D** addressed the technological infrastructure of the enterprises that provided access to the Internet and the forms of access provided to clients, including a question about Internet provision via neutral hosts.
- **Module E** researched the participation of the enterprises in IXPs or IX.br, reasons for use, and barriers to the presence of enterprises in these initiatives.
- **Module F** investigated means of service delivery to clients of ISPs, and difficulties faced by those who still do not provide IPv6.
- **Module G** covered the procedures and actions that took place in the enterprises regarding the compliance with the Brazilian General Data Protection Law (LGPD) and the presence of practices to mitigate digital security risks.

PRETESTS

The pretest for the ICT Providers 2024 survey was conducted between August 27 and 30, 2024, and consisted of phone interviews with 10 small ISPs. Distribution among regions was taken into account, with two enterprises from the Northeast, two from the South, one from the Center-West, three from the Southeast, and two from the North. The questionnaires were administered electronically and lasted an average of 21 minutes.

In general, the results of this step allowed for improvements to the data collection instruments to favor understanding by respondents. The problems identified during the interviews required minor adjustments to the answer options and the wording of the questions.

CHANGES TO THE DATA COLLECTION INSTRUMENTS

To keep pace with the organizational and technological changes in the Brazilian Internet provision market, the current version of the ICT Providers questionnaire underwent significant changes in relation to the previous edition. Based on information gathered from the survey frame and reassessment of previous results, changes were suggested, tested, and validated with the help of research experts.

Most of the changes were made in module B, on services offered and market operations, reflecting the need to broaden understanding of the role of ISPs in rural areas. The questionnaire also included new features in other modules, such as infrastructure (Module D) and security and personal data protection (Module G).

Therefore, even though the questionnaire maintains comparability with the 2022 survey, some indicators were updated to reflect changes occurring in a technologically dynamic sector and to reflect regulations that can permanently modify enterprises' scope of operations.

INTERVIEWER TRAINING

The interviews were conducted by a team of trained and supervised interviewers. They underwent basic research training, organizational training, ongoing improvement training, and refresher training. Furthermore, they underwent specific training for the ICT Providers 2024 survey, including how to approach the responding audience and information on the data collection instrument, field procedures, and potential situations.

The data collection team also had access to the survey's instruction manual, which provided a description of all necessary procedures for data collection and details on the survey objectives and methodology, ensuring the standardization and quality of the work. Data collection was carried out by 66 interviewers and two supervisors.

Data collection procedures

DATA COLLECTION METHOD

All enterprises were contacted using computer-assisted telephone interviewing (CATI).

The questionnaire could be filled out online, through a specific platform. This option was offered to respondents who spontaneously asked to complete it online or to those who promptly refused to respond to the survey by telephone. A specific link was sent to these providers to access the questionnaire, allowing them to change their responses. Furthermore, through additional phone calls, the interviewers followed up and tried to raise awareness among respondents who had reservations about starting or completing the questionnaire.

In all the surveyed enterprises, the goal was to interview the individuals responsible for IT, computer network management, or equivalent areas. This corresponded to positions such as:

- Enterprise owner;
- Director of the information and technology division; or
- Business manager (senior vice president, business vice president, or director).

DATA COLLECTION PERIOD

The data collection for the second stage of the ICT Providers 2024 survey was carried out between September 2024 and April 2025.

FIELD PROCEDURES AND CONTROLS

Before starting data collection, the existing list of telephone numbers was organized and verified, and new numbers were looked up to enable the interviews with the enterprises in the survey frame. Phone contact was attempted with all those identified in the list of enterprises said to be Internet access providers, and whenever a number was incorrect, outdated, or did not exist, the interviewers searched for alternative phone numbers on the Internet using the enterprise's company name as the keyword.

Several actions were implemented to ensure the highest possible level of data collection standardization. Therefore, it was necessary to establish a control system for the occurrences listed below to enable the identification and treatment of certain situations during the interviews, as well as the control of efforts to obtain interviews.

DATA COLLECTION RESULTS

The total number of ISPs in Brazil was estimated according to the final situation of data collection in the first stage described in the survey's "Methodological Report". Table 2 presents the results by final collection situations in the survey's first stage, and Table 3 presents the results of the survey's second stage.

TABLE 2
—
Number of enterprises, by collection situation in the survey's first stage

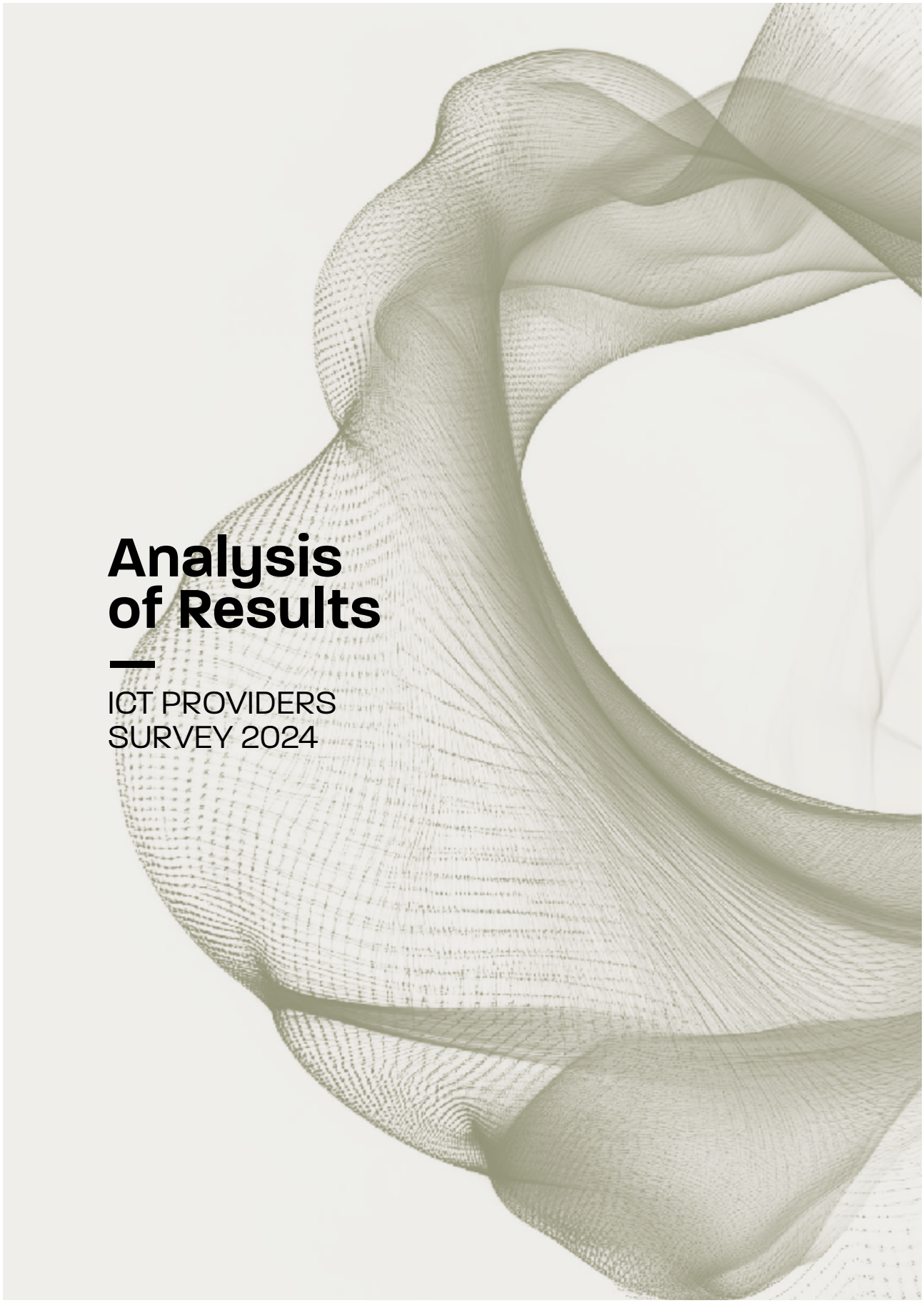
Use in the second stage	Final situation in the first stage	Number of enterprises
No	Information not conclusive	2 238
	Not a provider	96
	Enterprise no longer exists	76
	Informed by phone that they are not a provider/Confirmed as a provider on the Internet	11
	Informed by phone that the enterprise no longer exists/Confirmed as a provider on the Internet	5
Yes	Confirmed as a provider by phone/Information not conclusive on the Internet	2 356
	Confirmed as a provider both by phone and on the Internet	1 274
	Information not conclusive by phone/Confirmed as a provider on the Internet	378
Total		**6 434**

TABLE 3
—
Number of enterprises, by collection situation in the survey's second stage

Situation	%
Interview completed	43%
Number valid, but interview not completed	48%
Number valid, but institution outside the scope of the survey	4%
All missed calls	1%
Wrong number or number does not exist	4%

WEIGHTING PROCEDURES

Of the 11,898 enterprises estimated as ISPs by ICT Providers 2024, some are not represented in the sample of respondents, as they did not have at least one respondent in their respective strata. The strata in question are very small in the population and have 45 ISPs. For this reason, the ICT Providers 2024 survey gives results for 11,853 ISPs (of the 11,898 estimated). The full survey was carried out with 1,497 ISPs.



Analysis of Results

ICT PROVIDERS SURVEY 2024

Analysis of Results
ICT Providers 2024

The results of the ICT Providers survey have reflected the main transformations observed in this market over the last few years. Since the previous survey edition in 2022, a consolidation process among Internet service provider (ISP) enterprises has been observed, aligned with a trend of mergers and acquisitions.[1] In 2024, the survey results indicated greater diversification in the sector, with an expansion of the range of services offered by ISPs.

After an expansion in the number of enterprises, in a process that began in 2013 and intensified from 2017 onwards, a slowdown in this trend and a certain stability in the number of enterprises in operation are currently observed. In 2017, the ICT Providers survey estimated the existence of 3,092 active ISPs, increasing to 7,006 in 2020, 11,630 in 2022, and 11,853 in the 2024 edition.

The current period, as reflected in this edition of the ICT Providers survey, suggests a slowdown in the growth of enterprises and the onset of market consolidation.[2] Previously, the sector was characterized by an increase in the number of enterprises, favored by the establishment of regulatory asymmetries and reductions in barriers to entry.[3] The current situation is one of transformations that require enterprises to make significant changes in how they operate.[4]

[1] According to KPMG data, in 2022, out of 1,728 transactions, 640 involved Internet enterprises. The sector with the most transactions of this kind was information and communications technology (ICT), with 268 operations (KPMG, 2023).

[2] The concept of consolidation refers to the acquisition or merger of enterprises in a given market (Internet Society, 2019).

[3] Regarding the reduction of barriers to entry into the Internet access market, noteworthy resolutions from Anatel stand out, aimed at stimulating the emergence of new enterprises and promoting the provision of Internet access in markets of little interest to incumbent enterprises. Among these resolutions, it is worth mentioning the possibility of exclusive operation of the multimedia communication services (SCM) with a reduction in the price of its license from BRL 9,000 to BRL 400, established by Resolution No. 386, of November 3, 2004, later revoked (Anatel, 2004). To make the market attractive and viable for small businesses, Resolution No. 614, of May 28, 2013 (Anatel, 2013), which regulates SCM, established the rights and duties of enterprises according to the number of clients, as well as Resolution No. 680, of May 28, 2017 (Anatel, 2017), which approved the waiver of the need for an SCM license for ISPs that had up to 5,000 connections.

[4] In this regard, it is important to mention recent resolutions by Anatel (2025c, 2025e) requiring greater provision of registration data from providers and information about the enterprises' operations, in order to provide the regulator with information about the sector.

During the period of greatest expansion in the number of ISPs, especially from 2017 onwards, the growth in the participation of small organizations, particularly in regions far from large urban centers, also stood out. In 2015, 61% of connections reported to the National Telecommunications Agency (Anatel) came from large providers, a situation similar to that observed in 2020. In 2024, this characteristic was reversed, as small service providers[5] represented 64% of connections (Anatel, n.d.).

The increased presence of enterprises offering connectivity to end users also implies a network more exposed to digital security risks. In this direction, the enactment of Resolution No. 740/2020 established a digital security regulation for the telecommunications sector (Anatel, 2020). One highlight of this resolution is that, in several of its provisions, regulatory asymmetry is suspended, with the system being applied to enterprises regardless of their size. Therefore, this is a concern about vulnerabilities that can be amplified by the lower resilience of networks in ISPs, highlighting the need for practices aimed at mitigating digital security risks in this sector.

Discussions within industry associations also indicate that the current period is one of market saturation, with increased competition throughout the country and little room for expansion of the customer base (Brazilian Association of Internet and Telecommunications Service Providers [Abrint], 2025). In this scenario, one of the defining characteristics of the expansion period for enterprises in the sector may no longer be sufficient: Offering only access has ceased to be an enterprise's differentiating factor, with the quality of the connection and the diversification of services offered in the last mile becoming increasingly important.[6] In short, the market characteristics that marked the initial expansion of the number of new entrants may become less decisive, opening space for a new phase that demands greater expertise from ISPs, both from a technical standpoint and in terms of business knowledge.

In addition, the discussion about connectivity itself is taking on new dimensions. While initially bringing Internet access to end users was the main barrier to increasing Internet access in the country, nowadays it is becoming increasingly central to consider the quality of the connections offered to the population (Group of Twenty [G20], 2024). In this regard, there has been much discussion about the importance of improving connection quality, given the increased demand from users for various public and private services via the Internet. Thus, the concept of meaningful connectivity emerges, which takes into account the affordability of connections, access to equipment, connection quality, and the usage environment by the Internet user population (Brazilian Network Information Center [NIC.br], 2024). This concept encompasses a broad spectrum of connectivity, exploring precisely this multifaceted role of the Internet for people, as a means of providing services, a source of income generation, and a place for social and leisure activities, among other activities (NIC.br, 2024).

[5] It is worth highlighting that the characterization of small enterprises made by Anatel takes into account those that have less than 5% of the retail market in which they operate, according to Anatel Resolution no. 783 of September 3, 2025 (Anatel, 2025d).

[6] NIC.br maintains a platform for evaluating connection quality, called SIMET, which is also available as an app. More information at https://simet.nic.br/

Meaningful connectivity is becoming fundamental in the discussion about the population's digital inclusion, with implications for the performance of Internet access providers.[7] Despite the increase in the number of people connected in Brazil, a study by the Regional Center for Studies on the Development of the Information Society (Cetic.br) showed that only 22% of the population has high levels of meaningful connectivity (NIC.br, 2024). Therefore, despite the connectivity advancements of recent years,[8] it is possible to take action to improve the quality of Internet connections, especially in locations far from major urban centers and among the most vulnerable populations.

Significant improvements in connectivity levels necessarily depend on the activities of service providers to support the provision of Internet services. In a scenario of expanding policies to promote meaningful connectivity, it is essential that providers seek to improve their performance by offering increasingly faster and more stable connections (G20, 2024).

In this context, this analysis of the results presents a characterization of the performance of ISPs in Brazil, including the following dimensions:

- Size and services offered, which include the size of the ISPs and the services offered to end users;
- Operating model, encompassing types of clients, service offerings in rural areas, and infrastructure;
- Internet Exchange Points (IXPs) and IPv6 (Internet Protocol version 6), which present the technologies used by enterprises to connect customers, such as presence in IXPs and service delivery methods;
- Privacy and personal data protection, which highlights the practices implemented by ISPs for the proper handling and protection of customers' personal data;
- Digital security, which provides indicators related to ISPs actions for network resilience and protection against cyberattacks.

Size and services offered

The Internet service provider market continues to be composed mostly of micro and small enterprises (Chart 1), confirming a trend observed in previous editions of the survey. Although the proportion of microenterprises decreased between the 2020 and 2022 editions of the survey, the results for 2024 did not show a significant change. In 2022, 46% of ISPs were microenterprises and 39% were small enterprises, a proportion that was 45% and 39%, respectively, in 2024, indicating stability in terms of size among enterprises in the sector.

[7] It is important to highlight that Anatel has included the concept of meaningful connectivity in its regulatory agenda. In a recent study, the Agency evaluated the data allowance for Internet users and providers' adherence to meaningful connectivity requirements (Anatel, 2025a).

[8] According to the ICT Households survey: in 2016, 54% of Brazilian households were connected to the Internet, a proportion that rose to 83% in 2024. Regarding Internet users, in 2024, 89% of Brazil's population was connected, representing approximately 166 million people (CGI.br, 2025).

CHART 1

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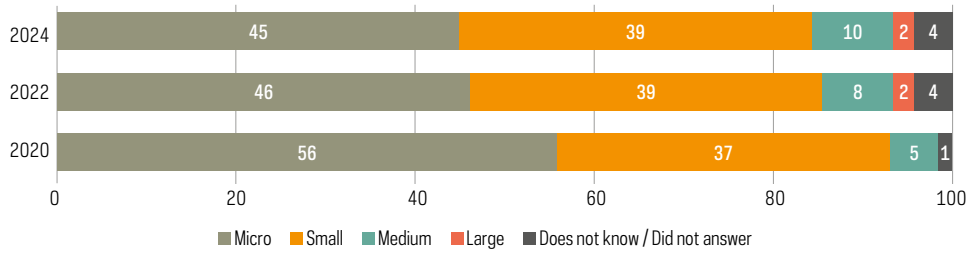
ISPs by size (2020–2024)

Total number of ISPs (%)



The same pattern is observed in relation to the number of clients. Despite significant changes in this indicator between 2020 and 2022, it remained stable in the current edition (Chart 2). Among the segments with the highest proportions of clients, in 2024, 19% of ISPs had between 101 and 500 clients, and 26% had between 1,001 and 3,000 clients.

CHART 2

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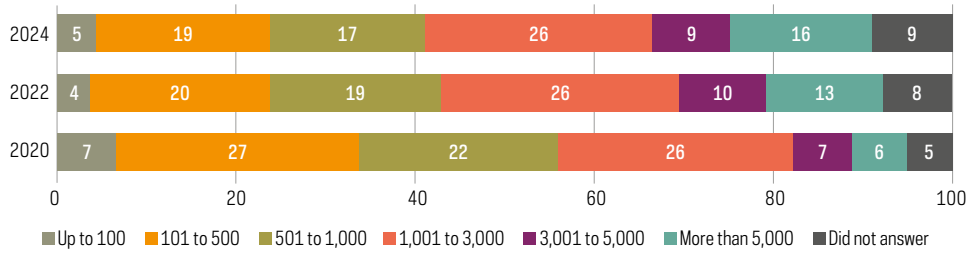
ISPs by number of clients (2020–2024)

Total number of ISPs (%)



Regarding the services offered by ISPs, the results indicated greater diversification, suggesting that this is a period of adaptation to a more competitive market. In 2024, four types of services showed significant increases (Chart 3): IP-based telephone service, which was offered by 23% of enterprises in 2022, rising to 35%; digital security, increasing from 24% to 32%; IP-based TV broadcasting, rising from 20% to 32%; and finally, applications (ASP), which had 9% of enterprises, reaching 13%.

CHART 3

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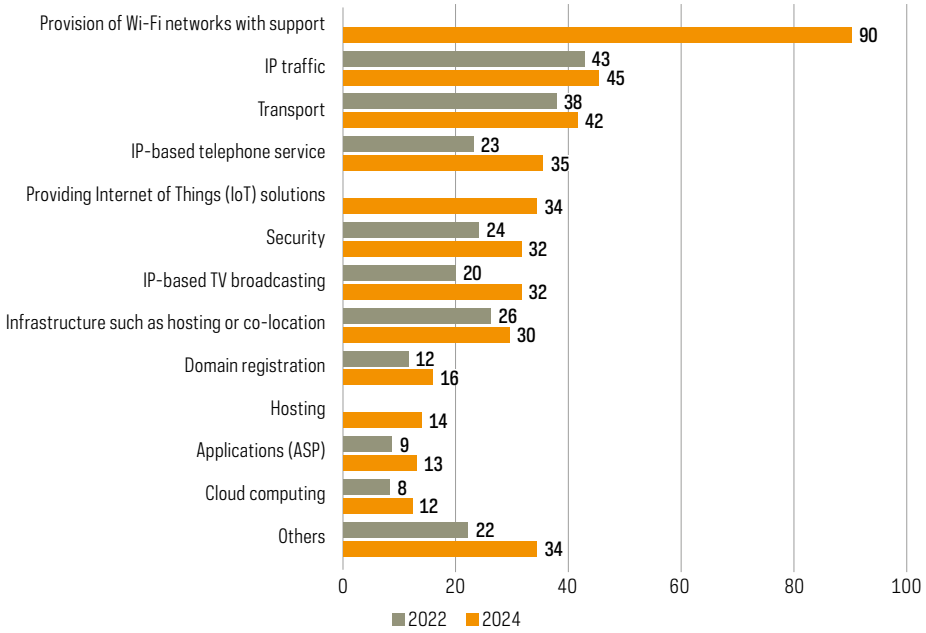
ISPs by type of services offered (2022–2024)

Total number of ISPs (%)



As for access technologies offered to end customers, fiber optics remained the most prevalent among providers, followed by radio access (wireless connection via free frequency), as shown in Chart 4. Confirming the trend of diversification of services offered, there was growth in Mobile Virtual Network Operators (MVNOs), which represented 4% of enterprises in 2022 and reached 8% in 2024.[9]

[9] According to the consulting firm Teleco, in 2024 there were 142 mobile virtual network operators in Brazil, of which 16 were authorized and 126 were accredited. MVNOs are those that hold a license to provide Mobile Telephony (SMP) and have a direct relationship with Anatel; accredited MVNOs, on the other hand, operate within the network of authorized MVNOs and relate directly only to the authorized provider. More information at https://www.teleco.com.br/mvno_br.asp

CHART 4

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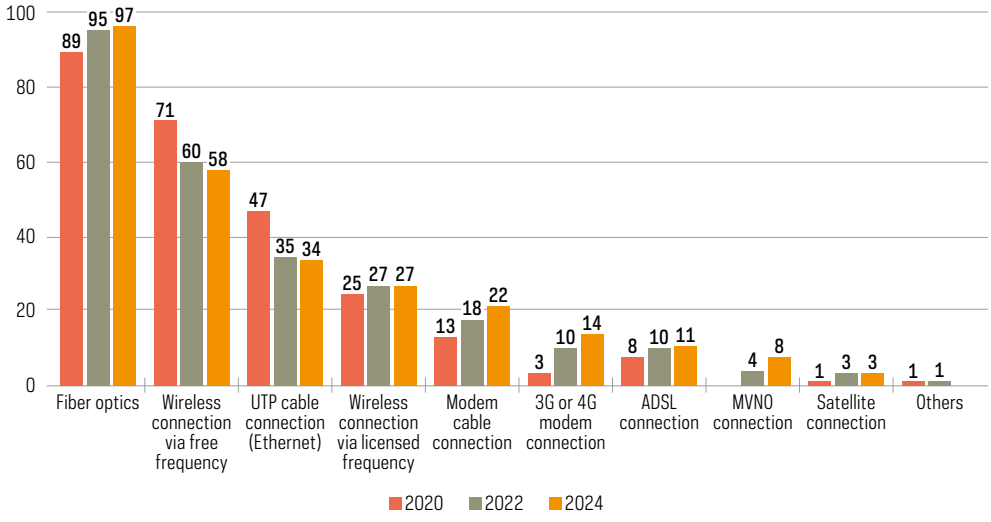
ISPs by type of access technology offered to clients (2020–2024)

Total number of ISPs (%)



Although the increased availability of fiber optics has been identified since the 2017 edition of the ICT Providers survey, it is observed that maximum connection speeds continue to grow over time, reflecting the improvement of the already installed infrastructure. Taking as an example the second most offered maximum speed by providers (over 500 Mbps to 1 Gbps), in 2022, 43% of enterprises offered this speed, reaching 57% in 2024 (Table 1).

TABLE 1
–

ISPs by minimum and maximum speeds offered (2024)
Total number of ISPs (%)

	Minimum speed	Maximum speed
Up to 10 Mbps	23	0
More than 10 Mbps up to 30 Mbps	12	2
More than 30 Mbps up to 100 Mbps	34	4
More than 100 Mbps up to 300 Mbps	19	6
More than 300 Mbps to 500 Mbps	6	16
More than 500 Mbps up to 1 Gbps	4	57
More than 1 Gbps up to 2 Gbps	0	6
More than 2 Gbps	0	7
Does not know	1	1
Did not answer	0	0

The results of the ICT Providers 2024 survey, therefore, indicated a movement by ISPs towards diversifying the services offered to end customers and improving the Internet access infrastructure provided, with an increasing number of fiber-optic connections in the last mile. The following section aims to describe how this infrastructure is managed and what its main characteristics are.

Operating model

This edition of the ICT Providers survey pointed to a consolidation process in the ISP sector.[10] In this direction, it is important to assess whether there have been changes in the way enterprises operate, especially with regard to their business models. Initially, the changes in the Internet access provision market did not alter the operational characteristics of enterprises in the sector, which continued to focus more on residential customers (Chart 5), especially among micro and small enterprises.

[10] To evaluate this process, one approach could be to use the enterprise's founding year at the time the data was collected. In the 2022 survey, 3% of enterprises stated that they were founded in that year, while in the current edition, 1% declared that they were founded in 2024.

CHART 5

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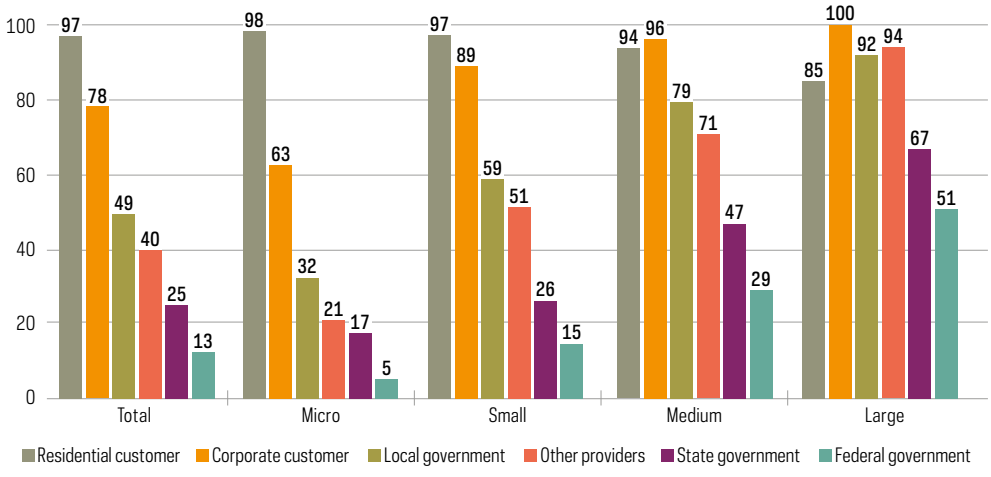
ISPs by type of client, by total and size (2024)

Total number of ISPs (%)



Also related to the type of clientele served by the provider, the number of municipalities served reveals the limits of small enterprises' operations. According to the ICT Providers 2024 survey, 41% of enterprises operated in only one municipality, a proportion that was 47% in 2020, highlighting the operational profile of a market populated by microenterprises characterized primarily by serving a single municipality. In addition, it is worth highlighting that, in 2024, 40% of ISPs operated in two to five municipalities, which shows once again that more than 80% of the market has a limited reach in terms of the number of locations served (Chart 6).

CHART 6

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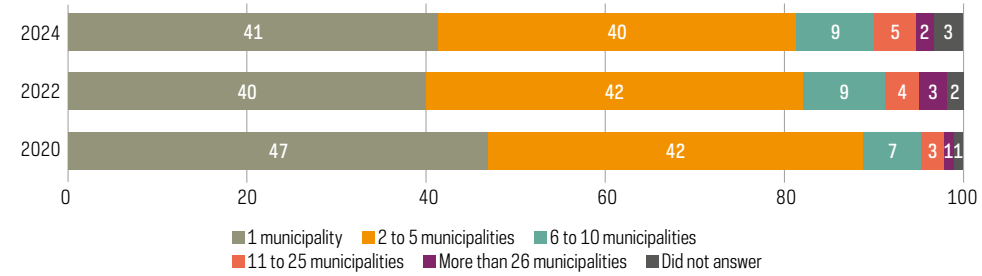
ISPs by number of municipalities in which they operate (2020–2024)

Total number of ISPs (%)



The state of the infrastructure used to reach end users is crucial for maintaining or expanding the customer base (Abrint, 2025). Most providers offered their services using only their own infrastructure (60%), maintaining the same proportion of outsourced infrastructure used as in 2022 (Chart 7).

CHART 7

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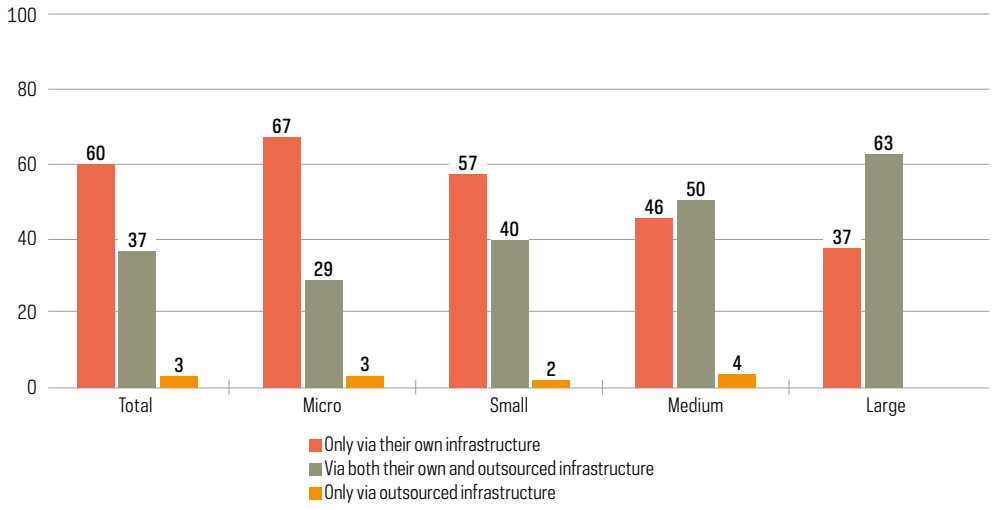
ISPs by method of providing Internet access to end users, by total and size (2020–2024)

Total number of ISPs (%)



One possibility for expanding providers' operations is the use of neutral networks. By having the option of not dealing with the implementation of fiber optic infrastructure, and instead leasing it from enterprises that manage the network, the provider can focus solely on the customer experience. However, there were no changes in the proportion of enterprises using neutral networks, remaining at 40% in 2024, with higher usage among medium-sized (47%) and large (52%) ISPs, as can be seen in Chart 8.

CHART 8

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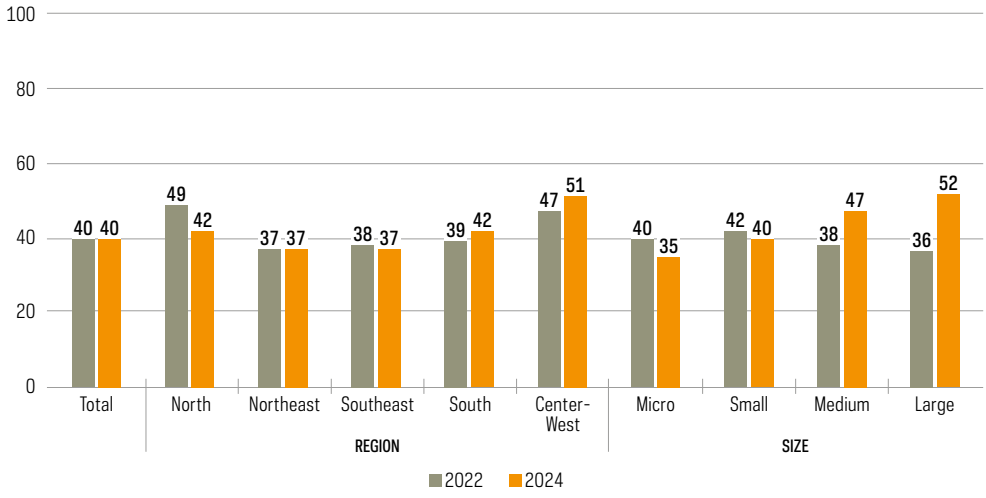
ISPs by whether they provide access to clients through a neutral network, by total, region, and size (2022–2024)

Total number of ISPs that offer access through third parties (%)



One unprecedented indicator in the survey on the operating models of ISPs is the service provided to clients in rural areas. There is a lack of information regarding the actions of enterprises to bring connectivity to areas far from municipal centers, and the few surveys available attest to the existence of digital blackouts in the outskirts of more remote regions (ConectarAGRO, 2025). Of all ISPs, 66% stated that they had clients in rural areas,[11] with the highest proportion in the South (80%). Furthermore, in terms of size, the profile shows a greater presence of medium-sized and large enterprises, indicating limitations in infrastructure and investment for smaller enterprises to reach areas further away from the municipal centers where they operate (Chart 9).

[11] It is important to mention that the classification of "rural" used in the survey is made from the enterprise's perspective, since official classifications of rural areas from the Brazilian Institute of Geography and Statistics (IBGE) or the Rural Environmental Registry (CAR) are not considered.

CHART 9

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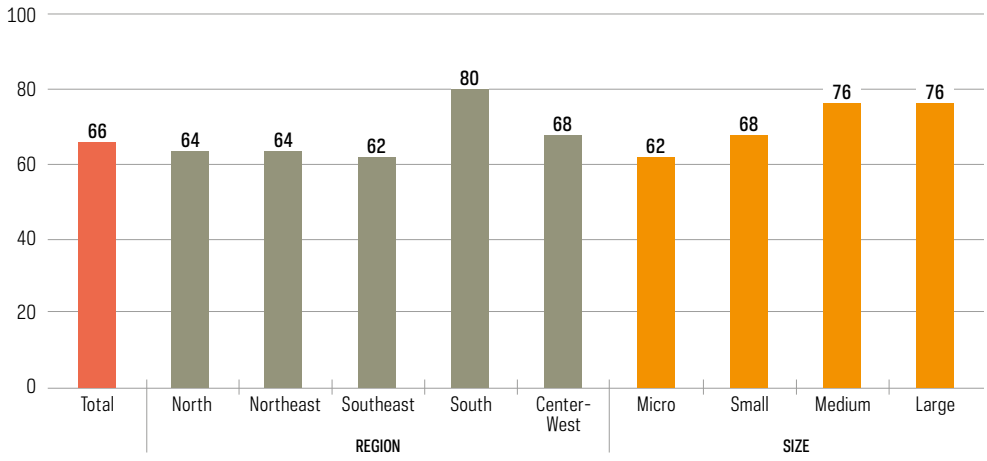
ISPs with clients in rural areas, by total, region, and size (2024)

Total number of ISPs (%)



Another new indicator in this edition of the survey is the service provided to corporate customers in rural areas. The indicator aimed to contribute to understanding the impact of digitalization in the agricultural sector, considering the scarcity of information on the connectivity of its enterprises. Although the indicator focuses exclusively on the provision of Internet services, some characteristics of these providers' performance show a relationship between connectivity and the country's agricultural sector. Among ISPs operating in rural areas and serving corporate customers, 36% served customers in the agricultural sector, representing approximately 4,278 enterprises. It is important to note that the largest proportion of these enterprises are located in the South and Center-West, as well as among medium-sized and large enterprises (Chart 10).[12]

[12] According to the Rural Connectivity Index, developed by the ConectarAGRO Association and the Federal University of Viçosa (UFV), 33.9% of the Brazilian agricultural area available for use has 4G or 5G coverage, while 48.1% of Brazilian rural properties have said coverage (ConectarAGRO, 2025).

CHART 10

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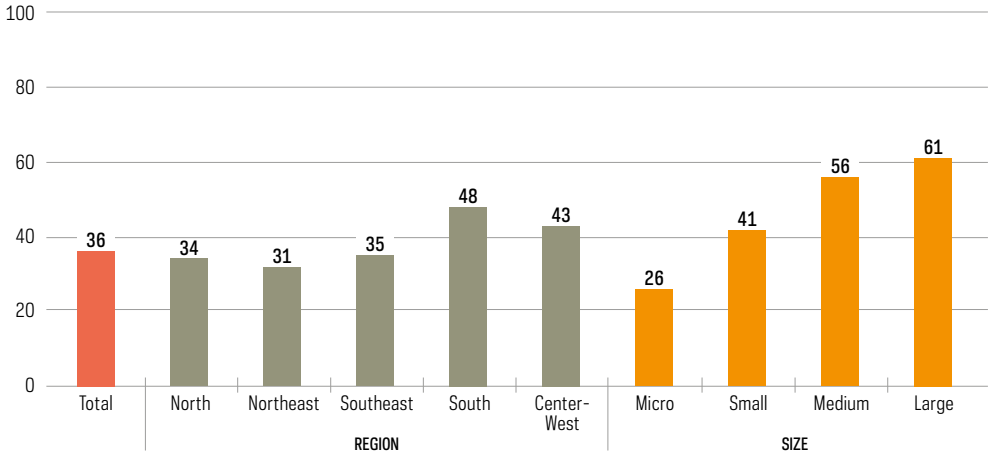
ISPs serving enterprises in the agricultural sector, by total, region, and size (2020–2024)

Total number of ISPs (%)



This section highlighted the predominance of microenterprise operations confined to a single municipality. As a consequence of this scenario, an operational pattern heavily focused on the use of proprietary infrastructure was observed, which may be related to a reduced scope of action. This can result in difficulties in contracting outsourced infrastructure, a decisive factor in expansion strategies. Furthermore, the survey indicated for the first time the presence of providers in rural areas, revealing the demand for connectivity from customers located far from the municipal centers. Beyond the physical infrastructure, it is also important to assess how these ISPs operate in relation to the possibility of improving connectivity through network management practices, which are crucial for enhancing the user experience, such as participation in IX.br (Brazil Internet Exchange) and the adoption of IPv6.

IXPs and IPv6

To improve customer experience by delivering faster and more stable connections, one action that providers can take is to participate in the NIC.br Internet exchange points — IX.br. Once on IX.br, the provider can directly access the content most sought after by customers, especially that from streaming enterprises.[13] In order to capture in detail

[13] On the demand side, according to the ICT Households 2024 survey, 60% of Internet users accessed the Internet through televisions and 77% stated that they watched videos, shows, movies or series online (CGI.br, 2025).

whether the provider participates exclusively in IX.br or is also present in other Internet exchange points, there has been a change in the indicator in the current edition. In 2024, 34% of providers stated that they participated in IX.br, mostly from the Southeast region and of medium to large size, with only 3% of providers participating in other Internet exchange points (Chart 11).[14]

CHART 11

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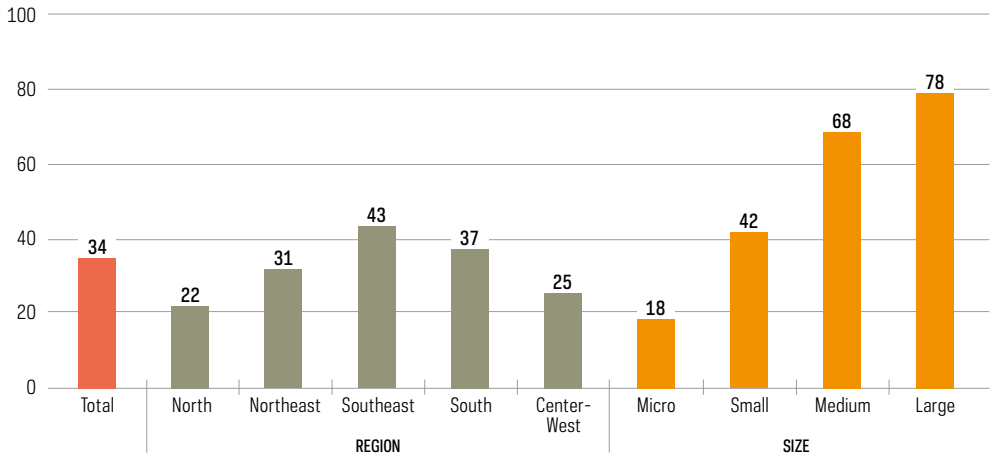
ISPs by participation in IX.br, by total, region, and size (2024)

Total number of ISPs (%)



The reasons why ISPs seek out IX.br are related to characteristics that can provide a competitive advantage over those that do not participate in it (Chart 12). For 34% of the providers participating in IX.br, their presence in the initiative was related to improving the quality of their Internet services. 32% stated that the reason for participating was to improve the organization of local Internet traffic. It is also worth highlighting that 28% of the providers on IX.br stated that the reason was to have access to a content delivery network (CDN), a crucial initiative for centralizing the main content accessed by Internet users, such as video calls and streaming services.[15]

[14] It is important to highlight that IX.br has been breaking consecutive traffic volume records, representing one of the largest Internet exchange points in the world. In April 2025, IX.br reached 40 Tbit/s of aggregate traffic. More information at https://ix.br/noticia/releases/ix-br-atinge-novo-recorde-com-40-tbit-s-de-trafego-agregado

[15] NIC.br promotes the OpenCDN (Open Content Delivery Network) initiative at its Internet exchange points, which aims to share infrastructure to reduce latency between content and users. More information at https://opencdn.nic.br/pt/about/

CHART 12

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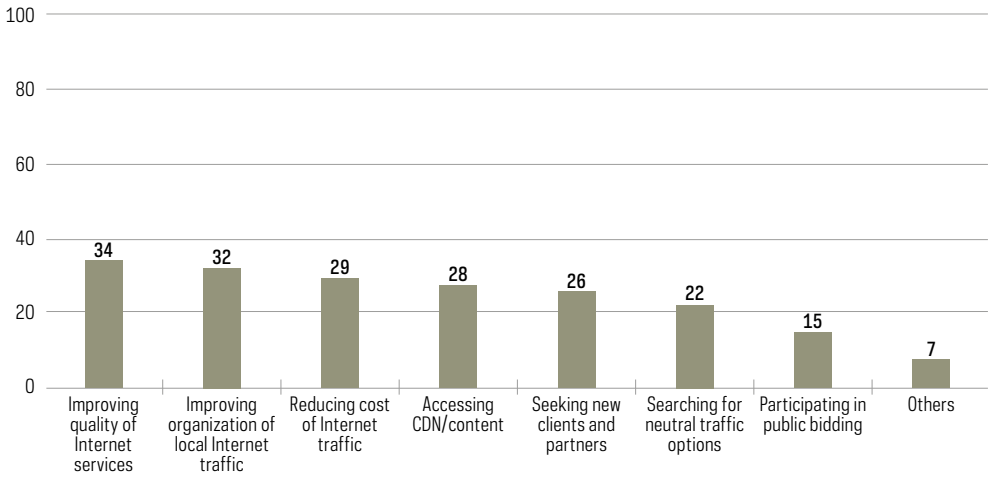
ISPs by reason for participating in IX.br (2024)

Total number of ISPs that participated in IX.br (%)



Another important aspect for improving the quality of the connection offered to customers is the delivery of IPv6. By offering connectivity via IPv6, providers can offer a more complete customer experience, since having a unique address allows for direct connection, not sharing the same address number as other subscribers. This translates to lower latency, an essential attribute for performing key online activities (such as video calls). The greater the use of IPv6, the more efficient the distribution of content will be, and the more secure the network becomes, since there is a unique identification of devices.[16] In a time of expanding Internet of Things (IoT) applications, it is important for countries to advance in the adoption of IPv6, which implies faster and more stable communication between devices, while also contributing to network resilience and reliability.[17]

[16] According to the ICT Households 2024 survey, 82% of Internet users made voice or video calls (CGI.br, 2025). Therefore, uses of the Internet that require higher speed and connection stability are becoming increasingly widespread among its users, imposing greater Internet traffic and a higher demand for the quality of service offered by the provider.

[17] According to the report The Mobile Economy 2025, in 2024, mobile technologies generated the equivalent of 8.2% of Latin America's gross domestic product (GDP), and this could reach 8.6% in 2030 (Global System for Mobile Communications Association [GSMA], 2025).

In 2024, according to the ICT Providers survey, there was an increase in the supply of IPv6: In 2020, 40% of ISPs offered IPv6 to customers, a proportion that was 64% in 2022 and reached 72% in 2024. However, it is important to highlight that there is still a large base of enterprises offering IPv4, as well as using NAT techniques, indicating that there is still room for qualification (Chart 13).[18]

CHART 13

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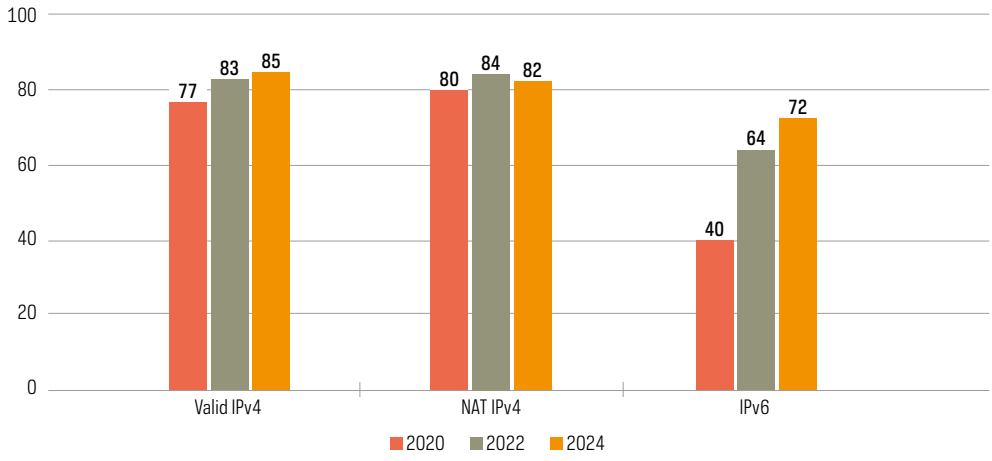
ISPs by service delivery method (2020–2024)

Total number of ISPs (%)



Although the use of IPv6 has increased in the country, the high supply of IPv4 remains, indicating that there is room for providers to accelerate this transition. Among the difficulties most frequently reported by providers for this adoption were: high investment cost, difficulties in creating an activation plan, and lack of appropriate equipment (Chart 14). It is worth highlighting that, since this is a universe massively populated by micro and small enterprises, the obstacles reported are related to the traditional difficulties in financing and human resources that plague enterprises of this size.

These enterprises may have difficulty providing the necessary guarantees to obtain loans for the purchase of equipment, for example, as well as facing barriers in finding and retaining employees, which may limit the possibilities of investing in the technical skills needed to make the transition to IPv6.[19]

[18] The indicator of IPv6 offerings by providers can be complemented by monitoring its adoption in traffic, as done by Google. According to the survey, 52.53% of Internet traffic in Brazil is carried out via IPv6, placing the country close to nations such as the United States, Mexico, and Uruguay. According to Google's monitoring, the countries with the highest adoption of IPv6 are France (86.19%), India (78.36%), and Germany (75.68%). More information at https://www.google.com/intl/pt-BR/ipv6/statistics.html#tab=per-country-ipv6-adoption

[19] NIC.br offers online and in-person courses on IPv6. The initiative's website provides access to tutorials and reading material. More information at https://ipv6.br/

CHART 14

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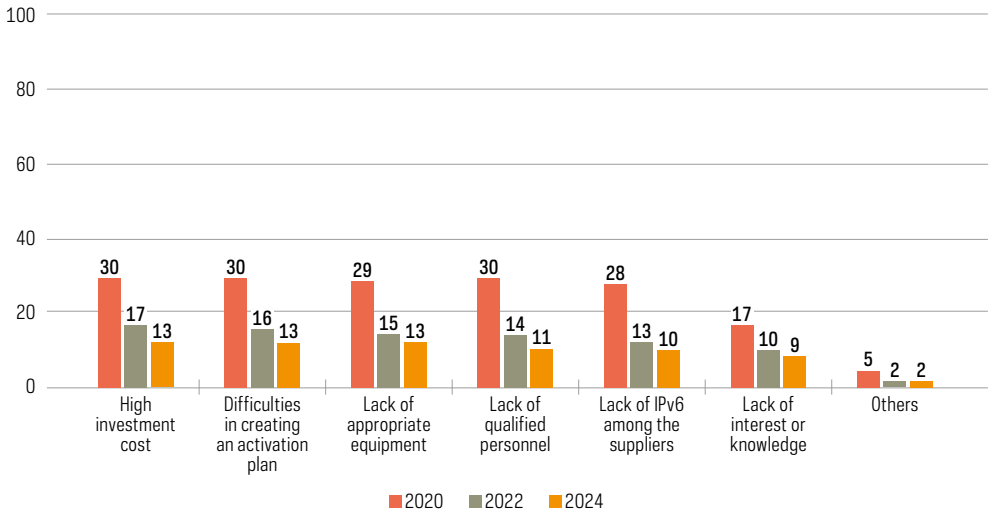
ISPs by difficulties in activating IPv6 (2020–2024)

Total number of ISPs (%)



Given that most applications used in users' work, study, and leisure activities consume a large amount of bandwidth, providers that offer customers lower latency and higher speeds will stand out in the competition with other enterprises. To achieve this goal, it is necessary to train teams technically, as well as implement more professional traffic management. The indicators discussed in this section show that there is progress in terms of a better distribution of numbering resources, through increased IPv6 availability, but that this may not yet reach the largest customer base.[20] From the perspective of presence on IX.br, greater efforts can be made to connect with this initiative, considering the benefits it can bring to the customer experience, especially regarding access to video content.[21]

[20] It is worth noting that, since October 2025, the "gov.br" pages of the federal government have been responding in IPv6. More information at https://ipv6.br/post/quando-o-governo-lidera-pelo-exemplo-o-ipv6-chega-ao-www-gov-br/

[21] IX.br currently has 38 locations. The list of cities and ways to connect are available on the initiative's page. More information at https://ix.br/adesao

Privacy and personal data protection

Furthermore, compliance with the Brazilian General Data Protection Law (LGPD) has become increasingly crucial for enterprises, both from a legal standpoint and in the relationship between providers and their clients. Legally, it is necessary to comply with the requirements of the law, which is overseen and monitored by the National Data Protection Agency (ANPD).[22] Since the sector involves a high volume of personal data processing, especially data capable of identifying customers, it is crucial to understand the sector's concerns regarding this issue.

From a strategic business perspective, it is important to highlight that the proper handling of personal data is becoming an increasingly important requirement for customers. According to the Privacy and Personal Data Protection 2023 survey, released by Cetic.br|NIC.br, in 2024 there was growing concern among Internet users regarding online activities: The highest level of concern related to online purchases made on websites and apps (29% very concerned and 27% concerned), followed by access to banking websites and apps (25% very concerned and 24% concerned). These results indicated that Internet users perceived a high potential for harm related to financial transaction data (CGI.br, 2024). Thus, it can be assumed that there is considerable unease regarding everything surrounding Internet use, including the enterprises that provide access to the network.

In this context, it is important to have a certain leveling between the different internal sectors, in order to disseminate knowledge and best practices in this field within enterprises. One action in this regard is holding meetings to deal exclusively with the topic of data protection. In 2024, 66% of providers stated that they carried out meetings to address data protection, a proportion that was 68% in 2020. It is important to highlight that a smaller proportion was observed among microenterprises (Chart 15), indicating the need for greater awareness among these organizations about the importance of addressing this issue internally.[23]

[22] Provisional Measure No. 1.317/2025 transformed the National Data Protection Authority into the National Data Protection Agency, which thus acquired functional, technical, decisional, administrative, and financial autonomy. More information at https://www.gov.br/anpd/pt-br/assuntos/noticias/governo-federal-estrutura-anpd-para-assumir-competencias-do-eca-digital

[23] It is important to highlight that, in general, ISPs demonstrate a higher level of action related to privacy and protection of personal data than enterprises as a whole. In 2023, 35% of enterprises held meetings to deal exclusively with the topic of personal data protection (CGI.br, 2024), indicating a greater concern among providers with internal awareness.

CHART 15

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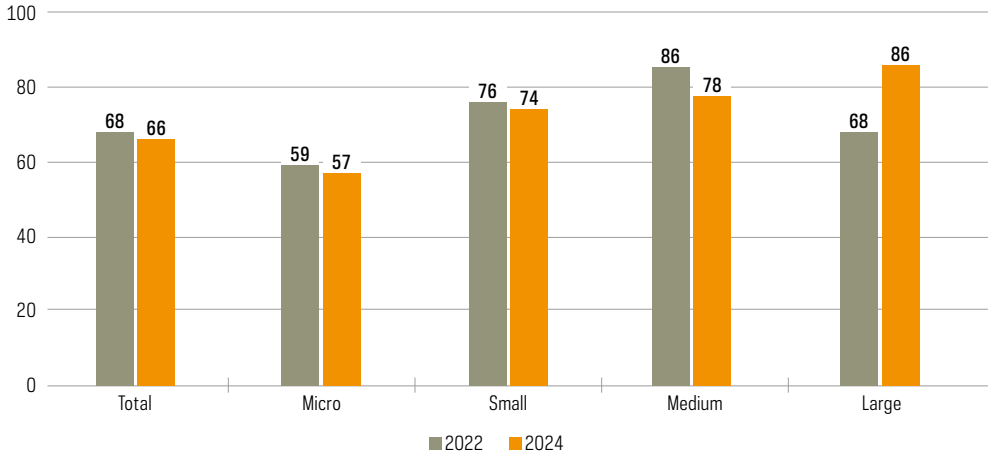
ISPs by whether they have carried out internal meetings specifically address the topic of personal data protection, by total and size (2022–2024)

Total number of ISPs (%)



One of the indicators used to assess organizations' internal capabilities in relation to the LGPD is the presence of departments or professionals dedicated to the subject. In 2024, 42% of providers had some kind of structure dedicated to protecting personal data, a proportion that was 40% in 2020. As observed regarding the occurrence of meetings, a higher proportion of them were found in larger enterprises (85%), while less than half of small and microenterprises had persons or departments responsible for the protection of personal data (Chart 16). It is important to highlight the fact that, regardless of the enterprise's size, concern about the handling of personal data should be considered a strategic aspect, since leaks or misuse of this data can lead to reputational damage, and the enterprise may also be subject to sanctions by the regulator. It is worth highlighting the increase in this indicator among large enterprises, from 51% in 2022 to 81% in 2024, demonstrating a greater concern in handling customer data, as well as a greater capacity to assign internal employees to deal with the subject. Therefore, the presence of areas responsible for the topic of personal data protection can serve as a catalyst for raising awareness of good practices in other areas of the organizations, as well as actually implementing actions within enterprises.[24]

[24] In comparison with the results of the Privacy and Personal Data Protection 2023 survey, regarding Brazilian enterprises as a whole, there was a lower degree of concern about formalizing organizational structures to deal with compliance with the LGPD: In 2021, 23% of enterprises had this type of structure, increasing to 25% in 2023 (CGI.br, 2024).

CHART 16

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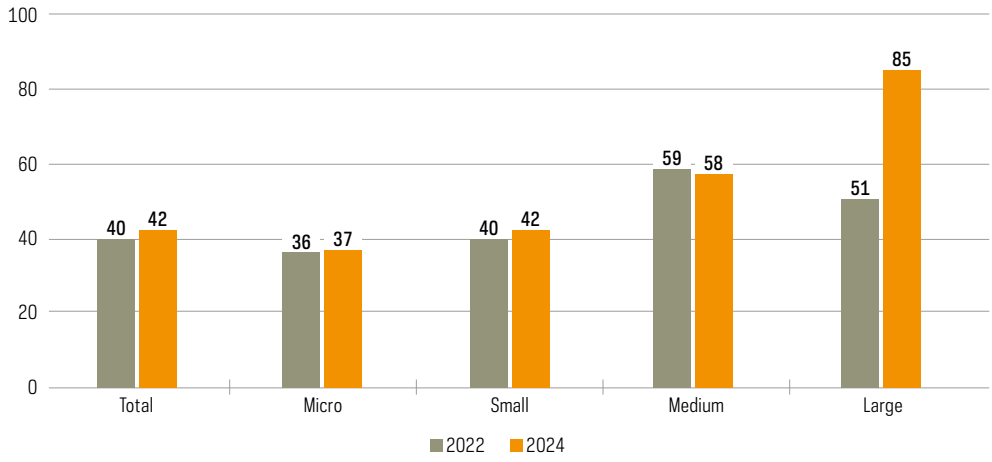
ISPs by presence of specific areas or persons responsible for personal data protection, by size (2022–2024)

Total number of ISPs (%)



Among the enterprises that had specific structures to deal with the issue of personal data protection, we investigated which of their areas were involved (Chart 17). Following the pattern observed in 2022, in 2024, 78% of providers stated that the employee responsible for personal data protection came from the information technology area, followed by the administrative department: 66% of enterprises. This was the same proportion of providers who stated that the professionals responsible for the LGPD were directors.[25]

[25] It is worth noting that, when compared with the results for enterprises as a whole in the Privacy and Personal Data Protection 2023 survey, the main areas or departments to which employees responsible for LGPD-related issues belonged was also information technology, followed by the administrative sector (CGI.br, 2024).

CHART 17

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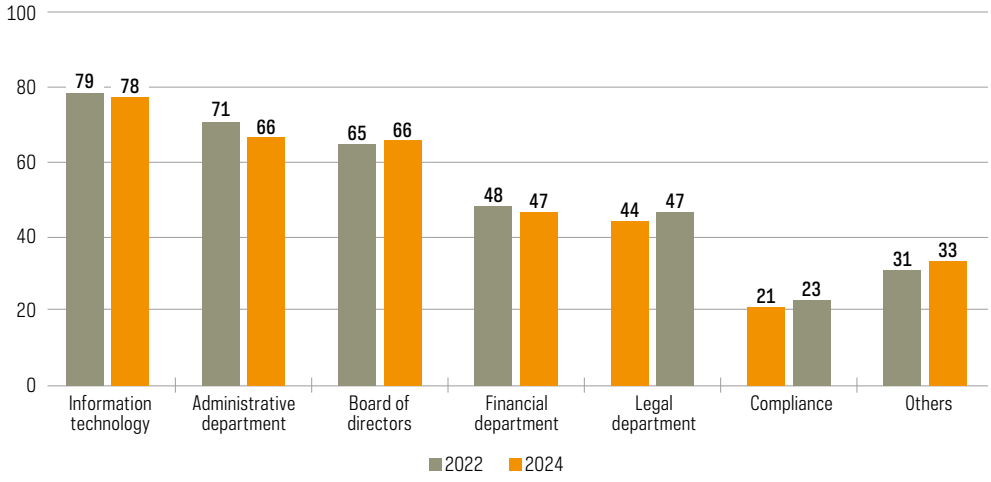
ISPs by areas or departments of the persons responsible for personal data protection (2022–2024)

Total number of ISPs with specific areas or persons responsible for personal data protection (%)



With regard to specific actions for compliance with the LGPD, stability was observed in the results (Chart 18). Most ISPs (65%) offered customer service channels for data holders, followed by data leakage security tests (57%). One of the actions least cited by enterprises was the appointment of data protection officers, mentioned by 30% in 2022 and 32% in 2024. Given the mandatory appointment of data protection officers, as well as the volume of personal data involved in the operation of service providers, it is important that enterprises consider seeking to comply with the requirements of the regulatory body.[26]

[26] It is important to highlight that, according to Resolution CD/ANPD No. 2, of January 27, 2022 (ANPD, 2022), there is a waiver of the requirement to appoint data protection officers for small-scale data processing agents, encompassing in this definition "microenterprises, small-sized enterprises, startups, and private legal entities, including non-profit entities, under the terms of current legislation, as well as individuals and unincorporated private entities that carry out personal data processing, assuming obligations typical of a controller or operator" (Provisional Measure No. 1.317/2025, art. 2, item I). However, some requirements remain, such as maintaining communication channels with data holders.

CHART 18

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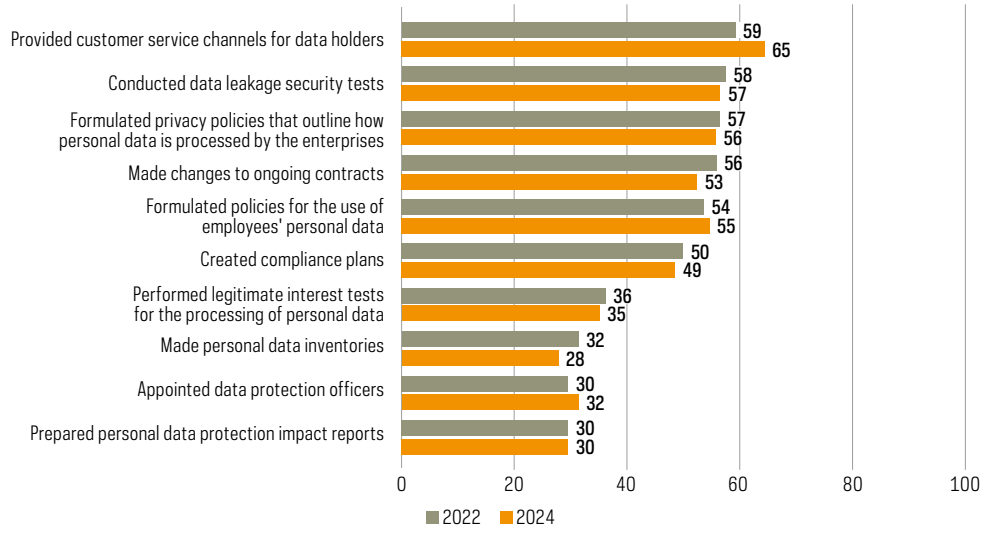
ISPs by types of action to comply with the LGPD (2022–2024)

Total number of ISPs (%)



The results of the indicators related to the LGPD showed that, when compared to Brazilian enterprises as a whole, ISPs have higher proportions in terms of actions for the processing of personal data. However, there is still room for expansion of these actions, especially among micro and small enterprises. In this context, understanding how enterprises manage their resilience, that is, how robust their digital security practices are, is crucial for both maintaining and expanding their customer base, as will be discussed in the next section.

Digital security

Several surveys point to a growing number of cyberattacks and incidents, highlighting the need for ISPs to stay up-to-date and alert to malicious actions. According to data from the Brazilian National Computer Emergency Response Team (CERT.br), 516,556 incidents and 57,498 denial-of-service attacks were reported in 2024.[27] Furthermore, data compiled by the Latin American and Caribbean Internet Address Registry (LACNIC) places Brazil as the largest recipient of prefix hijacking attacks in Latin America, something

[27] It is worth noting that these incidents and attacks are reported voluntarily to CERT.br, and those that were not detected or were omitted by the victims are not counted. More information at https://stats.cert.br/incidentes/

that centrally affects the activities of providers (LACNIC, n.d.). Added to all this, there are warnings about the digital vulnerabilities of most organizations, especially at a time when the number of attacks is growing, driven by advances in Artificial Intelligence (AI) (World Economic Forum [WEF], 2025).

Since providers can be both victims and agents of various cyberattacks, it is important for enterprises to seek to qualify themselves to manage digital security risks, avoiding the compromise of their routine activities and reducing the chances of serving as a means of amplifying such attacks, thus limiting damage to other organizations and individuals. In 2024, 70% of providers used their network operations teams to handle cases of abuse or security incidents. Additionally, but to a lesser extent, providers sought to internalize this expertise, with 57% maintaining persons or teams exclusively dedicated to handling abuse cases or security incidents. However, the results showed no variation between 2022 and 2024 (Chart 19).

CHART 19

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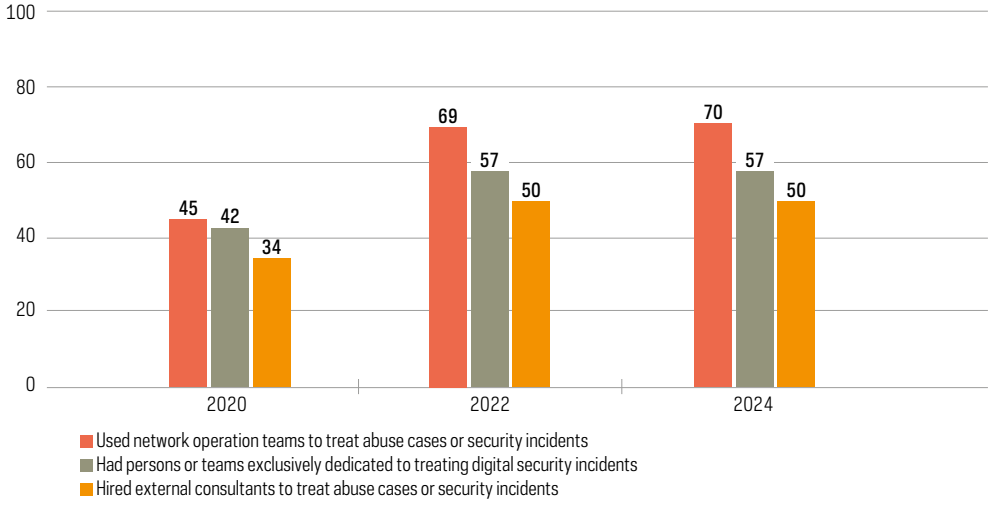
ISPs by type of action to handle abuse cases or security incidents (2020–2024)

Total number of ISPs (%)



One of the main digital security risks to which providers are most exposed is denial-of-service attacks. The ICT Providers 2024 survey showed an increase in the number of enterprises that reported receiving these attacks, rising from 23% in 2022 to 30% in 2024. It is worth highlighting that this growth was influenced by the increase in the number of attack reports by providers in the Northeast, rising from 14% in 2022 to 25% in 2024 (Chart 20).

CHART 20

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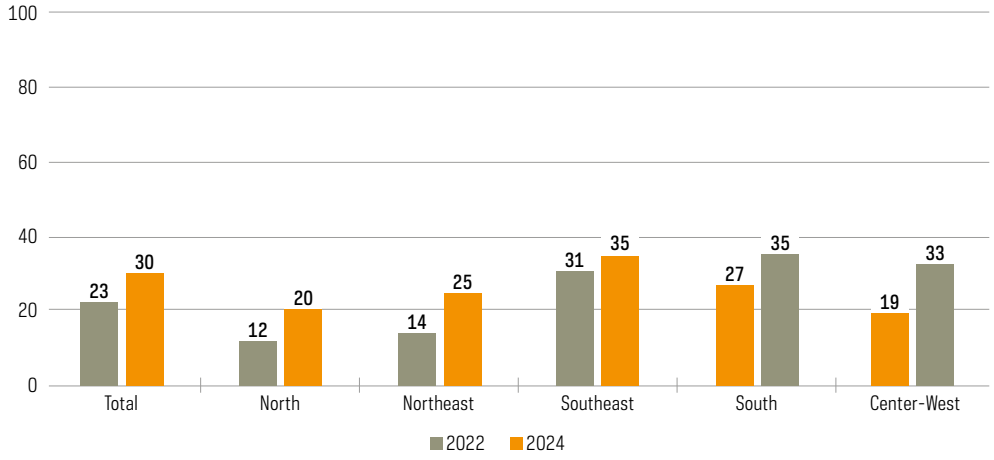
ISPs that suffered denial-of-service attacks, by total and region (2022–2024)

Total number of ISPs (%)



One of the effects of denial-of-service attacks is precisely the congestion of providers' networks, which can cause slowness for end users. This type of attack can compromise the quality of service offered by enterprises, generating complaints or even changes to the contracted providers. Among the ISPs that reported suffering attacks in 2024, 69% stated that they kept operating, but with greater delay; followed by quitting the service entirely (32%); and, less frequently, they reported being victims of extortion (4%) (Chart 21). Even though the most frequent effect of attacks does not render providers' operations unfeasible, it is always important to reduce the risks of exposure to this type of attack, since network slowdowns can lead to losses in the quality of service provided to customers.

CHART 21

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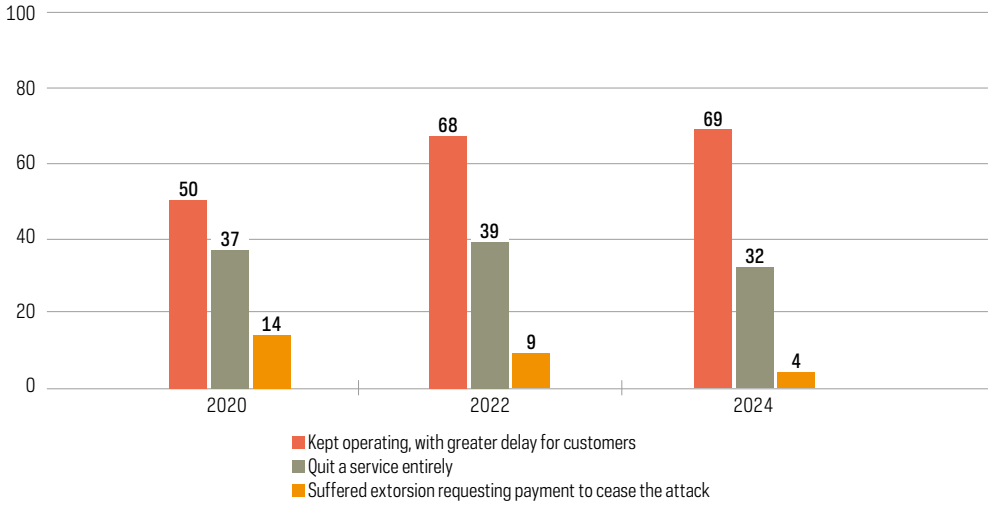
ISPs by type of impact from denial-of-service attacks (2020–2024)

Total number of ISPs that suffered denial-of-service attacks (%)



In the debate about digital security risk reduction practices among providers, it is possible to suggest that there is room for greater specialization of security professionals within enterprises. As cyberattacks become increasingly frequent and complex, requiring greater technical expertise, it is important for enterprises to seek specialized professionals or assistance from other establishments to mitigate digital security risks. It is worth highlighting that there are practices that can be adopted to detect attacks, which are beneficial not only for the enterprises but also for the network as a whole, such as adherence to the Mutually Agreed Norms for Routing Security (MANRS) (LACNIC, 2024).

BOX 1

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MUTUALLY AGREED NORMS FOR ROUTING SECURITY (MANRS)

MANRS, led in Brazil by NIC.br, is a global Internet Society initiative aimed at increasing the security of Internet routing. The main objective is to reduce problems such as BGP route hijacking and leakage, source IP address spoofing, coordination failures between operators, and difficulties in validating routing policies. To achieve this, MANRS proposes four essential actions: implementing route filtering to ensure that only legitimate announcements are accepted and propagated; adopting anti-spoofing techniques with source IP address validation; maintaining updated communication channels and operational contacts in databases such as PeeringDB, IRR, and Whois; and publicly documenting and validating routing policies, including the use of RPKI and IRR records. These practices are low-cost and significantly increase the resilience of the Internet, preventing attacks and operational failures. Participation in MANRS demonstrates a commitment to best practices and can benefit the reputation of providers and stakeholders, who can register directly on the initiative's website. For more information: https://bcp.nic.br/manrs

Final considerations: Agenda for public policies

The transformations in the Internet access provision market in Brazil point to a new era for the sector, with implications for how its enterprises traditionally operate. If, for a long time, the main business model was the expansion of connectivity to locations with little economic interest, it is now necessary to go beyond that, with greater concern about the quality parameters of the Internet offered, as well as the offering of more diverse service packages (Abrint, 2025). In this context, the results of this edition of the ICT Providers survey reveal a possible, albeit still incipient, movement toward a diversification of enterprises' activities in response to the new competitive landscape in the sector.

Following a trend already observed in the 2022 edition, there has been a reduction in the emergence of micro and small enterprises, which had been the driving force behind growth in the sector's expansion in previous years. However, as evidenced by all editions of the ICT Providers survey, the main characteristic of the sector is still that it is composed of small enterprises that are operating in one municipality, but are distributed throughout a large part of the country.[28]

Alongside the transformations in the sector's competitive dynamics, it is important to mention the increasing complexity of Internet use over time, for both individuals and organizations. From a demand perspective, the main applications and content consumed by Internet users increasingly require a greater amount of network bandwidth, making constant updating and maintenance essential. Slow service or service interruptions can affect the relationship with customers, generating complaints or changes of provider.[29] Furthermore, it is essential to mention the need for an adequate connection to carry out leisure, work, or study activities, thus meeting the needs of increasingly demanding customers in terms of network reliability and quality.[30]

Regarding the diverse needs linked to the quality of Internet access, it is worth highlighting the shift in the debate about connectivity itself, given the growing dependence on quality connections for accessing a wide range of digital services, both public and private. Therefore, Internet access is increasingly seen as a crucial means of guaranteeing citizenship, with Internet service providers also becoming part of this ecosystem to promote network access standards that ensure higher quality, and they must increasingly improve their performance in the face of a market with a higher level of demand, both from a regulatory perspective and in terms of meeting customer needs.

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[28] According to the *Mapa de Empresas* (Enterprise Map), in 2024, there were 22,004,843 active enterprises, the majority of which were individual microentrepreneurs. Compared to 2023, there was a 9.8% increase in the number of enterprises opened in 2024. More information at https://www.gov.br/empresas-e-negocios/pt-br/mapa-de-empresas/boletins-anteriores

[29] Anatel conducts a customer satisfaction survey among the main operators in the market. In the results for 2024, there were high levels of satisfaction with fixed broadband, but at lower levels than the other services covered, such as prepaid mobile, postpaid mobile, pay TV, and fixed telephony (Anatel, 2025b).

[30] In one of the rankings of the most commonly used Internet quality standards, Brazil ranks 26th in fixed broadband quality, with a median download speed of 210.56 Mbps; an upload speed of 112.08 Mbps; and a latency of 5 milliseconds. In comparison, the country that ranks first in this test, Singapore, has a median download speed of 400.68 Mbps; an upload speed of 311.32 Mbps; and a latency of 4 milliseconds. More information at https://www.speedtest.net/global-index

In this context, a series of challenges also emerge for ISPs. Since the sector is made up mostly of micro and small enterprises, one of the challenges in this new phase is the mobilization of financial and human resources to improve the services offered, considering the recognized difficulties they face in scaling up their operations. Therefore, expanding access to higher-quality connections in smaller areas necessarily requires improving the technical skills of service providers, especially smaller ones.[31]

In this time of transformation in the Internet access provision market, where there are greater demands regarding the quality of connections, it is essential to monitor how providers will adapt to this new context. While the results of this edition of the ICT Providers survey show improvements in the physical infrastructure of enterprises, there are also aspects related to connection quality that have room for growth.

For example, their presence on the IX.br Internet exchange points can provide greater proximity to the content most accessed by users by reducing latency, thus improving the customer experience. In addition, the availability of IPv6 also contributes to faster and more stable connections, as well as greater network resilience and security. In the context of digital security, some practices can be implemented more frequently, which helps to mitigate and prevent the effects of denial-of-service attacks.

In this context, the main challenges include the qualification of teams and the improvement of network management, which necessarily involves expanding technical skills. Finally, at a time of market transformation, it is important to highlight the growing debate in the sector about the need for transformation of business models, considering providers not only as enterprises responsible for Internet connection, but also as relevant players in promoting meaningful connectivity in the country.

[31] The Brazilian Development Bank (BNDES) has a specific credit line for micro, small and medium-sized service providers, through the Universal Service Fund (FUST). More information at https://agenciadenoticias.bndes.gov.br/infraestrutura/Linha-do-Fust-para-pequenos-provedores-do-BNDES-ganha-orcamento-75-maior-e-novas-modalidades-de-apoio/

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List of Abbreviations

Abranet – Internet Brazilian Association

Abrint – Brazilian Association of Internet and Telecommunications Service Providers

AI – Artificial Intelligence

Anatel – National Telecommunications Agency

ANPD – National Data Protection Authority

AS – Autonomous System

ASN – Autonomous System Number

ASP – Application Service Providers

BNDES – Brazilian Development Bank

CAR – Rural Environmental Registry

CATI – Computer-assisted telephone interviewing

CAWI – Computer-assisted web interviewing

CDN – Content Delivery Network

Ceptro.br – Center of Study and Research in Network Technology and Operations

CERT.br – Brazilian National Computer Emergency Response Team

Cetic.br – Regional Center for Studies on the Development of the Information Society

CGI.br – Brazilian Internet Steering Committee

CNCTI – National Conference on Science, Technology, and Innovation

CNPJ – National Registry of Legal Entities

DEWG – Digital Economy Working Group

Fust – Universal Service Fund

G20 – Group of Twenty

GSMA – Global System for Mobile Communications Association

IBGE – Brazilian Institute of Geography and Statistics

ICT – information and communication technologies

IP – Internet Protocol

ISPs – Internet Service Providers

IT – information technology

ITU – International Telecommunication Union

IX.br – Brazil Internet Exchange

IXP – Internet Exchange Points

LACNIC – Latin American and Caribbean Internet Addresses Registry

LGPD – Brazilian General Data Protection Law

MANRS – Mutually Agreed Norms for Routing Security

MCom – Ministry of Communications

MCTI – Ministry of Science, Technology, and Innovation

MGI – Ministry of Management and Innovation in Public Services

MVNO – Mobile Virtual Network Operator

NAT – Network Address Translation

NIC.br – Brazilian Network Information Center

NSF – National Science Foundation

OBIA – Brazilian Artificial Intelligence Observatory

OECD – Organisation for Economic Co-operation and Development

OpenCDN – Open Content Delivery Network

PBIA – Brazilian Artificial Intelligence Plan

RedeTelesul – National Association of Companies for Internet Solutions and Telecommunications

RNP – National Education and Research Network

SCM – Multimedia Communication Services

SeAC – Conditioned Access Services

Secom – Secretariat for Social Communication

SMP – Mobile Telephony

STFC – Switched Fixed Telephone Services

UNCTAD – United Nations Conference on Trade and Development

UNESCO – United Nations Educational, Scientific, and Cultural Organization

UNICEF – United Nations Children's Fund

UNSD – United Nations Statistics Division

WEF – World Economic Forum

WHO – World Health Organization

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Information Center

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