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Reservation of Last Autonomous System (AS) Numbers
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Abstract

This document reserves two Autonomous System numbers (ASNs) at the end of the 16 bit and 32 bit ranges, described in this document as "Last ASNs" and provides guidance to implementers and operators on their use.

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1. Introduction

IANA has reserved the last Autonomous System Number (ASN), 65535, of the 16 bit autonomous system number range for over a decade with the intention that it not be used by network operators running BGP [[RFC4271](#)]. Since the introduction of BGP Support for Four-Octet AS Number Space [[RFC6793](#)], IANA has also reserved the ASN of the 32 bit autonomous system number range, 4294967295. This reservation has been documented in the IANA Autonomous System Numbers Registry [[IANA.AS](#)]. Although these "Last ASNs" border on Private Use ASN ranges, they are not defined as Private Use ASNs by [[I-D.ietf-idr-as-private-reservation](#)]. This document describes the reasoning for reserving these Last ASNs and provides guidance both to operators and to implementers on their use.

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. Reasons for Last ASNs Reservation

The primary reason for reserving the Last ASN of both the 16 bit and 32 bit ASN ranges is that these numbers are also at the end of typical computational data structures holding the underlying number. Programmatic errors are more common when handling of end of range values, and sometimes last values (binary all ones) have been used as "magic numbers", to represent a different number or behavior.

Secondly, a subset of the standard BGP communities of the last ASN of the 16 bit range, 65535, are reserved for use by Well-known communities as described in [[RFC1997](#)] and [[IANA.WK](#)]. Although this not currently true of ASN 4294967295, if there is a future need for a Special Use ASN that is not designed to be globally routable, or the associated BGP attributes (such as communities) of such an ASN, this could be a valid candidate for such purpose. This document does not prescribe any such purpose to this ASN.

4. Operational Considerations

Operators MUST NOT use these Last ASNs as if they are Private Use ASNs, and SHOULD NOT use these Last ASNs for any other purpose, except a Special Uses defined elsewhere. Any other operational use of these Last ASNs could have unpredictable or undesirable results. For example; use of AS 65535 as if it were a Private Use ASN, may result in inadvertent use of BGP Well-known community values [[IANA.WK](#)], causing undesired routing behavior.

Operators that choose to filter Private Use ASNs within the AS_PATH and AS4_PATH attributes SHOULD also filter these Last ASNs. These last ASNs MUST NOT be advertised to the global Internet within AS_PATH or AS4_PATH attributes.

5. Implementation Considerations

While these Last ASNs are reserved, they remain valid ASNs from a protocol perspective. Therefore, implementations of BGP [[RFC4271](#)] SHOULD NOT treat the use of these Last ASNs as any type of protocol error. However, implementations MAY generate a local warning message indicating probable improper use of a reserved ASN.

Implementations that provide tools that filter Private Use ASNs within the AS_PATH and AS4_PATH attributes MAY also include these Last ASNs.

6. IANA Considerations

IANA has reserved last Autonomous System number 65535 from the "16-bit Autonomous System Numbers" registry for the reasons described in this document.

IANA has also reserved last Autonomous System number 4294967295 from the "32-bit Autonomous System Numbers" registry for the reasons described in this document.

This reservation has been documented in the IANA Autonomous System Numbers Registry [[IANA.AS](#)].

7. Security Considerations

This document does not introduce any additional security concerns in regards to usage of Last ASNs. Although the BGP protocol is designed to allow usage of these Last ASNs, security issues related to BGP implementation errors could be triggered by Last ASN usage.

8. References

8.1. Normative References

- [IANA.AS] IANA, ., "Autonomous System (AS) Numbers", July 2013, <<http://www.iana.org/assignments/as-numbers/>>.
- [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.

[8.2.](#) Informative References

- [I-D.ietf-idr-as-private-reservation]
Mitchell, J., "Autonomous System (AS) Reservation for Private Use", [draft-ietf-idr-as-private-reservation-05](#) (work in progress), May 2013.
- [IANA.WK] IANA, ., "Border Gateway Protocol (BGP) Well-known Communities", July 2013, <<http://www.iana.org/assignments/bgp-well-known-communities/>>.
- [RFC1997] Chandrasekeran, R., Traina, P., and T. Li, "BGP Communities Attribute", [RFC 1997](#), August 1996.

[Appendix A.](#) Acknowledgements

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