Wikiprint Book

Title: 1. IDRIS users' manual

Subject: lgcmg_doc - DocBenvAidrisAada

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Working on Ada

1. IDRIS users' manual

- See: ■http://www.idris.fr/eng/ada/ for ada : computing server
- See: ■http://www.idris.fr/eng/adapp/ for adapp : pre-post-treatment
- See: ■http://www.idris.fr/eng/ergon/ for ergon : file server

2. Commands to manage jobs on ada

- The job's time limit is measured in real time, for example 1 hour on 32 procs accounts for 32 hours. Be careful not to have too much time on 1 processor.
- llsubmit --> submit a job
- llcancel --> cancel a job
- llq -u *login* --> indicates all jobs in the queue or running for the login *login*
- Trick: parameterize the llq display to see the job names

```
llq -u $(whoami) -f %jn %id %st %c %dq %h -W
```

- Post-mortem : idrjar , idrjar -l -j #jobid#, to obtain detailed information: memory, real time, efficiency,...
- Example of idrjar output :

```
ada > idrjar
|-------------------------------------------|
|--- IDRIS/CNRS. Version du 18 mars 2015 ---|
|-------------------------------------------|


Sorties concernant l'identifiant rpslxxx pour la période du
      ==> 01 juin 2013 au 19 juin 2013



Owner    Job Name       JobId      Queue tEse  tCpu   #T   (%)    S
-------  ----------  --------------- ----- ---- ------ --- ------- -
rpslxxx ADA337      ada338.290170.0 c32t2  133   1232  32  28.95 C
rpslxxx ADA337      ada338.290333.0 c32t2 5425 165141  32  95.13 C
rpslxxx PACKDEBUG   ada338.290610.0 t2      11      2   1  18.18 C
rpslxxx ADA337      ada338.290438.0 c32t2 5471 166878  32  95.32 C
rpslxxx PACKRESTART ada338.290611.0 t2     182     25   1  13.74 C
rpslxxx REBUILDWRK  ada338.290612.0 t2    1577    503   1  31.90 C
rpslxxx PACKOUTPUT  ada338.290730.0 t2     114     43   1  37.72 C
```

3. Example of a job to start an executable in MPI

Here is an example of a simple job to start an executable orchidee_ol (or gcm.e commented). The input files and the executable must be in the directory before starting the executable.

```
#!/bin/ksh
# #####################
# ##   ADA IDRIS   ##
# #####################
# Query's name
# @ job_name = test
# Job type
# @ job_type = parallel
# Standard output file
```

```
# @ output = Script_Output_test.$(jobid)
# Error output file (the same)
# @ error = Script_Output_test.$(jobid)
# Number of requested processes
# @ total_tasks = 8
# max. CPU time per MPI process hh:mm:ss
# @ wall_clock_limit = 1:00:00
# Number of task OpenMP/pthreads per MPI process
### @ parallel_threads = 4
# End of header
# @ queue

poe ./orchidee_ol
#poe ./gcm.e
```

4. Information on Ergon files from Adapp

Ergon files are visible from Adapp. Use $ARCHIVE to reach Ergon files on Adapp. $ARCHIVE is /arch/home/rech/lab/plabxxx on Adapp. All Unix command are available on Adapp to provides information on Ergon files.

5. Job Header for MPI - MPI/OMP with libIGCM

5.1. Forced model

5.1.1. MPI

To launch a job on XXX MPI tasks, you need to use `libIGCM/ins_job` script. Check your header. It should be :

```
#!/bin/ksh
# #####################
# ##   ADA IDRIS   ##
# #####################
# Job name
# @ job_name = MyJob
# Job type
# @ job_type = parallel
# Standard output file name
# @ output = Script_Output_MyJob.000001
# Error output file name
# @ error = Script_Output_MyJob.000001
# Total number of tasks
# @ total_tasks = XXX
# @ environment = "BATCH_NUM_PROC_TOT=XXX"
# Maximum CPU time per task hh:mm:ss
# @ wall_clock_limit = 1:00:00
# End of the header options
# @ queue
```

5.1.2. hybrid MPI-OMP

Hybrid version are only available with _v6 configurations

To launch a job on XXX MPI tasks and YYY threads OMP on each task

- first you need to modify your config.card

```
ATM= (gcm.e, lmdz.x, XXXMPI, YYYOMP)
```

second you need to use `libIGCM/ins_job` script. Check your header. It should be :

```
#!/bin/ksh
# #####################
# ##  ADA IDRIS   ##
# #####################
# Job name
# @ job_name = MyJob
# Job type
# @ job_type = parallel
# Standard output file name
# @ output = Script_Output_MyJob.000001
# Error output file name
# @ error = Script_Output_MyJob.000001
# Total number of tasks
# @ total_tasks = XXX
# @ environment = "BATCH_NUM_PROC_TOT=XXX*YYY"
# Maximum CPU time per task hh:mm:ss
# @ wall_clock_limit = 1:00:00
# Specific option for OpenMP parallelization: Number of OpenMP threads per MPI task
# @ parallel_threads = YYY
# End of the header options
# @ queue
```

5.2. Coupled model

5.2.1. MPI

To launch a job on XXX (32) MPI tasks. 5 for NEMO, 1 for oasis and 26 MPI tasks for LMDZ by default for IPSLCM5A, you need to use `libIGCM/ins_job` script. Check your header. It should be :

```
#!/bin/ksh
# #####################
# ##  ADA       IDRIS ##
# #####################
# Job name
# @ job_name = MyCoupledJob
# Job type
# @ job_type = parallel
# Standard output file name
# @ output = Script_Output_MyCoupledJob.000001
# Error output file name
# @ error = Script_Output_MyCoupledJob.000001
# Total number of tasks
# @ total_tasks = 32
# @ environment = "BATCH_NUM_PROC_TOT=32"
# Maximum CPU time per task hh:mm:ss
# @ wall_clock_limit = 1:00:00
# End of the header options
# @ queue
```

5.2.2. hybrid MPI-OMP

Hybrid version are only available with _v6 configurations

To launch a job on XXX (47) MPI tasks and YYY (8) threads OMP for LMDZ, ZZZ (180) MPI tasks for NEMO and SSS (1) XIOS servers :

- first you need to modify your config.card. On ada, this is working for IPSLCM6 and _v6 configurations :

```
ATM= (gcm.e, lmdz.x, 47MPI, 8OMP)
SRF= ("" ,"" )
SBG= ("" ,"" )
```

```
OCE= (opa, opa.xx  , 180MPI)
ICE= ("" ,"" )
MBG= ("" ,"" )
CPL= ("", "" )
IOS= (xios_server.exe, xios.x, 1MPI)
```

second you need to use `libIGCM/ins_job -m Intel` script. Check your header. It should be :

```
#!/bin/ksh
# #####################
# ## ADA      IDRIS ##
# #####################
# Job name
# @ job_name = MyCoupledJob
# Standard output file name
# @ output = Script_Output_MyCoupledJob.000001
# Error output file name
# @ error = Script_Output_MyCoupledJob.000001
# Job type
# @ job_type = mpich
# Total number of tasks
# @ node = 18
# Specific option for OpenMP parallelization: Number of OpenMP threads per MPI task
# Memory : as_limit=3.5gb max per process per core. With 4 threads per process use max as_limit=14gb
# Maximum CPU time per task hh:mm:ss
# @ wall_clock_limit = 1:00:00
# @ environment = "BATCH_NUM_PROC_TOT=228" ; wall_clock_limit=$(wall_clock_limit)
# End of the header options
# @ queue
```

Note : an authorization is required. Please ask assist_at_idris.fr.

Note : Intel environment 2016.2 is forced by libIGCM since libIGCM v2.8 during execution

Note : this is working with all compiler.

6. Specificities libIGCM on Ada

At IDRIS and for Ada, output files are 'packed' using libIGCM_v2, i.e. they are grouped by periods (in general 1 year) using the command `tar` or `ncrcat` for NetCDF output files.

This option implies that files must be temporarily stored on the $WORKDIR space, which means that a large storage is needed (at least 20 To).

The diagram below details all jobs including `pack_debug`, `pack_restart` and `pack_output` as well as the directories those jobs are using. Note that the files are temporarily stored in the $WORKDIR/IGCM_OUT directories before being grouped and sent on Ergon in the IGCM_OUT directories.
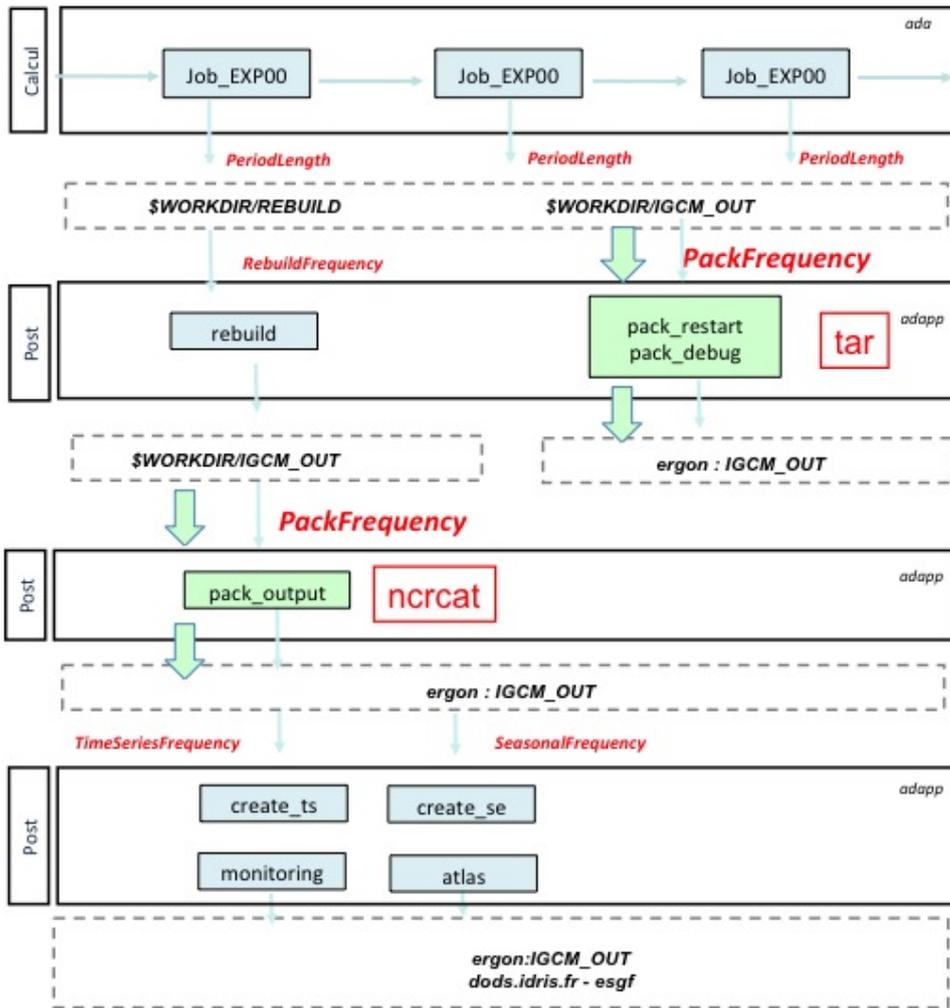
You will obtain annual output files with 12 monthly values in the Output/MO directory if you put `PeriodLength=1M` and `PackFrequency=1Y` in `config.card`. This is the default grouping period of most configurations but you can of course change it.

What you must remember:

- The tool [RunChecker.job](#) is meant to help you monitoring your simulations. It offers a synthetic view of the different post processing jobs' status.
- The tool [clean_latestPackperiod.job](#) is meant to help you clean until the last successfully computed pack period.
- If you detect anomalies and must rerun part of the simulation, you will have to make new complete pack periods (e.g. filling a gap by running 1 month of simulation is out of the question).
- The restart files are stored and grouped on Ergon in the directory IGCM_OUT/.../RESTART
- The different output text-files are stored and grouped on Ergon in the directory IGCM_OUT/.../DEBUG
- The listings for pack-jobs outputs stay on Ada in the directory $WORKDIR/IGCM_OUT/.../Out
- If you put the `SpaceName=TEST`parameter in `config.card` the pack jobs will not be started and your simulation will be stored in the WORKDIR/IGCM_OUT directory. This can be very useful for short tests.

To learn more about this Section, you can read the documentation on [Simulation and post-processing](#) and on [Monitor, debug and relaunching.](#)

Finally, in case of panic, visit us or send your questions to the list platform-users.

7. Specificities for Adapp

- Adapp is dedicated to pre and post-treatment.
- Note that Ergon files are visible in read only mode through $ARCHIVE.
    - you can use idrls to know the status of a file stored on ergon. See `idrls -?`. m means migrated on tape only, - means on disk.

```
cd $ARCHIVE
idrls IGCM/RESTART/IPSLCM6/DEVT/piControl/O1T03V14/*/Restart/*
M ACCESS      L USER     GROUP        SIZE   MOD_DATE   ACC_DATE   EXP_DATE FILE_NAME
= ========== = ======== ===== ============ ========== ========== ========== =========
- -rwxrwxr-x 1  rpslxxx   psl   218188352 09.06.2015 22.01.2016 22.01.2017 IGCM/RESTART/IPSLCM6/DEVT/piControl/O1T03
m -rwxrwxr-x 1  rpslxxx   psl  1411362796 09.06.2015 22.01.2016 22.01.2017 IGCM/RESTART/IPSLCM6/DEVT/piControl/O1T03
```

- Use largely Adapp for analyses and interactive work
- Adapp is free of charge

7.1. IDRIS users' manual for adapp

- See: ■http://www.idris.fr/eng/adapp/ for adapp : pre-post-treatment

7.2. Header for adapp job

A post-treatment jobs includes these header lines :

```
# @ job_type = serial
# @ requirements = (Feature == "prepost")
```