IS-ENES – WP 11 (JRA5)

D 11.4 – Software Code and e-impact-portal full documentation

Abstract:

This document describes the different modules of the EPICIC (climate4impact.eu) and their coherence and configuration. It does not describe how to use the climate4impact website. This is done on the website itself (FAQ, tooltips, help functions). Intended readers are content providers, system administrators and software developers.

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REVISION TABLE

Version	Date	Modified Pages	Modified Sections	Comments
0.1	22/8/2012	All	All	Initial Draft
0.2	20/9/2012	-	6,7,9	Added chapters
0.3	24/9/2012	All	All	Comments from Lars Barring and Christian Page.
0.4	26/9/2012	-	1	Comments from Lars Barring
1.0	26/9/2012	All	All	Accepted all changes and remove comments
1.1	22/02/2013	-	Executive Summary, 1, 3, 4, 5, 6	Review comments from Joachim Biercamp and Martin Jukes
Final	27/02/2013	All	All	Remove comments and accepted all changes.

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Executive Summary

The Software User Manual (SUM) is aimed at providing the information needed to run the EPICIC, also known as the climate4impact portal. It contains the structure of the software and hardware setup, the roles and responsibilities of people involved in operational management, the installation instructions and a reference manual.

The document does not describe the design of the portal or the requirements it should fulfil. This is described in D11.1, D11.2 and D11.3

It does not describe how users should use the portal. This is described on the portal itself (tooltips, FAQ, Howto pages)

As the current climate4impact portal is a prototype version, parts of the document are put in as placeholders (chapters 9 Reference Manual and 10 Tutorial).

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1. INTRODUCTION

1.1. PURPOSE AND SCOPE OF DOCUMENT

Purpose of the document is to describe the structure, installation, configuration and maintenance for the EPICIC (climate4impact.eu) software system. It does not describe the software components in details as this is done in D11.3: "The portal Software Requirements/Architectural Design IO Specification" [A3].

The prototype software components can be part of a distributed system and will be made available under a Open Source licence model. The exact Open Source license is not decided yet, but will be as soon as the portal will be operational.

It should be noted that the EPICIC is a prototype. This Software User Manual (SUM) is written to run the prototype portal, therefore chapters 9 and 10 are only briefly outlined at this point. When the operational version of the EPICIC will be developed, this document must be updated accordingly.

1.2. STRUCTURE OF DOCUMENT

The SUM document is organized according the ECSS-E-ST-40 and ECSS-Q-ST-80 standards from the ECSS standard for software engineering [R2].

- Chapter 1 contains the introduction and explains the structure of the document.
- Chapter 2 provides the references to applicable and reference documents.
- Chapter 3 describes the conventions used for symbols and stylistics.
- Chapter 4 describes a short description of the intended use of the software components.
- Chapter 5 identifies the software files, databases and start and stop procedures.
- Chapter 6 describes the operations environment in detail (hardware, software, constraints)
- Chapter 7 describes the tasks of the operator
- Chapter 8 is the operations manual, providing step-by-step procedures for the system [omitted for the prototype version]
- Chapter 9 is the reference manual, providing a quick reference card for using the software, describing frequently used functions, control sequences, formats and commands. [omitted for the prototype version]
- Chapter 10 contains a tutorial on how to use the software as an introduction to novices and reference for experts. For the prototype version a short tutorial on Drupal is added.

1.3. INTENDED READERS

The document is written for primarily for system administrators who will be responsible for running the EPICIC in operations. Secondly, the document is intended for software developers, working on improving and/or expanding the EPICIC functionalities. For users of the EPICIC, the documentation is made available online and is also part of this deliverable.

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2. APPLICABLE AND REFERENCE DOCUMENT

2.1. APPLICABLE DOCUMENTS

All applicable documents can be found on the IS-ENES portal internal collaboration area:

https://is.enes.org/eu-internal/useful-documents/deliverables-milestones-templates/deliverables

A1. D11.1 Final description of selected Use Cases including user requirements specification

A2. D11.2 Baseline documents on e-resources/tools and transverse themes

A3. D11.3 The portal Software Requirements/Architectural Design IO Specification

2.2. REFERENCE DOCUMENTS

R1. PSS-05 Software Engineering Standard
R2. ECSS-E-ST-40C Software Engineering Standard
R3. Redmine (www.redmine.org)
R4. ITIL - Information Technology Infrastructure Library - http://www.itil-officialsite.com/
R5. Drupal manual (http://drupal.org/documentation)

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3. CONVENTIONS

Code snippets and configuration file settings are put in grey boxes, using Courier 10pt. font. An example is provided below:

.

```
<VirtualHost *>
    ServerAdmin webmaster@localhost
    ServerName climate4impact.knmi.nl
    ServerAlias climate4impact.eu www.climate4impact.eu
    DocumentRoot /data/web/climate4impact
    ProxyPass /impactportal http://bhlnmgis.knmi.nl:8180/impactportal
timeout=120
    ProxyPassReverse /impactportal
http://bhlnmgis.knmi.nl:8180/impactportal
    ProxyPreserveHost On
</VirtualHost>
```

Example of a configuration file entry

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4. PURPOSE OF SOFTWARE

The purpose of the EPICIC portal is to provide easy access and guidance to climate model data to science impact users, notably those who need data to run impact models or to produce an analysis for practitioners or stakeholders. The portal provides, besides data and tools, guiding documentation and back ground information on the climate model data provided. The portal is not primarily intended to cover the full spectrum of functionality and requirements that end users of climate information may have.

Capabilities:

- Basic search capabilities, using the faceted search services provided by the ENES Portal
- Advanced search capabilities, using the faceted search services provided by the ENES Portal
- Mapping capabilities, for this the ADAGUC software package is used. ADAGUC implements the OGC WMS and WCS standard
- Plotting capabilities, using OGC WPS standard
- Processing capabilities, for this the OGC WPS standard is used for defining processing services
- Content Management for guiding documentation and back ground information. The Drupal CMS is used.

Benefits expected:

- Better understanding on how to use climate model data for impact modelling
- Improved access to climate model data for climate impact users
- Improved search and visualisation for selecting data
- Easy tailoring of datasets to fit for impact modelling
- Easy to maintain documentation (collaborative interface)
- Easy adding of new datasets (local and/or remote)
- Easy adding of new processing algorithms, notably data aggregation and subsetting which reduces the amount of data transferred to users
- Portal based on OGC standards which will enhance inter-operability and make possible the reuse of the data processing code into other specific impact portals

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5. EXTERNAL VIEW OF THE SOFTWARE

The EPICIC portal is built using the following software packages listed in the table below:

Software package	Version	Comment
Apache web server	2.x	Web server
Tomcat application container	7.x	Runs the EPICIC portal software
EPICIC software package	1.0	Java / java script software providing services like search, download, login
Drupal CMS	7.8	Contains all content (e.g. Documentation, FAQ, Glossary)
Drupal module Custom Breadcrumbs	7.x-1.0-alpha1	Provides breadcrumbs in the pages
Drupal module Lexicon	7.x-1.10	Needed for Glossary and highlighting Glossary terms on the pages
Drupal module Wysiwyg	Unknown	Provides user friendly Drupal interface for editing content
Drupal wysiwyg plugin CKEditor	3.6.3.7474	Javascript What You See Is What You Get Editor plugin for Drupal Wysiwyg editor.
ADAGUC Server and client software	1.1	Provides the WMS/WCS server and WMS/WCS client
THREDDS OpenDAP server	4.3.10	Provides the OpenDAP server
GDAL libraries	1.8.1	Used by the ADAGUC software
OGR libraries	1.8.1	Used by the ADAGUC software
PyWPS	3.2.1	Provides the framework for building WPS services
PostgreSQL database	9.1.x	Used by the ADAGUC software
Globus toolkit	5.2.0	Provides PKI infrastructure
MyProxy server	5.2.0	Provides proxy generation
MYSQL	5.5.x	Used for persistency

Note: the EPICIC portal itself is under version control but releases are not tagged. In the operational phase release will be tagged and release notes.

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6. OPERATIONS ENVIRONMENT

6.1. GENERAL

The EPICIC's main component is the **Impactportal**, a Java web application which runs in a Tomcat 7 application server. The Impactportal handles search requests; OpenID mechanism and connects to the ESG data nodes. The Impactportal embeds the Drupal content management system in its pages and styles these according to its own style sheet. The Impactportal controls the pyWPS server and ADAGUC server and provides extra GUI elements for the pyWPS service. The Impactportal renders the actual pages of the EPICIC portal, by embedding Drupal with custom style sheets and ExtJS GUI elements. In the Impactportal Drupal pages are parsed by a Dom parser, which filters the required parts from the Drupal page. The Impactportal is deployed from a .war file and runs in a Tomcat 7 application server.

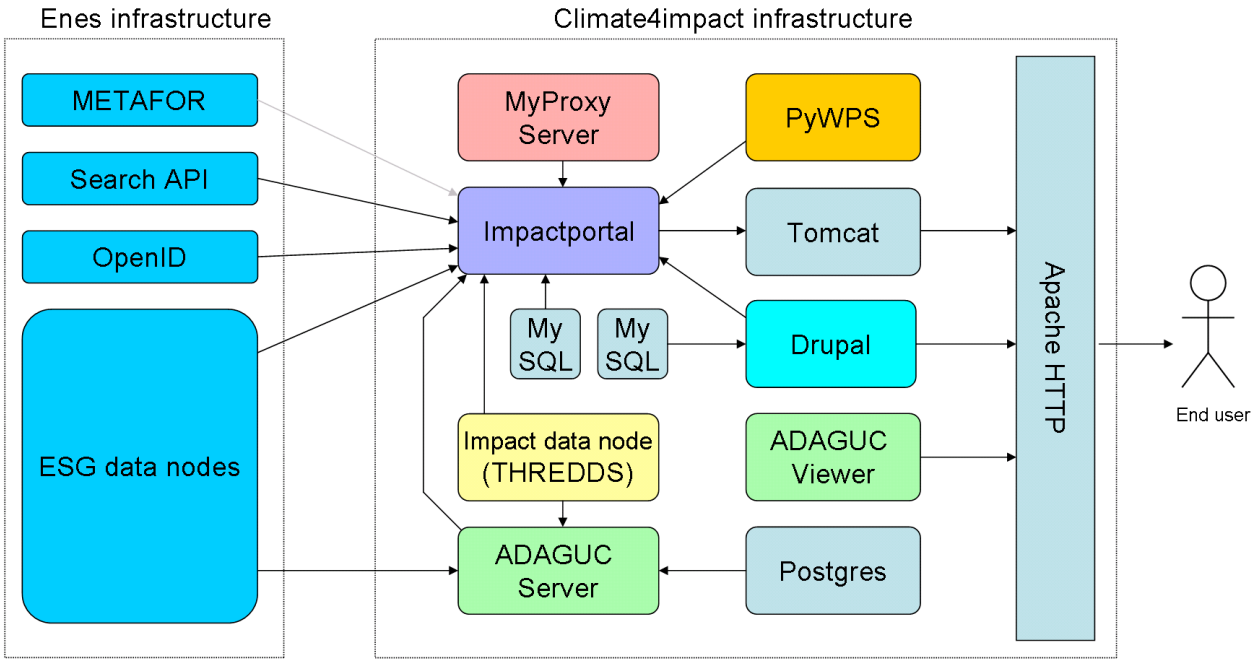

Figure 1 *Operations environment with software components and their connections*

6.1.1. DRUPAL

Drupal is used as a Content Management System within the Impactportal. With Drupal pages can be edited using HTML or by using the CK WYSIWIG editor. As extra modules breadcrumbs and lexicon are installed, the first gives a configurable breadcrumb path and the second highlights keywords in the text and gives a glossary on these keywords.

6.1.2. ADAGUC Server and ADAGUC Viewer

The ADAGUC system is developed for dissemination of scientific raster data with several dimensions like pressure, time and height over the web. Data available through ADAGUC can be displayed with several styles, colours and contouring. Data can be interpolated with nearest neighbour interpolation, bilinear interpolation and shading. Derived parameters like wind barbs can be drawn from wind components.

The ADAGUC system consists of a server and a viewer, which communicate through OGC standards. The ADAGUC Server is a C++ program and the client is a browser application written in JavaScript. The server and the client communicate through the standardized Web Map Service protocol (WMS), specified by the Open Geospatial Consortium (OGC).

The **Open Geospatial Consortium** (OGC) defines many standards for geospatial and location based

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services. The OGC Web Map Service (WMS) is a web service to generate visualizations of geospatial data in the form of 2D images suitable for transfer over the Internet. The OGC Web Coverage Service (WCS) is similar, but is used to transfer geospatial data, instead of visualizations. These standards help to make data more useable and interoperable. These standards basically involve communication over a REST interface using XML files and GIS files.

As mentioned, ADAGUC offers support for the Web Coverage Service protocol, which enables the exchange of geographical referenced data in several GIS formats, like ASCIIGrid, GeoTiff, netCDF3 and netCDF4. The WCS protocol allows for reprojection, subsetting and interpolation of data. ADAGUC makes use of the Geospatial Data Abstraction Layer (GDAL), which allows to output data in 50+ GIS formats.

Data formats that ADAGUC can read

ADAGUC is able to offer WMS and WCS for datasets in the netCDF format, which comply with the Climate and Forecast conventions. Besides netCDF, ADAGUC is also able to serve WMS and WCS on top of the KNMI HDF5 format. ADAGUC can be configured to generate on the fly WMS and WCS services for files on local disk or for files accessible through the OPeNDAP protocol. This enables to visualise any dataset in the ESGF over OpenDAP through WMS.

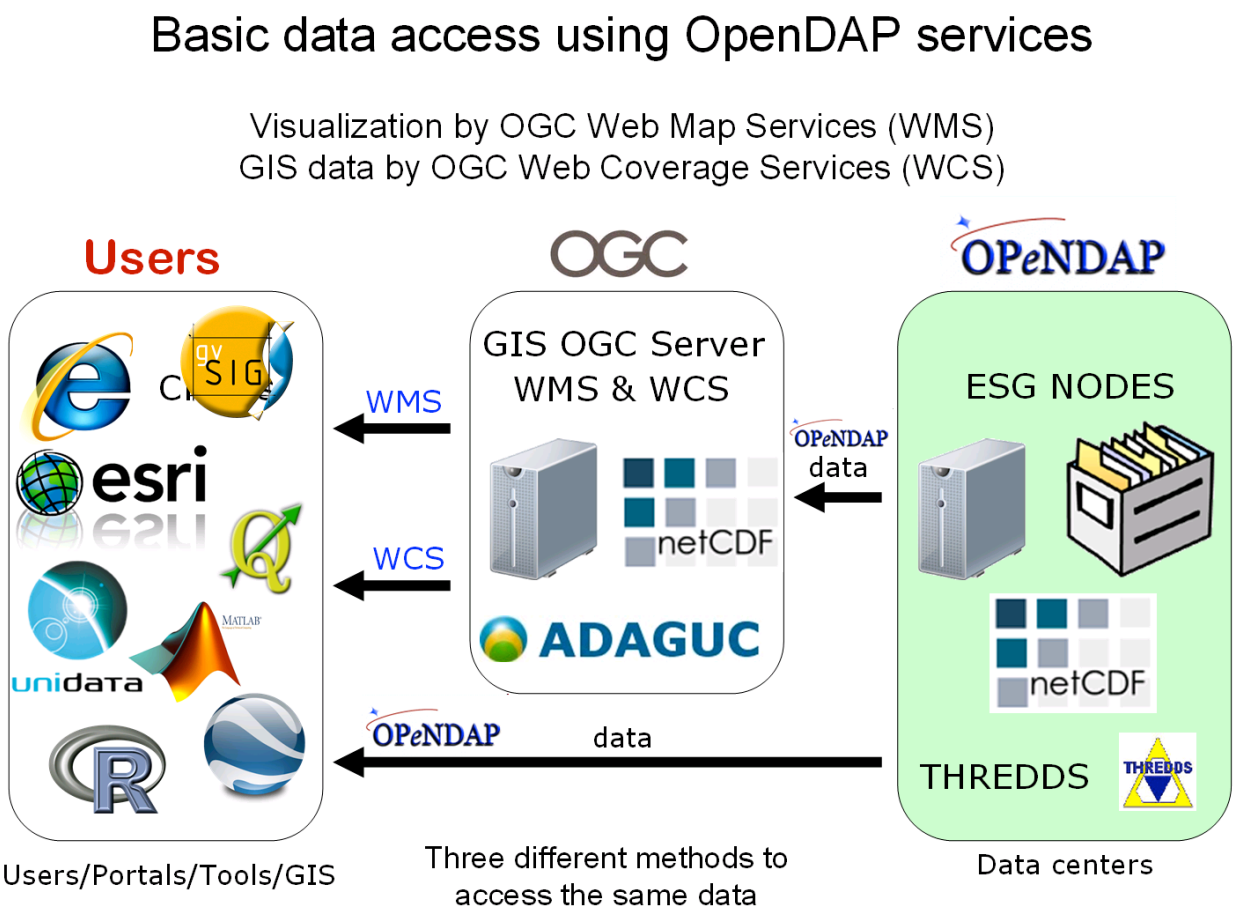

Figure 2 *Basic data access using OpenDAP services, ADAGUC enables data dissemination of data available in OpenDAP through OGC's WMS and WCS protocols.*

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6.1.3. PyWPS

PyWPS is a python environment supporting the implementation of custom processing routines over a standardized OGC Web Processing Service protocol.

6.1.4. MyProxyServer

The MyProxyServer is a server that runs on a trusted, secure host and manages a database of security credentials for use of remote sites on behalf of the user.

MyProxy is open source software for managing X.509 Public Key Infrastructure (PKI) security credentials (certificates and private keys). MyProxy combines an online credential repository with an online certificate authority to allow users to securely obtain credentials when and where needed. Users run myproxy-logon to authenticate and obtain credentials, including trusted CA certificates and Certificate Revocation Lists (CRLs).

The MyProxy CA can be used to issue issues short-lived session credentials to authenticated users. The impactportal uses the MyProxyServer to obtain short-lived session credentials for authenticated users.

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6.2. HARDWARE CONFIGURATION

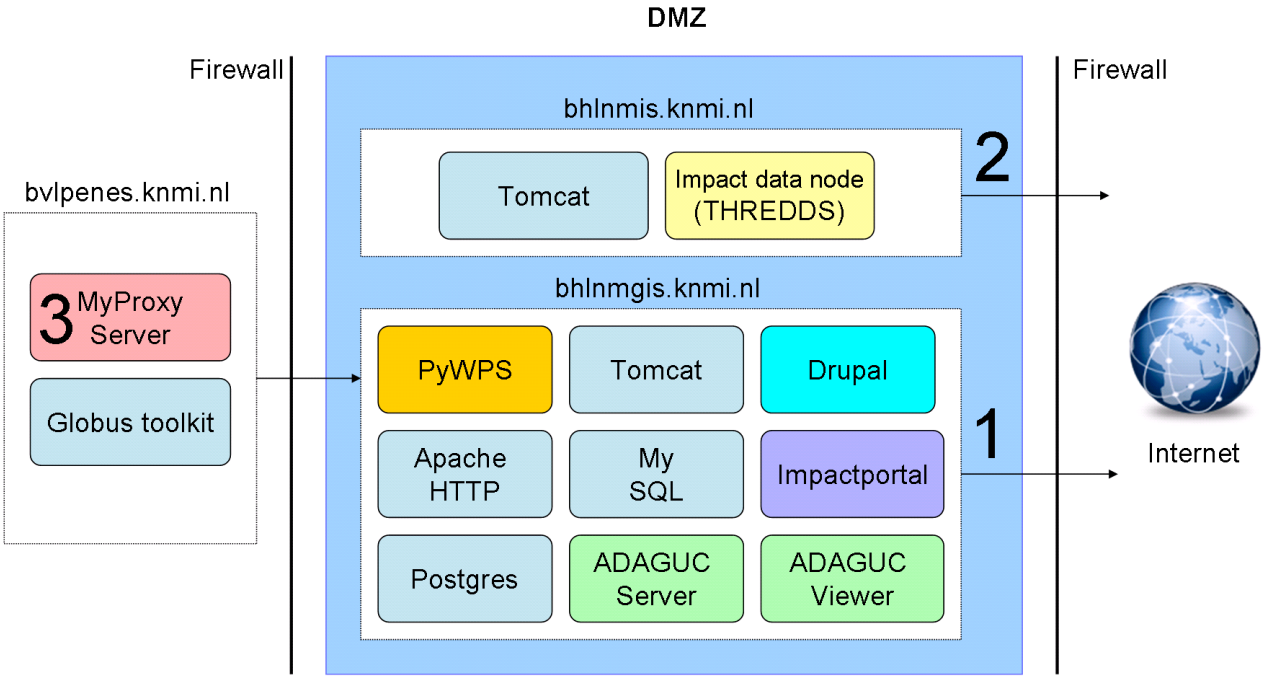

Figure 3 *Hardware environment of the climate4impact portal. The hardware environment consists of three separate servers: 1): the climate4impact application server; 2): the climate4impact custom data node and 3): the myproxyserver.*

The EPICIC's infrastructure consists of 3 separate environments: 1) the main environment in which the impactportal runs (bhlnmgis.knmi.nl); 2) the data node environment in which custom impact data is stored (bhlnmis.knmi.nl); 3) the MyProxyServer environment, which handles the generation of credentials (bvlpenes.knmi.nl).

6.2.1. Impactportal application server

The impactportal server is a standalone blade with 2TB of storage for temporary data and is connected to the Internet via port 80.

6.2.2. Data node server

The data node server is a standalone blade with 8TB of storage, which is used for impact data and is connected to the Internet via port 80.

6.2.3. MyProxy server

The MyProxyServer is a secure virtual machine isolated from the Internet, separated by a firewall from the impactportal. The MyProxyServer is only internally accessible for SSH and MyProxyClients to ensure isolation from the outside.

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6.3. SOFTWARE CONFIGURATION

The software versions are described in chapter 5 and will be updated when new versions are put in operation. This chapter describes the software configuration as deployed early 2013. These configurations are for illustration and are not updated. Please check chapter 5 and the document change table for the latest information on version changes.

6.3.1. Apache Tomcat

Apache tomcat runs as local user visadm. Tomcat is started by a crontab script, which checks every minute whether apache is running or not. Apache tomcat is deployed under default settings, but under non-standard port 8180.

6.3.2. Apache HTTP

Apache HTTP runs as user apache. Apache HTTP is started by the system on boot. Apache HTTP server is running under port 80. A proxy from apache tomcat to apache http is configured with name impactportal pointing to the impactportal web application under apache tomcat.

```
<VirtualHost *>
    ServerAdmin webmaster@localhost
    ServerName climate4impact.knmi.nl
    ServerAlias climate4impact.eu www.climate4impact.eu
    DocumentRoot /data/web/climate4impact
    ProxyPass /impactportal http://bhlnmgis.knmi.nl:8180/impactportal
timeout=120
    ProxyPassReverse /impactportal
http://bhlnmgis.knmi.nl:8180/impactportal
    ProxyPreserveHost On
</VirtualHost>
```

6.3.3. MySQL

Two mysql databases are used, one for Drupal and one for the impactportal web application.

Drupal MySQL database settings:

```
Host: localhost
Database name: drupaldb
Database username: drupal
Password: *
```

Impactportal MySQL database settings:

```
Host: localhost
Database name: impact
Database username: impact
Password: *
```

6.3.4. PostgreSQL

PostgreSQL is running under local user visadm. PostgreSQL is started automatically by a crontab script,

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which checks every minute whether PostgreSQL is running. PostgreSQL is used by ADAGUC for storing temporary information about OpenDAP data resources.

PostgreSQL settings for ADAGUC server:

```
Host: localhost
Database name: ENES_ADAGUCSERVER
Database username: visadm
Password: none
```

6.3.5. MyProxyServer

Myproxyserver is installed from repository by installing the Globus Toolkit. A MyProxy extension specially designed for ESG by JRA4 (Philip Kershaw) needs to be compiled afterwards. Detailed instructions for installation on a similar system can be found in Appendix B.

MyProxy configuration file (/etc/myproxy-server.config)

```
# Default policy written by myproxy-server-setup.
accepted_credentials  "*"
authorized_retrievers "*"
default_retrievers    "*"
authorized_renewers   "*"
default_renewers      "none"
authorized_key_retrievers "*"
default_key_retrievers    "none"
trusted_retrievers    "*"
default_trusted_retrievers "none"
cert_dir /etc/grid-security/certificates
pam required
pam_id "myproxy-credential-translation"
certificate_issuer_cert /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/cacert.pem
certificate_issuer_key /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/private/cakey.pem
certificate_issuer_key_passphrase "*********"
certificate_serialfile /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/serial
certificate_out_dir /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/newcerts
certificate_mapapp "/etc/grid-security/certificate_map_app.sh"
```

6.3.6. Drupal

Drupal is installed according to the instructions found here:

http://drupal.org/documentation/install

Drupal has been extended with two modules:

- Custom breadcrumbs 7.x-1.0-alpha1
- Lexicon 7.x-1.10
- WYSIWYG CKEditor version 3.6.3.7474

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Chapter 10 contains a short tutorial on how to create climate4impact pages.

6.3.7. ADAGUC Server

ADAGUC requires the presence of the following software packages:

```
- gcc
- gcc-c++
- libpng-devel
- zlib-devel
- libxml2-devel
- gd-devel
- netcdf-devel
- hdf5-devel
- proj-devel
- postgresql-devel
- udunits2-devel
- gdal-devel
- cairo-devel
- httpd
- postgresql-server
```

Afterwards ADAGUC can be compiled from source according to the provided instructions described in the file INSTALL.

6.3.8. ADAGUC Viewer

ADAGUC viewer requires Apache HTTP Server with PHP 5.2 or higher. In the document root the following JavaScript libraries need to be available:

```
- ext-3.4.0
- proj4js.
```

ADAGUC viewer is placed inside the documentroot of apache. When the provided instructions in the file INSTALL are followed, the ADAGUC viewer is ready for use.

6.3.9. PyWPS

PyWPS is installed according to the installation instructions found on:

http://pywps.wald.intevation.org/documentation/installation.html

6.3.10. Impactportal

Installation

The impactportal is deployed by the following steps:

- 1) Shutdown tomcat
- 2) Clean the tomcat webapps directory (rm –rf *)
- 3) Copy impactportal.war to the tomcat webapps directory
- 4) Start tomcat

Configuration

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The impactportal configuration file is located at:

~/impactportal/config.xml

```
<?xml version="1.0" encoding="UTF-8" ?>
<impactportal>
  <drupalconfig>
    <drupalhost>http://webgis.nmdc.eu/</drupalhost>
    <drupalbaseurl>is-enes/</drupalbaseurl>
    <drupaldirectory>drupal-7.8/</drupaldirectory>
  </drupalconfig>
  <searchconfig>

<vercsearchurl>http://verc.enes.org/myapp/cmip5/ws/rest/</vercsearchurl>
    <esgfsearchurl>http://esg-datanode.jpl.nasa.gov/esg-
search/search?</esgfsearchurl>
  </searchconfig>

  <impactworkspace>/home/visadm/impactspace</impactworkspace>

  <loginconfig>

    <myproxyserverhost>bvlpenes.knmi.nl</myproxyserverhost>
    <myproxyserverport>7512</myproxyserverport>
  </loginconfig>
  <expertcontact>

<mailaddresses>christian.page@cerfacs.fr,plieger@knmi.nl,sdecerff@knmi.n
l,fokke.dejong@wur.nl</mailaddresses>
  </expertcontact>
</impactportal>
```

6.4. OPERATIONAL CONSTRAINTS

Omitted for the prototype version.

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7. OPERATIONS BASICS

7.1. ROLES AND RESPONSIBILITIES

The EPICIC will run at KNMI. Therefore KNMI standard operational roles and procedures will be followed. KNMI is ISO 9001 certified.

The table below describes the role and responsibilities for EPICIC operations:

Role	Responsibility	KNMI dept.
ICT maintenance	Configuration, maintenance and operations of the hardware and Operating System the EPICIC is running on. Also responsible for OS standard services (such as Tomcat, Apache, PostgreSQL).	KNMI-ICT
Operational management (1st and 2nd line support)	Responsible for installation, configuration and monitoring of the EPICIC portal functionality. Providing feedback on basic questions from users or redirecting questions to experts.	KNMI-IRD*
Application management (3rd line support)	Responsible for bug fixing, planning and developing of new releases.	KNMI-IRD
Climate Specialist	Responsible for answering questions from users regarding climate model data or bringing the user in contact with a local specialist.	CERFACS SMHI

*will be KNMI-ID in operational phase

7.2. ERROR REPORTING, BUG FIXING, NEW RELEASES

For error reporting and bugtracking the Redmine system will be used. It is accessible for partners outside KNMI via:

http://dev.knmi.nl/projects/climate4impact

After registration access can be provided and errors can be reported to the developers. Issues put in Redmine involving ICT maintenance will be put into the KNMI internal Topdesk tracking system by Operational Management.

Redmine is also the access point to the climate4impact software repository. New releases will be made available here.

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8. OPERATIONS MANUAL

8.1. GENERAL

Note: the current version of the EPICIC portal is a prototype. This section describes how to setup, install and operate the prototype. When the operational version becomes available, these chapters need to be refined and extended.

8.2. SET-UP AND INITIALISATION

- Start MySQL
- Start PostgreSQL
- Start tomcat
- Start Apache HTTP

Note: these are normally automatically started by the Operating System (init.d)

See chapter 6 for installation and configuration details.

8.3. GETTING STARTED

N/A for prototype version

8.4. MODE AND SELECTION CONTROL

N/A for prototype version

8.5. NORMAL OPERATIONS

N/A for prototype version

8.6. NORMAL TERMINATION

N/A for prototype version

8.7. ERROR CONDITIONS

N/A for prototype version

8.8. RECOVER RUNS

N/A

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9. REFERENCE MANUAL

These chapters will be filled when the EPICIC is further developed from prototype to operational version.

9.1. INTRODUCTION

9.2. HELP METHOD

9.3. SCREEN DEFINITIONS AND OPERATIONS

9.4. COMMANDS AND OPERATIONS

9.5. ERROR MESSAGES

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10. TUTORIAL

These chapters will be filled when the EPICIC is further developed from prototype to operational version.

10.1. USING DRUPAL CMS TO ADD A PAGE TO THE PORTAL

First you need to visit the portal by going to the following link:

```
http://climate4impact.eu/impactportal/documentation/backgroundandtopics.jsp
```

On the bottom left of that page you will see the edit icon. If you click this link, the Drupal Content Management System will open, in which you can login. By using the link "Request new password" you can get a password for your account.

You can add content by clicking on the tab "Content"->"Add content"->"Basic page".

By default a WYSIWYG editor appears showing a preview of how the content will appear on the site. If you do not like WYSIWYG you can change the text format to "Full HTML" and edit the html manually. To start editing, we use an extra style, which limits the maximum width of the text. This style is named "textstandardleft". You should use this style too, so all pages will look the same.

In Full HTML your page will have to look like this:

```
<div class="textstandardleft">
<... Your Content ...>
</div>
```

In the WYSIWIG editor you can do this by clicking on the "Create div container" icon in the toolbar. In the textbox named Stylesheet Classes you can put the name textstandardleft.

You are now ready to start editing the body content and title.

Peculiarities of WYSIWYG editor

The WYSIWIG editor is a useful tool, but you should be warned when switching between plain HTML code and the WYSIWYG editor. Be carefull swiching from HTML to Wysiwyg as this can destroy certain markup.

- Line breaks are removed in the HTML code, reducing human readability
- Hyperlinks to a combination of text and images are not possible, the WYSISIG editor only allows hyperlinks on text *or* images, but not both. The frontpage of the climate4impactportal consists of a table with images and text. When editing this page with the Wysiwyg editors the lhyperlinkgs on the images are destroyed.

Saving and naming the page

When you have saved your page, it has a default name like ?q=node/12. We like to link to our page using an identifier or alias; you can accomplish this by setting an alias in the URL path settings of that page. The page will now be available under the name you have given it, like for example `?q=scenarios`. On the climate4impactportal you can access this page by adding a ?q=<name> to the end of a page. The page can be accessed from several places in the climate4impact portal, for example:

1. http://climate4impact.eu/impactportal/documentation/backgroundandtopics.jsp?q=scenarios
2. http://climate4impact.eu/impactportal/general/about.jsp?q=scenarios
3. http://climate4impact.eu/impactportal/help/faq.jsp?q=scenarios

You can link to your created page from where you like and where you want.

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Adding images

You can upload images by clicking on "Add a new file". The images will become accessible under /files/<...yourimagename.jpg...> from everywhere. You should not give absolute paths to the images, as this will make migration to another domain names more complex.

Bread crumb path and menu settings

If you like to have a breadcrumb path in your page, you can enable this by going in your page to "Menu settings", enable Provide a menu link", add a menu link title and choose a parent item. This can for example be "Guidance and Use cases". A breadcrumb path on top of your page will appear.

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11. ANALYTICAL INDEX

This chapter will be filled when the EPICIC is further developed from prototype to operational version.

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APPENDIX A : ACRONYMS AND ABBREVIATIONS

Acronym	
ASCIIGrid	ASCII Grid format is a good means of distributing raster image data files: it is an ASCII format so it is both human readable and hardware independent.
GDAL	Geospatial Data Abstraction Layer
GeoTIFF	GIS format for storing and distributing raster image files.
GIS	Geographical Information System
NetCDF	Network common data format
OGC	Open Geospatial Consortium
OPeNDAP	Open-source Project for a Network Data Access Protocol
PNG	Portable Network Graphic
WCS	Web Coverage Service
WMS	Web Map Service

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INSTALLATION OF MYPROXYSERVER

```
##########################################################################
########################
# Manual to install and configure MyProxyServer on a Scientific Linux or
RedHat 6 machine.
#
# MyProxyServer will be configured with a Pluggable Authenication Module
(PAM) to create credentials
# with predefined password for any username.
# This is achieved with the PAM extension pam_credential_translation
written by P. Kershaw
#
# (Author: Maarten Plieger, KNMI)
##########################################################################
########################

#Installation instructions on scientific linux 6.1 (or RH 6).

####################### As user root ######################
  yum update
  yum install gcc
  yum install openssl-devel
  yum install libtool
  yum groupinstall 'Development Tools'
  yum install libtool-ltdl-devel
  yum install pam-devel

  #install perl modules:
  cpan -i Archive::Tar
  cpan -i IO::Zlib
  cpan -i Package::Constants

  #Add user globus
  groupadd globus
  adduser -g globus globus
  passwd globus
  >(globus)

  #Create directories
  mkdir /usr/local/globus-5.2.0
  chown globus:globus /usr/local/globus-5.2.0

  mkdir /etc/grid-security
  mkdir /etc/grid-security/certificates

  #Set hostname bvmlab-218-21.knmi.nl in
  vi /etc/sysconfig/network
  vi /etc/hosts #145.23.218.21 bvmlab-218-21.knmi.nl
  hostname  bvmlab-218-21.knmi.nl
  etc/init.d/network restart
```


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```
  ### INSTALL PAM MODULE ###
  svn checkout http://proj.badc.rl.ac.uk/svn/ndg-
security/trunk/MashMyData/pam_credential_translation
  cd pam_credential_translation

  #Adjust pam_credential_translation.c with
  PAM_EXTERN int pam_sm_acct_mgmt(pam_handle_t *pamh, int flags, int
argc, const char **argv){
    return PAM_SUCCESS ;
  }
  make
  #Copy the pam_credential_translation.so file to /lib64/security/ (root
privileges required)

  ### Set Firewall as root, open port 7512 in the firewall: ###
  vi /etc/sysconfig/iptables
  #ADD: -A INPUT -m state --state NEW -m tcp -p tcp --dport 7512 -j
ACCEPT

  /etc/init.d/iptables restart

######################## As user globus ########################
#INSTALL Globus toolkit and MyProxyServer
  #Get gt5.2.0-all-source-installer.tar.gz
  export GLOBUS_LOCATION=/usr/local/globus-5.2.0/
  tar -xzvf gt5.2.0-all-source-installer.tar.gz
  cd gt5.2.0-all-source-installer
  ./configure
  make
  make install
  make gsi-myproxy
  make install

  export GLOBUS_LOCATION=/usr/local/globus-5.2.0/
  . $GLOBUS_LOCATION/etc/globus-user-env.sh

  ### Install SimpleCA ###
  export GLOBUS_LOCATION=/usr/local/globus-5.2.0/
  . $GLOBUS_LOCATION/etc/globus-user-env.sh

  #Create local grid security directories
  mkdir ${sysconfdir}/grid-security/
  mkdir ${sysconfdir}/grid-security/certificates

  #There is a bug in myproxy-server-setup, it is pointing to the wrong
location, can be fixed by:
  mkdir  /usr/local/globus-5.2.0//libexec/
  cp  /usr/local/globus-5.2.0/share/globus/globus-script-initializer
/usr/local/globus-5.2.0//libexec/
```


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```
  grid-ca-create -subject "cn=Globus Simple CA, ou=simpleCA-bvmlab-218-
21.knmi.nl, ou=GlobusTest, o=Grid" -email "plieger@knmi.nl" -days 1825 -
pass globus_install -force

### AS ROOT: request grid certificate ###
  mkdir /etc/grid-security
  mkdir /etc/grid-security/certificates

  #Copy certificates to root grid security directory
  cp /usr/local/globus-5.2.0/etc/grid-security/certificates/globus-user-
ssl.conf.* /etc/grid-security/globus-user-ssl.conf
  cp /usr/local/globus-5.2.0/etc/grid-security/certificates/globus-host-
ssl.conf.* /etc/grid-security/globus-host-ssl.conf
  cp /usr/local/globus-5.2.0/etc/grid-security/certificates/grid-
security.conf.* /etc/grid-security/grid-security.conf
  cp /usr/local/globus-5.2.0/etc/grid-security/certificates/* /etc/grid-
security/certificates

  #Request host certificate
  grid-cert-request -host 'bvmlab-218-21.knmi.nl'

  #Copy it to a place readable for user globus
  cp /etc/grid-security/hostcert_request.pem /usr/local/globus-
5.2.0/etc/hostcert_request.pem

### AS GLOBUS: sign the certificate ###
  grid-ca-sign -in /usr/local/globus-5.2.0/etc/hostcert_request.pem -out
/usr/local/globus-5.2.0/etc/hostsigned.pem

### AS ROOT: install the signed certificate ###
  cp /usr/local/globus-5.2.0/etc/hostsigned.pem /etc/grid-
security/hostcert.pem
  chown root:root /etc/grid-security/hostcert.pem
  chmod 644 /etc/grid-security/hostcert.pem

  myproxy-server-setup
  #If everything is allright, kill the proxy server and configure it

### Create the myproxy server configuration file ###
  accepted_credentials  "*"
  authorized_retrievers "*"
  default_retrievers    "*"
  authorized_renewers   "*"
  default_renewers      "none"
  authorized_key_retrievers "*"
  default_key_retrievers    "none"
  trusted_retrievers    "*"
  default_trusted_retrievers "none"
  cert_dir /etc/grid-security/certificates
  pam required
  pam_id "myproxy-credential-translation"
  certificate_issuer_cert /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/cacert.pem
```


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```
  certificate_issuer_key /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/private/cakey.pem
  certificate_issuer_key_passphrase "globus_install"
  certificate_serialfile /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/serial
  certificate_out_dir /usr/local/globus-
5.2.0/var/lib/globus/simple_ca/newcerts
  certificate_mapapp "/etc/grid-security/certificate_map_app.sh"
  #Store this in: /etc/myproxy-server.config

### Create certificate map application, which generates the new user
id's ###
  #!/bin/sh
  echo "certificate_map_app called: /O=Grid/OU=GlobusTest/OU=simpleCA-
bvmlab-218-21.knmi.nl/OU=local/CN=$1" >>
/var/log/pam_credential_translation.log
  echo "/O=Grid/OU=GlobusTest/OU=simpleCA-bvmlab-218-
21.knmi.nl/OU=local/CN=$1"
  #And store this in /etc/grid-security/certificate_map_app.sh

### Create myproxy-credential-translation configuration file ###
  auth required pam_credential_translation.so
sha256passwd=2bb80d537b1da3e38bd30361aa855686bde0eacd7162fef6a25fe97bf52
7a25b
  account  required pam_credential_translation.so
sha256passwd=2bb80d537b1da3e38bd30361aa855686bde0eacd7162fef6a25fe97bf52
7a25b
  #Store this in /etc/pam.d/

### TESTING on a client machine ###
  myproxy-get-trustroots -s bvmlab-218-21.knmi.nl
  myproxy-logon -s bvmlab-218-21.knmi.nl
```


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