

# EU IST KA4 Mobile/Satellite: WLAN — a Research Perspective

Brussels, 2002-10-17

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# Areas of Discussion

1. Standards -- 802.11b, 802.11a, Hiperlan, Future
2. Regulatory view; European harmonization
  1. Spectrum: 2.4 GHz, 5 GHz, 17 GHz
  2. License requirements
3. Business Models
4. Deployment Models

# Standards

- ▶ **Clearly, 802.11b reigns**
  - Market volume already 5 % of total cellular market!
- ▶ 802.11a still hampered by regulatory hurdles
  - Performance not really that great, either (“15 Mbit/s net throughput”)
  - Larger number of channels in 5 GHz bands attractive, though
- ▶ **Hiperlan ignored** by industry
  - Some feeble QoS flogging still present ➡ home markets!
  - New Thomson chip, though, so products are now at least possible
- ▶ Work on more advanced OFDM e.g. in 17 MHz area
- ▶ Surprise: Little to no discussion of **UWB** (why?)

# Spectrum and Licenses

- ▶ Telco licensing [practically going away in 2003]
- ▶ 2.4 GHz almost fully harmonized (83.5 MHz)
  - Remaining problems in France/Spain going away
  - Still need license for 3rd-party in FR ES IT
- ▶ 5 GHz: EU decision of 1999; little national progress
  - DFS/TPC hurdle due to potential RADAR interference
  - “Interim solution” getting traction, 200 MHz 5150-5350 indoor
  - 802.11a now licensable in BE DE FI NL UK (8 channels)
    - 4 channels in AT DK FR IE IT CH NO SE
- ▶ 17 GHz: 200 MHz lying around unused

# Business Models

- ▶ WLAN adds 4 % to 3G CAPEX
- ▶ European ISPs don't have the money (unless incumbents)
- ▶ General sentiment: **Cellular operators will be the ones**
- ▶ Tariffs should be simple (but little agreement otherwise)
  - Ross Pow: Start out free, add charges later once you understand
- ▶ Roaming high on the agenda
  - Campus networks may be just another “small WLAN operator”

# Deployment Models

- ▶ Hotspot operators: Telia Homerun, CosmOTE (GR)
- ▶ Campus WLANs; some talk about Metro WLANs
  - Uni Bremen: 2 €/m<sup>2</sup> (2001 prices), would be closer to 1 €/m<sup>2</sup> now
  - All presenting Universities have some IPv6 deployment in the WLAN
  - SNCF: Stations, on-board, in marshalling yards, possibly for travellers
- ▶ Security: Universities pro deep security
  - “802.11x” talk really was about .11a/.11b...
- ▶ Operator groups (WIG = WLAN interop group):
  - Favor complex AP-based models (DIAMETER backed)
  - Possibly require SIM-based devices
  - WLAN integration in 3GPP R6 (access/charging) and R7 (mobility)
  - Little chance of interoperability with deep security deployments?