The Internet in Australia

Geoff Huston

Telstra Internet

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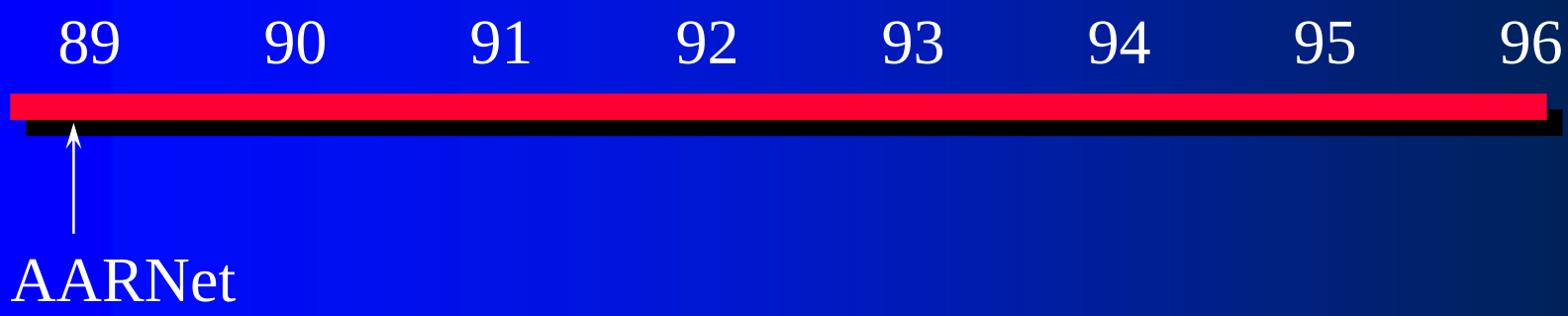
The Internet in Australia

- The Evolutionary Path
- The Current Environment
- Futures…..

1989 - Initiative



Initiative to create a national university network
Australian Vice-Chancellors' Committee program
Multiprotocol design
Seed funding from Australian Research Council
56Kbps link Melbourne - Hawaii

The Starting Point...

- the enthusiasts - anything that can be made to work - cheaply!
  - university and research base - computing departments
  - Messaging services interfacing to the Internet
    - UUCP, dial-IP, ACSnet
  - specialised knowledge and high enthusiasm
  - distributed expertise with no management framework
  - Cannot scale easily beyond hundreds (or low thousands) of users

Academic and Research Networks

- Emerging commitment to Internet access
- National Academic and Research Internet
  - university based
  - government funding support
  - non-commercial
  - no visible telco interest
- strong content emphasis
  - library funding a strong driver in this phase

1990 - Implementation

Initial Network Roll-out
48Kbps national network using star topology
TCP/IP and DECnet protocol support
2Mbps Melbourne - Canberra - Sydney
38 sites - universities
academic and research funding base
128Kbps link - Melbourne - Hawaii
email, usenet, ftp

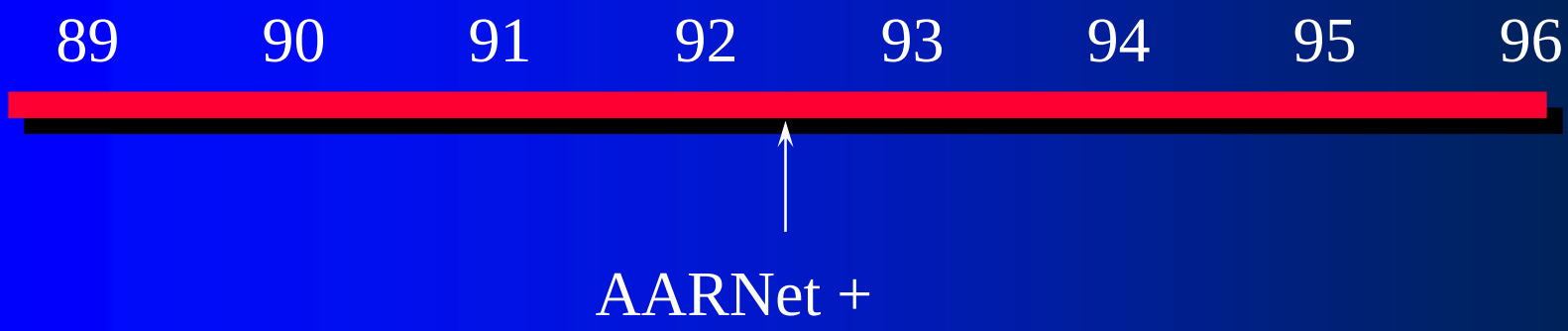
1991 - Academic Network

Resale to academic and research partners
2Mbps links to Brisbane, Adelaide
TCP/IP Internet network
academic and research funding base
256Kbps link - Melbourne - US West Coast
email, usenet, ftp, gopher, wais
library uptake in information resource activities

Expansion

- Scaling pressures increase
  - pressure to service A & R fringes
    - governmental bodies
    - schools
    - commercial entities working in areas common with A & R
  - fixed funding and strong dynamic growth
    - network outgrows its available funding base
    - pressures to commercialise to cross subsidise A & R networking growth

1992/93- Expansion



Commercial resellers of Internet dial access
Research Data Network funding initiative
768Kbps link - Melbourne - US West Coast
email, usenet, ftp, gopher, wais
multicast audio/video conferencing experiments

US Commercial Internet takes shape

Internet Startups

- pressure to resell academic and research network
  - reduce A & R funding demands by on-selling
- multiple commercial providers
  - low entry cost and high perceived growth
  - outflow of skill set from A & R sector
- construction of distinct networks
  - issues of control over the platform
  - service market perceptions

1994 - Commercial Internets

Multiple Australian Internet Service Providers
Multiple Australia - US links
    2Mbps total capacity
The World Wide Web takes over the net!

US NSFNET program winds down to be replaced by a multi-provider US Internet

1995 - The National Internet

Telstra purchases AARNet
Australia - US capacity expanded to 10Mbps
Dial Access providers expand:
    Ozemail, Access One, connect.com.au, On Australia,…..
Netscape dominates the Web market
Internet Commerce viability

Inter-provider Interconnection issues surface in US

Today

Australia - US capacity expanded to 50Mbps
450 Internet Service Providers
Access market opens to include:
- cable
- isdn

Large scale telco investment in Internet markets
Data communications market takes form

Today

- telco involvement now visible !
- massive growth pressure on the Internet from a very large investment base
  - threatened activity bases move into the Internet
  - new electronic markets opened
  - new communications market opened

Today

- A potentially revolutionary communications model
- BUT
  - anarchic administrative structure
  - rapid growth fatigue
  - stressed infrastructure
  - no coherent utility model

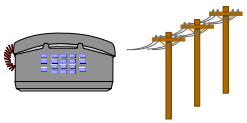
Today's Environment

Information Tool

Free Market

The Internet

Public Communications Utility



Growth

Current Issues

- Deregulated Service Provider market
  - low entry price as an ISP
  - very active market
  - high variability in pricing and quality
  - poor levels of consumer awareness
  - high volatility in the marketplace
  - in general poorly financially resourced

  - Increased regulatory structure initiated through consumer protection initiatives ?

Current Issues

- Backbone “wholesaler” and Access “retailer” model
  - will change as..
    - backbone providers enter the retail market
    - retailers band together to defend existing market share
    - new technologies impact on PSTN dial access model
  - Niche retail markets, opened through rapid market expansion, close as the expansion pace slackens off ?

Current Issues

- Market demand exceeds capability of supply
  - poor performance levels due to saturation of existing capacity
  - change of growth patterns for communications
  - existing supply systems are indicating signs of stress!
  - Market demand will continue to outpace supply rates for the next 3 - 5 years at least

Current Issues

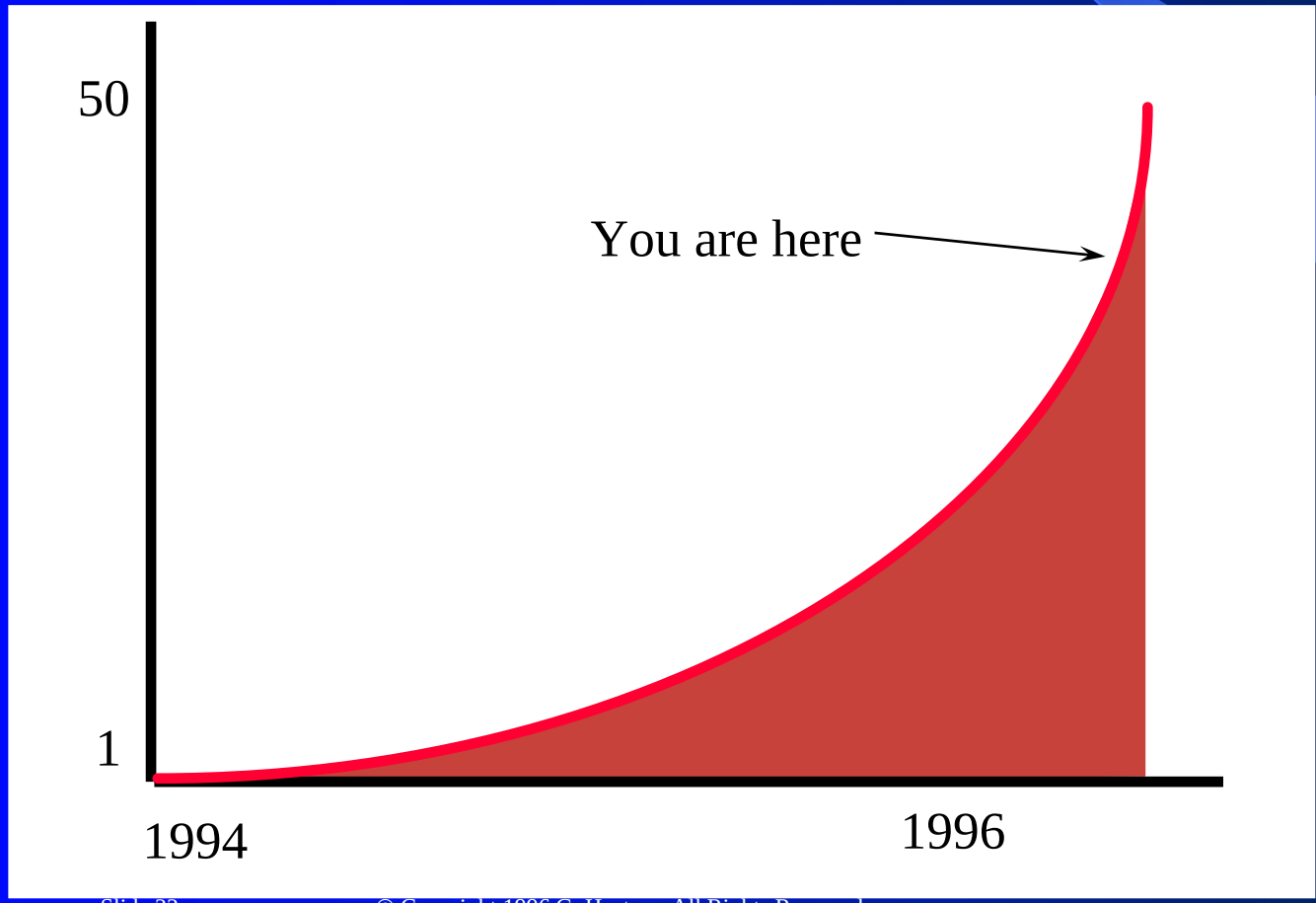
- Content and Advertising
  - Is there a pay per view market?
  - Is there a advertising market which can survive “fast forward” ?
  - Will spamming jam email to the extent that public directories are withdrawn?
  - Is there any moderating factor on behaviour?
  - Advertising models will evolve - the current match of the model to the medium is too poor to be effective

Current Issues

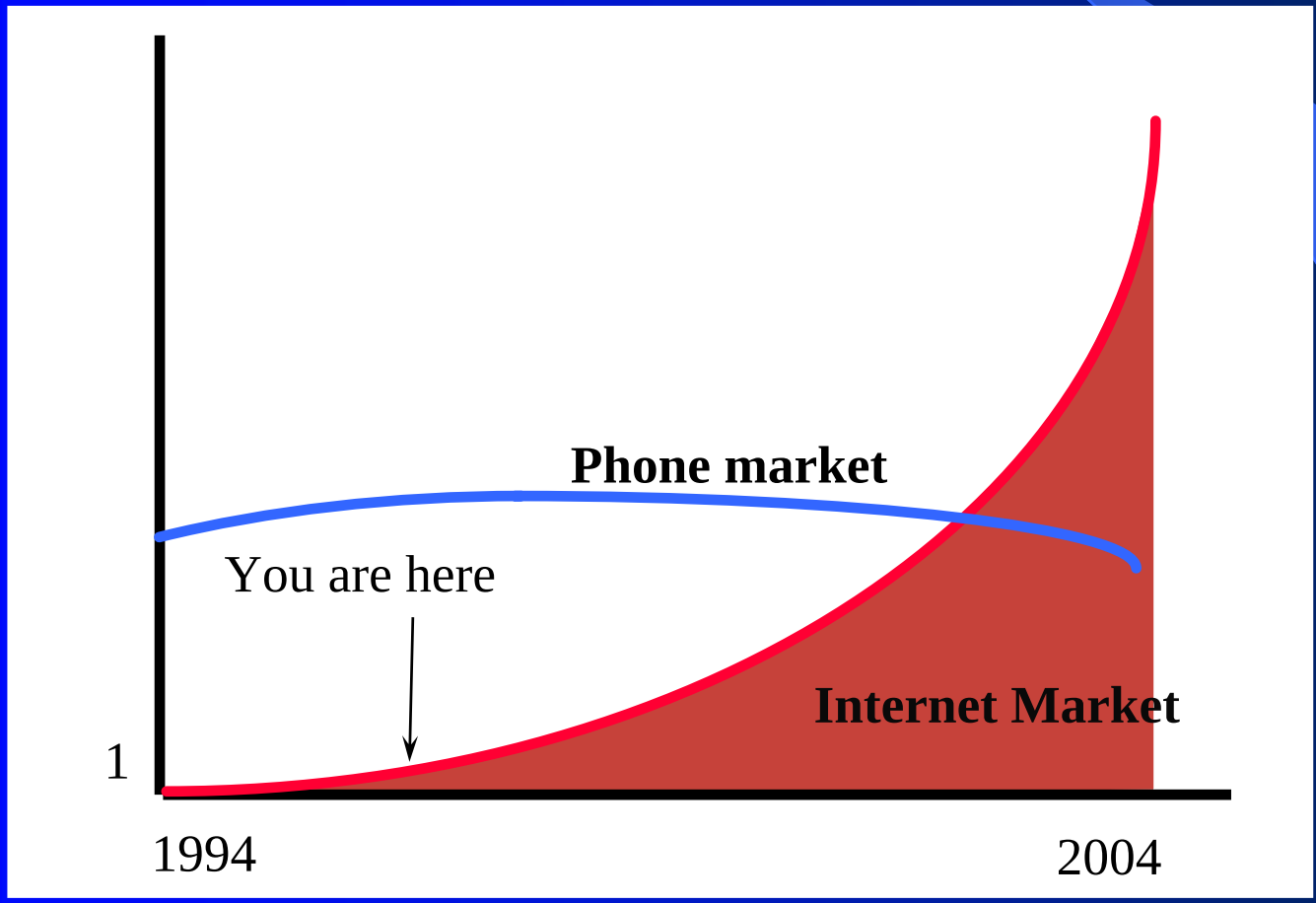
- Electronic commerce
  - where's the transaction?
  - Where's the bank?
  - Where's my money?
  - Who pays the tax?
- Will the market grow faster than the regulators can regulate to save the current system?

Futures

- Linear thinking in an Exponential World



Internet Futures



Near Term Futures

- marginalisation or expansion of existing commercial players as investment pressures are bought to bear
  - expansion rates open niche markets
  - these markets close down when growth rates stabilise, due to competitive price pressures
- Currently there are 460 Internet Service Providers in Australia
  - this number will probably decrease

Futures - Internet / Telco

- Will the Internet drive out the telco voice business?
  - Voice over the Internet is technically feasible
  - Is widespread deployment a likely outcome?
  - Will service quality be a determinant factor?
  - How will existing phone players survive if the squeeze happens?
- This outcome is unlikely in the next 5 - 10 years. Longer term predictions are highly speculative!

Futures - Internet / Telco

- Can the Internet market survive the telco?
  - investment pressures
  - economies of scale
  - protection of value of existing assets
  - current asset holdings of communications infrastructure
  - historically regulatory position of the Telco

Futures - Technology

- Is there a single “killer application” for the Internet?
  - nope!
  - The Internet is FAR more versatile than that!
- Embedding communications and processing
  - the “Internet chip” as a base of new consumer products
- Internet market expansion based on expansion of consumer products which use digital communications

Futures - Technology

- Can the Internet survive massive consumerism in technology terms?
  - fragmentation in address space
  - fragmentation in name space
  - scaling pressures in the routing space surpass available silicon
  - channel capacity pressures surpass available infrastructure
  - no service quality structure
  - fragmentation in connectivity space

Futures - Technology

- What will it look like?
  - Boxes, Screens, Keyboards and Mice
  - Digital Assistants
  - Network Computers
  - Personal Communicators
  - Not just smart, but highly communicative plastic money cards
  - really well connected and well informed coffee makers

Futures - the Information Economy

- workforce requirements
  - information literate
  - flexible
  - skill specialisation
- workforce profile largely achieved

Futures - the Information Economy

- effective domestic communications infrastructure
  - restructuring may be necessary to achieve maximal potential from the existing infrastructure investment
  - strategically separate the provision of basic bit carriage from layered services of voice and data switching
  - Mix of public and private investment profiles may be necedssary to achieve effective infrastructure platform

Futures - the Information Economy

- Will national infastructure fall prey to:
  - international telco consortia?
  - Marginalization of smaller national markets
- Is this a politically tenable / stable outcome?

Futures - the Information Economy

- effective international communications infrastructure
  - undersea cable systems under stress due to Internet expansion
  - rapid expansion of cable rollout plans
  - potential restructuring of international communications agreements

Futures - Social

- The Internet may drive a process of social change
  - alter the basis of economic wealth
  - alter the flows of information within society
  - Change the model of social structure
- It is unrealistic to anticipate a smooth transition...