

# Afrinic and IP Address Management

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WAIGF

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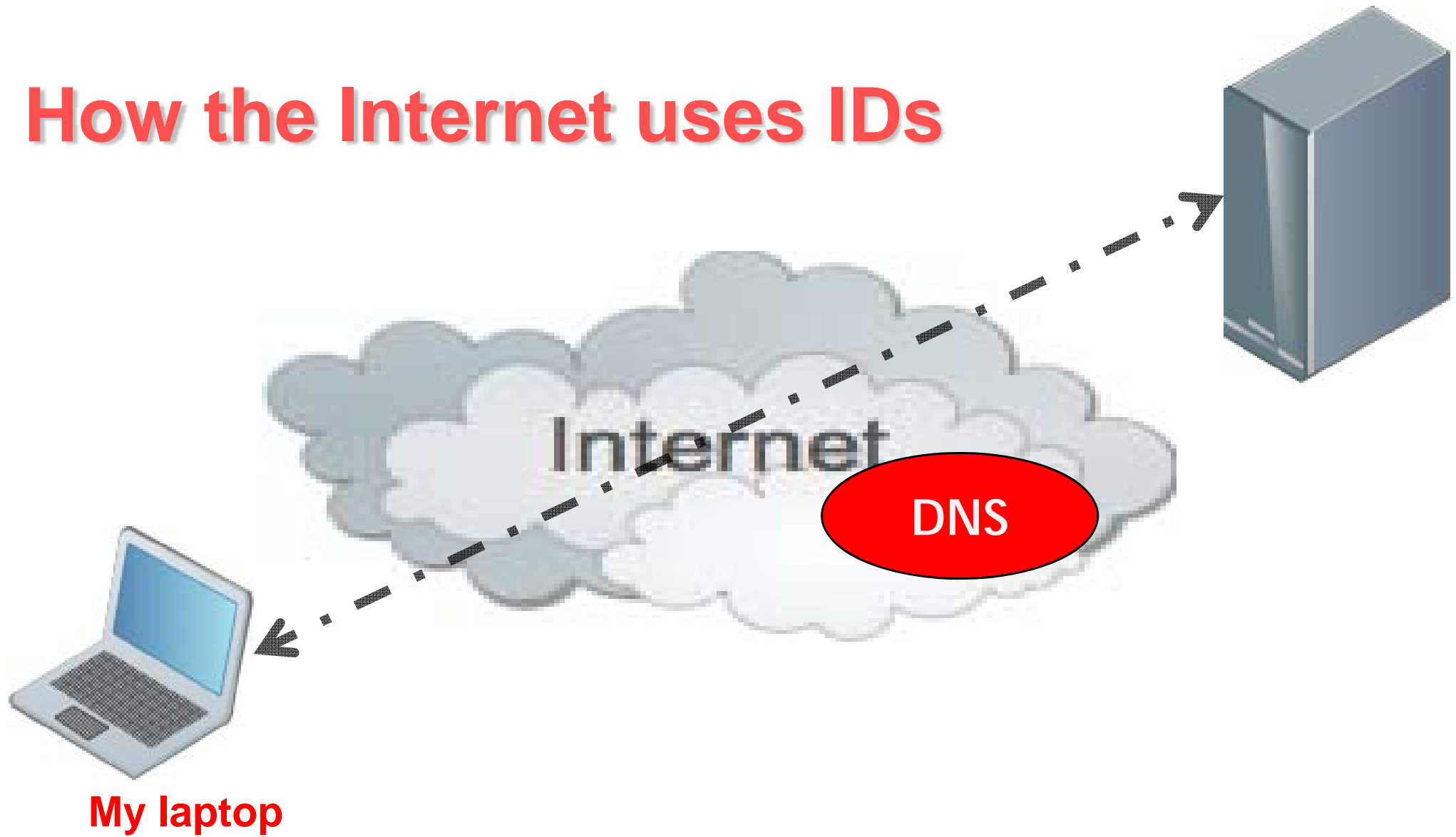
## Questions:

1. *What is an IP address and what do they do?*
2. *What is the role of regional Internet registries (RIRs)? and*
3. *the opportunities for human capacity development and training*
4. *Conclusion*

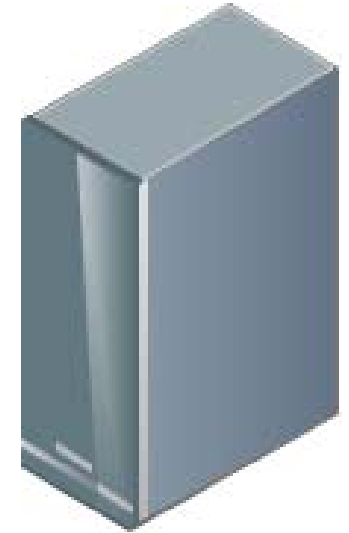
# Internet most known Identifiers

- ▶ Name resources:
  - **Names** – Names used to access the Internet
    - gTLDs: Generic Top level domains (.com, .net, info, .org, .int ...etc)
    - ccTLD: Country code Top level domain management (.ci, .za, .gh, .ly, .fr, .ru, etc....)
  
- ▶ Number resources:
  - **IP addresses** – Unique number identifiers of equipments on the Internet.
  
  - **ASN** – Unique identifier of networks falling under unique management with a unique routing policy.

# How the Internet uses IDs



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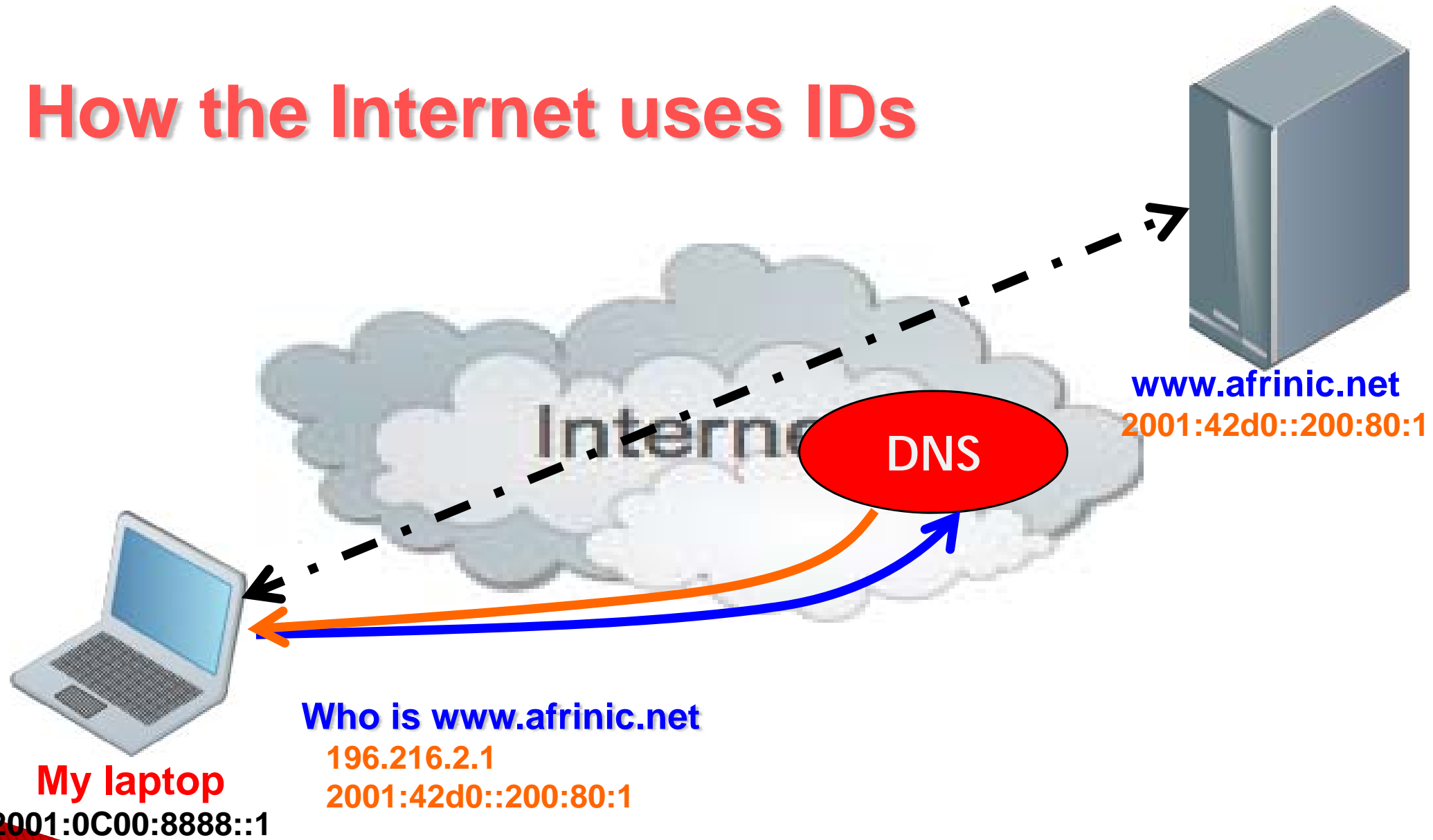
**My laptop**

**Who is [www.afrinic.net](http://www.afrinic.net)**

196.216.2.1

2001:42d0::200:80:1

# How the Internet uses IDs



`2001:0C00:8888::1`

# IP Addresses vs. Domain Names

## ▶ IP Address [Identifier]

- “Computer-friendly”
- Unique number identifies computer on Internet
- Used for routing

## ▶ Name [Reference]

- “People-Friendly”
- Maps host name to unique IP address
- Not used for routing

**IP addresses are mandatory for Internet Protocol communications (routing), while domain naming facilitates communication and accessibility of the Internet to the end users.**

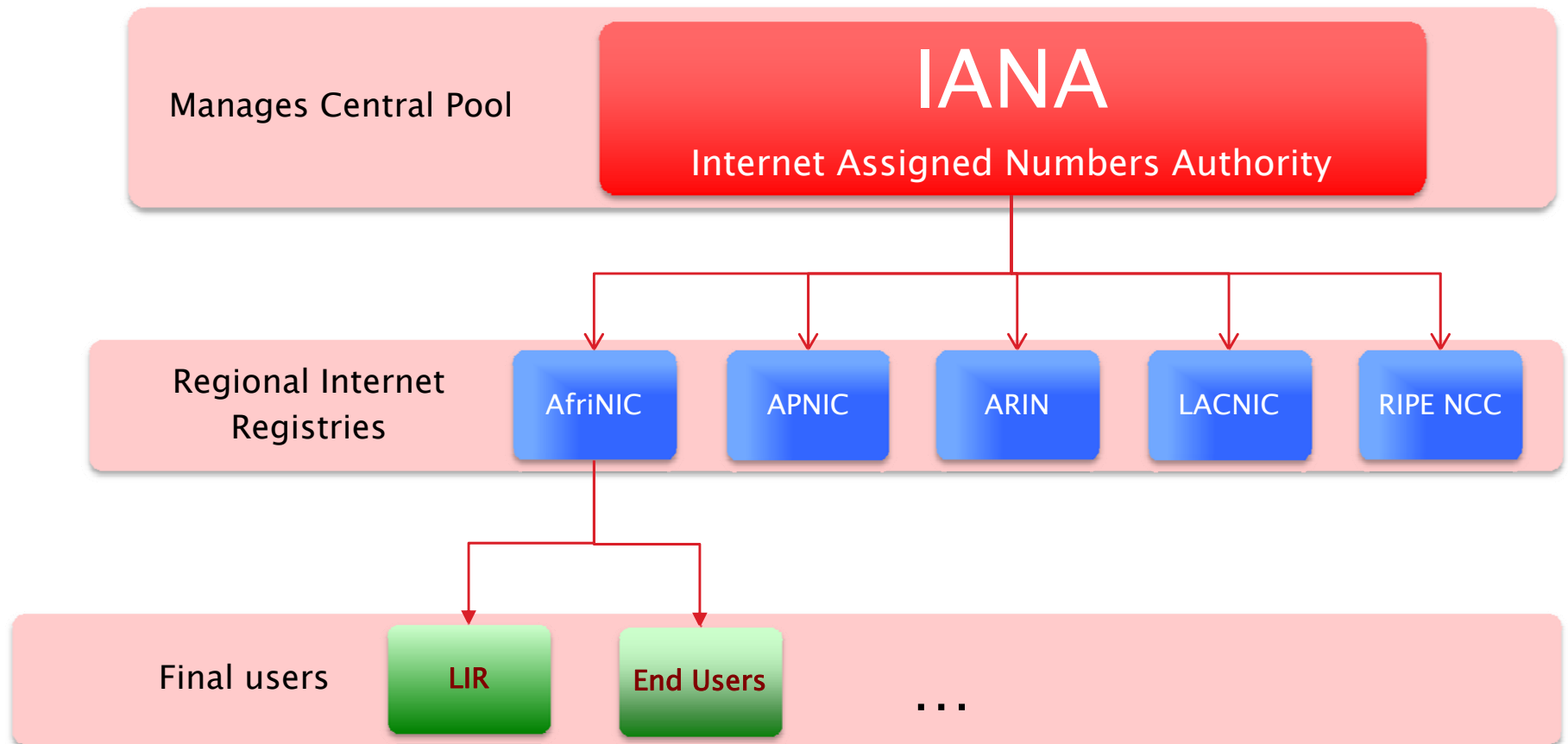
# Few more about IP addresses

- ▶ A **finite** “Common Resource” both v4 and v6
- ▶ 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
- ▶ Need careful management to ensure **uniqueness**.

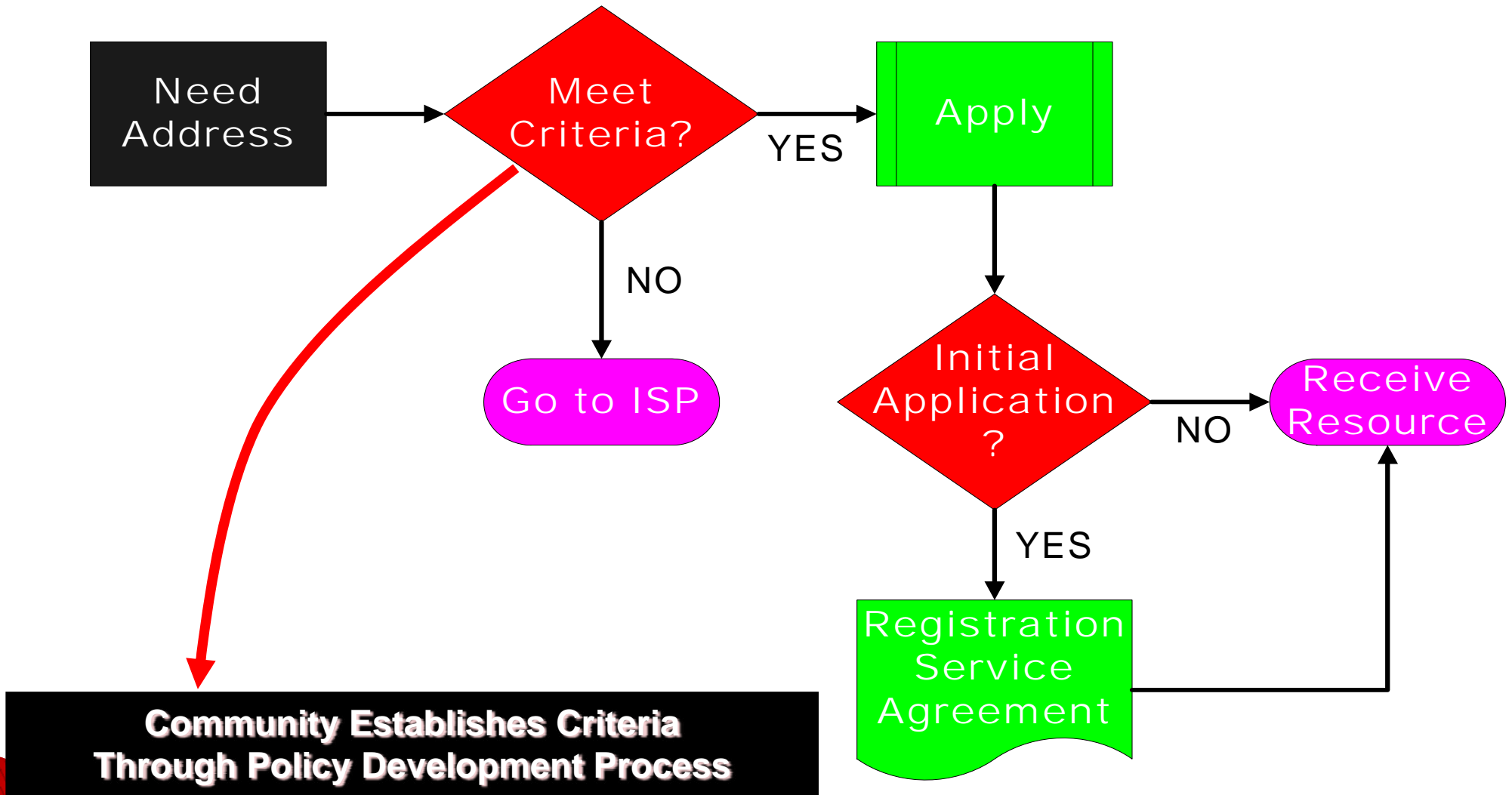
# IP address management Regime

- ▶ The common practice in Internet community is to separate the management of the two types of resources.
- **IP address and ASN** are managed regionally by Regional Internet Registries (RIRs) for technical reason (routing). 5 Registries operate today for 5 regions:
  - **AfriNIC**: Africa and Indian Ocean
  - **APNIC**: Asia Pacific Region
  - **ARIN**: North America
  - **LACNIC**: Latin America and Caribbean
  - **RIPE NCC**: Europe, Part of Asia and Middle East

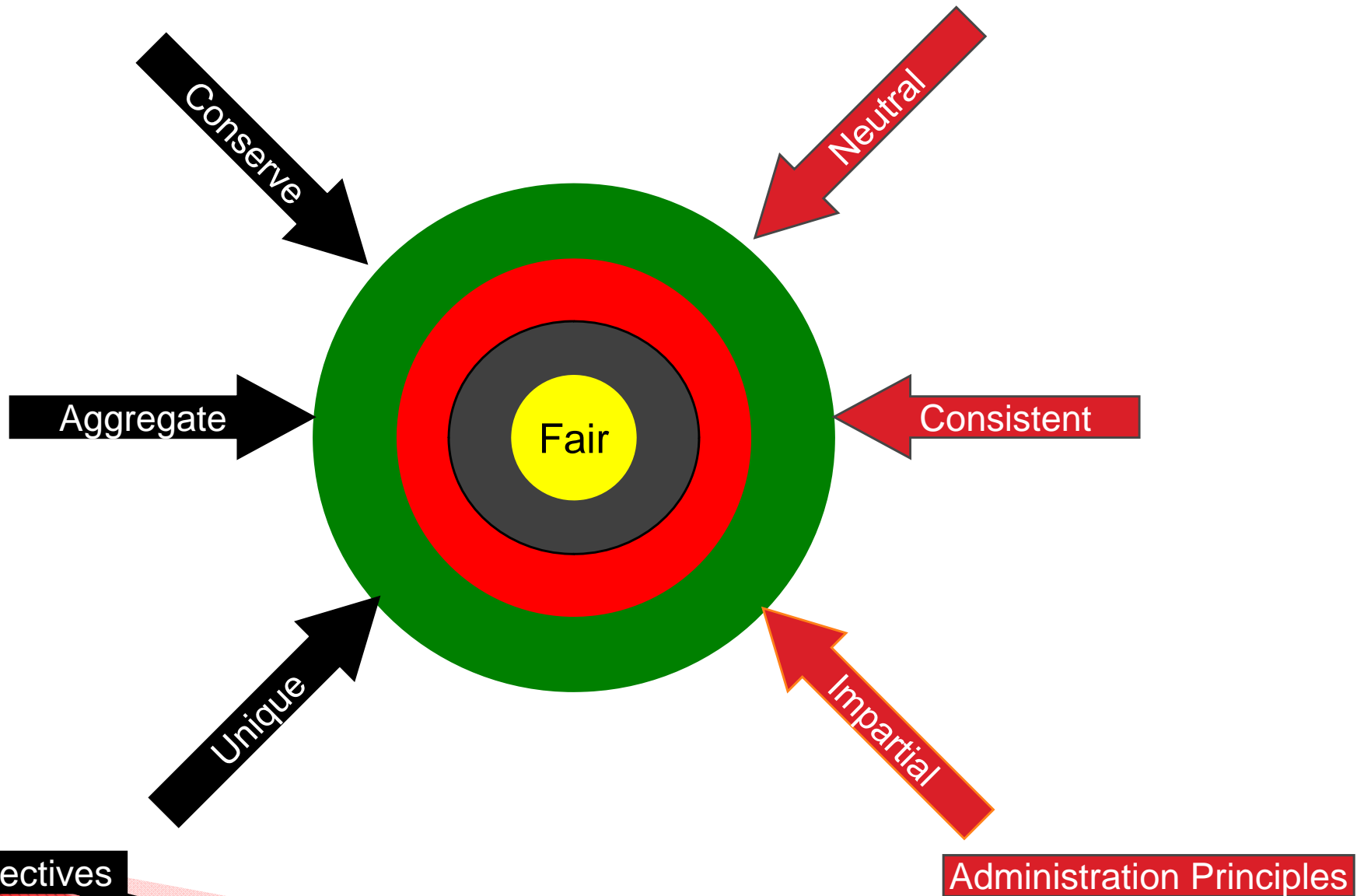
# How IP addresses are distributed



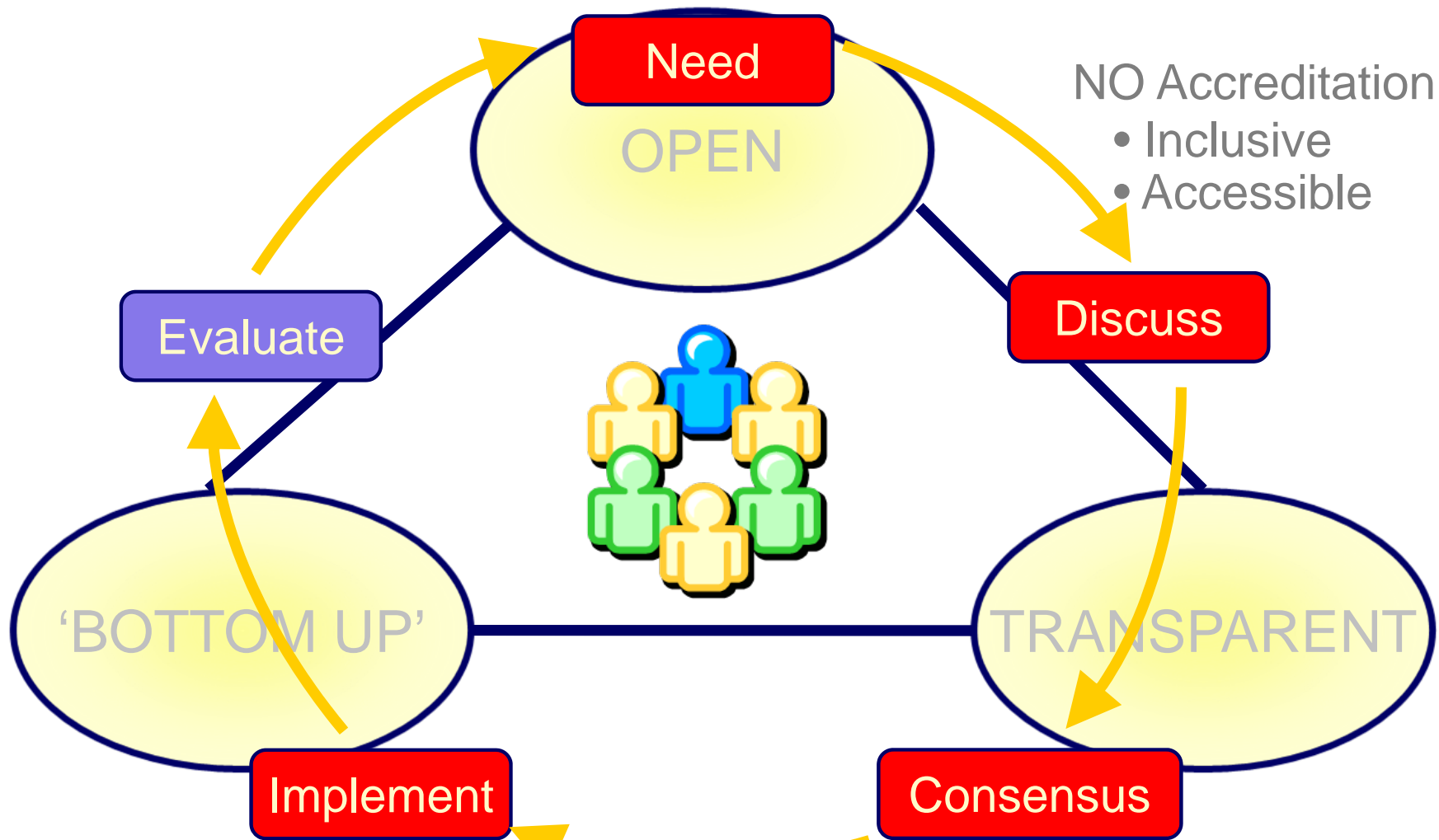
# How Are IP Addresses Provisioned?



# Guiding principles in Managing IP Addresses



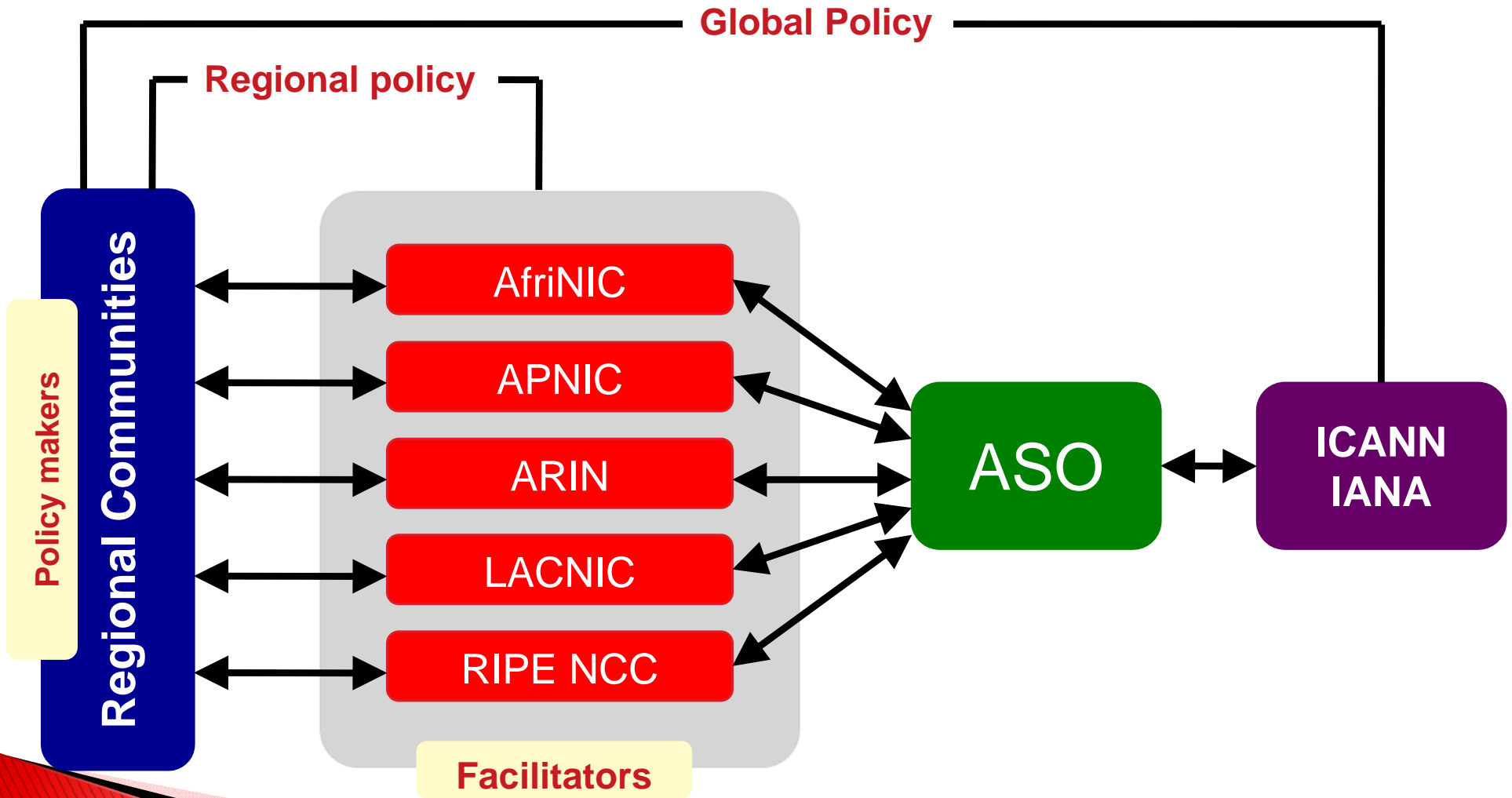
# Policy Development process

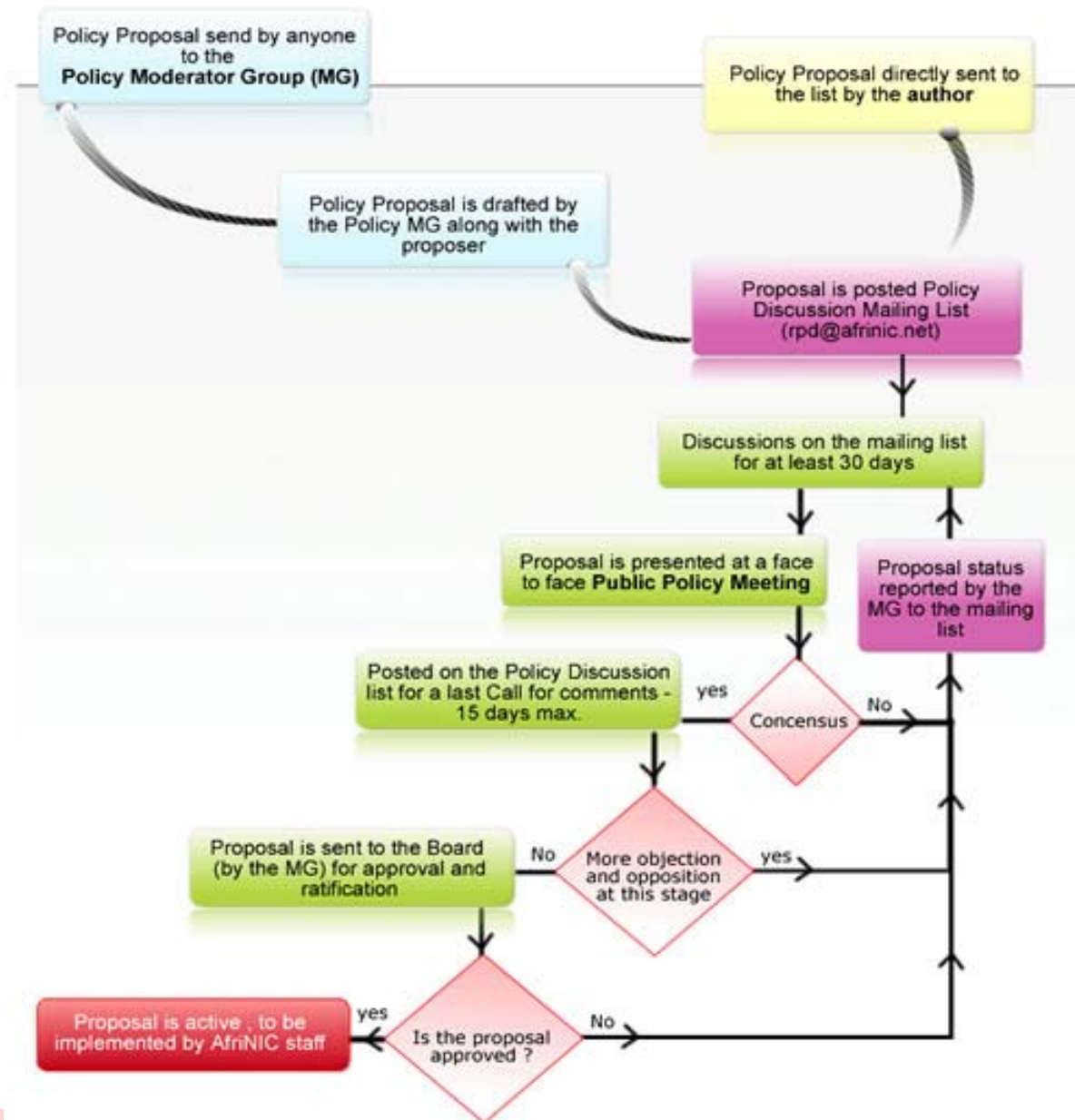


Internet Community Proposes,  
Discusses, & Approves  
Policy

Documented, Published & Accessible  
PDP, Policies, & Procedures

# How are IP management policies defined?





# Somme current policies discussion

Policy	Status
IPv4 Soft Landing Policy	<i>Douglas Onyango</i>
IPv6 Allocations to Non-Profit Networks	<i>Graham Beneke</i>

# Status of IP addresses usage

- ▶ In the rest of the worldwide there is about 0.5 IP address per inhabitant and about **2 per Internet user**.
- ▶ In Africa ratio is about 0.05 IP address per inhabitant and **0.76 IP addresses per Internet user**.
  - Worldwide Internet penetration is around 27% while **Africa is only ~6%**.

# IP addresses availability in the Africa Region

## IP address hold by Afrinic

- ▶ IPv4 Addresses (/8 ~16.77 Million hosts)
  - **196/8**
  - 197/8
  - **41/8**      **(total ~ 50 Million / ~32.4% issued)**
- ▶ IPv6 Addresses
  - **2001:4200::/23** (512 Networks of /32)
  - 2C00:0000::/12 (1,048,576 Networks of /32)

**(less than 0.006% network (/32 issued)**

# Why available resources are underutilized?

- ▶ Lack of awareness
  - **Network Operators need to express their needs in order to get access and use existing IPv4 addresses available for the region.**
- ▶ Abusive usage of NAT
  - **Myth in the early days of Internet in Africa about the exhaustion of IPv4 pool.**

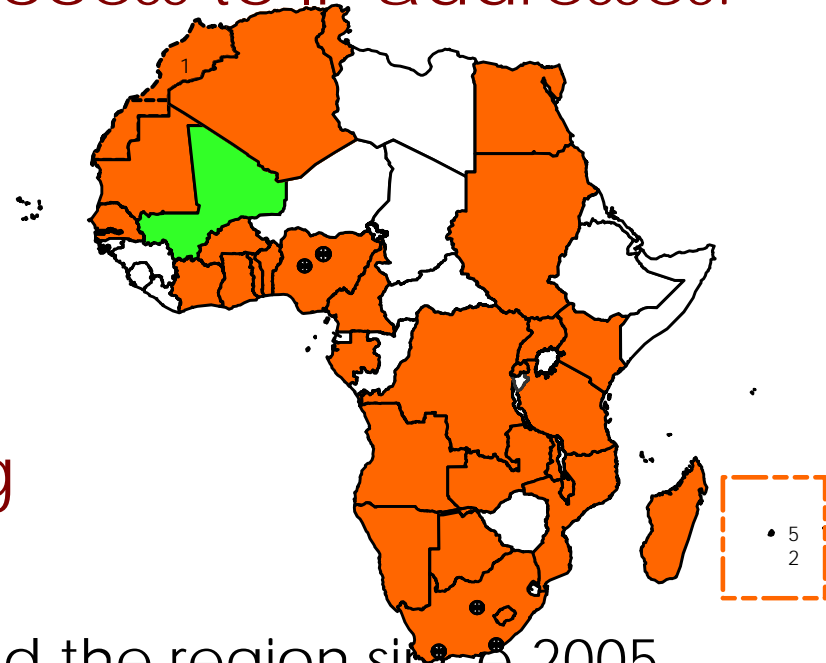
# Improving the the situation

## ▶ Policy measures to facilitate access to IP addresses:

- Review IPv4 Allocation criteria
- Ipv6 Assignment to End-Users
- Simplify IPv6 eligibility criteria
- Waive fees for IPv6 allocations

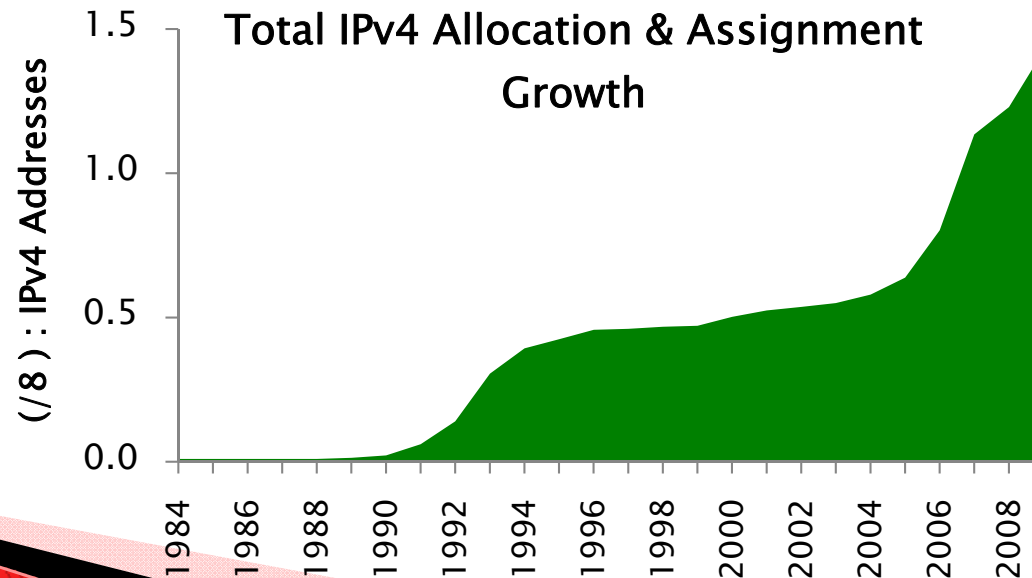
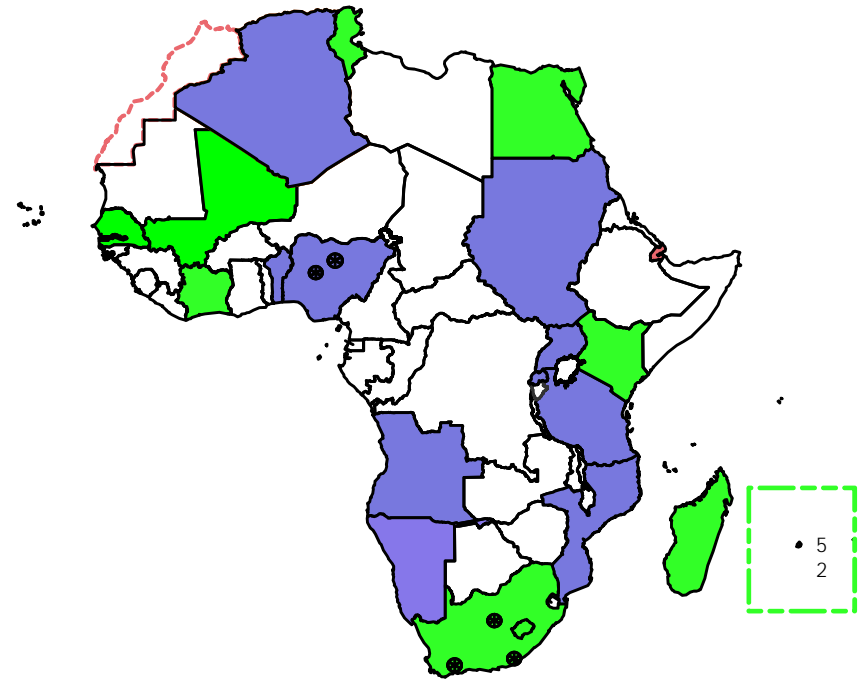
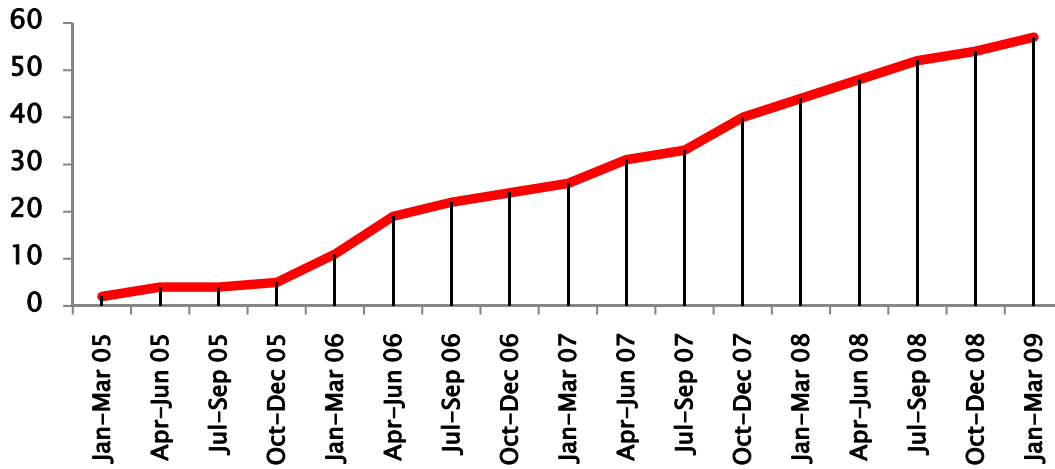
## ▶ Capacity Building and training

- Intensive **training program** around the region since 2005 (40 trainings attended by more than 800 people).
- **Fellowship program**: Offer fellowship to more than 30 people from all stakeholders (Operators, Civil Society and Governments) to attend policy making meetings and International standard forum such a as IETF



# Positive results

IPv6 Prefixes Allocation Growth – From Q1 2005



# AfrinIC today

- ▶ 2009 Budget:
  - Operating cost: ~ USD 1,8 M
  
- ▶ Head count: 17 people at work
  - Young and dynamic team
  - From 7 different countries
  - 99% located in Mauritius
  
- ▶ Membership growth
  - 565 Members in September 2009
  - 23 Million unique IP addresses allocated
    - *More than 150% growth of IP allocation in the region since 2005*

# Conclusion

- ▶ **Internet number resources are critical for Internet growth and its development.**
- ▶ As a new comer, the developing regions more than others have to care about sustaining their Internet growth by ensuring that appropriate resources are to support their long term ICT strategy supporting future growth.
- ▶ You are all invited to join the various RIRs policy development forums in order to contribute to policies that could help to improve the overall situation

# Thank you

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