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Stub Router Flag in ICMPv6 Router Advertisement Messages

Abstract

This document defines a new Stub Router flag in the Router Advertisement message that can be used to distinguish configuration information sent by stub routers from information sent by infrastructure routers.

Status of This Memo

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1. Introduction

A stub router provides IP connectivity between a stub network and an infrastructure network. A common stub router example is a device that attaches a 6LoWPAN-based network to a home network.

To support IPv6 reachability between infrastructure network devices and stub network devices, routable IPv6 addresses must be configured on both the infrastructure and stub networks. Stub routers decide whether or not to advertise their ULA prefixes [[RFC4193](#)] on the infrastructure network to which they are connected by tracking the presence of infrastructure-provided IPv6 service. When a stub router sees a new prefix advertised on infrastructure, this prefix may be coming from an infrastructure router, or from another stub router. In the second case, the two stub routers could wind up in a cycle of publishing and deprecating their prefixes as they see prefixes from the other stub router show up.

The stub router document [[I-D.ietf-snac-simple](#)] explains how two stub routers decide which one has precedence in the event of a conflict. However, the infrastructure prefix always has precedence over a prefix provided by any stub router. In order to differentiate between prefixes advertised by infrastructure and those advertised by stub routers, it is necessary to be able to mark RAs sent by stub routers.

Additionally, the RA header includes M and O flags that indicate whether DHCPv6 is available on the link. [Section 6.3.4](#) of [[RFC4861](#)] specifies that hosts consider the most recently received information as authoritative. As a result, stub routers must mirror the M and O values in RAs received from infrastructure routers. The Stub Router flag allows stub routers to easily identify which RAs are sent by infrastructure routers.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP

14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Stub Router Flag

This document defines a new "Stub Router" flag as flag bit 6 in the Router Advertisement flags field.

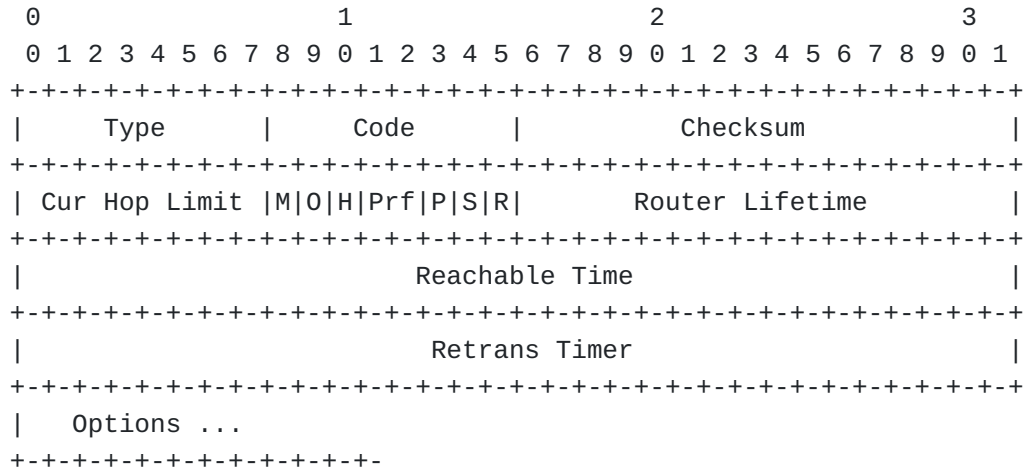


Figure 1: outer Advertisement Message Format

The S flag is the "Stub Router" flag.

The M, O, H, Prf, P, and R flags are as defined in [RFC5175].

4. Router Advertisement Transmission

A stub router that is not explicitly configured as part of the infrastructure network MUST set the Stub Router flag in outgoing RA messages.

How and when a stub router sets the M and O flags in outgoing RAs is specified in [I-D.ietf-snac-simple].

5. IANA Considerations

IANA is requested to allocate a flag from the "IPv6 ND Router Advertisement flags" registry of [RFC5175], as specified below:

| RA Option Bit | Description | Reference |
|---------------|----------------------|---------------|
| 6 | S - Stub Router Flag | This Document |

Table 1

6. Security Considerations

This protocol shares the security issues of NDP that are documented in the "Security Considerations" section of [[RFC4861](#)].

7. Normative References

- [**I-D.ietf-snac-simple**] Lemon, T. and J. Hui, "Automatically Connecting Stub Networks to Unmanaged Infrastructure", Work in Progress, Internet-Draft, draft-ietf-snac-simple-03, 30 January 2024, <<https://datatracker.ietf.org/doc/html/draft-ietf-snac-simple-03>>.
- [**RFC2119**] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [**RFC4193**] Hinden, R. and B. Haberman, "Unique Local IPv6 Unicast Addresses", RFC 4193, DOI 10.17487/RFC4193, October 2005, <<https://www.rfc-editor.org/info/rfc4193>>.
- [**RFC4861**] Narten, T., Nordmark, E., Simpson, W., and H. Soliman, "Neighbor Discovery for IP version 6 (IPv6)", RFC 4861, DOI 10.17487/RFC4861, September 2007, <<https://www.rfc-editor.org/info/rfc4861>>.
- [**RFC5175**] Haberman, B., Ed. and R. Hinden, "IPv6 Router Advertisement Flags Option", RFC 5175, DOI 10.17487/RFC5175, March 2008, <<https://www.rfc-editor.org/info/rfc5175>>.
- [**RFC8174**] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

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