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.
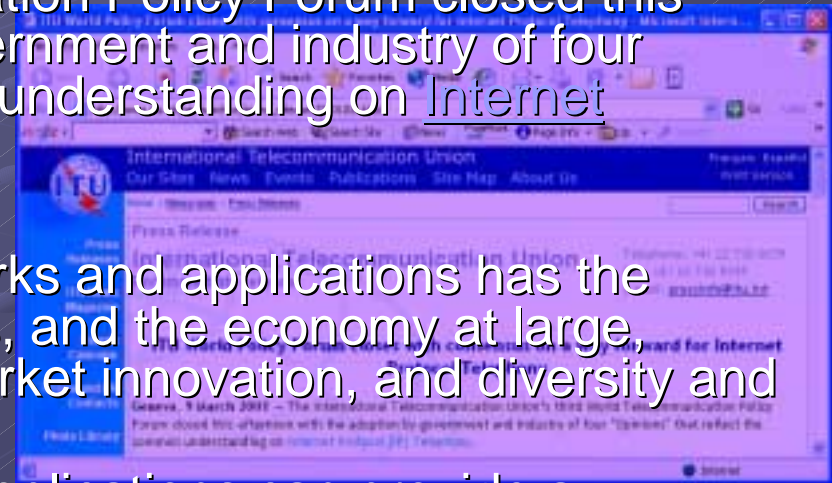
- The deployment of IP-based networks and applications has the potential to benefit users, industries, and the economy at large, because it fosters technical and market innovation, and diversity and growth in the economy;
- IP Telephony and other IP-based applications can provide a significant opportunity 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.
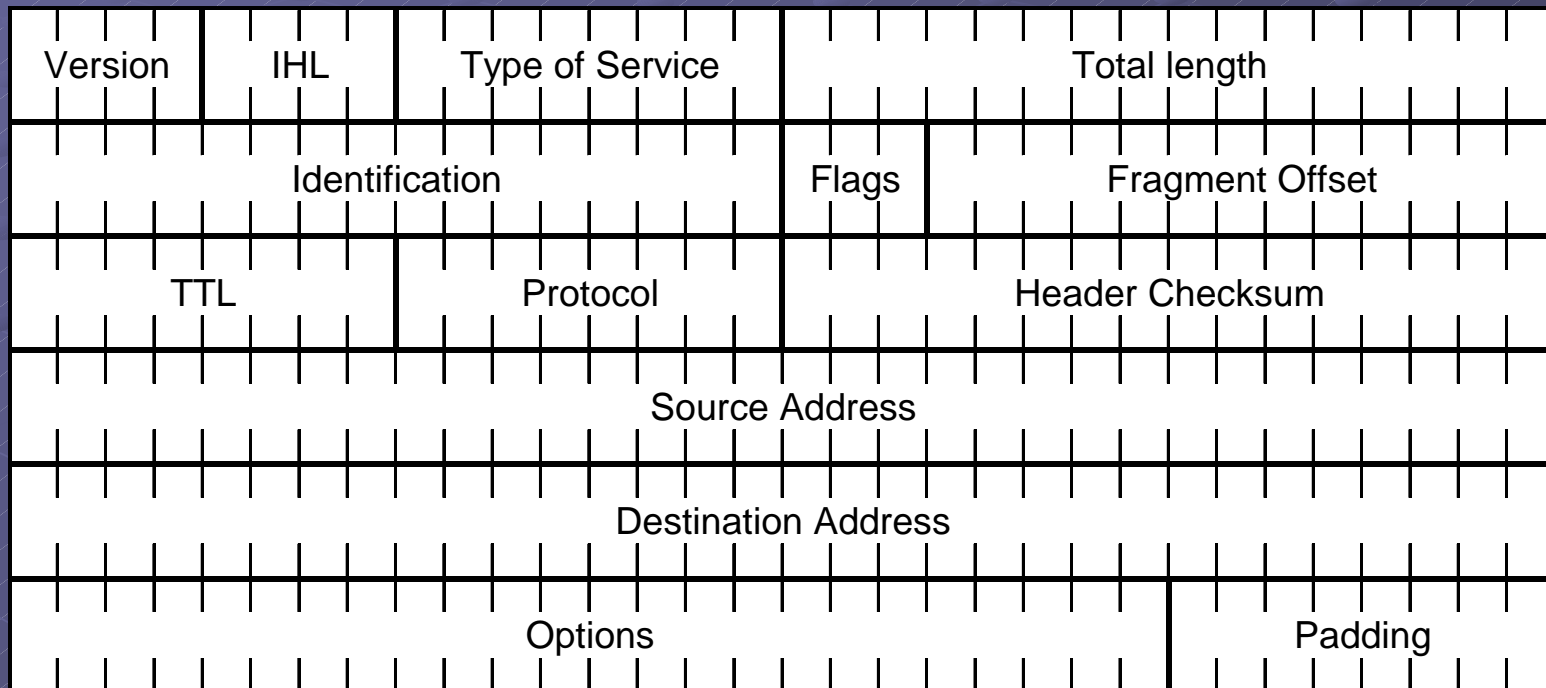
The basics of IP and the Internet

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

Version	IHL	Type of Service	Total length		
Identification			Flags	Fragment Offset	
TTL		Protocol	Header Checksum		
Source Address					
Destination Address					
Options				Padding	

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)

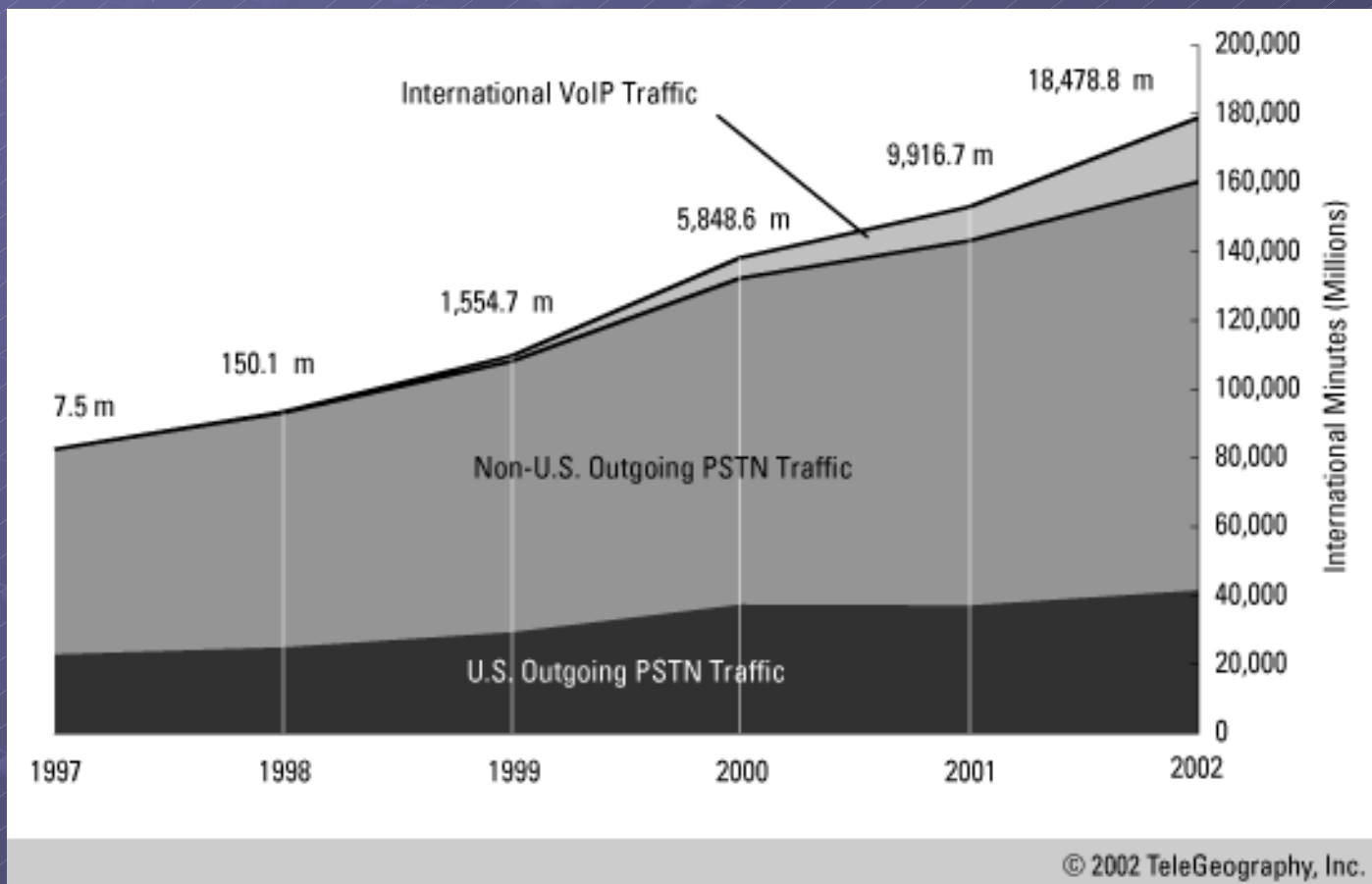Protocols: The language of the net.

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

International VoIP Traffic

18,478.8 m

9,916.7 m

5,848.6 m

1,554.7 m

150.1 m

7.5 m

Non-U.S. Outgoing PSTN Traffic

U.S. Outgoing PSTN Traffic

International Minutes (Millions)

200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0

1997   1998   1999   2000   2001   2002
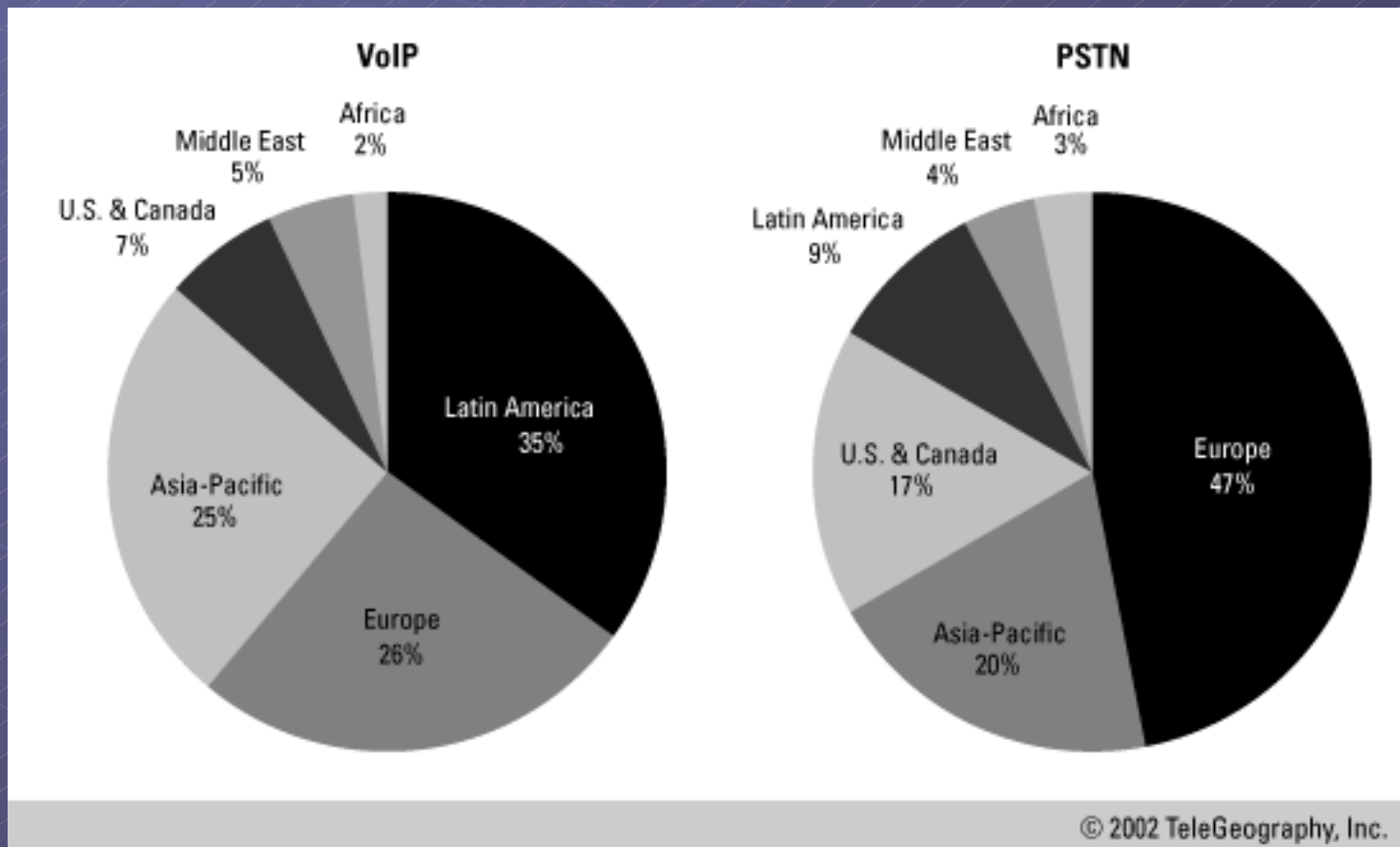
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IP Telephony: The What and Why

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

VoIP

- Africa 2%
- Middle East 5%
- U.S. & Canada 7%
- Latin America 35%
- Europe 26%
- Asia-Pacific 25%

PSTN

- Africa 3%
- Middle East 4%
- Latin America 9%
- U.S. & Canada 17%
- Europe 47%
- Asia-Pacific 20%

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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
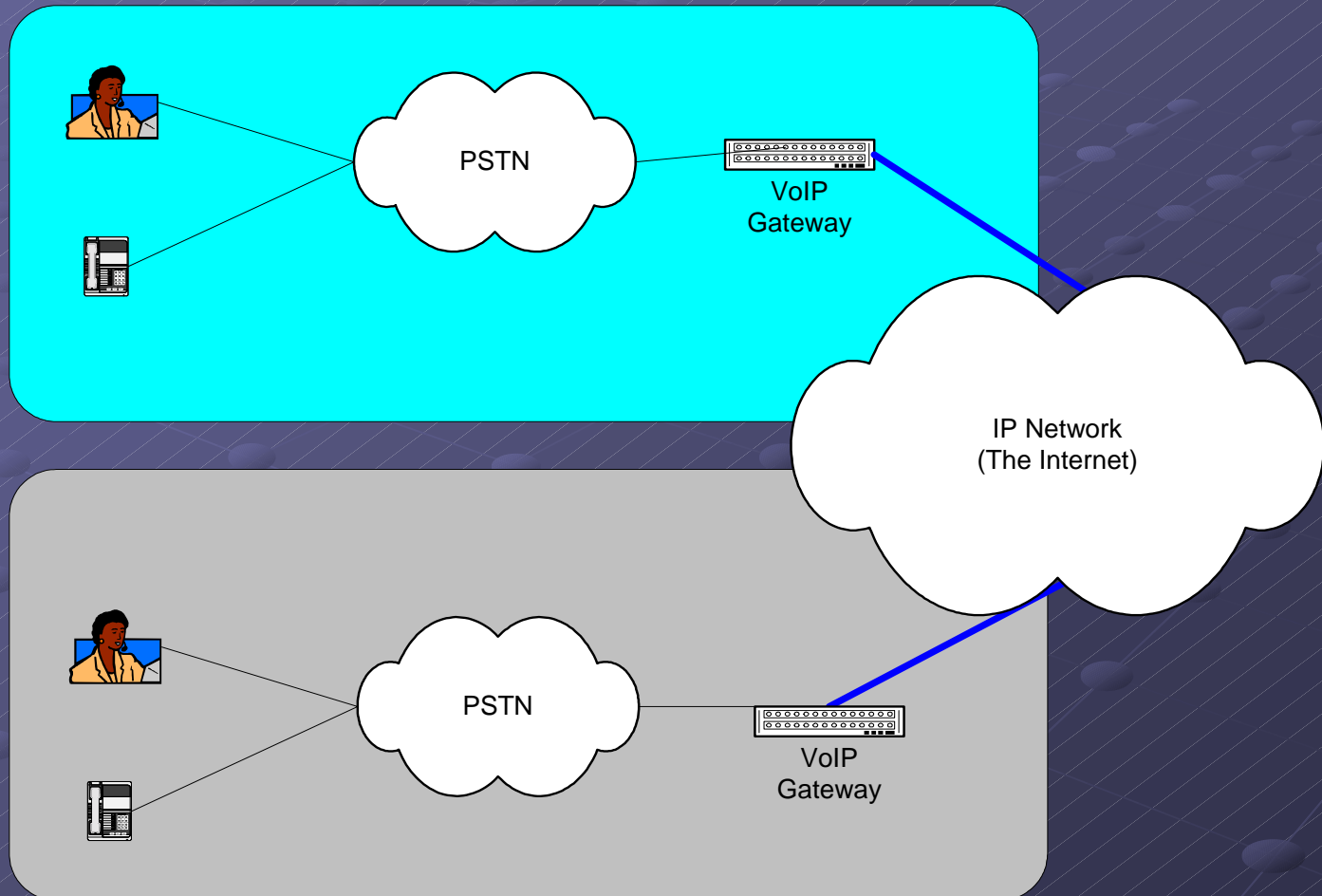
The H.323 Protocol

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

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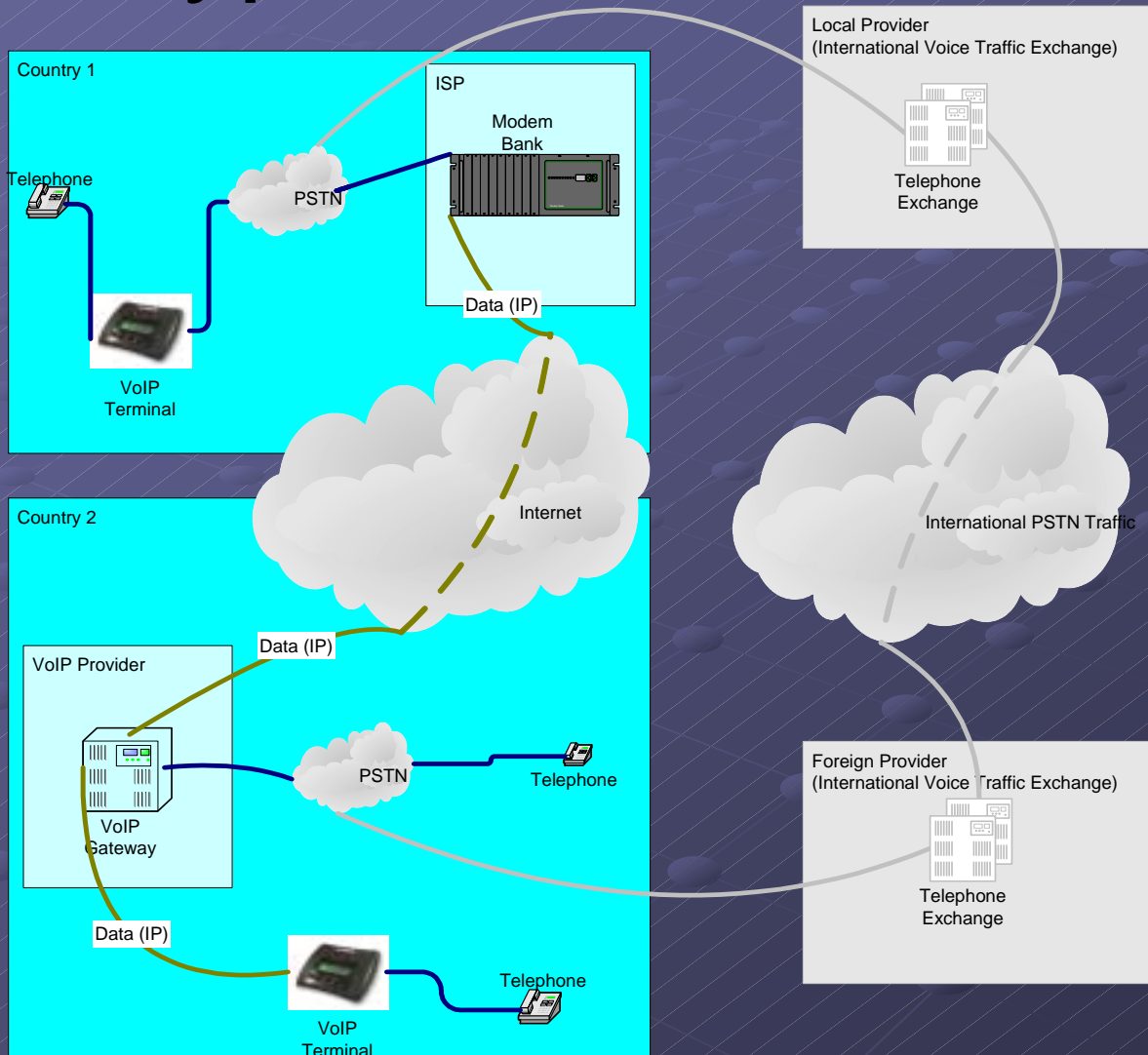4. Multipoint Control Units

Typical IP Call routing

Gateway
Device

IP Network
(The Internet)

Gateway
Device

Typical IP Call routing

Ronald Lessey
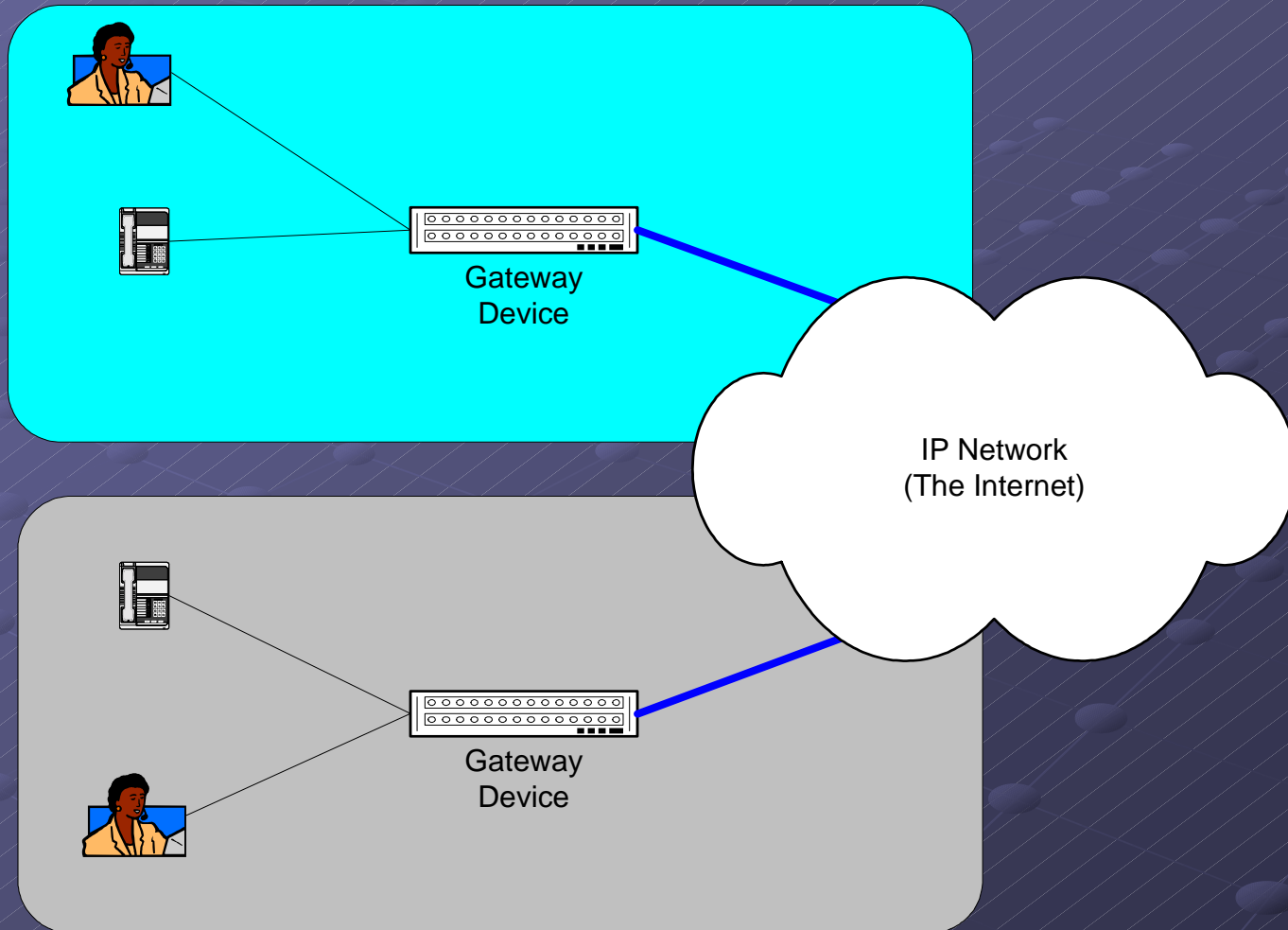
Typical IP Call routing

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., [...]
provided in Bermuda then the lice[...]
was made to me in this matter, I[...]
the Cayman Islands but it is cont[...]
I find that the new system is new[...]
previous scheme. When voice is co[...]
and efficient method of voice tel[...]
and must look at the reality of w[...]
production and marketing of a che[...]
license and I so find. A perusal [...]
in relation to the provision of t[...]
be used. There is a further claus[...]
will be noted that "packet switch[...]
agreement. (vide paragraph 4, ant[...]
service and I regard as specious [...]
Plaintiffs' legal team seemed to [...]
some kind of service. They submit[...]
Claim discloses no reasonable cau[...]
accordingly doomed to failure. I [...]
Defendants on their defence and c[...]
proves necessary, If it is of any[...]
nipped in the bud by C&W then dam[...]
to grant C &Wan injunction as the[...]
of the conduct complained of, C &[...]
if not agreed.

H.G.D, Graham Dated 26th October,[...]
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
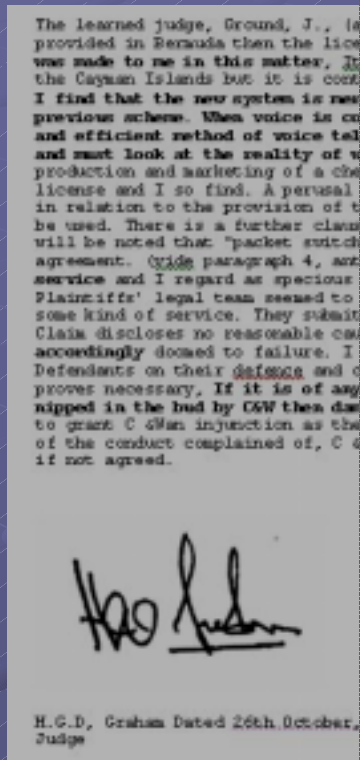
Approaches to VoIP: Incumbent providers

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

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