OFFICE OF COMMUNICATIONS

Draft Determination to resolve Dispute between Opal Telecom and BT about BT's Average Porting Conveyance Charge

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Draft Determination

Publication date: 29 October 2009

Contents

Section 1

Summary

1.1 This dispute is between Opal Telecom Limited ("Opal")[1] and British Telecommunications plc ("BT"). It relates to the manner in which non-BT originated, fixed line calls to geographic telephone numbers, which BT has ported-out to Opal, are transited across BT's network and handed over to Opal, and how related costs are borne. Opal wants BT to hand over these calls at the relevant BT Digital Local Exchange ("DLE") where Opal is interconnected with BT's network and submitted a Statement of Requirements ("SOR") to BT to this effect. While BT confirmed that a DLE Handover solution was technically possible, it stated that this could only be offered to Opal provided that Opal paid for the system development costs necessary to enable BT to implement DLE Handover. Opal rejected BT's proposal in response to the SOR on the grounds that BT should be required to cover the costs of providing DLE Handover pursuant to its obligations under General Condition 18 ("GC 18") of the General Conditions of Entitlement (the "General Conditions")[2] relating to number portability. As the parties have been unable to reach agreement on this, Opal brought this dispute to Ofcom for resolution.

1.2 Number portability is the facility that allows subscribers to keep the same telephone number when they change provider. Under the current arrangements, when a customer ports their fixed line telephone number from one fixed network provider (the "donor provider", here, BT) to another fixed network provider (the "recipient provider", here, Opal), calls to that telephone number will still be routed across the donor provider's network before terminating on the recipient provider's network.

1.3 Pursuant to GC 18, the donor provider is required, among other obligations, to provide portability to the recipient provider on reasonable terms, including charges (GC 18.2). The donor provider is not permitted to charge for certain system set-up costs or additional conveyance costs, as defined in GC 18.5[3]. The donor provider is, however, permitted to charge the recipient provider for its onward routeing costs when it receives a call originating on a third party network destined for termination on a number ported-out to the recipient provider[4]. In respect of fixed networks, this charge is known as the Average Porting Conveyance Charge ("APCC"). Any charges by the donor provider for the provision of portability must, subject always to the requirement of reasonableness, be cost oriented and, unless agreed otherwise between the donor provider and recipient provider or directed by Ofcom, be based on the incremental costs of providing portability.

1.4 On 1 July 2009 we received a submission from Opal arguing in essence that BT's APCC does not comply with GC 18.2 because it is not reasonable or cost oriented. Opal argued that BT's APCC is not based on the most efficient routeing method in BT's network and thus is based on inefficiently incurred costs. In order to comply with GC 18, Opal believes that the APCC must reflect the lower costs that can be achieved if ported calls are handed over at the DLE. Opal therefore requested that

[1] Opal is a wholly-owned subsidiary of Talk Talk Group Ltd and, ultimately, the Carphone Warehouse Group PLC.
[2] http://www.ofcom.org.uk/telecoms/ioi/g_a_regime/gce/
[3] Please note that this is numbered 18.8 in the most recent published consolidated version of the General Conditions, as at 16 September 2009; however, it should in fact be numbered 18.5; we therefore refer to GC 18.5 in this document, rather than 18.8.
[4] A charge is not recoverable for calls to ported numbers which originate on the donor provider's own network.

Ofcom make a determination requiring that BT hand over calls to ported numbers at the relevant DLE where Opal is interconnected with BT's network ("DLE Handover").

1.5 BT argues that its APCC is based on an efficient routeing method. Therefore it considers that it is compliant with GC 18 and is not required to offer DLE Handover to Opal.

1.6 Sections 185 to 191 of the Communications Act 2003 ("the 2003 Act") set out Ofcom's dispute resolution powers. They apply to disputes relating to the provision of network access and to other disputes relating to the rights and obligations conferred or imposed by or under Part 2 of the 2003 Act. Section 186 of the 2003 Act requires Ofcom to resolve a dispute referred to it under section 185 once it has decided in accordance with section 186(2) that it is appropriate for it to handle the dispute. We have decided that it is appropriate for us to handle this dispute.

1.7 The scope of this dispute is:

a. Whether BT should be required to hand over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant DLE; and if so

b. Whether BT should be required to bear any resulting costs that are relevant and/or necessary; and

c. For the purpose of giving effect to the above, whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment.

1.8 We have considered within the scope of this dispute whether Opal's proposed solution (DLE Handover) would be more efficient than BT's current routeing, such that BT should be required to offer it in order for its APCC to comply with GC 18.

1.9 In order to determine whether BT has met its obligations under GC 18, we have adopted the following approach:

a) In our view the primary issue is whether Opal's proposed solution, DLE Handover, would be more cost efficient than BT's current routeing (which is reflected in the current APCC), such that we should require BT to offer DLE Handover in order to comply with its obligations under GC18 to ensure that its charges are reasonable and cost oriented in the sense of being cost efficient. We have therefore assessed the costs of DLE Handover relative to the costs of BT's current routeing;

b) We have also considered additional factors that may be relevant:

i) Payments that are or would be made by the parties under BT's current routeing and DLE Handover;

ii) Potential wider impact on other stakeholders;

iii) Benchmarks (including BT's routeing method for non-ported calls to Opal); and

iv) Arguments put to us by Opal in terms of the six principles of pricing and cost recovery.

1.10 In addition, we have reached our provisional conclusion guided by our general statutory duties and Community obligations under sections 3 and 4 of the 2003 Act.

1.11 We have provisionally concluded that the status quo should remain, such that BT is not required to hand over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant DLE where Opal's network is interconnected with BT's network. We have come to this provisional conclusion on the basis of the evidence provided by the parties.

1.12 As regards the analysis of cost differences between BT's current routeing solution and DLE Handover, we note that the evidence available to us is insufficient to make a definitive assessment. We have not therefore been able to test to a sufficiently robust degree whether Opal's efficiency claims as regards DLE Handover are correct. Using the evidence provided to us by the parties, and making adjustments for which we have some supporting evidence, our analysis suggests that DLE Handover is higher cost than BT's current routeing solution, if we take account of the proposed introduction of additional CSI links (which will remove or substantially reduce the costs of inter-tandem conveyance in the current routeing solution). However, we have only been able to take account of the evidence provided by BT, as Opal has not provided us with cost estimates (despite our requests).

1.13 Similarly, there is insufficient information and clarity regarding resulting charging arrangements on DLE Handover and the potential wider impact on stakeholders.

1.14 On that basis, our provisional view is that it would not be appropriate or reasonable for us to require BT to provide DLE Handover to Opal, and so the status quo should remain. Consequently, it is not necessary to consider whether BT must bear any resulting costs that are relevant or required to implement DLE Handover; nor is it relevant to consider whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment of overpayment.

1.15 The background to this dispute is set out in **section 2;** the history to this dispute is set out in **section 3**; and Ofcom's analysis and reasoning underpinning the draft determination is set out in **section 4**. Ofcom's main statutory duties and regulatory principles are set out in **Annex 4**.

Section 2

Introduction and background

Dispute resolution

Ofcom's duty to handle disputes

2.1 Section 185(1)(a) of the Communications Act 2003 ("the 2003 Act") provides (in conjunction with section 185(3)) that in the case of a dispute relating to the provision of network access between different communications providers, any one or more of the parties to such a dispute may refer it to Ofcom.

2.2 Section 186 of the 2003 Act provides that where a dispute is referred to Ofcom in accordance with section 185, Ofcom must decide whether or not it is appropriate to handle it. Section 186(3) further provides that Ofcom must decide that it is appropriate for it to handle a dispute unless there are alternative means available for resolving the dispute, a resolution of the dispute by those means would be consistent with the Community requirements set out in section 4 of the 2003 Act, and those alternative means would be likely to result in a prompt and satisfactory resolution of the dispute.

2.3 In summary therefore, where a dispute which falls within section 185(1)(a) of the 2003 Act is referred to Ofcom, and Ofcom cannot identify alternative means which meet the criteria set out above, it has a duty to decide that it is appropriate to handle that dispute.

2.4 Section 188 of the 2003 Act provides that where Ofcom has decided that it is appropriate for it to handle a dispute, Ofcom must make a determination resolving the dispute within four months, except in exceptional circumstances.

Ofcom's powers when determining a dispute

2.5 Ofcom's powers in relation to making a dispute determination are limited to those set out in section 190 of the 2003 Act. Except in relation to a dispute relating to the management of the radio spectrum, Ofcom's main power is to do one or more of the following:

a) Make a declaration setting out the rights and obligations of the parties to the dispute;

b) give a direction fixing the terms or conditions of transactions between the parties to the dispute;

c) give a direction imposing an obligation to enter into a transaction between themselves on the terms and conditions fixed by Ofcom; and

d) give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment, in respect of charges for which amounts have been paid by one party to the dispute, to the other.

2.6 A determination made by Ofcom to resolve a dispute binds all the parties to that dispute (section 190(8) of the 2003 Act).

Ofcom's duties when determining a dispute

2.7 The dispute resolution provisions set out in sections 185-191 of the 2003 Act are functions of Ofcom. As a result, when Ofcom resolves disputes it must do so in a manner which is consistent with both Ofcom's general duties in section 3 of the 2003 Act and (pursuant to section 4(1)(c) of the 2003 Act) the six Community requirements set out in section 4 of the 2003 Act, which give effect, among other things, to the requirements of Article 8 of the Framework Directive[5].

Dispute referred to Ofcom by Opal

2.8 This dispute relates to how calls to telephone numbers ported from BT to Opal which are transited across BT's network are handed over to Opal and how related costs are borne. The remainder of this section provides background to the regime for porting telephone numbers and the facility by which calls to ported numbers are delivered to Opal via transit across BT's network. It also sets out the mechanism by which BT charges Opal for this facility.

Requirement to provide portability

2.9 Number portability is the facility that enables subscribers to keep their telephone number(s) when they switch Communications Provider ("CP"). It is recognised as a key facilitator of consumer choice and effective competition.

2.10 European Union Member States are required to ensure the provision of number portability to subscribers of publicly available telephone services pursuant to Article 30 of the Universal Services Directive[6]. Powers to enable Ofcom to set conditions requiring CPs to provide number portability are set out in section 58 of the 2003 Act. Obligations imposed on CPs in the UK to provide number portability to their subscribers and to provide portability to other CPs are set out in General Condition 18 (Number Portability) of the General Conditions of Entitlement ("GC 18").[7] Ofcom has powers to enforce any breach of that Condition under sections 94 to 103 of the 2003 Act.

Delivery of portability

2.11 The majority of Opal's customers have numbers ported from BT. When a subscriber of a CP other than BT makes a voice call to one of these numbers, rather than the call being routed directly to Opal, it is first routed to BT.

2.12 The reason that calls do not get sent directly to Opal is because the CP from which the call has originated (the originating CP or "OCP") is generally unable to tell whether or not the telephone number its subscriber has called is a telephone number that has been ported.

2.13 Once a call from the OCP has been received by BT (as the CP from which the number was originally ported, or "donor provider"), it will then route the call onwards to Opal (the "recipient provider").

2.14 Put another way, portability is the facility that allows subscribers who have requested number portability to continue to be provided with a telephony service. Calls to ported telephone numbers may be routed directly between originating, donor and recipient

[5] Directive 2002/21/EC.
[6] Directive 2002/22/EC.
[7] http://www.ofcom.org.uk/telecoms/ioi/g_a_regime/gce/ (see also Annex 6 of this document).

providers where they are directly interconnected or they may be routed indirectly via a transit provider. In this case, BT and Opal are interconnected directly as donor and recipient provider.

Route taken to deliver calls to ported numbers

2.15 The calls relevant to this dispute are from a CP other than BT or Opal itself to fixed, geographic telephone numbers (e.g. calls to London numbers which begin with the code 020) ported to Opal from BT. Since an OCP does not generally know whether a called telephone number has been ported or not, the first part of the delivery of the call will be treated in the same way as any other call from its network to the donor provider's network. In the case of calls to a fixed, geographic number the delivery will usually conform with the principle of 'far end hand-over'. This means that the network on which the call originates will generally seek to transport the call over its own network to a point of connection as close as possible to where it is thought the call will be terminated (that is, the destination of the call).

2.16 Most calls to BT fixed geographic numbers are handed over to BT for termination at the Digital Local Exchange ("DLE") on which the called number is hosted[8].Where a call to a ported number is received at the relevant (host) BT DLE, it is identified by that DLE as a call to a number that has been ported to another network, with the destination of the ported call identified by a routeing prefix. BT then transports the call from its DLE to its tandem switch (a switch that is 'higher' in BT's network architecture) and routes it onward to the point in its tandem layer where it connects with the recipient network.

2.17 There are some calls to geographic numbers that are handed over to BT not at the DLE level, but directly at its tandem switches. These calls are routed to the DLE on which the number is expected to be hosted during 'call set-up'. Where the call is determined as being a call to a ported number, the call is then dropped back to the tandem switch with the routeing prefix identifying the recipient network. It is then onward routed to the point of interconnect at BT's tandem layer[9]. For clarity, this dispute does not concern calls that are handed over to BT at its tandem layer, but only those that are handed over at its DLEs.

Charges for portability

2.18 As set out in paragraphs 2.11 to 2.14 above, when a customer ports their fixed line telephone number from one fixed network provider to another fixed network provider, any calls to that telephone number will still be routed across the donor provider's network before terminating on the recipient provider's network. Pursuant to GC 18, BT, as the donor provider, is required to provide portability to the recipient provider on reasonable terms, including charges. Any charges by the donor provider for the provision of portability must, subject always to the requirement of reasonableness, be cost oriented and, unless agreed otherwise between the donor provider and recipient provider or directed by Ofcom, be based on the incremental costs of providing portability. The donor provider is not permitted to charge for certain system set-up costs or additional conveyance costs, as defined in GC 18. The charge set by BT for providing portability is known as the Average Porting Conveyance Charge ("APCC"). As the APCC amounts to a charge for the provision of portability on the basis that it is

[8] The host DLE is the DLE serving the telephone number before it was ported.
[9] In such cases, the routeing essentially acts as a signalling query; BT does not levy a conveyance charge for this element as it is an Additional Conveyance Cost under GC 18.5 and may therefore not be recovered.

a charge levied by the donor provider for providing portability to the recipient provider, the APCC is subject to the requirements set out in GC 18.

The APCC

2.19 The concept of APCCs was first discussed in a determination of March 1998[10] issued by the Director General of Telecommunications concerning BT's costs and charges for *non-geographic* number portability. In this the Director General considered "…that a transit charge would be incurred anyway if operators were to use a transit operator to convey non-ported calls - a transit charge may therefore be made for the call whether it is to a ported or non-ported numbers" and that "BT may recover these costs in the normal manner…"[11]. APCCs were extended to include *geographic* portability in an Oftel statement of 31 May 2002[12] (the "2002 determination"), in which the Director General considered it reasonable for BT to recover average porting conveyance costs for geographic portability because such costs are "similar to those that BT would incur if acting as a transiting operator for a non-ported call".[13]

2.20 Therefore, in essence, the APCC levied by the donor operator compensates the donor operator for acting as a "transit operator" for ported calls under GC 18. This means that the donor operator can recover from the recipient operator the costs incurred for transiting a call between the originating and the recipient network. Thus, in this case, BT's APCC is intended to recover the costs it incurs for the conveyance of non-BT originated calls to numbers ported to Opal that would be similar to those BT would incur if acting as a transit operator for a non-ported call.

2.21 The APCC that BT charges Opal is thus calculated on the basis of the costs of the elements within the BT network that are used in conveying ported calls that originate on OCPs' networks to Opal. As illustrated by Figure 1 below, these calls may be handed over from an OCP to BT at either the local layer (at the DLEs) or the tandem layer. For calls handed over at the local layer (1 in Figure 1), BT currently routes this traffic (aggregated with its own originated traffic) up to its tandem layer which comprises a number of Next Generation Switches ("NGS"). This traffic and traffic received at the tandem layer (2 in Figure 1) is then routed on to a point of interconnect with Opal at the BT tandem layer (3 in Figure 1 below).

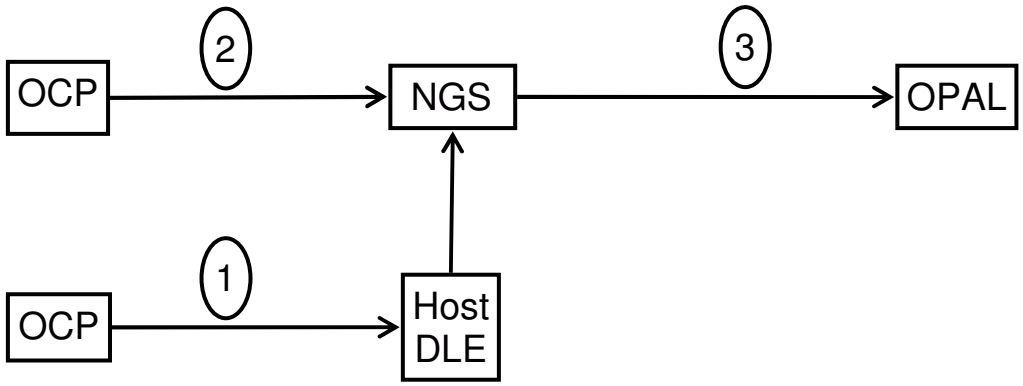
[10] March 1998 determination of BT's non-geographic number portability costs and charges at http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/numbering/nport398.htm

[11] See paragraph 8.3 of the March 1998 determination of BT's non-geographic number portability costs and charges

[12] 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, 31 May 2002 http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/2002/nupo0502.pdf

[13] see paragraph 8.1 of the 2002 determination http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/2002/nupo0502.pdf

Figure 1 Diagram showing routes by which ported calls are routed to Opal



2.22 In summary, the costs incurred by BT are:

a) For calls handed over at the DLEs: switching costs at the DLE (described as Local Exchange Processor or "LEP" costs), plus local-tandem conveyance costs ("LTC" – the route shown as the arrow from Host DLE to NGS in Figure 1 above, i.e. the costs of conveying a call from the DLE to the tandem layer), plus costs incurred in relation to BT's policy, planning and product management activities ("PPP"); and

b) For calls handed over at the NGSs: switching costs at the NGS, costs of interconnection circuits between NGSs and Opal's network, plus PPP costs.

2.23 As set out in paragraph 2.16 above, most calls to BT are handed over at the DLE layer. As an average for industry, around 73.3% of all traffic is handed over to BT's DLEs (and thus around 26.7% is handed over to BT at the tandem layer). By applying this industry average ratio to the costs above, an industry-average cost for routeing ported traffic is calculated. This rate is then applied to all non-BT (i.e. OCP) originated minutes of call traffic to calculate the cost of conveyance up to and including one NGS.

2.24 However, if not all NGSs are interconnected to the recipient CP, for the purpose of terminating ported traffic, some conveyance across more than one tandem layer switch of the BT network will be necessary. This incurs inter-tandem conveyance ("ITC") costs (that is, costs for carrying call traffic from one tandem switch to another) and any ITC charges based on such costs will be CP specific, based on the number of traffic minutes using each variant of ITC (short, medium and long) and the charge applied to each of these.

2.25 The APCC paid by Opal therefore comprises the industry average charge applied to all non-BT originated minutes of call traffic, added to any Opal-specific ITC charges. Since it is not possible, at the point of handover, to identify the origin of traffic (BT or non-BT), the cost is recovered across all minutes of call traffic. However, even though the charge is also levied on BT originated calls, it is important to note that the overall cost recovered is intended to equal that incurred on the non-BT originated traffic only.

2.26 The APCC for Opal has been subject to a series of increases. BT has explained these prices increases as follows. Up to 31 October 2008, a single, average, industry-wide APCC was applied. This did not include all costs. Costs such as ITC,

as discussed above, and/or extra costs related to porting of out-of-area lines[14] were excluded. BT updated the APCC charged to all CPs on 1 November 2008 to account for the costs which had not been included. This increased Opal's rate as its interconnection architecture arrangements with BT included a significant level of ITC charges incurred. This rate was further updated on 1 April 2009 to take account of BT's updated traffic data, as per the standard process for setting APCCs. Finally, on 1 June 2009 BT raised the level of the APCC again. This final increase arose because previously BT had treated certain traffic as BT originated when, in reality, it should have been treated as non-BT originated. In particular, traffic from customers connected to BT's network but routed via a different CP using Carrier Pre Selection (CPS) or Indirect Access (IA) was previously counted as BT traffic. The rate from 1 June 2009 accounts for this traffic as non-BT originated.

[14] An out-of-Area exchange lines are those which connect customers to the Public Switched Telephone Network (PSTN) via is assigned a telephone exchange which would phone number with an area code not normally provide a service to that customer's location associated with the end-user's locality.

Section 3

History of the dispute

3.1 According to the evidence submitted by the parties, Opal first wrote to BT in September 2007 when BT issued NCCN 811[15] setting out its intention to raise the APCC for Opal and other operators. After correspondence between the parties, on 4 June 2008 Opal submitted a request to Ofcom that we resolve a dispute between it and BT about NCCN 885 which contained a revised APCC applicable to Opal and other operators from 1 May 2008, at the heart of which was Opal's view that where BT receives calls at the relevant DLE, BT should hand over these calls to Opal at the DLE where it is directly interconnected rather than routeing to the tandem layer. On 1 July 2008, Ofcom rejected the dispute because it considered that commercial negotiations had not been exhausted and encouraged Opal to submit a Statement of Requirements ("SOR") to BT for the handover of ported calls at the DLE.

3.2 On 7 July 2008, Opal submitted to BT an SOR for the delivery of ported calls (specifically calls that originate on a non-BT network where the calls are to numbers ported from BT to Opal) to Opal's network at the DLE (i.e. "DLE Handover" as described in paragraph 3.13 below). On 25 November 2008, BT wrote to Opal to confirm that it had completed a feasibility study of Opal's SOR, offering a solution that provided DLE Handover for BT-originated and CP-originated calls using Opal-owned DLE routes[16]. BT advised that the changes required to its network to enable DLE Handover would create indicative costs of around £[✂] that would be chargeable to Opal. In a subsequent meeting between the parties on 11 December 2008, Opal advised that it was not going to accept BT's offer and the parties' discussions included reference to a potential referral to Ofcom if a solution could not be found. Opal's confirmation of its refusal was provided by email to BT dated 18 December 2008, in which Opal advised that its reason for refusing was that it did not believe that "the solution costs of this magnitude should be to [Opal's] account".[17]

3.3 Subsequent dialogue between the parties failed to conclude on a process for introducing a solution in response to Opal's SOR and in an email of 11 May 2009, Opal signalled to BT its intention to dispute the APCC.[18]

3.4 On 1 July 2009 Opal submitted a dispute to Ofcom (the "Submission"). Opal stated that BT's response to the SOR had not presented a solution that was commercially viable or compliant with GC 18 (in that it required Opal to pay for the system development of BT's network). Opal considered that the parties had now exhausted commercial negotiations on this matter.

3.5 In the Submission, Opal argues in essence that BT's current APCC does not comply with GC 18 on the grounds that it is not reasonable or cost-oriented, because it is not based on the most efficient routeing method in BT's network and therefore not based

[15] Network Charge Change Notice – a notice from BT to other CPs stating its intention to change a specific charge for use of its network, including the APCC.
[16] 'Opal-owned DLE routes' referred to the use of Opal-owned interconnect circuits between BT's DLEs and Opal's network. As part of this solution BT advised that if relevant, it would incur VIC (Virtual Interconnection Circuits) capacity usage as a consequence.
[17] Email from Chris Stocks (Carphone Warehouse Networks) to Richard Jones (BT), 18 December 2008
[18] Email from Chris Stocks (Carphone Warehouse Networks) to Richard Jones (BT), 11 May 2009 in which C Stocks states that "[Opal] will be disputing the charges as BT has not taken steps to route efficiently"

on efficiently incurred costs.[19] According to Opal, conveyance costs that are inefficiently incurred cannot by definition be said to be reasonable or cost-oriented. Opal considers that its proposed portability solution, based on DLE Handover, is a more efficient solution than the current one offered by BT (the "Current Solution"), and, if implemented, would result in a lower APCC. Opal therefore considers that BT should be obliged to offer it in order to comply with GC 18.

3.6 On 3 July 2009 we sent a non-confidential copy of Opal's Submission to BT for its consideration asking BT to comment on the scope of the dispute. On 10 July 2009, BT provided a response providing background to the matters raised by Opal's Submission and its representations on the scope of the dispute.

3.7 Having considered the parties' submissions and subsequent information, our view was that the dispute is a dispute between two CPs about network access, falling within section 185(1)(a) of the 2003 Act; that it would appear that the parties have exhausted commercial negotiations and are therefore in dispute; and that it is not clear that any appropriate alternative means to resolve the dispute are available.

3.8 While BT argued that commercial negotiations with Opal had not been exhausted and that discussions concerning DLE Handover were part of wider, on-going discussions between the parties concerning interconnection and number portability, BT could not confirm that both parties had understood that such ongoing discussions captured the matters raised in Opal's submission to Ofcom. Ofcom therefore decided that the parties had exhausted commercial negotiations in this matter.

3.9 On 23 July 2009 Ofcom decided it was appropriate for it to handle the dispute and opened an investigation into the dispute.

Opal's Dispute Resolution Request

Current delivery of calls ported to Opal

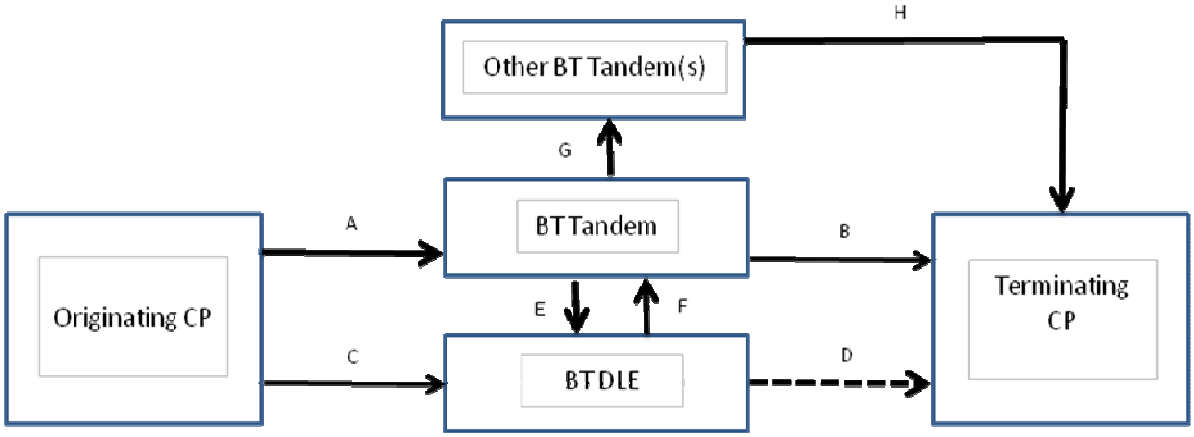
3.10 In its Submission, Opal set out that BT's routeing of non-BT originated (i.e. from other CPs), fixed geographic calls to numbers ported to Opal firstly depends on whether the OCP hands calls over at the BT tandem layer or at the BT DLE. These are shown as (A) and (C) respectively in Figure 2 below.

3.11 Opal explained that calls received by BT at its tandem layer (via (A) in Figure 2 are routed via (E) and (F) before being passed onto the terminating CP (i.e. the recipient provider) via (B). Meanwhile, calls handed over to BT at its DLE (via (C) in Figure 2) are passed to the tandem layer via (F) and then across to the terminating CP via (B).

3.12 Opal added that BT may choose to route the call across more than one tandem layer before handing the call over to the terminating CP (routes (G) and (H) in Figure 2).

[19] Opal argues that GC 18.2 requires the APCC to be reasonable, cost-oriented "and reflective of the most efficient routeing method" in the donor provider's network.

Figure 2 Opal's diagram: Routeing of calls to ported numbers via BT's network



Efficient delivery of calls ported to Opal

3.13 In its Submission, Opal explained that it is only calls handed to BT at the DLE that are subject to this dispute (route (C) in Figure 2). Opal's view is that for these calls, BT should be required pursuant to GC 18 to hand them over to Opal at the DLE at which BT has received them (route (D) in Figure 2), which we refer to in this document as "DLE Handover".

3.14 In Opal's view, BT should be required to provide DLE Handover as it offers a more efficient routeing of ported calls than the existing routeing of these calls. Opal asserts that where the terminating CP is interconnected with the BT network at the same DLE, calls should be handed over at that DLE. Opal considers that routeing calls up to the BT tandem layer instead (as BT currently does) is inefficient, with the result that the APCC is based on inefficiently incurred costs and is thus unreasonable.

3.15 Opal explained that it is interconnected at "virtually every" DLE in BT's network and would therefore be able to receive almost all calls to ported numbers over these interconnect circuits. Further, Opal advised that BT had confirmed that DLE Handover would be technically possible, but in order to deliver this BT would require system developments to its network costing in the region of £[✂] which Opal should pay for.

Costs of inefficient delivery of calls ported to Opal

3.16 Opal explained that BT's calculations for the APCC include "local layer costs", part of which are local-tandem conveyance ("LTC") costs (as set out in paragraph 2.22 above). Opal argues that as LTC costs would be avoided by BT on DLE Handover (as calls would not have to be routed to the tandem layer), the APCC would be reduced significantly, by "[✂]" per annum[20].

[20] Opal's Dispute Request states that this calculation is based on the APCC of 1 May 2009, with Opal's estimate of the conveyance costs of (F) in Figure 2 and using the current number of minutes terminated on Opal's network.

Opal's view of the regulatory basis for requiring DLE Handover

3.17 In its Submission, Opal stated its view that BT is failing to comply with its regulatory obligations under GC 18 as BT's current routeing mechanism means that the current APCC charged to Opal is not reasonable or cost-oriented.

3.18 Our understanding of Opal's stated view is that:

a) The APCC must reflect the lower costs achieved by DLE Handover. The provisions of GC 18.2(a) require charges to be reasonable, cost oriented and based on the incremental costs of providing portability. Opal considers that for BT's APCC to satisfy this test, it must represent efficiently incurred conveyance costs based on efficient routeing. Opal considers that BT's current routeing is not as efficient as its proposed method of DLE Handover would be, and so BT's APCC (based on its current routeing method) cannot meet the requirements of GC 18.2(a);

b) The LTC element of BT's APCC constitutes an Additional Conveyance Cost, which BT is prevented from recovering pursuant to GC 18.2(b). In support of this, Opal cites a section of a statement on portability by the Office of Telecommunications (Oftel) in which Oftel explained the objective of a specific reference to Additional Conveyance Costs was to ensure cost minimisation by "*encouraging operators to minimise additional conveyance and thus adopt the most efficient routeing method of providing portability*";[21]

c) Opal argued that because it considers the LTC charge to constitute an Additional Conveyance Cost, BT should (i) not be entitled to include LTC costs in the APCC and (ii) should be required to route calls using DLE Handover in order to comply with GC18.2. In order to comply with its regulatory obligations under GC18.2, Opal considered that BT should therefore also bear all the costs involved in offering DLE Handover, including any necessary system development costs as in Opal's view, these constitute System Set-Up Costs as defined by GC18.5, for which (pursuant to GC18.5) BT is not entitled to charge.

The six principles of pricing and cost recovery

3.19 As part of its Submission, Opal submitted its views on how Ofcom's six principles of pricing and cost recovery are applicable when assessing whether DLE Handover is fair and reasonable between the parties. These principles were developed by Oftel in the context of number portability, endorsed by the Monopolies and Mergers Commission[22] and have subsequently been used by Ofcom in analysing various pricing issues.[23] The six principles of pricing and cost recovery are:

[21] Numbering directive: Number portability requirements, Oftel, January 2000, paragraph 2.9. See: www.ofcom.org.uk/static/archive/oftel/publications/numbering/port0100.htm

[22] Telephone Number Portability: A Report on a reference under s13 of the Telecommunications Act 1984 (MMC, 1995).

[23] See for example 'Determination under Section 190 of the Communications Act and Direction under Regulation 6(6) of the Telecommunications (Interconnection) Regulations 1997 for resolving a dispute between Orange Personal Communications Services Ltd. and BT concerning the cost sharing arrangements for CSI links connection and rental charges', 19 November 2003. See also 'Direction concerning ADSL Broadband Access Migration Services and a Draft Determination to resolve a dispute between Tiscali, Thus and BT concerning ADSL Broadband Access Migration Services', both 9 August 2004; Determination to resolve a dispute between BT and Telewest about geographic call termination reciprocity agreement, June 2006; and Dispute between Cable and Wireless and T-Mobile about mobile termination, May 2009.

1. ***Cost causation***: costs should be recovered from those whose actions cause the costs to be incurred;

*2****. Cost minimisation***: the mechanism for cost recovery should ensure that there are strong incentives to minimise costs;

3. ***Effective competition*****:** the mechanism for cost recovery should not undermine or weaken the pressures for effective co*mpetition;*

4. ***Reciprocity****: where se*rvices are provided reciprocally, charges should also be reciprocal;

*5****. Distribution of benefits****: costs should be reco*vered from the beneficiaries especially where there are externalities; and

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

3.20 Opal's views on the principles, and Ofcom's comments on them, are set out in detail in section 4 of this document.

Opal's concluding remarks and matters requested for determination by Ofcom

3.21 Opal concluded that:

a) BT's current APCC is in breach of GC 18.2(a) in that it is not reasonable, cost-oriented or based on the incremental cost to BT for providing number portability because a different routeing method (DLE Handover), which is more cost efficient, is possible and should therefore be provided in order for BT to comply with its obligations under GC 18;

b) because of the above, BT's current APCC includes Additional Conveyance Costs in contravention of GC 18.2(b); and

c) on the basis that BT should provide DLE Handover in order to comply with GC 18, any system development costs which would be incurred to enable BT to offer DLE Handover represent System Set-Up Costs which BT is prevented from recovering pursuant to GC18.2(b).

3.22 Opal therefore requested that Ofcom make a determination requiring that BT must:

a) Hand over calls to ported numbers at the relevant DLE where Opal is interconnected with BT's network;

b) Bear the costs of any necessary system development to enable DLE Handover; and

c) Retrospectively adjust the APCC charged to Opal which would result from such call routeing with effect from 1 May 2008 by repaying to Opal the amounts it has paid in respect of the LTC.

BT's comments on Opal's Dispute Resolution Request

3.23 Ofcom invited BT to comment on Opal's Submission on 3 July 2009. BT responded in letters of 10 and 21 July 2009, and attended a meeting with Ofcom on 16 July 2009.

3.24 In its response of 10 July 2009, BT advised that in its view negotiations were ongoing, with discussions around the delivery of traffic to numbers ported to Opal concerning a number of wider issues about ported call conveyance between ingress to BT's network and arrival at Opal's switch. BT advised that the designs of BT's and Opal's networks offered various ways to transit calls from other CPs to Opal through the local exchange.

3.25 BT added that in accordance with GC 18 it is not recovering any costs for calls that originate on the BT network. It also stated that any solution for the routeing of non-BT originated calls to ported numbers should allow it to use the same routeing as for BT originated calls in order to minimise total cost.

3.26 BT's response also observed that as a result of investment in DLE interconnect there has been a significant increase in the amount of CP-originated traffic entering the BT network at the DLE, whilst the porting of numbers to outside the tandem switch area[24] has also increased. BT advised that both of these factors have caused "a dramatic increase in the cost of conveying ported traffic through the BT network".

3.27 BT concluded that whilst in its opinion commercial negotiations had not been exhausted, should Ofcom choose to resolve the dispute it should capture all wider aspects, and do so on a forward-looking basis only.

3.28 The wider aspects referred to by BT were outlined in a meeting with Ofcom on 16 July 2009 as being:

a) Where BT routes traffic to Opal's next generation ("GSX") switches, it does so via its own NGSs at the tandem layer. This can require routeing via more than one NGS, creating a "double tandem" effect[25] which Opal wishes to avoid and is an issue under discussion by the parties;

b) The termination rates payable by BT for traffic terminated on Opal's network (currently subject to a separate dispute for resolution by Ofcom)[26];

c) The use of the existing In Span Interconnection ("ISI"): BT believes that if DLE Handover uses the existing ISI between BT's DLE and Opal's Nokia switches (as proposed by Opal), it raises issues of whether (and on what terms) Opal's provision of this ISI can be used to deliver the traffic requested for DLE Handover (non-BT originated calls to numbers ported to Opal), as well as leaving open how the remaining traffic from the DLE (BT-originated calls to numbers ported to Opal) should be delivered.

[24] In other words, calls to such a ported number would require routeing via more than one NGS ("Inter Tandem Conveyance").
[25] This "tandem effect" concerns Inter Tandem Conveyance, for which BT recovers its costs through the APCC. This is discussed in more detail in section 5.
[26] This has been considered in "Dispute between Opal Telecom and BT about Opal's Fixed Geographic Termination Rates", October 2009. See www.ofcom.org.uk/bulletins/comp_bull_index/comp_bull_ccases/closed_all/cw_01027/

3.29 In an email to Ofcom of 21 July 2009[27], BT advised that the wider issues of capacity to backhaul traffic from the DLE, concerning charges that are appropriate for the requisite interconnect circuits and the termination payments that would then apply, had been subject to discussions with Opal and the Carphone Warehouse Group "over many months". BT also provided an overview of the negotiations that had taken place and a copy of its feasibility study in response to Opal's SOR of 7 July 2008 (see paragraph 3.1 above).

3.30 BT also explained that based on an initial review of the feasibility study, if DLE Handover were also provided to CPs other than Opal, the bulk of costs would concern data management amendments, adding that so far no other CPs had expressed an interest in using DLE Handover.

Scope of the dispute

3.31 On 23 July 2009, having decided it was appropriate for it to handle the dispute, in accordance with its dispute resolution guidelines, Ofcom set out what it considered to be the scope of the matters in dispute by published details of its scope for consultation on its on-line Competition and Consumer Enforcement Bulletin.[28]

3.32 The scope of the dispute was stated as to determine whether:

a) BT should be required to hand over calls to ported numbers at the relevant digital local exchange ("DLE"); and if so,

b) BT should be required to bear the costs of any resulting necessary system development in BT's network; and

c) For the purpose of giving effect to the above, whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment.

3.33 In line with its standard procedures in disputes, Ofcom invited representations on the scope of the dispute by 31 July 2009 and received responses from BT as well as Cable & Wireless UK ("C&W") which also registered itself as an interested party.

3.34 One further stakeholder, Virgin Media Limited ("Virgin"), registered itself as an interested party but did not submit representations on the dispute or its scope.

Comments from C&W

3.35 In an email to Ofcom of 31 July 2009, C&W commented that it felt the essence of the dispute was whether APCC charges are based upon efficiently incurred costs and should not necessarily focus on whether BT should be required to hand the calls over at the DLE. C&W added that whilst BT is able to choose to route ported calls in an inefficient manner, charges should not be based upon this.

Comments from BT

3.36 BT submitted that in its view the dispute encompasses a range of issues and that the scope would be acceptable to it only if it led to a full and final resolution of all the issues that it considers are related to the handover of calls to ported numbers at the

[27] Email from Tony Fitzakerly (BT) to Lawrence Knight (Ofcom), dated 21 July 2009
[28] http://www.ofcom.org.uk/bulletins/comp_bull_index/comp_bull_ocases/open_all/cw_01030/

relevant DLE. Specifically, BT requested that the scope included consideration of all the physical and commercial implications of putting DLE Handover in place. In this regard, BT referred to the interconnect links via which calls would be handed over and the provision of such links, ownership and charges for them, as well as the ownership of traffic at the point of DLE Handover and the "consequential commercial arrangements" such as any termination rates set by Opal.

3.37 BT's view followed a further meeting with Ofcom of 29 July 2009, at which BT explained that DLE Handover could be offered either by means of using Opal's existing interconnect links from the BT DLE to Opal's Nokia switches, or by creating new links from the BT DLE to Opal's GSX switches and that in either case it was not clear which party would provide the requisite capacity and how any charging arrangements would operate. These points were shared with Opal for its comments.[29]

Comments from Opal

3.38 Whilst Opal did not make formal representations on the scope of the dispute, Opal provided comments on the points outlined in paragraph 3.37 above. Opal's position, as provided in an email to Ofcom of 31 July 2009[30], was that with DLE Handover, it would be BT's responsibility to ensure that there is enough interconnection capacity, as BT "owns" the traffic under the Standard Interconnect Agreement ("SIA"); any costs could therefore not be recovered through the APCC. Opal added that it would accommodate any request in line with its obligations under the SIA and that the interconnection link could either be a Customer Sited Interconnect ("CSI") or an ISI[31], depending on what would be most suitable, and that BT could hand over this traffic either into Opal's TDM network (Nokia switches) or Opal's TDM-IP conversion platform in its NGN (the GSX switches). Opal explained that there are already points of interconnection between Opal and BT "at the vast majority of BT DLEs".

Ofcom's conclusions on the scope of the dispute

3.39 Having considered the representations made on the scope, our view remained that the matter in dispute concerns whether or not BT should be required to hand over calls to ported numbers at the relevant DLE. However, we recognised that in resolving this dispute there would be wider considerations which we would need to take into account where relevant.

3.40 In considering representations from the parties, Ofcom noted that the proposed scope had failed to be explicit in describing the types of calls specified in Opal's request for DLE Handover and this needed to be addressed. Ofcom also expected that DLE Handover may entail costs in addition to the costs of any necessary system development in BT's network to enable DLE Handover, and point 2 of the scope should be amended to reflect this.

[29] Telephone conversation between L Knight (Ofcom) and R Granberg (Opal) of 29 July 2009. Followed by email from L Knight to R Granberg of 30 July 2009.
[30] Email from R Granberg to L Knight, 31 July 2009.
[31] CSI circuits are established when BT provides a point of interconnection at the site of the interconnecting CP. In order to do so, BT has to extend its network out to the point of interconnection, by providing a 2Mbit/s circuit up to the site of the operator. BT controls the interconnect up to this point of interconnection. CSI differs to ISI, which is where the two CPs build out their networks to a handover point located between their switches. Where the route will be used for the CP's traffic only, this point will be close to the BT exchange and therefore most of the build is the responsibility of the interconnecting CP. Where the route will be used for the traffic of both parties, the point of interconnection will be at a point agreed by BT and the CP.

3.41 Accordingly, Ofcom published the finalised scope of the dispute on 7 August 2009 to determine:

a) Whether BT should be required to hand over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant digital local exchange ("DLE"); and if so,

b) Whether BT should be required to bear any resulting costs that are relevant and/or necessary; and

c) For the purpose of giving effect to the above, whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment.

3.42 On the basis of the above scope, we consider that the process for determining this dispute essentially requires the assessment of whether, on the evidence before us, (i) Opal's proposed solution (DLE Handover) would be more cost efficient than BT's current routeing (which is reflected in the current APCC), or (ii) there are any other reasons which mean that we should require BT to offer DLE Handover in order to comply with its obligations under GC 18.

3.43 In order to assess this, our view is that there would need to be a sufficiently material level of difference in the cost efficiency of DLE Handover compared with BT's Current Solution, and no other overriding relevant considerations, for us to require BT to provide DLE Handover in order to comply with GC 18.

3.44 Our methodology for assessing the above, and our conclusions, is set out in section 4.

Information gathered from the parties

3.45 On 19 and 20 August 2009, Ofcom sent Opal and BT respectively notices under section 191 of the 2003 Act requiring them to provide information in connection with this dispute (the "formal request"). This request had been sent in draft to both parties on 17 August 2009. We received responses from each party on 1 September 2009 and also met with BT on 10 September to discuss the cost analysis they had provided.

3.46 The formal requests set out Ofcom's understanding of possible end to end solutions for providing DLE Handover, shown as Solutions 2 and 3 in Figure 3 below, alongside Solution 1 which represents BT's Current Solution. Ofcom asked each party for their responses to a series of questions concerning:

a) The depiction of the Solutions, including whether it correctly reflects their own views, as well as their ***preferred solution*** and whether any other viable alternatives existed;

b) Identification of the key necessary ***technical elements*** concerned with the viable delivery of each of the Solutions;

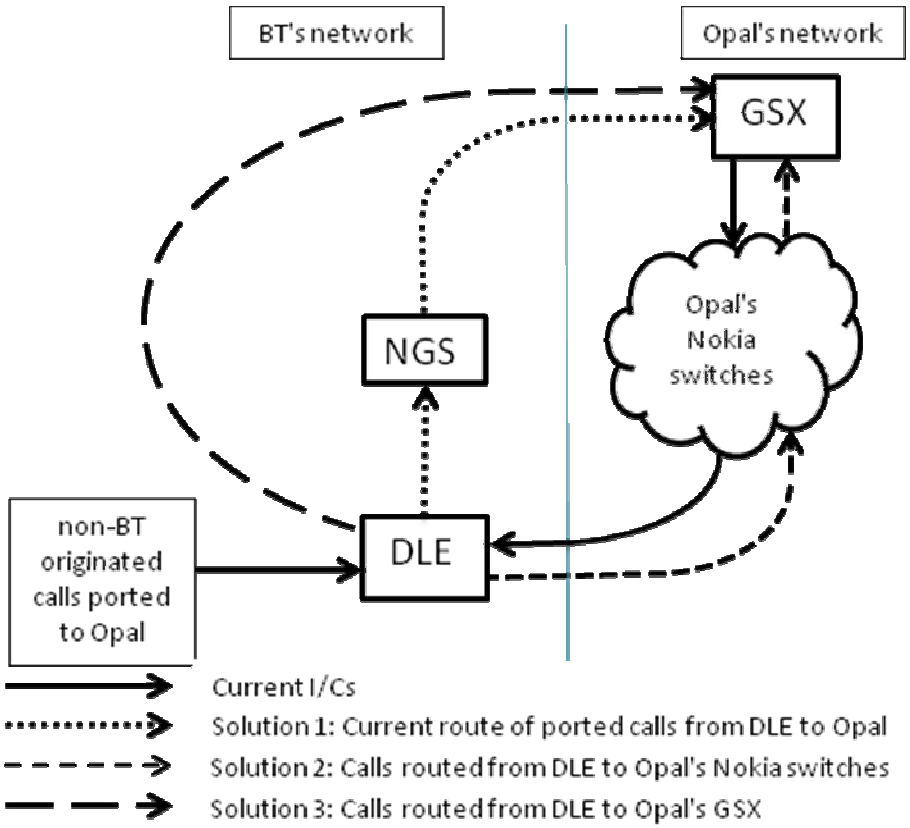
c) The overall ***costs*** to provide each of the Solutions, based on the costs of resources required by both networks to enable each Solution;

d) The likely ***charges*** that would be levied for each technical element identified for each of the Solutions and who would pay these;

e) The ***impact*** of each Solution including, where appropriate, the ability and ease of implementation, the extent to which they might affect the overall delivery of traffic (ported and non-ported), likely changes to payments made by Opal for portability, and whether the solutions could potentially be used by other CPs.

3.47 The formal request also sought from BT a breakdown of data concerning existing costs, charges and traffic volumes. This included the construction of the APCC charge and details of BT's response to Opal's SOR (see paragraph 3.1 above).

Figure 3: Diagram of Solutions 1-3



Information received from Opal and BT on the technical elements required for delivery of non-BT originated calls to numbers ported to Opal, for Solutions 1-3

Opal's view on technical elements

3.48 Opal responded to Ofcom's formal request on 1 September 2009. The response set out Opal's view that the technical elements required for each of the Solutions of Figure 3 are essentially the same and consist of physical interconnection links between the two networks equipped with sufficient capacity. Such capacity could be achieved by installing the correct number of E1 (2Mbits/s) circuits. The links themselves could be implemented using either ISI or CSI. In Opal's view, none of the three solutions would be unique in any way and would not require special technical elements. It also stated that it was not aware of any other viable solutions.

3.49 Opal explained further that, in its view, the technical elements for the Current Solution and Solution 2 are already in place. Those for the Current Solution were

obviously in place since this is the current working solution, and interconnection links are also already in place to support Solution 2. These consist of Opal-owned ISI links between BT's DLEs and Opal's Nokia switches that currently transmit carrier pre-selection ("CPS"), indirect access ("IDA") and network translation services ("NTS") traffic from BT's DLEs to Opal's Nokia switches, and CPS, IDA and geographic call traffic from the Opal Nokia switch to BT's DLEs. According to Opal, implementation of Solution 2 would merely require an increase in the capacity of these links.

3.50 Opal explained that, as regards DLE Handover, while it had no preference between Solutions 2 and 3, it would seem that Solution 2 would seem the most sensible because the interconnection links to support this Solution are already in place (as set out in paragraph 3.48 above) and the implementation would arguably be cost-neutral to BT because as it added capacity to those links it could simultaneously withdraw the same capacity from the current links between its NGS and Opal's Nokia switches. Furthermore, BT would no longer incur LTC costs. As regards the Current Solution, Opal noted that "*for the avoidance of doubt, Opal does not have any objections in principle to Solution 1 provided BT does not seek to recover the cost of Local Tandem Conveyance*."[32]

3.51 On 25 September 2009, Ofcom again asked Opal for its views on what technical arrangements would be required to make Solution 2 operational.[33] Ofcom also requested any supporting data and costs as part of this, as well as Opal's clarification of how the existing ISI links between BT's DLEs and Opal's Nokia switches could be used under Solution 2.

3.52 Opal clarified verbally that if the ISI links were used for Solution 2, [✂]. Opal further explained that:

a) From an interconnection and routeing perspective it did not believe that any physical changes to the current technical arrangements would need to take place before Solution 2 could be operational;

b) There is sufficient interconnection capacity available for CP originated traffic to numbers ported to Opal, and where capacity is insufficient, Opal is able to use [✂]. Opal explained that in the longer term, the parties would seek to expand the interconnection capacity to cope with the increase in traffic;

c) Opal would make available the use of its ISI links in order to facilitate delivery of Solution 2, but that the relevant (i.e. calls to ported numbers that originate on third party networks) traffic is the responsibility of BT under the BT SIA [and therefore BT is liable for the costs];

d) Further, that Opal would not seek to argue that under Solution 2 [✂]

3.53 Opal acknowledged that its response did not take into account the system development costs that BT would potentially need to incur to implement DLE Handover. Opal's understanding was that number portability capability resides in BT's DLEs and that this suggested that implementation of DLE Handover should be reasonably straightforward. Opal was concerned that BT's estimated figure for these costs of £[✂] may be too high, but provided no further information on this.

BT's view on technical elements

[32] Opal's response of 1 September 2009 to Ofcom's first notice to Opal under section 191 of the 2003 Act dated 19 August 2009.
[33] Email from L Knight (Ofcom) to R Granberg (Opal) of 25 September 2009.

3.54 BT responded to Ofcom's formal request with a description of the technical elements of the three solutions set out in Figure 3 above and with an Excel model of its estimates of the costs of those three solutions. It stated that its preferred Solution was Solution 1 as it considered the Current Solution to be the most efficient compared to DLE Handover.

3.55 In BT's view, the Current Solution is the most efficient because it aggregates the traffic from calls to ported numbers onto a relatively small number of routes, and thereby, according to established traffic engineering principles, maximises the utilization of transmission capacity. Solutions 2 and 3 would, in BT's view, be similar to one another in terms of transmission costs because Opal's Nokia switches and Opal's GSX devices are co-located. They would both, in BT's view, entail significantly greater transmission costs than the Current Solution because they would require a much larger overall number of longer circuits from a more geographically dispersed set of locations (corresponding to BT's DLEs). In addition, DLE Handover would also incur costs of system development to BT's network to enable calls to ported numbers to be handed over at BT's DLEs.

3.56 Following a meeting between BT and Ofcom on 10 September 2009, BT modified its initial response to Ofcom's information request to only include within the scope of its response and calculations those calls to ported numbers that originated on the network of third party CPs (in its initial model BT had also included BT originated calls). This revised response did not alter its view that the Current Solution is the most efficient of the three solutions.

3.57 The information provided by BT on the network elements for the Current Solution can be summarised as follows:

a) LEP: Local Exchange Processor (LEP): Any call handed over to BT at a DLE will require switching at that DLE. LEP is the cost incurred by this switching function and, as such, every call handed over at the DLE will require LEP. LEP includes ongoing PPP activities;

b) LTC: LTC is incurred where ported transit involves conveyance from BT's DLEs to BT's tandem switches for onward conveyance. As such, all calls handed over at the DLEs incur LTC as they route up to the tandem, layer before handover to Opal;

c) CSI: CSI involves BT providing interconnect links from the BT NGS switches to Opal's GSXs[34]. [✂]; and

d) Termination from GSX switch: Ultimately, the onward routed call will require termination on Opal's network from the GSX. This network element is owned and operated by Opal.

3.58 The information provided by BT on the network elements for DLE Handover can be summarised as follows:

a) LEP: The same BT DLEs will be utilised to onward route ported calls as under the Current Solution for the reasons given in 3.57(a) above. Accordingly, all else equal, the same LEP will be required under either Solution 2 or 3;

[34] Technically, CSI links connect the BT building to the Opal building and can be used to provide routes between any switches in those buildings.

b) Interconnect Circuits: Opal is presently interconnected with the BT network using ISI for interconnection between BT's DLE premises and Opal's Nokia switch premises. Absent the availability of these circuits for DLE Handover, traffic could instead be routed to the Nokia switches by means of additional CSI. In the case of Solution 3, traffic would instead be routed to Opal's GSX switches by means of additional CSI;

c) System development of BT's network (see Table 2 below for more details on system development);

d) Where interconnect circuits are connected to Opal's Nokia switches (under Solution 2), switching is required at those switches to allow for onward transit to Opal's GSX switches for call termination. This network element is owned and operated by Opal.

e) Termination on Opal's GSX switches. This is required in the case of Solution 2 or 3. This network element is owned and operated by Opal.

Information received from Opal and BT on the costs of technical elements required for delivery of non-BT originated calls to numbers ported to Opal

3.59 We also sought further information on the likely total costs of each of the Solutions in Figure 3 above.

Opal's view on costs

Response to the formal request

3.60 As set out in paragraphs 3.48 to 3.53 above, in its response to the formal request, Opal explained that interconnect circuits already exist in order to support Solution 2, adding that in order to manage the additional traffic on those circuits Solution 2 would require additional capacity of an estimated [✂] E1[35] 2Mbit/s circuits. Opal's estimate of costs is based on prices set out in BT's Carrier Price List of £808 for connection of each E1 circuit and £92.88 for the annual rental of each E1 circuit.

3.61 Opal estimated that the interconnect costs for Solution 2 would therefore be £[✂] in one-off connection costs and £[✂] in annual rental costs.

3.62 Opal added that BT already incurs these costs in providing the Current Solution through the handing over of traffic to Opal from BT's NGS to Opal's GSX switches. In other words, Opal's view is that the costs of implementing Solution 2 would be offset by the reduced costs of the Current Solution and therefore would be cost neutral to BT.

3.63 Opal further added that in addition to interconnection costs, both BT and Opal "would incur some costs as a result of the internal work required to rearrange traffic". However, Opal offered no data or estimates of these costs. Opal only explained that, for itself, the work would be minimal as its Nokia switches already manage overflow traffic from the BT network for call termination on the Opal network.

3.64 Opal did not provide cost data specific to Solution 3, adding that the costs of establishing new interconnection links is a matter that "only BT can determine".

[35] An 'E1' circuits are a standard form of interconnect circuits used by telecommunications providers. They are common in most telephone exchanges and may be bundled onto higher capacity (34Mb/s) E3 links.

3.65 Opal did not provide data on the costs for the Current Solution.

3.66 In its assessment of costs, Opal recognised that its response did not take account of system development costs that BT had estimated as £[✂]. Opal added that it had concerns that this estimate was too high, but did not provide an alternative estimate. Despite requests to do so, Opal has failed to provide cost data to support its claims. Opal considered that Ofcom should focus on the charges under each solution, rather than the costs.

Further information from Opal

3.67 On 17 September 2009, Ofcom advised Opal in an email that it was unclear to it how Solution 2 would be "cost neutral", without seeing any underlying calculations to support the assertion. Ofcom therefore requested that Opal, putting aside its views on charges, provide Ofcom with data and/or calculations that supported Opal's view that Solution 2 is cost neutral (or more cost efficient). Ofcom also sought Opal's view on whether there would be any efficiencies that could be exploited by routeing the same amount of traffic over a relatively smaller number of higher-capacity routes from NGSs to GSXs, rather than over a relatively larger number of lower-capacity routes from DLEs to Nokia Switches or GSXs. Ofcom also clarified that its request concerns the costs of providing the transmission capacity required, not who would pay these costs.[36]

3.68 In its response of 18 September 2009, Opal reiterated its position that the cost neutrality is derived from the view that additional interconnection capacity that would be required (i.e. number of E1 circuits) for BT to hand over the traffic at the DLE to the Nokia switches would be the same as that BT currently deploys to hand over the traffic from the NGSs to Opal's GSX switches.

3.69 While Opal recognised that there are cost-efficiencies involved in using a smaller number of higher-capacity routes, in its view this does not take account of its primary concern that it has to pay for the conveyance of traffic in BT's network but has no influence over how BT routes this traffic within its network. In Opal's view, BT has no commercial incentive to route this traffic in an efficient manner and BT also benefits from any cost-efficiencies involved from aggregating the traffic at the NGS layer, while Opal does not derive any benefit from BT's routeing choices.

3.70 In response to an informal request for information of 25 September 2009, (see paragraphs 3.60 to 3.66 above), whilst Opal explained that its existing ISI interconnection circuits could be used for Solution 2, it did not provide data demonstrating the associated costs. Opal added that it was unsure what data it could provide, given its view that the rearrangement of the call traffic to BT DLE-Opal Nokia routes (Solution 2) would be very straightforward and could form part of business-as-usual traffic routeing decisions that already take place in a reasonably cooperative manner between Opal and BT.

3.71 In the same response, Opal also advised that for Solution 2 [✂] but did not provide any information on what costs or charges would be incurred.[37]

3.72 In order to follow up Opal's response, Ofcom met with Opal on 29 September 2009. Opal repeated its position that under Solution 2, no additional capacity would be required to be added to the existing Opal ISI interconnect circuits, and should

[36] Email from L Knight (Ofcom) to R Granberg (Opal) of 17 September 2009.
[37] [✂]

capacity become insufficient, Opal would be able to reduce its own egress traffic to the DLE with the objective of ensuring there are always spare channels for the ingress traffic from BT. Opal advised that in the longer term, the parties would seek to expand the interconnection capacity to cope with the increase in traffic. Opal added that regardless, its view remained that the ownership of traffic, and therefore the responsibility of the costs of Solution 2, remained with BT.

BT's view on costs

3.73 In response to the formal request[38], BT provided a table, with supporting data and calculations, showing the costs of the key elements of each of the Current Solution versus those of Solutions 2 or 3. These costs are summarised in Table 1 below[39]. BT's estimates of the costs for each of Solutions 2 and 3 were the same (including both being modelled on the same requirement for new CSI circuits). They therefore had the same modelled costs and are shown in Table 1 as 'DLE Handover'.

Table 1: BT's summary of costs for ported calls routed to Opal

	Current Solution			DLE Handover		
	CP-originated calls	***BT-originated calls***	***TOTAL***	***CP-originated calls***	***BT-originated calls***	***TOTAL***
LEP costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
LTC costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Circuit costs (rental)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Opal specific costs			**n/a**			**unknown**
TOTAL ONGOING COSTS	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Circuits connections	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
System development costs						**£**[✂]
TOTAL ONE-OFF COSTS			**£1.85m**			**£3.58m**

**LEP costs include STT costs for CP originated calls delivered to the NGS*

3.74 Table 1 summarises the results of BT's model to estimate the costs of the Current Solution and DLE Handover. BT's model was based on:

[38] BT's response of 1 September 2009 to Ofcom's first notice to BT under section 191 of the 2003 Act, dated 20 August 2009.

[39] Table 1 shows corrected figures provided by BT on 16 September 2009. The corrections to the original submission were to amend some errors in the BT model and to show costs for Solutions 2 and 3 on the basis of Solutions 2 and 3 being used to deliver ported calls to Opal from non-BT originated calls coming in at the DLE: The original submission assumed all calls (BT originated and non-BT originated) were routed using DLE Handover.

a) CP originated traffic delivered over interconnect circuits at NGSs continuing to be routed from NGSs to GSXs;

b) BT originated traffic continuing to be routed from NGSs to GSXs;

c) CP originated traffic delivered over interconnect circuits at DLEs is routed from DLEs using DLE Handover (whether using Solutions 2 or 3).

d) The results reflected modelled costs for the Current Solution, rather than comparing modelled costs for DLE Handover with actual cost data for the Current Solution, although the model used the actual number of circuits in the case of the Current Solution compared with an estimate of the number of circuits required for DLE Handover.[40]

3.75 In carrying out its analysis, BT has not included the ITC costs in either the Current Solution or DLE Handover, because BT and Opal have separately agreed to implement additional interconnection between the BT NGSs and the Opal GSXs to reduce substantially the amount of ITC incurred. As such, BT's model does not capture the entire costs involved in providing either the Current Solution or DLE Handover. BT has, however, included the costs of interconnection circuits, in both cases using the cost of BT CSI circuits.

3.76 In a response dated 18 September 2009[41] to an informal request from Ofcom[42], BT provided additional clarification of its model, including assumptions on the capacity and utilisation of interconnection circuits, and resilience.

3.77 BT also provided Ofcom with the source of Erlang tables to help substantiate its assumption regarding the capacity of an E1 interconnect circuit[43] and in response to a further informal request from Ofcom[44], BT provided further clarification of its cost modelling assumptions concerning circuit utilisation and network efficiencies (and asserted that these assumptions are rooted in Erlang theory[45]), as well as sensitivity tests performed by BT and the application of specific costs in each modelled Solution.

3.78 Table 1 shows that based on BT's cost modelling, the annual costs for DLE Handover are £0.87 million (10.5%) higher than the Current Solution, whilst one-off costs for DLE Handover are £1.73 million (107%) higher than for the Current Solution. BT observed that DLE Handover is therefore significantly less efficient than the Current Solution.

3.79 BT explained that its initial estimate of £[✂] costs for the system development required for implementing DLE Handover (see paragraph 3.15 above), had been revised downwards to around £[✂][46], and that for a definitive view on these costs a

[40] As confirmed by BT in an email from J Davey (BT) to L Knight dated 25 September 2009
[41] Email from J Davey (BT) to L Knight (Ofcom) dated 18 September 2009
[42] Email from L Knight (Ofcom) to J Davey (BT) dated 16 September 2009
[43] Email from J Davey (BT) of 22 September 2009. Source: http://www.itu.int/itudoc/itu-d/dept/psp/ssb/planitu/plandoc/erlangt.pdf
[44] Emailed response from J Davey (BT) of 29 September 2009, in response to an emailed request from L Knight (Ofcom) of 25 September 2009
[45] Theory on telephone traffic developed by Agner Erlang, leading to the use of the Erlang B formula as a means to estimate the number of circuits required to achieve a required grade of service for a given level of busy-hour traffic.
[46] BT's response of 1 September 2009 explained that the original estimate was based on a crude estimate of £[✂] per DLE, whilst the revised estimate was based on a crude analysis of the amount of work involved and the time it would take.

full feasibility study would be required. In responding to the formal request, BT provided the following breakdown of the estimates (original and revised) for system development costs:

Table 2: Breakdown of BT's system development cost estimate

		Original	Revised
System	**Action**	**Estimated cost (£000s)**	**Estimated cost (£000s)**
Switch	Data change to System X & AXE10	£[✂]	£[✂]
INCA	Assimilate prefix in the call record	£25.4	£25.4
NCDB	Reflect assimilate prefix in the call record	£5.0	£5.0
EBC, INCA & VIC surcharge	1) Enable GNP call minutes to be assigned to the relevant VICs	£125.0	£125.0
	2) Differentiate BT & CP originated call minutes		
OMC	Amendment/change of destination category to point exported numbers to PDS table	£75.0	£75.0
RPD – Requirement 1	Capture routeings from differing origins		
RPD – Requirement 2	BT DLEs to be identified as Switch Connections	£89.3	£89.3
TOTAL		**£[✂]**	**£[✂]**

3.80 As noted in Table 1 above, subsequent modelling provided by BT to Ofcom has revised the £[✂] estimate upwards to £[✂].

Information received from Opal and BT on the charges which would be levied to fund the delivery of non-BT originated calls to numbers ported to Opal and who would be liable for the costs and/or charges

3.81 In order to understand the charges which would be levied to fund each of the Solutions, Ofcom requested from Opal and BT their best estimates for the likely charges for each technical element they had listed for each Solution in Figure 3.

3.82 Ofcom also sought from the parties their views on who would be liable to pay the costs and charges they had identified in their responses, as well as how introducing DLE Handover would impact any other charges payable by the parties.

Opal's response

3.83 In its response, Opal set out its view that BT is responsible for ensuring that there are enough interconnection links and capacity to convey calls to ported numbers from the BT network for termination on the Opal network and that this responsibility includes meeting the costs of maintaining the interconnection links and capacity.[47] Accordingly, Opal considered that BT should pay for all the necessary technical elements for any of the Solutions. Similarly, Opal set out that each component is set out in the BT Carrier Price List and, under the terms of the BT SIA, BT would be liable to pay all these charges.

3.84 As set out in paragraphs 3.62 and 3.68, Opal's view is that Solution 2 would be cost-neutral because the cost of increasing the interconnection capacity between the BT DLEs and the Opal Nokia switches would be offset by the cost savings BT would able to remove the equivalent interconnection capacity between the BT NGSs and the Opal GSXs. Explaining this view, Opal noted that existing interconnection links between its and BT's network were capable of supporting Solution 2 and that in order to implement Solution 2 "BT would simply have to install additional capacity (so-called E1 2MB circuits) in order to manage the additional call traffic", while "the same amount of capacity could then be withdrawn from the interconnection links between the BT NGSs and the Opal GSXs (ie the Current Solution)."[48] However, Opal did not provide any data supporting this assertion. Opal added that in order to implement Solution 3, BT may also need to install new interconnection links between the BT DLEs and the Opal GSXs but that "It is really only BT who determine with [sic] such new interconnection links are necessary."

3.85 Opal submitted that should DLE Handover (either Solution 2 or 3) be implemented, the APCC would be reduced in accordance with the resultant reduction in BT's LTC costs. Opal stated that it did not consider that such an implementation would have an effect on any other charges payable by Opal to BT or BT to Opal. In stating this, Opal noted that in theory calls from the BT DLE to the Opal Nokia switch would likely be classified as multi-switched calls under the BT Reciprocity Agreement (which would increase the termination charges payable by BT to Opal). However, as set out in paragraph 3.71, it stated that it would not insist that BT paid a higher termination charge in these circumstances.

BT's response

3.86 In responding to the questions about which party should be liable for the costs, BT stated that in its view, all the costs incurred by it from the point where the call to a geographic ported number is handed over to it by another CP, to the point where the call is handed over to the recipient network, are transit costs (including the interconnect links). As they are transit costs, it is BT's view that they should be paid for by the recipient network for calls which originate on another CP's network.[49] Were DLE Handover to be adopted, BT would expect that connection charges or

[47] Referring to paragraph 5.1.3 and Appendix D of Annex A to the BT Standard Interconnect Agreement http://www.btwholesale.com/pages/downloads/service_and_support/contractual_information/docs/nsia/nannexa.rtf

[48] Response to question 2(a)

[49] By reference to GC18.2 and GC 18.5 and Oftel's Determination of 31 May 2002 on fixed portability costs and charges www.ofcom.org.uk/static/archive/oftel/publications/pricing/2002/nupo0502.htm.

development costs would be charged to the recipient operator (that is, Opal) as a single payment.

3.87 BT set out that the LEP costs, LTC costs and interconnection circuit costs for CP originated traffic should be borne by Opal for the Current Solution (see paragraph 3.57 above). For DLE Handover BT stated that it would expect Opal to bear the full cost of the development "of an inefficient solution", the full connection costs for replacing the existing circuits and the incremental costs for BT-originated calls incurred as a result of the alternative solutions.

3.88 BT also noted that it is in fact currently undercharging Opal as it does not include the CSI connection and rental charges between the BT NGS and Opal GSXs in the APCC levied to Opal. BT believes that these costs should be included and stated that in due course it would expect to increase the APCC accordingly, backdated to include an appropriate proportion of all the connection and rental charges associated with GSX interconnect. BT did not provide the level to which the APCC might increase or the dates to which it would apply.[50]

3.89 BT explained that consequently, the APCC charge would increase in the case of all three solutions.

Information received from Opal and BT on the wider impact of introducing the different solutions for the delivery of non-BT originated calls to numbers ported to Opal

3.90 In order to understand the wider implications of BT meeting Opal's request for DLE Handover, Ofcom sought from the parties information on a number of areas including call traffic volumes and types affected by Solutions 2 and 3, whether Solutions 2 and/or 3 could be offered as standalone solutions and the degree to which they could be offered to other CPs. For completeness, Ofcom also requested that the parties provide details of any alternative solutions that they consider viable.

Opal's response

3.91 Opal responded that in its view that both Solutions 2 and 3 would offer a complete solution in isolation in the sense that all the traffic to the numbers ported to Opal's network could be conveyed through them. It noted that none of the solutions is unique from an engineering perspective and could be implemented through the establishment of normal interconnection links and capacity. It did not see any reason why such solutions could not be offered to other CPs for the same purpose. It was not aware of any alternative solutions.

3.92 In respect of traffic, Opal advised that it already received Carrier Pre-Selection (CPS), Indirect Access (IDA) and Number Translation Services (NTS) traffic from BT at its DLE. Opal added that it had ported numbers from virtually every BT DLE and would expect this number to increase. Finally, it provided a table of traffic volumes from information that it had received from BT, to show CP originated minutes (from both DLE and Tandem layer ingress) as a proportional of total traffic handed over to the Opal network. This is set out at Table 3 below.

[50] In a telephone conversation between Lawrence Knight (Ofcom) and John Davy (BT) on 8 September 2009, BT confirmed that it had no date in mind for making this increase.

Table 3: CP originated minutes as a proportion of total minutes for BT network to Opal network.

	Apr-07	Jul-08	Jan-09
CP originated minutes	[✂]	[✂]	[✂]
Total minutes	[✂]	[✂]	[✂]
% CP originated minutes	[✂]	[✂]	[✂]

BT's response

3.93 In terms of Opal's traffic, BT advised that the following traffic types, in addition to those requested in Opal's SOR, could be handed over at BT's DLE:

a) Egress traffic types for traffic owned by CP at DLE: IA, CPS, NTS, Geographic Egress (OLO to BT Any-Any), Dial IP, FRIACO, BT Import GNP (CP-BT).

b) Ingress Traffic Types for traffic owned by BT at DLE: Geographic (BT to OLO Any-Any), BT Export GNP (BT-CP) in practice not used as no Ingress routes exist at DLEs.

3.94 BT confirmed that Opal has ported numbers from, and interconnects with, [✂] of 666[51] of BT's DLEs. In terms of the volumes of traffic, BT also provided the following details concerning the volumes of traffic handed over to Opal in January 2009:

a) [✂]million minutes (BT originated and non-BT originated combined) of calls ported to Opal were sent to Opal; of which

b) [✂]million minutes of non-BT originated calls ported to Opal were collected at a BT DLE at which Opal has interconnection; and

c) [✂]million minutes of non-BT originated calls ported to Opal were collected either at a BT DLE at which Opal has interconnection or at a BT NGS

3.95 Confirming that each of the Solutions could offer a complete solution in isolation, BT explained that "the Solutions as described are all complete".

3.96 In terms of the application of the Solutions to other CPs, BT explained that the Current Solution is currently available to all CPs, whilst direct routeing from DLEs (Solutions 2 or 3) for other CPs could be offered if there were interconnect links in place. BT explained that if such links were available, the only development required to offer direct routeing from DLEs for additional CPs would be a bespoke data build (for which that CP would incur the additional bespoke costs), whilst other development would be a shared benefit as there would be no need to do any further development other than data build. In BT's view, only CPs which predominantly use ported numbers are likely to have sufficient traffic to consider direct routeing from DLEs, and confirmed that no CP other than Opal had so far requested DLE Handover.

3.97 BT did not provide details of any alternative options to the Solutions in Figure 3 that it considered viable.

[51] [✂]

Submissions on Ofcom's duties

3.98 On 11 September 2009, Ofcom wrote to each of BT and Opal asking them to make any comments or representations they had about how, in resolving this dispute, they believe each of Ofcom's duties (in particular under sections 3 and 4 of the 2003 Act) are relevant. In its letter to BT, Ofcom also asked whether, under each of routeing scenarios Solutions 1, 2 and 3, it considered it was compliant or would be compliant with its obligations under General Condition 18.

BT

3.99 BT responded that Ofcom's relevant duties centre on the need to promote the interests of citizens and consumers (section 3(1) of the 2003 Act). [52] In its view this necessarily involves benefits to citizens and consumers by meeting requirements efficiently and at least cost. BT stated that Ofcom's duties to promote competition and investment (sections 3(4)(b) and 3(4)(d) of the 2003 Act respectively) are also relevant as the resolution of the dispute should lead to effective and efficient competition without adding unnecessary cost. Further BT considered that to the extent that the current system of porting has been agreed with industry, it would argue that this is an example of effective self-regulation, which Ofcom is obliged to promote under section 3(4)(c) of the 2003 Act.

3.100 With reference to section 4 of the 2003 Act, BT stressed the relevance of the need for efficiency in securing network access and interoperability (section 4(8)).

3.101 On GC 18, BT's view is that all of the Solutions are capable of discharging the obligation under GC 18 to facilitate Portability by providing a transit service to connect any CP to the recipient network. Referring to Ofcom's Wholesale Narrowband Market Review statement and consultation[53], BT argued that GC 18 imposes a requirement for costs to be reasonable and that any number of solutions might be compliant so long as they provided the required functionality at a cost that was more or less in line with the most efficient design, but if the costs of implementing a new design were excessive then that solution would no longer be compliant with GC18.

3.102 BT argued that it can only expect to recover reasonably incurred costs in the APCC. In BT's view, the Current Solution utilises the efficiency afforded by BT's highly aggregated network to provide transport at the lowest cost, whilst other transit solutions are possible but would incur additional network cost and/or other operator charges that would increase the APCC which had to be levied. BT concluded that it would not be reasonable for it to adopt a solution that incurred these extra costs and consequently believe the current design is the only solution which is fully compliant with GC 18.

Opal

3.103 In responding to Ofcom's letter, Opal set out Ofcom's duties which it considered relevant to resolving this dispute, noting that sections 3(1)(b), 3(2)(b), 3(4)(b), 3(4)(d), 3(4)(m), 3(5), 4(3), 4(5) and 4(6) were of particular relevance because the resolution of the dispute would, in its view, have an impact on competition and, therefore, on the

[52] Tony Fitzakerly (BT) to Lawrence Knight (Ofcom) 18 September 2009.

[53] Ofcom's statement and consultation "Review of the fixed narrowband services wholesale markets", 15 September 2009. See http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/

offer of electronic communications services to consumers in terms of choice, price, quality of service and value for money.[54] This is because, in Opal's view, BT's current routeing of ported calls, which results in what it charges for the APCC, brings a competitive disadvantage to new market entrants such as itself; a decision to require BT to handover ported traffic at the DLE (and bear the cost of any necessary system development) would restore competitive neutrality in the market by "putting new entrants on a level playing field with the incumbent operator."

3.104 Opal stated that Ofcom's duty to ensure technology neutrality (section 4(6)) is also relevant, as is its duty to have regard to the desirability of encouraging investment and innovation in relevant markets. Opal stated that it has no choice but to pay by the APCC resulting from BT's "inefficient routeing costs". In its view this means that the current number portability regime unduly favours legacy TDM (Time Division Multiplexing) networks (such as BT's) rather than Next Generation Networks (NGN), such as that which Opal has recently invested in (and that a new market entrant would adopt). In Opal's view, the APCC "based on inefficient routeing" also hinders new investment and innovation in voice telephony markets, and so Ofcom's duty to have regard to the desirability of encouraging investment and innovation in relevant markets (section 3(4)(d)) is relevant.

3.105 Further, Opal considers that Ofcom's duties to further the interests of all citizens, have regard to the interests of different persons in different parts of the UK and promote the interest of all persons who are citizens of the European Union (section 3(1)(a), 3(4)(1) and (4(5) of the 2003 Act respectively) are all relevant to this dispute "as there is a potential for rural areas to be disadvantaged if investment in NGN technology favours high population density urban areas".

3.106 Opal also noted that the routeing of calls to ported numbers is essential for encouraging interoperability so that customers from one network can make and receive calls to and from customers from another network. Accordingly it considers that Ofcom's duties to encourage the provision of network access and service interoperability for the purposes of securing efficiency and sustainable competition in communications markets and the maximum benefit for the customers of communications networks and services providers (sections 4(7) and 4(8)) are relevant. Further, Opal stated that the facilitating of communications between customers of different networks is relevant for the purpose of development of the European internal market.

3.107 Finally, Opal stated that Ofcom's duties to be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed, are relevant to its resolving of this dispute (Section 3(3) of the 2003 Act) and that were it to resolve this dispute in Opal's favour, this would be a reasonably practicable solution to "the existing competition problem facing new market entrants who have no option but to pay an inefficiently incurred APCC" (section 3(4)(m)).

[54] Rickard Granberg (Talk Talk Group) to Lawrence Knight (Ofcom) 18 September 2009

Section 4

Ofcom's assessment of the issues

Issue to be resolved

4.1 BT and Opal are in dispute over BT's current method of routeing non BT originated calls to numbers ported to Opal, and the APCC which BT levies as a result. BT currently routes such calls to Opal using a particular routeing method across BT's network. Opal considers that BT should be required to offer and alternative method of routeing calls (DLE Handover), because that method would be more cost efficient that BT's current method. As a result, Opal has argued that BT's APCC charges for providing portability are not reasonable and cost oriented, because they are based on a method of routeing calls which is not as efficient as DLE Handover and as such include costs which are inefficiently incurred. Opal therefore considers that BT should be required to offer DLE Handover in order for its APCC charges to comply with the requirements of GC 18.

BT's regulatory obligations to provide portability

4.2 BT's regulatory obligations to provide portability derive from Article 30 of the Universal Service Directive ("USD")[55] and GC 18. Article 30(2) of the USD provides that "pricing for interconnection related to the provision of number portability [must be] cost oriented". This requirement is implemented in the UK by GC 18 (also see paragraph 2.10 above). The relevant parts of GC 18 require that the donor provider, in this case BT:

i) Provides portability on request, as soon as is reasonably practical, on reasonable terms;

ii) Subject always to the requirement of reasonableness, sets its charges to be cost oriented and, unless otherwise agreed with the recipient provider or directed by Ofcom, bases its charges on the incremental costs of providing portability;

iii) Does not charge for System Set-Up Costs or Additional Conveyance Costs, as defined in GC 18.5[56].

4.3 GC 18 does not prescribe the specific method of providing portability. Portability is defined in GC 18.5 as "*any* facility which may be provided by a Communications Provider to another" (emphasis added) which ultimately enables customers to retain the same telephone number when switching provider. This means that a donor provider can to some extent choose how and where it hands over ported calls to the recipient network, subject to certain parameters, such as reasonableness and cost orientation of charges.

Ofcom's approach to determining the dispute

4.4 In order to resolve the matters in dispute, we have considered the reasonableness and cost orientation obligations under GC 18. We have also considered Opal's

[55] Directive 2002/22/EC.
[56] Please note that this is numbered 18.8 in the most recent published consolidated version of the General Conditions, as at 16 September 2009; however, it should in fact be numbered 18.5; we therefore refer to GC 18.5 in this document, rather than 18.8.

assertion that the LTC cost element is an Additional Conveyance Cost ("ACC") and should therefore not be included in the APCC, as per GC 18.2(b).

4.5 In our view, the primary issue in this dispute is whether as Opal claims, its alternative DLE Handover method of routeing is more efficient than BT's current routeing mechanism, which is reflected in the APCC, such that the APCC is not reasonable and cost oriented in the sense of being cost efficient. This approach is based on the premise that inefficiently incurred costs cannot generally be said to be reasonable or cost oriented, unless there are good arguments to the contrary.[57]

4.6 Opal argues that BT's Current Solution of routeing is not as cost efficient as DLE Handover, and so in order to comply with GC 18, BT should be required to offer DLE Handover to Opal as an alternative to the Current Solution. In order to assess Opal's claims, we have therefore examined BT's Current Solution in comparison with alternative solutions based on DLE Handover. In the circumstances of this dispute, we take into account the costs of onward routeing, including interconnection links between the BT and Opal networks, as this is the portability service to which the APCC relates. The cost elements which Opal believes could be avoided by BT on DLE Handover are the LTC (and ITC) costs. It is also relevant to consider whether there are any costs associated with DLE Handover that are not incurred under BT's Current Solution.

4.7 While in the context of this dispute we have used the cost efficiency of the portability solution as the primary criterion for assessing whether the APCC is reasonable and cost oriented and thus compliant with GC 18, we recognise that there are additional factors that may be relevant, such as the resulting payments made by the parties and the potential wider impact on other stakeholders. We have therefore also taken these into account in resolving this dispute.

4.8 In considering the resulting payments referred to above, we have looked at the charges which may be levied by the parties on each other under the different routeing solutions. For example, it may be a relevant consideration for our conclusion if the provision of DLE Handover by BT of calls to numbers ported into Opal's network resulted in one of the parties having to pay higher charges (e.g. termination rates, interconnect circuit charges, etc).

4.9 In considering the potential wider impact of the portability solutions on other stakeholders we have taken account of the implications of DLE Handover (if any) for other CPs, based on (a) their opportunity to gain and use DLE Handover; and (b) the effect on charges paid by CPs for portability. For example, it may be a relevant consideration for our conclusion if the provision of DLE Handover by BT for Opal's traffic significantly reduced the costs for BT to provide DLE Handover to other CPs, and there was evidence of demand for such a solution by other CPs.

4.10 We have considered whether there are any relevant benchmarks which should be taken into account in resolving this dispute. We note that neither party has put forward any benchmarks that they consider to be relevant. We have considered DLE Handover against BT's Current Solution, as well as against BT's routeing method of delivering fixed geographic calls to *non-ported* numbers to Opal.

[57] Given the alignment between the implications of "reasonableness" and "cost orientation" in the specific context of this dispute, where we refer only to reasonableness in this document we also mean cost orientation.

4.11 Finally, we have considered the arguments put forward by Opal using the six principles of pricing and cost recovery as a general framework of analysis.[58]

4.12 We consider that the use of the principles of pricing and cost recovery is consistent with our statutory obligations, in particular the requirements under sections 3 and 4 of the 2003 Act, the duties set out in Article 8 of the Framework Directive[59] and our general obligations under administrative law.

Preliminary issue: additional conveyance costs

4.13 Before analysing the relative costs of the Current Solution and DLE Handover, there is the preliminary issue to consider of Opal's argument that the LTC cost element constitutes an ACC and is therefore a disallowed cost element in the APCC, as per GC 18.2(b).[60] ACCs, as defined in GC 18.5(a), are costs related to the network resources used by the donor operator in effecting switch-processing and providing switching and transmission capacity (e.g. LTC) for the conveyance of the call to the ported-out number and which are "*additional* to the costs of conveyance of non-ported calls from the Donor Provider's network to the Recipient Provider's network" (emphasis added).

4.14 We do not consider that LTC constitutes an ACC. As regards calls that originate on BT's network, LTC costs are generally incurred by BT when routeing a non-ported call to the Opal network (i.e. a call to an Opal number that has not been ported from BT)[61]. Therefore, such costs cannot be considered additional costs in a porting scenario and do not fall within the definition of ACCs. They may therefore in principle be recovered under the APCC (if reasonable and cost oriented).

4.15 We recognise that the application of the definition of ACCs in GC18.5(a) to calls originating on the network of a third party CP (rather than on the BT network) is less straightforward. In the case of a non-ported call to Opal, the OCP's network is aware that the called number is hosted on Opal's network. In such cases the OCP has, in general, a number of routeing options. If it has direct interconnection links with Opal it could route the call directly over those links. Alternatively, it could either use the transit services of an operator other than BT, or choose to use BT's transit services to deliver such calls to Opal. In the latter case it could only hand the non-ported calls over to BT at one of BT's tandem switches because transit traffic is not currently handed over to BT at DLEs. Therefore, no LTC cost would be incurred or charged by BT. However, this is because the routeing question we are considering in this dispute (for calls received by BT from the originating CP at its DLEs) does not arise in the case of non-ported traffic. Therefore, we do not consider that this analogy answers the relevant question in this dispute for what should happen in the case of ported traffic.

4.16 Our provisional conclusion on this preliminary issue, therefore, is that LTC is not an Additional Conveyance Cost within the meaning of GC 18.2(b).

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[58] See further paragraph 3.19 above,

[59] Directive 2002/21/EC.

[60] In support of this, Opal cites a section of a statement on portability by Oftel in which Oftel explained the objective of a specific reference to ACCs was to ensure cost minimisation by "encouraging operators to minimise additional conveyance [as compared to non-ported calls] and thus adopt the most efficient routeing method of providing portability"; "Numbering directive: Number portability requirements", January 2000, paragraph 2.9. See: www.ofcom.org.uk/static/archive/oftel/publications/numbering/port0100.htm.

[61] Currently, non-ported calls from a caller connected to BT's network are conveyed from the caller's DLE to one of BT's tandem exchanges where it is routed to Opal's network. In this case, LTC forms part of the cost of the call.

Ofcom's analysis and provisional conclusions on costs

Establishing the costs of the Solutions

4.17 We start by considering the costs for handing over non BT originated fixed geographic calls to numbers ported to Opal using DLE Handover compared to the costs using BT's Current Solution. Our approach to this is as follows:

a) First, we summarise the key network elements required to deliver the Current Solution and DLE Handover;

b) Second, we explain why we do not include within our cost assessment network elements that are not part of the onward routeing service;

c) Third, we identify those network cost elements that are likely to drive differences in the relative costs between each solution;

d) Fourth, we summarise BT's and Opal's views regarding the costs of each solution;

e) Fifth, we consider the robustness of the evidence provided, and how this affects our assessment of the costs under consideration in this dispute;

f) Sixth, we set out our assessment of the costs based on the evidence provided.

4.18 Our provisional conclusions using this approach are set out below at paragraph 4.69 to 4.72.

Technical network elements

4.19 As set out in paragraph 4.17 above, Ofcom's approach to assessing whether DLE Handover is a more efficient method for onward routeing of non BT originated calls to numbers ported from BT to Opal requires us to identify the key network elements required to deliver BT's Current Solution and DLE Handover. This section first summarises the views of the parties, and then Ofcom's provisional conclusion on those key network elements.

Views of Opal

4.20 We requested that Opal provide its views on the technical elements necessary for each of BT's Current Solution and DLE Handover. These are set out in detail in section 3. In summary:

a) Opal did not provide details of the technical elements required for the Current Solution.

b) In terms of DLE Handover, Opal did not provide a breakdown of the technical elements required. However, it advised that by making available the use of its ISI links, no physical changes to the current technical arrangements would need to take place before Solution 2 (i.e. routeing from the DLE to Opal's Nokia switches) could be operational. Opal's view is that there is sufficient capacity available for CP originated traffic to ported numbers. Where capacity is insufficient, Opal advises that it is able to use [✂] (see paragraph 3.52 above) to reduce its own egress traffic to the DLE with the objective of ensuring that spare channels are always available for the ingress traffic from BT.

c) Opal provided no view on the technical elements required as part of the system development proposed by BT (Opal explained that its response did not take into account the system development costs that BT had estimated, but urged Ofcom to require BT to provide a detailed breakdown and explanation of the costs).

Views of BT

4.21 Based on information provided by BT (see section 3), the network elements for the Current Solution can be summarised as follows:

a) DLE switch: All calls that enter BT's network at the DLEs will require switching at those DLEs and will incur the costs associated with doing this.

b) LTC: LTC relates to the conveyance of traffic from BT's DLEs to BT's tandem switches for onward conveyance. Every call handed to BT at the DLEs requires such onward conveyance using LTC. LTC represents the 'thickest' of BT's transmission routes due to the high levels of traffic aggregation between DLE and tandem points. Traffic on these routes is aggregated from BT's DLEs up to its NGS switches.

c) ITC: ITC relates to those calls which need to be conveyed between tandem switches on BT's TDM network before they can be handed over to Opal at the relevant GSX switch. In the Current Solution this can apply both to a proportion of traffic to ported numbers handed over to BT by the originating operator at the DLE (all of which is currently routed to the tandem layer), and to a proportion of traffic handed over to BT by the originating operator at the NGS switch (i.e. tandem layer).

d) CSI: CSI is BT's provision of interconnection links from its NGS switches to those of Opal, and BT connects to Opal's network in the buildings containing the Opal GSX switch. CSI transmission links are presently used for onward routeing [✂]

e) PPP: Product management, policy and planning costs (PPP) is a term given by BT to the administrative costs incurred by BT as a result of providing narrowband interconnection services. In this dispute, it refers to PPP costs allocated to transit calls.

f) System development costs: these relate to costs incurred by BT to develop software and hardware solutions to ensure calls to ported Opal numbers are carried along the correct routes.

g) Termination at GSX switch: Ultimately, the onward routed call will require termination on Opal's network at the GSX. This network element is owned and operated by Opal and therefore the associated cost is incurred by Opal.

4.22 Based on information provided by BT (see section 3), the network elements for DLE Handover (based on Solution 2) can be summarised as follows:[62]

a) DLE switch: The same BT DLEs will be utilised to onward route ported calls as under the Current Solution for the reasons given in 3(a) above. Accordingly, all

[62] We explain at paragraphs 4.31 below why we have restricted this assessment to Solution 2 and do not need to consider Solution 3.

else equal, the same DLE processing costs will be incurred under either the Current Solution or DLE Handover.

b) ITC: ITC relates to calls which need to be conveyed between tandem switches on BT's TDM network before they can be handed over to Opal at the relevant GSX switch. In DLE Handover this only applies to traffic handed over to BT by the originating operator at the NGS switch (i.e. tandem) layer, as calls handed over at the DLE will not be routed to this tandem layer.

c) ISI circuits: Opal is presently interconnected with the BT network using In-Span Interconnect (ISI) where interconnection occurs between BT's DLE premises and Opal's Nokia switch premises[63].

d) PPP.

e) System development costs.

f) Opal's Nokia switches will be required to allow for onward transit to Opal's GSX switches for call termination.

g) Transit from Nokia switch to GSX switch.

h) Termination from GSX switches will be required on Opal's network.

Summary of Ofcom's understanding of the key technical elements required to deliver BT's Current Solution and DLE Handover

4.23 Our understanding of the key technical elements required for BT's Current Solution and DLE Handover to Opal's Nokia switches is set out in Table 4 below. This is based on the information provided by the parties.

[63] [✂]

Table 4: Network elements in the Current Solutions and DLE Handover

	Current Solution	DLE Handover
Onward routeing service (ongoing costs)	DLE	DLE
	LTC	
	PPP	PPP
	ITC (note 1)	ITC (note 1)
		ISI (DLE to Nokia)
	CSI (NGS to GSX)	
Onward routeing service (one-off costs)	System development costs	System development costs
	CSI - connection	ISI - connection
Opal's network		Nokia switch
		Transit from Nokia switch to GSX
	Termination from GSX	Termination from GSX

Note 1: Under the Current Solution, ITC is incurred on some calls handed over at both the DLEs and the NGSs (because the routeing may use double tandem conveyance in BT's network). In DLE Handover, any call that BT hands over to Opal at the DLE would not incur ITC charges. Nevertheless, even if DLE Handover were implemented, those calls delivered to BT's tandem layer would still incur ITC (but see paragraph 4.52 below).

Costs

4.24 Having established the key technical elements for the Current Solution and DLE Handover, we analysed the cost differences between the two to establish whether DLE Handover is of overall lower cost and thus, more efficient.

4.25 We do not consider that all of the network elements set out in paragraph 4.23, and therefore their associated costs, will be relevant to the assessment of reasonableness required under this determination to resolve this dispute.

4.26 First, GC 18 relates to the arrangements for onward routeing. As shown in Table 4, some of the network elements in each solution are Opal-specific and relate to Opal's network, and these are therefore not part of BT's onward routeing service and can therefore be excluded.

4.27 Second, we are assessing the relative costs of the various solutions in relation to the onward routeing of non BT originated calls ported from BT to Opal. Accordingly, where alternative onward routeing proposals share common network elements, then to the extent their associated costs are the same, these network elements (and their costs) can be excluded from the cost difference assessment. Specifically, in this dispute, all proposed solutions require use of a DLE and hence associated costs of DLEs are unlikely to vary materially between the proposed solutions. Accordingly, DLE and PPP[64] costs are excluded from our analysis of cost differences.

4.28 Third, it is relevant to consider how we treat one-off costs such as system development costs in our assessment. The initial question is whether these costs should be included or excluded from the analysis. The argument for their inclusion is that such costs must be incurred. The argument to exclude them is that they constitute "System Set-up Costs" as defined in GC 18.5 (which under GC18.2 must not be included in the APCC) – see paragraph 4.87 below. On this question, we take the provisional view that they should be excluded. However, for completeness, we

[64] PPP charges are estimated to be £[✂] by BT for both the Current Solution and DLE Handover. We have interpreted these charges as a proxy for the underlying costs and therefore we assume that PPP costs do not vary by solution.

discuss these costs below, in order to allow us to assess the extent to which their inclusion would alter our provisional conclusions.

4.29 If, contrary to our provisional view, one-off system development costs were to be included in the analysis, it matters whether our assessment relates to comparing: (a) the incremental costs of moving from the Current Solution to DLE Handover (given that the Current Solution already exists); or (b) the costs from scratch of the Current Solution compared to DLE Handover. Under (a), system development costs need to be incurred for DLE Handover but not for the Current Solution (because they have already been incurred, i.e. are effectively treated as sunk). But under (b), the system development costs of establishing either solution (in relation to Opal's traffic) are relevant. We take the view that system development costs, if included, should be on the basis of (b), i.e. by estimating cost of both solutions from scratch. Otherwise the assessment would effectively be influenced by which solution BT chose to implement first.

4.30 The difference between the Current Solution and DLE Handover is therefore LTC, ITC and CSI (for the Current Solution) compared to ISI (for DLE Handover), as well as any difference in one-off system development costs.

4.31 It should be noted that in the following assessment of costs, we have not explicitly considered Solution 3 as a means for offering DLE Handover. This is on the grounds that the focus for DLE Handover has predominantly concerned Solution 2, as this was the solution referred to in Opal's original Submission and previously its SOR to BT. Further, it can be assumed that Solution 3 represents a higher cost solution for onward routeing than Solution 2, as Solution 3 would require (new investments in) interconnect links dedicated to ported calls to Opal. Therefore, references below to DLE Handover concern Solution 2 only (unless otherwise stated).

Opal's submissions on costs

4.32 As set out in paragraphs 3.60 to 3.72 Opal did not provide data demonstrating the costs associated with the provision of the key technical elements required in providing BT's current solution or DLE Handover.

4.33 However, Opal has argued that overall DLE Handover (Solution 2) would be "cost neutral" to BT. We note that Opal's view would appear to be based on interconnect circuits costs being the same for the Current Solution and DLE Handover, because the same traffic is involved for both. Opal's view did not explicitly take account of the consequences of the differences in routeing, or of any potential additional cost savings offered by DLE Handover removing LTC and ITC costs.

4.34 Whilst Opal has advised that its existing ISI interconnection circuits could be used for Solution 2, it has not provided data demonstrating the associated costs for providing DLE Handover.

BT's submissions on costs

Aggregation on BT's TDM network under the Current Solution

4.35 As set out in paragraph 3.55, in BT's view the Current Solution is the most efficient because it aggregates the traffic from calls to ported numbers onto a relatively small number of routes, and thereby, according to established traffic engineering principles, maximises the utilization of transmission capacity.

BT's cost model

4.36 Paragraphs 3.73 to 3.80 set out the data provided by BT to demonstrate its view of the costs associated with the provision of the key technical elements required in providing BTs Current Solution and DLE Handover. The costs concerning calls to numbers ported to Opal are summarised in Table 1 at paragraph 3.73 above.

4.37 BT suggests that the Current Solution has a lower ongoing cost than a solution using DLE Handover by £0.9 million per annum. This is because, in BT's cost model, the saving in LTC is more than offset by the increased cost of interconnection circuit rental, arising from the need for a larger number of longer interconnect links between BT's and Opal's network.

4.38 BT also considers that the Current Solution has lower one-off costs by £1.7 million, by avoiding additional system development costs and connection costs of new interconnection circuits.

Ofcom's assessment of BT's cost model

BT's general argument about traffic aggregation

4.39 BT's TDM network is characterised by a hierarchy of switches which are arranged within BT's network for the purpose of aggregating traffic on both LTC and ITC traffic routes. BT's TDM network first aggregates traffic from individual lines onto concentrators. Then a number of concentrators are parented on a single DLE, which further aggregates traffic at DLEs around the country. The aggregation effect is considerable, since a significant proportion of traffic originated both by BT and non-BT CPs (including, local, national, international, CPS, NTS and other calls) is carried across the same LTC elements of BT's network. This allows costs to be reduced because there are economies of scale in route size.

4.40 BT's tandem switches are then connected to a number of DLEs, which allows for further aggregation of traffic. However, the aggregation benefit on ITC traffic routes is less clear since the aggregation benefit will depend on the level of optimisation under the Current Solution, and the extent to which alternative conveyance routes to ITC is achievable at lower cost.

4.41 The assessment of relative costs between the Current Solution and DLE Handover therefore could, broadly speaking, rest on whether or not cost savings of moving to DLE Handover (i.e. avoiding LTC and ITC) would be outweighed by the loss of economies of scale from no longer aggregating calls to numbers ported to Opal with all other traffic using BT's core network and spreading the calls to numbers ported to Opal across a larger number of interconnect links.

4.42 The proposition that it is lower cost to aggregate traffic does not always apply and the specific circumstances need to be considered. DLE Handover could aggregate ported traffic with other traffic conveyed between BT and Opal on the ISI links. Whilst traffic is to or from the Opal network only and the scale benefits are therefore likely to be less than realised under the Current Solution (LTC transmission links carry traffic to and from multiple networks), DLE Handover should still be able to benefit from the aggregation of ported traffic with Opal's other traffic. Given this, we have not relied on a presumption or prior view that BT's Current Solution, using LTC and ITC, would, as a general proposition, necessarily be lower cost than DLE Handover because of traffic aggregation.

4.43 We consider that it is necessary to assess the circumstances applicable to this dispute. BT's analysis is set out in its cost model. On assessment, we identified two significant flaws in BT's cost model, which are set out below.

Flaw 1: Assumptions to estimating ITC costs

4.44 We have set out in paragraph 2.24 that the current deployment of interconnection between BT's NGSs and Opal's GSXs under the Current Solution results (in addition to LTC), in the case of some calls, in the need to convey the traffic between BT's tandem switches, and hence in ITC charges. This applies to (a proportion of) traffic received by BT from the originating operator at both (a) the NGS switch and (b) at the DLE. By comparison, for DLE Handover, for the latter category, traffic that is received by BT at the DLE is no longer routed from the DLEs to the NGS, so LTC and ITC costs are both removed. DLE Handover would still incur some ITC costs for the former category of non-BT originated traffic received by BT at the NGS.

4.45 We note that within BT's model there is no consideration of the costs of ITC. The annual cost of ITC to Opal (based on the ITC element of charges in the APCC paid by Opal) is at present approximately £[✂]. It is clear that by excluding ITC costs from the cost model, BT has understated the costs of both the Current Solution and DLE Handover. The costs of the Current Solution are, however, understated by a greater amount than those of DLE Handover for the reason set out above.

4.46 BT provided Ofcom with the underlying data used to set the ITC cost element of the APCC paid by Opal. The ITC data comprises volume data (traffic minutes) for January 2009, split by time of day ("TOD") (Day/Evening/Weekend) and multiplied through by corresponding standard interconnect rates for ITC-short, ITC-medium and ITC-long network conveyance services, to derive a total ITC cost of ported transit to be paid by Opal through the APCC. Based on this data, the estimated cost of ITC for ported transit under the Current Solution is £[✂]. Table 5 shows the breakdown of these costs according to TOD and ITC product.

Table 5: Current Solution ITC costs (£), January 2009, annualised

	Time Of Day			
ITC product	Day	Evening	Weekend	Total
ITC-short	[✂]	[✂]	[✂]	[✂]
ITC-medium	[✂]	[✂]	[✂]	[✂]
ITC-long	[✂]	[✂]	[✂]	[✂]
Total costs	[✂]	[✂]	[✂]	[✂]
Convert Monthly costs to yearly costs				[✂]

4.47 We have considered the relevant ITC costs under DLE Handover. There are two categories of ITC costs that arise where BT receives ported traffic from originating CPs: (a) ITC for traffic received by BT at the tandem switch, and (b) ITC for traffic received by BT at the DLE.

4.48 The first category (a) of ITC costs is not relevant to our assessment of cost differences between the Current Solution and DLE Handover, since it relates to routeing that is beyond the scope of this dispute. Even if such costs were within scope of this dispute, our view is that the costs in this category are unlikely to affect our assessment of cost differences as they are likely to be the same between the Current Solution and DLE Handover. This result would hold even if BT and Opal were to successfully negotiate additional CSI circuits to reduce the need for ITC, as the effect on calls received at the tandem layer would likely be the same under the Current Solution or DLE Handover (see also paragraph 4.46).

4.49 The second category (b) of ITC costs is relevant to our assessment, as this identifies potential cost differences between the Current Solution and DLE Handover. BT has provided data to Ofcom from which we can derive these ITC costs (using charges as a proxy). The data is broken down by volumes (traffic minutes) for January 2009, split by TOD and multiplied through by corresponding standard interconnect rates for ITC-short, ITC-medium and ITC-long network conveyance services to derive a total ITC cost of ported transit. BT has also applied an industry average of 73.25% to the total traffic minutes, in order to calculate the volume of traffic received by BT at the DLE. However, in providing its modelled costs for the Current Solution and DLE Handover, BT has separately advised us that its analysis of volumes shows that a significant proportion of calls charged at the local exchange rate use VICs and hence are actually handed over at DLEs. BT has advised us that for the purposes of its cost modelling for LTC it has therefore used a figure of 55% of total traffic to calculate the volume of calls handed over at DLEs.[65] As the tandem layer element of the APCC is CP-specific, we consider it appropriate to use this 55% proportion of traffic as a basis for estimating the costs of ITC. Under the Current Solution, for those calls that are received by BT at the DLE, the ITC cost is thus estimated at £[✂]. Table 6 below illustrates the breakdown of these costs by TOD and ITC product.

Table 6: ITC costs attributed to ported calls received by BT at DLEs (£), January 2009, annualised

	Time of Day			
ITC product	Day	Evening	Weekend	Total
ITC - short	[✂]	[✂]	[✂]	[✂]
ITC - medium	[✂]	[✂]	[✂]	[✂]
ITC - long	[✂]	[✂]	[✂]	[✂]
Total costs	[✂]	[✂]	[✂]	[✂]
Convert Monthly cost to yearly cost				[✂]

4.50 Our view is that the cost estimate for ITC associated with calls received by BT at the DLE of £[✂] per annum is relevant to our assessment, because it is incurred under the Current Solution but would not be incurred under DLE Handover. This cost

[65] Email from J Davey (BT) to L Knight (Ofcom) dated 18 September 2009

estimate is consistent with the calculation used by BT for the ITC element of the APCC.

4.51 We note that the cost estimates for ITC related to traffic received by BT at the DLE layer (£[✂]) deducted from the total estimated ITC costs (£[✂]) implies an estimated ITC cost for ported traffic received by BT at the tandem layer of (£[✂]).

4.52 Whilst the exclusion of ITC costs in BT's model would seem to understate the cost of the Current Solution, we also understand that BT and Opal have reached an agreement for BT to install an additional [✂] CSI interconnect circuits from its NGSs to Opal's GSXs, which would reduce substantially the level of ITC incurred[66]. If additional CSI circuits introduced were to largely remove ITC costs under the Current Solution, this would have an impact on the cost savings offered by DLE Handover. This is because reducing ITC costs through introducing additional CSI circuits would reduce the ITC costs of the Current Solution (for traffic received by BT at the DLE and tandem layer), meaning that any ITC costs associated with calls delivered at the DLE that could be removed by DLE Handover would have already been largely eliminated (see also paragraph 4.63 below).

4.53 However, this reduction would be offset to some extent by the additional costs of the extra [✂] CSI circuits. BT's advice was that the additional CSI circuits implied "an increase in the circuit costs for Solution 1 of around 25% all things being equal", but specific costs were not made available.[67] The overall impact of ITC costs and additional CSI costs will depend on the final costs for the additional CSI circuits and exactly what ITC savings they would introduce. Neither party has provided us with the data that would be necessary to quantify this overall impact accurately. But in our cost estimates below we have used BT's suggestion of the cost impact, as the best evidence currently available to us.

Flaw 2: Assumptions to estimate interconnect circuit costs

4.54 BT has estimated the number of circuits it would need from each DLE to the nearest Opal node that it would need in order to implement DLE Handover assuming new routes and using an assumption that each 2Mb/s circuit (E1) will carry, at most, [✂] minutes per month. By comparison, according to BT's data, the routes in the Current Solution carrying this traffic from the NGS to the GSXs carry approximately [✂] minutes per month on average. In general, larger routes are more efficient than smaller routes as illustrated by the data provided by BT on the utilisation of the current routes. However, BT's modelling assumption for routes from the DLEs may over-estimate the costs by under-estimating the efficiency that could be achieved on DLE routes:

a) If, for DLE Handover, the existing ISI interconnection links from the DLEs to Opal's Nokia switches were used, a greater efficiency could be achieved by aggregating traffic for non-BT originated calls to ported numbers together with traffic types already carried on these routes;

b) If, for DLE Handover, the existing ISI interconnection links from the DLEs to Opal's Nokia switches were used, a greater efficiency could be achieved by aggregating traffic for non-BT originated calls to ported numbers together with traffic types already carried on these routes;

[66] Email from J Davey (BT) to S Bevis (Ofcom) of 7 October 2009 and email from C Stocks (Opal) to L Knight (Ofcom) of 19 October 2009.
[67] Email from J Davey (BT) to S Bevis (Ofcom) of 7 October 2009.

c) In addition, if the existing ISI routes were used, the key issue to be determined would be the amount of additional capacity needed, not the total capacity needed for the ported traffic as if carried on new routes;

d) It is not clear to us that, irrespective of whether the existing routes or separate routes for the ported traffic are used, the generic assumption of a maximum of [✂] minutes per 2Mb/s circuit per month is appropriate for the analysis of costs in this dispute. Whilst this assumption may, more generally, be a reasonable assumption for initial planning of a new route, the volumes of CP-originated traffic to numbers ported from BT to Opal's network are relatively well established and the current routes from the NGS show a much higher utilisation than this. As such, we would expect that in dimensioning routes for DLE Handover (as in Solution 2), route sizes would be based on a specific assessment of the actual utilisation that could be achieved rather than a more generic assumption. A more detailed assessment of circuit requirements based on actual traffic rather than generic assumptions may lead to a reduction in circuit costs for DLE Handover which reduces the difference in costs.

4.55 BT has assumed the use of CSI circuits in estimating the costs of interconnecting its DLEs to Opal. This follows the approach it has used for interconnecting its NGSs to Opal's GSXs. However, using CSIs for the traffic under DLE Handover, given that Opal has already implemented interconnection to the DLEs for its own traffic using ISI routes, risks not taking into account the impact of the points set out at 4.54a) and 4.54b) above.

Ofcom's estimates of costs based on the evidence provided

4.56 Notwithstanding our reservations on BT's cost model, on the basis of the information provided to us, we have set out below a summary of our base case assessment of cost differences between the Current Solution and DLE Handover. The following paragraphs explain how we have identified relevant network elements, and the source of the cost estimates we have used for each network element.

4.57 LTC is a network conveyance service that would not be required under DLE Handover and therefore we would expect its inclusion in the assessment to generate a cost saving under DLE Handover. We understand that BT's estimate of the costs of LTC is based on traffic volumes (by time of day) for onward conveyance to Opal's network and BT's published standard charges. Whilst we consider the use of published standard charges to be reliable, we note that for traffic volumes BT has used Opal-specific assumptions, rather than the industry average (see paragraph 4.49 above). As the LTC element of the APCC is based on the industry average, we consider it appropriate to use this same industry average in calculating the LTC costs to Opal.[68]

4.58 For likely rental costs for interconnection circuits under the Current Solution and DLE Handover we have used BT's estimates. As stated previously (see paragraphs 4.54 to 4.55), although the estimates may not fully reflect the efficiency savings available on present ISI interconnection links between BT and Opal, in the absence of further information from the parties, BT's estimates provide the best estimates currently available to us. For the same reason, for the one-off connection costs of interconnection circuits, we have used BT's estimates.

[68] We intend to discuss BT's approach to calculating LTC costs with BT separately as an issue outside of this dispute.

4.59 As set out in paragraph 4.50 above, we consider that ITC costs related to those calls received by BT at the DLE are relevant to our assessment.

4.60 To combine ongoing and one-off costs into an aggregate assessment of the cost difference, we have derived a Net Present Value ("NPV") basis over 5 years using the (pre-tax, nominal) cost of capital for BT of 11% as the discount rate.[69] In the wholesale narrowband market review[70] we used a time period of five years for considering interconnection circuits, based on input from CPs. We therefore consider this an appropriate period to use in this assessment. Our base case estimates, using the assumptions set out above, are shown in Table 8.

Table 7: NPV[71] estimates of network cost differences – excluding additional CSI circuits (£m)

	Current Solution	DLE handover	Cost difference	Cost difference (NPV over 5 years)
Network service				
Annual costs				
LTC	[✂]	[✂]	-1.5	-5.8
ITC	[✂]	[✂]	-2.0	-7.6
Interconnection links (rental)	[✂]	[✂]	2.0	7.9
Sub-total			**-1.8**	**-5.5**
One –off costs				
Interconnection link (fixed)	[✂]	[✂]	0.8	0.8
Sub-total			**0.8**	**0.8**
Total				**-4.7**

4.61 DLE Handover would allow significant savings in the costs of LTC and ITC. In our base case estimates these savings would more than offset the increased cost of interconnection circuits. To reverse this view that DLE Handover is lower cost than the Current Solution would require an increase of more than 54% in the base case assumption of the interconnection circuit cost difference.

[69] http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/annexes.pdf BT Openreach has a slightly lower WACC (10.1%) and the rest of BT has a slightly higher WACC (11%) than for BT Group (10.6%). We apply the "rest of BT" WACC as BT's cost of capital for this dispute.
[70] http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/ Para 8.58 to 8.61
[71] NPV estimates are taken over a five-year period and using a pre-tax nominal WACC of 11%. For simplicity, we assume that the ongoing costs are the same in nominal terms over the five-year period, and for the purpose of discounted are treated as if they are incurred in the middle of the year. Our cost estimates are expressed in constant nominal terms and in 2009 prices. We have assumed, broadly speaking, that any future inflationary pressures or asset prices increases will be likely to be offset by other factors, including possible reductions in costs from network efficiencies and strengthening competition in the provision LTC and ITC over time.

4.62 As set out earlier (see paragraph 4.52) we have also considered information arising from ongoing commercial negotiations between BT and Opal that would result in a reduction of ITC costs with the Current Solution. Our view is that any information relevant to these negotiations could be highly relevant to identifying the least cost routeing method. BT has advised us that that it has agreed with Opal to provide additional CSI interconnect links between Opal's GSX switches and BT's NGS tandem layer. BT has provided information showing the number of new links ([✂]) and the [✂] routes over which these will run. BT has also advised that these links will act to substantially reduce ITC costs currently incurred under the Current Solution.

4.63 Specifically, BT advised that:

a) ITC costs between BT's NGS tandem switches and Opal's GSX switches will be substantially eliminated from the APCC by the re-configuration except for a "small residual amount of traffic that would still require the ITC element" for both solutions; and

b) The additional [✂] CSI circuits imply a 25% increase in CSI interconnection circuit costs.

4.64 Opal has also independently confirmed to us that it expects additional CSI interconnection circuits to be introduced over the [✂] routes and that Opal understands that BT hopes to have the majority of these in service before the end of December 2009.

4.65 For our base case estimates, in the absence of better information, we have assumed that 100% of the ITC costs are saved by the additional CSI circuits. As noted at paragraph 4.53 above, we have used BT's estimate of the additional cost of these circuits.

4.66 Based on the above approach, Table 8 below sets out our estimates of the cost differences of the Current Solution against DLE Handover, taking into account the planned additional CSI circuits.

Table 8: NPV estimates of network cost differences – including planned additional CSI circuits (£m)

	Current Solution	DLE handover	Cost difference	Cost difference (NPV)
Network service				
Annual costs				
LTC	[✂]	[✂]	-1.5	-5.8
ITC	[✂]	[✂]	0.0	0.0
Interconnection links (rental)	[✂]	[✂]	1.9	7.4
Sub-total			**0.6**	**1.6**
One –off costs				
Interconnection link(fixed)	[✂]	[✂]	0.7	0.7
Sub-total			**0.7**	**0.7**
Total				**2.3**

4.67 As can be seen from Table 8, the impact of the additional CSI interconnect circuit estimates on ITC is to remove the £2.0 million ITC cost saving of DLE Handover, while raising annual interconnection costs by approximately £0.1m and one-off interconnection costs by approximately £0.1m. The net impact of this suggests the Current Solution is lower cost than DLE Handover by an NPV of about £2.3 million.

4.68 To reverse this view that the Current Solution is lower cost than DLE Handover would require that less than 70% of ITC costs would be avoided by the additional CSI circuits (given the base assumptions of BT's estimates of interconnection circuit costs). Or it would require that BT's cost estimates overstate the difference in cost of interconnection circuits for DLE Handover compared to the Current Solution by more than 28%. Or there could be a combination of variation in these assumptions compared to the base case (such as 90% of ITC costs avoided and at least 19% overstatement in interconnection circuit cost difference).

Ofcom's provisional conclusion on costs

4.69 For the reasons set out above we consider that BT's model may over-state the costs of DLE Handover because it is based on an assumed traffic utilisation of CSI links from the DLE that, in our opinion, is not based on the actual ported traffic volumes. BT's model also under-states the cost of the Current Solution by failing to include ITC costs. Opal on the other hand has not provided us with any detailed cost data to support its views that DLE Handover is more efficient.

4.70 On the basis of the evidence provided to us, the analysis of costs that we have undertaken suggests the following:

a) If we abstract from the proposed introduction of additional CSI circuits under the Current Solution, which would remove (or substantially reduce) ITC costs, the evidence available to us suggests that DLE Handover is lower cost than the Current Solution. Our base case result is that DLE Handover is £4.7 million lower cost (NPV over 5 years) – see Table 7. ITC costs are a major contributor to this result (accounting for a saving of £7.6 million over 5 years).

b) If we take account of the proposed introduction of additional CSI circuits under the Current Solution, the evidence available to us suggests the opposite, i.e. that the Current Solution is lower cost than DLE Handover. Our base case result is that DLE Handover is £2.3 million higher cost (NPV over 5 years) – see Table 8. This result depends on the extent of ITC costs that are saved under the Current Solution, and the difference in interconnection circuit costs between the Current Solution and DLE Handover (our base case assumption reflects BT's estimates, despite our concerns set out above, because in the absence of any information from Opal, this is the only quantified estimate we currently have). Changes in either or both of these assumptions could affect the analysis sufficiently to alter our conclusion.

4.71 The inclusion or not of additional CSI circuits under the Current Solution could therefore have a material impact on the cost position. In our view we should in principle take this effect into account, because we understand that it has been agreed by the parties and has a material impact on our analysis.

4.72 We consider that system development costs should be excluded from the analysis for the reasons given at paragraph 4.86 to 4.87. However, we note that the inclusion of these costs would be unlikely to alter our conclusion on costs.

4.73 As we have set out above, we have serious reservations about the quality and comprehensiveness of the cost data provided to us. We note in this regard that Opal has not provided us with cost data to support its assertions. Whilst we have sought to assess costs on the basis of the information before us, our view is that the data is insufficient for us to decide that Opal's proposal for DLE Handover is more efficient than BT Current Solution and that we should accordingly determine that BT should be required to offer DLE Handover in order to comply with its obligations under GC18.

Further information required

4.74 In order for us to consider further whether DLE Handover is more cost efficient than BT's Current Solution, there are two key areas in relation to which further information is likely to be needed.

4.75 First, we would need data concerning the additional [✂] CSI interconnect links planned for December 2009. Specifically we would need the costs of these additional links and the ITC costs that would be avoided with the Current Solution.

4.76 Second, we would need reliable estimates of the differences in the costs of interconnection circuits between the Current Solution and DLE Handover, taking into account the potential higher efficiency that could be achieved if the ported traffic were to be combined with the existing traffic on Opal's ISI circuits under DLE Handover. The cost model that BT provided to Ofcom did not model this approach. BT has taken the approach that without agreement between the parties as to the commercial arrangements for the use of the existing ISI links, it is not possible for BT to do this modelling as it is unlikely to have access to the costs of the ISIs. This is because the

ISI links have been implemented and are owned and managed by Opal. We understand that, under the BT SIA, ISI links can be used for traffic owned by both parties, on agreement by the parties, but that this requires separate routes for the traffic owned by BT to that owned by Opal. It is unclear to us from the responses by BT and Opal that this agreement is in place.

4.77 Further, Opal has not, in response to our requests, provided any cost data (whether actual or estimated). Accordingly we have not been able to assess whether the use of the ISI links could lead to a more efficient solution.

4.78 In our view, the parties would need to agree the technical and commercial arrangements for using the ISI links to support the routeing of the ported traffic to Opal from the DLEs before a robust analysis of the costs of ISI under DLE Handover could be carried out. This agreement would need to address a number of key issues including:

- Whether, and if so how and on what terms, BT could use the ISI (or the steps that would need to be taken to provide this agreement);
- Whether the current routes would be used, or whether new unidirectional routes to carry ported traffic to Opal would need to be provided;
- If current routes were used bi-directionally:
  - The extent to which the existing installed capacity connecting BT's DLEs to Opal's Nokia switches could carry the additional ported traffic as well as the current traffic load;
  - Any costs that would be incurred for this;
  - The extent to which these routes could be expanded using the existing ISI (e.g. an ISI provides a high capacity link; routes between switches are then configured on multiple E1 circuits so there may be spare capacity on an ISI link allowing a relatively quick turn-up of additional capacity);
  - The costs that would be incurred in planning, deploying, operating and managing additional capacity over an existing ISI link;
  - The commercial arrangements between the parties related to the turn-up and usage of this additional capacity;
  - The planning and network management processes that would apply to these routes. In particular, where a route becomes congested so that calls overflow, what commercial arrangements would apply to this overflow traffic between the parties;

  If new unidirectional routes are needed (rather than using the existing routes), some of the above questions would still be relevant.

4.79 Further issues that would need to be addressed include:

- The costs of deploying additional ISI capacity should the current capacity be exhausted;

- The commercial arrangements between the parties related to the deployment of additional ISI capacity; and

- The technical and commercial solution that would be used where the DLE to Nokia interconnection is not realised by ISI (e.g. where ISI+IEC or VICs are used instead) and the technical and commercial solution that would be used where a DLE is not interconnected to Opal's Nokia switches at all.

Additional factors which may be relevant

4.80 As set out in paragraph 4.7 above, our starting point was to consider the relative costs of DLE Handover compared with BT Current Solution, and we have provisionally found that we do not have sufficient evidence to conclude whether Opal's proposed solution based on DLE Handover is more cost effective than BT's current method of routeing.

4.81 We now go on to consider whether there are any additional factors that provide a sufficiently strong reason for us to conclude that BT should be required to offer DLE Handover, notwithstanding our provisional conclusions above on costs. These are: the pattern of payments, i.e. the effect of the charges levied by the parties; financial impact on the parties; the impact of DLE Handover on other CPs; a consideration of whether there are any relevant benchmarks against which DLE Handover can be measured (and the outcome of any such measurement); and consideration of arguments concerning the six principles of cost recovery.

Pattern of payments

4.82 As previously discussed in section 3 in paragraphs 3.81 to 3.89, the parties disagree on who would be liable for payment of charges to cover some of the costs of DLE Handover, if it was implemented. As such, Ofcom sought the views of the parties, with supporting information, on who would be liable for payment of charges to cover some of the costs if DLE Handover was implemented, and the wider impact of introducing DLE Handover.

Opal's view

4.83 As set out in section 3, Opal's view is that each component for DLE Handover is set out in the BT Carrier Price List and, under the terms of the BT SIA, BT would be liable to pay all these charges. Further, as set out above, Opal considers that any system development costs for DLE Handover represent System Set-Up Costs for which BT is liable.

BT's view

4.84 BT argues that all the costs incurred by BT from the point where the call to a geographic ported number is handed over to BT by another CP to the point where the call is handed over to the recipient network are transit costs, including the interconnect links. As all the costs listed in the three solutions are transit costs, BT's view is that they should be paid for by the recipient network for calls which originate on another CP's network.

Ofcom's view on payment of charges

4.85 We set out below our views on the relevance of the payment of charges under different routeing methods, in light of our provisional conclusions on the relative costs (as set out above) and the parties' submissions.

One off payments for system development costs

4.86 The key issue in respect of the one-off payments which need to be made to cover system development costs is whether such costs fall within the definition of "System Set-Up Costs" in GC 18.5(o). If so, these costs would have to be borne by BT pursuant to GC 18.2(b).

4.87 In our view, System Set-Up Costs, as defined, mean the one-off costs incurred by a donor provider which are associated with the roll-out or extension of a number portability solution, or with the migration from one to another number portability solution, if the existing solution (more specifically, the portability charge based on the solution) does not comply with the obligations in GC 18. These costs are related to all activities needed to establish the technical, operational and administrative capability to provide portability, including development, implementation and initial testing. In this case, the relevant modifications required to BT's network to enable DLE Handover would in our view fall under the definition of System Set-Up Costs, were we to conclude that BT was required to offer DLE Handover in order to comply with its obligations under GC 18.

4.88 As explained in paragraph 4.28 above, in our assessment of the relative costs of the Current Solution and DLE Handover, we do not consider it appropriate to include system development costs. However, if, on this basis, it was demonstrated, based on sufficient evidence, that Opal's efficiency claims as regards DLE Handover were correct, the *level* of system development costs may be a relevant additional factor for us to take into account when deciding whether DLE Handover should be mandated. We would be less likely to conclude that BT is required to offer DLE Handover under GC 18 if BT were required to pay any system development costs that were significantly higher than any reasonably anticipated gain to CPs (and therefore ultimately, consumers) from the introduction of DLE Handover. In other words, where appropriate Ofcom would conduct a cost-benefit analysis, taking account of the impact on the two parties and other stakeholders in order to assess whether the system development costs required to implement the solution were so high so as to create a significant net cost to consumers, regardless of the benefits conferred by the introduction of DLE Handover. In such circumstances, it might therefore be unreasonable to require BT to pay for them to implement DLE Handover, and thus to require BT to offer DLE Handover pursuant to GC 18.

4.89 However, in this dispute we have not been able to test to a sufficiently robust degree whether Opal's efficiency claims as regards DLE Handover are correct. On that basis, we do not consider that it would be appropriate for us to require BT under GC 18 to incur costs to change its current method of providing portability to Opal, and therefore an assessment of whether or not the level of system development costs is proportionate or not is not relevant. For completeness, we note however that the estimated level of system development costs is relatively small (around £[✂]) compared to the potential benefits to Opal from the removal of annual LTC costs (see paragraph 4.105 below).

Payments for interconnection circuits

4.90 As regards any payments made (and charges levied) by the parties for the use of interconnection circuits, the parties have made opposing arguments (see paragraphs 4.82 to 4.84 above).

4.91 BT has argued that all the costs incurred by BT from the point where the call to a ported number is handed over to BT by an OCP to the point where the call is handed over to the recipient provider are transit costs, including the interconnection circuits. These costs should therefore be paid for by the recipient provider. We consider that this view is consistent with the sentiment of GC 18, i.e. that BT may recover certain porting conveyance costs from the recipient provider, subject to the parameters of reasonableness and cost orientation of charges, and the requirement that ACCs and System Set-Up Costs may not be charged for.[72]

4.92 Opal on the other hand has argued that ported traffic on BT's network is "BT's traffic" and thus BT's responsibility, including all costs and charges, under the SIA (paragraph 5.1.3 and Appendix D of Annex A). This view would suggest that the donor provider could not recover any porting conveyance costs, which, as indicated above, is not the case: GC 18 implies that BT may recover some costs for routeing the ported call from its network to Opal's network, subject to certain parameters.

4.93 If we concluded that BT was required to offer DLE Handover to comply with GC 18, we would consider that any costs incurred by BT for interconnection required to deliver DLE Handover (i.e. DLE to Nokia switches) would therefore most likely be recoverable by BT. BT would of course have to set its charges for such interconnection (included in the APCC) based on reasonable costs and the cost orientation principle, in line with GC 18.2.

4.94 Regardless of the payments, as set out in paragraph 4.76 above, it is unclear what interconnect circuit costs would be involved.

Financial impact on the parties to the dispute

Opal's views

4.95 Opal has provided information on traffic volumes indicating that, for January 2009, CP originated minutes (from both DLE and Tandem layer ingress) accounted for [✂]% of total traffic handed over to the Opal network (see paragraph 3.92 and Table 3 above).

4.96 In terms of the financial impact of introducing DLE Handover, Opal has asserted that, based on the January 2009 call volumes, it would save over £[✂] annually in reduced APCC payments to BT.

BT's views

4.97 BT has provided traffic volume information confirming that, for January 2009, CP originated minutes (from both DLE and Tandem layer ingress) accounted for [✂]% of total traffic handed over to the Opal network. BT added that of the total traffic handed over to the Opal network, [✂]% concerns CP originated DLE ingress (see paragraph 3.94 above for a breakdown of traffic volumes).

[72] Despite this, we note that BT has not so far included in its APCC its CSI circuit costs from its NGS to Opal's GSX. See paragraph 3.88 above

4.98 BT has explained that, in its view, DLE Handover has higher costs than BT's current solution and therefore would have an increased financial impact on CPs.

4.99 BT has also explained that in the case of BT's current solution, the APCC would increase on the basis that BT has undercharged Opal by not including CSI connection and rental costs (see paragraphs 3.88 to 3.89 above). BT therefore expects the APCC to be paid by Opal to increase accordingly and also to back date charges. BT has not provided information as to what this specific increase would be.

Wider impact of DLE Handover on stakeholders

Opal's views

4.100 Opal considers that none of the solutions is unique from an engineering perspective and could be implemented through the establishment of normal interconnection links and capacity. Opal does not see any reason why such solutions could not be offered to other CPs for the same purpose and was not aware of any alternative solutions.

BT's views

4.101 As set out in section 3, BT's view is that whilst the Current Solution is currently available to all CPs, DLE Handover for other CPs could also be offered. BT advised that the only further development required to offer direct routeing from DLEs for additional CPs would be a bespoke data build (for which that CP would incur the additional bespoke costs), whilst the other development costs would be a shared benefit. In BT's view, only CPs which predominantly use ported numbers are likely to have sufficient traffic to consider direct routeing from DLEs. In BT's view, DLE Handover could offer a complete solution in isolation.

Ofcom's provisional conclusions on the wider impacts on stakeholders

4.102 It appears to us that DLE Handover is primarily of interest to Opal because of the high proportion of calls it receives to numbers ported to it and its extensive use of direct interconnect to BT's DLEs.

4.103 Nonetheless, DLE Handover could be offered to other CPs requesting it. The costs for doing so would include bespoke data build (which, based on BT's estimates, account for around [✂]% of the system development costs), plus any necessary direct interconnect to BT's DLEs required by that CP where it does not offer its own.

4.104 Should Opal pay costs in order to implement the alternative solution, it appears that it is unlikely to be paying significant set-up costs (estimated at £[✂]million)[73] from which competitors could benefit. Competitors would still have to pay the data build and in the meantime Opal would have benefited from the net gain of the reduced APCC. Regardless, there is no clear evidence that competitors are willing to presently take advantage of the alternative solution.

4.105 Opal has told us that DLE Handover would offer it an annual saving of over £[✂] pounds in reduced APCC payments to BT. In its Submission, Opal submitted that these savings would be a result of reduced costs for LTC. Our review of Opal's calculations shows that DLE Handover assumes that all costs for LTC plus ITC are removed from the APCC. In our view, it is correct to reflect ITC costs in an

[73] See Table 2 in section 3 above. The set-up costs from which other competitors would benefit would be those system development costs other than Data Change, which based on BT's estimates in Table 2 would total around £0.32million.

assessment of the savings Opal might gain from DLE Handover. However the complete removal of ITC and LTC costs by Opal is, in our view, incorrect, as it would appear to us that only around [✂]% of traffic handed over to Opal might benefit from DLE Handover (see paragraph 4.97 above). This equates to a cost saving of nearer £[✂] (based on a reductions of approximately £[✂] in ITC costs and £[✂] in LTC costs). Regardless, this revised estimate in reduced APCC payments remains material.

4.106 Significantly, and as set out in paragraph 4.52 above, Ofcom understands that an agreement between Opal and BT has been reached to introduce [✂] CSI interconnect circuits that would act to circumvent ITC in the delivery of calls ported to Opal. In that ITC costs form around 50% of the APCC paid by Opal, the benefit of DLE Handover (in respect of a reduced APCC payment by Opal to BT) is significantly reduced.

4.107 We have taken account of Opal's potential savings in APCC payments from DLE Handover in our analysis of cost differences above. On balance, the introduction of DLE Handover would seem to predominantly only directly concern the two parties to the dispute.

Benchmarks

4.108 Neither party has put forward any benchmarks that they consider to be relevant. We have considered whether there are any appropriate benchmarks we could use, and, if so, whether they would inform our conclusion. As set out in this section, we have considered DLE Handover against the existing solution for handing over non-BT originated, fixed geographic calls to numbers ported to Opal, which we consider an appropriate methodology. In addition we have looked at how BT delivers both BT and non-BT originated fixed geographic traffic to Opal's number ranges (i.e. non-ported calls), to the extent that this is relevant – see paragraphs 4.13 to 4.16 above.

The six principles of cost recovery

4.109 We consider below the arguments put to us by Opal in the context of the six principles of cost recovery. BT did not use this structure for its submissions (and we have considered all of BT's significant arguments in the analysis above).

Cost causation

4.110 The principle of cost causation states that the cost should be recovered from those whose actions cause the costs to be incurred at the margin.

Opal's view

4.111 Opal argues that that under this principle, reasonable or cost oriented costs of fixed geographic number portability should be recovered from those parties that cause the costs (of onward routeing) to be incurred. Opal notes that in this case, both the calling party and the call recipient take actions to cause the costs of onward routeing to be incurred. The calling party, by initiating the call, makes onward routeing to the ported number necessary. The call recipient, by porting to another network, also causes onward routeing for the call to the ported number. Accordingly the principle for costs causation does not provide guidance as to who pays APCC.

Ofcom's view

4.112 Onward routeing costs arise if the call recipient has ported his/her number and in the absence of direct routeing between the originating network and the recipient network. In this dispute, we are primarily concerned with identifying whether DLE Handover would be more efficient than BT's Current Solution, and not the question of who bears the APCC. We agree with Opal that the principle of cost causation is not definitive in this case.

Cost minimisation

4.113 The principle of cost minimisation states that the mechanism for cost recovery should ensure that there are strong incentives to minimise costs.

Opal's view

4.114 Opal states that in this case, the principle of cost minimisation requires that the charges for porting transit (including APCC and system development costs) should be recovered so as to give operators an incentive to minimise the costs of providing number portability. Opal notes that Ofcom has previously stated the following in regards to this principle:

> "it would be appropriate to limit the costs which the donor network operator, who has a degree of control over the level of the costs, can recover from the recipient network."[74]

4.115 Opal then argues the following in support of its allegation that BT is not minimising costs of ported transit:

a) Under the present arrangements, Opal claims BT has no incentive to minimise costs of transit since BT has complete control over how it routes ported calls across its network, where the recipient must pay for these transit costs regardless of whether routed efficiently or not;

b) Opal has no option to refuse to pay higher APCC charges (otherwise BT will refuse to transit calls);

c) BT has an incentive to route calls inefficiently since it will generate higher profit for doing so (since APCC is based on Fully Allocated Costs ("FAC"), whereas the actual cost is based on Marginal Costs ("MC"), generating profit for any additional conveyance);

d) These inefficiencies have materialised in BT raising the APCC four times since May 2008 and by over 700%;

e) The principle suggests system development costs should be borne by BT, since BT will have an incentive to minimise these costs if borne by itself. Opal claim this is one reason why System Set-Up costs are prevented from inclusion in charging by donor providers under GC18;

f) In the absence of commercial incentives for BT to minimise costs, it is essential that the regulatory framework [compliance with GC 18] provides an incentive to

[74] Ofcom Determinations to resolve disputes between H3G and each of 02, Orange, and T-Mobile concerning donor conveyance charges, 17 August 2007, paragraph 4.6. See www.ofcom.org.uk.comp_bull_index/comp_bull_ccases/closed_all/cw_952/deter.pdf

minimise transit costs, thus the principle of cost minimisation supports a requirement on BT to hand over calls to Opal at the DLE.

Ofcom's view

4.116 The principle of cost minimisation is central to this dispute and we have considered it when assessing whether DLE Handover is more cost efficient than BT Current Solution. See the detailed discussion above.

4.117 In regard to Opal's specific claims, our responses are as follows:

a) In response to paragraphs 4.115a) to 4.115d) and 4.115f), we have recently consulted on the policy supporting current APCC arrangements.[75] However, for the foreseeable future, we continue to support the current policy to (a) facilitate Donor Provider onward routeing of ported calls where no direct routeing is possible and (b) the principle that Donor Providers should be able to recover reasonable costs only from the Recipient Provider for onward routeing. We consider that GC 18 fully reflects this policy position and in doing so, reflects the principle of cost minimisation by limiting cost recovery to those costs reasonably incurred.

b) In response to point 4.115e), BT has borne System Set-Up costs in respect of the present ported routeing arrangements. The position as regards system development costs for DLE Handover is discussed at paragraph 4.88 above.

Effective competition

4.118 The principle of effective competition states that the mechanism for cost recovery should not undermine or weaken the pressure for effective competition.

Opal's view

4.119 Opal claims that in this case, the principle of effective competition requires that the cost of transiting calls (including APCC and system development costs) to ported numbers should be recovered in a way that promotes effective competition. Opal then argues the following in support of its allegation that BT's present routeing of calls to ported Opal numbers and resulting APCC does not promote effective competition:

a) Opal claims fixed geographic number portability is central to promoting competition between fixed networks, yet there is a lack of commercial incentive under the current fixed portability arrangements to reduce costs of conveyance, as demonstrated in negotiations with Opal.

b) Opal considers that an inefficiently high APCC represents significant barrier to entry for alternative operators and switching in the voice telephony market. Opal claims that BT Retail therefore benefits from an asymmetry since it does not pay equivalent charges in the majority of cases (since numbers are typically ported from BT, not to BT). Opal claims this does not create a level playing field, and that potentially, action by BT Wholesale which gives strong advantages to BT Retail, is also potentially discriminating and anti-competitive.

[75] http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/main.pdf

c) The only way BT can effectively be prevented from incurring inefficient routeing costs is by allowing Opal as the Recipient Provider and payer of those costs to determine where it receives those calls from the BT network.

d) As a new entrant using Local Loop Unbundling ("LLU")[76], Opal advises that virtually all of its customers have ported their telephone number from BT. Thus, Opal advises, virtually all calls to Opal's LLU customers attract BT's APCC which therefore acts to reduce Opal's overall termination revenue (by overcharging of approximately £[✂] per annum, and forecast to increase given an expanding LLU customer base).

e) At the time of writing, Opal noted that LTC was currently in the cost stack under consideration in the narrowband market reviews, where Significant Market Power ("SMP") obligations are being reviewed. Opal claims that the conveyance of calls to ported numbers across the donor providers' network could constitute a discrete economic market in which the donor enjoys a monopoly position. Removing BT's SMP designation could result in BT having extensive pricing freedom in the narrow LTC APCC market. Opal argues that this could be addressed in this dispute by requiring BT to handover ported calls at the DLE, allowing Opal to bypass the LTC element in the absence of SMP regulation. This would be in line with Section 3 of the 2003 Act to promote effective competition.

f) The principle of effective competition suggests system development costs should be borne by BT to ensure the work is cost efficient. Opal claims this is one reason why System Set-Up costs are prevented from inclusion in charging by Donor Providers under GC18.

Ofcom's view

4.120 We agree with Opal that an inefficiently high APCC would represent a barrier to entry and expansion, given the importance of porting to LLU Operators using full MPF. Our focus in this dispute is to assess whether Opal's proposed DLE Handover is more efficient than BT's Current Solution.

4.121 We have considered this principle in light of the results of the comparison of costs. In particular, we consider that in the context of this dispute efficient competition is best served where charges for onward routeing are based on the lower cost solution, taking account of the best evidence available.

4.122 As regards Opal's concerns about the pricing of LTC, we stated the following in our Statement on the fixed narrowband wholesale market review:

> "Ofcom recognises that geographic number portability traffic will, in some scenarios incur LTC charges. This is because the majority of calls originating on other CPs networks to BT's geographic number ranges are handed off to BT at the DLEs, whilst the routes from BT to the terminating CP are hosted at the tandem switches. Therefore, the call will use LTC.
>
> As we said in our consultation, the price of LTC for non-ported traffic is constrained by the competitive supply for LTC. For ported traffic, General Condition 18 ("GC18") requires that charges for ported

[76] LLU is where a phone company other than BT installs its telecoms equipment into a local BT exchange. It can then offer its own direct. There are over 5 million unbundled lines in the UK.

traffic may not include, amongst others, "additional Conveyance Costs"[77]. This means that switching and transmission components used by ported traffic, including LTC, may not be charged at a higher rate than is charged for non-ported traffic. GC18 also places cost orientation and reasonableness obligations on the overall level of the APCC that may be levied.

As a result, we consider that GC18 sufficiently constrains the impact of the LTC element on APCC such that it should be no less competitively priced than it has been prior to the de-regulation of LTC. That is, we would expect that the LTC element in the calculation of the APCC reflects the competitive rates BT will charge for LTC more generally.

Therefore, Ofcom believes that GC18 provides sufficient protection against BT setting unduly high LTC charges for the calculation of APCCs."[78]

Reciprocity

4.123 The principle of reciprocity states that where services are provided reciprocally, charges should also be reciprocal.

Opal's view

4.124 Opal states that in the context of this dispute, the reciprocity principle "offers limited practical guidance because BT has ported very few telephone numbers from Opal". That said, Opal argues that there is no obstacle to why the same DLE Handover principle could not apply on a reciprocal basis when BT does port numbers from Opal in the future.

Ofcom's view

4.125 We agree with Opal that the principle of reciprocity is not important in the context of this dispute.

Distribution of Benefits

4.126 The distribution of benefits states that the costs should be recovered from the beneficiaries, especially where there are externalities.

Opal's views

4.127 Opal states that in the context of this case, the principle of distribution of benefits suggests that the costs of providing transit of calls to ported numbers should be recovered from those who benefit from it. Opal claim that because all fixed customers benefit from competition that arises from allowing customers to port their numbers, transit costs should therefore be recovered from all fixed customers with some costs being recovered specifically from fixed customers who port their numbers. However,

[77] Additional Conveyance Costs are costs related to the network resources used by the donor operator in providing switch-processing and switching and transmission capacity for the conveyance of the call to the ported out number and which are additional to the costs of conveyance of non-ported calls from the donor operator's to the recipient operator's network.
[78] See paragraphs 8.88-8.90, http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/main.pdf

Opal argues that this principle is not relevant in this case, because the dispute is not about who should pay APCC but rather what costs should be included.

Ofcom's view

4.128 We agree with Opal that this principle is not important in the context of this dispute.

Practicability

4.129 The principle of practicability states that the mechanism for cost recovery needs to be practicable and relatively easy to implement.

Opal's view

4.130 Opal claims that in the context of this dispute, the practicability principle provides that the outcome should be easy to implement as a general principle. Opal's claim is that it would be at least, if not more, practical to hand over calls to ported numbers (compared to the current routeing arrangement). In particular, Opal claims that fewer cost components required under DLE Handover would make ongoing monitoring, verification and compliance with GC18 easier.

4.131 Opal also claims that it would be more practical for BT to pay for and recover any system development costs through charges applicable to fixed operators, as compared to a situation where Opal was made to pay these costs and recover them from any other Recipient Provider who wanted to benefit from DLE Handover to ported numbers at a later stage).

Ofcom's view

4.132 As regards the physical arrangements for routeing and interconnection, the Current Solution is practicable. We also consider that DLE Handover should be practicable, although there is a range of practical questions about the technical and commercial arrangements that the parties have not yet addressed (see paragraph 4.78 above).

4.133 As regards the charging arrangements, reflecting either the Current Solution or DLE Handover in the APCC is practicable. DLE Handover would have the practical advantage of avoiding ITC for non-BT originated traffic delivered to BT at DLEs, which might reduce the monitoring and verification required. But ITC would still remain for (a proportion of) traffic delivered to BT at its tandem switches. We do not consider that this practical advantage is sufficiently large to overturn our conclusion.

4.134 We discuss system development costs and their recovery in paragraphs 4.86 to 4.89.

Summary of the six principles in this case

4.135 For the reasons set out above, we agree with Opal that three of the six principles are not important in the specific circumstances of this dispute (cost causation, reciprocity and distribution of benefits). The principle of practicability has a degree of relevance: the charging arrangements for DLE Handover could be simpler to monitor and verify (by reducing the extent of ITC), but there are practical questions about its technical and commercial arrangements that have not yet been addressed. On balance, we do not consider that the principle of practicability favours either the Current Solution or DLE Handover. The two most important principles in this dispute are cost minimisation and effective competition. These principles imply the relevance of

assessing the relative costs and charges of the alternative routeing solutions. We have conducted this assessment, as set out above.

Provisional conclusion on the dispute

4.136 We consider that the evidence before us in this dispute is not sufficient for us to determine, as proposed by Opal, that DLE Handover is a more efficient routeing solution than BT's Current Solution, such that we should required BT to change its routeing method to comply with GC18 or otherwise. Our provisional conclusion is therefore that the status quo should remain. It is therefore not necessary to decide whether BT should be required to bear any resulting costs that are relevant and/or necessary or whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment.

4.137 We note that Opal's claim that BT is not complying with its obligations under GC 18 is a contentious allegation, and one which we would expect BT to take very seriously. However, for the reasons set out in this draft determination, we do not consider that we have sufficient evidence to show that Opal's proposed DLE Handover is more efficient than BT's current solution, such that BT's current solution does not comply with GC18.

Assessment of provisional conclusion against Ofcom's statutory duties and Community requirements

4.138 We have carefully considered whether our provisional conclusion is consistent with both Ofcom's general duties in section 3 of the 2003 Act, and (pursuant to section 4(1)(c) of the 2003 Act) the six Community requirements set out in section 4 of the 2003 Act, which give effect, among other things, to the requirements of Article 8 of the Framework Directive[79].

4.139 As explained in detail above, we do not consider that the evidence provided to us by the parties is sufficient for us to robustly assess certain key aspects in this dispute, in particular whether Opal's DLE Handover solution is more efficient than BT's Current Solution. In reaching a provisional conclusion that the status quo should therefore remain, we have kept in mind our duty under section 3(3)(a) of the 2003 Act to ensure that our regulatory activities are, among other things, accountable, proportionate and targeted only at cases in which action is needed.

4.140 The parties' submissions on Ofcom's duties are summarised in paragraphs 3.98 to 3.107 above. The duties which both BT and Opal believe are of particular relevance to this dispute are as follows:

a. The duty to further the interests of citizens in relation to communication matters (section 3(1)(a) of the 2003 Act);

b. The duty to further the interests of consumers in the relevant markets, where appropriate by promoting competition (section 3(1)(b));

c. The duty to have regard to the desirability of promoting competition in relevant markets (section 3(4)(b));

d. The duty to have regard to the desirability of encouraging investment and innovation in relevant markets (section 3(4)(d)); and

[79] 2002/21/EC.

e. The duty to encourage, to the extent Ofcom considers it appropriate, the provision of network access and service interoperability for the purposes of securing efficiency and sustainable competition in communications markets and the maximum benefit for the customers of communications network and services providers (sections 4(7) and 4(8)).

4.141 Taking into account our observations and conclusions above as to the nature of the evidence available to us in this dispute, we have considered whether the application of any of our statutory duties suggests that we should reach a different conclusion to that provisionally set out in this draft determination. We agree that the specific duties highlighted by the parties might be of relevance in this dispute (in particular, it is recognised that number portability is important to promoting competition between networks because it encourages switching by consumers, which is reflected in the obligation on CPs under GC 18 to provide number portability to consumers and portability to each other). However, we do not consider that absent further and sufficient evidence, the application of these (or any of our other) statutory duties on their own would, or could, lead us to a different provisional conclusion.

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 10 November 2009**.

A1.2 Ofcom strongly prefers to receive responses using the online web form at http://www.ofcom.org.uk/consult/condocs/XXXX, 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 Lawrence.knight@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.

Lawrence Knight
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 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 Lawrence Knight on 020 7981 3411.

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 Following the end of the consultation period, Ofcom intends to publish a final determination by 20 November 2009.

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 Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@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.

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[80] 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.

[80] In the case of disputes we will consult for ten working days from the publication date of the draft determination; this reflects the four month deadline for Ofcom to issue its final determination.

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 www.ofcom.org.uk/consult/.

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.

Annex 4

Ofcom's statutory obligations and regulatory principles

A4.1 Sections 3 and 4 of the 2003 Act set out, respectively, the general statutory duties of Ofcom and Ofcom's duties for the purpose of fulfilling Community obligations with respect to, among other things, Ofcom's dispute resolution function under Chapter 3 of Part 2 of the 2003 Act.

A4.2 Section 3(1) of the 2003 Act sets out Ofcom's principal duties in carrying out its functions:

> "(a) to further the interests of citizens in relation to communications matters; and
>
> (b) to further the interests of consumers in relevant markets, where appropriate, by promoting competition."

A4.3 The things which, by virtue of its principal obligations, Ofcom is required to secure in the carrying out of its functions include, according to section 3(2) of the 2003 Act:

> "(a) the optimal use for wireless telegraphy of the electro-magnetic spectrum;
>
> (b) the availability throughout the United Kingdom of a wide range of electronic communications services;
>
> (c) the availability throughout the United Kingdom of a wide range of television and radio services which (taken as a whole) are both of high quality and calculated to appeal to a variety of tastes and interests;
>
> (d) the maintenance of a sufficient plurality of providers of different television and radio services;
>
> (e) the application, in the case of all television and radio services, of standards that provide adequate protection to members of the public from the inclusion of offensive and harmful material in such services; and
>
> (f) the application, in the case of all television and radio services, of standards that provide adequate protection to members of the public and all other persons from both –
>
> (i) unfair treatment in programmes included in such services; and
> (ii) unwarranted infringements of privacy resulting from activities carried on for the purposes of such services."

A4.4 Section 3(3) of the 2003 Act provides that in performing its principal duties, Ofcom must have regard, in all cases, to:

"(a) the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed; and

(b) any other principles appearing to Ofcom to represent the best regulatory practice."

A4.5 Section 3(4) of the 2003 Act sets out a number of principles which Ofcom must have regard to in performing its principal duties where it appears to Ofcom that they are relevant, including the desirability of promoting competition in the relevant markets and the desirability of encouraging investment and innovation in the relevant markets.

A4.6 In performing the principal duty of furthering the interests of consumers specifically, section 3(5) of the 2003 Act provides that Ofcom must have regard, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money.

A4.7 Section 4 of the 2003 Act provides that, in determining disputes referred to it under section 185 of the 2003 Act, Ofcom must act in accordance with the six Community requirements which give effect, amongst other things, to the requirements of Article 8 of the Framework Directive. In summary, those requirements are:

- to promote competition in communications markets;
- to secure that Ofcom contributes to the development of the European internal market;
- to promote the interests of all European Union citizens;
- to act in a manner which, so far as practicable, is technology-neutral; and
- to encourage, to the extent Ofcom considers it appropriate, the provision of network access and service interoperability for the purposes of securing efficiency and sustainable competition in communications markets and the maximum benefit for the customers of communications network and services providers; and
- to encourage such compliance with certain international standards as is necessary for facilitating service interoperability and securing freedom of choice for the customers of communications providers.

A4.8 Where it appears to Ofcom that any of its general duties under section 3 of the 2003 Act conflict in the resolution of a dispute, Ofcom has the discretion to secure that the conflict is resolved in the manner it thinks best in the circumstances.[81] Similarly, Ofcom has the discretion to secure that any conflict of the Community requirements set out in section 4 of the 2003 Act are resolved in the manner it thinks best in the circumstances.[82] Where it appears to Ofcom in the exercise of its dispute resolution

[81] Section 3(7) of the 2003 Act. Note that where Ofcom resolves a conflict in an important case between the duties in sections 3(1)(a) and 3(1)(b) it must publish a statement setting out the nature of the conflict; the manner in which they have resolved to resolve it; and the reasons for their decision to resolve it in that manner (section 3(8) 2003 Act). A matter is "important" if it involves a major change in the activities carried on by Ofcom; or it is likely to have a significant impact on persons carrying on businesses in any of the relevant markets; or it is likely to have a significant impact on the general public in the UK or a part of the UK; or it otherwise appears to Ofcom to have been of unusual importance.

[82] Section 4(11) of the 2003 Act.

functions that any of its general duties under section 3 of the 2003 Act conflict with one or more of its duties under section 4 of the 2003 Act, priority is given to the duties set out in section 4 of the 2003 Act.[83]

A4.9 Ofcom also exercises its regulatory functions according to the following regulatory principles:

- Ofcom will regulate with a clearly articulated and publicly reviewed annual plan, with stated policy objectives;
- Ofcom will intervene where there is a specific statutory duty to work towards a public policy goal which markets alone cannot achieve;
- Ofcom will operate with a bias against intervention, but with a willingness to intervene firmly, promptly and effectively where required;
- Ofcom will strive to ensure its interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome;
- Ofcom will always seek the least intrusive regulatory mechanisms to achieve its policy objectives;
- Ofcom will research markets constantly and will aim to remain at the forefront of technological understanding; and

Ofcom will consult widely with all relevant stakeholders and assess the impact of regulatory action before imposing regulation upon a market

[83] Section 3(6) of the 2003 Act.

Annex 5

The Draft Determination

1.1 Dispute between Opal and BT

Determination under sections 188 and 190 of the Communications Act 2003 ("2003 Act") for resolving a dispute between Opal Telecom Limited ("Opal") and British Telecommunications plc ("BT") concerning the issue whether BT should be required to hand over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant DLE where Opal's network is interconnected with BT's network

WHEREAS—

(A) section 188(2) of the 2003 Act provides that, where Ofcom has decided pursuant to section 186(2) of the 2003 Act that it is appropriate for it to handle the dispute, Ofcom must consider the dispute and make a determination for resolving it. The determination that Ofcom makes for resolving the dispute must be notified to the parties in accordance with section 188(7) of the 2003 Act, together with a full statement of the reasons on which the determination is based, and publish so much of its determination as (having regard, in particular, to the need to preserve commercial confidentiality) they consider appropriate to publish for bringing it to the attention of the members of the public, including to the extent that Ofcom considers pursuant to section 393(2)(a) of the 2003 Act that any such disclosure is made for the purpose of facilitating the carrying out by Ofcom of any of its functions;

(B) section 190 of the 2003 Act sets out the scope of Ofcom's powers in resolving a dispute which may, in accordance with section 190(2) of the 2003 Act, include—

- making a declaration setting out the rights and obligations of the parties to the dispute;
- giving a direction fixing the terms or conditions of transactions between the parties to the dispute;
- giving a direction imposing an obligation, enforceable by the parties to the dispute, to enter into a transaction between themselves on the terms and conditions fixed by Ofcom; and
- for the purpose of giving effect to a determination by Ofcom of the proper amount of a charge in respect of which amounts have been paid by one of the parties to the dispute to the other, giving a direction, enforceable by the party to whom sums are to be paid, requiring the payment of sums by way of adjustment of an underpayment or overpayment;

(C) on 7 July 2008, Opal issued a Statement of Requirement ("SOR") to BT concerning the delivery by BT of calls to ported numbers via DLE Interconnects;

(D) on 25 November 2008 BT responded to the SOR with a proposed Portability solution based on DLE Handover which was formally rejected by Opal on 18 December 2008 because of the costs involved to implement the solution, which, according to BT, should be borne by Opal;

(E) on 1 July 2009, Opal submitted a dispute with BT to Ofcom for resolution;

(F) on 23 July 2009, Ofcom decided that it was appropriate for it to handle the dispute, and informed the parties of this decision;

(G) on 23 July 2009, Ofcom published details of the dispute on its website and invited comments from stakeholders on the scope of the dispute;

(H) on 7 August 2009, Ofcom set the scope of the dispute to be resolved as to determine:

> *Whether BT should be required to hand over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant digital local exchange ("DLE"); and if so;*
>
> *Whether BT should be required to bear any resulting costs that are relevant and/or necessary; and*
>
> *For the purpose of giving effect to the above, whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment;*

(I) a non-confidential draft determination was sent to the parties on 28 October 2009 and published on Ofcom's website on 28 October 2009;

(J) in order to resolve this dispute, Ofcom has considered (among other things) the information provided by the parties and Ofcom has further acted in accordance with its general duties set out in section 3 of, and the six Community requirements set out in section 4 of the 2003 Act;

(K) a fuller explanation of the background to the dispute and Ofcom's reasons for making this Determination is set out in the explanatory statement accompanying this Determination; and

NOW, therefore, Ofcom makes, for the reasons set out in the accompanying explanatory statement, this Determination for resolving this dispute—

I Declaration of rights and obligations, etc.

1 It is hereby declared that BT is not required to hand over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant DLE where Opal's network is interconnected with BT's network. Consequently, it is not necessary to consider whether BT must bear any resulting costs that are relevant or necessary to implement DLE Handover; nor is it relevant to consider whether Ofcom should give a direction requiring the payment of sums by way of adjustment of an underpayment of overpayment.

II Binding nature and effective date

2 This determination is binding on Opal and BT in accordance with section 190(8) of the 2003 Act;

3 This Determination shall take effect on the day it is published.

III Interpretation

4 For the purpose of interpreting this Determination—

a) headings and titles shall be disregarded; and

b) the Interpretation Act 1978 shall apply as if this Determination were an Act of Parliament.

5 In this Determination—

a) **"2003 Act"** means the Communications Act 2003 (c.21);

b) **"BT"** means British Telecommunications plc (BT) is a wholly whose registered company number is whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;

c) **"DLE"** means digital local exchange;

d) **"DLE Handover"** means handing over non-BT originated, fixed geographic calls to numbers ported to Opal at the relevant DLE rather than routeing them via BT's tandem layer;

e) **"Ofcom"** means the Office of Communications;

f) **"Opal"** means Opal Telecom Limited whose registered company number is 3849133, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;

Neil Buckley

Director, Competition Policy

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2003

[date of final determination]

Annex 6

General Condition 18

18. NUMBER PORTABILITY[84]

18.1 The Communications Provider shall provide Number Portability as soon as it is reasonably practicable on reasonable terms, including charges, to any of its Subscribers who so requests.

18.2 The Communications Provider shall, pursuant to a request from another Communications Provider, provide Portability (other than Paging Portability) as soon as is reasonably practicable in relation to that request on reasonable terms[85]. In the case of Mobile Portability, where the request is for porting a total of less than 25 Telephone Numbers, the total period for providing Portability in respect of those Telephone Numbers shall not exceed two business days[86]. 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 Director 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;

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[84] On 22 July 2003, Oftel published a document, "Changes to the number portability functional specification to meet the new regime published by Oftel on 22 July 2003", http://www.ofcom.org.uk/static/archive/oftel/publications/numbering/2003/fun_final0703.pdf. This statement set out the number portability functional specification Issue No. 5 at Annex B (also known as the "Functional Specification" for the purposes of General Condition 18).

[85] Number Portability and technology neutrality, Statement, 30 March 2006, removed wording "and in accordance with the Functional Specification"

[86] "Arrangements for porting phone numbers when customers switch supplier, a review of General Condition 18", Statement and Further Consultation, 17 July 2007 inserted "In the case of Mobile Portability, where the request is for porting a total of less than 25 Telephone Numbers, the total period for providing Portability in respect of those Telephone Numbers shall not exceed two business days" with effect from 31 March 2008; "Telephone number portability for consumers switching suppliers", Statement, 29 November 2007 replaced "two business days" with "two hours" with effect from 1 September 2009.
As a result of the Competition Appeal Tribunal's judgment in Vodafone v Ofcom, of 18 September 2008, the modifications made to General Condition 18 of Part 2 of the General Conditions of Entitlement by Ofcom's concluding statement entitled "Telephone number portability for consumers switching suppliers" dated 29 November 2007 have been set aside.
http://www.ofcom.org.uk/consult/condocs/gc18review/updateoct08/

(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.

18.3 Where the Communications Provider provides Portability in accordance with paragraph 18.2:

(a) the Recipient Provider; and

(b) the Transit Provider,

shall, as appropriate, provide Portability (other than Paging Portability) on reasonable terms[87].

18.4[88] The Communications Provider shall, on the written request of the Director, provide the Director with a record of each Telephone Number in relation to which it is providing Portability, specifying the relevant Recipient Provider in each case.

18.8 For the purposes of this Condition:

(a) "Additional Conveyance Costs" mean any costs incurred by the Donor Provider associated with resources used in:

(i) effecting the switch-processing required to set up each ported call; and

(ii) providing the switch and transmission capacity for any part of the duration of each ported call,

additional to the costs of conveyance of non-ported calls from the Donor Provider's network to the Recipient Provider's network;

(b) "Communications Provider" means a person who provides an Electronic Communications Network or an Electronic Communications Service;

(c) "Donor Provider" means a Communications Provider whose Subscriber Numbers are in the process of being, or have been passed or ported to a Recipient Provider[89];

(d) "Mobile Communications Service" means any Publicly Available Telephone Service consisting in the conveyance of Signals by means of a Public Telephone Network where every Signal that has been conveyed thereby has been, or is to be, conveyed through the agency of Wireless Telegraphy to or from a Public Telephone Network which is designed or adapted to be capable of being used in motion;

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[87] Number Portability and technology neutrality, Statement, 30 March 2006, removed wording "and in accordance with the Functional Specification".

[88] Telephone number portability for consumers switching suppliers, Statement, 29 November 2007 inserted new Condition 18.4, 18.5, 18.6 and renumbered previous Conditions 18.4 and 18.5 as 18.7 and 18.8.
As a result of the Competition Appeal Tribunal's judgment in Vodafone v Ofcom, of 18 September 2008, the modifications made to General Condition 18 of Part 2 of the General Conditions of Entitlement by Ofcom's concluding statement entitled "Telephone number portability for consumers switching suppliers" dated 29 November 2007 have been set aside.
http://www.ofcom.org.uk/consult/condocs/gc18review/updateoct08/

[89] Number Portability and technology neutrality, Statement, 30 March 2006, removed definition "Functional Specification".

(e) "Mobile Portability" means Portability relating to Telephone Numbers Allocated for use with Mobile Communications Services;[90]

(f) "Number Portability" means a facility whereby Subscribers who so request can retain their Telephone Number on a Public Telephone Network, independently of the person providing the service at the Network Termination Point of a Subscriber[91] provided that such retention of a Telephone Number is in accordance with the National Telephone Numbering Plan;

(g) "Paging Portability" means Portability relating to Telephone Numbers Allocated for use with Radiopaging Services;

(h) "Point of Connection" means a point at which one Public Telephone Network is connected to another;

(i) "Portability" means any facility which may be provided by a Communications Provider to another enabling any Subscriber who requests Number Portability to continue to be provided with any Publicly Available Telephone Service by reference to the same Telephone Number irrespective of the identity of the person providing such a service;

(j) "Publicly Available Telephone Service":[92]

(a) in relation to a service to be used with a Telephone Number for receiving calls only under the contract between the person and the provider in question, means a Public Electronic Communications Service for only receiving national and international telephone calls through a number or numbers in a national or international telephone numbering plan;

(b) in relation to a service to be used with a Telephone Number for originating and receiving calls and access to Emergency Organisations under the contract between the person and the provider in question, has the meaning ascribed to it under paragraph 1 of Part 1 of this Schedule;

(k) "Radiopaging Service" means Electronic Communications Services consisting in the conveyance of Signals by means of Wireless Telegraphy where every Signal, apart from simple acknowledgement, is ultimately transmitted from a station for Wireless Telegraphy comprised in the Communications Provider's Electronic Communications Network to a station for Wireless Telegraphy or Wireless Telegraphy Apparatus that is not comprised in that network;

(l) "Recipient Provider" means a Communications Provider to whom Subscriber Number(s) are in the process of being, or have been passed or ported from a Donor Provider;

(m) "Subscriber" means any person who is party to a contract with the provider of Publicly Available Telephone Services for the supply of such services in the United Kingdom;

[90] Number Portability and technology neutrality, Statement, 30 March 2006, removed definition "Non-geographic Number".
[91] Number Portability and technology neutrality, Statement, 30 March 2006, removed wording "in the case of Geographic Numbers, at a specific location" and "in the case of Non-geographic Numbers, at any location"
[92] Regulation of VoIP Services, Notification, 29 March 2007, substituted the previous definition of PATS for this new one.

(n) "Subscriber Number" means the Telephone Number (or Telephone Numbers) which any Communications Provider's Public Telephone Network recognises as relating to a particular Subscriber of that Communications Provider;

(o) "System Set-Up Costs" mean costs of the Donor Provider incurred—

(i) in the course of making network and system modifications, configuration and reconfiguration, including adapting or replacing software;

(ii) in the course of testing functionality within that provider's network and in conjunction with any Recipient Provider's network,

(iii) thereby establishing the technical and administrative capability to provide Portability;

(p) "Transit Provider" means a Communications Provider providing, by agreement, Interconnection between a Donor Provider and Recipient Provider via Points of Connection with both Communications Providers. [93]

[93] Telephone number portability for consumers switching suppliers, Statement, 29 November 2007, inserted new definitions (q) to (t).
As a result of the Competition Appeal Tribunal's judgment in Vodafone v Ofcom, of 18 September 2008, the modifications made to General Condition 18 of Part 2 of the General Conditions of Entitlement by Ofcom's concluding statement entitled "Telephone number portability for consumers switching suppliers" dated 29 November 2007 have been set aside.
http://www.ofcom.org.uk/consult/condocs/gc18review/updateoct08/