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Mobisplit – A scalable approach to emerging mobility architectures.

J. Abeillé, T. Melia, I. Campos, P. Stupar, R. Aguiar

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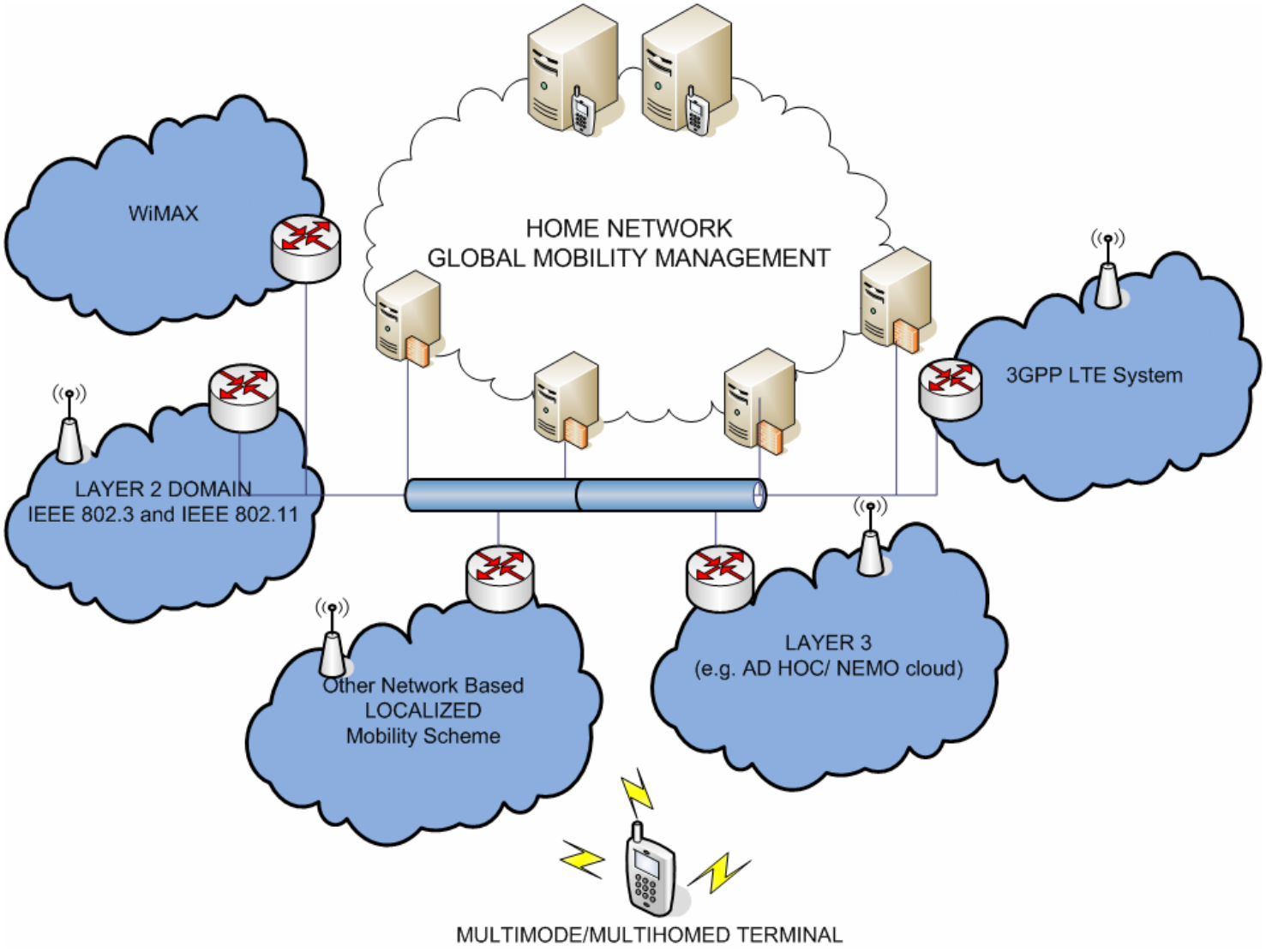
Introduction - Motivations

- Increasing complexity in NG mobile networks:
  - Administrative distribution.
  - Host complexity: multi-technology, applications requirements.
- Mobility management in the core of the complexity
- -> architecture based on the split of mobility according administrative domains
- -> seamless HO, support for multiple technologies, multihoming
- -> integration of QoS, identity framework

Requirements

- Access network operators can implement their own MMP
- Access / home network MM independent.
- Minimize complexity in the terminal
- Efficient use of wireless resources
- Reduce signaling in the network
- Seamless HO
- Multihoming support
- Scalability
- + Multicast support
- + QoS integration
- + identity framework integration

Architecture overview

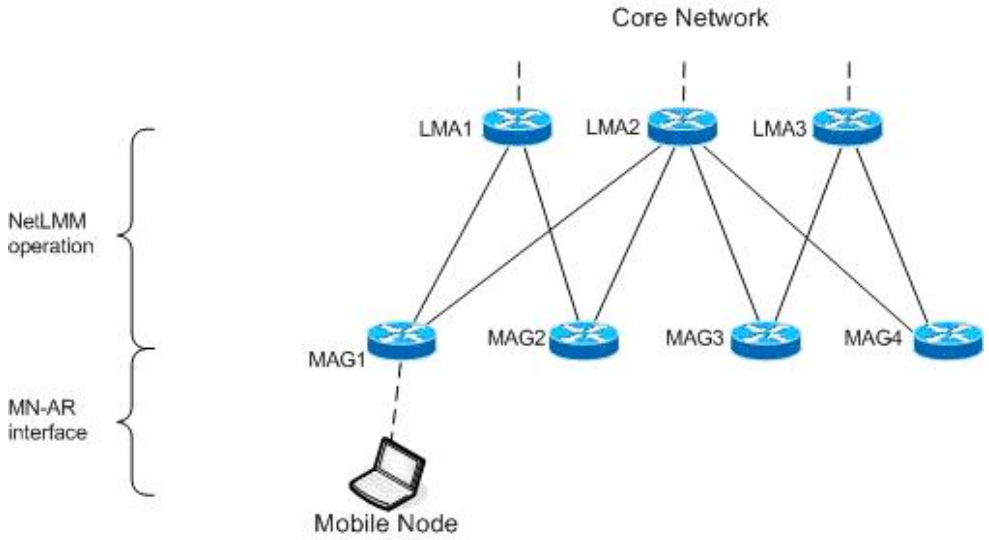


Architecture details

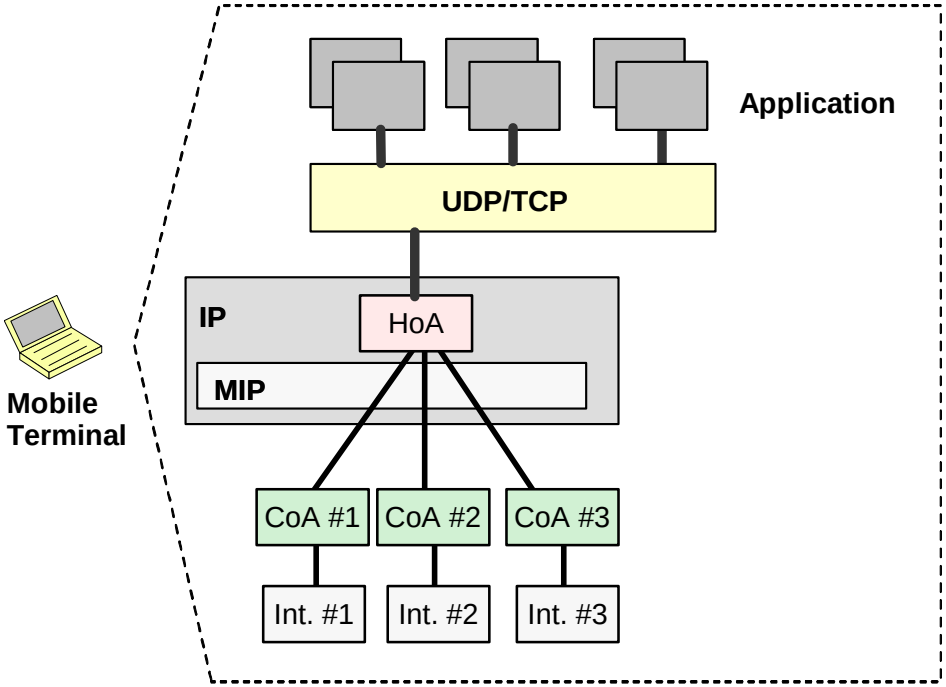
- Global MM: any host based solution, MIPv6 as an example
- Local MM: any network based solution, NetLMM DT draft as an example [NetLMM]
- Host – access network interface: 802.21 [802.21]
- -> matches architectural requirements
- -> extensions to support Multihoming and provide scalability presented here

Mobility management

- MIPv6 to handle global mobility
- NetLMM inside the LMD
- 802.21provides:
  - Standard interface on the access link
  - Seamless (proactive) handover
  - Heterogeneous access technology support



Multihoming – GMD level



- MIPv6 example
- Allow multiple CoA registration
- Assign flows to CoAs
- Benefits: transparent to the LMD, the host can be attached to different access providers.

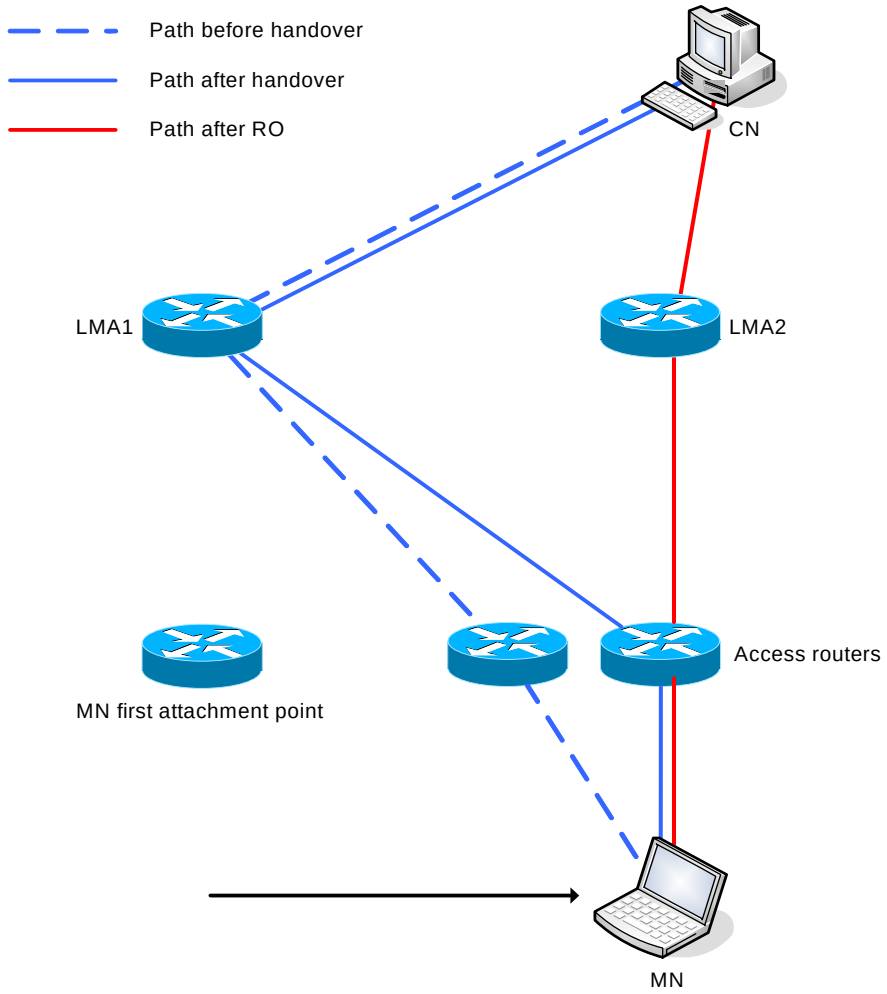
Multihoming – LMD level

- Same IP address on all interfaces
- Flow to interface mapping on LMA and MN
- Per flow routing
- Note: on the downlink, issue when two MN interfaces are attached to the same AR:
  - > tunnel dependant routing policies on the AR.
  - > or routing information in the packets from LMA to AR.

Scalability issue

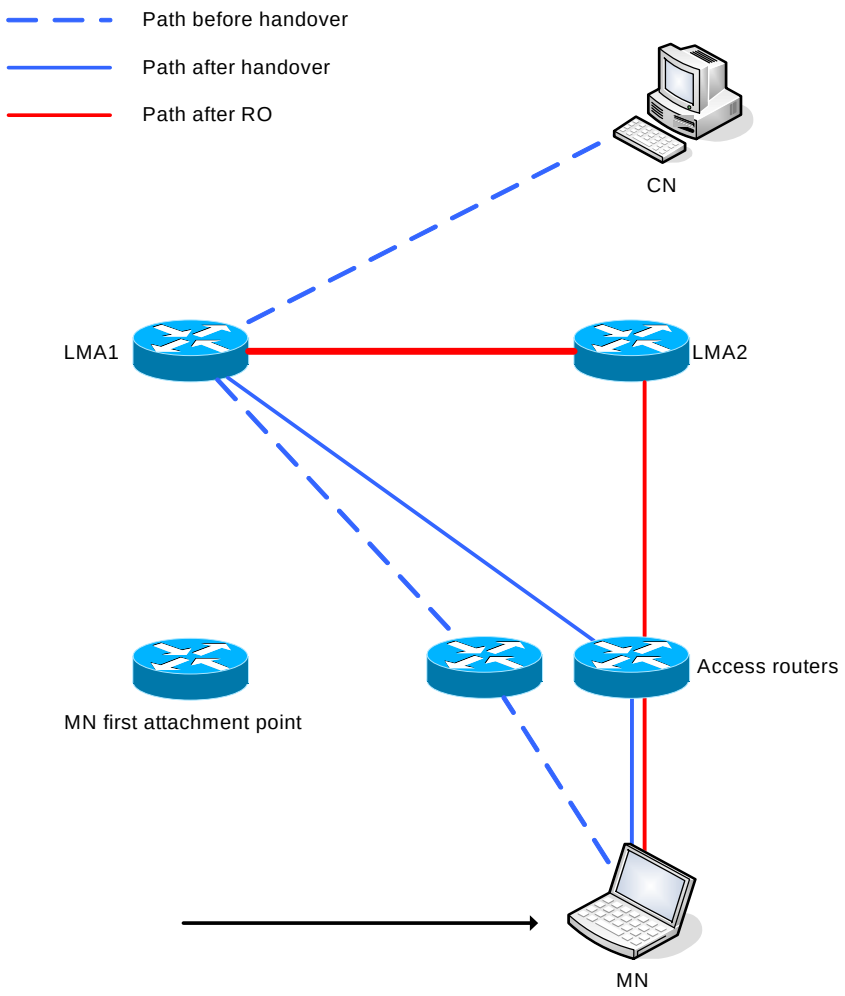
- LMDs can be large
- A MN is always registered in the same LMA
- -> suboptimal routing may occur

Scalability – solution 1



- Trigger on an AR
- LMA handover
- Drawback: GM involved

Scalability - solution 2



- Same trigger as solution 1
- Requirement: the link between LMAs is efficient
- Traffic routed through both LMAs
- Advantage: GM not involved
- Drawback: less efficient
- - the choice is left to the operator

Protocol comparison

	Cellular IP [CIP] [CIP-eval]	HMIPv6 [HMIP]	MIPv6	NetLMM [NetLMM]	Mobisplit
Local/global	L	L/G	G	L	L/G + independence
Use of wireless resources	-	-	-	+	+
Network load	-	+	+	+	+
Multiple technologies (L2, MANET…)	-	-	+	-	+
Multihoming	-	-	-	-	+
Seamless HO	+	+	-	-	+
Scalability	-	+	global	-	+

Acknowledgments

- The DAIDALOS project:
  - R. L. Aguiar et al, “Designing Networks for the Delivery of Advanced Flexible Personal Services: the Daidalos approach” Proc. IST Mobile & Wireless Telecommunications Summit, Lyon 2004.
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Authors

- Julien Abeillé and Telemaco Melia are with NEC Network Laboratories, Heidelberg, Germany (e-mail: {Julien.Abeille, Telemaco.Melia}@netlab.nec.de).
- Patrick Stupar is with Telecom Italia, Torino, Italy (e-mail: patrick.stupar@telecomitalia.it).
- Ignacio Soto is with Universidad Carlos III de Madrid, Madrid, Spain (e-mail: isoto@it.uc3m.es).
- Rui Aguiar is with Instituto de Telecomunicações, Aveiro, Portugal (e-mail: ruilaa@av.it.pt)

Questions