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A Discard Prefix for IPv6

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## [Abstract](#)

Remote triggered black hole filtering describes a method of mitigating against denial-of-service attacks by selectively discarding traffic based on source or destination address. This document explains why a unique IPv6 prefix should be formally assigned by IANA for the purpose of facilitating IPv6 remote triggered black hole filtering.

## [Status of this Memo](#)

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## **[1. Introduction](#)**

Remote triggered black hole (RTBH) filtering describes a class of methods of blocking IP traffic to or from a specific destination on a network. These methods operate by setting the next-hop address of an IP packet with a specified source or destination address to be a unicast prefix which is wired locally or remotely to a router's discard or null interface. Typically, this information is propagated throughout an autonomous system using a dynamic routing protocol. By deploying RTBH systems across a network, traffic to or from specific destinations may be selectively black-holed in a manner which is efficient, scalable and straightforward to implement. For IPv4, some networks configure RTBH installations using [\[RFC1918\]](#) address space or the address blocks reserved for documentation in [\[RFC5737\]](#).

However RTBH configurations are not documentation, but operationally important features of many public-facing production networks.

Furthermore, [\[RFC3849\]](#) specifies that the IPv6 documentation prefix should be filtered in both local and public contexts. On this basis, it is suggested that both private network address blocks and documentation prefixes described in [\[RFC5737\]](#) are inappropriate for the purpose of RTBH configurations.

While it could be argued that there are other addresses and address prefixes which could be used for this purpose (e.g. `::/128`), or that an operator could assign an address block from their own address space for this purposes, there is currently no operational clarity on what address block would be appropriate or inappropriate to use for this purpose. By creating an assigned discard prefix for IPv6, the IETF will introduce operational clarity and good practice for implementation of IPv6 RTBH configurations.

### **[1.1. Conventions](#)**

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 [\[RFC2119\]](#).

## **2. A Discard Prefix for IPv6**

For the purposes of implementing an IPv6 remote triggered black hole filter, a unicast address block is required. There are currently no IPv6 unicast address blocks which are specifically nominated for the purposes of implementing RTBH filters.

As [\[RFC5635\]](#) describes situations where more than one discard address may be used for implementing multiple remote triggered black holes, a single assigned prefix is not sufficient to cover all likely RTBH filtering situations. Consequently, an address block is required in preference to a single address.

## **3. Operational Implications**

This assignment MAY be carried in a dynamic routing protocol within an autonomous system. The assignment SHOULD NOT be announced to third party autonomous systems and IPv6 traffic with an destination address within this prefix SHOULD NOT be forwarded to third party autonomous systems.

On networks which implement IPv6 remote triggered black holes, some or all of this network block MAY be configured with a destination of a discard or null interface on any or all IPv6 routers within the autonomous system.

## **4. IANA Considerations**

This document directs IANA to record the allocation of the IPv6 address prefix xxxx/64 as a discard-only prefix in the IPv6 Address Space registry. No end party is to be assigned this prefix. The prefix should be allocated from ::/3.

## **5. Security Considerations**

As the prefix specified in this document should not normally be transmitted or accepted over inter-domain BGP sessions, it is appropriate to label the prefix as a Martian ([\[RFC3704\]](#)) for inclusion in inter-domain BGP prefix filters.

## **6. References**

### **6.1. Normative References**

<b>[RFC5635]</b>	Kumari, W. and D. McPherson, " <a href="#">Remote Triggered Black Hole Filtering with Unicast Reverse Path Forwarding (uRPF)</a> ", RFC 5635, August 2009.
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### **6.2. Informative References**

<b>[RFC1881]</b>	
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	Internet Architecture BoardInternet Engineering Steering Group, " <a href="#">IPv6 Address Allocation Management</a> ", RFC 1881, December 1995.
[RFC1918]	<a href="#">Rekhter, Y.</a> , <a href="#">Moskowitz, R.</a> , <a href="#">Karrenberg, D.</a> , <a href="#">Groot, G.</a> and <a href="#">E. Lear</a> , " <a href="#">Address Allocation for Private Internets</a> ", BCP 5, RFC 1918, February 1996.
[RFC2119]	<a href="#">Bradner, S.</a> , " <a href="#">Key words for use in RFCs to Indicate Requirement Levels</a> ", BCP 14, RFC 2119, March 1997.
[RFC3704]	Baker, F. and P. Savola, " <a href="#">Ingress Filtering for Multihomed Networks</a> ", BCP 84, RFC 3704, March 2004.
[RFC3849]	Huston, G., Lord, A. and P. Smith, " <a href="#">IPv6 Address Prefix Reserved for Documentation</a> ", RFC 3849, July 2004.
[RFC5226]	Narten, T. and H. Alvestrand, " <a href="#">Guidelines for Writing an IANA Considerations Section in RFCs</a> ", BCP 26, RFC 5226, May 2008.
[RFC5737]	Arkko, J., Cotton, M. and L. Vegoda, " <a href="#">IPv4 Address Blocks Reserved for Documentation</a> ", RFC 5737, January 2010.

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