

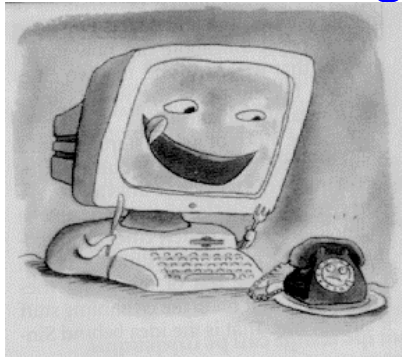
# Tariff strategies and the Internet

Dr Tim Kelly (ITU),  
Seminar on tariff strategies for  
competitive environments,  
ALTTC, Ghaziabad, 20-22 July 1999



The views expressed in this paper are those of the author and do not necessarily reflect the opinions of the ITU or its Membership. Dr Kelly can be contacted by e-mail at [Tim.Kelly@itu.int](mailto:Tim.Kelly@itu.int)

**“We started out running the Net  
on top of the phone system, and  
we’ll end up with telephony  
running over the Net.”**

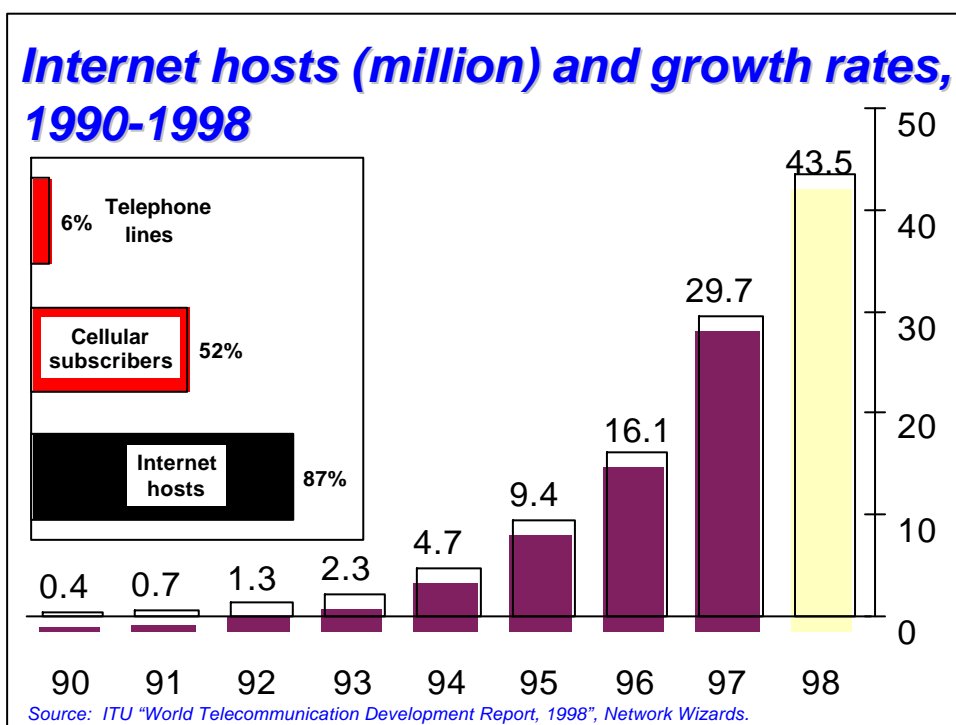


*Eric Schmidt,  
CEO, Novell,  
Quoted in  
Wired, August 1997*

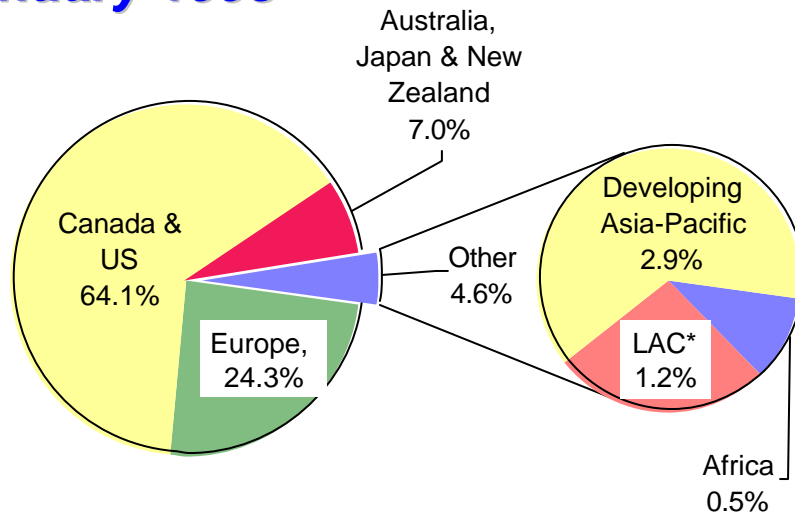
The Economist  
May 2nd 1998

## Agenda

- The phenomenal growth of the Internet
- Internet economics
- Internet telephony
- Pricing the Internet: What makes it different?
  - ⇒ Retail pricing
  - ⇒ Pricing of local calls
  - ⇒ Wholesale pricing
- Vulnerability of telephone companies to competition from the Internet
- Implications of the Internet for developing countries

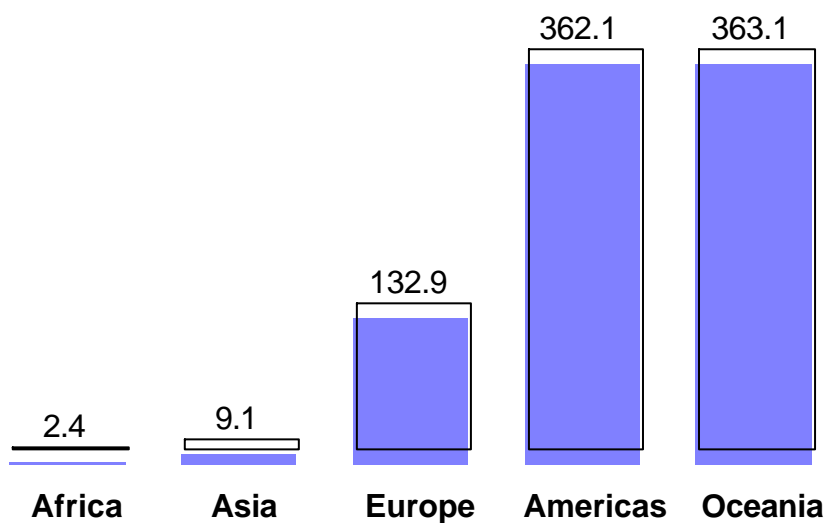


## Distribution of Internet hosts, January 1998



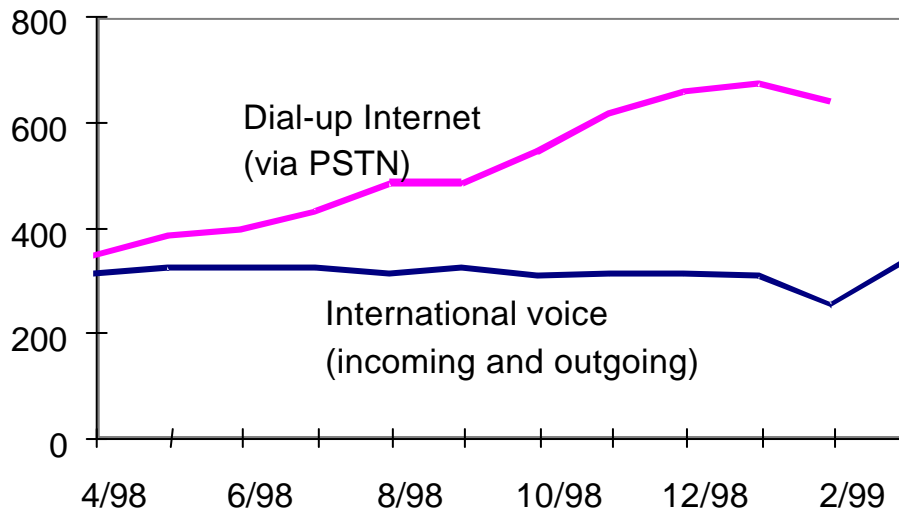
Source: ITU "Challenges to the Network: Internet for development, 1999".

## Internet host density by region, January 1999, Per 10'000 inhabitants



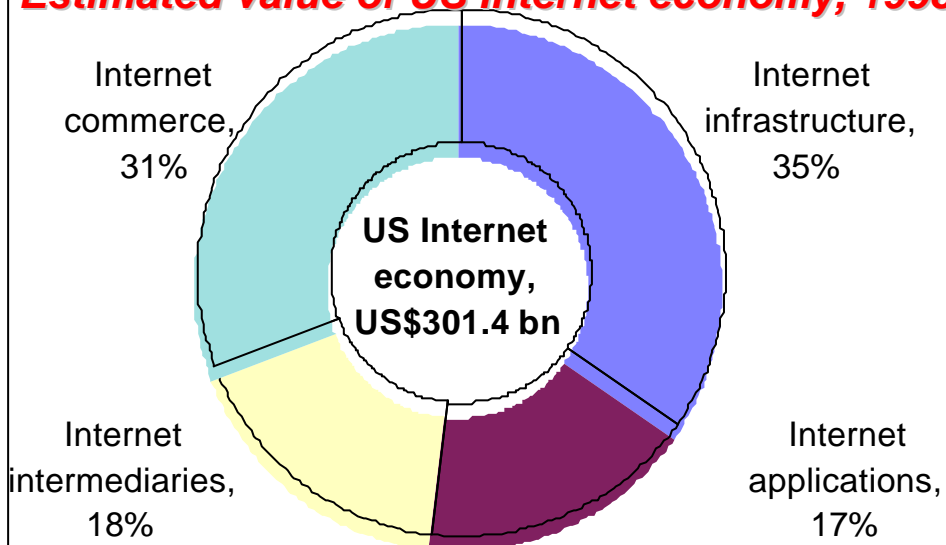
Source: ITU "Challenges to the Network: Internet for Development, 1999", Network Wizards.

**Internet traffic overtaking int'l voice traffic**  
**Hongkong-China, monthly minutes of use,**  
**April 1998-March 1999**



Source: ITU, TeleGeography Inc., "Direction of Traffic, 1999", OFTA.  
 Note: Excludes Internet access from leased lines.

**How big is the Internet economy?**  
**Estimated value of US Internet economy, 1998**



Source: University of Texas/Cisco, [www.internetindicators.com](http://www.internetindicators.com)

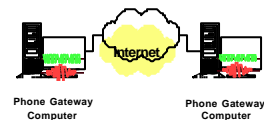
## **Internet Economics: Five factors that make the Internet different**

1. Packet-switched network architecture
  - ⇒ Connection-less not connection-oriented
2. Pricing independent of distance & duration
  - ⇒ Average message covers 15 or more “hops”
3. Peering arrangements, not settlements
  - ⇒ Based on a full-circuit regime, not on half-circuits
4. Traffic flows highly asymmetric
  - ⇒ Dominant flow is to terminal that initiates a session (though this is changing ....)
5. The United States sets the rules!
  - ⇒ There is no “Internet Telecommunication Union”

## **Internet telephony: Different modes**

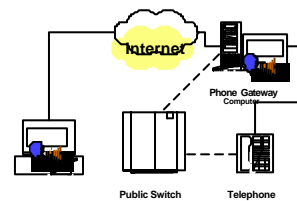
- **Computer to computer Since 1994**

- ⇒ Conversation between two similarly equipped computer users via Internet



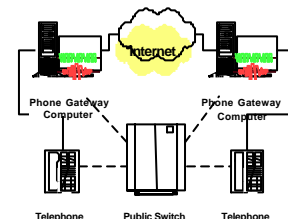
- **Computer to telephone Since 1996**

- ⇒ Internet user interconnecting with Public Telephone Network via an intermediary service provider (e.g., call-back company) or a service provider's Website



- **Telephone to telephone Since 1997**

- ⇒ Telephone carrier routes telephone or fax message via a data network (Internet, frame relay) rather than via the Public Telephone Network



## **Which would you choose?**

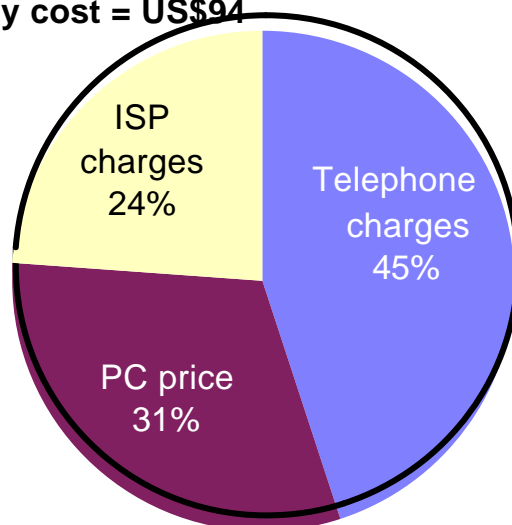
**Price per minute of a 3 minute international telephone/fax call from US (in US\$)**

	<i>AT&amp;T basic</i>	<i>AT&amp;T One</i>	<i>Internet</i>
<b>UK</b>	<b>3.27</b>	<b>0.36</b>	<b>0.60</b>
<b>Germany</b>	<b>3.75</b>	<b>1.05</b>	<b>0.96</b>
<b>Australia</b>	<b>4.53</b>	<b>1.35</b>	<b>1.02</b>
<b>Japan</b>	<b>4.35</b>	<b>1.44</b>	<b>1.29</b>
<b>Korea (Rep)</b>	<b>5.46</b>	<b>1.77</b>	<b>1.17</b>

Source: Adapted from data in TeleGeography 1997/98. Original source of AT&T tariff data is Tarifica. AT&T basic refers to the peak rate basic offering. "AT&T One" refers to the AT&T One Rate for which a US\$3 per month fee is payable. Internet Telephony tariff data is sourced from Global Exchange Carrier and is relevant for October 1997.

## **Internet charges, global average 1998**

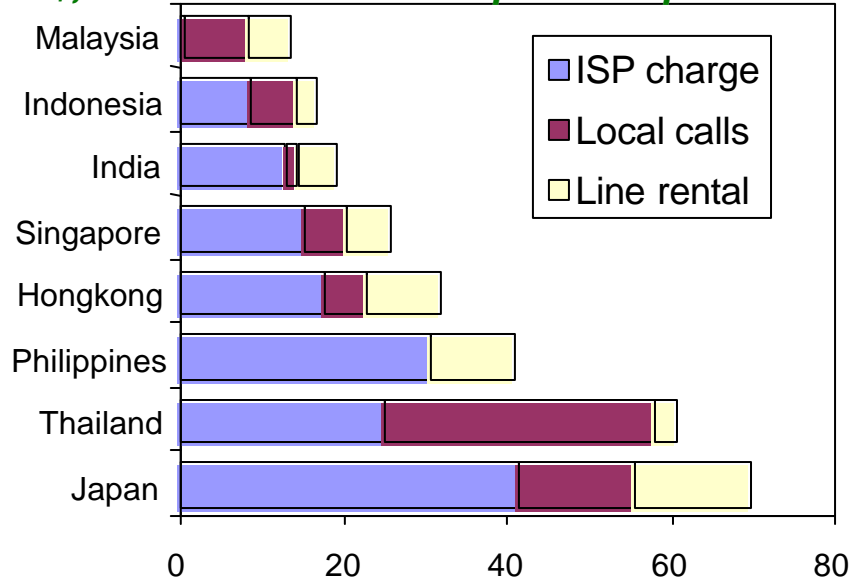
**Total monthly cost = US\$94**



Note: PC charges depreciated over 3 years.

Source: ITU "Challenges to the Network: Internet for development, 1999".

**Asia-Pacific, comparative prices,**  
*In US\$, based on 20 hours off-peak use per month*

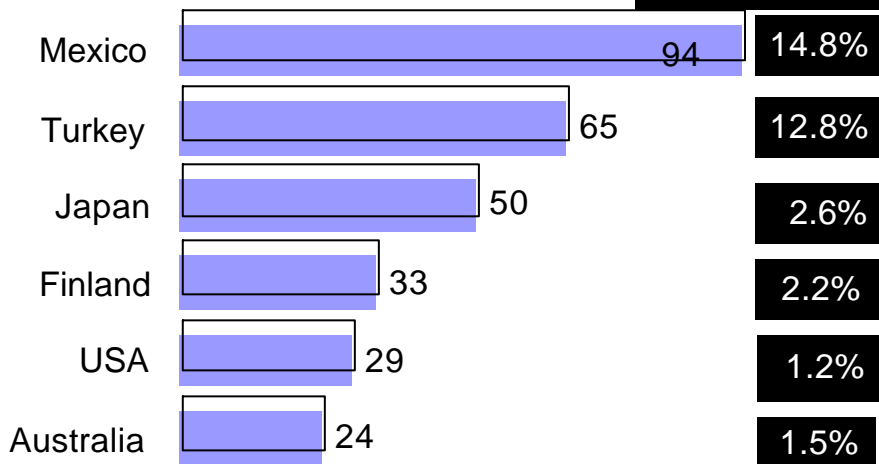


Source: ITU "Challenges to the Network: Internet for development, 1999".

**The relative cost of services**

OECD, Internet monthly access charge, US\$

As % of GDP per capita



Source: ITU 1999 "Challenges to the Network: Internet for Development"

## ***Internet, price and service trends: Retail market***

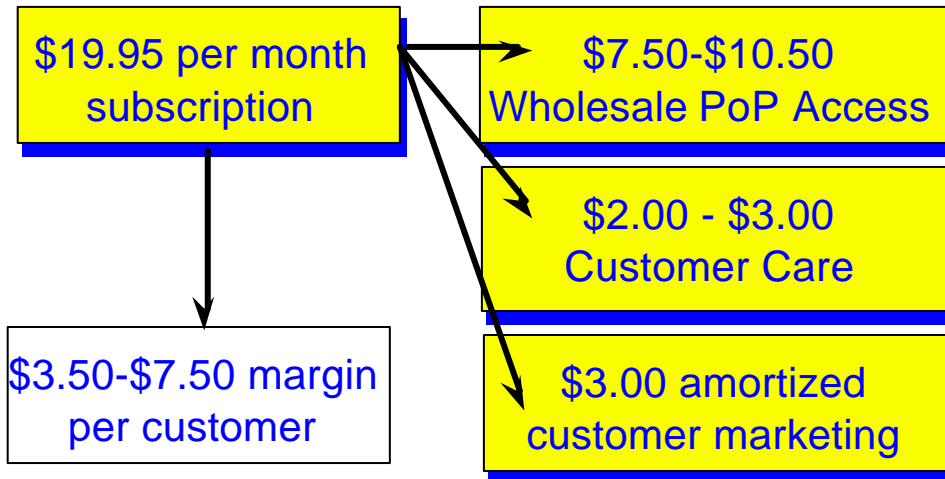
- **Until recently, flat-rate pricing dominant**
  - ⇒ **All you can eat for US\$19.95**
- **Now, “Free Internet” becoming highly popular**
  - ⇒ **Price of Internet access cross-subsidised by cost of local calls plus revenue drawn from advertising**
- **Towards lower service quality**
  - ⇒ **“Best efforts” service delivery at lowest price**
- **Cross-promotion of Internet and other services**
  - ⇒ **“Free PC” with three year’s ISP subscription**
- **Tendency towards industry concentration**
  - ⇒ **AOL’s subscriber base > next ten ISPs added together**

## ***What makes the Internet so cheap?***

- **Network externalities**
  - ⇒ **Interconnection of networks shares costs and builds economies of scale**
- **Technical efficiency**
  - ⇒ **Packet switching, routing, statistical multiplexing**
- **Piggybacking on Public Telephone Network**
  - ⇒ **Much of network investment already amortised**
  - ⇒ **Telephone network has built-in cross subsidies**
- **Competitive network and service provision**
- **Public policy subsidies (esp. in US)**
- **No settlements between operators**



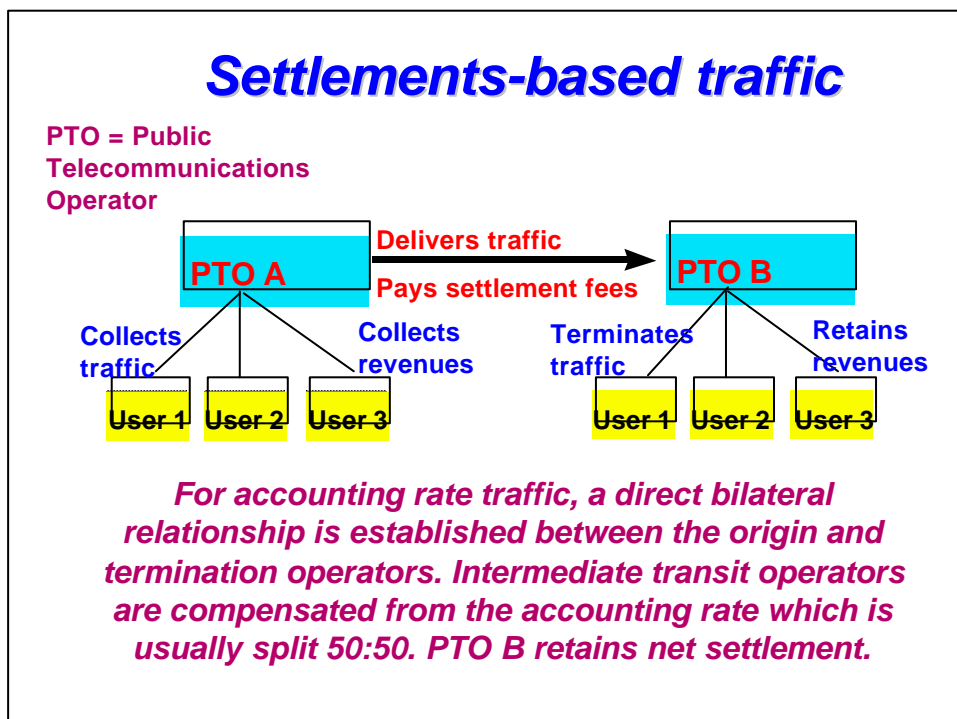
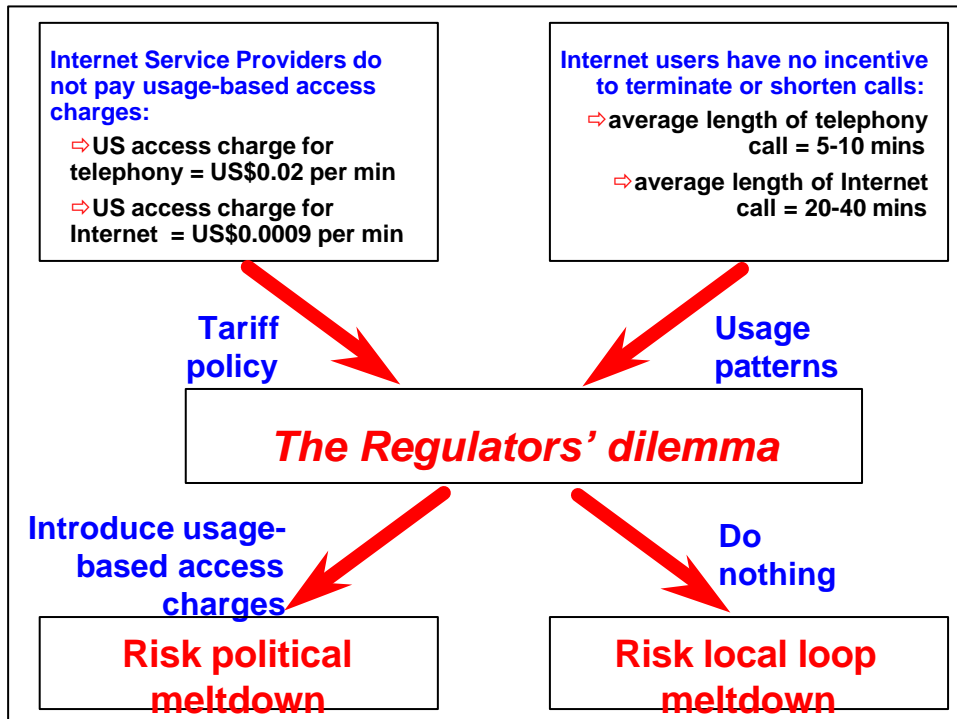
## Where does the money go? Typical Internet Service Provider cash-flow

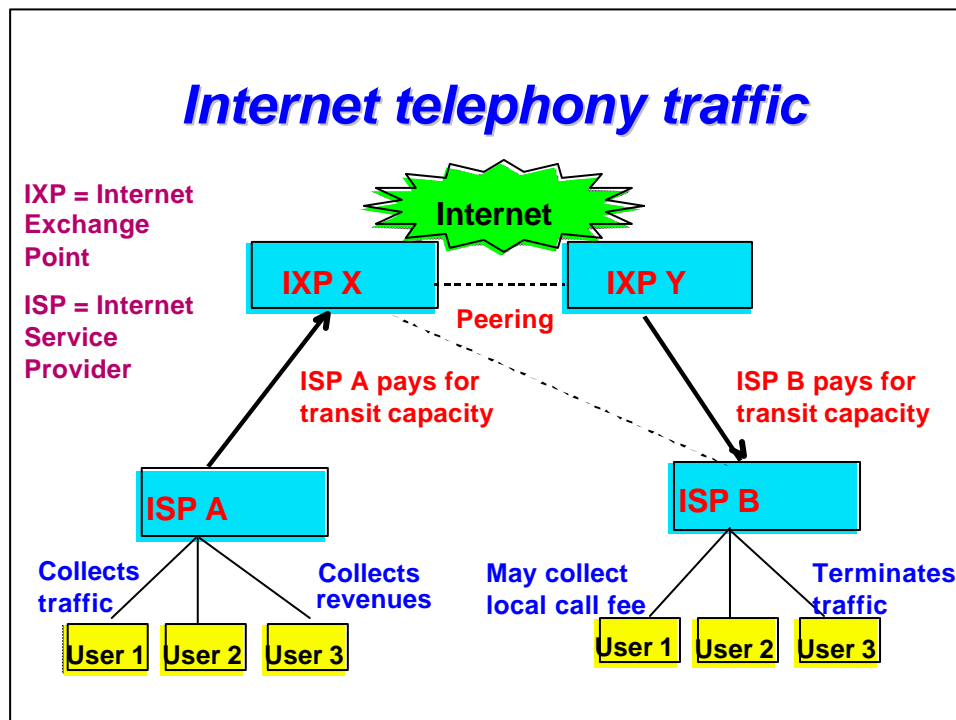


Source: Adapted from Paul Stapleton, ISP\$ Market Report, Boardwatch Magazine.

## When is a local call not a local call?

- Internet usage has grown fastest in countries which permit “free” or untimed local calls (e.g., USA, Canada, HK, Australia)
- But, PTOs claim that Internet users and ISPs are “free-riding” the network
  - ⇒ longer average sessions
  - ⇒ asymmetric traffic flows
- In countries where local calls are metered, users complain that Internet is too expensive
  - ⇒ “Strikes” of Internet users in Germany, France
- Rapid take-off of “Free Internet”
  - ⇒ Free monthly Internet access in return for loyalty to dial-up local loop service provider





- ## Settlements and sender-keeps-all: What's the advantage?
- **Settlement-payment traffic**
    - ⇒ Transfers revenue from core to periphery of network
    - ⇒ Promotes “organic” network growth
    - ⇒ BUT, where traffic is unbalanced, leads to big deficits (e.g., US\$5.7 bn deficit in US, in 1996)
  - **Sender-keeps-all traffic**
    - ⇒ No revenue transfers
    - ⇒ Promotes “spontaneous” network growth
    - ⇒ BUT, no incentive to carry traffic being transited or terminated
- Note: Where traffic flows are in balance, there is no practical difference*