Modelos de Interconexión a Internet
Y el Futuro de las Redes de Fibras Opticas

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Promover Internet

- **El actual modelo de Internet**

Como funciona Internet

ICANN

ONE WORLD. ONE INTERNET.

WHAT DOES ICANN DO?

To reach another person on the Internet you have to type an address into your device – a name or a number. That address must be unique, so computers will know where to find each other. ICANN maintains and administers these unique identifiers across the world. Without ICANN's management of this system, known as the Domain Name System or DNS, we wouldn't have a global, scalable Internet where we can find each other.

Community-Driven Policy

To keep pace with dynamic technologies and rapid innovation, ICANN enables consensus-driven, multistakeholder policy development, with broad representation from the global Internet community.

Multistakeholder Model:

Civil Society & Internet Users, the Private Sector, National & International Organizations, Governments, Research, Academic and Technical Communities are all represented.

Competition & Choice

From accrediting over 1000 registrars, to introducing new Top Level Domains (TLDs), ICANN works to expand consumer choice by fostering competition and innovation in the domain name marketplace.

WHICH FUNCTIONS DOES ICANN COORDINATE?

- Domain Name System (DNS)
- Internet Protocol (IP) address allocation
- Protocol-Parameter Registry
- Root Server Systems
- Generic Top-Level Domain name (gTLD) system management
- Country Code Top-Level Domain name (ccTLD) DNS
- Time zone database management

Security & Stability

ICANN supports DNS security through technical training and engagement, coordinating and collaborating with the community in the implementation of standards such as DNSSEC.

Interoperability

ICANN's work enables new technologies to flourish while maintaining interoperability across the global Internet. For example, management of the unique protocol identifiers allows communication using secure connections between users.

Contractual Compliance

ICANN oversees the contracts it maintains and enforces the consensus policies developed through the community-driven process. ICANN's Contractual Compliance function seeks to ensure compliance with the agreements and the consensus policies.

(Diagram labels: Users, COMMUNITY-DRIVEN POLICY MAKING, COORDINATION, DNS ECOSYSTEM, OPERATIONS, UNIQUE IDENTIFIERS, CONTRACTUAL COMPLIANCE, ICANN CONTRACTED PARTIES, Registrar, Registry)

HOW DO I PARTICIPATE?

- Sign up for updates at myicann.org
- Join one of the many Public Comment Forums on ICANN's website
- Attend ICANN's Public Meetings in person or online to provide input at a Public Forum
- Join one of ICANN's Supporting Organizations or Advisory Committees

For more information or to get involved, please visit **www.ICANN.org**

WHO'S INVOLVED?

A number of groups, each of which represents a different interest on the Internet. All of them come together with the Board of Directors to shape ICANN decisions.

Supporting Organizations	Advisory Committees	Technical Advisory Bodies	Board of Directors
• Addressing • Country Code Names • Generic Names	• At-Large • Governmental • Root Server System • Security & Stability	• Technical Liaison Group • Internet Engineering Task Force	

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WHO RUNS THE INTERNET?

NO ONE PERSON, COMPANY, ORGANIZATION OR GOVERNMENT RUNS THE INTERNET.

The Internet itself is a globally distributed computer network comprised of many voluntarily interconnected autonomous networks.
Similarly, its governance is conducted by a decentralized and international multistakeholder network of interconnected autonomous groups drawing from civil society, the private sector, governments, the academic and research communities, and national and international organizations. They work cooperatively from their respective roles to create shared policies and standards that maintain the Internet's global interoperability for the public good.

WHO IS INVOLVED:

IAB A C P S R
INTERNET ARCHITECTURE BOARD
Oversees the technical and engineering development of the IETF and IRTF.
www.iab.org

ICANN C O P V
INTERNET CORPORATION FOR ASSIGNED NAMES AND NUMBERS
Coordinates the Internet's systems of unique identifiers: IP addresses, protocol parameter registries, top-level domain space (DNS root zone).
www.icann.org

IETF C P S
INTERNET ENGINEERING TASK FORCE
Develops and promotes a wide range of Internet standards dealing in particular with standards of the Internet protocol suite. Their technical documents influence the way people design, use, and manage the Internet.
www.ietf.org

IGF A C P
INTERNET GOVERNANCE FORUM
A multistakeholder open forum for debate on issues related to Internet governance.
www.intgovforum.org

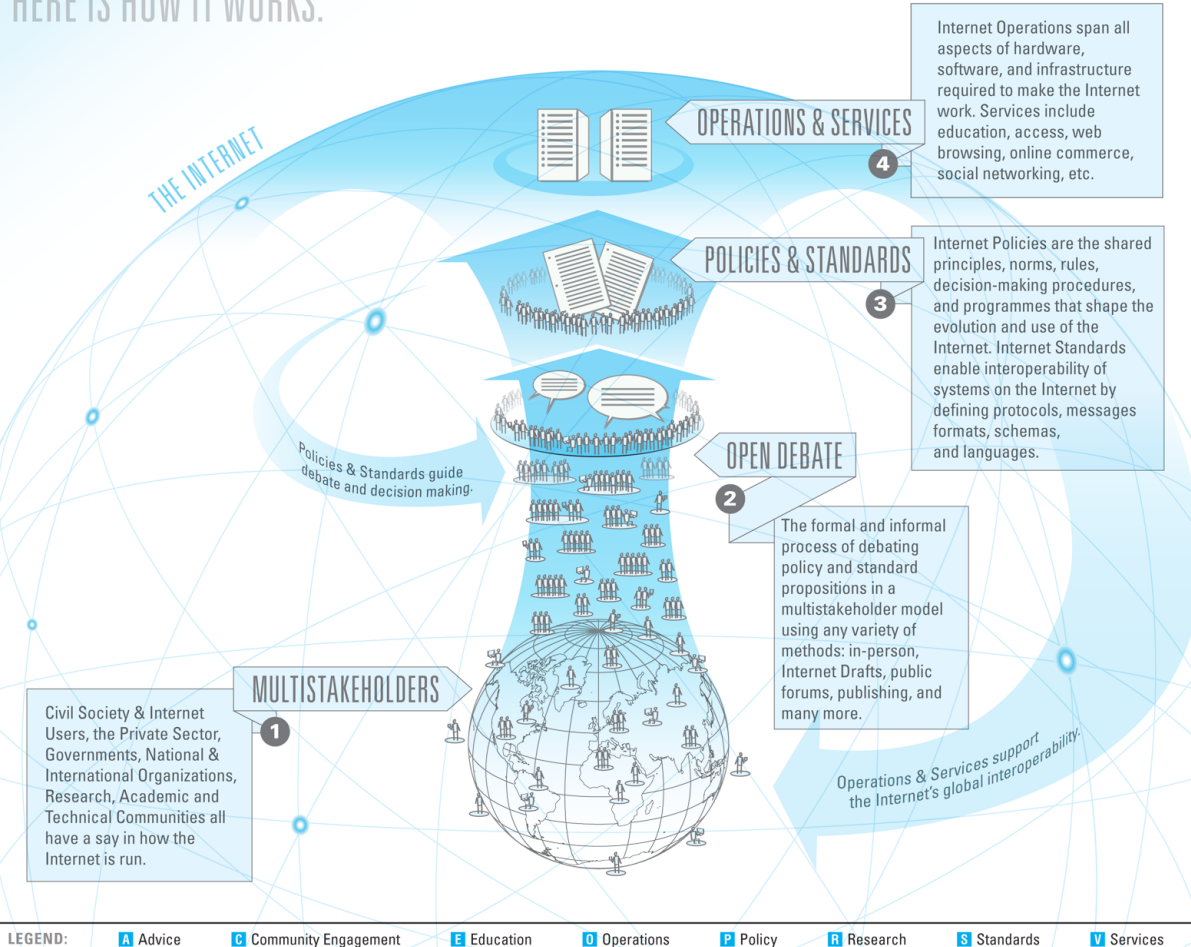**IRTF** R
INTERNET RESEARCH TASK FORCE
Promotes research of the evolution of the Internet by creating focused, long-term research groups working on topics related to Internet protocols, applications, architecture and technology.
www.irtf.org

GOVERNMENTS AND INTER-GOVERNMENTAL ORGANIZATIONS C P
Develop laws, regulations and policies applicable to the Internet within their jurisdictions; participants in multilateral and multistakeholder regional and international fora on Internet governance.

HERE IS HOW IT WORKS:

THE INTERNET

OPERATIONS & SERVICES 4
Internet Operations span all aspects of hardware, software, and infrastructure required to make the Internet work. Services include education, access, web browsing, online commerce, social networking, etc.

POLICIES & STANDARDS 3
Internet Policies are the shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet. Internet Standards enable interoperability of systems on the Internet by defining protocols, messages formats, schemas, and languages.

Policies & Standards guide debate and decision making.

OPEN DEBATE 2
The formal and informal process of debating policy and standard propositions in a multistakeholder model using any variety of methods: in-person, Internet Drafts, public forums, publishing, and many more.

MULTISTAKEHOLDERS 1
Civil Society & Internet Users, the Private Sector, Governments, National & International Organizations, Research, Academic and Technical Communities all have a say in how the Internet is run.

Operations & Services support the Internet's global interoperability.

WHO IS INVOLVED:

ISO S
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
Develops international standards. The ISO 3166 standard establishes internationally recognized codes for the representation of names of countries, territories or areas of geopolitical interest and their subdivisions. ISO 3166 does not establish the names of countries, only the codes that represent them.
www.iso.org/iso/country_codes.htm

ISOC C E P V
INTERNET SOCIETY
Assure the open development, evolution and use of the Internet for the benefit of all people throughout the world. Currently ISOC has over 90 chapters in around 80 countries.
www.internetsociety.org

RIRs O P V
5 REGIONAL INTERNET REGISTRIES
Manage the allocation and registration of Internet number resources, such as IP addresses, within geographic regions of the world.
www.afrinic.net — Africa
www.apnic.net — Asia Pacific
www.arin.net — Canada & United States
www.lacnic.net — Latin America & Caribbean
www.ripe.net — Europe, the Middle East & parts of Central Asia

W3C S
WORLD WIDE WEB CONSORTIUM
Create standards for the world wide web that enable an Open Web Platform, for example, by focusing on issues of accessibility, internationalization, and mobile web solutions.
www.w3.org

INTERNET NETWORK OPERATORS' GROUPS A O V
Discuss and influence matters related to Internet operations and regulation within informal fora made up of Internet Service Providers (ISPs), Internet Exchange Points (IXPs), and others.

LEGEND: | A Advice | C Community Engagement | E Education | O Operations | P Policy | R Research | S Standards | V Services

This graphic is a living document, designed to provide a high level view of how the Internet is run. It is not intended to be a definitive guide. Please provide feedback at www.xplanations.com/whorunstheinternet

Que hace falta para ser una red en Internet

- ASN
- Direcciones IP

Quien asigna los recursos

- **ARIN**
- **RIPE**
- **AFRINIC**
- **APNIC**
- **LACNIC**

Todos Queremos Estar!

- Usuarios
- Empresas
- Gobiernos
- Empresas de TV por CABLE…
- Carriers…
- Empresas de Telefonia Celular
- ISP…
- Productoras de Contenido
- Agregadores
- Las Señales de TV

De donde venimos?

- Redes Cerradas…

- Proveedores Unicos…

- Redes poco Interconectadas…

- Negocio de Reventa

- No Manejar el trafico,

- Pagar por ir a buscar el Contenido

- No decidir Nada!

A donde vamos?

- Mas trafico , Todo es Datos!!!…
- MSG, Multimedia, Video…
- …Multicast / Unicast?
- Manejar el trafico?
- Que Contenido Comprar / Traficar
- Varios Proveedores
- Los Usuarios mandan…
- DECIDIR!!

Como Nos Desarrollamos?

- Con mas USUARIOS ?
- Vamos a otra localidad? Nos expandimos?…
- Mejoramos nuestra RED?
- Invertimos en Fibra Optica?
- Desarrollamos Plataformas Propias?
- Nos integramos con Otros Proyectos?
- Que Servicios vamos a Brindar?

Que Hicieron las REDES

- **Construyeron mas Capacidad**

- **Crearon CDN**

- **Permitieron pagar por Uso y obtener Descuentos por volúmenes generados en la red**
- **Permitieron Mejorar el ruteo y la velocidad de respuesta al usuario final**

Que Hicieron los Contenidos

- **Mayor Volumen, OTT**

- **Mayor Definición SD, HD UHD,**

- **Van modificando el modelo de Negocios**

- **Mas Cerca del Usuario Final**

- **Ejemplo Google**

- **Ejemplo Netflix/Comcast?**

Que Hicimos Nosotros

- **Negociamos en Conjunto**

- **+ IXP/NAPs Regionales**

- **Como red nos transformamos en una SOLA**

- **Distribuimos Contenido...**

- **Mas Cerca del Usuario Final**

- **Ayudamos a los proyectos como el de RIU que generan mas Trafico en la Red**

El Tráfico en Internet

- En internet, el tráfico tiene distinto valor dependiendo de donde proviene o de a donde se lo va a buscar.

- Tiene un costo diferente el tráfico interno de mi red que un tráfico externo de mi red.

- Es distinto el trafico local que el Nacional, que el internacional

- Hemos mejorado la calidad acercando el contenido a los usuarios finales, con los CACHES y trayendo contenido a mi RED
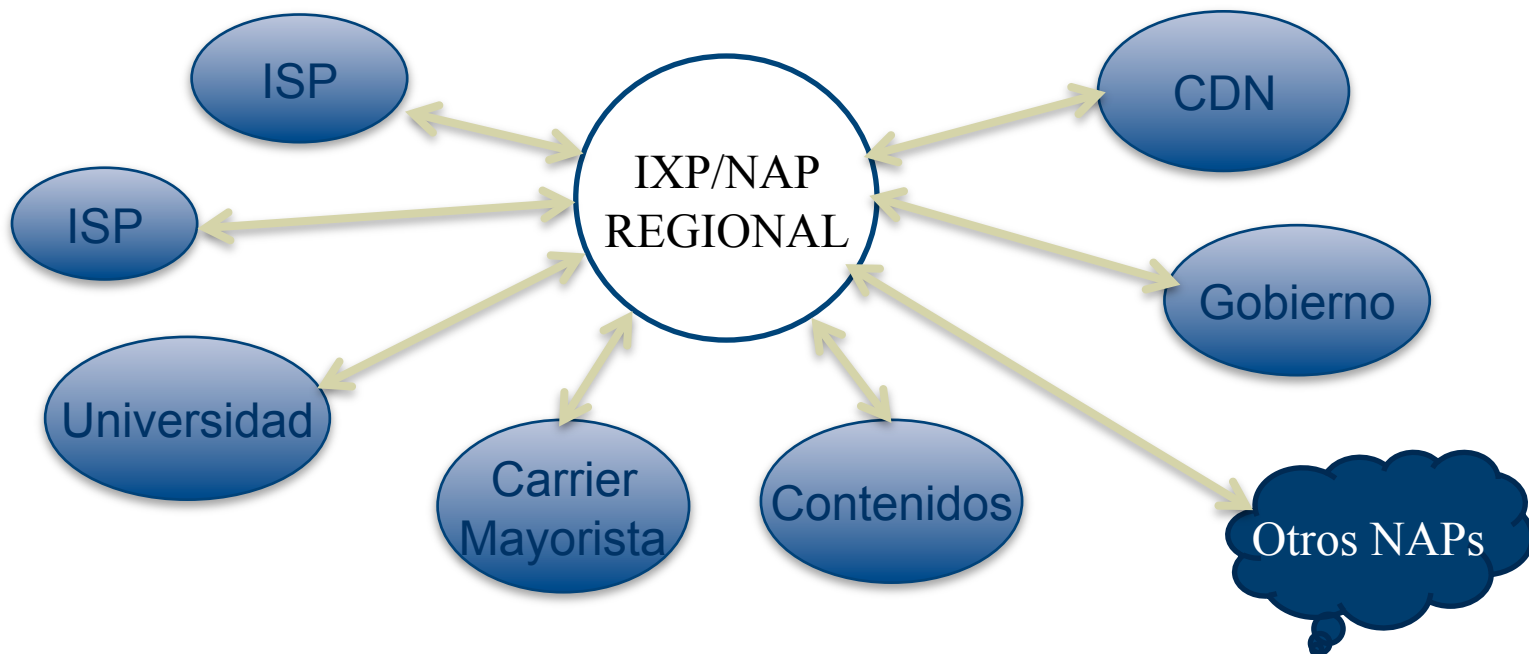
- Los proveedores generalmente no lo desglosan y cobran un valor uniforme.

Los "NAPs CABASE" permiten dividir en 4 Tráficos

1. **Interconexión con Tráfico Local.**

2. **Interconexión entre "NAPs" (Transporte Nacional).**

3. **Interconexión a CACHES/Contenidos .**
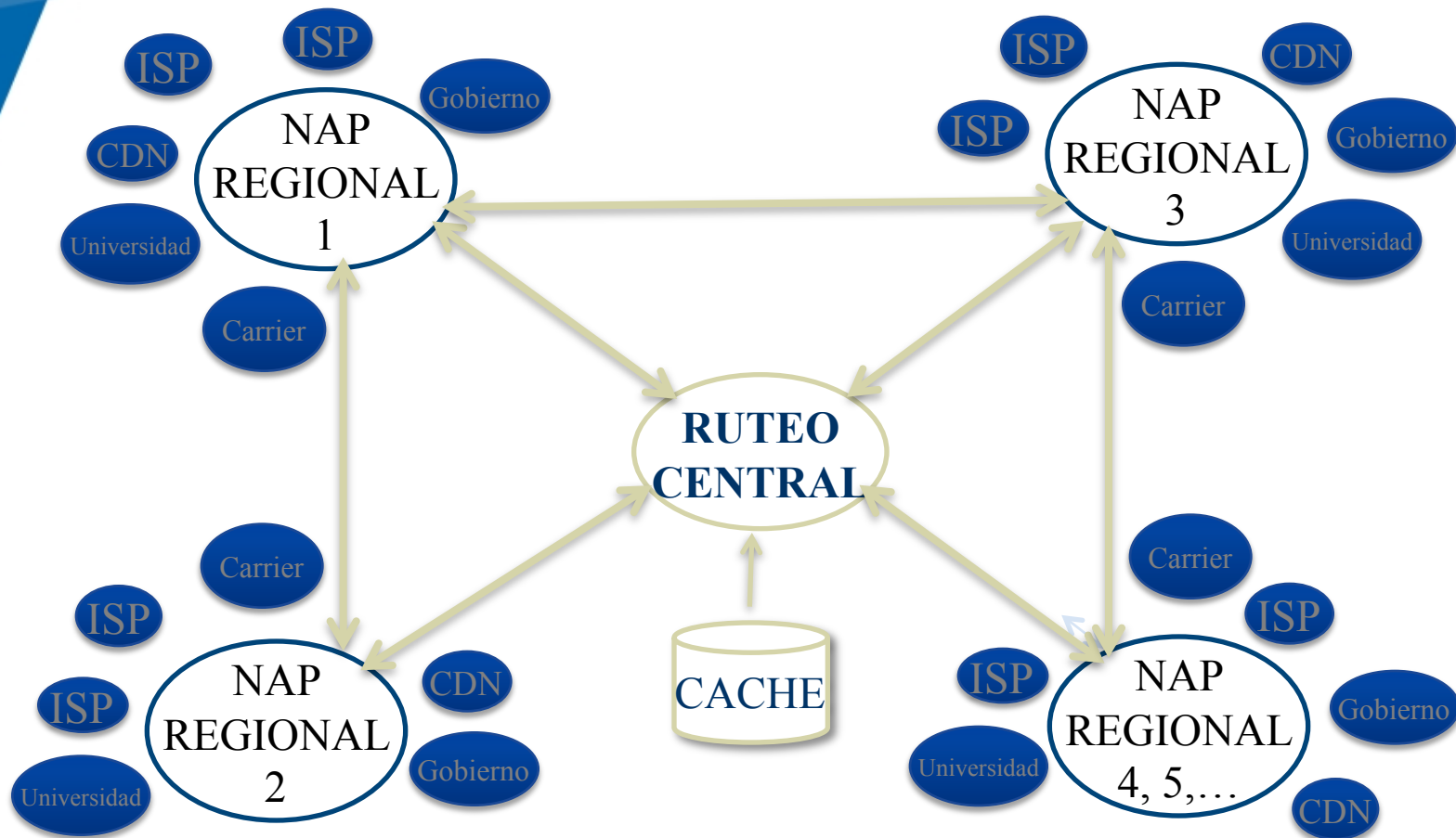
4. **Interconexión con el Resto**

¿Que es un NAP?

NAP (Network Access Point) o IXP (Internet Exchange Point)

- **Son puntos neurálgicos de Intercambio de Tráfico entre redes.**

- **Objetivo:** Eficientizar el ruteo de Internet, mejorar la calidad de servicio, la velocidad y reducir los costos de interconexión.
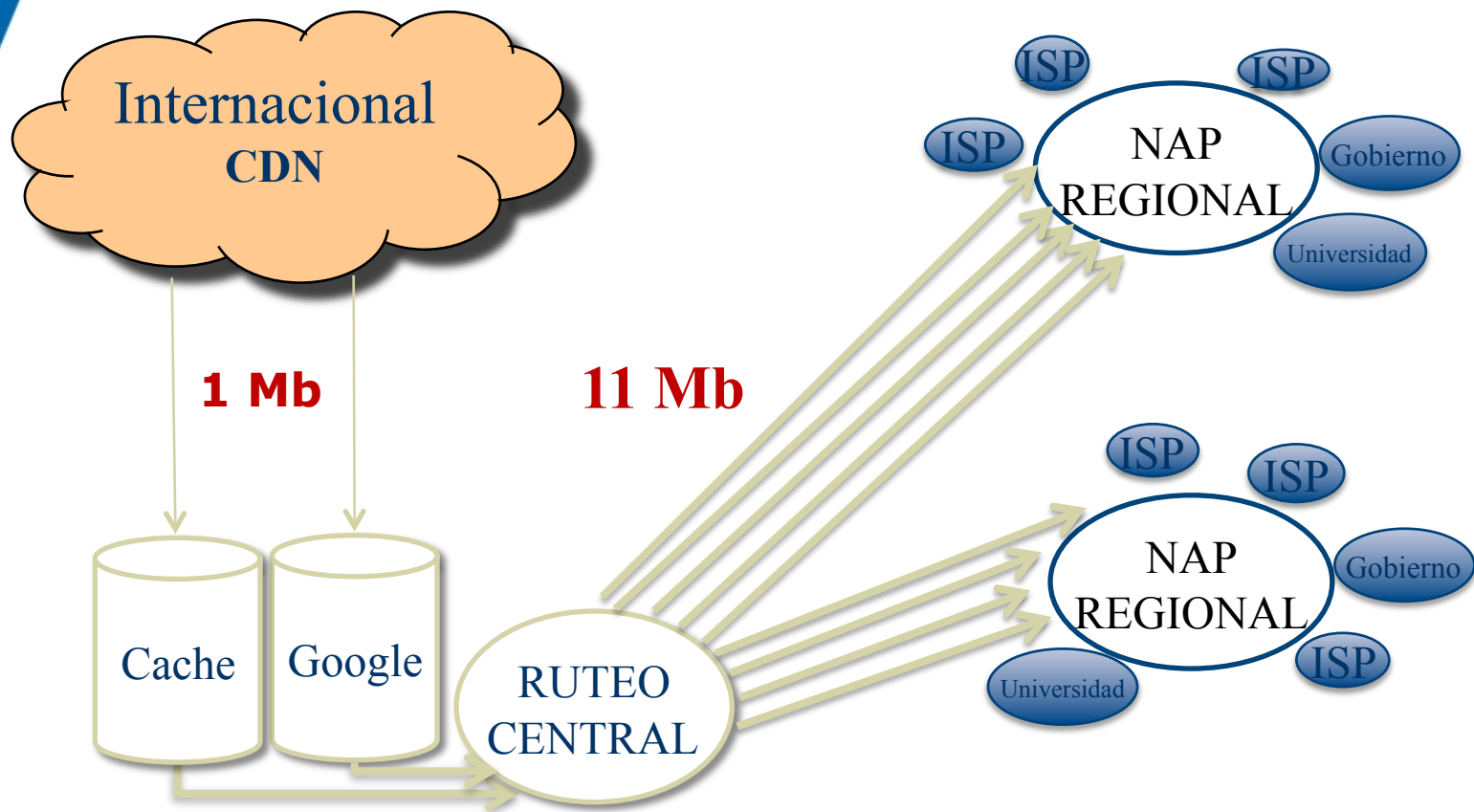
ISP — ISP — Universidad — Carrier Mayorista — IXP/NAP REGIONAL — CDN — Gobierno — Contenidos — Otros NAPs

Tráfico entre NAPs

- **Se paga POR USO al 95% percentil**

Tráfico CACHES

Internacional CDN

1 Mb   11 Mb

Cache   Google   RUTEO CENTRAL

NAP REGIONAL — ISP, ISP, ISP, Gobierno, Universidad

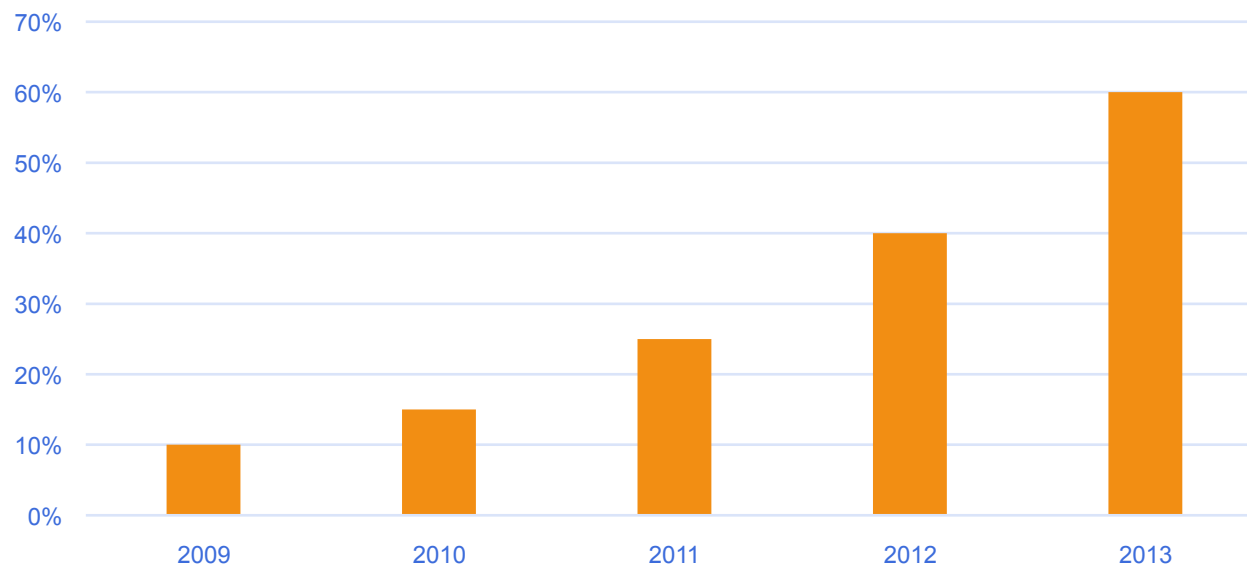NAP REGIONAL — ISP, ISP, Gobierno, ISP, Universidad

- **Relación 1 en 6**
- **Intercambio CACHE es por uso al 95 percentil .**
  Costo aprox. u$s 0,10 el Mb Google o u$s 2 el Mb

Tráfico del Miembro

70% X RED NAP CABASE

% del Tráfico del Miembro cursado por la red NAPs CABASE
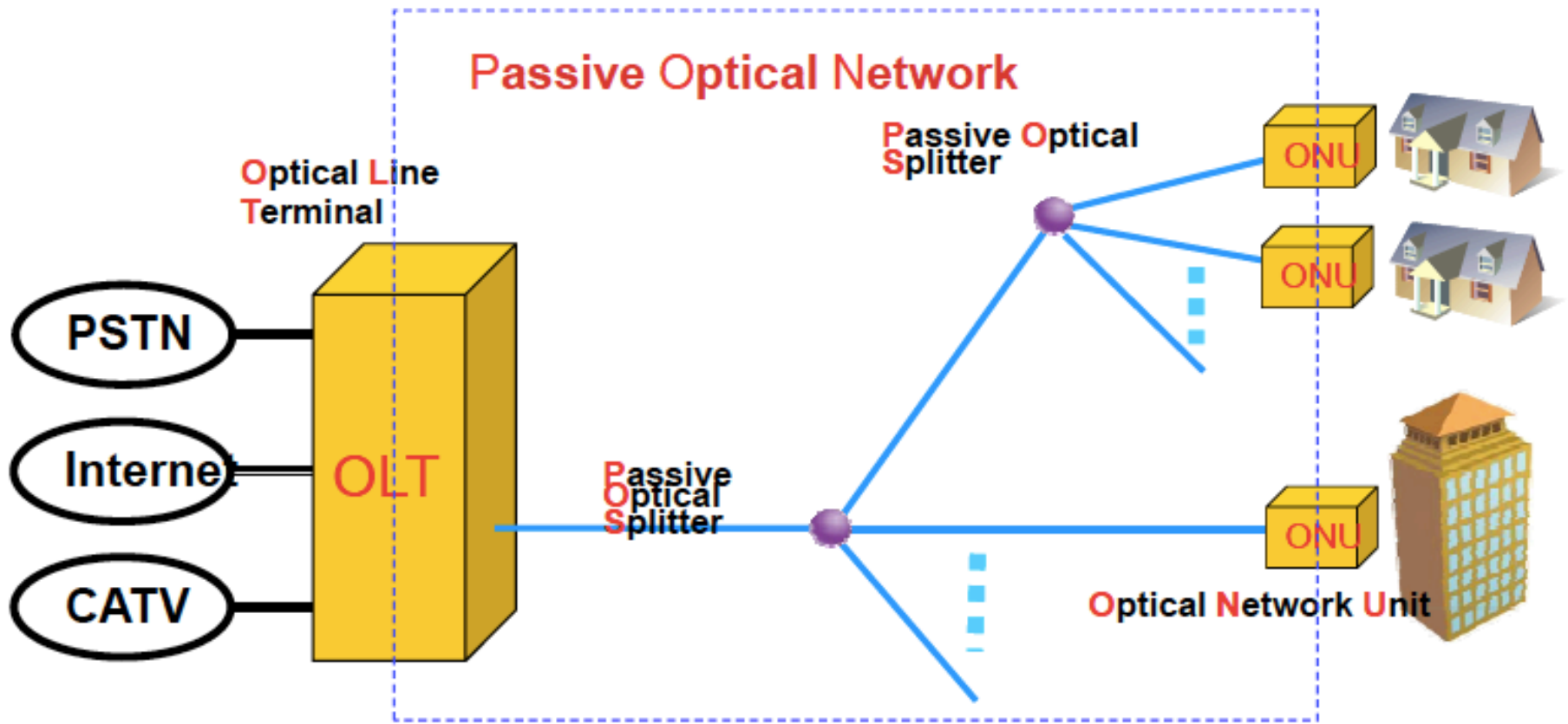

TIER 1

Bondades del modelo

- **Permite comprar a precios competitivos**

- **Permite realizar acuerdos bilaterales**

- **Permite pagar por Uso y obtener Descuentos por volúmenes generados en la red**

- **Permite Mejorar el ruteo y la velocidad de respuesta al usuario final**

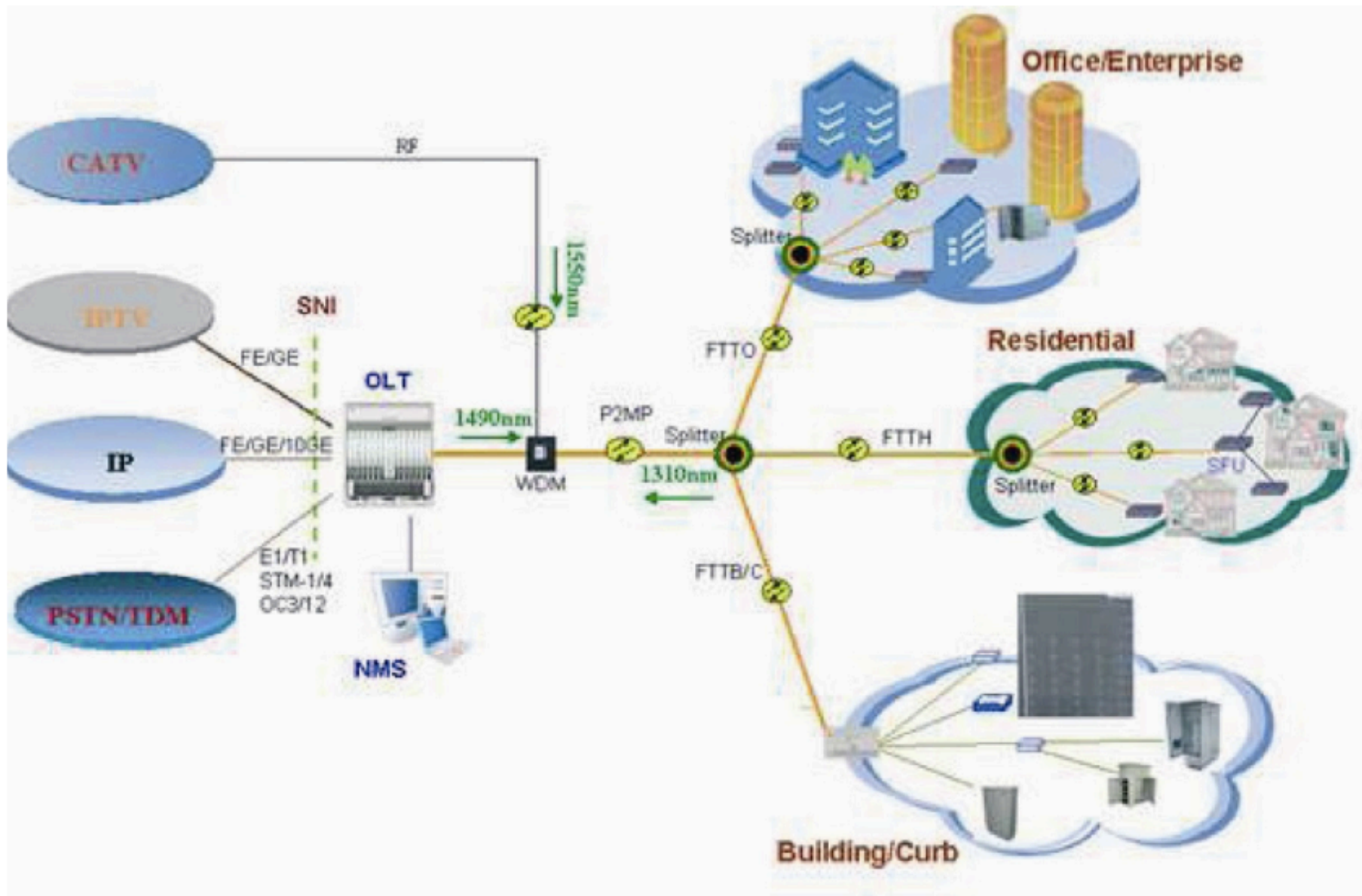- **Es un Punto Neutral, y sin fines de lucro**
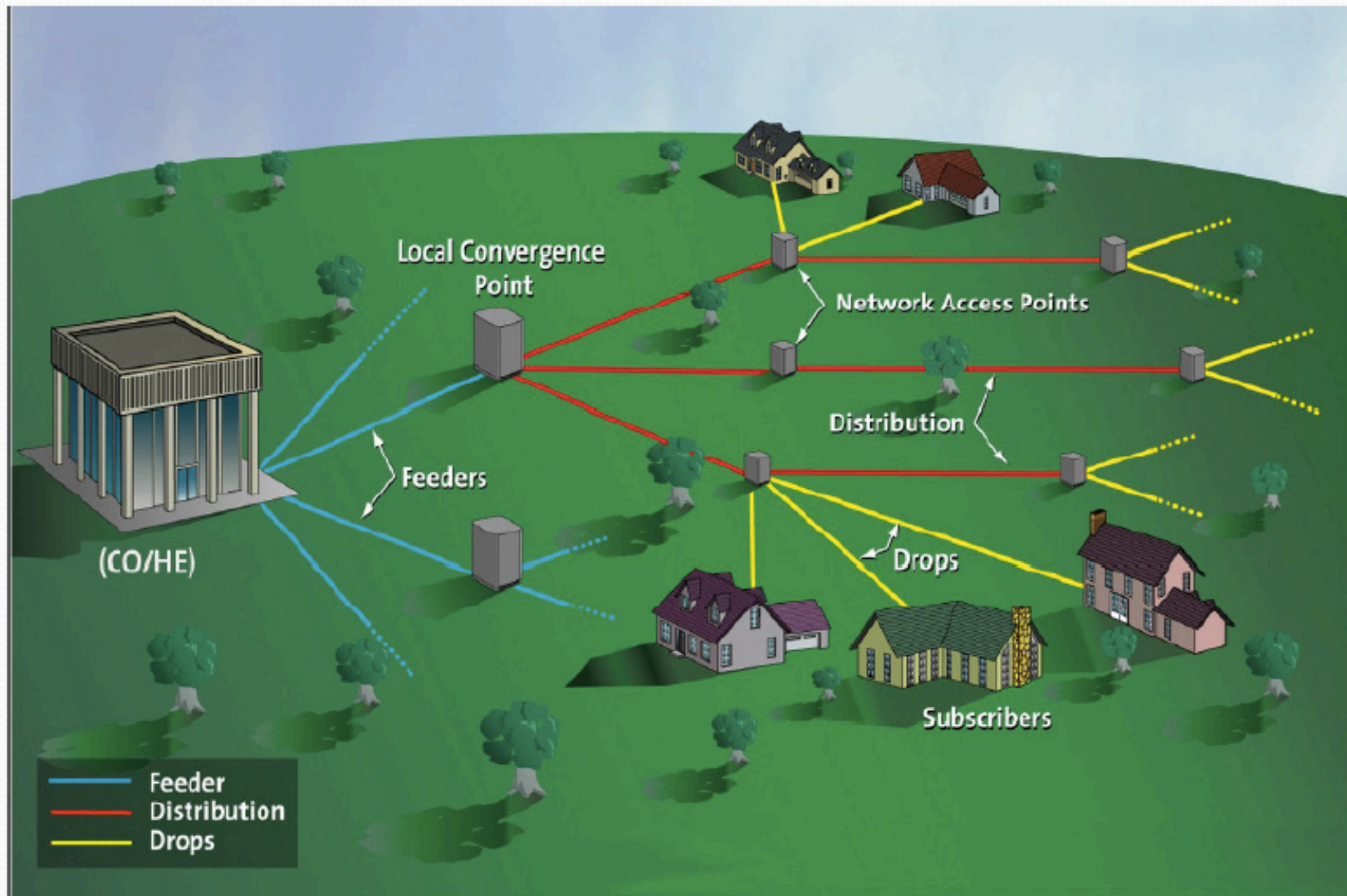
Modelos Presentes de Distribucion

- **REDES FTTH**

- **REDES TRONCALES**

Passive Optical Network
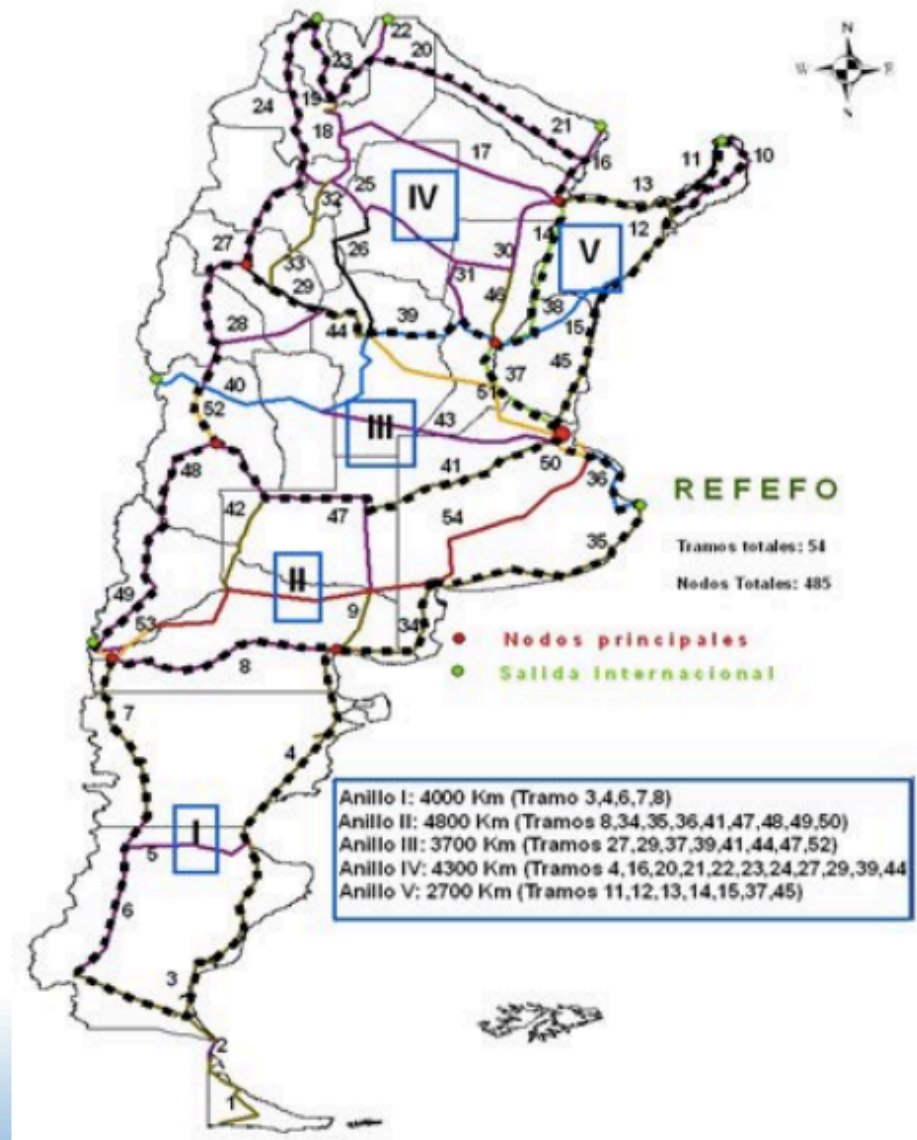
Optical Line Terminal

Passive Optical Splitter

PSTN

Internet

CATV

OLT

Passive Optical Splitter

ONU

ONU

ONU

Optical Network Unit

Esquema general de una red FTTH

Topología REFEFO

REFEFO

Tramos totales: 54

Nodos Totales: 485

● Nodos principales

● Salida internacional

Anillo I: 4000 Km (Tramo 3,4,6,7,8)
Anillo II: 4800 Km (Tramos 8,34,35,36,41,47,48,49,50)
Anillo III: 3700 Km (Tramos 27,29,37,39,41,44,47,52)
Anillo IV: 4300 Km (Tramos 4,16,20,21,22,23,24,27,29,39,44)
Anillo V: 2700 Km (Tramos 11,12,13,14,15,37,45)

Promover Internet

- **A Internet hay que promoverlo, NO regularlo!!!!**

Muchas Gracias !
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