

# Mobility and pervasiveness challenges beyond Daidalos or Is there future research after Daidalos?

Rui L. Aguiar  
Universidade de Aveiro / IT - Aveiro

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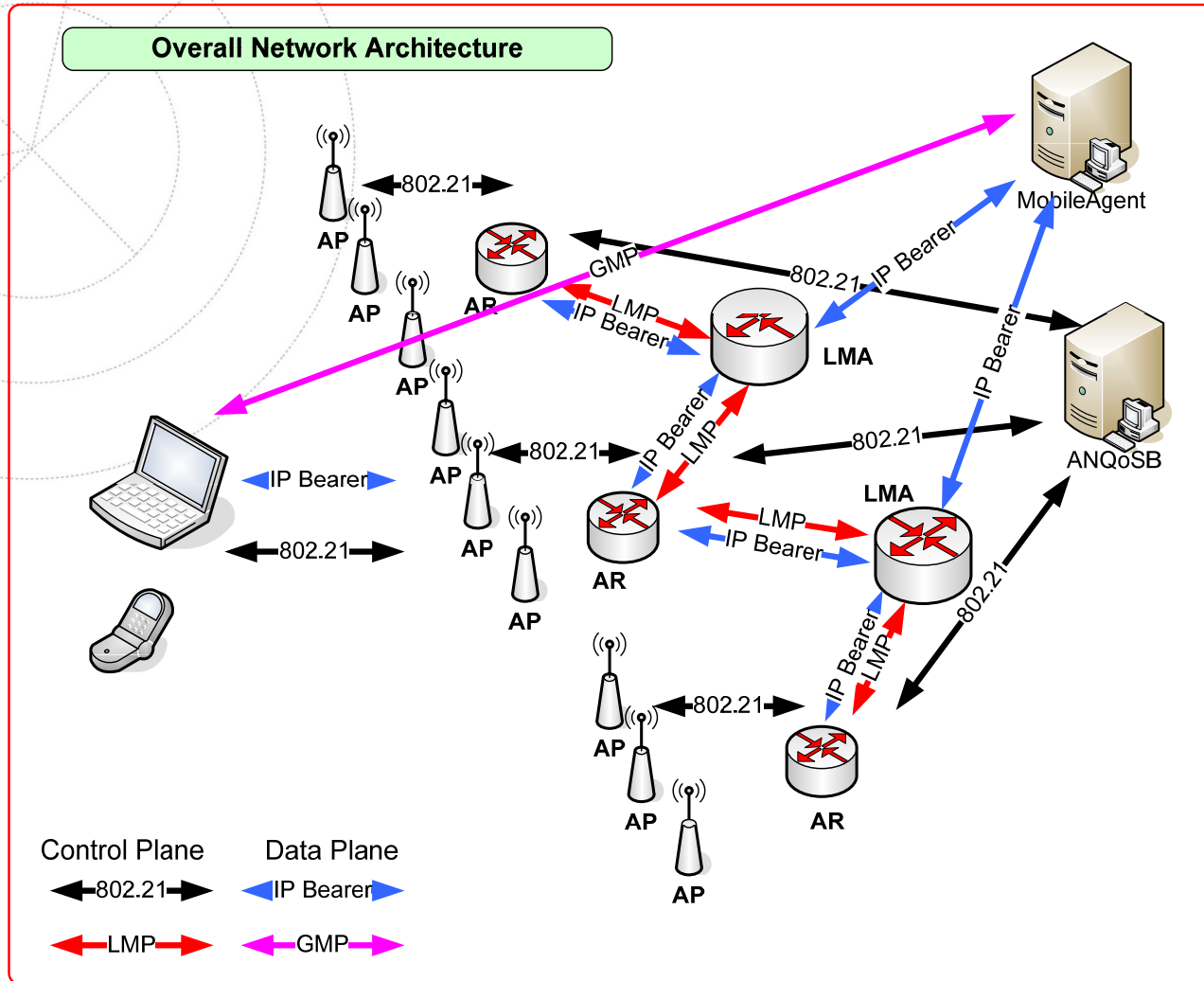
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## Overview

- Current mobility Daidalos world
- And the trends?
- What will we expect
  - Things, persons
  - Operators, companies
  - Traffics
- Conclusions

# Global solutions in Daidalos



## Features

- Integration with QoS, including resource optimization
  - NIHO
  - MIHO
- Integration with security
- Support of Multicast mobility
- Integration with unidirectional channels
- Hierarchical approaches, with flexible solutions potentially integrated
  - Gateways to Ad-hoc
  - Gateways to 3G+ possible
- Mapping/signaling independent of technology
  - Resort to 802.21
- Integration with measurement/accounting
- Full personalization incorporated
  - VIDs
  - User centric context

## Are there things missing?

Question with multiple aspects:

- Do we have *technical features* that can be improved?
  - Better performance?
    - Yeah, sure, always.
- Do these technical features provide *added-value* to the overall system ?
  - Hum... yes if compared with Daidalos implementations. *Maybe not*, if addressed on concepts only...
- Are there scenarios where *new requirements* may exist?
- Do these scenarios seem to have a reasonable *realistic impact* in the middle term?

Will not cover all of this.... But a small sub-set of the scenarios that may challenge Daidalos

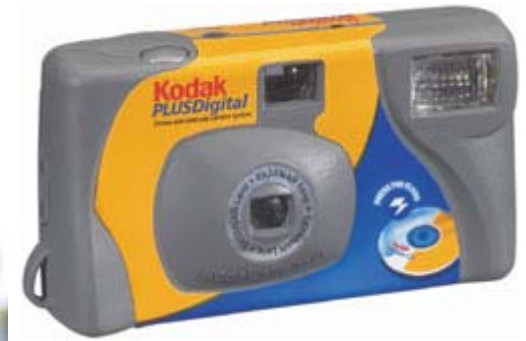
# So what may be new requirements?

## What are we seeing:

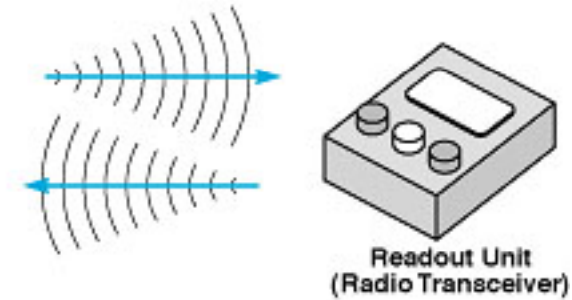
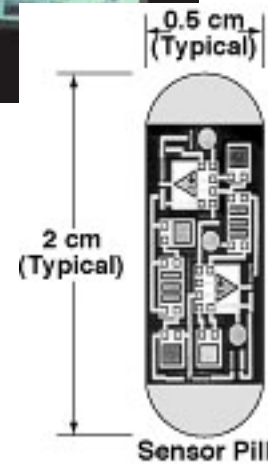
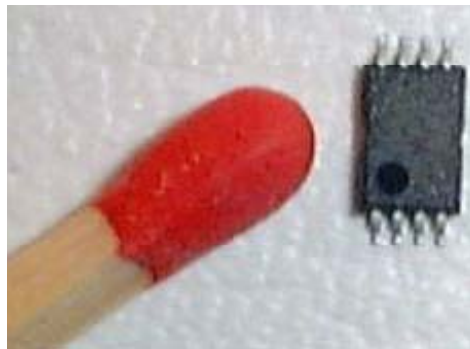
- Telecom Economics:
  - more competition
  - but aggregation of offers – pressure for cost reduction
- Network is now mobile
  - Email... and messaging
  - Multiple interfaces: access from anywhere
- Network is now social
  - Hi5, orkut, facebook*
- User economics:
  - Sharing of connections
  - Social network goes into transmission
- (Multi)Media has come to the mobile networks
  - Not only entertainment
  - Also other information – notably Location.

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# Internet of things



## The PAPER LAP TOP



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# Internet of things

Internet of Things presents multiple changes to the network:

- **New actors**
  - devices become both source and consumer of communication
- **Lack of authoritative domain**
  - Most devices will run as “self-owned”
- **Richer information environment**
  - these new devices provide for more complex cross-relation of data
  - Data mining can be exploited in much larger detail
- **New constrains**
  - Cost, power consumption, form factor, radio access
  - Data ownership, collection, mining in “self-owned” environments
  - Security of data
  - Privacy of data – including data

## MOBILITY AND PERVASIVENESS

## Telecommunications

- Internet of things
  - Many more devices
- Internet of people
  - Many more actors
- Internet mobile
  - Changes of needs, changes of communications

Internet of things + Internet of people + Internet mobile

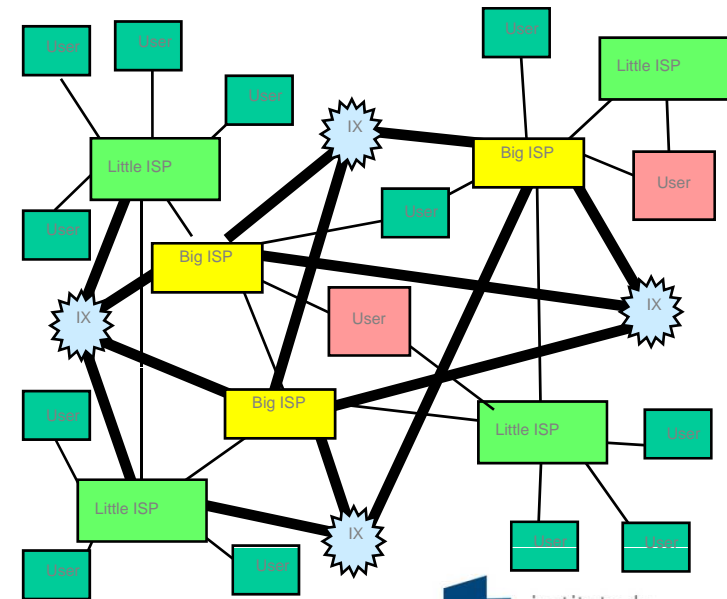
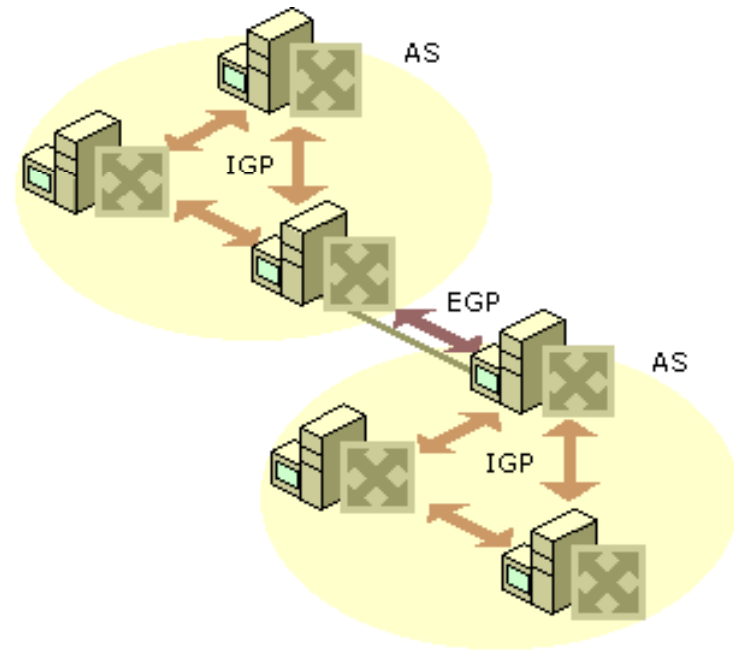
# Who controls?



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## And now?

- We had an AD concept clear(?)
  - Already complex deployments
- We do not have an AD concept for this!!!!
  - ... MVNO
  - .... Unbundling of the local loop
  - .... IT federation efforts
- No scaling possible!
- Not even ownership notions exist!
- What will happen to:
  - Reliability
  - “\*Public service”



# Management and control

- “Self-X” is a trend now...
- But with impact nice for manufacturers! 😊
  - Control will leave both users and operators
  - Control operators can just read instructions... ☹️
- What will be the consistency of the management?
  - Specially when some (most) nodes are mobile?
- Integration of intelligent managed mobile nodes, with overall consistent intelligence
  - Wireless communication can break easily with a couple of misbehaved nodes
  - Unexpected mobility can impact similarly
    - E.g. a mobile router moves away from a cell
    - Remember the cascade effects know in power grids!!!
- Mechanisms **for reliable control and behaviour** in complex systems
  - How to control mobility in this environment? What will happend to QoS?  
New “inter-domain” mobility protocols needed



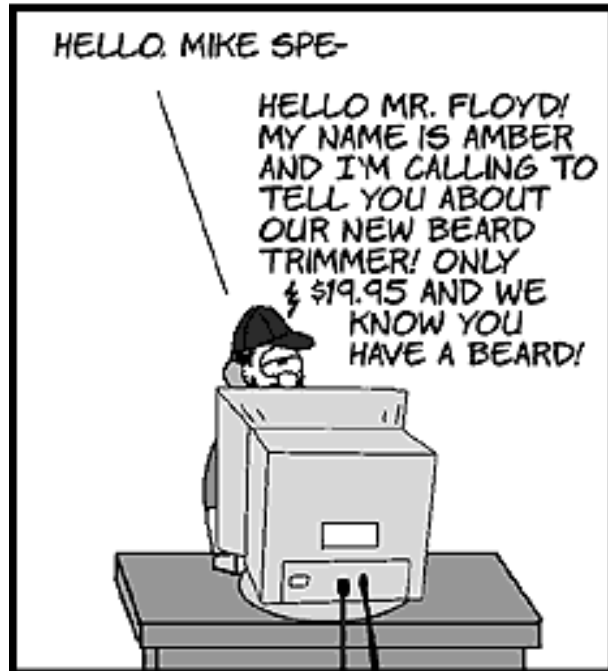
## Media (multimedia)

- Social web
  - Share!!!
- User journalism is here
  - Blogging!
  - Cell phone cameras!
- Expected wealth of multimedia (image/video) communications
  - How to search?

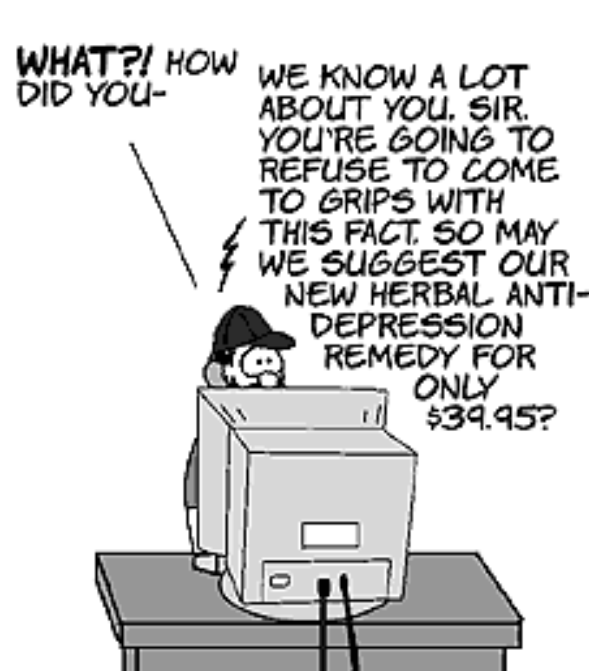
- Mobile TV is here
- Mobile video-conference is here
- Kids do not “phone”: they SMS and they MMS
- **How to build a pervasive environment which is image indexed?**
- **How to manage mobility when this will be image-oriented?**

# What waits for us...

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## Conclusions

- Daidalos copes with most current challenges.
  - Even the trendy “virtualization” stuff 😊
- But there is a future after Daidalos!
  - Integration of media with communications
    - Optimizations, security, privacy
  - Integration of multiple-domain control
    - Including actors at different levels
  - New protocols for optimal multiple-domain mobility
    - Off-line? On-line?

# Coments?

- 1 -
- 2 -
- 3 -
- 4 -