



RIPE Policy Proposal 2024-01

Revising the IPv6 PI Policy

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RIPE 2024-01: Status



- Published 2024-08-13
- Discussion phase until 2024-01-22
- Points brought forward on the ML so far:
 - Various concerns about the charging scheme implications (out of scope)
 - Details and suggestions about interpretations/applicability/formulation
 - Concern about too large assignments vs. need / arbitrarily large PI
 - Several questions about attribution



RIPE 2024-01: Goals



- Reduce registry space fragmentation
- Provide more flexibility to End-Users receiving assignments
- Clarify interpretation issues making PI requests difficult in practice
- Easier handle growth
- Make permissible/non permissible uses explicit
- Make evaluation easier (hello end site)
- Make it easier to align assignments with actual needs



Changes to 2.6 Assign



To “assign” means to delegate address space to an ISP or End User for specific use within the Internet infrastructure **that** they operate. Assignments must only be made for specific purposes documented by specific organisations , and **it is not allowed to create further sub-assignments to another entity from address space partially or fully covering an assignment.**



Changes to 2.6 Assign



Providing another entity with separate addresses (not prefixes) from a subnet used on a link operated by the assignment holder is not considered a sub-assignment. This includes for example letting visitors connect to the assignment holder's network, connecting a server or appliance to an assignment holder's network and setting up point-to-point links with 3rd parties.



Changes to 2.6 Assign



This does not pertain to uses of address space that do not constitute a subassignment: Providing connectivity to another entity inside the assignment holder's network located at the same geographical End Site as the holder's network with a prefix size of /56 or longer from the assignment is not considered a sub-assignment. This includes letting visitors connect to the assignment holder's network, providing back-office connectivity for devices deployed or operated by the assignment holder, providing static addresses when connecting a server or appliance to an assignment holder's network, providing a single service with multiple addresses, or using a /64 or longer when setting up point-to-point links with other ISPs for the purpose of exchanging traffic and Internet routing information.



Changes to 2.6 Assign



Finally, using more specific prefixes from a less-specific assignment for different parts of the same infrastructure within one organisation does not constitute a sub-assignment, if the purpose of the assignment is the operation of that infrastructure. Any other use of a prefix from an assignment up to prefixes of /128 bit to connect a separate End Site of another entity to the Internet always constitutes a prohibited sub-assignment.



Changes to 2.9 End Site



2.9.1 End Site for Assignments Made from Allocation

An End Site is defined as the location of an End User (subscriber) who has a business or legal relationship (same or associated entities) with a service provider that involves:

An End Site for assignments made from an allocation is defined as the topological location of an End User (subscriber) who has a business or legal relationship (same or associated entities) with a service provider that involves:

- that service provider assigning address space to the End User location
- that service provider providing transit service for the End User location to other sites
- that service provider carrying the End User's location traffic
- that service provider advertising an aggregate prefix route that contains the End User's location assignment



Changes to 2.9 End Site



2.9.2 End Site for PI Assignment

An End Site for provider independent assignments (PI) is defined as any topological location in the RIPE NCC Service Region where the End User deploys Internet-connected devices and that has a different routing policy than other End Sites of that End User. Furthermore, the following considerations hold:



Changes to 2.9 End Site



- different routing policies can be realised to ensure that traffic towards an End Site does not traverse other End Sites of the assignment holder, unless, for example, there is a loss of outbound connectivity at the End Site where a prefix from the assignment is used
- a Layer 2 connection between two End Sites does not make them one End Site as long as both End Sites have different routing policies
- a single device (CPE) with the main purpose of providing Internet access to a single End User / Customer from a location does not constitute an End Site of an assignment holder
- Anycast deployments originating a prefix from at least two independent end-sites are counted as a single additional end-site.



Changes to 5.4.2



5.4. Assignments from IPv6 allocations

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End Users are assigned an End Site assignment from their LIR or ISP. The size of the assignment is a local decision for the LIR or ISP to make, using a value of "n" x /64. Section 4.2 of ripe-690 provides guidelines about this.

5.4.2. Assignments shorter than a /48 from IPv6 allocations

Assignments larger than a /48 (shorter prefix) or additional assignments exceeding a total of a /48 made from IPv6 allocations must be based on address usage or because of routing requirements.



Changes to 7. IPv6 Provider Independent (PI) Assignments



This section states general policy for IPv6 Provider Independent (PI) Assignments. More specific regulations for additional special purpose PI assignments may deviate from the generic PI assignment criteria stated here.



7.1. IPv6 [...] (PI) Assignment Size



The minimum size of the assignment is a /48. The largest PI assignments always have a prefix size longer than the minimum allocation size. Generally, the smallest PI assignments have a maximum prefix size of /48, used in case of a single globally reachable End-Site. Smaller prefixes may be assigned in cases where an end-site does not require global reachability, e.g., making an assignment for addresses used in an Internet exchange's peering LAN.

The considerations of "5.4.2. Assignments shorter than a /48 to a single End-Site" must be followed if needed. To avoid fragmentation of the address registry, shorter assignments are possible based on addressing need analogous to Section 5.4.2 and for End Users with multiple End Sites according to Section 2.9.2 "End Site for PI Assignment," e.g. when different routing requirements exist for these End Sites.



7.1. IPv6 [...] (PI) Assignment Size



When requesting an assignment with a prefix shorter than a /48, an additional assignment, or an extension of an existing assignment to a size larger than a /48, the need must be justified, for example, by documenting the current and/or planned routing policies in place for each End Site or the expected utilisation according to 2.7 within the next 12 months.



7.1.1. PI Assignment at the Nibble Boundary



To aid aggregated registration and reduce the need for renumbering in case of growth, justified assignments are to be made in nibble boundary steps (i.e. starting with /48, followed by /44, /40, and /36, in steps of 4 bits), instead of assigning multiple shorter prefixes. This means that an End User demonstrating the need for at least two /48s, e.g. due to two End Sites, should receive a /44, and an End User demonstrating the need for at least seventeen /48s, e.g. due to seventeen End Sites, should receive a /40, etc. It is recommended that address space up to the next larger assignment size at the nibble boundary is left unused whenever a PI assignment is issued.



7.1.1. PI Assignment at the Nibble Boundary



Registrations for PI assignments made after *DATE OF PROPOSAL IMPLEMENTATION* cannot be split up into smaller prefixes (for example, a /44 assigned PI cannot be broken into two or more independent assignments). More specific prefixes from an assignment may be individually routed, as long as no sub-assignment takes place.



7.1.2. Requesting a Larger Assignment



If an End User or LIR already holding one or multiple PI assignments issued after *DATE OF PROPOSAL IMPLEMENTATION* needs more IPv6 PI address space, they must submit a request for an extension of their current assignment to the next nibble boundary satisfying the new needs.

Such an extension can be granted if the policy requirements are met and if there is sufficient available space contiguous to the existing assignment.

If the requested extension to the next nibble boundary cannot be granted from the existing available space, the End User or LIR receives a new Assignment as per "7.1.1. PI Assignment at the Nibble Boundary" and must return the previous assignment within a six-month renumbering period.



7.1.3. Existing PI Assignments



When requesting an additional or larger assignment, an End User or LIR holding PI assignments issued before *DATE OF PROPOSAL IMPLEMENTATION* will have their addressing needs reevaluated as per 7.1.2 “Requesting a Larger Assignment”. Such a reevaluation may also be explicitly request. Similarly, receiving a transfer of a PI assignment *that is not part of a transfer under merger and acquisition rules* also leads to a reevaluation of addressing needs. They will receive a single assignment corresponding to the result of that evaluation.



7.1.3. Existing PI Assignments



If the new assignment can be issued using or extending the prefix of an existing assignment including any or all of the following:

- Existing PI assignments to the same holder
- Contiguous available address space

Then that prefix should be used to make the new assignment.

If multiple existing assignments satisfy this requirement, the End User's preference for which assignment to expand should be considered.



7.1.3. Existing PI Assignments



All previously issued PI assignments must be returned to the RIPE NCC after renumbering once the new PI assignment has been issued or an existing one was extended.

The renumbering period for PI assignments issued after *DATE OF PROPOSAL IMPLEMENTATION* is six months.

For PI assignment requests evaluated before *DATE OF PROPOSAL IMPLEMENTATION* the initial renumbering period is twelve months, which can be extended by twelve months every twelve months, if the End User provides the RIPE NCC with documentation demonstrating that:

- A renumbering is currently not feasible, and
- The prefixes are currently in use.



7.1.3. Existing PI Assignments



Even though, technically, the renumbering period can thereby be extended indefinitely, return of these PI assignments remains mandated.

If a PI prefix from an assignment evaluated before *DATE OF PROPOSAL IMPLEMENTATION* is received in a transfer, it falls under the same rules.

An assignment holder may opt, at any time prior to an assignment being updated according to their addressing needs, to withdraw the initial request (transfer, reevaluation, larger assignment) that triggered the reevaluation. This may only be done once.



7.1.3. Existing PI Assignments



An assignment holder should be made aware of this option if either:

- The assignment holder holds an assignment evaluated before *DATE OF PROPOSAL IMPLEMENTATION* or is to receive such an assignment in a transfer
- The assessment of addressing needs would lead to a reduction in the assignment size, and/or mandate the return of address space under a given renumbering period

If the end user opts to do so, all assignments remain in the state prior to the request having been made.





- **This is rather complex**
 - Sadly needs to cover inconsistencies etc. often already in the policy
 - Changing tiny things has major implications
- **Why?!**
 - Address operational challenges in PI handling
 - Aggregated registration.

Onward



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