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Packet loss resiliency for Router Solicitations
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Abstract

When an interface on a host is initialized, the host transmits Router Solicitations in order to minimize the amount of time it needs to wait until the next unsolicited multicast Router Advertisement is received. In certain scenarios, these router solicitations transmitted by the host might be lost. This document specifies a mechanism for hosts to cope with the loss of the initial Router Solicitations.

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1. Introduction

As specified in [[RFC4861](#)], when an interface on a host is initialized, in order to obtain Router Advertisements quickly, a host transmits up to MAX_RTR_SOLICITATIONS (3) Router Solicitation messages, each separated by at least RTR_SOLICITATION_INTERVAL (4) seconds. In certain scenarios, these router solicitations transmitted by the host might be lost.

The generic scenario is that the interface on the host comes up before it gets access to a router. Examples are

- a. Host is connected to a bridged residential gateway (over Ethernet or WiFi). LAN connectivity is achieved at interface initialization, but the upstream WAN connectivity is not active yet. In this case, the host just gives up after the initial RS retransmits.
- b. Accesses that turn off periodic RAs and operate only in a RS triggered environment. In this case if the link between the AP and the host comes up before the link between the AP and the Controller/Router, the host will never be able to connect.

Once the initial RSs are lost, the host gives up and assumes that there are no routers on the link as specified in [Section 6.3.7 of \[\[RFC4861\]\(#\)\]](#). The host will not have any form of Internet connectivity until the next unsolicited multicast Router Advertisement is received. These Router Advertisements are transmitted at most MaxRtrAdvInterval seconds apart (maximum value 1800 seconds). In the worst case scenario, a host would be without any connectivity, on average, for half this period (900 seconds). This delay may be unacceptable in some scenarios.

1.1. Conventions used in this document

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. Proposed algorithm

To achieve resiliency to packet loss, the host needs to continue retransmitting the Router Solicitations until it receives a Router Advertisement, or until it is willing to accept that no router exists. If the host continues retransmitting the RSs at RTR_SOLICITATION_INTERVAL second intervals, it would cause excessive network traffic. To achieve resiliency while keeping the network traffic low, the host must use some form of exponential backoff algorithm to retransmit the RSs.

3. IANA Considerations

This document does not require any IANA actions.

4. Security Considerations

This document does not present any additional security issues beyond those specified in [[RFC4861](#)].

5. Acknowledgements

The author would like to thank Steve Baillargeon for his reviews and suggestions that made this document better.

6. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

[RFC4861] Narten, T., Nordmark, E., Simpson, W., and H. Soliman, "Neighbor Discovery for IP version 6 (IPv6)", [RFC 4861](#), September 2007.

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