

4. OWL Expression Reference Set Specification

Purpose

An [762676003 | OWL expression type reference set](#) associates description logic statements with [SNOMED CT concept](#) in the OWL functional syntax.

The SNOMED CT International Release contains content in two [reference sets](#) that follow the [762676003 | OWL expression type reference set](#) pattern:

- The [733073007 | OWL axiom reference set \(foundation metadata concept\)](#), in which the OWL expressions represent axioms that form the logical definition of the [concept](#) identified by the [referencedComponentId](#)
- The [762103008 | OWL ontology reference set \(foundation metadata concept\)](#), in which the OWL expressions represent essential information about an ontology. This information includes, namespaces, ontology URI, ontology version URI, and import statements. The [762103008 | OWL ontology reference set \(foundation metadata concept\)](#) enables the use of prefixes in the ontology

Data Structure

An [762676003 | OWL expression type reference set](#) is structured as shown in the following table.

Field	Data type	Purpose	Mutability	Part of Primary Key
id	UUID	A 128 bit unsigned Integer , uniquely identifying this reference set member . Different versions of a reference set member share the same id but have different effectiveTime . This allows a reference set member to be modified or made inactive (i.e. removed from the active set) at a specified time.	NO	YES (Full /Snapshot)
effectiveTime	Time	The inclusive date or time at which this version of the identified reference set member became the current version. Note: In distribution files the effectiveTime should follow the short ISO date format (YYYYMMDD) and should not include the hours, minutes, seconds or timezone indicator. The current version of this reference set member at time <i>T</i> is the version with the most recent effectiveTime prior to or equal to time <i>T</i> .	YES	YES (Full) Optional (Snapshot)
active	Boolean	The state of the identified reference set member as at the specified effectiveTime . If active = 1 (true) the reference set member is part of the current version of the set, if active = 0 (false) the reference set member is not part of the current version of the set.	YES	NO
moduleId	SCT ID	Identifies the SNOMED CT module that contains this reference set member as at the specified effectiveTime . The value must be a subtype of 900000000000443000 Module (core metadata concept) within the metadata hierarchy .	YES	NO
refsetId	SCT ID	Identifies the reference set to which this reference set member belongs. In this case, a subtype descendant of: 762676003 OWL expression type reference set (foundation metadata concept)	NO	NO
referencedComponentId	SCT ID	A reference to the SNOMED CT component to be included in the reference set . The concept to which the OWL expression applies. In the case of the 733073007 OWL axiom reference set (foundation metadata concept) , the axiom contributes to the definition of the identified concept .	NO	NO
owlExpression	String	The text of OWL expression to attach to the component identified by referencedComponentId .	YES	NO

Metadata

The following metadata supports this reference set:

[900000000000454005 | Foundation metadata concept](#)
[900000000000455006 | Reference set](#)
[762676003 | OWL expression type reference set](#)
[762103008 | OWL ontology reference set](#)
[733073007 | OWL axiom reference set](#)
[900000000000457003 | Reference set attribute](#)

706999006 | Expression
 762677007 | OWL expression
 900000000000459000 | Attribute type
 900000000000465000 | String
 762678002 | OWL 2 language syntax

Descriptor Template and Examples

The reference set example tables on this page have been revised as follows to aid clarity and understanding:

- The first four columns which are present in all release files are not shown. The omitted columns (id, effectiveTime, active) are used in the same way in all referenced sets to support identification, versioning and packaging. They do not directly affect the specific features of a particular reference set or reference set type.
- Reference set columns that contain SNOMED CT identifiers are expanded to show details of the concept or description referenced by that identifier. In some cases, the term is shown in the same column using the expression syntax, in other cases an additional column with a name suffix '_term' has been added. In the standard reference set files only the identifier is present in the column and there is no added column for the term. When using reference sets, the term and other details of the component are looked up from the relevant component release files.

Descriptor Template

The table below shows the descriptors that define the structure of the 762676003 | OWL expression type reference set pattern and examples of the descriptors for specific reference sets that follow this pattern.

Table 4-1: Descriptor templates for OWL expression reference sets

refsetId	referencedComponentId	attributeDescription	attributeType	attributeOrder
900000000000456007 Reference set descriptor	762676003 OWL expression type reference set	449608002 Referenced component	900000000000461009 Concept type component	0
900000000000456007 Reference set descriptor	762676003 OWL expression type reference set	762677007 OWL expression	762678002 OWL 2 language syntax	1
900000000000456007 Reference set descriptor	762103008 OWL ontology reference set	449608002 Referenced component	900000000000461009 Concept type component	0
900000000000456007 Reference set descriptor	762103008 OWL ontology reference set	762677007 OWL expression	762678002 OWL 2 language syntax	1
900000000000456007 Reference set descriptor	733073007 OWL axiom reference set	449608002 Referenced component	900000000000461009 Concept type component	0
900000000000456007 Reference set descriptor	733073007 OWL axiom reference set	762677007 OWL expression	762678002 OWL 2 language syntax	1

OWL Ontology Reference Set Example

Table 4-2: OWL ontology reference set example

moduleId	refsetId	referencedComponentId	owlExpression
90000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734146004 OWL ontology namespace	Prefix(=<http://snomed.info/id/>)
90000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734146004 OWL ontology namespace	Prefix(owl:=<http://www.w3.org/2002/07/owl#>)
90000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734146004 OWL ontology namespace	Prefix(rdf:=<http://www.w3.org/1999/02/22-rdf-syntax-ns#>)
90000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734146004 OWL ontology namespace	Prefix(xml:=<http://www.w3.org/XML/1998/namespace>)
90000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734146004 OWL ontology namespace	Prefix(xsd:=<http://www.w3.org/2001/XMLSchema#>)
90000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734146004 OWL ontology namespace	Prefix(rdfs:=<http://www.w3.org/2000/01/rdf-schema#>)

900000000000012004 SNOMED CT model component module	762103008 OWL ontology reference set	734147008 OWL ontology header	Ontology(< http://snomed.info/sct/9000000000000207008 >)
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OWL Axiom Reference Set Example

Table 4-3: OWL axiom reference set example

moduleId	refsetId	referencedComponentId	owlExpression	Explanatory Notes
9000000000000207008 SNOMED CT core module	733073007 OWL axiom reference set	404684003 Clinical finding (finding)	SubClassOf(:404684003 :138875005)	Example of SubClassOf, which is equivalent to an Is a relationship between most SNOMED CT concepts.  A different OWL expression is used to represent Is a relationships between attributes. This is shown in the row below. 404684003 Clinical finding (finding) 138875005 SNOMED CT Concept (SNOMED RT+CTV3)
900000000000012004 SNOMED CT model component module	733073007 OWL axiom reference set	774081006 Proper part of (attribute)	SubObjectPropertyOf(:774081006 :733928003)	Example of SubObjectPropertyOf, which is equivalent to an Is a relationship between attributes. 774081006 Proper part of (attribute) 733928003 All or part of (attribute)
9000000000000207008 SNOMED CT core module	733073007 OWL axiom reference set	90708001 Kidney disease (disorder)	EquivalentClasses(:90708001 ObjectIntersectionOf(:64572001 ObjectSomeValuesFrom(:609096000 ObjectSomeValuesFrom(:363698007 :64033007))))	Example of EquivalentClasses, which is equivalent to stating that a concept is sufficiently defined by a set of necessary relationships. 90708001 Kidney disease (disorder) 64572001 Disease 609096000 Role group (attribute) 363698007 Finding site (attribute) 64033007 Kidney structure (body structure)
9000000000000207008 SNOMED CT core module	733073007 OWL axiom reference set	126516008 Neoplasm of skin of upper limb (disorder)	EquivalentClasses(:126516008 ObjectIntersectionOf(:64572001 ObjectSomeValuesFrom(:609096000 ObjectIntersectionOf (ObjectSomeValuesFrom(:116676008 :108369006) ObjectSomeValuesFrom(:363698007 :371311000))))	Example of a role group with a conjunction of two relationships as its value. 126516008 Neoplasm of skin of upper limb (disorder) 64572001 Disease 609096000 Role group (attribute) 116676008 Associated morphology (attribute) 108369006 Neoplasm (morphologic abnormality) 363698007 Finding site (attribute) 371311000 Skin structure of upper limb (body structure)
900000000000012004 SNOMED CT model component module	733073007 OWL axiom reference set	774081006 Proper part of (attribute)	TransitiveObjectProperty(:774081006)	Example of a transitive object property. 774081006 Proper part of (attribute)

900000000000001 2004 SNOMED CT model component module	733073007 OWL axiom reference set	127489000 H as active ingredient (attribute)	SubObjectPropertyOf(ObjectPropertyChain(:127489000 :738774007) : 127489000))	Example of a property chain. • 127489000 Has active ingredient (attribute) • 738774007 Is modification of (attribute)
900000000000020 7008 SNOMED CT core module	733073007 OWL axiom reference set	703264005 S econdary osteoporosis (disorder)	SubClassOf(ObjectIntersectionOf(:64859006 ObjectSomeValuesFrom(: 609096000 ObjectSomeValuesFrom(:255234002 :387713003)) ObjectSomeValuesFrom(:609096000 ObjectSomeValuesFrom(: 363698007 :272673000)))) :703264005)	Example of a general concept inclusion (GCI). • 703264005 Secondary osteoporosis (disorder) • 64859006 Osteoporosis (disorder) • 609096000 Role group (attribute) • 255234002 After (attribute) • 387713003 Surgical procedure (procedure) • 363698007 Finding site (attribute) • 272673000 Bone structure (body structure)