

# IP Interconnection

BT Response to ERG consultation ERG (06) 42  
27 November 2006

## Introduction and summary

BT welcomes the opportunity to comment on the important issues raised in the ERG consultation. We believe that the consultation is about interconnection between NGNs, rather than about IP interconnection – and that this is an important distinction. We also think that there is a critical need for the ERG and NRAs to ensure that there is a fully transparent consultation process at the national level before key decisions are taken on the implementation of NGNs.

The consultation document discusses a wide range of regulatory and architectural issues regarding NGNs, but we have largely restricted our comments in this response to the four main questions posed by the ERG on page V of the document, which relate to the number and location of interconnection points, and to the relative merits of the charging approaches described in Chapter 4. BT's response can be summarised as follows:

- NGNs offer significant opportunities to build networks that are efficient both from a technical and economic point of view. BT's design philosophy, underpinned by analysis of optimal configurations and topologies, limits physical interconnection points to a limited number at locations well away from the edge of the network. The cost benefits of efficient design will be shared with all users of the NGN in due course, but this must not be undermined by regulatory interventions or pricing structures that impose a materially sub-optimal network design on the network operator.
- BT's 21CN is designed with points of service interconnect at a limited number of Metronodes, rather than at the much larger number of MSANs. The exact number is subject to ongoing design optimisation programmes and consultation with industry.
- The current charging models are likely to remain appropriate in an NGN world. The alternatives have significant downside impacts on end-users, who understand current "Caller Pays", and on network operators, whose business investment was based upon a stable model that does not result in imbalances in cost recovery between unequal operators. "Bill and Keep" or peering arrangements would be too dramatic a change for most, if not all, operators in Europe, and would result in unpredictable changes in business models and cash flows for unproven benefits.
- While the fundamentals of services will become packets (and associated quality attributes), and control planes, the use of minutes is likely to be retained at least in relation to voice calls originated on handsets connected to the fixed network. Customers need metrics that they can relate to and that result in charges that relate to apparent cost causality.
- Just as with current networks, geographic differentiation in costs will result in more pressure for geographic wholesale pricing, but the extent to which this results in geographic pricing for end users will depend on the nature of the services provided and the degree to which national "postage stamp" pricing structures are preferable from a marketing and customer service perspective.

## General remarks

The execution of NGNs across Europe is at a different stage in each market, and, as one would expect, the ways in which NGNs are being implemented vary by market. The differences will be driven by differences in the demographics in each country and the topologies of existing networks, along with the extent of competing networks and existing physical interconnection points.

A key way of minimising unsettling changes in existing business models, especially in relation to interconnection arrangements, is to ensure transparency and industry involvement in the development of NGNs. BT is doing this via a consultation programme called Consult21, and an independent industry body, NGNuk, has been created to ensure that there is a clear and effective framework for industry engagement.

For clarity, it needs to be noted that the types of NGN interconnection in the short to medium term will mirror those presently in use. In the case of BT's 21CN, the customer phone will remain unchanged as an analogue PSTN phone. Voice interconnection with CPs will also remain unchanged as PSTN traffic. What will alter is the way that BT carries the call across its network. Similarly, BT today exchanges best efforts internet IP traffic on a 'peer and transit' basis. This includes voice over the internet. No change to this is expected. All other data traffic, typically with defined QoS characteristics, IP or otherwise, is not "interconnected" today but is delivered end-to-end over a CP's VPN – even where that VPN uses the underlying transport of another CP. This model is expected to prevail for the foreseeable future. There are no agreed QoS or other interconnect standards necessary for the direct exchange of data traffic.

## Responses to specific questions

For clarity each of the four key questions identified in the consultation document are presented below in frames, with BT's position explained below each.

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?

Providing services from a common platform and aggregating traffic closer to the edge is expected to reduce costs, once migration is complete and legacy platforms have been removed. The trend for NGNs is towards larger but fewer control nodes rather than the distributed switching characteristic of legacy PSTN implementations. These factors would suggest that NGN interconnect will converge on fewer, multi-service interconnection links.

In the legacy Network, PSTN interconnection can be at Local and Tandem Switches. In BT's 21CN, provision has been made for traffic to be handed over at ~1100 Tier 1 MSANs which are linked to Points of Service Interconnect at Metronodes that can provide the appropriate service control. The Point of Handover is linked to the Point of Service Interconnect by one or more VLANs. Communications Providers will be able to choose where they interconnect within this framework. Their decision will be influenced both by BT's Network structure and where they have fibre themselves.

However many interconnection points there may be, there will still be a significant cost difference in delivering service to customers in heavily populated as opposed to those in lightly populated areas. This will need to be reflected in any pricing structure.

What is the equivalent to "local" interconnection in NGNs?

There is no simple answer to this. In some NGN implementations there will be no equivalent. In the case of BT's 21CN this will be possible at the first IP routing points for the services, which will be located in Metronodes. It is not economic to put routers further out into the network.

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?

In the immediate future NGNs are being designed to cause as little disruption to customers as possible during their implementation. In the longer term, SMP products could well be delivered in ways that would allow further downstream competition to develop, obviating the need for regulation in increasing areas. It is important that inappropriate regulatory intervention does not stifle innovative solutions here.

In terms of the Local Loop, there will be no change, with LLU operators able to provide their own MSANs, except where incumbent operators plan to close LLU sites. In the UK, BT has already made an undertaking to Ofcom that other CPs will be able to purchase network access in an NGN environment on an "equivalence of input" basis, and has specified the way in which BT will calculate compensation in the event of changes to access and interconnection caused by NGN deployment.

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

Operators should maintain the necessary flexibility to continue to meet the requirements of customers. Commercial negotiation will supply many of the answers to these questions, as it

has in the context of the public internet. Regulatory intervention will be necessary only where market power requires it. In response to the options put forward by ERG, our view is that:

- for the foreseeable future the retail principle of Calling Party Pays (CPP) and wholesale principle of Calling Party's Network Pays (CPNP) should continue
- retailers should be able to continue to differentiate by medium (fixed, mobile, internet) and usage (volume, distance and time of day)
- wholesalers may wish to differentiate geographically in relation to costs
- bill and keep for all call types in the wholesale market would drive retailers to charge their customers in relation to the value and costs of making and receiving calls which would remove the equalisation of costs between calling and receiving parties that results from CPP. This is unlikely to be acceptable to retail customers who would pay more e.g. mobile customers, fixed line customers in lightly populated areas

### **Simple Wholesale Bill and Keep Model**

Looking at the Wholesale Charging Principles first, consider the model where all interconnect between operators takes place at a single Telehouse location, whether Fixed, Mobile or Internet. Each operator could charge its customers for their connectivity to this common point to make and receive calls, and no money need change hands between operators. This is essentially the Bill and Keep Wholesale Model with peering between operators. It has possible advantages in that it reduces the need for interconnect payments and leaves each provider free to realise the value of what they provide to their customer.

### **Impact of Wholesale Bill and Keep on Retail Charging**

Wholesale Bill and Keep would in turn affect the Retail Market because in the current model, which in the UK and the rest of Europe is predominantly Calling Party Pays, the different costs of end to end calls are split between end users according to who initiates the call e.g. a caller from a fixed line to a mobile incurs a mobile termination fee and a caller from a mobile to an internet customer incurs a fixed line termination rate and so on. Under Bill and Keep, the Calling Party would pay for their connectivity to the Telehouse and no more. The Receiving Party would pay for their connectivity from the Telehouse and no more. Therefore the mobile customer would pay for connectivity to make and receive calls and therefore pay more than at present, fixed line customers would pay less and internet customers would pay less, incurring no incremental charges on their broadband connectivity and voice application at all except for interoperability. This is acceptable in economic terms, but would represent a fundamental change for the end user which may not be acceptable at present.

In the case of fixed line customers, the unit costs for calls are substantially higher in lightly populated areas than in heavily populated areas. As a consequence, under bill and keep, geographic differentiation would be required at the Wholesale level otherwise CPs focused on heavily populated areas would have an advantage over operators with ubiquitous coverage. This in turn would affect the common prices enjoyed by all customers for similar calls under CPP and the regulatory obligations that go with them

### **Retail Cost Sharing and Differentiation**

Under CPP the cost of shared connectivity is borne by the caller. Assuming all customers have similar calling patterns, they will share the costs of that connectivity equally irrespective of the medium they use. However, all customers do not have similar calling patterns, and retailers want to differentiate between customers. In particular, today retailers typically want to differentiate between internet, fixed, mobile and international calls, each of which has a different cost base, and value. For instance, mobile airtime is a scarce resource and mobile transmitters are more expensive than MSAN cards. Internet voice generates virtually no incremental costs using an existing PC and broadband connection, but only offers best endeavours quality, in contrast to PSTN which is quality assured. Similarly, all users do not incur the same proportion of shared costs. Light users make less use of shared assets than heavy users, and peak time users drive more costs than off peak users. This is still a meaningful differentiator in the NGN world and the requirement to meet the needs of light users is likely to continue. Although the trend is towards all inclusive 'flat rate' packages, they are all based on usage. All the time this is the case, there will be a requirement to measure

usage in both the wholesale and retail markets and charge accordingly. Call minutes are the obvious metric to use.

**Mixed Models**

For the pure Bill and Keep model to work agreement would be needed amongst all Industry players to operate on that basis, and for interconnect to occur in agreed places. Accepting that one telehouse would not be the answer, the costs of rings linking interconnect locations would have to be shared. Retail customers would have to be prepared to pay the full cost of their chosen medium. As media and services converge, this is likely to be the outcome in the long term. However, in the short to medium term, mixed models are likely to prevail to reflect the different costs and value generated by the various Industry players. All the time there are mixed models, minutes will be required as a universal measure of usage, and money will need to flow between CPs.

***end***

## Offices worldwide

© British Telecommunications plc 2004  
Registered office: 81 Newgate Street, London EC1A 7AJ  
Registered in England No: 1800000

