

How to Use the International Orthodox Christian Liturgical Database (ioc-liturgical-db)



Michael Colburn
Orthodox Christian Mission Center (OCMC)


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Conventions Used in this Guide

 When you see a box like this, with a blue key , it indicates a key point. That is, important information that will help you better understand or use the database.

 When you see a box like this, with a red exclamation mark in a triangle, it indicates a warning. That is, important information that will help you avoid making a mistake in how you use the database.

 () In the Cypher query language, a node is indicated by parentheses. For example, (n) means a node that will be referred to subsequently as *n*.

 -[]-> In the Cypher query language, a relationship is indicated by an arrow and brackets. The arrow has a direction and points from one node to another. For example, (n)-[r]->(o) means some node designated as *n* has a relationship designated as *r* with another node designated as *o*.

 (:Label)-[:Type]->(:Label) In the Cypher query language, nodes can be annotated with a label, and relationships can be annotated with a relationship type. Labels and relationship types start with a colon. For example, (:Text) means any node that has a label named *Text*. Another example is (n:Text:Liturgical)-[r:VALUE_FROM]->(o:Text:Liturgical) which means two nodes, one designated as *n* and the other as *o*, both of which have two labels (*Text* and *Liturgical*) and have a relationship designated as *r* that has a type *VALUE_FROM*. Note that a node can have more than one label. However, a relationship can only have one type.

Introduction

The ioc-liturgical-db is a joint project of AGES Initiatives, Inc. and the Orthodox Christian Mission Center (OCMC) on behalf of the international Orthodox Christian community.

Purpose of the Database

The ioc-liturgical-db has several purposes:

1. It is a database for applications that make use of the liturgical texts of the Eastern Orthodox Christian Church. It can be accessed by applications through a web service interface. It can also be copied into another database for use by an application.
2. It is a source of information for individuals who are studying the liturgical texts. In addition to the original text and translations, it contains annotated information that helps researchers analyze the text.

Neo4j

The database management system (DBMS) used for the ioc-liturgical-db is from a company called Neo4j. The DBMS is also called Neo4j. Neo4j is a graph database.

Cypher Query Language

Cypher is an open standard for accessing graph databases. Cypher allows the user to create, read, update, or delete information. Not all users have authorization to create, update, or delete information.

How to Access the Database

There are two official instances of the database. One is read-only and open to the public. The other may be updated by authorized users. The public, read-only instance contains the current release of the database. The updatable database is where changes are made and reviewed before being moved to the read-only version.

 At this point in time, only the private, updatable database is operational.

The location of the read-only, public database will be at:

ioc-liturgical-db.org

The location of the private, updatable database is:

ioc-liturgical-db.net

Direct use of the ioc-liturgical-db requires knowledge of the Cypher query language.

An Easier Way to Access the Database

An alternative means to access the database will be provided by the ioc-tms, the International Orthodox Christian Translation Management System.

The location of the ioc-tms is:

ioc-tms.org

Texts in the Database

This is the current list of texts in the ioc-liturgical-db ...

Biblical Texts


en_uk_kjv	English translation of the Bible, King James Version.
gr_eg_lxxRahlf	Greek language Septuagint, Rahlf version.
gr_eg_lxxCodexAlexandrinus	Greek language Septuagint, Codex Alexandrinus.
gr_eg_lxxCodexVaticanus	Greek language Septuagint, Codex Vaticanus version.
gr_eg_lxxM1sam	Greek language Septuagint, M 1sam version.
gr_eg_lxxM2sam	Greek language Septuagint, M2sam version.
gr_eg_lxxM1regn	Greek language Septuagint, M1regn version.
gr_eg_lxxM2regn	Greek language Septuagint, M2regn version.
gr_eg_lxxLiberApocryphus	Greek language Septuagint, Liber Apocryphus version.
gr_eg_lxxMEsdrNeh	Greek language Septuagint, MEsdrNeh version.
gr_eg_lxxCodicesAlexandrinusEtVaticanus	Greek language Septuagint, Codices Alexandrinus Et Vaticanus version.
gr_eg_lxxCodexSinaiticus	Greek language Septuagint, CodexSinaiticus version.
gr_eg_lxxPrologos	Greek language Septuagint, Prologos version.
gr_eg_lxxTheodotion	Greek language Septuagint, Theodotion version.
gr_gr_ntpt	Greek language New Testament, 1904 Patriarchal version.

Liturgical Texts

en_us_dedes	Fr. Seraphim Dedes English translation of the Orthodox Christian liturgical texts.
gr_gr_cog	Common Orthodox Greek liturgical texts.

Label and Relationship Type Naming Conventions

The labels and relationship types used in the ioc-liturgical-db are agreed upon by the team managing the ioc-liturgical-db . That is, the names used for labels and types are standardized.

 Label and type names may not start with a number. However, a number may occur in any position other than the first.

The ioc-liturgical-db uses the following naming conventions:

Labels

Labels are attached to nodes. Think of a label as a means to categorize a node.

Labels are named using CamelCase, and start with an uppercase letter. Note that labels that are derived from a topic in a library from the AGES Liturgical Workbench are often completely in lower case.

A node can have multiple labels. For example, *(n:Text:Liturgical)* is a node that is categorized as being text and specifically, liturgical text. And, *(n:Text:Scripture)* is a node that is categorized as being text and specifically, text from the Scriptures.

Relationship Types

Relationship types are named using all uppercase letters. Parts of a type name may be separated using the underscore character.

For example, *(n)-[r:ACTOR]->(o)* indicates a relations *r* with a type name of ACTOR.

List of Standardized Names

Standardized Names for Labels

Label names for nodes should start with a capital letter and then use lowercase letters, e.g. Liturgical, not LITURGICAL.

Label names can not have spaces. So if multiple words are required, use camel case. That is, make the first letter of each word a capital and the rest lowercase, e.g. JesusChrist.

Do not use hyphens in label names;

Following are the label names used in the ioc-liturgical-db .

Status Labels

Status labels can be used to indicate the life-cycle status of a text. When a text is being originally written or subsequently revised, it can be labeled as 'Draft'. When it is ready for someone else to review, it can be labeled 'Review'. When it is considered done, it can be labeled 'Final'.

Draft	text is being written or edited by the author
Review	text is being reviewed by other people
Final	this is the final version of the text

Liturgical Labels

Liturgical labels are added to the generic Text label, e.g. :Text:Liturgical:me means the Liturgical Text called the Menaion.

d01	day 1 in the monthly cycle
eo	Eothinon
e01	Eothinon 1 in the 11 week cycle of Matin's Gospel readings
ho	text from the Horologion
li	Divine Liturgy
Liturgical	text that is liturgical
me	text from the Menaion
m01	mode 1
m01	text for month 1 in the yearly cycle
oc	text from the Octoechos
pe	text from the Pentecostarian
Scripture	text that is Scripture, i.e. from the Bible
Text	a collection of sentences from some document.
tr	text from the Triodion
w01	week 1

Biblical Labels

Biblical labels are added to the generic Text label, e.g. :Text:Biblical:OT:GEN means the the book of Genesis, Old Testament, Biblical Text. The Biblical text book abbreviations are also used as part of the id for a Biblical text.

Standard Division of the Bible

OT	Old Testament
NT	New Testament

Old Testament

The divisions of the books of the Old Testament¹:

Abd	Additions to Book of Daniel
App	Appendix
Hist	History
Law	Law
Prph	Prophets
Wis	Wisdom

¹Old Testament names and divisions from https://en.wikipedia.org/wiki/Septuagint_of_books

GEN	Γένεσις	Genesis	Law
EXO	Ἔξοδος	Exodus	Law
LEV	Λευϊτικόν	Leviticus	Law
NUM	Ἀριθμοί	Numbers	Law
DEU	Δευτερονόμιον	Deuteronomy	Law
JOS	Ἰησοῦς Ναυῆ	Joshua	Hist
JUD	Κριταί	Judges	Hist
RUT	Ῥούθ	Ruth	Hist
SA1	Βασιλειῶν Α'	I Samuel	Hist
SA2	Βασιλειῶν Β'	II Samuel	Hist
KI1	Βασιλειῶν Γ'	I Kings	Hist
KI2	Βασιλειῶν Δ'	II Kings	Hist
CH1	Παραλειπομένων Α'	I Chronicles	Hist
CH2	Παραλειπομένων Β'	II Chronicles	Hist
ES1	Ἑσδρας Α'	1 Esdras	Hist
ES2	Ἑσδρας Β'	Ezra-Nehemiah	Hist
TOB	Τωβίτ	Tobit or Tobias	Hist
JDT	Ἰουδίθ	Judith	Hist
EST	Ἑσθήρ	Esther with additions	Hist
MA1	Μακκαβαίων Α'	1 Maccabees	Hist
MA2	Μακκαβαίων Β'	2 Maccabees	Hist
MA3	Μακκαβαίων Γ'	3 Maccabees	Hist
PSA	Ψαλμοί	Psalms	Wis
PSA	Ψαλμός ΡΝΑ'	Psalms 151	Wis
PMA	Προσευχή Μανασσή	Prayer of Manasseh	Wis
JOB	Ἰώβ	Job	Wis
PRO	Παροιμίες	Proverbs	Wis
ECC	Ἐκκλησιαστής	Ecclesiastes	Wis
SOS	ᾠσμα Ἀσμάτων	Song of Solomon or Canticles	Wis
WIS	Σοφία Σαλομώντος	Wisdom	Wis
SIR	Σοφία Ἰησοῦ Σειράχ	Sirach or Ecclesiasticus	Wis
POS	Ψαλμοί Σαλομώντος	Psalms of Solomon	Wis
HOS	Ὡσηέ Α'	Hosea	Prph
AMO	Ἀμώς Β'	Amos	Prph
MIC	Μιχαίας Γ'	Micah	Prph
JOE	Ἰωήλ Δ'	Joel	Prph
OBA	Ὀβδιού Ε'	Obadiah	Prph
JON	Ἰωνᾶς Ϛ'	Jonah	Prph
NAH	Ναούμ Ζ'	Nahum	Prph
HAB	Ἀμβακούμ Η'	Habakkuk	Prph
ZEP	Σοφονίας Θ'	Zephaniah	Prph
HAG	Ἀγγαῖος Ι'	Haggai	Prph
ZEC	Ζαχαρίας ΙΑ'	Zechariah	Prph
MAL	Μαλαχίας ΙΒ'	Malachi	Prph
ISA	Ἡσαΐας	Isaiah	Prph
JER	Ἱερεμίας	Jeremiah	Prph
BAR	Βαρούχ	Baruch	Prph
LAM	Θρήνοι	Lamentations	Prph
LJE	Ἐπιστολή Ἱερεμίου	Letter of Jeremiah	Prph
EZE	Ἰεζεκιήλ	Ezekiel	Prph
DAN	Δανιήλ	Daniel with additions	Prph
MA4	Μακκαβαίων Δ' Παράρτημα	4 Maccabees	App
STY	Οἱ Ἅγιοι Τρεῖς Παῖδες	Song of Three Youths	Abd
SUS	Σουσάννα	Susanna	Abd
BEL	Βήλ καὶ Δράκων	Bel and the Dragon	Abd

New Testament

MAT	Matthew
MAR	Mark
LUK	Luke
JOH	John
ACT	Acts
ROM	Romans
CO1	1 Corinthians
CO2	2 Corinthians
GAL	Galatians
EPH	Ephesians
PHP	Philippians
COL	Colossians
TH1	1 Thessalonians
TH2	2 Thessalonians
TI1	1 Timothy
TI2	2 Timothy
TIT	Titus
PHM	Philemon
HEB	Hebrews
JAM	James
PE1	1 Peter
PE2	2 Peter
JO1	1 John
JO2	2 John
JO3	3 John
JDE	Jude
REV	Revelation

Reference Node Labels

The Reference label identifies a special kind of node. That is, a node that provides information about a reference made by a liturgical text to something else, e.g. to a Biblical text.

Reference Node People Labels

Following are the 'people' related labels that may be attached to a Reference node:

JesusChrist
Solomon

Reference Node Sense Labels

Following are the 'sense' related labels that may be attached to a Reference node:

abbreviation	meaning	sense type
all	allegory	plenior
chr	Christological	plenior (typology)
ecc	Ecclesiological	plenior (typology)
exi	Existential	plenior
mar	Marionological	plenior (typology)
mor	Moral	plenior
pla	plain	plain
spi	Spiritual	plenior
tri	Trinitarian	plenior (typology)

Standardized Names for Relationship Types

Following are the type names used in the ioc-liturgical-db .

- ()-[HAS_NOTE]->>() The left node has a note that is found in the right node.
- (:Text)-[REFERS_TO]->(:Text) The value of left Text node refers to the value of right Text node. Properties: sense.
- (:Text)-[VALUE_FROM]->(:Text) Left Text node gets its value from right Text node.

Description of the Text Node

Nodes that have the label *Text* include Biblical and Liturgical text.

Nodes with the label *Text* have the following properties:

id	the identifier of the text
value	the actual text
nwp	text that is normalized with punctuation left
nnp	text that is normalized without punctuation left

Here is an example of a Liturgical Text node:

id: gr_gr_cog~le.ep.me.m01.d01~lemeLI.Epistle.title

value: Τῆς Ἑορτῆς.

nwp: της εορτης.

nnp: της εορτης

The *id* of a Liturgical text has three parts, separated by the ~character. The first part is the domain, the second is the topic, and the last is the key. The parts of a domain are separated by the _character. A domain has three parts: the language code, the country code, and a realm. The domain and the topic are also attached as labels to the node.

This means there are two ways to find all nodes whose domain is *gr_gr_cog* and whose topic is *actors*.

You can use:


match (n:gr_gr_cog:actors)

or

match (n) where n.id starts with "gr_gr_cog~actors"

It is probably easier to use the labels.

When you search the text of a Liturgical Text node or a Biblical Text node, there are three options.

 If you match a node using its *nwp* or *nnp* property, you don't need to worry about the case of the characters or about diacritics such as accent marks.

Text that is normalized has been converted to all lowercase letters, and diacritics have been removed. Diacritics are the marks that appear on certain letters, e.g. accent marks, breathing marks, the iota subscript, etc. Such text has the property name (*nwp*), meaning normalized with punctuation.

In addition, there is a property *nnp* that means normalized, no punctuation.

The purpose of the *nwp* and the *nnp* properties is to allow users to search the text without concern for diacritics, character case, or punctuation.

For example, the query

match (n) where n.nnp = ".*αγαπη.*" return n.id, n.value

will find text that contains

ἀγάπη

αγάπη

ἀγάπην

Ἀγαπήσωμεν

ἀγαπητοῦ

or

ἀγάπη

etc...

If you searched on *n.value* instead of *n.nnp*, you would have to specify the accents, breathing marks, character case, etc. that you were interested in. Of course, there are probably times when that is exactly what you want to do. But other times, you can search the value *nwp* or *nnp* and not worry about diacritics.

Description of the Reference Node

Nodes that have the label *Reference* contain information about a reference made in a Liturgical or Biblical text to something else. The most common reference is a Liturgical text referring to a Biblical text.

Nodes with the label *Reference* have the following properties:

bibMaterial	Biblical material
exenote	exegetical note(s)
lexnote	lexical note(s)
targetedTerms	targeted terms
textWitness	the manuscript witness to the text

A special set of Labels is used with nodes that are References. See the section above, *Reference Node Labels*.

Glossary

A

AGES Initiatives, Inc. (noun phrase) • A not-for-profit organization in the USA, founded by Fr. Seraphim Dedes. See <http://www.agesinitiatives.org>.

B

C

country code (noun phrase) • A two or three character code that identifies a specific country. The OSLWuses codes from the ISO 639-2 Code Table, that can be found at https://en.wikipedia.org/wiki/ISO_3166-1_alpha-3.

Cypher (noun) • A query language developed by Neo4j for accessing the Neo4j graph database. See *Neo4j, query*.

D

database (noun) *OALD* • an organized set of data that is stored in a computer and can be looked at and used in various ways. The phrase 'the database' specifically means the ioc-liturgical-db .

domain (noun) • The unique identifier of a specific version of text. A domain has three parts: a language code, a country code, and a realm. For ex-

ample, `en_uk_lash` uniquely identifies translations by Fr. Ephrem Lash that are in the English language as spoken in the United Kingdom. See **country code, language code, and realm**.

E

F

G

H

I

id (noun) • Short for *identifier*. An id is the unique identifier of a piece of text. It is made up from a language code, a country code, a realm, a topic, and a key. In the International Orthodox Christian Liturgical Database the parts of the id are separated by a tilde, i.e. .

J

K

key (noun) • A key is the fifth part of an *id*. For example, there are keys for *Priest* and *Deacon*. A key by itself does not uniquely identify a text. It is

combined with a language code, country code, realm, and topic.

L

label (noun) *Neo4j* • marks a node as a member of a named subset. A node may be assigned zero or more labels. Labels are written as `:label` in Cypher (the actual label is prefixed by a colon).

language code (noun phrase) • A two or three character code that identifies a specific language. The OSLWuses codes from the ISO 639-2 Code Table, that can be found at https://en.wikipedia.org/wiki/List_of_ISO_639-2_codes.

M

N

Neo4j (noun) • 1) A graph database written in the Java language and used as the database management system for ioc-liturgical-db . 2) The company that created and manages the Neo4j database management system.

node (noun) *Neo4j* • a data record within a data graph; contains an arbitrary collection of properties. Nodes may have zero, one, or more labels and are optionally connected by relationships. Similar to vertex.

O

OALD (acronym) • Oxford Advanced Learner's Dictionary. If a definition in this glossary comes from the OALD, it will be indicated by use of the acronym.

OCMC (acronym) • Orthodox Christian Mission Center. See www.ocmc.org.

P

property (noun) *Neo4j* • named value stored in a node or relationship. Synonym for attribute.

property graph (noun phrase) *Neo4j* • a graph having directed, typed relationships. Each node or relationship may have zero or more associated properties.

Q

query (noun) • A request made to a database using a special language made for that purpose. See *Cypher*.

R

realm (noun) • An acronymn or a name that together with a language code and country code uniquely identifies a version of the text. For example, `en_uk_lash` uniquely identifies translations by Fr. Ephrem Lash. Another example of a realm is *oak*, which is an acronymn for the Orthodox Archdiocese of Kenya. See **domain**.

relationship (noun) *Neo4j* • data record in a property graph that associates an ordered pair of nodes. Similar to arc and edge.

relationship type (noun phrase) *Neo4j* • marks a relationship as a member of a named subset. A relationship must be assigned one and only one type. For example, in the Cypher pattern `(start)-[:TYPE]→(to)`, `TYPE` is the relationship type.

S

T

topic (noun) • A topic is the fourth part of an *id* and is a word that groups together keys. For example, the keys *Priest*, *Deacon*, etc. all all grouped together in the *actors* topic. This allows the system or people to quickly find keys that are related to one another.

U**V****W****X****Y****Z**

