

# Mobile SSM Sources

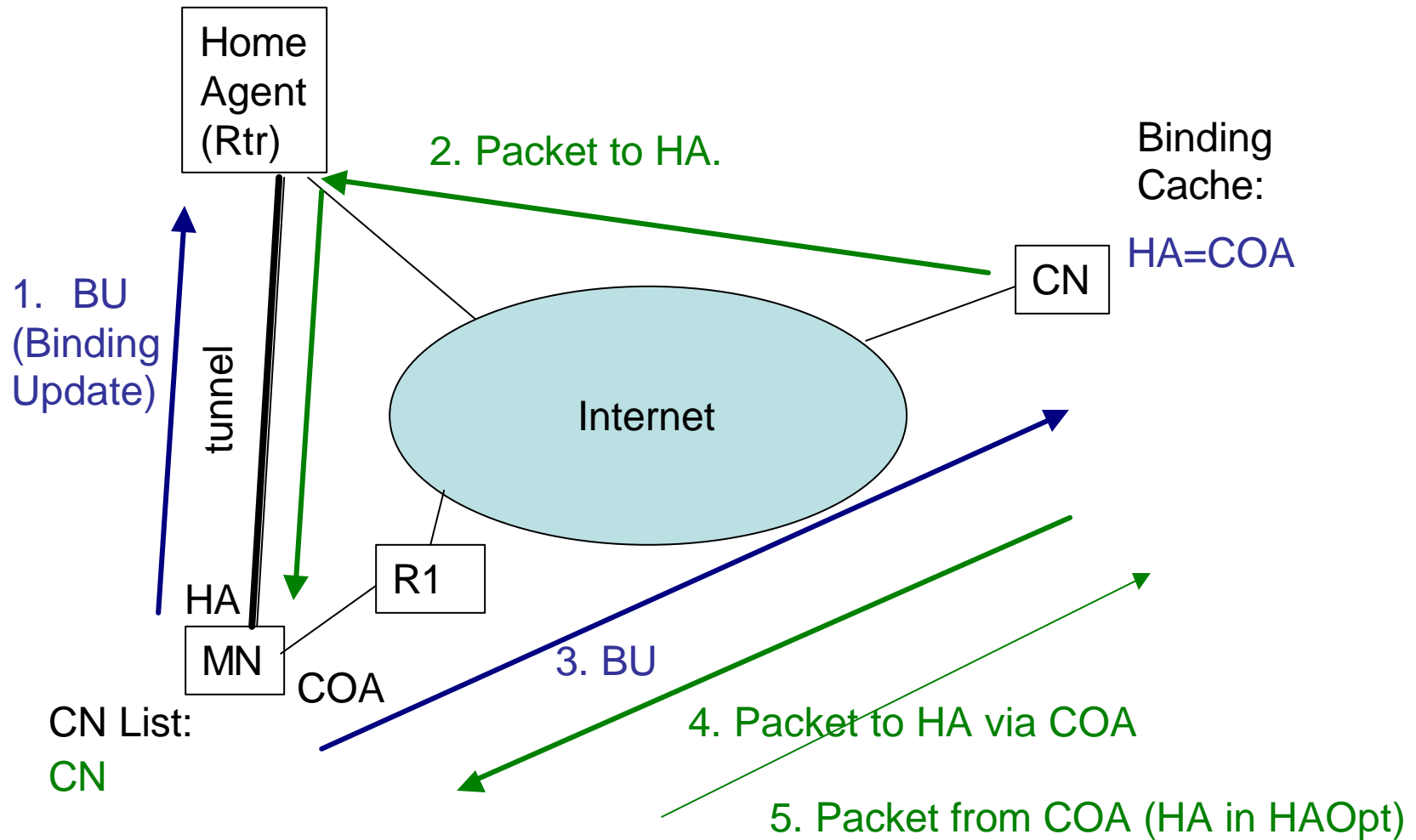
(magma/mobileip/ssm interactions)

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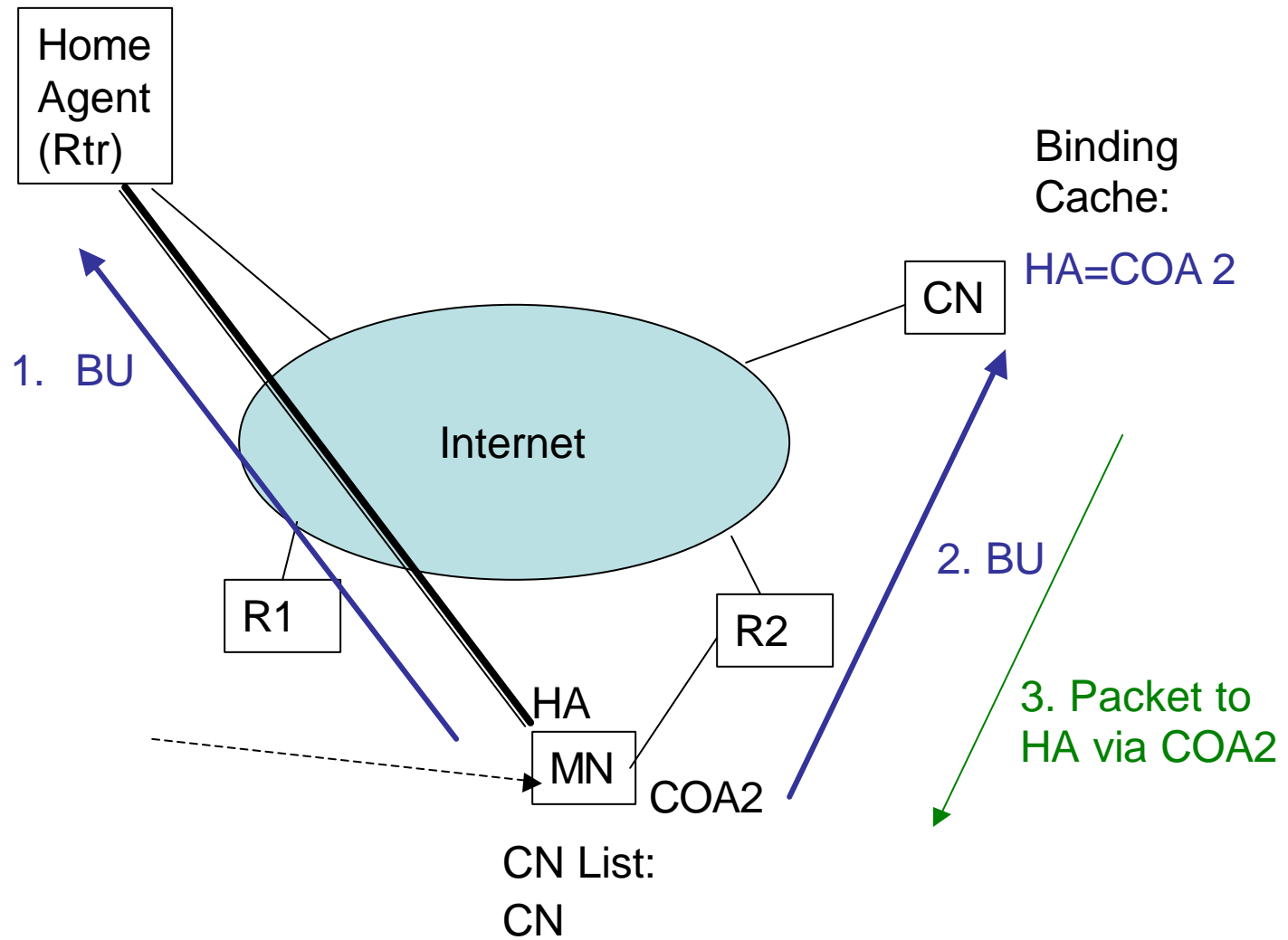
# Mobile IP Review

- Two primary requirements:
  1. **Transparent to apps/protocols**
    - Existing sessions continue working
  2. **Route optimization after first packet burst**
    - Packets follow shortest path between new location and correspondents
- Other requirements not affected by the multicast problem:
  - Work in presence of source ingress filtering (IPv6-only)
  - Don't require special infrastructure support in foreign locations (IPv6-only)
  - Allow stable home addresses in DNS
  - Allow location privacy as alternative to route optimization

# Unicast Mobile IPv6 Example



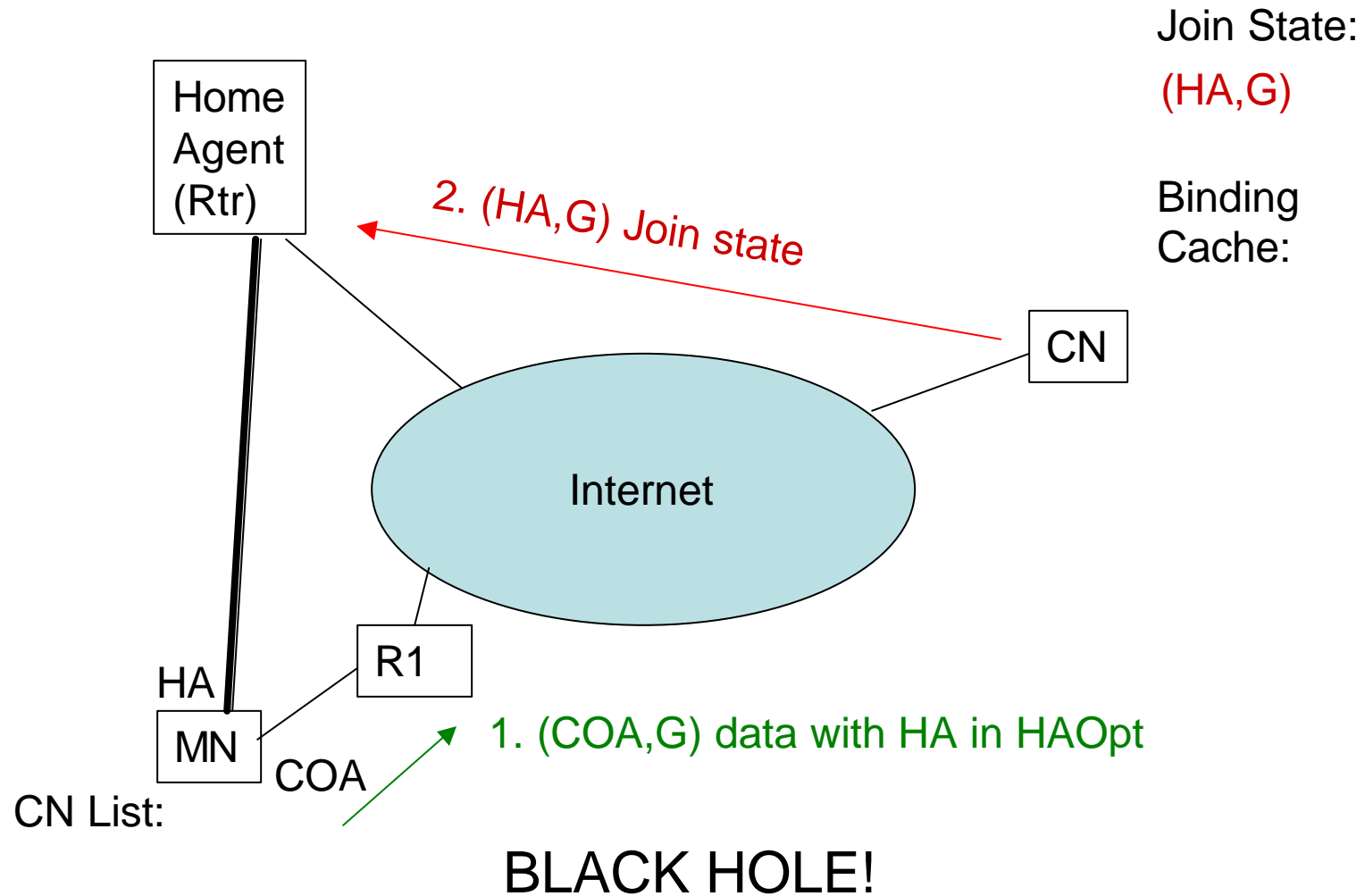
# Unicast Mobile IPv6 Example



# Effects on Multicast

- No problem receiving normal data
  - Receiver's address is typically irrelevant
  - After moving, you're just like a new receiver
- No problem sourcing ASM traffic from COA
  - Just like a new source to multicast routing
  - Can use HA Option so apps don't see source change

# The SSM Problem



# Possible Solutions

1. Don't use Mobile IP, make it the app's problem
  - Ignores transparency requirement
  - Can't expect arbitrary app writers to get it right
2. Always tunnel via HAgent from HA
  - Ignores route optimization requirement
  - Equivalent to PIM-SM with no SPT switching
3. Add mechanism to solve the problem

# What's the real cause?

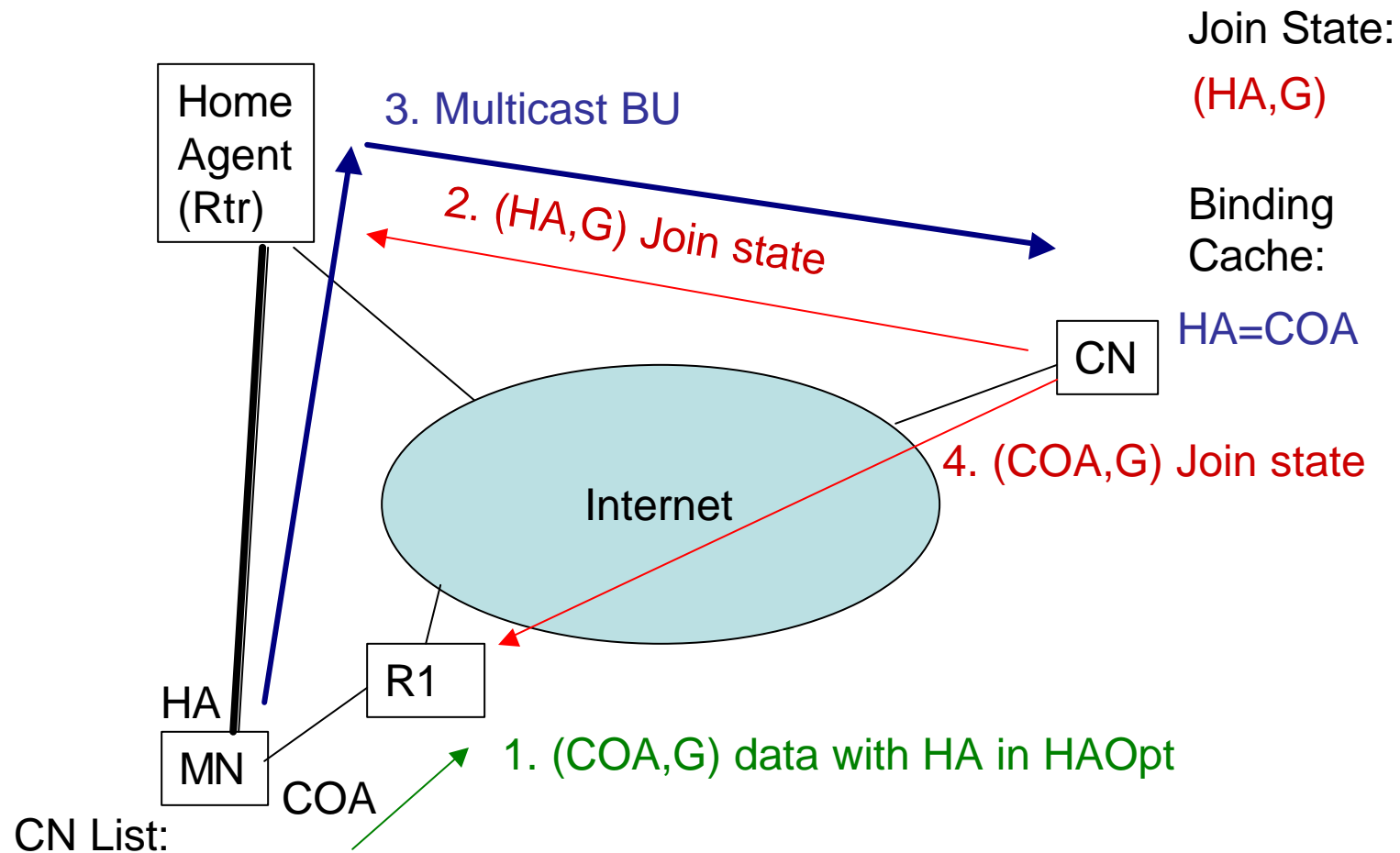
- In Mobile IP, the binding cache insures:
  - Upper layer always sees HA
  - Wire always sees COA
- Host's unicast routing uses binding cache
- Host's multicast routing does not! (Oops!)
- So obvious answer is to use the BC just like unicast does:
  - App joins (HA,G)
  - Host sends (COA,G) join on the wire



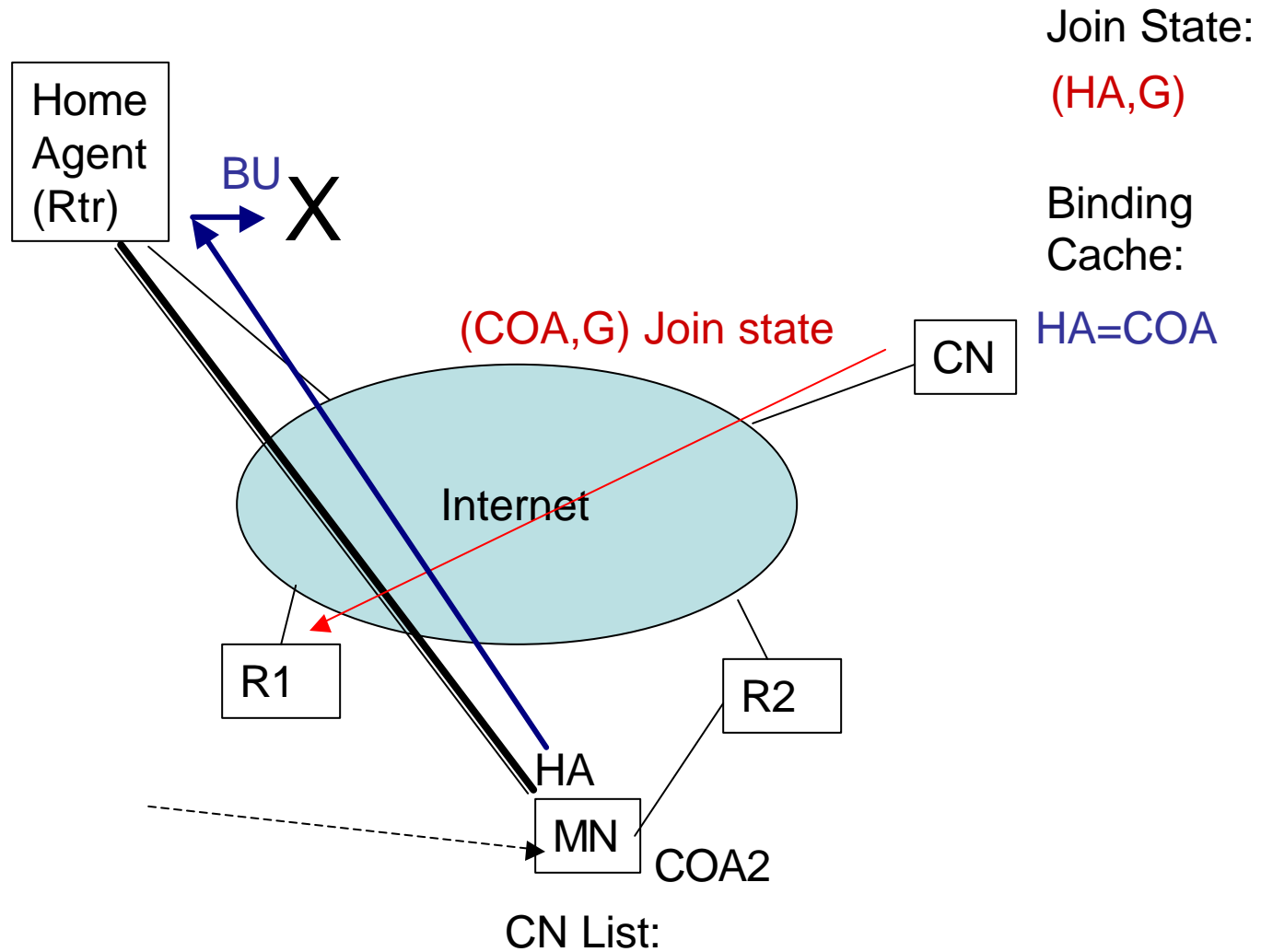
# The rest of the problem...

- So how do you get a BU to the group?
- Mobile source can multicast BU's from HA tunneled via Home Agent
  - Must be periodic to allow new joiners
  - Somewhat analogous to periodic null registers
  - Requires a security mechanism that works with this
- One final problem comes when source moves again...

# Multicast Mobile IPv6 Example



# Multicast Mobile IPv6 Example



# Final Rule Would Be

- MLDv2 receivers always join to (S,G)
- If a BC entry for S exists, they ALSO join to (COA,G)
- When BU is received for a source S
  - Leave any old (COA,G)'s for that source
  - Join new (COA,G)'s for that source

# So which solution?

1. Don't use Mobile IP, make it the app's problem
  - Ignores transparency requirement
  - Can't expect arbitrary app writers to get it right
2. Always tunnel via HAgent from HA
  - Ignores route optimization requirement
  - Equivalent to PIM-SM with no SPT switching
3. Add mechanism to solve the problem
  - Binding Cache becomes a MUST?

Keep in mind: source doesn't necessarily know whether all receivers are exclude mode today.