The Cambridge White Spaces Trial

2nd May 2012

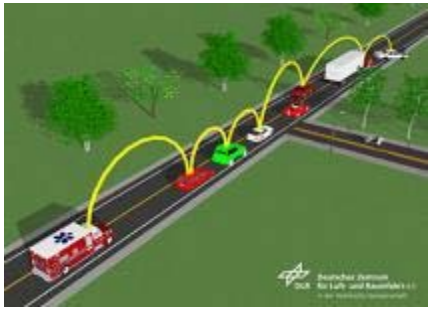
Content driving spectrum demand

European digital agenda

Video Content

Rural broadband

Machine to Machine

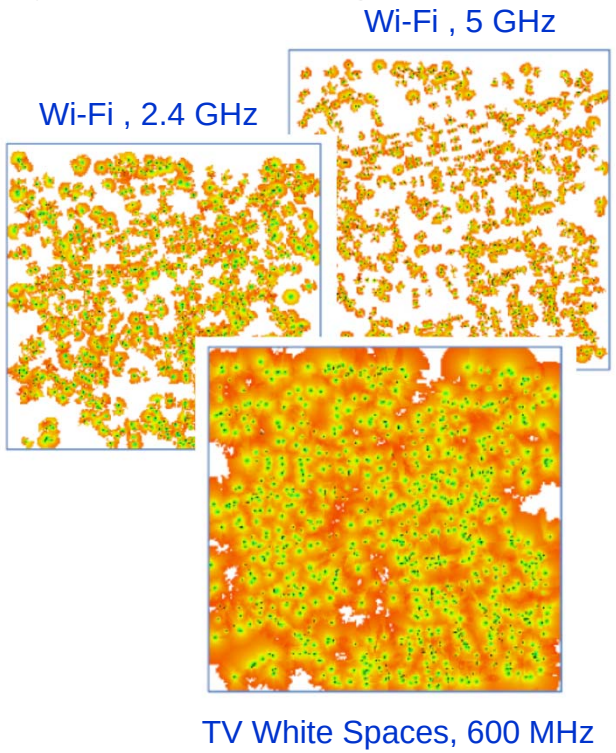


Cloud computing

Ofcom's TVWS proposals are attractive

- Ofcom proposes geolocation database controlled access to TVWS on an LE basis
- Industry encourages Ofcom and other regulators to progress the enabling regulations
  - Securing existing services
  - Providing flexibility for new applications and innovation

Capacity and propagation characteristics of white spaces spectrum compared to existing WLAN bands



Source: BT Innovate & Design

The Consortium Partners

Consortium aims and objectives

- To help Ofcom develop an enabling TVWS framework, providing:
  - Security for the existing services
  - Flexibility for new applications and innovation
- Explore the potential of white spaces to support key applications

Photo: Robyn Bemment

About the Cambridge Trial

- Led and funded by industry members
- Largest TVWS trial in the world
- 19-site test licence from Ofcom, with 10 UHF channels
- Mix of urban and rural access point locations
- Two geolocation databases
- Range of applications
- In depth test and measurement programme

The Cambridge Trial network

- The city centre sites use omnidirectional rooftop antennas (10 m high) on commercial premises
- Three access points at member's offices on outskirts of the city
- Databases enable the radios to be managed remotely

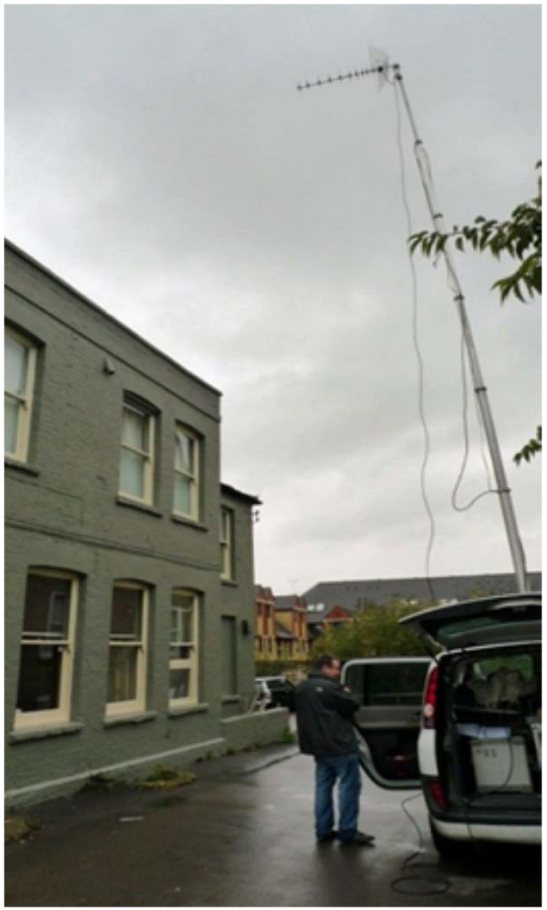
Photos: Sky, Arqiva

Mix of applications

- Many applications can build on the flexibility afforded by geolocation-enabled access to the white spaces
- These include:
  - Wireless broadband, using TVWS to enhance coverage and capacity – in rural & urban areas
  - Machine to machine applications
  - Location-based services
  - Local AV content distribution

In-depth tests and measurements

- Measurements were a key part of the trial, covering:
  - Co-existence with DTT and PMSE
    - Protection ratios
    - Coupling factors
  - TVWS network performance
    - Coverage and throughput
- Results have been fed into:
  - Ofcom's TVWS Technical Working Group
  - CEPT SE43 working group



Key findings and results

Embargoed until 25th April 2012

A few highlights

- Successful coexistence with DTT and PMSE, with deployed network serving a range of applications
- Useful white spaces capacity
  - 20 channels are white space – we had 10 in our test licence
  - Some of these are quieter than others
- Databases worked well
  - Easy to update with PMSE requirements for temporary reservations
- In theatre PMSE measurements can inform Ofcom's determination on protection requirements
- Location based services
  - Helping visitors to get more out of Duxford's fine collection of aircraft

A few highlights - continued

- Urban coverage – useful for wireless BB and M2M, with omni-directional antenna at base station
  - 1.5km range for CPE
  - 500m for UE
- Urban deployment – outdoor (rooftop) in trial, but significant potential for indoor
- Rural BB potential
  - Up to 6 km at over 10 Mbps – with a point to point link

Thank you

- Further information may be found here
- Trial reports are available Here (overview) and Here (technical)

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