

Mobile IPv6

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IPv6

Differences with IPv4

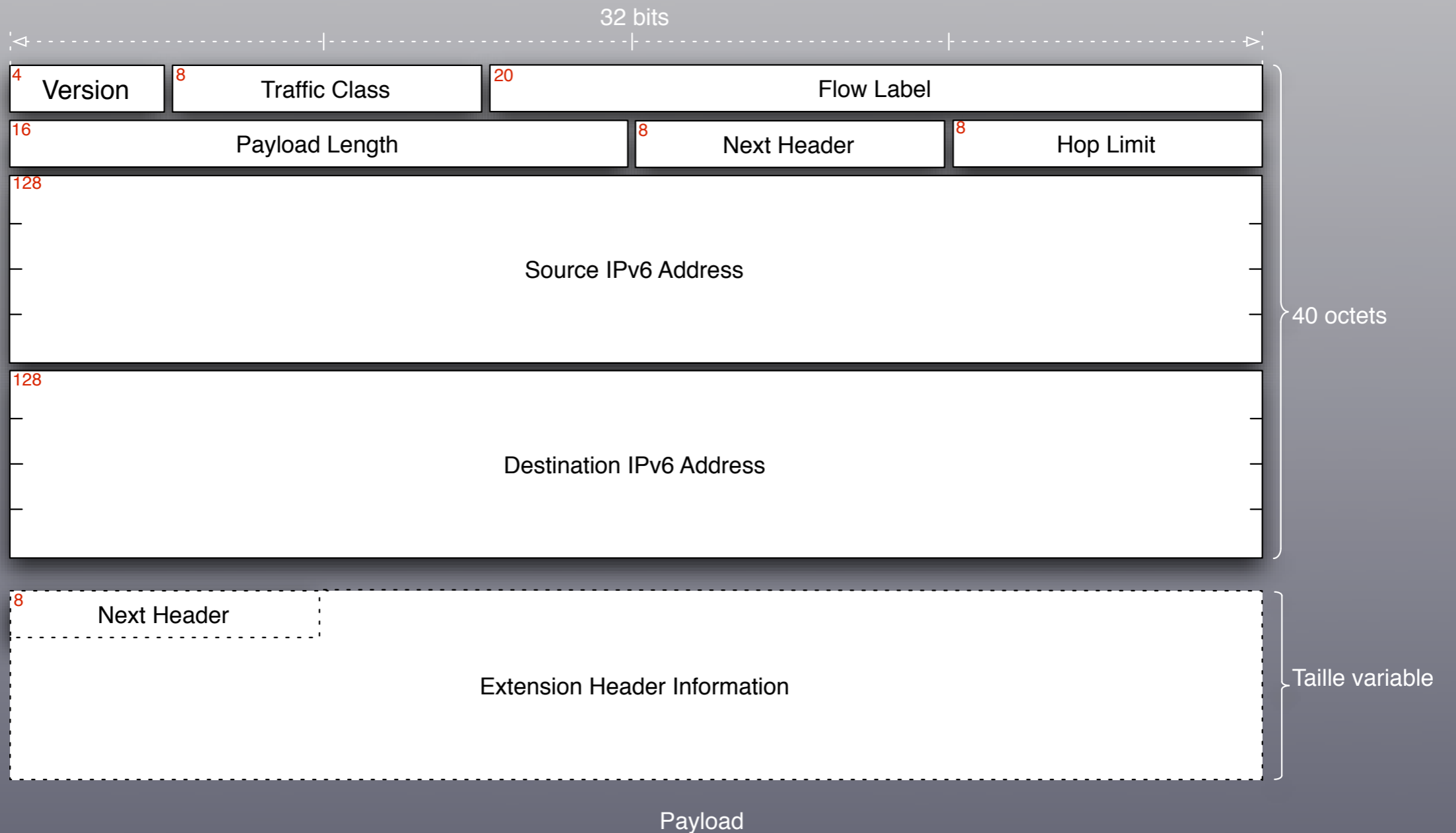
Functional changes

1. end to end communications
2. ARP included in ICMPv6

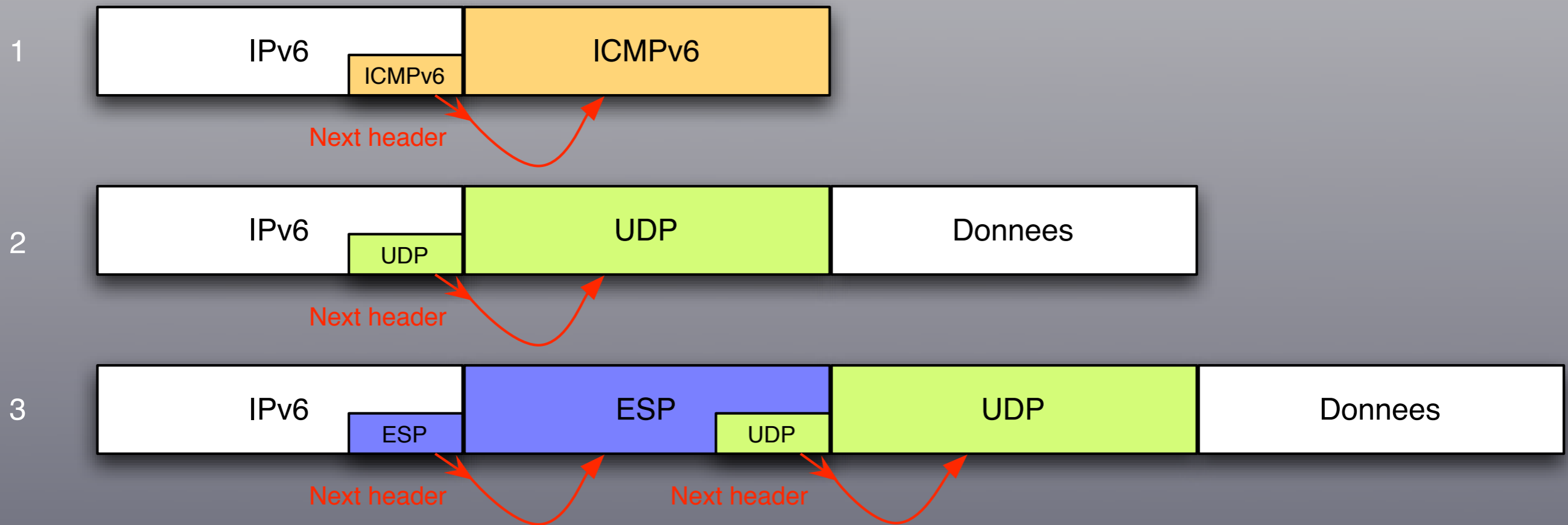
Structural changes

1. fixed length header
2. fragmentation at the source, no checksum
3. extensions/options with chain of header

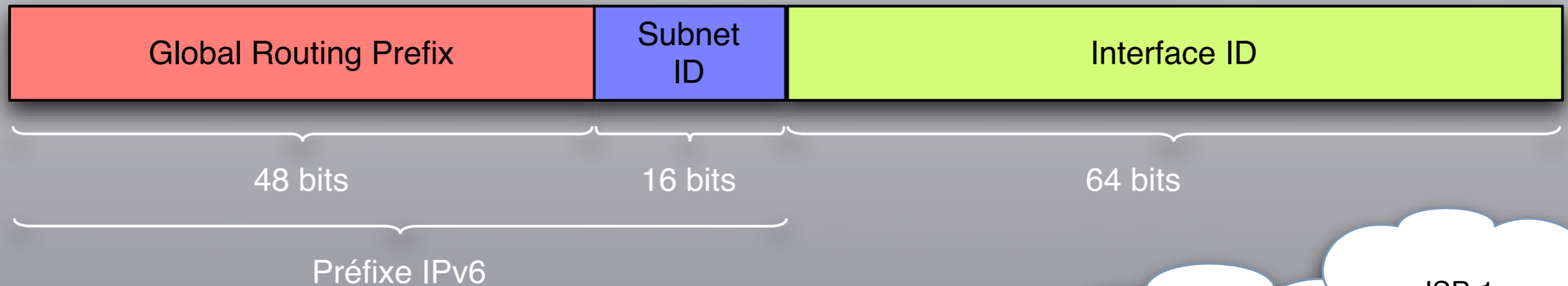
The header



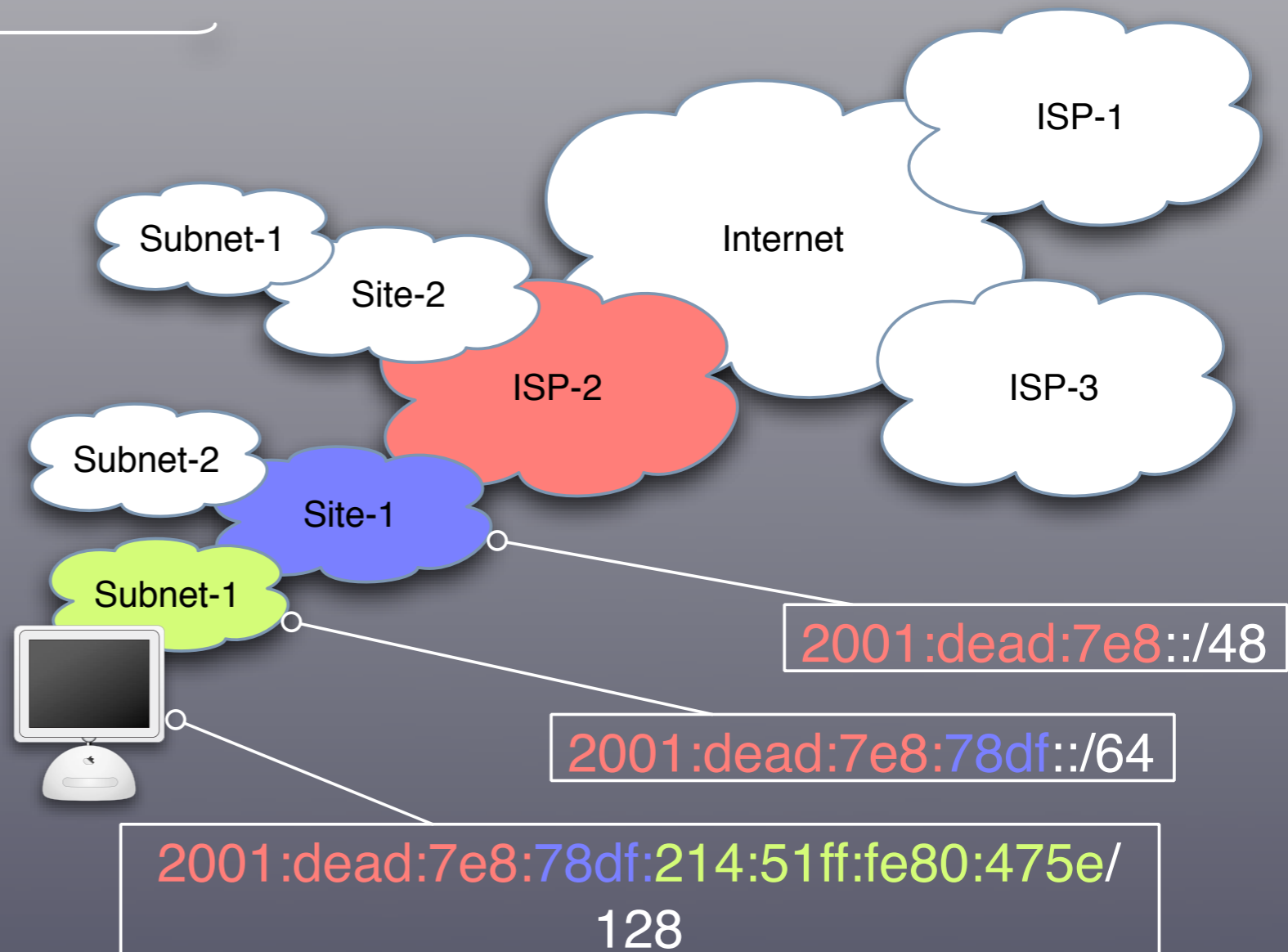
Extensions



IPv6 addresses



- hierarchical/geographical
- 64 bits prefix
- interface ID dynamically generated



Auto-configuration

- mechanism integrated to ICMPv6
- Behavior
 1. Retrieval of the IPv6 prefix advertised by the access router (RS/RA, Router Solicitation/Advertisement)
 2. Generation of the interface ID
 3. Generation of the global address adding the prefix and the unique interface ID

Mobile IPv6/NEMO

RFC 3775/3963

Why ?

1. Use the same IPv6 address wherever you are located
 2. Make changes of mediums transparent for transport layers
 3. Keep *connections* alive while moving
- ➔ use a laptop/PDA the same way that you do with your cell-phone

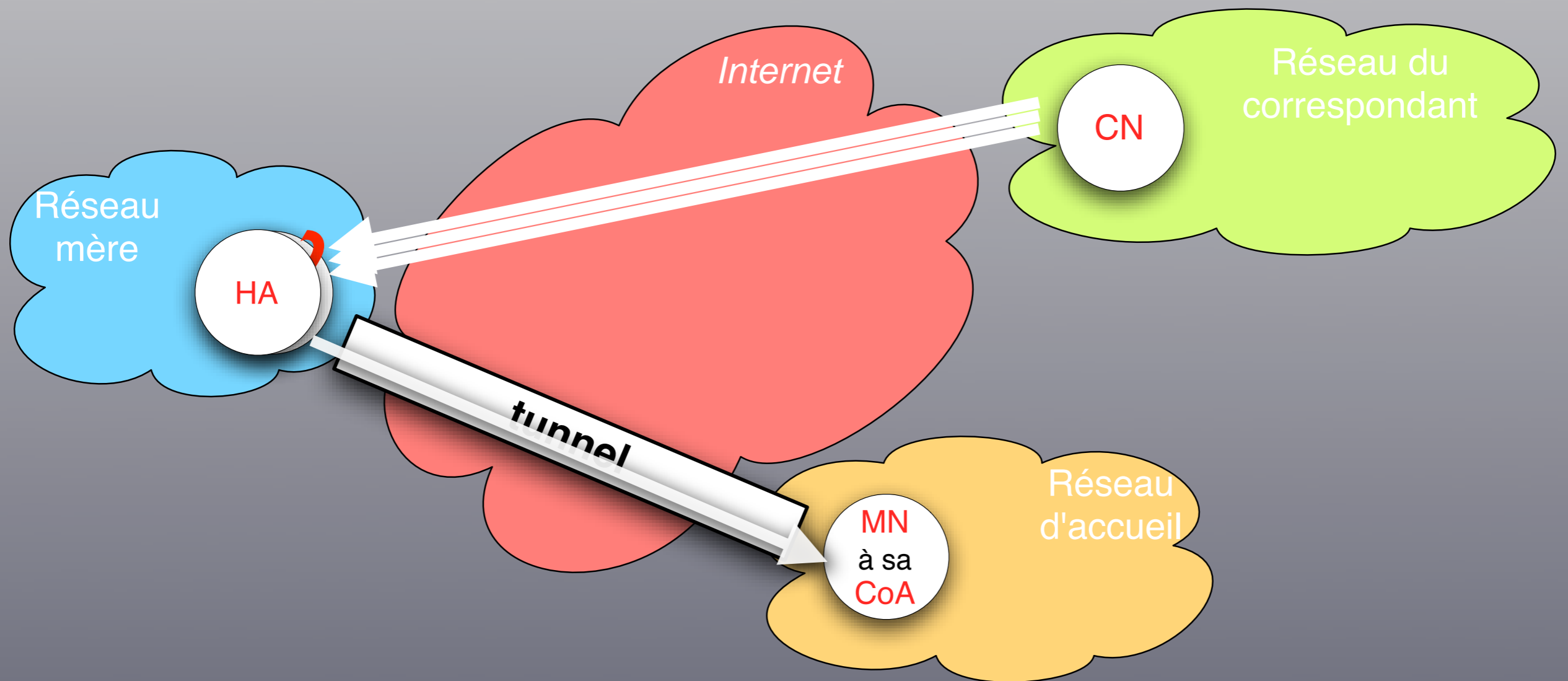
Challenges

- The routing is geographical, the IP address have a double functionality
 - ✓ **Identifier**: identify the machine
 - ✓ **Locator**: geographical position in the network
- A new architecture is necessary
 1. compatible with actual end nodes
 2. not modifying the actual routing system
 - ➔ MIPv6 is only implemented in end points

How ?

- The protocol is integrated to the IPv6 stack
- Separate identifier et locator with two addresses:
HoA (Home Address) and **CoA** (Care of Address)
- Three new entities:
 1. **Mobile Node**: always reachable to its HoA whatever is CoA
 2. **Home Agent**: map the CoA to the HoA
 3. **Correspondent Node**

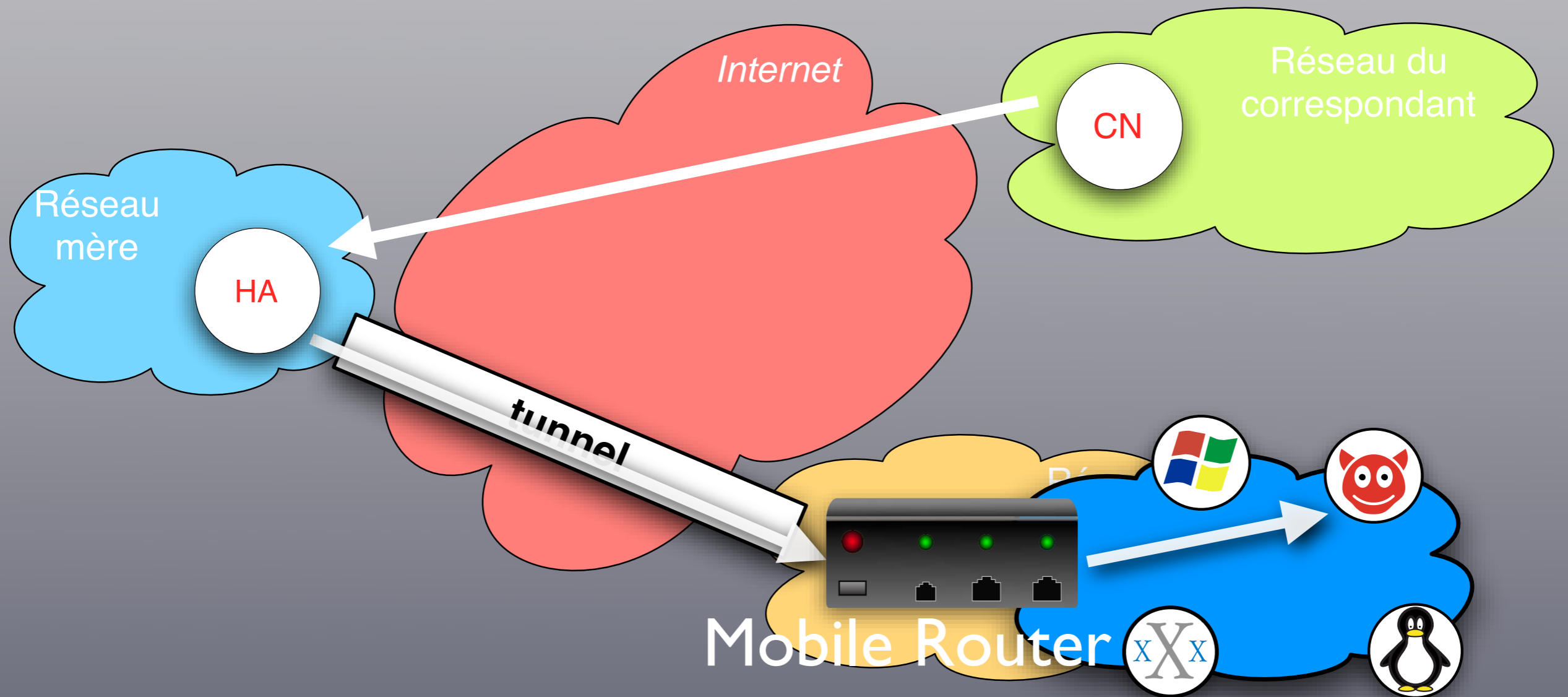
Behavior



HoA: permanent address of the MN; *identifier*

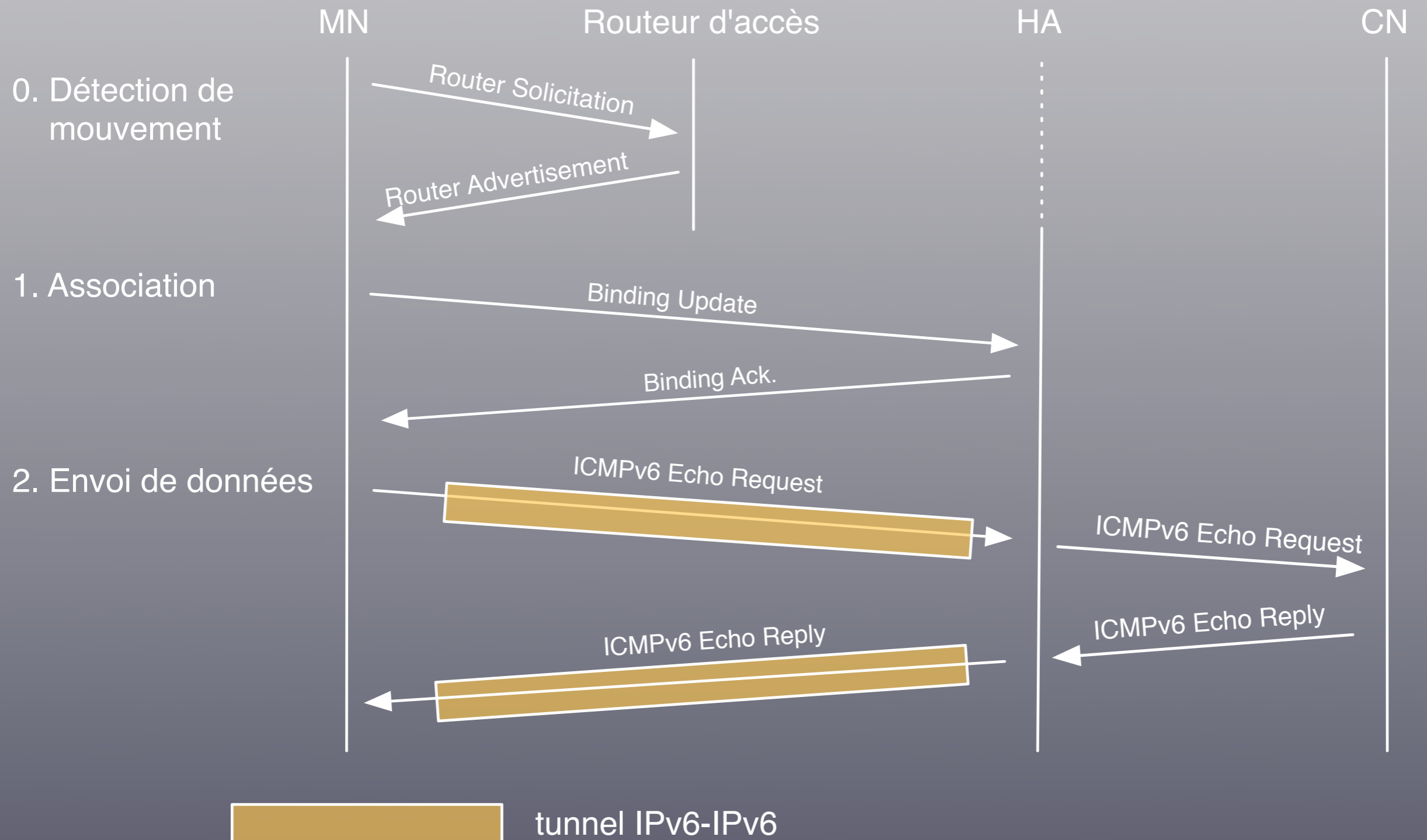
CoA: address of the MN in the visiting network; *locator*

NEMO

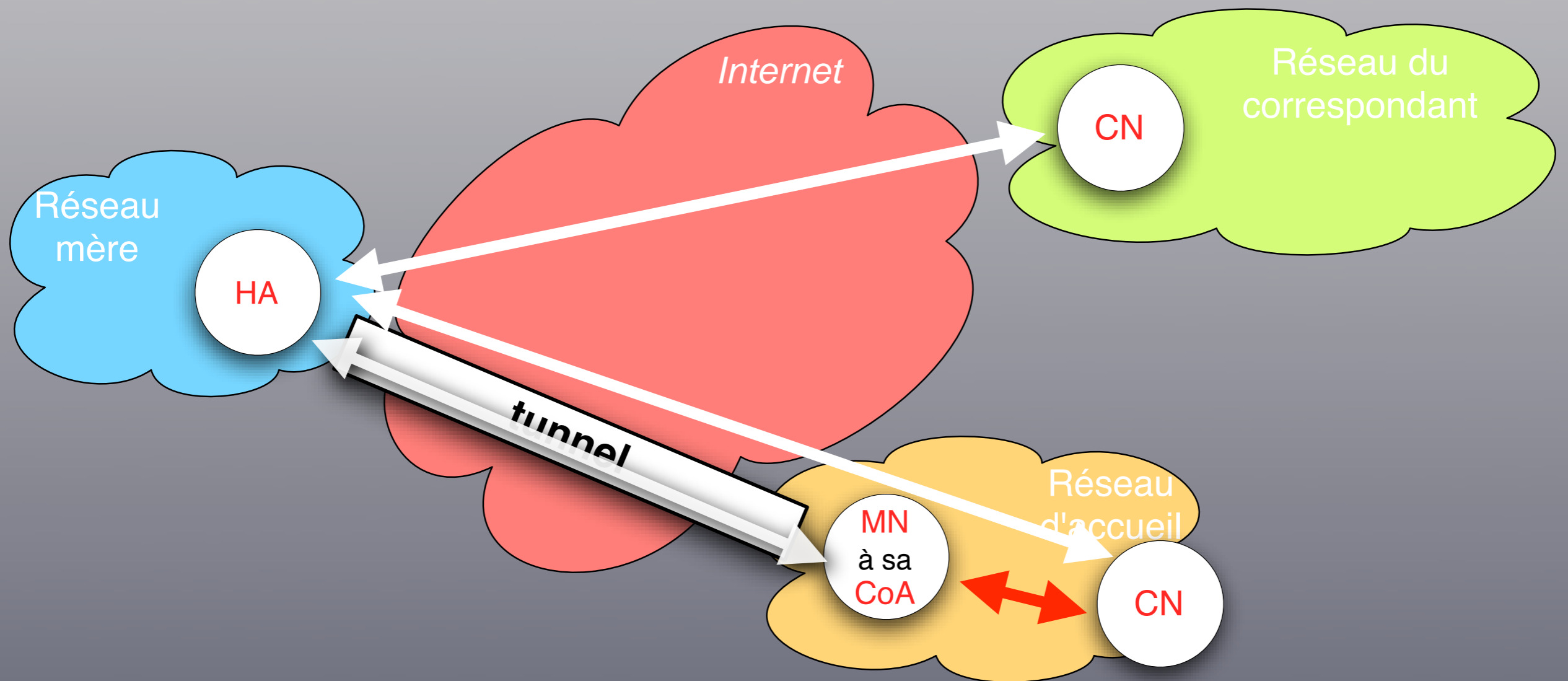


A whole network moves.

In details



Triangular routing



=> have an *optimal* routing

Return Routability Procedure

- Optimize the communication MN/CN safely
- Guarantee the relation between identifier and locator using the routing
 - ✓ verify that the MN is reachable its HoA and CoA
- ➔ generate a key to sign the Binding Update send to the CN

RRP issues

- It is not working with NEMO
- inefficient as it adds delay and must be performed after each movement
- problems when the MN can't perform it and the CN is still trying to reach the CN at its CoA