Host-based Translation Problem Statement
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Abstract

When operators start to customize user terminals, host-based IPv6 translation will be feasible. Host-based translation should overcome single-point failure problems and support various connections between two IP families networks simultaneously. In addition, legacy IPv4 applications should not be modified. This document will discuss host-based translation applicable scenarios and corresponding issues.
1. Introduction

Current network is mostly depending on IPv4. And, several sophisticated technologies have been proposed to prolong the IPv4 lifetime, such as NAPT, A+P[A+P]. Although these solutions could alleviate IPv4 depletion pressure in a short term, the transition from IPv4 to IPv6 is still a steady trend of network development.

Technical solutions of IPv6 transition could be divided into three categories, namely dual-stack, tunneling and translation technology.

Dual-stack hosts can communicate with both the IPv4 and IPv6 hosts, but it can not help to resolve the IPv4 address exhaustion problems. The tunneling technology can connect IPv4 networks across IPv6-only networks and IPv6 networks across IPv4-only networks, thus one IP family communication is transparent with another IP family.

The translation technology can help the communications between two address families. With regard to whether deploy translator on hosts or networks, the majority solutions would like to choose the latter since modifications on a numerous hosts were treated as not easy works. However, host-based translation schemes would progress more easily in recent time, since more and more operators start to customize hosts for their subscribers.

In this document, host-based translation scenarios and underlying problems have been described.

2. Host-based translation scenarios and problems

2.1. Host-based translation scenarios

Figure 1 shows host-based translation scenarios. Translator modules have been deployed on H1 and H3 located in IPv6 only network. And, both conventional IPv4 applications and IPv6 applications have been installed. H2 is legacy IPv4 host located in IPv4 site.

With regard to this scenario, H1 and H3 might maintain following service connections simultaneously.

- case 1: H1 and H4 initiate a service call with H2 using a IPv4 application
- case 2: H1 initiates a service all with the IPv6 application of H3 using a IPv4 application
o case 3: H3 initiates a service call with H2 using a IPv6 application

o case 4: H1 initiates a service call with the IPv4 application of H3 using a IPv4 application

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2.2. Problems

From individual case point-of-view, dual-stack-lite[DS-Lite] can support case 1, and BIA [RFC3338] or BIS [RFC2767] can support the case 2, and NAT64[NAT64] can support case 3. There are no solutions to perform case 4.

According to the analysis, existing solution can’t satisfy the demands of maintaining above all potential communications in the 4/6 host at one time. Furthermore, following problems should be considered.

o It is hard to modify numerous conventional IPv4 applications, when the hosts only have an IPv6 connection

o The hosts located in IPv6 site usually do not initiate query to DNS4 server, where IPv4 peer record is stored

o The hosts usually do not identify peer application type, thus translation handling can not be performed correctly
3. IANA Considerations

This memo includes no request to IANA.

4. Security Considerations

It needs to be further identified.

5. Normative References


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