



# Work Package 4 - Services

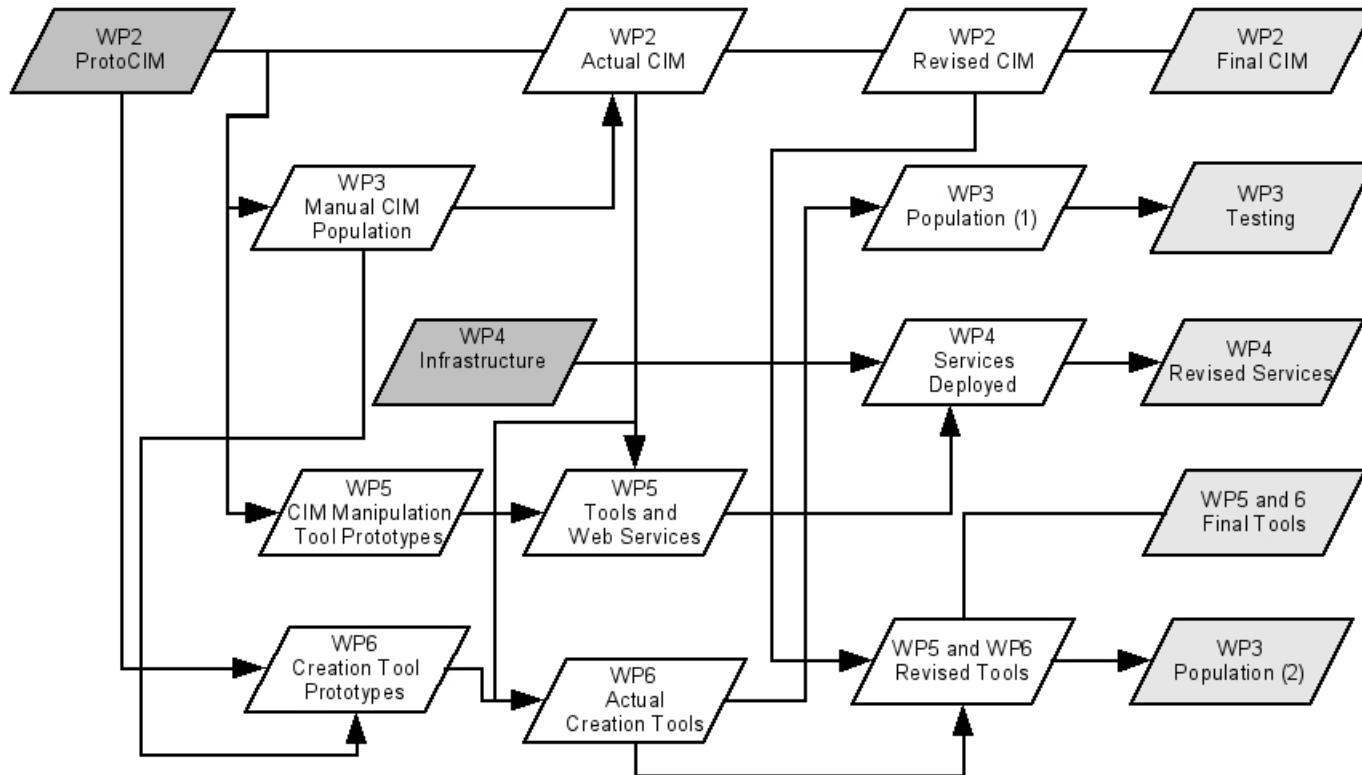


British Atmospheric  
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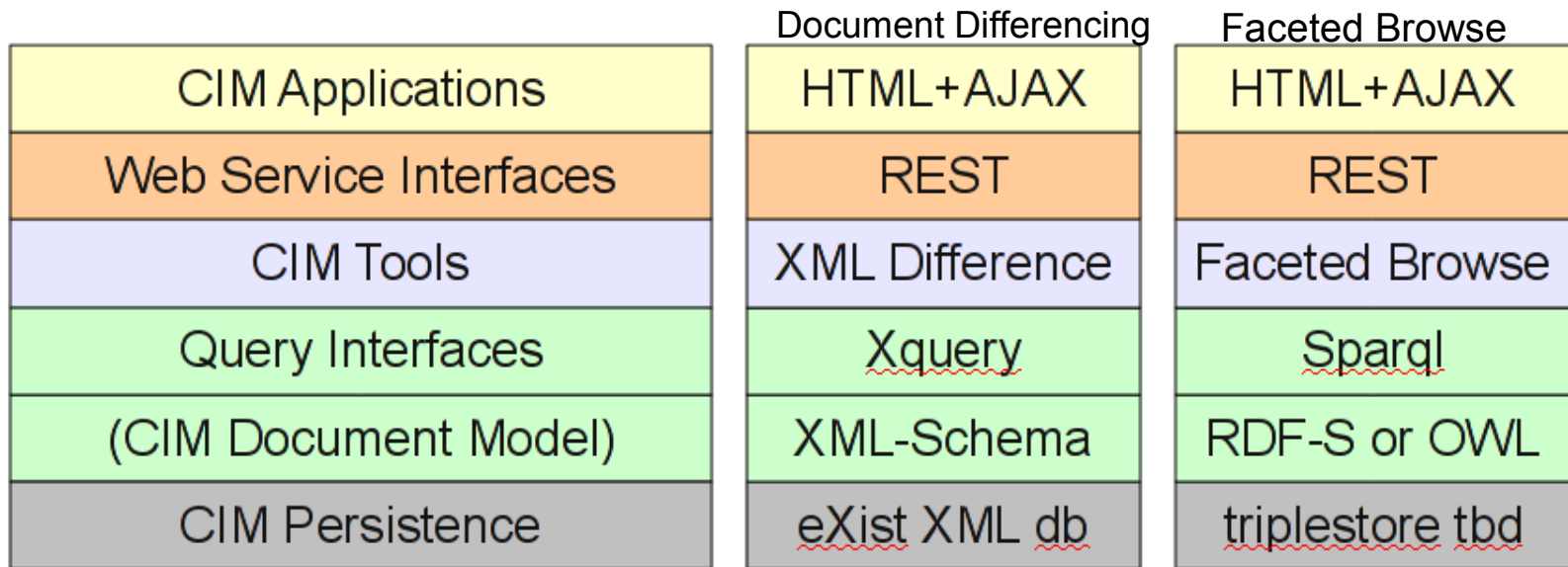
# Original PERT chart



WP4 provides the integrating architecture and delivers the services

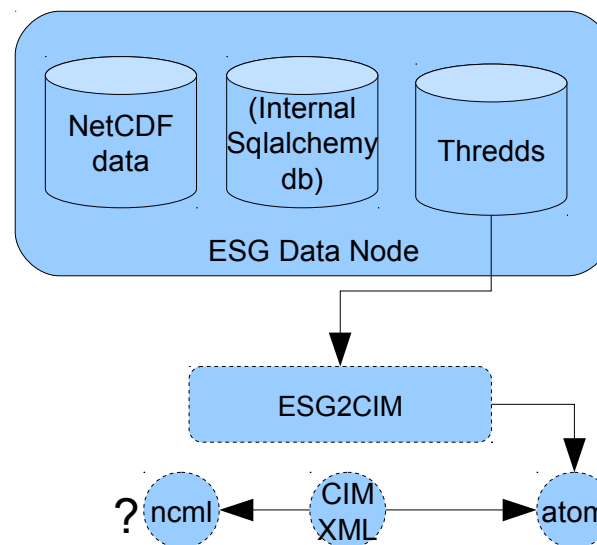
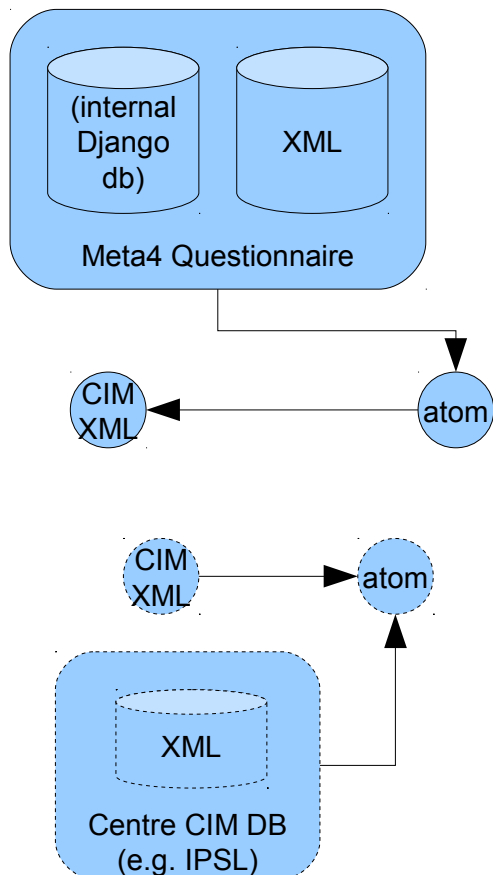
# Metafor Software Stack

- Persistence is decoupled from documents, which may be logically arranged in a variety of ways with associated query interfaces.
- Tools manipulate the query interfaces, and are exposed by web services.
- Applications exploit the web services to provide user services (generally as HTML pages exploiting Ajax to interact with RESTful web services).



These two examples depend on metafor documents being persisted in different formats, with different syntax (XML versus RDF triples) but a common semantic data/document model (CIM)

# CIM Creation



All creation tools provide atom feeds of their internal contents. XML documents are initially persisted locally and may be duplicated remotely (and persisted in different formats).

# Atom Feed

```
<?xml version="1.0" encoding="UTF-8"?>
<feed xmlns="http://www.w3.org/2005/Atom">
```

## FEED DESCRIPTION

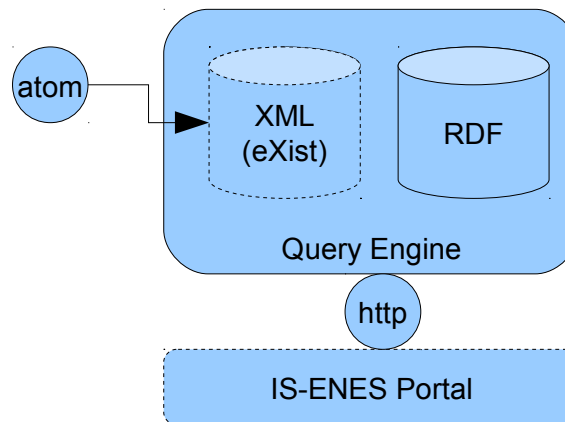
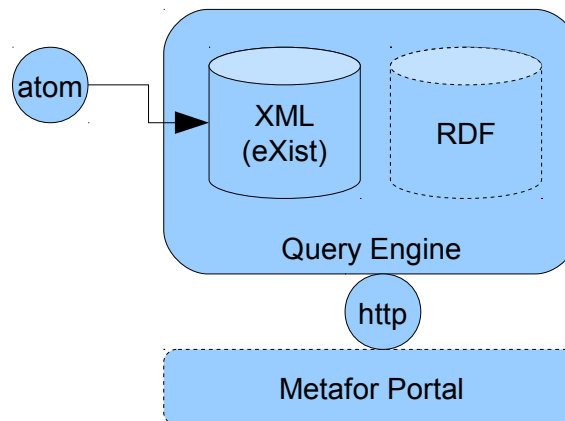
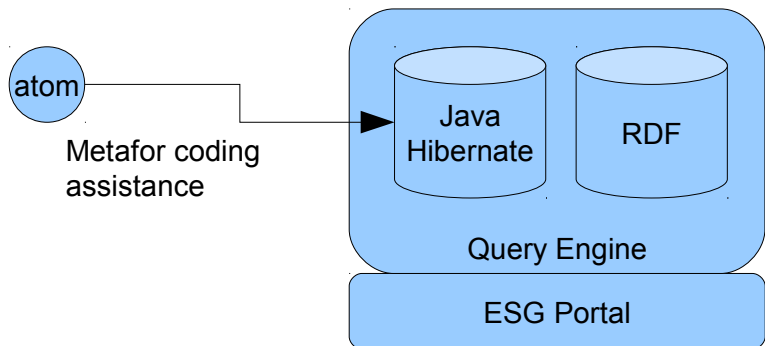
```
<id>http://ceda.ac.uk/feeds/cmip5/experiment/</id>
<title>CMIP5 model experiment metadata</title>
<subtitle>Metafor questionnaire - completed experiment documents</subtitle>
<updated>2010-03-04T00:00:00Z</updated>
<link href="http://ceda.ac.uk/feeds/cmip5/experiment/" rel="self"></link>
<author><name>The metafor team</name></author>
<generator version="r33" uri="http://code.google.com/p/django-atompub/">django-atompub</generator>
```

```
<entry>
  <id>urn:uuid:1fb380d2-2759-11df-924b-00163e9152a5</id>
  <title>5.5-1 esmFdbk1( 5.5-1 ESM feedback 1)</title>
  <updated>2010-03-04T00:00:00Z</updated>
  <published>2010-03-04T00:00:00Z</published>
  <summary>Impose conditions identical to 3.1.:Control but radiation code sees CO2 concentration increase. </summary>
  <content src="/cmip5/experiment/1fb380d2-2759-11df-924b-00163e9152a5/1/" type="application/xml"></content>
</entry>
```

## ENTRY DESCRIPTION – points to XML payload

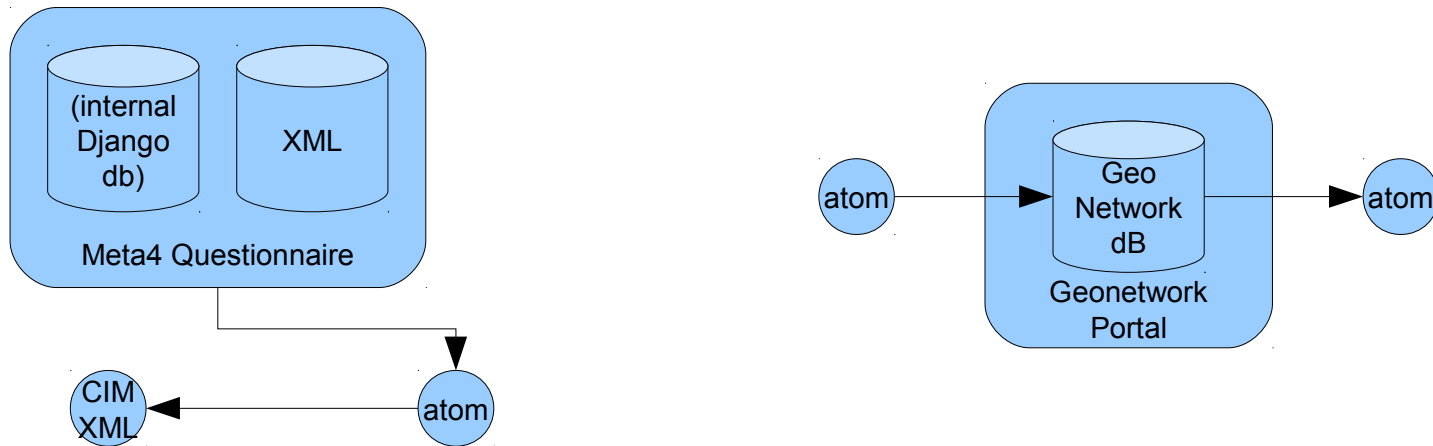
```
<entry>
  <id>urn:uuid:1fd2019c-2759-11df-924b-00163e9152a5</id>
  ...
```

# CIM Portals



Metafor and IS-ENES query engines have http service interfaces so they can be composed into third party portals.

# CIM Editing

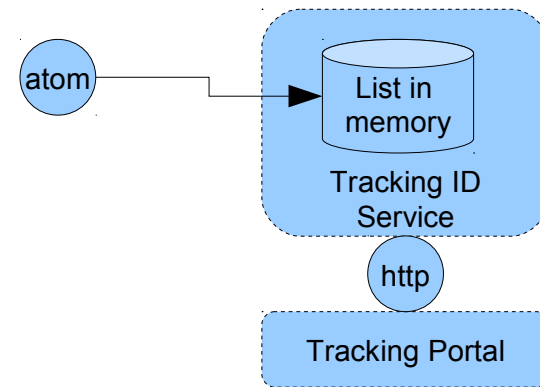


The metafor CMIP5 questionnaire provides a *CMIP5 specific* editing interface, the geonetwork tool provides a *generic* editing interface.

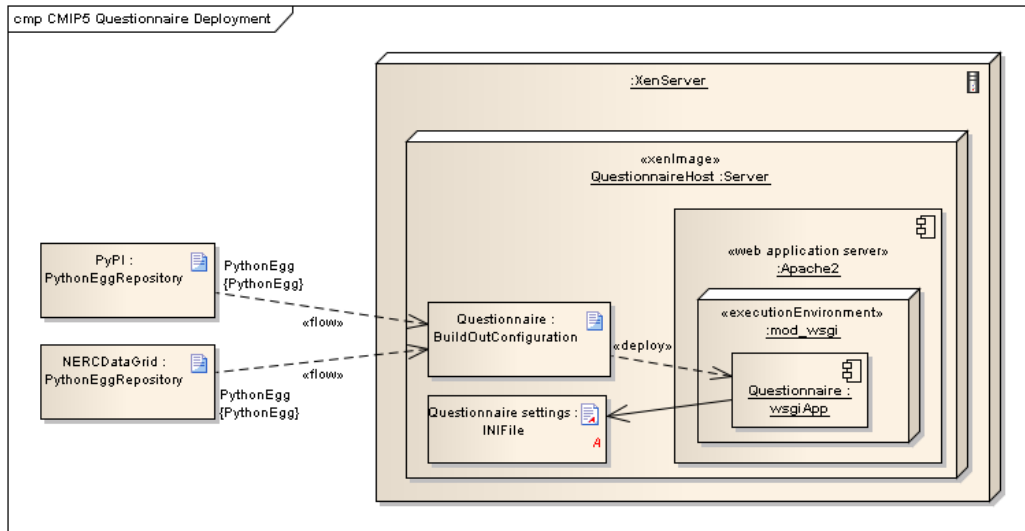
# Document Tracking

Use case:

- User has downloaded data. What simulation was it from?
- Data file has internal tracking id urn.
- Use tracking portal to go from tracking-id back to metadata.
- Service interface means tracking-id-to-metadata can be composed into any other portal.



# Questionnaire Deployment



(Underlying database on BADC production database server.)



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# Security Deployment (1)

## 2 MIP5 Questionnaire OpenID Sign-in

OpenID:   

CMIP5 Questionnaire Beta 2.

Centre for Environmental  
Data Archival



## 3 Login


Username:   
Password:

CEDA OpenID Provider Site

## 4 Approve OpenID Request?

The website <http://q.cmip5.ceda.ac.uk> has requested your OpenID for sign in:

<https://ceda.ac.uk/openid/Bryan.Lawrence>

Would you like to pass your OpenID credential information back to <http://q.cmip5.ceda.ac.uk> and return to this site? 

Remember this decision for session duration

CEDA OpenID Provider Site.

Logged in as lawrence. [\[Log out\]](#)

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DRAFT CMIP5 Metadata Questionnaire (beta 4)  
Completed data will be sent to the Earth System Grid for inclusion in its official CS-RE3 catalogues.

Please use this version only for testing the latest services. Data entered into this version will be trashed. A live version is expected at the end of March, 2010.

Summary Experiments Models Grids Simulations Files References Parties Help About

Summary: UK National Centre for Atmospheric Science (NCAS)

**Introduction**  
Each CMIP5 modelling centre is performing simulations which run Models on Platforms.  
The Models are made up of Components.  
The Simulations conform to the Numerical Requirements of Experiments via what we call Conformances. Conformances will consist of either specific code characteristics (defined here with specific hierarchy or initial conditions).  
The purpose of this questionnaire is to give information about the entire described in table under their subcategory.  
We expect each centre to enter at least one model, one platform, and then multiple simulations. It is not possible to start entering simulation information until at least one model and one platform are entered.  
It can take some time (minutes) to create a new model or copy an existing one - be patient!  
The status column provides an indication of how much of the model description has been completed.

Models associated with NCAS				Status
Model1	Model	Copy	0.0%	valid
Model1	Model	Copy	0.0%	valid
Model1	Model	Copy	0.0%	valid

**Competing platforms associated with NCAS**

Platform#6344	edit
<input type="button" value="Add a new Platform"/>	

**Simulations associated with NCAS**

**Files, References and Parties**

There are 0 references associated with NCAS  
There are 0 files associated with NCAS  
There are 1 people and institutions associated with NCAS

Done

# Security Deployment (2)

*What you have seen thus far is what the user sees, invoked by the security middleware. But the security middleware depends on information which much be collected and managed operationally by BADC (and not tied to this specific project).*

## The back end registration procedures:

- Provide openid for existing and new users (modify user database)
- Use openid from trusted institution as identifier with which to associate badc trust (modify user database)
- Modify forms so users know their openid for use at third party institutions
- Data Manager Tools to associate URIs with access control  
*(Various states of maturity and documentation)*

# The list of Metafor Services

- Atom feed of new CIM instances at all sites producing CIM content for wider accessibility (some CIM content will of course be only of local interest).
- An aggregation service – to harvest CIM compliant metadata from CIM producers.
  - In practice this will be achieved by exploiting Atom feed parsers in any applications exploiting the CIM. We may need a central registry of CIM production feeds.
- A generic search interface (possibly including OpenSearch as well)
  - To be deployed in the metafor portal.
- An annotation interface for CIM instances
  - To be deployed in the metafor portal, possibly also in the questionnaire for quality control management by data and metadata producers.
  - Along with a feed or feeds of such annotations
- An editing service for CIM instances
  - (being delivered by the geonetwork developments)
- A WFS interface to CIM content
  - This is unlikely to be delivered within Metafor as there are no internal use case drivers, but we can see that eventually interoperability requirements may make this useful.
- A service to allow differencing CIM documents so users can understand difference in simulations, experiments, models and data.
  - To be deployed in the portal exploiting the web services developed in WP5
- A service to expose underlying CIM transformation tools (such as validation, pretty printing, xml to rdf conversion, and vice versa, etc ).
- Query interfaces exposing the underlying web services so organisations can develop their own portals etc exploiting harvested CIM content.
  - This may be one of the methods of allow IS-ENES portals and Metafor portals to exploit co-development. See section .
- Vocabulary services exploiting a RESTful API – including editing services to allow the management of controlled vocabularies.
- Governance services allowing the upload of new version of the ConCIM UML and the download of conformant ApCIM XML schema and (hopefully, see section ) RDF-S or OWL schema.

# Future Roadmap

## Key Activities:

- Services to support ongoing governance of information models (including vocabularies) \*\*\*\*
- Help desk services.
- Further development of CMIP5 questionnaire (and live upgrades including information migration).
- Deployment & deployment of the metafor portal (in particular to support DOI “landing”).
- Transitioning software into formally standalone open source activities.
- URI management.

## Working with IS-ENES:

- Which activities need to be completed within metafor (and a possible extension).
- Which could be picked up by IS-ENES

## What needs to be considered for

- Ongoing national funding, and
- Ongoing (new) European funding.

# Services and the CIM

## **The CIM After Metafor:**

- The ongoing scientific management of the CIM will grow out of WP2.
- The deployment of services to support that management needs to grow out of WP4.
- This means we need NEW tools to mediate with the scientific community and to manage the information models.

## **Some new activities from within WP4:**

- Hollow World compliance for V2.0 CIM.
- Testing UML → XML schema via FullMoon
- Understanding UML → RDF schema (or OWL) logically and technically.
- Better vocabulary management.

(HollowWorld and FullMoon: model driven architecture technologies from CSIRO & colleagues in Australia)