

# Feasibility study for the implementation of number portability in Nicaragua

## Estudio de factibilidad para la implementación de la portabilidad numérica en Nicaragua

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## Keywords

Number Portability; Centralized Database; Administrator; All-Call Query; TELCOR; Regulation.

## Abstract

The document "Feasibility Study for the Implementation of Number Portability in Nicaragua" proposes the mechanisms to implement operator Number Portability, taking into account the ITU-T Series Q and E regulations. The existing information is analyzed, after the collection of information through interviews with operator officials, as well as surveys of users of telephone services. After reviewing the advantages and conditions of the different techniques to implement number portability, we recommend the All Call Query technique, a simple and effective method, as well as operator Number Portability, for which you need intelligent network capabilities to recognize the ported number, the status, the conditions and the operator must develop activities to adapt their networks to this model. The documents that legally and regulatory support the implementation of Number Portability are: Administrative Agreement No. 036-2003, the Numbering Resource Regulations and the National Numbering Plan, all of these issued by TELCOR Regulatory Entity, the Free Trade Agreement between the Dominican Republic - Central America and the United States (DR-CAFTA) and the Regional Technical Telecommunications Commission of Central America, COMTELCA. The elaboration of regulatory documents such as the Number Portability Regulation is proposed and indications are given for the creation of the Centralized Database Administrator with its subordinates in the different nodes that make up the network and a proposal for a General Implementation Plan.

## Palabras clave

Portabilidad numérica; Base de datos centralizada; Administrador; Consulta general; TELCOR; Regulación.

## Resumen

El documento "Estudio de Viabilidad para la Implementación de la Portabilidad Numérica en Nicaragua" propone los mecanismos para implementar la Portabilidad Numérica de operador, tomando en cuenta la normativa UIT-T Serie Q y E. Se analiza la información existente, luego de la recolección de información mediante las entrevistas a funcionarios de las operadoras, así como encuestas a usuarios de los servicios telefónicos. Después de revisar las ventajas y condiciones de las diferentes técnicas para implementar la portabilidad numérica, recomendamos la técnica de Consulta de Todas las Llamadas (All Call Query), método sencillo y eficaz, así como la Portabilidad Numérica de operador, para lo cual se necesita capacidades de red inteligente para reconocer el número portado, el estado, las condiciones y el operador debe desarrollar actividades para adecuar sus redes a este modelo. Los documentos que avalan de forma jurídica y regulatoria la implementación de la Portabilidad Numérica son: el Acuerdo Administrativo n° 036-2003, el Reglamento del Recurso de Numeración y Plan Nacional de Numeración, todos estos emitidos por TELCOR Ente Regulador, el Tratado de Libre Comercio entre la República Dominicana - Centroamérica y los Estados Unidos (DR-CAFTA) y la Comisión Técnica Regional de Telecomunicaciones de Centroamérica, COMTELCA. Se propone la elaboración de documentos de regulación como el Reglamento de Portabilidad Numérica y se dan indicaciones para la creación del Administrador de la Base de Datos Centralizada con sus secundarios en los diferentes nodos que conforman la red y una propuesta de un Plan General de Implementación.

## Introduction

After the privatization of telecommunications in Nicaragua, the first telephone company “Nicacel” emerged. The first telecommunications laws were established and regulatory bodies such as the Nicaraguan Institute of Telecommunications and Post Office (TELCOR) were created.

TELCOR issues the enabling titles for operators such as: concession contracts, permits, licenses, among others. The authorized cell phone operators are Claro, Tigo and Cootel. Each one has its particularities that the user analyzes to subscribe to the company, many times they do not meet expectations and they take it for the need to communicate. The drawbacks are: the price, the coverage and the quality of the service, this determines the client's satisfaction with the service acquired.

Data collection is carried out through interviews with operator officials and surveys of users of telephone services.

The structure of the numbering system is analyzed, as well as the routing of calls and its security, in addition, a comparison is made between several countries with similar characteristics to Nicaragua. An analysis of the legal basis in the field of telecommunications is carried out to justify its implementation and the need for it, as well as the benefits it brings to users, operators and commerce in general.

The purpose of implementing Number Portability in this study is to carry out a technical and legal analysis so that users conceive Number Portability as a right to maintain their telephone numbers regardless of the operator, service or geographical position of the users, when they for reasons quality of service, costs, location, etc. decide to change provider, service or geographic area. In this sense, it becomes an important agent for the development of competition between service operators.

## Objectives

### Overall Objective

- Propose the procedure for the feasibility of Number Portability through the standards and legal bases of the ITU-T Series Q, E, in order to make a comparison between countries and know the degree of knowledge of the main actors involved.

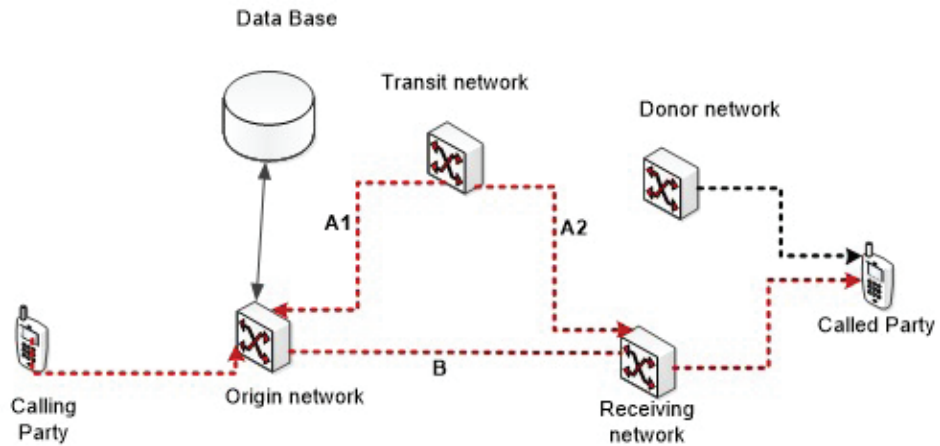
### Specific Objectives

- Collect and analyze information on Number Portability through user surveys and interviews with operator officials to measure the degree of knowledge of the different main actors involved in Nicaragua.
- Carry out a comparison between countries to determine applicable methods in Nicaragua.
- Use the standards of the ITU-T Series Q, E.

## Implementation description

### *All-Call Query*

This model consists of the generation of a Centralized Database, which contains information on telephone numbers, which will be used by mobile operators to route a call.

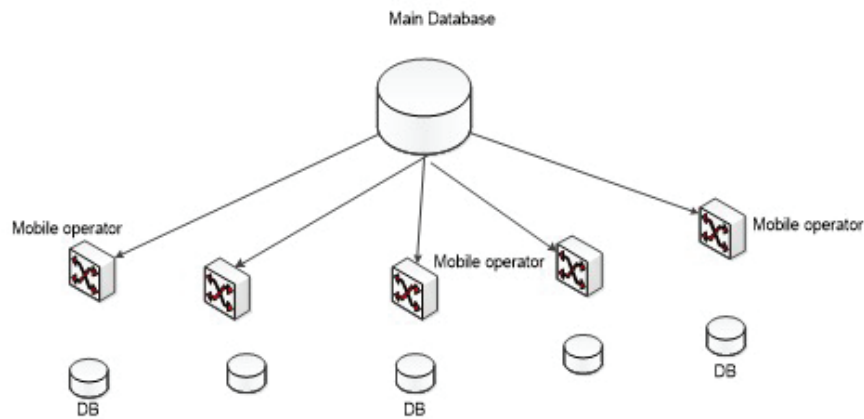


**Figure 1.** Routing initiated according to the principles of the query to every call.

The illustration shows that the Originating Network (RO) has access to the database (DB) of ported numbers (PN) with the full address of the receiving center. This indicates that only one database query is needed to complete the call, it is possible that more than one database query is needed, the donor network (RD) is not involved in establishing the call [1].

*Database Administrator*

To manage the portability of numbers, a centralized database (DB) is implemented that contains the ported numbers and to which the operators connect to keep their own database updated and thus establish communication with the ported number



**Figure 2.** Database administrator.

## Investigative development

Country	Law of PN	PN Regulation	PN implemented	Implementation date	Routing scheme	Number of ported numbers	Database administration	Time to port the number	Cost
Nicaragua	No	No	Not applicable	Undetermined	undetermined	Not applicable	Not applicable	Not applicable	Not applicable
Costa Rica	No	Yes	yes	30/11/2013	All-Call Query	1,9 M	Cortes Ingles	48 Hours	None
Honduras	yes	Yes	yes	30/4/2014	All-Call Query	206,338	International Syster	5 Minutes	None
Republica Dominica	no	Yes	yes	30/9/2009	All-Call Query	8000	Cortes Ingles	24 Hours	None
Peru	yes	Yes	yes	1/10/2010	All-Call Query	1,1 M	Cortes Ingles	24 Hours	None
El Salvador	yes	Yes	yes	24/8/2015	All-Call Query	3,6	Imcard Media fon	1-3 hours	None

**Figure 3.** Comparative table of the countries of the Free Trade Agreement DR-CAFTA and Peru on the implementation of Number Portability.

Unlike Nicaragua, all these countries have already implemented number portability and there is experience in this service aimed at the population as a right. All have implemented the ITU-T Q-series Supplement 2 All Call Query method. They all have a Database Administrator, highlighting the Spanish autonomous entity EL CORTE INGLES [2].

Supplement 2 to Recommendation ITU-T E.164 defines a standardized terminology for Number Portability within an ITU-T E.164 numbering system. Numbering and addressing formats, call flows, network architectures, and routing approaches are defined. [3].

Q-series Supplement 3 describes number portability from the standpoint of high-level service definitions and terminology and presents a set of high-level network architectures and generic routing methods for number portability. [4].

## Conclusion

The procedure for the feasibility of number portability with the ITU-T Series Q, E standards is proposed, with the routing described in the All Call Query method.

The study and analysis of the information obtained from TELCOR, CANITEL, the UIT-T and COMTELCA, from the experiences and knowledge of mobile users and other operators that have implemented Number Portability, was very useful for the feasibility proposal of number portability. Implementation is possible with fewer resources and less time than in other countries.

The operators must have the right environment and the minimum impact on the implementation. TELCOR should be in charge of carrying out the number portability, this may result in an additional cost to the annual budget already established by the operator.

## References

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## Introduction

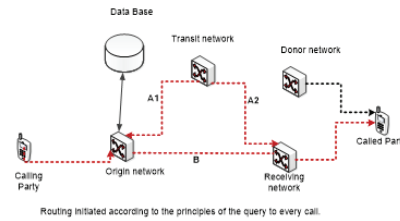
In Nicaragua, the number portability service does not exist, since the initiative has not been taken and the operators are reluctant to implement it. TELCOR, regulatory entity, issues enabling titles such as: concession contracts, permits, licenses, among others.

The authorized mobile operators are Claro, Tigo and Cootel. Each one has its particularities that the user analyzes to subscribe to an operator, many times they do not meet expectations and they take it for the need to communicate. The drawbacks are: price, coverage and quality of service. Data collection is carried out through interviews with operator officials and surveys of telephone service users.

The structure of the numbering system is analyzed, as well as the routing of calls and their security, in addition, a comparison is made between several countries with similar characteristics to Nicaragua. An analysis is carried out to justify its implementation, as well as the benefits it brings to users, operators and commerce in general. The purpose of implementing Number Portability is to carry out a technical and legal analysis so that users conceive Number Portability as a right to maintain their telephone numbers regardless of the operator, service or geographical position of the users, when for reasons of quality of service, costs, location, etc. decide to change your provider, service, or geographic area

## Implementation Description

The All-Call Query model consists of the generation of a Centralized Database, which contains information on telephone numbers, which will be used by mobile operators to route a call.



To manage the porting of numbers through the ACQ modality, it is necessary to implement a centralized database (DB) which contains the universe of ported numbers in operation and to which the Network and Service Providers must connect to keep their own database updated. BD of operation in order that, at the time of the communication, it is connected to the network where the destination user number is located and communication is established.

## Investigative Development

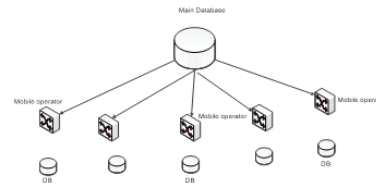
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República Dominicana	No	Yes	Yes	30/9/2009	All-Call Query	800	Comesingles	24-hours	None
Panamá	Yes	Yes	Yes	1/10/2010	All-Call Query	1.1 M	Comesingles	24-hours	None
El Salvador	Yes	Yes	Yes	24/8/2015	All-Call Query	3.6	Ilmcard Medafon	1-3 hours	None

Unlike Nicaragua, all these countries have already implemented number portability for years, there is already experience in managing this type of service, which is addressed to the population as a right.

They have all implemented the routing scheme described in the ITU-T Q-series Supplement 2 All Call Query method. They all have a Database Administrator, with the Spanish independent entity EL CORTE INGLES standing out.

Supplement 2 to Recommendation ITU-T E.164 defines a standardized terminology for Number Portability within an ITU-T E.164 numbering system. Numbering and addressing formats, call flows, network architectures, and routing approaches are defined.

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## Conclusions

The procedure for the feasibility of number portability with the ITU-T Series Q, E standards is proposed, with the routing described in the All Call Query method.

The study and analysis of the information obtained from TELCOR, CANITEL, the UIT-T and COMTELCA, from the experiences and knowledge of mobile users and other operators that have implemented Number Portability, was very useful for the feasibility proposal of number portability. Implementation is possible with fewer resources and less time than in other countries.

Regarding the acceptance by the operators, the recommendations are to give them the right environment so that the impact on their structure is minimal and the transition does not present a major inconvenience. However, TELCOR will have to take care of the financing between the operators and the entity in charge of portability, which represents an additional cost to the annual budget already established by the operator.