

Infrastructure and Services

Economic Issues and Market Dynamics

Ike Elliott

Senior Vice President, Global Softswitch
Services

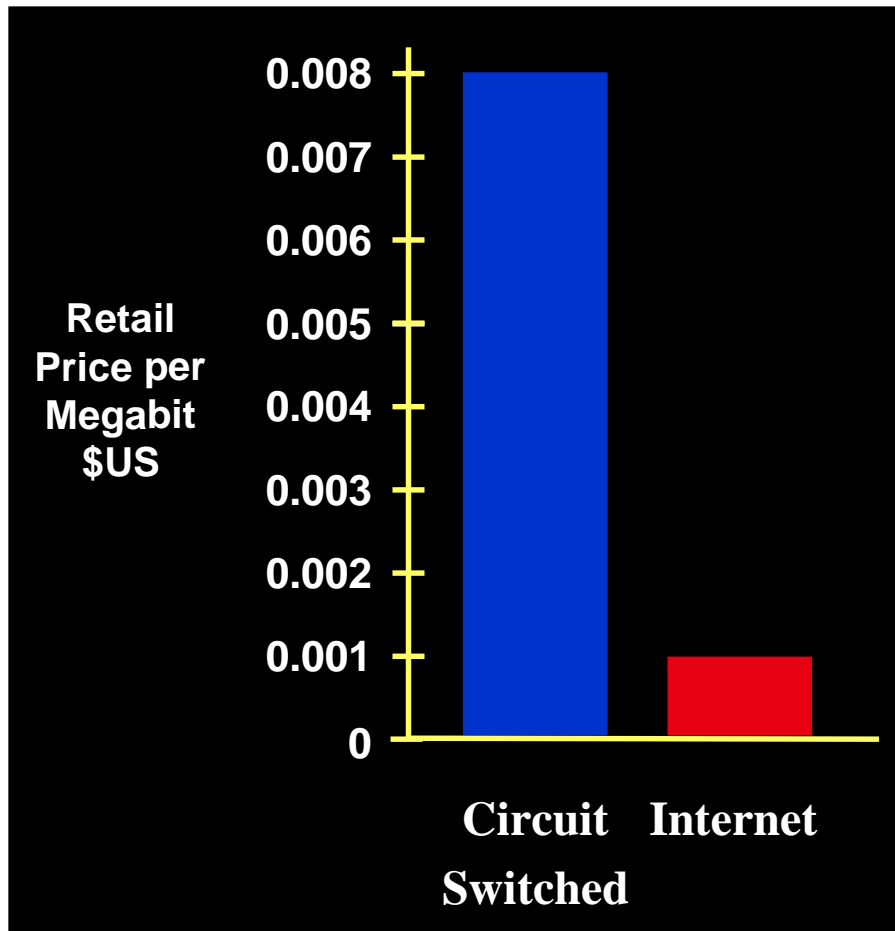
Level 3 Communications

Ike.elliott@Level3.com

Key Points

- Internet infrastructure costs much less per bit than circuit switching infrastructure
- With IP Telephony, internet infrastructure can also serve a nations telephony needs
- Internet telephony is a good investment
 - Pay less for your telephone infrastructure, and
 - Gain a multi-service data network, and
 - Improve national competitiveness

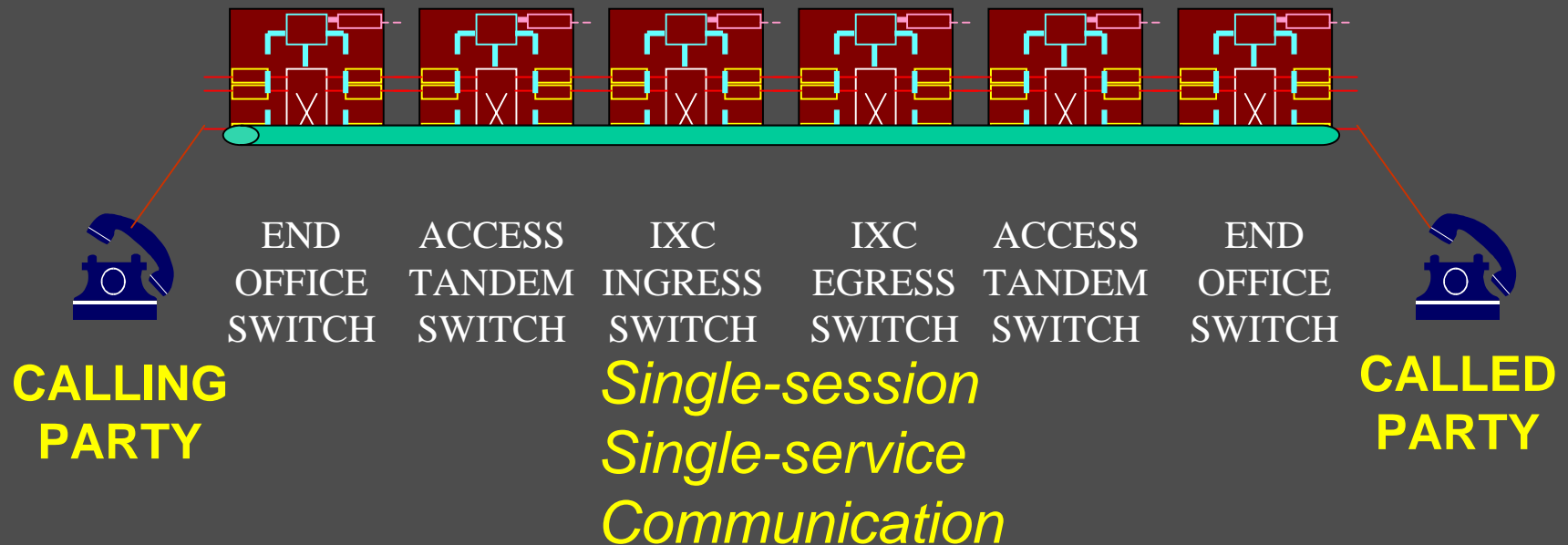
Internet Infrastructure Costs Much Less Than Circuit Infrastructure



- Internet bits are 1/8th the price of circuit bits
- Cost of internet equipment per bit is halved every 20 months
- Cost of circuit equipment per bit is halved every 80 months

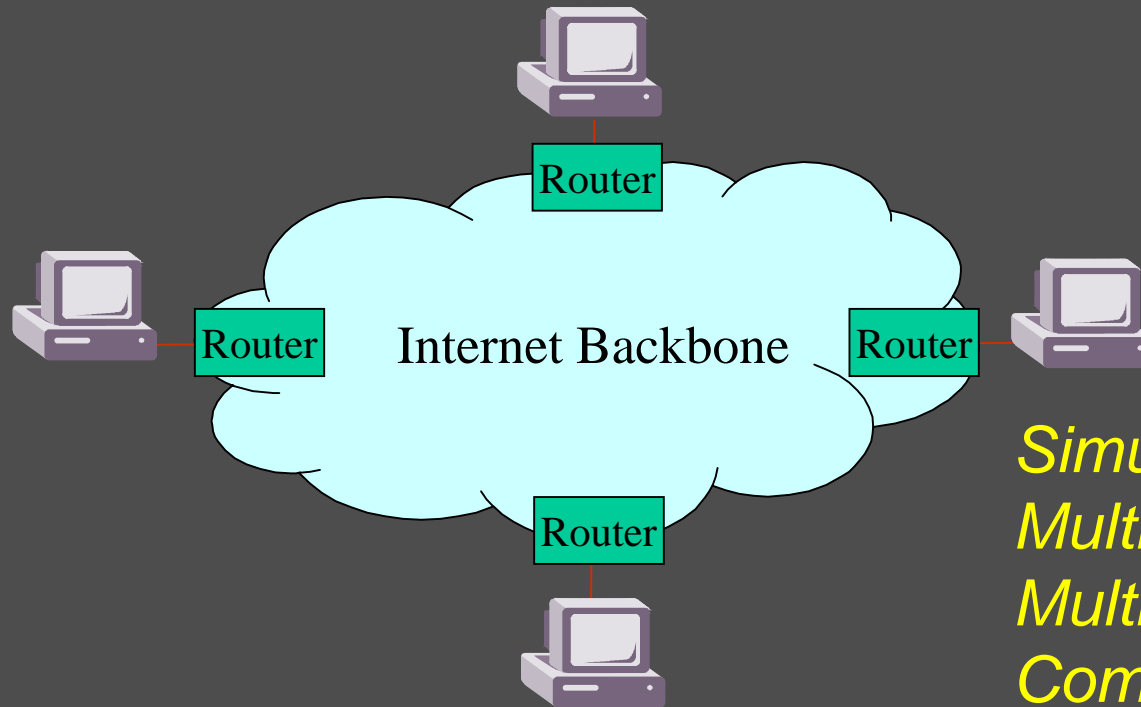
Assumptions: 3 cents per minute for a 64 Kpbs long distance voice call, compared to \$40 per month for 600 Kpbs DSL service, used 1 hour per day, 20 days per month

Circuit switching was primarily designed for interactive, two-party continuous voice communications



All traditional phones are connected directly to a circuit switch. When you dial a phone, a dedicated, 64 kbps pipe is set up between your phone and the called party's phone.

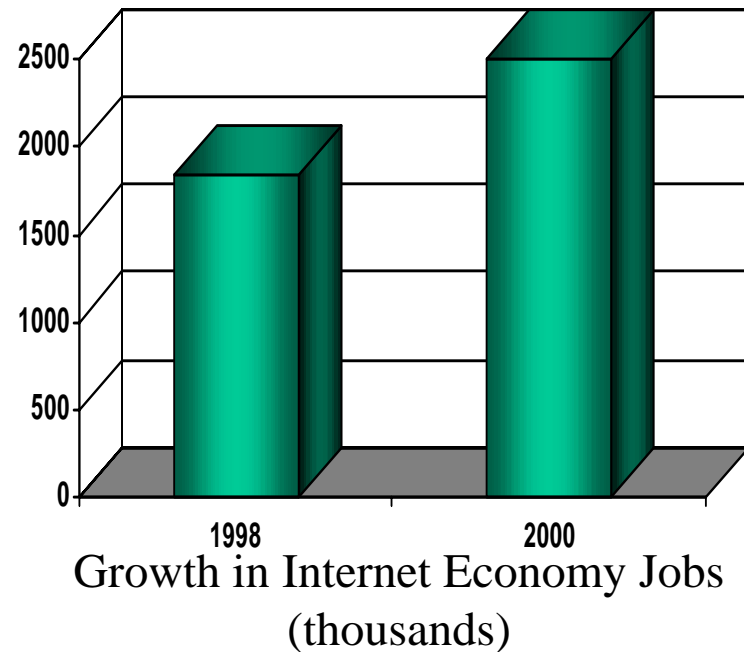
Packet switching was primarily designed for interactive, multi-party, media-independent data communications



Any party on a common backbone can instantaneously communicate with any other party, using the medium of choice, including email, video, audio, instant messaging, file transfer, etc. Your access line into the network is not dedicated for any single use, at any single point in time.

National Competitiveness and Economic Health Depend Upon a Strong Internet Infrastructure

- European and Asian e-commerce should reach \$3.2 trillion by 2004. (1)
- Internet users could exceed the 1 billion mark by 2005, with 700 million of those located outside North America. (2)
- The average internet economy worker earns almost twice the salary of a non-internet economy worker (2)



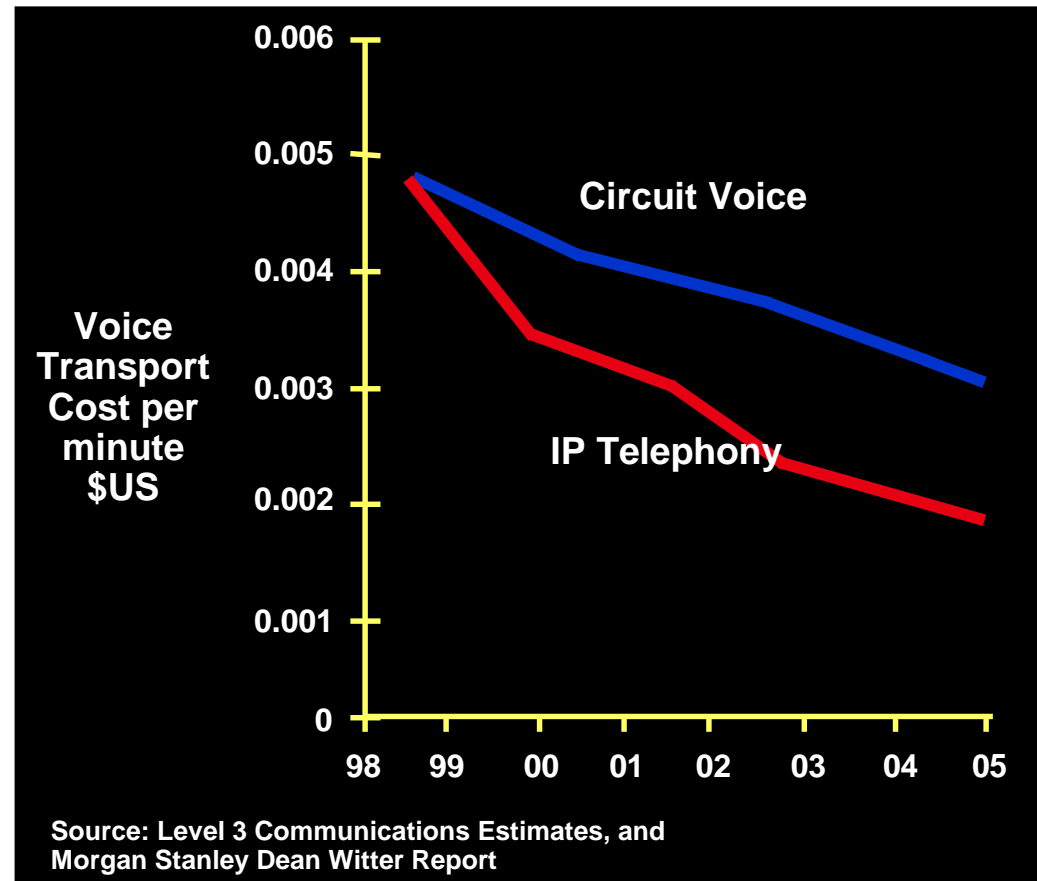
Source: State of the Internet 2000 Report

(1) Source: Forrester

(2) Source: State of the Internet 2000 Report

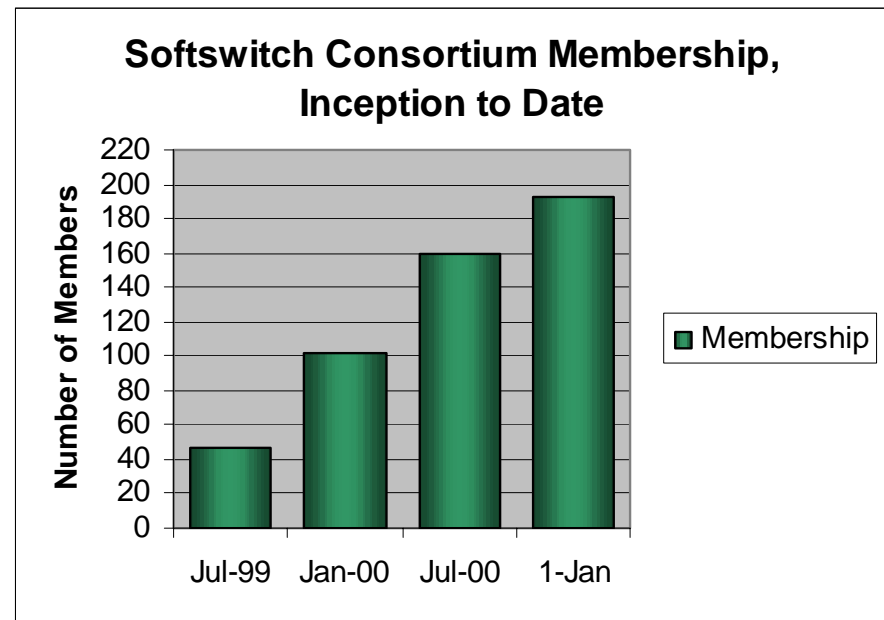
Internet Infrastructure Costs Are Declining and Increasingly Within the Reach Developing Nations

- Level 3 Communications estimates IP Voice Transport costs are currently 25% lower than circuit voice
- Switching and transmission costs for IP Telephony are approximately 50% lower than the costs for current circuit switching. (Martin Weiss, University of Pittsburgh, Sep 1998)



Internet Telephony Infrastructure Enables Competition

- Circuit Switch customers have little negotiating power
- Softswitch IP Telephony places innovation and negotiating power in the hands of any software developer
- Barrier to entry for softswitch vendors is much lower than for traditional circuit switch vendors
- IP Telephony allows nations to leverage the resource all nations have in common -- our minds.
- Committing to a national , multi-service internet infrastructure may assist in keeping the valuable, but limited pool of IT workers at home

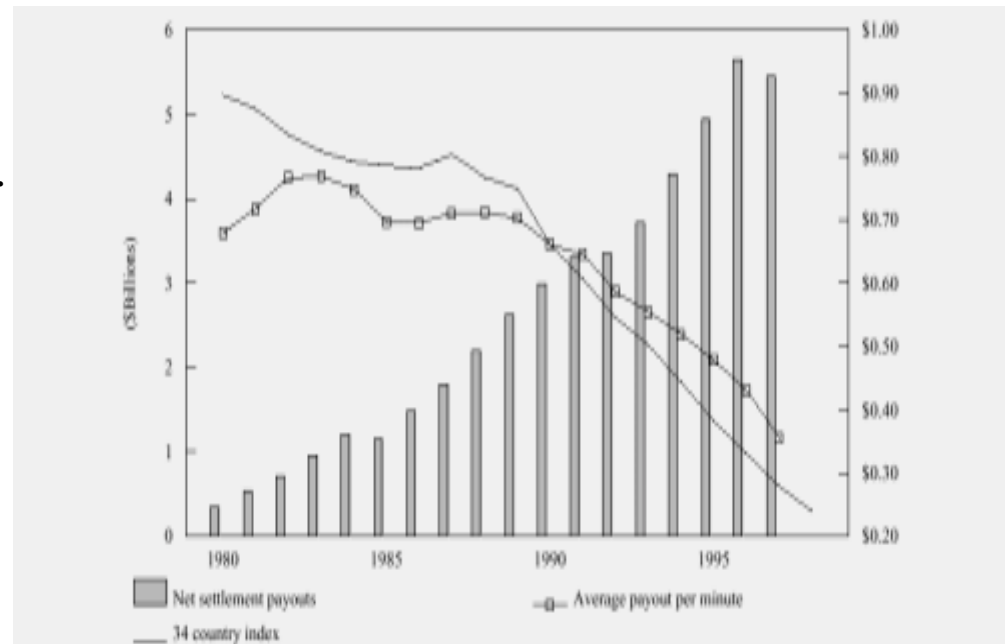


Source: International Softswitch Consortium

Telephony Settlement Income is Unreliable, Even Without Internet Telephony Bypass

- So long as there is a large gap between the price of a service and the underlying cost, there is sufficient incentive for arbitrage, regardless of available technology.
 - International Callback
 - IP Telephony
- Despite reduction in accounting rates, actual settlements income grew from 1986 to 1996, due to elasticity effects
- Even so, settlements income has proven to be an unstable income source, as shown by recent declines in settlement income

Net Settlement Payout Compared to with Settlement Rates



Source: FCC International Trends Report, 1999

Conclusion

Creation of a national internet infrastructure is an excellent investment, even if it causes an erosion of traditional telephony settlements-based income.

- **Internet infrastructure brings:**
 - Improvements in national competitiveness
 - Lower cost telephony infrastructure
 - Additional Data Services
- **Can not Depend upon accounting based settlements to provide revenue for internet infrastructure**
 - An increasing volume of traffic will be routed outside the accounting rate mechanism, with or without internet telephony.
 - Long-term stable revenue solutions, such as data services enabled by internet infrastructure, must be developed