

# IPv6 PI routing issues

AfriNIC-8

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# Background(1)

- IPv6 PI policy adopted in June 2007
  - <http://www.afrinic.net/docs/policies/afpol-v6200701.htm>
  - End-sites
    - End-Users who already have or qualify to get IPv4 PI addresses
    - Critical Infrastructure providers such as TLD root server operators and public Internet exchange Points (IXP's)
  - **The initial provider independent assignment size to an end-site should be a /48, or a shorter prefix if the end-site can justify it.**

# Background(2)

## Incentives

The current policy does not allow IPv6 provider independent (PI) address assignment to any 'end-sites'.

In addition, lack of IPv6 transport will compel many 'end-sites' to tunnel. Thus, to avoid renumbering when IPv6 transport will be available, a provider independent assignment seems reasonable.

More so, not all LIR's have IPv6 address space allocations. This makes it impossible for end-users to get PA IPv6 address space from such upstreams (LIR's).

This policy is also aimed at providing IPv6 address space to such end-users as long as they already have or qualify to get PI IPv4 addresses.

# Background(3)

- Implementation from July 2007
  - /48 from 2001:43f8::/29
  - Announce sent to NOGs and other lists
- 6+1 assignments (1<sup>st</sup> June 2008)
  - 2 IXP(.ke, .tz)
  - 3 countries(.ke, .tz, .za)

# Background(4)

- Portable IPv6 in other regions:
  - APNIC, ARIN, RIPENCC have policy for IPv6 PI
  - ARIN and LACNIC make micro-allocations(PI like)
- Minimum allocation and assignment size
  - <http://www.afrinic.net/Registration/resources.htm>
  - <http://www.apnic.net/db/min-alloc.html>
  - [http://www.arin.net/reference/ip\\_blocks.html](http://www.arin.net/reference/ip_blocks.html)
  - <http://lacnic.net/en/registro/index.html>
  - <http://www.ripe.net/ripe/docs/ripe-415.html>

# IPv6 PI routing problems

- PI prefixes showed limited routing scope
  - <http://www.sixxs.net/tools/grh/dfp/afrinic/>
  - Compared to /32 allocations
  - Despite the announce sent to the lists
  - Despite the calls for filters adjustments
- Thus, accessibility problems for nodes in these networks
- **This may affect CIs**
- AIRRS project to investigate
  - what is happening and What to do?

# Investigations

% Information related to '2001:43f8:0040::/48'

inet6num: 2001:43f8:0040::/48

netname: AIIRS

descr: -----

descr: Testing Reachability for PI /48s

descr: -----

country: MU

org: ORG-AFNC1-AFRINIC

admin-c: TEAM-AFRINIC

tech-c: TEAM-AFRINIC

status: ASSIGNED PI

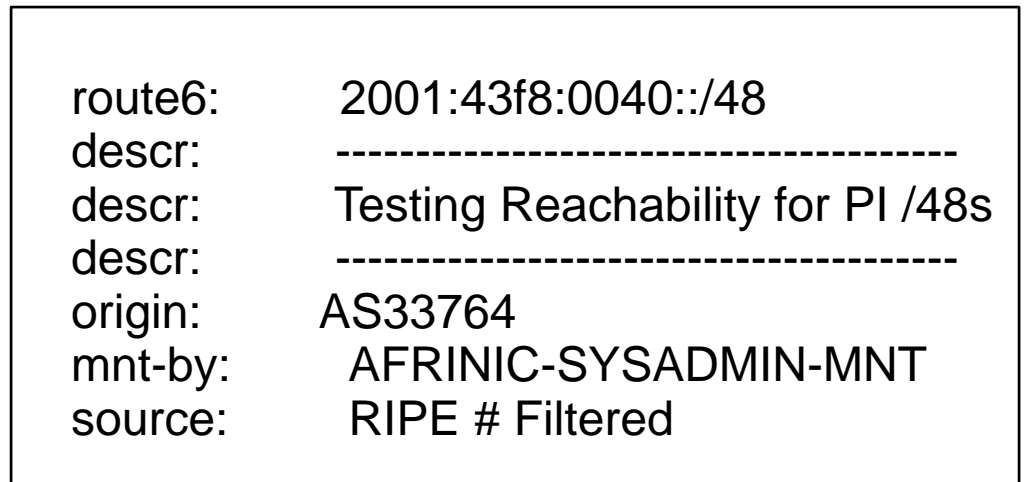
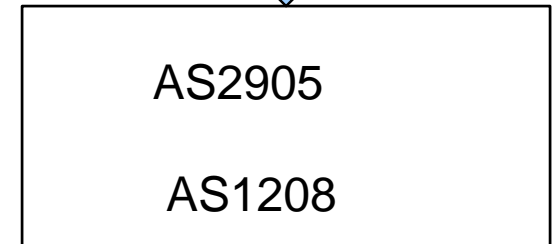
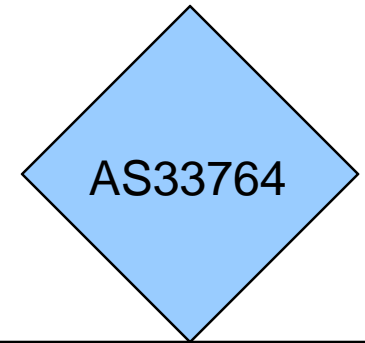
mnt-by: AFRINIC-HM-MNT

mnt-lower: AFRINIC-HM-MNT

mnt-domains: AFRINIC-HM-MNT

source: AFRINIC # Filtered

parent: 2001:4200::/23



# Findings

- The concept of IPv6 portable assignment is not yet widely accepted by the global community
- Some Networks are filtering IPv6 prefixes on the /32 boundary and not adjusting filters to accommodate PI as announced by RIRs
  - **IPv6 PI not defined by IETF**
  - **Wait for IPv6 PI and multi-homing solutions be standardized**
- The concept of IPv6 micro-allocation for critical Internet infrastructures seems acceptable.

# Some hints

- Define the rules for portable assignments for critical Internet infrastructures.
- For the IPv6 global portable assignment, consider a concerted work with the other communities which have adopted similar policy
  - <http://www.space.net/~gert/RIPE/ipv6-filters.html>
- Change the minimum for PI to /32 ?????

# **More details**

[http://www.afrinic.net/news/PI\\_Reachability\\_report.htm](http://www.afrinic.net/news/PI_Reachability_report.htm)

Questions ?