

Computationally Independent Model and Service Specification

LexEVS 6.0

1.4

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<u>Architecture Inception Team</u>	Craig Stancl, Harold Solbrig, Sridhar Dwarkanath, Scott Bauer, Kevin Peterson, Traci St.Martin
<u>Editor</u>	Craig Stancl, Traci St.Martin, Russell Hamm
<u>Authors</u>	Craig Stancl, Scott Bauer, Kevin Peterson, Traci St.Martin, Russell Hamm

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1 Overview and Business Case

1.1 Service Description and Purpose

LexEVS 6.0 represents the next generation of NCI Enterprise Vocabulary Services. LexEVS is a mechanism for the standard storage of controlled vocabularies and ontologies defining a flexible format for accurately representing a wide variety of vocabularies and other lexically-based resources in several different server storage repositories as well as a XML format. LexEVS provides a powerful and robust API and tool suite which permits access to controlled vocabulary content represented in the LexEVS model. This allows terminologies from a wide variety of resources such as RRF, OWL, and OBO to be represented and loaded to a single data base management system and accessed with a common set of tools and interfaces.

LexEVS is based off the LexGRID database schema and LexBIG API objects, where LexGRID defines how the terminologies are structured in the database and LexBIG defines how the terminology service looks as objects to the user. LexEVS provides optimizing query code that retrieves LexBIG objects, allows the user to tailor calls to the terminology service in such a way that a discrete set of values is returned increasing utility and interoperability.

One of the requirements of LexEVS 6.0 is to align the LexEVS Analytical Grid Services component operations - including Search and Query Operations for Code Systems and Associations but excluding other LexEVS capabilities for querying and loading Value Sets, Concept Domains and Usage Contexts – to international efforts at developing common terminology service interfaces, specifically, the [Health Level Seven \(HL7\) Common Terminology Services – Release 2 \(CTS 2\)](#) standard.

NOTE: *For the purpose of this document, the terms “Code System” and “Coding Scheme” are synonymous.*

1.2 Scope

The scope of this CIM is constrained to the Analytical Grid Services components for LexEVS 6.0. Analytical Grid Services are those interfaces that are exposed on the Grid, and include the LexBIG domains of:

- LexBIGService – service identification interfaces
- CodedNodeGraph – A virtual graph where the edges represent associations and the nodes represent concept codes
- CodedNodeSet – A coded node set represents a flat list of coded entries
- HistoryService – Service reference to the history API servicing the given coding scheme

- LexBIGServiceConvenienceMethods – service methods to be implemented as a generic extension of the LexEVS
- LexBIGServiceMetadata – Interface to perform system-wide query over optionally loaded metadata for loaded code systems and providers

These additional service interfaces provide query and filtering support to the core LexBIGService interface, allowing code system content to be queried and grouped according to the different attributes and properties of code system content.

There are however, components of LexEVS that are purposely excluded from the Analytical Grid Services, such as terminology authoring and administration, value domain query and concept domain query. This section outlines the scope of LexEVS CIM with respect to the scope of the Analytical Grid Services.

Items	In Scope / Out of Scope	Source
All Administration operations such as: <ul style="list-style-type: none">• Import Code System• Import Code System Revision• Import Value Set Version• Import Association Version• Export Association• Export Code System Content• Change Code System Status• Register for Notification• Update Notification Registration• Update Notification Registration Status	Out of Scope	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
All Code System Query Operations such as: <ul style="list-style-type: none">• Return Code System Details• List Code System Concepts• Return Concept Details• List Association Types	In Scope	CTS2 and LexEVS 6.0 Analytical Grid Services.xls

- Return Association Type Details

All Value Set Query Operations such as: Out of Scope [CTS2 and LexEVS 6.0 Analytical Grid Services.xls](#)

- List Value Set
- Return Value Set Details
- List Value Set Contents
- Check Value Set Subsumption
- Check Concept Value Set Membership

All Concept Domain operations such as: Out of Scope [CTS2 and LexEVS 6.0 Analytical Grid Services.xls](#)

- List Concept Domains
- Return Concept Domain Details
- List Usage Contexts
- Return Usage Context Details
- List Concept Domain Bindings
- Check Concept to Concept Domain Association

Association Query operations including: In scope [CTS2 and LexEVS 6.0 Analytical Grid Services.xls](#)

- List Associations
- Return Association Details

Association Query operation including	Out of Scope	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
<ul style="list-style-type: none">• Determine Transitive Concept Relationship• Compute Subsumption Relationship		
All terminology authoring operations	Out of Scope	CTS2 and LexEVS 6.0 Analytical Grid Services.xls

1.3 Assumptions

The following assumptions were made in developing this document. These assumptions were derived from the various wiki pages and documents pertaining to LexEVS Analytical Grid Services.

Assumption	Affects	Source
It is assumed that this service will be constrained to the LexEVS Analytical Grid Services	<p>Terminology authoring, value domain operations and administrative operations will not be supported.</p> <p>This constrains the storyboards and actors accordingly.</p>	<p>LexEVS Scope Document</p> <p>https://wiki.nci.nih.gov/display/EVS/LexEVS+6.0+Scope+Document</p>
When an Analytical Grid Service functional capability intersects with a HL7 CTS 2 function capability, the Analytical Grid Service function	Provides a limited standardized interface to LexEVS Analytical Grid Service functions.	<p>LexEVS Scope Document</p> <p>https://wiki.nci.nih.gov/display/EVS/LexEVS+6.0+Scope+Document</p>

<p>will conform to the CTS 2 functional capability.</p>		
<p>The ISO 21090 Health Informatics - Harmonized data types for information interchange will be used for data interoperability</p>	<p>ISO 21090 data types provide a harmonized set of data type definitions for representing and exchanging healthcare related information.</p> <p>LexEVS 6.0 will interchange information using the 21090 data type specifications</p>	<p>http://www.kith.no/upload/4414/ISODIS21090.pdf</p>

2 Business Storyboards

2.1 Storyboards Overview

These storyboards are focused on Search and Query Service (SQS) operations as specified by the scope of the LexEVS 6.0 Analytical Grid Service operations. When a storyboard or actor outline intersects with a known standardized functional component – for example from HL7’s CTS 2 Specification – the cross reference is noted.

2.2 Primary Actors

The actors defined for the LexEVS 6.0 CIM are constrained to actors necessary to perform query operations as per the scope of LexEVS Analytical Grid Services.

2.2.1 People Actors

Name	Role	Notes
Terminology user	An actor such as a subject matter expert or terminologist requiring access to controlled terminology content.	<i>Terminology User</i> activities include, but are not limited to, querying for specific concept codes and code system related content. Standards Link: This Actor correlates to the HL7 CTS 2 “ Terminology User ” Actor

2.2.2 System Actors

Name	Notes
LexEVS Service	LexEVS Analytical Grid Service APIs

2.3 Story Boards

2.3.1 SQS-SB1 – List Code Systems

Outline	Code System Search /Query Scenario – List Code Systems
Detail	A <i>Terminology User</i> queries the LexEVS Service to obtain a set of code systems available to the service, as well as the metadata pertaining to each code system in the set.

	Standards Link: This SB correlates to the HL7 CTS 2 “ Retrieve Available Code Systems ”
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2.3.2 SQS-SB2 – Return Code System Details

Outline	Code System Search /Query Scenario – Return Code System Details
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the metadata for a specified code system available to the LexEVS service.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Retrieve Available Code Systems”</p>

2.3.1 SQS-SB3 – List Code System Concepts

Outline	Code System Search /Query Scenario – List Code System Concepts
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain a set of concepts available for a specified code system.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Retrieve Coded Concepts from Code System”</p>

2.3.2 SQS-SB4 – Return Concept Details

Outline	Code System Search /Query Scenario – Return Concept Details
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the details (concept identifier, attributes, and other associated metadata) for a set of code system concepts for a given code system.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Retrieve Coded Concepts from Code System”</p>

2.3.1 SQS-SB5 – List Association Types

Outline	LexEVS Service Search /Query Scenario – List Association Types
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the set of association types available to the LexEVS service for a given set of code systems.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Enumerate”</p>

	Association Types”
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2.3.2 SQS-SB6 – List Association Type Details

Outline	LexEVS Service Search /Query Scenario – List Association Type Details
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the metadata for a specified association type.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Enumerate Association Types”</p>

2.3.3 SQS-SB7 – List Associations

Outline	LexEVS Service Search /Query Scenario – List Associations
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the associations available for a specified concept for a specific code system.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Identify / Retrieve Associations for a Single Concept”, “Identify / Retrieve Associations between Two or More Coded Concepts”</p>

2.3.4 SQS-SB8 – Return Association Details

Outline	LexEVS Service Search /Query Scenario – Return Association Details
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the metadata for a specified associations for a specific code system.</p> <p>Standards Link: This SB correlates to the HL7 CTS 2 “Identify / Retrieve Associations for a Single Concept”, “Identify / Retrieve Associations between Two or More Coded Concepts”</p>

2.3.5 SQS-SB9 – Retrieve Service Information

Outline	LexEVS Service Search /Query Scenario – Retrieve Service Information.
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain information about the service</p> <p>Standards Link: N/A</p>

2.3.6 SQS-SB10 – Retrieve Sort Algorithm

Outline	LexEVS Service Search /Query Scenario – Retrieve Sort Algorithm.
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the sort algorithms available to the service.</p> <p>Standards Link: N/A</p>

2.3.7 SQS-SB11 – Retrieve Match Algorithm

Outline	LexEVS Service Search /Query Scenario – Retrieve Match Algorithm.
Detail	<p>A <i>Terminology User</i> queries the LexEVS Service to obtain the match algorithms available to the service.</p> <p>Standards Link: N/A</p>

3 Detailed Functional Model

3.1 Structure of the Service

The LexEVS 6.0 Analytical grid service includes operations for the search and query of code system content. Query operations are performed via the LexBIGService interface, which represents the core interface to the LexEVS service. The LexBIGService interface directly exposes five supporting service interfaces, including:

- CodedNodeSet,
- CodedNodeGraph,
- LexBIGServiceConvenienceMethods,
- HistoryService,
- LexBIGServiceMetadata

These additional service interfaces provide query and filtering support to the core LexBIGService interface, allowing code system content to be queried and grouped according to the different attributes and properties of code system content.

At a conceptual level, the structure of the LexEVS Analytical Grid services includes the following capabilities:

Name	Description
Get Code System Concepts	This function is used retrieve the set of all concepts in a specified code system.
Get Concept Details	This function returns information for a specified concept.
Get Service Metadata	This function is used to return the metadata about the LexEVS service.
Get Supported Coding Schemes	This function returns a list of code system and code system versions supported by the service.
Get Last Update Time	This query returns the last time that content of this service changed,
Resolve Coding Scheme	This query returns detailed code system information for a specified code system.

Name	Description
Get Node Graph	This query the node graph as represented in the particular relationship set in the code system.
Get Generic Extensions	This query returns a description of all registered extensions used to implement application-specific behavior that is centrally accessible from a LexEVS service.
Get Generic Extension	This query returns an instance of an application specific extension on the LexEVS service registered with a specified name.
Get History Service	This query resolves a reference to the history API servicing the given code System.
Get Sort Algorithms	This query returns a description of all registered extensions used to provide additional sorting of query results.
Resolve Coding Scheme Copyright	This query returns code system copyright information for a specific code system version.
Get Filter	This query returns an instance of the filter extension registered with the given name.
Get Sort Algorithm	This query returns an instance of the sort extension registered with the given name.
Get Filter Extensions	This query returns a description of all registered extensions used to provide additional filtering of query results.
List Association Types	This function returns the types of associations available to a given code system.
List Associations	This function returns an instance of a set of specified of associations.
List Association Details	This function returns metadata for a specified association.
Get Match Algorithms	This function returns the match algorithms available to be used for code system query on the service.

3.2 Detail of the Capabilities

3.2.1 Get Code System Concepts

Name [M]	Get Code System Concepts
Description [M]	This function is used retrieve the set of all concepts in a specified code system.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. Code System is installed on LexEVS Service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.
Inputs [M]	<ol style="list-style-type: none"> 1. Code System Identifier 2. Filter Criteria 3. Sort Criteria
Outputs [M]	<ol style="list-style-type: none"> 1. Set of Coded Concept References
Post-Conditions [O]	
Exception Conditions [M]	<ol style="list-style-type: none"> 1. Invalid identifier(s)
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ List Code System Concepts ” detailed functional model.

3.2.2 Get Concept Details

Name [M]	Get Concept Details
Description [M]	This function returns information for a specified concept.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running

	2. Code System is installed on LexEVS Service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.
Inputs [M]	<ol style="list-style-type: none"> 1. Code System Identifier 2. Concept Identifier
Outputs [M]	<ol style="list-style-type: none"> 1. Coded concept details
Post-Conditions [O]	
Exception Conditions [M]	<ol style="list-style-type: none"> 1. Invalid identifier(s)
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ Return Code System Details ” detailed functional model.

3.2.3 Get Service Metadata

Name [M]	Get Service Metadata
Description [M]	This function is used to return the metadata about the LexEVS service.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has access permissions to the service.
Inputs [M]	None
Outputs [M]	<ol style="list-style-type: none"> 1. Service descriptive metadata
Post-Conditions [O]	
Exception Conditions [M]	

Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.4 Get Supported Code Systems

Name [M]	Get Supported Code Systems
Description [M]	This function returns a list of code system and code system versions supported by the service.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. A minimum of one code system is installed on the LexEVS Service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code systems being queried.
Inputs [M]	None
Outputs [M]	<ol style="list-style-type: none"> 1. The code systems available to the service that the user has permissions to.
Post-Conditions [O]	
Exception Conditions [M]	
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ List Code Systems ” detailed functional model.

3.2.5 Get Last Update Time

Name [M]	Get Last Update Time
Description [M]	This query returns the last time that content of this service changed,
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	None
Outputs [M]	The last time that the content of this service was changed; null if no changes have occurred. Tag assignments do not count as service changes for this purpose.
Post-Conditions [O]	
Exception Conditions [M]	1. None
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.6 Resolve Code System

Name [M]	Resolve Code System
Description [M]	This query returns detailed code system information for a specified code system.
Pre-Conditions [M]	1. LexEVS Service is Running 2. The code system is loaded on the service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.

Inputs [M]	1. Code system identifier
Outputs [M]	1. Detailed code system information (metadata)
Post-Conditions [O]	
Exception Conditions [M]	1. Invalid Identifier
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “Return Code Systems” detailed functional model.

3.2.7 Get Node Graph

Name [M]	Get Node Graph
Description [M]	This query the node graph as represented in the particular relationship set in the code system.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. The code system being resolved is loaded on the service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.
Inputs [M]	<ol style="list-style-type: none"> 1. Code system identifier 2. Code system version 3. Relation Identifier
Outputs [M]	1. The coded node graph
Post-Conditions [O]	
Exception Conditions [M]	<ol style="list-style-type: none"> 1. Invalid identifier(s) 2. Invalid version

Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ Determine Transitive Concept Relationship ” detailed functional model.

3.2.8 Get Match Algorithms

Name [M]	Get Match Algorithms
Description [M]	This query returns the match algorithms available to be used for code system query on the service.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	None
Outputs [M]	1. Match Algorithm List
Post-Conditions [O]	
Exception Conditions [M]	1. None
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.9 Get Generic Extensions

Name [M]	Get Generic Extensions
Description [M]	This query returns a description of all registered extensions used to implement application-specific behavior that is

	centrally accessible from a LexEVS service.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	None
Outputs [M]	1. Extension description list
Post-Conditions [O]	
Exception Conditions [M]	
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.10 Get Generic Extension

Name [M]	Get Generic Extension
Description [M]	This query returns an instance of an application specific extension on the LexEVS service registered with a specified name.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	1. Extension identifier
Outputs [M]	1. Extension
Post-Conditions [O]	
Exception Conditions [M]	1. Invalid identifier

Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.11 Get History Service

Name [M]	Get History Service
Description [M]	This query resolves a reference to the history API servicing the given code System.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	1. Code System Identifier
Outputs [M]	1. History Service Reference
Post-Conditions [O]	
Exception Conditions [M]	1. Invalid identifier
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.12 Get Sort Algorithm

Name [M]	Get Sort Algorithms
Description [M]	This query returns a description of all registered extensions used to provide additional sorting of query results.
Pre-Conditions [M]	1. LexEVS Service is Running

Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	None
Outputs [M]	1. List of available sort algorithms
Post-Conditions [O]	
Exception Conditions [M]	1. None
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.13 Resolve Coding Scheme Copyright

Name [M]	Resolve code system copyright
Description [M]	This query returns code system copyright information for a specific code system version.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. The code system being resolved is loaded on the service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.
Inputs [M]	1. Code system identifier
Outputs [M]	1. Code system copyright information
Post-Conditions [O]	
Exception Conditions [M]	1. Invalid identifier
Aspects left for Technical Bindings	

[O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ Return Code Systems ” detailed functional model.

3.2.14 Get Filter

Name [M]	Get Filter
Description [M]	This query returns an instance of the filter extension registered with the given name.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	1. Extension identifier
Outputs [M]	1. Filter reference
Post-Conditions [O]	
Exception Conditions [M]	1. Invalid extension identifier
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.15 Get Sort Algorithm

Name [M]	Get Sort Algorithm
Description [M]	This query returns an instance of the sort extension registered with the given name.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-	Access control mechanism needs to be in place to ensure that

Conditions [M]	the user is logged into the service.
Inputs [M]	1. Extension identifier
Outputs [M]	1. Sort reference
Post-Conditions [O]	
Exception Conditions [M]	1. Invalid identifier
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.16 Get Filter Extension

Name [M]	Get Filter Extension
Description [M]	This query returns a description of all registered extensions used to provide additional filtering of query results.
Pre-Conditions [M]	1. LexEVS Service is Running
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged into the service.
Inputs [M]	None
Outputs [M]	1. Extension Description List
Post-Conditions [O]	
Exception Conditions [M]	None
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: N/A

3.2.17 List Association Types

Name [M]	List Association Types
Description [M]	This function returns the types of associations available to a given code system.
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. Code system being queried is loaded on the service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.
Inputs [M]	<ol style="list-style-type: none"> 1. Code system identifier
Outputs [M]	<ol style="list-style-type: none"> 1. Association types for the code system
Post-Conditions [O]	
Exception Conditions [M]	<ol style="list-style-type: none"> 1. Invalid identifier
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ List Association Types ” detailed functional model.

3.2.18 List Associations

Name [M]	List Associations
Description [M]	This function returns an instance of a set of specified of associations for a concept
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. Code system being queried is loaded on the service
Security Pre-	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to

Conditions [M]	access the code system being queried.
Inputs [M]	<ol style="list-style-type: none"> 1. Code system identifier 2. Concept identifier
Outputs [M]	<ol style="list-style-type: none"> 1. Associations for a given concept
Post-Conditions [O]	
Exception Conditions [M]	<ol style="list-style-type: none"> 1. Invalid identifier(s)
Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ List Associations ” detailed functional model.

3.2.19 List Association Details

Name [M]	List Association Details
Description [M]	This function returns metadata for a specified association
Pre-Conditions [M]	<ol style="list-style-type: none"> 1. LexEVS Service is Running 2. Code system being queried is loaded on the service
Security Pre-Conditions [M]	Access control mechanism needs to be in place to ensure that the user is logged in and has valid privileges and licenses to access the code system being queried.
Inputs [M]	<ol style="list-style-type: none"> 1. Code system identifier 2. Association identifier 3. Optional code system version identifier
Outputs [M]	<ol style="list-style-type: none"> 1. Metadata details pertaining to the provided association
Post-Conditions [O]	None
Exception Conditions [M]	<ol style="list-style-type: none"> 1. Invalid identifier(s)

Aspects left for Technical Bindings [O]	
Notes [O]	Standards Link: This capability correlates to the HL7 CTS 2 “ Return Association Type Details, Return Association Details ” detailed functional model.

4 Profiles

4.1 Functional Profiles

A Functional Profile is a grouping of capabilities for conformance management purposes. Essentially, a FP is a named list of operations that are subset to define conformance.

Functional Profile No.	Functional Profile Name	Functional Profile Description	Capability Name
			•
QS-FP1	QS Content Query	This profile contains query operations specific to determining information pertaining to terminology content loaded in the service.	<ul style="list-style-type: none"> • Get Supported Code Systems • Resolve Code System • Get Code System Concepts • Get Concept Details • Get Node Graph • Get Match Algorithms • Get Generic Extension(s) • Get History Service • Get Sort Algorithms • Resolve Code System Copyright • Get filter • Get Filter extensions • List Association Types • List Associations • List Association Details

4.2 Semantic Profiles

Semantic Profile No.	Semantic Profile Name	Constrained Information Model	Semantic Profile Description
QS-SP1	CTS 2 Semantic Profile	HL7 CTS 2 Query Mature Terminology Conformance Profile	This semantic profile aligns with a subset of the CTS 2 Query Mature Terminology Conformance Profile (omitting value set and concept domain query). This profile permits definition and implementation of any desired datatype specification (i.e. ISO 21090).

4.3 Conformance Profiles

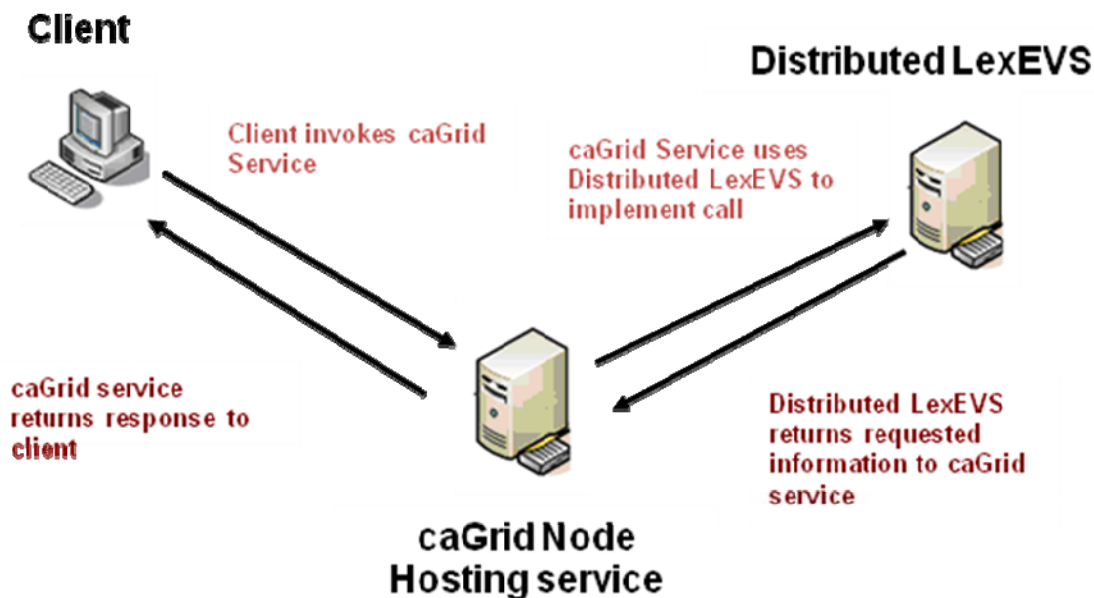
Conformance No	QS-CP1
Conformance Name	LexEVS 21090 Content Query Conformance Profile
Description	This conformance profile defines only the query capabilities for LexEVS coding schemes Analytical Grid Services.
Usage Context	This conformance profile is invoked when LexEVS Analytical Grid Services are called to query terminology content and return that content in ISO 21090 data types.
Mandatory	Yes
Functional Profile(s)	QS-FP2 : QS Content Query
Semantic Profile(s)	QS-SP1 : CTS 2 Semantic Profile

Conformance No	QS-CP2
Conformance Name	LexEVS 21090 Full Query Conformance Profile
Description	This \conformance profile defines only the query capabilities for LexEVS coding scheme and service related data for LexEVS Analytical Grid Services.
Usage Context	This conformance profile is invoked when LexEVS Analytical Grid Services are called to query either service specific information or terminology content and return that content in ISO 21090 data types.
Mandatory	No
Functional Profile(s)	QS-FP1: QS Content Query
Semantic Profile(s)	QS-SP1 : CTS 2 Semantic Profile

5 System Implementation Details

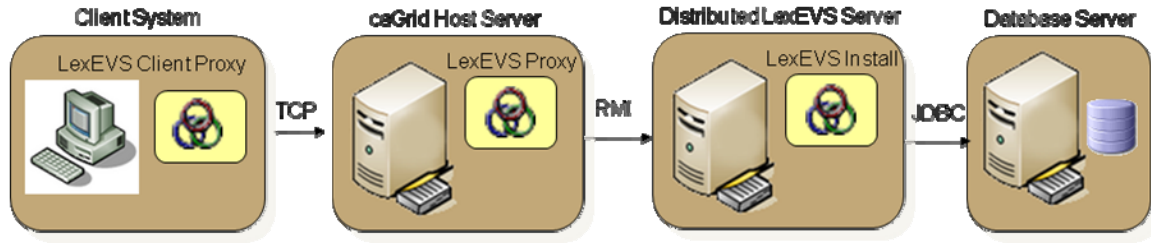
5.1 System Runtime Interaction Details

The caGrid Service consists of client system, caGrid Host Server, and Distributed LexEVS Server. Client interactions with LexEVS are made through a caGrid node Hosting Service, whereby the Hosting Service uses the grid enables LexEVS service to implement specific terminology service calls and return the requested terminology information to the client.



5.2 Implementation/Deployment Considerations

In the grid services environment, the client application makes calls the grid services interfaces which in turn call the distributed LexEVS API to access content in LexEVS. LexEVS for Analytical Grid Services consists of client system, caGrid Host Server, Distributed LexEVS server and database server. The client system is responsible for making calls to access controlled terminology content from the caGrid Host Server. The caGrid Host Server is responsible for routing information both to and from the client system from the LexEVS server. The LexEVS server is responsible for serving up structured terminology content represented in the LexGrid enabled repository (database server). Lastly, the database server houses the code systems available on LexEVS.



Implementation Considerations	Impacts
LexEVS Grid Services need the ability to make stateful calls to the server	Create a query on the server, add restrictions and limits with subsequent calls, and finally execute the query and retrieve the results.

6 Conformance and Compliance

6.1 Compliance and Conformance Statements

Name	Type	Viewpoint	Description	Test method
Grid Deployment	Obligation	Technology	The LexEVS profile should be deployed only within organization boundary restricting access and visibility to the external world	1. Test cases to be defined to test for network access
Secured Access	Obligation	Engineering	The LexEVS Content Query FP should be deployed only within organizational boundaries that restrict access to the terminology content to licensed terminology users where applicable	1. Design review 2. Test cases to be defined for security
Standardized Functionality	Permission	Informational	The LexEVS 6.0 service will provide standardized interfaces to code system query functionality as specified in the HL7 CTS 2 standard where such an interface exists	1. Design Review
Semantic Model	Obligation	Informational	The LexEVS service must support all terminologies represented in the LexGrid Model for all code system operations	1. Design Review

7 Appendix A - Relevant Standards

Name	Description	Location
HL7 CTS 2	<p>HL7's CTS 2 specification specifies functional model (CIM) outlining HL7's consensus requirement for terminology services.</p> <p>For the LexEVS CIM, only the terminology and association query components of HL7 CTS 2 is considered to be in scope.</p> <p>LexEVS will ultimately implement much of the CTS 2 functionality, and as such, early identification of potential points of alignment is necessary.</p>	<p>Health Level Seven (HL7) Common Terminology Services – Release 2 (CTS 2)</p>
ISO 21090 Health Informatics – Harmonized data types for information interchange	<p>ISO 21090 data types provide a harmonized set of data type definitions for representing and exchanging healthcare related information.</p> <p>LexEVS 6.0 will interchange information using the 21090 data type specifications</p>	<p>http://www.kith.no/upload/4414/ISODIS21090.pdf</p>

8 Appendix B - References

Name	Description	Location
LexEVS 5.x Analytical Grid Services API	API for LexEVS Analytical Grid Services Version 5.x	https://cabig-kc.nci.nih.gov/Vocab/KC/index.php/LexEVS_5.x_Analytical_Grid_Service_API
LexEVS Project		http://gforge.nci.nih.gov/projects/lexevs
Design and Implementation Specification 1.1 for LexEVS Grid service for caGrid 1.2	The detailed design and implementation of LexBIG Enterprise Vocabulary Service (LexEVS) caGrid Service	https://gforge.nci.nih.gov/docman/view.php/491/13735/LexEVS%20Grid%20Service%204.2%20Design%20and%20Implementation
LexEVS 6.0 Scope Document	The high-level needs and features of the National Cancer Institute Center for Biomedical Informatics and Information Technology (NCI CBIIT) caCORE LexEVS Release 6.0, focusing on the functionalities proposed by the product stakeholders and target users.	https://wiki.nci.nih.gov/display/EVS/LexEVS+6.0+Scope+Document
HL7 CTS 2	HL7's CTS 2 specification specifies functional model (CIM) outlining HL7's consensus requirement for terminology services. For the LexEVS CIM, only the terminology and	Health Level Seven (HL7) Common Terminology Services – Release 2 (CTS 2)

	<p>association query components of HL7 CTS 2 is considered to be in scope.</p> <p>LexEVS will ultimately implement much of the CTS 2 functionality, and as such, early identification of potential points of alignment is necessary.</p>	
<p>ISO 21090 Health Informatics – Harmonized data types for information interchange</p>	<p>ISO 21090 data types provide a harmonized set of data type definitions for representing and exchanging healthcare related information.</p> <p>LexEVS 6.0 will interchange information using the 21090 data type specifications</p>	<p>http://www.kith.no/upload/4414/ISODIS21090.pdf</p>

9 Appendix C - Glossary

Term	Description
Association	A binary relation from a set of entities to a set of entities and/or data.
Coding Scheme	A resource that makes assertions about a collection of terminological entities.
Property	A description, definition, annotation or other attribute that serves to further define or identify an resource.

10 Appendix D – Cross Reference Tables

10.1 List of Storyboards

#	Name	Description	Source
SQS-SB1	List Code Systems	A terminology user queries the service to obtain a list of the code systems available to the service	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB2	Return Code System Details	A terminology user queries the service to obtain the metadata for a given code system	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB3	List Code System Concepts	A terminology user queries the service to obtain an optionally filtered list of concepts available for a given code system	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB4	Return Concept Details	A terminology user queries the service to obtain an optionally filtered list of details for a concept from a specified code system	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB5	List Association Types	A terminology user queries the service to obtain a list of association types for a specified code system	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB6	List Association Type Details	A terminology user queries the service to obtain an optionally filtered list of details for an association from a specified code system	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB7	List Associations	A terminology user queries the service to obtain a list of associations for a specified code system concept	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB8	Return Association Details	A terminology user queries the service to obtain an optionally filtered list of details for an association for a specified concept from a specified code system	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB9	Retrieve Service Information	A terminology user queries the service to obtain metadata information for the LexEVS service	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB10	Retrieve Sort Algorithm	A terminology user queries the service to obtain the available sort algorithms for ordering code system queries	CTS2 and LexEVS 6.0 Analytical Grid Services.xls
SQS-SB11	Retrieve Match Algorithm	A terminology user queries the service to obtain the available match algorithms for querying code system contents	CTS2 and LexEVS 6.0 Analytical Grid Services.xls

10.2 Storyboards to Capabilities Mapping

#	Storyboard	Capabilities	Functional Profiles
SQS-SB1	List Code Systems	Get Supported Coding Schemes Resolve Coding Scheme	QS Content Query
SQS-SB2	Return Code System Details	Get History Service	QS Content Query
SQS-SB3	List Code System Concepts	Get Code System Concepts	QS Content Query
SQS-SB4	Return Concept Details	Get Concept Details	QS Content Query
SQS-SB5	List Association Types	List Association Types	QS Content Query
SQS-SB6	List Association Type Details	Get Node Graph	QS Content Query
SQS7-SB	List Associations	List Associations	QS Content Query
SQS8-SB	Return Association Details	List Association Details	QS Content Query
SQS9-SB	Retrieve Service Information	Get Service Metadata Get Last Update Time Resolve Coding Scheme Copyright	QS Service Query
SQS10-	Retrieve Sort Algorithm	Get Sort Algorithm	QS Content Query

SB		Get Sort Algorithms Get Generic Extensions Get Filter Get Filter Extensions	
SQS-SB11	Retrieve Match Algorithm	Get Match Get Match Algorithms Get Filter Get Filter Extensions Get Generic Extension	QS Content Query

10.3 Actors

Actors	Functional Profile	Type	Operations used
Terminology User	QS-FP1 : QS Service Query	Client	Query LexEVS for service specific metadata
Terminology User	QS-FP2: QS Content Query	Client	Query LexEVS for terminology content (concepts, associations, attributes, etc.)