INN Global Data Hub

INN Global Data Hub API User Manual

**Programme on International
Nonproprietary Names (INN)**

Document Title:	INN Global Data Hub User API Manual
	Version: **2.0**

Authors:	WHO INN Secretariat	
Type:	Public circulation	**Nature:** Public

Abstract: This document describes the API for the INN Global Data Hub from the user point of view.

Keyword list: **INN Global Data Hub, API, Application Program Interface, User Manual**

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The INN Global Data Hub is a software system designed to support interoperable machine-to-machine interaction over the network. It has an interface described in a machine-processable format. Other systems interact with the Web service in a manner prescribed by its description using the INN Hub API messages conveyed using HTTP protocol.

In order to access the INN Global Data Hub a formal mail is needed.
The applicant agrees on the INN Global Data Hub Copyright Code of Conduct statement (see below 1.1) and has to describe the intended use of the INN Data.

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1.2 INN Approval

When the INN Secretariat approves the request a secret INNHub password (Secret Key) and a INNHub user ID (*INN_Client_ID*) will be provide to the applicant. For each applicant a set of INN Global Data Hub Rights will be assigned.

1.3 INN Global Data Hub Rights

An approved INNHub client has rights according the intended use of the data.
The rights set which kind of queries can be done, XML or pure HTML (see chapter 2), which subset of information can be visible to the client and how many results are visible..
For instance, only English and French names, structures, molecular formula without alternative names in different regulation authorities and which authorities use the same INN name.

2. How to query the INN Global Data Hub

An authorized client can query the INNHub in two different ways, using html input tags or using XML. All the inputs can be sent using GET method only.

2.1 Using html

The easier way is to create a HTML form.
Mandatory fields are:

- *INN_Query_Content*
- *INN_Client_ID*
- *INN_Timestamp*
- *INN_Query_Token*

The query content will be applied only for the INN names in English.
If results are present a HTML list of results will be given.

2.1.1 The INN_Query_Content attribute

In order to query the INNHub a regular expression could be used. Below some examples of the special characters and constructs:

- ^

  Match the beginning of a string.

  ```
  Content 'fo\nfo' Search Command '^fo$';          Result: NO
  Content 'fofo' Search Command '^fo';             Result: YES
  ```

- $

  Match the end of a string.

  ```
  Content 'fo\no' Search Command '^fo\no$';        Result: YES
  Content 'fo\no' Search Command '^fo$';           Result: NO
  ```

- .

  Match any character (including carriage return and newline).

  ```
  Content 'fofo' Search Command '^f.*$';           Result: YES
  Content 'fo\r\nfo' Search Command '^f.*$';       Result: YES
  ```

- a*

  Match any sequence of zero or more a characters.

  ```
  Content 'Ban' Search Command '^Ba*n';            Result: YES
  Content 'Baaan' Search Command '^Ba*n';          Result: YES
  Content 'Bn' Search Command '^Ba*n';             Result: YES
  ```

- a+

  Match any sequence of one or more a characters.

  ```
  Content 'Ban' Search Command '^Ba+n';            Result: YES
  Content 'Bn' Search Command '^Ba+n';             Result: NO
  ```

- a?

  Match either zero or one a character.

```
Content 'Bn' Search Command '^Ba?n';              Result: YES
Content 'Ban' Search Command '^Ba?n';             Result: YES
Content 'Baan' Search Command '^Ba?n';            Result: NO
```

- de|abc

    Match either of the sequences de or abc.

```
Content 'pi' Search Command 'pi|apa';             Result: YES
Content 'axe' Search Command 'pi|apa';            Result: NO
Content 'apa' Search Command 'pi|apa';            Result: YES
Content 'apa' Search Command '^(pi|apa)$';        Result: YES
Content 'pi' Search Command '^(pi|apa)$';         Result: YES
Content 'pix' Search Command '^(pi|apa)$';        Result: NO
```

- (abc)*

    Match zero or more instances of the sequence abc.

```
Content 'pi' Search Command '^(pi)*$';            Result: YES
Content 'pip' Search Command '^(pi)*$';           Result: NO
Content 'pipi' Search Command '^(pi)*$';          Result: YES
```

- {1}, {2,3}

    {n} or {m,n} notation provides a more general way of writing regular expressions that match many occurrences of the previous atom (or "piece") of the pattern. m and n are integers.

    o a*

        Can be written as a{0,}.

    o a+

        Can be written as a{1,}.

    o a?

        Can be written as a{0,1}.

    To be more precise, a{n} matches exactly n instances of a. a{n,} matches n or more instances of a. a{m,n} matches m through n instances of a, inclusive.

    m and n must be in the range from 0 to 255, inclusive. If both m and n are given, m must be less than or equal to n.

```
Content 'abcde' Search Command 'a[bcd]{2}e';      Result: NO
Content 'abcde' Search Command 'a[bcd]{3}e';      Result: YES
Content 'abcde' Search Command 'a[bcd]{1,10}e';   Result: YES
```

- [a-dX], [^a-dX]

    Matches any character that is (or is not, if ^ is used) either a, b, c, d or X. A - character between two other characters forms a range that matches all characters from the first character to the second. For example, [0-9] matches any decimal digit. To include a literal] character, it must immediately follow the opening bracket [. To include a literal - character, it must be written first or last. Any character that does not have a defined special meaning inside a [] pair matches only itself.

```
Content 'aXbc' Search Command '[a-dXYZ]';        Result: YES
Content 'aXbc' Search Command '^[a-dXYZ]$';       Result: NO
Content 'aXbc' Search Command '^[a-dXYZ]+$';      Result: YES
Content 'aXbc' Search Command '^[^a-dXYZ]+$';     Result: NO
Content 'gheis' Search Command '^[^a-dXYZ]+$';    Result: YES
Content 'gheisa' Search Command '^[^a-dXYZ]+$';   Result: NO
```

2.1.2 The INN_Client_ID attribute

This field contains the ID provided by the WHO (within the Secret Key) after the approval process.

2.1.3 The INN_Timestamp attribute

This field is a timestamp with this format YYYY-MM-DD (e.g. 2011-09-30)

2.1.4 The INN_Query_Token attribute

This is the critical field.

The *INN_Query_Token* is the MD5 of the Secret Key, the *INN_Timestamp* and *INN_Query_Content*.

The MD5 Message-Digest Algorithm (http://tools.ietf.org/html/rfc1321) is a widely used cryptographic hash function that produces a 128-bit (16-byte) hash value.

INN_Query_Token = MD5(Secret Key + *INN_Timestamp* + *INN_Query_Conten*t)

The symbol "+" means text string concatenation.

How to assure the Secure Key confidentiality is out of the goal of this document.

2.1.5 The INN_Stem_ Query attribute

If the attribute exists, the INN_Query_Content attribute refers to a name on which the user wants to check possible stem (a.k.a stem check command). The result of a stem check command is in HTML.

2.2 Using xml

The use of an XML query allows more advanced search functionalities.

In Figure 1 and Figure 2 you can see the INN Hub Schema for queries (see link https://extranet.who.int/tools/inn_global_data_hub/index.html).
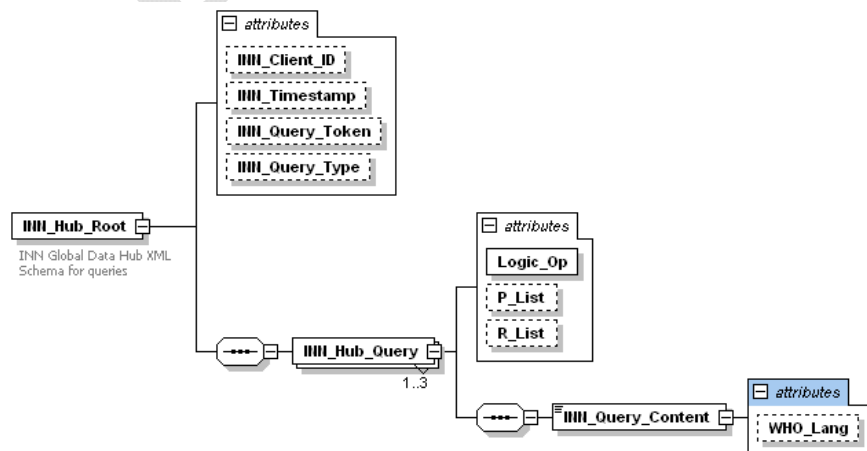
Figure 1: INN Hub XML Schema diagrams for queries

```
 1  <?xml version="1.0" encoding="UTF-8"?>
 2
 3  <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified" attributeFormDefault="unqualified">
 4    <xs:element name="INN_Hub_Root">
 5      <xs:annotation>
 6        <xs:documentation>INN Global Data Hub XML Schema for queries</xs:documentation>
 7      </xs:annotation>
 8      <xs:complexType>
 9        <xs:sequence>
10          <xs:element name="INN_Hub_Query" maxOccurs="3">
11            <xs:complexType>
12              <xs:sequence>
13                <xs:element name="INN_Query_Content">
14                  <xs:complexType>
15                    <xs:simpleContent>
16                      <xs:extension base="xs:string">
17                        <xs:attribute name="WHO_Lang">
18                          <xs:simpleType>
19                            <xs:restriction base="xs:string">
20                              <xs:enumeration value="English"/>
21                              <xs:enumeration value="French"/>
22                              <xs:enumeration value="Spanish"/>
23                              <xs:enumeration value="Chinese"/>
24                              <xs:enumeration value="Russian"/>
25                              <xs:enumeration value="Arabic"/>
26                              <xs:enumeration value="INNNo"/>
27                            </xs:restriction>
28                          </xs:simpleType>
29                        </xs:attribute>
30                      </xs:extension>
31                    </xs:simpleContent>
32                  </xs:complexType>
33                </xs:element>
34              </xs:sequence>
35              <xs:attribute name="Logic_Op" use="required">
36                <xs:simpleType>
37                  <xs:restriction base="xs:string">
38                    <xs:enumeration value="AND"/>
39                    <xs:enumeration value="OR"/>
40                    <xs:enumeration value="MAIN"/>
41                  </xs:restriction>
42                </xs:simpleType>
43              </xs:attribute>
44              <xs:attribute name="P_List" type="xs:string"/>
45              <xs:attribute name="R_List" type="xs:string"/>
46            </xs:complexType>
47          </xs:element>
48        </xs:sequence>
49        <xs:attribute name="INN_Client_ID"/>
50        <xs:attribute name="INN_Timestamp">
51          <xs:simpleType>
52            <xs:restriction base="xs:dateTime"/>
53          </xs:simpleType>
54        </xs:attribute>
55        <xs:attribute name="INN_Query_Token"/>
56        <xs:attribute name="INN_Query_Type">
57          <xs:simpleType>
58            <xs:restriction base="xs:string">
59              <xs:enumeration value="HTML"/>
60              <xs:enumeration value="IMAGE"/>
61            </xs:restriction>
62          </xs:simpleType>
63        </xs:attribute>
64        <xs:attribute name="INN_Query_Code" type="xs:string"/>
65      </xs:complexType>
66    </xs:element>
67  </xs:schema>
68
```

Figure 2: INN Hub XML Schema text for queries

2.2.1 The INN_Hub_Root

The *INN_Hub_Root* element encapsulates all the XML query elements needed to the INN_Hub.

2.2.1.1 The *INN_Client_ID* attribute

This field contains the ID provided by the WHO (within the Secret Key) after the approval process.

2.2.1.2 The *INN_Timestamp* attribute

This field is a timestamp with this format YYYY-MM-DD (e.g. 2011-09-30)

2.2.1.3 The *INN_Query_Token* attribute

This is the critical field.
The *INN_Query_Token* is the MD5 of the Secret Key, the *INN_Timestamp* and all the *INN_Query_Content* elements in the XML request.
The MD5 Message-Digest Algorithm is a widely used cryptographic hash function that produces a 128-bit (16-byte) hash value.

INN_Query_Token = MD5(Secret Key+ *INN_Timestamp*+ *INN_Query_Content* first element+ *INN_Query_Content* second element + *INN_Query_Content* third elements)

The symbol "+" means text string concatenation.

How to assure the Secure Key confidentiality is out of the goal of this document.

2.2.1.4 The *INN_Query_Type* attribute

This attribute is set as "HTML" by default. This means that the results will be showed with HTML tags and hyperlink to the INN web site with the full information.
The "IMAGE" option will show results only the PNG images encode with MIME base64 (http://tools.ietf.org/html/rfc4648).

2.2.1.5 The INN_Query_Code attribute

This attribute could be set with the code coming from the INN_Hub response and gives the capability to query a single INN request.

2.2.2 The INN_Hub_Query

The *INN_Hub_Query* encapsulates all the details to query the INN_Hub.
Using the attributes the applicant can compose logical operations and can select on which publications (proposed or recommended lists) applying the queries.
The maximum number of queries is three.
The first element is the MAIN query on which the user can apply AND/OR logic operators.

2.2.2.1 The *Logic_Op* attribute

The allowed logic operators are the AND and the OR.
Each operator will be applied according its position on the list.
The first one is MAIN by default.

2.2.2.2 The *P_List* attribute

The proposed list where the query will be applied.

2.2.2.3 The *R_List* attribute

The recommended list where the query will be applied.

2.2.3 The INN_Query_Content

The *INN_Query_Content* follows the rules described in 2.1.1 and will be applied on the INN names according the attributes described in 2.2.2 and in 2.2.3.1.

2.2.3.1 The *WHO_Lang* attribute

It is possible to query the INNHub specifying the languages.
The INN names are usually transliterated in the following languages Latin, English, French, Spanish, Arabic, Chinese and Russian.

3. How to manage the results

The main results of a query are **always** PNG images encoded with MIME base64 (http://tools.ietf.org/html/rfc4648) except for the stem check command.
The stem check command has a result in HTML format.

3.1 HTML results

Using the method described in 2.1 , the results will be a list of <div> encapsulating a hyperlink, <a>, and an embedded image <img>(see below).

```html
<div class="INN_Hub">
        <a class="INN_Hub" href=" INN_Hub.php?code=oWK7jT….rGxc">
                <img class="INN_Hub"
                src="data:image/png;base64,iVBORw0KGgoAAAANSUhEUg
                A……wAAAABJRU5ErkJggg=="/>
        </a>
</div>
```

The use of classes (e.g. INN_Hub) facilitates the manipulation of data for the applicant (e.g. the use of CSS). It is out of the scope of this document to describe how to extract or to use data.. However, the main concept is that the functionality has to be preserved (according the rights of the applicant). This means that if the INN result offers link to more information, the applicant has to guarantee this link.

3.2 XML results

Using the method described in 2.2 , the results will be a XML files following the schema showed in Figure 3 and Figure 4.
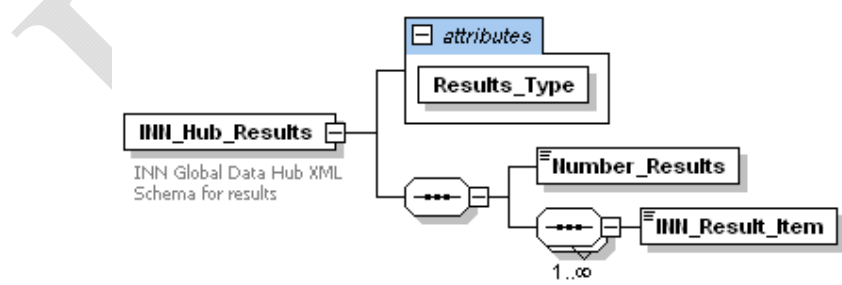

Figure 3: INN Hub XML Schema diagrams for results

```
1      <?xml version="1.0" encoding="UTF-8"?>
2      <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified" attributeFormDefault="unqualified">
3        <xs:element name="INN_Hub_Results">
4          <xs:annotation>
5            <xs:documentation>INN Global Data Hub XML Schema for results</xs:documentation>
6          </xs:annotation>
7          <xs:complexType>
8            <xs:sequence>
9              <xs:element name="Number_Results">
10               <xs:complexType>
11                 <xs:simpleContent>
12                   <xs:extension base="xs:unsignedInt"/>
13                 </xs:simpleContent>
14               </xs:complexType>
15             </xs:element>
16             <xs:sequence maxOccurs="unbounded">
17               <xs:element name="INN_Result_Item" type="xs:string"/>
18             </xs:sequence>
19            </xs:sequence>
20            <xs:attribute name="Results_Type" use="required">
21              <xs:simpleType>
22                <xs:restriction base="xs:string">
23                  <xs:enumeration value="IMAGE"/>
24                  <xs:enumeration value="HTML"/>
25                </xs:restriction>
26              </xs:simpleType>
27            </xs:attribute>
28          </xs:complexType>
29        </xs:element>
30      </xs:schema>
31
```

Figure 4: INN Hub XML Schema text for results

3.3 The INN_Hub_Results element

The INN_Hub_Results encapsulates the results of an XML queries addressed to the INN_Hub.

3.3.1 The Results_Type attribute

The "HTML" option will follow the format described in 3.1.
The "IMAGE" option will show results as PNG images encode with base64 only.

3.3.2 The Number_Results element

The *Number_Results* element contains the number of results in the INN data base. This number could be different from the number of *INN_Result_Item*.
The number of *INN_Result_Item* has been limited to 20 or less according the applicant rights (see 1.3)

3.3.3 The INN_Result_Item elements

The *INN_Result_Item* elements contain data according the *Results_Type* attribute.

4. How to link the INN Global Data Hub

The only way to reach information from the INNHub is <u>using HTTP protocol (only with GET method)</u>.

<u>It is out of the scope of this document to describe the way to implement connections with the INNHub</u>.

Just to give some helpful examples the following AJAX script

4.1 HTML

```
<html>
<head>
<script type="text/javascript">
function loadXMLDoc()
{
        var xmlhttp;
        if (window.XMLHttpRequest){
                // code for IE7+, Firefox, Chrome, Opera, Safari
                xmlhttp=new XMLHttpRequest();
        }else{
                // code for IE6, IE5
                xmlhttp=new ActiveXObject("Microsoft.XMLHTTP");
        }
        xmlhttp.onreadystatechange=function()
        {
                if (xmlhttp.readyState==4 && xmlhttp.status==200){

        document.getElementById("myINNResults").innerHTML=xmlhttp.responseText;
                }
        }

        xmlhttp.open("GET","https://extranet.who.int/tools/inn_global_data_hub/INN_Hub.php?
                INN_Query_Content=^ab&
                INN_Client_ID=1&
                INN_Timestamp=2011-09-23&
                INN_Query_Token=838f025b140768ceff1debd43fd64b6d",true);

        xmlhttp.send();
}
</script>
</head>
<body>

<div id="myINNResults">
        <h2>I would like to know the INN names in English starting with ab</h2>
</div>
        <button type="button" onclick="loadXMLDoc()">Query INN Global Data Hub</button>
</body>
</html>
```