Proxy Mobile IPv6 extensions for Distributed Mobility Management

draft-bernardos-dmm-pmipv6-dlif-00

Carlos J. Bernardos – Universidad Carlos III de Madrid
Antonio de la Oliva – Universidad Carlos III de Madrid
Fabio Giust – NEC Laboratories Europe
Juan Carlos Zúñiga – SigFox

Singapore, DMM WG, 2017-11-13

Outline

- Overview
- Network-based DMM
- Distributed Logical Interface
- Demos & Open Source
- Next Steps

Overview

- Replaces draft-bernardos-dmm-pmip & draft-bernardos-dmm-distributed-anchoring
- Network based DMM approach
  - Based on Proxy Mobile IPv6 (RFC 5213)
- Mobility management pushed to the edge
  - Access router level
- Partially distributed solution
  - Centralized control plane, kind-of LMA
    - A central node stores the mobility sessions of MNs
  - Distributed data plane
    - Only the edge routers handle the data forwarding

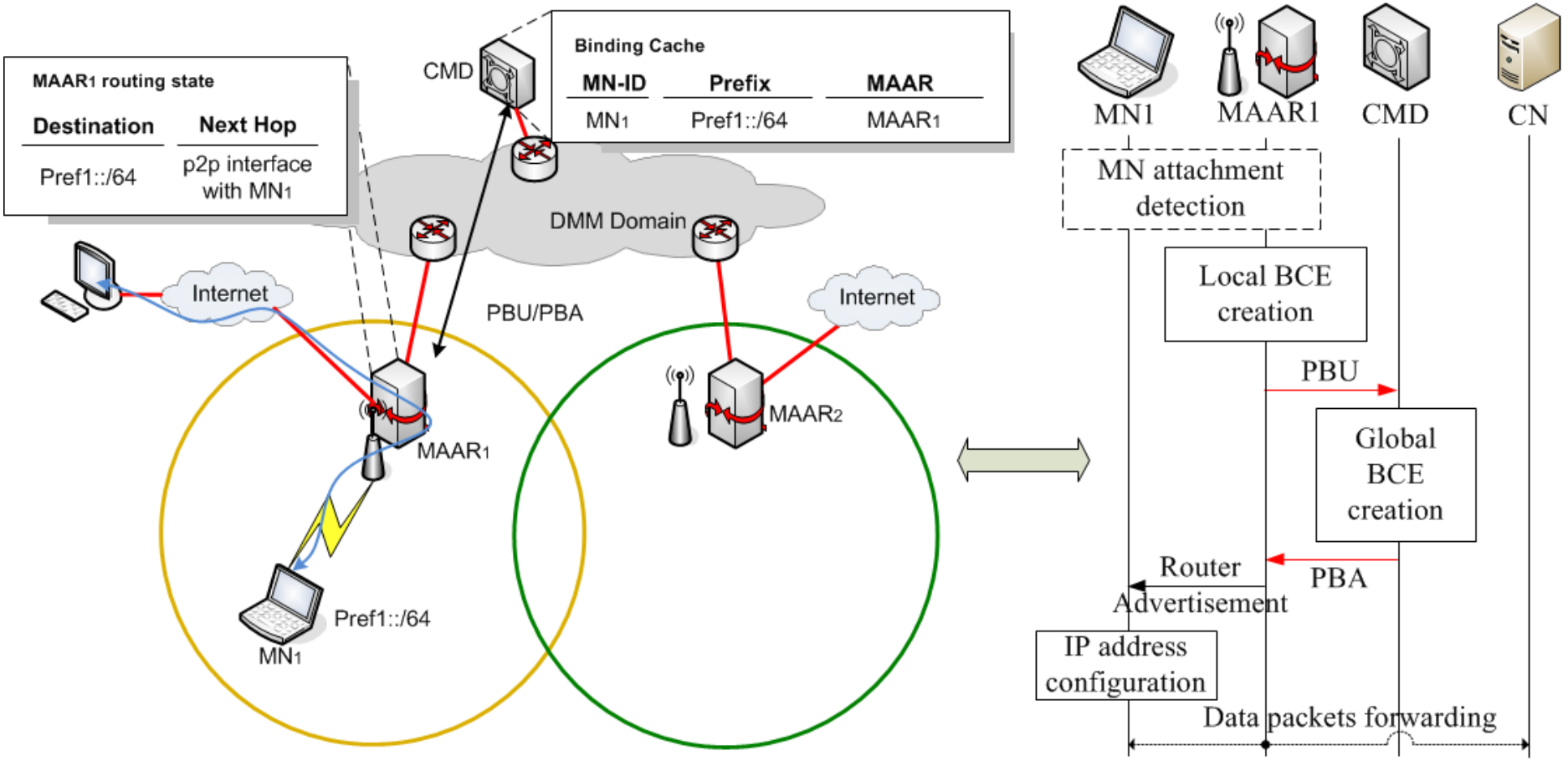
Entities

- Mobility Anchor and Access Router (MAAR)
  - One IP hop distance from the MN
  - Concentrates AR, LMA & MAG functions per-MN, per-prefix
  - Delegates and anchors an IP prefix to each MN attached
    - Serving MAAR (S-MAAR)
    - Anchor MAAR (A-MAAR)
  - Forwards data packets to/from IP networks

- Central Mobility Database (CMD)
  - Central node storing the BCEs of all the MNs in the domain
  - It plays the role of the LMA for the control plane

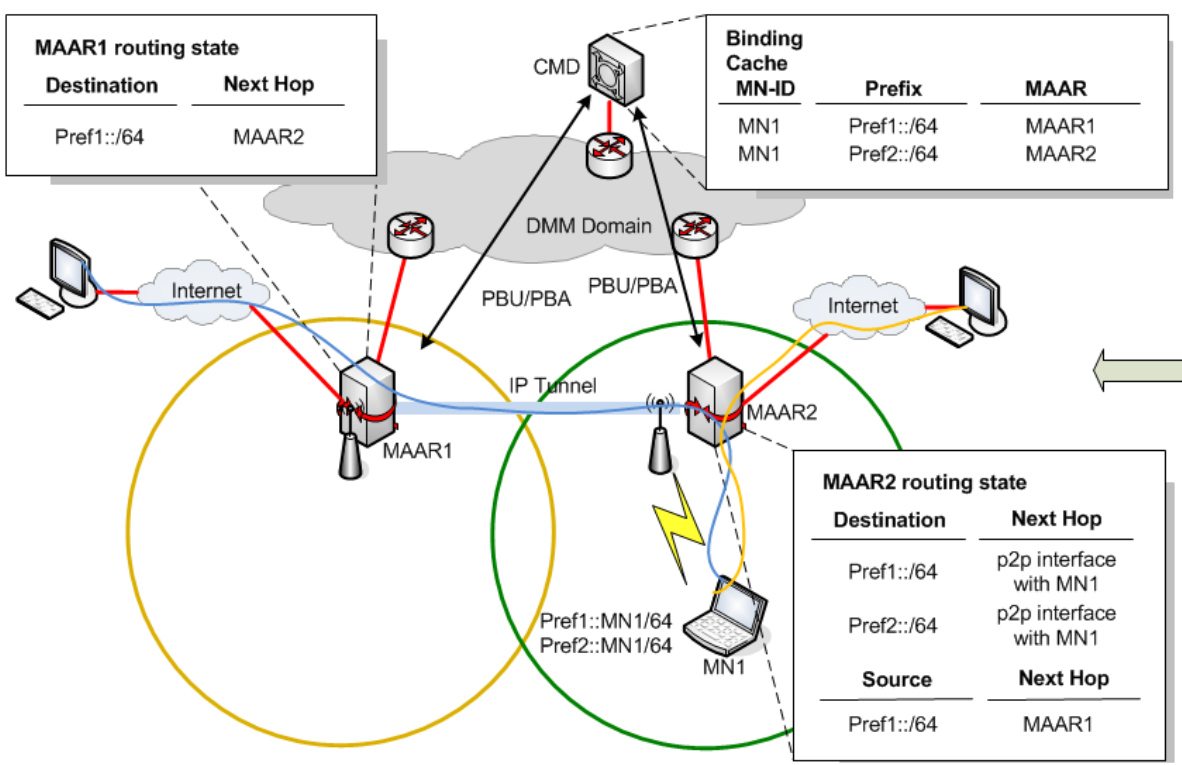
Operations: initial registration

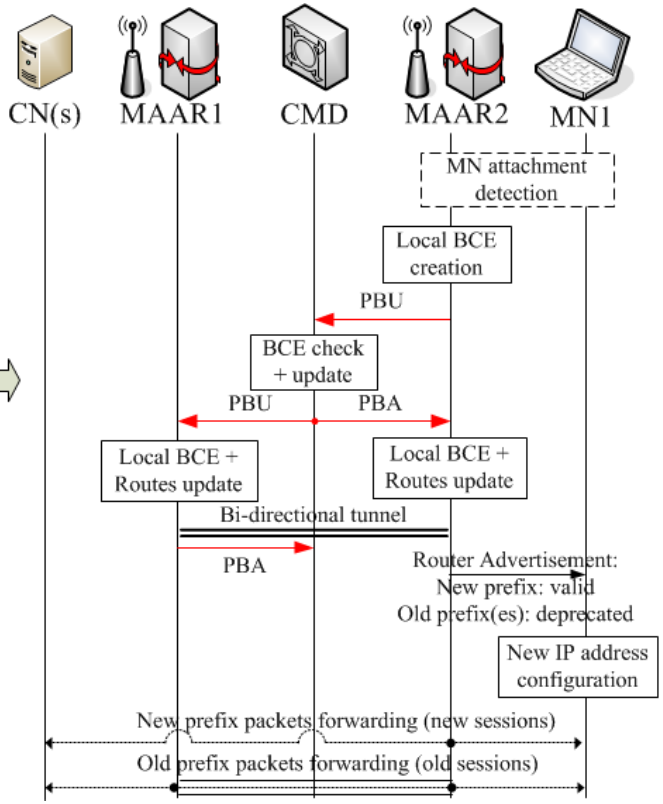
- The S-MAAR registers the MN at the CMD through a PBU/PBA handshake



CMD as PBU/PBA proxy

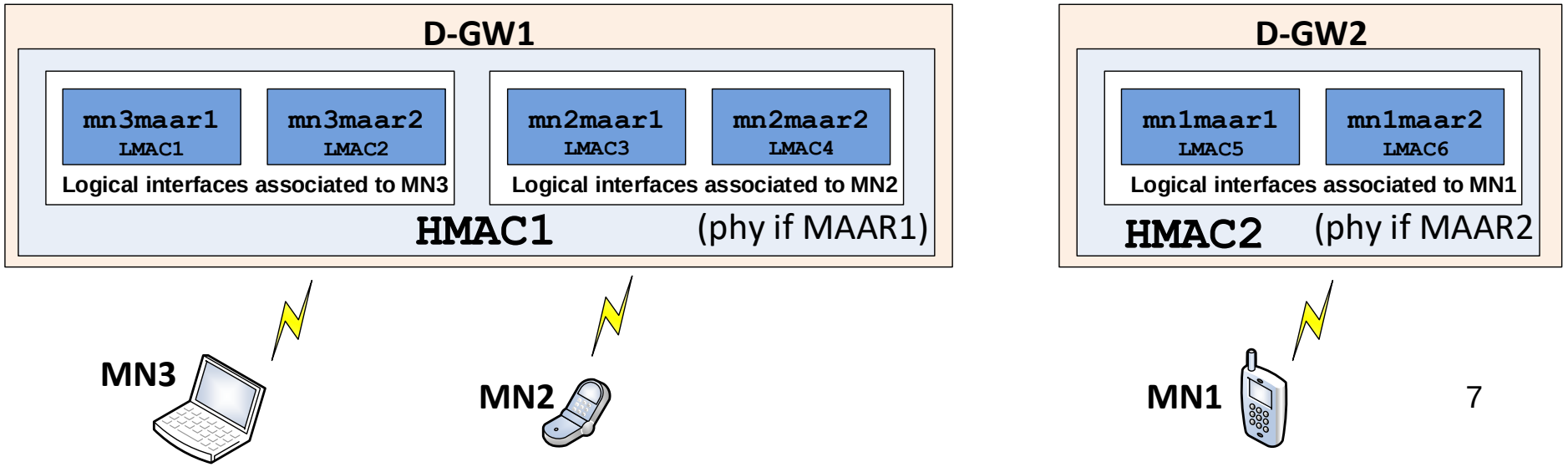
- The CMD receives a PBU from the new S-MAAR announcing the MN attachment
- The CMD sends instructions to the S-MAAR and A-MAAR(s) on how to establish the proper routing configuration



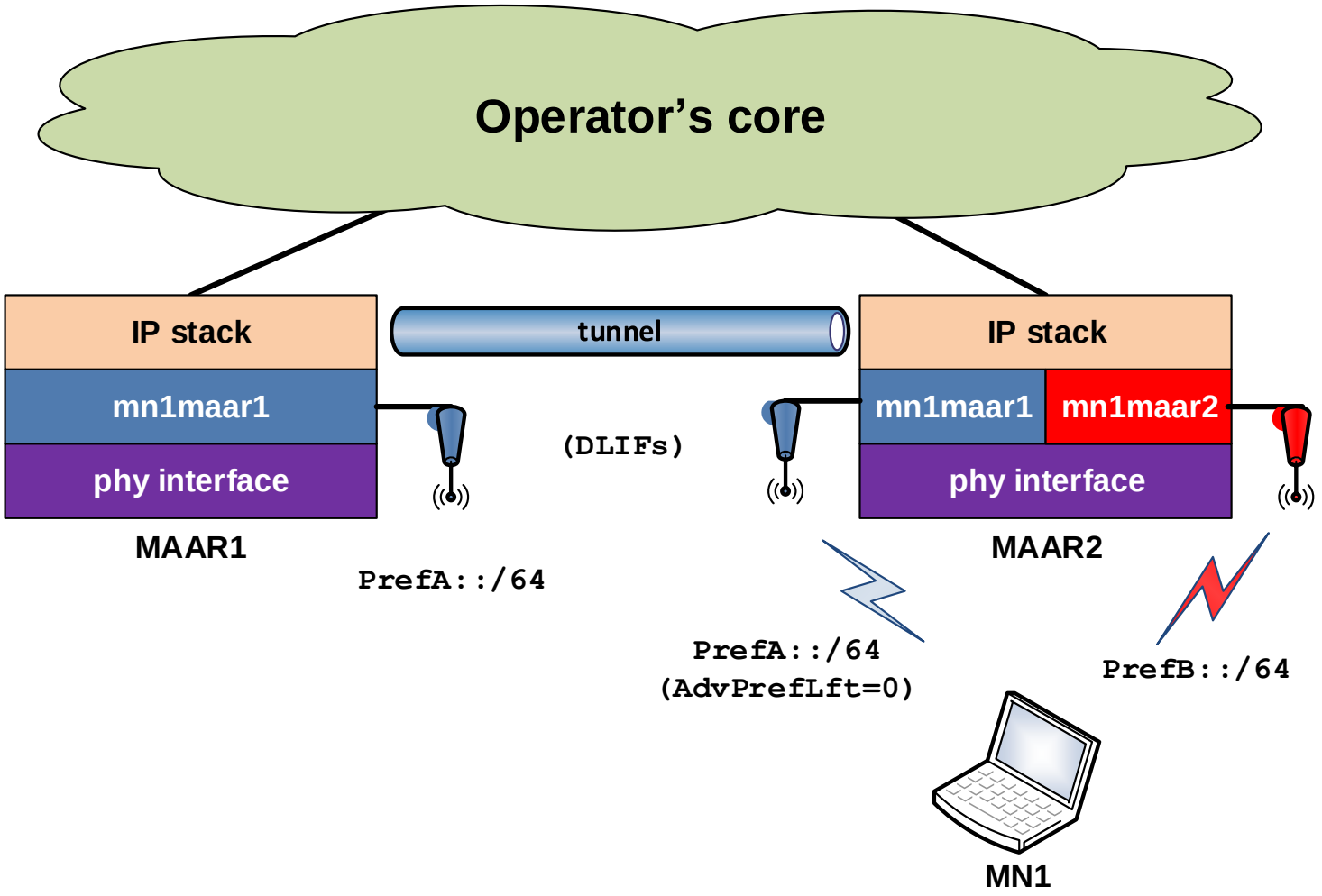


Distributed Logical Interface

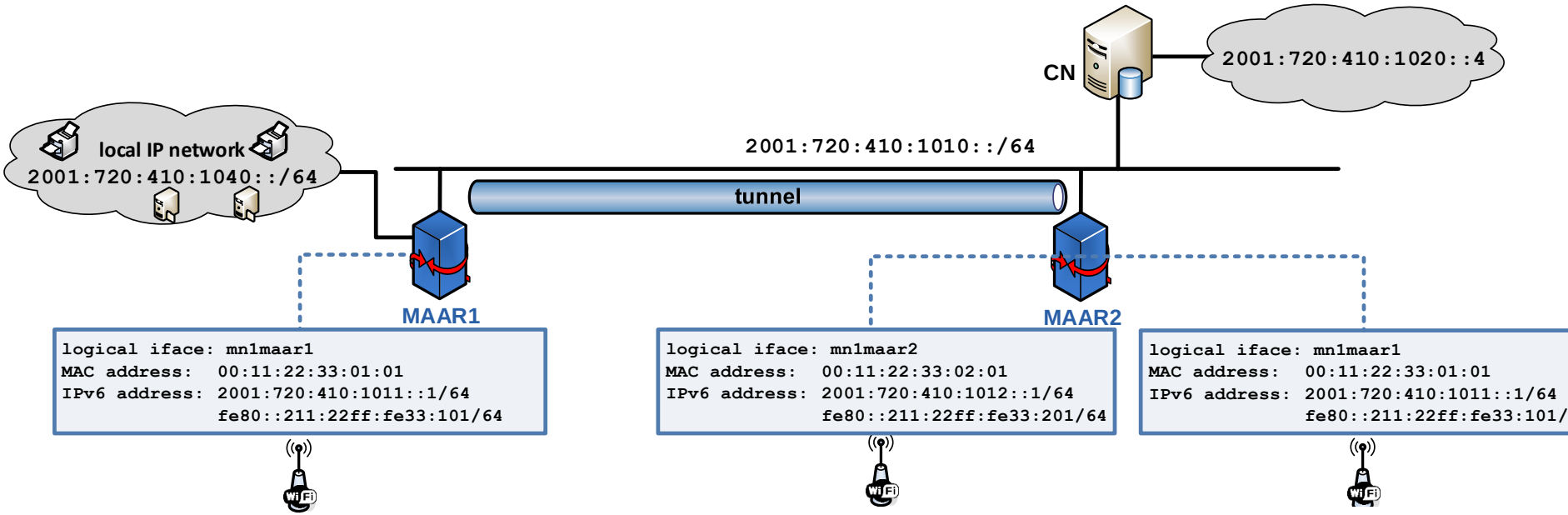
- Distributed Logical Interface (DLIF) concept
  - The DLIF is a software construct allowing to hide the change of anchor from the MN
  - Each serving D-GW exposes itself towards a given MN as multiple routers, one per active anchoring D-GW associated to the MN
    - This is achieved is by the serving D-GW configuring different logical interfaces
    - From the point of view of the MN, anchoring D-GWs are portrayed as different routers, although the MN is physically attached to only to the serving D-GW
  - The DLIF concept is also applicable to other network-based solutions



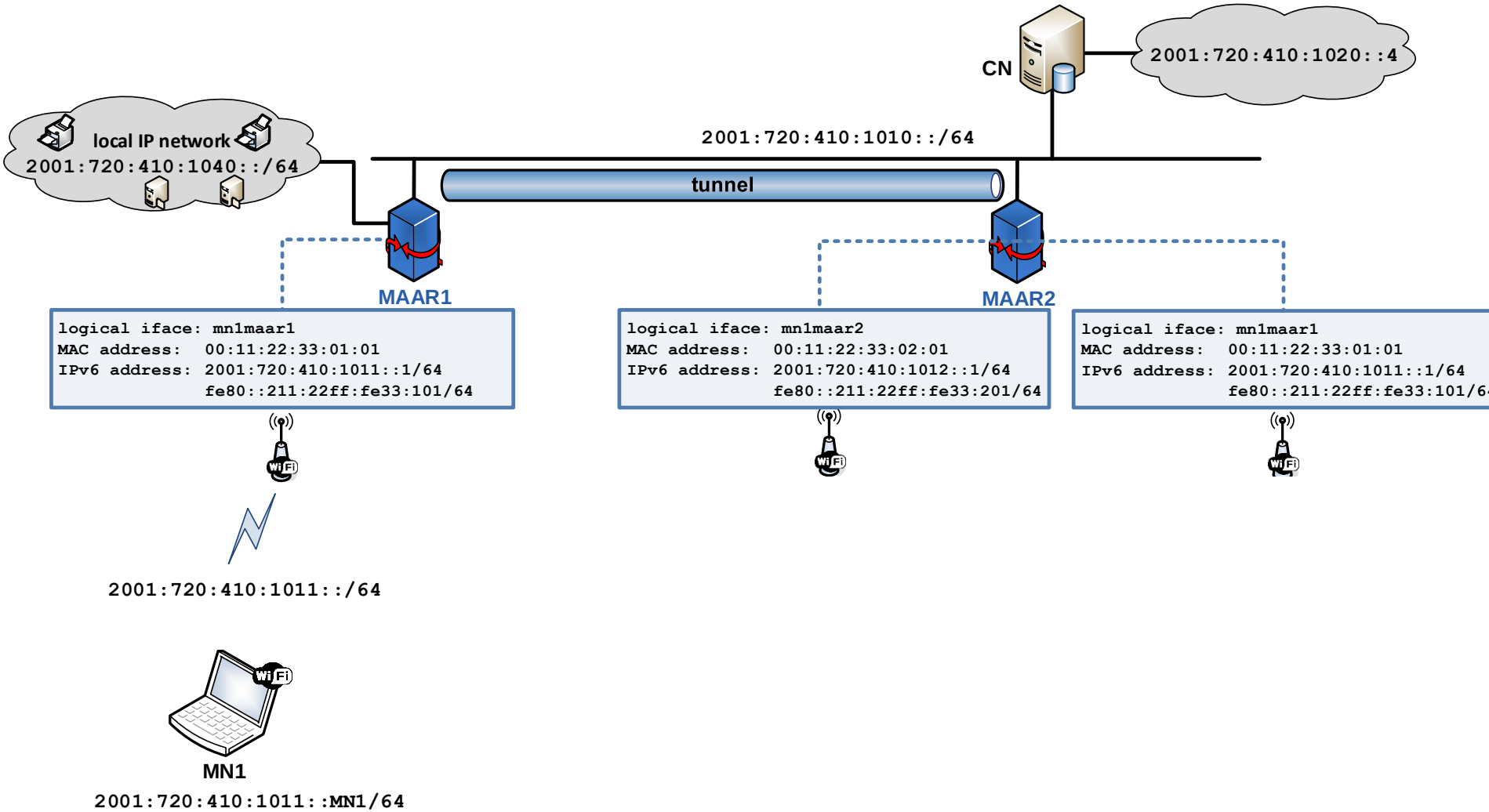
DLIF. Solution overview



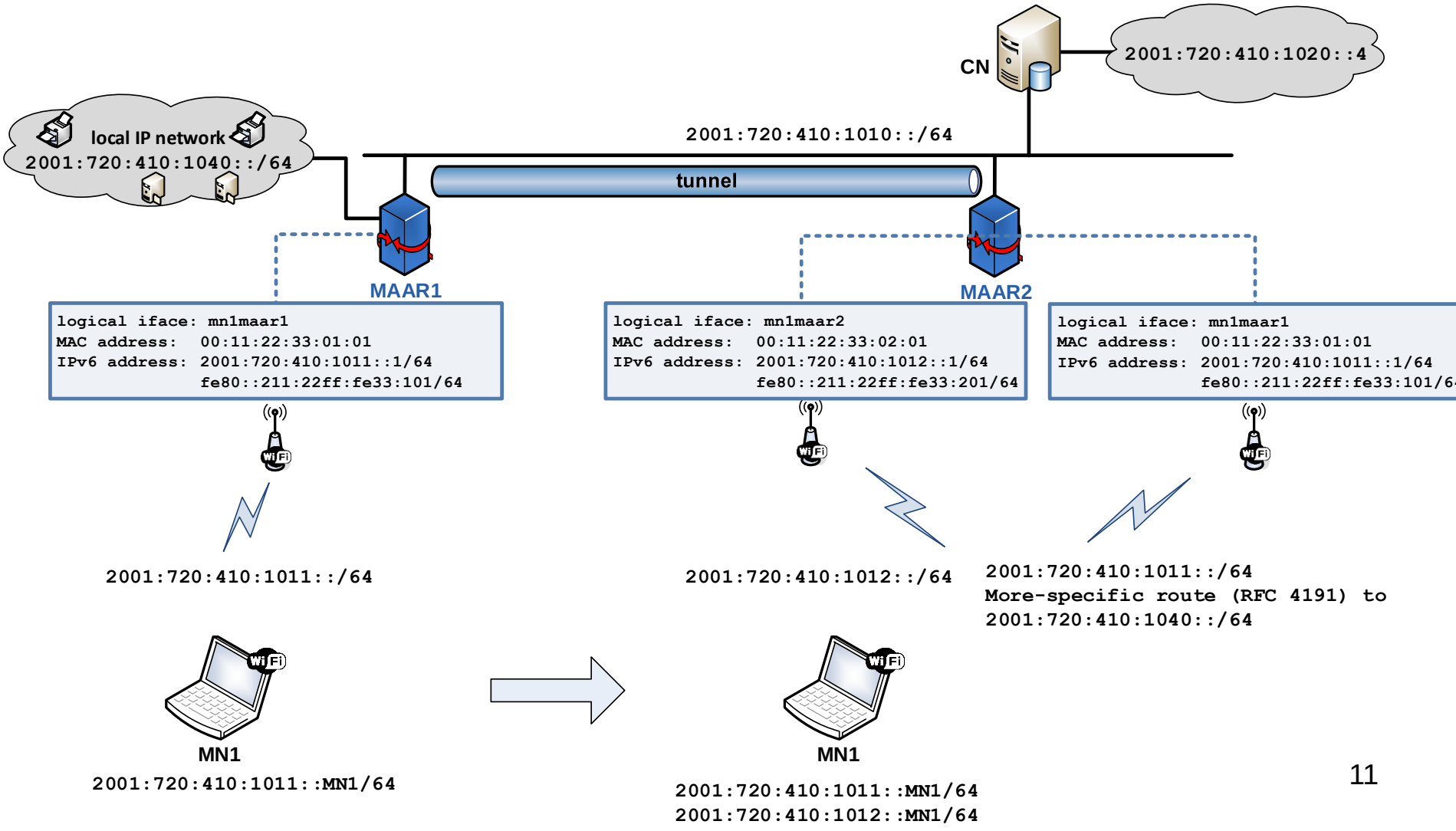
DLIF. Solution overview



DLIF. Solution overview



DLIF. Solution overview



Demos & Open Source

- **ODMM**: **O**pen platform for **DMM** solutions
  - https://www.odmm.net
    - GitHub repo http://github.com/ODMM
  - Platform hosting Open Source DMM implementations
    - Mobility Anchors Distribution for PMIPv6 (MAD-PMIPv6)
      - https://odmm.net/node/12
      - draft-bernardos-dmm-pmip & draft-bernardos-dmm-distributed-anchoring
- Network-based DMM demonstrations

83rd IETF, Paris (March 2012)

87th IETF, Berlin (July 2013)

Next steps

- Is the WG interested in standardizing (Proxy) Mobile-IPv6 based solutions?

- This draft can be taken as starting point
  - Solution has been demonstrated
  - Papers published
  - Open source implementations available
    - Used in EU-funded projects