

Connect to the National Terminology Server

As a new user

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Create an account on the Terminology Server

You can create an account yourself via [this link](#). Enter your name, e-mail address and password and click on 'Register'. After this you must accept the terms of use. Please read the user agreement carefully and accept if agreed. When the license terms change, you'll need to do so again before you can access the server again. With an account, you have direct access to all terminology resources on the server for which additional licensing is not required. You can use [account management](#) to find and edit your account information.

With this account you have access to the license-free content of the NTS. These are standards such as, Art Decor content, Human Phenotype Ontology (HPO), ICD-10 and HGNC.

Access the resources of the National Terminology Server

SNOMED, LOINC and the NHG tables (all subjected to licenses) can be made available to licensees in the NTS. We hope to be able to expand the list of terminology resources soon.

Therefore, to access resources a license is required. Once you are a licensee, you can submit the request to us for access via the [Nictiz Service desk](#), please note that you have to be a known NTS-user for us to process your application.

In the Nictiz Service desk, choose 'Ik ben een softwareleverancier, zorgverlener of andere stakeholder' and fill in the form as follows:

- Wat is de aanleiding van je wijzigingsverzoek? *Algemeen (Overig)*
- Voor welke producten of diensten? *Terminologie*
- Onderdeel: *Nationale Terminologie Server (NTS) – Licentie aanvragen*

In 'Onderwerp' please fill in your name, organisation, and the resources you wish to gain access to.

For SNOMED, the Dutch Labcodeset and the patient-friendly terms, the SNOMED affiliate number of the license must be entered in license data. This number can be found on your MLDS profile page. You can view this page after logging in to [MLDS](#).

For LOINC, the e-mail address as visible on the LOINC profile page (<https://loinc.org/profile/>) must be entered.

For the application of the NHG tables content, it is important to state which subscription type is linked to your license. It may take us a little longer to process this application (max. two working days) because we have to verify the subscription type with the NHG.

The application will be reviewed by our team and license details will be verified where necessary. Before proceeding to grant the appropriate rights/groups to your NTS-account, we might need additional information. We will address these questions via email address to the address which was used to make the request. This email address will also be used for notification purposes. If in any case you need to update your account information, like changing the email address, either upon your departure or just to change it to a more generic email address (after project completion). These types of change requests can be addressed to licentie_nts@nictiz.nl, with subject 'Update account information'.

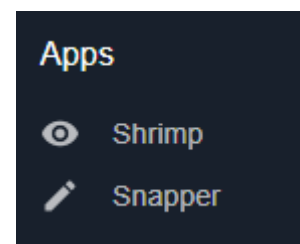
Reaching the National Terminology Server

You can log in to the Terminology Server with your username and password. There are several options for accessing the server:

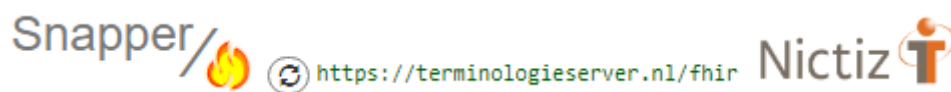
1. Onto-UI
2. Snapper
3. Shrimp
4. FHIR API

Onto-UI

Via the link <https://terminologieserver.nl/fhir> you will automatically be redirected to Onto-UI, the dashboard of Ontoserver. Here you may log in by clicking 'login' at the top right corner of the screen. In this user interface you can also see for which resources you have been granted access and you can view the metadata or the 'capability statement' of the server. Due to the functionality of Onto-UI, you will see the syndication and delete buttons, regardless of your rights on the server. The execution of these commands can only be done if you have the correct rights to do so, however. On this dashboard, you can also click through to Snapper and Shrimp, which you can find on the bar to the left under 'Apps'.



Snapper



Snapper is meant for adjusting and creating new terminology resources. You can approach the server with Snapper via the Onto-UI dashboard as mentioned earlier. You do this by going to <https://terminologieserver.nl/fhir> and clicking on 'Snapper', which you can find on the left-sidebar under 'Apps'. You can also use [this direct link](#), where you can log in by pressing 'Login' at the top right corner of the window.

Shrimp



Shrimp is used for a visual display of the hierarchy of the terminology resources. You can approach Shrimp on the server through the Onto-UI dashboard, as mentioned earlier. You do this by going to <https://terminologieserver.nl/fhir> and clicking on 'Shrimp', which you can find on the left-sidebar under 'Apps'. You may also use [this direct link](#), where you can log in by entering your information in the pop-up window. Should the pop-up window not appear, you can also login by pressing 'Login' at the top right.

FHIR API

The biggest advantage can be gained when you approach the server using the FHIR API. For approaching the server, we use a bearer token as authorization method. You may find the location of the endpoint where you may retrieve a token at <https://terminologieserver.nl/fhir/.well-known/smart-configuration>. You can send a POST-request to this endpoint. This endpoint expects a request with the 'Content-Type'-header with the value 'application/x-www-form-urlencoded':

"Content-Type" : "application/x-www-form-urlencoded"

The following data ('keys') must be sent in the request body, where you replace **{{username}}** and **{{password}}** with your login details.

```
{
  "grant_type" : "password",
  "client_id" : "cli_client",
  "username" : {{username}},
  "password" : {{password}}
}
```

After successful authentication, you will receive an **access_token**, a **refresh_token**, and account information as a JSON-object. The **access_token** is only valid for a specific period. By using the **refresh_token** you can retrieve a new **access_token** over extended periods of time. For more detailed instruction, we refer you to the [Keycloak documentation](#).

By adding this **access_token** to follow up-requests your personal information and licensing will be considered. An example of a JSON-object that can be sent in the header is the following, where **{{access_token}}** should be replaced by your access_token:

```
{
  "Authorization": "Bearer {{access_token}}",
  "Content-Type" : "application/x-www-
  form-urlencoded"
}
```

To verify if the authorization has been successful and the API is working you can search for a code system named ‘**NullFlavor**’. This code system can be reached without licensing and so can be approached directly after creating your account. A [Postman](#)-collection with example requests including authentication is available [GitHub](#).

Github

On Github you can find the Nationale Terminologieserver as an Organization on <https://github.com/terminologieserver/>. Here you will find example requests, such as for Postman and authentication with Keycloak. You will also find a manual for working with external content on the server. For example, this manual includes the usage of the terminology server with SNOMED, Nederlandse Labcodeset, LOINC, and HL7 resources.

Retrieving SNOMED designations, including patient-friendly designations

After establishing a connection with the API, you will notice that when retrieving a concept, various English and Dutch designations are provided:

- Fully specified names for US English, UK English and Dutch
- Preferred terms for US English, UK English, medical Dutch and patient-friendly Dutch, which are marked with "display":"Preferred For Language". They can be differentiated by language using *language*: this field contains the conceptId of the language reference set.
 - Medical Dutch = nl-x-sctlang-31000146-106
 - Patient-friendly Dutch = nl-x-sctlang-15551000-146102
 - US English = en-x-sctlang-90000000-00005090-07
 - UK English = en-x-sctlang-90000000-00005080-04
- Synonyms for these languages, marked with "display":"Synonym". These can be differentiated by *language* in the same manner.

To retrieve all Dutch synonyms regardless of target audience, you can simply filter in any description whose valueCode either matches or starts with ‘nl’.

The following \$lookup request is used to retrieve the designations of SNOMED concept 74400008:

```
GET {{url}}/fhir/CodeSystem/$lookup?system=http%3A%2F%snomed.info%2Fsc&code=74400008&property=designation
```

For some concepts the NTS also contains a medical text definition and/or a patient-friendly explanation. Where an ‘ordinary’ SNOMED description is limited to a few words, text definitions and explanations contain one or more complete sentences.

The following \$lookup request is used to retrieve the medical text definition of SNOMED concept 401776005:

```
GET {{url}}/fhir/CodeSystem/$lookup?system=http%3A%2F%snomed.info%2Fsc&code=74400008&property=definition
```

A medical tekst definition is unique to the SNOMED concept. A patient-friendly explanation, on the other hand, is not: concepts that are similar may be assigned identical explanations. To avoid confusion between unique definitions and shared explanations, the patient-friendly explanations have not been marked as text definitions but through a *CodeSystemSupplement*. The supplement

contains each explanation as a *designation* of type *Consumer* with language *nl_NL*. The following *\$expand*-request is used to retrieve all *designations* from the *CodeSystemSupplement*:

```
GET {{url}}/fhir/ValueSet/$expand?url=  
https%3A%2F%2Fterminologieserver.nl%2Furi%2Fvs%2Fsnomed-patient-friendly-  
explanations&filter=9826008&includeDesignations=true&displayLanguage=en-x-sctlang-90000000-  
00005090-07
```

This request returns all *designations* in SNOMED (fully specified names, preferred terms and synonyms) as well as the patient-friendly explanation. The latter is marked with:

- language=nl_NL
- code=Consumer
- display=Consumer-friendly

Please note that not all SNOMED concepts are translated to medical Dutch and only a small subset possesses a patient-friendly term or explanation. The parameter *displayLanguage=en-x-sctlang-90000000-00005090-07* ensures that all Dutch descriptions have the relevant language reference set id in their language tag.

In conclusion, all medical and patient-friendly terms can be retrieved with a *\$lookup* request, but the patient-friendly *explanation* can only be retrieved using an *\$expand* request. However, the *\$expand* query is slightly slower, which means performance can suffer when dealing with large quantities of queries. If necessary, performance can be improved by:

- Using a cache. When using a cache it is important to refresh the cache following each publication of a new SNOMED NL edition. Starting September 2024 SNOMED NL will be released monthly.
- Sending a *batch request*; see Appendix A – Batch request for *\$expand* for an example.

Github

On Github, the National Terminology Server can be found as an organization at: <https://github.com/terminologieserver/>. This contains repositories with example requests, for Postman and for authentication with Keycloak. You will also find our workflow regarding external content here. Currently, this method involves the use of the Terminology server with SNOMED, Dutch Labcodeset, LOINC and HL7.

Further questions

For questions about the above, or requests for more information, or when you experience problems with your account or the server. Feel free to contact us, you can address the email to terminologie@nictiz.nl

Appendix A – Batch request for \$expand

```
curl --location --request POST 'https://terminologieserver.nl/fhir' \
--header 'Authorization: Bearer XXX' \
--header 'Content-Type: application/json' \
--data-raw '{
  "type": "batch",
  "resourceType": "Bundle",
  "entry": [
    {
      "request": {
        "method": "POST",
        "url": "ValueSet/$expand"
      },
      "resource": {
        "resourceType": "Parameters",
        "parameter": [
          {
            "name": "valueSet",
            "resource": {
              "resourceType": "ValueSet",
              "extension": [
                {
                  "url":
"http://hl7.org/fhir/StructureDefinition/valueset-supplement",
                  "valueCanonical":
"http://terminologieserver.nl/uri/cs/snomed-patient-friendly-terms"
                }
              ],
              "compose": {
                "include": [
                  {
                    "system":
"http://snomed.info/sct",
                    "filter": [
                      {
                        "property": "constraint",
                        "op": "=",
                        "value": "9826008"
                      }
                    ]
                  }
                ]
              }
            }
          },
          {
            "name": "includeDesignations",
            "valueBoolean": true
          },
          {
            "name": "displayLanguage",
            "valueCode": "en-x-sctlang-90000000-00005090-07"
          }
        ]
      }
    },
    {
      "request": {
        "method": "POST",
        "url": "ValueSet/$expand"
      },

```

```

"resource": {
  "resourceType": "Parameters",
  "parameter": [
    {
      "name": "valueSet",
      "resource": {
        "resourceType": "ValueSet",
        "extension": [
          {
            "url":
"http://hl7.org/fhir/StructureDefinition/valueset-supplement",
            "valueCanonical":
"http://terminologieserver.nl/uri/cs/snomed-patient-friendly-terms"
          }
        ],
        "compose": {
          "include": [
            {
              "system":
"http://snomed.info/sct",
              "filter": [
                {
                  "property": "constraint",
                  "op": "=",
                  "value": "103388001"
                }
              ]
            }
          ]
        }
      }
    },
    {
      "name": "includeDesignations",
      "valueBoolean": true
    },
    {
      "name": "displayLanguage",
      "valueCode": "en-x-sctlang-90000000-00005090-07"
    }
  ]
},
{
  "request": {
    "method": "POST",
    "url": "ValueSet/$expand"
  },
  "resource": {
    "resourceType": "Parameters",
    "parameter": [
      {
        "name": "valueSet",
        "resource": {
          "resourceType": "ValueSet",
          "extension": [
            {
              "url":
"http://hl7.org/fhir/StructureDefinition/valueset-supplement",
              "valueCanonical":
"http://terminologieserver.nl/uri/cs/snomed-patient-friendly-terms"
            }
          ]
        }
      }
    ],

```

```

        "compose": {
          "include": [
            {
              "system":
"http://snomed.info/sct",
              "filter": [
                {
                  "property": "constraint",
                  "op": "=",
                  "value": "192782005"
                }
              ]
            }
          ]
        },
        {
          "name": "includeDesignations",
          "valueBoolean": true
        },
        {
          "name": "displayLanguage",
          "valueCode": "en-x-sctlang-90000000-00005090-07"
        }
      ]
    }
  ]
}'

```