Avoiding NAT66

draft-troan-multihoming-without-nat66-00

IETF78
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Purpose

- Accelerate standards and implementations to avoid NAT66
  - Source address selection
  - Route selection
  - DNS server selection

- Add mechanism to identify ‘new’ hosts

draft-fujisaki-dhc-addr-select-opt
draft-dec-dhcpv6-route-option
draft-savolainen-mif-dns-server-selection
NAT66 Is Not

- Sharing IP addresses
- Modifying TCP or modifying UDP ports
- Stateful

NAT66 Is

- Rewriting IPv6 prefixes

draft-mrw-behave-nat66
Goal

• Give host multiple IPv6 prefixes
  – Belonging to different networks
• Host does “The Right Thing”

• Not yet achievable
Tunnel to Enterprise, IPv4

- Contains routing and source address policy, and DNS proxy
- NAT traffic to Internet
- Tunnel terminates on router
- one IP address: corporate IP address
Simplified Tunnel Diagram, IPv4

10.1.1.1

Single IP address

NAT

Policy controller

Internet

Private IPv4

Avoiding NAT66
Same Scenario, IPv6

Want multiple IPv6 prefixes

Want to avoid policy control (NAT66)
Simplified Tunnel Diagram, IPv6

This works – but is not desirable

Single IPv6 address

Avoiding NAT66
Simplified Tunnel Diagram, IPv6

Desired

Avoiding NAT66
Why Consider NAT66

- Host and standards deficiencies:
  1. Source Address Selection
  2. Next-Hop Route Selection
  3. DNS Server Selection
  4. (Identifying Supporting Hosts)
Problem: Source Address Selection

- Multiple prefixes on one physical interface
- Wrong ISP

Internet

ISP-A

ISP-B

2001:db8:1000::/36

2001:db8:1000:1::100

Dropped by ingress filter (RFC2827)

2001:db8:8000:1::100

2001:db8:8000::/36

2001:db8:1000::/36

Avoiding NAT66
Problem: Source AddressSelection

- Multiple prefixes on one physical interface
- Disconnected network
Problem: Next-Hop Route Selection

Provide host with routing information of Partner network – so that Address Selection (RFC3484) can choose correct source address. RFC4191 does that (but there is a problem..)
Problem: DNS Server Selection

- Different Answers
  - Public DNS returns empty answer
  - Private DNS returns IP address
- Solution: host queries proper DNS server
- long-existing industry practice
Problem: Identifying Supporting Hosts

- Supporting Host:
  - Chooses proper source address
  - Accepts next-hop route information
  - Supports DNS server selection

- Network would like to determine:
  - If ‘supporting host’, give it two prefixes
  - If ‘non-supporting host’, give it one prefix and NAT66 its traffic

will be described in draft-troan-multihoming-without-nat66-01
# Scope of New Work

<table>
<thead>
<tr>
<th>Source Address Selection</th>
<th>Multiple physical interfaces</th>
<th>Multiple prefixes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>√ RFC3484</td>
<td>Revise standard</td>
</tr>
<tr>
<td>Next-Hop Route</td>
<td>√ (RFC4191)</td>
<td>√ (RFC4191)</td>
</tr>
<tr>
<td>DNS Server Selection</td>
<td>new standard</td>
<td>new standard</td>
</tr>
<tr>
<td>Identify supporting hosts</td>
<td>new standard</td>
<td>new standard</td>
</tr>
</tbody>
</table>
Actions

• Accelerate standards and implementations to avoid NAT66
  – Source address selection ← IETF: 6MAN
  – Route selection
  – DNS server selection
  }

• Add mechanism to identify ‘new’ hosts

draft-fujisaki-dhc-addr-select-opt
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Questions?

Avoiding NAT66

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Bar-BOF

- Including prototype demonstration

Day: Wednesday, 20:00-21:30
Place: TBD

http://trac.tools.ietf.org/bof/trac/wiki/BarBofsIETF78

- Please come and join us!