



2022

STUDY ON THE BENEFITS OF IXP in ARGENTINA

EXECUTIVE REPORT

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CONTEXT

Throughout the years, Internet Exchange Points (IXPs) have become a key element of the development of the Internet. In Latin America and the Caribbean, there are over 100 IXPs, founded over 20 years.

To date, studies carried out have shown the importance of keeping traffic local and of fostering and supporting the creation of IXPs, both from the perspective of technical infrastructure as well as from a social perspective, as they are catalysts for new initiatives and the exchange of experiences and knowledge among their participants.

However, different studies conducted are mainly based on the experience of those who manage and operate IXPs, of external organizations supporting them, and of other stakeholders within the Internet ecosystem that drive the creation and growth of these projects.

It is here that the need for information allowing us to know of the benefits and impacts of IXPs arises, yet from a different perspective: that of connected members. By knowing this perspective, it is possible to understand the benefits for and needs of members and have solid information facilitating the development of business cases useful for potential members assessing the possibility of connecting to an IXP.

With the support of the Internet Society, this research was carried out in Argentina, yet it could be useful in other countries in or outside the region.



OBJECTIVES

- a. Map the services offered by the Argentinian IXPs managed by CABASE, and the impact on and benefits for their members, as well as the impact of regional organizations in creating value for the members of IXPs.
- b. Document how members perceive their participation in IXPs and identify areas for improvement allowing for increased knowledge of the benefits of IXPs, their services, and their impacts.
- c. Build a business case based on experiences to enable new and existing IXP to attract members by understanding their real strengths and practical benefits.

METHODOLOGY

The aim was to meet the objectives proposed by gathering and analyzing information obtained from multiple activities carried out:

- a. Surveys sent by Argentinian IXPs to their members ask about the perceived benefits of belonging to an IXP, as well as about desired improvements.
- b. Interviews were conducted with different representatives from IXP members who provided significant information adding value to data obtained through the surveys.
- c. The creation of a business case based on the information obtained and subsequent analysis of that data.

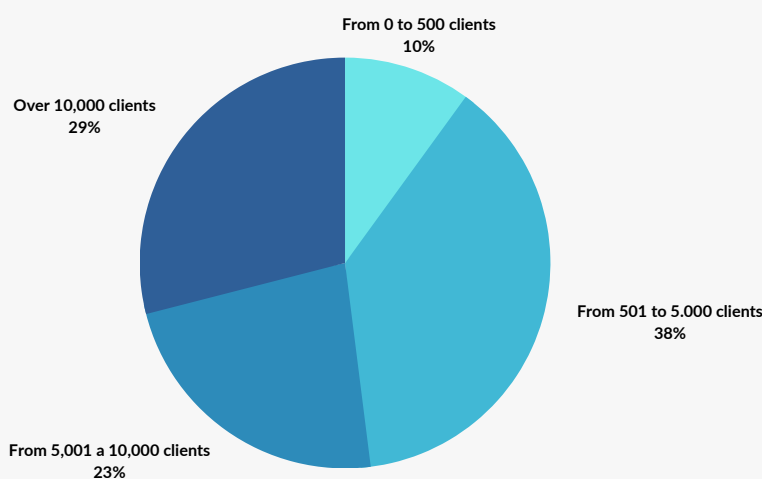
SUMMARY OF THE RESULTS OBTAINED THROUGH THE SURVEY

Members connected to CABASE, an IXP, are, for the most part, Internet Service Providers (ISPs) so the survey and interviews conducted were focused on that group. They were consulted, among other things, about their type of membership, transport technologies, associated costs, expected and currently received benefits, etc.

Based on the data collected through this survey, a total of 61 responses were obtained. Below is a summary of the results obtained.

Number of clients of each ISP¹: Out of the ISPs, 10% are small since they have no more than 500 clients; 38% are small to mid-sized ISPs, as they have no more than 5,000 clients, and they make up the largest group of ISPs participating in the survey; 23% of responses were sent by ISPs in the range of a maximum of 10,000 clients and are mid-sized and large ISPs, and a total of 29% of responses were sent by large ISPs who have over 10,000 clients.

NUMBER OF CLIENTS FROM ISPS INTERVIEWED

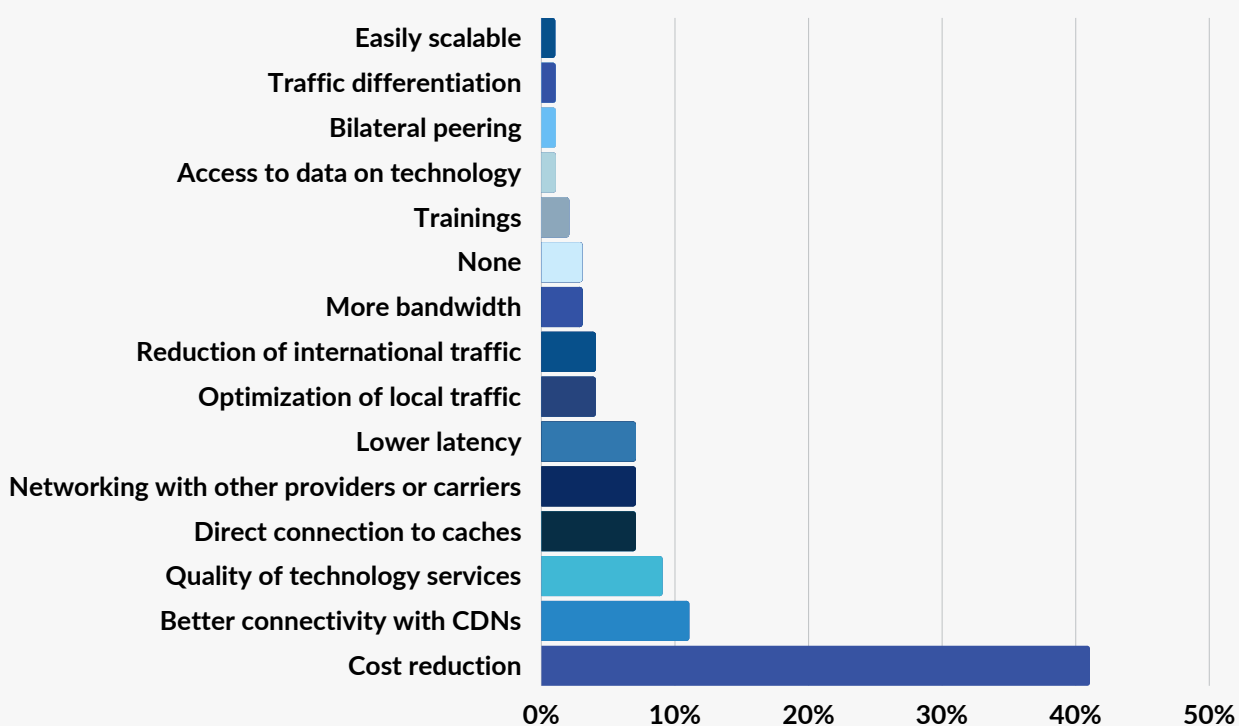


Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

¹ ISP (Internet Service Provider), Internet Service Providers, and members of IXPs distributed throughout the country (Argentina).

Benefits perceived by ISPs when connecting to an IXP: When ISPs connected to IXPs and became part of the technical community of Traffic Exchange Points in Argentina, they obtained benefits such as a decrease in the cost of local and international traffic, improved connectivity to CDNs² and improved quality in technology services due to lower latency in connections, among other benefits such as those mentioned in the following graph:

BENEFITS OBTAINED BY ISPs WHEN CONNECTING TO AN IXP

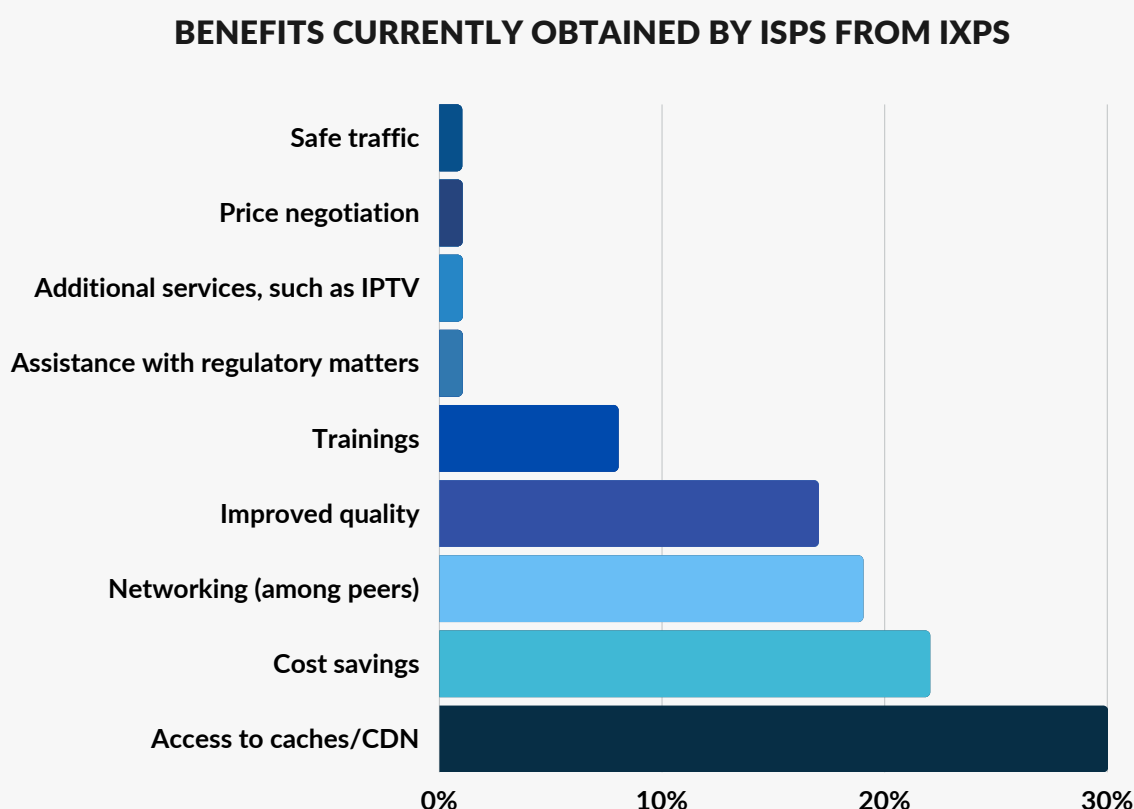


Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

² CDN: a content delivery network that, with geographically distributed servers, spread Internet traffic in a quicker, simpler way, making up the global traffic network and facilitating the exchange of data between Internet Service Providers through IXPs.

Benefits currently obtained by ISPs because of IXPs: Albeit it is true, as the following graph clarifies, that ISPs reported receiving multiple benefits by connecting to IXPs, their current perception about the benefits obtained has somewhat varied, either because they currently receive additional benefits or because the first ones are no longer primary and current benefits have become essential, to some extent, for their operations.

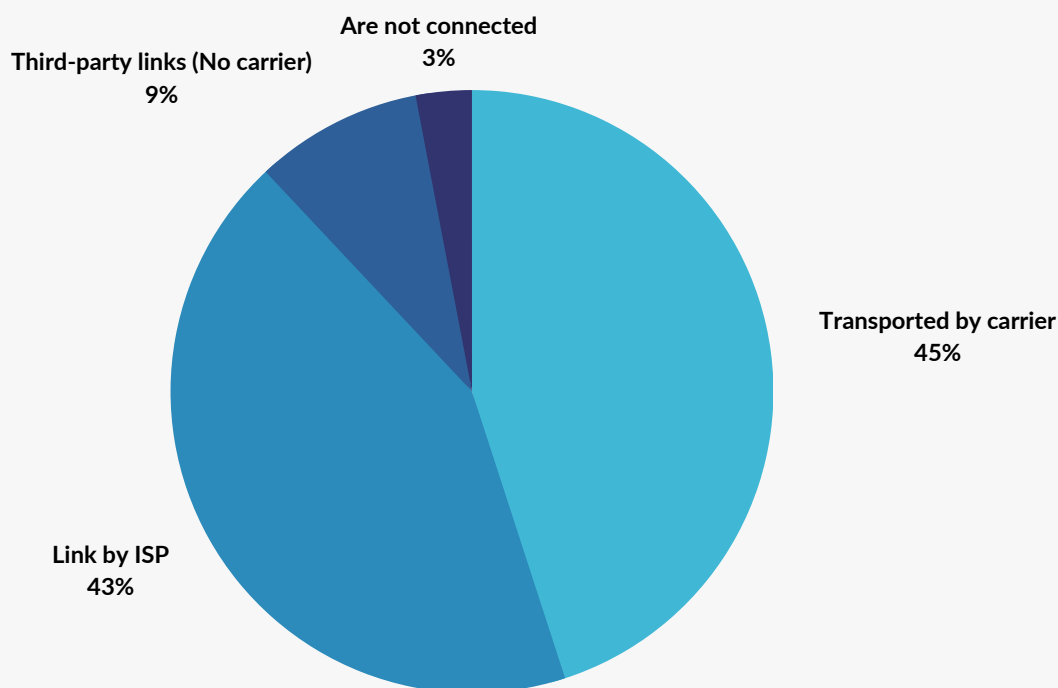
Some benefits obtained by ISPs when connecting to IXPs are access to CDN caches, cost savings, networking between peers, and an improvement in the quality of services, as shown in the following graph:



Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

Transport technology used by ISPs: Transportation of Internet traffic from ISPs to IXPs and from there to the Central Routing is done through several technologies. Some ISPs use their link and others use a carrier³ or third-party link. How ISPs solve the transportation method between their location and the IXP is shown in the following graph:

TRANSPORT TECHNOLOGY USED BY ISPs

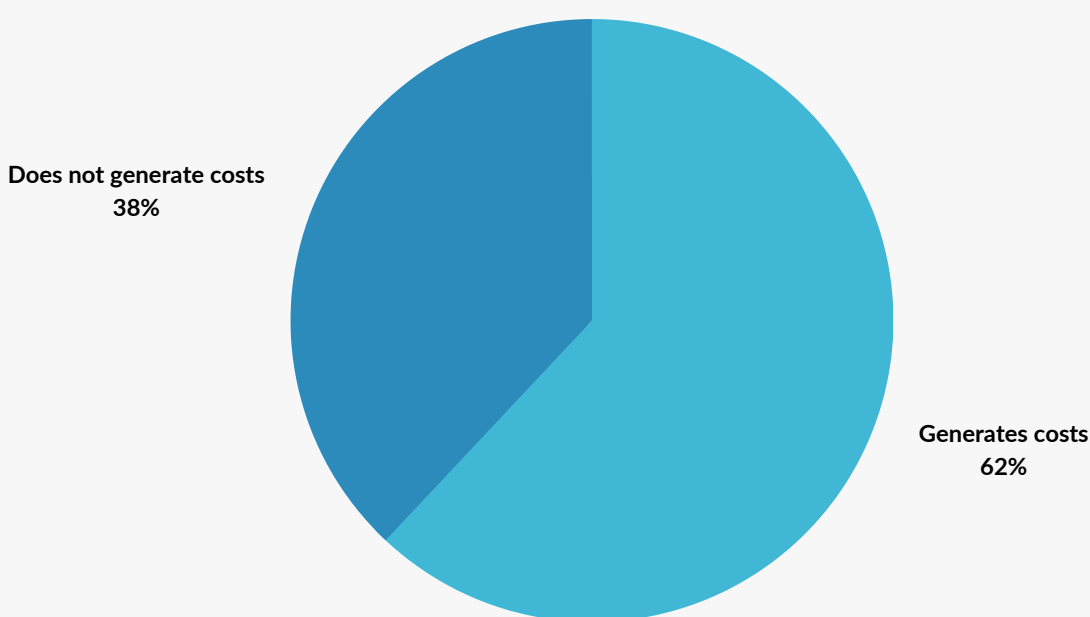


Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

³ *Carrier: Companies operating telecommunications services that lease their infrastructure to transport data*

ISPs covering costs to connect their node to the IXP: When the connection between an ISP node and the IXP depends on the use of a third-party link, this generates a cost that must be borne by that ISP. The average cost is US\$ 0.77 (US dollars) for each⁴ Mbps transported. The following graph shows that, for 62% of ISPs, this transport generates a cost.

ISPS BEARING COSTS FOR CONNECTING THEIR NODES TO AN IXPS

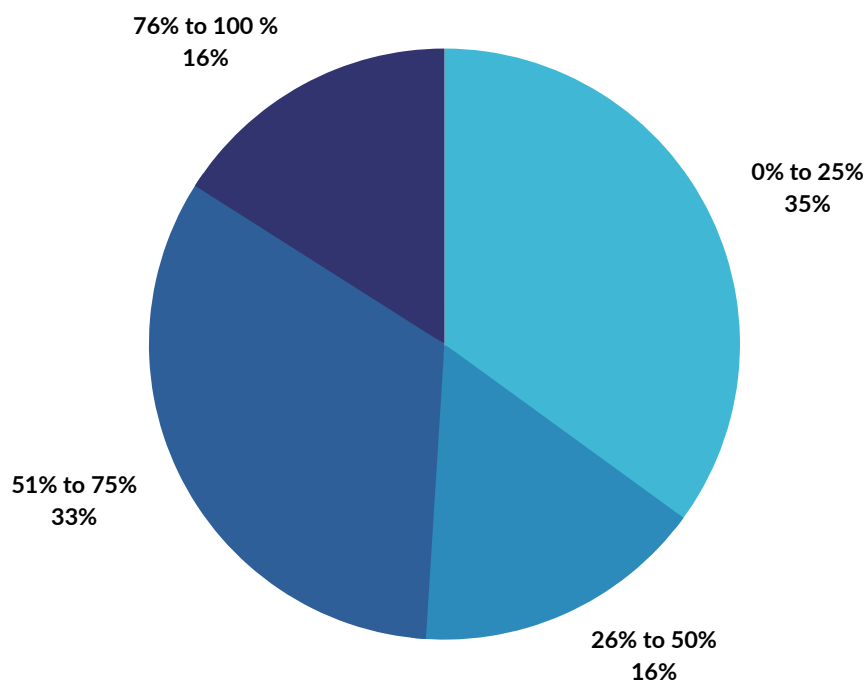


Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

⁴ The average cost per Mbps transported is obtained from the results of interviews conducted with a sample of different representatives of ISPs belonging to IXPs in Argentina.

Percentage of traffic ISPs send through IXPs: 16% of ISPs interviewed send 76% or more of their traffic through IXPs. 32% of ISPs send between 51% and 75% of their traffic through IXPs. 16% of ISPs send between 26% and 50% of their traffic through IXPs. 35% of ISPs send 25% of their traffic through IXPs.

PERCENTAGE OF TRAFFIC FROM ISPS GOING THROUGH IXPS

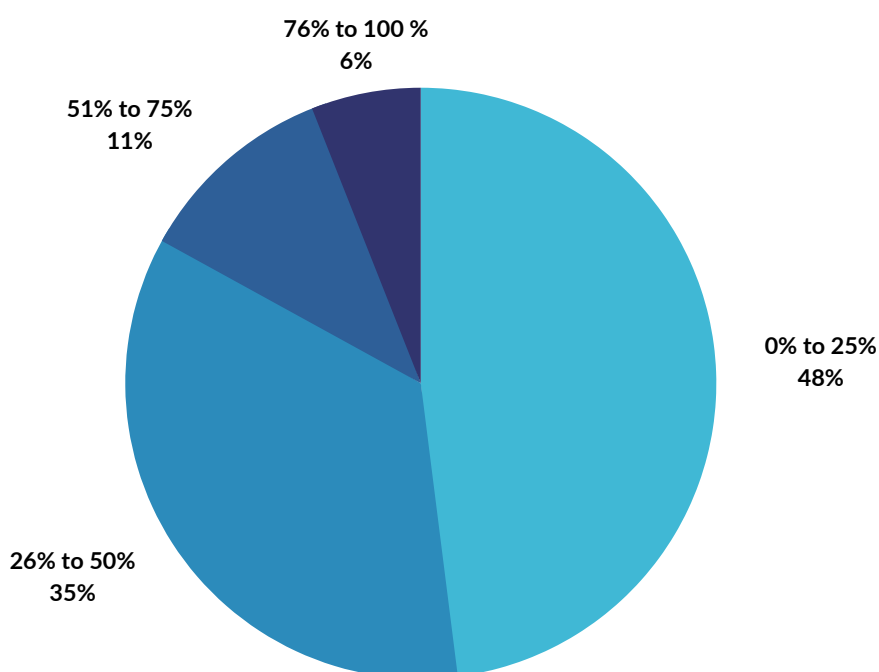


Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

In the group within the 0% to 25% range, it is noteworthy that they send 51% of traffic in transit, reflecting greater use of local CDNs.

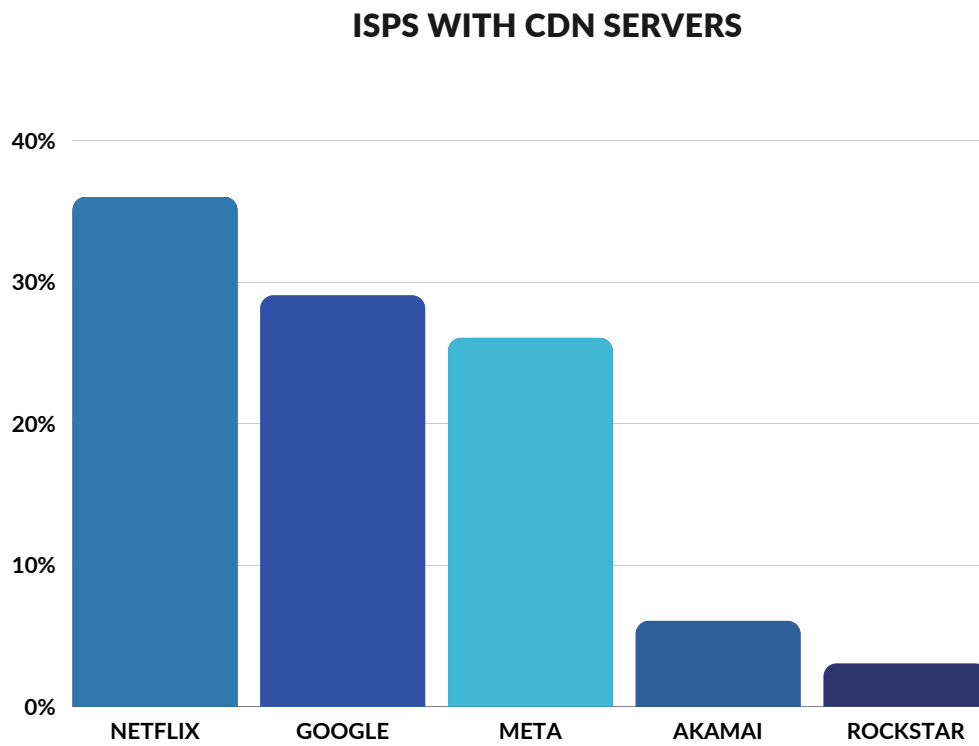
Percentage of traffic that ISPs send through IP transit providers: 6% of ISPs interviewed send 76% or more of their traffic through IP transit providers. 11% of ISPs send between 51% and 75% of their traffic through IP transit providers. 34% of ISPs send between 26% and 50% of their traffic through IP transit providers. 48% of ISPs send less than 25% of their traffic through IP transit providers.

PERCENTAGE OF TRAFFIC THAT ISPS SEND THROUGH IP TRANSIT PROVIDERS



Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

ISPs with CDN servers: 66% of ISPs interviewed have CDN servers on their networks. These CDNs are distributed across ISPs, as detailed in the following graph:



Source: Prepared by LAC-IX, December 2022. Data obtained through the survey applied to IXP members of Argentina between October and November 2022.

SUMMARY OF THE RESULTS OBTAINED THROUGH THE INTERVIEW

A total of 70 emails were sent to the representatives of the members of IXPs in Argentina, and a total of 13 interviews were conducted.

Interviews were conducted through Zoom and lasted about 30 minutes on average.

Expected benefits for ISPs when connecting to an IXP: The most expected benefit is the decrease in costs. However, other aspects are mentioned that, according to the comments made by the respondents, are of equal relevance than those costs.

EXPECTED BENEFITS FOR ISPS WHEN CONNECTING TO AN IXP

EXPECTED BENEFIT	PERCENTAGE OF ISPs
Decrease in costs	92%
Resolution to local traffic	31%
Commercial and technical networking with other members of the IXP	23%
Better connectivity for clients	15%
Access to content caches from CDNs	8%
Traffic regionalization	8%
Business opportunities	8%

Source: Prepared by LAC-IX, December 2022. Data obtained through the interview applied to IXP members of Argentina between November and December 2022.

100% of respondents indicated that all these benefits were immediately perceived at the time they were connected to the IXP.

Areas⁵ for improvement identified by ISPs: Out of all ISPs consulted in the survey and interviews applied, 92% believe that IXPs must provide better training in new technologies and 85% believe IXPs should improve in the implementation of best practices. The following are areas for improvement in IXPs:

- Provide training in new technologies.
- Provide technical support in the implementation of improvements for members.
- Apply best practices.
- Effectively communicate issues that concern the community.
- Monitor and effectively attend to queries by members.
- Provide support in the migration to IPV6 by its members.
- Search for faster technical solutions.
- Constantly decrease costs for point-to-point connections.
- IXP caches.
- Provide TV and phone services.
- Build communities to provide support in legal and administrative matters.
- Manage carriers.
- Provide transport redundancy to Central Routing.
- Obtain the highest traffic volume from CDN caches.
- Promote more carriers to improve competition.
- Have a more fluid communication with members.
- Costs (operation, traffic transport, etc.)
- Constantly promote the connection of new members to the IXP.
- Have more efficient reaction capabilities in the face of contingencies.
- Support ISPs migrating to IPv6.
- Offer IoT services.
- Promote the exchange of traffic with members and peering with members of the Central and Bilateral Traffic Routing.
- Add their fiber lines for the benefit of ISPs.
- Have greater support from services.
- Provide technical solutions to ISPs for fault resolution.
- Have an interactive portal with information about connection data updated in real-time.
- Implement a connection network format between all IXPs in the country.

⁵These improvements were proposed by ISPs through surveys conducted through FORMS and interviews conducted through the ZOOM platform.

GENERAL CONCLUSIONS

- Services offered by IXPs in Argentina to each of their members are currently perceived in a positive light by those who participated in this study. The expectations they had before connecting have been met and, subsequently, other aspects perceived as benefits have emerged that were not originally considered. These include, for example, a sense of belonging to a community of members, continuous improvement in costs and quality of services, the possibility of obtaining technical training, etc.
- The cost component related to the physical connection from the ISP site to the IXP constitutes a relevant factor in the total cost. Therefore, it is of particular interest for members to develop joint strategies to reduce this cost and/or provide different alternatives to facilitate the connection of more participants to IXPs.
- IXPs are perceived as an important source of knowledge, which might be a catalyst for new technologies, better practices, and new initiatives with a national impact. The development of a continuous training program is viewed with interest.
- Members perceive the opportunities for business exchanges with other participants as a significant benefit, highlighting the importance of IXPs, not just as technical projects but also as spaces to exchange ideas and initiatives.
- The perception of ISPs regarding the work carried out by IXPs is positive. However, there is room for improvement in different areas such as in the communication through digital platforms.
- As a result of this study, a business case is made that, with the opinions and experiences contributed by ISPs, showcases the benefits on and implicit need for the Internet infrastructure of Argentina.
- The knowledge of IXP members about the support received from regional organizations such as LAC-IX, ISOC, and LACNIC is very limited, as is the importance of synergies between IXPs and these organizations.

GENERAL RECOMMENDATIONS

- This study should be periodically conducted to have a real, first-hand overview of the approach taken by proposals to continue developing IXPs and move forward in managing the actual needs of their members.
- Technical support groups should be created to develop new platforms and technologies in ISPs, as well as to provide them with constant support in the everyday operation of their networks.
- Communication strategies allowing members to attain more knowledge about strategic partners and the benefits they provide should be analyzed together with partners such as LAC-IX, ISOC, and LACNIC.
- The information gathered in this study should be shared with IXPs so they may include the recommendations and opinions shared by their members in their improvement projects and create work plans to address these requests.

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