AFRINIC
The Internet Numbers Registry for Africa

Introduction to IP Numbers vs. Domain names

Adiel A. Akplogan
CEO, AFRINIC.
2014

Identifying an IP address

- *Internet identifiers including information about how to reach a network location*
  - (via the Internet routing system)

- IPv4: 32-bit* number. Written in Dotted Decimal Notation

  205.150.58.7

  4 billion different host addresses

- IPv6: 128-bit* number. Written in Hex Decimal Notation

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

  16 billion billion network addresses (/48)

* bit = binary digit

IP Addresses vs. Domain Names

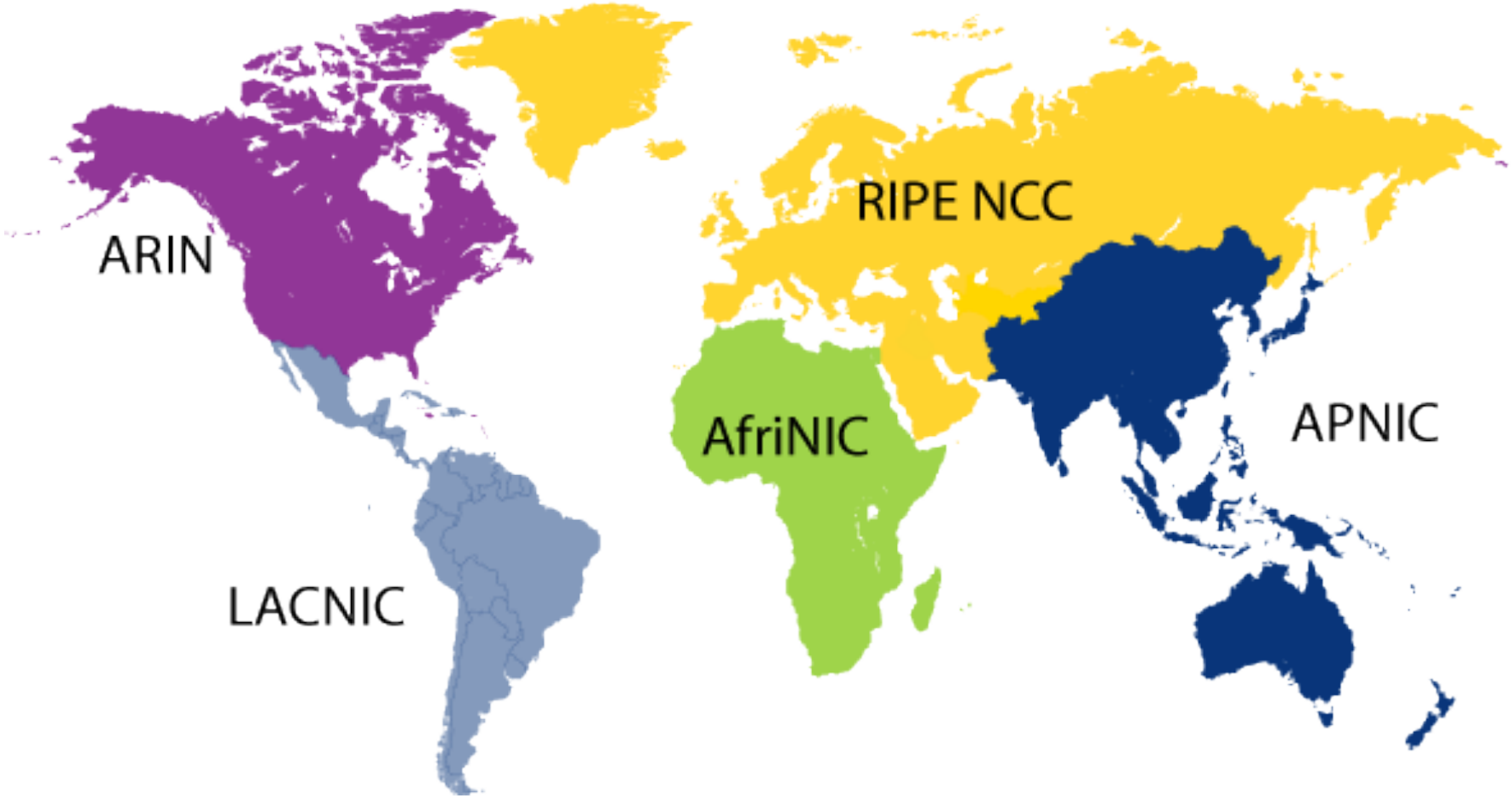
- **IP Address [Identifier]**
  - "Computer-friendly"
  - Unique number identifies computer on Internet
  - Used for routing
- **DNS Name [Reference]**
  - "People-Friendly"
  - Maps host name to unique IP address
  - Not used for routing

- IP addresses are mandatory for Internet Protocol communications, while domain naming facilitates communication and accessibility of the Internet to the end users

IP addresses

- Necessary for Internet Routing
- A finite "Common Resource"
- Never "owned" by address users
  - Are not property
  - Cannot be bought, sold, traded…
  - Provided on non-permanent basis for use
  - Returned to provider when no longer required
- **Not dependent upon Name System**

The Number Registry System TODAY



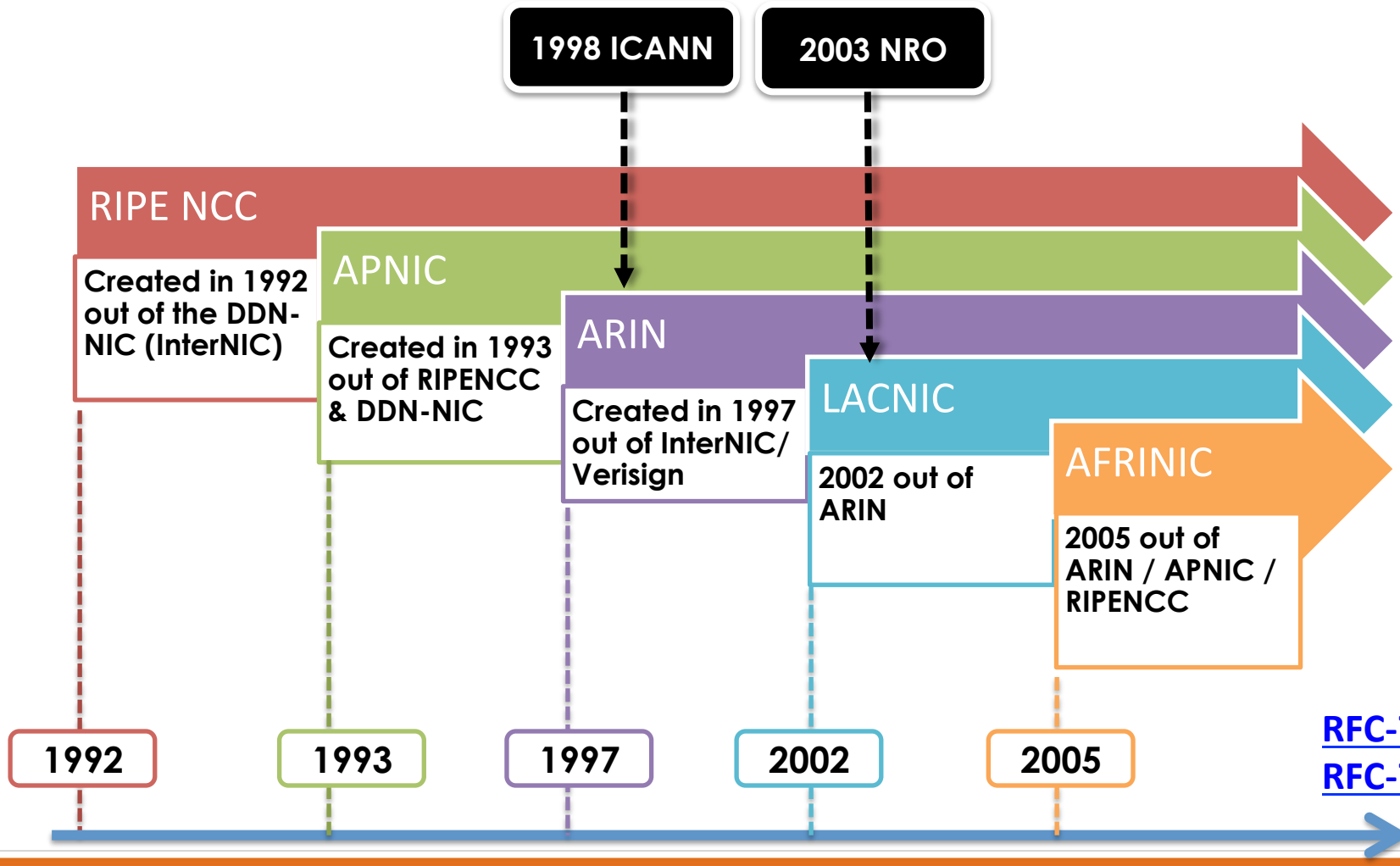
Questions

AFRINIC
The Internet Numbers Registry for Africa

The RIR in the IG Ecosystem - ICANN/ASO{-AC}/NRO{-NC}

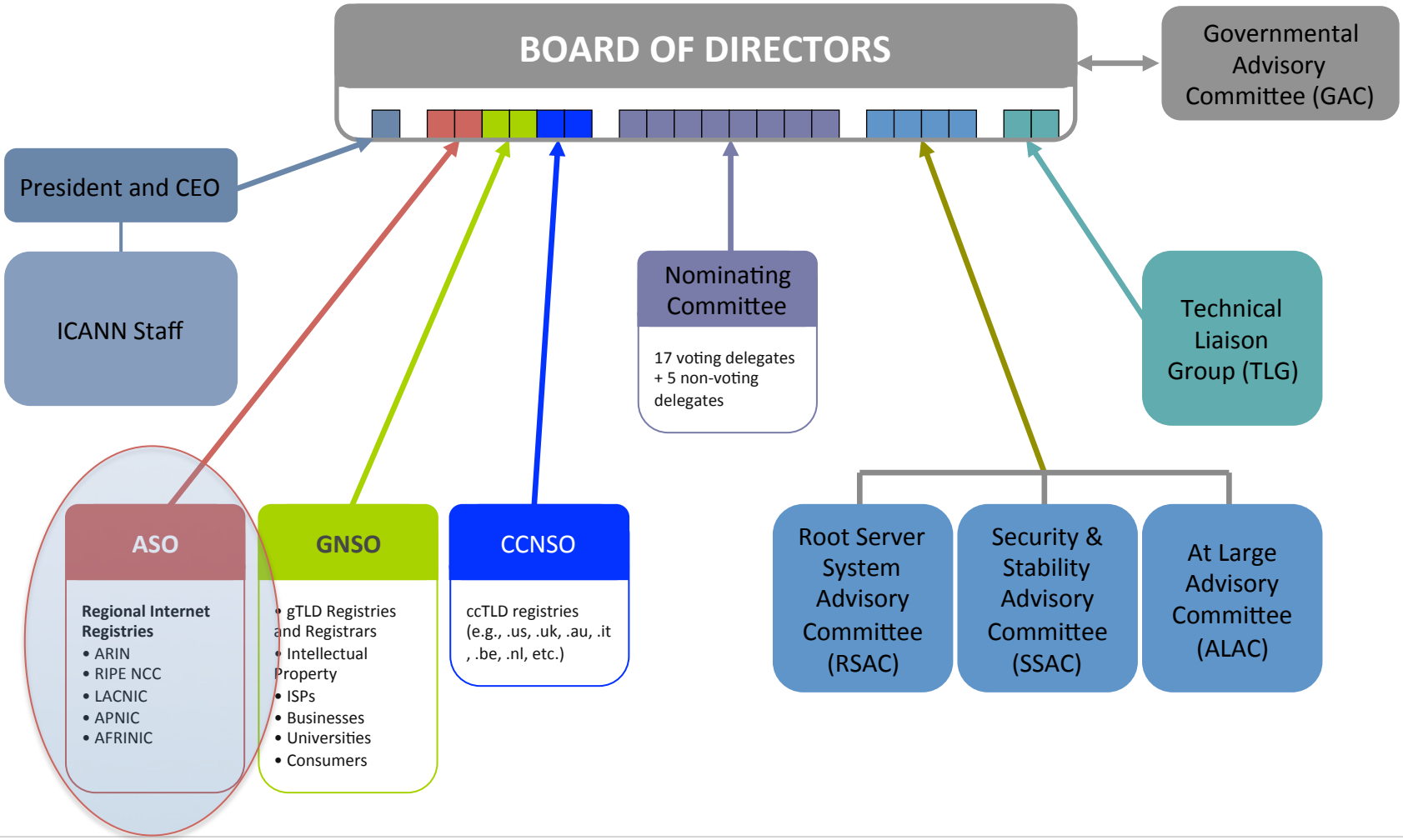
Adiel A. Akplogan
CEO, AFRINIC.
2014

RIR System History



RFC-7020
RFC-7249

ICANN Ecosystem



What is the ASO

- **Address Supporting Organization**
  - ASO MoU, 21 October 2004
- Recognized under the ICANN Bylaws to:
  - Oversee global number resource policy work
  - Appoint 2 Directors to the ICANN Board
  - Appoint representatives to serve on various ICANN bodies as needed: (e.g. NomCom)
  - Advise ICANN Board on number resource matters
- **ASO Address Council**
  - 15 individuals, 3 per RIR region

What is the NRO

- **Number Resource Organization**
  - Vehicle for RIR cooperation and representation
  - Lightweight, unincorporated association
  - NRO MoU, 24 Oct 2003
- **Why?**
  - Protect the unallocated Number Resource pool
  - Promote and protect the bottom-up policy development process
  - Act as a focal point for Internet community input into the RIR system
  - And: **Fulfill the role of the ICANN Address Supporting Organisation** (ASO)

NRO Structure

- **Executive Committee**
  - 1 appointed representative from each RIR, plus RIR board and staff observers
  - 3 officeholder positions, rotating annually
  - Decisions by unanimous EC agreement
  - 1 Board member as observer

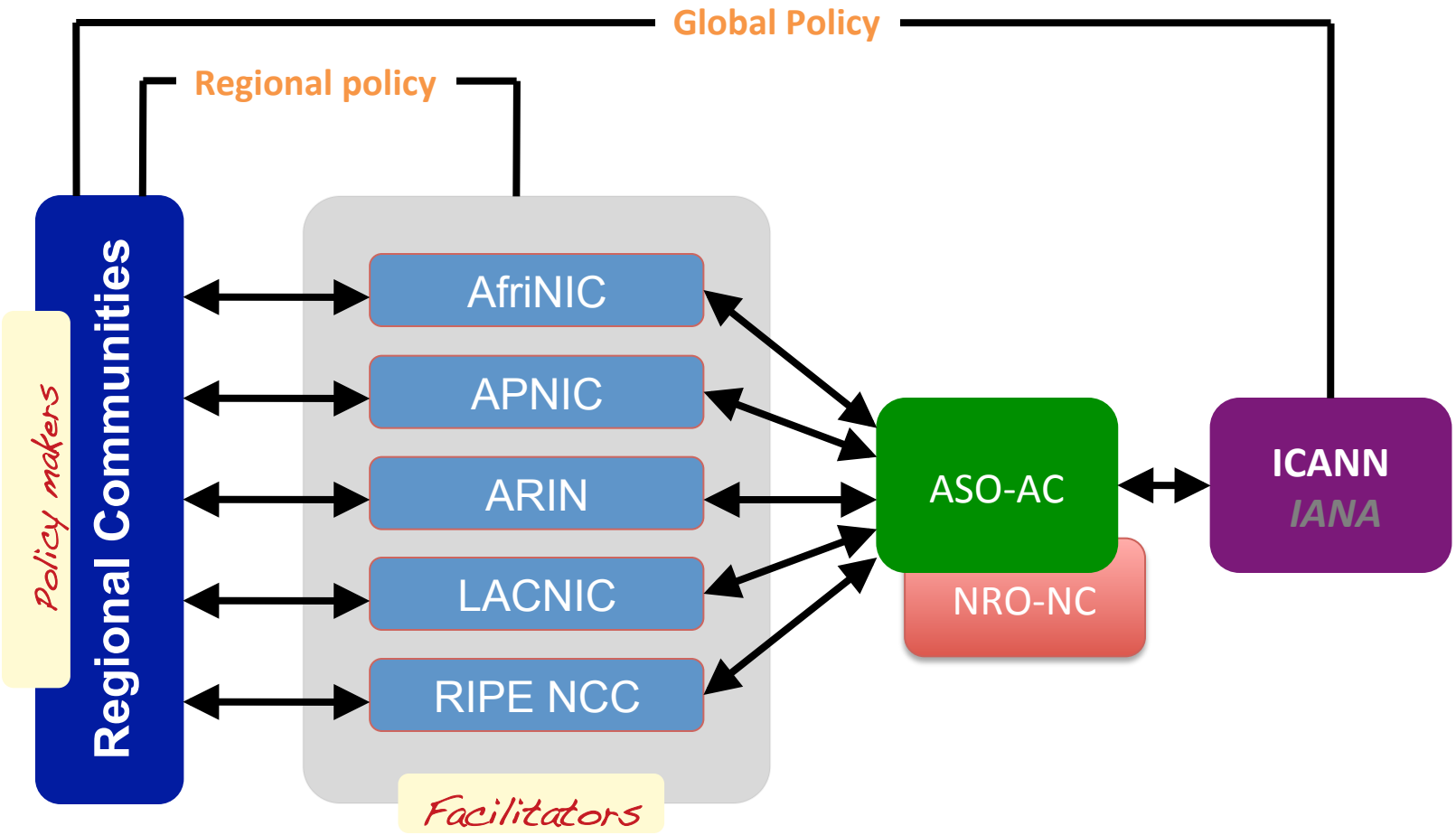
- **Secretariat**
  - Rotating with NRO Secretary position
  - **Executive Secretary:** German Valdez

- **Coordination Groups**
  - Engineering (ECG), Communications (CCG), Public Affairs (PACG) and Registration Services Managers (RSM), IPv6 Coordination Group (IPv6CG)

NRO in 2014

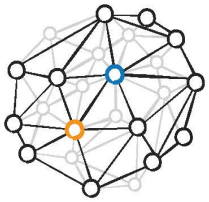
- **Executive committee**
  - Adiel Akplogan (AFRINIC) – Chair
  - Axel Pawlik (RIPE-NCC) – Secretary
  - Ernesto Majo (LACNIC) – Treasurer
  - APNIC: Paul Wilson
  - ARIN: John Curran
- **Executive Secretariat**
  - German Valdez

ASO/NRO and Policy Development



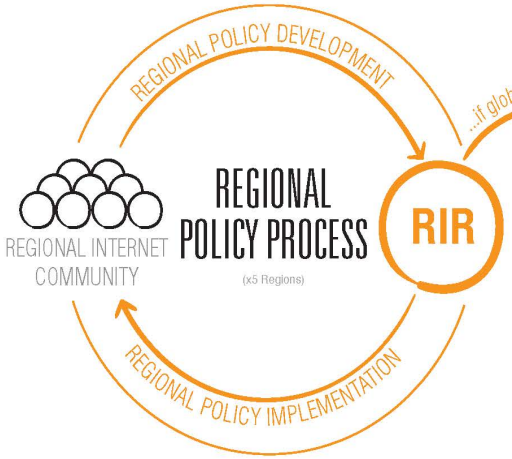
Internet Number Resource Policy Life Cycle

Global Internet Number Resource policy is developed through a bottom-up open and inclusive approach. Beginning in geographic regions, issues are raised through the Regional Internet Registry communities in the Number Resource Organization (NRO) and brought into the Address Supporting Organization (ASO). Global policies are forwarded to the ICANN Board of Directors and upon ratification, new policy is implemented through the Internet Assigned Numbers Authority (IANA) working cooperatively with the Regional Internet Registries (RIRs) and their constituencies in the respective regions.

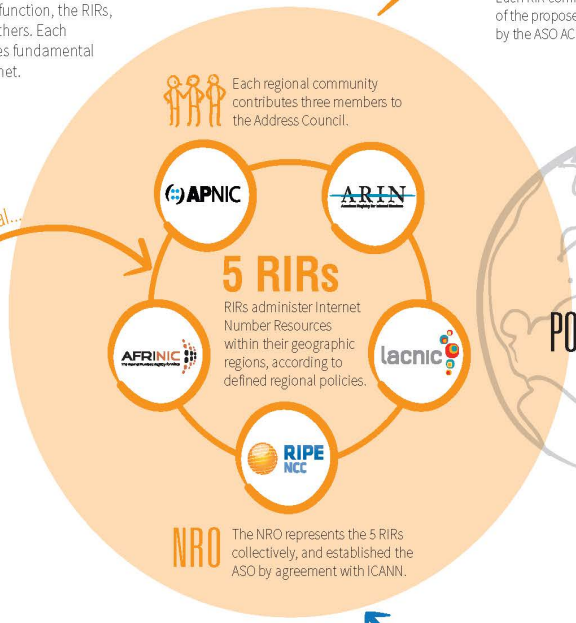


INTERNET GOVERNANCE ECOSYSTEM

The internet ecosystem consists of a collaborative network of organizations responsible for standardization, coordination, administration and day-to-day management in the Internet sphere including the IETF, ICANN, the IANA function, the RIRs, governments, IGOs and NGOs, and many others. Each organization has a specific role and provides fundamental value to the overall functioning of the Internet.



...if global...



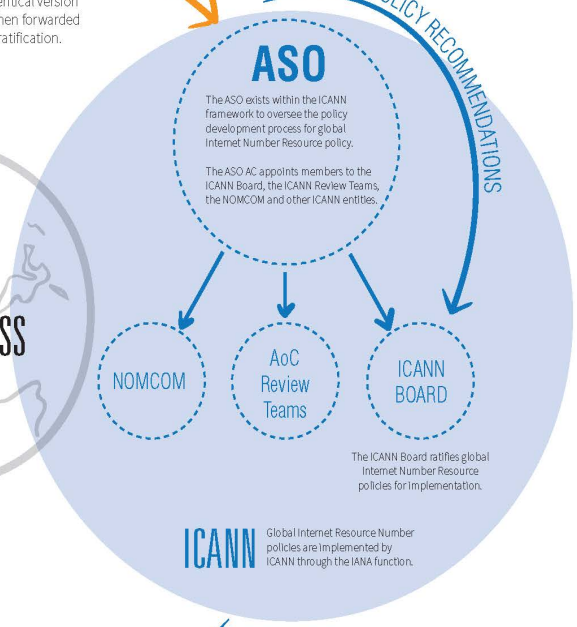
Address Council

GLOBAL POLICY DEVELOPMENT

Global policies must first be ratified by the RIRs. Each RIR community must ratify an identical version of the proposed policy. This policy is then forwarded by the ASO AC to the ICANN Board for ratification.

ASO AC

The ASO AC oversees the global policy development process for the creation of global Internet Number Resource policies, and delivers agreed policies to ICANN's Board of Directors for ratification.



IANA

GLOBAL POLICY IMPLEMENTATION

GLOSSARY

AoC	Affirmation of Commitments
ASO	Address Supporting Organization
ASO AC	Address Supporting Organization Address Council
IANA	Internet Assigned Numbers Authority
ICANN	Internet Corporation for Assigned Names and Numbers
INR	Internet Number Resources (IPv4 addresses, IPv6 addresses and AS Numbers)
IP	Internet Protocol (address or number)
NOMCOM	Nominating Committee
NRO	Number Resource Organization
RIRs	Regional Internet Registries

2014 | Creative Commons Attribution-ShareAlike 3.0

Disclaimer: This graphic is a living document. It is for illustrative purposes only and is not intended to be a definitive guide.

April 2014

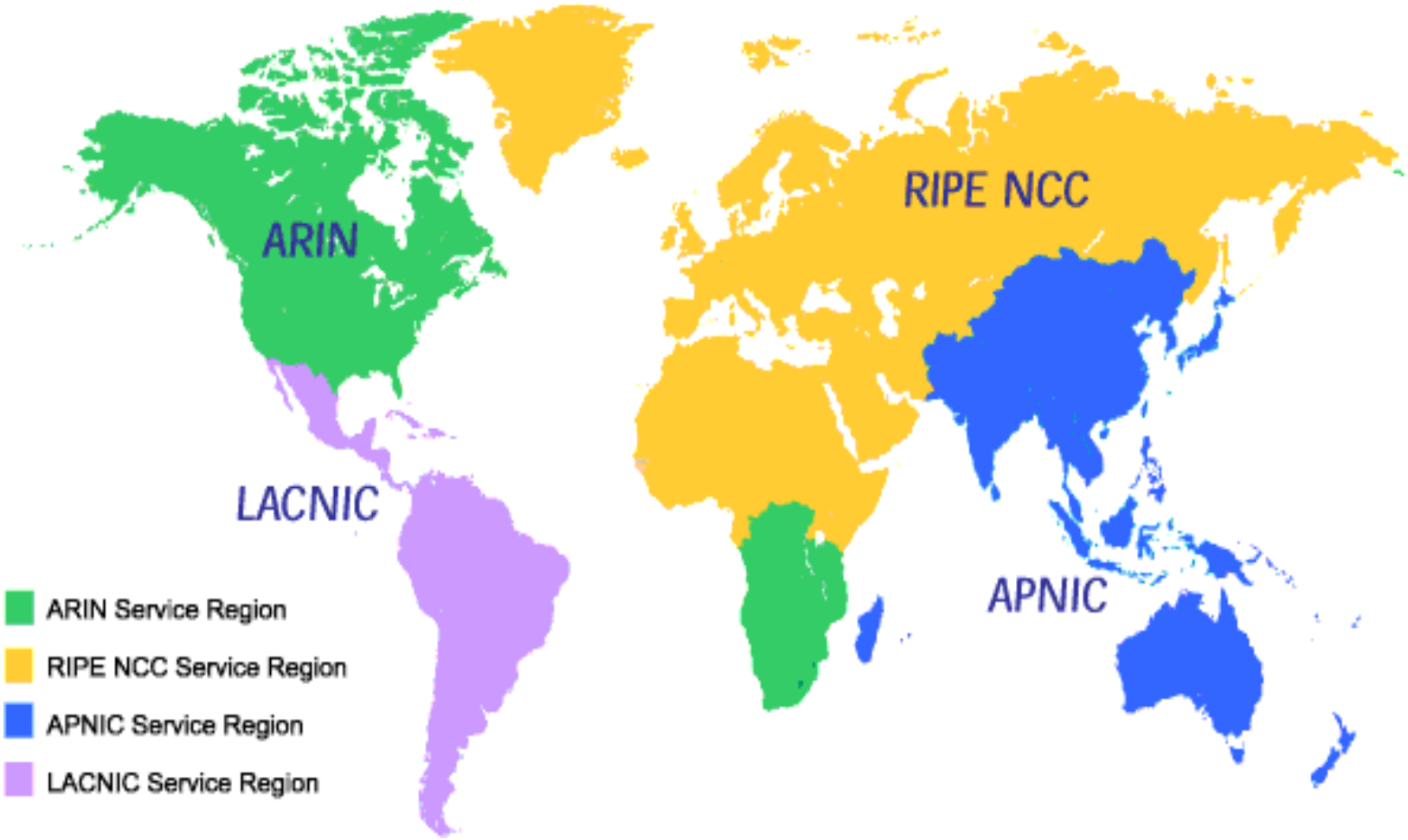
Questions

AFRINIC
The Internet Numbers Registry for Africa

AFRINIC & the RIR Ecosystem

Adiel A. Akplogan
CEO, AFRINIC.
2014

Before AFRINIC



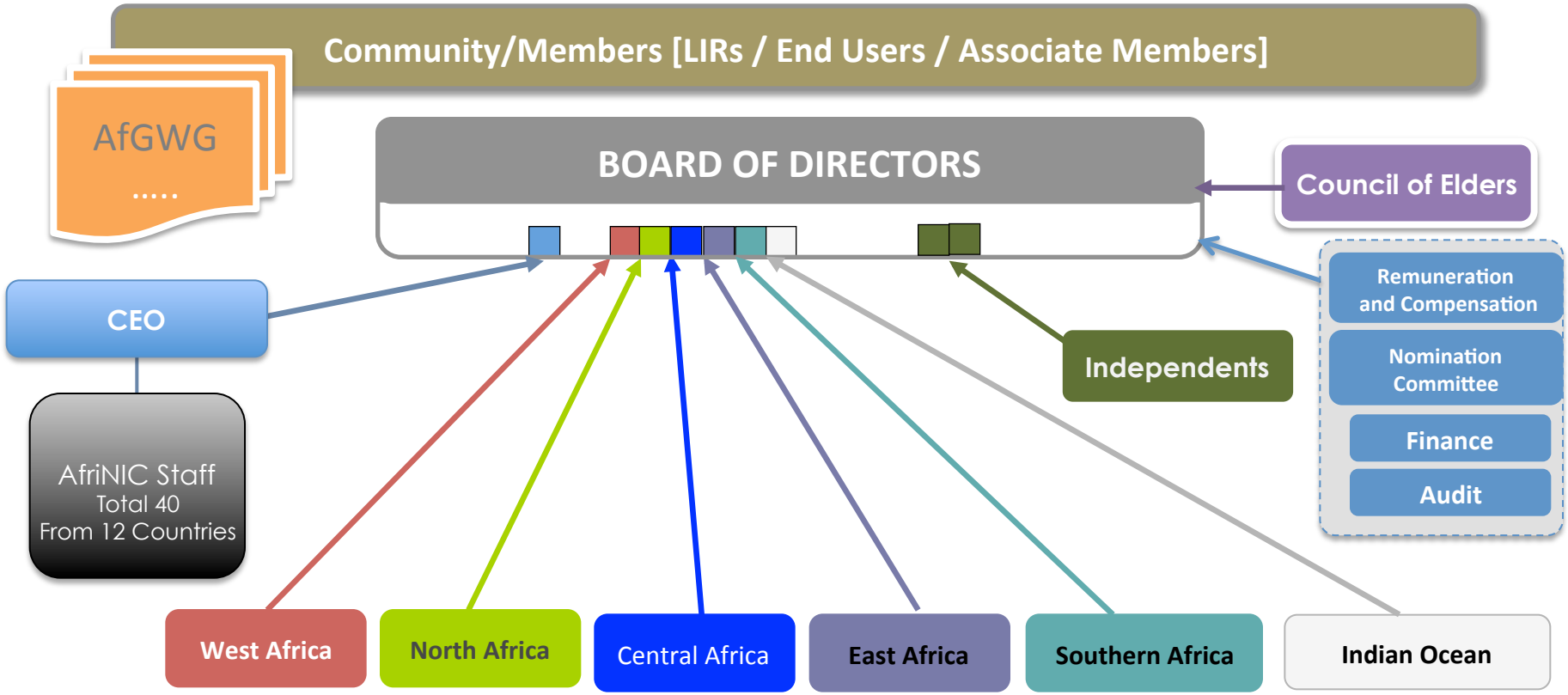
Why AFRINIC

- Need for a registry to address IPN resources needs in an homogenous manner.
- Provide “proximity” service to Local Operators.
- Provide an environment to define Policies that are more relevant to the local realities.
- Increase training and awareness in the region on Internet IP technology

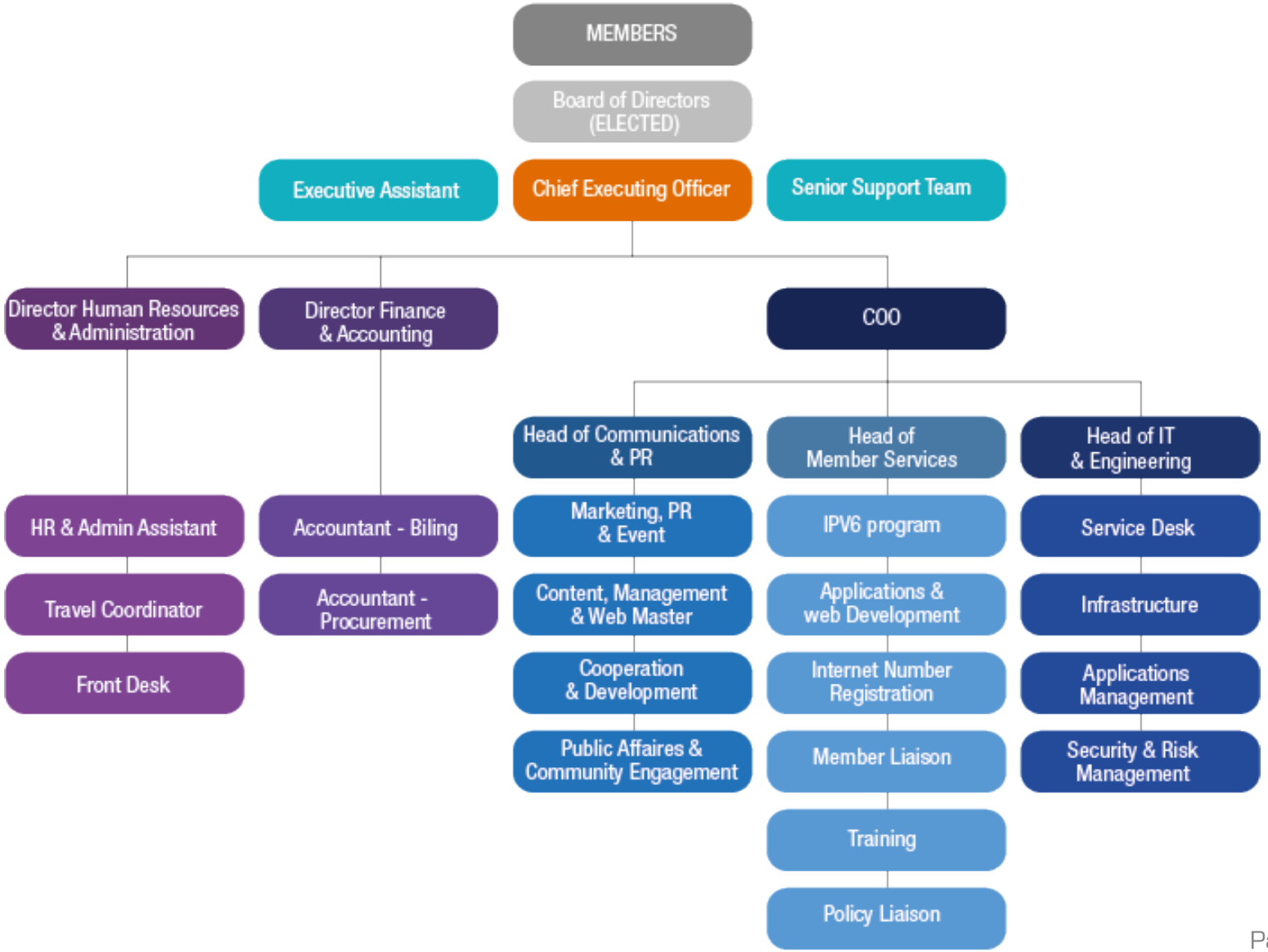
Highlight of New Bylaws (2013)

- Reduce Board size from 13 to **9** with three non-regional
- Membership Types
  - **Registered Members** (Board)
  - **Resources Members** (LIR/End-Users)
  - **Associate Members** (Others)
- Introduction of a formal General Member Meeting once a year
- Separate **Nomination committee** from **Election Committee**
- Formalisation of **CoE** in the Bylaws
- Introduce: **e-voti**ng and **emergency Policy decision**

Organisation Structure



Operational Structure



Values

Community, Excellence, Passion Innovation (C.O.P.I.).

1. Neutrality
2. Consistency
3. Impartiality

ACTIVITIES

Setup in 2004 and Headquartered in Mauritius. Employ **34 Staff today**

Internet Numbers Registry function

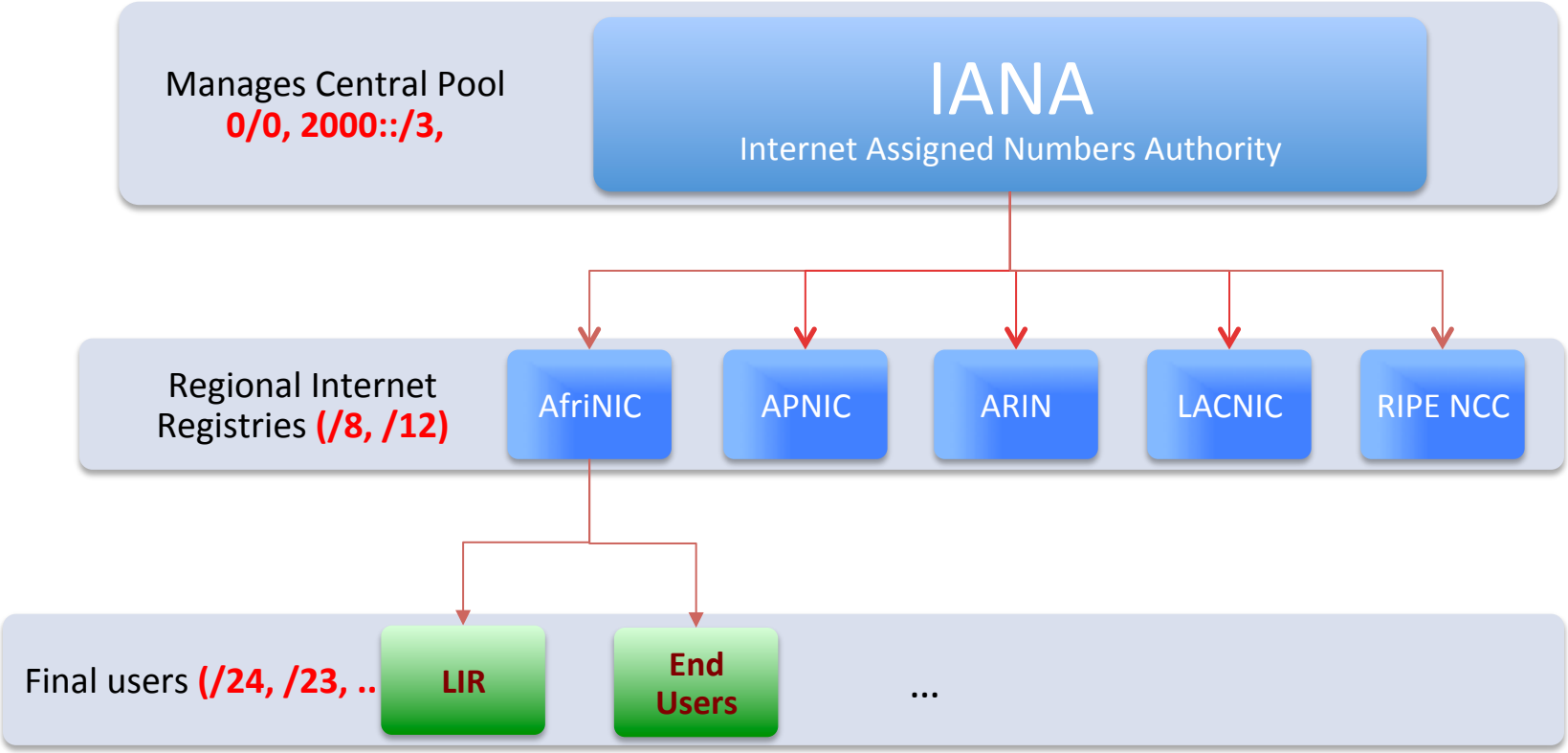
- **Manage IPv4 & IPv6**
- **Manage ASN (2 and 4 byte)**
- **Manage rDNS tree for IP prefixes in use by African Operators**
- **Provide a Public WHOIS**
- **Contribute to IP address Management Global Policy development**

Other Services to the community

- **Biannual Internet Protocol meeting**: 20 so far in 1 countries
- **Internet Infrastructure reinforcement** development in Africa:
- IXP
- DNS Root Server copy
- Anycast service to support ccTLDs in Africa
- Support to **academic Networks**

Training: more than 150 training sessions in 45 countries around Africa since 2005.

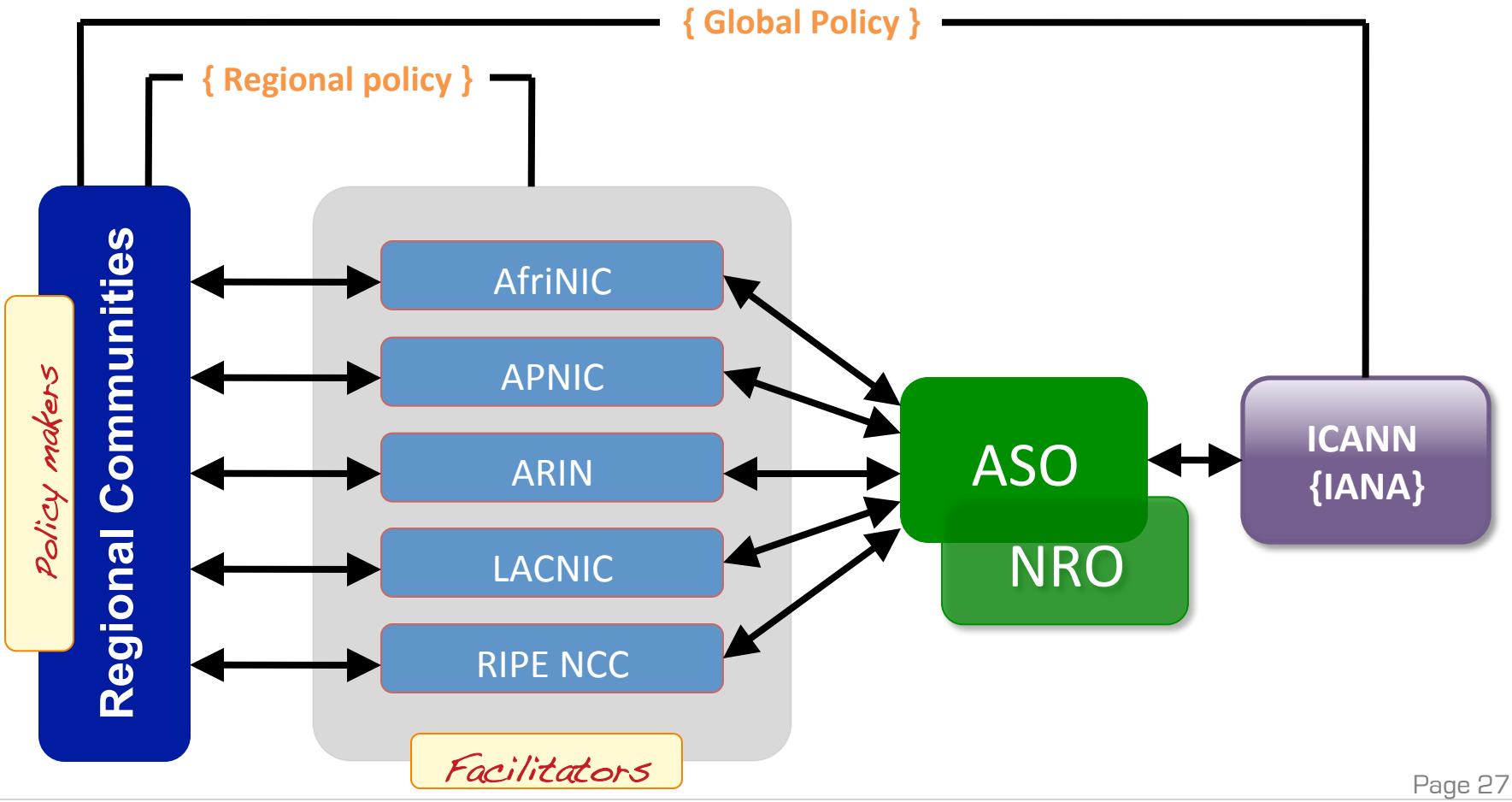
Number Management Chain



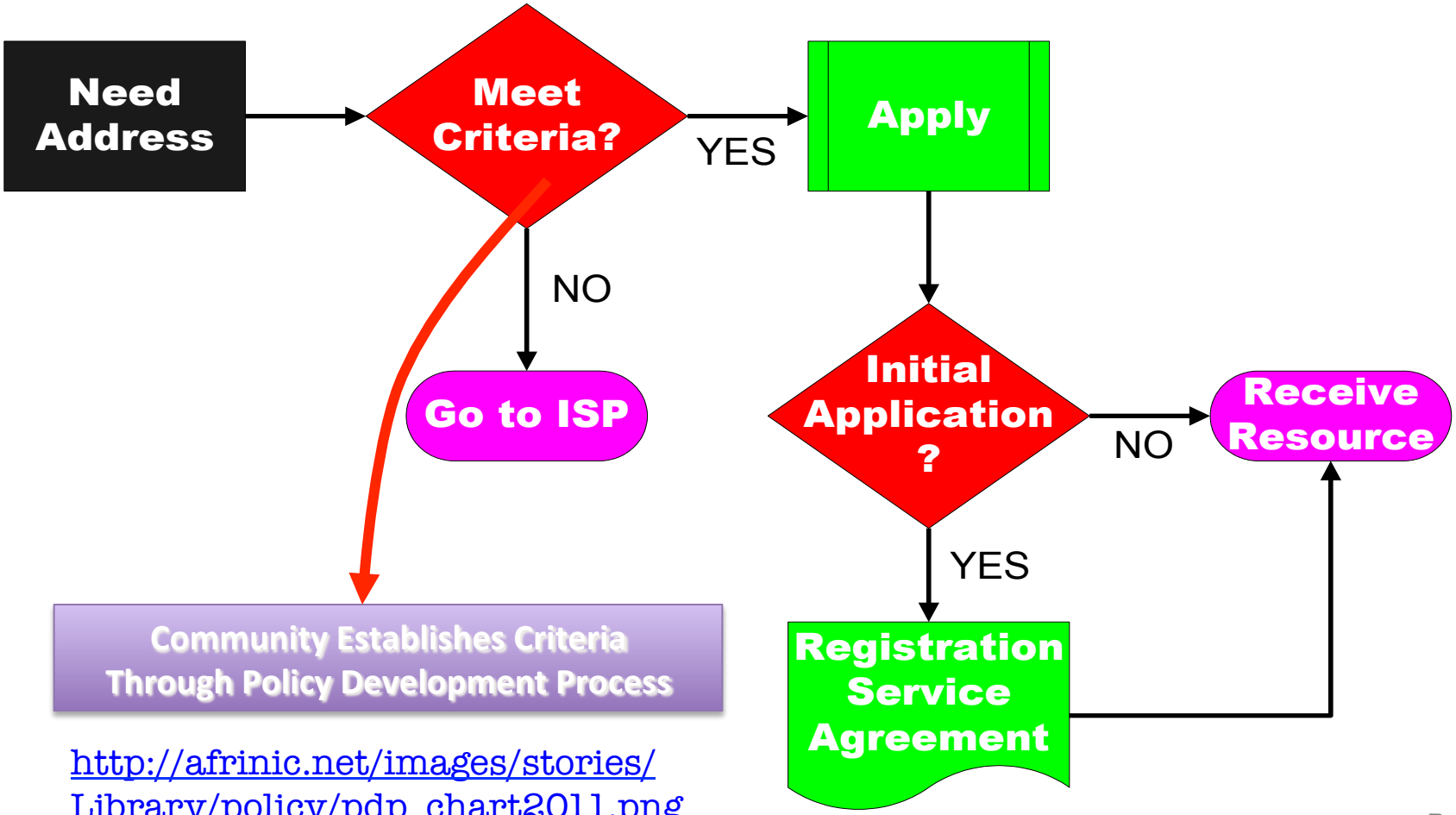
NR Management Principle

- **Policy Objectives**
  - Conservation
  - Aggregation
  - Uniqueness
- **Administrative Objectives**
  - Neutrality
  - Consistency
  - Impartiality

NR Management Polic{ies}



IP Address Allocation Process



http://afrinic.net/images/stories/Library/policy/pdp_chart2011.png

Where are we going

- 15% Internet penetration in Africa to 60% penetration by 2020 with mobile as key user device & multitude of online apps (including clouding).

1. From the management of scarce number resources to accurate & reliable Network Information Centre
2. Internet Protocol Knowledge Centre

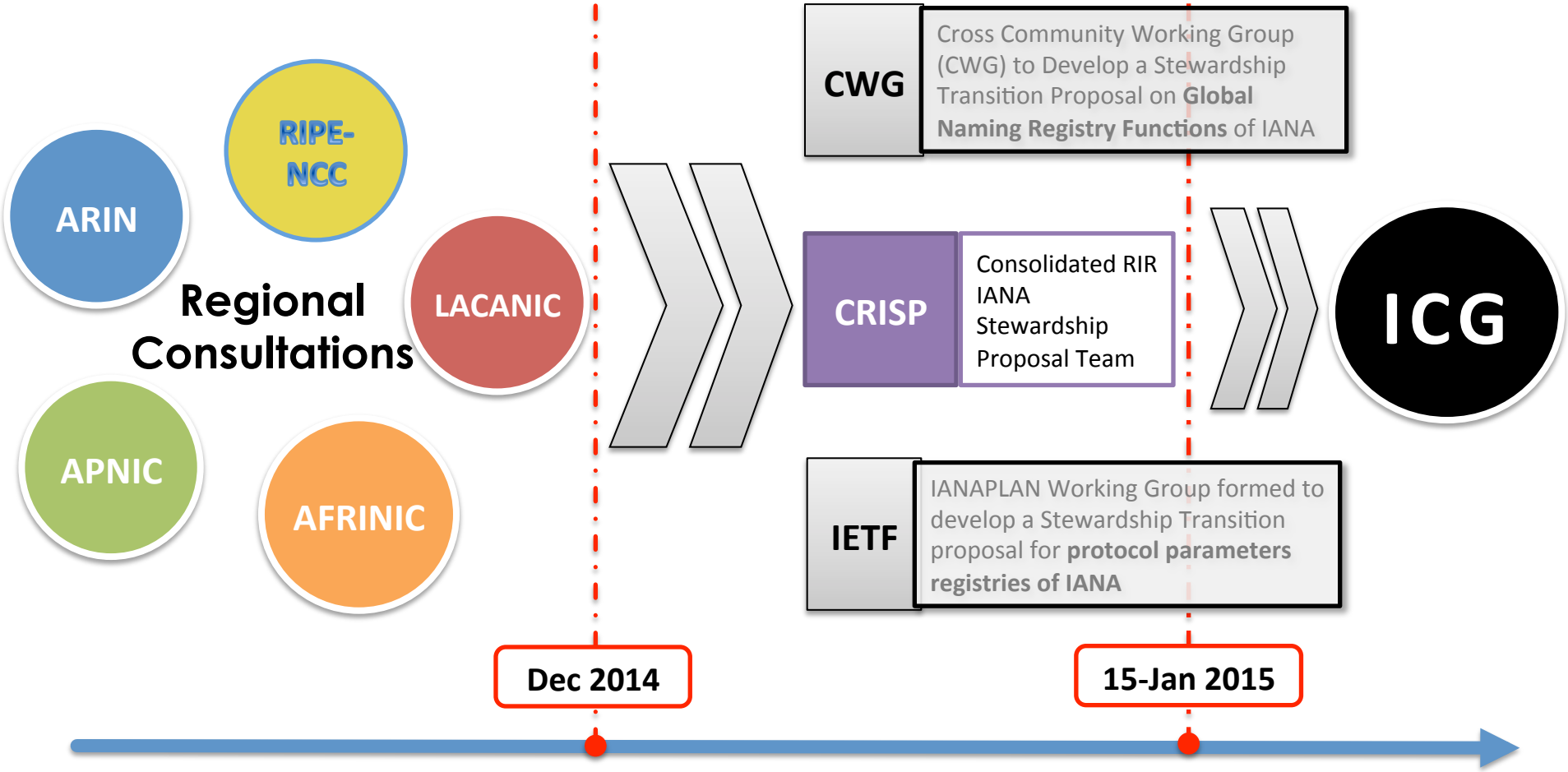
Questions

AFRINIC
The Internet Numbers Registry for Africa

IANA Oversight Transition

Adiel A. Akplogan
CEO, AFRINIC.
2014

Process & Timeline



AFRINIC Region

- First round Table in Djibouti
  - **Mailing list**: ianaoversight@afrinic.net
  - **Dedicate web repository**:

  http://afrinic.net/en/community/iana-oversight-transition

- **CRISP** Team from AFRINIC region:
  1. Alan P. Barrett
  2. Mwenda Kivuva
  3. Ernest Byaruhanga (staff)

- Survey to collect input from our community on guiding principles https://www.afrinic.net/images/stories/Initiatives/%20survey%20on%20the%20iana%20stewardship%20transition.pdf

Questions