Architecture and Framework for IPv6 over Non-Broadcast Access

draft-ietf-6man-ipv6-over-wireless

Pascal Thubert

IETF 117

San Francisco
What happened since London?

Conditional Adoption

- Redesigned as an Architecture document, new author (MCR)
- Really 4 docs in one (problem, Architecture, framework, applicability)

<table>
<thead>
<tr>
<th>6MAN Internet-Draft</th>
<th>P. Thubert, Ed. Cisco Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended status: Informational</td>
<td>11 October 2022</td>
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<tr>
<td>Expires: 14 April 2023</td>
<td>M. Richardson Sandelman</td>
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<td>27 June 2023</td>
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IPv6 Neighbor Discovery on Wireless Networks
draft-thubert-6man-ipv6-over-wireless-12

Abstract

This document describes how the original IPv6 Neighbor Discovery and Wireless ND (WIND) can be applied on various abstractions of wireless media.

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Architecture and Framework for IPv6 over Non-Broadcast Access
draft-ietf-6man-ipv6-over-wireless-04

Abstract

This document presents an architecture for IPv6 access networks that decouples the network-layer concepts of Links, Interface, and Subnets from the link-layer concepts of links, ports, and broadcast domains, and limits the reliance on link-layer broadcasts. This architecture is suitable for IPv6 over any network, including non-broadcast networks, which is typically the case for Intangible media such as wireless and overlays. A study of the issues with IPv6 ND over Intangible media is presented, and a framework to solve those issues within the new architecture is proposed.
Part 1) Problem statement (pervasive)

1. Introduction
2. Acronyms
3. Issues with IPv6 ND-Based Access
   3.1. IPv6 ND and ND-Proxies
   3.2. The case of Wireless
   3.3. The case of Overlays
   3.4. Power and Sustainability
   3.5. Security and Privacy
   3.6. More Middleboxes
   3.7. More Operational Issues
   3.8. Summary of Issues

Lack of generally accepted definition and specs
Broadcast issues
Silent nodes / BUM
Not just wasted spectrum
Woodstock vs. real world
Affecting the capability to evolve
Part 2) Architecture (decoupling L2 and L3)

- Decoupling is the core need and value
- Need to redefine and reposition L3 concepts vs. IPv4-based intuition
- Splitting the broadcast domain => routing inside the subnet
- Concept of SGP also central, proxy a limited alternative
- Thus, the new name “SND”
Part 3) Framework (leveraging WiND Design and RFCs)

- Leveraging original WiND text in adopted document
  - Which RFC does what
  - GAP analysis?

5. A Framework for Stateful address Autoconfiguration and Subnet Routing

5.1. Implementing Stateful address Autoconfiguration
5.2. Links and Link-Local Addresses
5.3. Subnets and Global Addresses
5.4. Anycast and Multicast Addresses
5.5. P2MP Networks
5.6. Advertising Prefixes
Part 4) Applicability statement (also pervasive)

6. SND Applicability

6.1. Case of LPWANs

6.2. Case of Infrastructure

IEEE std 802.11 BSS and ESS

6.3. Case of Mesh Under Technologies

6.4. Case of DMB radios

6.4.1. Using IPv6 ND only

6.4.2. Using Subnet ND

6.4.3. Example: BLE and BLE Mesh

6.4.4. Example: 6TiSCH

7. Coexistence with IPv6 ND

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LPWANs generally do not do any ND at all

IEEE 802.11 defines a proxy ARP fct

Inefficient flooding

Works / works not

RFC 8929 defines an ND proxy
Discussion

Please review (carefully) the terminology (IP Link, Subnet...) 4 parts: too much for one document? If so what split? Other proposed changes / missing pieces?
Backup