Reserved IPv6 Interface Identifiers
draft-ietf-6man-reserved-iids-03

Status of this Memo

By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she becomes aware will be disclosed, in accordance with Section 6 of BCP 79.

Internet-Drafts are draft documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

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."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on June 6, 2009.
Abstract

Interface Identifiers in IPv6 unicast addresses are used to identify interfaces on a link. They are required to be unique within a subnet. Several RFCs have specified interface identifiers or identifier ranges that have a special meaning attached to them. An IPv6 node autoconfiguring an interface identifier in these ranges will encounter unexpected consequences. Since there is no centralized repository for such reserved identifiers, this document aims to create one.

Table of Contents

1. Requirements notation ........................................... 3
2. Introduction .................................................. 4
   2.1. Applicability .............................................. 4
3. Issues with reusing reserved Interface Identifiers ............... 5
   3.1. Possible solutions ......................................... 5
4. IANA Considerations ............................................ 6
5. Acknowledgements ............................................... 7
6. Security Considerations ......................................... 8
7. References ..................................................... 9
   7.1. Normative References ..................................... 9
   7.2. Informative References ................................... 9
Appendix A. List of potentially affected RFCs ....................... 10
Author’s Address .................................................. 11
Intellectual Property and Copyright Statements ..................... 12
1. Requirements notation

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. Introduction

An IPv6 unicast address is composed of two parts: a subnet prefix and an interface identifier (IID) that identifies an unique interface within the subnet prefix. The structure of an IPv6 unicast address is depicted in the IPv6 Addressing Architecture [RFC4291] and is replicated here for clarity.

| n bits | 128-n bits |
| +-----------------+-----------------+ |
| subnet prefix    | interface ID    |

Figure 1: IPv6 Unicast Address Format

For all unicast addresses, except those that start with the binary value 000, Interface IDs are required to be 64 bits long and to be constructed in Modified EUI-64 format. Examples of mechanisms that generate interface identifiers without an unique token include Cryptographically Generated Addresses [RFC3972], Privacy Addresses [RFC4941], Hash Based Addresses [HBA] etc. Non-unique interface identifiers can also be allocated using managed address assignment mechanisms like DHCPv6 [RFC3315].

2.1. Applicability

This document applies only to interface identifiers that are formed in the modified EUI-64 format as defined in Appendix A of [RFC4291]. All other types of interface identifiers are out of scope.
3. Issues with reusing reserved Interface Identifiers

Let us assume a node comes up with an interface identifier that has been reserved for use in some other capacity. e.g. An IPv6 node that uses temporary IPv6 addresses [RFC4941] comes up with an IID of fdff:ffff:ffff:fff. This node will receive requests from all nodes that are requesting a service from a MobileIPv6 home agent since the above mentioned interface identifier has been reserved in [RFC2526] to serve as a MIPv6 home agents anycast address. At best this is an annoyance to the node that came up with this address. In the worst case scenario another node on the link would be denied service and may not look for other methods of acquiring a home agent. Thus, such reserved interface identifiers MUST NOT be used for autonomous auto-configuration or for managed address configuration.

3.1. Possible solutions

There are two possible ways to go about avoiding usage of these reserved interface identifiers. One of them would be to add normative reference to each specification that reserves an interface identifier. The other one would be to create an IANA registry for such interface identifiers. There are two disadvantages to the normative reference approach. Firstly, this approach does not scale well. This is because the number of such specifications that need to be updated is large. Secondly, the maturity level of the document reserving the IID might be lower than the one prohibited from using it. This will cause a downward reference problem. Therefore the better solution is to create an IANA registry for this purpose.
4. IANA Considerations

This document requests the creation of an IANA registry for reserved IPv6 Interface Identifiers. Initial values for the reserved IPv6 Interface Identifiers are given below.

+-----------------------------------------+-------------------------+
<table>
<thead>
<tr>
<th>Interface Identifier Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000:0000:0000:0000</td>
<td>Subnet-Router Anycast</td>
</tr>
<tr>
<td></td>
<td>[RFC4291]</td>
</tr>
<tr>
<td>FDFF:FFFF:FFFF:FF80-FDFF:FFFF:FFFF:FFFF</td>
<td>Reserved Subnet Anycast</td>
</tr>
<tr>
<td></td>
<td>Addresses[RFC2526]</td>
</tr>
</tbody>
</table>
+-----------------------------------------+-------------------------+

Table 1: Current Assignments

It is possible that implementations might predate a specific assignment from this registry and hence not be cognizant of the reserved nature of the interface identifier. Hence, future assignments from this registry are discouraged. Future assignments, if any, are to be made through Standards Action [RFC5226]. Assignments consist of a single interface identifier or a range of interface identifiers.

NOTE: Please note that the address :: (all zeros in the interface identifier field) is used as the unspecified address and ::/0 is used as a default route indicator, as specified in [RFC5156]. These uses do not conflict with the reserved interface identifiers defined here, since the reserved identifiers defined in this document are used for avoiding conflicts with stateless address autoconfiguration that utilizes a 64 bit prefix length.
5. Acknowledgements

The author would like to thank Alain Durand, Alex Petrescu, Bernie Volz, Bob Hinden, Christian Huitema, Fred Templin, Jordi Palet Martinez, Pekka Savola, Remi Denis-Courmont, Tim Enos, Alex Petrescu, Ed Jankiewicz, Brian Carpenter, Alfred Hoenes, Jari Arkko, Pasi Eronen, Tim Polk, Lars Eggert, Derek Atkins and Robert Sparks for reviewing this document and suggesting changes.
6. Security Considerations

By utilizing one of the reserved interface identifiers, an IPv6 node might receive requests that it is not authorized to receive. Information that creates or updates a registration in this registry needs to be authenticated and authorized by the IANA based on the instructions set forth by [RFC5226].
7. References

7.1. Normative References


7.2. Informative References


Appendix A. List of potentially affected RFCs

The following RFCs that generate interface identifiers need to be updated if they wish to avoid conflicts with the reserved interface identifier ranges.

- **RFC2590** - Transmission of IPv6 Packets over Frame Relay Networks
- **RFC3315** - Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- **RFC3972** - Cryptographically Generated Addresses (CGA)
- **RFC4489** - A Method for Generating Link-Scoped IPv6 Multicast Addresses
- **RFC4862** - IPv6 Stateless Address Autoconfiguration
- **RFC4941** - Privacy Extensions for Stateless Address Autoconfiguration in IPv6
- **RFC5072** - IP Version 6 over PPP
- **RFC4982** - Support for Multiple Hash Algorithms in CGAs
Author’s Address

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

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