

Wikiprint Book

Title: 1. Working on ESPRI mesocenter OLD COMPUTING CLUSTER: Ciclad and Climserv

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1. Working on ESPRI mesocenter OLD COMPUTING CLUSTER: Ciclad and Climserv

For several years, all the IPSL infrastructure is federated as the [■ESPRI mesocenter](#).

In this infrastructure there are:

- Ciclad: an IPSL computing cluster located on the Jussieu campus (Paris, France), which hosts mostly modeling data (such as CORDEX, CMIP...)
- ClimServ: an IPSL computing cluster located at Polytechnique (Palaiseau, France), which hosts mostly observation data.

The both clusters have the same software and some file systems are cross-mounted, thus [libIGCM](#) is used in the same way on both clusters. The shared account, located at Ciclad, is used also at ClimServ. The documentation below is mainly written for Ciclad but the same can be applied for ClimServ.

1.1. General information

1.1.1. Documentation

Quick documentation could be found [■here](#) (only in French for now).

For mesocenter details about [■computation on Ciclad and !ClimServ](#)

hotline : [■meso-support \(at\) ipsl.fr](#)

1.1.2. The machines and file systems

The front-end machine can be accessed via `ciclad.jussieu.ipsl.fr`.

Output files written by [libIGCM](#) are stored by default in `/data/yourlogin/IGCM_OUT` at Ciclad and in `/homedata/yourlogin/IGCM_OUT` at ClimServ.

1.1.3. Shared account

The repository for shared files are found in `/projjsu/igcmg/IGCM`.

Read more: [Repository for shared files and shared tools](#)

1.1.4. Individual account

You must belong to the `igcmg users'` group. Use following command to check to which groups you belong:

```
id -a
```

1.1.5. How to define your environment

To set up ferret and FAST tools and to load the modules needed for compilation of LMDZ, ORCHIDEE and XIOS, add the following line in your login file (e.g. `/${HOME}/.bashrc`), if you work at Ciclad:

```
source /home/igcmg/MachineEnvironment/ciclad/atlas_env_ciclad
```

or take following line if you work at ClimServ:

```
source /ciclad-home/igcmg/MachineEnvironment/climserv/atlas_env_climserv
```

Note that the file `atlas_env_ciclad` was previously stored as `/home/igcmg/.atlas_env_ciclad_ksh`.

To receive the end-of-job messages returned by the job itself (e.g. end of simulation, error,...) you must specify your email address in the file `/${HOME}/.forward`.

1.2. Compiling at Ciclad and ClimServ

When installing [modipsl](#), the default compiler at Ciclad and ClimServ is set to `ifort`. In `modipsl/util/AA_make.gdef` this corresponds to the target `ifort_CICLAD`. The same target is used for both Ciclad and Climserv. The corresponding arch files for compiling with fcm are named

arch-ifort_CICLAD.fcm and arch-ifort_CICLAD.path. Other compilers exist at Ciclad and ClimServ but they have not been tested with all models.

Note that the following message from the script *ins_make* which installs the makefiles is correct both for Ciclad and ClimServ:

```
Installation of makefiles, scripts and data for ifort_CICLAD
```

Following forced configurations have been tested at Ciclad with the ifort compiler:

- NEMO forced mode
- ORCHIDEE offline
- LMDZOR_v6

The coupled models IPSLCM5 or IPSLCM6 have not been tested at Ciclad.

1.2.1. LMDZOR_v6.2.2 and ORCHIDEE_trunk(rev 7377 tested) configurations

These configurations uses a compilation script which will source the needed modules via the file `modipsl/config/XXX/ARCH/arch-ifort_CICLAD.env`. No changes needs to be done to the default compilation.

This should as well be true for LMDZOR_v6.2_work and ORCHIDEE_trunk since revision 6573.

1.2.2. LMDZOR_v6.1_x and ORCHIDEE_2_x configurations

These configurations uses a main Makefile. When compiling using the main Makefile, the correct module environment needs to be loaded before. Therefor check below. When using v6.2 and more recent configurations, the compilation script takes care of loading modules.

Make sure following libraries are loaded in the terminal: **intel/15.0.6.233 openmpi/1.4.5-ifort netcdf4/4.2.1.1-ifort** (use "module liste" to see loaded modules). If this is not the case, load them as follow (use 1 of 2 options) :

```
/home/igcmg/MachineEnvironment/ciclad/atlas_env_ciclad
# or
module unload intel openmpi netcdf4
module load intel/15.0.6.233 openmpi/1.4.5-ifort netcdf4/4.2.1.1-ifort
```

- If you use an older version than revision 1039 on the trunk XIOS, then update compile options as follow :

```
cd modeles/XIOS/arch
svn update -r 1039
```

Verify that the option `--netcdf_lib netcdf4_seq` is set on the line with `make_xios` in `config/xxxx/Makefile`. Otherwise modify to have as follow :

```
xios :
    (cd ../../modeles/XIOS ; ./make_xios --netcdf_lib netcdf4_seq \
--prod --arch ${FCM_ARCH} --job 8 ; cp bin/xios_server.exe ../../bin/. ; )
```

1.2.3. Older versions

To compile at Ciclad/ClimServ you need LMDZ5/trunk rev 2133 or later, ORCHIDEE/trunk rev 2375 or later, XIOS branches/xios-1.0 rev 604 or XIOS/trunk, libIGCM_v2.7 or later. Some modifications might be needed :

Compiling XIOS using netcdf sequential. For this add in `modipsl/config/AA_make` : `--netcdf_lib netcdf4_seq` on the line `make_xios` as follow:

```
(cd ../../modeles/XIOS ; ./make_xios --netcdf_lib netcdf4_seq --prod --arch ${FCM_ARCH} --job 8 ; cp bin/xios_server.exe ../../bin/. ; )
```

To use older versions of LMDZ, add following 2 lines in the end of `modipsl/models/LMDZ/arch/arch-ifort_CICLAD.path`:

```
XIOS_INCDIR=$LMDGCM/../../XIOS/inc
XIOS_LIBDIR=$LMDGCM/../../XIOS/lib
```

- LMDZOR_v5, LMDZ_v5, LMDZOR_v5.2 : The versions of LMDZ and ORCHIDEE are too old in these configurations. They can be used but the arch* files needs to be added. Do following
 - update for LMDZ: cd modipsl/modeles/LMDZ/arch; svn -r 2449 update
 - update for ORCHIDEE only in LMDZOR_v5.2 : cd modipsl/modeles/ORCHIDEE/arch ; svn -r 3171 update
 - update for XIOS: cd modipsl/modeles/XIOS/arch; svn -r 1039 update

1.3. Running using libIGCM at Ciclad and ClimServ

[libIGCM](#) can be used since tag libIGCM_v2.6 . The options MONITORING, PACK and ATLAS are not implemented for Ciclad and ClimServ.

1.3.1. Memory settings in default job

The memory needs to be adapted or added in the job's heading section. For LMDZOR resolution 144x142x79 the following seems to be needed, adjust if needed more, in this example using 31MPIx1OMP for the gcm and 1MPI for xios server:

```
#PBS -l nodes=1:ppn=32
#PBS -l mem=60gb
#PBS -l vmem=200gb
```

For LMDZOR resolution 96x95x39 the following is enough:

```
#PBS -l mem=6gb
#PBS -l vmem=30gb
```

1.3.2. Only MPI

LMDZOR_v6.2.2, LMDZOR_v6.1.10 and LMDZOR_v6.1.12 configurations have been tested successfully using XIOS with 1 server when running using only MPI, 31 MPI for LMDZ. Only the memory needed to be adapted as said above. Note that default compilation for hybrid mode mpi_omp is used also to run with only MPI. Set following in config.card:

```
[Executable]
ATM= (gcm_${ResolAtm}_${OptMode}.e, lmdz.x, 31MPI, 1OMP)
SRF= ("", "")
SBG= ("", "")
IOS= (xios_server_${OptMode}.exe, xios.x, 1MPI)
```

1.3.3. Mixte MPI-OMP

This has not been tested with LMDZOR_v6.2.2.

Set XIOS to be used in attached mode (using one executable). Add following in the main job but change OMP_NUM_THREADS to the number of threads used in your case :

```
module load openmpi/1.4.5-ifort
export OMP_STACKSIZE=200M
export OMP_NUM_THREADS=2
```

1.4. Example of job for a MPI executable

In this example, ORCHIDEE offline is launched on 31 cores with XIOS server on 1 core. This example can also be used for LMDZ, change the executable name in the run_file. A minimum change before launching the script is to source the modules that are needed. The same modules as used during compilation should be set.

All input files and executables should be available in the folder where the job is launched.

```
#####
##  CICLAD/CLIMSERV  IPSL ##
#####
#PBS -N test
```

```

#PBS -m a
#PBS -j oe
###PBS -q h12 # Queue for 12 hours at ciclad only
#PBS -o Script_Output
#PBS -S /bin/ksh
#PBS -l nodes=1:ppn=32
#PBS -l mem=60gb
#PBS -l vmem=200gb

## Go to current folder
cd $PBS_O_WORKDIR

## To access module command
source /usr/share/Modules/init/ksh

## Source same modules as used during compilation. See examples below depending on the configurations used.
# For ORCHIDEE_3 and more recent offline versions or coupled v6.2 and more recent versions:
#source ../modips1/config/ORCHIDEE_OL/ARCH/arch-ifort_CICLAD.env
#source ../modips1/config/LMDZOR_v6/ARCH/arch-ifort_CICLAD.env
# For ORCHIDEE_2_0, 2_1, 2_2 and coupled models v6.1.x:
# source /ciclad-home/igcmg/.atlas_env_ciclad_ksh

## Create a run_file to be used to launch with XIOS in server mode
# Note: 3l+1 should be equal the number set in the header. For example, if you set 16 in the header, set -np 15 for orchid
# If you want to run LMDZ, change orchidee_ol_prod into the name for the lmdz executable.
rm -f run_file
echo "-np 31 ./orchidee_ol_prod" > run_file
echo "-np 1 ./xios_server_prod.exe " >> run_file
chmod +x run_file

## Launch the executables
time mpirun --app ./run_file

```

The job is launched with **qsub** . Use "**qstat -u login**" to check the queue. Use **qdel** to cancel a job in queue or running.