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# Schema Presentation to LLU Conference

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# Agenda

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- Use of Wireless Networks in the Local Loop
- Experience with LLU and bitstream services
  - growth in competitive supply in consumer markets in UK, France and Germany
- Role of NGNs and broadband access
- Implementing LLU in practice: role of neutral facilitator
  - case study : Ireland
- Conclusions



# Schema's wireless experience

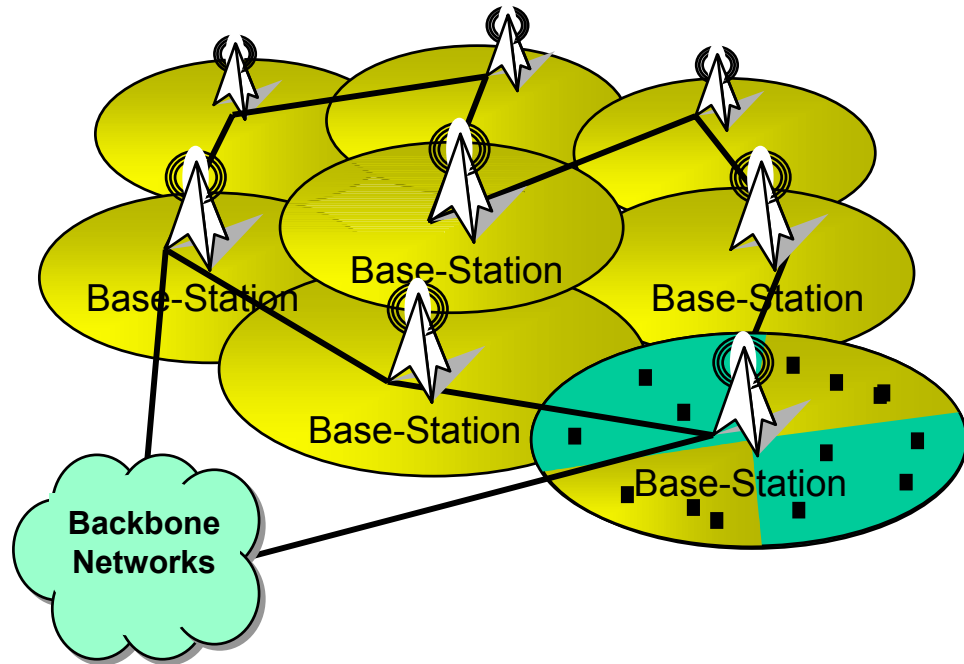
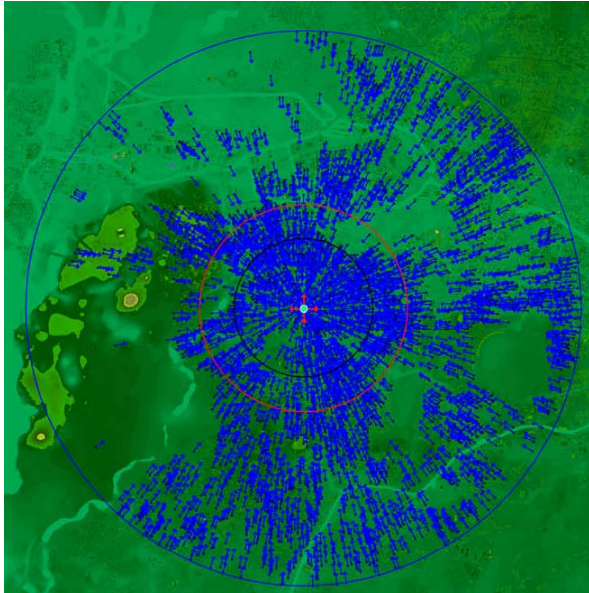
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- Advisor to UK Gov't on the release of spectrum at 3.4GHz
  - licence and award design
- FWA Strategy for UK Radiocommunications Agency
- Business cases for bidders for LMDS licences
- Due diligence on FWA operators in emerging markets
  - Phillipines
  - Argentina
  - Brazil



# Access trade-off

- Line of Sight and Shared Medium - law of diminishing returns



- Build more base stations to improve coverage
  - increased capital cost per incremental subscriber
  - management of interference - frequency re-use
    - fixed quantity of spectrum to share cf. dedicated bandwidth in copper network
  - increases cost of transport within the access network



# Wireless is a higher cost access network

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- Both Woosh<sub>[para 5, 8, 55-57]</sub> and BCL<sub>[para 3.5.5]</sub> expect TSLRIC copper to present a lower cost base than wireless
- Telecom<sub>[para 194]</sub> bemoans the higher cost structures of BCL's network when compared to DSL
  - despite later extolling the capital efficiency of wireless (in comparison to other wireless solutions!)
- The conclusion drawn is that LLU shouldn't be allowed because it will impact the delivery of alternate broadband solutions over a higher cost access network



# Telecom's views on wireless access

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- Presents a comprehensive review of the capital intensity of different wireless solutions
  - although no comparison with re-using a “sunk cost” copper infrastructure is provided for comparison [para 211-222]
- Unrealistic expectations of wireless: e.g. Woosh to build a network covering 70% of population for a minimum of NZ\$60-80m
  - likely that working capital requirements until breakeven would typically boost the cost to NZ\$120m [Schema estimate]
  - Telecom estimates the capitalisation of Woosh at NZ\$83m of which the remaining cash element to fund this rollout is unclear
    - mismatch between “Telecom’s plan for Woosh” and financing reality



# Telecom's views on wireless access

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- Return on Investment

- Telecom examines the comparable prices that Woosh could charge and still make a RoI
- needs to achieve 25% market share (when?) in order to get its RoI
  - makes the Woosh case look highly sensitive to market share assumptions
  - a “margin squeeze” would therefore be a dual blow for Woosh
    - reduce revenues per subscriber
    - increased price competitiveness from Telecom would reduce likely market share for Woosh
  - Telecom has plenty of headroom to instigate a margin squeeze
    - copper network is cheaper than using wholesale wireless
      - see comments on cost of using BCL network [para 194] where the operator expects to make return of *only* 10-12% rather than the 20-40% confidently predicted for Woosh [para 223]



# Other networks assessed by Telecom

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- **Business data only WiFi player (ThePacific.net)**
  - again 25% of the market needed to provide any long term return with prices below Telecom [para 298]
  - at those volumes there is a risk that the use of unlicensed WiFi spectrum will lead to capacity and interference for the operator
    - not a viable long term solution for a high volume business grade service
  - margin squeeze issues as per Woosh still apply
- **TelstraClear BWA network**
  - publicly stated the use of BWA is a solution if access to unbundled copper or bitstream is not allowed
    - NZ\$14m capital expenditure in wireless [para 265] does not supply ubiquitous access competition
    - only focussed on the business sector
    - would prefer access to more efficient copper network
    - contention/capacity problems



# Telecom's vision

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- CTO's presentation highlights the complementary nature of wireless and wireline
  - roles differ by geography, subscriber density and service class
  - identifies the problems inherent with wireless as a shared medium
  - demonstrates the importance [para 30] of QoS management
    - current IP solution is to throw capacity at the problem
    - not an option for the shared wireless bandwidth
- Clearly identifies wireless as a niche solution
  - role in rural areas and high density locations
    - dependent on the flavour of wireless
- Consequently
  - infrastructure competition will require equitable access to the existing copper infrastructure to complement wireless
    - should be an economic decision for the operator



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# Case Studies Presented to the Commission



# FWA success stories presented for comparable markets

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- BCL [para 5.15] –
  - “Eircom has deployed 55 sites to date with an announcement of an additional 28 before the end of the year. The predominant drive for this deployment is voice, although high speed internet is now also being introduced.”
- Reality
  - licences awarded to the incumbent Eircom and Chorus an alternate operator in 1999
    - Chorus handed its licence back as it was unable to meet rollout obligations
    - regulator recently reduced eircom’s coverage obligations and removed some business services from the licence
      - eircom will meet its rollout obligations by virtue of this network build
  - however, eircom has only connect 4,500 customers onto the network
    - 0.3% market share by lines
  - alternate carriers now applying for “per base station” licences to cover only those areas that are really of interest to alternate infrastructure operators
    - Chorus re-entering this market but only with 15 towns covered
      - just voice and internet broadband
    - 500 users connected to networks via 2.4GHz systems



# FWA success stories presented for comparable markets

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- Telecom present [para 261] Novis network in Portugal

- “Novis has built a 24% market share, including more than 300,000 customers on its Alvarion [26GHz LMDS] network”

- Reality

- principally a supplier of ADSL and dial-up internet as well as indirect voice services, with 300,000 customers for all its services not just FWA
- all alternate operators within Portugal have 20% market share
  - Novis has 28% by value of **alternate operator market share** not whole market - 6% share of whole market, 8% in the SME sector
- nearly a third of its revenue comes from wholesale services
  - the 26GHz network is principally wholesaled to a mobile operator for backhaul
  - FWA access focussed on main cities, Porto and Lisbon
- Sees FWA as a niche solution for access
  - already re-selling ADSL
  - “work to improve the regulatory environment - particularly with respect to LLU” (2003)



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# Experience with wholesale broadband and LLU services



# Country Comparisons

	<b>“Wholesale ADSL”</b>	<b>Bitstream</b>	<b>LLU</b>
UK	“BT Broadband” a white label product that an ISP can rebadge	Two products: <ul style="list-style-type: none"> <li>• IP Stream which provides access to the DSLAM, hubbing of traffic and an IP interconnection over BT’s ATM network</li> <li>• Datastream which provides access to the DSLAM and a virtual path through BT’s ATM network to an ATM interconnection point</li> </ul>	Available Very little take-up only 6,000 customers – slow implementation due to incumbent delays and bitstream has proven more attractive in capital constrained environment
France	“Ma Ligne ADS”L purchased by end user who must also subscribe separately to an ISP	Two products: <ul style="list-style-type: none"> <li>• IP ADSL 1 and IP ADSL 2 with Collecte IP/ADSL – No ATM transport product so must interconnect in 17 locations to provide a national product</li> <li>• ADSL Connect ATM – does provide some transport but only as far as one of 41 ATM Poles</li> </ul>	Available 63,000 customers
Germany	Must buy “T-DSL” from DTAG and then subscribe separately to an ISP	None available	Very widely used 250,000 broadband loops and further 575,000 used for ISDN

Product Descriptions from Ofcom benchmarking exercise  
LLU numbers from ECTA “DSL Scorecard” Sept. 2000



# Country Comparisons

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- Structure of wholesale products differ significantly between the countries
  - where no bitstream product is available (e.g. Germany) competition is restricted to “me too” ISP competition using a vanilla DSL product or full service using local loop unbundling focused on business customers
    - hence the lead position of Germany in LLU
    - one key user (QSC) of LLU supporting a range of other service providers and business customers, initially corporate and some SMEs.
    - downside is that absence of bitstream constrains competition for residential and SMEs
  - the UK has developed a wide range of bitstream services which allow differentiation in terms of modems, and via the ATM based Datastream on QoS, services and features
    - UK had major problems with LLU introduction “bow wave” which coincided dot.com bust - alternate operators too optimistic about use of LLU
    - BT also priced bitstream to be more favourable than LLU
      - while bitstream provides opportunities for service differentiation, still underlying reliance on incumbent network QoS
  - in France we see a middle ground, with the availability of both bitstream and wholesale services, but
    - France has been more successful in resolving LLU issues, but pricing of bitstream has been prohibitive



# Conclusion - require a range of solutions from the incumbent

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- LLU, bitstream and wholesale DSL are not mutually exclusive solutions
  - LLU : relatively high capex for the OLO provides maximum flexibility in product that can be delivered, QoS offered and margins achieved
    - suitable for concentrations of customers to achieve sufficient “fill” of the DSLAM and recover capital costs
  - Layer 2 bitstream : allows OLO to manage QoS to customers and create high value services over a multi-service ATM layer
    - useful for operators that want to control their service to the customer but cannot cost-justify investment in LLU for small concentrations
    - Suitable for mass markets such as SMEs and residential



# Using LLU and bitstream to support access competition

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- Competition will deliver cheaper prices, but this is only one half of the equation
  - Without service levels, cheaper prices are meaningless for users whose business depends on its communications
  - ATM based bitstream services provide the ability to monitor QoS and manage the end to end connection
  - SLAs must exist to enable equitable competition with comparable services
    - LLU is only one method of ensuring service level based competition, as the alternate service provider is responsible for management of all network elements except the metallic path itself
- Competition is about service level and price
  - Bitstream and LLU focus infrastructure competition at network intelligence rather than duplicating “dumb pipes” at network edge



# Unbundling Encourages Innovation - UK experience

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- **Bulldog Communications**

- began supplying SDSL services to BT using LLU
- incumbent not incentivised to offer this type of service on a national basis as it would cannibalise leased line revenues
- however, was willing to be a customer of an innovative network operator using LLU
- BT finally launched its own SDSL service over SHDSL on 9th Sept 2003 at 100 exchanges

- **Easynet Exchange Enable (E3)**

- allows a public sector body to enter a contract with this UK LLU operator to unbundle an MDF in return for a contract for a given number of sites in that exchange area
- multiple exchanges can be included, so that those in rural areas not enabled by BT for ADSL may now be enabled by Easynet alone
  - Easynet balances profits from one exchange and the “anchor tenant” with the costs of opening up rural exchanges



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# Developing the Core Network to Support Broadband



# Role of the NGN

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- As data volumes increase with the advent of widespread broadband a common packet network is required to efficiently manage voice and data
  - cf. Common Packet Network infrastructure for 2G/3G convergence
- The scope of the NGN development is a balance between cost and improving the performance of the network
  - most efficient network would have all exchanges as multi-service nodes
  - Siemens estimates a 70% saving in opex from implementing NGN



# Comparison - Austria and UK

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- Size and complexity

- BT has a network with 29m lines to support whilst Telekom Austria has 3m
- staged approach to a complex problem
  - BT - core network ATM implemented from 1999, edge now
  - Telekom Austria - IP in core from next year
- difficult technology choices
  - choice of ATM versus IP
    - partly driven by maturity of IP and MPLS at decision point
  - maturity in access concentrators is only now allowing movement of NGN infrastructure to the edge

- Conclusions

- both operators are implementing NGN for operating and volume capex efficiencies
  - in UK 27,000 access devices reduced to 5,000 (all of one type)
- both in markets with LLU and wholesale bitstream access
- NGN investment is not diluted by margin reduction via wholesale



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# Implementing LLU in Practice

## Case Study : Republic of Ireland



# Introduction

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- Following the enactment of the European Union's Local Loop Unbundling Regulation in December 2000, each national regulatory organisation was mandated to implement LLU
  - the act mandated both full unbundling and line sharing (where the existing telephone circuit is maintained)
- The Irish regulator The Commission for Communication Regulation (ComReg) engaged Schema to chair the industry working groups responsible for implementing operational processes to support LLU



# The challenge

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- Deliver a workable set of operational processes to support LLU against a tight deadline
- Due to the small size of the market the operational processes had to be very cost effective
  - initial email solution was “fit for purpose”
  - only now consulting on moving to an electronic interface for order process (dealing with bulk orders via CD)
- Only one competitive service provider had the resources to participate fully in the working groups
  - therefore a major part of Schema’s role was to represent the industry and ensure that the processes would meet the needs of future entrants not just those participating in the working groups



# Operational Processes

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- Schema was responsible for the development of a full set of operational processes
  - collocation processes
    - Site survey and Quotation
    - Ordering and Installation
    - Site access procedures
  - unbundling processes
    - Lineplant survey, Ordering and Fault repair etc.
  - “bow wave” processes
- In addition to chairing the meetings Schema also
  - acted as a neutral technical author
  - researched best practice from other markets to feed into process development



# Results

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- The industry working groups completed their work in five months
  - and subsequently met for regular reviews to improve the processes in the light of experience
- Unbundling began as soon as the working groups concluded
- Status (as of December 2002)
  - two service providers using LLU
  - 40 exchanges unbundled
  - 633 loops unbundled
    - 19% of all DSL lines in Ireland



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# Conclusions



# Infrastructure competition

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- **Wireless inherently a higher cost infrastructure than existing copper network**
  - has niche applications where new build is required, for example
    - LMDS vs cost of new fibre network
    - rural areas with no existing copper network
    - mobile data
- **LLU decision presented as a choice between**
  - reproducing an existing access network with a higher cost alternative
  - or, allowing intelligent use of the existing copper network
  - Telecom and wireless operators argue that the implementation of LLU and bitstream will reduce innovation and investment in competitive infrastructure



# Conclusion

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- But, these arguments imply that

- consumers should be given the choice between high priced DSL from Telecom over a low cost infrastructure
- or, similarly priced wireless broadband over a higher cost infrastructure
  - there is no consumer benefit in terms of price from competition by this means
  - wireless operators are exposed to a margin squeeze if they become too successful for Telecom's taste

- In reality

- competitive supply via copper networks can co-exist with wireless based access network competition
- LLU and bitstream would give operators a choice of where to focus limited investment capital
  - network intelligence
  - complementary networks, or direct access network competition



# Devil is in the detail

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- A simple legal direction to unbundle and also provide bitstream services is not sufficient
  - the practicalities of how alternate operators gain access to this copper will determine their ability to compete on service levels as well as prices
    - a net benefit to the consumer
  - clearly defined processes and systems that are “fit for purpose” will reduce costs and ensure service levels can be offered
- Relative pricing of wholesale products is key to determining the scope for innovation
  - attractiveness or otherwise of LLU vs bitstream
- Let access economics determine best solution
  - regulation on geographical limitations for LLU / bitstream may lead to market distortions
    - cf. experience with determining rollout conditions for wireless licences in Europe

