IP Telephony: Substitute or Supplement?

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IP Telephony: Substitute or Supplement?

- **What is IP Telephony?**
  - ⇨ **PC-to-PC; PC-to-Phone; Phone-to-Phone**
  - ⇨ **“Internet Telephony” and “Voice over IP”**
- **How will IP Telephony evolve?**
  - ⇨ **Market potential**
  - ⇨ **Constraints to market development**
  - ⇨ **Implications for Public Telecommunication Operators**
- **Regulatory policies regarding IP Telephony**
  - ⇨ **Is it voice? Is it data? Is it a substitute? Is it an “internet application”?**
- **Economic and strategic issues**
  - ⇨ **How will IP Telephony evolve?**

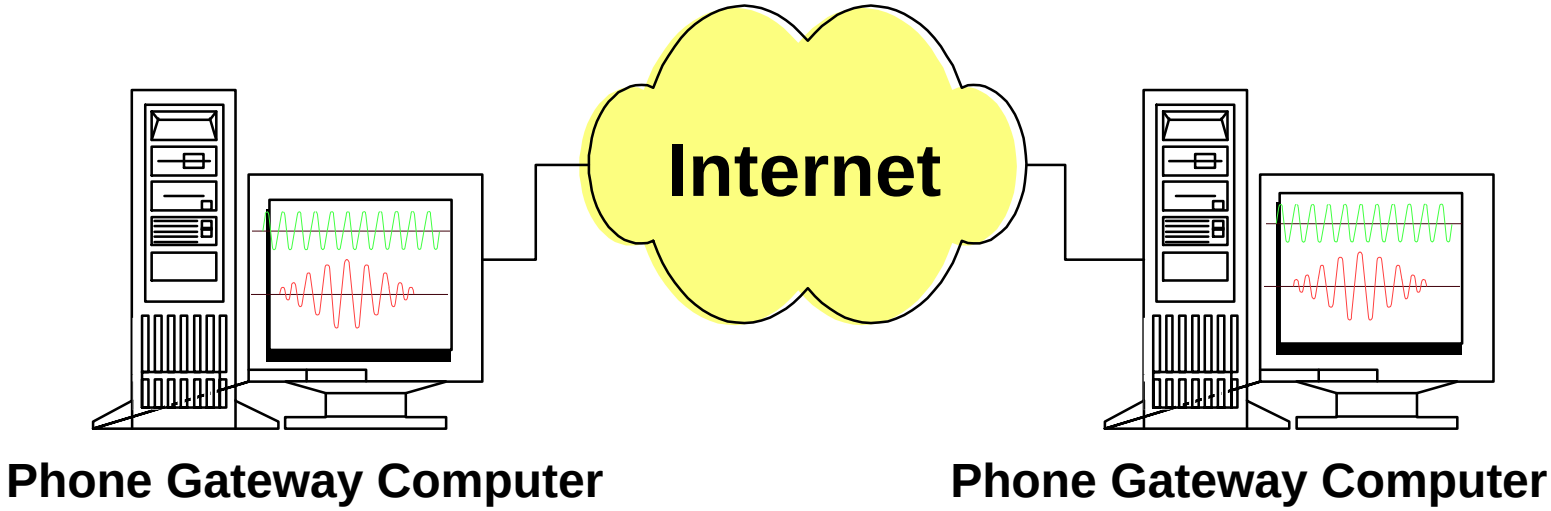
What is IP Telephony?

- **"IP Telephony" is the transmission of voice, fax and related 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

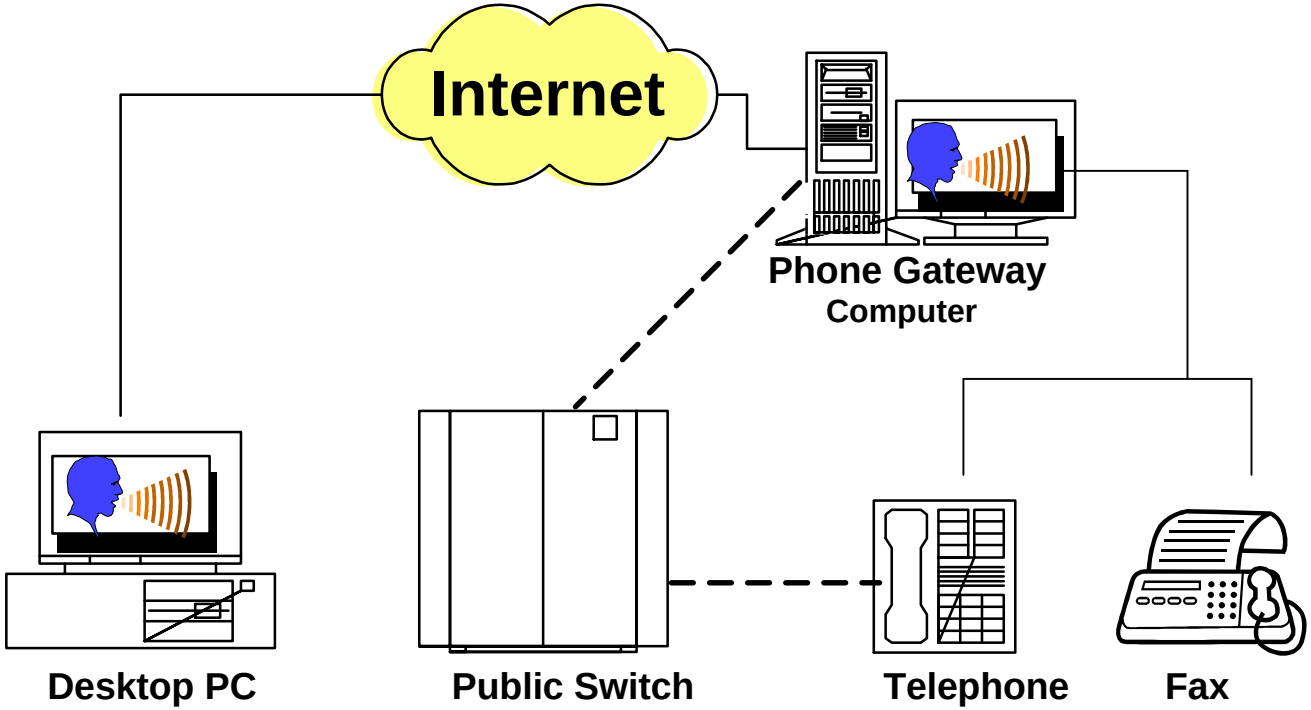
1. **PC-to-PC (since 1994)**
   - ⇨ Connects multimedia PC users, simultaneously online
   - ⇨ Cheap, good for chat, but inconvenient and low quality
2. **PC-to-Phone (since 1996)**
   - ⇨ PC users make domestic and int'l calls via gateway
   - ⇨ Increasingly services are"free" (e.g., Dialpad.com)
3. **Phone-to-Phone (since 1997)**
   - ⇨ Accounting rate bypass
   - ⇨ Low-cost market entry (e.g., using calling 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



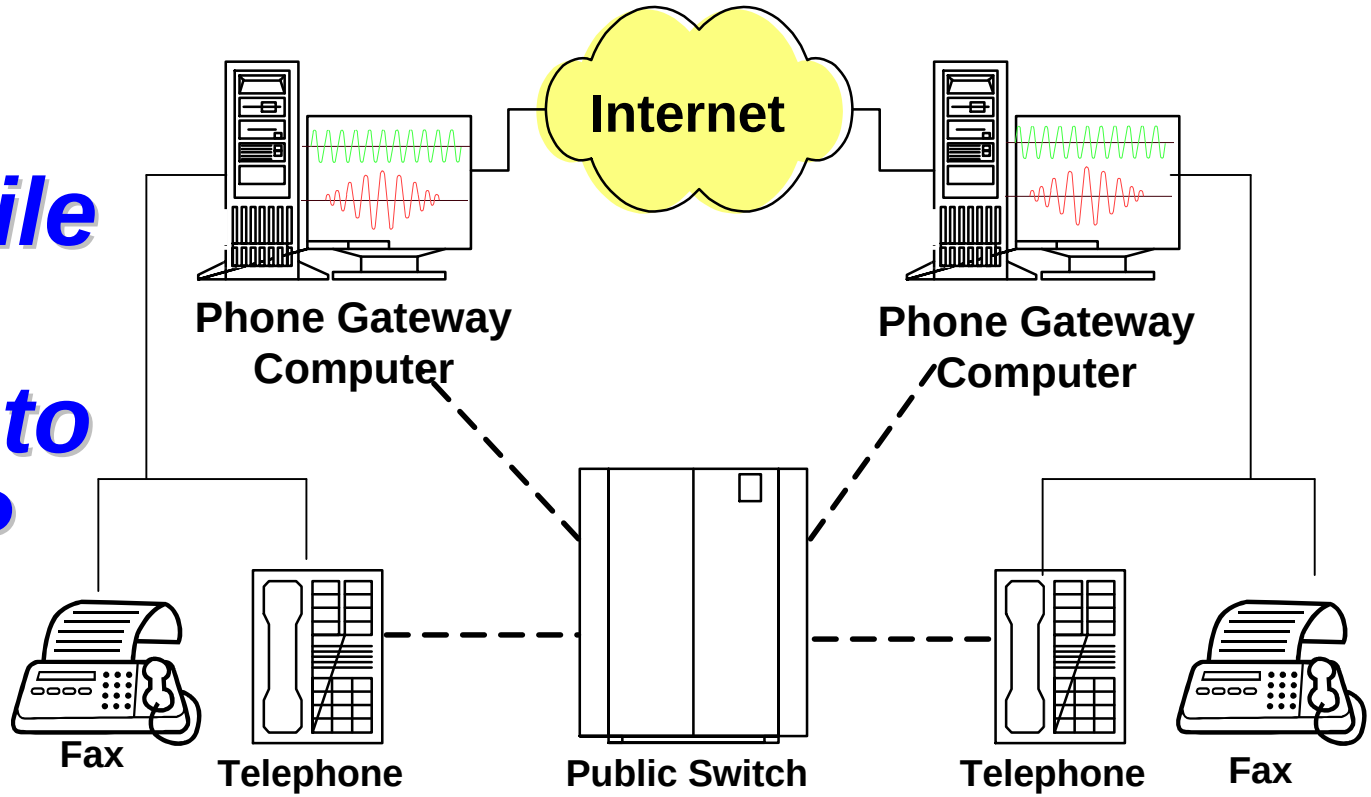
- Needs similarly equipped Internet users (e.g., IP telephony software, multimedia PC etc), both logged-on simultaneously
- Main applications: avoidance of usage-based telephone charges, chat-rooms, company LANs
- Application providers include Firetalk, Phonefree
- Potential Market: < 50 million users?

2. PC to phone (or fax), over IP



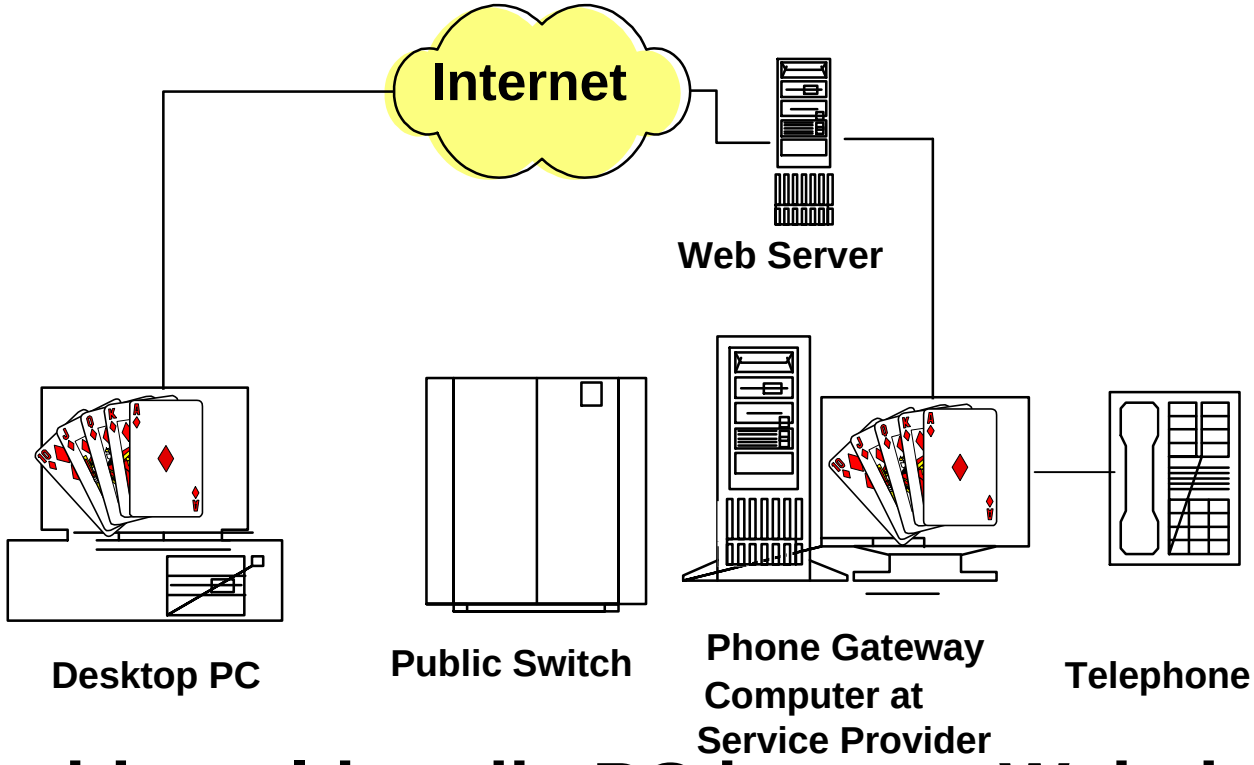
- Internet users with multimedia PC able to call any phone or fax user (not, at present, *vice versa*)
- Main motivation: Reduced telephone charges, “free” calls to US, Korea, Hongkong SAR etc
- Service providers include Net2Phone, DialPad etc
- Market potential: Sending, >250 million Web users, receiving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

3. Phone/mobile to phone/ mobile (fax to fax), over IP



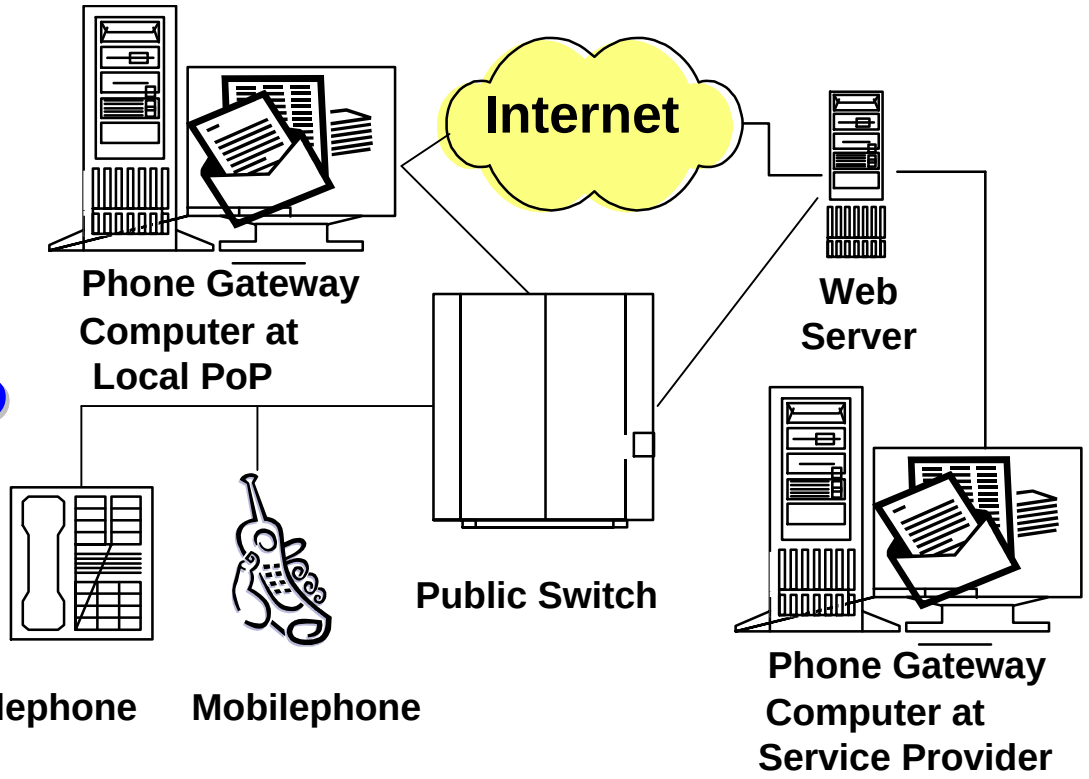
- **Any phone/fax/mobilephone user to any other**
- **Main motivation: Reduced call charges, accounting rate bypass, market entry for non-facilities-based carriers (e.g., via pre-paid cards)**
- **Service providers include speak4free, I-link etc**
- **Market potential: >1.3 billion phone/fax/mobiles**

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/ mobile to website/ e-mail, over IP

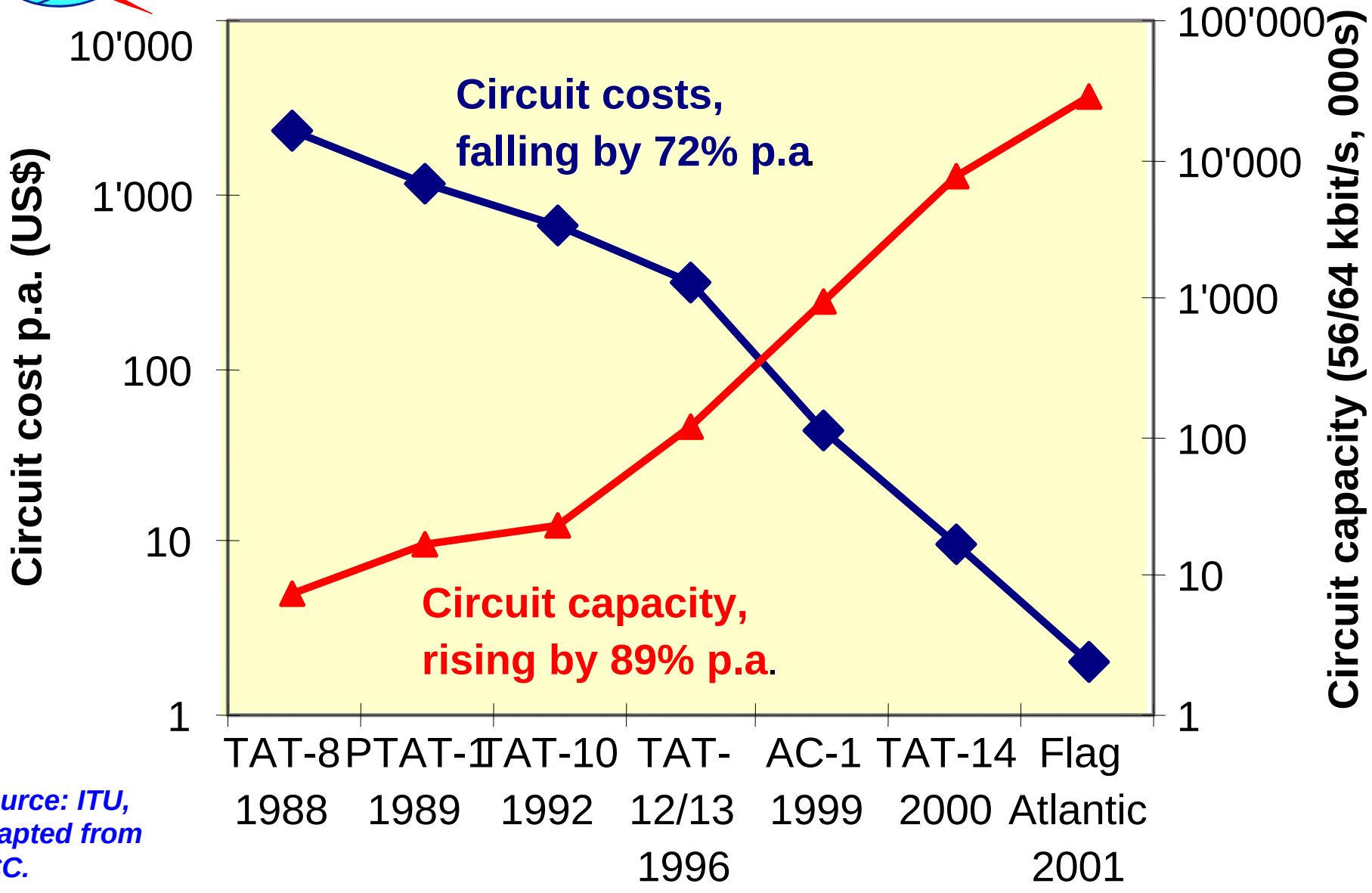


- Phone or mobilephone users utilise enhanced services (e.g., integrated messaging, voice response) available from IP service provider
- Main motivation: Integrated messaging, computer telephony integration, m-commerce
- Market potential: >1.4 bn phone/mobile users
- Service providers include Yac.com,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

Addressing constraints: Increased trans-Atlantic bandwidth

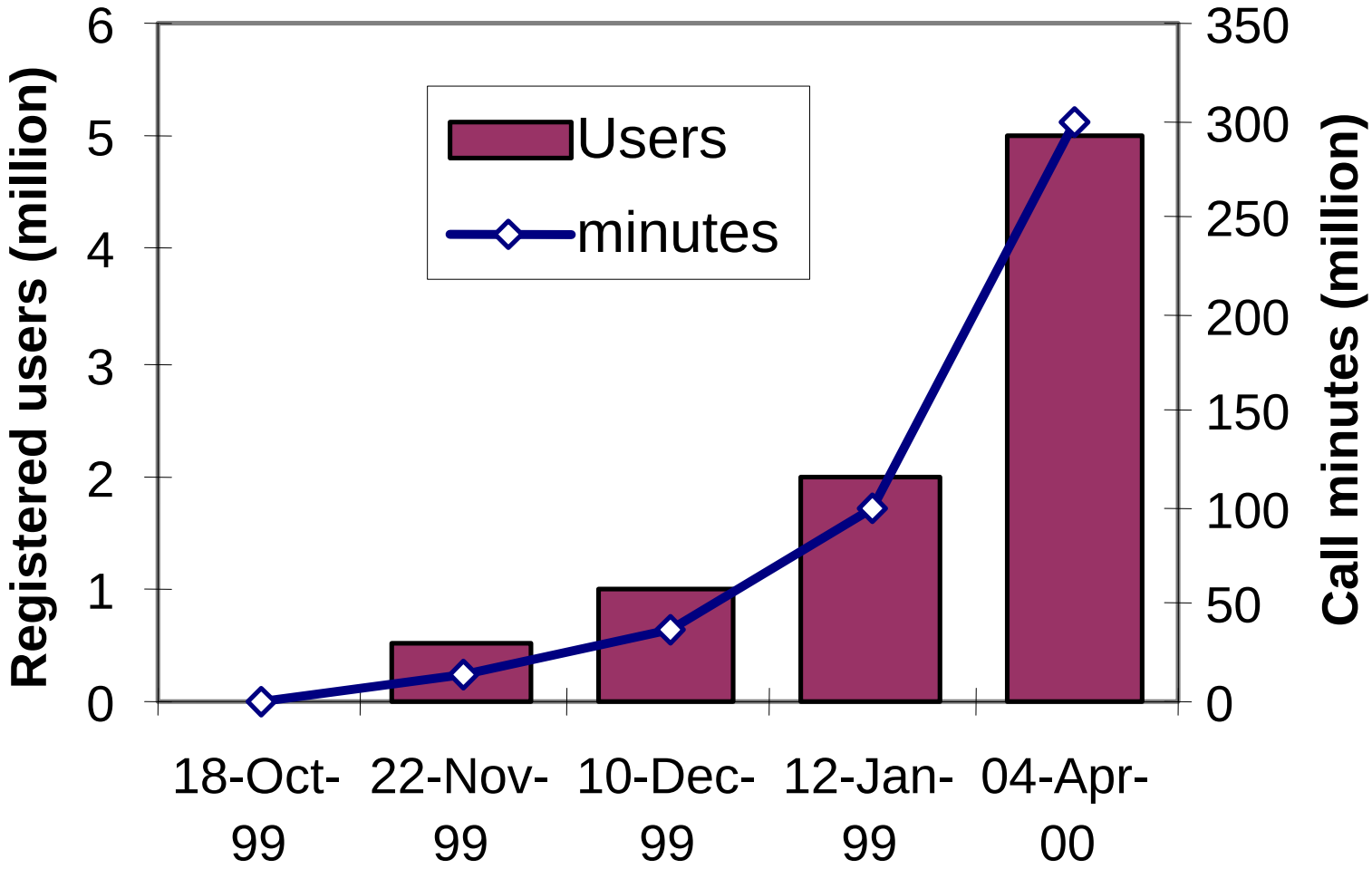


Source: ITU, adapted from FCC.

IP Telephony wants to be “free”

Cumulative number of Dialpad users & call minutes

Since launch on 18 Oct. 1999



Source: ITU, adapted from DialPad.com press releases.

Impact on Telecommunication Operators: Who gets what …. ?

- **International telephone call @ $3 per 3 mins**
  - ⇨ **Telco which "owns" customer gets share of line rental (<US$0.01 per call)**
  - ⇨ **Telco originating call gets int'l call charge (US$2.00)**
  - ⇨ **Telco terminating call gets net settlement (US$1.00)**
- **PC-to-Phone call (dial-up) @ $1 per call**
  - ⇨ **Telco which "owns" customer gets fractional share of line rental plus local call charge (<US$0.10 per call)**
  - ⇨ **ISP which "owns" customer or IP Telephony provider gets fractional share of subscription charge (<US$0.10)**
  - ⇨ **IP Telephony provider gets profit (>US$0.70)**
  - ⇨ **Telco terminating call gets interconnect or local call fee (<US$0.10)**

N.B. Interconnect rates are a fraction of settlement rates

Regulatory questions

- **Is IP Telephony voice or data? Is it a service or an application? Does it matter**
- **Should IP Telephony Service Providers be licensed and regulated?**
- **If so, should the regulation be focused on services, operators, technologies or consumers?**
- **Is the issue of delay in the call significant for regulatory purposes?**
- **Should incumbent operators be allowed to offer IP Telephony?**
- **Should IP Telephony service providers contribute to Universal Service Funds?**

Regulatory responses

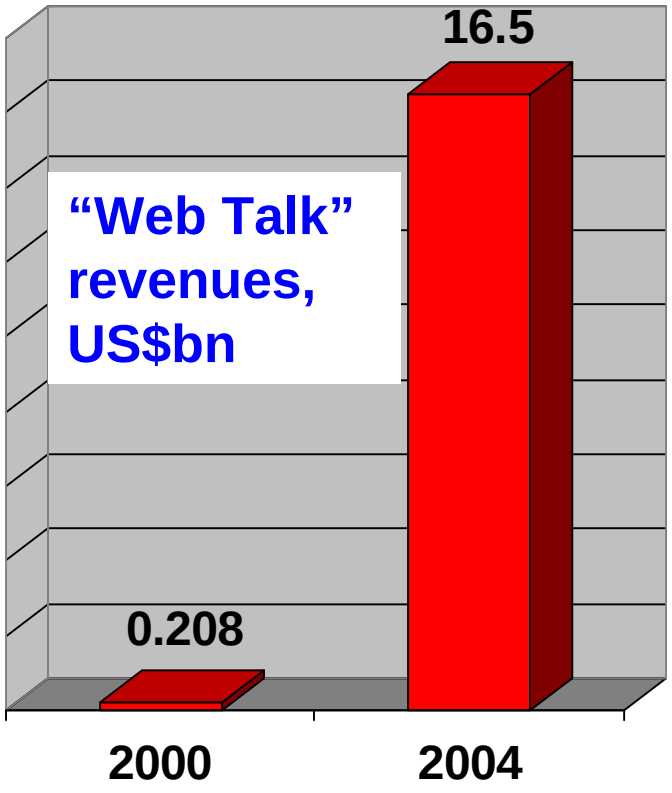
- **In the United States, there is no specific regulation of IP Telephony. It is exempt from FCC's international settlements policy.**
- **In the European Union, IP telephony is not considered as "voice telephony" because it is not considered as "real-time".**
- **In Canada, IP Telephony service providers are treated like other telephony providers and contribute to Universal Service Funds.**
- **In Hungary, IP Telephony is allowed providing the delay > 250 milliseconds and packet loss > 1%.**
- **In China, the operator has negotiated a specific accounting rate for IP Telephony traffic .**

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**
  - ⇨ **Tarifica forecast 40%**
  - ⇨ **Analysys forecast 25%**
- **In developing countries, the majority of IP Telephony calls are incoming**



Source: IDC.

Conclusions: 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.**

For more information: http://www.itu.int/iptel