



SNOMED Core Structures RF2

Core Tables

- Concepts (rf2_concept)
- Descriptions (rf2_description)
- Relationships (rf2_relationship)

Language RefSets

- der2_crefset_language_en
- US English
- VTSL
- Domain

Association RefSets

- der2_crefset_associationreference
- History Referrals

Attribute Value RefSets

- der2_crefset_attributevalue
- Reason for Concept Inactivation
- Reason for Description Inactivation

Terminology of Terminology

● Concept

- embodiment of a particular meaning
- Really a “virtual” element in the system

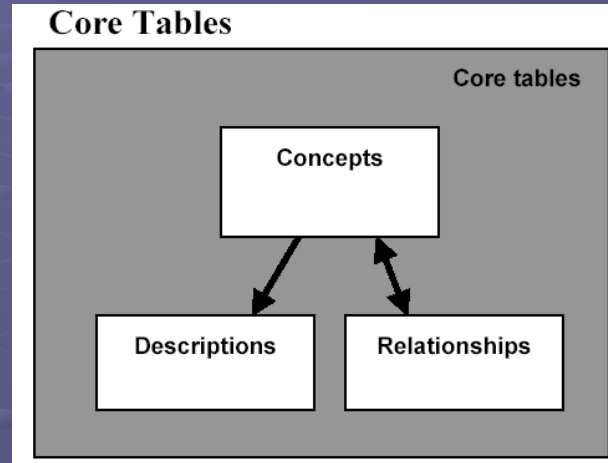
● Description

- Any string used to represent a concept

● Relationship

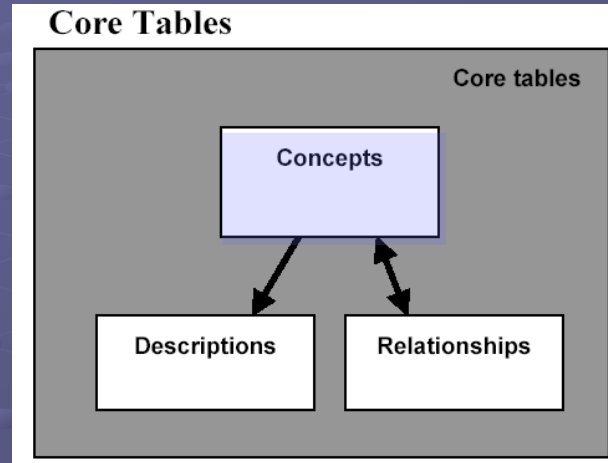
- (in SNOMED) an object – attribute – value triple connecting two concepts through an attribute
- Relationships in SNOMED are explicit rather than implicit (as was the case in SNOMED III)

SNOMED Core



- **Concepts Table**
 - Each row in this table represents a medical concept.
- ***Descriptions Table***
 - Each row in this table specifies a term that can be applied to describe a single clinical concept.
- ***Relationships Table***
 - Each row in this table specifies a relationship between two clinical concepts. The nature of each relationship is represented using a special kind of clinical concept.

SNOMED Core



Concept = A medical idea and basis for the terminology

- Each concept is represented by a unique identifier
 - SCTID
 - “Meaningless” 64-bit integer

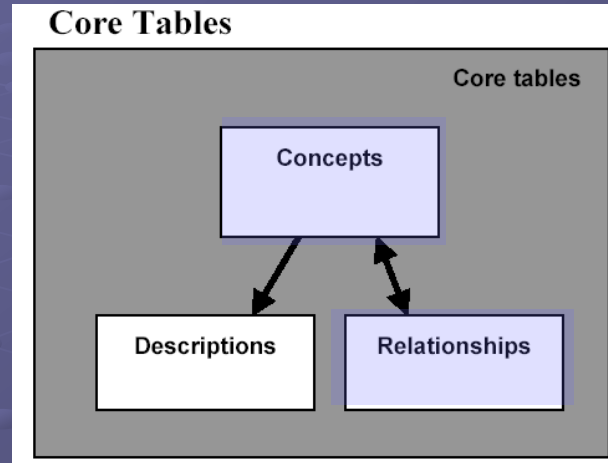
Concepts Table

Key Fields	
<i>id</i>	The unique <i>SNOMED Clinical Terms Identifier</i> for this <i>Concept</i> .
<i>effectiveTime</i>	Specifies the inclusive timestamp at which the concept's state became the then current valid state of the component
<i>active</i>	Active (1) or inactive (0) status of the concept at the given <i>effectiveTime</i> .
Data Fields	
<i>moduleId</i>	Identifies the Module to which the concept belongs at the given <i>effectiveTime</i> .
<i>definitionStatusId</i>	Specifies whether the concept's associated relationships are necessary and sufficient to define it (formerly fully defined) or just necessary for its definition (formerly primitive). Set to the SCTID of a concept for one of these statuses (child of Definition status in the metadata hierarchy).

Changes from RF1:

- Append only form of data storage
- SNOMEDID & CTV3ID moved to a refset
- FSN no longer stored here (eliminated the redundancy)

SNOMED Core



Relationship = Source + Relationship type + Destination

- A relationship refers to 3 concepts: a source, a relationship type, and a destination.
 - Equivalent to an Object – Attribute – Value triple
- Each concept is the source of 1-n relationships*
- Each concept is the destination of 1-n relationships.
- Relationship type is also represented by a concept.

*Exception is the root concept, SNOMED CT

Relationships Table

Key Fields	
<i>id</i>	The unique <i>SNOMED CT Identifier</i> of this <i>Relationship</i> .
<i>effectiveTime</i>	Specifies the inclusive timestamp at which the relationship's state became the then current valid state of the relationship
<i>active</i>	Active (1) or inactive (0) status of the relationship at the given <i>effectiveTime</i> .
Data Fields	
<i>moduleId</i>	Identifies the Module to which the relationship belongs at the given <i>effectiveTime</i> .
<i>sourceId</i> (<i>conceptId1</i>)	The unique <i>SNOMED CT Identifier</i> of the <i>Concept</i> which is the <i>source</i> of this <i>Relationship</i> .
<i>typeId</i> (<i>relationshipType</i>)	The unique <i>SNOMED CT Identifier</i> of the <i>Concept</i> which represents the <i>type</i> of <i>relationship</i> between the related <i>Concepts</i> .
<i>destinationId</i> (<i>conceptId2</i>)	The unique <i>SNOMED CT Identifier</i> of the <i>Concept</i> which is the <i>target</i> of this <i>Relationship</i> .
<i>CharacteristicTypeId</i> (<i>CharacteristicType</i>)	An indication of whether a <i>Relationship</i> specifies a <i>defining characteristic</i> of the <i>source Concept</i> or a possible <i>qualifying characteristic</i> of that <i>Concept</i> . (Child of <i>CharacteristicType</i> in metatdata hierarchy)
<i>RelationshipGroup</i>	An integer value that links together <i>Relationships</i> which are part of a logically associated <i>Relationship group</i> .
<i>modifierId</i>	A concept which identifies the type of Description Logic (DL) restriction (some, all, etc). Current defaults to some for backward compatibility with RF1. Future expansion of the use of this field is being considered.

Changes from RF1:

- Append only form of data storage
- Refinability moved to a refset

Concept -> Relationship

Concepts

SCT ID	Concept Name
71620000	Fracture of Femur
116676008	Associated Morphology
72704001	Fracture (morphology)

Relationship Table

sourceId	typeId	destinationId
71620000	116676008	72704001

Typeld Vs CharacteristicTypeld

- Typeld field is the concept code that specifies the attribute in the triple.
- CharacteristicTypeld tells whether the relationship is:
 - Defining (either stated or inferred)
 - Stated defining relationship = 9000000000000010007*
 - Inferred defining relationship = 9000000000000011006*
 - Qualifying
 - 90000000000000225001*
 - Additional (for facts that cannot be defining)
 - 90000000000000227009*

*SCTID for CharacteristicTypeld are found in the Metadata Hierarchy

Concept -> Relationship

Concepts

SCT ID	Concept Name
71620000	Fracture of Femur
116676008	Associated Morphology
72704001	Fracture (morphology)

Relationship Table

sourceId	typeId	destinationId	characteristicTypeId
71620000	116676008	72704001	9000000000000010007

Relationship Groups

- A mechanism for retaining relationships between definition “parts”
- Avoids relationship “nesting”

Relationship Groups

Contusion to heart with open wound into thorax

Is a Contusion to heart

Is a Open wound of trunk

Group 1

Associated morphology

Finding site

Open wound

Thoracic structure

Group 2

Associated morphology

Finding site

Contusion - lesion

Heart structure

Concept -> Relationship

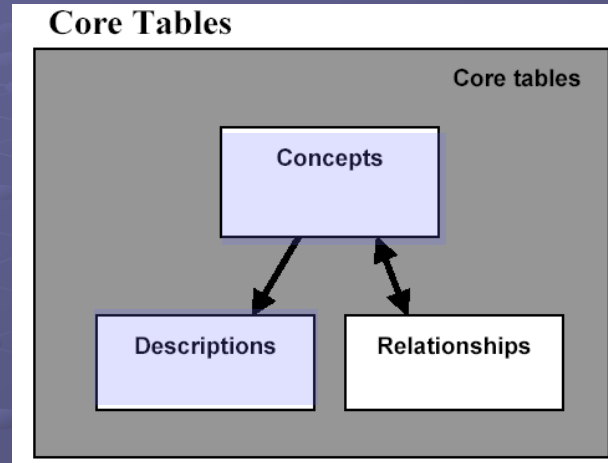
Concepts

SCT ID	Concept Name
71620000	Fracture of Femur
116676008	Associated Morphology
72704001	Fracture (morphology)

Relationship Table

sourceId	typeId	destinationId	characteristicTypeId	relationshipGroup
71620000	116676008	72704001	9000000000000010007	0

SNOMED Core



Description = Term or phrase that describes a concept

- Each concept is described by the term (string) in 2-n descriptions
 - At least the Fully Specified Name (FSN) + 1 synonym (chosen as Preferred in the Language RefSet...covered later...)
- Each description refers to (only) 1 concept.

Descriptions Table

Key Fields	
<i>Id</i>	The unique <i>SNOMED CT Identifier</i> for this <i>Description</i> .
<i>effectiveTime</i>	Specifies the inclusive timestamp at which the description's state became the then current valid state of the component
<i>active</i>	Active (1) or inactive (0) status of the description at the given <i>effectiveTime</i> .
Data Fields	
<i>moduleId</i>	Identifies the Module to which the concept belongs at the given <i>effectiveTime</i> .
<i>ConceptId</i>	The unique <i>SNOMED CT Identifier</i> of the associated <i>Concept</i> . (Foreign key to Concepts Table).
<i>Term</i>	The text of a <i>Term</i> used to describe the associated <i>Concept</i> .
<i>caseSignificanceId</i>	An indication of the significance of capitalization of the <i>Term</i> . SCTID of child of Case Significance in metadata hierarchy.
<i>TypeId</i>	An indication of whether the <i>Term</i> is the <i>Fully Specified Name</i> or <i>Synonym</i> for the <i>Concept</i> to which this <i>Description</i> applies.
<i>LanguageCode</i>	An indication of a <i>Language</i> in which this <i>Description</i> is valid.

Changes from RF1:

- Append only form of data storage
- Preferred designation moved to a language refset (US-English, GB-English, domain language refset, etc)

Concepts -> Descriptions

233604007	Pneumonia (concept)
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id	conceptId	term	typeId
350049016	233604007	Pneumonia (Disorder)	900000000000003001
621810017	233604007	Pneumonia	900000000000013009
xxxxxx01x	233604007	Synonym in Core	900000000000013009
xxxxxxyyy11x	233604007	Synonym in NAHLN Extension	900000000000013009
xxxxxxzzz11x	233604007	Synonym In Local Extension	900000000000013009

900000000000003001 = fully specified name
900000000000013009 = synonym (alternate)
(SCTIDs found in the Metadata Hierarchy)

Preferred Designation

- Preferred status is designated within a language reference set (refset)
- US-English and GB-English language refsets are distributed with International release.
- Local or domain language refsets can be created to designate local preferences.
 - VTSL, AAHA, AAEP

Preferred Designation

der2_crefset_language_en

Key Fields	
<i>Id</i>	UUID assigned to uniquely identify the refset member
<i>effectiveTime</i>	Specifies the inclusive date at which this change/row becomes effective.
<i>active</i>	Specifies the member's state (active or inactive) as of the effectiveTime
Data Fields	
<i>moduleId</i>	Identifies the member version's module
<i>refsetId</i>	SCTID of the language refset
<i>referencedComponentId</i>	SCTID of description included in the refset
<i>targetComponent</i>	SCTID of the applicable "Acceptability"

Preferred Designation

● Fully Specified Name

- `Rf2_description.typeId = 900000000000003001` (FSN)
- `languageRefSet.targetComponent=9000000000000548007` (Preferred)

● Preferred Term

- `Rf2_description.typeId = 9000000000000013009` (Synonym)
- `languageRefSet.targetComponent=9000000000000548007` (Preferred)

● Acceptable Synonym

- `Rf2_description.typeId = 9000000000000013009` (Synonym)
- `languageRefSet.targetComponent=9000000000000549004` (Acceptable)

Preferred Designation

FSN in US-English Language RefSet

id	conceptid	term	typeld
350049016	233604007	Pneumonia (Disorder)	900000000000003001
621810017	233604007	Pneumonia	900000000000013009
xxxxxx01x	233604007	Synonym in Core	900000000000013009
xxxxxxyyy11x	233604007	Synonym in NAHLN Extension	900000000000013009
xxxxxxzzz11x	233604007	Synonym In Local Extension	900000000000013009

refsetId	referencedComponentId	targetComponent
900000000000509007	350049016	900000000000548007
900000000000509007	621810017	900000000000548007
332851000009102	xxxxxxyyy11x	900000000000548007

Preferred Designation

Preferred in US-English Language RefSet

id	conceptid	term	typeld
350049016	233604007	Pneumonia (Disorder)	900000000000003001
621810017	233604007	Pneumonia	900000000000013009
xxxxxx01x	233604007	Synonym in Core	900000000000013009
xxxxxxyyy11x	233604007	Synonym in NAHLN Extension	900000000000013009
xxxxxxzzz11x	233604007	Synonym In Local Extension	900000000000013009

refsetId	referencedComponentId	targetComponent
900000000000509007	350049016	900000000000548007
900000000000509007	621810017	900000000000548007
332851000009102	xxxxxxyyy11x	900000000000548007

Preferred Designation

Preferred in VTSL Language RefSet

id	conceptid	term	typeld
350049016	233604007	Pneumonia (Disorder)	900000000000003001
621810017	233604007	Pneumonia	900000000000013009
xxxxxx01x	233604007	Synonym in Core	900000000000013009
xxxxxx yyy 11x	233604007	Synonym in NAHLN Extension	900000000000013009
xxxxxx zzz 11x	233604007	Synonym In Local Extension	900000000000013009

refsetId	referencedComponentId	targetComponent
900000000000509007	350049016	900000000000548007
900000000000509007	621810017	900000000000548007
332851000009102	xxxxxx yyy 11x	900000000000548007

History in RF2

- Append only form of data storage
- Association refsets hold historical referrals
- Attribute refsets hold reason for inactivation

History in RF2

- Append only form of data storage
 - Maintains full history within each table
 - Rows are never deleted - inactivated and remain in place
 - All rows are time stamped
- Association refsets hold historical referrals
- Attribute refsets hold reason for inactivation

History in RF2

rf2_concept

id	effectiveTime	active	moduleId	definitionStatusId
21148002	2002-01-31 00:00:00	1	900000000000207008	900000000000074008
21148002	2006-01-31 00:00:00	1	900000000000207008	900000000000073002
21148002	2013-01-31 00:00:00	0	900000000000207008	900000000000074008

- 2002-01-31: Concept added.

History in RF2

rf2_concept

id	effectiveTime	active	moduleId	definitionStatusId
21148002	2002-01-31 00:00:00	1	9000000000000207008	900000000000074008
21148002	2006-01-31 00:00:00	1	9000000000000207008	900000000000073002
21148002	2013-01-31 00:00:00	0	9000000000000207008	900000000000074008

- 2002-01-31: Concept added.
- 2006-01-31: Primitive to Fully Defined.

History in RF2

rf2_concept

id	effectiveTime	active	moduleId	definitionStatusId
21148002	2002-01-31 00:00:00	1	9000000000000207008	900000000000074008
21148002	2006-01-31 00:00:00	1	9000000000000207008	900000000000073002
21148002	2013-01-31 00:00:00	0	9000000000000207008	900000000000074008

- 2002-01-31: Concept added.
- 2006-01-31: Primitive to Fully Defined.
- 2013-01-31: Concept retired.

History in RF2

- Certain fields are “immutable”, i.e. they can't be changed. Component must be retired instead.

History in RF2

rf2_concept

Field	Immutable?
<i>id</i>	Y
<i>effectiveTime</i>	N
<i>active</i>	N
<i>moduleId</i>	N
<i>definitionStatusId</i>	N

rf2_description

Field	Immutable?
<i>id</i>	Y
<i>effectiveTime</i>	N
<i>active</i>	N
<i>moduleId</i>	N
<i>conceptId</i>	Y
<i>languageCode</i>	Y
<i>typeId</i>	Y
<i>Term</i>	N*
<i>caseSignificanceId</i>	N

rf2_relationship

Field	Immutable?
<i>id</i>	Y
<i>effectiveTime</i>	N
<i>active</i>	N
<i>moduleId</i>	N
<i>sourceId</i>	Y
<i>typeId</i>	Y
<i>destinationId</i>	Y
<i>relationshipGroup</i>	Y
<i>characteristicTypeId</i>	Y

*While Term is technically mutable, in practice the IHTSDO Workbench is programmed to force retirement of descriptions for spelling changes. Therefore we are following that example and retiring extension descriptions if spelling is incorrect.

History in RF2

- Append only form of data storage
- Association refsets hold historical referrals
- Attribute refsets hold reason for inactivation

History in RF2

der2_crefset_associationreference

id	effective Time	active	moduleId	refsetId	referencedComponentId	targetComponent
UUID	2013-01-31 00:00:00	1	9000000000000207008	9000000000000527005	21148002	191306005

9000000000000527005 = ***SAME AS association reference set***

21148002 SAME AS 191306005

9000000000000523009	POSSIBLY EQUIVALENT TO association reference set
9000000000000524003	MOVED TO association reference set
9000000000000525002	MOVED FROM association reference set
9000000000000526001	REPLACED BY association reference set
9000000000000527005	SAME AS association reference set
9000000000000528000	WAS A association reference set
9000000000000529008	SIMILAR TO association reference set
9000000000000531004	REFERS TO concept association reference set

History in RF2

- Append only form of data storage
- Association refsets hold historical referrals
- Attribute refsets hold reason for inactivation

History in RF2

der2_crefset_attributevalue

id	effective Time	active	moduleId	refsetId	referencedComponentId	valueId
UUID	2013-01-31 00:00:00	1	90000000000000207008	9000000000000489007	21148002	9000000000000482003

9000000000000489007 = **Concept inactivation indicator reference set**

9000000000000482003 = Duplicate component

Parent(s):

(Select a parent to make it the "Current Concept".)

[Attribute value \(foundation metadata concept\)](#)

Current Concept:

[Concept inactivation value \(foundation metadata concept\)](#)

Child(ren):

(N=7) (Select a child to make it the "Current Concept".)

[Ambiguous component \(foundation metadata concept\)](#)

[Component moved elsewhere \(foundation metadata concept\)](#)

[Duplicate component \(foundation metadata concept\)](#)

[Erroneous component \(foundation metadata concept\)](#)

[Limited component \(foundation metadata concept\)](#)

[Outdated component \(foundation metadata concept\)](#)

[Pending move \(foundation metadata concept\)](#)

Modules in RF2

- Module = group/area of development
- Could be a national center, or a sub group within a national center
- VTSL moduleId = 332351000009108

Parent(s):

(Select a parent to make it the "Current Concept".)

[Module \(core metadata concept\)](#)

Current Concept:

*International Health Terminology Standards Development
Organisation maintained module (core metadata concept)*

Child(ren):

(N=5) (Select a child to make it the "Current Concept".)

[SNOMED CT core module \(core metadata concept\)](#)

[SNOMED CT model component module \(core metadata concept\)](#)

[SNOMED CT Spanish edition module \(core metadata concept\)](#)

[SNOMED CT to ICD-10 rule-based mapping module \(core metadata concept\)](#)

[SNOMED CT to ICD-9CM equivalency mapping module \(core metadata concept\)](#)

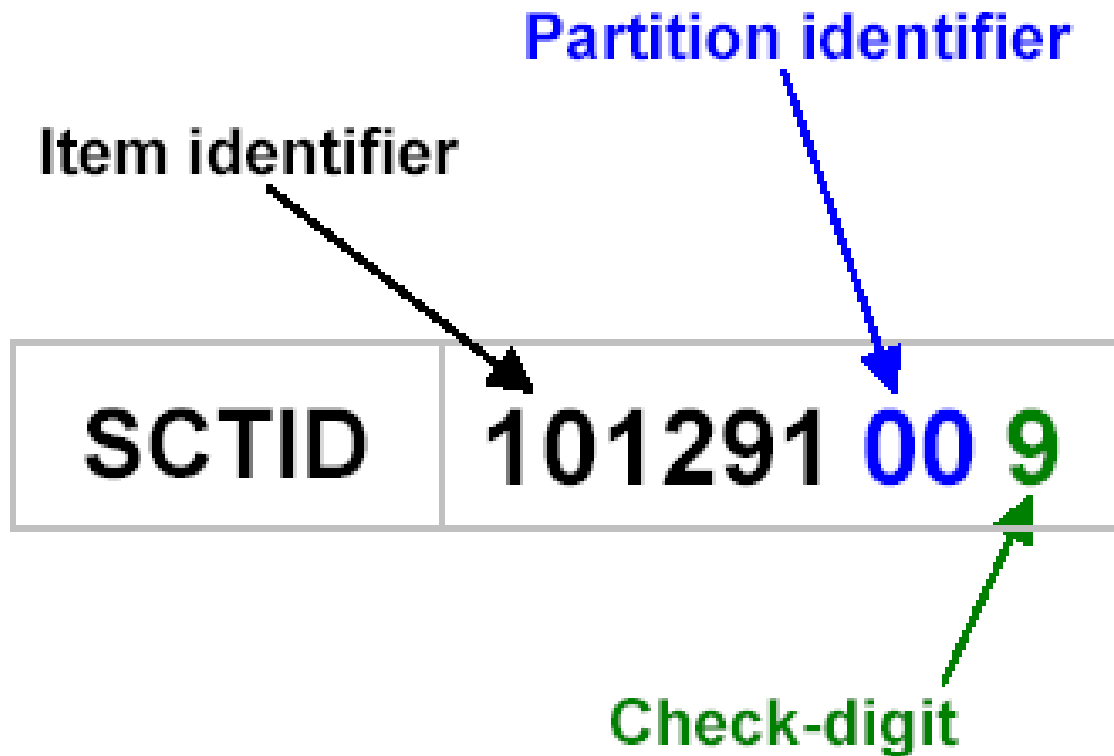
SCTID

- The SCTID data type is a 64-bit integer, which is subject to the following constraints:
 - Only positive integer values are permitted.
 - The minimum permitted value is 100,000 (6 digits)
 - The maximum permitted value is 999,999,999,999,999,999 (18-digits).
 - As result of rules for the *partition-identifier* and *check-digit*, many integers within this range are not valid *SCTIDs*.

SCTID

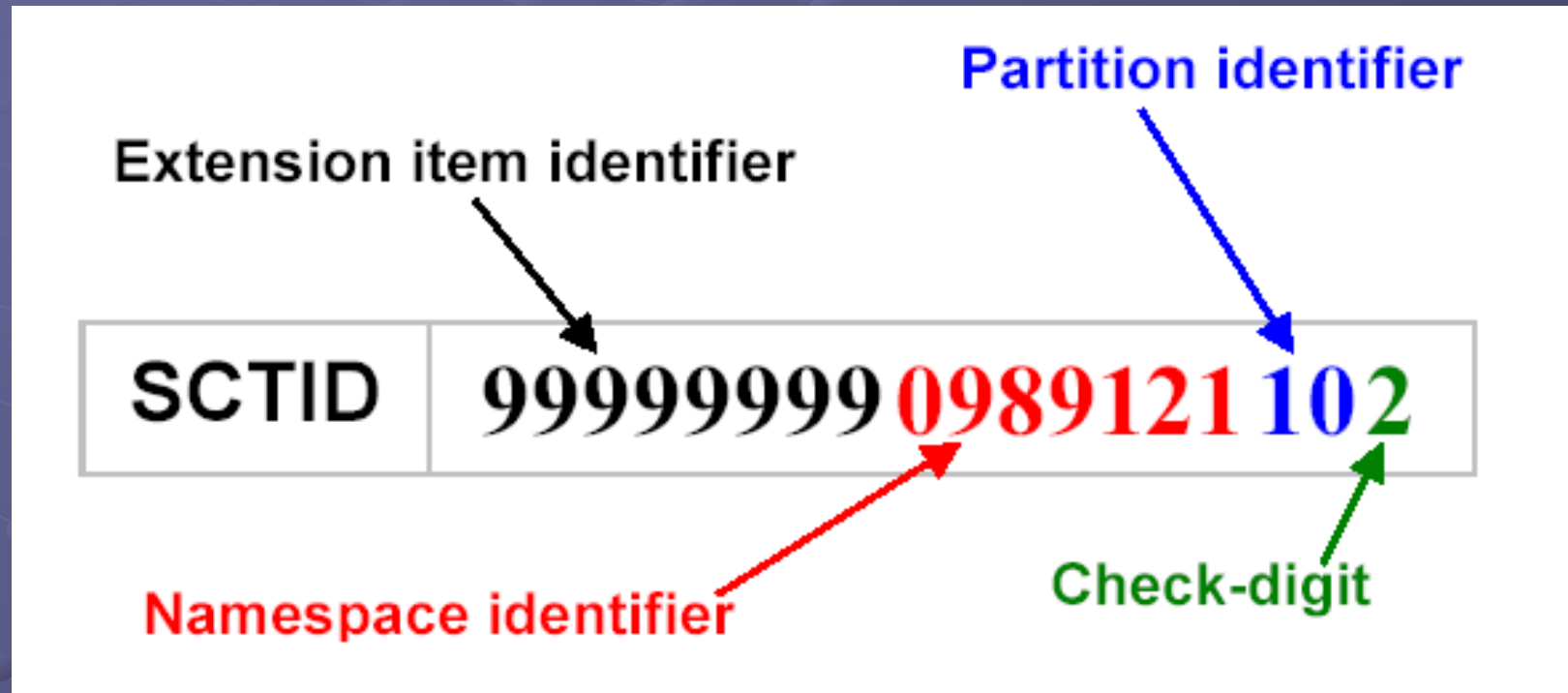
- The *SCTID* does not contain semantic information related to the meaning of a concept or term
- It does however have a structure that is designed to allow different types of terminological components to be recognized.
 - The nature of a component can be derived from the table in which a component is distributed.
 - Partitioning the *SCTID* avoids reuse of the same identifier for a different type of component – thus avoiding ambiguity.
 - This also allows the nature of the identifier to be recognized when stored in a record or transferred in a message.

SCTID



SCTID for centrally distributed component.

SCTID



SCTID for a component in an extension.

SCTID Partition Values

00	A concept
01	A description
02	A relationship
10	A concept in an extension
11	A description in an extension
12	A relationship in an extension