

# **Introducing Number Portability in Malta**

## **Consultative Paper**

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**October 2003**

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## **DEFINITIONS**

### **Donor network**

The network providing service to a subscriber number *before* porting.

### **Block owner**

The network that has been allocated the number range containing the ported number.

### **Number Portability**

A facility whereby subscribers who so request can retain their number on a telephony system independent of the organisation providing the service at the network termination point of the subscriber.

### **Originating network**

The network providing service to a subscriber placing a call.

### **Recipient network**

The network providing service to a subscriber number *after* porting.

### **Terminating network**

The network providing service to a subscriber receiving a call.

## 1 INTRODUCTION

The term Number Portability refers to the ability of end users to retain their telephone number when they change their network operator, location, or service. Customers are predominantly reluctant to switch their network operator if this means that they would have to change their telephone number. Changing one's telephone numbers can be a major inconvenience and a potential barrier preventing the general public from taking advantage of the options available in a developed competitive telecommunications market. The absence of number portability may therefore give the incumbent operators a significant competitive advantage over new entrants into the market.

Number portability is essential to maximise the benefits of a competitive telecommunications market. For example, Number Portability of the type that allows users to keep their telephone number when changing operator provides significant benefits:

- to the porting user, it eliminates the cost of informing other parties of the number change, changing stationery and other signage and, in the case of business users, of lost business;
- to callers, it eliminates the need to consult directory enquires and/or change entries in their address books or computer systems;
- it increases competition, with significant benefits for *all users*, by lowering the cost to users of switching operator or service provider.

Having said this, it is important that before switching operators, customers need to be satisfied that the service and the terms conditions offered by the new operator are acceptable. This is because it is only the number that is being ported rather than the service associated with the number.

The objective of this consultative paper is to seek the views of operators and interested parties regarding the planned introduction of Number Portability in Malta. The MCA is proposing the introduction of Operator Number Portability for geographic, non-geographic and mobile numbers and Location Number Portability for geographic numbers.

## **2 LEGISLATIVE BACKGROUND**

### **2.1 Maltese Legislation**

The Telecommunications (Regulation) Act defines number portability as ‘*a facility whereby subscribers who so request can retain their number on a telephony system independent of the organisation providing the service at the network termination point of the subscriber*’. The Act provides that the Minister can issue regulations on any matter concerning or related to number portability.

Number Portability is required by the Telecommunications Services (General) Regulations<sup>1</sup>. Articles 21 to 23 of the Regulations require operators to ‘*provide number portability to any operator qualified to receive portability under these regulations on reasonable terms, so that any number assigned maybe used by a customer should it cease to be a customer of the operator and become a customer of the other operator*’.

The Regulations also provide that the type of numbers that can be made portable shall be determined by the MCA. The regulations also contain provisions regarding the charges and costs applicable to this facility.

### **2.2 EU Regulatory Framework**

Article 30 of the Universal Service Directive<sup>2</sup> provides that Member States must ensure that number portability becomes available to all subscribers of publicly available telephony services, both fixed and mobile. For fixed telephony services this applies to geographic numbers at specific location and non-geographic numbers at any location.

The directive states that charges for interconnection related to the provision of number portability must be cost oriented and any direct charges to subscribers must not create a disincentive for using such a facility. NRAs are not to impose retail tariffs for the porting of numbers in a manner that would distort competition, such as by setting common or retail tariffs.

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<sup>1</sup> Legal Notice 151 of 2000

<sup>2</sup> Directive 2002/22/EC of the European Parliament and the Council of 7 March 2002 on universal service and users’ rights relating to electronic communications networks and services.

The recitals of the Directive provide directions that NRAs might pursue as follows:

40. Number portability is a key facilitator of consumer choice and effective competition in a competitive telecommunications environment such that end-users who so request should be able to retain their number(s) on the public telephone network independently of the organisation providing service. The provision of this facility between connections to the public telephone network at fixed and non-fixed locations is not covered by this Directive. However, Member States may apply provisions for porting numbers between networks providing services at a fixed location and mobile networks,
41. The impact of number portability is considerably strengthened when there is transparent tariff information, both for end-users who port their numbers and also for end-users who call those who have ported their numbers. National regulatory authorities should, where feasible, facilitate appropriate tariff transparency as part of the implementation of number portability,
42. When ensuring that pricing for interconnection related to the provision of number portability is cost-oriented, national regulatory authorities may also take account of prices available in comparable markets.

### 3 TYPES OF NUMBER PORTABILITY SERVICES

Three types of portability services can be identified:

1. **Operator portability:** refers to the ability of an end user to retain the same telephone number when changing from one operator to another.

There are three types of operator number portability:

- **Geographic number portability** – operator number portability which allows PSTN numbers to be ported between operators,
  - **Non-geographic number portability** - operator number portability which allows non-geographic<sup>3</sup> numbers to be ported between operators or service providers,
  - **Mobile number portability** - operator number portability, which allows mobile numbers to be ported between operators.
2. **Location portability:** refers to the ability of a fixed telephony end user to retain the same telephone number when moving from one physical location to another. Location Portability is only applicable to geographic numbers, as by their nature, non-geographic numbers do not incorporate location information.
  3. **Service portability:** refers to the ability of an end user to retain the same telephone number as he/she changes from one type of service to another. The extent of a change in service can be minor as in a change from normal fixed line to ISDN or major as in a change from a fixed to a mobile service.

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<sup>3</sup> Freephone and Premium Rate.

## **4 WHAT KINDS OF NUMBER PORTABILITY ARE REQUIRED?**

While the Telecommunications Services (General) Regulations provide that the type of numbers to be made portable shall be determined by the MCA, the Universal Service Directive is clear as to what types of Number Portability Member States are obliged to introduce. The Directive states that “all subscribers of publicly available telephone services, including mobile services, who so request can retain their number(s) independently of the undertaking providing the service:

- (a) in the case of geographic numbers, at a specific location;
- (b) in the case of non-geographic numbers, at any location.

The new framework of directives for electronic communications was brought into force by the European Union in July 2003. As an accession country, Malta is obliged to align its legislation with the new electronic communications framework by accession. It is logical to suppose that operator number portability for geographic, non-geographic and mobile numbers should be in place around that time.

## 5 SOLUTIONS FOR IMPLEMENTATION OF NUMBER PORTABILITY

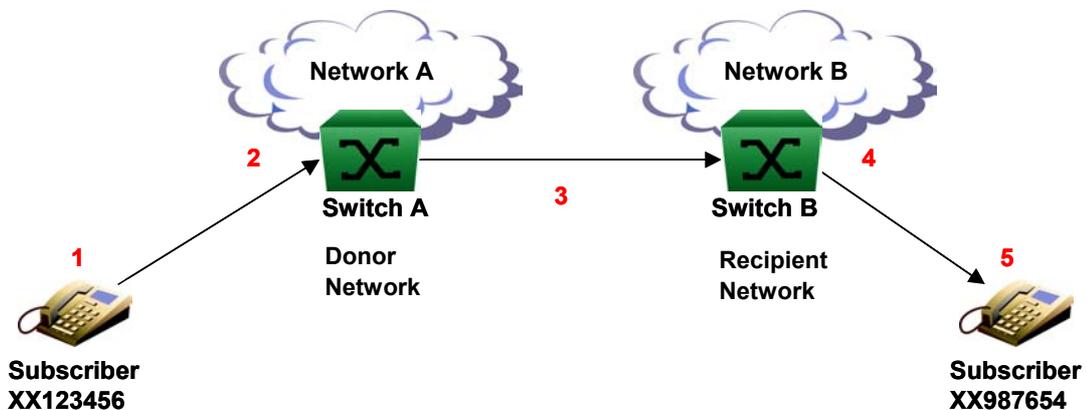
When taking into account the technical considerations involved in implementing number portability it would probably be best to discuss the various techniques available.

Many options exist and these can be categorised by:

- Service type: mobile and / or fixed
- Solution type: on-switch or off-switch
- Routing type: independent or inter-dependent
- Database: centralised or distributed

The priority here is for a NP implementation that is best suited for the local environment in the limited timeframe available. However, the competitive landscape for telephony services that could potentially require number portability could change significantly in the future. It is important not to get tied into a limited solution that cannot be expanded or modified at a later stage.

The typical sequence of what occurs when a ported number is called needs to be examined.



In this case there are two subscribers that had originally been using the same network. This network, A, has a numbering prefix of XX. At some point, the subscriber with telephone number XX98 7654 decided to move to network B. However the original number has now been ported to network B from network A. Subscriber XX12 3456 is now placing a call to subscriber XX98 7654. The following is the sequence of events.

1. Subscriber on network A dials XX98 7654
2. Switch A queries XX98 7654 and determines that the number has been ported and is no longer hosted on Network A but now resides on Network B,
3. The call is now routed to Network B,
4. Switch B analyses XX98 7654 and recognises the ported number as one that now resides within Network B,
5. Switch B completes the call.

A call to a ported number will be routed in two stages subsequent to dialling of the original directory number. The first stage is the recognition that the call is towards a ported number. This is often referred to as the **interception stage**. Interception can be performed at the donor switch (the local switch where the subscriber line was initially attached before being ported), at some transit switch, or at the originating switch (the switch from which the call from the calling party originates).

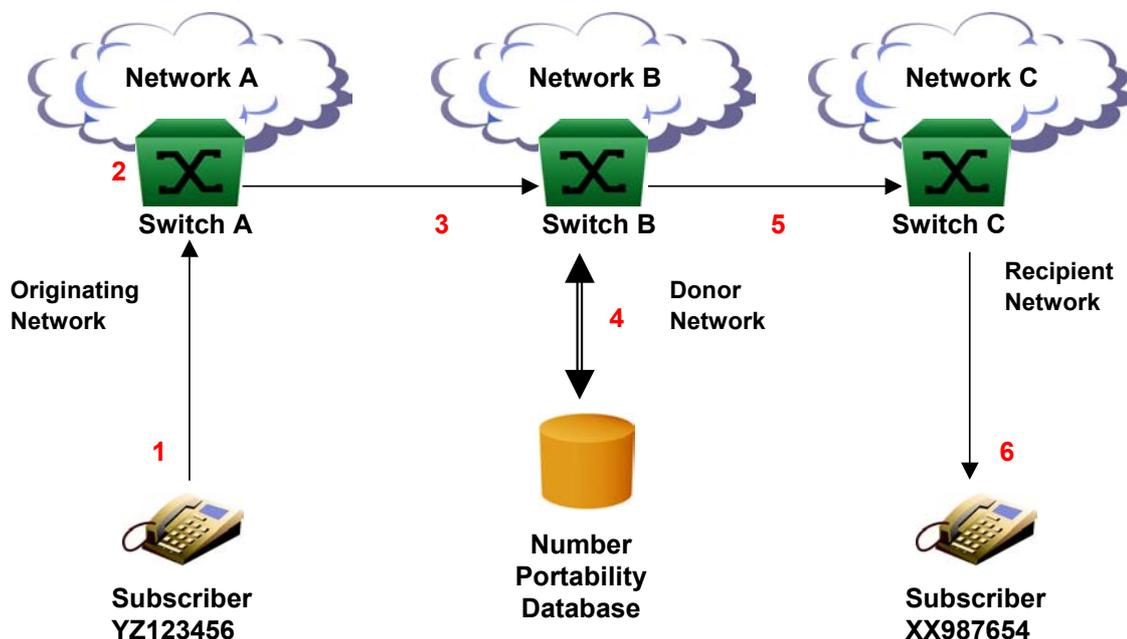
The second stage, referred to as the **routing stage**, occurs when the call has been recognised as a call to a ported number and then re-routed from the intercepting switch to the new terminating switch. The second stage of the call must be completed separately.

While the sequence described earlier seems straightforward, the processes involved in driving the sequence can be quite complex. For example, one of the simplest ways of implementing the above is to use the call-forwarding facility on Switch A. This is typical of an **on-switch** solution where the list of ported numbers resides on each switch. However this is an approach that has severe limitations – it is labour intensive, non-scaleable and inflexible. For these reasons it would be preferable to implement an **off-switch** solution where the list of ported numbers resides on a database that can be queried by all the networks participating in the NP scheme. However, the distinction between on-switch and off-switch techniques has relevance only to the first stage of the porting process (interception). The second stage (routing) is common to both on-switch and off-switch methods. In this case there are choices.

Should a number portability database be **centralised** or should it be **distributed**? Given the local circumstances, a central database would seem to be the ideal solution and this is indeed the solution selected in most countries that have implemented NP. In a centralised database environment, a master database is kept updated with all ported numbers in all networks and then each network can copy the information set to its own database. Queries between switches and databases normally occur via SS7 signalling.

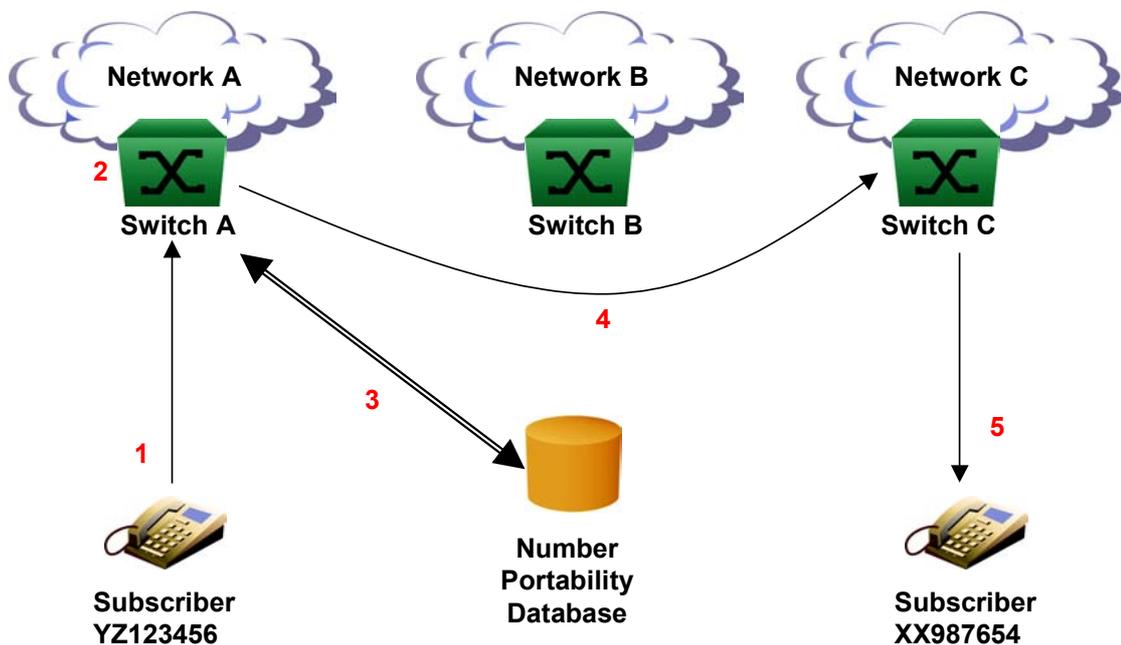
Once the methodology for determining whether a number is ported and where that number resides is clear, then the routing rules need to be decided upon. Again there is a choice.

In an **inter-dependent** scenario, operators have a joint responsibility for routing. This is also termed as **indirect routing**. The inter-dependent solution is normally easier to implement in the short-term but tends to have inefficiencies as the number of ports rises since more routing actions are required. In several countries where the inter-dependent solution was initially selected, eventually a change to the dependent solution was required. This solution is illustrated below.



1. Subscriber YZ123 456 connected to network A places a call,
2. Here the originating network A does not query the NPDB,
3. A simply routes the call to the 'block owner' B,
4. The 'block owner' – B – looks up the number in the NPDB,
5. Switch B realises that the number has been ported elsewhere and routes the call accordingly to network C,
6. Switch C then terminates the call to subscriber XX98 7654.

In an **independent** solution it is the originating network that always has responsibility for routing independent of which the terminating or recipient network is. This is also referred to as **direct routing**. All originating networks, whether mobile or fixed, have routing responsibility for NP.



1. Subscriber dials XX98 7654,
2. Originating network A immediately checks the NPDB,
3. NPDB provides porting information for called party,
4. A makes the correct and final routing decision to vector the call to network C that is the actual terminating network. Going via network B – the ‘block owner’ – is now avoided,
5. Switch C terminates the call correctly.

Since mobile subscribers may wish to avail themselves of number portability, some particular attention must be given to NP implementation in these networks. Although the basic infrastructure for wireline and wireless NP is similar, there are some important differences. For example, the Mobile Switching Centre (MSC) must be capable of NP queries and of processing calls to ported subscribers.

Furthermore, value-added services such as SMS (short messaging system) and voice mail also need to be catered for. The mobile number portability (MNP) database will be extended to mobile phone users using short message services (SMS) and related enhanced and multimedia variants (EMS and MMS), on the ported number. The SMS solution must exist in addition to the voice-only MNP service by adding the capacity to accommodate data forwarding. This consideration is of particular importance due to the huge local popularity of SMS. It is not foreseen that there can be an interim period where MNP applies only for voice services as this will result in a significant

deterrent to anyone wishing to port. The mobile operators' SMS gateways and servers must therefore be MNP compliant.

The ability to port a number from one operator to another must be made available to both pre-paid and contract customers. Care also has to be taken of "SIM-locked" phones, as these will have to be unlocked to work on any network once porting is implemented.

It follows that the technical solutions available to implement NP will depend on:

- the time scales required;
- the characteristics of the existing network (existence of Intelligent Network (IN) platforms, network architecture etc);
- the interconnection structure (number of POIs and level of interconnection etc); and
- the scale of implementation of NP (very small number of lines concerned, or generalised use of this service) and the number of operators involved.

While there are a great variety of solutions for implementing numbering portability from a technical point of view, it is vital that all operators agree upon a methodology, as there will have to be close co-operation between all stakeholders to ensure that NP is implemented expeditiously and efficiently.

**Q 1. Taking into consideration the options outlined above, what would your preferences be with regards to the technical solution in terms of**

- **on/off switch solutions,**
- **centralised/distributed databases,**
- **direct/indirect routing,**
- **one-step or two-step (with interim solution) implementation,**
- **special measures for value-added mobile services?**

**Please give detailed reasons for your answers.**

## 6 TARIFF TRANSPARENCY

There is an inherent conflict between number portability and tariff transparency. Allowing a called party to keep his/her number when changing operator, location or service has significant competitive and user benefits. Nevertheless, it also reduces tariff transparency. Callers can no longer tell from the number dialled what price they will pay for the call. An NRA that wishes to allow Number Portability while preserving tariff transparency can choose to restrict the tariffs charged under Number Portability or to require enhanced tariff transparency services.

Number Portability can also obscure differences in price between on-net and off-net<sup>4</sup> calls. In the case of Malta, tariffs that discriminate between own and other networks are not yet permitted. In other countries, some operators charge significantly less for on-net than off-net calls as a way of attracting customers. Operator NP hides such price differences. The caller can no longer tell from the number dialled whether the call is an on-net call or an off-net call at a significantly higher price. Some regulators decided to ban on-net/off-net price differences so as to preserve tariff transparency. Others took a more lenient approach.

Number Portability can also cloak differences in the price of making calls to competing networks of the same kind. For example, in a call made from a fixed line to a mobile, the interconnection costs of the mobile network may differ from that of another mobile network. In some EU member states this led to different retail prices for fixed to mobile calls according to the mobile network called. Operator NP between mobile operators hides these differences in retail price and this also reduces tariff transparency. Several NRAs, concerned about such a problem, have made proposals for dealing with such typical situations. These include:

- allowing the loss of tariff transparency on the grounds that it is immaterial;
- requiring the dominant fixed line operator to set a uniform retail price for calls to all mobile networks – whatever the call termination charge;
- requiring terminating mobile operators to set a common call termination charge;
- constraining the price to the caller to be no greater than the price of a call to the network which owns the number block in which the number dialled is located (or, if it is greater, that a warning message be provided to the caller before the call is connected);

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<sup>4</sup> On-net calls are calls made to the same network. Off-net calls are calls made to other networks.

A full tariff transparency service (in which the user is automatically informed of the price of calls in advance of making them) would help solve these problems. Examples of these are recorded announcements at the start of a call or when the caller has a terminal with a screen the tariff or service information could be displayed on it.

**Q 2. What solution/s should be established by the industry to ensure tariff transparency?**

## **7 THE IMPACT OF NUMBERING POTABILITY ON THE NUMBERING PLAN**

### **7.1 The impact on the National Numbering plan**

The main effect, if any, of Operator Number Portability on the national numbering plan is the loss of structure in the plan since individual numbers within a number block previously 'allocated' to one operator are ported to other operators.

The effect of NP on number assignment is that it opens the door to individual assignment by the MCA directly to the users. Number Portability between network operators ultimately implies that numbers cannot contain any operator or service provider identity. Individual assignment directly to users is feasible in particular for special-tariff services such as premium rate and freephone numbers. Direct assignment in the case of geographic numbers and mobile numbers is not viable.

An effect of all types of Number Portability is that the user may be able to retain his number longer and therefore may increasingly value his number. Individual assignment provides better possibilities to deal with valuable numbers than block assignment. A change from block assignment to individual assignment also implies a shift of the assignment workload from network operators and service providers to the MCA.

### **7.2 Charging for numbers**

At this stage, numbering resources are not subjected to a charge. The eventual levying of charges/fees for the usage of numbering resources is however foreseen as part of the implementation of a new licensing regime. The introduction of Number Portability implies that numbers from the blocks that a particular operator was originally assigned, will now be transferred to another operator. When charging is introduced, the block holder would have paid a fee for numbers that are not used any longer by its network. Consequently, a system catering with financial transfers between operators related to numbering fees will need to be set up. The MCA will consult the operators regarding this issue when the need arises.

## **8 ADMINISTRATION OF PORTING**

Operator number portability implies the transfer of service from one operator to another and involves the closure of the account with the donor operator and the opening of a new account with the recipient operator.

It is therefore important to develop simple porting procedures. These procedures should include the method by which the user requesting a port is verified as the holder of a number, arrangements for communication between entities involved in porting a number during the porting process, the procedures for porting large quantities of numbers at any one time, and timing.

The processes described in this section are to be considered by the industry players and the MCA before number portability is in place.

### **8.1 Entities handling porting requests**

The transfer process needs to be simple and user-friendly for the subscriber. There are various options for achieving these objectives. The following are two alternatives for requesting Number Portability by the subscriber:

- Separate interactions with both donor and recipient operators to request the closure of the old account and the opening of the new account. Separate interactions provide a simpler framework, but require more activity by the subscriber. There is also a risk that a subscriber will order the new service but fails to request closure of the old one,
- A one-stop shop procedure handled by the recipient operator. This approach offers the advantage of completing the customer's request in one session. The recipient operator is required to collect and pass on the customer's authority for the closure of the service and transfer of the number by the donor. The MCA is more inclined to the adoption of this option.

Regarding mobile number portability, most mobile operators deal almost exclusively with retail outlets to provide their services. Accordingly, it may seem natural for users to deal with retail outlets for porting their mobile number to a different operator.

## **8.2 Porting procedures**

### **8.2.1 Authentication**

An authentication procedure is usually built into porting processes to ensure that the person requesting Number Portability is authorised to do so. The way this is implemented can have significant effects on the robustness of the porting process, its convenience to users, and how long it takes to complete. The most important variables are the following:

1. Whether authentication is performed via reference to account records, or on some form of documentary evidence supplied by the person requesting the port (such as a bill),
2. Who performs the authentication — for example, the entity that receives the porting request, the recipient network or the donor network operator,
3. How communication between the various parties which are involved in authentication occurs — for example, electronically, by fax, or by letter; and
4. The level of trust between the various parties involved in a porting request, which itself may influence the need for an effective reversal procedure in the event that an unauthorised porting occurs.

The authentication procedure may be related to the assessed risk of fraud, or to the capability to quickly reverse a port if it is established that it has been fraudulently requested.

### **8.2.2 Communications during the porting process**

Entities involved in porting a number can establish special protocols or other arrangements for exchanging information during the porting process. A dedicated communications network can be established to carry information associated with the steps involved in the porting process. Such arrangements may ensure that messages are carried quickly and efficiently between entities involved in the porting process, the risk of fraud is reduced, and that the specified porting procedures are correctly followed.

### **8.2.3 Refusal to port**

It seems reasonable for a donor network operator to be able to refuse a request to port a number under certain circumstances. Apart from grounds for refusal such as flaws related to the porting request, other grounds for refusal may include for example mobile handsets recorded as stolen. Regarding cases where subscribers owe money or are have an outstanding dispute with their existing operator over a bill, the MCA considers that there are separate mechanisms to allow recovery of any legitimate outstanding debt.

It is, however, arguable that the ability to refuse a number to be ported should be carefully weighed against users' legitimate rights regarding the use of their numbers.

### **Q 3. Should the donor operator be allowed to refuse certain customer to port? If yes, on what grounds?**

### **8.2.4 Time to port**

A porting procedure that requires days or weeks to get a number ported will appear too lengthy when compared with the few minutes or hours it may take for a user to initiate a new connection especially a mobile connection. A lengthy porting period may create extra costs to users, or simply discourage them from porting at all. A short porting period, however, may allow insufficient time for proper checks at all stages of the porting process to avoid fraud and ensure proper completion of a port.

### **8.2.5 Bulk porting**

There may be procedural advantages in managing the porting of large quantities of numbers, for example, a "fleet" of corporate mobile telephony or DDI numbers, via a separate procedure suitable to the porting of individual numbers. There may also be financial advantages in managing bulk ports via a special procedure as it may allow the cost of porting many numbers to be reduced significantly.

## 9 ECONOMIC ARRANGEMENTS

This section considers the additional costs induced by Number Portability including proposed rules for cost apportionment.

There are one-off and recurring costs associated with the provision of Number Portability. Charges for interconnection related to the provisioning of number portability must be cost oriented and any direct charges to subscribers must not become a disincentive for using this facility.

There are three main types of cost associated with Number Portability as follows:

- a. General system set-up costs: These are one-off costs mainly incurred by the operators in modifying their network and support systems to enable Number Portability. System provisioning costs are incurred even before a single number is ported and are therefore independent of operator demand. These costs include all the capital costs of network upgrading and system development, as well as those involved in creating an agreed porting procedure and determining commercial terms and procedures,
- b. Transaction costs: These are mainly administrative costs incurred in implementing Number Portability for individual customer lines. These include the cost of complying with the agreed porting procedures, activating ported numbers, testing, and communicating the necessary call routing information to other operators,
- c. Additional conveyance costs: These are additional costs involved in routing a call to a subscriber with a ported number, compared to the costs involved in routing a call to a subscriber with a non-ported number.

### 9.1 Principles for Cost Apportionment

The MCA must determine how the costs documented above should be apportioned. A number of guiding principles have been identified which have been used by other NRAs as a basis for determining Number Portability cost allocations:

- a. Cost causation: the party responsible for causing costs should help to bear the costs,
- b. Distribution of benefits: the party(ies) benefiting from the process should help to bear the costs,
- c. Effective competition: the cost allocation mechanism should inherently encourage competition,

- d. Cost minimisation: the cost allocation mechanism should encourage operators to minimise costs and in particular to adopt technically efficient solutions,
- e. Reciprocity: charges between operators should be equal for the same service,
- f. Practicability: the allocation mechanism should be practical to implement,
- g. Relevance: charges should represent the costs of an efficient operator using a least cost approach.

**Q 4. Based on the preferred technical solution, how do you think the three types of cost mentioned above should be recovered?**

## **10 PROPOSED TIMEFRAMES**

The MCA has the obligation to introduce Operator Number Portability for geographic numbers (at a specific location), for non-geographic numbers (at any location) and mobile numbers. These facilities should be introduced as early as possible in view of the country's accession into the EU. Subsequently, the MCA would like to see the implementation of the said facilities by 1 May 2004.

Furthermore, the MCA is of the view that Maltacom should allow its subscribers to retain the same telephone number when moving from one physical location to another, that is, implement Location Number Portability by the same date.

**Q 5. Do you think that Maltacom should introduce Location Number Portability? If not, why? Are there any technical difficulties? Give details.**

## 11 CONSULTATION FRAMEWORK

The MCA would like to invite comments from interested parties in relation to the various issues raised in this document. The consultation period will run until 12.00pm on Friday 14 November 2003. Comments should be sent to:

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Written representations will be made publicly available at the MCA on request unless these are of a confidential nature. Respondents are therefore asked to separate out any confidential material into a clearly marked Annex. Respondents are also kindly requested to refer their comments to the specific sections of this document.