

Discrepancy Between RIPE Policies on IPv4 and IPv6 Provider Independent (PI) Address Space

The **ripe-127** policy “PI vs. PA Address Space”, published in June 1995, introduced two kinds of globally unique, unicast IPv4 addresses: Provider Independent (PI) and Provider Aggregatable (PA). This document was published after the adoption of Classless Inter-Domain Routing (CIDR), which brought the goals of aggregation and conservation to a new level of importance in address delegation policies.

ripe-127 discussed the advantages of PA address space, particularly in relation to the goal of route aggregation. It also noted the apparent advantage of PI space, namely that the user does not have to reconfigure when changing service providers. The document pointed out that smaller PI prefixes are not ideal for routing tables and that it could be difficult and expensive for End Users to find providers willing to route small PI prefixes.

In this RIPE Document and those that follow it, PI space assignments are referred to in relation to End Users. There is a clear assumption that LIRs (typically providers or enterprises) receive PA allocations, from which they can make PA assignments for use in their own infrastructure or for their customers.

PI Assignments: The IPv4 Situation

In 2002, **ripe-234** was published, containing the following text:

5.1.2 Registration Requirements

IP addresses used solely for the connection of an End User to an LIR can be considered as part of the service provider’s infrastructure. This means that these addresses do not have to be registered with the End User’s contact details but can be registered as part of the service provider’s internal infrastructure, i.e. point-to-point links. However, four or more addresses (e.g. /30 or more) used on the End User’s network need to be registered separately with the contact details of the End User.

From the reference in the first line to an “LIR”, it can be assumed that these requirements relate to PA assignments made from PA allocations.

In 2004, after several policy changes integrating feedback from the community and the PI Task Force, **ripe-288** was published, incorporating the following changes:

6.2 Network Infrastructure and End User Networks

IP addresses used solely for the connection of an End User to a service provider (e.g. point-to-point links) are considered part of the service provider’s infrastructure. These addresses do not have to be registered with the End User’s contact details but can be registered as part of the service provider’s internal infrastructure. When an End User has a network using public address space this must be registered separately with the contact details of the End User. Where the End User is an individual rather than an organisation, the contact information of the service provider maybe substituted for the End User’s.

The removal of the reference to an “LIR” makes it unclear whether these requirements relate to PA, PI or both. This text has been carried over into the current RIPE IPv4 policy document (**ripe-492**).

The RIPE NCC now applies these requirements to all assignments, including requests for PI, while noting that the policy also states that PA should be always encouraged and advising applicants that PI cannot be assigned further.

In summary, an organisation can receive PI address space if they can justify the size of the request and wish to be independent of another provider. The most common reason for requesting a PI assignment is the desire to multihome.

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New Trends

Recently, the RIPE NCC has observed that some of the organisations requesting PI assignments may not fit comfortably into the conventional “End User” category, but are running ISP-like operations and connecting customers of their own over DSL or cable. Recent statistics indicate that:

- 81% of the PI space assigned in 2010 to date has been for access and hosting services
- 66 % of all the PI requests came from organisations that are providing these services to their customers.

These organisations request PI assignments for their network because they often multihome as an ISP. Based on this justified need, the RIPE NCC makes the assignment to them. Although the policy states that PI cannot be further assigned, Section 6.2 of the policy document makes such assignments possible, as point-to-point connections are considered infrastructure of the provider (in this case the organisation requesting the PI assignment).

IPv6 PI Assignments

In the RIPE IPv6 policy (**ripe-481**), similar criteria apply to the assignment of PI space – multihoming is an explicit criteria to receive an assignment and it cannot be further assigned. However, there is no language resembling Section 6.2 of the IPv4 document, meaning that the RIPE NCC does not assign IPv6 PI space to ISPs who will use it to connect their customers via DSL or cable.

One can argue that the policies governing the assignment of PI address space should be consistent, no matter which version of the Internet protocol is used. However, the current language of these two policies has led to a situation in which an ISP who runs a DSL business over IPv4 PI cannot employ the same business model using IPv6 PI.

Where To From Here?

There is an agenda point about this in the RIPE 60 Address Policy Working Group. Some questions that the community may wish to consider:

- Should the PI policies be revised to apply to a more specific user group?
- Should the IPv6 policy be changed?
- Should the IPv4 policy be changed?
- Should IPv4 and IPv6 policies be harmonised at all?

I would encourage everyone to participate in this session and contribute their comments and ideas to the discussion surrounding RIPE PI address space policy.

Thanks for reading!

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