BT's response to Ofcom's Consultation – Porting charges under General Condition 18

12 May 2014

Executive Summary

1. Number portability is of great benefit to all consumers because it enables the changing of service-provider without having to change number, thereby improving competition in the voice market. Hitherto, the onward routing arrangements for calls have served the UK well, but the time for changing to direct routing is now here. It is the stark reality that the UK stands virtually alone in persisting with onward routing whereas later adopters in North America and most of the rest of Western Europe have chosen direct routing.

2. Since Ofcom last reviewed porting arrangement in 2009/10, there has been significant change in the industry and the potential for innovation has grown dramatically. More and more consumers are migrating to IP with the potential to benefit from cheaper prices and innovative services, such as high definition voice and full integration with smartphones and other VoIP devices. However, onward routing via TDM networks means that calls to most ported numbers are limited to TDM C7 features which severely restricts the addressable market and results in inefficient, poorer service for consumers. Therefore, it is timely that Ofcom has chosen to review these arrangements in 2014.

3. BT agrees with Ofcom that, in the fixed sector, porting charges should be based on the technology actually used, with BT's costs as the relevant benchmark of the costs of an efficient technology incurred in providing portability. BT also agrees that it makes sense for porting charges for the mobile sector to be set with reference to the hypothetical average efficient operator MCT cost model. However, the cost standard used should be LRIC+ to reflect the true opportunity cost to the Donor Communications Provider (DCP) of providing onward routing.

4. Regarding the recovery of porting costs, BT agrees with Ofcom that the one-off charges for setting up a ported number should continue to be borne by the Recipient Communications Provider (RCP). However, in view of the changes taking place in the industry, BT believes that now is the moment to incentivise and enable the direct routing of calls. To this end, BT proposes that Ofcom makes two simple and practical changes:

   - Move the obligation to pay the porting conveyance charge to the Originating Communications Provider (OCP)
   - Mandate the timely publication of all ported numbers with their prefixes

5. Once these arrangements are in place, the market will determine the pace of migration from onward to direct routing of ported calls and realise benefits for consumers. Most CPs have or are developing the capabilities required to route directly and the incremental cost of implementing direct routing is falling. The widespread adoption of All Calls Query (ACQ), which enables individual number routing, will not only facilitate direct routing, but also the more efficient and flexible use of numbers. If Ofcom fails to act, a significant opportunity will be missed to realise innovation, cost and service benefits for the consumer.

Introduction

6. In all North American and most Western European countries, calls are routed directly to ported numbers without reliance on the donor network and there is broad consensus that direct routing of calls to ported numbers is the preferred option. Ofcom pointed this out as long ago as in its 2007 Consultation[1], and it is supported by a current analysis by Cullen which shows that nearly all of Europe has chosen direct routing supported by national or local databases. This is attached as annex A – Cullen Report on Fixed Number Portability.

7. Direct routing of calls to ported numbers is clearly more efficient than onward routing via the DCP (the number range holder) in terms of network usage, Quality of Service and availability of services. Under the onward routing process, the OCP does not know the number being called has been ported. The OCP sends the call to the DCP as the original range holder for the number using the normal number block routing procedure. The DCP knows the number has been ported, adds a prefix supplied by the RCP, and onward routes the call to the RCP. The RCP recognises the prefix and accepts the call. Where the two end users are on Next Generation Networks (NGNs) and the DCP has a legacy network, which is often the case, two IP-legacy (TDM) signal conversions will be required as the call trombones in and out of the DCP's legacy network. Two signal conversions degrade the quality of the call and call features dependent on IP are lost. Direct routing eliminates the loss of quality and features, and requires fewer interconnects and less conveyance.

8. The UK was an early adopter of number porting and at that time Operators would have faced considerable costs to implement direct routing and onward routing via the DCP was chosen as the more efficient option. In 2007, when it appeared the whole industry was about to migrate to NGN networks, Ofcom determined that the mobile sector should migrate to direct routing by 2009, and the fixed sector by 2012[2]. This was overturned on appeal in 2008[3], and in 2009/10 Ofcom consulted again with the proposal to continue with onward routing for fixed networks but migrate to direct routing on mobile networks[4]. This proposal was supported by a Cost Benefit Analysis (CBA) which showed a negative NPV over 10 years of -£130m for fixed and a positive NPV for Mobile. Following the responses to this consultation, Ofcom concluded that the NPV of direct routing for mobile networks was marginal and therefore onward routing of calls to ported numbers continues to be the norm for both fixed and mobile networks.

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[1] Ofcom Consultation – Telephone number portability for consumers switching suppliers – Concluding Statement 29 November 2007 footnote 6
[2] Ofcom's 2007 Determination
http://stakeholders.ofcom.org.uk/binaries/consultations/gc18review/statement/statement.pdf
[3] Vodafone challenge in 2008
http://www.catribunal.org.uk/237-657/1094-3-3-08-Vodafone-Limited.html
[4] Ofcom consultation dated 1 April 2010
http://stakeholders.ofcom.org.uk/binaries/consultations/mnp/summary/mnp_condoc.pdf

9. There have been major developments in the telecommunications industry since 2009/10 when these issues were last considered by Ofcom and we are now at the point where prices of highly capable IP based devices are low enough to encourage mass market adoption. Customers can increasingly enjoy the features of advanced IMS platforms with the promise of seamless, high quality interconnection of voice, messaging and video, enabled by SIP based IP interconnect. However, over 10 million consumers, predominantly on NGN networks, have ported numbers where calls to them are onward routed via legacy TDM networks. This means that although new and innovative services are enabled by standards and devices, consumers will be denied the benefits by the porting process.

10. Future voice communications will require individual number routing most likely enabled by ACQ. Increasingly, telephone numbers will become associated with individuals rather than locations and will be used in conjunction with other personal unique identifiers across a range of media. The link between telephone number and pricing is breaking down as rates converge and consumers buy all inclusive packages. Individual number routing is a key enabler both for breaking the link between number and geography and the more efficient use of numbers.

11. BT's own plans for future voice involve managing the natural decline of the PSTN in the short to medium term while growing the volumes of IP customers. Onward routing calls via the PSTN to 8 million customers who have moved away from BT represents a significant barrier to our ability to sustain the PSTN. Many of the components in the PSTN are now obsolete and a key part of our strategy is to reuse equipment that becomes surplus as network utilisation falls.

12. There is the possibility that the industry will progressively adopt direct routing without any changes to the existing arrangements. However, the evidence to date suggests this will not readily happen. Apart from the obvious fact that OCPs have no incentive to direct route because RCPs bear the cost, there appear to be vested interests in maintaining the existing system beyond the point where it is efficient to do so. There seems to be some reticence to disclose numbers which have been imported, presumably because these customers by definition have the greatest propensity to switch operator. It is also in the interests of some operators to cause other operators, especially new entrants, to incur the porting conveyance charge. Whilst it is possible that direct routing could be introduced by mutual agreement, it does not appear that the balance of interests is such as to make this likely. A reduction of the cost to RCPs by obliging the DCP to bear more of the cost will only tip the balance further away.

13. It appears that the collective benefit of direct routing and the use of individual number routing is greater than the sum of the benefits of bilateral arrangements for CPs and, therefore, intervention by Ofcom is required. In particular:
    - Move the obligation to pay the porting conveyance charge to the Originating Communications Provider (OCP)
    - Mandate the timely publication of all ported numbers with their prefixes

14. The incremental cost of implementing direct routing is falling all the time as more and more CPs can reuse existing capabilities to provide it. An OCP pays regime gives the correct incentive to the OCP to realise the benefits of direct routing as soon as it costs in.

15. BT believes that now is the moment to put in place the enablers and incentives for the direct routing of calls to ported numbers to ensure that efficient decisions are taken in the collective interests of consumers. These arrangements offer future proofing to the consumer who will be able to enjoy the full benefits offered by IP-IP interconnection at the earliest economic opportunity.

Section 4 Choice of cost standard

Question 1: Do you agree with our assessment of the choice of cost standard? If not, please explain why.

16. BT does not agree with Ofcom's assessment of the choice of cost standard. The LRIC+ standard should be adopted.

17. Our first difficulty is that Ofcom's analysis makes the assumption that the current position of DCP/RCP having responsibility for the costs is maintained. This is a fundamental flaw, because the choice of cost standard itself cannot be divorced from the revenue flows between the parties for the provision of service, which necessarily includes the OCP.

18. Our second difficulty is that Ofcom is focussing too much on what are really fairly narrow short term factors when what is needed is to take a more holistic view over the long term and establish the framework that will encourage operators to use the capabilities of 21st century networks in innovative and exciting ways for the benefits of all customers across networks, not just islands of on-net calls.

19. Our third difficulty is Ofcom's suggestion [4.12] that porting services have the characteristics of a two way access service. We do not see a close parallel with call origination and termination even though porting takes place in both directions i.e. a DCP can also often be a RCP.

20. Onward routing is provided by the DCP to link the OCP to the RCP. The OCP and the RCP may or may not provide onward routing in relation to other calls depending on whether they have exported numbers. Ofcom draws a comparison with call termination as a two way service but, with onward routing, there are up to three parties involved, and there is not necessarily any reciprocal relationship between the DCP and the RCP, nor for that matter between the OCP and the RCP for a ported call.

21. Call termination is clearly a two sided service because both the calling customer and the terminating customer benefit from the call. There is a direct relationship between the two parties and the cost can be recovered from either side or both sides. The main reason why EC regulation moved to using 'pure' LRIC for call termination and the recovery of common costs from call origination was the competitive effects at the retail level from asymmetry in the position of the two parties.

22. However, in the case of onward routing, the additional cost is incurred by a third party, the DCP, who only has a relationship with the OCP and the RCP at the wholesale level similar to transit. The DCP has no retail option for recovering common costs or any other porting costs excluded from the charge from either the specific calling or called party other than when it is an 'on-net' call. Following the logic of the RCP pays option, on-net calls should be included because the RCP causes onward routing costs for these to be incurred in the same way as

off-net calls. It is only with the OCP pays option that it becomes appropriate for the DCP as an originator of calls to bear the cost.

23. Accepting there is a competitive impact at the retail level, the OCP should bear all of the DCP's onward routing costs i.e. LRIC+ accepting that all consumers benefit from a more competitive voice market. If the OCP pays the porting conveyance charge this will be spread across all CPs/consumers, including where the DCPs' own customers originate calls, but in an equitable fashion. It is not fair for large network DCPs only to receive LRIC as their remaining customers have to bear all the fixed and common costs associated with sustaining onward routing from which they derive no direct benefit. On this basis, the DCP should be able to charge for all efficiently incurred costs associated with the provision of porting including those specifically excluded by GC18, such as system set up costs.

24. As the largest supplier of ported numbers, BT has to maintain an onward routing capability for over 8 million end users. BT is seeking to manage the declining TDM PSTN service by reducing the size of the network and reusing network elements that are no longer in production to sustain the service while demand persists. The additional conveyance and traffic resulting from onward routing is an opportunity cost that would need to be covered and therefore LRIC+ should be used rather than LRIC. This is a major barrier to reducing the size of the PSTN. It is essential that CPs take the correct economic decision on introducing direct routing both to ensure consumers get the full benefits of IP-IP calls as soon as possible and that investment in legacy technology is minimised. This will only happen if the cost standard used for DCP costs is LRIC+ to reflect the true opportunity cost of the DCP.

25. If issues of competitive effect and equity are then largely resolved when the OCP pays, the key remaining issue is actually that of dynamic efficiency – whether or not the correct decisions are taken on how to ensure that the call is carried in the optimal way. This is not directly addressed in the six principles of pricing and cost recovery although Ofcom does consider allocative and productive efficiency. A LRIC+ solution is most appropriate here as investments all have to yield revenue which takes into account fixed and common costs.

26. Our views on the three most relevant principles as identified by Ofcom are as follows:

Cost causation

27. Three parties cause the costs of number portability:
    - The RCP causes the one off costs of the port
    - The OCP causes the costs of onward routing by not routing directly to the RCP
    - The DCP is responsible for providing the port and onward routing efficiently

    Number portability was extended from an SMP obligation to a consumer right such that there was no direct linkage between any of these three potentially separate network parties.

28. Whether or not the service is regarded as one or two-way – we would agree with Ofcom's general preference [4.28] for recovering costs at the competitive side of the market. As discussed above, this points to the OCP being responsible as, at the retail side, it is the calling party who chooses to make the call in a competitive environment.

29. Additionally, as we have stated, once the port has taken place, it is the OCP who has discretion over whether a call is directly or onward routed and therefore causes any cost of onward routing to be incurred. The RCP only creates the potential for that to happen by porting the number.

Cost minimisation

30. For similar reasons to our arguments on cost causation, we consider that Ofcom's reasoning here is misplaced. As a matter of principle, we do not believe that it is fair to the DCP to be limited to LRIC purely as a device to minimise costs – on that basis the incentive would be even greater if no payment was made at all. The true incentives for cost minimisation and efficiency should rest with the OCP not the DCP, where the correct investments can be made to expand capacity to offer direct routing or onward routing. This is necessarily dependent on the publication of ported numbers and their prefixes to give OCPs the opportunity to avoid onward routing costs.

Effective competition

31. Ofcom characterises the issue as one of entrants versus incumbent operators. Once the port has taken place, the RCP pays option discriminates against new entrants who are importers of numbers because the OCP decides whether to employ direct routing and their commercial interests are not necessarily the same as those of the RCP who pays for it.

32. There are two additional points we wish to make here:
    a. Firstly as discussed above, Ofcom misses entirely the nature of competition between onward routing and direct routing provided either by self-supply or through the transit market. It is important that LRIC+ is used to set a correct price standard for fair competition in this marketplace representing the true opportunity cost of onward routing.
    b. Secondly, Ofcom does not recognise that there is still a significant imbalance in the net flow of customers. For example, BT is currently a net exporter of numbers by a wide margin and it is not fair that our remaining customers should be expected to bear all the common costs across their services or that our competitive position be undermined by only receiving LRIC.

Section 5 Choice of technology

Question 2: Do you agree with our assessment of the choice of technology? If not, please explain why.

33. We largely support Ofcom's views on the choice of technology and specifically [5.11] the focus on economic efficiencies and effective competition. We also agree [5.15, 5.45] that prices should reflect forward looking costs although for a TDM network if they reflect the depreciated nature of the network assets this will generate a low price and reduce the incentive to invest in direct routing. It is important to go for a LRIC+ standard to reflect the full opportunity cost to the DCP.

34. With regard to the discussion [5.16-5.21] on productive and dynamic efficiency, we would again stress the simple fact that the industry is already moving towards the virtually universal capability to interrogate the call and either trap it or use direct routing.

35. Therefore, BT agrees that it makes sense for porting charges for the mobile sector to be set with reference to the hypothetical average efficient operator MCT cost model. In the fixed sector, porting charges should be based on the technology actually used with BT's costs as a relevant benchmark of the costs of an efficient technology incurred in providing portability.

Section 6 Recovery of porting costs

Question 3: Do you agree with our assessment of the recovery of porting costs? If not, please explain why.

36. BT does not agree with Ofcom's assessment of the recovery of porting costs.

37. BT notes the types of benefits from number portability that have been identified in the consultation [6.26]:

    - Type 1 are the benefits that accrue to customers who retain their telephone number when switching supplier and BT agrees with Ofcom that the one off porting costs of the DCP are associated exclusively with these benefits and therefore should be borne by the RCP.

    - Type 2 are the benefits which accrue to all UK telecommunications customers resulting from increased competitive pressure due to the availability of number portability. These are by far the largest benefits identified and the costs associated with them should be shared by all beneficiaries. BT is strongly of the view that porting conveyance costs fall in this category, and the fair and reasonable way for them to be recovered is from the OCP. This is not the case at the moment, where the OCP does not bear any of the costs directly on a per call basis. Under the present system, the DCP bears the costs excluded from recovery under GC18 and the RCP bears the recoverable costs in the fixed world, whilst they are shared with the DCP in the mobile world. This is unreasonable because

all consumers enjoy the benefits and therefore all UK consumers should bear the costs equitably. OCP pays porting conveyance charges best meets this desirable outcome and now is the moment for Ofcom to initiate the required changes.

Assessment of direct routing

38. Ofcom say:
6.9 We considered this issue in our 2010 review of routing calls to ported numbers. Evidence from that review suggested that regulatory intervention to mandate direct routing in the UK was not appropriate at that time. We undertook a cost benefit analysis of direct routing and found that the case for it was either marginal or negative (depending on the traffic type). We consider that the results of this analysis are likely to remain true today.
6.10 We consider that moving to an OCP pays option would be highly unlikely – in itself – to lead to substantial direct routing, and would instead shift the DCP's costs of porting conveyance from the RCP (or RCP and DCP in the mobile sector) to OCPs, without achieving greater efficiency through direct routing.

39. Ofcom's 2009 Cost Benefit Analysis (CBA) showed a negative NPV over 10 years of -£130m for fixed and a positive NPV for mobile. Following the responses to this consultation, Ofcom concluded that the NPV of direct routing for mobile networks was marginal and, therefore, onward routing of calls to ported numbers continues to be the norm for both fixed and mobile networks.

40. Ofcom says [2.52.4] that "how calls to ported numbers are routed ie the costs and benefits of a direct routing solution relative to the current onward routing solution" are outside the scope of their review. Despite this, Ofcom then goes on in paras 6.6-6.12 to provide some assessment of direct routing only to decide not to consider it further, asserting that the results of the 2009/10 are likely to remain true today. This is not the case. The industry has moved on since the CBA was done and the analysis now significantly understates the benefits, and hugely overstates the costs of implementing direct routing, not recognising the fact that many of the benefits can be realised at little or no cost.

Costs

41. Ofcom identified 3 main cost elements:

a) Cost of building, maintaining and operating a database of ported numbers (CDB)
b) Porting programme office costs – administrative costs of setting up and managing the CDB
c) Operator specific capital and operating costs of adapting systems to incorporate CDB and direct routing

Operator specific capital and operating costs to implement direct routing

Fixed network operators

42. Ofcom's 10 year NPV for fixed networks using a revised value for APCC in its statement of 1 April 2010 was -£102m which was largely driven by the cost of adapting systems to incorporate CDB and direct routing, including BT's.

43. Direct routing is now easily facilitated by modern technologies across both mobile and fixed networks by All Calls Query (ACQ). Since Ofcom carried out its CBA in 2009, Sky has developed into a major player alongside TTG, Gamma and C&W as NGN operators who have direct routing capabilities.

44. The growth of NGN operators is evidenced by the increase in the number of MPF lines from 1.7m in 2009 to over 8m in 2014, many of which will be IP based on NGNs. Consequently:

    - Calls from IP networks to ported numbers that are onward routed via a TDM network will lose the benefits of IP technology
    - IP-IP calls onward routed through a TDM network will lose quality due to two IP-TDM conversions
    - More CPs have or are in the process of acquiring the capability to trap calls on their own networks and use individual number routing

45. TDM operators such as BT and C&W (Vodafone) have developed IP capabilities alongside legacy networks. BT has a central routing engine which provides individual number routing. This is a major shift over the last five years and we believe that virtually all major players already have many of the capabilities to direct route traffic. They can make the choice to self-provide or acquire this functionality from a transit operator, or continue to use onward routing via the DCP.

MNOs

46. There are a number of commercial and technological reasons which lead us to believe that all MNOs are now in a position to implement look ups on an individual number basis for each call. First, we believe that all MNOs have implemented call trapping. Introducing this capability makes commercial sense to reduce DCC payments made unnecessarily for calls to their own imported numbers. We note that in its 2010 Statement, at paragraphs 4.33-4 Ofcom stated that 3 of the then 5 MNOs were already employing call trapping and the other 2 operators expected to do so shortly. Further, Ofcom noted at paragraph 4.33 that one MNO explicitly stated that this meant that all calls could be looked up on an individual basis at little or no incremental cost.

47. Second, all UK MNOs are now investing in rolling out 4G networks and there is also continuing investment in 2G and 3G networks. It can be expected that all MNOs are

preparing for the introduction of voice over LTE (VoLTE) and a move towards a Rich Communications Suite (RCS) based services. This will involve investing in IMS equipment in their core networks and implementing a move towards all services being delivered using IP based routing. Call routing in such an environment will require that all mobile network designs are aligned towards supporting an all call query approach, such that there is the possibility to route optimally. Further this will ensure that maximum use of capabilities such as HD voice and those enabled by RCS and VoLTE can be realised in as many call scenarios as possible. The ability to offer such enhanced capabilities for an individual call are determined by the network with the lowest capability. Onward routing means that there are three rather than two networks involved and this, therefore, increases the risk of losing such enhanced capabilities on any individual call. However, it is also notable that the mobile community is also moving towards establishing new standards for this new IP based routing based on the ENUM standard which will enable individual number look up to take place.

48. As a result, we expect that mobile operators would now (or at least in the very near future) be able to implement direct routing solutions for very little, if any, incremental cost on their own networks. Further the above approaches imply that individual MNOs will also have undertaken the investment to construct suitable internal databases of numbers. There should therefore be little cost in making this information available to a central numbering database to facilitate direct routing across networks. Should they choose not to do so, they also have the option to use a transit operator who can, especially as they often do not interconnect directly with fixed operators.

Central database

49. The other barrier to direct routing is that the information on numbers which have been ported is not made available. This can easily be rectified. Previously, Ofcom has focused on the creation of a real time national central routing database, which has proved to be an over-elaborate and expensive solution, and divisive within the industry. A simpler solution would be to mandate RCPs and/or DCPs to publish details of their ported numbers in a downloadable form on their websites. This could be achieved at very little cost.

50. It is essential for all of industry to be able to acquire up to date information on ported numbers and prefix codes. It is fair and reasonable for Ofcom to mandate this and we consider it is the only source of potential market power or bottleneck left in this value chain. The costs to industry of supporting this are miniscule and it does not need involvement of standards bodies or protracted industry negotiation.

Benefits

51. Ofcom defined the benefits of direct routing as the avoided costs of onward routing which comprised conveyance and transmission costs. In fact, Ofcom underestimated these savings because it excluded calls to ported numbers where the OCP and the DCP are the same operator. In fixed networks, in the absence of call trapping, calls to ported numbers will

always route via the home switch (DLE for BT) which hosts the number range because that is the only place where the porting information is held on the routing systems. The cost of this onward routing is borne by the customers of the DCP.

Quality of service

52. Onward routing discriminates against customers who port their number. Onward routing results in lower reliability from additional interconnections and switch networks and the porting process itself. Today, customers mostly port to an NGN. At one time customers would have simply moved from one TDM operator to another and, unless they migrated to Virgin, they would have continued to use BT call origination. Now, with the widespread adoption of MPF and dual play offerings, customers migrate onto other CPs' NGNs. However, inbound calls have to transit via a TDM network. Where IP-IP calls are onward routed via a TDM network, two signal conversions are required which degrade the quality of the call. There has always been broad agreement across the industry that double conversions should be avoided if at all possible. Furthermore, IP capabilities such as HD voice or multi-rate codecs are stripped by the TDM switches that only support basic C7 protocols. The 2009 CBA took no account of these factors which are becoming increasingly relevant. We estimate that some 10 million customers have ported their numbers, mostly to NGN operators, and they are being denied the benefits of IP-IP calls.

Numbering

53. Increasingly, customers are demanding integrated communications services. Where a number is required to contact them, customers want it to be the same number wherever they are and whatever service they are using. The link between charges and numbering will necessarily eventually break down. Any forward look will show that individual number routing will be an essential feature in future. This will also address the issues of number shortages and inefficient use of number blocks which is obviously already of concern to Ofcom. Putting in place the appropriate incentives and enablers for direct routing to ported numbers is entirely consistent with these market developments.

CBA modelling assumptions

54. Inevitably some of the assumptions in Ofcom's model have proved to be inaccurate and the model needs updating in light of what has actually transpired. In particular, the original 2009 consultation showed less than 25% of fixed lines ported in 2013/14. BT has exported over 8m numbers (numbers exported with live traffic) and imported over 1m, and other CPs have ported numbers between them. Ofcom says there were 33.1m business and residential lines in 2012 (and falling year on year) which suggests over 30% have ported numbers.

Bilateral agreements

55. Ofcom argues at paragraph 6.11 in the consultation that where an RCP believes it would benefit from direct routing it could negotiate bilateral agreements with OCPs:

    We note that expecting an OCP pays approach to lead to direct routing assumes that the OCP (under an OCP pays option) has stronger incentives to directly route the call than the RCP (were the RCP to bear all or some of the porting costs). It is not clear this is necessarily the case - e.g. if the efficiency benefits of direct routing were high enough, RCPs could agree bilaterally with OCPs to directly route calls (exchanging the necessary information) to avoid the RCP paying porting conveyance costs to the DCP. Given the same CPs are likely to be both OCPs and RCPs, such an arrangement could be mutually beneficial if the benefits of direct routing were larger than the costs.

56. Bi-lateral agreements are arrangements between two parties where each party seeks to maximise their profits through commercial leverage of their position. Each bilateral would be different depending upon net traffic, growth, direct interconnect points, transit operator arrangements, etc.

57. Under the current regime, the OCP has the sole capability to choose the routing and can exploit this supplier power. This is exacerbated by the lack of transparency on ported number destinations that prevents third parties from offering competing arrangements. Agreeing these deals is costly and time consuming and we are not aware of any such arrangements despite the long history of porting. In practice, they may only arise where the balance of traffic and power is roughly equal and a simple agreement not to bill each other reduces the implementation cost. Such arrangements would only cover a small proportion of all interconnect permutations. With over 400 operators originating calls in the UK, 16,000 bilateral agreements would be required with the 40 or so operators who have imported numbers to implement direct routing. This number will escalate rapidly as more consumers want to keep their numbers and more operators import numbers.

58. More effort has been put into call trapping in the mobile world where the trapping is of direct benefit to, and under the direct control of the trapper, than direct routing where there is no direct benefit to the OCP. With the RCP pays option, the benefit to the OCP will depend on traffic and porting volumes with the RCP and whatever agreement they reach with the RCP, which is an altogether more complex proposition. This illustrates the advantage of the OCP pays option in providing a direct incentive within the control of the OCP, and the requirement for the RCP and/or DCP to publish the information on ported numbers to enable direct routing in the interests of the consumer.

59. Given the difficulties in implementing bilateral arrangements, even for mature conventional voice calls where there may be an immediate increase in profits, the incentive to seek bilateral arrangements for innovative services is much weaker. By their nature new services would initially account for a small percentage of calls, capable devices would be distributed

across NGNs such that any single bilateral would not add many additional users. In fact this lack of direct interconnect could mean that a critical mass of users is not available and new services would fail to establish.

60. Innovative services are also often the driving factor for market entry. Large existing operators would have little incentive to agree bilaterals with small entrants who frequently rely on number portability to acquire the customers necessary to create their business. Without an existing direct routing infrastructure to provide an addressable market many start-ups may never happen.

Conclusion on direct routing

61. Ofcom seems to have lost sight of the advantages and consumer benefit of direct routing, which are, in summary:
    - Avoiding the intrinsic technical inefficiency of trilateral onward routing arrangements as opposed to bilateral direct routing.
    - Lower costs
    - Improved quality and availability of IP services for 10 million customers

    It would be an error for Ofcom to reject proposals to put in place appropriate enablers and investment incentives without obtaining the appropriate information and evidence on which to base that assessment.

62. The 2010 CBA is now 4 years old and as we have explained has a number of shortcomings because it does not take account of:
    - The rapid increase in CPs taking MPF rather than WLR
    - The rise of IP operators
    - More operators having some or all the capabilities required to introduce direct routing which mean the incremental cost is falling to zero
    - More ported calls than originally forecast
    - New innovative IP solutions where the benefits denied to IP customers by continuation of onward routing via TDM networks

    In a fast moving environment, it would be inappropriate for Ofcom to continue to rely on this CBA.

63. Ofcom's assertion in the consultation [6.10] that moving to an OCP pays option would be highly unlikely to lead to substantial direct routing is quite simply wrong. For the larger operators, millions of pounds would be at stake, and those with the capability to direct route would do so forthwith, quickly followed by those who could use their existing capabilities to direct route with a minimal amount of further development. For the remaining operators, it would be a standard economic decision between paying the onward routing charge, developing direct routing or using a third party to direct route. The elimination of onward routing would then offer consumers the twin benefits of lower costs and higher Quality of Service.

Assessment criteria for recovery of porting conveyance costs

64. We consider that a model with the OCP responsible for transport and payment will have the following advantages:

Economic efficiency

65. The OCP pays option will put the choice on the party which will make the most relevant investment decision of build or buy. The OCP can make an informed choice between direct routing and the remaining residual traffic that would pass through the DCP's network. The extent that these have different technical features can be reflected in the service offering to consumer who pays for the service. It has therefore allocative and dynamic efficiencies.

Practicality

66. Ofcom raises issues regarding the practicability of charging the OCP for onward routing.

67. Under the OCP pays option, the OCPs would bear the onward routing costs for all calls they originate whether or not they be a fixed or mobile operator and the calls are to a fixed or mobile number. There is no reason to confine the costs and charges within the fixed and mobile sectors. All customers benefit from improved competition, and the charges should be cost oriented and reflect the costs incurred in each sector to incentivise the most efficient routing. On this basis, the opportunity for gaming Ofcom refers to in paragraph 6.46 of the consultation will not arise.

68. The porting charges would be raised in the same way as today, but charged to the OCP rather than the RCP. The charge would either be an average rate or a bespoke rate based on an operator's interconnect arrangements and use of direct routing.

Permit a competitive market place

69. By focussing the purchasing decision on the originator, Ofcom can allow wider choice of transit with different solutions to co-exist. This would encompass the requirements of both entrants and incoming international traffic .

Future proofing

70. This is the model predominantly used in the North America and Europe and experience shows it will adapt both to different industry structures (different numbers of incumbents and entrants) and the introduction of more complex services for consumers. Onward routing will not support a wide range of services such as premium quality voice which will require

direct routing for technical reasons[5]. Numbers will be increasingly 'personal' and not identifiable with either just a fixed network or a mobile network with seamless switching between them.

71. The OCP has the primary relationship with the purchasing consumer and will be strongly incentivised to make the best choice of routing for the services which are offered. Further the OCP will also have customers who are ported in and wish to ensure that service for these customers is also optimised for a wide range of calls to other networks.

Section 7 Assessment of the impact of our proposals

Question 4: Do you agree with our assessment of the likely impact of our proposals? If not, please explain why.

72. BT does not agree with Ofcom's assessment of the likely impact of its proposals.

73. Ofcom's proposals essentially perpetuate the existing regime and an opportunity is being missed to take a forward look and put the incentives and enablers in place to drive numbering and number portability into the 21st Century.

74. The benefits of direct routing are significantly larger than Ofcom has suggested because the costs of on-net calls have been excluded. No allowance has been made for the improvements in Quality of Service (QoS) for IP-IP calls and the scope for innovation, nor have the benefits of individual number routing for the efficient use of numbers been quantified. Ofcom has simply dismissed such benefits as it identified in 2009 as still too expensive to realise in 2014.

75. Under BT's proposals for the OCP pays option, these benefits will be realised as and when it is efficient to do so. BT is not proposing that Ofcom mandates direct routing and sets up a central database with all its associated costs which did not gain much support when last proposed. BT is simply proposing that Ofcom puts the appropriate investment incentives and enablers in place by making the OCP, who determines the routing, responsible for any resulting porting conveyance charges. The RCP and/or DCP would be responsible for publishing details of their ported numbers and prefixes. The OCP can then make the choice to route directly, use a transit operator to route directly or pay the conveyance charges.

76. The difference in 2014 from 2009/10 is that more CPs have the ability to use individual number routing to route directly and avoid the onward routing costs. Contrary to Ofcom's view, some operators could start doing this tomorrow given the information and the incentives. Others would be able to reuse existing capabilities with very little incremental

[5] BT itself wishes to ensure that multiple signal conversion is avoided and is considering solutions for call trapping and these developments would have happened regardless of whether or not direct routing is introduced. Such costs are therefore not relevant in a CBA.

development. There is a real opportunity to realise many of the benefits at little or no cost, with the rest following as and when it becomes economic.

Section 8 Conclusions and next steps

Question 5: Do you agree with our proposals? If not, please explain why.

77. We disagree fundamentally with Ofcom's proposals for ported conveyance charges; they give all the wrong signals to the market and are completely out of step with other countries. Furthermore, they are not future proof to the evolution of network technologies and services.

78. Customers are increasingly migrating to IP networks and expect to be able to realise the benefits of HD voice and more integrated fixed and mobile services. Onward routing to ported numbers via TDM networks is a barrier to these aspirations being met, and migration to direct routing is clearly essential for new and innovative services to develop.

79. BT is the largest supplier of onward routing by a TDM network to over 8 million consumers. This is becoming increasingly burdensome as the need to reduce and ultimately replace the obsolete PSTN increases. It is therefore important that the porting charges use the LRIC+ cost standard to reflect the full opportunity cost of maintaining the onward routing process.

80. Meanwhile the incremental cost for operators wanting to migrate to direct routing to ported numbers are falling. More and more operators have some if not all the capabilities required in their networks already. Many now use ACQ and this opens up the possibility of more flexible use of numbers. This is important as number shortages grow and consumers want to make more personal use of numbers.

81. Despite these market trends, migration to direct routing does not appear to be happening, therefore BT is proposing that the enablers and investment incentives be put in place to facilitate migration to direct routing as the base option of economic choice for the industry. Therefore, Ofcom needs to:

    - Maintain the obligation on DCPs to onward route calls to ported numbers
    - Publish guidance on the cost standard to be used for charges based on LRIC+
    - Issue a further short consultation on implementing an OCP pays option:
        - Moving the obligation to pay the porting conveyance charge to the OCP
            - Systems changes
            - Contractual changes
            - Price publication
        - The publication of all ported numbers with their prefixes
            - Where the data should be published
            - Frequency of update

- Format
- Security and confidentiality of information

There is no need for Ofcom to mandate direct routing and, therefore, no need for Ofcom to update the CBA.

82. Once these measures are in place, OCPs will have the incentive to direct route and NGN operators who have the capability will start to use it. Those who use transit operators who have the capability will also use it. Operators with limited capability such as BT will consider expanding capability and those currently with no capability will consider developing direct routing or using a transit operator which does. The outcome will be that the market drives the migration to direct routing, which is a long held aim and ambition and one which is ultimately beneficial to consumers.