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Autonomous System (AS) Reservation for Private Use

Abstract

This document describes the reservation of Autonomous System Numbers (ASNs) that are for Private Use only, known as Private Use ASNs, and provides operational guidance on their use. This document enlarges the total space available for Private Use ASNs by documenting the reservation of a second, larger range and updates RFC 1930 by replacing Section 10 of that document.

Status of This Memo

This memo documents an Internet Best Current Practice.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on BCPs is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc6996.

1. Introduction

The original IANA reservation of Autonomous System Numbers (ASNs) for Private Use was a block of 1023 ASNs. This was also documented by the IETF in Section 10 of [RFC1930]. Since the time that the range was reserved, the Border Gateway Protocol (BGP) [RFC4271] has seen deployment in new application domains, such as data center networks, which require a larger Private Use AS space.

Since the introduction of "BGP Support for Four-Octet Autonomous System (AS) Number Space" [RFC6793], the total size of ASN space has increased dramatically. A larger subset of the space is available to network operators to deploy in these Private Use cases. The existing range of Private Use ASNs is widely deployed, and the ability to renumber this resource in existing networks cannot be coordinated given that these ASNs, by definition, are not registered. Therefore, this RFC documents the existing Private Use ASN reservation while also introducing a second, larger range that can also be utilized.

2. Requirements Language

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 RFC 2119 [RFC2119].

3. Private Use ASNs

To allow the continued growth of BGP protocol usage in new network applications that utilize Private Use ASNs, two ranges of ASNs are reserved by Section 5 of this document. The first is part of the original 16-bit Autonomous System range previously defined in [RFC1930], and the second is a larger range out of the Four-Octet AS Number Space [RFC6793].

4. Operational Considerations

If Private Use ASNs are used and prefixes originate from these ASNs, Private Use ASNs MUST be removed from AS path attributes (including AS4_PATH if utilizing a four-octet AS number space) before being advertised to the global Internet. Operators SHOULD ensure that all External Border Gateway Protocol (EBGP) speakers support the extensions described in [RFC6793] and that implementation-specific features that recognize Private Use ASNs have been updated to recognize both ranges prior to making use of the newer, numerically higher range of Private Use ASNs in the four-octet AS number space. Some existing implementations that remove Private Use ASNs from the AS_PATH are known to not remove Private Use ASNs if the AS_PATH contains a mixture of Private Use and Non-Private Use ASNs. If such

implementations have not been updated to recognize the new range of ASNs in this document and a mix of old and new range Private Use ASNs exist in the AS4_PATH, these implementations will likely cease to remove any Private Use ASNs from either of the AS path attributes. Normal AS path filtering MAY also be used to prevent prefixes originating from Private Use ASNs from being advertised to the global Internet.

5. IANA Considerations

IANA has reserved, for Private Use, a contiguous block of 1023 Autonomous System numbers from the "16-bit Autonomous System Numbers" registry, namely 64512 - 65534 inclusive.

IANA has also reserved, for Private Use, a contiguous block of 94,967,295 Autonomous System numbers from the "32-bit Autonomous System Numbers" registry, namely 4200000000 - 4294967294 inclusive.

These reservations have been documented in the IANA "Autonomous System (AS) Numbers" registry [IANA.AS].

6. Security Considerations

Private Use ASNs do not raise any unique security concerns. Loss of connectivity might result from their inappropriate use, specifically outside of a single organization, since they are not globally unique. This loss of connectivity is limited to the organization using Private Use ASNs inappropriately or without reference to Section 4. General BGP security considerations are discussed in [RFC4271] and [RFC4272]. Identification of the originator of a route with a Private Use ASN in the AS path would have to be done by tracking the route back to the neighboring globally unique AS in the path or by inspecting other attributes.

7. References

7.1. Normative References

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

[RFC4271] Rekhter, Y., Li, T., and S. Hares, "A Border Gateway Protocol 4 (BGP-4)", RFC 4271, January 2006.

[RFC6793] Vohra, Q. and E. Chen, "BGP Support for Four-Octet Autonomous System (AS) Number Space", RFC 6793, December 2012.

7.2. Informative References

[IANA.AS] IANA, "Autonomous System (AS) Numbers", <http://www.iana.org/assignments/as-numbers/>.

[RFC1930] Hawkinson, J. and T. Bates, "Guidelines for creation, selection, and registration of an Autonomous System (AS)", BCP 6, RFC 1930, March 1996.

[RFC4272] Murphy, S., "BGP Security Vulnerabilities Analysis", RFC 4272, January 2006.

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