

The Challenge of Interconnecting Next Generation Networks

In a traditional telecom network, it is taken as read that a call originating on one network can be satisfactorily terminated on another. The intricacies of interconnect, often the source of contention between operators, are invisible to the end user.

Behind the scenes, it has taken years of competition in telecoms to arrive at this situation. Equitable interconnection of networks requires the exchange of call minutes between operators at fair rates. The definition of reference interconnect agreements with charges based on true cost is the basis for effective and economic interworking between operators.

With the advent of next generation networks, the technical base of a voice network changes and, with it, the basis for interconnect. This paper raises some of the issues that will need to be considered as competition in Voice over IP dawns.

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1. Introduction

Traditional voice networks are currently being replaced with next generation networks 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. And the UK is far from being the first to implement an NGN. Uganda Telecom has already completed the first phase of the rollout of a USD5 million IP-based network.

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 paper 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.

2. A Simple Link?

“A rose by any other name” – William Shakespeare

There is plenty of established wisdom on how to interconnect voice networks. As a basis for exchanging calls, most dominant operators are required to produce a reference interconnect offer, or RIO which defines how other operators connect with the dominant 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. In a connection oriented world, the traffic exchanged is call minutes, in the 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).

Furthermore, interconnect prices are based on cost and there are sound principles for using an operator's actual cost base to determine how much it should charge for interconnect services.

So, the introduction of next generation networks requires no fundamental change. All that is needed is some investment in new equipment to make interconnect work and a slight rework of established principles to establish reasonable tariffs.

3. A Fair Price?

“My life depends on the quality of the lowest bidder” – John Glenn, sitting on the Apollo landing module

In truth, there probably are some issues. It has taken a time to get interconnect agreements properly balanced in a connection oriented world. To get the balance in a mixed world of traditional and next generation networks, there will be, inevitably, new challenges.

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One issue that will require 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 connection oriented bandwidth (i.e. multiples of E1 or T1 transmission links). The required interconnect capacity between the operators is determined by the anticipated number of calls that go between the two operators. For an IP-based operator, interconnect (or peering) is more commonly expressed in terms of a net transfer of data.

But the problem with next generation interconnect probably 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 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.

4. Conclusion

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 telecoms market delivers benefit to the user, interconnect agreements will have to include factors such as 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.

References

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