

**Contribution of France Telecom
to the public consultation of the ERG
on
IP interconnection**

November 2006

General comments

France Telecom welcomes the opportunity to contribute to ERG's consultation on IP interconnection and NGNs. This issue has indeed the potential to shape the future landscape of electronic communications networks and services.

France Telecom notes that the discussion document is relevant for fixed interconnection only, as it does not take into account characteristics of mobile interconnection such as variable air-time costs, later migration to IP, and the two-sided nature of relations between fixed and mobile customers.

While the ERG document addresses all the flows that will be conveyed on NGNs, the consultation focuses on IP-IP voice interconnection and this contribution consequently explicitly concentrates on this issue.

France Telecom would like to stress that these developments are still subject to ongoing technical and economical studies and that the pace for transition to NGN will vary across Europe. France Telecom today considers that this transition - as far as its French fixed network is concerned - will be progressive and sees the TDM and NGN architectures, and hence their interconnection modes co-existing during several years.

NGN interconnection market analysis should however be performed with respect to actual future market structure and service developments. In particular, the main driver of the evolution towards NGN is the integration of voice services and broadband access. This integration materialises for the end customer in the form of multiplay offers and for operators in the transition to native IP networks for voice services. It is reasonable to consider that voice access, traffic services and broadband access will be part of a unique competitive retail market, conditioned either by sustainable infrastructure-based competition or effective access regulation. As a consequence, the players will have symmetric positions on call termination.

Under such conditions, economic analysis suggests that letting the providers determine their own interconnection conditions through private arrangements at the IP-IP level is clearly a better option than any form of ex-ante regulation. It is also clear that various interconnection models will develop, on one hand because old and new networks will coexist during a transition period, but also because new and multiple interconnection modalities of new networks will emerge, leading to various approaches to this issue, particularly in terms of charging models and value-based pricing. This situation highlights the danger of imposing premature solution which risks hampering the sound development of the IP interconnection between the different players.

France Telecom would also like to recall that Article 4 of the Access Directive explicitly stipulates that interconnection is a reciprocal right and an obligation to negotiate between operators of public communications networks for the purpose of providing publicly available electronic communications services, in order to ensure provision and interoperability of services. This principle of symmetry should be guiding in a NGN context.

Questions for the Consultation

How should the transition from the PSTN number of interconnection points to the probably reduced number of interconnection points in NGNs look like? Which are the implications for the price structure and price level of interconnection rates?

It is important to recognize that the design of networks and of their interconnection will not necessarily be similar across Europe, as it will be a complex outcome of various conditions such as the geography, the level of infrastructure-based competition, and the development of VoIP.

Fewer interconnection points

France Telecom's French network offers PSTN interconnection, for technical and organizational reasons, at two levels:

- "local" interconnection that allows to reach the customers attached to one local exchange is available at about 500 points of interconnections, in about 400 different locations.
- "regional" interconnection that allows to reach the customers of a zone covering the local exchanges of one region is available in about 45 points of interconnection, in 18 locations.

France Telecom also provides points of interconnection allowing to reach several millions of VoIP customers. To date 14 points for TDM-mode interconnection are available in 7 locations. These numbers could evolve in the future. Voice over Broadband – which is substantially less geographic than TDM voice – is conducive to a greater centralisation of the traffic delivered by both France Telecom and competing operators.

TDM and IP interconnection modes will coexist, requiring consistency of charging mechanisms

In a temporary phase, both TDM and IP-based voice interconnections will coexist but it is obvious that the number of TDM points of interconnection will decrease in a near future.

Internal studies about the evolutions of the NGN architecture and the pattern of interconnection show that from a technical point of view and while geography does not play a major role anymore (see answer to Question 2 below), it could be useful to distinguish Pols for signalling flows from Pols for media flows, although it is not clear yet that logical interconnection and physical delivery will exactly overlap. While it will be very clear-cut in the case of signalling flows, it is expected that the number of Pols will be reduced for both flows.

The impact of this transition on the price structure and level will depend on various issues, the technical architecture being one of them. In any case France Telecom contends that future pricing structures should be driven by principles of symmetry when applicable (see answer to question 4).

Standardisation of IP-IP interconnection is needed to reduce entry barriers and inefficiencies

VoIP relates to a broad variety of redundant and partially standardized technologies, with substantially different implementations by market players.

Stable IP-IP interconnection standards will be key to enable efficient IP-IP interconnection, reduce inefficient capital expenditures on IP-TDM and TDM-IP transcoding gateways and stimulate the development of innovative services across the European Union.

What is the equivalent to “local” interconnection in NGNs?

As services will be more and more nomadic and fixed number portability develops driven by multiplay competition, “local” interconnection will make much less sense in the context of wide scale NGN deployments.

“Local” interconnection was mainly justified on PSTN by :

- the influence of distance on the costs in the context of a TDM architecture
- the direct link between customers location and numbering allocations.

In a NGN architecture, attaching a customer to a NGN platform is not driven by location - neither of the customer nor of the platform. A NGN platform can indeed manage customers located anywhere on the national territory, so that **the case for “local” level of interconnection as we know it today is not strong anymore.**

France Telecom would like to emphasize that the investments that were made for the purpose of interconnection in the TDM world will be re-used to a significant extent in the context of access competition (typically investments in LLU).

Reflecting the transition towards NGNs what are the implications for existing SMP products and bottleneck facilities? Does this technological change remove existing SMP positions or bottlenecks or could new ones emerge in NGNs?

Considering the question from the perspective of physical accessibility, France Telecom sees no bottleneck emerging in a NGN context as competition will essentially rely either on alternative infrastructures or regulated accesses of markets 11 and 12 of the Recommendation on relevant markets.

Generalisation of broadband capabilities will further lower entry barriers on services markets, stressing even more - if needed - the merit of full de-regulation at retail level.

As traffic is aggregated and delivered higher in the network, current **CS and CPS does not make technical sense anymore in a NGN context.** CS and CPS do not have any regulatory merit anymore as competition is effective at access or infrastructure level.

Adopting **symmetric rules** could constitute a promising alternative to the SMP-driven regulation of termination markets, especially in the context of generalised fixed number portability, which significantly reduces the ability of wholesale and retail customers to use E.164 numbers in order to identify access operators.

How do you evaluate the advantages and disadvantages of different charging principles discussed in the paper?

While the consultation document is supposed to address all the interconnection issues in NGN networks, this question seems to focus on voice interconnection: NGN networks will be designed to handle many new multimedia and complex services which have not been defined yet, the volume of which could be much greater than the volume of voice, which is itself extremely specific (bilateral in nature, easy to forecast, historically geographic).

Symmetry as a key principle

In the NGN context, all network operators will have the same capability to offer voice service access, traffic origination and traffic termination using either competitive infrastructures or regulated forms of access. Therefore the major characteristic of NGN interconnection should be the **symmetry** between all access operators on the market¹.

This symmetry will neutralise the effect of interconnection on the competition in retail markets. As access competition develops, artificial business models based on regulatory arbitrage, which have proved not sustainable, should not be encouraged further.

B&K mechanism can prove particularly difficult to implement and should not be imposed

Beyond symmetry, the principles guiding future interconnection arrangements between NGN access operators should address the real issues an access operator will face in this new context.

Bill and Keep (B&K) arrangements might be a compelling proposition for access operators exchanging traffic on a reciprocal basis as they broadly originate as much traffic as they terminate ; however the co-existence amongst others of NGNs, transit operators and TDM CPS-based providers could stimulate forms of undesirable free-riding and regulatory-based arbitrage, if operators could not limit the benefit of B&K to symmetrical traffic. France Telecom considers that the risk of free-riding - and also spamming – will limit the scope of B&K in the short and middle term.

It should also be noted that the generalization of number portability significantly increases the difficulty for market players to control the “equivalence” of interconnected local loops on a B&K basis. Implementing a “fair” B&K solution could therefore result in a more costly solution than call termination charging.

France Telecom therefore contends that B&K may be commercially negotiated between operators but could in no case be a regulatory obligation.

France Telecom sees limited scope for mandating B&K as such obligation would “destroy” the underlying market on which the obligation would be deemed to apply. Regulation and price control are not dissociable as regulation would result either in an obligation of SMP-conditioned cost orientation or of non-excessive pricing.

Finally, France Telecom would like to draw ERG’s attention to some inaccuracies in the consultation document that might have introduced a technical bias in the consideration of the different options, especially the B&K modality.

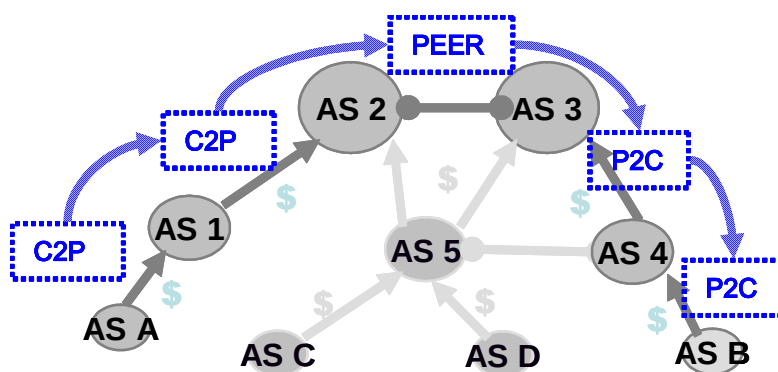
The document tends to derive principles from an incomplete understanding of inter-operator relationships in the internet world. It has to be recalled that in the Internet two kinds of commercial relations exist: client to provider relations (C2P) and peering relations (PEER) and that only peering relations are Bill and Keep relations. In a C2P relation the provider offers his client full accessibility to the Internet. In exchange of this accessibility the client pays a price that depends on the traffic flow on the C2P relation (function of the average or of the peak traffic flow). In a peering relation, each

¹ Residual asymmetrical interconnection regulation in some Member States relates to the ownership of the legacy PSTN local switching access infrastructure.

operator only gives accessibility to their respective clients (and recursively to the clients of their clients).

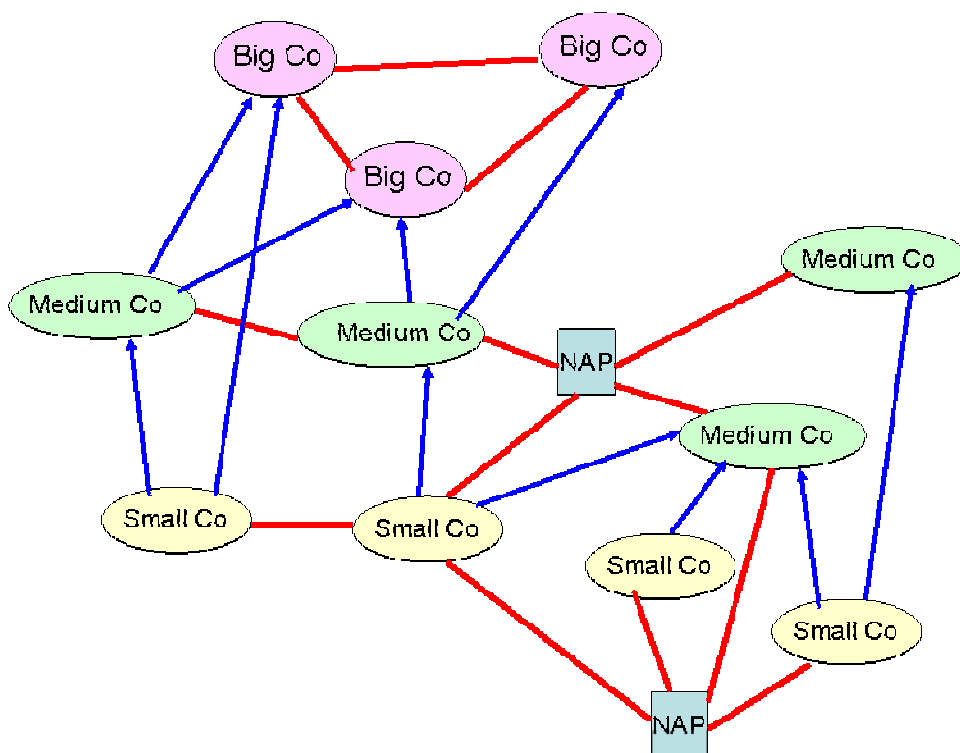
It must also be considered that peering in the internet is a bilateral commercial decision. Usually operators accept to open a peering relation with "equivalent" partners. By "equivalent" we mean that the operators have approximately the same size, exchange the same volume of traffic and have the same kind of business. So each Internet network operator asks for minimal conditions before entering in a peering relation. A minimum link capacity, a minimum number of peering points between the networks, a limited difference between "Input" and "Output" traffics on the relation are the most common agreed conditions.

Optimisation rules tend to limit peering at the top hierarchical level of the Internet operators that contribute to a specific routing path as illustrated below.



*Typical routing paths in the Internet
AS 2 and AS 3 are the AS (autonomous systems) with the higher hierarchy level*

It is also questionable (e.g. head of paragraph 4) that the technical relationship in the Internet is (historically) based on NAP (Network Access Point). In fact most leading operators in the Internet "interconnect" to each other through private peering points because public peering points are often overloaded and cannot offer sufficient QoS guarantees. NAPs are generally used by small or medium Internet actors that pool in a single peering point their interconnection resources with many others actors of equivalent size. The "interconnection" scheme of the Internet is more comparable to the following scheme than to those given in page 23 of the Consultation Document.



Interconnection scheme of the Internet
 - red lines represent peering relations
 - blue arrow are C2P relations

In the paragraph "Options for wholesale billing regimes", the authors of the Consultation Document conceive a dual regime where B&K is applied in the backhaul network and CPNP in the core networks. It is however exactly the opposite of how charging works in the Internet. Relations in the core network constituted by the AS (Autonomous System) of the Tier-1 operators are based on peering only. It should be reminded that client-to-provider, not B&K, is the most frequent relation in the Internet.