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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