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Informational Session for the ICANN Board on the Regional Internet Registries

AFRINIC The Internet Numbers Registry for Africa

APNIC

ARIN American Registry for Internet Numbers

lacnic

RIPE NCC

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Internet Number Resources
IPv4, IPv6 and ASNs

Unique IPv4 Addresses

4,294,967,296 or roughly 4.2 billion unique addresses

Unique IPv6 Addresses

340,282,366,920,938,463,463,374,607,431,768,211,456 or 340 undecillion unique addresses.

Or more IPv6 addresses than grains of sand on the Earth...

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IPv4

32-bit addresses;

Written in dotted decimal

2^32

Example:

205.150.58.732

IPv6

128-bit addresses;

Written in hexadecimal

2^128

Example:

2001:0503:0C27:0000:0000:0000:0000

IP Addresses

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Autonomous System Numbers (ASNs)

Globally unique numbers used to exchange routing information with neighboring autonomous systems

Group of IP networks administered under the umbrella of a single entity

Network operators must have an ASN to control routing within their network and to exchange routing information with other Internet Service Providers

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IP Addresses are *Not* Domain Names

IP address

[Identifier]

e.g. 2001:0db8:85a3:0000:0000:8a2e:0370:7334

- Computers recognize **numbers**
- Identifies a device on the Internet
- Used for routing (moves information across an inter-network from a source to a destination)
- Every device directly connected to the Internet requires a unique IP address

DNS name

[Reference]

e.g. www.nro.net

- People recognize **names**
- Maps host name to unique IP address
- A means of storing and retrieving information about hostnames and IP addresses in a distributed database

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How IP Addresses Are Issued

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Whois

Public directory service

- Used to query databases that store registered users of an Internet resource

Differs in usage/content depending on the type of registry

- Number resource registries
- Domain name registries and registrars
- Routing registries

RIR's Whois registry is publicly accessible

ARIN
American Registry for Internet Numbers

all requests subject to te

ARIN Online
enter

WHOIS-RWS

You searched for: **192.0.43.7**

Network	
Net Range	192.0.32.0 - 192.0.47.255
CIDR	192.0.32.0/20
Name	ICANN
Handle	NET-192-0-32-0-1
Parent	NET192 (NET-192-0-0-0-0)
Net Type	Direct Allocation
Origin AS	AS26711 AS16876 AS40528
Organization	ICANN (ICANN)
Registration Date	2009-06-29
Last Updated	2021-12-14
Comments	
RESTful Link	https://whois.arin.net/rest/net/NET-192-0-32-0-1
See Also	Related organization's POC records.
See Also	Related delegations.

Organization	
Name	ICANN
Handle	ICANN
Street	12025 Waterfront Dr. Suite 300
City	Los Angeles
State/Province	CA
Postal Code	90094
Country	US
Registration Date	2001-03-30
Last Updated	2024-05-31
Comments	
RESTful Link	https://whois.arin.net/rest/org/ICANN

Function	Point of Contact
Admin	JENKI373-ARIN (JENKI373-ARIN)
Abuse	ICANN-NET (ICANN-NET)
DNS	ICANN-ARIN (ICANN-ARIN)
Tech	CORZO1-ARIN (CORZO1-ARIN)
Tech	JENKI373-ARIN (JENKI373-ARIN)

Point of Contact	
Name	Internet Corporation for Assigned Names and Number
Handle	ICANN-NET
Company	ICANN
Street	12025 Waterfront Dr. Suite 300
City	Los Angeles
State/Province	CA
Postal Code	90094
Country	US
Registration Date	2001-06-26
Last Updated	2024-10-16
Comments	
Phone	+1-310-301-3889 (Office)
Email	ops@icann.org
RESTful Link	https://whois.arin.net/rest/poc/ICANN-NET

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Routing

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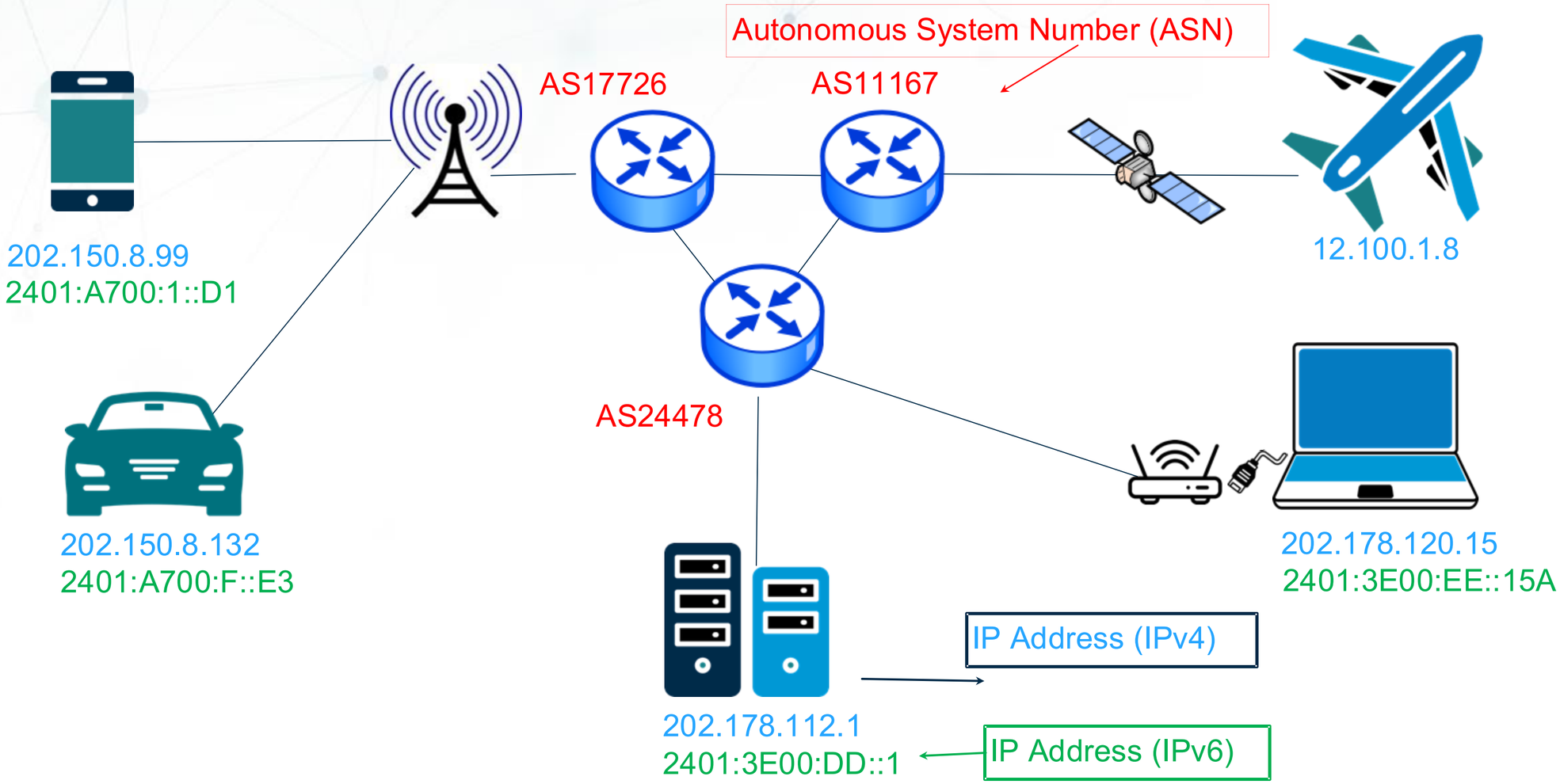
Networks That Use Standard Protocols



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Why is RPKI Important?

Establishes a **level of trust** that the RPKI information is authentic and is confirmed coming from the authorized holder of the resources

The RPKI gives network operators a **method to make better judgments** on which is the valid source (origin) of a route announcement

RPKI can **limit the impact** of a configuration mistake or nefarious activity of a bad actor

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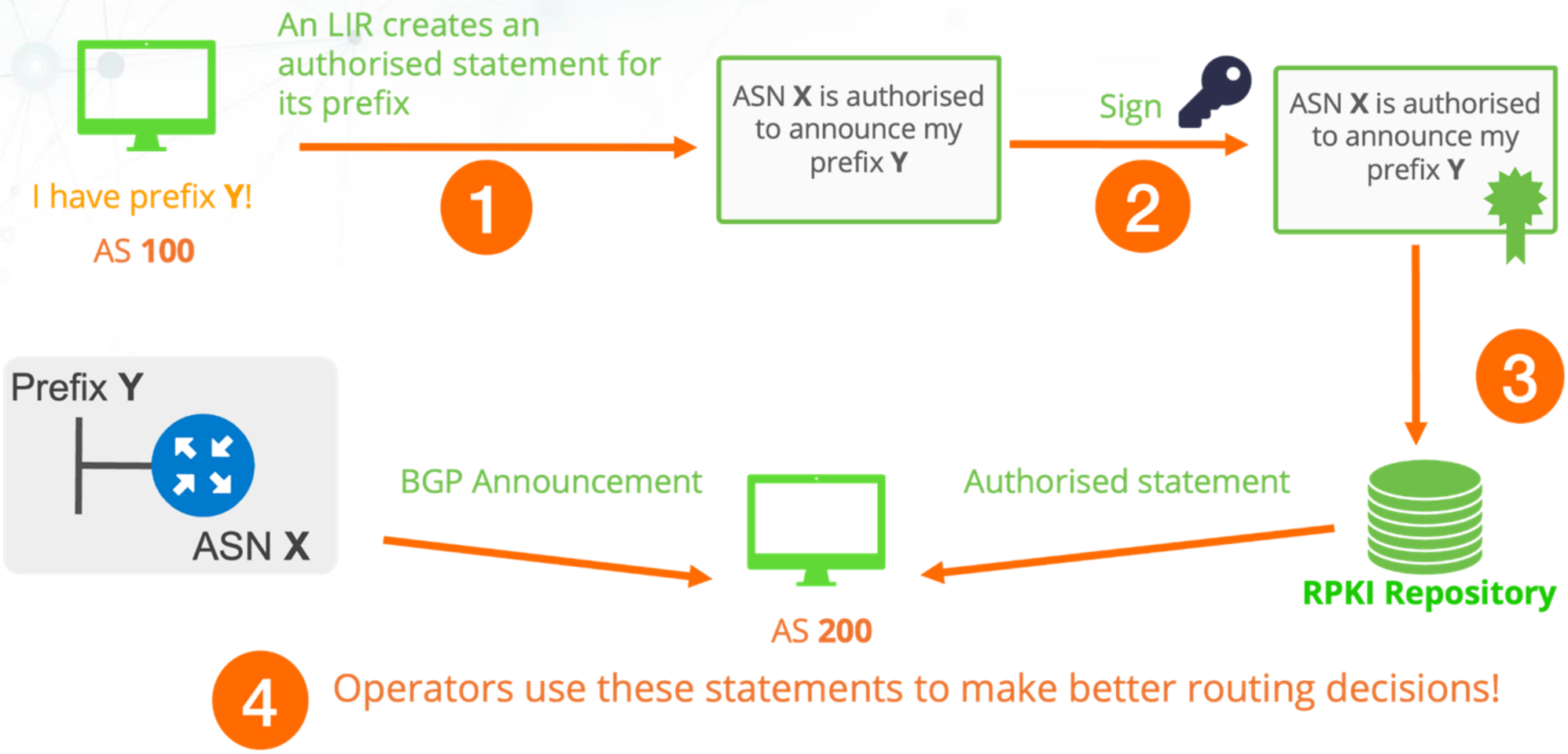
RPKI Explained



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RIR

Manages the allocation, administration and registration of Internet number resources in a specific region of the world.

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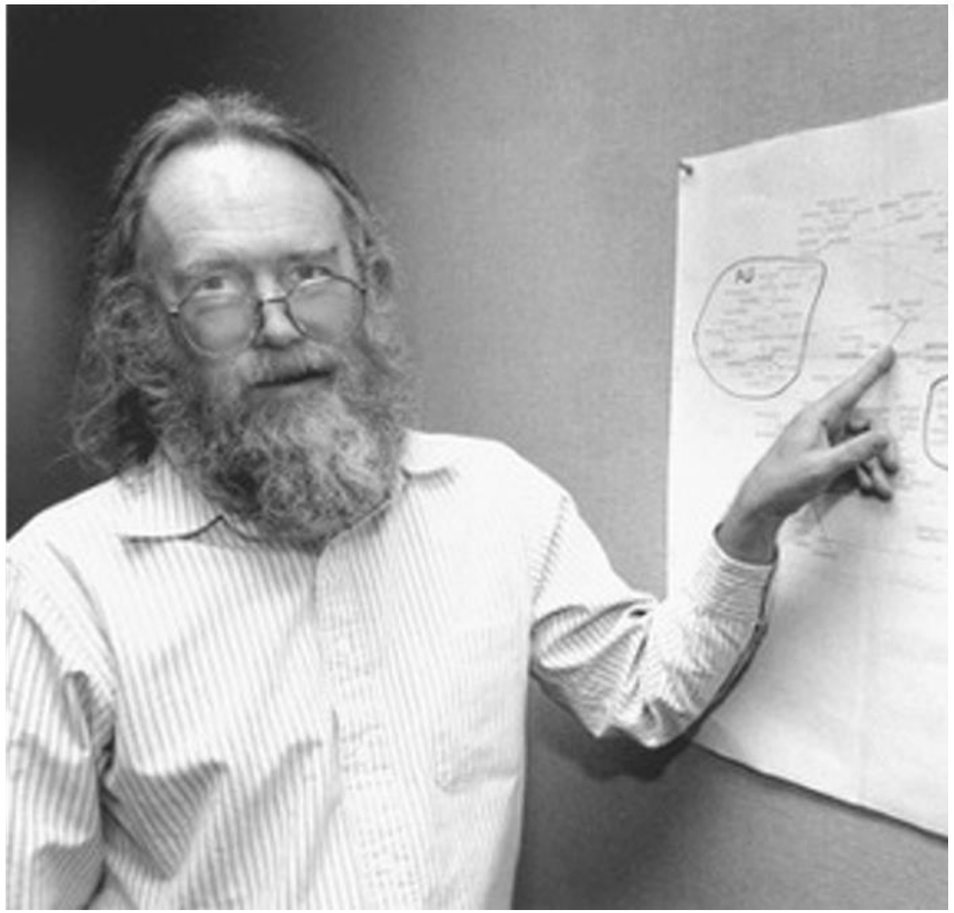
A Short History

The US Department of Defence contracted administration of names, numbers and protocols to the University of Southern California's ISI

Run by **Jon Postel**, the function was called Internet Assigned Numbers Authority (**IANA**)

The **RIR system** was formed in the early 1990s, starting with the RIPE NCC in 1992

Internet number resource administration was split from the Domain Name System (DNS)



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Early Registrations

Early IP address space referred to as “legacy space”

Internet number resources allocated liberally

Organizations made simple request; no contract required

The Internet rapidly expanded, distribution could not be managed this way

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The Regional Internet Registry (RIR) System

ARIN, *serving Canada, many Caribbean and North Atlantic Islands, and the United States*

LACNIC, *serving Latin America and the Caribbean*

AFRINIC, *serving Africa and the Indian Ocean*

RIPE NCC, *serving Europe, the Middle East, and parts of Central Asia*

APNIC, *serving the Asia Pacific region*

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Core Functions

Non-profit, member-based organizations

Manage, distribute, and register Internet Number Resources

Maintain directory services

Support Internet infrastructure through technical coordination

Facilitate community-driven policy development

Key Elements of an RIR

Independent

Nonprofit

Membership based

Community Driven

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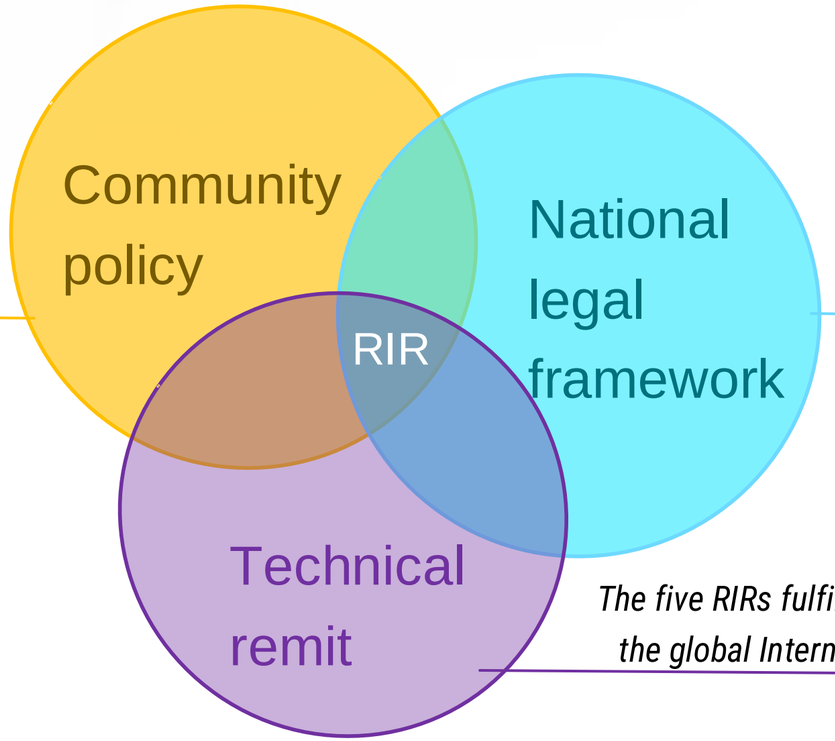
RIR Governance

Each RIR operates in accordance with three factors

Each RIR community sets the policies by which that RIR registers and distributes resources



Each RIR is established under the legal framework of a specific country

The five RIRs fulfil a specific function in the global Internet governance system

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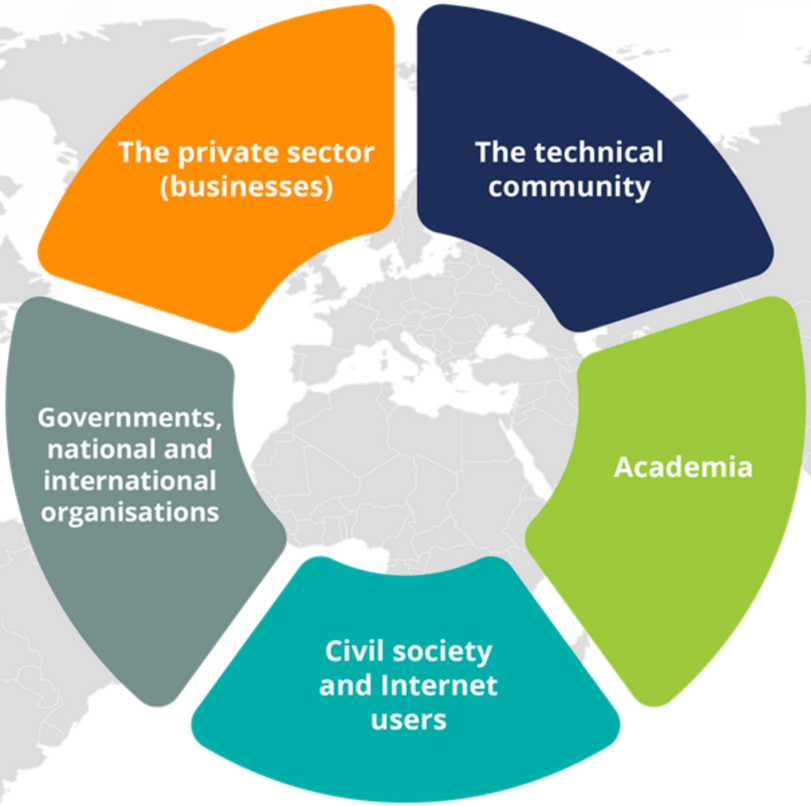
Policy Development

Multistakeholder approach



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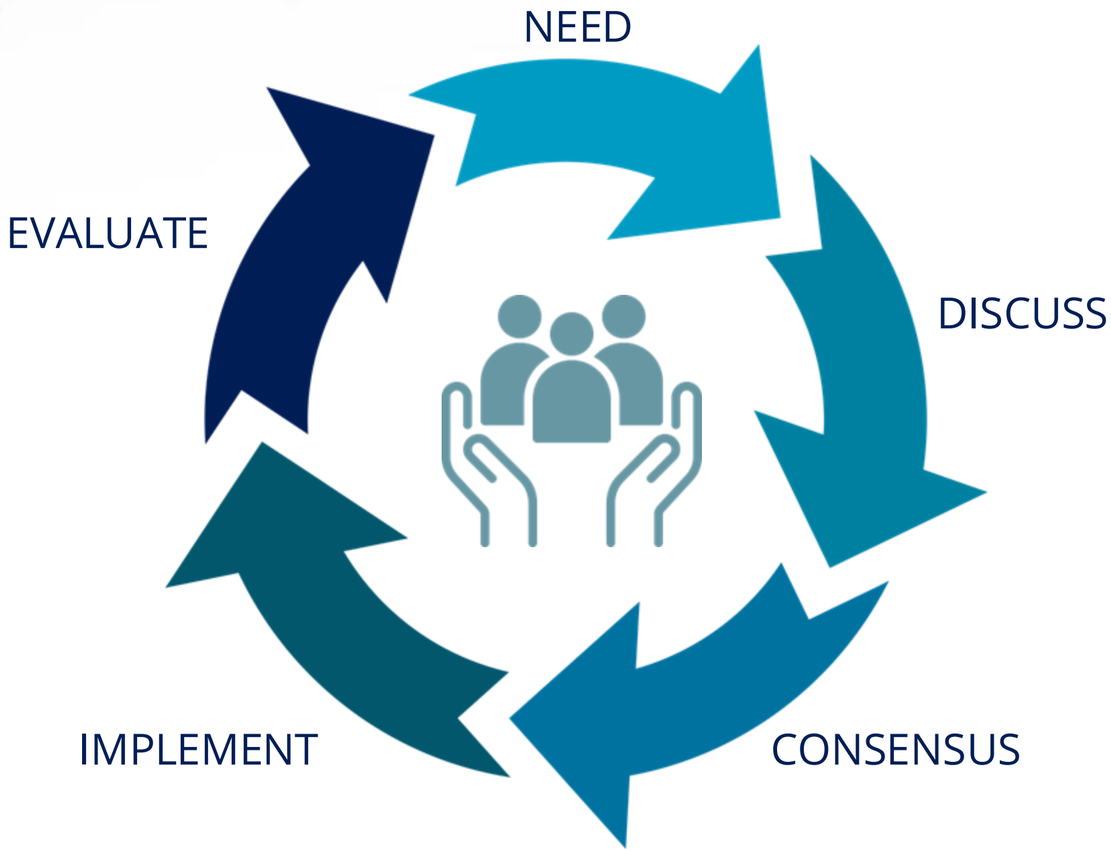
RIR Policy Development Process

Inclusive
Anyone can participate

Bottom Up
Internet community proposes and approves policies

Transparent
Documented and published decisions and policies



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Number Resource Organization (NRO)

www.nro.net

ARIN AFRINIC APNIC lacnic RIPE NCC

Serves as the Address Supporting Organization Mission

To actively contribute to an **open**, **stable**, and **secure Internet** by:

- Providing and promoting a coordinated Internet number registry system
- Being an authoritative voice on the multistakeholder model and bottom-up policy process in Internet governance
- Coordinating and supporting joint activities of the RIRs

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The ASO

- Part of the ICANN supporting organizations since October 1999
- Active participants of the ICANN empowered community mechanisms
- Charged with reviewing and developing recommendations on Internet Protocol (IP) address policy and advises the ICANN Board on policy issues relating to the operation, assignment, and management of IP addresses.

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NRO Publications

- **Global Internet Number Statistics**
  - Internet Number Resources Status Report (updated quarterly)
  - Global stats on IPv4, IPv6, ASN (updated daily)
  - RPKI Adoption Reports by IPv4, IPv6, economy (updated daily)
  - https://www.nro.net/statistics

- **Comparative Policy Overview**
  - Updated quarterly
  - Information on RIRs Membership policies (access to delegation and registration services)
  - https://www.nro.net/rir-comparative-policy-overview

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ICANN Policy Development Stakeholders

Supporting Organisations

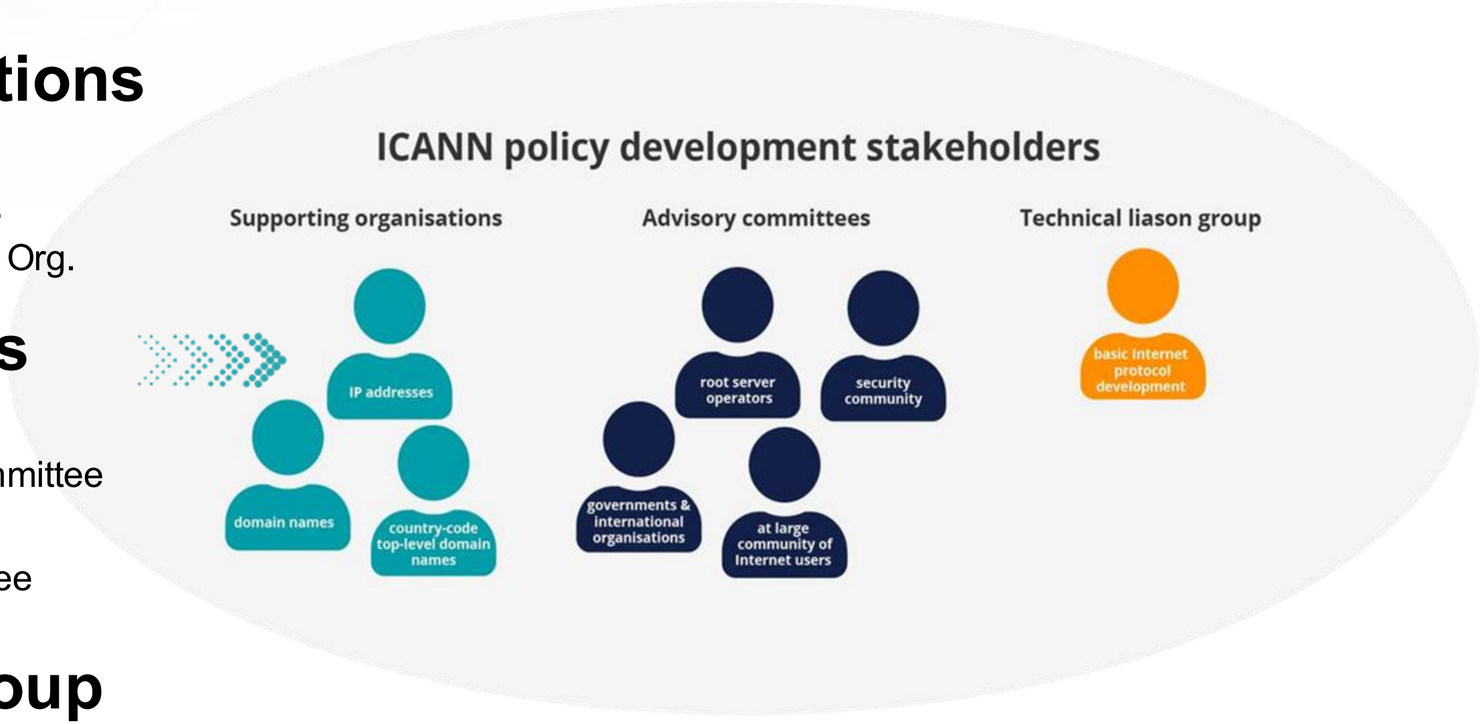
ASO: Address Supporting Org.
GNSO: Generic Names Supporting Org.
CCNSO: Country Code Names Support Org.

Advisory Committees

At Large Advisory Committee
DNS Root Server System Advisory Committee
Governmental Advisory Committee
Security and Stability Advisory Committee

Technical Liaison Group

Works with the organisations developing the basic Internet protocols.



https://www.icann.org/community

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ICANN ASO AC (Address Council)

Who is it:	**NRO Number Council**
What is it?	Number Resource Advisory Council
How is it Organized?	15 Members [3 From Each Region] – 2 Elected at Large – 1 Appointed by RIR Board • RIR & ICANN Observers
Term of Office	Different for every RIR
What Does it Do?	Advise ICANN Board on Internet Numbers • Overseeing the Global Policy Development Process • Appoint ICANN Board Members (2) • Appoint member to ICANN NomCom (1)

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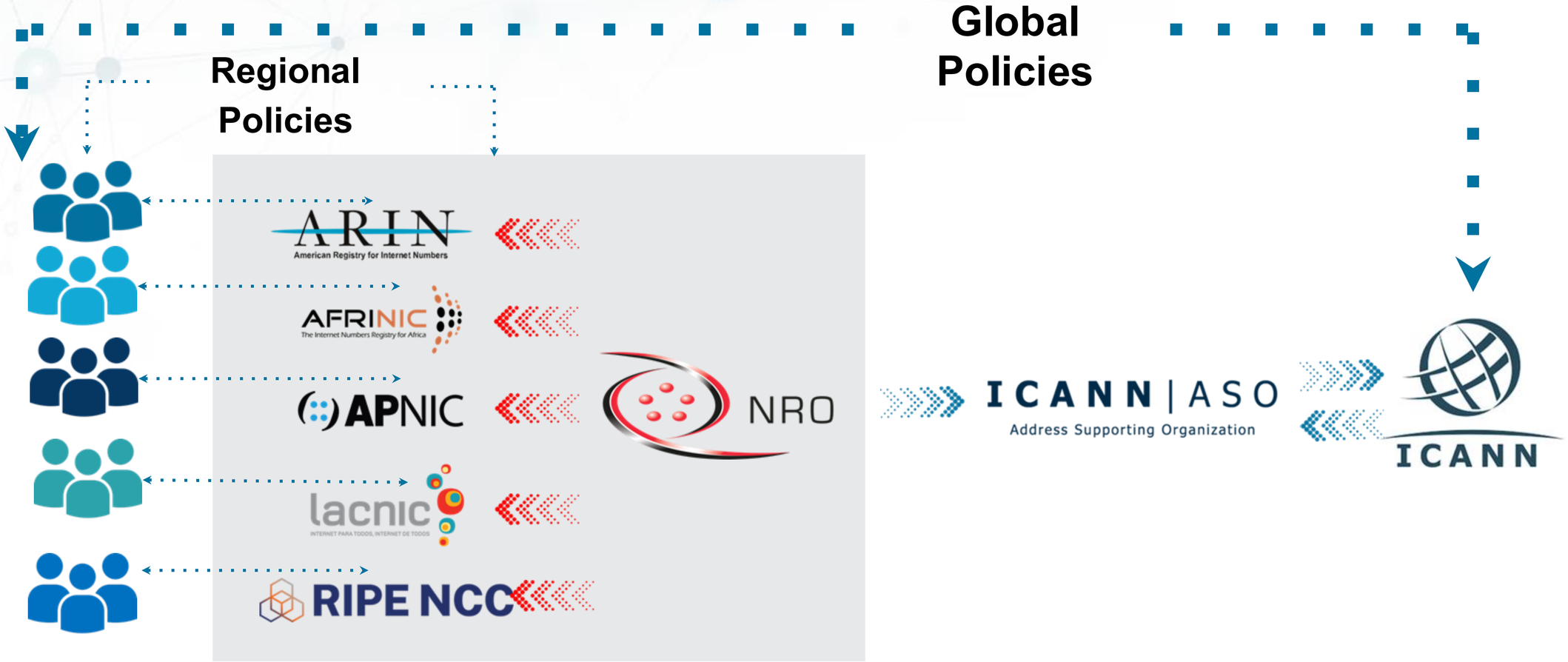
Global Policy Development Process



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Questions?