**Integrating the Healthcare Enterprise**



**IHE IT Infrastructure (ITI)**

**Technical Framework Supplement**

**Sharing Valuesets**

**Codes and Maps**

**(SVCM)**

HL7® FHIR® Release 4

Using Resources at FMM Level 3-N

**Revision x.x – Draft in Preparation for Public Comment**

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**Please verify you have the most recent version of this document.** See [here](http://ihe.net/Technical_Frameworks/) for Trial Implementation and Final Text versions and [here](http://ihe.net/Public_Comment/) for Public Comment versions.

**Foreword**

This is a supplement to the IHE IT Infrastructure Technical Framework <VX.X>. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

*<For Public Comment:>* This supplement is published on <Month XX, 201x> for Public Comment. Comments are invited and can be submitted at <http://www.ihe.net/Public_Comment/#domainname>. In order to be considered in development of the Trial Implementation version of the supplement, comments must be received by <Month XX, 201X>.

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Information about the IHE IT Infrastructure domain can be found at [ihe.net/IHE\_Domains](http://ihe.net/IHE_Domains/).

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at [http://ihe.net/IHE\_Process](http://ihe.net/IHE_Process/) and [http://ihe.net/Profiles](http://ihe.net/Profiles/).

The current version of the IHE IT Infrastructure Technical Framework can be found at [http://ihe.net/Technical\_Frameworks](http://ihe.net/Technical_Frameworks/).

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# Introduction to this Supplement

Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE committee determines that an emerging standard offers significant benefits for the use cases it is attempting to address and has a high likelihood of industry adoption, it may develop IHE profiles and related specifications based on such a standard.

The IHE committee will take care to update and republish the IHE profile in question as the underlying standard evolves. Updates to the profile or its underlying standards may necessitate changes to product implementations and site deployments in order for them to remain interoperable and conformant with the profile in question.

This ITI Technical Framework Supplement uses the emerging HL7® FHIR® specification. The FHIR release profiled in this supplement is Release 4. HL7 describes the STU (Standard for Trial Use) standardization state at <https://www.hl7.org/fhir/versions.html>.

In addition, HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through 5 (normative ballot ready). The FHIR Maturity Model is described at <http://hl7.org/fhir/versions.html#maturity>.

Key FHIR Release 4 content, such as Resources or ValueSets, used in this profile, and their FMM levels are:

|  |  |
| --- | --- |
| FHIR Content  (Resources, ValueSets, etc.) | FMM Level |
|  |  |
| ValueSet | N |
| CodeSystem | N |
| ConceptMap | 3 |

The Sharing Valuesets, Codes and Maps (SVCM) Profile defines a lightweight RESTful interface through which healthcare systems may retrieve centrally managed uniform nomenclature and mappings between code systems based on the HL7 healthcare interoperability resources (FHIR) specification.

The SVCM Profile leverages the IHE ITI Sharing Value Sets (SVS) and IHE Patient Care Coordination Concept Mapping (CMAP) Profiles[[1]](#footnote-2), combining the functionalities of each and simplifying for a lighter weight, mobile-compatible transport and messaging format. This profile leverages HTTP transport, the JavaScript Object Notation (JSON), Simple-XML, and Representational State Transfer (REST). The payload format is defined by the HL7 FHIR standard.

Using these patterns, the SVCM Profile provides a FHIR-based approach to sharing value sets, code systems, and concept maps, which is suitable for mobile and lightweight browser applications.

This supplement is intended to be fully compliant with the HL7 FHIR specification, providing only use-case driven constraints to aid with interoperability and making it easier for implementers to benefit from the robust ecosystem of tools available for HL7 FHIR.

Currently, the HL7 FHIR standard components used in this profile (CodeSystem and ValueSet) are at Normative state, with the exception of the FHIR ConceptMap resource, which is not expected to be revised in a manner that would substantively impact this profile.

**Differences from existing SVS and CMAP Profiles**

The SVCM Profile provides an alternative for the exchange and management of the metadata required for sharing data and replaces the use of HL7 Common Terminology Services (CTS) and Common Terminology Services 2 (CTS 2) with HL7 FHIR.

SVCM will create an easily referenceable resource for profiles to use the Terminology Service in their workflows. It would lead to better overall standardization of those profiles and save future profile authors and editors from redefining how to interact with the Terminology Service across various use cases.

A single Terminology Repository can be accessed by many Terminology Consumers, establishing a domain of consistent and uniform set of nomenclatures. It supports automated loading of value sets by Terminology Consumers, reducing the burden of manual configuration. This profile describes three transactions for retrieving value sets from a Terminology Repository by a Terminology Consumer.

A single value set can be retrieved based on a Value Set Unique ID. This is aimed at meeting the needs of systems that are pre-configured to use specific value sets. These systems may be medical devices with strictly controlled functions that should not be modified without careful review. This transaction does not include metadata content and provides just the value set concept list as uniquely identified in the request.

## Open Issues and Questions

1. Combine discovery use case for Code System, Value Set and Concept Map into one or separate out Concept Map discovery as its own use case?
2. Confirm title for the merged SVS and updated CMAP profiles – SVCM?
3. Need decision on how/whether to incorporate Clinical Mapping (CMAP) Actor Options
4. Are there concepts or descriptions included in X.4 that are unnecessary for the purposes of this profile?

## Closed Issues

1. For the validate and translate concept map, is an additional actor needed? (that can be drawn from existing actors in other profiles) Simplified actors to “Terminology Repository” and “Terminology Consumer.”
2. Use of the Clinical Mapping Profile (CMAP). Decision made to merge the updated FHIR-enabled SVS and CMAP profiles into one here.
3. Within the document, two words are being used for “value set.” One word “valuesets” is being used in the title to simplify and avoid the use of commas in the title.
4. Older SVS language on the “Retrieve multiple value sets” transaction on intensional and extensional value set definitions was removed.

# General Introduction and Shared Appendices

The [IHE Technical Framework General Introduction and Shared Appendices](http://ihe.net/Technical_Frameworks/#GenIntro) are components shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to these documents where appropriate.

Update the following appendices to the General Introduction as indicated below. Note that these are **not** appendices to Volume 1.

# Appendix A – Actor Summary Definitions

Add the following actors to the IHE Technical Frameworks General Introduction Appendix A:

<Add any actor definitions for **new actors** defined specifically for this profile. These will be added to the IHE TF General Introduction Appendix A after publication for trial implementation.. Verify that any actors added here are not already contained in the [IHE General Introduction Appendix A](http://ihe.net/Technical_Frameworks/#GenIntro).>

| Actor Name | Definition |
| --- | --- |
| Terminology Repository | Provides value sets, codes, and maps to consumers as well as expanding value sets, validating codes, and translating codes. |
| Terminology Consumer | Retrieves expanded value sets from repositories as well as validating and translating codes. In addition can retrieve value sets, codes, and maps from the repository. |

# Appendix B – Transaction Summary Definitions

Add the following transactions to the IHE Technical Frameworks General Introduction Appendix B:

<Add any transaction definitions for **new transactions** defined specifically for this profile. These will be added to the IHE TF General Introduction Appendix B after publication for trial implementation. Verify that any transactions added here are not already contained in the [IHE General Introduction Appendix B](http://ihe.net/Technical_Frameworks/#GenIntro).>

<After determining that a suitable transaction does not already exist, please note that the “verb-noun” construction for transaction names is preferred were possible. For additional guidance, see the IHE wiki at <http://wiki.ihe.net/index.php/IHE_Profile_Design_Principles_and_Conventions#Transactions>.

| Transaction Name and Number | Definition |
| --- | --- |
| Query Terminology Resource [ITI-Y1] | Search or read a terminology resource from the Terminology Repository. |
| Expand Value Set [ITI-Y2] | Expand the given Valuset to retrieve the list of available concepts in the value set. |
| Lookup Concept [ITI-Y3] | Retrieve the concept details from a Code System. |
| Validate Code [ITI-Y4] | Validate a code in a Code System to make sure it exists. |
| Translate Code [ITI-Y5] | Translate a code from a source system into a target system and return the result. |

# Glossary

Add the following **new** glossary terms to the IHE Technical Frameworks General Introduction Appendix D.

<Add any **new glossary additions** associated with the profile here. Verify that any glossary terms added here are not already contained in the [IHE Glossary](http://ihe.net/Technical_Frameworks/#GenIntro). Also, please review the [Glossary Rules](http://wiki.ihe.net/index.php/Official_Templates#Glossary_Rules) for terms that should/should not be added to the IHE Glossary>

| Glossary Term | Definition |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |

Volume 1 – Profiles

## Copyright Licenses

NA

## Domain-specific additions

NA

# X Sharing Valuesets, Codes, and Maps (SVCM)

The Sharing Valuesets, Codes, and Maps (SVCM) Profile defines a lightweight RESTful interface through which healthcare systems may retrieve centrally managed uniform nomenclature and mappings between code systems, based on the HL7 Fast Healthcare Interoperability Resources (FHIR) specification.

Terminologies stored in value sets are most useful when they are widely shared and standardized across geography and disciplines to add clarity and specificity. The IHE ITI Sharing Value Sets (SVS) profile addresses the challenge of standardized distribution of Value Sets. Furthermore, the IHE PCC Clinical Mapping (CMAP) profile addresses the need to translate codes between different value sets, as is often needed when converting a device-generated observation to a reference term for use in clinical decision making or record keeping.

A FHIR-based approach to sharing value sets and their underlying code systems, as well as to using concept maps to translate codes, makes these functionalities more suitable for mobile and lightweight web applications. It also allows implementers to benefit from the robust ecosystem of tools available for HL7 FHIR.

**Differences from existing SVS and CMAP Profiles**

The SVCM Profile provides an alternative for the exchange and management of the metadata required for sharing data and replaces the use of HL7 Common Terminology Services (CTS) and Common Terminology Services 2 (CTS 2) with HL7 FHIR.

SVCM will create an easily referenceable resource for profiles to use the Terminology Service in their workflows. It can lead to better overall standardization of those profiles and save future profile authors and editors from needing to redefine how to interact with the Terminology Service across various use cases.

A single Terminology Repository can be accessed by many Terminology Consumers, establishing a domain of consistent and uniform set of nomenclatures. It supports automated loading of Value Sets by Terminology Consumers, reducing the burden of manual configuration.

This profile describes three transactions for retrieving Value Sets from a Terminology Repository by a Terminology Consumer.

A single value set can be retrieved based on a Value Set Unique ID. This is aimed at meeting the needs of systems that are pre-configured to use specific value sets. These systems may be medical devices with strictly controlled functions that should not be modified without careful review. This transaction does not include metadata content and provides just the value set concept list as uniquely identified in the request.

## X.1 SVS Actors/Transactions

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A at [http://ihe.net/Technical\_Frameworks](http://ihe.net/Technical_Frameworks/).

Figure X.1-1 shows the actors directly involved in the SVCM Profile and the relevant transactions between them. Other actors that may be indirectly involved due to their participation in related profiles are not necessarily shown. The method for creating a Value Set is also not covered by this profile (this subject will be addressed once the basic infrastructure is in place).

Translate Code [ITI-Y5]

Validate Code [ITI-Y4]

Lookup Concept [ITI-Y3]

Expand Value Set [ITI-Y2]

Query Terminology Resource [ITI-Y1]

Terminology Repository

Terminology Consumer

Figure X.1-1: Actors and Transactions

Table X.1-1 SVCM Integration Profile - Actors and Transactions lists the transactions for each actor directly involved in the SVCM Profile. In order to claim support of this Integration Profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional. A complete list of options defined by this Integration Profile is shown in Table X.2-1.

Table X.1-1: SVCM Integration Profile - Actors and Transactions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Actors | Transactions | Initiator or Responder | Optionality | Section |
| Terminology Repository | Query Terminology Resource [ITI-Y1] | Responder | R | ITI TF-2c: 3.Y1 |
| Expand Value Set [ITI-Y2] | Responder | R | ITI TF-2c: 3.Y2 |
| Lookup Concept [ITI-Y3] | Responder | R | ITI TF-2c: 3.Y3 |
| Validate Code [ITI-Y4] | Responder | R | ITI TF-2c: 3.Y4 |
| Translate Code [ITI-Y5] | Responder | O | ITI TF-2c: 3.Y5 |
| Terminology Consumer (Note 1) | Query Terminology Resource [ITI-Y1] | Initiator | O | ITI TF-2c: 3.Y1 |
| Expand Value Set [ITI-Y2] | Initiator | O | ITI TF-2c: 3.Y2 |
| Lookup Concept [ITI-Y3] | Initiator | O | ITI TF-2c: 3.Y3 |
| Validate Code [ITI-Y4] | Initiator | O | ITI TF-2c: 3.Y4 |
| Translate Code [ITI-Y5] | Initiator | O | ITI TF-2c: 3.Y5 |

Note 1: A Terminology Consumer shall support at least one of these requirements.

### X.1.1 Actor Descriptions and Actor Profile Requirements

No additional requirements

## X.2 SVCM Actor Options

Options that may be selected for this Integration Profile are listed in Table X.2-1 Sharing Value Sets - Actors and Option,along with the actors to which they apply. Dependencies between options, when applicable, are specified in notes.

Table X.2-1: Sharing Value Sets - Actors and Options

| Actor | Options | Vol. & Section |
| --- | --- | --- |
| Terminology Repository | Translate Option | Section X.2.1 |
| Terminology Consumer | Translate Option | Section X.2.1 |

#### X.2.1 Translate Option

The translate option enables querying for Concept Maps and translating codes.

A Terminology Consumer or Terminology Repository that supports the Translate Option shall support the Translate Option on Query Terminology Resource [ITI-Y1] and Translate Code [ITI-Y5] transactions. See ITI TF-2c: 3.Y1 and ITI TF-2c: 3.Y5.

## X.3 SVCM Required Actor Groupings

**Table X.3-1: SVCM Profile - Required Actor Groupings**

|  |  |  |  |
| --- | --- | --- | --- |
| PMIR Actor | Actor(s) to be grouped with | Reference | Content Bindings Reference |
| Terminology Repository | ATNA / Secure Node or Secure Application | -- | -- |
| Terminology Consumer | None | -- | *--* |

## X.4 SVCM Overview

### X.4.1 Concepts

The FHIR terminology specification defines the following concepts, see <http://hl7.org/fhir/R4/terminology-module.html>:

* **Concept** – A code and definition. A representation of a real or abstract thing, which provides meaning.
* **Code System** - Define a set of concepts with a coherent meaning. Examples of code systems include ICD-10, LOINC, SNOMED-CT, and RxNorm. See <http://hl7.org/fhir/codesystem.html>.
* **Value Set** - Specifies a set of codes drawn from one or more code systems, intended for use in a particular context. Value sets link between code system definitions and their use in coded elements. See <http://hl7.org/fhir/valueset.html>.
* **Concept Map** - Defines a mapping from a set of concepts defined in a code system to one or more concepts defined in other code systems. See <http://hl7.org/fhir/R4/conceptmap.html> and <http://www.hl7.org/documentcenter/public/standards/V3/core_principles/infrastructure/coreprinciples/v3modelcoreprinciples.html#gl-concept>.
* **Expanded Value Sets** - Convert a Value Set Definition to a list of concept representations at a point in time, which typically consists of codes. Good practice is that a system that captures a coded value should be capable of reconstructing the Value Set Expansion in effect when a given code was selected. <http://www.hl7.org/documentcenter/public/standards/V3/core_principles/infrastructure/coreprinciples/v3modelcoreprinciples.html#coreP_Coded_Properties-value-sets-resolution>.

### X.4.2 Use Cases

The following use cases provide examples of how this profile might be used by various disciplines.

X.4.2.1 Use Case #1 Code System, Value Set, and Concept Map Discovery

In this use case, a Terminology Consumer retrieves and filters a list of Code Systems, Value Sets, or Concept Maps available in a Terminology Repository.  
  
X.4.2.1.1 Code System or Value Set Discovery Use Case Description

A Terminology Consumer requires a method for querying a Terminology Repository for a list of available Value Sets, Code Systems, and Concept Maps, based on filter criteria. Periodically, a health care organization publishes updated Value Sets, Code Systems, and Concept Maps documenting the codes that point of service systems must use. An electronic medical record system, the Terminology Consumer, periodically retrieves the list of available Value Sets, Code Systems, and Concept Maps that are relevant to its care unit and verifies that it has an up-to-date version of each cached locally.

Query Terminology Resource [ITI-Y1]

Terminology Repository

Terminology Consumer

**Figure X.4.2.1-1: Discovery interaction diagram**

X.4.2.2 Use Case #2 Expand a Value Set

In this use case, a point of service system is providing a list of codes to provide decision support to a clinician prescribing medications.

X.4.2.2.1 Expand a Value Set Use Case Description

A clinician uses a computerized physician order entry (CPOE) system to order opioid medications for an inpatient. A value set containing all of the opiate medication formulations that are considered to have abuse potential can be pulled to support clinical decision support in a health record system. Using a pre-assigned identifier, the CPOE system queries the Terminology Repository for an "expanded" ValueSet to retrieve the list of codes based on the definition of the ValueSet. The codes returned by an “expand” operation are suitable for providing decision support and validation.

Expand Value Set [ITI-Y2]

Terminology Repository

Terminology Consumer

**Figure X.4.2.2-1: Expand a Value Set Use Case Diagram**

X.4.2.3 Use Case #3 Look up a concept

In this use case, a Terminology Consumer asks a Terminology Repository for details about a particular code system/code combination.  
  
X.4.2.3.1 Look up a concept Use Case Description

A physician updates a patient’s problems list (conditions) at a point of service terminal. After a code is entered, the point of service terminal—the Terminology Consumer—queries a Terminology Repository to retrieve the full details of the code using the lookup operation. The Terminology Repository returns information for both display and processing purposes, such as a longer narrative description along with inclusions and exclusions, allowing the physician to verify that she entered the correct code and to make a correction if necessary.

Lookup Code [ITI-Y3]

Terminology Repository

Terminology Consumer

**Figure X.4.2.3-1: Look up a Concept Use Case Diagram**

X.4.2.4 Use Case #4 Validate a code  
In this use case, a point of service system verifies whether a particular code is a valid member of a value set.   
  
X.4.2.4.1 Validate a code Use Case Description  
A health system publishes value sets consisting of codes relevant to particular clinical contexts and related procedures. Value sets are updated periodically to represent changes in clinical practice and available medicines and supplies. Before submitting an update to a patient record, an electronic medical record system uses the “validate-code” operation of a Terminology Repository to validate that each medical code is valid. The Terminology Repository returns true/false indicating whether a code/concept is in the set of codes associated with a value set and a list of errors and warnings associated with it.

Validate Code [ITI-Y4]

Terminology Repository

Terminology Consumer

**Figure X.4.2.4-1: Validate a Code Use Case Diagram**

X.4.2.5 Use Case #5 Translate a code

In this use case, a concept is translated from a source code system, possibly a proprietary local terminology, to a target code system, such as LOINC.  
  
X.4.2.5.1 Translate a Code Use Case Description

In this example, an ambulatory clinic might refer to a lab test as a “white count”. To report and analyze these tests accurately, the clinic must submit its data using a shared terminology standard used within the health system, such as LOINC. The clinic’s reporting system queries a Terminology Repository to translate its local “white count” concept to a LOINC concept using a pre-loaded Concept Map, which defines relationships between concepts in a source Code System and one or more target Code Systems. The Terminology Repository returns LOINC 6690-2 “Leukocytes [#/volume] in Blood by Automated count”.

Translate Code [ITI-Y5]

Terminology Repository

Terminology Consumer

**Figure X.4.2.5-1: Translate a Code Use Case Diagram**

## X.5 SVCM Security Considerations

The contents handled by the SVCM Profile are not patient-specific, so there are no risks to patient privacy. Some Expanded Value Sets are of little value to an attacker as they are public tables of non-critical information (e.g., Expanded Value Sets used for coding of body parts in medical exams). Other Expanded Value Sets might need protection against malicious modification or interception. For example, there can be integrity risks such as masquerade, or the modification of Expanded Value Sets. Another possible type of risk would be at the privacy and confidentiality level, such as the interception of an Expanded Value Set containing confidential data. The profile will allow mitigation of those risks when needed in the following manner:

* A Terminology Repository shall be grouped with an ATNA Secure Node or Secure Application. Since the Terminology Consumer is not required to be grouped with the Secure Node or Secure Application, the Terminology Repository shall support both secure and non-secure connections.
* Terminology Repositories shall be able to restrict access to a specific Expanded Value Set to authorized and authenticated nodes, while allowing unauthenticated network queries to other Expanded Value Sets.

See ITI TF-2x: Appendix Z.8 “Mobile Security Considerations”

## X.6 SVCM Cross Profile Considerations

None

Appendices

Not applicable

Volume 2c – Transactions

Add Section 3.Y1

## 3.Y1 Query Terminology Resource [ITI-Y1]

This section corresponds to transaction [ITI-Y1] of the IHE IT Infrastructure Technical Framework. Transaction [ITI-Y1] is used by the Terminology Consumer and Terminology Repository Actors.

### 3.Y1.1 Scope

This transaction is used by the Terminology Consumer to solicit information about terminology resources whose data match data provided in the query parameters on the request message. The request is received by the Terminology Repository. The Terminology Repository processes the request and returns a response of the matching terminology resources.

### 3.Y1.2 Actor Roles

Table 3.Y1.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Terminology Consumer |
| **Role:** | Requests terminology resource(s) matching the supplied set of criteria from the Terminology Repository. |
| **Actor:** | Terminology Repository |
| **Role:** | Returns information for terminology resource(s) matching the criteria provided by the Terminology Consumer. |

### 3.Y1.3 Referenced Standards

|  |  |
| --- | --- |
| HL7 FHIR | HL7 FHIR standard R4 <http://hl7.org/fhir/R4/index.html> |

### 3.Y1.4 Interaction Diagram

Search Terminology Resource Request:   
HTTP GET /<Resource>

Search Terminology Resource Response:   
Bundle

Read Terminology Resource Request:   
HTTP GET /<Resource>/<ResourceId>

Read Terminology Resource Response: <Resource>

Terminology Consumer

Terminology Repository

#### 3.Y1.4.1 Search Terminology Resource Request Message

The Search Terminology Resource message is a FHIR search interaction on the ValueSet or CodeSystem Resources or the ConceptMap Resource when the Translate Option is supported.

##### 3.Y1.4.1.1 Trigger Events

A Terminology Consumer triggers a Search Terminology Resource Request to a Terminology Repository according to the business rules for the search. These business rules are outside the scope of this transaction.

##### 3.Y1.4.1.2 Message Semantics

A Terminology Consumer initiates a search interaction using HTTP GET as defined at <http://hl7.org/fhir/R4/http.html#search> on the ValueSet or CodeSystem Resources. The query parameters are identified below. A Terminology Consumer may query any combination or subset of the parameters. The target is formatted as:

GET [base]/[resource]?[parameter=value]

Where [base] is the URL of Terminology Repository.

A Terminology Repository shall support combinations of search parameters as defined at <http://hl7.org/fhir/R4/search.html#combining>, “Composite Search Parameters.”

A Terminology Repository shall support responding to a request for both the JSON and the XML messaging formats as defined in FHIR. A Terminology Consumer shall accept either the JSON or the XML messaging formats as defined in FHIR. See ITI TF-2x: Appendix Z.6 for more details.

A Terminology Repository shall implement the parameters described below. A Terminology Repository may choose to support additional query parameters beyond the subset listed below. Any additional query parameters supported shall be supported according to the core FHIR specification.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

###### 3.Y1.4.1.2.1 Common Parameters

The Terminology Repository shall support the :contains and :exact modifiers in all of the string query parameters below.

The Terminology Repository shall support the following search parameters as defined at <http://hl7.org/fhir/R4/search.html#all>.

\_id

\_lastUpdated

The Terminology Repository shall also support the following prefixes for the \_lastUpdated parameter: gt, lt, ge, le, sa, and eb.

###### 3.Y1.4.1.2.2 ValueSet Resource Message Semantics

The Terminology Repository shall support the following search parameters on the ValueSet Resource as defined at <http://hl7.org/fhir/R4/valueset.html#search>. String parameter modifiers are defined at <http://hl7.org/fhir/R4/search.html#string>.

status

identifier

name

description

reference

title

url

version

###### 3.Y1.4.1.2.3 CodeSystem Resource Message Semantics

The Terminology Repository shall support the following search parameters on the CodeSystem Resource as defined at <http://hl7.org/fhir/R4/codesystem.html#search>. String parameter modifiers are defined at <http://hl7.org/fhir/R4/search.html#string>.

status

identifier

name

description

system

title

url

version

###### 3.Y1.4.1.2.4 Translate Option ConceptMap Resource Message Semantics

The Terminology Repository supporting the Translate Option shall support the following search parameters on the ConceptMap Resource as defined at <http://hl7.org/fhir/R4/conceptmap.html#search>. String parameter modifiers are defined at <http://hl7.org/fhir/R4/search.html#string>.

status

identifier

name

description

title

url

version

source-system

source-uri

target-system

target-uri

##### 3.Y1.4.1.3 Expected Actions

The Terminology Repository shall process the query to discover the resources that match the search parameters given, and return a response as per Section 3.Y1.4.2 or an error as per <http://hl7.org/fhir/R4/search.html#errors>.

#### 3.Y1.4.2 Search Terminology Resource Response message

##### 3.Y1.4.2.1 Trigger Events

The Terminology Repository sends the Search Terminology Response to the Terminology Consumer when results to the query are ready.

##### 3.Y1.4.2.2 Message Semantics

The Terminology Repository shall support the search response message as defined at <http://hl7.org/fhir/R4/http.html#search> on the following resources.

* ValueSet, as defined at <http://hl7.org/fhir/R4/valueset.html>
* CodeSystem, as defined at <http://hl7.org/fhir/R4/codesystem.html>
* ConceptMap, as defined at <http://hl7.org/fhir/R4/conceptmap.html> when the Translate Option is supported

The “content-type” of the response will depend upon the requested response format indicated by the Terminology Consumer.

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

##### 3.Y1.4.2.3 Expected Actions

The Terminology Consumer has received the response and continues with its workflow.

##### 3.Y1.4.2.4 CapabilityStatement Resource

Terminology Repositories implementing [ITI-Y1] shall provide a CapabilityStatement Resource as described in ITI TF-2x: Appendix Z.4 indicating the query operation for the Resources have been implemented and shall include all query parameters implemented for the Resources.

#### 3.Y1.4.3 Read Terminology Resource Request Message

This message represents an HTTP GET from the Terminology Consumer to the Terminology Repository and provides a mechanism for retrieving a single Resource with a known resource id.

##### 3.Y1.4.3.1 Trigger Events

When the Terminology Consumer possesses a Resource’s id (either through query, database lookup, or other mechanism) for which it requires additional or new information, it issues a Read Terminology Resource Request.

##### 3.Y1.4.3.2 Message Semantics

A Terminology Consumer initiates a read interaction using HTTP GET as defined at <http://hl7.org/fhir/R4/http.html#read> on the ValueSet or CodeSystem Resources. The target is formatted as:

GET [base]/[resource]/[resourceId]

Where [base] is the URL of Terminology Repository.

The Terminology Repository shall respond to this query by sending a single Terminology Resource instance.

The resourceId included in the request always represents the unique id for the Resource within the scope of the URL. For example, while http://example1.org/ihe/ValueSet/1 and http://example2.com/ihe/ValueSet/1 both contain the same [resourceId], they reference two different resource instances.

Note: The use of "http" or "https" in URL does not override requirements to use TLS for security purposes.

A Terminology Repository shall support responding to a request for both the JSON and the XML messaging formats as defined in FHIR. A Terminology Consumer shall accept either the JSON or the XML messaging formats as defined in FHIR. See ITI TF-2x: Appendix Z.6 for more details.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

##### 3.Y1.4.3.2.1 Translate Option Message Semantics

The Terminology Repository supporting the Translate Option shall support the FHIR read interaction on the ConceptMap Resource.

##### 3.Y1.4.3.3 Expected Actions

The Terminology Repository shall process the request to retrieve the resource that matches the given resource id, and return a response as defined at <http://hl7.org/fhir/R4/http.html#read> or an error code as defined at <http://hl7.org/fhir/http.html#Status-Codes>.

#### 3.Y1.4.4 Read Terminology Resource Response Message

The Terminology Repository’s response to a successful Read Terminology Resource message shall be an **HTTP 200** (OK) Status code with a Terminology Resource, or an appropriate error code with an OperationOutcome Resource.

##### 3.Y1.4.4.1 Trigger Events

The Terminology Repository found a terminology resource matching the Resource id specified by the Terminology Consumer.

##### 3.Y1.4.4.2 Message Semantics

The Read Terminology Resource Response is sent from the Terminology Repository to the Terminology Consumer as a single terminology Resource.

* ValueSet, as defined at <http://hl7.org/fhir/R4/valueset.html>
* CodeSystem, as defined at <http://hl7.org/fhir/R4/codesystem.html>
* ConceptMap, as defined at <http://hl7.org/fhir/R4/conceptmap.html> when the Translate Option is supported.

The “content-type” of the response will depend upon the requested response format indicated by the Terminology Consumer.

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

If the Terminology Repository is unable to produce a response in the requested format, it shall respond with an **HTTP 4xx** error indicating that it was unable to fulfill the request. The Terminology Repository may be capable of servicing requests for response formats not listed, but shall, at minimum, be capable of producing XML and JSON encodings.

### 3.Y1.5 Security Considerations

See the general Security Consideration in ITI TF-1: X.5

Add Section 3.Y2

## 3.Y2 Expand Value Set [ITI-Y2]

This section corresponds to transaction [ITI-Y2] of the IHE IT Infrastructure Technical Framework. Transaction [ITI-Y2] is used by the Terminology Consumer and Terminology Repository Actors.

### 3.Y2.1 Scope

This transaction is used by the Terminology Consumer to expand a given ValueSet to return the full list of concepts available in that ValueSet. The request is received by the Terminology Repository. The Terminology Repository processes the request and returns a response of the expanded ValueSet.

### 3.Y1.2 Actor Roles

Table 3.Y2.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Terminology Consumer |
| **Role:** | Requests an expanded ValueSet from the Terminology Repository. |
| **Actor:** | Terminology Repository |
| **Role:** | Returns information for the expanded ValueSet based on criteria provided by the Terminology Consumer. |

### 3.Y2.3 Referenced Standards

|  |  |
| --- | --- |
| HL7 FHIR | HL7 FHIR standard R4 <http://hl7.org/fhir/R4/index.html> |

### 3.Y2.4 Interaction Diagram

Expand Value Set Request:   
HTTP GET /ValueSet/$expand

Expand Value Set Response:   
ValueSet

Terminology Consumer

Terminology Repository

#### 3.Y2.4.1 Expand Value Set Request Message

The Expand Value Set Request message is a FHIR $expand operation on the ValueSet Resource.

##### 3.Y2.4.1.1 Trigger Events

A Terminology Consumer triggers a Expand Value Set Request to a Terminology Repository according to the business rules for the expansion. These business rules are outside the scope of this transaction.

##### 3.Y2.4.1.2 Message Semantics

A Terminology Consumer initiates an $expand request using HTTP GET as defined at <http://hl7.org/fhir/valueset-operation-expand.html> on the ValueSet Resource. The required input parameters are identified in Table 3.Y2.4.1.2-1.

The URL for this operation is: [base]/ValueSet/$expand

Where [base] is the URL of Terminology Repository.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

Table 3.Y2.4.1.2-1: Expand Value Set Message HTTP Input Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Query parameter Name | IHE Constraint | Search Type | Description |
| url  [0..1] | [1..1] | uri | A canonical reference to a value set. The server must know the value set (e.g. it is defined explicitly in the server's value sets, or it is defined implicitly by some code system known to the server |
| \_format  [0..1] |  | mime-type | The requested format of the response from the mime-type value set. See ITI TF-2x: Appendix Z.6 |
| valueSet  [0..1] | [0..0] | ValueSet | The value set is provided directly as part of the request. Servers may choose not to accept value sets in this fashion |
| valueSetVersion  [0..1] | [0..1] | uri | The identifier that is used to identify a specific version of the value set to be used when generating the expansion. This is an arbitrary value managed by the value set author and is not expected to be globally unique. For example, it might be a timestamp (e.g. yyyymmdd) if a managed version is not available. |
| context  [0..1] | [0..0] | uri | The context of the value set, so that the server can resolve this to a value set to expand. The recommended format for this URI is [Structure Definition URL]#[name or path into structure definition] e.g. http://hl7.org/fhir/StructureDefinition/observation-hspc-height-hspcheight#Observation.interpretation. Other forms may be used but are not defined. This form is only usable if the terminology server also has access to the conformance registry that the server is using, but can be used to delegate the mapping from an application context to a binding at run-time |
| contextDirection  [0..1] | [0..0] | code | If a context is provided, a context direction may also be provided. Valid values are:   * 'incoming': the codes a client can use for PUT/POST operations, and * 'outgoing', the codes a client might receive from the server.   The purpose is to inform the server whether to use the value set associated with the context for reading or writing purposes (note: for most elements, this is the same value set, but there are a few elements where the reading and writing value sets are different) |
| filter  [0..1] |  | string | A text filter that is applied to restrict the codes that are returned (this is useful in a UI context). The interpretation of this is delegated to the server in order to allow to determine the most optimal search approach for the context. The server can document the way this parameter works in TerminologyCapabilities..expansion.textFilter. Typical usage of this parameter includes functionality like:   * using left matching e.g. "acut ast" * allowing for wild cards such as %, &, ? * searching on definition as well as display(s) * allowing for search conditions (and / or / exclusions)   Text Search engines such as Lucene or Solr, long with their considerable functionality, might also be used. The optional text search might also be code system specific, and servers might have different implementations for different code systems |
| date  [0..1] |  | dateTime | The date for which the expansion should be generated. if a date is provided, it means that the server should use the value set / code system definitions as they were on the given date, or return an error if this is not possible. Normally, the date is the current conditions (which is the default value) but under some circumstances, systems need to generate an expansion as it would have been in the past. A typical example of this would be where code selection is constrained to the set of codes that were available when the patient was treated, not when the record is being edited. Note that which date is appropriate is a matter for implementation policy. |
| offset  [0..1] |  | integer | Paging support - where to start if a subset is desired (default = 0). Offset is number of records (not number of pages) |
| count  [0..1] |  | integer | Paging support - how many codes should be provided in a partial page view. Paging only applies to flat expansions - servers ignore paging if the expansion is not flat. If count = 0, the client is asking how large the expansion is. Servers SHOULD honor this request for hierarchical expansions as well, and simply return the overall count |
| includeDesignations  [0..1] |  | boolean | Controls whether concept designations are to be included or excluded in value set expansions |
| designation  [0..\*] |  | string | A token that specifies a system+code that is either a use or a language. Designations that match by language or use are included in the expansion. If no designation is specified, it is at the server discretion which designations to return |
| includeDefinition  [0..1] |  | boolean | Controls whether the value set definition is included or excluded in value set expansions |
| activeOnly  [0..1] |  | boolean | Controls whether inactive concepts are included or excluded in value set expansions. Note that if the value set explicitly specifies that inactive codes are included, this parameter can still remove them from a specific expansion, but this parameter cannot include them if the value set excludes them |
| excludeNested  [0..1] |  | boolean | Controls whether or not the value set expansion nests codes or not (i.e. ValueSet.expansion.contains.contains) |
| excludeNotForUI  [0..1] |  | boolean | Controls whether or not the value set expansion is assembled for a user interface use or not. Value sets intended for User Interface might include 'abstract' codes or have nested contains with items with no code or abstract = true, with the sole purpose of helping a user navigate through the list efficiently, where as a value set not generated for UI use might be flat, and only contain the selectable codes in the value set. The exact implications of 'for UI' depend on the code system, and what properties it exposes for a terminology server to use. In the FHIR Specification itself, the value set expansions are generated with excludeNotForUI = false, and the expansions used when generated schema / code etc, or performing validation, are all excludeNotForUI = true. |
| excludePostCoordinate  [0..1] |  | boolean | Controls whether or not the value set expansion includes post coordinated codes |
| displayLanguage  [0..1] |  | code | Specifies the language to be used for description in the expansions i.e. the language to be used for ValueSet.expansion.contains.display |
| exclude-system  [0..\*] |  | canonical | Code system, or a particular version of a code system to be excluded from the value set expansion. The format is the same as a canonical URL: [system]|[version] - e.g. <http://loinc.org|2.56> |
| system-version  [0..\*] |  | canonical | Specifies a version to use for a system, if the value set does not specify which one to use. The format is the same as a canonical URL: [system]|[version] - e.g. <http://loinc.org|2.56> |
| check-system-version  [0..\*] |  | canonical | Edge Case: Specifies a version to use for a system. If a value set specifies a different version, an error is returned instead of the expansion. The format is the same as a canonical URL: [system]|[version] - e.g. <http://loinc.org|2.56> |
| force-system-version  [0..\* |  | canonical | Edge Case: Specifies a version to use for a system. This parameter overrides any specified version in the value set (and any it depends on). The format is the same as a canonical URL: [system]|[version] - e.g. http://loinc.org|2.56. Note that this has obvious safety issues, in that it may result in a value set expansion giving a different list of codes that is both wrong and unsafe, and implementers should only use this capability reluctantly. It primarily exists to deal with situations where specifications have fallen into decay as time passes. If the value is override, the version used SHALL explicitly be represented in the expansion parameters |

##### 3.Y2.4.1.3 Expected Actions

The Terminology Repository shall process the input parameters to discover the ValueSet that matches the parameters given and return a response as per Section 3.Y2.4.2 or an OperationOutcome with an error message.

#### 3.Y2.4.2 Expand Value Set Response Message

##### 3.Y2.4.2.1 Trigger Events

The Terminology Repository sends the Expand Value Set Response to the Terminology Consumer when results to the expansion are ready.

##### 3.Y2.4.2.2 Message Semantics

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

The response message is a FHIR ValueSet Resource with the expansion element populated with the expanded ValueSet concepts.

##### 3.Y2.4.2.3 Expected Actions

The Terminology Consumer has received the response and continues with its workflow.

### 3.Y2.5 Security Considerations

See the general Security Consideration in ITI TF-1: X.5

Add Section 3.Y3

## 3.Y3 Lookup Concept [ITI-Y3]

This section corresponds to transaction [ITI-Y3] of the IHE IT Infrastructure Technical Framework. Transaction [ITI-Y3] is used by the Terminology Consumer and Terminology Repository Actors.

### 3.Y3.1 Scope

This transaction is used by the Terminology Consumer to lookup a given concept to return the full details of the concept. The request is received by the Terminology Repository. The Terminology Repository processes the request and returns a response of the concept details as a Parameters resource.

### 3.Y3.2 Actor Roles

Table 3.Y3.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Terminology Consumer |
| **Role:** | Requests concept details from the Terminology Repository. |
| **Actor:** | Terminology Repository |
| **Role:** | Returns information for the concept based on criteria provided by the Terminology Consumer. |

### 3.Y3.3 Referenced Standards

|  |  |
| --- | --- |
| HL7 FHIR | HL7 FHIR standard R4 <http://hl7.org/fhir/R4/index.html> |

### 3.Y3.4 Interaction Diagram

Lookup Concept Request:   
HTTP GET /CodeSystem/$lookup

Lookup Concept Response:   
Parameters

Terminology Consumer

Terminology Repository

#### 3.Y3.4.1 Lookup Concept Request Message

The Lookup Concept Request message is a FHIR $lookup operation on the CodeSystem Resource.

##### 3.Y3.4.1.1 Trigger Events

A Terminology Consumer triggers a Lookup Concept Request to a Terminology Repository according to the business rules for the expansion. These business rules are outside the scope of this transaction.

##### 3.Y3.4.1.2 Message Semantics

A Terminology Consumer initiates an $lookup request using HTTP GET as defined at <http://hl7.org/fhir/codesystem-operation-lookup.html> on the CodeSystem Resource. The required input parameters are identified in Table 3.Y3.4.1.2-1.

The URL for this operation is: [base]/CodeSystem/$lookup

Where [base] is the URL of Terminology Repository.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

Table 3.Y3.4.1.2-1: Lookup Concept Message HTTP Input Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Query parameter Name | IHE Constraint | Search Type | Description |
| code  [0..1] | [1..1] | code | The code that is to be located. If a code is provided, a system must be provided |
| system  [0..1] | [1..1] | uri | The system for the code that is to be located |
| \_format  [0..1] |  | mime-type | The requested format of the response from the mime-type value set. See ITI TF-2x: Appendix Z.6 |
| version  [0..1] |  | string | The version of the system, if one was provided in the source data |
| coding  [0..1] | [0..0] | Coding | A coding to look up |
| date  [0..1] |  | dateTime | The date for which the information should be returned. Normally, this is the current conditions (which is the default value) but under some circumstances, systems need to acccess this information as it would have been in the past. A typical example of this would be where code selection is constrained to the set of codes that were available when the patient was treated, not when the record is being edited. Note that which date is appropriate is a matter for implementation policy. |
| displayLanguage  [0..1] |  | code | The requested language for display (see $expand.displayLanguage) |
| property  [0..\*] |  | code | A property that the client wishes to be returned in the output. If no properties are specified, the server chooses what to return. The following properties are defined for all code systems: url, name, version (code system info) and code information: display, definition, designation, parent and child, and for designations, lang.X where X is a designation language code. Some of the properties are returned explicit in named parameters (when the names match), and the rest (except for lang.X) in the property parameter group |

##### 3.Y3.4.1.3 Expected Actions

The Terminology Repository shall process the input parameters to discover the concept that matches the parameters given and return a response as per Section 3.Y3.4.2 or an OperationOutcome Resource with an error message.

#### 3.Y3.4.2 Lookup Concept Response Message

##### 3.Y3.4.2.1 Trigger Events

The Terminology Repository sends the Lookup Concept Response to the Terminology Consumer when results to the lookup are ready.

##### 3.Y3.4.2.2 Message Semantics

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

The response message is a FHIR Parameters Resource with properties of the concept set based on the out parameters defined at <http://hl7.org/fhir/codesystem-operation-lookup.html> and reproduced in Table 3.Y3.4.2.2-1.

Table 3.Y3.4.2.2-1: Validate CodeSystem Code Message HTTP Output Parameters

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| name  [1..1] | string | A display name for the code system |
| version  [0..1] | string | The version that these details are based on |
| display  [1..1] | string | The preferred display for this concept |
| designation  [0..\*] |  | Additional representations for this concept |
| designation.language  [0..1] | code | The language this designation is defined for |
| designation.use  [0..1] | Coding | A code that details how this designation would be used |
| designation.value  [1..1] | string | The text value for this designation |
| property  [0..\*] |  | One or more properties that contain additional information about the code, including status. For complex terminologies (e.g. SNOMED CT, LOINC, medications), these properties serve to decompose the code |
| property.code  [1..1] | code | Identifies the property returned |
| property.value  [0..1] | code | Coding | string | integer | boolean | dateTime | decimal | The value of the property returned |
| property.description  [0..1] | string | Human Readable representation of the property value (e.g. display for a code) |
| property.subproperty  [0..\*] |  | Nested Properties (mainly used for SNOMED CT decomposition, for relationship Groups) |
| property.subproperty.code  [1..1] | code | Identifies the sub-property returned |
| property.subproperty.value  [1..1] | code | Coding | string | integer | boolean | dateTime | decimal | The value of the sub-property returned |
| property.subproperty.description  [0..1] | string | Human Readable representation of the sub-property value (e.g. display for a code) |

##### 3.Y3.4.2.3 Expected Actions

The Terminology Consumer has received the response and continues with its workflow.

### 3.Y3.5 Security Considerations

See the general Security Consideration in ITI TF-1: X.5

Add Section 3.Y4

## 3.Y4 Validate Code [ITI-Y4]

This section corresponds to transaction [ITI-Y4] of the IHE IT Infrastructure Technical Framework. Transaction [ITI-Y4] is used by the Terminology Consumer and Terminology Repository Actors.

### 3.Y4.1 Scope

This transaction is used by the Terminology Consumer to lookup a given concept to return the full details of the concept. The request is received by the Terminology Repository. The Terminology Repository processes the request and returns a response of the concept details as a Parameters resource.

### 3.Y4.2 Actor Roles

Table 3.Y4.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Terminology Consumer |
| **Role:** | Requests the code to validate from the Terminology Repository. |
| **Actor:** | Terminology Repository |
| **Role:** | Returns validation information for the code provided by the Terminology Consumer. |

### 3.Y4.3 Referenced Standards

|  |  |
| --- | --- |
| HL7 FHIR | HL7 FHIR standard R4 <http://hl7.org/fhir/R4/index.html> |

### 3.Y4.4 Interaction Diagram

Validate ValueSet Code Request:   
HTTP GET /ValueSet/$validate-code

Validate ValueSet Code Response:   
Parameters

Validate CodeSystem Code Request:   
HTTP GET /CodeSystem/$validate-code

Validate CodeSystem Code Response: Parameters

Terminology Consumer

Terminology Repository

#### 3.Y4.4.1 Validate ValueSet Code Request Message

The Validate ValueSet Code Request message is a FHIR $validate-code operation on the ValueSet Resource.

##### 3.Y4.4.1.1 Trigger Events

A Terminology Consumer triggers a Validate ValueSet Code Request to a Terminology Repository according to the business rules for the validation. These business rules are outside the scope of this transaction.

##### 3.Y4.4.1.2 Message Semantics

A Terminology Consumer initiates an $validate-code request using HTTP GET as defined at <http://hl7.org/fhir/valueset-operation-validate-code.html> on the ValueSet Resource. The required input parameters are identified in Table 3.Y4.4.1.2-1.

The URL for this operation is: [base]/ValueSet/$validate-code

Where [base] is the URL of Terminology Repository.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

Table 3.Y3.4.1.2-1: Validate ValueSet Code Message HTTP Input Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Query Parameter Name | IHE Constraint | Search Type | Description |
| url  [0..1] | [1..1] | uri | Value set Canonical URL. The server must know the value set (e.g. it is defined explicitly in the server's value sets, or it is defined implicitly by some code system known to the server |
| code  [0..1] | [1..1] | code | The code that is to be validated. If a code is provided, a system or a context must be provided (if a context is provided, then the server SHALL ensure that the code is not ambiguous without a system) |
| system  [0..1] | [1..1] | uri | The system for the code that is to be validated |
| \_format  [0..1] | [0..1] | mime-type | The requested format of the response from the mime-type value set. See ITI TF-2x: Appendix Z.6 |
| context  [0..1] | [0..0] | uri | The context of the value set, so that the server can resolve this to a value set to validate against. The recommended format for this URI is [Structure Definition URL]#[name or path into structure definition] e.g. http://hl7.org/fhir/StructureDefinition/observation-hspc-height-hspcheight#Observation.interpretation. Other forms may be used but are not defined. This form is only usable if the terminology server also has access to the conformance registry that the server is using, but can be used to delegate the mapping from an application context to a binding at run-time |
| valueSet  [0..1] | [0..0] | ValueSet | The value set is provided directly as part of the request. Servers may choose not to accept value sets in this fashion. This parameter is used when the client wants the server to expand a value set that is not stored on the server |
| valueSetVersion  [0..1] |  | string | The identifier that is used to identify a specific version of the value set to be used when validating the code. This is an arbitrary value managed by the value set author and is not expected to be globally unique. For example, it might be a timestamp (e.g. yyyymmdd) if a managed version is not available. |
| systemVersion  [0..1] |  | string | The version of the system, if one was provided in the source data |
| display  [0..1] |  | string | The display associated with the code, if provided. If a display is provided a code must be provided. If no display is provided, the server cannot validate the display value, but may choose to return a recommended display name using the display parameter in the outcome. Whether displays are case sensitive is code system dependent |
| coding  [0..1] | [0..0] | Coding | A coding to validate |
| codeableConcept  [0..1] | [0..0] | CodeableConcept | A full codeableConcept to validate. The server returns true if one of the coding values is in the value set, and may also validate that the codings are not in conflict with each other if more than one is present |
| date  [0..1] |  | dateTime | The date for which the validation should be checked. Normally, this is the current conditions (which is the default values) but under some circumstances, systems need to validate that a correct code was used at some point in the past. A typical example of this would be where code selection is constrained to the set of codes that were available when the patient was treated, not when the record is being edited. Note that which date is appropriate is a matter for implementation policy. |
| abstract  [0..1] |  | boolean | If this parameter has a value of true, the client is stating that the validation is being performed in a context where a concept designated as 'abstract' is appropriate/allowed to be used, and the server should regard abstract codes as valid. If this parameter is false, abstract codes are not considered to be valid.  Note that. 'abstract' is a property defined by many HL7 code systems that indicates that the concept is a logical grouping concept that is not intended to be used asa 'concrete' concept to in an actual patient/care/process record. This language is borrowed from Object Orienated theory where 'asbtract' objects are never instantiated. However in the general record and terminology eco-system, there are many contexts where it is appropraite to use these codes e.g. as decision making criterion, or when editing value sets themselves. This parameter allows a client to indicate to the server that it is working in such a context. |
| displayLanguage  [0..1] |  | code | Specifies the language to be used for description when validating the display property |

##### 3.Y4.4.1.3 Expected Actions

The Terminology Repository shall process the input parameters to discover the code that matches the parameters given and return a response as per Section 3.Y3.4.2 or an OperationOutcome Resource with an error message.

#### 3.Y4.4.2 Validate ValueSet Code Response Message

##### 3.Y4.4.2.1 Trigger Events

The Terminology Repository sends the Validate ValueSet Code Response to the Terminology Consumer when results to the lookup are ready.

##### 3.Y4.4.2.2 Message Semantics

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

The response message is a FHIR Parameters Resource with properties of the code set based on the out parameters defined at <http://hl7.org/fhir/valueset-operation-validate-code.html> and reproduced in Table 3.Y4.4.2.2-1.

Table 3.Y4.4.2.2-1: Validate ValueSet Code Message HTTP Output Parameters

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| result  [1..1] | boolean | True if the concept details supplied are valid |
| message  [0..1] | string | Error details, if result = false. If this is provided when result = true, the message carries hints and warnings |
| display  [0..1] | string | A valid display for the concept if the system wishes to display this to a user |

##### 3.Y4.4.2.3 Expected Actions

The Terminology Consumer has received the response and continues with its workflow.

#### 3.Y4.4.3 Validate CodeSystem Code Request Message

The Validate CodeSystem Code Request message is a FHIR $validate-code operation on the CodeSystem Resource.

##### 3.Y4.4.3.1 Trigger Events

A Terminology Consumer triggers a Validate CodeSystem Code Request to a Terminology Repository according to the business rules for the validation. These business rules are outside the scope of this transaction.

##### 3.Y4.4.3.2 Message Semantics

A Terminology Consumer initiates an $validate-code request using HTTP GET as defined at <http://hl7.org/fhir/codesystem-operation-validate-code.html> on the CodeSystem Resource. The required input parameters are identified in Table 3.Y4.4.3.2-1.

The URL for this operation is: [base]/CodeSystem/$validate-code

Where [base] is the URL of Terminology Repository.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

Table 3.Y3.4.3.2-1: Validate CodeSystem Code Message HTTP Input Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Query Parameter Name | IHE Constraint | Search Type | Description |
| url  [0..1] | [1..1] | uri | CodeSystem URL. The server must know the code system (e.g. it is defined explicitly in the server'scode systems, or it is known implicitly by the server |
| Code  [0..1] | [1..1] | code | The code that is to be validated |
| \_format  [0..1] |  | mime-type | The requested format of the response from the mime-type value set. See ITI TF-2x: Appendix Z.6 |
| codeSystem  [0..1] | [0..0] | CodeSystem | The codeSystem is provided directly as part of the request. Servers may choose not to accept code systems in this fashion. This parameter is used when the client wants the server to check against a code system that is not stored on the server |
| version  [0..1] |  | string | The version of the code system, if one was provided in the source data |
| display  [0..1] |  | string | The display associated with the code, if provided. If a display is provided a code must be provided. If no display is provided, the server cannot validate the display value, but may choose to return a recommended display name in an extension in the outcome. Whether displays are case sensitive is code system dependent |
| coding  [0..1] | [0..0] | Coding | A coding to validate. The system must match the specified code system |
| codeableConcept  [0..1] | [0..0] | CodeableConcept | A full codeableConcept to validate. The server returns true if one of the coding values is in the code system, and may also validate that the codings are not in conflict with each other if more than one is present |
| date  [0..1] |  | dateTime | The date for which the validation should be checked. Normally, this is the current conditions (which is the default values) but under some circumstances, systems need to validate that a correct code was used at some point in the past. A typical example of this would be where code selection is constrained to the set of codes that were available when the patient was treated, not when the record is being edited. Note that which date is appropriate is a matter for implementation policy. |
| abstract  [0..1] |  | boolean | If this parameter has a value of true, the client is stating that the validation is being performed in a context where a concept designated as 'abstract' is appropriate/allowed to be used, and the server should regard abstract codes as valid. If this parameter is false, abstract codes are not considered to be valid. |
| displayLanguage  [0..1] |  | code | Specifies the language to be used for description when validating the display property |

##### 3.Y4.4.3.3 Expected Actions

The Terminology Repository shall process the input parameters to discover the code that matches the parameters given and return a response as per Section 3.Y3.4.4 or an OperationOutcome Resource with an error message.

#### 3.Y4.4.4 Validate CodeSystem Code Response Message

##### 3.Y4.4.4.1 Trigger Events

The Terminology Repository sends the Validate CodeSystem Code Response to the Terminology Consumer when results to the lookup are ready.

##### 3.Y4.4.4.2 Message Semantics

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

The response message is a FHIR Parameters Resource with properties of the code set based on the out parameters defined at <http://hl7.org/fhir/codesystem-operation-validate-code.html> and reproduced in Table 3.Y4.4.4.2-1.

Table 3.Y4.4.4.2-1: Validate CodeSystem Code Message HTTP Output Parameters

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| result  [1..1] | boolean | True if the concept details supplied are valid |
| message  [0..1] | string | Error details, if result = false. If this is provided when result = true, the message carries hints and warnings |
| display  [0..1] | string | A valid display for the concept if the system wishes to display this to a user |

##### 3.Y4.4.4.3 Expected Actions

The Terminology Consumer has received the response and continues with its workflow.

### 3.Y4.5 Security Considerations

See the general Security Consideration in ITI TF-1: X.5

Add Section 3.Y5

## 3.Y5 Translate Code [ITI-Y5]

This section corresponds to transaction [ITI-Y5] of the IHE IT Infrastructure Technical Framework. Transaction [ITI-Y5] is used by the Terminology Consumer and Terminology Repository Actors.

### 3.Y5.1 Scope

This transaction is used by the Terminology Consumer that supports the Translate Option to translate a given code from a ValueSet to a code from another ValueSet based on a ConceptMap Resource. The request is received by the Terminology Repository that supports the Translate Option. The Terminology Repository processes the request and returns a response of Parameters with the translated code.

### 3.Y5.2 Actor Roles

Table 3.Y5.2-1: Actor Roles

|  |  |
| --- | --- |
| **Actor:** | Terminology Consumer |
| **Role:** | Requests a translation of a code from one ValueSet to another based on a ConceptMap from the Terminology Repository. |
| **Actor:** | Terminology Repository |
| **Role:** | Returns information for the translated code based on criteria provided by the Terminology Consumer. |

### 3.Y5.3 Referenced Standards

|  |  |
| --- | --- |
| HL7 FHIR | HL7 FHIR standard R4 <http://hl7.org/fhir/R4/index.html> |

### 3.Y5.4 Interaction Diagram

Translate Code Request:   
HTTP GET /ConceptMap/$translate

Translate Code Response:   
Parameters

Terminology Consumer

Terminology Repository

#### 3.Y5.4.1 Translate Code Request Message

The Translate Code Request message is a FHIR $translate operation on the ConceptMap Resource.

##### 3.Y5.4.1.1 Trigger Events

A Terminology Consumer triggers a Translate Code Request to a Terminology Repository according to the business rules for the translation. These business rules are outside the scope of this transaction.

##### 3.Y5.4.1.2 Message Semantics

A Terminology Consumer initiates an $translate request using HTTP GET as defined at <http://hl7.org/fhir/conceptmap-operation-translate.html> on the ConceptMap Resource. The required input parameters are identified in Table 3.Y5.4.1.2-1.

The URL for this operation is: [base]/ConceptMap/$translate

Where [base] is the URL of Terminology Repository.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

Table 3.Y5.4.1.2-1: Translate Code Message HTTP Input Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Query Parameter Name | IHE Constraint | Search Type | Description |
| url  [0..1] | [1..1] | uri | A canonical URL for a concept map. The server must know the concept map (e.g. it is defined explicitly in the server's concept maps, or it is defined implicitly by some code system known to the server. |
| source  [0..1] | [1..1] | uri | Identifies the value set used when the concept (system/code pair) was chosen. May be a logical id, or an absolute or relative location. The source value set is an optional parameter because in some cases, the client cannot know what the source value set is. However, without a source value set, the server may be unable to safely identify an applicable concept map, and would return an error. For this reason, a source value set SHOULD always be provided. Note that servers may be able to identify an appropriate concept map without a source value set if there is a full mapping for the entire code system in the concept map, or by manual intervention |
| code  [0..1] | [1..1] | code | The code that is to be translated. If a code is provided, a system must be provided |
| system  [0..1] | [1..1] | uri | The system for the code that is to be translated |
| target  [0..1] | [1..1] | uri | Identifies the value set in which a translation is sought. May be a logical id, or an absolute or relative location. If there's no target specified, the server should return all known translations, along with their source |
| \_format  [0..1] |  | mime-type | The requested format of the response from the mime-type value set. See ITI TF-2x: Appendix Z.6 |
| conceptMap  [0..1] | [0..0] | ConceptMap | The concept map is provided directly as part of the request. Servers may choose not to accept concept maps in this fashion. |
| conceptMapVersion  [0..1] |  | string | The identifier that is used to identify a specific version of the concept map to be used for the translation. This is an arbitrary value managed by the concept map author and is not expected to be globally unique. For example, it might be a timestamp (e.g. yyyymmdd) if a managed version is not available. |
| version  [0..1] |  | string | The version of the system, if one was provided in the source data |
| coding  [0..1] | [0..0] | Coding | A coding to translate |
| codeableConcept  [0..1] | [0..0] | CodeableConcept | A full codeableConcept to validate. The server can translate any of the coding values (e.g. existing translations) as it chooses |
| targetsystem  [0..1] | [0..0] | uri | identifies a target code system in which a mapping is sought. This parameter is an alternative to the target parameter - only one is required. Searching for any translation to a target code system irrespective of the context (e.g. target valueset) may lead to unsafe results, and it is at the discretion of the server to decide when to support this operation |
| dependency  [0..\*] |  |  | Another element that may help produce the correct mapping |
| dependency.element  [0..1] |  | uri | The element for this dependency |
| dependency.concept  [0..1] |  | CodeableConcept | The value for this dependency |
| reverse  [0..1] |  | boolean | if this is true, then the operation should return all the codes that might be mapped to this code. This parameter reverses the meaning of the source and target parameters |

##### 3.Y5.4.1.3 Expected Actions

The Terminology Repository shall process the input parameters to discover the ValueSet that matches the parameters given and return a response as per Section 3.Y2.4.2 or an OperationOutcome with an error message.

#### 3.Y5.4.2 Translate Code Response Message

##### 3.Y5.4.2.1 Trigger Events

The Terminology Repository sends the Translate Code Response to the Terminology Consumer when results to the expansion are ready.

##### 3.Y5.4.2.2 Message Semantics

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

The response message is a FHIR Parameters Resource with properties of the code set based on the out parameters defined at <http://hl7.org/fhir/conceptmap-operation-translate.html> and reproduced in Table 3.Y5.4.2.2-1.

Table 3.Y5.4.2.2-1: Translate Code Message HTTP Output Parameters

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| result  [1..1] | boolean | True if the concept could be translated successfully. The value can only be true if at least one returned match has an equivalence which is not unmatched or disjoint |
| message  [0..1] | string | Error details, for display to a human. If this is provided when result = true, the message carries hints and warnings (e.g. a note that the matches could be improved by providing additional detail) |
| match  [0..\*] |  | A concept in the target value set with an equivalence. Note that there may be multiple matches of equal or differing equivalence, and the matches may include equivalence values that mean that there is no match |
| match.equivalence  [0..1] | code | A code indicating the equivalence of the translation, using values from <http://hl7.org/fhir/valueset-concept-map-equivalence.html> |
| match.concept  [0..1] | Coding | The translation outcome. Note that this would never have userSelected = true, since the process of translations implies that the user is not selecting the code (and only the client could know differently) |
| match.product  [0..\*] |  | Another element that is the product of this mapping |
| match.product.element  [0..1] | uri | The element for this product |
| match.product.concept  [0..1] | Coding | The value for this product |
| match.source  [0..1] | uri | The canonical reference to the concept map from which this mapping comes from |

##### 3.Y5.4.2.3 Expected Actions

The Terminology Consumer has received the response and continues with its workflow.

### 3.Y5.5 Security Considerations

See the general Security Consideration in ITI TF-1: X.5

Appendices

<Detailed cross transaction relationships or mapping details are described in an appendix in Volume 2x. Volume 2 appendices may be informational or normative. Immediately after the title of a Volume 2 appendix, provide a very explicit statement defining whether this new appendix is informative or normative.

If there are no Volume 2 appendices, enter “Not applicable” and delete the Appendix A and Appendix B placeholder sections.>

# Appendix A – <Appendix Title>

Appendix A text.

## A.1 <Title>

Appendix A.1 text.

### A.1.1 <Title>

Appendix A.1.1 text.

# Appendix B – <Appendix Title>

Appendix B text.

## B.1 <Title>

Appendix B.1 text.

### B.1.1 <Title>

Appendix B.1.1 text.

# Volume 2 Namespace Additions

<For Public Comment, please explicitly identify all new OIDs, UIDs, URNs, etc., defined specifically for this profile. These items should be collected from the sections above, and listed here as additions to the applicable domain OID Registry. This section will be deleted prior to inclusion into the Technical Framework as Final Text, but should be present for publication of Public Comment and Trial Implementation.>

At Trial Implementation publication, the domain technical committee **must** ensure that all new OIDs, UIDs, URNs, etc., defined specifically for this profile have been recorded in their OID Registry. This section will be deleted prior to inclusion into the Technical Framework Volumes as Final Text but should be present for publication of Public Comment and Trial Implementation.>

The IT Infrastructure registry of OIDs is located at <link to your OID registry(ies)

Additions to the IT Infrastructure OID Registry are:

Volume 3 – Content Modules

<The current version of the supplement template only addresses HL7 v3 CDA Content Modules. All CDA Content Modules will go in Section 6 of Volume 3 of each domain’s Technical Framework document. In the future, this supplement template may have additional sections for DICOM Content Modules (section 7 of Volume 3) and other types of Content Modules (section 8, etc., of Volume 3).

<Please note that prior to the release of the new template set, some domains may have defined CDA Content Modules in Volume 2 (e.g., PCC); however, going forward CDA Content Modules will be defined in Volume 3.>

Appendices

*<Add any applicable Volume 3 appendices below.*

*<If there are no Volume 3 appendices, enter “Not applicable” and delete the Appendix A and Appendix B placeholder sections.>*

# Appendix A – <Appendix Title>

Appendix A text.

## A.1 <Title>

Appendix A.1 text.

### A.1.1 <Title>

Appendix A.1.1 text.

# Appendix B – <Appendix Title>

Appendix B text.

## B.1 <Title>

Appendix B.1 text.

### B.1.1 <Title>

Appendix B.1.1 text.

Volume 4 – National Extensions

Add appropriate Country section

# 4 National Extensions

4.I National Extensions for <Country Name or IHE Organization>

<A template for Volume 4 is included in this document for completeness; however, National Extensions are typically developed after a profile has been published for Trial Implementation. If you are developing a new profile for Public Comment, it is recommended that this section be marked “Not Applicable”.>

<Avoid using this section if you can, this is “only if absolutely necessary”. Differences add cost to implementation and testing and can reduce interoperability. Review carefully to determine if the national use case truly requires a difference in the profile mechanisms rather than just differences in system configuration.>

< National Extensions can add requirements above and beyond IHE, but **not** relax requirements. This would prevent Connectathon results based on national testing being recognized elsewhere. For more information, see <http://wiki.ihe.net/index.php?title=National_Extensions_Process>.>

The format of this section is not strongly specified due to the varying nature of national extensions. For an example of National Extensions, see RAD TF 4.>

4.I.1 Comment Submission

This national extension document was authored under the sponsorship and supervision of <sponsor name>, who welcome comments on this document and the IHE <country> initiative. Comments should be directed to:

<Name, organization, title, email address>

4.I.2 Mobile Sharing Value Sets SVCM

<Add info or tables>

4.I.2.1 SVCM Value Set Binding for <Country Name or IHE Organization> Realm Concept Domains

*<This section defines the actual value sets and code systems for any coded concepts that were described by concept domains in the main profile and binds the value set to the coded concepts.>*

*<Add info or tables>*

*<Delete the example below prior to publication for Public Comment.>*

*<e.g.,*

4.I.2.1 SVCM Value Set Binding for US Realm Concept Domains

| UV Concept Domain | US Realm Vocabulary Binding or Single Code Binding | Value Set OID |
| --- | --- | --- |
| UV\_CardiacProcedureDrugClasses | US\_CardiacProcedureDrugClasses | 1.3.6.1.4.1.19376.1.4.1.5.15 |

#### 4.I.2.1.1 US\_CardiacProcedureDrugClasses (1.3.6.1.4.1.19376.1.4.1.5.15)

|  |  |  |
| --- | --- | --- |
| Coding Scheme  Concept | SNOMED CT | NDF-RT |
| Calcium channel blockers | 48698004 | N0000029119 |
| Beta-blockers | 33252009 | N0000029118 |
| Nitrates | 31970009 | N0000007647 |
| Aminophylline | 55867006 | N0000146397 |

>

4.I.2.2 SVCM <Type of Change>

<Add info or tables>

4.I+1 National Extensions for <Country Name or IHE Organization>

<Repeat (and increment) the section above as needed for additional National Extensions>

Appendices

*<Add any applicable Volume 4 appendices below>*

*<If there are no Volume 4 appendices, enter “Not applicable”* *and delete the Appendix A and Appendix B placeholder sections.>*

# Appendix A – <Appendix Title>

Appendix A text.

## A.1 <Title>

Appendix A.1 text.

### A.1.1 <Title>

Appendix A.1.1 text.

# Appendix B – <Appendix Title>

Appendix B text.

## B.1 <Title>

Appendix B.1 text.

### B.1.1 <Title>

Appendix B.1.1 text.

1. http://ihe.net/Technical\_Frameworks/ [↑](#footnote-ref-2)