


CyberPsychology / DIS : Internet Governance & RIPE Community Resilience

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 @Ms_Multicolor

Amsterdam, 1st March 2022



Placing Today in a Context

- **2020(2) = Third Year of Global Pandemic**
- **Russia-Ukraine War**
 - started on 24th February (or in 1982/2004/2014...)
- **IPCC AR6 published on 28.2. [\(link\)](#)**
- **Consequences**
 - zoom-fatigue is real! // yet, I am at home, with Covid-19 :(
 - I'm afraid of nuclear arms being used & re-triggered by the refugee crisis / reminded of Yugoslav Wars
 - Climate Chaos causing stress & **also** calls for solidarity & equity
- **I am grateful for being alive, safe, together**

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

VAX-VMS, DecNET, ZaMir...

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

About Me



Alisa, Charlie, Olivia

RIPE NCC: 

1999-2021+
IPv4, IPv6 /
RIPEness,
DNSSEC, RPSL,
RIS, RIPE Atlas,
hackathons

RIPE:
SEE{1-9}, CoC-TF,
NOGs, IXPs, RIRs,
“Trusted Contact”

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

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



Vesna Manojlovic | DIS <->

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



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

Internet Governance / Introduction to RIPE NCC

Overview



History of Internet

Networking Basics

Internet Registry System

RIPE and RIPE NCC

Data Ethics / Data Feminism / Hackers

Internet Governance



Electronics

Software



**Digitalised
Information**

ASCII Alphabet			
A	1000001	N	1001110
B	1000010	O	1001111
C	1000011	P	1010000
D	1000100	Q	1010001
E	1000101	R	1010010
F	1000110	S	1010011
G	1000111	T	1010100
H	1001000	U	1010101
I	1001001	V	1010110
J	1001010	W	1010111
K	1001011	X	1011000
L	1001100	Y	1011001
M	1001101	Z	1011010

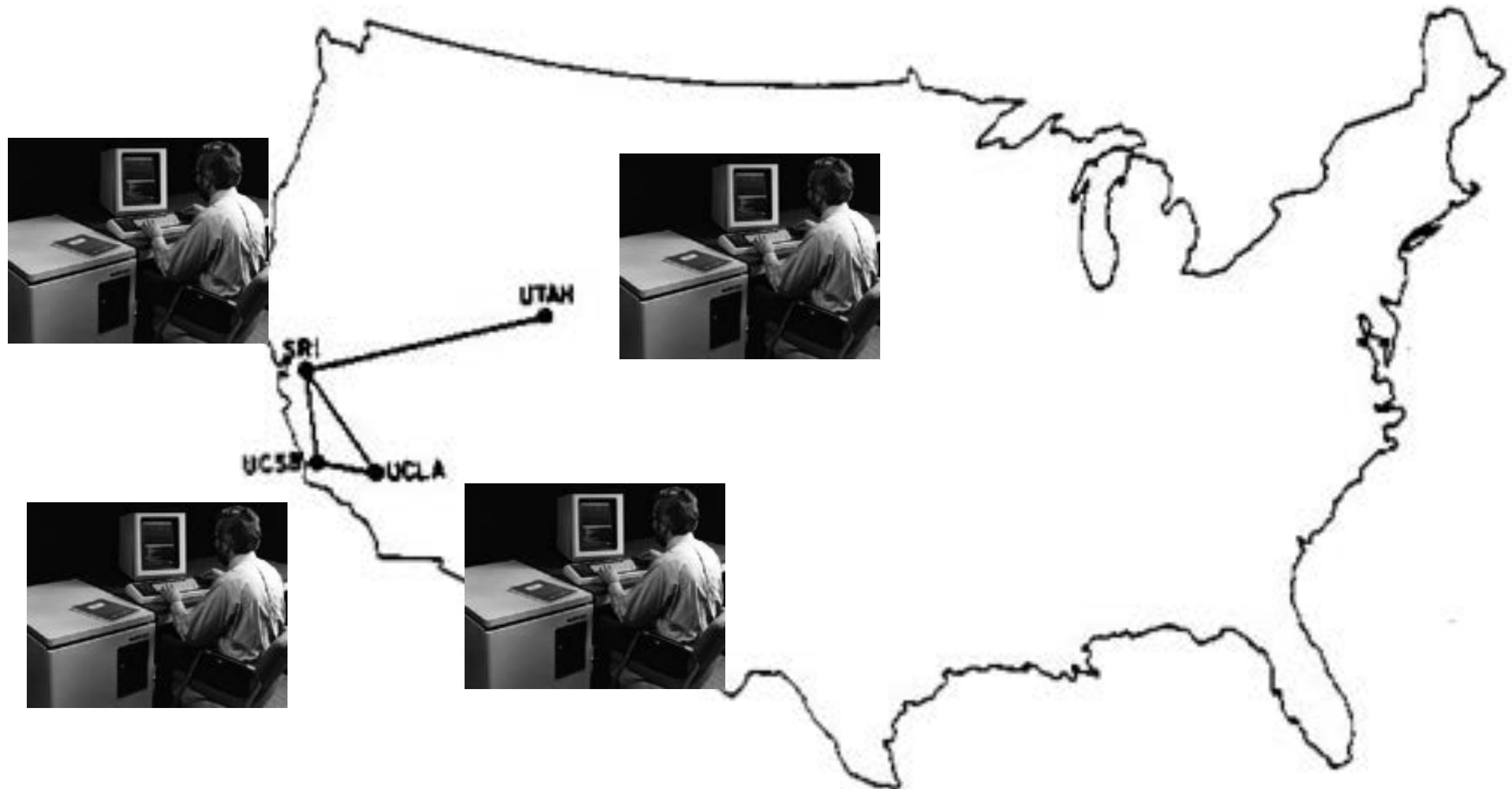
Digital Data Transmission



- Send information from one place/device to another
- Need to codify the info -> digitally
- Binary codification -> uses two characters: 0 / 1
- Bit (0 or 1) minimal unit of information
- Byte = 8 bits; used by ASCII characters => 256 (2^8)
(*American Standard Code for Information Interchange*)
- If you want to transmit “hi”:
 - h ->
 - i ->

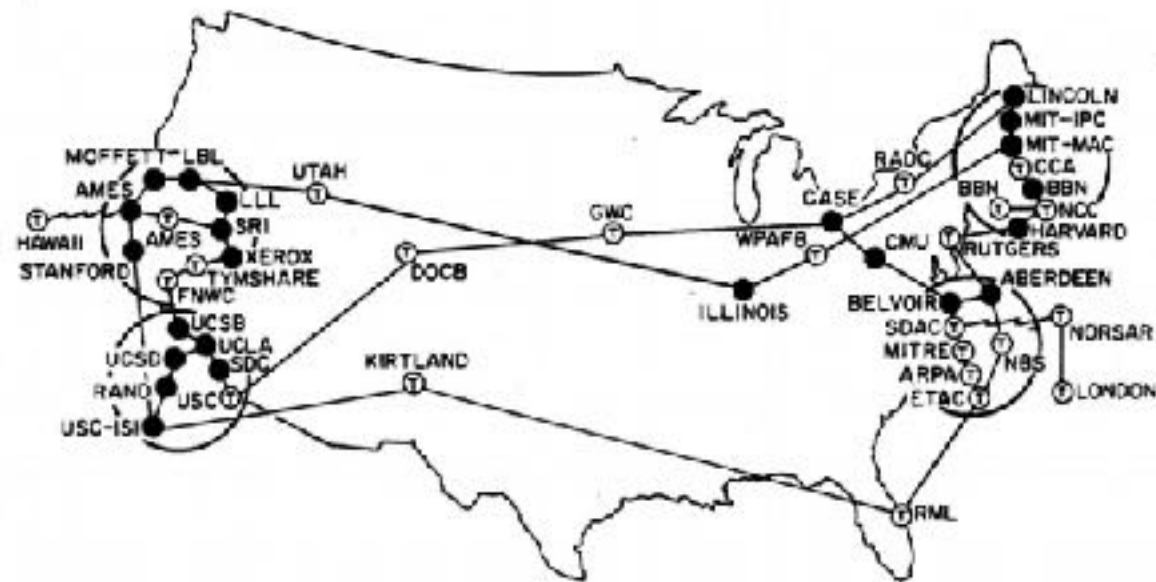
0	1	1	0	1	0	0	0
0	1	1	0	1	0	0	1

1969 ...



...1970s ...

... begin 1980s

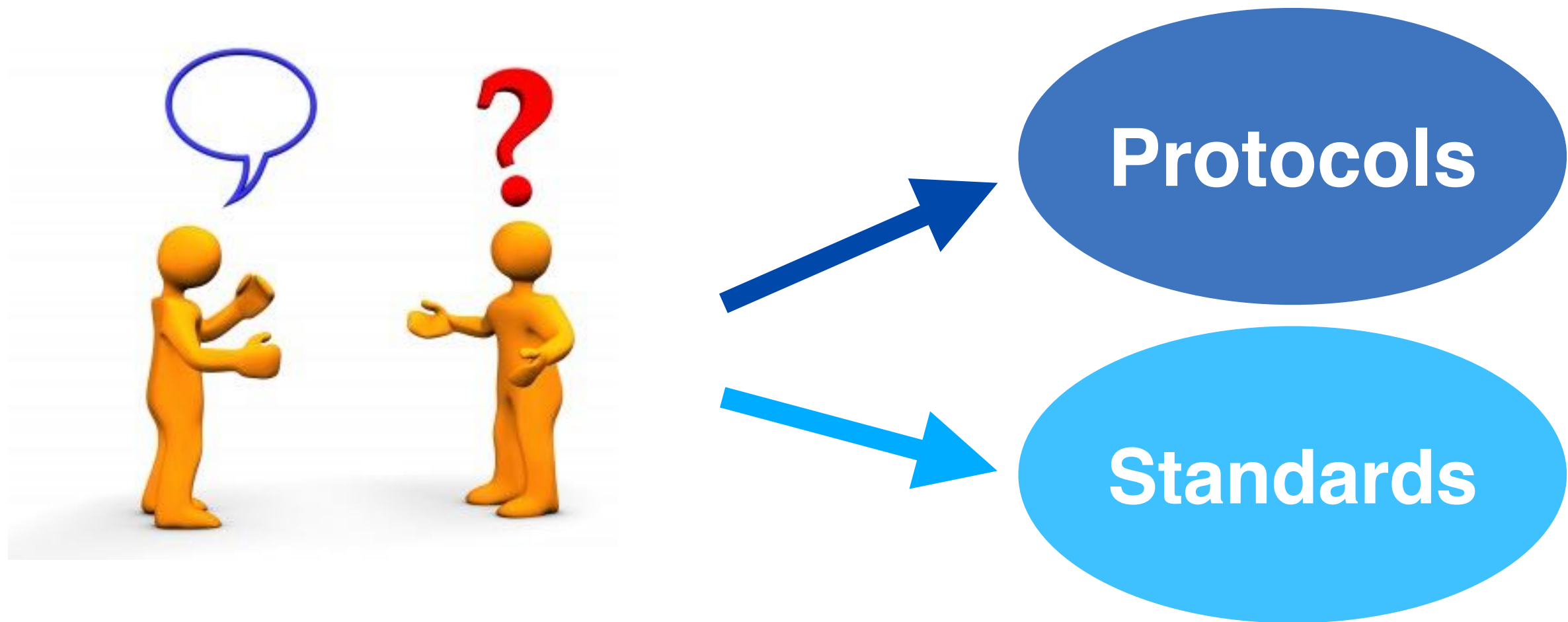


Europe

Asia

© ARPA / ARPANET Completion Report

...1980s ...



TCP/IP

DNS

WWW

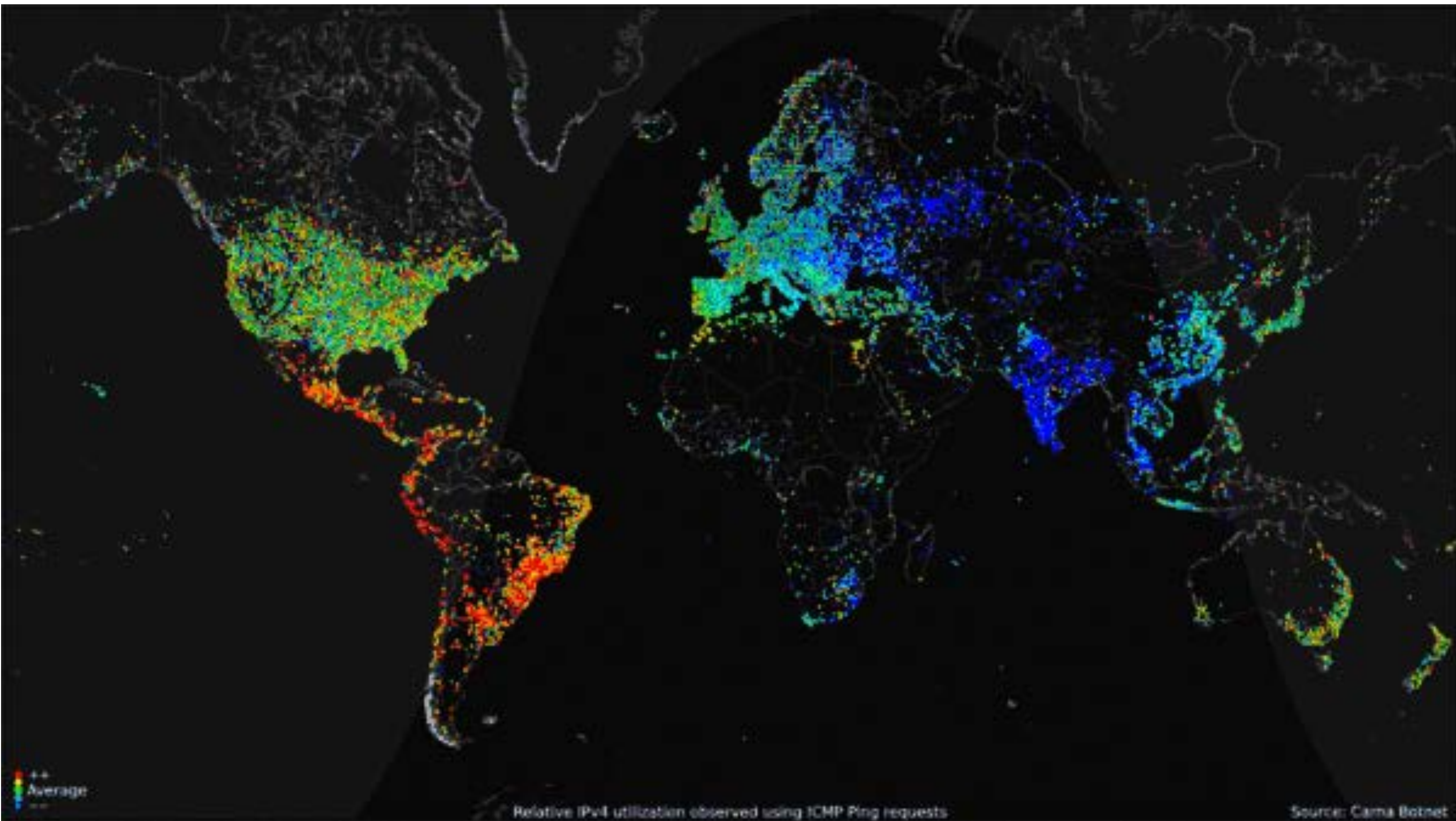
...1990s ...



Public WWW

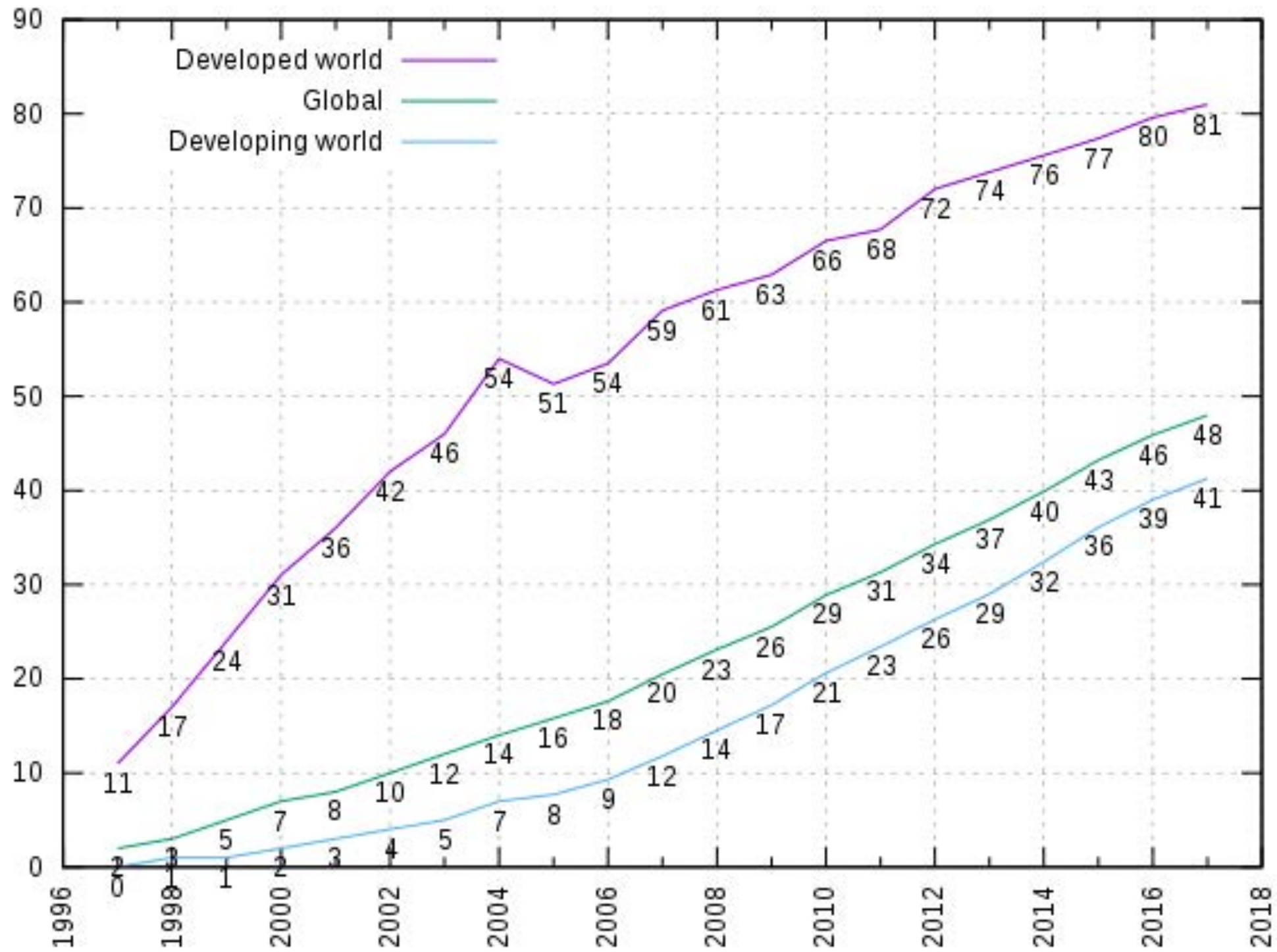
**Mosaic
Browser**

...2000s-Today





Internet Users Per 100 Inhabitants



WITHOUT WOMEN
COMPUTING AS WE KNOW IT
WOULD NOT EXIST

ADA LOVELACE



INVENTOR OF
SCIENTIFIC COMPUTING

HEDY LAMARR



INVENTOR OF WIFI
BLUETOOTH & GPS

TOP SECRET ROSIES



THE WORLD'S FIRST
COMPUTER PROGRAMMERS

GRACE HOPPER



WROTE THE FIRST
COMPILER

WomenRockScience.tumblr.com



Sitting in a moving wagon



Bigger

Faster

Critical

Insecure

Squirrels Winning the Cyber-War ;-)

TOTAL SUCCESSFUL CYBER WAR OPS
AS OF 2017.01.08 - 1748

Agent	Success
Squirrel	879
Bird	434
Snake	83
Raccoon	72
Rat	36
Marten	22
China	0
Russia	0*
USA	1

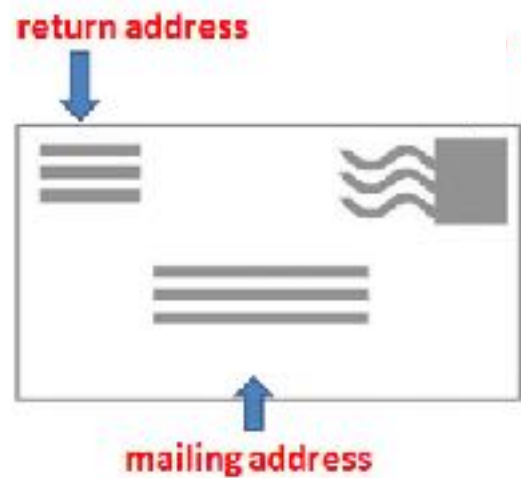


- https://wiki.techinc.nl/index.php/Hackers_tribes#Squirrels_against_technology

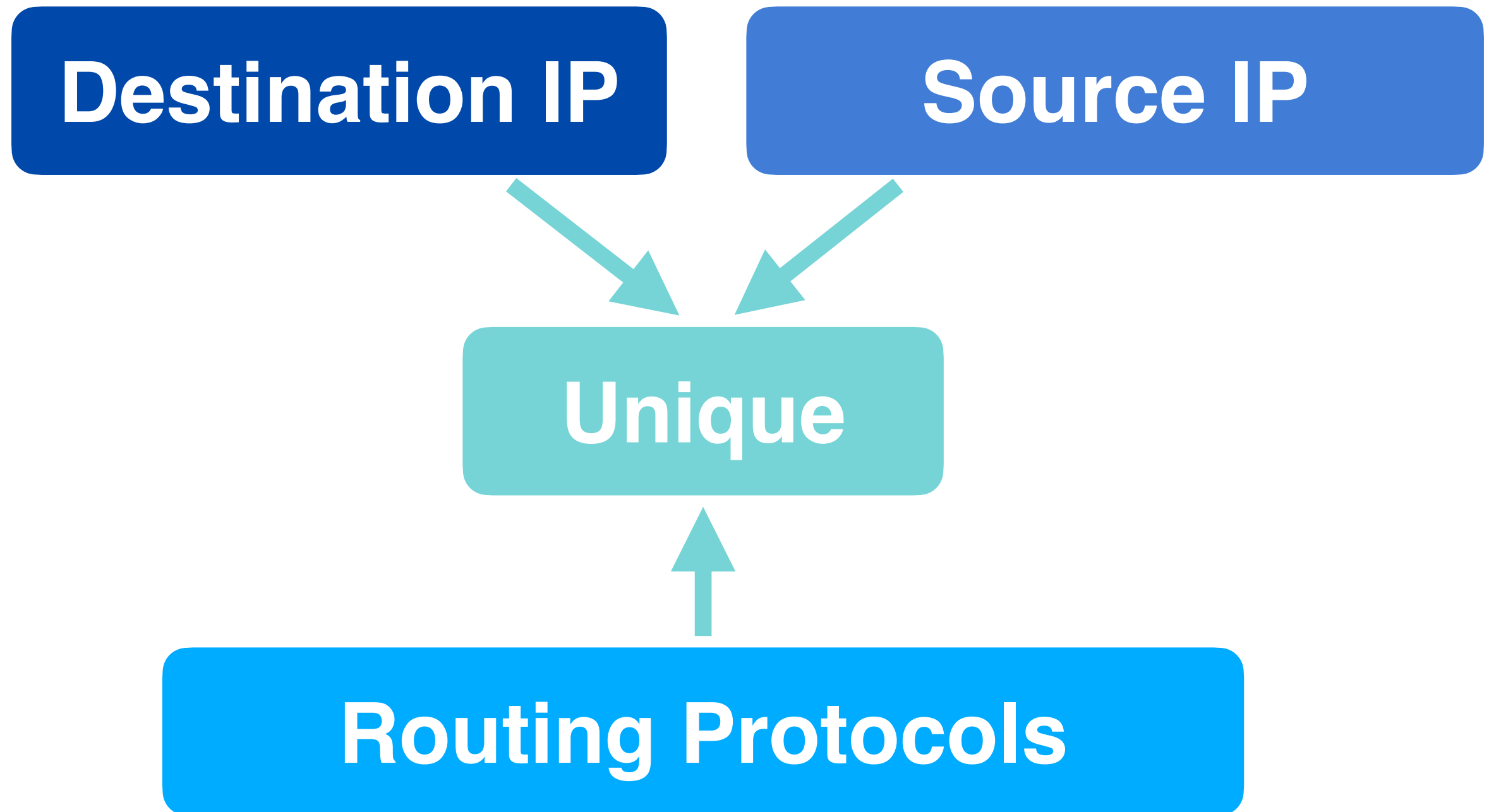


Networking Basics (Internet Plumbing)

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)
 - Communication can start at any moment (example: postal mail, Internet)
- *As opposed to “circuit switching” (classical telephony)*

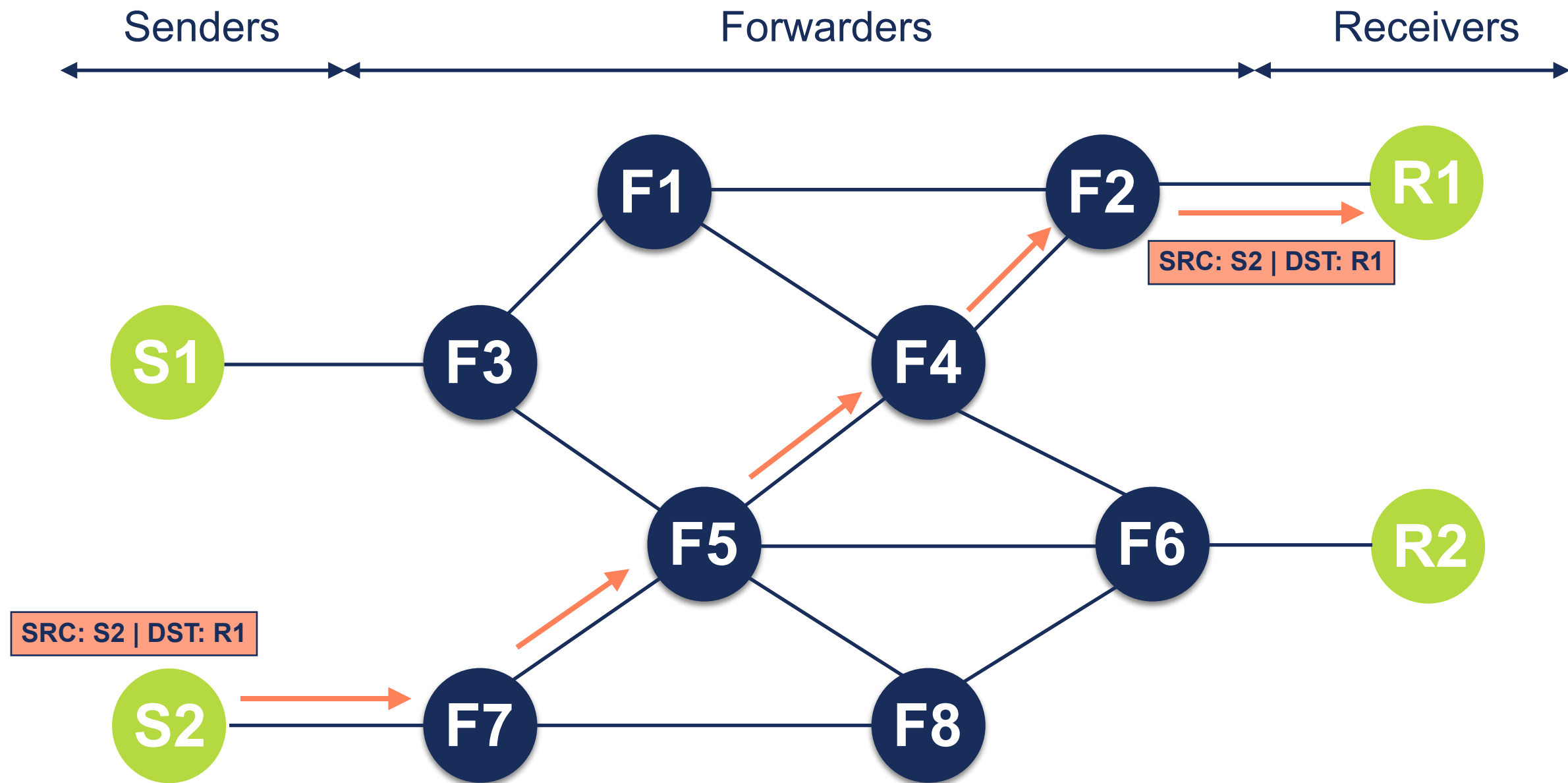
Packet-Switched Networks (2)



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

Packet-Switched Networks (3)



Resilience & “Routing Around Damage”!!!

Layered Model (1)



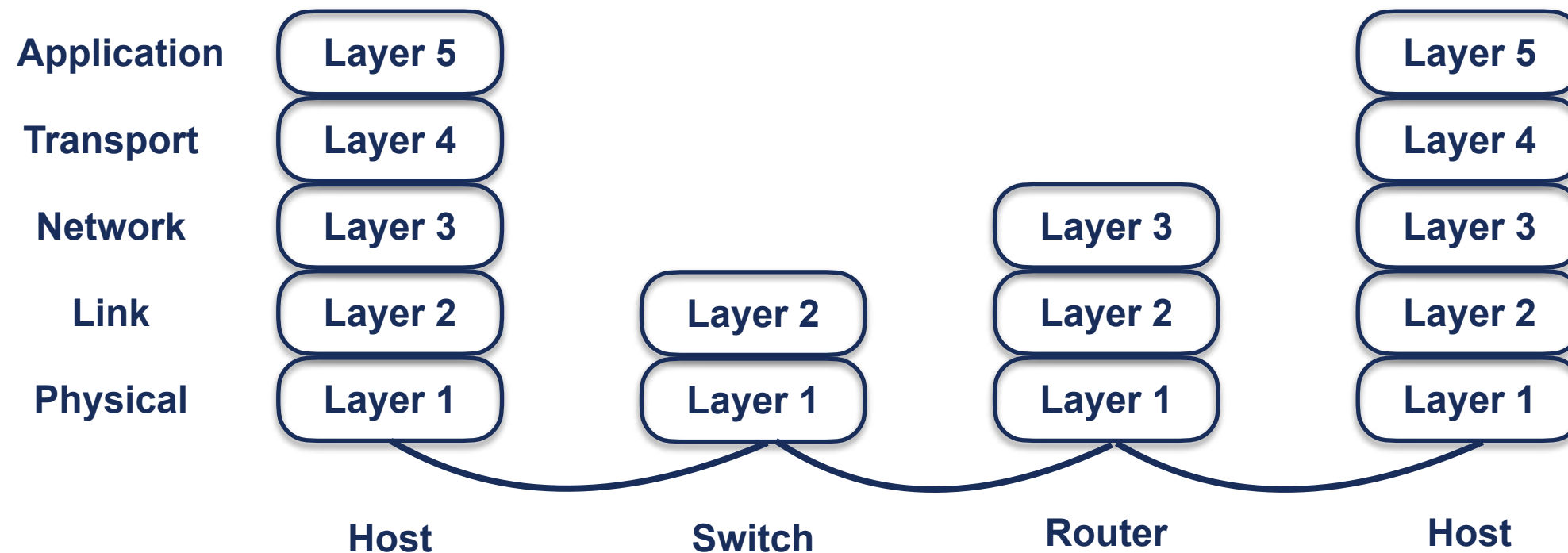
Let's define things:

- **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

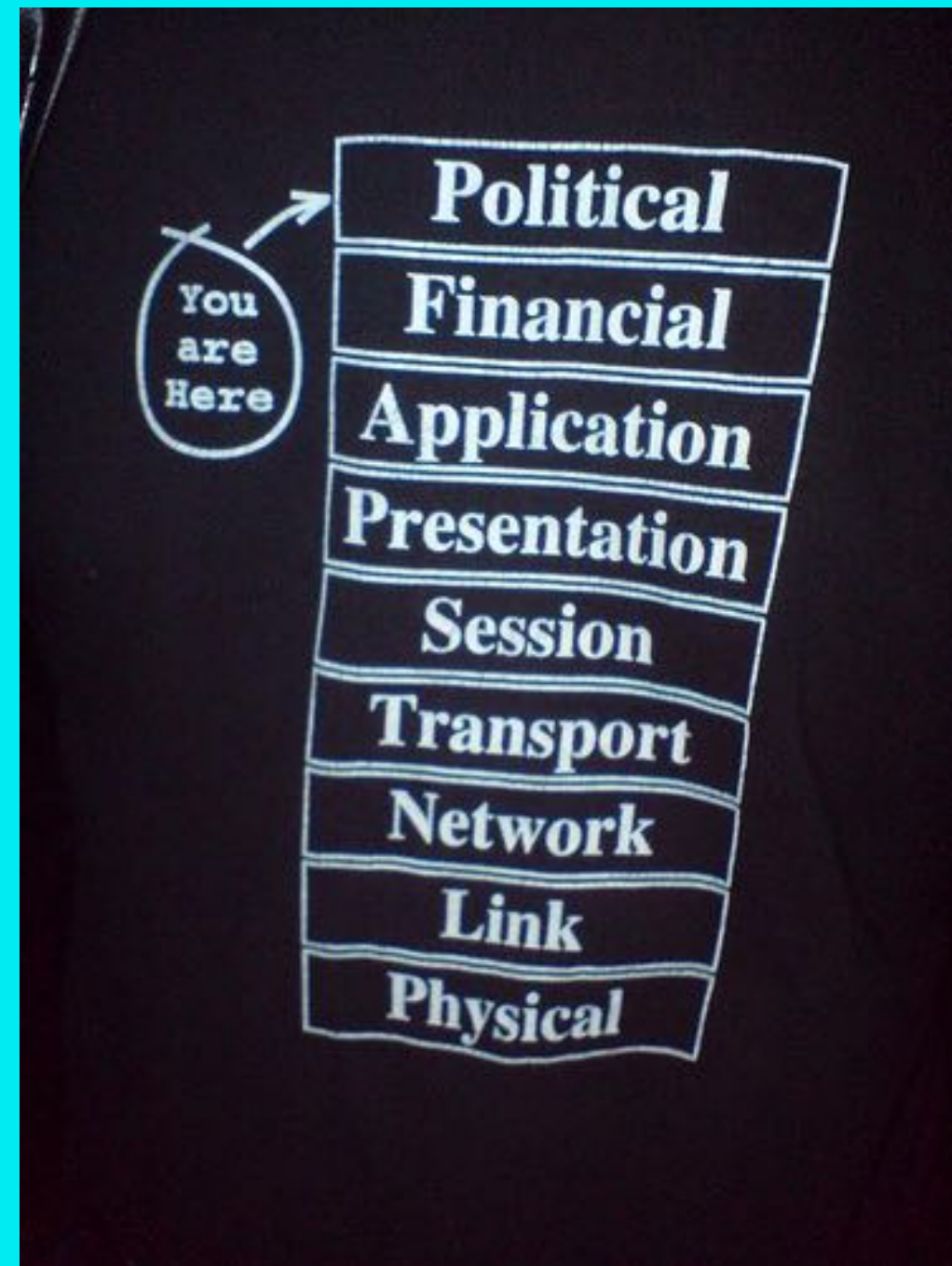
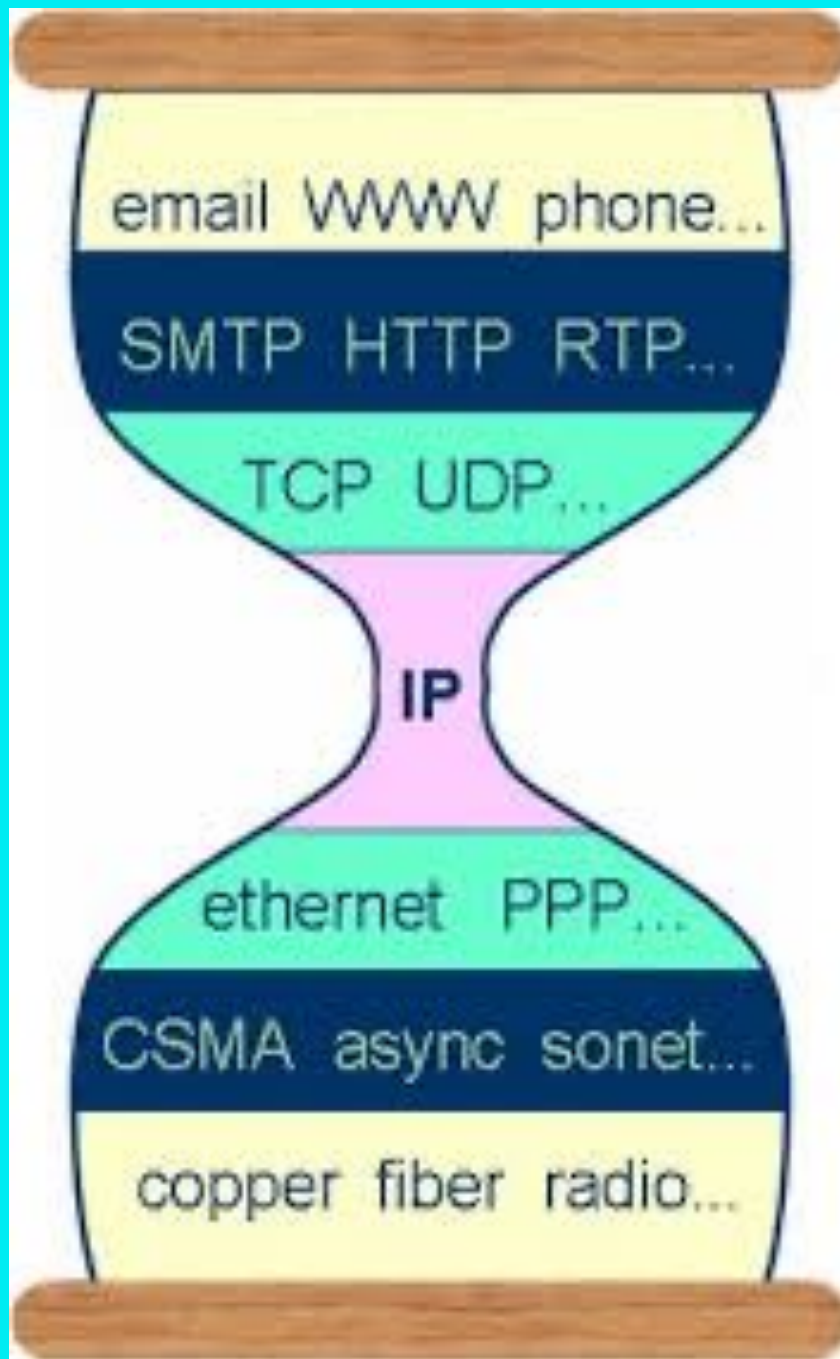
Layered Model (2)



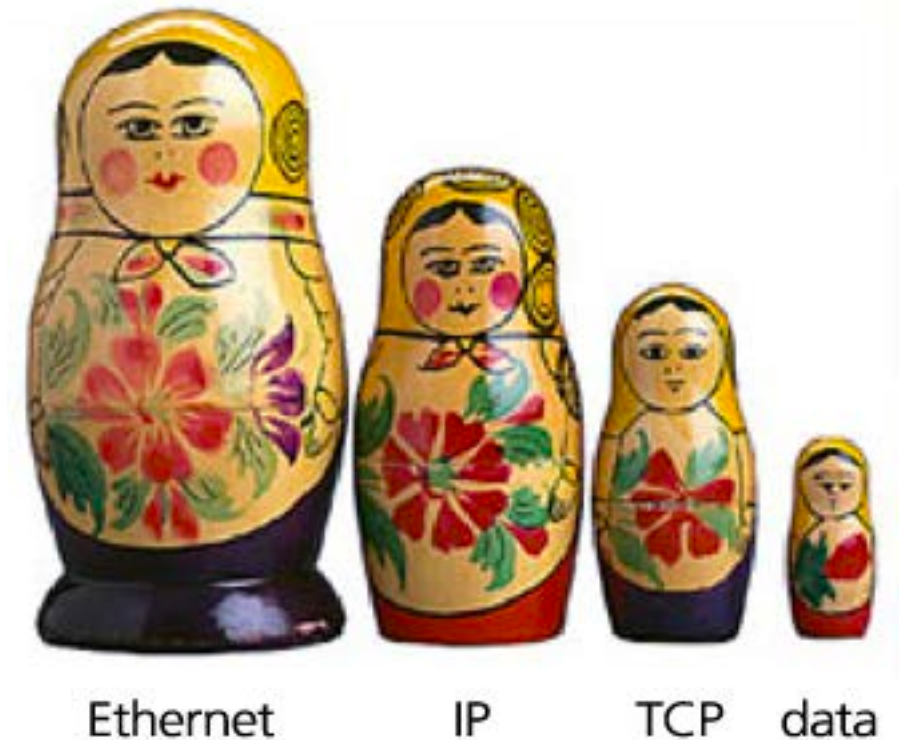
- TCP/IP layered model -> Used in Internet



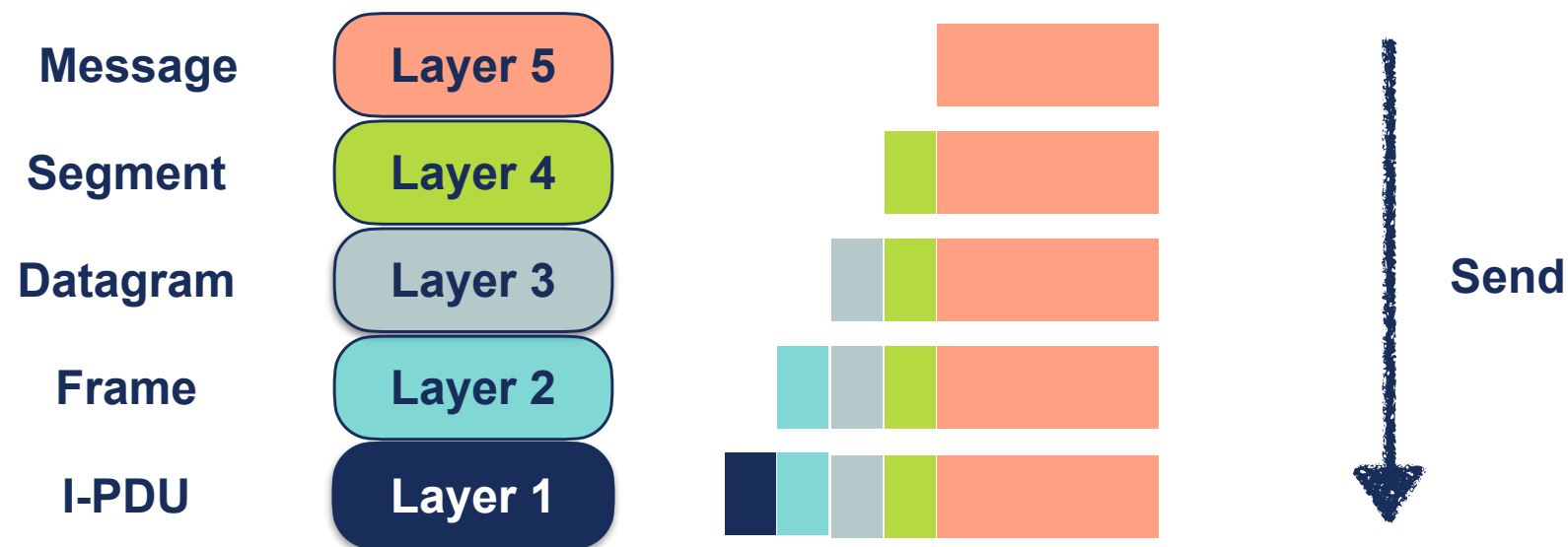
Networking as “Abstraction Layers”



Layered Model (3)



- PDU: Protocol Data Unit



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

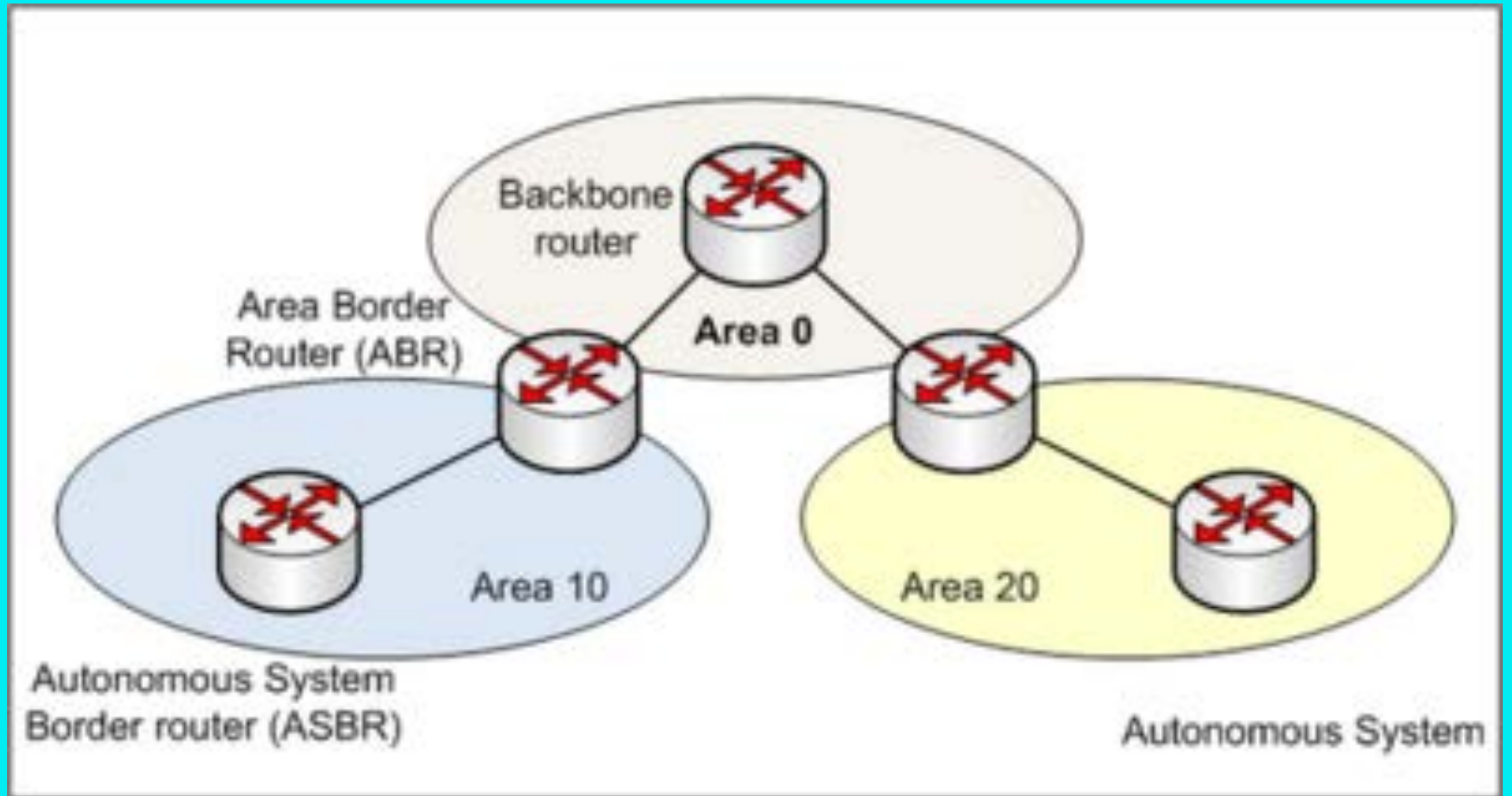
Network of networks

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

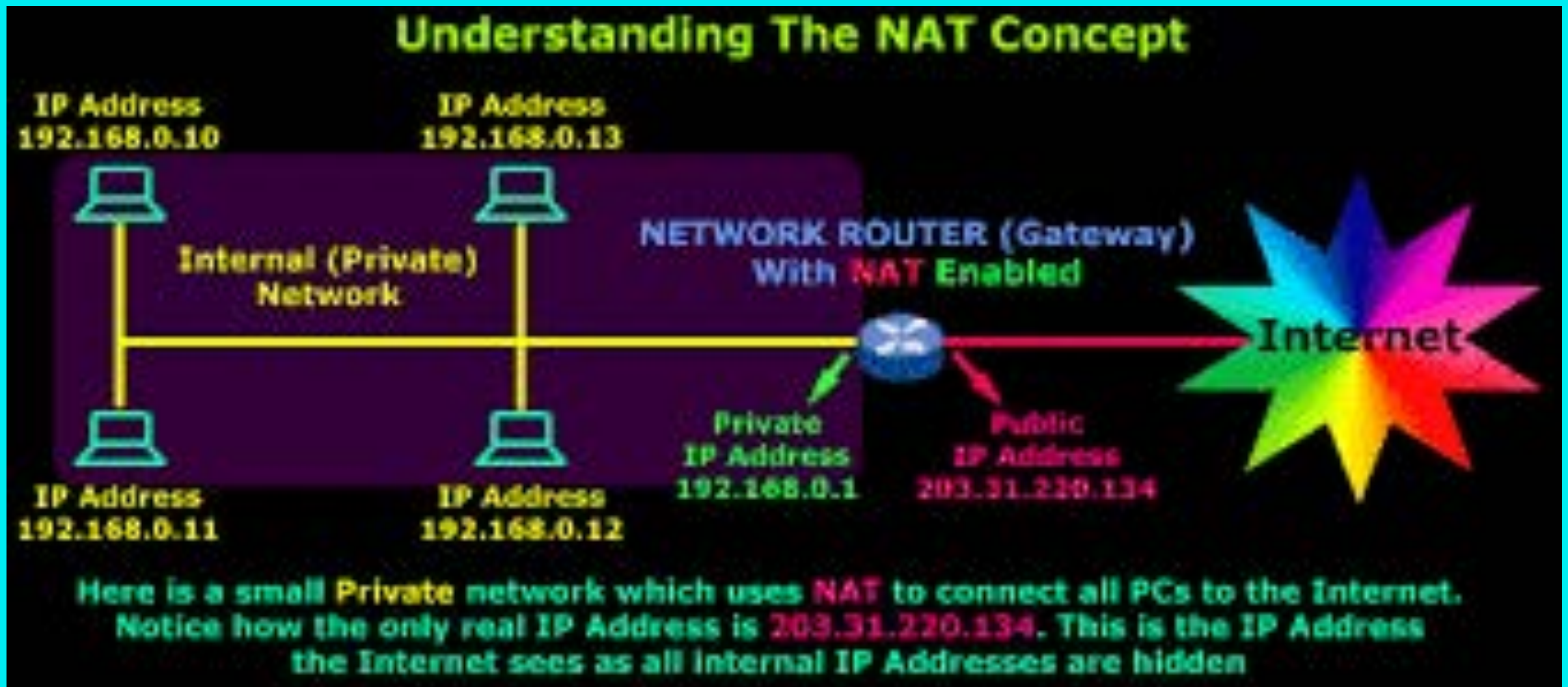
An IPv4 address (dotted-decimal notation)

172	.	16	.	254	.	1
↓		↓		↓		↓
10101100		00010000		11111110		00000001
└──────────┘		└──────────┘				
One byte = Eight bits						
└──┘						
Thirty-two bits (4 x 8), or 4 bytes						

Distributed, Decentralised, Ungovernable



Private Networks & DNS



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

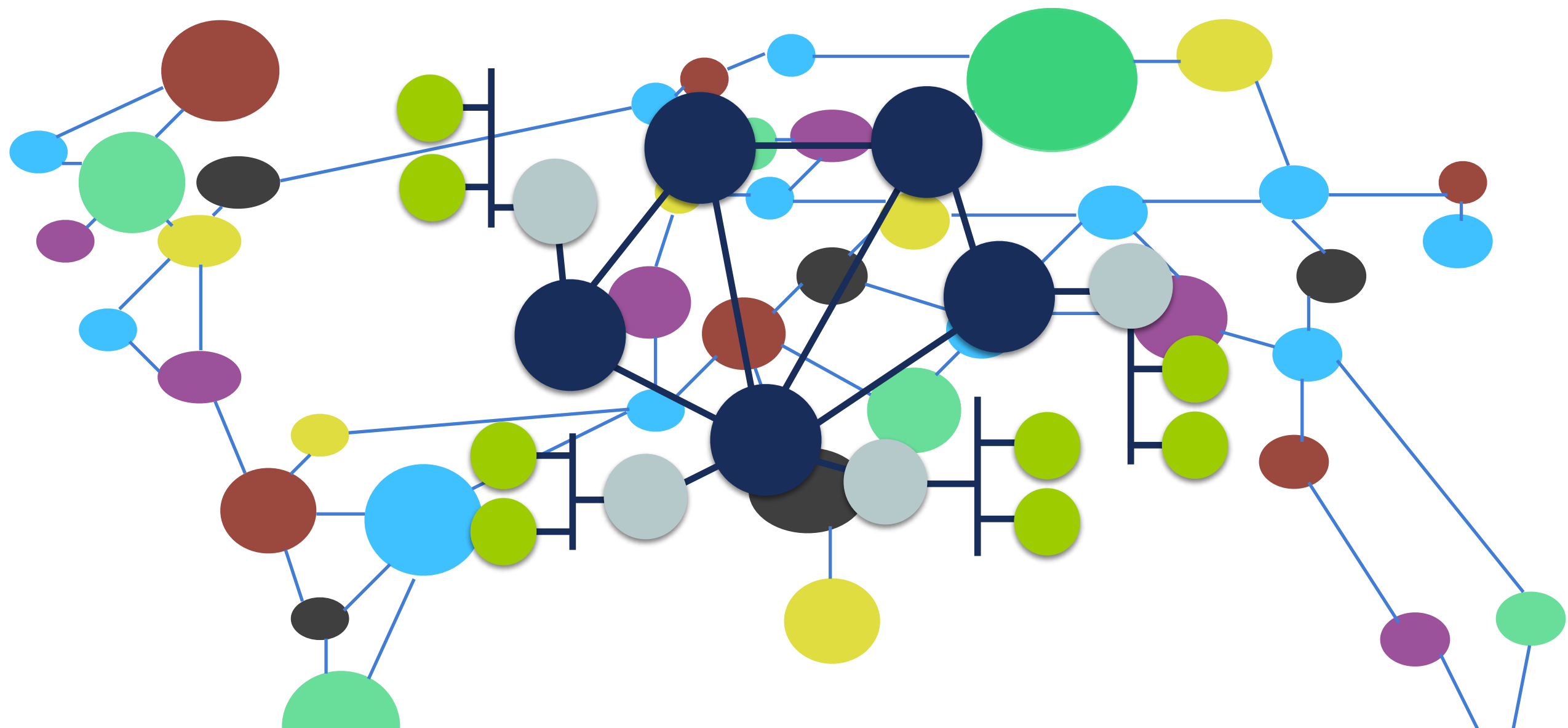
Internet building blocks



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

Goals: Registration



- **Why?**
 - Ensure uniqueness of Internet number resources
 - Provide contact information
- **How?**
 - RIR whois databases
- **Results:**
 - IP address space used only by one organisation
 - Information available on users of Internet number resources

Goals: Aggregation



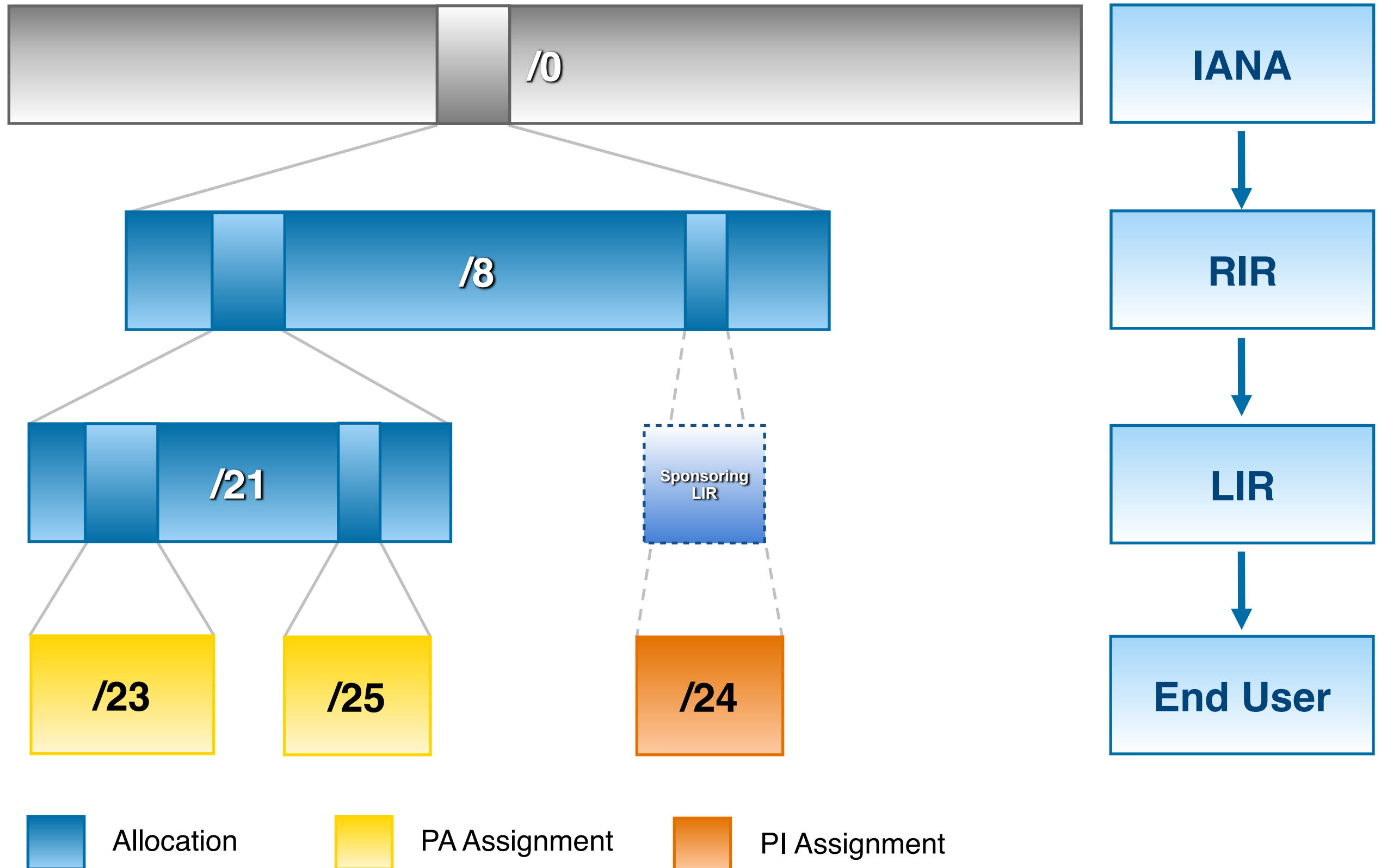
- **Why?**
 - Routing tables growing too fast
 - Provide scalable routing solution for Internet
- **How?**
 - Encourage announcement of whole allocations
 - Introduction of Classless Inter Domain Routing (CIDR)
- **Result:**
 - Growth of routing tables has slowed a bit

Goals: Conservation

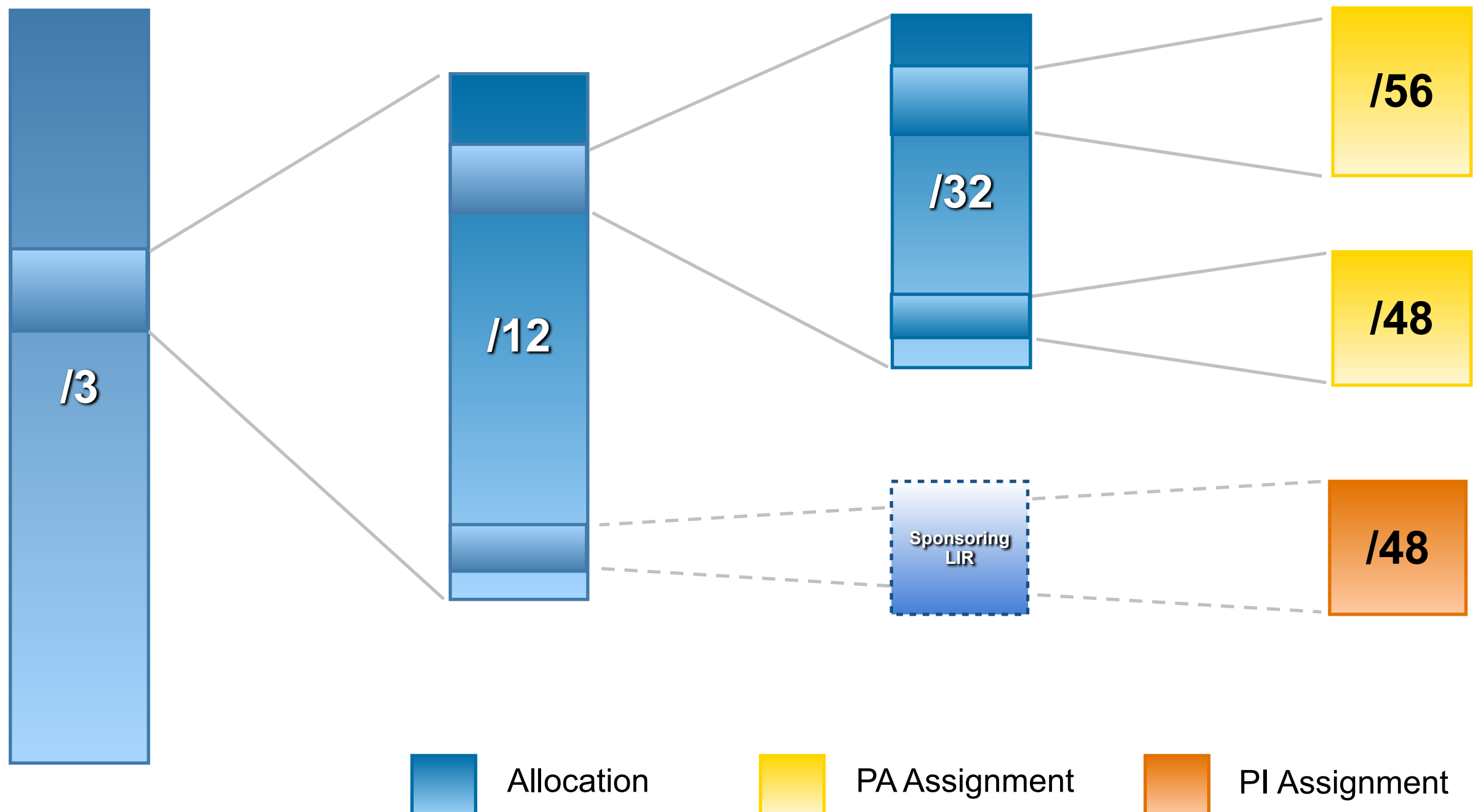
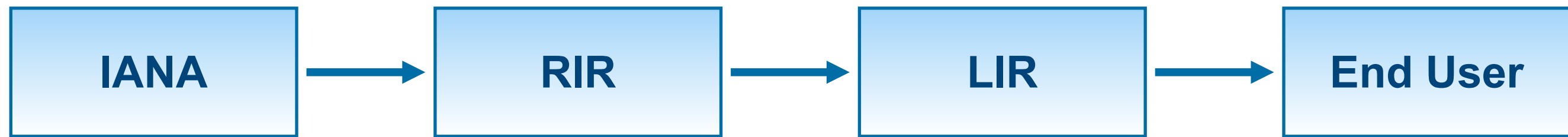


- **Why?**
 - IP addresses and AS Numbers are limited resources
 - These resources were not used efficiently in the past
- **How?**
 - Introduction of CIDR
 - Policies to ensure fair usage
- **Results:**
 - Growth in IP address space usage slowed down
 - Resources were distributed based on need

IPv4 Address Distribution - Historical



IPv6 Address Distribution

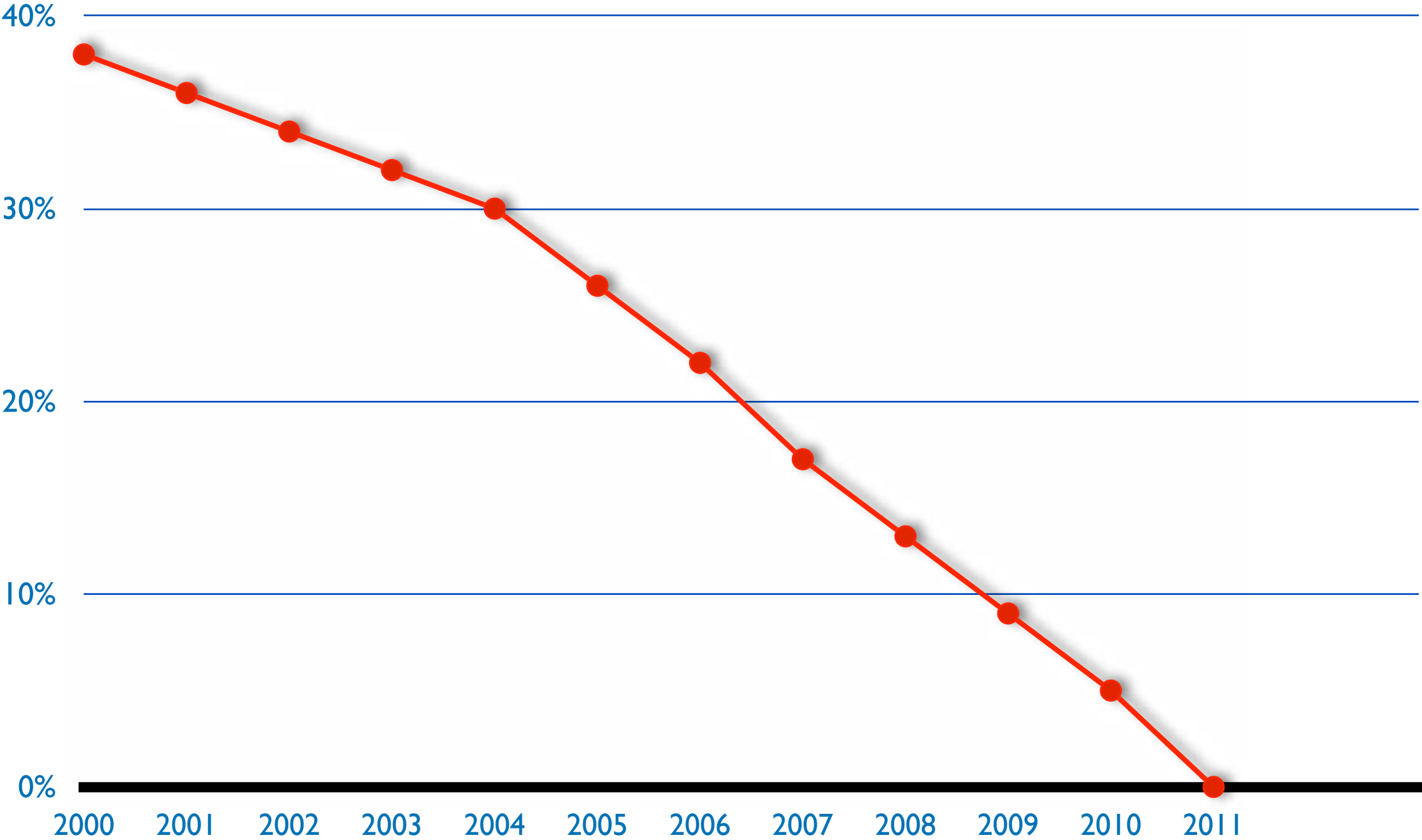




IPv4 Pool Exhaustion

14:15

IANA IPv4 Pool



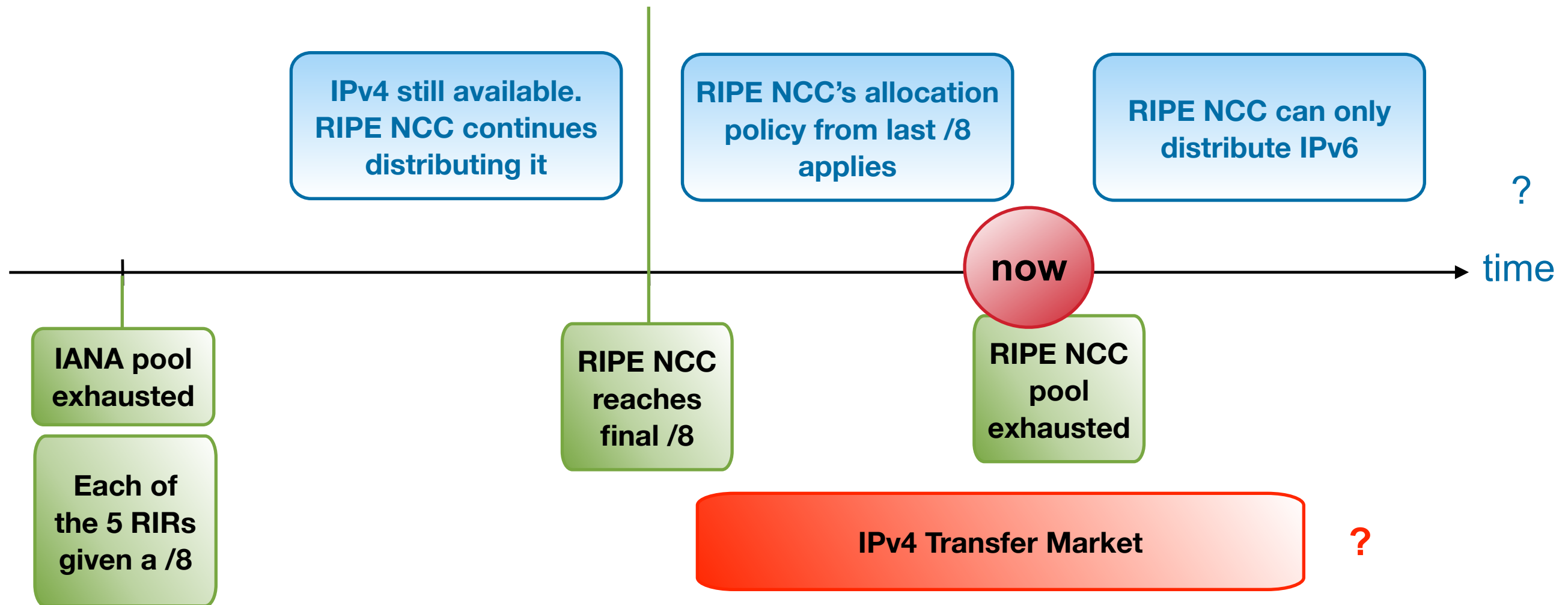
IPv4 Exhaustion



“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”



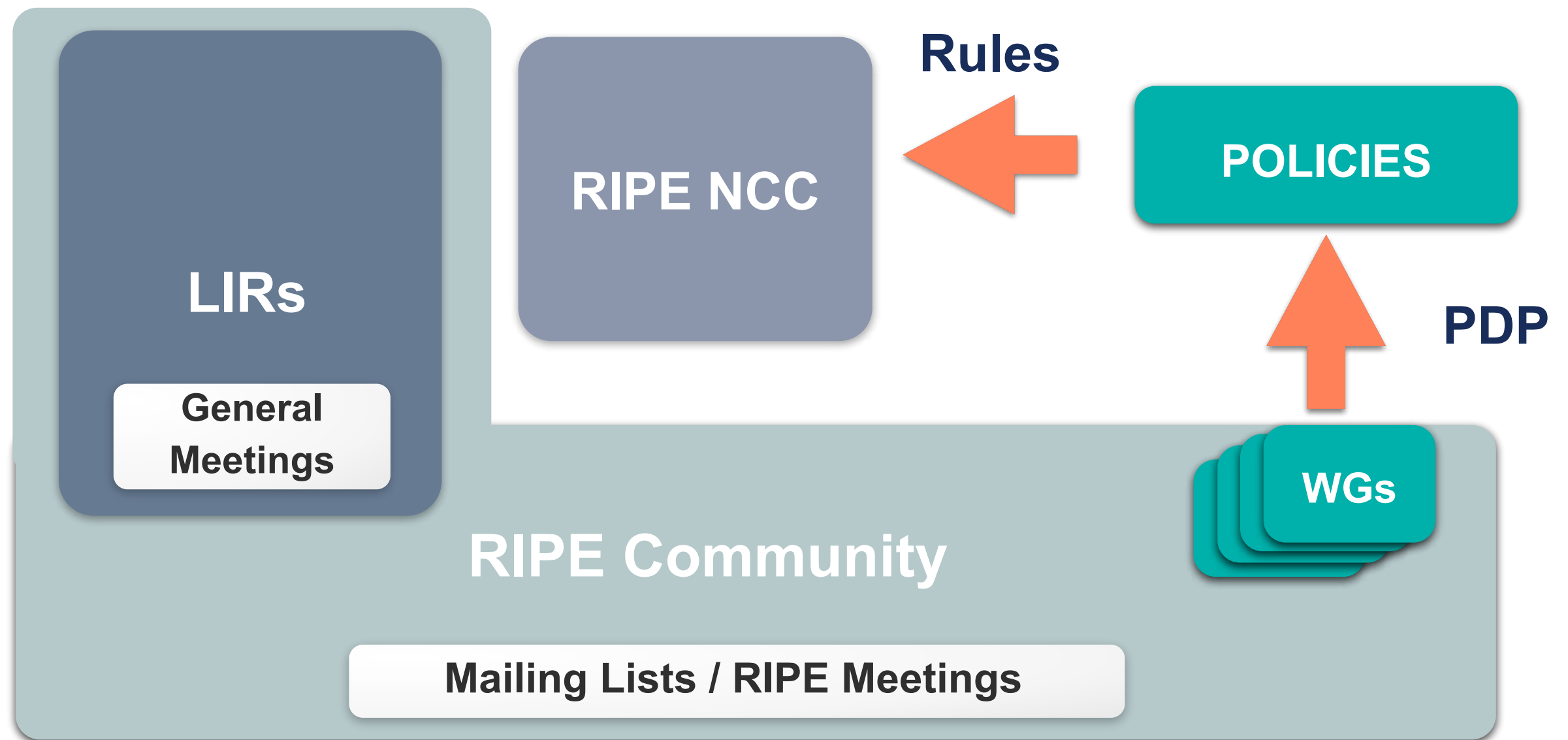
Image source: <http://bit.ly/1b4bJAp>



RIPE and RIPE NCC

14:35

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
 - [RIPE84.ripe.net](https://ripe.net) (hybrid / Berlin: May 2022)
 - [RACI programme](#) & RIPE Fellowship
- Join events organised by RIPE NCC
 - Regional meetings / Training courses & on-line education / Hackathons
 - ripe.net/see10 : Ljubljana, 11-12 April 2022
- Write for RIPE Labs: <https://labs.ripe.net>

RIPE NCC



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

Who Does What ?



- **The RIPE community**
 - Creates & discuss proposals
 - Seeks consensus
- **Working Group (WG) chairs**
 - Accept proposals
 - Chair the discussions
 - Decide if consensus has been reached
- **The RIPE NCC**
 - Acts as the secretariat to support the process
 - Publishes policies documents and implement them

RIPE NCC General Meeting



- During RIPE Meetings
- 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





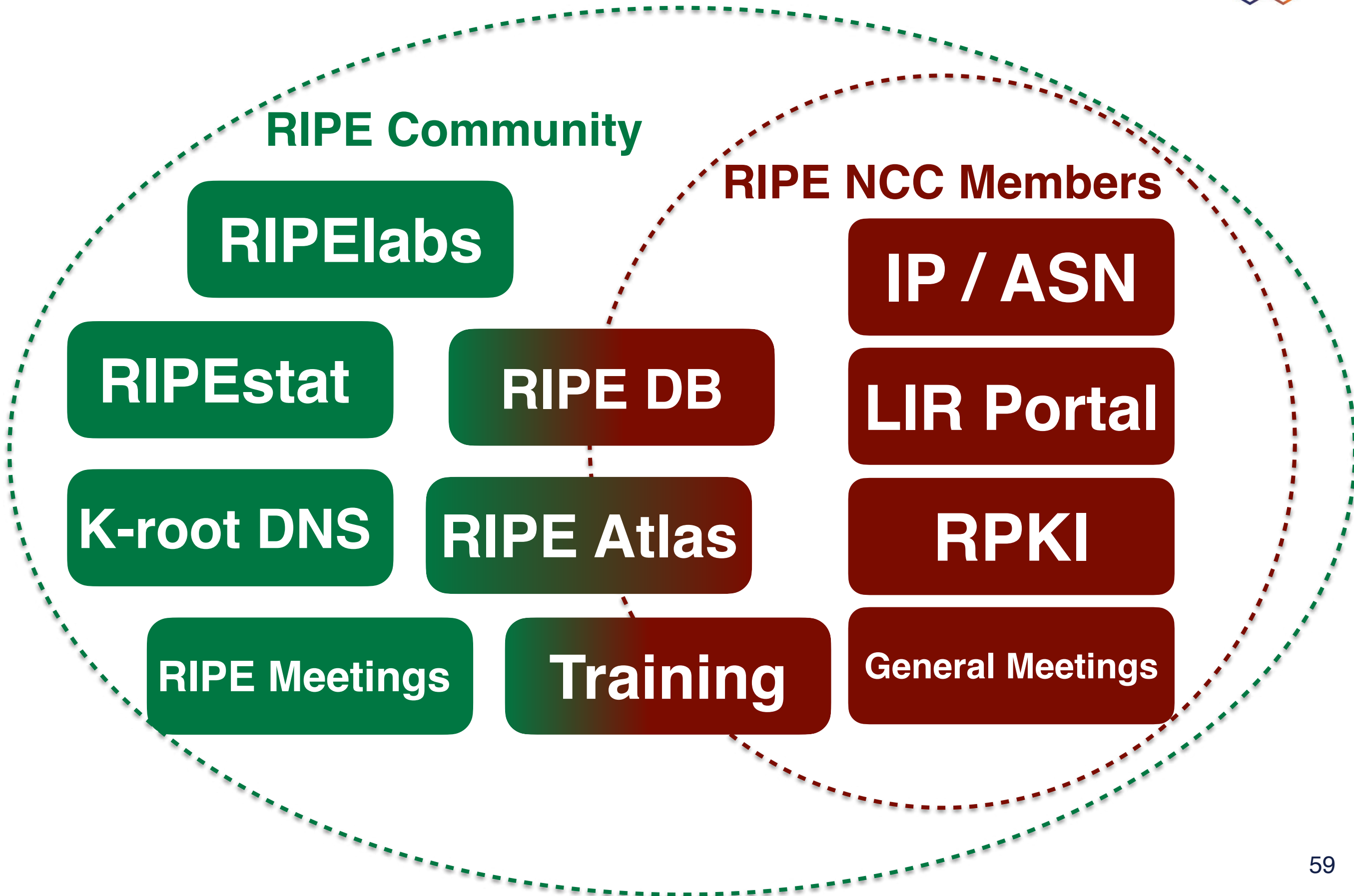
RIPE NCC's Vision

- 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



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

Querying the RIPE Database



- Web interface
- Command line
- Full Text Search
- Restful API (XML/JSON)

☒ Show full object details ?
☐ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources

Types

Hierarchy Flags

Inverse lookup

☐ Search resource objects in all available databases ?
☒ Search RIPE Database only

Are you looking for the [TEST Database](#)?

By submitting this form you explicitly express your agreement with the [RIPE Database Terms and Conditions](#)

Search

RPKI Digital Resource Certificates



- **Issue digital certificates along with the registration of Internet number resources**
- **Two main purposes:**
 - Make the registry more robust
 - Making Internet routing more secure
- **Added security comes with validation**
- **“Resource Public Key Infrastructure”**



- **A place to showcase new and interesting Internet related developments**
- **Anyone can:**
 - Present research
 - Showcase prototype tools
 - Share operational experience
 - Exchange ideas

[**http://labs.ripe.net**](http://labs.ripe.net)



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!**



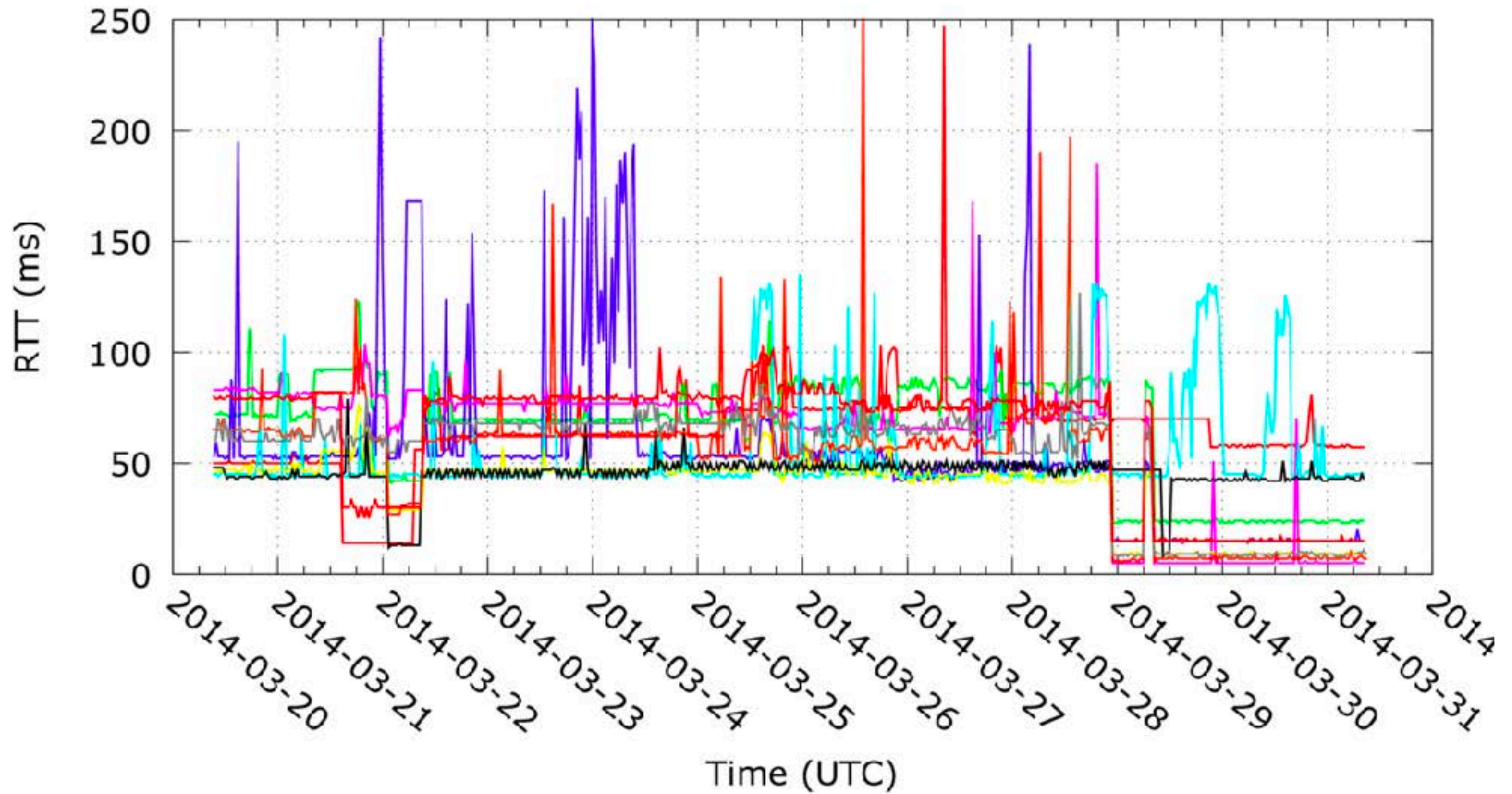
Data Ethics

14:35

RIPE Atlas



Latency to 8.8.8.8 from RIPE Atlas probes in Turkey





RIPE ATLAS

Ethics, Human Rights Considerations & atlas.ripe.net

- Right to security (safety)
- Right to political participation
- Right to non-discrimination
- Right to freedom of expression
- Right to education

IETF: RFC8280

- Personal data not revealed
- No passive measurements
- No HTTP measurements
- “Gratis” devices & SW probes
- Consenting volunteers
- Existence of “non-public” measurements
- Data, API, source code, tools: **free and open**

IETF / IAB; IPPR and Data Commons

- Internet Engineering Task Force
- Internet Architecture Board
- RFC8890: “The Internet is For End Users”
- “The Internet is for Empowerment of End Users”
- Institute for Public Policy Research: “Creating Digital Commons”
- “Governing Internet Infrastructure as Commons”

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

<https://data-feminism.mitpress.mit.edu/>

<https://labs.ripe.net/author/becha/data-feminism-from-data-ethics-to-data-justice/>



1. A feminist internet starts with and works towards empowering more women and queer persons – in all our diversities – to dismantle patriarchy. This includes universal, affordable, unfettered, unconditional, and equal **access** to the Internet.

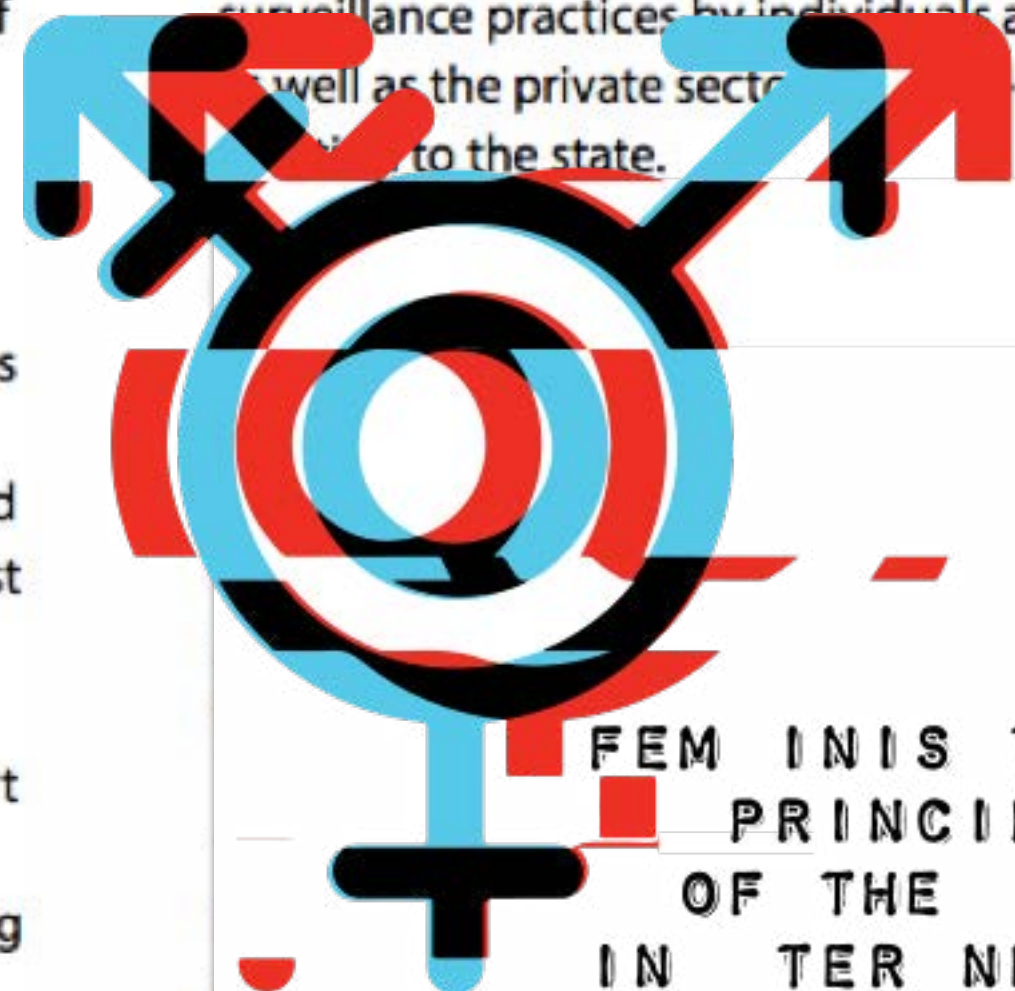
2. A feminist internet is an extension, reflection, and continuum of our movements and **resistance** in other spaces, public and private. Our agency lies in us deciding as individuals and collectives what aspects of our lives to politicize and/or publicize on the internet.

3. The internet is a **transformative** public and political space. It facilitates new forms of citizenship that enable individuals to claim, construct, and express our selves, genders, sexualities. This includes connections across territories, demands for accountability and transparency, and significant opportunities for feminist movement-building.

4. **Violence** online and tech-related violence are part of the continuum of gender-based violence. The misogynistic attacks, threats, intimidation, and policing experienced by women and LGBTQI people are real, harmful, and alarming. It is our collective responsibility

9. The internet's role in enabling access to critical **information** - including conversations on health, pleasure, and risks - is essential, and must be supported and protected.

10. Surveillance by default is the tool of patriarchy to control and restrict rights both online and offline. The right to **privacy** is a critical principle for a safer, open internet for all. Equal attention needs to be paid to surveillance practices by individuals against each other as well as the private sector and state actors, in addition to the state.



Imagine a Feminist Society

- a society predominantly concerned with preserving its existence (*and not endlessly expanding*)
- a society with a modest standard of living,
- conservative of natural resources,
- with a low constant fertility rate and
- a political life based upon consent;
- a society that has made a successful adaptation to its environment
- and has learned to live without destroying itself or the people (*or squirrels*) next door.
- ***Ursula Le Guin, “A Non-Euclidean View of California as a Cold Place to Be” (1989)***

Technical is Political

- “Technological ideas and technological things are **not** politically **neutral**: routinely, they have strong, built-in tendencies.” [r]
- “The machines, structures, and systems of modern material culture are (should be) judged for their:
 - contributions of efficiency and productivity,
 - positive and negative environmental side effects,
 - the ways in which they can embody specific forms of power and authority.” [art]

Programming is Political

- Language is political
- Artefacts are political [art]
- Transcription / translation is political [p]
- Crypto is political [r]
- Code Is Politics [how]
- “The Personal is Political” [feminism]

References

- [r] Phillip Rogaway: “The Moral Character of Cryptographic Work” (2015)
- [ensr] “Philosophy meets Internet Engineering: Ethics in Networked Systems Research”
- [art] Langdon Winner: “Do Artefacts Have Politics?” (1980)
- [p] Allison Parrish: “Programming is Forgetting: Toward a New Hacker Ethic” (2016)
- [u] Ursula K. Le Guin: “A Non-Euclidean View of California as a Cold Place to Be” (1989)



Internet Governance



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

But...



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

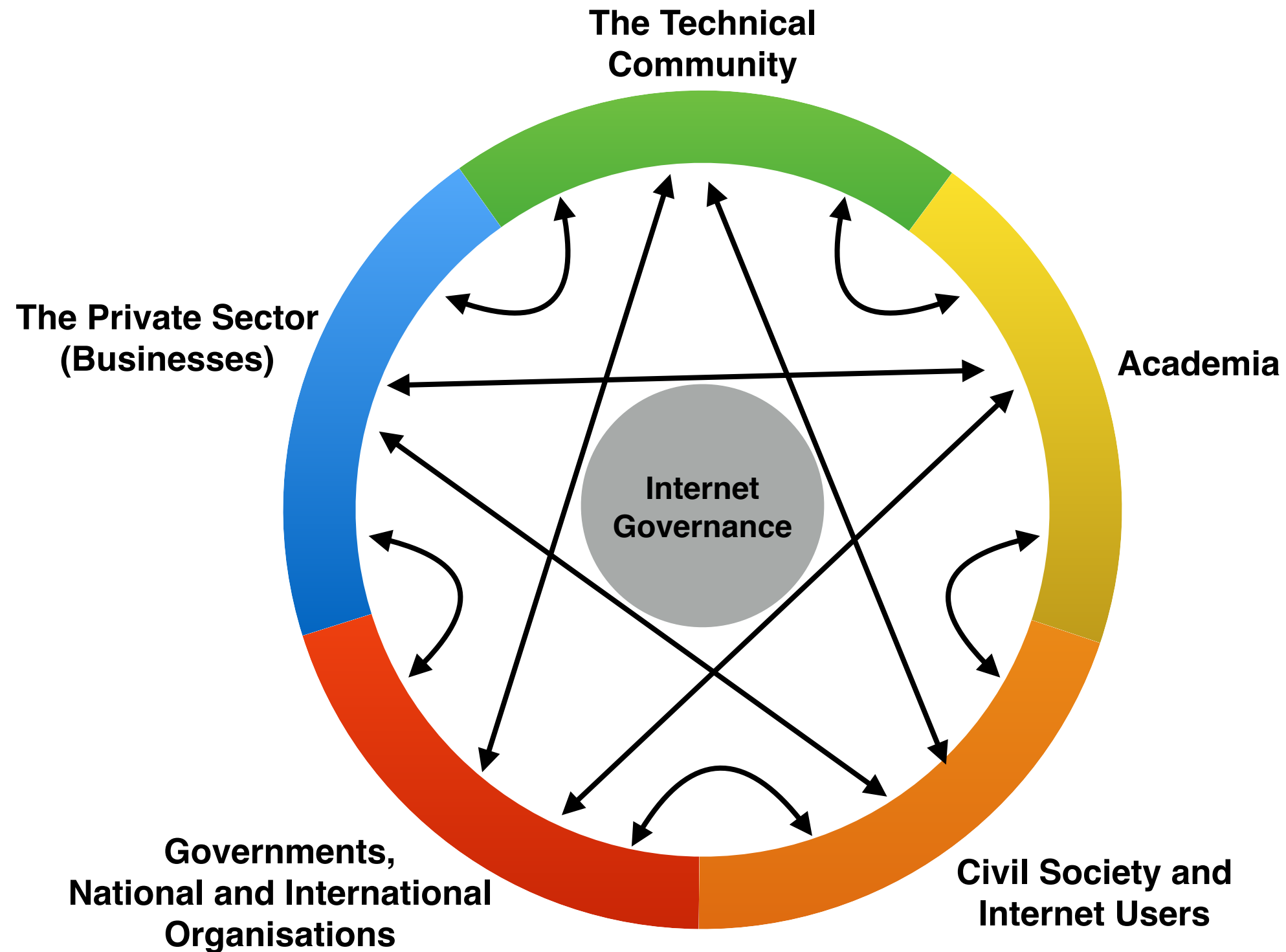
Definitions

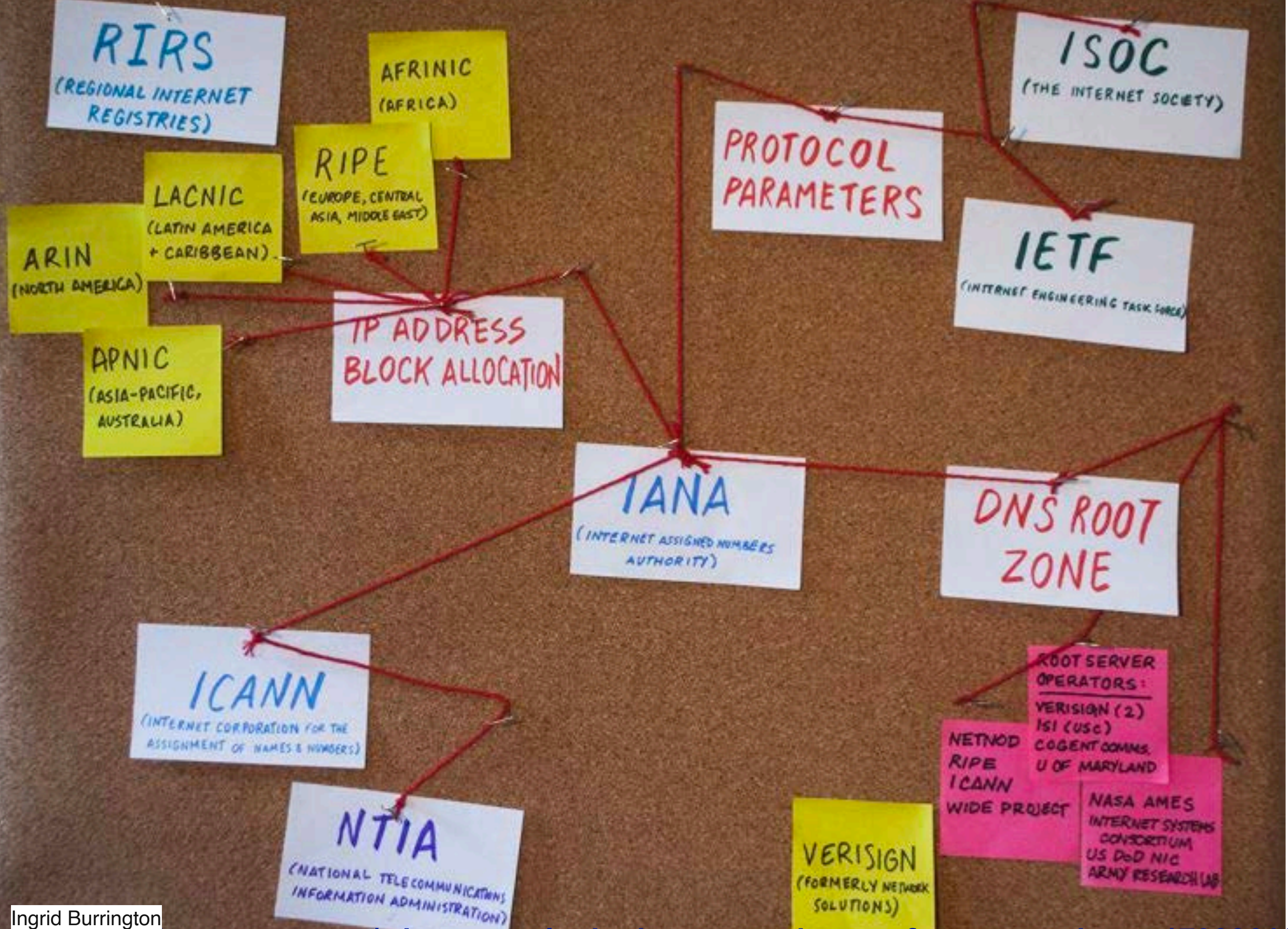


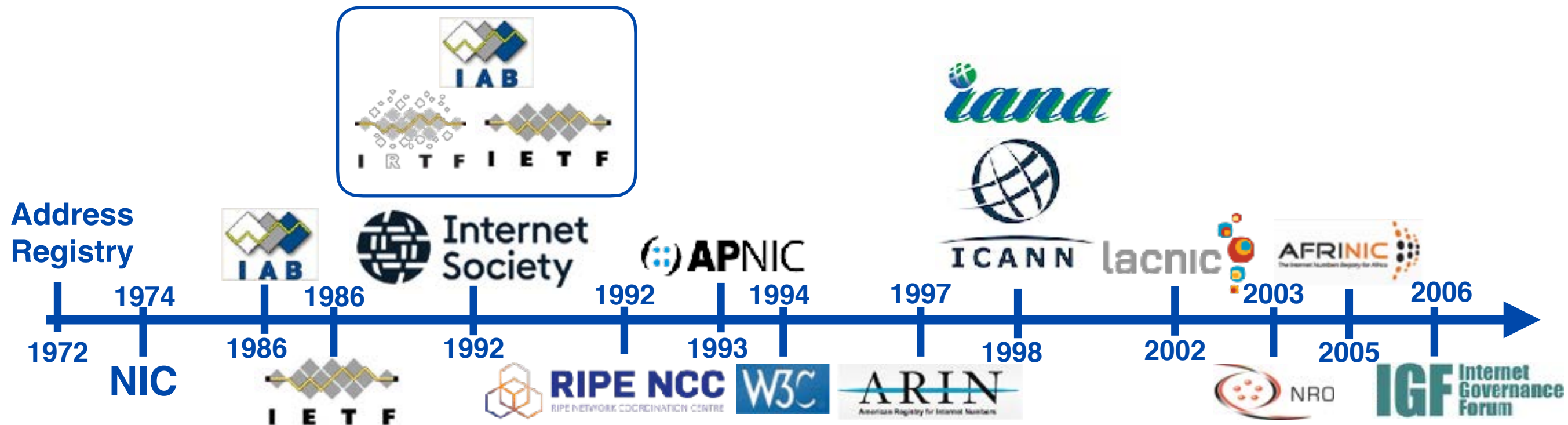
“Internet governance (IG) is the development and application by ***governments***, the ***private sector*** and ***civil society***, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the ***evolution*** and ***use*** of the Internet.”

World Summit on the Information Society (WSIS), 2005

The Multistakeholder Model







IXPs

NOGs

Hacking (and) Internet Governance

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

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



AUTOMATE ALL THE THINGS



RIPE Atlas Probes at hackerspaces



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!

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

AFRO
PUNK.

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.



MOTHERSHIP
HACKER MOMS

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)**

<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

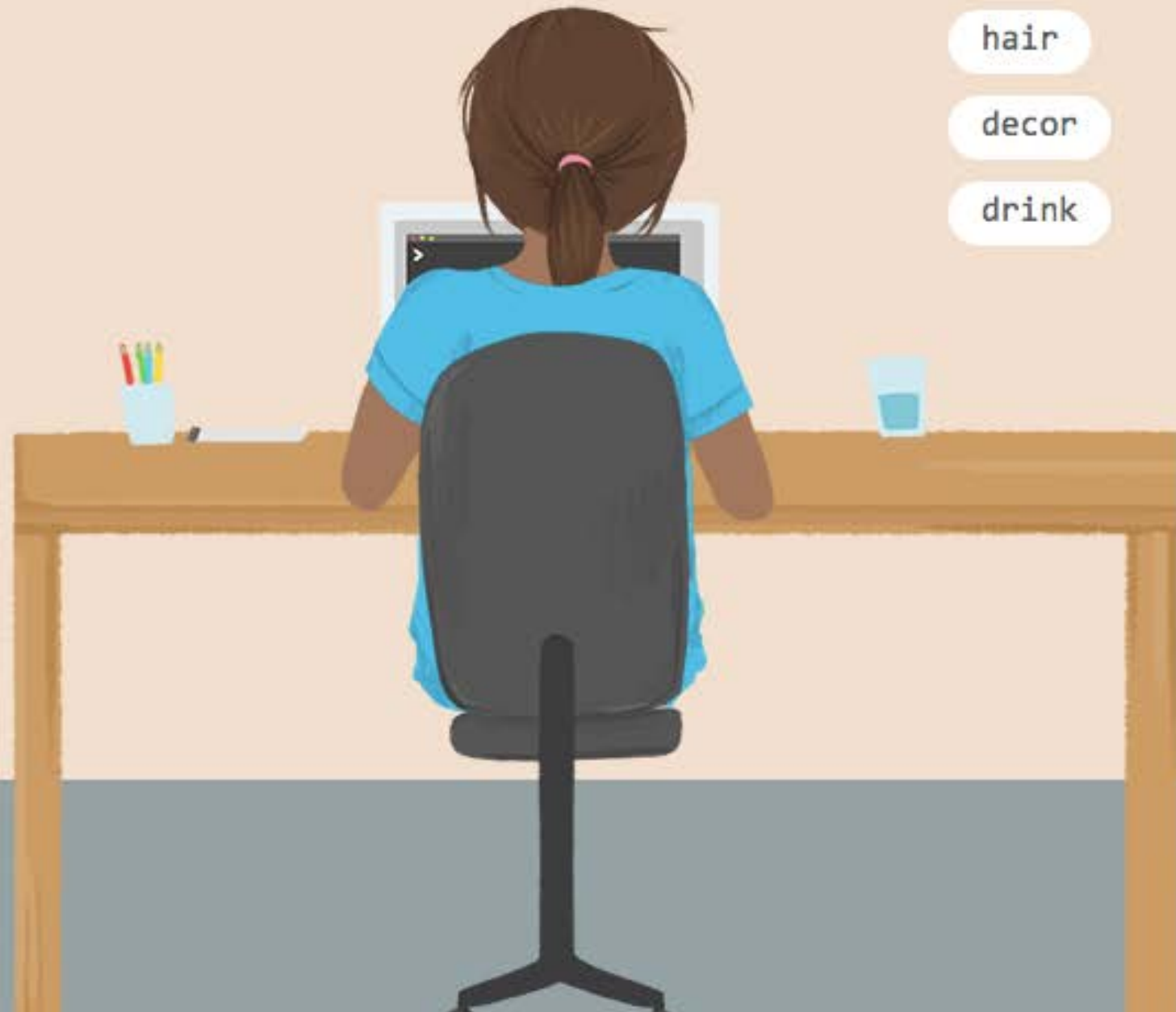
clothing

skin

hair

decor

drink



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

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!



“Data is the New Oil”



A NATURAL PAIRING A data center in Ashburn, Va., seen past a Dominion Virginia Power substation serving it. Worldwide, such centers use the rough equivalent of the output of 30 nuclear power plants.
Timander Smith/Source for The New York Times



Child carries in Bakula Free - PBS NewsHour



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



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>

