

IPv6 maintenance Working Group (6man)  
Internet-Draft  
Updates: [2464](#), [2467](#), [2470](#), [4291](#) (if approved)  
Intended status: Standards Track  
Expires: April 25, 2014

F. Gont  
SI6 Networks / UTN-FRH  
A. Cooper  
CDT  
D. Thaler  
Microsoft  
W. Liu  
Huawei Technologies  
October 22, 2013

Deprecating EUI-64 Based IPv6 Addresses  
draft-gont-6man-deprecate-eui64-based-addresses-00

## Abstract

Stateless Address Autoconfiguration (SLAAC) for IPv6 typically results in hosts configuring one or more stable addresses composed of a network prefix advertised by a local router, and an Interface Identifier that typically embeds a hardware address (e.g., an IEEE LAN MAC address). The security and privacy implications of embedding hardware addresses in the Interface Identifier have been known and understood for some time now, and some popular IPv6 implementations have already deviated from such scheme to mitigate these issues. This document deprecates the use of hardware addresses in IPv6 Interface Identifiers, and recommends the use of an alternative scheme ([[I-D.ietf-6man-stable-privacy-addresses](#)]) for the generation of IPv6 stable addresses.

## Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on April 25, 2014.

## Copyright Notice

Internet-Draft

Generation of IPv6 IIDs

October 2013

Copyright (c) 2013 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">2</a>
<a href="#">2.</a>	Terminology . . . . .	<a href="#">3</a>
<a href="#">3.</a>	Generation of IPv6 Interface Identifiers . . . . .	<a href="#">3</a>
<a href="#">4.</a>	IANA Considerations . . . . .	<a href="#">3</a>
<a href="#">5.</a>	Security Considerations . . . . .	<a href="#">4</a>
<a href="#">6.</a>	Acknowledgements . . . . .	<a href="#">4</a>
<a href="#">7.</a>	References . . . . .	<a href="#">4</a>
<a href="#">7.1.</a>	Normative References . . . . .	<a href="#">4</a>
<a href="#">7.2.</a>	Informative References . . . . .	<a href="#">5</a>
	Authors' Addresses . . . . .	<a href="#">5</a>

## [1.](#) Introduction

[RFC4862] specifies Stateless Address Autoconfiguration (SLAAC) for IPv6 [[RFC2460](#)], which typically results in hosts configuring one or more "stable" addresses composed of a network prefix advertised by a local router, and an Interface Identifier (IID) [[RFC4291](#)] that typically embeds a hardware address (e.g., an IEEE LAN MAC address).

The security and privacy implications of embedding a hardware address in an IPv6 Interface ID have been known for some time now, and are discussed in great detail in [[I-D.ietf-6man-ipv6-address-generation-privacy](#)]; they include:

- o Network activity correlation
- o Location tracking

- o Address scanning
- o Device-specific vulnerability exploitation

Some popular IPv6 implementations have already deviated from the traditional IID generation scheme to mitigate the aforementioned security and privacy implications [[Microsoft](#)].

As a result of the aforementioned issues, this document deprecates the use of hardware addresses in Interface Identifiers, and recommends the implementation of an alternative scheme ([\[I-D.ietf-6man-stable-privacy-addresses\]](#)) that mitigates most of the aforementioned issues.

NOTE: [\[RFC4291\]](#) defines the "Modified EUI-64 format" (which this document does not deprecate) for Interface identifiers. [Appendix A of \[RFC4291\]](#) then describes how to transform an IEEE EUI-64 identifier, or an IEEE 802 48-bit MAC address from which an EUI-64 identifier is derived, into an interface identifier in the Modified EUI-64 format. Deriving an IPv6 interface identifier based on an IEEE EUI-64 identifier is what is deprecated in this document. Other ways of generating an interface identifier in the Modified EUI-64 format are unaffected.

## [2.](#) Terminology

Stable address:

An address that does not vary over time within the same network (as defined in [\[I-D.ietf-6man-ipv6-address-generation-privacy\]](#)).

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](#)].

## [3.](#) Generation of IPv6 Interface Identifiers

Nodes MUST NOT employ IPv6 address generation schemes that embed the underlying hardware address in the Interface Identifier. Namely, nodes MUST NOT generate Interface Identifiers with the schemes specified in [\[RFC2464\]](#), [\[RFC2467\]](#), and [\[RFC2470\]](#).

Nodes SHOULD implement and employ [\[I-D.ietf-6man-stable-privacy-addresses\]](#) as the default scheme for generating stable IPv6 addresses with SLAAC.

#### [4.](#) IANA Considerations

There are no IANA registries within this document. The RFC-Editor can remove this section before publication of this document as an RFC.

Gont, et al.

Expires April 25, 2014

[Page 3]

---

Internet-Draft

Generation of IPv6 IIDs

October 2013

#### [5.](#) Security Considerations

This document deprecates the use of hardware addresses in IPv6 Interface Identifiers, and recommends an alternative scheme for generating IPv6 addresses with SLAAC such that a number of security and privacy issues are mitigated.

#### [6.](#) Acknowledgements

The authors would like to thank [TBD] for providing valuable comments on earlier versions of this document.

Fernando Gont would like to thank Ray Hunter for providing valuable input on this topic.

#### [7.](#) References

##### [7.1.](#) Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2460] Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", [RFC 2460](#), December 1998.
- [RFC2464] Crawford, M., "Transmission of IPv6 Packets over Ethernet Networks", [RFC 2464](#), December 1998.
- [RFC2467] Crawford, M., "Transmission of IPv6 Packets over FDDI

Networks", [RFC 2467](#), December 1998.

[RFC2470] Crawford, M., Narten, T., and S. Thomas, "Transmission of IPv6 Packets over Token Ring Networks", [RFC 2470](#), December 1998.

[RFC4291] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", [RFC 4291](#), February 2006.

[RFC4862] Thomson, S., Narten, T., and T. Jinmei, "IPv6 Stateless Address Autoconfiguration", [RFC 4862](#), September 2007.

[I-D.ietf-6man-stable-privacy-addresses]  
Gont, F., "A Method for Generating Semantically Opaque Interface Identifiers with IPv6 Stateless Address Autoconfiguration (SLAAC)", [draft-ietf-6man-stable-privacy-addresses-14](#) (work in progress), October 2013.

Gont, et al.

Expires April 25, 2014

[Page 4]

---

Internet-Draft

Generation of IPv6 IIDs

October 2013

## [7.2.](#) Informative References

[I-D.ietf-6man-ipv6-address-generation-privacy]  
Cooper, A., Gont, F., and D. Thaler, "Privacy Considerations for IPv6 Address Generation Mechanisms", [draft-ietf-6man-ipv6-address-generation-privacy-00](#) (work in progress), October 2013.

[Microsoft]  
Davies, J., "Understanding IPv6, 3rd. ed", page 83, Microsoft Press, 2012, <<http://it-ebooks.info/book/1022/>>.

## Authors' Addresses

Fernando Gont  
SI6 Networks / UTN-FRH  
Evaristo Carriego 2644  
Haedo, Provincia de Buenos Aires 1706  
Argentina

Phone: +54 11 4650 8472  
Email: [fgont@si6networks.com](mailto:fgont@si6networks.com)

URI: <http://www.si6networks.com>

Alissa Cooper  
CDT  
1634 Eye St. NW, Suite 1100  
Washington, DC 20006  
US

Phone: +1-202-637-9800  
Email: [acooper@cdt.org](mailto:acooper@cdt.org)  
URI: <http://www.cdt.org/>

Dave Thaler  
Microsoft  
Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052

Phone: +1 425 703 8835  
Email: [dthaler@microsoft.com](mailto:dthaler@microsoft.com)

Gont, et al.

Expires April 25, 2014

[Page 5]

---

Internet-Draft

Generation of IPv6 IIDs

October 2013

Will Liu  
Huawei Technologies  
Bantian, Longgang District  
Shenzhen 518129  
P.R. China

Email: [liushucheng@huawei.com](mailto:liushucheng@huawei.com)

