



# Going Mobile Challenges for Campus Networks

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HEAnet Conference 13th - 14th of November 2008, Kilkenny.

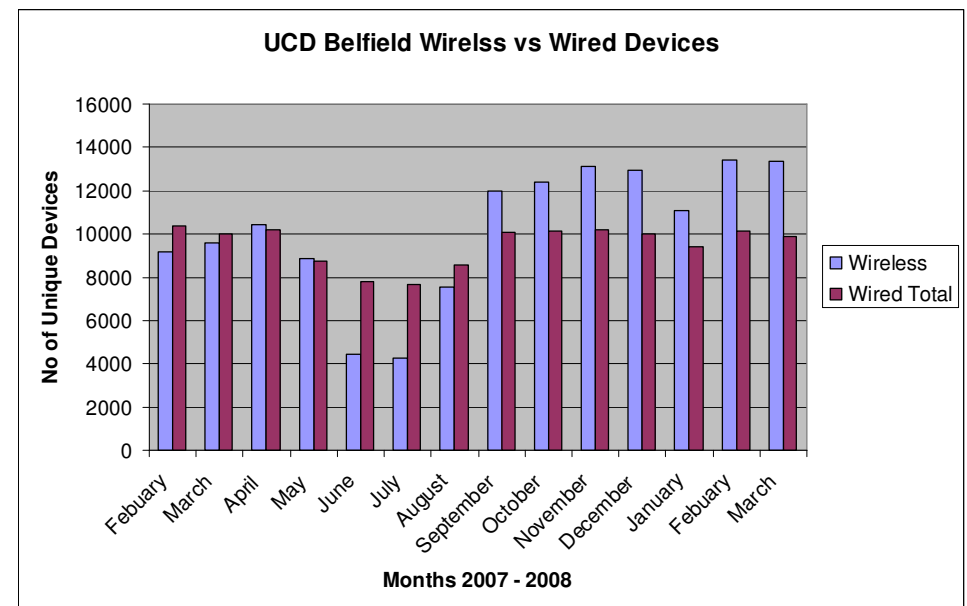
# Agenda

- Campus networks trends
- Access technologies
- Possible outcomes
- HEAnet wireless strategy
- Tender for national mobile broadband service
- Initial results
- Next steps



# Campus Networks are Changing

- On Campus
  - Wireless has already overtaken wired at some campuses!
  - Number of base stations
    - Mean 156
    - Max 900
    - Min 16
- Nationally – Comreg Q2 2008
  - Mobile Broadband 222,330 +394.07%
  - Total 1,054,920
- Globally
  - 4 Billion Mobile phones Globally (SIMs) – ITU Dec 17th 2008. How many have WiFi and or 3G?
  - Sensor deployments just beginning ~10 Billion sensor devices by 2020



# What is WiMAX?

- WiMax - Worldwide Interoperability for Microwave Access
- Broadband wireless access technology started by the IEEE in 1999.
- IEEE 802.16, is intended for wireless "metropolitan area networks"
- WiMAX coverage 50Km for fixed stations(5-8Km typical) and 5-15Km (<3Km typical) for Mobile stations
- IEEE 802.16e 46Mbit/s down, 7Mbit/s up – based on 10Mhz channel , 2x2 MIMO
- IEEE 802.16m 100Mbit/s Mobility and 1Gbit/s low mobility
- Licensed and Unlicensed spectrum



# What is 3G?

- 1G – old Analog 088 service
- 2G – GSM
- 2.5G – GPRS(56-114Kbit/s)
- 2.5G – EDGE (236Kbit/s)
  
- 3GPP - 3rd Generation Partnership Project
- 3G – 384Kbit/s
- HSPA - HSDPA/HSUPA 3.6, 7.2, 14.4Mbit/s – 5Mhz channel.
- 4G – LTE Long term evolution 100Mbit/s
- LTE Advanced 100Mbit/s mobile, 1Gbit/s low mobility)



E220 USB modem

N95 HSDPA, WiFi, Bluetooth



N810 Mobile WiMAX, WiFi, Bluetooth



SPH-H1300 Mobile WiMAX & HSDPA



Acer laptop with Intel WiFi/WiMAX



Cisco BWX 350 Mobile WiMAX



Intel WiFi 802.11a,b,g,N and WiMAX 802.16e

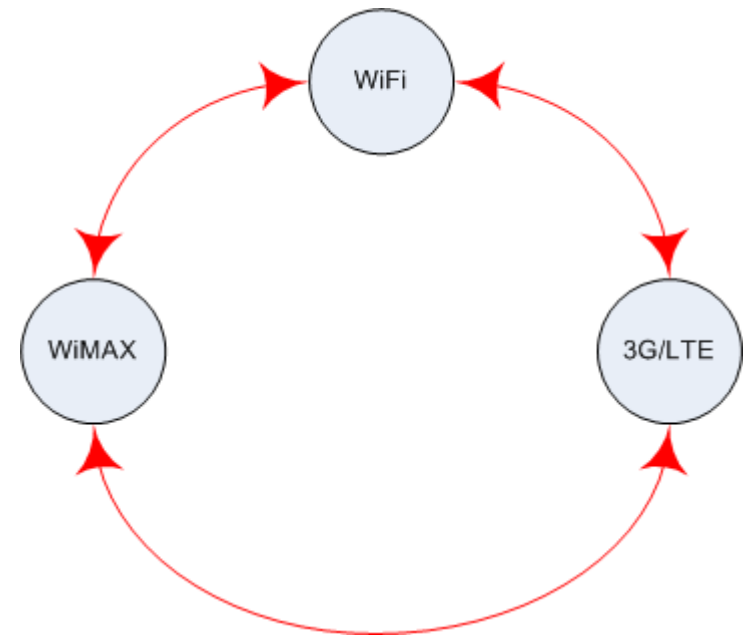


## What access network will your users use to connect to your network in 2010?

- Access technologies
  - Fixed network
  - WiFi
  - WiMAX
  - 3G
  - LTE(4G)
  - Combination of all of the above?
  - Other technologies?

# Possible Outcomes..

- Stick with WiFi only on Campus
- Negotiate 3G/4G service and remove WiFi
- Build, wholesale or negotiate a WiMAX service
- Combination of all of the above?
- Other standards IEEE 802.22 (Cognitive radio in TV Broadcast spectrum) /IEEE 802.20 (Mobile)



# Some More Issues

- Introduces issues:
  - Roaming between WiFi/WiMAX/3G
  - On Campus and off campus
  - Provision of services
  - Mobile portal? More portals?
  - Support – IT helpdesk, operator?
  - Authentication – SIM, Passwords, Identity Management
  - Federation
  - Spectrum issues, licensed, unlicensed
  - Others?

# HEAnet Wireless Strategy

- Phase 1 (2008-2011)
  - **National Mobile Broadband Service**
  - Continued rollout of eduroam
  - Implement existing middleware strategy to support mobility
  - Licensing and the communications regulator
  - Governance and Review
  - Trials of new wireless broadband technology (WiMAX/LTE)
- Phase 2 (2010)
  - On Campus and extended campus deployment

# Tender Objectives

- Provide national coverage
- Price point at or below 15 Euro per month
- Dongle must not be a barrier to entry
- Different Contract options
- Available to staff and students
- Commitment to track the retail price
- Availability of service
- Quality of service
- Support for IPsec, IMAP, SSH, Voip etc
- Ability to roam
- Support
- Reporting

# O2 & HEAnet Offer



- O2 Clear
  - 9 month contract
  - 30 days termination notice
- - E220 Modem. 7.2Mbit/s down, 384kbit/s up
  - 5GB limit/month, 0.02 Euro/MB over this
  - Roaming possible but disabled by default
  - Monthly cost 15 Euro, modem 20 Euro.
- O2 Contract
  - 12 month contract
  - 30 day happiness guarantee
- - E220 modem. 7.2Mbit/s down, 384kbit/s up
  - 10GB limit/month, fair usage applies
  - Roaming possible but disabled by default
  - Monthly cost 13 Euro, modem 20 Euro.

# HEAnet/O2 Mobile Broadband User Statistics

- Total number of users:
  - September 1314
  - October 571 (Mid October)
  - Total today 2700 with approx 50 new/day
- Contract breakdown:
  - 9 months 8%
  - 12 months 92%
- Sales channel breakdown:
  - Campus sales 37%
  - Retail sales 63%
- Working with O2 to get statistics on:
  - Distribution nationally of users
  - Max and Min speeds by area
  - Average throughput and hourly usage

## Next steps

- We will be asking you all for your feedback on the national mobile broadband service.
- Federation - Identity management and Mobility
- User trials of WiMAX technology in early 2009
- Possible trial of LTE technology late 2009/2010
- Anything else we should be investigating?

# Questions?

