OFFICE OF COMMUNICATIONS

An assessment of alternative solutions for UK number portability

Policy statement

Consultation

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Contents

Section 1

Summary

1.1 This statement summarises the responses Ofcom received to last year's consultation entitled "An assessment of alternative solutions for UK number portability" and sets out Ofcom's conclusions. These responses have been taken into account by Ofcom in relation to the matters subject to consultation.

1.2 With regard to the assessment of an Intelligent Network (IN) central database solution ("CDB") for number portability, Ofcom concludes that mandating such a solution is not cost justified. However Ofcom would seek to remove any regulatory obstacles should Industry choose to implement a CDB approach.

1.3 Ofcom concludes that the Number Portability Commercial Group should continue to investigate potential contingency measures to address number portability continuity where business failure leads to the loss of service and inability to use telephone numbers as a result of the implemented number portability solution. Ofcom will work with Industry and other stakeholders towards the realisation of viable and effective contingency measures to protect consumers.

1.4 The move to Next Generation Networks (NGNs) is a timely opportunity to revisit the implementation of number portability and the options for next generation number portability should be considered now, whilst NGNs are being planned. Ofcom will send a clear signal, through its NGN work programme, of its expectation that a more robust solution for number portability should be adopted in a future NGN environment.

Section 2

Background

2.1 Number portability is a regulated facility which enables subscribers of publicly available telephone services (including mobile services) to change their service provider whilst keeping their existing telephone number. Its purpose is to foster consumer choice and effective competition by enabling subscribers to switch between providers without the costs and inconvenience of changing telephone number. The UK is required to ensure the provision of number portability to subscribers pursuant to Article 30 of the Universal Services Directive (2002/22/EU).

2.2 The UK technical solution for number portability (both fixed and mobile), at a network level, is based on the principle of indirect routing. This is sometimes referred to as onward routing or call forwarding. In short, the originating network serving the calling subscriber routes calls to the number range holder. (This is the communications provider to whom Ofcom has allocated telephone numbers in order that they may provide service to their subscribers.) The number range holder is responsible for identifying calls to any of its numbers which have been ported. Where a call is made to a ported number the range holder onward routes the call to the recipient network over agreed interconnect arrangements (direct or transit). The detailed way in which this is achieved, technically speaking, varies between geographic, non-geographic and mobile portability.

2.3 On 26 August 2004, Ofcom published its consultation document on its assessment of alternative solutions for UK number portability. This document is available on the Ofcom web site at http://www.ofcom.org.uk/consult/condocs/uk_numb_port/uk_numb_port_cons/?a=87101

2.4 The ten week consultation period closed on 4 November 2004. Ten responses were received and all non-confidential responses were published. They are available on the Ofcom website at http://www.ofcom.org.uk/consult/condocs/uk_numb_port/Responses/?a=87101 A list of respondents is at Annex 1.

2.5 The consultation sought the views of stakeholders on Ofcom's economic assessment of central database ("CDB") number portability solutions, such as those adopted in several EU countries, the US and elsewhere. CDB solutions are considered most likely, from a technical perspective, to ensure that landline subscribers can transfer their telephone numbers between competing communications providers without the risk of losing their numbers in situations where networks fail.

2.6 The failure of Atlantic Telecom in 2001 resulted in some 14,000 customers having to switch to another provider and take a new telephone number. The current number portability facility could not support the provision of telephone service to customers who had already transferred their number to another provider regardless of how long ago this transfer took place. Neither could it support the transfer of telephone numbers for Atlantic Telecom customers who had no option but to take service from another provider.

2.7 Ofcom's assessment was informed by a report commissioned from Mason Communications Limited ("Mason") which was published alongside the consultation. This is accessible on the Ofcom website at

http://www.ofcom.org.uk/consult/condocs/uk_numb_port/uk_numb_port_cons/mason/mason_report.pdf

2.8 The assessment, looking over a ten year period, showed that the costs of CDB solutions in the context of currently deployed circuit-switched network technology were likely to exceed the benefits. The most viable of the options covered by the assessment, a solution called All Call Query ("ACQ") where all calls are queried against a porting database and routed directly to the network serving the subscriber, was shown to carry a net cost of £200.6 million using core assumptions. Ofcom also highlighted that migration to Next Generation Networks ("NGNs") over a five to ten year time frame offered opportunities to migrate to a new solution to number portability. But investment now in legacy circuit-switched infrastructure risked assets becoming obsolete in only a few years time.

2.9 Ofcom drew an initial conclusion that an Intelligent Network ("IN") based CDB approach was unlikely to be cost justified and that it should not therefore be implemented as a regulatory solution to the public policy issues raised by business/network failures. However Ofcom wished to consult with stakeholders on its assessment in order to check the robustness of its analysis and to enable it to come to a final conclusion on whether an IN based CDB solution for number portability should be mandated. The consultation also enabled Ofcom to seek stakeholder views on other practical, technical and strategic issues. The consultation asked twelve specific questions. These are listed in Annex 2.

Section 3

Summary of consultation responses

3.1 Ofcom received responses to its consultation document from communications providers and industry bodies. Organisational respondents included: the Internet Telephony Service Providers Association ("ITSPA"); the Association of Communication Services Providers ("ACSP"); and the Number Portability Commercial Group. Several communication providers also responded including: BT; Cable & Wireless; Inclarity plc; T-Mobile; a joint response from Uniworld Communications and Gamma Telecom; and Vodafone.

3.2 Almost all the respondents agreed that there was not a robust economic case for an IN CDB solution and that Ofcom should not, therefore, mandate such a solution for UK number portability. There was less support for Ofcom's proposals to implement short term contingencies to address any future forced number changes arising from a network failure. Most respondents thought it was too early to say whether a direct routing solution would emerge as a consequence of migration to NGNs and whether 'infrastructure' ENUM might be adopted as a future database for number portability in an NGN environment.

3.3 The following pages summarise in more detail the responses to specific questions posed in the consultation document.

Question 1: *Do you agree that the three options Ofcom has chosen to consider represent the scope of technically viable IN based CDB solutions?*

3.4 All responses to this question agreed that the three options, (1) IN interrogation using All Call Query ("ACQ"), (2) IN interrogation using Query on Release ("QoR") and (3) a hybrid of options 1 and 2, broadly represented the current technical scope.

3.5 The fixed network providers had identified the hardware required to convert existing switches for ACQ but was not clear if the hardware was available or whether switch manufacturers could produce it in the quantity required to change all UK switches. Similar issues regarding switch development were also relevant for QoR and, as Ofcom and respondents all noted, this option alone does not address the issue of a failing network.

3.6 ITSPA suggested that there is significant value in selecting distributed database solutions although Mason reported that no operator interviewed in the course of its study was positive about US style local switch databases.

Question 2: *Do you agree that Ofcom has identified the relevant benefits of significance in the context of this Regulatory Impact Assessment ("RIA")?*

3.7 All responses to the question agreed that the relevant benefits had been broadly identified. One respondent suggested that some of the benefits are general to number portability rather than specific to a CDB assessment but no respondent identified any potential benefits which had been omitted.

Question 3: *Do you agree with Ofcom's assessment on the potential size of Type 2 benefits?*

3.8 'Type 2' describes a category of benefits. Type 2 benefits may arise if improvements to the number portability regime led to increased levels of customer switching and hence increased competition. These cost reductions stemming from increased competition would constitute Type 2 benefits.

3.9 Most responses to this question suggested that the Type 2 benefits were exaggerated and the costs of implementing an IN based CDB solution were underestimated. Most respondents also considered that a CDB solution would have little or no impact on overall competitiveness or on port volumes. ITSPA took the opposite view suggesting that the benefits had been underestimated by not considering the impact of the entry to market of new voice service providers. ITSPA suggested that the lower costs to new entrants of a CDB approach, as opposed to the current solution, would drive an increase in portability and overall competition.

Question 4: *Do you agree that the ten year life of investment Ofcom have used in this assessment of the costs and benefits of a CDB architecture are appropriate?*

3.10 Almost all responses to this question considered that the ten year period Ofcom used was too long. Most respondents cited the migration to Internet Protocol (IP) NGNs over a five to seven year time period as having the potential to render upgraded legacy switches obsolete.

Question 5: *Do you agree that there is not a robust economic case for investment in IN based CDB over a ten year period? If you disagree, explain why?*

3.11 All respondents with the exception of ITSPA agreed that investment in an IN based CDB solution for UK number portability is not cost justified. ITSPA strongly disagreed suggesting that no value had been calculated for the impact on new voice services as summarised in question 3 above.

Question 6: *Do you agree with Ofcom's initial conclusion that it should not mandate the implementation of an IN based CDB solution for UK number portability?*

3.12 Only ITSPA disagreed with Ofcom's initial conclusion. Another respondent argued that the current number portability solution is not fit for purpose or consistent with competition requirements. The inefficiencies associated with the current solution make it less attractive to new entrants, dampening switching, and therefore maintains incumbency advantages. The respondent therefore argued that regulatory intervention was required to address these incentives.

Question 7: *Do you agree that, if an IN based CDB solution is not viable, Industry (landline providers) should implement option B or C (or a hybrid) as a contingency measure to address forced number changes arising from any future network failure?*

3.13 Respondents presented a range of views on question 7. ITSPA, ACSP, Uniworld Communications and Gamma Telecom did not support expending any resource on the development of contingency measures.

3.14 The Number Portability Commercial Group, which is currently investigating possible contingency measures, believes that a single solution will not support every potential 'failure' scenario. BT, Cable & Wireless and Inclarity plc suggested that any such contingency measures would have to have the full support of Ofcom and the DTI in order to encourage administrators or liquidators to work with Industry to secure the relevant contingency arrangements.

3.15 Whilst BT agreed that it wished to see a better solution for customers, it argued that the provision of such safeguards for consumers has nothing whatsoever to do with number portability but arises as a result of a company going out of business – a consequence of competition. BT suggests that the costs of such contingency measures should be borne by those customers who benefit from it together with public funding. In the absence of funding then BT suggests that caveat emptor applies. Vodafone also considered that individual consumers retain an element of responsibility in selecting a network.

Question 8: *Do you agree that voluntary migration to a direct routing solution for mobile number portability is likely? If so, over what time period?*

3.16 Vodafone and T-Mobile confirmed that voluntary migration to a direct routing solution for mobile number portability is likely. Vodafone indicated that the timing of such a change was "in the medium term".

Question 9: *Do you consider that migration to NGNs will necessitate a change to the current Onward Routing solution for number portability? If yes, what changes and for what reasons? If no, why not?*

3.17 All responses agreed that migration to NGNs will not, of itself, necessitate a change to the current solution i.e. the call forwarding between donor and recipient networks. The migration to NGNs would have to be designed with backward compatibility with pre-NGN networks. However, some respondents suggested that a direct routing solution might nevertheless emerge as a preferred solution to increase capability and reduce costs. Some respondents also pointed out that a CDB approach to number portability might be more inherently efficient in a NGNs era. For example functionality to translate between telephone numbers and IP addresses may form an integral part of call routing.

Question 10: *Do you consider that Ofcom has a role to play in considering whether a CDB approach to number portability should form part of the development of NGNs?*

3.18 Most respondents thought Ofcom should have a role to play or would inevitably be involved given its general duties. Most envisaged Ofcom's role to be advisory or one of general oversight whereas major Industry investments, such as the solution for number portability, should be based on commercial considerations.

Question 11: *What changes (if any) do you think may be necessary to the current regulatory framework for number portability e.g. the Number Portability Functional Specification in response to migration to NGNs?*[1]

[1] In its response to Ofcom's consultation on conserving geographic numbers published on the 16 February 05 (http://www.ofcom.org.uk/consult/condocs/geo/), ITSPA commented that it "would like to reiterate its calls for a Central Database System for number portability to be implemented from the outset of 21CN (rather than an Onward Forwarding system, as is currently in use)."

3.19 All responses considered this question to be premature with the exception of ITSPA who consider that changes are required now to mandate a CDB solution, rather than waiting for the result of migration to NGNs.

Question 12: *What are your views on any 'operator' or 'infrastructure' ENUM facility being used as a future number portability database? What are the potential benefits and drawbacks of this?*

3.20 There were mixed responses on ENUM (a standard to map telephone numbers onto Internet domain names). But, most respondents did agree that it was too early to say whether infrastructure ENUM could or should provide a core function to number portability in an NGN era. For example, Cable & Wireless suggested infrastructure ENUM is likely to be a "prime candidate" for number portability whereas BT suggested ENUM was less likely to be adopted for number portability as it was likely to perform real time functions as opposed to the administrative functions performed by a number portability CDB.

Section 4

Ofcom's response and conclusions

Overview of responses

4.1 The responses show the different perspectives of established communications providers and new entrants to markets where number portability has a significant impact. New entrants are likely to have a much higher proportion of subscribers with ported numbers. New entrants may therefore be expected to seek changes to the porting solution which benefit them e.g. a reduction in costs borne by net gainers, whereas the incentive for established providers may be to resist change.

4.2 There were some comments which questioned the basis for Ofcom's assessment of alternative solutions for UK number portability. For example, ITSPA did not view protecting consumers against network failure to be a primary benefit of number portability and BT set out its argument that the issues surrounding network failure have nothing to do with number portability.

4.3 Ofcom's responsibility is to ensure that UK number portability facilitates consumer choice and effective competition in a competitive communications market and that the right to retain their telephone numbers on public telephone networks, independently of the business providing the publicly available telephone service, is afforded to UK subscribers.

4.4 Ofcom believes that no matter how carefully a consumer chooses their provider, that choice may be affected adversely by a combination of business failure and the way the current number portability solution works. The consequence for the consumer is severe and damaging i.e. both loss of service and loss of their telephone number.

4.5 Ofcom would disagree with any suggestion that consumers, who ported from one provider to another, can be considered to be at fault for failing to have given sufficient thought to the future business prospects of their original provider. Moreover, consumers are in all likelihood unaware of how number portability actually works.

4.6 If there were further businesses failures, in circumstances like that of Atlantic Telecom, and if this then led to a loss of consumer confidence in number portability, there would be a risk of damage to competition. It is therefore wholly consistent with Ofcom's general duties to assess alternative solutions or enhancements to the current implementation which seek to break the link between network failure and number portability or otherwise mitigate the damage caused.

4.7 The economic assessment nevertheless brought together a much broader range of issues relating to number portability not just those associated with network failure.

Conclusions in relation to the economic assessment

4.8 Bearing in mind the respective positions of stakeholders, the economic assessment produced by Ofcom prompted anticipated responses. More established providers tended to comment that the assessment underestimated the costs of a CDB solution and overestimated the benefits. New entrants responded in the reverse suggesting that the assessment underestimated the benefits of a CDB solution. Ofcom's economic modelling did take account of variations using a technique called 'sensitivity analysis'. Because many of the factors informing the assessment can only

be estimated, the analysis used low, core and high figures to test the overall outcome of the analysis against a wide range of assumptions. Ofcom accepted that there could be some reduction in porting costs and that this could lead to increased porting (although not specifically mentioning the entry to market of new voice services) and hence switching, although the results of the analysis suggested the benefits were likely to be small. In addition, Ofcom recognised that the new system could make it quicker to establish porting arrangements for new entrants. However, the impact of these factors was expected to be negligible given that few consumers have identified the system as a barrier to porting. Only when using the most optimistic assumptions, did the analysis support a net benefit after ten years for the more viable ACQ solution. Ofcom notes that most respondents considered that a ten year discount period was too long given the likely timescales of five to seven years for migration to NGNs. Using Ofcom's most optimistic case the Net Present Value ("NPV") for ACQ over a five year discount period was minus £46.5 million.

4.9 In summary, the costs of implementing an IN based CDB solution in current UK PSTN networks are high. Proceeding with such a significant development in legacy networks at a time when widespread migration to IP telephony in the UK seems probable over a period of probably less than ten years is likely to be an unsound investment decision. The potential benefits of a CDB solution, particularly in terms of the impact on the level of porting, are not clear. On the one hand there is little evidence to support the view that more consumers will port their numbers simply because the new solution overcomes the problem of network failure. Moreover, some consumers may have switched their provider via Carrier Pre-Selection ("CPS") and, more recently, Wholesale Line Rental ("WLR") products instead of switching to an alternative network via number portability. On the other hand, there may be a resurgence of number portability through the entry to market of new voice service providers, Local Loop Unbundling ("LLU"), evolving CPS/WLR inbound products and, potentially, fixed to mobile convergence and substitution. A CDB solution might increase the level of porting if it proves to be more commercially attractive to communications providers and new entrants in particular. However, Ofcom notes that whilst a direct routing approach might resolve the additional conveyance costs which impact net gainers, leaving aside any cost recovery arrangements for the upfront investment of a CDB solution, additional costs will still be incurred in providing and administering number portability.

Having taken all the responses from stakeholders into consideration, Ofcom has concluded that an IN based CDB solution is highly unlikely to be cost justified and it will not therefore seek to mandate such a solution in response to concerns about the current onward routing solution. However Ofcom will seek to remove any regulatory obstacles should Industry wish to implement a CDB approach.

The future

4.10 Whilst Ofcom agrees that imposing migration to a direct routing solution is not an option at this point in the life-cycle of the PSTN, it has already begun to highlight number portability in the context of developments toward NGNs: a role which most respondents supported in response to this consultation.

4.11 In its consultation of November 04 entitled "Next Generation Networks – Future arrangements for access and interconnection" Ofcom sought responses on whether a new approach to number portability might be appropriate given the potential for degradation of quality of service where calls traverse multiple networks as is likely to be the case if calls to ported numbers continue to be onward routed.

4.12 In their response, the UK Competitive Telecommunications Association (UKCTA) commented that the importance of number portability issues would be driven by the model of future voice competition. If there were to be a substantial move to LLU or an evolved CPS/WLR model where inbound calls were owned by the competing provider, then this could lead to a much larger volumes of ported numbers. UKCTA outlined two models for implementing number portability on NGNs. One envisages using a number portability central database together with a mechanism (possibly ENUM) to map telephone numbers to IP addresses. The other being the use of Session Initiation Protocol (SIP) routing techniques. SIP is a signalling protocol. Its job is to broker communications between two devices. UKCTA sees SIP requests being re-directed by the donor network call server to the recipient network call server.

Ofcom concludes that migration to Next Generation Networks (NGNs) is a timely opportunity to revisit the implementation of number portability and that the options for next generation number portability should be considered now, whilst NGNs are being planned. Ofcom will set out, in its next NGN consultation, an expectation that NGNs will enable a more robust approach to number portability (as part of the more general issue of resolving telephone numbers to IP addresses), which will address the current concerns regarding a single point of failure. Ofcom will be working with Industry to ensure that this is achieved in practice.

Short term issues

4.13 Ofcom reviewed the options, where the current solution remains extant, for affording appropriate protection to consumers in circumstances similar to the failure of Atlantic Telecom.

4.14 Ofcom is aware that the Number Portability Commercial Group, representing Industry providers with interests in geographic and non-geographic number portability, has already begun work to develop tactical contingency planning for number portability continuity in the event of corporate failure of a UK telephony network. Ofcom welcomes this action.

4.15 Ofcom recognises that the ability of Industry to respond will vary depending on the specific circumstances of the business failure. Moreover, the effectiveness of any measures may be dependent on other factors such as the degree of advanced notice of network termination and co-operation with administrators/liquidators. Ofcom also recognises that implementing such contingencies is not without cost and that an appropriate means of recovering those costs will be an important commercial concern for Industry.

Ofcom concludes that the Number Portability Commercial Group should continue and complete its assessment of contingency measures. Ofcom will engage in dialogue with Industry and other relevant stakeholders to help develop viable contingency measures.

Annex 1

List of respondents to the consultation

1. Association of Communication Services Providers
2. BT
3. Cable & Wireless
4. Inclarity plc
5. Internet Telephony Service Providers Association
6. Number Portability Commercial Group[2]
7. T-Mobile
8. Uniworld Communications and Gamma Telecom
9. Vodafone
10. One confidential response

[2] On behalf of BT, Cable & Wireless, Colt, Energis, Inclarity, Kingston Communications, MCI Worldcom, ntl, Telewest, Thus and Your Communications.

Annex 2

Consultation questions

Question 1: *Do you agree that the three options Ofcom has chosen to consider represent the scope of technically viable IN-based CDB solutions?*

Question 2: *Do you agree that Ofcom has identified the relevant benefits of significance in the context of this RIA?*

Question 3: *Do you agree with Ofcom's assessment on the potential size of Type 2 benefits?*

Question 4: *Do you agree that the ten year life of investment Ofcom have used in this assessment of the costs and benefits of a CDB architecture are appropriate?*

Question 5: *Do you agree that there is not a robust economic case for investment in IN-based CDB over a ten year period? If you disagree, explain why?*

Question 6: *Do you agree with Ofcom's initial conclusion that it should not mandate the implementation of an IN-based CDB solution for UK number portability?*

Question 7: *Do you agree that, if an IN-based CDB solution is not viable, Industry (landline providers) should implement option B or C (or a hybrid) as a contingency measure to address forced number changes arising from any future network failure?*

Question 8: *Do you agree that voluntary migration to a direct routing solution for mobile number portability is likely? If so, over what time period?*

Question 9: *Do you consider that migration to NGNs will necessitate a change to the current Onward Routing solution for number portability? If yes, what changes and for what reasons? If no, why not?*

Question 10: *Do you consider that Ofcom has a role to play in considering whether a CDB approach to number portability should form part of the development of NGNs?*

Question 11: *What changes (if any) do you think may be necessary to the current regulatory framework for number portability e.g. the Number Portability Functional Specification in response to migration to NGNs?*

Question 12: *What are your views on any 'operator' or 'infrastructure' ENUM facility being used as a future number portability database? What are the potential benefits and drawbacks of this?*

Annex 3

Glossary

Block transfer:
The facility to transfer a block of telephone numbers from one provider to another.

Central Database (CDB):
A database usually managed by a neutral third party and containing details of all ported numbers. Network providers download information from this database in order to route calls to the appropriate destination.

Communications provider:
A person who provides an electronic communications network or provides an electronic communications service.

DTI:
Department of Trade and Industry.

Donor provider:
The communications provider, whose subscriber number(s) are in the process of being, or have been passed or ported to a recipient provider.

Intelligent network (IN):
An Intelligent Network is a telecommunications network where some of the intelligence relating to routing and service provision is separated from the switches and centralised into a few service control points.

Protocol.
The packet data protocol used for routing and carriage of messages across the internet and similar networks.

Mobile portability:
Portability relating to telephone numbers allocated for use with mobile communications services.

Net Present Value (NPV):
The current value of the future benefits of a project or investment net of the future costs, discounted at an appropriate rate.

Next Generation Networks (NGNs):
NGN is a catch-all phrase for the infrastructure that will enable the advanced new services that are expected to be offered by mobile and fixed network operators in the future, while continuing to support all of today's existing services. The NGN concept is commonly referred to through various characteristics, such as:

the use of packet-based transfer mechanisms,

increasingly separated control functions for bearer resources, call/sessions and services/applications,

decoupling of service provisioning from network access,

support for a wide range of services and information flows (including real time/streaming/non-real time services, point-to-point, multipoint, broadcast and multicast voice, data, video and multi-media applications),

seamless inter-working with legacy networks,

support of generalized mobility, and

provision of unfettered users access, via modern high speed access technologies, to competing service providers and/or services of their choice.

Number portability:
facility that enables subscribers, who so request, to keep their number independent of the organisation providing service.

Ofcom: The Office of Communications.
The regulator for the communication industries, created by the Communications Act 2003.

Oftel:
The Office of Telecommunications, whose functions transferred to Ofcom on 29 December 2003.

Onward Routing (OR):
The system currently adopted for portability for geographic, non-geographic and mobile numbers, whereby calls to ported numbers continue indefinitely to be routed via the switches of the donor provider.

Portability:
Any facility provided by a communications provider to another communications provider 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.

Public Switched Telephone Network (PSTN):
The collection of interconnected systems operated by the various telephone companies and administrations around the world. Also known as the Plain Old Telephone System (POTS). The PSTN started as human-operated analogue circuit switching systems, progressed through electromechanical switches. By now this has almost completely been made digital, except for the final connection to the subscriber.

Recipient provider:
The communications provider to whom a subscriber number(s) are in the process of being, or have been passed or ported from a donor provider.

Subscriber:
Any person who is party to a contract with the provider of publicly available telephone services for the supply of such services in the UK.