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**IPv6 Router Advertisement IPv4 Availability Flag  
draft-hinden-ipv4flag-00**

Abstract

This document specifies a Router Advertisement Flag to indicate that there is no IPv4 service on the advertising router. This document updates [RFC5175](#).

Status of This Memo

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## [1.](#) Introduction

This document specifies a Router Advertisement Flag to indicate that there is no IPv4 service on the advertising router.

Hosts that support IPv4 and IPv6, usually called dual stack hosts, need to work on IPv6 only networks. That is, a link where there are no IPv4 routers and/or IPv4 services. Monitoring of IPv6-only networks, for example at the IETF 100 meeting in Singapore, shows that current dual stack hosts will create local auto-configured IPv4 addresses and attempt to reach IPv4 services. A mechanism is needed to inform hosts that there is no IPv4 support and that they should turn off IPv4.

Because there is no IPv4 support on these links, the only way to notify the dual stack hosts on the link is to use an IPv6 mechanism. An active notification will be much more robust than attempting to deduce this state by the lack of IPv4 responses or traffic.

IPv4-only hosts, and dual-stack hosts that do not recognize the new flag, will continue to attempt IPv4 operations, in particular IPv4 discovery protocols typically sent as link-layer broadcasts. This legacy traffic cannot be prevented by any IPv6 mechanism. The value of the new flag is limited to dual-stack hosts that recognize it.

This document specifies an new flag for IPv6 Neighbor Discovery [[RFC4861](#)] Router Advertisement Flag [[RFC5175](#)]. It updates [[RFC5175](#)].

## [2.](#) IPv4 Availability Flag

[RFC5175](#) currently defines the flags in the NDP Router Advertisement message. This currently contains the following one-bit flags defined in published RFCs:



```
 0 1 2 3 4 5 6 7
+-+--+--+--+--+
|M|O|H|Prf|P|R|R|
+-+--+--+--+--+
```

M    Managed Address Configuration Flag [[RFC4861](#)]  
O    Other Configuration Flag [[RFC4861](#)]  
H    Mobile IPv6 Home Agent Flag [[RFC3775](#)]  
Prf   Router Selection Preferences [[RFC4191](#)]  
P    Neighbor Discovery Proxy Flag [[RFC4389](#)]  
R    Reserved

This document defines bit 6 to be the IPv4 Available Flag:

4    IPv4 Available Flag [[RFC4861](#)]

This flag has two values. These are:

0    IPv4 is Available on this Router  
1    IPv4 is Not Available on this Router

[RFC 5175](#) requires that unused flag bits be set to zero. Therefore, a router that does not support the new flag will not appear to assert that IPv4 is unsupported.

If there are multiple IPv6 routers on a network, they might send different values of the flag. A host that receives only RAs with the flag set to 1 should not attempt IPv4 operations, unless it subsequently receives at least one RA with the flag set to zero.

### 3. IANA Considerations

IANA is requested to assign the new Router Advertisement flag defined in [Section 2](#) of this document. Bit 6 is the next available bit in this registry, IANA is requested to use this bit unless there is a reason not to use this bit.

IANA should also register this new flag bit in IANA IPv6 ND Router Advertisement flags Registry [[IANA-RF](#)].



#### **4. Security Considerations**

This document shares the security issues with other parts of IPv6 Neighbor Discovery. General techniques to protect Router Advertisement traffic such as Router Guard [[RFC6105](#)] are useful in protecting these vulnerabilities.

A bad actor could use this mechanism to attempt turn off IPv4 service on a network that is using IPv4. In that case, as long as there are routers sending Router Advertisements with this Flag set to 0, this would override this attack given the mechanism in [Section 2](#). Specifically a host would only turn off IPv4 service if it wasn't hearing any Router Advertisement with the Flag set to 0.

#### **5. Acknowledgments**

[Your name here]

#### **6. References**

##### **6.1. Normative References**

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##### **6.2. Informative References**

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