A Network for the 21st Century
- BT infrastructure, applications and services

Presentation to South Derbyshire District
Council

13th February 2008
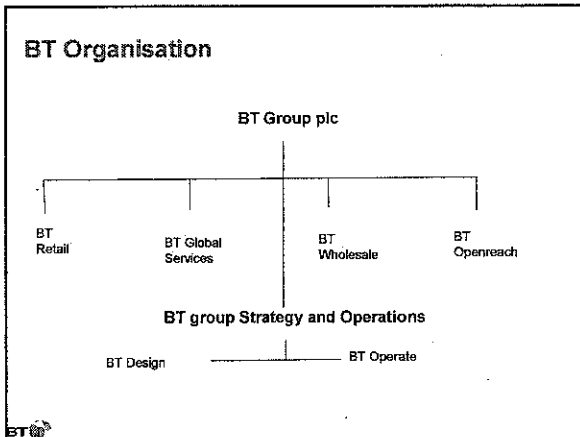
Tom Hamilton
BT Regional Manager East Midlands

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Proposed topics for discussion

BT organisation

Infrastructure South Derbyshire

Benefits to citizens and businesses in South
Derbyshire

Economic

Social

Environmental

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BT Organisation

BT Group plc

BT Retail | BT Global Services | BT Wholesale | BT Openreach

BT group Strategy and Operations

BT Design ———————— BT Operate

BT

BT Group some community information

- BT's total tax contribution to central and local Government was in the UK £3,005 million in 2005/6;
- flexible working has reduced absenteeism to 3.1%, compared with a national average of 8.5%;
- our home working policies have resulted in a 31% increase in productivity, with savings of £69 million each year from reduced accommodation and overhead costs;
- 99% of women return after maternity leave, compared with a national average of 47%;
- we have reduced office paper consumption by 60% over the last 5 years;
- we invest 1% of our pre-tax profits back into the community annually - £21.8 million last year;

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BT Openreach

- Run at arms length from other parts of BT
- Owns and operates the "last mile" of lines on behalf of service providers
- Provides installation and maintenance service
- Ensures that all Communications Providers can compete on fully equal terms
- 25,000 engineers
- 22,000 vans
- 7M km of fibre
- 120M km of copper

- http://www.openreach.co.uk/orpg/aboutus/Downloads/5447_corp_brochure.pdf

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BT Retail, Global Services and Wholesale

Customer facing sales and service delivery arms
- Retail
  - Over 18M consumer and business customers in UK
  - 18,000 staff.

- Global Services
  - Corporate and Government Customers
  - Staff in 50 countries
  - Provides service in over 170 countries
- Wholesale
  - Delivers products and services to a wide range of retail service providers in the UK

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BT Design and BT Operate

- BT Design
  - Provides IT design and delivery service on BT's core network and IT platform, also carries out research with industry and academic bodies
  - Is the design authority for the 21CN programme

- BT Operate
  - Runs the main core networks
  - Delivers services over the network for a wide range of customers
  - Responsible for the implementation of the 21CN programme

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Network in South Derbyshire

- All 8 exchanges broadband enabled
  - Maximum 8Mb

- 99.8% of premises within range of broadband
  - Approx 90 out of 42,000 do not have access to ADSL

- 29% ADSL take up in Derbyshire

- 30.1% take up East Midlands

- 29.9% take up in UK

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Network in South Derbyshire

- Issues
  - Unable to get service
    - Causes
      - Long lines
      - Digital Access Carrier System
  - Slower speeds
    - Causes
      - Long lines
      - Crosstalk
  - Solutions
    - Network upgrades
    - New access technology
    - Alternative delivery technologies

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Competition in the Broadband Market

UK has one of the most comprehensive and competitive broadband markets in the world

- Service Providers selling BT Wholesale ADSL services
- Service Providers using Local Loop Unbundling
- Cable TV networks
- Alternative networks, usually fibre to large customers
- Wireless networks, using a variety of backhaul and last mile technologies
- Satellite

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## Performance affecting factors

DSL performance

- The performance of DSL on any given line in the access network is a function of the signal to noise ratio at the end of that line:
  - Signal is affected by the length, quality and dimensions of the copper cable, and by the ANFP
  - Noise can come from
    - sources in the home or premises (including home wiring). This is the dominant problem on long lines.
    - network crosstalk (directly related to the 'fill' level of the copper cables in use)
    - sources in the environment, e.g. RFI
- Geographic coverage achieved at any given speed also depends on
  - the topology of the access network
  - the statistical distribution of line lengths
  - the design parameters of the particular model of DSLAM
  - product design
- These factors are identical for anyone operating DSL on BT's access network   BT

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Exchange Based ADSL and ADSL2+ Performance Model (GB Model, 50% Cable Fill)
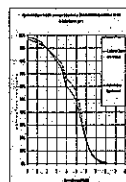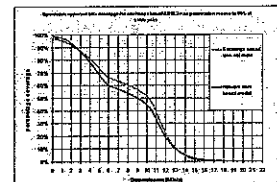
ADSL   ADSL2+

- Line Length and Line Quality are key factors
- Performance is limited by crosstalk from other end users
  - Fill has an impact
  - Actual performance depends on position in cable
  - Every line is in a unique situation
- Other Factors include: External Noise, Customer Wiring, Modem and Configuration Options

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Technical solution to access and speed

Technology provides a number of options
to 'accelerate' last mile bandwidth

Bandwidth (Mbit/s)[1]	DownStream (Headline)	Indicative DownStream (Median)	Indicative UpStream (Headline)	Indicative UpStream (Median)
ADSL – Exchange based	8	4-5	0.8	0.75
ADSL2+ (MSAN) – Exchange based	24	6-10	0.9	0.75
FTTC – VDSL2	c50	22-25	c24	9
FTTP/GPON	c75+burst	c75+burst	40+burst	40+burst
Broadcast satellite	100s	100s	n/a	n/a
Broadcast terrestrial digital TV	10s	10s	n/a	n/a
Wireless (HSPA, LTE, WiFi, WiMax)	10s	1-5++?	<1	<1

Technical solutions are all subject to business case and
commercial viability tests, ADSL 2+ will be universally available by
2011 (part of 21st Century network programme)

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Alternative delivery technologies in not spot or low speed areas

- Satellite
  - Single user
  - Multi user with wireless distribution
- Leased Line/Fibre
  - Fibre onward distribution
  - Wireless onward distribution
  - Ethernet onward distribution
- Wireless
  - Point to point
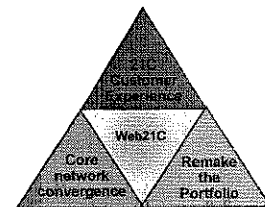 - Point to multipoint

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BT next steps

- 21st Century Network
- Existing network upgrades
- New infrastructure to support major developments
- Next Generation Access Network

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21CN It's big and bold

Not simply network
transformation...a radical
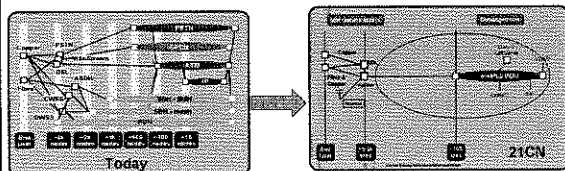overhaul of BT's business
and systems

A world first for a
telecommunications
company

Delivering a step change in the way
industry creates and delivers services

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21CN evolution

Massive network simplification

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Potential services enabled by broadband

Small business applications

Personalised converged infotainment service delivery

Virtual reality "human machine interface" for using "the web"

Virtualised call centre agents and employees

Supply chain to all locations

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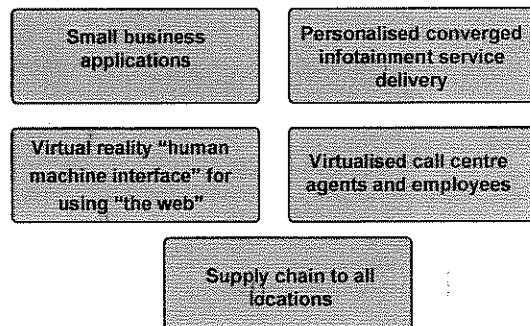
In summary

21CN is carrier grade, secure and industrialised

21CN will support traditional and next generation services on the same platform

21CN will simplify and speed up new service delivery

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Access network

- Existing network is being upgraded and expanded as a result of service issues and demand
- Digital Access Carrier Systems (line sharing devices) are being replaced as a result of broadband orders being placed
- Fibre being installed to premises in response to orders from customers for high capacity services
- New developments will be served with appropriate medium, from late 2008 fibre on large sites
- BT Openreach team works with developers to ensure physical infrastructure is appropriate
- New methods of service are constantly under development and test, BT has trialled wifi, wimax, fibre to the kerb and fibre to the premises. Tests cover both technical and commercial aspects

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Next generation access drivers

- New major developments
  - Economics changing civil costs and material costs
  - Development of new products
- Major upgrades to existing developments
  - Step change in capacity required with new infrastructure end to end
- Roll out of next generation networks to replace existing infrastructure
  - Replacing unserviceable infrastructure
  - Enabling new products, services and applications which will deliver return on investment

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Benefits of Adoption of ICT

Economic

•Adoption of ICT by SMEs can increase GDP by 3 -4%

•Adoption of Flexible working can improve efficiency of any organisation significantly

Since implementing flexible working more than 20 years ago, BT has recorded higher rates of employee productivity, lower absenteeism and reduced overheads. BT homeworkers are 7% happier than their site-based colleagues and 99% of women return to BT after maternity leave, saving the company around £5m per year in recruitment and induction costs. Over a 12 month period, flexible working saveds BT people the equivalent of 1,800 years commuting, reduced travel costs amount to £9.7 million. Annual cost to support an office-based desk worker in London is £18,000 a year, compared with the £3,000 price tag of supporting a home worker.

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Benefits continued

Environmental

- Mobile and flexible working can reduce carbon footprint by a significant amount and BT calculates that is saves over £200M pa

Social

- Use of ICT to improve skills and access to support information can significantly reduce welfare dependency and improve delivery of services
  - Everybody on line
  - Internet Rangers
  - Community access hubs with support

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Next Steps

- Reinforce positive messages
  - In 2002 range was 3 miles now in excess of 5 and availability was <50%
  - Check on the BT .com/broadband site
  - We will always send an engineer out to try to make it work

- Concentrate on taking advantage of the 99.8% availability
  - Become an exemplar in flexible working
  - Encourage business to use ICT
  - Encourage citizens to use ICT
  - By telling them why and supporting them in the early stages

- By driving up usage the market will respond positively

- Discuss potential new developments with communications providers early in the cycle

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