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M. Cotton  
L. Vegoda  
ICANN  
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Special Use IPv4 Addresses  
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## Abstract

This document obsoletes [RFC 5735](#). It describes the global and other specialized IPv4 address blocks that have been assigned by the Internet Assigned Numbers Authority (IANA). It does not address IPv4 address space assigned to operators and users through the Regional Internet Registries, nor does it address IPv4 address space assigned directly by IANA prior to the creation of the Regional Internet Registries. It also does not address allocations or assignments of IPv6 addresses or autonomous system numbers.

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## 1. Introduction

Throughout its history, the Internet has employed a central Internet Assigned Numbers Authority (IANA) responsible for the allocation and assignment of various identifiers needed for the operation of the Internet [[RFC1174](#)]. In the case of the IPv4 address space, the IANA allocates parts of the address space to Regional Internet Registries (RIRs) according to their established needs. These RIRs are responsible for the registration of IPv4 addresses to operators and users of the Internet within their regions.

On an ongoing basis, the IANA has been designated by the IETF to make assignments in support of the Internet Standards Process [[RFC2860](#)]. [Section 4](#) of this document describes that assignment process.

Small portions of the IPv4 address space have been allocated or assigned directly by the IANA for global or other specialized purposes. These allocations and assignments have been documented in a variety of RFCs and other documents. This document is intended to collect these scattered references and provide a current list of special use IPv4 addresses.

This document is a revision of [RFC 5735](#) [[RFC5735](#)], which it obsoletes; its primary purpose is to reflect the changes to the list of special IPv4 assignments since the publication of [RFC 5735](#). It is a companion to [[RFC5156](#)] which describes special IPv6 addresses.

## 2. Terminology

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 [BCP 14](#), [[RFC2119](#)].

## 3. Global and Other Specialized Address Blocks

0.0.0.0/8 - Addresses in this block refer to source hosts on "this" network. Address 0.0.0.0/32 may be used as a source address for this host on this network; other addresses within 0.0.0.0/8 may be used to refer to specified hosts on this network [\[RFC1122\]](#), [section 3.2.1.3](#).

10.0.0.0/8 - This block is set aside for use in private networks. Its intended use is documented in [\[RFC1918\]](#). As described in that RFC, addresses within this block do not legitimately appear on the public Internet. These addresses can be used without any coordination with IANA or an Internet registry.

127.0.0.0/8 - This block is assigned for use as the Internet host loopback address. A datagram sent by a higher level protocol to an address anywhere within this block loops back inside the host. This is ordinarily implemented using only 127.0.0.1/32 for loopback. As described in [\[RFC1122\]](#), [Section 3.2.1.3](#), addresses within the entire 127.0.0.0/8 block do not legitimately appear on any network anywhere.

100.64.0.0/10 - This block is used as Shared Address Space. [\[RFC6598\]](#) states that Shared Address Space can only be used in Service Provider networks or on routing equipment that is able to do address translation across router the interfaces when addresses are identical on two different interfaces.

169.254.0.0/16 - This is the "link local" block. As described in [\[RFC3927\]](#), it is allocated for communication between hosts on a single link. Hosts obtain these addresses by auto-configuration, such as when a DHCP server cannot be found.

172.16.0.0/12 - This block is set aside for use in private networks. Its intended use is documented in [\[RFC1918\]](#). As described in that RFC, addresses within this block do not legitimately appear the public Internet. These addresses can be used without any coordination with IANA or an Internet registry.

192.0.0.0/24 - This block is reserved for IETF protocol assignments. At the time of writing this document, there are no current assignments. Allocation policy for future assignments is given in [\[RFC5736\]](#).

192.0.2.0/24 - This block is assigned as "TEST-NET-1" for use in documentation and example code. It is often used in conjunction with domain names example.com or example.net in vendor and protocol documentation. As described in [\[RFC5737\]](#), addresses within this block do not legitimately appear on the public Internet and can be used without any coordination with IANA or an Internet registry. See [\[RFC1166\]](#).

192.88.99.0/24 - This block is allocated for use as 6to4 relay anycast addresses, in to [\[RFC3068\]](#). In contrast with previously described blocks, packets destined to addresses from this block do appear in the public Internet. [\[RFC3068\], Section 7](#) describes operational practices to prevent the malicious use of this block in routing protocols.

192.168.0.0/16 - This block is set aside for use in private networks. Its intended use is documented in [\[RFC1918\]](#). As described in that RFC, addresses within this block do not legitimately appear the public Internet. These addresses can be used without any

coordination with IANA or an Internet registry.

198.18.0.0/15 - This block has been allocated for use in benchmark tests of network interconnect devices. [\[RFC2544\]](#) explains that this range was assigned to minimize the chance of conflict in case a testing device were to be accidentally connected to part of the Internet. Packets with source addresses from this range are not meant to be forwarded across the Internet.

198.51.100.0/24 - This block is assigned as "TEST-NET-2" for use in documentation and example code. It is often used in conjunction with domain names example.com or example.net in vendor and protocol documentation. As described in [\[RFC5737\]](#), addresses within this block do not legitimately appear on the public Internet and can be used without any coordination with IANA or an Internet registry.

203.0.113.0/24 - This block is assigned as "TEST-NET-3" for use in documentation and example code. It is often used in conjunction with domain names example.com or example.net in vendor and protocol documentation. As described in [\[RFC5737\]](#), addresses within this block do not legitimately appear on the public Internet and can be used without any coordination with IANA or an Internet registry.

224.0.0.0/4 - This block, formerly known as the Class D address space, is allocated for use in IPv4 multicast address assignments. The IANA guidelines for assignments from this space are described in [\[RFC3171\]](#).

240.0.0.0/4 - This block, formerly known as the Class E address space, is reserved for future use, see [\[RFC1112\]](#), [section 4](#).

The one exception to this is the "limited broadcast" destination address 255.255.255.255. As described in [\[RFC0919\]](#) and [\[RFC0922\]](#), packets with this destination address are not forwarded at IP layer.

#### [4.](#) Summary Table

| Address Block  | Present Use               | Reference                                 |
|----------------|---------------------------|---|
| 0.0.0.0/8      | "This" Network            | <a href="#">RFC 1122, section 3.2.1.3</a> |
| 10.0.0.0/8     | Private-Use Networks      | <a href="#">RFC 1918</a>                  |
| 100.64.0.0/10  | Shared Address Space      | <a href="#">RFC 6598</a>                  |
| 127.0.0.0/8    | Loopback                  | <a href="#">RFC 1122, section 3.2.1.3</a> |
| 169.254.0.0/16 | Link Local                | <a href="#">RFC 3927</a>                  |
| 172.16.0.0/12  | Private-Use Networks      | <a href="#">RFC 1918</a>                  |
| 192.0.0.0/24   | IETF Protocol Assignments |   |
| 192.0.2.0/24   | TEST-NET-1                | <a href="#">RFC 5737</a>                  |
| 192.88.99.0/24 | 6to4 Relay Anycast        | <a href="#">RFC 3068</a>                  |
| 192.168.0.0/16 | Private-Use Networks      | <a href="#">RFC 1918</a>                  |

|                    |                          |                                     |
|--------------------|--------------------------|-------------------------------------|
| 198.18.0.0/15      | Network Interconnect     |                                     |
|                    | Device Benchmark Testing | <a href="#">RFC 2544</a>            |
| 198.51.100.0/24    | TEST-NET-2               | <a href="#">RFC 5737</a>            |
| 203.0.113.0/24     | TEST-NET-3               | <a href="#">RFC 5737</a>            |
| 224.0.0.0/4        | Multicast                | <a href="#">RFC 3171</a>            |
| 240.0.0.0/4        | Reserved for Future Use  | <a href="#">RFC 1112, section 4</a> |
| 255.255.255.255/32 | Limited Broadcast        | <a href="#">RFC 919, section 7</a>  |

## 5. Assignments of IPv4 Blocks for New Specialized Uses

The IANA has responsibility for making assignments of protocol parameters used in the Internet according to the requirements of the "Memorandum of Understanding Concerning the Technical Work of the Internet Assigned Numbers Authority" [[RFC2860](#)]. Among other things, [[RFC2860](#)] requires that protocol parameters be assigned according to the criteria and procedures specified in RFCs, including Proposed, Draft, and full Internet Standards and Best Current Practice documents, and any other RFC that calls for IANA assignment.

The domain name and IP address spaces involve policy issues (in addition to technical issues) so that the requirements of [[RFC2860](#)] do not apply generally to those spaces. Nonetheless, the IANA is responsible for ensuring assignments of IPv4 addresses as needed in support of the Internet Standards Process. When a portion of the IPv4 address space is specifically required by an RFC, the technical requirements (e.g., size, prefix length) for the portion should be described [[RFC5226](#)]. Immediately before the RFC is published, the IANA will, in consultation with the Regional Internet Registries, make the necessary assignment and notify the RFC Editor of the particulars for inclusion in the RFC as published.

As required by [[RFC2860](#)], the IANA will also make necessary experimental assignments of IPv4 addresses, also in consultation with the Regional Internet Registries.

## 6. IANA Considerations

This document describes the IANA's past and current practices and

does not create any new requirements for assignments or allocations by the IANA.

## 7. Security Considerations

The particular assigned values of special use IPv4 addresses cataloged in this document do not directly raise security issues. However, the Internet does not inherently protect against abuse of these addresses; if you expect (for instance) that all packets from a private address space such as the 10.0.0.0/8 block or the link local block 169.254.0.0/16 originate within your subnet, all routers at the border of your network should filter such packets that originate from outside your network. Attacks have been mounted that depend on the unexpected use of some of these addresses.

It should also be noted that some of these address blocks may be used legitimately outside of a single administrative domain, and may appear on the global Internet. Security policy SHOULD NOT blindly filter all of these address spaces without due consideration, and network operators are encouraged to review this document, and references contained therein, and determine what security policies should be associated with each of these address blocks within their specific operating environments.

## 8. Acknowledgments

Your name here?

## 9. References

### 9.1. Normative References

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- [RFC6598] Weil, J., Kuarsingh, V., Donley, C., Liljenstolpe, C., and M. Azinger, "IANA-Reserved IPv4 Prefix for Shared Address Space", [BCP 153](#), [RFC 6598](#), April 2012.

#### [Appendix A](#). Changes from [RFC 5735](#)

This document includes 100.64.0.0/10, which was assigned in [\[RFC6598\]](#). It is the only substantive change between this document and [\[RFC5735\]](#).

#### Authors' Addresses

Michelle Cotton  
Internet Corporation for Assigned Names and Numbers  
4676 Admiralty Way, Suite 330  
Marina del Rey 90292  
United States of America

Phone: +310-823-9358  
Email: [michelle.cotton@icann.org](mailto:michelle.cotton@icann.org)  
URI: <http://www.iana.org/>

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Special Use IPv4 Addresses

April 2012

Leo Vegoda  
Internet Corporation for Assigned Names and Numbers  
4676 Admiralty Way, Suite 330  
Marina del Rey 90292  
United States of America

Phone: +310-823-9358  
Email: [leo.vegoda@icann.org](mailto:leo.vegoda@icann.org)  
URI: <http://www.iana.org/>

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Cotton & Vegoda

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## 1. Introduction

Throughout its history, the Internet has employed a central Internet Assigned Numbers Authority (IANA) responsible for the allocation and assignment of various identifiers needed for the operation of the Internet [[RFC1174](#)]. In the case of the IPv4 address space, the IANA allocates parts of the address space to Regional Internet Registries (RIRs) according to their established needs. These RIRs are responsible for the registration of IPv4 addresses to operators and users of the Internet within their regions.

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## [2.](#) Terminology

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 [BCP 14](#), [[RFC2119](#)].

## [3.](#) Global and Other Specialized Address Blocks

0.0.0.0/8 - Addresses in this block refer to source hosts on "this" network. Address 0.0.0.0/32 may be used as a source address for this host on this network; other addresses within 0.0.0.0/8 may be used to refer to specified hosts on this network [[RFC1122](#)], [section 3.2.1.3](#).

10.0.0.0/8 - This block is set aside for use in private networks. Its intended use is documented in [[RFC1918](#)]. As described in that RFC, addresses within this block do not legitimately appear on the public Internet. These addresses can be used without any coordination with IANA or an Internet registry.

127.0.0.0/8 - This block is assigned for use as the Internet host loopback address. A datagram sent by a higher level protocol to an address anywhere within this block loops back inside the host. This is ordinarily implemented using only 127.0.0.1/32 for loopback. As described in [[RFC1122](#)], [Section 3.2.1.3](#), addresses within the entire 127.0.0.0/8 block do not legitimately appear on any network anywhere.

100.64.0.0/10 - This block is used as Shared Address Space. [[RFC6598](#)] states that Shared Address Space can only be used in Service Provider networks or on routing equipment that is able to do address translation across router the interfaces when addresses are identical on two different interfaces.

169.254.0.0/16 - This is the "link local" block. As described in

[[RFC3927](#)], it is allocated for communication between hosts on a single link. Hosts obtain these addresses by auto-configuration, such as when a DHCP server cannot be found.

172.16.0.0/12 - This block is set aside for use in private networks. Its intended use is documented in [[RFC1918](#)]. As described in that RFC, addresses within this block do not legitimately appear the public Internet. These addresses can be used without any coordination with IANA or an Internet registry.

192.0.0.0/24 - This block is reserved for IETF protocol assignments. At the time of writing this document, there are no current assignments. Allocation policy for future assignments is given in [[RFC5736](#)].

192.0.2.0/24 - This block is assigned as "TEST-NET-1" for use in documentation and example code. It is often used in conjunction with domain names example.com or example.net in vendor and protocol documentation. As described in [[RFC5737](#)], addresses within this block do not legitimately appear on the public Internet and can be used without any coordination with IANA or an Internet registry. See [[RFC1166](#)].

192.88.99.0/24 - This block is allocated for use as 6to4 relay anycast addresses, in to [[RFC3068](#)]. In contrast with previously described blocks, packets destined to addresses from this block do appear in the public Internet. [[RFC3068](#), [Section 7](#)] describes operational practices to prevent the malicious use of this block in routing protocols.

192.168.0.0/16 - This block is set aside for use in private networks. Its intended use is documented in [[RFC1918](#)]. As described in that RFC, addresses within this block do not legitimately appear the public Internet. These addresses can be used without any

coordination with IANA or an Internet registry.

198.18.0.0/15 - This block has been allocated for use in benchmark tests of network interconnect devices. [[RFC2544](#)] explains that this range was assigned to minimize the chance of conflict in case a testing device were to be accidentally connected to part of the Internet. Packets with source addresses from this range are not



meant to be forwarded across the Internet.

198.51.100.0/24 - This block is assigned as "TEST-NET-2" for use in documentation and example code. It is often used in conjunction with domain names example.com or example.net in vendor and protocol documentation. As described in [[RFC5737](#)], addresses within this block do not legitimately appear on the public Internet and can be used without any coordination with IANA or an Internet registry.

203.0.113.0/24 - This block is assigned as "TEST-NET-3" for use in documentation and example code. It is often used in conjunction with domain names example.com or example.net in vendor and protocol documentation. As described in [[RFC5737](#)], addresses within this block do not legitimately appear on the public Internet and can be used without any coordination with IANA or an Internet registry.

224.0.0.0/4 - This block, formerly known as the Class D address space, is allocated for use in IPv4 multicast address assignments. The IANA guidelines for assignments from this space are described in [[RFC3171](#)].

240.0.0.0/4 - This block, formerly known as the Class E address space, is reserved for future use, see [[RFC1112](#)], [section 4](#).

The one exception to this is the "limited broadcast" destination address 255.255.255.255. As described in [[RFC0919](#)] and [[RFC0922](#)], packets with this destination address are not forwarded at IP layer.

#### [4.](#) Summary Table

| Address Block      | Present Use               | Reference                                 |
|--------------------|---------------------------|---|
| 0.0.0.0/8          | "This" Network            | <a href="#">RFC 1122, section 3.2.1.3</a> |
| 10.0.0.0/8         | Private-Use Networks      | <a href="#">RFC 1918</a>                  |
| 100.64.0.0/10      | Shared Address Space      | <a href="#">RFC 6598</a>                  |
| 127.0.0.0/8        | Loopback                  | <a href="#">RFC 1122, section 3.2.1.3</a> |
| 169.254.0.0/16     | Link Local                | <a href="#">RFC 3927</a>                  |
| 172.16.0.0/12      | Private-Use Networks      | <a href="#">RFC 1918</a>                  |
| 192.0.0.0/24       | IETF Protocol Assignments |   |
| 192.0.2.0/24       | TEST-NET-1                | <a href="#">RFC 5737</a>                  |
| 192.88.99.0/24     | 6to4 Relay Anycast        | <a href="#">RFC 3068</a>                  |
| 192.168.0.0/16     | Private-Use Networks      | <a href="#">RFC 1918</a>                  |
| 198.18.0.0/15      | Network Interconnect      |   |
|                    | Device Benchmark Testing  | <a href="#">RFC 2544</a>                  |
| 198.51.100.0/24    | TEST-NET-2                | <a href="#">RFC 5737</a>                  |
| 203.0.113.0/24     | TEST-NET-3                | <a href="#">RFC 5737</a>                  |
| 224.0.0.0/4        | Multicast                 | <a href="#">RFC 3171</a>                  |
| 240.0.0.0/4        | Reserved for Future Use   | <a href="#">RFC 1112, section 4</a>       |
| 255.255.255.255/32 | Limited Broadcast         | <a href="#">RFC 919, section 7</a>        |

#### [5.](#) Assignments of IPv4 Blocks for New Specialized Uses

The IANA has responsibility for making assignments of protocol parameters used in the Internet according to the requirements of the "Memorandum of Understanding Concerning the Technical Work of the Internet Assigned Numbers Authority" [[RFC2860](#)]. Among other things, [[RFC2860](#)] requires that protocol parameters be assigned according to the criteria and procedures specified in RFCs, including Proposed, Draft, and full Internet Standards and Best Current Practice documents, and any other RFC that calls for IANA assignment.

The domain name and IP address spaces involve policy issues (in addition to technical issues) so that the requirements of [[RFC2860](#)] do not apply generally to those spaces. Nonetheless, the IANA is responsible for ensuring assignments of IPv4 addresses as needed in support of the Internet Standards Process. When a portion of the IPv4 address space is specifically required by an RFC, the technical requirements (e.g., size, prefix length) for the portion should be described [[RFC5226](#)]. Immediately before the RFC is published, the IANA will, in consultation with the Regional Internet Registries, make the necessary assignment and notify the RFC Editor of the particulars for inclusion in the RFC as published.

As required by [[RFC2860](#)], the IANA will also make necessary experimental assignments of IPv4 addresses, also in consultation with the Regional Internet Registries.

## [6.](#) IANA Considerations

This document describes the IANA's past and current practices and does not create any new requirements for assignments or allocations by the IANA.

## [7.](#) Security Considerations

The particular assigned values of special use IPv4 addresses cataloged in this document do not directly raise security issues. However, the Internet does not inherently protect against abuse of these addresses; if you expect (for instance) that all packets from a private address space such as the 10.0.0.0/8 block or the link local block 169.254.0.0/16 originate within your subnet, all routers at the border of your network should filter such packets that originate from outside your network. Attacks have been mounted that depend on the unexpected use of some of these addresses.

It should also be noted that some of these address blocks may be used legitimately outside of a single administrative domain, and may appear on the global Internet. Security policy SHOULD NOT blindly filter all of these address spaces without due consideration, and network operators are encouraged to review this document, and references contained therein, and determine what security policies should be associated with each of these address blocks within their specific operating environments.

## [8.](#) Acknowledgments

Your name here?

## [9.](#) References

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#### [Appendix A](#). Changes from [RFC 5735](#)

This document includes 100.64.0.0/10, which was assigned in [\[RFC6598\]](#). It is the only substantive change between this document and [\[RFC5735\]](#).

Authors' Addresses

Michelle Cotton  
Internet Corporation for Assigned Names and Numbers  
4676 Admiralty Way, Suite 330  
Marina del Rey 90292  
United States of America

Phone: +310-823-9358  
Email: [michelle.cotton@icann.org](mailto:michelle.cotton@icann.org)  
URI: <http://www.iana.org/>

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Leo Vegoda  
Internet Corporation for Assigned Names and Numbers  
4676 Admiralty Way, Suite 330  
Marina del Rey 90292  
United States of America

Phone: +310-823-9358  
Email: [leo.vegoda@icann.org](mailto:leo.vegoda@icann.org)  
URI: <http://www.iana.org/>

