Guidelines on the Registration of Validation Methods

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Introduction – the basic principle of validation

Every ENUM domain name is derived from an e.164 phone number. Before an ENUM domain name can be registered, a check has to be made to verify that the prospective registrant is also the legitimate user of the corresponding e.164 phone number.

A validation method has to reliably establish:

- whether the phone number in question belongs to the Dutch number plan;
- whether it is a valid e.164 phone number;
- whether the registration applicant is the phone number's legitimate user.

For registration purposes, it is also necessary to confirm the identity of the applicant. If the registrar (the party that operates the registration process and submits the registration application to ENUM NL) is also the validation agent (the party that makes the validation), it makes sense to confirm the identity of the applicant as part of the validation process.

A successful validation implies conditional approval for the registration of a particular domain in name of the applicant for a given period. Approval is conditional because validation and registration may involve two separate parties: one to perform the validation (the validation agent) and the other to make the registration (the registrar).

For each successful validation, the validation agent issues a validation token. This token contains the validation details in encrypted form. It is issued to the party that requested the validation. ENUM NL can verify the validity of all tokens and will not accept a registration application unless it is supported by a token issued on the basis of an approved validation method.

Validation techniques - general

On the basis of the validation methods so far submitted for approval, ENUM NL is able to give general assessments of various validation techniques and advise validation agents accordingly. Suggestions are made below regarding a number of generic validation methods. It should be stressed that these are *suggestions*, not directions; validation agents are entirely free to develop and put forward their own methods.

It is important to recognise that the reliability of a validation method depends not only on the basic concept, but also on the methodical details and on the manner of implementation. For further information, refer to the section headed 'Implementation and review of the validation method'.

Validation techniques - model methods

The model methods currently available are listed below. Full descriptions can be downloaded from the ENUM website http://www.enum.nl (Download Page, under 'Model validation methods').

Bill examination (plus call-back or directory verification)

The applicant's name and phone number are checked against a recent phone bill (or contract). This information is then verified by calling the applicant on the relevant number or checking the applicant's directory listing (see below).
This method is suitable for the validation and revalidation of geographical numbers and similar number ranges (such as 085 and 091). It can be used for both individual numbers and number blocks. In the context of periodic revalidation, bill examination can be used without supplementary call-back or directory verification.

Call-back verification

The information requiring validation (number and name) is checked by calling the number to be registered. The person who answers the call has to explicitly confirm that the number in question may be registered with ENUM under the specified name.
This method is suitable for the validation of mobile numbers and for use in combination with another method, such as bill examination. Call-back can also be used as a periodic revalidation method.

Directory verification

The information requiring validation (number and name) is checked by reference to a recognised on-line listing, such as the public telephone directory.
This method is suitable for use in combination with another method, such as bill examination, and as revalidation method.

Verification on the basis of information published by OPTA on-line

The information requiring validation (number and name) is checked by reference to the information published on OPTA's website.
This method is suitable for the validation or revalidation of business numbers (088) and information numbers (0800 / 0900 / 0906 / 0909). It can be used for both individual numbers and number blocks.

SMS authentication

The information requiring validation (number and name) is checked by sending an SMS message (text message) to the number to be validated. This message contains a unique code generated for this particular validation request. The number user has to quote the code back to the validation agent and explicitly confirm that the number in question may be registered with ENUM under the specified name.
This method is suitable for the validation and revalidation of mobile numbers.

Reference to telecom service provider's own information

Where the validation agent is a public telecom service provider registered with OPTA, the information requiring validation (number and name) is checked against the agent's own records.
This method is suitable for the validation and revalidation of applications made by the validation agent's own customers (subscribers to numbers operated by the agent).

Specification of the validation method (for each technique, implementation scenario and purpose)

If a validation method distinguishes between various number types, validation techniques or implementation scenarios, the procedure and process set-up for each type, technique or scenario needs to be described in detail. ENUM NL strongly recommends registering a separate validation method in each such case. Then, if an erroneous registration and validation occurs, or a sub process is modified, only the corresponding variant of the method has to be reviewed, rather than the whole 'family' of methods and the associated validations.

ENUM NL sometimes receives applications to register validation methods that seek to cover as many number types as possible, or to incorporate as many checks as possible. From a regulatory/assessment viewpoint, this is undesirable, for the following reasons:

- The description of the various processes and conditions is hard to follow; it is often not apparent which details relate to which parts of the validation process.
- If any sub process is modified, the whole method has to be reviewed, including those parts of it that remain the same.
- It is very difficult to analyse the design and implementation of the method in the event of an erroneous registration.

Confusion can arise where a single definition covers several number types, as in the following example:

'Applications relating to numbers of all types are subject to SMS authentication, but where applications relating to geographical numbers are concerned, we additionally ask the applicant to provide a copy of a recent bill, and where applications relating to 088 numbers are concerned, we also check the information on line.'

In the situation described above, it would have been better to define three separate validation methods, and apply to register them using three separate forms:

- We validate applications relating to mobile numbers by means of SMS authentication (method SMS1).
- We validate applications relating to geographical numbers by means of combined bill checking and SMS authentication (method GEO2).
- We validate applications relating to 088 business numbers by reference to OPTA information (method OPT3).

Identification as part of the validation process

Before an ENUM domain can be registered to an applicant, it is necessary to verify that the applicant is also the legitimate user of the associated phone number. Furthermore, the registrar submitting the application to ENUM NL must have the permission of the prospective registrant to do so. Although identification is not formally part of the validation process, it makes sense to include an identity check in the validation process in situations where a single party is acting both as registrar and as validation agent. If an identity check is incorporated into the validation method, it is necessary to specify how the registrant, the number user and the identified person or business are to be associated.

If the check is to involve the provision of identity documentation, it is important that certain matters are specified in the description of the validation method. The business registers or forms of identification that are acceptable should be stipulated, as should the criteria governing the

acceptability of such documents (e.g. their recentness or validity), the particulars that are to be checked and what checks are to be made.

Revalidation

Revalidation is a process that has to be repeated at least once every six months to check that the registrant of an ENUM domain name is still the legitimate user of the corresponding e.164 phone number. Revalidation is essential for renewal of the ENUM registration.

The requirements that a revalidation procedure has to meet are less strict than those that an initial validation procedure has to meet. For example, a method based on a call-back or bill examination technique (possibly involving the examination of a single recent bill) is in principle sufficient for revalidation.

Implementation and review of the validation method

If ENUM NL is informed of an erroneous registration (e.g. a registration made in the name of someone who is not the legitimate number user, or made without the legitimate number user's permission), the cause has to be investigated. The findings of this investigation will determine whether the validation method in question is declared unacceptable for use by any validation agent, or whether the particular validation agent in question is required to modify its procedures.

A validation method can be reviewed only if a detailed description is available of both the methodology and its practical implementation. ENUM NL needs to be able to ascertain whether an erroneous validation and registration are the consequence of:

- a shortcoming in the validation method; or
- a shortcoming in the implementation of the validation method.

Example:
A description such as "the applicant's telephone bill is checked" is too imprecise to allow adequate review. It leaves the following questions unanswered:

- What information on the bill is checked?
- What is the information checked against?
- Are the checks performed manually or automatically?
- Which department/individuals perform the checks, or what software/systems are used?

By contrast, the following description would be acceptable:
'A copy of the applicant's telephone bill is checked by our Administration Department to verify that: a) the phone number given on the bill is the same as that specified in the application and listed for the applicant on line at www.detelefoongids.nl; and b) the name on the bill, in the application and in the on-line listing is exactly as stated on the identity document supplied by the applicant.'

In order that, in the event of an erroneous registration, it is possible to determine whether the cause may have been incorrect implementation of the validation method, ENUM NL recommends including a process description in the validation method definition. The process description might address questions such as the following:

- How is the validation process initiated? This question might be answered by a statement such as: "the client applies for an ENUM registration" or "we receive a digital validation request from our Administration Department".
- How is the information exchanged? Many descriptions begin with statements such as "we compare the data". Unfortunately, such a statement is insufficient; it is important to say exactly

what data are involved and how these data are collected. In other words, your description must specify how information is passed between systems, people or organisations in the context of the validation process and what the information consists of.

- What does the validation procedure involve? To answer this question, it is necessary to provide a work description; what action is undertaken at each stage of the process?

If validation is a component of another process, such as enrolment or registration, describe the relevant aspects of the other process as well. In many cases, ENUM will be provided as part of an integrated package of services (as with SMTP for e-mail), of which validation is one component. In such situations, the validation process is a sub process of something larger. It is important for ENUM NL to have sight of the bigger picture, insofar as it is relevant to the validation process.

Glossary

Number block
A consecutive series of numbers for use by a single party. For example, an organisation might have a series of numbers for assignment to individual personnel, which all begin with the same digits and are therefore recognisable as that organisation's numbers (e.g. 012 345678, 012 345679, 012 345680, etc). Under the Dutch number plan, both geographical numbers and 088 business numbers include number blocks consisting of 10, 100, 1,000 or 10,000 numbers.

DNS Delegation
A domain is the unique name of an Internet host. The registration of a domain is the contractual and administrative association of a registrant (and certain administrative data) with a particular domain name. Registration entitles the registrant to use the domain name for Internet addressing. Delegation entails the inclusion of the domain name in the zone of the authoritative name servers for the relevant top-level domain, with pointers to authoritative name servers for the particular domain name and all subordinate pointers.

E.164
E.164 is an ITU standard defining the international telecommunication number plans.
E.164 numbers contain up to fifteen digits with a "+" at the beginning, followed by the international dialling code for the country that the number belongs to. The "+" represents the international access code used in the caller's country. To call an (international) E.164 phone number from a landline, the caller first has to dial the international access code. This code differs depending on the country that the call originates from. From the Netherlands, the international access code is "00".

Geographical numbers
Geographical numbers are phone numbers that are linked to fixed phone lines (landlines) and include a dialling code that relates to a particular place or region (e.g. '030' for Utrecht and '0183' for the Arkel area).

Various distinct roles exist within the Public User ENUM system. These roles are described below in general terms; the descriptions do not attempt to detail what the actors do or to define the actors' rights and responsibilities. Furthermore, a single party may perform more than one role (a registrar may also be a DNS service provider, for example).

Registry
The registry manages the ENUM zone and the relevant country's authoritative name servers. The Netherlands' registry is ENUM NL, which manages the name servers for the 1.3.e164.arpa zone. The registry registers ENUM domain names within its domain, and enters delegations to the relevant zones in the DNS.

Registrar
A registrar submits ENUM domain registration applications to the registry on behalf of number users. The role of the ENUM registrar is similar to that played by registrars in the context of ccTLDs and gTLDs. Number users cannot register domains with the registry directly; all registrations have to go through a registrar.

Registrant
An ENUM registrant is the person or organisation to whom or to which an ENUM name is registered. The registrant decides where the domain name is registered (through which registrar and using which name servers) and what pointers (NAPTR records) are included in the zone file. The registrant of an ENUM domain must always be the corresponding phone number's user.

Number holder
A number holder is a party that, directly through OPTA, has control of a phone number or a block of numbers. The number (block) may be for the user's own use (e.g. 0900 numbers) or for assignment to a telephony service end user (e.g. a mobile or geographical phone number).

Number user
A number user is the person or organisation that has use of a phone number that is included in the Netherlands' number plan. An ENUM domain can be registered only to the corresponding phone number's user.

Validation agent
A validation agent is an organisation that verifies that the party applying to register an ENUM domain is indeed the corresponding phone number's user. Various parties may act as validation agents; validation does not have to be performed by one particular body. Various validation methods may be used, depending on the circumstances. A number holder may, for example, use an internal method to validate its own numbers, while applications from outside parties require validation by means of call-back or SMS verification.

DNS service provider
A DNS service provider manages the name servers for the ENUM DNS zones where the NAPTR records are located. There is a direct relationship between the DNS service provider and the registrant and registrar. The registrant will often delegate technical management of his/her ENUM zone to a DNS service provider.

When a registration application is made, the registrar has the task of checking whether the DNS service provider satisfies the technical requirements. In many cases, the registrar and the DNS service provider will be the same party; in other cases, the registrant and the DNS service provider will be the same party. Sometimes, however, the three will be separate parties.