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Pedro Seixas
ITU Expert



Session 2: Voice Traffic in IP Telephony



Agenda

- Alternative calling procedures: what is it about, what is the history
- IP telephony : overview of current practice, what is currently done and what are the issues
- Voice traffic volumes in IP Telephony
- Impacts on traditional voice services



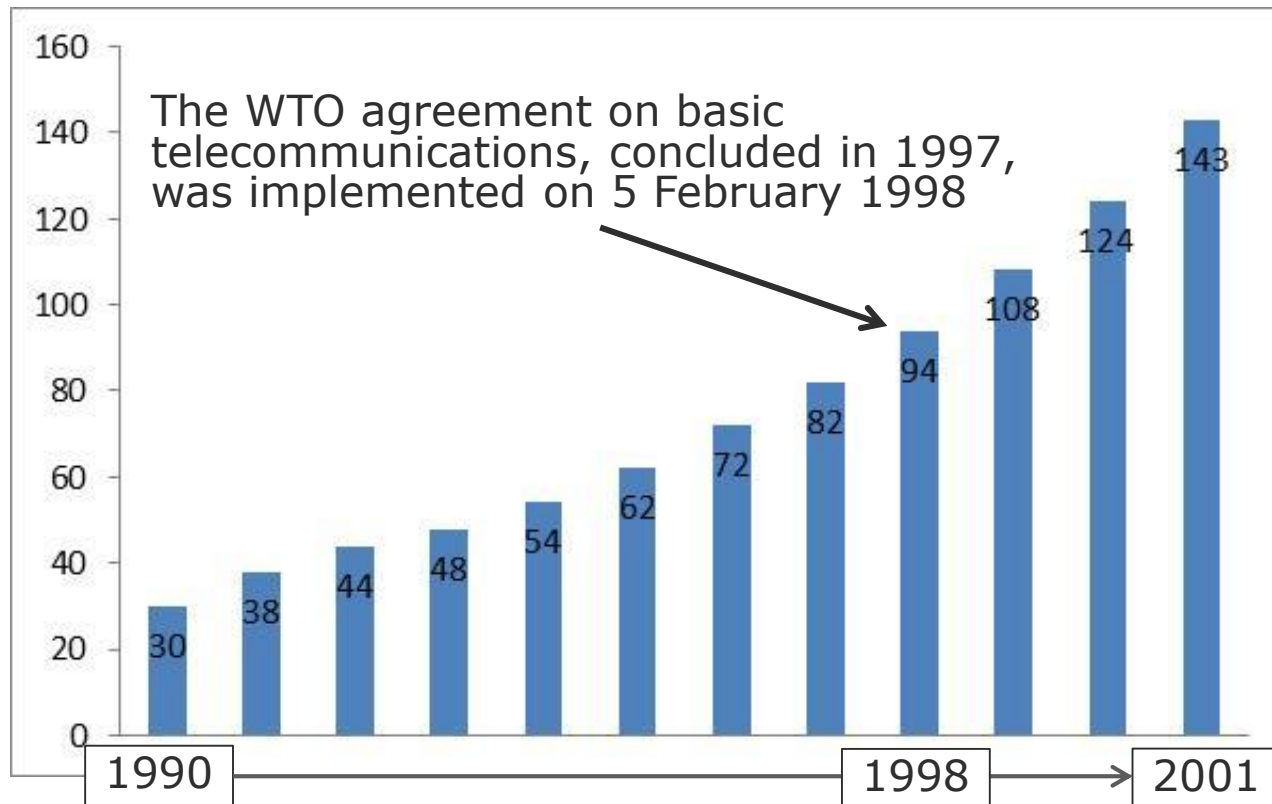
Alternative calling procedures emerged in the 1990s due to high prices of international calls

- For decades, and through the 1980s, the international voice telecommunications market was monopolised by national incumbents which exchanged circuit-switched minutes through the international settlements procedures,
- In the beginning of the 1990s a number of alternative procedures emerged as a response to high prices of international traffic:
 - International re-file of traffic
 - International call-back services
 - Calling cards and reverse billing
 - "Leaky PBX" & by-pass calling



Even with consumers paying premium prices for international traffic, growth was substantial

International traffic evolution
(billions minutes)

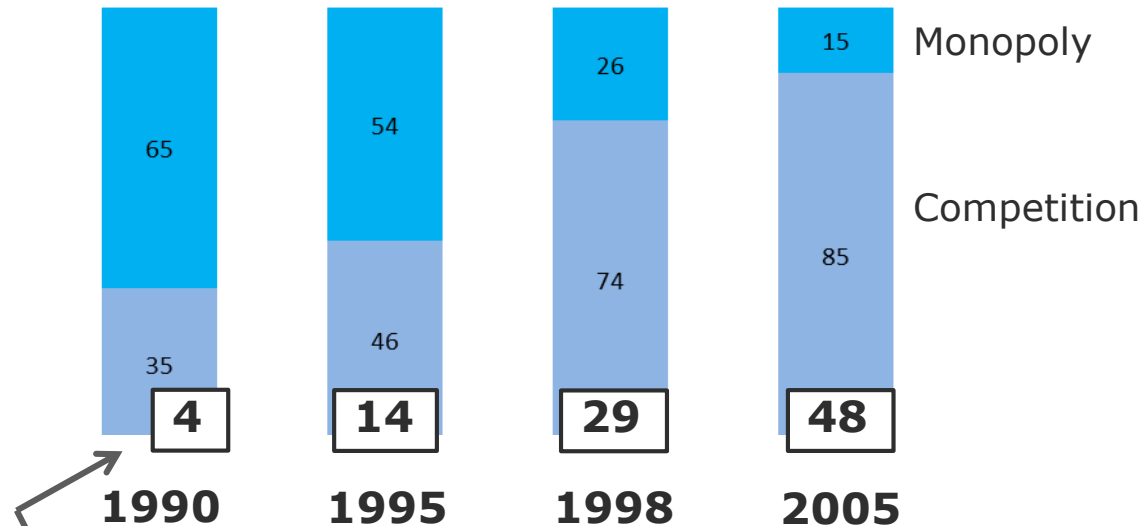


Source: ITU World Telecommunication Indicators Database

Liberalisation, decreasing technology costs and the wider availability of access alternatives increased the demand for international calling

Percentage of outgoing international traffic open to competition

- In the two decades and a half between 1990 and 2014, Telegeography, estimated that the volume of international minutes terminating on public switched telecommunication networks (PSTNs) increased almost 20 fold
- The rate of growth has decreased in recent years, which many attribute to the rise in PC-to- PC calls that are not accounted in those figures



Number of countries permitting more than one operator for international telephony

Source: ITU World Telecommunication Indicators Database

In 2005 the majority of countries had informed the ITU that both incoming and outgoing call-back practices were prohibited

Algeria, Netherlands Antilles, Saudi Arabia, Bahrain, Burkina Faso, Burundi, China, Cyprus, Cook Islands, Cuba, Djibouti, Egypt, United Arab Emirates, Ecuador, Ethiopia, Gabon, Guinea, Honduras, India, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Mexico, Niger, Nigeria, Uganda, Qatar, Dem. Rep. of the Congo, South Africa, Tanzania, Thailand, Viet Nam, Wallis and Futuna, Albania, Armenia, Bahamas, Belize, Benin, Brazil, Brunei Darussalam, Central African Rep., Comoros, Costa Rica, Côte d'Ivoire, Dominica, Eritrea, Fiji, Ghana, Guyana, Haiti, Hungary, Ireland, Israel, Kiribati, Lesotho, Macao (China), Malawi, Mali, Mauritania, Moldova, Mozambique, Nicaragua, New Caledonia, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Philippines, Syria, Romania, San Marino, Samoa, Serbia and Montenegro, Slovakia, Sri Lanka, Chad, Tonga, Tunisia, Tuvalu, Vanuatu, Venezuela.

Andorra, Austria, Australia, Belgium, Bulgaria, Canada, Czech Rep, Dem. People's Rep. of Korea, Denmark, El Salvador, Estonia, Finland, Germany, Greece, Guatemala, Hong Kong China, Iceland, Italy, Japan, Korea (Rep. of), Lithuania, Luxemburg, Malta, New Zealand, Portugal,, Saint Vincent and the Grenadines, Senegal, Singapore, Slovenia, Spain, Sweden, Switzerland, Tajikistan United Kingdom and United States.



Source: ITU TSB 30

In 2012 Resolution 29 reaffirmed the right of each country to set their policies regarding call-back practice

- The **World Telecommunications Standardization Assembly** (WTSA-04) adopted Resolution 29 on alternative calling procedures on international telecommunication networks.
- In that Resolution, the sovereign right of each country to regulate its telecommunications, as expressed in the basic instruments of ITU, was reaffirmed. In this regard, each country has the right to authorize, prohibit or regulate call-back practices.
- National regulatory measures must be respected by other countries within the limits of their own legislation, and the recognized operating agencies (ROAs) and administrations concerned must communicate and collaborate.

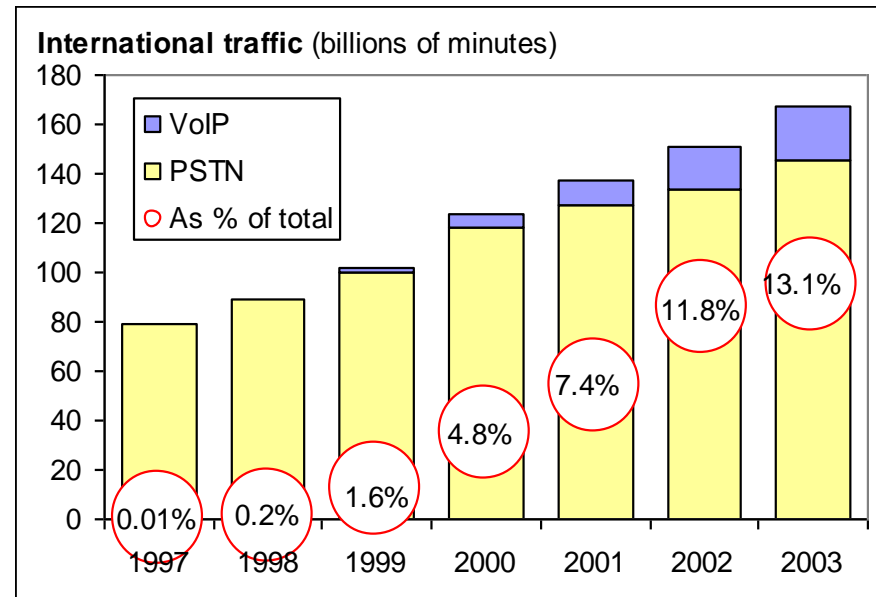


Source: ITU website

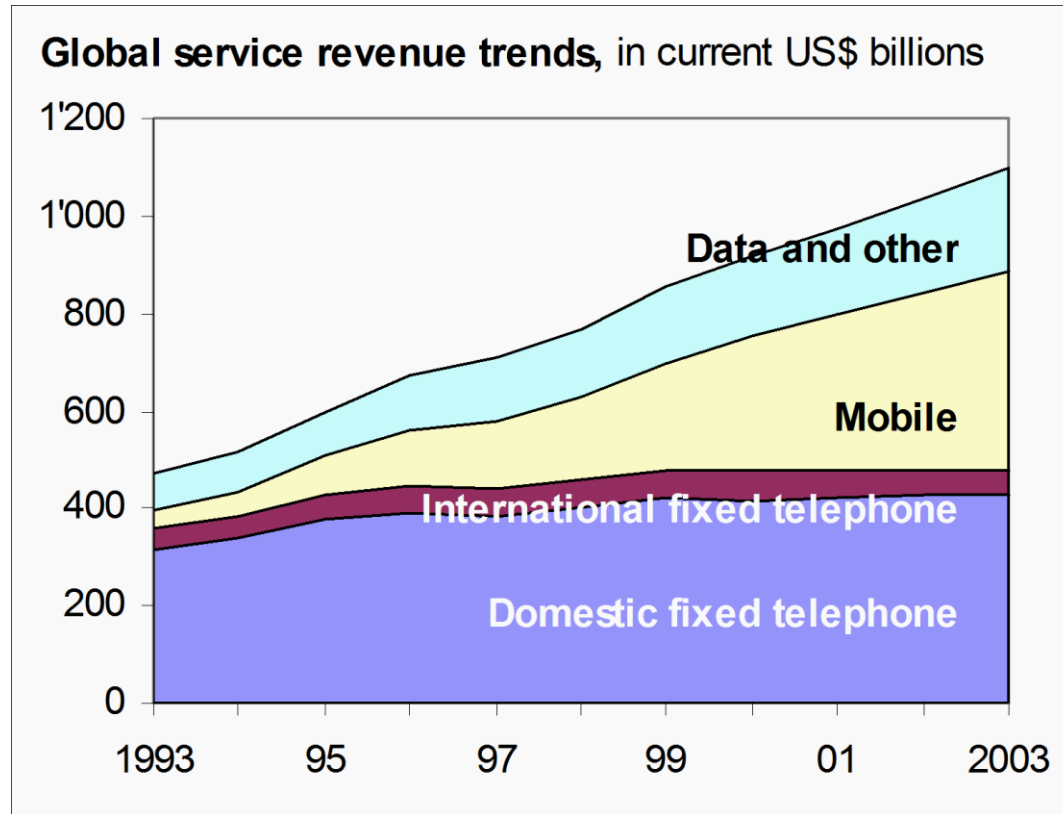
International traffic was the main segment of VOIP quick adoption as the cost of these calls was still significant

- VOIP's presence started to be felt in 1999 and in a matter of few years reached 13% of total international voice traffic
- In 1998 the average price/minute of an international voice call was around 42 cents (based on data of the 20 top telecommunications operators)

Evolution of international voice traffic on public switched telephone networks (PSTN) and Voice over IP (VoIP) 1997-2003



But overall the international fixed traffic revenues were the smallest segment which reduced the impact of lost revenues

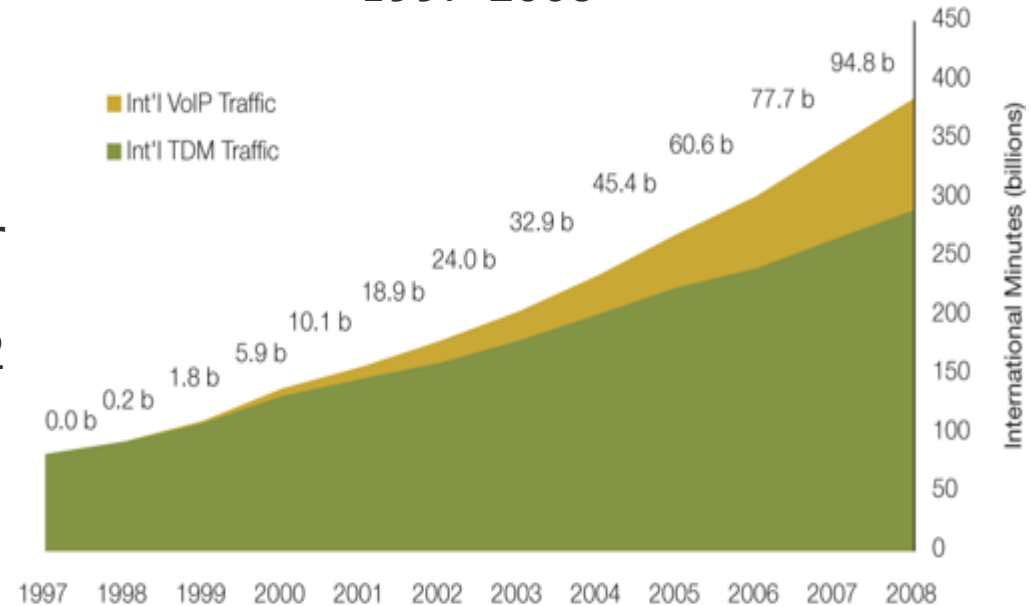


Source: ITU World Telecommunication Indicators Database

According to the ITU regulatory reaction to VOIP emergence was prudent in most places

- Data reported to the ITU for the period 2004-2009 showed an opposite reaction to VoIP adoption compared to call back.
- During that period, the number of countries “legalizing” VoIP doubled, from 46 in 2004 to 92 five years later while only 39 banned it outright;
- The remainder either had no regulatory framework for VoIP or allowed it only in a wholesale or restricted form.

Evolution of international voice traffic on public switched telephone networks (PSTN) and Voice over IP (VoIP) 1997-2008



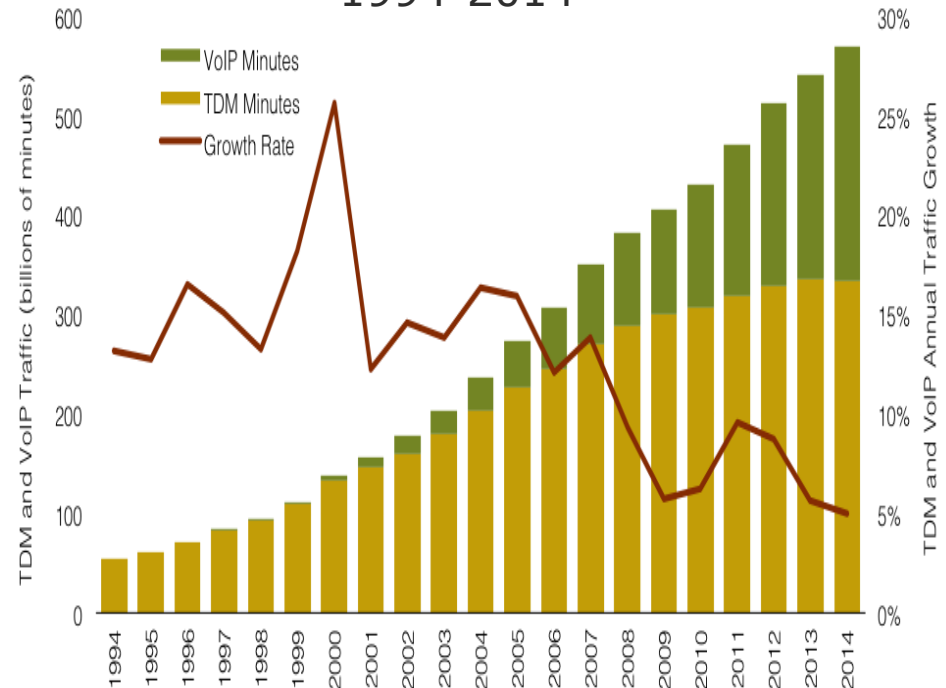
Source: Telegeography



IP Telephony is fast changing the business model for network operators who have built their businesses around the voice premium

- Total international voice traffic grew 6% in 2013, to 542 billion minutes and was predicted to reach 569 billion in 2014.
- International traffic in legacy networks grew 2% in 2013 to 335 billion minutes
- Traffic transported by carriers via IP networks grew 12% to 207 billion minutes amounting to 38% of international traffic

Evolution of international voice traffic on public switched telephone networks (PSTN) and Voice over IP (VoIP) 1994-2014



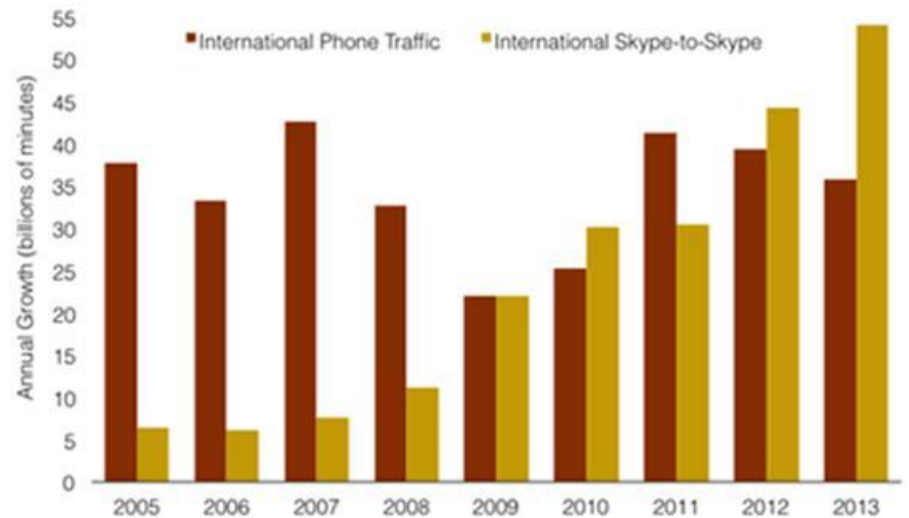
Source: Telegeography



Besides competition from the likes of Skype there are other impacts as well, such as the mobile revolution

- Skype on-net international traffic estimated growth was 35 billion minutes in 2014, to reach a total 248 billion minutes
- OVUM estimated \$52bn revenues lost to OTT VoIP globally in 2016, and it goes up to \$71bn (or 9% of total voice revenues) before 2020
- Mobile voice substitution by VoIP will accelerate after introduction of IP-based LTE network (VOLTE)
- Some countries mostly in Africa have introduced surcharges, an additional tax on incoming international traffic,

Increase in International Phone and Skype Traffic



Source: TeleGeography

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Source: Telegeography



Traffic data between North America and Asia support the beneficial effects of liberalisation and lower termination rates



- The trend toward lower termination and increased volumes can be exemplified in the relationship between the United States and Asia. The payments made by carriers taking traffic from the United States to Asia decreased from above USD 0.11 per minute in 2003 to less than USD 0.03 per minute in 2011.
- Over the same period, the number of calls and minutes from the United States to Asian countries dramatically increased, a trend that was not witnessed in calls to other regions : from 1000 (million) calls in 2003 to 7500 (million) calls in 2011 and from 6 to 30 billion minutes.

Source: OCDE, International Traffic Termination, 2015

Moving in the opposite direction some countries introduced monopolies in specific segments and surcharge taxes

- Contrary to liberalisation and decreasing termination prices trend, Bangladesh, Pakistan and some African countries from 2008 onwards have introduced monopolies on international incoming traffic (through international traffic gateways) or additional taxes. Some corrected these policies later on
- Surcharge taxes can have impacts on volumes of incoming international calls potentially reducing revenues and profits for operators and therefore corporate tax receipts for governments
- The surcharge taxes also induces substitution of calls to VoIP, for which governments obtain no tax revenues, and substitution of calls routed via illegal SIM boxes. Increases in the costs for businesses, in the costs for emigrants of calling families at home and in the amount of remittances sent are also to be expected



Conclusions regarding VOIP

- There appears to be no single global response but from the static efficiency point of view some benefit has been going to consumers
- For example the WTSA Resolution (29) seems to accord acceptance and legitimacy to any national approach – but we know that some approaches are self-defeating and others seek to extend costs to countries in which callers are located
- There will always be incentives to bypass international voice pricing for as long as a voice premium remains. Taxing inbound calls or reducing competition of international gateways only increases this
- Bypassers (and technology) are smarter than regulators – at least in the past, perhaps this will change one day
- Some operators have better strategic responses to Content Application Providers than others



Merci
Thank you

