

OASIS Dedicated User Support



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Coupling Workshop NCAR
February 20-22, 2013

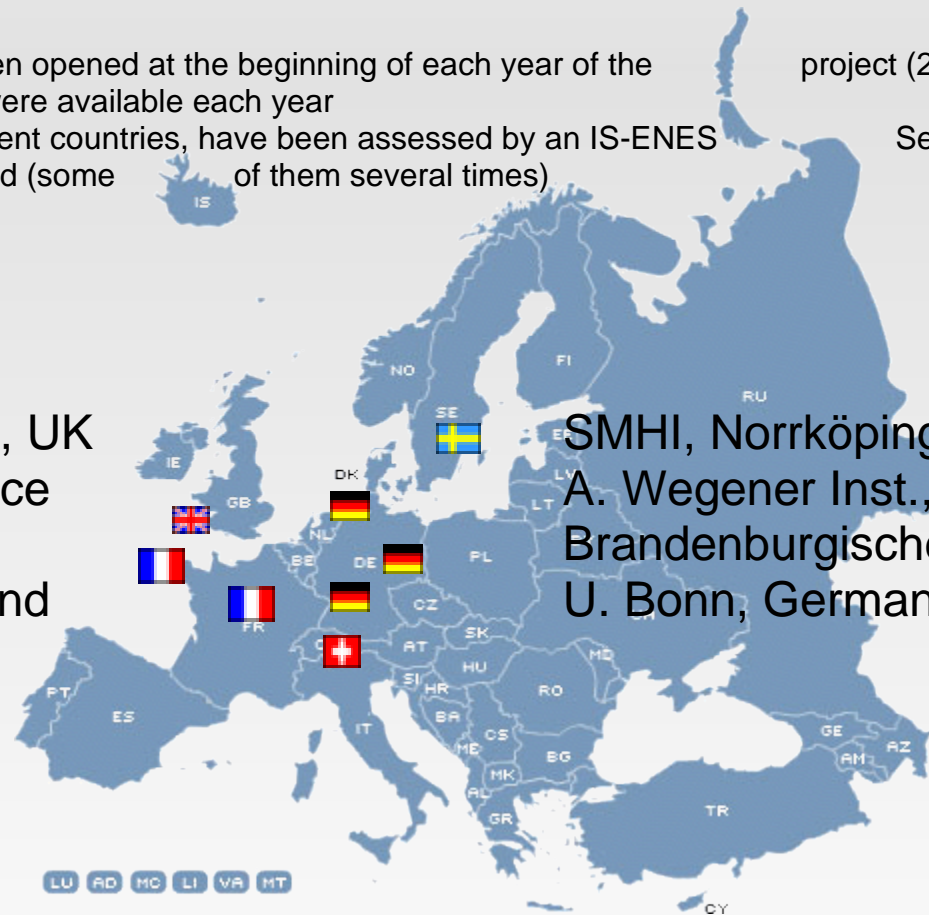


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Description

- Calls for applicants have been opened at the beginning of each year of the project (2009-2012)
- A total of 3 person-months were available each year
- 31 applications, from 8 different countries, have been assessed by an IS-ENES Selection Committee
- 8 laboratories were supported (some of them several times)

The Met Office, Exeter, UK
IFREMER, Brest, France
IPSL, Paris, France
ETH, Zürich, Switzerland



SMHI, Norrköping, Sweden
A. Wegener Inst., Bremerhaven, Germany
Brandenburgische Tech. U., Cottbus, Germany
U. Bonn, Germany



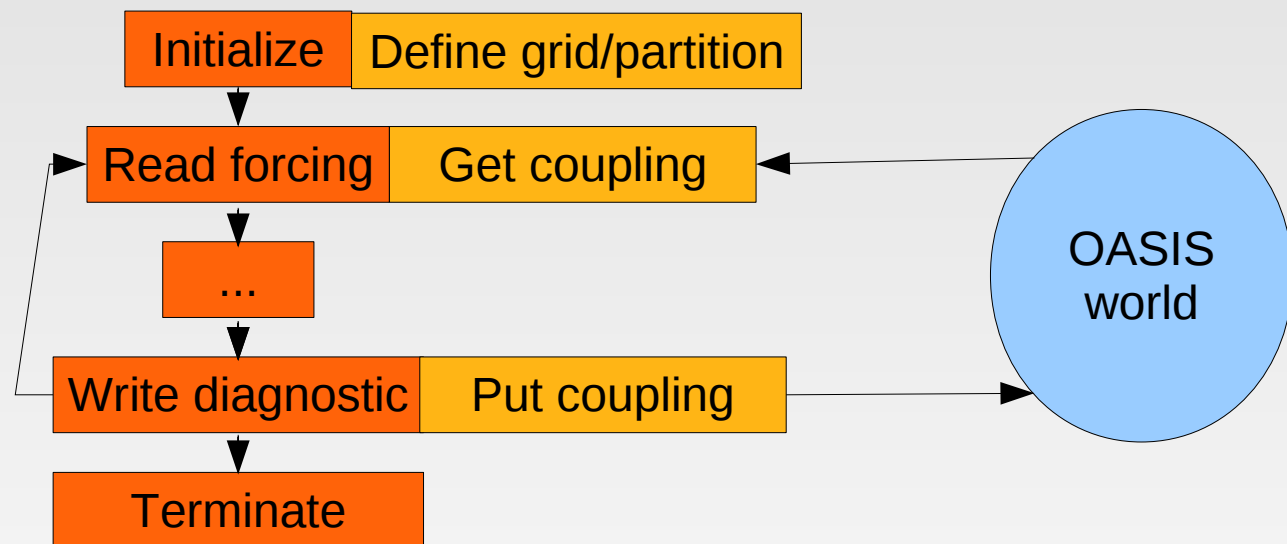
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Description

- Design new interfaces in models



- Improve performances of existing configurations



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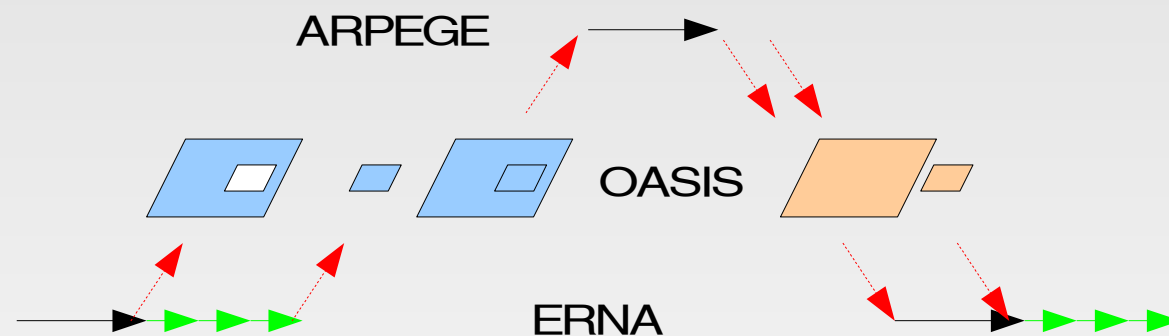


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Coupling interface design

OASIS3.3 coupling between global atmosphere and 2 different ocean grids:

- Global
- Regional AGRIF zoom over Atlantic Ocean (ERNA configuration)



Main results

- Interpolation mask designed to avoid artificial gradients at child/parent grids limit
- Evaluation of what can be done by OASIS, what must be defined by the user

Location

IFREMER, Brest, Breizh

Models

ARPEGE (global atmosphere)
NEMO (global ocean) +
zoom North Atlantic

Resolution

400 to 50Km stretched grid
1/2 degree +
1/8 degrees zoom

Computing

o(10) cores
IBM Power 6, IDRIS, CNRS



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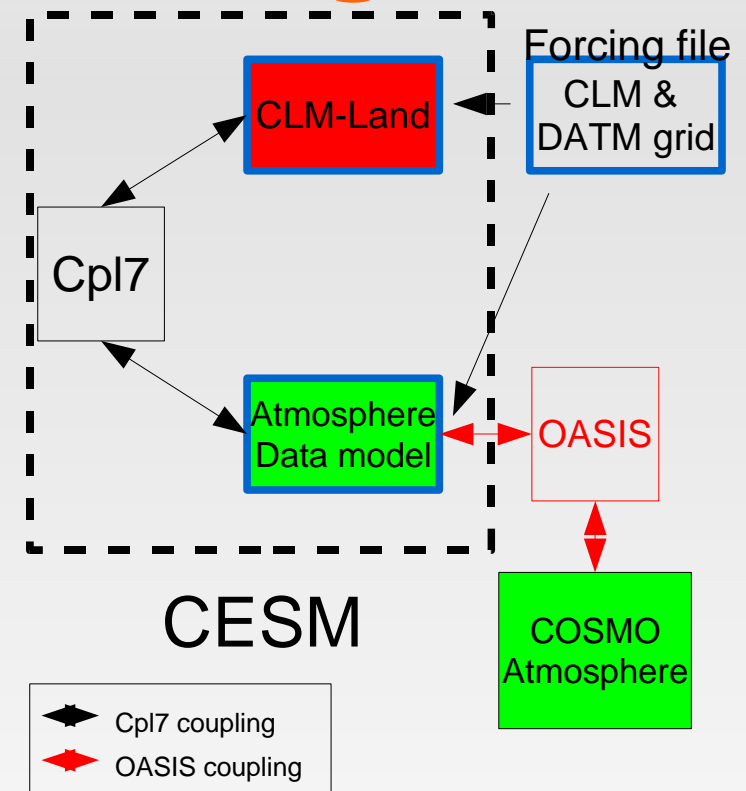
Coupling interface design

OASIS3.3 coupling between two regional grid

- At each time step
- On different grids with different extensions
- Through CPL7 (between CLM and DATM) and OASIS (DATM and COSMO)

Main results

- Efficiency (same performances than initial per-subroutine call to native TERRA land model)
- Modularity: COSMO interface with NEMO ocean implemented by DWD/Frankfurt U., with Parflow hydrology by TR32/Bonn U.



Location

ETH, Zürich, Switzerland

Models

COSMO (regional atmosphere)
CESM-CLM (land)

Resolution

40Km

Computing

o(10) cores
CRAY XT5, CSCS



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InfraStructure for the European
Network
for Earth
System
Modelling
is-enes

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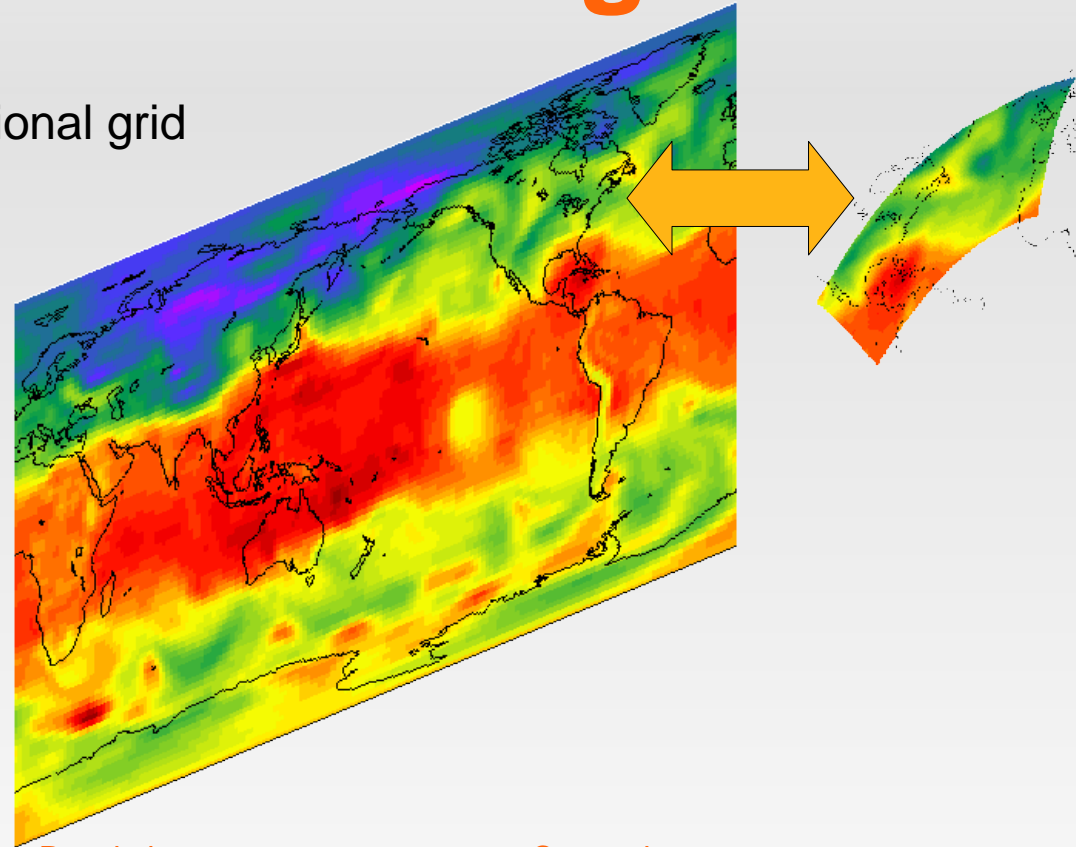
Coupling interface design

OASIS3-MCT coupling between global & regional grid

- with 6 47-levels 3D fields (2 way nesting)
- at each ECHAM time step
- includes ECHAM-MPI-OM (ocean) coupling

Main results

- Efficiency: few % coupling overcost (t.b.i.)
- Modularity: can be coupled with Zürich configuration (COSMO-CLM community)



Location

BTU, Cottbus, Brandenburg

Models

COSMO (regional atmosphere)
ECHAM (global atmosphere)

Resolution

60Km
200Km

Computing

o(10) cores
IBM Power 6, DKRZ



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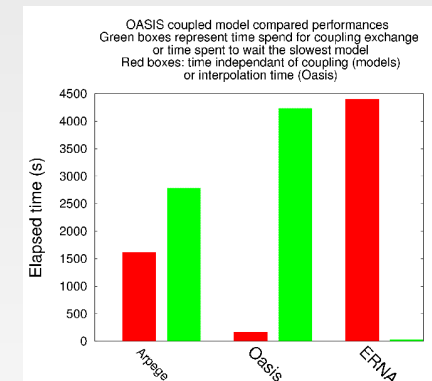
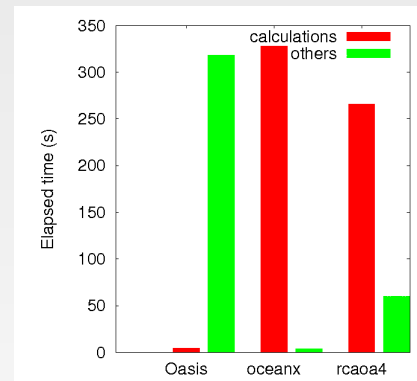
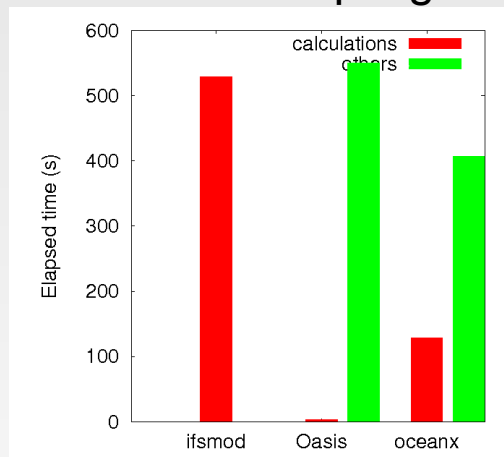


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Improve performances

How to measure relative performances of each component when they are running in parallel ?

- Development of a specific tool (“lucia”) to evaluate load balancing between models
- Measure of OASIS performances at the same time (interpolation/communications)
- Tests on almost all coupling interfaces already set up



Location

SMHI, Norrköping, Östgöta

Models

IFS (global atmosphere)
NEMO (global ocean)
EC-Earth configuration

Resolution

25Km
40Km

Computing

o(1000) cores
AMD Opteron cluster, KTH



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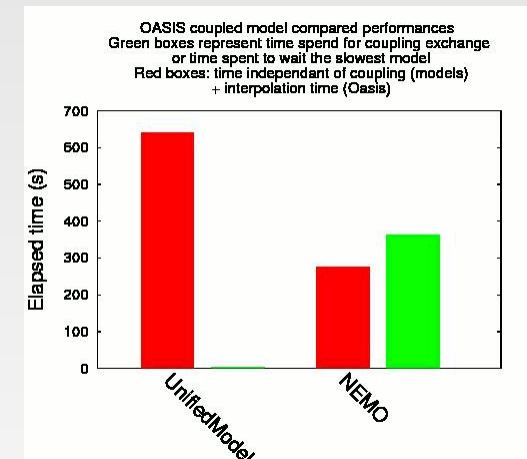


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Improve performances

OASIS3-MCT performances on Met Office high resolution model

- Check coupled model reproducibility (UM and NEMO and OASIS3-MCT)
- Coupling cost 6 times less than OASIS3.3
- Load balancing improved thanks to “lucia” tool (adapted to OASIS3-MCT)



Location

Met Office, Exeter, Devon

Models

Unified Model (global atmosphere)
NEMO (global ocean)

Resolution

25Km
25Km

Computing

o(1000) cores
IBM Power 7, Met Office

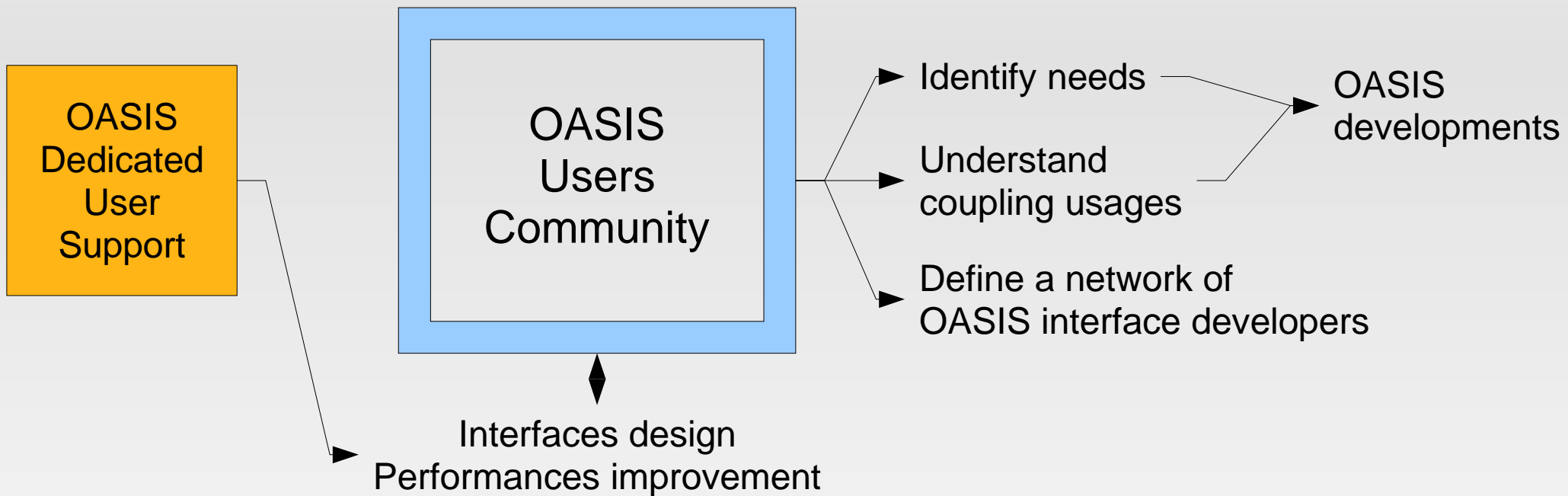


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Conclusions



And now ?

- OASIS Dedicated User Support still possible (ex: ETHZ 2013)
- Applicants must involve CERFACS in national/international projects
- Mutual agreement with CERFACS possible



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Questions ?



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