Introduction to practical sessions

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Egeon

The practical sessions of this tutorial will be run on Egeon

- 35 compute nodes
  - 2x AMD 7H12 EPYC 64-core processors
  - 512 GB RAM
- `/mnt/beegfs`
  - BeeGFS filesystem, 466 TB
- `/home`
  - NFS filesystem, 729 TB

MPAS
Model for Prediction Across Scales

Egeon

The practical sessions of this tutorial will be run on Egeon

```
egeon-login.cptec.inpe.br
```

Your username will be: aluno#

Don't forget to enable X11 forwarding when connecting!

```
ssh -XC <username>@egeon-login.cptec.inpe.br
```

On macOS systems you might try –Y rather than -X

```
ssh -YC <username>@ egeon-login.cptec.inpe.br
```

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Job scripts

```
#!/usr/bin/env sh

#SBATCH --output=job.out
#SBATCH --error=job.err
#SBATCH --time=00:30:00
#SBATCH --tasks-per-node=128
#SBATCH --nodes=1
#SBATCH --job-name=run_model
#SBATCH --partition=batch

# ... load modules ...

mpiexec ./atmosphere_model
```

Job scripts are submitted to the queuing system with `sbatch`

Managing queued jobs

The `squeue` command is used on Egeon to check the status of queued jobs

- `squeue` with no arguments shows all jobs on the system, which is less useful for us
- `squeue -u $USER` shows only your jobs

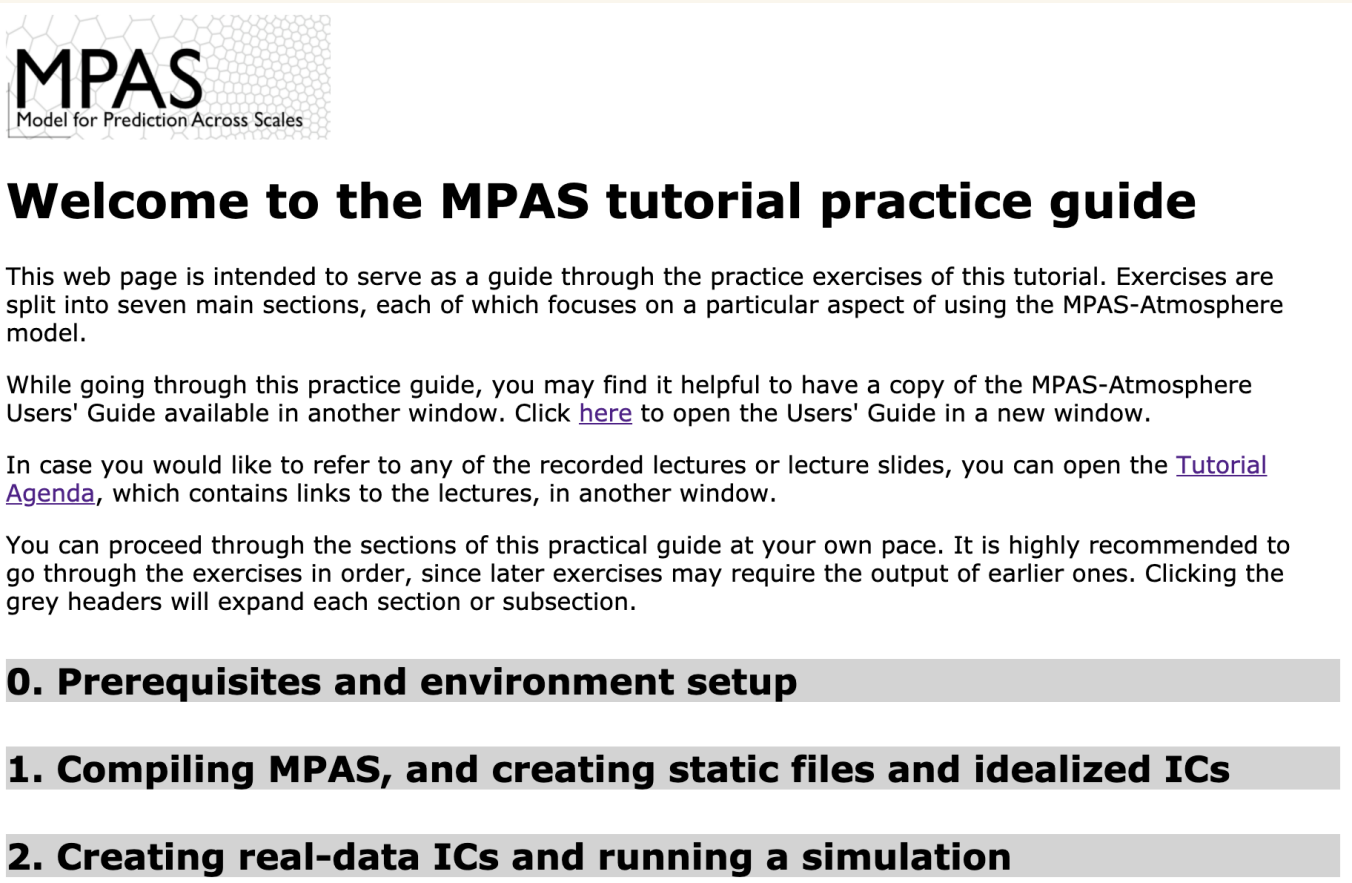
The `scancel` command is used to cancel a job

- `scancel <job_id>`
- The `<job_id>` can be obtained from the `squeue` command

Practical exercises

We have a web page to guide you through some exercises:

https://www2.mmm.ucar.edu/projects/mpas/tutorial/INPE2024/



MPAS
Model for Prediction Across Scales

Welcome to the MPAS tutorial practice guide

This web page is intended to serve as a guide through the practice exercises of this tutorial. Exercises are split into seven main sections, each of which focuses on a particular aspect of using the MPAS-Atmosphere model.

While going through this practice guide, you may find it helpful to have a copy of the MPAS-Atmosphere Users' Guide available in another window. Click here to open the Users' Guide in a new window.

In case you would like to refer to any of the recorded lectures or lecture slides, you can open the Tutorial Agenda, which contains links to the lectures, in another window.

You can proceed through the sections of this practical guide at your own pace. It is highly recommended to go through the exercises in order, since later exercises may require the output of earlier ones. Clicking the grey headers will expand each section or subsection.

0. Prerequisites and environment setup

1. Compiling MPAS, and creating static files and idealized ICs

2. Creating real-data ICs and running a simulation

MPAS
Model for Prediction Across Scales

Practical exercises

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https://www2.mmm.ucar.edu/projects/mpas/tutorial/INPE2024/

If you're logged in to Egeon, you can get this URL with:

```
cat ~professor/url
```

Practical exercises

Blocks of shell commands can be selected all at once

Next, we will load modules needed for compiling and
Besides the Parallel-NetCDF module (**pnetcdf/1.12**
netcdf-fortran/4.5.3 modules are being loaded to
and so that we have access to the standard **ncdump**
can load these module with the following commands

```
$ ml autotools
$ ml prun/2.2
$ ml gnu9/9.4.0
$ ml hwloc/2.5.0
$ ml ucx/1.11.2
$ ml libfabric/1.13.0
$ ml openmpi4/4.1.1
$ ml ohpc
$ ml pnetcdf/1.12.2
$ ml phdf5/1.10.8
$ ml netcdf/4.7.4
$ ml netcdf-fortran/4.5.3
```

Practical exercises

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$ ml phdf5/1.10.8
$ ml netcdf/4.7.4
$ ml netcdf-fortran/4.5.3
```

MPAS
Model for Prediction Across Scales

Environment setup

As noted in the practice guide, you should **set up your environment every time you log in**:

If you've logged out of Egeon and would like a quick list of commands to set up your environment again after logging back in, you can copy and paste the following commands into your terminal:

```
module --force purge
ml anaconda3-2022.05-gcc-11.2.0-q74p53i
source activate /mnt/beegfs/professor/conda/envs/mpas
export PYTHONPATH=/mnt/beegfs/professor/python_scripts
ml autotools
ml prun/2.2
ml gnu9/9.4.0
ml hwloc/2.5.0
ml ucx/1.11.2
ml libfabric/1.13.0
ml openmpi4/4.1.1
ml ohpc
ml pnetcdf/1.12.2
ml phdf5/1.10.8
ml netcdf/4.7.4
ml netcdf-fortran/4.5.3
export PNETCDF=$PNETCDF_DIR
ml imagemagick-7.0.8-7-gcc-11.2.0-46pk2go
ml metis/5.1.0
```