

Software Specification for the 3rdE2SCMS Deliverable D3.3



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About this document

Work package in charge: WP3 Usability

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Dissemination level: PU

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1. Abstract /publishable summary

Narrowed down the “Application Software Framework: A White Paper” to the software specification for the 3rdE2SCMS.

2. Conclusion & Results

The main result of the deliverable is the publication of the first version of the software specification for the 3rdE2SCMS. This list can be found as an attachment here, and will be published on the www.esiwace.eu website, as a living document.

3. Project objectives

This deliverable contributes directly and indirectly to the achievement of all the macro-objectives and specific goals indicated in section 1.1 of the Description of the Action:

Macro-objectives	Contribution of this deliverable?
Improve the efficiency and productivity of numerical weather and climate simulation on high-performance computing platforms	No
Support the end-to-end workflow of global Earth system modelling for weather and climate simulation in high performance computing environments	Yes
The European weather and climate science community will drive the governance structure that defines the services to be provided by ESIWACE	No
Foster the interaction between industry and the weather and climate community on the exploitation of high-end computing systems, application codes and services.	No
Increase competitiveness and growth of the European HPC industry	No

Specific goals in the workplan	Contribution of this deliverable?
Provide services to the user community that will impact beyond the lifetime of the project.	Yes
Improve scalability and shorten the time-to-solution for climate and operational weather forecasts at increased resolution and complexity to be run on future extreme-scale HPC systems.	No
Foster usability of the available tools, software, computing and data handling infrastructures.	Yes
Pursue exploitability of climate and weather model results.	No
Establish governance of common software management to avoid unnecessary and redundant development and to deliver the best available solutions to the user community.	Yes
Provide open access to research results and open source software at international level.	Yes
Exploit synergies with other relevant activities and projects and also with the global weather and climate community	Yes

4. Detailed report on the deliverable

Converted the recommendations into a contribution for a real life ESiWACE environment.

5. References (*Bibliography*)

References can be found in the software specification.

6. Dissemination and uptake

6.1 Dissemination

Not applicable.

6.2 Uptake by the targeted audience

As indicated in the Description of the Action, the audience for this deliverable is (*mark with an X here below*):

X	The general public (PU)
	The project partners, including the Commission services (PP)
	A group specified by the consortium, including the Commission services (RE)
	This reports is confidential, only for members of the consortium, including the Commission services (CO)

We intend to ensure the uptake of this list by using all the dissemination channels existing for ENES. A more detailed plan will be made part of the deliverable D3.2 and D3.8.

7. The delivery is delayed: Yes No

This is due to the employment procedures and the delayed start of the project.

8. Changes made and/or difficulties encountered, if any

The project was rescheduled to an earlier starting date. The summer school organizers decided to have the school already in June 2016 – instead of September as originally planned. Recruitment of appropriate staff took longer than expected.

9. Efforts for this deliverable

Person-months spent on this deliverable:

Beneficiary	Person-months	Period covered	Names of scientists involved, including third parties (if appropriate) and their gender (f/m)
DKRZ			
ECMWF			
CNRS-IPSL			
MPG	0.5	1 September 2015-today	S. Kosukhin (m)
CERFACS			
BSC	0.3	September 2015-today	K. Serradell (m), O. Mulla-Valls (m)
STFC	0.3	1 September	G. Lister (m)

		2015-today	
MET O			
UREAD			
SMHI			
ICHEC			
CMCC			
DWD			
SEAGATE			
BULL			
ALLINEA			
Total	1.1		

10. Sustainability

10.1. Lessons learnt: both positive and negative that can be drawn from the experiences of the work to date

Very cooperative mood between the centres, quite clear setting for the goals, and good understanding for the usefulness of the approach.

10.2 Links built with other deliverables, WPs, and synergies created with other projects

Deliverable D3.1 was taken as a basic version.

11. Dissemination activities

Peer-review articles

Not applicable.

Intellectual property rights resulting from this deliverable

Not applicable.

Annex -Application Software Specification 3rdE2SCMS (Status 24 March 2016)

Mandatory software

- GNU Make, version 3.81 or higher
<https://www.gnu.org/software/make/>
- Unidata NetCDF library, version 3 or higher
<http://www.unidata.ucar.edu/software/netcdf/>
- Unidata NetCDF-Fortran library, version 4.2 or higher
<http://www.unidata.ucar.edu/software/netcdf/>
- HDF5 szip library, version 2.1 or higher
https://www.hdfgroup.org/doc_resource/SZIP/
- Zlib, version 1.2.3 or higher
<http://www.zlib.net/>
- MPI library (available implementation)
<http://www.mpi-forum.org/docs/>
- C/C++ compiler (available implementation)
<https://isocpp.org/>
- Fortran compiler (available implementation)
<http://www.j3-fortran.org/>

Recommended software

- GNU Bash, version 4.1.2 or higher
<https://www.gnu.org/software/bash/>
- Apache Subversion, version 1.6.11 or higher
<https://subversion.apache.org/>
- Environment Modules, version 3.2.10 or higher
<http://modules.sourceforge.net/>
- Climate data operators (CDO), version 1.7.1 or higher
<https://code.zmaw.de/projects/cdo>
 - ECMWF GRIB API, version 1.12 or higher (**optional**)
<https://software.ecmwf.int/wiki/display/GRIB>
 - HDF5 szip library, version 2.1 or higher (**optional**)
https://www.hdfgroup.org/doc_resource/SZIP/
 - PROJ.4 library, version 4.6 or higher (**optional**)
<https://trac.osgeo.org/proj/>
 - Magics library, version 2.18 or higher (**optional**)
<https://software.ecmwf.int/wiki/display/MAGP/Magics>
- CDFTOOLS
<http://servforge.legi.grenoble-inp.fr/projects/CDFTOOLS>

Nice to have

- Python
<https://www.python.org/>
- NCL
<https://www.ncl.ucar.edu/>
- NCO
<http://nco.sourceforge.net/>
- R
<https://www.r-project.org/>
- GrADS
<http://cola.gmu.edu/grads/grads.php>

Earth system models

- EC-EARTH
<http://www.ec-earth.org/https://www.gnu.org/software/make/>
- MPI-ESM
<http://www.mpimet.mpg.de/en/science/models/mpi-esm.html>
- HadGEM2
<http://www.metoffice.gov.uk/research/modelling-systems/unified-model/climate-models/hadgem2>
- CMCC-CESM
<http://www.cmcc.it/models>
- CNRM-CM5
<http://www.cnrm-game-meteo.fr/spip.php?rubrique235&lang=en>
- IPSL-CM5
<http://icmc.ipsl.fr/>
- NorESM
<http://folk.uib.no/ngfhd/EarthClim/index.htm>