RESPONSE TO THE OFCOM CONSULTATION:

REVIEW OF GENERAL CONDITION 18 – NUMBER PORTABILITY

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26 January 2007

Hutchison 3G UK Limited ("H3G")

BASIC DETAILS

Consultation title: Review of General Condition 18 – Number Portability

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Timothy Lord

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EXECUTIVE SUMMARY

Hutchison 3G UK Limited (**H3G**) welcomes Ofcom's review of number portability arrangements in the UK. Ofcom has proposed a significant reduction in the time to port a mobile number and a move to direct routing of calls to ported mobile numbers. However, H3G believes it is both possible and necessary to move more swiftly, and proposes a mechanism to achieve an interim solution by December 2007.

H3G, and its sister companies, have experience of mobile number portability (**MNP**) systems in its operations in eight countries. There is a clear correlation between the speed of porting and the amount of porting achieved. Despite it being one of the first to launch, the UK market's porting rate of 8% is one of the lowest in the world, with best practice countries such as Ireland and Australia porting 13% and 17% respectively, despite launching much later than the UK. The different take up of porting for H3G as a new entrant is even starker with H3G Ireland running at [✂]% compared to H3G UK's figure of [✂]% of total post pay customers. The existence of significant unmet demand for porting in the UK is supported by a consumer survey conducted by H3G during January 2007.

Direct routing, recipient-led same-day porting is European best practice and should be adopted in the UK.

International comparison also demonstrates the importance of efficient MNP in driving competition by a new entrant. In saturated markets, winning customers who port their number is a key means of gaining market share so new entrants have a much higher proportion of ported-in customers than average. Ported-in customers receive [✂]% more inbound calls than non-ported customers and, in our experience, in direct routing MNP systems generate higher average revenues from the differential mobile termination rates (**MTR**) generally applicable to new entrants. They are more valuable customers.

The Consultation recognises many of the shortcomings of the current system. This Submission adds to that understanding, and explains the consequences of these shortcomings. Customer choice is artificially limited; network congestion is increased; new services may be hindered; the consequences of operator failure are exacerbated; significant costs of inefficiencies are incurred and passed through to customers; and the competitive operation of the market is damaged by disadvantaging new entrants.

The extent of that disadvantage is explained here. Customer acquisition is made more difficult. The arbitrary impact of differential MTRs due to call tromboning costs H3G some £[✂] per annum. The burden of the Donor Conveyance Charge falls disproportionately on a new entrant, costing H3G some £[✂] per annum. Overall, the impact on H3G in 2006 was some £[✂] that directly benefited its competitors due to the flaws of the current MNP system.

More widely, the lost inbound traffic from unmet demand for porting contributes to a significant traffic imbalance for H3G, with outgoing call minutes exceeding incoming minutes. [✂] H3G estimates that its net cash outflow to competitors in the UK from this imbalance will be £[✂] per annum (including tromboning costs). Efficient MNP will contribute towards redressing this enforced subsidy to competitors.

Maintaining the current system longer than necessary will exacerbate and prolong a market failure which leads to significant inefficiencies.

H3G contends that the damage to competition from these effects, as well as lost consumer benefit, requires the most urgent action. We have pressed Ofcom for many years to rectify the current system. Incumbents' resistance is unsurprising

given the above subsidies they enjoy from H3G, and the opportunity to win back defecting customers during the excessively long port lead time. Hence we now propose a swifter means of moving to an ACQ/CDB system, by running the new system in parallel with the existing system as from December 2007. As well as being swifter to implement, this would have cost advantages over the NICC[1] interim solution proposed as an option by Ofcom. We provide estimates of costs and implementation times, supported by a feasibility report from Accenture.

This parallel running period would need to be supported by Ofcom action to encourage incumbents onto the new system before a mandatory date of January 2009, including amending the General Condition 18 and giving guidance on the interpretation of General Condition 18 and its dispute resolution powers with respect to the following:

- mandate complete switchover from MNP2 to MNP3 by January 2009;

- that transit operators are able to directly route calls to ported numbers irrespective of any provisions to the contrary in their interconnection agreements with the MNOs that specify range-holder routing;

- the DCC payable by recipient operators should be zero;

- where an originating network (mobile or transit) does not use ACQ/CDB and sends a call to a range holding network, if the number has been ported and the range holding network is an MNP3 participant, the originating network would pay the DCC to the donor network to cover their costs;

- ensure the provision of data by incumbent operators so that a comprehensive MNP routing database can be constructed; and

- address the governance and competitive issues within the OSG.

We hope that this proposal assists Ofcom to fulfil its primary statutory duty to further consumer interests by promoting competition and by moving as fast as possible to an efficient MNP system which will rectify the current failures in the operation of the UK mobile market.

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[1] Service Description 08

1   INTRODUCTION

This Submission responds to Ofcom's consultation on the *"Review of General Condition 18 – Number Portability"*, published 16 November 2006 (**Consultation**). Ofcom proposes to implement a direct routing solution for ported numbers and to shorten mobile port lead times.

H3G fully agrees with Ofcom's assessment that:

> "*number portability facilitates consumer choice and effective competition by allowing consumers to retain their telephone numbers when they switch provider. This makes switching a more attractive proposition as consumers may be reluctant to switch if they have to go through the inconvenience and possible expense of changing their telephone number*" (Consultation, Section 1.2),

and that:

> *"the shorter the process, the better it is for competition and consumers"* (Consultation, Section 1.12).

H3G welcomes Ofcom's proposal for a direct routing MNP solution using an 'all call query' (**ACQ**) system with a 'central database of ported numbers' (**CDB**), and the proposal to shorten port lead times. H3G considers this a necessary step towards ensuring a fully competitive and efficient process of competition. H3G's one, albeit significant, concern with Ofcom's current proposal is that the implementation timescales proposed by Ofcom are too long, and fail to reflect the urgency with which it is necessary to address the barrier to entry created by the existing MNP system.

Delaying implementation until potentially 2009 is not necessary. The rapid implementation of an ACQ/CDB solution in the UK is required for all inbound services such as voice, video, SMS and MMS and to reduce barriers to switching at the retail level. It is also, in our view, possible on a cost effective basis, to implement a direct routing solution with same day porting by December 2007. This proposal should be fully considered by Ofcom as it is essential to redress the short term adverse consumer impacts of the current MNP system. A move to an ACQ/CDB system more generally is also required to redress the more dynamic/longer term consumer detriments which currently exist e.g. the adverse effects on the process of competition and increased barriers to entry.

This Submission is structured as follows:

- Part 2 confirms the problems with the current MNP system in the UK and its adverse affects on competition in the mobile sector, as identified by Ofcom, and demonstrates the need for Ofcom to act now;

- Part 3 reviews the experience of H3G companies operating in other countries, and the competitive benefits from best practice MNP;

- Part 4 considers Ofcom's specific proposals to implement a direct routing solution for ported numbers and to shorten port lead times against the background of the above;

- Part 5 sets out H3G's proposal for an interim solution to achieve direct routing within 2007 (referred to as **MNP3**), which H3G considers should be fully considered by Ofcom given it would deliver the benefits of improved MNP at a much earlier stage and at a reasonable cost; and

- Part 6 concludes with H3G's responses to the specific questions asked by Ofcom in the Consultation.

Annex 1 contains a glossary of the acronyms used in this Submission, Annex 2 analyses the welfare costs of the current MNP system in the UK, Annex 3 contains the business requirements for MNP3, and Annex 4 contains an analysis of consumer attitudes towards mobile number portability based on research conducted by TNS Sofres in January 2007 (*H3G/TNS Survey*).

The following supporting evidence is also enclosed:

- a review by Accenture (dated January 2007) of the technical feasibility of the interim solution proposed by H3G, to accelerate transition to the new MNP process – MNP3 – ahead of the date proposed by Ofcom; and

- Syniverse proposal and indicative costs for the development and implementation of MNP3.

2 IMPACT OF MNP: URGENT NEED FOR OFCOM TO ACT NOW

This Part analyses:

- the shortcomings of the current MNP system in the UK;

- the immediate short term impacts on consumers;

- the distortion effects to the UK mobile sector, to the detriment of new entrants;

- the reasons why MNOs are incentivised to delay or prevent any improvement to the current MNP system; and

- the need for urgent intervention by Ofcom to rectify the market failures.

Annex 2 analyses in detail, and therefore elaborates on the information contained in this Part, the welfare costs of the current MNP system in the UK.

2.1 Introduction

As Ofcom is aware, the UK currently implements an onward routing solution for the routing of calls to ported numbers, which is dependent on the network from which the relevant number has been ported (**donor network**). The UK solution achieves mobile port lead times of five working days[2], and the customer remains dependent on the donor network for the correct routing of calls long after that customer has ceased its contractual relationship with the donor network.

There is an urgent need for action to improve UK MNP. By international standards, the UK system is an out-dated and inefficient MNP solution which has distorted competition in the UK mobile sector to the detriment of new entrants and, critically, consumers.

The four incumbent mobile network operators (**MNOs**) benefit from the current system, not least as it makes it more difficult for smaller competitors to persuade their customers to switch. They are financially incentivised to delay or avoid the implementation of a more efficient system based on direct routing which is recipient led and, indeed, have continually resisted improvements despite H3G's efforts.

The current system rewards and promotes inefficiency and acts as a significant barrier to competition. It is some time since any material changes (other than the statement of 30 March 2006, which is contributing to an increased demand for MNP) have been introduced. Ofcom's statutory duties, including the duty to further the interests of consumers and having regard to the desirability of promoting competition, point towards the urgent need for Ofcom to intervene to rectify these market failures.

It is against this background, set out in further detail below, that H3G assesses Ofcom's proposals and puts forward its own interim solution.

2.2 The shortcomings of the current MNP solution in the UK

H3G welcomes the fact that many of the technical shortcomings of the current UK MNP solution are recognised by Ofcom in the Consultation, including:

- potential loss of inbound services (e.g. voice calls, video calls, SMS messages and MMS messages) to customers if the donor operator fails. H3G believes that this risk will be increased through the market entry of new operators to whom mobile numbers are allocated;

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[2] Note that if a network operator or service provider takes the full 48 hours to issue the Porting Authorisation Code (PAC), the port period extends to seven working days.

- effect on quality of service if congestion occurs on the donor network; and

- technological barriers which delay or prevent the effective introduction of new services by competitors of the donor operator if the donor operator does not support the required signalling (i.e. the incumbent operators can delay technical innovation by faster moving competitors).

H3G believes there are also the following shortcomings to the present system:

- wasteful use of port and transmission capacity due to the tromboning of voice and video calls via the donor network to the recipient which in turn increases the cost of inbound calls (i.e. the incumbents being to able raise rivals' costs);

- an arbitrary impact on mobile termination rates (**MTRs**) due to call tromboning: (i) recipient 2G MNOs receive the MTR of the donor network rather than their own (regulated) 2G rate and (ii) where H3G ports in a former 2G MNO number, it only receives the 2G MTR, which is lower than the appropriate the 3G rate and less than H3G's costs. This means that MNOs are over or under recovering costs of mobile termination in an increasingly arbitrary fashion. The resulting arbitrary impacts have potential adverse consequences, *inter alia*, on incentives to invest, incentives to provide portability, migration of customers to 3G networks and competition between MNOs;

- the inability to support additional operators: the present MNP system is not fully scalable and therefore will be increasingly strained in its ability to support new entrant operators, including the nineteen VoIP providers to whom Ofcom has issued mobile number ranges, and the Guardband operators;

- each MNO must have a dedicated data link to each other network in order to transfer porting information on the day of the port. At present, with five MNOs operating MNP, ten distinct links are required. If the total number of supported networks increases to thirty (i.e. with the inclusion of VoIP and Guardband operators) the number of data links increases to over four hundred. This degree of additional complexity was never anticipated when the current system was designed and we do not believe could be properly supported by the current system; and

- the involvement of the donor network means that significantly more billing complexity is required than is necessary. Under the present arrangements, each MNO bills every other MNO for the donor conveyance charge (**DCC**). Each MNO therefore has four DCC billing relationships. With thirty providers (i.e. including the VoIP and Guardband operators), each operator will be required to calculate twenty nine DCC bills per month and manage each of these relationships. Similarly, each operator must maintain twenty nine sets of other operators' termination rates in order to generate twenty nine MTR bills each month. This constitutes a barrier to entry.

2.3   The current MNP system has immediate short-term adverse impacts on consumers

The current MNP system has had the following short-term adverse consumer impacts in the UK:

- given the current long port lead times there is a significant unmet demand for mobile number portability, as demonstrated by the much greater porting levels in countries with faster and more efficient MNP solutions (see further Part 3) and by the consumer research in Annex 4. Customers have been

disincentivised from exercising choice and benefiting from network competition;

- where customers do exercise their choice, they have to incur higher than necessary switching costs to do so; and

- the shortcomings of the existing system (as described paragraph 2.2 above) has resulted in unnecessary costs in the running of the current system which in turn impacts retail prices (e.g. the DCC, the wasted transmission paths, increased administrative costs etc.).

See Annex 2 for further detail.

2.4 The current MNP system distorts competition in the UK mobile sector, to the detriment of new entrants and, in the medium term, to consumers

The four incumbent MNOs, as explained further in paragraph 2.5 below, have significant incentives to retain the current inefficient routing system while at the same time having an effective veto on any improvements to the system. They benefit from the barriers to switching that exist, given that they have the largest customer bases. This is exacerbated by the fact that, as the UK market is a saturated market, the incumbent MNOs control access to the existing numbers of essentially all potential customers for new entrants.

[✂] new entrants are dependant on an effective MNP system in order to be able to win customers on a level playing field. In a saturated market, without effective MNP, new entrant operators can only acquire customers by persuading them to change their number and by incurring significant switching costs. This constitutes an unnecessary barrier to switching and dampens the process of rivalry.

Also of relevance is that, in such circumstances, the way in which customers can change operators and retain their number [✂]. In all these cases, new entrant operators will be disadvantaged in comparison to incumbents and have their costs of expansion increased. Thus, this constitutes both a barrier to switching for customers and a barrier to entry and growth for existing and potential new entrants.

These barriers, and the increase in the relative costs of new entrants, have a wider detrimental effect on the overall level of competitiveness the market. The rate of customer acquisition for a new mobile operator seeking to reach scale as quickly as possible is the single most important factor in its ability to compete on a level playing field with the incumbent operators.

The practical impact of these lead times is that customers face increased costs of switching supplier, and incumbent operators can direct their retention activity to higher value customers further reducing the effectiveness of the new entrant in driving the benefits of competition to the whole market. This makes customers less likely to change networks [✂] as well as less likely to port their number if they do switch.

By contrast in Ireland, where there is a two-hour port lead time, [✂]% of H3G's post-pay customers have ported in their number. The equivalent statistic in the UK is [✂]%. See Part 3 for further details. H3G believes, as demonstrated by its own customer research set out in Annex 4, that (i) the majority of UK consumers who wish to change operator want to keep their number (56%) and (ii) such customers generally do not find it acceptable to wait over a week for the port to take place (78%).

Put simply, an inefficient MNP solution is a significant barrier to entry and growth of any new operator. It, therefore, distorts effective competition in the UK mobile sector, with longer term adverse impacts for consumers. Unless urgently rectified, H3G believes that:

- the current MNP system discourages porting, and hence is a barrier to customer acquisition;

- evidence from our business in the UK, and the H3G business in Austria, shows that ported customers receive [[✂]]-[✂]% more calls than non-ported customers. Low rates of porting in therefore results in lower incoming call volumes leading to lost revenue to new entrants and higher average costs;

- the arbitrary impact on termination charges (due to call tromboning) results in immediate lost MTR revenues for new entrants and further increases the traffic imbalance with incumbent operators:

  - for customers who have ported out to a 2G network, the 2G network operator recovers a 3G MTR which is higher due to the higher underlying 3G costs. H3G estimates that, based on current call termination rates, H3G overpays £[✂] per annum (based on 2006 figures) to the 2G MNOs; and

  - for customers who have ported in to H3G, H3G loses MTR revenue because H3G receives the MTR of the 2G MNO. H3G calculates that between 2004 and 2006, the 2G MNOs have underpaid H3G approximately £[✂] in MTR revenue as a result.

- the burden of the DCC payable to the donor networks falls disproportionately on new entrants. The ratio of ported in to ported out numbers for a new entrant will mean that such operators pay out a net sum to their competitors as a result of the DCC being set well above cost. Between established operators this ratio is balanced, making net DCC payments close to zero. As a result, a new entrant like H3G pays a net DCC sum to the incumbent MNOs as, effectively, compensation for having won customers from them. This represents another way in which the current arrangements are biased against new entrants. [✂][3]

- the life time value of ported in customers is higher since these customers have a lower churn and spend more on outbound services; and

- [✂]

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[3] [✂]

[✂]

Table 2.4(a)

[✂]

Table 2.4(b)

The impact of MNP needs to be taken in to account in relation to Ofcom's other decisions and processes, specifically its decision on appropriate and proportionate remedies as a result of any findings of significant market power, which should also take account of relevant asymmetries between operators.

Given the above, and international best practice (see Part 3 below), it is clear that the time it takes to port a number in the UK (one calendar week from the customer request) is too long and the current system is inefficient. There is an additional

problem with the porting process in that it gives the donor operator a four-day opportunity to 'win-back' the customer. We note that Ofcom considers that General Condition 1.2 does not apply to such a situation (see Ofcom Defence (pages 27-28) in the recent appeal) and there is no Ofcom guidance in relation to what win back activity is allowed and/or reasonable in the mobile sector.

The impact of these financial arrangements is to limit the benefit of competition for all mobile consumers (both those that switch and those that do not) because new entrants such as H3G cannot compete on equal terms with the incumbent operators. [✂] Any unnecessary prolonging of the transition period to an MNP solution which removes these competitive distortions will create very real consumer detriments, including through diluting the extent to which H3G as a new entrant is able to bring more competition to mobile markets, driving price competition and innovation in new products and services.

2.5 Summary of why incumbent operators are highly incentivised to delay or refuse to act

It is quite clear from the above, that the incumbent operators are incentivised to delay or prevent any improvement to the current MNP system. Compared to new entrant, incumbent mobile operators directly benefit from:

- the length of lead time to port, which gives them the opportunity to 'win back' the customer and to 'cherry pick' valuable customers;

- the donor conveyance charges which is above cost and therefore a windfall profit for the incumbents;

- the traffic imbalance, with the incumbents being net recipients of MTR from H3G; and

- the incorrect MTR payments being levied, with the incumbents receiving more than their regulated cost for 2G call termination and H3G receiving less than its costs.

Since H3G entered the market in 2003, it has not seen any improvements in the MNP system despite driving forward initiatives. The incumbent operators have, as Ofcom is aware, rejected implementing proposals on a number of occasions.

2.6 The urgent need for Ofcom intervention

Given the incentives on the incumbent operators to prevent or delay any improvements to the MNP system in the UK, it is necessary for Ofcom to intervene. The ongoing harm to consumers who are denied the full benefits of competition, the lack of material changes despite the entry of new players, as well as the financial harm to H3G which contributes to the reduced competition, mean that the need for immediate action is now even more urgent.

The legal framework and Ofcom's legal duties support (and in H3G's view require) intervention that brings about change as soon as possible.

Pursuant to Article 30 (1) of the Universal Services Directive, H3G considers that Ofcom is legally obliged to mandate the move from onward routing to direct routing as Article 30 does not permit making an MNP service dependent on another network[4].

Furthermore and in any event, Ofcom has a duty under the Communications Act 2003 to further the interests of consumers (section 3(1)(b)) having regard to the

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[4] As H3G has previously explained, the judgment in Mobistar v IBPT (Case C-438/04, 13 July 2006) is consistent with this interpretation.

desirability of promoting competition in relevant markets (section 3(4)(b)), and a duty to encourage efficiency and innovation with regard to the use of telephone numbers (section 63).

These duties translate into a duty to promote number portability and ensure that this system works efficiently, which (as recognised by the Competition Appeal Tribunal in the CMC hearing on 30 June 2006 and by Ofcom in the Consultation) is a key element for competition in the mobile market, itself a key economic sector in the UK.

This interpretation of what Ofcom's legal duties require is also consistent with earlier statements by Oftel and others. For example, the importance of MNP was recognised early on by Oftel which stated in its 1997 consultation on *Number Portability in the Mobile Telephony Market* that:

> *"Changing a number can be a major inconvenience for customers and a barrier which prevents them from exercising choice and taking advantage of growing competition in the telecommunications markets. (...) Oftel considers that the introduction of number portability between mobile operators is essential to <u>promote full competition and to ensure that consumers get a good deal in the mobile market.</u> Oftel is therefore proposing modifications to mobile operators' licences, in order to ensure the <u>early, efficient and effective introduction of mobile number portability</u>"* (<u>emphasis added</u>).

The ECJ recently stated in its judgment of 13 July 2006 in Mobistar S.A. v IBPT, at paragraph 25 that:

> *"Number portability is intended to remove the obstacles to consumers' freedom of choice, particularly between mobile telephone operators and thus to <u>ensure development of effective competition on the telephone services market</u>"* . (<u>emphasis added</u>)

Given the above, Ofcom's focus in this Consultation should not be on whether these changes should be implemented. Rather, Ofcom should focus on how quickly change can be implemented, given the urgency to improve the current highly-inefficient MNP system.

3 INTERNATIONAL BEST PRACTICE: THE UK IS OUT OF STEP

The UK is out of step with international best practice:

- all countries known to H3G to have an MNP system, are recipient led with the exception of the UK;

- 86% of European countries (19 in a sample of 22) employ direct routing solutions; and

- same-day porting is both European and international best practice (as recognised in Section 4.8 of the Consultation).

We set out in this Part a review of the experience of H3G companies operating in other countries, and the competitive effects from best practice MNP.

3.1 Best practice in the experience of the H3G companies operating in other countries

The telecommunications division of Hutchison Whampoa Limited also operates 3G networks in Australia, Austria, Denmark, Hong Kong, Ireland, Italy and Sweden.

Porting lead times. In all of these countries except for the UK and Sweden, the port lead times regularly achieved are within the same day, and well within the maximum time limits required in these countries.

Country	Maximum Port Lead Time	Achieved Porting Time in Practice
Australia	2 days	2 hours
Austria	3 working days	2 hours
Denmark	10 working days	24 hours
Hong Kong	2.5 days	2 hours
Ireland	1 day	20 mins
Italy	5 working days	3.5 hours
Sweden	5 working days	4 days
United Kingdom	2 working + 7 calendar days	5 days

Table 3.1(a)

Rate of porting. These countries also show significantly greater ratios of ported to non-ported numbers, compared to the UK for H3G operations in those countries.

Country	Percentage of numbers ported to date
Australia	[✂]%
Austria	[✂]%
Denmark	[✂]%
Hong Kong	[✂]%

| Ireland	[✂]%
Italy	[✂]%
Sweden	[✂]%
United Kingdom	[✂]%

Table 3.1(b)

Direct routing and recipient led. All of these countries, apart from the UK, have a recipient-led direct routing process. This is significant, since a donor-led process introduces the possibility for the donor operator to win back a porting customer during the port lead time. Recipient-led is widely regarded as best practice in both the telecommunications industry and in other industries.

H3G's own research shows that:

- all countries who have an MNP system (where this information is known to us), are recipient led with the exception of the UK;

- 86% of European countries (19 in a sample of 22) employ direct routing solutions;

- internationally, recent MNP implementations have all utilised direct routing (e.g. South Africa, Saudi Arabia, Japan, and Pakistan);

- internationally, planned MNP implementations will use direct routing (e.g. Canada, Brazil and New Zealand); and

- early adoptors of MNP are now migrating their decentralized, indirect routing MNP systems towards centralized MNP systems with direct routing. Take for example Singapore, which is now moving from an indirect routing system to a centralised system with direct routing (Q4 2007).

The Table below illustrates how the UK has the oldest MNP system, the longest porting time, and the lowest percentage of ported numbers.
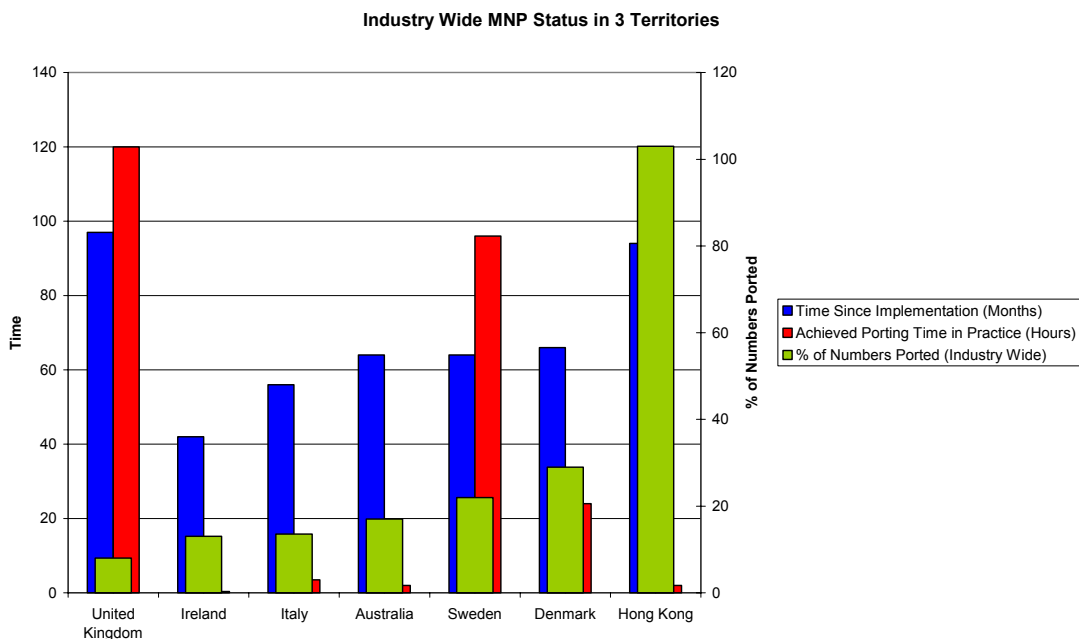
Table 3.1(c)

Even more striking are the same figures but specifically for the H3G businesses in those countries. This illustrates how porting is much more important to a new entrant than it is to the industry as a whole. The UK's restrictions on effective porting therefore have a disproportionate effect on a new entrant.

[✂]

Table 3.1(d)

The inescapable conclusions from these figures are that:

- the current MNP system is limiting the uptake of porting in the UK, and that consumers' resulting inability to easily exercise choice fundamentally affects the operation of the market; and

- where demand for porting is not met, the new entrant is unable to properly compete in the market.

3.2   Competitive effects of swifter MNP in other H3G countries

Ported customers receive more calls. For a new entrant this is critically important in view of (i) increasing traffic on new and therefore sub-scale networks and (ii) the balance of its costs and revenues for call termination with its competitors.

With efficient porting, it seems that incoming and outgoing calls are likely to be in balance, [✂].

With unmet demand for porting, [✂] In the UK, this results in a net outflow of funds from H3G to the incumbent operators of £[[✂] per annum. This [✂] off-sets the effect of any differential in current MTRs, which is intended to compensate for the differential cost bases between new entrants and incumbents.

[✂].

The experience of the H3G companies in other countries demonstrates how inefficient MNP can in practice undermine the new entrant, in a regulatory regime intended to provide the new entrant with a level competitive playing field.

4 ASSESSMENT OF OFCOM PROPOSALS

This Part considers Ofcom's proposals to implement direct routing of calls to mobile ported numbers, and to reduce the time to port a mobile number, against the backdrop outlined above. In Part 5, H3G puts forward a proposal which it thinks is consistent with Ofcom's general aim, but facilitates an improvement on a much quicker timescale.

H3G agrees with Ofcom's proposal for a direct routing MNP solution using an 'all call query' (**ACQ**) system with a 'central database of ported numbers' (**CDB**), and the need to shorten port lead times, but believes that the timescales proposed by Ofcom are too long.

Further, the reduction of port lead times cannot be divorced from the implementation of direct routing, and the rapid implementation of both is required in order to remedy the harm to consumers (and H3G), as described in Part 2 above and in Annex 2.

We set out in the Table below, the ultimate timescales proposed for MNP by Ofcom, and H3G's views as to what is necessary, reasonable and achievable.

	Ofcom	H3G
Port lead time	Same day or Within 3 days – can be implemented within 6 months	Same day *See paragraph 5.9 for porting lead times during the parallel running period
Implementation of direct routing for mobile originated calls using NICC Service Description 08 (Option 4b)	1 year from the date of Ofcom's final notification	1 year from the date of Ofcom's final notification **BUT** Option 4b would be largely redundant if the H3G proposal for an interim parallel running period is adopted
Voluntary use of CDB	September 2008	December 2007 (if MNP3 is accepted with a parallel running period)
Mandatory use of CDB	September 2009	January 2009 (if MNP3 is accepted with a parallel running period)

Table 4

4.1 Direct Routing

H3G agrees with Ofcom that an ACQ/CDB solution is required to achieve independence of consumers from their previous service provider for all inbound services such as voice, video, SMS and MMS. The shortcomings of the current UK MNP system are set out above.

It is quite clear that dependence on the donor networks is no longer appropriate, and is out of step with international best practice. There is an urgent need to replace the current system with a direct routing solution which is recipient led. H3G therefore welcomes Ofcom's proposals.

We believe however that the target dates proposed by Ofcom (that a central database be available for voluntary use by September 2008 and for mandated use by September 2009) are too long (and indeed, possibly too late). In our view, direct routing can be available and operational for voluntary use by December 2007 and mandated use by January 2009.

In Part 5 we set out in detail our proposal for an interim solution to achieve direct routing (which we refer to as *MNP3*) within 2007. In summary, MNP3 would incorporate direct routing and operate a recipient-led same day porting process, and would be fully backward compatible with the current onward routing solution (which we refer to as *MNP2*) and would run in parallel with MNP2 until the date mandated by Ofcom for a complete switchover.

We set out below our comments on the call routing options relevant to mobile number portability (Options 3 to 5), as identified by Ofcom in the Consultation. We do not comment on Option 1 (no immediate change), as H3G does not believe this is a realistic option and would not be consistent with Ofcom's statutory duties, and we do not comment on Option 2 as this is not relevant to mobile.

Option 3: Implementation of ACQ/CDB for direct routing of calls from fixed networks

Ofcom puts forward the proposition that the transition to ACQ/CDB for calls from fixed networks should occur in the course of migration of fixed networks to NGN architectures, which shall be no later than 2012.

Whilst H3G accepts that direct routing within BT's current Time Division Multiplex (TDM) Digital Local Exchange (DLE) network is not currently practical and that the implementation of fixed number portability is most likely to occur with the roll-out of NGNs, the target date of 2012 is too late for the direct routing of inbound calls originating on the fixed networks to ported mobile numbers.

In H3G's view, it is possible for direct routing to be implemented with BT's existing transit network at the point at which calls are passed from the fixed network to the mobile networks. A description of this solution is set out in paragraph 5.11 (ii). For BT to be able to perform the ACQ function in this scenario, amendments to the interconnect agreements between BT and the four incumbent MNOs would be needed. Currently, the BT Standard Interconnect Agreement specifies the individual number ranges for which calls must be routed to each network and there is no provision for ported numbers to be excluded from this 'number block' approach and thereby enable direct routing to the recipient network. If this proposal were pursued, Ofcom would need to consider how to address this issue. This could be done by issuing guidance on the interpretation of General Condition 18 and/or its dispute resolution powers in this context or by more detailed amendment to the General Conditions.

Option 4: Implementation of ACQ/CDB for mobile networks only

Ofcom puts forward two options for the direct routing of mobile to mobile calls using an ACQ/CDB solution:

- Option 4a: the implementation of a CDB solution with voluntary use by September 2008 and mandatory use by 2009; and

- Option 4b: as an interim step to Option 4a, the implementation of direct routing for mobile originated calls only using the system specified in NICC

(Network Interoperability Consultative Committee) Service Description 08, within one year from the date of Ofcom's final notification.

As outlined above, H3G agrees with Ofcom that an ACQ/CDB solution is required to achieve proper customer independence from the donor networks. Ultimately, Option 4a is the only full solution that achieves this purpose. However, again, the timescales proposed by Ofcom are too long (H3G's proposal for MNP3 in Part 5 addresses this requirement in full, but within a shorter timeframe).

If, contrary to H3G's view, evidence shows that it is not reasonable to adopt MNP3 (or any other ACQ/CDB solution) in parallel to the existing system, then we agree that the phased approach proposed in Option 4b for the implementation of direct routing should be adopted, so that the efficiency savings in mobile to mobile calls to ported numbers can be achieved as soon as possible. H3G believes, however, that if the interim parallel running proposal (as described in Part 5) was implemented, it would make the system specified in NICC Service Description 08 unnecessary.

Although, in an attempt to achieve a pragmatic solution, H3G asked for the adoption of Option 4b in the recent appeal, as Ofcom itself recognises in Section 3.47 of the Consultation, Option 4b does not achieve all of its objectives:

- it does not provide full independence from the donor network;

- it does not work for calls originating from fixed networks since fixed networks do not have the required signalling and functionality (Mobile Application Part or 'MAP');

- it may not work for many VoIP and Guardband operators for similar reasons as for fixed networks (the solution predates the Ofcom policy statement of 30 March 2006 discussing MNP for these operators);

- (since not all operators can use it) this solution would have to be run in parallel with call forwarding. This would require operators to be able to distinguish between directly routed calls and call forwarded calls in order to bill the DCC and different MTR correctly. This would require networks to undergo some reconfiguration (or development) on their billing and mediation systems;

- (whilst saving port and transmission capacity) this solution would require extra signalling capacity. This would amount to approximately fifty E1 links from each of the four incumbent MNOs at a cost of approximately £50,000 per annum, and a proportionately smaller number from H3G; and

- it would require extra signalling capacity between the networks to be reserved or installed.

Option 5: Implementation of ACQ/CDB for both fixed and mobile networks

With respect to the proposal for a common database to be shared by fixed and mobile networks, we have assumed that this is a proposal for a single MNP system to manage both fixed and mobile number portability, rather than a proposal to mandate the porting of fixed and mobile numbers interchangeably between fixed and mobile networks.

If mobile numbers are only ported between operators holding mobile number ranges, and fixed numbers are only ported between operators holding fixed number ranges, we do not see any advantages that would be gained by having a shared system. Conversely, we cannot see any disadvantages that would arise from a common system. However, given the different timescales proposed for the implementation of direct routing in the mobile and fixed networks, a common solution is not practical in the short term.

4.2   **Port Lead Time**

H3G strongly agrees with Ofcom that the shorter the number porting process, the "*better it is for competition and consumers*" (Section 1.12 of the Consultation).

Ofcom is considering whether the port lead should be reduced to a maximum of three working days or to within one working day. We believe that the harm caused by not mandating same day porting in the UK far outweighs the time, effort and expenditure required to achieve same day porting. See Part 2 and Annex for analysis of the welfare costs if an ACQ/CDB system (with same day porting) is not implemented.

As Ofcom itself has suggested, same-day porting is European best practice (Section 4.8 of the Consultation) e.g. in Ireland there is a maximum two-hour port lead time. International best practice also suggests same day porting (e.g. Australia and the United States). We set out in Part 3 a review of the experience of H3G companies operating in other countries, and the competitive effects from best practice MNP. It is difficult to see how Ofcom could conclude that European best practice is not suitable for the UK.

The H3G/TNS Survey into consumer attitudes to MNP (Annex 4) shows that 61% of consumers say that porting a number is only acceptable if the port lead time is same day or next day.

We set out below our comments on the port-lead time options (Options 2 and 3) identified by Ofcom in the Consultation. We do not comment on Option 1 (no immediate change), as this is not a viable option and would be inconsistent with Ofcom's statutory duties.

Option 2: require a reduction of port lead times to three working days

H3G agrees with Ofcom that:

- the current porting process can be reduced to three working days without any significant changes to the overall process or additional costs being incurred. Indeed, H3G believes the process can be reduced to two working days without incurring any significant changes to the overall process or additional costs; and

- it should only take one day for a subscriber to request a new service from the recipient network, the recipient network to submit a port-out request to the donor network and the donor network to process the port-out request. This is in keeping with European best practice, as recognised by Ofcom in Section 4.8 of the Consultation.

With respect to the question whether MNOs should be able to implement a three working day process within six months, H3G is of the view that:

- this timeframe is more than adequate since only minor changes to back-end systems will be required. Likewise the changes that Syniverse would need to make on the current MNP system are very minor, amounting to little more than a change in the default port date presented to the recipient networks. The main changes required are updates to the Porting Process Manual which will affect the paper processes and procedures that network operators and service providers operate which currently specify the durations of each stage in the porting process; and

- if MNP3 is implemented quickly (as described in Part 5), a same day porting process could be implemented within 2007 for the new entrant operators. A

shorter port lead time process on the MNP2 system would be required for ports involving the MNP2 networks during the parallel running period.

Option 3: require a reduction of port lead times to less than one working day

H3G agrees with this proposal as a matter of principle and is of the view that it is achievable on a cost-effective basis. H3G sets out in Part 5 a detailed description of its proposal for a recipient-led direct porting process with same day porting, and its proposal for an interim parallel running period in order to achieve same day porting for new entrants within 2007.

5   H3G TECHNICAL PROPOSAL - MNP3

5.1   Overview of MNP3

As set out in Part 4, H3G agrees with Ofcom's proposals to implement direct routing of calls to ported numbers, and to reduce the time to port a mobile number to within one day only. The timescales proposed by Ofcom are, however, too long and there is an urgent need for a remedy (as described in Part 2).

Bearing in mind Ofcom's overall aims and duties, H3G has developed a proposal for an interim solution to quickly achieve direct routing (***MNP3***). Essentially, MNP3 constitutes a different phasing of Ofcom's proposal so that direct routing can be available and operational for voluntary use by December 2007 (as opposed to September 2008) and for mandated use by January 2009 (as opposed to September 2009). Otherwise, the MNP3 proposal comprises the same characteristics as those proposed by Ofcom in the Consultation, namely:

- the porting process is recipient-led;
- the port lead time is 'same day';
- the ported numbers are maintained in a CDB;
- the ported numbers are periodically downloaded to participating networks; and
- the services to ported numbers are directly routed to the recipient network without any ongoing dependence on the donor or range holding network.

The feasibility and timescales for this interim solution have been confirmed by an independent report commissioned from Accenture (enclosed with this Submission). In addition, the costs have been confirmed to be reasonable by the existing MNP2 supplier, Syniverse, which has also provided a proposal with indicative pricing for the development and implementation of MNP3. Syniverse also confirmed that they would be able to supply the MNP3 system by December 2007 at a cost of £400,000. As such, MNP3 constitutes a proposal which would achieve the desired results on a cost-effective basis in a more timely manner, thus improving the competitive process for the benefits of consumers. In H3G's view, Ofcom should adopt this proposal in its final decision.

5.2   Incentives to participate

In terms of the practicalities, H3G is of the view that new market entrants (such as the VoIP providers and Guardband operators) would benefit from joining MNP3 because they would not have to incur the costs in setting up on MNP2 for an interim period, before having to migrate to MNP3.

Whilst the four incumbent MNOs would need to be required to migrate to MNP3 within the timescale for complete switchover set by Ofcom, H3G believes they would also be incentivised to move to MNP3 sooner if:

- the DCC payable by recipient operators is set to zero irrespective of any contractual agreements requiring interconnect payments for calls to ported numbers (this could be justified on the basis that the DCC would be inefficient as compared to MNP3, an available system); and

- the originating network be required to pay a DCC type payment to the range holding donor if the originating network (mobile or transit) does not use ACQ/CDB (again, reflecting the efficiency issue). If an originating operator instead sends the call to a range holding network when the range holding network is an MNP3 participant and has therefore provided the ported

number information to the CDB, the originating network should pay the costs of prefixing the call[5]. The justification for this is that the originating network could have used the more cost effective solution of sending the call directly (using the CDB) but has chosen to continue sending calls using call forwarding arrangements. As explained below, this could be achieved by way of suitable guidance.

5.3   Ofcom to amend General Condition 18 and/or to give guidance on the interpretation of General Condition 18 and its dispute resolution powers

Assuming that Ofcom agrees that MNP3 is a necessary and sensible step, an issue arises as to how to make sure it is effective. In order for parallel running to be effective and incentivised, Ofcom may need to amend General Condition 18 and/or give guidance on the interpretation of General Condition 18 and/or its dispute resolution powers with respect to one or more of the following:

- the transit operators (such as BT) who pass calls from the UK fixed and international networks must be enabled to route calls to ported numbers, irrespective of any provisions to the contrary in their interconnection agreements with the incumbent MNOs. To ensure this, it would need to be clear that if the position were otherwise they would not be acting reasonably under General Condition 18 and that, if a relevant dispute arose, Ofcom would be minded to resolve it so as to facilitate this outcome. (Presently the standard BT wholesale agreement specifies that all calls to number ranges allocated to the MNOs must be routed to those networks even if the number is ported out. The means by which BT, for example, could achieve direct routing using its TDM transit network is described in paragraph 5.11(ii) below);

- the DCC payable by recipient operators should be zero. While there are no doubt clauses regarding interconnect payments for calls to ported numbers in relevant interconnection agreements, Ofcom could make it clear that, in resolving any dispute, Ofcom would regard DCC as an inefficient charge and not recoverable because a direct porting system is available;

- where an originating network (mobile or transit) does not use ACQ/CDB and sends a call to a range holding network, if the number has been ported and the range holding network is an MNP3 participant, the originating network would pay the DCC to the donor network to cover their costs. In order to achieve this, Ofcom could issue guidance that it would resolve any dispute in this way; and

- all mobile number range holders to provide a complete up to date and accurate list of ported in numbers to Ofcom for the purposes of establishing a single common database.

During this interim period, the porting lead times would range between same day port to porting within three working days, depending on whether one of the operators is on the MNP2 system the call origination type. See further paragraph 5.9 below.

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[5] This is the mechanism used in the Republic of Ireland.

5.4   Business requirements for MNP3

We set out in paragraphs 5.7 to 5.12 a description of how MNP3 would run in parallel with MNP2 for one year (December 2007 – December 2008), and how MNP will work thereafter.

We also attach in Annex 3 the business requirements for MNP3 that were provided to Syniverse, and which served as the basis upon which Syniverse provided their indicative costs and timescales for the development and implementation of the MNP3 (enclosed with this Submission). We note that some of the information provided below duplicates the business requirements in Annex 3, but in anticipation of a competitive tender to select a vendor, it is intended that Annex 3 be a standalone alone document that can form the basis of a tender.

5.5   Pricing received in 2005

H3G considers the Syniverse estimates to be realistic and that there would be demand to implement MNP3. In 2005, H3G led an initiative within the MNP OSG to seek information from vendors of number portability systems. Vendors were asked to consider MNP systems capable of operating direct routing (but not same-day port lead times).

Seven vendors responded to the Request for Information with solutions meeting these requirements:

[✂]

Against these costs must be set the resolution of the numerous problems previously identified in the Submission. Even a small increase in competitive pressure in the UK mobile market and the consequent lower prices would show these amounts to be relatively trivial. They are also small in comparison to existing DCC payments and the amount Ofcom estimated as the true cost of call tromboning.

5.6 Costs and feasibility of MNP3

Syniverse have provided an outline proposal for MNP3, and proposes two alternative pricing models:

- [✂] The support cost would be in addition to the MNP2 support cost of £[✂], during parallel running period; or

- a 'pay per port' model, whereby Syniverse would bear the capex and opex costs and charge each participating operator an amount per port on the system.

H3G notes that these figures are small when compared of the existing DCC payments referred to earlier.

5.7 Parallel Running

H3G proposes that the MNP3 runs in parallel with MNP2 for one year (December 2007 – December 2008), in which time the incumbent MNOs would migrate their systems from MNP2 to MNP3. This would not require any changes to be made to the MNP2 system. Rather, for the purposes of interworking, MNP3 would 'emulate' the MNP3 operators so that they appear to the MNP2 system as MNP2 operators.

This would meet the needs of the new entrant operators who require new MNP arrangements as soon as possible, whilst allowing time for the incumbent MNOs to switch to the new arrangements. Otherwise, given the divergent commercial interests between the incumbent MNOs and the new entrants, we would envisage that they would delay migration to direct porting as long as possible, and certainly up until any mandated date.

Parallel running would be achieved by using a system of 'emulation'. It can be seen from 5.7 that the present MNP2 system and the new MNP3 system would operate side by side.
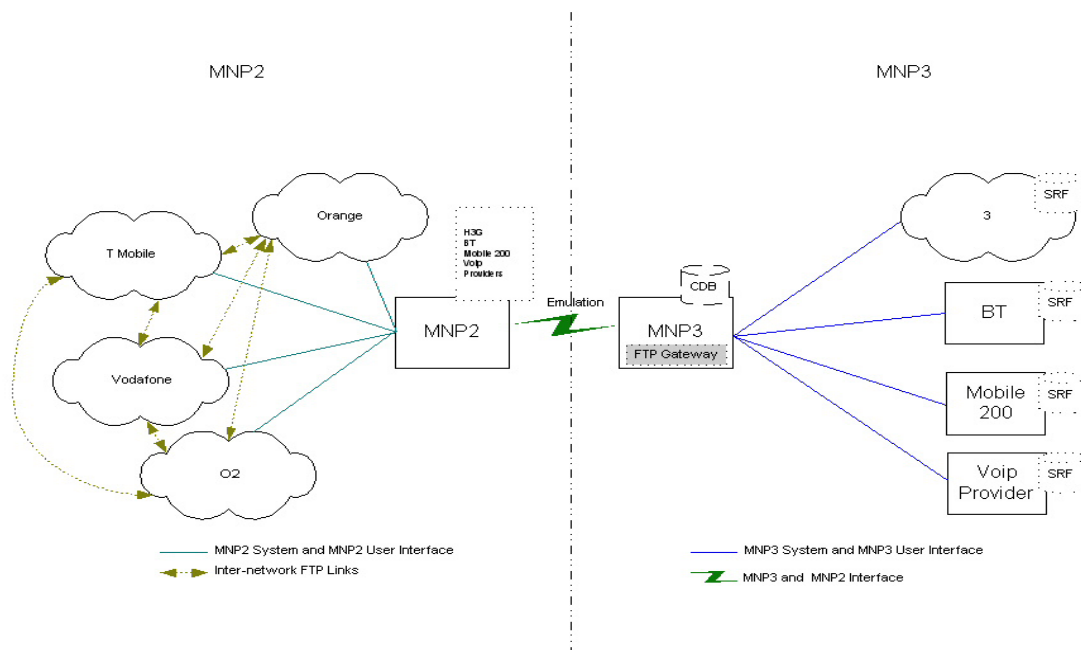
MNP2 & MNP3 PARALLEL RUNNING

Figure 5.7

API Emulation. The MNP3 system would emulate the MNP2 interface on behalf of the MNP3 operators that are connected to it. The MNP2 system would see the MNP3 operators as though they were connected to it directly. This would allow the MNP2 system to continue without change through the parallel running period, and to port numbers between MNP2 and MNP3 operators.

Conversely, the MNP3 system would recognise the MNP2 operators through the same bilateral link and would be able to port numbers to and from the MNP2 system.

By this means of emulation, MNP3 would not require any changes to the MNP2 system except that it would have to recognise the new MNP3 operators as network operators. Accordingly, each MNP3 operator would have to be added to the MNP2 list of available network operators.

FTP Clearing House. The MNP3 system would also provide an FTP 'clearing house' function for MNP3 operators to interwork with MNP2 operators in respect of day-of-port information transfer. Paragraph 2.1 above describes how under the current MNP2 system, every operator must have an FTP arrangement with every other operator for the transfer of ported number information. This will result in a very large number of FTP links. During the parallel running period, the MNP3 can ameliorate the position by providing a central point for all the MNP3 operators to use as their FTP transfer points. When all network operators are using direct routing with the CDB, the FTP clearing house will no longer be required.

5.8 Recipient-led Port Process and same day port lead time

As Ofcom is aware, to achieve 'same day' porting, the MNP3 porting process must be recipient-led. This is in contrast with the current donor-led process. A diagram of the new process is shown below.
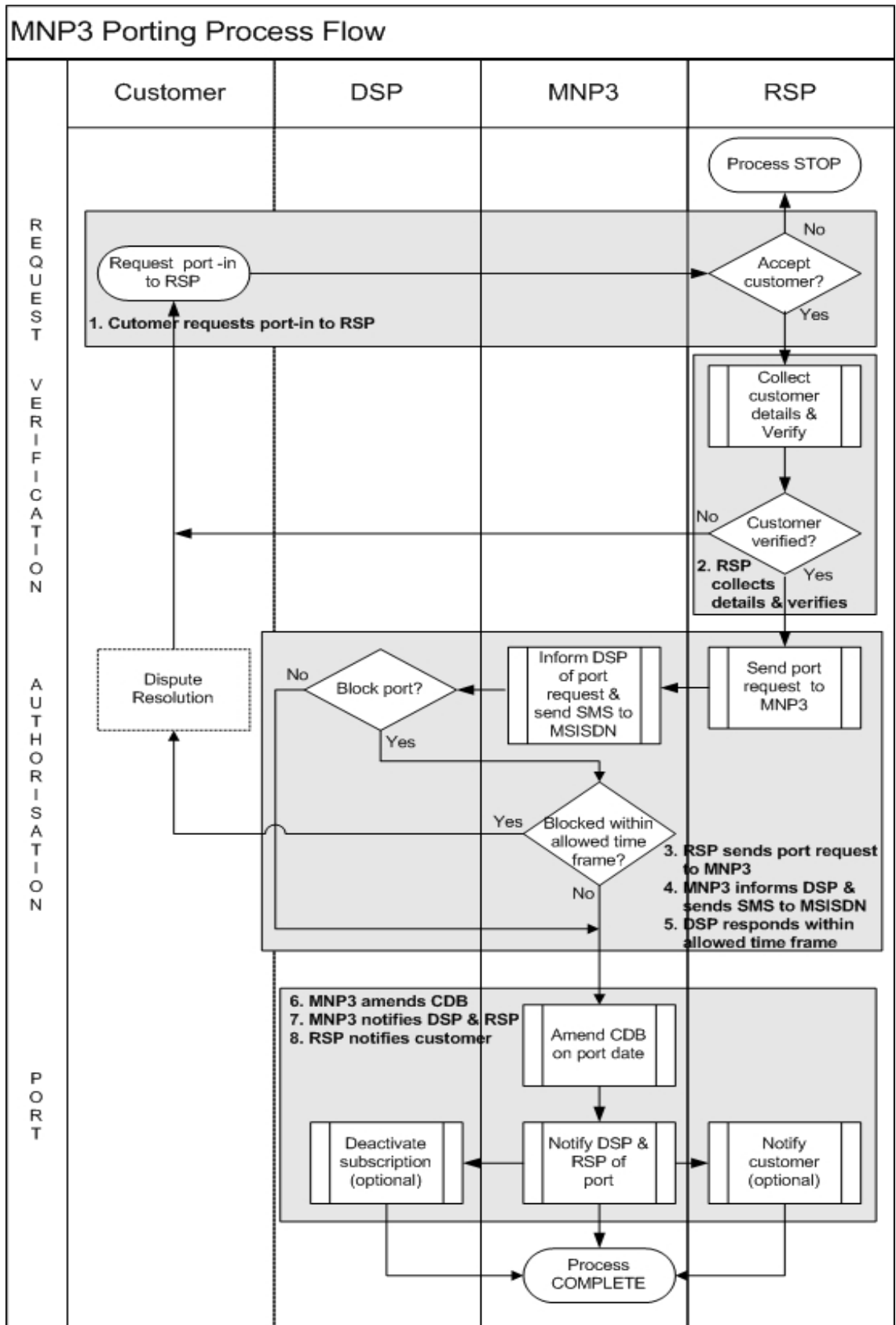
MNP3 Porting Process Flow

Figure 5.8

The steps involved in porting a number will be as follows:

- The customer makes a port-in request to the Recipient Network Provider (RSP).
- The RSP collects customer details to (i) establish the new service contract and (ii) verify the customer's identity. Note that it is crucial that the customer is verified as genuine at this point in order to avoid porting fraud and slamming.
- The RSP enters the port request into the MNP3 system.
- MNP3 informs the Donor Service Provider (DSP) of the port request and sends an SMS confirmation to the MSISDN. This is a safety measure to alert the customer in the event of attempted porting fraud or slamming.
- The DSP has a 'window' of, say, one hour, in which to block the port. Note that the DSP may only block the port for agreed, valid reasons.
- If the port is not blocked by the DSP in the allowed time frame, the MNP3 system will proceed with the port and will amend the CDB with the new details.
- MNP3 will notify the DSP and the RSP of the port on the port time and date.
- The DSP may deactivate the subscription.
- The RSP may inform the customer of the port.

During the period when MNP2 and MNP3 run in parallel, if the port involves an MNP2 network, the porting process followed will be the MNP2 process. The role of the MNP3 system in this scenario will be to emulate the MNP3 operator on the MNP2 system.

5.9   Implications for the three call origination scenarios during the parallel running period

During the parallel running period (ending December 2008), there will be different port lead times depending on the call scenario:

Porting scenario	Porting lead time during the parallel running period (ending 31 December 2008)
The donor or the recipient network are MNP2 networks	2 to 3 days (because the timing of the port is controlled by the MNP2 system)
The donor, the recipient and range holding networks are all MNP3 networks	Same day (because the timing of the port is controlled by the MNP3 system)
The donor and recipient networks are MNP3 networks, but the range holding network is MNP2	Next day (because the range holding network is informed of the re-routing only once a day at 11am)

5.10   Central Database

The MNP3 system will provide a centralised number portability database (CDB) which will record all ported numbers and their network location. The fields required in the direct routing database will be:
- MSISDN
- NPPC
- Date of port

It can be seen that this data entry structure is extremely simple. It should be noted that these fields are a subset of those that would be found in an Enum database. This database structure would therefore be fully upgradeable to an Enum data entity structure if and when a common solution was provided across fixed and mobile number portability. It is envisaged that very little effort would be required from the NICC to ratify this structure.

Note that the CDB is a source of information only. It will not be used as the 'Control Point' for real time ACQ: this function will be resident in each network of the network operators.

At the time of implementation, the CDB of ported numbers will be empty. As operators join the MNP3 system, they will need to provide their complete list of numbers ported into their network.

Each hour (during business porting hours) the CDB will transmit an XML file of changes to each operator who uses the ported number database for direct routing.

With 24 hours notice, participating operators will be able to request a complete file for verification purposes if required.

5.11 Call Routing

Set out below is the call routing for voice and video calls, SMS messages and MMS messages for (i) mobile originated services (ii) UK fixed network originated services and (iii) international originated services.

(i) Mobile originated services

Services originating from an MNP3 network. With direct routing, each mobile network will keep a copy of the CDB and receive regular updates. The database will be used when sending voice and video calls and SMS and MMS messages to other networks which use mobile number ranges.

- Before a service is routed out of the network the CDB will be consulted.

- In the case of voice and video calls, the call to a ported number will be routed with the correct NPPC prefixing the MSISDN. Routing may use direct interconnect where this exists between the originating and recipient operator, otherwise it will route via a transit network capable of recognizing the NPPC[6].

- The originating network will pay the recipient network the recipient's correct MTR.

- In the case of SMS messages, the originating network will use the CDB to send a location request message directly to the recipient network. The recipient network will send a confirmation reply to the originating network and then the SMS will be forwarded directly. This avoids the need to pass the location request via the range holding network.

- In the case of MMS messages, the initial routing will take place using the SMS message system and the MMS message will be forwarded to the recipient network's URL.

Services originating from an MNP2 network. During parallel running period, where the originating network is an MNP2 network the routing will work in the same way that it does now under the MNP2 arrangements (albeit with the settlement and DCC arrangements modified, as described in paragraphs 5.2 and 5.3 above). A service originating on an MNP2 network will be routed as follows:

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[6]At present BT is the only transit network that offers an NPPC routing service.

- In the case of voice and video calls, the call will be routed to the range holding network.

- The range holding network will identify the network that the number has been ported to and forward the call with the correct NPPC prefixing the MSISDN. Routing may use a direct interconnect where this exists between the originating and recipient operator, otherwise via a transit network.

- The range holding network will pay the recipient network its correct MTR (and not the range holder's MTR).

- The recipient network will not be liable to the range holding network for an DCC charges.

- Where the range holding network is an MNP3 operator (and the ported number information is therefore in the CDB) the originating operator will be required to pay the DCC (in contrast to the present arrangements where the DCC is paid by the recipient network).

- In the case of SMS messages, the originating network will send a location request message to the range holding network. The range holding network will identify that the number is ported out and forward the request to the recipient network. The recipient network will send a confirmation reply to the originating network and then the SMS will be forwarded directly.

- In the case of MMS messages, the initial routing will take place using the SMS message and the MMS message will be forwarded to the recipient network's URL.

(ii) UK fixed network originated services

As stated in Part 4, H3G believes that 2012 is too late for implementation of direct routing of calls originating from fixed networks (and international originated traffic which often passes through the same transit operators).

[✂]

BT Wholesale's transit network consists of a cluster of Ericsson AXE10 switches. AXE switches are inherently capable of operating an ACQ system, in contrast to the System X switches used in BT's DLE network.

In order to implement direct routing of the transit calls, BT would need to implement a CDB which the AXEs would use for ACQ. There are two types of hardware which cold be used:

- [✂] Signalling Transfer Point nodes (STP); or

- Enum server.

The advantage of the Siemens STP solution is that it is tried and tested, and BT have already implemented it for a smaller application. The advantage of the Enum server option is that the Enum server will be needed for BT's 21st Century Network and so it will be a reusable asset when the AXE network is eventually decommissioned.

BT's feasibility study confirmed that the solution (using the STP option) was possible, but in the absence of any interest from the four incumbent MNOs, BT has been unable to proceed.

In order to make this solution possible, transit operators would need to be permitted to directly route calls to ported numbers, irrespective of any provisions in the interconnect agreements with the incumbent MNOs which specify that all calls to number ranges allocated to the MNOs must be routed to those networks. Suitable guidance from Ofcom may be needed to ensure this.

(iii) International originated services

Where services originate from international networks they will be routed as follows:

- Voice calls will usually enter the UK via an international gateway. The gateway provider will pass the call to a transit provider. The transit provider will pass the call directly to the recipient network as described in paragraph 5.11(ii). Note than in practice the international gateway provider and the transit provider may be one and the same.

- Under some circumstances, voice calls may enter a mobile network via a direct route. In this case, the mobile network must forward the call to the recipient network using the arrangements described in paragraph 5.11(i).

- Video calls will enter the UK via an international gateway that is capable of handling such calls (there are certain requirements for signalling and bandwidth). The international gateway provider will pass the call to a transit provider who will pass the call directly to the recipient network as described in paragraph 5.11(ii). Note than in practice the international gateway provider and the transit provider may be one and the same.

- SMS messages will be routed as described in paragraph 5.11(i) using the MNP2 style arrangements. However, there is a trend in the industry to move towards an 'international gateway' solution which would use the CDB to provide for direct routing of SMS messages using the MNP3 style arrangements.

- In the case of MMS messages, the initial routing will take place using the SMS message and the MMS message will be forwarded to the recipient network's URL.

5.12   MNP2 System Capacity Limitations

At present the MNP2 system has capacity limitations. The level of UK porting is approaching approximately two million ports per annum. In order to accommodate higher levels of porting and migrations, testing is currently underway to establish whether any increase in capacity is necessary on the MNP2 system. An increase in capacity would require capital expenditure to increase the throughput of the MNP2 system.

The early implementation of the MNP3 system – which has been specified with a porting level of 4 million ports per annum - would make any such expenditure unnecessary.

6   RESPONSES TO THE SPECIFIC QUESTIONS ASKED BY OFCOM

Set out below are H3G's responses to the specific questions asked by Ofcom in annex 4 of the Consultation. These answers should be read in the context of this Submission as a whole.

Question 1: Do you agree that an ACQ/DCB solution is required to achieve independence of Donor Networks?

Yes, an ACQ/CDB system is the only way to achieve true independence from the range holding network and to rectify the very significant costs and market distortions of the current MNP system.

The shortcomings of the current MNP system in the UK are described in Part 2, and the immediate short term impacts on consumers, and the distortion effect to the UK mobile sector to the detriment of new entrants, are described in Part 2 and Annex 2.

A Query and Release solution or a direct routing solution such as the one described in NICC Service Description 08, addresses some of these issues but does not achieve full independence.

Question 2: Do you agree that an ACQ/CDB solution common to both fixed and mobile networks is the preferred option?

See paragraph 4.1, Option 5.

Question 3: Do you agree that any transition to ACQ/CDB should occur in the course of migration of fixed networks to NGN architectures?

See paragraph 4.1, Option 3.

Question 4: Do you agree that it would be beneficial to require the mobile industry to complete its transition to an ACQ/CDB solution by September 2009?

H3G agrees with the proposed solution but does not agree with the proposed timescales. See Part 5.

Question 5: Ofcom would welcome respondents' analyses of the costs and benefits of a comprehensive transition of the mobile industry to direct routing using NICC Service Description 8 or other suitable standard by the end of 2007, ahead of a further transition to ACQ/CDB.

See paragraph 4.1 Option 4, paragraph 4.2 and Part 5 for an analysis of this transition. See Part 2 with respect to he shortcomings of the current MNP system in the UK, and see Part 2 and Annex 2 with respect to the immediate short term impacts on consumers, and the distortion effect to the UK mobile sector to the detriment of new entrants.

Question 6: Ofcom welcomes views from stakeholders as to the appropriate approach to be adopted in achieving the implementation of ACQ/CDB whilst

ensuring that such co-operation is limited to technical matters directly related to the ACQ/CDB solution.

H3G believes that the OSG should be disbanded and a new entity formed which will address the issues discussed in this Submission.

The new steering group should include:

- clear reporting line to Ofcom with Ofcom involvement as required;

- meetings held in the open;

- minutes published on a website;

- vendor contracts not to be multi-way between participants, but to be structured such that any single member cannot block contract amendments;

- vendor contracts to be structured so that enhancements to benefit a single operator (which are not to the detriment of any other operator) can be paid for by that operator and implemented; and

- a financial structure for participants which is proportionate to the usage made of the system.

Question 7: Do you have any comments on the transition milestones and their corresponding dates? Could the dates be achieved earlier? Alternatively, could any of the dates be at known significant risk of being missed?

H3G has shown that the new MNP arrangements proposed by Ofcom can be implemented by December 2007. An early implementation would benefit any operator who wishes to enter into MNP arrangements. Without an early MNP3 implementation such operators would have to incur the cost and other disadvantages of the MNP2 system for an interim period before bearing the costs of switching to the MNP3 system at a later date.

Whilst the MNP3 requirements will go out to competitive tender, the supplier of the present system has confirmed that delivery would be possible by October 2007. Accenture have confirmed that the overall delivery would be possible by December 2007. H3G believes that the involvement of NICC will be minimal. A subgroup of the NICC will be sufficient to amend Service Description 08 to reflect the new arrangements.

Question 8: Do you agree that Ofcom should require port lead times to be reduced to less than one working day? If you do not agree, please provide evidence that shows otherwise.

Yes. The evidence from the H3G/TNS Survey demonstrates that consumers expect same day porting (see Annex 4). H3G has shown in Part V that same day porting is only possible if the process flow is changed to make the porting process recipient-led. The MNP3 system is specified to be recipient-led and same day porting (two hours) will therefore be possible.

Question 9: Alternatively, do you agree that Ofcom should require port lead times to be reduced to three working days?

With the implementation of MNP3 and parallel running, H3G does not recommend that the process flow on MNP2 be altered as this would be wasted investment. Instead, H3G proposes that the current MNP (donor-led) system be run in parallel

with the MNP3 system until the date for mandated use of MNP3. H3G believes, however, that the current porting process can be reduced to two working days without incurring any significant changes to the overall process or additional costs. See paragraph 4.2 Option 7.

Question 10: What is a reasonable timeframe for the implementation of a one working day process?

In Part 5, H3G has shown that the same day porting process can be implemented as part of the MNP3 system by December 2007. During the parallel running period porting with MNP2 networks will be on the shortened MNP2 timescales which could be 'next day (see also paragraph 5.9). H3G is proposing that all networks must use the MNP3 system by January 2009.

Question 11: Do you consider that a three working days port lead time process could be implemented within 6 months?

See paragraph 4.2 Option 2.

ANNEX 1: GLOSSARY

ACQ	All Call Query
API	Application Programming Interface
ARPU	Average revenue per user
CAC	Customer Acquisition Cost
CARS	Customer Acquisition and Retention Services
CDB	Central Database
DCC	Donor Conveyance Charge
DLE	Digital Local Exchange
DNO	Donor Network Operator
DSP	Donor Service Provider
FTP	File Transfer Protocol
Migrations	Transfer of a MSISDN between SPs where the Network Operator remains the same
MMS	Multimedia Message Service
MNO	Mobile Network Operator
MNP	Mobile Number Portability
MSC	Mobile Switching Centre
MTR	Mobile Termination Rate
NPPC	Number Portability Prefix Code
ONO	Original Network Operator
RNO	Recipient Network Provider
RSP	Recipient Service Provider
SIM	Subscriber Identity Module
SMS	Short Message Service
SMSC	Short Message Service Centre
SP	Service Provider
SRF	Signalling Routing Function
SRI	Send Routing Information
Supplier	A 3rd party MNP solution provider
TDM	Time Division Multiplex
VOIP	Voice Over Internet Protocol
XML	eXtensible Markup Language

ANNEX 2: WELFARE COSTS OF THE CURRENT MNP SYSTEM IN THE UK

This Annex analyses the manner in which the existing MNP system in the UK is sub-optimal, in terms of:

- short-term consumer impacts; and

- distortion of the market against new entrants, thereby reducing the benefits of competition for consumers.

6.1   Short-term immediate consumer impacts

Excessive port lead times

The UK port lead time of one calendar week is excessive. European and international best practice is "same day" porting as recognised in the Consultation (Section 4.8). Australia, Hong Kong, South Korea and the USA each have port lead times of 2 hours or less.

This delay in porting in the UK is a significant inconvenience to, and imposes significant switching costs on, customers. The consumer surveys carried out by each of H3G/TNS and Ofcom show that consumer expectations are for short port lead times. The H3G/TNS Survey, undertaken in January 2007 and attached as Annex 4, found that 42% of respondents believed an acceptable timeframe to port a number was the same day.

This means that customers either incur higher costs in switching networks or change suppliers less often than would be efficient. This means UK consumers cannot reap the full benefits of competition in terms of the retail prices they pay and the quality and types of mobile services they purchase.

Overlapping contracts

Postpay consumers find that their new service provider will commence their contract and start taking payments from the date that the customer signs their new agreement (and, at least in H3G's case, the date from which at least some services need to be provided), rather than from the date that their number is ported from the donor network.

Assuming that the average monthly contract payments across the industry are £25 and using Ofcom's 2006 porting figure of 1.78 million consumers porting their number, it can be calculated that the cost to the porting consumer in 2006 of unnecessarily overlapping contracts is £10.38 million (assuming a seven day overlap in contracts). A same day porting process would therefore significantly increase consumer welfare by a far greater proportion than the cost to the industry of switching to a same day process.

Consumers switching without porting

The H3G/TNS Survey (attached in Annex 4), indicates that 13% of consumers switch networks without porting their number because port lead times are too long. H3G's measurements of the difference in inbound minutes received by ported and non ported numbers shows that consumers who do not port their numbers are missing a large number of calls – presumably from callers who do not yet know the consumer's new number.

Consumers who don't switch

The H3G/TNS Survey (Annex 4) suggests that up to 65% of consumers do not switch networks because port lead times are too long, or because they are led to believe that they cannot change their number. Such consumers are disadvantaged because they do not have the opportunity to take advantage of better offers from

alternative providers. Not moving to a cheaper provider is a significant cost to consumers.

Increased costs from call forwarding

The UK call forwarding arrangements result in higher DCC costs and additional network transmission costs. These costs are ultimately passed on to the consumer.

The biggest single expenditure related specifically to the indirect routing of calls is the DCC. This was originally a regulator determined amount intended to cover the donor network's costs of 'tromboning' ported out traffic through its network.

The second major cost of call forwarding is indirect routing. This is a highly inefficient way of routing large volumes of calls. H3G estimates that with 8% of all mobile numbers in the UK being ported, the overall mobile industry capital cost of the extra capacity (at today's prices) to be £5.1 million per annum. There are also the ongoing support and maintenance costs to be taken into account, together with the opportunity costs of wasted port capacity that could be utilised for other purposes. H3G notes that these wasted transmission and port costs are very much larger than the estimates from Syniverse and others for implementing MNP3 this year.

The DCC mechanism, which is now significantly out of date, means that in addition these costs fall disproportionately on the new entrant to the degree that the incumbents are actually over recovering their costs and the new entrant is subsidising its competitors. This must be addressed as a matter of urgency.

6.2 Market distortion leading to reduced competition

It is clear from the research that the inefficiencies of MNP2 result in unmet demand for porting and switching in the UK market. As well as its immediate damage to consumers, this unfulfilled demand and resulting cost differences distort competition, making it harder for new entrants to gain market share and achieve the critical mass of customers necessary to break into a capital-intensive business with large economies of scale.

Set out below are the many ways in which costs or processes of MNP2 disadvantage new entrants, creating barriers to entry and growth.

Donor Conveyance Charge

The DCC falls disproportionately on new entrants. Owing to the imbalance of ported in customers to ported out customers on the H3G network (approximately [✂])[7]. H3G does not receive as much in DCC as it pays to the other operators. H3G currently pays out £[✂] per month to other MNOs (average for 2006) but only receives £[✂] per month, a net outpayment of £[✂] per month. H3G's current position of net outpayments is therefore £[✂] per annum (based on 2006 figures).

Clearly this is [✂] impacts a new entrant over the incumbent operators. H3G believes that the payments of the DCC between the four incumbents will be more or less equal, therefore the only reason for the incumbents to maintain this level is either inertia or because the volumes involved produce a favourable and guaranteed revenue stream (and a net revenue stream from new entrants).

The present DCC of 0.8ppm is significantly above cost and allows the incumbent MNOs to charge excessive prices. This further provides them with a disincentive to move to a direct routing solution. H3G's estimates suggest that the actual donor network costs of providing donor conveyance are maybe 0.1ppm, with

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[7] [✂]

approximately an additional 0.1ppm if the BT transit service is used to connect the donor and recipient networks.

The wrong MTR applies to ported numbers

Under the present call forwarding system, calls to a customer ported in from another network are charged at the rate of the donor network. This means that MNOs are over or under recovering costs of mobile termination in an increasingly arbitrary fashion. This distorts competition and incentives to invest.

Under a direct routing solution, calls to ported in customers would be charged at the standard MTR of the recipient network. Given the current difference between the H3G MTR and the regulated 2G rates of the incumbent mobile networks, H3G estimates that a direct routing solution would have the following effects on monthly costs and revenues (based on November 2006 payments):

- amount received by H3G for voice call termination for calls to ported numbers would increase by £[✁];

- discontinuation of the DCC would result in net benefit to H3G of £[✁] ;

- leading to a net improvement in the month for H3G of £[✁] .

These effects would be made worse if indirect routing was maintained but with improved port lead times. We believe that an improved port lead time will increase the proportion of H3G customers that port their number in from another network. H3G estimates that an improvement in lead times could lead to ultimately [✁]%[8] of H3G's post pay customer base having a ported in number.

Similarly, there is a related situation where customers who have ported their number from H3G to another network. In this scenario the current charging principles mean that the H3G termination rate is passed to the recipient network i.e. a rate that is above the operator's regulated 2G rate. H3G currently pays the other mobile operators a total around £[✁] million per month (based on November 2006 figures). Of this amount, H3G estimates that the other MNOs are over-recovering approximately in aggregate £[✁] per month from this effect, which further distorts competition and incentives. We estimate that this would equate to a total over-payment to the other MNOs of between £[✁] to £[✁] over three years.[9]

These incorrect MTRs cause a distortion in the market. Further, we note that in its cost modelling for the mobile call termination market review, Ofcom has not taken these effects into account. [✁][10]

Inability to win new customers

H3G entered a saturated market[11] in March 2003. By then, the four incumbent MNOs were well established and had gained their market shares in a period when many customers were buying a mobile phone for the first time.

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[8] [✁]

[9] These assumptions are based on present charges applied by the mobile operators and are subject to any determinations made by Ofcom as part of its Mobile Termination Market Review.

[10] Ofcom's proposals in "Mobile Call Termination: proposals for consultation", published 13 September 2006. H3G's response of 22 November 2006 also described this issue.

[11] Essentially all potential customers already have mobile service and a mobile number from one of the incumbent operators.

In so far that the incumbent operators forward calls to ported numbers they have maintained control over the customer's won by the new entrant operators.

New entrant operators are therefore particularly sensitive to the effectiveness of measures to remove barriers to customer migration (i.e. barriers to expansion) such as MNP. After three years of H3G's operation, the effect of the barriers is illustrated by comparing market shares, which were as follows as at quarter 4 2005:

Operator	Date Launched	Subscribers ('000s)	Retail Revenues	Market share by subscribers	Market share by revenue
Vodafone	1985	14,820	£3.7bn	22.7%	28.1%
O2[12]	1985	16,981	£3.2bn	26.0%	24.3%
Orange	1994	14,858	£3.1bn	22.7%	23.5%
T-Mobile[13]	1993	15,312	£2.2bn	23.4%	16.7%
H3G[14]	2003	3,441	£0.97bn	5.3%	7.4%

[✁] The rate of customer acquisition for a new mobile operator seeking to reach scale as quickly as possible is the single most important factor in its ability to compete on a level playing field with the incumbent operators. Until a new entrant has reached scale it has to compete at a cost disadvantage to its competitors.

It can be seen from the answers given to question 7 in the H3G/TNS Survey (Annex 4) that 60% of customers said they would not switch suppliers as a result of being told that it would take a week to port their number rather than one day. It is clear that H3G has therefore acquired fewer customers through adverse port lead times than it otherwise would.

New entrants are therefore dependant on an effective MNP system in order to compete effectively. In a saturated market, without effective MNP, new entrant operators can only win customers by persuading them to lose their old number or incur the switching costs associated with the existing MNP solution. Poor MNP is a significant barrier to entry. [✁]

Increased customer acquisition costs

In a marketplace where there is fewer propensity for customers to switch networks, the cost of customer acquisition is higher than where customers' switching costs are lower making them more likely to change networks more freely and of their own choosing.

Under the current system the donor operator has the chance to win back customers for a period of time when the PAC is requested. There is a 48 hour period in which the donor network has to issue the PAC, and a further two working days after the customer registers with a new network before the port is 'locked'. This gives a period of between two and four working days (or six calendar days if the weekend falls in this period) in which the donor network can exercise 'win back' activities.

[✁]

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[12] O2 subscribers include Tesco
[13] T-Mobile Subscribers include Virgin
[14] H3G Retail Revenues are as at end of Q2 2005 annualised

[✂] It is reasonable to expect that with shorter port lead times this will reduce for a given level of customer acquisition as customers do not need to be compensated for the costs of switching networks to the same extent.

Ported customers are higher quality

H3G has compared the 'lifetime' value of H3G postpay customers who have ported numbers with those who did not port their number. The measurements show that customers with ported numbers:

- receive more inbound minutes;

- spend more on their retail bill; and

- churn less often.

Inbound minutes

H3G has analysed the number of minutes received by customers with ported-in minutes compared to those with H3G native numbers. In 2006 the average ported in customer received [✂] minutes per month compared to [✂] for non-ported customers. The reason for this is that a ported in number is longer established and known by more of the customer's friends, family and business contacts.

The difference in value of the termination minutes of ported and non ported customers is in the order of approximately £[✂] per customer of additional monthly ARPU. [✂]

Retail spend

Through bill analysis H3G estimates that customers who port their number in from another network, make more outbound calls and use more retail services than customers who do not port. Typically customers who port their number have higher ARPU in the order of £[✂] per month.

Lower churn

H3G has analysed the rate of churn of ported in customers compared to those with native H3G numbers. Customers who have ported in their number are likely to churn less and therefore stay with H3G for a period which is [✂]% longer than average.

H3G (and other new entrant operators) stand to benefit from faster porting lead times. However a move to a solution with a shorter port lead times will also have an effect on the amount of customer churn out of the H3G network. Under a system that employs a two hour porting process, there is no opportunity for customer retention activity on the part of the donor network. This, combined with the increased attractiveness of porting, means H3G estimates an overall increase in churn on its network of [✂]%; it is anticipated that this would be reflected throughout the mobile industry.

Ported customers are less attractive to new entrant operators

Although ported customers are of higher quality, the MNP2 arrangements mean they are less attractive to new entrant recipient operators than customers using numbers from number ranges allocated to the recipient operator.

Under the present MNP2 arrangements, when a customer ports their number into a new network, that recipient network must pay the donor (range holding) network the DCC of 0.8ppm for all voice and video calls. This is a permanent cost to the recipient network which directly reduces the contribution from call termination.

Since the MTR of ported in numbers is that of the donor (range holding) network, networks with higher termination rates suffer when calls are received to numbers

ported in from networks with lower MTRs. New entrants, who generally have higher MTRs reflecting their initially higher costs, suffer the most, whilst the incumbent MNOs benefit.

With these two disadvantages, it is not surprising that the availability of MNP is downplayed (or even denied) to customers who may be switching or considering switching. The market signals are wrong.

6.3   Conclusion

The very significant costs and market distortions of MNP2 should be rectified as a matter of urgency. The current system carries significant immediate costs, inappropriate distortion of investment and innovation incentives and denial of choice for consumers, and prevents the market from operating efficiently, to the particular disadvantage of new entrants such as H3G.

[✂] This cannot be allowed to continue.

ANNEX 3: THE BUSINESS REQUIREMENTS FOR MNP3

This Annex sets out the business requirements for MNP3 that were provided to Syniverse, and is the basis upon which they provided their proposal [and indicative quote] for the development and implementation of the MNP3 enclosed with this Submission. We expect, however, that a competitive tender will be conducted to select a vendor, and these business requirements can form the basis for discussion and agreement amongst the participating MNOs.

6.4   Background

The current system used for Mobile Number Portability in the UK is referred to as MNP2, and is currently being consulted upon by Ofcom in its *"Review Of General Condition 18 – Number Portability (November 2006)".* The four main characteristics of the current system are:

- it is a donor led process;

- port lead times are greater than 5 working days (one calendar week);

- indirect routing of calls and signalling which is wasteful of capacity and costs (and results in the DCC); and

- dependence of inbound services on the donor network thereby exposing customers to risks of business and hardware failures.

When implemented, MNP2 was designed to only involve the recipient and the donor networks. There was no requirement at the time, to provide visibility to all network operators of every port that takes place.

There is now a requirement that all mobile operators and fixed line transit operators host a list of ported numbers in order that they can directly route services to ported numbers. Ofcom is mandating that a new direct routing solution is implemented. This is referred to here as "MNP3".

Direct routing in MNP3 will mean that inbound services to handsets with ported numbers would be routed correctly first time. There will be cost savings on switch ports and signalling and transmission capacity. Also, functionality and services that may be supported by both the originating and terminating network will no longer necessarily need to be supported by the donor network. Port lead times will reduce to 2 hours for ports between MNP3 users. It is also envisaged that MNP3 will run in parallel with MNP2 for an interim period which may mean that the intersystem port lead times may only be reduced to 3 working days during this interim period.

6.5   Purpose

The purpose of this document is to identify the business requirements for a UK MNP3 solution so as to enable potential vendors to provide quotations.

6.6   PROPOSED SOLUTION ("MNP3") USING CDB

Solution Description

As depicted in Figure 1, the originating network is no longer dependent on the donor network and routes incoming services directly to the appropriate recipient network.

MNP3 will provide a centralised number portability database ("CDB") which records all ported numbers and their network location. Operators will download the ported number records to allow them to directly route inbound services.
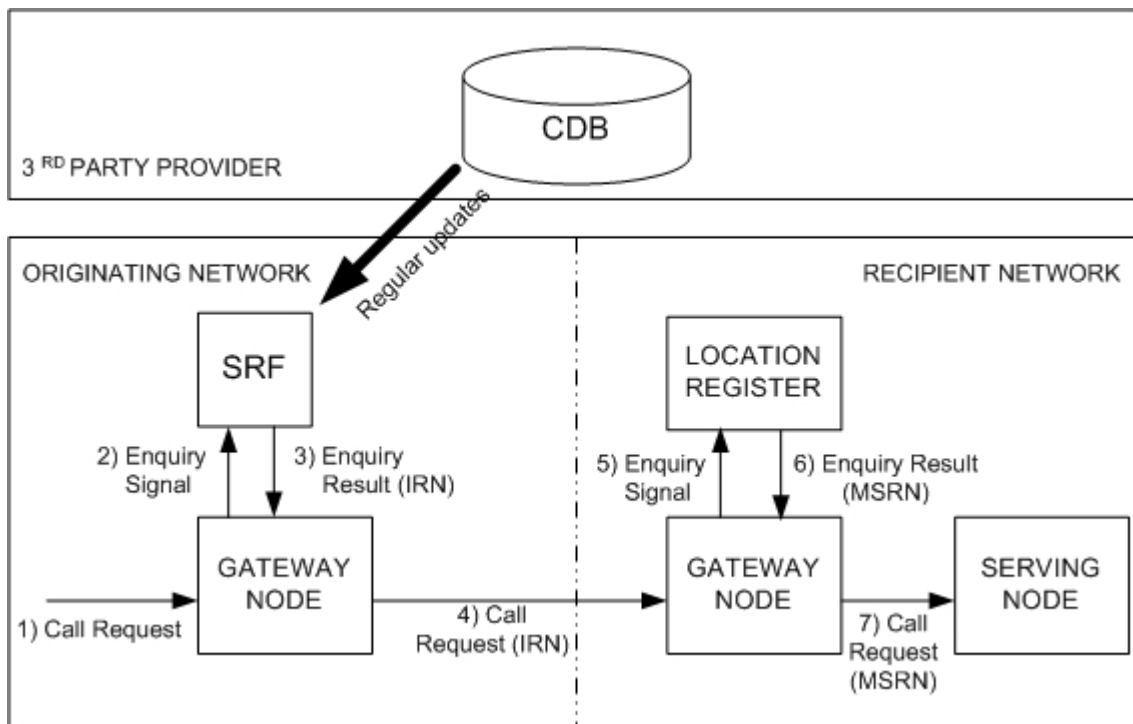
Figure 1 Solution Description

Inbound Service Routing

Direct Interconnect

The inbound service routing for a direct interconnect involves the following steps:

1. The originating network queries its SRF which returns the information on location of the ported number

2. The originating network routes the service directly to the recipient network

No Direct Interconnect (via transit provider)

The inbound service routing where interconnect is provided via the transit provider involves the following steps:

1. The originating network routes the service to its transit provider

2. The transit network queries its SRF which returns the information on location of the ported number

3. The transit network routes the service directly to the recipient network

Porting Process

1. As depicted in Figure 2, the porting process contains the following steps:

2. Customer requests port-in to the RSP

3. RSP collects customer details for port in. The customer shall provide the following information to the RSP:

    MSISDN

    Port Date

4. RSP collects customer details for verification. The customer shall provide the following information to the RSP subject to agreed business requirements:

    Name

Address

Proof of DSP SIM

Driving Licence (if available)

2 household bills

2 DSP bills

RSP sends port request to MNP3

5. MNP3 informs DSP of the port request and sends SMS confirmation to MSISDN

6. DSP responds within the allowed time frame (5 minutes - 1 hour; subject to agreed business requirements) to block the port

7. If port is not blocked by the DSP in the allowed time frame, MNP3 proceeds with the port and amends CDB on port date

8. MNP3 notifies DSP & RSP of porting

9. DSP deactivates the subscription (optional)

10. RSP informs customer (optional)
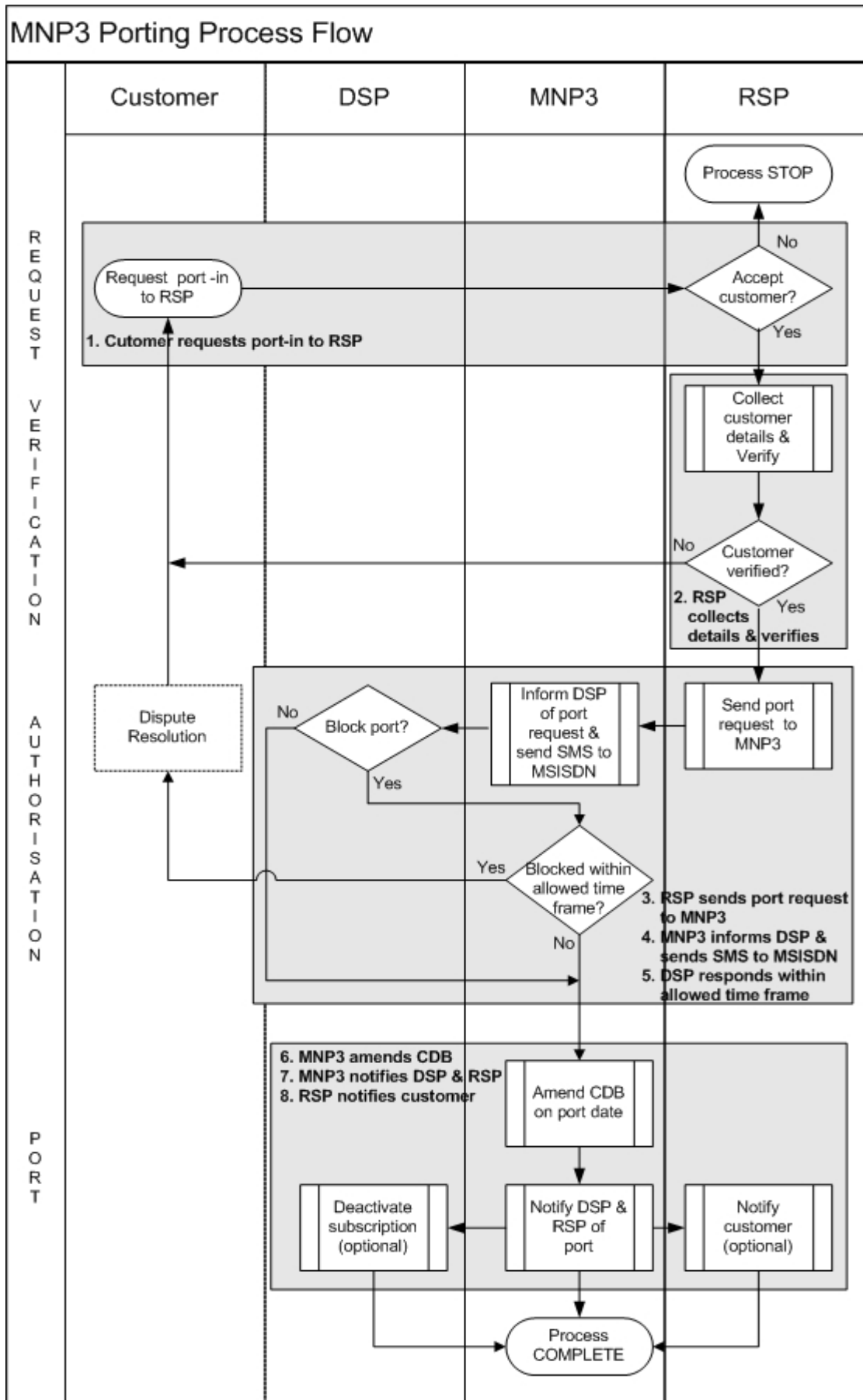
Figure 2 MNP3 Porting Process Flow

6.7 **Business Requirements**

The following are the key design objectives for MNP3:

R-GEN-1: The solution should be architecturally **scalable** so that it will address the future needs of each of the UK Mobile networks and the new entrants. This is to ensure that a permanent rather than an 'interim' solution is adopted. See below for the volumes requirements.

R-GEN-2: The solution should not be dependant on 100% participation of mobile operators since initially there will be **parallel running with the MNP2**. It should be capable of working with an initial group of participating mobile operators and allow for migration of legacy MNP2 mobile operators after launch.

R-GEN-3: The port process will be **recipient led**

R-GEN-4: The solution should provide **safeguards** against port frauds

R-GEN-5: The solution should support **bulk as well as single ports**

R-GEN-6: The solution should provide **Port History Support**

R-GEN-7: The solution should incorporate **standard industry protocols & interfaces** to **minimise cost** to the mobile operators

Central Database (CDB)

This database will:

R-CDB-1: be created and populated with MSISDN, NPPC, Port Date for inbound service routing

R-CDB-2: provide Port Timestamp, DSP, RSP, DNO, RNO, ONO information for Port History

R-CDB-3: provide an XML interface.

R-CDB-4: be managed and updated in real time as ports take place,

R-CDB-5: provide updates to network operators' SRFs for example once every hour

R-CDB-6: be scalable proof to accommodate any number of users

The provision of the historical information needed for R-CDB-1 above, will need to be collected from each operator.

Deployment and Hosting

R-DH-1: The CDB will be hosted by the vendor. Details are requested of the proposed deployment process

R-DH-2: Deployment shall include rollout of hardware and software to the hosting site and rollout of new software releases as required

R-DH-3: The Vendor shall provide person day effort and timescales showing detailed breakdown of activities and tasks based on previous experience learnt in projects of similar magnitude at other mobile operating companies.

Interfaces

MNP3 and MNP2 – Parallel Running via Emulation

As depicted in Figure 3, the MNP3 system will run in parallel with MNP2 via emulation.

R-INT-1: The MNP3 system shall provide FTP Gateway functionality to enable MNP2 users to exchange "day of port" information using the present MNP2 arrangements

R-INT-2: The MNP3 system shall require no changes to the MNP2 apart from adding MNP3 Users in "network" drop down list

R-INT-3: The MNP3 system shall present an MNP3 user as an MNP2 user to the MNP2 System
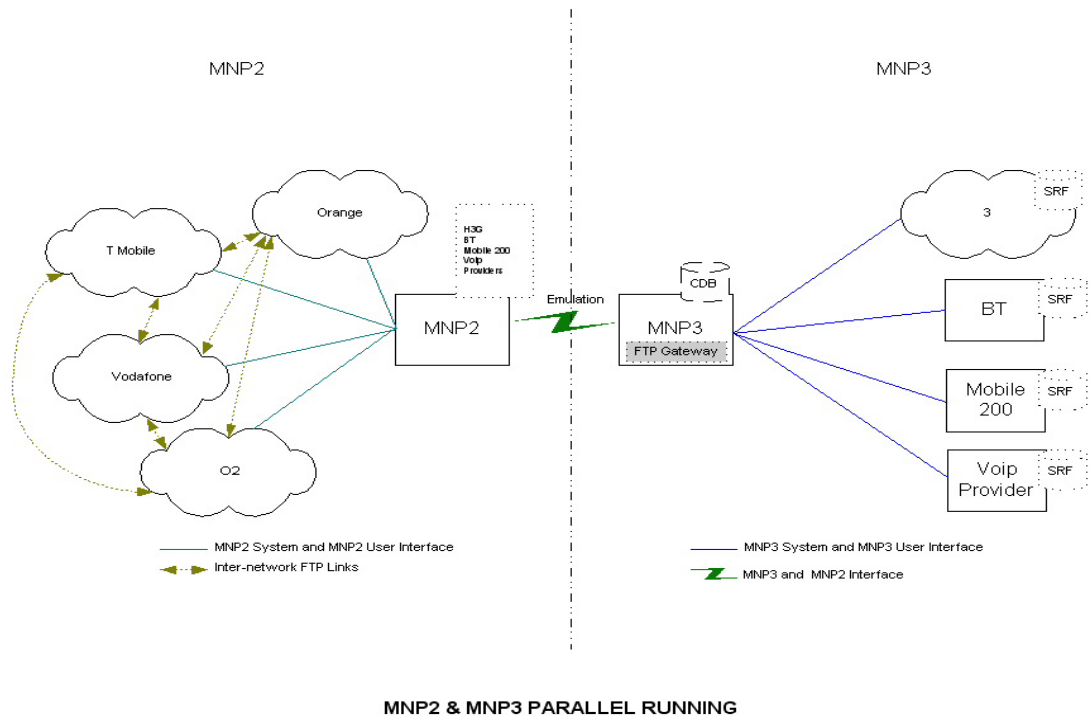

MNP2 & MNP3 PARALLEL RUNNING

Figure 3 MNP3 and MNP2 Parallel Running via Emulation

MNP3 System (CDB) and MNP3 User

R-INT-4: Access to the MNP3 system for the purpose of managing the porting of subscribers from one network to another will be possible via two methods.

- Graphical User Interface (GUI) over the Internet

- Machine to Machine (API)

R-INT-5: The access method described in R-INT-4 shall be secured and partitioned to allow an MNO to access and audit its own data only

R-INT-6: The access method for the regular updates described in R-CDB-3 and R-CDB-4 shall be based on XML

CDB and SRF

R-CS-1: The access method described in R-CDB-5 shall be based on XML

Use Case Scenarios

The matrices in Table 1 (MNP3 Number Range) and Table 2 (MNP2 Number Range) below depict various scenarios that may arise under the parallel running of the two systems.

R-UC-1: The MNP System shall provide support for all scenarios in Tables 1 and 2.

Recipient / Donor	MNP2 NO	MNP2 SP	MNP3 NO	MNP3 SP
MNP2 NO	Hybrid MNP3 & MNP2 (>5 days)	Hybrid MNP3 & MNP2 (>5 days)	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)
MNP2 SP	Hybrid MNP3 & MNP2 (>5 days)	Hybrid MNP3 & MNP2 (>5 days)	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)
MNP3 NO	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)	MNP3 Process (< 2 Hours)	MNP3 Process (< 2 Hours)
MNP3 SP	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)	MNP3 Process (< 2 Hours)	MNP3 Process (< 2 Hours)

Table 1: MNP3 Number Range

ONO = MNP3, DNO/DSP = MNP2, RNO/RSP = MNP2
- Port process takes place on MNP2 system as at present
- On the porting date, for valid porting MSISDNs, the DNO shall request the ONO via MNP3 FTP Gateway functionality to re-route incoming services to the porting MSISDN towards the RNO.
- On the porting date, for valid porting MSISDNs, the MNP3 shall update CDB

ONO = MNP3, DNO/DSP = MNP2, RNO/RSP = MNP3
- MNP3 system shall emulate MNP2 process with the DNO/DSP
- On the porting date, for valid porting MSISDNs, the DNO shall request the ONO via MNP3 FTP Gateway functionality to re-route incoming services to the porting MSISDN towards the RNO
- On the porting date, for valid porting MSISDNs, the MNP3 shall update CDB

ONO = MNP3, DNO/DSP = MNP3, RNO/RSP = MNP2
- MNP3 system shall emulate MNP2 process with the RNO/RSP
- On the porting date, for valid porting MSISDNs, the MNP3 system shall update CDB.

ONO = MNP3, DNO/DSP = MNP3, RNO/RSP = MNP3
- This is a normal case of an "all MNP3 port".
- On the porting date, for valid porting MSISDNs, the MNP3 system shall update the CDB.

Recipient / Donor	MNP2 NO	MNP2 SP	MNP3 NO	MNP3 SP
MNP2 NO	MNP2 Process (>5 days)	MNP2 Process (>5 days)	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)
MNP2 SP	MNP2 Process (>5 days)	MNP2 Process (>5 days)	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)
MNP3 NO	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)	MNP3 Process (< 2 Hours)	MNP3 Process (< 2 Hours)
MNP3 SP	Hybrid MNP3 & MNP2 (<3 days)	Hybrid MNP3 & MNP2 (<3 days)	MNP3 Process (< 2 Hours)	MNP3 Process (< 2 Hours)

Table 2: MNP2 Number Range

ONO = MNP2, DNO/DSP = MNP2, RNO/RSP = MNP2
- This is a normal case of an "all MNP2 port".

ONO = MNP2, DNO/DSP = MNP2, RNO/RSP = MNP3
- MNP3 system shall emulate MNP2 process with the DNO/DSP
- On the porting date, for valid porting MSISDNs, the DNO shall request the ONO to re-route incoming services to the porting MSISDN towards the RNO
- On the porting date, for valid porting MSISDNs, the MNP3 system shall update CDB.

ONO = MNP2, DNO/DSP = MNP3, RNO/RSP = MNP2
- MNP3 system shall emulate MNP2 process with the RNO/RSP
- On the porting date, for valid porting MSISDNs, the MNP3 system shall request the ONO to re-route incoming services to the porting MSISDN towards the RNO
- On the porting date, for valid porting MSISDNs, the MNP3 system shall update CDB

ONO = MNP2, DNO/DSP = MNP3, RNO/RSP = MNP3
- On the porting date, for valid porting MSISDNs, the MNP3 system shall request the ONO to re-route incoming services to the porting MSISDN towards the RNO
- On the porting date, for valid porting MSISDNs, the MNP3 system shall update CDB

6.7.1 Porting Timescales

R-PT-1: Default port time will be as depicted in Tables 1 and 2 above

R-PT-2: The customer must be able to specify a later (than described in R-PT-1) port time and date up to 28 days hence

6.7.2 Migrations

R-MIG-1: The MNP3 system shall provide emulation for intersystem migrations

6.7.3 Test and Training Platform

R-TT-1: The Vendor shall provide a test and training platform which may be shared with MNP2

6.7.4 Implementation

R-IMP-1: The MNP3 system shall target implementation by Q4 2007

6.7.5 Availability

R-AV-1: As a minimum, availability will be 7 days a week during business hours (between 9.00 am and 6.00 am).

6.7.6 Disaster Recovery

R-DR-1: As a minimum, dual site redundancy will be required with automatic cutover (or rapid manual)

6.7.7 Training and Documentation

R-TD-1: Training and documentation shall be supplied with the platform(s).

6.7.8 Support and Maintenance

R-SM-1: Support and Maintenance contract for the complete and future end-to-end service solution(s) will be required

6.7.9 Vendor Information and Requirements

Account Management

R-SUP-1: How will the Vendor interface to the UK MNOs at their locations in the UK?

R-SUP-2: What is will be the account management structure?

R-SUP-3: What is proposed as follow-up meetings /discussions?

R-SUP-4: What are the escalation paths within the Vendor organisation for dealing with this proposal?

Personnel capabilities

R-SUP-5: The Vendor must have suitably qualified personnel to fill the following positions.

R-SUP-6: The Vendor will provide information (academic, professional qualifications and relevant messaging experience) on a prime candidate and an alternate for each position, conforming to the experience data requested in the following table.

Table 3: Personnel Capabilities

Position	Total Experience (Years)	In Similar Project (Years)	As Manager of Project of similar magnitude (Years)
Site Project Manager	**10**	**8**	**5**
Design Engineers	**10**	**5**	**3**
Installation and Commissioning Engineers	**8**	**4**	**2**

6.8 VOLUMES

Port Transactions

The system shall be required to handle 2 million port transactions per annum and be scalable to at least 4 million per annum if required

Ported Numbers

The system shall be required to handle 30 million ported numbers scalable to 100 million

Participating networks and Service Providers

The system shall be capable of supporting up to 100 networks.

The system shall be capable of supporting up to 100 Service Providers.

New networks and service providers should be capable of being added at no incremental cost.

ANNEX 4: MNP RESEARCH INTO CONSUMER ATTITUDES TO MOBILE NUMBER PORTABILITY

Background & Objectives

Research was carried out for H3G by TNS-Sofres (PhoneBus) on 6-8 January 2006, and more recently on 19-21 January 2007.

In both cases, a sample of over 750 respondents was drawn from a nationally representative group of mobile users:

Questions asked in the 2007 survey

A range of questions were asked in 2007, some of which were also included in the 2006 survey. Some of the questions in the 2007 research were also asked in consumer research carried out by Ofcom, and attached as annex 8 to the Consultation. Where relevant, the analysis below makes comparisons between the Ofcom findings and the H3G findings.

13 questions were asked in the 2007 survey:

Q1. Do you have a mobile phone?

Q2. If you change your mobile provider did you know that you can keep your number if you wanted to?

Q3. If you were switching mobile phone providers and you wanted to keep the same number,* how long would be an acceptable time to wait whilst the existing number is transferred to your new network, assuming that all factors such as cost are not a problem?

Q4. Assuming you could transfer your number in (answer at Q3), how likely would you be to do it if you were changing providers?

Q5. If you were told that it actually takes at least one week to transfer your number how fast or slow would you say that was?

Q6. If you were changing provider, how likely would you be to transfer your number, if you were told it would take at least a week?

Q7. Thinking about the difference between transferring your number on the same day compared to the transfer taking over a week. If it took over a week to transfer your number would it make a difference to your decision to change providers?

Q8. Have you ever changed your mobile provider?

Q9a. Why have you never changed mobile phone providers?

Q9b. What were your reasons for changing your mobile phone provider?

Q10. Did you transfer your number?

Q11a. Why did you transfer your number?

Q11b. How long did the process take from the time you first requested the transfer to when the number was working on your new network?

Q11c. Were you satisfied with how long the process took?

Q12. Why didn't you transfer your number?

Q13. If you had a new number what did you do about calls still coming into your old number?
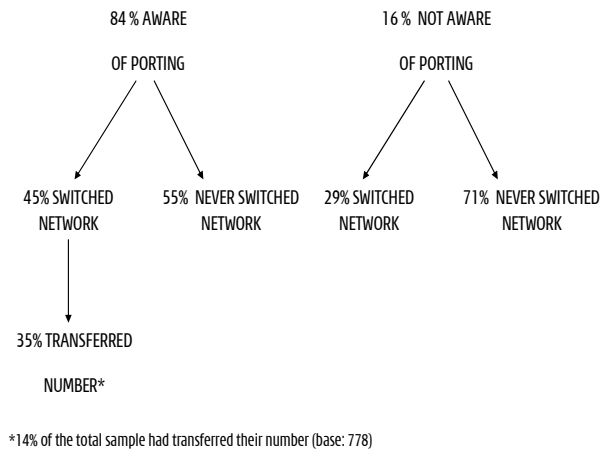
Summary of key findings

Set out below is a summary of the key findings from the TNS/H3G research:

- Most people (84%) are aware of mobile number porting but only a minority of them have ever ported their number (14% of those aware of porting).

- Most of the sample (64%) have never changed mobile provider: of these half (49%) were put off by hassle factors, including 20% who specifically cited waiting time for number transfer.

- Of those that did transfer, most (79%) cited the fact that everyone had their number as the reason for transferring.

- Most (61%) think an acceptable time to wait for the transfer is 1 or 2 days.

- Over three quarters of the people in the study (78%) think 1 week is too long to wait.

- If their acceptable time period is met, about half of the sample (56%) would be likely to transfer if they switched network provider compared to just 29% if the transfer time was 1 week.

- In fact 60% say they would more likely stay with their current provider altogether rather than switch as a direct result of the 1 week waiting time

Awareness and Usage of Porting

Most people (84%) are aware of mobile number porting but only a minority of them have ever ported their number (14% of those aware of porting).

Awareness & Usage

84 % AWARE

OF PORTING

16 % NOT AWARE

OF PORTING

45% SWITCHED
NETWORK

55% NEVER SWITCHED
NETWORK

29% SWITCHED
NETWORK

71% NEVER SWITCHED
NETWORK

35% TRANSFERRED

NUMBER*

*14% of the total sample had transferred their number (base: 778)

Reasons for Not Changing Provider

As in the Ofcom consumer research, most of the consumers in TNS/H3G survey had never changed mobile provider (TNS/H3G survey: 64%; Ofcom survey: 57%).

Of those who have never switched, half (49%) were put off by hassle factors, including 20% who specifically cited waiting time for number transfer.

Q9a– Reasons for not changing provider

	3 Research 2007	OFCOM
Base: those who have not changed mobile provider		
Sample size	446	1167
	%	%
Happy with present provider	79	44
Haven't ever thought about it	33	Not Asked
Too much hassle to change providers	21	23
Because I want to keep my number and transferring it would take too long	20	5
Wanted to keep number and I didn't know I could transfer it	8	Not Asked

Question not asked in Jan 06

Reasons for Porting

Of those who had transferred, most cited the fact that everyone had their number as the reason for transferring (79%). Note that the H3G/TNS data is based on a prompted list of reasons where consumers could give as many reasons as they wished: the equivalent Ofcom question may not have been structured in this way.

Q11a– Why transferred number

	3 Research 2007	OFCOM
Base: All who transferred their number		
Sample size	105	142
	%	%
Everyone knows my number	79	56
Too much hassle to tell other people a new number	53	34
I have got used to my number	45	15
I didn't want to remember a new number	30	26
Other / don't know	8	Not Asked

Question not asked in Jan 06

Process Time

Most of those persons who had transferred were satisfied with the process time (60%) but significantly nearly a quarter (24%) were not satisfied. The level of dissatisfaction was higher in the H3G/TRN survey than in the Ofcom survey, but even in the H3G/TRN survey, 15% were not satisfied with the process time.

Q11b/c – Process Time

- How long did the process take from the time you first requested the transfer to when the number was working on your new network?

|	3 Research 2007	OFCOM
Base: those who have ported		
Sample size	105	142
Average Process Time		
% Satisfied with the process time	60%	75%
% Indifferent to the process time	6%	10%
% Dissatisfied with the process time	24%	15%

Question not asked in Jan 06

Port Time

Most of the consumers in the sample (61%) think an acceptable time to wait for the transfer is 1 or 2 days. Note that the figure is higher than that in the OFCOM research which measures expected rather than acceptable wait times, i.e. expectations can be lower than what is seen to be acceptable.
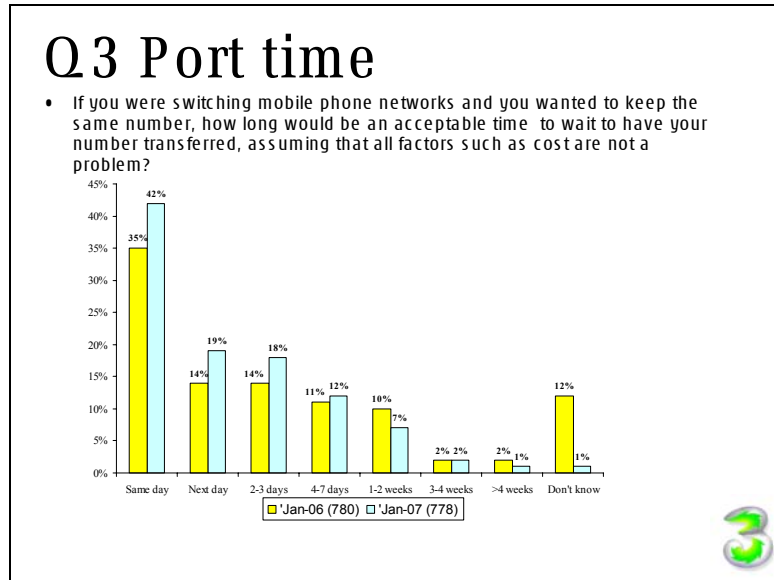

View on 1 Week Port

Over three quarters of the people in the study (78%) think 1 week is too long to wait. Opinions are even stronger than in 2006, when 63% felt it was too long a time period for the transfer.
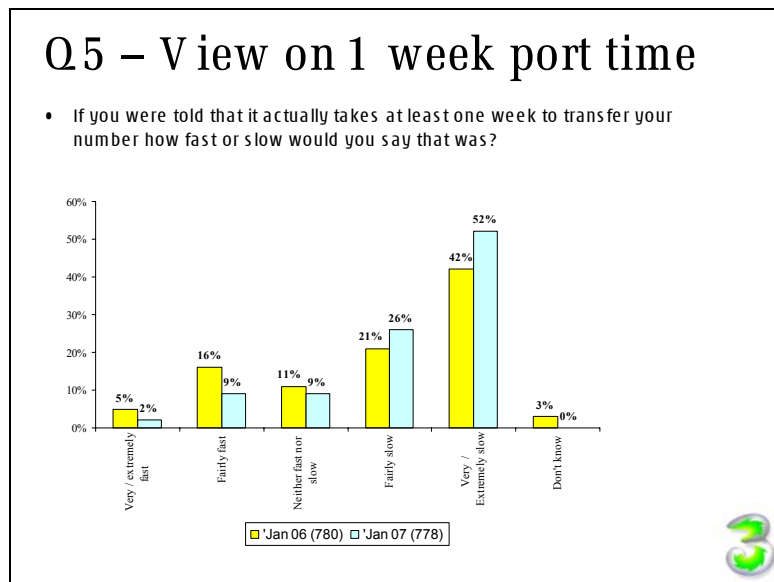

How Likely to Port

If their acceptable time period is met, about half of the sample (56%) would be likely to transfer if they switched network provider.

Of those persons who have already switched provider but did not transfer their number, most (72%) would be likely to transfer if they did it again if it was possible to do so in 1 or 2 days.
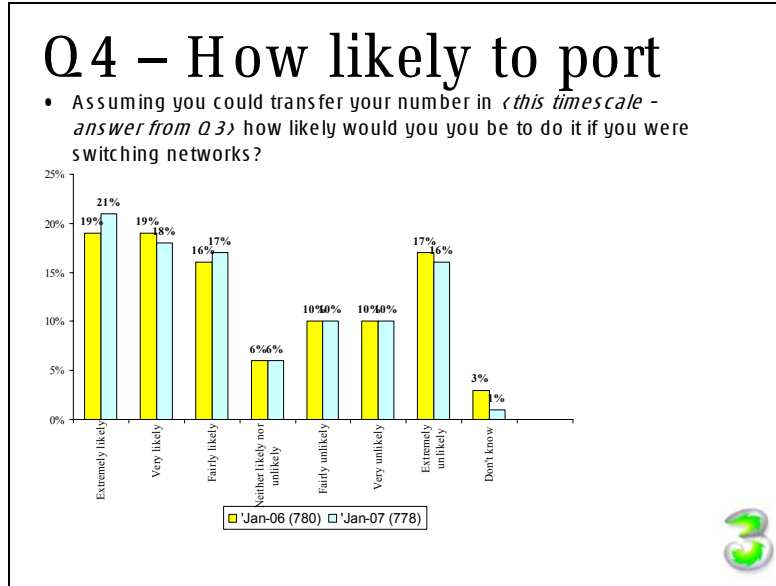

Likelihood of Port if 1 Week

However only 29% would be likely to transfer if the process time was 1 week. Most (65%) said that if they were switching, they would be unlikely or unsure about transferring as a result the 1 week waiting time.
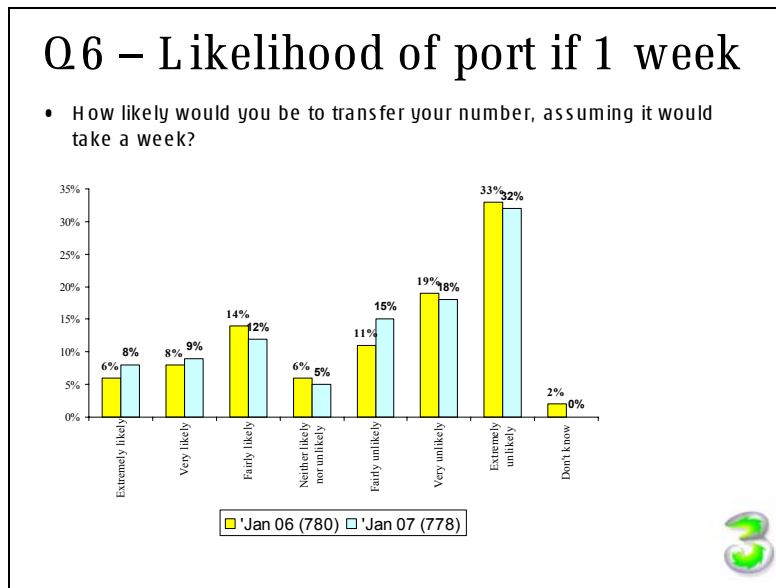
Impact of 1 Week Porting on Switching

Overall, 60% say they would more likely to stay with their current provider rather than switch as a direct result of the 1 week waiting time.

accenture
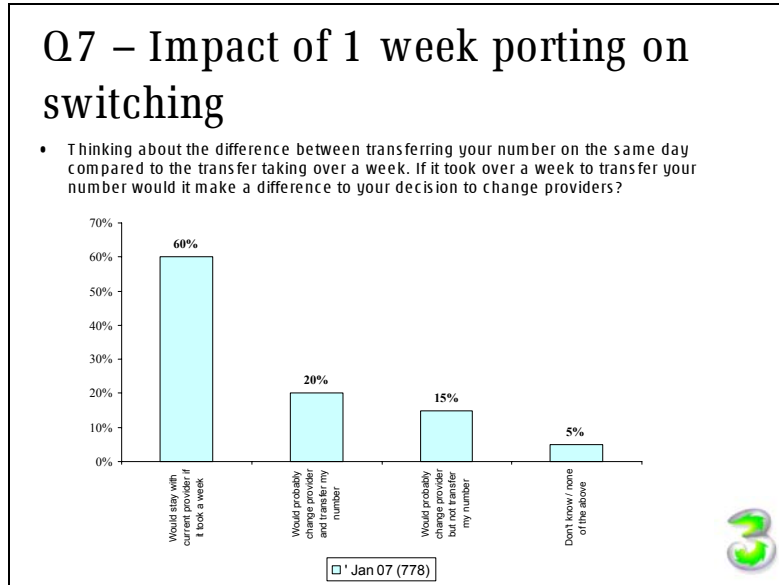
High performance. Delivered.

Technical Feasibility Study of Early Transition to MNP3:

Same Day Porting and Direct Routing of Inbound Services

January 2007

• Consulting • Technology • Outsourcing

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Table of Contents

1. Executive Summary

Accenture has been asked by H3G to provide a technical feasibility review of parts of its response to the Ofcom MNP consultation on General Condition 18, issued November 16, 2006. This document summarises Accenture's technical assessment of the interim solution being proposed by H3G to accelerate transition to the new MNP process – MNP3 – ahead of the proposed date in the consultation of September 2009.

Accenture concurs with the opinion that transition to an all query routing, central database process can result in reduction of porting lead times and more efficient routing, providing mobile operators with better control over the introduction of new services, such as video-share, push-to-talk and new wideband codecs. Accenture has compared the MNP process in UK with MNP processes in the Republic of Ireland and USA and confirmed that the ACQ/CDB processes can result in shorter port leads, direct routing and simplified call accounting.

Accenture has examined an interim "parallel run" solution proposed in the H3G consultation response and believes that all relevant call scenarios have been included and could work correctly under this model. Accenture concluded that the interim solution is beneficial in reducing the cost incurred by MNOs due to the market expansion by eliminating the need to be connected to every other MNO. This method also creates a path for mobile network operators that do not want to convert to MNP3 routing at this time to move to the new MNP process at any time before September 2009, once the solution is activated.

Accenture believes that should a third party vendor be promptly selected and a suitable interface protocol approved, it will take the vendor six to seven months to implement the solution and will take an MNO between three and four months to fully implement CDB protocols and new business processes in parallel. We have therefore concluded that if vendor selection and protocol developments are concluded in the first half of 2007, mobile operators willing to move to MNP3 process can accomplish it in December 2007.

Accenture concluded that the proposed interim, "parallel run" solution is technically feasible and will be a step towards the resolution of core problems of the current process. It will provide immediate benefit for the participating operators and will cause no disruption for the operators willing to remain on MNP2 process.

2. Review of Mobile Number Portability in UK

Mobile Number Portability has been available in UK since 1999. The process is essentially unchanged and is a donor operator led onward routing process. In this process a customer willing to port the number to a new operator must first contact the current operator and obtain a Port Authorisation Code (PAC). This PAC is then taken to the recipient operator's office and porting proceeds using bilateral communications facilities between the donor and the recipient operators. It takes a minimum of five business days to complete a number port in the UK. Some of the delays are the result of the customer having to contact both the donor operator and the recipient operator. Both donor and recipient operators' systems are involved in the port and the "window of vulnerability" for porting the customer's service spans from 11:00 to 15:00 on the day of the port.

Operators must maintain connectivity with each and every other mobile operator in order to support porting thus creating a mesh of communications links. The mesh consisted of ten links when the market space was limited to five operators, but it will grow to 435 when the number of mobile operators increased to thirty through entry of VoIP and Guard Band providers in the near future. Each operator will have to maintain (n-1) links for the field of n operators with increasing operational costs for each new entrant in the marketplace.

Once the port is completed, inbound calls to the ported number are routed via the donor network. The originating network forwards a call to the ported number to the original donor ("range-holding") operator. The range-holding operator is identified by the initial four digits in the phone number; each mobile operator is assigned unique number ranges. The donor operator network then forwards the call to the recipient network, based on port information stored in its internal database. The recipient operator will pay a conveyance fee to the original donor and will charge the donor operator for the donor's mobile termination rate, not its own, resulting in a complication of billing and call accounting systems.

Onward routing implies that if the donor network is unavailable or is experiencing performance difficulties inbound services to the ported number will not be completed. If the recipient network wants to launch a new service it has to verify that donor networks have capabilities to carry all data streams associated with the service to the recipient. If such facilities do not exist in the donor network, service introduction by a recipient will be delayed or may become unfeasible.

Comparison with all call query / central database based processes implemented in the USA, many European countries [1], Australia and Hong Kong shows that they usually have shorter port lead and more straightforward handling of inbound calls [2]. In best cases porting takes place in less than two hours and a simple database "dip" provides accurate routing to the recipient service provider.

3. Analysis of MNP process in the Republic of Ireland and USA

Accenture interviewed H3G personnel involved in the operations management of MNP processes for H3G owned operators in Ireland. The following is the summary of these interviews.

Ireland has implemented a central database for all query routing. Operators communicate port requests over the Internet from the recipient to the donor, with a port usually taking less than 2 hours. Routing is direct for mobile-to-mobile calls and for fixed-to-mobile calls. The central database is administered by the third party, Ward Solutions, and four operators each implemented interface protocols to the database independently. The database access protocol using XML and HTTPS was implemented by H3G in less than three months.

Accenture also interviewed H3G personnel in several other European Countries, namely Austria, Denmark, Italy and Sweden. These countries have not yet fully realised the efficiencies of an ACQ-CDB solution although average porting time is still below the five business day lead time in the UK. In some of these countries, MNP databases are distributed and time is spent on reconciliation, whereas in others the processes enabling porting process acceleration have not been put in place.

Accenture has been involved in various aspects of mobile local number portability in the USA where local mobile number portability was introduced in late 2003. The system is ACQ- CDB and porting between mobile carriers seldom takes more than two and half hours, and in many cases is completed within an hour. Fixed-to-mobile routing is ACQ and mobile-to-fixed portability is allowed and is commonplace. US networks operate on different radio standards and customers usually buy new handsets when porting the number to a different mobile operator.

In summary, port lead times in countries such as the Republic of Ireland and USA are reduced to no more than a few hours as a result of the implementation of an ACQ–CDB solution. Routing and call accounting are also simplified.

4. Description of the Proposed Solution
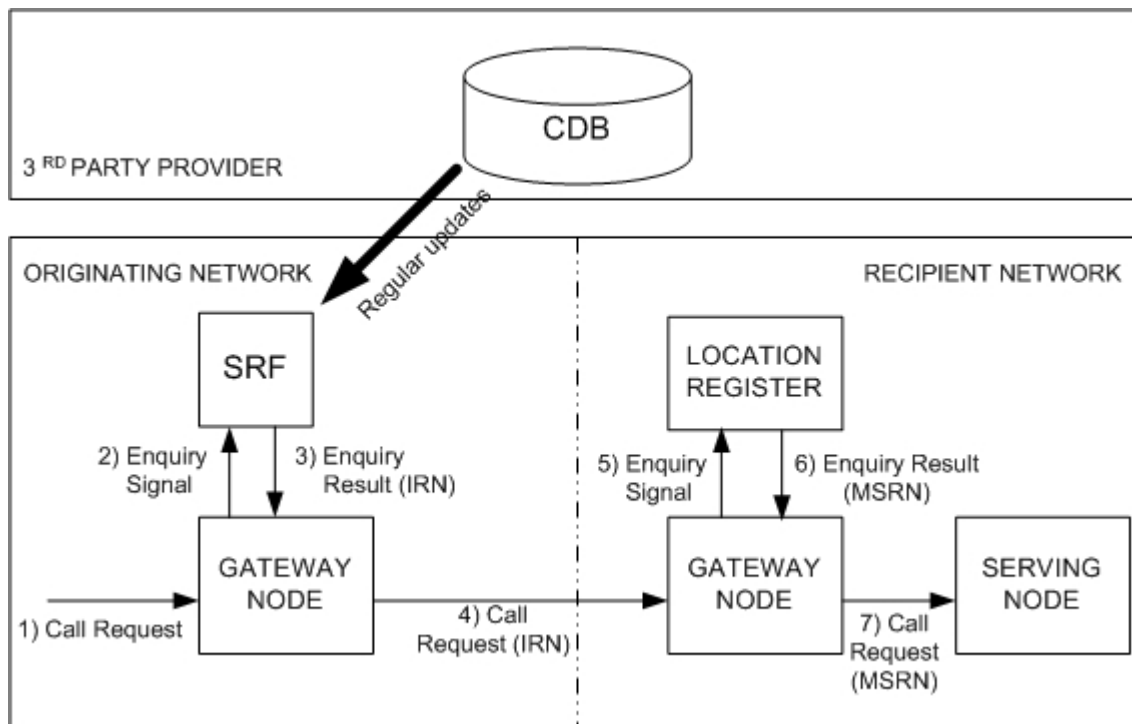
Figure 1 MNP3 ACQ-CDB Solution Description [5]

Slow lead times and routing limitations of an MNP2 solution have led the industry and Ofcom to explore the possibility of transitioning to the ACQ-CDB solution successfully implemented in many other countries. The purpose of such a system would be to cut the port lead time, simplify routing and minimise fees, facilitating service introduction, reducing call accounting costs and improving call delivery reliability.

In the proposed solution for next generation Mobile Number Portability in the UK, a central database is created and an initial load of all ported numbers is performed. It is proposed that the database be operated by a third party contract entity (the 'solution provider'). Each operator receives regular updates containing all numbers ported by other operators, eliminating the need to access the master database for routing.

When a customer decides to port a number, the customer contacts the recipient's office or retail store with the paperwork necessary for authentication. The recipient operator then submits a port request to the donating operator through the third party clearinghouse facilities, co-managed with the central database. The clearinghouse acknowledges the port request and forwards it to the donor operator. It should be possible for the donor to validate the customer's request and determine port eligibility within a very short period of time, most likely without human intervention as only billing and contract data need to be checked.

All mobile providers will need to agree upon and implement a common CDB/clearinghouse access protocol. The protocol should be XML based, and conform to most accepted Web Services standards, simplifying implementation and maintenance.

It should be possible to complete most port requests within an hour, provided all operators implement the necessary integration with number administration systems.

Inbound calls to the ported number from other mobiles are routed directly to the recipient operator network. Routing instructions are obtained via a "dip" into the local copy of the CDB, which is kept accurate through regular updates from the master database.

Operators no longer need to build a mesh of connections to handle the ports. Being connected to the clearinghouse is sufficient to initiate a port, authorise it and update the local copy with the current routing instructions.

Transition to such a system requires selecting the vendor for the master database management and clearinghouse functionality. At present there is no consensus in the industry that such a transition is necessary and the date mentioned in Ofcom Consultation is September of 2009. The system is usually referred to as MNP3.

However, entry of new operators, and the desire to improve port lead times and routing performance prompted H3G to advance a staged, "parallel run" solution, in which the operators not willing to execute rapid move to ACQ-CDB would be able to stay on an MNP2 solution until September 2009, while other operators will be able to start an MNP3 process as soon as the hybrid solution becomes active. H3G estimated that this staged solution can become operational by October of 2007.
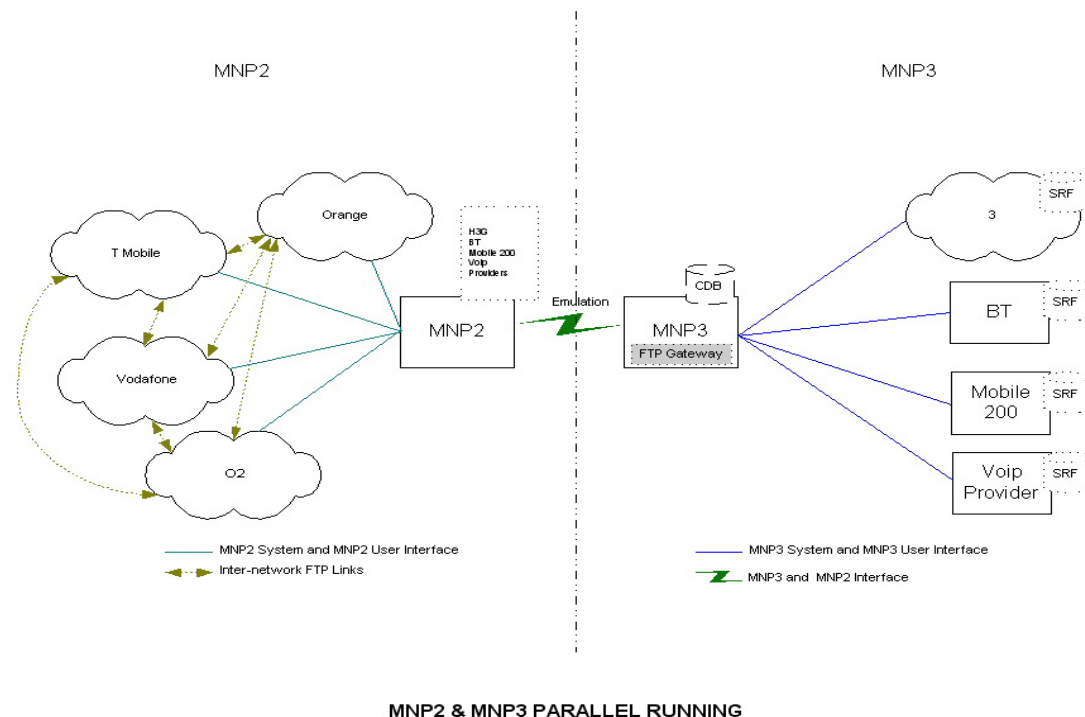

MNP2 & MNP3 PARALLEL RUNNING

Figure 2. Interim Staged MNP2 – MNP3 solution. [5]

In the staged solution it should be possible to achieve port time reductions in the majority of scenarios. All ports in which the donor operator has migrated to an MNP3 solution should take no more than three days due to the streamlined process on the donor side. All ports between the MNP3 operators should conclude in less than two hours. Ports between MNP2 operators will continue unchanged.

The solution provider will operate a newly created central porting database, which will be loaded with data from participating operators initially and will be updated for every port involving the MNP3 operator(s).

The key element in the solution is the emulation interface between the MNP3 process and MNP2 operators, which allows MNP2 ports to proceed unchanged. Such an interface will use the MNP3 process but present a familiar MNP2 interface to operators still using MNP2. This emulation interface will support FTP Gateway facilities to enable communication between the operators during the execution of the port, following current MNP2 practice.

The other interface between the MNP3 clearinghouse and MNP3 operators is the port request, authorisation and activation protocol. Such a protocol should be sufficiently rich to accommodate all call scenarios and most common causes of failure. This will ensure that effective fallout procedures can be developed by the operators and the process can be almost completely automated. Each operator can integrate porting operations with the back office systems to a degree the operator considers feasible. The protocol should provide enough information to enable porting authorisation and implementation operation as a flow-through process, requiring no or minimal human intervention.

The solution will limit the number of steps a new market entrant/operator has to complete in order to start the porting process, both with MNP2 and MNP3 existing operators, as only the interface to the CDB operating clearinghouse will need to be developed.

A full set of requirements is presented in the Annex to H3G response to Consultation [5].

5. Required Activities to Implement Staged Transition to MNP3

Various business models for operating a CDB and MNP clearinghouse exist, the most prevalent being third party operated facilities, with a fee structure partially set by the regulators. This analysis presumes that such a third party service bureau model will be adopted and that key protocols will be developed by the selected third party, and agreed by the industry . There are several vendors with relevant experience, capable of both developing a complete solution and operating at the desired levels of availability.

Accenture believes that a third party service bureau solution is the proven way to administer CDB and provide additional services to the operators related to number portability. A capable CDB operator should be able to enhance the solution to facilitate its use by fixed operators in the future, including provision of ENUM facilities in all IP environments. Such a third party provider should have experience in development and maintenance of rich communications interfaces with multiple clients. The provider will be able to guarantee higher levels of availability than is achieved in MNP2 solutions, which is required due to shortened port intervals. The system should be made available seven days a week, with uptime guaranteed at 99.95% during extended business hours.

The Interface Protocol to CDB should include a message structure capable of conveying all key port request, authorisation and activation information. The protocol messages should be delivered in XML format, facilitating the tasks of integration and Web interface development. Secure Web services interfaces will ensure that customer and operator information is adequately protected. There are examples of both HTTPS and SOAP secure implementations of this type of application.

The CDB service bureau should be able to support uploads of batch updates to the local copies of CDB at regular intervals, possibly as short as 10 minutes. This will ensure that local copies are almost always in synch with the CDB master database. The selected vendor should have experience with regulatory compliance and be able to provide audits to the regulators and participating operators.

The service bureau should provide test facilities for the mobile operators both for the initial rollout of the service and on an ongoing basis. It is also mandatory that the service bureau employs dedicated staff to support fallout processing and dispute resolution during extended business hours.

The following steps are necessary for the staged solution to be in place:

> ➢ selection of a CDB service bureau provider and signing of the contract

> ➢ approval and publication of interface protocols

> ➢ development of interfaces to CDB by participating operators

> ➢ testing of the interfaces and business processes with the service bureau test facility

> ➢ initial load of the database by all participating operators

> ➢ pilot run of the system

> ➢ failover and disaster recovery site tests

> ➢ sign off by participating operators

Based on experience in other countries, for the transition to take place rapidly the first two steps may require active Ofcom involvement to help manage the vendor selection process. Some of the candidate CDB vendors will have a developed API already, tested and refined through years of deployment in other countries. Ofcom involvement can reduce the comments period and lead to prompt approval of the protocol.

6. Expected Costs, Resources and Timescales

Due to time limits, no extensive attempt to estimate costs has been undertaken. The following is the list of timescale estimates based on past MNP implementation experience and discussions with one prospective vendor.

It is envisaged that the service bureau operator will charge participating MNOs transaction fees for every port which results in a database update and port process execution. The CDB provider will, therefore, not start implementing the solution until the contract is signed and the interface protocol is approved.

Several responses to UK Mobile Network Operators' Mobile Number Portability System Request for Information tabled in early 2005 indicate that the time required for the development and implementation of an MNP3 platform is in the order of 6 to 9 months. During the course of this study, Accenture interviewed one of the leading MNP service bureau providers to ascertain the viability of the timeframe. Based on their wide international experience in providing CDB service bureau solutions, the interviewed provider estimated the time frame to be about six months from the point of approval of the protocol (API). It is advisable that additional service providers are consulted in the near term.

Based on H3G experience in the Republic of Ireland, it takes approximately three months for an operator to implement the API and integrate it with the back office systems. Development entails realisation of an API message structure, building a Web services infrastructure and updating billing, accounting and network management systems. These are substantially concurrent developments and the overall time limitation is the availability of vendor's API test environment. Based on interviews, it took slightly over three months and approximately 15 person-months to build such an interface for H3G Ireland.

Therefore, to launch the solution in 2007, vendor selection and protocol approval have to be completed by June 01, 2007.

The following is the list of tasks, with rough estimates, that need to be completed to launch the solution in the expected seven months with a cut-off date in mid-December:

  ➢ June – August: the CDB service bureau builds the platform, test environment and disaster recovery site

  ➢ June – August: each participating MNO develops API implementation, builds Web services infrastructure and integrates with BSS/OSS systems and complete internal testing

  ➢ September: each MNO tests in the service bureau's test environment, testing complete by October 01

  ➢ October: pilot run, disaster recovery failover tests, and service level agreements are finalised

  ➢ November 15: joint MNO and service bureau evaluation of pilot run

  ➢ December 01: acceptance and sign-off

  ➢ December 15: solution goes live

With the appropriate arrangements in place, implementation and launch of this solution could be achieved in seven months.
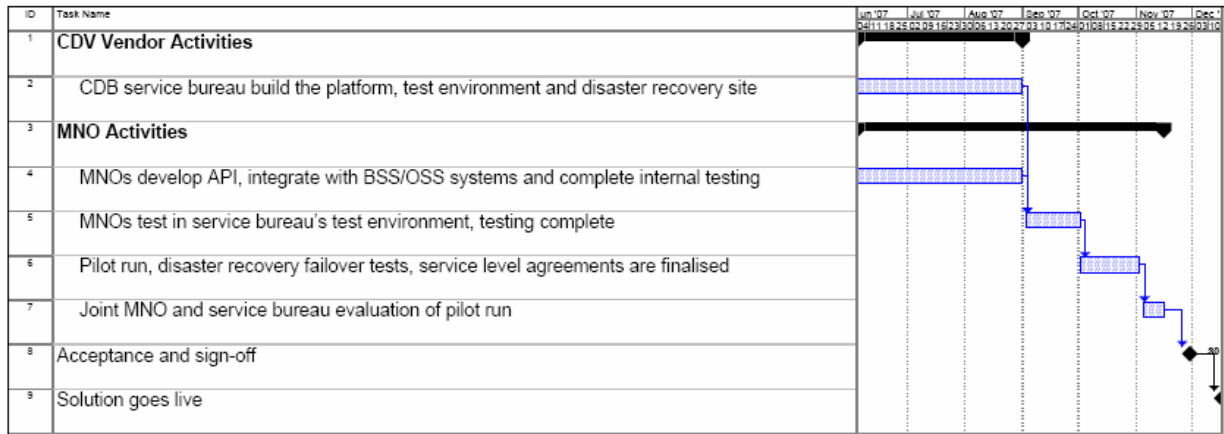
Figure 3. Estimated Times for Implementation of Staged Solution

7. Summary

Based on Accenture's analysis of the MNP process in the UK, the Republic of Ireland and the USA, transition to an ACQ-CDB system (MNP3) can result in a substantial reduction of port lead times and more efficient routing. The implementation of the staged, "parallel run" solution could bring many of the benefits of MNP3 to mobile operators ahead of the September 2009 date proposed in Ofcom Consultation.

Accenture believes that the best way to realise the goals of the staged solution is to engage a competent third party vendor to provide a service bureau type CDB solution. Rapid implementation of the proposed solution will require Ofcom's involvement in the vendor selection and interface protocol approval process. Accenture interviewed one of the vendors during this assessment and has worked with several others successfully in the past.

The estimates obtained from vendor interviews, analysis of several RFI responses for similar work and our own experience indicated that an implementation schedule of at least seven months is necessary. If Ofcom's involvement results in a "straight path" development program and the appropriate arrangements are established to govern efficiently and affectively the development efforts towards the launch of the solution, we believe that this could be achieved by December 2007. It should be noted that the MNO side of the interface protocol can be implemented in approximately three months and fifteen person-months.

8. Glossary

ACQ – All Call Query – direct routing of inbound call to ported number to recipient network

CDB – Central Database contains all routing references for all call query routing in MNP3

MNO – Mobile Network Operator

MNP – Mobile Number Portability

MNP2 – MNP solution currently in place in UK

MNP3 – ACQ/CDB based proposed MNP solution

MNP2-Operator – Mobile Network Operator following donor-led, onward routing process

MNP3-Operator – Mobile Network Operator following recipient-led, all call query, CDB process

This document contains confidential and proprietary information.

9. References and Background Information

[1] ECC Report 31: Implementation of Mobile Number Portability in CEPT Countries .2005 Update

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