



Comments by Cisco Systems, Inc.

on

ComReg Consultation Paper 04/72
Numbering for VoIP Services

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A. Introduction

Cisco Systems, Inc. (“Cisco”) welcomes the opportunity to provide its comments on Consultation Document 04/72 issued by the Commission for Communications Regulation, entitled “*Numbering for VoIP Services*”, but also covering broader issues, i.e. going beyond strict numbering issues, relating to Voice over Internet Protocol.

Cisco is the worldwide leader in networking for the Internet. Today, networks are an essential part of business, education, healthcare, government and home communications, and Cisco’s Internet Protocol-based (IP) networking solutions are the foundation for many of these networks. Cisco hardware, software and service offerings are used to create Internet solutions that allow individuals, companies, public administrations and even countries and the European Union as a whole to increase productivity, improve customer satisfaction and strengthen competitive advantage.

Since the company invented the first multi-protocol router in 1984, Cisco has been one of the leaders in the development of IP-based networking technologies. This tradition of IP innovation continues with industry-leading products in the core areas of routing and switching, as well as advanced technologies in areas such as home networking, IP-enabled voice, optical, network security, storage networking and wireless LAN.

We would like to emphasise from the outset that VoIP is a technology which underpins applications and which can be used to create services supporting, amongst-others, the conveyance of voice. VoIP, as such, is not an electronic communications service, it can also be utilised by end-users without an intervening service provider.

Also, VoIP-enabled applications and services are capable of delivering much more than basic telephony; they are part of the new IP communications environment, with innovative features, providing real benefits in terms of productivity and convenience to businesses, administrations and consumers.

In general terms, we strongly believe that VoIP is a transformative technology, beneficial to innovation, economic efficiency, overall market growth and development, and hence contributing in a major way to business, government, and personal productivity and well-being. Therefore it provides real benefits to its users in Ireland and to the European Union as a whole.

Policy makers and regulatory authorities, at all levels, should embrace VoIP-enabled applications and services, and encourage their provision by a wide range of entities, including the incumbent operators, the existing alternative operators, entirely new service providers and end-users themselves. Cisco Systems believes that the role of the policy-making and regulatory community should be to ensure that meaningful innovation can flourish, and is not held back by legalistic or transitory issues, and/or by unnecessary, untimely or inappropriate regulation.

B. VoIP Categorisation

Annex 4 of the ComReg consultation document contains a categorisation of “*Typical types of VoIP services*”. Although this categorisation is not the subject of specific consultation questions, ComReg is inviting interested parties to comment, and Cisco Systems would like to present brief comments on VoIP categorisation before addressing the detailed questions about numbering and related matters.

Cisco Systems agrees with ComReg that the category “*Corporate internal use on a business LAN/WAN*” is likely to be the main driver for VoIP growth for the immediate future. Indeed, Cisco is providing equipment, software and integration services to end-users who are making this a reality today. Thus, we would like to take this opportunity to address some of ComReg’s statements relating to this category (ref. page 40 of the consultation document).

ComReg begins by stating that, in general, this is a Virtual Private Network situation, where there is not considered to be a service provider, although the management of the system may be outsourced to a service provider. Cisco agrees with this. ComReg goes on to state that: “*Except insofar as it reaches out beyond the corporate Intranet (e.g. to reach PSTN or public VoIP customers), this is effectively a private network.*” This statement entails a risk of being misinterpreted, as it seems to suggest that a self-provided system, which would be connected to the PSTN or to external VoIP systems, would NOT be a private network, and may, by implication, perhaps be considered to fall within the definition of “*electronic communications service*”, which in turn may trigger certain regulatory obligations. If it was not ComReg’s intention to suggest that connection to the PSTN/external VoIP would trigger qualification as an electronic communications service, we invite ComReg to clarify the scope of the category “*Corporate internal use on a business LAN/WAN*” in its September 2004 Report.

VoIP enabled corporate private networks with connections to the PSTN or external VoIP systems are not different from traditional circuit-switched corporate private network implementations, whereby large corporations connect their buildings by making use of leased lines or managed services (Frame Relay, ATM, IP-VPN, Ethernet links), and where the routing of outgoing calls to the PSTN/ISDN/Mobile networks is optimised through one or more PABXs connected to public networks. Such implementations can be concentrated in a single country, or can be rolled-out in multiple countries and are generally considered to be self-provided, i.e. not considered to fall within the definition of “*electronic communications service*”. Likewise, VoIP-enabled equivalent implementations, which are gaining ground with large corporations, should unequivocally be categorised as self-provided, and therefore, fall outside the definition of electronic communications service.

Cisco Systems would like to propose a refinement of the Annex 4 categorisation by ComReg, to ensure that self-provided systems are unequivocally categorised as falling outside the definition of “electronic communications service”.

Perhaps the following reasoning can help to underscore the fundamental distinction between self-provision by end-users on the one hand, and voice service provision (VoIP-enabled) by service providers on the other hand.

Cisco Systems believes that, where the following circumstances apply, there is self-provision by the end-user, and no provision of an electronic communications service.

Where an end-user, irrespective of type or scale, develops or purchases:

- software applications;
- software applications embedded in hardware devices;
- traditional hardware;

and makes use of these to convey voice without any intervention by an external voice services provider¹ to effectuate voice communications:

- within an enterprise/public administration (i.e. inside buildings, between buildings, at remote locations in contexts such as tele-working, business travel by employees, etc.);
- within a closed user group (e.g. a community of trading partners, etc.);
- in the public sphere, with anyone else with whom the software or hardware enables voice communication;

then, the end-users are self-providing their voice communications, and no provision of an electronic communications service occurs.

This is the case, even if:

- an enterprise/public administration self-provides one or multiple gateway(s) to the traditional voice networks (PSTN/ISDN/mobile)²;
- end-users, including individuals, use the Internet to reach each-other³.

¹ We distinguish making use of a service provider whose service offering consists of the conveyance of voice calls, from making use of a signal transport provider, e.g. a provider of leased lines, point-to-point IP traffic transport, an Internet access provider, etc.

² Interworking with public networks is a classic feature of traditional Private Branch Exchanges (PBX) or Private Automatic Branch Exchange (PABX); this is in no way different for IP-PBX.

Cisco Systems believes that its reasoning on self-provision by end-users is entirely consistent with the EU regulatory framework for electronic communications, and with its transposition into Irish national law, and that such self-provision should clearly fall outside the definition of “electronic communications service”.

We would therefore propose that ComReg confirm and endorse this reasoning on self-provision in its future approach to VoIP, and in particular in the September 2004 Report.

Cisco Systems believes that no specific regulation is justified on self-provision by end-users as outlined above, and that this is also entirely consistent with the EU regulatory framework for electronic communications networks and services.

By contrast, where a service provider⁴ supplies to third parties (end-users, resellers, systems integrators, other service providers, etc.), a service consisting (wholly or partly) of the conveyance of voice, this activity is not self-provision, but service provision.

Cisco Systems has no particular comments on the other categories put forward in Annex 4 of the ComReg consultation, except that we would like to point out the following:

As was indicated in the introduction of this response, we consider VoIP to be a technology which underpins applications and services supporting, amongst others, the conveyance of voice. With this consideration in mind, we submit that, if an operator providing a traditional circuit-switched voice service⁵ decided to change network elements (e.g. core transport and switching) to VoIP, but this implementation would not change in any way the characteristics of the voice service provided, this should not in any way change the qualification/categorisation of the voice service. ComReg appears to indicate that this is also its position in Chapter 4.13 of the consultation document, but we propose that this also be explained clearly in the forthcoming September 2004 Report.

³ Individuals and enterprises can download or otherwise obtain freeware, shareware or commercial software, or purchase hardware devices with embedded software, which enable them to use the broadband Internet access to which they already subscribe, in order to reach other users of the same or similar/interoperable software and hardware and conduct voice conversations with them, without having to pay a voice service provider to convey calls.

⁴ The notion of service provision normally implies that the supply is made against remuneration. This is confirmed by Article 2.1 of Statutory Instrument No. 307 of 2003.

⁵ The traditional circuit-switched voice service could be the Universal Service, as defined, the Publicly Available Telephone Service (PATS), as defined, or another electronic communications service.

C. Numbering for VoIP-enabled Services

C.1 Introduction

Before discussing details of numbering policy and number allocation/assignment for VoIP-enabled services, we believe that it should be recognised that, inherently, numbering resources are not scarce. However, Cisco Systems does accept that there may be selective temporary scarcity in specific number ranges in Ireland, as a result of historic choices (which in fact pre-date the establishment of ComReg). We also recognise that this factual scarcity may continue for some time, given that it is non-trivial and very disruptive to change number ranges or digit lengths. We also understand and believe that any temporary scarcity needs to be addressed in order to prevent unnecessarily hampering the diffusion of innovation, be it for VoIP-enabled services, or other services. We encourage ComReg to devise a strategy to ensure that, in the medium term, sufficient numbers of all categories and types (including geographic numbers) are available, in all areas, in such a way that all undertakings requiring numbers can receive them.

C.2 Choice of number ranges: response to ComReg Questions 1 through 8

Introduction

ComReg's reasoning and proposals in Chapter 4.1 through 4.3 are clearly inspired by a situation of serious factual scarcity of geographic numbers in certain Minimum Number Areas (MNAs), as well as by concerns about a potential massive increase in the demand for geographic numbers for new VoIP-enabled services (multiple numbers per household/user), which could put extreme pressure on the availability of geographic numbers in all MNAs.

Cisco Systems believes that ComReg's proposals with regard to the possible use of geographic numbers are particularly restrictive, in that geographic numbers would only be available for a subset of "Publicly Available Telephone Services" (PATs), i.e. those provided at a fixed location, and with a maximum of one number per termination point. Furthermore, we are not convinced that this proposal is proportionate, and if it were to be adopted, it should be: (i) very specifically justified on the basis of applicable legislation, including its compliance with the principle of non-discrimination, (ii) temporary, and (iii) accompanied by a published strategy to ensure its temporary character, i.e. accompanied by a commitment on the part of ComReg to evolve the number plan, within a specified timeframe, to a situation where there is no scarcity of geographic numbers.

The above comment is made because Cisco Systems fundamentally believes that both geographic and non-geographic numbers (and 'new' number ranges where appropriate, which will presumably be assimilated to non-geographic status in Ireland) should be available to support VoIP-enabled services, and that it should be for the providers of VoIP-enabled services to determine the type of numbers they wish to work with, rather

than for the regulator to pre-determine the services that are or will be allowed to make use of particular number ranges. In Cisco's view, only factual number scarcity can constitute a justification for a temporary exception from this principle.

This position is consistent with the statement⁶ made by the European Commission in Chapter 7 of its Information and Consultation Document on Voice over Internet Protocol (and which the European Commission seems to have incorporated in the 'Information' part of the document, rather than in the 'Consultation' part of the document, given that no questions are put to consultation on this point).

The permission or lack thereof to use geographic numbers is likely to have immediate implications for the business models of VoIP-enabled service providers, especially in the short-term, given the absence of established interconnection arrangements for new number ranges and for certain non-geographic number ranges. Access to geographic numbers enables the rapid launch of services that will be well-understood by all end-users, whether or not they are customers of VoIP-enabled services. Some providers of VoIP-enabled services may choose to develop new business models, which may rely on new number ranges, or existing non-geographic number ranges to facilitate a broader array of services to consumers. These providers should have the opportunity to create new business models and to negotiate new underlying interconnection arrangements.

Q. 1. Do you agree with ComReg that geographic numbers could be allocated for VoIP purposes in specific cases (see also Q21)?

Q. 2. Do you agree that if geographic numbers are made available for VoIP use (See Q1), they should follow the same rules as for PSTN (i.e. only one number per 'line' or termination point, allocated from the MNA in which the customer is based)?

Q. 3. If geographic numbers are made available for VoIP use, would you consider that this should be limited to VoIP services that qualify under the current definition of PATS (i.e. have the rights and corresponding obligations - as far as those can be applied - of PATS)?

⁶ Chapter 7.2: [...] Member states are encouraged to give any undertaking providing or using electronic communication networks or services that applies for it, access to geographic numbers. Chapter 7.3: [...] Member states are encouraged to give any undertaking providing or using electronic communication networks or services that applies for it, access to non geographic numbers. (our underlining)

Cisco Systems believes that there is a strong intrinsic case for allowing the widespread use of geographic numbers by VoIP-enabled services. Any restriction on this principle should only be justifiable on the grounds of temporary scarcity of geographic numbers, and therefore any restriction of this nature should itself be temporary.

Arguments in favour of the widespread use of geographic numbers are as follows:

a) Technical and economic basis

It is important to recall the historical basis which underlies currently existing numbering arrangements. Geographically distinct telephone zones were introduced as a technical measure to facilitate hardware-based call routing, and de-facto became a mechanism for operators to differentiate retail tariffs (between local and longer distance calls). Today, in Ireland, the difference between retail tariffs for local and for long-distance domestic calls has contracted (in several smaller EU Member States, the retail price for a local and a national call is now identical), and the physical and logical architecture of networks is changing. Therefore, for all intents and purposes, the technical basis (physical routing) and the economic basis (tariff differentiation by operators; tariff information to end-users) for the existence of geographically distinct telephone zones are fading into obsolescence.

More generally, it is Cisco Systems' opinion that innovation would be unnecessarily curtailed if the "semantics" historically associated with specific number ranges (location=tariff information) would be artificially maintained or enforced by regulation. This would likely have the effect of freezing or perpetuating the business models of the past.

This would be especially counterproductive where, as is the case in many VoIP implementations, the costs incurred by both the calling party and the called party no longer vary according to their location (within a country, and even globally).

Equipment and software exists which enables companies and public administrations to ensure that a particular person can be reached, on a particular (often geographic) number, irrespective of where the person in question is located, be it at their office, at another company office (business travel), at home (tele-work), or anywhere in the world where a suitable Internet connection is available. The calling party pays the normal (often geographic number related) retail tariff to reach the called party, irrespective of the called party's physical location.

b) End-user familiarity with geographic numbers

End-users are familiar with geographic numbers, but are often wary of calling non-geographic numbers, which are perceived as being expensive to call, and in some cases may be subject to default call-barring (especially in companies and public administrations where the network administrator seeks to control costs). Requiring IP-enabled voice service providers to use new (and therefore unfamiliar) number ranges will almost

certainly seriously mitigate the rapid development of applications and services making use of VoIP technology.

Even though it may be an issue of unfounded negative perception, it would be against the interests of end-users, and harmful to innovation, to 'relegate' VoIP-based services to number ranges which will artificially depress the take-up of services.

c) Interconnection issues with new number ranges and non-geographic numbers

There are currently no defined interconnection arrangements (reference offer provisions, technical implementation in routing tables of operators, etc.) for un-allocated non-geographic number ranges, and the same may be true for some allocated, but un-assigned/un-used non-geographic number ranges. If VoIP-based services must be deployed in such number ranges, there is a great likelihood that practical implementation will be seriously delayed, due to the necessity to negotiate technical and economic arrangements (including wholesale call termination charges, and in some cases perhaps call origination or retention charges depending on the business models).

There is a genuine possibility of failure of such negotiations, which would trigger the need to resort to dispute resolution by ComReg, and possible appeals of the ComReg decision.

ComReg could conceivably intervene ex-ante in setting wholesale interconnection principles and charges, but, in Cisco Systems' opinion, this is not desirable as it prejudices business models, and reduces the opportunities for different providers to define different business models. Also, it is not in accordance with the principles laid down in the EU directives (primacy of negotiations).

d) Conclusion on ComReg Questions 1, 2 and 3

Cisco Systems believes that there is, intrinsically, a good case for allowing very widespread use of geographic numbers in the context of enabling VoIP.

Therefore, geographic numbers should certainly be made available for providers meeting all aspects of the definition of PATS, and providing their services at a fixed location.

Cisco Systems believes that the same should be applicable for providers of VoIP-enabled services, which meet the definition of PATS, which in itself does NOT specify a fixed location, and provide nomadic services.

In addition, it is difficult to identify any intrinsic justification for disallowing the use of geographic numbers by providers whose VoIP-enabled services are genuinely new, different, or comprise or combine considerable added value features which do not make them substitutable (in both directions) with PATS, including nomadic VoIP-based access.

The case for including nomadic access is justified by the fact that, in principle, there are no negative effects compared to the traditional arrangements, neither for the calling party (in the calling party pays logic), and, in many implementations, nor for the called party (no call reception charge or roaming charge), although some service providers could choose to levy charges for VPN-based nomadic access. Also, the interconnection point, and the corresponding wholesale call termination charge, should not vary according to the end-users' physical location, just as is the case with mobile networks.

In conclusion, it would seem preferable to enable quick service launch without obstacles, by using geographic numbers, and in parallel to leave room to all interested parties to define innovative business models and to negotiate the corresponding interconnection agreements, including for the conveyance of traffic to non-geographic numbers, or to number ranges dedicated to VoIP. The only justifiable motivation for deviating from this approach is acute factual scarcity of geographic numbers.

Q. 4. Do you agree with ComReg that Personal numbers could be allocated for VoIP purposes in very specific cases (e.g. where justification can be provided for allocating a number to a natural person using an IP connection)?

Yes, Cisco Systems believes that providers of VoIP-enabled personal services, including nomadic access, should be entitled, if they so wish, to use personal numbers (0700 range).

Given that personal numbers are not widely used today, it should perhaps be possible for ComReg to extend the 0700 range (or create sub-ranges) to support a larger amount of available personal numbers. Creating opportunities for the market to enable the expansion of services is a positive role for the regulators to play – allowing the VoIP enabled providers to offer personal numbers is one way to achieve this.

Q. 5. Do you agree with ComReg that other non-geographic numbers and mobile numbers should not be allocated for VoIP purposes – at least at this point in time?

Cisco Systems believes that providers of VoIP-enabled services should be free to devise new business models, some of which may involve the use of non-geographic numbers, including Shared Costs, Premium Rate, FreePhone, Universal Access, as well as new types of non-geographic numbers with new types of wholesale charges (including third party billing) and retail tariff principles.

Such numbers should be available on request of providers of VoIP-enabled services, and ComReg should be prepared to arbitrate in interconnection disputes concerning the use of such non-geographic number ranges.

As regards mobile numbers, Cisco believes that it makes sense to reserve these to fully mobile voice services irrespective of whether they are traditional or VoIP enabled. The mobile networks are evolving: 3GPP mobile networks have an Internet Protocol (IP)

Multi-Media (MM) subsystems that overlays the circuit-switched layer, which means that in the very near future, mobile networks will be able to support SIP-based VoIP.

. 6. Do you agree that a new number range should be opened for VoIP services?

Cisco Systems has no objections to the definition of a new number range that can be used by providers of VoIP-enabled services.

However, we would like to stress that, in our view, providers of VoIP-enabled services should have a choice of the number range they wish to work with, and should be given the opportunity of autonomously defining their business models (which can be linked to the choice of number range, as well as the wholesale charging and retail tariff principles).

Indeed, in our view, it would not be appropriate if ComReg were, de facto, to pre-determine the business models of all (or almost all) service providers, by setting common economic (interconnection / retail) principles, of a number range that all (or almost all) providers of VoIP-enabled services would be required to use.

Q. 7. If so, do you agree that this new range should be the 076 range? If not the 076 range, which range do you think would be more appropriate?

Q. 8. Do you agree that the number length should be 3+7 digits long? If not, please suggest your alternative.

As and when a 'new' number range is to be defined, Cisco Systems' preference goes to a number range that 'looks and feels' as much as possible like a geographic number range. A 'national geographic number range' (as is under consideration in Germany), or 'multiple new MNA number ranges with national characteristics rather than a geographic area' (if possible) and with the same number of digits as traditional geographic numbers, might be more appropriate than a 07 sub-range, which may give rise to (possibly unfounded) negative perceptions by end-users, and hence entails the risk of artificially depressing the take-up of VoIP-enabled services.

Also, we would like ComReg, in its September 2004 Report, to justify in more detail the reasons for ruling out the use of the 03 top-level range.

Aside from the above remarks, Cisco Systems can agree with the selection of 075, 076, 077, 078 and 079 as the 'new' ranges for VoIP-enabled services (assuming that this will open just under 50 million new available numbers).

C.3 ENUM: Response to ComReg Questions 9 through 11

Cisco Systems is a strong proponent of ENUM, in combination with a flexible approach to the use of traditional numbering arrangements.

ENUM provides additional means of identifying users, enriching the user identification information (e.g. e-mail address, postal address, company information, etc.), creating private number plans, introducing special billing arrangements (e.g. reverse billing, split billing, etc.), which are all features that contribute to VoIP-based solutions providing genuine added value compared to traditional voice services. ENUM provides a level of abstraction that offers great flexibility on the manner in which identification data are treated and supports some value added services such as presence management.

In addition, ENUM can usefully be leveraged to provide facilities such as number portability, in a more decentralised manner, in a standards-based environment, and without having to use dedicated, switch vendor specific hardware and country specific software. ENUM can run on commodity hardware and software (equipped DNS servers), which is 10 times cheaper than proprietary IN platforms attached to legacy voice switches. ENUM, if appropriately deployed, is country independent, and enables, for instance, a voice service provider to create pan-European services more easily, and to reduce the costs of operating in multiple countries.

However, ENUM should not be seen as a panacea to solve numbering issues. In particular, ENUM does not resolve issues surrounding the attribution of numbers, and, while it can support number portability, it does not address aspects such as responsibility for numbers in the context of number portability.

Q. 9. Do you consider that ComReg should support ENUM using a distinctive number range (which could be a sub-set of a range designated for VoIP, or a separate range with its own access code)?

Q. 10. Do you prefer designation of the first digit(s) of the VoIP subscriber number to achieve this (i.e. the digits immediately following the VoIP access code), or the allocation of a separate access code (e.g. 079)?

Q. 11. Do you support the broad principle that end-users who wish to avail of this ENUM number range should be obliged to “opt-in” to the ENUM protocol, and would lose the number if subsequently opting out?

Cisco Systems is a proponent of ENUM, but sees no need to define a distinctive number range or sub-range for ‘ENUM enabled’ services.

C.4 Different VoIP number ranges: response to ComReg Questions 12 to 14

In Chapter 4.5 of the consultation document, ComReg puts forward the possibility of introducing differentiation of VoIP number ranges according to ‘VoIP service type’ as defined in Annex 4, but in fact the differentiation discussed relates rather to quality levels than to service types. ComReg suggests that the ‘075’ range could be dedicated for ‘PATS service levels’ or (at least partially) guaranteed quality, and ‘076’ could be available for ‘basic service’ (not defined). Chapter 4.6. builds on this, by being more explicit about quality as a differentiation criterion.

Cisco Systems believes that VoIP technology enables the delivery of high levels of quality of service, and indeed in some implementations it enables a distinctly higher quality of service than is offered by traditional circuit-switched telephony, e.g. ‘hi-fi’ telephony. Regulators should promote possibilities to evolve towards higher quality, and not impose minimum or “standard” quality, be it for VoIP-enabled services, or for other voice services.

Whilst it may seem appealing, and consumer-friendly, to pre-categorise VoIP-enabled service providers according to quality of service and to use number ranges to differentiate them, Cisco would not endorse this approach. See also our response to Q. 14.

Also, pre-categorisation structured around quality of services entails risks of inflexibility. Specifically, it could be a gating factor for operators wishing to move from one business model to another, or from one level of quality of service to another, as technology evolves. Such a change would potentially require changing number ranges, with end-users either being left stranded with a legacy quality of service, or being required to change numbers.

There are, and Cisco Systems believes there will be, numerous different providers of VoIP-enabled services, all making their own determinations in terms of the quality levels they wish to offer. In our view, it should be for the market to determine which services are successful and which are not, and quality will be a major parameter in the choices of end-users. It is already clear today, in the circuit-switched and in the VoIP-enabled voice markets, that there is demand for different quality levels. In the future, the range of quality levels is likely to become even greater, and will include ‘hi-fi telephony’.

Pre-categorisation by the regulatory authority creates a higher level of risk by limiting end-user choice and competition, and removing incentives for innovation. This is particularly true if only a limited set of number ranges is offered, and the ‘high quality’ number range is equated to the service quality level offered historically, by technology/protocols that are decades old.

Q. 12. Do you consider that ComReg should allow or support the differentiation of different VoIP service types using distinctive number ranges?

No, and certainly not according to the pre-determined quality parameters.

Q. 13. Do you agree with the opinion that the selection of a number range to facilitate the provision of VoIP services should not be predicated on the quality of those services? If you disagree, please give your opinion as to why it should be based on voice quality.

Q. 14. If not by number range, how can consumers be best informed about the expected quality of service?

Cisco Systems agrees with ComReg that it is not desirable, and certainly not at the early stages of development of VoIP-enabled services, to link voice quality to specific number ranges and/or to determine minimum or “standard” quality. In actual fact, VoIP-enabled services can offer higher quality than traditional voice services, and the most important limitation on the widespread development of ‘hi-fi’ telephony resides in the fact that most calls still terminate on the PSTN, and hence interconnection with the PSTN is needed, using the traditional standards and protocols.

In accordance with EU Directive 2002/22/EC on Universal Service (articles 22 and 20), ComReg may consider imposing obligations on VoIP-enabled service providers to publish information on the quality of their services in order to ensure that the consumer (and if applicable other end-users) are informed and not misled. We believe that exercising this option is sufficient to ensure consumer information, knowing that consumer associations will surely highlight any manifest problems of quality of service and that end-users have the ability of changing providers.

D. Number Portability

Number portability is clearly expressed as a subscribers' right in Article 30 of EU Directive 2002/22/EC, from which obligations result for providers of 'publicly available telephone services' (PATS - fixed and mobile).

Cisco Systems believes that Article 30 of EU Directive 2002/22/EC should not be interpreted so restrictively as to mean that Member States may only entitle subscribers of PATS to benefit from number portability, to the exclusion of subscribers to other services.

Ireland's Statutory Instrument No. 308 of 2003 transposes Article 30 into national law, but, in addition, the Irish National Numbering Conventions (ComReg document 04/35), Chapter 11.6, stipulates that: *"All fixed network operators with Geographic or Non-geographic number allocations and all mobile network operators, including MVNOs, are obliged to offer full Operator Number Portability to their customers. In the case of geographic numbers, Location Portability may also be offered by an operator, but only within the MNA for which the number was originally allocated."*

The implication here is that, in Ireland, the obligation of number portability is extended beyond what is required by the EU directives.

With regard to ComReg's proposals in Chapter 4.7 of the consultation document, i.e. the possibility of not enforcing the general obligation of number portability in the specific case of VoIP-to-VoIP portability within the new number range(s) from the outset, but to adopt a transition period, please allow us to comment that number portability should, in Cisco's opinion, not be immediately mandatory for non-PATS VoIP-enabled service providers that use the new number range(s), but where a provider exercises a right to port-in numbers, this provider should be required to support the porting-out of numbers to all categories of numbers/providers it is entitled to port-in from.

Cisco Systems appreciates that ComReg is inviting viewpoints on portability between (primarily or totally) PSTN-based services and VoIP-based services, and specifically on the criteria that might be used to differentiate between cases where portability should or should not be mandated. In response, we submit the following proposal, which also contains Cisco's own categorisation of VoIP-enabled services, and which differs from the categorisation contained in Annex 4 of the ComReg consultation document, but not to an irreconcilable extent (except perhaps as regards self-provision by end-users; see also Section B of this submission).

Our proposal is structured around the position expressed in Section C of this submission, i.e. widespread rights of providers of VoIP-enabled services to make use of geographic numbers, and takes into account our understanding that ComReg itself is proposing to amend the Irish National Numbering Conventions, to allow for a transition period relating to the obligation of number portability.

Cisco Systems believes that number portability should –at least– be available in the following configurations:

Category	Number Portability Principles
<p>Category 1:</p> <p>Genuinely new/different VoIP-enabled services; with no 2-way substitutability with PATS</p> <p><i>e.g. video telephony, services with presence awareness, nomadic services.</i></p>	<p>Should be allowed to benefit from geographic numbers (See Section C above).</p> <p>Should be allowed to port-in geographic numbers from categories 4 and 3 (and, if applicable, category 2) and must clearly communicate to users/consumers, and establish contractually, that the service they provide is different.</p> <p>If allowed to port-in geographic numbers, it should be a requirement to support port-out of geographic numbers to all categories from which they are entitled to port-in.</p> <p>If a specific number range is dedicated or available for VoIP-enabled services of this type, number portability should be promoted within this range, but not immediately mandated. A glide path towards an obligation could be considered to be in the public interest.</p>
<p>Category 2:</p> <p>VoIP-enabled services not meeting all elements of the definition of PATS</p> <p><i>e.g. not providing emergency calls, only providing outgoing calls.</i></p>	<p>If allowed to use geographic numbers, they should be allowed to port-in geographic numbers and must clearly communicate to users/consumers, and must establish contractually, that the service they provide is limited.</p> <p>If allowed to port-in geographic numbers, it should be a requirement to support port-out of geographic numbers to all categories from which they are entitled to port-in.</p> <p>If a specific number range is dedicated or available for VoIP-enabled services of this type, number portability should be promoted, but not mandated. A glide path towards an obligation could be considered to be in the public interest.</p>

Category 3: PATS (<i>VoIP-enabled or not</i>)	Obligation to support number portability for all number ranges used.
Category 4: Universal Service provider	Obligation to support number portability for all number ranges used.

Cisco Systems believes that it would be premature to consider porting a geographic number to a mobile network, but, as discussed in Section C above, nomadic VoIP-enabled services (which could meet the definition of PATS or not, depending on the choice of the service provider), should, in our opinion, be entitled to geographic numbers. Consequently, porting a geographic number from a traditional telephony service to a nomadic VoIP-enabled service should also be allowed.

Q. 15. ComReg invites comments on the Number Portability (NP) issues.

a) Do you agree that NP should be required between PSTN and VoIP operators for geographic numbers? Please comment on your answer.

Please refer to our comments above.

b) Do you agree that NP should not be required between PSTN and VoIP operators for personal numbers (if these are permitted to be used for VoIP purposes), in view of the existing complexity of personal numbers even without taking inter-technology issues into account?

We believe that number portability should be allowed, although not mandated, if the provider of VoIP-enabled services chooses to support it, and insofar as the provider commits to reciprocity, i.e. the right to port-in triggers the obligation to port-out.

c) If existing number ranges (e.g. geographic or personal numbers) are allowed for use with VoIP services, do you agree that NP should be required between different (but compatible) VoIP operators?

Yes, please refer to our comments above.

d) If (a) new number range(s) are designated specifically for VoIP and/or other new technologies, do you consider that NP should be required for these between different (but compatible) operators of such services, either from the outset or at a later more mature stage of the market?

Please refer to our comments above. Cisco Systems agrees with the notion of a well-defined transition period.

E. Interconnection and Tariffing for VoIP-enabled Services

Cisco Systems is a supplier of hardware and software, but is not a service provider. Therefore, we may not be well suited to comment on the details of inter-operator wholesale charges and on retail tariffs for end-users.

However, we would like to express, in general terms, our disagreement with ComReg's proposals set forth in Chapters 4.8 and 4.9 of the consultation document. These proposals would set a maximum retail tariff for calls from the PSTN to VoIP destinations in Ireland (not to exceed the national rate of the originating PSTN network), and project wholesale and retail principles of the existing PSTN arrangements onto VoIP.

In Cisco's opinion, business models for VoIP-enabled services should not be predetermined by the regulatory authority, as this would reduce the opportunities for service providers (be they incumbents, existing alternative operators, or entirely new service providers) to innovate, and for different providers to define different business models and service packages for end-users. Pre-determination will ultimately have a negative impact on competition for VoIP services in the Irish market.

Q. 16. Do you anticipate any undue difficulties in respect of commercial negotiations between operators (whether existing or new market entries) in respect of the development of tariffs for new VoIP services, whether based on existing or new number ranges? If so, please explain and if possible suggest your solutions to these.

Q. 17. If yes, what broad criteria should be applied to these tariffs?

Cisco Systems would not be surprised if certain difficulties were to arise with regard to wholesale charges and retail tariffs for new VoIP-enabled services, especially where one or several new number range(s) is/are introduced, or non-geographic numbers are employed for which no pre-existing interconnection arrangements and retail tariffs have been defined.

If ComReg believes that some intervention would be needed to 'kick-start the market', we would suggest defining multiple number ranges, with multiple maximum retail tariff bands (but, as discussed earlier, not to link these number ranges to a specific type of VoIP-enabled service or to a specific quality level). Sufficient charge bands should then be provided to support many different business models, and service providers should have the right to request the creation/opening of new charge bands. Moreover, we believe this process should be rapid, i.e. ComReg should rapidly proceed with the attribution of number ranges, and be prepared to exercise its dispute resolution role expediently. In this context, it must be noted that VoIP-enabled services will often comprise more than just the conveyance of voice, and may also be mixed services with video, data and media services.

Q. 18. Specifically, would you agree with ComReg’s proposal that the maximum retail tariff for calls from PSTN to VoIP destinations in Ireland (i.e. where the PSTN/VoIP gateway or the final destination is in Ireland) should not exceed national rate for the originating PSTN network? Please comment on this and on the corresponding situation where any VoIP network that may be subject to regulation originates such a call, where the termination may be on a) PSTN or b) IP. If you feel national rate is excessive for VoIP, would you alternatively consider that local rate is a practical alternative maximum amount to set down?

Q. 19. Alternatively, is there merit in allowing totally free market competition to set the retail tariff without any number-related indication for customer transparency of the maximum permitted retail prices? If ‘yes’, is it also your view that commercial negotiations can generally be concluded sufficiently quickly without such a retail ‘starting point’?

Q. 20. Do you agree that the wholesale settlement and retention arrangements that would apply to any usage of existing number ranges for VoIP purposes should follow existing PSTN arrangements, or do you consider that VoIP represents a special case which would necessitate changes? Please explain your views in the latter case.

Q. 21. Do you agree that retail, settlement and retention principles that would apply to any new VoIP non-geographic number range could be quickly determined based on existing arrangements for other non-geographic services (and not taking account of the special case of Premium Rate services)? Please explain your views, with suggestions if appropriate.

Q. 22. Respondents are invited to comment on the above section 4.9, dealing with interconnection: Do you agree with ComReg’s position on the VoIP interconnection issues of opening of number ranges, call termination and call origination? If not, please comment.

Cisco Systems does not agree with ComReg’s proposals as per Questions 18, 20 and 21. See also our comments above.

We believe that ComReg should closely monitor developments, identify difficulties if they arise, and should be prepared to exercise its dispute resolution powers in the most expedient manner possible, but that wholesale charges or retail tariff caps should not generically be applied ex-ante and collectively for “VoIP services” or for “calls to VoIP services”.

F. Display of Calling Line Identification (CLI)

Q. 23. Do you agree with ComReg's view that unless the unaltered status of CLI on VOIP services can be guaranteed with a very high degree of certainty, it should either come with a 'health warning' to this effect, or else not be displayed – and in any case should be 'Unavailable' for PSTN purposes? Please comment on this topic, which has potential importance for billing, data security and privacy, emergency services, fraud prevention and customer service levels.

VoIP allows CLI to be transmitted in all cases. Cisco Systems' technology, if properly implemented by network operators and service providers, allows a very high degree of confidence that CLI integrity will be ensured.

Cisco Systems is strongly opposed to CLI not being displayed for VoIP services, or associating a 'health warning' as ComReg proposes, as this entails a major risk of reducing the credibility of VoIP-enabled services compared to traditional services. Any such measures should only be considered after repeated serious issues with hacking/fraud occur, and if such cases are of a magnitude which is substantially greater than issues that exist in the circuit-switched environment.

In this context, it should be noted that CLIs can be, and are being, manipulated in the circuit-switched environment, by end-users ('blueboxing', 'phonephreaking') and by unscrupulous and fraudulent service providers. Such fraud is actively being combated by the industry, without ex-ante regulatory interventions, and the situation should not be different for VoIP-enabled services, unless it is proven to be necessary by practical negative experience on a wide scale. At this early launch stage of VoIP-enabled services, this fraud is not evident.

G. Inclusion in Carrier Pre-Selection (CPS)

Q. 24. Do you agree with ComReg's view that in principle VoIP origination is incompatible with CPS, while PSTN origination to VoIP numbers can follow principles already established for other non-geographic numbers?

Certain VoIP implementations are and will be positioned on the market as a mechanism for call origination, seeking to complement or substitute traditional call origination arrangements, for example those that rely on carrier selection (CS) and carrier pre-selection (CPS).

Cisco Systems wishes to stress that there is no 'technical incompatibility' between CS/CPS and VoIP, but that there is merely a possibility for certain service providers to use VoIP as a substitute for CS/CPS. ComReg could usefully clarify this in its September 2004 Report, to ensure that no misunderstandings occur, and to ensure that CS/CPS is not unduly refused to VoIP-enabled service providers that would wish to use a combination of CS/CPS and VoIP.

H. Directory Enquiries (DQ)

Q. 25. ComReg invites responses from interested parties on the topic of Directory Enquiry entries for VoIP users availing of public telephone numbers.

a) Should a listing in a publicly available directory be available to all subscribers to these VoIP services?

b) Should this directory be linked to the National Directory Database (NDD), if separate?

Cisco Systems believes that it is in the public interest that end-users of publicly available VoIP-enabled services (of any type) have the right (at their option) of inclusion of their number (of any type) in publicly available printed or electronic directories and in publicly accessible directory enquiry services. We see no immediate reason for this to be in any way separate or differentiated from the Irish National Directory Database.

I. Entitlement to Receive Allocations of VoIP numbers

Cisco Systems agrees with the principles outlined by ComReg in Chapter 4.13, which we understand as implying that the Numbering Conventions would apply in a technologically neutral manner to all providers that apply for numbers and/or are allocated numbers, irrespective of whether they provide traditional or VoIP-enabled services.

Q. 26. ComReg calls for comments regarding these terms and conditions. Do you feel that these are appropriate to the proposed use of numbers for VoIP services? Are there any conditions of use that are unnecessary or (conversely) omitted from this set? Respondents are invited to respond these issues, with suggested alterations if so desired.

As regards Annex 5 of the ComReg consultation document, which is the subject of Question 26, Cisco Systems hereby expresses its agreement with the totality of its contents, and welcomes in particular the very progressive Point 5, which addresses occasional nomadic use outside Ireland. Nomadic usage is likely to become widespread, and there is a possibility that the principles on nomadic usage will have to be revised in the future to match the objective reality. However, as a starting point, the proposed principle is most welcome indeed.

J. Conclusion

Cisco Systems believes that ComReg's Consultation Document "*Numbering for VoIP*" represents an important contribution to the development and deployment of VoIP-enabled services in Ireland, by the incumbent operator, by the existing alternative operators, and by entirely new service providers and network operators.

We would like to emphasise the following points, which stand at the core of this response:

- 1) We are firmly of the view that many VoIP-enabled services are genuinely new, comprise genuinely innovative features, and are capable of delivering much more than plain telephony services (e.g. nomadic use, video calling, presence awareness, facilities for blind or deaf users, etc.). Many of these services are not substitutable in both directions with traditional circuit-switched telephony, but represent an important contribution to enhancing business, government, and personal productivity and well-being. We believe that this justifies treating them differently from PATS, while giving them maximum possibilities to develop, including by entitling their providers to the types of numbering resources of their choice, including geographic telephone numbers and to number portability. Number portability should not be immediately mandatory for non-PATS VoIP-enabled service providers that use the 'new' number range(s), but where a provider exercises a right to port-in numbers, this provider should be required to support the porting-out of numbers to all categories of numbers/providers it is entitled to port-in from.
- 2) Service providers should be given the opportunity of autonomously defining their business models (which can be linked to the choice of number range, as well as the wholesale charging and retail tariff principles) to effectively compete in the communications space.
- 3) We invite ComReg to make a clear statement, in its forthcoming September 2004 Report, that self-provided systems are unequivocally categorised as falling outside the definition of "electronic communications service". Self-provision of VoIP by end-users should not be subject to regulation. In our view, this is entirely consistent with the EU regulatory framework for electronic communications networks and services.
- 4) Public policy concerns, relating to access to emergency services, location information, lawful interception and data preservation/retention, are important, but were not addressed in detail in this response. Overall, our position is that the goals/obligations can either already be satisfied today by VoIP-enabled services, or are likely to be adequately served in the relatively near term. Industry-led, pragmatic solutions are to be preferred over top-down imposition of regulatory requirements.

We appreciate this opportunity to provide comments on this ComReg Consultation and we look forward to discussing this topic and any others of interest to ComReg. Should you require any clarifications or further information on the positions set out in this response, please contact:



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