Voice over IP

- Understanding the basics
- The impact on the price of telecommunications service in the region

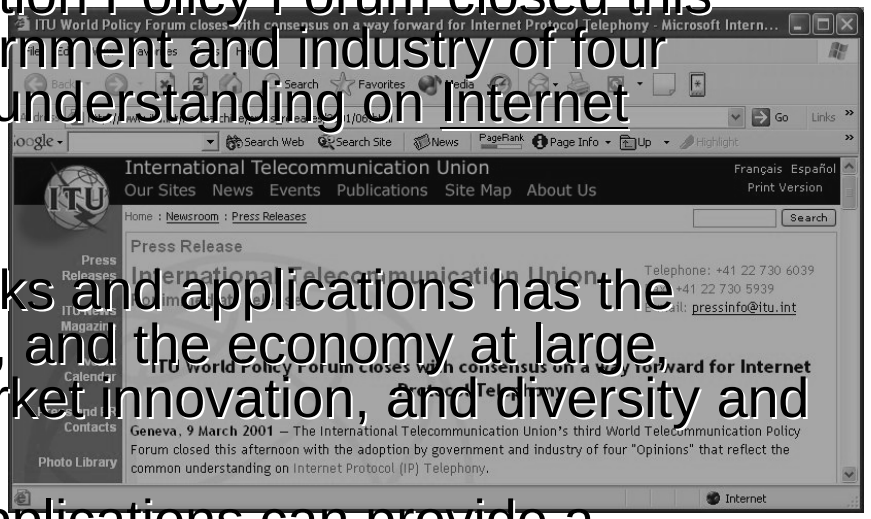
VoIP: The Basics

Agenda

- The basics of IP and the Internet
  - IP addressing
  - Internet architecture (Routers and hosts)
- IP Telephony – The What and Why
- The H.323 Protocol
- Typical IP call routing
- Regional Cases: Panama and the Cayman Islands

ITU World Policy Forum

Geneva, 9 March 2001 — The International Telecommunication Union's third World Telecommunication Policy Forum closed this afternoon with the adoption by government and industry of four "Opinions" that reflect the common understanding on Internet Protocol (IP) Telephony.



- The deployment of IP-based networks and applications has the potential to benefit users, industries, and the economy at large, because it fosters technical and market innovation, and diversity and growth in the economy;
- IP Telephony and other IP-based applications can provide a significant opportunity for all countries to respond to the convergence of information and communication technologies and to evolve their networks in order to expand the availability and use of a broader range of modern communication capabilities service sectors;

ITU World Policy Forum (Cont'd)

- The flexibility of IP technologies will contribute to an integration of voice and data networks, thereby allowing suppliers to take advantage of synergies and possible cost reductions, which will enable the provision of new innovative services and applications;
- Mobile wireless systems are expected to migrate towards an IP-based architecture in order to deliver integrated voice, data and multimedia services, as well as access to the Internet;
- Although IP Telephony has created some negative impacts on voice revenues generated by a number of telecommunication operators, particularly in some developing countries, there could also be a revenue gain for other communication operators and service providers.

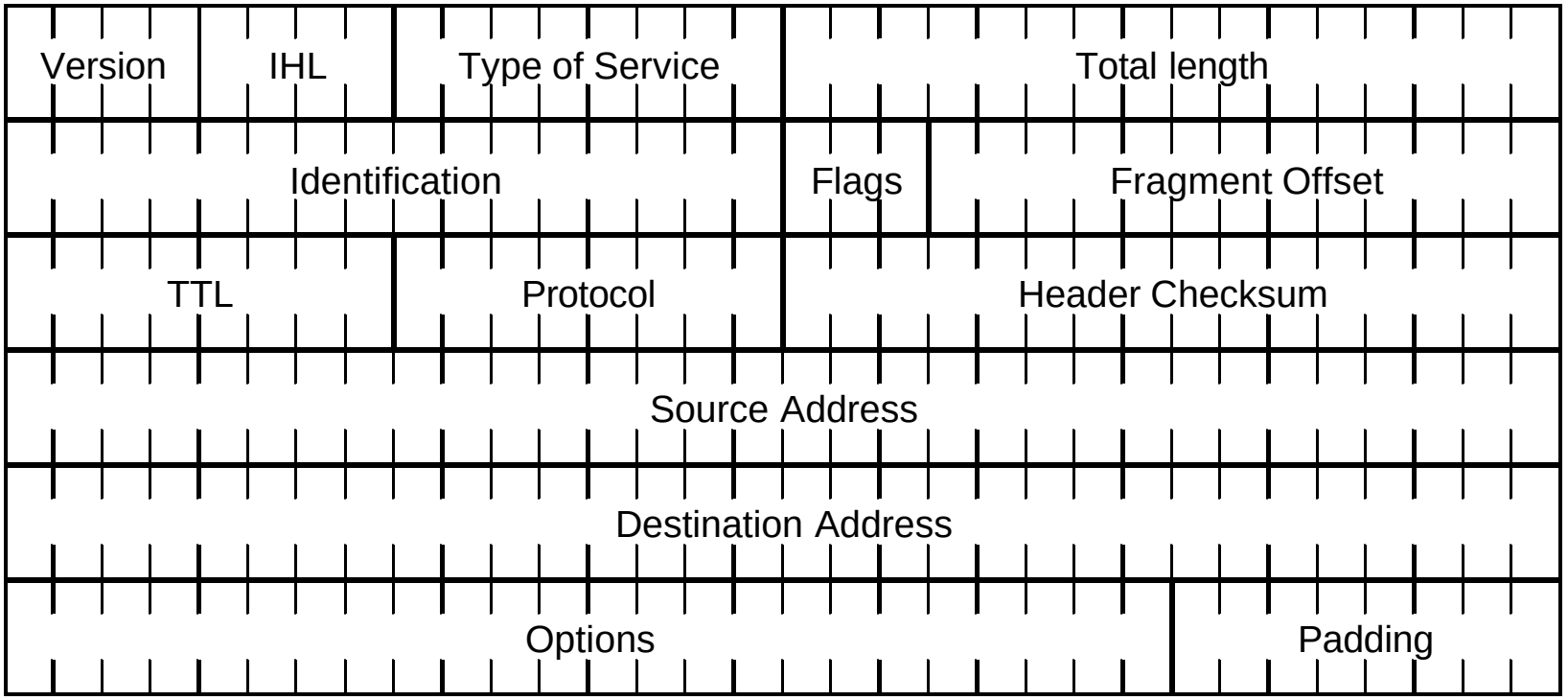
The basics of IP and the Internet

The Internet Protocol or IP is the best known protocol of the TCP/IP suite. It provides fast and generally unreliable movement of packets of data and the address and delivery mechanism for all TCP/IP-related traffic.

IP performs the following:

- Logical addressing
- Connectionless packet delivery
- Fragmentation and re-assembly

The basics of IP and the Internet: Typical IP Packet Header



The basics of IP and the Internet: IP addressing

- IP addresses are basically broken down into 4 numbers separated by a dot.
  Eg: 196.3.132.1
- There are currently two standards - IPV4 (detailed above) and IPV6.
- IP addressing scheme is broken down in classes that allow for sub-netting or separation of logical address boundaries.

The basics of IP and the Internet: Internet Architecture

(Routers, Hosts and Protocols)

- Routers: (Hardware) devices that direct IP packets to their next hop on the way to their final destination.

The basics of IP and the Internet: Internet Architecture

(Routers, Hosts and Protocols)

- Host: A generic term used to identify devices other than routers on the Internet. May be computers or other addressable devices

The basics of IP and the Internet: Internet Architecture

(Routers, Hosts and Protocols)

Protocols: The language of the net.

Typically service specific.

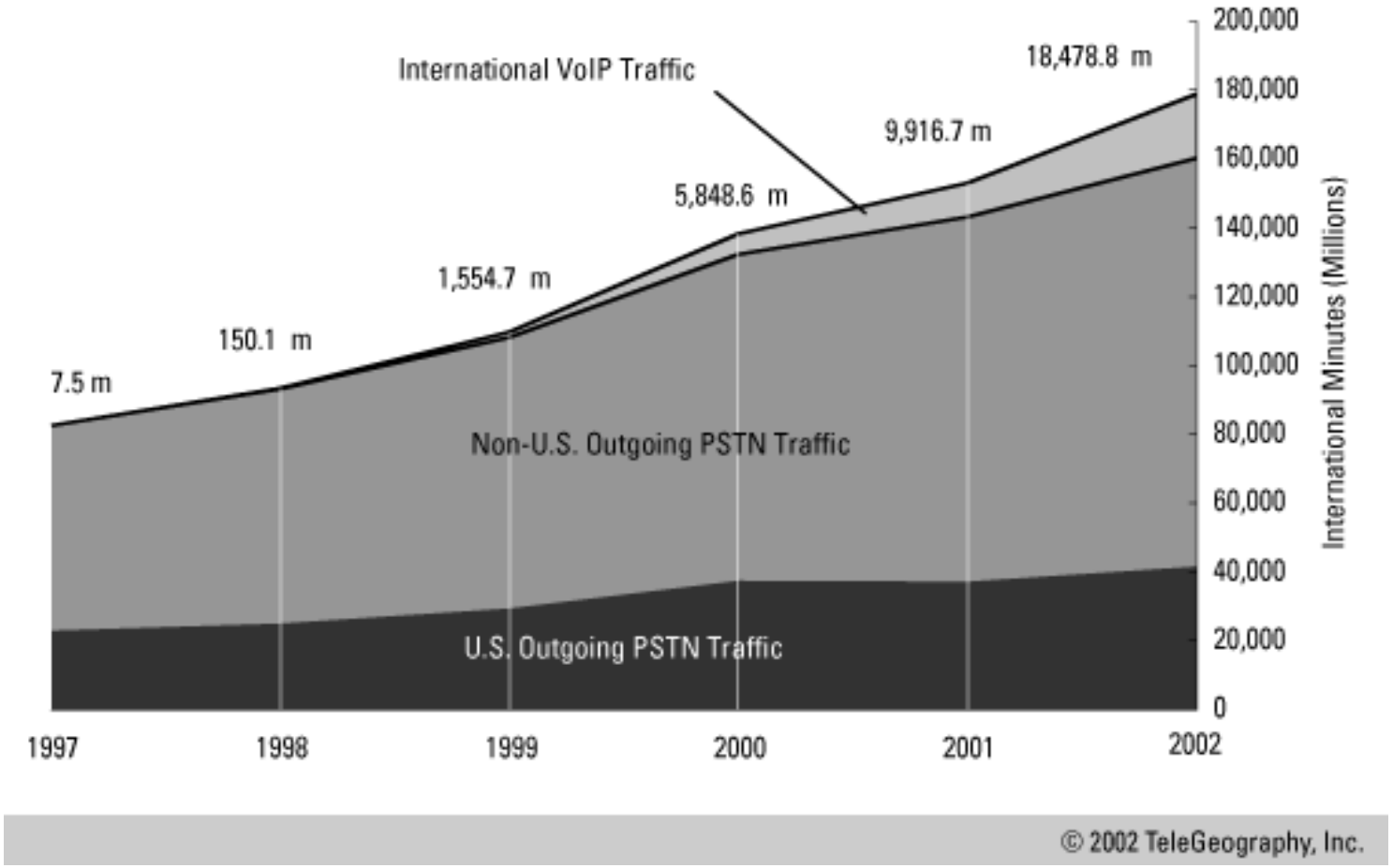
- http – Hyper Text Transport Protocol (Web)
- ftp – File Transfer Protocol (File Transfer)
- nntp – Network News Transport Protocol (News)
- snmp – Simple Network Management Protocol (Network Management)
- H.323 – General protocol used for the transport of voice over IP (VoIP)

IP Telephony: The What and Why

- IP Telephony shall be defined as the SERVICE and PROTOCOL suite associated with the transport of voice communication over the Internet independent of the end-point devices.

IP Telephony: The What and Why

International VoIP and PSTN Traffic Summary, 1997-2002



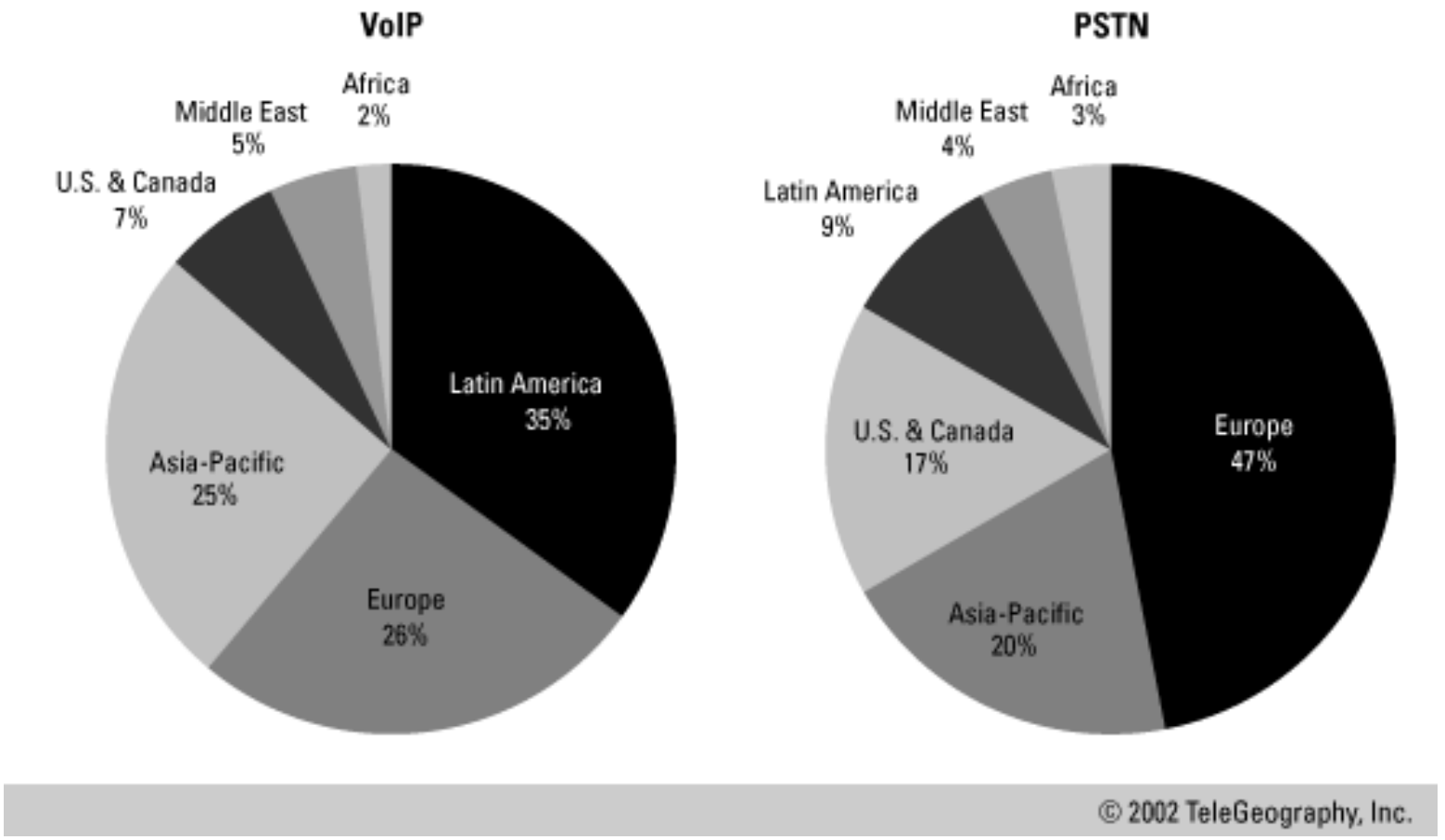
IP Telephony: The What and Why

The promise made by VoIP include:

- Increased service revenues
- Shorter time to Market
- Service Flexibility
- Expenditure and Revenue Opportunities

IP Telephony: The What and Why

International VoIP and PSTN Traffic Destination Summary, 2001



The H.323 Protocol

H.323 is the cornerstone technology for the transmission of real-time audio, video, and data communications over IP packet based networks

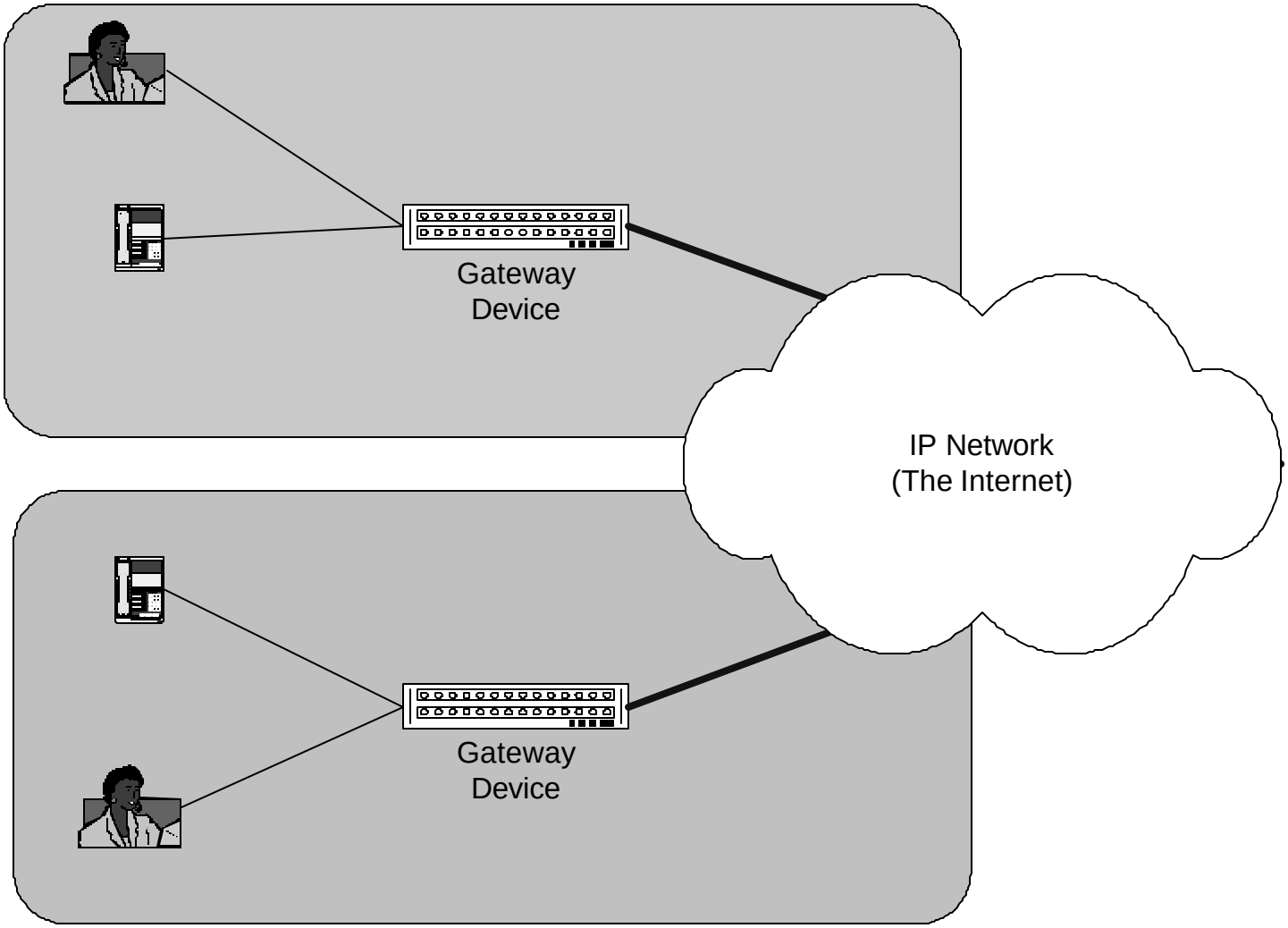
- Version 1 of the standard was proposed by the ITU-T Study Group 16 and was accepted in Oct 1996 (Version 1 DOES NOT provide guaranteed QoS)
- Current Standard is H.323 Version 4 approved Nov 2000

The H.323 Protocol

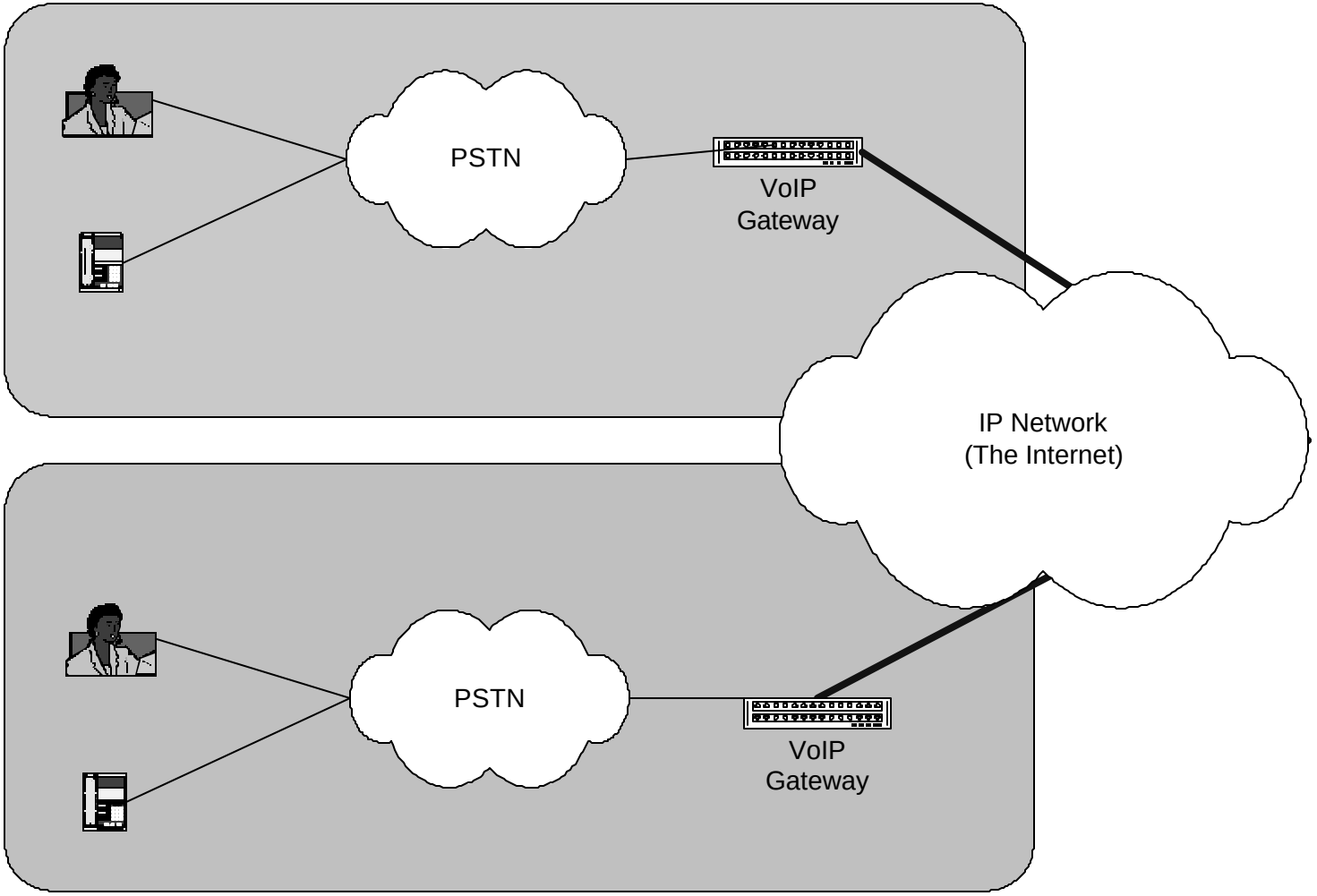
H.323 defines four major components for a network-based communications system:

1. Terminals
2. Gateways
3. Gatekeepers
4. Multipoint Control Units

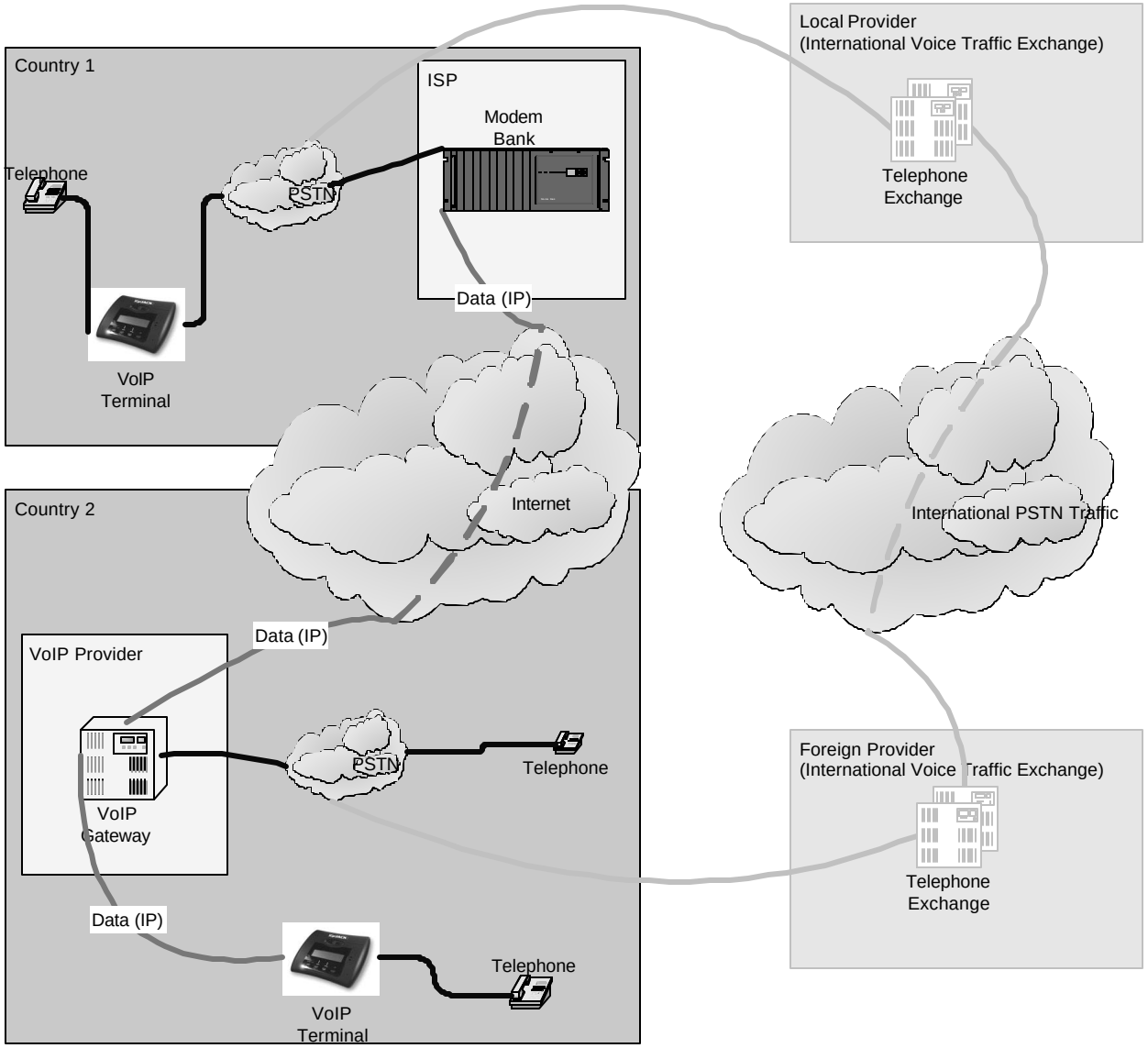
Typical IP Call routing



Typical IP Call routing



Typical IP Call routing



Regional Cases
Panama

- In Nov 2002 the Gov't took measures to outlaw VoIP

C&W argues that unlicensed providers took advantage of Panama's liberalization of wireless and data services last year, bypassing the traditional voice market … The VOIP ban also poses some interesting technical challenges—and some question whether it's enforceable … Dialpad and Net2Phone are reportedly among the service providers that have seen their services disrupted in Panama

By Eugenie Larson
Light Reading
21 November 2002

Regional Cases
Panama

República de Panamá

ENTE REGULADOR DE LOS SERVICIOS PÚBLICOS

Resolución Nº: JD-3576 **Panamá 25 de octubre de 2002**

Por la cual el Ente Regulador de los Servicios Públicos ordena a los concesionarios del Servicio No. 211 SERVICIO INTERNET PARA USO PUBLICO bloquear 24 puertos de acceso User Datagram Protocol (UDP).

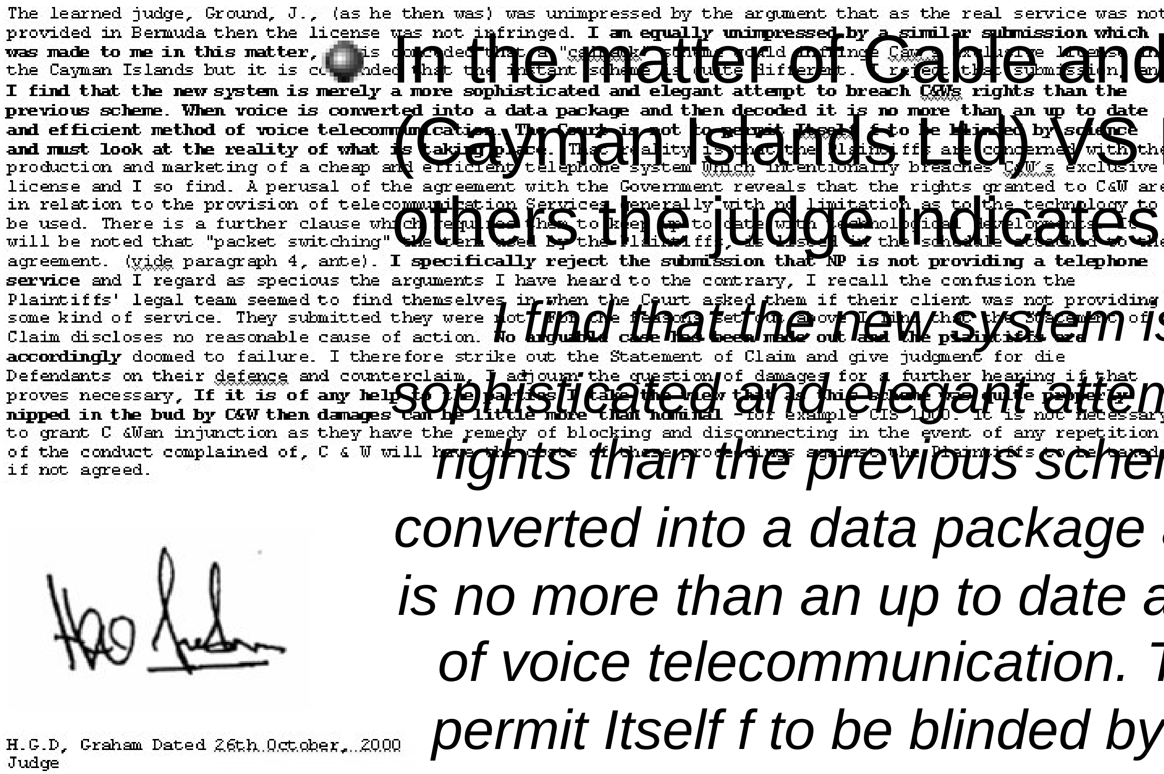
LA JUNTA DIRECTIVA

Del Ente Regulador de los Servicios Públicos
en uso de sus facultades legales

CONSIDERANDO:

1. Que mediante Ley No. 26 de 29 de enero de 1996, modificada mediante Ley No. 24 de 30 de junio de 1999 y Ley No. 15 de 7 de febrero de 2001, se creó el Ente Regulador de los Servicios Públicos como organismo autónomo del Estado, con personería jurídica y patrimonio propio, el cual tiene a su cargo el control y fiscalización de los servicios públicos de abastecimiento de agua potable, alcantarillado sanitario, telecomunicaciones, electricidad, radio y televisión, así como la distribución y transmisión de gas natural, de conformidad con las disposiciones contenidas en la citada Ley y las respectivas leyes sectoriales;

Regional Cases
Cayman Islands



The learned judge, Ground, J., (as he then was) was unimpressed by the argument that as the real service was not provided in Bermuda then the license was not infringed. **I am equally unimpressed by a similar submission which was made to me in this matter,** [illegible] is conceded that a "callback" [illegible] would infringe [illegible] exclusive license in the Cayman Islands but it is co[illegible]nded that the instant scheme is quite different. I reject that submission and **I find that the new system is merely a more sophisticated and elegant attempt to breach C&Ws rights than the previous scheme. When voice is converted into a data package and then decoded it is no more than an up to date and efficient method of voice telecommunication. The Court is not to permit Itself f to be blinded by science and must look at the reality of what is taking place.** The reality is that the Plaintiffs are concerned with the production and marketing of a cheap and efficient telephone system which intentionally breaches C&W's exclusive license and I so find. A perusal of the agreement with the Government reveals that the rights granted to C&W are in relation to the provision of telecommunication Services generally with no limitation as to the technology to be used. There is a further clause which [illegible] to keep up to date with technological developments. It will be noted that "packet switching" [illegible] the Plaintiffs, [illegible] the schedule [illegible] to the agreement. (vide paragraph 4, ante). **I specifically reject the submission that NP is not providing a telephone service** and I regard as specious the arguments I have heard to the contrary, I recall the confusion the Plaintiffs' legal team seemed to find themselves in when the Court asked them if their client was not providing some kind of service. They submitted they were not. [illegible] set out above I find that the Statement of Claim discloses no reasonable cause of action. **No arguable case has been made out and the plaintiffs are accordingly** doomed to failure. I therefore strike out the Statement of Claim and give judgment for die Defendants on their defence and counterclaim. I adjourn the question of damages for a further hearing if that proves necessary, **If it is of any help to the parties I take the view that as this scheme was quite properly nipped in the bud by C&W then damages can be little more than nominal** - for example CI$ 1000. It is not necessary to grant C &Wan injunction as they have the remedy of blocking and disconnecting in the event of any repetition of the conduct complained of, C & W will have the costs of these proceedings against the Plaintiffs to be taxed if not agreed.

H.G.D, Graham Dated 26th October, 2000
Judge

In the matter of Cable and Wireless (Cayman Islands Ltd) VS Net2Phone and others the judge indicates that:

I find that the new system is merely a more sophisticated and elegant attempt to breach C&Ws rights than the previous scheme. When voice is converted into a data package and then decoded it is no more than an up to date and efficient method of voice telecommunication. The Court is not to permit Itself f to be blinded by science and must look at the reality of what is taking place

Oct 2000

Approaches to VoIP: Incumbent providers

1. Initiate (technical) actions to protect rights offered under subsisting licenses
2. Initiate legal action
3. Offer competitive differentiators and directly face the competing offers.

Approaches to VoIP: Governments and regulators

1. Embrace and establish a legal framework for official competition
2. Defer to industry self regulation with only timed interventions

Thank You

Ronald Lessey

ronald@tstt.net.tt