# DATAFON LIMITED
# NUMBER LOOKUP – TECHNICAL PRODUCT DESCRIPTION

DECEMBER 2024
VERSION A.04

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# 1- Introduction

## 1.1- About Datafon

Datafon are a provider of data, intelligence and analytics, helping customers find extra value from the information they hold. Our team of technology and telecommunications specialists has a proven track record empowering companies, brands and agencies around the world to better understand their businesses and their customers.

Datafon has a suite of technology and telecommunications data available, for further information, please visit www.datafon.co.uk or email info@datafon.co.uk

## 1.2- Number Lookup Services

Datafon provide Lookup services to determine the status and validity of any mobile phone number from anywhere in the world.

We currently offer the following Number Lookup related services:

1. Mobile Number Portability (MNP) Lookups
2. Home Location Register (HLR) Lookups

The scope and technical specifications for these services are discussed in the following sections.

# 2- Mobile Number Portability (MNP) Lookup Service

## 2.1- Supported Protocols

At the time of writing, the ENUM protocol is offered as Datafon's standard communication protocol for Number Portability services. The HTTP and HTTPS protocols may be supported as required.

The parameters for communication are:

Record-Type: NAPTR
Domain: api.2datafon.co.uk
IPs for the service: To be provided during provisioning, referred below as DFIP
Port: 5353

## 2.2- ENUM Query format

### With / Without Host Names

ENUM resolution operates much like reverse DNS lookup. To perform the lookup, the E.164 number needs to be transformed as follows:

Remove non-numeric characters such as spaces, +, dashes, etc. (e.g. number "+40 766-610060" should be transformed to "40766610060").

Reverse the digits and add a dot between every digit (e.g. 40766610060 becomes 0.6.0.0.1.6.6.6.7.0.4)

Add suffix domain *e164.arpa* (e.g. the number now becomes 0.6.0.0.1.6.6.6.7.0.4.e164.arpa

After transforming the number, perform a DNS lookup looking for NAPTR records:

```
# dig @DFIP -p 5353 0.6.0.0.1.6.6.6.7.0.4.e164.arpa IN NAPTR

; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 18515
;; flags: qr; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
; 0.6.0.0.1.6.6.6.7.0.4.e164.arpa. IN NAPTR
```

## 2.3- ENUM response

A successful query will return a NAPTR Record with a tel-uri in the format tel:+msisdn.

Example:

;; ANSWER SECTION:
0.6.0.0.1.6.6.6.7.0.4.e164.arpa. 864000 IN NAPTR 100 10 "U" "E2U+pstn:tel"
"!^(.*)$!country=null\;operator=null\;mcc=604\;mnc=001\;ported=false\;err=0!" .

;; Query time: 3 msec
;; SERVER: DFIP#5353(DFIP)
;; WHEN: Thu May 4 15:04:56 2023
;; MSG SIZE rcvd: 187

The parameters returned are based on RFC4694 (https://tools.ietf.org/html/rfc4694):
tel – the original number queried
npdi – NP Database Dip Indicator (indicates to any downstream systems a portability lookup has been performed)
rn – Routing Number (LRN for USA/Canada)
cic – Carrier Identification Code
cc – Country Code
cn – Carrier short name
nt – Number type (mobile/fixed)
mcc – MCC of the network (if mobile nt)
mnc – MNC of the network (if mobile nt)
ported – Whether the number has been ported or not

## 2.4- Unsuccessful query response

Unsuccessful queries will be responded to with status NXDOMAIN and a blank answer section.

Example:
# dig @62.67.222.167 -p 5353 0.6.0.0.1.6.6.6.7.0.4.e164.arpa IN NAPTR

; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 18515
;; flags: qr; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
; 0.6.0.0.1.6.6.6.7.0.4.e164.arpa. IN NAPTR

;; ANSWER SECTION:
0.6.0.0.1.6.6.6.7.0.4.e164.arpa. 864000 IN NAPTR 100 10 "U" "E2U+pstn:tel"
"!^(.*)$!country=null\;operator=null\;mcc=604\;mnc=001\;ported=false\;err=3!" .

;; Query time: 3 msec
;; SERVER: DFIP#5353(DFIP)
;; WHEN: Thu May 4 15:04:56 2023
;; MSG SIZE rcvd: 187

## 2.5- Response Code Definitions

- Response Code “0” – OK – No error
- Response Code “-1” – No MCCMNC found for the requested destination address
- Response Code ‘’-2’’ – Unidentified Prefix
- Response Code “-3” – No valid MCCMNC found for the requested destination address or no translation rule is found for the returned error code/status
- Response Code “-4” or “-6” or “-7” – System timeout
- Response Code “-5” – The number specified is blacklisted

# 3 – HTTP response

## 3.1- Supported Protocols

At the time of writing, the The HTTP and HTTPS protocols are offered as Datafon's standard communication protocol for Number Lookup services.

The parameters for communication are:

Record-Type: HTTP POST
Domain: mnp.datafon.datafon.co.uk
Credentials: To be provided during provisioning (a Username and Password)

## 3.2- HTTP Lookup Query format

The request can be raised using either the http and https protocols in the following syntax:

"protocol"://mnp.datafon.datafon.co.uk/hlr/mccmnc_request?login="username"&password="password"&dnis="number"

This syntax can be understood as:

- Protocol: The http or https protocol as preferred
- Username: The username provided to you by Datafon for the use of this service
- Password: The password provided to you by Datafon for the use of this service
- DNIS: The number to be queried*

**Remove non-numeric characters such as spaces, +, dashes, etc. (e.g. number "+40 766-610060" should be transformed to "40766610060").*

An example Lookup request would be:

https://mnp.datafon.datafon.co.uk/hlr/mccmnc_request?login=acmecorp&password=letmein&dnis=40766610060

## 3.3- HTTP response

A successful query will return a response in the following format:

Example:

{"mccmnc":"60401","result":0,"ported":0,"dnis":"40766610060","login":" acmecorp"}

This syntax can be understood as:

"mccmnc": returned 6-digit MCCMNC
"result": shows if the result is successful (0 – yes, other values - no)
"ported": shows if the number is ported (0 - no, 1 - yes)
“dnis”: the number queried
“login”: the username used to raise the lookup request

**Please note ‘0’ means the result was successful.**

## 3.4- Unsuccessful query response

A unsuccessful query will return a response in the following format:

NOTE: A response does not contain an MCCMNC:
{
"result": -1,
"ported": 0,
"dnis":"12345678910",
"login": "login",
"message": ..
}

**Please note ‘-1’ means the result was unsuccessful.**

## 3.5- Response Code Definitions

The following values can be returned for an unsuccessful response:
"result" : -1 - No MCCMNC found for the requested destination address
"result" : -3 - No valid MCCMNC found for the requested destination address or no translation rule is found for the returned error code/status
"result" : -4; -6; -7 – System timeout
"result" : -5 – the number is blacklisted

message: contains extended information in regard to the requested number

# 4- Customer Support – Service Level Agreement

## 4.1- Hours of Operation and Contact Information

| | Supplier Customer Support Services |
|---|---|
| **Hours of Operation** | 24/7 |
| | 7*24*365 |
| **Email Address** | support@datafon.co.uk |

## 4.2- Fault Resolution Time

The time of Datafon's initial response to the Customer's request for the Technical Support services and the deadline for settling the request depend on the type of the request. The full list of all possible request types and the time of response and resolution deadlines for each request type are provided within this document.

The type of request must initially be defined by the Customer in an explicit manner. However, Datafon may change the request type according to Datafon's own evaluation of the essence of the request. When Datafon are not able to provide a solution on the Customer's request within the declared period, Datafon shall immediately notify the Customer about this and shall exert all reasonable efforts aimed at settling the request.

## 4.3- Target response time

| Type / Priority | Targeted Response Time | Progress Report |
|---|---|---|
| Critical Error | 30 minutes | upon progress or every 1 hour |
| Major Error | 1 hour | upon progress or every 8 hours |
| Error | 4 hours | upon progress |
| Minor Error | 6 hours | upon progress |

Response time is triggered at the time of notification by Customer to Datafon Support via one of the error reporting interfaces provided.

## 4.4- Escalation matrix

The below table summarises the escalation levels available from Datafon in response to operational issues with the service:

| Priority | Name | Position | Email | Tel |
|---|---|---|---|---|
| 1 | 24x7 Support | Operations | support@datafon.co.uk | Email only |
| 2 | Souhila Benhammou | Support Manager | souhila.benhammou@datafon.co.uk | Email only |
| 3 | Provided during account creation | Account Manager | Provided during account creation | Provided during account creation |
| 4 | Sohail Juna | CTO | sohail.juna@datafon.co.uk | Provided during account creation |