HIP DNS Extensions
draft-nikander-hip-dns-00.txt

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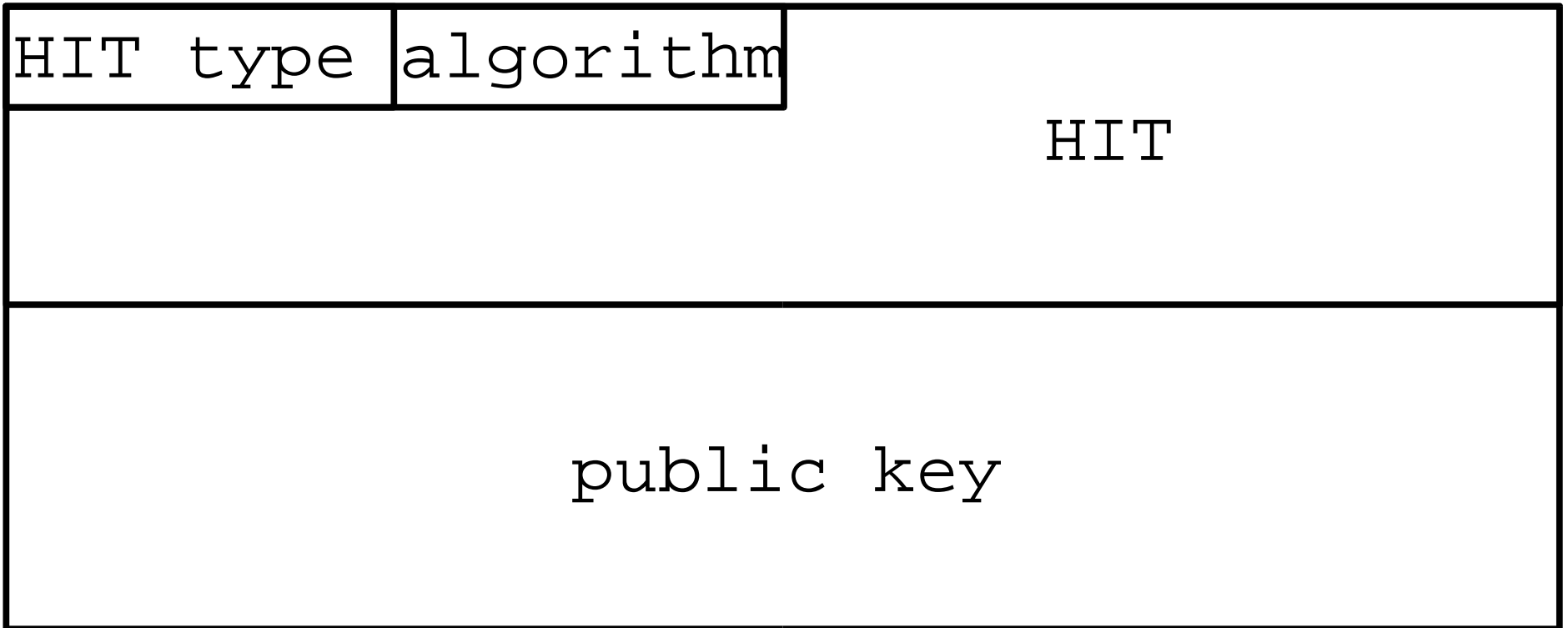HIP WG, 60th IETF
San Diego, CA, USA

Thurday, August 5th, 2004

Goals

- Two news DNS RRs used by HIP nodes
- The HIPHI allows a HIP node to store:
  - Its HI and/or HIT
  - Similar to the public key field of an IPSECKEY RR
- The HIPRVS allows a HIP node to store:
  - Its Rendezvous Servers' FQDN or IP address
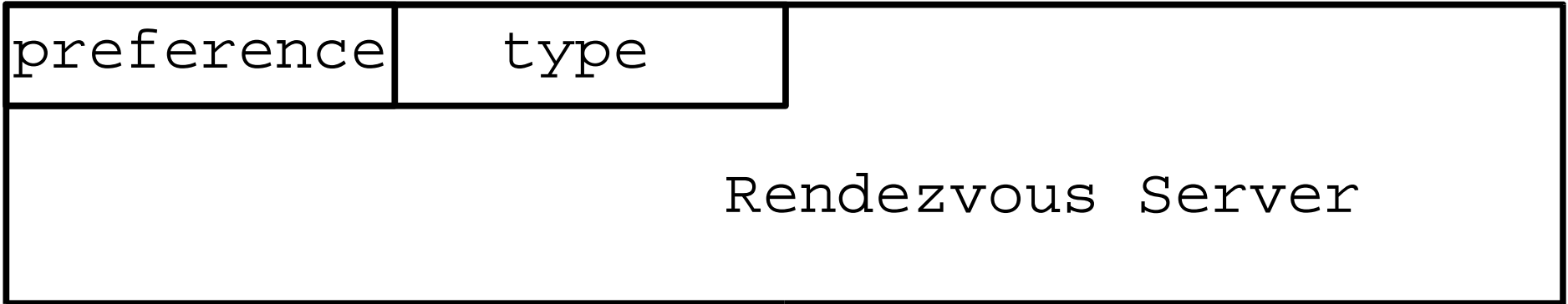 - Similar to the gateway field of an IPSECKEY RR

HIPHI RR

```
 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
+---------------+---------------+
|   HIT type    |   algorithm   |
+---------------+---------------+---------------------------------+
|                                                                 |
|                             HIT                                 |
|                                                                 |
+-----------------------------------------------------------------+
|                                                                 |
|                          public key                             |
|                                                                 |
+-----------------------------------------------------------------+
```

HIPRVS RR

```
 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
+-----------------------+-----------------------+
|      preference       |         type          |
+-----------------------+-----------------------+
|                                               |
|              Rendezvous Server                |
|                                               |
+-----------------------------------------------+
```
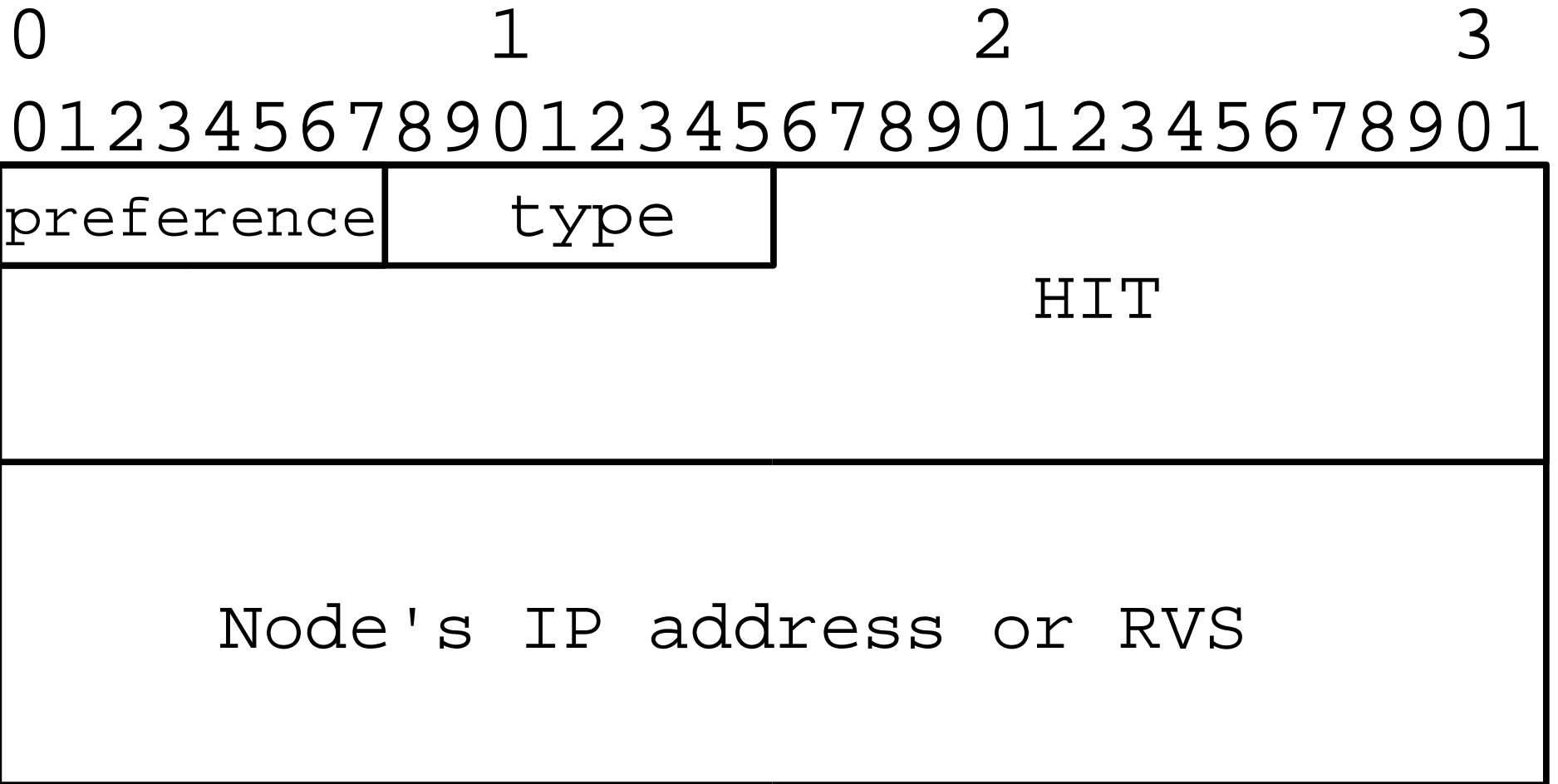
Implicit HI→IP mapping

- In the simplest case:

  - A given FQDN maps to a single HI

  - This HI is associated to one or more IP addresses

- But what if:

  - A given FQDN maps to multiple HIs

  - Each HIs maps to a particular set of IP addresses

  - Could be the case when load balancing on several peers with distincts HIs

Storing implicitly HI→IP mapping (1)

FQDN

↓

HI

↙ ↘

IP_a IP_b

FQDN HIPHI   HI

FQDN A IP_a

FQDN HIPRVS IP_b

FQDN

↙ ↘

HI_1 HI_2

↙ ↘   ↙ ↘

IP_{1a} IP_{1b} IP_{2a} IP_{2b}

FQDN HIPHI HI_1

FQDN A IP_{1a}

FQDN HIPRVS IP_{1b}

FQDN HIPHI HI_2

FQDN A IP_{2a}

FQDN HIPRVS IP_{2b}
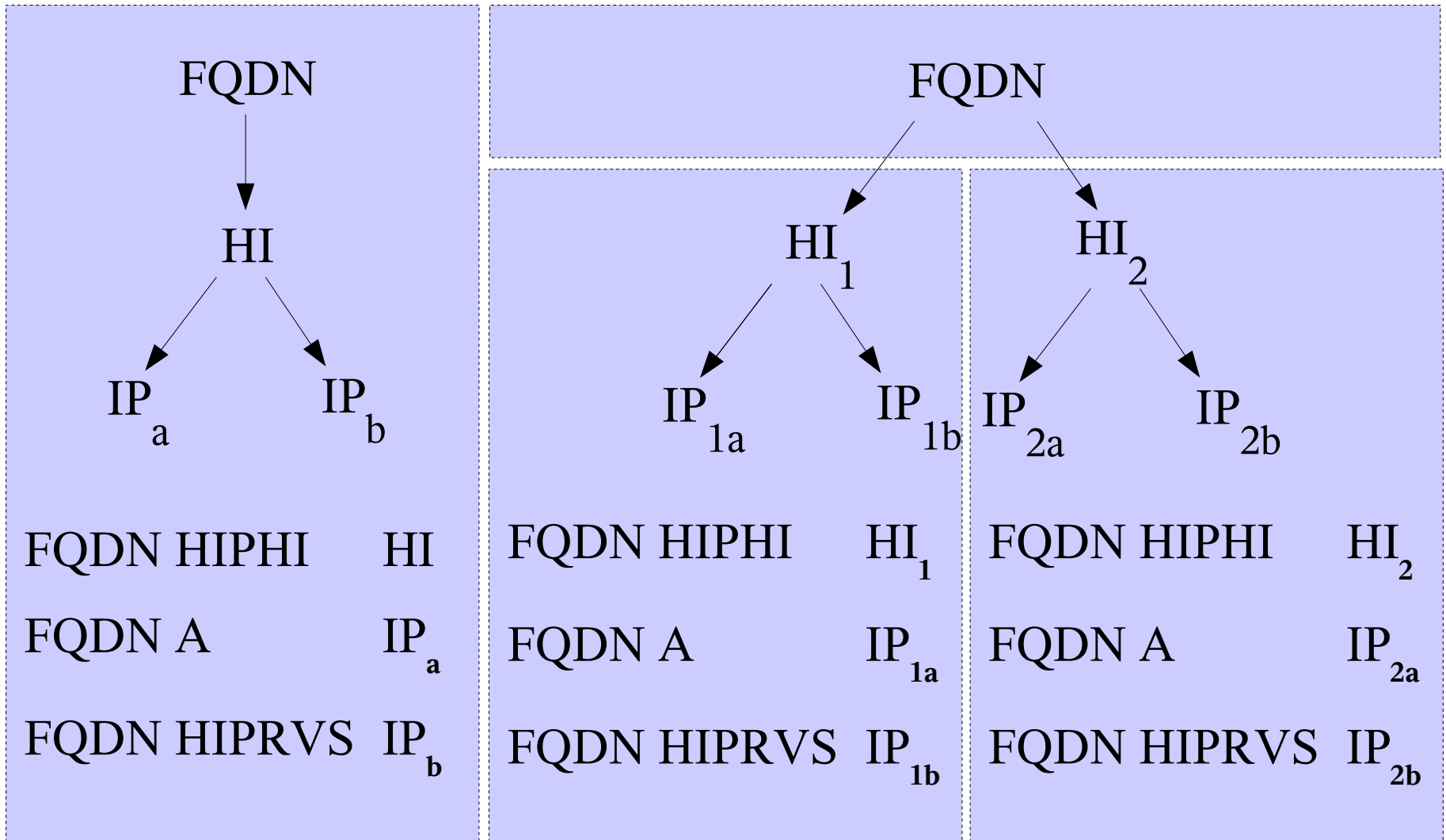
HIT-indexed HIPRVS and HIPLOC

```
 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
+-----------------------+-----------------------+
|preference|    type    |
+-----------------------+-----------------------+
|                              HIT                              |
|                                                               |
|                                                               |
+---------------------------------------------------------------+
|                                                               |
|                 Node's IP address or RVS                      |
|                                                               |
|                                                               |
+---------------------------------------------------------------+
```

Storing implicitly HI→IP mapping (2)

FQDN

HI$_1$

IP$_{1a}$ IP$_{1b}$

FQDN HIPHI   HIT$_1$HI$_1$

FQDN HIPLOC HIT$_1$IP$_{1a}$

FQDN HIPRVS HIT$_1$IP$_{1b}$

HI$_2$

IP$_{2a}$ IP$_{2b}$

FQDN HIPHI   HIT$_2$HI$_2$

FQDN HIPLOC HIT$_2$IP$_{2a}$

FQDN HIPRVS HIT$_2$IP$_{2b}$
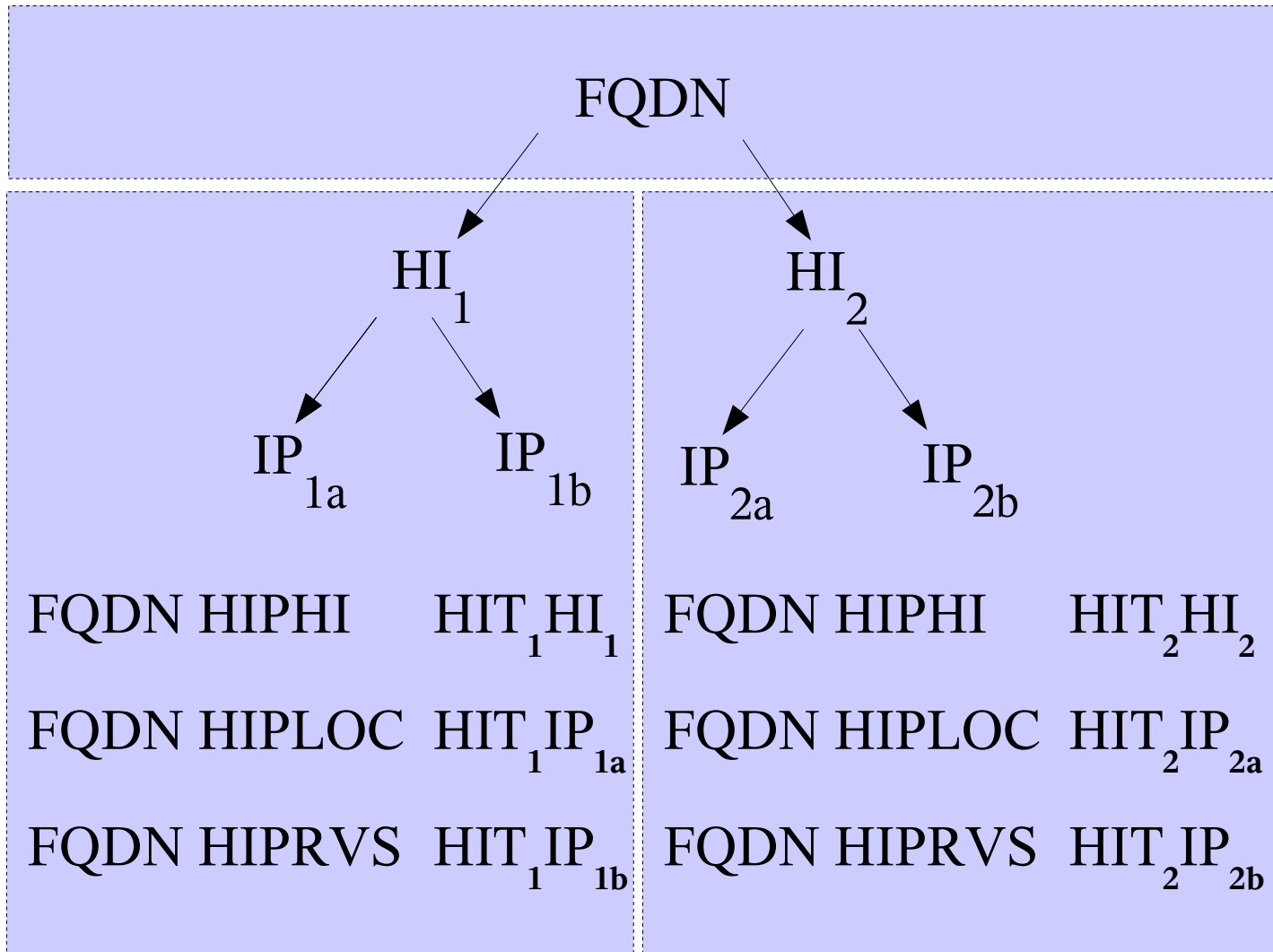
Open questions

- Is something missing?

- Do we need:
  - HIT-indexed RRs or Byte-indexed RRs

- Do we need separate RRs?
  - i.e., HIPHI, HIPRVS, and perhaps HIPLOC

- Or subtype on a single HIP RR?
  - www.example.com HIP HI 0x1236723...
  - www.example.com HIP LOC 195.123.12.34
  - www.example.com HIP RVS rvs.example.com

Questions or comments...

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