

Dual Stack Hosts Using "Bump-In-the-Host" (BIH)

draft-ietf-behave-v4v6-bih-01

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Behave WG meeting @ IETF#79

11-November-2010

New charter item in behave WG

- An IPv4 application running on an IPv6-only connected host to the IPv6 Internet, i.e. perform translation between IPv4 and IPv6 for packets in uni- or bi-directional flows that are initiated from an IPv4 host towards an IPv6 host. The translator function is embedded in the IPv4 host.
- Apr 2011 Submit to IESG: host-based NAT46 translation for IPv4-only applications to access IPv6-only servers (std)
- draft-huang-behave-bih-01 was adopted as draft-ietf-behave-v4v6-bih-00 for which one update was made already

Main open items and issues

1. What scenarios should be handled technically
 1. Extension Name Resolver Configuration
 2. IPv4 addresses to be used
 3. Clarification of base deployment scenarios
- Editorial issues and some additional technical clarifications to be added (see ongoing mailing list discussions)

#1 What scenarios should be handled *technically*

| Application IP version support | Host's Internet connectivity | Network (paths in between) | Server's Internet connectivity | Do BIH? |
|--------------------------------|------------------------------|----------------------------|--------------------------------|--|
| IPv4 | IPv6 | IPv6 | IPv6 | Yes |
| IPv4 | IPv4/IPv6 | IPv4/IPv6 | IPv6 | Yes |
| IPv4 | IPv6 | IPv6 | IPv4/IPv6 | Yes, but <u>recommend use of tunneling</u> instead |

- In the last row, should the application be shown server's real IPv4 address or synthetic IPv4 (i.e. maybe even do just AAAA query)? Current draft says real, but synthetic might be much more in line with other scenarios? ⁴

SEE ALSO NEXT SLIDE

#1.1

Extension Name Resolver config 1/2

- draft-ietf-behave-dns64-11 section describes “AAAA exclusions” (protect hosts from “unwanted” AAAAs, such as none working addresses)
- Maybe something like:”A BIH ENR implementation SHOULD provide configurable means for excluding selected IPv4 and IPv6 addresses (*excluding = matching response is handled as empty response*). For example, no IPv4 address synthesis for non-working IPv6 addresses should be done, and if all IPv4 addresses are excluded, IPv4 synthesis from IPv6 address would always occur.”
- Default values need to be agreed (what is/can be excluded)
- Configuration guidelines are needed as well (see next slide)

#1.1

Extension Name Resolver config 2/2

- Need guidance on whether appropriate to exclude or not:
 - Addresses that should never appear in DNS or on the wire
 - Addresses that are known to be permanently unreachable (e.g. net 10, ULA space) from the DNS synthesizer's network
 - Addresses that are observed to be problematic/flaky (maybe 6to4 in some cases, WKP to avoid double translation by default?)
 - Addresses that would work but the admin would prefer to avoid by policy
 - All addresses for a given IP version (which actually might be the same as one of the previous 3)
- By tuning the above rules it would be possible to have IETF recommended set (such as use direct IPv4 always when possible), as well as the opposite (never use IPv4)

#2 IPv4 addresses to be used

- Use only RFC1918 addresses for application backwards compatibility reasons
 - 127/8, 169.254/16, or new dedicated addresses are no go
- Conflicts on dual-stack accesses should be avoided
 - In emerging conflict BIH is allowed to disconnect ongoing connections
- First proposal for destination address synthesis:
 - Primary address pool: 172.21.80.0/20 (mask 255.255.240.0)
 - Secondary pool: 10.170.160.0/20 (mask 255.255.240.0)
- First proposal for source addresses:
 - Primary address pool: 172.21.112.0/30
 - Secondary pool: 10.170.224.0/30 (*not in draft yet*)
- Alternative – or additional - is to just define: *"just use some non-conflicting RFC1918 addresses"*

#3 Clarification of base deployment scenarios

- BIH is not recommended to be used as a tunnel replacement nor for double protocol translation
- BIH is recommended for conventional DNS using applications, not for 100% of existing application population
- Discussion on mailing list about applicability statements. Where should the applicability statements reside and in what detail?
 - In this document (to extent that seems to need more discussions)
 - In draft-arkko-ipv6-transition-guidelines