Distributed Mobility Management (DMM)
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Deprecated Network Prefix Provision
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Abstract

This document introduces new extensions to router advertisement and router solicitation messages. The extensions are used to provide a mobile node's deprecated network prefix information to an access router. This document updates [RFC4861].

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

Router advertisement and router solicitation messages defined in [RFC4861] are used during stateless IPv6 autoconfiguration. A mobile node listens for router advertisement messages that are periodically sent by access routers on the local link or are explicitly requested by the mobile node using a router solicitation message. The router advertisement message contains information to allow the mobile node configures a global unicast IPv6 address. The provided information by the router advertisement message is, for instance, network prefix(es), default router address(es), hop limit, etc.

The router advertisement message is used by an access router to provide the network prefix information required for stateless IPv6 autoconfiguration, whereas the router solicitation message is used by a mobile node to quickly receive the router advertisement message from the access router. In other words, the current specification of Neighbor Discovery for IP version 6 does not specifies how the access router obtains the deprecated network prefix information (e.g., previous network prefix information) from the mobile node keeping deprecated IPv6 address(es) that are for instance global unicast IPv6 address(es) generated and used at previous access networks.

This document introduces new extensions to router advertisement and router solicitation messages to allow a mobile node provides its deprecated network prefix information to an access router.

2. Motivation

A mobile node changes its point of attachment from a previous network to a new network while keeping its global unicast IPv6 address for communications with a correspondent node. At the new network the

mobile node's global unicast IPv6 address previously configured at the previous network becomes a deprecated address. The mobile node configures a new global unicast IPv6 address at the new network and uses the new address for new communications. The mobile node also may use the deprecated address (i.e., the previously configured address at the previous network) for the communications with the correspondent node.

Nowadays ingress filtering is widely used to prevent source address spoofing. In this case, when the mobile node sends packets with the deprecated address as a source address at the new network, the packets will be filtered unless a rule of ingress filtering is updated in advance.

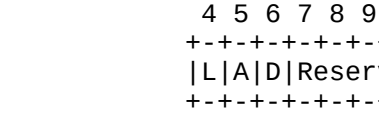
An access router at the new network may need to obtain the mobile node's deprecated network prefix information. For instance, the new access router needs to establish a bidirectional tunnel with the previous access router of the mobile node for the communications associated with the deprecated address of the mobile node [Paper-Distributed.Mobility].

3. Option Formats

A router solicitation message is extended to include the deprecated network prefix information. A router advertisement message is extended to include a flag that requests the mobile node to send a router solicitation message including the deprecated network prefix information.

3.1. Deprecated Network Prefix Provision in Router Solicitations

A new flag is defined to indicate that a router solicitation message includes the deprecated network prefix information of a mobile node in the prefix information option.

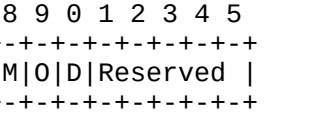


D: 1-bit "Deprecated network prefix" flag. It indicates that the prefix included in this prefix information option is the deprecated network prefix of the mobile node.

When the mobile node wants to send the deprecated prefix to the new access router, the prefix information option is used to carry the deprecated network prefix and the D flag is set to 1.

3.2. Deprecated Network Prefix Request in Router Advertisements

A new flag is defined to request the deprecated network prefix information in a router solicitation message.



D: 1-bit "Deprecated network prefix" flag. It indicates that the deprecated network prefix of the mobile node is needed by an access router.

When a mobile node receives the router advertisement message containing the D flag set to 1, the mobile node should respond with a router solicitation message carrying the prefix information option and with D flag set to 1 in the option. In the prefix information option, the deprecated network prefix of the mobile node is contained.

After the new access router learns the previous prefix of the specific mobile node, it updates the rule of ingress filter. Afterwards, the D flag in the following router advertisement message sent to this mobile node will be set to 0 and the mobile node will recognize that its previous prefix has been recorded by the access router. Then the mobile node will not feedback with a router solicitation message.

This extension is not supported by the access router if the D flag is not included in the router advertisement message and then the mobile node should not send a router solicitation message accordingly.

4. Security Considerations

TBD

5. IANA Considerations

TBD

6. References

6.1. Normative References

[RFC4861] Narten, T., Nordmark, E., Simpson, W., and H. Soliman, "Neighbor Discovery for IP version 6 (IPv6)", RFC 4861, DOI 10.17487/RFC4861, September 2007, <http://www.rfc-editor.org/info/rfc4861>.

6.2. Informative References

[Paper-Distributed.Mobility] Lee, J., Bonnin, J., Seite, P., and H. Chan, "Distributed IP Mobility Management from the Perspective of the IETF: Motivations, Requirements, Approaches, Comparison, and Challenges", IEEE Wireless Communications, October 2013.

[RFC7333] Chan, H., Ed., Liu, D., Seite, P., Yokota, H., and J. Korhonen, "Requirements for Distributed Mobility Management", RFC 7333, DOI 10.17487/RFC7333, August 2014, <http://www.rfc-editor.org/info/rfc7333>.

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