    Host Identity Protocol-Based Overlay Networking Environment (HIP BONE)
     Instance Specification for REsource LOcation And Discovery (RELOAD)
                draft-keranen-hip-reload-instance-00.txt

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Abstract

   This document specifies the HIP BONE instance specification for
   RELOAD. It provides the details needed to build a RELOAD-based

   overlay that uses HIP.

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1. Introduction

The HIP BONE (Host Identify Protocol-Based Overlay Networking
Environment) specification [I-D.ietf-hip-bone] provides a high-level
framework for building HIP-based [RFC5201] overlays. The HIP BONE
framework leaves the specification of the details on how to combine a
particular peer protocol with HIP to build an overlay up to documents
referred to as HIP BONE instance specifications. A HIP BONE instance
specification needs to define, minimally:

o the peer protocol to be used
o how to transform the peer IDs used by the peer protocol into the
   ORCHIDs (Overlay Routable Cryptographic Hash Identifiers)
   [RFC4843] that will be used in HIP
o which peer protocol primitives trigger HIP messages

This document addresses all the previous items and provides
additional details needed to built RELOAD-based HIP BONEs.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
document are to be interpreted as described in RFC 2119 [RFC2119].

3. Peer Protocol

The peer protocol to be used is RELOAD, which is specified in
[I-D.ietf-p2psip-base]. When used with RELOAD, HIP takes the role of
the RELOAD's Forwarding and Link Management Layer (described in
Section 5.5. of [I-D.ietf-p2psip-base]). The RELOAD HIP BONE
instance provides to the applications the RELOAD Messaging API.

4. Peer ID to ORCHID Transformation

RELOAD uses 128 bit peer IDs called Node-IDs. Since HIP uses 128 bit
ORCHIDs, peer's ORCHID can be used as such as the RELOAD Node-ID.

5. Mapping between Protocol Primitives and HIP Messages

The Attach procedure in RELOAD establishes a connection between two
peers. This procedure is performed using the AttachReq and AttachAns
messages. When HIP is used, the Attach procedure is performed by
using a HIP base exchange. That is, peers send HIP I1 messages

instead of RELOAD AttachReq messages.

The RELOAD AttachLite procedure is used for the same purpose as the
Attach procedure in scenarios with no NATs. When HIP is used, the
AttachLite procedure is also performed by using a HIP base exchange.
That is, peers send HIP I1 messages instead of RELOAD AttachLiteReq
messages.

All other RELOAD messages are sent as such between the peers using
the paths set up by HIP.

6. Routing HIP Messages via the Overlay

If a host has no valid locator for the receiver of a new HIP packet,
and the receiver is part of a RELOAD HIP BONE overlay the host is
participating in, the host can send the HIP packet to the receiver
using the overlay routing.

When sending a HIP packet via the overlay, the host MUST add an empty
ROUTE_VIA parameter [I-D.ietf-camarillo-hip-via] to the packet with
the SYMMETRIC flag set and with an OVERLAY_ID parameter (see
Section 7) containing the identifier of the right overlay network.
Host consults the RELOAD Topology Plugin for the next hop and sends
the HIP packet to that host.

An intermediate host receiving a HIP packet with the OVERLAY_ID
parameter checks if it is participating in that overlay, and drops
packets sent to unknown overlays. If the host is not the final
destination of the packet (i.e., the HIP header's receiver's HIT does
not match to any of its HITs), it checks if the packet contains a
ROUTE_DST parameter. Such packets are forwarded to the next hop as
specified in [I-D.ietf-camarillo-hip-via]. Otherwise, the host finds
the next hop from the RELOAD Topology Plugin and forwards the packet
there. The host MUST add the HIT it uses on the HIP association with
the next hop host to the end of the ROUTE_VIA parameter, if present.

When the final destination host receives the HIP packet, the host
processes it as specified in [RFC5201]. If the HIP packet generates
a response, the response is routed back on the same path using
ROUTE_DST parameter as specified in [I-D.ietf-camarillo-hip-via].

7. Packet Formats

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|               Type            |             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          Identifier                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+


Type        [ TBD by IANA: 980 ]
Length      4
Identifier  32 bit identifier for the overlay
```
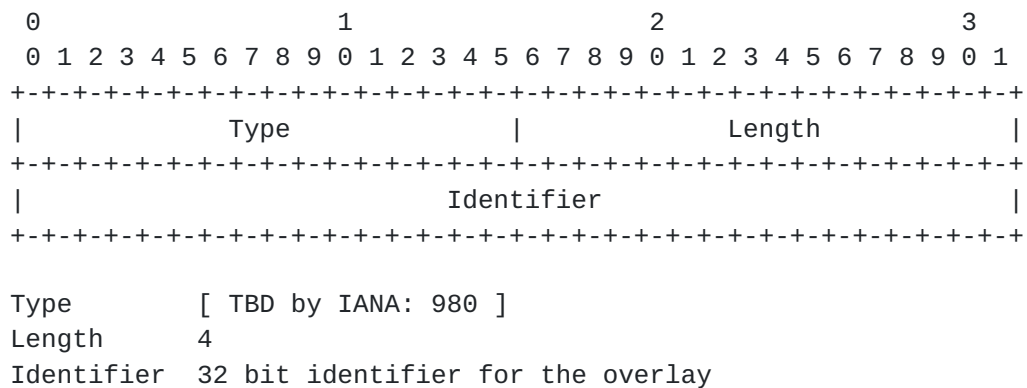
Figure 1: Format of the OVERLAY_ID parameter

Figure 1 shows the format of a new HIP parameter used for identifying
the right overlay if a host participates in multiple overlay
networks. For RELOAD HIP BONE overlay networks, the identifier is
calculated as defined in Section 5.3.2 of [I-D.ietf-p2psip-base].

8. NAT Traversal

RELOAD relies on the Forwarding and Link Management Layer providing
NAT traversal capabilities. Thus, the RELOAD HIP BONE instance
implementation MUST implement [I-D.ietf-hip-nat-traversal] or some
other reliable NAT traversal mechanism.

HIP relay servers are not generally needed with this HIP BONE
instance since the overlay network can be used for relaying the Base
Exchange and further HIP signaling can be done directly between the
peers.

9. Security Considerations

TBD.

10. IANA Considerations

This section is to be interpreted according to [RFC5226].

This document updates the IANA Registry for HIP Parameter Types
[RFC5201] by assigning new HIP Parameter Type value for the new HIP
Parameter OVERLAY_ID (defined in Section 7).

11. Normative References

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[RFC4843]   Nikander, P., Laganier, J., and F. Dupont, "An IPv6 Prefix
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[RFC5201]   Moskowitz, R., Nikander, P., Jokela, P., and T. Henderson,
            "Host Identity Protocol", RFC 5201, April 2008.

[RFC5226]   Narten, T. and H. Alvestrand, "Guidelines for Writing an
            IANA Considerations Section in RFCs", BCP 26, RFC 5226,
            May 2008.

[I-D.ietf-hip-bone]
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[I-D.ietf-p2psip-base]
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[I-D.ietf-camarillo-hip-via]
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