



Introduction to Number Portability

Since 1 January 1999, number portability has been a legal requirement within the telecom industry in the Netherlands. This obligation makes it possible for customers to transfer to another telecom provider while retaining their phone number. The advantage to the consumer and to businesses is that the phone number stays the same (for fixed lines, the phone number may also be retained for a move within the same area code) and people who know your number do not need to change it, and as a business, you do not have to change your number on notepaper or in distribution channels.

Legal obligations

In the Telecom Act, there are many obligations with which providers of telecommunication services must comply: Availability (to be dialed), number portability, number hiding, directory listing, judicial tapping and monitoring, 112 (emergency services) routing, etc.

The figure below shows how availability and number portability may be positioned in the protocol stack for telecommunication services.

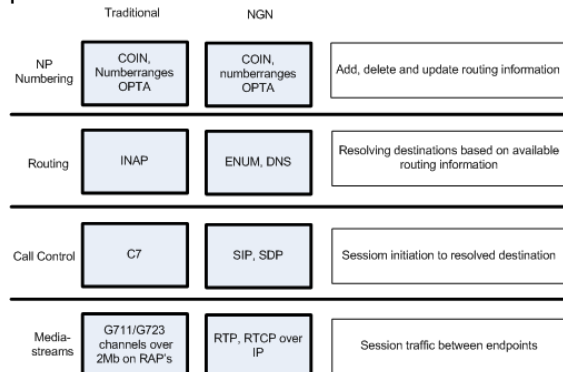


Figure 1: schematic overview of protocols in the Netherlands

Organization of number portability in NL

The Netherlands Telecom operators have decided to address a number of these legal obligations jointly and to this end have formed the COIN Association, in which they are represented. Besides the traditional fixed and mobile telecom operators, in the course of time more and more virtual fixed and mobile telephone providers and service providers have come into the market and have joined the COIN Association. At the moment, around 70 providers are members of the COIN association.

Essentially, number portability means knowing with which provider a phone number is active. This is important to many telecommunication services which are based on a phone number, such as voice and SMS.

In order to allow the number-porting process to proceed unambiguously, efficiently, and in a standardized and faultless manner, the operators in the Netherlands have bonded together in the COIN association. This is known as "End-to-end Standard Number Portability". Besides preparing and maintaining the process standards, the COIN association manages a central system / platform, with which operators may inform each other about number porting operations, and about which number series are active with which operator, via safe and standardized message traffic. Number porting operations are the exceptions to this which arise when consumers / businesses change their provider.

The porting process in NL

In order to keep the porting process unambiguous and simple for the consumer, the operators have elected to implement the 'assurance model' which means that the consumer approaches the new provider and authorizes him to port the number, thus terminating the customer's telephony service with his current provider.

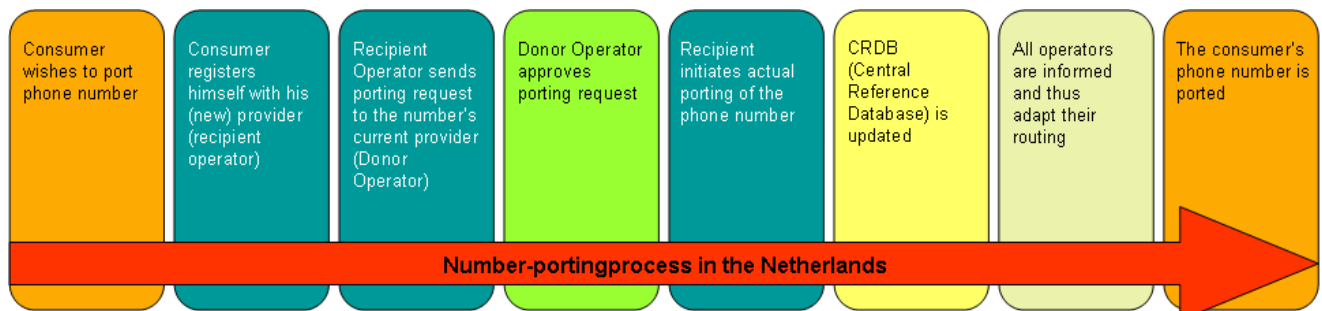


Figure 2: high-level number-porting process in the Netherlands



Then a porting operation is agreed between the two operators, by means of a porting request from the recipient operator to the donor operator, and a confirmation by means of an answer from the donor to the recipient operator. The recipient next initiates the actual number porting operation, on the agreed date, by sending a message to the Central Reference Database (CRDB), maintained by the COIN association. Upon successful validation, the CRDB is updated and all operators are informed by the CRDB that the phone number concerned is henceforth active on the other operator's network.

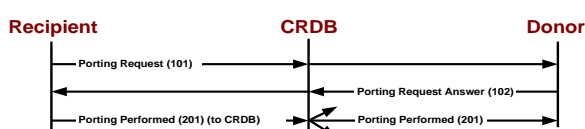


Figure 3 Message flow in number porting process in NL

Central solution

The operators in the Netherlands, in contrast to other European countries, have thus opted for a central solution in which it has also been elected to have the routing occur on an 'All Call Query' basis. For routing and network efficiency, this is the most desirable solution.

Common INfrastructure porting in NL

Operators in the Netherlands exchange porting messages via a shared, closed network. This message exchange (XML messages / MQ series) happens via a 'star'-shaped topology, so that all messages are exchanged via the central platform, and in which the central platform also carries out validations.

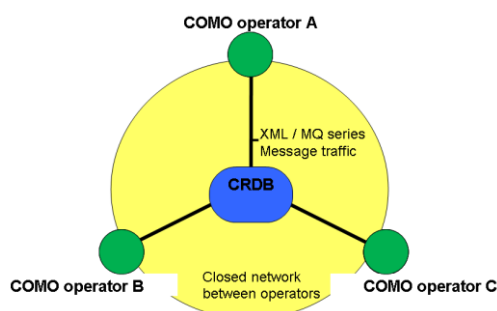


Figure 4 Common INfrastructure for NP in NL

Central Reference Database for NL

The CRDB is part of the COIN association's central IT platform. Besides the ported numbers, the CRDB also contains all active number series in the Netherlands. The CRDB is thus NL's de facto number database, in which is recorded which phone numbers is

active by which operators. This information is of importance to ensure that a phone call / SMS is sent to the correct network. The CRDB is more dependable, more detailed (network code, POP) and more up to date than the OPTA due to the validations employed and the fact that the operators use CRDB information to route traffic. The CRDB also contains records including the end-user rates charged in the Netherlands for Free Phone (0800) and Premium Rate (0900).

Number portability / bundles / infrastructures

As well as number portability, the COIN association takes care of regulation of the Netherlands market for the Unbundled Local Loop (ULL) and the transfer of broadband bundles. These processes have a close connection with number portability. To transfer a consumer to a new provider, besides the internal activation of the service or bundle of services, many other matters must also be updated and synchronized with other providers (for example the transfer process, combined with a number porting operation and a ULL / DSL Telco-Telco migration, and further, issues such as directory listings and number blanking).

Challenges in number portability

- Faster and more flexible porting (off-the-shelf porting, porting 24-7).
- The Netherlands has a dynamic churn market. Both the fixed and mobile markets are mature. At the same time, there are many new entrants to the market and there is much mobility in the value chain (Service Providers who develop into Network Operators).
- Fixed-mobile integration (service bundles / processes are becoming ever more complex)
- The number of infrastructures used for services will increase, or existing infrastructures will be opened up to services from other providers. (copper, glass, cable, 2G, 3G, LTE).
- Further simplification / integration / harmonization of the various processes involved in the transfer of a consumer between providers.
- A long-lasting migration / hybrid situation from TDM to IP-based networks. Make CRDB information known in NGN networks (Next Generation Networks) by means of ENUM infrastructure.

What is ENUM Infrastructure?

ENUM stands for tElephony NUmber Mapping System. Originally developed to link end users' phone numbers to different IP services, the protocol is proving to be very useful for linking carriers' interconnecting VoIP networks. It takes care of the following:



- It translates telephone numbers to URIs (IP-routable addresses).
- It makes routing of IP-based services based on phone numbers possible.
- It is based on DNS (Domain Name System).
- It provides a private implementation of ENUM by Network Operators with an Operator opt-in.

ENUM is thus a component that may be used to determine with which operator a number is active in Next Generation Networks. For traditional telephony, operators have vested this in the COIN association, which in the Netherlands manages number activation, deactivation and porting processes, and the central number database (CRDB) for telephone numbers (in conformity with ITU standard E164 which standardizes phone numbers). An investigation is underway, in which VDVL staff are also involved, to make this information available via ENUM (DNS technology) to the members of the COIN association. For this, please also see the VDVL white paper about ENUM and SIP.

Relevant links:

- www.coin.nl
- www.ez.nl/Onderwerpen/Betrouwbare_telecom/Nummers_en_domeinnamen
- http://www.ez.nl/Onderwerpen/Betrouwbare_telecom/Telecomwet_en_regelgeving
- www.opta.nl/nl/nummers/nummers-zoeken/

VDVL has carried out assignments for various telecom operators related to number portability as well as local loop (MDF and SDF) and transfers. Besides this, VDVL also carries out assignments within the COIN Association itself, including simplification of the porting process and the preparation for infrastructure ENUM in the Netherlands. **VDVL** thus has extensive experience with:

- Number portability, ENUM, Interworking and legal frameworks in general.
- Implementation of number portability at SPs, ISPs, and mobile and fixed operators.
- Relevant Processes and IT related to consumers' transfers between operators
- Integration of number portability with BSS/OSS systems.
- VDVL has for some considerable time been a preferred supplier to the COIN association and to a large number of suppliers in the Netherlands.

Additional Information

Additional information about our references and field of expertise may be found on our website www.vdvl.nl. For more information, you may also contact:

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VDVL experience with number portability