



lacnic

2019 Annual Report

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Wardner Maia, Board of Directors President

A Year Full of Commitments and Great Challenges

LACNIC's commitment to the participation of the regional community and the constant efforts of the Internet ecosystem to reduce the digital divide are reflected in the more than 10,000 organizations that are part of our membership base at the closing of 2019. This growth in the number of members over the past year is characterized by the incorporation of smaller Internet providers, who are requesting IP addresses to expand their businesses in the digital world.

At LACNIC, we made an important effort to reach the largest possible number of regional organizations, to encourage both their engagement and their participation in events aimed at regional Internet providers and visits to our members.

As for the allocation of Internet number resources, 1,457,152 IPv4 addresses were allocated in 2019, almost exclusively to new entrants. There are currently 899,092 available IPv4 addresses, which makes IPv6 essential for sustaining Internet growth in the region as well as for connecting the unconnected.

Although more than 94% of our members have already received IPv6 assignments, the effective rate of implementation of networks with IPv6 traffic in our region is close to 20%, a figure that is still below global implementation levels, which are approximately 30%. Faced with this situation, the LACNIC Board also published a statement in November, inviting the regional community to accelerate IPv6 deployment and requesting the actors involved to take measures in this regard.

Also seeking to promote the use of IPv6, LACNIC made a wide range of training activities available to the community, including online seminars, tutorials and panels through the LACNIC Campus, its online e-learning platform. This year, the various IPv6 training activities offered by LACNIC have allowed more than 5,500 regional ICT experts and professionals to participate and strengthen their IPv6 technical skills.

To strengthen Internet infrastructure, we promoted the installation of I-root server copies in different countries of the region and, together with expert Hugo Salgado, we published a study on the use of DNS root servers in Latin America. Likewise, we are also working together with NIC Mexico to create an RPKI validator, based on the FORT validator, that will allow operators to validate their routes.

This year was a year of major celebrations: we celebrated the Internet's 50th anniversary with different pioneers and organizations that are part of the Internet ecosystem and, together with ICANN, the Internet Society and LACTLD, we published the book titled "The Development of the LACNIC Community. A History Under Construction," where its author, Carolina Aguerre, tells the history of the Registry and its community.

For the eighth consecutive year, I am proud to say that LACNIC was named the second best place to work in Uruguay, according to the ranking prepared by GPTW.

And so, a great year comes to a close. A year full of commitments, activities and challenges that allow us to be closer to you, our community, and to continue to fulfill our leading role by contributing to the development of the Internet in the region.

About LACNIC

The Internet Addresses Registry for Latin America and Caribbean is an international non-government organization established in Uruguay in 2002. It is responsible for assigning and managing Internet number resources (IPv4, IPv6), Autonomous System Numbers and Reverse Resolution for the region.

LACNIC contributes to Internet development in the region through an active cooperation policy, promotes and defends the interests of the regional community, and helps create conditions such that the Internet will become an effective instrument for social inclusion and economic development in Latin American and the Caribbean.

Vision and Mission

LACNIC's vision is to lead the strengthening of a single, open, stable and secure Internet at the service of the development of Latin America and the Caribbean, promoting the collaborative Internet model.

Its mission is to manage Internet number resources for Latin America and the Caribbean through the participatory development of policies, based on a culture of excellence, transparency and continuous improvement, adding value to our community by:

- Building capacity within the regional community by providing training as well as by cooperating and collaborating with other organizations;
- Engaging in, and contributing a regional perspective to, the industry and Internet Governance forums;
- Strengthening the multistakeholder, participatory, bottom-up Internet Governance model; and
- Promoting the use and development of Internet standards, involving the regional community in the process.

LACNIC seeks to serve as a permanent regional leader on issues related to Internet development.

¿Quiénes integran LACNIC?

The LACNIC Board of Directors [↗](#)

LACNIC is managed and led by a Board of seven directors elected by LACNIC members, more than 10,000 organizations that operate networks and provide services in 33 different Latin American and Caribbean territories. In 2019, the LACNIC Board was made up as follows:

Name	Position	Country of residence	Term ends in
Wardner Maia	President	Brazil	December 2019
Javier Salazar	Vice President	Mexico	December 2019
Gabriel Adonaylo	Treasurer	Argentina	December 2020
Rosalía Morales	Deputy Treasurer	Costa Rica	December 2020
Esteban Lescano	Secretary	Argentina	December 2021
Alejandro Guzmán	Deputy Secretary	Colombia	December 2021
Evandro Varonil	Member	Brazil	December 2021
Oscar Robles Garay	Executive Director / CEO		



Fiscal Commission [↗](#)

The Fiscal Commission is LACNIC's control body. It is responsible for supervising that all accounting and administrative standards are met and overseeing compliance with LACNIC's legal and statutory framework. In 2018, this Commission was made up as follows:

Name	Country	Term
Hernán José Arcidiácono	Argentina	2017 Elections - 2020 Elections
Aristóteles Dantas Gaudêncio	Brazil	2016 Elections - 2019 Elections
Adriana Ibarra	Mexico	2018 Elections - 2021 Elections

Electoral Commission [↗](#)

The Electoral Commission organizes and supervises elections to ensure the transparency of these processes. This Commission analyzes nominations within the framework of the Regulations Regarding Incompatibilities, Capacities and Suitability and solves any issues that may arise during an election. It also validates the vote counts and proclaims the final results.

Name	Country	Term
Vivian Valverde	Costa Rica	2017 Elections - 2020 Elections
Nancy Julia Cordova Gamarra	Peru	2018 Elections - 2020 Elections
Marcelo Corradini	Brazil	2018 Elections - 2021 Elections
Carolina Cofré Fernández	Chile	2018 Elections - 2021 Elections
Horacio Tedesco	Argentina	2016 Elections - 2019 Elections

Ethics Committee [↗](#)

LACNIC's Code of Ethics and the LACNIC Community Code of Conduct are interpreted, applied and updated by the Ethics Committee, which may handle cases that transcend the sphere of operational authority. This Committee is made up as follows:

- Adriana Ibarra (Fiscal Commission)
- Esteban Lescano (Board of Directors)
- Oscar Robles-Garay (CEO)

Our Members

LACNIC ended the year with a total 10,053 members, including the most important companies, organizations and universities of Latin America and the Caribbean.

Categories

LACNIC members are divided into different categories: Active A Members, Founding Members and Adhering Members.

Active A Members are organizations that receive IP address space directly from LACNIC, or indirectly through NIC.br or NIC.MX, the national registries for Brazil and Mexico. This category also includes a few organizations that received resources from ARIN (prior to the creation of LACNIC) that are now part of the address space assigned to LACNIC, and that have requested their admission as members.

Detailed information regarding membership categories and member rights and obligations is available in LACNIC's [Bylaws](#).



Small Regional ISPs

To a greater extent, the growth of LACNIC's membership base in 2019 was the result of small Internet providers who approached the regional organization looking for IP addresses to expand their business in the digital world.

LACNIC made important efforts to engage with the largest possible number of regional organizations, both by encouraging their participation and involvement in events designed for regional Internet providers as well as by visiting our members.

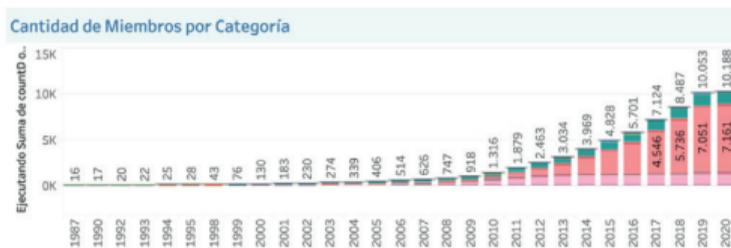
To this end, we were present at ten events held in Argentina, Colombia, Costa Rica, Ecuador and Mexico. These events were attended by a total of more than 4,500 participants, so this participation resulted in a strong increase in the number of new members in these countries.

Colombia and Mexico doubled the number of new members in one year, while Ecuador and Argentina increased their number of members by 39% and 26% respectively.



Growing Membership Base

This year, 1,566 new members joined LACNIC and the year closed with a total of **10,053 member organizations**. The following chart shows the evolution of our membership base in recent years.



It is worth noting that the **Nano category** we implemented two years ago to allow smaller organizations to join LACNIC now has 216 members and represents 14% of this year's growth.

Visiting Our Members

In 2019, we visited 53 of our members in the following countries: Curaçao, Belize, Costa Rica, Panama and Ecuador. In each country, we visited approximately 22% of the ISPs, bringing the total number of organizations we visited since the start of the project to more than 280.

Results of these efforts include an increase in member participation, both in LACNIC training activities and in the organization's election processes.



The LACNIC Team

For the eighth year in a row, LACNIC made the list of the top ten places to work in Uruguay according to the ranking prepared by international consultants Great Place to Work.

This promotes a positive environment that allows us to pursue our organizational goals.

This year, LACNIC was ranked second among the best places to work in the category of up to 150 employees.

“The commitment and contribution of each of the organization's collaborators make LACNIC an excellent place to work and grow,” observed Oscar Robles, LACNIC CEO. “Qualifying for this ranking is the result of the spirit of collaboration and our daily efforts in the pursuit of excellence,” Robles added.



Highlights of 2019

February

Meeting of Internet Organizations in Montevideo [↗](#)

In February, the organizations that are part of Casa de Internet for Latin America and the Caribbean (CILAC) met in Montevideo to share common strategies and actions for the year.

CILAC is home to the region's most relevant Internet organizations and was created to help build synergies, support development, and offer more and improved services to our community by engaging a growing number of stakeholders.

These days of intense activity brought together the nine organizations that are part of Casa de Internet: [ALAI](#), [ASIET](#), [eCOMLAC](#), [ICANN](#), [Internet Society](#), [LACIX](#), [LACNIC](#), [LACTLD](#) and [RedClara](#).



March

LACNIC and NIC Mexico Launch the FORT Initiative: Routing Security for a Free and Open Internet [↗](#)

The goal of the project is to strengthen routing system security and resilience by promoting the certification of Internet number resources using RPKI through the implementation of a validator developed jointly by LACNIC and NIC.MX. The initiative also seeks to reduce routing system vulnerabilities that are currently affecting user security and their free access to information on the Internet.

FORT is supported by the Open Technology Fund for the strengthening of critical infrastructure, a global enterprise that seeks to protect freedom of expression on the Internet.



April

LACNIC and LACNOG Partner to Strengthen the Network Operators' Forum [↗](#)

LACNIC and the Network Operators' Forum (LACNOG) signed a collaboration agreement for the consolidation and financial independence of LACNOG and the continuous improvement of the events the two organize jointly each year.

Under this agreement, LACNIC will provide administrative and financial support to LACNOG to contribute to LACNOG's growth and autonomy and strengthen the network operator community.

May

LACNIC 31 [↗](#)

The LACNIC 31 event was held in Punta Cana, Dominican Republic, from May 6 to 10 with the support of Indotel. Highlights of the meeting included the keynote presentation by Radia Perlman and a panel with regional Internet pioneers.

This meeting was co-located with the [Regional Forum of Incident Response and Security Teams \(FIRST\)](#), which brought together a large number of experts and professionals who analyzed the current status of cybersecurity in the region.

Approval of a New Recommendation on IPv6 [↗](#)

The Inter-American Telecommunications Commission (CITEL) approved a recommendation for OAS member countries to require that any new equipment marketed and/or purchased in their territories should be compatible with the IPv6 protocol.

This measure was approved based on a series of technical documents submitted by LACNIC to CITEL's Permanent Consultative Committee (CCP1) and seeks to facilitate the deployment of this technology to deal with IPv4 exhaustion in Latin America and the Caribbean. The initiative also seeks to avoid the potential introduction of equipment that does not support IPv6 and is therefore considered technological waste into the region.



June

IPv6 day [↗](#)

As part of the celebrations marking the seventh anniversary of the Global IPv6 Launch and IPv6 Day on June 6 and 8 respectively, LACNIC organized a four-hour webinar that addressed IPv6 for decision makers, IoT and IPv6, IPv6 in academic networks and IPv6 security, and included brief presentations on different topics.

July

The History of LACNIC and Its Community [↗](#)

LACNIC published the book titled [The Development of the LACNIC Community](#). A History Under Construction, a document that traces the RIR's seventeen years of history.

With the support of ICANN, the Internet Society and LACTLD, Carolina Aguerre, author of the book, researched the multiple stories and actors that allowed the creation of LACNIC and was thus able to immerse herself in the most relevant milestones of the last 20 years of the regional Internet community.

Talking about the book, LACNIC CEO Oscar Robles stressed that the project deals not only with the creation of the organization, but also with the permanent construction of a highly diverse community that helps keep LACNIC current.

LACNIC on the Move in the Caribbean [↗](#)

Organized together with the Bureau Telecommunicatie en Post (BTP), the telecommunications regulator for Curaçao, this three-day event addressed local and regional difficulties for IPv6 development and shared potential forms of cooperation to advance in the deployment of the protocol. An AMPARO workshop was also organized focusing on the creation of Computer Security Incident Response Teams (CSIRTs) and developing capabilities for responding to local and regional cybersecurity challenges.



August

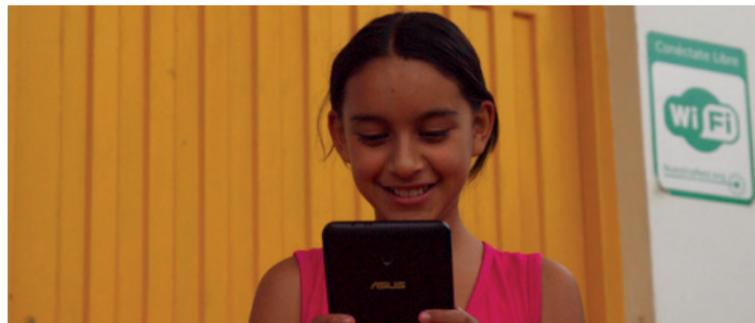
LACNIC and CISCO Partner to Offer Training in Entrepreneurship in Haiti [↗](#)

LACNIC and Cisco partnered to train 350 graduates of the Ayitic Goes Global program on entrepreneurship in Information Technology (ICT) by offering a training course through the Cisco Networking Academy.

The purpose of the course was to strengthen the abilities of those who successfully completed the workshops on digital skills, networking and Internet security offered by LACNIC and the International Development Research Center (IDRC) of Canada through its Ayitic Goes Global program.



Empowering Women through Digital Markets



Winners of the 2019 FRIDA Call for Projects [↗](#)

FRIDA's 2019 call for projects focused on two major topics: contributing to greater Internet access in the region and closing the digital gender divide in technology.

NuestraRed.org (Colombia) received the USD 5,000 FRIDA Award in the Community Networks category and a fellowship to participate in the 2019 Internet Governance Forum held in Berlin.

In turn, the projects that received a FRIDA Grant to promote new initiatives focusing on gender and technology were the Center for Women in Technology Mx (USD 12,000) and the Virtual Digital Literacy Platform for Women in Argentina and Latin America (USD 8,000).

September

LACNIC Community Code of Conduct [↗](#)

The LACNIC Board approved a Community Code of Conduct to ensure that the organization's participation spaces are safe and inclusive and thus favor a broad and diverse exchange of ideas.

The Code originated as an initiative of LACNIC's Women in Technology project and is in line with the work of the other Regional Internet Registries, which have already implemented codes of conduct for the members of their respective communities.

Unexpected Consequences of Website Blocking [↗](#)

LACNIC [published an announcement](#) about the operational complexities and the technical and non-technical implications of website blocking.

It is common to observe restrictions on Internet use and/or access either by blocking certain websites or domains or by limiting the use of content, which results in a fragmentation of the Internet. As a result, these actions create technical complexities that affect legitimate content and/or the users who access services in content networks.

October

The LACNIC Region to Add Four New Root Server Copies [↗](#)

The +RAÍCES Program selected Telesur (Suriname), Comteco (Cochabamba, Bolivia), TIGO (Guatemala City, Guatemala) and Transtelco (Monterrey, Mexico) for the installation of new copies of the I-Root server within the framework of LACNIC's agreement with Netnod, the global operator of this root server.

Twenty-seven Latin American and Caribbean organizations expressed their interest in hosting a root server copy and replied to the call for proposals launched by +Raices. While LACNIC does not operate any of the 13 main root server instances, it is common for their operators to approach LACNIC to help them identify organizations that have the interest and conditions required to operate a copy in the region.



LACNIC 32 LACNOG 2019 [↗](#)

More than 500 participants attended the event held in Panama City at the Hard Rock Hotel Convention Center from October 7 to 11.

On Sunday 6 May, the Second LACNIC Hackathon was held in the run-up to the main event. In addition, there was an increase in the number of tutorials offered during the meeting and two special panels were organized: [Evolution of DNS Privacy and Security](#) and [Technologies for Small ISPs](#). Representatives of Mexican, Panamanian and Brazilian ISPs agreed that their proximity to their customers is their differentiating factor and that partnering and working together is the best way to face the challenges of competing with large operators.



50 Years of the Internet [↗](#)

Casa de Internet for Latin America and the Caribbean was delighted to welcome a group of regional Internet pioneers. During the activity, the panelists shared their experiences during the initial stages of regional Internet development and reflected on the first half-century of the Internet and the future of the Network. Organized by LACNIC and the Internet Society, the panel featured renowned experts Florencio Utreras (Chile), Ermano Pietrosémoli (Italy/Venezuela) and Demi Getschko (Brazil).

The celebrations marking the first data transmission from a computer at UCLA to the Stanford Research Institute (United States) over what was then known as the ARPANET continued a few days later.

LACNIC also organized a ^o with the participation of Internet pioneers such as Leonard Kleinrock (professor at the UCLA on 31st October 1969), Charles Kline (Kleinrock's student at the lab who devised and sent the first data to connect to a computer located 600 kilometers away), and Steve Crocker (one of the creators of ARPANET and recognized worldwide as one of the fathers of the Internet).



November

Five Years of LACNIC WARP [↗](#)

Marking its fifth anniversary in security incident management, LACNIC WARP published a report reviewing its history.

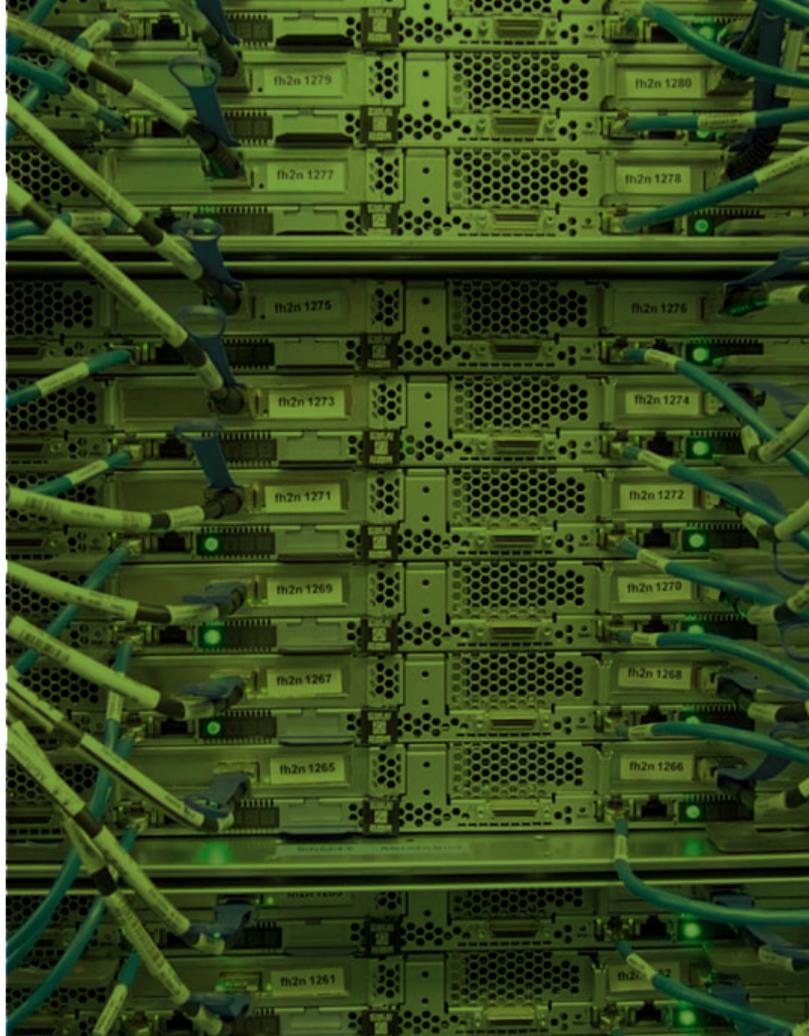
LACNIC Board Calls On the Community to Promote IPv6 Deployment [↗](#)

The LACNIC Board called on the community to implement effective measures to promote IPv6 deployment across the region and to work on the development of policies to accelerate the process.

December

Report: Use of DNS Root Servers in Latin America [↗](#)

LACNIC published a study conducted by Chilean expert Hugo Salgado in which he compares Internet connection measurements in the countries of the region and conducts a historical analysis of the performance of the root servers installed since 2013 promoted by LACNIC's [+RAICES Program](#).



Internet Number Resource Management



In 2019, LACNIC continued to apply the policy titled Special IPv4 Allocations/Assignments Reserved for New Members, currently in Phase 3. For the current phase, this policy establishes a maximum assignment of a /22 and a minimum assignment of /24, and that IPv4 resources can only be assigned to organizations that have not received IPv4 space from LACNIC or from the organizations that preceded LACNIC.

In addition, in accordance with the global policies currently in force, LACNIC received from the IANA the last of the eleven blocks it was scheduled to receive and which are part of the globally recovered address space: in March 2019 LACNIC received two /24 blocks.

As for number resource assignments, 1,614 IPv6 assignments were made in 2019 in the LACNIC service region and the year closed with a cumulative total of 9,721 assignments. The number of members who received IPv6 assignments reached 94.88%.

In terms of IPv4, 5,692 /24s were assigned in 2019, 598 /24s more than in 2018.

In addition, this year, the number of ASNs (Autonomous System Numbers) assigned by LACNIC was somewhat higher than the previous year. In 2018, 1,322 ASNs were assigned, while the number of ASNs assigned in 2019 totaled 1,495.

All in all, during 2019, the following number resources were assigned in the LACNIC service region:

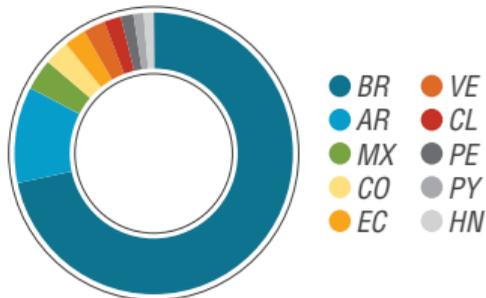
- IPv6: 1.614
- IPv4: 1.556
- ASN: 1.495
- IPv6 space in /32s: 1,496
- IPv4 in /24s: 5,692

Resource Assignment Statistics for 2019

The following statistics show IPv4 and IPv6 address assignments in the region.

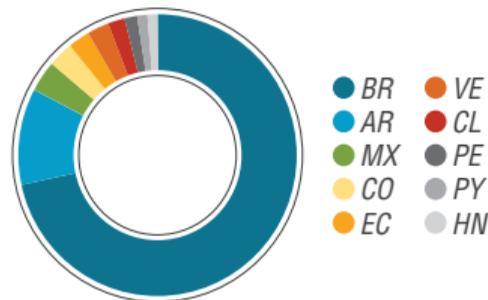
Distribution of IPv4 Address Assignments in 2019 by Country

In 2019, Brazil took the highest percentage of assigned IPv4 resources (69.7%), followed far behind by Argentina (10.1%) and Mexico (4.6%).



Distribution of IPv6 Address Assignments in 2019 by Country

With 68.9% of the total, in 2019 Brazil also led the list of countries with the highest number of IPv6 assignments, followed by Argentina (9.4%) and Colombia (5.3%).

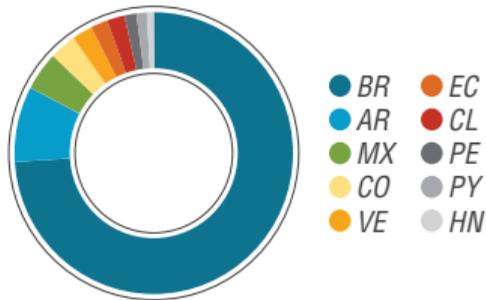


Number of IPv6 Assignment Requests by Year

Requests for IPv6 assignments increased as compared to 2018. In 2018, 1,448 IPv6 assignments were made, compared to 1,614 made in 2019.

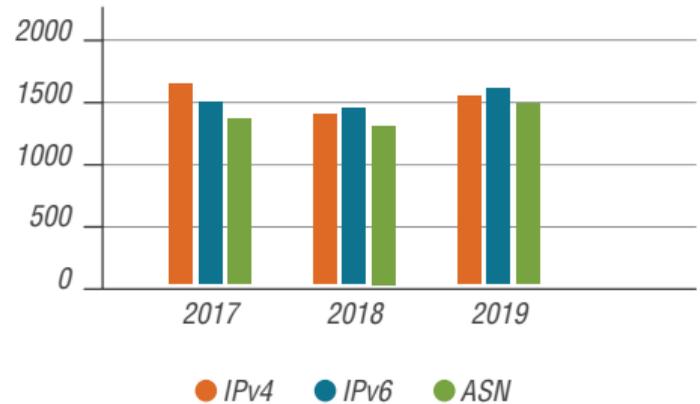
Number of ASNs Assigned in 2019

Once again, Brazil and Argentina received the highest number of ASN assignments. Overall, 72.3% of ASNs were assigned in Brazil, a clear sign of how much the Internet has grown in the country. Argentina and Mexico were next in the ranking, having received 9% and 4.1% of the assignments, respectively.



Evolution of Number Resource Assignments

It is also worth noting the evolution of number resource assignments in general (IPv4, IPv6, ASN) over the past ten years.



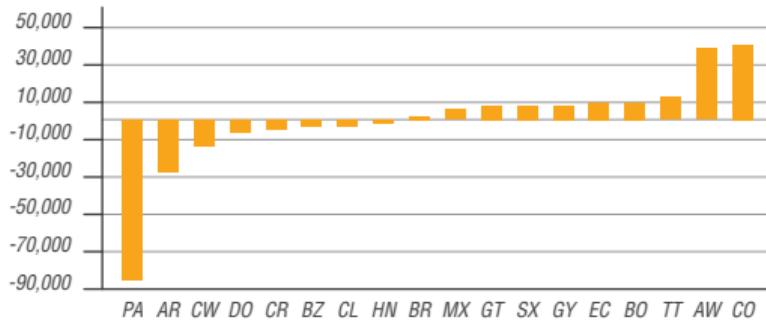
Overall, a comparison with 2018 shows a 13.5% increase in ASN assignments, a 13.7% increase in IPv4 address assignments, and an 11.9% increase in IPv6 address assignments.

IPv4 Transfers

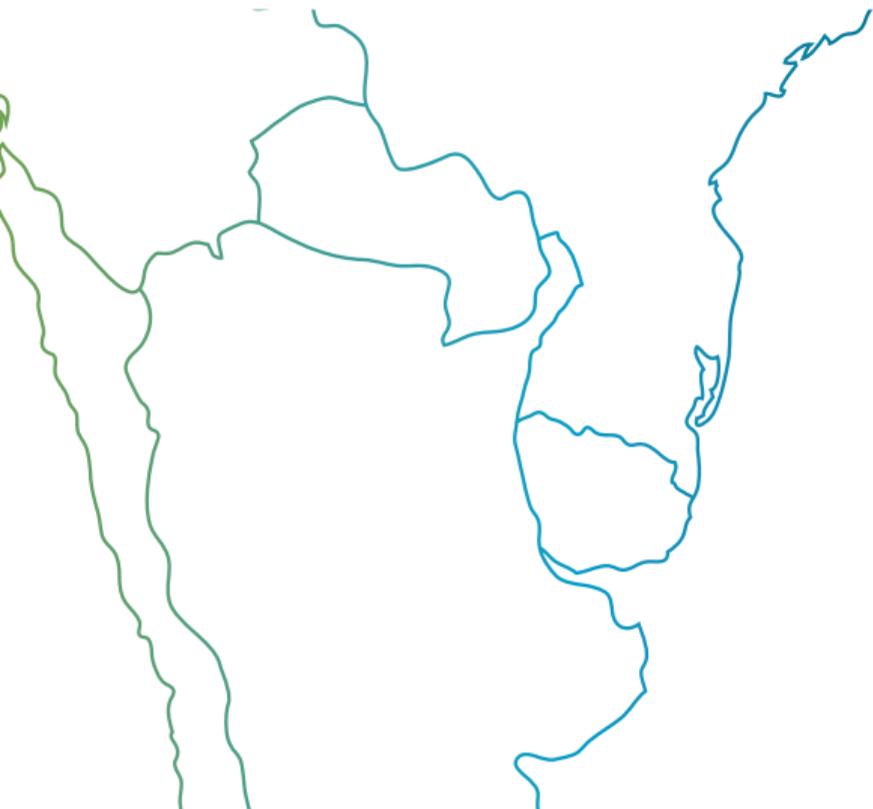
In 2019, there were 23 transfers, raising the total number of transactions completed since policy 2.3.2.18 was implemented to 55 with a total of 305,000 IP addresses.

As for the net IPv4 balance (received minus transferred space), Colombia is the country with the highest positive balance, while Panama has the highest negative balance.

NET TRANSFER BALANCE BY COUNTRY (IP)



The LACNIC Community



The LACNIC community comprises more than 10,000 member organizations based in the different territories that are part of our service region. In addition, our extended community includes a very diverse group of individuals and organizations interested in regional Internet development and applies multistakeholder, open-bottom-up processes. Anyone interested in participating in our [discussion lists](#), our meetings or contributing to LACNIC's policy development process is welcome to do so, whether an end user or an organization and regardless of their structure.

The LACNIC community covers a [geographic area](#) of exceptional diversity, with territories in Central America, South America and some of the Caribbean islands. Its members participate in LACNIC in different capacities and share their interests and concerns regarding the realities of Internet development in their own locations. Thus, they celebrate unity in diversity, working towards developing [an open, stable and secure Internet](#) in the most inclusive way possible.

LACNIC Events in 2019

Each year, LACNIC organizes two events that bring together approximately 600 participants for the purpose of sharing technical information and promoting the creation of synergies for regional Internet development. These meetings provide spaces for multistakeholder dialogue, high-level technical training activities, and the discussion of issues that are relevant to the Internet community.

LACNIC 31 [↗](#)

The event was held in Punta Cana, Dominican Republic, from 6 to 10 May with the support of the Dominican Institute of Telecommunications (INDOTEL).

The meeting agenda included LACNIC's most important institutional spaces: the LACNIC Member Assembly and the Public Policy Forum, during which eleven proposals were presented.

In addition, LACNIC 31 included a keynote presentation by [Radia Perlman](#), creator of the Spanning-Tree Protocol (STP) and a [special session with regional Internet pioneers](#) marking the 50th anniversary of the first packet sent from one computer to another. Panelists included Rafael (Lito) Ibarra (El Salvador), Peter Harrison (Jamaica), Demi Getschko (Brazil) and Daniel Trujillo (Mexico).

The week-long event also included the LACNIC Technical Forum, the Peering Forum and seven different tutorials.



LACNIC 32 LACNOG 2019 [↗](#)

LACNIC 32 - LACNOG 2019 was held in Panama City from 7 to 11 October 2019. The meeting included a [Hackathon](#) and the [Law Enforcement Agency \(LEA\) Forum](#), which was held as a parallel activity for the first time.

This time, three new tutorials were added: Wifi and IPv6 with Cisco, Best Practices for Autonomous Systems and the Internet Policies workshop, thus raising the number of tutorials offered during the event to a total of ten. In turn, the LACNOG agenda included 23 presentations and a panel. Thanks to the the fellowship program for the community, 26 fellows received partial sponsorships and were able to attend the event.



LACNIC on the Move [↗](#)

LACNIC on the Move consists of a series of events that have been held since 2015 in both Central America and the Caribbean. They are geared towards Internet communities, governments and key actors who are part of the Internet ecosystem and who meet to share information, experiences and best practices on IPv6 deployment, the promotion of Internet Exchange Points (IXPs), computer security issues, and key global Internet Governance topics currently under discussion.

These events take place over one or one-and-a-half days and their goal is to forge closer ties between the various Internet actors and stakeholders.

This year, [this initiative](#) took place on 3-5 July in Curaçao with the support of Bureau Telecommunicatie en Post.

The program included topics such as how to request resources, DNS, the transition to IPv6, and IPv6 deployment statistics.

The event was co-located with an Amparo workshop where participants worked on how to create and manage a computer security incident response team.

More information: <https://onthemove.lacnic.net/curacao-2019/>



Fellowship Program

Each year, LACNIC's fellowship program provides funds to help more than 75 members of the Latin American and Caribbean Internet community attend the annual conferences and forums organized in different countries of the region.

Through this program, LACNIC provides **financial support** to help participants attend its two annual events. For the second meeting of the year, this is done jointly with LACNOG.

In addition, for the third year in a row, LACNIC implemented the **youth fellowship program** which seeks to promote the participation of young members of the community in LACNIC events and encourage their involvement in Internet governance issues and the participation spaces offered by LACNIC. This program is aimed exclusively at young people living in the country where each event takes place. Candidates must be students or young professionals working in the general field of technology and/or on Internet governance or ICT topics.

In 2019, more than 22 fellowships were awarded to help students and young professionals attend LACNIC's two annual events.



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.

Training and support are offered in various formats based on the preferences and needs of the Internet community and which ensure the accessibility and continuity of learning across the region.

Webinars

In 2019, LACNIC continued to strengthen its webinars, a service highly valued by the community.

More than 2,500 participants attended the **26 webinars** that were organized on topics such as computer security, IPv6 and policy proposals.

Highlights included **IPv6 Day**, a four-day activity focused on celebrating the seventh anniversary of Global IPv6 Launch and IPv6 Day.



This year, LACNIC also presented three webinars in English. This cycle addressed different aspects of IPv6 and was organized in response to the requests received while visiting customers in different parts of the region.

Finally, marking the Internet's 50th anniversary, a webinar was organized with three of the pioneers who sent the first data packet between the University of California at Los Angeles (UCLA) and the Stanford Research Institute in October 1969.

IPv6 Day and the Internet's 50th Anniversary

Panel on IPv6
in Academic
Networks

Lighting
talks

Lighting
speakers

+300
Attendees



IoT in IPv6

+240
Attendees



Steve
Crocker



años de
Internet
tecmwebinars

+3
hours

IPv6
Security



Charles
Kline



Leonard
Kleinrock

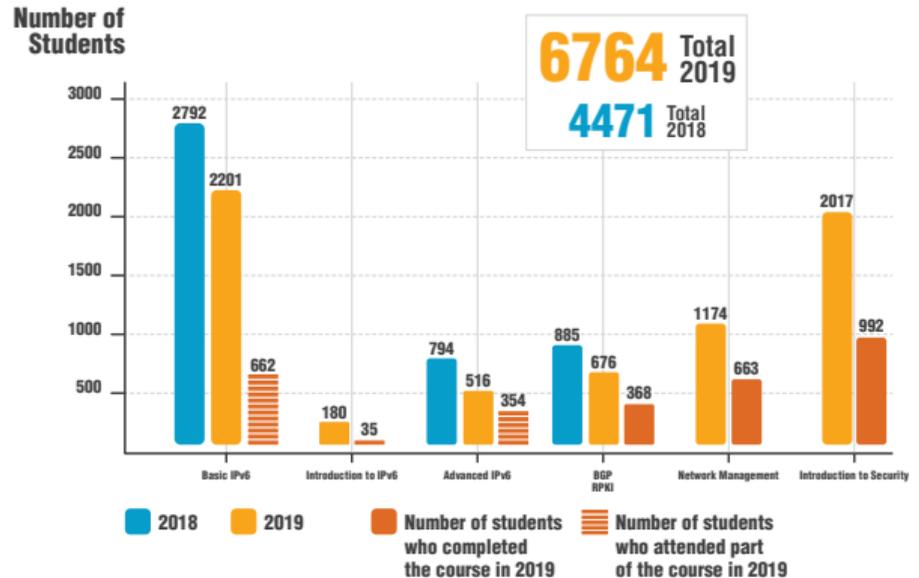
LACNIC Campus

In 2019, LACNIC's e-learning platform expanded its course offerings. In addition to the Basic and Advanced IPv6 and RPKI courses, new courses were offered on Network Management and Computer Network Security. The platform also launched Introduction to IPv6, the first course to be offered entirely in English.

In addition, the BGP + RPKI course and the entire contents of the Advanced IPv6 course were updated.

Campus participants reported a high level of satisfaction with the courses and their content (92% average satisfaction). It is also worth noting that more than 50% of those who registered on the LACNIC Campus obtained their official certificate after completing the courses in which they participated, a very good figure compared to the average numbers for online training.

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



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 who wishes to participate and built on consensus.

Open participation of all stakeholders ensures that these policies are in line with regional interests, thus safeguarding the community as a whole.

As customary, the two annual events included the tutorial Changing Internet Policies, where participants shared their ideas on the different proposals under discussion. LACNIC 32 also incorporated a practical workshop to explain the different policy proposals in a more friendly and accessible language.

The following table shows the current status of the policy proposals submitted in 2019:

Proposal	Status
LAC-2018-13: Acceptable Use Policy (AUP) for the Policy List ↗	Under discussion
LAC-2018-7: Clarification of IPv6 Sub-Assignments ↗	Implemented
LAC 2019-5: BGP Hijacking is a Policy Violation ↗	Abandoned
LAC 2018-14: Inter-RIR Resource Transfer Policy ↗	Abandoned
LAC 2019-1: Inter-RIR Transfer Policy (Comprehensive) ↗	Ratified. Will be implemented in 2020.
LAC-2019-6: Resources Are Assigned in a Unique and Exclusive Capacity ↗	Reached consensus. Pending analysis by the Board
LAC-2019-7: PDP Chair Election Procedure ↗	Under discussion
LAC 2019-2: IPv4 Mergers, Acquisitions, Reorganizations and Relocations ↗	Reached consensus. Pending analysis by the Board
LAC 2019-3: IPv6 Mergers, Acquisitions, Reorganizations and Relocations of the Policy Manual ↗	Reached consensus. Pending analysis by the Board
LAC 2019-4: ASN Mergers, Acquisitions, Reorganizations and Relocations ↗	Reached consensus. Pending analysis by the Board
LAC-2018-5: Registration and Validation of “abuse-c” and “abuse-mailbox” ↗	Reached consensus. Pending analysis by the Board
LAC-2019-9: Update to “Resource Recovery and Return” and Consistency with the Rest of the Manual ↗	Reached consensus. Pending analysis by the Board
LAC-2019-8: Modification of the Time Required for a Proposal to Be Presented at the Public Policy Forum ↗	Under discussion

Technical Forums

LACNIC's support of its technical forums reflects the articulation of initiatives aimed at achieving regional Internet development and stability. Among others, these forums include the Network Operators' Forum (LACNOG), the CSIRT meetings, the LACNIC Technical Forum, and the Peering Forum, all of which meetings represent spaces for sharing knowledge and experiences and contribute to further strengthen our region's technical Internet community.



LACNIC Technical Forum

The LACNIC Technical Forum (FTL), a space for sharing and discussing Internet technologies and technical implementations, held its second edition in Punta Cana within the framework of LACNIC 31. [Charlie Kauffman](#) participated as keynote speaker.

The FTL program is coordinated by a Program Committee comprised of representatives of the LACNIC Community, LACNIC staff and LACNOG. More information: <https://www.lacnic.net/ftl>

FIRST Regional Symposium (Global Forum for Incident Response and Security Teams)

The [FIRST Regional Symposium](#) was organized jointly by LACNIC and CERT.br within the framework of the LACNIC 31 meeting in Punta Cana. This three-day activity was attended by more than 40 participants.

The first day of activities included a plenary session with nine presentations that addressed topics related to security incident management, new trends in cyberattacks, and new tools for their detection. The second and third days offered courses aimed at strengthening the computer security response capabilities of the region's professionals.

CSIRT Meeting

The LAC-CSIRT community gathered at LACNIC's two annual events, where several regional CSIRTs shared their progress and current projects. Taking advantage of their vast experience in CSIRT management, various participants answered the questions posed by professionals who are in the process of creating CSIRTs in their organizations.

The LAC-CSIRT meeting has become a workspace where Latin American and Caribbean actors share security-related issues. By improving knowledge and sharing information, it seeks to strengthen the region's ability to prevent computer security incidents and mitigate their impact.

Peering Forum

This joint initiative by LACNIC, the Internet Society and LAC-IX and supported by several important sponsors provides network operators and other members of the industry the opportunity to meet, exchange ideas and experiences, and discuss future Internet interconnection activities. In 2019, the Peering Forum changed its format to match that of other peering/interconnection forums held in other regions. The full-day edition of the event was divided into a half-day of conferences and a half-day of meetings for negotiating interconnection agreements.

LACNOG

As usual, the second LACNIC meeting of the year was held together with the annual meeting of the Latin American and Caribbean Network Operators' Forum, LACNOG, a space where participants meet to share their experiences and information on topics normally discussed on the mailing list.

The program for the tenth edition of the Forum covered topics such as route leaks, MANRS (Mutually Agreed Norms for Routing Security), the latest developments in IPv6 and cybersecurity incidents, the new 5G technology for mobile networks, routing, network management, LACNIC's new Internet Routing Registry, and other relevant issues.

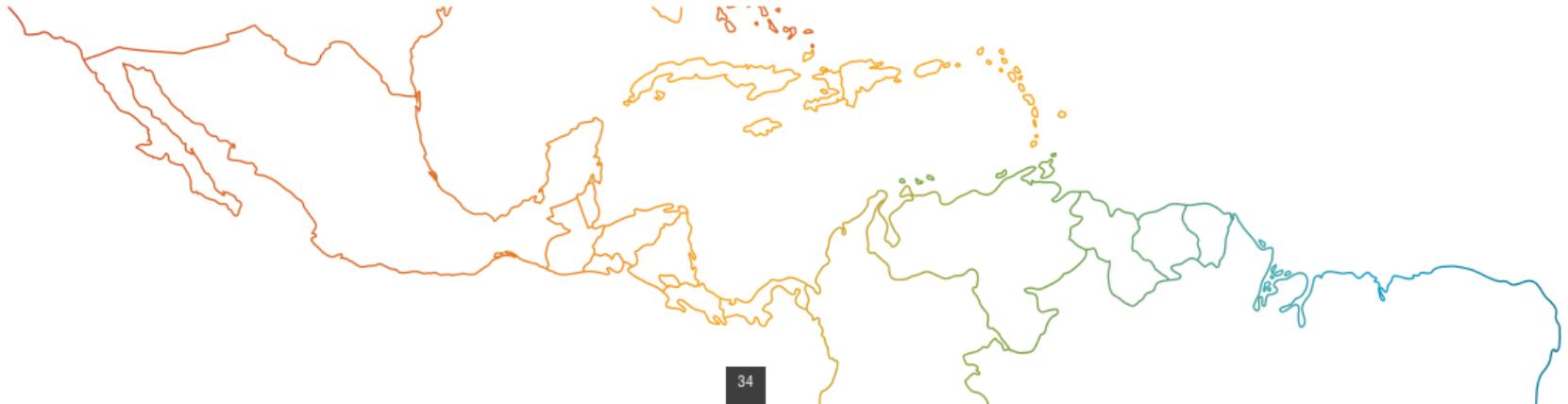


LACNIC and Internet Governance

Support for Internet Governance Spaces

LACNIC supports the strengthening of Internet governance discussion spaces or dialogues, including LACIGF and national Internet governance initiatives. Currently, more than fifteen countries have national Internet governance dialogues, each with its own local characteristics.

By actively participating in these spaces, LACNIC contributes to the different topics and discussions, thus contributing to a better understanding of the multistakeholder model and the role of LACNIC. At the same time, these spaces enable actors (**leaders**) to emerge who can then participate in global processes or play a relevant role in developing and/or implementing national policies that will have an impact on regional Internet development.



LACIGF 12

The 12th meeting of the Latin American and Caribbean Internet Governance Forum was held on 6-8 August in La Paz, Bolivia organized by the local chapter of the Internet Society.

In its role as technical secretariat for LACIGF, LACNIC provided support for coordinating the process led by the Program Committee and managed the different operational processes that ensure that the annual event can be held.

Support for the Review of LACIGF as a Regional Dialogue Mechanism

Based on the concerns raised during a meeting held in February by the organizations of Casa de Internet for Latin America and the Caribbean, a [study](#) was promoted to identify the main weaknesses and changes required for the Forum. LACNIC commissioned the study to Raúl Echeberría. The conclusions were presented to the community at LACIGF 12 and served as an objective basis to support the LACIGF Program Committee's decision to begin the process of restructuring the forum.



Support for National Internet Governance Initiatives: The Líderes Program

Since 2017, LACNIC has been implementing the [Líderes Program](#), an initiative created to support national Internet governance spaces across the region through the participation of LACNIC experts and the contribution of small funds to help with the organization of the events.

The goal of this project is for national initiatives to appropriate this way of approaching Internet issues, preparing their agendas through open and inclusive processes, the coordination of funds, and allowing the topics to be decided by all stakeholders.

In 2019, direct support was offered to Internet governance initiatives (IGF) in El Salvador, Costa Rica, Haiti, Ecuador, Bolivia and Argentina.

A third way of supporting this program is by facilitating the participation of representatives of these spaces in LACIGF, so they can share their experiences and bring their different perspectives to the regional debate.



Interaction with Governments and Decision Makers

To complement its IPv6 training actions in the region, LACNIC works permanently with government actors and decision-makers for operators and organizations involved in the IT industry, particularly with those of the countries facing the greatest challenges. Since 2017, we are implementing a program for visiting the countries that are lagging behind in terms of IPv6 deployment. During each visit, direct meetings are held with relevant national authorities and local stakeholders with an impact on Internet development.

In 2019, meetings were held with the authorities of [Bolivia](#) and Paraguay.

Bolivia

In Bolivia, LACNIC visited academic institutions (Universidad Mayor de San Andrés), operators (the Bolivian Telecommunications Chamber - CATELBO, DIGITALWORK and ENTEL), government authorities [the Vice Ministry of Telecommunications, the Telecommunications and Transport Regulator (ATT), the Agency for the Development of the Information Society (ADSIB) and the Agency for Electronic Government and ICT (AGETIC)].

Paraguay

Taking advantage of the CITEL-PCC.I meeting held in Asuncion, Paraguay, in the month of September, LACNIC planned a series of visits to government and academic entities that are part of the Paraguayan Internet community.

These visits included COPACO, the National Computing Center (CNC), the Vice Ministry of ICT, and authorities of the International Telecommunications Union (ITU).



Participation in Telecommunications Forums

CITEL

As usual, LACNIC participated in the two meetings of CITEL/OAS CCP1, where two informational documents were presented: one regarding the [Ayitic Goes Global](#) project, the other about the [LACNIC Campus](#).

LACNIC also promoted a [recommendation](#) for [importing equipment: Acquisition and/or Commercialization of IPv6-Ready CPE](#). Approved based on a series of technical documents submitted by LACNIC to CITEL-CCP.I, this measure seeks to facilitate the deployment of this technology after IPv4 address exhaustion in Latin America and the Caribbean. The initiative also seeks to avoid the potential introduction of equipment that does not support IPv6 and is therefore considered technological waste into the region.

COMTELCA

Together with COMTELCA's Standardization Committee, LACNIC prepared **general IPv6 guidelines** or recommendations for Member States to encourage and promote IPv6 deployment in Central America.

CTU

As part of its 30th anniversary celebrations, the Caribbean Telecommunications Union (CTU) organized a week of activities on Information and Communication Technologies (ICT). One of the highlights of LACNIC's participation in these spaces was the LACIGF11 Report presented at the Caribbean Internet Governance Forum.



Monitoring of Policy or Regulatory Initiatives in the Region

In 2019, LACNIC worked in coordination with ALAI on the Mexican case (“**Internet Kill-Switch**”) and prepared a message alerting on the risks of the widespread use of website blocking.

This work was based on a document previously prepared by the LACNIC team on the [consequences of blocking websites or IP addresses](#).

Likewise and also in coordination with ALAI, LACNIC worked on a [position statement against the intention of several countries to limit and/or ban the use of encryption in application messages](#).

Follow Up and Contribution to Regional Digital Agendas

LACNIC has been involved in the discussions and has actively contributed to the development of the region's Digital Agendas. In these spaces, LACNIC has promoted the topics most directly related to our work, such as infrastructure development (IPv6 deployment and Internet exchange points), Internet governance, capacity building in computer security incident management, and others.

LACNIC has also participated in other spaces that have recently emerged for the discussion of digital agendas as they relate to subregional processes.

eLAC

During 2019, the eLAC 2020 plan was under review and a new eLAC 2023 plan was in the works. LACNIC maintains its historic role as observer of the follow-up mechanism in representation of the Technical Community, filling one of two available seats while the other is filled by ICANN.

LACNIC participated in the monthly online meetings and contributed to the documents with the new goals that will be agreed in the future plan. The topics directly related to the work of LACNIC include security and stability (creation of CSIRTs), connectivity (IPv6 deployment and community networks), interconnection (IXPs), and Internet governance (strengthening of regional spaces, LACIGF, and national spaces).

Meeting with the Technical Community and the Organizations Based in Casa de Internet

A meeting of the regional managers of the technical community and other organizations at Casa de Internet was organized for the first time on 19-20 February. The main goal of the activity was to share information on the priorities and work plans of the different organizations in order to improve the synergies between the different entities working from Casa de Internet.



An Open, Stable and Secure Internet



Strengthening Internet Infrastructure

The [+RAÍCES project](#) allows increasing the scope, strength and response speed of the DNS system – a key part of Internet infrastructure – at both the regional and the global level. Through this project and agreements with different root server operators, LACNIC has enabled the installation of anycast copies of the F-, L-, I- and K-Root servers, thus improving the stability and performance of the DNS root server system in Latin America and the Caribbean.

In 2019, four new locations were selected for installing copies of the I-Root server, an instance operated by Netnod (Sweden): Telesur (Suriname), Comteco (Bolivia), TIGO (Guatemala) and Transtelco (Mexico).



Root server copies installed under the +Raíces initiative (since 2004).

Installing Services at IXPs

During 2019, we worked on installing services at Internet exchange points (IXP), in the understanding that hosting such services generates a cascade effect among members and helps incorporate and spread the use of new technologies among operators. This year, we prioritized the work with RPKI validators (accompanying the development of the [FORT validator](#)) and we installed validators at the Costa Rican IXP (CR-IX) and the Ecuadorean NAP (AEPROVI). These two sites were selected as partners in the FORT project.

The following installations were completed:

- CR-IX, Costa Rica
- NAP Ecuador
- RedCLARA
- CUDI, Mexico

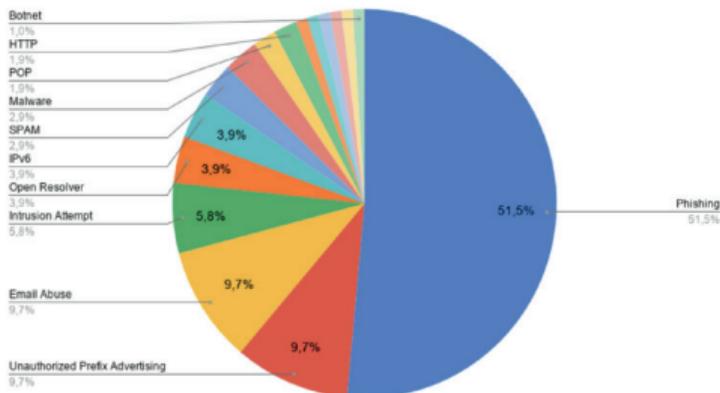
Promoting Cybersecurity

Computer Security Incident Management: LACNIC WARP

This year, LACNIC WARP – the cybersecurity incident response center for Latin America and the Caribbean – managed over fifty reported security incidents and published ten critical warnings. It also publishes monthly statistics and maintains a history of events at: warp.lacnic.net/estadisticas

Types of security incidents managed by LACNIC WARP - 2019

Tipos de Incidentes gestionados por WARP - 2019



In order to automate the reports received through LACNIC's "abuse" mailbox and process the majority of the reports in bulk, we implemented a tool specifically designed for this purpose – AbuseMQ – which automatically identifies the resource, the type of incident and notifies the organizations involved. This has allowed the WARP to process close to 40,000 cases of abuse.

To strengthen regional cybersecurity capabilities, in 2019 LACNIC organized three AMPARO workshops on how to create a security incident response team. More than 120 professionals from various sectors received training during these activities organized in Mexico, Argentina and Curaçao.

In 2019 progress was also made in the creation of a sensor network for detecting security incidents in the region. To date, ten honeypots have been installed. These sensors were installed in cooperation with different entities, including the University of Cuenca in Ecuador, Cable Atlántico SRL in the Dominican Republic, WMAX in Chile, and CARICERT in Curaçao.

LACNIC also developed a new service for organizations and network administrators in the region to verify whether the DNS servers they are using with IPv6 addresses are properly configured. This tool is available [here free of charge](#) and provides a very simple way to check whether a DNS server is open.

While this service was under development, LACNIC conducted a survey that allowed the organization to detect that 2.63% of the IPv6 DNS servers in Latin America and the Caribbean were open and vulnerable to cyberattacks. The project identified the number of open resolvers on IPv6 in the region and prepared a [series of recommendations](#) to correct server configuration errors.

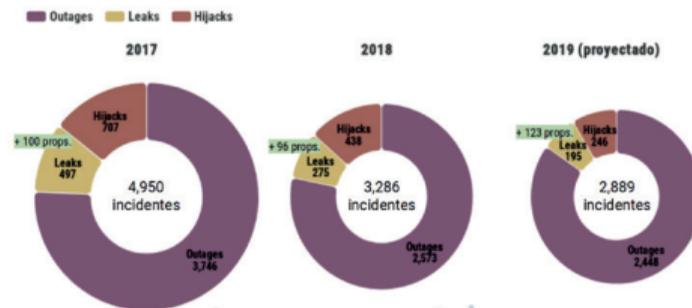
To strengthen its relations with the law enforcement agencies (LEAs) of the region, together with our Strategic Relations department, LACNIC WARP organized a face-to-face meeting in the Dominican Republic within the framework of LACNIC 31 and the first Law Enforcement Agency Forum in Panama during LACNIC 32.

Marking its five years of operation, the WARP published a [report](#) compiling valuable statistics on its first years of work.

Study on Security Incidents in LAC

As part of the [FORT project](#), a report on routing security incidents from 2017 to date was produced. This report was prepared by Argentine consultant [Augusto Mathurin](#) and presented during LACNIC 32.

The report shows the number of incidents such as route hijacks, route leaks and service failures that affect the region, approaching them from both the point of view of the victims of the attacks, and well as from the point of view of the attackers. The following charts show the number of incidents that occurred each year in Latin America and the Caribbean and how this number has been decreasing over the three years analyzed by the project.



Routing security incidents in the LACNIC region, 2017-2019.

Promoting IPv6 Deployment

Statistics

LACNIC continues to survey information to measure the [evolution of IPv6 deployment](#), regularly presenting up-to-date statistics for our region and providing information on the state of progress of IPv6 deployment as changes occur in the different countries and at various operators.

IPv6 Training

Promoting, strengthening and creating awareness on the importance of IPv6 deployment are priority issues for LACNIC and cross cut all of the organization's activities. For this reason, this document devotes a specific section to the strengthening of technical capabilities in the use of this protocol.

In order to facilitate the transition to IPv6 and strengthen technical capacities in this area, LACNIC organized a series of training activities for the community, including webinars, tutorials and workshops both in-person and via the LACNIC Campus, the organization's e-learning platform. Throughout 2019, the various IPv6 training activities offered by LACNIC allowed more than 5,500 ICT experts and professionals across the region to participate and improve their technical IPv6 skills.

In response to requests received while visiting our clients in the Caribbean, LACNIC organized a cycle of [three webinars on IPv6 offered entirely in English](#).

In addition, as part of the celebrations marking the seventh anniversary of Global IPv6 Launch and IPv6 Day, LACNIC organized a [four-hour webinar](#) to show regional statistics, tools and good practices for IPv6 implementation.

The [LACNIC Campus](#) added an English version of the Introduction to IPv6 course to its existing Introduction to IPv6 and Advanced IPv6 courses in Spanish.

Likewise, the [LACNIC on the Move](#) event included presentations on IPv6 for decision makers and IPv6 adoption statistics.

Within the framework of LACNIC 31 and LACNIC 32, we also organized two [Advanced IPv6 tutorials](#), with an emphasis on IPv6-only and IPv6 solutions for decision makers.

IPv6 Deployment, a New Section on the LACNIC Website

The purpose of the new [IPv6 Deployment](#) section created for the LACNIC website is to share relevant information regarding IPv6 deployment, events and workshops throughout the region, statistics, and the transition to the latest version of the Internet protocol, as well as to offer the community reading material and the latest news on the topic.

There, you will find generic information on IPv6, success stories, articles, podcasts, webinars, interviews and many other materials for those interested in deploying IPv6.

The section also provides information on the various editions of the IPv6 Challenge, a competition designed to promote and support IPv6 deployment in the region. To join the Challenge, participants must set a goal that will allow them to implement or advance their IPv6 deployment and then present their process and final results.

More information: <https://www.lacnic.net/despliegaiIPv6>



LACNIC's R+D Projects

Use of DNS Root Servers in Latin America

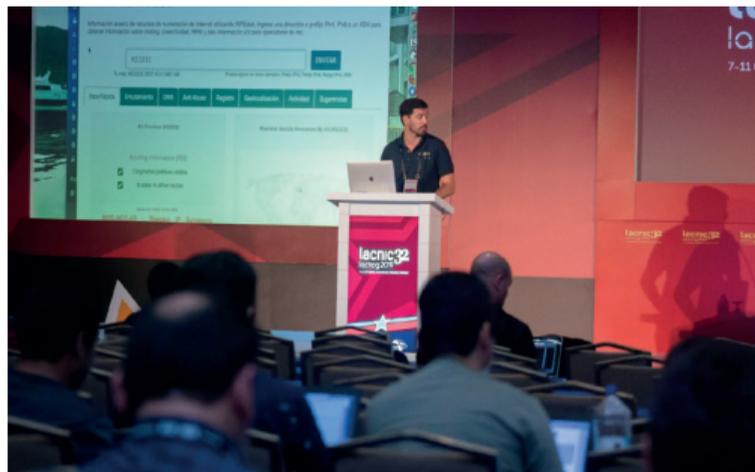
Since 2004, LACNIC's + RAICES program has promoted the installation of DNS root server “copies” in the region. This initiative was initially implemented under an agreement with ISC, operator of the “F-Root” domain server and later with other operators such as ICANN (“L-Root”), RIPE NCC (“K-Root”) and NETNOD (“I-Root”). [This study](#) conducted in our region and developed by Hugo Salgado allowed measuring the result of fifteen years of efforts to promote and finance the deployment of dozens of root server copies in the region. Thanks to the data available since 2013, we can now quantify improvements in the locations where copies were installed and detect priority locations and regions where additional copies should be installed in the future. The measurements were made using RIPE Atlas probes deployed in the region.

The study analyzes access to each root server from the region, from each country and its evolution over time.

InfoRedes [↗](#)

In cooperation with RIPR NCC, LACNIC developed InfoRedes, a platform that can be used to look up data and information on Internet resources in the region and worldwide.

The new tool provides data on IP address space, autonomous system numbers (ASNs), and information related to hostnames, whois, routing status, and the history of organizations in the region and around the world.



BGP Collector in the LACNIC Region

A RIPE RIS data [route collector](#) was added in Montevideo, which now joins the existing collector located in San Pablo. Based on information provided by regional Internet organizations, these collectors allow us to know what is going on with the routing tables at the regional level and contribute to a better understanding of the global situation. The information provided by the collectors in the LACNIC service region will be public and it is expected to be very useful for understanding the region's routing status and contribute to the stability of the global routing system.

DNS Open Resolvers on IPv6

LACNIC also developed a new service for organizations and network administrators in the region to verify whether the DNS servers they are using with IPv6 addresses are properly configured. This tool is available [here free of charge](#) and provides a very simple way to check whether a DNS server is open.

While this service was being developed, LACNIC conducted a survey through which the organization detected that 2.63% of all IPv6 DNS servers in Latin America and the Caribbean were open and vulnerable to cyberattacks. The project identified the number of open resolvers on IPv6 in the region and also prepared a series of recommendations to correct server configuration errors.



Developing the Regional Internet Community

IT Women

Several initiatives were implemented this year to reduce the barriers that hinder the participation of women in LACNIC's various spaces, particularly in its annual events.

The first action worth noting is the implementation of childcare services at both LACNIC 31 and LACNIC 32.

In addition, the IT Women space was revived through a [Coaching and Networking session](#) at LACNIC 32 which was organized with the support of Google. The session provided participants with the opportunity to network with other industry professionals and meet different leaders of the technical community who participated as meeting facilitators.

The session was open to the public and consisted of an interactive activity with questions that guided participants as they reflected on three main topics: leadership, resilience and authenticity.

Finally, this year LACNIC announced the [Community Code of Conduct](#) to ensure that the organization's participation spaces are inclusive and safe and thus favor a broad and diverse exchange of ideas.

This guide specifies standards of conduct that apply to everyone involved in LACNIC's participation spaces, including events, training activities, online forums, committees and working groups.

[LACNIC's Ethics Committee](#) will be the authority responsible for enforcing the code and will analyze potential breaches of the standards of behavior and establish any penalties that may apply.



Ayitic Goes Global [↗](#)

Ayitic Goes Global is an initiative of LACNIC and the IDRC which was implemented to increase Haitian women's access to employment by developing their digital capabilities and strengthening the Internet in the country.

The project culminated in 2019 after three years of work and achieved the following results:

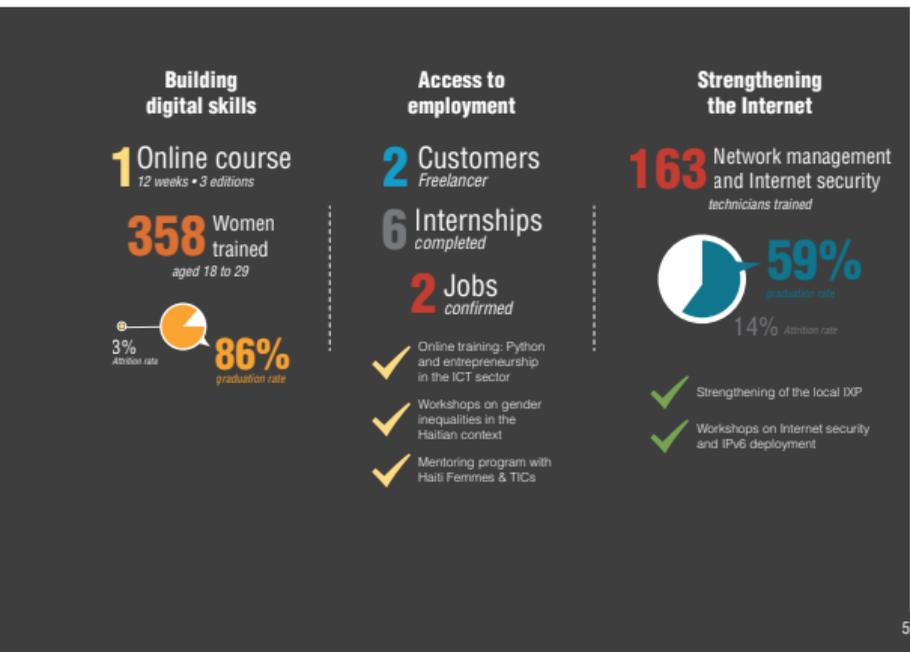
Working on this project in Haiti allowed LACNIC to validate a strategy for contributing to Internet development in scenarios with low Internet penetration rates and significant socio-economic and political challenges.

While the results in connecting women with employment opportunities were modest, the women who participated in the program stressed that the project had managed to empower them before their families and social circles.

Ayitic's success was recognized by Google, who took the developments and experiences as a model to replicate the experience in other countries of the Caribbean.

Likewise, Ayitic Goes Global proved that, even in contexts such as Haiti with low connectivity levels, limited access to digital devices, and challenges in gaining access to electricity, online training remains a perfectly viable option.

The technical courses developed for Haiti were also added to the LACNIC Campus, allowing more than 3,000 students across the region to benefit from this content.



FRIDA Program [↗](#)

The goal of the 2019 FRIDA call for projects was to fund projects with an emphasis on community networks and initiatives led by women to promote gender equality in technology. A total of 487 projects were submitted under the two Grants categories (Technology and Gender) and the Awards category (Community Networks).

The following projects were selected as the winners of this edition of the FRIDA program:

FRIDA Grants for Technology and Gender

- 1. Mx Center for Women in Technology (CMTMx).** Launching of a mentoring and training program to encourage greater participation of women in technical careers.
- 2. Fundación Activismo Feminista Digital (Argentina).** Developing online courses on digital literacy and gender violence.

FRIDA Award for Community Networks

NuestraRed.org (Colombia). A community network that has been operating for more than four years, with 23 nodes and more than 12,000 users since its creation. Technical experts and social leaders on access issues in Colombia.



Annexes

- *External Auditor Report*
- *LACNIC's Fiscal Commission Report*