Common **Meta**data **for** Climate Modelling Digital Repositories

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Current issues in climate simulations

- Simulations have a key role in climate science in constructing understanding, and in producing predictions.

- Discriminating between two simulations is not easy, even when you were responsible for them!

- Documentation currently revolves around (at best) the runtime, but not the scientific detail and relevance of the model components.

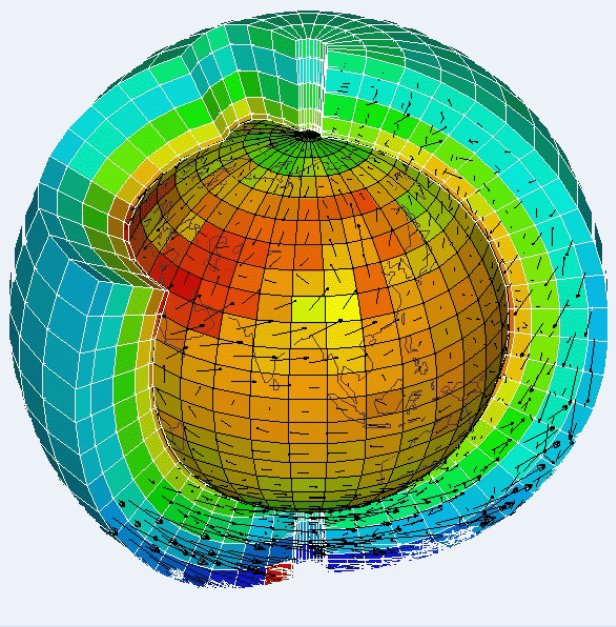
- Little or no documentation of the “simulation context” (the whys and wherefores and issues associated with any particular simulation).

Goals of Metafor

"The main objective of METAFOR is to develop a **Common Information Model (CIM)** to describe climate data and the models that produce it in a standard way, and to ensure the wide adoption of the CIM"

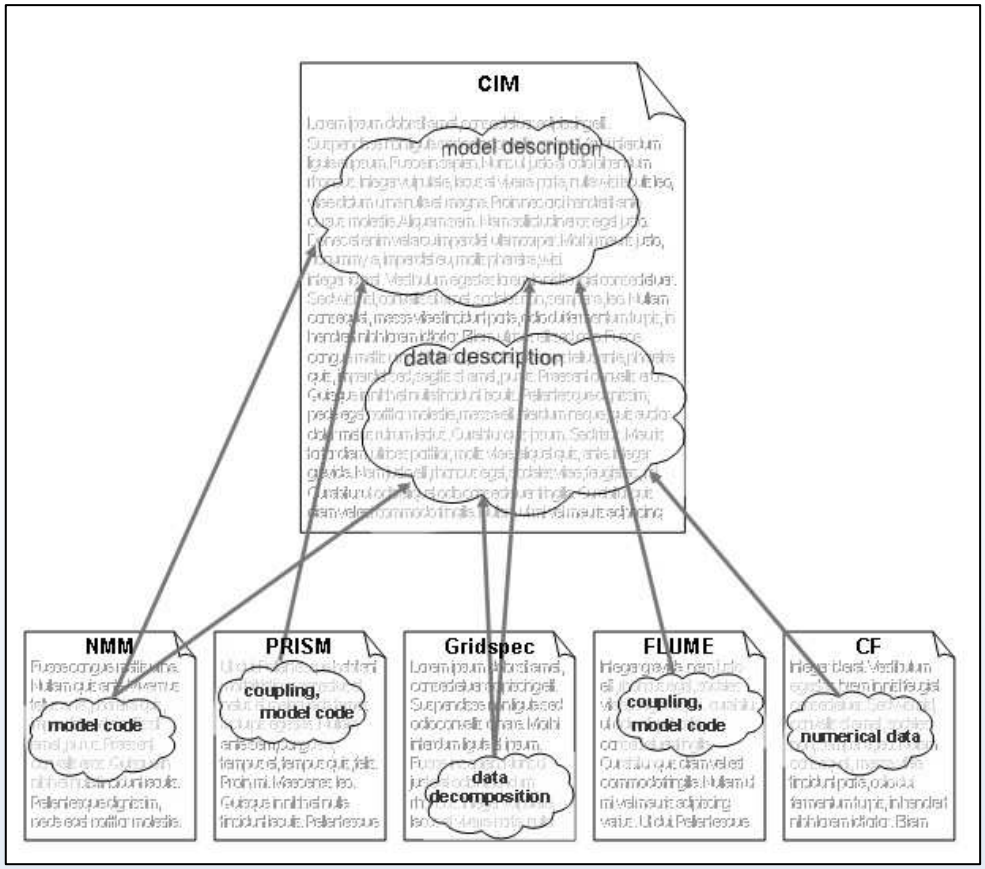
Requirements for success:

- Gather top field experts
- Engage with similar existing activities
- Work towards community adoption
- Capture wider community needs
- Produce Metafor EU deliverables



Metafor objectives

- To allow essential data, model and experiment distinctions to be understood
- To build on existing metadata standards used internationally in climate (CF, CDML, CSML, Curator, NMM, FLUME, etc.)
- Use existing formats and frameworks (XML, RDF, etc.)



Metafor Metadata Standards

Discovery metadata	*Climate Modelling*	*Data*
ISO 19139	Gridspec - *model discretisation*	CF for netcdf
ISO 19115	Sensor ML - *observations*	
	NMM - *model description*	
	CERA2 - *data management*	

METAFOR will coordinate the filling of the metadata gaps, mapping to different standards, aggregating the metadata and, if necessary, creating new standards.

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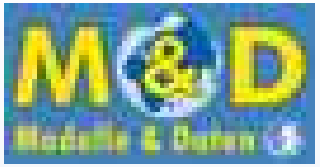
Guiding Principles for metadata

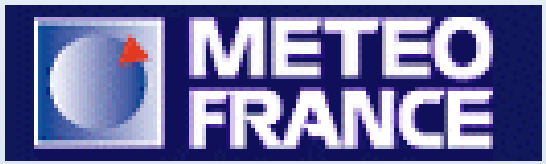
- integration of existing standards (ISO, climate modeling community,...)
- flexibility to support emerging standards both from within Metafor as well as from the broad community
- maintaining the “separation of concerns” (modularity)
- providing clear governance policies

Metafor partners

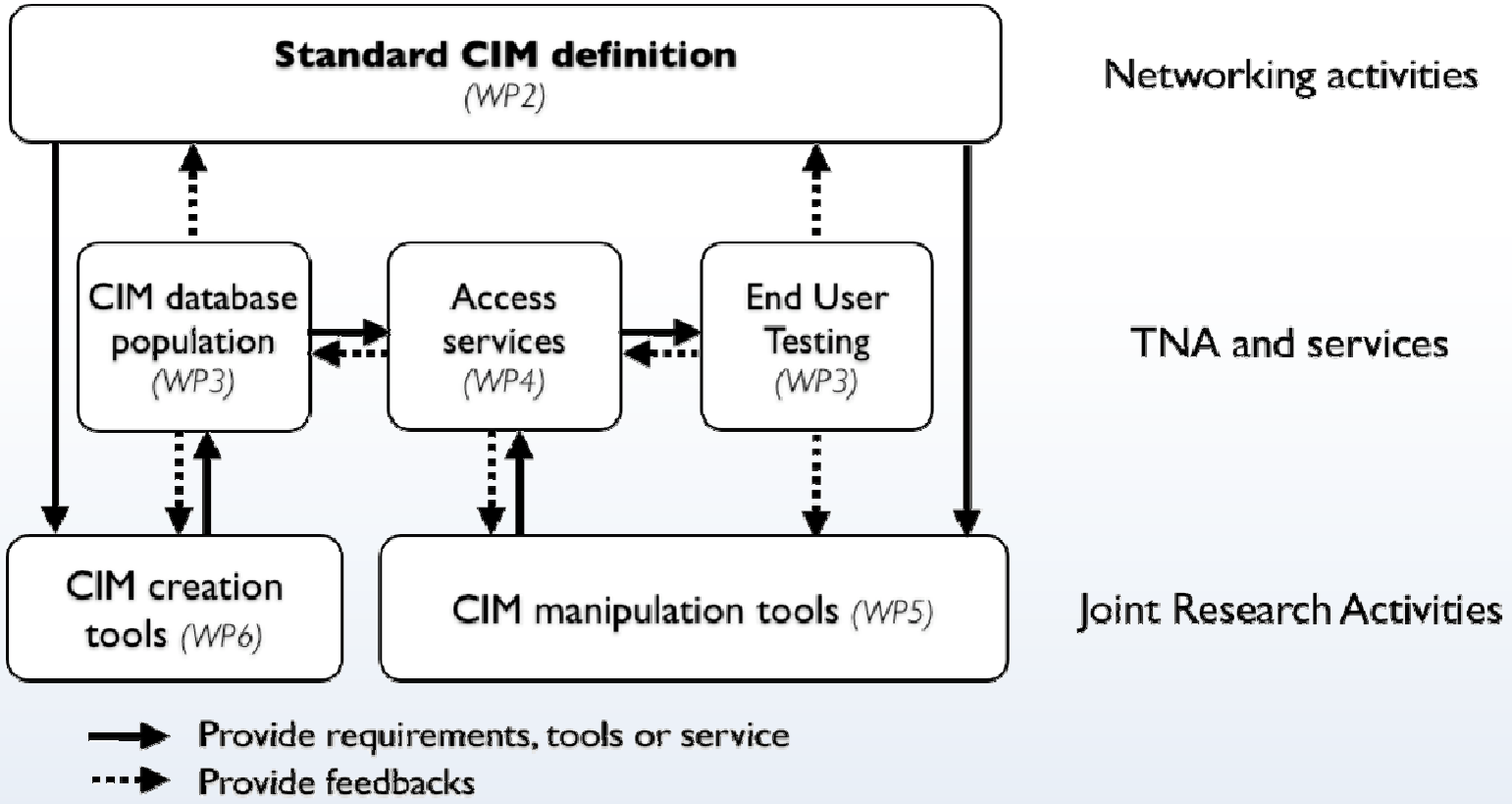
- 11 partners
- EU contribution of 2.2M€
- Started March 2008, duration 3 years



- BADC, Science and Technology Facilities Council, UK
- CERFACS, France
- Models and Data, Max Planck Institute for Meteorology, Germany
- NCAS, University of Reading, UK (Coordinator)
- Institute Pierre-Simon Laplace, CNRS, France
- University of Manchester, UK
- Met Office, UK
- Administratia Nationala de Meterologie, Romania
- Météo France, CNRM, France
- CLIMPACT, France
- CICS, Princeton University, USA



Metafor Work Plan

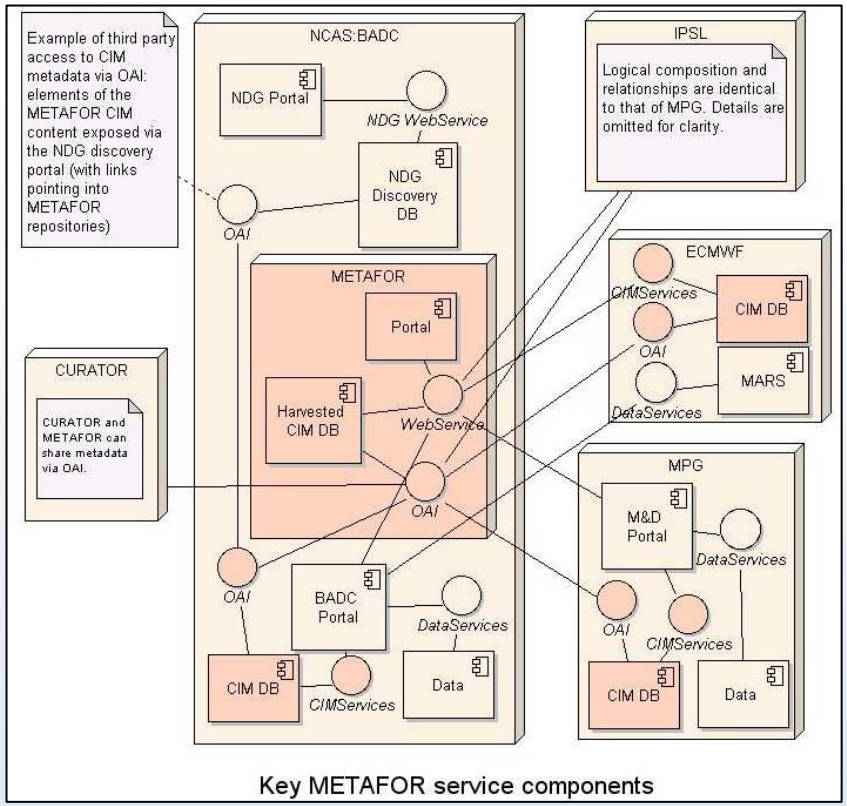


Project management, training and dissemination are organised in WP1 and WP7.

Metafor Infrastructure

Develop, deploy, and evaluate a **prototype infrastructure** that will allow key **data** and **models** to be **discovered** and **compared** between **distributed digital repositories**

- single sign-on services to populate and manipulate, the CIM metadata
- services exploit NDG CSML to provide a common Geographic Markup Language interface to climate data
- centralized CIM content harvested from individual repositories using OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting).



CIM development

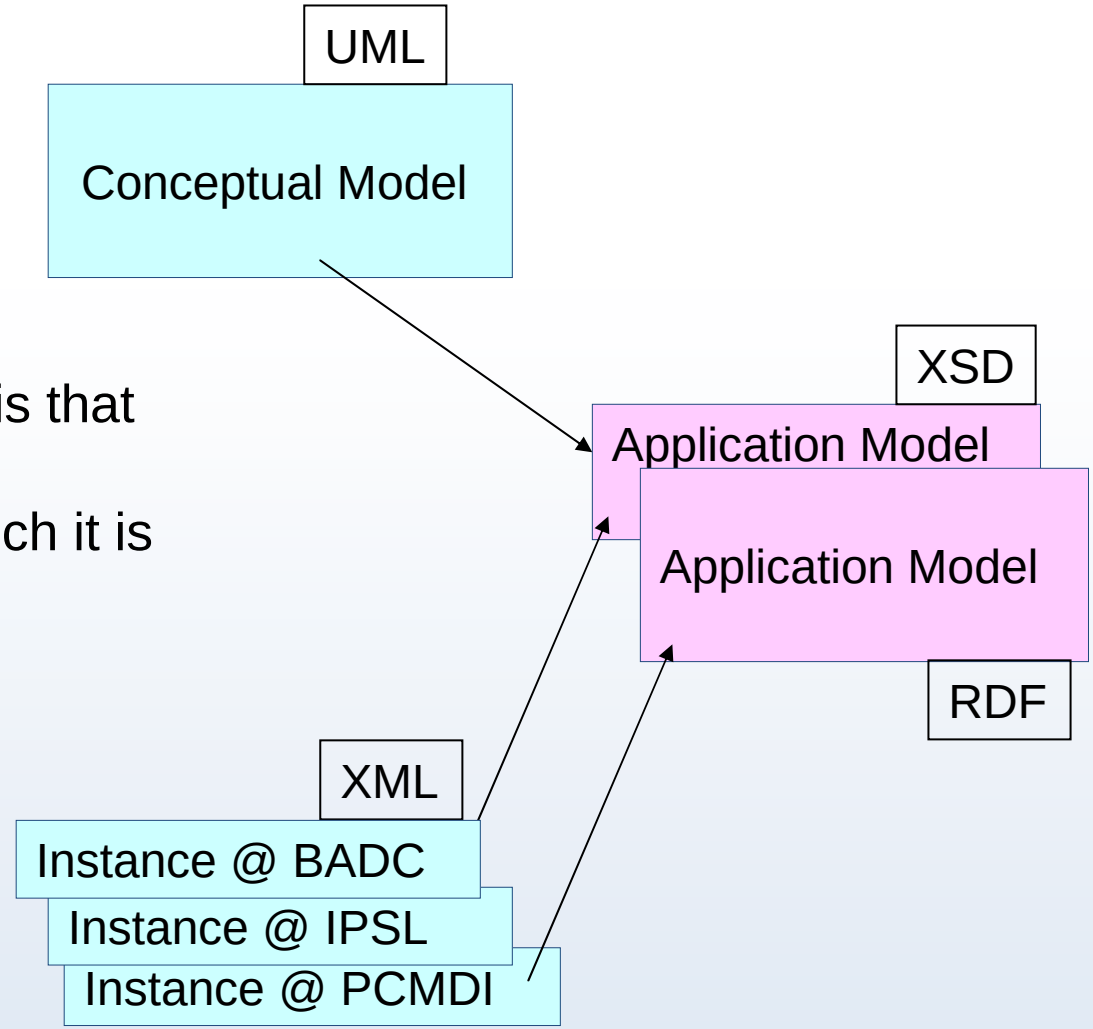
"The main objective of METAFOR is to develop a **Common Information Model (CIM)** to describe climate data and the models that produce it in a standard way, and to ensure the wide adoption of the CIM"

Goal :

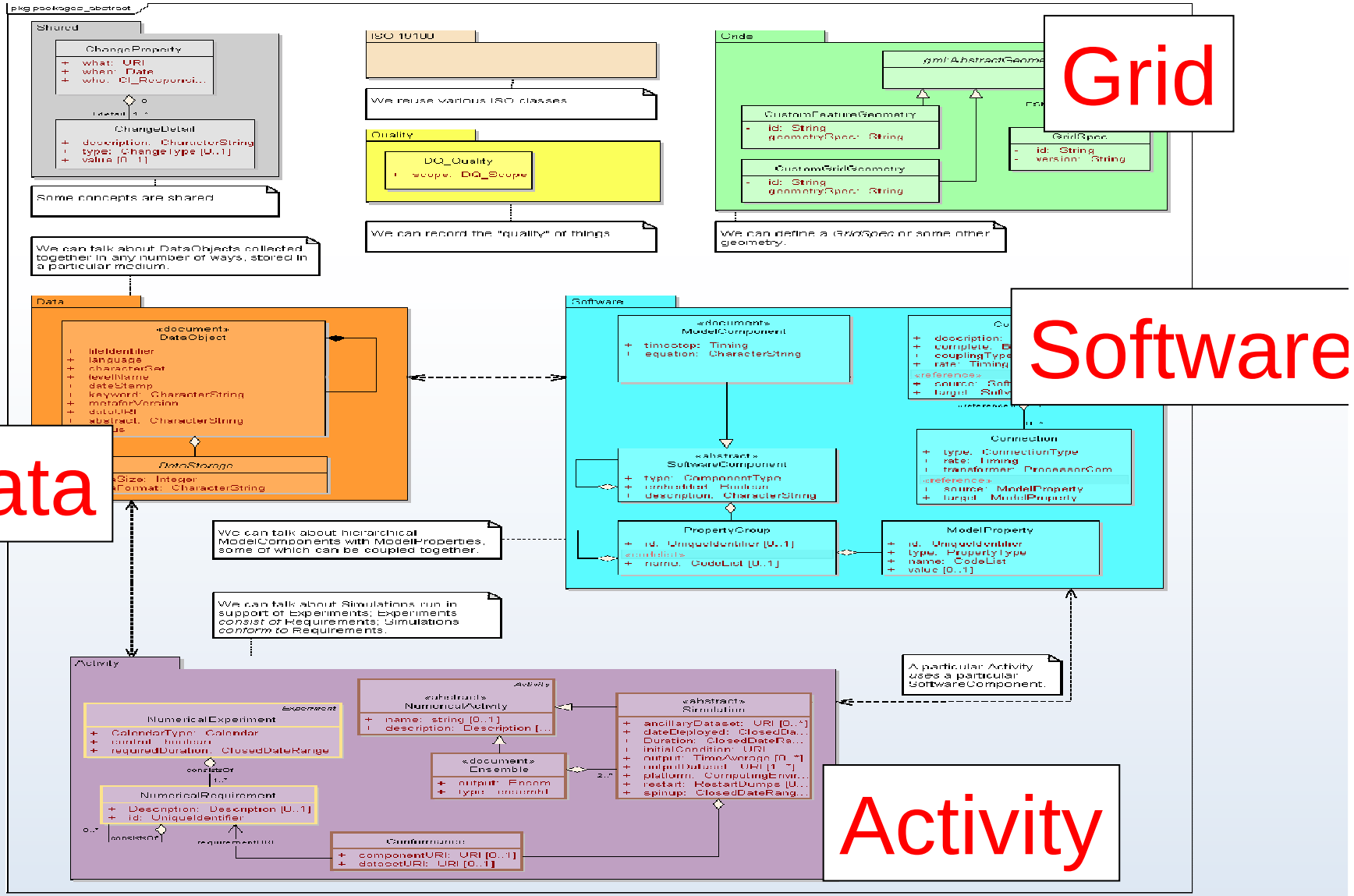
- One normative artefact – the UML model
- Derived XSD generated automatically

CIM development

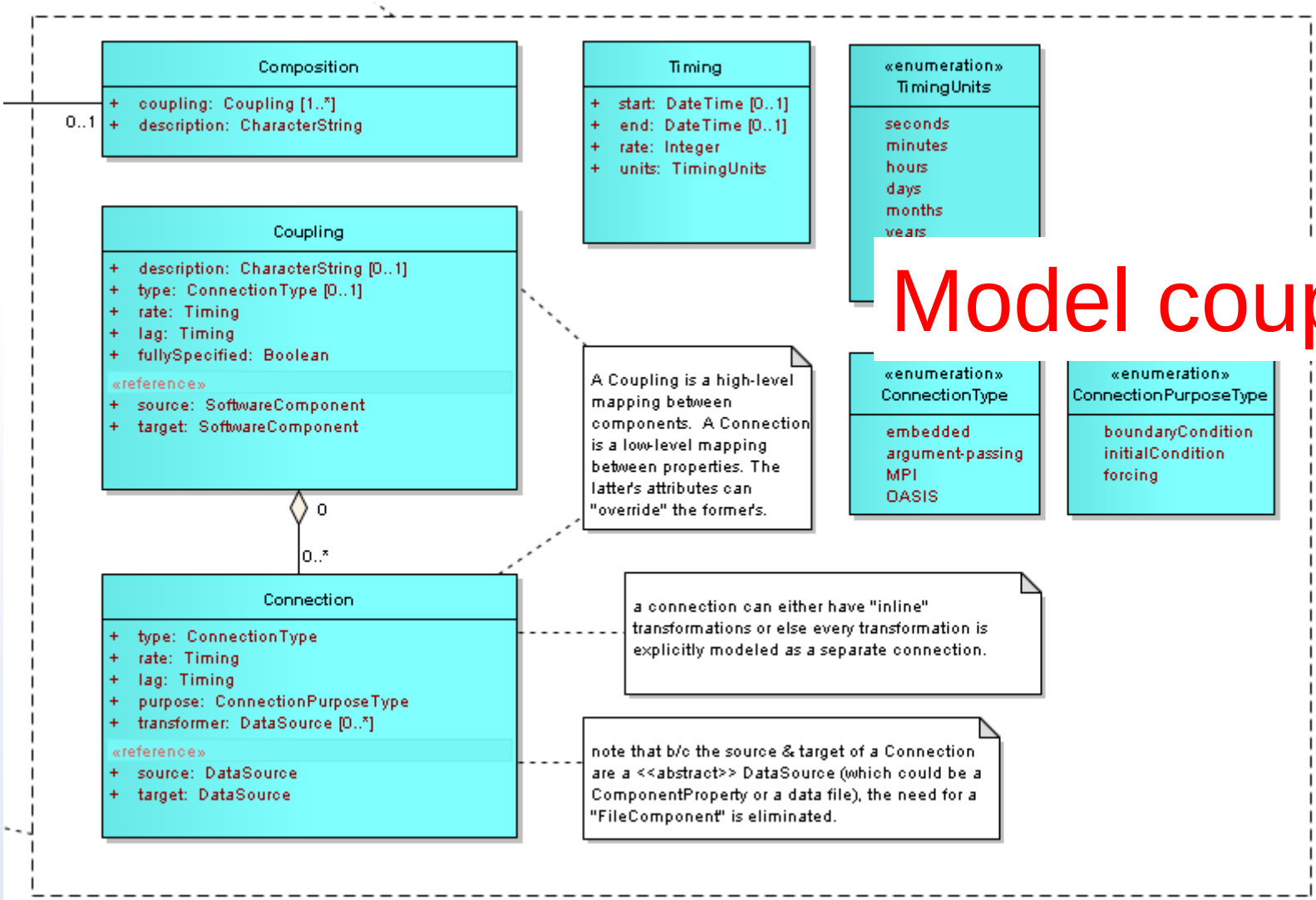
An essential aim of **Metafor** is that the conceptual model is not changed by the manor in which it is used or applied.



CIM structure



CIM software package



Model coupling

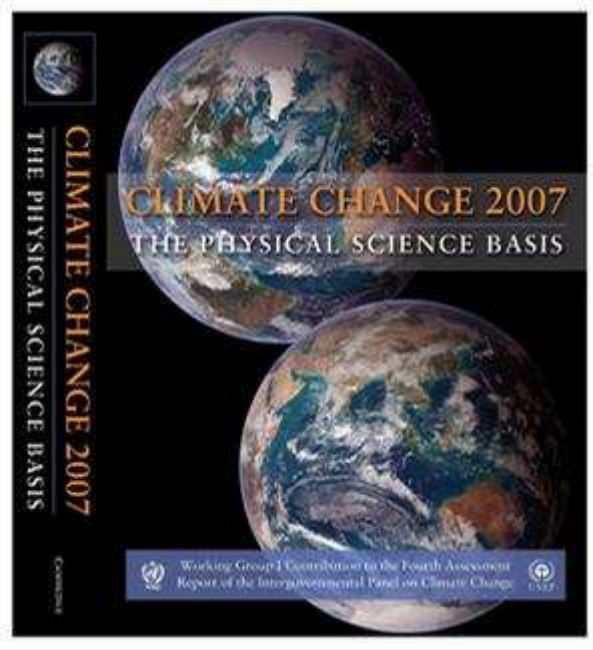
Metafor highlights so far

- A dedicated and tightly organised group of experts
- A methodology: CIM development strategy proposed, including conceptual level and meta□model
- A first CIM: v1.0 delivered, freely available at:

http://metaforclimate.eu/trac/browser/CIM

- Strong international collaboration and links established with USA colleagues in Curator/ESG/PCMDI
- A prototype portal deployed
- Strong community buy□in:
  - □ Leading the CMIP5 metadata collection
  - □ An inclusive mail list (~100/month)
  - □ Future wide□range dissemination planned to tie in with CMIP5 questionnaire and AR5 (the “stick” and the “carrot” !)

CMIP5/IPCC

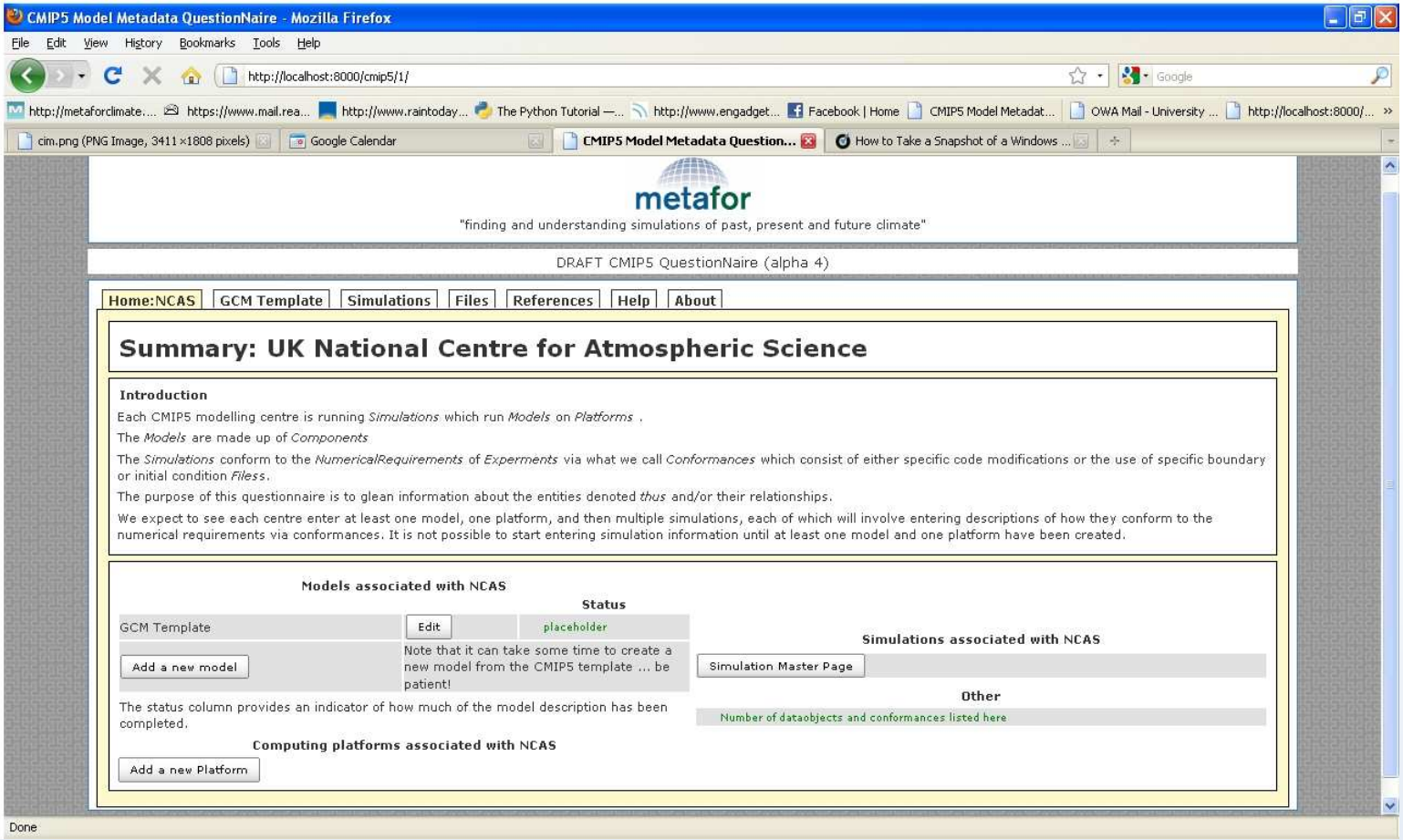


- The CMIP5 experimental archives will be ~500TB of model run data

- We need to be able to capture all the details of these experiments (and the component models and platforms used) to allow users of the archive to differentiate between the experiments and the models.

- To do this, Metafor has been tasked by WGCM/CMIP to produce a questionnaire to capture the model metadata.

CMIP5 questionnaire



.....to be discussed in a separate talk