

# IP Telephony: Economic implications and impact on PTOs

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*The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership. Tim Kelly can be contacted at [tim.kelly@itu.int](mailto:tim.kelly@itu.int).*



## ***IP Telephony: Economic implication and impact on PTOs***

- **Definitions and market evolution**
  - ⇒ **PC-to-PC; PC-to-Phone; Phone-to-Phone; IP Voice/Web integration applications**
- **How big will the market become?**
  - ⇒ **Market potential**
  - ⇒ **Constraints to market development**
- **Impact on public telecommunication operators**
  - ⇒ **“Bypass” of accounting rate system**
  - ⇒ **How should developing country carriers respond?**
  - ⇒ **Impact on tariff rebalancing**
- **Economic and strategic questions**
  - ⇒ **Is IP Telephony traffic a substitute or a supplement?**



## **What is IP Telephony?**

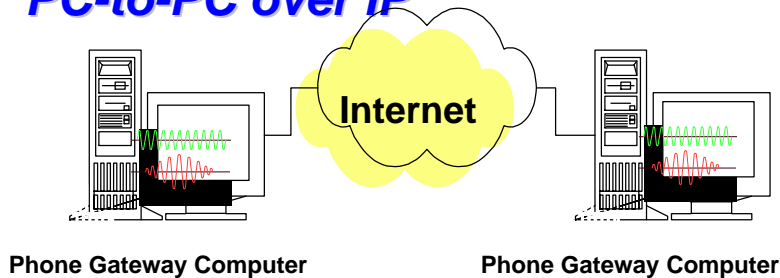
- **“IP Telephony” is the transmission of voice signals over packet-switched IP-based networks. There are two main subsets:**
  - ⇒ **“Internet Telephony”:** using the public Internet;
  - ⇒ **“Voice over IP”:** using private, managed IP-based networks, in addition to the Public Internet.
- **“IP Telephony” is also used as a generic term to cover Fax over IP, Voice over Frame Relay, Voice over xDSL etc,**
- **Relevant ITU-T standards include H.323, H.324, H248, T.120 etc.**



## **IP Telephony: Four main stages of evolution**

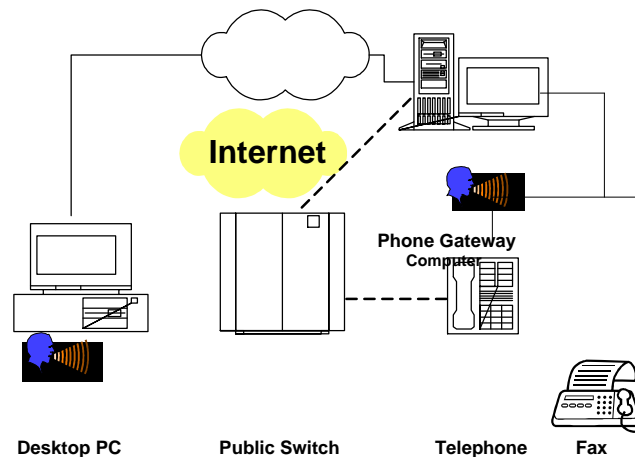
- 1. PC-to-PC (since 1994)**
  - ⇒ **Connects multimedia PC users, simultaneously online**
  - ⇒ **Cheap, good for chat, but inconvenient and low quality**
- 2. PC-to-Phone (since 1996)**
  - ⇒ **PC users make domestic and int'l calls via gateway**
  - ⇒ **Increasingly services are “free” (e.g., Dialpad.com)**
- 3. Phone-to-Phone (since 1997)**
  - ⇒ **Accounting rate bypass**
  - ⇒ **Low-cost market entry (e.g., using pre-paid cards)**
- 4. Voice/Web integration (since 1998)**
  - ⇒ **Calls to website/call centres and freephone numbers**
  - ⇒ **Enhanced voice services (e.g., integrated messaging)**

## 1. PC-to-PC over IP



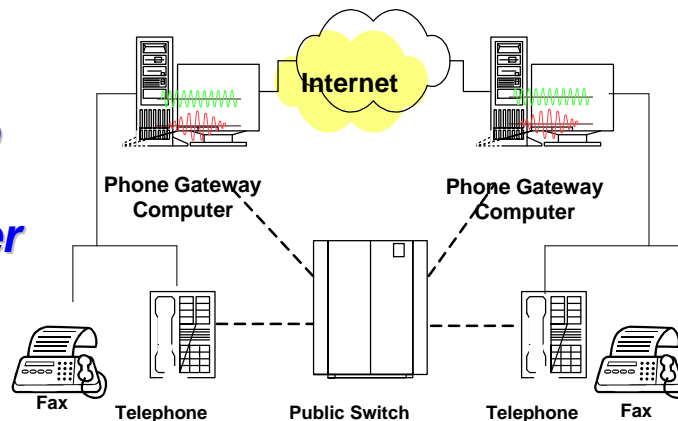
- Needs similarly equipped Internet users (e.g., IP telephony software, multimedia PC etc), both logged-on simultaneously
- Main applications: avoidance of usage-based telephone charges, chat-rooms, company LANs
- Application providers include Firtalk, Phonefree
- Potential Market: < 50 million users?

## 2. PC to phone over IP



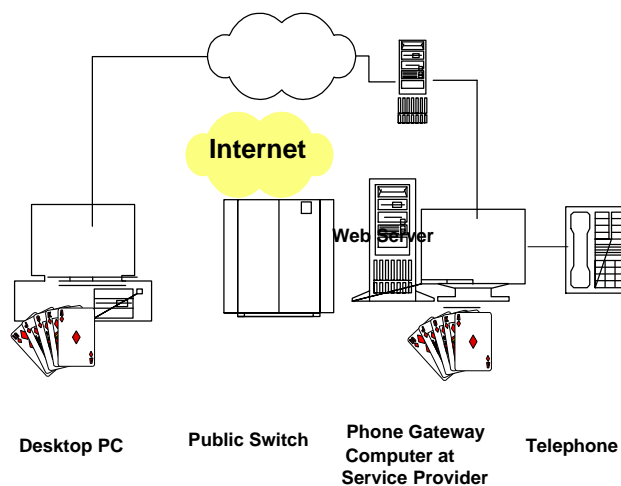
- Internet users with multimedia PC able to call any phone or fax user (not, at present, *vice versa*)
- Main motivation: Reduced telephone charges, “free” calls to US, Korea, Hongkong SAR etc
- Service providers include Net2Phone, DialPad etc
- Market potential: Sending, >250 million Web users, receiving >1.3 billion telephone/mobile users

### 3. Phone to phone Mobile, over IP



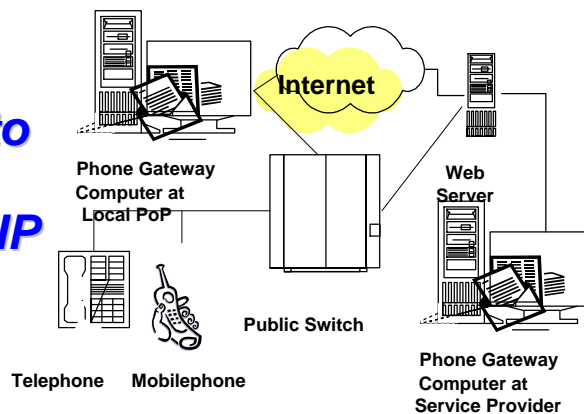
- Any phone/fax/mobilephone user to any other
- Main motivation: Reduced call charges, accounting rate bypass, market entry for non-facilities-based carriers (e.g., via pre-paid cards)
- Service providers include speak4free, I-link etc
- Market potential: >1.3 billion phone/fax/mobiles

### 4a. PC to website/ Call centre, over IP



- Internet users with multimedia PC browse Website and choose voice/video connection option
- Main motivation: Service provider can interact directly with potential clients, via voice or video, for instance for telemarketing, freephone access
- Service providers include NetCall, ITXC etc
- Market potential: >250 million Internet users

## 4b. Phone/ to website/ e-mail, over IP



- Phone or mobilephone users utilise enhanced services (e.g., integrated messaging, voice response) available from IP service provider
- Main motivation: Integrated messaging, computer telephony integration, m-commerce
- Market potential: >1.4 bn phone/mobile users
- Service providers include Yac.com, T2mail etc



## Constraints to IP Telephony

- Quality of service
  - ⇒ But, getting better, thanks to common standards, upgrade to IPv6, diffserv etc.
  - ⇒ Transition to private, managed networks (VoIP) rather than use of public Internet (Internet Telephony)
- Bandwidth
  - ⇒ But, getting better, particularly on trans-Atlantic and trans-Pacific routes
  - ⇒ Bandwidth shortage still a problem in developing countries especially if gateway to IP is asymmetric
- Regulatory prohibition
  - ⇒ But, more than 70% of int'l traffic flows between markets where IP Telephony already liberalised
  - ⇒ Many more regulators are liberalising some form of IP Telephony, or “turning a blind eye”



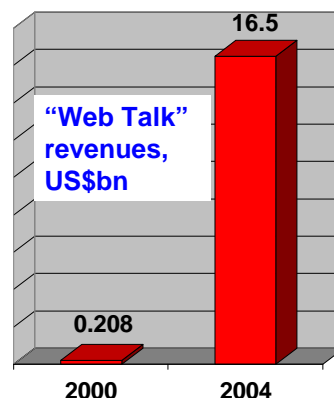
## Economic and strategic questions

- How big is the **market** for IP Telephony? How big will it become?
- What impact is IP Telephony having on **net settlement payments** to developing countries?
- Does IP Telephony generate *new* traffic, or does it **substitute** for existing traffic?
- What impact will IP Telephony have on **tariff rebalancing** strategies of carriers?
- Should **developing country carriers** attempt to block IP Telephony or to provide it?
- Should **incoming and outgoing** IP Telephony calls be treated differently?



## How big is the IP Telephony market? How big will it become?

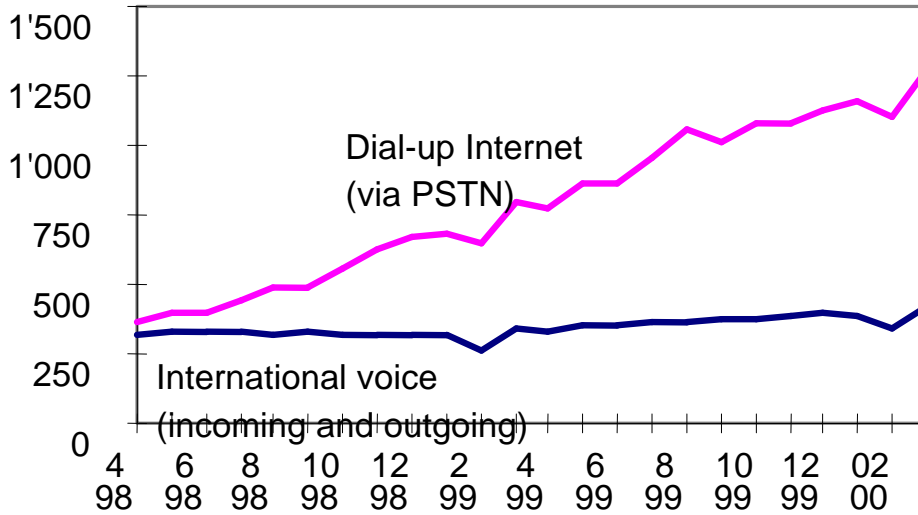
- **IDC** forecasts that “Web Talk” revenues will reach US\$16.5 bn by 2004 with 135 billion mins of traffic
- **DeltaThree** estimates that IP Telephony will generate 16 billion mins of int’l traffic in 2000
- IP Telephony as % of all int’l calls in 2004
  - ⇒ **Tarifca** forecast 40%
  - ⇒ **Analysys** forecast 25%
- In **developing countries**, the majority of IP Telephony calls are incoming



Source: IDC.



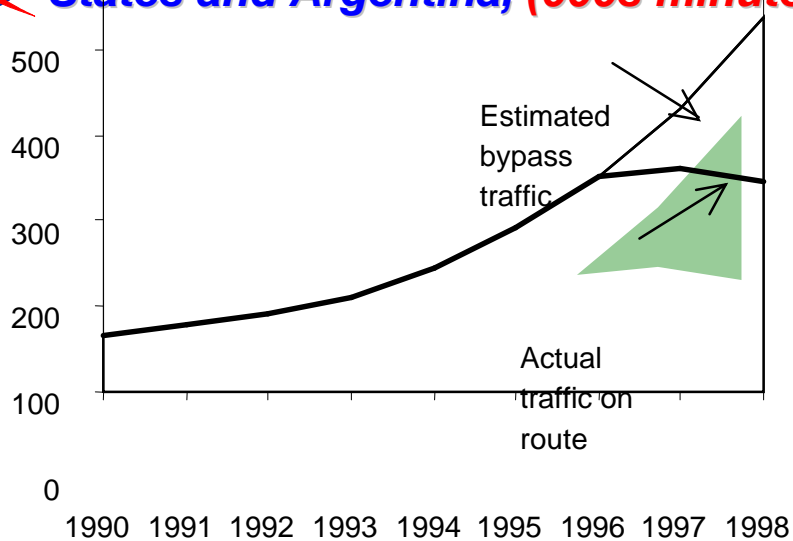
### Minutes of use by month, Hongkong SAR ('000s)



Source: OFTA ([www.ofta.gov.hk](http://www.ofta.gov.hk))

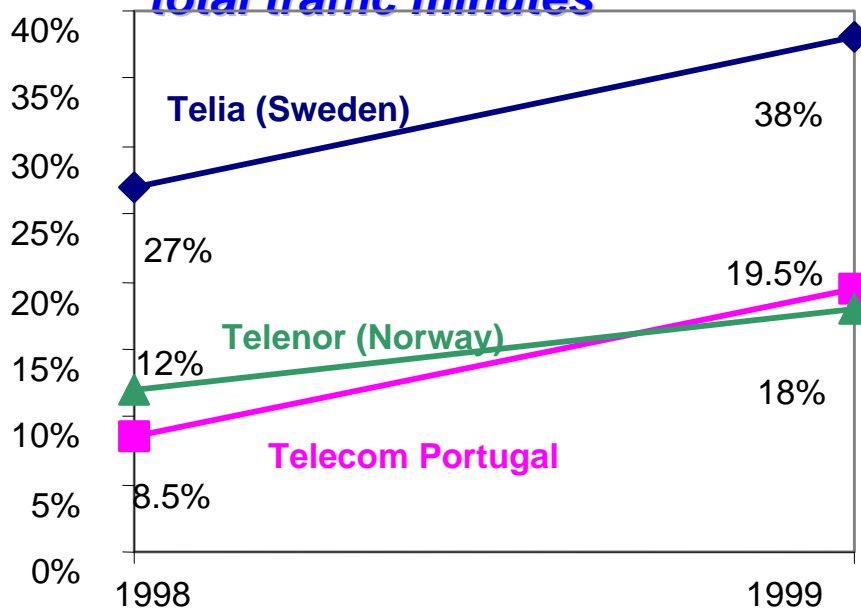


### International traffic, between United States and Argentina, (000s minutes)



Source: ITU/TeleGeography inc., "Direction of Traffic" database.

## Dial-up Internet traffic as % of total traffic minutes



Source: PTO annual reports. Note: For Telia, Internet traffic as % of local minutes. For others, as % of total

## Egypt Telecom's Voice over IP service

- Alliance formed with eGlobe (US)
- Marketed through ISPs (including Egypt Telecom's own ISP); ISPs get 10% of revenues
- Marketed via pre-paid cards
- Majority of calls are incoming
- Long-term plan to move whole network to IP platform
- Calls to US cost US\$0.23 per minute, compared with US\$1.32 for PSTN







## **IP Telephony Traffic: Substitute or supplement?**

- Historically, IP Telephony has been a substitute for high-cost PSTN telephony:
  - ⇒ **Avoiding long-distance and international call prices;**
  - ⇒ **Avoiding above-cost settlement rates.**
- Increasingly, IP Telephony is becoming a supplementary application, offered by ISPs:
  - ⇒ **“Free” PC-to-Phone calls to US and elsewhere;**
  - ⇒ **Integrated messaging and computer/telephony.**
- In future, a majority of telephony offered by telecom carriers will be “IP Telephony”:
  - ⇒ **Integrated voice and data networks;**
  - ⇒ **Regulators need to be consistent in approach.**



## **Conclusions: Implications depend on who is asking question ...**

- For **Consumers**, IP Telephony offers cheaper international telephone calls and integrated messaging
- For **Internet Service Providers**, “voice” is a potential killer application to make their sites more attractive
- For incumbent **Public Telecommunication Operators**, IP Telephony will accelerate rebalancing between international and local calls. It is a threat, but also an opportunity.
- For new market entrants, IP Telephony offers low-cost, low-risk market access
- For **Regulators**, IP Telephony poses many difficult questions!