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

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

In addition to the compliance with section 6.5, a credible IPv6 deployment and addressing plan, must be presented clearly showing specifically 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 (EUs).

Proposed Text (2)

When applying for additional IPv4 space, the following conditions must be met as per the time frames from issuance of the first IPv6 space to LIRs and EUs, or {policy implementation date}, whichever is later.

In the case of access networks, the percentage of customers that have access to global IPv6 delegations “without interference required from the Network Operator” must be at or above the following thresholds:

- 25 % within 12 months;
- 50% within 24 months;
- 75% within 36 months;
- 95% within 48 months.

In the case of content hosting networks, the percentage of assigned IPv4 space assigned to those networks “also covered by IPv6 assignments” must reach:

- 25 % within 12 months;
- 50% within 24 months;
- 75% within 36 months;
- 95% within 48 months.

Proposed Text (3)

In the case where a network provides both access and content hosting services, both criteria must be independently complied with.

AFRINIC will establish as much as possible automated testing to verify the compliance, which will be complemented with existing public tools and measurements. Failure to comply with the IPv6 deployment plan according to the relevant criteria, once verified by AFRINIC, constitutes a policy violation.

Notes, for the avoidance of doubt:

- “without interference required from the Network Operator" means that all the devices of the access network must permit a fully working IPv6 configuration, and the assigned space must be reachable from the global routing table.
- “also covered by IPv6 assignments” means that it must be reachable from the global routing table.

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.

Impact Assessment (1)

3.1 Staff Interpretation

- Measurements can’t be based on AAAA (that was in v1 – in v2 the resource holder can’t warrantee the customer will actually use it), just routing the prefix to either access or hosting customers.
- Leasing is not acceptable according to CPM, so customers doing so will be acting against policies.
- Small operators aren’t affected, if they need more IPv4 addresses, is because they have more customer, so they buy more equipment. There is no price difference if it supports IPv6.

Impact Assessment (2)

3.2.1 Interaction with Existing CPM

- The conditions on IPv6 already say the deployment should be done in 12 months. This is not being verified by AFRINIC, so the proposal improves the situation.
- Since IPv6 was designed, was expected that deployment will impact on IPv4, is not a “different Internet”.

3.2.4 Member Services Operations

- Evaluation of compliance with existing IPv6 resource holders is not changed by this proposal. Is something that should have been already done for compliance with existing policies (12 months deployment).

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3.2.1 Interaction with Existing CPM

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3.2.4/3.2.5 Member Services Operations/IT

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Impact Assessment (4)

3.2.7 Legal

- Credible is easy to evaluate when there is sufficient IPv6 knowledge, which is the case for AFRINIC. The point is to early catch possible “fake” plans which don’t make sense, which otherwise will be discovered on the next years. In fact, it also helps the resource holders to understand if they are don’t something that may be technically incorrect in an IPv6 deployment.
- There are no new conditions to existing allocations/assignments, only if they request IPv4. As already said, AFRINIC should be checking if existing resource holders are following the CPM.

3.2.8 Finance

- AFRINIC already has the knowledge and provides support for IPv6 deployment to resource holders.

Impact Assessment (5)

5. Staff Clarification Requests

- Difficult to believe that an upstream has no IPv6 support; in that case, a tunnel resolves it. Vendor/market to not deploy IPv6 is an excuse, it has been demonstrated worldwide for years. How AFRINIC is ensuring that the existing 12 months deployment is complied with? The proposal is not changing it.
- IPv6-Only+IPv4aaS reduce the number of IPv4 addresses required.
- As said, no new legal implications on previous allocations, up to AFRINIC to ensure that the CPM is complied already (12 months deployment).
- No new conditions on this proposal for transfers, however, both inter and intra RIR policies already state that the destination should comply with the CPM (so, once more, 12 months deployment).