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Faster cleanup of invalid NCE
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Abstract

When an IPv6 address is moved or removed or when it becomes invalid on an interface of an IPv6 node, the old neighbor cache entry for this address on the neighboring nodes sharing the interface link continues to be used for data forwarding till the STALE entry time-out happens or till the neighbor unreachability detection algorithm runs in order to rediscover the correct link layer address or purge the incorrect neighbor cache entry. This document specifies a mechanism for the faster removal of invalid neighbor cache entries on the neighboring nodes. This document updates [RFC 4861](#).

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[1.](#) Introduction

When an IPv6 address is removed on a neighboring host or router node, the neighbor cache entry corresponding to that address continues to reside in the neighbor cache of the peer IPv6 nodes. As per [\[RFC4861\]](#), currently there is no notification to the peer nodes to flush those invalid neighbor cache entries from the cache. As a result, the invalid entry wastes the table space and possibly avoids a new valid entry from joining the network when the table is in full condition. Traffic destined to that invalid cache entry continues to get forwarded into a possible black hole for some time. In case of IPv6 address movement too, the traffic continues to get forwarded to the wrong node for some time.

These conditions continue to exist till the STALE entry timeout (1200 seconds) happens or till the NUD runs for that address on the forwarding nodes in order to discover the new link layer address or purge the invalid entry when the NUD fails.

To handle this situation some implementations choose to run NUD periodically on each neighbor to detect the neighbor unavailability at the earliest and update the table accordingly. But this approach increases the load on the CPU and is not scalable.

The scenarios above do not include the case where an interface link goes down. In that case the NUD or STALE timeout has to recover the situation on the nodes as before.

This document updates [RFC 4861](#) to efficiently handle the above scenarios.

[1.1.](#) Conventions used in this document

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 [\[RFC2119\]](#).

Nodes processing the received unsolicited neighbor advertisement with

F-bit set SHOULD delete the matching neighbor cache entry if it exists in the cache.

2.1. Retransmission of unsolicited neighbor advertisement

Unsolicited neighbor advertisements are unreliable mechanism to propagate information unlike solicited neighbor advertisements.

To increase the chances of the neighboring IPv6 node to flush the invalid entry when the network is under stress, the sending node MAY send multiple unsolicited neighbor advertisements at reasonably time spaced intervals.

3. IANA Considerations

This document does not require any IANA actions.

4. Security Considerations

This document does not present any additional security issues beyond those discussed in [[RFC4861](#)].

5. References

5.1. Normative References

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

5.2. Informative References

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

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