Internet Engineering Task Force
Internet-Draft
Intended status: Standards Track
Expires: July 18, 2015

S. Jiang
Huawei Technologies Co., Ltd
D. Zhang
Alibaba Co., Ltd
S. Krishnan
Ericsson

January 14, 2015

CGA SEC Option for Secure Neighbor Discovery Protocol
draft-jiang-6man-cga-sec-option-01

Abstract

A Cryptographically Generated Address is an IPv6 addresses binding with a public/private key pair. It is a vital component of Secure Neighbor Discovery (SeND) protocol. The current SeND specifications are lack of procedures to specify the Sec bits. A new SEC option is defined accordingly to address this issue.

Table of Contents

1. Introduction

Cryptographically Generated Addresses (CGA, [RFC3972]) are used to make sure that the sender of a Neighbor Discovery message is the "owner" of the claimed address. Although it is not mandatory, it is a vital component of Secure Neighbor Discovery (SeND, [RFC3971]) protocol. After CGA has been defined, as an independent security property, many other CGA usages have been proposed and defined, such as Enhanced Route Optimization for Mobile IPv6 [RFC4866], Site Multihoming by IPv6 Intermediation (SHIM6) [RFC5533], etc.

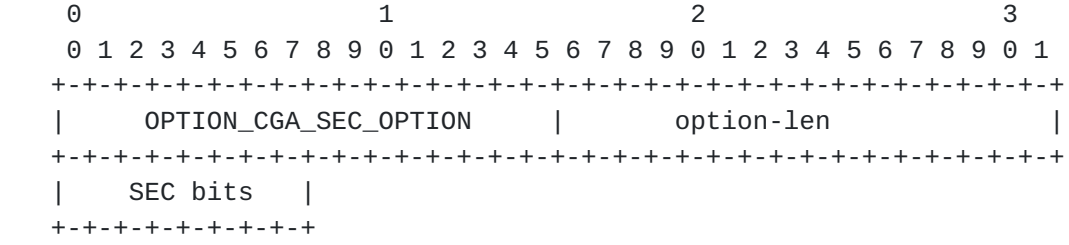
SEC bits are an important parameter in the generation of CGAs. Particularly, SEC values are used to artificially introduce additional difficulty in the CGA generation process in order to provide additional protection against brute force attacks. Therefore, in different environments, host may be required to use different SEC bits in the generation of their CGAs. However, the base SeND protocol fails to distribute the SEC values to the hosts. As a result, the network administration cannot propagate any requirements regarding to SEC value of host-generated CGA addresses. In order to fill this gap, a new CGA SEC Option, is defined in this document.

2. Requirements Language

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].

3. CGA SEC Option

CGA SEC Option is used to indicate on link hosts the lowest CGA SEC value they SHOULD use. It SHOULD be contained in and only in the Router Advertisement Message [RFC4861].



option-code OPTION_CGA_SEC_OPTION (TBA1)

option-len 1.

SEC bits The value of SEC bits is specified in [RFC3972].

4. Host Behavior

On receiving the CGA SEC Option with a recommended SEC value, a host SHOULD use a CGA with the recommended or higher SEC value. If choosing a CGA with a SEC value lower than the recommended, the host MAY take the risk that it is not able to use full network capabilities. The network may consider the hosts that use CGAs with lower SEC values as unsecure users and decline some or all network services.

5. Security Considerations

This document extends SeND with a CGA SEC Option to transprot SEC bits used in the generation of GCAs, which enables administrators to specify and adjust the security level of the CGAs used in the network. Apart from that, this approach does not introduce any significant changes to the underlying security issues considered in Section 9 of [RFC3971].

6. IANA Considerations

This document defines a new Neighbor Discovery Protocol options, which must be assigned an Option Type value within the IPv6 Neighbor Discovery Option Formats table of Internet Control Message Protocol version 6 (ICMPv6) Parameters (http://www.iana.org/assignments/icmpv6-parameters):

Type	Description	Reference
TBA1	CGA SEC option	This document

7. Acknowledgements

The authors would like to thanks the valuable comments made by members of 6man WG.

This document was produced using the xml2rfc tool [RFC2629].

8. References

8.1. Normative References

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

[RFC3971] Arkko, J., Kempf, J., Zill, B., and P. Nikander, "SEcure Neighbor Discovery (SEND)", RFC 3971, March 2005.

[RFC3972] Aura, T., "Cryptographically Generated Addresses (CGA)", RFC 3972, March 2005.

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

8.2. Informative References

[RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", RFC 2629, June 1999.

[RFC4866] Arkko, J., Vogt, C., and W. Haddad, "Enhanced Route Optimization for Mobile IPv6", RFC 4866, May 2007.

[RFC5533] Nordmark, E. and M. Bagnulo, "Shim6: Level 3 Multihoming Shim Protocol for IPv6", RFC 5533, June 2009.

Authors' Addresses

Sheng Jiang
Huawei Technologies Co., Ltd
Q14, Huawei Campus, No.156 Beiqing Road
Hai-Dian District, Beijing, 100095
P.R. China

Email: jiangsheng@huawei.com

Dacheng Zhang
Alibaba Co., Ltd
9th Floor, A Area, Wentelai World Finance Centre, 1 West Dawang Road
Chaoyang District, Beijing, 100095 100025
P.R. China

Email: dacheng.zdc@alibaba-inc.com

Suresh Krishnan
Ericsson
8400 Decarie Blvd.
Town of Mount Royal, QC
Canada

Phone: +1 514 345 7900 x42871
Email: suresh.krishnan@ericsson.com