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Intercai Briefing

NGN Interconnect

Interconnecting the old with the new

Traditional voice networks are currently being replaced with Next Generation Networks (NGNs) that use the Internet Protocol (IP) to carry voice, data and other types of traffic. The transition to an IP based network is under way in many countries. In the UK, for instance, BT's 21st century network aims to support over 10M users by 2008.

The reason for the transition is cost – it is cheaper to have one IP network for all services than a set of separate networks. But this briefing is not about next generation networks *per se*. The specific issue here is how next generation operators will interconnect with legacy telecom networks, and with each other.

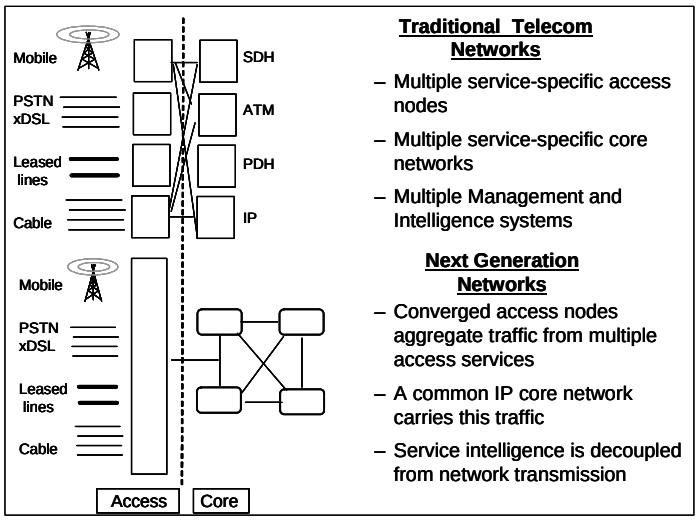
A simple link

There is plenty of established wisdom on how to interconnect voice networks. As a basis for exchanging calls, most operators with significant market power are required to produce a Reference Interconnect Offer, or RIO which defines how other licensed operators connect with that operator. In addition to the physical arrangements for interconnect, the RIO contains a description of the available interconnect services and, usually the most sensitive issue, how much it costs to exchange traffic.

At first sight it might appear that little changes with the introduction of next generation networks. After all, operators will still want to send some of their traffic to be terminated on other networks. The way in which links are built (in-span, customer sited etc) remain the same and the issue of where the points of interconnect (or handover) are located still exists, but, from a technical perspective, there is not a lot that changes in a next generation context.

In a traditional, connection oriented world, the traffic exchanged is call minutes; in the next generation IP world it is bulk data, but the principle is the same. And there are plenty of suppliers of devices for the interconnection of traditional and next generation technologies (that come complete with all the necessary management functions to control the link). Perhaps more of a challenge is the determination of interconnect prices. These are based on the cost of provision and there are sound principles for using an operator's actual cost base to determine how much it should charge for its interconnect services.

So, the introduction of next generation networks may not require a fundamental change, but that does not mean that there is nothing to do. Planning and investment in new equipment is probably needed to make interconnect work, and a root and branch revision of established principles to establish reasonable tariffs is likely.



Fair price

It has taken a long time to get interconnect agreements properly balanced in the long established connection oriented world. To get the balance in a mixed world of traditional and NGNs inevitably brings new challenges. The basis for interconnect charging for time based tariffs traditionally use one of two preferred methods:

Fully Allocated Costing (FAC) is widely used but has the perceived disadvantage that it preserves the inefficiencies of the incumbent and, to some extent, allows pricing to be controlled solely by them.

The main alternative is **Long Run Incremental Costing**, or **LRIC** which is perceived as fair but requires the preparation of a large amount of validated input data, taking a considerable amount of time and effort from both the incumbent and the regulator.

The radically different cost base of a next generation network will require the appropriate method to be chosen and for that method to be reapplied.

A further issue requiring resolution is how calls that have been measured in voice minutes are equated with those defined by a number of IP packets. The established practice for most telecom operators is to exchange traffic as call minutes. The required interconnect capacity between the operators (in the form of installed 2Mbit/s links) is determined by the anticipated number of calls that go between them. For an IP-based operator, interconnect (more commonly referred to as peering) is usually expressed in terms of a net transfer of data – Capacity Based Interconnect (CBI).

However, an issue with CBI is that regulation is usually based on precedent, and there is relatively little experience with CBI in the telecom world. Indeed there are some concerns over the application of CBI in a telecom market – if it was implemented on a 'bill and keep' basis, there is the risk of it being a licence for unwanted telephony. A further point that needs to be considered is the possible use of both capacity and time based interconnect (as happens, for example in Columbia). When both options are present, it is important to ensure fair balance between the two; the danger being that new entrants will seize on one of the interconnect regimes if it is offered on preferential terms for their business (e.g. it encourages arbitrage). Additionally, there is inevitably increased workload on an operator if it is required to price both capacity and usage based interconnection within its reference offer.

Notwithstanding these implementation issues, there is some evidence that a capacity-based interconnection regime can lead to reduced interconnection charges – a desirable situation for consumers and new entrants (but probably not for an incumbent).

In practice, the problem with next generation interconnect will not be how operators reconcile their net exchange of calls (and hence revenue). The real issue is more likely to be quality of service. All operators want to minimise their cost of operation and, if possible, project a favourable image of their service compared with the competition. Hence they would not be averse to compressing traffic they send to be delivered on another network as this reduces cost. The poor perceived call quality then becomes a problem for the innocent party that receives the traffic.

So, there is a concern that an interconnect regime that does not consider the end to end quality of service will impact on consumer satisfaction, and, ultimately, impede competition.

Same old rules, just a few more headaches

There are sound principles for interconnecting telecommunication networks and there is no reason why these principles should not be valid for the next generation of networks.

However, for all the solidity of established practice in network interconnect, satisfactory agreements are complex and require a considerable amount of detailed work to get right. In order to ensure that a competitive telecom market delivers benefit to the user, interconnect agreements will have to evolve to consider a radically different cost base for the network and will have to include factors such as the basis for measuring interconnect traffic and assuring the end-to-end quality of service.

Service level agreements are already a key part of the interconnect offers in some countries (Bahrain, for example) and it is likely that service level monitoring will become a key aspect of market regulation.