

document must include Revised BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Revised BSD License.

Table of Contents

- [1. Introduction](#)
 - [2. Terminology](#)
 - [3. Assignment of address space for use in large-scale lab and prototyping environments](#)
 - [3.1. Operational Implications](#)
 - [3.1.1. Resource utilization](#)
 - [4. Acknowledgements](#)
 - [5. Security Considerations](#)
 - [6. IANA Considerations](#)
 - [7. Appendix A.](#)
 - [8. References](#)
 - [8.1. Normative References](#)
 - [8.2. Informative References](#)
- [Authors' Addresses](#)

1. Introduction

The address architecture for IPv6 [[RFC4291](#)] does not explicitly define any prefixes allocated exclusively for lab use, nor is such address space allocated in [[RFC6890](#)] or in [[RFC8200](#)]. While lab deployments could potentially use IPv6 address prefixes typically assigned and configured in non-lab network, the use of such addressing in lab environments may create addressing conflicts and unnecessary operational confusion. For instance, designing labs utilizing ULA fc00::/7 [[RFC4193](#)] is problematic due to the random global ID requirement preventing hierarchical network prefix design possibilities. Further, default address selection behavior [[RFC6724](#)] by end nodes may result in a de-preference of such addresses and prevent lab deployments from accurately modeling their desired non-lab equivalents, especially in the testing of devices that are incapable of adjusting the global source selection table. To resolve these problems involved in building large-scale lab networks, and pre-staging, or automating large-scale networks for deployment, this document allocates the IPv6 address prefix 0200::/7 for these purposes. The goal is to allow organization to share working lab configuration files (with little or no need of modification) to be deployed in a third party lab environment, public and private externally managed services, virtualization or hosting environments as well as in other networks such as Service Providers, Enterprise, Government, IoT, and Energy, all with the knowledge that the lab GUA address space will perform the same as any GUA but with the added knowledge that filtering will be used to protect accidental leaks to

the Internet. The following criteria is for selecting the lab prefix:

- *Address space should reside outside of IANA allocated GUA block of 2000::/3

- *The precedence for the lab prefix should not be lower than the GUA prefix as defined in [[RFC6724](#)] (unlike ULA).

- *Reduce the operational impacts to IANA and the RIR's in selecting lab prefix space.

2. Terminology

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](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

3. Assignment of address space for use in large-scale lab and prototyping environments

The prefix reserved for large scale lab and testing purposes is 0200::/7.

3.1. Operational Implications

This space **SHOULD NOT** be employed for addressing use cases which are already defined in other RFCs, such as addresses set apart for documentation, testing, etc. Enterprise and large-scale networks have some specific criteria around building and validating prior to deployment. The issues with ULA for infrastructure modeling, lab creation, configuration and behavior testing at the host level are notably impactful in large enterprises as well as continental and global scale networks. This is primarily, but not exclusively, due to the increased focus on large-scale hosts, servers, and application testing. Additionally, it is likely that both GUA and ULA may co-exist or are planned to co-exist, and reconfiguring lab hosts, network elements, operational technology systems, and IoT hardware isn't practical or desirable due to inconsistent results for host preference due to [[RFC6724](#)] behavior. Most large-scale enterprises strive to build lab, dev, and QA environments that reflect production as accurately as possible. This is a fairly straightforward way to avoid disparity between production and non-production. Enterprise environments are an area that need increased IPv6 adoption. In an effort to enable a more approachable mechanism to model a global scale network, and to avoid the pitfalls of ULA de-preferenced host behavior or mis-use (i.e. address space

squatting) on other IPv6 space, a specific IPv6 lab prefix is being assigned.

3.1.1. Resource utilization

The prefix in question, (0200::/7) has previously been used for the OSI NSAP-mapped prefix set in [RFC4048] and [RFC4548], and deprecated, this address prefix is already limited in its usability and has not been officially re-purposed. The address prefix was returned to IANA and is available to be marked for other purposes. This assignment implies that IPv6 network operators **SHOULD** add this address prefix to the list of non-routable IPv6 address space, and if packet filters are deployed, then this address prefix **SHOULD** be added to packet filters. This is not a local-use address prefix so these filters may be used in both local and public contexts.

As noted [here](#) by the IANA Internet Protocol Version 6 Address Space allocation reference, 0200::/7 was deprecated as of December 2004 by [RFC4048]. This space is outside of the 2000::/3 address block, making it significantly easier to filter and providing straightforward visual and programmatic identification. Because the resource has been previously allocated, no new resources are required. Additionally, as noted by the IANA allocation list, approximately 85% of the IPv6 address space is reserved for future definition and use, and is not assigned by IANA at this time, leaving ample room for growth over the coming decades.

4. Acknowledgements

The authors would like to acknowledge the valuable input and contributions of the v6ops WG. The authors further acknowledge the work of Bob Hinden and Stephen Deering, in authoring the protocol standard and the addressing architecture for IPv6. The authors would also like to recognize the valuable input, suggestions, and insight by Tom Coffeen, Scott Hogg, and Jay Stewart.

5. Security Considerations

The addresses assigned for lab and staging use **SHOULD** be filtered as noted above. Setting aside address space for lab and staging use, and adding this address space to common filters to prevent destinations in this space from being routed in production networks (including the global Internet) improves security by preventing the leakage of prefixes used for testing into production environments. As such, setting aside this space improves the overall security posture of the Internet.

6. IANA Considerations

IANA to allocate and record the reservation of the IPv6 global unicast address prefix 0200::/7 as a lab-only prefix in the IPv6 address registry. No end party is to be assigned this address.

7. Appendix A.

8. References

8.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/rfc/rfc2119>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/rfc/rfc8174>>.
- [RFC8200] 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/rfc/rfc8200>>.

8.2. Informative References

- [RFC4048] Carpenter, B., "RFC 1888 Is Obsolete", RFC 4048, DOI 10.17487/RFC4048, April 2005, <<https://www.rfc-editor.org/rfc/rfc4048>>.
- [RFC4193] Hinden, R. and B. Haberman, "Unique Local IPv6 Unicast Addresses", RFC 4193, DOI 10.17487/RFC4193, October 2005, <<https://www.rfc-editor.org/rfc/rfc4193>>.
- [RFC4291] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", RFC 4291, DOI 10.17487/RFC4291, February 2006, <<https://www.rfc-editor.org/rfc/rfc4291>>.
- [RFC4548] Gray, E., Rutenmiller, J., and G. Swallow, "Internet Code Point (ICP) Assignments for NSAP Addresses", RFC 4548, DOI 10.17487/RFC4548, May 2006, <<https://www.rfc-editor.org/rfc/rfc4548>>.
- [RFC6724] Thaler, D., Ed., Draves, R., Matsumoto, A., and T. Chown, "Default Address Selection for Internet Protocol Version 6 (IPv6)", RFC 6724, DOI 10.17487/RFC6724, September 2012, <<https://www.rfc-editor.org/rfc/rfc6724>>.

[RFC6890]

Cotton, M., Vegoda, L., Bonica, R., Ed., and B. Haberman,
"Special-Purpose IP Address Registries", BCP 153, RFC
6890, DOI 10.17487/RFC6890, April 2013, <<https://www.rfc-editor.org/rfc/rfc6890>>.

Authors' Addresses

Nick Buraglio
Energy Sciences Network

Email: buraglio@forwardingplane.net

Chris Cummings
Energy Sciences Network

Email: chriscummings@es.net

Kevin Myers
IP ArchiTechs

Email: kevin.myers@iparchitech.com

Russ White
Akamai Technologies

Email: russ@riw.us

Ed Horley
Hexabuild

Email: ed@hexabuild.io