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**Security Implications of the Use of IPv6 Extension Headers with IPv6
Neighbor Discovery
draft-gont-6man-nd-extension-headers-00**

Abstract

IPv6 Extension Headers with Neighbor Discovery messages can be leveraged to circumvent simple local network protections, such as "Router Advertisement Guard". Since there is no legitimate use for IPv6 Extension Headers in Neighbor Discovery messages, and such use greatly complicates network monitoring and simple security mitigations such as RA-Guard, this document proposes that hosts silently ignore Neighbor Discovery messages that use IPv6 Extension Headers.

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1. Introduction

IPv6 Router Advertisement Guard (RA-Guard) is a mitigation technique for attack vectors based on ICMPv6 Router Advertisement messages. describes the problem statement of "Rogue IPv6 Router Advertisements", and specifies the "IPv6 Router Advertisement Guard" functionality.

[[draft-gont-v6ops-ra-guard-evasion](#)] describes how IPv6 Extension Headers can be leveraged to circumvent the RA-Guard protection. Additionally, the use of Extension Headers (and of the Fragmentation Header in particular) greatly increases the difficulty to monitor Neighbor Discovery traffic (e.g., with tools such as NDPMon).

Since there is no current legitimate use for IPv6 Extension Headers in IPv6 Neighbor Discovery packets, and since avoiding their use for such packets greatly simplifies monitoring of Neighbor Discovery traffic and the possible mitigations for Neighbor Discovery attacks, this document proposes that hosts silently ignore Neighbor Discovery messages that employ IPv6 Extension Headers.

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 [RFC 2119](#) [[RFC2119](#)].

2. Specification

Hosts SHOULD silently ignore Neighbor Discovery messages (Neighbor Solicitation, Neighbor Advertisement, Router Solicitation, and Router Advertisement messages) that employ IPv6 Extension Headers.

3. Security Considerations

IPv6 Extension Headers can be leveraged to circumvent network monitoring and mechanisms such as RA-Guard [[draft-gont-v6ops-ra-guard-evasion](#)]. By updating the relevant specifications such that IPv6 Extension Headers are not allowed in Neighbor Discovery messages, protection of local network against Neighbor Discovery attacks, and monitoring of Neighbor Discovery traffic is greatly simplified.

[[draft-gont-v6ops-ra-guard-evasion](#)] discusses possible filtering rules that could be enforced to mitigate Neighbor Discovery attacks that employ IPv6 Extension Headers.

4. Acknowledgements

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5. References

5.1. Normative References

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5.2. Informative References

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