

*Mobile IP Reverse Tunneling
Update
(RFC2344bis)*

Gabriel Montenegro

gab@sun.com

Sun

IETF-47, Adelaide

3/00

Outline

- **Changes to base RFC2344**
 - **New Appendix on limited *disparate* (“private”) address support (DAS)**
 - **More general considerations**
 - **Other issues**
-

Problem with HA discovery

- **Dynamic home agent discovery (non-directed broadcast type)**
 - home agent field in registration request is zero
- **Destination Addr in reverse tunnels (RFC2344)**
 - “Copied from the Home Agent field within the Registration Request”

THIS BREAKS!

Pointed out by Yingchun_Xu@MW.3COM.COM

Solution

- **But we can use language in Encapsulating Delivery Style:**

The address of the agent as learned from the IP source address of the agent's most recent registration reply.

- **Modified the above as follows and used it also for the reverse tunnels:**

The address of the agent as learned from the IP source address of the agent's most recent successful registration reply.

Consensus on Private Addresses

- **3 choices on the mailing list:**

- use co-located addresses
- reverse tunneling (if going thru a foreign agent)
- new solution to deal with private addresses

- **consensus on reverse tunneling**

- solves many problems
 - relies on help from globally routable address space (draft-ietf-[iab-ntwlyrws-over-02.txt](#))
 - relies on layer 2 for disambiguation and security (ok for cellular standards)
-

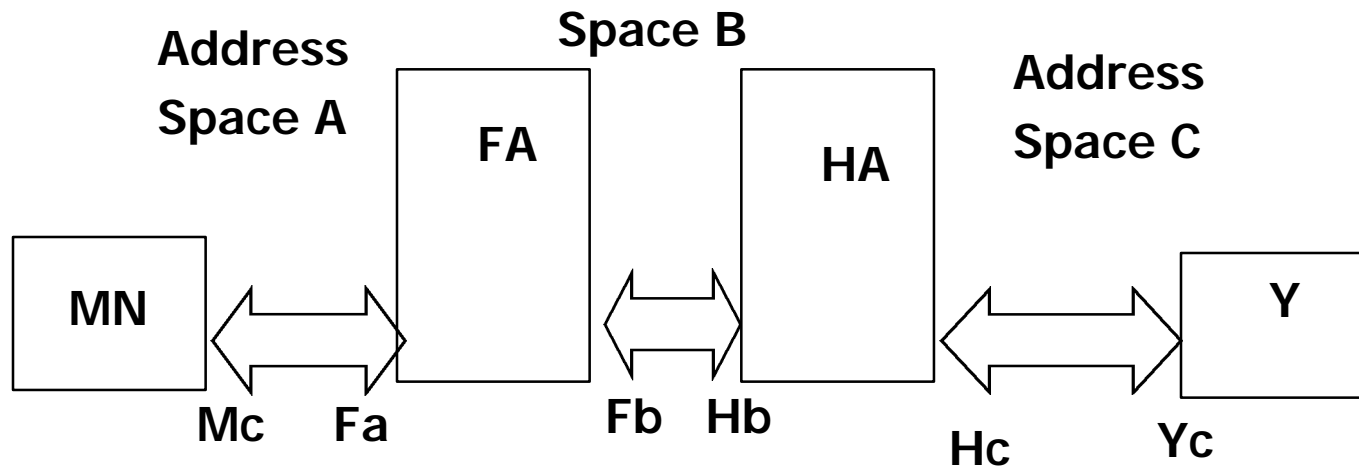
What was done

- **scenario and its limitations was documented**
- **new section in rfc2344bis: Appendix on Disparate Address Space Support**
- **Informational, no new protocol elements within this section.**



Limited DAS Support

- **In same address space:**
 - correspondent node and MN
 - HA and FA
- **FA to use link-layer info to disambiguate MN's**
- **typical: A and C: “private”; B: public internet.**



More general considerations

- **How do network elements advertise their realm?**
 - Use of Realm Indicator
- **How to discover which tunnel endpoints to use?**
 - use of 'P' bit, etc



Realm Indicator

- Not quite an NAI (“user@realm”), but a realm.
- How to express the root domain (global Internet) as a realm? From RFC1034, section 3.1:
 - binary null label (zero length)
 - ascii: “ “
 - ascii: “. ” <=====



Realm Indicator (2)

- **Realm Indicator (RI), in ABNF:**

`realm-indicator = realm / "."` ;see RFC1034, sec.3.1

`realm = <from network access identifier (rfc2486)>`

- **Private address extension might include:**

`coa, ri`

- **Example, FA advertises two Care-of Addresses:**

`ipaddr1, "A.com." (or simply "A.com")`

`ipaddr2, "."`

Using the right tunnel end-points

- **For registration with HA, use Fb, not the usual COA of Fa.**
 - **How to discover and use Fb? Some options:**
 - FA recognizes an rfc1918 MN and forces Fb
 - always advertise Fb? Fine if $Fb \iff H$ is always valid, for any H
 - ‘P’ bit and RI could prompt the MN to ask for a relevant COA,RI pair.
 - **For registration with FA, use Hb, not the usual Hc.**
 - **How to discover and use Hb? Some options:**
 - the MN always uses Hb (perhaps it never goes home)
 - triggered by using Fb (a “public” coa)
 - used to match the RI of the COA being used.
-

Other issues

- **TTL=255 for reverse tunnel registrations**
 - necessary for security
 - **TTL=1 for 224.0.0.11**
 - 224.0.0.11 is link-local and **MUST** not be forwarded by routers
 - this requirement is superfluous
 - 8 of rfc2365 (administratively scoped IP multicast) which maps ipv6 address types to ipv4 address types
 - link local is defined in rfc2373 (ip version 6 addressing architecture)
 - **Limit on error replies is per FA not per MN address that tries to register**
-