



Comments by Cisco Systems
on

CMT Consulta Pública sobre la provisión de servicios
de voz mediante tecnologías IP (VoIP)

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A. Introduction

Cisco Systems (“Cisco”) welcomes the opportunity to provide its comments on the Consultation Document issued by the Comisión del Mercado de las Telecomunicaciones, entitled “*Consulta Pública sobre la provisión de servicios de voz mediante tecnologías IP (VoIP)*” of 27 May 2004.

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.

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 Spain and to the European Union as a whole.

In our view, policy makers and regulatory authorities, at all levels, should embrace VoIP-enabled applications and services, and encourage their provision and utilisation 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 useful innovation can flourish, and is not held back by legalistic or transitory issues, and by unnecessary or inappropriate regulation.

Cisco Systems therefore strongly welcomes the CMT’s document, which recognises that VoIP-enabled applications and services are capable of delivering much more than basic telephony, and which generally tends towards minimal regulation.

We would also like to encourage the CMT to take rapid and decisive action to remove any uncertainties about the regulatory treatment of VoIP.

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

B. Differentiation of VoIP from Traditional Telephony

The CMT, in its consultation document, takes the perspective that VoIP-enabled services are different from traditional telephony, and asks the following question:

¿se considera acertado considerar los servicios de VoIP como “diferenciados” de la telefonía regulada convencional? ¿qué otro enfoque sería más apropiado?

Cisco agrees entirely with the CMT, and 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 markets.

Such VoIP-enabled services provide real benefits in terms of productivity and convenience to businesses, public administrations and consumers, and we agree with the CMT that the development of VoIP-enabled services, by various types of market participants, will stimulate innovation and competition, and that minimal regulation is the best option to allow new services to appear and flourish.

C. Classification of VoIP-Enabled Services

The CMT's consultation document addresses in great detail the types of technical VoIP implementations that are used to deliver services to the public, consisting of the conveyance of voice. The CMT defines 3 broad categories and asks:

¿es adecuada la clasificación utilizada? ¿qué otra aproximación sería preferible?

Cisco Systems welcomes the CMT's focus on services provided to the public. This implies, according to our understanding, that other VoIP-implementations, i.e. those that do not entail the provision of a service to the public, for instance self-provision by an enterprise or public administration, fall outside the regulated domain.

As regards the proposed categorisation itself, Cisco Systems broadly agrees, but has one basic reservation. We believe that *telefonía Internet VoIP_{web} sin numeración telefónica*, as

defined by the CMT, does not actually entail any kind of service provision in accordance with the applicable EU and Spanish legislation, but that the situation in this case is rather one where the end-user is self-providing the ability to convey voice, without any intervention by an external service provider.

We believe that for the application of VoIP technologies in an enterprise context (e.g. by large companies and public administrations using a private network), the situation is the same, i.e. that this is a situation of self-provision, without the intervention of an external service provider¹ providing an ongoing voice service against remuneration².

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 believes that this is entirely consistent with the EU regulatory framework for electronic communications networks and services (in particular the definition of “electronic communications service” and with its transposition into Spanish law).

Where a service provider 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, and we broadly agree with the CMT’s proposals for classification.

D. Numbering for VoIP-enabled Services

D.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.

Cisco Systems does of course accept that selective temporary scarcity may be the factual situation in specific number ranges. However, any temporary scarcity needs to be

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 In accordance with the definition in Anexo II, point 28 of the Ley General de Telecomunicaciones, which includes “*prestado por lo general a cambio de una remuneración*”.

addressed in order to prevent unnecessarily hampering the diffusion of innovation, be it for VoIP-enabled services, or other services.

We encourage the CMT to ensure that 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 fully consistent with the principles established in the Plan Nacional de Numeración para los Servicios de Telecomunicaciones (section 1.2) and with Real Decreto 1651/1998 (article 27.12, b).

D.2 Choice of number ranges

The CMT asks:

¿es necesaria la atribución de una numeración específica de VoIP para diferenciar estos servicios de la telefonía convencional? En tal caso, ¿debería atribuirse cuanto antes y sin esperar a una armonización europea?

Cisco Systems believes that numbers, both geographic and non-geographic, should be available to providers of VoIP-enabled services, and that it should be for providers of VoIP-enabled services themselves to determine the type of numbers they wish to use to provide their services. This approach is favoured by Cisco because it offers the best guarantees for providers to be able to determine their own business models, including the applicable wholesale charges and retail tariffs, which should not be predetermined by regulation, or by implication of a mandatory number range.

We understand that the CMT is proposing to create a specific new number range for VoIP-enabled services, taking the perspective (with which we agree) that the services are or will be different from what is known today, that there will be high demand for new numbers, and to stimulate the rapid development of such services. Cisco Systems is not at all opposed to the introduction of additional number ranges, but we believe that any new number range(s) should be available for VoIP-enabled services in addition to existing number ranges, and that forcing services into one new range would not be the best way of supporting innovation and rapid new service development.

Moreover, if a new number range is created to meet the demand for new numbers, such a number range should be structured in such a way, for example by creating sub-ranges, that providers of VoIP-enabled services have the liberty of defining their own business models, even within that number range (including sub-ranges). Also, 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.

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, irrespective of whether they are 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 or on new number ranges. They should be free to do so, and be free to negotiate new underlying interconnection arrangements.

D.3 Use of geographic numbers

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). In Spain, since 1998, the Plan Nacional de Numeración para los Servicios de Telecomunicaciones, and RD 1651/1998, have established tariff transparency for the calling party (usuario llamante) as the basic logic for having and maintain geographic telephone zones.

Today, in several EU Member States, the difference between retail tariffs for local and for long-distance domestic calls has disappeared, and in Spain it is sharply reduced. In addition the physical and logical architecture of networks, of incumbents and new entrants, 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 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, EU-wide, 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 new fangled 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.

We believe that, specifically if there is no tariff transparency problem, e.g. if the retail price for the calling party is the standard (local call) tariff irrespective of the location of the called party, and/or if the wholesale interconnection charges allow interconnecting operators to charge their end-users at a clearly established/communicated tariff for the calling party, geographic numbers should be available for nomadic VoIP-enabled services. In this context, we note that in RD 1651/1998, article 27.12, contains several criteria for the management of the numbering plan, including the promotion of competition, and not only tariff transparency.

As regards the definitional issues, specifically definiciones 19 y 22 de número geográfico y punto de terminación de red in Anexo II of the Ley 32/2003, and their equivalents in EU Directive 2002/22/EC, our opinion is as follows. The phrase "*geographic significance used for routing calls to the physical location of the network termination point*" in the definition of geographic number does not address tariff transparency as such, and, with VoIP, there is no technical obstacle to routing calls to a network termination point that is not always at the same physical location, thereby respecting the definition.

As the CMT itself puts it in paragraph 4 of the Introduction of its Consultation Document: regulators in the EU have the duty to take measures at national level, preferably harmonized at European level, with a view to facilitating (and not blocking), the development of innovative VoIP services in a stable and predictable regulatory environment. Cisco Systems believes that a flexible interpretation of definiciones 19 y 22 is possible, and should be adopted in this particular context, in order to support one of the most important innovations in fixed telephony for many decades, i.e. nomadic usage.³

In this context, it is also useful to note that there is a precedent of such flexible interpretation in the United Kingdom. The definition of geographic number in the UK National Telephony Numbering Plan⁴ is as follows (there is no definition of geographic number in the UK Electronic Communications Act 2003):

³ The above statements imply that we believe that the CMT should consider re-assessing its Resolución sobre la solicitud de BT Ignite España, S.A., de numeración geográfica para servicios de voz sobre IP of 27 November 2003.

⁴ The National Telephone Numbering Plan - Published by Ofcom on 22 July 2004

Geographic Number

A Telephone Number, from a range of numbers in the National Telephone Numbering Plan, where part of its digit structure contains geographic significance used for routing calls to the physical location of the Network Termination Point of the Subscriber to whom the Telephone Number has been assigned, or where the Network Termination Point does not relate to the Geographic Area Code but where the tariffing remains consistent with that Geographic Area Code. (Our underlining)

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, 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-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 the CMT, and possible appeals of the CMT decision.

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 CMT 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). Of course, this argument can be countered by stating that, for geographic numbers, the parameters have largely been set, and the business models are therefore at least partially predetermined.

d) Conclusion on 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, 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.

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, 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.

On the issue of European harmonization, Cisco Systems believes that, in an ideal world, numbering systems should and could be harmonized within the EU, but that there is no realistic short-term prospect for this. We therefore wish to encourage the CMT to take into full account the Guidelines to be issued shortly by the European Commission, but we agree with the CMT that it is preferable to proceed quickly with providing legal certainty and appropriate number ranges for providers of VoIP-enabled services, and not hold the developments back until complete European harmonization can be achieved.

E. Appropriate Regulatory Obligations

E.1 Introduction

The CMT's Consultation Document puts forward a set of proposed obligations for the various categories of providers of VoIP-enabled services it has identified, takes a generally minimalist line on regulation, and asks the following question:

¿es apropiado no regular los escenarios de telefonía Internet VoIPweb sin numeración telefónica? En su caso, ¿qué obligaciones o condiciones podrían imponerse y cómo se aplicarían? ¿cómo debería interpretarse para los servicios VoIP la previsión de las Directivas de que en las llamadas al número 112 se suministre información sobre la ubicación de las personas “en la medida en que sea técnicamente posible”?

Cisco Systems agrees partially with the CMT's proposal on page 16 of the Consultation Document that the scenario(s) *telefonía Internet VoIPweb sin numeración telefónica* should not be subject to regulatory obligations, but our reasoning is different.

As was indicated in Section B above, we believe that *telefonía Internet VoIPweb sin numeración telefónica* (e.g. Skype) does not actually entail any kind of service provision in accordance with the applicable EU and Spanish legislation, but that the situation in this case is rather one where the end-user is self-providing the ability to convey voice, without any intervention by an external service provider. In such a scenario, no electronic communications service is provided, and therefore obligations such as access to emergency services and location information should not apply.

The situation becomes different when VoIPweb is augmented by a service which is provided against remuneration (e.g. SkypeOUT). For the sake of clarity, we do not believe that the existence of a gateway to the PSTN is the differentiating criterion, but the fact that a service (conveyance of voice against remuneration) is being provided. Here, we believe that it would be appropriate to impose the minimum regulation which flows from the status of electronic communications service, i.e. the requirement for the provider to notify the service to the CMT, to offer consumers a contract in accordance with Article 20 of Directive 2002/22/EC, and possibly, should the CMT wish to impose this, the publication of quality of service information in accordance with Article 22 of Directive 2002/22/EC.

As regards the other service classes, Cisco is broadly in agreement with the proposals of the CMT on page 16 of the Consultation Document, although, given our preference for the widespread use of geographic numbers, we would add that portability of geographic numbers should be available from traditional circuit-switched telephony to VoIP-enabled services. As regards number portability within a possible new VoIP number range, Cisco Systems could agree to this, but would advocate that a transition period is given, as is under consideration in Ireland⁵ and following the precedent of mobile telephony, where number portability was imposed later than fixed portability.

⁵ ComReg Consultation Document 04/72, entitled “Numbering for VoIP Services”.

E.2 Access to Emergency Services / Location Information

Regarding emergency services and lawful interception, the CMT asks the following:

¿qué obligaciones deberían aplicarse y por qué? En particular, ¿considera imprescindible en todos los casos para la VoIP el acceso a los servicios de emergencia y la posibilidad de interceptación de las comunicaciones bajo requerimiento de la autoridad?

Cisco Systems welcomes the CMT's pragmatic attitude regarding access to emergency services and regarding the provision of location information.

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.

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 IETF⁶, 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 would like to encourage the CMT to take note of the European Commission's proposals of industry-led pragmatic solutions, to be implemented over time, made in its Consultation document on the "Treatment of Voice over Internet Protocol (VoIP) under the EU Regulatory Framework", whereby initially a "best effort" approach is encouraged, and firm obligations can be imposed, if necessary, once common solutions have been adopted.

E.3 Lawful Interception and Data Preservation/Retention

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)⁷ have been defined but are often transformed

⁶ 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>

⁷ 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

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 encourage the CMT and the Spanish authorities to promote tangible European-level 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.

F. Interconnection

The CMT asks:

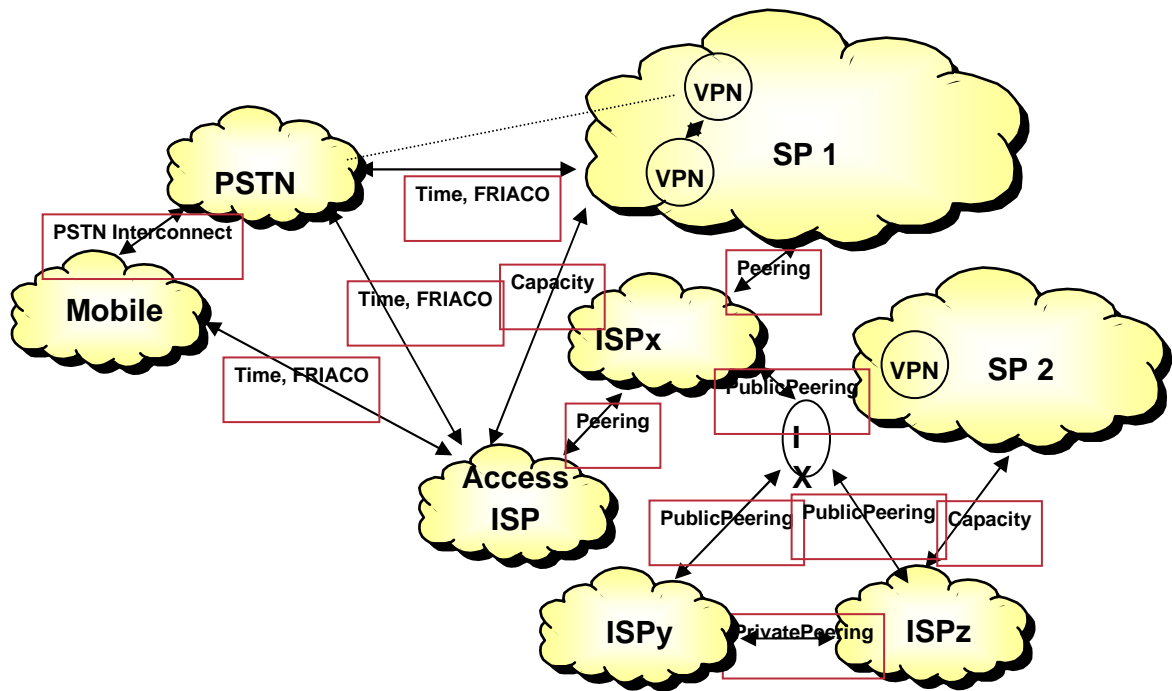
*¿sería necesario incentivar de algún modo la interconexión directa al nivel IP?
¿cómo?*

Our response is provided in the two separate sub-sections hereafter.

F.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 Spain, which have rolled-out softswitch and IP-based core networks since the late 1990s.

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



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.

F.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 and if the market needs them.

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

This does not mean that regulators cannot play a developmental role in this area. Cisco Systems 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. Other CMT questions

Cisco Systems, being an equipment supplier to end-users and to service providers and network operators, does not have specific remarks on possible collateral effects of the introduction of VoIP technologies and VoIP-enabled services, mobile services, and extraterritorial provision.

The CMT asks:

¿es apropiado dar respuesta rápida al nivel nacional a las demandas que ya existen o sería mejor esperar a un posicionamiento armonizador de la Comisión Europea?

Cisco Systems believes that, in an ideal world, regulatory classification, regulatory obligations, numbering, etc. should and could be harmonized within the EU, but that, with the exception of the European Commission's forthcoming Guidelines on VoIP under the EU regulatory framework, there is no realistic short-term prospect for this. We therefore agree with the CMT that it is preferable to proceed quickly with providing legal certainty for providers of VoIP-enabled services, and not hold the developments back until European harmonization can be achieved.

However, as was stated earlier in this submission, Cisco agrees with the European Commission's position that it is for the providers of VoIP-enabled services themselves to determine the number ranges they wish to work with, and that there should not be a rigid pre-categorisation, or an enforcement of a single number range, which would entail risks for pre-determining the business models of all providers of VoIP-enabled services, and may, in the short term, mitigate rather than stimulate the take-up of such services.

H. Conclusion

Cisco Systems believes that CMT's "Consulta Pública sobre la provisión de servicios de voz mediante tecnologías IP (VoIP)" represents an important contribution to the development and deployment of VoIP-enabled services in Spain, by the incumbent operator, by the existing alternative operators, and by entirely new service providers and network operators. We strongly agree with the CMT's proposals to keep regulation to a minimum.

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. presence awareness, nomadic usage, collaborative

working (e.g. voice + video + file sharing), interactive multiplayer gaming, 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.

- 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).
- 3) 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.

We look forward to meeting with you soon to review this and other positions we have on telecommunications and VoIP-related policy issues. Should you require any clarifications or further information on the positions set out in this response, please contact:

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