



**RIPE NCC**  
RIPE NETWORK COORDINATION CENTRE

# Internet Governance & Climate Action

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**"Traces of Power"**

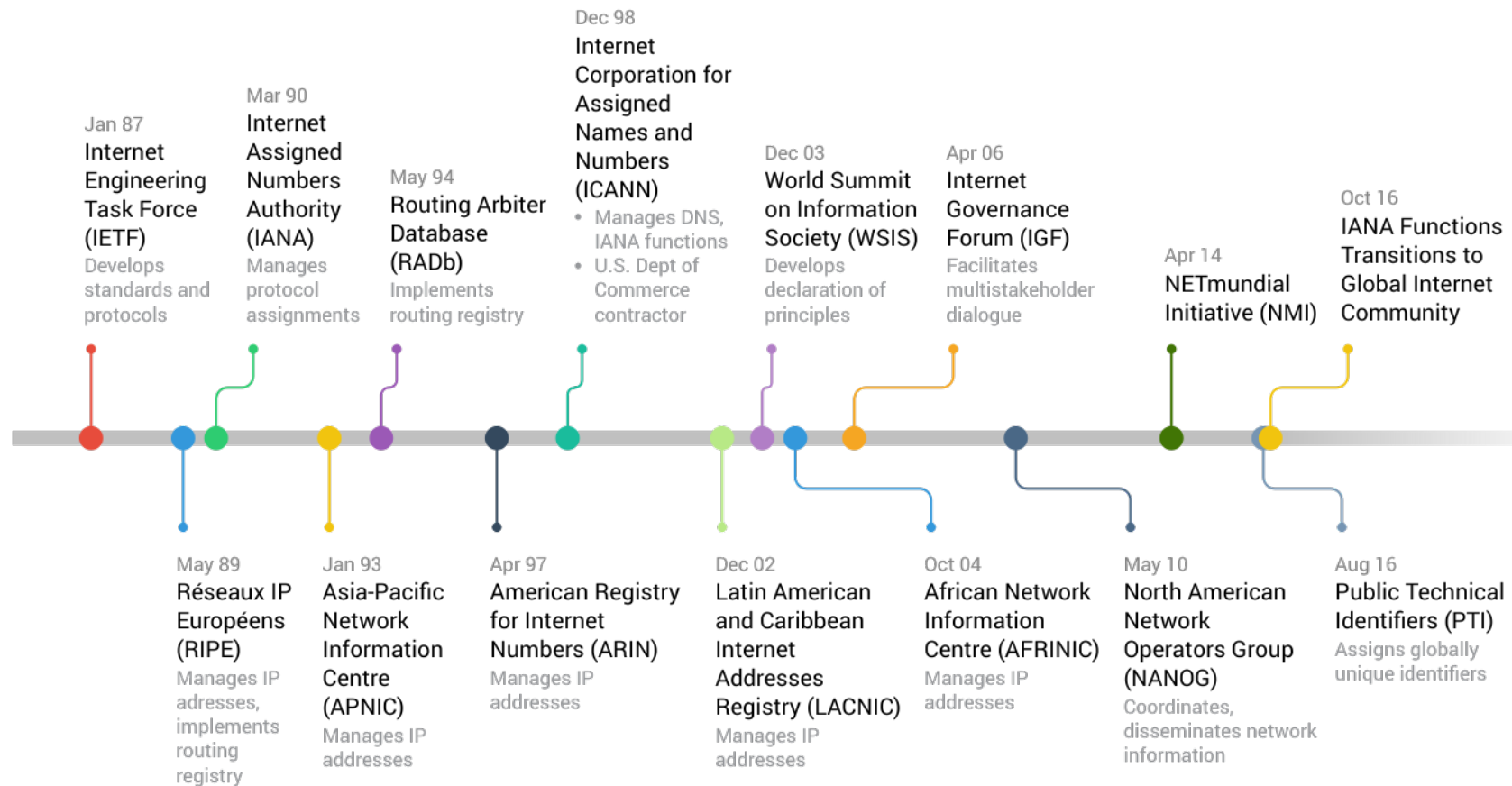
<https://top.permacomputing.net/>

Vesna Manojlovic | 2024-03-07 | WdKA, Rotterdam

# Vesna Manojlovic Internet Governance & Environmental (un)Sustainability

We are in an environmental emergency! As a part of Internet Governance community, technical communities must focus on immediate actions of decreasing material & energy consumption, reducing GHG emissions and decelerating growth. Let's build the Internet within planetary boundaries. Vesna Manojlovic is a hacker, mother, activist, feminist and community builder at RIPE NCC, a regional internet registry.  
<https://labs.ripe.net/author/becha/>

# Internet governance timeline



# “Data is the New Oil”



**THE INTERNET USES A HUGE AMOUNT OF ENERGY. THIS IS DUE TO TWO KEY FACTORS:**

## MANUFACTURING AND SHIPPING



Technology companies must manufacture and ship the internet's hardware including:



COMPUTERS

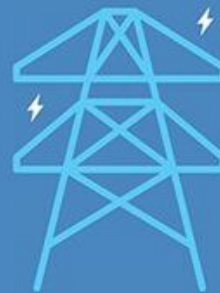


SMARTPHONES



SERVERS

## POWERING AND COOLING



Computers and smartphones must be powered and cooled, drawing electricity from local grids.

This power is generated in different ways with varying emissions!



COAL



NATURAL GAS



NUCLEAR



RENEWABLES



© Henry Hering CC0 1.0

© Walery CC0 1.0

**1860s - 1910s, England**  
Statistician Florence Nightingale & physician Elizabeth Garrett Anderson, women's suffrage movement



© Cyro A. Silva CC BY 2.0

**1920s, Brazil**  
Biologists from National Museum, environmental protection



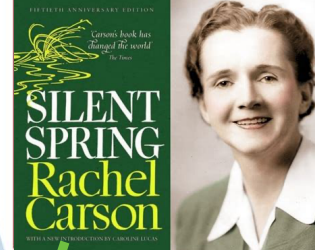
**1960 - present, USA**  
Science for the People collective, anti-war and social justice



© SR Nigeria



© SR Spain



**1962**



© SR Panamá

**2020s, Worldwide**  
Scientist Rebellion, climate and ecological breakdown

Vesna Manojlovic @becha - 2 hours ago  
Eunice Newton Foote wrote a first paper (1856) on relationship between carbon dioxide and the earth's climate <https://archive.vn/DPhg2>



ALT ewton Foote. (Victorial Press Ltd./Alamy)

1860

1890

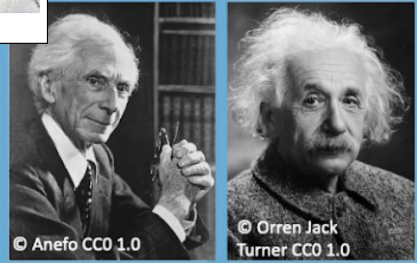
1920

1950

1980

2010

**1856!**



© Anefo CC0 1.0

© Orren Jack Turner CC0 1.0

**1957, USA & Europe**  
Nobel winners' Russell-Einstein Manifesto, abolition of atomic weapons and war



© NASA CC0 1.0

**1988 - present, USA**  
Climatologist James Hansen, climate change



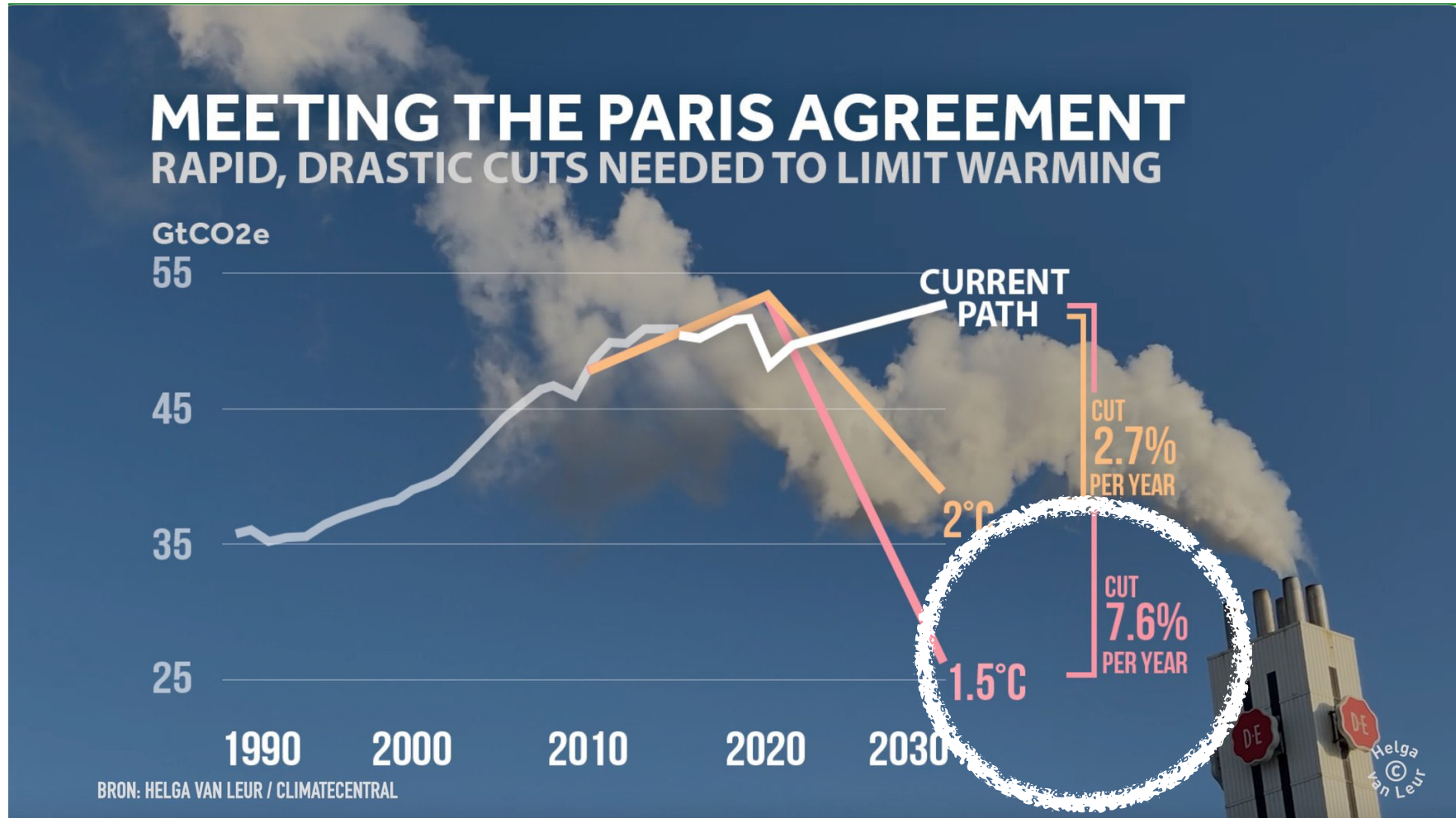
© Stefan Müller CC BY 2.0

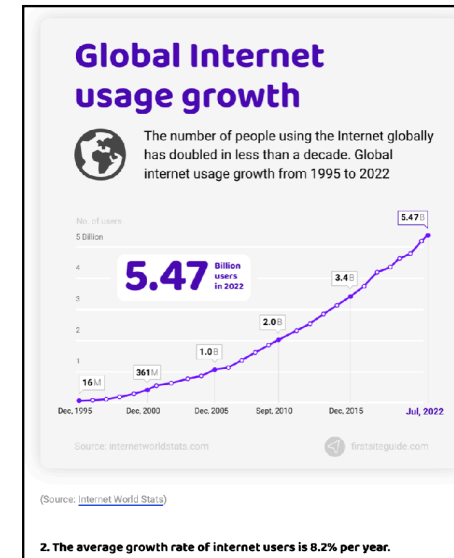
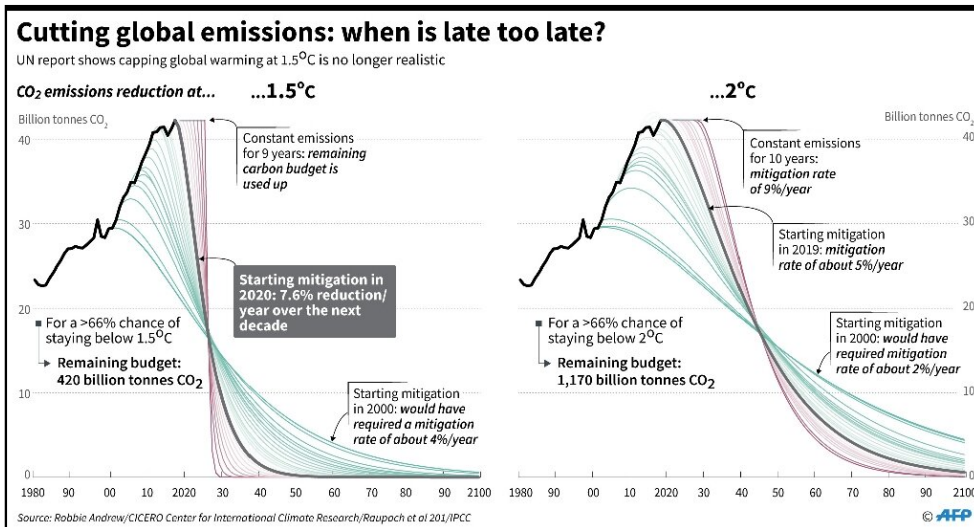
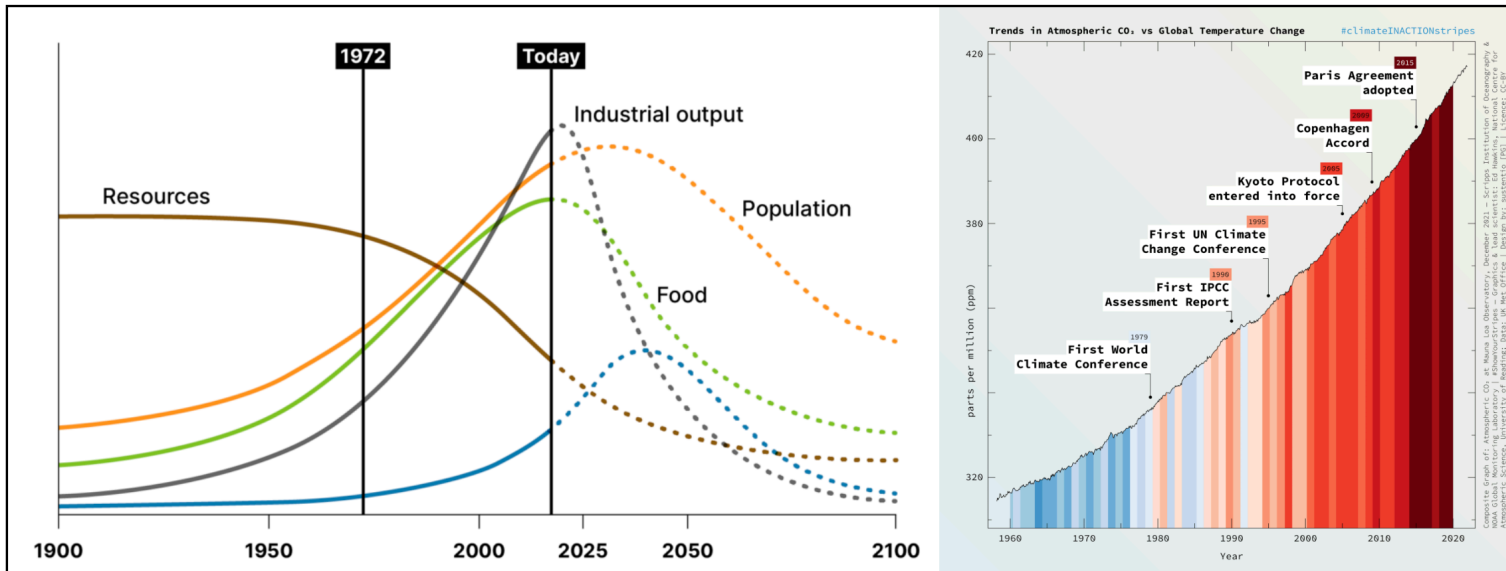
**2018 - present, Argentina**  
Biologist Esteban Servat, social struggles and environmental abuse



# scientist rebellion\_



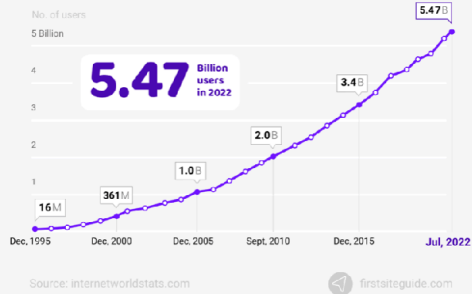




## Global Internet usage growth



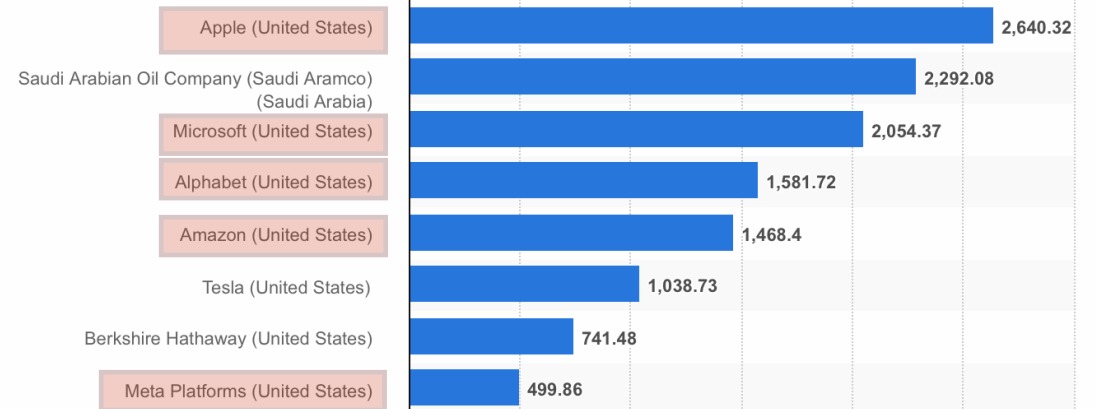
The number of people using the Internet globally has doubled in less than a decade. Global internet usage growth from 1995 to 2022



(Source: [Internet World Stats](https://www.internetworldstats.com))

2. The average growth rate of internet users is 8.2% per year.

## The 100 largest companies in the world by market capitalization in 2022 (in billion U.S. dollars)



Source: <https://www.statista.com/statistics/263264/top-companies-in-the-world-by-market-capitalization/>

## Global trends in digital and energy indicators, 2015-2021

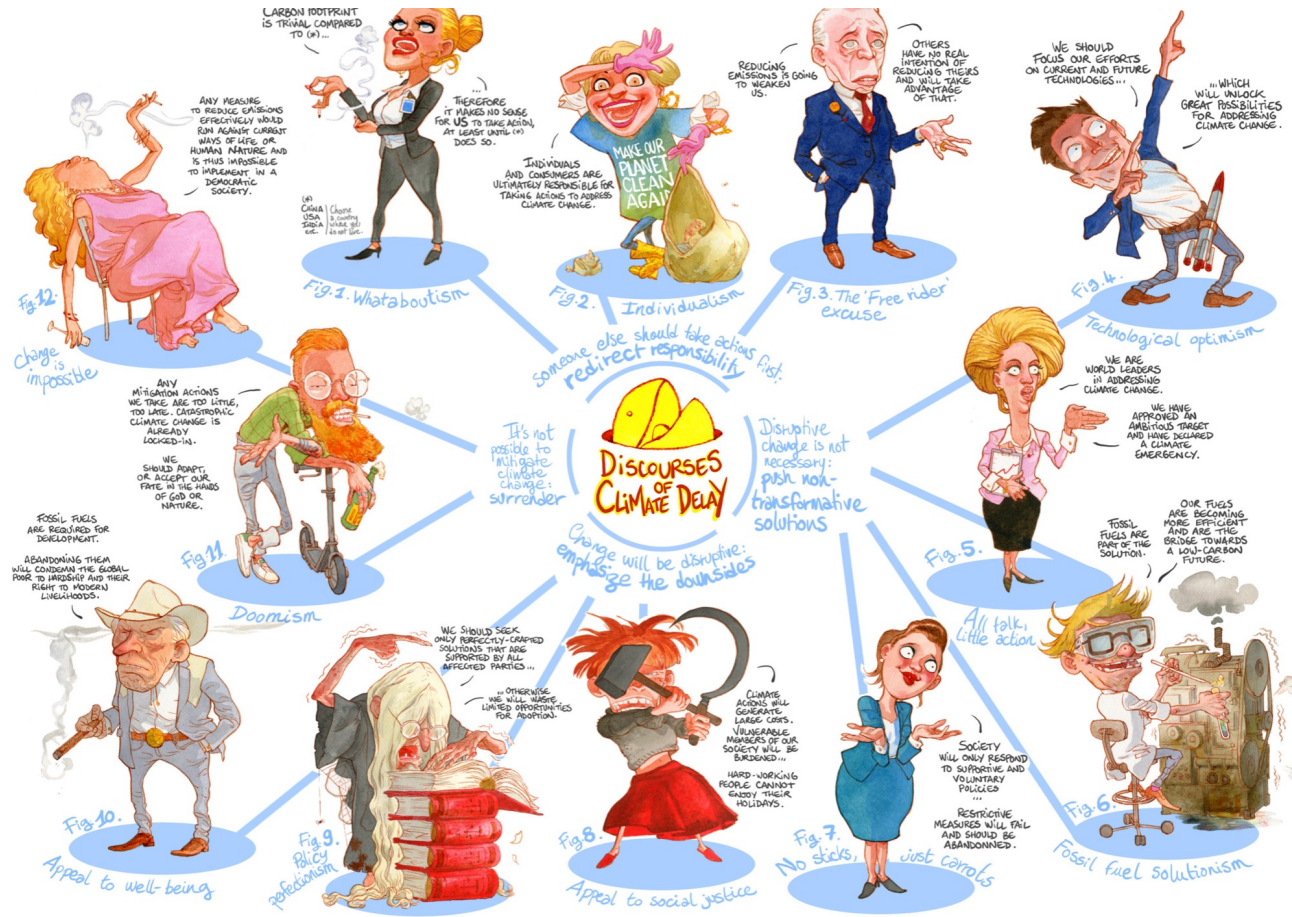
	2015	2021	Change
Internet users	3 billion	4.9 billion	+60%
Internet traffic	0.6 ZB	3.4 ZB	+440%
Data centre workloads	180 million	650 million	+260%
Data centre energy use (excluding crypto)	200 TWh	220-320 TWh	+10-60%
Crypto mining energy use	4 TWh	100-140 TWh	+2 300-3 300%
Data transmission network energy use	220 TWh	260-340 TWh	+20-60%

Source: <https://www.iea.org/reports/data-centres-and-data-transmission-networks>

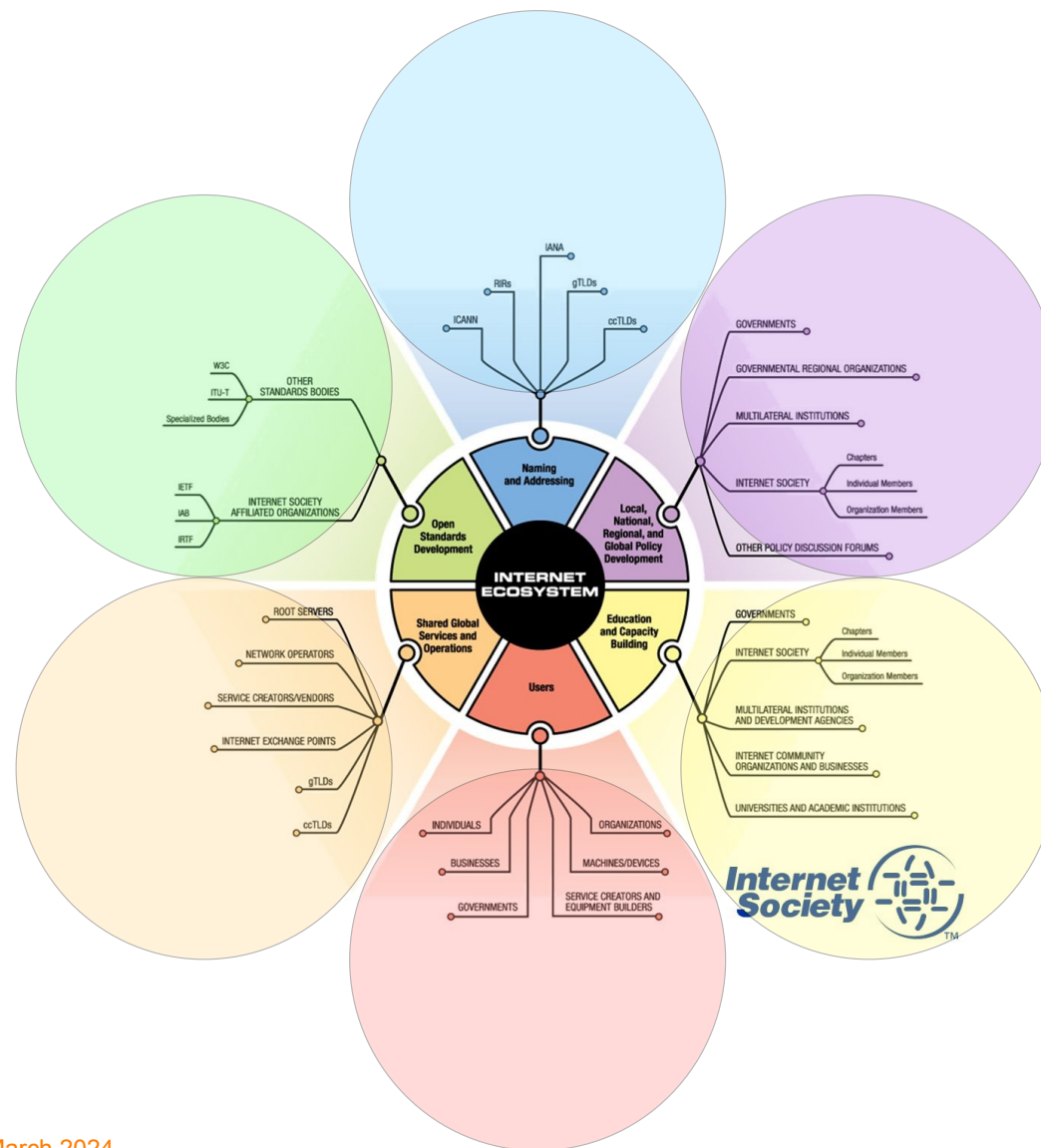


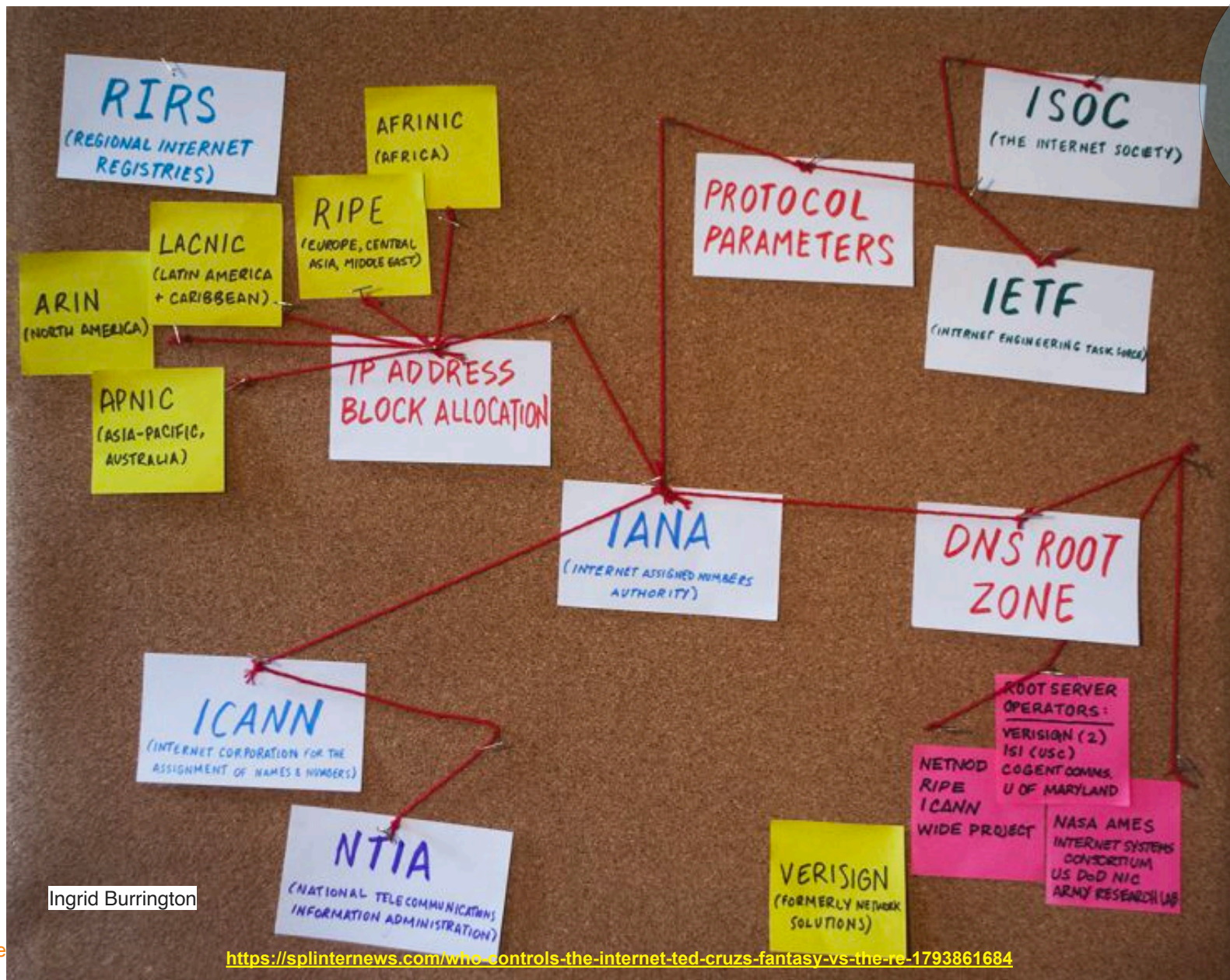


# “Delay is the New Denial”



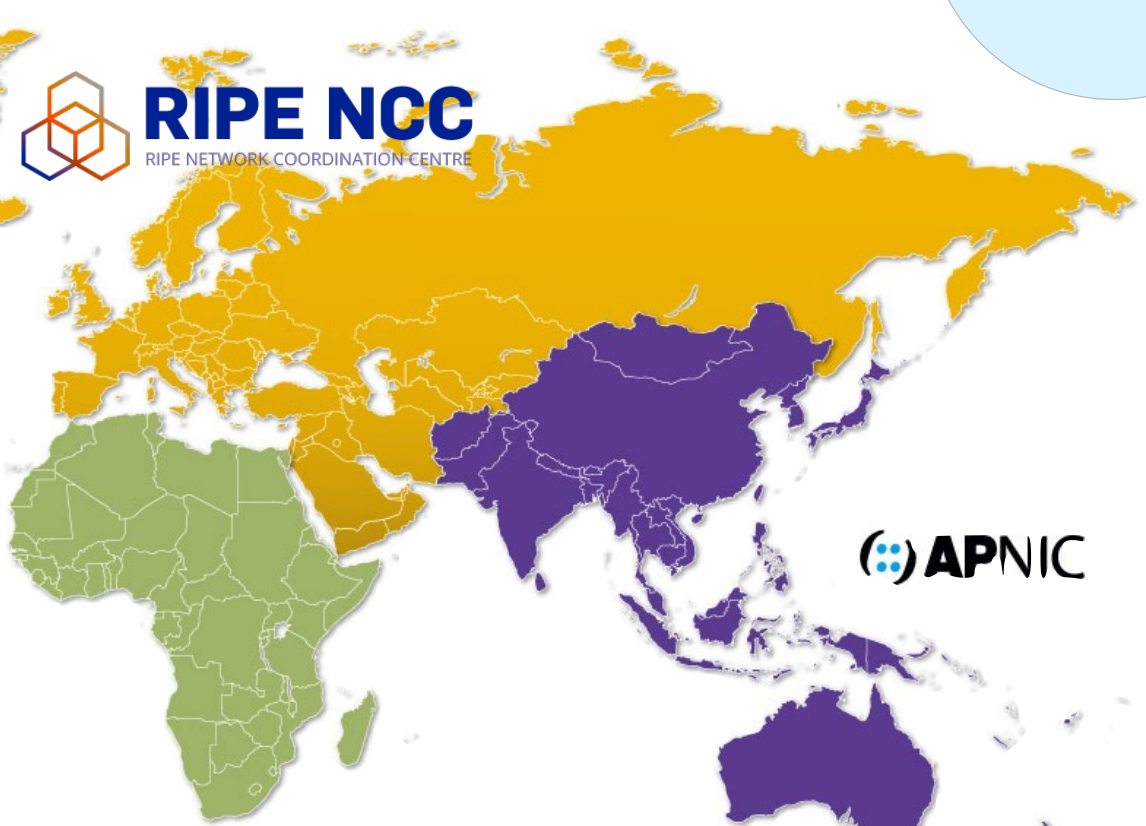
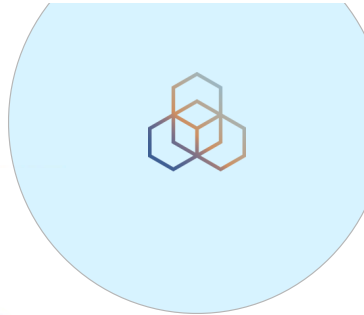
<https://www.researchgate.net/publication/342596080> Discourses of climate delay



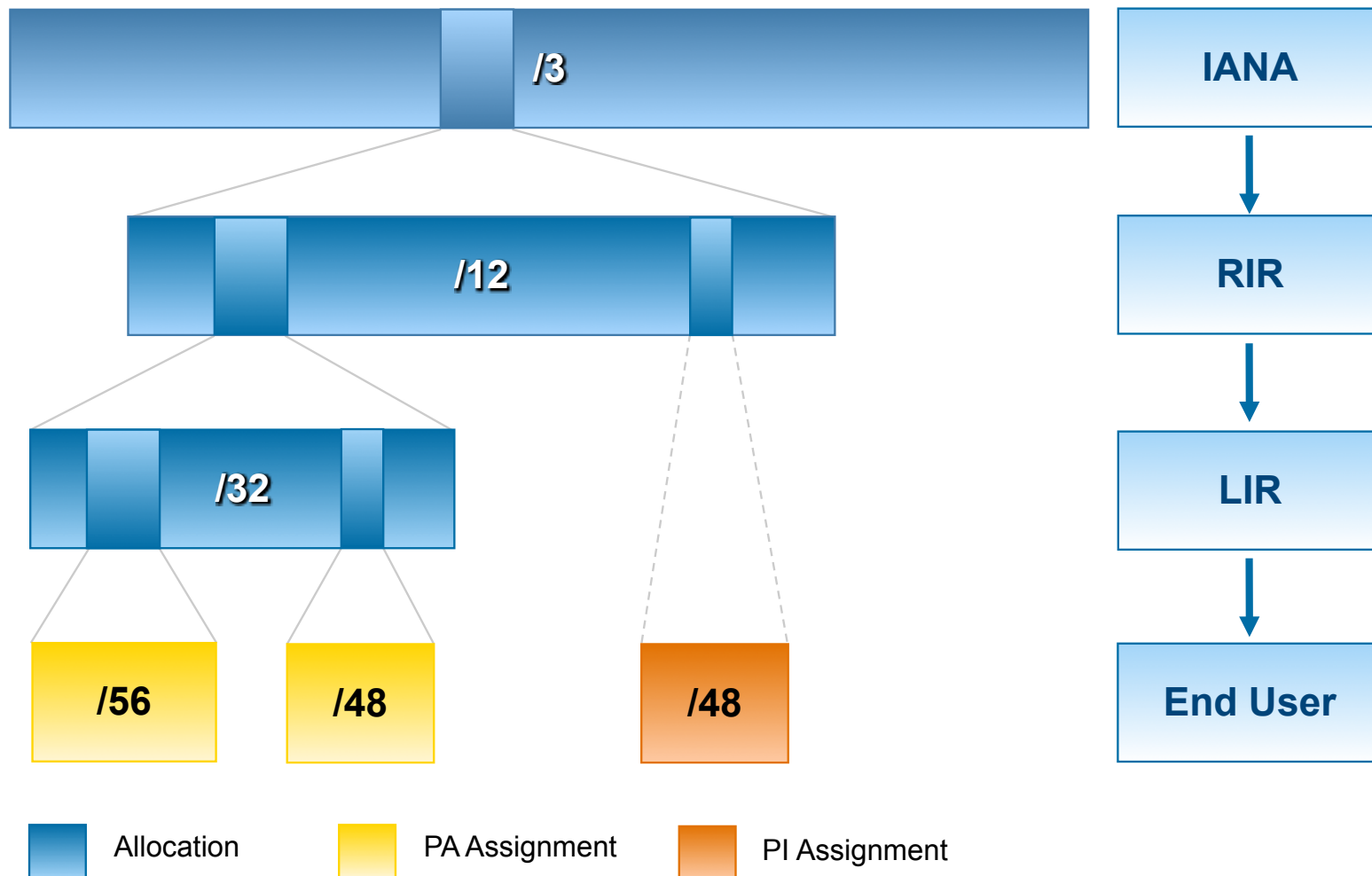
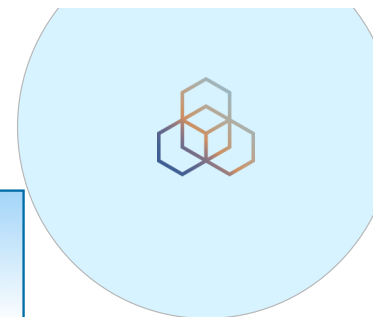


Ingrid Burrington

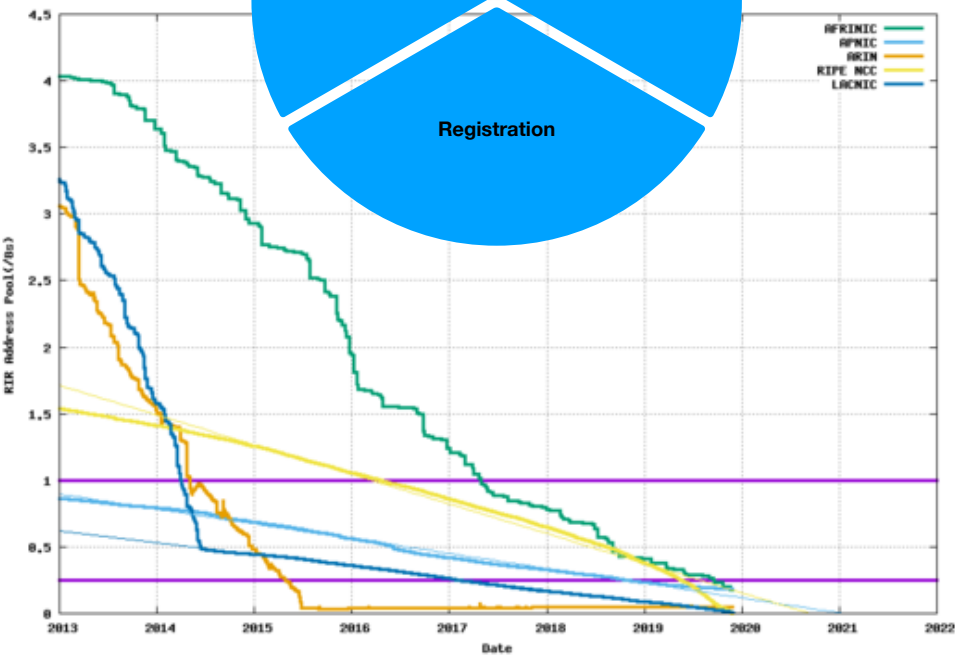
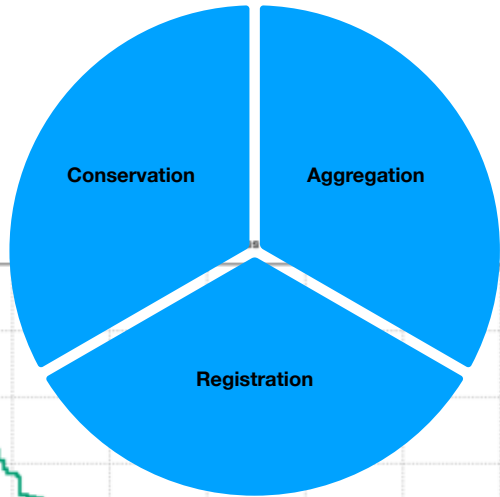
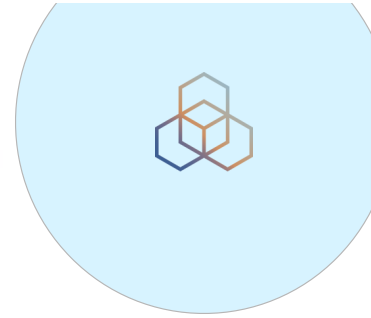
# Regional Internet Registries



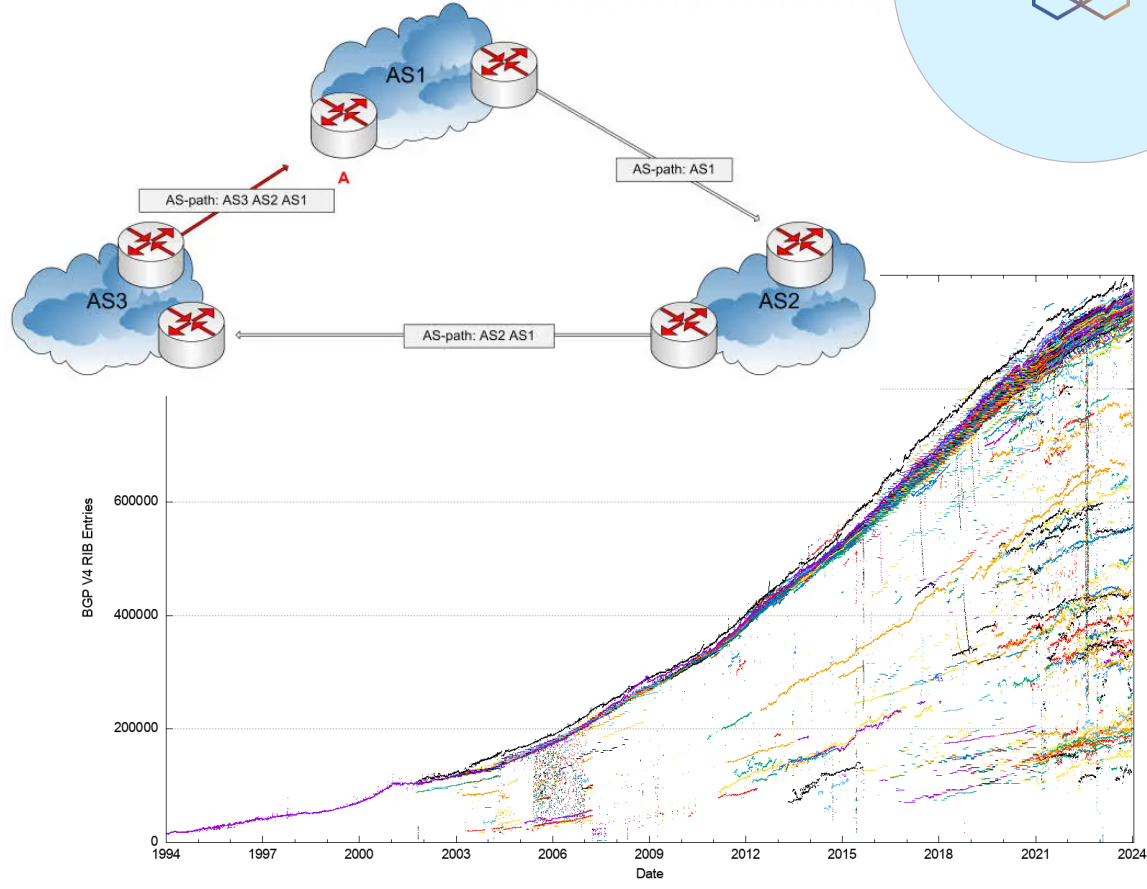
# IPv6 Addresses Distribution



# Principles for Fairness & Routability



[https://en.wikipedia.org/wiki/IPv4\\_address\\_exhaustion](https://en.wikipedia.org/wiki/IPv4_address_exhaustion)



<https://blog.apnic.net/2024/01/09/measuring-bgp-in-2023-have-we-reached-peak-ipv4/>

# RIPE (community) and the RIPE NCC



# Join RIPE Community



**In-Person Training**

**& Online Webinars, open to all!**

**[learning.ripe.net](https://learning.ripe.net)**



**The 12th South East Europe  
Regional Meeting**

- Athens

22-23 April 2024

**[ripe.net/see-12](https://ripe.net/see-12)**



**RIPE Meeting**

- Krakow

20-24 May 2024

**[ripe88.ripe.net](https://ripe88.ripe.net)**

- Join [forum.ripe.net](https://forum.ripe.net)
- Articles & podcasts: [Labs.ripe.net/sustainability](https://labs.ripe.net/sustainability)
- Academic Grants: [ripe.net/raci](https://ripe.net/raci)



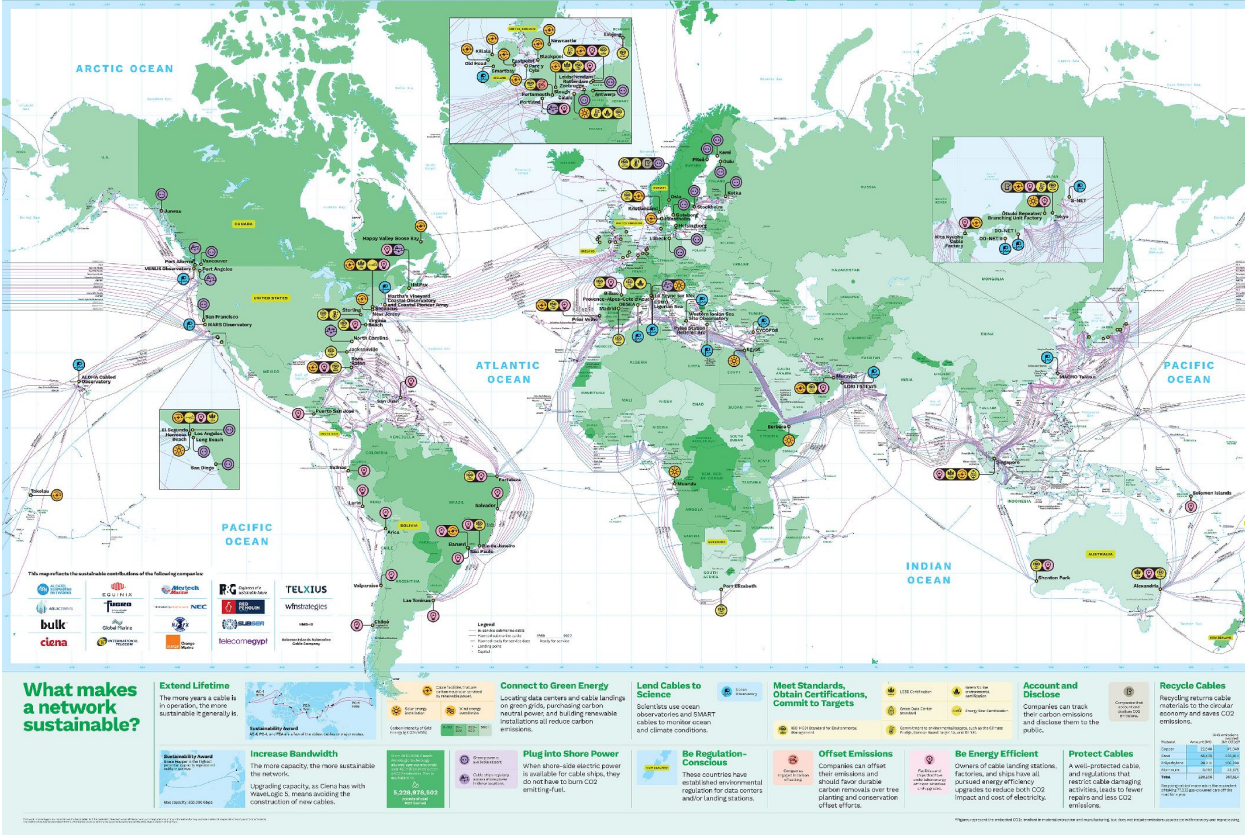
# Network Operators / Internet Industry



## Sustainable Subsea Networks Map

Designed and produced by  
TeleGeography

In partnership with  
SUBOPTIC  
EUROPEAN  
SOCIETY  
FOR  
SUSTAINABLE  
SUBSEA NETWORKS



<https://labs.ripe.net/nogs/>

<https://www.dns-oarc.net/>

<https://www.centri.org/>

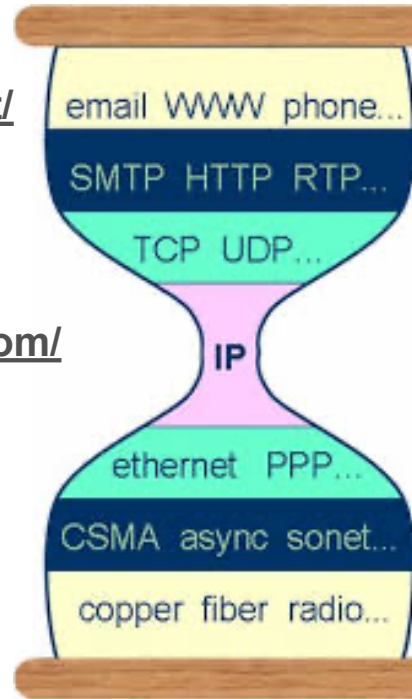
<https://www.peeringdb.com/>

<https://www.euro-ix.net/>

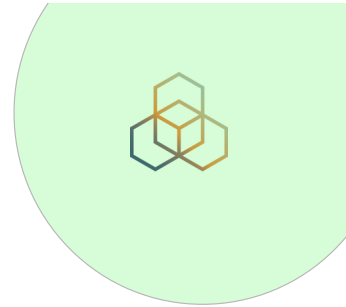
<https://etno.eu/>

<https://www.gsma.com/>

<https://www.eudca.org/>



# IETF & IAB



- **e-impact group**

- <https://datatracker.ietf.org/group/eimpact/about/>

- **IRTF: GAIA**

- <https://datatracker.ietf.org/rg/gaia/about/>

- **IAB: BIAS workshop**

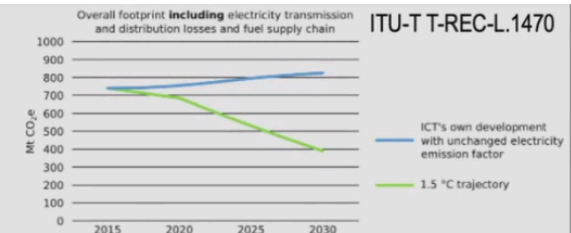
- The Internet is an important tool to reach the SDG

- <https://datatracker.ietf.org/group/biasws/about/>

- **RFC8890** <https://ftp.ripe.net/rfc/rfc8890.pdf>

- <https://labs.ripe.net/author/becha/the-internet-is-for-the-empowerment-of-end-users/>

## Goals?



- Reduction of environmental impact of **about 50%** by 2030 to align with the IPCC 1.5°C trajectory, [ITU-T L.1470] or severe effects for 2°C or ...

- **Keep warming at 1.5°C implies global emissions must peak by 2025 → in 9-10 IETF meetings**

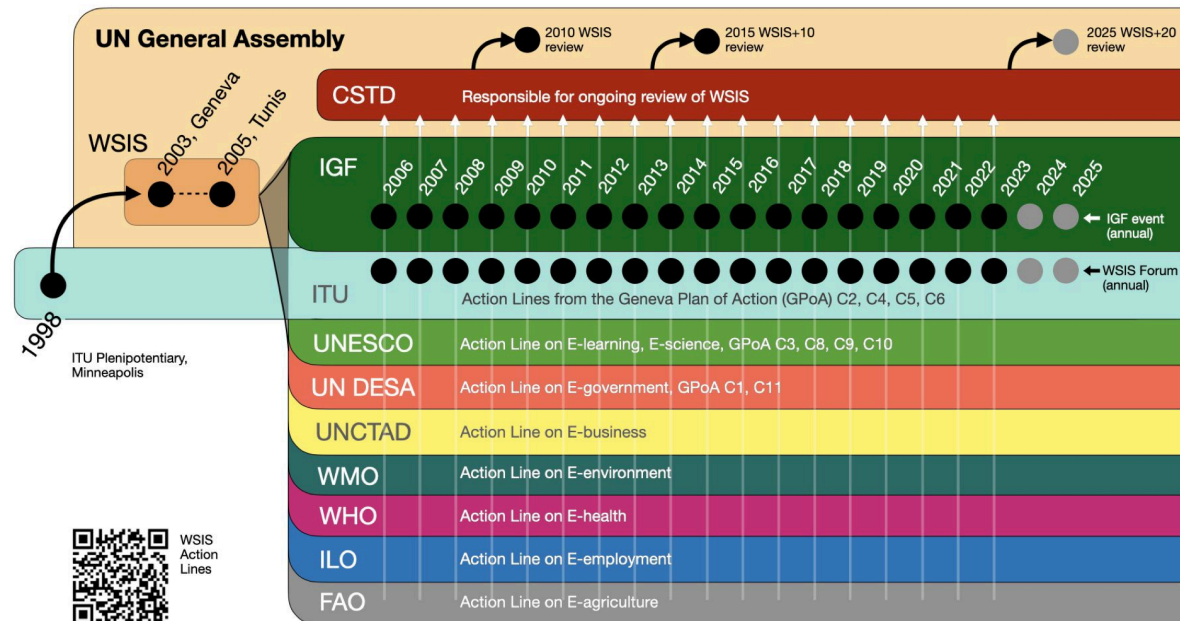
<https://theconversation.com/ipcc-report-global-emissions-must-peak-by-2025-to-keep-warming-at-1-5-c-we-need-deeds-not-words-165598>

- Contribution of ICT in electricity usage is a major green-house gases factor:
  - By **2030** it could use up to 51% of global electricity, and contribute up to 23% of globally released GHG emissions

A. Andrae, T. Edler. *On Global Electricity Usage of Communication Technology: Trends to 2030*. Challenges 2015

# Global Digital Compact & SDGs

## The WSIS Process - a timeline



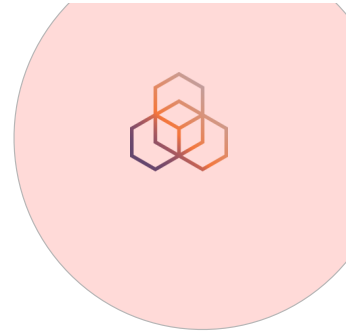
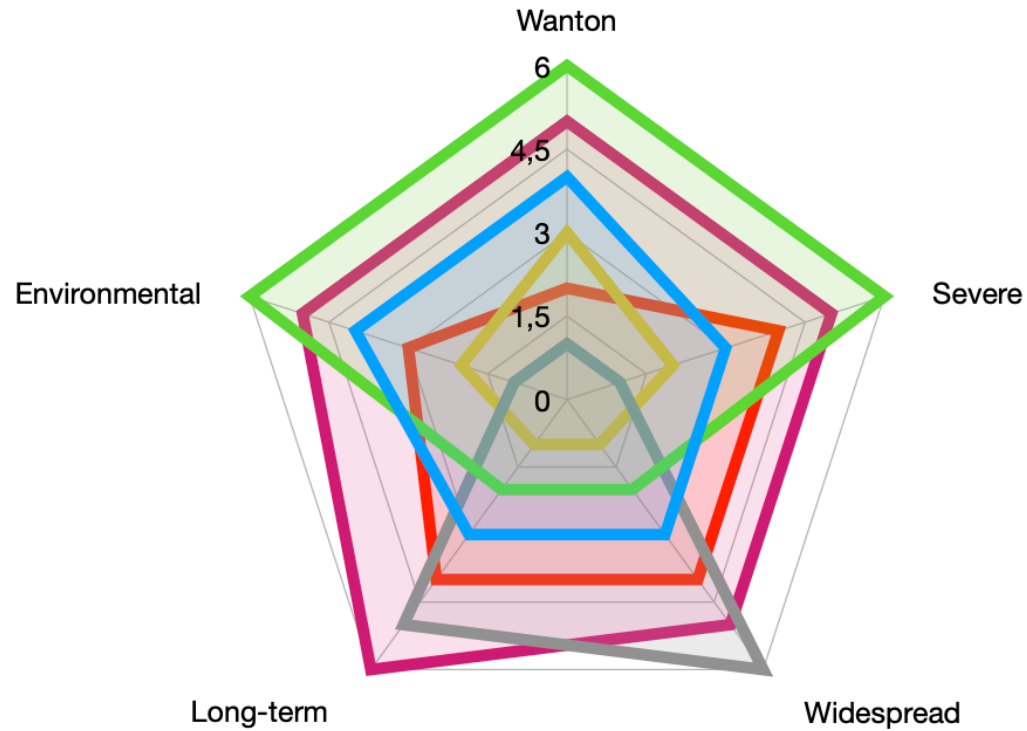
<https://internet.exchangepoint.tech/internet-governance-roadmap-2024/>

<https://datatracker.ietf.org/meeting/interim-2024-iab-07/materials/slides-interim-2024-iab-07-sessa-internet-governance-now-00>

<https://www.apc.org/en/news/bringing-gender-justice-lens-uns-global-digital-compact>

## Computing is Ecocide

AI / LLM Bitcoin Networks 5G Data Centers e-waste



[https://wiki.techinc.nl/User:Becha/AI\\_is\\_ecocide](https://wiki.techinc.nl/User:Becha/AI_is_ecocide)

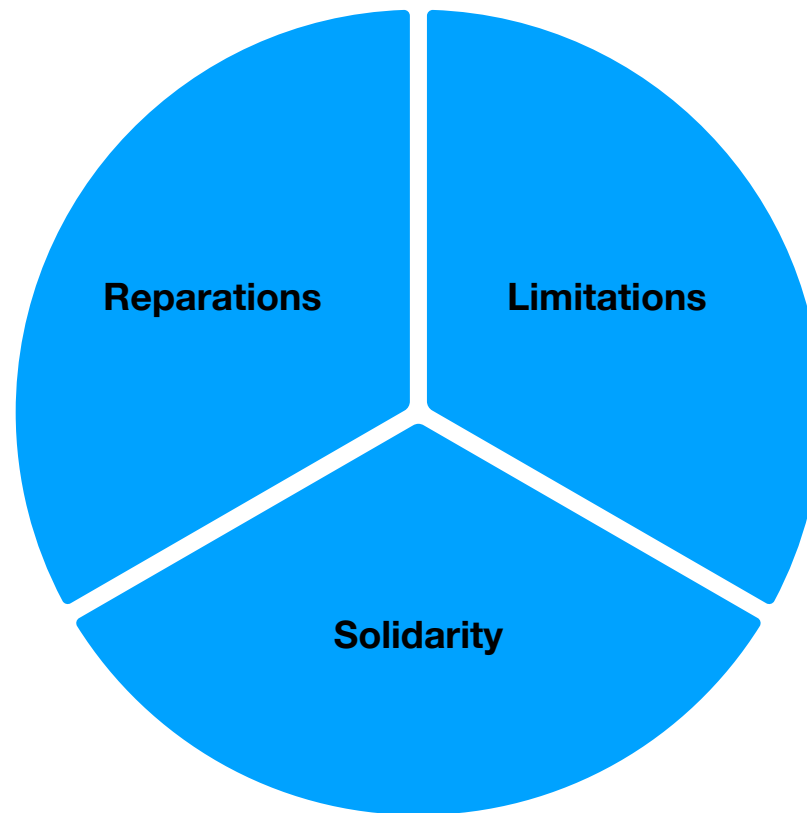


all **technical**  
decisions  
are **political**

 authentic  
engine



# Principles for Climate Justice in Tech



<https://labs.ripe.net/author/becha/towards-climate-justice-in-tech/>



<https://www.frontiersin.org/articles/10.3389/feduc.2023.1237076>



traceroute

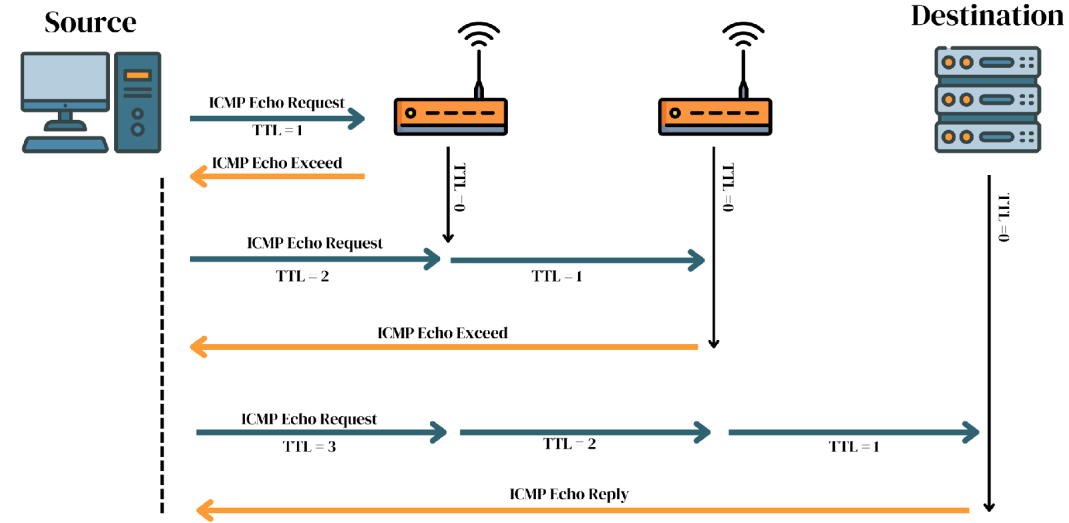


```

Terminal - nick@tomorrow: ~
File Edit View Terminal Tabs Help
11 149.6.185.42 (149.6.185.42) 394.910 ms 149.14.8.78 (149.14.8.78) 394.904 m
s 532.206 ms
12 border3.xe-1-1-0-bbnet2.lon003.pnap.net (212.118.240.116) 532.148 ms 335.7
33 ms border3.xe-0-1-0-bbnet1.lon003.pnap.net (212.118.240.52) 335.724 ms
13 canonical-4.edge1.lon.pnap.net (212.118.242.26) 335.723 ms 112.963 ms 112
.939 ms
14 bond0.ravi.canonical.com (91.189.88.5) 113.402 ms 114.088 ms 113.613 ms
15 * * *
16 * * *
17 * * *
18 * * *
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24 * * *
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27 * * *
28 * * *
29 * * *
30 * * *
nick@tomorrow

```

## How does Traceroute work?



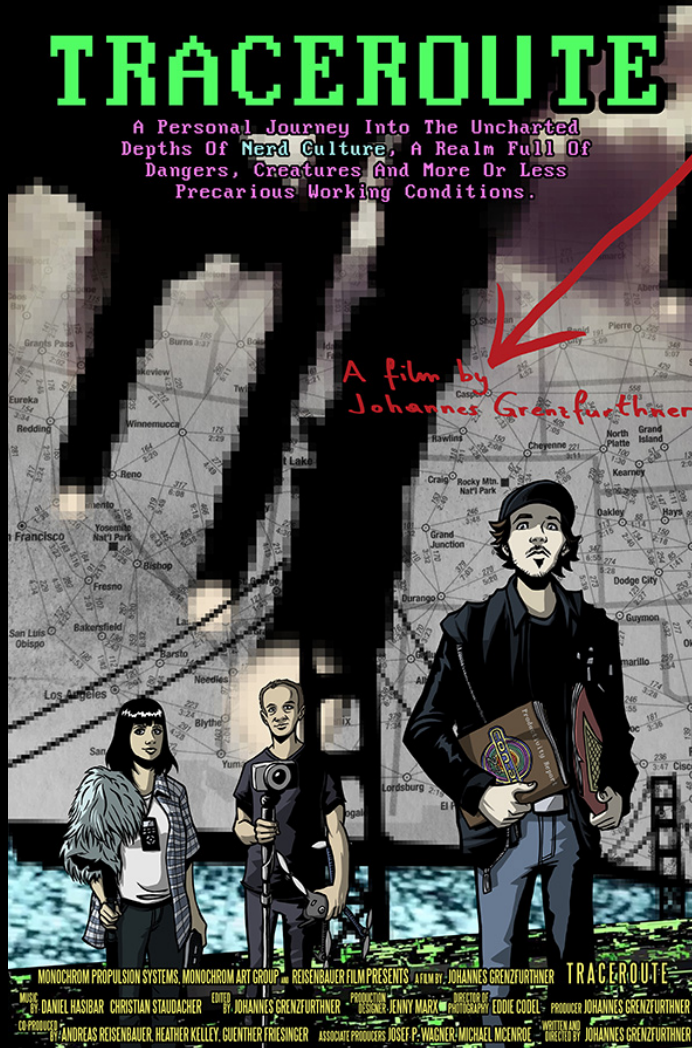
- [https://wiki.techinc.nl/User:Becha/InternetPlumbing/Traceroute\\_Much](https://wiki.techinc.nl/User:Becha/InternetPlumbing/Traceroute_Much)
- <https://Atlas.RIPE.net>
- <https://ipmap.ripe.net/>



# TRACEROUTE

A Personal Journey Into The Uncharted  
Depths Of Nerd Culture, A Realm Full Of  
Dangers, Creatures And More Or Less  
Precarious Working Conditions.

A film by  
Johannes Grenzfurthner



<http://monochrom.at/traceroute/>