

IPv6 Address Prefixes Reserved for Documentation

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Abstract. RFC3849 specified an IPv6 prefix to be used in documentation, in order to reduce the likelihood of conflict and confusion when relating examples of deployed systems. This prefix was reserved to be used in examples in RFCs, books, documentation, and the like. It became widely accepted and used. Although the IPv6 documentation prefix proved to be very useful, a /32 prefix is not enough to be used to document some kinds of IPv6 deployments, such as large ISP deployments, transition techniques, and other useful examples that require longer prefixes. This document defines the allocation of a new global unicast (GUA) block and a new unique local (ULA) block, to expand the range of documentation blocks. It also updates RFC3849.

1. Introduction

This document describes the IPv6 address blocks provided to be used in documentation. These blocks SHOULD be used to describe network topologies, transition techniques or other systems, in RFCs, books, videos, and documentation in general. They also MAY be used in didactic laboratories, which aim to teach IPv6 or network principles.

The first block was reserved in [IETF - RFC3849 2004], from the address space of the Asia Pacific (APNIC) regional addressing community. Other documentation ranges have been defined in the IETF, such as example domain names described in [IETF - RFC2606 1999], and IPv4 documentation-only address blocks described in [IETF - RFC5737 2010]. The IPv4 ranges reserved in [IETF - RFC1918 1996] for private use are also used in documentation, as well as the Autonomous System numbers reserved in [IETF - RFC6996 2014].

Although the address block defined in [IETF - RFC3849 2004] was within the range of a conventional allocation size for an Internet Service Provider, and it was expected that it could accurately match deployment scenarios, there are some situations that can't be represented accordingly with a prefix of 32 bits, such as: transition techniques, peering between multiple ISPs, IPv6 address plan for multi-regional ISPs, and others.

This situation leads to the same problem that [IETF - RFC3849 2004] tried to address. Some documentation material, particularly some didactic material and laboratories, today is using IPv6 prefixes drawn from address blocks already allocated or assigned. A similar situation with IPv4 addresses caused problems in production environments, because of address and routing conflicts with other services.

This document reserves an additional larger IPv6 block for documentation, avoiding such problems. It does not obsolete the current IPv6 documentation block 2001:0db8::/32, since it is widely deployed. Nonetheless, it updates the current practice and specifies one larger IPv6 block, for the same use.

2. Problem Statement

This document proposes a solution for the situations where the length of the current documentation prefix for IPv6 (2001:db8::/32) is not enough to represent some addressing scenarios and also proposes a specific documentation block for ULA.

2.1. Didactic Usage

In some didactic laboratories and materials, people are using other prefixes from Global Address space when they need networks bigger than /32. For example, if you have a lab setup where each group represents an Autonomous System (AS) the ideal situation is that each group receives a block of the same size of the smallest allocation, it means a /32 for each group. A typical scenery is to have 8 to 16 groups, each one with your own /32, that requires a /28. This scenery is used by the authors of this document in IPv6 courses in Latin America.

Some IPv6 instructors use of ULA addresses when they have to represent networks bigger than /32, but it generates confusion on students that are struggling to understand the differences between IPv4 and IPv6. Some other instructors use non allocated or already allocated prefixes and it may lead to operational problems in the event of an example being inadvertently copied into a production environment.

The same problems may occur to ULA being used for teaching purposes, as the [IETF - RFC3849 2004] does not define an ULA for documentation.

2.2. Test Networks

Some transition techniques from IPv4 to IPv6 uses the IPv4 addresses embedded in the IPv6 addresses, for example, 6rd [IETF - RFC5969 2010], 464XLAT [IETF - RFC6877 2013] and MAP-E [IETF - draft-ietf-softwire-map 2013]. Using only a /32 to test those network may generate prefixes bigger than /64 that will conflict with SLAAC mechanism, as described in [IETF - RFC6052 2010].

New protocols development may also need test networks larger than a single /32, specially when making a large functional test to check the new protocol behavior on a big network trying to emulate a production environment.

2.3. Visual Identification and Address Filtering

It is important that the documentation blocks and addresses can be easily identified, specially to avoid that those address to generate problems in production networks. A simple

visual identification also avoid that people will use allocated or unallocated addresses to test or teach IPv6, just because those addresses would be easier to remember.

Books and documentation that includes IPv6 addresses would have a standard to follow and that will serve their needs.

Having a large defined block for documentation will also help filtering test and documentation addresses that may leak into production networks.

3. IPv6 Documentation Prefixes

The blocks provided for use in documentation are: 2001:0db8::/32 (v6 -TEST-NET-1), UUUU:U000::/20 [Note to RFC Editor: this address range is to be added before publication] (v6-TEST-NET-2) and FCUU:UUUU:UUU0::/44 [Note to RFC Editor: this address range is to be added before publication] (v6-TEST-NET-3).

4. Operational Implications

Addresses within the v6-TEST-NET-1, v6-TEST-NET-2 and v6-TEST-NET-3 SHOULD NOT appear on the public Internet and are used without any coordination with IANA or an Internet Regional Registry (RIR). Network operators SHOULD add these address blocks to the list of non-routable address spaces, and if packet filters are deployed, then this address block SHOULD be added to packet filters.

These blocks are not for local use, and the filters may be used in both local and public contexts.

5. IANA Considerations

IANA recorded the allocation of the IPv6 global unicast address prefix v6-TEST-NET-1 as a documentation-only prefix in the IPv6 address registry.

IANA is asked to record the allocation of v6-TEST-NET-2 prefix, within the range reserved for Global IPv6 addresses, for use as an additional documentation-only prefix, in the IPv6 address registry.

IANA is asked to record the reservation of v6-TEST-NET-3 prefix, within the range reserved for Unique Local IPv6 addresses, for use as an additional documentation-only prefix, in the IPv6 address registry.

No end party is to be assigned any of these address blocks.

References

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