



GOVERNMENT OF BERMUDA
Ministry of Energy, Telecommunications and E-Commerce
The Department of Telecommunications

**Local Number Portability for Bermuda
Second Consultation Paper**

**Ministry of Energy, Telecommunications &
E-Commerce**

25th September 2009

Closing Date for Responses Monday 9th November 2009

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1 Introduction

In anticipation of forthcoming legislation that will establish a new regulatory framework in Bermuda, the Ministry of Energy, Telecommunications and E-Commerce (METEC) is launching a series of initiatives that will pave the way for the transition.

Local Number Portability (LNP) is one of several regulatory building blocks that form the basis for the telecommunications reform programme. Other blocks include the Dominance Framework, Retail Price Regulation, Access & Interconnection and Consumer Protection.

An initial consultation on LNP was carried out in August 2008. METEC is now launching a second consultation to explore in more detail the key aspects of LNP and invites all interested parties to submit their views.

2 Scope of Consultation

Subsequent chapters of this consultation paper address the following:

- Fixed number portability
- Mobile number portability
- LNP for VoIP based services
- The benefits and costs of number portability
- Impact on the numbering plan
- Routing of calls for number portability
- Termination rates and tariff transparency
- Consumer focused activities
- Implementation plan
- Management structure and industry working groups

3 Consultation Procedure

This consultation is being run in accordance with the Consultation Process documented in METEC's publication of the same name dated 28 November 2008 (available on METEC's web portal¹).

The consultation period will run from 25th September 2009 to 9th November 2009. Written comments should be submitted before 5pm on 9th November 2009.

Please submit your responses in MS Word format by email to gtelecom@gov.bm and a hard copy delivered by hand to:

¹ <http://www.mtec.bm/portal/server.pt?>

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All comments should be clearly marked “Comments on Local Number Portability in Bermuda: Second Consultation Document”

The Minister intends to make responses to this consultation available on the Government of Bermuda website. Any material that a respondent considers to be commercially sensitive should be put into an Annex and clearly marked “IN COMMERCIAL CONFIDENCE”. Further details on the submission of confidential information are provided in the Consultation Process document available on the web portal.

The Minister regrets that he is not in a position to respond individually to the responses to this consultation.

This document does not constitute legal, technical or commercial advice; the Minister is not bound by this document and may amend it from time to time. This document is without prejudice to the legal position or the rights and duties of the Minister to regulate the market generally.

4 Introduction

For competition to deliver benefits in a telecommunications market place it is necessary for customers to be able to freely choose the services of an alternative carrier should they wish. One mechanism that can enable this choice is Local Number Portability (LNP).

LNP allows customers to change their carrier while retaining their existing telephone numbers. This enables them to avoid a number of costs – so-called switching costs - associated with a number change. These costs can be significant, particularly for business customers. With lower switching costs, there is more potential for the development of competition and market entry. The lack of LNP in a market can be considered to be a “barrier to switching” and thus can limit the effect of competition.

On 22nd August 2008 METEC published its consultation document “Number Portability for Bermuda”, which was designed as the first step in enabling the Ministry to develop a policy for LNP covering both fixed and mobile communications for Bermuda.

This consultation is the second LNP consultation issued by METEC and is aimed at addressing a number of specific issues relating to the design and implementation of LNP in Bermuda.

METEC has been encouraged by the active participation of the carriers in the industry working group set up to take LNP forward in Bermuda and is keen to ensure that all carriers take an active part in the successful implementation of this key promoter of competition in the telecommunications market place.

5 Regulatory Objectives

Through its Regulatory Objectives, it remains the steadfast aim of the Government² to encourage the development of the electronic communications sector to the benefit of the people and the economy of Bermuda. These objectives are:

- To ensure that the people of Bermuda are provided with reliable and affordable access to quality public communications services;
- To enhance Bermuda's competitiveness in the area of communications so that Bermuda is well positioned to compete against its "real" global competitors in the tourism and international business markets;
- To encourage the development of a public communications sector which is responsive to the requirements of users (both individuals and businesses) and which provides its users with choice, innovation, efficiency, and affordability;
- To encourage the development and rapid migration of innovative technologies to Bermuda;
- To promote the orderly development of Bermuda's public communications sector;
- To encourage sustainable competition and create an invigorated public communications sector which would lay the groundwork for the further development of communications reliant industries;
- To encourage the development and maintenance of resilient and fault-tolerant infrastructures;
- To promote investment in the public communications sector and in communications reliant industries thereby stimulating the economy and employment; and
- To promote Bermudian ownership and Bermudian employment at all levels of the communications industry.

METEC considers that LNP provides a key functionality to customers that is in support of the regulatory objectives quoted above.

² Telecommunications Regulatory Reform Policy, 18th November 2008, http://www.gov.bm/portal/server.pt/gateway/PTARGS_0_2_7286_330_1813_43/http%3B/ptpublisher.gov.bm%3B7087/publishedcontent/publish/min_telecom_and_e_commerce/telecommunications/telecommunication_regulatory_reform/telecommunications_regulatory_reform_policy_0.pdf

6 Background to this consultation

6.1 Background

Following METEC's initial consultation on LNP it was agreed to proceed with the solution of a central reference database solution to support LNP in Bermuda.

It is important to take into account the principle that any measures adopted in Bermuda should be proportionate to the level of demand and their associated costs are at a level proportionate to the anticipated benefits.

This consultation makes a number of proposals on how LNP should be implemented in accordance with this principle whilst seeking to maximise the benefits for Bermuda.

6.2 Scope of this Consultation

The introduction of LNP is discussed in detail in this consultation paper with a particular focus on the options for cost recovery, process issues, consumer issues and the timing for introducing the service.

Operational processes to support the ordering, provisioning and ongoing management of LNP will also need to be designed to reflect the size of the Bermuda market place. METEC considers that it may be appropriate for carriers not to consider processes that are based on highly sophisticated automated interfaces and protocols such as those introduced in larger jurisdictions. In order to reduce overall costs, processes should be based on appropriate communication methods and interfaces considering the scale of Bermuda and the potential volume of porting requests.

7 Number Portability

7.1 Number Portability Requirements

Number Portability (NP) in most jurisdictions is a remedy that is specified by the National Regulatory Authority (NRA) and is applicable to all carriers in the market. It is not a remedy that is specifically directed to carriers that are deemed to be dominant in specific markets.

There are several different forms of NP in use across the world. NP is applicable to both fixed and mobile networks. METEC's initial consultation document addressed the following:

- 'fixed number portability' on fixed networks, whereby customers of a fixed network can port their numbers from one access carrier to another, when the customers change their access carrier;
- 'mobile number portability' on mobile networks, whereby customers of a mobile network can port their numbers from one mobile carrier to another, when the customers change their mobile carrier, and;
- 'cross number portability' whereby customers of a mobile network can port their numbers from the mobile carrier to a fixed carrier and customers of a fixed network can port their numbers from the fixed carrier to a mobile carrier, when the customers change their carrier.

Local Number Portability (LNP) allows any customer to change from one carrier to another carrier as long as the area code of the number remains the same. As Bermuda only has one area code this means that in Bermuda LNP would enable all customers to be able to port their numbers as follows:

- Between fixed carriers;
- Between mobile carriers;
- From a mobile carrier to a fixed carrier, and;
- From a fixed carrier to a mobile carrier.

7.1.1 Fixed number portability

Number portability is only relevant when competition exists for incoming calls and where the competing carrier has a direct connection to the customer rather than using the existing access network provider's network. Direct connection includes the situation where access is provided by the unbundling of the local loop. METEC expects competition to develop further as the regulatory reform process continues to make progress.

Fixed number portability should be compatible with any indirect access remedies³ that might be mandated by METEC.

³ Indirect access can take one of two forms: 1) Carrier Pre-Selection (CPS) is when customers pre-determine their carriers of certain types of call. 2) Carrier Selection (CS) allows customers to choose their carrier on a call by call basis. 3) Carrier Pre-Selection with call-by-call override combines Carrier Pre-Selection and Carrier Selection.

There are synergies between the porting process for fixed number portability and mobile number portability. However, more time is usually required to port a fixed number as there maybe a requirement for a carrier to provide a new customer access connection, rearrange the local loop or provide service via the unbundling of the local loop⁴.

7.1.2 Mobile number portability

Bermuda currently has three carriers in the mobile market. The availability of LNP could be an important factor for increased competition between mobile carriers as well as for any other carrier wishing to enter the mobile market.

Mobile number portability is usually implemented on the network by adding a database function between the Gateway Mobile Switching Centre (GMSC) and the Home Location Register (HLR). This is commonly called Signalling Relay technology. This facility allows the mobile carrier to do All Call Query (ACQ) for outgoing calls and to Onward Route (OR) calls to numbers that it has ported off of its network. This setup also supports SMS services to numbers that have been ported.

7.1.3 LNP for Voice over Internet (VoI) based services

In a number of jurisdictions VoI⁵ based services that support incoming calls require that the VoI user is provided with a telephone number that is either within a dedicated number range or within the same numbering ranges as fixed services.

In practice VoI based services are used at present either as:

- A means to make out-going calls at low prices from any location with Internet access; or
- A substitute for fixed telephony (often called voice over broadband).

Where VoI based services are available and are used as a substitute for fixed telephony there is a case for including them within the scope of LNP.

METEC proposes that VoI based services should be included within the scope of LNP but wishes to consider allowing these services the possibility of opting-out for at least the next two to five years; the companies providing these services are relatively small companies and some are working in niche markets where the availability of portability is less relevant. It is therefore proposed that at launch VoI service providers are not mandated to provide LNP.

Question 1: Does the respondent agree that LNP should include VoI based services? Does the respondent also agree that VoI service providers should have the choice as to whether they provide LNP to their customers? If the respondent does not agree then please provide justification.

⁴ In the case that Local Loop Unbundling (LLU) is mandated by METEC.

⁵ Also commonly known as Internet Telephony. VoI enables people to use the Internet as the transmission medium for telephone calls. For users who have free, or fixed-price Internet access, VoI software essentially provides free telephone calls anywhere in the world. To date, VoI does not offer the same range of facilities or offer the same quality as conventional telephone services.

7.1.4 Special services and premium rate services

The market for services such as freephone and premium rate numbers is at an early stage of development in Bermuda.

Special service and premium rate service numbers may be highly visible if they are used extensively in publicity and marketing. The cost of changing a special service or premium rate service number is high and therefore LNP is very important for this type of number. LNP can be provided relatively easily for this type of number.

METEC proposes that portability within each tariff band for special services and premium rate numbers should be implemented in conjunction with fixed and mobile number portability.

Question 2: Does the respondent agree that number portability within each tariff band for special services and premium rated numbers should be implemented in conjunction with fixed and mobile number portability? If the respondent does not agree then please provide justification.

7.2 The benefits and costs of number portability

One of the main drivers for the introduction of LNP is to reduce the cost of changing carriers for customers. This has benefits for the customer and also facilitates competition.

7.2.1 Classification of benefits

LNP benefits can be classified⁶ in terms of:

- **Direct Benefits** – benefits to the customers who change carrier. some of whom would change anyway and others would change only if LNP was available.
- **Indirect Benefits** – benefits to all customers in terms of:
 - Increased competition
 - Reduced costs in changing address data or finding the new telephone number of customers who have ported their number.

These benefits can be further broken down as shown below.

⁶ This classification was initially used by NERA in 1993, (Cost-Benefit Analysis of NP under Condition 34B of BT's licence - published by OFTEL in January 1994) and subsequently referred to by the UK MMC in its 1995 ruling (Telephone number portability: A report on a reference under section 13 of the Telecommunications Act 1984), by Ovum in its cost benefit analysis for Oftel (UK) in 1997 (Oftel (1997), Economic Evaluation of Number Portability in the UK Mobile Telephony Market, Oftel: London, July 1997) and by NERA for OFTA Hong Kong in 1998 NERA/Smith (1998), Feasibility Study & Cost Benefit Analysis of Number Portability for Mobile Services in Hong Kong, Final Report to OFTA, NERA/Smith: London, May 1998).

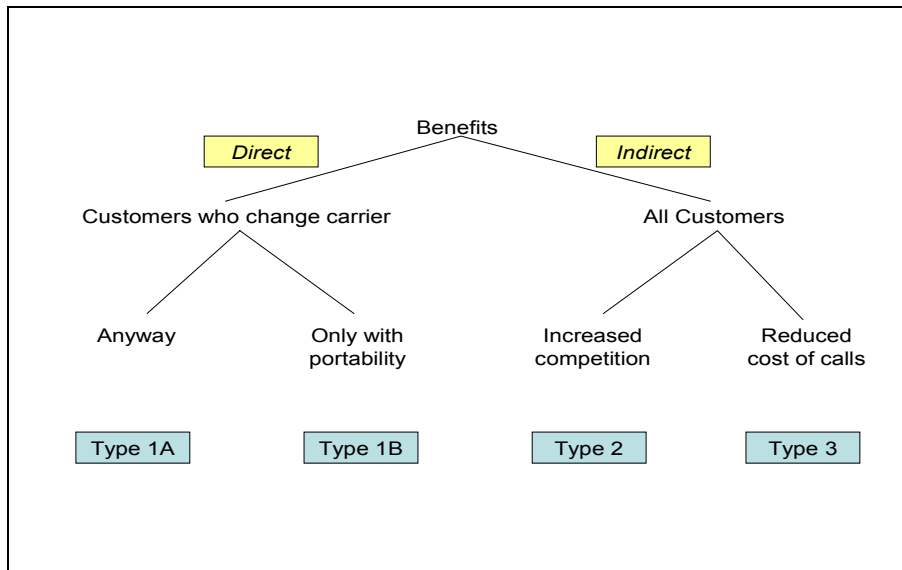


Figure 1: Direct and indirect benefits of local number portability

As shown in figure 1 the benefits are normally categorised into Type 1A, 1B, 2 and 3. These types of benefits are described below.

7.2.1.1 Type 1A Benefits: Benefits to customers who port their number

This is the benefit to those customers who port their number and consequently the total benefit of this type is proportional to the number of customers who port their number.

These benefits are the avoidance of costs concerned with changing a number. They include the costs of:

- Telling friends/family/colleagues/associates about the change of telephone number;
- The cost of providing some form of call trapping that could be used to capture incoming calls to the old number so callers receive a message that the number has changed;
- The risk of lost calls that could mean lost income for businesses;
- The costs of having stationery changed to incorporate the new telephone number;
- The costs of having business signage changed or replaced.

7.2.1.2 Type 1B Benefits: Benefits to those who port only with LNP

This benefit is more difficult to understand than the Type 1A benefit. This benefit is meant to cover the benefit that a consumer will receive from changing its carrier in terms of lower call charges, etc. These benefits are only realised if there is LNP otherwise the consumer will not change carrier. These benefits are in addition to the Type 1A benefits.

7.2.1.3 Type 2 Benefits: Benefits to all consumers in terms of the result in increased competition

There are benefits to the whole country that the resulting increase in competition following the introduction of LNP brings. These benefits might include reduced prices and improved quality of service (included customer care type activities) that carriers implement to protect themselves against losing consumers because of LNP.

7.2.1.4 Type 3 Benefits: Benefits to callers to the consumers who have ported their number

These benefits can be quantified as the avoided costs of:

- Updating address books and contact information following a number being ported,
- Making “wasted” calls to old numbers that have been changed when a consumer moves to another carrier, and the subsequent lost time in having to find the new number

7.2.2 Costs of number portability

It is generally accepted that there are four main cost groups for the implementation of LNP, which can be described as:

- The set-up cost for any common systems that are implemented across the industry;
- The individual set-up cost for each of the carriers implementing LNP;
- The per-line set-up costs for each individual number that is ported; and
- Any additional conveyance costs that result from calls being routed to a ported number.

The greatest of these costs by far are the set-up cost which is independent of the number of consumers who eventually port their numbers. This set-up cost can include:

- Changes to carriers networks for the routing of calls and the carrying of SMS messages;
- Changes to the Operations Support Systems (OSS) and Business Support Systems (BSS) to support telephone numbers from number blocks that were not originally allocated to the carrier concerned;
- Setting up of an LNP ordering process;
- The setting up and running of the centralised database;
- The training of retail outlets to support the ordering and customer care of LNP;
- Communications to the consumer base to raise awareness of LNP.

These set-up costs can vary from carrier to carrier depending on the state of each carrier’s network and the associated OSS/BSS.

Following the launch of LNP the main on-going cost is the handling of porting requests on a daily basis.

7.2.3 Cost recovery

There are four main elements in the recovery of costs relating to number portability, which are:

- **Set-up costs** – involves costs for both networks and IT support systems and in addition will include the central database costs and the costs incurred of rolling out LNP to all of the carrier's points of sale;
- **Additional annual running costs** – relates to equipment that is required specifically for LNP. For example this might include the annual recurring, volume independent, costs for the operation of the central database and administration system;
- **Cost per port** – this includes the per order handling cost of LNP (i.e. this cost is dependent on the volume of porting orders; and
- **Additional conveyance costs** – this cost might be negligible if the carriers' networks are capable of performing All Calls Query (ACQ).

Where there is an agreement to port numbers between carriers, numbers can be ported in both directions. Thus any "per carrier" costs - that is the cost of establishing NP arrangements between two carriers - are incurred by both carriers. In order to promote economic efficiency by providing strong incentives for carriers to minimise these costs, any "per carrier" costs are generally borne by the carrier that incurs the costs.

System set up costs typically account for a very large proportion of the cost of LNP solutions. Due to the reciprocal nature of the costs, each carrier generally has to recover their own costs. For solutions where there is a common database set up for all carriers the cost of this database would be shared between the carriers.

The allocation of call conveyance costs can be problematic. Three parties may be involved in the transmission of the call: the originating carrier; the "donor" carrier from whom the number is ported; and the "recipient" carrier who terminated the call. In a report for the European Commission⁷, it was recommended that the extra costs of conveyance be recovered from the originating carrier. In the UK, costs were initially (whilst an inefficient method of call routing was in place) shared between the donor and recipient carrier, but then allocated completely to the donor carrier when a more efficient method of call routing was introduced.

If the "donor" carrier chooses not to implement a routing solution that ensures the most efficient routing for a call to a ported number then inefficient routing of calls to ported numbers will incur additional conveyance costs. As the "donor" carrier causes these costs then it is generally considered that this carrier should bear that cost.

Additional conveyance costs have also led to problems and were the main focus of the UK's Monopolies and Mergers (MMC) inquiry⁸. In France⁹ it has been shown that

⁷ Study on the Cost Allocation for Number Portability, Carrier Selection and Carrier Pre-Selection :Final Report for DGXIII of the European Commission by Europe Economics & Arcome

⁸ "In the UK, the treatment of the additional conveyance costs before the introduction of the more efficient call drop-back solution led to a dispute between operators. This was resolved through a decision that operators share the "tromboning" costs during the period of the transitional solution."

the additional conveyance costs, even if cost orientated, could substantially limit the take-up of number portability.

The charging arrangements for LNP should, according to economic studies carried out in other jurisdictions, be based on a balanced combination of the economic principles shown in Table 1¹⁰ below.

These categories shown in the table follow those recommended by the MMC in its 1995 report on fixed network number portability and subsequently included in BT's licences and applied in Oftel's determination of BT's costs of providing portability.

The question of cost allocation was examined in great detail by the MMC with respect to fixed networks in 1995. The MMC based its conclusions on a set of principles which can be universally applied to any form of portability¹¹. Those principles were:

Principle	Charging Rule
Cost causation	in general, cost-recovery mechanisms should have strong regard to whose actions cause additional costs to be incurred
Cost minimisation	those who are in a position to affect the size of the costs should face strong incentives to minimise costs
Distribution of benefits	cost recovery mechanisms should recognise that ported customers are not the only beneficiaries of number portability
Effective competition	cost recovery mechanisms should promote competition, and not weaken the benefits which number portability would bring in the mobile market
Reciprocity and	cost recovery mechanisms should as far as

⁹ Study on the Cost Allocation for Number Portability, Carrier Selection and Carrier Pre-Selection: Final Report for DGXIII of the European Commission by Europe Economics & Arcome stated that “The most significant lesson from the review of Member States’ experience has been that the cost allocation arrangements for the additional conveyance costs could affect the take-up of number portability. This has become apparent in Finland and France where on-switch solutions involving significant additional conveyance costs were implemented and the costs passed on to recipient network operators. It may, therefore, be appropriate for the cost allocation arrangements to contain the appropriate incentives to migrate to a suitable long-term solution”

¹⁰ Number Portability in the Mobile Telephony Market – Oftel July 1997, citing UK MMC report on Fixed Number Portability; 1995; NERA/Smith (1998), Feasibility Study & Cost Benefit Analysis of Number Portability for Mobile Services in Hong Kong, Final Report to OFTA, NERA/Smith: London, May 1998. Broadly similar principles have also been used by other regulators (e.g. See also Malta Communications Authority; Introducing Number Portability in Malta’ Report on Consultation and Decision March 2005 and New Zealand Commerce Commission, Decision 554 “Determination on the multi-party application for determination of ‘local telephone number portability service’ and ‘cellular telephone number portability service’ designated multinet network services”, August 2005)

¹¹ Chapter 7, The Economics of Number Portability, http://www.competition-commission.org.uk/rep_pub/reports/1995/fulltext/374c7.pdf

symmetry	possible be symmetrical and reciprocal, given that portability is required to be offered in both directions
Practicability	ease of implementation

Table 1: The six economic principles for the recovery of LNP costs

Question 3: Does the respondent agree with the six economic principles for the recovery of LNP costs? If the respondent does not agree then it is requested to provide its reasoning for this.

METEC has considered the application of the six principles above in respect of the set-up costs. The set-up costs in Bermuda could be much higher per customer than in other countries where the number of customers is much greater. METEC has concluded that the approach taken in other countries, that each operator should bear its own set-up costs should also be applicable in Bermuda. METEC's reason behind this decision is that this approach encourages carriers to minimise their costs and spreads the costs of LNP over all customers. METEC believes that this is fair because all customers will benefit from the increase in the benefits of competition that should arise from the introduction of LNP and that the size of the customer base should not affect this decision. An alternative solution would be to recover the set-up costs from those customers who decide to port. METEC considers that this would be counter productive because the cost of each port would be too high and this may limit the number of customers who decide to port their numbers.

METEC proposes that each carrier should bear its own set-up costs. This should encourage the efficient implementation of LNP solutions within carriers. This proposal reflects the above economic principles for the recovery of LNP costs:

- Cost minimisation
- Distribution of benefits; and
- Practicability

Question 4: Does the respondent agree with METEC's proposal that each carrier should bear its own set-up costs? If the respondent does not agree then it is requested to provide its reasoning for this.

METEC proposes that the total one-off set-up cost related to the purchase and implementation of the central reference database should be shared equally between all of the existing carriers who have, at the time of introduction of LNP, numbers assigned to them. In an extreme case this would mean that a carrier entering the market with no existing customers would pay a share equal to that paid by a long established carrier. However, the new carrier would have most opportunity to gain from the benefits of LNP and the removal of barriers to switching. The reverse of this argument is that, for example, an incumbent fixed line operator would pay an equal share but would have most to lose as, potentially in the short term, most of the porting requests would be for ports off of the incumbent's network. However, this carrier would expect to see the highest volume of port requests and an efficient and effective porting solution would benefit the carrier in terms of process and operational costs.

This proposal reflects the following economic principles, listed above, for the recovery of LNP costs:

- Distribution of benefits;
- Effective competition;
- Reciprocity; and
- Practicability.

Question 5: Does the respondent agree with METEC's proposal that all carriers should pay an equal share of the set-up costs related to the purchase and implementation of the central reference database. If the respondent does not agree then it is requested to provide its reasoning for this.

With regards to the porting transaction costs the theoretical solution that is based on cost causation is that the recipient carrier pays the donor carrier the incremental costs of an efficient transaction. This approach is adopted in many countries but in practice the costs are sometimes waived because the porting volumes in each direction tend to balance each other out after porting has been in operation for a period of time (one year minimum) and so it becomes no longer cost effective to charge between carriers.

However, in theory, the following options exist:

- No charge is raised;
- A charge is set by negotiation, but successful negotiation is unlikely between carriers who consider themselves to be winners or losers;
- A non-reciprocal cost based charge is raised based on the donor carrier's actual porting costs (however, these true costs will not be known until porting has been operational for a period in excess of one year);
- A reciprocal charge that is related to the average costs of the two carriers;
- A charge set by METEC that is based broadly on the results of the benchmarking of charges in jurisdictions that have implemented LNP.

METEC considers that the charges between carriers should be reciprocal so that each carrier pays the other carrier the same amount of money for the same service. This practice is common in other jurisdictions (including Jersey, Guernsey, Ireland and Malta) and this encourages efficiency between the carriers. However, some carriers may opt to waive these charges.

METEC favours a charge that is based on a benchmarked rate. This charge will then be reviewed if there is substantial evidence that a Bermuda based rate would be more beneficial. A data to support a Bermuda based rate would become more evident after porting has been operational for a period of time.

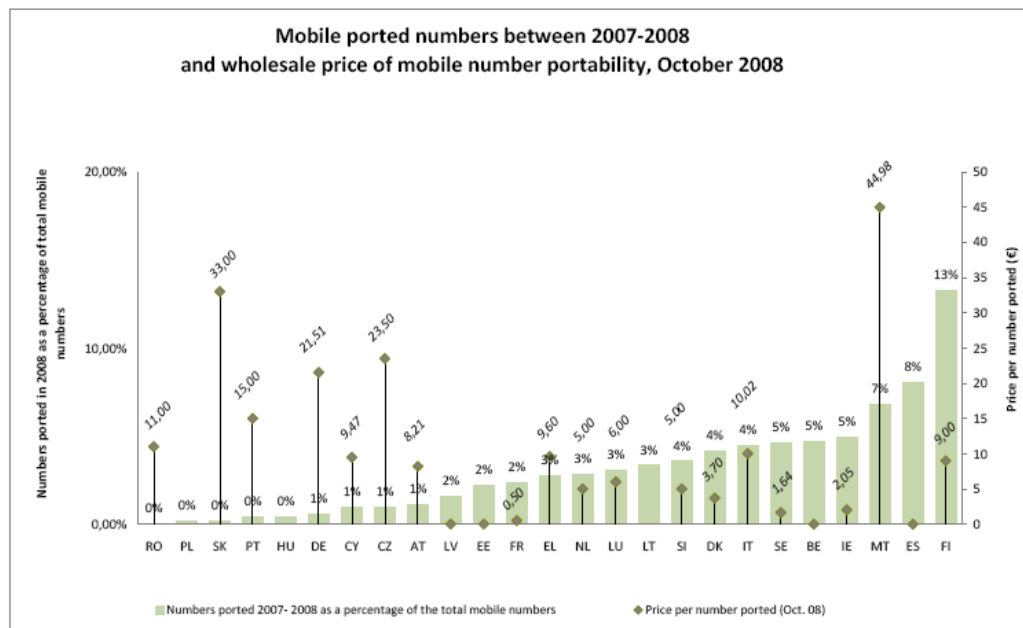
METEC therefore proposes to set reciprocal default charges as a ceiling based on benchmarking. Carriers are then free to agree alternative, reciprocal charges that must be below the ceiling set and provided that they are applied in a non-discriminatory manner. METEC will also consider any representations for changes to these charges based on evidence of the incremental costs. This is the approach adopted in Malta and the carriers there welcomed the simplicity of this approach.

Question 6: Does the respondent agree with METEC proposal to set a ceiling based on benchmarked information for the porting transaction charge? If the respondent does not agree then it is requested to provide its reasoning for this.

The following information is provided in order to give the reader the opportunity to gain a sense of understanding of the range of feasible prices that can be applied to LNP.

In 2005 CEPT published a report¹² on Mobile Number Portability which contained a survey of transaction charges for MNP ranging from €0 up to €29 (at a current exchange rate of €1 equals \$1.42¹³ this equates to a range of \$0 up to \$41.29). With the average cost was €12.80 (\$18.26).

Information is also available from the figure shown below which is taken from the European Commission's 14th Implementation Report¹⁴.



Cullen International¹⁵ also produces a survey of European inter-carrier mobile porting charges, the average of which is approximately €10 (\$14.20).

The Maltese NRA has set a default figure of ~€10 (\$14.20) for pre-pay and ~€14 (\$19.93) for post pay (the regulation is in the former local currency).

ComReg, the Irish NRA, has recently published¹⁶ a review of the fully automated incremental costs of mobile number portability and proposed to reduce the charge from €20 (\$28.40) to €2.05 (\$2.92) per successful port

¹² CEPT Report 31 rev 1

¹³ Exchange rate as of 3rd June 2009

¹⁴ Progress Report of the Single European Electronic Communications Market 2008 (14th Report Annex 2)

¹⁵ Cullen International SA, Western Europe Cross Country Analysis, September 2008

¹⁶ See ComReg Consultation and Draft Decision 08/65, 15th August 2008, www.comreg.ie

CEPT has not published a similar survey for fixed number portability. Figure 46 of the European Commission's 13th Implementation Report¹⁷ provides some information on the average consumer charge of €9.69 (\$13.80).

Both the UK and Ireland currently have a more complex set of charges for different types of operation with lower charges for portings that fail and higher charges for successful portings..

In a review ComReg proposed to reduce the charges for successful portings from the range €14 (\$19.93) to €24 (\$34.17) to the range €4 (\$5.70) to €8 (\$11.39) depending on circumstances but with smaller charges for unsuccessful portings.

A simple charging mechanism applying only to a successful port seems preferable initially.

Less comparative information is available for porting transaction charges for special service number and premium rate service numbers. ComReg has proposed a new charge of €5.74 (\$8.17). In the UK, BT's charges range from £7 (\$11.52) in the working day to over £100 (\$164.56) outside normal business hours.

Specifically for Bermuda, in order to set prices METEC proposes to carry out a benchmarking exercise closer to the launch of LNP and to set a price ceiling for a port no later than 3 months prior to the published launch date for LNP.

Question 7: Does the respondent agree with METEC's proposal to set the LNP port price ceiling no later than three months prior to the launch date? If the respondent does not agree then it is requested to provide its reasoning for this.

METEC considers that the donor carrier should be entitled to recover the reasonable cost of carrying out the porting transaction from the recipient carrier but not from the customer. Carriers may decide that there is little value in billing each other for these charges if there is an equivalent volume of ports between them.

METEC considers that the recipient carrier should be entitled to charge the customer for the port if it so wishes to do so. However, this should be at the discretion of the carrier. This is acceptable because all of the customers of the carrier will benefit from the increased benefits of competition.

When additional conveyance charges are considered there appears to be a conflict in the economic principles. Using the cost causation principle leads to the conclusion that the receiving carrier should pay the donor carrier for the additional conveyance costs incurred in routing calls to the ported number. But applying the cost minimisation principle suggests that the originating carrier or a transit network carrier, which is in a position to route such calls optimally, should bear the additional conveyance costs.

¹⁷ Progress Report of the Single European Electronic Communications Market 2007 (13th Report) – Annex 2

METEC believes that the argument with regards to applying the price minimisation principle is the stronger argument and therefore METEC proposes that it is preferable that the originating carrier should bear the additional conveyance costs. This is based on the fact that additional conveyance costs are avoidable if the originating carrier chooses to use All Call Query (ACQ) which is the most efficient method of routing calls to ported number. This provides an incentive to the originating carrier to minimise costs.

Question 8: Does the respondent agree that it is preferable that the originating carrier should bear the additional conveyance costs? If the respondent does not agree then it is requested to provide its reasoning for this.

In summary, METEC proposes, that in common with cost allocations in other jurisdictions:

- Each carrier should bear its own set-up costs and those running costs that are not dependent on the volumes of numbers ported;
- Set-up costs for a central reference database will be funded by carriers paying an equal proportion of the cost of implementation and the central reference database operational costs will be funded by the carriers paying an equal share¹⁸;
- The recipient carrier should pay the donor carrier for the incremental cost of each porting. In practice METEC will set a default ceiling reciprocal charge but will allow carriers to set their own reciprocal charges by negotiation;
- The originating carrier should pay for any additional conveyance costs. In practice METEC will set a default ceiling charge.

¹⁸ The cost of the central database should be shared equally between the initial number of carriers with numbers assigned to them. When a new carrier enters the market (and has numbers assigned to them) the new carrier would pay its relative share of the total cost of the database. This would effectively mean that the new carrier would be refunding each of the original carriers a portion of their initial investment.

8 Chosen technical solution for the implementation of LNP in Bermuda

Following the initial METEC consultation on LNP an industry working group was set-up to determine which of two short-listed solutions would be implemented in Bermuda.

The industry working group made the decision to implement LNP using an off-switch solution. Off-switch solutions typically use an external database to house all the information relating to the allocation of number ranges to carriers and information on all ported numbers. This database can be a central reference database or a distributed database.

Most commonly the database is used to provide the porting information to the carriers in order to allow them to determine how to route a call to a ported number. This database is commonly called a 'routing' database.

The working group in its determination decided to implement LNP using the centralised reference database solution.

The central reference database utilises a single database that is implemented and used by all of the carriers as a reference database. In some cases the central database is managed by an independent third party and not by the carriers themselves. The solution can also be provided as a hosted solution supported by an independent third party.

A central reference database is regarded as the best option in markets with several carriers and it is regarded as the most effective long-term solution. One key advantage of this solution is that it minimises the risk of disputes between carriers as the central database provides a single, un-equivocal, reference list of telephone numbers in use in the jurisdiction and on which network the number is currently located. The central reference database ensures that the number cannot be allocated on two networks at the same time.

9 Impact on the numbering plan

LNP does not affect existing number allocation within the current Bermuda Number Plan. Numbers may continue to be used but with different carriers providing the service.

Numbers can be ported from a given range to another carrier in the same or different number range.

The Bermuda Numbering Plan is based on the North American Numbering Plan which has the following services distinguished by use of clearly defined number ranges:¹⁹

- Toll free numbers are given the calling codes: 800, 888, 877, and 866;
- N11, or service codes. The FCC recognizes the following N11 codes as being nationally assigned:
 - 211--Community Information and Referral Services;
 - 311--Non-Emergency Police and Other Governmental Services;
 - 411--Local Directory Assistance;
 - 511--Traffic and Transportation Information (US); Provision of Weather and Traveller Information Services (Canada);
 - 611--Repair Service;
 - 711--Telecommunications Relay Service (TRS);
 - 811--Access to One Call Services to Protect Pipeline and Utilities from Excavation Damage (US); Non-Urgent Health Teletriage Services (Canada); and,
 - 911—Emergency
- PCS 5YY numbers are used for "follow me" personal communication services. Personal communications service is defined more formally as "a set of capabilities that allows some combination of personal mobility, terminal mobility, and service profile management. It enables each personal communications service user to participate in a user-defined set of subscribed services and to initiate and/or receive calls on the basis of some combination of a personal number, terminal number, and service profile across multiple networks at any terminal, fixed or mobile, irrespective of geographic location. Service is limited only by terminal and network capabilities and restrictions imposed by the personal communications service provider."

PCS 5YY numbers are in the format 5YY-NXX-XXXX. 5YY-NXX codes, each subsuming a block of 10,000 numbers, are assigned to service providers who provide personal communications service as defined above. These service providers, in turn, assign individual numbers to their customers.

¹⁹ http://www.nanpa.com/number_resource_info/index.html except for the toll free numbers, which are from <http://www.sms800.com/PublicContent.aspx?Text=History%20of%20SMS^800&URL=Shared%20Documents/Public/About%20SMS^800/History%20of%20SMS^800&Site=Public>

- 900 numbers are used for premium services, with the cost of each 900 call is billed to the calling party.

900 numbers are in the format 900-NXX-XXXX. 900-NXX codes, each subsuming a block of 10,000 numbers, are assigned to service providers who provide and typically bill for premium services. These service providers, in turn, assign individual numbers to their customers.

- Numbers within the 456 NPA are used to identify carrier-specific services. This is accomplished by providing carrier identification within the dialed digits of the E.164 number. More specifically, the prefix following 456 (456-NXX) identifies the carrier. Use of these numbers enables the proper routing of inbound international calls destined for these services into and between North American Numbering Plan area countries. Current 456-NXX assignments are shown below:

NXX	Carrier	Date Assigned
226	Teleglobe Canada	08/30/93
288	AT&T	08/15/97
289	AT&T	08/23/93
333	Startec, Inc.	04/11/95
624	MCI	08/16/93
640	Sprint	10/05/93
741	STSI	08/26/93
808	Hawaiian Tel	02/25/94

- 555 numbers are used to reach a wide variety of information services. 555 numbers are in the format 555-XXXX. The line number (XXXX) indicates the particular information service. 555 numbers are assigned according to guidelines developed by the ATIS-sponsored Industry Numbering Committee.
- Vertical service codes (VSCs) are customer-dialed codes that provide access to features and services provided by local exchange carriers, interexchange carriers, commercial mobile radio service (CMRS), etc. Services invoked by VSCs include call forwarding, automatic callback, customer originated trace, and many others. The format of a VSC is *XX or *2XX (touchtone) and 11XX or 112XX (rotary). For example, call forwarding is activated by dialing *72 or 1172.
- 800-855 line numbers, in the format 800-855-XXXX, are used to access Public Switched Telephone Network services for the deaf, hard of hearing, or speech impaired. Such services include Telecommunications Relay Service and Message Relay Service.

Question 9: Does the respondent agree that LNP has no effect on the current Bermuda National Numbering Plan? If the respondent does not agree then it is requested to provide its reasoning for this.

10 Routing of calls for number portability

There are issues when deciding on a single routing solution for calls to ported numbers. The major issue is that the cost implications of a routing solution can be quite diverse for different carriers and the costs can vary dramatically by solution for various traffic volumes. Generally these issues have led to a more general approach to defining routing solutions and the setting of the corresponding charge, which allows the carriers to make their own individual decisions on routing within the framework laid out. This means that a carrier could start with one routing solution that is most cost-effective when its volume of calls to ported numbers is low and then migrate to alternative solutions in their own time as the volumes grows.

10.1.1 ETSI Solutions for Routing

The European Telecommunications Standardisation Institute (ETSI) has defined four technical options for the routing of calls to ported numbers²⁰. These options are:

- Onward Routing (OR)
- Call drop-back
- Query on Release (QoR) [IN²¹ only]
- All Call Query (ACQ) [IN only]

The following diagrams show how these options work. In showing how these solutions operate the following assumptions are made:

- The “serving network” is the latest recipient of the number
- The “number range network” is the network identified by number analysis, i.e. the network that originally served the number and through which the number was allocated
- For the first porting, the number range network is the donor and the serving range network is the recipient.

Onward Routing

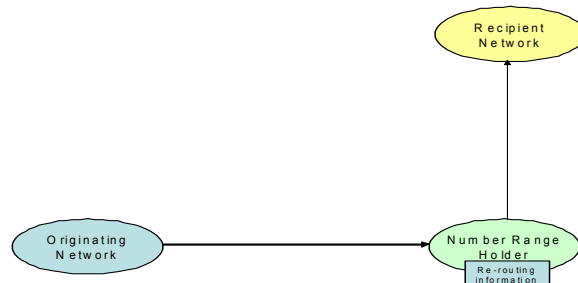


Figure 2: Onward Routing

²⁰ ETSI Technical Report TR 101 118 v1.1.1 (1997-11)

²¹ IN – Intelligent Network – Refers in the main to off-switch solutions

Onward routing would be used by the number range network in both cases.

- With an inter-dependent solution it would be the only solution and would be used for all traffic
- With an independent solution it is an option and should always be available for traffic that reaches the number range network.

With the independent solution the carriers would in addition have the option to use:

- Call-drop-back
- Query on Release (QoR)
- All Call Query (ACQ)

Each carrier can choose for itself whether or not to use ACQ. The use of QoR and drop-back depends on co-operation with the number range network. Most carriers choose to use ACQ with QoR being used in only a few countries.

These two solutions combine routing and charging consistently are distinguished by defining the responsibility for routing and requiring the carrier, that has the responsibility for routing, to pay the additional conveyance costs but allowing it a choice over the routing mechanism used.

The alternatives have been named as:

- The **independent solution** – where the originating network has the responsibility for routing and can make this choice independently. This means that all networks are affected by LNP, not just the ones that are porting numbers between each other. In the case of incoming international calls, the originating network is the domestic network that receives the call from the foreign carrier.
- The **inter-dependent solution**, where the networks at the terminating end of the call path are jointly responsible for the routing of the call. This means in practice that the number range carrier performs onward routing and that the recipient carrier pays for some or all of the additional conveyance costs. In this case only the networks that are porting numbers between each other are affected.

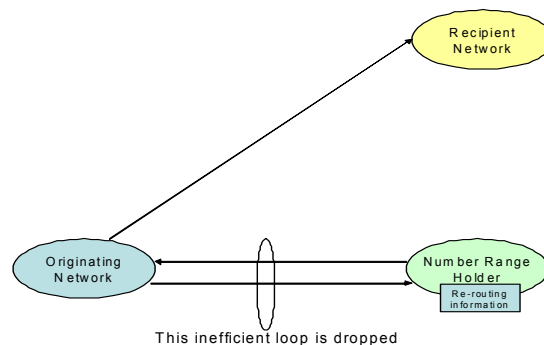


Figure 3: Call Dropback

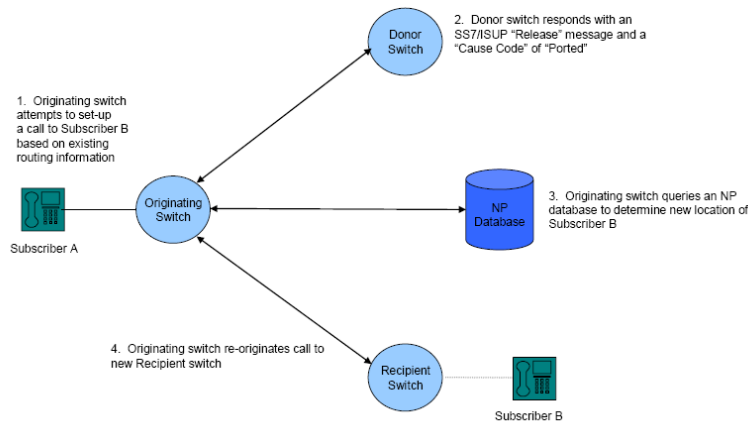


Figure 4: Query on Release

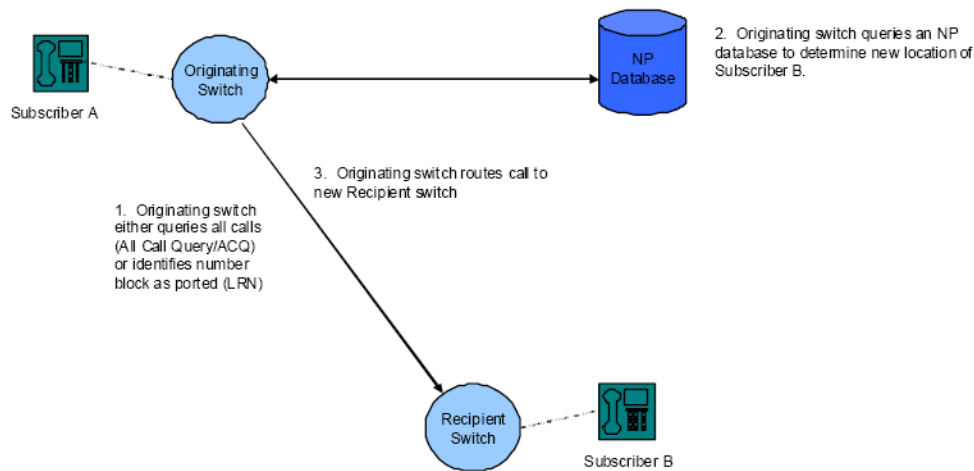


Figure 5: All Calls Query

10.2 Termination rates and tariff transparency

Tariff transparency is the ability by a calling customer to estimate the cost of the call it is making.

Tariff transparency is not normally a significant issue where the retail rates for a call offered by different carriers are the same or where the carrier of the call is clearly identifiable by the called number. This is currently the case in Bermuda.

With the introduction of LNP the identification of the carrier terminating the call is no longer obvious from the dialled number. This means that tariff transparency will be affected adversely if:

- The retail rate for calls to carriers who are part of LNP are different;
- There are significant on-net discounts applied.

Some NRAs have discussed or requested that carriers take measures such as:

- Providing a distinctive ringing tone to identify when a call is either on-net or off-net;
- Providing a free web service or voice response service where a potential caller can find which carrier services a particular number (e.g. as available in Belgium and The Channel Islands);
- Providing a warning beep during the call set-up if the called number is off-net (e.g. as used in South Africa).

The following is a table from a CEPT²² report that shows, for a number of European countries, what tariff transparency solutions have been implemented.

Country	Service indicating network to which specified number belongs (voice-based)	Service indicating network to which specified number belongs (SMS-based)	Tariff information service	Audible warning of off-net call at start of call
Austria				✓
Belgium	✓	✓		✓
Croatia				✓
Denmark			✓	
Estonia			✓ ²³	
Finland ²⁴	✓			
Hungary	✓	✓		
Iceland ²⁵				
Ireland ²⁶		✓		✓
Lithuania				✓
Malta ²⁷	✓	✓		
Norway	✓			
Portugal ²⁸	✓ ²⁹		✓ ³⁰	
Slovenia		✓		
Switzerland		✓		

Table 2: Tariff transparency – indications to consumers

The simple solution of a warning beep has tended to have been mis-understood and consumers have “turned-off” this facility where it is optional. In addition the use of web sites or voice response services appears to have a lower utilisation than was originally expected.

As mobile pricing plans mature carriers may decide to introduce on-net discounts to their customers. This is already the case in Bermuda with carriers introducing this

²² ECC Report 31, Implementation of Mobile Number Portability in CEPT Countries, Updated October 2005 (Original report March 2003)

²³ Information on operators website

²⁴ Also a www-based service

²⁵ Information on operators website

²⁶ Varies depending on the network

²⁷ Different operators use different methods

²⁸ If mobile operators have different tariff plans that might imply that a call to a ported is more expensive than before portability

²⁹ The clients can inhibit or re-activate this indication without any charge to them. This indication is provided on line at start of voice calls between mobile networks and addressed to ported numbers

³⁰ This tariff information service is provided by telephone

form of pricing. An on-net discount is where calls to mobile phones on the same network as the calling party will be charged differently from those to a mobile numbers on a different network.

An issue with on-net discounts is determining which carrier actually serves the called number since carriers may implement on-net discounts within their billing systems by applying the discount to allocated number ranges. Suppose a carrier is allocated a number block xxx, then all calls from a calling party on the same network would be charged at the on-net rate. Now consider a situation where the number being called was originally on the network of the carrier with the xxx number block but has subsequently been ported out of that network to another carrier. If the calling party, on the xxx number block holder's network, calls the number that has been ported out then the on-net discount would still apply. This is because as far as the billing system is concerned the number is still part of the on-net number block and is charged accordingly.

In this case there would not be a requirement to make changes to the billing systems of carriers and the issue of a reduction of tariff transparency would disappear. This approach could be feasible in jurisdictions where there is a low volume of ported numbers.

Owing mainly to the limited success of tariff transparency solutions mandated by other NRAs, METEC has decided not to propose to introduce any specific measures on the carriers for tariff transparency at the launch of LNP. However, it would like to see the central reference database supplier make available a web-based interface where the identification of the called carrier may be located for a known number. This publically available web-based interface should only provide information on the carrier which is currently hosting a specific number. This database should be provided in accordance with all relevant data protection and consumer protection legislation in Bermuda.

Question 10: Does the respondent agree with METECs proposed approach to tariff transparency? If the respondent does not agree then it is requested to provide its reasoning for this.

11 Consumer Focused Activities

11.1 Winback

Winback is defined as an attempt made by a donor carrier to discourage a specific customer from porting its number to another carrier. These attempts are usually made either during the course of any contact between the customer and the donor carrier to initiate the porting request or during calls to the customer made by the donor carrier after the donor carrier has become aware that the customer has requested its number to be ported.

Winback activities can take a number of forms including:

- Offering the consumer special (discriminatory) discounts to stay with the donor carrier; or
- Offering other incentives (e.g. gifts, handsets, etc.); or
- Making negative comments about the recipient carrier in order to attempt the customer to consider staying with the donor carrier.

Winback itself is widely accepted as a competitive tool. However, using winback during the porting process or for a designated period of time after a port has been completed (i.e. between 1 and 6 months) can be seen as being anti-competitive. The reason for a moratorium following the port being completed is to allow the carrier who has ported-in the customer to recover some of its costs incurred during the porting process and to ensure that administrative processes such as the billing cycle is not adversely affected by customers porting their numbers too frequently.

Winback during, or shortly after, the porting process is strictly prohibited in some countries and in other countries the activity is controlled through agreed codes of practice. Whilst some RAs regard the use of winback activities as an acceptable competitive activity most RAs consider any winback activity to be anti-competitive.

METEC considers that winback activities during the porting process are anti-competitive. In addition, METEC also considers that by not permitting carriers to partake in winback activities would provide an additional incentive for carriers to provide higher levels of service and performance to their customers.

METEC proposes to restrict the ability for the donor carrier to directly contact the customer following that customer's 'request to port'. This restriction should apply for the duration of the porting process.

Carriers should ensure that information relating to requests from customers to port numbers should not be shared between the wholesale and retail divisions of the carrier.

Question 11: Does the respondent agree with METECs proposed approach to prohibit winback activities during the porting process and for a period of 1 (one) month after the completion of the port? Does the respondent also agree that porting information should not be shared between the wholesale and retail divisions within

the donor carriers? If the respondent does not agree then it is requested to provide its reasoning for this.

In addition to restricting the donor carrier from contacting the customer during the porting process METEC proposes that customers are not able to port their number (either back to the donor carrier or to another carrier) for a period of 1 (one) month following the completion of a previous port.

The above restriction should not stop a customer from being able to return to the donor carrier following a port where the customer finds that there are specific service issues with the carrier to which the number was ported.

Question 12: Does the respondent agree with METECs proposed approach to prohibit customers porting their numbers for 1 (one) month following a previous port unless the customer has specific service issues with the carrier to which the number was ported? If the respondent does not agree then it is requested to provide its reasoning for this.

11.2 Recipient versus donor led porting

Porting can be either recipient [carrier] led or donor [carrier] led.

In the recipient led process, the customer will contact the recipient carrier (the new carrier to which the customer wishes to move) and arrange his or her new account including the request for porting its number. The recipient carrier then arranges the full porting process with the donor carrier (the carrier which the customer wishes to leave) on behalf of the customer. It is therefore generally the case that the customer does not have to contact the donor carrier at all during the porting process.

In the donor led process the customer must make contact with the donor carrier first to obtain a reference number commonly known as a Porting Authorisation Code (PAC) code and then the customer contacts the recipient carrier to arrange a new account and to supply the PAC code, which will be used by the recipient carrier for the porting activity with the donor carrier. This is often known as a two-stage process as the customer must contact the donor carrier and then the recipient carrier.

Nearly all countries use the recipient led, one-stage, porting process because:

- The customer has the benefit of a one-stop shop experience whereby they need only contact one of the carriers involved in the porting process;
- It avoids the customer having to make contact with the donor carrier, which could lead to the donor carrier exploiting opportunities for winback activities;
- It encourages the recipient carrier to make the process as quick and easy as possible and therefore increases the customer satisfaction of LNP, whereas in the case of donor led porting there is little incentive for the donor carrier to make the process quick and easy and could incentivise the carrier to make the process as difficult and unreliable as possible.

METEC proposes that LNP in Bermuda be based on a recipient led porting process.

Question 13: Does the respondent agree with METEC’s proposed approach to implement a recipient led, single stage porting process for Bermuda? If the respondent does not agree then it is requested to provide its reasoning for this.

11.3 Code of practice and consumer protection

METEC proposes that all carriers should work together to produce an industry-agreed code of practice and guidelines for the protection of consumer interests with regards to LNP. METEC expects that, once agreed, the contents of the code of practice and consumer protection guidelines will form the basis of a communications document. It is anticipated that this document would be distributed and made widely available, in many forms, to all consumers in Bermuda. Any code of practice and guidelines developed by the carriers will need to be approved by METEC.

Question 14: Does the respondent agree with METECs proposed approach on the production of a code of practice and consumer protection guidelines? If the respondent does not agree then it is requested to provide its reasoning for this.

11.4 Porting times

The porting time is usually defined as the time taken to port a number following the validation of the porting request.³¹

Across the world there is a wide variety of porting times that range from a near instant port where the porting system is fully automated (both inter- and intra-carrier) to up to 5 weeks where porting is managed manually.

The European Commission is planning to limit the porting time to one day³² but this proposal is still under discussion. Where parts of the donor carrier’s authorisation process are manual, allowing more time may provide flexibility for cost savings, for example through the use of batch processing. However, allowing a porting time in excess of two days does not provide any increase in savings to the carriers.

The table below provides a comparison of Mobile Number Portability times in different countries and also provides the annual percentage of consumers porting their numbers. These porting rates are from 2007 and have been extracted from data that have been published by the NRAs or provided from the central database operating company.

³¹ The final definition may change during the porting process definition.

³² See proposal for a Directive of the European Parliament and of the Council amending Directive 2002/22/EC on universal services and user’s rights relating to electronic communications networks, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communication sector and Regulation (EC) No 2006/2004 on consumer protection cooperation Brussels, xxx COM(2007)698: Amendments to Directive 2002/22/EC (Universal Service Directive) Article 30 Paragraph 4.

Country	Porting Times	% of numbers porting per annum
Spain	6 days	7.8%
Sweden	5 days	6.1%
Belgium	2 days	4.6%
Hong Kong	1.5 days	14%
Australia	3 hours	7.5%
Ireland	2 hours	6.5%
Malta	4 hours	3.6%

Table 3: Porting times and % of mobile numbers ported per year

In addition the following figure, taken from the EU's 14th Implementation Report, shows the variations in the time to port a mobile number.

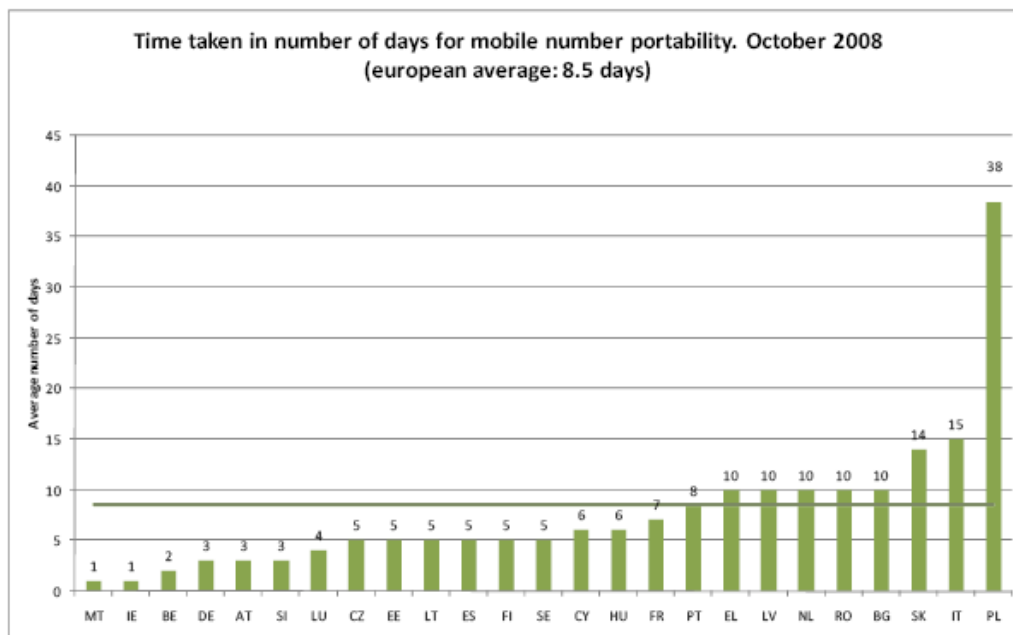


Figure 6: Time taken for porting a mobile number in Europe

Fixed number portability can differ from mobile number portability due to different operational and provision time requirements depending on the access network and the technology deployed to manage the access network. The various scenarios could include:

- A competing 'traditional' carrier or cable carrier with exchange lines to consumers' premises;
- A carrier that uses local loop unbundling to provide services to consumers;
- A carrier that uses a fixed wireless access solution to provide services to consumers; and
- A VoI carrier.

In the main the porting process for a fixed carrier is very similar to that for a mobile carrier except that:

- In the case of a carrier with exchange lines it may be necessary to allow a substantial period of time for the installation of an exchange line at the consumer's premises, i.e. number portability may be ordered up to a period of one month before the recipient carrier is ready to 'port in' the number and complete the provision of service and the fixed number portability process needs to allow flexibility over the timing of the provision of this access line plant;
- In the case of a carrier that uses local loop unbundling the process needs to be synchronised with the unbundling process.

The figure below is taken from the EU's 14th Implementation Report

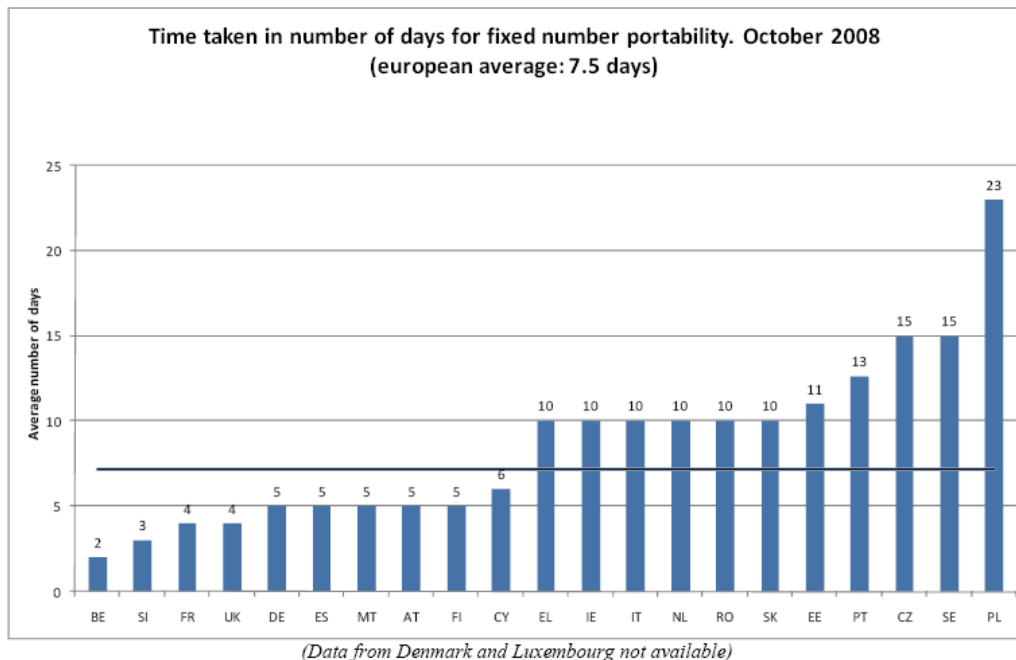


Figure 7: Time taken to port a fixed number in the EU

The time allowed for fixed number portability is not always the dominant time factor for the consumer. The following are examples of fixed number portability timings:

- In Ireland:
 - the validation of the initial porting request must be completed within one day;
 - eight further days are then allowed for the installation activity by the recipient carrier;
 - the porting activity occurs on day 9.
- In Malta:
 - the validation of the initial porting request must be completed with three days;
 - one day is allowed for the finalisation of the process;

- however, the recipient carrier may have a variable time of their choosing of up to 20 days between the validation and finalisation activities in order to allow the installation activities to take place.;
- In the UK:
 - single line porting takes a minimum of 4-5 days;
 - multi-line porting with more than ten lines takes 17 days.

The process for porting special service and premium rate services will depend on the nature of the service and the traffic levels involved. In principle, the time required for validation and finalisation activities should not differ from those for fixed numbers but some special service and premium rate service numbers may carry high traffic volumes and peaky traffic demand profiles and require additional careful planning in order to allow porting to take place.

METEC takes the view that porting should be completed as quickly as possible without it leading to a significant increase in the cost of porting. Allowing for the potential cost savings from working in batches of orders suggests an initial target porting time of not more than two days to port a mobile number.

Therefore METEC proposes that the mobile part of the LNP porting solution should not take more than 2 working days³³ at the date of implementation.

Question 15: Does the respondent agree with METEC's proposed porting time of two working days for mobile number portability at the date of implementation? If the respondent does not agree then it is requested to provide its reasoning for this.

For the porting of fixed numbers METEC proposes that, at the date of implementation of LNP, the initial validation period should not take more than 2 working days³⁴ and that the finalisation activity should not take more than one working day. A further variable time may be set by the recipient carrier to allow for the installation of the access network after the initial validation has been completed. In the case of porting to a carrier that is not dependent on an installation activity this would result in a fixed number porting time of up to 3 working days.

Question 16: Does the respondent agree with METECs proposed initial validation time of two working days for fixed number portability at the date of implementation? If the respondent does not agree then it is requested to provide its reasoning for this.

In common with other jurisdictions³⁵ METEC is of the view that there should be no overriding practical reasons why number portability for both mobile and fixed

³³ For the avoidance of doubt 2 working days means that if a customer requests a port at 1600 on a Tuesday then the port will be completed by 1600 on the Thursday of that week. In addition if a customer requests a port at 1600 on a Thursday the port will be completed by 1600 on the Monday of the following week.

³⁴ For the avoidance of doubt 2 working days means that if a customer requests a port at 1600 on a Tuesday then the validation will be completed by 1600 on the Thursday of that week. In addition if a customer requests a port at 1600 on a Thursday then the validation will be completed by 1600 on the Monday of the following week.

³⁵ See EU Telecoms Reform: the 6 Most Important Issues Still Open; European Commission, MEMO/08/551; 02/09/2008 and MEMO/07/458; 13/11/2007.

network numbers should not, in the fullness of time, be achievable within one working day. METEC therefore proposes that, no later than 2 (two) years after the implementation of LNP in Bermuda, the time for the porting process for both fixed and mobile number shall not exceed 1 (one) working day (this excludes any time required by the recipient carrier to provide access network to the customer).

Question 17: Does the respondent agree with METECs proposed porting time of 1 (one) working day for both fixed and mobile number portability 2 (two) years after the date of implementation? If the respondent does not agree then it is requested to provide its reasoning for this.

For special service numbers and premium rate services processes METEC proposes that the same limits for the validation and finalisation stages of the process be applied as in the fixed portability process but with additional allowances (based on the recipient carrier's requirements) for planning for high volume traffic where necessary (and justifiable).

11.5 Authorisation and validation

Authorisation and validation are the processes by which the person requesting the port is checked to be verified as the customer or the authorised representative of the customer to whom the number is currently allocated. If Authorisation and validation are not successful then the porting request is rejected.

Experience from other countries suggest that the validation process should not be based simply on the matching of names and addresses against the consumer records as there may be errors with these records and pre-pay mobile customer may not be registered at all.

The following validation activities have been demonstrated in Ireland and Malta to be reliable and effective as a form of check:

- Obtaining a copy of the identity papers (ID card, passport, driving licence) of the person who is requesting the port. This activity is seen to be a deterrent for fraudulent porting;
- Checking the actual possession of the number to be ported by either making a test call or (specifically in the case of mobile number portability) by sending an SMS to the number or by checking the CLI of a call or SMS from the number;
- Obtaining the account number and matching it against the account number held by the recipient carrier.

METEC proposes that the authorisation and validation process, should at the minimum, consist of the above checks. When the porting process is a recipient led process the authorisation and validation are extremely important. It is essential that, at the time of requesting a port, the recipient carrier confirms that the person requesting the port is the actual customer or a person duly authorised to request the port and that no fraudulent activity is taking place.

When the porting process is being designed and the Request for Proposal (RFP) for any central reference database is being specified, additional (or substitute equivalent) validation checks may be introduced.

Question 18: Does the respondent agree with METEC's proposed minimum requirements for the authorisation and validation process? If the respondent does not agree then it is requested to provide its reasoning for this.

11.6 Debts and handset subsidies

An issue of concern for carriers when implementing number portability is that of bad debt (for both fixed and mobile number portability) and handset subsidies (for mobile number portability). Handset subsidies result in carriers implementing minimum duration contracts with a penalty for the early termination of the contract.

In the mobile market it is normal that when a post-pay mobile customer leaves a carrier it may have to pay-off both the outstanding bill for calls and rental as well as a payment for early contract termination. This also occurs when a customer changes network without number portability. It is the view of some carriers that the donor carrier should be afforded the added leverage of refusing to port the number to help to ensure that the final bill is paid by the consumer. To require a post-pay customer to pay off their final bill before allowing them to port the number is not easily compatible with a quick and simple porting process for the customer as the payment may take several days to clear and in addition there might be a delay of several days (or weeks if the customer has recently been roaming) before all the billing information is available for the carrier to produce the final bill.

There are at least three different positions on the outstanding debt issue. These apply both to fixed and mobile networks:

- The donor carrier is not allowed to refuse porting for any payment related reasons;
- The donor carrier is not allowed to refuse porting if the customer is not overdue in paying any of its bills; and
- The donor carrier may require final payment or a credit card authorisation for payment before the number is released for porting.

METEC considers that the issue discussed in this section is a general commercial concern and that LNP should not be used as a method of addressing debts and customers in arrear with their payments. These should be dealt with in the same commercial manner as any other debt and arrears are managed. Therefore, METEC considers that a carrier should not refuse a port because of debt or arrears.

In the UK, specifically relating to Mobile Number Portability, the donor carrier "...may take whatever steps are necessary (including barring continued use of service) to manage bad debt prior to the [number] being ported. Such bad debt shall

not allow the [donor carrier] to refuse to issue a [porting code] or fail to meet their obligations...³⁶.

Question 19: Does the respondent agree with METEC's proposed approach to handling bad debt in relation to number portability? If the respondent does not agree then it is requested to provide its reasoning for this.

11.7 Reasons to refuse a port request

In order to avoid disputes between consumers and carriers as well as disputes between carriers, the reasons to refuse a port should be clearly defined as well as documented in any agreed regulation for LNP.

METEC proposes that there are really only three acceptable reasons for a carrier to refuse a request to port a number. These can be described as:

- the request to port contains errors;
- the information required to port a number is missing from the request to port; and
- the authorisation information is incorrect, e.g. the account number and number to be ported do not match.

METEC may consider other reasons on their merits in the course of both this consultation as well as during the inter-customer working groups for the development of the inter-customer porting process. Any further acceptable reasons will be included in the final regulations for LNP.

Question 20: Does the respondent agree with METEC's proposed approach to reasons to refuse a port request? If the respondent does not agree then it is requested to provide its reasoning for this.

11.8 Statistics collection and publication

METEC will require information on the performance of the carriers in meeting the requirements for LNP. The specified period for reporting should be monthly so that METEC has good oversight, especially during the early stages following the introduction of LNP. This reporting period can be increased at a later date if everything is performing well. It is envisaged that the administration facilities of the central reference database will be able to collect the statistical data independent of the carriers and to report this information directly to METEC.

METEC proposes that the following list of parameters should be reported upon every month and that this information is supplied for each carrier separately.

- Number of ports requested;
- Number of ports accepted;
- Number of ports rejected;

³⁶ Mobile Number Portability Porting Process Manual, Operator Steering Group, February 2009, http://www.ofcom.org.uk/telecoms/ioi/numbers/num_port_info/mob_num_portab/mnp.pdf

- Number of successful ports within the required timeframe;
- Number of successful ports outside the required timeframe;
- Number of ports not followed through by the recipient carrier;
- Donor carrier response times at each stage of the process;
- The top reason(s) for the refusal of a port request.

Depending on the functionality of the central reference database it would be acceptable that these reporting statistics are collected and published by the party who operates the central reference database.

Question 21: Does the respondent agree with METECs proposed requirements on the reporting of number portability activities? If the respondent does not agree then it is requested to provide its reasoning for this.

11.9 Lessons from other countries

Number portability has been implemented in many countries with a wide range of different results. In some countries number portability has been seen as being successful and for MNP between 5% to 10% of customers have ported their number per year, see previous tables. In other countries the level of porting has been lower.

The following points summarise the main lessons learned from other countries:

- Customers need to be made aware of the availability of number portability and what it means to them;
- The porting process needs to be well defined with clear documentation and fits easily within the carriers existing retail systems;
- The preparation of the specifications can be accelerated and improved if expertise is used and lessons learned from other implementations of number portability;
- The customer processes and procedures should be led by the recipient carrier and the customer should not have to contact their existing carrier (the donor carrier). This is because the donor carrier has no incentive to make the porting out of its customer easy or efficient and because, by its nature, the customer contacting the donor carrier provides an opportunity for the donor carrier to enter into winback activities;
- The donor carrier should not be allowed to charge the customer for porting its number as such charges act as a strong barrier to porting and some donor carriers in other jurisdictions have used excessive charges as a deterrent;
- Porting times of up to 5 (working) days do not deter customers from porting provided that the customers can use any new handset immediately;
- Allowing porting times greater than 2 working days for MNP may not result in reduced porting costs;
- Carriers may express concerns about the danger of increased bad debts if customer can port their number before paying their final bill. However, paying off the final bill and closing the account before leaving a carrier causes a reduction in the speed of the process and this process would require that the customer contacts the donor carrier and therefore increases the possibility of the donor carrier instigating winback activities. Concerns about the increase

in bad debt due to the introduction of number portability are often exaggerated;

- Carrier concern over fraudulent portings is often exaggerated. A check to confirm possession of the number and taking a copy of the identity check of the person requesting the port is normally an effective deterrent to any fraud activity;
- The porting process should not include checks on the exact name and address of the customer as often the information held by the donor carrier may be inaccurate, out of date, or recorded in a different format (i.e. Alan Smith instead of A. B. Smith, use of an house name instead of a house number);
- The porting process should be tested thoroughly before launch in order to avoid any problems that could occur following launch. Weaknesses or failures of the porting process following launch can cause adverse public reactions and a reduction in the number of customers who wish to port their numbers;
- The NRA should require regular reporting on the porting volumes and the percentage of ports that are achieved within the designated timeframe and without any problems, in order to identify and resolve the main causes of any inter or intra-carrier problems.

METEC considers that it has taken full account of these lessons learned in preparing the proposed implementation plan.

12 Implementation plan

The basic obligation to provide LNP can be expressed in two quite different ways:

- As a consumer right, as defined in European Union; or
- As a measure to increase competition, this was the approach originally taken in the UK by Oftel.

METEC considers LNP to be a consumer right that will also support the enhancement of competition in the Bermuda market.

METEC therefore proposes to implement a policy of requiring all carriers to both port-in and port-out numbers and to do so from a given date, which is 7th June 2010. Subject to the result of this consultation it is proposed that this date does not apply to VoI service providers.

In addition, METEC considers that mobile, fixed special number/premium number portability can be introduced at the same time and implementation activities should commence as soon as possible.

Question 22: Does the respondent agree with METECs statement that LNP should be implemented as a consumer benefit? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 23: Does the respondent agree with METECs proposed launch date for LNP in Bermuda? If the respondent does not agree then it is requested to provide its reasoning for this.

13 Management structure and industry working groups

METEC proposes to manage the LNP implementation programme in conjunction with the carriers through a continuation of the existing inter-carrier working group for LNP. Under this group individual working groups may be formed to prepare each of the specifications.

METEC proposes therefore that at least four sub-working groups are formed. These working groups will focus their activities as follows:

- A mobile number porting sub-group will be tasked to produce the mobile number porting process;
- A fixed number porting sub-group will be tasked to produce the fixed number porting process;
- A routing and porting charge sub-group will be tasked to prepare the routing and porting charge specifications; and
- A central reference database sub-group will be tasked to prepare the requirement Request for Proposal (RFP) for the database and manage the procurement process through to completion of the contract.

It is standard practice for sub-groups to have formal terms of reference. These will be produced and agreed at the start-up of each of the sub-groups.

In addition, METEC proposes to implement a Steering Group which will sit above the working groups. The Steering Group will be chaired by the Director of METEC and will provide the point of escalation for any issues that cannot be resolved at the working group level. The Steering Group will also convene at specific points in the implementation plan to receive progress reports from the working groups and to sign off stages of the implementation delivery.

Question 24: Does the respondent agree with METECs proposed structure of working groups and a steering group? If the respondent does not agree then it is requested to provide its reasoning for this.

As previously mentioned, experience in other countries has shown that the work of the sub-groups can be accelerated and improved if a person with experience of implementing number portability is used to propose initial drafts and to lead the discussion between the carriers and to assist in the production of the documented outputs of the sub-groups.

METEC expects to provide an expert to support (or lead) these sub-groups (at least in the initial stages) and act as document editor, utilising where possible, existing number portability specifications and process from other jurisdictions.

Question 25: Does the respondent agree with METECs proposed approach of using a person with previous experience of launching number portability to be available to support or lead working group activities? If the respondent does not agree then it is requested to provide its reasoning for this.

The maximum elapsed time needed should be between 3 and 4 months for each of the process specification but the processes can be worked on in parallel. Experience shows that the carriers need time to consider any draft documents and to submit detailed comments. Therefore it would be difficult to reduce the time below 3 months. Attendance at the sub-groups should be limited to people with the required expertise to carry out the work. Large working groups sometimes means that the work becomes difficult to conduct and therefore effective representation by the carriers is important.

During the sub-group meetings it may not be possible to reach consensus on some issues. As mentioned in the previous section METEC therefore proposes to set-up a steering group to which the issues can be raised. The steering group will consider the various arguments so that it can propose a solution where there is no consensus.

METEC will primarily take account of user and consumer interests and aim to ensure that number portability is implemented in an effective, secure and user-friendly manner.

14 Specification of the inter-carrier process

The main issues to be addressed in the process sub-groups and included in the process specifications are:

- Overview of the process;
- Account classification;
- Porting hours, batch processing and batch size limitations;
- Customer handling and order validation;
- Special cases;
- Requirements of the recipient carrier when taking an order to port a number;
- Checks performed by the administration function of the central reference database;
- Actions by the donor carrier on receiving a request to port a number;
- Activation activities to be carried out by the recipient carrier;
- Activities to be carried out by the donor carrier in closing the old account;
- Updating of the central reference database and ensuring that at all times the contents of the database is 100% accurate;
- Subsequent porting requirements and restrictions;
- Porting back of the number to the block carrier;
- Portings where neither the recipient carrier nor the donor carrier is the block carrier;
- Database logs and the reporting of late responses by carriers;
- Termination of service;
- Clarification of cooling-off periods and win-back activities;
- Data cleansing and resolution of data issues;
- Request to port form;
- List of the porting messages and their format.

The routing and charging specifications

The main issues to be addressed in the routing and charging sub-group and included in the specification are:

- Number portability prefixes;
- Routing of circuit switched calls;
- Routing of Short Messaging System (SMS) messages;
- Routing of Multimedia Message Service (MMS) messages;
- Routing of other signalling messages;
- Subsequent porting of numbers;
- Pending messages;
- Retail call charging;
- Interconnection call related charging;
- Interconnection SMS related charging;
- Interconnection MMS related charging.

Specification of the central reference database

METEC proposes that the central reference database is procured as a service that will be run by the database supplier and provided to the carriers. The main issues to be addressed in the database sub-group and included in the resultant specification include:

- The service requirements (by reference to the porting process specifications);
- Interfacing with the carriers;
- Structure of the data records;
- Dimension and scalability of the database;
- Availability and quality of service (QoS) parameters;
- Disaster recovery;
- Implementation schedule;
- Provision of information to law enforcement agencies;
- Compliance with data protection requirements;
- Reporting of statistics;
- Logging of activities and archiving of data;
- Availability of a test platform;
- Availability of a training platform;
- Placing of the software into an ESCROW account;
- Provision of training (user and super-user per carrier);
- Documentation;
- Conditions of delivery of database;
- Price;
- Penalties;
- References of existing customers;
- Support and consultancy services;
- Format of the quotation.

Database procurement

When the database specification has been completed METEC proposes to prepare and issue a Request for Proposal (RFP) and undertake a formal procurement process.

The process will be undertaken in conjunction with the carriers. The procurement process is expected to take 4 months to complete including the preparation of the RFP and the contract terms agreement.

Annex A – Summary of Consultation Questions

Question 1: Does the respondent agree that LNP should include VoI based services? Does the respondent also agree that VoI service providers should have the choice as to whether they provide LNP to their customers? If the respondent does not agree then please provide justification.

Question 2: Does the respondent agree that number portability within each tariff band for special services and premium rated numbers should be implemented in conjunction with fixed and mobile number portability? If the respondent does not agree then please provide justification.

Question 3: Does the respondent agree with the six economic principles for the recovery of LNP costs? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 4: Does the respondent agree with METEC's proposal that each carrier should bear its own set-up costs? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 5: Does the respondent agree with METEC's proposal that all carriers should pay an equal share of the set-up costs related to the purchase and implementation of the central reference database. If the respondent does not agree then it is requested to provide its reasoning for this.

Question 6: Does the respondent agree with METEC proposal to set a ceiling based on benchmarked information for the porting transaction charge? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 7: Does the respondent agree with METEC's proposal to set the LNP port price ceiling no later than three months prior to the launch date? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 8: Does the respondent agree that it is preferable that the originating carrier should bear the additional conveyance costs? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 9: Does the respondent agree that LNP has no effect on the current Bermuda National Numbering Plan? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 10: Does the respondent agree with METECs proposed approach to tariff transparency? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 11: Does the respondent agree with METECs proposed approach to prohibit winback activities during the porting process and for a period of 1 (one) month after the completion of the port? Does the respondent also agree that porting information should not be shared between the wholesale and retail divisions within the donor carriers? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 12: Does the respondent agree with METECs proposed approach to prohibit customers porting their numbers for 1 (one) month following a previous port unless the customer has specific service issues with the carrier to which the number was ported? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 13: Does the respondent agree with METEC's proposed approach to implement a recipient led, single stage porting process for Bermuda? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 14: Does the respondent agree with METECs proposed approach on the production of a code of practice and consumer protection guidelines? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 15: Does the respondent agree with METEC's proposed porting time of two working days for mobile number portability at the date of implementation? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 16: Does the respondent agree with METECs proposed initial validation time of two working days for fixed number portability at the date of implementation? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 17: Does the respondent agree with METECs proposed porting time of 1 (one) working day for both fixed and mobile number portability 2 (two) years after the date of implementation? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 18: Does the respondent agree with METEC's proposed minimum requirements for the authorisation and validation process? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 19: Does the respondent agree with METEC's proposed approach to handling bad debt in relation to number portability? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 20: Does the respondent agree with METECs proposed approach to reasons to refuse a port request? If the respondent does not agree then it is requested to provide its reasoning for this.

Question 21: Does the respondent agree with METECs proposed requirements on the reporting of number portability activities? If the respondent does not agree then it is requested to provide its reasoning for this.

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