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Reserving Additional IPv6 Address Prefixes for Use in Documentation

Abstract

To reduce the likelihood of conflict and confusion when relating documented examples to deployed systems, the IPv6 unicast address prefix 2001:db8::/32 is reserved for use in examples in documentation including RFCs, books, articles, vendor manuals, etc. This document proposes the reservation of additional IPv6 prefixes for this purpose; specifically, 3ffe::/16 (formerly 6bone) and fec0::/10 (formerly site-local).

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1. Introduction

The address architecture for IPv6 [[RFC4291](#)] does not specifically allocate any IPv6 address prefixes for documentation purposes. The current IPv6 documentation prefix of 2001:db8::/32 defined in [[RFC6890](#)] is not large enough for many design and documentation requirements. No additional documentation prefix(es) were allocated in the most recent IPv6 Specification [[RFC8200](#)].

These are example use cases that require a documentation IPv6 prefix larger than a /32:

- *Ability to document network architectures (including addressing plans) larger than a /32 (Service Providers, Enterprise, Government, IoT, Energy),
- *Ability to document mergers and acquisitions designs for large networks (multiple /32 prefix space or larger, plus networks with multiple ASNs),
- *Reduction of operational impacts by having sufficiently large IPv6 prefixes dedicated for documenting and sharing designs and best practices,
- *Ability to depict unique IPv6 prefix identification (simple visual representation to identify separate networks)

The following existing criteria are beneficially extended to the additional documentation prefixes:

- *Filters are already commonly in use to block the existing documentation prefix from the Internet.

- *There are no operational impacts to IANA or the RIRs with documentation prefix space.

2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [[RFC2119](#)] when, and only when, they appear in all capitals, as shown here.

3. Documentation IPv6 Address Prefixes

The additional IPv6 address prefixes allocated for documentation purposes are 3ffe::/16 (formerly 6bone - [[RFC3701](#)]) and fec0::/10 (formerly site-local - [[RFC3879](#)]), resulting in the following prefixes for use in documentation:

- *fec0::/10

- *3ffe::/16

- *2001:db8::/32 - existing as defined in [[RFC3879](#)]

4. Operational Implications

The addition of IPv6 address prefixes for documentation implies that IPv6 network operators should add these address prefixes to their lists of non-routable/bogon IPv6 address space. If packet filters are deployed in live networks, these address prefixes should be added to those filters intended to prevent any public routing of such address space.

Because the 3ffe::/16 address prefix was previously used for the subsequently decommissioned 6bone network, this address prefix is included in many existing non-routable prefix filters and lists. Its precedence value per [[RFC6724](#)] is 1, which limits its usability in production networks. In addition, the 3ffe::/16 address prefix was returned to IANA and is available to be reserved for documentation purposes.

Similarly the fec0::/10 address prefix was previously used for site-local addressing, and thus is already included in many non-routable prefix filters and lists. Its precedence value per [[RFC6724](#)] is 1,

which limits its usability in production networks. In addition, the fec0::/10 address prefix was returned to IANA and is available to be reserved for documentation purposes.

As a documentation prefix, the former site-local scope of fec0::/10 is considered deprecated and filters may be required and used with any scope.

5. IANA Considerations

These documentation prefixes have limited impact on IANA and no impact on any RIRs.

IANA is to record the allocation of the IPv6 global unicast address prefix 3ffe::/16 and fec0::/10 as documentation-only prefixes in the IPv6 address registry. No end-user or service provider/LIR is to be assigned these addresses.

6. Security Considerations

IPv6 addressing documentation has no direct impact on Internet security.

However, the assignment of a new address space for documentation purposes does mean, as indicated above, that these addresses SHOULD be added to any filters required by individual operators to prevent their use for globally routed destinations.

7. Acknowledgements

The authors acknowledge the work of Geoff Huston, assisted by Anne Lord, and Philip Smith, in authoring the previous proposal for the IPv6 documentation prefix.

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