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Reaction of Stateless Address Autoconfiguration (SLAAC) to Flash-Renumbering Events

Abstract

In scenarios where network configuration information related to IPv6 prefixes becomes invalid without any explicit and reliable signaling of that condition (such as when a Customer Edge router crashes and reboots without knowledge of the previously employed prefixes), nodes on the local network may continue using stale prefixes for an unacceptably long time (on the order of several days), thus resulting in connectivity problems. This document describes this issue and discusses operational workarounds that may help to improve network robustness. Additionally, it highlights areas where further work may be needed.

Status of This Memo

This document is not an Internet Standards Track specification; it is published for informational purposes.

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Table of Contents

[1. Introduction](#)

[2. References](#)

[2.1. Normative References](#)

[2.2. Informative References](#)

[Authors' Addresses](#)

1. Introduction

IPv6 Stateless Address Autoconfiguration (SLAAC) [[RFC4862](#)] conveys information about prefixes to be employed for address configuration via Prefix Information Options (PIOs) sent in Router Advertisement (RA) messages. IPv6 largely assumes prefix stability, with network renumbering only taking place in a planned manner, old/stale prefixes being phased out via reduced prefix lifetimes, and new prefixes (with longer lifetimes) being introduced at the same time. However, there are several scenarios that may lead to the so-called "flash-renumbering" events, where the prefix employed by a network suddenly becomes invalid and replaced by a new prefix. In some of these scenarios, the local router producing the network renumbering event may try to deprecate the currently employed prefixes (by explicitly signaling the network about the renumbering event), whereas in other scenarios, it may be unable to do so.

[snip]

- There may be existing advice for ISPs to deliver dynamic IPv6 prefixes **by default** (e.g., see [[GERMAN-DP2](#)]) over privacy concerns associated with stable prefixes.

For a number of reasons (such as the ones stated above), IPv6 deployments may employ dynamic prefixes (even at the expense of the issues discussed in this document), and there might be scenarios in which the dynamics of a network are such that the network exhibits the behavior of dynamic prefixes. Rather than trying to regulate how operators may run their networks, this document aims at improving network robustness in the deployed Internet.

2. References

2.1. Normative References

[[RFC4862](#)]

Thomson, S., Narten, T., and T. Jinmei, "IPv6 Stateless Address Autoconfiguration", RFC 4862, DOI 10.17487/RFC4862, September 2007, <<https://www.rfc-editor.org/info/rfc4862>>.

2.2. Informative References

[GERMAN-DP2] BFDI, "Einführung von IPv6 Hinweise für Provider im Privatkundengeschäft und Hersteller" (Introduction of IPv6: notes for providers in the private sector and manufacturers), Entschliessung der 84. Konferenz der Datenschutzbeauftragten des Bundes und der Länder, November 2012, <http://www.bfdi.bund.de/SharedDocs/Publikationen/Entschliessungssammlung/DSBundLaender/84DSK_EinfuehrungIPv6.pdf?__blob=publicationFile>.

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