Porting charges under General Condition 18

Consultation document
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Consultation

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Contents

Section 1

Summary

1.1 Number portability enables subscribers to retain their telephone number(s) when they switch between communications providers (CPs). When a subscriber keeps their telephone number when changing CP the number is described as 'ported' from one CP to another. Calls that the subscriber subsequently receives are usually first routed to the CP that originally held the number being called. The call is then identified as a call to a ported number and 'onward routed' to the network to which the number has been ported.

1.2 Wholesale porting charges are levied between CPs to recover certain costs associated with the provision of number portability. General Condition 18 (GC18) sets out the terms that CPs must comply with in setting porting charges. GC18.5 states that any porting charges levied by CPs must, subject to the requirement for reasonableness, be cost oriented and based on the incremental costs of providing portability.[1] GC18.5 also prohibits CPs from charging for certain specific types of costs.

1.3 Costs that may be recovered include the cost of conveying onward routed calls: between mobile CPs these charges are called donor conveyance charges (DCCs); and between fixed CPs these charges are called average porting conveyance charges (APCCs). CPs may also levy charges for some non-conveyance costs such as per number set up (i.e. the cost of handling and processing customer orders for number portability) and costs associated with making technical changes to a CP's porting service after it has been built.[2]

1.4 Recent developments in the fixed and mobile sectors have led us to consider how CPs should set porting charges to be compliant with GC18. These developments are the 2013 Narrowband Market Review (2013 NBMR)[3] and the review of mobile donor conveyance charges, which concluded in February 2014 (the DCC Review). [4]

2013 NBMR

1.5 During 2012 and 2013, we conducted the 2013 NBMR which reviewed fixed narrowband telephony services. In concluding the 2013 NBMR, we decided to change the basis on which the charges for terminating calls to geographic numbers on fixed networks (fixed termination rates or FTRs) are calculated. As a consequence, FTRs reduced considerably from January 2014 from (on average) 0.219 pence per minute (ppm) to 0.034 ppm (in 2012/13 prices).

1.6 Some CPs considered that this change should have an impact on geographic APCCs (the relevant charges for porting in this context) because the updated FTR would be below the APCCs currently set by BT and sought clarity from Ofcom on GC18 in relation to setting porting charges.

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[1] Unless the relevant CPs agree another basis for charges, or otherwise directed by Ofcom.
[2] See Section 2, sub-section *Scope of the proposed guidance*, paragraph 2.51.
[3] Ofcom, *Review of the fixed narrowband services markets*, Statement, 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf
[4] Ofcom, *Review of mobile donor conveyance charges*, Statement and Direction, 14 February 2014, http://stakeholders.ofcom.org.uk/consultations/review-mobile-donor-conveyance-charges/

1.7 We recognised stakeholders' requests for guidance on the level of geographic APCCs in the 2013 NBMR Statement, and said we would give further consideration as to how GC18 should be applied in setting porting conveyance charges.[5]

DCC Review

1.8 On 14 October 2013, we commenced a review into whether we should set a maximum DCC on an ex-ante, mobile industry-wide basis and, if so, at what level. We undertook this review as an alternative means of resolving disputes brought by Hutchinson 3G UK Limited (H3G) against each of EE Limited (EE) and Telefónica UK Limited (Telefónica) about the level of the DCC charged between them.

1.9 On 6 December 2013, we published a consultation document outlining our proposal to set a maximum DCC across the mobile industry until 31 March 2016. On 14 February 2014 we published a statement, concluding we should set a maximum DCC and that the maximum DCC should be set at 0.028ppm in 2013/14 and 2014/15 and 0.027ppm in 2015/16[6] (the 2014 DCC Review Statement).[7]

Our proposals

1.10 Based on the concerns raised by stakeholders in response to the 2013 NBMR consultation[8] and the disputes raised by H3G we concluded that, whilst we would reset the DCC to reflect our updated view on costs in the DCC Review, it would be preferable to undertake a wider policy review to determine how, on a forward looking basis, GC18 should be interpreted in relation to the setting of porting charges.

1.11 Wholesale porting charges, whether levied in the fixed or mobile sectors, are subject to the same regulation set out in GC18. However there are differences between how GC18 has been applied to derive certain charges in each of these sectors. This review provides an opportunity to consider whether it would be appropriate to apply regulation consistently across the fixed and mobile sectors. There is also some commonality in the substantive issues raised by CPs in both sectors which, absent guidance from us, have and may in future be a contributory factor in disputes between CPs over the level of porting charges.

1.12 We have identified three relevant issues: (i) the appropriate cost standard for calculating porting costs, (ii) the appropriate technology for calculating conveyance costs, and (iii) the appropriate recovery of porting costs.

1.13 Regarding the cost standard, our proposal is that all porting charges should be calculated using Long Run Incremental Cost (LRIC). This proposed guidance applies to all charges covered by GC18 (e.g. APCCs, DCCs and non-conveyance charges).

1.14 Because the technologies used in communications networks evolve over time, we have also considered what technologies could reasonably be used to calculate porting conveyance charges. For both fixed and mobile networks, we consider that porting charges should be reflective of an efficient technology choice. In the mobile

[5] 2013 NBMR Statement, paragraph 8.140
[6] See Table 2.5 in Section 2
[7] Ofcom, *Review of mobile donor conveyance charges*, 14 February 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/review-mobile-donor-conveyance-charges/statement/statement.pdf
[8] Ofcom, *Review of the fixed narrowband services markets*, Consultation, 5 February 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/summary/NMR_Consultation.pdf

sector the DCC is currently set with reference to a hypothetical efficient operator.[9] We see no reason to depart from this approach.

1.15 For fixed networks, there are two distinct technologies (Next Generation Networks (NGN) and Time Division Multiplex (TDM)) in use in the UK. We propose that both TDM networks (based on current asset values)[10] and NGNs could be an efficient choice, and that it would be reasonable for fixed CPs to charge for porting conveyance based on the costs of the technology of their own network.[11]

1.16 We have also considered how porting costs should be recovered from relevant CPs. Currently, for calls to ported mobile numbers, the donor CP recovers 50% of the costs of porting conveyance from the recipient, while recipient CPs in the fixed sector pay 100% of porting conveyance costs for calls to their ported numbers. Our proposal is that the donor CPs can charge the recipient CP up to 100% of the costs of providing porting conveyance and non-conveyance. This would not prevent the donor CP from charging less than that amount.

Proposals regarding implementation

1.17 Our intention through this process is to provide guidance to CPs as to how charges compliant with GC18 should be set. Following due consideration of consultation responses, if we consider the above proposals remain appropriate we will publish our guidance in a Statement. This guidance would be relevant for all porting charges, including conveyance and non-conveyance charges for fixed and mobile CPs. Our aim is to publish a Statement later this calendar year.

1.18 In relation to mobile porting conveyance charges, we have considered our approach to the direction set in the 2014 DCC Review Statement under GC18.5(a)(ii) (the DCC Direction), which runs until 31 March 2016. Subject to consultation responses we will decide on whether it is necessary and/or appropriate to reset the maximum DCC set by the DCC Direction. If so, we propose that we would consult on a modification to the DCC Direction at the time our final statement is published or shortly thereafter.

1.19 For other porting charges, we consider that CPs should be able to set charges compliant with GC18 taking account of our guidance, and we do not currently propose to issue a direction setting maximum charges.

1.20 We also propose that it would be consistent with GC18 for charges that BT pays to other CPs to be calculated using BT's network[12], on the basis that it would be based on a relevant benchmark of the costs of an efficient technology incurred in providing portability. Further, we consider that it would be consistent with GC18 if CPs reference these rates for setting charges to CPs other than BT.

[9] In determining the DCC in the 2014 DCC Review Statement, we used the same model that we used to set the DCC in 2007, but updated this in line with the latest version of Ofcom's 2011 mobile call termination (MCT) model and our most up-to-date understanding of the costs of donor conveyance (2014 DCC Review Statement, paragraph 1.6)

[10] TDM networks have been deployed for some time and will, at some point, be replaced with an alternative technology. Therefore, in considering whether TDM is an efficient technology choice we believe that it should be assessed based on the costs associated with heavily depreciated network assets values, rather than being adjusted to reflect a hypothetical on going network (e.g. based on uplifting net replacement costs as has been done in certain charge control cost models).

[11] This is consistent with the 2013 NBMR, in which we considered technology choice in the context of setting FTRs and concluded that both NGN and TDM networks could be efficient, depending on the particular circumstances of the CP.

[12] BT currently publishes rates for this purpose in its Carrier Price List (CPL).

1.21 If we conclude that providing guidance is the appropriate approach following careful consideration of responses to this consultation, we understand that CPs would need some time to re-consider their charges based on our guidance. We would not expect this to take longer than two to three months following our final Statement.

Consultation

1.22 This document sets out our proposals for guidance on GC18 compliant porting charges and seeks responses from industry stakeholders and other interested parties by 12 May 2014 (a 7 week consultation). Having taken responses to this consultation into account, we aim to publish a Statement setting out our final guidance, and any consultation on modification to the DCC Direction under GC18 that may be appropriate, later in 2014.

Section 2

Background, context and purpose

2.1 In this Section, we explain what number portability is and set out the background and the reasons why we have decided to carry out this review.

Number portability

2.2 Consumers are more likely to benefit from competition in communication markets when they are able to switch easily between CPs. Number portability was introduced to facilitate switching by allowing subscribers to keep their telephone number(s) when changing CP within either the mobile or fixed sector. It is thus an important facilitator of consumer choice and fosters effective competition in markets for electronic communications. In particular, it has made switching possible for those consumers who would not switch if it meant having a new telephone number[13], and also for those consumers discouraged from switching due to the costs and hassle of having to take a new number. It also reduces the cost of switching for those consumers who would have switched even without number portability. Number portability also benefits callers by, for example, reducing the number of calls to wrong numbers where the person they want to call would have changed their number in the absence of number portability.

2.3 The United Kingdom (UK) was one of the first countries to introduce number portability. Subscribers were able to keep their geographic telephone numbers (numbers which today begin with 01 and 02) when switching between fixed-line CPs from 1996. Subsequently, number portability was extended to include non-geographic numbers (numbers which nowadays begin with 03, 08 and 09) commonly used by businesses, financial institutions, help-lines and government agencies, to provide a wide range of information and services. From 1999 mobile subscribers were also able to keep their numbers when switching between mobile CPs.

2.4 Since the introduction of number portability, millions of UK consumers and businesses have ported their telephone numbers when switching between competing providers of fixed-line and mobile telephony services.

Implementation of portability

2.5 In the UK we have a technical solution commonly referred to as 'onward routing'.[14] Although the way in which onward routing is technically implemented is different as between geographic, non-geographic and mobile porting, the principles of this approach are common and are described below.

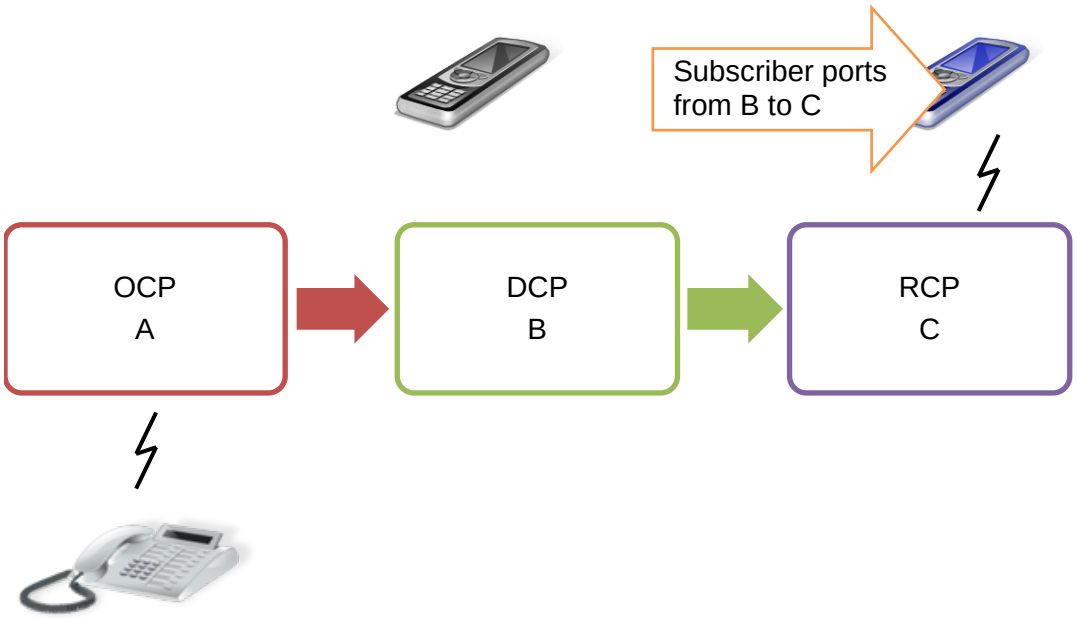
2.6 When a subscriber makes a call to a ported fixed-line or mobile telephone number, the call is first routed to the CP which originally held that number (the donor CP (DCP) or number range holder) and that DCP then 'onward routes' the call to the CP to whom the number has been ported (the recipient CP (RCP) or gaining provider).

[13] For consumers who highly value their telephone number, for example, businesses and institutions which rely on a well-known publicised telephone number and/or for whom the costs of changing their number may be high.

[14] To date, the UK has not changed the technical approach to providing portability since its introduction although this issue has been considered several times over the last ten years or so.

2.7 This is illustrated in Figure 2.1 below, showing three different networks: the originating CP (OCP) from where the call to a ported number is made; the DCP which originally held the number before the subscriber first ported-out; and the RCP which currently serves the called customer having ported-in the telephone number.

Figure 2.1: Onward routing for calls to ported numbers



Source: Ofcom.

2.8 There is an alternative to onward routing known as direct routing, whereby the OCP routes calls to ported numbers direct to the serving RCP rather than onward routing calls to the RCP via the DCP. Where a direct routing solution is implemented the OCP identifies that the telephone number, dialled by their calling subscriber, has been ported and to whom, and routes the call to the RCP as it would a non-ported call to that CP. The UK has not implemented a direct routing solution.

2.9 In Annex 5 we set out further detail on the above technical solutions and how a porting service is established between CPs.

Types of porting charges

2.10 DCPs that have ported-out geographic, non-geographic or mobile numbers generally levy porting conveyance charges on RCPs for onward routing calls to ported numbers. In respect of fixed networks, this charge is known as the APCC and between mobile CPs it is known as the DCC.

2.11 CPs may also levy charges for some non-conveyance costs such as per number set up (i.e. the cost of handling and processing customer orders for number portability)[15]

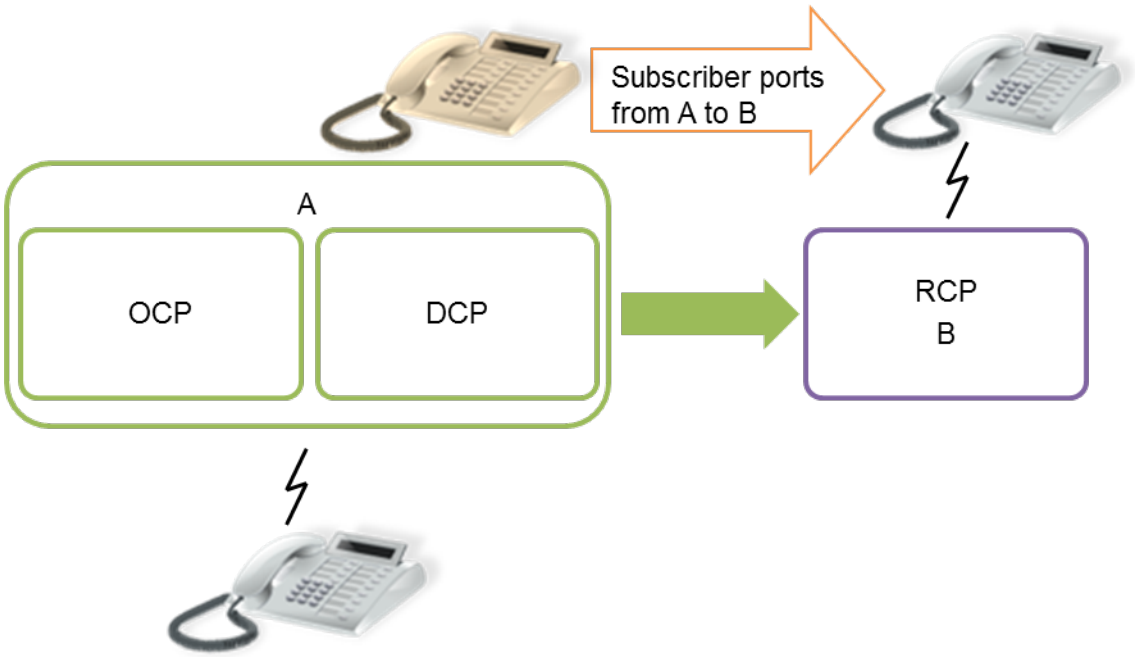
[15] In the context of discussions in this consultation which also concern per number set up costs, our references to costs being incurred and recovered by the DCP should also be taken to include, where relevant, the losing RCP. For example, where a subscriber subsequently ports from their current

and costs associated with making technical changes to a CP's porting service after it has been built (for example, as a result of the RCP reconfiguring its network and requesting that the DCP modify the routing of ported traffic).

The APCC

2.12 Geographic and non-geographic APCCs are based only on the costs incurred in onward routing traffic originated on a different network to the DCP, which we refer to as off-net traffic[16], not traffic originated on the DCP's own network (on-net originated traffic) to ported numbers as illustrated at Figure 2.2.[17] However, the costs to be recovered are spread across all traffic (on and off-net) to ported-out geographic and non-geographic numbers.[18]

Figure 2.2: On-net calls to ported numbers



Source: Ofcom

Geographic APCCs

2.13 The APCCs which BT levies on other CPs for conveyance to ported geographic numbers vary by CP. This is because the cost of providing onward routing for each CP depends on the interconnection arrangements between BT and that CP. The elements of BT's network that are required to convey the call from where BT receives

(losing) RCP to another (gaining) RCP or back to the DCP, per number set up costs may be incurred and charged by the losing RCP. Network management/administration activities may also be undertaken by the DCP in re-routing traffic from one RCP to another (or removing onward routing) or by the losing RCP in removing Call Trap (see Annex 5) from a telephone number which is no longer imported.

[16] Illustrated in Figure 2.1.

[17] See also Annex 5.

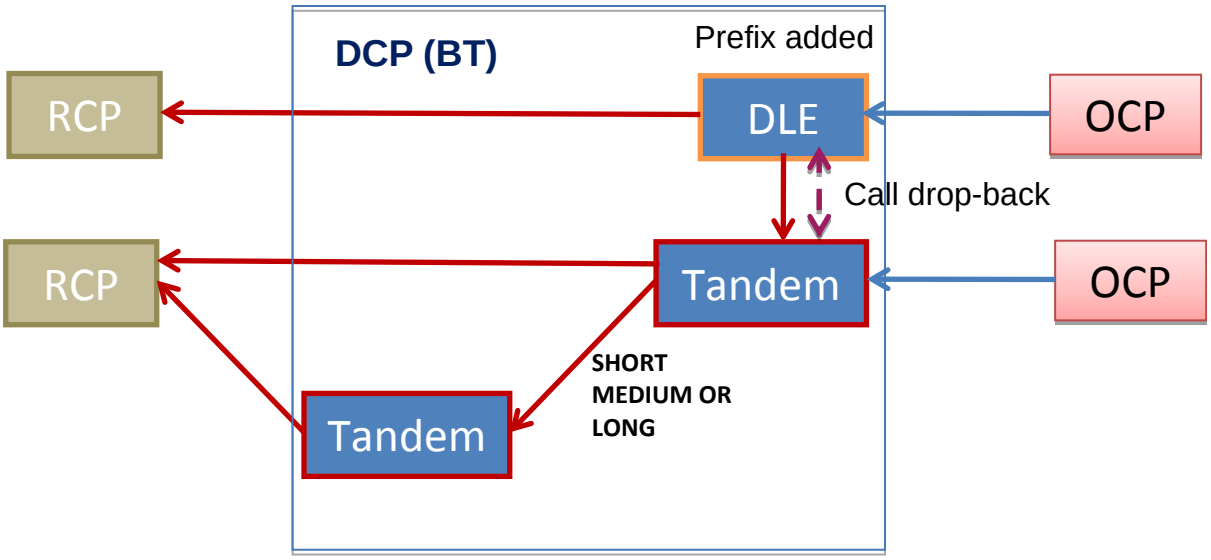
[18] This approach avoids the requirement for more complex billing arrangements.

it from the OCP[19] to the RCP identified by a geographic porting prefix will depend on the location of the interconnect that carries the traffic from the BT network to the RCP.[20]

2.14 The elements of BT's network used to provide onward routing include local exchange handover, local-to-tandem conveyance, single transit and inter-tandem conveyance (at short, medium and long distances). Where BT receives a call from the OCP at a tandem switch, the prefix-addition at the donor local exchange is achieved through call drop-back to avoid inefficient routing within BT's network (i.e. 'tromboning' the call from the tandem switch to the local exchange and back again).

2.15 This is illustrated in Figure 2.3 below.

Figure 2.3: BT geographic porting conveyance



Non-geographic APCCs

2.16 The APCCs which BT levies on other CPs for conveyance to ported non-geographic numbers varies by the type of non-geographic number e.g. freephone, local call, national call, premium rate, 03 UK-wide etc rather than by CP. We understand that such variations in non-geographic APCCs arise primarily because of differences in the proportions of on/off-net traffic to different types of non-geographic numbers whereas (unlike fixed geographic conveyance described above) the usage of network elements to convey traffic to non-geographic numbers across BT's network from the handover from OCPs to the handover with RCPs is broadly similar.

The DCC

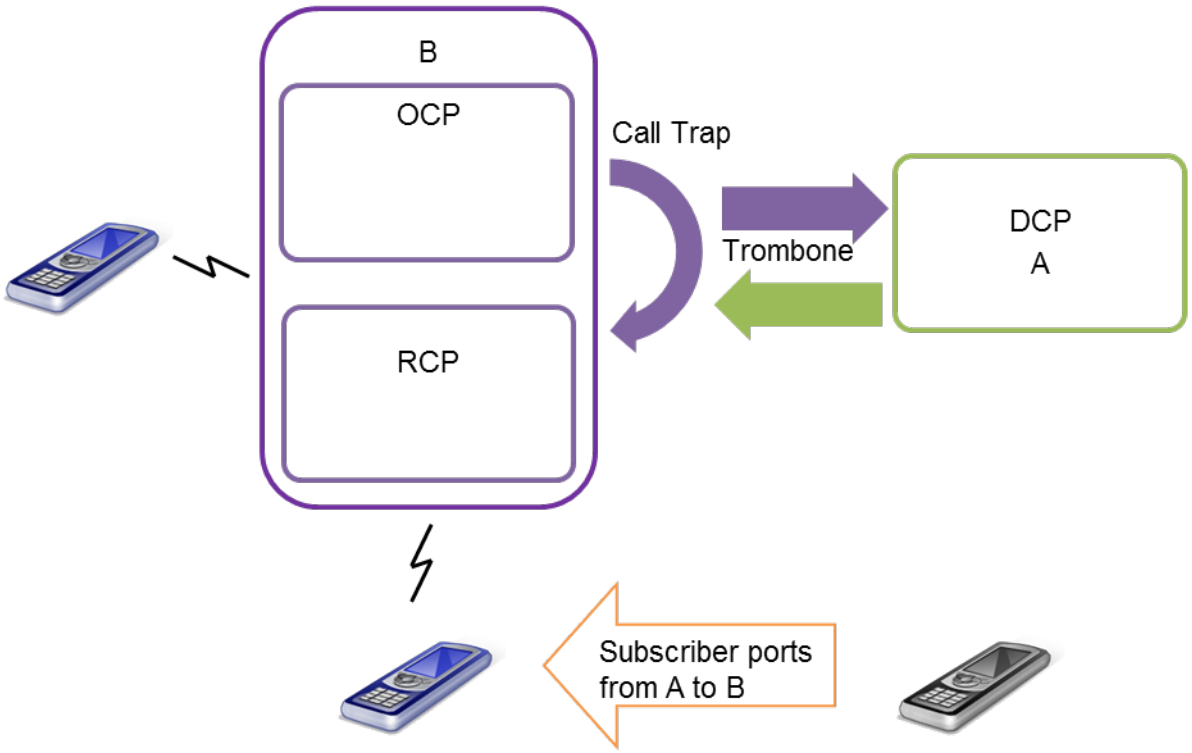
2.17 As explained above, the DCC is the charge payable by the RCP to the DCP for the onward routing of a ported mobile call by the DCP to the RCP. As described in paragraph 2.12 above with regard to APCCs, DCCs are also based only on the costs

[19] In most cases at BT's digital local exchange (DLE) on which the number was originally hosted or, alternatively, at a tandem switch.
[20] RCP points of handover identified using porting prefixes are agreed and built during service establishment as summarised in paragraph A5.18.

incurred in onward routing off-net calls to ported mobile numbers but are spread across all traffic (on and off-net) to ported-out mobile numbers.[21]

2.18 Calls to ported numbers that originate with an RCP can be connected without routing via the DCP where the RCP has installed a Call Trap facility. Most mobile CPs have implemented Call Trap.[22] This allows the RCP to 'trap' calls that it originates to numbers that have been ported into its network. Call Trap removes the requirement for a call to be routed (sometimes described as 'tromboned') to the DCP and then back to the RCP in circumstances where the call originates on the RCP's network. Calls that are effectively trapped do not attract a DCC. This is illustrated in Figure 2.4[23] below which shows how Call Trap avoids traffic being tromboned via DCP A.

Figure 2.4: Call Trap and tromboned traffic



Source: Ofcom

Regulatory and factual background

Introduction of GC18

2.19 The Communications Act 2003 (the Act) and the general conditions of entitlement entered into force in July 2003. GC18 obliges a CP to provide number portability[24] to its subscribers, and to provide portability[25] to other CPs for that purpose.

[21] This approach avoids the requirement for more complex billing arrangements.
[22] Call Trap may also be deployed by fixed CPs but its implementation may be more limited in scope – see Annex 5.
[23] See also Annex 5.
[24] Number portability is defined in GC18 as a facility whereby subscribers who so request can retain their telephone number on a public communications network, independently of the person providing the service at the network termination point of the subscriber provided that such retention of a telephone number is in accordance with the National Telephone Numbering Plan.

2.20 GC18.5 obliges CPs to comply with certain principles when levying a charge for the provision of portability.

2.21 We set out the legal framework in Section 3.

The 2007 Determinations

2.22 On 3 April 2007, H3G submitted disputes to Ofcom about the DCCs charged to it by each of T-Mobile (UK) Ltd (T-Mobile), Telefónica (then trading as O2) and Orange Personal Communications Services Ltd (Orange). As part of its assessment of the disputes, Ofcom engaged Analysys Mason to provide an estimate of the costs of donor conveyance that would be incurred by an average efficient operator. Analysys Mason estimated the costs using data from the cost model constructed for the 2007 mobile call termination (MCT) market review.[26]

2.23 Analysys Mason estimated that an average efficient operator would incur donor conveyance costs of 0.2ppm in 2007. On 17 August 2007, Ofcom determined the disputes by directing that the DCC payable between the parties should be 0.1ppm (the 2007 Determinations). [27] This was based on the donor conveyance cost estimate of 0.2ppm being split equally between the DCP and RCP to derive the DCC.[28]

Industry wide DCC

2.24 On 8 February 2008, Ofcom wrote to all mobile CPs, which at this time was H3G, T-Mobile, Vodafone, Orange and Telefónica (O2), noting that, in making the 2007 Determinations, it had assessed the costs of donor conveyance that would be incurred by an average efficient operator and, consequently, the results were applicable on an industry-wide basis.[29] Ofcom therefore expected all mobile CPs to ensure that their DCCs were cost-oriented, in accordance with GC18, which required them to be set at 0.2ppm, to be split equally between DCP and RCP.

2.25 On 7 March 2008, in light of responses to the 8 February letter, Ofcom wrote to all mobile CPs advising that compliance with GC18.5 required them to be charging a DCC of 0.1ppm as from 8 February 2008. The letter requested the mobile CPs to

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[25] Portability is defined in GC18 as any facility which may be provided by a CP to another CP enabling any subscriber who requests number portability to continue to be provided with any public electronic communications service by reference to the same telephone number irrespective of the identity of the person providing such a service.

[26] Donor conveyance and MCT are wholesale services which involve the use of a number of common mobile network assets.

[27] Ofcom, *Determinations to resolve disputes between Hutchison 3G and each of O2, Orange and T-Mobile concerning donor conveyance charges*, 17 August 2007, see: http://stakeholders.ofcom.org.uk/binaries/enforcement/competition-bulletins/closed-cases/all-closed-cases/cw_952/deter.pdf.

[28] The decision in the 2007 Determinations that the DCC should be split equally was based on a review of determinations made by the Office of Telecommunications (Oftel) into the level of the DCC in 1999 published at http://www.ofcom.org.uk/static/archive/oftel/ind_info/numbering/mnpdetre.pdf

[29] T-Mobile had appealed the 2007 Determinations to the Competition Appeal Tribunal (CAT) in October 2007. However, T-Mobile did not challenge Ofcom's assessment of the costs of donor conveyance (0.2ppm), nor Ofcom's decision that this cost estimate should be split equally between the donor network operator and recipient network operator to produce a cost oriented DCC of 0.1ppm. In light of the fact that Ofcom decided to consider enforcement of GC18.5 on an industry wide basis, T-Mobile subsequently applied, and was granted permission by the CAT, to withdraw its appeal and the dispute determinations were therefore not overturned. *T-Mobile (UK) Limited v Office of Communications (Donor Conveyance Charge)* (Case 1093/3/3/07), see: http://www.catribunal.org.uk/237-655/1093-3-3-07-T-Mobile-UK-Limited.html.

confirm, by 12 March 2008, that their DCC was set at 0.1ppm. All of the mobile CPs provided this confirmation to Ofcom.

H3G's 2013 dispute submission and alternative means

2.26 On 20 September 2013, we received a request from H3G to resolve disputes under section 185 of the Act between H3G and each of EE and Telefónica. H3G subsequently revised the scope of its dispute submission on 9 and 11 October 2013.

2.27 The dispute submission (as revised) advised us of the current DCCs and requested that we determine a new DCC payable going forward under each agreement.

2.28 After consideration of the parties' submissions we agreed with H3G's assertion that the parties were in dispute. However, we considered it would be preferable for us to assess the appropriate level of DCCs on a mobile industry-wide basis. In particular, we have a duty under Article 30(2) of the Universal Service Directive (USD)[30] to ensure that pricing between operators related to the provision of number portability is cost oriented. We therefore considered, in this particular case, that the outcome of our assessment (if we were to determine a new rate) should be applied across the mobile industry with effect from a common date, rather than being set in determinations of two bilateral disputes which only formally bind the parties to those disputes. We considered that a review of DCCs on a mobile industry-wide basis would constitute appropriate alternative means for resolving the disputes, consistent with the requirements of section 186(3) of the Act.

2.29 Therefore, on 14 October 2013, we decided not to handle the disputes, as we considered them suitable for resolution via alternative means, and we commenced a review.

2.30 Following a consultation[31], we published the 2014 DCC Review Statement on 14 February 2014 in which we set a maximum DCC across the mobile industry by way of a direction issued under GC18.5(a)(ii) until 31 March 2016 (the DCC Direction).[32] The maximum DCC is set out in Table 2.5 below:

Table 2.5: DCCs to be applied to all donor conveyance calls (ppm, nominal prices)

	2013/14	2014/15	2015/16
DCC (50% of cost, with on-net adjustment[33])	**0.028**	**0.028**	**0.027**

Source: 2014 DCC model.

2.31 As shown in the table, in this review we decided to continue to apply the 50:50 charging rule established in 1999 and followed in 2007 and made an adjustment to account for the DCC being charged for on-net originated calls to ported numbers.

[30] Directive 2002/22/EC as amended by Directive 2009/136/EC.
[31] Ofcom, *Review of mobile donor conveyance charges – consultation document*, 6 December 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/review-mobile-donor-conveyance-charges/summary/condoc.pdf
[32] Ofcom, *Review of mobile donor conveyance charges – Statement and Direction*, 14 February 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/review-mobile-donor-conveyance-charges/statement/statement.pdf
[33] The on-net adjustment recognises that the DCC should not be applied to on-net originated traffic to ported numbers but, for practical reasons, is billed on all calls to ported numbers. This is similar to the approach taken to calculate APCCs discussed in paragraph 2.12.

2.32 In carrying out that review we did not examine substantive issues in relation to the appropriate cost standard and the recovery of costs, explaining that we would examine these as part of this review.

The current level of porting charges other than the DCC

2.33 Unlike DCCs, there is no direction in place in respect of APCCs or other non-conveyance porting charges.[34] As a result, APCCs are set by commercial agreement between CPs but are still subject to the requirements of GC18.5.

2.34 BT's geographic APCCs for each CP and non-geographic APCCs are published in its CPL. [35] BT also publishes details of:

- the APCC it pays for porting conveyance performed by most[36] other CPs to geographic and non-geographic numbers ported-in to BT[37];
- the per number set up charges levied by BT on other CPs, and the charges BT pays out to other CPs when porting-in other CPs' geographic and non-geographic telephone numbers;[38] and
- the charges for service maintenance in relation to geographic and non-geographic portability services e.g. porting prefix additions.[39] In its published pricing, Openreach agrees to pay the same charges to other CPs for the same service.[40]

[34] However, we note that in 2010 we determined a dispute between Opal Telecom and BT regarding BT's APCCs. The scope of this dispute did not require us to determine the level of the APCC. Instead it required us to determine whether BT should be required to hand over calls to ported numbers at the relevant DLE; and if so, whether BT should be required to bear the costs of any resulting necessary system development in BTs network. http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/closed-cases/all-closed-cases/cw_01030/

[35] BT Wholesale, Carrier Price List, https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/index.htm Section B1 Telephony (Part 1.08 Number Portability); Section B3 Ancillary Service (Part 3.27 Operator Imported NTS Service Calls)

[36] [✂]

[37] BT Wholesale, Carrier Price List, https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/index.htm Section B1 Telephony (Part 1.08 Number Portability); Section B3 Ancillary Service (Part 3.26a Average Porting Conveyance)

[38] Openreach Service Product Pricing, Part 4.3.1.1, http://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=kDkYlXGkuDxhC5oS0XKPJocCWTtNCZBtKnb0bsRD3FtZ6rNZujnCs99NbIKJZPD9hXYmiijxH6wr%0ACQm97GZMyQ%3D%3D; BT Wholesale Price List, Section B3 Ancillary Service, Parts 3.26 and 3.27, https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/cpl_sectionb3ancillaryservice.htm

[39] Openreach Service Product Pricing, Openreach data management charges for geographic and non-geographic number portability Part 4.3.4.1, BT Set-Up Charges for Geographic & Non-Geographic Number Portability, http://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=z2xg89UCwFHm%2BivgEVRZAydNht4ujW0IXJwzbRNaqxBZ6rNZujnCs99NbIKJZPD9hXYmiijxH6wr%0ACQm97GZMyQ%3D%3D

[40] Openreach Service Product Pricing, Openreach data management charges for geographic and non-geographic number portability Part 4.3.4.2 Operator Set-Up Charges for Geographic & Non-Geographic Number Portability, http://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=z2xg89UC

2.35 In some instances, the commercially agreed charges between CPs other than BT are set with reference to BT's CPL.

2.36 With regard to per number charges, we note that, even where such charges have been agreed, in some instances, they are not invoiced.

2.37 Some CPs (other than BT) also have agreements which include service maintenance charges which are in most cases the same as Openreach's charges. Based on the information we gathered, no CPs reported either paying or receiving service maintenance charges since 2011.[41]

2.38 Finally, we understand that mobile CPs do not charge each other per number or service maintenance charges in relation to the provision of mobile number portability.

Why we are doing this review?

2.39 Recent developments in the fixed and mobile sectors have led us to consider GC18 to provide clarity to CPs as to how charges should be set. These developments include the 2013 NBMR and the DCC Review.

2013 NBMR

2.40 During 2012 and 2013, we conducted the 2013 NBMR which reviewed fixed narrowband telephony services.[42] In the 2013 NBMR Statement, we decided to change the basis on which the charges for terminating calls to geographic numbers on fixed networks (FTRs) are calculated.[43] This included changing the cost standard used to calculate FTRs to LRIC, which means that FTRs no longer include a mark-up for recovery of common costs. This, along with other modelling factors (such as modelling an NGN), resulted in FTRs reducing considerably from January 2014 from (on average) 0.219ppm to 0.034ppm (in 2012/13 prices).

2.41 This change resulted in porting charges (which are based on charges for network services that, when last regulated, included a mark-up for common costs) being calculated on a different cost basis to FTRs. Some CPs considered that this change should have an impact on geographic APCCs (the relevant charges for porting in this context) as a result of geographic APCCs set by BT being above the FTRs.

2.42 In particular, in their responses to the 2013 NBMR Consultation[44], a number of CPs argued that:

- the reasonableness requirement and a cost orientation obligation in GC18 does not specify what costs and cost standard should be considered; and
- Ofcom should therefore review what is "reasonable" in the context of GC18 for the purposes of setting APCCs and provide guidance, although CPs expressed different views on the cost-basis they consider would be appropriate for APCCs.[45]

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[41] Specifically the third calendar quarter of 2011 to the third calendar quarter of 2013.

[42] Ofcom's publications relating to this market review can be found at http://stakeholders.ofcom.org.uk/consultations/nmr-13/

[43] To take effect from 1 January 2014.

[44] Ofcom, *Review of the fixed narrowband services markets – Consultation*, 5 February 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/summary/NMR_Consultation.pdf

2.43 We recognised stakeholders' requests for guidance on the level of geographic APCCs in our draft 2013 NBMR Statement which we notified to the European Commission on 20 August 2013.[46] We said we would give consideration to how GC18 should be applied in setting the APCC once we had concluded in the 2013 NBMR Statement.

2.44 We published our final statement on 26 September 2013[47] in which we concluded that:

> "We do not consider it appropriate in this market review to determine how GC18 might be interpreted in the context of a dispute in the light of our decision to set FTRs at LRIC based on the costs of an NGN. Even though we did not explicitly consult on the interpretation of GC18, from the responses received to the February 2013 consultation it is clear that different stakeholders take differing views on how GC18 should be interpreted in future. We recognise that further guidance on the interpretation of GC18 has been requested by a number of stakeholders and that this would provide greater certainty for CPs. Therefore, following the completion of the Narrowband Market Review we will commence a project to consider how GC18 should be applied in setting porting conveyance charges.
>
> We have concluded that the basis on which we set regulated FTRs should not be altered for the fact that calls to certain numbers will incur an APCC levied on the terminating CP. APCCs are currently commercially negotiated between CPs, but must be set on terms compliant with GC18."

DCC Review

2.45 As explained above, we decided not to handle the disputes between H3G and each of EE and Telefónica, as we considered them suitable for resolution via alternative means, and instead we carried out a review of the level of the DCC.

2.46 In its dispute submission, H3G proposed setting DCCs on the basis of LRIC. In our 2014 DCC Review Statement, we explained our view that the use of a LRIC cost standard would constitute a change in policy in how we derive cost-based DCCs. We considered that it would be inappropriate to consider and address this question by looking at mobile porting conveyance costs and charges in isolation, noting that the question of how to derive cost-based charges is relevant to any charges for portability pursuant to GC18 (including, for example, fixed porting conveyance charges) and therefore any such change in policy may have broader implications. In this regard, we observed that a number of stakeholders had raised the question of the appropriate cost standard to be used to derive cost-based geographic APCCs taking into account the decisions reached in the 2013 NBMR Statement (as discussed above).

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[45] CPs offered differing views on how APCCs should be set. Sky, ITSPA and Talk Talk argued that APCCs should now be based on the LRIC of an NGN whereas Vodafone argued for LRIC+ of an NGN.

[46] Ofcom, *Review of the fixed narrowband services markets – draft Statement*, 20 August 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Draft_Statement.pdf

[47] Paragraphs 8.140 to 8.141, Ofcom, *Review of the fixed narrowband services markets – final Statement*, 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf

2.47 We therefore explained that we intended to address the question of the appropriate cost standard for DCCs in this policy project. For similar reasons, we also decided that it was not appropriate to address the issue of cost recovery as part of the DCC review. We noted, in particular, that the split of costs between the DCP and RCP represented an important difference between the methodologies used to derive APCCs and DCCs and that this question would be more appropriately addressed within this policy project.

Aims and objectives

2.48 In light of the above regulatory background, we have commenced this review to look at the following issues:

1. the appropriate cost standard for calculating porting costs (see Section 4);
2. the appropriate technology choice for conveyance costs (see Section 5); and
3. the appropriate recovery of porting costs (see Section 6).

2.49 Our aim is to produce guidance that will provide greater clarity as to the appropriate interpretation of reasonable and cost oriented charges under GC18 going forward; avoid unnecessary disputes, so far as is possible; and facilitate the resolution of disputes, should CPs fail to agree commercial terms after our planned statement setting guidance regarding the interpretation of GC18.

2.50 Notwithstanding any guidance which we may publish following this consultation, we would nevertheless consider any dispute about a particular CP's porting charges on a case-by-case basis, taking into account the specific circumstances of the case. However, we would normally expect to have regard to our guidance when resolving a dispute concerning porting charges.

Scope of this review

2.51 The scope of this review is fixed and mobile wholesale porting charges (i.e. charges for the provision of portability levied between CPs), including conveyance charges (geographic and non-geographic APCCs and mobile DCCs) and non-conveyance porting charges (per number charges and any relevant charges relating to the provision of service maintenance).

Outside of the scope of this review

2.52 We have not considered the following as part of this review:

2.52.1 Retail porting charges i.e. direct charges to subscribers relating to the provision of number portability. GC18 requires that any such charges are reasonable (GC18.1) and do not act as a disincentive to subscribers against changing their CP (GC18.5(e)).

2.52.2 Wholesale ported transit charges i.e. charges levied by a transit provider for conveying ported traffic by agreement between the DCP and RCP (e.g. absent direct interconnection between the DCP and RCP).

2.52.3 Interconnection circuits. CPs may choose to enter into direct interconnection arrangements with each other which are generally

negotiated on a commercial basis.[48] These negotiations will include the totality of traffic between the two CPs, of which ported conveyance traffic will be only one element.

2.52.4 How calls to ported numbers are routed i.e. the costs and benefits of a direct routing solution relative to the current onward routing solution.

Structure of the document

2.53 The remainder of this consultation document is structured as follows:

- In Section 3 we set out the legal framework;
- In Section 4 we discuss the choice of cost standard;
- In Section 5 we discuss the choice of technology;
- In Section 6 we consider the recovery of porting costs;
- In Section 7 we consider the impact of our proposals; and
- In Section 8 we set out our proposed guidance.

[48] Interconnection negotiations are also subject to GC1. Interconnect circuits are subject to significant market power (SMP) conditions when interconnecting to BT (for call origination and call termination services) and KCOM (for call origination services). See 2013 NBMR Statement, section 10.

Section 3

Legal framework

The Universal Service Directive and GC18.5

3.1 Article 30(2) of the USD[49] imposes a duty on Ofcom to ensure that pricing between operators and/or service providers related to the provision of number portability is cost-oriented.

3.2 GC18.5 implements Article 30(2) USD:

> "18.5 The Communications Provider shall, pursuant to a request from another Communications Provider, provide Portability as soon as is reasonably practicable in relation to that request on reasonable terms[…]. Any charges for the provision of such Portability shall be made in accordance with the following principles:
>
> (a) subject always to the requirement of reasonableness, charges shall be cost oriented and based on the incremental costs of providing Portability unless:
>
> (i) the Donor Provider and the Recipient Provider have agreed another basis for the charges, or
>
> (ii) the Office of Communications[…] has directed that another basis for charges should be used;
>
> (b) the Donor Provider shall make no charge in relation to System Set-Up Costs or Additional Conveyance Costs;
>
> (c) in respect of Mobile Portability, the Donor Provider shall make no charge or annual fee for ongoing costs relating to registration of a ported Telephone Number or a Subscriber;
>
> (d) charges levied by the Donor Provider shall be based on the reasonable costs incurred by it in providing Portability with respect to each Telephone Number;
>
> (e) any direct charges to Subscribers for providing Number Portability do not act as a disincentive to Subscribers against changing their Communications Provider."[50]

3.3 In summary, therefore, any charges for the provision of portability shall be reasonable and cost oriented, and must be based on the incremental costs of providing portability unless, either, the DCP and RCP have agreed another basis for the charges or Ofcom has directed that another basis for charges should be used.

[49] Directive 2002/22/EC as amended by Directive 2009/136/EC.
[50] Consolidated version of General Conditions as at 26 December 2013 (including annotations) available at http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/GENERAL_CONDITIONS_AS_AT_26_DECEMBER_2013.pdf

3.4 In 2006, the European Court of Justice (ECJ) held that, subject to the requirement for cost orientation, Article 30(2) USD confers a discretion on national regulatory authorities (NRAs) to define the methodology which appears to them to be the most suitable to make portability fully effective, in a manner which ensures that consumers are not dissuaded from making use of that facility. The ECJ considered that an NRA would be acting within the scope of its discretion by defining a maximum cost-oriented price, provided that it is genuinely possible for new operators to contest the application of maximum prices by operators already present in the market by showing that those prices are too high in relation to their cost structure. In principle, therefore, NRAs may adopt a national measure that lays down the specific method to be used in calculating costs under Article 30(2) USD and which fixes maximum ex ante prices in respect of all CPs on the basis of an abstract model of costs.[51]

Ofcom's duties

3.5 Our principal duty in carrying out our functions is to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition.

3.6 In doing so, we are required to secure a number of specific objectives and have regard to a number of matters, as set out in section 3 of the Act. We consider the objective of securing availability throughout the UK of a wide range of electronic communications services as particularly relevant to this review.

3.7 In performing our general duties, we are also required under section 3(4) of the Act to have regard to a range of other considerations, which appear to us to be relevant in the circumstances. The desirability of promoting competition in relevant markets and of encouraging investment and innovation in relevant markets appear to us to be most relevant in the context of this review.

3.8 Pursuant to section 3(3) of the Act, in performing our general duties, we must have regard, in all cases, to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases in which action is needed, and any other principles appearing to us to represent the best regulatory practice.

3.9 In this regard we note our general regulatory principles[52], in particular:

- operating with a bias against intervention, but with a willingness to intervene firmly, promptly and effectively where required;
- ensuring our interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome;
- always seeking the least intrusive regulatory mechanisms to achieve our policy objectives; and

[51] Case C438/04 *Mobistar v IBPT* (the Mobistar case), paragraphs 32 to 37. Although the case specifically concerned set-up costs incurred by mobile operators in implementing requests for number portability, we consider that the ECJ's comments apply equally to any costs recovered through wholesale charges for portability.
[52] Ofcom, *Statutory Duties and Regulatory Principles*, http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/

- consulting widely with all relevant stakeholders and assessing the impact of regulatory action before imposing regulation upon a market.

3.10 Section 4 of the Act requires us to act in accordance with the six European Community requirements for regulation. The following requirements appear particularly relevant to this review:

- promoting competition in the provision of electronic communications networks and services, associated facilities and the supply of directories;

- taking account of the desirability of Ofcom in carrying out its functions in a manner which, so far as practicable, does not favour one form of or means of providing electronic communications networks, services or associated facilities over another; and

- encouraging, to such extent as Ofcom considers appropriate for certain prescribed purposes, the provision of network access and service interoperability, namely securing efficient and sustainable competition and the maximum benefit for customers of communications providers.

3.11 Finally, we have an on-going duty under section 6 of the Act to keep the carrying out of our functions under review with a view to ensuring that regulation by us does not involve the imposition of burdens which are unnecessary or the maintenance of burdens which have become unnecessary.

Impact assessment

3.12 The analysis presented in this document represents an impact assessment, as defined in section 7 of the Act.

3.13 Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making. This is reflected in section 7 of the Act, which means that generally Ofcom has to carry out impact assessments where its proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out and publishing impact assessments in relation to the great majority of its policy decisions. For further information about Ofcom's approach to impact assessments, see our guidelines.[53]

3.14 Specifically, pursuant to section 7, an impact assessment must set out how, in our opinion, the performance of our general duties (within the meaning of section 3 of the Act) is secured or furthered by, in relation to what we propose.

Equality impact assessment

3.15 We are also required to assess the impact of our functions, policies, projects and practices on particular groups such as those identified by age, race, religion, disability, maternity, gender and sexual orientation. Equality Impact Assessments also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers.

[53] Ofcom, *Better Policy Making – Ofcom's approach to Impact Assessment,* Ofcom, 21 July 2005 http://stakeholders.ofcom.org.uk/binaries/consultations/better-policy-making/Better_Policy_Making.pdf

We do not consider the impact of the proposed guidance set out in this document to be to the detriment of any such group within society; in particular, we do not consider that our guidance will have a differential impact on consumers in different parts of the UK or consumers with low incomes. This is because our guidance will primarily affect wholesale payments between CPs. Therefore, we do not consider it necessary to carry out a full Equality Impact Assessment.

Section 4

Choice of cost standard

Introduction

4.1 In this Section we consider the appropriate cost standard to calculate the costs of porting under GC18.

4.2 We consider both the choice of cost standard in this Section, and the choice of technology in Section 5, ahead of the question of the recovery of costs in regulated charges in Section 6. This is because the first two determine the level of costs to be recovered in any charges and are issues we have considered previously in setting charge controls, particularly in the related, but distinct, markets of fixed and mobile termination.

4.3 In this Section we:

- 4.3.1 identify the options to assess;
- 4.3.2 summarise the current situation;
- 4.3.3 propose the criteria to assess these options;
- 4.3.4 evaluate the options; and
- 4.3.5 present our preliminary conclusions.

Options

4.4 We consider that the cost standards that we should compare for the purpose of this assessment are LRIC and LRIC+. This is consistent with the options we have considered when setting charge controls for fixed and mobile termination rates. The fundamental difference between the two cost standards is whether the DCP is allowed to recover common costs[54] through its charges:

- 4.4.1 LRIC: LRIC takes the relevant service as the relevant increment of output over which to measure costs.[55] LRIC does not include a contribution to the DCP's network and non-network common costs. This means under LRIC, porting charges would be estimated purely on the basis of the incremental costs of providing porting services. LRIC is thus lower than LRIC+ when measured on a consistent basis (i.e. same volume increment, time period, network technology and so on).
- 4.4.2 LRIC+: A LRIC+ cost standard reflects long run incremental costs including a mark-up for common costs.

4.5 The assessment below considers all potential costs associated with providing porting. Therefore, unless otherwise specified, when we use the term porting costs

[54] Common costs arise from the provision of a group of services but are not incremental to the provision of any individual service.
[55] For example, in this case, the increment would be the conveyance of calls to ported numbers which originate from CPs other than the DCP

(and charges) for the purpose of this assessment we mean both the conveyance and non-conveyance[56] porting-related costs (and charges) which can be permissibly recovered under GC18.

Current situation

4.6 Currently in the mobile sector the cost standard used to determine DCCs is LRIC+, as most recently determined in the 2014 DCC Review.[57]

4.7 In the fixed sector we understand the porting conveyance charges that BT pays and receives were originally based on the charges for the network services used to provide porting conveyance. These network services include inter-tandem conveyance/transit (ITC/ITT), single transit (ST) and local-tandem conveyance/transit LTC/LTT), and are used to different degrees depending on the CP's interconnection arrangements with BT. Regulation has now been removed from these network services and, therefore, charges for these services are set on a commercial basis.[58] When these services were subject to charge controls we allowed a mark-up for common costs.

4.8 Fixed sector non-conveyance porting charges are also currently agreed on a commercial basis. When BT's charges were last regulated (in 2002) they were set based on LRIC but with a 9.5% mark up for common costs, which amounts to LRIC+.[59]

4.9 As noted in paragraph 2.35, we understand that sometimes other (non BT) fixed CPs reference the rates that BT pays to other CPs listed in the BT CPL in their porting agreements.

Assessment criteria

4.10 In considering the appropriate assessment criteria, we:

4.10.1 outline the six principles of pricing and cost recovery (henceforth the 'six principles');

4.10.2 consider whether alternative or further criteria are relevant (for example, in the light of the assessment of LRIC and LRIC+ undertaken in the context of call termination); and

4.10.3 provide our preliminary conclusions on the appropriate criteria for this question.

[56] Non-conveyance charges includes per number set up and service maintenance charges – see paragraph 2.11.
[57] See paragraphs 4.3 to 4.36 of the 2014 DCC Review Statement (Ofcom, *Review of mobile donor conveyance charges*, Statement and Direction, 14 February 2014, http://stakeholders.ofcom.org.uk/consultations/review-mobile-donor-conveyance-charges/). We excluded administrative costs when setting the DCC in 2007, these costs were included in the 2014 Determination (see paragraphs 4.24 and 4.30 to 4.34 of the 2014 DCC Review Statement).
[58] Regulation was removed from ITC/ITT in 2005 and from LTC/LTT in 2009. The last charge control on ST expired in 2009 and all remaining regulation was removed in 2013.
[59] Oftel, *Determination of fixed portability costs and charges and statutory consultation on proposed modifications to BT's Licence to give effect to charge controls for portability*, May 2002 paragraph 11.7 http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/2002/nupo0502.pdf.

4.11 We consider that the six principles are a useful starting point and provide a practical way to evaluate the options, not just in terms of the appropriate cost standard, but also in deciding from which CPs (and ultimately consumers or groups of consumers) these are recovered from (see Section 6). These were originally developed by Oftel and also used by the Monopolies and Mergers Commission (MMC) for assessing geographic number portability.[60] The six principles are:

4.11.1 **Cost causation**: costs should be recovered from those whose actions cause the costs to be incurred at the margin;

4.11.2 **Cost minimisation**: those that can affect the size of the costs should have an incentive to minimise them;

4.11.3 **Distribution of benefits**: costs should be recovered from the beneficiaries, including a consideration of the wider benefits of number portability e.g. benefits arising due to increased competition;

4.11.4 **Effective competition**: the mechanism for cost recovery should not weaken effective competition. The charging structure should not distort competition;

4.11.5 **Practicability**: the mechanism for cost recovery needs to be practicable and relatively easy to implement; and

4.11.6 **Reciprocity**: where services are provided reciprocally, charges should also be reciprocal.

4.12 The issue of the cost standard for regulated charges for termination services was discussed in considerable detail in the 2011 wholesale mobile voice call termination statement (2011 MCT Statement); the subsequent appeal to the CAT (which was referred to the Competition Commission (CC)[61]); and in the 2013 NBMR Statement.[62] We have considered below whether the criteria used to assess the appropriate cost standard in the context of call termination are relevant in this case. We note that, like call termination, number portability is a service which CPs provide to each other. As such, we consider that porting services are more akin to a two way access service (such as termination) than a one way access service (such as wholesale access to BT's exchange lines e.g. local loop unbundling (LLU) and wholesale line rental (WLR)).

4.13 In the context of MCT,[63] we (and later the CC) assessed the two cost standards on the basis of the following criteria:

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[60] MMC, *Telephone number portability: A report on a reference under section 13 of the Telecommunications Act 1984*, 1995, available at http://webarchive.nationalarchives.gov.uk/+/http:/www.competition-commission.org.uk/rep_pub/reports/1995/374telephone.htm

[61] CC, *BT v Ofcom, EE v Ofcom, H3G v Ofcom and Vodafone v Ofcom – telecommunications price control appeal: wholesale mobile voice call termination*, http://www.competition-commission.org.uk/our-work/directory-of-all-inquiries/bt-everything-huthchison-vodafone-telecoms-appeal-mobile-call-term.

[62] Ofcom, *Review of the fixed narrowband services markets*, Statement 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf, see section 8.

[63] We used exactly the same framework for fixed call termination. See 2013 NBMR Statement, paragraphs 8.5 to 8.35.

4.13.1 economic efficiency effects. This includes allocative efficiency (i.e. where prices are aligned to marginal or incremental costs), productive efficiency (i.e. where costs are minimised) and dynamic efficiency (i.e. incentives for innovation and investment).[64]

4.13.2 competition effects;

4.13.3 effects on vulnerable consumers; and

4.13.4 commercial and regulatory consequences.[65]

4.14 The main reason for adopting LRIC (later confirmed in the 2012 CC Determination) was the effect on competition.[66] For example, for MCT, we considered the impact of the cost standard adopted for setting mobile termination rates (MTRs) on competition between mobile CPs and, separately, mobile and fixed CPs.[67] We concluded that higher MTRs under LRIC+ appeared to dampen competition among mobile CPs to some degree, as a result of a combination of competition effects, and that a move to set MTRs at LRIC would eliminate (or substantially reduce) these effects. We considered that LRIC best promotes sustainable competition, as it would intensify retail price competition, eliminate the barriers to expansion that exist when MTRs are above LRIC, and reduce the competitive distortions between mobile CPs and fixed CPs.[68]

4.15 In relation to FTRs, in the 2013 NBMR Statement we found no reason to depart from the approach used to determine MTRs (i.e. setting termination rates on a LRIC basis).[69] We noted that this was driven primarily by a consideration of competitive impacts.[70]

4.16 Notwithstanding the framework considered in the 2011 MCT Statement and 2013 NBMR Statement, we do not consider it necessary to add to the six principles. Specifically:

4.16.1 economic efficiency: we consider that this is already covered under the six principles (in particular under cost causation, cost minimisation and distribution of benefits);

4.16.2 competition effects: this overlaps directly one of the six principles;

4.16.3 vulnerable consumers: the choice of cost standard may have some redistribution effects, as when a RCP wins a customer that ports in their number, the net termination revenues associated with calls to that customer would be lower if porting charges were calculated based on LRIC+ rather than LRIC. There may also be an effect on the customers of the DCP since

[64] See also paragraph 5.11.
[65] See Ofcom, *Wholesale mobile voice call termination statement*, March 2011, paragraph 8.25 http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement.pdf
[66] See paragraph 8.159 of the 2011 MCT Statement, and 2012 CC Determination, paragraph 2.929(a) available at http://www.competition-commission.org.uk/assets/competitioncommission/docs/appeals/telecommunications-price-control-appeals/final_determination.pdf .
[67] As porting costs are only recovered within each sector, the issue of competitive interaction between fixed and mobile CPs is not relevant for this assessment.
[68] See 2011 MCT Statement, paragraph 8.159 and also 8.98.
[69] 2013 NBMR Statement, paragraph 8.35.
[70] 2013 NBMR Statement, paragraph 8.25.

LRIC based charges mean that more of the common costs must now be recovered from the DCP's own customers. In both of these situations, the way in which the CP structures its retail prices could in principle have differing effects on different consumer groups. For example, to the extent that a fixed CP chose to recover any revenue shortfall by increasing the line rental price, there could be a greater proportionate impact on more vulnerable consumers.

However, we expect the impact on retail prices that would result from moving from LRIC+ to LRIC for porting charges would be small and so unlikely to adversely impact vulnerable customers. We have considered the potential impacts of our proposals in the round in Section 7 - where we found any impact on consumers was likely to be small (see paragraphs 7.3 to 7.7);[71] and

4.16.4 commercial and regulatory consequences: we consider commercial and regulatory consequences separately in Section 7.

4.17 Recital 47 of the USD makes it clear that number portability is intended to facilitate competition through switching and that, amongst other things, charges should not hinder consumers from changing providers. In addition, when considering the appropriate cost standard for both MTRs and FTRs we considered the impact on competition to be a particularly important criterion not least in light of our principal duty to further the interests of consumers, where appropriate by promoting competition.[72] In light of this, we consider that the principle of effective competition is also an important criterion in the assessment of porting charges.

4.18 We also consider that cost causation and cost minimisation are important to the choice of cost standard. The distribution of benefits criterion concerns how costs should be recovered from the beneficiaries of the activities/services giving rise to those costs. We cover this in Section 6 where we consider the implications of recovering porting costs between different consumers (via wholesale charges to their CPs), rather than in our assessment of the cost standard.

4.19 We consider that practicability and reciprocity are not determinative in our choice of cost standard. The two cost standards are similar in terms of practicability in that, in general, the ability to estimate the costs with and without common costs should be equally practicable. Reciprocity is not determinative in the choice of cost standard because it is about equalising the charges set between parties (and so reciprocity could be achieved at any cost level provided it was the same level between the parties).

4.20 For the above reasons, the assessment which follows focuses on cost causation, cost minimisation and effective competition.

Provisional assessment

4.21 In assessing the appropriate cost standard for porting charges there are two issues to consider at the outset:

[71] It is also worth noting that in the 2011 MCT Statement (paragraph A3.272) Ofcom considered the effects on vulnerable consumers, but also stated that it would not be appropriate to pursue social objectives via regulation of (mobile) call termination.
[72] See paragraphs 8.25 to 8.35 of the 2013 NBMR Statement and Section 8 and Annex 3 (in particular paragraphs 8.158 to 8.159) of the 2011 MCT Statement.

4.21.1 The comparison between LRIC and LRIC+ depends on the relative importance of the contribution to common costs (i.e. the size of the '+' in the LRIC+). If this were small, any difference in the assessment between the two standards would also be consequently small. We do not consider, though, that the relative importance of common costs would change our overall assessment under each criterion as the size of the '+' affects the materiality but not the direction of the assessment; and

4.21.2 According to our Impact Assessment guidance[73] it is appropriate to include the status quo as one of the options. As discussed at paragraph 6.4, the recovery of porting costs differs in the fixed and mobile sectors. While in the fixed sector porting costs are recovered from the RCP in full, in the mobile sector porting conveyance costs are split equally between the DCP and RCP using a 50:50 charging rule.[74] For ease of exposition we principally refer to the RCP pays rule, though we also discuss whether our proposals would be affected under a 50:50 charging rule.[75]

Cost causation

4.22 In terms of cost causation we distinguish between:

4.22.1 Per number set up costs that can be thought of as being caused by the RCP's customer when he or she ports his or her number;[76] and

4.22.2 Porting conveyance costs which two parties could be considered to cause, as follows:

- one perspective might be that the cause of the conveyance costs is the initiation of calls to people who have ported their numbers i.e. it is the caller that causes the relevant parts of the DCP's network to be used; or

- an alternative perspective is that the underlying resource costs used are first determined by the RCP customer's decision to port – which makes it necessary for calls to be onward routed.

4.23 In the UK the established principle of telephony charging is that the caller pays the full costs for the call - i.e. the calling party pays principle. However, we do not think this is the most satisfactory view of cost causation in the present case since the need for onward routing is not determined by the actions of the calling party – even if the calling party does cause the costs of the call to arise in a general sense. Put another way, the incremental resource costs arising from a call to a ported number, over and

[73] Ofcom, *Better Policy Making – Ofcom's Approach to Impact Assessments*, July 2005, available at http://www.ofcom.org.uk/about/policies-and-guidelines/better-policy-making-ofcoms-approach-to-impact-assessment/

[74] Mobile CPs do not currently levy non-conveyance charges which means they are effectively borne by the DCP.

[75] In Section 6, where we discuss the recovery of porting costs, we also consider OCP and DCP cost recovery rules. We do not discuss these options here because we do not consider they would affect the results of our assessment.

[76] In this assessment we focus on per number set up costs as fixed CPs currently levy these charges. We do not discuss service maintenance costs (see paragraph 2.11) given these charges are not currently levied (see paragraph 2.38). However, in principle, we consider that our analysis of per number set up cost is applicable to service maintenance charges, in particular, these costs are caused by the RCP e.g. as a result of the RCP reconfiguring its network and requesting that the DCP modify the routing of ported traffic.

above those arising from a call to a non-ported number, are not caused by the calling party.

4.24 LRIC is the cost standard which most directly measures the costs causally related to the provision of a service, such as porting conveyance. Common costs are not causally related to a given service increment (such as porting conveyance), rather they are common across a number of service increments (for example much of the switching and conveyance infrastructure will be common across many different voice traffic services – e.g. call origination, transit, etc). Consistency with the cost causation principle suggests that common costs should be recovered from the services within the group to which they are common, but they do not have to be recovered from any one service. In the context of MCT, when considering which services within a group common costs should be recovered from, we note that the CC in its 2012 Determination said, "...*in general it is preferable for costs to be recovered where there is competition, so that regulated firms have the appropriate incentives to minimize their costs and behave efficiently."*[77] While number portability is not a service where we have found individual CPs to hold SMP, it is clear that number portability is not a contestable service – since only the DCP can provide onward routing to the RCP. This would point towards common costs being recovered from services other than porting.

4.25 Since charges set at LRIC+ start – explicitly or implicitly - from LRIC (i.e. LRIC+ involves a mark-up over LRIC) then in some sense both might be seen as reasonably following cost causation. However, we note that charges set at LRIC might be considered to be more immediately linked to the costs directly attributable to the service in question, at least taking the service increment in isolation. However, charges set at LRIC do of course raise the question of how common costs should be recovered (including those costs which would become incremental if considering a broader traffic or service increment - e.g. all voice traffic or all network traffic).

4.26 Moving from LRIC+ to LRIC based porting charges would not change the amount of common costs to be recovered by the DCP, and so we would expect some redistribution of common costs from porting services to competitively provided services in the event that we move from a LRIC+ (the status quo) to a LRIC cost standard for porting charges. As discussed in Section 7, porting charges are relatively small in the context of retail revenues (and common costs form only a portion of porting charges), therefore we expect any redistribution of common costs if we adopt a LRIC cost standard would have a relatively small impact.[78]

4.27 If a 50:50 charging rule is assumed, LRIC based charges mean that the RCP (and ultimately its customer(s)) pays less than the incremental cost as it would only bear 50% of incremental costs, with the DCP (and ultimately its customer(s)) bearing the other 50% and all common costs. Therefore under a 50:50 charging rule, we consider that the case for LRIC would be less compelling under the principle of cost causation than it would be under LRIC+.

4.28 Our provisional conclusion is that both LRIC and LRIC+ could be consistent with the cost causation criterion. Under a RCP pays charging rule we have a slight preference for LRIC as this more directly reflects the costs caused by the decision to port. For similar reasons to those considered in the regulation of termination rates, in a

[77] 2012 CC Determination, paragraph 2.577.
[78] Mobile porting conveyance costs are currently split using a 50:50 charging rule between the DCP and RCP so the present extent of common cost recovery from the RCP is limited.

situation of two-way access, we prefer that common costs are recovered from the 'competitive' (e.g. retail) side of the market.

Cost minimisation

4.29 Porting charges reflect activities the DCP undertakes to provide and facilitate number portability. The DCP's incentives to minimise such costs are directly related to the proportion of these costs it has to bear. As a general principle, the higher the proportion of costs that the DCP is required to bear, the stronger its incentives to minimise the costs.

4.30 Following this principle, we consider that LRIC provides greater incentives for cost minimisation than LRIC+ under both a RCP pays and a 50:50 charging rule as it means the DCP would recover less of its costs from the RCP. Under a LRIC cost standard and a RCP pays rule, the DCP would recover its incremental costs but not its common costs from the RCP, whilst under a 50:50 charging rule it would recover half of its incremental costs and none of its common costs.

4.31 However, in both the mobile and the fixed sectors, the infrastructure used to deliver ported calls (i.e. switching and transmission assets) is in general also used to provide services now subject to effective competition, which will act to incentivise cost minimisation.[79] While some dedicated infrastructure used for porting is not likely to be shared with other activities – e.g. system set up – some of these costs are not in any case recoverable under GC18. Therefore, the difference between LRIC versus LRIC+ in relation to cost minimisation may be less material. (We consider the materiality of the charging rule in terms of incentives to minimise costs in Section 6).

4.32 Nonetheless, our provisional conclusion is that LRIC would provide slightly stronger incentives for the DCP to minimise its porting costs than LRIC+.

Effective competition

4.33 As noted in Section 2, number portability was introduced to facilitate consumer switching and is thus an important facilitator of retail competition. We note that in the recent Fixed Access Market Review (FAMR) consultations we have proposed to adopt a LRIC cost standard for wholesale charges that have a direct impact on switching costs. In the 2013 FAMR we proposed that Generic Ethernet Access migration charges should be reflective of incremental costs, noting that, "*setting migration charges on an incremental basis, rather than including a contribution to fixed and common costs, is likely to reduce switching costs. Lower switching costs are generally likely to be in consumers' interests since they help strengthen retail competition."*[80] We also proposed to set WLR and metallic path facility (MPF) migration service charges based on incremental costs. We noted that, "*The main*

[79] The only remaining exceptions are call termination and, in the case of BT and KCOM, call origination. However, charges for these services are subject to price cap regulation (or in the case of call termination for CPs other than BT, fair and reasonable charges benchmarked to a price cap rate), and one of the objectives of price cap regulation is to provide incentives for cost minimisation.

[80] Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30*, July 2013, paragraph 11.172 http://stakeholders.ofcom.org.uk/binaries/consultations/fixed-access-market-reviews/summary/fixed-access-markets.pdf

argument in favour of setting migration charges at incremental cost is that this reduces switching costs and promotes competition."[81]

4.34 Effective competition could be undermined if the choice of cost standard resulted in barriers to entry and expansion, or reduced the incentives to compete for customers. The lifetime profitability of customers who port their numbers is affected by the level of the porting charges the RCP has to pay. The higher the porting charges the RCP has to pay, the fewer incentives it would have to compete intensively to gain customers that are likely to port their number. Porting charges would be higher under a LRIC+ cost standard (relative to LRIC) which could therefore have a negative impact on incentives to compete.

4.35 In terms of barriers to entry and expansion the cost standard could have an impact because later entrants, who tend to win customers from established providers, are likely to have a larger proportion of customers with ported-in numbers compared to incumbent CPs. This, in itself, is likely to disadvantage later entrants since they will have to pay porting charges for a greater proportion of their customer base. This competitive disadvantage is exacerbated under LRIC+ since porting charges are higher.

4.36 With the exception of wholesale charges which directly affect the switching process (noted in paragraph 4.33 above), typically when we regulate one way access charges a LRIC+ cost standard is most appropriate because otherwise the regulated entity (e.g. BT) would not have scope to recover its common costs. However, since CPs levy porting charges on each other, as noted at paragraph 4.12, we consider that porting services are more akin to a two way access service (such as call termination). When we have recently considered the regulation of wholesale charges for two way access, we considered that a LRIC cost standard was more appropriate, in particular to facilitate effective competition.

4.37 While the competition issues from higher termination rates may not necessarily manifest themselves in the same way as higher porting charges (e.g. because higher termination rates feed directly to higher call charges faced by the calling party, whereas in porting they increase the costs of serving customers with ported-in numbers), termination rates and porting charges both directly affect the costs of rival CPs in situations of two-way access. We note that the level of porting charges affects the cost of serving particular customer types (i.e. customers with a ported-in number versus those without). We noted a similar effect in the context of MCT where we found that MTRs above LRIC affect the overall profitability of serving particular consumer segments (due to the impact on the net cost of serving those customers).[82]

[81] Ofcom, *Fixed access market reviews: Approach to setting LLU and WLR charge controls,* July 2013, paragraph 4.110 http://stakeholders.ofcom.org.uk/binaries/consultations/llu-wlr-cc-13/summary/LLU_WLR_CC_2014.pdf

[82] This effect arises because MTRs above marginal cost drive a wedge between the cost of on-net and off-net calls, making off-net calls more costly. When MTRs are above marginal cost, as the proportion of calls by a consumer that terminate off-net increases, all else being equal, the profitability of serving that consumer falls. For mobile CPs with fewer subscribers, this effect means that consumers who make more calls than they receive – i.e. that have a high outbound/inbound calling ratio - are less profitable than for a mobile CP with a larger share of subscribers. This is because consumers that subscribe to a mobile CP with fewer subscribers are likely to make a higher proportion of their calls off-net. As these are more costly than on-net calls when MTRs are above LRIC, that subscriber generates more out-payments than inbound revenues. See 2011 MCT Statement, paragraphs 8.71 to 8.77.

4.38 For the reasons set out above, and consistent with our approach to the wholesale regulation of termination rates, we consider that LRIC would better fit with the principle of effective competition.

4.39 In practice, if porting charges are regulated at LRIC, the DCP would have to recover the contribution to common costs that is currently included in LRIC+ porting charges from either its remaining customers or the customer that has ported out. In this regard, we have considered whether under LRIC the DCP could have some incentives to pass the contribution to common costs to the switching consumer in the final bill - e.g. via an exit or termination charge.[83] If the level of the retail exit charge for porting were high this might discourage some consumers from porting, and in turn switching, which could have a dampening impact on competition.

4.40 However, we understand that retail exit charges for number portability are not currently levied in the mobile sector, yet DCPs in the mobile sector currently bear the entire non-conveyance costs and half of the (LRIC+) conveyance costs. Moreover, we consider that retail exit charges for number portability could dis-incentivise switching which may contravene the requirements of GC18 (dependent on the nature and level of any such charges). In light of the above, we consider that the introduction of retail exit charges for number portability is unlikely. If a 50:50 charging rule is assumed, this risk could be higher when LRIC is applied. Other than this, we do not consider that a 50:50 charging rule would affect our assessment under this heading (as LRIC reduces the porting costs borne by the RCP under both a RCP pays and 50:50 charging rule).

4.41 Therefore, we consider that LRIC is most consistent with the criterion of effective competition.

Preliminary conclusion

4.42 For the reasons set out above, we consider that a LRIC cost standard is most consistent with the principles of effective competition, cost minimisation and is likely to be at least as consistent with cost causation as LRIC+. Therefore, our preliminary conclusion is that all porting charges (both conveyance and non-conveyance, and both fixed and mobile) should be set using a LRIC cost standard rather than LRIC+.

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

[83] That is, a one-off charge levied on the customer when he or she leaves the CP. It could seek to recover both conveyance and non-conveyance charges.

Section 5

Choice of technology

5.1 In this Section we discuss how the technology choice should be considered for setting porting charges under GC18. The focus of our analysis is on porting conveyance costs.

5.2 The technologies used in communications networks evolve over time. In the fixed sector there are currently two distinct technologies in use; TDM and NGN. The choice of technology may affect the porting costs by having an impact on the way fixed CPs route traffic to ported numbers, and the amount of network conveyance used by the DCP to deliver calls to ported numbers.

5.3 Differences in technology are less pronounced in the mobile sector where mobile CPs tend to use the same technologies (i.e. 2G/3G circuit switched voice)[84], albeit in different proportions.

5.4 We have not considered the choice of technology in relation to per number set up charges. This is because per number set up costs reflect activities undertaken in order handling systems and differences in these system costs would be difficult to assess due to the large number of possible system configurations. Furthermore, we consider that per number set up charges are of a lower order of magnitude relative to conveyance charges.[85]

5.5 In this Section we:

- 5.5.1 identify the options to assess;
- 5.5.2 briefly summarise the current situation with respect to the technology used to set porting charges;
- 5.5.3 propose the framework to assess these options;
- 5.5.4 assess the options; and
- 5.5.5 set out our preliminary conclusions.

Options

5.6 We have considered two options in relation to technology choice:

- 5.6.1 An own network technology approach: under this option each CP sets charges based on its own network; or
- 5.6.2 A benchmark technology approach: this is the current situation for recovery of porting costs in the mobile sector where a maximum DCC for all CPs is

[84] 4G, in the form of Long-Term Evolution (LTE), is being deployed by UK mobile CPs. Currently only data services are provided on these networks, although we are aware that certain mobile CPs plan to deploy voice over LTE (VoLTE).

[85] For reference, based on data provided by BT its geographic and non-geographic per number set up revenues were around [✂] over Q4 2012 to Q3 2013, which compares to geographic and non-geographic conveyance revenues of [✂] over the same period.

determined with reference to a hypothetical efficient operator. An approach based on a benchmark technology would seek to deliver efficient price signals by not allowing inefficient technology costs to be recovered. We effectively adopt this approach when setting charge controls for MTRs and FTRs.

Current situation

5.7 In the 2007 Determinations we set an industry wide DCC for mobile CPs based on the costs of a hypothetical efficient operator carrying donor conveyance traffic using 2G and 3G technologies.[86] Our modelling of costs drew on intermediate outputs from the 2007 MCT cost model. In the 2014 DCC Review we maintained this approach[87], but used intermediate outputs from the 2011 MCT cost model as the basis for calculating efficient donor conveyance costs.

5.8 In the fixed sector, the current porting charges have not been directly set by Ofcom, although, as in the mobile sector, all CPs have an obligation to set them in a manner consistent with GC18.

5.9 As discussed in Section 2, BT sets the APCCs that it levies on other CPs based on its own network technology and we understand that the APCCs that BT pays to other CPs are also generally based on BT's own costs.

5.10 While non-BT CPs can negotiate bilateral charges between themselves (providing they comply with GC18), we understand that they sometimes reference the BT CPL in their porting agreements. Where the charges are based on BT's CPL, they are effectively based on BT's TDM network (even though the CP may actually use a different technology).

Assessment framework

5.11 We consider that the objectives and framework used for the discussion of technology choice in the 2013 NBMR are relevant to the question of technology choice in the present context. In the 2013 NBMR, we assessed technology choice with the following objectives in mind:[88]

- Allocative efficiency – i.e. to ensure that prices reflect forward looking (marginal or incremental) costs;[89]

[86] The costs are split between the DCP and RCP using a 50:50 charging rule to derive the DCC.
[87] The 2014 DCC Review Statement did not examine whether this was the most appropriate approach. In particular, we explained that we would consider substantive issues of approach in this review. See section 4 of the 2014 DCC Review Statement (Ofcom, *Review of mobile donor conveyance charges*, Statement and Direction, 14 February 2014, http://stakeholders.ofcom.org.uk/consultations/review-mobile-donor-conveyance-charges/.)
[88] Ofcom, *Review of the fixed narrowband services markets*, Statement 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf, paragraph A5.40.
[89] Allocative efficiency is maximised when there is an optimal distribution of goods and services taking into account costs of supply and consumers' preferences. Economic theory suggests that prices set at marginal cost lead to efficient outcomes. However, fixed and common costs are a feature of telecoms services and need to be recovered in some way. The Ramsey pricing principle suggests that for a multi-service regulated firm, all (wholesale and retail) services, whose demand is not perfectly price elastic, should make some contribution to common costs. However, assessing appropriate cost recovery under Ramsey pricing principles is a difficult task (for example, the CC's 2002 determination

- Productive efficiency – i.e. to ensure that access providers and access seekers face incentives to minimise costs and efficient buy/build signals;

- Dynamic efficiency – i.e. provides incentives to invest in the most efficient production technique. Dynamic efficiency is driven by successful investment and innovation. Delivering dynamic efficiency in regulated markets typically involves providing an opportunity for firms to recover efficiently incurred costs, although not providing a guarantee of cost recovery – consistent with what would be expected in a competitive market; and

- Effective competition – i.e. to ensure that our intervention promotes competition but does not unnecessarily restrict the ability of CPs already operating in regulated markets from competing.

5.12 In the 2013 NBMR, we recognised that often these objectives would be in tension:

- Pricing at forward looking (marginal or incremental) cost, while good for allocative efficiency, would not recover sunk costs. Regulating in a way which does not provide an opportunity to recover sunk costs is undesirable for dynamic efficiency, because it undermines incentives to invest in new assets which, once acquired, are themselves sunk.

- Setting prices on the basis of full replacement costs is likely to be good for effective competition (since access seekers face appropriate 'buy/build' signals – i.e. whether to 'buy' access or 'build' their own infrastructure). However, prices based on full replacement costs, may not be good for allocative efficiency (since prices would depart from marginal/incremental costs if replacement costs involve sunk investments when there are already usable sunk assets in place). Moreover, if investment in competing infrastructure is not practicable or commercially viable, prices set on the basis of replacement cost may result in access seekers paying a higher price than the incumbent needs for cost recovery.

5.13 We consider these tensions again in the present context below.

5.14 It should also be noted that we see the choice of technology as an intermediate input to the exercise of calculating costs and then setting charges. We recognise that rather than using the above framework, the six principles could in theory be used for the decision on technology choice. However, given the use of the above framework in the recent 2013 NBMR to decide between TDM and NGN cost modelling (which is a specific consideration in the present context), and because we think this framework lends itself more readily to the intermediate exercise of technology choice, our preference is to be consistent with that framework. In any event, we do not think that an assessment based on the six principles would lead us to a different decision on technology choice.

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on MCT concluded, "*there are formidable problems associated with computing correct Ramsey prices"* see http://www.competition-commission.org.uk/rep_pub/reports/2003/475mobilephones.htm paragraph 1.6, page 4). In practice regulators do not implement Ramsey pricing because of the complexity and uncertainty in doing so. Nevertheless, when setting charges for one way access services it is generally reasonable to allow for recovery of common costs (see paragraph 4.36). However, there are some notable exceptions, for example, in relation to migration charges where we propose to set charges at LRIC to reduce switching costs and promote competition (see paragraph 4.33). Also, when we have regulated wholesale charges in relation to two way access, for example, in relation to call termination rates we (and the CC) have recently done so on the basis of LRIC (see paragraph 4.36).

Provisional assessment

Allocative efficiency

5.15 We consider that this criterion does not allow us to differentiate significantly between an own network and a benchmark technology approach. Under either approach prices should reflect forward looking costs – the key is appropriately measuring forward looking cost (we discuss this further with respect to fixed networks at paragraphs 5.37 to 5.38).

Productive efficiency

5.16 At first glance, we might be concerned that an own network technology approach does not provide as strong an incentive to minimise costs, because the DCP can pass inefficiently incurred costs through to other CPs.

5.17 As noted at paragraph 4.31, in both the mobile and the fixed sectors, the infrastructure used to deliver ported calls is in general also used to provide services now subject to effective competition, which would act to incentivise cost minimisation. While some dedicated infrastructure used for porting is not likely to be shared with other activities – e.g. system set up – some of these costs are not in any case recoverable under GC18.

5.18 Moreover, where charges are subject to the threat of regulation (in this case, dispute resolution under GC18), this may provide a further discipline to minimise costs. For example, in resolving a dispute we might consider not only the CP's own costs, but also those of other CPs providing similar services or other forms of benchmarking. In addition, if the outcome of a regulatory determination is to set a limit on future pricing (either explicitly or because it influences future expectations) it could deliver similar incentive properties to price cap regulation (i.e. the incentive to 'outperform' the charge control by minimising costs).

5.19 Therefore, while a benchmark technology approach may provide slightly stronger incentives to minimise costs, and thus be more consistent with productive efficiency, we consider that an approach based on a CP's own technology could be consistent with productive efficiency when considered in the broader commercial and regulatory context (as above) and depending on the circumstances of the CP in question (as explained in paragraph 5.38).

Dynamic efficiency

5.20 An own network approach would be less likely to encourage investment or innovation (e.g. investment in new technology) than a benchmark technology approach because a CP using less efficient technology would be able to pass its costs through to its competitors. Moreover, if the competitors were using efficient technology and setting charges on this basis, this would benefit less efficient rivals.

5.21 However, as indicated in our assessment under productive efficiency above, broader regulatory and commercial considerations would be at play. In that regard, we note that migration from TDM to NGN is likely to be a major decision, and the recovery of costs associated with porting conveyance, or the charges set by rivals by for porting conveyance, are unlikely to significantly shape such decisions.

Effective competition

5.22 Under an own network approach with a RCP pays charging rule, CPs with less efficient technologies could pass higher costs though to their competitors. An own network approach could have perverse outcomes, where less efficient CPs are able to disadvantage more efficient competitors by levying higher porting conveyance charges. At the same time, less efficient operators would benefit from more efficient competitors lower conveyance costs. This would not arise under a benchmark technology approach.

5.23 Nevertheless, as noted previously, broader commercial and regulatory considerations may mean that such effects are muted. However, other things equal, a benchmark technology approach is likely to be more consistent with effective competition.

Our proposals

5.24 The above assessment suggests that, we might in theory prefer a benchmark technology approach. However, there are broader commercial and regulatory considerations which suggest that the potential gains in economic efficiency and effective competition may be limited.

5.25 In practice, an own network approach could also deliver an efficient outcome where the costs incurred by the CP using its own particular technology are consistent with (or at least no higher than) the costs associated with the benchmark technology.

5.26 We now consider what this means for technology choice used to calculate the costs of mobile and fixed porting conveyance, respectively, below.

Mobile sector

5.27 In the mobile sector we use a hypothetical average efficient operator approach to set MTRs and the current DCCs. [90] The hypothetical average efficient operator used in our MCT cost model is effectively the benchmark technology. We see no reason to depart from this approach and do not currently think that there are more appropriate alternative options for the mobile sector.

5.28 This is because the current approach has a number of advantages, as it:

- caps charges by reference to the costs of an efficient network which uses the benchmark technology and so is not vulnerable to actually incurred costs which may be inefficiently high;
- provides incentives for cost minimisation; and
- is practical as it draws on the modelling approach used for setting MTRs.

5.29 Further, mobile CPs are required to ensure on-going compliance with GC18 and our preliminary conclusion is that the costs of a hypothetically efficient operator

[90] The modelling approach behind the hypothetical efficient operator is described in Section 9 and Annex 6 of the 2011 MCT Statement (Ofcom, *Wholesale mobile voice call termination statement*, March 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement.pdf)

(consistent with the technology used in the prevailing MCT cost model) would remain an appropriate way to set porting conveyance charges.

Fixed sector

5.30 There are two distinct technologies (TDM and NGN) in use in the UK to provide fixed communications services and fixed CPs use predominantly one or other of these. The choice of technology has a significant influence on the topology for interconnection and call conveyance between competing networks.[91] As a result, and for the further reasons below, the issue of technology choice for porting conveyance for fixed networks is somewhat more complex and raises important practical issues.

TDM networks

5.31 Calls on a TDM network are connected via switches (which establish an end-to-end circuit for each call). The number of switches in a TDM network will depend on the scale of the network, in terms of traffic volume, number of customers connected and geographic coverage of the network. In the case of BT, in order to support the customer and traffic volumes on its network, it has built a tiered TDM network, with local layer switches (i.e. DLEs) and tandem layer switches.

5.32 In order to allow customers of other networks to call BT's customers, other CPs must interconnect to BT's network. They may connect to any of the DLEs or tandem exchanges. This means traffic to a particular number may take different routes through the BT network, depending on where it is handed over to BT. Where the call is to a number ported away from BT, the call would need to be onward routed from BT to the RCP. Again, the extent of interconnection between BT and the RCP will determine the routing of the call through BT's network and therefore the cost incurred by such onward routing.

5.33 Other TDM networks may also have a similar hierarchical structure, although the lower volumes (of customers and/or traffic) and smaller geographic footprint may mean that the local exchange and tandem exchange functionality are combined into a single layer.

5.34 Whilst voice services may share some equipment with other services in a TDM network (for example, transmission between locations could be shared) the switches are dedicated to the voice service.

NGNs

5.35 NGNs use Internet Protocol (IP) technology. To a much greater extent, voice and other traffic share the same network elements. However, there would still be some voice specific elements (for example, call servers and directory servers that manage the voice service and call routing). To connect to an NGN, the CP operating the network must make available points of interconnection. Unlike in TDM networks, there is no direct equivalent of the switches to which other CPs could interconnect.

5.36 In the 2013 NBMR Statement, we included 20 points of interconnection in our NGN model although we accepted that other numbers could be reasonable.[92] Because the

[91] In contrast, in the mobile sector, all mobile CPs except H3G use both 2G and 3G technology (H3G uses only 3G) and the use of 2G and 3G technology does not significantly influence the topology for interconnection and call conveyance between competing networks.
[92] 2013 NBMR Statement, paragraph A5.73.

call server is queried at the point where the call enters the network (i.e. the point of interconnection) and the destination of the call can be determined at this point (i.e. if it is to a ported number and, if so, to which network the number was ported), the routing across the DCP's network to the point of interconnection with the RCP can be determined straight away. This is in contrast to the current approach on a TDM network such as BT's where, for geographic number portability[93], we understand the call queries the switch that originally hosted the number to determine it has been ported (see Figure 2.3 in Section 2).[94]

We have considered both TDM networks and NGNs as options for our technology choice

5.37 Our general approach (e.g. when modelling costs for charge controls) is to assess each technology on a replacement cost basis. However, in times of significant technological transition such an approach may not be appropriate. TDM networks have been deployed for some time and we believe that they will, at some point, be replaced with an alternative technology, most likely some form of NGN. We do not envisage TDM equipment being replaced on a like-for-like basis.

5.38 In the 2013 NBMR Statement we concluded that both NGN and TDM networks could be efficient, depending on the particular circumstances of the CP.[95] Our analysis in that statement indicated that the forward looking costs of running a TDM network were low (and for the period up to 2016/17 were likely to lie below the full replacement costs of an NGN) because the assets are heavily depreciated and unlikely to be replaced by new TDM equipment.[96]

5.39 There are significant differences in technology choice (and network topology) in the fixed sector. As explained in the 2013 NBMR Statement[97], BT, KCOM, Vodafone[98] and Virgin Media built, and continue to use, to a large extent, TDM networks whereas TalkTalk, Sky and Gamma have deployed NGNs. In addition, as discussed above, BT's network provides national coverage and connects more customers than other networks and this drives topology differences. These topology differences are reflected in different costs of conveyance for porting traffic between different CPs, because of the way networks connect to BT. BT reflects these topology and interconnection differences in APCCs, which it sets on a CP by CP basis.

5.40 Unlike for mobile networks, where we have previously set a single DCC for all CPs based on our view that mobile CPs use more technologically and topologically comparable voice call networks, in fixed networks, CPs do not use the same technologies and topologies. Porting charges between fixed CPs will therefore vary

[93] Where a TDM network supports non-geographic number portability, the routing of the call (including whether it is ported or not) can be determined through querying a database in the DCP network. Each switch in the DCP network may be able to query the database, depending on the specific network implementation.
[94] In other non-BT TDM networks tandem/transit exchanges may not be present, or (as in the case of BT) call drop back may be used within networks to avoid tromboning. Also, a network may determine and add the routing number at a location other than the donor switch (for example using a database inquiry at an interconnect switch).
[95] As we explained in the 2013 NBMR Statement, paragraph A5.63.
[96] Indeed, in the 2013 NBMR Statement we looked at analysis prepared by BT and also our own analysis of end-to-end call costs based on extending the forecast period covered by the 2009 NCC model, but adjusted to reflect the depreciated nature of TDM assets. The results of the latter exercise are shown in Figure A6.14 of the 2013 NBMR Statement, alongside the results of the 2013 NCC model (which was based on an NGN).
[97] 2013 NBMR Statement, paragraph A5.90.
[98] Previously Cable & Wireless (for example under the Mercury Communications brand).

depending on the specific interconnection points agreed between the OCP, DCP and RCP networks.

5.41 We recognise that it would cause practical difficulties if we were to require that fixed CPs set porting charges on the basis of a single benchmark technology because some CPs would have to set their charges based on the costs of a technology and/or topology which they do not use. Therefore, because we consider both TDM networks (on a forward looking cost basis) and NGNs could be efficient, we consider that it would be reasonable for fixed CPs to charge for porting conveyance based on the costs of the technology and topology of their own network.

5.42 In practice, this means that fixed CPs are likely to continue to agree bilaterally the porting charges they pay and receive – subject, of course, to the requirements of GC18. BT, in addition to setting charges for when a number is ported from its network, would also need to agree the charges it pays to other CPs when it ports in a number. For geographic APCCs, BT has historically published a rate in its CPL for this purpose (although we note CPs may agree a different rate with BT). In agreeing the rate that other CPs charge BT (for numbers BT has ported in), our view is that if a CP sets its charge based on BT's network costs, this could meet the CP's obligations under GC18 as its charges would be based on a relevant benchmark of the costs of an efficient technology incurred in providing portability.

5.43 To the extent that BT continues to agree and publish these rates in its CPL, we consider that CPs could also reference this in their own commercial agreements on the basis that it would be reflective of an efficient technology. Further, given that there are a large number of CPs, some with low volumes of ported-out numbers, we consider it would result in a significant additional regulatory burden on them to develop porting cost models and negotiate rates based on them with BT and other CPs. We also consider that there would be little impact on the overall outcome (in terms of the overall level of charges CPs pay and the ultimate impact on consumers) between CPs setting charges using their own cost models or charges derived from BT's network costs.

Preliminary conclusion

5.44 In the mobile sector, our preliminary view is that porting charges should continue to be set with reference to the hypothetical average efficient operator (i.e. on the basis of a model such as that used in the 2014 DCC Review Statement that is based on the MCT cost model).

5.45 In the fixed sector we recognise that both TDM networks and NGNs may be efficient, and therefore our preliminary view is that CPs should be allowed to set charges based on the technology actually used. In both cases we would expect the costs to be calculated on a forward looking basis, which in the case of a TDM network would reflect the depreciated nature of the network assets.

5.46 We also propose that it would be consistent with GC18 for charges that BT pays to other CPs to be calculated by reference to charges derived from the costs of using BT's network[99], on the basis that it would be based on a relevant benchmark of the costs of an efficient technology incurred in providing portability. Further, we consider that it would be consistent with GC18 if CPs reference these rates for setting charges to CPs other than BT.

[99] Currently these rates are published in the BT CPL.

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

Section 6

Recovery of porting costs

6.1 In Sections 4 and 5 we considered the appropriate cost standard and the choice of technology that CPs should use to set porting charges under GC18. In this Section we consider the recovery of porting costs that are incurred by the DCP. Porting charges are levied at a wholesale level - i.e. between CPs - and whatever approach we take will have a financial impact on CPs. However, we recognise that ultimately CPs pass these costs through to consumers, and our primary concern is about which approach confers the maximum benefit for citizens and consumers.

6.2 In this Section we:

6.2.1 identify the options to assess;

6.2.2 briefly summarise the current situation with respect to the recovery of porting costs in the fixed and mobile sectors;

6.2.3 propose the criteria to assess these options;

6.2.4 assess the options; and

6.2.5 present our preliminary conclusions.

Options

6.3 We have identified four charging rule options as to which CP(s), and ultimately consumers, should bear the porting costs which are recoverable under GC18:

- Option 1 - OCP pays (the OCP bears the DCP's porting costs);
- Option 2 - DCP pays (the DCP bears its porting costs);
- Option 3 - RCP pays (the RCP bears the DCP's porting costs); and
- Option 4 - a 50:50 charging rule splitting the DCP's costs equally between the DCP and the RCP.[100]

Current situation

6.4 GC18 explicitly prohibits the DCP from recovering some porting costs through porting charges. In particular, GC18.5(b) prohibits DCPs from charging in relation to system set-up costs or additional conveyance costs. This means the DCP has to bear these costs in full. In relation to porting costs that are recoverable under GC18, the cost recovery differs across the fixed and mobile sectors:

- in the fixed sector the porting costs[101] incurred by the DCP are recovered in full from the RCP; and

[100] We could envisage other charging rules recovering the costs between the OCP, DCP and RCP in different proportions. However, the four options set out appear to be the most obvious options and therefore, in the interests of proportionality and practicability, we have not included further options in this assessment.

- in the mobile sector the porting conveyance costs incurred by the DCP are split equally (50:50) between the DCP and RCP while non-conveyance costs are currently borne by the DCP as they do not charge for these services.

6.5 It is also worth noting that porting costs are recovered within each sector – i.e. fixed callers do not contribute to mobile porting costs and vice versa.

Assessment of direct routing

6.6 Before assessing the options, we first consider whether onward routing should be taken as a given, or whether the OCP should be viewed as having a choice as to whether to onward route or directly route a call to a ported number.[102] Direct routing does not require an additional call conveyance step from the DCP to the RCP. However, CPs would need to invest in direct routing infrastructure.

6.7 Where direct routing is available, if the OCP faced the porting conveyance cost it would face an economic incentive to choose the most efficient routing – be that direct or onward routing. In other words, the OCP would be able to make a rational decision factoring in, on the one hand, the costs of onward routing (e.g. conveyance costs) and, on the other hand, the costs of moving to direct routing (e.g. set up costs and costs of obtaining routing information). This approach would, however, require CPs to make available such data on ported numbers as necessary to facilitate direct routing by OCPs, and OCPs would need to develop the systems to access this data and make routing decisions based on it.

6.8 Where an OCP has access to the relevant data, an OCP pays option would result in the OCP opting for direct routing when this was the lowest cost option (to the extent it makes the efficient routing decision). However, when this is not the case it would continue to rely on the DCP for onward routing. In the latter case the DCP's charges would be subject to the requirements in GC18.

6.9 We considered this issue in our 2010 review of routing calls to ported numbers.[103] 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.[104]

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.

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[101] i.e. porting conveyance costs, and non-conveyance costs (where charged), calculated on the agreed cost standard (currently LRIC+)

[102] Descriptions of onward and direct routing are provided at Annex 5.

[103] Ofcom's consultation and statement on *Routing calls to ported telephone numbers* is available at http://stakeholders.ofcom.org.uk/consultations/gc18_routing/

[104] We note that, even if the costs of achieving direct routing are now lower than estimated in the 2010 review of routing calls to ported numbers statement, this does not necessarily mean that it is cost justified for two reasons. First, the net present value (NPV) for achieving direct routing for some call types was strongly negative e.g. the NPV for implementing direct routing for fixed originated calls to fixed ported numbers was -£130m over 7 years so that even a very large decrease in costs would be unlikely to result in a net benefit. Second, we expect the costs of onward routing to have declined in the intervening years as a result of technological improvements. For mobile we note that the costs of onward conveyance decreased significantly between the 2007 and 2014 Determinations of the DCC.

6.11 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.

6.12 In light of the above, we have assessed the options below on the basis that the current system of onward routing is maintained.

Assessment criteria

6.13 As in Section 4, we consider the six principles (see paragraph 4.11) are an appropriate assessment criteria. We assess the options against each of the principles below, with the exception of the principle of reciprocity which we consider is not determinative in this case. This is because reciprocal charging can be implemented under all the options considered.

6.14 We consider that the cost causation, distribution of benefits, effective competition and practicability criteria are the more important criteria for the assessment of how charges should be set. While cost minimisation is relevant, for the reasons set out below (paragraphs 6.22 to 6.25) we consider that it is less important than the other criteria above for the assessment of this question.

Provisional assessment

Cost causation

6.15 For this principle we consider separately the costs associated with (i) per number set up and (ii) porting conveyance. [105]

6.16 We noted in Section 4 that per number set up costs could be thought as being caused directly by the provision of portability to a particular customer. Therefore, if the recovery of costs was determined solely by reference to the principle of cost causation, the porting customer should pay. This suggests an RCP pays rule is appropriate for per number set up costs. We note that RCP pays would align to cost causation most closely if the RCP ultimately passed the costs to the customer that has ported the number.

6.17 As also noted in Section 4, with respect to porting conveyance costs, there are two possible views as to the cause:

i) the normal principle of telephony charging is that the caller pays the full cost of the call because they have initiated the call, thus causing the costs to arise. This would point to the OCP pays rule; or

ii) the underlying resource costs used are first determined by the RCP customer's decision to port – which causes the need for calls to this customer to be onward routed. This would point to a RCP pays rule.

[105] As in Section 4, we do not explicitly discuss service maintenance charges. See footnote 76.

6.18 Viewed in either of the above two ways, it would be argued that it is either the calling party (and in turn OCP) or the called party (in turn the RCP) that is causing the costs of porting conveyance and not the DCP (and its customers). Therefore, we consider that the DCP pays and 50:50 charging rules are not supported by the cost causation criterion.

6.19 There could be a case for the OCP bearing some of the costs as the caller causes the relevant parts of the network to be used. However, as explained in Section 4, we do not think this is the most satisfactory view of cost causation since the need for onward routing is not determined by the actions of the calling party – i.e. the incremental resource costs arising from a call to a ported number, over and above those arising from a call to a non-ported number, are not caused by the calling party. Moreover, even if the calling party faced the additional resource costs involved, there is little he or she could do to avoid the conveyance costs arising from a call to a ported number. Further, as discussed above in relation to direct routing, we do not consider that the OCP is likely to be in a position to respond to such a pricing signal. In any case, this would not best reflect our view of cost causation (for the reasons set out above and in Section 4).

6.20 Therefore, we consider that the principle of cost causation points to the costs being recovered from the RCP (and hence its customers). An RCP pays charging rule is also consistent with our general approach to regulated services whereby the CP providing the regulated service should be able to recover efficiently incurred costs from the CP causing the costs to be incurred by using the service.

6.21 In light of the above, we consider that a RCP pays rule is most appropriate for both conveyance and per number set up porting costs.

Cost minimisation

6.22 Porting costs reflect actions the DCP undertakes to achieve portability. Therefore, in principle, options where the DCP bears all or part of the costs would provide the greatest incentive to minimise costs.

6.23 However, we have already considered the appropriate level of cost recovery in the cost standard and technology choice sections, where we provisionally concluded that cost recovery should be based on LRIC using an efficient technology. Given we are proposing guidelines that would limit porting charges to efficiently incurred incremental costs, we do not consider that the impact of providing additional incentives to minimise costs is likely to be material.

6.24 As noted in paragraph 4.31, in both the mobile and the fixed sectors, the infrastructure used to deliver ported calls is in general also used to provide services now subject to effective competition, which would act to incentivise cost minimisation. While some dedicated infrastructure used for porting is not likely to be shared with other activities – e.g. system set up – some of these costs are not in any case recoverable under GC18.

6.25 We note that, other things equal, the DCP pays and 50:50 charging rule options would, in principle, provide the greatest incentives for the DCP to minimise its costs. However, taking into account the considerations in the two preceding paragraphs, we think that the DCP already faces strong incentives to minimise costs, irrespective of the decision of who should bear porting costs. Therefore we consider the cost minimisation principle is less important in this case.

Distribution of benefits

6.26 Based on the original cost benefit analyses (CBAs) undertaken for fixed[106] and mobile[107] number portability, the following three types of benefits from number portability have been identified:

i) Type 1: the benefits to customers who retain their telephone number when switching suppliers. These include savings from not having to change number and from switching to lower cost operators;

ii) Type 2: the benefits which accrue to all UK telecommunications customers. These arise from efficiency improvements and price reductions which result from increased competitive pressure due to the availability of number portability; and

iii) Type 3: the other resource savings arising from fewer number changes (fewer misdialled calls, directory enquiry calls, updates to directory information and changes to information stored in customer equipment). These benefits mainly accrue to subscribers calling ported numbers as a result of there being fewer number changes.

6.27 Type 1 benefits accrue directly to customers that port their numbers. Type 2 and 3 are indirect benefits of number portability, in that they accrue to customers more generally. These categories of benefits were originally identified and estimated by NERA in its 1993 CBA for the introduction of fixed number portability. NERA's CBA was later considered as part of the 1995 MMC Inquiry into fixed telephone number portability. NERA, on behalf of Oftel, found that the benefits to competition (Type 2) were significantly larger than the two other types of benefit identified.[108] The MMC concluded that, while a precise quantification of the benefits (for fixed number portability) was not possible, the indirect benefits of (fixed) number portability (i.e. Types 2 and 3 above) were significant in relation to the direct benefits (Type 1).[109]

6.28 We recognise that any quantification of the benefits from number portability is likely to be imprecise. Furthermore, we do not think that a quantification of the benefits is either necessary or proportionate for the purposes of this proposed guidance on the interpretation of GC18. We have therefore not undertaken such an exercise. However, we consider that the relativity of the benefits identified by NERA may still be likely to hold i.e. the broader competition benefits from portability (that is Type 2 benefits) could still be the largest. Nevertheless, we note that the NERA CBA was undertaken in 1993 when the competitive landscape was different (for example BT had a significantly larger market share in retail access and calls and 'bundling'[110] of communications services was significantly less prevalent). Therefore we need to be cautious in applying the benefits derived by NERA to the current situation.

[106] The cost benefit analysis of fixed number portability was conducted by National Economic Research Associates (NERA) for Oftel, the results are discussed in the 1995 MMC Inquiry.
[107] The CBA for the introduction of mobile number portability was conducted by Ovum for Oftel and is available at http://www.ofcom.org.uk/static/archive/oftel/ind_info/numbering/ovum1.htm#3
[108] NERA estimated the Type 1 benefits at £554m, Type 2 benefits at £1280m and Type 3 benefits at £19m. These are undiscounted benefits for the period 1995/96 to 2004/05, in 1993 prices. Source: MMC Inquiry, Table 7.7 page 105.
[109] MMC Inquiry, paragraph 2.155.
[110] By which we mean the purchase of several communications services as a single package from one supplier. The most commonly purchased types of service bundles in communications are 'dual-play' (fixed voice and fixed broadband bundles), and 'triple-play' (fixed voice, fixed broadband and pay-TV bundles).

6.29 Type 1 benefits accrue directly to the porting customer and are therefore consistent with a RCP pays rule. However, Type 2 and 3 benefits can be thought of as 'externalities', meaning that benefits accrue to customers other than the customer that decided to port. Because of the presence of such externalities, we have considered whether the distribution of benefits principle suggests that we should deviate from a RCP pays charging rule.

6.30 Such externalities would matter to economic efficiency if certain consumers did not port because their private benefit from doing so was less than the costs of switching and porting, but the total benefits (private and external) were more than the costs of their switching and porting. In the case that the externalities were large it might suggest the RCP should not bear all of the porting costs and that such costs should be shared more widely (either with the DCP, the OCP or both). Type 2 benefits arise due to increased competitive pressure from which most[111] customers are likely to benefit. This might suggest that porting costs should be distributed across all customers/CPs. Type 3 benefits instead give rise to resource cost savings for consumers calling the ported numbers which might suggest that the originating customers/CPs ought to bear a portion of the costs.

6.31 The presence of externalities might suggest a deviation from a pure RCP pays rule (i.e. where the porting customer is required to bear the entire cost of porting[112]). However, the need for an adjustment to porting charges to reflect these externalities is mitigated by two reasons:

i) some porting costs are not recoverable under GC18, for example system set up costs and additional conveyance costs.[113] These costs are effectively borne by the DCP which means that there is implicitly already some cost sharing inherent under GC18; and

ii) currently, in both fixed and mobile, the porting conveyance (and, for fixed CPs, also per number set up) charges paid by RCPs are not passed through to only the porting customers, but instead they are recovered from all the RCP networks' customers.

6.32 While some costs are already shared, we recognise that the current share might not precisely reflect the distribution of benefits arising from the externalities that may exist. Therefore, we have considered whether failure to take further account of externalities is likely to matter.

6.33 We have estimated the difference in DCC and APCC payments by a number of large fixed and mobile CPs under a RCP pays rule versus a 50:50 charging rule.[114] We

[111] This assumes that there is no or limited price discrimination between customers that switch provider and those that do not.
[112] This might arise if the RCP made the porting customer pay all the porting costs - e.g. via an additional item on the bill
[113] System set up costs would have been incurred when number portability was established which, for most CPs, is likely some time ago. Additional conveyance costs are ongoing costs.
[114] To estimate mobile DCC payments we took onward routed minutes which attract a DCC from Q3 2012 to Q2 2013 (based on information provided by EE, Vodafone, Telefonica and H3G) multiplied by the current DCC (0.028ppm). This provides an estimate of DCC payments under the current 50:50 charging rule. Under a RCP pays rule these payments would be doubled.
For fixed CPs we took the actual geographic and non-geographic APCC payments by 5 large CPs that also provide data for Ofcom Telecommunications Market Data Tables (BT, Vodafone, Virgin Media, TalkTalk and Sky) over Q3 2012 to Q2 2013 under the current RCP pays rule. Under a 50:50 charging rule these payments would be halved.

note that, given the costs already borne in full by the DCP, a 50:50 charging rule would lead to the DCP bearing a greater proportion of the overall costs of porting than the RCP (and so is likely to over-state the benefits received by the DCP's customers compared to those of the RCP or consumers more generally).

6.34 Taking each large CP individually, an RCP pays charging rule leads to an increase in porting conveyance charges of at most 0.62%[115] relative to its total retail revenues, when compared to a 50:50 charging rule.[116] If such costs were passed through to retail prices in full, it seems unlikely that a subsequent price increase would lead to sub-optimal switching activity. For example, if a fixed (mobile) customer expected to switch on the basis of an annual bill of £256[117] (£184)[118] an increase of £1.59[119] (£1.14)[120] seems unlikely to deter the customer from switching.

6.35 In summary, under an RCP pays charging rule cost recovery is already spread beyond the individual customer who has ported, which is consistent with recognising the presence of the external benefits created by a customer's decision to port. While the current cost sharing might not precisely reflect the relative balance of benefits between different parties, we consider that a more precise recovery of costs is unlikely to result in a material difference to decisions to port/switch provider. Further we consider that attempting to more precisely assess the distribution of benefits to determine a cost sharing arrangement that accurately matches these benefits is unlikely to be practical.

6.36 On balance, and considering all the costs associated with providing number portability in the round (including those not recoverable under GC18), we think that an RCP pays charging rule for costs that are recoverable under GC18 is appropriate because there is inherently already a degree of cost sharing.

Effective competition

6.37 We recognise that, in principle, if the RCP bore none or only a small proportion of the porting costs, it might be encouraged to compete more vigorously for customers (resulting in general benefits of enhanced competition). If the DCP has to bear a portion of the costs it might also have incentives to compete more strongly not to lose customers (because its profitability would be reduced to the extent it has to bear porting costs for customers it no longer earns revenues from). However, we have already considered the external benefits from competition arising from number

[115] This analysis looks at each CP individually. In Section 7 we present aggregated porting charges in the context of aggregated retail revenues.
[116] For each CP we took the difference in porting charges under a 50:50 and RCP pays charging rule and divided it by the total retail revenues for that CP. For fixed CPs retail revenues include access and calls revenues for residential and business customers (excluding fixed broadband revenues). For mobile CPs retail revenues includes access, bundled services, calls and data services revenues for subscribers.
[117] Representing average retail revenue per exchange line for fixed access and calls across residential and business customers (excluding fixed broadband revenues). Calculated as total retail access and calls revenues for residential and business customers over Q3 2012 to Q2 2013 (£8,502m) divided by total residential and business exchange lines at Q2 2013 (33.2m). Source: Ofcom Telecommunications Market Data Tables Q2 2013 available at http://stakeholders.ofcom.org.uk/binaries/research/cmr/telecoms/Q2-2013.pdf
[118] Representing average annual retail revenue per mobile subscriber, source Ofcom Telecommunications Market Data Tables Q2 2013, page 19 table 4. The average monthly retail revenue for Q2 2013 (£15.31) is multiplied by 12 to provide an annual figure.
[119] i.e. 0.62% x £256
[120] i.e. 0.62% x £184

portability (i.e. Type 2 benefits) under the distribution of benefits heading above. We do not consider it appropriate to double count these benefits and therefore do not discuss them further here.

6.38 In any case, where we have imposed regulation for the purposes of encouraging competition, we have generally allowed the provider of the regulated services to recover its efficiently incurred costs. We do not generally set regulated charges below incremental cost (i.e. LRIC) with the aim of further promoting competition. If we required the subsidisation of regulated services in this way (without allowing for the recovery of costs via other regulated services), some of the costs would need to be recovered from the regulated entity's own customers. Whilst this may lead to more customers purchasing services from suppliers other than the regulated entity, it would not necessarily, in the long term, be more effective in promoting efficient entry and competition.

6.39 Moreover, denying the DCP an opportunity to recover its efficiently incurred incremental costs (as would follow from a DCP pays rule or 50:50 charging rule coupled with a LRIC cost standard) could reduce its incentive to invest in the capacity or quality of onward routing infrastructure. While such a risk would be mitigated to an extent by the shared nature of some of the assets in question, at least some of the infrastructure will be incremental to ported traffic (i.e. the LRIC is above zero).

6.40 An additional potential downside if the DCP is forced to bear a significant portion of the porting costs is that it would have a stronger incentive to pass these costs through to the switching customer in the final bill - e.g. though an exit/termination charge.[121] If such a charge were material it might discourage relevant consumers from switching, which could have a dampening impact on porting, and in turn switching and competition. However, we discussed this possibility in Section 4 (see paragraph 4.39 to 4.40) and noted that the risk of retail exit/termination charges for number portability is small and that retail exit charges that acted as a disincentive to switching may contravene the requirements of GC18 (dependent on the nature and level of any such charges).

6.41 Therefore, for the reasons outlined above, we do not consider it appropriate to reduce the amount of costs the DCP is allowed to recover below an efficient LRIC level. We consider that the DCP pays and 50:50 charging rules do not perform as well as the RCP rule under the effective competition criterion.

Practicability

6.42 We consider that DCP pays, RCP pays and a 50:50 charging rule are all practicable, as follows:

- DCP pays: under this option the DCP does not recover the costs, so simply does not bill any other parties.

- RCP pays: this is the current situation in the fixed sector. In the mobile sector the RCP already pays 50% of the porting conveyance costs, amending this to 100% would be straightforward since it is simply involves changing the value of the DCC.

- 50:50 charging rule: this is currently the situation in the mobile sector, the only change in the fixed sector would be changing the APCCs and non-conveyance

[121] This could apply to both conveyance and per-line set up charges.

charges so the DCP only recovers half of the porting costs (which we expect would be straightforward to implement).

6.43 However, we have a number of potential concerns with an OCP pays rule.

6.44 We note that an OCP pays option opens up the possibility of recovery of the DCP's porting costs from outside the sector. That is, under an OCP pays model a fixed OCP would be required to pay the porting conveyance costs for a fixed originated call to a ported mobile number, similarly a mobile OCP would be required to pay porting conveyance cost for mobile originated calls to a ported fixed number. Internationally originated traffic would also need to be considered, and an OCP pays model would suggest that porting conveyance charges would need to be factored into international agreements.

6.45 We do not consider that this would be appropriate. The most significant benefit of number portability is that it reduces barriers to switching and thus promotes competition. However, we expect the competitive benefits from UK fixed and UK mobile number portability to be largely confined within the UK fixed sector and the UK mobile sector, respectively. For example, we would expect mobile portability to largely affect mobile switching and enhance competition in the mobile sector. For this reason, we consider that the costs should remain within that sector. This means that under an OCP pays model porting conveyance charges would only be levied for mobile originated calls to mobile ported numbers, and fixed originated calls to fixed ported numbers. The costs of calls originated outside the sector would need to be considered separately.

6.46 However, under such arrangements, the OCP would have the incentive and opportunity to avoid the charges altogether. This arises because the DCP (who levies the porting charges) may not be able to identify the OCP, particularly if the call is delivered via a transit CP. For example, mobile originated traffic to mobile ported numbers might reach the mobile DCP via a transit CP that operates in the fixed sector (for example, BT). In these cases the DCP may not be able to easily determine if the traffic is actually fixed or mobile originated. This means the system could be open to gaming - e.g. mobile CPs could send mobile originated traffic to ported mobile numbers via fixed transit to avoid paying conveyance charges.[122] The same reasoning applies to the fixed sector.

6.47 In light of the above, we consider that all the options would be practicable, but the OCP pays option raises practical complications if it were to be implemented satisfactorily.

Preliminary conclusion

6.48 We consider that the cost causation criterion points towards an RCP pays rule. The distribution of benefits principle suggests that the benefits from portability are to some extent felt by all consumers, and this might suggest that the RCP should not bear all of the costs. However, we propose that it is not appropriate to recover costs beyond the RCP, given that the recovery of certain costs is already excluded under GC18 and because, in practice, the RCP already spreads the porting costs it incurs across its whole retail subscriber base. In principle, we consider that an RCP pays rule is consistent with effective competition because we generally allow the provider

[122] If the OCP cannot identify ported and non-ported numbers it would need to route all traffic via the transit network.

of a regulated service to recover its efficiently incurred costs from the user of the service.

6.49 Practicability offers little differentiation between the DCP pays, RCP pays and 50:50 charging rule options, but tends to point away from an OCP pays rule.

6.50 We consider that the cost minimisation criterion is less relevant to the issue of how porting costs should be recovered. Cost minimisation would tend to point toward the DCP bearing at least some of the costs, however, we consider that there are already adequate incentives in place for cost minimisation.

6.51 Considering the principles in the round, our preliminary view is that an RCP pays rule is most appropriate for both fixed and mobile porting costs.

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

Section 7

Assessment of the impact of our proposals

7.1 In this Section we set out the specific impact of our proposals on consumers (and citizens), competition and on fixed and mobile CPs. This should be seen as complementary to our broader assessment of the policy options in the remainder of this document.

7.2 The porting charges under consideration in this consultation are wholesale charges between CPs and, currently, consumers who port their numbers do not generally face retail charges for porting. We would not expect that to change as a result of our proposals.

7.3 The total size of wholesale porting charges covered under GC18 is small in the context of retail revenues in both the fixed and mobile sectors. Fixed porting charges at current levels represent around 0.2% of total industry retail fixed access and call revenues.[123] The corresponding figure for mobile porting charges is 0.02%.[124] Given the relatively small size of porting charges (and the fact that these are wholesale charges between CPs) we anticipate that our proposals would have only a limited impact on consumers.

Impact on consumers and competition

7.4 As noted above, porting charges are wholesale charges between CPs and, generally, CPs do not charge retail customers directly for porting. Therefore, porting charges have so far usually been reflected in prices for all the customers of fixed RCPs, and the prices paid by customers of both mobile RCPs and DCPs. We expect the impact on retail prices of our proposals to be very small.

7.5 Nevertheless, number portability is in our view important in facilitating switching by enabling subscribers to keep their telephone number(s) when changing CP. As such consumers may well be more willing to switch if porting exists than if it does not. It is thus in our view an important enabler of competition.[125] To the extent that our proposals reduce the wholesale charges associated with number portability CPs would be expected to earn higher net revenues from winning customers. This might

[123] This represents geographic and non-geographic porting conveyance revenues received by five large CPs that also provide data for Ofcom Telecommunications Market Data Tables (BT, Vodafone, TalkTalk, Sky and Virgin Media) over Q3 2012 to Q2 2013 (£14.2m, Source S135 information) divided by total retail access and call revenues for residential and business customers for the same CPs over Q3 2012 to Q2 2013 (£6.9bn, Source Ofcom/Operator data).

[124] This represents estimated porting conveyance revenues based on onward routed minutes which attract a DCC for the 4 large mobile CPs (Telefonica, Vodafone, EE and H3G) over Q3 2012-Q2 2013 multiplied by the DCC published in 2014 Review Statement (estimated porting conveyance revenues equals £2.9m), divided total retail revenues generated by mobile telephony (excluding data services for comparison with the fixed sector above) over Q3 2012 to Q2 2013 (£13.2bn, Source Ofcom Telecommunications Market Data Tables Q2 2013, http://stakeholders.ofcom.org.uk/binaries/research/cmr/telecoms/Q2-2013.pdf). (In this case the four mobile network operators we have gathered onward routed minutes from correspond to the mobile network operators in the Ofcom Telecommunications Market Data Tables.)

[125] Based on the information we gathered from the largest fixed and mobile CPs 22.5m fixed and mobile numbers have been ported since number portability was introduced.

encourage CPs to compete more strongly for customers. Thus we consider the overall impact of our proposals on competition and consumers is likely to be positive.

7.6 CPs could decide to reflect any change to their net porting revenues as a result of our proposals in overall retail prices (e.g. line rental/subscription and call charges).[126] As noted below, we expect the impact on mobile CPs to be very small and thus would not anticipate any material impact on mobile retail pricing.

7.7 In the fixed sector we expect porting charges to fall. This would have a negative impact on net exporters of numbers (see paragraph 7.13), the biggest of which is BT. It is possible that BT might seek to recover this loss in wholesale revenues from other (non-regulated) services – including from its retail customers. However, we consider that even if BT were to do this, any impact on headline line rental/call prices would be very small, perhaps even imperceptible, because its porting revenues are very small in relation to its retail revenues.[127] Further, the ability of BT to pass through these costs via higher retail charges is likely to be limited. This is because rival fixed CPs are net importers of ported numbers and they might pass the reduction in porting charges through to their consumers in the form of lower prices. Given that BT competes against these providers at the retail level, its incentive to pass any cost increases onto retail customers is likely to be limited.

Impact on CPs

7.8 We have also considered the impact of our proposals on CPs. We have not undertaken detailed cost modelling to estimate revised values for porting charges, therefore the impacts discussed below are described largely in qualitative (rather than quantitative) terms.

Mobile sector

7.9 In Figure 7.1 below we summarise the expected impact on mobile CPs as a result of our proposals:

[126] As noted at paragraph 7.2, consumers do not generally currently face retail charges for portability and we do not expect this to change.

[127] BT's porting conveyance revenues for geographic and non-geographic numbers were [✂] over Q3 2012 to Q2 2013, which compares to its total retail access and call revenues over Q3 2012 to Q2 2013 of £3,942m across residential and business services (Source: Ofcom Telecommunications Market Data Tables Q2 2013). Therefore porting conveyance revenues were only [✂]% of retail revenues.

Figure 7.1: Impact on mobile CPs as a result of our proposals

	Proposal	Impact
Cost standard	LRIC	The cost standard is currently LRIC+, so moving to LRIC is expected to reduce the DCC (all else equal)
Technology	Hypothetical efficient operator	No change
Recovery of porting costs	100% RCP	The costs of porting conveyance are currently split according to a 50:50 DCP/RCP charging rule. Our proposal that the RCP bears 100% of porting costs will increase the DCC (all else equal).

7.10 The proposed changes have offsetting impacts. In the 2011 MCT Statement we estimated that that the LRIC MTR in 2014/15 would be around half of the LRIC+ rate.[128] If this LRIC:LRIC+ ratio also holds for porting conveyance costs, we would expect that changing the cost standard to LRIC would be broadly offset by moving to a 100% RCP pays charging rule - meaning the overall impact on the DCC as a result of our proposals could be small.

7.11 Taking into account the reduction to the DCC following the 2014 DCC Review Statement, we estimate that total DCC revenues for the four large mobile CPs are around £2.9m per year.[129] As noted above, this represents only 0.02% of total retail revenues generated by mobile telephony. We anticipate that any change to the DCC (and consequently DCC revenues) following our proposals would have a very small impact in the context of total mobile revenues.

Fixed sector

7.12 In Figure 7.2 below we summarise the expected impact on fixed CPs as a result of our proposals:

[128] We estimated that the maximum average LRIC+ MTR would be 1.61ppm by 1 April 2014, with the corresponding LRIC MTR estimate at 0.69ppm (both in 2008/9 prices). See 2011 MCT Statement, paragraph 1.14.6 (Ofcom, *Wholesale mobile voice call termination statement*, March 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement.pdf).
[129] To estimate DCC revenues we took onward routed minutes which attract a DCC from Q3 2012 to Q2 2013 (based on information provided by the large mobile CPs) multiplied by the DCC (0.028ppm).

Figure 7.2: Impact on fixed CPs as a result of our proposals

	Proposal	Impact
Cost standard	LRIC	When last regulated, the services that are inputs to BT's porting charges included a mark-up for common costs (i.e. effectively LRIC+). We expect that moving to LRIC would reduce porting charges (both conveyance and non-conveyance), all else equal.
Technology	TDM or NGN. However, for TDM CPs we consider that cost recovery should reflect the forward looking costs of the TDM network.	Our understanding is that most CPs set APCCs based on BT's network costs (with a number of CPs referencing BT's charges). For a TDM network operator (such as BT) our proposals are likely to reduce APCCs (to the extent that current APCCs reflect historic or full TDM replacement costs, rather than depreciated forward-looking network costs). We expect that any reduction in BT's APCCs would have an impact on other CPs that base their APCCs on BT's charges. For any CPs that do not reference BT's charges when setting APCCs, the impact of our proposals would depend on the extent to which their charges currently reflect the costs of an efficient network.
Recovery of porting costs	100% RCP	No change

7.13 The proposed changes would reduce fixed porting charges across the industry. This would affect CPs differently depending on whether they are net exporters or importers of numbers. Net exporters of numbers (such as BT), which we would expect to receive more in porting charges than it pays out, would face a net reduction in revenues. On the other hand, net importers of numbers, which we would expect to pay out more in porting charges than they receive, would benefit. Irrespective of whether CPs gain or lose, we consider that the change in net position in relation to porting charges is likely to be very small in the context of the CP's total revenues.

7.14 The five fixed CPs (see footnote 123) that provided information in response to the October 2013 s135 information request received, in total, £14.2m in geographic and non-geographic APCC revenues over Q3 2012 to Q2 2013. As noted above, the total APCC revenues received represent only 0.2% of retail revenues generated by fixed network access and calls by these CPs. We were not able to robustly estimate non-conveyance revenues, but based on the information we have we consider that these are significantly lower than conveyance revenues.

7.15 We anticipate that our proposals would have a larger impact on the fixed sector relative to the mobile sector, however, we still consider that any change would be very small in the context of retail fixed network revenues. Given the sums involved, we do not expect the changes to the flow of funds between CPs to have a significant

impact on the relative competitiveness of individual CPs, although we have sought to outline charging principles that are consistent with delivering effective competition across each of the fixed and mobile sectors, respectively, taken as a whole.[130]

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

[130] That is, effective competition across the market(s) as a whole is one of the important factors considered in our analysis of the charging options under the six principles (see Section 4).

Section 8

Provisional conclusions and next steps

Introduction

8.1 In this Section we summarise our proposals as to how we consider CPs should set reasonable and cost oriented charges for the provision of portability pursuant to GC18. These proposals are relevant to all porting charges covered by GC18.

Proposals on GC18 compliant porting charges

8.2 As described in Section 2, GC18 requires that, amongst other things, charges should, subject to the requirement of reasonableness, be cost oriented, and based on the incremental costs of providing porting.[131]

8.3 We have considered what cost standard should be used to calculate the incremental costs of porting according to GC18. As described in Section 4, our proposal is that all porting charges should be set according to a LRIC cost standard. For the avoidance of any doubt, the LRIC cost standard excludes any mark-up for common costs.

8.4 We have proposed a different approach to technology choice for mobile and fixed sectors (see Section 5). In the mobile sector, the hypothetical efficient operator approach (based on a 2G/3G cost model) is well established. We see no reason to depart from this approach and do not think that there are more appropriate alternative options for the mobile sector at the current time.

8.5 For fixed networks, there are two distinct technologies (NGN and TDM) in use in the UK. In line with our conclusions in the 2013 NBMR we propose that both TDM networks (on the basis of depreciated asset values) and NGNs could be efficient, and that it would be reasonable for fixed CPs to charge for porting conveyance based on the costs of the technology and topology of their own network. We propose that it would be consistent with GC18 for charges that BT pays to other CPs to be calculated using BT's network[132], on the basis that it would be based on a relevant benchmark of the costs of an efficient technology incurred in providing portability. Further, we consider that it would be consistent with GC18 if CPs reference these rates for setting charges to CPs other than BT.

8.6 We also propose that it is appropriate for both the conveyance and non-conveyance porting costs that are chargeable under GC18 to be recovered from the RCP (see Section 6). This would mean that the DCP could charge the RCP 100% of its relevant porting costs. However, this would not prevent the DCP from charging less than that amount.

8.7 We have considered whether these proposals should be in the form of guidance or whether it would be appropriate to implement them in a direction under GC18.5(a)(ii). For the reasons set out below, we propose that it would be appropriate to continue to set a maximum DCC in respect of porting charges for calls terminated to a mobile number but that guidance would be appropriate in respect of all other porting charges.

[131] See paragraph 3.2 in Section 3 for full details.
[132] Currently these rates are published in the BT CPL.

Proposed approach for the DCC

8.8 In the 2014 DCC review, we imposed a direction to set a maximum DCC across the mobile industry on a forward-looking basis. We considered that this was appropriate because we have set a maximum DCC historically, and it had been six years since the last DCC was set by Ofcom. Furthermore, bilateral negotiations to revise the DCC had failed between some parties and disputes had been referred to us, such that we considered it unlikely that DCCs would remain at a suitable rate across the mobile industry going forward without Ofcom's involvement.

8.9 Although, as explained above, the 2014 DCC Review did not examine substantive issues, such as the appropriate cost standard, instead noting that these issues would be more appropriately considered as part of this review, it concluded that a direction was the most appropriate means to set the basis on which DCCs should be calculated and the resultant maximum DCC that may be charged. In particular, we explained that we considered a direction under GC18.5 to be an appropriate measure to use in those particular circumstances as it ensured that our proposals are subject to the statutory safeguards set out in sections 49 to 49C of the Act and requirements that the giving of the direction is proportionate, not unduly discriminatory and transparent in relation to what it is intended to achieve.[133]

8.10 We believe that the reasons for issuing a direction setting a maximum DCC remain relevant. However, the current direction sets a maximum DCC until March 2016 and is modelled on a LRIC+ cost standard, using the costs of a hypothetical efficient network based on a 2G/3G technology and where the recovery of costs is split 50:50 between the DCP and RCP.

8.11 Therefore, if we proceed with the proposals set out in this document, we would need to consider whether it is necessary to modify the DCC Direction to reflect the change in cost standard from LRIC+ to LRIC and the change in recovery of costs to 50:50 to RCP pays.

8.12 As described in Section 7, our proposals would have offsetting impacts on the DCC, and, although we have not yet carried out a full analysis of the impact of our proposals on the level of the DCC, we would expect that the overall impact on the maximum DCC as a result of our proposals would be small.

8.13 However, if, on carrying out our full analysis of the impact of our proposals on the maximum DCC, we consider they would lead to a material change to the current maximum DCC, we would be likely to consult on a modification to the DCC Direction, setting out the proposed new maximum DCC, at the time our final statement is published or shortly thereafter.

Proposed approach for other porting charges

8.14 We have considered whether it would be appropriate to issue a direction under GC18.5(a)(ii) to set maximum APCCs via a direction as we have previously done for the DCC. At this stage we do not believe that this would be a proportionate approach. Unlike the DCC, there is currently no direction in place setting maximum APCCs. We have not been asked to resolve disputes regarding the level of the APCC in the past. Fixed CPs have, in the past, been able to determine and reach commercial agreements regarding their own APCCs.

[133] Ofcom, *Review of mobile donor conveyance charges* consultation at paragraph 3.10.

8.15 Setting the maximum level of APCCs would be significantly more complex than setting the maximum DCC. This is because in the fixed sector there are currently two distinct technologies in use, and we propose that it would be reasonable for fixed CPs to charge for porting conveyance based on the costs of the technology and topology of their own network (see paragraph 8.5 above). This is different to the mobile sector where the differences in technology are much less pronounced meaning that, for the reasons set out in Section 5, modelling costs on the basis of a hypothetical efficient operator, rather than on an own network basis, appears to be the most appropriate approach in respect of the DCC.

8.16 We have also considered whether, with regards to setting porting charges other than the DCC, we should issue a direction requiring CPs to set charges in accordance with our proposals in paragraphs 8.3 to 8.6 above. However, we note that fixed CPs have historically been able to set APCCs without a direction being in place and without bringing disputes regarding the level of charges to us (as described in paragraph 8.14 above). Furthermore, both fixed and mobile CPs have set and/or reached commercial agreements regarding non-conveyance charges with reference to their own network. We therefore we do not have evidence to suggest that issuing such a direction would be more appropriate than issuing guidance.

8.17 We believe that the approach of providing this guidance, rather than setting any direction(s) for APCCs and non-conveyance charges as considered above, is consistent with our duties and regulatory principles. In particular, we believe that this approach reflects the principle that we will operate with a bias against intervention, and intervene only where required.

8.18 Our preliminary view, therefore, is that the most appropriate and proportionate approach it is to set out the above principles in the form of guidance in respect of APCCs and non-conveyance porting charges. In the context of a dispute or investigation, subject of course to the particular circumstances in any case, Ofcom proposes to use the principles set out above as its starting point in assessing whether porting charges (other than the DCC which, as discussed above, we propose should be subject to a direction) are reasonable, cost-oriented and based on the incremental costs of providing portability as required by GC18.5.

8.19 If, after considering responses to this consultation, we conclude that providing guidance is the appropriate approach, we anticipate that CPs would need some time to consider whether they wish to make any changes to their porting charges in light of our guidance. We would not expect this to take longer than two to three months following our final statement.

Next steps

8.20 This consultation closes on 12 May 2014. We aim to publish a Statement setting out our final guidance, having taken responses to this consultation into account, later in 2014. We aim to publish, if required, any consultation on modification to the DCC Direction at the time our final statement is published or shortly thereafter.

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

Annex 1

Responding to this consultation

How to respond

A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 12 May 2014**.

A1.2 Ofcom strongly prefers to receive responses using the online web form at http://stakeholders.ofcom.org.uk/consultations/gc18-porting-charges-guidance/howtorespond/form , as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.

A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email Portingchargesgc18@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.

A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Steve Perry
4th Floor
Competition Group
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7783 4109

A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.

A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Steve Perry on 020 7783 4151.

Confidentiality

A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all

responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at http://www.ofcom.org.uk/about/accoun/disclaimer/

Next steps

A1.11 This consultation closes on 12 May 2014. We aim to publish a Statement setting out our final guidance having taken responses to this consultation into account, later in 2014. We aim to publish, if required, any consultation on modification to the DCC Direction at the time our final statement is published or shortly thereafter.

A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.

A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.

A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Graham Howell, Secretary to the Corporation, who is Ofcom's consultation champion:

Graham Howell
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Tel: 020 7981 3601

Email Graham.Howell@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.

A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.

A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at http://stakeholders.ofcom.org.uk/consultations/consultation-response-coversheet/ .

A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing ☐

Whole response ☐

Part of the response ☐

Name/contact details/job title ☐

Organisation ☐

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. ☐

Name

Signed (if hard copy)

Annex 4

Consultation questions

A4.1 When responding to this consultation, respondents are asked that they do so by providing answers to the questions which are listed below.

A4.2 In answering these questions, respondents are also advised to consider the analysis included in this consultation.

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.

Section 5 Choice of technology

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

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.

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.

Section 8 Conclusions and next steps

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

Annex 5

How portability works

Introduction

A5.1 The way in which portability works (i.e. its technical implementation) in both fixed and mobile sectors underpins the costs which are incurred by CPs in its provision.

A5.2 In this Annex we describe:

- onward routing (including porting agreements and service establishment); and
- direct routing.

Onward routing

Onward routing scenarios

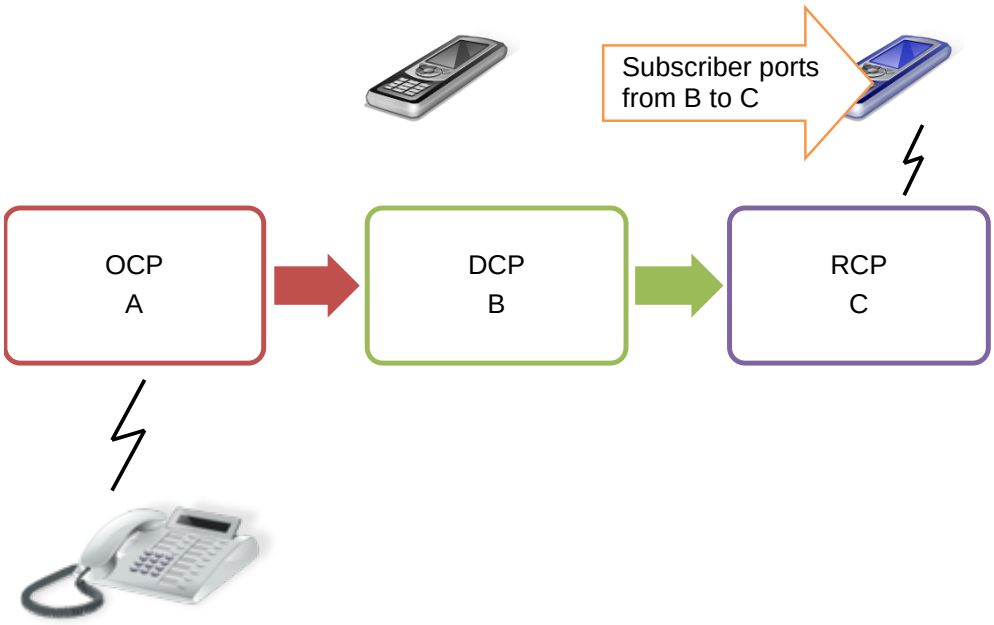
A5.3 In the UK we have a technical solution commonly referred to as 'onward routing'.[134] Although the way in which onward routing is technically implemented is different as between geographic, non-geographic and mobile porting, the principles of this approach are common and are described below.

A5.4 When a subscriber makes a call to a ported fixed-line or mobile telephone number, the call is first routed to the CP which originally held that number (the donor CP (DCP) or number range holder) and that DCP then 'onward routes' the call to the CP to whom the number has been ported (the recipient CP (RCP) or gaining provider).

A5.5 This is illustrated in Figure A5.1 below, showing three different networks: the originating CP (OCP) where the call to a ported number is made; the DCP who originally held the number before the subscriber first ported-out; and the RCP who currently serves the called customer having ported-in the telephone number.

[134] To date, the UK has not changed the technical approach to providing portability since its introduction although this issue has been considered several times over the last ten years or so.

Figure A5.1: Onward routing for calls to ported numbers



Source: Ofcom.

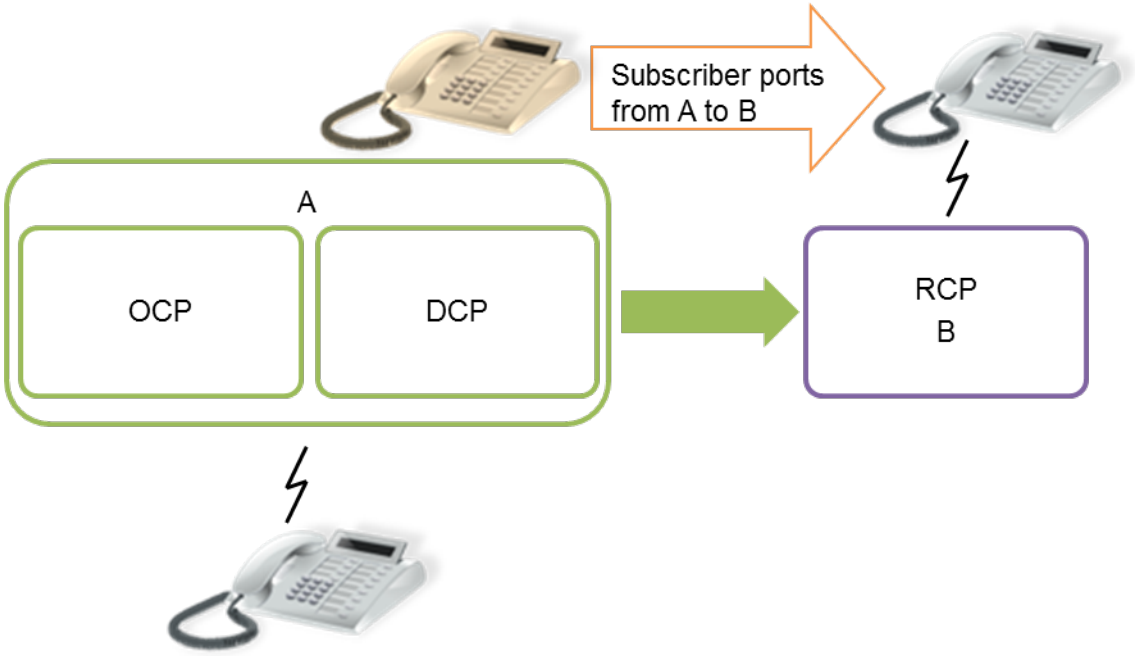
A5.6 Generally, for onward routed calls, the OCP does not know that a particular dialled number has been ported. An exception to this is when the dialled number was originally held by the OCP. In this case the OCP is also effectively the DCP. These cases are referred to as 'on-net calls' to a ported number.

A5.7 For on-net calls, once the OCP (also the DCP) identifies the called number as ported-out to a particular RCP, the call is routed to the RCP in much the same way as a call to a non-ported number from one network to another.

A5.8 Unlike the scenario above where the DCP, in effect, acts as a transit provider between the OCP and RCP, in the case of on-net originated calls to ported numbers, the costs the DCP incurs in originating and paying for the termination of the call to the RCP are recoverable through the DCP's retail charges i.e. like any 'normal' call.

A5.9 This scenario is illustrated in Figure A5.2 below.

Figure A5.2: On-net calls to ported numbers



Source: Ofcom

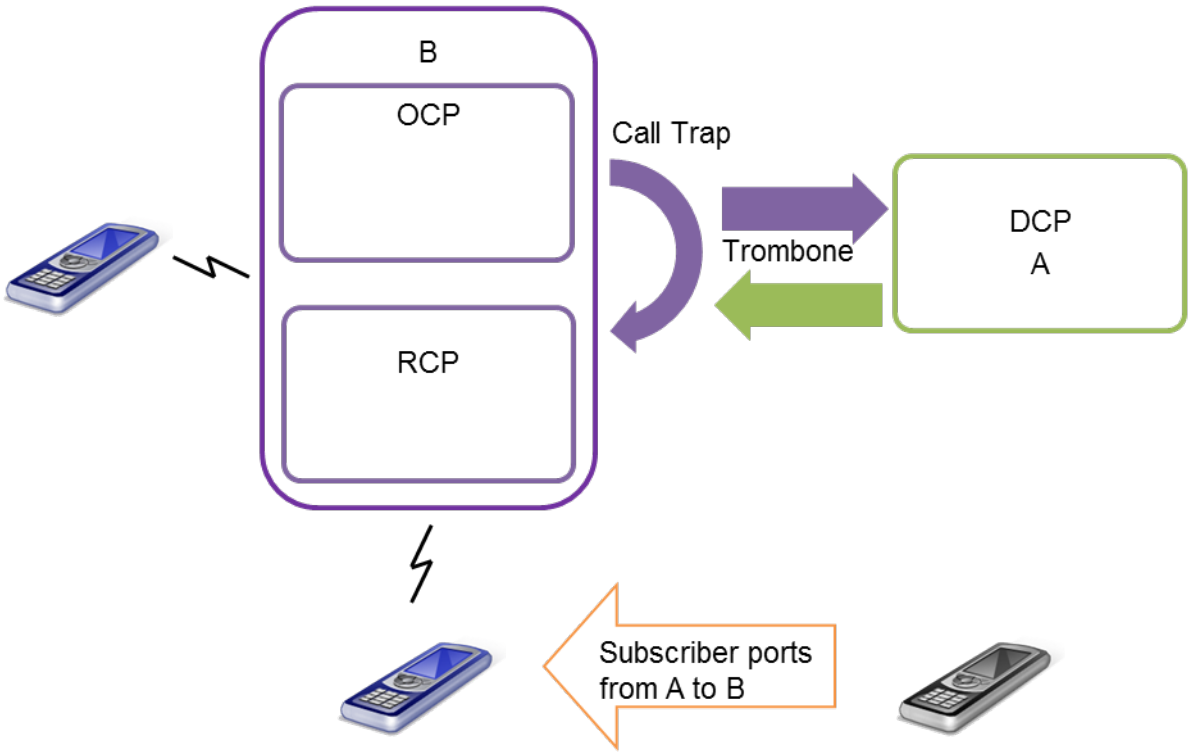
A5.10 A further type of ported call occurs when the OCP is also the RCP (i.e. the calling party has dialled a number that has been ported onto the same network). Some CPs have chosen to implement the means to check when this has occurred – a function known as Call Trap.[135]

A5.11 Call Trap enables the OCP (which is also the RCP) to complete the call to a ported-in number without routing it to the DCP and back again (which we refer to as 'tromboning'). By introducing Call Trap the OCP/RCP can avoid paying porting conveyance charges on calls originated on-net to numbers which it has ported in.

A5.12 This is illustrated in Figure A5.3 below which shows how Call Trap avoids traffic being tromboned via DCP A.

[135] In the case of geographic number portability, trapping calls which originate in the recipient's exchange to a number which has been ported-in to the same exchange, forms part of the agreed technical solution described in the relevant Network Interoperability Consultative Committee (NICC) Service Description. The NICC is a technical forum for the UK communications sector that develops interoperability standards for public communications networks and services in the UK. It is an independent organisation owned and run by its members.

Figure A5.3: Call Trap and tromboned traffic



Source: Ofcom

A5.13 Where a subscriber subsequently ports from one RCP (X) to another RCP (Y), the DCP modifies its systems so that calls are onward routed to RCP Y instead of RCP X. The various routing arrangements described above continue to apply.

A5.14 Where a subscriber ports back from an RCP to the DCP the number becomes un-ported (sometimes referred to as 'return to donor'). The various routing arrangements described above no longer apply.

A5.15 More technical details for porting geographic, non-geographic and mobile telephone numbers are described in NICC Service Descriptions 1203, 1207 and 1208 which are publically available at http://www.niccstandards.org.uk/publications/service-desc.cfm.

Commercial porting agreements and service establishment

A5.16 Before a subscriber number can be ported between any two CPs, the DCP and RCP need to establish a porting service both commercially and technically to facilitate onward routing as described above.

A5.17 A commercial porting agreement may be part of an existing or new interconnect agreement or a free standing contract. The bilateral agreement may cover porting of numbers including various charges between the two networks in both directions or in one direction only.[136] Where the two networks are not directly interconnected, they will need to establish a commercial agreement with a third-party network (e.g. BT) with whom both have an existing interconnect agreement to provide a transit

[136] Other porting agreements may only cover subsequent porting (i.e. the porting of a third party donor's numbers between two RCPs) to support the order handling relationship.

portability service. In these circumstances, the two networks still require a commercial agreement with each other to support the order handling relationship.

A5.18 Service establishment concerns the planning, building and testing of the technical arrangements for porting. Common to service establishment for fixed-line and mobile portability is the use of porting prefixes (codes allocated by Ofcom specifically for routing calls to ported numbers[137]) which are used to identify and route ported calls from the donor to the recipient network or particular nodes in the recipient's network.

Direct routing

A5.19 There is an alternative to onward routing known as direct routing[138], whereby the OCP routes calls to ported numbers direct to the serving RCP rather than onward routing calls to the RCP via the DCP.

A5.20 Where a direct routing solution is implemented the OCP identifies that the telephone number, dialled by their calling subscriber, has been ported and to whom, and routes the call to the RCP as it would a non-ported call to that CP.[139]

A5.21 One way of facilitating this type of porting solution is for CPs to update their own routing information on a regular basis by reference to a shared common database[140] to which CPs register and maintain up-to-date details of numbers that have been ported and to whom.[141]

A5.22 Other countries have generally chosen to implement number portability[142] using direct routing solutions, rather than onward routing. Ofcom has previously considered requiring direct routing in the UK and assessed the costs and benefits thereof. Our most recent assessment was carried out in 2008-10[143] in which we concluded that regulatory intervention was not appropriate. However, there is no regulatory impediment to CPs choosing to implement a direct routing solution.

[137] As provided for in the *National Telephone Numbering Plan* published by Ofcom at http://stakeholders.ofcom.org.uk/binaries/telecoms/numbering/Numbering_Plan_Dec_2013.pdf
[138] Further information on network architectures and solutions to support fixed number portability are described in the European Telecommunications Standards Institute (ETSI) Technical Report TR 101 118 v1.1.1 (1997-11) at http://www.etsi.org/deliver/etsi_tr/101100_101199/101118/01.01.01_60/tr_101118v010101p.pdf
[139] i.e. over direct interconnection links or via a transit provider.
[140] Whether run by a third party vendor or by the CPs who have implemented porting.
[141] We describe here a solution commonly known as all-call-query. There are other types of 'direct-routing' solutions which rely on the DCP providing the OCP with the relevant routing information on a call-by-call basis e.g. call drop-back or query-on-release.
[142] Most counties implemented number portability more recently than the UK.
[143] Ofcom's consultation and statement on *Routing calls to ported telephone numbers* is available at http://stakeholders.ofcom.org.uk/consultations/gc18_routing/