Benchmarking IPv6 Neighbor Cache Behavior

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How IPv6 Neighbor Discovery Works

• Node has packet to send
• Node searches IPv6 Neighbor Cache for destination
• If the destination is present, the forwards the packet using the appropriate link-layer address
• If the destination is not present
  • Create a Neighbor Cache entry and put it in the INCOMPLETE state
  • Until ICMP Neighbor Advertisement (NA) received or maximum-solicitations
    • Send ICMP Neighbor Solicitation (NS) message
    • Wait
    • If NA is received, set neighbor cache state to REACHABLE
• Cache entry transitions to STALE state if it does not refreshed for a configurable period of time
  • Refreshed by traffic
  • Refreshed by NA
Neighbor Cache Can Grow Large

• When the DUT really has a large number of neighbors and its talking to all of them
• When an attached network is being scanned
  • This happens all the time
This Draft Asks The Following Questions

• Test 1: How long does it take for a cache entry to go from the REACHABLE to STALE states
• Test 2: How many entries can the Neighbor Cache accommodate
• Test 3: During periods of Neighbor Cache exhaustion, determine whether node prefers previously discovered neighbors
Next Steps

• Request review from IPv6 Neighbor Discovery expert
  • 6man WG?
• WG Last Call