WTPF – 2001
On IP Telephony

(Seminar in Niamey, April 2001)

Saburo TANAKA
Councellor, TSB/ITU

Saburo.tanaka@itu.int

Note: The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership.

Agenda

- Overview of WTPF
  - ⇨ Purpose
  - ⇨ Agenda for WTPF
- What are the issues?
  - ⇨ What is IP Telephony
  - ⇨ Opportunities and challenges
  - ⇨ Policy and Regulatory issues
- What will be the impact of IP Telephony?
  - ⇨ In developed countries
  - ⇨ In developping countries
- Results of WTPF

Overview of WTPF

(Held in Geneva from 7-9 March 2001)

- **Purpose**
  - ⇨ To provide a forum for discussion and for exchange views
  - ⇨ WTFP shall not produce prescriptive regulatory outcome but prepare reportPurpose
- **The agenda of the WPTF**
  - ⇨ The general implication of IP Telephony
  - ⇨ Actions to assist Member States & Sector Members to facilitate adaption to the new environment
  - ⇨ Action to assist MS & SM in meeting the human resource development
- **Attendance**
  - ⇨ WTFP was attended by 757 persons (121 MS including 25 LDC, 99 SM)

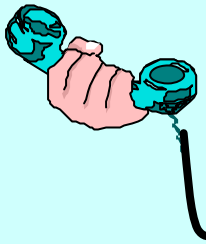
What is IP Telephony?

- **Definition**
  - ⇨ **IP Telephony: a generic term for the transmission of voice, fax over packet-switched IP-based networks**
  - ⇨ **Voice over IP: The transmission of voice over circuit employing Internet Protocol**
  - ⇨ **Internet Telephony: Transmission of voice over the Internet**

A wide variety of services can be provided using combination of: the type of terminal devices used, where the gateways are located and the underlying means of transmission.

WTPF had only "working definition" and it requested ITU-T to define more clear definition on "IP Telephony" and "Internet Telephony".

A call from the GSTN to an IP terminal

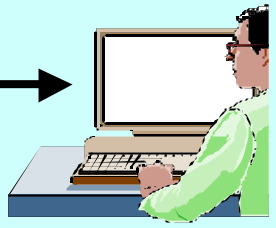


GSTN

IP network

POP(Gateway)

IP access



H.323.

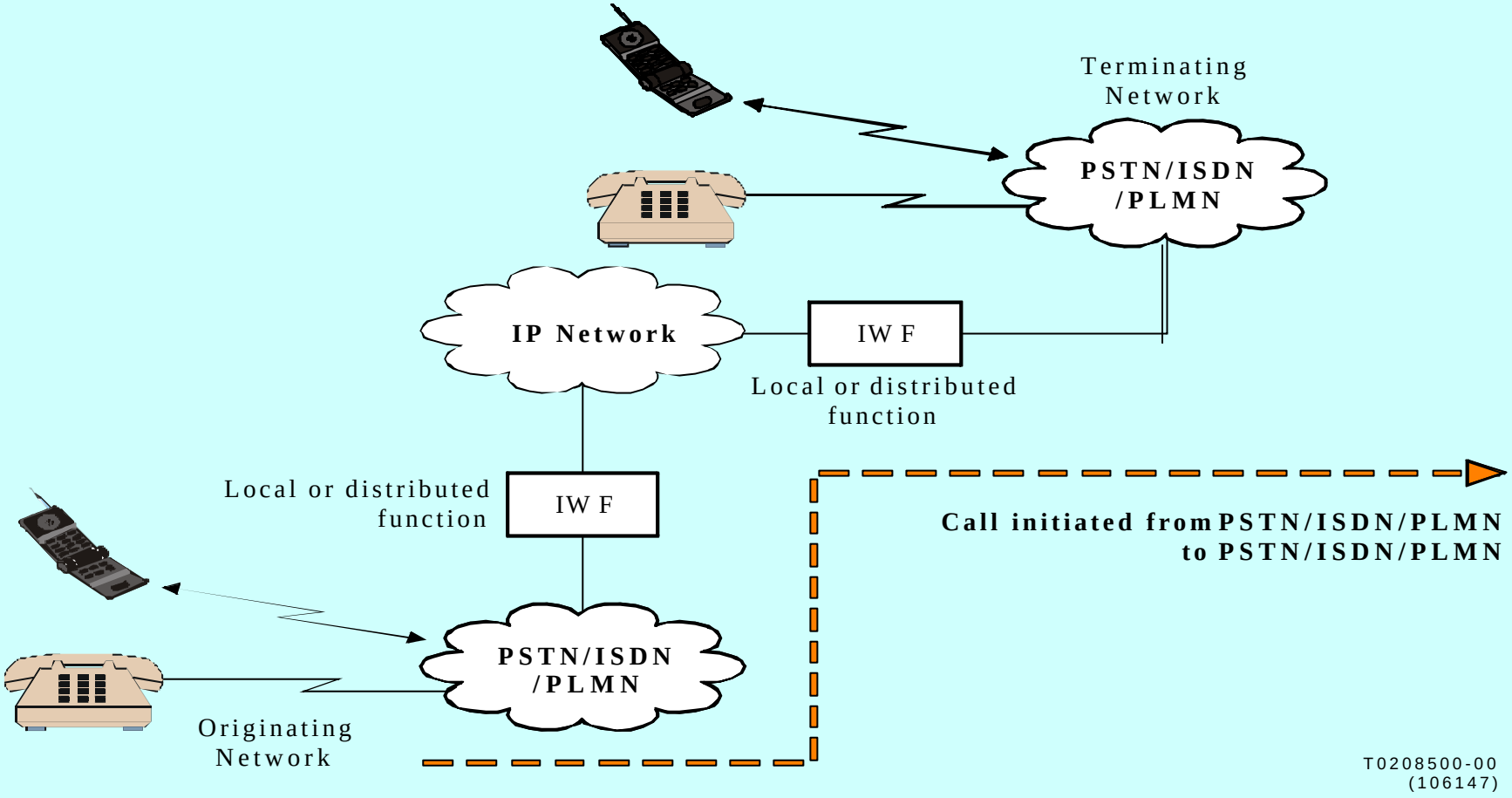
Normally a local call, handled by Telco A

International boundary

Carrier Domain

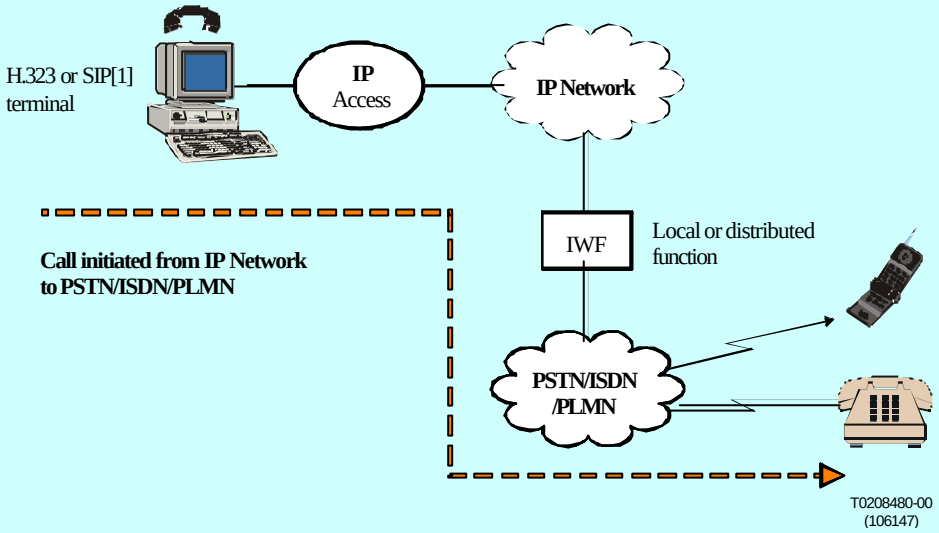
International geographic part of the call. There is no 1 to 1 correspondance to normal PSTN distance

IP-Based network domain

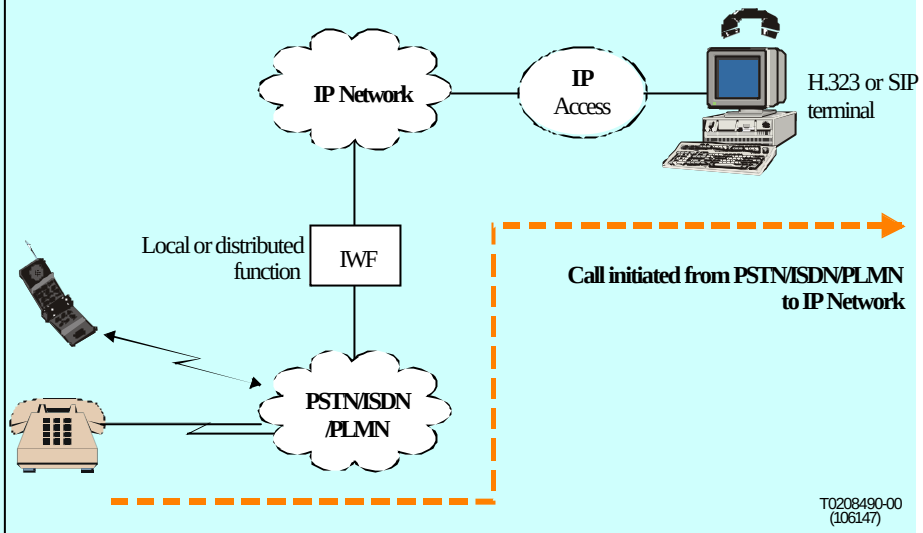


Call from International Telecommunication Network (ITN) to another ITN via IP-based Network

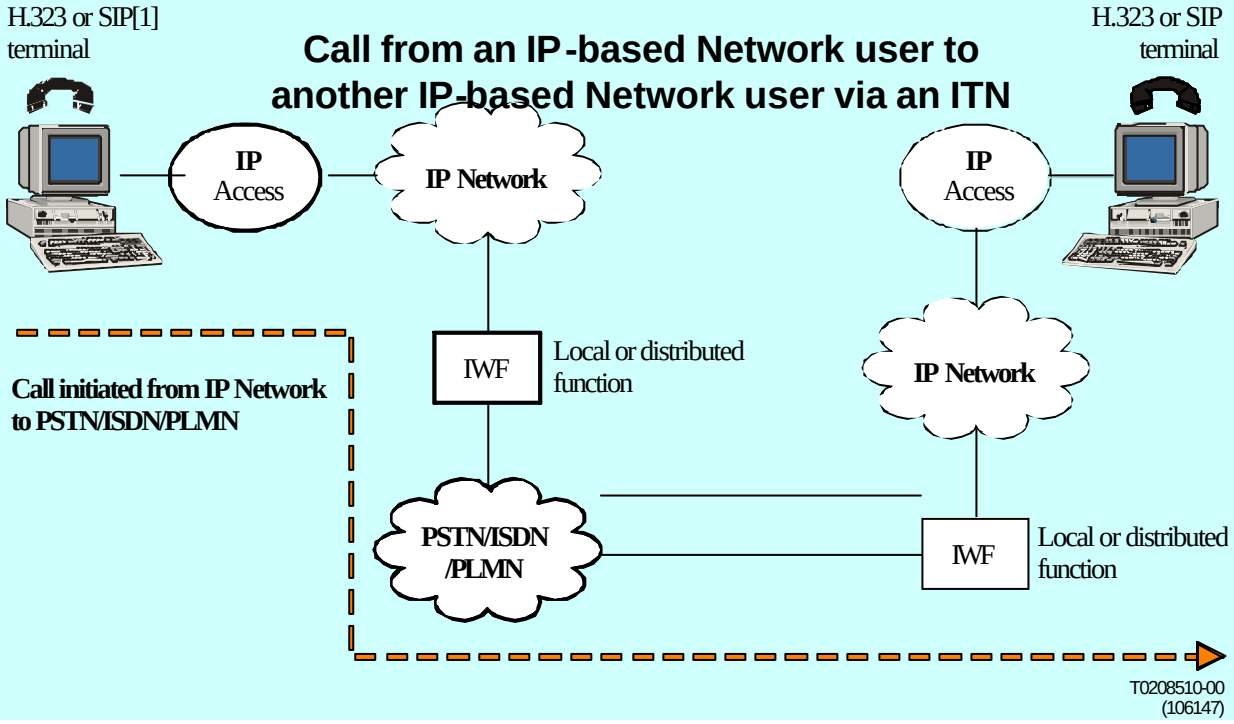
Call from IP Network User to the ITN



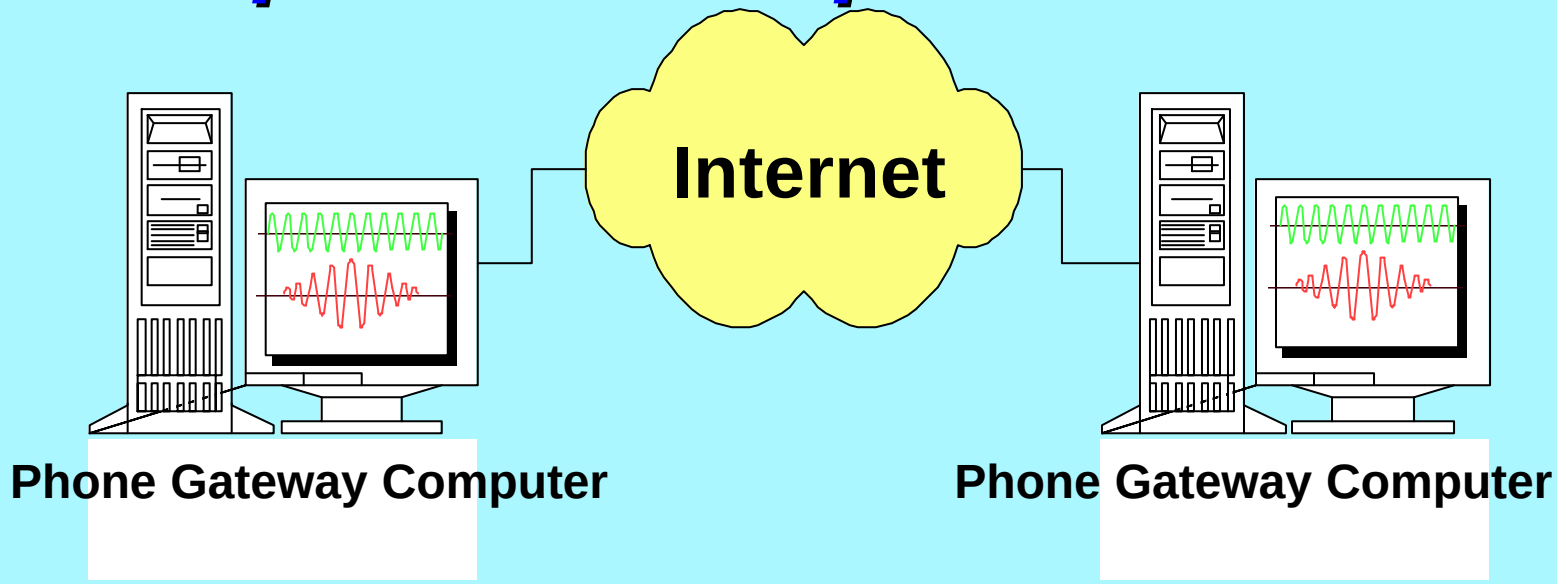
Call from ITN to an IP-based Network user



Call from an IP-based Network user to another IP-based Network user via an ITN

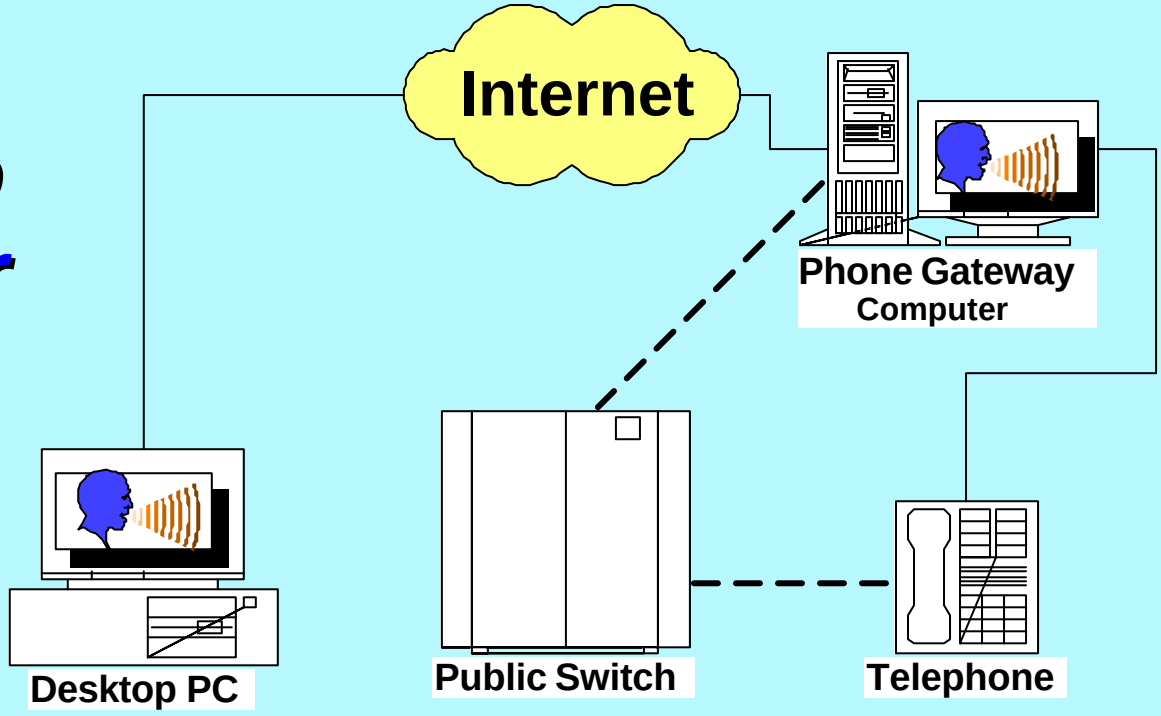


1. Computer to computer



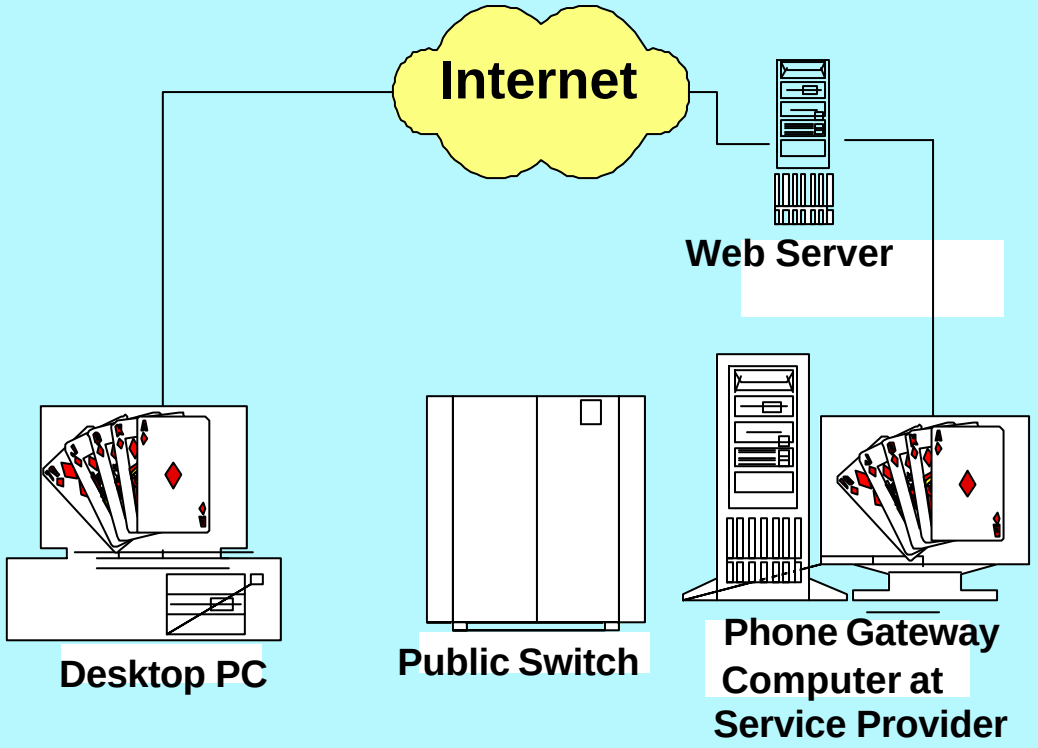
- Needs similarly equipped Internet users (e.g., IP telephony software, multimedia PC etc), both logged-on simultaneously
- Main motivation: avoidance of usage-based telephone charges
- Software vendors include VocalTec, Camelot etc
- Market: Less than 15 million potential users?

2a. Computer to telephone or fax



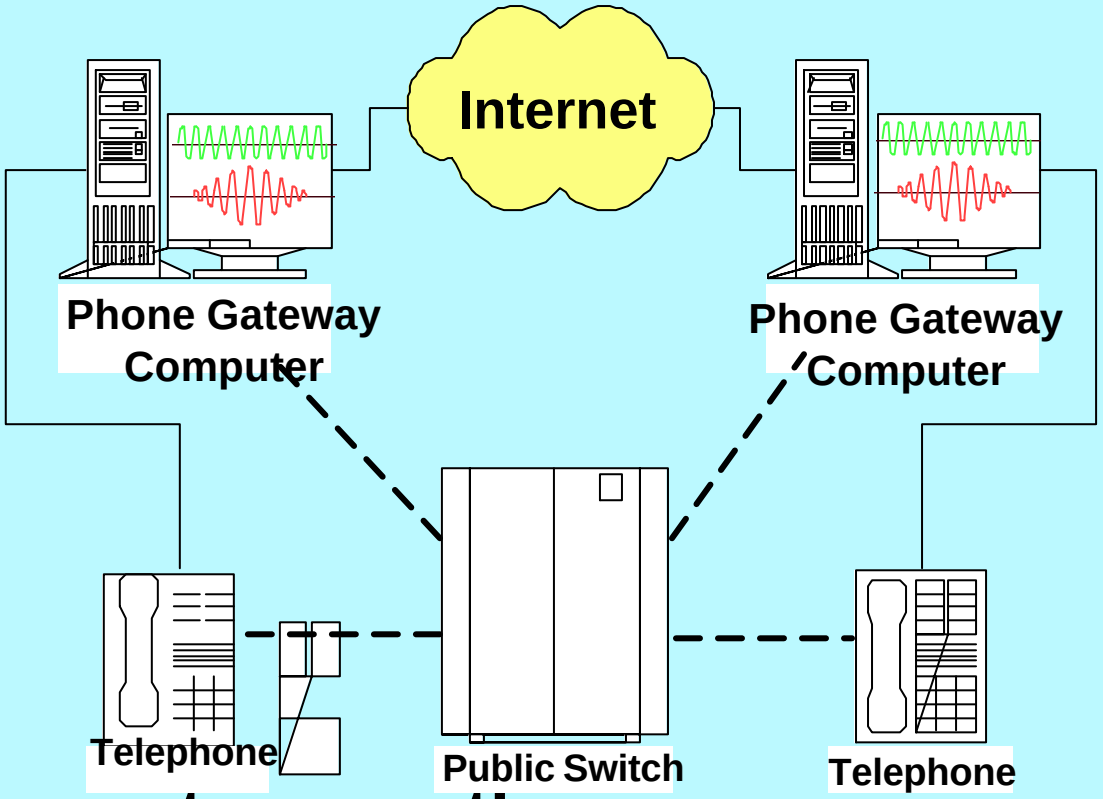
- Suitably equipped Internet users able to call any telephone user (not necessarily *vice versa*)
- Main motivation: Reduction of international telephone charges
- Service providers include IDT (Net2Phone), FWD
- Market potential : Sending <15 million equipped users, receiving >800 million telephone users

2b. Computer to service provider telephone



- Suitably equipped Internet users browse Website and choose voice/video connection option
- Main motivation: Service provider can interact directly with potential clients, via voice or other electronic means
- Market potential: Integration of sales-oriented web site and telemarketing. Pornography, Gambling ...

3. Telephone to telephone (fax to fax) via Internet



- Any telephone user to any other
- Main motivation: Accounting rate bypass, market entry for non-facilities-based carriers
- Potential service providers include any PTO with settlement payments deficit (e.g., US = US$5.7bn)
- Market potential : 850+ million telephone users

Opportunities and challenges

- **Opportunities**
  - ⇨ Unifying platform for emerging converged network
  - ⇨ Reduce prices to consumers and the costs of market entry for operators
  - ⇨ In terms of volume of traffic carried and level of investment committed
- **Challenges**
  - ⇨ Undermine the pricing structure of the incumbent Public Telecommunication Operators (PTOs)
  - ⇨ Transition to IP-based networks also poses significant human ressource development challenges

IP-based networks = the technology of choice?

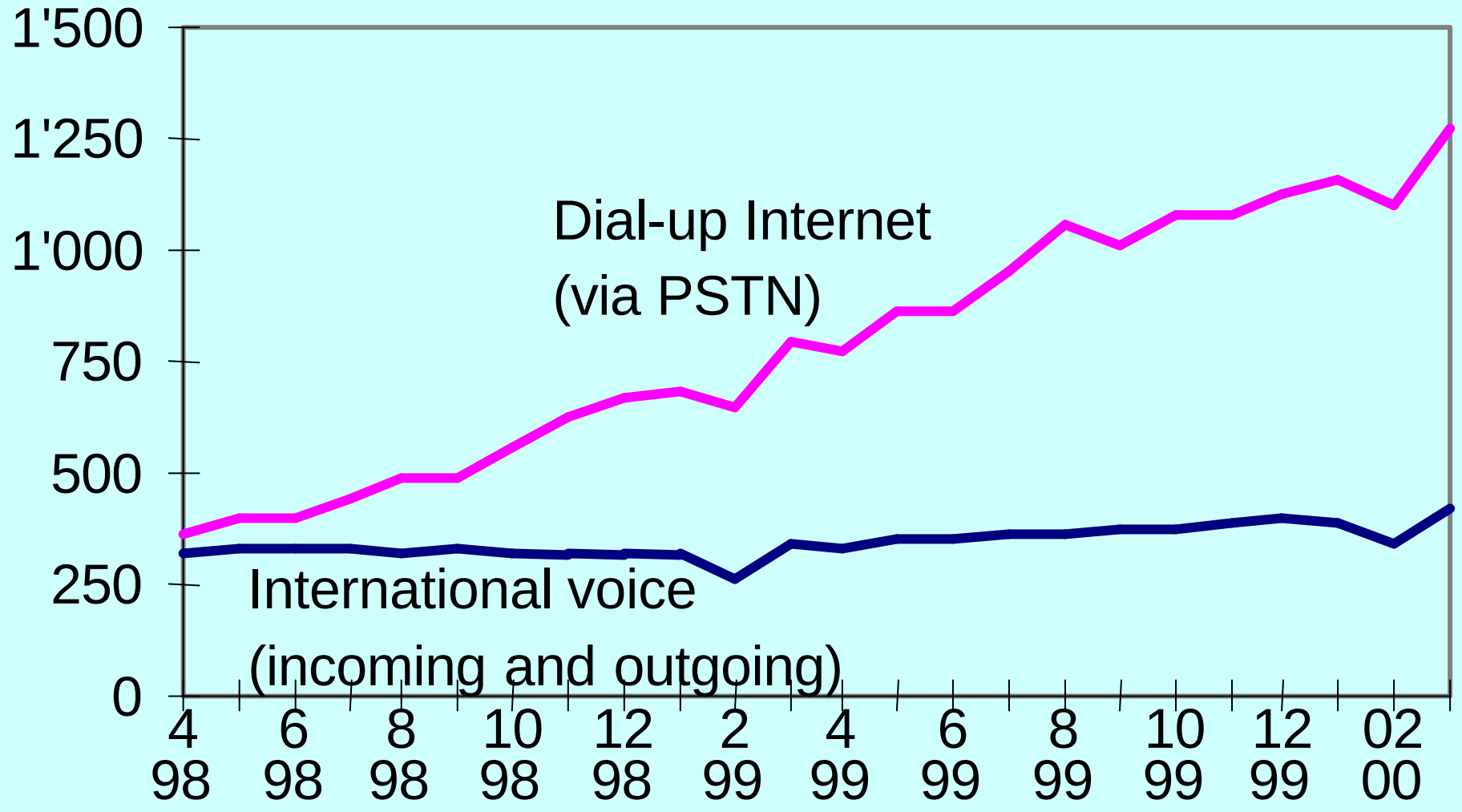
- **Several major PTOs will migrate all their international traffic onto IP**
  - ⇨ **The apparently lower cost of moving traffic over IP-based network**
  - ⇨ **Necessity in the age of the Information Society**
  - ⇨ **May serve as a dynamic stimulus to economic growth**
  - ⇨ **To offer much wider and diverse range of multi-media services and innovative applications**
- **But how about for developing countries?**
  - ⇨ **No answer, study requested to ITU-T**

The influence of IP Telephony on price

- **IDC forecasts that "Web Talk" revenues will reach US$16.5 bn by 2004 with 135 billion mins of traffic**
- **Gartner Group forecast that IP Telephony and competition in Europe will reduce prices by 75% by 2002**
- **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.

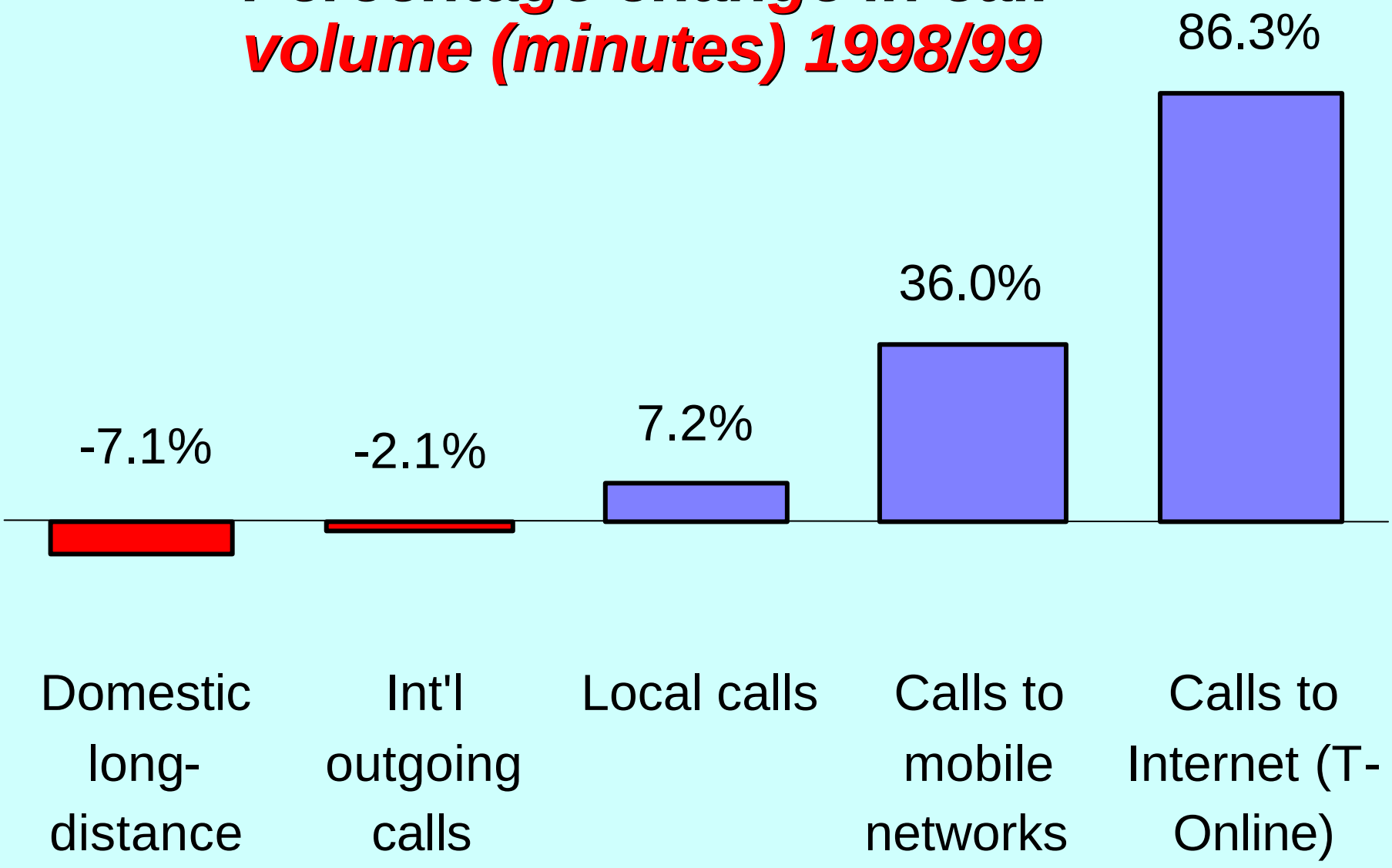
Minutes of use by month, Hongkong SAR ('000s)



Source: OFTA (www.ofta.gov.hk)

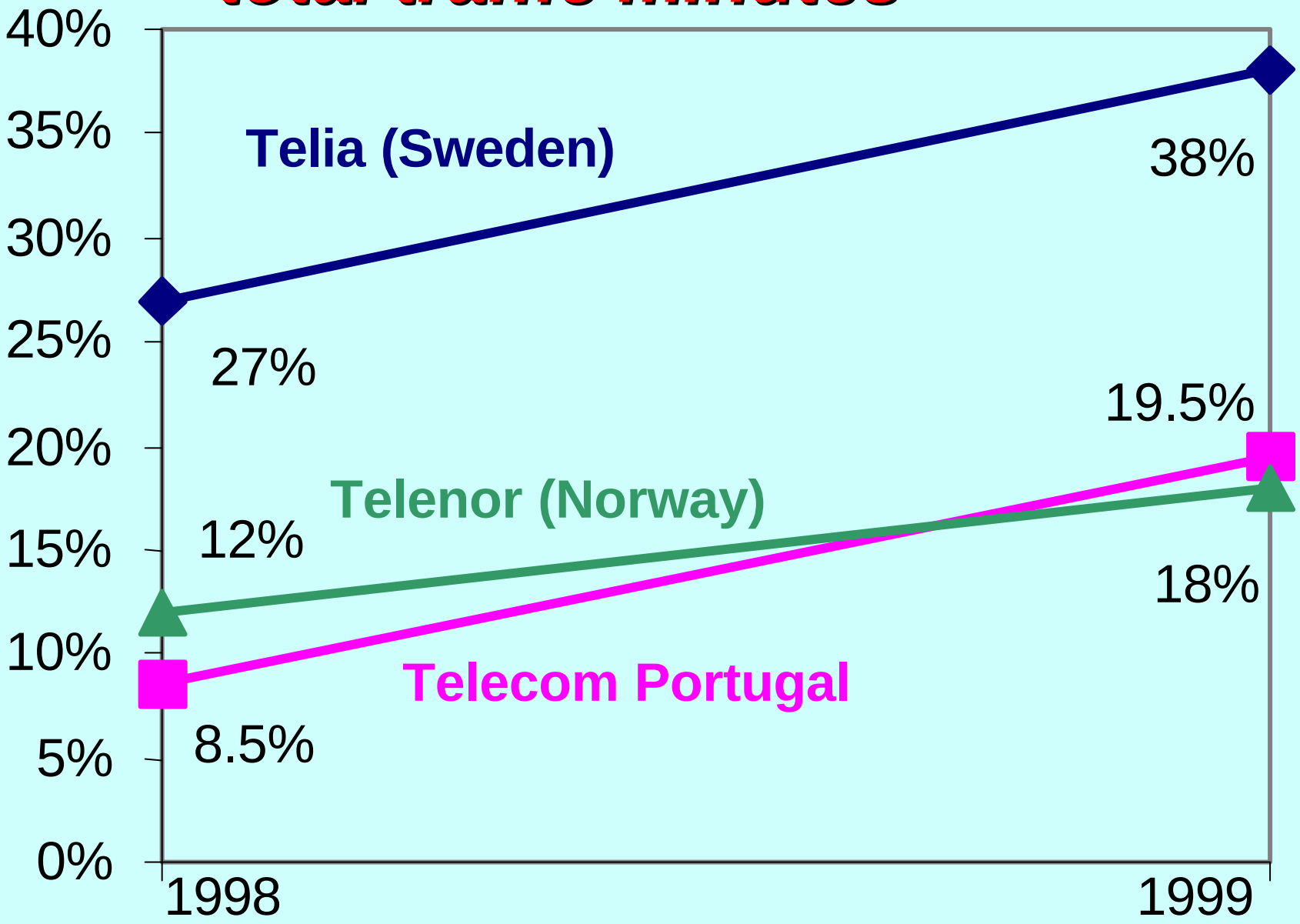
Deutsche Telekom

Percentage change in call volume (minutes) 1998/99



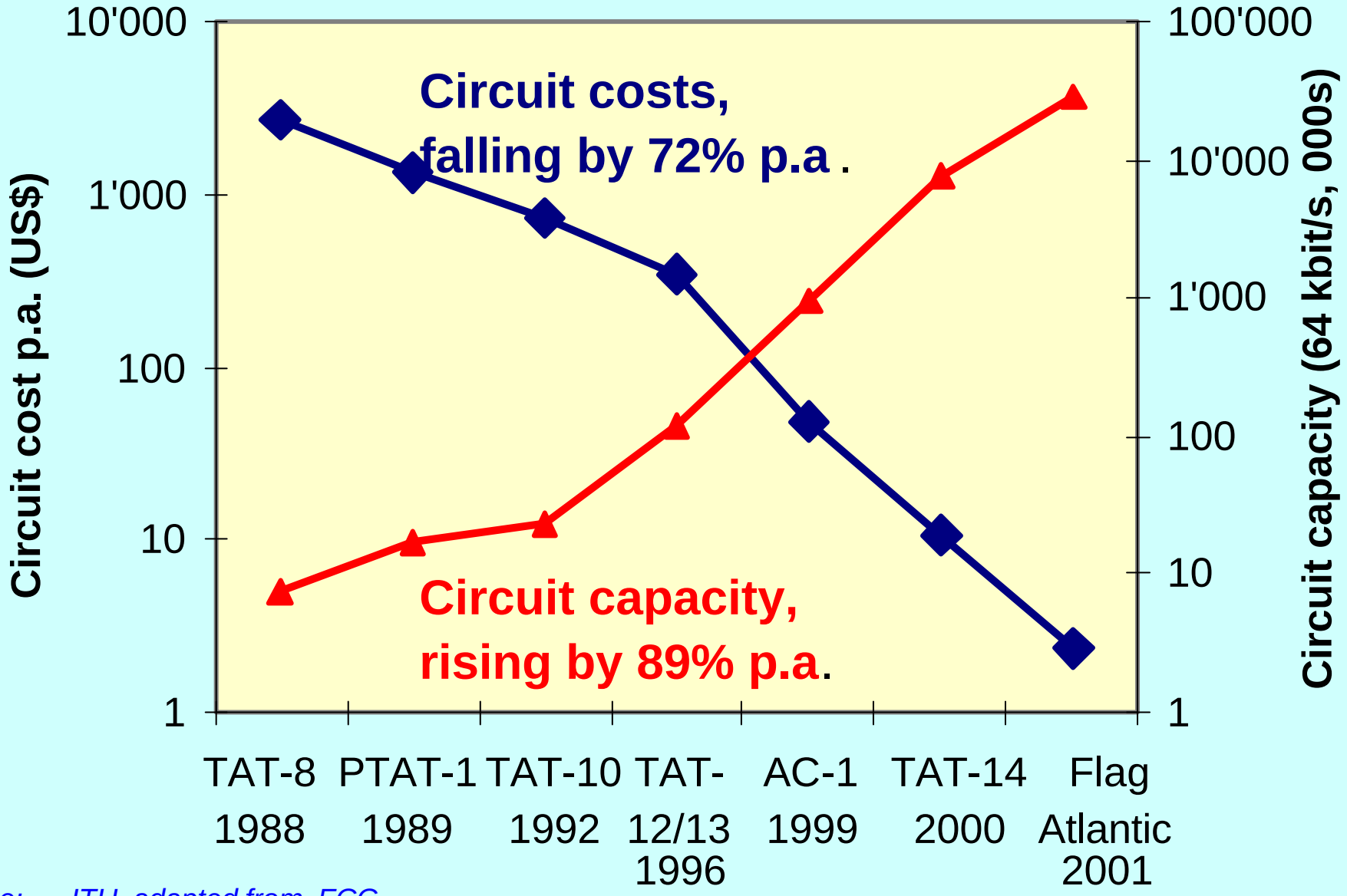
Source: **Deutsche Telekom annual report.**

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

Infrastructure capacity and costs, TransAtlantic cables, 1988-2001



Source: *ITU, adapted from FCC.*
Note: *Circuit costs assume a usage level of 18%, a compression level of 5:1 and a life-time of 20 years.*

Challenges

Revenue gain and revenue loss

	Accounting Rate	IP-Telephony	Difference
PTO in Developed country	**Collect US$ 1.00 from user** Pays **US $ 0.55 settlement.** **Retains US $ 0.45**	**Collect US$ 1.00 from user** Pays **US$ 0.30 to ISP for terminating call.** Retains **US$** 0.70	**+0.25 US$**
PTO in Developing country	Receives **US $ 0.55 settlement.**	Receives **US $ 0.02 local call charge.**	**-0.53 US$**
ISP in Developing country	**0**	Receives **0.30 US $ for terminating charge** Pays **0.02 US $ for local call.** **Retains 0.28 US $**	**+0.28 US$**

Different Policy and Regulatory approaches

- **Possible government policy objectives for IP-Teleph.**
  - ⇨ **Universal Service / Universal Access**
  - ⇨ **Affordable telecommunications services**
  - ⇨ **Tariff re-balancing**
  - ⇨ **Ensuring a level-playing field for competitors and new entrants**
  - ⇨ **Promotion of new technologies and services**
  - ⇨ **Stimulating investment in network build-out and new services**
  - ⇨ **Impact on revenue streams of incumbent operators**
  - ⇨ **Technology transfer**
  - ⇨ **Human resource development**
  - ⇨ **Economic growth as a whole and in particular in the communications sector.**

The general picture

At present, several broad national policy emerge

- ⇨ **First, there are countries that include some or all forms of IP Telephony within their regulatory system**
- ⇨ **Second, there are countries that prohibit IPTelephony**
- ⇨ **Third, there are countries that do not regulate IP Telephony**
- ⇨ **Lastly, there are countries where the situation is uncertain or the issue remains to be formally addressed.**

Status of IP Telephony in ITU Member States

No specific prohibition for voice/fax over the Public Internet or over IP-based networks	Angola, Antigua and Barbuda,[1] Argentina, Bhutan, Congo, Costa Rica, Dominican Republic, Estonia[2], Gambia, Guatemala, Guyana, Madagascar, Malta, Mexico, Mongolia[2], Nepal, New Zealand, Poland, Slovak Republic, St Lucia[1], St Vincent[3], Tonga, Uganda, United States[4], Viet Nam
Permitted or not regulated, if not real-time (not considered voice telephony)	EU Countries[5], Hungary (if delay =/>250ms and packet loss >1%), Iceland
Permitted. If real-time, subject to light conditions (notification/registration may be required, other basic provisions of voice regulation	Czech Republic, Hong kong SAR, Japan, Singapore, Switzerland
Permitted. If real-time, treated similarly to other voice telecommunications services (licensable, subject to more extensive provisions of voice regulation)	Australia, Canada, China, Korea (Rep.), Malaysia
Countries that prohibit the use of <u>both</u> the Public Internet <u>and</u> IP-based networks for voice or fax services	Albania, Azerbaijan, Belize, Botswana, Cambodia, Cameroon, Côte d'Ivoire, Croatia, Cuba, Ecuador, Eritrea, Gabon, Indonesia, India, Israel, Jordan, Latvia, Lithuania, Morocco, Mozambique, Myanmar Nicaragua, Nigeria, Pakistan, Paraguay, Qatar, Romania, Senegal, Seychelles, Swaziland ,Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey
Countries that permit voice/fax over IP based networks but prohibit over public Internet	Cyprus, Ethiopia, Kenya, Peru, Philippines

Other Policy and Regulatory issues

- **License restriction**
  - ⇨ **A few countries expressly license PTOs to provide IP Telephony -**
- **Regulatory distinction**
  - ⇨ **Type of service, Voice or Data, Mode of network transmission, Quality of service**
- **Ffunctional equivalence**
- **Technological Neutrality**
- **Impact of IP Telephony on Universal Service/Access**

Developing country concerns

- **Developing countries receive no international settlement payments for IP traffic**
  - ⇨ **Increasingly, incoming IP traffic includes IP telephony and fax traffic which they must terminate**
- **They must pay to peer with US/EU backbone**
  - ⇨ **Peering costs are rising as IP traffic continues to grow exponentially**
- **They must pay both half-circuits of the International Private Line to the foreign ISP**
  - ⇨ **Even though traffic flows in both directions over the circuit, once it is established**
- **Telephone and fax traffic shifting to the Internet**
  - ⇨ **What will replace the US$7 bn from settlements?**

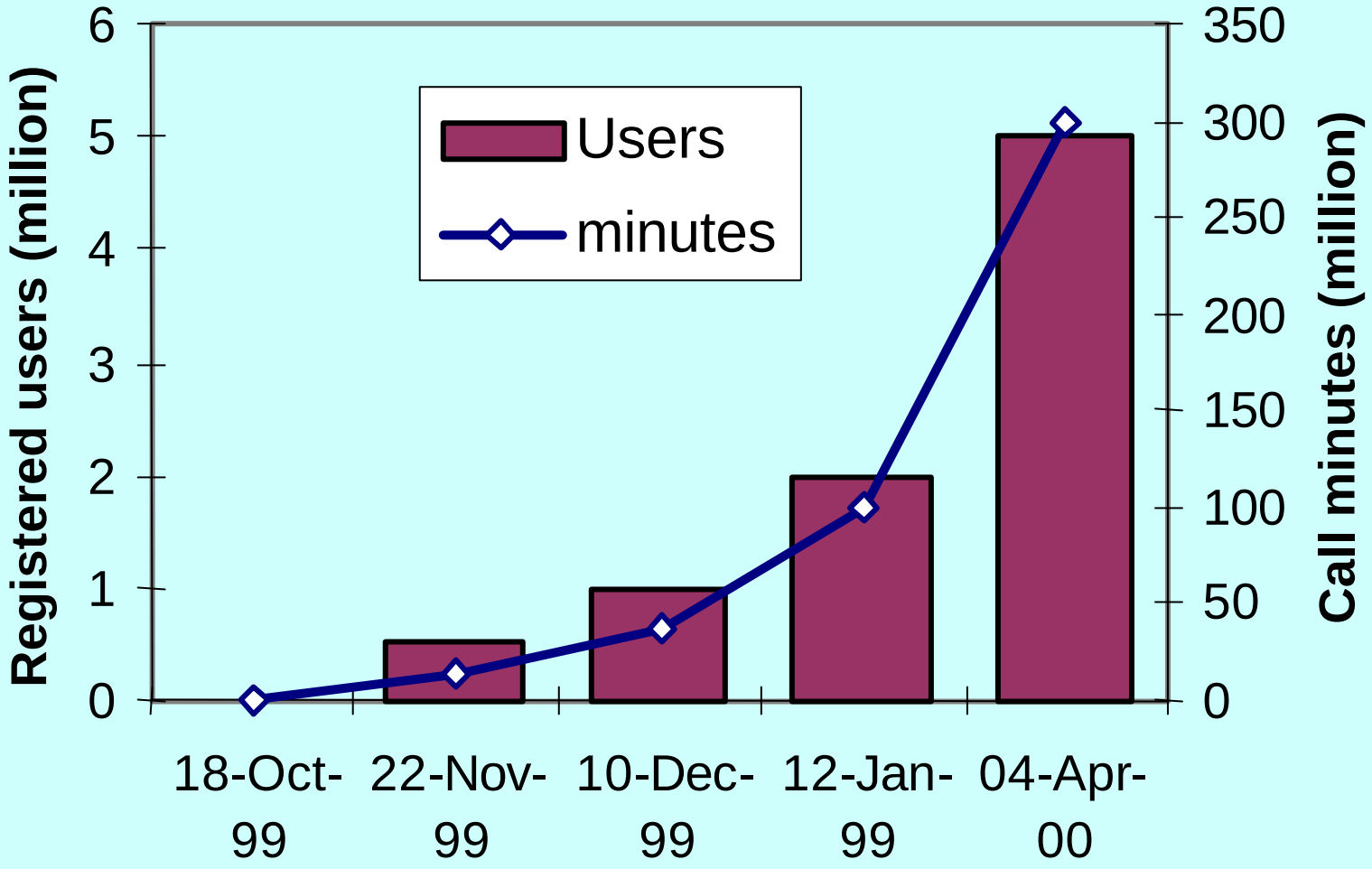
Pricing IP for voice services

- **In competitive, low-price markets**
  - ⇨ **Main market opportunity for IP Telephony is for value-added services, e.g., unified messaging**
- **In markets in transition to competition**
  - ⇨ **IP Telephony offers a route towards early introduction of competition and creates downward pressure on prices**
- **In high-price, monopoly markets**
  - ⇨ **Where permitted, IP Telephony creates opportunities for low-cost calls**
  - ⇨ **Even if not permitted, IP Telephony is widely used to reduce costs of international call termination**

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.

Opinion A

(The general implication of IP Telephony)

WTPF is of view that

- ⇨ **IP Telephony application are best supplied in a market in which consumers have choice**
- ⇨ **Government regulation should aim to foster an effective competitive environment**
- ⇨ **Regulation may be appropriate where there is market failure or when public interest cannot be adequately met by industry**
- ⇨ **Member States should examine the implication of applying existing regulatory regime to IP-based services and application**

WTPF invites

- ⇨ **MS & SM to consider the possibility of the introduction and of the deployment of IP technologies and IP application**
- ⇨ **All MS to review their current regulatory framework with a view to:**
  - **Encourage investment**
  - **Achieving public policy goals in the context of a converged communication service environment**
  - **Considering the possibility of opening their communication services market with respect to IP Telephony by adopting a competition oriented approach**

Opinion B

(Action to assist MS & SM in adopting to the changes in the telecommunication environment due to the emergence of IP Telephony)

WTPF invite the Secretary General and the Director of the Bureaux

- ⇨ **To promote understanding of the potential benefits of IP-based technologies and IP application to assist MS &SM, particularly developing countries**
- ⇨ **(i) by updating previous IP Telephony case studies;**
- ⇨ **(ii) by carrying out cost studies;**

  (iii) by helping to attract investment and promoting the use of international lending, Bureaux
- ⇨ **In the pursuit of the above, to conduct regional workshops in partnership with Member States and Sector Members**

  (i) how telecommunication infrastructure build-out;

  (ii) technologies that can support IP Telephony;

  (iii) how to create an environment that will attract investment;

  (iv) issues such as cost structures, pricing mechanisms, interconnection, numbering, quality of service and market consideration, etc.

Opinion C

(meeting the human resource development challenges)

WTPF invites the ITU, in particularly ITU-D

- ⇨ to facilitate the sharing of knowledge and views, by Member States and Sector Members

Invites ITU-D

- ⇨ 1 to encourage Member States and Sector Members to create integrated human resources transition plans;
- ⇨ 2 to assist Member States and Sector Members in evaluating and identifying new and changing human resources requirements;
- ⇨ 3 to draw upon existing BDT research and skilled personnel to identify:
- ⇨ (i) HRD/HRM and training issues related to network evolution;
- ⇨ (ii) HRD/HRM and training issues related to new technologies, including IP;
- ⇨ (iii) skills leading to the creation of a business environment that will attract infrastructure investment,

Invites ITU-T and ITU-R….

Invites Sector Members…

Invites SM & MS….

invites ….

Opinion D

(Essential studies by the ITU to facilitate the introduction of IP Telephony)

WTPF invites the three ITU Sectors

- ⇨ **each, for matters within its competence, and based on contributions from ITU Member States and Sector Members, to initiate new studies or pursue current ones, and to present any findings as soon as possible, to facilitate the introduction of "IP telephony" on a global basis, particularly with respect to:**
- ⇨ **1. in ITU-R,**

  compatibility and inter-operability of radio access between IP networks and PSTNs,
- ⇨ **2. in ITU-T,**

  a) a clear working definition of "IP telephony" and "Internet telephony";

  b) whether, and to what extent:
- ⇨ **i) to require compatibility of "IP telephony" with the existing international telephone service;**
- ⇨ **ii) compatibility should also include, but not be limited to, aspects of performance;**

  c) whether, and to what extent:
- ⇨ **i) to consider the possibilities of how "IP telephony" can be a part of national PSTNs;**

  ii) aspects of traffic identification and measurement;

  d) identifying the cost elements of international IP connectivity
- ⇨ **3. In ITU-D,**

  taking account of the need of developing countries to plan a strategy of migration for their networks into IP-based networks