IANA Registration for an Enumservice
Containing Number Portability and PSTN Signaling Information
draft-livingood-shockey-enum-npd-00

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Abstract

This document registers the Enumservice Æ‘npdÆ¶ and subtype Æ‘telÆ¶ using the URI scheme Æ‘telÆ¶ as per the IANA registration process defined in the ENUM specification, RFC 3761. This data is used to facilitate the routing of telephone calls in those countries where Number Portability exists.
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1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
document are to be interpreted as described in BCP 14, RFC-2119 [1].

2. Introduction

ENUM (E.164 Number Mapping, RFC 3761 [1]) is a system that transforms
E.164 numbers (The International Public Telecommunication Number
Plan, ITU-T Recommendation E.164 [2]) into domain names and then uses
DNS (Domain Name Service, RFC 1034 [3]) delegation through NS records
and NAPTR records (Dynamic Delegation Discovery System (DDDS) Part
Three: The Domain Name System (DNS) Database, RFC 3403 [4]) to look
up what services are available for a specific domain name.

This document registers Enumservices according to the guidelines
given in RFC 3761 [1] to be used for provisioning in the services
field of a NAPTR [4] resource record to indicate the type of
functionality associated with an end point and/or telephone number.
The registration is defined within the DDDS (Dynamic Delegation
Discovery System [4][5][6][7][8]) hierarchy, for use with the "E2U"
DDDS Application defined in RFC 3761.

Number portability (NP) allows telephone subscribers to keep their
telephone numbers when they change service provider, move to a new
location, or change the subscribed services [14]. In many counties,
such as the United States and Canada, the functions of naming and
addressing on the PSTN have been abstracted. The dialed directory
number is not routable on the PSTN and must be translated into a routing number for call completion.

The following Enumservice is registered with this document: "npd" to indicate number portability data. The purpose of this Enumservice is to describe information about telephone numbers which cannot be used on the public Internet or a private/peered Internet Protocol (IP) network. Thus, these are numbers which are only reachable via the traditional Public Switched Telephone Network (PSTN).

This Enumservice could enable carriers, as well as other service providers and users, to place ported, pooled, and blocks of numbers and their associated PSTN contact information, into ENUM databases, using standardized, non-proprietary methods. This, in turn, could enable such parties to consolidate all telephone number lookups in their networks into a single ENUM lookup, thereby simplifying call routing and network operations, which would then result in either an on-net, or IP-based response, or off-net, or PSTN-based response. It is conceivable that being able to query for this information in ENUM could significantly reduce or eliminate the need for these parties to maintain traditional, SS7/TCAP/SIGTRAN-based query gateways, applications, and protocols in their networks.

The service parameters defined in RFC 3761 dictate that a "type" and a "subtype" should be specified. Within this set of specifications the convention is assumed that the "type" (being the more generic term) defines the service and the "subtype" defines the URI scheme.

When only one URI scheme is associated with a given service, it should be assumed that an additional URI scheme to be used with this service may be added at a later time. Thus, the subtype is needed to identify the specific Enumservice intended.

In this document, there is one URI scheme specified, 'tel:', as specified in RFC 3966 [9], and as further specified with number portability data in draft-ietf-iptel-tel-np-06.txt [10] (Internet-Draft New Parameters for the "tel" URI to Support Number Portability, draft-ietf-iptel-tel-np-06.txt [10]).

3. ENUM Service Registration for NPD

Enumservice Name: "npd"

Enumservice Type: "npd"

Enumservice Subtype: "tel"

URI Scheme: 'tel:'
Functional Specification:

This Enumservice indicates that the remote resource identified can be addressed by the associated URI scheme in order to initiate a telecommunication session, which may include two-way voice or other communications, to the PSTN.

Security Considerations: See Section 5.

Intended Usage: COMMON

Authors:

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Any other information the author deems interesting:

None

4. Examples

The following sub-sections document several examples for illustrative purposes. These examples shall in no way limit the various forms that this Enumservice may take.

4.1 Example of a Ported Telephone Number

$ORIGIN 3.1.8.7.1.8.9.5.1.2.1.e164.arpa.
NAPTR 10 100 "u" "E2U+npd:tel"
"!^.*$!tel:+1-215-981-7813;rn=+1-215-981-7600;npdi!"

In this example, a Routing Number (rn) and a Number Portability Dip Indicator (npdi) are used as shown in draft-ietf-iptel-tel-np-06.txt [10] (Internet-Draft New Parameters for the "tel" URI to Support Number Portability, draft-ietf-iptel-tel-np-06.txt [10]). The npdi field is included in order to prevent subsequent lookups in legacy-style PSTN databases.

4.2 Example of a Non-Ported Telephone Number

$ORIGIN 3.1.8.7.1.8.9.5.1.2.1.e164.arpa.
NAPTR 10 100 "u" "E2U+npd:tel"
"!^.*$!tel:+1-215-981-7813;npdi!"

In this example, a Number Portability Dip Indicator (npdi) is used [10]. The npdi field is included in order to prevent subsequent lookups in legacy-style PSTN databases.
5. Security Considerations

DNS, as used by ENUM, is a global, distributed database. Thus any information stored there is visible to anyone anonymously. While this is not qualitatively different from publication in a Telephone Directory, it does open or ease access to such data without any indication that such data has been accessed or by whom it has been accessed.

Such data harvesting by third parties is often used to generate lists of targets for unsolicited information. Thus, a third party could use this to generate a list that they can use to make unsolicited "telemarketing" phone calls. Many countries have do-not-call registries or other legal or regulatory mechanisms in place to deal with such abuses.

Carriers, service providers, and other users may simply choose not to publish such information in the public E164.ARPA tree, but may instead simply publish this in their internal ENUM routing database which is only able to be queried by trusted elements of their network, such as softswitches and SIP proxy servers.

Although an E.164 telephone number does not appear to reveal as much identity information about a user as a name in the format username@hostname (e.g., an email or SIP address), the information is still publicly available, thus there is still the risk of unwanted communication.

An analysis of threats specific to the dependence of ENUM on the DNS and the applicability of DNSSEC [12] to this is provided in RFC 3761 [1]. A thorough analysis of threats to the DNS itself is covered in RFC 3833 [13].

DNS does not make any policy decisions about the records that it shares with an inquirer. All DNS records must be assumed to be available to all inquirers at all times. The information provided within an ENUM NAPTR resource record must therefore be considered to be open to the public, unless otherwise secured through split-DNS or some other method, which is a cause for some privacy considerations.

6. IANA Considerations

This document registers the ‘npd’ Enumservice and the subtype Ä¸telÃ¶ under the Enumservice registry described in the IANA considerations in RFC 3761. Details of this registration are provided in sections 3 and 4 of this document.

7. Acknowledgements
The authors wish to thank Tom Creighton, Jason Gaedtke, Jaime Jimenez, and Chris Kennedy from Comcast Cable, Jonathan Rosenberg from Cisco, and James Yu from NeuStar, for their helpful discussion on this topic.

8. References

8.1 Normative References


8.2 Informative References


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