IP Telephony:
Results of the ITU World Telecom Policy Forum

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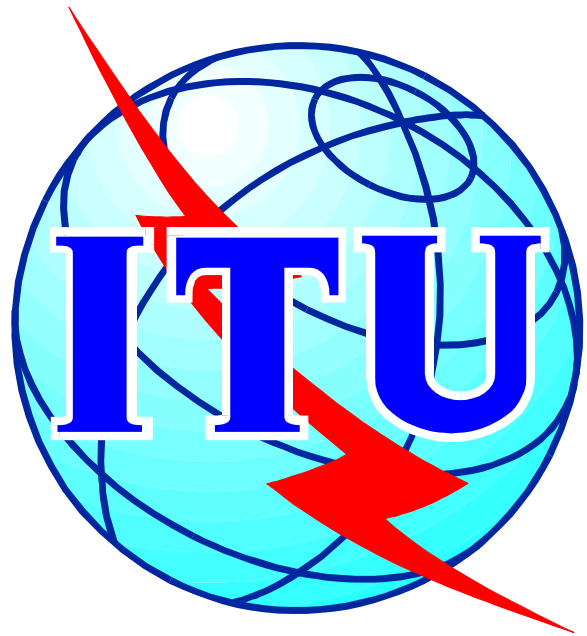
Arab States Internet and Telcom Summit, Oman, 28-30 May 2001



The views expressed in this paper are those of the author and may not necessarily reflect the opinions of the ITU or its membership. *Tim Kelly can be contacted at tim.kelly@itu.int.*

Agenda

- IP Telephony
  - ⇨ What is it?
  - ⇨ Why is it important?
- World Telecom Policy Forum, 2001
  - ⇨ Secretary-General's report
  - ⇨ Country case studies
- Outputs: Draft Opinions
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  - ⇨ Opinion B: Actions to assist ITU membership
  - ⇨ Opinion C: Human resource development issues
  - ⇨ Opinion D: Essential studies to facilitate IP Telephony introduction on a global basis
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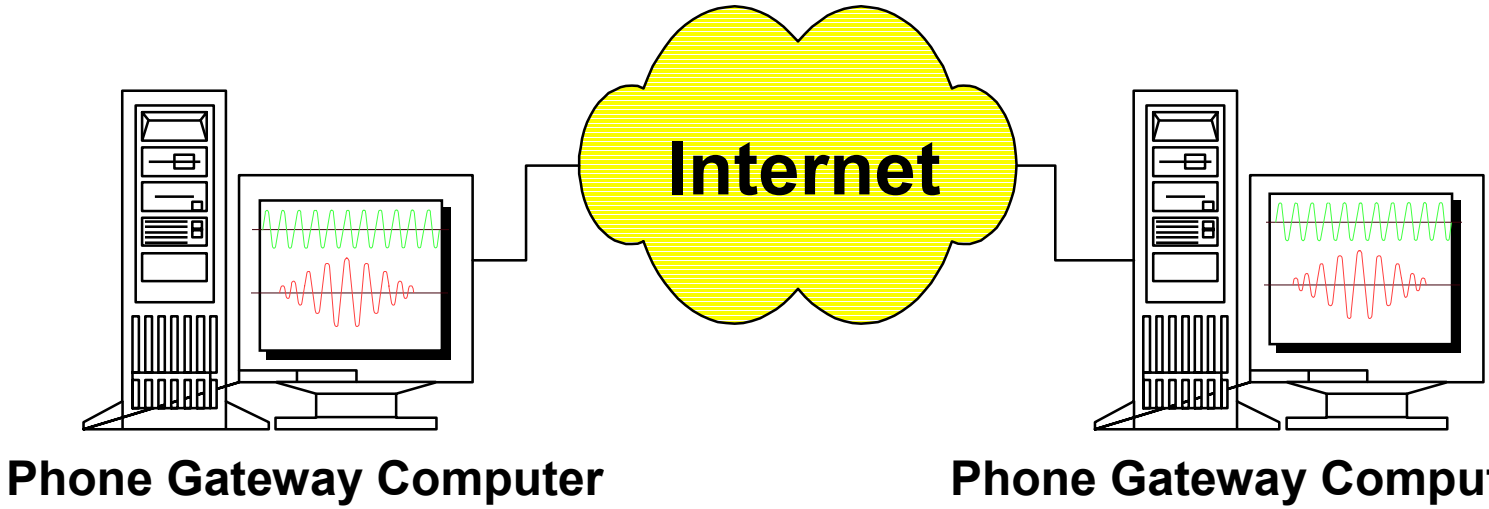
IP Telephony: What is it?

- Internet Protocol (IP) Telephony is a generic term describing voice or fax carried over IP-based networks, such as the Internet.
- IP Telephony is important:
  - ⇨ In the short-term, because it cuts the cost of calls, especially if routed over the public Internet
  - ⇨ In the longer-term, because telecoms carriers are migrating their separate voice and data networks to converged IP-based networks
- Examples of IP Telephony Service Providers include Net2Phone, Dialpad.com, iBasis etc.

IP Telephony: Four main stages of evolution

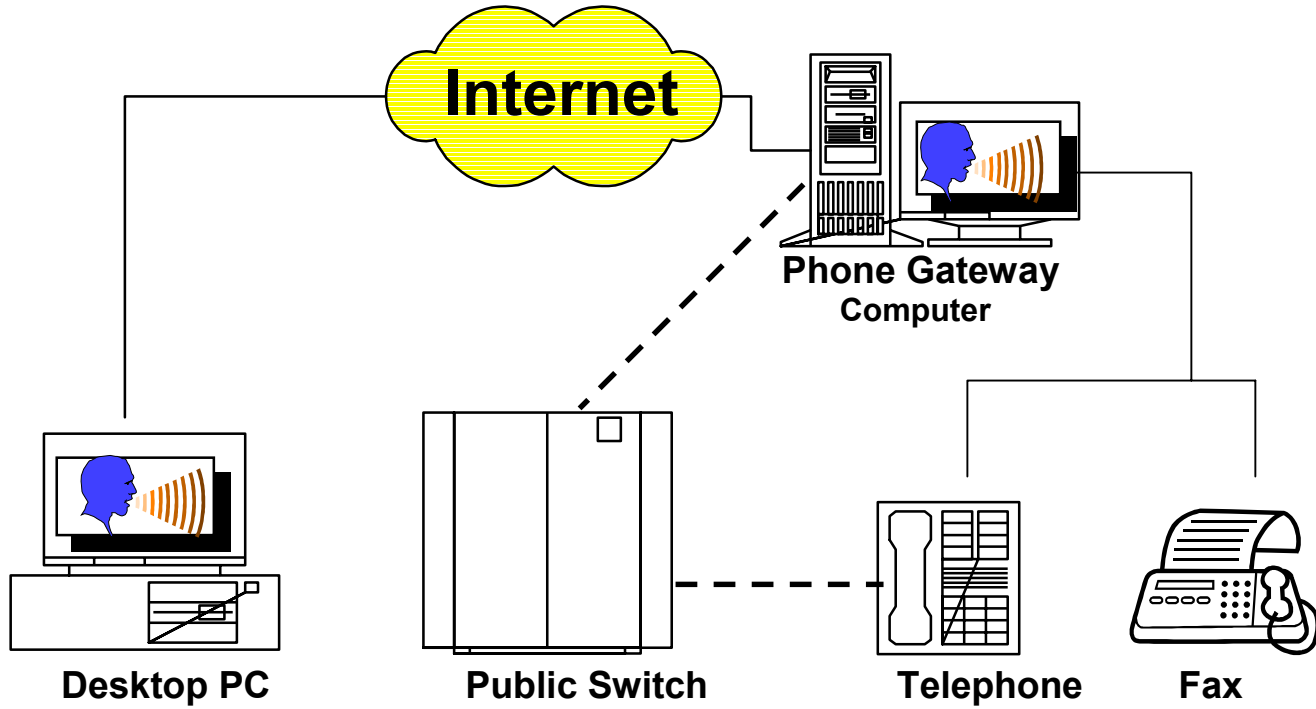
1. **PC-to-PC (since 1994)**
   - ⇨ Connects multimedia PC users, simultaneously online
   - ⇨ Cheap, good for chat, but inconvenient and low quality
2. **PC-to-Phone (since 1996)**
   - ⇨ PC users make domestic and int'l calls via gateway
   - ⇨ Increasingly services are"free" (e.g., Dialpad.com)
3.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



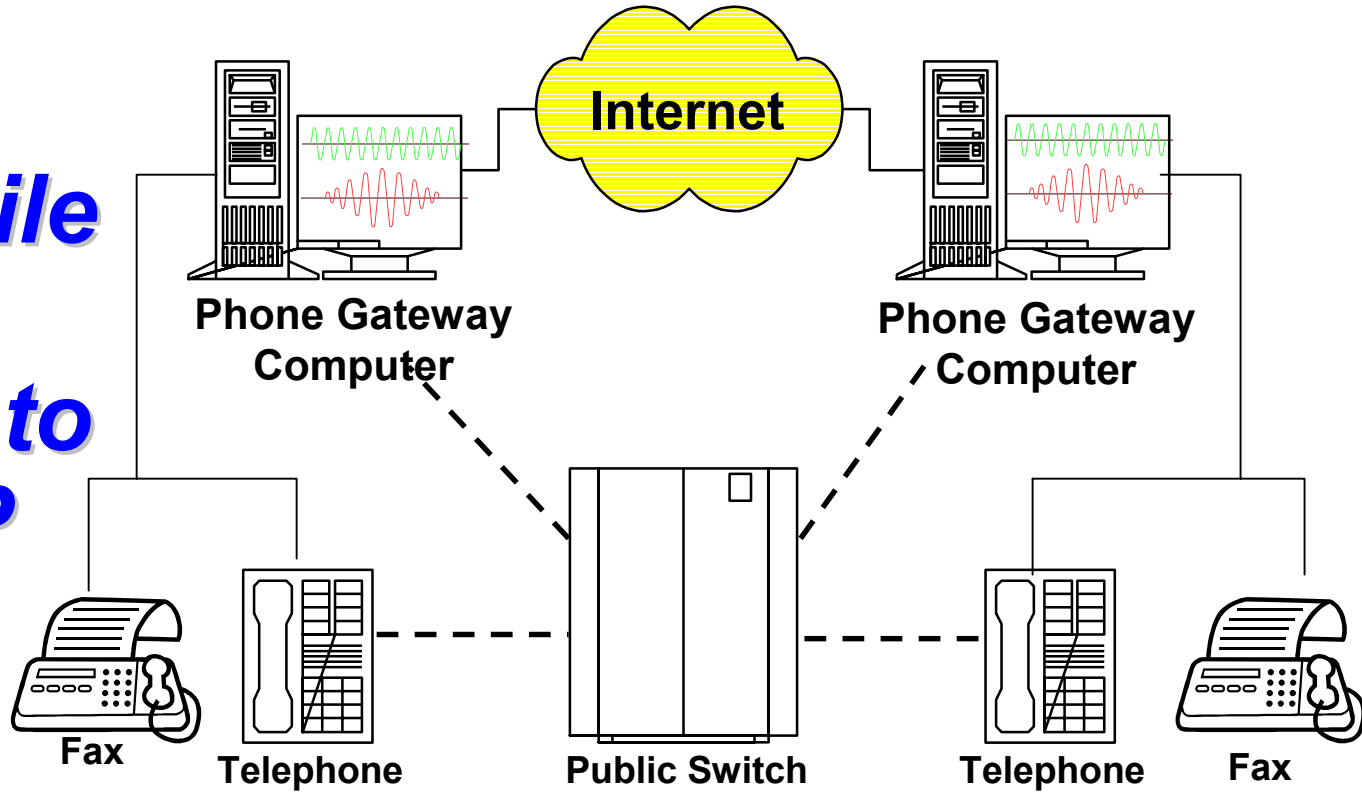
- Needs similarly equipped Internet users (e.g., IP telephony software, multimedia PC etc), both logged-on simultaneously
- Main applications: avoidance of usage-based telephone charges, chat-rooms, company LANs
- Application providers include Firetalk, Phonefree
- Potential Market: < 50 million users?

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



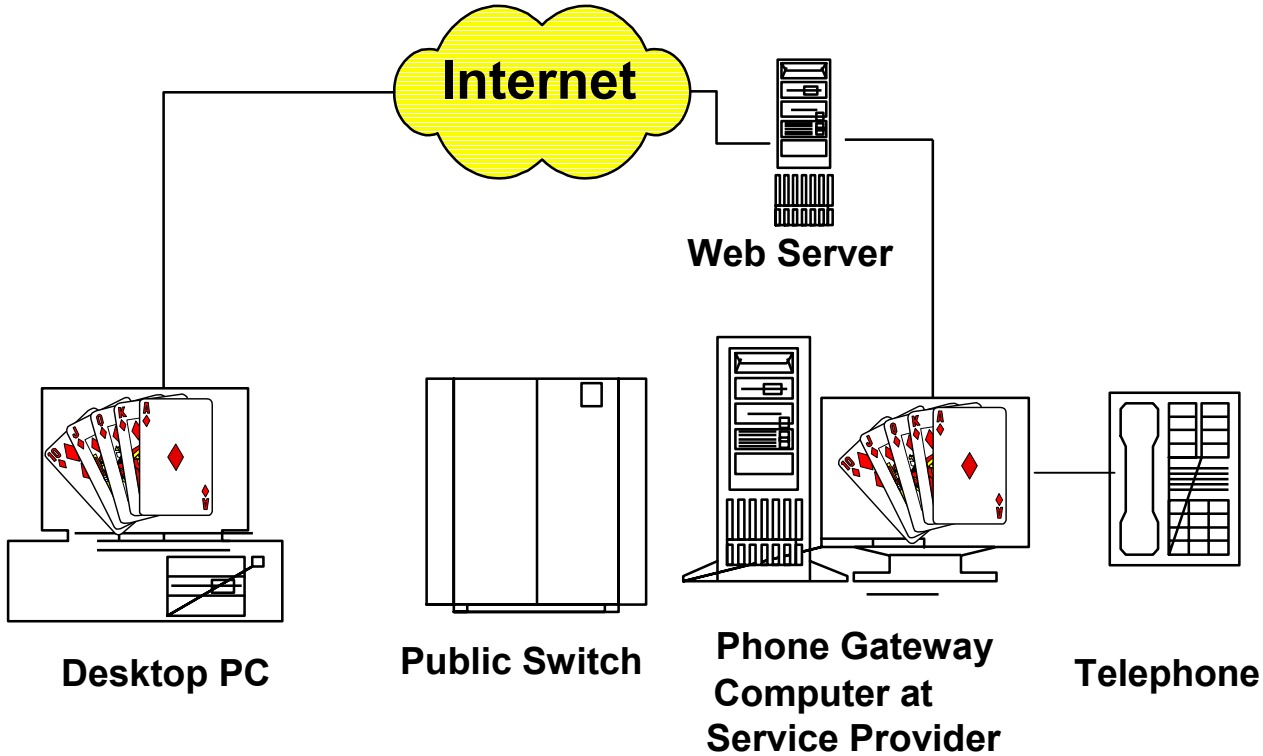
- Internet users with multimedia PC able to call any phone or fax user (not, at present, *vice versa*)
- Main motivation: Reduced telephone charges, “free” calls to US, Korea, Hongkong SAR etc
- Service providers include Net2Phone, DialPad etc
- Market potential: Sending, >350 million Web users, receiving >1.6 billion telephone/mobile users

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



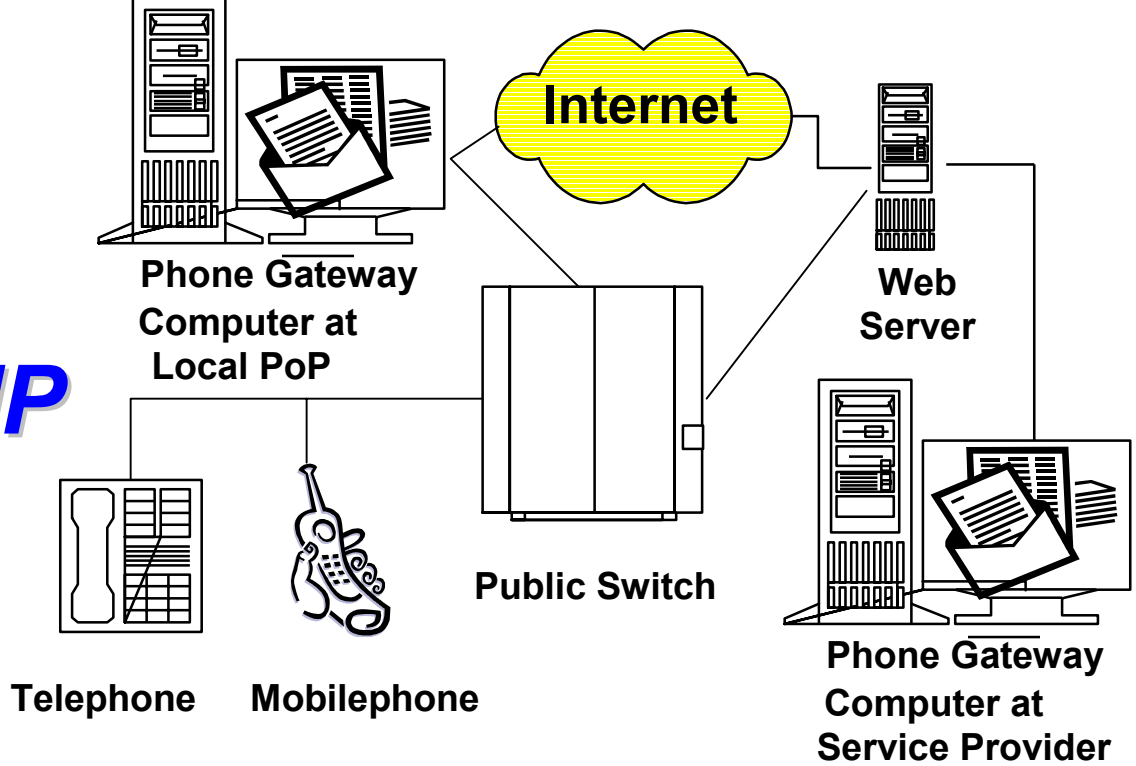
- Any phone/fax/mobilephone user to any other
- Main motivation: Reduced call charges, accounting rate bypass, market entry for non-facilities-based carriers (e.g., via pre-paid cards)
- Service providers include speak4free, I-link etc
- Market potential: >1.6 billion phone/fax/mobiles

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: >350 million Internet users

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

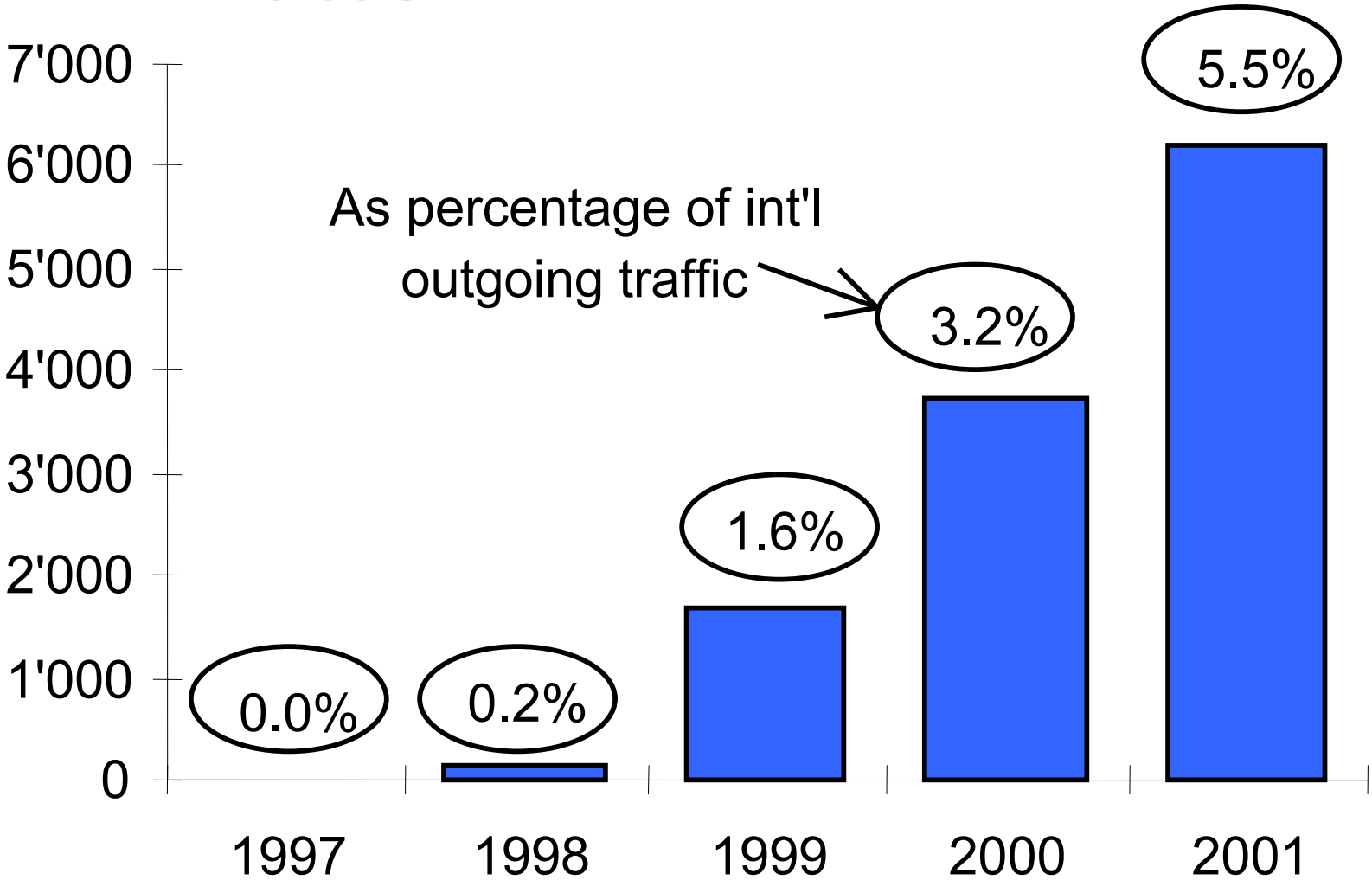


- Phone or mobilephone users utilise enhanced services (e.g., integrated messaging, voice response) available from IP service provider
- Main motivation: Integrated messaging, computer telephony integration, m-commerce
- Market potential: >1.6 bn phone/mobile users
- Service providers include Yac.com, 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"**

Why is IP Telephony important?
IP Telephony traffic, in million minutes

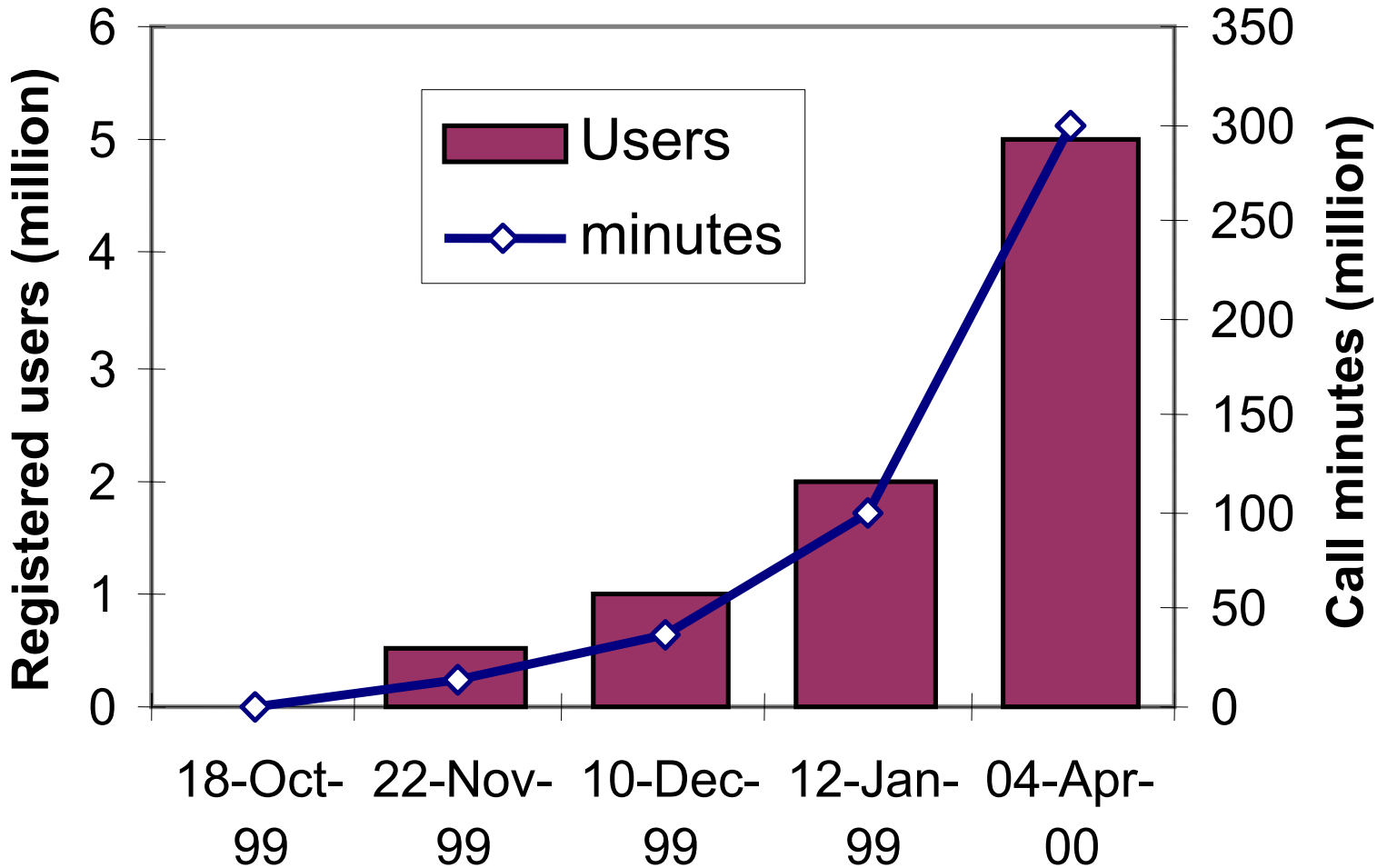


Source: ITU Internet Reports, adapted from TeleGeography Inc.

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.

World Telecommunication Policy Forum: What is it?

- "The purpose of the forum is to provide a venue for creating a shared vision among policy-makers worldwide on the issues arising from the emergence of new telecommunication services and technologies, and to consider any other policy issue in telecommunications which would benefit from a global exchange of views"
- "Rough consensus" in the form of 4 opinions which are non-prescriptive and non-binding
- Some 750 senior policy-makers, regulators and industry experts took part, from more than 120 countries and 100 private sector members

Background issues paper: Secretary-General's report

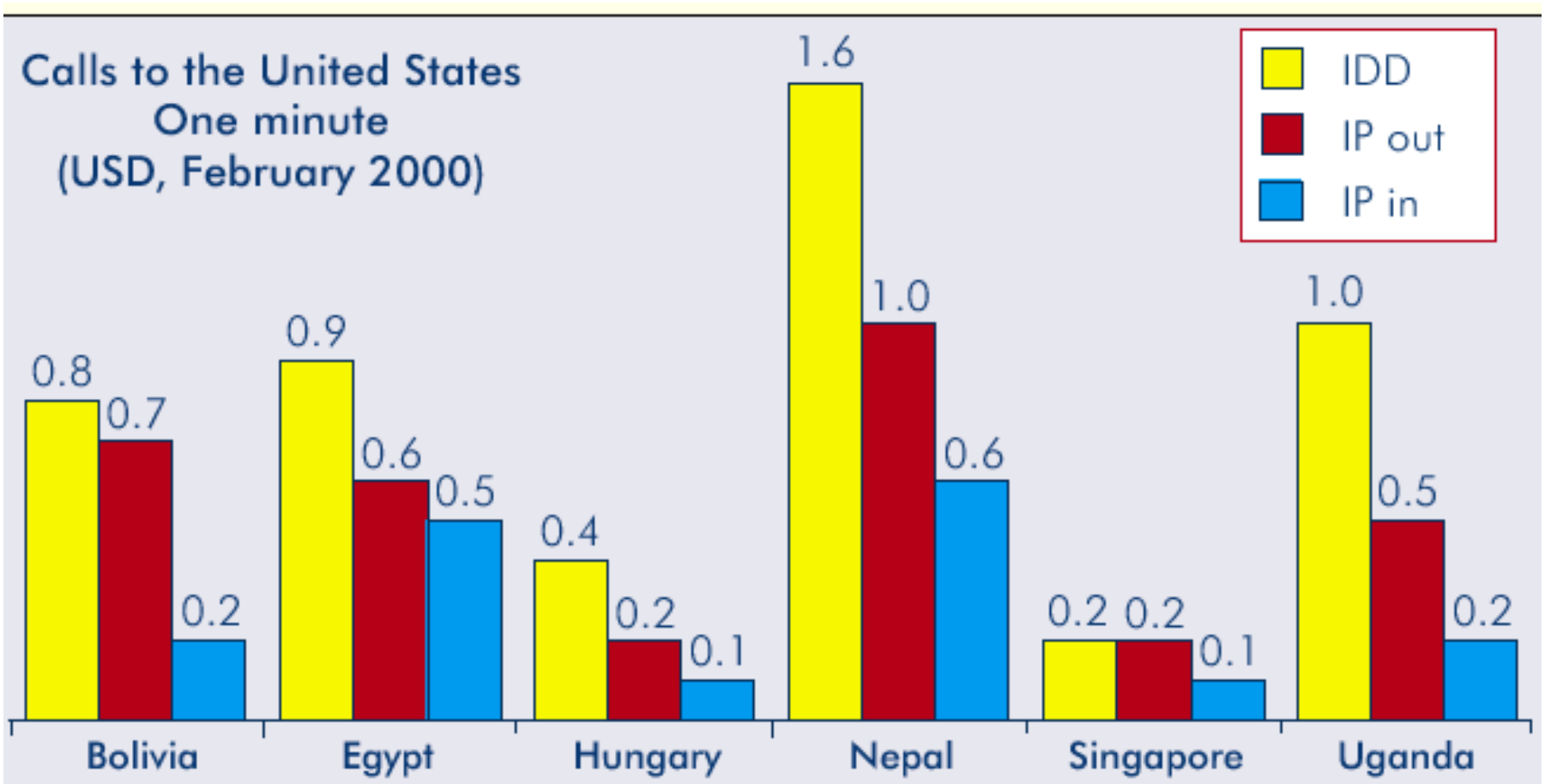
- **Technical:**
  - ⇨ How to define IP Telephony?
  - ⇨ Is quality of service comparable? Will it improve?
  - ⇨ How to handle numbering issues?
- **Economic:**
  - ⇨ What price and cost savings can be expected?
  - ⇨ How quickly will carriers migrate their networks?
  - ⇨ Isn't it just a form of bypass of telecom monopolies?
- **Regulatory:**
  - ⇨ Is it voice or is it data?
  - ⇨ License it? Prohibit it? Restrict it? Liberalise it?
  - ⇨ Should IP Telephony contribute to Universal Service?

Country case studies: IP Telephony legal status

Country	Legal status	Situation
Bolivia	Forbidden except for licensed operators	Licensed operators not providing this service. Use is limited
Egypt	Forbidden except for licensed operator	Licensed operator recently launched this service
Hungary	Allowed for international traffic	40 licensed IP telephony providers by the end of 1999
Nepal	Voice over IP, forbidden except for licensed operator. Fax over IP allowed	Licensed operator not providing this service. Use is prevalent for both outgoing and incoming traffic
Singapore	Allowed	70 licensed IP telephony providers by the end of September 2000
Uganda	Forbidden except for licensed operators	Licensed operator not providing this service. Use is prevalent for both outgoing and incoming traffic

Source: Summary of ITU country case studies, available at: www.itu.int/wtpf/casestudies.

Country case studies: Potential price savings using IP Telephony



Note: "*IDD*" refers to published prices from the incumbent operator for international direct dialling. "*IP out*" refers to using the Net2Phone IP Telephony service within the country. "*IP in*" refers to using Net2Phone in the US to call to the country.

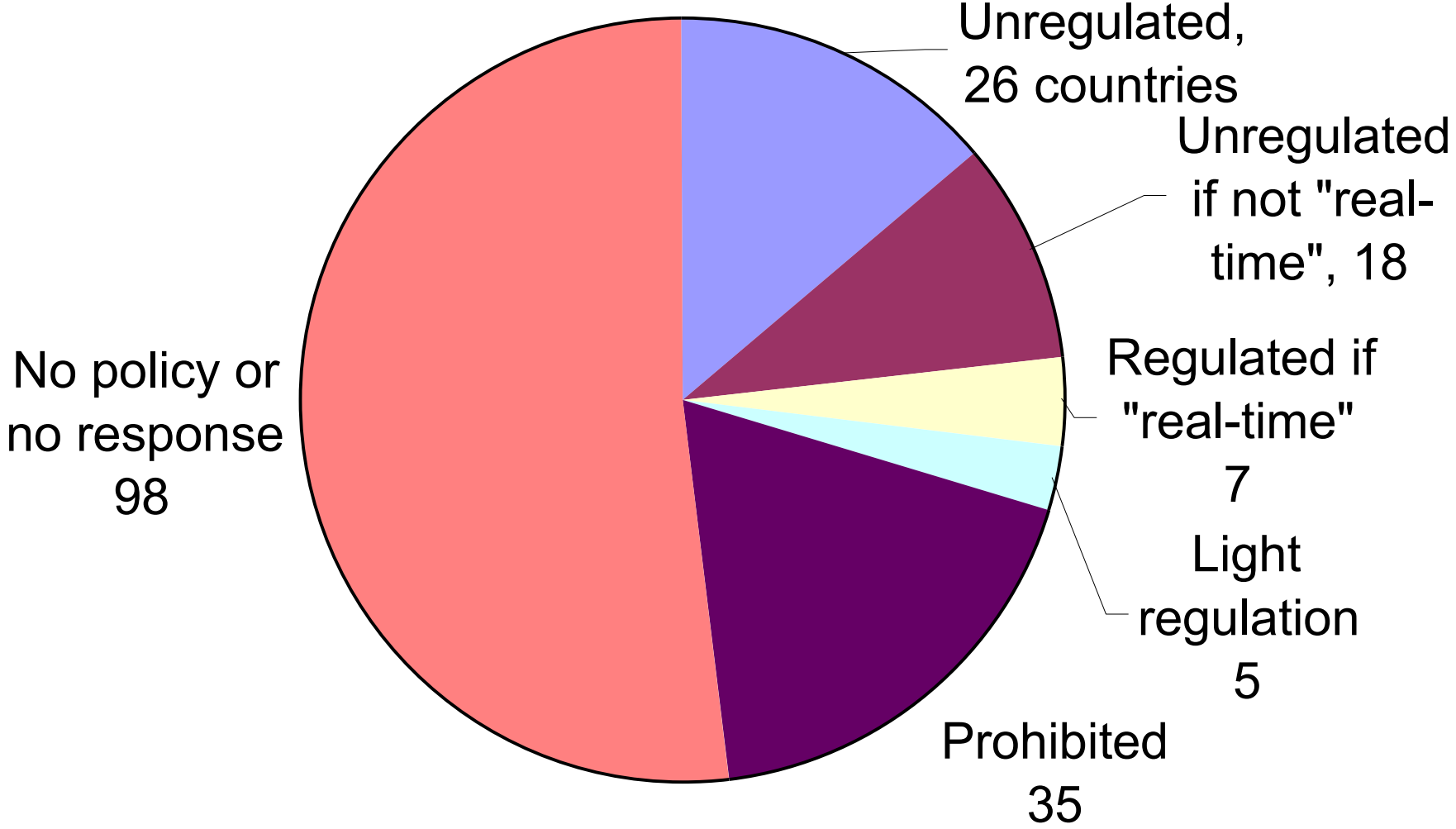
Source: Summary of ITU country case studies, available at: www.itu.int/wtpf/casestudies; Net2Phone; PTOs.

Country case studies: The stakes in international traffic flows

Country	Outgoing	In-coming	Total	Per in-habitant	Per main line	As percentage of revenue
Bolivia	32	88	120	15	239	35
Egypt	149	532	681	11	145	25
Hungary	229	441	670	67	180	8
Nepal	25	23	48	2	190	55
Singapore	1 350	1 080	2 430	624	1 295	39
Uganda	10	19	29	1	509	23

Note: "*Outgoing*", "*Incoming*" and "*Total*" show international traffic in millions of minutes p.a. "*Per inhabitant*" and "*per main line*" shows traffic in minutes p.a., "*As % of revenue*" shows revenue from international traffic as a % of total telecom revenue for the country.
Source: Summary of ITU country case studies, available at: www.itu.int/wtpf/casestudies. ITU World Telecommunication Indicators Database.

Country positions on IP Telephony
189 ITU Member States



As of March 2001. Based on responses to ITU regulatory questionnaire and inputs to WTPF-01.

Opinion A: General implications of IP Telephony

- **The World Telecom Policy Forum noted that:**
  - ⇨ **the deployment of IP-based networks benefits users, industries, and the economy at large, because it fosters technical and market innovation, diversity and economic growth**
- **… and adopted the view that:**
  - ⇨ **IP Telephony applications are best supplied in a market in which consumers have choices among multiple, alternative sources because only then will citizens, businesses and the overall economy reap the benefits of innovation and cost effectiveness**
- **… and invited Member States to review their current regulatory frameworks**

Opinion B and C: Co-operation among members, esp. on HRD

- **Invites the ITU to:**
  - ⇨ Carry out and update IP Telephony case studies;
  - ⇨ Carry out cost studies and assist Members in performing cost-benefit analyses;
  - ⇨ Help Member States attract investment
- **… and to carry out regional workshops on:**
  - ⇨ IP-based technologies and network evolution
  - ⇨ Cost structures, pricing mechanisms, interconnection, numbering, attracting investment, market considerations etc.
- **… to assist Member States in:**
  - ⇨ Creating integrated human resources transition plants to IP and evaluating new HRD challenges

Opinion D: Essential Studies to facilitate introduction of IP Tel

- **Issues to consider include:**
  - ⇨ compatibility and inter-operability of radio access between IP networks and PSTNs,
  - ⇨ working definitions of IP Telephony and Internet Telephony
  - ⇨ compatibility with the existing international telephone service, including developing appropriate performance metrics and QoS
  - ⇨ Whether traffic identification and measurement need to be considered?
  - ⇨ identifying the cost elements of international IP connectivity with respect to the introduction of IP Telephony

Information resources

- ITU Internet Reports 2001: IP Telephony
- Secretary-General's report (sole working document of the Forum)
- Chairman's report (output of Forum)

- Website: www.itu.int/wtpf
- Country case studies: Canada, China, Colombia, Egypt, Korea (Rep.), Nepal, Peru, Uganda, etc