



2019 Impact Report

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Foreword



2019 Impact Report: working together to grow and strengthen the Internet

The Internet Society worked around the world in 2019 to ensure the Internet can enrich people's lives, and that it is a force for good in society. This Impact Report shows how we did that.

In 2019, we worked with our global community of partners, members, and Chapters to connect some of the most challenging places on Earth and to enhance trust in the transactions we carry out online every day. From supporting the creation of community networks in Argentina and Hawai'i to advocating for strong end-to-end encryption and securing the Internet's routing system, I am proud of the work the Internet Society team accomplished in the past year.

As you will read on these pages, however, we have much work left to do. As powerful a connector as the Internet is, divisions are forming. No longer do people think of it only as a force for positive change. Certain governments portray the Internet as something to be feared, not embraced. There are those who use the Internet only in support of their evil intent. And meanwhile, nearly half of the world's population lacks access to the Internet of opportunity.

Reports like this one give us the opportunity to take stock of where we've been, not so that we can rest on our laurels, but so that we can challenge ourselves to do more. The challenges we face are daunting, but the strength of our team, Board of Trustees, and our community of members and Chapters shows me that we can overcome them. Only together can the whole Internet Society achieve our mission of ensuring everyone, everywhere has access to the open, globally-connected, secure, and trustworthy Internet.

I encourage you to read this report, and to visit our website to learn more about our activities.

Please join us today in our work to ensure the Internet is for everyone.

Andrew Sullivan
President and CEO

Our work to grow and strengthen the Internet is more important now than ever.

In this first-ever Internet Society Impact Report, we present some of our important work in 2019, highlighting four projects that had a significant effect on the development of the Internet: community networks, Internet Exchange Points (IXPs), routing security, and encryption. While the projects we highlight in this report touch on particular successes, they represent only a fraction of the full scope of the Internet Society's activities.

For the past 28 years, the Internet Society has been home to a global community driven by a common idea: when people get access to the Internet, amazing things happen. They can share ideas, build communities, connect to education opportunities, improve health outcomes, and more. The Internet has become a force for positive social and economic change.

Over our nearly three-decade-long history, there has been significant progress toward reaching our goal of an open, globally connected, secure, and trustworthy Internet available to everyone. In 1992, the year the Internet Society was founded, there were fewer than 14 million Internet users. By the end of 2019, more than half of the world's population – 4.1 billion people – were online. Governments around the world have embraced the Internet, realizing the opportunities it provides for education, entrepreneurship, employment, and access to healthcare, as well as language and culture preservation and promotion.

The Internet Society has a long history with some of the projects we discuss in this report. We've been involved with community networks and IXPs for many years. Others, like routing security and encryption, are more recent areas of activity for us. That said, all of these projects have something in common: a sense of urgency to act. Our work to grow and strengthen the Internet is more important now than ever. Nearly 3.5 billion people remain offline. The Internet is under threat by governments around the world, who increasingly do not view it as a force for good. And online misinformation, election interference, and use of the Internet for criminal activity are contributing to declining trust in the Internet.

As we bring more people and communities online, we not only help improve their lives, we contribute to improving the Internet for all users around the world. As we secure the Internet's global routing system, we advance our collective Internet experience. And as we work toward ensuring strong encryption is protected, we enhance trust in the Internet.

In 2019, the Internet Society expanded access to the Internet to some of the world's hardest-to-reach places, made progress toward securing the Internet's routing system, influenced governments around the world to protect end-to-end encryption, and grew local Internet infrastructure through IXPs, improving the Internet experience for many people and enhancing baseline connectivity.

We also laid the foundation to have an even greater impact in the future through capacity building, policy advocacy, nurturing our global community, working with new partners, and supporting the open, globally connected, secure, and trustworthy Internet.

We don't do this alone. The Internet Society's network of members, Chapters, and partners play a crucial role.



Community Networks



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Community networks — networks built, managed, and used by local communities — are cornerstones of the Internet Society’s work.

The Internet is a part of the social, economic, and cultural fabric for billions of people around the globe. It is how they connect, communicate, create, and collaborate. But while the Internet revolution has come to most of the world, there are places that have been missed.

There is a solution for many of these places. Community networks — networks built, managed, and used by local communities — are cornerstones of the Internet Society’s work. These do-it-yourself networks are a solution for many remote and rural areas, as well as underserved urban areas where there is a limited business case for traditional Internet service providers.

Community networks offer a way for anyone, anywhere, to connect to the Internet with right tools and support.

While the technology — the “network” part of a community network — is important, our experience shows us that the most important part of building a sustainable community network is the human factor — the “community” part of a community network. Sometimes, one of the best roles the Internet Society can play is as a convenor, providing the opportunity for open discussions and helping expand and strengthen the Internet development community.





In 2019, the Internet Society held five regional community network summits. These summits brought together thousands of network operators, regulators and policymakers, development agencies, community members, and other interested stakeholders in person and online to promote the use of community networks, stimulate policy and regulatory change, and increase collaboration between network operators.

But the summits weren't just about talking. They had concrete, meaningful outcomes.

Indigenous Connectivity Summit in North America

At the Indigenous Connectivity Summit in Hawai'i, participants worked together to develop a set of policy recommendations that will help support the creation of community networks in Indigenous communities in Canada and the United States.

European Summit on Community Networks

In the Republic of Georgia, a new community network was brought online as part of the 2019 European Summit on Community Networks.

A collaborative effort, this network was the result of the Georgian government, United States Agency for International Development (USAID), the Czech Development Agency, and the Internet Society working together.

This deployment drew the interest of both the Internet Society Armenia Chapter and the Government of Armenia, who are now working with us to deploy a network there in 2020, building our global community of local connectivity champions.



Latin American Summit of Community Networks

Summit on Community Networks in Africa

Asia-Pacific Community Networks Summit

Effective policies and legislation, as well as funding, are key to creating an environment that fosters the development of community networks.

In 2019, the Internet Society worked with governments and intergovernmental organizations on a wide variety of connectivity issues, resulting in the following achievements:

- At its Information and Communications Technology ministerial meeting in October 2019, the African Union (AU) adopted a declaration to [“Promote the formulation and pilot projects for unlocking basic infrastructure and services for rural and remote areas, including Community Networks,”](#) paving the way for AU member states to review their national policies and regulations to encourage the creation of community networks.
- Discussions at the Community Network Summit in Tanzania, held in partnership with the Association for Progressive Communications, led to increased government support to fund community networks through Universal Service Funding.
- The Arctic Council’s 2019 report, [Improving Connectivity in the Arctic](#), referenced the 2018 Indigenous Connectivity Summit, and includes recommendations that reflect the discussions held there. This report provides the eight Arctic States and Indigenous organizations with a framework for enhancing connectivity in some of the most remote regions in the world.
- In 2019, the Government of Papua New Guinea signed a Memorandum of Understanding (MOU) with the Internet Society to work together to design and deploy a community network in a rural coastal area of the country that local residents will manage. The activities outlined in the MOU include training workshops for community residents to successfully use online services and the development of a case study on the network deployment.
- Furthermore, by the end of 2019, six development agencies and international development banks support community networks or have provided funding from their portfolios: the International Telecommunication Union’s Development Sector, the World Bank, the African Union, the Development Bank of Latin America, the Czech Development Agency, and USAID.

Ensuring communities have access to the skills and knowledge they need to build and operate their own networks is also crucial for access-related initiatives to succeed.

For example, the Internet Society worked with CITEC, the telecommunications commission of the Organization of American States, to deliver the online course [Building Wireless Community Networks](#). More than 150 individuals from across the Americas registered for this training program.



Pu'uhonua o Waimanolo, Community Network

- In 2019, the Internet Society worked with the Nation of Hawai'i, the Hawaiian Chapter, University of Washington, MuralNet, and others to build a community network in the Native Hawaiian community of Pu'uhonua o Waimanolo, Hawai'i.
- Over eight weeks, residents were trained to build, troubleshoot, and manage their own network.
- This new network, owned and operated by the community, now provides high-speed Internet access to all 90 residents.
- Children in the community no longer have to travel outside of their village to complete homework and new opportunities for economic and social development are available to residents.

El Cuy Community Network

- Extreme weather and economic marginalization meant that El Cuy, a village in the Patagonia region of Argentina, was not connected to the Internet.
- In 2019, the Internet Society worked with community members and partners like CABASE and the ENACOM to help El Cuy build and operate a sustainable, self-deployed community network.
- El Cuy's residents see many benefits of the network, including health, education, and access to information. For example, community members can now access information and certain medical procedures online, instead of traveling more than 100 kilometres to the hospital.



The Internet Society's 2019 Chapterthon, an annual event in which Internet Society Chapters develop projects to achieve a common goal, focused on access.

Twenty-eight Chapters participated in the 2019 event, themed Connecting the Unconnected. They were challenged with creating innovative solutions to extend Internet access to the unconnected. The winning projects represent a diverse set of innovative and ambitious projects.



© Elliot Adombila, Internet Society Ghana Chapter

The Internet Society South African Chapter's project, Qokolweni Wi-fi Hotspots, provides Internet hotspots for underserved, rural communities. During the 24-hour Chapterthon, the Chapter created a network for the

350 residents of Qokolweni, as well as a checklist for others interested in building community networks.

The digital divide isn't limited to rural and remote regions. Many residents of urban areas lack affordable access to the Internet. For this reason, the New York Chapter helped NYC Mesh expand its urban network to six new, previously underserved locations, all within 24 hours.

In Ghana, the Chapter helped enhance access to information for rural communities in their local language using an FM broadcast system and Raspberry-pi computers. RADIONET provides access to crucial information like weather forecasts for local residents.

By participating in the 2019 Chapterthon, these Chapters were able to highlight their work to expand access in their region, and promote new and unique access solutions that can serve as inspiration for projects in other parts of the world.

There is still much more to do to bring the Internet to the 49 per cent of the population who lack access. In 2020, our focus will be to continue to support local communities to build and operate their own networks, build local capacity, convene stakeholders so that they learn from each other and create the human

networks to support local connectivity, and to work with governments to ensure policies and laws support their creation. Together with our partners, Chapters and members, we will ensure everyone, everywhere has access to the Internet of opportunity.

Keep up to date on the Internet Society's work on community networks, and follow #CommunityNetworks on Twitter!



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Internet Exchange Points (IXPs)



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Over the decades since this work began, the Internet Society has supported the development of more than 40 IXPs worldwide.

Since the early 1990s, the Internet Society has worked with our partners to ensure a strong and trustworthy Internet. A key part of this work has been supporting the creation of IXPs, physical locations where network operators, Internet service providers, and content delivery networks connect and exchange traffic with each other. Over the decades since this work began, the Internet Society has supported the development of more than 40 IXPs worldwide.

IXPs provide many benefits to end users, including lower costs for data transit (as that data can be exchanged locally, instead of having to travel long distances), improved Internet service quality, better network resiliency, increased local content development and hosting, and development of technical expertise to grow and sustain the local infrastructure. However, many regions around the world lack an IXP, or they have IXPs that need to be upgraded to meet increasing demands.

In 2019, the Internet Society helped train hundreds of local experts and supported the development of 12 new IXPs with equipment donations and technical expertise. An additional 10 IXPs in Africa were able to scale up their operations with our help.

We also hosted or supported local peering forums to bring IXP operators together for skills development, networking, and community building. More than 400 individuals received training through our online [Network Operations courses](#). We delivered additional training for IXP operators on routing security and peering best practices with our on-the-ground partners in Kuwait, Saudi Arabia, Oman, Myanmar, Jordan, Montenegro, and Pakistan, as well as Indigenous communities in Canada and the United States, reaching hundreds more.

This work has improved the Internet experience for tens of thousands of people.

The strength of the Internet Society's work on IXPs really comes from a community that has been developing over many years. Like community networks, IXP development is dependent on training local technical experts, building communities of interest, and working with policymakers and regulators to support their development. Over the years, we have worked with local and regional technical fora, like Network Operators Groups and Internet Exchange Point associations, to increase community participation and embrace technical capacity building.



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To keep up to date on the Internet Society's work on IXPs, follow #IXPs on Twitter!



Internet Exchange Points in Africa

- Great work has been done to build out the 45 active IXPs in Africa, located in 33 countries; however, most intra-continental Internet traffic continues to be exchanged in Europe or North America, something the Internet Society and our partners want to change.
- The African Peering and Interconnection Forum (AfPIF) is a shining example of the power of this work. For 10 years, the Internet Society has helped organize this important annual event, which has been central to nurturing a continent-wide community of experts who play an integral role in the development of the Internet in Africa.
- Since the first AfPIF, Africa has seen many new networks deployed, and the amount of Internet traffic exchanged locally has grown by an astounding 456,860 per cent. Data from Nigeria and Kenya show that at least 70 per cent of local traffic was exchanged locally at the end of 2019, reducing the cost of transit for Internet users in that region.
- In 2019, AfPIF celebrated its 10th anniversary with more than 300 participants and an impressive number of sponsors, demonstrating the high value the African and global Internet communities place on this event.



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Internet Exchange Points in Pakistan

- Until 2016, there was no local IXP in Pakistan, resulting in most local Internet traffic being exchanged in Singapore.
- This meant that network operators had to pay more to carry customers' data, and those customers experienced high latency and poor-quality service.
- With support from the Internet Society in 2016, a workshop was held in partnership with Pakistan's national telecommunications regulator and the Network Startup Resource Center (NSRC) to provide technical training focused on developing an IXP in the country. The first Pakistani IXP was launched soon after that workshop in Islamabad.
- With training and technical support provided by the Internet Society, a second IXP was launched in 2019, resulting in more local traffic being exchanged locally, thereby enhancing the Internet experience for many people in Pakistan.
- Collaboration was central to the success of these two IXPs. The national regulator, network operators, the Higher Education Commission, NSRC, and the local Internet community worked together to improve the local Internet traffic environment in Pakistan.

Mutually Agreed Norms for Routing Security (MANRS)

Routing security is crucial to the development of a stable and resilient Internet.

It provides stability to core Internet operations and instills trust in its use. However, routing incidents can seriously affect the flow of Internet traffic, causing incidents such as outages, route leaks, and hijacks. In 2014, a small group of concerned and dedicated experts recognized the need for the international operator community to work together to improve the security and resilience of the Internet's global routing system. With the support of the Internet Society, Mutually Agreed Norms for Routing Security, or MANRS, was born.

MANRS asks network operators to commit to four simple but concrete actions that address filtering, anti-spoofing, coordination with other operators, and global validation. These four actions provide baseline global security requirements and can be used as a reference point for efforts to enhance the security and stability of the Internet.

MANRS is a true community-driven initiative — it was created by members of the network operator community, for the network operator community. The Internet Society has been proud to support this important work since its beginning, providing hosting for the initiative's website, managing email lists, and promoting participation.

In 2018, an IXP Programme was launched to broaden support for MANRS, calling on IXPs around the world to work together to implement crucial fixes that can eliminate the most common threats to the Internet's routing system. In 2019, more than 20 IXPs joined MANRS, from Sweden to Taiwan, Argentina, and Rwanda to Canada.

We also launched the MANRS Observatory in 2019, a vital tool to bring increased transparency to routing operations, and to shed light on trends in routing security globally, regionally, and for individual networks. MANRS participants can view the performance of two thirds of the individual networks worldwide — more than 64,000 — and receive detailed monthly incident reports on their networks. As the number of MANRS participants increases and the Observatory evolves, policymakers, security experts, network operators, and other interested parties will be able to better

understand the state of routing security and resilience, and make improvements based on evidence.

The global routing and security community has expressed growing interest in MANRS. Even members of the non-technical community recognized the importance of MANRS, including the World Economic Forum (WEF). In its Cybercrime Prevention: Principles for Internet Service Providers report, WEF called on Internet Service Providers to “strongly consider joining the MANRS project and implementing MANRS requirements.”



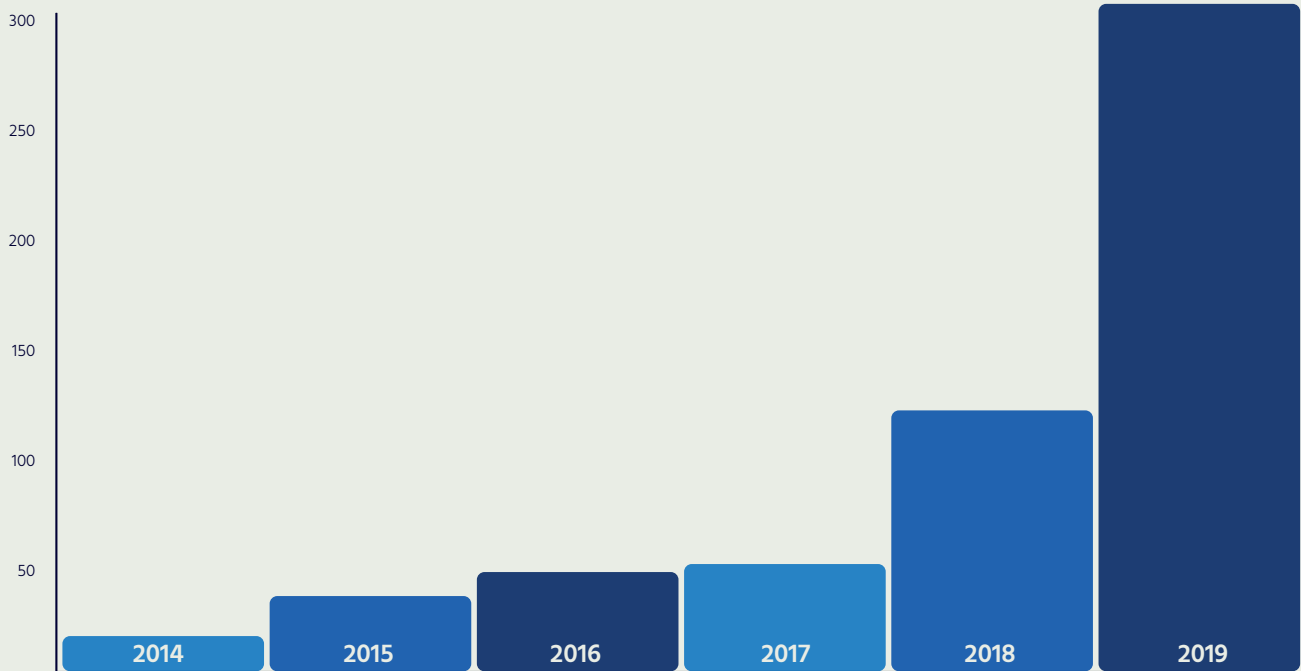
© Internet Society

Most importantly, 2019 saw tremendous growth in the number of network operators and IXPs joining the MANRS movement. With a 113 per cent increase in participation, MANRS had 311 participants by the end of the year, up from 146 in 2018.

While the Internet Society will continue to provide administrative support to the MANRS initiative, the network operators community is taking an increased ownership role. With the establishment of an Advisory Committee in 2019, a roadmap is in place to transition the initiative to a fully-owned and -governed community effort.

MANRS by the Numbers

Since 2017, growth in the number of MANRS participants has been exponential, reaching 311 network operators (ISPs) and IXPs by the end of 2019.



To keep up to date on the Internet Society's work on MANRS, follow @RoutingMANRS, #MANRS and #MANRSObservatory on Twitter!





C 2 R 4 P 6 N 8 I 0 C 2 R 4 P
0 E 4 P 7 C 9 T Y P 0 E 4 P 7
R 5 N 7 E 4 D 3 T 2 R 5 N 7 E
C 2 R 4 P 6 N 8 I 0 C 2 R 4 P
1 Y 3 T 5 0 7 E 9 D 1 Y 3 T 5
R 5 N 7 E 4 D 3 T 2 R 5 N 7 E
0 E 4 P 7 C 9 T Y P 0 E 4 P 7
1 Y 3 T 5 0 7 E 9 D 1 Y 3 T 5
C 2 R 4 P 6 N 8 I 0 C 2 R 4 P
R 5 N 7 E 4 D 3 T 2 R 5 N 7 E
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C 2 R 4 P 6 N 8 I 0 C 2 R 4 P
R 5 N 7 E 4 D 3 T 2 R 5 N 7 E
1 Y 3 T 5 0 7 E 9 D 1 Y 3 T 5

Encryption

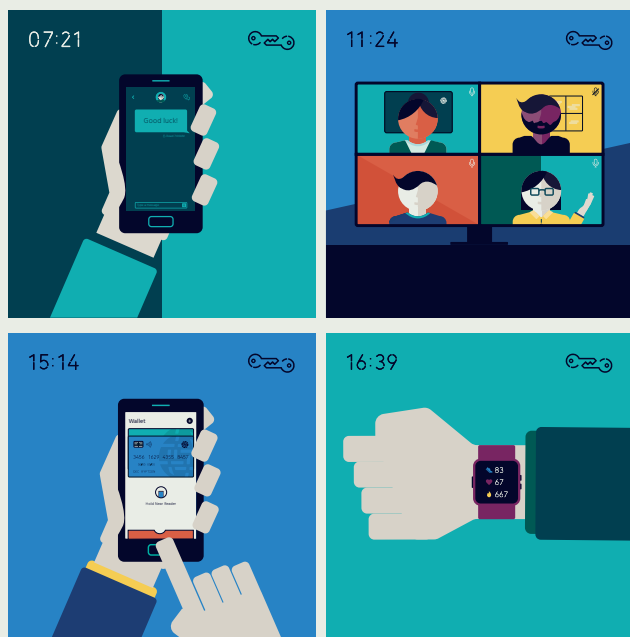
At the Internet Society, we believe that encryption is an essential part of the trusted Internet.

In recent years, encryption has become more commonplace, with most websites now protected with HTTPS (a security extension to Hypertext Transfer Protocol, or HTTP). Millions of users worldwide are using end-to-end encrypted messaging applications, more services have encryption turned on by default, and there's greater public awareness of encryption as an important security tool.

However, the increasingly secure nature of Internet communications has also prompted renewed calls for law enforcement to gain access to encrypted communications and data. If allowed, such access would jeopardize the security of virtually everyone online. Access to encrypted messages and data can't just be granted to the "good guys." A backdoor to encrypted communications is an opening for anyone

to exploit, even the "bad guys" — be they criminals or hostile governments. With access, they could eavesdrop on sensitive communications, putting all of us at risk. Simply put, granting access to the good guys only makes it easier for the bad guys to get access, too.

At the Internet Society, we believe that encryption is an essential part of the trusted Internet. It underpins many sensitive activities online, providing security to online transactions to the finance industry and protecting users' information from cyber criminals and state actors. We advocate for ubiquitous encryption, and oppose government proposals and business models that would weaken encryption or otherwise undermine the security of digital systems.



Why is encryption important?

The most basic assurances online in terms of confidentiality, integrity, and authentication are all accomplished using cryptography.

It is no exaggeration to say that encryption — in its many forms — is the substance that "glues" together the various online services and products we enjoy.

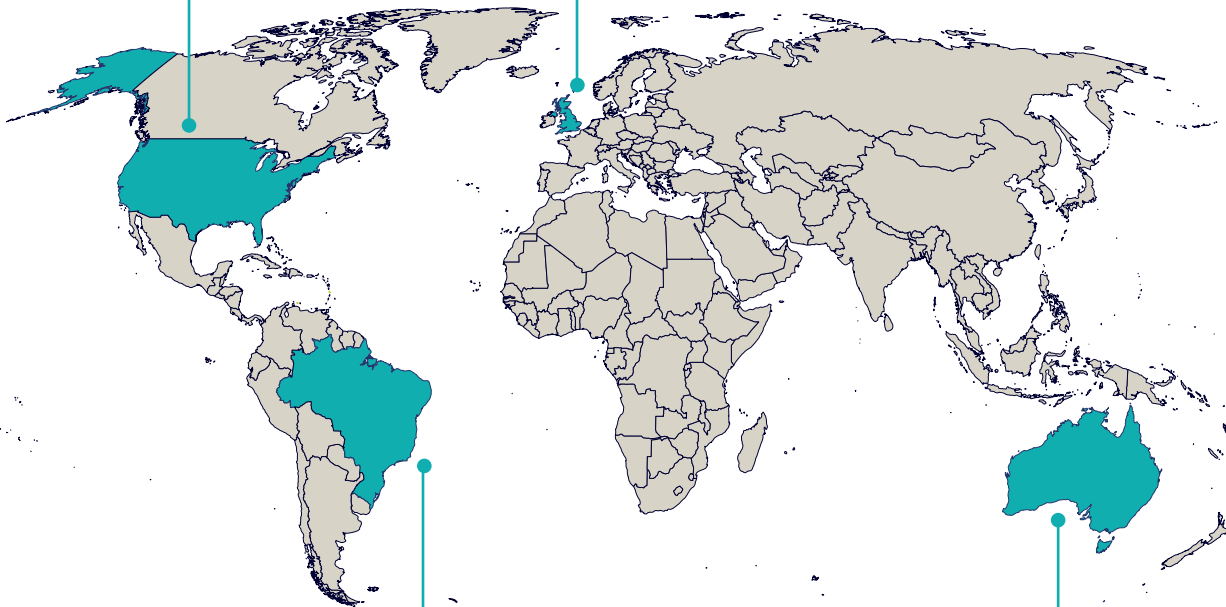
Most of us use encryption every day, though we may not be aware of it. Encrypted messaging applications like Signal and WhatsApp, credit and debit payment services, many videoconferencing systems, and data transfer and storage systems all rely on strong encryption.



The Internet Society had several encryption-related advocacy successes in 2019, all the result of working together with our Chapters, partners, and allies. Working together has enabled the Internet Society – and our partners – to have a greater impact than if we’d worked alone. In particular, several Internet Society Chapters took a leadership role, becoming strong advocates and community leaders for strong encryption.

United States: The Internet Society engaged in regular communications with policymakers and led a Congressional briefing event. Two Congresspersons, whose staff had participated in the Congressional briefing event, sent a [letter](#) to the U.S. Attorney General urging the government to stop making requests for access to encrypted communications.

United Kingdom: In coordination with its security-focused partners, the Internet Society successfully countered the GCHQ “ghost proposal” for access to end-to-end encrypted messages. Specific advocacy activities included an [open letter](#) to the GCHQ that was signed by 47 leading technology and security organizations and experts.



Brazil: The Internet Society advised a civil society advocacy effort that successfully led to the removal of problematic text regarding encryption from a Brazilian anti-crime bill.

Australia: The Internet Society, local Chapter Internet Australia, and regional partners led an effort to stop a proposed law that would introduce powers requiring Internet service providers to be able to decrypt content. While the law ultimately passed, the advocacy effort led to greater awareness of the danger of weakening encryption in the country.

The Internet Society also supported Facebook’s commitment to deploy end-to-end encryption across its services with partners in an [open letter](#) to Facebook and another [letter](#) to the United States, United Kingdom, and Australian governments. Through the Internet Society’s financial support, Let’s Encrypt was able to [help more Web sites encrypt their traffic](#), from 150 million in January 2019 to more than 180 million one year later.

Going forward, the Internet Society’s advocacy goals and messaging will evolve. Our goal is to ensure that exceptional access proposals will not be considered a viable action for governments by 2025. In 2020, this means we will continue to shape encryption discussions and foster our global network to support strong end-to-end encryption.

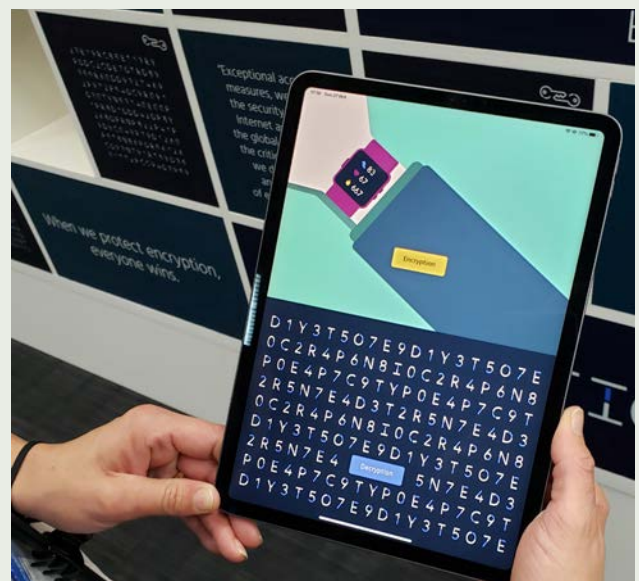
To keep up to date on the Internet Society’s work on encryption, follow #encryption on Twitter!



Encryption at MozFest

To promote the importance of encryption, the Internet Society had a strong presence at Mozfest 2019, a leading event hosted by Mozilla:

- With more than 2,500 people representing about 50 nations, Mozfest is one of the largest and most influential gatherings of experts and other engaged parties dedicated to creating a healthier Internet.
- At Mozfest, the Internet Society convened a panel of experts to explore the encryption debate and to shed light on why strong, end-to-end encryption is crucial to trust in the Internet.
- The Internet Society also brought encryption to light at Mozfest with a two-metre-high interactive display that highlighted how encryption touches everyday life, from a banking transaction to a fitness monitor and more.



Photos: © Internet Society

Get Involved

The Internet Society's mission — an open, globally connected, secure, and trustworthy Internet for all — is a challenging one. It is all equally important. The Internet is an incredible resource for humanity. It's an unparalleled technological force that brings about social and economic development, fosters innovation, expands education opportunities, unites people and cultures, and builds communities.

With your help, we can achieve this mission. Our community is our strength, whether that's a network operator group in Asia-Pacific or the Middle East supporting MANRS and IXPs, a Chapter in Latin America or Africa helping build a community network, or an individual member in Europe or North America advocating for strong encryption.

We encourage you to join this global movement of people committed to creating a bigger, stronger Internet for everyone. Become a member and join a local Chapter. Or, if there isn't a Chapter in your region, start one. Encourage your organization to become an Organization Member. Attend an Internet Society event. Follow us on social media. Read about our activities for the next year in our [2020 Action Plan](#).

Above all, learn more about these issues and engage in the conversations that bring us together to create an open and trusted Internet:

[Community Networks](#)
[Internet Exchange Points](#)
[Mutually Agreed Norms for Routing Security \(MANRS\)](#)
[Encryption](#)

2019 Impact Report



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