


Internet Governance & RIPE Community

Vesna Manojlovic, Community Builder
BECHA@ripe.net
 @Ms_Multicolor

Amsterdam, 21st September 2022

**B.S. CS @
ETF.ac.yu
1991-1998**

VAX-VMS, DecNET,
ZaMir...

**ASCII, TechInc, LAG;
HIP97, HAL2001,
WTH2005, HAR2009,
OHM2013, SHA2017,
MCH2022; TBD@ADM;
CCC 1999-2018**

**C-PTSD, RSI, OCD
ADHD, LGBTQ***

About Me:



Alisa, Charlie, Olivia



RIPE NCC:

1999-2022+
IPv4, IPv6 /
RIPEness,
DNSSEC, RPSL,
RIS, RIPE Atlas,
hackathons

RIPE:

SEE{1-10}, CoC-TF,
NOGs, IXPs, RIRs,
“Trusted Contact”

**NVC, EMDR, SNRI, yoga
EFT, CBD, MBSR, ASMR**

Today's Tragic Context

- **2020(2) = Third Year of Global COVID-19 Pandemic**
(+2 new ones) 
- **Wars in Ukraine, Armenia, Syria, Yemen...**
- **Climate Chaos...**
 - Summer heat-waves: draughts, forest fires, dry rivers, lack of drinking water...
 - Floods in Pakistan, Texas, Middle-East, Africa, Australia...
 - Glaciers melting in Alps, Andes, Himalayas, Greenland...
 - Upcoming "hunger winter" with inadequate heating infrastructure...
- **Still, I am grateful for being alive, safe, healthy-ish**

What to do in Amsterdam

- **SPAs** <https://wiki.techinc.nl/User:Becha/spa>
- **Nature / Parks** https://wiki.techinc.nl/User:Becha/nature_Amsterdam
- **Alternative Amsterdam (agenda / venues)**
 - <https://amsterdamalternative.nl/agenda>
 - <https://amsterdamalternative.nl/places>
 - <https://radar.squat.net/en/events/city/Amsterdam>
- **TechInc hackerspace Social: Wednesday Evening**
- **BookCrossing:** https://wiki.techinc.nl/Book_Crossing

Choose Your Own Adventure



X

History of Internet

Networking Basics

Internet Registry System

RIPE and RIPE NCC

Internet Governance

Green Tech / Hackerspaces / JEDI



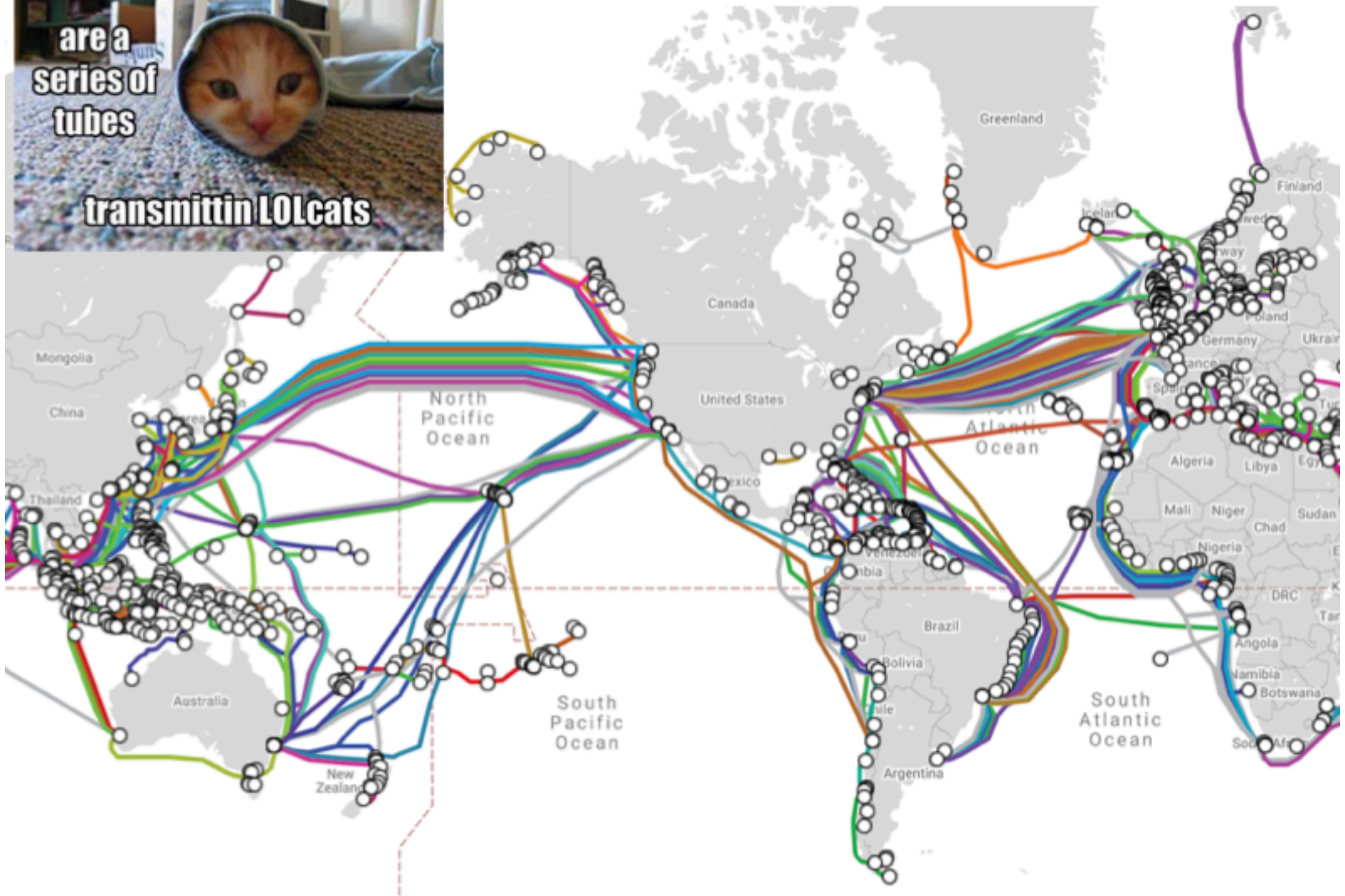
Networking Basics (Internet Plumbing)

Teh Internets

**are a
series of
tubes**



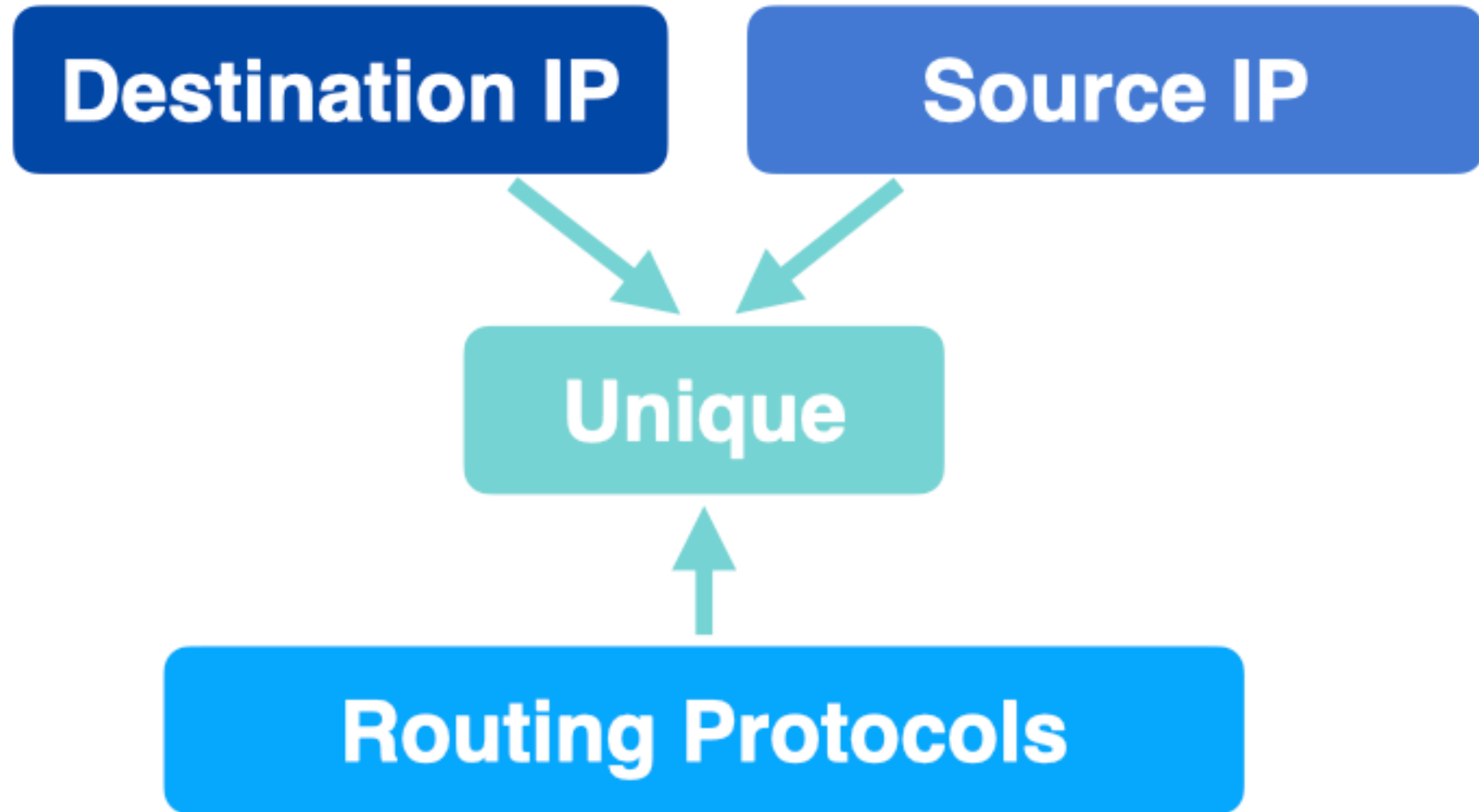
transmittin LOLcats



Sending and Receiving: Postal Mail



Sending and Receiving: Internet



Packet-Switched Networks (1)



- Digital pieces of information put in packets
- Packets sent over packet-switched networks:
 - Paths can vary
 - Shared resources (best effort)
 - Asynchronous (example: postal mail, Internet)
- *As opposed to “circuit switching” (classical telephony)*

Packet-Switched Networks (2)



Basic elements on a switched network:

- **Sender:** Generates the info to be sent to a receiver. Should codify the message.
- **Receiver:** Is the destination of the information sent by the sender. Should decode the message.
- **Forwarder:** Not the origin or the destination of the information. Just receive and forward the information in its path to the destination
- **Identification:** Each element in the switched network should be uniquely identified



Layered Model (1)

Let's define things:

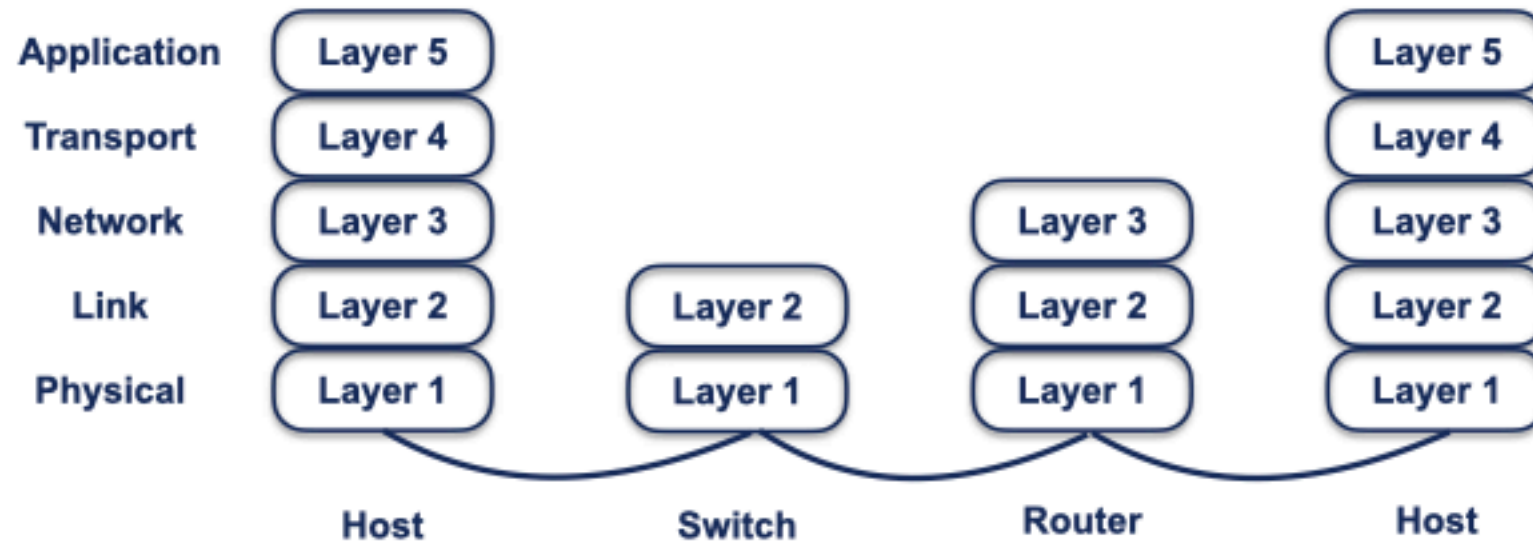
- **Layered model:** physical, link, network, etc. each one is in charge of different things/services
- **Network elements:** Node, host, router, server
- **Addresses:** link layer, network layer

- **Protocol:** definition of the format and order of messages exchanged between two or more communicating entities, as well as the actions taken on the transmission and/or reception of a message or other event



Layered Model (2)

- TCP/IP layered model -> Used in Internet

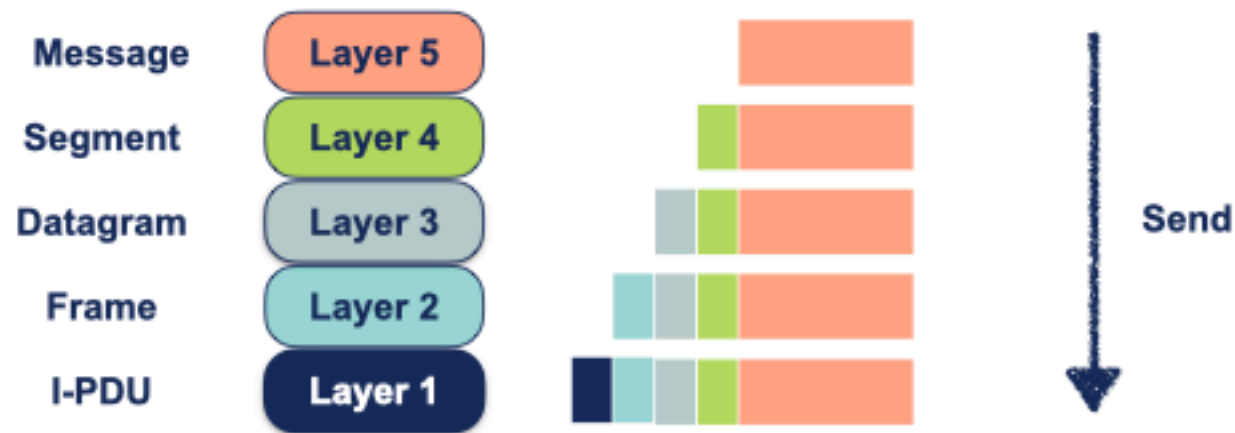


Layered Model (3)



Ethernet IP TCP data

- PDU: Protocol Data Unit

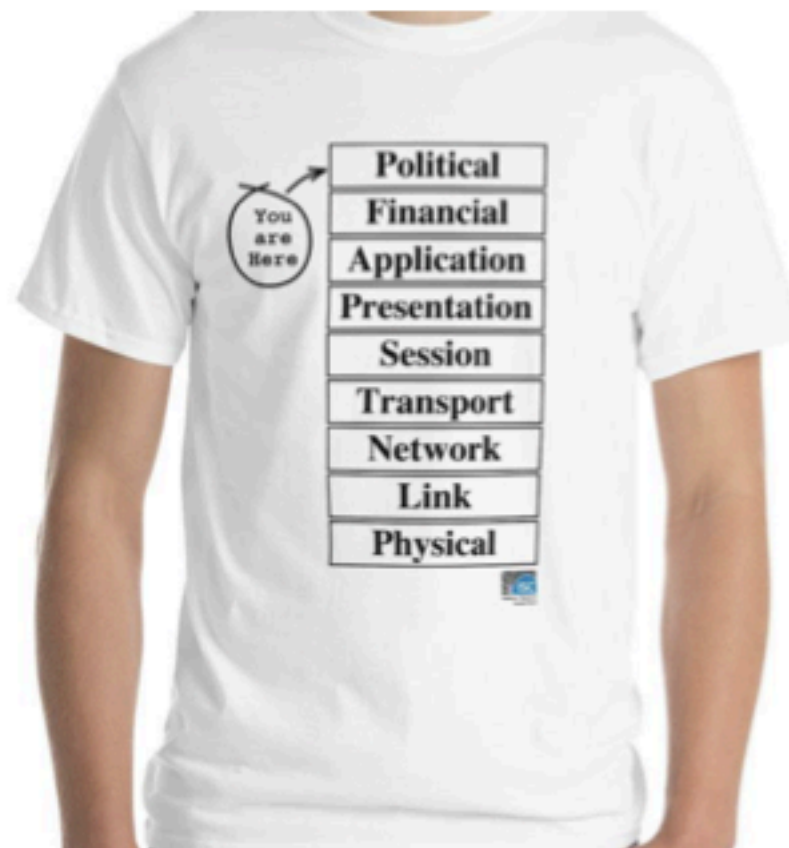


- Layer 3 Header includes Source and destination Network Address (IP Address)

Maslow's Hierarchy of Needs \Leftrightarrow OSI Layers

<https://www.netnod.se/blog/technical-communities-resilience-during-covid-19-pandemic>

<https://www.ripe.net/about-us/press-centre/publications/presentations/2021/technical-communities-resilience-during-covid-19-pandemic-nluug-najaarsconferentie-2021>

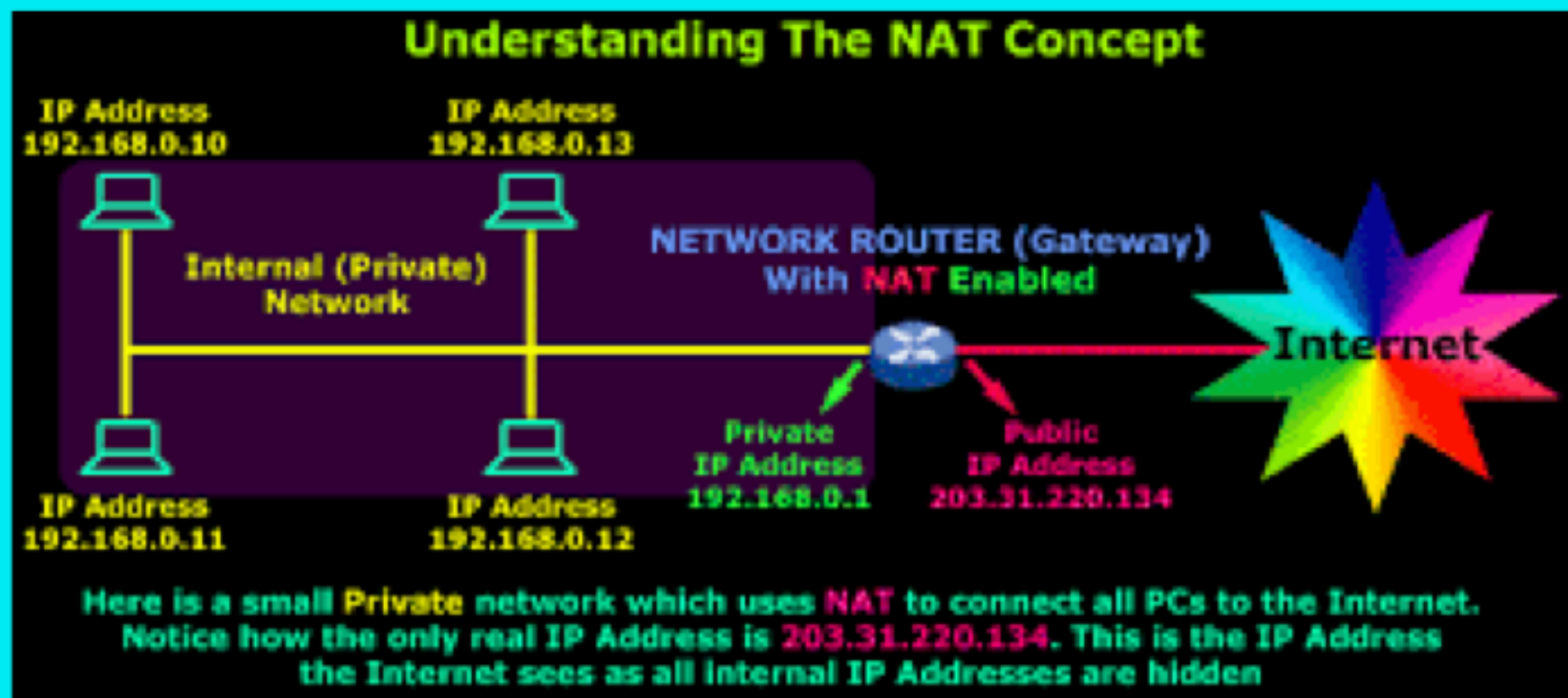


Network of networks

- **Local (Area) Networks (LAN)**
 - connected by cable or wireless
 - uses “private” or “public” IP addresses
 - (IPv4 / IPv6) Internet Protocol
- **Larger networks:**
 - Metropolitan Area Network
 - Wide Area Network
- **Autonomous networks interconnect using BGP**
 - Border Gateway Protocol

An IPv4 address (dotted-decimal notation)
172 . 16 . 254 . 1
↓ ↓ ↓ ↓
10101100 . 00010000 . 11111110 . 00000001
┌──────────┐ ┌──────────┐
One byte = Eight bits
└──┘
Thirty-two bits (4 x 8), or 4 bytes

Private Networks & DNS

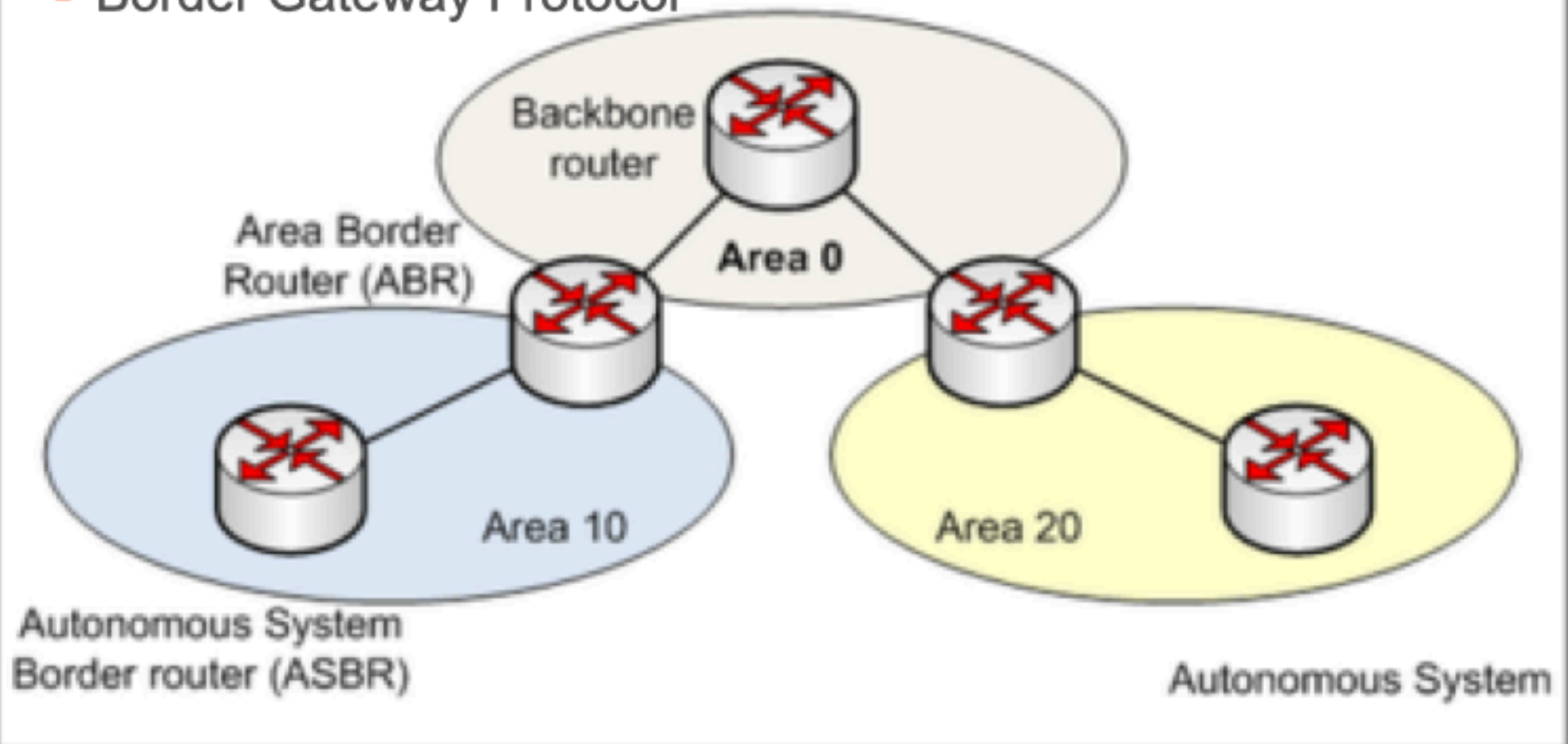


- Translating IP addresses to (domain) names
 - Domain Name System (DNS)

Distributed, Decentralised, Ungovernable

- Autonomous networks interconnect using BGP

- Border Gateway Protocol



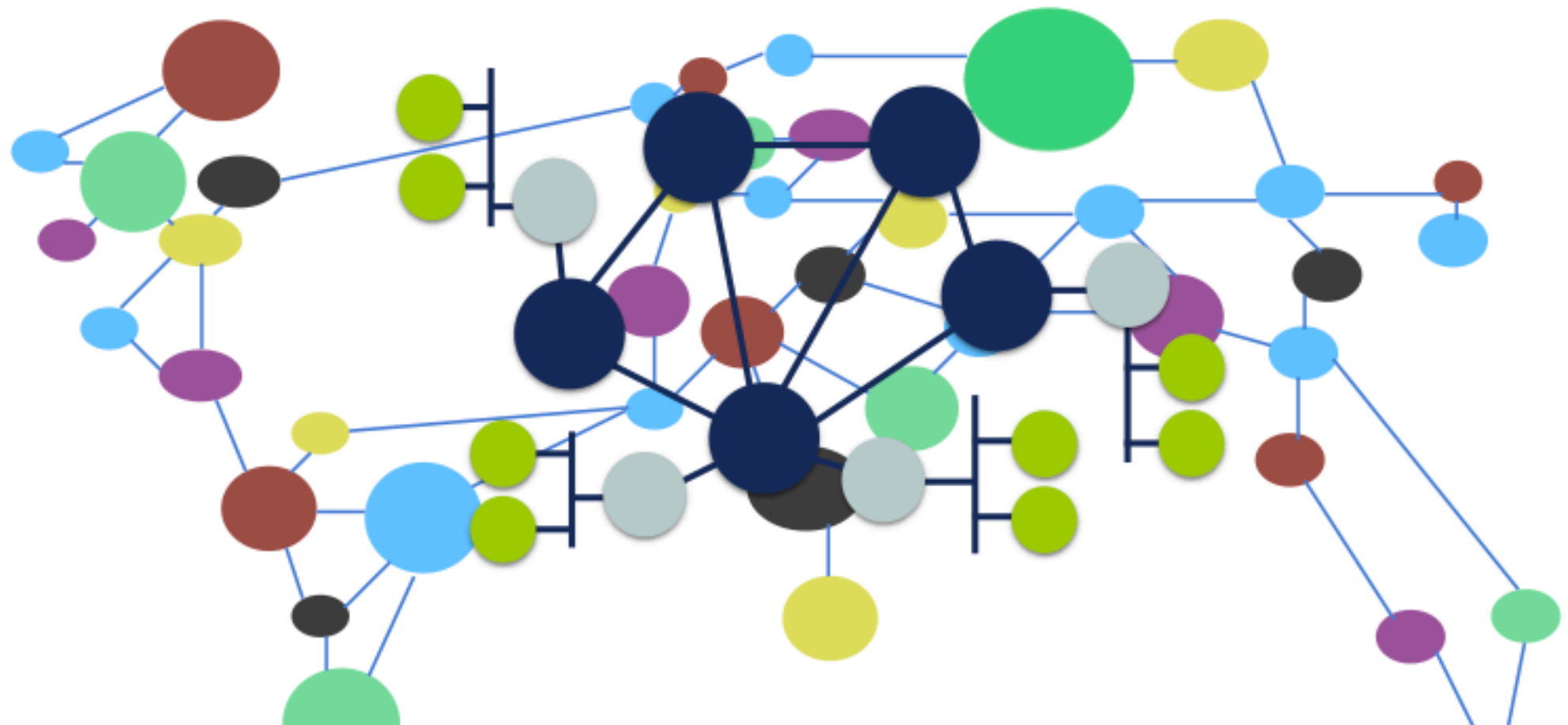
Internet building blocks



Internet building blocks



Autonomous System



ASN

Addresses

Interconnect

**Let's take a
break!**





The Internet Registry System

14:05

The Internet Registry System



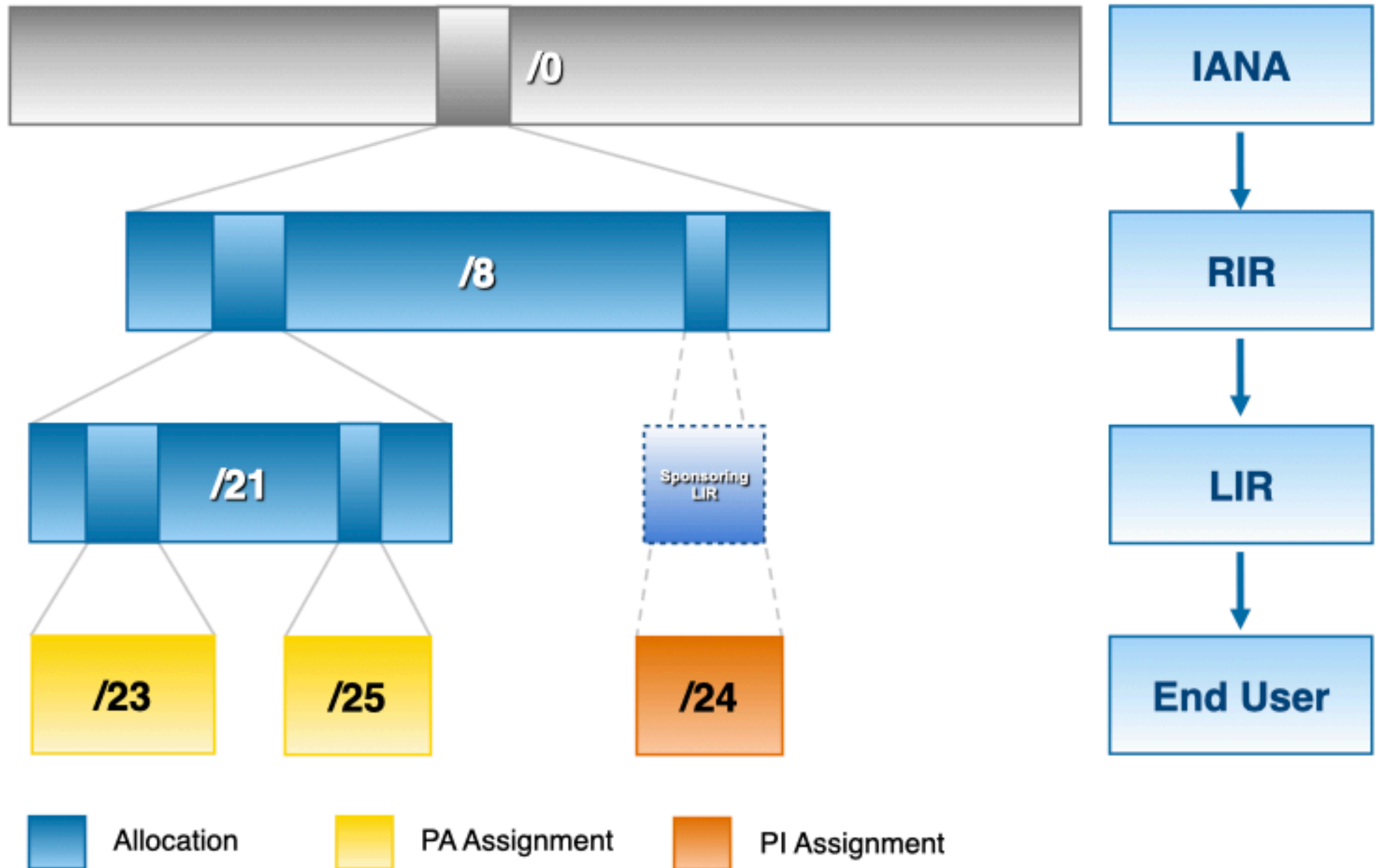


Regional Internet Registries

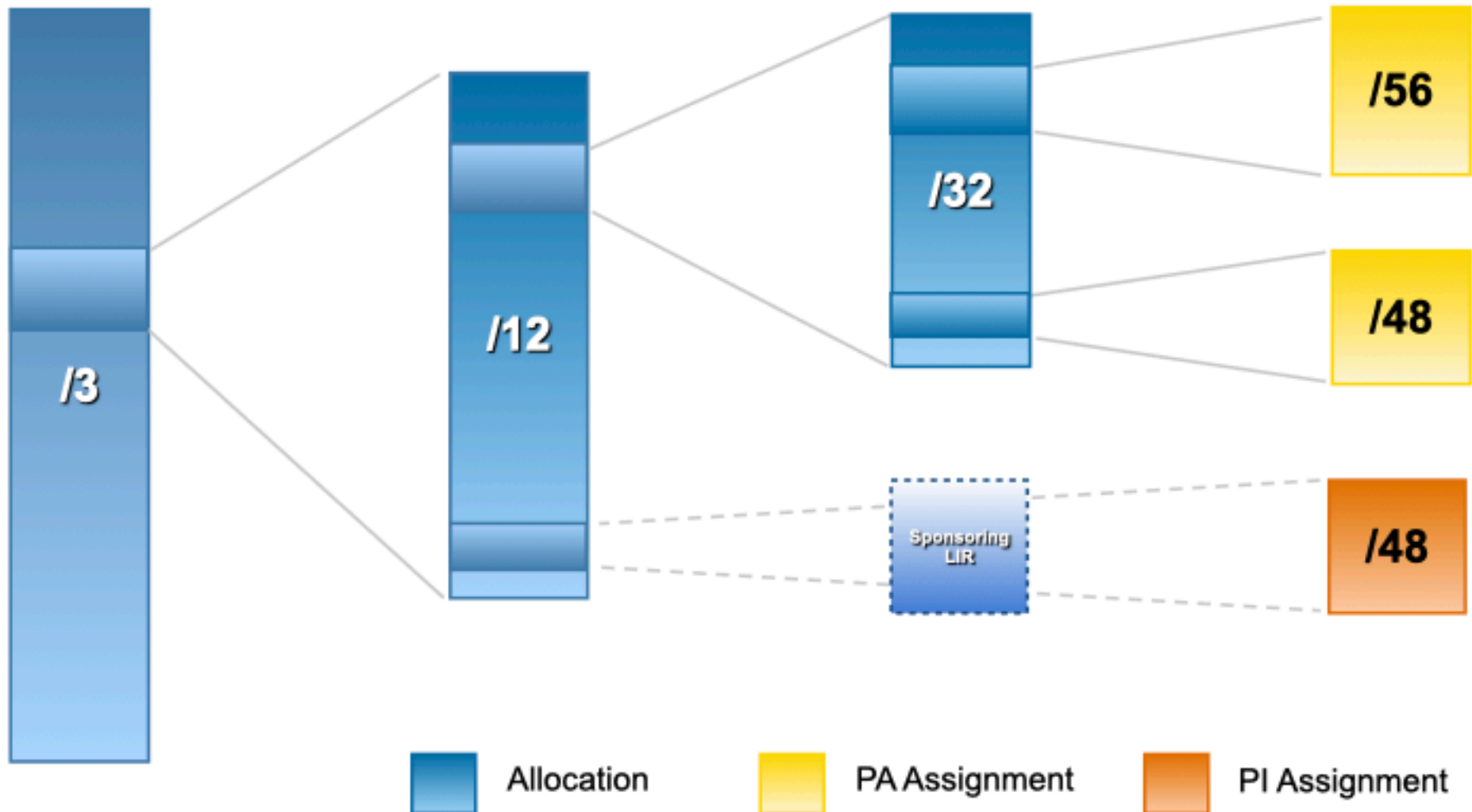
- Five RIRs worldwide
 - Not-for-profit organisations
 - Funded by membership fees
 - Policies decided by regional communities
 - Neutral, Impartial, Open, Transparent

- RIRs Goals: Registration, Aggregation, Conservation

IPv4 Address Distribution - Historical



IPv6 Address Distribution





IPv4 Pool Exhaustion

14:15

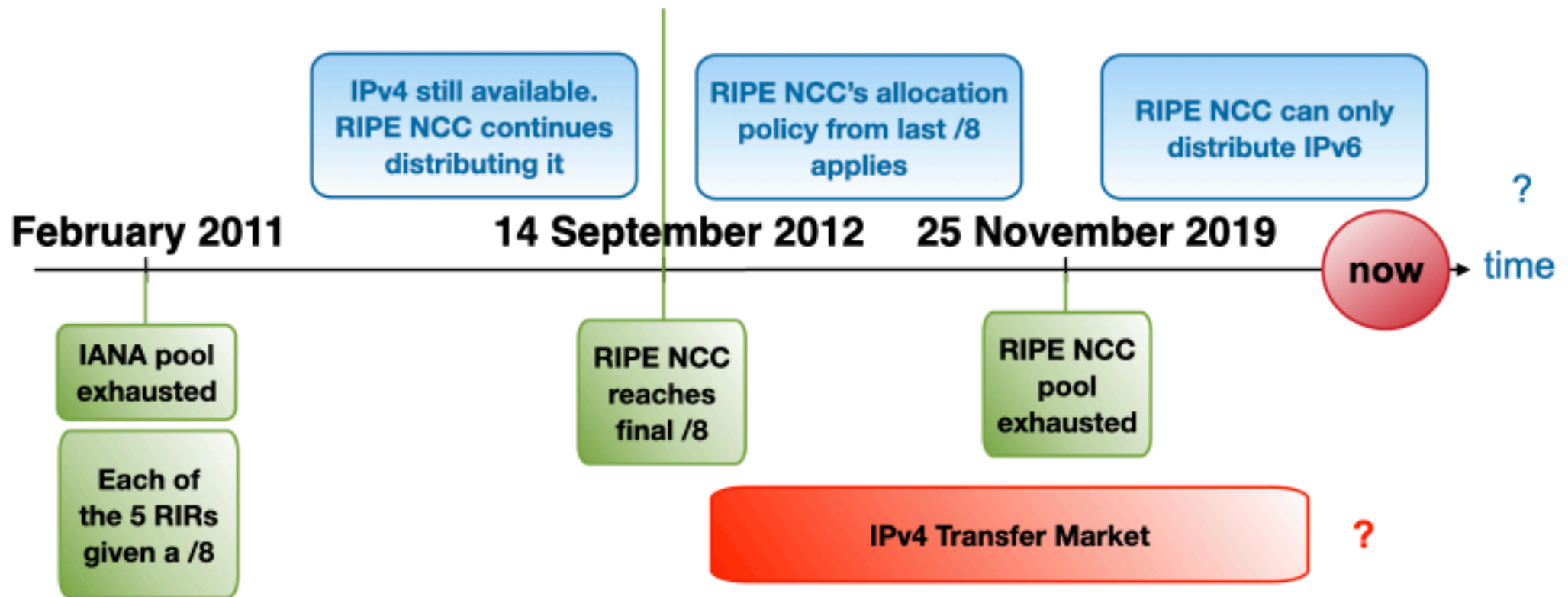
IPv4 Exhaustion



“On 14 September 2012, the RIPE NCC ran out of their regular pool of IPv4”



IPv4 exhaustion phases



IPv4 Transfers



- Transfer PA allocations to another LIR
- PI assignments can also be transferred
- No minimum size
- RIPE NCC evaluates it
- Cannot be transferred again within 24 months
- Permanent or temporary
- Negotiated via “brokers”



Image source: <http://bit.ly/1b4bJAp>

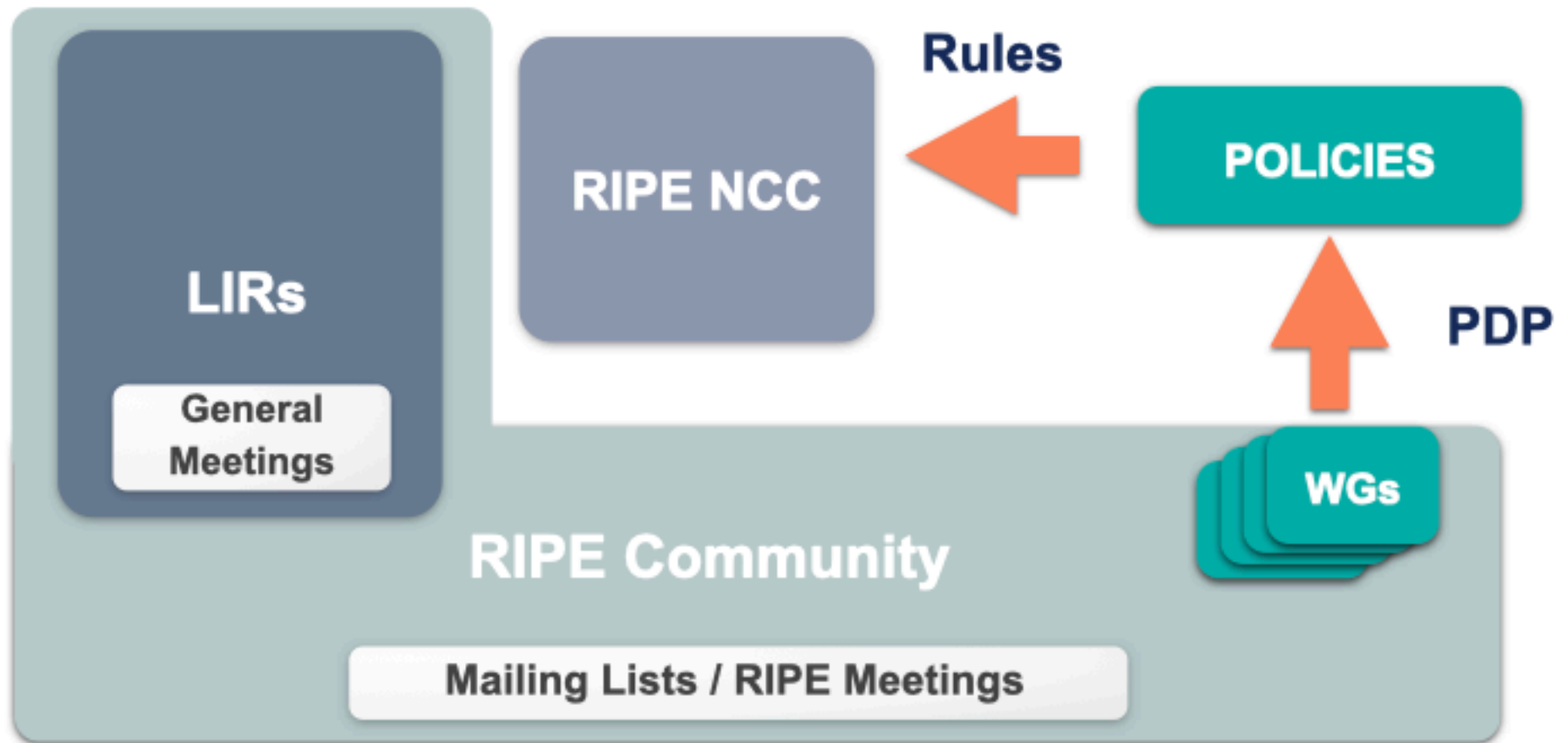


RIPE and RIPE NCC

RIPE (community) and the RIPE NCC



RIR Bottom-up Model



Réseaux IP Européens (RIPE) Community



- Since 1989 discussion forum open to all parties interested
- Not a legal entity and no formal membership
- Work done in Working Groups
- Develops policies (by consensus)
- Activities are performed on a voluntary basis
- RIPE meetings twice a year





Policy Development Process

- Open
 - Anyone can participate
 - On mailing lists and at meetings
- Transparent
 - List discussions archived publicly
 - Meetings transcribed
- Developed bottom-up
 - **ANYBODY** make the policies
 - The RIPE NCC implements them



RIPE Community: Working Groups

- Anyone can join the discussion & do the work
 - on “mailing lists” & web-forum
 - at the RIPE meetings In Real Life
 - through “remote participation”
- Read and / or subscribe
 - <https://www.ripe.net/participate/ripe/wg>

Address Policy Working Group

Anti-Abuse Working Group

Connect Working Group

Cooperation Working Group

Database Working Group

DNS Working Group

Internet of Things Working Group

IPv6 Working Group

MAT Working Group

Open Source Working Group

RIPE NCC Services Working Group

Routing Working Group

Take part in RIPE/NCC Communities

- Join RIPE meetings
 - RACI programme: ripe.net/raci & Fellowship
- Join events organised by RIPE NCC
 - Regional meetings / Training courses & on-line education / Hackathons
- Write for RIPE Labs: <https://labs.ripe.net>

<https://ripe85.ripe.net/>



<https://labs.ripe.net/author/becha/building-bridges-between-diverse-communities-at-ripe-85/>

&

4. October, 5PM, online: <https://ripe85.ripe.net/programme/parallel-events/student-event/>

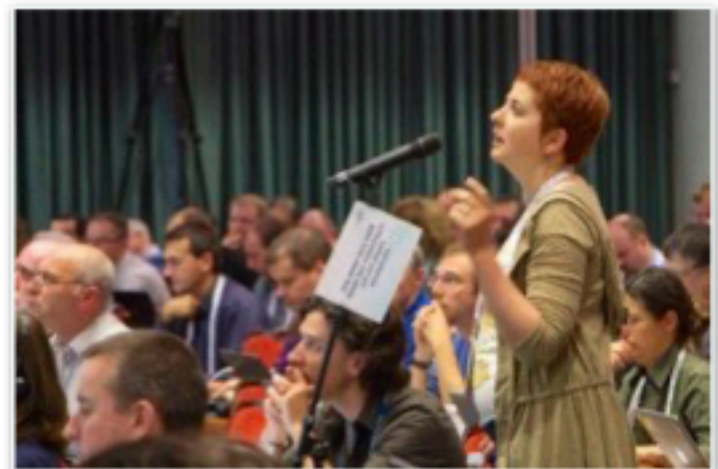
RIPE NCC (Network Coordination Center)



- Began operating in 1992
- Not-for-profit membership organisation
- One of the 5 Regional Internet Registries
- 23,000+ LIRs (Local Internet Registries)
- Neutral, Impartial, Open, Transparent
- Provides administrative support to RIPE

RIPE NCC's members General Meeting

- RIPE NCC **members** (LIRs) participate
- Discuss the RIPE NCC operations and activities
- Give feedback on the Budget and Activity Plan
- Vote on:
 - Charging Scheme, Resolutions
 - Executive Board nominees
 - Approving Financial Report





RIPE NCC's Vision

- Together, let's shape the future of the Internet

RIPE NCC's Mission

- As an **authority on unique Internet number resources**, we enable our members to operate and develop the Internet
- As a neutral **source of information and knowledge**, we actively contribute to a stable and innovative Internet
- We are a **trusted steward** of the open, inclusive, **collaborative Internet** model, connecting people, communities and stakeholders

RIPE NCC Services



RIPE Community

RIPElabs

RIPEstat

K-root DNS

RIPE Meetings

RIPE DB

RIPE Atlas

Training

RIPE NCC Members

IP / ASN

LIR Portal

RPKI

General Meetings



Purpose of the RIPE Database

- Registry of WHO holds IPs and ASNs
- Keep contact information
 - For troubleshooting, notifying of outages, etc.
- Publishing routing policies
- Provisioning reverse DNS



Training and Education Services

Online Learning

Academy



Webinars



Remote Learning



Educa



Videos



Face-to-Face Training

Training Courses



Tutorials



Course Material



<http://ripe.net/support/training>

RIPE Atlas - Active Measurements



- **Next generation Internet measurement network**
 - Gives a big picture about Internet traffic
- **10,900+ active probes worldwide**
- **User Defined Measurements available for LIRs**
 - ping, traceroute, DNS, SSL



<http://atlas.ripe.net>

**Let's take a
break!**





Internet Governance



- ***“As a globally distributed network of voluntarily interconnected autonomous networks, the Internet operates without a central governing body”***

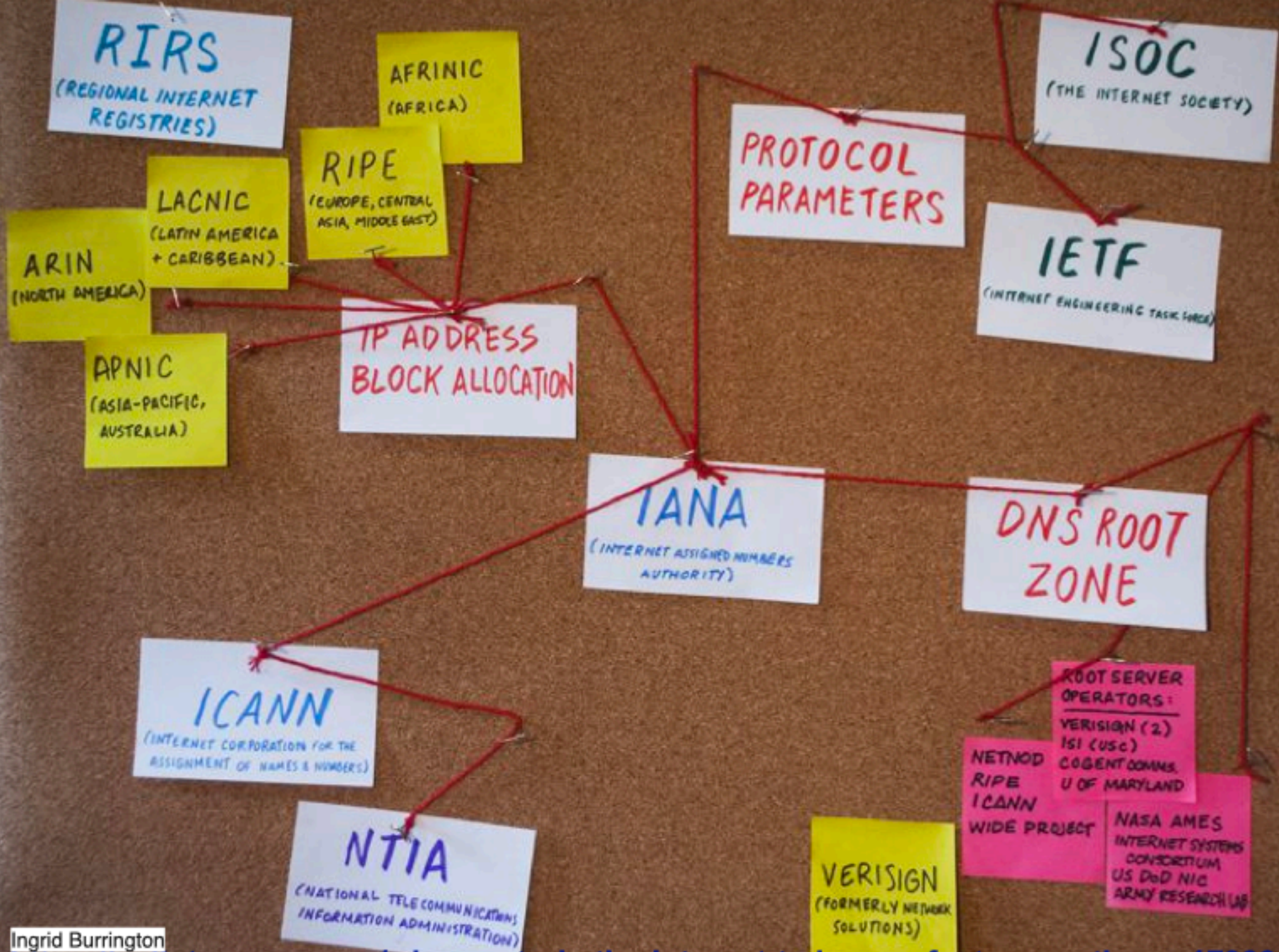


- ***“No one person, company, organisation or government runs the Internet. It is a globally distributed network comprising many voluntarily interconnected autonomous networks. It operates without a central governing body with each constituent network setting and enforcing its own policies. Its governance is conducted by a decentralised 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 organisations. They work cooperatively from their respective roles to create shared policies and standards that maintain the Internet's global interoperability for the public good.”***

But...



- **Internet is based on shared resources**
 - IP addresses, ASNs, domain names, protocol numbers
- **Coordination and registration is needed**
- **Many organisations were created**



Ingrid Burrington

<https://splinternews.com/who-controls-the-internet-fed-crux-fantasy-vs-the-re-17938616>

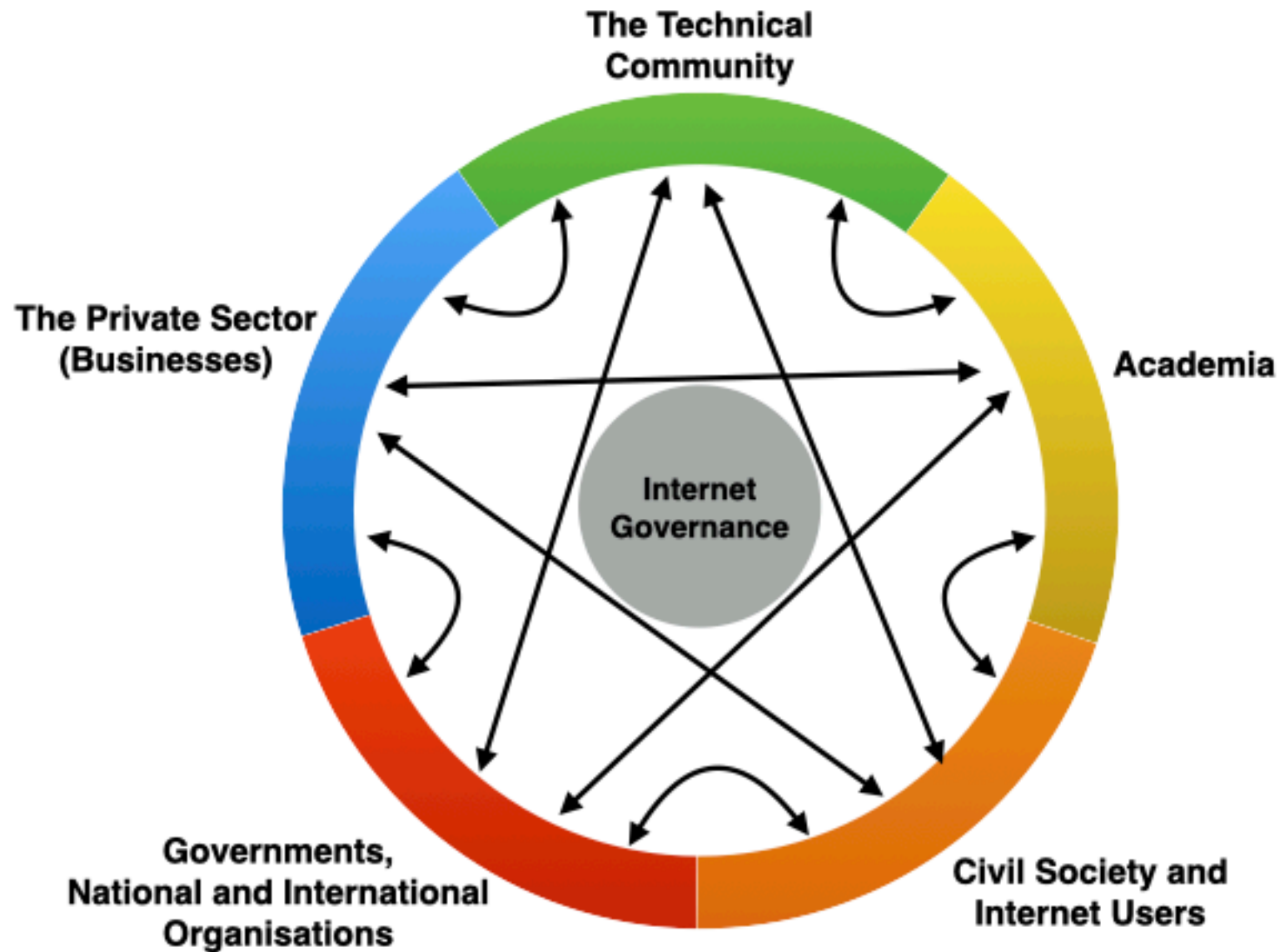
Definitions



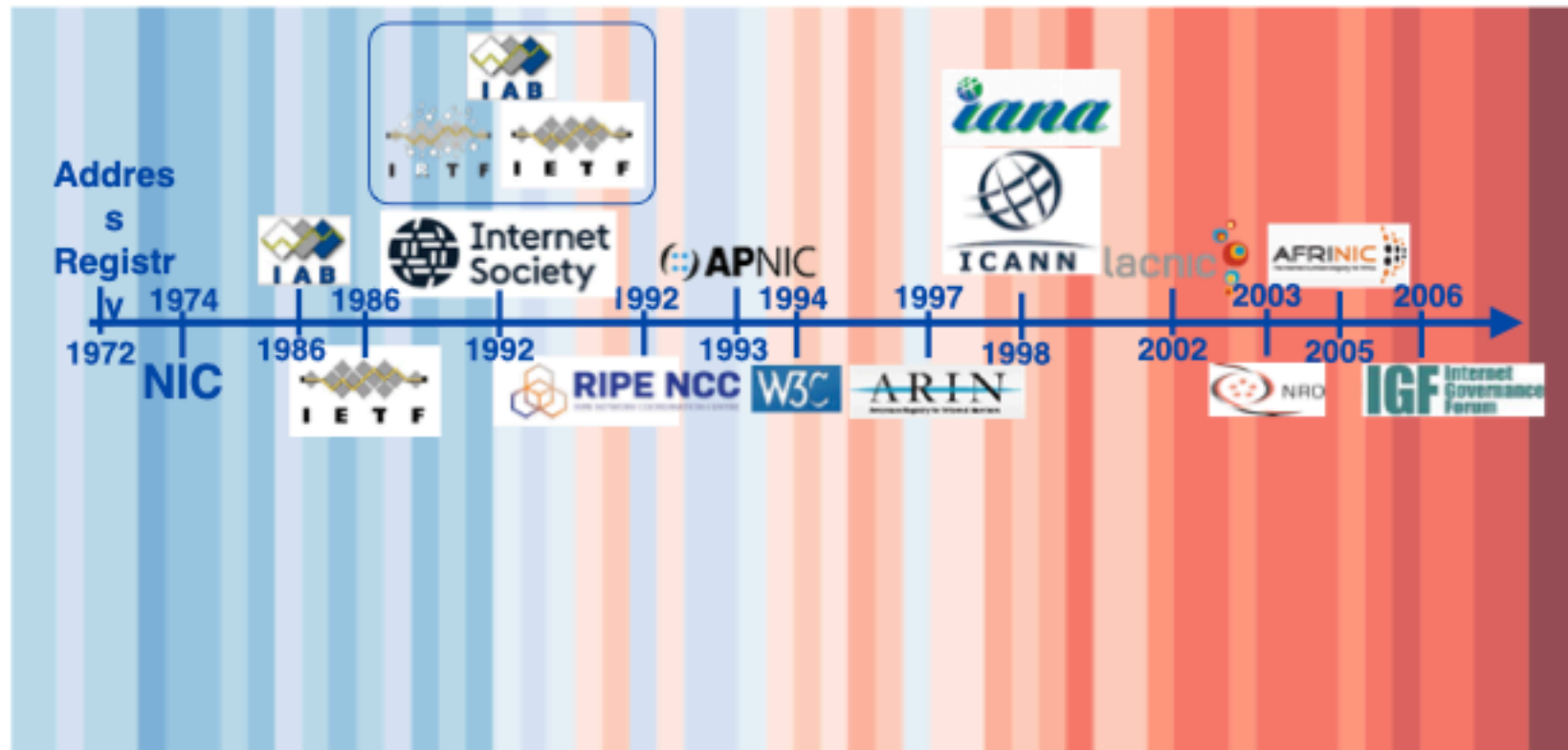
“Internet governance (IG) is the development and application by **governments**, the **private sector** and **civil society**, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the **evolution** and **use** of the Internet.”

World Summit on the Information Society (WSIS), 2005

The Multistakeholder Model



Internet Governance & Global Warming Timeline





Give Attention to Environmental Sustainability

History of RIPE & Green Tech



To Green the Internet, We Need RIPE

Michael Oghia · 29 Jun 2020

If Europe is going to realise its vision for a greener ICT ecosystem and a sustainable future, support from the RIPE community is imperative. But what can you do - as a network operator and as a user - to work towards a sustainable Internet?

sustainability policy community

1 ❤️ 2 💬 🔗 📌



What Do We Do With E-Waste?

Mirjam Kühne · 9 Nov 2018

The headlines are raising awareness about the plastic soup that's clogging up our oceans but there's another problem much closer to home for much of the RIPE community: e-waste (aka 'dead electronics'). E-waste is a massive contributor to environmental pollution globally. We want to keep the conver...

sustainability community

2 ❤️ 1 💬 🔗 📌



Sustainability is Good for the Internet (and Business too)

Michael Oghia · 23 Jun 2017

In recent weeks, I've attended two events, SEE 6, hosted by the RIPE NCC in Budva, Montenegro, and the 10th European Dialogue on Internet Governance (EuroDIG) in Tallinn, Estonia. At both events, I had the opportunity to speak about the issue of sustainable access to the Internet.

sustainability governance

0 ❤️ 4 💬 🔗 📌

● RIPE81 (October 2020): Sustainable ICT Procurement

- Michael Oghia, Independent Community Member

- <https://ripe81.ripe.net/programme/meeting-plan/bof/#mon14>

● RIPE84 (May 2022): Towards a Fossil Free Internet

- Chris Adams, Green Web Foundation

- <https://ripe84.ripe.net/archives/video/751>

● My RIPE Labs series on Resilience

- [Layer 9](#) and [Layer 6](#) articles

RIPE-adjacent Communities & Green Tech

- **IETF (Internet Engineering Task Force) / IRTF (Research)**



- <https://www.ietf.org/blog/towards-a-net-zero-ietf/>
- <https://datatracker.ietf.org/doc/html/draft-cx-green-ps-00>
- <https://datatracker.ietf.org/doc/draft-eckert-ietf-and-energy-overview/>
- <https://datatracker.ietf.org/doc/slides-113-gaia-the-internet-and-environmental-sustainability-revolutionary/>
- <https://datatracker.ietf.org/doc/draft-nottingham-avoiding-internet-centralization/>

- **2021: GreenTech Events Every Month!**

- <https://labs.ripe.net/author/becha/green-tech-2021-compilation/>

13 Propositions on an Internet for a "Burning World"

Tobias Fiebig

Max-Planck-Institut für Informatik

Doris Aschenbrenner

Aalen University

APNIC 2022:

<https://youtu.be/x5HwbtdgBEEQ?t=3710>



<https://media.ccc.de/v/mch2022-278-m-a-y-will-contain-climate-change>

Vesna Manojlovic | September 2022



APC 2020: <https://www.apc.org/en/project/technology-environmental-justice-and-sustainability>

CCC 2019
<https://labs.ripe.net/author/becha/reporting-back-from-36c3-resource-exhaustion/>



Join Green Internet Events This Year

- **22-23.9. SDIA, Berlin or online: hackathon**



- <https://labs.ripe.net/author/max-schulze/competition-environmental-impact-of-open-source-23-september-2022/>

- **1-2.10. Bits&Bäume, Berlin: Digitalization and Sustainability** <https://bits-und-baeume.org/konferenz/en>

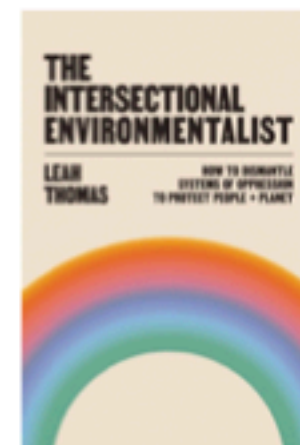
- **5.12. IAB Workshop, online** <https://www.iab.org/activities/workshops/e-impact/>

Vesna Manojlovic | September 2022

- **27-31.12. CCC/37c3, Hamburg&online:**
events.ccc.de

Hopeful Directions Towards Planet-Friendly Internet

- Decolonising The Internet
- Feminist Internet / Data Feminism
- Community-owned & community-run networks (e.g. GAIA)
- “Right To Repair” Movement
- Permacomputing
- “Computing Within Limits”
- Low-Tech, Slow-Tech, Retro-Tech
- Intersectional Environmentalism
- Open Manifesto, September 2022
Extinction Rebellion, Scientists Rebellion, Mothers Rebellion



Rebel

for Life!




With Great
Power
Comes
Great
Responsibility

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

 authentic
engine

**extinction
rebellion**



Not so “Green” Internet

Why?

- ... all this, and:

- “tech is neutral”
- focus on growth
- “we are the good guys” bias
- efficiency myth (Jevons paradox)
- aligned with dominant power structures



“Data is the New Oil” & Digital Colonialism



A NATURAL GASING A data center in Ashburn, Va., was just a Dominion Virginia Power collocation center in 2010. Now, each center can be the rough equivalent of the output of 20 nuclear power plants. (Source: Bloomberg for The New York Times)



Wood worker in Bohemia Falls - 1900s












A child at the Agbogbloshie electronic waste dump in Ghana. Photograph: Andrew McConnell/Keany





Een datacenter van Google in Midd

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

MANUFACTURING AND SHIPPING	POWERING AND COOLING
 <p>Technology manufacturing and shipping involves a lot of energy-intensive processes.</p>	 <p>Power lines and energy grids are essential for generating and distributing electricity.</p>
  	   
COPIER	DIGITAL

Nature is Fighting Back

- impact on the the operations of Internet infrastructure:

• **Sea-level rise & storms: flooding of data centers**



- <https://labs.ripe.net/author/ggm/surviving-the-flood-how-data-centres-and-the-internet-must-face-climate-change/>

• **... Forest fires** <https://www.akcp.com/blog/data-centers-coping-with-climate-change-induced-wildfires/>

• **Water (un)availability for cooling power-plants & data centers:**

- <https://www.datacenterdynamics.com/en/opinions/why-data-centers-need-to-talk-about-water>

• **Energy over-consumption leads to (un)availability**

- <https://www.consultancy.uk/news/28772/10-ways-businesses-can-reduce-their-digital-carbon-footprint>

- ... taking water, land & energy **away** from local (human/plant/animal) population

Animals Winning the Cyber War ;)

- https://wiki.techinc.nl/Hackers_tribes#Other_animals_against_Technology



With great power...

At a time when science plays such a powerful role in the life of society, when the destiny of the whole of mankind may hinge on the results of scientific research, it is incumbent on all scientists to be fully conscious of that role, and conduct themselves accordingly. I appeal to my fellow scientists to remember their responsibility to humanity.²¹⁰

- ... comes great responsibility
- to humanity...
- to the planet...
- and to squirrels!

<https://UnCiv.nl>



Hacking (and) Internet Governance

<https://wiki.techinc.nl/>
Internet Governance and hackers

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



AUTOMATE ALL THE THINGS



Coming up: Quantum Internet Hackathon: 1-2 December

RIPE Atlas Probes at hackerspaces



Take part in Hackers Communities

- Join local hackerspace
 - Copenhagen: Labitat & Illutron (art-ship!)
 - WorldWide: hackerspaces.org
 - Amsterdam: LAG, TechInc

- Join hackers events

- MCH2022.org
- BornHack
- CCC Congress

- Hack for the Planet!



Justice, Equity, Diversity, Inclusion (JEDI)

<https://wiki.techinc.nl/>
Internet Governance and hackers

WITHOUT WOMEN
COMPUTING AS WE KNOW IT
WOULD NOT EXIST

ADA LOVELACE

HEDY LAMARR



INVENTOR OF
SCIENTIFIC COMPUTING



INVENTOR OF WIFI
BLUETOOTH & GPS

TOP SECRET ROSIES

GRACE HOPPER



THE WORLD'S FIRST
COMPUTER PROGRAMMERS



WROTE THE FIRST
COMPILER

7 Principles of Data Feminism



Examine power

Challenge power

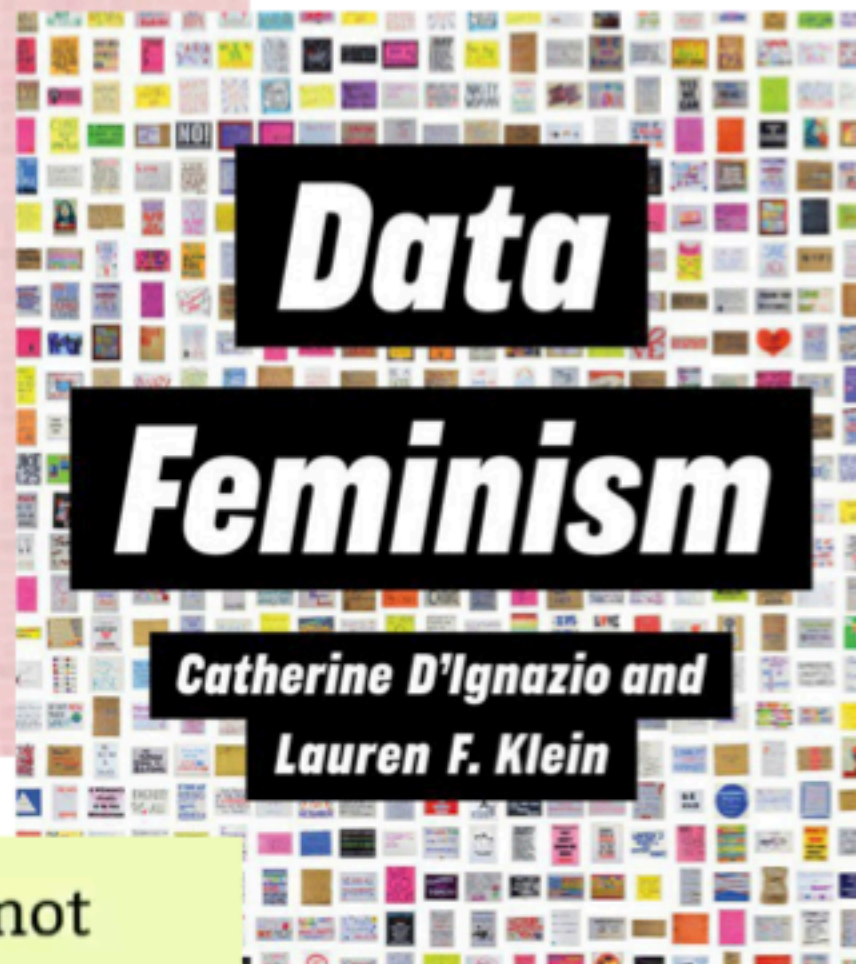
Rethink binaries and hierarchies

Elevate emotion and embodiment

Embrace pluralism

Consider context

Make labor visible



Intersectional feminism is not only about women and gender.

It is about power - who has it and who doesn't.

(Intersectional) Data Feminism



Table 2.1: From data ethics to data justice

Concepts That Secure Power	Concepts That Challenge Power
Because they locate the source of the problem in individuals or technical systems	Because they acknowledge structural power differentials and work toward dismantling them
Ethics	Justice
Bias	Oppression
Fairness	Equity
Accountability	Co-liberation
Transparency	Reflexivity
Understanding algorithms	Understanding history, culture, and context

2. How to get more women in tech?

1. Be explicit and inviting
2. Role Models
3. Talk about this issue
4. Create spaces for women
5. More women in tech → more women in tech!

Female Conference Speaker				
B	I	N	G	O
Women just aren't interested in this field	There aren't enough qualified female speakers	We need big-name speakers, and few of those are women	It's a male-dominated field	There aren't a lot of women in C-level positions
Both women we called were booked that weekend	Both women we booked bailed at the last minute	All the women were probably busy	Female speakers are always burnt out from speaking so much	Trying to get more female speakers is sexist
The organizers just wanted to get the best speakers they could find	You can't kick out a male speaker just to fit a woman in there	FREE	You can't shoehorn in a woman where she doesn't fit	Women never volunteer to present
You have to be bold; people aren't just going to invite you to present	Women are shy	Women only ever want to talk about woman-stuff	Women need to act more like men	No one has complained about this before
Attendees want to hear from people like themselves	Well, there aren't that many female attendees, either	We're only responding to demand	Fine, YOU tell me who they should have invited	Who? I've never heard of her.

"When you're accustomed to privilege, equality feels like oppression"

AFRO
PUNK

<http://linnytu.com/hacker>

linnytu.com/hacker

this is what a hacker looks
like.

or is it?

the image of the white,
male hacker in a hoodie is
harmful and exclusive to
people who don't fit that
mold.

what if you could change
that image?

lights

clothing

skin

hair

decor

drink



Hacker ~~Ethic~~ Questions

- ~~Access to computers should be unlimited and total.~~ Who gets to use what I make? Who am I leaving out? How does what I make facilitate or hinder access?
- ~~All information should be free.~~ What data am I using? Whose labor produced it and what biases and assumptions are built into it? Why choose this particular phenomenon for digitization/transcription? What do the data leave out?
- ~~Mistrust authority—promote decentralization.~~ What systems of authority am I enacting through what I make? What systems of support do I rely on? How does what I make support other people?
- ~~Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race or position.~~ What kind of community am I assuming? What community do I invite through what I make? How are my own personal values reflected in what I make?

Allison Parrish: “Programming is Forgetting: Toward a New Hacker Ethic” (2016)



MOTHERSHIP
HACKER MOMS

Hacking Feminism!

Consent

Response to sexual violence and community
accountability

Programming

Networking (protocols, packet distribution)

De-learn norms

Internet Governance

Break stuff

Amygdala hacks

Command line skills

Securing linux

Decolonising queerness & feminism

Poster making & spreading

Cryptography

Shoplifting

Gaming the system

Learn new tricks

TransHackFeminist! Convergence

Film/documentary nights

Open events for ally education

Anticop

Debate

Workshop

https://wiki.laglab.org/Hacking_Feminism



Vesna Manojlovic

More Presentations

- <https://www.ripe.net/about-us/press-centre/publications/presentations/2022/the-resilience-of-the-internet-in-ukraine-ietf-113>
- <https://www.ripe.net/about-us/press-centre/publications/presentations/2021/technical-communities-resilience-during-covid-19-pandemic-nluug-najaarsconferentie-2021>
- <https://www.ripe.net/about-us/press-centre/publications/presentations/2020/ripe-ncc-tools-and-services-an-update-denog-10>

Additional Links



- <https://labs.ripe.net/author/becha/ripe-community-resilience-economy-of-care/>
- <https://labs.ripe.net/author/becha/data-feminism-from-data-ethics-to-data-justice/>
- <https://labs.ripe.net/author/becha/computing-within-limits-2022-event-wrap/>
- <https://labs.ripe.net/author/becha/ripe-community-resilience-every-society-has-the-internet-they-deserve/>
- <https://labs.ripe.net/author/becha/ripe-community-resilience-nature-is-healing/>
- <https://irtf.org/gaia>
- https://wiki.techinc.nl/Hackers_tribes#Other_animals_against_Technology
- https://en.m.wikipedia.org/wiki/Jevons_paradox
- <https://UnCiv.nl>