<Title>
Implementation of Parallel NetCDF output and COSP in OpenIFS

Project plan

< The purpose of the project plan is to identify, define and delimit the project's commitment. >

< WHO IS INVOLVED IN THE PROJECT >

1. Project organization

Requester
Name: Marston S. Johnston
Title/position: PostDoc
Affiliation: Gothenburg University
Phone: 0736637909
E-mail: Marston.Johnston@gu.se

Project responsible for SNIC
Name: Hamish Struthers
Title/position: Application expert
Affiliation: NSC, SNIC
Phone: 0732702419
E-mail: struthers@nsc.liu.se

< For other project members, please specify role and contact details. >

Project manager
Name: Torben Rasmussen
Title/position: Application expert
Affiliation: NSC, SNIC
Phone: 013281494
E-mail: torbenr@nsc.liu.se

2. SNIC project name

< Name of an associated SNIC resource allocation project, if applicable (e.g. SNIC 2014/X-YYY). >

< MOTIVATION FOR GETTING THIS PROJECT SUPPORT >

3. Expected enabling benefit

< Generally provided by the requester. Formulate the expected enabling benefit. That is, the benefit the project will contribute to associated research activities on short and/or long term. How will this further enable research activities for the requester and others? >

Short-term goal:
  • Develop a NetCDF ouput in OpenIFS that is capable of handling the full COSP output data arrays.

Long-term goal:
  • Fully integrate COSP and parallel NetCDF into the trunk of the official version of the OpenIFS model

COSP will be used as part of the upcoming sixth phase of the Couple Model Intercomparison Project (CMIP6) supported by the Intergovernmental Panel on Climate Change (IPCC). It is extremely important for any prominent model to participate in model intercomparison projects as this allows us valuable opportunities for development in this critical area.

4. Impact of the research that the project is associated with

< Generally provided by the requester. Why is this enabling important? For example, describe how important the software/data is for your current and future research activity and for other national and international research activities. >

OpenIFS (https://software.ecmwf.int/wiki/display/OIFS/OpenIFS+Home) is an atmospheric model being developed by ECMWF and used by a wide range of international institutes, including Swedish modeling groups.

5. Why is SNIC assistance needed?

The proposed project is a technical development of the OpenIFS model and therefore outside the scope of the climate modeling scientific research. SNIC application experts have experience with code modifications of complex models such as OpenIFS.

< WHAT ARE WE HANDS-ON GOING TO DO IN THE PROJECT? AND HOW? >

6. Project objective

< Describe briefly the background and formulate the project objective, i.e. what is it intended that the project should do to achieve the expected enabling benefit? How are you going to deliver the requested enabling? >

The standard output file for OpenIFS (IFS: Integrated Forecast System) is GRIB: GRIdded Binary or General Regularly-distributed Information in Binary form. However, not all the output from OpenIFS components are compatible with GRIB. For example, GRIB files can only carry arrays with up to 4 dimensions (time, lat, lon, lev) but one of the latest components, the The Cloud Feedback Model Inter-comparison Project (CFMIP) Cloud Observation Simulation Project (COSP), outputs higher dimensional data. There are currently no active OpenIFS projects to address this problem.

Therefore, we propose a project to setup a NetCDF output module linked to OpenIFS, which will use parallel NetCDF writing. We plan to explore the possibility of using the Community Atmosphere Model's (CAM) output parallel NetCDF library.

Deliverables:

Delivery no.	Description	Schedule
1	Implement PIO (NCAR parallel IO library) OpenIFS	Completed 2016-12-31

7. Work plan and resource estimate

< Specify the required staff resources in PM and the time frame for the project. >

The project will be conducted during 2016-H2. NSC will spend up to 0.5 PM within this project. Person months will be carried by the 'Avancerat national Användarstöd' project.

Start date: 2016-06-01
End date: 2016-12-31

Defined milestones (MS) and decision points (DP):

< Describe important review points in the form of milestones and decision points. >

Milestone/Decision point	Description	Date
MS	Implement PIO within IFS	2016-12-31

LiU-XXXX   SNIC
                          Project based user support

11/1/16   Page 4 of
DP   Evaluate the functionality   2016-10-31
                          and performance of PIO and
                          ESMF

Responsibilities:
< Describe the responsibilities of the various project members and stakeholders. Who is responsible for what? And who decides what? >

- Installing (compiling and testing) PIO and ESMF libraries on NSC systems: Hamish Struthers
- Implementing PIO within OpenIFS: Marston S. Johnstion, with assistance from Hamish Struthers, Mats Hamrud (ECMWF) and Andrew Gettelman (NCAR)

Communication and dialogue:
< Describe how the project members will keep each other updated throughout the project. Describe how results, decisions, project changes, etc. will be discussed and communicated. >

Confidentiality requirements:
N/A

8. Approval
< The signatures of all parties confirm the validity of the project plan. The SNIC office can overrule this approval or require adjustments to the project plan, such as the amount of PMs that can be spent in the project. >

I agree to the objective, scope, and responsibilities described in this project plan:

Requester	**For SNIC**
Date:	Date:
Marston Johnston	

Project responsible for SNIC

Date: _____

_____

Hamish Struthers