

Mobile Broadband for R&E Customers

Eoin Kenny HEAnet

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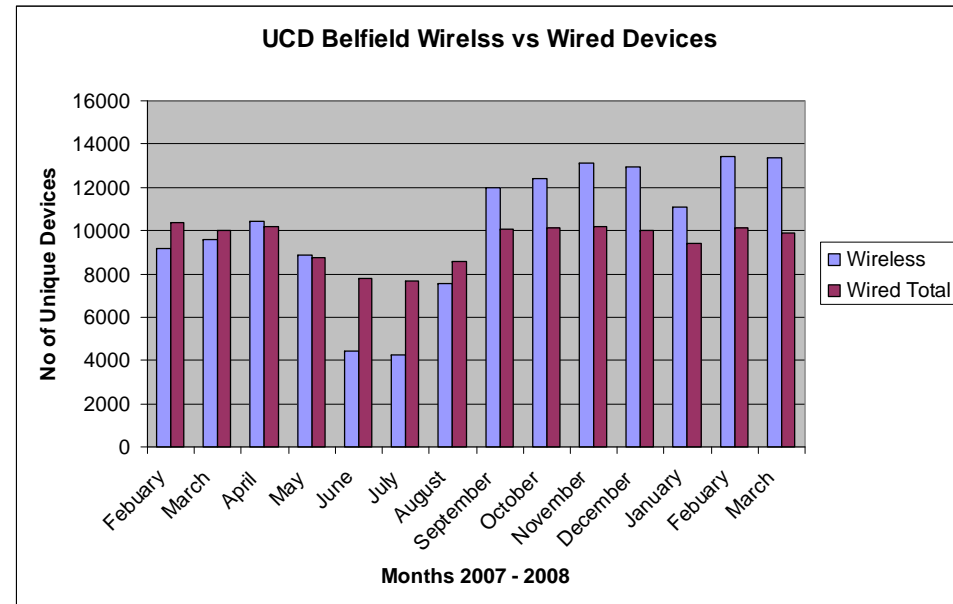
Agenda

- Campus networks trends
- Access technologies
- Possible outcomes - issues
- 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
 - Laptop penetration up to 80%
- Nationally – Comreg Q3 2008
 - Mobile Broadband Q3 268,705 +203%
 - Total 1,125,080
- 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



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

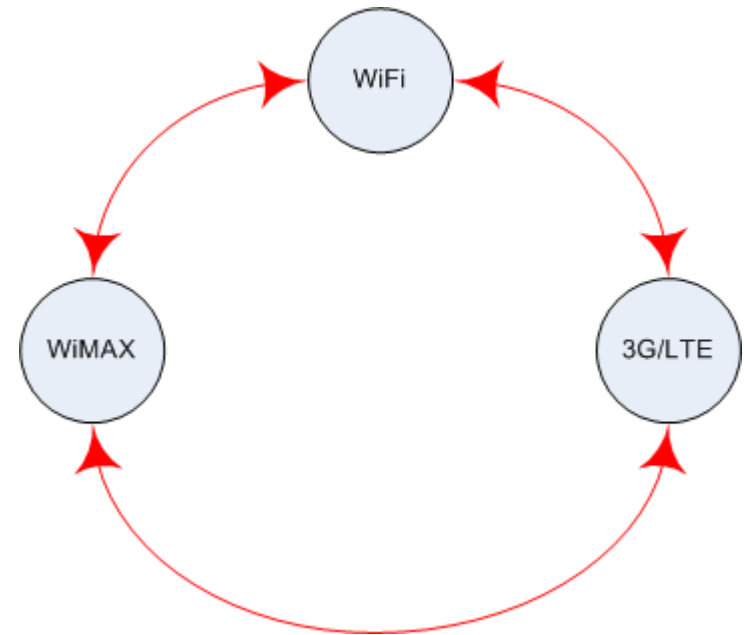


What access network will your users use to connect to your network in 2010?

- Access technologies
 - Campus Fixed network
 - Campus WiFi - Eduroam
 - 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

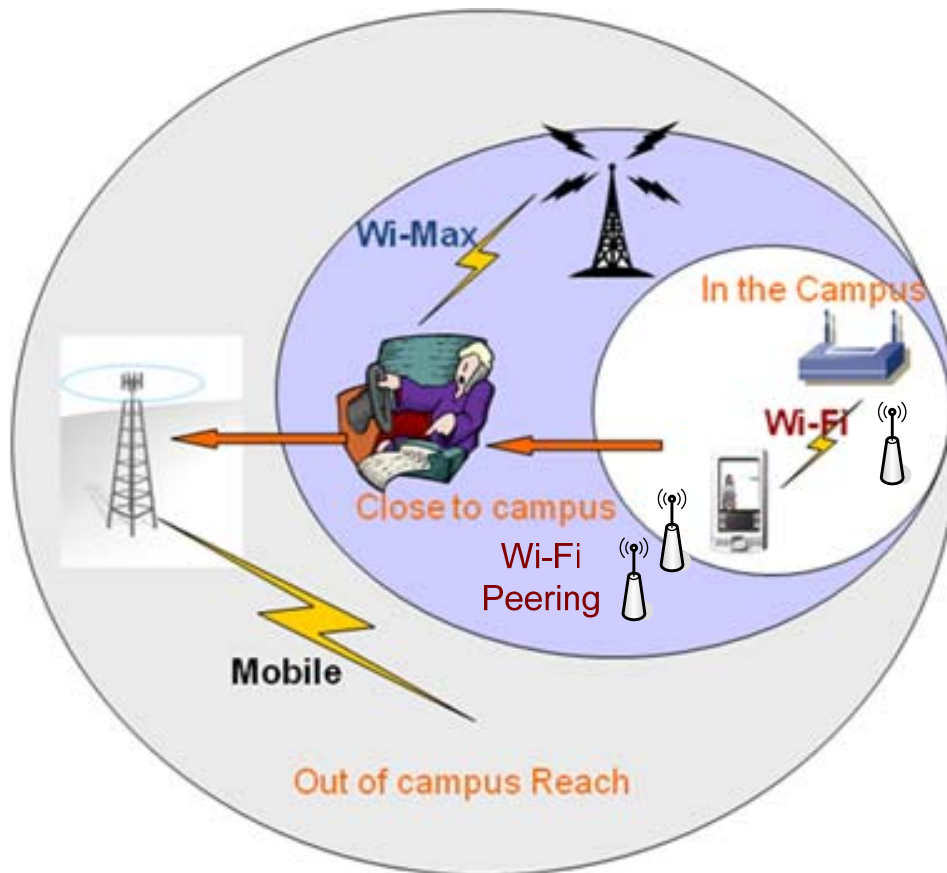
- HEAnet Board decision - Mid 2008
- Consultants selected – Ward Solutions
- Report and Strategy published end 2008



Brief

- Investigate nationally ubiquitous wireless access to the HEAnet network for all HEAnet clients.
- Identify all potential options
- Identify & Investigate the most feasible options
- Recommend a Strategy

Approach



**Widespread
Consultation**

**13 Candidate
Solutions Initially
Considered**

**5 Candidate Solutions
Investigated in detail**

**Strategy Issued to
board & adopted**

**Procurement exercise
conducted**

Tender awarded to O2

Service ready Aug 08

Some Key Findings

- Overwhelming agreement - extend campus cloud
- Quality of Service
- Price/Cost
- Ease of use
- Regulatory Viability
- Commercial Viability
 - To deliver
 - To maintain
- Mobility
- Ease of delivery
- Inability to fund from existing HEI funds

Key Recommendations

- Develop, communicate and implement a wireless strategy
 - meets major requirements
 - has widespread sectoral buy-in
 - Is flexible to keep pace with technology and commercial changes
 - Acquisition, Provisioning and Support Mechanisms
 - Funding Plan
- Implement the strategy over 2 major phases
- Put in place review and Governance mechanisms

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

Market review & Trial

- In early 2008 UCD carried out a 100 user trial with Vodafone
- HEAnet carried out a survey of our University and Clients to obtain a level of interest and wiliness to promote.
- Results from the user trial and feedback from clients was used as input to the tender.

Tender Objectives

- Stimulate the use of IT on and off campus
- Provide a quality mobile broadband service in Ireland for students and staff in HEAnet HEI institutions
- National coverage
- Price point at or below 15 Euro per month
- Dongle must not be a barrier to entry
- Different Contract options
- Commitment to track the retail price
- Availability of service
- Quality of service
- Support for IPsec, IMAP, SSH, Voip etc
- Ability to roam
- Support & Reporting
- Limited to 10,000 users

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 User Statistics

- Total number of users:
 - Total today 4396 (Sept 08 – Jan 09) with approx 50 new/day
 - O2 Ireland
- Churn rate
 - 8-10% of customers
- Data usage
 - HEAnet 12 month contract average 2.36Gbytes/month
 - HEAnet 9 month average 1.87Gbytes/month
- 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

- Review of the National Mobile Broadband Service
 - Currently reviewing prior to September 2009
- 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?

