

eduCONF / NRENum.net Survey

Pre-analysis

Objectives

- Identify a set of policies recommendations that can help solving the issues as follows:
 1. Management of virtual numbers
 2. Integration of virtual numbers into NRENum.net tree populated by valid E.164 numbers;
 3. Definition of implementation options and technical parameters on a consensus basis
 4. Number delegation to transnational organizations/projects that are:
 1. not affiliated with academic community or
 2. not representing a particular country

Glossary

- **Virtual numbers:** PSTN-like telephone numbers that are not assigned to end-users by (national) authority, but chosen deliberately by local administrators of communication infrastructures (such as Videoconferencing, VoIP). Only exist in the Internet context, not valid, visible and accessible from traditional PSTN networks.
- **Transnational Organizations/Projects:** Organizations or projects serving global communities across nations (not representing a particular country). Examples: GÉANT, Polycom, Microsoft, Google, Skype, Cisco, ...
- **Number/block delegation:** Technical process of assigning country codes to national registries (by NRENum.net) or number blocks under country codes to end users.
- **Number/block registration:** Technical process of configuring DNS and populating it with the appropriate ENUM records (adding NAPTR to DNS) via registrars.

The responses

- 23 responses all together
- 3 universities and 1 'other'
- 19 NRENs
 - 6 NRENs are new to ENUM (or not very keen...)
 - 13 NRENs provide ENUM-based services (considered as the CORE group)
- The survey covers 80% of the current NRENum.net service participants

Who responded the survey

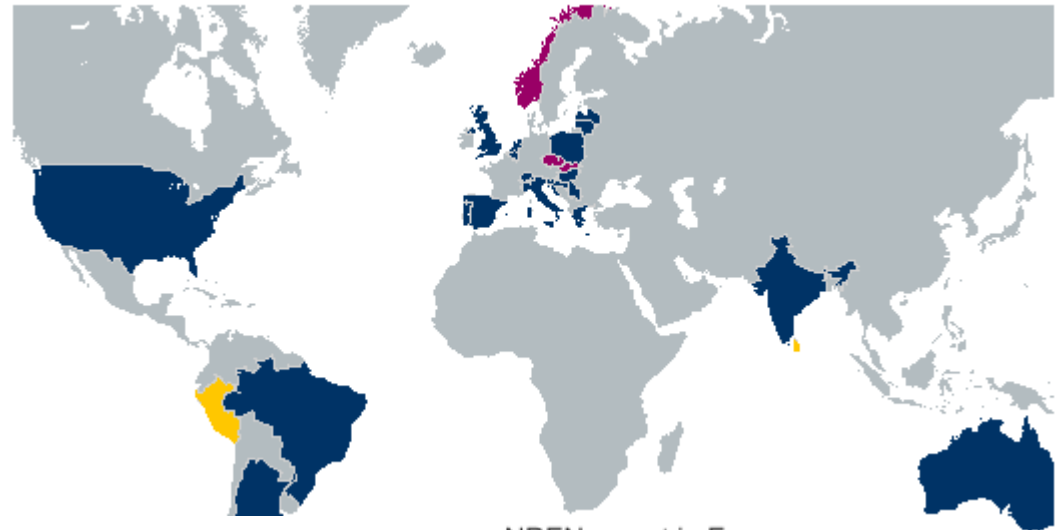
Responses received:

Romania	NREN
Brazil	NREN
Belgium	NREN
France	NREN
Czech Republic	NREN
Australia	NREN
Croatia	NREN
Netherlands	NREN
Italy	NREN
Switzerland	NREN
Serbia	NREN
UK	NREN
Portugal	NREN
Hungary	NREN
Greece	NREN
Poland	NREN
Spain	NREN
Germany	NREN
Slovenia	NREN

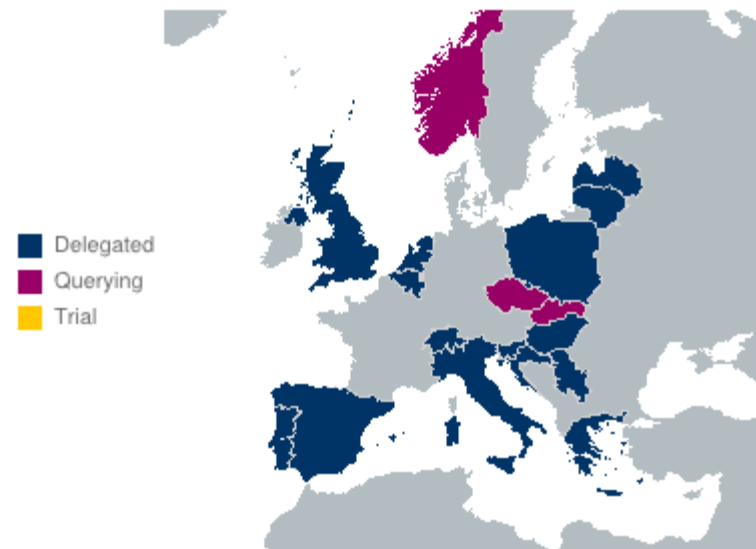
Switzerland	entrepreneur / consulting
Norway	University
Greece	University
Lithuania	University

Good representation of the NRENum.net service participants

NRENum.net participants



NRENum.net in Europe



■ Delegated
■ Querying
■ Trial

ENUM Service

- Services provided:
 - VC only (8)
 - VC and VoIP (11)
- Do you provide services based on ENUM protocol:
 - No (6)
 - Yes (13)

ENUM Services Tree

Provide some information about the trees that you populate and query.

- Which tree(s) do you populate?
 - NRENum.net (11)
 - e164.arpa (1)
 - Both (1)

- Which tree(s) do you query?
 - NRENum.net (4)
 - Both (9)

Current Practice

Please give us some information about the current policy (or practice) that you apply, and services that you provide within your constituency.

- What kinds of NAPTR records are used in your ENUM delegation?
 - SIP only (5)
 - SIP and H323 (8)
- Who performs the registration of E.164 numbers/blocks to the ENUM tree?
 - NREN (8)
 - University (4)
 - Both (1)
- How the registration of E.164 numbers/blocks is technically performed?
 - manually (in the configuration text file) (8)
 - semi-automatically (using database and scripts) (5)
- Do you accept registration of virtual numbers under your NRENum.net delegation?
 - Yes (4)
 - No (8)

Virtual Numbers

A "virtual number" is a PSTN-like telephone numbers that are not assigned to end-users by (national) authority, but chosen deliberately by local administrators of communication infrastructures (such as Videoconferencing, VoIP). Only exist in the Internet context, not valid, visible and accessible from traditional PSTN networks.

- Do you or your users already use virtual numbers in the communication infrastructure (Videoconferencing, VoIP, other)?
 - Yes (12)
 - No (5)
 - Dunno (2)

- Do you or your users are willing to use virtual numbers in the communication infrastructure?
 - Yes (9)
 - No (3) – Australia, Czech Republic, France
 - Dunno (7)

Management of virtual numbers in NRENum.net

Managing virtual numbers is becoming an issue if you or your users are assigning invalid E.164 numbers to terminals because of PSTN number shortage or the simplicity of short numbers. This section deals with the handling of virtual numbers.

- Where do you think virtual numbers should be populated under?
 - In a separate ENUM tree, dedicated only to virtual numbers (3)
 - Inside the existing NRENum.net tree (12)
 - Others (4)
 - any option that doesn't obviously clash with PSTN plans
 - still open, needs to be discussed
 - both options create confusion for the end user
 - don't care

Management of virtual numbers in NRENum.net

Managing virtual numbers is becoming an issue if you or your users are assigning invalid E.164 numbers to terminals because of PSTN number shortage or the simplicity of short numbers. This section deals with the handling of virtual numbers.

- Assuming that the NRENum.net tree will be used to populate virtual numbers, where do you think virtual numbers should be delegated?
 - Inside each national dialling plan; a non-clashing virtual “area code” prefixes should be selected (16)
 - No strong feelings
 - Inside each national dialling plan; using a prefix digit not used in the national dial plan (1XXX, in Brazil) for each area code.
 - Outside the national dialling plans; a globally unique, worldwide virtual “country code” prefix should be selected, Inside each national dialling plan; a non-clashing virtual “area code” prefixes should be selected (2)
 - Extension to full length number (1)

Technical implementation options

Consider the following scenarios (even if it's not your preference) and choose the option that matches best your view on the issue.

Scenario 1: Separate ENUM tree

- What do you think the domain of the separate virtual NRENum tree should be?
 - don't care, but under "nrenum.net" root tree (17)
 - v.nrenum.net (2)
 - virtual.nrenum.net (1)
 - don't know, should be discussed (2)
- To access the virtual NRENum tree, should users dial a specific selector?
 - No (note that the separate NRENum tree must be added to all configurations) (13)
 - Yes (note that call routers must be aware of this selector and query the specific tree) (6)

Scenario 2a: Worldwide virtual country code prefix

For instance, +36 is the worldwide prefix of Hungary, +351 is the worldwide prefix of Portugal, +xxx could be the worldwide prefix of virtual numbers.

- How do you think a worldwide virtual country code prefix should be selected?
 - Must be ITU-T assigned to TERENA (11)
 - Must be ITU-T assigned, although it can be shared with other projects/initiatives (even if commercial) (2)
 - Take one now, but it must be an unused/reserved ITU-T country code in order to pursue possible future integration (5)
 - I don't care, make it available ASAP! (1)
- How do you think the virtual number delegation under the worldwide prefix should be managed?
 - Each organisations (primarily NRENs) apply for a sufficient block of numbers under the worldwide prefix that is centrally administered as a flat numbering scheme (12)
 - NRENs assume de-facto control over ITU-T country codes and reproduce the hierarchy of country codes (6)

Scenario 2b: Virtual Prefix under the National Dialling Plans

For instance, +351 is the prefix for Portugal, +351xxx could be a prefix for virtual numbers within Portugal.

- Please, express your view on the possibility of creating such a prefix (i.e. sandbox) within your national dialling plan.
 - I'm using a virtual prefix already and I may continue to use it in this scenario (8)
 - Yes, I can create a virtualprefix without any problem. It is a matter of days/weeks. (6)
 - Yes, I cancreate a virtual prefix, but it has to be validated outside my NREN by an external body. Its a matter of months (2)
 - **No! I can't create a "virtual number prefix" within my country code (3) – France, Australia, Portugal**

Scenario 2c: Virtual Suffix under the National Dialling Plans

Virtual numbers can also be created by adding extra digits to valid PSTN numbers under the national dialling plan. For instance, +351<valid E.164 number>XXX could be a virtual number in Portugal.

- Please, express your view on the possibility of creating such a long virtual numbers within your national dialling plan.
 - I think this solution is not viable (10)
 - I foresee some issues, but I'm, in general, in favor (6)
 - I can handle those long virtual numbers, no problem (3)

Delegation to transnational organizations/projects

Assume that a transnational organization/project with a private (virtual) numbering/dialling plan wants to be delegated to the NRENum.net tree.

- What do you think about the integration of virtual numbers used by transnational organizations/projects?
 - Possible, must be coordinated by TERENA (11)
 - Possible, must be coordinated by registrars (NRENs) (7)
 - Not possible (1) – Australia
- How transnational organisations/projects should register their virtual numbers?
 - inside the particular country (each set of terminals in a country should be registered within that national dialling plan) (10)
 - inside the organisation's legal country (hosting the whole dial plan under one country, even if terminals are not within that particular country) (6)
 - in the top level domain (whole dial plan assigned to a separate virtual country code prefix) (3)

Pilot implementation options

In order to gain practical experiences with virtual number delegation, it is important to pilot some implementation options in a close-to-production environment.

- During the pilot period I'm willing to take the following actions, if recommended (Y/N)
 - Enable ENUM lookup of virtual numbers by adding the separate virtual tree agreed to the configurations (v.nrenum.net) (14/5)
 - Accept the policy that the pilot recommends and respond to queries coming from the worldwide virtual country code prefix agreed (+xxx) (14/5)
 - Accept the policy that the pilot recommends and respond to queries coming from virtual prefixes agreed under the national dialling plans (+351xx) (15/4)

Numbering Plan

