

# Forum RNP 2016

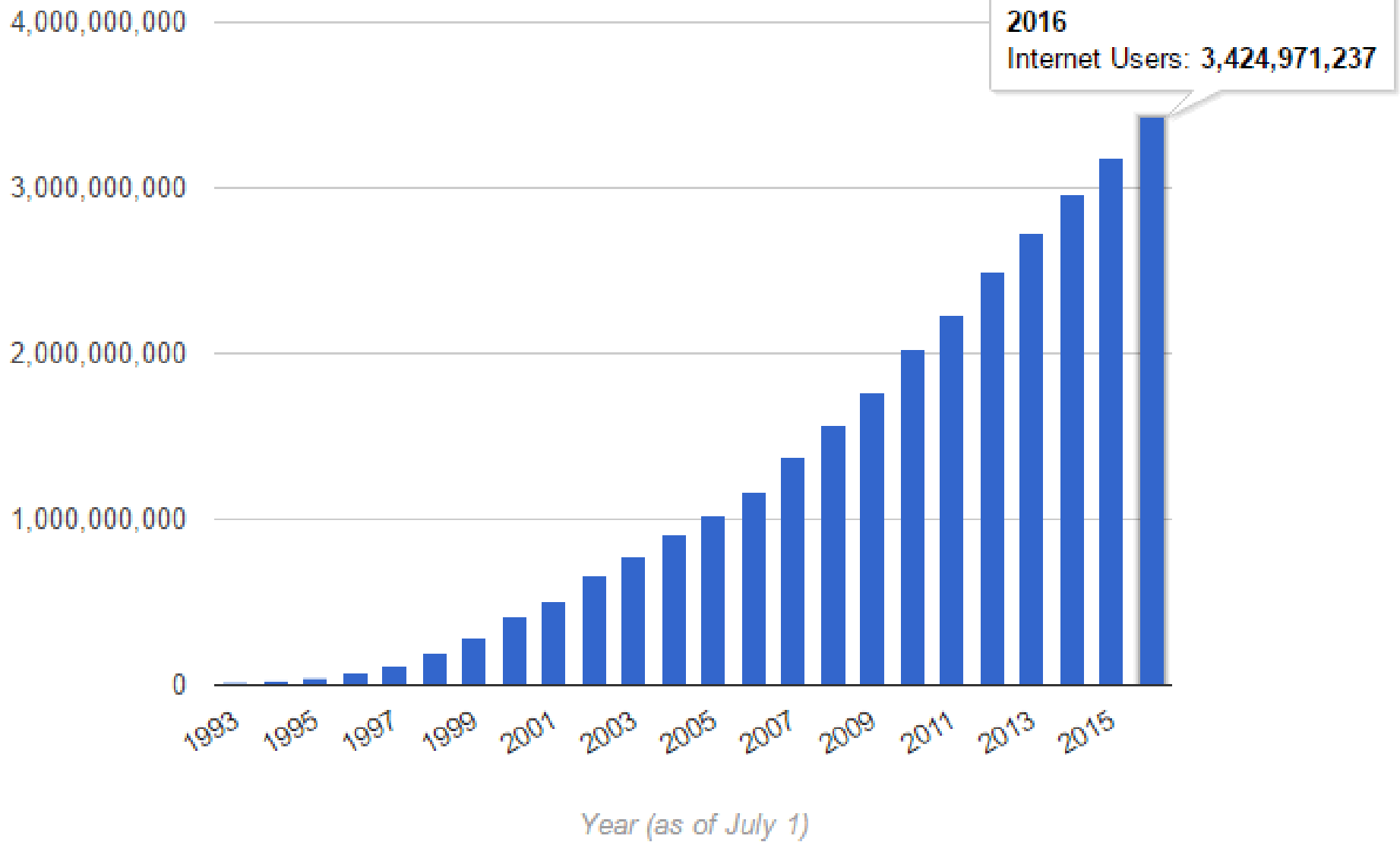
## **Cabos Submarinos e a Ascensão do Ceará como Hub Internacional**

João Pedro Flecha de Lima

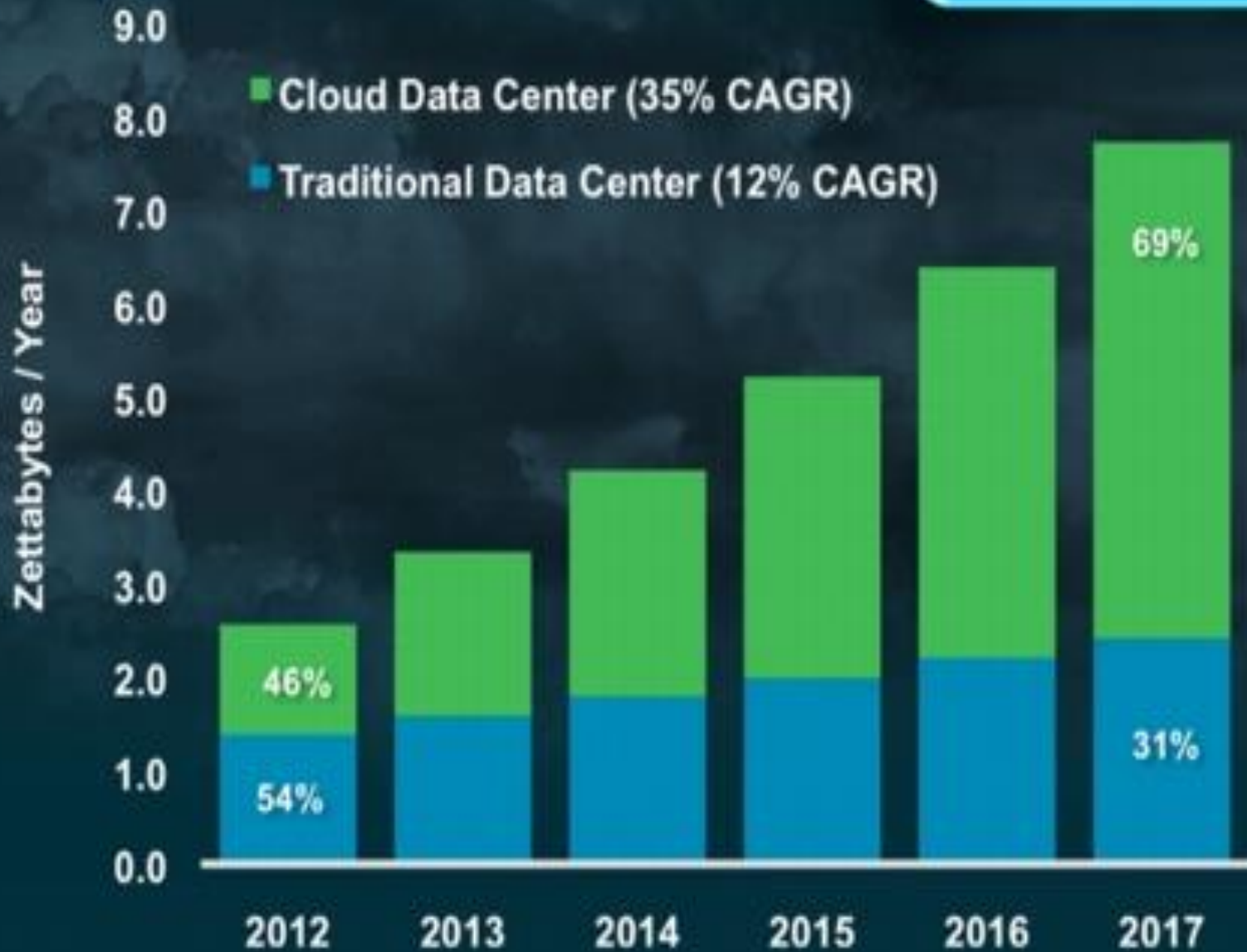
Brasília 10 de Nov. de 2016

**EllaLink**

## Internet Users in the World



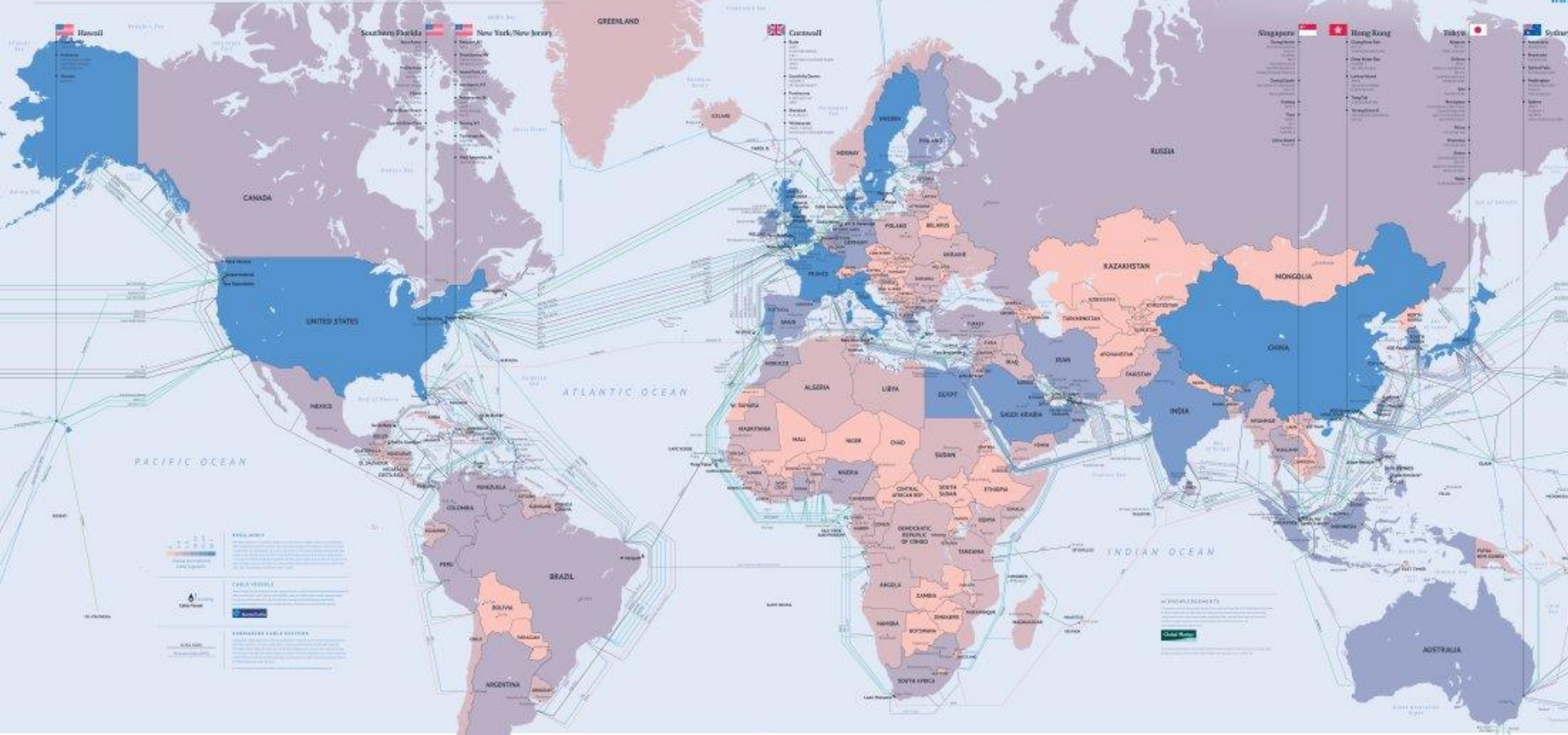
25% CAGR 2012-2017



# 2014 Submarine Cable Map

Designed by TeleGeography  
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 www.telegeography.com

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 www.mapbox.com



**KEY SYMBOLS**

- Active Cable
- Proposed Cable
- Under Construction

**CABLE TYPES**

- Optical Fiber
- Copper

**REMARKABLE CABLE SYSTEMS**

- SEA-ME-WE 3
- EURO-ASIA
- AFRICA-EUROPE

**ACKNOWLEDGMENTS**

TeleGeography

## Protectors of the Internet

Fiber-optic cables that traverse the bottom of the ocean floor form the backbone of the Internet. This critical global infrastructure relies on a small group of companies responsible for both the installation and maintenance of the more than 300 active submarine cable systems that interconnect the world.

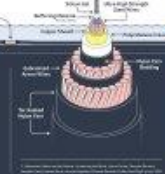


**CABLE INSTALLATION**

The design of a new cable system begins with a study of the ocean floor to ensure conditions for laying the cable are suitable. This involves geological surveys, and precise measurements of the proposed route of the cable system. Special survey vessels collect data, which is used to plan the installation.

The cable system is then installed in a trench or on the seabed. This is done using a cable-laying vessel, which is equipped with a large crane and a cable-laying machine. The cable is laid in a trench or on the seabed, and the trench is then filled with sand to protect the cable.

Once the cable is installed, it is tested to ensure it is working properly. This involves sending signals through the cable and measuring the time it takes to reach the other end. This test is repeated several times to ensure the cable is working properly.

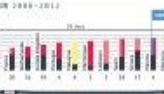


**CABLE MAINTENANCE**

Cable operators participate in various cable maintenance agreements, such as the Atlantic Cable Maintenance Agreement (ACMA), the Indian Ocean Cable Maintenance Agreement (IOCM), and the Pacific Cable Maintenance Agreement (PCMA).



Annual Indian Ocean, Atlantic, and ACE (North America-Central America) maintenance agreements, and the maintenance of submarine cable systems in the Indian Ocean, Atlantic, and Pacific Oceans. The operators of these cable systems have long been able to identify and repair faults quickly, and this has helped to ensure the reliability of the Internet.



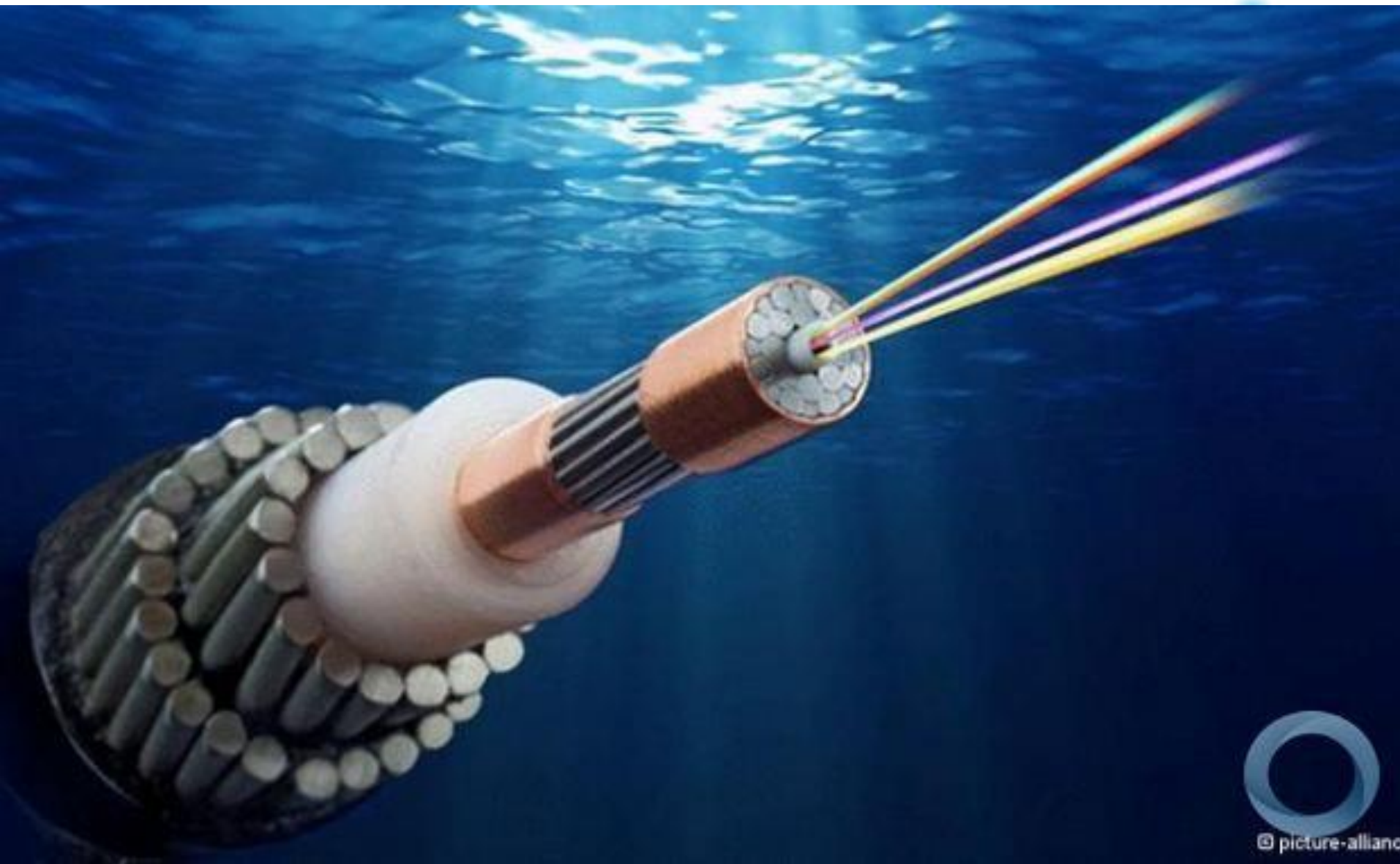
**CABLE FAULTS**

Many of the faults that occur on submarine cables are caused by physical damage to the cable. This can be caused by anchors, fishing gear, and other objects that come in contact with the cable. Faults can also be caused by natural disasters, such as earthquakes and tsunamis.

When a fault occurs, it is usually repaired within a few days. This is done by sending a repair vessel to the location of the fault. The vessel will then locate the fault and repair it. This process is usually completed within a few days, and the cable is then back in service.

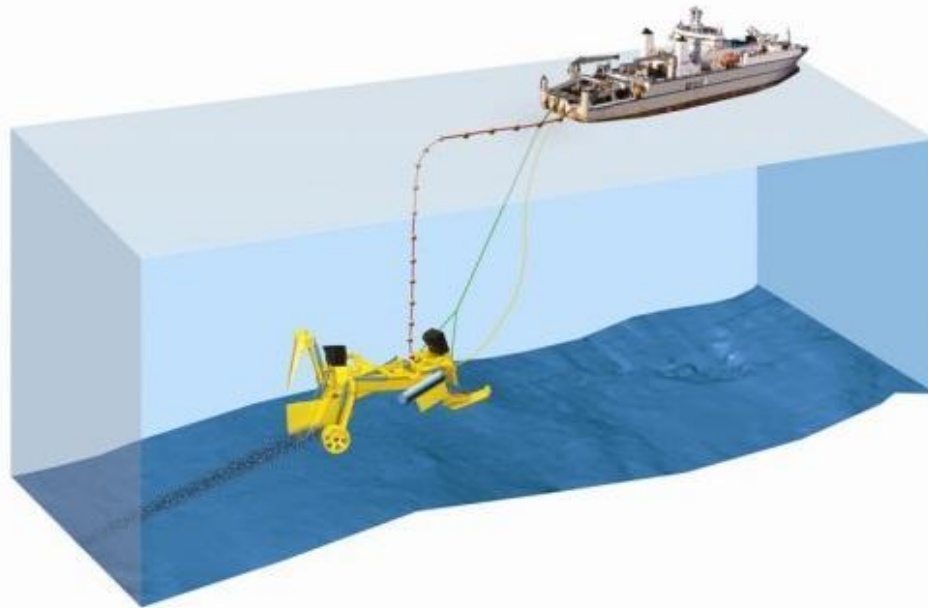


## Seção transversal de um cabo submarino com proteção de região costeira



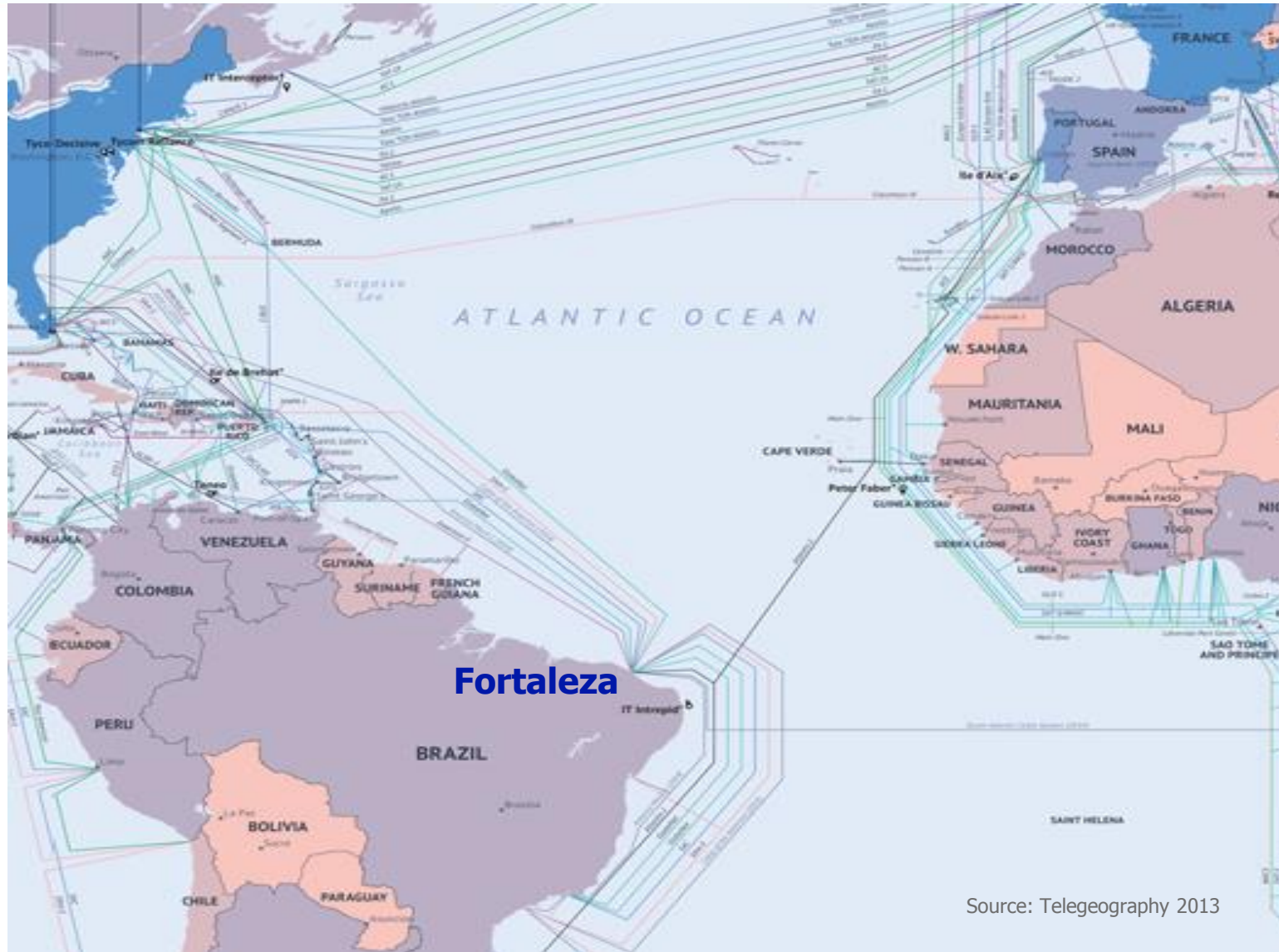
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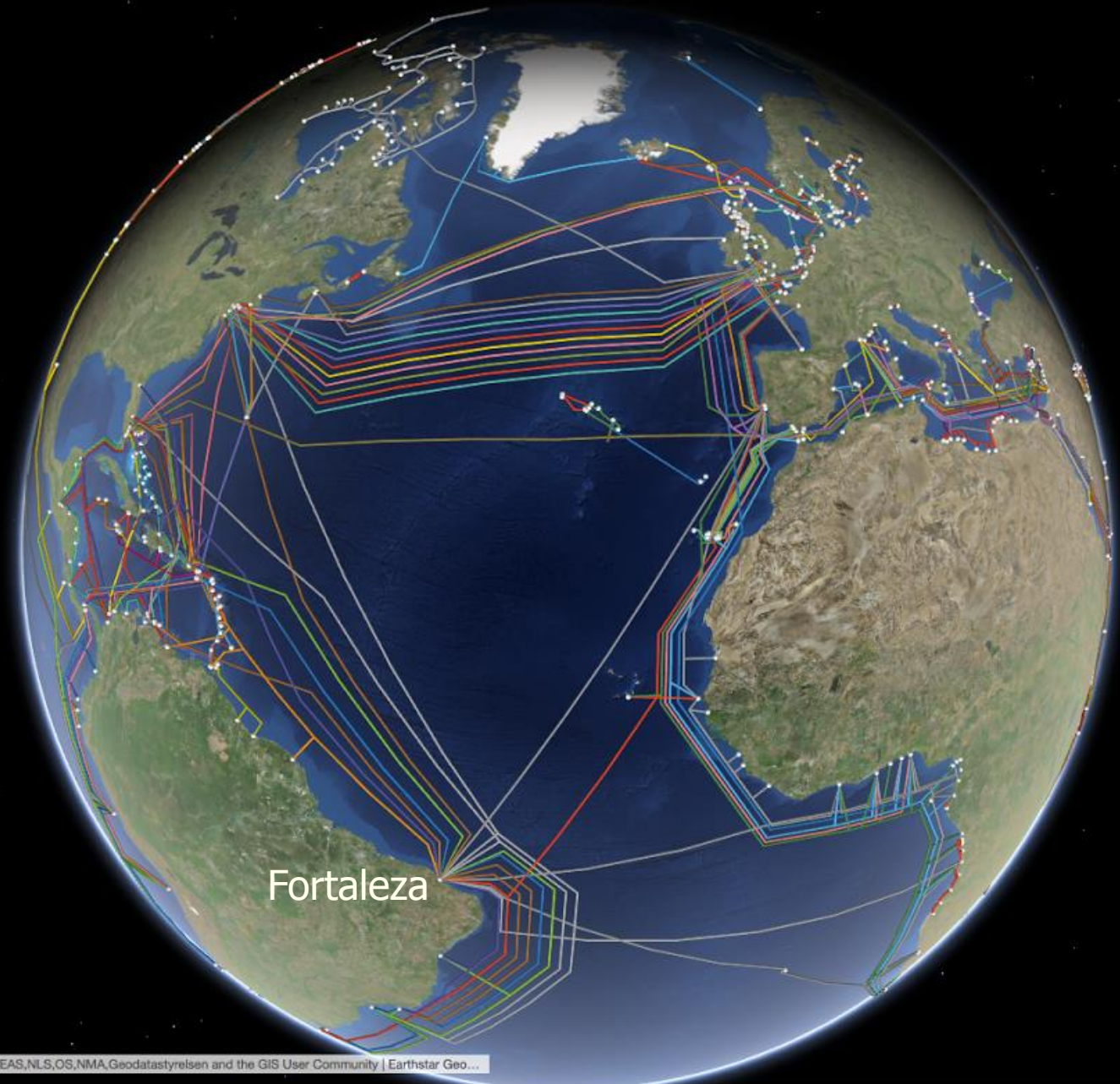
**EllaLink**





# A importância do Ceará como Hub Internacional de Cabos Submarinos é inconstestável





Fortaleza

Source: USGS, NGA, NASA, CGIAR, GEBCO, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen and the GIS User Community | Earthstar Geo...



## Cabos Submarinos chegando em Fortaleza e ano RFS

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- [Americas-II](#) - 2000
- [Atlantis-2](#) - 2000
- [GlobeNet](#) - 2000
- [South American Crossing \(SAC\)/Latin American Nautilus \(LAN\)](#) - 2000
- [South America-1 \(SAm-1\)](#) - 2001
- [America Movil Submarine Cable System-1 \(AMX-1\)](#) – 2014
  
- [Monet](#) - 2017
- [BRUSA](#) - 2018
- [EllaLink](#) - 2018
- [South Atlantic Cable System \(SACS\)](#) - 2018
- [South Atlantic Inter Link \(SAIL\)](#) - 2018

# Praia do Futuro





**EllaLink:** Um cabo de 72Tbps,  
conectando Fortaleza e Praia  
Grande diretamente com a Europa

Portugal

9.501 km

727 km

Fortaleza

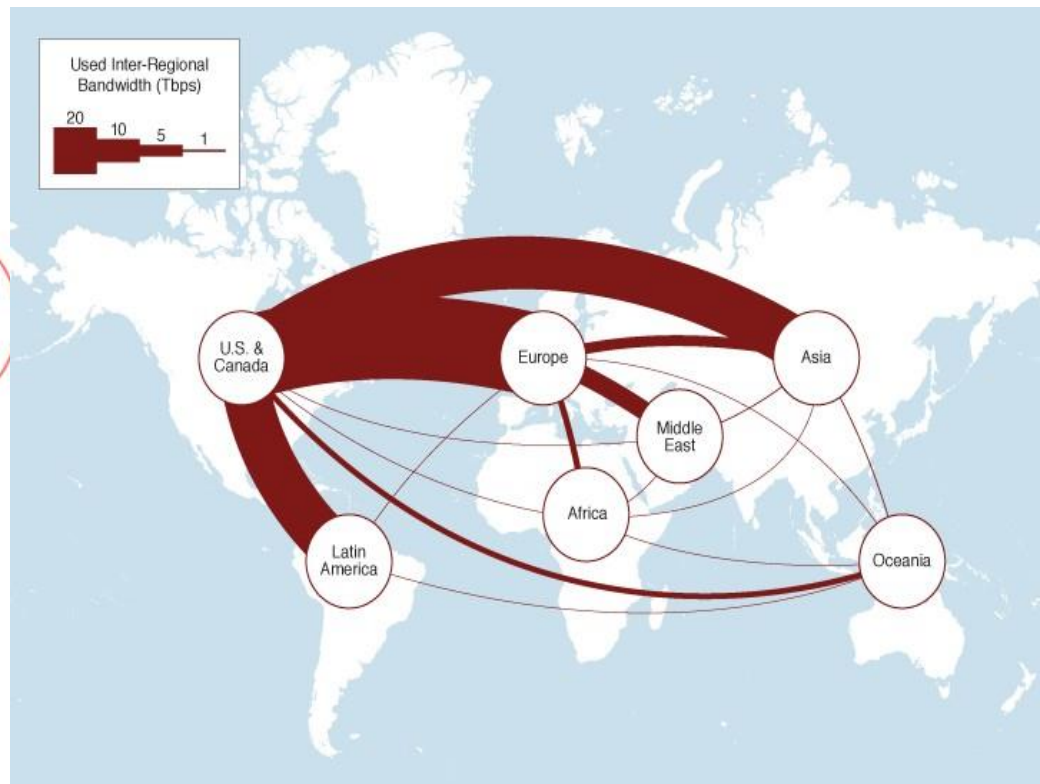
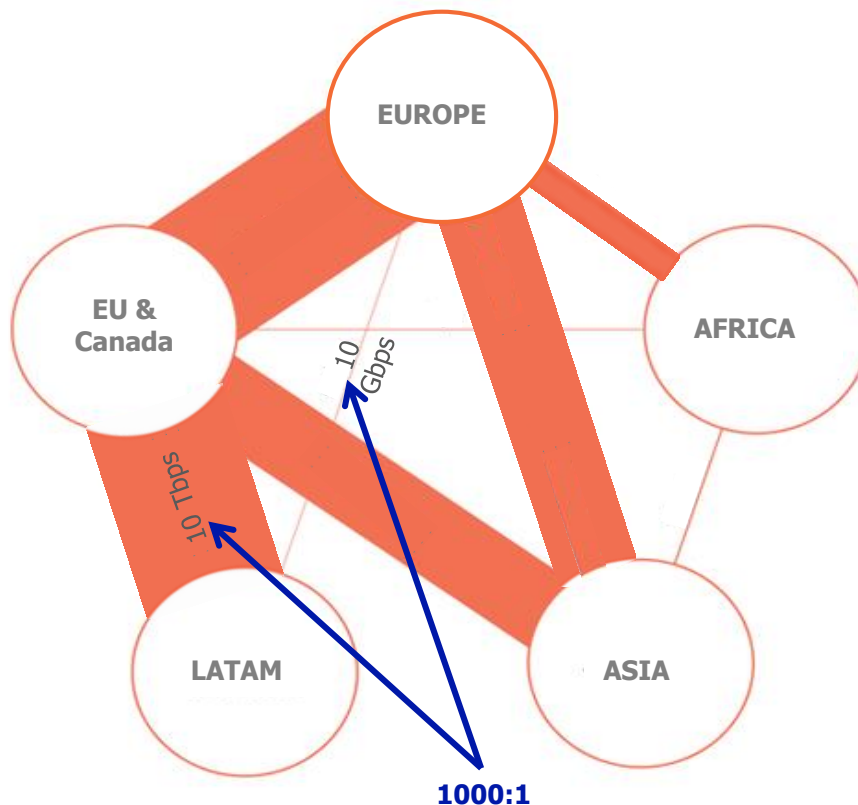
Praia Grande

**EllaLink**



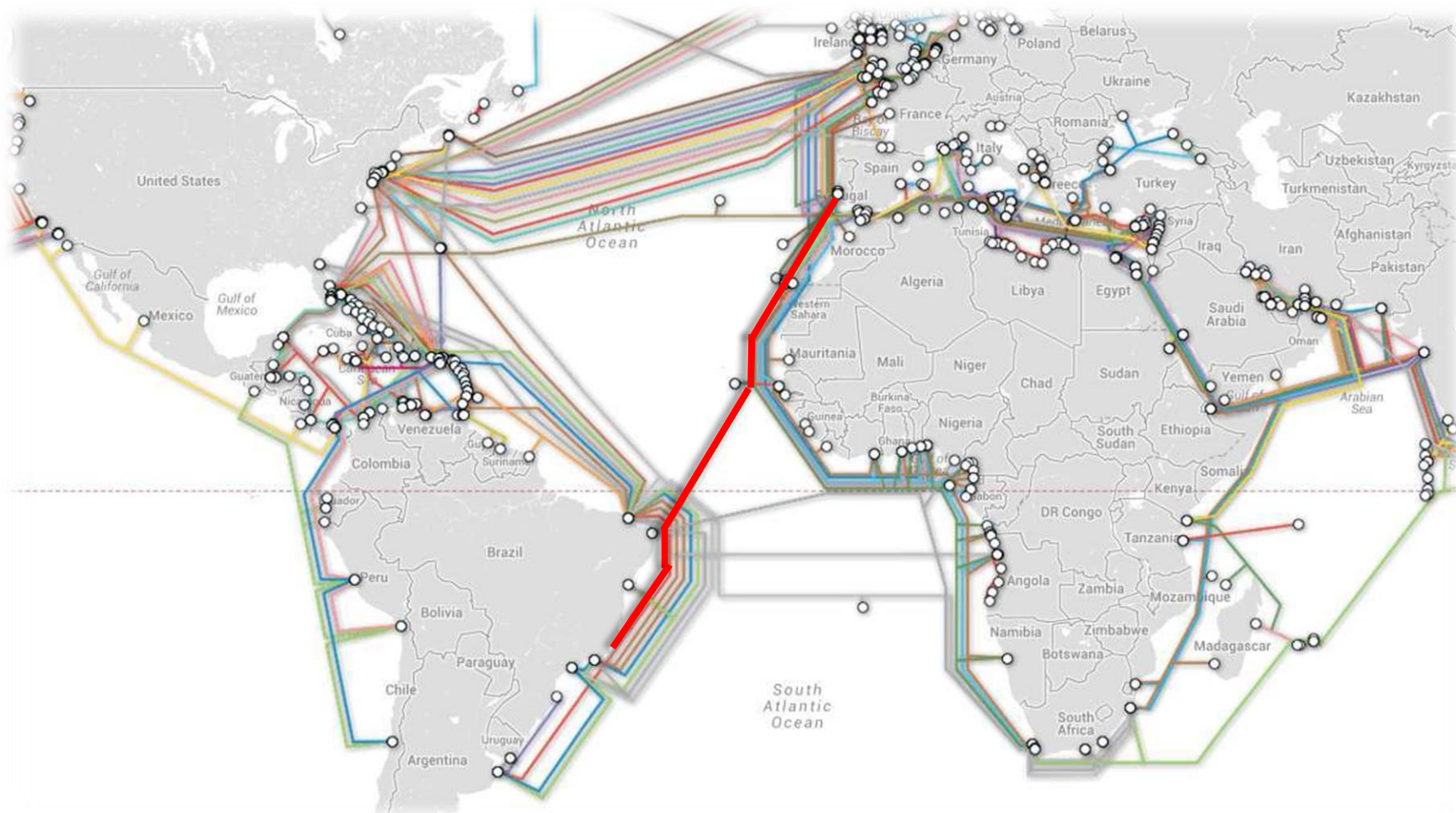


# O tráfego entre os cabos submarinos que ligam o Brasil aos EUA é 1.000 vezes superior aos da rota direta para a Europa

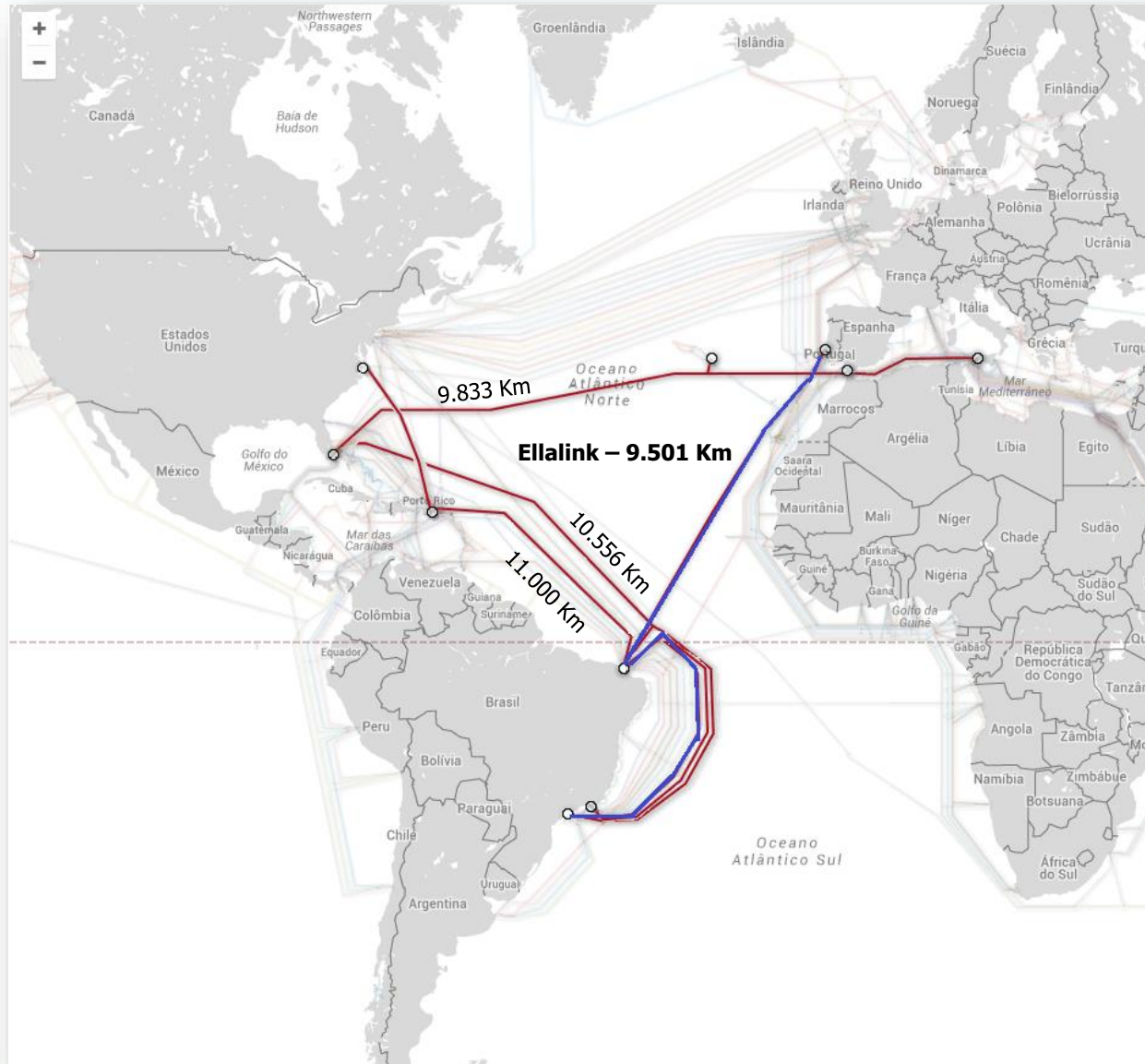


Source: Telegeography

# O cabo submarino EllaLink será o único que ligará diretamente Fortaleza à Europa com tecnologia de ponta



# A rota Fortaleza - Europa via EUA tem, pelo menos, o dobro da distância quando comparada à ligação direta entre as duas localidades





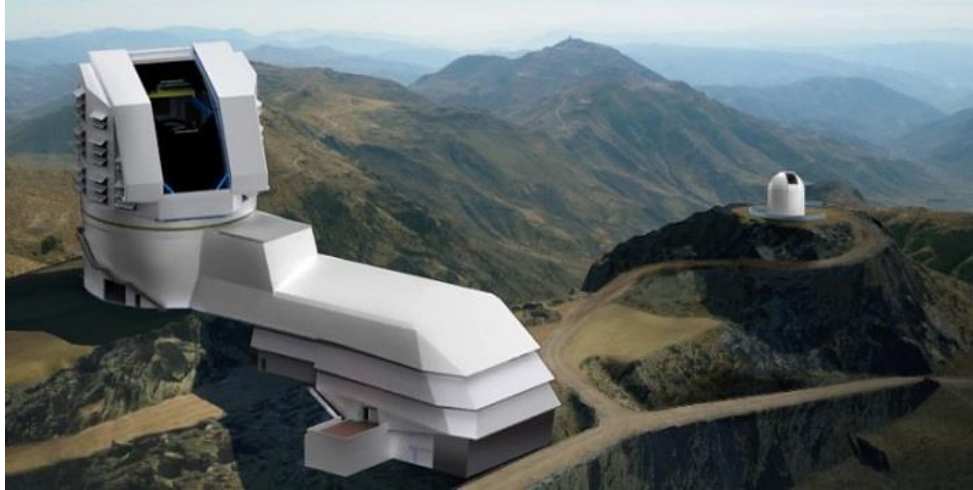
# Exemplos de Aplicações Sensíveis a Latência

MERCADOS FINANCEIROS - HFTs

JOGOS



# APLICAÇÕES CIENTÍFICAS



Quando o LSST começar a capturar imagens de todo o céu visível do Sul em 2022, produzirá os pontos de vista mais amplos, profundos e de maneira mais rápida, de todo o céu noturno já observado.

Créditos da imagem: Large Synoptic Survey Telescope Project Office



O Large Hadron Colider é o mais poderoso acelerador de partículas do mundo. Milhares de ímãs de diferentes variedades e tamanhos são utilizados para direcionar os feixes ao redor do acelerador.

Créditos da imagem: CERN



# 7 dos 10 maiores Pontos de Troca de Tráfego\* estão na Europa

 **TeleGeography**  
**Internet Exchange Map**

The Internet Exchange Map is a free resource from TeleGeography. Data contained in this map was compiled by TeleGeography and is updated on a regular basis.

To learn more about TeleGeography or this map, please visit [www.telegeography.com](http://www.telegeography.com)

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Country	City	Gbps
UK	London	7723
Germany	Frankfurt	7218
France	Paris	6527
Netherlands	Amsterdam	5757
USA	New York	3850
USA	Miami	2167
Sweden	Stockholm	2111
Italy	Milan	1659
USA	Washington	1626
Spain	Madrid	1511





# Opção de Diversidade Geográfica e Regulatória: $\frac{3}{4}$ do conteúdo acessado por brasileiros na internet também está disponível na Europa

Google

YAHOO!

facebook

Apple iTunes

You Tube

NETFLIX

Linked in

ebay

amazon.es

Baidu 百度

Alibaba.com<sup>®</sup>  
Global trade starts here.™

Apple TV

# Multinacionais europeias e latino-americanas precisam conectar suas redes corporativas para aplicações "Cloud", Video-Conferência, etc.





## Praticamente todos os dados que entram ou saem do Brasil passam pelos EUA, sobretudo pelo NAP of The Americas, em Miami



O NAP das Américas tem acesso a 160 operadoras globais e 1/3 do edifício é ocupado pela NSA.



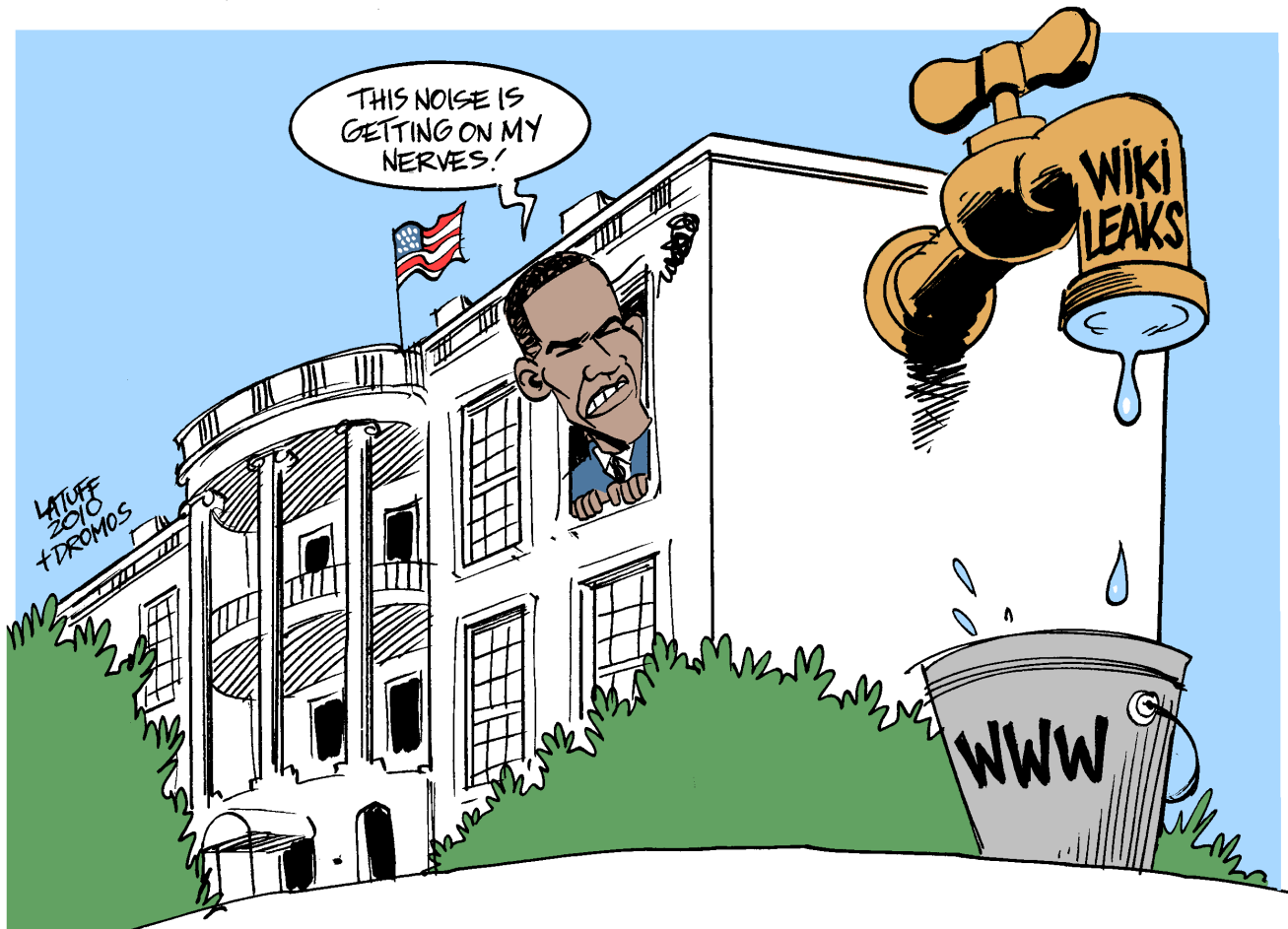
# Ao passar pelos EUA os dados brasileiros são monitorados pela NSA e outras agências de segurança, conforme revelado por Edward Snowden

ESPIONAGEM...





# Obama e sua candidata Hillary Clinton acabaram sendo vítimas de vazamentos de dados e informações sigilasas



# Trump prometeu construir um muro no norte do México, o que separaria não apenas o país, mas toda América Latina dos EUA.







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