## The role of the regulator in promoting the deployment of IPv6

The technological evolution and the widespread use of the Internet protocol have given rise to a new scenario in which Internet addressing resources are a critical element to continue with the innovation of services and technologies such as the Internet of Things (IoT).

The need to deploy the IPv6 protocol has as one of the causes, the growth of connected devices. It is estimated that by 2020 there will be around 29 billion of them, which approximately 18 billion will be related to the IoT.

Furthermore, a point to highlight is that the IPv4 and IPv6 protocols are not compatibles, so it is necessary that the websites of Internet have an IPv6 configuration, otherwise the users will not be able to access its content. Furthermore, the Internet service providers must support the IPv6 protocol so that their users can access content published only in that protocol.

It is for the above that the different sectors and involved in the development of the Internet, including users, creators and content generators, service providers, technology providers, companies, public administration entities and international organizations, must have knowledge of the operation and deployment of the IPv6 protocol to encourage its use and achieve a rapid, efficient and safe transition.

Therefore, the Federal Institute of Telecommunications of Mexico has been a promoter of the transition to IPv6, since in the country this transition is considered as a platform for innovation, economic development and global connectivity.

Among the activities that the Institute has carried out in order to promote the deployment of IPv6 are the following:

- Issuance of guidelines and technical provisions.

  - "Guidelines that set the terms under which the predominant economic agent in the telecommunications sector or with substantial power must have a physical presence at Internet traffic exchange points in the national territory and enter into agreements that allow service providers Internet exchange of internal traffic more efficiently and less expensively."[1]

    These guidelines were issued in July 2017 and they require statistical information regarding the volume of incoming and outgoing traffic exchanged in the IXP through the IPv6 protocol.

  - "Agreement on Minimum Technical Conditions and Interconnection Fees, 2018."

    Its objective is to establish the rules for efficient interconnection and interoperability between public telecommunications networks which will permit efficient traffic exchange between public telecommunication networks under equitable conditions and will lay the foundation for healthy competition.

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[1] *Guidelines that set the terms under which the predominant economic agent in the telecommunications sector or with substantial power must have a physical presence at Internet traffic exchange points in the national territory and enter into agreements that allow service providers Internet exchange of internal traffic more efficiently and less expensively*, Federal Telecommunications Institute, http://www.dof.gob.mx/nota_detalle.php?codigo=5491665&fecha=24/07/2017

A four-year term is established to complete the transition to IP technology interconnection. In addition, the IPv6 addressing scheme should be used, IPv4 addressing can be used by mutual agreement between the parties.

- Micrositio IPv6[2]

In order to promote the transition to the use of the IPv6 protocol, during the last quarter of 2017, the Institute developed a microsite to inform permanently about the benefits and advances of its adoption in Mexico. For this, considering the best international practices, in this microsite will be published a series of recommendations that allow public and private entities that use and / or offer services through the Internet the transition to the IPv6 protocol that promotes interoperability with services borrowed through future generation networks.

The microsite is addressed to Internet users, academics, industry, interested in the sector, dependencies and federal, state and municipal entities.

The information is organized as follows:

1. **What is IPv6?** Information about what is the Internet Protocol version 6 is provided, what are its foundations, as well as information regarding the transition.
2. **Indicators and statistics.** This section presents key information to interpret the current state of the adoption and use of the IPv6 protocol in Mexico and with this find a point of reference for international comparisons. Also has information regarding the deployment and adoption of IPv6 in the international arena.
3. **IPv6 library.** It provides documents, books and presentations, among other resources related to IPv6; also, it contains information about some proposed standards related to the subject.
4. **Useful links.** In this section are provided different links to other websites of organizations, groups and entities, both national and international, in order to deepen more on the subject.
5. **Best practices.** This section provides some documents, made by the IFT, related to best practices regarding the transition to IPv6. Also, there are some documents related to best practices at the international level.
6. **Tools.** This section provides some tools with which the networks and protocols that are supported can be evaluated.
7. **Frequent questions.** This section addresses questions about what IPv4 and IPv6 is, the importance of IPv6, what the transition is, how this transition affects the user, among others.

The information on this website is constantly being updated, also provides information about national and international events that are related to the transition to IPv6.

Within the content of this microsite, there is a *Reference **Guideline for the implementation of the Internet Protocol version 6 (IPv6)***, elaborated by the Institute in order to establish a reference guide of the relevant and necessary aspects to consider for the design of implementation of IPv6.

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[2] IPv6 Microsite, Federal Telecommunications Institute, http://ipv6.ift.org.mx/

This guide consists of four stages, which describe some activities that will facilitate the understanding and implementation of a network based on the IPv6 Protocol.

1. Training - Training for telecommunications team.

The first point for the implementation of IPv6 is the training of the responsible personnel for implementation. This have the purpose to familiarize the staff with the concepts and logic of the protocol's operation.

2. Equipment capabilities - Perform an audit of all hardware and software about their support for the IPv6 protocol.

It is necessary to perform an audit of all the hardware and software used in the organization. This list must include the corresponding models and versions, as well as the details on their compatibility with IPv6.

3. . Design - Address planning.

Determine the type of IPv6 addressing according to your needs. IPv6 addresses of all types are assigned to interfaces, not to nodes, therefore, each interface can use different IPv6 addresses simultaneously.

4. Testing - Construction of a test IPv6 network.

It is recommended to build a test network and implement the same services that run over IPv4.

The promotion of the deployment of IPv6 is one of the actions that the Institute is carrying out with the approach of participating in the digital ecosystem. The future regulation of the digital ecosystem is a key issue, at a time when the pace of regulatory changes is not reaching the speed of transformation in the digital world. Therfore, to meet the expectations of the rapidly evolving digital ecosystem, regulators have to adapt and create more flexible, innovative and less invasive regulatory frameworks that transcend the traditional telecommunications sector to take into account the multi-faceted and multipartite nature of the world digital.

Therefore, based on the activities carried out by the telecommunications regulator of Mexico, this panel will address the following issues:

- Exhaustion of addressing

- Incentives and facilities for the deployment of IPv6

- Role played by users and the industry

- Work of the regulatory body to promote the deployment of IPv6

- Participation of regulators in the digital ecosystem