ngPIF
Nigerian Peering and Interconnection Forum

AFRINIC
The Internet Numbers Registry for Africa

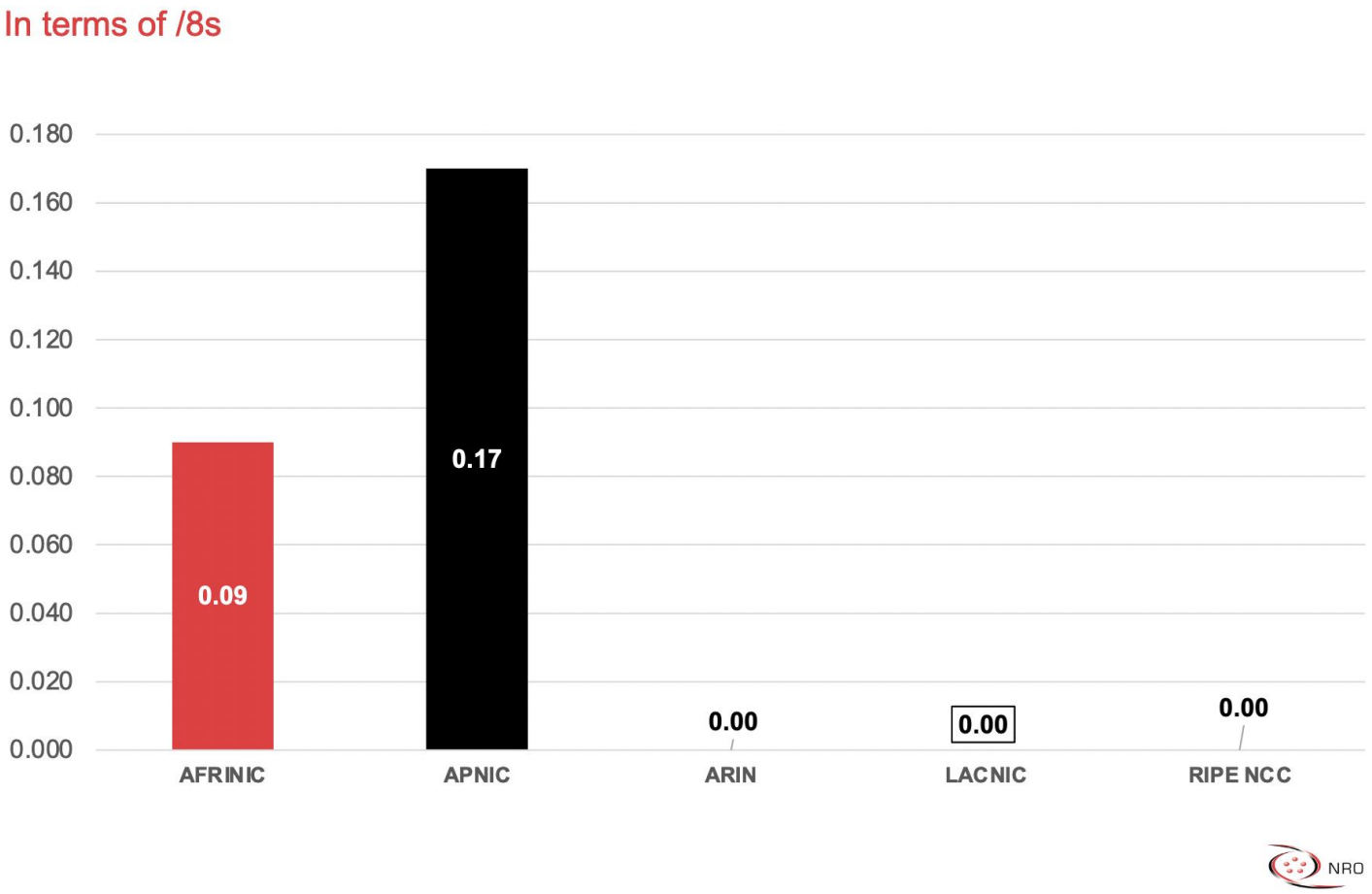
Why Migrate from IPv4 to IPv6?

Willy Manga
Deployment Ops
AFRINIC

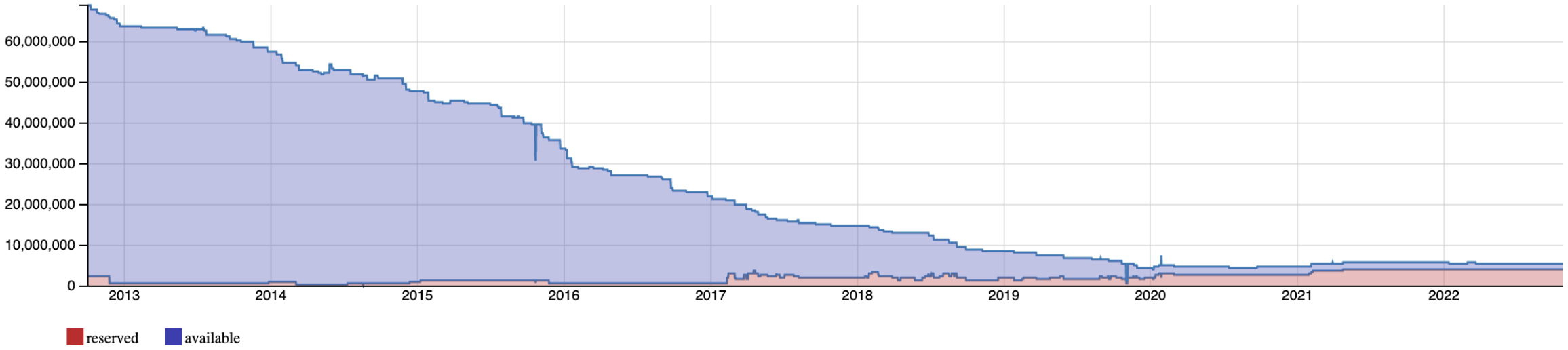
2022.10.25

Available IPv4 space available in each RIR

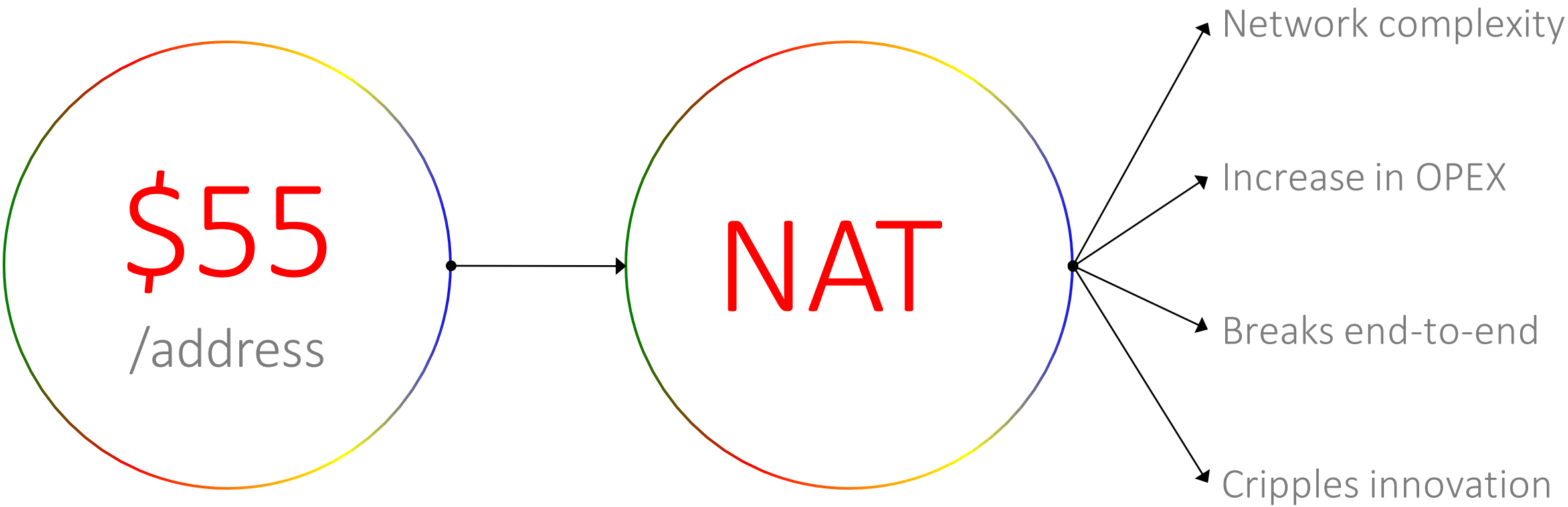
Number Resource Organization (NRO) stats as of 30 June 2022



IPv4 exhaustion at AFRINIC



Exhaustion drives up address costs & NATs



How will you deal with IPv4 exhaustion?

Wait and see

Deploy IPv6

Deploy NAT on Steroids

Our recommandations

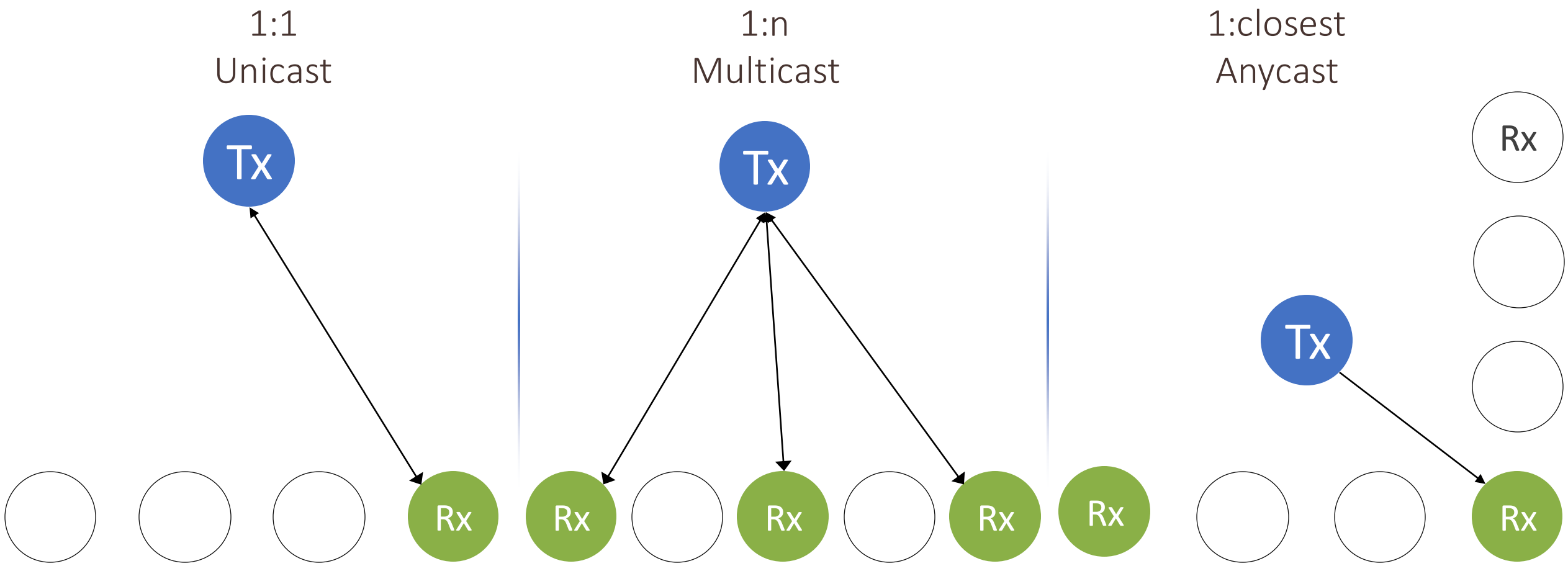
1. Secure IPv4 resources from AFRINIC
2. Get IPv6 resources
3. Learn as you deploy (*afrinic.academy has everything you need to start*)
4. Set a small goal to actually advance IPv6
5. If you ever get stuck, call for help from us at bit.ly/6deployEN

What is IPv6?

RFC8200

- A new version of the Internet Protocol (IP) designed as a successor to IP version 4. The changes fall primarily into the following categories:
  - Expanded Addressing Capabilities
  - Header Format Simplification
  - Improved Support for Extensions and Options
  - Flow Labelling Capability
  - Authentification and Privacy Capabilities

There’re 3 types of IPv6 addresses



No broadcast addresses (or communications) in IPv6

More than ever, you need DNS !

- The DNS has always been around to ‘map’ one element to another like a phonebook

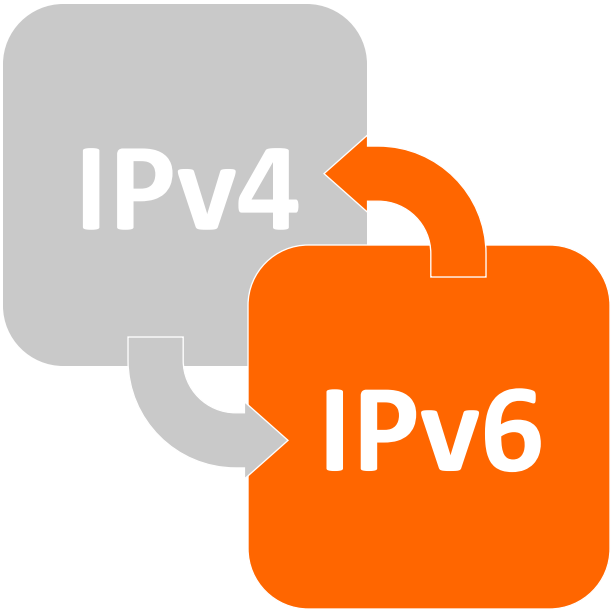
- E.g : www.afrinic.net maps to
  - 196.216.2.6 (*A record*)
  - 2001:42d0:0:200::6 (*AAAA record*)

- All you have to remember is … the name

There’re 3 categories of transition techniques

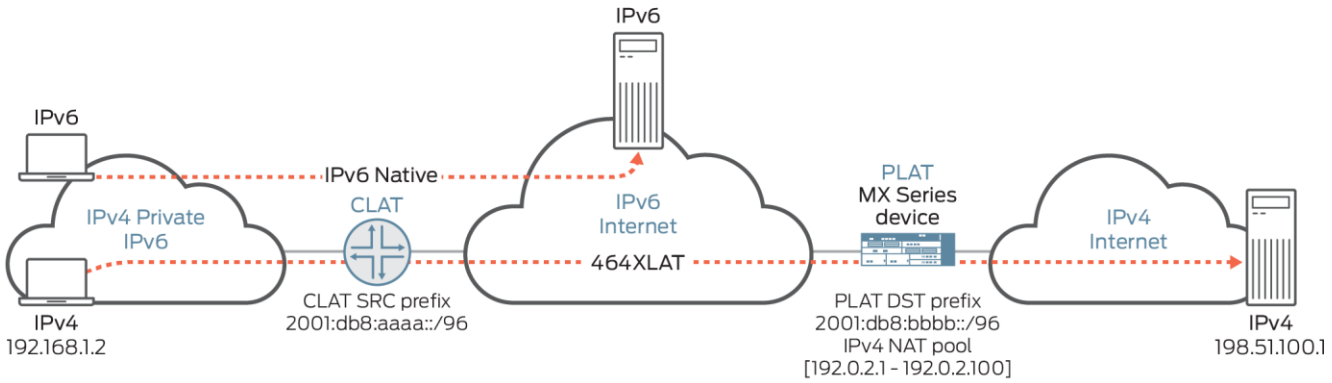
Dual stack

Tunneling



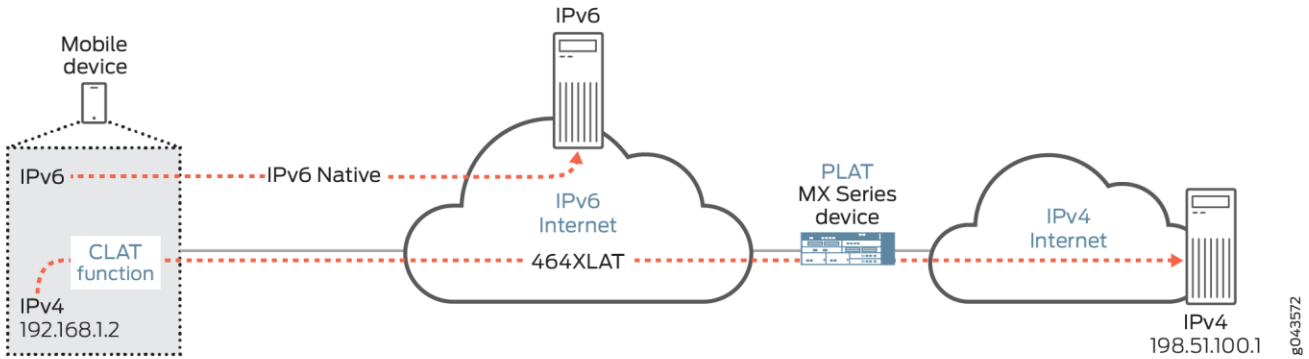
Translation

One transition technique: 464XLAT



Wireline flow

Wireless flow



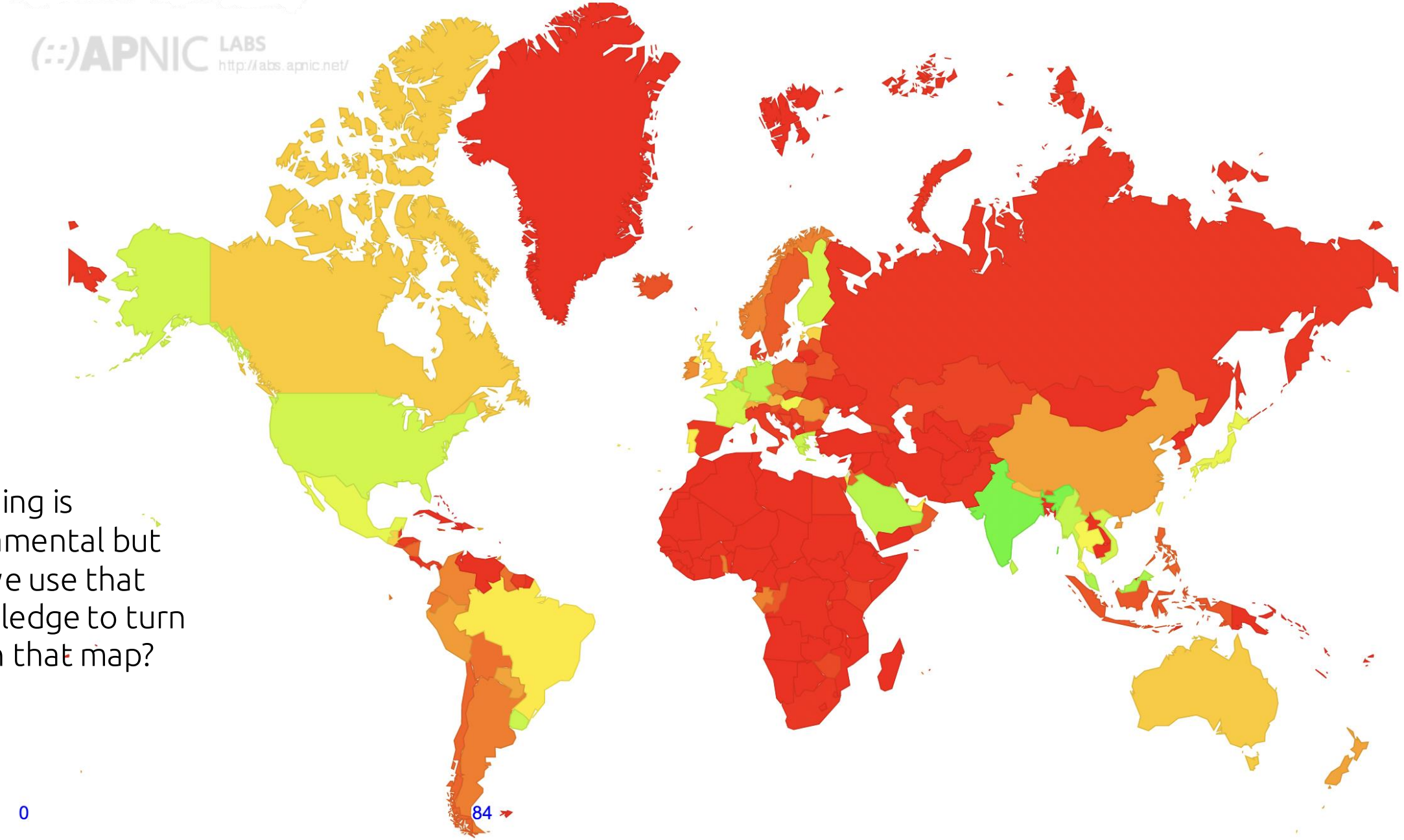
From Juniper

IPv6 at AFRINIC

The learning path at AFRINIC

- At AFRINIC, we have an elearning platform that help people understand and master IPv6 concepts → https://afrinic.academy/
- You can even get certified with our internationaly recognised certification platform → https://certi6.io/

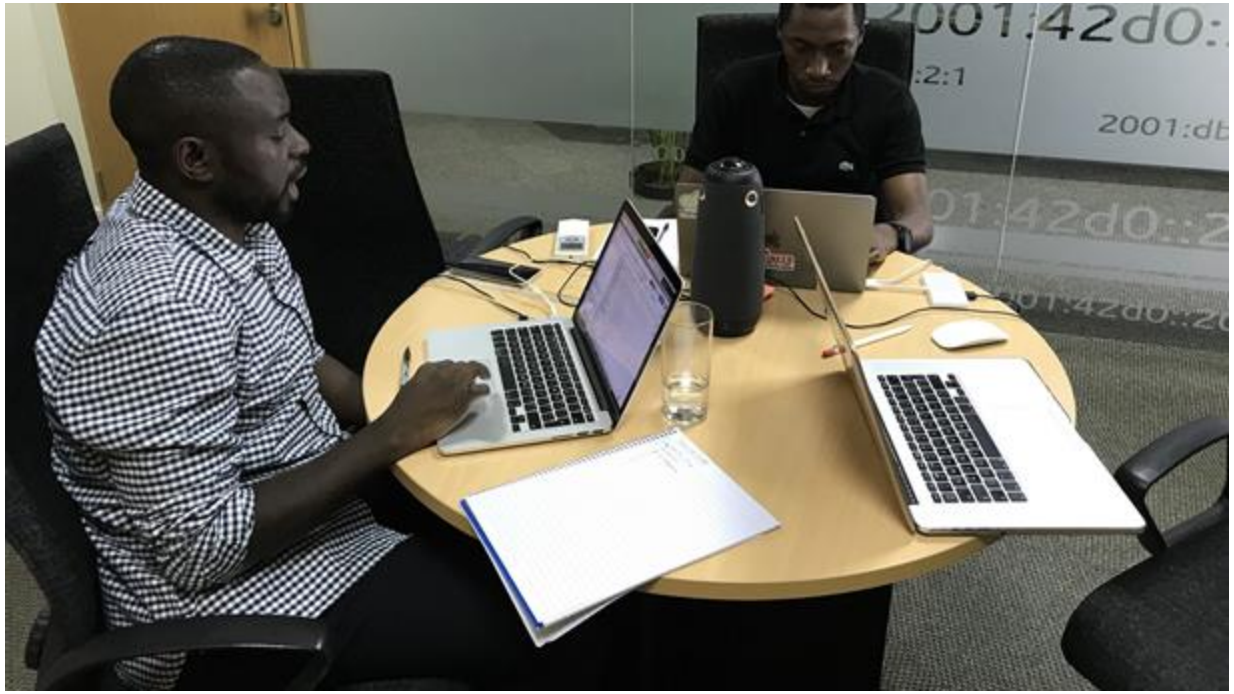
IPv6 Capable Rate by country (%)



Learning is fundamental but can we use that knowledge to turn green that map?

Our Solutions

DO Helpdesk



(e-)Deployathon

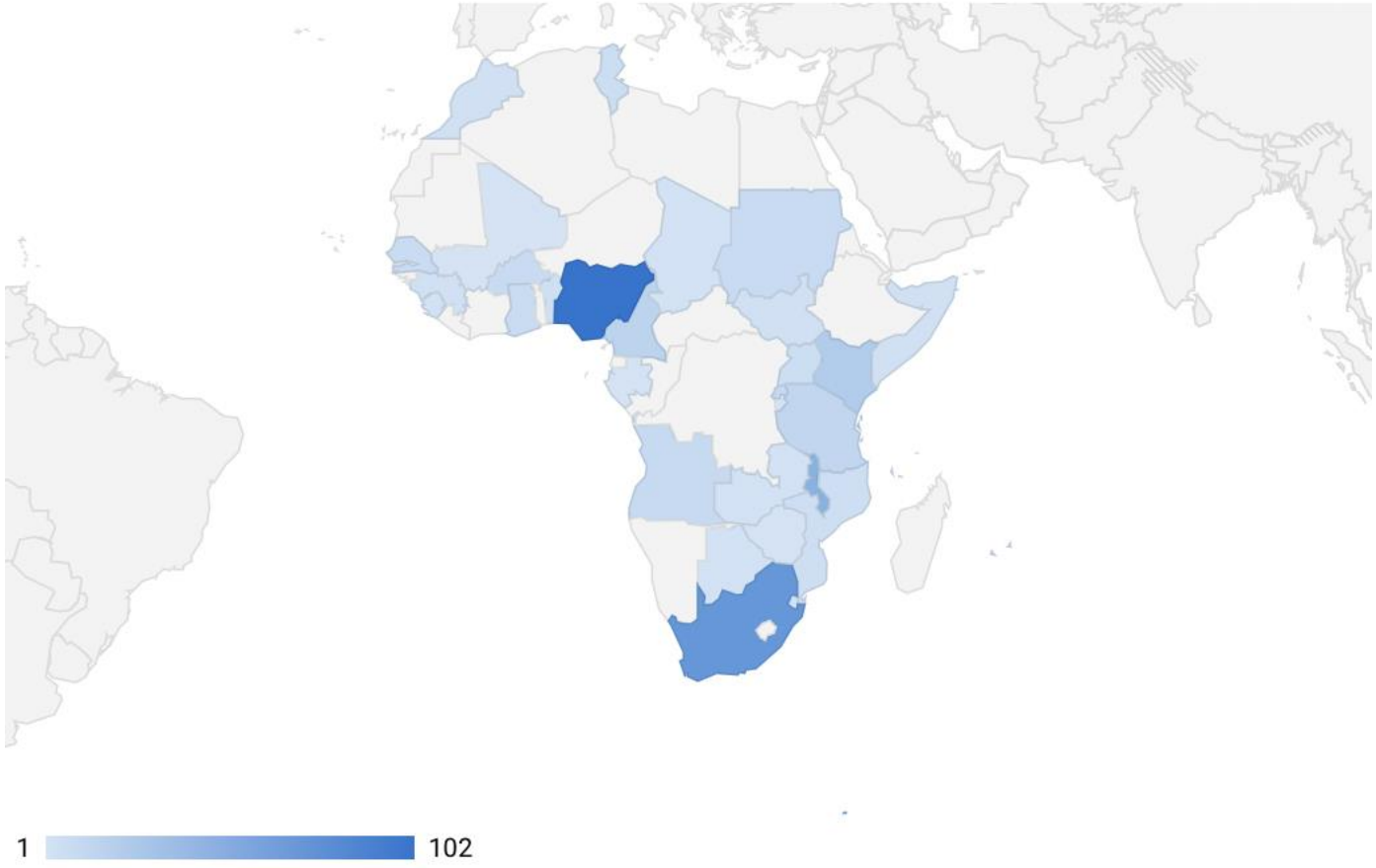
Deliver expert guidance to operational engineers so they can collaborate with their peers from different networks to confidently implement IPv6 on their network

How we measure success: Milestones

- IPv6 prefix (PI)
- Correct RPKI ROA
- Valid route6 object
- Advertised IPv6 prefix
- Validated address plan (IPAM)
- Completed network audits
- IPv6 traffic from test VLAN

- IPv6-enabled DNS
- IPv6-enabled email
- IPv6-enabled website
- IPv6 domain objects
- DNSSEC signed IPv6 reverse zone
- IPv6-enabled access network
- IPv6-enabled customer
- Detailed IPv6 project plan

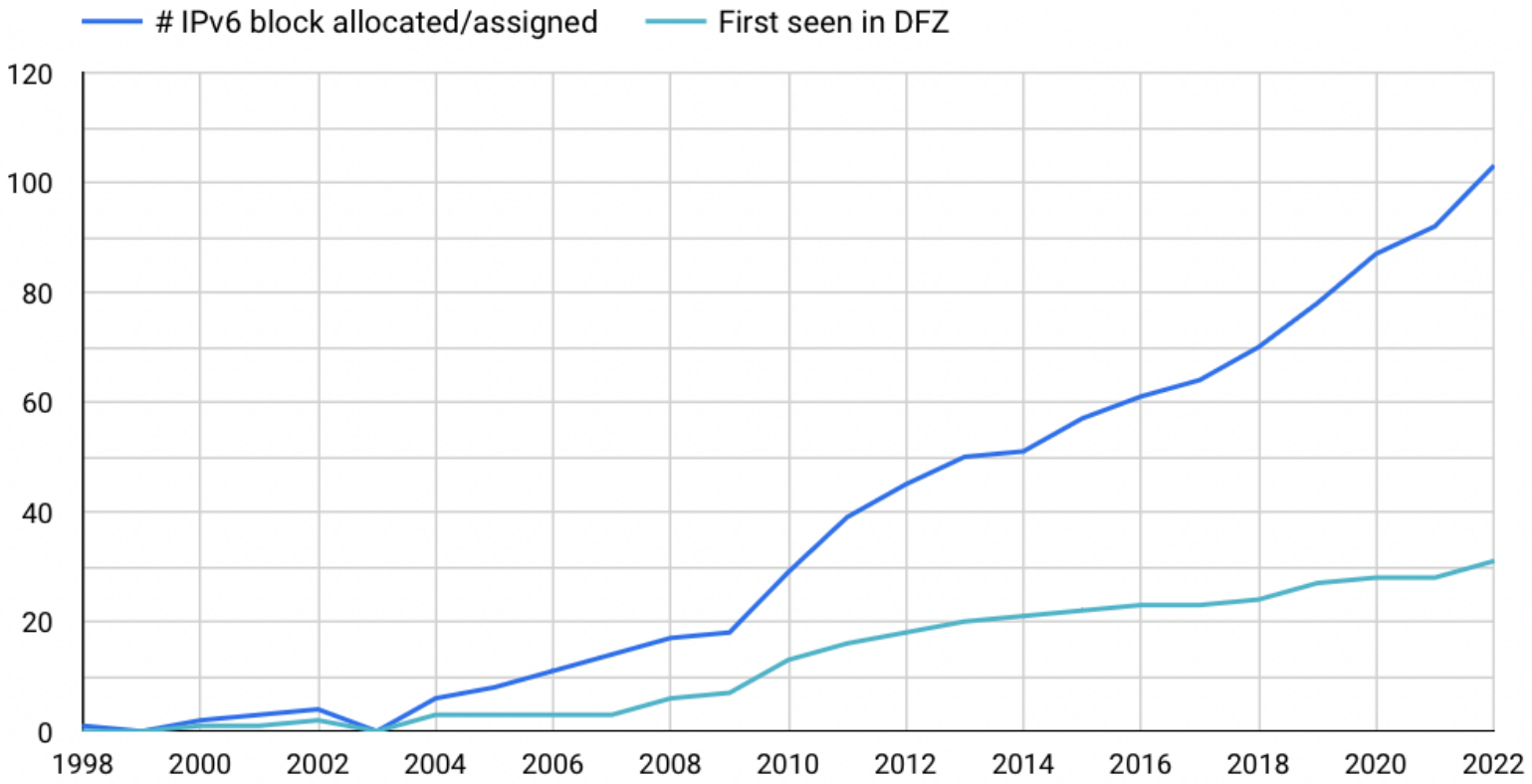
What is the impact of our actions so far?



As at 24 October 2022:

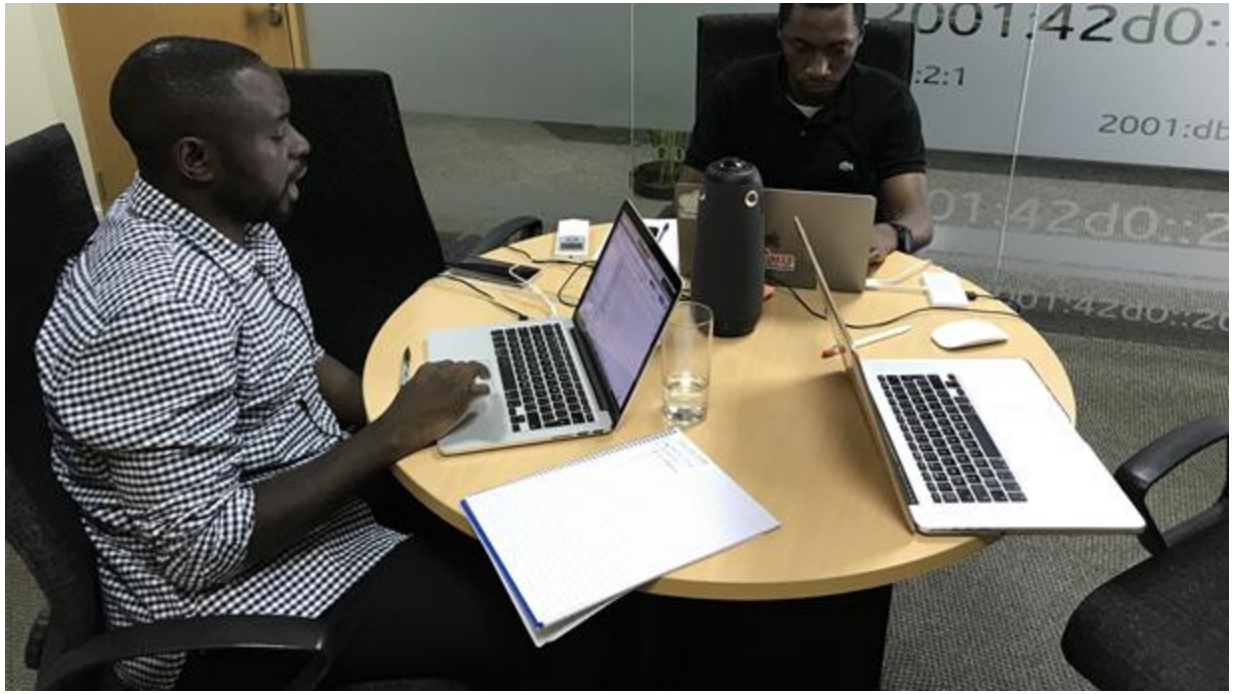
- 367 deployment milestones attained
  - 102 from Nigeria
- 146 organisations
- 32 countries

IPv6 resources usage from AFRINIC members in Nigeria



- 103 AFRINIC members with IPv6 blocks allocated/assigned
- 31 AFRINIC members with IPv6 blocks advertised (*aggregate)*

We are here to help you address your challenges



http://bit.ly/6deployEN

Cohort-Based Workshop

7th November

bit.ly/zero2c6

$0.00

Please scan me!

Learn all you need to know about IPv6 in 21 days