ND Prefix
Robustness Improvements
draft-vv-6man-nd-prefix-robustness-02

Olorunloba Olopade loba.olopade@virginmedia.co.uk
Eduard Vasilenko vasilenko.eduard@huawei.com
Paolo Volpato paolo.volpato@huawei.com
Background & Status

• Study initiated in the context of first-hop analysis
  • Looking at cases of IPv6 instability in real networks

• Eventually, attention shifted to Neighbor Discovery and the cases that may lead to network prefixes invalidity

• Specific focus is on the multi-homing, multi-prefix scenario
  • Other cases are also analyzed for the sake of completeness

• Version -02 submitted on March 5th

• Main changes with respect to version -01:
  • Reviewed section 3 – Problem scenarios
  • Reviewed section 5 – Solutions
  • Added section 5.8 to link the proposed solutions to the extensions discussed in section 6
  • Done some editorial adjustments and corrections.

• Feedback, comments, criticism… much appreciated.
Coping with Prefix Invalidity - Options

- SLAAC Parameter Tweaking
  - Modify Valid Lifetime of PIOs (e.g. reduce the time a host maintains stale information)
  - Modify Preferred Lifetime of PIOs (e.g. reduce the time for a host to prefer another prefix).

- Introduce small modifications or extensions to protocols
  - Add / modify rules in ND, SLAAC
  - Proposals shown in the next slide

Prefix invalidity

Handle timers of RFC 4861

Look at protocol behavior in RFC 4861, 4862 (and others)
Solutions Dependency and Proposal for Extensions

<table>
<thead>
<tr>
<th>#</th>
<th>Solutions</th>
<th>Standard modifications</th>
<th>Change/Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>MHMP support</td>
<td>Prefer default router that advertise prefix used for source address chosen</td>
<td>sec 6.3.6 of ND</td>
</tr>
<tr>
<td>5</td>
<td>Provider lost in MHMP</td>
<td>Deprecate PIOs if prefix source is lost (with optional dampening)</td>
<td>sec 4.2, 5.1 of SLAAC</td>
</tr>
<tr>
<td>5</td>
<td>Routers’ LLA change</td>
<td>Do not deprecate default routers, deprecate PIOs</td>
<td>G-4/5 of RFC 7084 (CPE requirements)</td>
</tr>
<tr>
<td>5</td>
<td>Planned router outage</td>
<td>Mandatory deprecation of changed prefixes</td>
<td>sec 4.1 of SLAAC</td>
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<tr>
<td>5</td>
<td>Abrupt configuration change</td>
<td>Mandatory deprecation on shutdown</td>
<td>sec 6.2.5, 6.2.8 of ND</td>
</tr>
<tr>
<td>5</td>
<td>Abrupt router outage</td>
<td>Synchronization flag in RA (all information is in this RA)</td>
<td>sec 4.2, 6.2.3, 6.3.4 of ND</td>
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<tr>
<td>5</td>
<td>Abrupt hardware replacement</td>
<td>Requirement for prefixes storage in non-volatile memory</td>
<td>sec 5.7 of SLAAC</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>RA for faster detection of stale default router</td>
<td>sec 6.3.7 of ND</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Clean orphaned prefixes after default router list change</td>
<td>sec 6.3.6 of ND</td>
</tr>
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