NUD is too impatient

draft-nordmark-6man-impatient-nud-01.txt

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Background

- RFC 4861 requires that Neighbor Unreachability Detection
  - Give up after exactly 3 retransmissions 1 second apart
  - And discard the Neighbor Cache entry
  - IPv6 ready test suite verifies this behavior
- ARP implementations can be more robust by trying longer – no hard requirements on timeouts
- We need that flexibility for IPv4 parity

Motivation

- Overall motivation is flexibility; not over-constraining the implementations
- Some specific reasons why we need that flexibility are in draft-gashinsky-v6nd-enhance-00.txt

Overview

- Add implementation flexibility
  - Don't mandate 3 NUD transmissions 1 second apart
  - Require preserving failover behavior when there are alternates (multiple default routers)
  - Require detecting L2 address change
- Suggest binary exponential backoff retransmissions
  - But merely a suggestion

Details

- Introduce an UNREACHABLE state in NUD state machine
  - Allows current logic to prefer alternative, reachable default routers
  - While keeping L2 address in Neighbor Cache
- In UNREACHABLE state
  - Continue to send to unicast address in NCE
  - Send multicast NS messages (discovers MAC address change)
  - Recommend binary exponential backoff

Unchanged

- Still suggest three unicast NS messages sent 1 second apart (before marking as UNREACHABLE)
    - But not required behavior
- Same state machine
- Same next-hop and default router selection
- Same NUD behavior for redirects

Next Steps

- Accept as a WG document?