








# IPv6 and 4G

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Michelle Wetterwald  
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# Agenda

-  **Introduction**
-  Architecture
-  Mobile Terminal Function Elements
-  Mobility scenarios
-  QoS
-  Multicasting
-  Conclusion

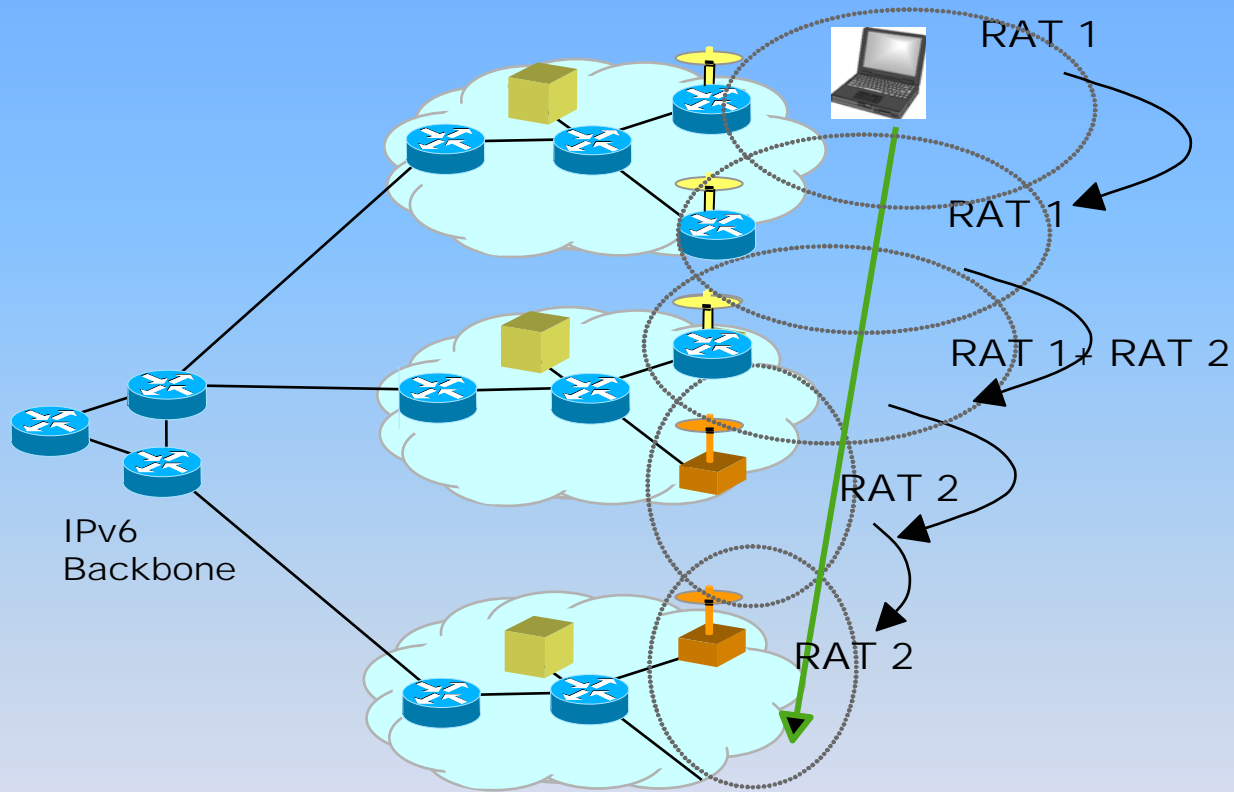
# Introduction : 4G Attributes

- ☞ Heterogenous Multiple Radio Access Technologies
- ☞ Terminals with Multiple Radio Interfaces
- ☞ IPv6 as a global framework for content delivery and for mobility control
- ☞ IPv6 « close » to Base Stations

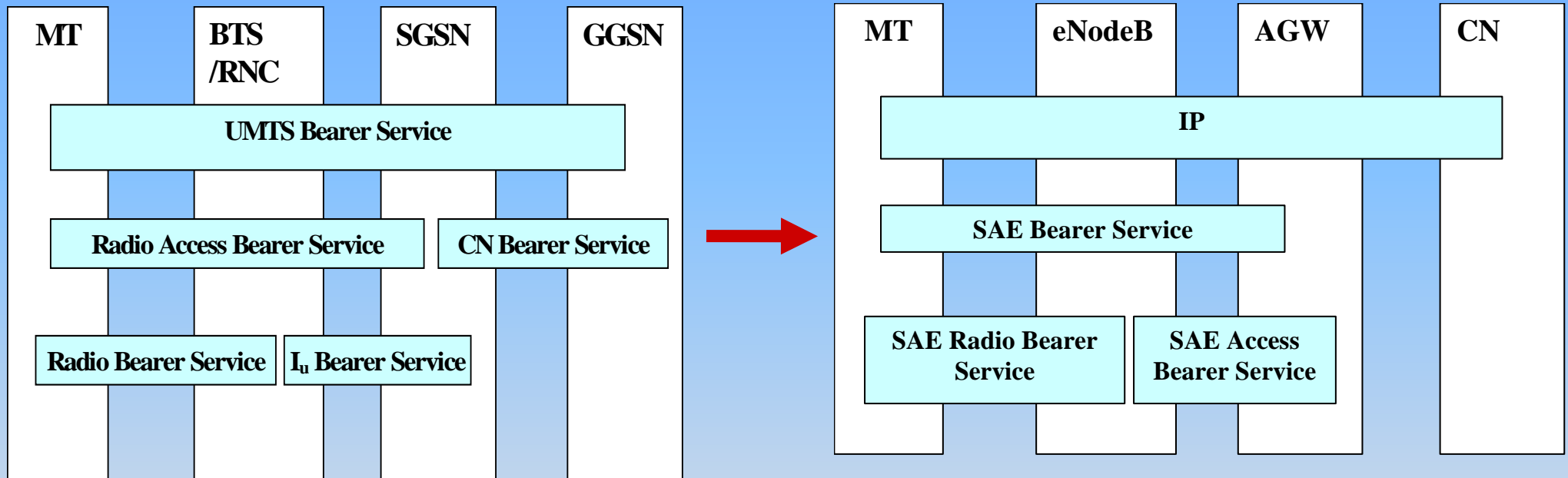
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# IPV6 + 4G = Seamless Roaming Architecture



# Architecture Evolution: LTE (Long Term Evolution)



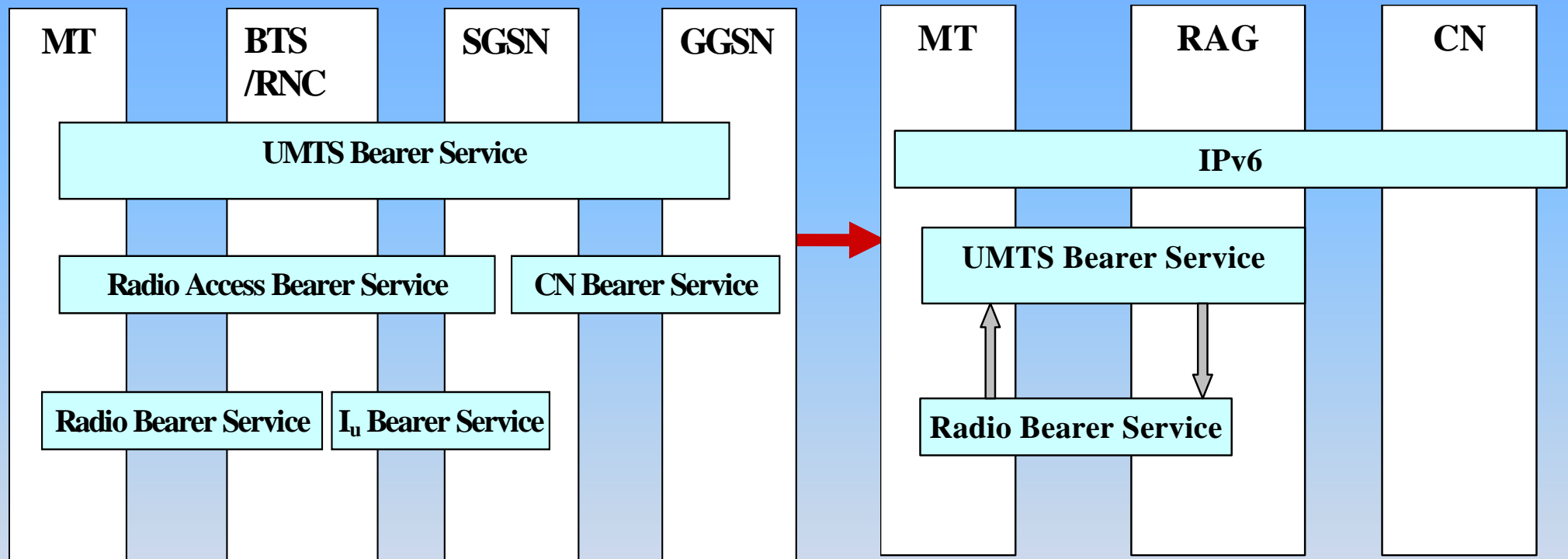
MT : Mobile Terminal

SGSN : Serving GPRS Support Node

GGSN : Gateway GSN

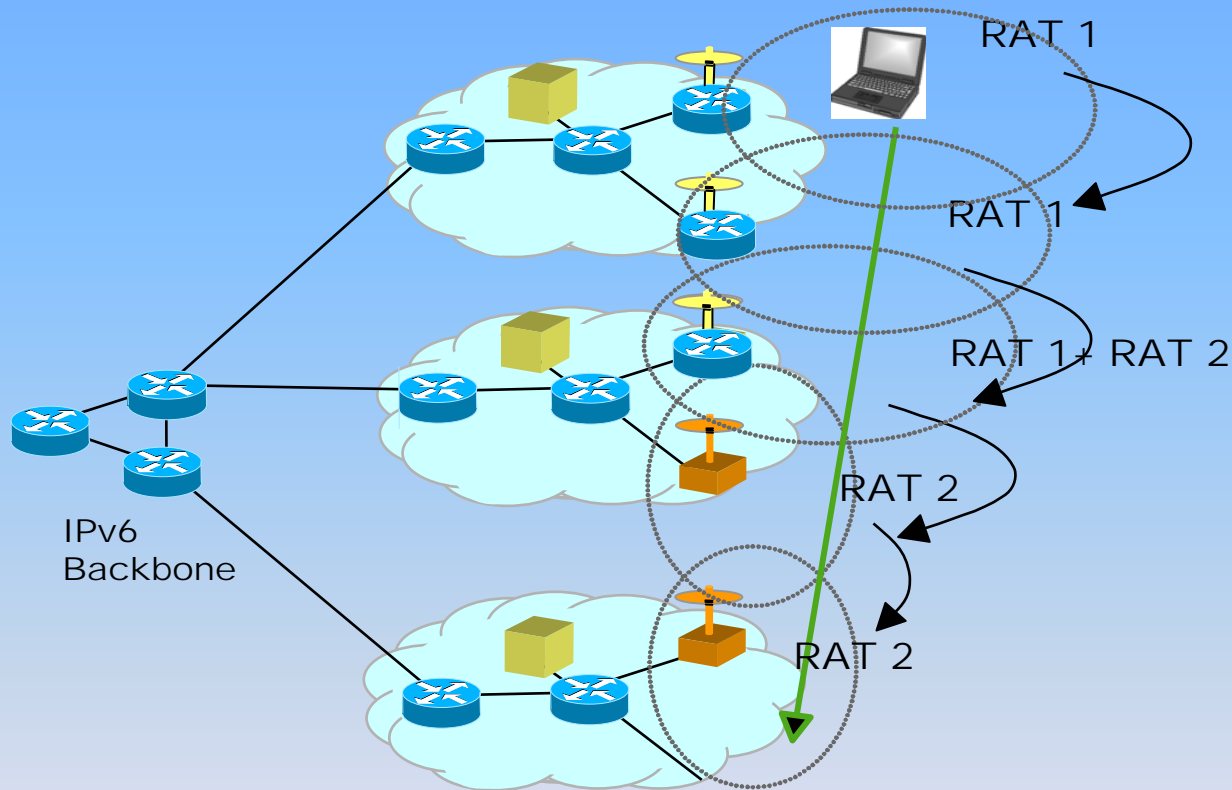
SAE : System Architecture Evolution

# New Architecture : All IPv6 (Eurecom)



RAG :Radio Access Gateway= IPv6 Router + NodeB

# IPv6 + 4G = Convergence “Pure – IP” Architecture



One IPv6 Subnet per radio cell  
Stateless IPv6 Address reconfiguration  
while roaming



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# Heterogeneity : Terminal with several interfaces

## Multiple interfaces on terminals

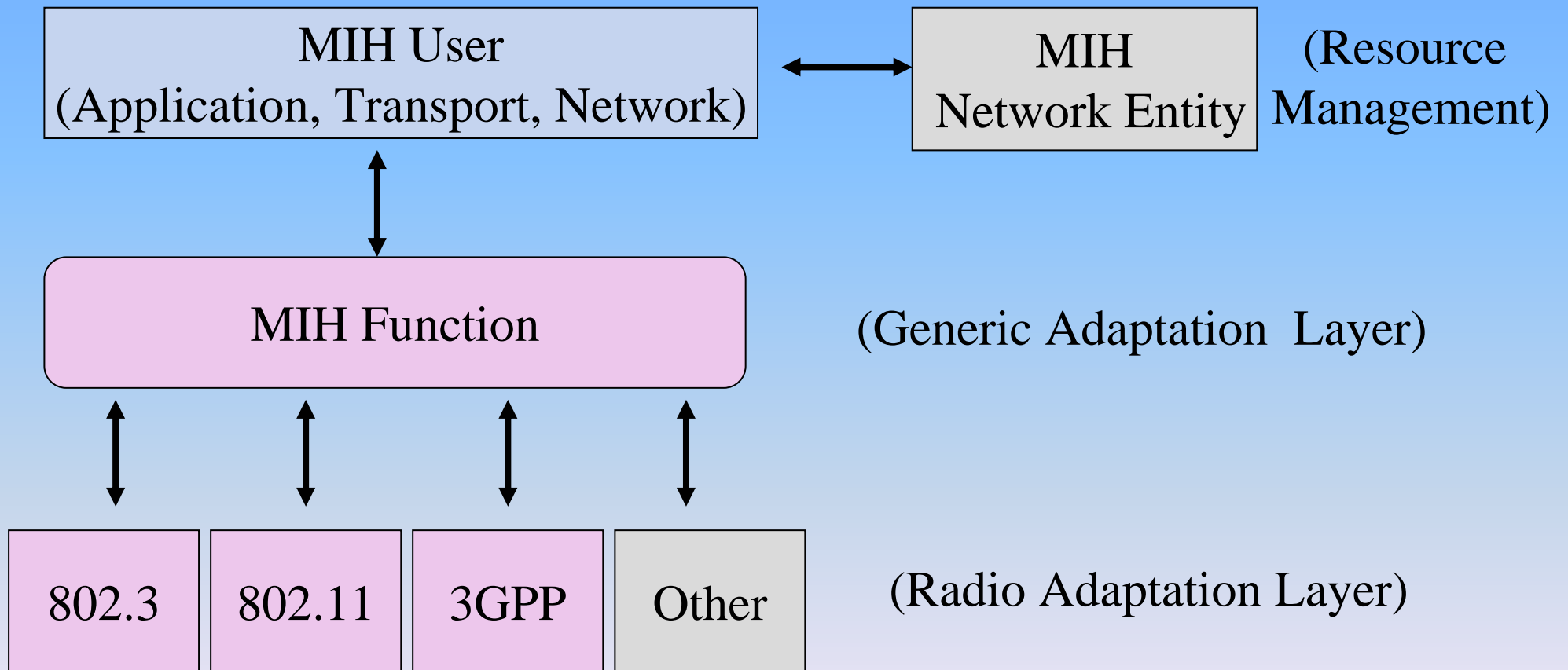
- *May be active at the same time or not (consequences on Handover process)*
- *Possible multihoming (attachment to multiple networks)*

## Impacts on radio resources management

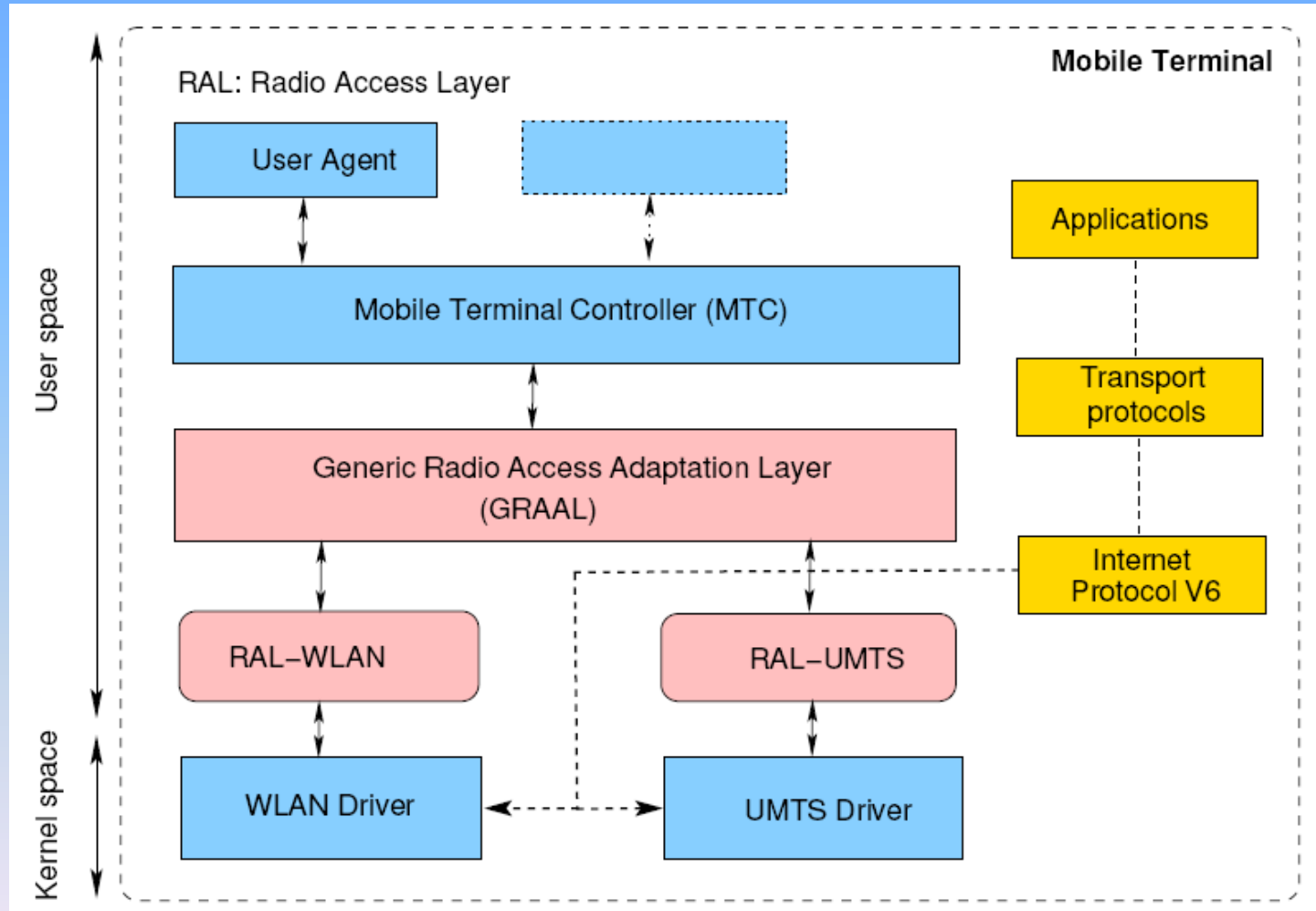
- *QoS parameter handling*
- *Resource allocation and admission control*

# Heterogeneity : Handover Handling (MT side)

## IEEE 802.21 Media Independent HO



# Heterogeneity : Eurecom IPv6 MT



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# IPv6 + Multiple Interfaces Scenarios

 **Vertical HO (several interfaces, one active )**

 **Soft IPv6 HO (several active interfaces)**

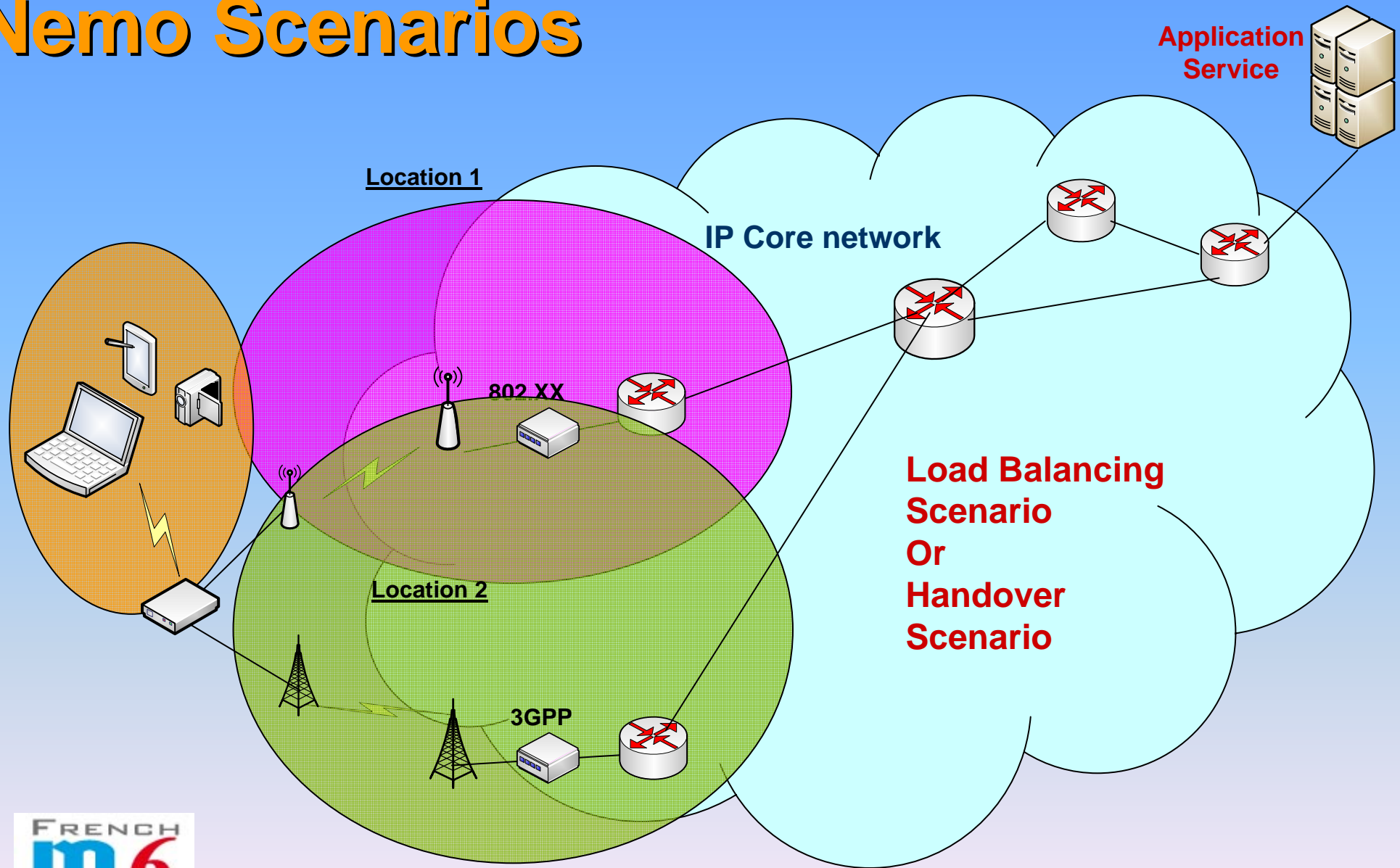
 **Multiple Interfaces for Mobile Routers (Nemo)**

➤ *HO (service continuity)*

➤ *Load balancing (Interface selection according to QoS requirements)*










# Nemo Scenarios





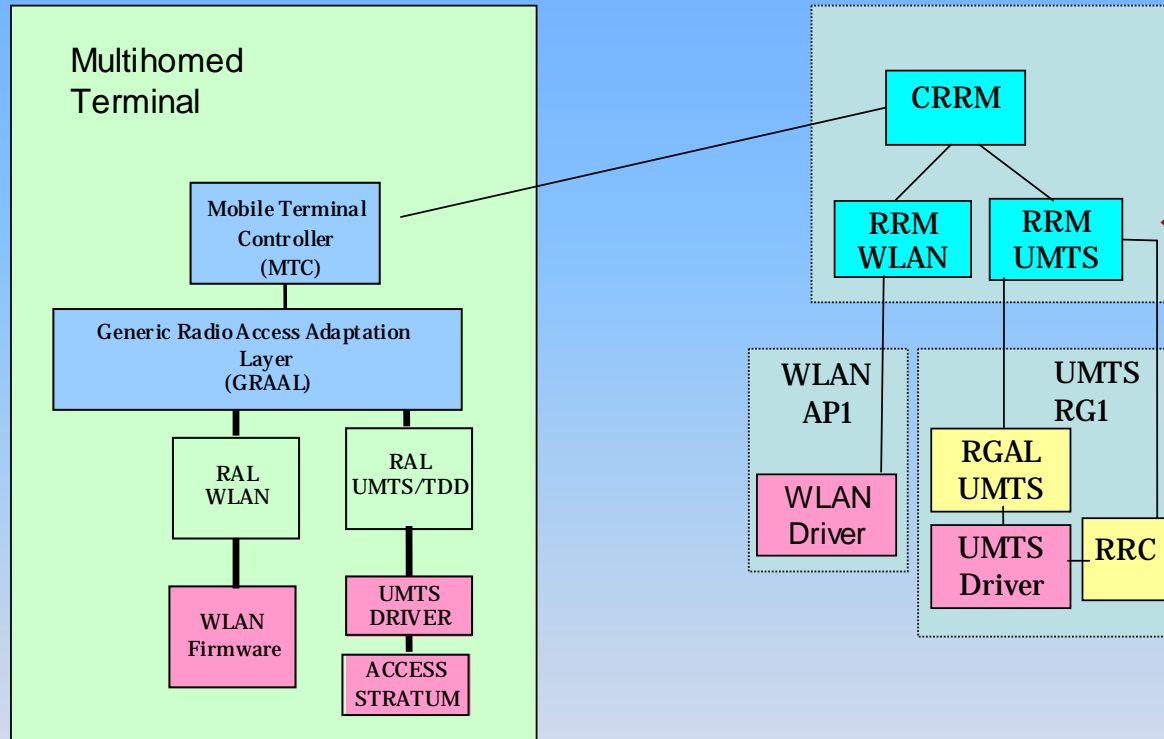
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# Radio resource management

- Allocation in presence of multiple RAT
- Quality Monitoring on Multiple RAT
- Liaison with « Always Best Connected » concept

# Common Radio Resource Management

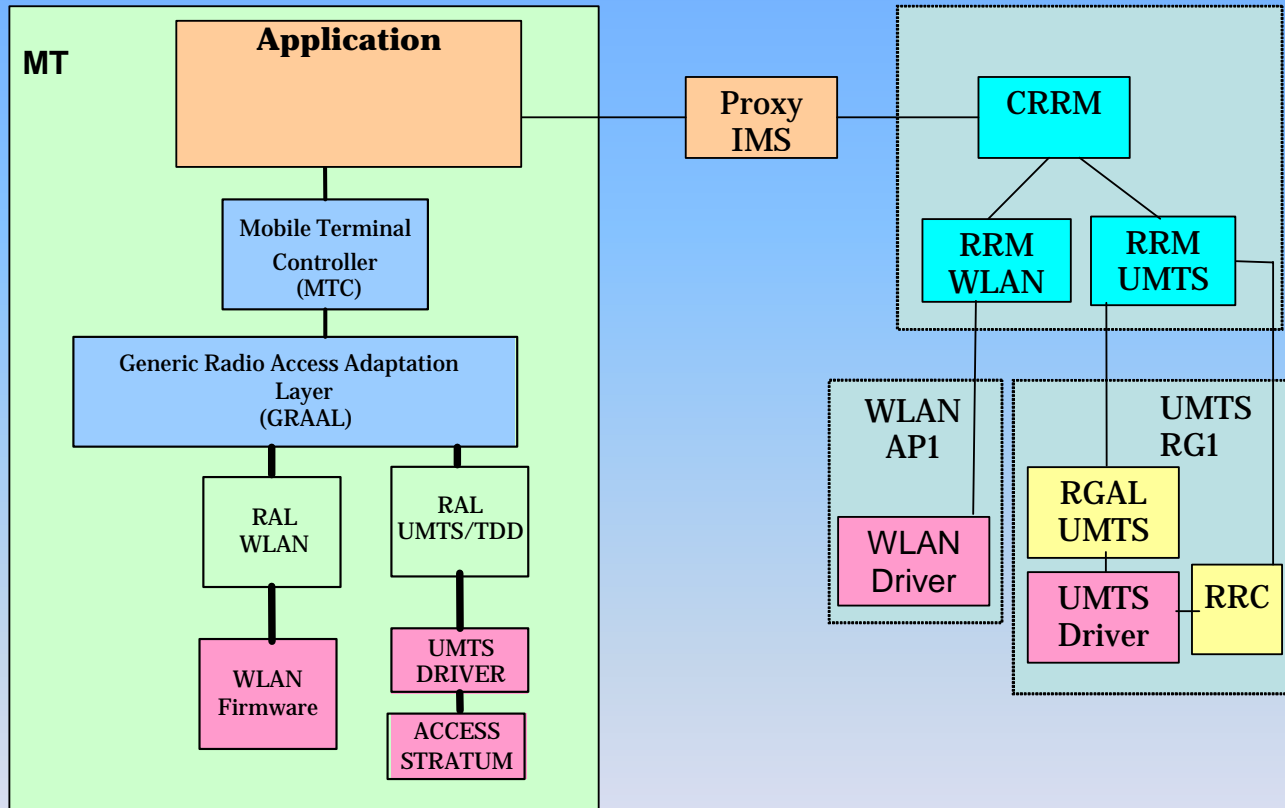


Common Radio  
Resource Management:  
« Always Best Connected »  
Information

# IMS (IP Multimedia Subsystem)

- ☞ Cooperation with CRRM
- ☞ End 2 End QoS parameters negotiation

# Liaison with IMS (IP Multimedia Subsystem)



QoS Requirement  
Capture  
In heterogeneous  
RAT

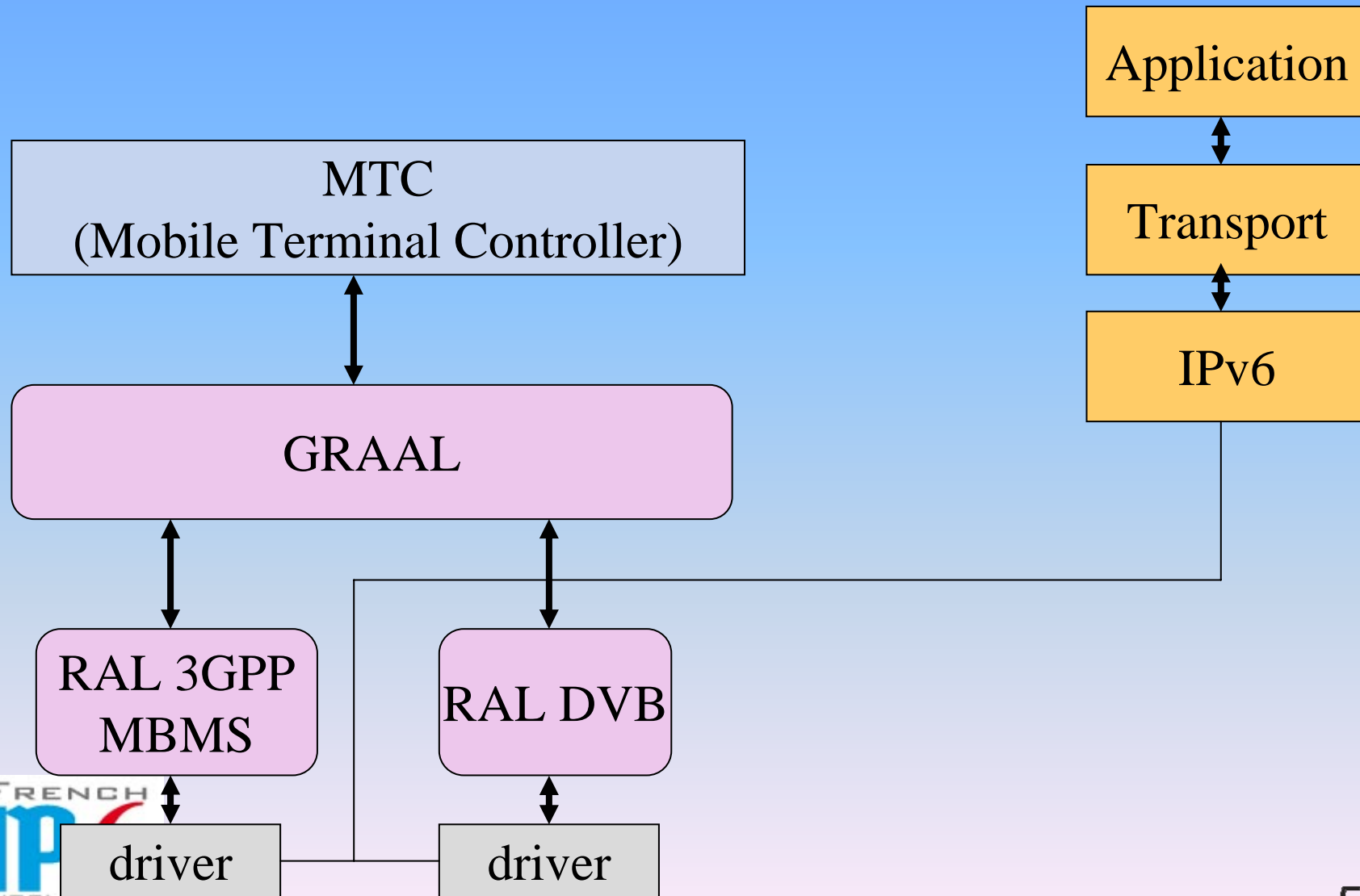
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- 📄 **Multicasting**
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# All IPv6 architecture and Multicast

- 📄 Multicast and Broadcast Content delivered in a single framework
- 📄 Reuse of : Multicast Tree, Group Management Protocols
- 📄 Reuse of IPv6 based Mobility Management

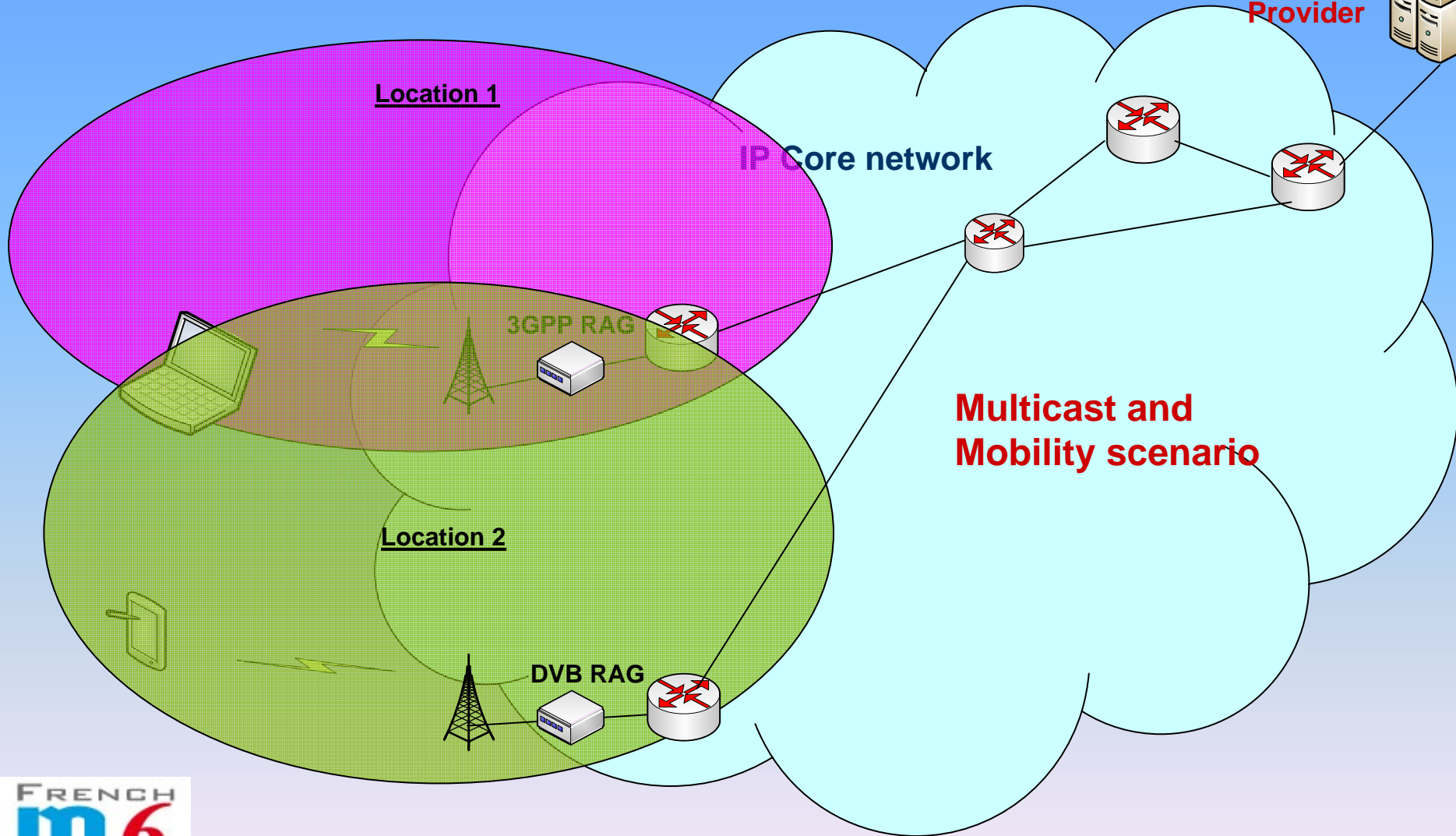
# Multicast Broadcast Integration





# Multicast Broadcast Integration

Streaming  
Service  
Provider



# Agenda

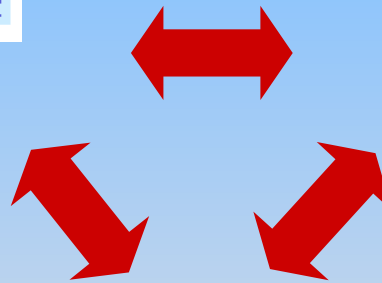
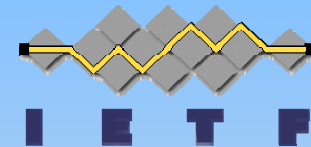
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- 📄 **Conclusion**

# 3-Way Technology Convergence

3.5G +  
WLAN+WiMax+ ...  
Radio Access



Next Generation Mobile Internet  
Technology (Mobile-IPv6, NEMO,  
DiffServ, Multihoming)



Open-Source Software  
(Linux, RTLinux, RTAI)



# OpenAirInterface.org

- ☰ Open test framework for innovative IP-based Air interface technologies
  - *Website*
  - *CVS repository (HW/SW)*
  - *Forum (for internal/external development)*
- ☰ Generic/reconfigurable Air Interface for
  - *Cellular topologies*
  - *Mobile AdHoc/MESH*
  - *Point-to-multipoint and Single-Relay Networks*