



2021 Annual Report

www.lacnic.net

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Reinforcing Our Commitment to the Internet Community

Despite the difficulties brought about by the global health situation over the past two years, we at LACNIC have reinforced our commitment to continue to offer quality services to our members and to increasingly engage with the community to work towards Internet development in Latin America and the Caribbean.

The challenge that began in 2020 with the pandemic continued in 2021. Once again, this put us to the test and encouraged us to continue to maintain our operations, improve our processes, and test and increase the resilience of our organization. This is why I would like to express on behalf of the LACNIC Board of Directors our gratitude and pride in our excellent team of collaborators.

This major learning opportunity has increased LACNIC's level of maturity and professionalism. From the Board of Directors, we have worked to consolidate the financial strength of the organization, solidify risk management and control, establish transparency in our processes, focus on customer service, and make our organization an excellent place to work.

In this sense, I would like to highlight the recognition received by LACNIC for the ninth year in a row as one of the best places to work in Uruguay — Great Place to Work® (GPTW) ranked us fifth on their list. We also conducted quarterly surveys among our members to obtain their feedback and detect opportunities for improvement. Once again, our customers expressed excellent levels of satisfaction of between 93% and 98%.

Along the same lines, we evaluated the community's satisfaction with the LACNIC 35 and LACNIC 36-LACNOG 2021 events. The two meetings achieved satisfaction levels above 95%, outstanding numbers given the limitations imposed by the situation. These results encourage us to consolidate continuous improvement in our processes, reinventing ourselves and maintaining the spirit of collaboration that has always characterized LACNIC.



Alejandro Guzman, Board of Directors President

Thus, a challenging year comes to an end, a year filled with projects and commitments that allow us to be close to our community and to continue to fulfill our leading role in Internet development across the region.

About LACNIC

We are an international non-government organization established in Uruguay in 2002. We are responsible for assigning and managing Internet number resources (IPv4, IPv6), Autonomous System Numbers and Reverse Resolution for the region. We contribute to Internet development in the region through an active cooperation policy, promoting and defending the interests of the regional community, and helping create conditions for the Internet to become an effective instrument for social inclusion and economic development in Latin America and the Caribbean.

Vision

We are building a regional community for a better global Internet.

Our Mission

We manage Internet number resources for Latin America and the Caribbean, maintaining standards of excellence and transparency and promoting the participatory policy development model.

We lead the permanent construction of the regional community, strengthening technological capabilities and applied research for the development of a stable, open Internet.



Who is Part of LACNIC?

LACNIC Board of Directors

<https://www.lacnic.net/web/lacnic/directorio>

LACNIC is managed and administered by a Board of seven directors elected by LACNIC members, a total of more than 12,000 organizations operating networks and providing services in 33 different territories across Latin America and the Caribbean.

In 2021, the LACNIC Board was made up as follows:



Alejandro Guzman

President
Colombia
Term Ends:
12/2024



Javier Salazar

Vice President
Mexico
Term Ends:
12/2022



Gabriel Adonaylo

Treasurer
Argentina
Term Ends:
12/2023



Wardner Maia

Deputy Treasurer
Brazil
Term Ends:
12/2022



Esteban Lescano

Secretary
Argentina
Term Ends:
12/2024



Evandro aronil

Deputy Secretary
Brazil
Term Ends:
12/2024



Carmen Denis

Member
Mexico
Term Ends:
12/2023



Oscar Robles

CEO

Fiscal Commission

<https://www.lacnic.net/1202/1/lacnic/comision-fiscal>

The Fiscal Commission is LACNIC’s control organ, charged with supervising that all accounting and administrative standards are met and overseeing compliance with the organization’s legal and statutory framework. In 2021, the Fiscal Commission was made up as follows:

Name	Country	Term
Aristóteles Dantas Gaudêncio	Brazil	2019 Elections - 2022 Elections
Hernán José Arcidiácono	Argentina	2020 Elections - 2023 Elections
Adriana Ibarra	Mexico	2021 Elections - 2024 Elections

Electoral Commission

<https://www.lacnic.net/1187/1/lacnic/comision-electoral>

The Electoral Commission supervises elections, [guaranteeing the transparency of the entire election process](#). It analyzes candidate nominations considering the incompatibility framework and solves any issues that may arise during an election process. It also validates vote counts and announces final election results.

In 2021, this commission faced the challenge of auditing and supervising election processes open to the community, namely, the elections to appoint a member to the ASO AC and the Review Committee, and the election to select a chair for the Policy Development Process.

Name	Country	Term
Horacio Tedesco	Argentina	2019 Elections - 2022 Elections
Nancy Julia Cordova Gamarra	Peru	2020 Elections - 2023 Elections
Vivian Valverde	Costa Rica	2020 Elections - 2023 Elections
Marcelo Corradini	Brazil	2021 Elections - 2024 Elections
Carolina Cofré Fernández	Chile	2021 Elections - 2024 Elections

Ethics Committee

<https://www.lacnic.net/2358/1/lacnic/comite-etica>

The Ethics Committee is the body responsible for interpreting, enforcing, and updating the [LACNIC Code of Ethics](#) and the [LACNIC Community Code of Conduct](#). It is authorized to handle cases that are beyond the authority of the organization's operational staff.

In 2021, the Ethics Committee was made up as follows:

- Adriana Ibarra
(Member of the Fiscal Commission)
- Carmen Denis
(Member of the LACNIC Board)
- Oscar Robles-Garay
(LACNIC CEO)

LACNIC members are Latin American and Caribbean organizations that have requested IPv4, IPv6, or ASN resources from LACNIC.

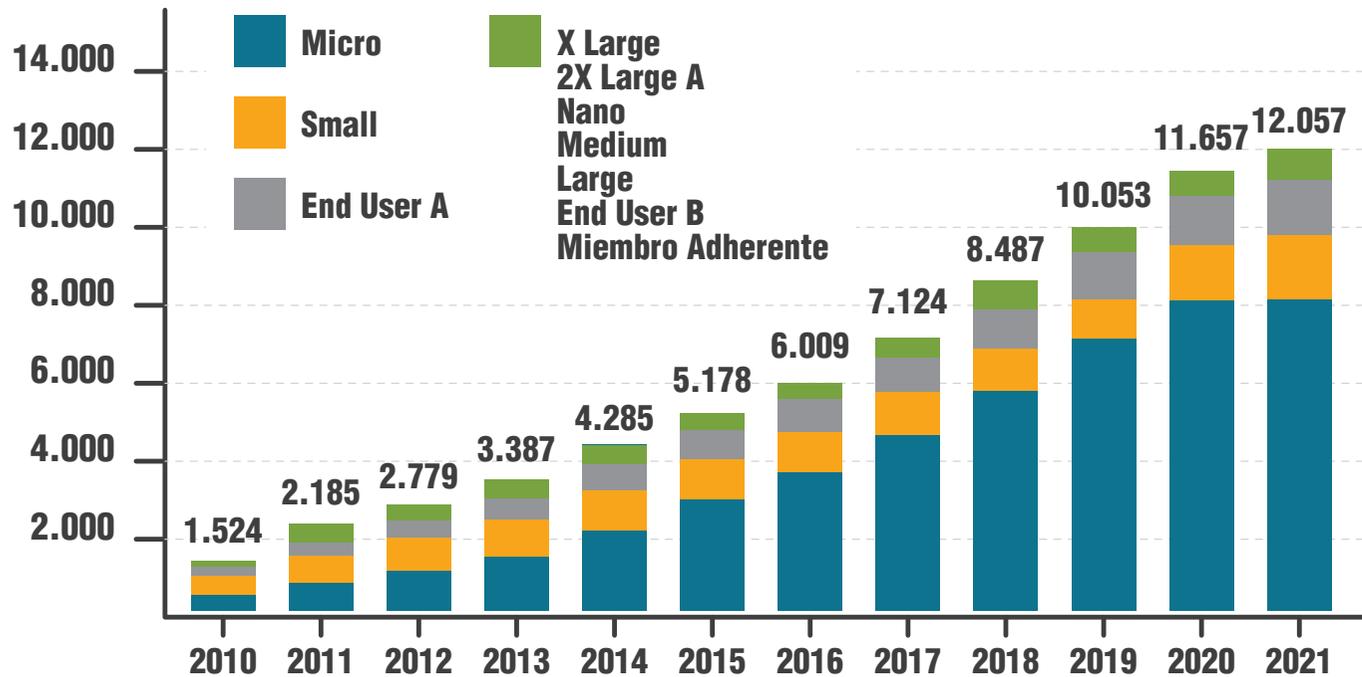
Our Members

In 2021, our members totaled more than 12,000 organizations, including major Internet companies and organizations, as well as universities and other organizations across the region that have received number resources.

Growing Membership Base

This year, 487 new members joined LACNIC and the year closed with a total of **12,144 member organizations**. The following chart shows the evolution of our membership base in recent years.

Evolution of LACNIC's membership base



Visiting Our Members

We began visiting our members in person in 2015 to learn first-hand about their needs, as well as to bring the services and benefits we offer closer to them.

In 2021, we held a total of 60 online meetings with organizations in Venezuela, Colombia, Peru, and Bolivia. Among other topics, we discussed member rights and benefits, the shortage of IPv4, alternatives for obtaining IPv4 addresses (waiting list and transfers), and IPv6 deployment.



Number of virtual meetings by country

Satisfaction Survey

During 2021, we conducted quarterly surveys that allowed us to measure the evolution of general satisfaction levels and propose improvements to our processes. Since they were launched in 2020, these quarterly surveys show that our customers have maintained excellent levels of satisfaction, which reached 98%, 93%, and 94%, respectively, in the first three quarters of 2021.

Our Team

Teamwork, commitment, the search for excellence, and taking care of our people are the values that identify LACNIC's organizational culture.

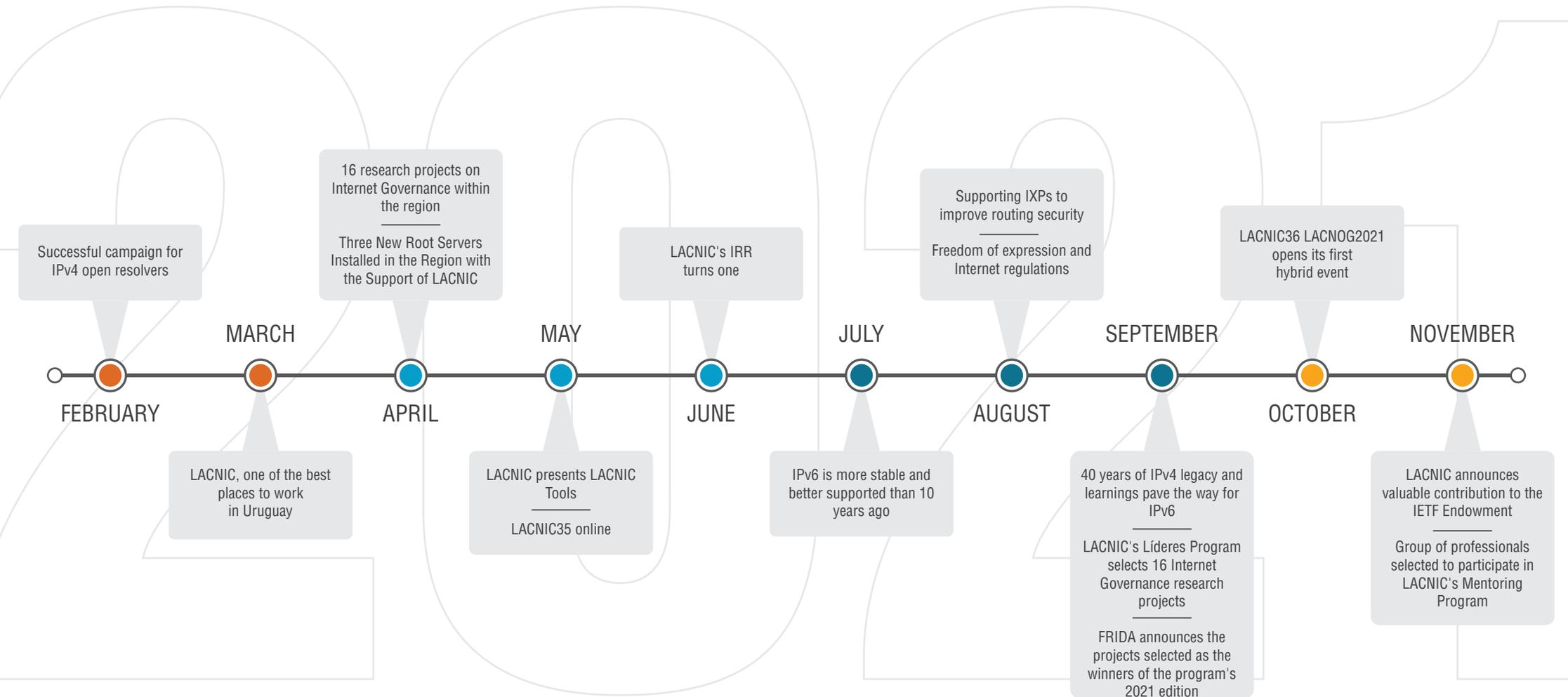
For the ninth year in a row, we have been recognized as one of the best places to work in Uruguay in the category of up to 150 employees. This time, LACNIC took the fifth place in the ranking prepared by international consultants Great Place to Work® (GPTW).

We also **topped the ranking of Best Places to Work for Women in Uruguay** (small organizations category) for the second year in a row.

This ranking recognizes those organizations that stand out for their work in reducing the gap between men and women, thus achieving greater equality in the workplace.



Highlights of the Year



Resource management

IPv4 Address Exhaustion

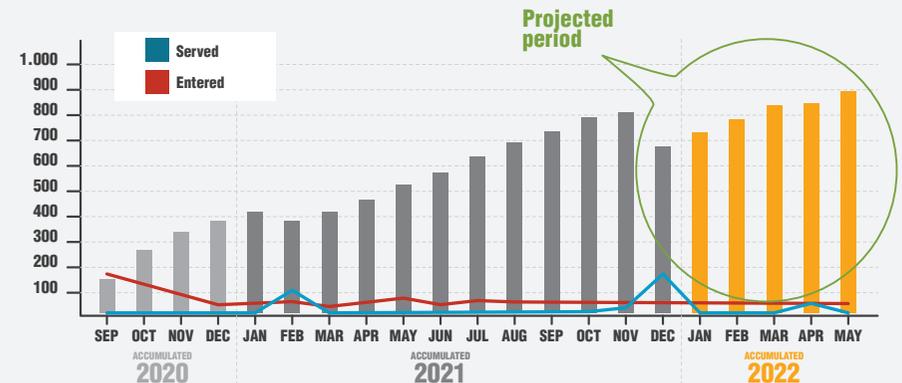
During 2021, we continued to adapt our processes to a context with a high number of requests and little IPv4 space available for assignment. This shortage did not affect the number of requests, which remained at pre-IPv4 exhaustion levels.

As a result, by the end of 2021, the waiting list of organizations interested in receiving IPv4 resources had grown to about 700.

Throughout the year, we received approximately 60 requests per month. Recovered space allowed us to meet an average of 12 requests per month (except during the month of December, when we recovered the extraordinary amount of more than 170,000 addresses).

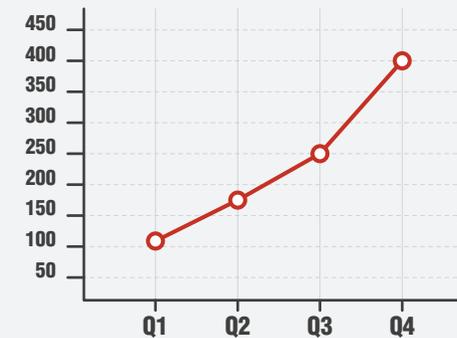
Based on the growing trend in the waiting list, we estimate that in May 2022 this list will include 900 organizations.

Number of requests on the waiting list



The time that organizations had to spend on the waiting list grew significantly over the course of the year, increasing from 100 days in the first months of 2021 to more than 400 at the end of the year.

Average number of days on the waiting list before receiving IPv4 addresses



Assignment Statistics

We processed a total of 2,239 resource requests (IPv4, IPv6, and ASN), which represents an 8% drop compared to the previous year. It is important to consider that the numbers for 2020 reflect a rise caused by the announcement of the imminent exhaustion of IPv4. A comparison of historical quarterly averages shows that, with the exception of 2020, the numbers for 2021 were always higher.

Intra- and Inter-RIR IPv4 Transfers

Throughout 2021, we worked in collaboration with NIC Mexico, NIC.br, and the other Regional Internet Registries to continue with the [implementation of inter-RIR transfers](#).

One hundred and seven IPv4 blocks were transferred in 2021, 50 more than in 2020.

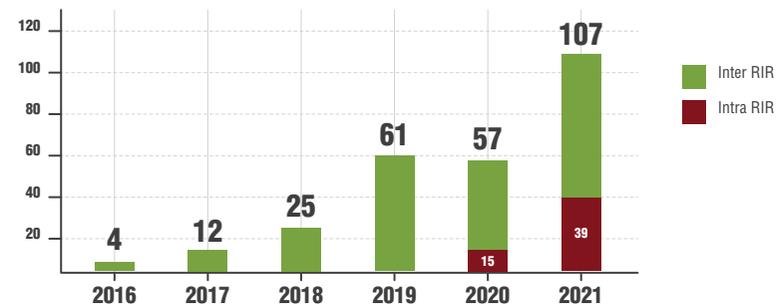
Likewise, inter-RIR transfers increased from 15 to 39, and the outbound trend observed in 2020 continued: 248,000 addresses were transferred to other RIRs, while 27,000 addresses were received by our region.

A look at the inter-RIR and intra-RIR movement of IP addresses shows that Brazil and Argentina were the countries that transferred the highest number of addresses, while Mexico and Colombia were the ones that received the highest number of transfers within the region. France was the country that received the highest number of addresses (including inter-RIR transfers), followed by Brazil and Ecuador..

Entry of requests by type



Transfers made per year



Community Participation Opportunities

The LACNIC community is made up of more than 12,000 member organizations, plus an extended community that comprises a diverse group of people and organizations interested in regional Internet development.

Below we have highlighted some of the activities conducted during 2021 and which reflect the generation of spaces for sharing and exchanging experiences and technical knowledge, providing networking opportunities, and allowing participants to strengthen their skills.

Our Events

Each year, we organize two events for the purpose of sharing technical information and promoting the creation of synergies that will contribute to regional Internet development. This year, we adapted the content to an online format for our first event, and a hybrid format for the second.

We received the support of 17 sponsors, 6 of which participated for the first time: Team Cymru, Transtelco, IPv4 Global, CentralNic Registry, IPXO, Scala Data Centers, Netflix, AWS, IPv4Mall, IP.Broker, Manrs, Amsix, Facebook, Google, ICANN, Red Clara, NIC.br.

LACNIC 35

<https://www.lacnic.net/lacnic35>

Our LACNIC 35 event was held online from 10 to 14 May 2021. To preserve the spirit of our face-to-face events, we designed a shorter format which included our most important activities: technical tutorials, the LACNIC Technical Forum, the Public Policy Forum, the LAC CSIRTs meeting, an introductory session for newcomers, and the presentation of the 2020 Annual Report and Budget.



LACNIC 36 - LACNOG 2021

<https://www.lacnic.net/lacnic36>

LACNIC 36 LACNOG 2021 was our first hybrid event. It was transmitted 100% online and we simultaneously had a face-to-face meeting venue in Montevideo, Uruguay, and a remote hub in the city of Pergamino, Argentina.

The event was opened from Montevideo by Javier Salazar, Vice President of the LACNIC Board, and Oscar Robles, LACNIC CEO. Ariel Weher, president of the LACNOG Board, was in charge of opening the event from Pergamino.

The event was attended by Omar Paganini, the Uruguayan Minister of Industry, Energy, and Mining. Event highlights included an interview with Vint Cerf on the technical aspects that were key in the development of the Internet.



LACNIC on the Move

<https://onthemove.lacnic.net/en/belize-2021/>

On 4-5 August we organized LACNIC on the Move (LOTM) in virtual format and focusing on the community of Belize.

The purpose of these meetings is to bring regional content and discussions closer to the different countries. At LOTM events, the Internet community, governments, and other key actors who are part of the Internet ecosystem share information, experiences, and best practices on different technical issues for the purpose of promoting Internet development in their territory.

The event program included topics such as IP address assignments and transfers, IPv6 for decision makers, IXP operations, cybersecurity, DNS and DNSSEC, among others.

This edition of LOTM was organized with the support of the Belize Internet Exchange Point (BIXP) and 66 persons connected the to the online platform to participate.



Training Center

LACNIC's Training Center offers the community permanent support to help network operators, educators, regulators, and governments of the region develop their knowledge and technical skills on topics related to LACNIC's responsibilities.

Throughout 2021, we worked to increase the number of online training opportunities on the topics most requested by the community, which included IPv6, routing, Internet governance, security, network management, and BGP-RPKI. We organized more than 14 editions of the courses on the LACNIC Campus and more than 10 webinars on various topics.

Webinars

<https://www.lacnic.net/2465/1/lacnic/webinars>

We hosted more than 11 webinars on topics relevant to our community. Transcription services were offered for 100% of these webinars, and simultaneous interpretation services were available when necessary (76% of the webinars).

Attendees by subject



Other Training Activities

We participated as trainers in online IPv6 events organized by others, including:

- Colombia and Mexico: Training Center for Women in Technology (2 meetings)
- Mexico: IPv6 Workshop - ANUIES-TIC Meeting 2021 (4 meetings)
- Colombia: Let's Talk about Digital Government: The Importance of IPv6 Adoption
- WALC 2021: Hands-On IPv6 Workshop: Routing and Services (5 meetings)

The LACNIC Campus is a learning platform that allows participants to complete different courses online. It provides training and support to meet the needs of the Internet community and guarantee access to learning opportunities and the continuity of education across the region.

Campus LACNIC

In 2021, we relaunched the Basic IPv6 course, aligning its contents with those of the Advanced IPv6 program.

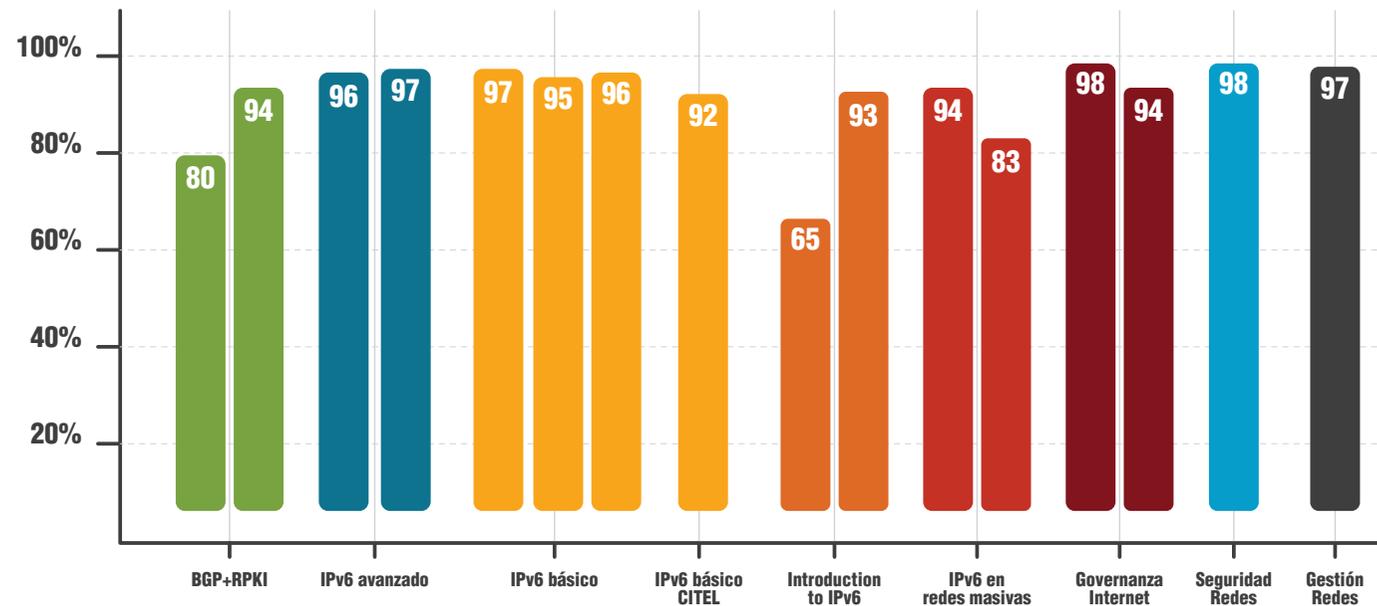
We also offered this course to CITELOAS Member States, with the aim of sharing with them relevant content on IPv6 that will contribute to informed decision-making. The result of the experience was that more than 60% of the people who registered for the course took the final exam.

This year, the Campus welcomed more than **7,000 students**. Forty-six percent of these students successfully completed their courses. In addition, more than 50% of them opted for **training in IPv6 (3,898 students)**.

More information: <https://campus.lacnic.net/>

Satisfaction levels

92% Average reached



Policy Development

LACNIC operates based on a self-regulation model according to which the rules (policies) that govern Internet resource administration are developed by the regional community through a public, participative, and transparent process that is open to anyone with an interest in topics related to Internet numbers and built on consensus.

During LACNIC 36, we worked together with the PDP chairs based on an open microphone participation format for the discussion of proposals during the online Public Policy Forum, and a three-dimensional dynamic (Q&A, microphone, and in-person mic queue).

Fourteen proposals were discussed during the year, nine of which proposed changes to the PDP and five to the Policy Manual. Only one of the fourteen proposals — LAC-2021-1 Modify section “2.3.2.19 and 4.3 Inclusion of origin ASN in the WHOIS database when available” — reached consensus and was ratified by the Board.

During the Public Policy Forum held in October, the chairs proposed the creation of a Working Group to discuss two similar proposals related to changes to the PDP chair election process. The authors of both proposals agreed to form a group with other members of the community for the purpose of drafting a single, consolidated proposal. Likewise, given the low levels of discussion, comments, and interest shown by the community on these issues, the chairs decided that consensus for four new versions of proposals that had already been discussed at a previous Forum would be evaluated on the Policy List.

The following is a list of the policy proposals presented in 2021 and their status as at December 2021:

Proposal	Status
LAC-2020-1: Add Operational IPv6 as a Requirement for IPv4 Transfers	Abandoned
LAC-2020-3: Impact Analysis Is Mandatory	Did not reach consensus
LAC-2021-1: Modify section “2.3.2.19 and 4.3 Inclusion of origin ASN in the WHOIS database when available”	Ratified
LAC-2021-2: Non-Competition Between Proposals	Did not reach consensus
LAC-2020-6: Miscellaneous Modifications to the PDP	Did not reach consensus
LAC-2020-9: PDP Chair Election	Did not reach consensus
LAC-2019-7: PDP Chair Election Procedure v7	Did not reach consensus
LAC-2020-10: Authorize Recipients of Delegated Blocks to sign ROAs	Under discussion
LAC-2020-4: Adjustment to the Functions of the Board of Directors v2	Did not reach consensus
LAC-2018-13 v6: Acceptable Use Policy (AUP) for the Policy List	Did not reach consensus
LAC-2021-6 v1: Modify the PDP to improve the quality of proposals and participation in the policy development process.	Did not reach consensus
LAC-2021-5 v1: Update End-User and End-Site Definitions	Did not reach consensus
LAC-20214 v1: Permission to Transfer and Non-Return of Resources	Did not reach consensus
LAC-2018-5: Registration and Validation of Abuse Contacts	Implemented
LAC-2019-9: Update to “Resource recovery and return” and consistency with the rest of the Manual	Implemented
LAC-2021-3: PDP Chair Election	Abandoned

2021 was a key year in term of the implementation of policies related to the Registry Service.

These two policies were implemented:

1. 1. Validation of Abuse Contacts

a policy that requires that the abuse contact for an IP address block or ASN must validate and monitor their email account. In December 2021, 2,600 contacts (81%) had been validated, representing 93% of the resources assigned by LACNIC (IPv4, IPv6 and ASN).

Evolution of the number of non-validated abuse contacts



2. 2. Resource Recovery Policy

To implement this policy, we decided that we would use a process that allowed us to adjust the level of severity of the controls at different times so that we could begin by fixing the most serious issues.



To do so, we developed a system that calculates each organization's level of non-compliance of a series of previously selected policies. Among other things, this allows us to set different tolerances and affords us the flexibility to change the weight we assign to each evaluated policy.

Technical Forums

Technical Forums are spaces for sharing knowledge and experiences, and they contribute to further strengthen our region's technical Internet community. Just as our events and other training activities, this year's Technical Forums were held in virtual format.

LACNIC Technical Forum

<https://www.lacnic.net/2362/1/lacnic/foro-tecnico-de-lacnic>

The LACNIC Technical Forum, a space for sharing and discussing Internet technologies and technical implementations, was also held in virtual format within the framework of LACNIC 35. The Program Committee received a total of 26 proposals, seven of which were selected to fit the time allowed by the virtual format. This forum addressed topics such as IPv6, MAP Translation, BGP, IoT, and geolocation.

FIRST Regional Symposium

(Global Forum for Incident Response and Security Teams)

The [FIRST Regional Symposium](#) was held together with LACNIC 36. The event was co-organized with FIRST and co-hosted by NIC.br/CERT.br.

The first day included plenary conferences addressing topics such as sensor networks, regional statistics, and the importance of sharing information among the different CSIRTs.

On the second day, Ernesto Pérez Estévez and Paul F. Bernal of CSIRT CEDIA (Ecuador) presented “SIM3 Security Incident Management Maturity Model,” a tutorial that focused on how to use the SIM3 model to measure the maturity of a CSIRT, identify opportunities for improvement, and plan actions for their implementation.

CSIRT Meeting

LAC-CSIRT is a space for regional actors involved in security-related issues to share and coordinate.

The LAC-CSIRT community was also part of LACNIC 35 Online. Among other topics, the program included a summary of cyberattacks in Peru, the benefits of a HoneyNet and how to extract useful data from a sensor, a project to identify malicious hosts, and a web service that helps the general population to analyze suspicious files and provides training in basic security techniques.

LACNOG

As usual, LACNIC's second annual event was held jointly with the annual meeting of the Latin American and Caribbean Network Operators Forum, LACNOG.

The program included 13 technical presentations and two panels. These presentations addressed topics such as connectivity in Latin America and the Caribbean, DDoS attacks during a pandemic, IoT protocols at the IETF, and MANRS.

These presentations are [available here](#).

An Open, Stable, and Secure Internet

Strengthening Internet Infrastructure

RAÍCES Program

The purpose of the +RAÍCES Project is to promote the installation of anycast root server copies in countries that are part of the LACNIC service region. By installing these servers at strategic locations across the region, we seek to increase the resilience of the DNS, one of the Internet's critical resources.

<https://www.lacnic.net/raices>

In doing so, we generate a better response to potential DDoS attacks or eventual infrastructure failures which might render certain root-servers inoperative.

LACNIC annually publishes a call for expressions of interest from organizations that would like to host an anycast copy of a root server. The sites that meet the requirements to host a root server are selected in cooperation with the root server operators (RSO) with whom we have already signed an agreement.

In 2021, we installed servers at locations selected following the calls for proposals launched by +RAÍCES in 2020 and earlier and which the pandemic had delayed.

RSO	Location	Organization	Role of LACNIC	In operation since
I	Buenos Aires, Argentina	ARIU	Coordination	February 2021
I	Suriname	Telesur	Funding and coordination	February 2021
I	Guatemala	IXP-GT	Funding and coordination	March 2021
I	Lima, Perú	PIT Perú	Funding and coordination	April 2021

As a result of the 2021 call for proposals, the following locations were selected:

- Santo Domingo, Dominican Republic: IXP IXDO
- Port-au-Prince, Haiti: IXP AHTIC
- Panama, Panama: IXP InteRed

Location of the root-server copies sponsored by LACNIC



Deployment of Services in IXPs

As part of the collaboration agreement between LAC-IX, the Internet Society, and LACNIC, we are implementing a [program for the strengthening of regional IXPs](#) to improve the infrastructure of the IXPs themselves, the quality of the services they provide to their members, and the quality of the Internet in each country.

The services promoted by LACNIC for their installation by IXPs include RPKI validation, routing security and stability through the deployment of route servers and DNS servers.

The work carried out jointly by the three organizations has also allowed improving IXP management (IXP Manager, monitoring systems, etc.), hardware for their infrastructure, as well as the introduction of the MANRS standards in most IXPs.

This year, the following IXPs received the support of these services:

- IXP Py - Paraguay
- CRIX - Costa Rica
- Aprosva - Ecuador (Guayaquil)
- Perú IX - Perú (Trujillo)

LACNIC also provided support in the form of servers that were added to the virtualization systems at the following locations:

- InterRed, Panamá
- Aprosva, Ecuador
- Perú IX, Perú (en proceso)

In addition to infrastructure support, we organized training workshops on topics such as BGP, RPKI, IPv6, and IXP Services at IXSY, an IXP in Yucatan, Mexico, as well as in CRIX Costa Rica.

Actions in Cybersecurity

This year, our CSIRT managed more than 120 security incidents involving Internet resources managed by LACNIC.

We continued to improve our sensor network. In 2021, we finalized the incorporation of nine new sensors to the CSIRT's HoneyNet, which reached a total of 25 sensors. The sensors that were incorporated correspond to organizations based in Ecuador, Bolivia, Costa Rica, Brazil, Guatemala, Mexico, and Argentina.

Activities related to law enforcement agencies (LEAs) included one for the staff of the Uruguayan Office of the Attorney General organized for the purpose of raising awareness regarding the importance of information security and its protection. There, we shared best practices for the treatment and access to information based on the most common threats reported to LACNIC CSIRT.

We also presented the online seminar titled “Information Management for Cybercrime Investigation.” Guests were invited from the Argentine Attorney General's Office; the Cybercrime Execution Unit of the Ministry of Security, Justice and Human Rights of La Rioja, Argentina; the Argentine Federal Police, as well as the Cybercrime Unit of the Uruguayan Ministry of the Interior.

Promotion of IPv6 Deployment

Promoting, strengthening, and creating awareness on the importance of IPv6 deployment are priority issues that cut across all of our activities.

Throughout the year, we organized four webinars on the topic, including a virtual meeting for decision makers to mark the tenth anniversary of [World IPv6 Launch](#) and [IPv6 Day](#).

We also offered a special edition of the Basic IPv6 course for CITELOAS Member States on the LACNIC Campus.

Within the framework of the LACNIC 35 and LACNIC 36 events, we offered tutorials on [IPv6 Network Operation](#) which were very well-received by participants.

In addition, the LACNIC on the Move event included an [IPv6 for Decision Makers tutorial](#).

Together with consulting firm SMC+ Digital Public Affairs, in 2021 we prepared a report titled "[Statistics and Trends: IPv6 Deployment in Latin America and the Caribbean 2016-2020](#)". The study shows that IPv6 grew 18% in the region over the past five years, although asymmetries persist in IPv6 development at the subregional level. While South and Central America have good IPv6 adoption levels (25% and 30%, respectively), the Caribbean (7%) appears to be struggling.

At the global level, Latin America and the Caribbean are in a good place and have made significant progress. However, the region is still below the global average and adoption rates in other regions.

R+D Projects

Study on Internet Resources in the LAC Region that Enable DDoS Attacks

In collaboration with CERT UNLP (Argentina), we conducted a study on the presence of scalable User Datagram Protocol (UDP) services with potential for traffic amplification, which can be used to launch distributed denial of service (DDoS) attacks in Latin America and the Caribbean.

The purpose of the study was to identify the presence of these attack vectors, notify organizations in the region, and provide recommendations to fix existing issues and therefore reduce the number of vulnerable systems and the risk of their use to reflect DDoS attacks.

Click here to read the full report: <https://bit.ly/33UlsRK>

Response Times from Latin America and the Caribbean to the LACTLD Anycast DNS Cloud

In 2021, we conducted a [study](#) that focused on the health of DNS root servers, the first level in this hierarchy. In this phase, we analyzed the perceived performance of the next level in the DNS hierarchy, namely, top level domains (TLDs), especially our region's country code top level domains (ccTLDs).

To do so, we analyzed response times to the LACTLD anycast cloud, an initiative comprising 14 anycast nodes hosted in various countries across the region. These nodes are exact copies that account for a total of 15 ccTLDs and other critical infrastructure zones, for example, LACNIC's reverse zones.

Study on Local BGP Interconnection in Latin America and the Caribbean

The purpose of this [study](#) was to compare some basic characteristics of the routes published in the region, draw meaningful conclusions about operators' behavior in publishing prefixes, and answer questions such as: What is the average number of autonomous systems through which traffic passes? How many organizations publish their prefixes at an IXP? Are there any differences between IPv4 and IPv6 prefixes in terms of publishing? Do operators favor or discourage traffic through the IXP? What is the impact of this on regional routing stability?

Some encouraging data: An analysis of each IXPs' area of influence showed that, while there is still room for improvement, a certain level of regional interconnection already exists. Brazil is one of the most interconnected countries, with IXPs reaching all but the smallest operators (IXSY and GYE). Internet exchange points with larger tables also cover a good proportion of IPv4 prefixes and ASNs when compared to global collector tables (approximately 70% intersection for Chilean and Argentine IXPs).

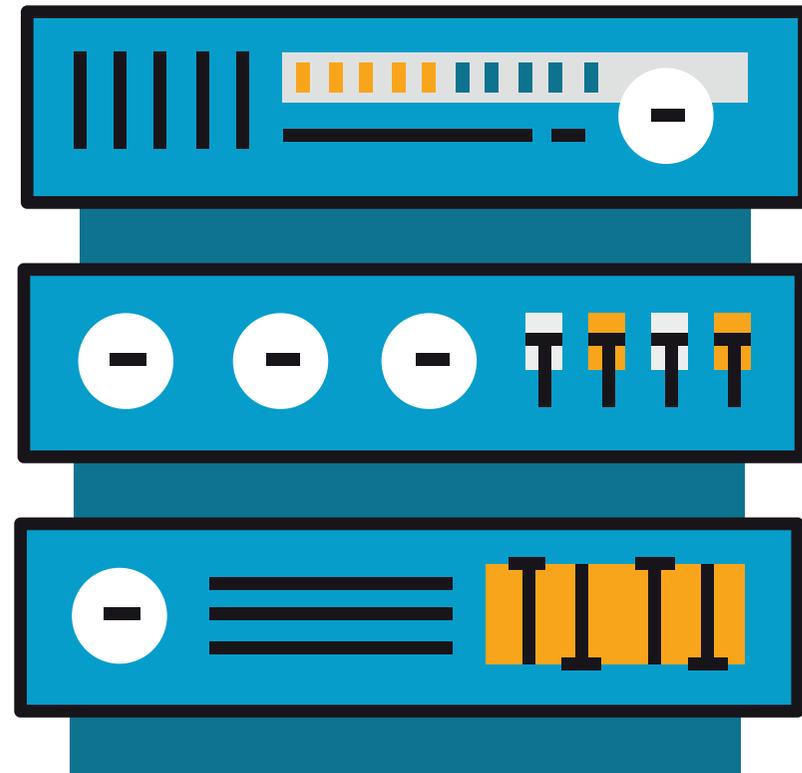
Nevertheless, there is still work that network operators can do to achieve a better Internet: there is considerable disparity between IPv4 and IPv6, which shows that IPv6 interconnection has not yet been developed to the extent of IPv4. Likewise, there is a considerable number of prependings in IXP tables, something that should not be so frequent. The study specifically analyzes each IXP with BGP tables published on LACNIC or PCH collectors.

LACNIC Internet Routing Registry

<https://www.lacnic.net/5920/1/lacnic/>

The LACNIC Internet Routing Registry has positioned itself as a key tool in the operation of many Internet service providers and end users of IP addresses and ASNs in Latin America. Since the beginning of 2021, our IRR is being replicated by RADB, the most important IRR in the ecosystem.

It has remained stable and reliable, to the point that its use has become a requirement of some Internet service providers and content generators to enable interconnections.



The Internet and Its Social Impact

IT Women

IT Women Webinars

These webinars focus on topics of interest to the community in general which are also particularly significant in terms of the barriers faced by women.

In 2021, we organized a webinar titled “[Applying Tools for Innovation to Our Daily Lives](#)” the purpose of which was to present concepts related to innovation and technology and their application at both the personal and the professional level.

Mentoring Program

The first edition of the IT Women Mentoring Program concluded in May 2021. This program seeks to encourage new generations of women in technology who have the knowledge and skills to present at technical forums. The program includes follow-up meetings with a mentor, a leader of the technical community who will help guide the work that each expert proposes in her application, as well as two training activities to develop their soft skills.

Four participants completed their mentorship and [presented their work](#) during the LACNIC 35 Technical Forum.

Ten women applied for the [second edition of the program](#), six of whom were selected and will prepare technical papers to be presented at the LACNIC 37 Technical Forum.

FRIDA Program

Two years ago, the FRIDA Program selected the following three thematic categories: (a) Internet Stability and Security, (b) Open and Free Internet, and (c) Internet Access. The program has evolved since then and is now funded solely by LACNIC, so the organization independently decides which project lines will be supported.

In 2021, we will double the funding available for grants and prioritize projects that are closest to the LACNIC technical community.

After analyzing more than 250 applications, the selection committee selected [3 winning projects for the FRIDA Award, while 14 projects were selected to receive a FRIDA Grant.](#)



frida

Support for Internet Governance Spaces

LACNIC supports the strengthening of regional Internet governance discussion spaces, including LACIGF and national Internet governance initiatives. Many countries have established national Internet governance dialogues, each with their own local flavor. By actively participating in these spaces, we contribute to the various discussions and to a better understanding of the multistakeholder model and the role of LACNIC.

Participation in Governance Spaces during 2021

■ JANUARY

Haitian School on Internet Governance

We participated in the webinar titled “The Need to Deploy IPv6 Right Now.”

■ MAY

CaribNOG

We participated in the two virtual CaribNOG meetings, where we presented on the design of secure networks, security measures for IXPs, number resource trends in the LAC region, and other topics.

Caribbean Public Policy Forum and Caribbean Technical Forum

We joined in the organization of these two spaces to contribute our vision to this space which had been coordinated by ARIN and the CTU since 2018.

■ JULY

CANTO 36

We participated in the panel on “The Status of the Internet: Trends and Significant Changes during the Pandemic.”

4th Edition of IGF Panama

We participated as panelists in the session titled “Technology at the Service of Society during the Pandemic,” where we discussed how trends in technology and their evolution converge on the need to use IPv6.

ITU

We participated in the event on 5G and Internet Access to stress the need for IPv6 adoption.

■ AUGUST

17th Caribbean Internet Governance Forum - CIGF

We participated in multiple sessions, offering our perspectives on the transformation of Internet governance at the national and regional levels.

COMTELCA Standardization Committee

We gave a presentation on future trends in technology as well as the role of governments in creating favorable conditions for open, stable, and secure Internet development.

■ SEPTEMBER

CTU ICT Week General Conference of Ministers

We received a special invitation to present the views of the numbers community to CTU member ICT Ministers.

CRIX

We organized three webinars on IPv6 and a lab on IPv6 transition mechanisms.

■ OCTOBER

South School on Internet Governance 2021

We participated in the session on “Internet as a Tool for Post COVID-19 Economic Recovery.”

Latin American Congress on Digital Transformation

We organized the session titled “What Are We Talking about When We Say ‘Regulate the Internet’?”

Regional Innovation Forum - ITU

We participated in this event to highlight the importance of IPv6 deployment.

■ NOVEMBER

Virtual School of Internet Governance (VSIG)

We provided training to the students who participated in the first edition of VSIG to be held in Spanish. We offered a talk on strategic considerations for IPv6 deployment.

■ DECEMBER

IGF LAC Space

Together with LACTLD, we co-organized the fifth edition of the IGF LAC Space during IGF 2021, where we promoted the research conducted within the framework of the Líderes 2.0 Program.

Participation and Contribution to the Global IGF and LACIGF

LACNIC supports the Global IGF through the NRO. We also participate by submitting proposals for sessions at the annual event. This year, we worked together with APNIC on the session on the Internet's Technical Success Factors.

As for LACIGF, we actively participate in both the Program Committee and the organization of sessions for the annual event together with the regional technical community.

LACIGF

<https://lacigf.org/>

As a result of the situation created by the pandemic, LACIGF 14 was held online on 23-24 November. This time, we were part of the LACIGF Program Committee, leading an update of the LACIGF Bylaws based on a study conducted in 2019.

We also co-organized the technical community session, for which we facilitated the participation of the Argentine ICT Secretariat for the purpose of stressing the role of the IPv6 Coalition as a model for governments to promote IPv6.

Líderes 2.0

<https://www.lacnic.net/4906/1/lacnic/lideres-20>

The Líderes Program supports national, regional, subregional, and youth Internet Governance Forums (NRIs) and promotes participation in LACIGF.

For the Program's second edition, we provided funding and mentorship to 16 candidates from across the region to conduct research and share knowledge in five thematic areas: Internet and the Pandemic: Impacts on Human Rights; Digital Inclusion; Security and Trust; Internet and Productivity; and Strengthening and Expansion of NRIs.

The [16 projects](#) were submitted by researchers from 10 different countries of our region: Bolivia, Ecuador, Colombia, Brazil, Dominican Republic, Guyana, Venezuela, Mexico, Trinidad and Tobago, and Haiti.

Interaction with Governments and Decision Makers

In 2021, we participated in various activities aimed at strengthening our ties with regional government authorities and generating trust and influence among decision makers. The topics we addressed included the promotion of IPv6 deployment, IPv4 exhaustion, and cybersecurity.

Activities included virtual meetings with the Superintendency of Telecommunications (SIT) of Guatemala; the Costa Rican Ministry of Science, Technology, and Telecommunications (MICITT); the Connectivity Agency of Cordoba, Argentina; and the Argentine Secretariat for Public Innovation and Undersecretary for ICTs.

We also met with the Caribbean Telecommunications Union and COMTELCA to identify proposals that will promote Internet-related issues in the region of Central America and the Caribbean.

We also met with Uruguayan legislators to provide them concrete information regarding the unexpected consequences of website blocking.

Telecommunications Forums

CITEL/OAS

We participated in the two meetings of the Inter-American Telecommunications Commission (CITEL/OAS) Permanent Consultative Committee 1 (PCC-1). The first edition of PCC-1 was held from 28 to 30 April. There, we presented an informational document on LACNIC CSIRT, a key instrument for coordination among LACNIC members in relation to cybersecurity incidents.

The second edition of PCC-1 was held from 4 to 8 October. There, we presented an informational document on the technical consequences of website blocking.

In September, we organized the webinar “[Strategic Role of IPv6 in the Digital Transformation](#)” jointly with CITEL. The webinar presented different perspectives on the digital transformation process and the strategic role of IPv6.

eLAC

LACNIC maintains the role of observer of the eLAC Coordination Table in representation of the Technical Community. We coordinated the contributions of the technical community to the eLAC2022 Cooperation Program activity plan, which included training and awareness-building activities on IPv6 and IXPs by LACNIC and the Internet Society (ISOC), workshops on the experiences of the national research and education networks that are part of RedCLARA, and training for governments on the implementation of LACTLD security measures.

Annexes

- External Auditor Report
- LACNIC's Fiscal Commission Report