



Comments by Cisco Systems
on
European Commission Staff Working Document on the
Treatment of Voice over Internet Protocol (VoIP)
under the EU Regulatory Framework

Table of Contents

A. Introduction.....	2
B. VoIP Categorisation.....	4
B.1 Self-provision by end-users vs. voice service provision by service providers.....	4
B.2 Proposed service provider categorisation.....	7
B.3 Obligations of providers of VoIP-enabled services – general remarks.....	9
C. Numbering	10
C.1 Introduction.....	10
C.2 Geographic and non-geographic numbers	11
C.3 Use of geographic numbers – categories of entitlement	12
C.4 Role of ENUM.....	14
D. Number Portability	15
E. Access to Emergency Services / Location Information	17
F. Lawful Interception and Data Preservation/Retention	20
G. Interconnection and Interoperability.....	21
G.1 Interconnection between circuit-switched and packet-switched networks.....	21
G.2 IP-to-IP interconnection.....	22
G.3 Interoperability.....	23
H. In-Line Powering of Terminals.....	23
I. Consultation Questions Not Covered by the Chapters Above	24
I.1 On the issuing of declarations to PATS providers	24
I.2 On Article 23 of the Universal Service Directive (integrity of the network).....	24
J. Conclusion.....	25

A. Introduction

Cisco Systems (“Cisco”) is pleased that the European Commission has taken the initiative to issue the Information and Consultation Document on Voice over Internet Protocol (VoIP) of 14 June 2004 and welcomes the opportunity to provide its comments.

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.

Moreover, 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.

Cisco Systems also wishes to emphasise that VoIP-enabled applications and services are readily available today. We detect a risk that their further development and deployment could be held back by hesitations on the part of policy-makers and regulatory authorities within the EU, notably due to discussions about categorisation, and difficulties of transposition¹ and interpretation relating to the definitions adopted at EU level and at national level.

Indeed, in several Member States discussions concerning “PATS versus non-PATS” and on numbering are ongoing, and these could effectively slow down the diffusion of innovation, and entail a major risk of a non-harmonised outcome.

¹ The European Commission will be aware of the fact that the definition of “Publicly Available Telephone Service” has not been transcribed literally into national legislation by all Member States.

We therefore strongly welcome the European Commission's document, which goes further than simply opening a debate and raising questions, but also provides interpretative guidance of the applicable EU directives, whilst generally defending minimal regulation, promoting innovation and flexible industry-led solutions.

In general terms, we would like to encourage the European Commission to take rapid and decisive action to avoid regulatory divergence and excess, and hence, market fragmentation, by:

- (i) finalising Guidelines to Member States as quickly as possible (in order to discourage contradictory outcomes of parallel national consultations), and
- (ii) introducing more justification in the interpretative guidance, so as to strengthen harmonisation within the EU.

While the European Commission's document covers a broad range of issues, we have limited our comments to key areas for which we as an equipment supplier to end-users and to service providers and network operators have specific technical expertise. We have also attempted to highlight those areas/issues we believe are most important to the overall development and growth of IP communications.

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

Policy makers and regulatory authorities, at all levels, should embrace VoIP-enabled applications and services and their utilisation and provision by a wide range of entities, including the incumbent operators, the existing alternative operators, entirely new service providers and end-users themselves. 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

Section 3 of the European Commission document contains a categorisation of “*Voice over IP offerings*”, and does not propose any formal, rigid, classification of different “publicly available VoIP service offerings”.

Cisco Systems agrees that, given the rapidity of technological and market evolution, a rigid pre-categorisation of all imaginable types of VoIP-enabled applications and services is neither necessary nor desirable. However, we consider that it is necessary to define more explicitly what should not be subject to any sector-specific regulatory conditions or requirements (under the EU framework or otherwise) by Member States.

Fundamentally, Cisco believes that before proceeding with any categorisation for the purposes of discussing the possible application of the EU regulatory framework for electronic communications to any VoIP-enabled applications or services, it must be clearly established (as the European Commission has in fact done, but could perhaps have done more explicitly) that VoIP is a technology which underpins applications and services incorporating, amongst-others, the conveyance of voice, and are capable of providing much more than plain telephony services. VoIP, as such, is therefore not an electronic communications service but a technology.

In terms of categorisation, Cisco Systems believes that it is appropriate to fundamentally and explicitly distinguish, on the one hand, self-provision by end-users, and on the other hand, provision of services incorporating, amongst-others, the conveyance of voice by service providers. (Noting that service provision is understood to be against remuneration, which is consistent with Article 2 of the EU Framework Directive 2002/21/EC.)

B.1 Self-provision by end-users vs. voice service provision by service providers

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

Where end-users, irrespective of type or scale, develop or purchase:

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

and make use of these to convey voice without any intervention by an external voice services provider² to effectuate voice communications:

- within an enterprise/public administration (i.e. inside buildings, between buildings, at remote locations in contexts such as teleworking, 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)³;
- end-users, including individuals, use the Internet to reach each-other⁴.

Cisco Systems believes that this reasoning is entirely consistent with the EU regulatory framework for electronic communications, and specifically with the definition of “electronic communications service” in Article 2c) of the Framework Directive 2002/21/EC, which excludes self-provision.

We therefore invite the European Commission to confirm and endorse this reasoning on self-provision in its Guidelines (given that it is not inconsistent with the consultation document, but offers a particularly clear-cut division).

In this context, we would like to express a concern relating to Section 3, point (2) of the consultation document. The Commission states in this section that, “*Corporate private networks, used to provide internal communications within large companies, are within the scope of the EU regulatory framework in that they are covered by the Authorisation*”

² 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.

³ Interworking with public networks is a classic feature of traditional Private Branch Exchanges (PBX) or Private Automatic Branch Exchanges (PABX); this is in no way different for IP-PBX.

⁴ 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.

Directive. There are no conditions or restrictions on the use of Voice over IP services that are used inside a corporation, for the sole use of that corporation” and includes a footnote reference to Articles 3 and 4 of the Authorisation Directive. [Our underlining].

We understand that this statement was designed to address the fact that, in some Member States, self-provision of physical infrastructure (e.g. the establishment of underground cables or radio links to connect the buildings of an enterprise or public administration) may entail a requirement of notification of the national regulatory authority, and may involve a procedure to confirm the self-providers’ right to install facilities, or to grant the self-provider the right to use frequencies. However, Cisco Systems strongly believes that any such ‘required contact’ with the regulatory authority in no way changes the status of self-provision, and in no way leads to a re-qualification of the activity from self-provision to service provision.

More generally, we are concerned that the statement insufficiently distinguishes corporate networks that are self-provided from corporate networks that are supplied by service providers, and that there is an undue emphasis on the exclusively company-internal nature of the communications (see the words we underlined).

We fear that national regulatory authorities might misinterpret the European Commission’s statement in Section 3 (2), and that this might cause unnecessary complications in the future. We also note that some national regulatory authorities put forward the existence of a gateway to the PSTN as a qualification criterion for the imposition of regulation, which we believe not to be correct, because the presence of a self-provided gateway to the PSTN does not affect the question as to whether there is self-provision or service provision.

Based upon the above expression of concerns, we would like to request a substantial elaboration of Section 3 (2), for example by providing a clearer distinction of self-provision versus service provision, along the lines set out above, and/or a re-phrasing of the first paragraph of Section 3 (2), for example to read as follows:

Corporate private networks, whereby the end-user (e.g. a large company or public administration) self-provides its voice communications for its own sole use, are not subject to any restrictions or conditions on the use of Voice over IP technologies.

Conclusion:

Self-provision by end-users (enterprises, government administrations, individuals) ≠ electronic communications service.

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

Where a service provider⁵ 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.

A proposed categorisation of service provision is discussed in Section B.2. below.

B.2 Proposed service provider categorisation

Cisco is 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 (e.g. presence awareness, nomadic usage, collaborative working (e.g. voice + video + file sharing), interactive multiplayer gaming, etc.), therefore many of them are not substitutable in both directions with traditional circuit-switched telephony, and may genuinely be considered to represent emerging markets⁶.

In an ideal world, the legislative texts and definitions could quickly be adapted when the deployment of worthwhile new technologies is unnecessarily hampered, or as a result of major market developments, such as the one we are now witnessing.

Whilst Cisco Systems would endorse calls for engaging a reflection exercise on the possible evolution of the definitions, including the definitions of “Publicly Available Telephone Service” (PATS), the definition of “Network Termination Point”, and the definition “Geographic Number” and noting that it might even be worth considering whether the PATS definition is necessary at all⁷, the remainder of our observations take the current text of the EU directives as a given, and our proposed categorisation also reflects this where possible.

In the EU, the provision of a service consisting (wholly or partly) of the conveyance of voice falls within the broad definition of “electronic communications service” contained in Article 2c of the Framework Directive 2002/21/EC.

⁵ The notion of service provision normally implies that the supply is made against remuneration. This is confirmed by Article 2 of Directive 2002/21/EC.

⁶ Given that the European Commission is explicitly not consulting on economic regulation, we do not provide further comments at this stage on the issues surrounding emerging markets.

⁷ In actual fact, the differentiation in terms of regulatory obligations, between the categories of « publicly available electronic communications service » and « publicly available telephone service » is fairly limited in the EU directives. Differentiation becomes stronger if a link is made at Member State level with rights and obligations relating to numbering, but this link does not exist in the EU directives.

This is the case:

- irrespective of the technology used (traditional or VoIP); and
- irrespective of whether any form of numbering/addressing is used, or the form taken by such numbering/addressing (e.g. E.164 numbers).

Electronic communications services that consist (wholly or partly) of the conveyance of voice are further categorised under the EU directives, and each of these categories has to a lesser or greater degree regulatory implications, as the European Commission has outlined in the Annex of its Information and Consultation Document.

Cisco proposes the following categorisation:

Category 1

VoIP-enabled services, which are genuinely new, different, or comprise or combine considerable value added features which do not make them substitutable (in both directions) with PATS.

(e.g., presence awareness, nomadic usage, collaborative working (e.g. voice + video + file sharing), interactive multiplayer gaming, etc.)

Category 2

VoIP-enabled services which do not meet all aspects of the PATS definition.

(e.g. only offering outgoing calls, not offering access to emergency services).

Category 3

VoIP-enabled services which meet all aspects of the PATS definition.

(note that a nomadic service CAN meet all aspects of the PATS definition (which does not specify access at a fixed location), and CAN comply with the PATS obligations if the provider chooses to implement the relevant features).

Category 4

Voice services, meeting the definition of PATS, and complying with the additional regulatory obligations that fall upon Universal Service providers.

The logic of our approach (VoIP as a technology, as stated in the Commission Consultation Document, rather than as a service) and the categorisation proposed above, implies that, if an operator providing a traditional circuit-switched voice service decided to change network elements (e.g. core transport and switching) to VoIP, but this implementation does 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.

B.3 Obligations of providers of VoIP-enabled services – general remarks

The EU directives impose a minimum set of obligations on all providers of electronic communications services. The obligations in question reflect core public policy interests.

In Cisco Systems' opinion, all communications technologies – and all types of service providers – can play a part in advancing these interests, and in some cases VoIP technologies will provide opportunities to do so in a more efficient way than traditional technologies do (e.g. to assist disabled users, to support number portability at a lower cost and more rapidly than is common practice today, etc.).

Clearly, there are also commercial incentives and commercial pressures on service providers to provide a high standard of service and a high level of user/consumer protection.

In this context, Cisco Systems particularly wishes to welcome the European Commission's statement in the last paragraph of Section 4.1 that: *“With the specific exception of those operators that are designated as USO providers, the model in the EU framework is that a service provider has the commercial freedom to offer services that qualify him as ECS and hence operate within the rights and obligations that apply to a provider of electronic communications services; or offer services that qualify him as PATS, and hence operate within the rights and obligations that apply to a provider of publicly available telephone services.”* We have observed that, at Member State level, this philosophy does not always form the core of the statements, consultations, and action (or inaction) by policy-makers and regulatory authorities. Indeed, in practice at national level, debates are more or less ongoing about which providers of VoIP-enabled services will be forced to meet the PATS obligations. Given this state of affairs, we would welcome clear and strong final Guidelines emphasising that, in the context of categorisation, and in the context of numbering, that the choice of the service provider should be a driving factor, rather than a rigid categorisation by the regulatory authorities.

However, compliance with PATS-related obligations in the context of VoIP-enabled services (be it on the provider's own initiative, or in the more directive manner that we are witnessing in certain Member States) should be handled pragmatically in the context of the capabilities of the technology, the cost of deployment and the new market developments.

In order to address critical social policy concerns, such as lawful intercept or access to emergency services, Cisco recommends that regulators should not automatically impose regulation designed for the PSTN. Rather, any necessary social regulation must be tailored to the realities of IP technology and networks. Regulatory authorities should recognise the differences in technologies and encourage and allow providers of VoIP-enabled services to develop the most efficient means of meeting those obligations.

In the competitive market for IP-enabled voice services, the marketplace may be more responsive to social needs than regulation, and the IP-enabled services industry is well equipped to develop the most efficient and creative solutions to pressing social concerns.

Accordingly, we believe that regulators generally should refrain from imposing top-down requirements and, instead, allow industry to implement creative solutions that meet public policy requirements and consumers' needs efficiently. In this respect, we believe that Europe could learn from the Japanese experience, where light-touch regulation is yielding active competition for VoIP-enabled services. This has resulted in widespread adoption by Japanese subscribers (4 million at the end of 2003), and broadband penetrations and broadband speeds at one of the highest levels in the world.

We would recommend that regulators articulate the objectives that industry must meet within a given timeframe, and leave the providers (spurred by productive market forces) to develop and propose the best solutions.

In the event that it is considered that certain regulatory obligations must be met immediately without any transition period, it should be ensured that no legacy regulation is imposed in a manner which would impede the development of solutions based on the strengths of IP technology. A well-balanced approach to encourage adoption will yield optimal results.

The sections hereafter address public policy issues, such as numbering, number portability, emergency services, lawful interception, etc. that may affect providers of VoIP-enabled services depending on the nature of the service provided.

C. Numbering

C.1 Introduction

Cisco Systems believes that before discussing details of VoIP numbering policy and number allocation/assignment, it should be recognised that, inherently, numbering resources are not scarce. However, Cisco Systems does accept that temporary scarcity may be the factual situation, and this situation may continue for some time, in specific countries and in specific number ranges, as a result of historic choices made by the authorities in charge of numbering (or in fact historic choices made by the operator(s) before the national regulatory authority was established).

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 for other services.

In our responses to national consultations on VoIP, we encourage regulators to devise a strategy to ensure that, in the shortest term possible, 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. This is the regulators' duty, in the interest of end-users and to support innovation

C.2 Geographic and non-geographic numbers

Cisco Systems welcomes the European Commission's position, expressed in Section 7 of the Information and Consultation Document, relating to numbering and addressing, in particular the encouragement of Member States to grant both geographic and non-geographic numbers to providers of electronic communications services that apply for such numbers, i.e. without linking the right to use numbering resources to the service providers' status (ECS, PATS, PTN, USO provider).

We believe that this position (which the European Commission seems to incorporate in the 'Information' part of the document, rather than in the 'Consultation' part of the document) deserves reinforcement, in the form of finalised Guidelines to Member States.

In essence, our position is the same: numbers, both geographic and non-geographic, should be available, and it is for providers of VoIP-enabled services to determine the type of numbers they wish to work with. The use of geographic numbers is likely to have immediate implications for the business model, especially in the short-term, and enables the rapid launch of services that will be well-understood by all end-users, be they customers of VoIP-enabled services or not. Some providers of VoIP-enabled services may well wish to develop new business models, which may rely on non-geographic numbers and on new number ranges. They should be free to do so, and to negotiate new underlying interconnection arrangements.

We are keenly aware of the fact that several national authorities that are in charge of numbering in EU Member States are proposing to define 'new' number ranges for VoIP-enabled services. Cisco Systems believes that any decision to this effect needs to be fully justified, and, if 'new' number ranges are to be created, our preference goes to number ranges that 'look and feel' as much as possible like a geographic number range, i.e. preferably (if possible) with the same number of digits, and not starting with 7, 8, or 9 as these are often associated in end-users' perception with expensive retail tariffs.

In its submissions to national authorities that propose to define 'new' number ranges, Cisco also advocates that it would not be appropriate to define a single new number range, which could have the effect of, de facto, pre-determining the business models of all (or almost all) service providers, by setting common economic (interconnection / retail)

principles. If ‘new’ number ranges must be defined, there should be multiple ranges or sub-ranges, allowing service providers to differentiate their services, including the retail tariffs to call the numbers.

C.3 Use of geographic numbers – categories of entitlement

Several strong arguments plead in favour of the very widespread use of geographic numbers in the context of VoIP.

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 several smaller EU Member States, the retail price for a local and a national call is now identical, and in the other Member States the previously prevailing difference has been sharply reduced and continues to contract. Also, 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, within the EU, 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.

Therefore, in principle, for fixed services as well as for nomadic services, the utilisation of geographic numbers does not cause newfangled 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.

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

In most EU Member States, there are currently no defined interconnection arrangements (reference offer provisions, carrier price list elements, technical implementation in routing tables of operators, etc.) for un-allocated number ranges, and even for allocated, but un-assigned/un-used number ranges, such as personal numbers. If VoIP-enabled 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 the national regulatory authority, and possible appeals of the decision of the national regulatory authority.

In summary, we fear a delay, which may run into years rather than months, if VoIP-based services are 'relegated' to number ranges that are not yet in use and for which no established interconnection principles exist.

The national regulatory authorities could conceivably intervene ex-ante in setting wholesale interconnection principles and charges and/or maximum retail tariffs 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 geographic and non-geographic numbering

Given what has been indicated above, Cisco Systems believes that there is a good case for allowing very widespread use of geographic numbers in the context of VoIP.

Therefore, geographic numbers should certainly be made available for providers meeting all aspects of the definition of PATS (Categories 3 and 4 as defined in Section B.2 above), 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, and provide nomadic services. (The definition of PATS does NOT specify fixed location).

In addition, it is difficult to identify any potential 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 (Category 1 as defined in Section B.2 above).

As regards those providers of VoIP-enabled services whose services do not meet the definition of PATS because they are not able to respect all elements of the PATS definition (Category 2 as defined in Section B.2 above), Cisco Systems sees no strong reasons to restrict their access to geographic numbers, but such a restriction could perhaps be justified on the grounds that incentives should be created for service providers to extend the capabilities of their services (especially access to emergency services) in the public interest.

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 other 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.

C.4 Role of ENUM

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 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 and than proprietary IN platforms attached to legacy voice switches. ENUM, if appropriately deployed, is country independent, and enables, for instance, a voice services 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 responsibility for numbers in the context of number portability.

D. Number Portability

Number portability is clearly expressed as a subscribers' right in EU Directive 98/61/EC and also in Directive 2002/22/EC, from which obligations result for certain providers identified by the directives (in Directive 98/61/EC this was *'the fixed public telephone network and the integrated services digital network'*; in Directive 2002/22/EC it is *'publicly available telephone services' – fixed and mobile*).

Cisco Systems is concerned that the wording in the European Commission's Information and Consultation Document, specifically in Sections 4.3 and 7.5 and Annex B, is very restrictive with regard to number portability.

In our view, EU Directive 2002/22/EC (Article 30) 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.

It would be preferable if the European Commission would allow the Directive to be interpreted as meaning that –at least– the subscribers of PATS must be enabled to benefit from number portability, without excluding the possibility of a wider application at national level of the right of the subscriber (and, where appropriate, the corresponding obligation of the service provider) of number portability, notably to support the development of innovative services. Several Member States (e.g. Ireland, The Netherlands) do in fact mandate number portability for all service providers that are granted number ranges.

Applied to the categorisation introduced in Section B.2, we believe 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>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>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 (VoIP enabled or not)	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.3.a), nomadic VoIP-enabled services (which could meet the definition of PATs or not, depending on the choice of the service provider), should 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, especially given that it is not expected to pose any intrinsic technical or economic difficulties, and given that, in typical implementations, neither the calling party nor the called party would incur a different retail tariff reflecting the different location of the called party.

E. Access to Emergency Services / Location Information

Cisco Systems welcomes the European Commission’s pragmatic attitude regarding access to emergency services and regarding the provision of location information. We strongly agree that, in the first instance, proper information for end-users is essential, combined with an evolutionary and market-led development of realistic solutions.

In our opinion, clear distinctions need to be made between:

- 1) Access to emergency services – for services provided at a fixed location.
- 2) Provision of location information – for services provided at a fixed location.
- 3) Access to emergency services – for nomadic applications/services.
- 4) Provision of location information – for nomadic applications/services.

Cisco wishes to emphasise that it has delivered technical solutions to customers, which are operational today, in each of the above categories, and that, in reality, only category 4) presents serious difficulties, but even for this category, solutions have been developed (specifically in the large enterprise context) and these are being further developed.

For example, for several providers of integrated broadband and VoIP-enabled voice services, Cisco Systems has delivered fully functional systems which enable access to emergency services, which route calls to the appropriate (geographically decentralised) emergency service centres, and provide them with the appropriate location information.

Emergency number translation is handled by the Cisco Softswitch as follows. A set of “Community ID’s” (corresponding to regional emergency service centres) is entered into a table, and the operator’s customer provisioning process is structured in such a way that,

when a customer subscribes to the VoIP-enabled telephone service, the (geographic) number assigned to that customer is matched with the appropriate “Community ID”, using the postal code and address of the customer location. The emergency dial plan of the operators, implemented on Cisco hardware and software, ensures that calls are prioritised to bypass congestion control, and ensures that calls to emergency services automatically bypass the call barring and CLIR functions. The called party emergency number (e.g. 112) is automatically replaced by the correct emergency service centre number. This type of system can be designed and implemented in a matter of days, and several such systems have been functioning perfectly since they have been put into service already more than two years ago in EU Member States.

The exact same systems, or a subset thereof, can be rolled-out by providers of VoIP enabled services which do not control the underlying network (e.g. providers operating on the Vonage model).

In summary, where services are provided at a fixed location, e.g. by the fixed incumbent operator, by a cable operator, by a fibre-to-the-home provider, or by alternative operators making use of local loop unbundling, bitstream access, or other wholesale arrangements, access to emergency services, as well as the provision of location information, can be fully supported by currently available Cisco solutions.

Whilst such systems function correctly today, we would like to take this opportunity to express our concern with regard to the envisaged proposals in Chapter 5.3 of the Consultation Document. This chapter specifically concerns routing of emergency calls.

The European Commission is proposing that, in the case of PATS, the actual making of an emergency call, as well as the provision of caller location information to emergency services, should be possible without the user having to input any location information. This would be applicable not only before a user makes an emergency call, but also at the time of installation of the terminal equipment (i.e. this responsibility would rest solely on the network operator/service provider, as opposed to a shared obligation of the network operator, service provider, and the end-user).

We fear that this proposal could result in unnecessarily raising costs, for the industry, and ultimately for end-users, as it may prevent/prohibit self-installation of equipment related to VoIP-based services by end-users, or require intensive interactions between the purchaser and the provider and/or his distributors at the time of purchase of services, and at the time of purchase of terminal equipment. Perhaps the European Commission could, in its finalised Guidelines, opt for a two-stage approach, which would allow self-installation by the end-user, subject to verification by the provider of VoIP-enabled services.

As regards nomadic applications and services, Cisco Systems has devised systems for large enterprises and public administrations, covering specifically the scenario in which an individual moves from one building to another building belonging to the same organisation. These systems provide access to emergency services, as well as location

information to the emergency services. Such systems are highly structured, require a strictly controlled environment, and are highly complex. It is difficult to envisage equivalents for services targeted at individual consumers.

It should be noted that the Internet Engineering Task Force (IETF) takes great interest in presence awareness/management, to enhance user friendliness, to enable the development of new applications, but also in the context of improving emergency service access/location information. Cisco Systems is an active participant in the relevant working groups of the IETF⁸, and we urge regulators to take an interest in this work. More generally, we are of the opinion that the issues surrounding nomadic use should be addressed, pragmatically (cf. example of mobile networks), in mutual co-operation between the emergency services organisations and the industry. Cisco welcomes the European Commission's proposal of a glide-path, whereby initially a 'best effort' approach is encouraged, and firm obligations can be imposed, if necessary, once common solutions have been adopted.

Finally, please allow us also to address suggestions that have been made in some Member States about labelling VoIP terminal equipment, i.e. warnings about the unavailability of access to emergency services.

All of Cisco Systems' network and terminal equipment is able to support access to emergency services, insofar as the network operator / service provider has made the proper technical arrangements, for instance by making use of the solutions developed by Cisco. Consequently, if emergency services cannot be accessed, this is due to a choice of the network operator or service provider. Cisco Systems is opposed to labelling terminal equipment, as this would create the impression that the terminal equipment is at fault. Users must be informed if access to emergency services is not possible, but it should also be made clear that this is the responsibility of the network operator or service provider. Cisco is in favour of requiring all providers of voice services to communicate clearly to their customers how they deal with emergency services and caller location, in marketing materials and in contracts, in accordance with Article 20 of Directive 2002/22/EC.

In summary, given that Cisco Systems provides network and terminal equipment (which is able to support access to emergency services) to a variety of network operators, service providers and end-users, which have varying regulatory obligations, and often a choice with regard to the handling of emergency calls, etc. it is not acceptable that Cisco's equipment would be generically labelled.

⁸ For details of relevant IETF work in which Cisco participates, see for example:
<http://www.ietf.org/internet-drafts/draft-ietf-sipping-location-requirements-01.txt>
<http://www.ietf.org/internet-drafts/draft-ietf-geopriv-policy-02.txt>

F. Lawful Interception and Data Preservation/Retention

In the EU, lawful interception is, today, a matter for national governments to address, whilst, in the area of data preservation/retention, there is limited EU-level harmonization, through Directive 2002/58/EC, which has not yet been fully transposed by all Member States.

Regulations and technical specifications applicable to lawful interception and data preservation/retention exist today, for both circuit-switched networks and for packet-switched networks (including for certain IP network applications). ETSI Standards (ES) and (draft) ETSI Technical Standards (TS)⁹ have been defined but are often transformed into ‘national interpretations’, and these national interpretations are then subject to revisions and amendments, leading to increasing divergence over time in the EU Member States.

This results in considerable costs of compliance, for network operators, service providers, and for the equipment suppliers, which are required to incorporate the various rules and technical specifications, and deal with the day to day operational complexities. This situation may lead to sub-optimal results where and when efficient and expedient interception is essential.

Cisco would therefore wish to introduce a plea for a tangible European-level initiative to promote implementation, by the EU Member States, of harmonized legal requirements, technical specifications and practical lawful interception and data preservation (and if needed data retention) requirements. Existing ETSI standards actually already provide a good basis to achieve this, including for IP networks and for VoIP-enabled services.

⁹ ES 201 158 (multiple versions), ES 201 617 (multiple versions), and draft TS 102 232 (handover specification for IP delivery), TS 102 234 (service-specific details for internet access services). Cisco Systems is an active supporter of this ETSI work. See:

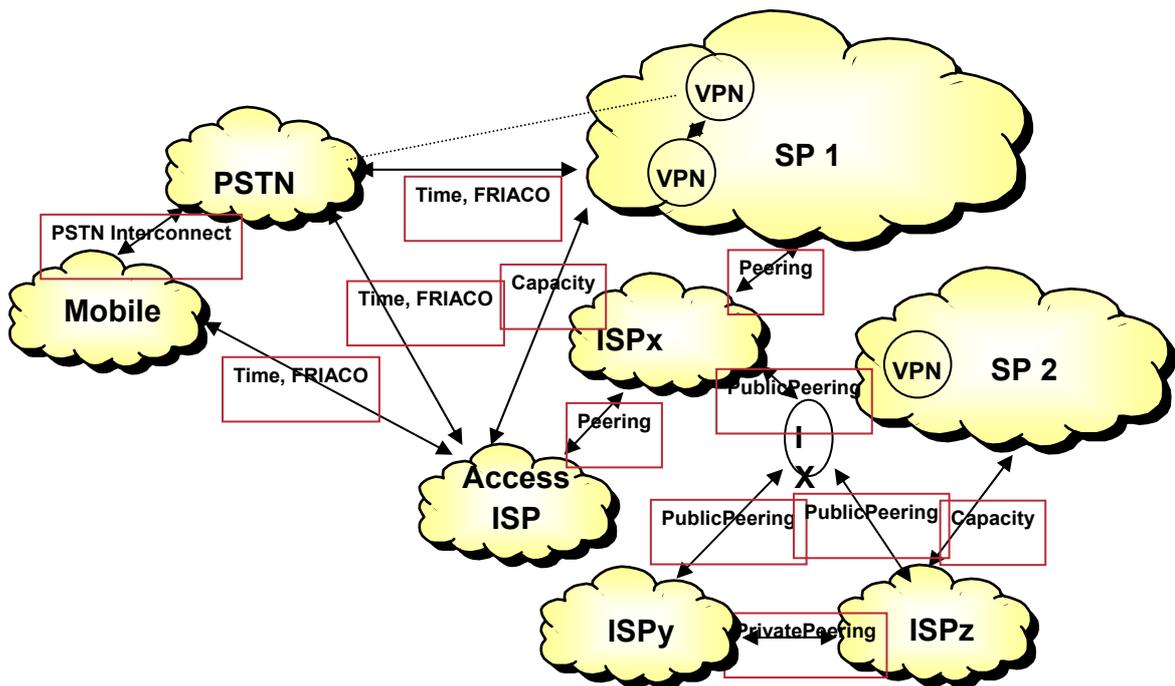
http://webapp.etsi.org/WorkProgram/Report_WorkItem.asp?WKI_ID=20517

http://webapp.etsi.org/WorkProgram/Report_WorkItem.asp?WKI_ID=20519

G. Interconnection and Interoperability

G.1 Interconnection between circuit-switched and packet-switched networks

As is shown in the following illustration, interconnection between traditional circuit-switched networks and networks/services making use of IP technologies, has been in existence for several years, for instance to support dial-up Internet access, but also to support the voice services of certain network operators and service providers, including major alternative operators in Europe, which have rolled-out softswitch and IP-based core networks at least since the late 1990s.



Typically, the Internet Service Provider (ISP) or IP enabled voice service provider, deploys properly equipped softswitches and related equipment, and makes use of traditional ETSI ISUP (or equivalent) and SS#7 to implement the interconnection with third party networks and service providers. This same approach is used by the majority of the new generation of VoIP-enabled operators and service providers that is now entering the market.

However as VoIP-enabled services become more pervasive and new/value added features are implemented around these VoIP-based offers, the existing interconnection arrangements will have to evolve to IP-to-IP interconnection in order to

- preserve the end-to-end availability of those features (VoIP-to-TDM interconnection will not support advanced VoIP-related features - i.e. it 'breaks' the advanced functionalities -);

- avoid technical and economic inefficiencies that would result from VoIP-TDM-VoIP conversions (this could result in reduction of quality of service);
- provide the required environment for operators to develop new business models.

G.2 IP-to-IP interconnection

When discussing IP-to-IP interconnection to transport voice traffic, it is necessary to differentiate the interconnection at the transport level (i.e. the bearer level) from the interconnection at the signalling level (i.e control level)

At the transport level, technology is fully mature, and it is perfectly possible to ensure a level of quality of service (in terms of delay, packetloss, and jitter) which is at least equivalent to that of traditional circuit-switched networks. Indeed technologies such as the DiffServ model, MPLS and MPLS traffic engineering are used internally today on a large scale by several network operators, in order to provide “toll-quality on-net” voice transport within their own core network. These same technologies can be implemented at the inter-operator transport interconnection point, and this has effectively been done by some wholesale transit operators (IP-based voice transport is already used for a sizeable proportion of all international wholesale transit traffic).

At the signalling level, IP-to-IP interconnection to transport voice traffic also exists in practice today. Some SIP-to-SIP full-IP network interconnection has effectively been implemented by new service providers using VoIP technologies, albeit on a small scale. The solutions implemented today are not standards based and there are security issues (through the current arrangements it is difficult to shield the operator-internal ‘world’ from the ‘external world’), which means that a very high level of trust is needed between operators, or physical separation of network elements is needed, to protect proprietary information about operators’ physical and logical internal network architecture. However, physical separation suffers from the same problems as VoIP-TDM-VoIP interconnection: it may ‘break’ the advanced VoIP features.

Nevertheless, Cisco Systems is convinced that, given the different standardisation activities that are ongoing in this area, and as a result of market pressure, the required solutions will emerge when the market needs them.

Given what has been stated in G.1 and G.2 above, Cisco Systems is of the opinion that regulators can rely on the industry to evolve technical interconnection models when the market requires it.

This does not mean that regulators cannot play a developmental role in this area. Cisco believes that facilitation/participation by regulators, in launching and supporting initiatives to achieve such standardisation could be of great value. Ex-ante regulation, or any formal intervention, however, are not necessary in this area at this time.

G.3 Interoperability

Cisco Systems is an active participant in industry efforts to achieve interoperability for VoIP-based enhanced services (IETF, ETSI, ITU) and believes that current industry dynamics are sufficient to ensure rapid development in the public interest, and that regulatory intervention is unlikely to be needed for the foreseeable future to ensure interoperability.

Cisco Systems believes that interoperability is important going forward, to ensure the rapid development of VoIP-based services, but wishes to stress that interoperability can be achieved by voluntary industry agreement, without a need for rigid or enforced standardisation.

H. In-Line Powering of Terminals

Cisco Systems agrees with the proposals of the European Commission.

‘In-line powering’ of terminals is a historic PSTN feature, which has not been extended to newer systems, such as PABX’es installed on customer premises (representing a large proportion of the total installed base of traditional PSTN lines), DECT and other cordless phones used on business premises and in homes, and GSM/3G terminals, cable TV networks providing telecommunications services, etc. The same treatment should be given to VoIP terminals.

Transposing legacy regulation on new generations of terminal equipment and related applications and services would unnecessarily increase costs.

Whilst various terminal equipments are powered by batteries, or have batteries as a fall-back, Cisco Systems cannot endorse any regulation that would require terminal equipment to have backup battery power or would require network operators or service providers to ensure the availability of battery power, as this would unnecessarily increase the price of the equipment, and increase service provider/operator costs (capital expenditure and operational expenditure).

Also, the requirement for ‘in-line powering’ for ‘lifeline’ purposes is less acute today than it has been in the past, given that a very large proportion of individuals in the EU carries a mobile phone, which will typically have charged batteries, and which could be used as an alternative means of reaching emergency services in case of a power loss of fixed lines.

I. Consultation Questions Not Covered by the Chapters Above

We believe that the preceding text addresses most of the proposals and questions contained in the European Commission's Information and Consultation Document.

Brief remarks on two of the further questions are provided below, in the areas where Cisco Systems has specific technical expertise and on the areas/issues that are of greatest importance to the overall development of VoIP-enabled applications and services.

I.1 On the issuing of declarations to PATS providers

The European Commission proposes that:

- NRA's could consider providing, on request, a standardised declaration to those suppliers that undertake to provide *publicly available telephone services* in accordance with the applicable conditions in the general authorisation.

Cisco Systems agrees with this proposal, but, if it is implemented, we believe that the European Commission would be well-advised to track the precise manner in which it is implemented by Member States, specifically to ensure that this does not result in a new form of prior authorisation regime being introduced (especially if it would be linked with the right to obtain certain numbering resources).

Please allow us also to reiterate that Cisco Systems believes that regulators, including the European Commission, should keep an open mind about the possible evolution of definitions, including the definition of "Publicly Available Telephone Service" (PATS), especially to ensure that innovation can flourish, in the public interest.

I.2 On Article 23 of the Universal Service Directive (integrity of the network)

The European Commission proposes that:

- Member States consider applying this article in such a way as to recognise that only those service providers that have control over or ownership of the underlying transport infrastructure are able to ensure the availability of publicly available telephone services in cases of *force majeure*.

Cisco Systems agrees with this proposal, and notes that network integrity can even be enhanced by the introduction of VoIP technologies.

More generally, as regards Universal Service, Cisco Systems wishes to emphasise that all existing components of the universal service definition can be provided by making use of VoIP technologies, and that in some areas, e.g. services for disabled users, VoIP-enabling universal service could represent genuine progress.

J. Conclusion

In summary, Cisco Systems believes that the European Commission's *Information and Consultation Document on Treatment of Voice over Internet Protocol (VoIP) under the EU Regulatory Framework* represents an important contribution to addressing unnecessary hesitations and constraints on the rapid development and deployment of VoIP-enabled services in the EU, by incumbent operators, by the existing alternative operators, or by entirely new service providers and network operators.

Please allow us to emphasise the following points, which stand at the core of this response:

- 1) We encourage the European Commission to take rapid and decisive action to avoid regulatory divergence and excess, and hence, market fragmentation, by finalising clear Guidelines to Member States as quickly as possible, and by introducing more justification in the interpretative guidance, so as to strengthen harmonisation within the EU.
- 2) We believe that more attention needs to be given to ensuring that self-provision of VoIP by end-users is not impeded or hampered by regulation. In our view, this is entirely consistent with the EU regulatory framework for electronic communications networks and services.
- 3) 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 advanced services than plain telephony (presence awareness, nomadic usage, collaborative working (e.g. voice + video + file sharing), interactive multiplayer gaming, etc.), i.e. many of them are not substitutable in both directions with traditional circuit-switched telephony, and that this justifies treating them differently from PATS.
- 4) Public policy concerns, relating to access to emergency services, location information, in-line powering of terminals, lawful interception and data preservation/retention, are important, but 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.

Should you require any clarification or further information on the positions set out in this response, please contact:



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