

## **VALIDATION AND AUTHENTICATION**

This document is being released for consultation and UK ENUM Consortium Limited (UKEC) welcome comments to implement any changes that may be deemed necessary. It must be stressed that the document is the result of discussions taken place in the past by the UK ENUM Trial Group, the Interim Directors of UKEC and research on validation methods used by other ENUM agencies around the world.

First, a couple of definitions:

**Authentication:** The process of verifying the identity of a person (in the case of ENUM, this would be the Registrant)

**Validation:** The process of verifying that the Registrant has the right to use a particular geographic or mobile number corresponding to an ENUM domain.

It was initially thought UKEC would be open to being approached for accreditation by both Validation Agencies (VA) and Authentication Agencies (AA) interested in providing their services to ENUM registrants. However, UKEC believe Authentication is a normal part of doing business with customers and should be left entirely to Registrars. Instead, UKEC is keen on focusing solely on Validation (with no mention of Authentication), and thus falling in line with the IETF technical standard for a Validation Token.

This paper will thus only consider Validation and UKEC will only look at accrediting VA and not AA. UKEC will however, welcome comments by both VA and AA organisations during this consultation.

A VA may be an organisation that provides these solutions as their core business, or it may be a Telephone Service Provider, an Internet Service Provider, a Registrar (within the Tier1 ENUM registry structure) or even the Tier1 Registry itself.

It is recommended that the Validation and Authentication process is a combination of solutions, some of which are described in this document. Those described in this document are by no means an exhaustive list and UKEC is open to other methods of validation and authentication as long as the proposer explains them in detail.

There are two different types of Validation: 'Basic' and 'Trusted', dependent on the level of trust in the process.

Any results data (validation tokens, for example) from the validation process must meet the requirements of those of the Tier1 registry.

## **TYPES OF VALIDATION**

### **Trusted Validation**

The 'Trusted Validation' process must be regarded as the recommended mechanism to ensure that the registrant has the rights to register a certain number because it is seen as providing the additional benefit of Authentication that supplements the registrars own business practices.

A direct Telecommunications Service provider (TSP) service, the Directory Enquiries (DQ) database and the number portability process have been identified as potential 'trusted' data sources. However, they may not be the only 'trusted data sources' as other industry processes may be used.

Although the UK ENUM industry has yet to even reach its infancy, it is envisaged that 'Trusted Validation' may enable additional services (ENUM Applications), such as digital certificates to be issued for uses such as trusted SIP caller ID and secure personal identification perhaps using the ENUM system as a directory for Public Key Infrastructure (PKI) services. UKEC is not making any comment or judgements on this, merely predicting how Trusted Validation may aid in the future.

It must be noted that at this present time, there is no way of telling the Tier 1 Registry the difference between Trusted and Basic Validation as there is nothing within the Validation Token to record the difference.

### **Basic Validation**

When a user number can not be validated using the 'trusted' authentication method, either because their number is not in the DQ or their TSP is not participating in ENUM, then a user should still have the right to register a number using a 'basic' validation mechanism. By implication the basic process may use alternate, less rigorous, validation methods that do not rely on validating and authenticating against TSP data, for example, CLI (Caller Line Identification) and PIN.

There is no reason to oblige a TSP to participate in ENUM as VA. If a TSP feels they must ensure their customer numbers are adequately protected against misuse then participation in the ENUM validation process, either directly or indirectly via an appointed agent, would ensure a 'trusted' validation method is followed. If however, a TSP is not convinced of the need to participate then their customers are not discriminated against in that they can still register albeit using a 'basic' validation method.

It should be noted that if a TSP decides to participate in the trusted validation process, the TSP has to provide validation data and service at a reasonable cost in order to allow the ENUM registrant to successfully validate and authenticate the number without undue

costs. It will be the responsibility of the Policy Advisory Group (falling within the UKEC Governance structure) to monitor and ensure TSPs, and any other source of trusted data required for validation and authentication, provide their services and data at a reasonable cost and do not act in a way that may negatively affect the services offered by the VA. The VA is ultimately responsible for validation.

The VA may need to rely on information and data provided by an Electronic Communications Service Provider (ECSP), Registrars and other sources in order to perform its tasks. It has to offer its services in a competitive, open and transparent way.

### **SEPARATE VALIDATION SOLUTIONS**

The following are proposed, although by no means are exhaustive solutions. Other Validation solutions that may be proposed by any potential Validation Agency (VA) or any other body (for example during the consultation period) will be scrutinized by UKEC and if it is decided to be a valid solution may be incorporated into this (validation and authentication process) documentation.

#### **Use of paper documentation (Basic):**

In order to validate a number, the ENUM registrant is requested to send a recent paper copy of the telephone bill to prove that they have the right to use a number. In order to be sure that the telephone bill has not been forged, the VA should try to ring the number to be sure that the number is still active and assigned to the registrant (in the case of a mobile number, the check could also be done by sending a SMS).

This solution has the disadvantage of requiring an exchange of paper documentation and some (manual) interactions between VA and ENUM registrant. There is also a data protection and security issue. The holding of paper copies of bills may also be an issue.

#### **Use of DQ database (Trusted):**

The right for a user to register an E164 number is validated by checking the associated numbers/user names in the DQ database. This solution has the advantage of using an already publicly available service. The clear disadvantage of this solution is that only a portion of UK numbers are listed in the DQ system (40% of UK numbers are ex-directory and only a small percentage of mobile numbers are listed) and for some type of numbers like DDI there is not an accurate match between number and user name.

Example use of DQ Database

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The VA software sends Name, Address and Postcode to the DQ database. If the resulting phone number matches that supplied by the registrant, then a valid response is returned.

e.g.

Name: Joe, Bloggs

Address: 10 Nowhere Road, Endsville, Surrey, KT1 1AA

If

DQ (Name, Address) = Customer Submitted Telephone Number:  
Then Validate Response

This is not as strong as TSP Participation as the data requested is not as precise and DQ databases can be spoofed. If a VA were to choose the DQ route to validate a Registrant's details there are now a number of Directory Enquiries companies offering services using the number range 118 XXX. However it will be the responsibility of the VA to ensure that they meet the appropriate Commercial usage Terms and Conditions of the DQ service.

We are unaware of any automated link for queries into any of the DQ companies. If the validation and registration process is to be quick and low cost an automated link should be investigated with the individual 118 companies. The database that provides the raw data to the 118 companies is known as OSIS and is provided through a licensing scheme to the 118 companies. If a VA required a link into the OSIS database then a license would certainly be necessary.

### **Pin Code Validation (Basic & Trusted):**

Dependent on the type of number (i.e. Voice, Fax, Mobile) being validated a pin code is communicated to the number within an agreed time period (it could be possible for the Registrant to request this to happen within office hours or later).

In the case of a mobile or fax number this is trivial, with a voice number it would be expected that an automated announcement could be used (note: it may be possible to make the customer dial a specific number and validate on a reversed pin code and inbound caller ID to speed up the process. This may be useful if the DQ check is used but does involve extra security risks).

In the case of a DDI range, this Pin Code will be sent for use with the first and last numbers within the range for registration. Note that this may require configuration of Customer Equipment to ensure these numbers are mapped to a service or select the Presentation Number to be used when calling to a specific number. If this fails the number assignment cannot be validated in a basic way and ENUM registration cannot take place.

Pin Code Validation Example:

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Data Sent for;

Normal Landline:

Name: Joe Bloggs

Address: 10 Nowhere Road, Endsville, Surrey, KT1 1AA

Validation: CC Match

RegNo1: +441234000111

RegNo1\_Type: Voice

RegNo1\_Time: Evening

AuthType: Trusted

Mobile Number:

Name: Joe, Bloggs

Address: 10 Nowhere Road, Endsville, Surrey, KT1 1AA

Validation: CC Match

RegNo1: +4477701234567

RegNo1\_Type: SMS

RegNo1\_Time: Any

AuthType: Basic

Business DDi Range (block of 40):

Name: Bloggs Limited

Address: Unit A, Endsville Business Park, Endsville, Surrey, KT1 1AA

Validation: Invoice - Utility Bill

RegNo1: +441234000000

RegNo1\_Type: Voice

RegNo1\_Time: Any

RegNo2: +441234000039

RegNo2: Fax

RegNo2\_Time: Day

AuthType: Trusted

## **SUMMARY**

A number of solutions exist to enable validation of an ENUM registration. As there is no universal service obligation not all solutions are considered to be 'trusted'. However, in the absence of a trusted solution basic solutions should be acceptable.

- All the combined Verification (and Authentication) solutions are considered to be 'trusted': Direct query to a TSP
- Hook into number portability or other industry process

The separate Authentication solutions are to be categorised as follows:

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- Send pin/password to address – trusted
- Credit card – trusted
- Paper documentation – basic

The separate Validation solutions are to be categorised as follows:

- Paper documentation – basic
- Query to DQ – trusted
- Pin code - basic