IPv6 as a criteria in IPv4 Soft Landing

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Summary of the problem

Current deployment of IPv6 in AFRINIC service region is very low compared with other parts of the world, despite the continuous efforts undertaken by AFRINIC.

Data from APNIC Labs:

- Average IPv6 World capability 44% (including Africa)
  - 37%-51% depending on the region, about 50 countries exceed 50%)
- Africa IPv6 World capability 6%
  - Only 8 countries exceed 20%, 15 countries 10-19%, 15 countries below 1%

At the same time, AFRINIC is under the Soft Landing policy, Phase 2 since 2020 and since then, 3 million IPv4 addresses have been recovered.

The Soft Landing policy restricts the requests of IPv4 addresses, and despite that, it has not clearly proven an increase of the IPv6 deployment, so it looks like further measures need to be enforced towards giving a strong push on that direction, aligned with the Soft Landing policy.

Community discussions often come back to the same question: Should we mandate IPv6 deployment for new IPv4 requests? It seems there is no plausible reason for not doing so.

Addressing the problem

This proposal adds a paragraph to the existing Soft Landing policy in order to enforce IPv6 deployment for those requesting new IPv4 resources, regardless of being an initial or subsequent request.

Proposed Text (1)

5.4.4 For any LIR or End User requesting IPv4 address space during the Exhaustion

There is no explicit limit on the number of times an organization may request additional IPv4 address space during the Exhaustion Period.

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Any IPv4 request must be done with a simultaneous IPv6 request if the requesting party does not already have IPv6 space.

Regardless of if the IPv6 requests was already done previously or simultaneously with the IPv4 request, the relevant allocation/assignment criteria conditions must be met.

In addition, a coherent IPv6 deployment and addressing plan, must be presented clearly showing how will be met:

a) 6.5.1.1.3 and 6.5.1.1.4, in the case of LIRs.

b) 6.8.2.2.d, in the case of end-users.

Proposed Text (2)

The IPv6 deployment plan must show the actual IPv4 top-25 traffic destinations of that network. For each of those external destinations that are IPv6-enabled, the following minimum IPv6 % will be considered as compliant:

- 25% in a maximum of 12 months.
- 50% in a maximum of 24 months.
- 75% in a maximum of 48 months.

In case of networks hosting any kind of services, applications or contents, will be considered as compliant when matching the following % of AAAA RRs available and IPv6 reachable from Internet:

- 25% in a maximum of 12 months.
- 75% in a maximum of 24 months.
- 95% in a maximum of 48 months.

Failure to comply with the IPv6 deployment plan according to the relevant criteria, constitutes a policy violation.

References

In other regions, all IPv4 addresses have been exhausted and it seems that the equivalent to the soft-landing is not any more an issue, because most of the existing members only can access IPv4 addresses via transfers. Some of them have waiting lists,

ARIN has a dedicated IPv4 pool (NRPM 4.10.) to facilitate IPv6 deployment, which only can be used for specific IPv6 deployment needs.

In LACNIC, a request for IPv4 must be accompanied by an IPv6 request (if it was not already done for that member). This was already part of the IPv4 policy even before the equivalent to the “Soft Landing” policy.

There are some other exceptions, like for example the mandatory deployment of IPv6 in IXPs.

IA Inputs (1)

- Impact on Resource Members:
  - Actually, based on 100s of deployments experience, deploying IPv6 is easier in smaller networks, so can’t be considered disproportionate.
  - Similarly, deploying IPv6 using 464XLAT is cheaper than maintaining IPv4 with CGN.
  - There is no unfairness, otherwise, we could also say that Soft Landing policy is unfair to newcomers that can only get a maximum of /22 instead of /10. Policies need to adapt to the Internet evolution!

IA Inputs (2)

- Clarity of Policy text:
  - The evaluation of the IPv6 usage if you are not asking for more IPv4 is up to the existing policies, not changing that. A deployment plan if you request more IPv4 should be integral, it doesn’t make sense that you deploy only for a few customers, it will be against yourself.
  - The policy ask for a deployment plan and state specific details that are already part of the existing policies. Not changing the rest of the policies, just asking to explain some of them in the plan.
  - Coherent means that the deployment plan doesn’t show strange discrepancies that don’t make sense (or explain them otherwise).
  - All the operators already must measure traffic in order to properly operate a network (snmp, netflow, etc.). If they don’t do already, it can be implemented with open source.
  - Matching the relevant % is a sufficient demonstration of compliance, don’t see any issues.

IA Inputs (3)

- Clarifications:
  - The average calculation of a prefix can be done with simple math. A /32 accommodate around 50.000 (instead of 65.535, because routing, PoPs distribution, etc.) end-sites. For 100.000 you need /31, for 200.000 a /30, and so on.
  - If the upstream don’t have IPv6, then you find a better one or use a tunnel with BGP. However, I doubt this is a problem today. Nevertheless, using the % in the deployment plan, because the evidence will show that top-25 aren’t reachable with IPv6, you’re done because 25% of 0% is 0%.