Number Portability for The Bahamas

Consultation Document

ECS 8/2011

Issue Date: 15 April 2011

Response Date: 10 June 2011

Contents

1. Introduction

Number portability is defined as: "*a facility whereby subscribers who so request can subject to the numbering plan retain their telephone number on a public network, independently of the licensee providing the service at the network termination point of a subscriber*".[1]

The introduction of competition in the electronic communications sector is accompanied by the ability of users of electronic communications services to access new and/or existing services or to change the operator from whom they obtain services, which is intended to result in operators providing more and better services at cost reflective prices as they compete to attract customers. The Utilities Regulation and Competition Authority ("URCA") recognises that the need to change telephone numbers when changing provider, location or service (and losing the identification and any goodwill invested in their existing number) presents a potential inconvenience and barrier to enabling persons to take advantage of the benefits of growing competition in electronic communication services. Those issues may be addressed by the introduction of number portability.

Number portability is expected to deliver the following benefits (discussed in greater detail below):

- eliminates the cost and inconvenience of informing others of a number change;
- eliminates the need for callers to consult directory enquiries and/or change entries in their address books;
- lowers the cost of switching operator or service provider;
- results in more efficient allocation of limited numbering resources; and,
- results in a more level competitive environment with lowered barriers to entry and competition.

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[1]See section 2 of the Communications Act 2009 ("the Comms Act").

Prior to revising the framework for regulation of the electronic communications sector the Government (through the BTC privatisation committee) conducted a consultation with public and industry stakeholders to inform the formulation of the Electronic Communications Sector Policy for The Bahamas (the "ECS Policy"). Feedback from that consultation, as well as more recent surveys conducted by URCA, present evidence that there is significant sector and public desire for number portability to be implemented in The Bahamas at an early stage of competition and that the introduction of number portability would be a significant enabler of effective competition in The Bahamas.

1.1   Objective of this Consultation

URCA must ensure that number portability is introduced in The Bahamas at the appropriate time in relation to the development of competition and that the implementation of number portability is achieved in a manner which ensures the maximum benefit to The Bahamas, having regard to the objectives of the Comms Act and the ECS Policy.

The purpose of this consultation is to present proposals and seek views from stakeholders on a framework for the implementation of number portability. URCA's research of and deliberations on the various issues relating to the implementation of number portability reveal that while there are a number of issues which URCA can determine through the consultation process, there are also a number of matters which will require a considerably more in-depth collaboration with the industry and the general public to determine appropriate measures to be taken.

URCA is required by the provisions of the Comms Act to make a determination on number portability. This document outlines URCA's deliberations and makes proposals on matters relating to number portability. However, some issues have been proposed for consideration by a working group which is to be established as an outcome of this consultation (the "Number Portability Working Group" or "NPWG", see Section 5 below). URCA will, in accordance with the requirements for making determinations, conduct a further consultation, bringing together all the relevant aspects of number portability after that working group has had an opportunity to

deliberate and make detailed recommendations to URCA on the issues referred to it, and will thereafter make its determination on number portability as required by the Comms Act.

1.2 Structure of the Document

This document contains the following sections:

Section 1: introduction and information on how to participate in the consultation process;

Section 2: legal basis for URCA's consultation on number portability and a discussion and proposals for each type of number portability;

Section 3: detailed deliberations and proposals on the implementation of service provider number portability;

Section 4: discussion of the cost allocation and recovery principles and considerations relevant to service provider number portability;

Section 5: proposals for the establishment of a working group to consider in further detail and direct the implementation of service provider number portability.

1.3 How to Respond

URCA hereby invites and welcomes comments and submissions from members of the public, licensees and other interested parties on the matters contained in this Consultation document.

Persons may deliver their written submissions or comments on this Consultation Document to the Director of Policy and Regulation of URCA either:

- by hand, to URCA's office at UBS Annex Building, East Bay Street, Nassau, Bahamas;
- by mail to P.O. Box N-4860, Nassau, Bahamas; or
- by fax, to 242 393 0237; or

- by email, to info@urcabahamas.bs

All submissions to this consultation should be submitted by 5pm on 10 June 2011.

After the consultation closes, all responses will be published online on the URCA website, with the exception of any responses that are clearly marked (in full or part) as being private and confidential. Explanations should be provided to justify any information that is submitted on a confidential basis, but URCA shall have the sole discretion to determine whether to publish any contribution. URCA will carefully consider all submissions received, and publish the Statement of Results of this Consultation, which will be taken into account in further processes as set out herein.

2.   Implementation of Number Portability in The Bahamas

2.1   Legal Framework

The Communications Act, 2009 ("Comms Act") establishes the law applicable to the Electronic Communications Sector, empowers URCA as the independent regulator of that sector, and charges URCA with responsibility for implementing the ECS Policy and enforcing the provisions of the Comms Act.

Numbering and number portability are addressed in sections 79 and 80 of the Comms Act. In relation to numbering, section 79 requires efficient use of numbers and requires that number portability be taken into account in numbering by providing as follows:

(1) *URCA shall publish a numbering plan for carriage services and may make rules pursuant to that plan for the allocation of numbers to licensees and the use and assignment of those numbers to licensees.*

(2) *In preparing the numbering plan referred to in subsection (1), URCA shall – …*

(c) *promote the efficient use of numbering, taking into account if technically feasible the need to ensure that number allocation is made on a non-discriminatory basis geographically amongst different islands in The Bahamas and within the islands;*

(d) *ensure that any numbering plan takes account of number portability to the extent it is implemented under section 80. …*

Section 80 makes the following specific provisions in respect of number portability:

(1)   *URCA shall issue a consultation and make a determination on number portability.*

(2)   *Licensees shall provide, to the extent technically feasible, operator to operator number portability when required to do so in accordance with the requirements prescribed by URCA so that subscribers who have been allocated a telephone number or telephone numbers may retain that number or those numbers when switching to the carriage services of an alternative licensee, provided that –*

(a) *the subscriber does not request that the carriage service is cancelled or suspended between switching suppliers; and*

(b) *using the telephone number for the carriage service provided by the new carriage service provider would not violate the numbering application provisions of the numbering plan.*

URCA is also mindful of the requirements of section 5 of the Comms Act and its responsibility to introduce regulatory measures that are efficient and proportionate to their purpose and to introduce such measures in manner that is transparent, fair and non-discriminatory. The legislation clearly envisages that number portability will be introduced where and when appropriate based on URCA's considerations and directs URCA to consult on the issue and make appropriate determinations.

The Comms Act specifically provides for URCA to consult and make a determination on service provider number portability. However, under its general power to regulate the sector, URCA may also consult on and implement other forms of portability to meet the objectives of section 4 of the Comms Act.

In its second round responses to the Draft BTC RAIO consultation[2], BTC suggested that URCA should undertake a market review prior to determining whether number portability is an appropriate remedy for the access market, and advised that any deliberation on number portability must consider the costs and benefits of implementing the service, and how the costs of number portability should be shared between operators and between operators and their customers.

URCA considers that a market review is not necessary to the consultation on number portability. Number portability is not an SMP based remedy but a regulatory measure that would be applicable to all operators including non-SMP based licensees. URCA intends in its deliberations

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[2]BTC Comments on Submissions received by URCA to BTC's Draft RAIO Public Consultation – November 10, 2010.

and any determination to have regard to the costs and implications of implementing number portability in The Bahamas, and to ensure that the measures introduced are proportionate to the benefits. However, URCA does not consider that such regard requires that URCA conduct a formal cost/benefit analysis of implementing number portability.

URCA recognizes that the cost recovery process for portability has significant implications for the level and structure of charges associated with implementing and operating the service. This in turn will have significant implications for customers and the market structure for the country's electronic communications industry. In Section 4 below URCA sets out its proposals on cost recovery for service provider number portability.

2.2   Types of Number Portability

Based on the system of allocation and assignment of numbers, there are three basic types of number portability:

- service provider number portability;
- location portability; and,
- service portability.

2.3   Service Provider Number Portability

Service provider number portability enables users of electronic communications services (particularly their voice, or telephone, service provider) to change their service provider and retain their telephone number. In order to ensure clarity, URCA restricts discussions to portability of a single element only, and therefore service provider number portability is limited to users changing between providers *within the same service type and location*, for example from one fixed provider to another fixed provider at the same location. URCA believes that service provider number portability is likely to have the most significant impact on competition, as it is the only form that is an enabler of competition between different providers.

Considerations

A competitive electronic communications sector should offer customers an environment where the available choice of service providers results in lower prices, improved service offerings, and enhancements to the customer service experience. This is because in order to attract customers, operators must strive to gain competitive advantage, which usually takes the form of better prices and/or service quality than customers' existing provider. Similarly, current service providers must improve their service offerings to the public.

A significant barrier to changing service provider (for example, to take advantage of the lower prices or better service offered by a competitive provider) is the need for customers to change their telephone number when changing provider. Over time, an individual's identity becomes intricately linked with his or her telephone number, while a business builds up goodwill in a telephone number through the marketing activities performed by the business using that number. Therefore, the need to change of number creates a significant inconvenience and expense for the customer, and, particularly, in the case of businesses where business cards, letterhead, company advertisements, etc have to be updated. In addition, businesses often have "vanity numbers", which are designed to be associated with that business by selection of numbers that are easy to remember or are the letter equivalent related to the business or trade name. In a market without number portability, an operator seeking to convince a customer to change provider must provide an offering which is not only better than the existing provider's offering but the benefits of which justify these challenges for the customer. Service provider number portability helps to eliminate this issue by enabling the customer to keep his or her number when changing provider thereby improving the ability of customers to take advantage of competition, and directly promoting competition between service providers. It levels the playing field amongst competitors as a service provider is not conferred an advantage simply by being the customer's existing service provider.

URCA conducted a high-level survey on number portability to ascertain, *inter alia*, the extent to which service provider number portability is desired by subscribers, and the likelihood that it would significantly impact the competitiveness of the relevant markets in The Bahamas. A copy of the questionnaire used for the survey is at Appendix B. While some of the questions asked were not relevant to this consultation and would be used as appropriate by URCA in other

regulatory processes, URCA received a total of 645 valid responses to the survey and the key relevant outputs were as follows:

- 49% of respondents with fixed services, and 67% of respondents with mobile services, indicated an interest in changing their existing service provider if a choice was available.
- 69% of respondents indicated that they would be more likely to switch providers if they could access service provider number portability, while 52% indicated their willingness to pay an additional charge for number portability.

The survey results tend to support the position that, in The Bahamas, service provider number portability would be a significant enabler of effective competition.

An additional benefit is that customers who can keep their existing number when changing provider do not need to be assigned a new number. There is therefore a reduction in the need for new numbers, and corresponding improved efficiency in the usage of numbers, which are a finite resource.

The elimination of the need to change numbers when changing providers also reduces the incidence of incorrect numbers dialled due to someone being unaware of the change of number, or by incorrect notifications. This may reduce excess network usage and have a positive effect on efficiency.

In summary, service provider number portability:

- removes a significant obstacle to customers wishing to change service provider;
- improves network efficiency and customer satisfaction by reducing the number of incorrectly dialled numbers;
- enhances the beneficial effect of competition by encouraging service providers to attract and/or retain customers through innovation, improved quality of service and reduced prices;
- motivates the current provider to increase the efficiency of their networks, lower the cost of service, and provide a greater variety of products and services; and,
- leads to more efficient use of numbering resources.

URCA notes that the mobile market remains a monopoly, and that there is currently an expectation that competition will be introduced no earlier than three years in the future. On the basis of the experience with fixed telecommunications it is desirable to have portability in the mobile market at the time that competition is introduced. URCA notes that discussions which inform the implementation of portability in the mobile market should, as far as practicable, involve the operators who provide or will provide services in that market, and therefore, URCA considers that it would be appropriate to conduct further deliberations and a consultation in parallel with the processes which will introduce competition for mobile services, which process should include prospective new mobile providers. However, URCA is also mindful that such discussions should not be permitted to delay mobile number portability and therefore the current process should be conducted in a manner which would facilitate the introduction of mobile number portability upon the introduction of competition in that sector.

Proposals

URCA proposes to implement service provider number portability for fixed communications services as soon as economically and technically feasible and, subject to further consultation with interested parties, for mobile communications services in time for the introduction of competition in that market segment.

URCA's proposals are consistent with the Government's proposal based on the BTC Privatisation Committee consultation in March 2009, which stated, *"The Government is pleased that there is broad acceptance for the implementation of number portability. URCA will be holding a separate consultation and operator workshops on number portability which will address the issues raised by the stakeholders in the Framework Consultation. The Government will introduce number portability for fixed line communications as a matter of priority. Number portability will also be introduced for mobile communications in time for the arrival of competition in the sector. Implementation will take into consideration any numbering issues."[3]*

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[3]A paper on the responses received on the Consultation Paper on the Issues and Options for Regulatory Framework of the Communications Sector in The Commonwealth of The Bahamas, 19 March 2009, at paragraph 57.

2.4   Location Portability

This facility enables a subscriber to retain the same (fixed) telephone number when moving from one physical location within The Bahamas to another, without changing service provider.

Due to the pervasiveness of the domestic fixed network operated by the Bahamas Telecommunications Company Limited (BTC) much of the discussion on location portability is related to the network configuration currently operated by BTC. URCA is mindful that other fixed operators may implement different network configurations, with implications for location portability not considered here, though it is expected that new operators would design their network to implement location portability at least to the extent provided by BTC.

Based on the current framework for assignment of numbers in The Bahamas, there are three possible options for location portability of fixed numbers, which are discussed below:

Portability within the local exchange area
On the BTC network, a local exchange area is delineated by a single local telephone exchange, with one or more switching units, which are directly connected to subscribers. Providing number portability whereby subscribers can change their location within the local exchange area without changing their number poses no significant technical or billing issues.

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Local Call Area

The BTC network combines local exchange areas situated on a single island into a local call area ("LCA") or Rate Centre, and applies a single uniform rate (namely, the local call charge) to all calls that both originate and terminate within that area.

URCA's information indicates that number portability within an LCA is feasible both technically and from a pricing perspective.

Between Local Call Areas

Charging for calls between LCAs is toll based, depending on the origin and destination locations. It is therefore desirable that when placing a call a subscriber is able to determine the location of the person being called, in order to determine the rate that would be applicable to the call. This is traditionally achieved through assignment of particular central office codes ("CO Codes") to each LCA, so that the LCA can be identified by the number's CO Code.

Portability between different LCAs will result in numbers having CO Codes which do not correspond to the location of the subscriber, which, unless addressed, would in some cases result in persons unknowingly making long distance calls. URCA considers that this would not be acceptable. Accordingly, URCA intends to direct that portability between different LCAs can only be implemented by an operator who ensures that callers can identify the cost of calls made to a ported number.

Proposals

URCA is of the view that there is currently no barrier to location portability on the BTC network up to and including portability within a single LCA, and that while there may be challenges to implementation of location portability on a national level, these can be addressed by operators on an individual basis. It is noted that changes to the configuration of networks in The Bahamas can affect the proposals made here, however, operators should be mindful of the benefits of number portability and should factor this in to future network changes.

URCA proposes to mandate the implementation of portability at that level, for all operators. URCA also encourages location portability at the National level but believes that this should be at the discretion of the relevant operator. In the event that a particular operator seeks to

implement location portability, it may do so only where a uniform charging rate is applicable to all calls within The Bahamas, or where the operator is able to satisfy URCA that a suitable method has been implemented to ensure that subscribers are able to identify the cost of all calls being made.

Question #2

Do you agree that location portability should be mandated at the Local Charging Area level? If you disagree, please provide reasons.

Question #3

Do you agree with URCA's proposal that number portability at the National level should be left to the discretion of the Operator and subject only to the Operator's ability to satisfy URCA that the user will be able to identify the charges for calls to ported numbers? If you disagree, please provide reasons.

2.5   Service Portability

This facility allows a subscriber to retain his telephone number without impairment of quality, reliability or convenience when changing from one type of service to another, but without changing service provider, the most significant example being between fixed and mobile services. For example, service portability would enable a subscriber to replace his or her existing landline telephone number with a mobile service having the same number.

This "absolute number portability" as it was referred to in the BTC Privatisation Consultation document[4], poses a number of significant challenges, and while it may offer convenience to

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[4]A Consultation Paper on the Issues and Options for Reform of the Regulatory Framework for the Communications Sector in The Commonwealth of The Bahamas, 5 December 2008

customers in certain very specific circumstances, URCA does not perceive it to offer any or any significant benefits to competition or to customers.

The most significant argument against implementation of service portability is the need for customers to have clarity regarding charges between fixed and mobile networks. This was recognized by the Government in its proposals coming out of the BTC Privatisation Consultation in which the Government stated *"… absolute number portability … would interfere with numbering plans which seek to assign certain numbers to certain types of services or to a certain geographic location."*[5] URCA endorses this sentiment and, although URCA considers there to be benefits to customers which would justify adopting a different approach in relation to geographic portability, URCA notes in respect of portability between fixed and mobile communications:

1. The 'receiving party pays' charging regime for mobile calling means that there is a need for mobile users to be able to identify when received calls are from fixed lines. Unlike the pricing issues that arise in relation to location portability (discussed in Section 2.5 above) this issue cannot be addressed by any means other than ensuring that fixed numbers are readily identifiable.

2. There is no evidence to suggest (particularly having regard to the high price differential between them) that mobile and fixed telephones are substitutes for each other. Therefore it is expected that customer demand for portability between them will be limited to exceptional circumstances. This is also a further reason why it is desirable to be able to distinguish between calls received from mobile and fixed numbers.

3. At this time, there is no competition-related incentive to implement service portability that might offset the challenges identified.

On the basis of the above considerations, URCA does not consider that there is currently sufficient justification or demand for service portability in The Bahamas. URCA's research has

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[5]A Consultation Paper on the Issues and Options for Reform of the Regulatory Framework for the Communications Sector in The Commonwealth of The Bahamas, 5 December 2008, at page 10

not disclosed any jurisdiction where service portability between discrete electronic communications services has been successfully implemented. It is noteworthy, however, that in several countries there are services available that span both fixed and mobile; the increasing possibility of substitution between fixed and mobile services may result in reconsideration of the implementation of service portability in the future.

Proposal

URCA will not consider the implementation of service portability at this time, and proposes to prohibit the porting of numbers between fixed and mobile communications services. URCA proposes to keep developments in the sector under review and will determine if and when it would be appropriate to reconsider this position.

Question #4

Do you agree with URCA's proposal not to introduce the porting of numbers between fixed and mobile communications services at this time? If you disagree, please provide reasons.

In summary, URCA proposes that:

1. Service provider number portability for fixed communications be implemented across all fixed networks as soon as economically and technically feasible.

2. Service provider number portability for mobile communications be implemented in time for the introduction of competition in that market, subject to further consultation with interested parties.

3. Location portability within the Local Call Area be mandated by URCA for implementation when practicable.

4. Operators be permitted to implement location portability on a National level at their discretion, provided that before implementing National location portability the operator must satisfy URCA that the user will always be able to determine the applicable charge for calls made to ported numbers.

5. Service portability not be permitted in The Bahamas at this time.

3. Framework for Service Provider Number Portability

'Porting' is the act of transferring a number to a new service, location, or service provider.

Where porting is occurring with no change of service provider (as in location and service portability) the process is based solely on the service provider having in place internal systems to enable porting. Service provider number portability, however, requires additional systems to coordinate the necessary administrative and technical changes between the subscriber's original service provider and his/her new service provider (known as inter-operator procedures). This Section of this consultation document therefore explores and seeks views on the specific matters that are required to be determined by URCA in implementing service provider number portability.

3.1 Methods of Implementation

There are a number of technical methods that can be implemented for the querying and routing of calls made to ported numbers. The most common are:

- Onward Routing

- Call Forwarding

- Query on Release

- Call Drop Back

- All Call Query.

The detailed description of each method is included below, however the alternative methods for call routing can first be divided into broad classes based on simple characteristics.

- Firstly, they are either direct or indirect:

o In indirect methods, calls to ported numbers are first sent to the network on which the number was originally resident, and must then be re-routed to the network which the number has been ported to.

o In direct methods, the current location of a ported number is determined before the call is routed, thereby enabling the direct routing of the call to the network on which the number is currently located.

- The methods can also be divided into bilateral and centralised approaches:

o In the bilateral methods, the administration of ported numbers is the responsibility of the service providers, each of whom maintains its own database of ported numbers and routing information. The information is shared among the databases.

o In centralized number portability methods, the administration of the database of ported numbers is done by a single party, with service providers themselves responsible only for the routing of the calls (unless one of the operators also manages the centralized database).

- Finally, solutions are either "on switch" or "off switch":

o In "on switch" solutions, each switch is linked to a separate, decentralised database which assigns the access carrier codes to telephone numbers within the catchment area of the switch.

o "Off switch" means that the databases with routing information are separated from the switches (that is, there are central databases which can be accessed by multiple switches).

The classification of each method using the following criteria is set out in Table 1 below.

Table 1 – Classification of Routing Methods

Method	Routing	Database Administration	Database Location
Onward Routing	Indirect	Bilateral	On Switch
Call Forwarding	Indirect	Bilateral	On Switch
Query on Release	Indirect	Centralised	Off Switch
Call Drop Back	Indirect	Centralised	On Switch
All Call Query	Direct	Centralised	Off Switch

Onward Routing (also known as Tromboning)

Onward Routing is an indirect, bilateral, on switch approach with the following call progression:

1. The call is routed to the network on which the number originally resided (the "Donor Network") as this is where the network on which the call originated (the "Originating Network") knows that it has been assigned.

2. The Donor Network identifies the dialled number as no longer being in its inventory because it has been ported to another network and checks with an internal network-specific number portability database ("NPDB").

3. The NPDB provides the routing number associated with the dialled number to the Donor Network.

4. The Donor Network uses the routing number to route the call to the network to which the user has ported his number (the "Recipient Network").

Figure 1 below illustrates the onward routing process.

Onward Routing (OR)
Scheme
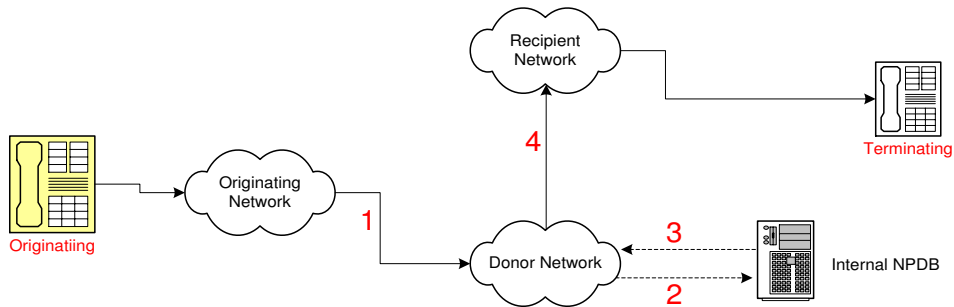
Figure 1: Diagram of Onward Routing Call Progression

The advantages of this configuration include:

- The NPDB of the Donor Network can be small since it contains only the routing numbers of the Donor Network's customers that have been ported. It does not have to contain all ported numbers;
- the signalling impact is minimal; and,
- there is no increase in call set-up time for non-ported numbers.

The disadvantages of this configuration include the following:

- Since the call to a ported number does not go directly from Originating Network to Recipient Network, the routing of a ported call is not optimized nor efficient. Call forwarding or "tromboning" occurs, which involves additional transit/interconnect charges.
- If the Donor Network goes out of business, the porting of calls would fail, as portability based on indirect routing is dependent on the Donor Network forwarding such ported calls. The Donor Network is therefore an additional, single point of failure.
- The Originating Network is dependent on the Donor Network for the call handling and the Donor Network typically does not provide this service for free.

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- The Originating Network has no control over the quality of service provided by the Donor Network.

Call Forwarding

Call forwarding is very similar to, and in some cases is treated as a subset of, Onward Routing. It is therefore also indirect, bilateral and on switch. Call forwarding is usually available as a service to subscribers who wish to have their incoming calls forwarded to another number. Call forwarding can also be used to facilitate number portability.

Usually the recipient switch assigns a "shadow number" for each number ported. All calls are then forwarded for incoming calls to the newly ported number.

Calls to the ported number will travel all the way to the Donor Network's switch which identifies the number as ported, then forwards and terminates the call to the Recipient Network's switch.

Figure 2 below illustrates the call forwarding process.

Figure 2: Diagram of Call Forwarding
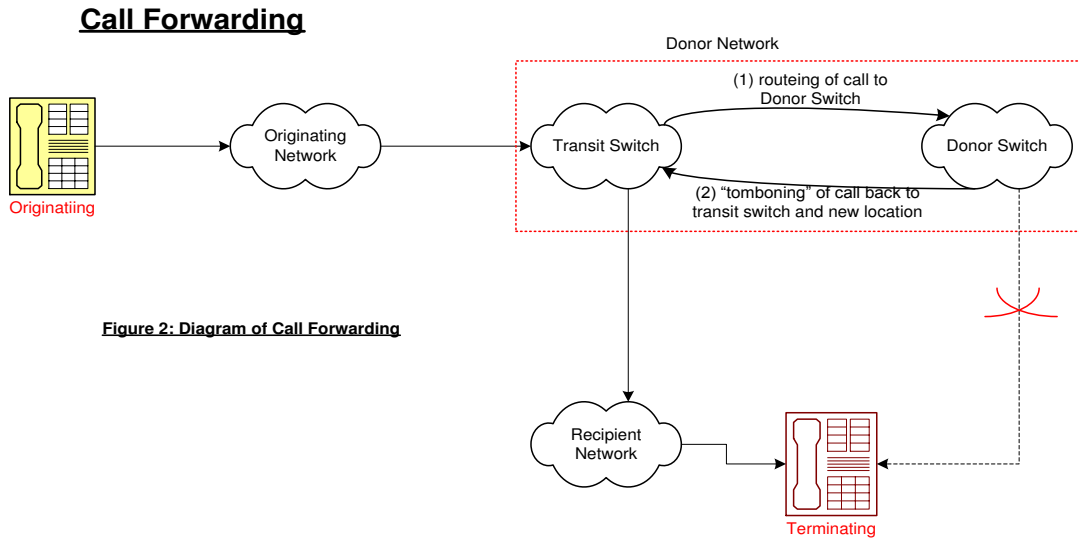
The key advantage of call forwarding is that the solution is readily available. Also, call forwarding is low in cost to implement and is quick to market.

Some significant drawbacks to call forwarding solutions, include:

- The call to a ported number does not go directly from Originating Network to Recipient Network, the routing of a ported call is not optimized nor efficient, "tromboning" occurs, which involves additional transit/interconnect charges.
- The Originating Network is dependent on the Donor Network for the call handling and the Donor Network typically does not provide this service for free.
- The Originating Network has no control over the quality of service provided by the Donor Network.
- Caller Line Identity (CLI) information is not passed on to the recipient in a call forwarding arrangement.
- Because of the high network usage for calls to ported numbers, call forwarding is suitable where only a small volume of numbers might be ported.

It should be noted that the advantages/disadvantages of call forwarding are very similar to those for onward routing, and in fact, many regulators treat call forwarding as a variant of onward routing.

Query on Release
Query on Release is an indirect, off switch method that uses a centralized database. The call progression is as follows:

1. The call is routed to the Donor Network for completion. If the dialled number is resident on the Donor Network, the call is completed.
2. If however the dialled number has been ported, the Donor Network detects that and releases the call to the Originating Network with an indication that the number has been ported.
3. The Originating Network queries its copy of a centrally administered NPDB.
4. The routing information for the dialled number is provided by the NPDB to the Originating Network.
5. The Originating Network completes the call to the Recipient Network, on which the dialled number currently resides.

Figure 3 below illustrates the query on release configuration.

Query on Release (QoR)
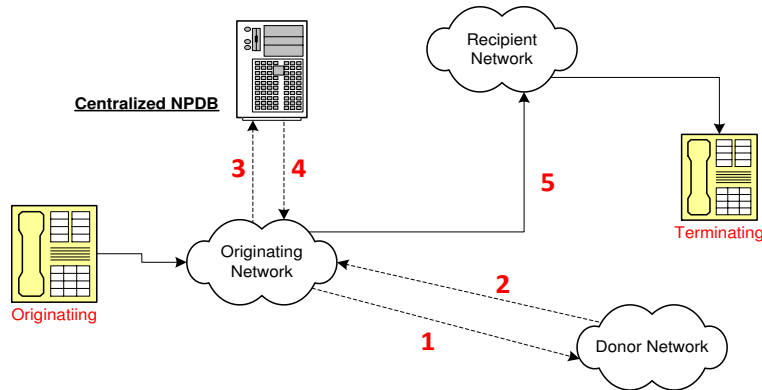
Figure 3: Diagram of Query on Release Call Progression

Query on Release optimises call routing, and circuits are not held in the Donor Network for the duration of the call. The Donor Network does not need to access data for calls to be ported (but it does need to maintain data for each ported number external to the switch).

A key disadvantage of Query on Release is that it consumes additional network resources because each call to a ported number is routed twice, once to the Donor Network and once to the Recipient Network.

Call Dropback

The Call Dropback scheme for routing calls to ported numbers is indirect, bilateral and on switch. The call progression is as follows:

1. The call is routed from its Originating Network to the Donor Network.
2. The Donor Network detects that the dialled number is no longer resident on its network and queries its internal NPDB.
3. The internal NPDB provides the correct routing number of the dialled number (on the Recipient Network) to the Donor Network.
4. The Donor Network passes the routing number to the Originating Network.
5. The Originating Network uses the new routing number to complete the call.

Figure 4 illustrates the call dropback scheme

Call Dropback Scheme
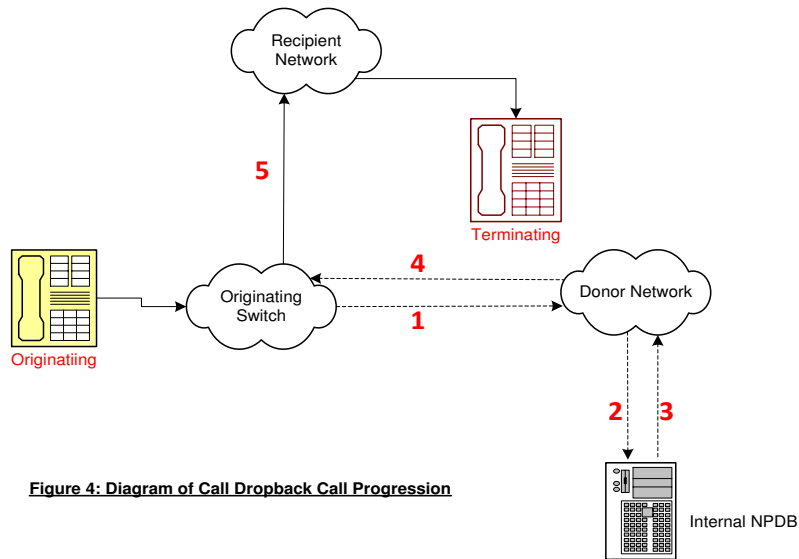
Figure 4: Diagram of Call Dropback Call Progression

There are a number of potential advantages with the call dropback solution, such as:

- Reduced routing inefficiency

- Reduced interconnection capacity requirement

- Potentially reduced processor capacity requirements

- The Donor Network is released from being part of the call path.

The main disadvantage is that there are potentially more hardware/software changes required to switches to implement the call dropback solution.

Direct Routing/All Call Query ("ACQ")

In the ACQ scheme, the routing of a call to a ported number uses the centralised database approach and routes calls directly to ported numbers in the following manner.

1. The Originating Network, upon receiving each dialled number, first queries the NPDB, which may be a mirror of the centralized NPDB or may be provided by a third party.

2. The NPDB sends the location routing number on the Recipient Network (on which the dialled number resides) to the Originating Network.

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3. Whether the dialled number has been ported or not, the routing number on the Recipient Network is used to route the call.

Figure 5 illustrates the ACQ process.
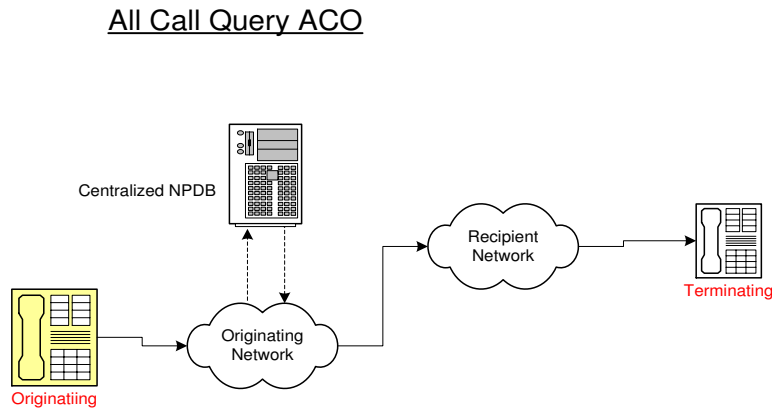
All Call Query ACO

Figure 5: Diagram of All Call Query Call Progression

Accordingly, the Donor Network does not have to be queried for routing information as the NPDB is queried to obtain correct routing information for all calls.

The advantages of this configuration are:

- It eliminates the reliance on the Donor Network, thereby providing the ability to maintain portability in the event that the Donor Network fails.
- Network congestion, which could occur on the Donor Network as ported calls are routed through it, is minimised.
- There is no "tromboning" so call routing and network usage is more optimised and efficient.

ACQ has the following disadvantages:

- Since all calls are queried, call set-up time for both ported and non-ported numbers will increase due to additional signalling and processing time for each call compared to a regular call. However, the increase in call set-up time is usually not noticeable by the caller.

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- The required network database needed to support ACQ versus Onward Routing needs to be larger and more complex.

Summary

In summary, most of the implementation methods discussed above have advantages and disadvantages, relating to the speed and costs of implementation (both set up and ongoing), as well as the efficiency of the system. The current market in The Bahamas is characterised by a high level of penetration by BTC in both fixed and mobile services so that initially much of the porting will likely be from BTC's network to other competitors. It is therefore desirable to implement a solution that will ensure separation between operators and fair and non-discriminatory management of the porting process.

Internationally, the All Call Query (ACQ) method of implementation is the most popular method. Regionally, the Dominican Republic, which launched number portability for both fixed line and mobile markets on September 30, 2009, chose the All Calls Query mode of implementation, as has the Cayman Islands where number portability is in process of being implemented. When the regulator in Singapore, the Infocomm Development Authority (IDA), introduced a centralized database for number portability, it stated: *"This is deemed more efficient and importantly beneficial for the telecom sector in the long run as it can better support more complex routings expected from the next generation services and application."* The table below provides information regarding the number portability methods chosen in a selection of countries. It can be noted that centralized methods are by far the preferred solution, and that the ACQ call progression is most common among the countries sampled.

Table 2 – Number portability solutions in selected countries[6]

Country	Fixed Network Routing	Mobile Network Routing	Type of Ported Database Used
Albania	All Call Query	All Call Query	Centralized
Austria	Onward routing or all call query	All Call Query	Distributed
Belgium	All Call Query	All Call Query & Query on Release	Centralized
Cayman Island	All Call Query		External Database
Croatia	All Call Query	All Call Query	Centralized
Cyprus	All Call Query	All Call Query	Distributed
Denmark	All Call Query	All Call Query	Centralized
Dominican Republic	All Call Query	All Call Query	Centralized
Estonia	All Call Query	All Call Query	Centralized
Finland	All Call Query	All Call Query	Centralized
France	All Call Query	All Call Query	Centralized
Germany	Onward Routing & All Call Query	All Call Query	Centralized
Hungary	All Call Query & Query on Release	Phase 1: All Call Query & Query on Release	Centralized
Iceland	All Call Query	All Call Query	Centralized
Ireland	Onward Routing (Late 90s) – All Call Query (Current)	All Call Query (2003)	Centralized
Italy	All Call Query	All Call Query	Centralized
Kenya	Onward Routing	All Call Query	Centralized
Lithuania	All Call Query	All Call Query	Centralized
Luxembourg	Onward Routing	All Call Query	Centralized
Malta	Onward Routing but ACQ may also be used	All Call Query	Distributed
Netherlands	All Call Query	All Call Query	Hybrid Distributed & Centralized
Norway	All Call Query	All Call Query	Centralized
Peru		All Call Query	Centralized
Poland	All Call Query	All Call Query	Centralized

[6]Source: ECC Report on Implementation of Mobile Number Portability in CEPT Countries, and URCA research of Regulator websites.

Portugal	All Call Query & Query on Release	All Call Query & Query on Release	Centralized
Rwanda		All Call Query	Centralized
Slovenia	All Call Query	All Call Query	Centralized
Spain	Onward Routing	Onward Routing	Centralized
Sweden	Onward Routing & All Call Query	Onward Routing & All Call Query	Centralized
Switzerland	Onward Routing	Onward Routing	Centralized
USA			NPAC

URCA's review of the possible solutions suggests that ACQ is the optimal method of implementation provided that there is adequate volume to justify the cost of implementation and maintenance of the required infrastructure. URCA is cognisant that an ACQ solution is likely to require significant lead-time for implementation and is also likely to be ineffective from a cost perspective if porting volumes are not suitably high.

The Call Forwarding method, while not suitable for large volumes of porting has the advantage of speed and ease of implementation in the short term, as it is based on existing services offered by operators. URCA has therefore also considered the possibility that service provider number portability might most suitably be implemented on an interim basis using call forwarding, with eventual migration to ACQ based on call volumes and completion of any necessary preparation.

URCA recognises, however, the need for input from existing and potential operators on this issue, and is therefore seeking opinions on the appropriate method or methods. URCA specifically notes that the broad objective is to achieve fixed number portability as quickly as possible and invites interested persons to comment and propose solutions that will best achieve this objective, in an efficient and cost effective manner.

Proposals

URCA is therefore seeking input from respondents on the following issues:

- Which of the methods of service provider number portability would be most suitable for implementation in The Bahamas?

- In the event that call forwarding is not considered an appropriate long-term solution, would it be appropriate having regard to the stated desire for number portability to be

implemented as soon as possible to implement number portability using call forwarding as an interim solution.

Question #5

Which of the methods of service provider number portability would be most suitable for implementation in The Bahamas?

Question #6

In the event that call forwarding is not considered an appropriate long-term solution, would it be appropriate, having regard to the stated desire for number portability to be implemented as soon as possible, to implement number portability using call forwarding as an interim solution?

3.2   Establishment of a Clearinghouse

The Query on Release, Call Dropback and All Calls Query methods of implementation as considered by URCA in Section 3.1 above require a centralized database and/or a clearinghouse. The main function of the clearinghouse is to track and bill for the usage of the centralized database used for storing the routing information for numbers. The clearinghouse would also be responsible for the day-to-day running of the centralised database, its operational maintenance and keeping it updated.

Clearinghouse support staff administers and operates the system. This includes the Help Desk functions such as trouble ticketing, problem resolution, logon administration, and training. It also includes personnel to perform system administration, hardware, software and network support, and data back-up.

Three options exist for establishing a clearinghouse:

- Local (that is, in The Bahamas);

- External (that is, outsourced to a number portability service provider located abroad);

- Regional (that is, in partnership with other regulated jurisdictions in the Caribbean).

Locally based clearinghouse

A local clearinghouse may be established in one of three ways:

- Bahamian operators may collaboratively establish a clearinghouse (with the centralized database included).

- A neutral third party may establish the clearinghouse and centralized database in The Bahamas and manage all aspects of the porting of numbers.

- URCA may establish the clearinghouse and centralized database and manage all aspects of the porting of numbers.

The advantages of a local clearinghouse are as follows:

- it reduces the demand for foreign exchange as it eliminates the need to remit cost of database dips (that is, queries) in a foreign currency;

- it would eliminate any possible influence that the politics, economics and policies of a foreign entity might exert upon the clearinghouse;

- it would not include a requirement to increase the capacity of international signalling networks to allow for traffic between the clearinghouse and the local operators;

- it may offer lower operational costs (dependent upon volume of business) when compared to those of a foreign facility.

The disadvantages are as follows:

- relatively high up front (establishment) costs;

- no expertise in the establishment and operation of a clearinghouse currently exists in The Bahamas, and therefore that expertise would have to be developed;

- long establishment/set-up time;

- there may be a delay for the conduct of negotiations between operators thereby delaying the establishment of service provider number portability;

- it is uncertain whether the solution would be cost effective for the size of electronic communications services market in The Bahamas, particularly before mobile liberalisation.

External outsourced clearinghouse

In this option, the clearinghouse function is outsourced to a third party in another country. Similar to the establishment of a local clearinghouse, URCA has considered the advantages and disadvantages of an external clearinghouse, which are set out below.

This option has the following advantages:

- lower up-front capital (establishment) costs;

- it may be more cost effective in the long term, depending on take-up of service;

- a shorter time to implement service provider number portability; and

- it allows operators to concentrate on administrative and technical issues to facilitate the implementation of number portability.

The disadvantages are:

- it requires an increase in capacity of the international signalling network to accommodate database dips from operators;

- there is an increased outflow of foreign exchange to meet the cost of database dips and contractual payments; and

- It raises potential privacy and security concerns given that subscriber information is given to a foreign third party, though URCA notes that these concerns were considered to be surmountable in those jurisdictions that have implemented this solution.

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Regional clearinghouse

A third possibility presents itself in the current status of number portability in several jurisdictions throughout the Caribbean region.

Currently, a number of regulators in the Caribbean are seeking to implement number portability, and all are presented with similar challenges related to the size of their jurisdictions, and the relatively high cost of implementation, particularly on a "per capita" basis. This may present an opportunity for regional cooperation between regulators and operators to devise and implement a regional clearinghouse.

A regional clearinghouse would offer many of the advantages of the external solution while still retaining the control and flexibility of a local solution. However, such a solution would also present many of the disadvantages of an external solution (unless it was housed in The Bahamas).

Summary

URCA believes it is unlikely there would be sufficient volume to justify establishing a local clearinghouse for The Bahamas alone within the initial years of number portability. This is particularly so given the anticipated delay in mobile competition. Many jurisdictions that have recently adopted number portability chose to use an international outsourced provider, and URCA considers that this may be the most easily achievable solution for The Bahamas. Notwithstanding this view, URCA believes that further study is needed to properly consider and decide on the merits of a local solution versus an external one, and also decide on the solution to be implemented in The Bahamas, if the technical solution selected requires a clearinghouse for implementation. URCA considers it possible that establishing a clearinghouse in collaboration with other regional jurisdictions may be a feasible, lower cost alternative to outsourcing. A working group consisting of URCA and stakeholders is best suited to determine the best fit for The Bahamas. URCA therefore proposes that recommendations on this matter should be considered by the NPWG.

Proposals

URCA proposes that the NPWG be mandated to make recommendations to URCA on the choice of a locally established, an external outsourced or a regional clearinghouse (in the event that the selected technical solution requires the establishment of a clearinghouse).

> **Question #7**
>
> Do you agree with URCA's analysis and proposal that the issue of whether a clearinghouse should be established locally, outsourced to an external third party, or in partnership with regional regulators and operators in other Caribbean jurisdictions, should be considered and recommended by the NPWG? If you disagree, please provide reasons.

3.3   Initiation of Porting

To start the porting process, a subscriber has to contact an operator to request that his or her number be ported and that operator must act to lead the porting process. Port initiation may either be "donor initiated" or "recipient initiated".

Donor Initiated Porting

In donor initiated porting, the subscriber starts the process by contacting his/her current service provider (the "Donor") and indicating his/her desire to change service providers and port his/her number. The Donor then initiates the administrative process required to port the number with the new service provider (the "Recipient") by issuing a porting authorisation code to the subscriber, which code the subscriber must provide to the recipient who uses it to conduct the porting transaction with the Donor.

The donor initiated process presents challenges as the Donor, which is losing a customer, has the opportunity to control the porting transaction. The Donor can discourage the subscriber from porting by making derogatory comments about the Recipient or by offering discriminatory inducements. Subscriber contact with the Donor under this process undermines a key way in which number portability enables and enhances competition, because the Donor establishes

relatively low levels of performance and then offers improvements in service and performance to a subscriber only when faced with the loss of that particular subscriber.

Recipient Initiated Porting

In this model, the porting process starts when the subscriber contacts a desired new service provider (the Recipient) to initiate the porting process. In this scenario, the subscriber may contact any of the Recipient's retail points of sale (for example, a retail centre or an authorized agent) and provide agreed upon information regarding his or her service with their current service provider (the Donor), such as an account number and service address.

The Recipient then begins the administrative process and contacts the Donor to validate the information provided by the subscriber. At this point, the Donor has the ability to reject the port, but only based on agreed valid reasons, which would include matters such as incorrect or incomplete subscriber information, or subscriber account issues such as arrears.

The Recipient initiated process allows the subscriber to contact the Recipient and arrange both the new account and request number portability at the same time. It is a one-stop shop with the subscriber needing to make only one transaction while avoiding contact with the Donor.

Proposals

URCA proposes that:

- Service provider number portability in The Bahamas should be Recipient initiated.

Question #8

Do you agree that service provider number portability in The Bahamas should be Recipient initiated? If you disagree, please provide reasons.

3.4 Subscriber "Winback"

Another significant issue is that of "winback" or the extent to which the Donor would be permitted to make attempts to retain a subscriber who has already decided to switch, during the course of the porting process.

The winback attempts may range from making derogatory comments about the Recipient, to offering inducements such as special discounts (which may or may not be discriminatory in nature). A Recipient initiated process will significantly limit the opportunity for winback attempts, but URCA has considered whether it should permit winback, limit it, or prohibit it outright.

While URCA believes that the making of winback attempts may in certain circumstances be a legitimate competitive activity, it has the potential to quickly undermine the benefits of number portability by acting as a further barrier to switching. URCA does not consider that the benefits of permitting winback attempts are sufficient to justify the risk of winback undermining the very purpose of number portability, particularly in the early stages when number portability is a new and developing feature of the competitive environment.

URCA therefore proposes to prohibit winback attempts for a period of at least two years following the introduction of number portability. URCA proposes to reconsider this issue through consultation once that initial two year period has elapsed.

Proposals

URCA proposes to prohibit the Donor from contacting the customer for retention purposes for a period of at least two (2) years following the introduction of service provider number portability. URCA will reconsider this prohibition once the two (2) year period has elapsed.

> **Question #9**
>
> Do you agree that with URCA's proposal to prohibit the Donor from contacting the customer for retention purposes for a period of at least two (2) years following the introduction of service provider number portability?

3.5   Porting Times

The time taken to port a number, from request to completion, can vary widely, from almost instant porting for fully automatic systems, to several weeks for some manual systems. The UK has the most stringent requirement for porting with a maximum time of 2 hours for mobile ports. An Ofcom study conducted in 2006 indicated user preference for port times of 1-2 days[7]. A study by Analysys Mason, an international agency which provides communications consultancy in several jurisdictions, conducted in 2006 indicated that 33% of countries had port times of 3-5 days, with 29% having port times of less than 2 days. URCA is of the view that the timeframe for porting should be cognisant of the user's desire for the process to be both timely and convenient, in order to ensure that users are not discouraged from using number portability. URCA therefore proposes to mandate a maximum timeframe for service provider number portability.

URCA considers that the issue of porting timeframe requires a detailed review of the relevant administrative and technical capabilities of the operators concerned, and therefore proposes that this issue be considered in detail by the NPWG, which should make recommendations to URCA.

Proposals
URCA proposes that:

- Maximum timeframes for service provider porting should be implemented and mandated by URCA;
- The NPWG should be tasked to review and make recommendations to URCA on appropriate timeframes for porting between service providers.

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[7] Ofcom Review of General Condition 18 – Number Portability (2006)

Question #10

Do you agree that maximum timeframes for service provider porting should be implemented and mandated by URCA, and that the NPWG should be tasked with making recommendations to URCA on those timeframes? If you disagree, please provide reasons.

3.6   Miscellaneous Issues

There are a number of other issues which should be determined in respect of service provider number portability but which URCA has not considered in detail in this document. URCA proposes that these issues, outlined below, should be considered by the NPWG, which should make appropriate recommendations to URCA.

Authorisation and Validation of Subscribers

It is necessary, particularly in a Recipient initiated process (as proposed in Section 3.3 above), for the Recipient to be able to reliably ensure that the person requesting the port is a valid subscriber of the Donor, to verify correct subscriber information, and to ensure that he porting request is a valid one. There are various methods used internationally to resolve these issues, with varying levels of success. URCA considers it necessary to implement procedures that will ensure the highest level of accuracy, without unduly delaying or complicating the porting process, or increasing the costs of portability.

Recovery of Debts and Fulfilment of Other Obligations

Any post-paid subscriber who decides to change service provider remains liable to settle any outstanding fees (including outstanding bills, early termination charges, and subsidies for handsets or customer premises equipment provided to the subscriber as part of the contract) due to the Donor. The subscriber may also be in possession of rented equipment, which must be returned to the Donor or paid for. The issue of whether the Donor can refuse porting, and whether the Recipient should refuse service until such debts and issues are settled, needs to be

carefully considered, and clear procedures and rules put in place to ensure fairness and transparency.

Refusal of Porting Requests

To avoid misunderstandings and disputes during porting, and to ensure that the porting process is as smooth and timely as possible, the permitted reasons for a Donor to refuse to port a number must be clearly specified and limited by regulation.

Collection and Publication of Number Portability Statistics

In order to monitor the success of number portability and its effect on the development of competition in The Bahamas, and also to determine the need for changes to the policies and regulations (if necessary), URCA proposes to require the submission by all operators to or from whom numbers are ported, statistics regarding the porting activities carried out.

A further consideration is the extent to which URCA will publish such statistics and if so, whether they would be published as aggregated or individual operator information.

Proposals

URCA proposes that the NPWG should be mandated to consider the following issues and make recommendations to URCA on regulatory measures to be implemented:

- Authorisation and validation of subscribers and porting requests;
- Recovery of debts and fulfilment of other obligations;
- Reasons for refusal of porting requests; and,
- Collection and publication of Number Portability Statistics.

4. Cost Allocation and Recovery

In this Section, URCA describes its proposals for cost recovery for service provider number portability. As discussed in Section 2, number portability is a key enabler of competition and can generate considerable welfare benefits for customers. URCA recognizes that the cost recovery process for portability has significant implications for the level and structure of charges associated with implementing and operating this very important regulatory measure in The Bahamas. This in turn will have significant implications for customers and the market structure for the country's electronic communications industry. For example, if subscribers are charged directly to port their telephone numbers, this could limit take-up of the service and the expected benefits of portability would not be realised.

URCA sets out below its proposals on cost recovery for service provider number portability on fixed networks. URCA does not believe that cost recovery for number portability should be left solely to commercial negotiations between operators. This view is informed by experience in other countries where reliance on commercial negotiations has served to delay implementation of number portability and resulted in high or inappropriate charges, or both. URCA has a statutory duty under section 4 of the Comms Act to *"further the interests of persons in The Bahamas in relation to the electronic communications sector…"* and must ensure that the framework for portability is fit for purpose and offers protection to customers.

Classification of Cost for Number Portability

International studies and experience of number portability suggests that there are two broad categories of costs associated with the provision of number portability. These are: (i) establishment costs and (ii) consumption costs. The first category represents the capital costs incurred by service providers to ensure that customers have the capability to port their telephone numbers. These costs are incurred because of the regulatory policy objectives to reduce the cost and inconvenience of customers switching between operators, and to foster competition amongst service providers through the implementation of number portability.

On the other hand, consumption costs represent the additional costs incurred when customers make use of number portability functionalities. These costs are typically more easily linked to individual service providers or customers.

Table 3 below provides a more detailed breakdown of each of the two broad cost categories described above. For example, establishment costs consist of: (i) system set-up costs and (ii) per operator set-up costs of implementing number portability. Consumption costs, on the other hand, consist of: (i) per-line administration costs, (ii) additional conveyance costs and (iii) continuing administrative costs.

Table 3 – Classification of Costs for Number Portability

Cost Category		Description
Establishment costs	System set-up costs	Cost incurred as a result of: • initial network modifications for on-switch/off-switch solutions; • software modifications in the information systems such as customer accounting and billing system and inter-operator accounting and billing system; • set-up of new inter-operator tools and procedures; and • national database of ported numbers (for off-switch only).
	Per operator set-up costs	Initial programming of routing tables
Consumption costs	Per-line administration costs	Cost incurred as a result of: • service ordering procedures; • modifications of subscribers data in the information systems (namely, customer care and customer billing systems, inter-operator accounting and billing systems); and • modification of subscriber data in the network elements.
	Additional conveyance costs	Cost incurred as a result of: • extension of traffic link capacity; and • additional call processing, switching and intelligent network ("IN") resources.
	Continuing administrative costs	Includes: • management of a national 'ported numbers' database; and • administration of general information.

This distinction between the various cost components is critical when determining how the costs incurred in the provision of number portability should be shared between operators and

between operators and their customers. Thus, only costs associated with implementation and operations of number portability should be considered in the cost recovery process.

URCA understands that the quantum of each cost component may vary from operator to operator due to:

- network characteristics in terms of size, structure and architecture, and equipment;

- the operator's technical and administrative organisation (for example, the level of automation of tools and procedures);

- the competitive environment - number of competitors and regulatory and technical obligations of each operator regarding number portability; and

- the structure of interconnection between operators.

In this document, URCA does not seek to quantify the cost of enabling number portability functionalities in The Bahamas. For one, URCA has no information on the likely level of inter-operator charges for number porting on fixed networks at this time. More significantly, this would require detailed knowledge of each operator's systems and costs. URCA is of the view that any discussion on this important issue should await detailed information on cost from operators. URCA proposes that the NPWG (see Section 5 below), which will include representation from operators, will collect and compile information on the costs of implementation, which information will be reported to URCA for review and final decision.

Table 4 compares the significance of the various cost components for establishing and operating number portability in the EU and provides an indication of which operator incurs the costs.

Table4 – Cost Components

NP Solutions	Establishment Cost		Consumption Costs		
	System set-up costs	Per operator set up cost	Per line set-up	Additional conveyance	Other administration
On-switch solutions	• Initial network modifications for on-switch/off-switch solutions • Software modifications in the information systems such as customer accounting and billing system and inter-operator accounting and billing system • Set-up of new inter-operator tools and procedures	• Initial programming of switches (except for second number solution	• Modification of subscriber data	• Tromboning and non-optimal routing of calls	• Allocation of geographic numbers
Significance of costs	High proportion of total costs	Small proportion of total costs	Very small	Varies depending on technical solution, but can be quite high	Negligible
Main Party Incurring Costs	The bulk of costs will fall on the donor service provider, but new operators will also incur some costs	Low impact on the donor operator as well as other originating and transiting operators	Medium for the donor operator and low for other operators	High impact on the donor network operator and medium for others	Very low impact on the regulator
Off-switch solutions	• Set up of Intelligent Network • Adaptation of information	• Initial programming of switches • Access to national NP	Modification of subscriber database	Additional conveyance of IN query	• Management of a national ported numbers database

	systems • Creation of inter-operator service management tools and procedures • Adaptation of maintenance and customer support procedures	database			• Allocation of non-geographic numbers
Significance of costs	Significant proportion of total cost (higher than on-switch solutions)	Higher proportion of total cost than for on-switch solutions.	Very small	Negligible	Very small
Main Party Incurring Costs	High impact on all operators, but low on other operators.	Medium impact on all operators	Medium impact on the donor operator and low on other operators	Very low impact on all call-originating operators	Very low impact on the regulator

Principles of Cost Recovery

URCA must ensure that the implementation of number portability is broadly in line with the legislative objectives for the sector, in particular those contained in Section 4 of the Comms Act. These include:

- enhance the efficiency of the Bahamian electronic communications sector and the productivity of the Bahamian economy;

- encourage, promote and enforce sustainable competition; and

- promote affordable access to high quality networks and carriage service in all regions of The Bahamas.

Given these objectives and in common with other national regulators, URCA is proposing a set of economic principles to ensure that the cost recovery process for number portability is fit for purpose. URCA believes that the cost recovery process should be equitable by ensuring the appropriate allocation of the costs resulting from the implementation of number portability between operators and their customers. URCA believes that its proposals will engender regulatory certainty, and minimise inter-operator disputes, thereby ensuring the mechanism for cost recovery is transparent, non-discriminatory, and reasonable, and reflects the underlying costs of providing number portability.

As set out in Table 5 below, URCA is of the view that there are seven high level principles that can usefully guide a regulatory authority when determining a cost recovery scheme for number portability.

Table 5 – Cost Recovery Principles	
Relevant costs	Only those costs directly incurred as a result of the provision of number portability should be recovered
Cost causation	Cost should be borne by those whose actions cause the cost to be incurred.
Distribution of benefits	Cost recovery mechanism should reflect the distribution of benefits that accrue from a customer porting his telephone number. Portability generates both direct and indirect benefits, as everyone benefits from increased competition. Hence, those who benefit from portability indirectly should pay some of the costs.
Effective competition	Pressures for effective competition should not be weakened by the mechanism of cost recovery. As such, the cost recovery mechanism should not be used to raise competitor's cost or weaken their ability to compete.
Cost minimisation	The mechanism for cost recovery should provide strong incentives to minimise costs. Those who are in a position to affect the size of the costs should face strong incentives to minimize costs.
Practicality	Costs should be recovered in a way that is practicable and does not unduly raise administration costs.
Reciprocity	Where number portability is provided on a reciprocal basis it may be appropriate for charges to be reciprocal in each direction.

It is URCA's view that the cost recovery arrangements for number portability should reflect a balanced combination of the above stated principles. This approach is very much in keeping with the approach adopted by regulators in the EU and Hong Kong, among others.

URCA believes that its proposals on cost recovery broadly reflect established practices in markets where number portability has long been implemented, and take account of in-depth studies and consultations on number portability in developed and emerging markets. In fact, URCA's cost recovery proposals were previously developed by the legacy regulator in the UK (Oftel) to help it decide how the costs of enabling number portability ought to be recovered. These principles were endorsed by the Competition Commission (formerly the Monopolies and Mergers Commission) in its Report on fixed number

portability in the UK. Subsequently, sector regulators and/or competition bodies from around the world have adopted these principles when determining how the costs of number portability should be recovered (for example, Hong Kong[8], New Zealand, and Malta). These principles have also been either adopted or proposed by regional regulators in various consultations on number portability (for example, Trinidad & Tobago, Bermuda, and the Cayman Islands).

Cost Recovery on the Fixed Network in The Bahamas

URCA recognises that there are various ways to recover the cost of implementing and operating number portability functionalities. Table 6 provides a high level overview of cost allocation and recovery for number portability in six EU member states. The proposals for cost allocation and recovery in two regional markets (namely, Trinidad & Tobago, and Bermuda) are broadly in line with the countries identified in Table6.

In the context of The Bahamas, URCA is of the view that detailed discussion on cost allocation and recovery for number porting should await information and data on the quantum of the various cost groups and only after the NPWG has had an opportunity to discuss and consider issues concerning implementation of number portability in The Bahamas. This would require detailed knowledge of individual operating systems and cost.

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[8] http://www.ofta.gov.hk/en/tas/mobile/mnp-ta.pdf

Table 6 – Cost Allocation and Recovery for Number Portability[9]

	Finland	France	Germany	Netherlands	Sweden	UK
Costs that each operator must bear itself	System set-up costs	System set-up costs	System set-up costs and additional conveyance costs	System set-up costs	System set-up costs and the investment costs associated with additional conveyance	System set-up costs and additional conveyance costs.
Principles used by National Regulatory Authority	Cost orientation and reasonable costs	Cost causation and cost orientation	Not applicable as industry working group made a decision on this.	Cost-orientation	Cost-orientation, cost minimization	Cost causation, cost minimization, distribution of benefits, effective competition, reciprocity, and

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[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 Volume 1 October 1999.

						practicability.
Means of ensuring reasonableness of inter-operator charges	Commercial negotiations	Regulatory approval, as part of interconnection charges	Commercial negotiations	Commercial negotiations	Commercial negotiations	Charges calculated by reference to BT's incremental costs.
Current (or planned) charging to customers by recipient operators	Yes	Varies (i.e., some operators charge customers)	No	Varies	Yes	Varies
Perceived impact of customer charges on take-up	Argued to be significant	Argued to be significant	Not applicable	Not significant	Not applicable	Not significant

Proposals

In respect of cost allocation and recovery, URCA therefore proposes:

- The relevant principles for cost recovery should be cost causation, relevant cost, cost minimisation, reciprocity, effective competition, practicability, and distribution of benefits.
- The NPWG (see Section 5 below) should be mandated to:
  - investigate and ascertain (subject to URCA addressing any relevant confidentiality concerns) the costs for service provider number portability based on the decisions made by URCA arising out of this consultation, and to report to URCA within timeframes established by URCA;
  - provide URCA with recommendations for the allocation and recovery of the specific costs of service provider number portability based on the decisions made by URCA and its investigations under (a) above, and report to URCA within the timeframes set by URCA;

URCA shall make its final determination on the implementation of service provider number portability (including any necessary further consultation) having regard to the report of the NPWG.

Question #11

Do you agree with URCA's proposal that the relevant principles for cost recovery should be cost causation, relevant cost, cost minimisation, reciprocity, effective competition, practicability, and distribution of benefits? If you disagree, please provide reasons.

Question #12

Do you agree that detailed consideration of the actual costs and consideration of detailed mechanisms for cost recovery should be referred to the Number Portability Working Group which should make detailed recommendations to URCA consistent with the principles set out in the consultation document? If you disagree, please provide reasons.

5.   The Number Portability Working Group

The earlier Sections of this consultation document introduce a number of issues which must be determined in relation to number portability in The Bahamas, and this consultation is intended to provide a clear framework for the implementation of number portability including timeframes, overall technical issues, costing, cost allocation and cost recovery. Upon completion of the consultation process, URCA will issue the Statement of Results of this consultation, which will guide further deliberations and implementation of number portability. URCA is of the view, however, that the details of number portability implementation must be undertaken with the benefit of detailed knowledge of the existing status of operations in the relevant markets. URCA therefore proposes that before making its final determination on number portability, as required by section 79 of the Comms Act, a working group should be formed involving participation by URCA, all affected operators, and such other persons as may be required to ensure that the working group has all required competencies to properly advise URCA on the implementation of service provider number portability, based on the results of this initial consultation.

The working group would be responsible for conducting such investigations, research and enquiries to advise URCA on the detailed matters which remain to be determined prior to the implementation of service provider number portability, as identified in this consultation document. The working group would be given detailed timelines within which to make its report to URCA, advising on the matters within its mandate. URCA would then be responsible for making the required determinations (and conducting any necessary consultation) to enable the implementation of service provider number portability.

URCA also considers that such a working group would also be ideally placed to oversee (under URCA's general jurisdiction and guidance) the actual implementation of service provider number portability for the fixed market.

URCA therefore proposes the establishment of an advisory group known as the Number Portability Working Group ("NPWG") to consider and make recommendations to URCA on the detailed matters pertaining to service provider number portability and, following URCA's

determination on number portability, to oversee the implementation of service provider number portability, subject to URCA's direction.

5.1   Formation and Decision Making

(1) URCA will establish the NPWG, which will be subject to URCA's general direction and jurisdiction.

(2) The group shall comprise:

   a. Up to two (2) representatives from each provider of fixed telephone services in The Bahamas. The representatives from each operator should include persons who possess knowledge of the network and administrative systems of the operator relevant to the implementation of number portability, and at least one of the representatives should have full power and authority to represent the operator.

   b. No less than two (2) and no more than four (4) members of URCA's staff (one of whom shall be appointed as the Chair of the NPWG); and,

   c. Such other persons, who shall not be affiliated to any licensee, as URCA may consider necessary or appropriate, having regard to their qualifications and expertise.

(3) The NPWG shall meet as often as required initially to make recommendations to URCA in an expeditious manner, and following URCA's determination, to ensure the timely and efficient implementation of number portability.

(4) URCA shall establish rules for the making of decisions by the NPWG upon formation of the NPWG. Such decisions shall take effect as a recommendation to URCA only, and URCA shall have the sole discretion in respect of any regulatory action to be taken in respect of any matter relating to number portability.

5.2   Terms of Reference

(1) Within timeframes set by URCA in consultation with the NPWG, the NPWG shall consider and make recommendations to URCA on the following:

   a. The technical solution(s) for service provider number portability to be implemented in The Bahamas; and

   b. The proposed clearinghouse solution if relevant to the technical solution proposed.

   c. The detailed costs of the implementation of number portability using the recommended technical solution(s).

   d. The allocation of the costs of service provider number portability using the recommended technical solution(s), and the manner in which such costs may be recovered from consumers.

(2) Within six (6) months of the establishment of the NPWG, each licensee which is a member of the working group shall prepare and submit to URCA on a strictly confidential basis, a comprehensive technical assessment of its networks and administrative systems for service provider number portability using the selected technical solution, and make recommendations for addressing any identified gaps in readiness.

(3) Subject to URCA's consideration of the recommendations made in its initial report, and any subsequent determination made by URCA, the NPWG shall:

   a. Coordinate the implementation of service provider number portability, consistent with any directions made by URCA.

   b. Formulate procedures and processes for URCA's approval and adoption, including but not limited to:

      ▪ Authorisation and validation of customers, and customer requests for porting;
      ▪ Treatment of requests for porting;

- Assessment, allocation and recovery of costs;

- Quality of service;

- Porting settlement arrangements;

- Test plans;

- Time limits for activities;

- Porting timeframes;

- Recovery of debts and fulfilment of other obligations;

- Reasons for refusal of porting requests; and,

- Collection and Publication of Number Portability Statistics.

c. Prepare number portability guidance and procedures documentation for users and operators, for URCA's approval and issuance.

Question #13

Do you agree with the appointment, the composition and the Terms of Reference of the Number Portability Working Group as proposed by URCA? If you disagree, please provide reasons.

Appendix A – Summary of Consultation Questions

Question #1

Do you agree with URCA's proposal to introduce service provider number portability for fixed communications services as soon as economically and technically feasible and, subject to further consultation with interested parties, for mobile communications services in time for the introduction of competition in mobile communications? If you disagree, please provide reasons.

Question #2

Do you agree that location portability should be mandated at the Local Charging Area level? If you disagree, please provide reasons.

Question #3

Do you agree with URCA's proposal that number portability at the National level should be left to the discretion of the Operator and subject only to the Operator's ability to satisfy URCA that the user will be able to identify the charges for calls to ported numbers? If you disagree, please provide reasons.

Question #4

Do you agree with URCA's proposal to prohibit the porting of numbers between fixed and mobile communications services at this time? If you disagree, please provide reasons.

Question #5

Which of the methods of service provider number portability would be most suitable for implementation in The Bahamas?

Question #6

In the event that call forwarding is not considered an appropriate long-term solution, would it be appropriate having regard to the stated desire for number portability to be implemented as soon as possible to implement number portability using call forwarding as an interim solution?

Question #7

Do you agree with URCA's analysis and proposal that the issue of whether a clearinghouse should be established locally, outsourced to an external third party, or in partnership with regional regulators and operators in other Caribbean jurisdictions, should be considered and recommended by the NPWG? If you disagree, please provide reasons.

Question #8

Do you agree that service provider number portability in The Bahamas should be Recipient initiated? If you disagree, please provide reasons.

Question #9

Do you agree that with URCA's proposal to prohibit the Donor from contacting the customer for retention purposes for a period of at least two (2) years following the introduction of service provider number portability?

Question #10

Do you agree that maximum timeframes for service provider porting should be implemented and mandated by URCA, and that the NPWG should be tasked with making recommendations to URCA on those timeframes? If you disagree, please provide reasons.

Question #11

Do you agree with URCA's proposal that the relevant principles for cost recovery should be cost causation, relevant cost, cost minimisation, reciprocity, effective competition, practicability, and distribution of benefits? If you disagree, please provide reasons.

Question #12

Do you agree that detailed consideration of the actual costs and consideration of detailed mechanisms for cost recovery should be referred to the Number Portability Working Group which should make detailed recommendations to URCA consistent with the principles set out in the consultation document? If you disagree, please provide reasons.

Question #13

Do you agree with the appointment, the composition and the Terms of Reference of the Number Portability Working Group as proposed by URCA? If you disagree, please provide reasons.

Appendix B – Number Portability Survey

GENERAL INFORMATION

Please select the group which best describe you and place the (X) in the space.

Age: Between 18 – 25 ____
Between 26 – 35 ____
Between 36 – 55 ____
Over 56   ____

Male ____   Female ____

Number portability (NP) is a facility which allows subscribers to retain their existing telephone number when changing service providers. URCA need you to spend a few minutes answering the questions on this survey in order to help us determine whether NP is something that residents of the Bahamas want going forward. Thank you.

Questions	Response
1. Which of the following describes your existing telephone service?	Residential Business Mobile Mobile ONLY ___ ___ ___ ___
2. Which service would you prefer Number Portability on?	Residential Business Mobile Mobile ONLY ___ ___ ___ ___

3. How likely would you consider changing your service?
      Fixed Services
      Mobile Services
	More Likely Less Likely Not Inclined
	 ___ ___ ___
	 ___ ___ ___

4. If you could keep your existing telephone number(s) when switching to a new Operator, how likely would you be to consider switching?	___ More likely ___ Less likely ___ No difference
5. Would you be interested in keeping your existing telephone number(s) when changing Service Provider even if an additional cost is added to your monthly phone Bill?	Yes ___ No ___
6. What would influence your desire to switch to another Service Provider?	Please Rate Your answer with 1 being the lowest & 5 the highest. 1 2 3 4 5 Lower Prices __ __ __ __ __ Better Customer Service __ __ __ __ __ Better Range of Service __ __ __ __ __ Better Quality of Service __ __ __ __ __

Questions	Response		
7. How satisfied are you with the following elements of your residential and/or business telephone:	**Very Satisfied**	**Satisfied**	**Not Satisfied**
i. Overall service level	———	———	———
ii. Range of services provided	———	———	———
iii. Quality of service (connection time, sound quality, etc)	———	———	———
iv. Charges for local calls	———	———	———
v. Charges for International calls	———	———	———
vi. Customer care by Operator.			