Current trends & issues

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Introduction

- Introduction
- Broadband
- Mobile Internet access
- Voice telephony
- Conclusions

Competition and growth

- Competition has:
  – lowered costs
  – increased demand
  – encouraged innovation
- Often limited or mis-directed by lobbying from vested interests
- Economic growth is mainly downstream from telecommunications

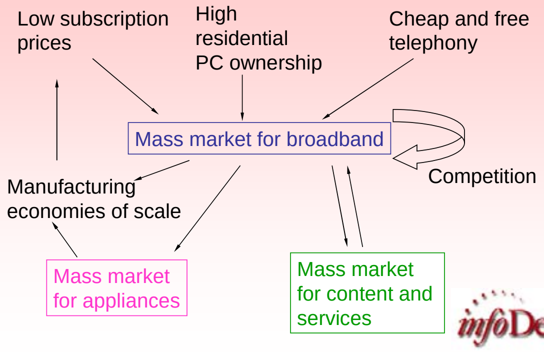
Challenges

- To maximise competition
- To learn lessons from around the world
- To realise that national incremental improvement is too slow, we need to draw on all experiences
- To ensure we create sufficient options to give future policy-makers a fair chance

Broadband

- A “flagship” policy area
- A significant contributor to growth and productivity
- A wide range of:
  – technologies
  – applications and services
  – business models and revenues
- Enormous variations in outcomes
- That are still only poorly explained
- Only a limited enthusiasm for real competition

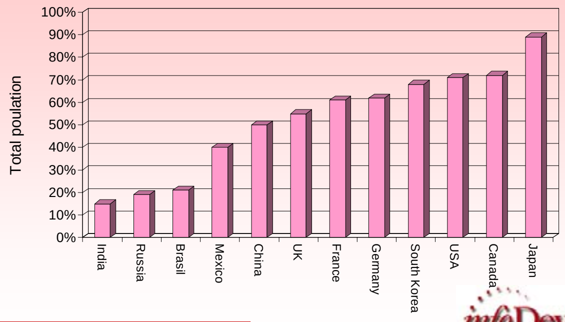
Drivers



What is world class broadband?

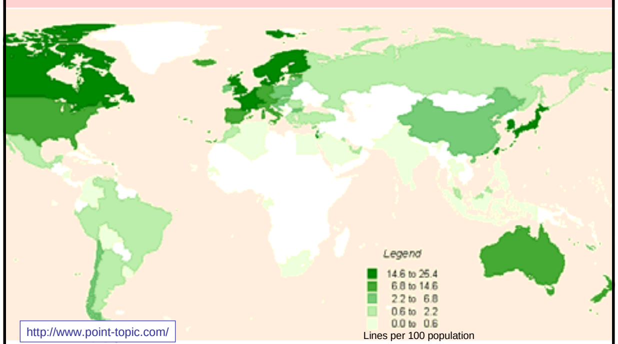
- Residential services:
  - 1,000 Mbits per second
  - Wi-Fi or WiMAX for individuals and devices
- Competition:
  - low and affordable prices
  - diversity of providers and offers
  - wide range of complementary services
- Innovation:
  - new devices
  - new services
  - new business models
- Policy instruments:
  - pro-competition
  - opening licensed and unlicensed spectrum
  - local loop unbundling
  - government-industry collaboration
  - targeted state aid
  - content creation industry to support demand

Internet usage in last 30 days



http://www.ipsos-na.com/news/pressrelease.cfm?id=3030

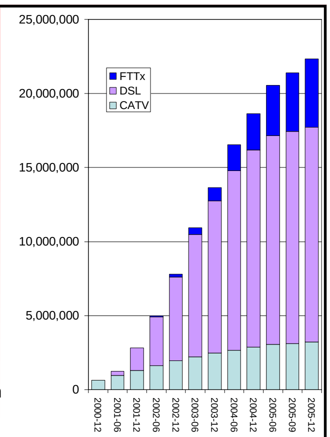
Global broadband teledensity



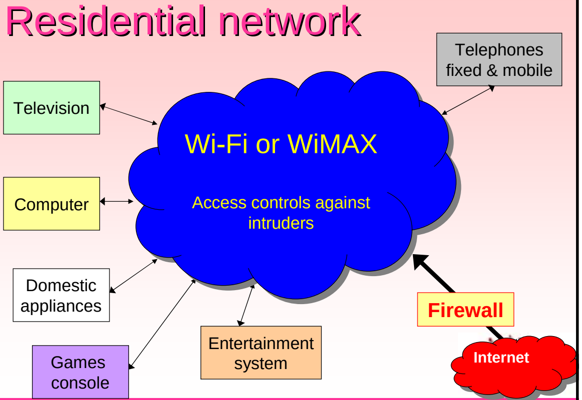
http://www.point-topic.com/

Japan

- Yahoo! BB
  - 50 Mbps downstream
  - 12.5 Mbps upstream
  - ¥ 4,500 per month
  - VoIP and television
- NTT market shares
  - 37.5% of retail DSL
  - 33.9% of FTTB
  - 77.8% of FTTH
- Hikari FTTx
  - symmetric 100 Mbps
  - from ¥ 6,000 per month
- Significant growth of “heavy-hitters” on the backbone, such traffic is gradually increasing



Residential network



Hong Kong SAR

- 4 million people
- High-tech image
- High-rise apartments
- Competition in wiring cabinets of multi-storey buildings
- Very high mobile tele-density and 3G

HKBN residential offers:
- bb10 (Mbps)
- bb25
- bb100 for HK$238
- bb1000 for HK$1,680 (since June 2005)

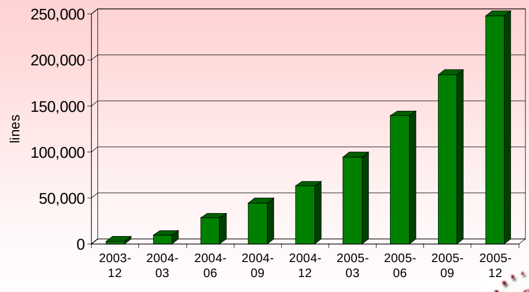
- Movies to download, free for first 18 mins. (DVD in 7 mins.)

Mahgreb – broadband prices

- Menara (Morocco)
  - 4 Mbps for MAD 799
  - 0.512 Mbps MAD 399
  - 0.256 Mbps MAD 299
- Wanadoo (Algeria)
  - 128 kbps for DZD 1900
  - 256 kbps for DZD 3999
- Wanadoo (Tunisia)
  - 256 kbps for TND 40
  - 128/256 kbps peak/off-peak for TND 25
  - 128/64 kpbs peak/off-peak for TND 17

MAD 10.00 = EGP 6.38 = TND 1.50 = DZD 8.32

Morocco ADSL



Source: ANRT

Ubiquitous network societies

- A model from Japan and South Korea
- Seen as a major economic driver
- Avoids access and interconnection issues by full-blown competition
- Will have to be much slower in other countries:
  - operators will push their own networks
  - negotiation of access is protracted

Beyond 2G

- 2 billion “voice and SMS” only users:
  - but they need access to multi-Megabit broadband
- Serial failures by GSM operators:
  - WAP and MMS
  - GPRS and EDGE
  - expertise limited to finance and voice
- CDMA networks have moved easily to 3G
- Threat from other wireless technologies:
  - WiMAX, WiBro, etc
  - DAB, DMB, DVB, etc

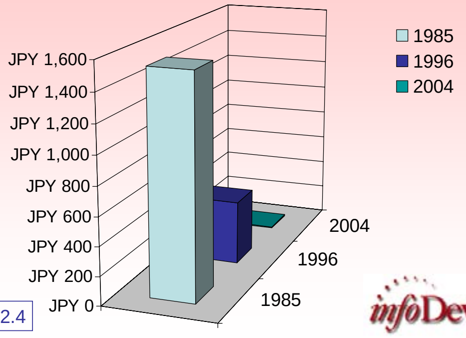
Japanese 3G

- A dash for growth
- DoCoMo overtaken by KDDI Au
- Vodafone forced out of the market
- Flat rate data prices
- Migration from 2G to 3G of:
  - customers
  - service providers
  - networks
- 50% of customers were on 3G in March ‘06
- Now pushing to add wireless broadband to the mix

International telephony

- Governments have (mostly) removed the bottlenecks
- Which has increased competition
- Causing sharp reductions in prices
- Except for calls to mobile networks with Calling Party Pays (CPP)
- In developed countries:
  - incumbent operators response to the challenge of cheap VoIP is to bundle:
    - “all you can eat” national tariff conceals per minute rates
    - DSL plus “telephony” (plus video, etc.)
    - but excluding fixed-to-mobile
  - enormous benefits from economies of scale
  - some operators offer in-bound numbers in other cities and countries

A call from Japan to the USA



INR 1 = JPY 2.4

United States of America

- Mobile operators have offered flat-rate plans
- Vonage (unlimited calls within USA and Canada):
  - works with broadband connection
  - area codes available in most states
  - US$ 24.99 per month residential
  - US$ 49.99 per month small business
- Broadvoice:
  - Unlimited world US$ 24.95 per month (35 countries, to fixed not mobile)
  - also offers numbers for/in the United Kingdom
- The end of the long distance operators:
  - AT&T acquired by SBC
  - MCI acquired by Verizon

VoIP in Africa

VoIP is an important technology that has the potential to transform telephony in Africa. Entry of IP telephony service providers whether legal or illegal in domestic markets has facilitated the acceleration of pace of market liberalisation and the introduction of competition in the long-distance and international service markets.

The general approach evidenced in Africa of prohibition is at best, short sighted, and at worst, a serious threat to innovation, eventual competition and overall consumer welfare.

Tracy Cohen and Russell Southwood
CTO report, funded by UK DfID

IP services

- Voice over IP:
  - very low and flat rate calling plans
  - secondary numbers in remote locations for nomads and ex-pats
- Television over IP:
  - access to more content
  - much more flexible access
- Radio over IP:
  - terrestrial and satellite
  - listen in real time or on demand
- Which firms have the expertise to make profits in these areas?
  - probably not TelCos

IP television

- Fixed:
  - pull rather than push
  - search for content
  - few geographical constraints
  - changes the way we watch
  - what about advertisers?
- Mobile:
  - smaller screen size
  - more disruptions
  - will change how and what we watch
  - evidence of demand is still very unclear

Slingbox:
- a personal bridge between satellite or cable television with your Internet access
- re-transmits content
- accessible when not at home:
  - fixed networks
  - mobile networks
- now a software alternative
- what comes next?

http://www.slingmedia.com/

VoIP is an application

- Simple download
- Instant messaging (ICQ, Yahoo, etc)
- Skype:
  - is not a service
  - already reached 5,000,000 concurrent users
  - shows on-line status of “buddies”
  - can be embedded in a PDA
  - SkypeOut gateway to the PSTN
  - SkypeIn gateway from the PSTN
- Games consoles with voice (and Wi-Fi):
  - Nintendo DS
  - Sony PSP

Wireless VoIP

Nokia E-Series handsets

- Wi-Fi when in:
  - corporate offices worldwide
  - home
- SIP client
- otherwise GSM
- Being combined with iPASS, a global Wi-Fi supplier

France Iliad "free.fr"

- Any Wi-Fi hotspot with "freebox":
  - your home
  - your neighbours
  - people in the next street, village or town
- Free calls to fixed networks in France and 14 countries

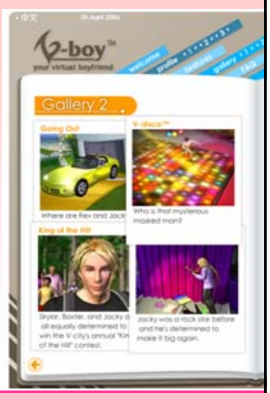
Mobile content

- Sport
- Betting
- News
- Music (downloads and streaming)
- Television (broadcasts and "mobisodes")
- The content that nobody talks about

Is it one device or many?

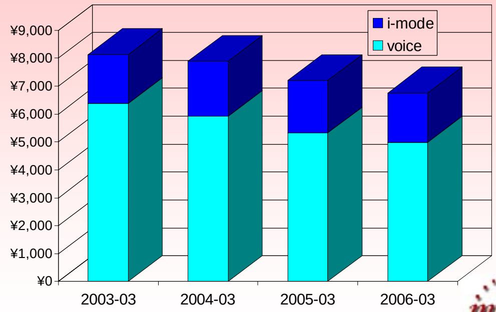
Artificial Life

- Developer of games:
  - standalone
  - multi-user games
- Games within games
- Examples:
  - Virtual Girlfriend
  - Virtual Boyfriend
  - Virtual Emperor Penguin
- Launched with MNOs in:
  - Brunei
  - China
  - Hong Kong, SAR
  - Malaysia
  - Singapore
  - Taiwan



http://www.artificial-life.com/
http://mobileindustry.biz/

Japan - DoCoMo ARPU

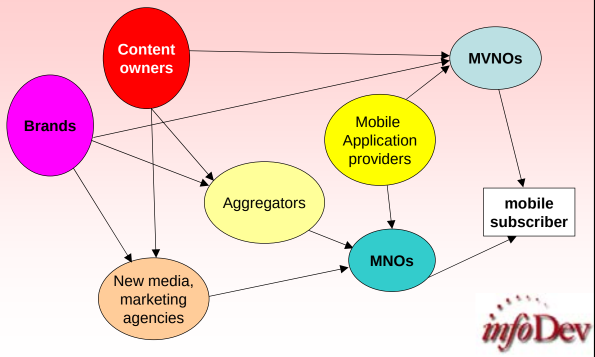


Location Based Services

- Originally the big hope of 3G
- Adoption has been painfully slow
- Now there are many alternatives:
  - Global Positioning System (GPS)
  - Bluetooth
  - Ultra Wide Band (UWB)
  - Radio Frequency Identification (RFID) tags
  - Wi-Fi
  - identification of mobile cell
  - embedded in cars

http://www.oecd.org/dataoecd/19/7/34884388.pdf

Mobile value chain



An Internet of things

- The next step, beyond today's Internet, is to connect inanimate objects to networks
- Networks and networked devices become omnipresent
- Electronic tags (e.g. RFID) and sensors extend the communication and monitoring potential of the "network of networks"

http://www.itu.int/osg/spu/publications/internetofthings/

infoDev

Definition from NRI

"As is the Internet, the ubiquitous network is a single integrated ICT paradigm that covers a full range of key elements from network infrastructure, digital equipment with communications capabilities and digital platforms (infrastructure environment) to solutions, and represents the environment for ICT utilization."

Teruyasu Murakami

http://www.nri.co.jp/english/opinion/papers/2004/pdf/np200479.pdf

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Challenges for content creators

- Must obtain a route to the customer:
  - which networks are best and cheapest?
- Must remain within the limits of the law:
  - national security
  - politically acceptable
  - socially acceptable
- Must find viable business models:
  - revenue from customers
  - revenue from advertisers

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Small and medium sized businesses

- Limited attention to ICTs
- Slow uptake of ICTs
- Opportunities to provide IP telephony as a managed service

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Constraints on demand

- Income levels:
  - low GDP per capita
  - maldistribution of wealth within countries
- Spending capacity:
  - established willingness to spend on telephony
  - but what about spending on entertainment?
- Literacy:
  - low levels of traditional literacy
  - low levels of ICT literacy
- Infrastructure:
  - lack of electricity
  - lack of computers
  - lack of telecommunications networks
  - lack of investment

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Challenges for fixed carriers

- Low (economic) barriers to entry
- New carriers with lower cost structures
- Loss of traditional revenues
- Perceptions of the financial markets:
  - they do not like declining revenues
- Additionally, in developing countries:
  - lack of resources, skills and capital
  - "grey market" eroding their profit margins
  - bundling with broadband and video is not financially significant

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Challenges for 3GSM operators

- Arun Sarin (CEO, Vodafone) thinks VoIP is 3-5 years away from mobile operators
- VoIP "prices" make fixed-to-mobile calls look yet more expensive:
  - for many, the only itemised call charges
- Can MNOs move to a "flat fee" model?
  - for subscription customers?
  - for pre-paid customers?
- VoIP over EDGE or UMTS?
  - not with per Megabyte charges
  - unnecessary with flat rate voice fees

Challenges for security

- Emergency services:
  - access to
  - provision of location information
- Personal/corporate security
  - denial of service attacks
  - viruses, worms, trojans and other malware
  - SPIT - SPam over Internet Telephony
- Law enforcement authorities:
  - provision for wire tapping
  - data preservation
  - data retention

Challenges for policy makers

- Declining cost of basic telephony
- Increasing range and richness of services and applications
- Blurring of traditional distinctions
  - how is VoIP different from CPS?
- Change undermines:
  - mechanisms to fund universal service
  - the regulatory regime
  - the established operators
  - fixed opinions

Challenges for regulators

- Definition:
  - one service or many?
  - how to distinguish types?
- Assignment of telephone numbers:
  - geographic and/or non-geographic
  - "nomadic"
  - secondary numbers (other city, ex-patriates)
- Quality of service:
  - defining
  - measuring
  - publishing and enforcing
- Anti-competitive effects of bundling
- Access for the disabled to VoIP

The level playing field

- The *el dorado* of telecommunications
- The only constant is technological change
- Many new business models
- Market players are supposed to be much better at coping with change than bureaucrats
- Incumbents use regulation and regulatory processes to disadvantage market challengers

But level for whom?

- Users:
  - national market
  - international market
- Content providers
- New entrants
- Operators with licences and concessions
- Incumbent operator with its historical advantages

Conclusions

- VoIP and IP Telephony offer real benefits:
  - for users/consumers
  - for established operators
  - for policy makers
- Need to encourage:
  - investment
  - market entry
- Policy aims should be:
  - competitive market structures
  - incentives to provide better and cheaper services
  - keeping options open for future policies
- Need to avoid regulatory arbitrage and gamesmanship

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