



## Collaborative Climate Community Data and Processing Grid (C3-Grid)

### C3Grid ISO Metadata Profile

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**Reference to project plan:**

This report summarizes the work on the C3Grid adoption of the ISO 19115 standard as part of Work Package 3. The key components are summarized, based on the ISO 19115 UML definitions. Also the C3Grid ISO 19139 XML peculiarity of the ISO 19115 standard is described by a catalogue along with a C3Grid XML template.

# C3Grid Metadata Profile Description

The following chapter gives a high level overview of the C3Grid metadata agreement, which is based on ISO 19115 standard [1] and its ISO 19139 XML representation [2]. A more detailed description of the ISO C3Grid profile can be found in Appendix A) and a C3Grid XML template can be found in Appendix B).

The agreement is aligned with other recent international ISO profile specifications like the WMO profile [3].

In the ISO 19115 standard, metadata is structured into components to

- abstractly characterize and identify data (**MD\_Identification**),
  - describe their content (**MD\_ContentInformation**),
  - their access (**MD\_Distribution**) and production context (**DQ\_DataQuality**),
- to name the most important parts (see highlighted sections in Figure 1).

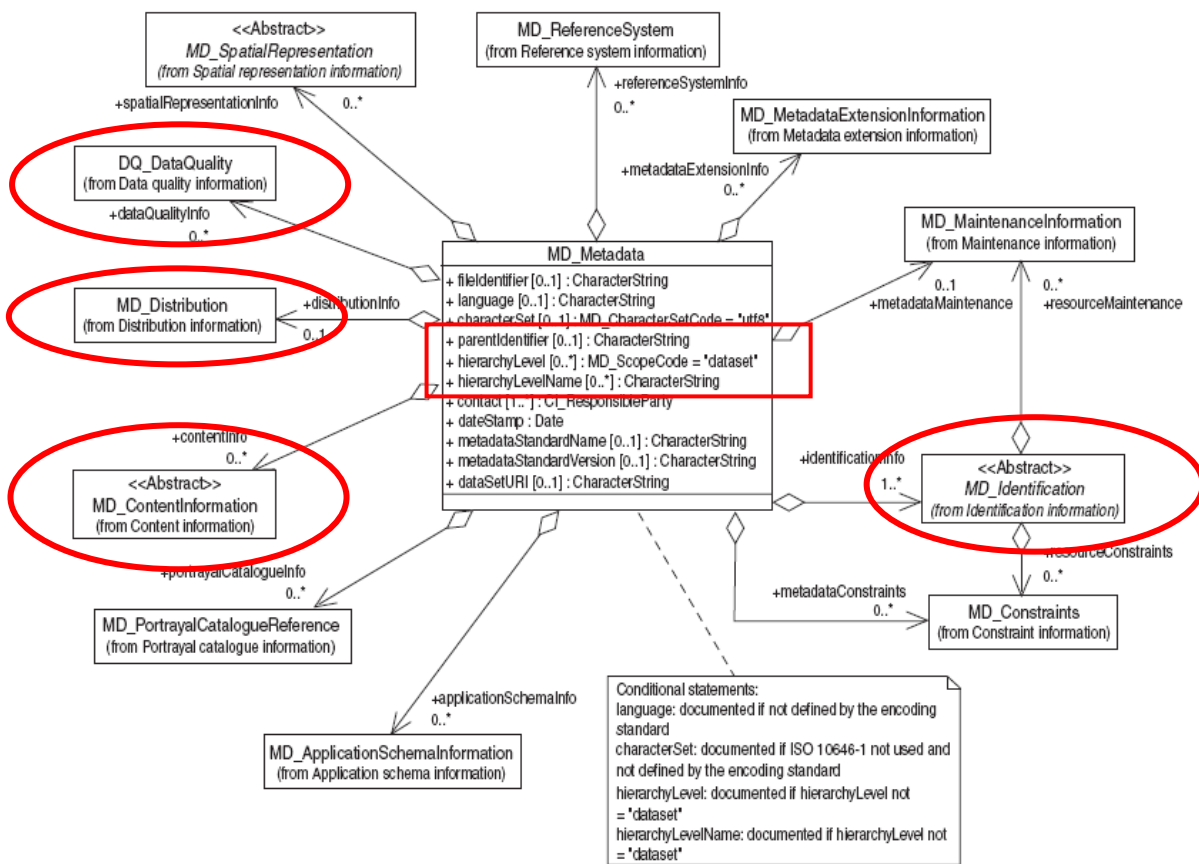


Figure 1: UML model of ISO top level (MD\_Metadata) part

C3Grid characterizes data at different aggregation levels (e.g. dataset/collection). In the metadata description this is reflected by the possibility to name and link metadata according to hierarchy levels (**parentIdentifier**, **hierarchyLevel**, **hierarchyLevelName**).

The **MD\_Identification** part (see Figure 2) allows to uniformly characterize the described data based on e.g. the specification of **abstract**, **keywords** and **point of contact** information, which enables tool based free text search.



The **MD\_ContentInformation** part of ISO (see Figure 4) is used in C3Grid to characterize the physical properties of the described data sets by means of the widely accepted CF (Climate and Forecast [4]) standard names catalogue. This provides a unique description of climate parameters used in climate data sets.

C3Grid decided to not define separate feature catalogues, but to use the **MD\_CoverageDescription** part to specify this information. Therein CF variables are specified as **attributes**.

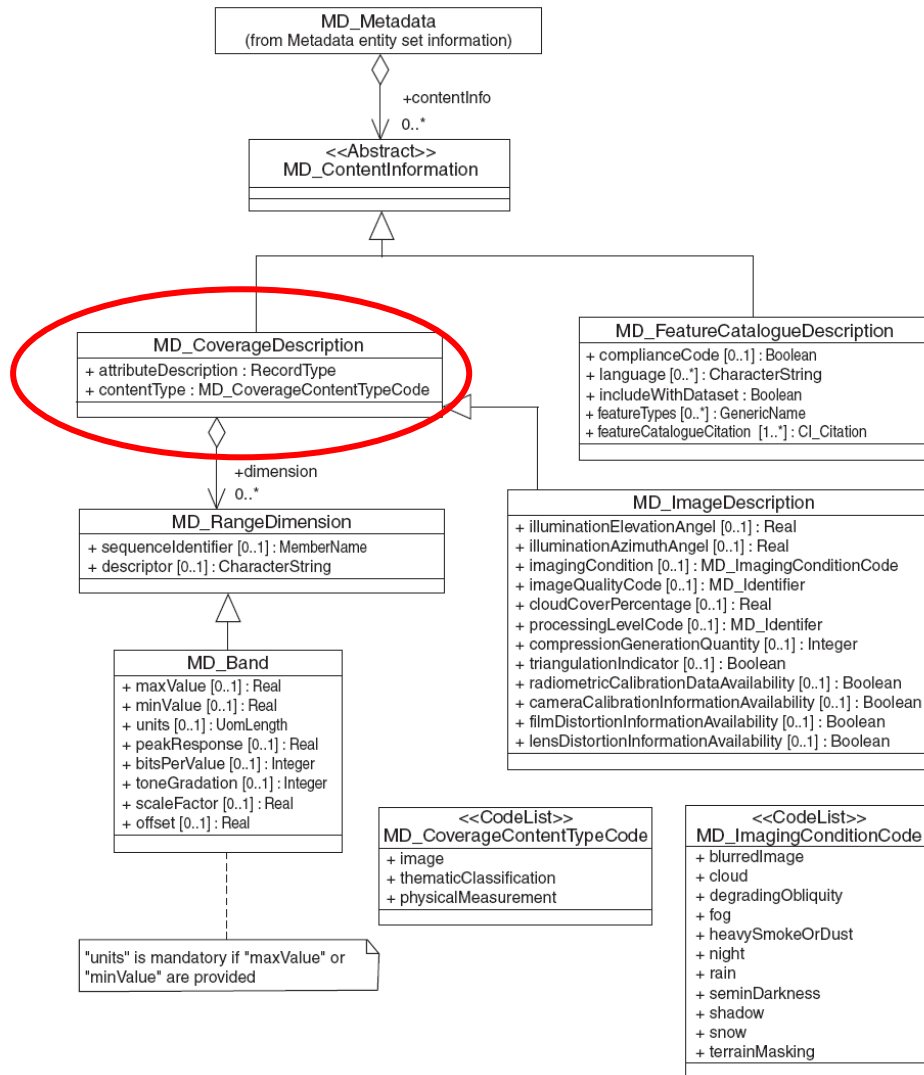


Figure 4: ISO Content part with coverage description (holding CF variables in C3Grid)

Within C3Grid metadata also has to carry information how and where to access the described data at the data providers, the size and format of the data. This information is given in the **DigitalTransferOptions** and **MD\_Format** sections (see Figure 5).

The **DigitalTransferOption** part references the two data access interfaces, which were developed in C3Grid: The web service interface reference, where data can be ordered as well as the GridFTP workspace reference where the data is accessible via GridFTP and the C3Grid data management service.

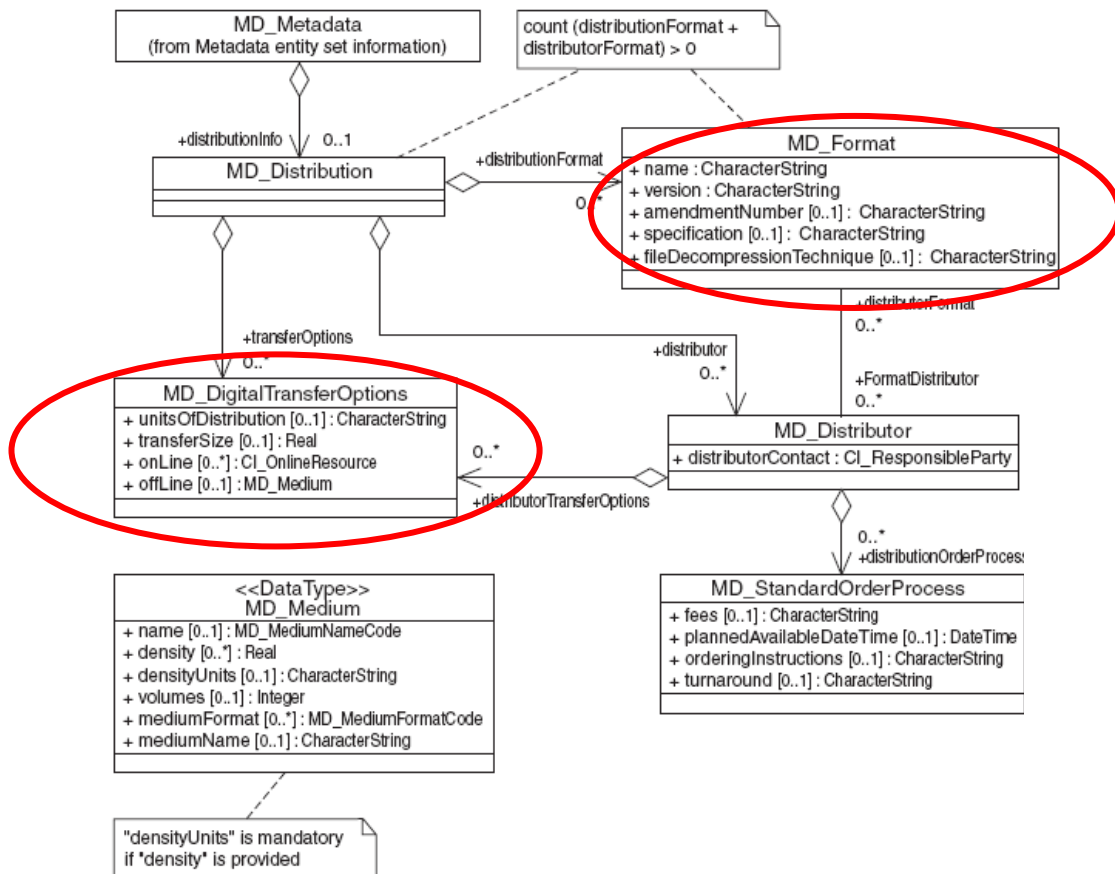


Figure 5: ISO parts holding C3Grid data access information

One important aspect in C3Grid is the reproducibility of newly generated data and thus a clear description of data processing history as well as data origin description as part of a concise data quality description. This information is collected in the ISO **LI\_Lineage** part (see Figure 6).

The processing history in C3Grid is recorded in individual process step descriptions (**LI\_ProcessStep**), whereas the origin is described in source descriptors (**LI\_Source**).

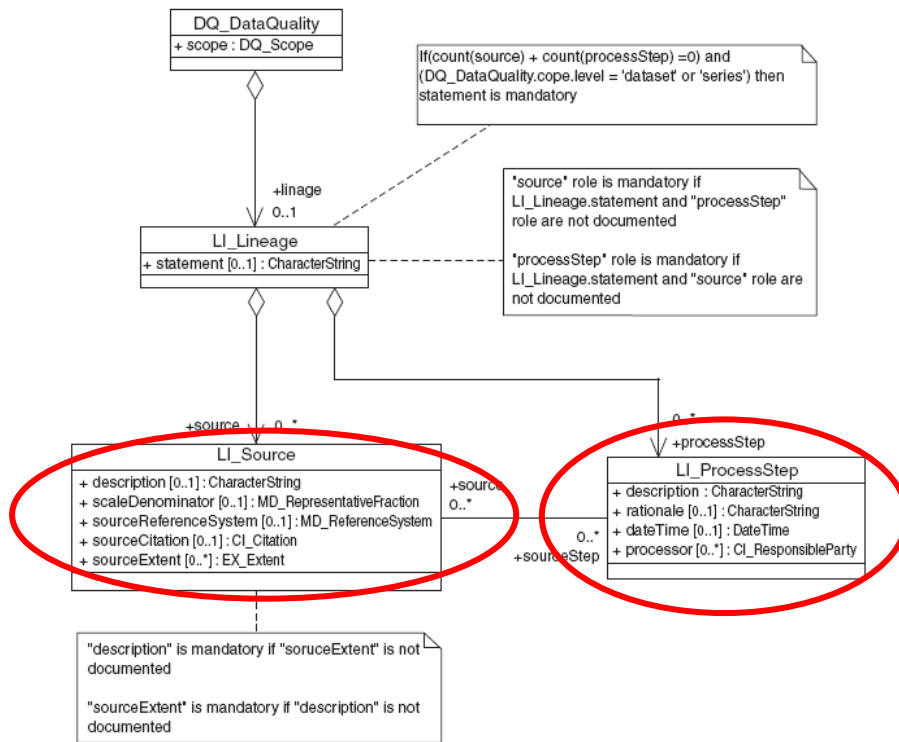


Figure 6: ISO parts holding C3Grid data derivation information

References:

- [1] ISO 19115:2003 "Geographic information – Metadata"; ISO standard
- [2] ISO/PRF TS 19139 "Geographic information – Metadata – XML schema implementation"; ISO technical standard
- [3] Version 0.3 of WMO Core Metadata Standard, July 2006  
<http://wis.wmo.int/2006/WMOCoreTextVer03.doc>
- [4] CF Standard Names, <http://cf-pcmdi.llnl.gov/documents/cf-standard-names>

**Appendix A) C3Grid Metadata Catalogue**  
**Appendix B) C3Grid XML template**