2022
Annual Report

LACNIC

Resource Management

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An Open, Stable, and Secure Internet

The Internet and Its Social Impact

Support for Internet Governance Spaces

Annexes

LACNIC

Twenty Years of Community Building for a Better Global Internet

The year 2022 was very special for several reasons: among other things, we returned to in-person events and visits after two years of pandemic, we launched our LACNIC Campus specializations, and we celebrated our twentieth anniversary.

The LACNIC 37 event held in Colombia in the month of May reminded us of the importance of meeting face to face. Networking spaces and collaboration with other regional organizations and efforts were highlights of the event's agenda. This meeting brought together more than 500 participants from 40 different countries and provided an essential space for meeting and reestablishing professional ties.

We were also able to resume our Annual LACNIC Member Assembly and present the usual rendering of accounts along with our summary of activities and financial reports, as well as our audit mechanisms.

Another highlight of the reunions and the return to face-to-face activities were our visits —both in person and online— to more than 80 member organizations in Chile, Mexico, Cuba, Honduras, Nicaragua, and the Dominican Republic. Combined with the information obtained from our biannual satisfaction survey, this feedback allows us to gain a first-hand understanding of the needs of our members and to determine potential improvements to our processes and services.

On behalf of the LACNIC Board, I would like to express our pride and satisfaction with the results obtained in 2022: an overall satisfaction level of 96%. Based on this input, we will continue to work on the identified concerns and interests to keep adding value to the services we offer to our more than 12,400 members.

Another key topic in 2022 was the launch of the specializations offered through the LACNIC Campus, a virtual learning platform open to the community and our members. These specializations allow creating a training path with different levels and content specifically designed for anyone interested in doing so to strengthen their skills.

Alejandro Guzman, Board of Directors President

Finally, I would like to share the joy of seeing how the regional Internet community has grown and how LACNIC has accompanied this growth evolving as a regional registry over the past 20 years. LACNIC's twentieth anniversary was the focal point of LACNIC 38, and the experiences, anecdotes, evolution, and future of various technical issues were the event's connecting thread.

Let us continue to generate synergies and work collaboratively —as is characteristic of the Internet— so that on future anniversaries we will continue to see this Latin American and Caribbean community grow for a better global Internet.

About LACNIC

We are an international non-government organization established in Uruguay in 2002. Our role is to assign and manage 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.

Our 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

LACNIC is managed and administered by a Board of seven directors elected by LACNIC members, a total of more than 12,400 organizations operating networks and providing services in 33 different territories across Latin America and the Caribbean. In 2022, the LACNIC Board was made up as follows:

Alejandro Guzman	Javier Salazar	Gabriel Adonaylo	Wardner Maia	Esteban Lescano	Evandro Varonil	Carmen Denis	Oscar Robles
President	**Vice President**	**Treasurer**	**Deputy Treasurer**	**Secretary**	**Deputy Secretary**	**Vocal**	**Executive Director**
Colombia	México	Argentina	Brasil	Argentina	Brasil	México	
Term Ends: 12/2024	Term Ends: 12/2022	Term Ends: 12/2023	Term Ends: 12/2022	Term Ends: 12/2024	Term Ends: 12/2024	Term Ends: 12/2023	

Fiscal Commission

The Fiscal Commission is LACNIC's control organ. Its members are charged with supervising that all accounting and administrative standards are met and overseeing compliance with the organization's legal and statutory framework. In 2022, the Fiscal Commission was made up as follows:

Name	Country	Term
Hernán José Arcidiácono	*Argentina*	*2020 Elections - 2023 Elections*
Adriana Ibarra	*México*	*2021 Elections - 2024 Elections*
Aristóteles Dantas Gaudêncio	*Brasil*	*2022 Elections - 2025 Elections*

Electoral Commission

The Electoral Commission supervises elections, guaranteeing the transparency of the entire process. It analyzes candidate nominations within the framework of the Regulations Regarding Incompatibilities, Capacities and Suitability, solves any issues that may arise during an election process, validates vote counts, and announces final election results.

Name	Country	Term
Nancy Julia Cordova Gamarra	*Perú*	*2020 Elections - 2023 Elections*
Vivian Valverde	*Costa Rica*	*2020 Elections - 2023 Elections*
Marcelo Corradini	*Brasil*	*2021 Elections - 2024 Elections*
Carolina Cofré Fernández	*Chile*	*2021 Elections - 2024 Elections*
María José Franco Lugo	*Paraguay*	*2022 Elections - 2025 Elections*

Ethics Committee

The Ethics Committee is responsible for interpreting, enforcing, and updating the Code of Ethics and the LACNIC Community Code of Conduct. It deals with cases that are beyond the authority of the organization's operational staff.

In 2022, the Ethics Committee was comprised as follows:

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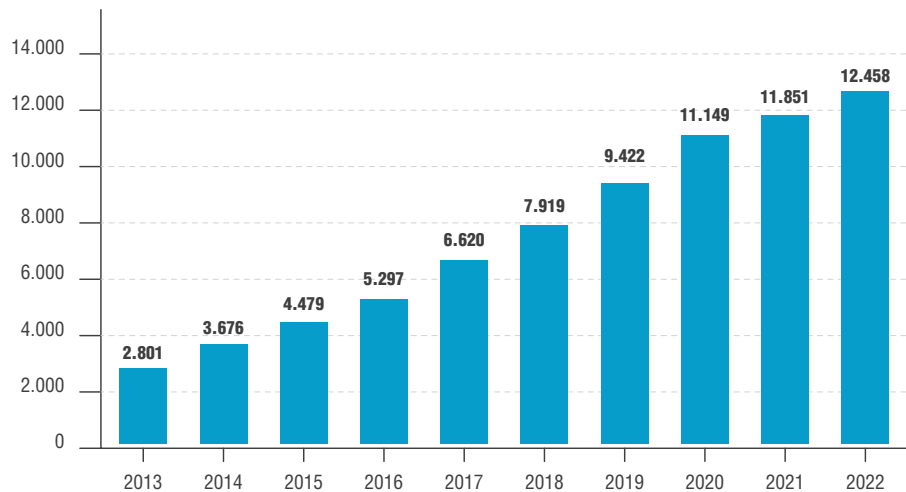- Oscar Robles-Garay (LACNIC CEO)

Our Members

LACNIC members are Latin American and Caribbean organizations that have been assigned IPv4, IPv6, and/or ASN resources by LACNIC.

Our more than 12,400 members include major Internet companies and organizations, as well as universities and organizations across the region that have received and hold Internet number resources.

Growing Membership Base

At the close of 2022, LACNIC had a total of **12,458 member organizations**. The following chart shows how our membership base has evolved in recent years.

Evolution of LACNIC's membership base

MÉXICO 19 — Encuentro presencial

CUBA 4 — Encuentro virtual

Rep. DOMINICANA 11 — Encuentro virtual

HONDURAS 11 — Encuentro virtual

ANDINALINK 1 — Stand

NICARAGUA 7 — Encuentro virtual

CHILE 30 — Encuentro presencial

Visits to Our Members

In 2015, we began visiting members both in person and virtually for the purpose of learning first-hand about their needs and being able to bring our services and benefits closer to them.

In 2022, we paid in-person visits to a total of 49 organizations in Chile and Mexico. We also held 33 online meetings with members in Cuba, Honduras, Nicaragua, and the Dominican Republic.

Likewise, during the first semester of the year, we participated with a stand at the AndinaLink event, where we held more than 120 meetings with current and potential members.

Satisfaction Survey

In order to effectively identify and address the needs of our members, every two years we conduct a satisfaction survey. In 2022, our members reported an **overall level of satisfaction of 96%** (https://bit.ly/3Lb1p4L).

Approval and satisfaction levels have remained stable in all the measurements carried out since 2014, which means that users value and approve the work that is being done. The highest rated items were overall satisfaction with the service and a positive evaluation of the training activities and online courses offered by LACNIC. The **MiLACNIC portal** has the best knowledge/use ratio.

In addition to this survey, we continue to conduct quarterly surveys that allow us to constantly measure the evolution of general satisfaction levels. Since they were launched in 2020, the results of these surveys have reflected levels of excellence, achieving satisfaction values above 94%.

Evolution of LACNIC's membership satisfaction

Year	Satisfaction
2014	94%
2016	94%
2018	92%
2020	98%
2022	96%
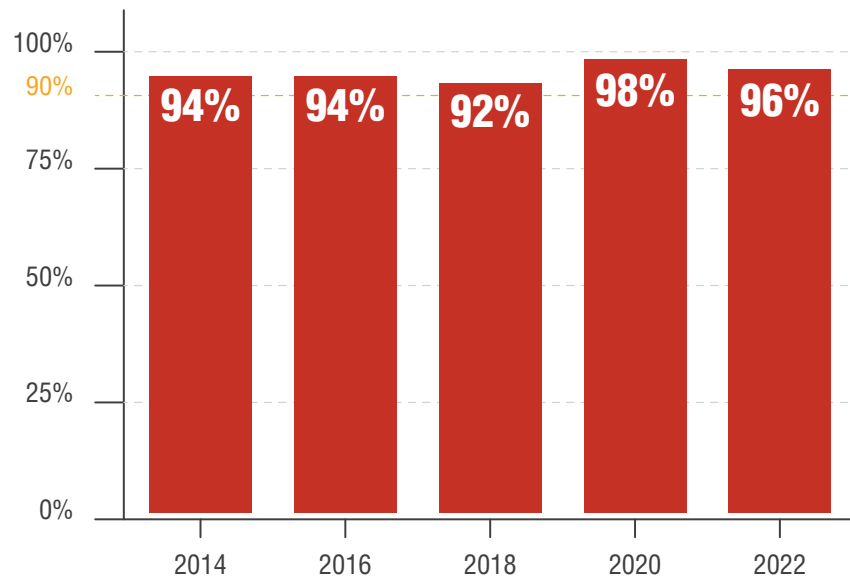
Our Team

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

Thus, **for the tenth 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 placed fifth
in the ranking prepared by international consultants Great Place to Work® (GPTW).

We also took the **third place in the ranking of Best Places to Work for Women in Uruguay** (small organizations category). This ranking recognizes organizations that stand out for their efforts to reduce the gap between men and women and achieve greater equity in the workplace.

Highlights of the Year

FEBRUARY — LACNIC and RedCLARA launch LACNet, the first global, production-grade, enterprise blockchain network

MARCH — LACNIC is named one of the Best Places to Work in Uruguay

APRIL — A journey through the four dimensions of Internet success

MAY — LACNIC 37: the return to face-to-face events

JUNE — Survey and interactive map of IXPs in LAC / Operating a network minimizing the use of IPv4 and getting the most out of IPv6

JULY — The challenge of expanding resource certification in the LACNIC region

AUGUST — Waiting times for IPv4 addresses increase

SEPTEMBER — LACNIC Campus expands its training offer with three specializations in network operation

OCTOBER — Celebrating LACNIC's 20th anniversary / Hartmut Glaser receives the 2022 Lifetime Achievement Award / Group of professional women selected to participate in the third edition of LACNIC's Mentoring Program / IPv6 has become essential

NOVEMBER — 20 Years of Internet evolution and technical success

Resource Management

IPv4 Address Exhaustion

During the first half of 2022, we worked on improving the information we provide regarding the IPv4 wait list.

To this end, we automated the generation of statistics and improved the information we publish on our website. We also developed individual estimates for each organization.

Combined with an above-average recovery of address space and a slight decrease in the number of organizations joining the list, these actions have allowed the total number of organizations on the list to **remain at approximately 900, a 30% growth in relation to the previous year.**
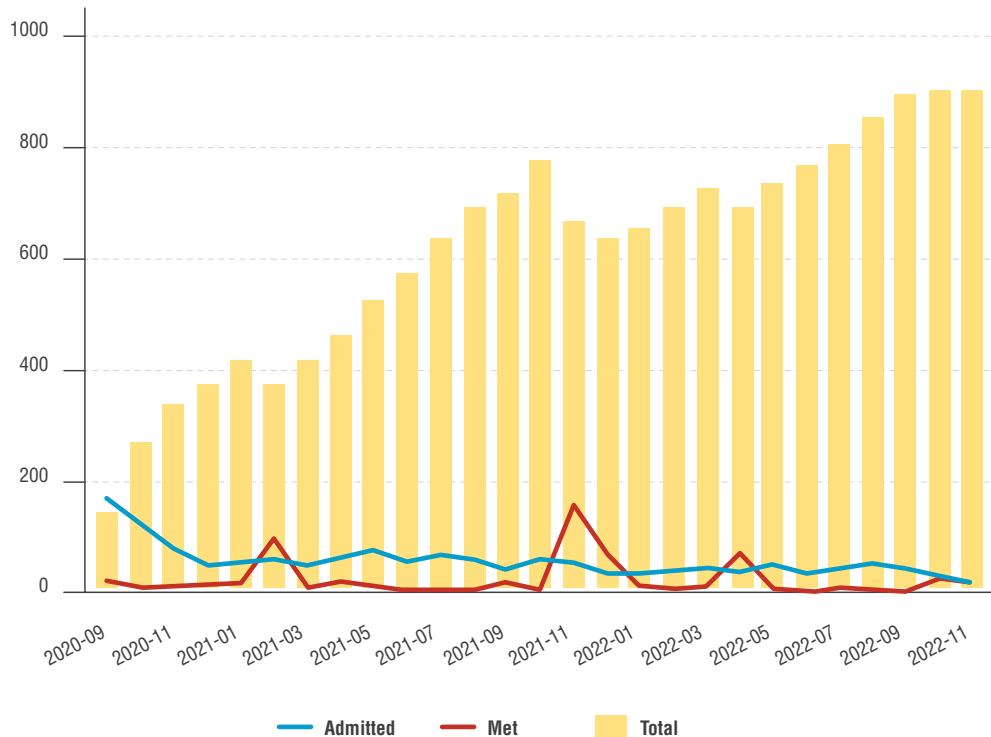
Organizations that are currently receiving resources had an average wait time of **670 days.**

https://www.lacnic.net/6334/1/lacnic/lista-de-espera-para-recibir-direcciones-ipv4

We estimate that organizations joining the waiting list today will receive IPv4 addresses in the first half of 2029.

The time that organizations remained on the waiting list grew significantly during the year, increasing from 400 days in early 2022 to more than 670 at the end of the year.

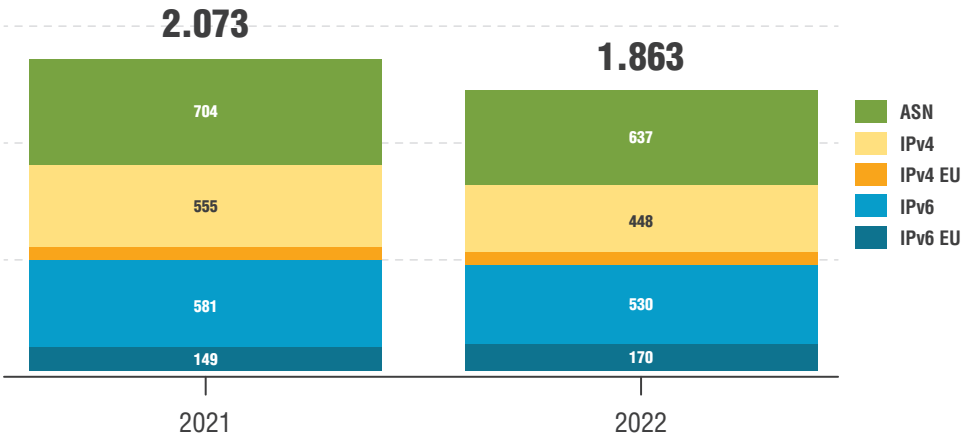## Policy on the Validation of Abuse Contacts

This year saw the consolidation of the efforts that had begun in 2021 for the validation of abuse contacts. Now, 99.9% of the resources have their contacts validated.

The first phase of the process began in 2021 by providing information. This was followed by an automatic emails campaign and a block on access to the MiLACNIC platform. Finally, individual contacts with organizations not in compliance were initiated in January 2022.
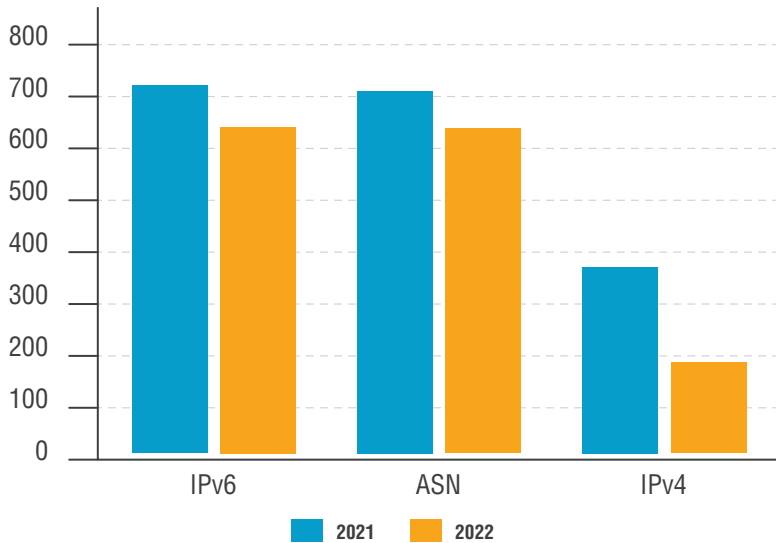

Legend: Admitted — Met — Total

Assignment Statistics

During 2022, we processed a total of 1,863 resource requests (IPv4, IPv6, and ASN), which represents a 10% decrease compared to the previous year.

Likewise, we completed 1,465 number resource assignments (IPv4, IPv6, and ASN), 18% less than in 2021. It is worth noting that the number of IPv4 assignments decreased following the decrease in the amount of recovered address space (150,528 addresses in 2022 vs 349,696 in 2021).

Admitted requests by type

2.073

704	ASN	
555	IPv4	
	IPv4 EU	
581	IPv6	
149	IPv6 EU	

1.863

637
448
530
170

2021 2022

Legend: ASN, IPv4, IPv4 EU, IPv6, IPv6 EU

Number of assignments by type of resource

Grouped bar chart comparing 2021 and 2022 by resource type: IPv6, ASN, IPv4.
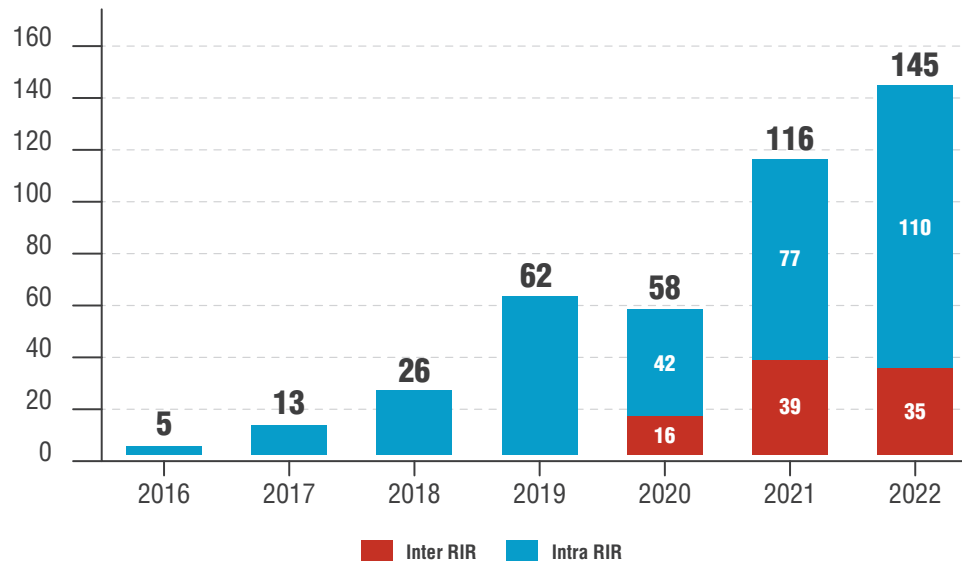
2021 2022

Inter- and Intra-RIR IPv4 Address Transfers

In 2022, 145 IPv4 blocks were transferred, 25% more than in 2021. A total of 499,200 IP addresses were transferred during the year, a number that represents a 7.5% increase compared to 2021.

The number of inter-RIR transfers remained close to the previous year, while there was an increase in intra-RIR transfers.

Since 2015, the year when transfers were enabled, we have transferred 1.5 million IP addresses.

A look at the flow of IP addresses both at the inter-RIR and intra-RIR levels shows that **Chile, Brazil, and Argentina** were the countries where the largest number of outgoing transfers originated. **Colombia, Aruba, and Mexico** were the countries that received the highest number of transfers within the region. Likewise, **France and the United Arab Emirates** were the countries outside the region that received the most transfers.

A look at the same information at the RIR level shows that during these years the number of IPv4 addresses managed by LACNIC decreased by 630,784. These were mainly absorbed by RIPE and correspond to the address space transferred between related French and UAE groups.

Number of transfers by year

Bar chart "Number of transfers by year" showing Inter RIR (red) and Intra RIR (blue) totals:
- 2016: 5
- 2017: 13
- 2018: 26
- 2019: 62
- 2020: 58 (Intra 42, Inter 16)
- 2021: 116 (Intra 77, Inter 39)
- 2022: 145 (Intra 110, Inter 35)

Legend: Inter RIR, Intra RIR

Community Participation Opportunities

Our Events

The LACNIC community comprises more than 12,400 member organizations, plus an extended community that includes a diverse group of individuals and organizations interested in regional Internet development.

Highlighted below are some of the activities organized during 2022 that reflect the generation of spaces for sharing and exchanging experiences and technical knowledge, provide networking opportunities, and allow participants to strengthen their skills.

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.

We received the support of 24 sponsors, 9 of which were participating for the first time:

LACNIC 37

LACNIC 37 was held in hybrid format from 2 to 6 May in the city of Cali, Colombia, and approximately 1,060 participants attended the event (510 in person and 550 remotely). The meeting focused on three main pillars: enabling the largest number of networking spaces, offering technical training, and holding the Annual Member Assembly and the Public Policy Forum.

With this in mind, we organized a panel on **the four dimensions of Internet success** (https://youtu.be/UHnJUMXMdho), four technical tutorials, a special session for ISPs undergoing expansion, and 18 technical presentations within the framework of the LACNIC Technical Forum.

Regional ISP Meeting (https://www.lacnic.net/5989/67/evento/). As part of LACNIC 37, we implemented an activity in collaboration with LAC-ISP aimed at generating a space for exchanging experiences and knowledge with regional Internet service providers. During this session we presented a panel on access to CDNs, discussed how to obtain resources, and explained how to operate networks with scarce IPv4 addresses, among other topics.

LACNIC 38 - LACNOG 2022

https://www.lacnic.net/lacnic38

LACNIC 38 - LACNOG 2022 was the first annual LACNIC event to be held in Bolivia, in this case, in the city of Santa Cruz de la Sierra. A remote participation hub was also set up in Havana, Cuba.

The common theme of this meeting was **LACNIC's 20th anniversary**. To mark the occasion, we organized two panels on the technical evolution of the Internet: "IPv6 and Interconnection" and "Policies that Made History." Gerry Garbulsky was the main keynote speaker and shared some tools to translate being part of a community into personal well-being, learn how to take risks, and innovate.

The event included a record number of tutorials and workshops, as well as additional activities such as the LAC Peering Forum, the LACTLD Technical & Commercial Workshop, a DNS hackathon organized in coordination with ICANN, and the LAC-CSIRT meeting.

The event also hosted the Lifetime Achievement Award (https://bit.ly/3A8fmKl) ceremony, an award that recognizes community leaders who have continuously worked to promote Internet development and deployment in the region. The award is presented every two years, and 16 candidates were nominated in 2022.

The winner of the 2022 edition of the Award was **Hartmut Glaser**, who has actively contributed to strengthening the multistakeholder governance model in the region and worldwide, and played an essential role in the creation and consolidation of regional organizations such as the Brazilian Internet Steering Committee and in the institutional development of NIC.br.

We also took the opportunity to present the prize to the winner of the 2020 edition, **Rafael Lito Ibarra**, as the corresponding in-person awards ceremony could not be not held due to the pandemic.
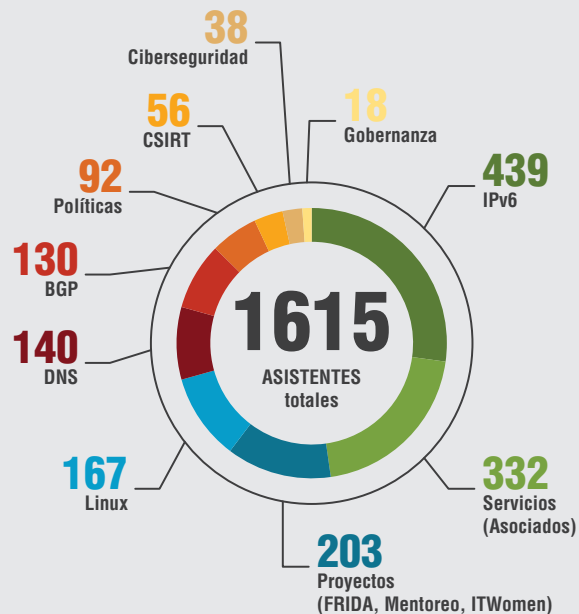
Training Center

The LACNIC Training Center offers continuous 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.

Webinars

Throughout the year we held 14 webinars on topics such as IPv6, DNS, cybersecurity, and BGP. These webinars were attended by a total of 1,615 participants, 30% more than in 2021.

38 Ciberseguridad

18 Gobernanza

56 CSIRT

92 Políticas

439 IPv6

130 BGP

140 DNS

167 Linux

1615 ASISTENTES totales

332 Servicios (Asociados)

203 Proyectos (FRIDA, Mentoreo, ITWomen)
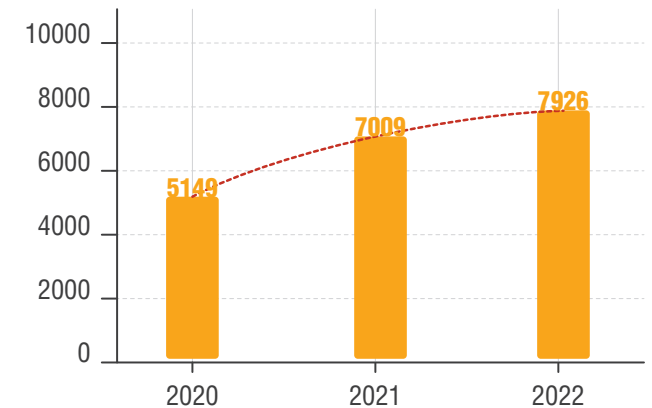
LACNIC Campus

The LACNIC Campus is an online platform that offers training opportunities and guarantees access to learning and continuing education in the region.

In 2022 we added five new courses on Internet Governance (English version), Digital Information Management, CSIRT Creation and Management, DNS, and Basic Routing.

The Campus welcomed **7,926 students**, 77% of whom successfully completed their courses. More than 40% of the students opted for training in IPv6.

Evolution of the number of students

In 2022 we launched the **LACNIC Campus Specializations**, which are training tracks organized by levels that allow participants to obtain a certification in three specializations related to network operation:

- ISP Network Operation
- Campus Network Operation
- Datacenter Network Operation

Through a system based on earning badges, students will be able to reach each of the three levels within each specialization and will be eligible to take the exam that allows them to achieve the LACNIC Certification.

This format is an evolution of the technical training courses offered through the LACNIC Campus. It will provide professionals and member organizations to visualize a training path with contents specifically designed to strengthen their training and skills.

More information:

Policy Development

LACNIC operates based on a participative 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.

With the aim of encouraging the nomination of candidates to serve as chairs of the Policy Development Process (PDP), we implemented a campaign to highlight the professional and reputational value of the role. As a result of the 2022 elections, Sergio Rojas was elected, and took over the role of chair at the end of the LACNIC 37 forum.

In 2022 we continued to work with the PDP chairs using an open microphone participation format for the discussion of the policy proposals at the hybrid Public Policy Forum.

At the Public Policy Forum held in October 2021, the chairs proposed the creation of a Working Group to work on two similar proposals on adjustments to the PDP chair election process. The result of the work of this group was a new proposal, LAC-2022-4, which was implemented in 2022.

The list below shows the policy proposals submitted during 2022 and their current status:

As for the **policy on the validation of abuse contacts**, we were able to consolidate the efforts initially started in 2021 and now 99.9% of the resources have validated contacts. The first phase of the process began in 2021 by providing information and was followed by automatic emails. If a contact was still not validated after these notifications, we blocked their access to MiLACNIC. The final step of the process was to initiate contact with non-compliant organizations through other means of communication.

Proposal		Comments
New (first submitted in 2022)	5	• LAC-2022-1: Unify Texts That Apply to Both IPv4 and IPv6 • LAC-2022-2: Clarification: The lease of resources is not allowed under the policies in force • LAC-2022-3: Managing Recovered Resources that were originally part of the Reserve for Critical Infrastructure • LAC-2022-4: PDP Chair Elections • LAC-2022-5: Proportionality in the Cost of Resources (*)
Under discussion in 2022	8	**Policy proposals that seek to modify the Policy Manual:** • LAC-2022-1: Unify Texts That Apply to Both IPv4 and IPv6 • LAC-2022-2: Clarification: The lease of resources is not allowed under the policies in force • LAC-2022-3: Managing Recovered Resources that were originally part of the Reserve for Critical Infrastructure • LAC-2021-5: Update End-User and End-Site Definitions • LAC-2021-4: Permission to Transfer and Non-Return of Resources • LAC-2020-10: Authorize Recipients of Delegated Blocks to sign ROAs **Policy proposals that seek to modify the PDP:** • LAC-2020-3: Impact Analysis Is Mandatory • LAC-2022-4: PDP Chair Elections
Reached second consensus	1	• LAC-2022-1: Unify Texts That Apply to Both IPv4 and IPv6
Ratified	1	• LAC-2020-10: Authorize Recipients of Delegated Blocks to sign ROAs
Not ratified	1	• LAC-2022-3: Managing Recovered Resources that were originally part of the Reserve for Critical Infrastructure
Implemented	3	• LAC-2022-4: PDP Chair Elections • LAC-2021-1: Modify section "2.3.2.19 and 4.3 Inclusion of origin ASN in the WHOIS database when available" • LAC-2021-4: Permission to Transfer and Non-Return of Resources

(*): LAC-2022-5: This proposal did not reach the discussion stage because the chairs agreed that the PDP was not the appropriate forum for the topic.

Technical Forums

Technical Forums *are spaces for sharing knowledge and experiences, and they contribute to further strengthening our region's technical Internet community.*

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 technology and technical implementations, was also held in hybrid format within the framework of LACNIC 37. Out of a total of 19 proposals that were received, the program committee selected 16 presentations on topics such as IPv6, RPKI, DNS, IoT, cybersecurity, and others (https://www.lacnic.net/5959/67/evento/foro-tecnico-de-lacnic).

FIRST Regional Symposium

(Global Forum of Incident Response and Security Teams)

The FIRST Regional Symposium was held within the framework of LACNIC 37. This event was co-organized with FIRST and co-hosted by NIC.br/CERT.br.: https://bit.ly/lacnic37FIRST

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

The second day included the tutorial titled "SIM3 Security Incident Management Maturity Model," which 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.

We also presented "Cloud Open Source Intelligence (OSINT)," a set of tools designed to develop skills for finding confidential information that may be exposed in various cloud services, understand the risk that this represents for an organization, and identify potential measures to mitigate these vulnerabilities.

CSIRT Meeting

The LAC-CSIRT community was also part of LACNIC 38 - LACNOG 2022. This meeting has become a workspace for Latin American and Caribbean actors to share security-related issues. This sharing of knowledge among participants seeks to strengthen the region's ability to prevent computer security incidents and mitigate their impact.

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 11 technical presentations, two panels on current challenges, and a workshop on VXLAN and EVPN.

All the presentations are available here: https://www.lacnic.net/6405/70/evento#oct6

Likewise, in 2022 and with the collaboration of LACNOG and ISOC, we worked on a **program to support NOGs** through which we organized the following activities:

- A workshop for Intered and PANOG of Panama on LACNIC Services for IXPs, MANRS, and Generating ROAs.
- A panel during LACNIC 38 - LACNOG 2022 where representatives of four NOGs currently active in the region explained the value of these national groups in sharing experiences, good practices, and the creation of local networks.
- We contributed to the creation NOG Colombia at the meeting held during the LACNIC 37 event and hosted their mailing list.

NOGs. *National network operation groups are spaces for organizations operating networks in each country to discuss their problems and needs. LACNIC supports this type of initiatives that allow coordinating actions with the various network operators (ISPs, universities, government networks, etc.) to promote the adoption of technologies such as RPKI, IPv6, IP and ASN resource management, best routing practices, and others.*

An Open, Stable, and Secure Internet

Strengthening Internet Infrastructure

+RAICES Program

https://www.lacnic.net/993/1/lacnic/proyecto-raices

The goal 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, we seek to increase the resilience of the DNS, one of the Internet's critical resources. In doing so, we generate a better response to possible DDoS attacks or eventual infrastructure failures which could potentially render one or more root-servers inoperative.

LACNIC annually publishes a call for expressions of interest from organizations within the region interested in hosting an anycast copy of a root server. The locations that meet the requirements for hosting a root server are selected in cooperation with the root server operators (RSO) with whom we have already signed agreements.

In 2022, we installed the servers selected after the call for expressions of interest launched by +RAÍCES in 2021:

RSO	Location	Org	Role of LACNIC	Operating since
I	Panama City, Panama	Intered	Coordination	September 2022
I	Santo Domingo, Dominican Republic	IXP DO	Funding and coordination	Server on site, pending configuration by Netnod

As a result of the 2022 call for proposals, the following locations were selected:

- Princes Town, Trinidad & Tobago, Airlink Networks (connected to TTIX2, Trinidad & Tobago IXP)
- Arequipa, Peru, Peru IX

Location of the root server copies sponsored by LACNIC as at December 2022, with the letter of the corresponding RSO

Installing Services at IXPs

As part of a collaboration agreement between LAC-IX, the Internet Society, and LACNIC, we are implementing a program to strengthen regional IXPs. The goal is to improve IXP infrastructure, the quality of the services each IXP provides to its members, and Internet quality in each country.

The services we promote among IXPs include RPKI validation, as well as routing security and stability through the installation of DNS and route and DNS servers and the analysis of routing behavior using BGP collectors.

The work carried out jointly by the three organizations allowed improving IXP management (IXP Manager, monitoring systems, etc.), provided support in the form of hardware for their infrastructure, and introduced the MANRS standards in most IXPs.

This year, the following IXPs received support:

- IXSAL, El Salvador
- NAP Colombia
- Intered, Panamá
- PIT Bolivia, Bolivia

LACNIC also supported NAP Colombia in the purchase of servers integrated into virtualization systems.

In addition to infrastructure support, we organized training workshops on topics such as BGP, RPKI, IPv6, and IXP Services at IXP Yucatán, NAP Colombia, PIT Bolivia, as well as for LAC-IX professionals.

## Deployment of Anycast Services in LACNIC's Reverse Zones

LACNIC operates a slave server for the in-addr.arpa and ip6.arpa zones which has been assigned the letter "D". The remaining slave servers are operated by the other four RIRs and one by the IANA.

Until 2019 this server was located in São Paulo. As part of our commitment to Internet stability, in 2020 we began to deploy anycast copies of this service, the first of which was installed in LACNIC's datacenter in Montevideo. In 2021 we installed a new anycast copy in Miami and another one at the cloud computing facilities of Vultr in Mexico. In 2022 we installed anycast copies in Santiago and at EdgeUno's datacenter in Lima.

DNS queries received over a 7-day period by the LACNIC anycast copy installed in Lima, Peru.
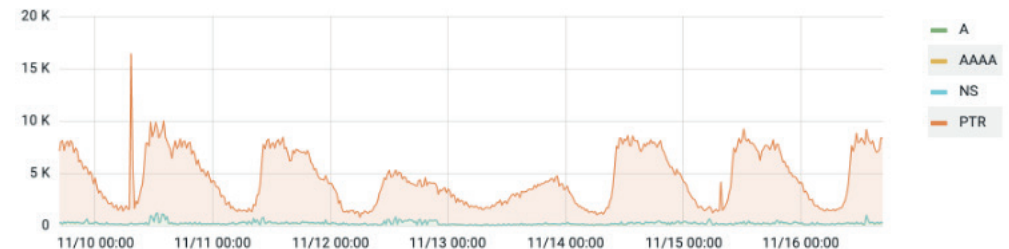
DNS queries received over a 7-day period by the LACNIC anycast copy installed in Santiago, Chile.
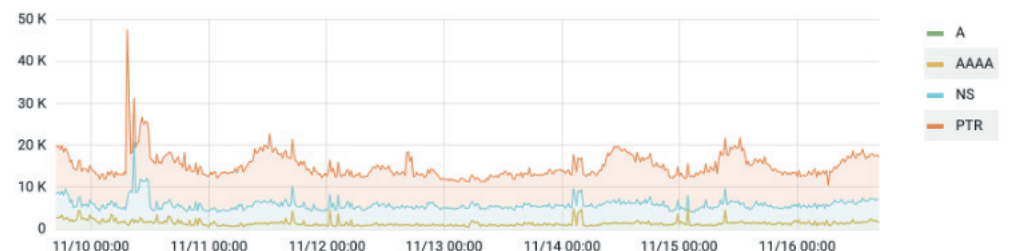
Actions in Cybersecurity

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

We continued to improve our sensor network by incorporating three new honeypots to the CSIRT HoneyNet network, which reached a total of 28 sensors. The new sensors belong to organizations in Argentina, Colombia, and Ecuador.

In addition, we presented two new courses on the LACNIC Campus: Digital Information Management for Research Purposes, aimed at law enforcement agencies (LEAs), and The Basics of CSIRT Creation and Management.

We also continued to enhance the situational awareness information we provide to our members through the MiLACNIC portal security module, which now includes information on DNS open resolvers hosted on the IP address ranges of each member.

Promotion of IPv6 Deployment

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

To continue to improve the knowledge available to our community, we brought the experiences and lessons learned in Latin America and the Caribbean closer to the community through content generated by various experts: https://news.lacnic.net/tag/ipv6

Within the framework of the LACNIC 37 and LACNIC 38 events, we offered tutorials on IPv6 Network Operation and IPv6-Only Datacenters which were very well-received by participants (https://youtu.be/52r9-jCPvOU).

We also participated in the following activities related to IPv6 deployment:

- AndinaLink - We presented the course IPv6 in Mikrotik Devices (https://bit.ly/3KXna7R)
- VENOG: Strategies for Internet development in Venezuela
- MINTIC Colombia: IPv6 Colombia
- Meeting of MERCOSUR SGT-1: IPv6 as a Strategic Decision
- PIT Bolivia: Course on IPv6 for Decision Makers, and IPv6 and BGP Theory and Practice
- IXP Yucatan + WISP MX Meeting
- ANUIES talk on IPv6 Planning
- Talk by PIT Bolivia and ISOC Bolivia
- Digital Around the World Conference
- ASISPY 2022 event (Association of Internet Service Providers of Paraguay)

In addition, LACNIC produced three podcasts with content specifically on IPv6 https://www.lacnic.net/6370/1/lacnic/ and developed a specific webpage with tutorials and tools to promote IPv6 Only (https://www.lacnic.net/ipv6only).

IPv6-Only Networks

In 2022 we decided to offer specific tools and tutorials for IPv6-only networks. On this page, you will find documents on IPv6 compatible equipment and tutorials on IPv6-only datacenters, IPv6-only DNS, and how to configure an IPv6-only datacenter, among others. https://www.lacnic.net/ipv6only

We also continued to improve and expand the information available on the IPv6 Deployment webpage (https://www.lacnic.net/despliegaipv6), where we share information on topics such as transition mechanisms, IPv6 statistics, and IPv6 addressing plans.

Contribution to Internet Measurements

RIPE Atlas "Deployathons" and Measurement Probes

Many research activities in the region are based on active measurements obtained through the use of probes such as those that are part of the RIPE Atlas project (https://atlas.ripe.net/about/).

Given that in most countries of Latin America and the Caribbean these probes have low coverage, we organized deployment activities in the form of "configuration hackathons" or deployathons, including:

- Probe deployathon in Panama, in collaboration with AIG Panama and the Panama ISOC chapter, with the support of the RIPE NCC. Through this activity, we were able to install 17 RIPE Atlas software probes on Raspberry PIs that will be distributed in various locations in Panama.

- LAC 2022 RIPE Atlas Deployathon: Implementation session in which we participated together with RIPE NCC, ANUIES, Internet Society, LAC-IX, LACNOG, IXSAL, CUDI, and others, and where we installed software probes in virtual environments based on Centos, Debian, or Raspberry PIs.

BGP Collectors at IXPs in the Region

To better understand the interconnection of operators at the local level in each country, we continued to install BGP table collectors at some of the Internet Exchange Points (IXPs) we supported.

Our collectors participate in the BGP dialogue that occurs within the IXP's infrastructure and this information is copied daily to a central repository at LACNIC (https://ixpdata.labs.lacnic.net/raw-data/).

In 2022 we installed the following collectors:

- Intered, IXP de Panamá
- APROSVA, IXP de Ecuador

R+D Projects

Study on Anti-spoofing in the Region

http://bit.ly/3KULGFJ

IP spoofing is the creation of IP packets with a false source IP address for the purpose of impersonating another computing system. This enables different types of attacks which are difficult to detect and mitigate.

The report unifies terminology and organizes the information obtained from various sources, allowing an understanding of this problem, the mechanisms to identify the status of a network, and actions that can be implemented to improve security with respect to spoofing.

Use of DNS-over-TLS In LAC

http://bit.ly/41s2RFe

In recent years we have seen a growing interest in introducing privacy-enhancing features to the DNS, most notably query and response encryption. In this sense, various technologies have emerged, including DoT (DNS over TLS), DoH (DNS over HTTPS), and DoQ (DNS over Quic).

The first results of this study show that DoT is slowly starting to be used in Latin America and the Caribbean, where 8.5% of open resolvers currently offer IPv6 DoT and 1.2% IPv4 DoT. On the other hand, between 3.5% and 13.3% of queries from probes in the region to known resolvers that offer DoT failed, which may be an indication of the existence of blocks that might prevent a service from reaching 100% of the clients.
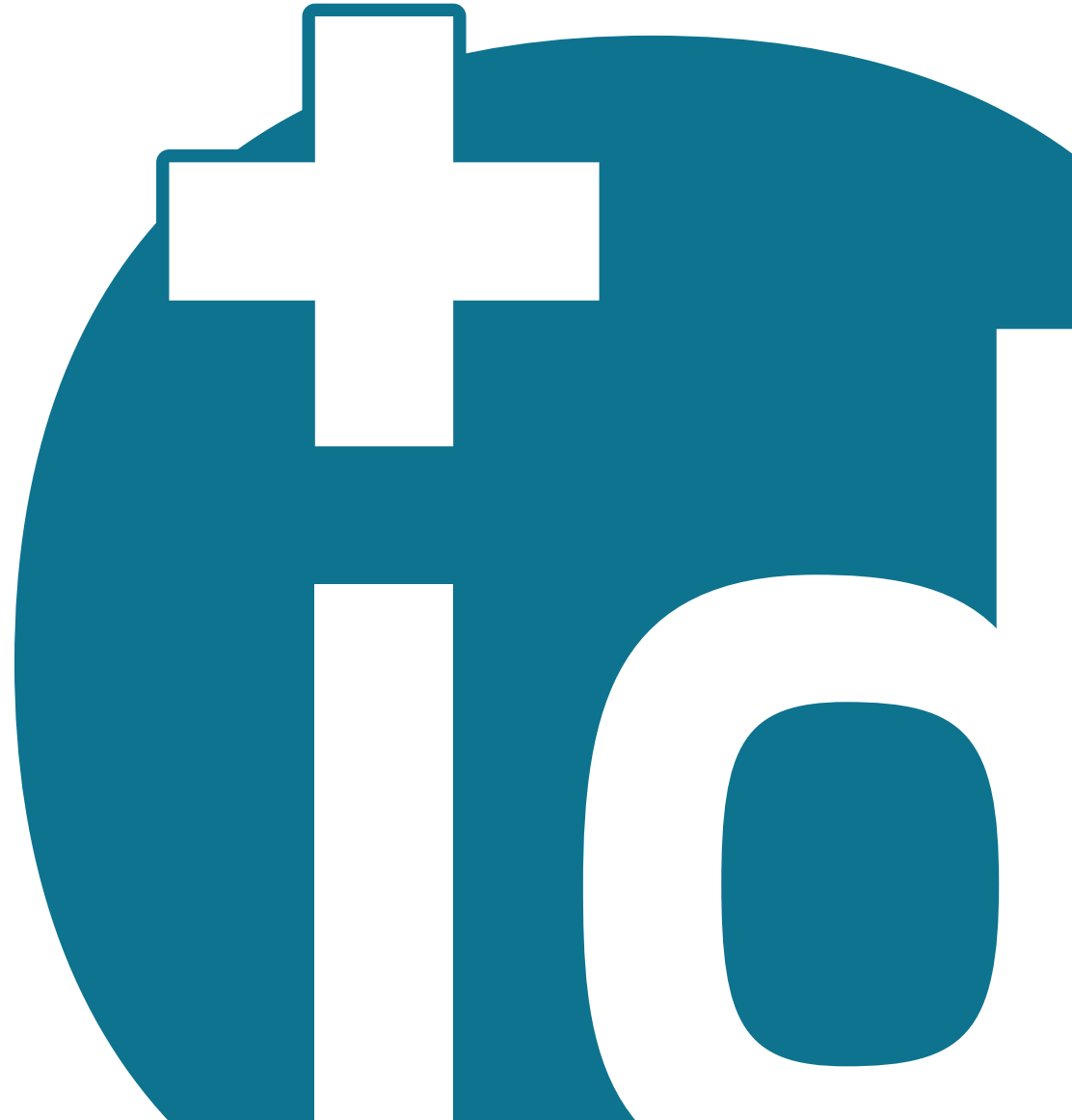
The Internet and Its Social Impact

FRIDA Program

The FRIDA Program supports Latin American and Caribbean projects, initiatives, and solutions that contribute to the consolidation of a global, open, stable, and secure Internet.

For the 2022 call for proposals, we updated the categories and thematic axes, adding new topics and a subcategory on the use and application of blockchain technology for Internet stability and security.

We received 204 applications, representing an increase of 44.1% in the participation of the academic sector compared to 2021 and an increase of 8.7% in the number of applications under the Internet Stability and Security category, 26% of which corresponded to blockchain technology.

Applications

38
68

ACADEMIA 2021
ACADEMIA 2022

+44.1%
increase in participation

↑8.7%
Internet stability and security

26% Blockchain
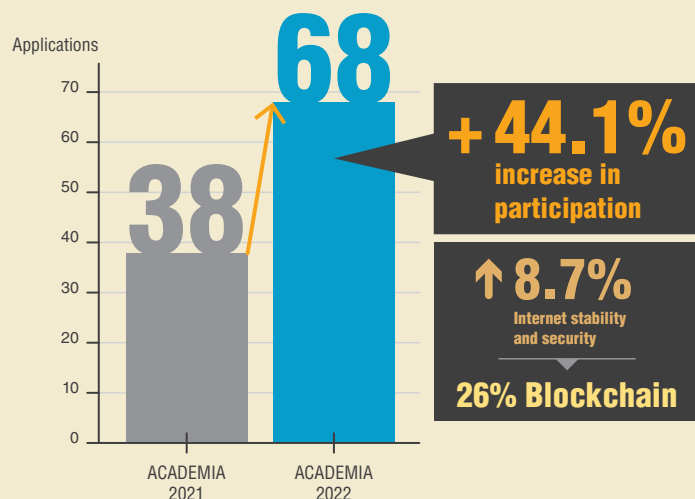
After carefully assessing each proposal, the selection committee selected eight projects to receive a FRIDA grant.

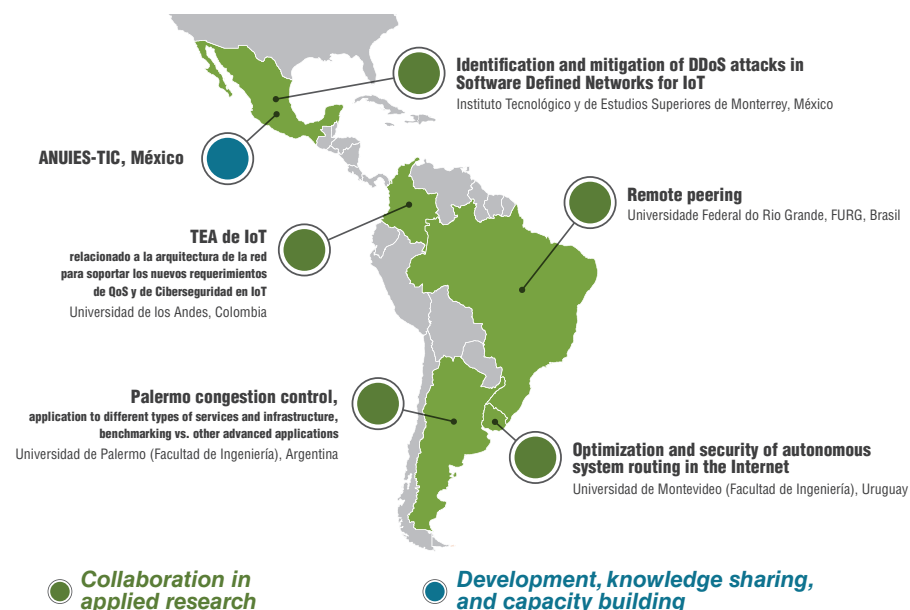Check out the winning projects: https://bit.ly/408XNnQ

Effective Collaboration for Applied Research

During the first phase of this project, we surveyed the technical topics that are of interest to us and then mapped the academic institutions in the region working on technical issues related to Internet development.

In parallel, during LACNIC 37 we conducted semi-structured interviews with 15 leading academics. With this in mind, we created a portfolio of priority topics and lines of research/work (https://bit.ly/3ocJZvt).

44 Universities surveyed in the region *representing 16 countries*

21 Universities and **24** *research groups identified*

15 Semi-structured interviews *with leading academics*

Once this portfolio was defined, we generated frameworks and identified the first institutions with which to enter into agreements.

Identification and mitigation of DDoS attacks in Software Defined Networks for IoT
Instituto Tecnológico y de Estudios Superiores de Monterrey, México

ANUIES-TIC, México

Remote peering
Universidade Federal do Rio Grande, FURG, Brasil

TEA de IoT
relacionado a la arquitectura de la red para soportar los nuevos requerimientos de QoS y de Ciberseguridad en IoT
Universidad de los Andes, Colombia

Palermo congestion control,
application to different types of services and infrastructure, benchmarking vs. other advanced applications
Universidad de Palermo (Facultad de Ingeniería), Argentina

Optimization and security of autonomous system routing in the Internet
Universidad de Montevideo (Facultad de Ingeniería), Uruguay

● **Collaboration in applied research**

● **Development, knowledge sharing, and capacity building**

WOMEN & ICT

This year we organized the third edition of the Mentoring Program for Women in Technology (http://bit.ly/3KYIISU) together with ANUIES-TIC of Mexico. We received a total of 20 applications from 13 different countries of the region, an increase of 50% compared to 2021.

The winners will participate in training activities, have access to the courses on the LACNIC Campus (https://campus.lacnic.net/) and the opportunity to present the results of their work at the LACNIC Technical Forum to be held at LACNIC 39.

Cybersecurity **IPv6**
Routing security Traffic management
BGP *Blockchain*
Network architecture **IoT** Routing

IT WOMEN

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 in 2022

CaribNOG

We supported the second annual meeting of CaribNOG, which took place within the framework of the CTU ICT Week.

CITEL/OAS

We continued with the rapporteurship on interoperability, infrastructure, connectivity, numbering, services and applications, including Internet and international connectivity at CCP.I.

CANTO

We attended the annual CANTO meeting in Miami. There, we set up a joint stand with ARIN and participated in the panel titled "Outlook on the Caribbean ICT Industry" where we stressed the importance of IPv6 adoption for the development of the Caribbean. We also held meetings with government authorities of Curaçao, Trinidad and Tobago, and Guyana, as well as with the CEO of BTL.

Caribbean Public Safety Forum

Together with the CTU and ARIN, we organized the fifth edition of the Caribbean Public Safety Forum.

CTU

Together with the CTU and ARIN, we supported and organized the Public Safety, Public Policy, and Technical Forums. We also participated in the CTU Ministerial Meeting held within the framework of ICT Week in the Bahamas.

Meeting of MERCOSUR SGT-1

We gave a presentation on "IPv6 as a Strategic Decision," which was attended by 20 government officials representing Mercosur member countries.

ITU

We participated in the 2022 Plenipotentiary Meeting in Bucharest, Romania. There, together with other organizations that are part of the global technical community, we worked to ensure that resolutions related to the Internet are not modified in a way that threatens a free, open, and secure Internet.

We also held meetings with representatives of El Salvador, Paraguay, the Dominican Republic, and Colombia, with whom we discussed opportunities for collaboration with their governments.

eLAC

We worked on the eLAC2024 digital agenda, which was approved in November during the Ministerial meeting in Montevideo. We also participated in the panel on Innovation, entrepreneurship and digital transformation: triggers and accelerators of development.

IIDH

We worked jointly with the Inter-American Institute of Human Rights and contributed two classes to their course on Privacy: How the Internet Works and Privacy in the DNS.

Participation and Contribution to the Global IGF and LACIGF

LACIGF

https://lacigf.org/lacigf-14/

The 15th edition of LACIGF was held virtually from 24 to 26 October. LACNIC supported both the Program Committee and the event's logistics. LACNIC CEO Oscar Robles participated in the session "Towards meaningful connectivity for everyone: challenges, lessons learned, and proposals from Latin America and the Caribbean," while Miguel Ignacio Estrada participated in the closing session.

CIGF / SIDS IGF / Youth Caribbean IGF

This year, the Caribbean IGF was held together with the Youth Caribbean IGF and the new SIDS IGF (Small Islands Developing States IGF) from 24 to 26 August.

Kevon Swift, Head of Public Security Affairs at LACNIC, participated in the opening session and in the "SIDS IGF Governance/Way Forward" panel. Likewise, Miguel Ignacio Estrada, Chief Strategic Relations Officer at LACNIC, presented "Technical Success Factors of the Internet," a report prepared jointly with APNIC.

SSIG 2021

We supported the 2022 South School on Internet Governance, in which 200 students participated (60 in person and 140 online).

Oscar Robles gave a keynote presentation titled "The Role of the Internet in Digital Transformation."

National IGFs

During 2022 we reformulated our support to national IGFs. Given that most of these events continue to be held remotely, we decided to support them by providing access to Zoom so that they could organize large-scale online activities, as well as financial support.

We supported the following national initiatives:

- IGF Bolivia
- IGF Costa Rica
- IGF Ecuador
- IGF El Salvador
- IGF Panamá
- IGF Uruguay
- Mesa de Gobernanza de Internet de Colombia

DIGI 2022

Together with the Catholic University of Uruguay, we provided one of the venues for the 2022 edition of the Diploma in Internet Governance, which took place in Montevideo. This time, this initiative of the San Andres University Center for the Study of Technology and Society (CETyS) was attended by 20 participants representing various sectors and nine different countries of the region (Argentina, Bolivia, Brazil, Ecuador, Mexico, Nicaragua, Panama, Dominican Republic, and Uruguay).

We participated in the definition of the curriculum for the Diploma with Oscar Robles as part of the Program Committee. LACNIC also contributed by participating as lecturers. Oscar Robles gave an inaugural lecture on the Internet's Technical Success Factors, while Miguel Ignacio Estrada participated in the closing session.

In addition, we supported the Diploma and sponsored four participants of our Policy Shapers program as well as a member of the LACNIC Staff who is part of the Development and Cooperation department.

IGF LAC Space

Together with LACTLD and the University of San Andres Center for the Study of Technology and Society (CETyS), we organized the fourth edition of the IGF LAC Space during the global IGF in Ethiopia.

Líderes and
Policy Shapers Programs

The Líderes Program

https://www.lacnic.net/5480/1/lacnic/lideres-20

Líderes is a program created to provide funding and mentorship opportunities for research and present more detailed insights into selected Internet Governance (IG) topics as perceived within participants' communities.

For the 2022 edition, we received 32 applications from different countries across the region, 16 of which were selected as the winners.

Selected topics included access gaps, digital citizenship, content blocking, and digital inequality.

Click here to see the projects selected in 2022: http://bit.ly/3myU5Gy

Policy Shapers Programs

The Policy Shapers Engagement program seeks to attract actors from various sectors to our community and accompany their insertion into the world of Internet Governance.

Twelve candidates were selected to attend the LACNIC 37 event. These candidates had previously completed the Líderes program and the course Introduction to Internet Governance in LAC on the LACNIC Campus.

Already in the Policy Shapers stage, these leaders received scholarships to participate in the IIDH Personal Data Protection course and the University of San Andrés CETyS Diploma in Internet Governance.

Relations with Governments and Decision Makers

In 2022, we participated in various activities aimed at strengthening our ties with regional government authorities, as well as to generate trust and influence among decision-makers. We discussed topics such as IPv6 deployment, IPv4 exhaustion, cybersecurity, and the unintended consequences of Internet blocking.

Highlights of our activities include the meetings of OAS/CITEL, COMTELCA, the ECLAC School of New Technologies, and the ITU Plenipotentiary Meeting. We also worked on the eLAC2024 digital agenda, which was approved in November during the Ministerial meeting in Montevideo, and took advantage of events such as the GSMA Mobile World Congress, the CANTO assembly, the CTU ICT Week, and the eLAC Ministerial meeting to create spaces to interact with authorities of the region.

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

ECLAC and CETIC.BR School on Digital Transformation and Innovation

The Latin American School on Digital Transformation and Innovation was conceived as a capacity building program that includes lectures, case study presentations, and discussions. The School has become a relevant capacity building platform where policy makers and professionals engage in an intersectoral and multistakeholder debate about the challenges of digital transformation and innovation in Latin America.

For this edition, LACNIC coordinated a special section where Technical Community organizations were able to introduce themselves and share the challenges identified for the development of a free, open, and secure Internet. The School was attended by 44 participants, policy makers from various countries in the region.

High-level Reception at Casa de Internet for Latin America and the Caribbean

Within the framework of the eLAC (ECLAC) Ministerial Meeting, we coordinated a high-level reception for the heads of each delegation. The reception was attended by more than 50 authorities representing different countries across the region, as well as by representatives of other organizations that are part of Casa de Internet, CAF, ECLAC, and panelists at the eLAC Ministerial meeting.

Annexes

Annexes

- External Auditor Report

- LACNIC's Fiscal Commission Report

www.**lacnic**.net