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| SNOMED CT URI Guide | | |
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# Introduction

## Purpose of document

This document provides guidance on the usage of URIs that identify SNOMED CT components and extensions, as defined in the associated document *SNOMED CT URI Specification v 0.06*. It covers:

1. Mechanisms to resolve/locate components using the specified URIs
2. How the various use cases identified in the specification are addressed
3. How machine-readable URIs can be made human-understandable

It does not cover mechanisms or URIs for non-SNOMED CT based terminologies.

## Who Should Use this Specification?

The intended audience for this document includes both technical professionals who are involved in the development or implementation of terminology systems or healthcare information systems that use SNOMED CT, as well as academics, researchers, and others who are using SNOMED CT in the context of OWL and other Semantic Web technologies.

This guide may be used to help understand certain design and implementation trade-offs that may arise when making use of URIs conforming to the SNOMED CT URI Specification.

## Use cases for URIs

The following use cases have guided the specification detailed in this document:

1. The OWL representation of the stated form of SNOMED CT requires URIs to identify Concepts and Roles. It has historically used its own de facto URI space for this purpose, and has not directly addressed the issue of a URI to identify the ontology itself.
2. The CTS2 specification requires all resources to be identified using URIs. It too has a proposed approach with a narrower scope than we have here.
3. Within the HL7 community there is a need for a consistent mechanism to identify “versions” of SNOMED CT. An appropriate URI space could simply address this need in an extensible fashion.

# Resolving SNOMED CT URIs

The *SNOMED CT URI Specification* defines a set of URI spaces that are used to **identify** a variety of SNOMED CT resources, but it does not talk about resolving these URIs. The URIs in the specification use the http scheme and the domain name snomed.info, which is owned by the IHTSDO. This means that the IHTSDO is in control of whether or not these URIs, when treated as URLs and resolved, will result in a document being available, a 404 ("Not Found") error, or something else.

However, a Release Centre or other service provider may also want to support the resolution of these URIs. A general approach to this involves deploying a resolving service with an endpoint URL such as

http://myservice.example.com/

which is configured to resolve URLs that embed SNOMED CT URIs. Continuing the example, a URL of the following form

http://myservice.example.com/?url=http://snomed.info/{...}

might be redirected to

http://myservice.example.com/snomed/{...}

which in turn resolves and returns an appropriate document. Conceptually, we can think of the original URL as identifying what the *MyService* endpoint knows about the identified SNOMED CT resource.

What might such a document look like? Let us consider the example URL

http://myservice.example.com/?url=http://snomed.info/id/900000000000498005

The document ultimately returned by the service might be in JSON or XML or HTML or plain text format and contain information indicating that the SCTID is valid, and refers to a non-extension Concept[[1]](#footnote-1). It might also indicate that the service knows about one or more Editions in which this Concept is defined. It might further supply the Fully Specified Name for the Concept as given in the Edition with the most recent effectiveTime. Note that the exact nature of what the service says about the Concept is up to the service itself.

## Version-relative URIs

The idea of what one resource knows about another can be applied to the SNOMED CT URIs themselves so that URIs of the form:

http://snomed.info/sct/{moduleid}/version/{time}?id=http://snomed.info/id/{sctid}

can be used to identify the definition of a component relative to a specific Edition of SNOMED CT. That is, the first part of the URI is a URI for an Edition, and the query parameter is the URI for a component.

When the query parameter URI is that of a ReferenceSet, for example, this allows the identification of a specific version of the Reference Set.

http://snomed.info/sct/900000000000207008/version/20120131?id=http://snomed.info/id/900000000000509007

Continuing then with our example service, we can ask for what it knows about this version of the Reference Set with the URL:

http://myservice.example.com/?url=http://snomed.info/sct/900000000000207008/version/20120131?id=http://snomed.info/id/900000000000509007

## Comparing URIs

Any two URIs from the http://snomed.info/id/, http://snomed.info/module/, and http://snomed.info/sct/ URI spaces identify the same thing if, after syntax-based normalisation as described in section 6.2.2 of *IETF RFC3986 Uniform Resource Identifier (URI): Generic Syntax*[[2]](#footnote-2), they are equal when treated as character strings. The syntax-based normalisation includes case normalization, percent-encoding normalization, and removal of dot-segments. Scheme-based and protocol-based normalisation should not be required since any URIs that would be affected by them (e.g., by including explicit port numbers or trailing slashes) fall outside of the URI specification.

# Addressing URI use-cases

## The OWL representation of SNOMED CT

The OWL representation of SNOMED CT makes use of URIs for Concepts, the previously-implicit grouping role, and the ontology (the set of axioms).

The old pattern used for Concepts was

http://www.ihtsdo.org/SCT\_{sctid}

which is now replaced by

http://snomed.info/id/{sctid}

The grouping role URI was

http://www.ihtsdo.org/RoleGroup

and is now

http://snomed.info/id/{role group sctid}

For the OWL XML representation, the URI was unspecified (the empty string), while for the OWL Functional Syntax representation the URI was (via RDF:about)

http://www.ihtsdo.org/sct.owl

and now includes explicit version information

http://snomed.info/sct/{sctid}/version/{timestamp}

When representing SNOMED CT ontologies using OWL 2, both an ontologyURI and a versionURI should be included using the following forms respectively[[3]](#footnote-3):

http://snomed.info/sct/{sctid}

http://snomed.info/sct/{sctid}/version/{timestamp}

## The CTS2 Specification

The CTS2 specification requires that all resources be identified using URIs. This section lists, where such a thing exists, the IHTSDO standard URIs for the resources that require URIs in the CTS2 implementation. This omits URIs for things such as External Code Systems and Value Sets since they are outside the scope of the SNOMED CT URI Specification. Note, however, that a Reference Set is the SNOMED CT mechanism for identifying an arbitrary set of Concepts, which is analogous to a Value Set. Thus the Reference Set URI would be the appropriate thing to use as the Value Set identifier.

| Resource | URI | Example |
| --- | --- | --- |
| SNOMED CT | http://snomed.info/sct/{module sctid} | http://snomed.info/sct/900000000000207008  SNOMED CT International Edition |
| A specific SNOMED CT release | http://snomed.info/sct/{module sctid}/version/{effectiveTime} | http://snomed.info/sct/900000000000207008/version/20120131  SNOMED CT International January 2012 Release |
| Modules | http://snomed.info/module/{module sctid} | http://snomed.info/module/900000000000207008  SNOMED CT Core Module (only) |
| A specific release of a module | http://snomed.info/module/{module sctid}/time/{timestamp} | http://snomed.info/module/900000000000207008/time/20120131  SNOMED CT Core Module (only) with respect to the timestamp 20120131 |
| SCTID | http://snomed.info/id/{sctid} | http://snomed.info/id/449650002 |
| UUID | http://snomed.info/id/{uuid} | http://snomed.info/id/00000692-31c5-81a8-2e54b488c824 |
| Table Fields | http://snomed.info/field/{table name}.{field name} | http://snomed.info/field/Relationship.characteristicTypeId |
| Map | http://snomed.info/id/{map sctid} | http://snomed.info/id/900000000000498005  A map is just a reference set in a specific format |
| A specific version of a Map | http://snomed.info/sct/{sctid}/version/{effectiveTime}  ?id=http://snomed.info/id/{map sctid} | http://snomed.info/sct/900000000000207008/version/2012013  ?id=http://snomed.info/id/900000000000498005 |
| Refset | http://snomed.info/id/{refset sctid} | http://snomed.info/id/900000000000498005 |
| A specific version of a Refset | http://snomed.info/sct/{sctid}/version/{effectiveTime}  ?id=http://snomed.info/id/{refset sctid} | http://snomed.info/sct/900000000000207008/version/2012013  ?id=http://snomed.info/id/900000000000498005 |
| Role Group | http://snomed.info/id/609096000 | http://snomed.info/id/609096000 |

## Identifying SNOMED CT versions in HL7

HL7 uses OIDs to identify Code Systems. The OID for SNOMED CT is 2.16.840.1.113883.6.96. This is the OID that should be used for all versions of SNOMED CT and related terminologies (such as the Australian Medicines Terminology) because it identifies the **system**, i.e., the set of rules for interpreting SCTIDs. Under these rules, any specific SCTID is either defined with respect to a particular Version (Edition), or it is undefined (i.e., not included/mentioned in that version). Furthermore, any given SCTID always identifies the *same thing* in all versions in which it is defined.

The HL7 specification says that the interpretation of version strings is defined by the Code System (and not by HL7). This means we can use the URI for a versioned Edition as the version code:

http://snomed.info/sct/{sctid}/version/{timestamp}

For example, here is how a CDA document with an element of CD Data Type might appear:

<xyz code="78835011000036104"  
 codeSystem="2.16.840.1.113883.6.96"  
 codeSystemName="Australian Medicines Terminology (AMT)"  
 codeSystemVersion=  
"http://snomed.info/sct/900062011000036108/version/20121231"  
  displayName="GANFORT 0.03% / 0.5% eye drops: solution, 3 mL"/>  
</xyz>

It should be noted that, because the URIs for identifying a specific version of an Edition can be used to unambiguously determine its content, using these URIs as version numbers works regardless of whether a single OID is used to identify SNOMED CT as a "system" or individual OIDs are assigned to different Editions.

# Guidance when using RF1 for releases

While support for RF1-based content is specifically outside the scope of the SNOMED CT URI Specification, it is recognized that while RF1-based content continues to be released in some jurisdictions, there may be a desire to apply the principles embodied in the SNOMED CT URI Specification for identifying these RF1-based Editions.

Since modules are not part of the legacy RF1 specification, there is no clear mechanism within it for identifying versions that could be used as a complete alternative that allows for the automated identification and determination of the contents of a release from its identity alone. In which case, whichever URI space is chosen is essentially an arbitrary scheme that requires external context or knowledge to be available to map it to the appropriate set of RF1 content.

It would be possible to create one or more concepts that play the part of RF2 modules and thus can be used according to the URI space defined in Section 3, *URIs for Editions* of the *SNOMED CT URI Specification*.

# Potential future extensions to the SNOMED CT URI space

This section exists to document potential future extensions to the standard SNOMED CT URI space that have been proposed but that have not been fully evaluated for impact, feasibility, and need.

In general, the use of URIs in the http://snomed.info URI space that are not defined with respect to the SNOMED CT URI Specification should be avoided. At the very least consideration must be given to the possibility that future changes to the Specification may clash with experimental non-standard extensions.

## Approaches to human-understandable URIs

In certain contexts it may be desirable to support some URIs that are human-understandable and perhaps even human-memorable. Since Fully-Specified Names are required to be unique, it would be feasible to extend the URI space to allow URIs of the form:

http://snomed.info/id/url-encoding({fsn})

as aliases for the Concept

http://snomed.info/id/{sctid}

where fsn is the Fully-Specified Name of the sctid and url-encoding({fsn}) is the URL encoding (see IEEE RFC 3986) of the Fully-Specified Name. Encoding the name like this takes care of any characters that may have a special interpretation with respect to a URL such as /, ?, and &. The FSN should be supplied to the url-encoding function in UTF-8 so that appropriate percent-encoding is performed for non US-ASCII characters, as per section 1.2.1 of RFC 3986.

For example,

http://snomed.info/id/Appendicitis+(disorder)

could be an alias for

http://snomed.info/id/74400008

## URIs for collections of SNOMED CT entities

A URI with the following form might be used refer to all (conceptual, known) components of a particular kind:

http://snomed.info/{kind}

For example, to refer to all known modules use the URI:

http://snomed.info/module

A service resolving such a URI would hopefully return the URLs or URIs for all the modules it knows about. It may even include information about specific versions of the modules it knows about.

1. This information is directly discernable from the SCTID itself. [↑](#footnote-ref-1)
2. Uniform Resource Identifier (URI): Generic Syntax <http://tools.ietf.org/html/rfc3986#section-6> [↑](#footnote-ref-2)
3. See OWL 2 Web Ontology Language Structural Specification and Functional-Style Syntax  
   http://www.w3.org/TR/owl2-syntax/#Ontology\_IRI\_and\_Version\_IRI [↑](#footnote-ref-3)