Framework for Multi-domain IPv6-only Underlay Network and IPv4 as a Service

draft-ietf-v6ops-framework-md-ipv6only-underlay

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Overview

- This draft was proposed in Jan. 2022, first presented in IETF 113, adopted after IETF 115, the current version is -02.
- Its purpose is to provide end-to-end IPv4 service delivery over multi-domain IPv6-only underlay networks, and eliminate unnecessary IPv4/IPv6 conversions in a scalable way.
Acknowledgement for your comments

• Comments were received from Brian E. Carpenter, Bob Harold, Dhruv Dhody, Xipeng Xiao, Eduard Metz, Giuseppe Fioccola, Qin Wu, Shuping Peng, Zhenbin Li, Ron Bonica, Cheng Li, Vasilyenko Eduard, Jingrong Xie, Aijun Wang, Dhruv Dhody, Nick Buraglio, Linda Dunbar, Guoliang Han, Weiqiang Cheng, Tianran Zhou, Huaimo Chen, etc.

• All are appreciated!
Revisions made since IETF 116

• 1) The following statements are added
  • Section 1: “For example, when broadband users experience abnormal access to services, network operators need to troubleshoot whether it is an IPv4 protocol failure or an IPv6 protocol failure, which increases the workload by at least twice.”
  • Section 4: “Since it is based on the OSPF protocol, it only supports IPv4aaS within a single AS.”
  • Section 6.1: “which needs to be obtained remotely in advance.”

• 2) Section 4: “backbone” → “network”
  • “They are routed through the network to another PE router, after which they leave the network and continue their way.”

• 3) “Users” is added in the sentence of section 4
  • “In other words, IPv6-only network should not only carry native IPv6 services, but also allow users to reach IPv4-only services.”

• 4) Nit fixed
  • Transpor → transport
System Implementation and Test

IPv4 Network A

IPv4 Client

IPv6

AS #1

IPv6

P1

IPv6

AS #2

IPv6

AS #3

IPv6

IPv4 Internet

IPv4 Network B
Original IPv4 Route vs New IPv6 Route

IPv4 route

IPv6 route received by P1 router

110.242.68.0/24 is in IPv4 Internet
(110.242.68.3 is www.baidu.com)
IPv6-IPv4 autoconfig

PE1 received IPv6 route 2001:da8:282:2408::6ef2:4400/120 (attribute plen=96)

PE2 map this route to an IPv4-IPv6 translation rule:
IPv6 host→IPv4 server visit

Support IPv6→IPv6, IPv4→IPv4, IPv6→IPv4, etc.

ping IPv4 Internet server from IPv6 hosts

windows IPv6 host

MacOS IPv6 host

Android IPv6 host
Next Steps

• Collect comments and suggestions, make further improvement to this document.

• Plan to demo in IETF 118.
Thank you!

Q&A