RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Maintaining a Unique Global Network

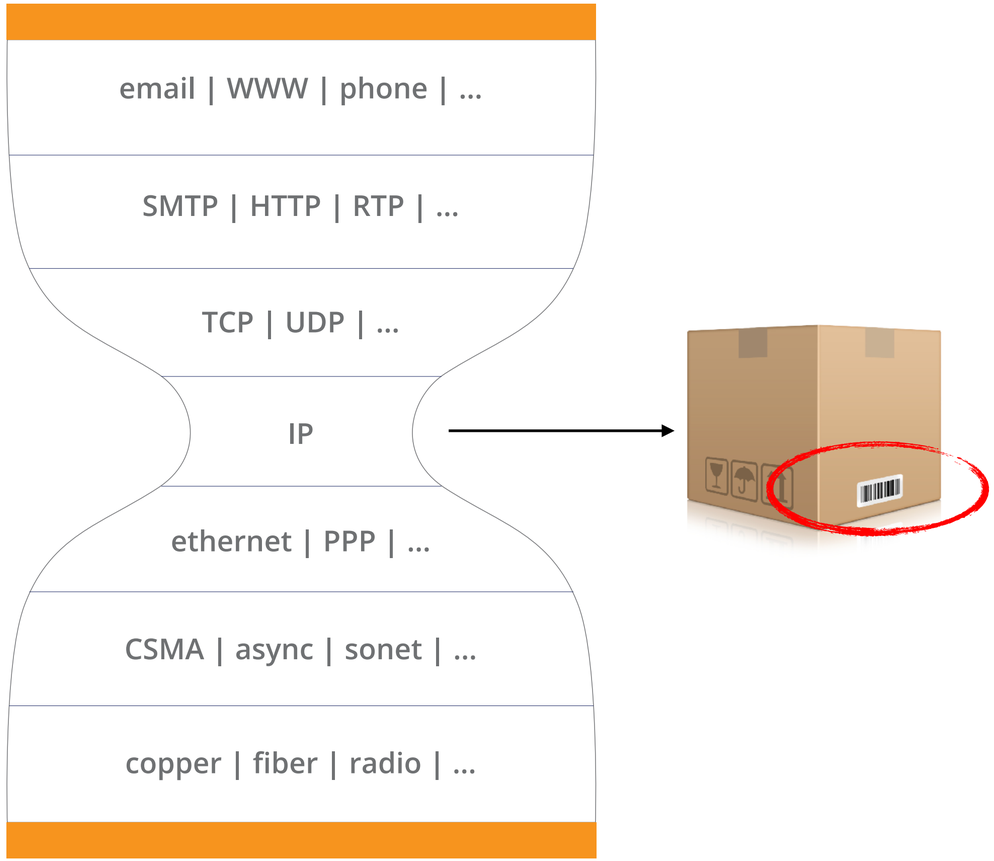
IP Addressing

Chris Buckridge | 28 June 2021 | EuroDIG 2021

Internet Protocol is Everywhere

- The Internet Protocol allows packets of date to move across the Internet
- An IP address is what defines an Internet connection
  - The IP address is a fundamental building block of any Internet-based service
- Each address must be unique in the context of the network
  - In a global network, the address needs to be globally unique

The Narrow Waist of the Internet



An IP Address Is Not An Identity

- An IP address points to a location in a network
  - If you move, your address will change!
- IP address sharing is a common
  - Multiple people living in your house
  - Your ISP delivering traffic “to the front door”
  - What goes on in your network is managed by you
  - Your wifi box keeps track and distributes the packages

Two flavours of IP

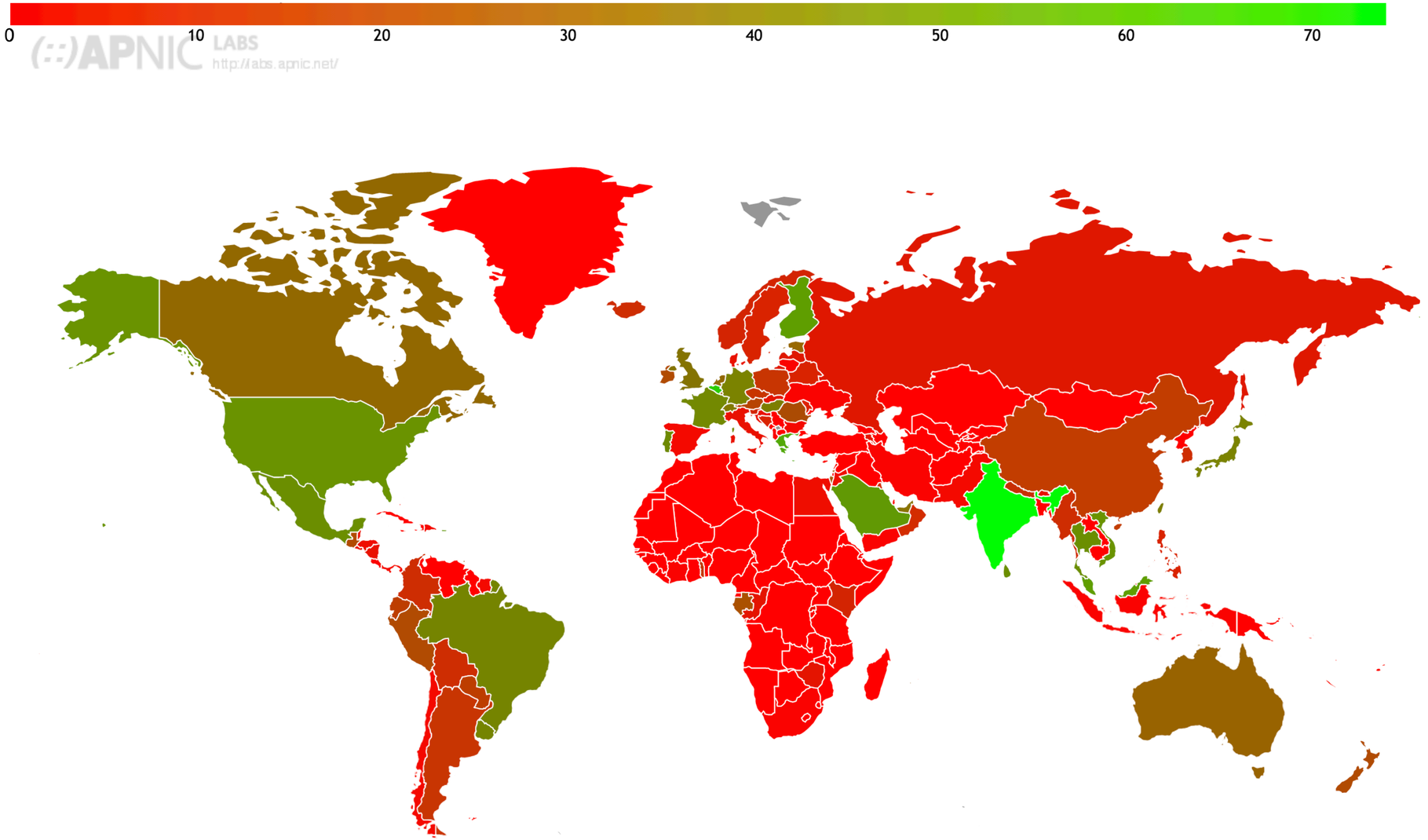
IPv4

- First deployed 1982
- 32-bit addresses
- 2^{32} unique addresses (4,294,967,296)
- Written as four “octets”, separated by periods
  - e.g. 192.0.2.130

IPv6

- Developed in the late 1990s
- 128-bit addresses
- 2^{128} unique addresses (340,282,366,920,938,463,463,374,607,431,768,211,456)
- Written as eight hexadecimal “hextets”, separated by colons
  - e.g. 2001:db8::8a2e:370:7334 (the double-colon can stand for multiple 0-value sextets)

IPv6 deployment

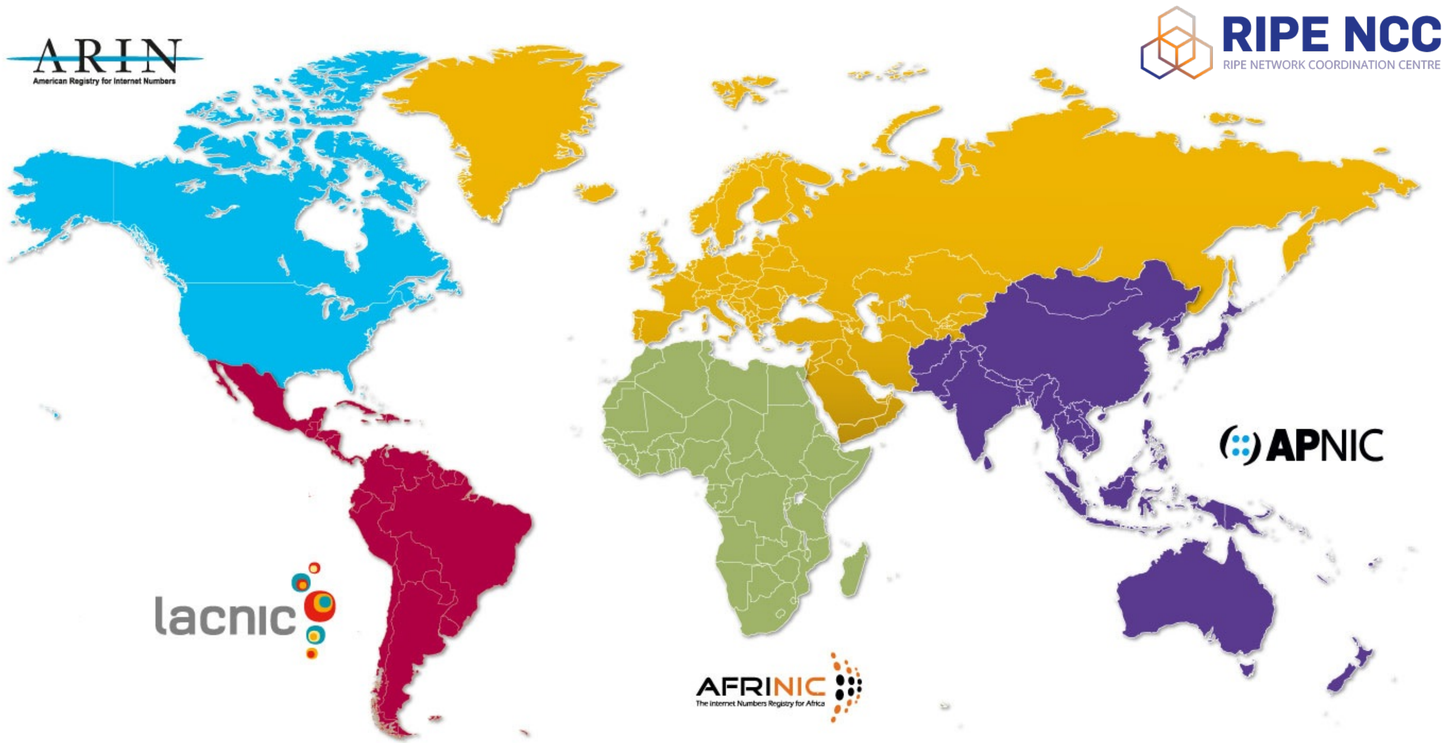


Principles & Challenges

- Key principles
  - An accurate, up-to-date registry of Internet number resource holdings
  - Open, transparent, inclusive, bottom-up development of relevant policies
- Some challenges
  - Exhaustion of IPv4 address pool
  - Emergence of a market in IPv4 addresses
  - Commodification of IP addresses creating incentives for fraud
  - Slow uptake of IPv6 across the Internet
  - RIR operation in conflict with local or regional regulation

Regional Internet Registries (RIRs)

- Making sure IP addresses remain unique
  - Delegate responsibility for address blocks to their members
  - Publish a list of all addresses in use (and by whom)
- There are five RIRs
  - Each serving their part of the world (service region)
  - You pick the RIR based on where you are located
  - Global coordination with each other and IANA



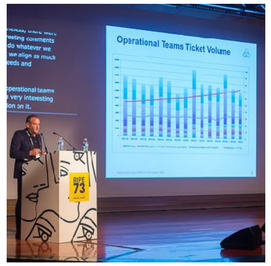
RIPE NCC

- A not-for-profit membership association under Dutch law
- Founded in 1992
- Serves as Regional Internet Registry for 76 countries
- Around 140 staff based in Amsterdam, Dubai, and around the service region

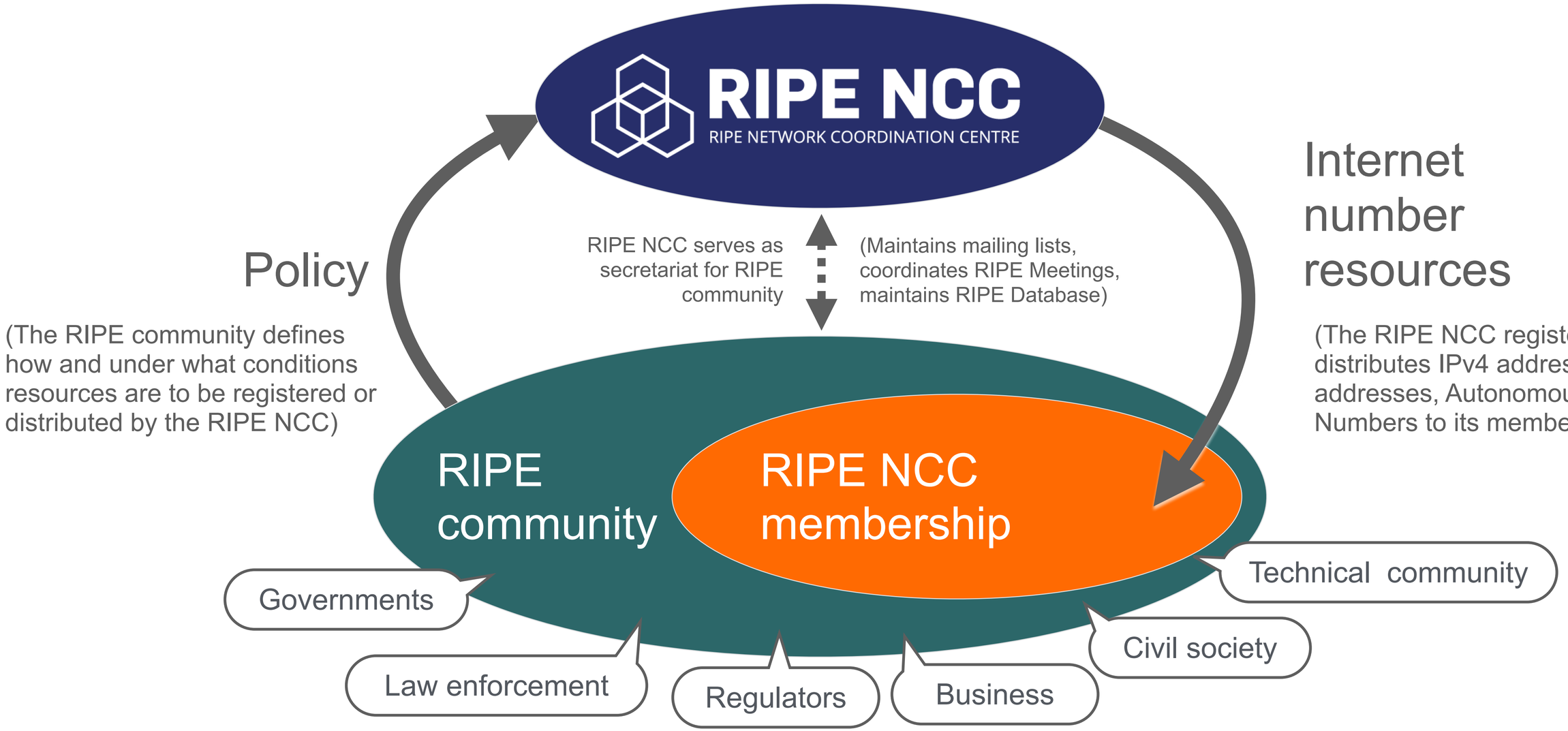
RIPE Community

- Open, transparent, inclusive, bottom-up
- The community is responsible for making policy
  - Also sharing information and expertise, sharing and defining best practices

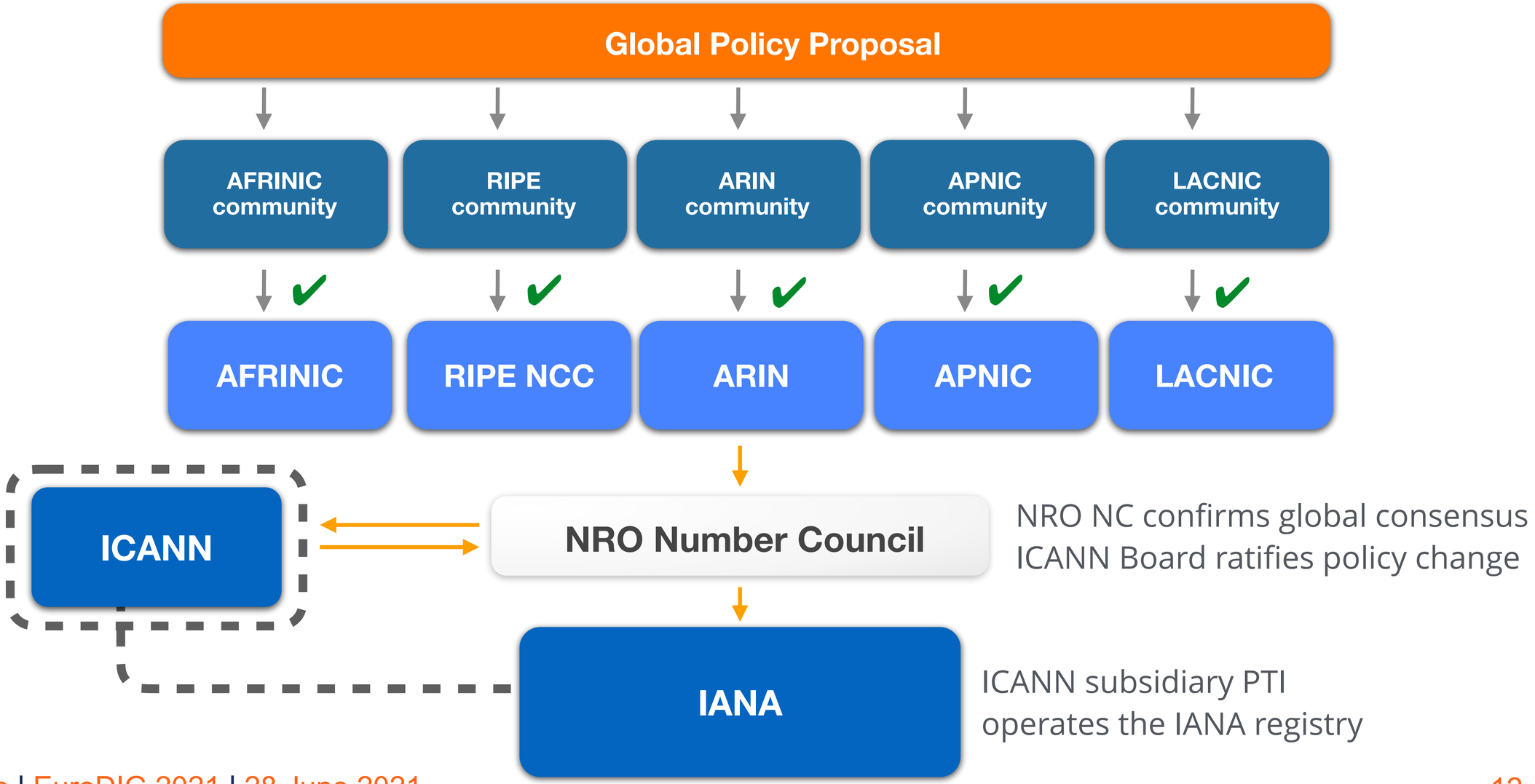
- RIPE structures
  - Working groups
  - Mailing lists
  - RIPE Meetings



The RIPE Ecosystem



Global Policy Development



Questions

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