Mobility Support in NSIS
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How NSIS can work with Mobility

Problem:

- In WG charter: "*The work produced in this Working Group should **work with** existing IETF **mobility** and AAA protocols, including **(but not limited to) Mobile IP, SeaMoby Context Transfer** and Diameter.*"
- But - there are various mobility protocols (IPv4+v6 mobility, FMIP, HMIP/LMM, CTP, …)

Implications:

- NSIS concerns with signaling along **data path**
  - **Separating** NSIS signaling from mobility signaling!
- How about generalizing data path **after completing** various mobility protocols?
  - API for (mobility) route change notification & query

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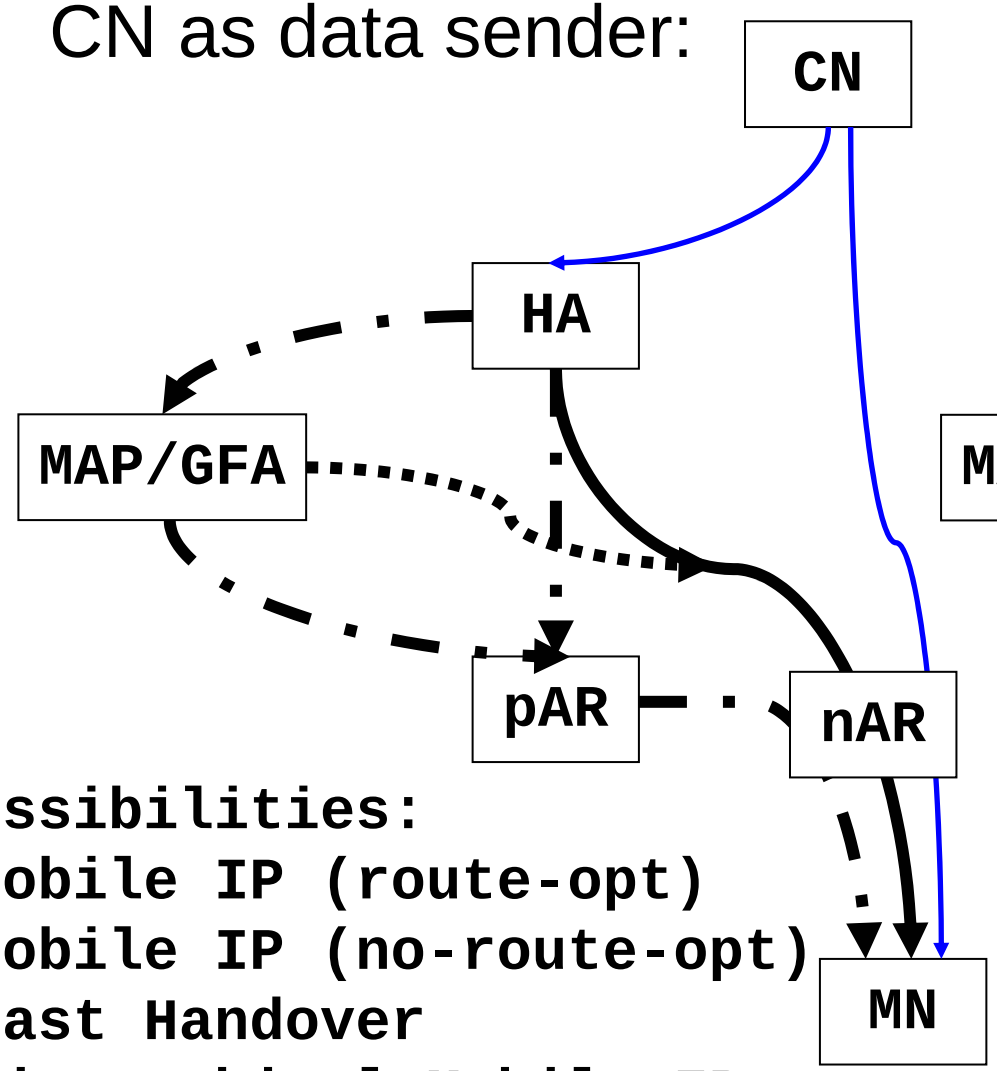
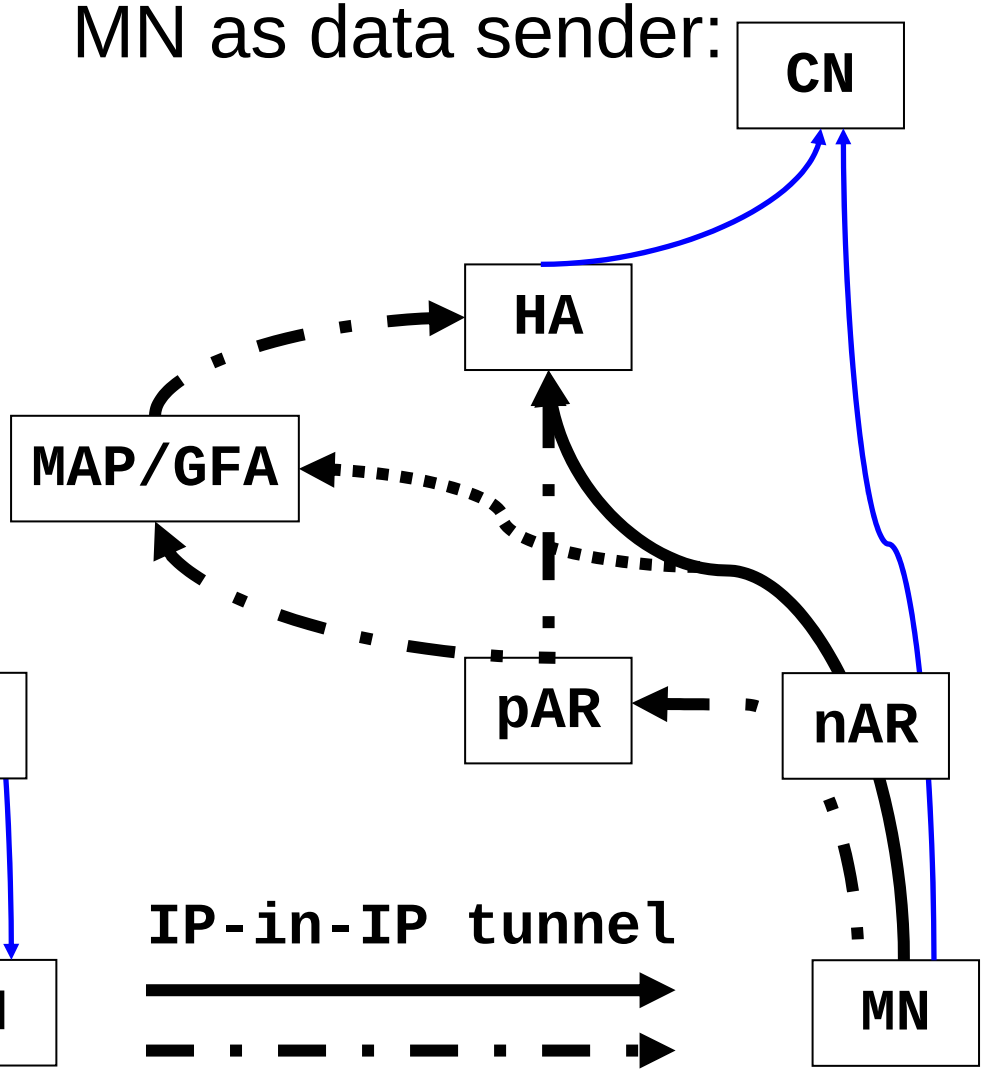
CN as data sender:



MN as data sender:



Possibilities:

- **Mobile IP (route-opt)**
- **Mobile IP (no-route-opt)**
- **Fast Handover**
- **Hierarchical Mobile IP**
- **Fast handover with HMIP**
- **……**

IP-in-IP tunnel

Normal routing

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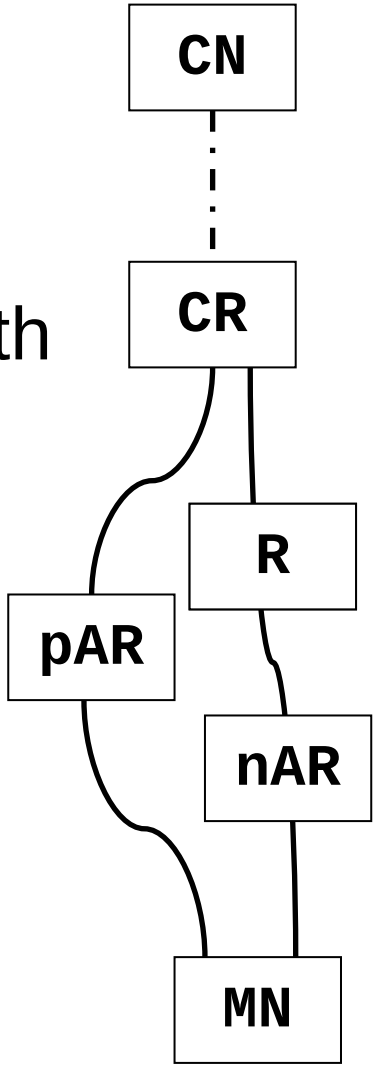
General issue: state management

Problem:

- Cross-Over Router (CR) splits the data path
- State must be updated to reflect the flow
  - Must be **ONE state** per single session
  - Scope to refresh: **locally** or **E2E**?

Implications:

- Session ID independent of flow ID
- E2E refresh to update flow ID



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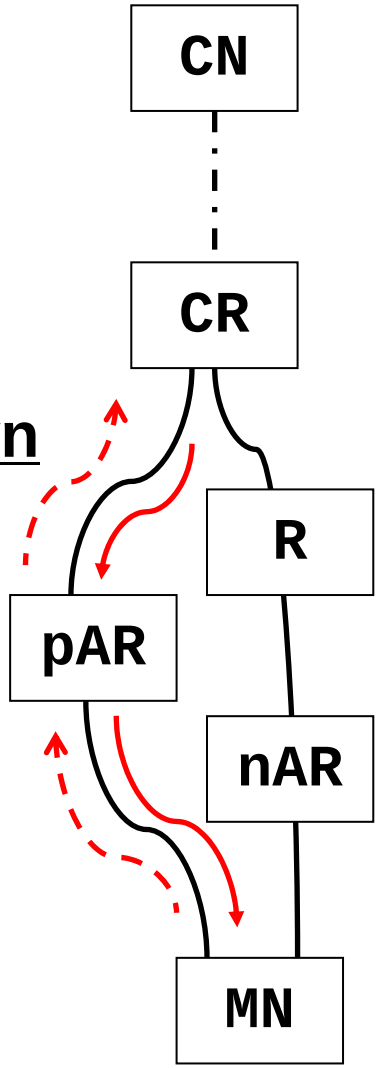
Local repair issue

Problem:

- Between MN and CR:
  - New path → establish new states
  - Old path→ state expiration or explicit **teardown**
- MN may loose connectivity
  - → **impossible** to send a teardown
- Teardown should **NOT** release state in **common** path

Implication:

- Maybe a Branch_ID or Message_ID?
- CR is best to initiate teardown?
- Authentication/DoS?



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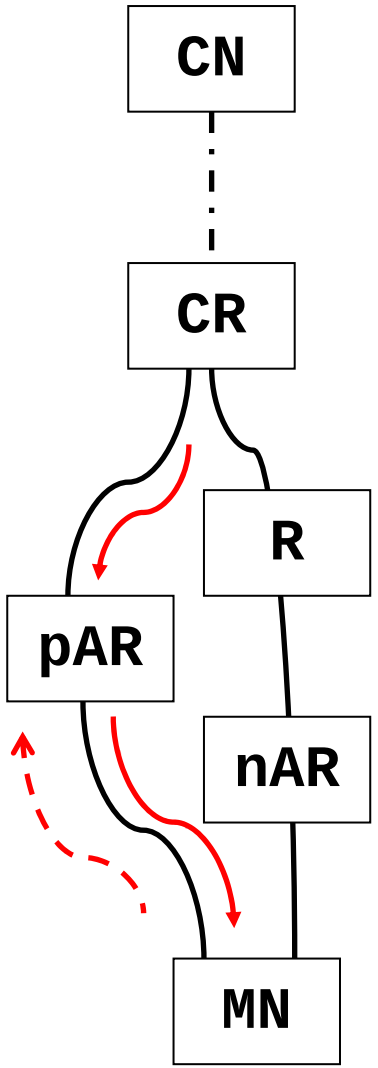
Data source issue

Problem:

- MN or CN as data source
- how to determine a CR?
  - MN→CN: by detecting a session ID match
  - CN→MN: ***network-triggered, or MN triggered?***
- When to initiate a teardown?
  - MN→CN: after/simultaneous to refresh?
  - CN→MN: after/simultaneous to refresh?

Implication:

- Unification of operations is necessary
- Securing local repair?



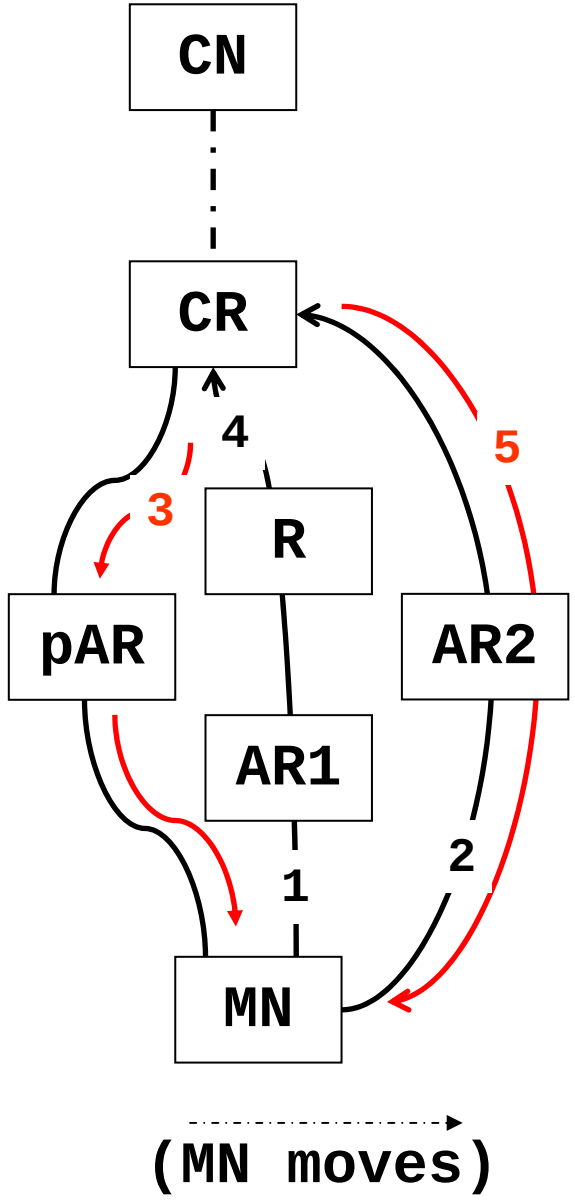
Synchronization issue

Problem:

- Improper local repair can cause:
  - States removed improperly
  - States established improperly
  - Even run into race conditions

Implication:

- ***Incremental*** Branch_ID / Message_ID?
- RSVP LIH-like object?
- Wait timer



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Tunneling issue

Problem:

- Tunnel endpoints should support NSIS
  - ➔To signal into tunnels
  - ➔Tunnels can be physically long, even for pAR➔nAR

Implication:

- Tunnel signaling optional?
  - How about several levels of tunnels?
- **P2P addressing**: discovery component?
- **E2E addressing**: RFC2746-like NTLP-in-NTLP?

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Summary

- NSIS **independent** of mobility protocols
- General state management
- Mobility-caused local repair
- Synchronization
- Who is data source
- Mobility-caused tunnels
- How to address NSIS messages
  - P2P or E2E?
- How to secure NSIS mobility support

- **Should these issues be considered in NSIS design?**

- **Next step for “NSIS working with mobility”?**
  - **Make this a separate item, or**
  - **Incorporated with NSIS design**