INTERCONNECT COMMUNICATIONS

Ofcom

MC / 065: Relay Services Technical Assistance

Use of Relay Service Suppliers and Estimates of Additional Costs

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Contents

1. Background

Ofcom has asked some additional questions regarding the migration of the Text Relay Service and the costs of connecting to it by Other Generally Authorised Operators (OGAOs). This short report has been prepared by InterConnect Communications in order to address these questions and provide some background information for Ofcom as to how both BT and OGAOs may be affected.

2. Technological Steps Required to Connect to an NGTR

What are the technological steps that (a) Mobile Network Operators (MNOs) and (b) fixed communications providers would need to take to connect to a Next Generation Text Relay (NGTR) service (of the kind previously contemplated by InterConnect in their report in 2011) run by a provider? This would include any costs associated with call diversion, as a result of the removal of the dialling prefix.

Currently any relay calls initiated from an operator which is not BT would be sent to the BT relay service over the interconnect links which would exist between that OGAO and BT. These are the same interconnect links that are used for all other types of traffic. If the BT service continues then no changes will be required. In the event of an operator other than BT providing the relay services to customers of non-BT operators or a new OGAO enters the market, three possibilities are presented:

1. The OGAO would send and receive the relay calls to the relay platform operator using direct interconnect links already in service for all types of traffic between those two operators.

2. The OGAO would install new interconnect links to send the traffic to the relay platform operator.

3. If no direct interconnect exists between the OGAO and the relay platform operator, the calls would be transited via BT. Such a solution would probably already be in place for any non relay traffic between the two operators.

If BT were the NGTR provider, there would be no additional steps or cost for originating operators compared to the current costs to connect to the text relay node.

If some other provider were the NGTR provider there may be some additional steps and cost for originating operators compared to the current situation, as follows.

In the first and third cases above, the direct or transit links may need to be augmented to a degree if an increase in originating and terminating relay calls causes additional interconnection capacity to be required, either directly or via BT. As a result some additional cost would be incurred by the originating operator.

In reality however it is likely that the number of relay calls between an OGAO and a text relay platform operated by another operator would not cause a significant need for additional interconnection capacity and any increases needed would probably disappear into the background noise of general interconnection traffic management. Each operator is already originating and terminating those calls with the BT text relay platform so the current interconnect links with BT should be dimensioned to take account of this traffic. Although the total amount of traffic being handled by the BT text relay service is currently known, and has been used for previous cost estimate calculations, no data is currently available as to which networks are originating and terminating this traffic. However the majority of text terminals are currently used on fixed networks and BT, as the historic incumbent operator, is likely to be the major source and destination of this traffic (although mobile networks are likely to generate an increasing volume of speech originating calls to the text relay service). So, there are grounds for the view that, subject to certain points about prefix and routing issues below, for any OGAO the steps required, and their costs, would be minimal.

In the second case there would be additional steps and additional capital and annual costs and these are discussed below.

Based on our understanding of the current arrangements there should be no difference in this concept of required interconnection links for fixed and mobile operators originating and terminating relay calls, as each type of operator either interconnects directly, or indirectly via BT, with other operators, depending on its commercial requirements. Small amounts of traffic passing between operators may mean it is uneconomic to support a direct interconnection between them in which case BT is used as a transit operator as its transit charges are low, and all operators interconnect with BT.

2.1 Prefix and Routing Issues

Ofcom has asked additionally about call routing and the removal of the dialling prefix which is currently used to route calls to the text relay service for inbound calls. This question is likely to present a number of issues to network operators which may well be somewhat different for fixed and mobile operators, depending on the practical solution which is implemented. We discuss these below, and for completeness, we refer to outbound calls in Annex A to this report.

2.1.1 Inbound Calls to a Text User

Without a call prefix, the telephone network needs a way to identify that the inbound call is destined for a text user and so must be diverted via the text relay platform operator. This could be done in one of two ways:

- Option 1: Using a number within the number block already allocated to the network operator which would need to be forwarded to the relay platform based on a look-up (by the originating OGAO).
- Option 2: Allocating new number codes or blocks such as 03 or 07 to the text relay service which would then be routed directly by the originating OGAO, without a look-up, to the appropriate relay platform if there is more than one. Ofcom has informed InterConnect that this is the likely method to be used by BT (as the current relay provider).

Option 1

Under this option, fixed and mobile operators are likely to handle the call forwarding in slightly different ways. With fixed networks it is likely that some form of look-up would need to be used. Such a mechanism would be similar to that used to determine whether a number had been ported to another network. In addition, a similar arrangement for the onward routing to the destination would be needed to prevent circular routing[1].

The number allocated to the text relay and routed via the text relay platform would be a second number associated with the fixed destination. This would mean that only the calls to the text terminal would need to be routed via the text relay platform and other voice calls could continue

[1] Circular routing occurs when one network sends a call to another network which in term returns it to the same network. This could occur if the text relay platform returned the call to the originating network with the same destination number which would result in the call being routed back to the text relay platform. The relay platform would need to add a prefix to the destination number in order to prevent this.

to be routed directly to the destination location. This would prevent the inefficient use of the text relay platform and the interconnect links.

In mobile networks a second number is unlikely to be needed as the called number will be dedicated to a single handset and if it is a text terminal then it would be reasonable to route all incoming calls via the text relay platform. With the current and expected technology used for the text relay, calls that are answered by a non-text user, i.e. in voice, will not trigger the allocation of a Relay Assistant and the call will be transparent from the point of view of the caller. The call forwarding to the text relay platform could be done through use of the Home Location Register (HLR) although some arrangement would also need to be made for the return of the call from the relay platform operator to prevent circular routing.

Option 2

The other option would be to use a block or blocks of non-geographic numbers (e.g. 0X000) specifically for text users. Calls to text users would be achieved by the caller dialing a number in the 0X000 range which would deliver the call to the text user via the relay service. Potentially, and most likely, the relay service(s) could hold the look-up table to route the call to a standard fixed or mobile number. The advantage of this method is that if there were to be more than one relay provider, then sub-blocks of 0X000 numbers could be issued to each provider for their service.

Additionally, calls to other, non terminal using, members of the household would not be affected and they would use the standard number and thus not be routed via the text relay node.

One potential issue here is billing. Calls to the text number may be local or national in fixed networks and on-net or off-net in mobile networks and thus should offer varying call rates. This is not practical with a non-geographical number. This issue could be addressed by offering a discount for text users so that all calls attract a reduced charge. This could be justified on the same lines as BT's current discount for text callers given that text calls take, on average, five times longer than speech calls for the same amount of information.

Care would need to be taken however to avoid potential fraud. Consideration could be given to the current system employed by BT that applies the discounted rate only when the call is connected to a text terminal. If the call is all or partly in speech a different, higher charge rate applies for the non-text portion(s).

2.2 Cost Categories

What categories of costs would those steps involve for (a) MNOs and (b) fixed communication providers? What are InterConnect's estimates for each category and costs in both cases?

If BT were to continue to offer a relay service on a wholesale basis, this is likely to be the least cost scenario for OGAOs as no additional costs would be incurred by interconnecting operators as their current interconnection arrangement would continue.

The arrangements set out in cases 1 and 3 on page 5 above should not involve any additional capital and current account costs to the OGAO irrespective of whether the OGAO uses a BT provided NGTR or a service provided by another network operator.

The second option would involve additional costs whether the NGTR is provided by BT or by another network operator. These would represent our estimate of a worst case cost scenario, as set out further below.

The external costs to set up an interconnect link to a text relay provider are likely to be much the same for MNOs as for fixed operators, as the process and structure of interconnection is the same for both, but the costs for using the text relay service may be different (unless they become regulated) due to the respective commercial arrangements between the interconnecting parties.

Any text relay service provider would need two nodes to offer redundancy in the case of node failure. Therefore it is assumed that two text relay nodes would be installed and operators sending and receiving traffic to/from the relay service would need a minimum of one E1 link to each node, therefore a minimum of two E1 links.

InterConnect has used the relay services traffic model already developed for and provided to Ofcom to calculate interconnect capacity requirements for the links to the node. If a single operator was originating up to 12.5% of the total current volume of relay calls, then the minimum of 2 E1s would be sufficient to carry the relay traffic. Once more than 12.5% of the current relay traffic was being originated an additional E1 per node would need to be installed, and once more than 37.5% of the current relay calls were being originated by one operator then 3 E1s per node would be required.

As with any interconnect link, there would be one off connection costs and then ongoing rental charges associated with the links required to send traffic to and from the relay nodes. The cost for these links would be the same as for the rest of the interconnect links between the two operators. The level of the link charges may be different from those charged by BT, as the link charges would not be regulated, just negotiated between the operators as part of their agreement.

The operator providing the text relay service would also charge an “Access to Relay Service” fee to the originating operator and a charge for terminating the call on the destination network, as does BT today. The level of the access fee in particular may include an element of recovery of the capital cost of the platform implementation as well as an element for ongoing maintenance. Both the access fee and termination charge are ongoing (non capital) costs which will vary with the volume and duration of calls. These are currently payable to BT, so it is likely that the principle of payment would remain the same for the next generation text relay service offered by an alternative provider.

The table below shows an estimate of the categories of costs of setting up a new interconnection link between an operator and the alternative text relay provider. The assumptions used in these figures are:

- Interconnect link prices are those taken from the latest version of BT’s carrier price list for a Customer Sited Interconnect link. It is assumed that the alternative operator providing the text relay service, provides interconnect links at the same cost as the wholesale prices as offered in the standard BT Carrier Price List. The costs assume that the originating operator’s port costs are the same as BT’s
- Different interconnect link distances have been modelled as the exact length of the interconnect link is not known

	Unit Cost	Interconnect Link Length (km) 10	50	100
CSI Interconnect Link Connection Per 2 Mbit/s	£ 982.38			
CSI Interconnect Link Fixed Rental per 2Mbit/s pa	£1,103.64			
CSI Interconnect Link Distance Rental per km per 2Mbit/s pa **	£ 22.00	£ 220.00	£ 1,100.00	£ 2,200.00
Intrabuilding Link (port) Connection Per 2Mbit/s	£ 808.36			
Intrabuilding Link (port) Rental per 2Mbit/s pa **	£ 100.92			
Originating Operator Port Connection per 2Mbit/s	£ 808.36			
Originating Operator Port Ongoing Annual Cost per 2Mbit/s pa	£ 100.92			
Total On Off Cost per 2Mbit/s		**£ 2,599.10**	**£ 2,599.10**	**£ 2,599.10**
Total Annual Cost per 2Mbit/s		**£ 1,525.48**	**£ 2,405.48**	**£ 3,505.48**

Number of 2Mbit/s Links required to Access Relay Operator, including redundancy	2Mbit/s	Interconnect Link Length (km) 10	50	100
One Off Cost	2	£ 5,198.20	£ 5,198.20	£ 5,198.20
Annual Cost	2	£ 3,050.96	£ 4,810.96	£ 7,010.96
One Off Cost	4	£ 10,396.40	£10,396.40	£10,396.40
Annual Cost	4	£ 6,101.92	£ 9,621.92	£14,021.92
One Off Cost	6	£ 15,594.60	£15,594.60	£15,594.60
Annual Cost	6	£ 9,152.88	£14,432.88	£21,032.88

** Shows prices correct as of 1 April 2012

The table shows one off and annual estimated costs to an operator of setting up a new interconnection link between itself and the network of an operator providing the text relay service.

Scenario	Cost Impact		
1 - Connect to Text Relay Operator using Current Interconnect Links	No additional cost		
2 - Connect to Text Relay Operator using New Interconnect Links	10km Interconnect Link	50km Interconnect Link	100km Interconnect Link
One off cost - 2 x E1 Interconnect link	£ 5,198.20	£ 5,198.20	£ 5,198.20
Annual cost - 2 x E1 Interconnect link	£ 3,050.96	£ 4,810.96	£ 7,010.96
One off cost - 4 x E1 Interconnect link	£ 10,396.40	£ 10,396.40	£ 10,396.40
Annual cost - 4 x E1 Interconnect link	£ 6,101.92	£ 9,621.92	£ 14,021.92
One off cost - 6 x E1 Interconnect link	£ 15,594.60	£ 15,594.60	£ 15,594.60
Annual cost - 6 x E1 Interconnect link	£ 9,152.88	£ 14,432.88	£ 21,032.88
3 - Connect to Text Relay Operator using transit via BT	No additional cost		

The table above shows the comparison of the estimated additional cost required by the originating operator for each of the three interconnection scenarios detailed.

In addition to the costs shown above are internal operator costs for administration of the text service including management and operation of the service, marketing its availability and so on. These costs will likely be absorbed into the general running costs of services as a whole (as the scale of the text relay service calls is fairly small), but may well differ between fixed and mobile operators depending on their processes and efficiency. As these costs are likely to be small and difficult to quantify from outside a particular operator, they have not been included in the above figures.

The costs above also do not include any provision for the routing of calls without a prefix. Were operators to take prefix Option 2 in 2.1.1 above, there would be no additional cost. Were operators to take prefix Option 1 then costs will be different for each operator, fixed and mobile,

depending on the solution which they choose, the equipment which they are using and what their vendors charge them for the necessary upgrades. InterConnect does not currently have access to such costs and is not at present able to provide any realistic estimates.

3. Lifespan of the Current System and Replacement Cost

We understand that BT's current text relay service would need to be replaced soon in any event. Could you give us an estimate of the lifespan of the current TR service and how much it might cost BT to develop a replacement (as in a new system that would replicate its current functions)?

The current BT "Text Direct" system went live in 2001 and is likely to be reaching the end of its economic and operational life. Given that it was largely custom built for the purpose it is probable that maintaining it is going to become increasingly costly and that BT will be looking to replace it in the near future.

To maintain the current functionality, it is InterConnect's expectation that BT is unlikely to go down the route of having another custom system built. Instead they would buy one of the systems now available that have already been discussed in earlier documents as a virtual turnkey solution. Whether or not this solution has additional functionality will have little bearing on the capital cost, but BT may wish to increase the facilities offered to its relay customers and/or reduce operating costs by using such available additional facilities. The estimates of costs of such a replacement system are as already provided by InterConnect to Ofcom.

Annex A

Outbound Calls

If Ofcom were to require the removal of prefixes for outbound calls to relay services, then the networks will need to be able to identify the calling number of outbound calls from users of text terminals and then route such calls to the relay platform operator. This is not unlike the arrangements for carrier preselection which already exists in fixed networks.

It must however also be recognised that deaf people are often not the only users of a fixed line for both outbound and inbound calls as the lines are usually shared with other hearing family members. This “carrier preselection” method could therefore introduce practical problems for other, non -text users, of the same telephone line. Of key importance must be the routing of calls to emergency services.

This may not be a large problem if the current system is examined. Currently, if a call originating from a speech user is answered by another speech user, the text relay node detects that speech-speech has been established and thus does not involve a Relay Assistant. If this subsequently changes to a text terminal then the text relay node detects the change and invokes relay procedures. Assuming a similar system is integrated within the new relay system(s) then voice calls from lines which have preselection for relay activated numbers will route through the node and proceed as a standard voice call. This approach however will tie up some of the interconnect links and node capacity for the duration of that call.

Mobile networks do not generally have carrier preselection facilities enabled. However, for text terminals which are connected to mobile networks a similar process would apply, but it is less likely that the telephone number will be shared with hearing users and so a default routing to the relay system(s) should be less problematic. In the absence of carrier preselection in mobile networks each network operator would need to adopt some form of call forwarding solution and this may be a bespoke solution for each mobile network operator.

The same scenarios will exist irrespective of whether the terminal is allocated a geographical, 07 or non geographical number.