

Consultation on the Intelligent Network (IN) Charge for DLE and ST FRIACO

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Draft Direction under the provisions of Regulation 6(3) of the Telecommunications (Interconnection) Regulations 1997 regarding the Intelligent Network Charge for Flat Rate Internet Access Call Origination

WHEREAS:

A) The Secretary of the State granted to British Telecommunications on 22 June 1984 a licence (the "Licence") under section 7 of the Telecommunications Act 1984 (the "Act") for the running of the telecommunication systems specified in Annex A to the Licence;

B) By virtue of Section 109 of, and paragraph 20 of Schedule 5 to, the Act, the Licence has effect as if granted to British Telecommunications plc ("BT");

C) On 26 May 2000 the Director issued a direction (the 'First Direction') under Regulation 6(6) of the Telecommunications (Interconnection) Regulations 1997 (the "Regulations") requiring BT to enter into an agreement with MCI Worldcom plc relating to the provision of Flat Rate Internet Access Call Origination ("FRIACO"). The First Direction specified in paragraph 4.3 that BT may make a reasonable additional charge for any Intelligent Network ("IN") or Signalling Transfer Point ("STP") signalling services provided by BT for the purpose of using the FRIACO service and for any service provided under paragraph 8 of the First Direction;

D) On 15 February 2001 the Director published a second direction (the "Second Direction") amending the First Direction by inserting *inter alia* new paragraphs 9 and 11 to require BT to make Single Tandem FRIACO available from its tandem exchanges;

E) On 15 May 2002 the Director published a third direction (the 'Third Direction') which amended paragraph 4.3 of the First Direction to enable BT to make a reasonable additional charge for any IN or STP signalling services provided by BT for the FRIACO services required to be provided under the First Direction as amended by the Second Direction (the 'IN Charge');

F) BT, in accordance with Condition 45 of the Licence, has entered into interconnection agreements with a number of Operators regarding the provision of FRIACO. The term "Operators" in this direction shall refer to those operators that have entered into such an interconnection agreement with BT. The terms of those agreements reflect the terms as set out in the First Direction as amended by the Second and Third Direction;

G) Following a complaint made by Cable and Wireless UK Services Limited and Energis plc the Director has been investigating the level of the IN Charge made by BT. The Director has reached the conclusion that BT should not be permitted to make the IN Charge;

H) The Regulations inter alia implement Directive 97/33/EC on interconnection in telecommunications with regard to ensuring universal service and interoperability through application of the principles of open network provision;

I) Regulation 6(1) of the Regulations provides that the Director shall encourage and secure adequate interconnection in the interests of all users and that he exercises his functions in a way that provides maximum economic efficiency and gives maximum benefit to end-users having regard to the matters set out in Regulation 6(1)(a) to (g) of the Regulations.

J) Pursuant to Regulation 6(3) of the Regulations the Director may intervene at any time, in order to make a direction specifying issues which must be covered in an interconnection agreement, or to make a direction that specific conditions be observed by one or more parties to such an agreement. The Director may in exceptional circumstances make a direction that changes be made to interconnection agreements already concluded where it is justified to ensure effective competition or interoperability of services for users or both;

K) A draft of this direction and the explanatory memorandum were published on [...2003] and comments invited by [...2003];

L) Comments were received from [...] and these have been considered by the Director.

THEREFORE

the Director, pursuant to Regulation 6(3) of the Telecommunications (Interconnection) Regulations 1997 makes the following direction:

1. With effect from 1 December 2001 BT shall not be permitted to make any additional charge for Intelligent Network or Signalling Transfer Point signalling services provided by BT to the Operators for the purposes set out in Paragraph 4.3 of a direction issued by the Director on 26 May 2000 as amended by directions published on 15 February 2001 and 15 May 2002 (the 'Consolidated Direction').

2. Paragraph 4.3 of the Consolidated Direction shall be revoked.

3. BT and the Operators shall amend their interconnection agreements relating to the provision of FRIACO to give effect to this direction by 28 days from the date of this direction.

4. In respect of any IN charge repayable by BT to the Operators in accordance with this direction, BT shall pay to the Operators the amount repayable together with interest calculated in accordance with paragraph 13.13 of the Standard Interconnection Agreement.

5. The terms defined or described in the recitals to this direction shall have the meaning so defined or described. All other words or expressions used in this direction shall have the same meaning as in the Directive, the Regulations, the Act or the Licence as appropriate.

[Chris Kenny,

Director of Compliance]

A person authorised under Paragraph 8 of Schedule 1 to the Telecommunications
Act 1984

[Date] 2003

Explanatory Memorandum

Summary

S1 In May 2000, the Director General of Telecommunications (the 'Director') issued a direction relating to a dispute between British Telecommunications plc ('BT') and MCI Worldcom plc ('Worldcom') requiring BT to provide Flat Rate Internet Access Call Origination ('FRIACO') (the 'First Direction'). A copy of the First Direction is at <http://www.oftel.gov.uk/publications/internet/fria0500.htm>. In the First Direction the Director also permitted BT to make a reasonable additional charge for the use of the Intelligent Network (the 'IN') to route FRIACO calls. The additional IN charge was permitted as the Director accepted that in comparison to calls to numbers in blocks of 10,000, the routing of FRIACO calls to numbers in blocks of 1,000 required additional switch decode. This switch decode was not available, and the use of BT's IN was one method of carrying out the additional processing that was required.

S2 The Director understands that the shortage of switch decode is no longer a concern, as the situation was remedied in July 2001 when there was an increase in the amount of available switch decode. On the basis of this increase in resource available, and both current and future forecast demand for FRIACO, the Director provisionally concludes that sufficient switch decode exists to enable FRIACO calls allocated in 1,000 number blocks to be delivered without necessitating the use of the IN.

S3 During the course of this investigation, BT has stated that the use of the IN to route FRIACO calls also plays a central role in the management of network congestion. Of tel acknowledges that, in principle, the use of the IN to manage congestion has a number of benefits. For example, applying such congestion controls at the point of call origination means that such controls are likely to be most effective, and the use of a network – wide call threshold represents a particularly effective solution to the problem of focussed overload.

S4 However, despite these strengths, the Director provisionally concludes that the use of the IN to route FRIACO calls in order to control congestion does not represent a necessary or proportionate response to any specified problem. BT's Standard Interconnection Agreement provides that interconnecting operators agree appropriate network management procedures for congestion management. The Director has found no evidence that the use of the IN to route FRIACO calls, in order to control congestion, has been discussed or agreed with interconnecting operators. Furthermore, the Director notes that BT deployed purpose-built Signalling Transfer Point ('STP')s in November 2001. These have sufficient throughput to be able to handle any load likely to be generated by the Digital Local Exchange ('DLE')s. Therefore, the Director believes that since November 2001, use of the IN to route FRIACO calls has not been necessary to protect the STP network.

S5 Although this investigation was initiated by a complaint from Cable & Wireless UK Services Limited ('Cable and Wireless') which was later supported by Energis plc ('Energis'), the Director considers that there is not an existing dispute between Cable & Wireless or Energis and BT within the meaning of Regulation 6(6) of the Telecommunications (Interconnection) Regulations 1997 (the 'Regulations'). Therefore, the Director proposes to issue a direction as set out below using his powers under Regulation 6(3) of the regulations, having considered the matters set out in Regulation 6(1) of the regulations. In particular, under Regulation 6(1) of the regulations the Director, in exercising his functions under the regulations, shall encourage and secure adequate interconnection in the interests of all users, exercising his responsibility in a way that provides maximum economic efficiency and gives the maximum benefit to end-users, and in doing so shall have regard to, *inter alia*, the need to stimulate a competitive market.

S6 If BT was allowed to charge above the efficiently incurred cost of providing the FRIACO service, competition between BT and the purchasers of FRIACO in downstream markets would be distorted. Therefore, preventing BT from doing this is necessary to ensure effective competition to the benefit of end users.

S7 Therefore pursuant to Regulation 6(3) of the regulations the Director proposes to direct that BT shall no longer have the right to make a charge for the use of the IN to route FRIACO calls. Furthermore, the Director also proposes that the Direction take effect from 1 December 2001, thus requiring BT to repay all purchasers of FRIACO the IN charge paid since 1 December 2001, plus interest in accordance with paragraph 13.13 of the Standard Interconnection Agreement.

S8 In addition, it is noted that all signalling charges are effectively included in the price of a 2Mbit/s IEC (Interconnection Extension Circuit) link. Therefore, the Director also proposes to direct that BT shall no longer have the right to make an additional charge for the use of its STP network to route FRIACO calls. It is noted that BT has never made an additional charge for use of STP signalling arrangements for FRIACO.

Chapter 1

Background

1.1 This Chapter sets out the background to the draft Direction which accompanies this explanatory memorandum. Oftel has undertaken an investigation which was initiated by a complaint received from Cable & Wireless on 30 March 2001, which was later supported by Energis in February 2002, about BT's additional charge for using the IN to route FRIACO calls. Some service providers have also expressed concern about the level of BT's IN charge associated with FRIACO.

1.2 Set out below is a brief history of FRIACO in the United Kingdom.

1.3 In December 1999, a dispute between Worldcom and BT (the 'Dispute') was referred to the Director. WorldCom complained that BT was supplying unmetered products to consumers, without making available a comparable wholesale product which would enable its competitors to provide equivalent unmetered services.

1.4 On 26 May 2000 the Director issued a direction relating to the dispute requiring BT to provide FRIACO (the 'First Direction'). The First Direction required BT to offer only DLE FRIACO, that is, wholesale flat rate internet access from its local exchanges. This allowed those Other Licensed Operators ('OLO's) interconnecting at the local exchange level to purchase wholesale unmetered call origination in order to offer services to compete with BT's SurfTime internet products, launched on 1 June 2000. For those OLOs which were interconnected at the Digital Main Switching Unit ('DMSU'), the Director required BT to offer a service for the conveyance of internet traffic from each enabled DLE to any Point of Connection of the OLO at the DMSU. BT fulfilled this requirement by offering Interconnection Extension Circuits ('IEC's).

1.5 Under paragraph 4.3 of the First Direction, BT was permitted to make a reasonable additional charge for any IN or Signalling Transfer Point ('STP') service provided by BT to operators for the purpose of using the FRIACO service. Paragraph 53 of the explanatory memorandum of the First Direction explained that the IN was needed for identifying the 1k number blocks allocated for FRIACO.

1.6 In addition, paragraph 33 of the recitals to the First Direction explained that: "the Director [has not] determined the charge for IN services since he believes that, where possible, charges should be set by negotiation between the parties. Nevertheless, he may intervene should BT's charges for IN capability give rise to dispute. BT will, therefore, be free to provide such services on request and to charge for them. The Director understands that BT proposes to charge £64 per 64kbit/s circuit for IN capability. The Director also understands that, at present, BT takes the view that all signalling charges are effectively included in the price of a 2

Mbit/s IEC link and therefore does not propose to raise additional charges for STP signalling where used.”

1.7 However, as the original request from WorldCom was for interconnection at the DMSU, some aspects of the dispute remained unresolved. Following BT's submission that the expected increase in unmetered internet traffic would exceed the capacity of the public switched telephone network, Oftel obtained advice from technical experts on the options available to enable unmetered interconnection at the tandem layer. The Director made a second FRIACO-related direction (the 'Second Direction'), published on 15 February 2001, requiring BT to make Single Tandem ('ST') FRIACO available from its tandem exchanges, with the implementation occurring in stages (see the Second Direction for details).

1.8 The Director made a third FRIACO-related direction, published on 15 May 2002 (the 'Third Direction'). The Third Direction amended, *inter alia*, paragraph 4.3 of the First Direction to allow BT to make a reasonable additional charge for any IN service provided by BT for ST FRIACO. This was simply to bring the arrangements for ST FRIACO into line with DLE FRIACO and was without prejudice to the outcome of this investigation (which was ongoing in May 2002).

1.9 Although this investigation was initiated by a complaint from Cable & Wireless which was subsequently supported by Energis, the Director considers that there is not an existing dispute between Cable & Wireless or Energis and BT within the meaning of Regulation 6(6) of the Telecommunications (Interconnection) regulations 1997 (the 'regulations'). Therefore, the Director proposes to issue a Direction using his powers under Regulation 6(3) of the Telecommunication (Interconnection) regulations, having considered Regulation 6(1) of the regulations.

1.10 Regulation 6(3) of the regulations allows the Director to make a direction that changes be made to interconnection agreements already concluded in exceptional circumstances where it is justified to either ensure effective competition or interoperability of services for users or both. Under Regulation 6(1) of the regulations the Director, in exercising his functions under the regulations, shall encourage and secure adequate interconnection in the interests of all users, exercising his responsibility in a way that provides maximum economic efficiency and gives the maximum benefit to end-users. In doing so the Director shall have regard to the matters set out in Regulation 6(1) (a) to (g) of the regulations. In particular, sub-paragraph (b) of Regulation 6(1) refers to the need to stimulate a competitive market.

1.11 Having investigated the complaint made by Cable & Wireless (later supported by Energis), the Director believes that for the reasons set out in this explanatory memorandum it is justified in the circumstances to make a direction under Regulation 6(3) removing BT's right to make a charge for the IN, with effect from 1 December 2001. This is justified in order to ensure effective competition. The proposed direction will enable purchasers of FRIACO to buy the service at a

price which reflects the efficiently incurred costs of the service, which will encourage more effective competition to the benefit of end users of unmetered internet access. Having considered Regulation 6(1) the Director believes that to make such a direction provides maximum economic efficiency and gives maximum benefit to end-users, and is required in order to stimulate a competitive market.

1.12 In Oftel's recent consultation on its review of Fixed Narrowband Wholesale Exchange Line, Call Origination, Conveyance and Transit Markets, 17 March 2003 [<http://www.oftel.gov.uk/publications/eu-directives/2003/eu-narrow/index.htm>], it was stated at paragraph 15.23 that Oftel would be separately consulting on the IN charge for FRIACO services. Following this consultation, if the Director confirms the proposed Direction, the Director envisages that this issue would be resolved before the new regulatory regime comes into effect.

1.13 In addition, the draft direction clarifies the position in relation to additional charges for use of the STP network to route FRIACO calls. Notwithstanding the provision which allows BT to make an additional charge for these services, all the costs have in fact always been included in the charge for the IEC link. The Director sees no reason why this will change in the foreseeable future and therefore is proposing to amend the FRIACO directions to remove the right to make an additional charge.

1.14 The structure of this explanatory memorandum is as follows. Chapter 2 discusses IN functionality in relation to FRIACO and explains why the Director believes there is no longer any justification for using the IN in the context of FRIACO. Chapter 3 then sets out, in the light of this initial technical conclusion, the Director's provisional conclusion that to continue to allow BT to make an additional charge for the IN would not be appropriate since it would prevent more effective competition in internet termination and ultimately in unmetered internet access from emerging to the benefit of end users. Furthermore, it would lead to excessive charges and economic inefficiency which would be contrary to the interests of end-users. For similar reasons, an additional charge for STP, when the costs are recovered elsewhere, is not appropriate.

Chapter 2

Functionality of the Intelligent Network for FRIACO

2.1 Intelligent networks have a wide variety of possible applications, from the routing of complex call types (eg time of day routing), to the provision of value-added call termination services using intelligent peripherals (eg messaging services). Set out below is a summary of those applications that BT has argued to be relevant to FRIACO.

Routing of numbers allocated in 1k blocks

2.2 The original justification given by BT for the use of the IN to route FRIACO calls, and the basis on which Oftel permitted BT to make an additional reasonable charge for use of the IN, was that it was a necessary consequence of Oftel's decision to allocate FRIACO numbers in blocks of 1,000 numbers.

2.3 Since 14 February 2000, Oftel has adopted a policy of allocating numbers for internet services in blocks of 1,000 numbers rather than the 10,000 number blocks previously used, and still used, for the majority of non-internet services such as most calls to geographic numbers. This policy applies to all new allocations of numbers for both metered internet services and unmetered internet services using FRIACO, and has since been extended to some other designated number ranges, for example, geographic numbers in conservation areas. It is based on the need to conserve numbers and the experience of the exhaustion of the 0906 and 0905 premium rate numbering ranges. Oftel believes that allocating in blocks of 10,000 numbers may result in the inefficient use of numbers, with ranges being exhausted within a relatively short period of time.

2.4 DLEs have traditionally routed calls by decoding the dialled number, one digit at a time, starting with the most significant digit, and comparing the result with routing tables stored on the switch. This process of 'switch decode' continues until sufficient digits have been analysed for the routing of the call to be uniquely determined.

2.5 If the number of digits which must be analysed increases, this will result in an increase in the amount of switch decode required at each DLE. If FRIACO numbers had been allocated in blocks of 10,000, then it would only have been necessary to decode the first six digits of the dialled number in order uniquely to determine the owner of the number block, and hence route the call. However, because FRIACO numbers are allocated in blocks of 1,000 it is necessary to decode the first seven digits of the dialled number in order to route each call.

2.6 At the time when FRIACO was introduced, BT was of the view that there was insufficient switch decode at each of its DLEs to support the routing of FRIACO numbers allocated in blocks of 1,000. BT therefore adopted an alternative solution,

which was to offload the detailed analysis of the dialled number to an external processor. The external processor carries out the detailed analysis of the called number and returns the required routing information to the DLE. The specific solution adopted was based on BT's existing IN platform, under which the DLE acts as an IN Service Switching Point (SSP), whilst the external processor and associated database constitute an IN Service Control Point (SCP). This process is commonly referred to as an 'IN dip'.

2.7 At the time the FRIACO service was launched in May 2000, Oftel accepted that in comparison to calls to numbers in blocks of 10,000, such as the majority of geographic numbers, the routing of FRIACO calls to numbers in blocks of 1,000 required additional switch decode. This switch decode was not available, and the use of BT's IN was one method of carrying out the additional processing that was required. Therefore, the Director permitted BT to make a reasonable additional charge for use of the IN to route FRIACO calls because of the additional processing required to route calls where numbers are allocated in blocks of 1,000 numbers.

2.8 However, Oftel understands that the shortage of switch decode is no longer a concern. This situation was remedied in July 2001. (Although there was regular dialogue with BT throughout the investigation, this information only became apparent to Oftel in February 2003). On the basis of this increase in resource availability and both current and forecast future demand for FRIACO, the Director provisionally concludes that sufficient switch decode now exists to enable FRIACO calls to numbers allocated in 1,000 number blocks to be delivered without necessitating an IN dip.

Congestion control

2.9 During the course of this investigation, BT has stated that the IN is not just required to route numbers allocated in blocks of 1,000 numbers, but also plays a central role in the management of network congestion. Oftel is unable to provide full details of BT's arguments due to commercial confidentiality. However, the Director has fully evaluated BT's technical arguments, and his conclusions are set out below.

2.10 BT has expressed particular concern about the need to protect its originating network, and possibly other operators' transit networks, from overload conditions triggered by the failure of a component in the terminating operator's network. Such a failure would be expected to trigger an unanticipated mass call event, as subscribers attempt to re-establish their dial-up connections to the internet. A mass call event triggered in this manner is expected to be particularly severe, due to the aggressive redial characteristics associated with the software auto-diallers frequently used for internet calls.

2.11 Oftel acknowledges that the use of the IN dip for congestion has a number of benefits, at least in principle. The use of the IN dip allows congestion controls to

be applied at the point of call origination, which is where such controls will be most effective, whilst the use of an IN-based network-wide call threshold represents a particularly effective solution to the problem of focussed overload.

2.12 However, despite these benefits, it is not obvious that the use of the IN dip to control congestion represents a necessary or proportionate response to any specified problem. BT's Standard Interconnection Agreement specifies that interconnecting operators *agree* appropriate network management procedures for congestion management. Oftel understands that BT has not notified interconnecting operators that it is using the IN dip for congestion control.

2.13 BT has identified three specific congestion issues that are being addressed by its use of the IN dip. These are described below.

Protection of DLEs from local overload

2.14 One of the main concerns expressed by BT is the need to protect its DLEs from overload. BT has addressed this issue by limiting the rate at which IN queries can be triggered from each DLE. This in turn limits the number of FRIACO call attempts.

2.15 Oftel acknowledges that this is a way of protecting the DLE from a local overload condition, but also notes that it is closely equivalent to the permanent application of call-gapping to FRIACO numbers. Since the use of permanent call-gapping would not require the use of an IN dip, Oftel has discussed with BT why this solution was not adopted.

2.16 BT has cited four reasons why IN-based rate-limiting is preferred to permanent call-gapping:

- BT has argued that, until May 2002 only a limited number of call-gap slots were available. Oftel does not however accept that this was a major constraint, since a single call-gap slot could have been used to apply a control to any consecutive range of numbers, and a single call-gap slot could therefore have been used to apply a control to all FRIACO numbers;
 - BT has argued that, until May 2002 it was impossible to apply a call-gap of less than one second. Oftel does not however accept that this was a major constraint, since applying a call-gap of one second to multiple sub-ranges is functionally similar to applying a call-gap of a fraction of a second to a single range of numbers;
 - BT has raised arguments about the effectiveness of the algorithm used by DLEs for call gapping. Oftel has considered whether this is likely to have a material impact on the delivered quality of service, given the level of call attempts expected in practice, and has provisionally concluded that this is unlikely because the rate of call attempts expected in routine operation is expected to be well below the threshold rate that must be applied in order for congestion control to be effective; and
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- BT has argued that even where call-gapping is effective, a very high level of rejected calls can still result in switch overload. Oftel acknowledges this concern, but notes that this problem has so far only arisen in relation to a very small number of unanticipated voice mass call events, and that BT is not proposing the introduction of an IN dip for voice calls in order to address this.

2.17 Furthermore, Oftel notes that there is at least one respect in which permanent call-gapping represent a better solution to congestion control than IN-based rate-limiting. IN-based rate-limiting applies a single threshold to all traffic that uses an IN dip to route calls. This means that a failure in one terminating operator's network will impact on the quality of service for all calls that use the IN. However, there are now sufficient call-gapping slots to allow permanent call-gapping to be applied on an individual basis to each number range belonging to a FRIACO operator, and this would ensure that a failure in one FRIACO operator's network would not affect other operators.

2.18 The Director provisionally concludes that there is a legitimate requirement to protect DLEs from overload conditions, but that this requirement can adequately be met by the permanent application of call-gapping. The ability to apply congestion controls using call gapping is already available, and so this approach should not require BT to incur any significant additional cost. The Director is not seeking to require that BT should put call-gapping in place. However, Oftel believes that OLOs should pay only efficiently incurred costs of protecting DLEs from overload and hence concludes that there is no justification for imposing the significantly higher IN charge in this respect.

Protection of the STP network from focussed overload

2.19 FRIACO was one of the first services deployed by BT to make extensive use of a STP network for interconnect signalling links. The benefit of this approach is that it allows multiple operators to share signalling links to BT's DLEs. This is much more efficient than requiring every operator to maintain dedicated signalling links to every DLE. However, a consequence of this shared use of signalling links is that signalling congestion due to a failure in one terminating operator's network will impact on the quality of service for all calls that use the shared signalling network.

2.20 The specific concern raised by BT in discussion with Oftel was that the volume of call attempts that could be generated by its DLEs, even after the local application of IN-based rate-limiting, was greater than could be handled by its STP network. This is because the STP network originally deployed by BT was not a purpose-built STP network, but was based on System X switches which were no longer required as DMSUs.

2.21 The solution adopted by BT was to use the IN to set a network-wide limit for the number of calls that can be carried to each FRIACO operator. This ensures

that the aggregate volume of call attempts generated by all BT's DLEs does not exceed the capacity of the STP network.

2.22 However, BT deployed purpose-built STPs in November 2001. These have sufficient throughput to be able to handle any load likely to be generated by the DLEs. Therefore, the Director believes that since November 2001, use of the IN to route FRIACO calls has not been necessary to protect the STP network.

Protection of interconnecting networks from focussed overload

2.23 BT has argued that the use of the IN may also protect elements within the networks of interconnecting operators from any overload condition.

2.24 Of tel acknowledges that the use of the IN may provide a means of protecting interconnecting operators' networks. However, this does not appear to be a consideration in BT's current use of the IN dip, since BT has not made any contact with interconnecting operators in order to establish an appropriate threshold for the congestion control. It is difficult to see how the congestion control can be effective in these circumstances. In any case, it would clearly not be for BT to impose such a solution, since it is the responsibility of interconnecting operators to manage congestion within their own networks.

2.25 The Director therefore provisionally concludes that the IN dip is not required to protect the networks of interconnecting operators from overload conditions. Interconnecting operators are free to enter into commercial negotiations regarding the use of the IN dip for this purpose.

Number Portability

2.26 During the course of this investigation, BT has argued that the use of an IN dip for FRIACO may also provide an efficient means of supporting number portability in relation to FRIACO numbers.

2.27 The technical implementation of number portability in the UK relies on the terminating switch forwarding a call to a ported number, and this can be difficult to implement in cases where the terminating switch is actually a modem bank, as may be the case for FRIACO calls. Even where it is possible for the terminating switch to forward calls, this tends to result in calls being routed in an inefficient manner. An alternative approach is to use an IN dip from the originating exchange to identify the destination of each call, and then route accordingly.

2.28 Of tel acknowledges the potential benefits of this approach to number portability, and has recently set out its own proposals in this area (Proposals to change the framework for number portability, 20 December 2002, <http://www.of tel.gov.uk/publications/numbering/2002/nupo1202.htm>). However, Of tel also notes that the formal responsibility for the provision of FRIACO number

portability lies with the operator who owns the FRIACO number block, and not with BT as an originating operator.

2.29 The Director therefore provisionally concludes that the IN dip is not required in order to support number portability for FRIACO numbers. Interconnecting operators are free to enter into commercial negotiations regarding the use of the IN dip for this purpose.

Conclusion

2.30 The Director has considered all the arguments made by BT as to why an IN charge is justified to handle FRIACO traffic and has provisionally concluded that there is no longer any justification for such a charge. Indeed, the Director has provisionally concluded that the justification fell away after November 2001.

2.31 When FRIACO was launched the Director accepted the use of the IN as necessary because of the shortage of switch decode in the DLE, however this problem was remedied in July 2001. During the course of this investigation he has also accepted that an interim use of the IN was justified to protect the STP network from focussed overload, but that problem was remedied in November 2001. In respect of the other reasons provided by BT during the course of the investigation as to why the use of the IN is necessary for FRIACO traffic and so why an IN charge is justified, the Director does not accept that any of these can justify the use of the IN at BT's current charges in the absence of commercial agreement with other interconnecting operators in respect of those particular matters. Accordingly, the Director is proposing to remove BT's right to make an additional charge for the use of IN to route FRIACO calls. The next chapter discusses why this is appropriate in the light of the Director's technical analysis.

Chapter 3

The Director's Proposals and Reasoning

Director's Proposals

3.1 The draft Direction which accompanies this explanatory memorandum proposes to remove BT's right to make an additional charge for use of the IN to route FRIACO calls. It also removes BT's right to make an additional charge for STP signalling services for FRIACO.

3.2. As explained in the previous chapter, the Director has provisionally concluded that use of the IN was no longer justified after the date when BT deployed purpose built STPs which had sufficient throughput to be able to handle any load likely to be generated by the DLEs (see paragraph 2.23 above). BT has informed the Director that this occurred in November 2001 and therefore it is proposed that the Direction should have effect from 1 December 2001. This will require BT to repay all purchasers of FRIACO the IN charge paid since 1 December 2001, together with interest on the repayments in accordance with Clause 13.13 of the Standard Interconnection Agreement.

3.3 In addition, it is proposed to remove BT's right to make an additional charge for STP signalling services for FRIACO, as signalling costs are included within the IEC charge. The Director notes that BT accepted in May 2000 that all signalling charges were effectively included in the price of a 2 Mbit/s IEC link (see Paragraph 33, the First Direction). The Director also notes that currently, no such additional charge is made for STP signalling services for FRIACO. By removing the right for BT to make an additional charge for STP signalling services, the Director is therefore simply seeking to clarify that no additional charges should be made for STP signalling services.

Director's Reasons

3.4 As explained in the previous chapter the Director has provisionally concluded that since November 2001 there has been no justification for imposing an IN charge to route FRIACO traffic. The Director believes that the routing service that the IN currently provides can be provided through the DLE by the enhanced switch decode capability provided in July 2001. Similarly, protection of the DLE from overload can be managed through permanent call-gapping at the DLE, and the network overload can be protected against by the use of purpose built STPs that BT has already deployed. The Director also considers that BT has market power in the relevant market (see below) and therefore for BT to charge in excess of cost of providing FRIACO services (given that the use of the IN is no longer justified) would adversely affect competition in the relevant market to the detriment of end users.

3.5 Accordingly, the Director considers that it is justified in this case to amend existing interconnection agreements using his powers under Regulation 6(3) of the Regulations to remove BT's ability to make an additional charge for the IN and STP signalling services for the purpose of FRIACO services, in that to do so will ensure the development of effective competition in the services using FRIACO. Further, having considered Regulation 6(1) of the regulations the Director believes that to make such a direction provides maximum economic efficiency and gives maximum benefit to end-users, and is necessary in order to stimulate a competitive market. In the absence of the proposed Direction BT will be effectively charging for the FRIACO service in excess of costs, as it will be making a charge where the costs are zero, since there is no need to use the service to which the charge relates. The effect of this would be to require purchasers of FRIACO to pay an excessive amount and so hinder the development of more effective competition in internet termination and ultimately unmetered internet access and so operate against the interests of end users.

The Relevant Market

3.6 The Director has considered what is the relevant market in which to assess whether BT has market power in relation to the provision of FRIACO and various applications of the IN.

3.7 Chapter 2 has discussed the various applications of the IN that BT has cited with respect to FRIACO. Each of the applications, namely routing, congestion control, protection of DLEs from local overload, and protection of the STP and interconnecting networks from focussed overload, is related to the origination of FRIACO numbers. FRIACO is a call origination product and therefore is part of the market for call origination. Hence in determining the relevant market, it is necessary to examine if the different applications that the IN provides are part of the market for call origination.

3.8 Due to the different functions that each application provides, a purchaser of call origination will not view any of these as a substitute for call origination itself. Further, any supplier offering these applications would not be able to easily enter into the provision of call origination due to the significant sunk and fixed costs involved in providing call origination services.

3.9 The Director believes that a provider of call origination services will seek to provide all types of call origination services because of the economies of scope present in doing so. Therefore providers of call origination would compete to provide a range or basket of services across a customer's exchange line rather than offering only limited services across many exchange lines. Such competition means customers choose the provider who can provide the range of services at the lowest price. The fact that wholesale call origination services face a common pricing constraint suggests that all call origination services should be treated as part of the same wholesale market.

3.10 In a similar manner, the provider of call origination will provide the applications associated with the call origination since the functionalities of such services are a value added element to the basic call origination service. As argued above, a common pricing constraint operates for the provider of such applications and therefore such services would be part of the market for call origination. The relevant market for the assessment of market power is therefore wholesale call origination.

BT's Market Power

3.11 Although BT faces competition in call origination from other providers of direct access networks, its market share in call origination is greatly in excess of those of its competitors. The Director estimates BT's current market share for call origination by volume to be around 75 per cent across all customers or 82 per cent for residential customers over the last three years (1999/2000 – 2001/2002). In addition, substantial barriers to entry are faced by new entrants due to the significant sunk costs required in providing such services.

3.12 The Director therefore concludes that BT has market power in the market for wholesale call origination. This implies that in addition to having market power in the provision of FRIACO, BT also has market power in the provision of applications such as routing FRIACO calls and the protection of the DLE and STP network.

Consequences

3.13 In the light of the Director's conclusion that BT has market power in the relevant market and the Director's provisional finding that use of the IN to handle FRIACO traffic is not required (see Chapter 2), the Director has considered the consequences of continuing to allow BT to make a charge for the use of the IN. He believes that these will lead to economic inefficiency, distort competition and so not be in the interests of end users.

3.14 The Director believes that the routing service that the IN currently provides can be provided through the DLE by the enhanced switch decode capability available since July 2001. Similarly, protection of the DLE from overload can be managed through permanent call gapping at the DLE, and the network overload can be protected against by the use of purpose built STPs that BT has already deployed. The costs of the switch decode and signalling links are already recoverable by BT through the average charges for the Call Originating Local Exchange Segment and the IEC links. To permit BT to recover the costs of the IN for provision of the above applications would lead to higher costs to users of FRIACO, and consequently, higher costs to end-users. This would not be economically efficient, as it would price the applications above the true cost of providing the services.

3.15 Furthermore, allowing BT to charge above the true cost of providing the services would distort competition in downstream markets between BT and the purchasers of FRIACO and therefore preventing BT from doing this is necessary to ensure effective competition to the benefit of end users.

3.16 The current charge for the IN constitutes 17.4 per cent of the cost of purchasing a FRIACO circuit. This is a significant cost for operators who need to purchase large volumes of FRIACO circuits to meet the demands of their customers. A high charge for purchasing FRIACO, including the IN dip, is likely to impact adversely on the strength of such operators to compete effectively with BT in the internet termination market. Operators particularly face a higher risk than BT in pre-ordering FRIACO circuits in anticipation of demand from ISPs and retail consumers. The Director takes the view that BT does not face similar risks when its position is assessed on an end-to-end basis. Any transfer charges incurred by BT Retail Systems Business for purchasing FRIACO circuits would be purely notional and be offset by notional profits in its network business. There are two reasons for this.

3.17 First, the IN charge paid to BT's Network Business (both by BT Retail Systems Business and OLOs) is significantly above the marginal cost incurred by BT Network Business in providing FRIACO IN dips. This means that BT's actual costs of the IN service per FRIACO circuit are substantially lower than the IN charges made by OLOs purchasing FRIACO circuits. Secondly, BT Network Business does not incur the marginal cost of the IN unless there is traffic flowing on a FRIACO circuit. Until FRIACO traffic actually flows on the circuit, no FRIACO IN dips will be triggered and no marginal cost will be incurred. However, OLOs are required to pay the standard charge for IN per FRIACO circuit irrespective of whether they use it or not. In addition, if BT is allowed to continue to charge for the IN, this, as explained above, will mean one of the key input services into the provision of retail unmetered internet access would be inflated above its efficiently incurred costs. This is likely to hamper the development of effective competition in internet termination and unmetered internet access. The effect would be to require purchasers of FRIACO to pay an excessive amount for FRIACO which would feed through to excessive retail prices and so reduce the benefit end users.

3.18 Therefore, the Director believes that there are exceptional circumstances which make it appropriate for him to intervene in interconnection agreements to ensure effective competition. Also, to allow BT to make an additional charge for STP when the costs are already recovered would also result in FRIACO being purchased in excess of its true costs and so for the same reasons as discussed above, the Director is proposing to remove this right.

3.19 It should be noted in this context that in the Director's recent consultation document which related to FRIACO and internet termination he set out the provisional conclusion that there was no individual or collective significant market power in the internet termination market. A copy of the consultation document is at http://www.oftel.gov.uk/publications/eu_directives/2003/eu_narrow_term/index.htm

However, such a conclusion was predicated on the basis of appropriate regulation of the wholesale call origination market. The appropriate regulation that is considered to be relevant for unmetered internet termination is the regulation relating to FRIACO. Amongst other things this includes ensuring that the charges for the FRIACO service reflect the costs of the service and so do not include the IN charge for which there is no justification. Accordingly the Director believes this draft Direction is consistent with the proposals made in the wholesale unmetered narrowband internet termination market review.

3.20 Whether or not the IN will continue to be used for FRIACO will be a decision for BT. It is for BT to decide how to provide services over its network so long as they satisfy regulatory requirements. However, for the reasons set out above the Director's provisional conclusion is that use of the IN for FRIACO calls is not necessary and so BT should not be permitted to charge for it in addition to the FRIACO virtual circuit charges.

Implementation

3.21 The Director has considered when the proposed Direction should take effect. As discussed in Chapter 2, the switch decode capability at the DLE was enhanced by July 2001 and purpose-built STPs were in place by November 2001, therefore the Director provisionally concludes that there was no justification for using the IN to route FRIACO calls after November 2001. Accordingly the Director proposes that BT's right to make a reasonable additional charge be removed as from 1 December 2001.

Cost recovery

3.22 The Director does not dispute that use of the IN for FRIACO was necessary initially from May 2000, but has provisionally concluded that it became unnecessary after November 2001. The Director has therefore considered whether BT has had the opportunity to recover its reasonably incurred costs relevant to the provision of IN for FRIACO in the period May 2000 - November 2001.

3.23 It is clear that BT's charges for FRIACO IN in the period May 2000 - November 2001 covered the relevant operating and capital costs reasonably incurred in that period. Firstly, the charge of £66 per 64 kbit/s circuit was set by BT itself based on its fully allocated costs. Secondly, since IN costs are caused on a per 'dip' or per call basis, the charge was based on an assumed number of FRIACO calls per circuit, reflecting a mature usage level. The Director does not consider such an approach to be unreasonable. Indeed, in principle it is consistent with the way in which the Director has himself set the adjustment ratio which is used in the derivation of the FRIACO circuit charge (Review of adjustment ratio for DLE FRIACO, which is at www.oftel.gov.uk/publications/internet/2002/dlefriaco0702.htm). However, the Director notes that the actual usage of the IN by FRIACO circuits was rather less than allowed for in the IN charge set by BT, ie the actual number of calls per circuit

was less than BT's assumption. This feature, although not unreasonable in itself, ensured in the view of the Director that BT's revenue from FRIACO IN at least matched its costs in the period May 2000 - November 2001.

3.24 It is possible that there could be a further cost relating to the cost of brought-forward investment. This could be relevant if all of the following conditions applied:-

- i. if BT needed to expand the capacity of its IN platform in order to serve FRIACO for the short run period of May 2000 - November 2001;
- ii. if there was a material cost of such additional capacity; and
- iii. if such capacity would have been left unused for a material period of time after November 2001 in the (hypothetical) scenario that BT had stopped using the IN for FRIACO after that date. The growth over time in use of the IN of other (ie non-FRIACO) traffic means that at most any IN capacity installed for FRIACO would have represented an investment brought forward.

Given the discussion above of costs and revenues in the period between May 2000 - November 2001 a further condition would also need to apply for there to be any need to make allowance for costs of brought forward investment (if any):-

- iv. if the investment cost (if any) multiplied by BT's cost of capital for the period of time such capacity was unused (if any) were materially larger than the excess of FRIACO IN revenue over cost in the period May 2000 - November 2001.

3.25 It appears to the Director that it is likely that at least one of i-iv does not apply and so BT has not been denied the opportunity to recover its reasonably incurred costs. However, if BT were able to provide the evidence to convince the Director that all of i-iv applied and the magnitude of any unrecovered cost (net of the over-recovery in May 2000 - November 2001), the Director would make a downward adjustment to the retrospective rebates to be paid by BT to operators that purchased FRIACO after November 2001.

3.26 As explained in 3.22, the IN charge is based on an assumed number of FRIACO calls per circuit, reflecting a mature usage level of the circuit. Since the actual usage of the IN by FRIACO circuits during May 2000-November 2001 was rather less than allowed for in the IN charge set by BT, this might have resulted in over-recovery. Consequently there might be a question of retrospective rebates during this earlier period of May 2000-November 2001. However, the Director believes that the basis for charging for the IN is consistent with the approach used in the Adjustment Ratio in the derivation of the FRIACO charge. The methodology for the adjustment ratio reflects the importance of deriving FRIACO charges that capture cost causation and are reasonably stable and sustainable. In a similar manner, the Director does not consider it unreasonable for the level of the IN charge to have been stable by basing it on the mature number of calls per

FRIACO circuit during the period of May 2000-November 2001 in which levying an IN charge was legitimate. Stability has the advantage of facilitating business planning for operators by providing reasonable predictability of the IN charge. Therefore, to allow operators with retrospective rebates on the basis of the actual number of calls rather than the mature number of calls will be inconsistent with the aim of providing stability in the charge. The Director clearly stated that this was his approach in the determination on the adjustment ratio when he stated that “one of the important principles adopted by Of tel in deriving FRIACO charges is that certainty about the charge should be promoted to facilitate business planning. Therefore the Director considers that changes in the adjustment ratio should not apply retrospectively”. Accordingly, the Director thinks it is inappropriate to provide operators with retrospective rebates for the period May 2000-November 2001.

Interest charges

3.27 In accordance with Clause 13.13 of the Standard Interconnection Agreement, it is proposed that BT will pay interest on repayments made under this Direction to operators from 1 December 2001. The applicable annual rate set out in Clause 13.13 as the 'Of tel Interest Rate' is the London Inter-Bank Offered Rate (LIBOR) plus 3/8 per cent.

Chapter 4

Consultation

4.1 The Director General's proposed draft direction is being made available to interested parties, together with the Director General's reasons, so that stakeholders may have a reasonable opportunity to make representations. The Director General seeks the views of interested parties on the proposals contained in this consultation document by **7 May 2003**. All non-confidential responses will be published. Having considered any such representations, the Director General will, if appropriate, make the direction and will notify BT and interested parties of that direction and his reasons for making it.

4.2 Where possible, comments should be made in writing and sent by e-mail to ruth.gibson@oftel.gov.uk. However, responses may also be posted or faxed to the address below. If any stakeholders are unable to supply their comments in one of these ways, please use the contact details below to discuss alternatives:

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50 Ludgate Hill
London EC4M 7JJ

tel: 020 7634 8976
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Further copies of this document

4.3 This document can be viewed in the *Publications* section of Oftel's website (www.oftel.gov.uk), under classification 'internet access'. Paper copies and more accessible formats such as large print, Braille, disc and audio cassette can be made available on request. Please contact Oftel's Research and Information Unit by phoning 020 7634 8761 or by sending an email to infocent@oftel.gov.uk.

Publication of representations made by stakeholders

4.3 On this occasion, Oftel is not programming a formal period during which interested parties may comment on the representations made by others. However, in the interests of transparency, all representations will be published, except where respondents indicate that a response, or part of it, is confidential. Respondents are therefore asked to separate out any confidential material into a clearly marked annex. However, in the interests of transparency, respondents are requested to avoid confidential markings wherever possible.

4.4 Non confidential representations can be viewed on Oftel's website in the Publications section under the classification *Responses to Oftel consultations*.

They can also be viewed at Ofcom's Research and Information Unit. Appointments must be made in advance by phoning 020 7634 8761 or sending an e-mail to info@ofcom.gov.uk.

Annex A

Glossary of terms and acronyms

DLE – Digital Local Exchange – The telephone exchange to which customers are connected, usually via a local concentrator.

DMSU – Digital Main Switching Unit – The main type of tandem switch, primarily used for conveying long distance calls.

FRIACO – Flat Rate Internet Access Call Origination

IEC – Interconnection Extension Circuit

IN – Intelligent Network – A telecommunications network in which the network intelligence is centralised and separated from the switching function.

STP – Signalling Transfer Point – A facility whereby C7 signalling messages can be passed between exchanges without requiring a discrete circuit between them.
