CVIS – SEVECOM
Security & Access Control Aspects to be considered in the CVIS protocol communication architecture

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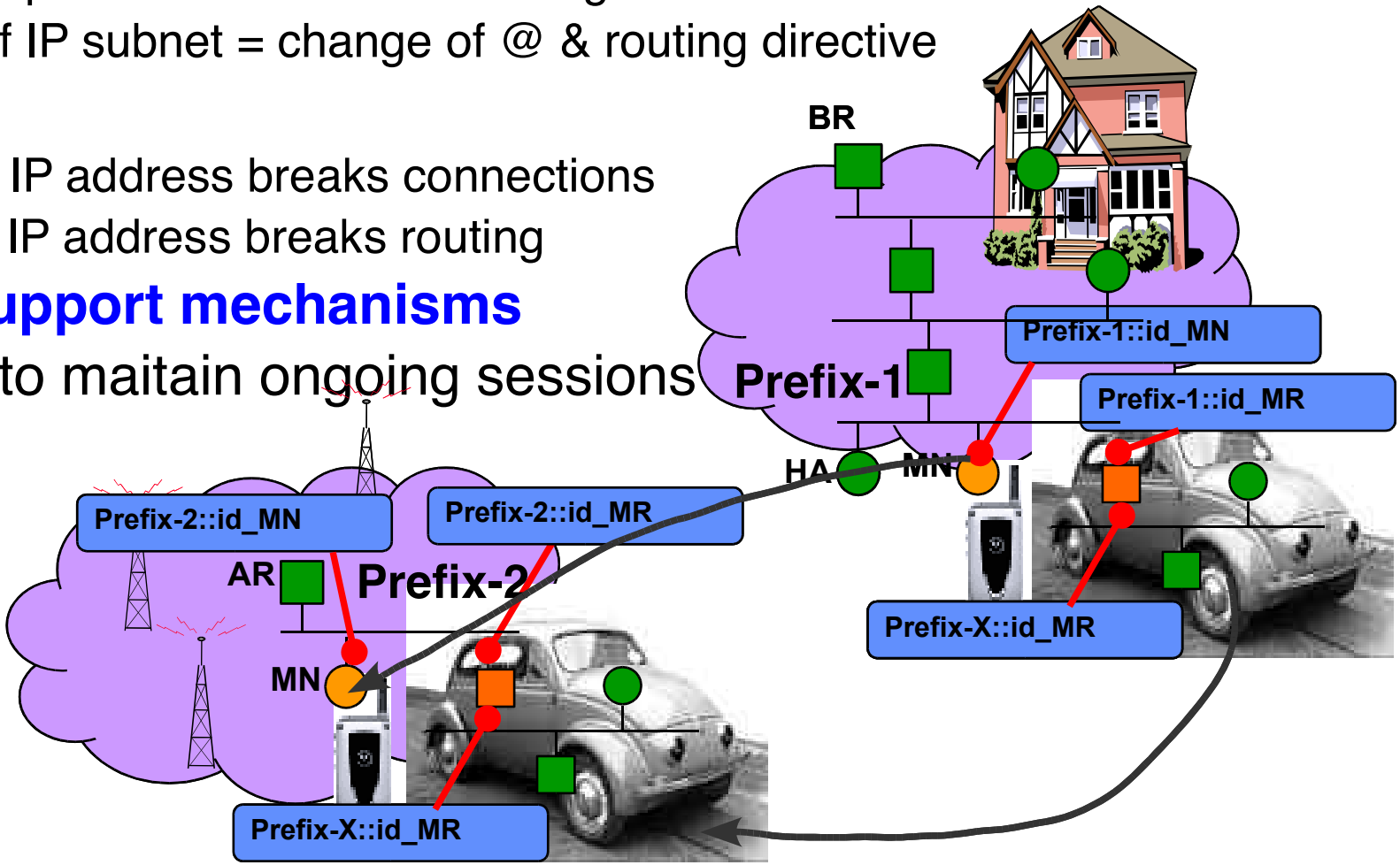
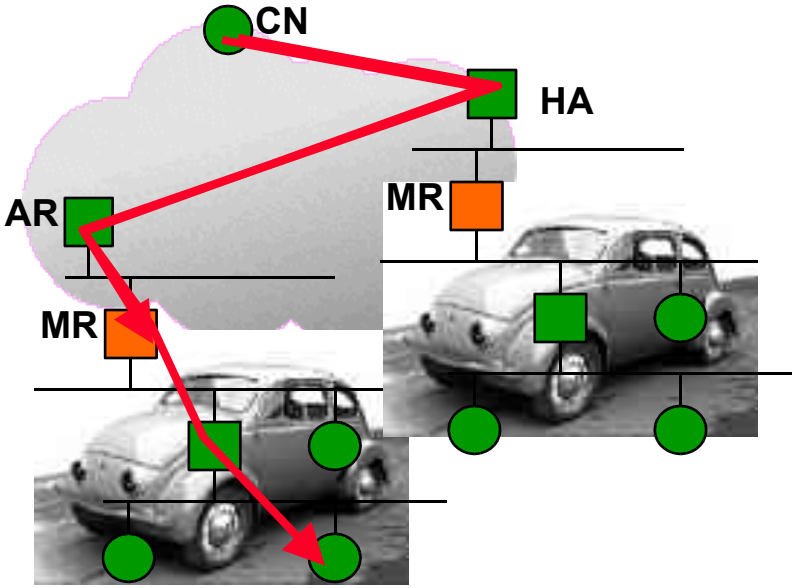
IP-layer Mobility: Addressing in IPv6

- Address must be topologically correct
  - Each interface must have an @ formed after the prefix advertised on the link where it is attached
  - Change of point of attachment = change of IP subnet
  - Change of IP subnet = change of @ & routing directive
- Problem
  - Changing IP address breaks connections
  - Retaining IP address breaks routing
- **Mobility support mechanisms**
  - needed to maitain ongoing sessions



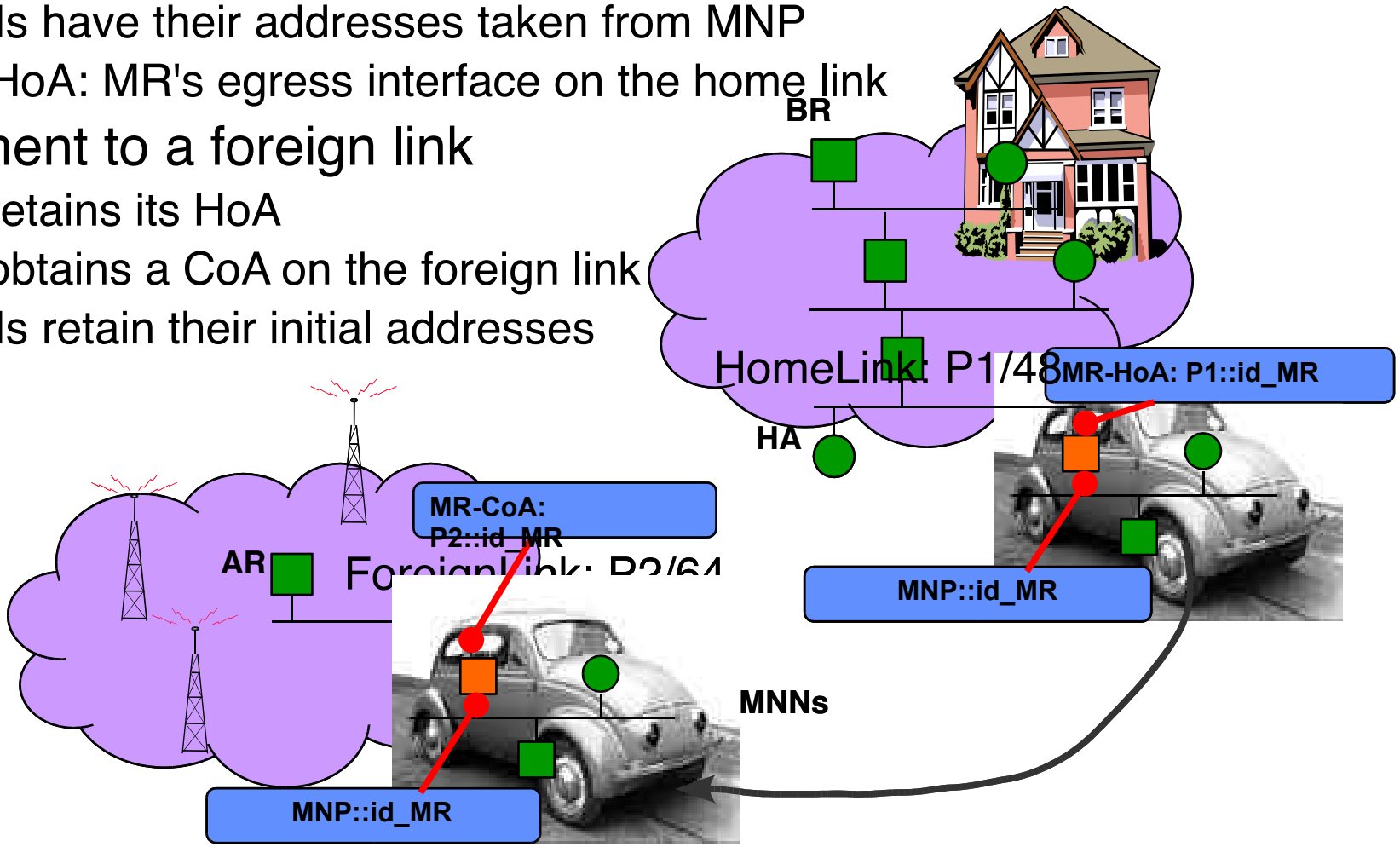
IETF: IPv6 Network Mobility Support (NEMO)

- Entire network mobile as a unit and attached to the Internet via a Mobile Router (MR)
  - One or more IP-subnets
  - One or more Mobile Router
- MR changes its point of attachment
  - Only MR changes its IP address
  - Nodes behind MR don't change their own point of attachment
- Handled by NEMO WG since Fall 2002
  - NEMO Basic Support: RFC 3963 (Jan.05)



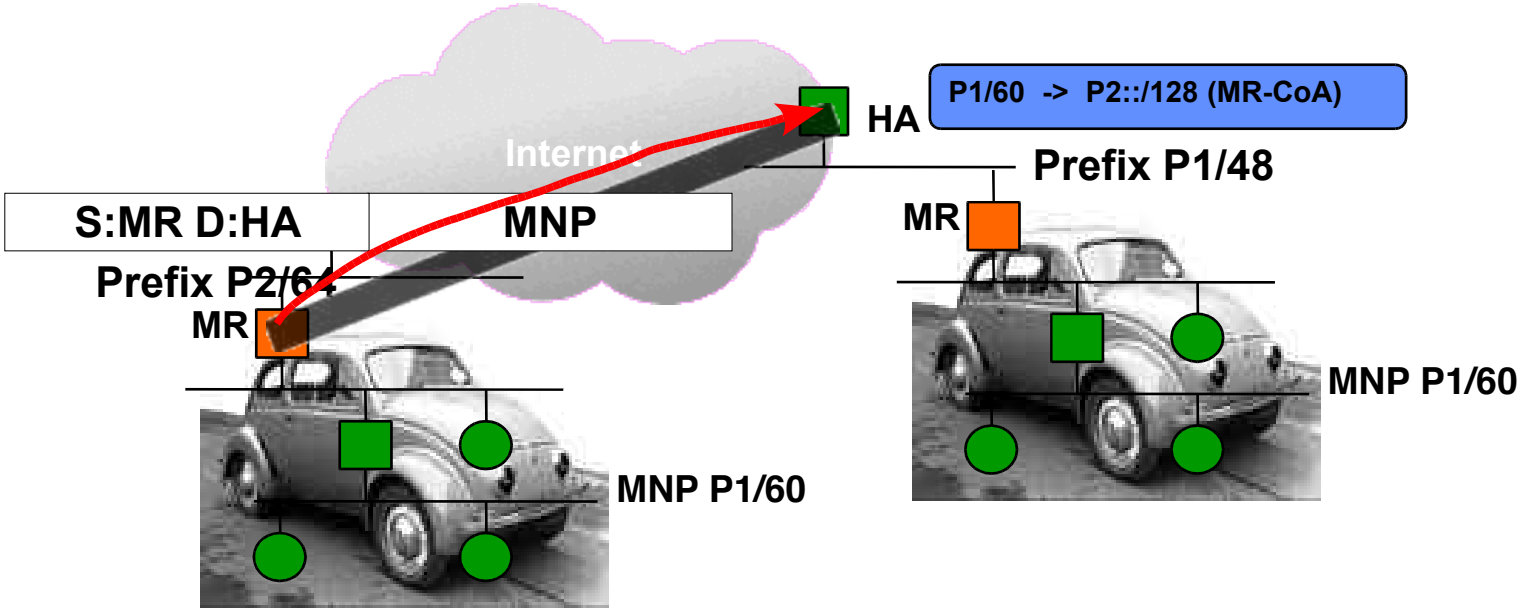
Network Mobility Support: IETF NEMO Basic Support

- Goal: session maintenance
- Initialisation:
  - MNP (Mobile Network Prefix) is assigned to the mobile network
  - MNNs have their addresses taken from MNP
  - MR-HoA: MR's egress interface on the home link
- Movement to a foreign link
  - MR retains its HoA
  - MR obtains a CoA on the foreign link
  - MNNs retain their initial addresses



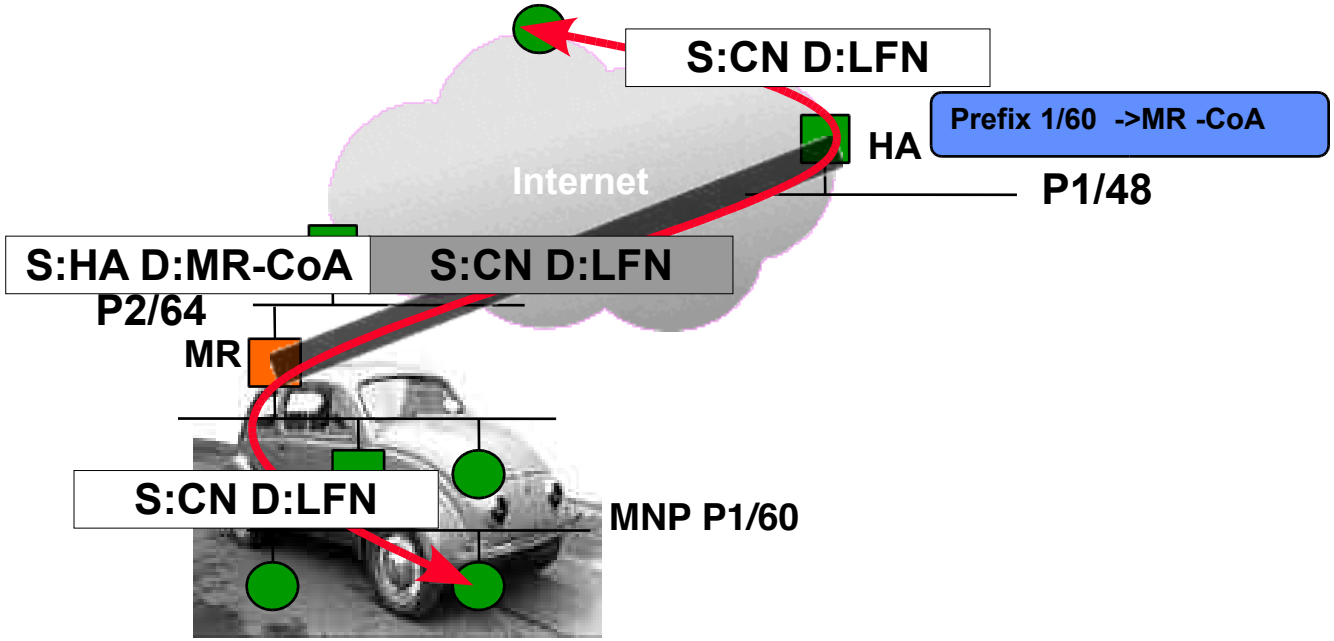
Network Mobility Support: IETF NEMO Basic Support

- How to maintain sessions
  - Bi-directional tunnel between MR and HA
- Registration
  - CoA is bound to MNP, not HoA
    - **Registration with HA: MNP -> MR-CoA instead of MR-HoA-> MR-CoA**
  - HA records a network-specific route instead of host-specific
  - MR-CoA = next hop to MNP



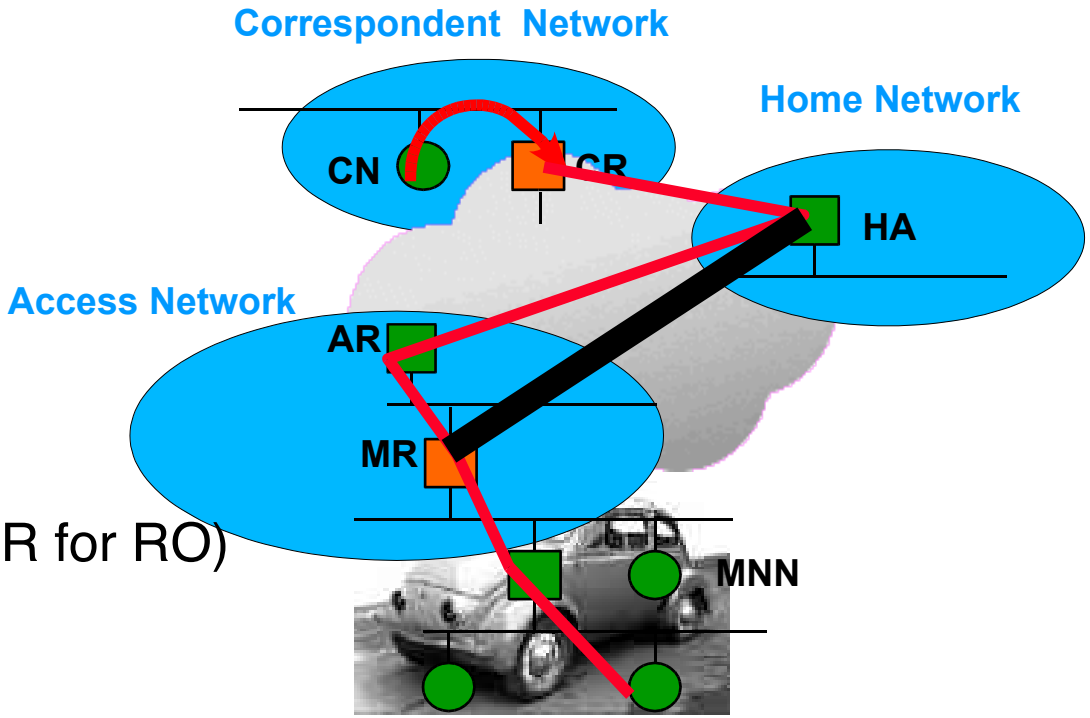
Network Mobility Support: IETF NEMO Basic Support

- Routing
  - Encapsulation between HA and MR in BOTH directions
  - Not optimal solution, but guarantee mobile networks are supported with minimal effort

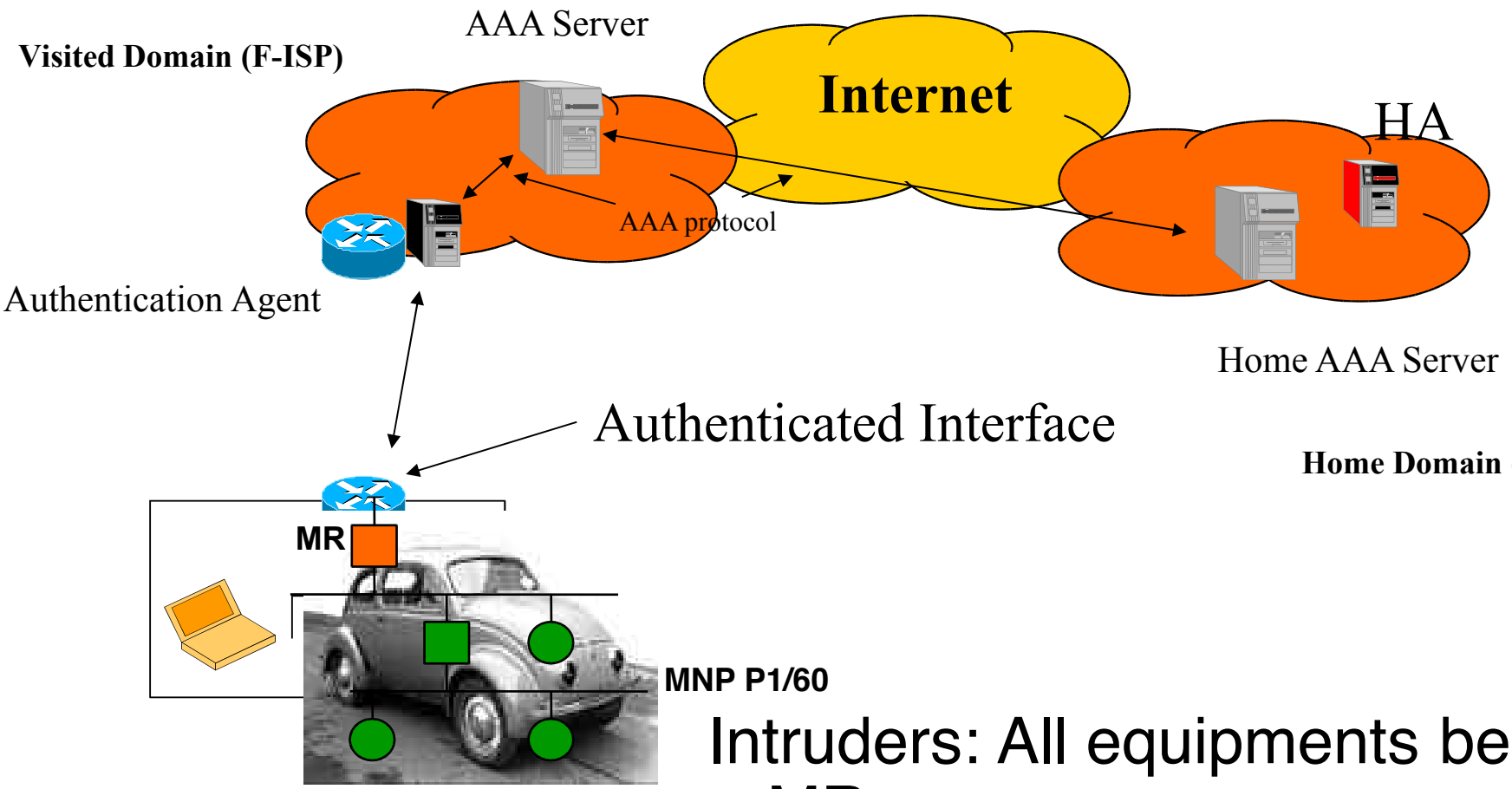


CVIS: Network Architecture

- Home Network:
  - address space (who will provide that?)
  - HA
  - Multiple HNs (operators) can be deployed and should be handled
- 3 layers of authentication
  - Access Network
  - Home Network
  - Correspondent Node
- Components:
  - Mobile Router (MR)
  - Home Agent (HA)
  - Correspondent Node (CN or CR for RO)
  - Mobile Network Node (MNN)
  - Correspondent Router (CR)
  - Roadside Eqipment (RSE)
    - **it can provide Access Router, Correspondent Router functionality, or both)**



CVIS: Network Access Authentication



Intruders: All equipments behind MR may access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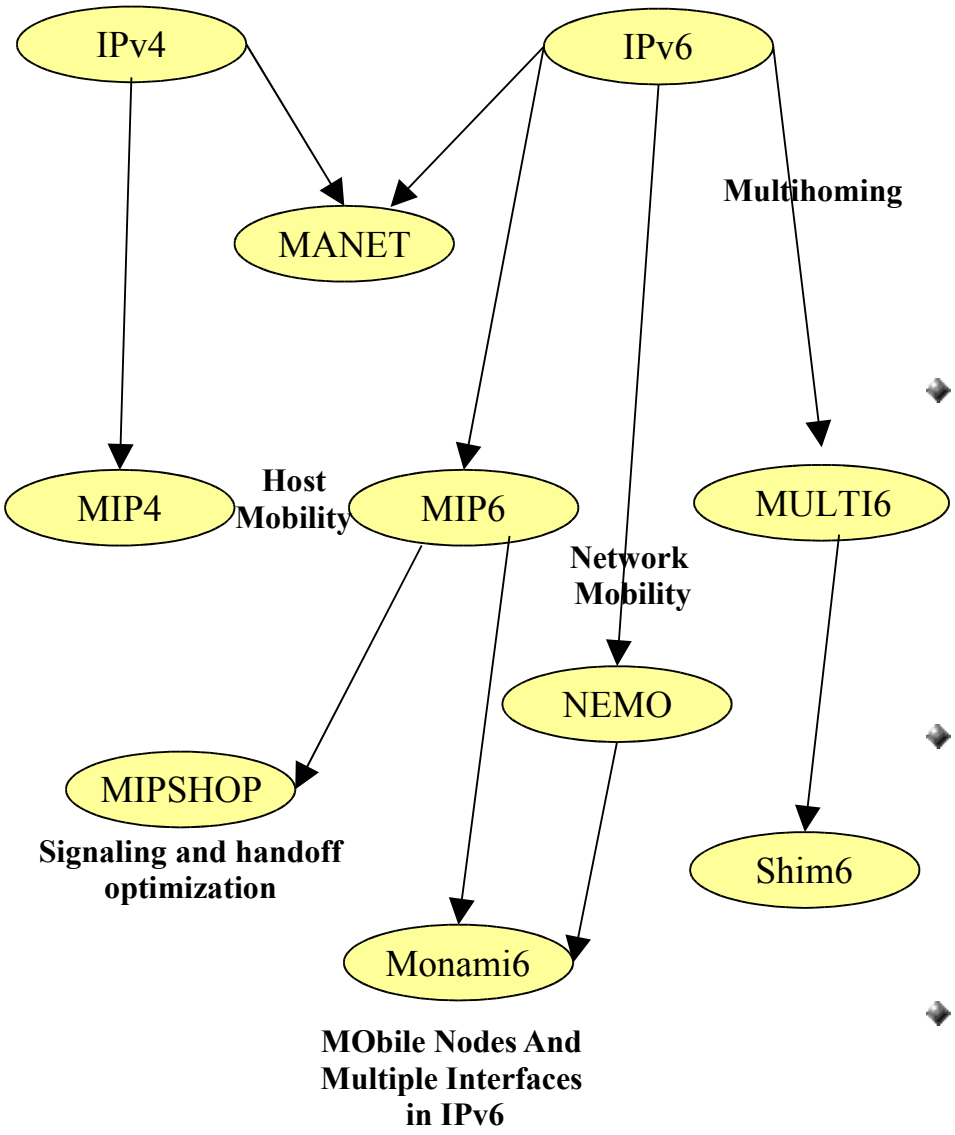
IETF: Mobility-related activities



- Host Mobility Support:
  - Proto: Mobile IP, HMIPv6, FMIPv6
  - End sysyems that change point of attachment
  - WG: MIP4, MIP6, MIPSHOP (+ IRTF Mobops)
- Network Mobility Support:
  - Proto: NEMO Basic Support
  - Entire networks that change point of attachment
  - WG: NEMO
- Ad-hoc networks:
  - Routing protocols for infrastructure-less networks
  - WG: MANET
- Multihoming:
  - WG: Monami6, Shim6
- Security: PANA, IPsec, ..

Netwok Mobility: IETF NEMO WG

- Initial discussion started August 2000 in Mobile IP WG
- 2 BOFs in March and July 2002
  - Confusion between Mobile Networks and Mobile Ad-Hoc Networks
- NEMO (NEtwork MObility) WG created october 2002
  - Chairs: Thierry Ernst / TJ Kniveton
- Open Mailing List: +700 subscribers
  - Different background:
    - **Car manufacturers/Airline carriers/Army/Public transportation/Network equipment manufacturers/Telecom companies**
  - Most active: Japan, France, Korea
- Stepwise Approach
  - NEMO Basic Support : session maintenance (now)
  - NEMO Extended Support : performances issues (may be later)