

## 1. Working on ESPRI mesocenter: Ciclad and Climserv

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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 `/prodigfs/ipslfs/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`):

```
. /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.

### To be checked before compilation

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) :

```
source /home/igcmg/.atlas_env_ciclad_ksh
# 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/. ; )
```

### 1.2.1. 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.
```

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. libIGCM at Ciclad and ClimServ

[libIGCM](#) can be used since tag libIGCM\_v2.6 . The options MONITORING, PACK and ATLAS is not implemated for Ciclad and ClimServ.

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
```

### 1.3.1. Only MPI

LMDZOR\_v6 configuration (LMDZ testing 3114, ORCHIDEE trunk 2724, XIOS branches/xios-1.0 rev 604, libIGCM\_v2.7) has been tested successfully using XIOS with 1 server when running using only MPI. 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.

### 1.3.2. Mixte MPI-OMP

#### 1.3.2.1. Attached mode or 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
```

#### 1.3.2.2. Server mode or using two executables

Not yet done

## 1.4. Example of job for a MPI executable

```
#PBS -S /bin/bash
#PBS -N job_mpi8
###PBS -q short
#PBS -j eo
#PBS -l nodes=1:ppn=8
#PBS -l walltime=00:15:00
#PBS -l mem=6gb
#PBS -l vmem=20gb

ulimit -s unlimited
module load netcdf4/4.2.1.1-ifort

# Go to directory where the job was launched
cd $PBS_O_WORKDIR

/usr/lib64/openmpi/1.4.5-ifort/bin/mpirun gcm.e > gcm.out 2>&1
```

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