Multicast Scoped Address Assignment Guidance
draft-pashby-mboned-mc-scoped-addr-01.txt

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Purpose

• Define IPv6 multicast identifier ranges for Dynamically Assigned Link-local Scoped addresses and Local Network Control Block
  – Ranges should guarantee that no other multicast will overlap the range
Justification

• Uniqueness is very important for these ranges based on the link-layer mapping
• Guidance is needed for assigning addresses in these scopes (e.g. draft-ietf-ipngwg-icmp-name-lookups)
RFC3307 Current Ranges

• Permanent IPv6 Multicast Addresses
  – 0x00000001 – 0x3FFFFFFF
• Permanent IPv6 Multicast Group Identifiers
  – 0x40000000 – 0x7FFFFFFF
• Dynamic IPv6 Multicast Addresses
  – 0x80000000 – 0xFF000000
  – Solicited Node Address fall in here
Problem

- One or more hosts join a high traffic group
- Unsuspecting host that is running a real-time application joins its Solicited Node’s group
- The groups collide at the layer 2
- The unsuspecting host gets inundated by the high traffic and it fails to perform its real-time task
Solution

• Define ranges that guarantee no collision with “real” multicast traffic to the node’s required multicast groups.
New Ranges Defined

- Local Network Control Block (Scope = 2)
  - 0x00000001 – 0x000000FF

- Dynamically Assigned Global (Scope = 9 – E)
  - 0x80000000 – 0xBFFFFFFF

- Dynamically Assigned Non-Global (Scope = 1 – 8)
  - 0xC0000000 – 0xFFFFFFFF
    - **Reserved Dynamically Assigned Non-Global (Scope = 3 – 8)**
      - Future use may be for Site-Local Scoped and Organization Scoped
      - 0xC0000000 – 0xEFFFFFFF
  - **Dynamically Assigned Link-Local Scoped (Scope = 2)**
    - 0xF0000000 – 0xFFFFFFFF
    - Includes 0xFFxxxxxx Solicited Node Addresses
# Probabilities of Collisions

## Probability of Collisions

<table>
<thead>
<tr>
<th>Number of Groups</th>
<th>2B Range</th>
<th>1B Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>&lt;0.001%</td>
<td>&lt;0.001%</td>
</tr>
<tr>
<td>1000</td>
<td>0.023%</td>
<td>0.047%</td>
</tr>
<tr>
<td>10000</td>
<td>2.3%</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

## Number of Groups with Probability of Collisions

<table>
<thead>
<tr>
<th>Probability</th>
<th>2B Range</th>
<th>1B Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01%</td>
<td>650</td>
<td>456</td>
</tr>
<tr>
<td>0.1%</td>
<td>2077</td>
<td>1465</td>
</tr>
<tr>
<td>1%</td>
<td>6572</td>
<td>4647</td>
</tr>
</tbody>
</table>
Related Drafts

draft-pashby-magma-simplify-mld-snooping
  - “Simplifying IPv6 MLD Snooping Switches”
  - Recommends that Network Control Block and Dynamically Assigned Link-Local Scoped be sent to all ports without the need for MLD Joins and MLD state for these groups
Recommendation

• Accept this draft as a WG draft and proceed to incorporate modifications into RFC3307 and RFC3306

Questions?