



NGN interconnection: costing challenges

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Introduction (1)

Today different wholesale charging principles are used : Element based distance dependant, capacity based, bill and keep ..etc.

For retail, different charging schemes are used as CPP and RPP impacting also the wholesale termination fees (CPP termination leads to a problem that is known as the termination monopoly).



Introduction (2)

Developing an interconnection regime for an NGN entails addressing the issue of wholesale charging principles.

An answer should be found to the question : How to determine the cost of regulated interconnection products in a multi-service environment?



NGN architecture : impact on costing (1)

The transition towards NGNs entails several structural changes. Each transition stage implies a change in the topology of the networks in terms of the kind and number of elements used as well as their geographic position within the network.

The fact that it is expected that less elements will be used as compared to TDM networks, impacts directly CAPEX and OPEX and therefore the wholesale tariffs.

Furthermore NGN interconnection may be differentiated according to quality of service classes or not differentiated at all.



NGN architecture : impact on costing (2)

A main difference between TDM networks and NGN architecture is the separation of the main functional levels. This means a clear separation of transport, control and service layers.

Therefore, transport, control and service layers can be technically and commercially separated and provided by different market players.

Thus, unlike TDM networks, interconnection costing methodologies may apply for each layer. This fact may lead to more segmented interconnection market products and more interconnection markets to analyze for Ex-ante regulation purposes.



NGN architecture : impact on costing (3)

Furthermore, NGNs will allow more aggregation of traffic through a smaller number of nodes, as well as greater sharing of Links for all types of IP traffic.

Therefore NGNs can be operated at significantly lower operational costs than other legacy networks by moving to a single infrastructure based on IP.

As said in the previous slide, this will give the players the opportunity to drastically reduce their CAPEX and OPEX giving rise to lower retail as well as wholesale tariffs.



NGN costing options: EBC vs. CBC



In the Arab world, the CPP model is commonly used for Wholesale charges. It can either take the form of Element Based Charging (EBC) or Capacity Based Charging (CBC).

The main distinction between EBC and CBC is that, under the latter, system bandwidth is being bought in advance by competitors. This leads to a more adequate risk sharing between incumbent and competitors.

Usually, the efficient costing is EBC based and consist of LRAIC plus a mark-up for common costs including an appropriate rate of return on capital employed (WACC). It is likely to be applied for NGNs.



NGN costing options: Bill and keep (1)



The Bill & Keep principle is widely applied for Internet traffic and to some extent to voice traffic interconnection (mobile sector in the USA and previously in France, local interconnection in New Zealand).

Thus, the interconnection services costs are confined to capacities costs engaged by each carrier to convey the traffic to be terminated in the competitor network.



NGN costing options: Bill and keep (2)



This principle could be applied under the strict condition that the traffic between carriers is symmetric.

Moreover, in the case of NGNs, the symmetry requirement should be met for each QoS class. We may ask the question if investment costs in QoS may be recovered through retail tariffs in the case of B&K principle.



NGN costing options: Bill and keep (3)



Bill & Keep Option advantages:

- Transaction costs can be reduced, for example those of determining the “right” termination rates.
- Reduced need for regulatory intervention and consultancy fees.
- No termination monopoly problem under Bill & Keep and positive network externalities are internalized.
- Without payments for termination services the problem of arbitrage is avoided.



NGN costing options: Bill and keep (4)

Bill & Keep Option shortcomings:

- “Hot potato” problem: providers have an incentive to hand over their traffic to another network for termination as close to the point of origination as possible.
- The “hot potato” problem entails underinvestment, but could be solved by requiring a minimal number of POIs. The closer the POI is located to the called customer, the smaller is the “hot potato” problem (and vice versa).
- Therefore the use of B & K option would require the determination of the adequate topology of POIs.



NGN costing : a combination of options (1)



In the case of a multi-service IP-network like NGN, there is a certain rationale in combining options either as a function of :

- a) service or QoS classes or
- b) the network level (access vs. core network).

Option a) implies that it is required to unambiguously distinguish between different services and that usage of services can be measured and even transport them separately. Unless these preconditions are met, there is a high risk of adverse selection and arbitrage problems. It is also possible to apply different regimes to different QoS classes (example: Best effort vs. Defined QoS).



NGN costing : a combination of options (2)



Option b) implies that Different regimes are used for different network levels.

Many specialists do support such a scenario as it minimizes the “Hot potato” problem mentioned above.

For instance a “two-level” regime could be implemented as follows: Bill & Keep on the access/backhaul level (between customer and point of interconnection), and EBC (or CBC) for transit in the core network.

However, in this approach, the minimum number of interconnection points required to take part in the Bill & Keep regime at the access/backhaul level is of great importance.



NGN costing : Death of the distance? (1)



In an NGN context, the additional cost of crossing each extra mile is on average lower than with legacy systems. This does not confirm or infirm if distance-related charging is adequate or not for setting regulated interconnection charges.

It is expected that unit costs occurring in the crossing of the periphery should be similar to those of traversing the core network.

This means that it may be relevant to charge according to distance without consideration of the hierarchical level as for TDM networks today (local, tandem, single transit, double transit).



NGN costing : Death of the distance? (2)



Even in the context of NGN distance may stay as a relevant determinant of cost for efficiently routed traffic within an efficiently dimensioned network.

For costs calculation, distance is a reasonable factor translating the number of nodes used or the congestion generated within an efficient network. Therefore, Distance-related costs still exist (even if small) in the context of NGN. Instead of considering the “death of distance”, the move to NGN may decrease the importance of the distance as a potential cost driver.



CONCLUSION (1)



It seems that no consensus has been reached yet concerning the type of Wholesale tariffs method.

Very likely, as advocated by many authors, a combination of methods may be applied to avoid, as it has been said previously, problems like the “hot potato” problem.

It sounds reasonable that a method applied for a service would not be necessarily applied to other services. For instance interconnection if available for Video streaming or data applications may apply capacity based tariffs modulated by the type of content and QoS .



CONCLUSION (2)



For voice applications, The parameter “distance “ will continue to be part of the wholesale tariff calculation, although the increase in traffic and capacity in the NGN context makes the relationship between the cost of conveying traffic and distance over which traffic is carried is more uniform between periphery and core.



Thank you for your attention

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