



Number Verification

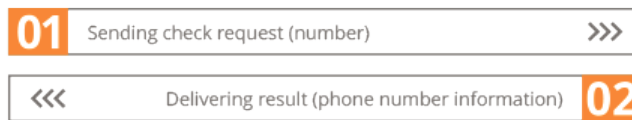
Protocol: ENUM

Interface information

tyntec's Global Number Verification minimizes message loss and unsuccessful call attempts with real-time phone number verification, providing key information on your users' phone number, such as subscriber status and roaming data.

Global Number Verification is available with the ENUM API, which is a protocol that uses the Internet DNS system to translate E.164 (i.e. ordinary) telephone numbers into IP addresses. It is based on UDP communication by default, which in general means that there's no guaranteed package delivery.

Here is the overview of the workflow for querying phone number information:



Here are a few specifics of the ENUM API:

- No username or password has to be transmitted.
- The authentication is based on your IP. We recommend a VPN connection to increase the connection security.
- There is no unique identifier (like the message ID used by other tyntec products). The identification of individual queries is based on the phone number queried, the IP the query came from and the query timestamp.
- tyntec can customize the maximum time used before a result is returned (timeout parameter). If tyntec does not get a response within this timeframe, you will get an error response.

Connection steps

Communication parameters

The following are the parameters for the UDP communication:

- The record type is NAPTR
- The domain is e164.arpa

The IP and the port can be found in the Products section in my tyntec

The most important parameters for each request are the unique id, which is used as the reference for the response, and the MSISDN that is queried. The MSISDN needs to be transformed using the following steps:

1. Check that the E.164 number is written in its full form, including the country code. Example: +1-51-45868291
2. Remove all non-digit characters, with the exception of the leading '+'. Example: +15145868291
3. Remove all characters, with the exception of the digits. Example: 15145868291
4. Put dots (",") between each digit. Example: 1.5.1.4.5.8.6.8.2.9.1
5. Reverse the order of the digits. Example: 1.9.2.8.6.8.5.4.1.5.1
6. Append the string ".e164.arpa" to the end. Example: 1.9.2.8.6.8.5.4.1.5.1.e164.arpa .

An example for such a request can be sent using e.g. the dig command:

```
dig @78.110.226.74 IN NAPTR 1.9.2.8.6.8.5.4.1.5.1.e164.arpa
```

The result would look like this:

```
;; ->>HEADER<<- opcode="" query="" status="" noerror="" id="" 43692="" flags="" rd="" qd="" 1="" an="" 0="" au="" ad="" questions="" 9="" 2="" 8="" 6="" 5="" 4="" e164="" arpa="" type="NAPTR," class="IN" answers="" authority="" records="" additional="" pre=""><!-->
```

Successful query

If the query is successful, a NAPTR record will be returned, with the result being in the answer-section as a tel URI in the format tel:+msisdn. The ENUM protocol permits maximum 255 bytes in the ANSWER section. If the Global Number Verification response contains more information than can fit in 255 bytes, it will use two ANSWER sections.

The following is an example of a successful response:

```
1.9.2.8.6.8.5.4.1.5.1.e164.arpa. 60 IN NAPTR 10 100 "u" "E2U+tel" "!^.*!tel:+15145868291;nrh_mcc=11;nrh_mnc=103;nrh_c=USA;nrh_ttid=4345;hrl_mcc=11;hrl_mnc=103;hrl_c=USA;hrl_ttid=4345;imsi_mcc=11;imsi_mnc=103;imsi_c=USA;imsi_ttid=4345;msc_mcc=11;msc_mnc=103;msc_c=USA;msc_ttid=4345;port=0;roam=0;pres=1;e=0!"
```

Here is the explanation of the parameters:

- nrh_mcc: Number Range Holder Mobile Country Code
- nrh_mnc: Number Range Holder Mobile Network Code
- nrh_c: Number Range Holder Mobile Network Code

- nrh_ttid: Number Range Holder operator ID
- hlr_mcc: Subscription network Mobile Country Code (based on answering HLR)
- hlr_mnc: Subscription network Mobile Network Code (based on answering HLR)
- hlr_c: Subscription network country (based on answering HLR)
- hlr_ttid: Subscription network operator ID (based on answering HLR)
- imsi_mcc: Subscription network Mobile Country Code (based on IMSI)
- imsi_mnc: Subscription network Mobile Network Code (based on IMSI)
- imsi_c: Subscription network country (based on IMSI)
- imsi_ttid: Subscription network operator ID (based on IMSI)
- msc_mcc: Servicing (roaming) network Mobile Country Code
- msc_mnc: Servicing (roaming) network Mobile Network Code
- msc_c: Servicing (roaming) network country
- msc_ttid: Servicing (roaming) network operator ID
- port: porting flag (0 = number not ported; 1 = number ported; 2 = porting status unknown)
- roam: roaming flag (0 = number not roaming; 1 = number roaming; 2 = roaming status unknown)
- pres: presence flag (0 = handset turned off, 1 = handset turned on; 2 = presence status unknown)
- e: SS7 network error code. A value different than zero does not indicate a failed query. The error code parameter can be interpreted according to the error code documentation that tyntec provides.

Unsuccessful query

If the system is unable to return a result for the query, a NAPTR record will not be returned. Instead, the request will be returned with an error code in the status element that is returned, e.g.:

```
;; ->>HEADER<<- opcode: QUERY, status: NOTZONE, id: 43692
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 0
;; WARNING: recursion requested but not available
;; QUESTION SECTION:
;1.9.2.8.6.8.5.4.1.5.1.e164.arpa. IN NAPTR
;; Query time: 352 msec
```

There are cases in which no result can be returned. The following list shows these cases, accompanied by the returned status:

- The MSISDN format is invalid: REFUSED
- The request could not be authenticated: NOTAUTH
- The number does not exist or is not a callable MSISDN (e.g. it is a Global Title): NOTZONE
- The request could not be processed in time: BADTIME

Features

Feature	Activation	Functionality
Multiple ENUM accounts	Default	<p>ENUM is not using a username/password combination for authentication. Therefore, using multiple ENUM services requires a special query format.</p> <p>Option 1: You have one ENUM account for Global Number Portability and another one for Global Number Verification. The format is .gnp.e164.arpa and .gnv.e164.arpa respectively.</p> <p>Example Global Number Portability: 1.9.2.8.6.8.5.4.1.5.1.gnp.e164.arpa</p> <p>Example Global Number Verification: 1.9.2.8.6.8.5.4.1.5.1.gnv.e164.arpa</p> <p>Option 2: You have several ENUM accounts for Global Number Portability and / or several for Global Number Verification. The format is <account_name>.e164.arpa. You can get the account_name from your Business Center account.</p> <p>Example Global Number Portability: 1.9.2.8.6.8.5.4.1.5.1.account12345.e164.arpa</p>
Result Adjustment	On request	<p>tyntec is able to adjust the results by adding an additional 0 when the query gives out a 5-digit result, and therefore have only 6-digit results.</p>