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RFC 9812
Clarification of IPv6 Address Allocation Policy

Abstract

This document specifies the approval process for changes to the "Internet Protocol Version 6 Address Space" registry. It also updates RFC 7249.

Status of This Memo

This memo documents an Internet Best Current Practice.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on BCPs is available in Section 2 of RFC 7841.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at https://www.rfc-editor.org/info/rfc9812.

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1. Introduction

Internet Protocol Version 6 (IPv6) and its address space are defined by [STD86] and [RFC4291]. The management of the IPv6 address space was delegated to IANA by [RFC1881], some years before the relationship between the IETF and IANA was formalized [RFC2860] and registry details were clarified [RFC7020] [RFC7249].

Occasionally, IPv6 address space allocations are performed outside the scope of routine allocations to Regional Internet Registries (RIRs). For example, a substantial allocation was requested by an IETF document approved by the IESG [RFC9602], which moved the range 5f00::/16 from the "Internet Protocol Version 6 Address Space" registry [IANA1] to the "IANA IPv6 Special-Purpose Address Registry" [IANA3].

At the time of writing, the allocation policy in the "Internet Protocol Version 6 Address Space" registry [IANA1] was shown as "IESG approval", whereas a more stringent policy is appropriate for major allocations. The present document therefore strengthens the approval level needed for non-routine address allocations, which requires an update to [RFC7249].

This document also clarifies the status of [RFC1881]. This clarification is necessary because [RFC1881], a joint publication of the IAB and IESG following an IETF Last Call, was incorrectly listed in the RFC index at the time of writing as "Legacy", whereas it is part of the IETF Stream [RFC8729].

2. Approval Level of IPv6 Address Allocations

Portions of the IPv6 address space are shown in the registry as "Reserved by IETF" [IANA1]. This is the address space held in reserve for future use if ever the 125-bit unicast space (2000::/3) is found inadequate or inappropriate.

[RFC1881] did not specify an allocation policy for this space. At some point, IANA listed "IESG approval". As defined in [BCP26], this is a rather weak requirement ("Although there is no requirement that the request be documented in an RFC, the IESG has the discretion to request documents...") and is "a fall-back mechanism in the case where one of the other allowable approval mechanisms cannot be employed...".

For something as important as the majority of the spare IPv6 address space, this process is clearly insufficient. The present document replaces the "IESG approval" process by the "IETF Review" process as defined by [BCP26]. The stricter "Standards Action" policy is not considered necessary, because there may be cases where opening up a new range of address space does not in fact require a new protocol standard.

It may be noted that the allocation for [RFC9602], which was processed as a working group document, did indeed follow the more stringent "IETF Review" process proposed by this document. Indeed, the other two related registries [IANA2] [IANA3] cite the "IETF Review" policy, consistent with [RFC7249].

This document therefore extends the first paragraph of Section 2.3 of [RFC7249] as follows:

OLD:

> The vast bulk of the IPv6 address space (approximately 7/8ths of the whole address space) is reserved by the IETF [RFC4291], with the expectation that further assignment of globally unique unicast address space will be made from this reserved space in accordance with future needs.

NEW:

> The vast bulk of the IPv6 address space (approximately 7/8ths of the whole address space) is reserved by the IETF [RFC4291], with the expectation that further assignment of globally unique unicast address space will be made from this reserved space in accordance with future needs, through "IETF Review" as defined in [BCP26].

3. RFC Editor Considerations

Per this document, the RFC Editor has updated the Stream information for [RFC1881] to IETF in place of Legacy.

4. IANA Considerations

IANA has updated the registration procedure of the "Internet Protocol Version 6 Address Space" registry [IANA1] to "IETF Review".

5. Security Considerations

The security considerations of [RFC7249] apply. While having no direct security impact, carefully reviewed address allocation mechanisms are necessary to ensure operational address accountability.

6. References

6.1. Normative References

[BCP26] Best Current Practice 26, <https://www.rfc-editor.org/info/bcp26>.
At the time of writing, this BCP comprises the following:

Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/info/rfc8126>.

[RFC4291] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", RFC 4291, DOI 10.17487/RFC4291, February 2006, <https://www.rfc-editor.org/info/rfc4291>.

[STD86] Internet Standard 86, <https://www.rfc-editor.org/info/std86>.
At the time of writing, this STD comprises the following:

Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", STD 86, RFC 8200, DOI 10.17487/RFC8200, July 2017, <https://www.rfc-editor.org/info/rfc8200>.

6.2. Informative References

[IANA1] IANA, "Internet Protocol Version 6 Address Space", <https://www.iana.org/assignments/ipv6-address-space>.

[IANA2] IANA, "IPv6 Global Unicast Address Assignments", <https://www.iana.org/assignments/ipv6-unicast-address-assignments>.

[IANA3] IANA, "IANA IPv6 Special-Purpose Address Registry", <https://www.iana.org/assignments/iana-ipv6-special-registry>.

[RFC1881] IAB and IESG, "IPv6 Address Allocation Management", RFC 1881, DOI 10.17487/RFC1881, December 1995, <https://www.rfc-editor.org/info/rfc1881>.

[RFC2860] Carpenter, B., Baker, F., and M. Roberts, "Memorandum of Understanding Concerning the Technical Work of the Internet Assigned Numbers Authority", RFC 2860, DOI 10.17487/RFC2860, June 2000, <https://www.rfc-editor.org/info/rfc2860>.

[RFC7020] Housley, R., Curran, J., Huston, G., and D. Conrad, "The Internet Numbers Registry System", RFC 7020, DOI 10.17487/RFC7020, August 2013, <https://www.rfc-editor.org/info/rfc7020>.

[RFC7249] Housley, R., "Internet Numbers Registries", RFC 7249, DOI 10.17487/RFC7249, May 2014, <https://www.rfc-editor.org/info/rfc7249>.

[RFC8729] Housley, R., Ed. and L. Daigle, Ed., "The RFC Series and RFC Editor", RFC 8729, DOI 10.17487/RFC8729, February 2020, <https://www.rfc-editor.org/info/rfc8729>.

[RFC9602] Krishnan, S., "Segment Routing over IPv6 (SRv6) Segment Identifiers in the IPv6 Addressing Architecture", RFC 9602, DOI 10.17487/RFC9602, October 2024, <https://www.rfc-editor.org/info/rfc9602>.

Appendix A. Acknowledgements

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