

METAFOR CIM processes (CONCIM, tools and services) documentation for IS-ENES METAFOR Deliverable 4.7 M42

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Table of Contents

1. SUMMARY.....	4
2. ARTEFACT CATALOG.....	5
3. CIM ONTOLOGY.....	6
OVERVIEW.....	6
LEAD DEVELOPER(S).....	6
TECHNICAL DOCUMENTATION.....	6
SOURCE CODE.....	6
4. WEB APPLICATION - CMIP5 QUESTIONNAIRE.....	7
OVERVIEW.....	7
LEAD DEVELOPER(S).....	7
TECHNICAL DOCUMENTATION.....	7
SOURCE CODE.....	7
5. WEB APPLICATION - CIM QC TOOL.....	7
OVERVIEW.....	7
LEAD DEVELOPER(S).....	7
SOURCE CODE.....	7
6. WEB APPLICATION - CIM PORTAL.....	7
OVERVIEW.....	7
LEAD DEVELOPER(S).....	7
TECHNICAL DOCUMENTATION.....	8
SOURCE CODE.....	8
UNIT TESTS.....	8
7. WEB APPLICATION - CIM GEONETWORK.....	8
OVERVIEW.....	8
LEAD DEVELOPER(S).....	8
TECHNICAL DOCUMENTATION.....	8
8. WEB SERVICES – CIM PORTAL.....	9
OVERVIEW.....	9
LEAD DEVELOPER(S).....	9
TECHNICAL DOCUMENTATION.....	9
SOURCE CODE.....	9
UNIT TESTS.....	9
9. COMMAND LINE UTILITY - CIM VALIDATOR.....	10
OVERVIEW.....	10
LEAD DEVELOPER(S).....	10
10. COMMAND LINE UTILITY - CMIP5QINGESTOR.....	10
OVERVIEW.....	10
LEAD DEVELOPER(S).....	10
SOURCE CODE.....	10
11. COMMAND LINE UTILITY - CIMGEONETWORKINGESTOR.....	10
OVERVIEW.....	10
LEAD DEVELOPER(S).....	10
SOURCE CODE.....	10
12. COMMAND LINE UTILITY - CIMQCINGESTOR.....	10
OVERVIEW.....	10
LEAD DEVELOPER(S).....	11
SOURCE CODE.....	11
13. COMMAND LINE UTILITY - CIM FROM CODE.....	11
OVERVIEW.....	11

1. Summary

The METAFOR Common Information Model, i.e. the CIM, is an ontology designed to become the ipso-facto standard for climate modelling related metadata. METAFOR is responsible for incubating a CIM ecosystem, i.e. a set of useful CIM compliant tools & services. Such an eco-system is essential to encouraging adoption of the CIM by the global climate modelling community.

CIM compliant tools & services consist of a collection of software artefacts designed to standardise the operational activities of climate modelling institutes. Such activities include model documentation, output data discovery, quality control, experimental design, code documentation, coupling configuration, etc. The software artefacts have been developed in the Python programming language and can be divided into 3 categories:

1. Web services;
2. Web applications;
3. Command line utilities.

The CIM plus CIM compliant tools & services have been developed during the course of the Metafor project. Continued development and support will take place during the course of the IS-ENES project. This document catalogs the set of ontological and software artefacts that IS-ENES will have to take custodianship for along with other members of the international community such as Earth System Grid Federation.

For each artefact the following is provided where possible:

1. Overview;
2. Links to technical documentation;
3. Contacts details of lead developer;
4. Link to source code;
5. Link to unit tests;

2. Artefact Catalog

Below is defined the full list of software artefacts and associated lead developers to be contacted for any questions.

Web Applications	CMIP5 Questionnaire	Gerard Devine, Univ. of Reading.
	CIM QC Tool	Bryan Lawrence, Univ. of Reading.
	CIM Geonetwork	Hans Ramthun, DKRZ.
	CIM Web Portal	Mark Morgan, IPSL.
Web Services	CIM Web Services	Mark Morgan, IPSL.
	Command Line Utilities	
	CIMValidator	Paul Slavin, Univ. of Manchester.
	Cmip5QIngestor	Mark Morgan, IPSL.
	CIMQCIngestor	Mark Morgan, IPSL.
	CIMGeonetworkIngestor	Mark Morgan, IPSL.
	TDS2CIM	Hans Ramthun, DKRZ.
	CIMfromCODE	Paul Slavin, Univ. of Manchester.
Deployments	CMIP5 Questionnaire	Gerard Devine, Univ. of Reading.
	CIM QC Tool	Bryan Lawrence, Univ. of Reading.
	CIM Geonetwork	Hans Ramthun, DKRZ.
	CIM Web Services	Andrew Harwood, BADC.
	CIM Web Portal	Andrew Harwood, BADC.

3. CIM Ontology

Overview

The METAFOR Common Information Model, i.e. the CIM, is an ontology designed to become the ipso-facto standard for climate modelling related metadata. METAFOR is responsible for incubating a CIM eco-system, i.e. a set of useful CIM compliant tools & services. Such an eco-system is essential to encouraging adoption of the CIM by the global climate modelling community.

The CIM has been developed as a UML (Unified Modeling Language) using the Enterprise Architect software tool. It first release into the public domain was as version 1.5. It is currently (end September 2011) being further developed towards version 2.0.

Lead Developer(s)

1. Allyn Treshansky, formerly BADC: allyn.treshansky@noaa.gov
2. Dominic Lowe, BADC: dominic.lowe@stfc.ac.uk

Technical documentation

1. For technical documentation of the cmip5 questionnaire implementation please refer to METAFOR EU deliverables 2.6 *Governance Plans Report*; D2.3 *Actual CIM for delivery of METAFOR tools and services*..

Source code

1. Source code (i.e. UML) is located here: <http://bit.ly/pNeOQx>.

4. Web Application - CMIP5 Questionnaire

Overview

The CMIP5 Questionnaire is a rich internet application (RIA) using html, css and javascript to collect metadata for the CMIP5 process. It has been developed using the Django python web framework and uses a PostGres database backend. It exposes collected metadata as Atom feeds for consumption by 3rd parties such as ESG Curator. The questionnaire itself is based upon a metadata template based upon mind-maps.

Lead Developer(s)

1. Gerard Devine, University of Reading: g.m.devine@reading.ac.uk

Technical documentation

1. For technical documentation of the cmip5 questionnaire implementation please refer to METAFOR EU deliverable 4.6 *Report on CMIP5 Support*.

Source code

1. Source code is located here: <http://bit.ly/qLZ9KT>.

5. Web Application - CIM QC Tool

Overview

The CMIP5 QC (Quality Control) Tool is in production and has been developed under the auspices of METAFOR. It assists the community to document quality related issues connected with CMIP5 output. It exposes it's content, i.e CMIP5 output quality control issues/reports, as CIM compliant XML documents embedded within an Atom feed. It can be found online at <http://qc.cmip5.ceda.ac.uk/qc>. For further information please refer to its wiki page [http://bit.ly/cmip5_qc_tool].

Lead Developer(s)

1. Bryan Lawrence, University of Reading: bryan.lawrence@ncas.ac.uk

Source code

1. Source code is located here: <http://bit.ly/qyTagh>.

6. Web Application - CIM Portal

Overview

The CIM web portal is a rich internet application (RIA) using html, css and javascript to deliver a diverse set of use cases placed into several categories: outreach, ontology, search, tools and publishing. The set of potential users can be placed upon a spectrum of familiarity with CIM meta-data ranging from members of the public to climate or metadata experts.

It is advised that anyone continuing further development of the portal familiarizes themselves with javascript & the JQuery javascript plug-in in order to fully understand how the application is constructed.

Lead Developer(s)

1. Mark Morgan, Institut Pierre Simon Laplace: momips1@ipsl.jussieu.fr

Technical documentation

1. For technical documentation of the web portal implementation please refer to METAFOR EU deliverable 5.5 *CIM Web Portal Deployed* [<http://bit.ly/pJGAQu>].

Source code

1. Source code is located here: <http://bit.ly/qvNEDt>.
2. Note – this code is part of the cim_software package (<http://bit.ly/n01OFu>).

Unit Tests

1. Unit testing a user interface is not practical, however all backend components are unit tested.
2. Source code is located here: <http://bit.ly/q05Ksi>.

7. Web Application - CIM Geonetwork

Overview

GeoNetwork provides a GUI for the editing of XML documents. It is an Ajax based standardized and decentralized spatial information management environment. Any kind of data that is based on an XML schema can be made available inside the GeoNetwork framework. This XSD file describes everything about the structure of a record. The GeoNetwork software analyses the XSD schema during start up so that the appropriate structures and settings appear when a record is displayed in 'Show' or 'Edit' mode e.g. an enumeration list in the schema is shown as a selection list at the screen.

A GeoNetwork server in support of the CIM has been set up by the DKRZ group in Hamburg. CIM instances hosted by this server are eligible for ingestion into the CIM Web Portal (see above) and thus are discoverable.

Lead Developer(s)

1. Hans Ramthun, DKRZ (Hamburg): ramthun@dkrz.de

Technical documentation

1. For a technical introduction to the geonetwork application please refer to <http://geonetwork-opensource.org/>.

8. Web Services – CIM Portal

Overview

The CIM web services have been implemented according to the Service Orientated Architecture (SOA) paradigm. Such an architecture deconstructs a system into a set of discrete functional units known as web services. Such services are supplied by providers (i.e. METAFOR) and consumed by clients (i.e. portals, tools, applications, and in some cases other web services).

The CIM web services are designed so that institutes can gradually over time integrate them into their own climate modelling workflows. The CIM web services run within the CIM web portal container (see below). The implemented web services have been chosen in response to community demand and are thus:

Repository	Supports persistence of CIM documents within CIM repository.
Search	Supports discovery of CIM documents within CIM repository
Validation	Supports validation of potential CIM compliant documents.
Viewer	Supports html rendering of CIM documents.

Lead Developer(s)

1. Mark Morgan, Institut Pierre Simon Laplace: momipsl@ipsl.jussieu.fr

Technical documentation

2. For a technical introduction to the web service implementation please refer to METAFOR EU deliverable 5.5 CIM Web Service Implementation [<http://bit.ly/qbPa61>].

Source code

1. Source code is located here: <http://bit.ly/pojKsb>.
2. Note – this code is part of the cim_software package (<http://bit.ly/n01OFu>).

Unit Tests

1. Source code is located here: <http://bit.ly/nofg5T>.
2. Unit tests run against sandbox instance of web services.
3. Backend components are separately unit tested, the source code is located here: <http://bit.ly/q05Ksi>.

9. Command Line Utility - CIM Validator

Overview

A command line tool for validating potential CIM documents by uploading the documents to a remote web server (i.e. CIM validation web service) for validation.

Lead Developer(s)

1. Paul Slavin, University. of Manchester: slavinp@cs.man.ac.uk.

10. Command Line Utility - C mip5QIngestor

Overview

The CMIP5 questionnaire ingestor performs the task of reading CIM instances from the atom feeds and exposing the instances for further processing. They are used within the CIM web portal to ingest data into the CIM Repository, however they can be used in other scenarios if desired.

Lead Developer(s)

1. Mark Morgan, Institut Pierre Simon Laplace: momipsl@ipsl.jussieu.fr

Source code

1. Source code is located here: <http://bit.ly/oCguvB>.
2. Note – this code is part of the cim_software package (<http://bit.ly/n01OFu>).

11. Command Line Utility - CIMGeonetworkIngestor

Overview

The Cim Geonetwork ingestor performs the task of reading CIM instances from the CIM Geonetwork atom feeds and exposing the instances for further processing. They are used within the CIM web portal to ingest data into the CIM Repository, however they can be used in other scenarios if desired.

Lead Developer(s)

1. Mark Morgan, Institut Pierre Simon Laplace: momipsl@ipsl.jussieu.fr

Source code

1. Source code is located here: <http://bit.ly/oCguvB>.
2. Note – this code is part of the cim_software package (<http://bit.ly/n01OFu>).

12. Command Line Utility - CIMQCIngestor

Overview

The CIMQC ingestor performs the task of reading CIM instances from the CIM QC Tool atom feeds and exposing the instances for further processing. They are used within the CIM web portal to ingest data into the CIM Repository, however they can be used in other scenarios if desired.

Lead Developer(s)

1. Mark Morgan, Institut Pierre Simon Laplace: momipsl@ipsl.jussieu.fr

Source code

1. Source code is located here: <http://bit.ly/oCguvB>.
2. Note – this code is part of the `cim_software` package (<http://bit.ly/n01OFu>).

13. Command Line Utility - CIM From Code

Overview

A command line tool for generating CIM documents from climate model fortran code.

Lead Developer(s)

1. Paul Slavin, University. of Manchester: slavinp@cs.man.ac.uk.