



Regulation of VoIP: The Ultimate Challenge?

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1. Introduction

The evolution of VoIP services have transformed the telecommunication industry to an extent that was beyond imagination. In other words, it is “probably the most significant paradigm shift in the entire history of modern communications, since the invention of the telephone”¹.

This paper examines the various regulatory issues concerning VoIP services and their advanced versions such as Voice over Broadband (VoB), from a UK perspective. It highlights the role of VoIP in internet governance and its potential to bridge the digital divide. Finally, tracing the development of VoIP services and their ability to replace the traditional telecommunication systems, concludes, that its time for regulation of internet telephony as no longer they can evade their obligations.

2. The Internet and its Governance

The transformation of the internet from an academic and research medium in 1983 to a convergent medium of communications and entertainment, has created new challenges of control and governance. Developments in technology have intensified this debate over the past decade.

The Report of the Working Group on Internet Governance (WGIG), July 2005, defined Internet governance as “the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms,

¹ Michael Powell, Chairman of the FCC, <http://www.tcsdaily.com/article.aspx?id=020204F>

rules, decision-making procedures, and programmes that shape the evolution and use of the Internet”². Since, the internet is a ‘network of networks’³ the question of internet governance involves a number of services and organisations. The regulation of VoIP is one such issue that determines the evolution and use of the internet as a converged communications medium and can therefore be construed as one element of the internet governance debate.

The question of internet governance also involves a number of public policy issues⁴. Convergence, Next- Generation Networks (NGNs), interconnection costs, Internet Protocol (IP) addressing, development policies, issues of use and internet stability are some of the issues that have been identified by the WGIG Report as issues of high priority in internet governance⁵. It is to be noted that all of the above mentioned topics have an impact on the provision of VoIP services.

3. Internet Telephony/ VoIP

The internet consists of a hierarchical structure of protocols comprising an application, transport, network and a link layer⁶. It is these protocols that facilitate the communication or interconnection of networks. The Transmission Control Protocol and Internet Protocol (TCP/IP) are the most significant ones of the protocol family⁷.

Internet Telephony is an application of the internet that uses internet protocols for delivering voice. Internet Protocol (IP) telephony has been defined by the International Telecommunication Union (ITU) as “the exchange of information primarily in the form of speech that utilizes a mechanism known as Internet

² Internet Governance-IP Addressing, “IP Numbers No address, No Access”, The International Telecommunication Union,
<http://www.itu.int/itu/news/manager/display.asp?lang=en&year=2005&issue=06&ipage=internet-governance&ext=html>

³ Andrew Terrett, “The Internet”, Edition 2000

⁴ Internet Governance, “The need for a Shared Understanding on Internet Governance”, The International Telecommunication Union,
<http://www.itu.int/itu/news/manager/display.asp?lang=en&year=2005&issue=06&ipage=shared-understand&ext=html>

⁵ Internet Governance, “Global Internet: Where do we go from here?” The International Telecommunication Union,
<http://www.itu.int/itu/news/manager/display.asp?lang=en&year=2005&issue=06&ipage=global-internet&ext=html>

⁶ Chris Reed, “Internet Law”, Second Edition, 2004

⁷ Lars Davies and Ashurst Morris Crisp, “What is the Internet”, A Practitioner’s Guide To The Regulation of The Internet”, Edition 1999/2000.

Protocol”⁸. The terms internet protocol telephony, internet telephony and Voice over Internet Protocol (VoIP) are synonymous and are commonly referred to as IP enabled services. The above terms are used interchangeably in this paper. VoIP is also known as the “generic name for the transport of voice traffic using IP technology”⁹. Internet protocols convert speech into data packets and transmit them through data networks like a private managed network or a public internet.

VoIP is divided into three different categories depending on the infrastructure used for the communication.¹⁰ They are

1. PC-to-PC
2. Phone-to-Phone
 - a) Phone-to-Phone over IP using Gateways
 - b) Phone-to-Phone over IP using adaptor boxes
3. PC-to-Phone or Phone-to-PC

VoIP services have to lead to the convergence of voice, data and video services, leading to the creation of enhanced services in the market¹¹. Network efficiency, innovation and cost effectiveness are the greatest advantages of a VoIP service¹². The primary differences between the traditional public switched telephone networks (PSTN) and IP networks are¹³:

1. The former is circuit-switched, whereas the latter is packet switched and is based on IP.
2. The mobility of users is limited in the former, whereas IP networks provide ‘generalised mobility’.

⁸ Durga V.Sivasubramanian, “E-911 The Dawn of a New Era of Regulation,” June 2005, <http://www.abdn.ac.uk/cass/pgradconf/papers/DurgaVaishnaviSivasubramanian.pdf>

⁹ Ibid.

¹⁰ Ibid.

¹¹ “Regulating in a Broadband World”, ITU Global Symposium for Regulators, Nov 14-15, 2005, Tunisia, http://www.itu.int/itunews/manager/display.asp?lang=en&year=2005&issue=10&ipage=global_symposium&ext=html,

Christine Bellamy and John A.Taylor, “Governing in the Information Age”, Edition 1998.

¹² Supra n. 8

¹³ Next- Generation Networks, “Standardisation starts for Next Generation Networks”, The International Telecommunication Union, 2006, <http://www.itu.int/itunews/manager/display.asp?lang=en&year=2006&issue=01&ipage=nextGeneration&ext=html>

3. There is vertical integration of layers in the former and horizontal integration in the latter. Also, there is no dedicated network in the latter where, services provided are independent of the technology used.

3.1 Regulation

The 1998 notice and 2000 communication of the European Commission excluded VoIP services from regulation, since they did not satisfy the criteria of quality and reliability of speech in real time as established by the definition of Voice telephony in the Service Directive (90/388). However, in its 2000 communication the Commission emphasised the need to classify IP services offered over PSTN networks as voice telephony. On many occasions countries such as Canada, Finland and United States adopted the theories of functional equivalence and technological neutrality to regulate VoIP services¹⁴.

Due to developments in technology and convergence of different sectors, the European Union, in 2002, adopted a technology neutral framework for electronic communications services and networks. This new framework subjects the electronic communications networks and services to the same rules, irrespective of the basic underlying technology. This technology neutral approach of the European Union is considered a forward step in the regulation of IP services, which offer enhanced quality and functionalities from that of the traditional internet¹⁵. This framework consisted of four directives, which were implemented by the Communications Act, 2003 in the UK¹⁶.

VoIP services can still be exempt from the rules if they do not fall within the category of publicly available telephone services (PATS). This is the new debate in the European Union and the rest of the countries that have implemented the new regulatory framework for electronic communications¹⁷. The provision of emergency services is an important element that could qualify VoIP services as PATS. Additional

¹⁴ Supra n.8

¹⁵ Rainer Handel, Siemens Munich, "Governance of IP-Based Next Generation Networks : A New Aspect of Internet Governance", 2004.

¹⁶ (Framework Directive, Access Directive, Authorisation Directive, Universal Service Directive and the Directive on Privacy and Electronic Communications)

Katrina Dick, "The Emergence and Regulation of VoIP", CTLR, Volume 10, Issue 7, October 2004.

¹⁷ Supra n.15

obligations are imposed on the providers of PATS, compared to the providers of private and public electronic communications services¹⁸.

With developments in technology, VoIP services are expected to soon replace the traditional telecommunication system¹⁹. The prediction of the ITU “that VoIP is expected to account for at least half of all international calls by 2008, and many carriers worldwide will have entirely IP networks by then” proves the earlier notion.

The first regulatory question concerning IP services was whether they were ‘telecommunication’ or ‘information’ services. The focus has now shifted to issues of regulatory challenge. VoIP services have to lead to the convergence of voice, data and video services thus, leading to the creation of enhanced services in the market. Therefore, in the light of developments offered by VoIP to the market and the users, and the fact ‘that VoIP cannot be stopped’²⁰, most regulators have started addressing regulatory issues concerning VoIP services, while many others are still trying to answer questions of its legalisation.

3.2 VoIP and VoB

While the regulation of VoIP services continues to be a great challenge for regulators across the globe, an improved version of the VoIP services, called the Voice over Broadband (VoB) services have come existence. VoB services are defined as “VoIP services that are delivered over broadband networks, for example DSL or cable”²¹. The increased growth of the internet as a converged medium for communications has lead to the demand for greater speeds. The ‘always on’ capability of the broadband and its high speed has made it a popular medium among the masses for the use of enhanced services.

VoIP services can be accessed through a variety of networks such as dial up, narrowband and broadband. However, broadband is the commonly used platform for

¹⁸ Supra n. 8

¹⁹ “VoIP and Regulation”, Olli Mattila, Senior Advisor, Finnish Communications Regulatory Authority and Russell Southwood, the CEO of Balancing Act

²⁰ Supra n. 11

²¹ Consumer Protection for Voice over Broadband, OFCOM Discussion Paper, January 2004, http://www.ofcom.org.uk/telecoms/groups/nvs_index/dg_250204/ofcom_vob_discussion_paper.pdf.

VoIP services in the UK. VoB services are provided only on a broadband network. Despite technical differences both terms are used synonymously.

Since, VoB is an advanced form of VoIP service, the features of both services are said to be similar²². Some of the major issues concerning VoIP services are emergency services, universal service, numbering, quality, interconnection, access to the disabled, legal interception, privacy and consumer protection²³. These topics concern questions of both policy and technology.

4. Regulatory Agencies

4.1 ITU

The International Telecommunication Union (ITU) is an international organization that was established in 1865 to facilitate interconnection between countries. It is one of the oldest organisations of the United Nations. Allocation of spectrum, standardisation, organisation of interconnection arrangements, promotion of technical assistance and international cooperation²⁴ are some of its functions. Its membership includes various governments and private sectors, who work to coordinate and develop the provision of advanced telecommunication services and networks²⁵. The convention and constitution of the ITU have a treaty status and therefore, are binding on its Member States²⁶.

The ITU plays a prominent role in the development of VoIP services and has from time to time initiated meetings and conferences among its member states for addressing the regulatory challenges. As regards the provision of VoIP services, the Plenipotentiary Conference of the ITU held in 2002 resolved, that “ITU shall fully

²² Internet Governance, “Stakeholders in Internet Governance: Understanding Their Roles and Responsibilities”, The Telecommunication Union, 2006, <http://www.itu.int/itunews/manager/display.asp?lang=en&year=2005&issue=05&ipage=internet&ext=html>

²³ Supra n.8

²⁴ <http://en.wikipedia.org/wiki/ITU>

²⁵ The International Union, Purposes, <http://www.itu.int/aboutitu/overview/purposes.html>

²⁶ Professor Ian Lloyd and Professor David Mellor, “Telecommunication Law”, Edition 2003

embrace the opportunities for telecommunications development that arise from growth of IP-based services”²⁷.

The World Summit on the Information Society (WSIS) endorsed by the UN General Assembly in 2001, was held in two phases and ITU held the major role in the organisation of the summit. The first summit was held from 10 to 12 December 2003, in Geneva and the second was held from 16 to 18 November in Tunisia. Heads of state, Vice Presidents, Ministers, Vice-Ministers, representatives from international organisations, civil society and the private sector from 175 countries attended both the summits²⁸. The primary object of the first phase was to establish the foundations for an information society, whereas the second one addressed issues of internet governance and financing mechanisms in addition to implementing the action plan of both the summits.

4.2 ICANN

The Internet Corporation for Assigned Names and Numbers (ICANN) was established in November 1998. It is a not-for-profit private sector organisation that manages the assignment and allocation of IP addresses. Member States have given the ITU a mandate to work in the area of IP addressing²⁹.

Internet Protocols form the basic infrastructure of an internet. It is these protocols that facilitate the communication or interconnection of networks. IP addresses are construed as one of the virtual, valuable international resources of the global community and an important part of the internet governance debate. There is alleged to be an ‘imbalance in the distribution of IPv4 addresses’, the version that was introduced in 1983. The present concern is about the allocation of IPv6, the new version introduced in 1999. There is a great dispute about the existing management and allocation policies of IP addresses. The current system is approved by 40 and

²⁷ “ITU and its Activities Related to Internet Protocol Networks”, April 2004, <http://www.itu.int/osg/spu/ip/itu-and-activities-related-to-ip-networks.html>

²⁸ “World Summit on the Information Society: Geneva 2003- Tunis 2005”, The International Telecommunication Union, <http://www.itu.int/wsis/basic/about.html>

²⁹ Supra n.2

disapproved by 32 per cent of countries. Since, the issue involves national governments and international organisations, there is a need for a creative solution³⁰.

4.3 EC and OFCOM

A number of regulatory agencies exist at different stages of the telecommunication sector. At the European level, there is the European Commission (EC) and at the national level, we have the national regulatory authority. The communications regulator for UK is OFCOM. It was created in 2003. It controls the telecommunication and wireless services in addition to radio and television³¹.

The European Commission has been the prime driver of all telecommunication regulations in the UK. Interconnection and liberalisation were first of its interests. From time to time it has through the framing of different directives, influenced the UK legislations³². The Commission is now working on its review of the new regulatory framework, as required by the 'review clauses' of the directives, which it expects to complete at the end of 2006. Any changes to the existing UK framework are expected to take effect only in 2009³³. Ofcom and the Department for Trade and Industry (DTI) are expected to jointly respond to the review of the Commission. VoIP and convergence are some of the primary issues that will be considered in the review.

4.4 OFCOM

As, VoIP services transformed into the mainstream, Ofcom used the guidelines framed by Oftel to regulate IP services. According to the guidelines, VoIP services could be regulated if they satisfied the following conditions:

1. if the services were offered as a substitute to the traditional service, or
2. if the services provided both substitutability and access to emergency services, or
3. if the service is the only source of access to the PSTN³⁴.

³⁰ Supra n. 2

³¹ Office of Communications, Statutory Duties and Regulatory Principles, <http://www.ofcom.org.uk/about/sdrp/>

³² Supra n. 26

³³ Ofcom, Regulation of VoIP Services, Statement and Further Consultation, 22 February 2006, <http://www.ofcom.org.uk/consult/condocs/voipregulation/voipregulation.pdf>

³⁴ Supra n.8

The provision of emergency services qualified VoIP providers as PATS both in the Universal Service Directive and the Communications Act, 2003. However, VoIP services offered as a secondary service to the PSTN were not considered PATS. Ofcom, also requested VoIP providers to educate and inform consumers of the limitations in their service, with specific regard to the lack of access to emergency services³⁵.

OFCOM on many occasions emphasised the need to address issues concerning the provision of VoIP/VoB services³⁶. In 2004, Ofcom allotted a new number range (056), for VoIP services.

5. VoIP Consultation

5.1 2004 Consultation

Ofcom issued a consultation on the regulation of New Voice Services with specific regard to VoIP services, in September 2004 titled “New Voice Services: A consultation and interim guidance”³⁷. Depending on their importance it classified issues as immediate and long term. The consultation dealt with the immediate issues of regulation and consumer protection, whereas, Ofcom's Strategic Review of Telecommunications was to deal with the long term issues concerning the impact of the new services on the market. The primary aims of Ofcom were:

1. Promotion and development of innovation and competition
2. Restriction of barriers to entry
3. Provision of adequate consumer protection

Ofcom realised the need to create a balance between the right conditions for market entry and consumer protection. Realising that VoIP services cannot provide the same standards of a PSTN, it suggested that the provision of emergency services were not

³⁵ Supra n.8

³⁶ Ofcom, VoB discussion group meeting on 25 February 2004,
http://www.ofcom.org.uk/telecoms/groups/nvs_index/dg_250204/meeting_notes

³⁷ Ofcom, “New Voice Services : A Consultation and Interim Guidance”, September 2004,
http://www.ofcom.org.uk/consult/condocs/new_voice/aneu_voice/

mandatory and therefore, the customers were given the right to an informed choice. The initiatives proposed by Ofcom concerned three important areas:

1. An interim policy that allowed new voice services to offer emergency access without meeting the obligations of Publicly Available Telephone Services (PATS).
2. Withdrawal of guidelines relating to network integrity
3. A co-regulatory approach to policies of consumer information.

5.2 2006 Consultation

Due to developments in technology and the growth of VoIP services, Ofcom on 22 February 2006, issued a consultation on the regulation of VoIP services, as a follow up to its previous consultation of 2004. It is expected to make a final statement in August 2006. Some of the measures such as withdrawal of the essential requirements guidelines and discontinuance of the interim forbearance policy are said to have an immediate effect. The primary aim of Ofcom in addition to its previous consultation is to encourage and increase the provision of emergency access.

Some of the important proposals highlighted by Ofcom in its consultation are³⁸:

- “Discontinuation of its interim forbearance policy for VoIP services (as introduced in the 2004 consultation) to ensure compliance with Community obligations under the relevant European Community directives;
- Withdrawal of the the Essential Requirements Guidelines given the inappropriate nature of these guidelines for VoIP services and for NGNs;
- Establishment of guidelines on how Ofcom will investigate potential contraventions of obligations in relation to network reliability and emergency calls, to aid transparency and understanding of the requirements and increase the incentive for VoIP services to offer 999 access ;
- Discontinuance of its interim policy for number portability (as introduced in the 2004 consultation); that allowed a communications provider to restrict

³⁸ Supra n. 33

number portability to those PATS providers who were not complying with PATS obligations under the interim forbearance policy.

- Modification of General Condition 18 to clarify the availability of number portability rights to consumers of services using receive only geographic and non-geographic numbers and increase the incentive for VoIP services to offer 999 access;
- Specification of the information that providers must offer their customers to ensure customers are well informed of the capability of VoIP services and a proposal to modify General Condition 14 to mandate this code in respect of certain providers;
- A planned approach to encourage and enforce the maximum level of compliance by providers of VoIP services; and,
- A planned approach to monitoring and reviewing so that as the market and technology develops regulation can be quickly adapted to meet consumers needs continue to be met particularly the need to maintain widespread availability of high quality 999 access”.

The above proposals show the changes effected by Ofcom in its approach to the regulation of VoIP services, from its previous consultation in 2004. It is when Ofcom issues a final statement in August, that the nature of the proposals implemented will be known. However, the European Commission has to also conduct a review this year on the regulation VoIP services. The outcome of which will be known in 2006.

6. Universal Service

Most of the significant issues concerning VoIP services have been addressed by the consultation to a reasonable extent. Consumer Protection, number portability and issues of emergency services have been dealt in detail. However, the consultation remains silent on the issue of universal service or universal service obligations of VoIP providers. It could have been avoided fearing distortion to market entry and innovation of VoIP services. Broadband is the commonly used platform for VoIP services. The number of VoIP consumers in the UK is estimated at 500, 000³⁹.

³⁹Ofcom, VoIP Consultation Announced for UK, 22 Feb 2006 ,
http://digital-lifestyles.info/display_page.asp?section=business&id=3034

The term ‘universal service’ has undergone a sea change, since 1907 when it was first coined by Theodore Vail. From the provision of basic voice telephony in 1995, to the provision of various advanced telecommunication services in 2002, the concept has witnessed massive technological developments. The European Commission enacted a Universal Service Directive in 2002⁴⁰, to specifically address the issue of implementing universal services in the European context.

The aim of universal service is to provide a basic set of communication services to the people deprived of such services either due to their low income or because of the location in peripheral areas⁴¹. This aim of the scheme is to encourage providers to establish basic services in less profitable areas by creating a specific fund for such purpose. As rightly said, universal service has to create a balance between promoting competition and protecting end users⁴².

The current debate is whether ‘Broadband’ services should be included within the scope of universal service⁴³? In 2005, both the European Commission and the OFCOM (Office of Communications) dismissed the possibility of including broadband in universal service obligations, noting that it was premature to make such an amendment. However, both the authorities foresee a possibility of change in the near future, on grounds of market and technological developments⁴⁴. The i2010 Agenda of the European Commission⁴⁵, to invest in broadband services and the ‘innovative agenda’ of President George W. Bush⁴⁶, to ensure universal availability of broadband in the United States by 2007, can be seen as forward steps in that direction.

⁴⁰ Directive 2002/22/EC on universal service and user’s rights relating to electronic communications networks and services (Universal Service Directive)

⁴¹ Hank Intven, McCarthy Tetrault, “Telecommunication Regulation Handbook”, Edition 2000

⁴² Laurent Garzaniti, “Telecommunications, Broadcasting and the Internet”, 2nd Edition, 2003

⁴³ Ibid.

⁴⁴ The European Commission,

http://europa.eu.int/information_society/policy/ecom/doc/info_centre/public_consult/universal_service/comments/kpn_nl.pdf

⁴⁵ http://europa.eu.int/information_society/europe/2005/index_en.html

⁴⁶ Bush Details Broadband Goals, June 24, 2004,

http://www.infoworld.com/article/04/06/24/HNbushbroadband_1.html

Despite changes in factors of efficiency, cost and demand for publicly available services, it appears that authorities are waiting for the market to mature⁴⁷. Also, Internet services are slowly taking over the traditional telecommunication systems creating a massive competition in the market.

The Global Symposium for Regulators in 2004, emphasised the need for regulatory reform in the promotion of low-cost broadband and internet connectivity to achieve universal service. The ITU's Director for Telecommunication Development Bureau remarked that, "in many countries, today's broadband missing link is the regulatory framework"⁴⁸. The number of broadband subscribers increased from 98.9 million in 2003 to 160 million in 2004. Europe, Asia Pacific and Americas contribute to 98.8% of the total broadband subscribers of the world⁴⁹. The creation of a ubiquitous broadband network was seen by the EU and the US as the 'backbone of the information Society' (Bangemann 1994:21) and also a way to achieve universal service in telecommunication services⁵⁰.

Thus, Broadband services have decreased costs, increased speed limits and the provision of advanced applications by serving as a converged platform for communications and entertainment. Since, broadband applications need a 'virtuous circle of supply and demand' (Bangemann 1994:23)⁵¹, authorities could consider its inclusion within the scope of universal service, to enable them to achieve broadband penetration and universal service at the same time. With the right set of regulations and pricing strategy, universal service can soon be a reality for every citizen of the country.

⁴⁷ Ian Walden and John Angel, "Telecommunications Law and Regulation", Second Edition. 2005

⁴⁸ Supra n.11

⁴⁹ Broadband Boom, Broadband markets pick up speed, ITU 2006,
<http://www.itu.int/itu-news/manager/display.asp?lang=en&year=2006&issue=01&ipage=broadband&ext=html>

⁵⁰ Christine Bellamy and John A. Taylor, "Governing in the Information Age", 1998.

⁵¹ Ibid.

7. Conclusion

VoIP services have caused a paradigm shift in the nature and structure of telecommunication services all over the world. VoIP services have been evading regulatory obligations calling them as 'information services'. Developments in technology have given VoIP services, the potential to replace traditional telecommunication systems. This transformation has created the need for better consumer protection amongst other issues of regulation. Some countries have started regulating VoIP services on the basis of functional equivalence and substitutability.

Thus, VoIP services can no longer evade regulation in the auspices of an information service and the time has come for them to be regulated.