Internet Engineering Task Force
Internet-Draft
Intended status: Best Current Practice
Expires: April 24, 2014

A. Moreiras
E. Cordeiro
R. Santos
NIC.br
A. Servin
LACNIC
A. Acosta
Universidad Nueva Esparta

October 21, 2013

IPv6 Address Prefixes Reserved for Documentation
draft-moreiras-v6ops-rfc3849bis-01

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].

Table of Contents

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 [RFC3849], 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 [RFC2606], and IPv4 documentation-only address blocks described in [RFC5737]. The IPv4 ranges reserved in [RFC1918] for private use are also used in documentation, as well as the Autonomous System numbers reserved in [RFC6996].

Although the address block defined in [RFC3849] 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 [RFC3849] 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. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

3. 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.

3.1. 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 [RFC3849] does not define an ULA for documentation.

3.2. Test Networks

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

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.

3.3. 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.

4. 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).

5. 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.

6. Security Considerations

There are no new security considerations pertaining to this document.

7. 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.

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

8.2. Informative References

[RFC1918] Rekhter, Y., Moskowitz, R., Karrenberg, D., Groot, G., and E. Lear, "Address Allocation for Private Internets", BCP 5, RFC 1918, February 1996.

[RFC2606] Eastlake, D. and A. Panitz, "Reserved Top Level DNS Names", BCP 32, RFC 2606, June 1999.

[RFC3849] Huston, G., Lord, A., and P. Smith, "IPv6 Address Prefix Reserved for Documentation", RFC 3849, July 2004.

[RFC5737] Arkko, J., Cotton, M., and L. Vegoda, "IPv4 Address Blocks Reserved for Documentation", RFC 5737, January 2010.

[RFC6996] Mitchell, J., "Autonomous System (AS) Reservation for Private Use", BCP 6, RFC 6996, July 2013.

[RFC5969] Townsley, W. and O. Troan, "IPv6 Rapid Deployment on IPv4 Infrastructures (6rd) -- Protocol Specification", RFC 5969, August 2010.

[RFC6877] Mawatari, M., Kawashima, M., and C. Byrne, "464XLAT: Combination of Stateful and Stateless Translation", RFC 6877, April 2013.

[RFC6052] Bao, C., Huitema, C., Bagnulo, M., Boucadair, M., and X. Li, "IPv6 Addressing of IPv4/IPv6 Translators", RFC 6052, October 2010.

[I-D.ietf-softwire-map] Troan, O., Dec, W., Li, X., Bao, C., Matsushima, S., Murakami, T., and T. Taylor, "Mapping of Address and Port with Encapsulation (MAP)", draft-ietf-softwire-map-08 (work in progress), August 2013.

Authors' Addresses

Antonio Marcos Moreiras
NIC.br
Av das Nacoes Unidas 11541 7o andar
Sao Paulo, SP 04578-000
Brazil

Phone: +55 11 5509 3553
Email: moreiras@nic.br

Edwin Cordeiro
NIC.br
Av das Nacoes Unidas 11541 7o andar
Sao Paulo, SP 04578-000
Brazil

Phone: +55 11 5509 3537
Email: ecordeiro@nic.br

Rodrigo Santos
NIC.br
Av das Nacoes Unidas 11541 7o andar
Sao Paulo, SP 04578-000
Brazil

Phone: +55 11 5509 3537
Email: rsantos@nic.br

Arturo Servin
LACNIC
Rambla Republica de Mexico 6125
Montevideo 11300
Uruguay

Phone: +598 2604 2222
Email: aservin@lacnic.net

Alejandro Acosta
Universidad Nueva Esparta
Avenida Sur 7
Caracas, Los Naranjos del Cafetal CP 1081
Venezuela

Email: aacosta@rocketmail.com