A Optimal Load-balance mechanism for NAT64 (OL-NAT)
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What’s problems we want to resolve

• Deployment of large-scale network and growth of data traffic could result in a single-point failure of NAT64

• Load-balance based on routing metrics might lead to unbalanced load distribution. For example, the traffic is always led to the NAT64 which has minimum distance from source to GW

• Multiple NAT mechanism is still restrained by a static configuration and localized mapping information
How to overcome the problems

• A extended anycast load-balance mechanism is proposed to discover the optimum NAT64 and avoid single-point failure problem
  – NAT64 load status combining with routing distance metrics are adopted to perform the selection of optimal NAT64

• New defined ICMP process are used to synchronize the mapping states between different NAT64
Anycast Load-balance mechanism

- The flag A indicates this message is delivered by anycast propagation
- Anycast address represents identifier of a bundle of NAT64 equipments
- Hop is used to measure the distance from source to destination NAT64

NAT64 anycast request message

- A unicast address is listed in order to show unicast address of respective NAT64
- The top unicast address has high priority
Mapping Information Synchronization

For memory issues and considerable synchronization traffic, mapping states information could be reduced by constructing a virtual group, which identified by a specific anycast address and multicast address. Depending on that, only NATs within the virtual group are required to share state. Meanwhile, the update traffic could be also decreased.

**NAT64 anycast synchronization message**

- **Anycast address** represents identifier of a bundle of NAT64 equipments
- **Unicast address** indicate itself network interface address
- **Server load** is to indicate loading status
- **The IPv6 address and IPv4 address fields** are used to carry IP address related mapping information
Optimal Load-balance Data Flow Description

1) Synchronize the mapping information and service load status
2) Send a NAT64 anycast request message to discover optimal NAT64
3) Update Hop field
4) Load information combing with distance to discover the optimal NAT64
5) Response the unicast address of optimal NAT64 to the host

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<thead>
<tr>
<th>Host</th>
<th>Router</th>
<th>NAT64(A)</th>
<th>NAT64(B)</th>
<th>NAT64(C)</th>
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<td></td>
<td></td>
<td>synchronization message</td>
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<tr>
<td>(1)</td>
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<td>request message</td>
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<td>Hop plus 1</td>
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<td>request message</td>
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THANKS