

IPv6 Multihoming Using PA Space

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Introduction

- IPv6 multihoming using provider independent (PI) space not possible (until now?)
- Other approaches not ready yet (shim6)
- So use more specific from ISP's provider aggregatable (PA) block
- But: some network operators filter out those more specifics

Introduction (2)

- Question to IETF IPv6 operations (v6ops) working group:
 - "Can you make routing guidelines that tell people to permit /48 to allow PA multihoming?"
- I wrote a draft to address part of this:
 - `draft-van-beijnum-v6ops-pa-mhome-community-01.txt`

Multihoming in IPv6

- PI:
 - Get PI block (impossible or at least hard)
 - Announce to 2+ ISPs (fairly easy)
- PA:
 - Get prefix from ISP PA space (very easy)
 - Announce to 2+ ISPs (will be filtering)

Difference With IPv4

- In IPv4, relatively few people filter on PA block size
 - most people filter on /24
- In IPv6, fixed minimum PA block is /32
 - a good number of people filter on /32 for PA

Pros and Cons of PA

- Pro:
 - space is easy to get, only talk to ISP
 - compatible with future shim6 mechanism
 - survive filtering of all /48s
- Con:
 - still dependency on address proving ISP

BGP Community

- Proposal to get around filters: BGP well-known community
 - let's call it MULTIHOME
- So for all network operators:
 - when filtering on /32, allow /48s (/56s?) that have MULTIHOME community

Example Filter Config

- Pseudo code:
 - 10 IF (pfx falls-in list-of-direct-allocation-blocks
 - AND length(pfx) less-or-equal /48)
 - THEN ACCEPT
 - 20 IF (pfx falls-in ipv6-global-unicast-space
 - AND length(pfx) less-or-equal /32)
 - THEN ACCEPT
 - 30 IF (pfx falls-in ipv6-global-unicast-space
 - AND pfx has-community MULTIHOME
 - AND length(pfx) less-or-equal /56)
 - THEN ACCEPT
 - 40 REJECT

Cisco/Zebra Filter (1)

- Cisco/Zebra filter:
 - !
 - ipv6 prefix-list except-apnic seq 5 permit 2001:7fa::/32 le 64
 - !
 - ipv6 prefix-list except-arin seq 5 permit 2001:500::/29 le 48
 - !
 - ipv6 prefix-list except-lacnic seq 5 permit 2001:1200::/23 le 48
 - !
 - ipv6 prefix-list except-ripe seq 5 permit 2001:600::/23 le 64
 - !
 - ipv6 prefix-list global-pa seq 5 permit 2000::/3 le 32
 - !
 - ipv6 prefix-list global-pa-mhome seq 5 permit 2000::/3 le 56
 - !
 - ip community-list standard mhome-cty permit 1:1
 - !
 -

Cisco/Zebra Filter (2)

- Cisco/Zebra filter:
 - !
 - route-map import permit 10
 - match ipv6 address except-apnic
 - !
 - route-map import permit 20
 - match ipv6 address except-lacnic
 - !
 - route-map import permit 30
 - match ipv6 address except-ripe
 - !
 - route-map import permit 40
 - match ipv6 address except-arin
 - !
 - ...

Cisco/Zebra Filter (3)

- Cisco/Zebra filter:
 - ...
 - !
 - route-map import permit 60
 - match community mhome-cty
 - match ip address global-pa-mhome
 - !
 - route-map import permit 70
 - match ip address global-pa
 - !

Questions, Comments?

- draft-van-beijnum-v6ops-pa-mhome-community-01.txt
- Can be found in:
 - <http://www.ietf.org/internet-drafts/>
 - <http://www.muada.com/drafts/>