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Special-Purpose IP Address Registries

Abstract

This memo reiterates the assignment of an IPv4 address block (192.0.0.0/24) to IANA. It also instructs IANA to restructure its IPv4 and IPv6 Special-Purpose Address Registries. Upon restructuring, the aforementioned registries will record all special-purpose address blocks, maintaining a common set of information regarding each address block.

This memo obsoletes RFCs 4773, 5156, 5735, and 5736.

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/rfc6890.

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1. Introduction

In order to support new protocols and practices, the IETF occasionally reserves an address block for a special purpose. For example, [RFC1122] reserves an IPv4 address block (0.0.0.0/8) to represent the local (i.e., "this") network. Likewise, [RFC4291] reserves an IPv6 address block (fe80::/10) to represent link-scoped unicast addresses.

Periodically, the IETF publishes an RFC that catalogs special-purpose address blocks. Currently, [RFC5735] catalogs all IPv4 special-purpose address blocks and [RFC5156] catalogs all IPv6 special-purpose address blocks.

[RFC5736] assigns an IPv4 address block (192.0.0.0/24) to IANA and instructs IANA to allocate special-purpose address blocks from this space. [RFC5736] also instructs IANA to create an IPv4 Special-Purpose Address Registry that records allocations from this address

space. However, [RFC5736] does not instruct IANA to record special-purpose address block reservations from outside of the aforementioned space in the IPv4 Special-Purpose Address Registry.

Likewise, [RFC2928] assigns an IPv6 address block (2001:0000::/23) to IANA and instructs IANA to allocate special-purpose address blocks from this space. [RFC4773] instructs IANA to create an IPv6 Special-Purpose Address Registry that records allocations from this address space. However, [RFC4773] does not instruct IANA to record special-purpose address block reservations from outside of the aforementioned space in the IPv6 Special-Purpose Address Registry.

This memo reiterates the assignment of an IPv4 address block (192.0.0.0/24) to IANA. It also instructs IANA to restructure its IPv4 and IPv6 Special-Purpose Address Registries. Specifically, this memo instructs IANA to record all special-purpose address blocks in the aforementioned registries. These include, but are not limited to, IPv4 allocations from 192.0.0.0/24 and IPv6 allocations from 2001:0000::/23. Furthermore, this memo defines:

- a common set of information that the registries will maintain regarding each special-purpose address block
- a common set of requirements for future entries

When the aforementioned registries include all special-purpose address blocks, [RFC5735] and [RFC5156] will become redundant with the registries. Therefore, this memo obsoletes [RFC5735] and [RFC5156]. Because this memo reiterates the assignment of 192.0.0.0/24 to IANA, and because it restructures the IPv4 Special-Purpose Address Registry, it obsoletes [RFC5736]. Finally, because this memo restructures the IPv6 Special-Purpose Address Registry, it obsoletes [RFC4773].

2. IANA Considerations

2.1. Assignment of an IPv4 Address Block to IANA

Table 7 of this document records the assignment of an IPv4 address block (192.0.0.0/24) to IANA for IETF protocol assignments. This address allocation to IANA is intended to support IETF protocol assignments. A more general view of the roles of IANA with respect to address allocation functions is documented in Sections 4.1 and 4.3 [RFC2860].

IANA has designated special-purpose address blocks in compliance with [RFC2860].

2.2. Restructuring of the IPv4 and IPv6 Special-Purpose Address Registries

IANA has restructured the following registries:

- IPv4 Special-Purpose Address Registry
- IPv6 Special-Purpose Address Registry

The IPv4 Special-Purpose Address Registry records all IPv4 special-purpose address blocks. These reservations include, but are not limited to, allocations from the 192.0.0.0/24 address block. Likewise, the IPv6 Special-Purpose Address Registry records all IPv6 special-purpose address blocks. These reservations include, but are not limited to, allocations from the 2001:0000::/23 address block.

Section 2.2.1 of this document describes information that both registries will maintain for each entry. Initially, IANA has populated the IPv4 Special-Purpose Address Registry with information taken from Section 2.2.2 of this document. Likewise, IANA has populated the IPv6 Special-Purpose Address Registry with information taken from Section 2.2.3 of this document.

IANA will update the aforementioned registries as requested in the "IANA Considerations" section of a document that has passed IETF Review [RFC5226]. The "IANA Considerations" section must include all of the information specified in Section 2.2.1 of this document.

2.2.1. Information Requirements

The IPv4 and IPv6 Special-Purpose Address Registries maintain the following information regarding each entry:

- Address Block - A block of IPv4 or IPv6 addresses that has been registered for a special purpose.
- Name - A descriptive name for the special-purpose address block.
- RFC - The RFC through which the special-purpose address block was requested.
- Allocation Date - The date upon which the special-purpose address block was allocated.
- Termination Date - The date upon which the allocation is to be terminated. This field is applicable for limited-use allocations only.

- Source - A boolean value indicating whether an address from the allocated special-purpose address block is valid when used as the source address of an IP datagram that transits two devices.

- Destination - A boolean value indicating whether an address from the allocated special-purpose address block is valid when used as the destination address of an IP datagram that transits two devices.

- Forwardable - A boolean value indicating whether a router may forward an IP datagram whose destination address is drawn from the allocated special-purpose address block between external interfaces.

- Global - A boolean value indicating whether an IP datagram whose destination address is drawn from the allocated special-purpose address block is forwardable beyond a specified administrative domain.

- Reserved-by-Protocol - A boolean value indicating whether the special-purpose address block is reserved by IP, itself. This value is "TRUE" if the RFC that created the special-purpose address block requires all compliant IP implementations to behave in a special way when processing packets either to or from addresses contained by the address block.

If the value of "Destination" is FALSE, the values of "Forwardable" and "Global" must also be false.

2.2.2. IPv4 Special-Purpose Address Registry Entries

Tables 1 though 16, below, represent entries with which IANA has initially populated the IPv4 Special-Purpose Address Registry.

Attribute	Value
Address Block	0.0.0.0/8
Name	"This host on this network"
RFC	[RFC1122], Section 3.2.1.3
Allocation Date	September 1981
Termination Date	N/A
Source	True
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 1: "This host on this network"

Attribute	Value
Address Block	10.0.0.0/8
Name	Private-Use
RFC	[RFC1918]
Allocation Date	February 1996
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 2: Private-Use Networks

Attribute	Value
Address Block	100.64.0.0/10
Name	Shared Address Space
RFC	[RFC6598]
Allocation Date	April 2012
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 3: Shared Address Space

Attribute	Value
Address Block	127.0.0.0/8
Name	Loopback
RFC	[RFC1122], Section 3.2.1.3
Allocation Date	September 1981
Termination Date	N/A
Source	False [1]
Destination	False [1]
Forwardable	False [1]
Global	False [1]
Reserved-by-Protocol	True

[1] Several protocols have been granted exceptions to this rule. For examples, see [RFC4379] and [RFC5884].

Table 4: Loopback

Attribute	Value
Address Block	169.254.0.0/16
Name	Link Local
RFC	[RFC3927]
Allocation Date	May 2005
Termination Date	N/A
Source	True
Destination	True
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 5: Link Local

Attribute	Value
Address Block	172.16.0.0/12
Name	Private-Use
RFC	[RFC1918]
Allocation Date	February 1996
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 6: Private-Use Networks

Attribute	Value
Address Block	192.0.0.0/24 [2]
Name	IETF Protocol Assignments
RFC	Section 2.1 of this document
Allocation Date	January 2010
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	False

[2] Not usable unless by virtue of a more specific reservation.

Table 7: IETF Protocol Assignments

Attribute	Value
Address Block	192.0.0.0/29
Name	DS-Lite
RFC	[RFC6333]
Allocation Date	June 2011
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 8: DS-Lite

Attribute	Value
Address Block	192.0.2.0/24
Name	Documentation (TEST-NET-1)
RFC	[RFC5737]
Allocation Date	January 2010
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	False

Table 9: TEST-NET-1

Attribute	Value
Address Block	192.88.99.0/24
Name	6to4 Relay Anycast
RFC	[RFC3068]
Allocation Date	June 2001
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	True
Reserved-by-Protocol	False

Table 10: 6to4 Relay Anycast

Attribute	Value
Address Block	192.168.0.0/16
Name	Private-Use
RFC	[RFC1918]
Allocation Date	February 1996
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 11: Private-Use Networks

Attribute	Value
Address Block	198.18.0.0/15
Name	Benchmarking
RFC	[RFC2544]
Allocation Date	March 1999
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 12: Network Interconnect Device Benchmark Testing

Attribute	Value
Address Block	198.51.100.0/24
Name	Documentation (TEST-NET-2)
RFC	[RFC5737]
Allocation Date	January 2010
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	False

Table 13: TEST-NET-2

Attribute	Value
Address Block	203.0.113.0/24
Name	Documentation (TEST-NET-3)
RFC	[RFC5737]
Allocation Date	January 2010
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	False

Table 14: TEST-NET-3

Attribute	Value
Address Block	240.0.0.0/4
Name	Reserved
RFC	[RFC1112], Section 4
Allocation Date	August 1989
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 15: Reserved for Future Use

Attribute	Value
Address Block	255.255.255.255/32
Name	Limited Broadcast
RFC	[RFC0919], Section 7
Allocation Date	October 1984
Termination Date	N/A
Source	False
Destination	True
Forwardable	False
Global	False
Reserved-by-Protocol	False

Table 16: Limited Broadcast

2.2.3. IPv6 Special-Purpose Address Registry Entries

Tables 17 through 28, below, represent entries with which the IANA has initially populated the IPv6 Special-Purpose Address Registry.

Attribute	Value
Address Block	::1/128
Name	Loopback Address
RFC	[RFC4291]
Allocation Date	February 2006
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 17: Loopback Address

Attribute	Value
Address Block	::/128
Name	Unspecified Address
RFC	[RFC4291]
Allocation Date	February 2006
Termination Date	N/A
Source	True
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 18: Unspecified Address

Attribute	Value
Address Block	64:ff9b::/96
Name	IPv4-IPv6 Translat.
RFC	[RFC6052]
Allocation Date	October 2010
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	True
Reserved-by-Protocol	False

Table 19: IPv4-IPv6 Translation Address

Attribute	Value
Address Block	::ffff:0:0/96
Name	IPv4-mapped Address
RFC	[RFC4291]
Allocation Date	February 2006
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 20: IPv4-Mapped Address

Attribute	Value
Address Block	100::/64
Name	Discard-Only Address Block
RFC	[RFC6666]
Allocation Date	June 2012
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 21: Discard-Only Prefix

Attribute	Value
Address Block	2001::/23
Name	IETF Protocol Assignments
RFC	[RFC2928]
Allocation Date	September 2000
Termination Date	N/A
Source	False[1]
Destination	False[1]
Forwardable	False[1]
Global	False[1]
Reserved-by-Protocol	False

[1] Unless allowed by a more specific allocation.

Table 22: IETF Protocol Assignments

Attribute	Value
Address Block	2001::/32
Name	TEREDO
RFC	[RFC4380]
Allocation Date	January 2006
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 23: TEREDO

Attribute	Value
Address Block	2001:2::/48
Name	Benchmarking
RFC	[RFC5180]
Allocation Date	April 2008
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 24: Benchmarking

Attribute	Value
Address Block	2001:db8::/32
Name	Documentation
RFC	[RFC3849]
Allocation Date	July 2004
Termination Date	N/A
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	False

Table 25: Documentation

Attribute	Value
Address Block	2001:10::/28
Name	ORCHID
RFC	[RFC4843]
Allocation Date	March 2007
Termination Date	March 2014
Source	False
Destination	False
Forwardable	False
Global	False
Reserved-by-Protocol	False

Table 26: ORCHID

Attribute	Value
Address Block	2002::/16 [2]
Name	6to4
RFC	[RFC3056]
Allocation Date	February 2001
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	N/A [2]
Reserved-by-Protocol	False

[2] See [RFC3056] for details.

Table 27: 6to4

Attribute	Value
Address Block	fc00::/7
Name	Unique-Local
RFC	[RFC4193]
Allocation Date	October 2005
Termination Date	N/A
Source	True
Destination	True
Forwardable	True
Global	False
Reserved-by-Protocol	False

Table 28: Unique-Local

Attribute	Value
Address Block	fe80::/10
Name	Linked-Scoped Unicast
RFC	[RFC4291]
Allocation Date	February 2006
Termination Date	N/A
Source	True
Destination	True
Forwardable	False
Global	False
Reserved-by-Protocol	True

Table 29: Linked-Scoped Unicast

3. Security Considerations

Security of the Internet's routing system relies on the ability to authenticate an assertion of unique control of an address block. Measures to authenticate such assertions rely on validation that the address block forms part of an existing allocated address block and that there is a trustable and unique reference in the IANA address registries.

The proposed registry is intended to provide an authoritative source of information regarding the currency and intended purpose of special purpose address blocks that are designated from the IANA-administered Special-Purpose registry. This is a small step towards the creation of a comprehensive registry framework that can be used as a trust point for commencing a chain of address validation. Consideration should be given to IANA registry publication formats that are machine parsable. Additionally, consideration should be given to the use of file signatures and associated certificate mechanisms to allow applications to confirm that the registry contents are current and that they have been published by the IANA.

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