

IP mobility protocols for multihomed residential gateways (RG) in fixed networks

DMM – IETF#90

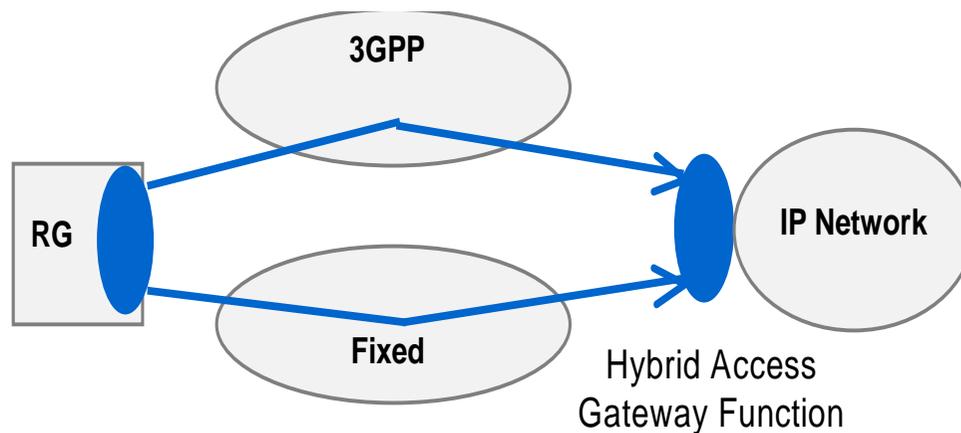
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Use-case

- Multihomed Residential Gateway (RG)
 - BBF Work item introduced in bbf2014.546.03

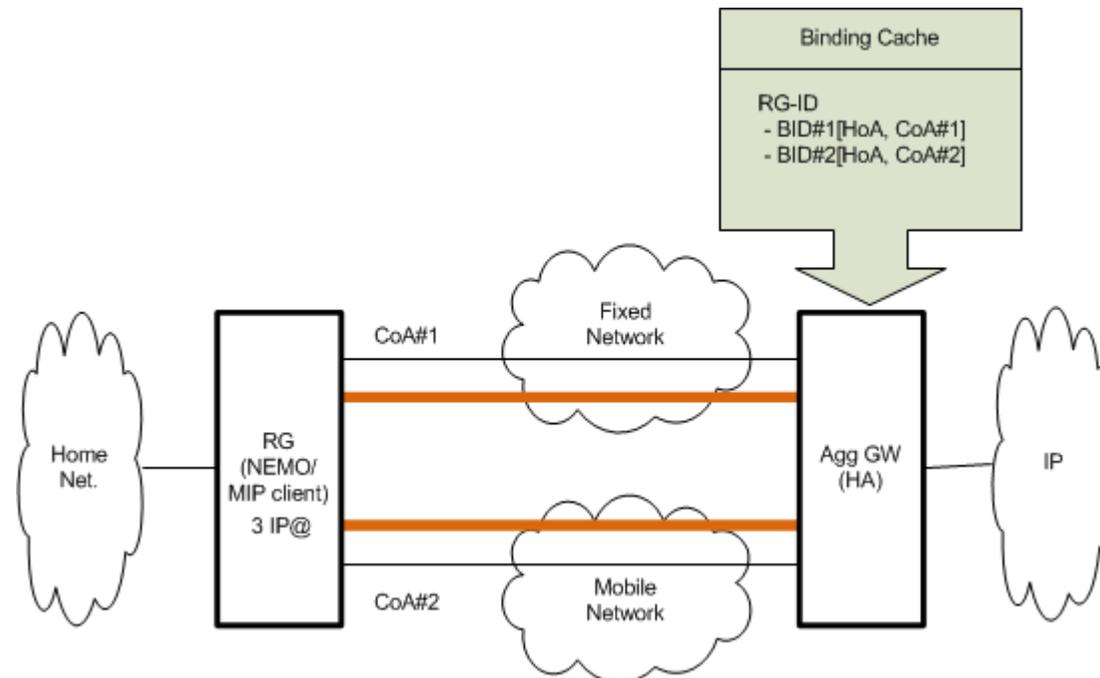


source: BBF2014.546.03

- Take benefit from multihoming
 - load sharing
 - redundancy, reliability
 - interface bonding
 - ...

Hybrid access gateway = Mobility anchor...

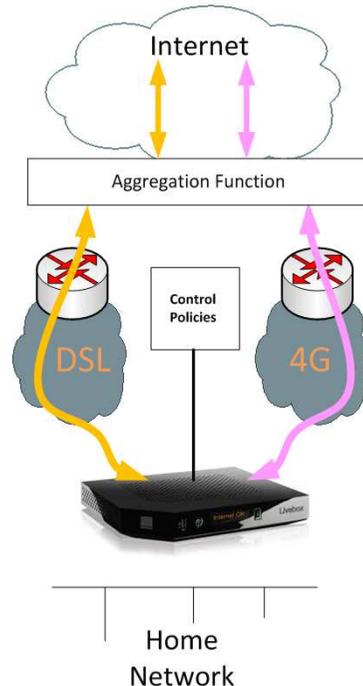
- Hybrid access architecture could be realized using IP mobility protocols (NEMO, MIP, PMIP)
 - **Use IP mobility protocols for subscriber management and MCoA features but not for RG mobility management**
 - **RFC 4908** has introduced the concept... time to refresh this work?



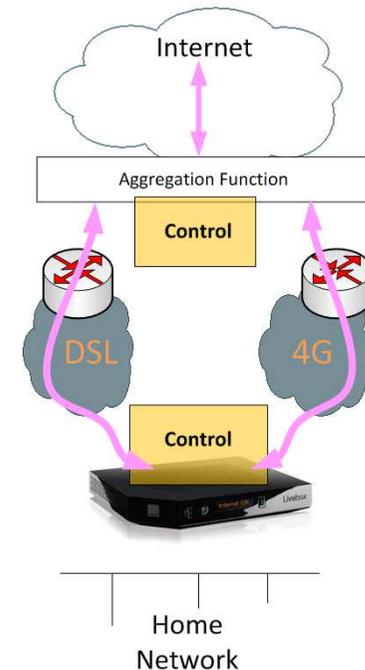
Traffic distribution Schemes

Aggregation should consider both physical and virtual interfaces

**per-flow
management**
(bring resource and
QoE optimization)



**per-packet
management**
(Interface bonding to bring
higher BW per application)



No major technical issue: basically, an application of the IP flow mobility concepts with out-of band or in-band (i.e. flow binding) policy provisioning

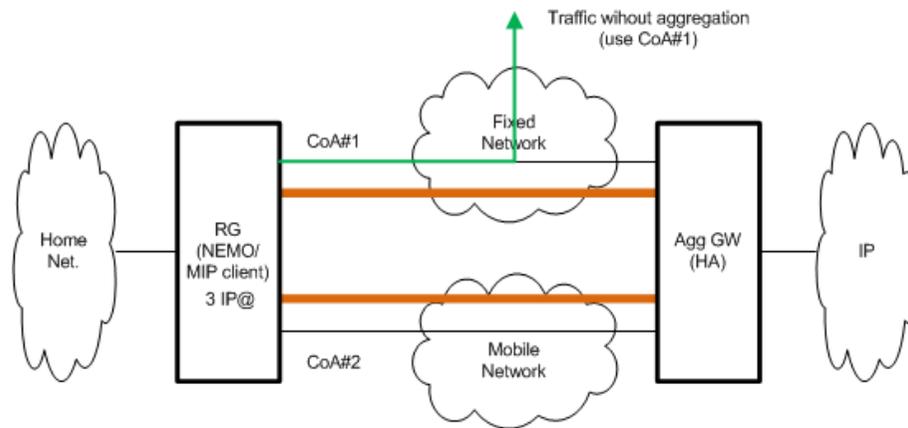
some architecture may require GRE, some decision model may need to exchange RAT information,...

key issue: packet distribution management – out of IETF scope

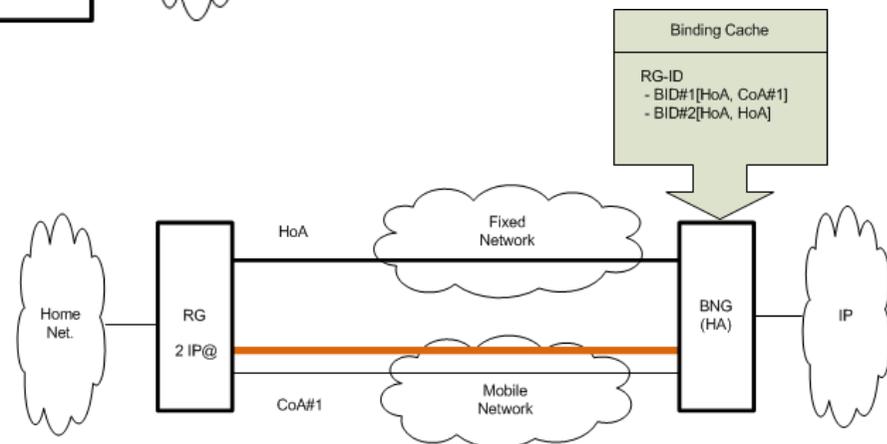
in scope (for example): bonding policy provisioning (application X, bounded on interfaces A,B..), packet numbering (e.g. using GRE sequence number)...

MIP/NEMO allows hybrid access architecture digression

- On-demand aggregation
 - Similar to « on-demand mobility » currently discussed in DMM

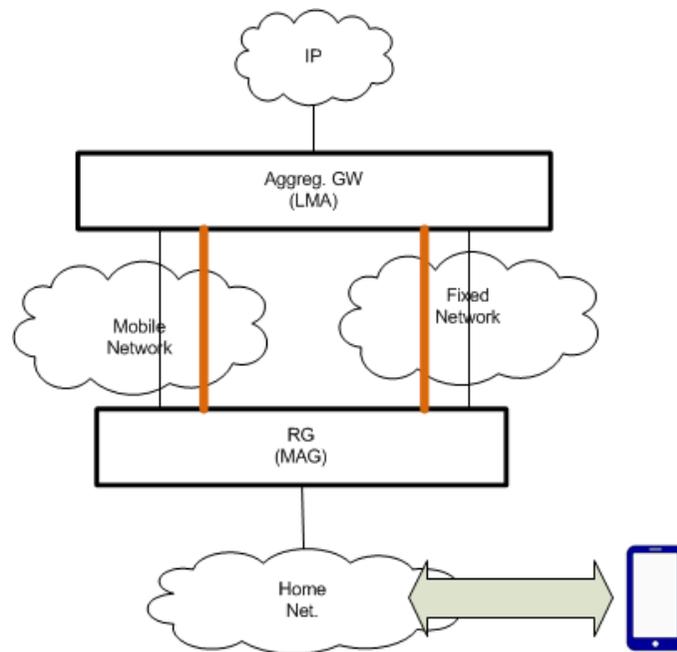


- Home link support
 - anchoring at the BNG or P-GW

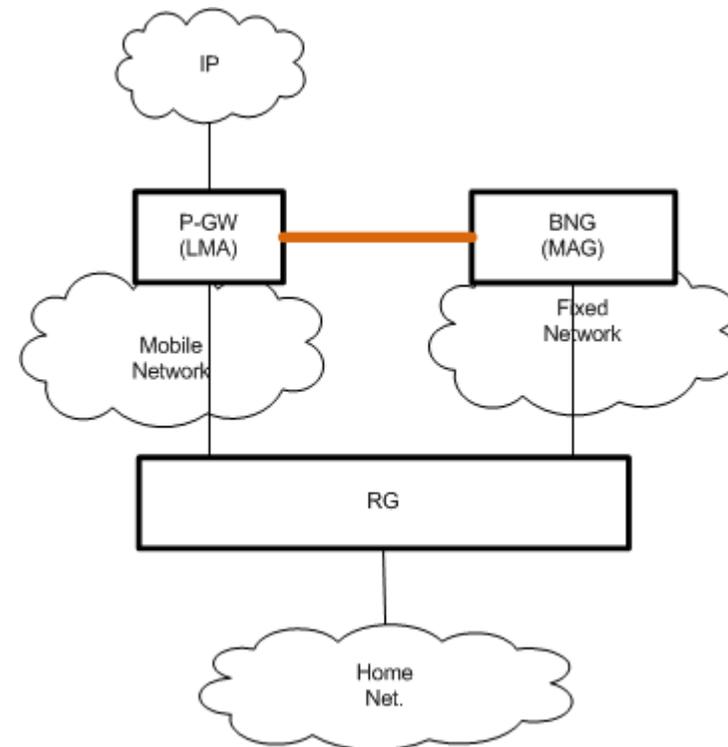


Hybrid access using Proxy Mobile IP

- End-user mobility
 - Multiple pCoA support for PMIP

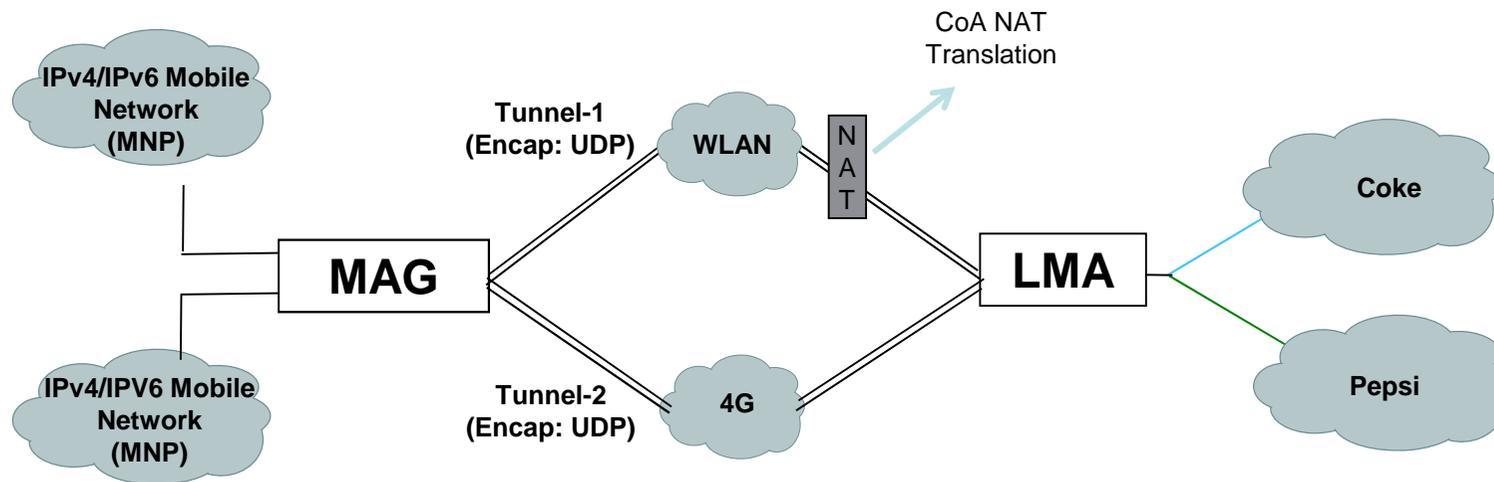


- If the RG cannot support mobility client



PMIP - Multipath Extensions

- Multiple egress cellular links are enabled. All the egress cellular links are shared across all customers and with usage-based charging. Application-based path selection.

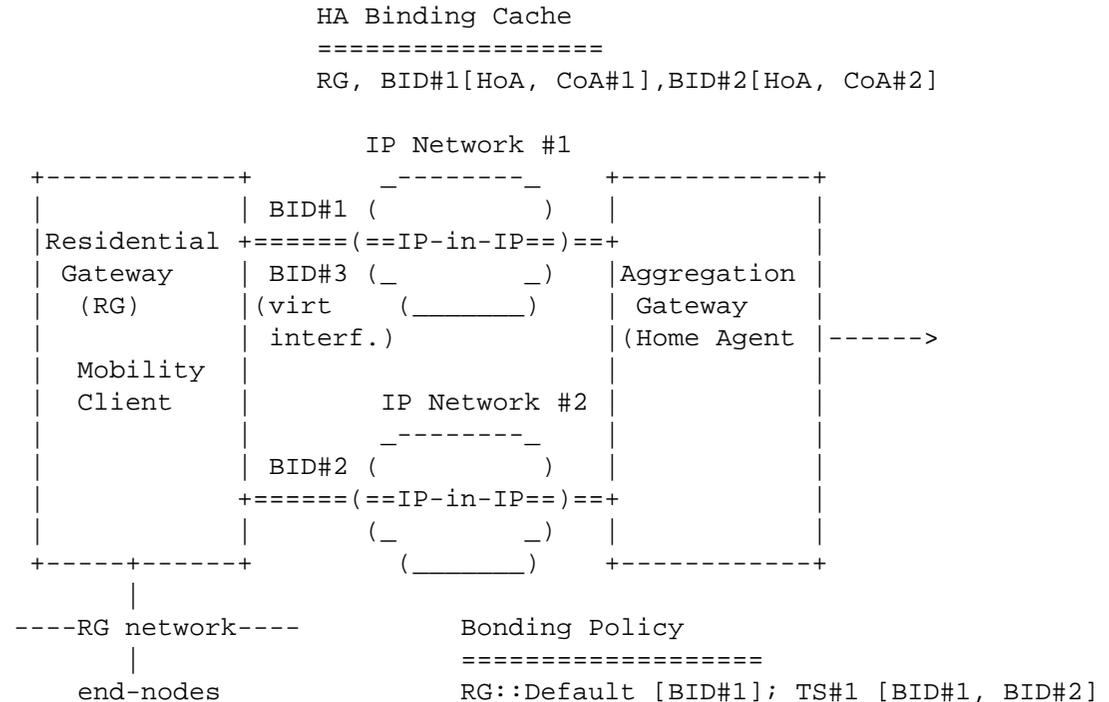


Flow Direction	Policy Routing Selectors	Outgoing Interface
MAG Uplink	WLAN-0/Application	Tunnel-1
MAG Downlink	Tunnel-1/Application	WLAN-0
LMA Uplink	MR (any path)	Destination Routing
LMA Downlink	Application	Tunnel-1

Bonding Policies provisioning

- Bonding policy associates preferred interfaces and application type

- In-band signaling: mobility option to exchange bonding policies
 - traffic selector to identify traffic
 - « bonding path » identified by the Binding ID



Proposed Work items for IP mobility maintenance

- #1 - MCoA Extension for PMIP
- #2 – BCP: how to use MIP/NEMO/PMIP in hybrid access context (RFC 4908 update)
- #3 - bonding policies provisioning
 - in-band signaling
- #4 - Extensions for MIP/NEMO
 - Negotiate GRE as tunneling protocol
 - Transport RAT information
 - HA controlled multihoming
 - ...