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Communication between a HIP-enabled Host and a Legacy Host
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Abstract

This document describes a way to support a HIP-enabled host to have the ability to communicate with legacy hosts. By leveraging a proxy to bridge the communication between HIP host and non-HIP hosts, this document does not need the extensions to the HIP protocol.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

HIP protocol [RFC5201] establishes an IP-layer communications context (called HIP association) between two hosts prior to communications. It also defines a packet format and procedures for updating an active HIP association. HIP offers many well-defined features to end hosts such as security, integrity protection, mobility and multi-homing.

HIP was designed to work with unmodified applications[RFC5338]. To ease incremental deployment, it is important to support the transition of legacy hosts towards HIP-enabled host. In the first phrase of this transition, some legacy hosts are turning on their abilities to support HIP, but most of them, especially internet servers have not been HIP-aware. There should be a mechanism that supports a HIP-enable host to communicate with non-HIP enabled legacy hosts.

[I-D.melen-hip-proxy] defines HIP protocol extensions that allow a non-HIP host to use the services of a HIP-aware proxy node and have capabilities to communicate with a HIP host.
[I-D.irtf-hiprg-proxies] investigates the HIP proxies for both directions. The scenario introduced in this document is slightly different in that the proxy is located in the local network when serving the HIP host to communicate with the non-HIP host.

This document describes a way to support a HIP-enabled host to have the ability to communicate with legacy hosts. By leveraging a proxy to bridge the communication between HIP host and non-HIP hosts, this document does not need the extensions to the HIP protocol.

2. Proposed Mechanism

2.1. Overview

In [I-D.melen-hip-proxy], HIP-proxy generates a Host Identity for each legacy host it will represent in the network. Instead of creating a static identity for each legacy host, this document specifies a mechanism of proxy dynamically assigning a host identity for each non-HIP host. The proxy will serve as the end point of the HIP base exchange. After the HIP association is established, the proxy will be in charge of translation between the HIP packet and legacy IP packets. The proxy will encapsulates the HIP packet payload into the IP header, so that the non-HIP host will participate into the communicate as usual. [I-D.irtf-hiprg-proxies]

This solution does not introduce any HIP protocol extention. The proxy that intercepts the communication will take the responsibility of holding the communication. Both the HIP aware initiator and non-HIP responder will be kept transparent about the proxy.

2.2. Proposal Walkaround

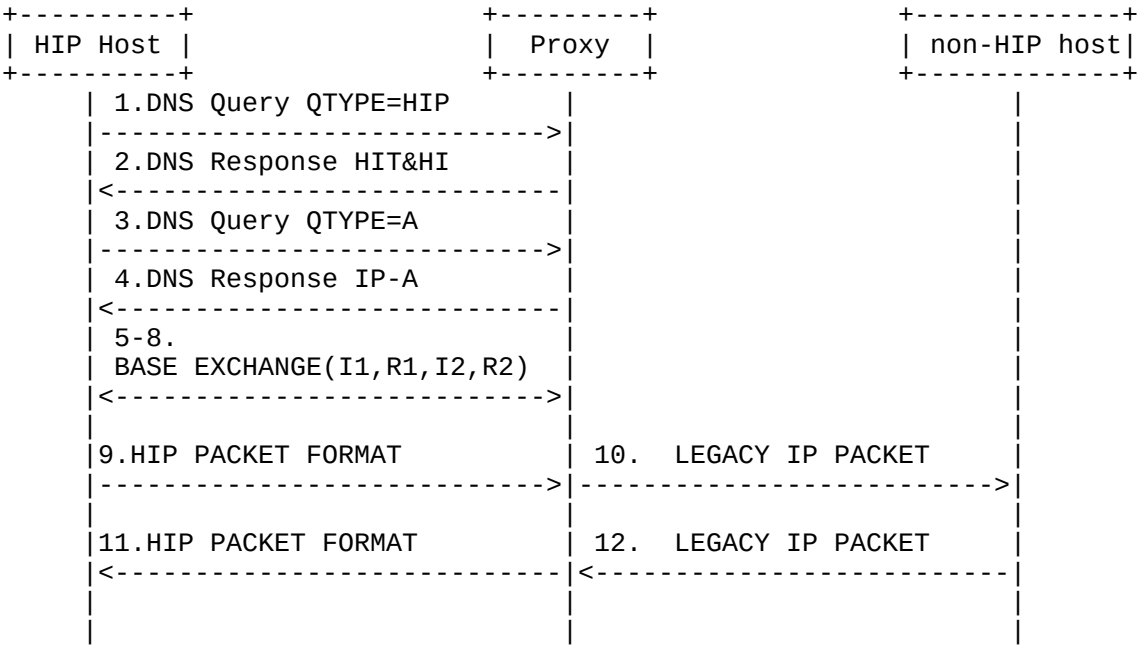

Figure 1: Proposed Mechanism

Most applications translate the domain name into one of more IP addresses before data plane communication. HIP is no exception. The HIP-enabled host first launches the DNS query to retrieve the remote host's HI/HIT or RVS address. Without knowing if the remote host supports HIP-based exchange, the HIP host is expecting to receiving the remote host HIP based Identities.

The proxy, which intercepts the DNS query, will iteratively forward the query to the global DNS to find an answer. If the responder is HIP enabled, it will have its HI or HIT registered in the DNS and the proxy will get an answer. However, if the responder is not HIP aware, and only have type A or AAAA records in the DNS system, the query for QTYPE=HIP will fail. On detecting that the responder is not HIP aware, the DNS proxy will use a temporary HI/HIT (T-ID) generated locally and reply this temporary HI/HIT to the initiator. The proxy will associate the T-ID with the IP address of the responder. After the HIP RR query reponse, the Type-A query response is followed, via which the initiator get the the IP address of the proxy node.

The HIP base exchange will proceed between the initiator and the proxy (step.5-8). Then, the HIP association is established between the initiator and the proxy, i.e., between the host's HI and the temporary HI assigned to the reponder by the proxy. If the initiator starts data communication towards the responder, the proxy on the data path will be responsible for the tranlation between HIP packets and IP packets. First, the proxy will de-capsulate the packet and decrypte the packet to get the original IP packet inside. By inspecting the HIP header after the IP header, the proxy is aware of the destination's HIT/LSI. If the HIT and LSI is mapped to one of the responder's IP address, the proxy will translate the packet with the destination address as the responder's IP address, and source address as the proxy IP address. The destination port is kept unchanged, but the source port can be dynamically assigned.

2.3. Host Identity Management

TBD.

3. Security Considerations

TBD.

4. IANA Considerations

This document does not require any IANA actions.

5. Normative References

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[RFC5205] Nikander, P. and J. Laganier, "Host Identity Protocol (HIP) Domain Name System (DNS) Extensions", RFC 5205, April 2008.

[RFC5338] Henderson, T., Nikander, P., and M. Komu, "Using the Host Identity Protocol with Legacy Applications", RFC 5338, September 2008.

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