           **Autonomous System (AS) Reservation for Private Use**
               **draft-mitchell-idr-as-private-reservation-00**

Abstract

   This document describes the reservation of Autonomous System numbers
   (ASNs) that may be used within networks but should not be advertised
   to the Internet, known as private use ASNs.  This document enlarges
   the total space available for private use ASNs by documenting the
   reservation of a second larger range and updates RFC 1930.

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## 1.  Introduction

The original IANA reservation of ASNs for private use was a block of
1023 ASNs.  This was documented by IETF in Section 10 of [RFC1930]
that specified the private use ASN range as 64512 through 65535
(implying the inclusion of ASN 65535).  Since that range was reserved
and documented over a decade ago, BGP has seen much wider deployment
in Service Provider, Enterprise and Content Provider networks.  The
use cases in these networks for private use ASNs include networks
that are attached to the Internet, utilizing implementation specific
features to remove them upon advertisement to Internet peers, and
networks that are not attached to the Internet.  The displacement of
Frame Relay and ATM based VPNs by BGP/MPLS IP VPNs [RFC4364] has also
increased the deployment of BGP to a larger number of sites,
especially for networks with requirements for multi-homing or
provider redundancy.

The limited size of the current range of private use ASNs has led to
the usage of a number of implementation specific features that
manipulate the AS_PATH or remove AS_PATH based loop prevention
described in Section 9 of [RFC4271].  These workarounds have
increased the operational complexity of the networks since the
implementations of these functions vary and have been largely out of
scope of existing BGP standards.

Since the introduction of BGP Support for Four-octet AS Number Space
[RFC4893], the total size of the ASN space has increased
dramatically, and a larger subset of the space should be available to
network operators to deploy in private use cases.  The existing range
of private use ASNs is widely deployed and the ability to renumber
this resource for reassignment in existing networks cannot be
coordinated given these ASNs by definition are not registered.
Therefore this document clarifies the existing ASN range, while
introducing a second, larger, range that can also be utilized.

## 2.  Private Use ASNs

To allow the continued growth of usage of the BGP protocol in
networks that utilize private ASNs two ranges of ASNs are reserved by
this document in Section 5.  The first which was previously defined
in [RFC1930] out of the original 16-bit Autonomous System range and a
second, larger, reserved block available out of the higher part of
the Four-Octet AS Number Space [RFC4893].

## 3.  Operational Considerations

If private use ASNs are used and prefixes are originated from these
private use ASNs which are destined to the Internet, private use ASNs
must be removed from the AS_PATH before being advertised to the
global Internet.  Prior to making use of the second, numerically
higher, range of these ASNs network operators should be confident any
implementation specific features or filters that recognize private
use ASNs have been updated to recognize both ranges correctly so that
no unintended announcement of private use ASNs to the Internet
occurs.

## 4.  Acknowledgements

The author would like to acknowledge Christopher Morrow and Jason
Schiller for their advice on how to pursue this change.

## 5.  IANA Considerations

[Note to IANA, not for publication: The IANA may wish to consider
updating the existing private use AS number reservation to explicitly
include ASN 65535 that has been documented in RFC 1930 as well as
implemented in a number of implementations that recognize private use
ASNs as part of the existing range.  Further, to maintain consistency
from an operator standpoint, it is suggested that the end of the "32-
bit number set" be reserved for Private Use, and a size of 967,295 is
suggested corresponding to the range of 4294000000 to 4294967295
inclusive, primarily motivated by being visibly recognizable while
not consuming a large portion of the total ASN space.]

[Note to WG, not for publication: a small poll of network
implementors was taken and it was not felt optimizing the range to a
bit boundary was important for control plane performance of any
features that recognize private use ASNs - others implementors in WG
may want to weigh in here.  Also very interested in feedback on
appropriate sizing of the future range given the many current and
future uses of BGP in networks]

(If approved) IANA has reserved, for Private Use, a contiguous block
of TBD (1023 or 1024) Autonomous System numbers from the "16-bit
Autonomous System Numbers" registry, namely 64512 - TBD1 (65534 or
65535) inclusive.

(If approved) IANA has also reserved, for Private Use, a contiguous
block of TBD Autonomous System numbers from the "32-bit Autonomous
System Numbers" registry, namely TBD2 - TBD3 inclusive.

(If approved) These reservations have been documented in the IANA AS
Number Registry [IANA.AS].


## 6.  Security Considerations

This document does not introduce any additional security concerns in
regards to private use ASNs.


## 7.  References

### 7.1.  Normative References

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

[RFC4893]   Vohra, Q. and E. Chen, "BGP Support for Four-octet AS
            Number Space", RFC 4893, May 2007.

### 7.2.  Informative References

[IANA.AS]   IANA, "Autonomous System (AS) Numbers", June 2012,
            <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.

[RFC4364]   Rosen, E. and Y. Rekhter, "BGP/MPLS IP Virtual Private
            Networks (VPNs)", RFC 4364, February 2006.


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