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

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Redactions are indicated by "[✂]"

Statement

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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 fixed line calls from providers other than BT, to geographic telephone numbers which have been ported-out to Opal from BT, are transited across BT's network and handed over to Opal, and how related costs are borne.

1.2 Currently, where such calls are received by BT at a Digital Local Exchange ("DLE"), it routes these up to its tandem layer before being handed over to Opal. Opal wants BT to instead hand over these calls at the relevant 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.

1.3 Opal rejected BT's proposal in response to the SOR on the grounds that it should not be required to bear the system development costs. In Opal's view, the costs of providing DLE Handover to Opal should be borne by BT 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.

1.4 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)[3] 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.

1.5 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 system set-up costs or additional conveyance costs, as defined in GC 18.5[4]. 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[5]. 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 (GC 18.2(a)).

[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] For clarity, the donor provider in these circumstances is the provider to which the (now ported) number was originally allocated.
[4] 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.
[5] A charge is not recoverable for calls to ported numbers which originate on the donor provider's own network.

1.6 On 1 July 2009 we received a submission from Opal arguing that BT's APCC does not comply with GC 18.2 because it is not reasonable and not 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 to Opal at the DLE. Opal therefore requested that Ofcom determine that BT must hand over calls to ported numbers to Opal at the relevant DLE where Opal is interconnected with BT's network ("DLE Handover").

1.7 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.

1.8 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 decided that it was appropriate for us to handle this dispute.

1.9 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.

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

1.11 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 to Opal, would be more cost efficient than BT's Current Solution (which is reflected in the current APCC), such that we should require BT to offer DLE Handover to Opal in order to comply with its obligations under GC 18 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 to Opal relative to the costs of BT's Current Solution;

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 Solution and under DLE Handover to Opal;

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 in terms of the six principles of pricing and cost recovery.

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

Consultation on the First Draft Determination

1.13 We issued a Draft Determination for consultation purposes on 29 October 2009 (the "First Draft Determination")[6] in which we set out a provisional view that the evidence before us was not sufficient for us to determine that DLE Handover is a more efficient routeing solution than BT's Current Solution. Our provisional conclusion was therefore that the status quo should remain.

1.14 Our provisional view included a comparison of the efficiencies of the solutions, based on end-to-end costs. Section 4 of this determination sets out the analysis upon which we consulted in the First Draft Determination.

1.15 We received responses from three parties: BT, Opal and Cable and Wireless ("C&W").

1.16 BT supported the conclusions we reached in our First Draft Determination.

1.17 Opal and C&W disagreed with our provisional conclusions, with Opal considering that we had ignored information or used wrong information to come to this conclusion. In particular, Opal argued that the relevant costs to be included in our analysis are those that BT would incur up to the point where the calls are handed over to the Opal network, that is, the point of handover ("PoH").

1.18 C&W considered that any reduction in efficiency resulting from the use of DLE interconnect will be more than offset by the saving of local tandem conveyance ("LTC") costs in BT's network. C&W also considered that system development costs should be lower than BT's estimates and provided views on the level of traffic to be assumed to be delivered by originating CPs to BT's DLEs (when adjusted to account for virtual interconnect circuits).

1.19 Opal also reiterated its request for repayments on the basis of a retrospective application of an efficiently incurred APCC.

Consultation on the Second Draft Determination

1.20 In the light of responses to the First Draft Determination we conducted further analysis and amended our proposals. We issued a revised Draft Determination for consultation purposes on 18 December 2009 (the "Second Draft Determination")[7].

1.21 Our Second Draft Determination proposed that BT should be required to offer DLE Handover to Opal, if Opal so requests, in order to remain compliant with GC 18. We also proposed that BT would be required to bear any resulting System Set-up Costs

[6] See http://www.ofcom.org.uk/consult/condocs/draft_deter_bt_opal_charge/draft_determination.pdf.
[7] See http://www.ofcom.org.uk/consult/condocs/draft_deter_bt_opal_charge2/draft_determination2.pdf .

(as defined by GC 18.5), which include the system development costs identified by BT. We also proposed that BT should not be required to make any repayments to Opal by way of an adjustment of an overpayment.

1.22 These revised proposals included a comparison of the efficiencies of the solutions, based on costs up to the PoH. Our further analysis and views, where necessary to address responses made to our First Draft Determination, are provided within section 5 of this determination.

1.23 We received responses to the Second Draft Determination from three parties: BT, Opal and C&W.

1.24 BT disagreed with the conclusion reached in our Second Draft Determination. It stated that it had never been opposed to providing DLE Handover, but considered that it already provides an efficient end-to-end solution and that DLE Handover offers a less efficient alternative.

1.25 BT also advised that in its view, a significant part of the system development costs do not fall within the definition of System Set-Up costs.

1.26 Opal and C&W broadly agreed with our provisional conclusions.

1.27 However, Opal disagreed that BT should be able to recover the costs of interconnect installation and maintenance to provide DLE Handover to Opal and also reiterated its view that BT should be required to make repayments to Opal. Opal also believes that Ofcom needs to be more specific about what needs to be agreed between the parties when concluding on technical and commercial negotiations to implement DLE Handover to Opal.

1.28 C&W welcomed the proposals of the Second Draft Determination and confirmed that it is now also actively pursuing from BT an alternative routeing solution for ported traffic.

1.29 We have considered the responses we received to the Second Draft Determination. Those responses, and our views thereon, are set out in section 6 of this determination. For the reasons set out in section 6, we do not consider that those responses raise matters which should lead us to alter materially the provisional conclusions which we set out in the Second Draft Determination. However, we have noted that a solution provided by BT could include BT-originated traffic as well as non-BT originated traffic in order to offer further efficiency gains.

1.30 In summary, our final determination is that:

a) If Opal so requests, BT is required to offer DLE Handover to Opal within a reasonable time period to be agreed by the parties, subject to the following conditions:

i) BT is required to pay for the system development costs on its network;

ii) BT is entitled to make charges for on-going costs on its network up to the PoH (subject always to the requirements of GC 18);

iii) Opal should bear the costs for Interconnect Extension Circuits ("IECs") required for DLE Handover;

iv) Opal will not seek to charge termination rates based on [✂]; and

v) Opal will not impose charges on BT for the use of Opal's interconnection links on Opal's side of the PoH.

b) Where agreed by the parties, a solution provided by BT to meet these requirements can also include BT-originated traffic in addition to non-BT originated traffic.

1.31 We have considered whether, in order to give effect to our determination, we should exercise our discretion to order BT to make any payments to Opal by way of an adjustment of an overpayment. Having considered the responses to our Second Draft Determination and taken account of all relevant considerations on the facts of this case, in light of our statutory duties we remain of the view that we should exercise our discretion under section 190(2)(d) of the Act not to require BT to make any payments to Opal. We therefore make no direction in this regard

1.32 The background to this dispute is set out in **section 2**; the history to this dispute is set out in **section 3**; Ofcom's analysis and reasoning underpinning the First Draft Determination is set out in **section 4**; the responses to consultation on the First Draft Determination and our consideration of the points raised in these responses are set out in **section 5**[8]; and the responses to consultation on the Second Draft Determination, our consideration of the points raised and our final conclusions are set out in **section 6**. Our formal determination is set out in Annex 1.

[8] For convenience, the text in sections 4 and 5 is the same (other than amendments for clarification) as that in the corresponding section of our First Draft Determination and Second Draft Determination respectively.

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[9].

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[10]. Powers to enable Ofcom to set conditions requiring CPs to provide number portability are set out in sections 51 and 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").[11] 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 (where BT was originally allocated those numbers). 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 Such calls are not sent directly to Opal 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 receive phone calls after they change providers. The

[9] Directive 2002/21/EC.
[10] Directive 2002/22/EC.
[11] http://www.ofcom.org.uk/telecoms/ioi/g_a_regime/gce/ (see also Annex 2 of this document).

routeing of calls to ported telephone numbers between originating, donor and recipient providers may or may not use additional transit providers. In this case, BT and Opal are interconnected with each other 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 handover'. 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[12]. 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 type of node which switches traffic between a regional group of DLEs and the rest of BT's network) 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[13]. 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, the networks which originate any calls to that telephone number still route those calls to the donor provider's network, which delivers them for termination to 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 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 a charge levied by the donor

[12] The host DLE is the DLE serving the telephone number before it was ported.
[13] 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.

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[14] 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…"[15]. APCCs were extended to include *geographic* portability in an Oftel statement of 31 May 2002[16] (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".[17]

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).

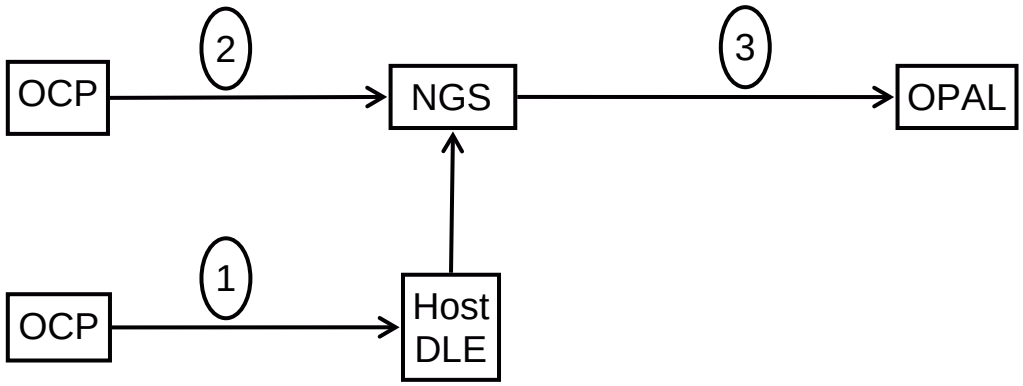
[14] March 1998 determination of BT's non-geographic number portability costs and charges at http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/numbering/nport398.htm

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

[16] 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

[17] 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 price 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[18] 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 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.

[18] An out-of-area exchange line connects a customer to the Public Switched Telephone Network (PSTN) via a telephone exchange which would not normally provide a service to that customer's location.

Section 3

History of the dispute

Commercial negotiations prior to a Dispute Resolution Request

3.1 According to the evidence submitted by the parties, Opal first wrote to BT in September 2007 when BT issued NCCN 811[19] 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 a 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[20]. 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".[21]

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.[22]

3.4 On 1 July 2009 Opal submitted a dispute resolution request 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

[19] 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.
[20] '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.
[21] Email from Chris Stocks (Carphone Warehouse Networks) to Richard Jones (BT), 18 December 2008
[22] 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.[23] 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. We therefore decided that the parties had exhausted commercial negotiations in this matter.

3.9 On 23 July 2009 we 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

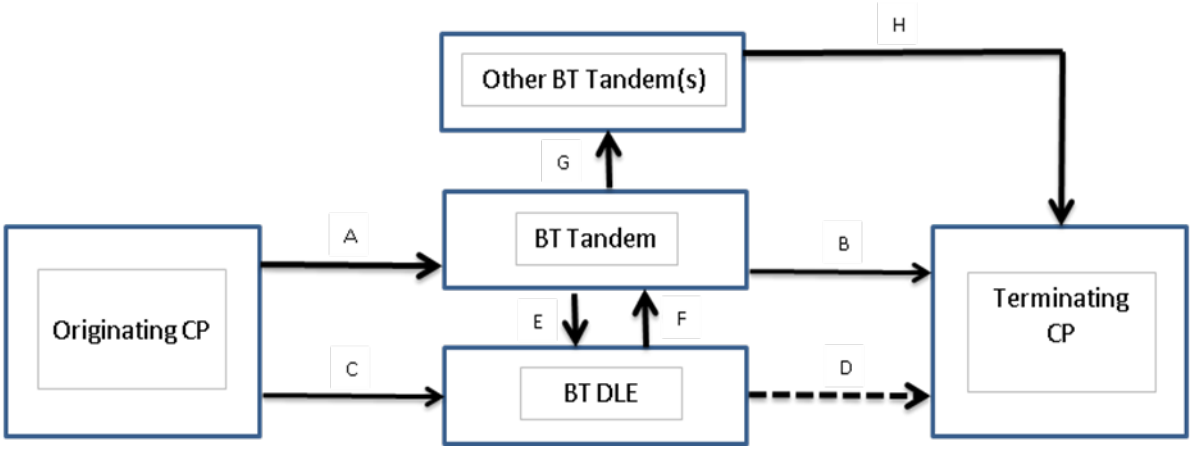
3.10 In its Submission, Opal set out that BT's routeing of non-BT originated (i.e. from other CPs), fixed geographic calls to numbers ported to Opal firstly depends on whether the OCP hands calls over at the BT tandem layer or at the BT DLE. These are shown as (A) and (C) respectively in Figure 2 below.

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).

[23] 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 interconnection 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[24].

[24] Opal's Submission 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 ("ACC"), 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 ACCs was to ensure cost minimisation by "*encouraging operators to minimise additional conveyance and thus adopt the most efficient routeing method of providing portability*"; [25]

c) Opal argued that because it considers the LTC charge to constitute an ACC, 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 GC 18.2. In order to comply with its regulatory obligations under GC 18.2, 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 GC 18.5, for which (pursuant to GC 18.5) 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[26] and have subsequently been used by Ofcom in analysing various pricing issues.[27] The six principles of pricing and cost recovery are:

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

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

[27] 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 C&W 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 ACCs 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 GC 18.2(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[28] 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[29] 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 (which at the time was subject to a separate dispute for resolution by Ofcom)[30];

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.

[28] In other words, calls to such a ported number would require routeing via more than one NGS ("Inter Tandem Conveyance").
[29] 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.
[30] 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[31], BT advised that the wider issues of capacity to backhaul traffic from the DLE, concerning charges that are appropriate for the requisite interconnection 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 3.2 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 us to handle the dispute, in accordance with our dispute resolution guidelines, we set out what we considered to be the scope of the matters in dispute by publishing details of our scope for consultation on our on-line Competition and Consumer Enforcement Bulletin.[32]

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 our standard procedures in disputes, we 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

[31] Email from Tony Fitzakerly (BT) to Lawrence Knight (Ofcom), dated 21 July 2009
[32] 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.[33]

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[34], 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[35], 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, we 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. We 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.

[33] 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.
[34] Email from R Granberg to L Knight, 31 July 2009.
[35] 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, we 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 provisional conclusions, as consulted on in the First Draft Determination, are set out in section 4. Responses to the First Draft Determination and Ofcom's comments thereon, including any changes to our proposed methodology and provisional conclusions are set out in section 5.

Information gathered from the parties

3.45 On 19 and 20 August 2009, we 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 it had provided.

3.46 The formal requests set out our 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. We 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;

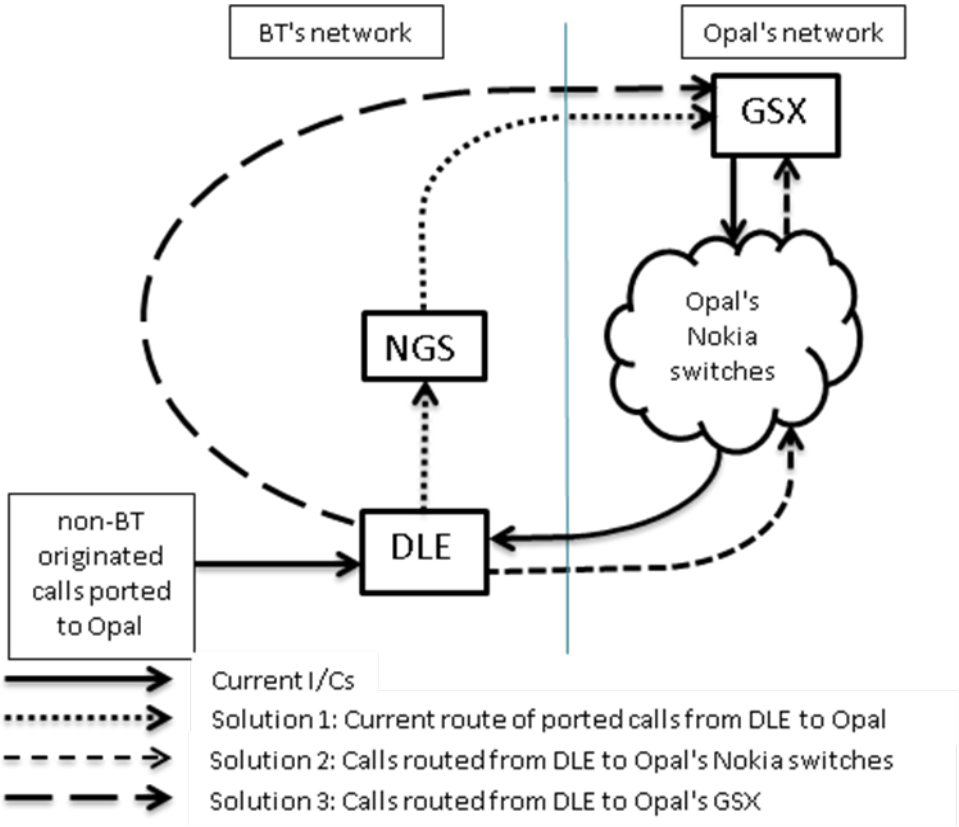
c) The overall ***costs*** to provide each of the Solutions, based on the costs of resources required by both networks to enable each Solution;

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 3.2 above).

Figure 3: Diagram of Solutions 1-3



3.48 Below we describe the information that Opal and BT supplied in response to our formal requests, set out in the order provided in paragraph 3.46 above. This order reflects the analytical framework we have used to determine this dispute (see paragraphs 4.5 to 4.13). For each heading ('technical elements', 'costs', 'charges' and 'impact of each solution') we set out responses to the formal requests, along with any subsequent information gathered, from each of Opal and BT.

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

3.49 Opal responded to our 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.

3.50 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.

3.51 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 3.49 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*."[36]

3.52 On 25 September 2009, we again asked Opal for its views on what technical arrangements would be required to make Solution 2 operational.[37] We 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.

3.53 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 [✂].

[36] 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.
[37] Email from L Knight (Ofcom) to R Granberg (Opal) of 25 September 2009.

3.54 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

3.55 BT responded to our 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.

3.56 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.

3.57 Following our meeting with BT on 10 September 2009, BT modified its initial response to our 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.

3.58 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[38].[✂]; and

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

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.

3.59 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 3.58(a) above. Accordingly, all else equal, the same LEP will be required under either Solution 2 or 3;

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 interconnection 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

3.60 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

3.61 As set out in paragraphs 3.49 to 3.54 above, in its response to the formal request, Opal explained that interconnection 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[39] 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.

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

3.63 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

[39] 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.

by the reduced costs of the Current Solution and therefore would be cost neutral to BT.

3.64 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.

3.65 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".

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

3.67 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

3.68 On 17 September 2009, we 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. We therefore requested that Opal, putting aside its views on charges, provide us with data and/or calculations that supported Opal's view that Solution 2 is cost neutral (or more cost efficient). We 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. We also clarified that its request concerns the costs of providing the transmission capacity required, not who would pay these costs.[40]

3.69 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.

3.70 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.

3.71 In response to an informal request for information of 25 September 2009, (see paragraphs 3.61 to 3.67 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

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

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.

3.72 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.[41]

3.73 In order to follow up Opal's response, we 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 interconnection circuits, and should 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

3.74 In response to the formal request[42], 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[43]. 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'.

[41] [✂].
[42] 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.
[43] 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.

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

	Current Solution			DLE Handover to Opal		
	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*

3.75 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:

a) CP originated traffic delivered over interconnection 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 interconnection 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.[44]

3.76 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

[44] As confirmed by BT in an email from J Davey (BT) to L Knight dated 25 September 2009

Handover. BT has, however, included the costs of interconnection circuits, in both cases using the cost of BT CSI circuits.

3.77 In a response dated 18 September 2009[45] to an informal request from Ofcom[46], BT provided additional clarification of its model, including assumptions on the capacity and utilisation of interconnection circuits, and resilience.

3.78 BT also provided Ofcom with the source of Erlang tables to help substantiate its assumption regarding the capacity of an E1 interconnection circuit [47] and in response to a further informal request from Ofcom[48], 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[49]), as well as sensitivity tests performed by BT and the application of specific costs in each modelled Solution.

3.79 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.

3.80 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 £[✂][50], and that for a definitive view on these costs a 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:

[45] Email from J Davey (BT) to L Knight (Ofcom) dated 18 September 2009
[46] Email from L Knight (Ofcom) to J Davey (BT) dated 16 September 2009
[47] Email from J Davey (BT) of 22 September 2009. Source: http://www.itu.int/itudoc/itu-d/dept/psp/ssb/planitu/plandoc/erlangt.pdf
[48] Emailed response from J Davey (BT) of 29 September 2009, in response to an emailed request from L Knight (Ofcom) of 25 September 2009
[49] 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.
[50] 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.

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		**£**[✂]	**£**[✂]

3.81 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

3.82 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.

3.83 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

3.84 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.[51] Accordingly, Opal considered that BT should pay for all the necessary technical elements for any of the Solutions. Similarly, Opal advised 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.

3.85 As set out in paragraphs 3.63 and 3.69, 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 be able to make by removing 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)."[52] 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."

3.86 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 3.72, it stated that it would not insist that BT paid a higher termination charge in these circumstances.

BT's response

3.87 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.[53] Were DLE Handover to be adopted, BT would expect that connection charges or development costs would be charged to the recipient operator (that is, Opal) as a single payment.

[51] 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

[52] Response to question 2(a)

[53] By reference to GC 18.2 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.

3.88 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 3.58 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.

3.89 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.[54]

3.90 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

3.91 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

3.92 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.

3.93 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.

[54] 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

3.94 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.

3.95 BT confirmed that Opal has ported numbers from, and interconnects with, [✂] of 666[55] 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.

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

3.97 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.

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

[55] [✂]

Submissions on Ofcom's duties

3.99 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

3.100 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). [56] 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.

3.101 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)).

3.102 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[57], 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 GC 18.

3.103 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

3.104 In responding to our 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 offer

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

[57] 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/

of electronic communications services to consumers in terms of choice, price, quality of service and value for money.[58] 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."

3.105 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.

3.106 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".

3.107 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.

3.108 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)).

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

Section 4

Ofcom's assessment of the issues in the First Draft Determination

Explanation of this section

4.1 For convenience, this section repeats our analysis of the matters in dispute and the provisional conclusions which we published in our First Draft Determination on 29 October 2009[59]. The text of this section is the same (other than amendments for clarification) as that in the corresponding section of our First Draft Determination. Where we refer to Ofcom's views and conclusions in this section, we are referring to the provisional views which we set out in the First Draft Determination.

4.2 In section 5 we set out the responses which we received to our First Draft Determination, our consideration of those responses, and our revised provisional conclusions.

4.3 In section 6 of this Determination we set out the responses which we received to our revised provisional conclusions set out in the Second Draft Determination, our consideration of those responses, and our final conclusions.

Issue to be resolved

4.4 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 it an alternative method of routeing calls (DLE Handover), because that method would be more cost efficient in Opal's case than 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 to Opal 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

4.5 BT's regulatory obligations to provide portability derive from Article 30 of the Universal Service Directive ("USD")[60] 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:

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

[59] See http://www.ofcom.org.uk/consult/condocs/draft_deter_bt_opal_charge/draft_determination.pdf.
[60] Directive 2002/22/EC.

b) 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;

c) Does not charge for System Set-Up Costs or ACCs, as defined in GC 18.5[61].

4.6 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

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

4.8 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.[62]

4.9 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.

4.10 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.

4.11 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

[61] 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.

[62] 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.

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, interconnection circuit charges, etc).

4.12 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.

4.13 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.

4.14 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.[63]

4.15 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[64] and our general obligations under administrative law.

Preliminary issue: Additional Conveyance Costs

4.16 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).[65] 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).

4.17 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)[66]. 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).

[63] See further paragraph 3.19 above,
[64] Directive 2002/21/EC.
[65] 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.
[66] 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.

4.18 We recognise that the application of the definition of ACCs in GC 18.5(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, 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.

4.19 Our provisional conclusion on this preliminary issue, therefore, was that LTC is not an ACC within the meaning of GC 18.2(b).

Ofcom's analysis and provisional conclusions on costs

Establishing the costs of the Solutions

4.20 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.

4.21 Our provisional conclusions using this approach are set out below at paragraph 4.72 to 4.75.

Technical network elements

4.22 As set out in paragraph 4.20 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

4.23 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 3.53 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

4.24 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.

4.25 Based on information provided by BT (see section 3), the network elements for DLE Handover (based on Solution 2) can be summarised as follows:[67]

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 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[68];

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

4.26 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.

[67] We explain at paragraphs 4.34 below why we have restricted this assessment to Solution 2 and do not need to consider Solution 3.
[68] [✂]

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

	Current Solution	DLE Handover to Opal
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 4.55 below).

Costs

4.27 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.

4.28 We do not consider that all of the network elements set out in paragraph 4.26, and therefore their associated costs, will be relevant to the assessment of reasonableness required under this determination to resolve this dispute.

4.29 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.

4.30 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[69] costs are excluded from our analysis of cost differences.

4.31 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 GC 18.2 must not be included in the APCC) – see paragraph 4.90 below. On this question, we take

[69] 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.

the provisional view that they should be excluded. However, for completeness, we discuss these costs below, in order to allow us to assess the extent to which their inclusion would alter our provisional conclusions.

4.32 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.

4.33 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.

4.34 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

4.35 As set out in paragraphs 3.61 to 3.73 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.

4.36 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 interconnection 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.

4.37 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

4.38 As set out in paragraph 3.56, 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

4.39 Paragraphs 3.74 to 3.81 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 3.74 above.

4.40 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.

4.41 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

4.42 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.

4.43 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.

4.44 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.

4.45 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.

4.46 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

4.47 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.

4.48 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.

4.49 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				[✂]

4.50 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.

4.51 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 4.49).

4.52 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 NGSs[70]. 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.[71] 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				[✂]

4.53 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

[70] The First Draft Determination stated "DLEs" in error, of which C&W made us aware in its response.
[71] Email from J Davey (BT) to L Knight (Ofcom) dated 18 September 2009

the Current Solution but would not be incurred under DLE Handover. This cost estimate is consistent with the calculation used by BT for the ITC element of the APCC.

4.54 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 (£[✂]).

4.55 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 273 CSI interconnection circuits from its NGSs to Opal's GSXs, which would reduce substantially the level of ITC incurred[72]. 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 4.66 below).

4.56 However, this reduction would be offset to some extent by the additional costs of the extra 273 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.[73] 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 interconnection circuit costs

4.57 BT has estimated the number of circuits it would need from each DLE to the nearest Opal node 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) 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;

[72] 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.
[73] Email from J Davey (BT) to S Bevis (Ofcom) of 7 October 2009.

c) 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.

4.58 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 a) and 4.57b) above.

Ofcom's estimates of costs based on the evidence provided

4.59 Notwithstanding our reservations about 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.

4.60 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 4.52 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.[74]

4.61 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 4.57 to 4.58), 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.

4.62 As set out in paragraph 4.53 above, we consider that ITC costs related to those calls received by BT at the DLE are relevant to our assessment.

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

4.63 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.[75] In the wholesale narrowband market review[76] 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[77] estimates of network cost differences – excluding additional CSI circuits (£m)

	Current Solution	DLE Handover to Opal	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**

4.64 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 the 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.

4.65 As set out earlier (see paragraph 4.55) we have also considered information arising from ongoing commercial negotiations between BT and Opal that would result in a

[75] 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.

[76] http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/ Para 8.58 to 8.61

[77] 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.

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 (273) 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.

4.66 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 273 CSI circuits imply a 25% increase in CSI interconnection circuit costs.

4.67 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.

4.68 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 4.56 above, we have used BT's estimate of the additional cost of these circuits.

4.69 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 to Opal	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			**0.4**[78]	**1.6**
One –off costs				
Interconnection link(fixed)	[✂]	[✂]	0.7	0.7
Sub-total			**0.7**	**0.7**
Total				**2.3**

4.70 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 £0.1 million. The net impact of this suggests the Current Solution is lower cost than DLE Handover by an NPV of about £2.3 million.

4.71 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 in the First Draft Determination

4.72 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

[78] The First Draft Determination stated "0.6" in error.

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.

4.73 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.

4.74 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.

4.75 We consider that system development costs should be excluded from the analysis for the reasons given at paragraph 4.89 to 4.90. However, we note that the inclusion of these costs would be unlikely to alter our conclusion on costs.

4.76 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 GC 18.

Further information required

4.77 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.

4.78 First, we would need data concerning the additional 273 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.

4.79 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.

4.80 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.

4.81 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.

4.82 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

4.83 As set out in paragraph 4.10 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 that Opal's proposed solution based on DLE Handover is more cost efficient than BT's current method of routeing.

4.84 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 pricing and cost recovery.

Pattern of payments

4.85 As previously discussed in section 3 in paragraphs 3.82 to 3.90, 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

4.86 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 pursuant to GC 18.2.

BT's view

4.87 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

4.88 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

4.89 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).

4.90 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.

4.91 As explained in paragraph 4.31 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.

4.92 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 4.108 below).

Payments for interconnection circuits

4.93 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 4.85 to 4.87 above).

4.94 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.[79]

4.95 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.

4.96 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.

4.97 Regardless of the payments, as set out in paragraph 4.79 above, it is unclear what interconnection circuit costs would be involved.

Financial impact on the parties to the dispute

Opal's views

4.98 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 3.93 and Table 3 above).

4.99 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

4.100 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 3.95 above for a breakdown of traffic volumes).

[79] 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 3.89 above

4.101 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.

4.102 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 3.89 to 3.90 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

4.103 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

4.104 As set out in section 3, BT's view is that whilst the Current Solution is currently available to all CPs, DLE Handover for CPs other than Opal 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

4.105 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.

4.106 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.

4.107 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)[80] 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.

4.108 Opal has told us that DLE Handover would offer it an annual saving of over £[✂] 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 assessment of the savings

[80] 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.

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 4.100 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.

4.109 Significantly, and as set out in paragraph 4.55 above, Ofcom understands that an agreement between Opal and BT has been reached to introduce 273 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.

4.110 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

4.111 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 4.16 to 4.19 above.

The six principles of pricing and cost recovery

4.112 We consider below the arguments put to us by Opal in the context of the six principles of pricing and 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

4.113 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

4.114 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

4.115 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

4.116 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

4.117 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."[81]

4.118 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 GC 18;

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

[81] 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

4.119 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.

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

a) In response to paragraphs 4.118a) to 4.118d) and 4.118f), we have recently consulted on the policy supporting current APCC arrangements.[82] 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 4.118e), 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 4.91 above.

Effective competition

4.121 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

4.122 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;

[82] 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")[83], 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 £[✂], 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 GC 18.

Ofcom's view

4.123 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.

4.124 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.

4.125 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 ("GC 18") requires that charges for ported

[83] 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"[84]. 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. GC 18 also places cost orientation and reasonableness obligations on the overall level of the APCC that may be levied.
>
> As a result, we consider that GC 18 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 GC 18 provides sufficient protection against BT setting unduly high LTC charges for the calculation of APCCs."[85]

Reciprocity

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

Opal's view

4.127 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

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

Distribution of Benefits

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

Opal's views

4.130 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,

[84] 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.
[85] 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

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

Practicability

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

Opal's view

4.133 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 GC 18 easier.

4.134 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

4.135 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 4.81 above).

4.136 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.

4.137 We discuss system development costs and their recovery in paragraphs 4.89 to 4.92.

Summary of the six principles in this case

4.138 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 in the First Draft Determination

4.139 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 require BT to change its routeing method to comply with GC 18 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.

4.140 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 GC 18.

Section 5

Responses to the First Draft Determination and Ofcom's proposed conclusions

Explanation of this section

5.1 For convenience, this section repeats our analysis of the matters in dispute and the revised provisional conclusions which we published in our Second Draft Determination 18 December 2009[86]. The text of this section is the same (other than amendments for clarification) as that in the corresponding section of our Second Draft Determination. Where we refer to Ofcom's views and conclusions in this section, we are referring to the provisional views which we set out in the Second Draft Determination.

5.2 In section 6 of this Determination we set out the responses which we received to our revised provisional conclusions set out in the Second Draft Determination, our consideration of those responses, and our final conclusions.

Responses to the consultation

5.3 Ofcom received responses to its consultation on the First Draft Determination from:

a) BT;

b) Opal; and

c) C&W.

5.4 In summary, BT welcomed Ofcom's provisional view that it would not be appropriate or reasonable for Ofcom to require BT to provide DLE Handover to Opal, and so the status quo should remain. BT agreed with Ofcom's analysis in the First Draft Determination that DLE Handover to Opal is higher cost than BT's Current Solution.

5.5 In contrast, Opal disagreed with Ofcom's provisional view stating that the more detailed cost information that it was supplying in its response clearly shows that DLE Handover to Opal would in all circumstances be more cost efficient than the Current Solution. As a result, in Opal's view, BT should be required to implement DLE Handover to Opal in order to comply with its obligations under GC 18.

5.6 C&W called on Ofcom to revisit the modelling it had used in order to resolve the dispute, believing that resultant changes "will fundamentally alter the Draft Determination's proposed resolution." In its view any reduction in efficiency resulting from the use of DLE interconnect would be more than offset by the saving of LTC.

5.7 In this section, we group the comments of the respondents into four themes and then set out our view on each of these themes. Our analysis includes any required clarifications of and revisions to our analysis set out in section 4. We then set out our

[86] See http://www.ofcom.org.uk/consult/condocs/draft_deter_bt_opal_charge2/draft_determination2.pdf .

revised proposed determination to resolve this dispute, having carefully taken into account the responses.

5.8 The themes around which we have grouped the consultation responses are as follows:

a) Ofcom's analysis of the costs of the Current Solution and DLE Handover to Opal and evidence relied on;

b) The recovery of costs including interconnection costs and system development costs;

c) Wider considerations in Ofcom's analysis; and

d) Procedural issues.

Ofcom's analysis of costs and evidence

Use of Opal's costs, CSI and ISI circuit costs in Ofcom's NPV analysis

Opal's comments

5.9 Opal argued that Ofcom's NPV analysis, which assumes that BT would provide DLE Handover to Opal using CSI links, inflates costs to an excessive level and therefore does not bear any resemblance to how a UK fixed network operator would interconnect with BT. Opal provided to Ofcom a letter from BT to Opal of 25 July 2008[87], which, Opal argues, sets out BT's clear commercial position that it would never use CSI links to hand over traffic to the Opal network. Opal argued that the relevant costs to be included in the NPV analysis are those that BT would incur up to the point where the calls are handed over to the Opal network, that is, the point of handover ("PoH") [88] using ISI links. In Opal's view, any costs that Opal would incur in the circumstances of DLE Handover to it (ie once the calls have been handed over and are being carried on Opal's network) "are plainly irrelevant and should therefore be disregarded".

5.10 In addition to the above, Opal set out three other reasons why it considers that costs on the Opal network should not be taken into account in Ofcom's assessment of the comparative costs of the Current Solution and DLE Handover:

a) That GC 18.2 requires BT to ensure that the APCC is reasonable and cost-orientated (with no reference made to the costs of the recipient provider), so that it follows that only BT's costs are relevant in Ofcom's assessment;

b) That this position has been confirmed in a previous regulatory statement from Oftel in 2000[89] which states "The cost of additional conveyance should be subsumed into the donor operator's general network costs, spreading the cost over all calls on the network. Such an approach follows the principle of cost minimisation, by encouraging operators to minimise additional conveyance and thus adopt the most efficient routing method of providing portability";

[87] J.P.Hopkinson, Commercial Manager, BT Wholesale to Chris Stocks, Opal.
[88] PoH essentially refers to the point where BT hands calls over to Opal's network, namely when 'ownership' of the traffic is passed from BT to Opal.
[89] Opal cited paragraph 2.9 of the *Numbering directive: Number portability requirements*, Oftel, January 2000.

c) That the alternative position of including Opal's cost in the assessment is logically perverse because for other types of traffic (CPS, IDA and NTS) BT has been required to offer DLE Handover. Opal's view is that when imposing these (other) requirements Ofcom had not taken into account the costs of the other network operator extending its network to the DLE. Doing so would, in Opal's view, effectively make Ofcom a "central planner" trying to second guess the market and technology and make its own determination of the most efficient routeing. Opal considers that this would be a "gross misinterpretation of Ofcom's role"; Ofcom's role is to allow a range of options for alternative network operators, allowing market forces to ensure an efficient outcome. Opal added that the alternative network operator should be able to "choose whether it makes economic sense to build out its own network to the DLEs [….] rather than asking BT to route the traffic via the BT NGS instead".

5.11 Opal elaborated on this argument, stating that requiring BT to provide DLE Handover to Opal is the most appropriate way to ensure 'society-wide' efficiency and that an approach based on an approximate estimate of Opal's own costs is likely to lead to 'society-wide' inefficiencies.

5.12 Opal also stated that the First Draft Determination did not set out why Opal's costs would be relevant.

5.13 Accordingly, in Opal's view, the NPV model should be based on ISI links established between BT and Opal, rather than CSI links, which it believes to be unrealistically expensive. Opal referred to a meeting between Ofcom and Opal on 2 November 2009, noting that Ofcom "stated … that it was aware that its NPV estimates were using excessive costs (although arguing that this was only because it did not have any other cost estimates available). Ofcom even appeared to concede that using existing ISI links would be a preferable alternative as this solution was likely to be more cost efficient than CSI links."

5.14 Opal provided us with a revised NPV model based on using existing ISI links which it stated demonstrates "a commercially realistic picture of what the DLE Handover solution would cost BT compared to the Current Solution." This model, which was to be compared to Table 8 above, showed that DLE Handover is £5.91 million less costly on a five year NPV basis than the Current Solution.

5.15 Opal's model is based on BT meeting the costs of the 2Mb/s E1 circuit capacity required to convey the relevant ported calls over Opal's existing ISI links up to the PoH.[90] It did not include any costs "that BT may incur in extending its network to the PoH". Opal stated that such costs would be:

a) "Insignificant because the PoH for each of the DLEs is located in the immediate vicinity of the BT building (and where this is not the case, we have included the cost of IECs[91] to extend BT's network to the PoH)"; and

b) BT has already incurred these costs when establishing the ISI links in the first place so that these costs should arguably be considered sunk and not incremental to implementing DLE Handover.

[90] In its response, Opal advised that it had used the Ofcom APCC Dispute Model as a starting point and replaced the relevant values based on CSI interconnection with values based on ISI interconnection.
[91] An IEC (Interconnect Extension Circuit) extends an ISI circuit from the BT node where the ISI link terminates to another BT location.

Ofcom's view

5.16 We note the arguments for estimating costs based on different PoHs and different types of interconnection circuits for the Current Solution and DLE Handover. In particular, the Current Solution uses CSI, which is a product provided by BT to extend its network up to a PoH at the site of Opal's buildings. This compares with DLE Handover using ISI, where BT and Opal build out their networks to an agreed PoH located between their respective switches.

5.17 Having considered the arguments made by Opal, we have identified three ways in which the relative costs of the interconnection circuits in the Current Solution and DLE Handover to Opal could be modelled:

a) Modelling the interconnection circuit costs of the Current Solution as CSI and of DLE Handover to Opal as if it would also use CSI (Approach A);

b) Modelling the interconnection circuit costs of the Current Solution as if it used ISI and of DLE Handover to Opal using ISI (Approach B);

c) Modelling the interconnection circuit costs of the Current Solution as CSI and of DLE Handover to Opal as ISI (Approach C).

5.18 Paragraph 4.20 above explains that in comparing the end-to-end costs of the Current Solution with DLE Handover to Opal, Ofcom's approach to assessing whether DLE Handover to Opal is a more efficient method for onward routeing of non-BT originated calls to numbers ported from BT to Opal involved us identifying the key network elements required to deliver BT's Current Solution and DLE Handover to Opal. Our provisional view was that this was an appropriate approach to take on the basis that it provided a like-for-like comparison of costs, examining total end-to-end costs of delivering calls from BT's DLEs to Opal's switches (as was already offered by the Current Solution).

5.19 We adopted Approach A in the First Draft Determination. As made clear in paragraph 4.61 above, in order to estimate likely rental costs for interconnection circuits under the Current Solution and DLE Handover to Opal, we used BT's estimates. As set out in paragraphs 4.57 to 4.58, the estimates using CSI costs contained a flaw in that they may not fully reflect the efficiency savings available on present ISI interconnection links between BT and Opal. However, our view was that in the absence of further information from the parties, BT's estimates provided the best estimates currently available to us. For the same reason, for the one-off connection costs of interconnection circuits, we used BT's estimates. Table 8 showed the net impact of this – it suggested that the Current Solution is lower cost than DLE Handover to Opal by an NPV of about £2.3 million.

Approach B to cost modelling

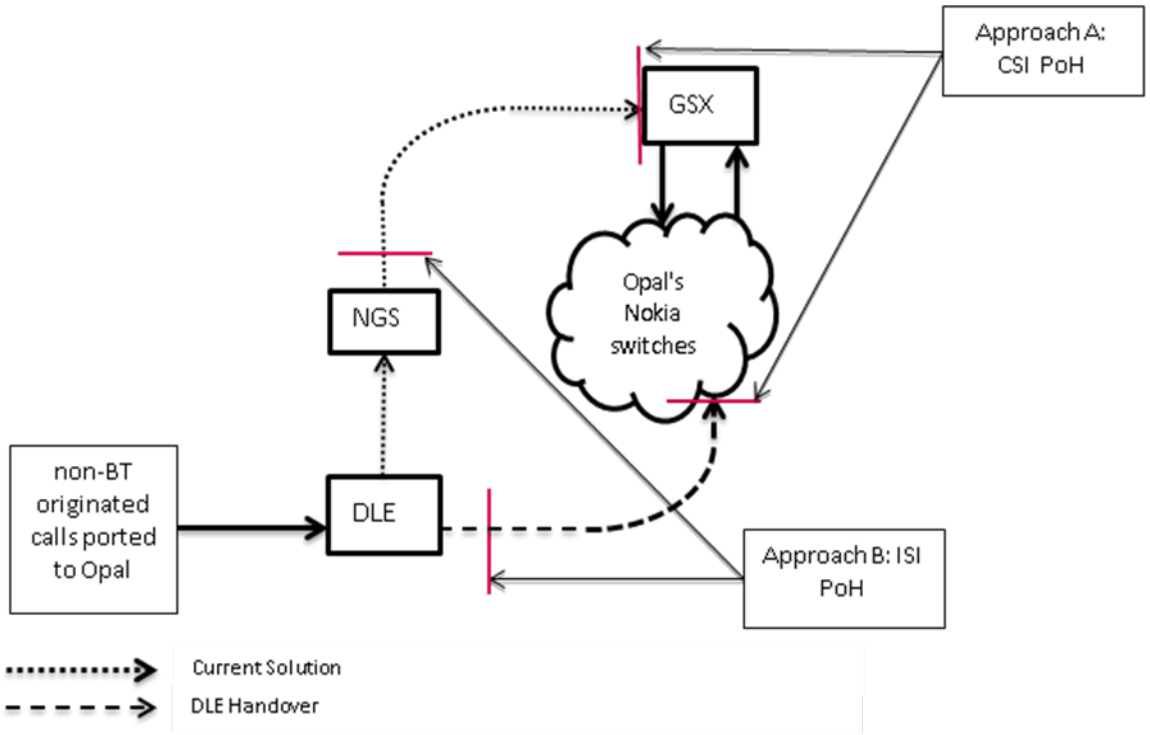
5.20 As set out in paragraph 5.9 above, Opal argued that an assessment of cost differences where DLE Handover costs were modelled using CSI routeing would not be appropriate. Specifically, Opal argued that CSI routeing would not be a commercially realistic means to achieve DLE Handover to Opal, and that instead costs of DLE Handover to Opal should be modelled based on an ISI routeing solution.

5.21 Approach B therefore assumes that ISI routeing (and not CSI routeing) would be used to achieve DLE Handover to Opal. It also differs from Approach A by assuming

ISI routeing for the Current Solution. That is, Approach B compares costs as if ISI routeing were used for both DLE Handover to Opal and the Current Solution. This is on the argument that the same type of interconnection links (in this case, ISI) should be assumed for both solutions in order to provide a like-for-like comparison of costs between the two solutions.

5.22 For both solutions, BT's onward routeing comprises the network elements required to transit CP originated ported traffic to 'analogous' points on Opal's network. However, unlike Approach A, where the analogous CSI PoH is at the Opal network end of the links (i.e. Opal's switches), Approach B assumes that the analogous ISI PoH is situated at the BT network end of the ISI links (i.e. at the footplate next to a BT DLE or NGS building). Under this interpretation of a like-for-like approach, the costs of onward routeing incurred by BT up to these analogous ISI PoHs are relevant to our assessment of the more efficient routeing solution. Approaches A and B are illustrated in Figure 4 below.

Figure 4: Approaches A and B



Cost elements for Approach B

5.23 There are two elements of cost differences relevant to Approach B:[92]

a) Local Tandem Conveyance ("LTC"); and

b) Interconnection circuits.

[92] For ITC costs, Approach B assumes all of these costs will be avoided for both the Current Solution and DLE Handover to Opal, as in Approach A.

LTC costs

5.24 LTC costs are estimated in the same way as in Approach A, and, as set out in section 4, we estimated the cost of LTC by applying standard interconnection rates by time of day to BT's estimate of CP originated ported minutes transited to Opal's network. LTC charges under the Current Solution are £[✂] per year and [✂] under DLE Handover to Opal. This represents an LTC saving of £1.5 million annually and £5.8 million in NPV terms over 5 years.

Interconnection circuit costs

5.25 For interconnection circuit costs, we include only the costs of those E1 circuits used for traffic where onward routeing can be expected to differ under DLE Handover to Opal, compared to the Current Solution. Specifically, there are three types of ported traffic requiring E1 circuits:

a) CP originated traffic handed over to BT at the DLE;

b) CP originated traffic handed over to BT at the NGS; and

c) BT originated traffic.

5.26 Of these, only onward routeing of traffic in a) above will vary with DLE Handover to Opal and hence only costs of E1 circuits required for this particular traffic type should be included in the assessment. This is illustrated in Figure 4 above. Under the Current Solution, CP originated traffic handed to BT at the DLE is routed to Opal via the NGS. Under DLE Handover to Opal, such traffic would instead be routed along the dashed line from BT's DLE to Opal's Nokia switches (without being routed to BT's tandem layer). Traffic under b) and c) (not shown in Figure 4) will continue to be routed to Opal in the existing way even under DLE Handover to Opal. The costs of onward routeing for such traffic are, therefore, expected to be the same under both solutions and so we have omitted them from our cost modelling.

5.27 We modelled the costs of ISI links on BT's network up to the PoH as comprising only the costs of In Building Circuits ("IBC"), consistent with Opal's view (where IECs are not involved). In the case of the Current Solution, we have used BT's estimate of the number of E1 circuits required for CP originated traffic handed over to BT at the DLE because this represents the actual number of E1 circuits used by BT to route ported traffic to Opal using CSI links up to Opal's GSX switches. In the case of DLE Handover, we have used Opal's estimate of the number of E1 circuits that it believes would be required for CP originated traffic handed over to BT at the DLE, if using its existing ISI links. This estimate is larger than BT's corresponding estimate and so is less favourable to DLE Handover to Opal. We applied IBC rates to these volumes of circuits.

5.28 We note that Opal has also estimated additional E1s at DLEs where IECs are used to extend Opal's network to some of BT's DLEs (e.g. those remotely located). While these costs were included in Opal's cost model submitted to Ofcom, we consider IECs (and use of IEC standard interconnection rates to calculate their costs) should not be included in the cost assessment. This is because the solution would involve BT handing over traffic to Opal at the DLE. Therefore, where Opal is not interconnected to some of BT's DLEs with its own physical network, Opal will need to extend its own network itself, or by leasing extension circuits from a third party (in this by case purchasing IECs from BT), in order to be able to collect the traffic handed over by BT at those DLEs. In the latter case, we would view IEC circuits as being on

the Opal network side of the ISI PoH. On this basis, IEC costs should be excluded from the cost assessment as they would not be circuit costs relevant to BT's onward routeing service up to its side of the ISI PoH.

5.29 A more detailed discussion of our methodology for interconnection circuit costs is set out in Annex 3. An updated version of Approach A, including a few changes since the First Draft Determination, is set out in Annex 4.

Results using Approach B

5.30 Table 9 sets out the results of Approach B.

Table 9: Approach B NPV[93] Results (£m)

Annual costs	Current solution (ISI)	DLE Handover to Opal (ISI)	Difference (annual)	Difference (5yr NPV)	Difference (10yr NPV)
LTC	[✂]	[✂]	-1.5	**-5.8**	**-9.3**
IBC (rental)	[✂]	[✂]	0.0	**0.2**	**0.3**
IBC (rental) Additional 273 E1s	[✂]	[✂]	-0.0	**-0.0**	**-0.1**
ITC	[✂]	[✂]	0.0	**0.0**	**0.0**
sub-total	[✂]	[✂]	**-1.5**	**-5.7**	**-9.1**
One-off costs	[✂]	[✂]			
IBC (connection)	[✂]	[✂]	0.4	**0.4**	**0.4**
IBC (connection) Additional 273 E1s	[✂]	[✂]	-0.1	**-0.1**	**-0.1**
system development costs (SDC)	[✂]	[✂]	0.0	**0.0**	**0.0**
sub-total	[✂]	[✂]	**0.3**	**0.3**	**0.3**
TOTAL				**-5.4**	**-8.7**

5.31 Approach B suggests that DLE Handover to Opal would represent a cost saving over the Current Solution of around £5.7 million in NPV terms over 5 years and around £8.7 million in NPV terms over 10 years.

5.32 The net overall saving is reflected almost entirely in the savings from avoiding LTC under DLE Handover to Opal (£5.8m in NPV terms over 5 years). This is because BT's other costs of onward routeing to Opal, and in particular interconnection (rental)

[93] NPV results are discounted using a social discount rate of 3.5% (real) over 5 and 10 years in 2009 prices.

costs, are low under an ISI routeing approach for both solutions. For example, due in part to the ISI PoH being situated next to BT's DLEs, annual rental costs based on IBC charges are low for both solutions (reflecting the minimal costs of BT links to this nearby PoH).

5.33 We have also identified the costs for a proportion of 273 additional E1 circuits under the Current Solution that will not be incurred under DLE Handover to Opal. We note these additional links have been agreed between the parties and we understand that they will avoid the need for ITC conveyance in the future. These additional ISI costs are relatively small. See Annex 3 for a detailed explanation of this calculation.

5.34 We consider, however, that there are flaws with Approach B. Whilst we know that the Current Solution uses CSI links, in using Approach B we would be modelling the costs as if ISI links were used. Therefore, just as Approach A was flawed, this second approach using a proxy of ISI for BT's Current Solution is equally flawed; neither Approach A or B reflects the real nature of the links which are/would be used.

5.35 We have therefore considered Approach C as an alternative to Approaches A and B.

Approach C to cost modelling

5.36 Approach C models the interconnection circuit costs for the Current Solution as CSI and for DLE Handover to Opal as ISI. That is, Approach C compares the costs of interconnection circuits for each of the Current Solution and DLE Handover to Opal up to the point when BT hands calls over to Opal's network, on the basis of the types of circuits which are actually being used/would be used.

5.37 Under Approach C, the CSI PoH under the Current Solution is at the Opal end of the CSI links (i.e. Opal's GSX switches) whereas the ISI PoH under DLE Handover to Opal would be situated at the BT network end of the ISI link (at the footplate outside BT's DLEs). The costs of onward routeing incurred by BT up to the PoH – wherever these lie on the two different solutions – are therefore relevant to our assessment of which is the more efficient routeing solution. Importantly (and unlike Approach A and B), Approach C does not involve traffic being handed over at analogous PoHs. Instead it is based on the actual PoHs, which differ materially between the Current Solution and DLE Handover to Opal.

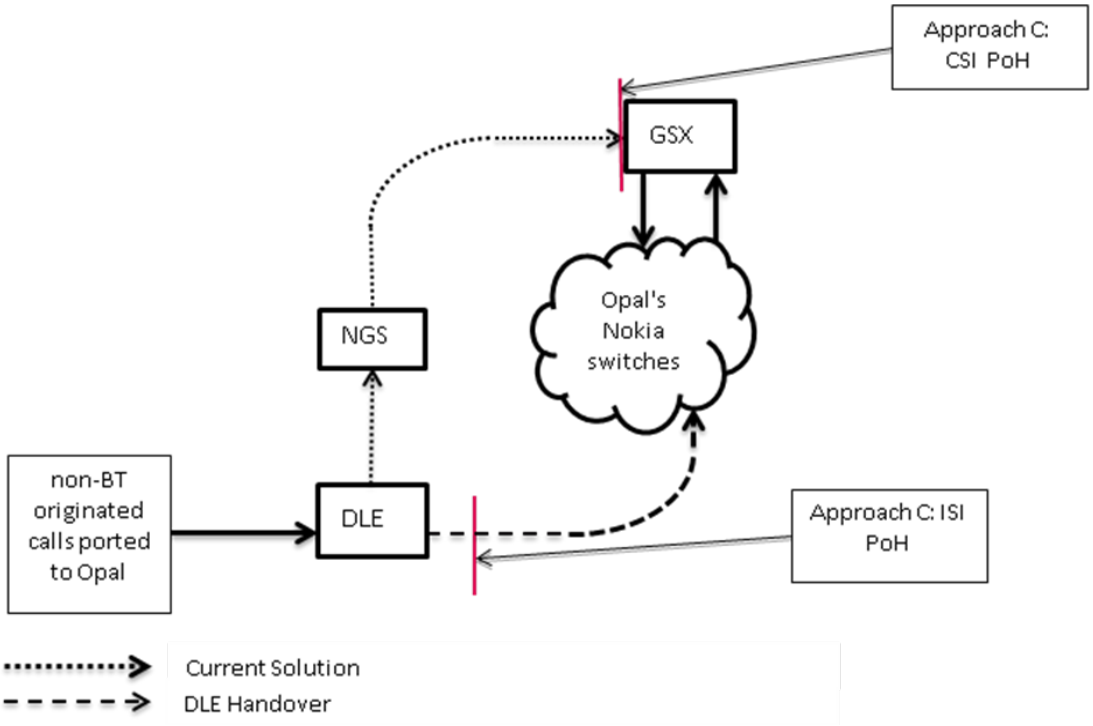
5.38 In light of the above, we consider that Approach C provides a more meaningful like-for-like cost comparison by assessing interconnection costs based on the most likely routeing solution in practice, even where the routeing configurations differ between solutions. Under this approach, the like-for-like comparison assumes that only BT's costs of onward routeing are relevant up to the handover of ported traffic to Opal's network. We consider that this is consistent with the provisions of GC 18. Portability is defined in GC 18 as "any facility which may be provided by a CP to another enabling any subscriber who requests number portability to continue to be provided with any PATS by reference to the same telephone number irrespective of the identify of the person providing such a service." We understand this as requiring the donor provider to supply onward routeing of the call to the ported number such that it is handed over to the recipient provider's network for termination to the person being called. As such, the portability service provided by the donor provider ends on handover of the ported call to the recipient provider, and it is on this basis that we have compared the respective costs of the different portability solutions.

5.39 We also consider that Approach C is broadly consistent with price signals for efficient decision making. Costs on Opal's side of the PoH are incurred by Opal. If these costs

are different between the Current Solution and DLE Handover to Opal (as they may well be), then Opal has an incentive to take such cost differences into account when considering whether to request DLE Handover from BT. Our view set out at paragraph 5.123 below, that BT is entitled to charge (in line with GC 18) for the interconnection circuit costs on BT's side of the PoH, is also relevant in this context. This is because, if BT sets its charges in this way, the potential price signals (i.e. APCC) faced by Opal for the different portability solutions will reflect the different costs on BT's network associated with the position of the actual PoH in each case.

5.40 Approach C is illustrated in Figure 5 below.

Figure 5: Approach C



Cost elements for Approach C

5.41 There are two elements of cost differences relevant to Approach C:

a) Local Tandem Conveyance ("LTC"); and

b) Interconnection circuits.

LTC costs

5.42 LTC charges are estimated in the same way as under Approach A and B (see paragraph 5.24).

Interconnection circuit costs

5.43 For the Current Solution we have taken BT's estimates of E1 circuits required for CP originated traffic handed over to BT at the DLE and calculated their costs by using both CSI and IBC rates. For DLE Handover to Opal, we have taken Opal's estimates of E1 circuits required for this traffic and calculated their costs by applying IBC rates (see paragraph 5.27 above).

5.44 Under the Current Solution, the (rental) costs of CSI circuits are significant. The saving of these costs from DLE Handover to Opal is around £2.5 million (in NPV terms over 5 years).

5.45 Under DLE Handover to Opal using ISI, IBC costs will be incurred. However, the estimated annual rental charge for IBCs is relatively small and the net cost of DLE Handover to Opal is approximately £0.3 million (in NPV terms over 5 years).

5.46 We have also identified the costs for a proportion of 273 additional circuits under the Current Solution that will not be incurred under DLE Handover to Opal (i.e. those related to CP originated traffic handed over to BT at the DLE). These additional ISI costs are relatively small: approximately £[✂]. See Annex 3 for a detailed explanation of this calculation.

5.47 Unlike Opal's model, our model does not include the cost of IECs for the same reasons as discussed at paragraph 5.28 above.

Results using Approach C

5.48 Table 10 sets out the results of Approach C.

Table 10: Approach C[94] NPV results (£m)

Annual costs	Current solution (CSI)	DLE Handover to Opal (ISI)	Difference (annual)	Difference (5yr NPV)	Difference (10yr NPV)
LTC	[✂]	[✂]	-1.5	**-5.8**	**-9.3**
IBC (rental)[95]	[✂]	[✂]	0.1	**0.3**	**0.5**
CSI (rental)	[✂]	[✂]	-0.6	**-2.5**	**-3.9**
IBC (rental) Additional 273 E1s	[✂]	[✂]	-0.0	**-0.0**	**-0.1**
ITC	[✂]	[✂]	0.0	**0.0**	**0.0**
sub-total	[✂]	[✂]	**-2.1**	**-8.0**	**-12.8**
One-off costs					
IBC (connection)	[✂]	[✂]	0.7	**0.7**	**0.7**
CSI (connection)	[✂]	[✂]	-0.7	**-0.7**	**-0.7**
IBC (connection) Additional 273 E1s	[✂]	[✂]	-0.1	**-0.1**	**-0.1**
System development costs (SDC)	[✂]	[✂]	0.0	**0.0**	**0.0**
sub-total	[✂]	[✂]	**-0.1**	**-0.1**	**-0.1**
TOTAL				**-8.1**	**-12.8**

5.49 As seen in Table 10, the key drivers of savings under DLE Handover to Opal are:

a) LTC savings of £5.8 million; and

b) the net saving in interconnection circuit (rental) costs of approximately £2.2 million.

[94] NPV results are discounted using a social discount rate of 3.5% (real) over 5 and 10 years in 2009 prices
[95] IBC rental refers to that concerned with DLE Handover; for the Current Solution, CSI rental includes both CSI and IBC costs.

5.50 These broadly make up the overall net saving from DLE Handover to Opal of NPV £8.1 million under Approach C. For detailed explanations of both the technical elements considered and the treatment of CSI and ISI costs see Annex 3.

Summary of results using Approaches A, B and C

5.51 Table 11 summarises the results of modelling costs using each of the approaches A to C. Approach A was followed in the First Draft Determination (Approach A is set out in section 4 above), with the result that the Current Solution seems to be a lower-cost solution compared to DLE Handover to Opal. However, based on the modelling Approaches of B and C, DLE Handover to Opal seems to be materially lower cost in both cases. As explained in paragraphs 5.38 to 5.39 above, we consider that Approach C is the approach to making a cost comparison between the Current Solution and DLE Handover to Opal.

Table 11: Results of modelling using Approaches A, B and C

	Current Solution – PoH	**DLE Handover to Opal – PoH**	**Assessment of benefit of DLE Handover (5 year NPV)**
Approach A: CSI for both Current Solution and DLE Handover to Opal	Opal GSX	Opal Nokia switch	**-£4.1m** [96]
Approach B: ISI for both Current Solution and DLE Handover to Opal	Next to BT NGS	Next to BT DLE	**£5.4m**
Approach C: CSI for Current Solution and ISI for DLE Handover to Opal	Opal GSX	Next to BT DLE	**£8.1m**

5.52 The revised analysis of costs that we have undertaken, taking account of the responses to the First Draft Determination, suggests that BT's costs under DLE Handover to Opal are in fact significantly lower than those under the Current Solution. This suggests that DLE Handover to Opal is more efficient than BT's Current Solution and therefore supports a provisional view that BT should be required to offer DLE Handover to Opal in order to comply with its obligations under GC 18.

Other comments on Ofcom's analysis of costs in the First Draft Determination

Opal's comments

5.53 We consider that our amended approach, using Approach C, means that many of Opal's specific comments on our cost modelling (as set out above) fall away. Accordingly we have not responded to them all individually, except where they continue to be relevant.

5.54 Opal noted that the additional 273 circuits would be ISI not CSI and accordingly made this change in its model. It also noted that "BT has never committed to Opal

[96] Note that the -£4.1 million is revised from -£2.3 million set out in the First Draft Determination. Annex 4 sets out the basis for this revision.

that the APCC would be reduced as a result of removing [the] inter-tandem leg in their network".

Ofcom's view

5.55 Prior to our First Draft Determination, BT advised us that an additional 273 CSI circuits are planned which implies an increase in the circuit costs (and decrease in ITC costs) for the Current Solution[97]. Opal confirmed that these links would be over [✂] additional routes to NGS sites and it was hoped to have the majority in service before the end of December 2009[98]. Following the issuing of the First Draft Determination, it has come to light that both parties consider these 273 links to be ISI, not CSI.[99] Neither party has disputed the inclusion of the costs for these additional 273 links in modelling BT's Current Solution costs (nor our modelling assumption that all ITC costs would thereby be avoided).

5.56 In respect of BT's charges, in that GC 18 requires (among other things) that charging for portability is cost-oriented, we would expect that any reduction in ITC costs would be reflected in BT's charges to Opal for providing portability.

BT's comments

5.57 BT welcomed the clarification that it is appropriate for BT to include reasonably incurred costs for LTC (paragraph 4.17 above) and interconnect circuits (paragraph 4.96) in the APCC, adding that this will be relevant when BT recalculates the rates going forward.

C&W's comments

5.58 C&W submitted that whether or not Ofcom should take into account the additional CSI circuits (now considered to be ISI circuits) in its analysis (as it did in Table 8 in section 4), depends on whether or not these circuits have already been implemented, and in any event, that it may not be correct for Ofcom to exclude all of the savings available from the reduction in the ITC. In its view, if the circuits have not been implemented, then the Current Solution in Table 8 should include the incremental cost of both the connections and on-going rental of these circuits. If already implemented, then DLE Handover would benefit from the removal of both a one-off rebate of a proportion of relevant connection charges and avoidance of on-going rentals.

Ofcom's view

5.59 As noted in paragraph 5.55 above, neither of the parties to the dispute has questioned the inclusion of the costs of the 273 additional circuits, nor the exclusion of the resulting ITC cost savings. Further, in considering the forward-looking question of whether BT should be required to offer DLE Handover to Opal, it would be inaccurate not to include these costs in our assessment. We consider, therefore, that it is appropriate to reflect these costs in our assessment.

[97] Email from J Davey (BT) to L Knight (Ofcom) of 7 October 2009.
[98] Email from C Stocks (Opal) to L Knight (Ofcom) of 19 October 2009
[99] Email from J Davey (BT) to L Knight (Ofcom) of 11 November 2009. At a meeting with Ofcom of 2 November 2009, R Granberg (Opal) advised that the 273 additional circuits were to be ISI and that Opal had not advised Ofcom of this in previous correspondence.

The recovery of costs

Interconnection circuit costs

Opal's comments

5.60 Opal disagreed with our comments at paragraph 4.96 above where we stated that if we concluded that BT were required to offer DLE Handover to Opal to comply with GC 18, we would consider that any costs incurred by BT for interconnection required to deliver DLE Handover to Opal would therefore most likely be recoverable by BT. In Opal's view we have "completely misunderstood existing commercial arrangements and thereby misrepresented Opal's position". It considers such an outcome would go against established commercial practice as governed by the SIA. It stated that the SIA[100] classifies ported call traffic as being "owned by BT", "which means the contract provides that BT is responsible for paying for the interconnection capacity (i.e. the connection and rental of the ISI links)" and that these provisions are separate from what party pays for the conveyance of calls.

5.61 Opal also stated that should BT be able to recover such interconnection costs, this would contravene GC 18.2 that prevents BT from recovering System Set-Up Costs.

Ofcom's view

5.62 We consider that compliance with regulatory provisions takes precedence over commercial arrangements. Therefore, to the extent that the provisions of the SIA may conflict with what is required under GC 18 in relation to the recovery of interconnection costs concerned with Portability (i.e. where the donor provider onward routes a call from an OCP to the recipient provider), we consider that the provisions of GC 18 should prevail. We therefore consider that BT would be able to recover such costs which BT reasonably incurs in order to deliver the ported call to the PoH to Opal's network. This is consistent with GC 18, which provides that the donor provider may make reasonable, cost oriented charges provided they are not System Set-Up Costs or ACCs.

5.63 We do not consider that interconnection costs are System Set-Up Costs because they are part of BT's on-going management of its network and conveyance of traffic, rather than a single cost incurred in order to implement a portability solution.

System development costs

Opal's comments

5.64 Opal reiterated its argument that BT should bear the cost of any system development in order to enable DLE Handover to Opal.

5.65 Opal also found it "astonishing how quickly BT has stepped back from its original estimate of £[✂] that they gave in response to Opal's SOR." Opal went on to state that Ofcom should place no reliance on BT's cost estimates in this regard (given that they had changed their estimate from £[✂] in response to the SOR, to £[✂] and then to £[✂] in response to Ofcom's questions) and instead use the lowest estimate given (£[✂]) "to ensure that BT understands it cannot continue to frustrate regulatory efforts to ensure that full compliance with General Condition 18 is

[100] Paragraph 5.1.3 and Appendix D of Annex A

achieved through this dispute". Opal added that Ofcom had not explained in the First Draft Determination why the figure quoted by BT had changed from £[✂] to £[✂].

5.66 Opal went on to say that it "..has provided robust evidence of the true cost that BT would incur in providing DLE Handover of ported calls" (£5.91 million over a five year period), and whether system development costs were £[✂] or £[✂], in its view the reasonably anticipated gain to CPs (and therefore ultimately to consumers) would be far greater than either figure. Opal cited paragraph 4.108 above where Ofcom set out that the cost saving to Opal would be about £[✂] in one year. Opal contends that "It [therefore] follows that the consideration of system development costs does not in any way represent a regulatory obstacle to requiring BT to provide DLE Handover."

Ofcom's views

5.67 As set out in paragraph 4.89 above, if system development costs fall within the definition of "System Set-Up Costs" in GC 18.5(o) then they would have to be borne by BT pursuant to GC 18.2(b). We believe that this is the case here. In our view, System Set-Up Costs, as defined, means the costs incurred by a donor provider in setting up its network to be capable of providing a portability solution, as opposed to the ongoing costs incurred by that provider in carrying and transferring calls to ported numbers to the recipient provider. We consider that System Set-up Costs can include the costs of modifying an existing network, if those modifications are necessary to ensure that the donor provider remains compliant with GC 18. In this case, the system development costs are costs related to the activities needed to establish the technical, operational and administrative capability to provide portability via DLE Handover to Opal, including development, implementation and initial testing. If we conclude (as we provisionally have done) that DLE Handover to Opal is more cost efficient than BT's Current Solution, such that BT should be required to provide DLE Handover to Opal in order to remain compliant with GC 18, then the relevant modifications required to BT's network to enable DLE Handover to Opal would in our view fall under the definition of System Set-Up Costs (see further paragraphs 5.120 to 5.121 below), such that BT would not be entitled to recover them in its portability charges to Opal.

5.68 In terms of the estimates for system development costs provided by BT, we have noted in footnote 50 above that BT had described these as having been revised from an initial "crude estimate". In paragraph 3.79 above we also note BT's advice that for a definitive view of such costs a full feasibility study would be required.

C&W's comments

5.69 C&W welcomed Ofcom's conclusions that necessary system development costs should be borne by BT as the donor network and agreed with our position (at paragraph 4.91 above) that the level of system development costs should be incorporated into any analysis of whether an alternative routeing mechanism should be mandated under GC 18.

5.70 However, C&W advised that "Systems development costs built into [such] analysis should not necessarily be the estimates provided by BT; rather they should be those that an efficient operator would reasonably incur". In support of this, C&W suggested that based on its analysis showing an upper limit of £100,000 costs for data build[101], a total cost for system development should not exceed £200,000.

[101] N.B. C&W's analysis was based on its view that data build required would be to take an existing code (Opal

5.71 C&W added that in its view, system development would benefit any CP that wants direct routeing from BT's DLEs.

5.72 C&W raised several points in relation to Virtual Interconnect Circuits ("VICs"), which allow a CP to access the DLEs connected to a tandem switch through the tandem without paying tandem rates.

5.73 C&W also questioned the data presented by BT in relation to the percentage of traffic handed over to BT at the DLEs (rather than at the tandem switches). In its submissions, BT indicated that 73% of traffic to BT geographic number ranges incurred the local exchange termination rate. However, due to the existence of VICs, some of this traffic is physically handed over at the tandem exchanges. This traffic is routed in the same way as traffic handed over at the tandem exchanges and as such BT did not include it in its model of traffic that could be handed over at the DLEs. Taking this into account, BT indicated that 55% of non-BT originated traffic to numbers ported to Opal was handed over to BT by the originating CP at the DLEs. C&W argued that this indicated a higher percentage of traffic using VICs than it would have expected.

5.74 C&W further noted Ofcom's comments in paragraphs 4.57 and 4.58 above regarding the assumption made by BT that a 2Mb/s circuit may be assumed to carry [✂] minutes per month. C&W said that whilst Ofcom had questioned this assumption, we had used it in our modelling "in the light of no contradictory evidence being provided". C&W then states that "the best proxy for estimating the volume of traffic that can utilise a DLE route is once again the VIC product".

5.75 In the approach proposed by C&W, CP-specific traffic tables showing the minutes per month for a particular VIC route are calculated, taking account of traffic profiles. C&W indicates that for its own traffic, these tables give significantly higher figures of usage than [✂] minutes per month and that, even though it does not have access to the Opal specific tables, it would expect the VIC tables for Opal would also show a higher utilisation.

Ofcom's views

5.76 As set out in paragraph 4.31 above, we do not consider it appropriate to include the costs of system development in our assessment of the relative costs of the Current Solution and DLE Handover to Opal. But we consider that, should this assessment suggest that DLE Handover to Opal was lower cost, we would then consider the level of system development costs as part of our wider considerations whether DLE Handover to Opal was appropriate. If the level of costs was disproportionate compared to the perceived benefits of the new solution, we may decide that it is not reasonable to mandate the implementation of such solution (note however that the level of costs is only one factor in the overall assessment). As regards the point that we should consider the level of system development costs an efficient operator would reasonably incur, we agree with this view in principle. However, in the time available for this dispute, we have not been able to assess whether or not BT's estimate is appropriate. We do not consider that this affects our provisional conclusion, because our view would be the same with a lower estimate of system development costs (e.g. see paragraph 5.121 below).

5xxxxx prefix) and change the routeing so that instead of having a primary routeing to a nominated parent NGS (tandem node), the routeing would be to the direct Opal capacity. By using (i) the routeing of C&W's GNP export (i.e. C&W to BT) traffic; and (ii) advice from its own data build teams that they would not require more than one man-hour to build and test the routeing change, C&W set an upper limit of £100k for data build based on these two proxies.

5.77 We agree with C&W's observation that at least a proportion of system development of BT's network would likely benefit any CP that desires direct routeing from the DLEs (as also noted in paragraph 4.107 above). As to C&W's suggestion that it and other CPs may well be interested in routeing from DLE, our understanding is that only one CP, namely Opal, has so far actively pursued DLE Handover with BT.

5.78 On VICs, whilst C&W routes large traffic volumes to BT via direct interconnects and VICs, as well as receiving relatively large volumes of ported traffic from BT, C&W's view that BT's figure for the percentage of traffic routed via VICs is too high is based on examining its own specific implementation of VICs and the effect on traffic distribution. On the other hand, the data presented to Ofcom by BT is based on BT's view of the overall industry volumes.

5.79 We have modelled the costs of DLE Handover compared to the costs of the Current Solution using two figures: BT's original data that indicated 73% of traffic was handed over at the DLE and BT's revised figure, taking account of VICs, which indicates around 55% of traffic is handed over at the DLEs. The conclusions of the cost modelling are not affected whichever of these two numbers is used (other factors being equal). Therefore, since C&W's argument is that the actual figure lies between 73% and 55%, we are of the view that further analysis of this exact percentage would not change the outcome and would not therefore be instructive in reaching a conclusion to this specific dispute, which is to determine whether BT should be required to provide DLE Handover to Opal.

5.80 In relation to C&W's comments that VIC tables provided the best proxy for estimating traffic utilisation of routes, we note that, in its response, Opal agrees with BT's use of the [✂] minutes per month figure and does not propose a higher utilisation should be assumed (whether based on the use of VIC tables or another mechanism). Specifically, in its response, "[Opal] have also indicated the number of minutes that could be accommodated by these routes based on BT's assertion that it would expect to carry [✂] minutes per month per E1 (a number with which [Opal] agree entirely on the basis of our own experience)".

5.81 As such, whilst BT has not explicitly addressed our concerns set out in paragraphs 4.57 and 4.58 above, our view is that it remains reasonable to use this number, given that both parties to this dispute consider it a representative assumption for this type of traffic.

Wider considerations in Ofcom's analysis

Efficiency incentives

Opal's comments

5.82 In its original Submission and its response to the First Draft Determination, Opal asserts that BT has no incentive to route calls to ported numbers that are routed over the BT network in an efficient manner, and Opal has no option but to pay an inefficiently incurred APCC in order to allow its customers to receive these calls.

5.83 In its response, Opal also states that BT has "clearly failed to act in good faith throughout this dispute by consistently providing inflated costs for the required system development and the necessary DLE interconnection links. Opal submits that BT's actions bear all the hallmarks of an operator in a dominant position with a distorted incentive to maximise profits at the expense of effective competition".

Ofcom's response

5.84 In the First Draft Determination we considered incentives as part of our assessment of Opal's arguments in respect of the six principles of pricing and cost recovery, specifically concerning cost minimisation and effective competition. At that time, we set out our view that GC 18 reflects the principle of cost minimisation by limiting cost recovery to those costs reasonably incurred (see paragraph 4.120 above) and that effective competition is best served where charges for onward routeing are based on the lower cost solution, taking account of the best evidence available (paragraph 4.124 above).

5.85 Having considered the responses to the First Draft Determination, we have re-visited this issue in light of the provisional conclusions on costs based on Approach C. Based on the principles set out in the previous paragraph, we believe that Approach C addresses Opal's concerns on incentives.

5.86 We recognise that the assessment of the costs of DLE Handover to Opal under Approach C does not take account of the costs of a significant section of the end-to-end routeing, i.e. the section from PoH to Opal's Nokia switches which are costs on Opal's network and thus to be borne by Opal, whereas the assessment of the costs of the Current Solution include the costs all the way to Opal's GSX (because this is where the PoH is). Therefore the ability (and incentive) to route efficiently is to a significant extent moved from BT under the Current Solution into the control of Opal under DLE Handover to Opal, in that it would have control over the costs of call traffic on its network. Opal would clearly have an incentive to ensure these costs are minimised.

5.87 Portability based on DLE Handover to Opal as set out in Approach C reduces the on-going costs BT incurs on its network and therefore also reduces the portability charges set by BT (in form of the APCC).

5.88 In respect of system development costs, as set out in paragraph 5.76 above, if BT is required to cover the costs of enabling DLE Handover to Opal in order to remain compliant with GC 18, BT has a clear incentive to ensure that any such costs are incurred on as efficient a basis as possible.

5.89 We therefore consider that Approach C addresses the issues of incentives raised by Opal in the context of the principles of both cost minimisation and effective competition.

5.90 We also note that Opal cites paragraph 4.108 above in order to assert that Ofcom has verified that DLE Handover to Opal would represent a cost saving to Opal of £[✂] over a single year. We do not consider this to be an accurate reflection of our position: paragraph 4.107 describes a potential saving as comprising approximately £[✂] in ITC costs and £[✂] in LTC costs. As paragraph 4.106 then observed, our understanding was that the introduction of the additional 273 interconnect circuits would act to circumvent ITC and the benefit of DLE Handover to Opal would be reduced – the cost savings offered by DLE Handover to Opal are more likely to be approximately £[✂] per annum. We have considered the level of system development costs (of £[✂], based on BT's revised estimates) in our assessment of the wider impact of DLE Handover to Opal.

Commercial Agreements on use of ISI

Opal's comments

5.91 Opal interpreted paragraph 4.81 above as Ofcom suggesting that using Opal's existing ISI links would have significant contractual implications. In its view there are no contractual impediments to BT using Opal's ISI links for the relevant traffic. Opal stated that "it is a simple matter of agreeing the relevant capacity arrangements between the companies that is no different to the joint network and interconnection management that occurs daily between Opal and BT." However, Opal also noted that Ofcom had clarified in a meeting of 2 November 2009 that these 'contractual issues' "would not constitute an obstacle to requiring BT to provide DLE Handover".

5.92 Opal also set out its concern that Ofcom may have fundamentally misunderstood the cost sharing arrangements, as set out in BT's SIA, for the planning, deploying, operating and managing of additional capacity over ISI links.

Ofcom's view

5.93 We welcome Opal's view in its response that agreement on the technical and commercial arrangements for using the ISI links to support the routeing of ported traffic to Opal from BT's DLEs is a relatively straightforward matter, and that it is no different to the day-to-day joint network and interconnection management between the parties. We set out in paragraphs 4.81 to 4.82 our suggestions on the minimum considerations that such agreement should cover in order to assist the parties in any work they do following the resolution of this dispute.

Stranded Assets

5.94 DLE Handover to Opal would result in some ported traffic (defined as type a) traffic at paragraph 5.25 above) no longer requiring transit beyond BT's DLE layer through to its NGS layer. This could leave some of BT's existing E1 circuits (or ports containing E1 circuits) at the NGS layer being under-utilised or unused.[102]

5.95 Where circuits used by the Current Solution become under-utilised or unused as a direct result of DLE Handover to Opal, and cannot be redeployed elsewhere (i.e. the circuits are sunk investments), we note that in theory this could create costs to be borne by BT. To the extent that the circuits can be redeployed elsewhere (i.e. if interconnection circuit costs are not sunk), costs related to the redeployment of the circuit elsewhere may still arise.

5.96 There may therefore be an argument that circuits that become underutilised or unused as a direct result of DLE Handover to Opal could be treated as stranded assets and the costs of the assets should be recoverable (for example, through charges to the CP requesting DLE Handover).

5.97 However, we note that at present there are no general charges to recover costs of the cessation of circuits where customers migrate from BT's network to another CP's network. While there are circuit rearrangement charges, we understand these are not intended to recover costs of cessation of existing circuits (but rather provisioning of new or alternative circuits for alternative routeing).

[102] This was a possibility noted by BT at a meeting with Ofcom on 26 November 2009.

5.98 Therefore, our preliminary view is that an argument for treating under-utilised or unused circuits as stranded assets would need to be supported by compelling evidence of these circuits incurring sunk costs (or material costs of redeployment) as a direct result of DLE Handover to Opal, and why the investment in such circuits (or ports) would not otherwise have been undertaken in the absence of the ported traffic to Opal.

5.99 Further, we consider that where an argument for the recovery of stranded circuit costs in this case differs from any general approach, an explanation for a departure from the general approach should be provided.

5.100 Where reasoned and evidence-based arguments for the recovery of stranded circuit costs are provided with supporting evidence, we shall take account of these as part of our wider considerations.

Procedural comments

Opal's comments

5.101 Opal alleges in its response to the First Draft Determination that Ofcom appears to have acted inappropriately by giving greater weight to cost evidence supplied by BT than that provided by Opal. Further, it stated that "This may have resulted in Ofcom treating Opal in an unfair and discriminatory fashion up to this point in the dispute resolution process. We are indeed concerned that Ofcom's NPV assessment and overall handling of the dispute thus far would not stand up to rigorous scrutiny on appeal."

5.102 Opal argues in essence that Ofcom has disregarded the cost evidence submitted by Opal, relying exclusively on the information provided by BT. It stated that despite our doubts about using this information we chose to carry out the NPV calculations using the CSI links and accused Opal of failing to provide cost information when it had "plainly provided highly relevant ISI cost information in response to Ofcom's formal information request." However, Opal also said, with reference to the information it provided Ofcom: "We appreciate that this estimate was much below the cost information that we have now provided in the Annex to this [response]. However, the BT cost information was just as incorrect in that it grossly exaggerates the costs of interconnection by using CSI links."

5.103 Opal also expressed its disappointment and frustration at the "poor and quite misleading information that BT has supplied to Ofcom", not understanding why BT could justify basing its calculations on CSI links, given that it would never use them (in Opal's view).

5.104 Finally, Opal requested that Ofcom consider extending the statutory four-month period for resolving this dispute on the basis that it presents exceptional circumstances. In Opal's view an extension would allow us to consider the facts "in a proper and orderly fashion in order to reach a fair and reasonable decision that stands up to rigorous scrutiny."

Ofcom's view

5.105 We note Opal's views on Ofcom's treatment of the costs evidence supplied by it and that provided by BT. However, we wholly reject the assertion that we did not consider the evidence provided by the parties in a fair and equal manner. The only specific

cost information that Opal provided was in response to a formal information request and stated:

"Based on the interconnection capacity that is currently in place between the BT NGS and the Opal GSX (to manage the handover of calls to ported numbers), Opal estimates that approximately [✂] E1 2MB circuits would be required. Depending on how BT chooses to manage its network and the handover of these calls to Opal, this number may increase to avoid large amounts of unnecessary overflow traffic.

"In terms of costs, the connection cost for one E1 circuit is currently £808 and the annual rental cost for the same is £92.88 (prices taken from current BT Carrier Price List). Based on the above estimate of required E1 circuits, the total connection cost for BT would be £[✂] with an annual rental cost of £[✂]. It must be borne in mind of course that BT already incurs these costs when handing this traffic over to Opal through the NGS to GSX route… In other words, [DLE Handover] would effectively be cost neutral to BT.

"In addition to the above interconnect costs, both BT and Opal would incur some costs as a result of the internal work required to rearrange the traffic. With regard to Opal, however, it is estimated that the amount of work would be minimal principally because the Opal Nokia switches already manage overflow traffic from the BT network (for call termination on the Opal network)."

5.106 This was then followed by a submission[103] stating:

"The additional interconnection capacity that would be required (i.e. no 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. This must be so as the amount of traffic stays the same, i.e. traffic originating off the BT network and destined for ported numbers now on the Opal network. It follows that BT would incur the same cost of maintaining the interconnection capacity in [DLE Handover] as they would in [the Current Solution]. This is what we mean by [DLE Handover] being "cost neutral" ".

5.107 When we asked Opal whether this meant that additional interconnection link capacity for DLE Handover to Opal was not required, Opal advised us that this was the case (that there is currently sufficient capacity) and that the second response corrected Opal's response to the formal request for information[104].

5.108 We had understood this to mean that there were no costs associated with DLE Handover. We now understand this interpretation was incorrect. This was clarified by Opal in its response to the First Draft Determination.

5.109 However, as indicated above, we strongly refute Opal's serious allegation that we have treated Opal in an unfair and discriminatory fashion. We have sought to obtain and clarify information on a number of occasions and as noted by Opal itself, the cost evidence it provided was insufficient.

5.110 We have been transparent during the process and have consulted on our proposed approach; we will continue to do so in light of the submissions and clarification provided. We would also note that there is a significant difference between genuine

[103] Email from R Granberg to L Knight dated 17 September 2009.
[104] Meeting between Opal and Ofcom of 29 September 2009.

misunderstanding, which we believe may have taken place in this complex matter, and allegations of discrimination.

5.111 We also note Opal's comments on the quality of the evidence provided by BT. We rely on using formal powers to help ensure that the information we request is accurate and we believe we have treated both parties equally in our assessment of the information provided, including highlighting errors on both sides where we believe this is appropriate.

5.112 On Opal's request for an extension to this dispute process, we have considered this in light of the substantive submissions made in response to the First Draft Determination and our subsequent analysis. We have concluded that it is appropriate and necessary to extend the timetable for the resolution of this dispute in order to issue this revised draft determination and allow interested parties the opportunity to consider and respond to Ofcom's revised proposals. This is consistent with section 188(5) of the Act.

C&W's comments

5.113 C&W has stated that the level of redactions within the First Draft Determination prevented it from understanding our provisional conclusion. C&W added that the further information it sought was required in order to provide constructive and relevant comments on Ofcom's approach. C&W further noted that "The Communications Act [2003] requires Ofcom to make its decisions in a transparent manner. At present the analysis Ofcom has undertaken is not clear". C&W added that "..by the time we [C&W] found out that our request to see further information was refused it was too late to explore alternative options to understand the analysis".

Ofcom's view

5.114 Whilst the First Draft Determination that was made publicly available[105] on 29 October 2009 included redactions to information, the two parties to the dispute were each provided with a confidential version of the document as well as Ofcom's cost model underlying the analysis.

5.115 On 5 November 2009, Ofcom received a request from C&W for sight of some of the redacted information. Within two working days of receiving this request, we sought permission from BT and Opal to release the information and provided a response to C&W including further information where permission to release such information was granted by the parties.

5.116 We consider we have acted in a reasonable and timely manner in providing sufficient information to allow C&W to comment as a party outside of the dispute, on a sufficiently informed basis.

Provisional conclusion on the dispute

5.117 Having carefully considered the responses to the consultation on the First Draft Determination, on which we have set out our views above, and having conducted further analysis on the issues raised and the further information provided, we consider that our provisional conclusion in the First Draft Determination should change. We are now therefore consulting on the revised analysis and conclusion in this Second Draft Determination.

[105] A copy was also emailed directly to C&W on 29 October 2009.

5.118 We consider that the evidence provided in response to our First Draft Determination and our subsequent analysis shows that, for BT (whose network costs are the relevant ones for the purposes of GC 18), DLE Handover to Opal is a lower cost, and thus more efficient, routeing solution than the Current Solution. This suggests on its face that BT should be required to provide DLE Handover to Opal in order to meet its obligations under GC 18.

5.119 Our analytical framework, as set out in paragraphs 4.7 to 4.15 above, recognises that whilst an assessment of costs is the primary parameter for assessing whether BT should offer DLE Handover to Opal, there are factors in addition to cost efficiency that may be relevant in deciding whether mandating DLE Handover to Opal is appropriate in this case. We have therefore also considered the following:

a) The level of costs incurred for the system development required to implement DLE Handover to Opal;

b) Payments that would need to be made between the parties under DLE Handover to Opal;

c) Potential impact of DLE Handover to Opal on other stakeholders;

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

e) Arguments concerning the six principles of pricing and cost recovery.

The level of system development costs

5.120 First, we consider the initial costs which BT would need to incur for system development to enable it to provide DLE Handover to Opal. For the reasons set out in paragraph 4.90 above, we consider that such costs fall within the definition of System Set-Up Costs as defined in GC 18, such that if we mandate the provision of DLE Handover to Opal, BT would not be entitled to recover them pursuant to GC 18.2(b). However, as set out above, we consider that we must take into account the actual level of the costs which BT would incur, in order to determine whether the level of such costs is disproportionate compared to the benefit of DLE Handover to Opal, and ultimately, to consumers. If the level of these costs were disproportionately high when assessed against the anticipated resulting benefits, it may be unreasonable to require BT to offer DLE Handover to Opal, and bear these costs, in these circumstances. This is consistent with BT's view that if the costs of implementing a new solution are excessive, then requiring that solution to be provided would not be compliant with GC 18 (see paragraph 3.101).

5.121 Notwithstanding the comments received from Opal and C&W about whether BT's forecast of system development cost is correct (see arguments at paragraphs 5.64 to 5.71 above), BT's estimated level of one-off system development costs (around £[✂]) appears relatively small compared to the on-going potential benefits to Opal, and, ultimately consumers, from a reduced APCC. We therefore consider that the level of system development costs does not render the introduction of DLE Handover to Opal unreasonable, nor is it unreasonable for BT to pay for them, consistent with the requirements of GC 18.2(b).

Payments by the parties

5.122 As regards on-going payments by the parties under DLE Handover to Opal, we have considered in more detail the matters of interconnection charges and termination rates.

5.123 In the case of interconnection link costs up to the PoH, we believe that these constitute porting conveyance costs that BT is entitled to charge the recipient provider for on a cost-oriented and reasonable basis, in line with the GC 18. As set out in paragraph 5.62 above, we recognise that this may be inconsistent with the current terms of the SIA (specifically, paragraph 5.1.3 and Appendix D of Annex A), which Opal considers implies that ported traffic is BT's traffic and thus BT's responsibility, including costs. However, if this were so, BT could never levy any charges on the recipient provider for providing portability, which is clearly not the case – GC 18 provides that a donor provider is allowed to charge for the provision of portability, subject to the principles of reasonableness and cost orientation, and the requirement that ACCs and System Set-Up Costs may not be recovered.

5.124 We therefore agree with BT that onward routeing costs include 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 by BT to the recipient provider (i.e. the PoH). This includes the interconnection circuit costs, which can be recovered from the recipient provider pursuant to GC 18 (as stated in paragraph 4.96 above). The implementation of DLE Handover to Opal would therefore not affect BT's ability to include such costs in the APCC.

5.125 As detailed in Annex 3, we have included intra-building circuit ("IBC") costs in our assessment. As IBCs act to connect from the equipment that terminates an ISI link (the LTE and MUX) onto the BT switch and as such are on BT's side of the ISI PoH.

5.126 We therefore consider IBCs to be part of such onward routeing costs that could be recovered by BT from the recipient operator. However, we note that the IBC costs incurred as a result of DLE Handover might only form a proportion of total IBC costs at a DLE and thus we would expect that BT only sought to recover that relevant proportion of IBC costs.

5.127 It should be noted that as set out in paragraph 5.28 above, in the case of IECs, we consider that the costs of IECs do not form part of BT's onward routeing service in the circumstances which are the subject of this dispute in that they constitute a logical part of Opal's network. Their costs should therefore be borne by Opal.

5.128 As regards termination rates, [✂].

Potential impact on other stakeholders of DLE Handover to Opal

5.129 We have considered what the impact of DLE Handover to Opal would be on other stakeholders.

5.130 It seems to us that the introduction of DLE Handover for Opal would predominantly concern the two parties to the dispute, given that Opal's interest in this routeing mechanism is driven not only by the high proportion of calls it receives to numbers ported to it but also by its extensive use of direct interconnect to BT's DLEs. Nevertheless, other CPs could request DLE Handover.

5.131 BT has advised that once DLE Handover is implemented for Opal, the further system development required on BT's network to offer DLE Handover to another CP would be a bespoke data build (which in the case of Opal is estimated by BT to be around £[✂] of the total system development costs of £[✂][106]). The other system development costs incurred in offering DLE Handover to Opal would be a shared benefit. Set against the reduction in LTC costs of approximately £[✂] per annum, the one-off system development costs in this case of an estimated £[✂] seem relatively low and the shared benefit of approximately £0.32 million that arises is therefore also relatively low.

5.132 The implementation of DLE Handover for Opal therefore does not affect other stakeholders, apart from the fact that Opal receives a net gain in the reduction of the APCC and other CPs may be able to gain from a relatively low shared benefit in terms of system development costs. As explained above, Opal's request for DLE Handover is to a significant extent driven by its own extensive use of direct interconnect to BT's DLEs. Were any other CPs to request DLE Handover or propose any other alternative solution to BT's Current Solution, these would need to be considered in the individual circumstances of each case in order to determine whether BT should be required to implement such solution(s) to comply with its obligations under GC 18.

5.133 Whilst we note C&W's comment that during the summer of 2009 it decided that it wished to have its own GNP traffic routed directly from DLEs, we also note that C&W has not so far actively pursued the development (see paragraph 5.77 above). Currently, our view remains that there is no clear evidence that competitors are actively pursuing such alternative solutions.

Benchmarks

5.134 None of the parties raised any specific comments in their response relating to our analysis of any relevant benchmarks. Our position therefore remains as set out in our First Draft Determination (see paragraph 4.109 above).

Six principles of pricing and cost recovery

5.135 Our views on the application of the six principles of pricing and cost recovery have not changed from the ones set out in section 4 (see paragraphs 4.111 to 4.137 above). We have the additional comments noted at paragraphs 5.85 to 5.89 above.

Proposed determination

5.136 Having taken account of the above factors, we propose to determine that, on the facts of this case, if Opal so requests, BT is required to offer DLE Handover to Opal pursuant to GC 18. This determination is subject to the condition that the charging arrangements between Opal and BT shall be as set out in paragraphs 5.121 to 5.128 above. That is, for the avoidance of doubt:

a) BT is required to pay for the system development costs on its network;

b) BT is entitled to make charges for on-going costs on its network up to the PoH (subject always to the requirements of GC 18);

[106] See Table 2 in section 3 above. Note that the total in the table quoted as £[✂] was subsequently revised upwards by BT to £[✂] (as noted in paragraph 3.81).

c) Opal should bear the costs for Interconnect Extension Circuits ("IECs") required for DLE Handover;

d) Opal will not seek to charge termination rates based on [✂]; and

e) Opal will not impose charges on BT for the use of Opal's interconnection links after the PoH.

5.137 We propose that, following the final determination, Opal should re-request DLE Handover from BT, specifying its requirements in a sufficiently detailed manner. If BT does not then implement DLE Handover to Opal within a reasonable time period (see further paragraphs 5.138 to 5.145 below), we would consider BT to be in breach of GC 18.

Reasonable time period to implement DLE Handover

5.138 In proposing what would be a reasonable time period, we have considered comments on timescales from both parties provided informally to Ofcom since the First Draft Determination, as well as any relevant events concerning implementation of DLE Handover that have taken place thus far.

5.139 On 24 November 2009, we informally asked Opal and BT for their respective views on what the key process steps are for implementing DLE Handover, and what they would consider to be a reasonable timescale to complete each of these steps in the event of DLE Handover being implemented.

5.140 Opal responded that in its view BT should be required to implement DLE Handover as quickly as possible. Accordingly, Opal considers that:

a) BT should be required to make a commercial offer within one month of the date of publication of the Ofcom final determination, explaining how BT intends to comply with the Ofcom final direction and should include BT's calculation of the APCC resulting from the implementation of DLE Handover; and

b) BT should be required to place all necessary capacity orders using the standard procedures set out in the SIA. These orders should be placed as soon as possible to ensure that all DLE routes are operational (i.e. are used to hand over traffic to the Opal network) as from three months after the date of publication of the Ofcom Final Determination. In Opal's view, there is no reason why BT could not place the capacity orders in parallel with carrying out the necessary system development at the DLEs.

5.141 BT advised us that the following might apply in implementing DLE Handover:

a) That BT would need a detailed routeing plan from Opal, stating the relevant DLEs to which DLE Handover would apply and by when;

b) That BT repeats the feasibility study (taking 60 working days);

c) That a period of two to three months would be required to be spent on solution design in order to come to a view as to what is required in order to implement DLE Handover. This would include areas such as billing, any requirements concerning VIC and any requisite amendments to contracts; and

d) That BT would not know timescales for implementation of DLE Handover until a feasibility study had been completed.

5.142 We note that a feasibility study has already been completed by BT in response to a SOR from Opal requesting DLE Handover, and that an initial offer was subsequently made to Opal. We also note that since the SOR of July 2008, it would be appropriate for Opal to review its original request for DLE Handover (for example, specifying the DLEs from which DLE Handover to Opal should take place). Whilst BT may thereafter need to update some aspects of its feasibility study, we do not consider that it should be necessary for BT to undertake a full new such study. We also consider that BT should start any necessary updating of its solution design no later than the time at which Opal submits any revised request for DLE Handover.

5.143 We also note that technical and commercial arrangements (e.g. the specific availability and use of ISI links and supporting technical arrangements) may need to be resolved before implementation of DLE Handover takes place.

5.144 Accordingly, clarification of requirements from Opal and some subsequent adjustments to the offer from BT may be necessary. We consider that such adjustments should be made in the course of negotiations between the parties to reach agreement on the technical and commercial arrangements needed to implement DLE Handover. Taking account of this, we therefore consider that Opal should resubmit a request to BT, and that a reasonable time period to conclude negotiations on arrangements for the full implementation of DLE Handover to Opal is four months from Opal's request. This requires a minimum of the following information being provided by Opal and a maximum time taken for the following actions to be carried out by the parties:

a) Within one calendar month from the date of this determination, Opal is to provide BT with a revised request for DLE Handover, specifying, at a minimum, the points of handover of traffic from each of BT's DLEs, any additional circuits, such as IECs, that Opal requires, and technical information sufficient to enable BT to design a complete solution and prepare an offer of DLE Handover to Opal;

b) Within one calendar month of receipt of Opal's revised request for DLE Handover to Opal, BT should provide Opal with a revised offer for DLE Handover to Opal. This allows for any adjustments to the original offer by BT in light of any changes and/or clarification from Opal;

c) Within three calendar months of BT's revised offer for DLE Handover to Opal, BT and Opal should conclude negotiations on the technical and commercial arrangements for DLE Handover to Opal, including a deadline for implementation based on reasonable timescales; and

d) BT and Opal to complete the necessary implementation activities within the agreed deadline, such that DLE Handover to Opal of the relevant calls is fully operational.

5.145 BT and Opal may agree between themselves shorter timescales than those specified here. If both parties agree that a longer time scale is needed, they should inform Ofcom of this.

Repayments

5.146 As set out in paragraph 3.32, the scope of this dispute includes whether, should we find that BT is required to offer DLE Handover to Opal, we should give a direction requiring the payment of sums by way of adjustment of an underpayment or overpayment.

5.147 We therefore now go on to consider the question of whether, in order to give effect to our proposed determination, we should exercise our discretion to require any repayment.

Opal's comments

5.148 In its response to our First Draft Determination, Opal reiterated its request for "retrospective application of an efficiently incurred APCC" i.e. repayments from BT, from 1 May 2008[107]. In Opal's view "BT has clearly failed to act in good faith throughout this dispute by consistently providing inflated costs for the required system development and necessary DLE interconnection links" and that "Retrospective application of an efficiently incurred APCC would therefore be a proportionate and effective measure to provide the correct incentives on BT to route calls to ported numbers in an efficient manner."

Ofcom's view

5.149 We have considered the evidence presented by both parties on this matter and in particular, whether it would have been reasonable to expect BT to have implemented DLE Handover to Opal when Opal first requested it.

5.150 Based on our understanding of the evidence provided of discussions that took place between the parties since Opal first requested DLE Handover, the evidence we have seen suggests that BT could not have reasonably been expected to have implemented DLE Handover to Opal:

a) Prior to Opal issuing its SOR to BT, the termination rate that would be set by Opal for the relevant traffic and the terms upon which Opal would allow BT to use the ISI links on DLE Handover to Opal was unresolved. Upon issuing the SOR, the termination rate issue remained unresolved, and the SOR was unclear on whether BT could use existing ISI links;

b) While BT did not respond to the SOR for around eight weeks, which could be viewed as a considerable delay, we have seen no evidence from either party showing interim discussions, or that BT's response to the SOR was actively being pursued by Opal;

c) BT's response to the SOR suggests that their offer was only a first step in discussions to deliver DLE Handover to Opal, with subsequent discussions on specifics to follow (which never took place because negotiations between the parties mutually broke down at this point);

d) The estimated system development costs provided by BT were clearly higher than the revised estimates provided to us in response to a formal request for

[107] Opal's response of 10 November 2009 to the draft determination stated 1 May 2009. Opal has since advised us that this should have read 1 April 2009, since corrected again to 1 May 2008 (which was in their original submission).

information. Equally, the evidence suggests that these costs were an initial estimate, [✂];

e) We also note that certain technical arrangements had not been clarified; in particular whether or not Opal's ISI interconnect links would be used for DLE Handover to Opal. [✂];

f) [✂];

g) [✂]. Therefore, we consider that to suggest that BT has alone prevented the implementation of DLE Handover to Opal would not appear to be a fair or reasonable reflection of what took place;

h) Whilst subsequent ongoing negotiations suggest to us that there was not a will on both sides to continue with negotiations to find a solution to the issues raised, it is not clear that BT was acting to prevent the implementation of DLE Handover to Opal; and

i) In addition, as demonstrated by our own consultative process, it was not necessarily immediately clear that DLE Handover to Opal should have been provided under GC 18; it has taken considerable information requests and analysis for us to reach our provisional view set out in this Second Draft Determination.

5.151 Based on the evidence presented by both parties, whilst the parties had exhausted commercial negotiations, the evidence does not appear reasonably to demonstrate that BT had "failed to act in good faith" or could have reasonably been expected to agree to implement DLE Handover to Opal at the time.

5.152 As a result, we do not propose to conclude that BT should be directed to make any repayments to Opal by way of an adjustment of an overpayment.

Section 6

Responses to the Second Draft Determination, Ofcom's conclusions and final determination

Responses to the consultation

6.1 Ofcom received responses to its Second Draft Determination from:

a) Opal;

b) BT; and

c) C&W.

Opal's response

6.2 Opal is "very pleased" with the proposals in the Second Draft Determination, suggesting that Ofcom's proposals would enhance effective competition and are a "helpful indicator that Ofcom is prepared to take active steps to support operators like Opal who have rolled out next generation networks in the UK".

6.3 However, Opal raises three specific concerns with Ofcom's proposals:

a) Opal disagrees that BT should be able to recover the costs of interconnection circuit installation and maintenance required to provide DLE Handover to Opal. Opal believes that such costs fall within the definition of Additional Conveyance Costs and therefore cannot be recovered by BT pursuant to GC 18.2;

b) Whilst agreeing with the proposed period within which parties should conclude negotiations on the technical and commercial arrangements for DLE Handover to Opal[108], Opal believes that Ofcom should be more specific on what needs to be agreed, and that the deadline for implementing DLE Handover to Opal should be 25 working days after concluding negotiations (in line with what is required under the SIA);

c) In Opal's view, evidence shows that BT has "either deliberately or recklessly sought to delay the implementation of DLE Handover" and thus, contrary to the proposals of the Second Draft Determination, Ofcom should order BT to make repayments to Opal.

6.4 In support of c) above, Opal submitted new evidence[109] concerning negotiations between itself and BT in the period leading up to Opal's Submission to Ofcom on 1 July 2009.

[108] Within four months from the date of Opal's formal request for DLE Handover to Opal following this Determination, specifying its requirements in a reasonably detailed manner, the parties must agree a reasonable time period within which the solution must be implemented.
[109] Opal provides five emails and one letter sent between July and October 2008.

BT's response

6.5 BT registers its disappointment with Ofcom's proposals set out in the Second Draft Determination, advising that BT has never been opposed to providing DLE Handover in principle and that the issue has always been who bears the system development costs.

6.6 BT believes that it already meets the requirements of GC 18 by offering an efficient end to end solution (the Current Solution). Further, BT argues that it is unreasonable to require that the costs of an inefficient alternative solution are spread across BT's network and therefore charged to all CPs and end users, when only the requesting CP benefits from the alternative solution.

6.7 BT states that in its view, system development costs associated with CP specific prefix changes to permit altered routeings are not System Set-Up Costs as defined in GC 18.5, but Data Management Amendments under the Industry GNP E2E Process Manual[110] and are therefore chargeable to that CP.

6.8 BT notes that C&W has submitted a SOR requesting an alternative portability solution to BT's Current Solution.

6.9 Finally, BT "strongly refutes any suggestion that it has deliberately exaggerated or distorted any information supplied to Opal or Ofcom" (in particular as regards the level of system development costs) and states that it is disappointed that "Opal has chosen to make such unfounded allegations".

C&W's response

6.10 C&W welcomes Ofcom's proposals. C&W believes that the methodology employed by Ofcom (Approach C in the Second Draft Determination) is correct, also advising that in its view "intuitively, it must be correct that direct routeing from DLEs is more cost-effective than utilising an extra switching stage in BT's network".

6.11 C&W confirms that it is actively pursuing direct routeing from BT (adding that C&W "had thought we had made this clear to Ofcom in our response [to the First Draft Determination]"[111]. C&W states that it looks forward to Ofcom confirming its conclusions in the Second Draft Determination, in order that its own SOR can be progressed by BT in a timely manner.

Approach to addressing issues raised in responses

6.12 In this section 6, we group the consultation responses around three themes and then set out our view on each of these themes. Our analysis includes any required clarifications of and revisions to our analysis in the Second Draft Determination, set out in Section 5 of this document. We then go on to reach a final determination to resolve this dispute, having taken into account the parties' responses as set out above.

[110] See http://www.magrathea-telecom.co.uk/industry_porting.htm or http://www.ofcom.org.uk/telecoms/ioi/numbers/num_port_info/geogr_num_portab/

[111] C&W's response to the First Draft Determination stated "...whilst we have not actively pursued the development [of direct routeing]; Cable&Wireless has been fully aware due to Opal's Statement of Requirements which is in the pipeline. As a result we are certainly interested in making use of such routeing". We interpreted this at the time as C&W 'not actively pursuing' direct routeing.

6.13 The themes around which we have grouped the consultation responses are as follows:

a) Requirements of GC 18 and the efficiency of DLE Handover to Opal;

b) Charges for the provision of the Current Solution / DLE Handover to Opal; and

c) Repayments.

Requirements of GC 18 and the efficiency of DLE Handover to Opal

BT's response

6.14 BT does not accept that the least cost routeing for BT, i.e. least cost concerning the costs of routeing on BT's side of the POH, is a sufficient reason for BT to be required to provide DLE Handover to Opal in order to meet its obligations under GC 18.

6.15 In BT's view, before requiring DLE Handover to Opal, Ofcom must be satisfied that there is a reasonable prospect that the end-to-end solution is lower cost overall, i.e. assess the costs of routeing on Opal's side of the POH as well as those on BT's side of POH.

6.16 Therefore, BT does not accept that DLE Handover to Opal is necessarily a more efficient routeing solution than the Current Solution.

Ofcom's view

6.17 BT's arguments raise nothing new that we consider should cause us to alter our position as set out in the Second Draft Determination (see section 5 above). As set out in paragraph 5.38, we consider that our approach is consistent with the provisions of GC 18. Further, and as set out in paragraph 5.39, we believe our approach is broadly consistent with price signals for efficient decision making. As such, we consider that both points raised by BT are addressed.

6.18 Further, we note that in theory a solution may exist that increases the costs on BT's side of the PoH, but generates overall benefits to a recipient operator such that it would be rational for that recipient operator to request the solution. If the recipient is willing to bear the increased costs on BT's side of the PoH, this might be considered an acceptable request for BT to meet.

6.19 We have has assessed the relevant costs associated with BT's onward routeing of CP originated traffic to numbers ported to Opal under both the Current Solution and DLE Handover to Opal. Based on that assessment, we have identified that DLE Handover to Opal is a lower cost, and thus more efficient, routeing solution than the Current Solution.[112] This assessment is supported by broader considerations including an analysis of relevant principles of pricing and cost recovery[113].

[112] Second Draft Determination, paragraphs 5.7-5.57.
[113] Ibid 5.58 – 5.98

Charges for the provision of the Current Solution / DLE Handover to Opal

System development

BT's response

6.20 BT maintains that a significant proportion of the system development costs to implement DLE Handover to Opal are CP-specific data build costs, in particular those related to changing the routeings at each DLE associated with the [✂] number portability prefix codes already used by Opal. In BT's view, these are not costs associated with establishing a portability service, but with maintenance of a service as a result of a recipient provider moving from one portability solution to another. BT thus argues that these costs are not System Set-Up Costs as defined in GC 18.5 but costs incurred due to subsequent changes requested by Opal. BT states that it already incurred System Set-Up Costs when it first established a portability solution for Opal (the Current Solution).

6.21 BT refers to industry's GNP E2E Process Manual which it claims reflects an industry agreement that changes to prefix codes to enable routeing changes (an activity BT says falls under the description of 'service maintenance') are chargeable to the requester as Data Management Amendments.

6.22 BT further argues that this view of system development costs not being System Set-Up costs aligns with the rationale behind the cost allocation recommendations of the Monopolies and Mergers Commission ("MMC") in 1995[114], which set out that such costs are CP-specific, and it is unfair and unreasonable to recover such costs across all recipient providers or across all calls, as the benefits are only realised by the CP causing the costs to be incurred. BT argues that the MMC considered[115] System Set-Up costs to be caused by the single operation of establishing the capacity to provide portability on the donor provider's network and its associated administrative systems. The costs of subsequent changes are therefore service maintenance activities which are chargeable.

6.23 BT also notes that the principles set out in GC 18 on the allocation of the costs caused by implementing portability date back to the MMC Report, which undertook a detailed analysis of the six cost principles to identify which are the relevant cost categories in implementing portability and who should bear the costs in each category. Given that this analytical work has not been revisited since then means therefore, in BT's view, that the MMC Report is a source on the rationale and interpretation of the cost definition and cost allocation rules in GC 18.

C&W's response

6.24 C&W asks that Ofcom requires that any system development undertaken by BT is usable for direct routeing to CPs other than Opal. In C&W's view, whilst it may be in BT's interests to minimise system development costs (on the basis that it would be required to bear the associated costs pursuant to GC 18.2), it conversely may be in BT's interest to make such developments as bespoke to Opal as possible, in order to make any regulatory cost-benefit analysis for further deployments unattractive.

[114] Monopolies and Merger Commission report on 'Telephone Number Portability, November 1995 (the "MMC Report").
[115] BT cites paragraphs 2.130, 2.190 and 6.7 of the MMC Report.

6.25 C&W notes that reference data it provided to Ofcom for the costs incurred by an efficient operator in implementing the network data build changes was not used in the revised analysis. In C&W's view, "while noting Ofcom's position that there was no need to address this aspect in detail because the case was proven in any case, we would highlight that this essentially results in a position where the data in the [Second Draft] Determination is known to be possibly flawed, but this is ignored because it gives the correct answer", leaving the [Second Draft] Determination vulnerable to challenge.

6.26 C&W adds that by not addressing whether BT's estimated system development costs were reasonable, Ofcom leaves Opal (and any other CP that requests direct DLE routeing) either having to pay BT's cited costs or raising a further dispute with Ofcom.

6.27 C&W also notes that because of the redactions made by Ofcom in producing a non-confidential version of its revised proposals (as published on Ofcom's website), C&W cannot fully assess the materiality of BT's costs for network data build changes. C&W adds that as such, it would not know if BT was charging C&W in a manner consistent with the approach taken for Opal.

Ofcom's view

Definition of System Set-Up Costs

6.28 Our position on this matter remains unchanged from the First Draft Determination, where we provisionally concluded that if BT was required to offer DLE Handover to Opal in order to comply with its obligations under GC 18 then in our view the one-off costs related to the activities needed to establish the technical and administrative capability to provide the portability solution fall within the definition of "System Set-Up Costs" as defined in GC 18.5 (see paragraph 4.90 above). Having provisionally concluded in our Second Draft Determination that BT is required to offer DLE Handover to Opal in the future, we set out that if BT's system development costs fall within the definition of System Set-Up Costs, then they would have to be borne by BT pursuant to GC 18.2(b) (see paragraph 5.67 above).

6.29 GC 18.5(o) states that System Set-Up Costs are "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".

6.30 We conclude that, among other things, the costs described by BT as incurred in building Opal's prefixes on BT's DLEs are costs of the donor provider incurred "in the course of making network and system modifications, configuration and reconfiguration" in order to provide portability (via DLE Handover) to Opal in accordance with GC 18. With regard to the Industry Process Manual to which BT refers, our view is that the set-up activities required in this case might be more appropriately described as 'service establishment' for DLE Handover rather than 'service maintenance' as envisaged by the Process Manual, which may become

relevant should subsequent business-as-usual routeing changes arise, whether due to prefix changes or new prefixes, or other circumstances as detailed in industry's process documentation.[116]

6.31 As regards the MMC Report which BT relies on, we recognise that certain statements in the Report could be construed as suggesting that system set-up is intended to be a one-off single operation, which involves the incurring of costs necessary to provide portability to the market as a whole in a unified way, rather than to an individual operator. In particular, the MMC contrasted system set-up costs with "per-line set up costs" (the costs of enabling individual customers to port their numbers) which it considered that, unlike system set-up costs, BT should be entitled to recover. We note that BT argues that as a result of this distinction between ongoing costs and one-off costs suggests, we should favour an interpretation that classifies the system development costs here as being more akin to ongoing costs rather than one-off costs. We disagree. We consider there are other factors which point to such costs being System Set-Up Costs under GC 18:

a) First, there is the actual drafting of the definition of System Set-Up Costs, as considered above.

b) Second, the MMC Report was undertaken in 1995, at a time when number portability was in its infancy. The context of the MMC Report was therefore a situation in which one of the main aims was to set up as quickly as possible an effective and mutual system to enable portability in order to promote competition between CPs. It seems that at the time, the possibility that the way that networks interconnect might evolve in future was apparently (and wholly reasonably) neither foreseen nor taken into account. The market position is now quite different, and we consider that the MMC could not have envisaged at that stage the evolution of the market that has taken place since, and that portability solutions other than the one established initially may be more efficient, and therefore required to be offered in the future.

c) Finally, we note that if BT is required to offer DLE Handover in order to remain in compliance with its regulatory obligations under GC 18, then it would seem to be a perverse regulatory position to require Opal to cover the costs necessary to enable to BT to remain in such compliance.

6.32 It is also important to note that our position in this case does not automatically make BT liable for any system development costs associated with other CPs requesting DLE Handover or other alternative portability solutions. This determination concerns the specific circumstances of the dispute referred to us, namely Opal's request for DLE Handover. Our finding that BT is required under GC 18 to provide DLE Handover to Opal (if so requested by Opal) is based on the consideration of the specific factors arising in relation to routeing solutions for calls to numbers ported to Opal. Any similar requests of BT by other CPs would need to be considered on their own facts.

Application of the six principles of pricing and cost recovery

6.33 The primary issue in this dispute is whether DLE Handover is more efficient than BT's Current Solution, and whether as a result BT should be required to offer it pursuant to its obligations under GC 18 (see paragraph 4.8 above). As set out in the Second Draft Determination, our analysis conducted within the scope of this dispute

[116] In any event, regulatory obligations under GC 18 take precedence over industry agreement.

has demonstrated that DLE Handover to Opal is a lower cost, and thus more efficient, routeing solution than the Current Solution (see paragraph 5.118 above).

6.34 As part of this dispute, we have also considered the six principles of pricing and cost recovery and identified that the principles of cost minimisation and effective competition were particularly relevant and supported our findings (see paragraph 5.135).

6.35 As set out above, we consider that the definition of System Set-Up Costs in GC 18 includes the system development costs identified by BT. For completeness, we have also examined principles of pricing and cost recovery to identify who should pay the system development costs, and in particular, the Opal-specific data build costs which form part of the system development costs.

6.36 Again, we consider that the principles of cost minimisation and effective competition are particularly relevant, and they support our view that system development costs in this dispute should thus be borne by BT. We reach this conclusion for the following reasons:

a) First, BT has direct operational control over the system development required to implement DLE Handover to Opal, and if BT was to bear these costs, it would have a strong financial incentive to minimise them.[117] This incentive would be markedly reduced, however, if BT was simply able to pass on these costs to Opal. We therefore consider that our conclusions are consistent with the principle of cost minimisation.

b) Second, where such system development costs are not minimised, and are then passed on to competitors as inefficiently incurred charges, it could discourage entry by competitors and thus fails to encourage effective competition. We therefore consider it appropriate to require BT to bear the costs of system development (including Opal-specific data build costs) to facilitate number portability to Opal. Thus, we consider that our conclusions are consistent with the principle of effective competition.

6.37 As regards the principle of the distribution of benefits, in the Second Draft Determination we indicated that we agreed with Opal that this principle was not relevant in this case, because the dispute is not about who should pay the APCC but rather what costs should be included in the APCC. Nevertheless, with regard to who should pay the system development costs, we note that this principle could support an element of system development costs being borne by CPs to whom numbers are ported (where arguably these CPs and their customers benefit most directly from number porting). Equally, we note that all fixed customers potentially benefit from the competition encouraged by supporting porting, which could suggest that BT should continue to bear all system development costs necessary to implement new portability solutions, if those solutions are required to be offered pursuant to GC 18. We therefore do not believe that the principle of the distribution of benefits strongly argues in either direction to confirm or overturn our conclusions.

6.38 As regards the principle of cost causation, as we have previously noted:

"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.

[117] BT could choose to either absorb these costs or to recover these costs spread across all customers.

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." (see paragraph 4.115).

6.39 We therefore note that cost causation does not provide a clear indication of who should bear the system development costs since both the calling and called party take actions to cause the costs of ported traffic. Similarly, we do not consider the principles of reciprocity or practicability are material to assessing who should bear system development costs in this case.

6.40 In conclusion, we consider that the most relevant principles of pricing and cost recovery support our view that pursuant to GC 18, BT should pay the system development costs in this case, including those costs specific to Opal.

Level of system development costs

6.41 We welcome submissions from interested third parties and are grateful to C&W for providing cost estimates for data build costs of an efficient operator implementing DLE Handover (along with other information including circuit utilisation figures). We also note C&W's view that not addressing whether the estimates of the system development costs were reasonable leaves Opal (and any other CP requesting direct DLE routeing) with the options of either having to pay BT's cited costs, or raising a further dispute with Ofcom.

6.42 Our approach concerning the level of system development costs was set out in paragraph 5.76 above. We decided not to include C&W's estimate in our analysis on the grounds that the provisional finding that DLE Handover to Opal is less costly than the Current Solution does not turn on either BT's or C&W's estimate of system development costs. The NPV cost savings of DLE Handover to Opal (NPV £12.8 million over 10 years) would have been considerably more than either BT's or C&W's estimated system development costs (ranging from £0.2 to £[✂] million).

6.43 As indicated above, as the system development costs proposed by BT (initially of approximately £[✂], subsequently revised twice by BT to £[✂] and then to £[✂][118]) should, in our view, be borne by BT pursuant to the requirements of GC 18, we would expect BT to have a clear incentive to minimise the costs of implementation. We therefore do not consider it necessary to confirm the exact figures, which in any event will only become clear once a "full and accurate analysis is completed" (see paragraph 5.150d) above). We also note that BT has not claimed that the level of system development costs is so high that this would overturn our provisional conclusions. We believe our approach on this issue is pragmatic and proportionate in the context and timescales of a dispute resolution process.

6.44 We also note that C&W urges that we require in our Final Determination that any system development is implemented in such a way that it is usable for direct routeing of ported traffic to other CPs, advising that it may be in BT's interests to make such development as bespoke for Opal as possible "in order to make any regulatory cost-benefit-analysis for further deployments unattractive".

6.45 As previously noted in paragraph 5.77 above, we believe that a proportion of system development would likely benefit any CP that seeks an alternative routeing solution (although we note that it is not an automatic result of the determination of this dispute

[118] See paragraph 3.81 above.

that BT would be required to offer all such alternative routeing solutions, as this would depend on the efficiency in each individual case). We note that C&W is now actively pursuing direct routeing from BT, and that this is acknowledged by BT which has advised of its intention to "run project review calls to which the relevant CPs would be invited". Regardless, it is not clear to us why Opal would be left "having to pay BT's cited costs" as C&W claims when we have concluded that these are to be borne by BT pursuant to the requirements of GC 18.

6.46 We further note that in a meeting on 29 January 2010[119], BT advised us that should it be required to provide DLE Handover to Opal on the terms proposed in the Second Draft Determination – that is for CP originated traffic only – additional system development costs would be incurred. BT explained that its previous submissions on the costs estimates for system development costs were based on both CP and BT originated traffic being routed using DLE Handover and the separation of this traffic for the purposes of DLE Handover would add an estimated £[✂] to these costs. While this estimate was provided informally without any supporting data, we have since repeated our analysis using this figure and found that it does not overturn our previous conclusions (an outcome which was also recognised by BT during the meeting).

6.47 We further note that nothing in our previous proposals or this determination precludes the inclusion of BT-originated traffic as part of traffic routed via DLE Handover to Opal. Indeed, if this is more efficient, we would consider any decision on this to form part of the commercial and technical negotiations between BT and Opal.

6.48 At the same meeting in January, BT also suggested that providing DLE Handover for CP originated calls may require it to offload capacity from concentrators on [✂] of BT's switches. BT added that the requisite re-parenting of concentrators would affect other CP traffic which in turn would lead to other operators having to re-route some of their traffic, which could create further costs to be faced by BT and the other affected CPs. However, BT did not provide any cost estimates or data to support this claim. Further, until the commercial and technical negotiations between BT and Opal in relation to the provision of DLE Handover to Opal are concluded, whether such activity is necessary is unclear.

6.49 At the meeting, BT claimed that this issue was the reason for its feasibility study (in response to Opal's SOR) discounting the option of DLE Handover for CP originated traffic only. However, BT did not offer any evidence that this issue had been discussed with Opal. On this basis, and in particular in the absence of indicative costs or supporting evidence, we have not further considered the issue raised.

Interconnection

Opal's response

6.50 Opal objects to Ofcom's view in the Second Draft Determination that BT is able to recover from Opal the costs of installing and maintaining interconnection circuits required to hand over ported calls at the DLEs. It argues that such costs are Additional Conveyance Costs ("ACCs", as defined in GC 18.5) and are therefore not recoverable pursuant to GC 18.2(b). Opal refers to Oftel's statement of January

[119] Meeting during which BT took Ofcom through its response to the Second Draft Determination, 29 January 2010.

2000[120] which sets out a general principle that in terms of charges, calls to ported numbers should be treated in the same way as calls to non-ported numbers.

6.51 Opal also argues that the MMC Report[121] states that the routeing of calls to ported numbers should not be regarded as a facility requiring special charging arrangements. Allowing BT to charge for the interconnect links for calls to ported numbers would therefore conflict with this policy principle, and discriminating between the charging of ported and non-ported calls would also mean that Ofcom had failed to discharge its duty to promote competition as set out in Section 3(1)(b) of the 2003 Act by *"failing to ensure an effective regime for fixed number portability"*.

6.52 Further, Opal asserts that the regulatory policy that forms the basis of GC 18.2 essentially makes a deliberate trade-off between two cost recovery principles, cost causation and effective competition. Opal argues that the policy *"comes down firmly in favour of effective competition"*. In Opal's view, it does not matter that costs to a donor provider for conveying a ported call are higher than those for a non-ported call, as the principle underpinning GC 18.2 is that these cannot be recovered from the recipient provider, but from the donor provider. Opal argues that this policy principle was expressed *"in a slightly different way"* by Oftel stating in 2002 that [portability costs are]:

"the transit costs incurred by the Donor Operator in conveying calls originating 'off-net' to a Recipient Operator. This process is essentially the same as the Donor Operator acting as a transit operator in the conveyance of a non-ported call."[122]

6.53 Opal believes that as BT does not normally charge for interconnect circuits used in transit of non-ported calls, this same principle must therefore apply in the case of calls to ported numbers.

6.54 Finally, Opal proposes that should Ofcom decide that it has to pay for the interconnection link costs incurred by BT in implementing DLE Handover, it should have the ability to decide whether BT should use existing DLE routes already implemented by Opal for other traffic types.

BT's response

6.55 BT welcomes our view which we set out in the Second Draft Determination that it should be able to recover the costs of its interconnection circuits through the APCC (or otherwise).

Ofcom's view

6.56 As set out in GC 18.5(a), an ACC is *additional* to the costs of conveyance of non-ported calls from the donor provider's network to the recipient provider's network (an example of an ACC might be the prefix addition to calls to ported numbers).

6.57 We do not consider that the interconnection costs are ACCs as they are not additional to the costs of conveying non-ported traffic. Rather, they are the costs reasonably incurred by the donor provider in supporting an alternative routeing approach requested by the recipient provider.

[120] Numbering Directive: Number portability requirements, Oftel, January 2000, para. 2.9.
[121] MMC Report, paragraph 2.200.
[122] Oftel's 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, paragraph 3.1.

6.58 It is clear that DLE Handover would create a situation whereby portability for geographic numbers would be provided using a routeing solution that is not currently used by non-ported geographic traffic. BT routes all its non-ported traffic to Opal's geographic numbers from its tandem exchanges. Therefore, we do not have a like-for-like comparison to which we can refer. However, if non-ported calls *were* routed in the same way, they would likely incur similar interconnection circuit costs: there is therefore nothing obviously "additional" in the interconnection costs for ported traffic against non-ported traffic.

6.59 This approach is based on Opal rationally determining that DLE Handover to Opal is the most efficient routeing of this traffic, taking into account both the APCC it has to pay to BT and network investments it makes on its side of its chosen PoH. It therefore seems consistent with the cost minimisation principle that the costs of any interconnection circuits provided by BT are included in the APCC in order to ensure that Opal's incentives are aligned with minimising efficiently incurred costs. So, for example, where there is insufficient network capacity on Opal's side of a PoH such that investment in interconnection is required, this must be taken into account by Opal in deciding whether to request DLE Handover.

6.60 We do not consider that our view in this dispute would mean that we have *"failed in [our] duty to promote competition...by failing to ensure an effective regime for fixed number portability"*. We believe our decision in this case promotes competition by creating a desirable out*come whereby portability is promoted through the lowering of [overall?] costs to BT and therefore charges to Opal. W*e believe our decision leads to a reduced APCC based on more efficiently incurred costs, as well as handing to Opal greater control of the conveyance of calls to numbers it has ported. The discharging of our duties is discussed further below and in particular, paragraph 6.148 expands on our view that we have met our duty to promote competition.

6.61 We note, that Opal argues, with reference to the MMC Report, that the routeing of calls to ported numbers is not a facility requiring special charging arrangements. As set out above, since the introduction of GC 18 in 2003, charges for the provision of portability are explicitly permitted, subject to the requirement of reasonableness, cost orientation and based on incremental costs. For the reasons set out above we consider that we have correctly interpreted and applied GC 18.2.

Stranded assets

BT's response

6.62 BT claims that should Opal pursue DLE Handover, much of the additional capacity created by installing CSI circuits[123] at the tandem layer in order to "all but eliminate the ITC element of the APCC" will be significantly underutilised or made redundant.

6.63 BT advises that it will engage with Opal to make best use of this capacity, but reserves the right to seek financial redress from Opal in respect of any of this capacity left surplus to requirements as a result of DLE Handover to Opal (i.e. CSI circuits at the tandem layer).

C&W's response

6.64 C&W states that it broadly agrees with Ofcom's conclusions on stranded assets. However, C&W highlights that potentially stranded assets concerning switchports on

[123] Both parties had previously advised us that these are ISI circuits. See paragraph 5.55 above.

BT's NGSs and capacity between BT's DLEs and NGSs, are, in the event of DLE Handover to Opal, likely to be used for other purposes. C&W bases this view on alleged BT concerns[124] over port shortages on the NGSs and capacity on routes between DLEs and NGSs (i.e. LTC links).

Ofcom's view

6.65 We note BT's comment that capacity created on circuits at the tandem layer in order to eliminate ITC between BT and Opal may become under-utilised under DLE Handover to Opal.

6.66 We also note C&W's view that where either transmission capacity between DLEs and NGSs and/or switchports on the NGS are freed up, demand for these assets is such that BT should be able to re-contract or redeploy them for other purposes.

6.67 We stated in the Second Draft Determination that where evidence was provided, we would take account of the costs of stranded assets as part of our wider considerations (paragraph 5.100). We considered that an argument for treating under-utilised or unused circuits as stranded assets would need to be supported by:

a) Compelling evidence of these circuits incurring sunk costs (or material costs of redeployment) as a direct result of DLE Handover to Opal, and why the investment in such circuits (or ports) would not otherwise have been undertaken in the absence of the ported traffic to Opal (paragraph 5.98); and

b) an explanation for a departure from BT's usual approach (paragraph 5.99).

6.68 BT has provided no evidence in relation to its comments in this regard. We do not consider that BT's response is such that we should reach a different overall conclusion on the basis of the costs of any alleged stranded assets.

Repayments

Opal's response

6.69 As regards the issue of repayments of (parts of) the APCC, Opal "fundamentally disagrees" with the proposals of the Second Draft Determination. Opal contends that "the only conclusion that Ofcom could legitimately come to" would be to order repayments by BT to Opal to cover the period from 1 May 2008.

6.70 Opal suggests that requiring that BT repay overpaid charges is important to "restore the competitive imbalance" and that promotion of effective competition (via effective number portability) requires Ofcom to take active steps to ensure compliance with regulatory obligations. Opal argues that by not requiring repayment of overpaid charges when BT has failed to be in compliance with GC 18, Ofcom undermines its own statutory objectives.

6.71 In Opal's view, Ofcom's analysis is flawed on three counts. These can be summarised as:

1. Ofcom does not have wide discretion; repayments are a default position.

[124] C&W refer to the concerns being raised by BT in its review of the VIC product, initiated in Summer 2009.

6.72 In Opal's view, this is supported by the TRD judgment[125] to which, Opal notes, Ofcom fails to make any reference.

6.73 Opal adds that Ofcom has immediate power to order repayments under section 190(2)(d) of the 2003 Act and Ofcom's analysis should therefore proceed from the presumption that repayment should be ordered.

6.74 Opal argues that on a proper consideration of its duties under the EC Communications Directives and the 2003 Act, Ofcom should follow this presumption and by failing to do so, Ofcom would "err in law".

6.75 Further, Opal argues that at no point does Ofcom recognise the presumption of repayment to be the natural and *prima facie* consequence of a liability between parties in a dispute that the owing party will paid the owed party.

2. Ofcom wrongly assumes that BT's own subjective consideration whether DLE Handover was required to comply with GC 18 is a relevant consideration.

6.76 Opal refers to paragraph 5.150 of the Second Draft Determination, citing the following:

"…*the evidence we have seen suggests that BT could not have reasonably been expected to have implemented DLE Handover to Opal*".

6.77 Opal submits that BT's subjective belief that its charges were compliant cannot be a relevant consideration in deciding whether or not to order repayment of an unlawful charge, stating that "by unlawfully taking BT's subjective appreciation into account, Ofcom would further err in law because this created an unlawful condition precedent to, and fettering of, Ofcom's statutory discretion under section 190(2)(d)."

6.78 In Opal's view, having determined that BT should be required to provide DLE Handover to Opal, Ofcom must move directly to consideration of its power to order repayments. Opal submits that this power is immediately available and is not subject to any precondition in the 2003 Act. Further, Opal argues that by considering the reasonableness of BT's conduct, Ofcom has inserted an extra, irrelevant, step for which there is no statutory permission, nor relevant authority, and is contrary to the TRD Judgment.

6.79 Opal adds that in elevating the consideration of what it considers to be an irrelevant factor to the status of a pertinent factor, Ofcom would also unlawfully fetter its discretion.

3. In any event, Ofcom fails to consider all the relevant facts (or has misinterpreted facts) as to the commercial negotiations between Opal and BT.

6.80 In Opal's view, the evidence "points to one inescapable conclusion, namely that BT never had commercial intention or willingness to provide DLE Handover on fair and reasonable terms in compliance with GC 18.2".

6.81 In support of this, Opal's response makes a series of statements which can be summarised as follows:

[125] In particular, Opal cites paragraph 169 of the TRD Judgment [2008] CAT 12.

a) BT has known about Opal's concerns regarding the APCC since September 2007 but failed to take any steps to ensure compliance with GC 18.2. This was evidenced in annexes to Opal's Submission to Ofcom;

b) BT withdrew two APCC increases (in Autumn 2007) because Opal pointed out that they failed to comply with GC 18.2. This was evidenced in annexes to Opal's Submission to Ofcom;

c) When BT sought to increase the APCC from 1 May 2008, Opal proposed DLE Handover "as a sensible way forward" and then issued a dispute resolution request to Ofcom in June 2008. Ofcom did not accept the dispute but suggested that Opal issue a SOR (requesting DLE Handover) to BT, which in turn has led to the current dispute (Opal issued a SOR to BT on 7 July 2008);

d) Contrary to Ofcom's statements in paragraph a), the issues of the termination rate that would be set by Opal or whether existing ISI links could be used for DLE Handover was never an issue between the parties. BT belatedly brought both issues to Opal in an email of 12 September 2008[126] and Opal accepted terms proposed by BT (see paragraph g) below);

e) Opal made it clear that the only reason it rejected BT's offer in response to the SOR was because it felt system development costs were excessive and that BT should be liable to pay them;

f) Ofcom's view that "it had seen no evidence from either party showing interim discussions, or that BT's response to the SOR was actively being pursued by Opal" (see paragraph 5.150b)) makes incorrect assumptions based on no evidence. Opal actively pursued BT for a response to the SOR on 12 August 2008[127] since this was not forthcoming within the promised timescales (a first response from BT was due by 31 July 2008 and an initial offer from BT was due by 3 October 2008)[128];

g) BT "surprisingly" sent an email to Opal on 12 September 2008, asking Opal to clarify whether the SOR also encompassed BT-originated traffic, and advising that any offer it made would be based on using Opal-owned routes and that any traffic handed over at the DLE would not [✂]. Opal confirmed it was happy with BT's proposals;

h) Opal's SOR was very clear that the request only encompassed non-BT originated traffic. This was evidenced in Annex 33 to Opal's Submission[129];

i) On 13 October 2008, BT contacted Opal to advise that it had only then secured funding for a feasibility study[130]. BT signalled that the feasibility study would take a minimum of eight weeks to complete. Opal responded to BT on 17 October 2008, expressing its serious concerns that BT was unduly delaying the process[131]. Opal specifically objected to BT seemingly delaying the process by

[126] Opal provides a copy of this email in Annex 3 to its response to the Second Draft Determination.
[127] Opal provides a copy of a reminder sent to BT on 12 August 2008 in Annex 2 to its response to the Second Draft Determination.
[128] Opal provides correspondence showing these timescales in Annexes 1 and 2 to its response to the Second Draft Determination.
[129] Opal refers to Point 12 of its SOR, which reads: "a. This product will allow BT to comply with its obligations under GC 18.2. b. In addition to handing over non-BT originated calls at the DLE, BT could choose to hand over BT originated calls."
[130] Opal provides a copy of this email in Annex 4 to its response to the Second Draft Determination.
[131] Opal provides a copy of this in Annex 5 to its response to the Second Draft Determination.

asking Opal to confirm whether BT-originated traffic was included in the request when the SOR was explicitly clear this was not the case;

j) In an email of 24 October 2008[132] BT claimed that it never intended to follow the SOR process as originally outlined and that it could have rejected Opal's SOR if it had wanted to do so;

k) Contrary to Ofcom's view in paragraph 5.150c) of the Second Draft Determination, BT's response to the SOR cannot be dismissed as a "*first step in discussions to deliver DLE Handover to Opal*". BT's response was based on a completed feasibility study that had generated an indicative system development cost of approximately £[✂];

l) BT effectively made it a condition that Opal accepted liability for £[✂] of system development costs in order to progress negotiations. Opal refused to pay these costs and this is the sole reason why it did not accept BT's SOR[133]. It is now known that the system developments costs were based on "shoddy calculations and vastly inflated the realistic cost to BT". Negotiations did not mutually break down; rather, BT's response was based on "a recklessly inflated estimate of system development costs" and made no effort to continue genuine commercial negotiations;

m) Ofcom therefore characterises the situation incorrectly with the benefit of hindsight. BT made it quite clear that Opal would be required to pay for system development costs; in Opal's view, any negotiations on that basis would be "pointless and…unrealistic";

n) In response to paragraph 5.148.5 of the Second Draft Determination (see paragraph 5.150e) in this document), Opal did not in the SOR refer to what interconnect links to use precisely because the SIA provides that it is BT's responsibility to arrange suitable and sufficient interconnection capacity;

o) Ofcom's view in paragraph 5.150f) of the Second Draft Determination that BT's offer for BT-originated and CP-originated traffic appearing contrary to the SOR is "patently incorrect". Point 12 of the SOR explicitly provides that BT could also choose to hand over BT-originated calls. Further, the matter arguably falls outside the scope of this dispute as it was never an issue in dispute and was therefore not mentioned by Opal in its Submission to Ofcom;

p) For the reasons already set out above, Ofcom's views in paragraphs 5.150g) and 5.150h) is an "utterly unrealistic reflection of the state of commercial negotiations in late 2008 between Opal and BT";

q) Ofcom had previously urged BT to "take a timely approach to this work";[134]

r) Ofcom's observation in paragraph 5.150i) of the Second Draft Determination that "*as demonstrated by [its] consultative process, it was not necessarily immediately*

[132] Opal provides a copy of this email in Annex 6 to its response to the Second Draft Determination.
[133] Opal refers to Annex 37 to its Submission; an email from C Stocks (Opal) in reply to an email from R Jones (BT) of 12 December 2008 (chasing a response to BT's proposal of 25 November 2008). The email from C Stocks reads: "Thank you for this Richard. Unfortunately we will have to decline this proposal as we do not believe that the solution costs of this magnitude should be to our account".
[134] Opal refers to Annex 32 to its Submission; a letter from N Buckley (Ofcom) to R Granberg (Opal) advising that Ofcom is not intending to accept Opal's dispute at that time, but advising that Ofcom had taken the opportunity to write to BT to urge it to take a timely approach [to further commercial negotiations], once Opal has made its formal request [for DLE Handover].

clear that DLE Handover to Opal should have been provided under GC 18" is irrelevant: Interconnect disputes are never "immediately clear"; if they were, there would be no dispute. Following "Ofcom's distorted logic", it would mean that BT could refuse to concede anything in interconnection disputes "in the safe knowledge that retrospection would never apply because Ofcom would have to consider the detailed cost evidence in a formal dispute."

BT's response

6.82 In its response, BT rejects any claim by Opal for repayments since May 2008. BT states that it could not reasonably have been expected to implement DLE Handover to Opal at the time.

Ofcom's view

6.83 We note that Opal's arguments in relation to the question of repayments are substantially identical to the legal arguments that Opal has raised in the context of its appeal against a different Ofcom dispute determination[135].

6.84 Before we consider Opal's arguments (set out in the headings) below, it is also important to note that in the Second Draft Determination in this dispute, we proposed to find that in order to remain compliant with GC 18, BT should be required to offer DLE Handover to Opal following our final determination. We did not propose finding that BT was or had been in breach of GC 18 in the past in this regard, including at the time when Opal requested DLE Handover from BT, but that it would in future be in breach of GC 18 if it did not comply with the terms of this determination. This point is relevant to a number of Opal's contentions as regards the question of repayments in this dispute.

1. Ofcom does not have wide discretion; repayments are a default position

6.85 Opal contends that the TRD Judgment suggests that *"when Ofcom has determined that BT should be required to offer DLE handover…the default position is for repayment to be ordered…[and] Ofcom should proceed from the presumption that repayment should be ordered"* to which Ofcom has failed to pay heed[136].

6.86 We disagree with Opal for the following reasons.

6.87 First, the 2003 Act does not provide for any presumption to order repayment in relation to Ofcom's powers under that section. Ofcom is subject to a set of specific statutory duties under the 2003 Act, which guide it in exercising its powers, including under section 190(2)(d). It would be potentially inconsistent with those duties, and an unlawful fetter on Ofcom's discretion, for it to apply any presumption as to the way in which the section 190(2)(d) power will be exercised.

6.88 Opal's argument to the contrary is based on a passage of the TRD Judgment, which provides in relevant part as follows (paragraph 169, emphasis added):

> *"The question of what sums should be ordered to be paid under section 190 does not, at the moment therefore, arise for the*

[135] Dispute about per-customer line transaction charges for Carrier Pre-Selection. See: http://www.ofcom.org.uk/bulletins/comp_bull_index/comp_bull_ccases/closed_all/cw_999/ for details of the dispute determination. Details of the appeal can be found on the Competition Appeals Tribunal website: http://www.catribunal.org.uk/

[136] Opal's response to the Second Draft Determination, section 3.1.

> *Tribunal's decision. We consider, however, it is useful to clarify certain matters, in deference to the submissions that have been made. Section 190(2)(d) of the 2003 Act is a straightforward provision designed to ensure that OFCOM's determination of what is a reasonable rate is backdated to the time at which that rate would have come into effect had the OCCN been accepted. It should ordinarily follow on from a determination that this kind of readjustment takes place. Otherwise the party which has wrongly resisted the proposed OCCN is in a better position than they would have been in had they accepted it without challenge."*

6.89 Opal's citation of this passage in their response to the Second Draft Determination omits the words which are underlined above. However, it is necessary to have regard to those words in order to set paragraph 169 of the TRD Judgment in its proper context in that case. In paragraph 40 of the same Judgment, the role of an "OCCN"[137] with regard to the SIA between BT and other operators which was under consideration in the TRD Judgment is explained (emphasis added):

> *"Clause 13 sets out the mechanism whereby the parties can seek to vary the price charged for the services that the MNO provides to BT. It provides that the Operator may from time to time send BT a Charge Change Notice proposing a new charge. BT must then notify the Operator whether it accepts or rejects the proposed variation. ... If the party receiving a Charge Change Notice accepts the Charge Change Proposal the parties modify the SIA accordingly. If the party receiving a Charge Change Notice rejects the Charge Change Proposal then the parties must negotiate in good faith. If they fail to reach agreement then either party may refer the matters in dispute to OFCOM; in default of a referral, the charge continues at the prevailing rate. If OFCOM upholds the proposed charge then it may direct that the charge takes effect on the date specified in the Charge Change Notice and the parties must enter into an agreement to modify the Agreement accordingly. If OFCOM does not uphold the proposed change then that Charge Change Notice ceases to be of any effect. The parties to these SIA agreements with BT refer to a Charge Change Notice served under either paragraph 13.2 or 13.3 of the SIA as an "Operator Charge Change Notice" or "OCCN" ..."*

6.90 When read in light of this paragraph, it is clear that the Tribunal in paragraph 169 of the TRD Judgment was not intending to create a generally applicable presumption, as Opal contends. On the contrary, the Tribunal's observations in paragraph 169 of the TRD Judgment were clearly specific to the context of disputes under BT's SIA, where service of an OCCN has defined contractual consequences and indeed provides the formal precursor for triggering Ofcom's dispute resolution function.

6.91 We believe that any attempt by Opal to transform the comments in paragraph 169 of the TRD Judgment, which were specific to the context being considered in that case, into a generally applicable presumption is misconceived as a matter of interpretation of both the TRD Judgment itself and the 2003 Act.

[137] Operator Charge Change Notice.

6.92 In any event, on the particular facts of this case (as set out further in this determination), we are not determining that BT has been or is in breach of GC 18, only that it would in future be in breach if it does not comply with the terms of this determination. We consider that this is a relevant consideration to take into account when exercising our discretion under section 190(2)(d) of the Act in relation to repayments. We therefore disagree with Opal's contention that the only conclusion to which we could legitimately come would be to order repayment of any sums to Opal.

2. Ofcom wrongly assumes that BT's own subjective consideration whether DLE Handover was required to comply with GC 18 is a relevant consideration".

6.93 Opal argues that Ofcom would in two ways err in law by having regard to BT's "subjective appreciation" namely: (1) that *"BT's subjective appreciation"* was an irrelevant consideration; and (2) that by considering the reasonableness of BT's conduct Ofcom created a *"condition precedent"* to the exercise of its power under section 190(2)(d) of the 2003 Act, for which there is no statutory permission.

6.94 In line with the scope of the dispute agreed by both parties (set out in paragraph 3.32), having provisionally concluded in the Second Draft Determination that BT should be required to provide DLE Handover to Opal, we then went on to consider whether, in order to give effect to our proposed determination, we should exercise our discretion to require any repayment. The power available to Ofcom, under section 190(2)(d) of the 2003 Act, is:

> *"...to give a direction, enforceable by the party to whom the sums are to be paid, requiring the payment of sums by way of adjustment of an underpayment or an overpayment."*

6.95 We considered in the Second Draft Determination whether to exercise this power. In considering that question, we considered that it is relevant for Ofcom to examine the parties' conduct during that time, including the information that was available to them. Such consideration went directly to the appropriateness and reasonableness of Ofcom exercising its discretion to require a repayment in the particular circumstances of the case.

6.96 For the reasons set out in paragraph 5.150 a) to 5.150i), we did not consider that the evidence demonstrated that BT could reasonably have been expected to implement DLE Handover to Opal at the time, because a number of factual matters were not clear, and have only become clear during this dispute investigation (see further paragraphs 6.100 to 6.114 below).

6.97 Opal contends that "*...if subjective appreciation were a relevant factor it would have the effect that only a charge levied in bad faith or with the knowledge that it was not compliant could be the subject matter of an order for repayment under section 190(2)(d)*" and that this would create *"…an unlawful condition precedent to, and fettering of, Ofcom's statutory discretion under section 190(2)(d)"*. In Ofcom's view, such reasoning confuses a relevant consideration with a precondition – whether BT could reasonably have been expected to implement DLE Handover to Opal when Opal first requested it is in Ofcom's view a relevant consideration to be taken into account, and just that.

6.98 We do not believe that by considering whether BT could reasonably have been expected to implement DLE Handover to Opal when Opal first requested it, we have created an unlawful condition precedent to section 190(2)(d) of the 2003 Act. In exercising our discretion, we have considered the information which was available to

BT at the time of Opal's request and BT's conduct. We consider that this was reasonable and appropriate in the circumstances of the case. Accordingly, there was no "condition precedent" to the exercise of Ofcom's power under section 190(2)(d). On the contrary, in the Second Draft Determination we were considering precisely whether or not to exercise that power taking account of certain factors.

6.99 Importantly, requiring BT to make repayments would rely upon, amongst other things, BT having been able in practice to offer DLE Handover to Opal for that period (the counterfactual). As noted in paragraph 5.147, we have considered evidence presented by both BT and Opal as to whether it would have been reasonable to expect BT to have implemented DLE Handover to Opal when Opal requested it. As set out above, in our view we do not believe that this is the case, hence our provisional conclusion in the Second Draft Determination, and our final conclusion below that in order to *remain* compliant with GC 18, BT should be required to offer DLE Handover to Opal within a reasonable period *following* this determination. We are not finding that BT was or is in breach of GC 18, only that it would in future be in breach of GC 18 if it does not comply with the terms of this determination.

3. In any event, Ofcom fails to consider all the relevant facts (or has misinterpreted facts) as to the commercial negotiations between Opal and BT.

6.100 We note Opal's contention that BT has known about Opal's concerns regarding the APCC since September 2007 but failed to take any steps to ensure compliance with GC 18.2. However, we also note that BT in September 2007 suggested that if Opal would "*…offer BT access to existing Opal ISI egress routes on appropriate commercial terms, BT would consider delivering ported traffic via these Opal ISI routes…"* and that "*[on first indication] this would reduce the APC charge levied by BT to a rate closer to single tandem*".[138] In addition, subsequent correspondence from Opal suggested that its belief that BT would not accept that traffic terminated [✂] created an issue that meant that Opal could not accept BT's proposal.[139] This seems to demonstrate that BT was willing to engage in negotiations with Opal about DLE Handover and that, given various unresolved issues, BT could not have been expected to have implemented DLE Handover to Opal when Opal first requested it.

6.101 Opal states that when BT sought to increase the APCC from 1 May 2008, Opal proposed DLE Handover "*as a sensible way forward*". We note that in proposing this to BT, while Opal was *"…happy to consider the alternative of BT handing over ported traffic to the Opal legacy Nokia network at DLE level"*, it advised that *"…any calls terminated on the Opal network in this manner are* [✂]*"*[140]. This suggests that the issue of [✂] termination rates was unresolved between the parties[141]. The first confirmation we have that [✂] termination rates would not be applied was in Opal's response of 1 September 2009 to our formal request for information, in which Opal advised us that "*Opal has always made it clear to BT that it would not insist that BT pays any higher termination rate …(assuming the calls do not originate on BT's network…)"*.[142] Based on the evidence, we therefore disagree with Opal's assertion that the issue of the termination rate *"…was never an issue between the parties".*

[138] Email of 21 September 2007 from J Hopkinson (BT) to C Stocks (Opal), as provided in Annex 3 to Opal's Submission
[139] Email of 30 September 2007 from C Stocks (Opal) to J Hopkinson (BT), as provided in Annex 5 to Opal's Submission
[140] Letter of 17 April 2008 from C Stocks (Opal) to J Hopkinson (BT), provided in Annex 30 to Opal's Submission
[141] Further suggestion that the parties had concerns [✂] is provided by BT's rejection dated 9 April 2009 of Opal's proposals of 19 March 2009[✂].
[142] Opal's response of 01 September 2009 to a section 191 information request.

6.102 Opal asserts that it had made it clear that the only reason it rejected the BT offer in response to the SOR of 7 July 2008 was because Opal felt that system development costs were excessive and that BT should be liable to pay for those costs. However, we note that the evidence presented to us by the parties does not show that any subsequent discussion was held by the parties to resolve this specific matter or that any details behind BT's costs estimate were requested from BT by Opal.

6.103 We note Opal's view that the Second Draft Determination in paragraph 5.150b) makes incorrect assumptions based on no evidence, and that in fact Opal actively pursued BT for a response to the SOR[143] since this was not forthcoming within the promised timescales (a first response from BT was due by 31 July 2008 and an initial offer from BT was due by 3 October 2008)[144]. Opal is supporting this argument with new evidence provided in its response to the Second Draft Determination. In respect of the new evidence provided by Opal, we note that it supports Opal's claim that it had chased BT's response to the SOR which was, based on SIA timescales, overdue.

6.104 We note Opal's view that BT then "*surprisingly*" sent an email to Opal on 12 September 2008, asking Opal to clarify whether the SOR encompassed BT-originated traffic [in addition to CP-originated traffic], and confirming that any offer it made would be based on using Opal-owned routes on the basis that [✂]. In its response to the Second Draft Determination, Opal advises us that it had subsequently confirmed that it was happy with BT's proposals[145]. Opal also states that its SOR *"…was very clear that the request only encompassed non-BT originated traffic"*. Opal referred to Annex 33 to its Submission, specifically point 12 of the SOR issued. Point 12 of the SOR requests that the party completing the SOR (i.e. Opal) outlines any potential benefits, if any, to BT in developing the specified product – e.g. net incremental value. In response to this, Opal has submitted:

> *"a. This product will allow BT to comply with its obligations under GC 18.2.*
>
> *b. In addition to handing over non-BT originated calls at the DLE, BT could choose to hand over BT originated calls"*

6.105 Our view is that this is not, as Opal asserts, "…*very clear that the request only encompassed non-BT originated traffic*". On our reading, we do not consider it unreasonable that this would suggest that the request might include BT-originated traffic, or at least does not preclude it.

6.106 It is worth noting that in its response to the Second Draft Determination Opal asserts that Ofcom's view that BT's offer of 25 November 2008 (which included both BT-originated and CP-originated traffic) was contrary to the SOR (see paragraph 5.150f)) is "*patently incorrect*. *Opal's SOR explicitly provided that in addition to handing over non-BT originated calls at the DLE, BT could choose to hand over BT originated calls",* with Opal again citing point 12 of the SOR. This seems to contradict Opal's suggestion that Opal was "…*very clear that the request only encompassed non-BT originated traffic*".

[143] Opal provides a copy of a reminder sent to BT on 12 August 2008 in Annex 2 to its response to the Second Draft Determination.
[144] Opal provides correspondence showing these timescales in Annexes 1 and 2 to its response to the Second Draft Determination.
[145] Opal's response to the Second Draft Determination states that "*Opal accepted both of them, i.e. that DLE handover calls to ported numbers should not* [✂] *and that Opal-owned interconnection links could be used*".

6.107 Further, in point 2 of the SOR (which requests a written description of the product or service), Opal states:

> *"This is a statement of requirement for the delivery of Ported Calls over DLE interconnects. For the purpose of this SoR, we define Ported Calls as calls that originate on a non-BT network",*

whilst Point 3 of the SOR shows a diagram of the proposed new arrangement as also being for *"a call originating off BT's network".*

6.108 Opal has thus argued that its SOR:

a) was very clear in only encompassing non-BT originated traffic, but

b) explicitly provided for BT originated calls.

6.109 Based on Opal's first assertion in a), we do not consider it "patently incorrect" to assume that an offer from BT that encompasses BT-originated traffic might be viewed as contrary to the SOR. This in combination with Opal's second assertion in b), along with the evidence provided, suggests that it would not be unreasonable for BT to seek clarification of what traffic types are to be delivered via DLE Handover. However, we also observe such clarification of the SOR dated 7 July 2008 was not sought by BT until 12 September 2008.

6.110 We note that following BT's advice of 13 October 2008 concerning arrangements for a feasibility study, Opal raised with BT its serious concerns that BT was unduly delaying the process[146]. We also note Opal's view that BT's response of 24 October 2008[147] claimed that it had never intended to follow the SOR process as originally outlined and that it could have rejected Opal's SOR if it had wanted to do so. The evidence provided by Opal supports a view that BT was not treating Opal's request as one concerning a product that was a regulated service and thus in BT's view it was not subject to the timescales of the SOR process. BT's response does note that it had *"been slower in some cases that we would like on this"* and accepting that *"…progress on [Opal's] SOR was poor between mid-September and early October".* This suggests that BT had not progressed Opal's request as quickly as possible and not within the timescales set by the SOR process.

6.111 Opal argues that contrary to Ofcom's view in paragraph 5.150c) of the Second Draft Determination, BT's response to the SOR cannot be dismissed as a "*first step in discussions to deliver DLE Handover to Opal*", asserting that BT's response was based on a completed feasibility study that had generated an indicative system development cost of approximately £[✂]. We note that BT's response to the SOR advised that the feasibility study had been completed and *"…the next logical stage is to discuss the results, I trust the meeting on 11th December in Irlam will provide us with this opportunity"* adding that if Opal wished to progress with the solution, *"…a full and accurate analysis will be carried out, full and accurate costs will be notified and a complete description of the solution would be devised and provided."* We understand this to suggest that further discussion of the detail behind BT's feasibility study would be required along with more detailed analysis. In other words, at the stage of the proposal being put forward, further discussions would be required before delivery of DLE Handover would be possible.

[146] Opal provides a copy of this in Annex 5 to its response to the Second Draft Determination.
[147] Opal provides a copy of this in Annex 6 to its response to the Second Draft Determination.

6.112 Opal contends that *"BT effectively made it a condition to progress negotiations that Opal accepted liability for £*[✂] *of system development costs"*. We note that Opal has claimed that this was *"the only reason"* it had rejected BT's proposal and that at that point (November 2008) *"any commercial negotiations based on those premises [Opal paying system development costs] were bound to be quite pointless and it would therefore have been unrealistic to expect Opal to pursue further negotiations".* We note that the matter was however only referred to Ofcom in July 2009.

6.113 In Opal's view they now know that the system developments costs were *"…based on shoddy calculations and vastly inflated the realistic cost to BT"*, with BT's response to the SOR based on *"a recklessly inflated estimate of system development costs and made no effort to understand Opal's concerns or otherwise continue genuine commercial negotiations"*. We do not believe this correctly characterises the evidence presented to us. We note that the original system development cost estimates of £[✂] are significantly higher than subsequent estimates provided by BT to Ofcom (see paragraph 3.81). We also note that, and as recognised by Opal, BT advised that these were indicative and that BT also proposed that further analysis would be required. We note that in its proposal BT had suggested that the parties discussed the results of the feasibility study and that Opal did not respond to this suggestion in its reply and that a specific discussion about the feasibility study did not appear to take place between the parties.

6.114 We note Opal's comments in response to paragraph 5.150e) of the Second Draft Determination that Opal did not in the SOR refer to what interconnect links to use *"…precisely because the SIA provides that it is BT's responsibility to arrange suitable and sufficient interconnection capacity"* adding that Opal *"fail to understand why Opal would or could have stated anything differently in the SOR".* Whilst recognising that Opal did not subsequently object to the use of its own ISI routes, given that the proposal for their use had previously been rejected (see paragraph 6.100 above) it would not have been unreasonable for BT to clarify this point. Equally, we do not agree that Opal *could not* have stated anything differently; the SOR template does not appear to preclude statements that clarify or qualify proposals. Against the context of the negotiations between the parties thus far, if Opal was prepared for DLE Handover to utilise its existing ISI links, it may have been beneficial to volunteer this at point 13 of the SOR (which asks "Does the service use new or existing routes?") rather than stay silent on the issue (Opal's response to point 13 reading *"This SOR refers to BT owned traffic and therefore we would expect BT to consider this question"*).

Conclusion on Repayments

6.115 In deciding whether to require a repayment under section 190(2)(d) of the Act, Ofcom must consider all relevant factors. It must give appropriate weight to those factors in light of the particular circumstances of the case, always taking account of its statutory duties.

6.116 We set out in the Second Draft Determination our analysis in this regard, and provisionally concluded that we would not exercise our discretion to order any payments in this case. We have considered Opal's comments in response to that provisional conclusion.

6.117 As noted in paragraph 6.84 above, our starting position is that we consider that in order for it to remain in compliance with GC 18 BT is required to provide DLE

Handover to Opal, following a new request by Opal (and subject to certain conditions as set out in paragraphs 6.141 below).

6.118 We have considered whether the evidence provided by the parties shows that BT was able to implement DLE Handover when requested.

6.119 Firstly, we note that whether or not Opal intended to [✂] for traffic it terminates as part of DLE Handover could have significantly impacted on any assessment by BT of whether DLE Handover would be more efficient than its Current Solution. From the evidence provided we have seen that:

a) BT originally proposed DLE Handover, but this was refused by Opal because of issues concerning [✂] termination rates, (see paragraph 6.100);

b) The issue of whether or not [✂] was unresolved at the time of Opal's SOR and remained unresolved until Opal's submission to us of 1 September 2009 made in response to our formal request for information. We also note that Opal claims that it confirmed that "it was happy with BT's proposals [✂]" of September 2008 (see paragraph 6.104). However, evidence of this was not provided.

6.120 Secondly, we note that whether or not BT included BT originated traffic in DLE Handover would impact the technical arrangements it would have needed to establish in order to provide DLE Handover. The evidence provided suggests that whether or not Opal was agreeing to the inclusion of BT originated traffic required some clarification (see paragraphs 6.104 to 6.108).

6.121 Thirdly, we note that in order for BT to have assessed whether it could provide DLE Handover, it would have needed to understand what interconnect circuits would be used. This, as our analysis in this determination shows, can significantly impact on whether DLE Handover would be considered more efficient that the Current Solution (see paragraphs 5.51 and 5.52). The evidence shows that at the time of Opal's request, it was unclear on what terms ISI circuits would be made available, if at all (see paragraph 6.114).

6.122 Further, Opal would need to identify to BT those DLEs to which the request for DLE Handover applies. We note that the original SOR requests DLE Handover "...*at all BT DLEs where Opal has Number Portability established*" (Point 7 of the SOR), but Opal has since advised us that it may not wish for DLE Handover at all of these DLEs.[148]

6.123 We therefore conclude that overall the evidence presented to us does not show that BT could reasonably have been expected to have implemented DLE Handover to Opal when first requested. We note that the evidence suggests that the process has not been progressed as quickly as possible, but we consider that this can not reasonably be attributed solely to BT.

6.124 In respect of Opal's observation that Ofcom had previously urged BT to "take a timely approach to this work", we note that our letter to Opal of 1 July 2008[149] advised that we had urged BT to take a timely approach to further commercial negotiations, once Opal had made its formal request [for DLE Handover]. We do not consider that this in any way supports an argument that BT might be subject to enforcement action of any kind by Ofcom.

[148] At a meeting between Ofcom and Opal on 26 November 2009, Opal advised us that where it uses interconnect extension circuits (IECs) and would also have to bear the associated interconnection costs "*it may be logical not to have DLE Handover*".

[149] Letter from N Buckley (Ofcom) to R Granberg (Opal), as provided by Opal in Annex 32 to its Submission.

6.125 Finally, we note that Opal considers Ofcom's observation in paragraph 5.150i) of the Second Draft Determination (that it was not necessarily immediately clear that DLE Handover to Opal should have been provided under GC 18) as irrelevant and that Ofcom's *"distorted logic"* would mean that *"BT could refuse to concede anything in interconnection disputes in the safe knowledge that retrospection would never apply because Ofcom would have to consider the detailed cost evidence in a formal dispute."*

6.126 Paragraph 5.148.9 was intended to relay a view that establishing whether or not DLE Handover to Opal offers efficiencies such that it should be provided by virtue of GC 18 has proven to be a complex matter. We do not consider this to be *"distorted logic"*.

Timescales for the implementation of DLE Handover

Opal's response

6.127 Opal intends to submit an updated request to BT as soon as Ofcom has published the Final Determination.

6.128 Opal requests that Ofcom provides some more detail as to what the agreement at the end of the four month period should encompass to ensure commercial negotiations achieve their desired objective. Opal expects that at that time an "Advance Capacity Order" should be agreed. In addition the process for submitting the required Data Management Amendments should also be agreed. This would allow all the relevant orders to be submitted such that additional capacity should be in place within 25 working days of the end of the four month period. Opal therefore expects DLE Handover to be operational at this time and believes these are entirely reasonable timescales that Ofcom should outline in its Final Determination.

BT's response

6.129 BT states that it is essential that Opal (or any other CP) submits a SOR requesting DLE Handover once Ofcom's Final Determination is published.

6.130 BT explains that Ofcom should be aware that the feasibility study undertaken in response to Opal's original SOR was only an initial analysis and not a detailed design. To that extent, the approach considered in the feasibility study proposed both BT originated and CP originated calls would be routed via DLE Handover, whereas BT's interpretation of Ofcom's proposals in the Second Draft Determination was that only CP originated calls should be subject to DLE Handover.

6.131 BT accepts that the timetable proposed in the Second Draft Determination (see paragraphs 5.144 to 5.145) is reasonable.

6.132 Finally, BT explains that it intends to run project review calls to which the relevant CPs would be invited, in the event that Opal or any other CP submitted a SOR for DLE Handover. BT's view is that this approach would provide transparency and facilitate rapid resolution of development issues.

C&W's response

6.133 As noted in paragraph 6.11 above, C&W has stated that it looks forward to Ofcom confirming its conclusions in the Second Draft Determination, in order that its own SOR can be progressed by BT in a timely manner.

Ofcom's view

6.134 In proposing the timescales set out in the Second Draft Determination, we considered comments from both parties and any relevant events concerning implementation of DLE Handover to Opal that have taken place thus far.

6.135 We took into account that a feasibility study has already been completed by BT in response to a SOR from Opal requesting DLE Handover, and that an initial offer was subsequently made to Opal, but that it would be appropriate for Opal to review its original request. Whilst BT may need to update some aspects of its feasibility study, we did not consider that it should be necessary for BT to undertake a full new such study. We also took the view that BT should start any necessary updating of its solution design no later than the time at which Opal submitted its revised SOR, but that further negotiation on technical and commercial aspects between the parties would be needed.

6.136 For the reasons set out in the Second Draft Determination – namely the need for the parties to agree commercial and technical arrangements for DLE Handover – we consider it inappropriate to determine a deadline by which DLE Handover should be implemented. Our proposed timescales allow for the negotiation of commercial and technical aspects related to Opal's request for DLE Handover. Should the outcome of these negotiations be agreement between the parties that DLE Handover can be achieved using processes currently set out in the SIA, then it would be reasonable to expect that the agreed timescales for implementation would be based on the timescales set in the SIA for those activities.

6.137 We also note that these negotiations could also take into account the routeing of BT-originated traffic via the DLEs, if the parties agree. Although consideration of the routeing of BT-originated traffic is outside the scope of this dispute, which is only related to the CP-originated traffic which gives rise to the APCC, the parties are free to agree a solution that includes the routeing of traffic not considered in this determination if such routeing offers a more efficient and expedient delivery of DLE Handover to Opal.

6.138 Based on the above, we do not agree with Opal that the implementation timescales should be four months plus 25 working days and that the reduced APCC should apply from this timescale, irrespective of whether the solution has been implemented.

6.139 In relation to BT's point about the approach it would take to develop the solution, we believe that our decision does not preclude the parties, by agreement, extending implementation proposals to include multiple parties and multiple requests in the same development activity.

Overall conclusion

6.140 We have considered carefully all of the responses we received to the Second Draft Determination and have set out above our views on those responses. For the reasons set out above, we do not consider that the issues raised in response to our Second Draft Determination are such that our analysis and conclusions as set out in the Second Draft Determination should change. Therefore, our final conclusions remain as set out in the Second Draft Determination.

6.141 We have therefore determined that BT is required to provide DLE Handover to Opal, following a new request by Opal and in line with the following:

a) If Opal so requests, BT is required to offer DLE Handover to Opal within a reasonable time period to be agreed by the parties, subject to the following conditions:

i) BT is required to pay for the system development costs on its network;

ii) BT is entitled to make charges for on-going costs on its network up to the PoH (subject always to the requirements of GC 18);

iii) Opal should bear the costs for Interconnect Extension Circuits ("IECs") required for DLE Handover;

iv) Opal will not seek to charge termination rates based on [✂] on the relevant traffic (which means calls to ported numbers that originate on third party networks); and

v) Opal will not impose charges on BT for the use of Opal's interconnection links on Opal's side of the PoH.

b) Where agreed by the parties, a solution provided by BT to meet these requirements can also include BT-originated traffic in addition to non-BT originated traffic.

6.142 We have considered whether, in order to give effect to our determination, we should exercise our discretion to order BT to make any payments to Opal by way of an adjustment of an overpayment. Having considered the responses to our Second Draft Determination and taken account of all relevant considerations on the facts of this case, in light of our statutory duties we remain of the view that we should exercise our discretion under section 190(2)(d) of the Act not to require BT to make any payments to Opal. We therefore make no direction in this regard.

6.143 Our formal Determination to this effect is set out at Annex 1.

Assessment of our conclusions against Ofcom's statutory duties and Community requirements

6.144 We have carefully considered whether our 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[150].

6.145 We believe that the evidence shows that Opal's DLE Handover solution is more cost efficient than BT's Current Solution, and therefore, having also taken account of other factors, BT is required to provide DLE Handover to Opal in accordance with GC 18. In reaching this conclusion, 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, transparent, accountable, proportionate and targeted only at cases where action is needed. We believe that this is the case here: compliance by CPs with the General Conditions is important to ensure the proper functioning of the UK telecommunications sector, and while this dispute addresses certain issues of general application as regards GC 18, our determination is based on the specific

[150] 2002/21/EC.

facts of this dispute and will only bind the parties to it. Any future cases which raise such issues would need to be assessed on their own specific facts.

6.146 The parties' submissions on Ofcom's duties are summarised in paragraphs 3.100 to 3.107 above. They identify a number of duties which they both believe are of particular relevance to this dispute. We agree that these duties are relevant. They are as follows:

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

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

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

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

v) 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)).

6.147 As regards the duty to further the interests of citizens and consumers ((i) and (ii) above), in Ofcom's view, the outcome of the dispute involves benefits to citizens and consumers by BT having to meet its obligations at lower cost, leading to a reduction in BT's on-going costs for providing portability to Opal and a reduction in charges that Opal has to pay. This could have a positive impact on competition and, therefore, on the offer of electronic communications services to consumers in terms of choice, price, quality of service and value for money (which we must have regard to under section 3(5) of the 2003 Act).

6.148 In having regard to our duties listed in (ii), (iii), (iv) and (v) above, it is widely recognised that number portability is important in promoting competition between networks because it encourages switching by consumers. This is reflected in the obligation on CPs under GC 18 to provide number portability to customers and portability to each other, and the reasonableness and cost orientation obligations of charges levied by the donor provider on the recipient provider in providing portability. In this determination, we find that as against Opal, BT's APCC is based on a routeing method which is less cost efficient than a different method (DLE Handover to Opal) and (having also taken account of factors other than costs) will be in breach of GC 18 if BT does not offer DLE Handover to Opal within a defined period. Requiring BT to change its routeing mechanism for calls to numbers ported to Opal to a less costly one would lead to a reduced APCC that is based on efficiently incurred costs, which would therefore help the promotion of competition. In addition, the principle of effective competition requires that charges imposed should not undermine or weaken the pressure for effective competition (whether competition between those already in the marketplace or competition via entry by efficient operators). A charge levied by a network operator on a competitor that is too high – because it is not reasonable or cost oriented – is likely to undermine or weaken the pressure for effective competition, thereby dampening innovation and investment. In that regard, Opal's concern, as an operator the majority of whose customers have ported their telephone

numbers from BT, that it is competitively disadvantaged by an inefficiently incurred APCC, or that investment and innovation in voice telephony markets is hindered (see (iv) above), is addressed.

6.149 As regards our duty set out in (v), Ofcom considers that this is relevant in this context because the routeing of calls to ported numbers is important for encouraging interoperability so that customers from one network can make and receive calls to and from customers from another network, which facilitates the development of communication between customers of different networks. By ensuring that BT's APCC payable by Opal is based on efficiently incurred costs, we will help to ensure that customers of OCPs are able to call Opal's customers who ported their numbers from BT.

6.150 In addition to the duties set out above, in our analysis we have sought to adopt a technology neutral approach which does not favour the use of any particular technology to provide portability by BT (as we are required to do under section 4(6) of the 2003 Act).

6.151 We also consider that our duty set out in section 3(4)(m) of the 2003 Act (the duty to have regard to the extent to which, in the circumstances of the case, the furthering or securing of the matters mentioned in section 3(1) (and 3(2)) is reasonably practicable), is relevant to the resolution of this dispute. As our conclusion is that existing arrangements will continue until the parties have begun the process for implementing DLE Handover within a reasonable time-frame, we consider that the determination is reasonably practicable.

Annex 1

The Determination

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 to Opal 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 first draft determination was sent to the parties on 28 October 2009 and published on Ofcom's website on 29 October 2009;

(J) Ofcom reviewed the responses to the first draft determination and conducted subsequent further analysis;

(K) a non-confidential second draft determination was sent to the parties on 17 December 2009 and published on Ofcom's website on 17 December 2009;

(L) Ofcom reviewed the responses to the second draft determination;

(M) 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;

(N) 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 required, if Opal so requests, 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, and that BT is required to bear the system development costs that are necessary on its network to implement DLE Handover to Opal.

2 The requirement set out in 1 is subject to the following charging arrangements once DLE Handover to Opal is implemented:

a) BT is entitled to make charges for costs of onward routeing on its network up to the point of handover of the calls to Opal's network (subject always to the requirements of GC 18);

b) The costs for Interconnect Extension Circuits ("IECs") required for DLE Handover to Opal (if any) should be borne by Opal;

c) Opal will not seek to charge termination rates based on [✂];

d) Opal will not impose charges on BT for the use of its interconnection links beyond the point of handover of the calls to Opal's network;

e) Where agreed by Opal and BT, DLE Handover also includes the handover of BT originated, fixed geographic calls to numbers ported to Opal at the relevant DLE.

3 Within four months from the date of Opal's formal request for DLE Handover to Opal following this Determination, specifying its requirements in a reasonably detailed manner, the parties must agree a reasonable time period within which the solution must be implemented.

II Binding nature and effective date

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

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

III Interpretation

6 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.

7 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;

g) **"Relevant traffic"** means calls to ported numbers that originate on third party networks.

David Stewart

Director, Competition Policy

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

26 March 2010

Annex 2

General Condition 18

18. NUMBER PORTABILITY[151]

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[152]. 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[153]. 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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[151] 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).

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

[153] "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[154].

18.4[155] 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[156];

(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;

[154] Number Portability and technology neutrality, Statement, 30 March 2006, removed wording "and in accordance with the Functional Specification".
[155] 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/
[156] 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;[157]

(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[158] 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":[159]

(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;

[157] Number Portability and technology neutrality, Statement, 30 March 2006, removed definition "Non-geographic Number".
[158] 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"
[159] 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. [160]

[160] 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/

Annex 3

Interconnect circuit costs

Modelling of interconnect link and circuit costs

A3.1 This Annex sets out the detailed approach to modelling interconnection link and circuit costs for the APCC model.

A3.2 The 3 categories of ported traffic are:

a) CP originated handed over to BT at the DLE

b) CP originated handed over to BT at the NGS

c) BT originated

A3.3 The following table identifies relevant interconnection circuit costs for the **Current Solution** as they relate to traffic type a) only (see above) since only the routeing of this traffic will differ under DLE Handover to Opal. Therefore, we expect the costs of traffic types b) and c) to be the same for the two solutions. Since we are interested in the *difference* in costs between the two solutions, we would derive the same result whether we included the costs associated with these traffic types in both solutions or excluded them from both. For simplicity, we have omitted these costs and focussed on the traffic type a), whose costs are different between the two solutions.

Table 12: Modelling of interconnection circuit costs for the Current Solution

Interconnection link and circuit cost	**Model A** (CSI/IBC)	**Model B** (IBC only)	**Model C** (CSI/IBC)
DLE-Opal There are no BT-Opal E1 links at the DLE layer for ported traffic	na	na	na
NGS-Opal, traffic type a) Note the same number of links/circuits is used for Model A, B and C for the Current Solution. Because we estimate the cost of the circuits using the same CSI and IBC rates for Model A and C, costs are identical for these two approaches. Only the cost for Model B differs since the same number of E1 circuits are assumed to be ISI circuits and so have costs based on IBC rates only (i.e. excluding CSI rates)	In BT's model the % of traffic which is CP originated (i.e. handed over to BT at both DLE and NGS) is 52% (i.e. (a) and (b) above). Accordingly, we still need to include only the proportion of traffic handed over from the originating CP to BT at the DLE (i.e. traffic type a) and exclude the proportion handed over at the NGS (i.e. traffic type b). This is estimated by us as 73% of the 52% above. The total volume of E1 circuits for all three categories of ported traffic, as estimated by BT, is [✂]. The circuit volumes relevant to traffic type a) are therefore:	As for **Model A** except we cost the same circuits at IBC rates only (i.e. we do not additionally estimate the costs of the circuits at CSI rates). This is done for costs related to traffic in category a). [✂] X 52% X 73% = [✂] 2Mbit/s E1's. *Rental (IBC)* [✂] X £92.88/ 2Mbit/s = **£**[✂] *Connection (IBC)* [✂] X £808.36/ 2Mbit/s = **£**[✂]	Same as **Model A**

Interconnection link and circuit cost	**Model A** (CSI/IBC)	**Model B** (IBC only)	**Model C** (CSI/IBC)
	[✂] X 52% X 73% = [✂] 2Mbit/s E1's. *Rental (CSI)* [✂] X £1103.64/ 2MBit/s = £[✂] [✂] X £22.80 X 18kms = £[✂] *Rental (IBC)* [✂] X £92.88/ 2Mbit/s = £[✂] *Connection (CSI)* [✂] X £982.38/ 2Mbit/s = £[✂] *Connection (IBC)* [✂] X £808.36/ 2Mbit/s= £[✂] *Total* Total CSI/IBC rental = **£**[✂][161] Total CSI/IBC connection = **£**[✂]		
NGS – Opal, traffic types b) and c) (Excluded) We exclude from the model all costs associated with BT originated traffic and CP originated traffic handed to BT at NGS (i.e. traffic types b) and c).	Our modelling assumptions imply the following volumes of circuits for traffic types c) and b) respectively. But the costs of these circuits are excluded from the model (because they do not vary between the Current Solution and DLE Handover to Opal). BT originated traffic [✂] X 48% = [✂] 2Mbit/s E1's. CP originated traffic received by BT at the NGS [✂] X 52% X 27% = [✂] 2Mbit/s E1's.	As for **Model A**	As for **Model A**
Additional 273 ISI circuits	In BT's model the % of traffic that is CP originated is 52%	As for **Model A**	As for **Model A**

[161] Ofcom has used an estimate of the CSI cost of interconnection (rental) based on BT's model for the Current Solution rather than Ofcom's own bottom up estimate provided here (for Approaches A and C). Note that in Table 10 the corresponding estimate is slightly different (i.e. £[✂] rounded to £[✂]) to the bottom-up estimate derived by Ofcom in this annex of £[✂]. We note that using Ofcom's estimate makes no material difference to the results. Our workings for this particular calculation are provided here in Annex 3 to illustrate the approach underpinning the BT calculation as well as provide a useful independent cross check to the BT model.

Interconnection link and circuit cost	**Model A** (CSI/IBC)	**Model B** (IBC only)	**Model C** (CSI/IBC)
We include only the proportion of the additional 273 E1s that relate to CP originated traffic handed to BT at the DLE (traffic type a) Because these additional 273 E1s relate to proposed ISI links, we estimate their cost using IBC rates (not the CSI rates used for [✂] circuits above).	(i.e. traffic types (a) and (b). Accordingly, we still need to exclude the proportion of traffic handed from the originating CP to BT at the NGS i.e. only include (a), estimated by us as 73% of the 52% above. *Rental (IBC)* 273 X 52% X 73% = **104** 2Mbit/s **104** X £92.88/ 2Mbit/s = **£9,706** *Connection (IBC)* **104** X £808.36/ 2Mbit/s = **£84,473**		

A3.4 The following table identifies relevant costs for **DLE Handover** to Opal.

Table 13: Modelling of interconnection circuit costs for DLE Handover to Opal

Interconnection link and circuit cost	**Model A** (CSI/IBC)	**Model B** (IBC only)	**Model C** (IBC only)
DLE – Opal, traffic type a) We show here the costs on BT's side of the PoH for the circuits related to traffic type a). In Model A these are assumed to be CSI circuits. In Models B and C these are assumed to be ISI circuits.	For DLE Handover, Opal estimates there are [✂] E1 circuits related to CP originated traffic handed over to BT at the DLE. This compares to BT's corresponding estimate of [✂] circuits. [✂] x 2Mbit/s E1's. *Rental (CSI)* [✂] X £1103.64/ 2MBit/s = £[✂] [✂] X £22.80 X 92kms = £[✂] *Rental (IBC)* [✂] X £92.88/ 2Mbit/s = £[✂] *Connection (CSI)* [✂] X £982.38/ 2Mbit/s = £[✂] *Connection (IBC)* [✂] X £808.36/ 2Mbit/s = £[✂] *Total* Total CSI/IBC rental = **£**[✂]	We include IBC costs because these are on BT's side of the ISI point of handover The volume of E1 circuits is the same as for Model: [✂] 2Mbit/s E1s *Rental (IBC)* [✂] X £92.88/ 2Mbit/s = **£**[✂] *Connection (IBC)* [✂] X £808.36/ 2Mbit/s = **£**[✂]	As for **Model B**

Interconnection link and circuit cost	**Model A** (CSI/IBC)	**Model B** (IBC only)	**Model C** (IBC only)
	Total CSI/IBC connection = **£**[✂]		
NGS – Opal (Excluded) Under DLE Handover to Opal, there are no NGS-Opal interconnection circuits for traffic type a). The costs related to NGS-Opal interconnection circuits for traffic types b) and c) are excluded, because they do not differ between the Current Solution and DLE Handover.	Costs excluded	As for **Model A**	As for **Model A**
Additional 273 ISI circuits Under DLE Handover to Opal fewer than 273 ISI circuits will be required, because they are not needed for traffic type a), which is not routed to BT's tandem layer. This cost saving from DLE Handover to Opal is captured in the modelling by including the costs of this proportion of circuits in the Current Solution in the Table above (and including no such costs here). The proportion of the additional 273 ISI circuits related to traffic types b) and c) is excluded from the model, because these costs do not vary between the Current Solution and DLE Handover to Opal.	Costs excluded	As for **Model A**	As for **Model A**

Annex 4

Revised NPV[162] results for Approach A

Key revisions to the modelling

A4.1 There are two key revisions to the cost estimates under Model A that increase costs savings of the Current Solution from £2.33m to £4.13m over 5 years on an NPV basis (ie a £1.8m increase).

A4.2 First, under the Current Solution, interconnection circuit costs have been revised to include only those circuits costs related to traffic type (a) as set out in 5.24. By applying a 73% scaling factor to the costs of all CP originated traffic handed to BT, this generates a cost for E1's used at the NGS layer that relate specifically to CP originated traffic handed over to BT at the DLE.

A4.3 The second is to (a) revise the costing of the additional 273 circuits to an ISI basis (instead of CSI as previously modelled)[163] and (b) strip out costs related to E1s used at the NGS layer that relate specifically to CP originated traffic handed over to BT at the NGS layer.

A4.4 The combined effect of these adjustments is to raise the increased savings from interconnection circuits under the Current Solution from £7.4m to £9.1m (ie £1.7m increase) and to increase savings from one off interconnection costs from £ 0.7m to £0.8m (i.e. £0.1m increase). In total, there are £1.8milion in additional NPV savings under the Current Solution.

Table 12: Revised NPV Results for Approach A (£m) (compare against Table 7)

	Current Solution (1)	DLE Handover to Opal (2)	Difference (2)-(1) (annual)	Difference (2)-(1) (5 year NPV)	Difference (2)-(1) (10 year NPV)
Network service					
Annual costs					
LTC	[✂]	[✂]	**-1.50**	**-5.84**	**-10.04**
CSI/IBC(rental)	[✂]	[✂]	**2.36**	**3.34**	**5.74**
ITC	[✂]	[✂]	**-1.96**	**-7.65**	**-13.15**

[162] All NPV results are NPVs over 5 and 10 years using a social discount rate of 3.5% and in 2009 prices.

[163] Since issuing our First Draft Determination, it has come to light that BT and Opal do not share the same views on whether the interconnect links used in the Current Solution constitute CSI interconnection. Opal believes that BT does not regard these circuits as CSI circuits for charging purposes. Contrary to this, BT appears to consider that these links should be treated as CSI links and intends to charge for them on this basis (see paragraph 3.88 above). For the purposes of modelling, we have continued to treat these circuits as CSI links on the basis that this reflects their true nature, rather than any charging arrangements currently agreed (or not) by the parties.

Subtotal	[✂]	[✂]	**-1.11**	**-10.15**	**-17.45**
One-off costs					
CSI/IBC (connection)	[✂]	[✂]	**0.92**	**0.92**	**0.92**
Subtotal	[✂]	[✂]	**0.92**	**0.92**	**0.92**
Total				**-9.23**	**-16.53**

Table 13: Revised NPV Results for Approach A (compare against Table 8)

	Current Solution (1)	**DLE Handover to Opal (2)**	**Difference (2)-(1) (annual)**	**Difference (2)-(1) (5 year NPV)**	**Difference (2)-(1) (10 year NPV)**
Network service					
Annual costs					
LTC	[✂]	[✂]	**-1.50**	**-5.84**	**-9.31**
CSI/IBC (rental)	[✂]	[✂]	**2.35**	**9.14**	**14.56**
ITC	[✂]	[✂]	**0.00**	**0.00**	**0.00**
Subtotal	[✂]	[✂]	**0.85**	**3.30**	**5.26**
One-off costs					
CSI/IBC (connection)	[✂]	[✂]	**0.83**	**0.83**	**0.83**
Subtotal	[✂]	[✂]	**0.83**	**0.83**	**0.83**
Total				**4.13**	**6.09**