                Reserved IPv6 Interface Identifier for Proxy Mobile IPv6

Abstract

   Proxy Mobile IPv6 (RFC 5213) requires that all mobile access gateways
   use a fixed link-local address and a fixed link-layer address on any
   of their access links that they share with mobile nodes. This
   requirement was intended to ensure that a mobile node does not detect
   any change with respect to its Layer 3 attachment, even after it
   roams from one mobile access gateway to another. In the absence of
   any reserved addresses for this use, coordination across vendors and
   manual configuration of these addresses on all of the mobility
   elements in a Proxy Mobile IPv6 domain are required. This document
   attempts to simplify this operational requirement by making a
   reservation for special addresses that can be used for this purpose.
   This document also updates RFC 5213.

Status of This Memo

   This is an Internet Standards Track document.

   This document is a product of the Internet Engineering Task Force
   (IETF). It represents the consensus of the IETF community. It has
   received public review and has been approved for publication by the
   Internet Engineering Steering Group (IESG). Further information on
   Internet Standards is available in Section 2 of RFC 5741.

   Information about the current status of this document, any errata,
   and how to provide feedback on it may be obtained at
   http://www.rfc-editor.org/info/rfc6543.

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1. Introduction

   Proxy Mobile IPv6 [RFC5213] is a network-based mobility management
   protocol that enables IP mobility support for a mobile node without
   requiring its participation in any mobility-related signaling. The
   mobility elements in the network ensure that the mobile node does not
   detect any change with respect to its Layer 3 attachment, even after
   it roams from one mobile access gateway to another and changes its
   point of attachment in the network. All mobile access gateways in a
   Proxy Mobile IPv6 domain use a fixed link-local address and a fixed
   link-layer address on any of their access links that they share with
   the mobile nodes. This essentially ensures that a mobile node, after
   performing a handoff, does not detect any change with respect to the
   IP network configuration.

Although the base Proxy Mobile IPv6 specification [RFC5213] requires the use of a fixed link-local and a fixed link-layer address, it did not reserve any specific addresses for this purpose. This is proving to be an operational challenge in deployments involving multi-vendor equipment. To address this problem, this specification makes the following two reservations.

1. This specification reserves one Ethernet unicast address, 00-00-5E-00-52-13, for use with Proxy Mobile IPv6. This reserved link-layer address SHOULD be used by the mobile access gateway in a Proxy Mobile IPv6 domain, on all of the access links that it shares with the mobile nodes. The protocol configuration variable FixedMAGLinkLayerAddressOnAllAccessLinks [RFC5213] SHOULD be set to this reserved address. The mobile access gateway can use this address in all packet communication with the mobile node on the access links. Considerations from [RFC5342] apply with respect to the use of Ethernet parameters in IETF protocols. This address is allocated from the registry "IANA Ethernet Address Block - Unicast Use".

2. This specification reserves an IPv6 interface identifier, 0200:5EFF:FE00:5213. This interface identifier is a modified EUI-64 interface identifier generated from the allocated Ethernet unicast address 00-00-5E-00-52-13. This reserved IPv6 interface identifier SHOULD be used by all of the mobile access gateways in a Proxy Mobile IPv6 domain on all of the access links that they share with the mobile nodes. The protocol configuration variable FixedMAGLinkLocalAddressOnAllAccessLinks [RFC5213] SHOULD be set to the link-local address generated using this reserved IPv6 interface identifier. The mobile access gateway can use this link-local address generated using this reserved IPv6 interface identifier in all Neighbor Discovery-related [RFC4861] communication with the mobile node.

2. Conventions and Terminology

2.1. Conventions

   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].

2.2. Terminology

   All of the mobility-related terms used in this document are to be interpreted as defined in the base Proxy Mobile IPv6 specifications ([RFC5213], [RFC5844]). All of the terminology related to IPv6 addressing is to be interpreted as specified in [RFC4291].

3. IANA Considerations

    o This specification reserves one Ethernet unicast address,
       00-00-5E-00-52-13, for Proxy Mobile IPv6. This address has been
       reserved in the registry "IANA Ethernet Address Block - Unicast
       Use".

    o This specification reserves an IPv6 interface identifier,
       0200:5EFF:FE00:5213, for Proxy Mobile IPv6 [RFC5213] in the
       registry "Reserved IPv6 Interface Identifiers" [RFC5453]. This
       interface identifier is a modified EUI-64 interface identifier
       generated from the allocated Ethernet unicast address
       00-00-5E-00-52-13, as specified in Appendix A of [RFC4291].

4. Security Considerations

    All of the security considerations specified in [RFC5213] and
    [RFC5844] continue to apply to the mobility elements in a Proxy
    Mobile IPv6 domain when those elements conform to this specification.
    Specifically, the issues related to the use of fixed link-local and
    link-layer addresses as documented in Section 6.9.3 of the base Proxy
    Mobile IPv6 specification are equally relevant here. In some sense,
    the reservations made in this specification result in the use of the
    same set of link-local and link-layer address values beyond a single
    Proxy Mobile IPv6 domain, thereby expanding the scope of the existing
    problem related to asserting ownership of the configured addresses
    from a single domain to a multi-domain environment. Future work may
    be needed to address these issues.

5. Acknowledgements

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    the discussions around the use of fixed link-local and link-layer
    addresses during work related to the standardization of Proxy Mobile
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    document.

6. References

6.1. Normative References

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

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

[RFC5213]   Gundavelli, S., Ed., Leung, K., Devarapalli, V.,
             Chowdhury, K., and B. Patil, "Proxy Mobile IPv6",
             RFC 5213, August 2008.

[RFC5453]   Krishnan, S., "Reserved IPv6 Interface Identifiers",
             RFC 5453, February 2009.

6.2. Informative References

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

[RFC5342]   Eastlake 3rd, D., "IANA Considerations and IETF Protocol
             Usage for IEEE 802 Parameters", BCP 141, RFC 5342,
             September 2008.

[RFC5844]   Wakikawa, R. and S. Gundavelli, "IPv4 Support for Proxy
             Mobile IPv6", RFC 5844, May 2010.

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