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Special-Use IPv6 Addresses

Status of This Memo

Abstract

This document is a compilation of special IPv6 addresses defined in other RFCs. It can be used as a checklist of invalid routing prefixes for developing filtering policies for routes and IP packets. It does not discuss addresses that are assigned to operators and users through the Regional Internet Registries.

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1. Introduction

This document is a compilation of special IPv6 addresses defined in other RFCs. It can be used as a checklist of invalid routing prefixes for developing filtering policies for routes and IP packets. It does not discuss addresses that are assigned to operators and users through the Regional Internet Registries.

The document is structured by address types. The document format is similar to [RFC3330].

Some tips about filtering are given, but are not mandatory to implement.

The addresses listed in this document must not be hard-coded into implementations.

2. Address Blocks

2.1. Node-Scoped Unicast

::1/128 is the loopback address [RFC4291].

::/128 is the unspecified address [RFC4291].

These two addresses should not appear on the public Internet.

2.2. IPv4-Mapped Addresses

::FFFF:0:0/96 are the IPv4-mapped addresses [RFC4291]. Addresses within this block should not appear on the public Internet.

2.3. IPv4-Compatible Addresses

::<ipv4-address>/96 are the IPv4-compatible addresses [RFC4291]. These addresses are deprecated and should not appear on the public Internet.

2.4. Link-Scoped Unicast

fe80::/10 are the link-local unicast [RFC4291] addresses. Addresses within this block should not appear on the public Internet.

2.5. Unique-Local

fc00::/7 are the unique-local addresses [RFC4193]. Addresses within this block should not appear by default on the public Internet. Procedures for advertising these addresses are further described in [RFC4193].

2.6. Documentation Prefix

The 2001:db8::/32 are the documentation addresses [RFC3849]. They are used for documentation purposes such as user manuals, RFCs, etc. Addresses within this block should not appear on the public Internet.

2.7. 6to4

2002::/16 are the 6to4 addresses [RFC3056]. The 6to4 addresses may be advertised when the site is running a 6to4 relay or offering a 6to4 transit service. Running such a service [RFC3964] entails filtering rules specific to 6to4 [RFC3964]. IPv4 addresses disallowed in 6to4 prefixes are listed in section 5.3.1 of [RFC3964].

2.8. Teredo

2001::/32 are the Teredo addresses [RFC4380]. The Teredo addresses may be advertised when the site is running a Teredo relay or offering a Teredo transit service.

2.9. 6bone

5f00::/8 were the addresses of the first instance of the 6bone experimental network [RFC1897].

3ffe::/16 were the addresses of the second instance of the 6bone experimental network [RFC2471].

Both 5f00::/8 and 3ffe::/16 were returned to IANA [RFC3701]. These addresses are subject to future allocation, similar to current unallocated address space. Addresses within these blocks should not appear on the public Internet until they are reallocated.

2.10. ORCHID

2001:10::/28 are Overlay Routable Cryptographic Hash IDentifiers (ORCHID) addresses [RFC4843]. These addresses are used as identifiers and are not routable at the IP layer. Addresses within this block should not appear on the public Internet.

2.11. Default Route

::/0 is the default unicast route address.

2.12. IANA Special-Purpose IPv6 Address Registry

An IANA registry (iana-ipv6-special-registry) exists [RFC4773] for Special-Purpose IPv6 address block assignments for experiments and other purposes. Addresses within this registry should be reviewed for Internet routing considerations.

2.13. Multicast

ff00::/8 are multicast addresses [RFC4291]. They contain a 4-bit scope in the address field where only some values are of global scope [RFC4291]. Only addresses with global scope in this block may appear on the public Internet.

Multicast routes must not appear in unicast routing tables.

3. Security Considerations

Filtering the invalid routing prefixes listed in this document should improve the security of networks.

4. IANA Considerations

To ensure consistency and to provide cross-referencing for the benefit of the community, IANA has inserted the following paragraph in the header of the iana-ipv6-special-registry.

"Other special IPv6 addresses requiring specific considerations for global routing are listed in RFC 5156."

5. Acknowledgements

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6. References

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