



Apresentação do Ambiente Padronizado de Desenvolvimento do MONAN na EGEON

Workshop Interno da DIMNT para início dos trabalhos com o
MONAN-ATM/SFC de 2 a 3 de outubro de 2023.

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Sumário

1. **Introdução**
2. **Ambiente Computacional: Cluster Egeon**
3. **Passo a passo da instalação do MONAN**
4. **Resumo**
5. **Referências**

1. Introdução

2. Ambiente Computacional: Cluster Egeon

3. Passo a passo da instalação do MONAN

4. Resumo

5. Referências

1 Introdução

- Procedimento rápido e prático
- Para desenvolvedores compilar e executar o modelo MONAN
- Passo a passo resumido desenvolvido baseado no manual elaborado pelo Grupo de Avaliação de Modelos (GAM)
- Maiores detalhes: manual@GAM
- Manual deste passo a passo:

<ftp.cptec.inpe.br/pesquisa/dmdcc/monan/documentos/manuais/>

[Manual_MONAN_V0.1.0_QuickStart_V0.0.1.pdf](#)

1. Introdução
2. **Ambiente Computacional: Cluster Egeon**
3. Passo a passo da instalação do MONAN
4. Resumo
5. Referências

2 Ambiente Computacional: Cluster Egeon

- **Nós computacionais:**

- 33 servidores (nós) Dell EMC *Power Edge* R6525 configurados com:
- 2 sockets AMD EPYC 7H12 64-Core (**128 cores/nó**)
- 512Gb de memória/nó

- **Filas:**

- **OPER:** reservado à operação (máx. 16 nós)
- **batch:** 8:00:00 - 33 nós (**dedicado ao MONAN** - máx. 16 nós)
- **PESQ1:** 12:00:00 - 8 nós (uso geral - máx. 4 nós)
- **PESQ2:** 12:00:00 - 8 nós (uso geral máx. 4 nós)
- **PESQ3:** 2:00:00 - 1 nó (uso geral)
- **proc:** 4:00:00 - 2 nós (uso geral, jobs sequenciais 1 CPU)

2 Ambiente Computacional: Cluster Egeon

- **Compiladores e bibliotecas:**
 - **GNU:** versão 9.4.0 (*gnu9/9.4.0*)
 - **MPICH:** [mpich.org] (*mpich-4.0.2-gcc-9.4.0-gpof2pv*)
 - Essas e demais bibliotecas são carregadas **automaticamente** pelos scripts

2 Ambiente Computacional: Cluster Egeon

- **Áreas do MONAN na Egeon:**
 - **Área de trabalho (BeeGFS):**
/mnt/beegfs/monan
 - **Área no storage corporativo (NetApp):**
 - /pesq/dados/monan - 20Tb
 - /pesq/share/monan - 4,8Tb
 - /pesq/scripts/monan - 51Gb
 - /pesq/log/monan - 10Gb
 - **Área para transferências de arquivos:**
http://dataserver.cptec.inpe.br/dataserver_dmnit/monan/
(todos os arquivos que estiverem em "/pesq/share/monan")

1. Introdução
2. Ambiente Computacional: Cluster Egeon
3. **Passo a passo da instalação do MONAN**
4. Resumo
5. Referências

3 Passo a passo da instalação do MONAN

Este passo inicial faz o download dos scripts necessários para a execução completa do passo a passo. (Só deve ser executado uma vez.)

```
git clone https://github.com/monanadmin/MONAN-scripts.git
```

Estrutura dos diretórios e arquivos dos scripts:

```
|— README.md
|— egeon
|   |— 1.install_spack.bash
|   |— 2.install_wps.bash
|   |— 3.install_monan.bash
|   |— 4.pre_monan.bash
|   |— 5.monan.bash
|   |— 6.pos_monan.bash
|   |— MPAS_ori
|       |— testcase
|           |— scripts
|               |— link_grib.csh
|               |— ngrid2latlon.sh
|               |— prec.gs
|               |— run_mpas_gnu_egeon.bash
|               |— static.sh
|— README.md
|— load_monan_app_modules.sh
```

3 Passo a passo da instalação do MONAN

Passo 1: `1.install_spack.bash`

- Instalação do spack para compilar o WPS.
- Instala o gerenciador de pacotes spack. Para instalação do WPS. (só deve ser executado uma vez.)
- Entrar na sua área de download os script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Executar a instalação
`./1.install_spack.bash`

3 Passo a passo da instalação do MONAN

Passo 1: `1.install_spack.bash`

```
[eduardo.khamis@headnode: /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon [main] $ ./1.install_spack.bash
```

```
==> git clone https://github.com/spack/spack.git spack_wps
```

```
Cloning into 'spack_wps'...
remote: Enumerating objects: 482212, done.
remote: Counting objects: 100% (606/606), done.
remote: Compressing objects: 100% (297/297), done.
remote: Total 482212 (delta 291), reused 485 (delta 214), pack-reused 481606
Receiving objects: 100% (482212/482212), 179.38 MiB | 10.63 MiB/s, done.
Resolving deltas: 100% (216796/216796), done.
Updating files: 100% (10863/10863), done.
```

```
==> git checkout tags/v0.18.1 -b branch_v0.18.1
```

```
Updating files: 100% (9580/9580), done.
Switched to a new branch 'branch_v0.18.1'
```

```
==> criando env_wps.sh
```

```
==> Please source /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/spack_wps/env_wps.sh before continue...
```

```
[eduardo.khamis@headnode: /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon [main] $ source /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/spack_wps/env_wps.sh
```

Currently Loaded Modules:

```
1) autotools    3) gnu9/9.4.0    5) ucx/1.11.2    7) openmpi4/4.1.1  9) python-3.9.13-gcc-9.4.0-moxjnc6
2) prun/2.2     4) hwloc/2.5.0  6) libfabric/1.13.0  8) ohpc            10) cmake/3.21.3
```

3 Passo a passo da instalação do MONAN

Passo 1: `1.install_spack.bash`

- Instalação do spack para compilar o WPS.
- Instala o gerenciador de pacotes spack. Para instalação do WPS. (só deve ser executado uma vez.)
- Entrar na sua área de download os script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Executar a instalação
`./1.install_spack.bash`
- Após a instalação, têm-se a seguinte estrutura:

```
.  
├── egeon  
│   └── spack_wps  
...
```
- Execute o comando abaixo para carregar o *spack*, sugerido após a instalação:
`source spack_wps/env_wps.sh`

3 Passo a passo da instalação do MONAN

Passo 2: `2.install_wps.bash`

- Instalação do WPS (WRF)
- Necessário para utilizar o `ungrib.exe` do WPS no pré-processamento. (só deve ser executado uma vez.)
- Este passo leva aproximadamente 2h para executar completamente
- Na sua área de download dos script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Executar a instalação
`./2.install_wps.bash`

Validação: após a instalação, o local de instalação WPS pode ser encontrado usando o seguinte comando:
`spack location -i wps@4.3.1%gcc@9.4.0`, onde se encontrará por exemplo o executável `ungrib.exe`, necessário para o pré-processamento do modelo.

3 Passo a passo da instalação do MONAN

```
eduardo.khamis@headnode: /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon [main] $ ./2.install_wps.bash
```

```
==> Installing WPS from spack...
```

```
==> Added 3 new compilers to /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/.spack/spack_wps/linux/compilers.yaml  
nvhpc@22.11 gcc@9.4.0 gcc@8.5.0
```

```
==> Compilers are defined in the following files:
```

```
/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/.spack/spack_wps/linux/compilers.yaml
```

```
==> The following specs have been detected on this system and added to /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/.spack/spack_wps/packages.yaml  
cmake@3.18.2 cmake@3.21.3
```

```
==> The following specs have been detected on this system and added to /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/.spack/spack_wps/packages.yaml  
perl@5.26.3
```

```
==> The following specs have been detected on this system and added to /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/.spack/spack_wps/packages.yaml  
-- no arch / gcc@9.4.0 -----  
openmpi@4.1.1
```

```
==> Bootstrapping clingo from pre-built binaries
```

```
==> Fetching https://mirror.spack.io/bootstrap/github-actions/v0.2/build_cache/linux-centos7-x86_64-gcc-10.2.1-clingo-bootstrap-spack-z6v6zvc6awioeompbvo735b4flr3yuyz.spec.json
```

```
==> Fetching https://mirror.spack.io/bootstrap/github-actions/v0.2/build_cache/linux-centos7-x86_64/gcc-10.2.1/clingo-bootstrap-spack/linux-centos7-x86_64-gc  
c-10.2.1-clingo-bootstrap-spack-z6v6zvc6awioeompbvo735b4flr3yuyz.spack
```

```
==> Installing "clingo-bootstrap@spack%gcc@10.2.1-docs~ipo+python+static_libstdcpp build_type=Release arch=linux-centos7-x86_64" from a buildcache
```

```
==> Bootstrapping patchelf from pre-built binaries
```

```
==> Bootstrapping patchelf@0.13.1:0.13.99 %gcc target=x86_64 from sources
```

```
==> Installing patchelf-0.13.1-2zsbv3uyqiw2jochs4yutc6qi5s4qd3
```

```
==> No binary for patchelf-0.13.1-2zsbv3uyqiw2jochs4yutc6qi5s4qd3 found: installing from source
```

```
==> Fetching https://mirror.spack.io/_source-cache/archive/08/08c0237e89be74d61ddf8f6ff218439cdd62af572d568fb38913b53e222831de.tar.gz
```

```
==> No patches needed for patchelf
```

```
==> patchelf: Executing phase: 'autoreconf'
```

```
==> patchelf: Executing phase: 'configure'
```

```
==> patchelf: Executing phase: 'build'
```

```
==> patchelf: Executing phase: 'install'
```

```
==> patchelf: Successfully installed patchelf-0.13.1-2zsbv3uyqiw2jochs4yutc6qi5s4qd3
```

```
Fetch: 0.12s. Build: 9.59s. Total: 9.71s.
```

```
[+] /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/.spack/spack_wps/tmp/bootstrap/store/linux-rhel8-x86_64/gcc-9.4.0/patchelf-0.13.1-2zsbv3uyqiw2jochs4yutc6qi5s4qd3
```

```
Input spec
```

3 Passo a passo da instalação do MONAN

Input spec

```
wps@4.3.1%gcc@9.4.0
```

Concretized

```
wps@4.3.1%gcc@9.4.0 build_type=serial patches=3f0d999,62c1bcc,e208f47,e86d029 arch=linux-rhel8-zen2
^jasper@3.0.3%gcc@9.4.0+jpeg+opengl+shared build_type=Release arch=linux-rhel8-zen2
^cmake@3.21.3%gcc@9.4.0~doc+ncurses+ownlibs~qt build_type=Release arch=linux-rhel8-zen2
^libjpeg-turbo@2.1.3%gcc@9.4.0 arch=linux-rhel8-zen2
^nasm@2.15.05%gcc@9.4.0 arch=linux-rhel8-zen2
^libtool@2.4.7%gcc@9.4.0 arch=linux-rhel8-zen2
^m4@1.4.19%gcc@9.4.0+sigsegv patches=9dc5fbd,bfdffa7 arch=linux-rhel8-zen2
^libsigsegv@2.13%gcc@9.4.0 arch=linux-rhel8-zen2
^netcdf-c@4.8.1%gcc@9.4.0~dap~fsync~hdf4~jna+mpi~parallel-netcdf+pic+shared patches=de556da arch=linux-rhel8-zen2
^hdf5@1.12.2%gcc@9.4.0~cxx+fortran+hl~ipo~java+mpi+shared~szip~threadsafe+tools api=default build_type=RelWithDebInfo arch=linux-rhel8-zen2
^openmpi@4.1.1%gcc@9.4.0+atomics~cuda+cxx~cxx_exceptions~gpf~internal~hwloc~java~legacylaunchers~lustre~memchecker+pmi+romio+rsh~singularity~static+vt~wrapper~rpath fabrics=ofi,psm2,ucx schedulers=slurm,tm arch=linux-rhel8-zen2
^pkgconf@1.8.0%gcc@9.4.0 arch=linux-rhel8-zen2
^zlib@1.2.12%gcc@9.4.0+optimize+pic+shared patches=0d38234 arch=linux-rhel8-zen2
^netcdf-fortran@4.5.4%gcc@9.4.0~doc+pic+shared arch=linux-rhel8-zen2
^tclsh@6.24.0%gcc@9.4.0 patches=3a4e60f arch=linux-rhel8-zen2
^ncurses@6.2%gcc@9.4.0~symlinks+term lib abi=none arch=linux-rhel8-zen2
^time@1.9%gcc@9.4.0 arch=linux-rhel8-zen2
^wrf@4.3.3%gcc@9.4.0+pnetcdf build_type=dmpar compile_type=em_real nesting=basic patches=01c0f71,68548f6,b3f063c,e07c39c,e4971f6,e6f3db3,f3dd50d,fa78635
arch=linux-rhel8-zen2
^libpng@1.6.37%gcc@9.4.0 arch=linux-rhel8-zen2
^libtirpc@1.2.6%gcc@9.4.0 arch=linux-rhel8-zen2
^krb5@1.19.3%gcc@9.4.0+shared arch=linux-rhel8-zen2
^bison@3.8.2%gcc@9.4.0 arch=linux-rhel8-zen2
^diffutils@3.8%gcc@9.4.0 arch=linux-rhel8-zen2
^libiconv@1.16%gcc@9.4.0 libs=shared,static arch=linux-rhel8-zen2
^perl@5.26.3%gcc@9.4.0~cpanm+shared+threads patches=8cf4302 arch=linux-rhel8-zen2
^gettext@0.21%gcc@9.4.0+bzip2+curses+git~libunistring+libxml2+tar+xz arch=linux-rhel8-zen2
^bzip2@1.0.8%gcc@9.4.0~debug~pic+shared arch=linux-rhel8-zen2
^libxml2@2.9.13%gcc@9.4.0~python arch=linux-rhel8-zen2
^xz@5.2.5%gcc@9.4.0~pic libs=shared,static arch=linux-rhel8-zen2
^tar@1.34%gcc@9.4.0 zip=pigz arch=linux-rhel8-zen2
^pigz@2.7%gcc@9.4.0 arch=linux-rhel8-zen2
^zstd@1.5.2%gcc@9.4.0+programs compression=none libs=shared,static arch=linux-rhel8-zen2
^openssl@1.1.1o%gcc@9.4.0~docs~shared certs=system arch=linux-rhel8-zen2
^parallel-netcdf@1.12.2%gcc@9.4.0~burstbuffer+cxx+fortran+pic+shared arch=linux-rhel8-zen2
```


3 Passo a passo da instalação do MONAN

Passo 3: `3.install_monan.bash`

- Instala o MONAN à partir do seu repositório de desenvolvimento pessoal.
- Na sua área de download dos script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Executar a instalação
`./3.install_monan.bash https://github.com/<seu_usuario>/<seu_MONAN_repo>.git`
- Após a instalação, execute o comando sugerido no terminal, semelhante ao abaixo:
`cd MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940 && source make.sh`

Validação: Ao final da execução do script, a mensagem abaixo é emitida no terminal para confirmar que foram gerados os executáveis, e seguir com os próximos passos.

!!! Files `init_atmosphere_model` and `atmosphere_model` generated Successfully in ... !!!

3 Passo a passo da instalação do MONAN

```
joao.messias@headnode:/mnt/beegfs/joao.messias/MONAN-scripts/egeon :) ./3.install_monan.bash https://github.com/joaomas/MONAN-Model-JMAS.git
```

```
==> Moduling environment...
```

```
Currently Loaded Modules:
```

```
1) autotools 3) gnu9/9.4.0 5) phdf5/1.10.8 7) netcdf-fortran/4.5.3 9) hwloc/2.5.0  
2) prun/2.2 4) ohpc 6) netcdf/4.7.4 8) mpich-4.0.2-gcc-9.4.0-gpof2pv
```

```
==> Cloning repository...
```

```
Cloning into '/mnt/beegfs/joao.messias/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940'...
```

```
remote: Enumerating objects: 1700, done.
```

```
remote: Counting objects: 100% (1700/1700), done.
```

```
remote: Compressing objects: 100% (995/995), done.
```

```
remote: Total 1700 (delta 664), reused 1675 (delta 652), pack-reused 0
```

```
Receiving objects: 100% (1700/1700), 3.57 MiB | 10.95 MiB/s, done.
```

```
Resolving deltas: 100% (664/664), done.
```

```
Updating files: 100% (1585/1585), done.
```

```
Switched to a new branch 'develop'
```

```
==> Making compile script...
```

```
==> execute: the following to compile MPAS:
```

```
==> cd /mnt/beegfs/joao.messias/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940 && source make.sh && cd ../../..
```

```
joao.messias@headnode:/mnt/beegfs/joao.messias/MONAN-scripts/egeon :) cd /mnt/beegfs/joao.messias/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940 && source make.sh && cd ../../..
```

```
Currently Loaded Modules:
```

```
1) autotools 2) prun/2.2 3) gnu9/9.4.0 4) ohpc 5) mpich-4.0.2-gcc-9.4.0-gpof2pv
```

```
cd src; make clean RM="rm -f" CORE="atmosphere"
```

```
make[1]: Entering directory '/mnt/beegfs/joao.messias/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940/src'
```

```
rm -f libframework.a libops.a libdycore.a libatmosphere.a *.o
```

```
( cd tools; make clean )
```

```
make[2]: Entering directory '/mnt/beegfs/joao.messias/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940/src/tools'
```

```
(cd input_gen; make clean)
```

3 Passo a passo da instalação do MONAN

```
make[2]: Leaving directory '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940/src/core_atmosphere'  
*****  
MPAS was built with default single-precision reals.  
Debugging is off.  
Parallel version is on.  
Papi libraries are off.  
TAU Hooks are off.  
MPAS was built with OpenMP enabled.  
MPAS was built without OpenMP-offload GPU support.  
MPAS was built without OpenACC accelerator support.  
Position-dependent code was generated.  
MPAS was built with .F files.  
The native timer interface is being used  
Using the SMIOL library.  
*****  
make[1]: Leaving directory '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940'
```

```
make[2]: Leaving directory '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940/src/core_init_atmosphere'  
*****  
MPAS was built with default single-precision reals.  
Debugging is off.  
Parallel version is on.  
Papi libraries are off.  
TAU Hooks are off.  
MPAS was built with OpenMP enabled.  
MPAS was built without OpenMP-offload GPU support.  
MPAS was built without OpenACC accelerator support.  
Position-dependent code was generated.  
MPAS was built with .F files.  
The native timer interface is being used  
Using the SMIOL library.  
*****
```

3 Passo a passo da instalação do MONAN

```
eduardo.khamis@headnode: /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon [main] $ ls MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940/
total 14M
-rwxrwxr-x 1 eduardo.khamis eduardo.khamis 8.1M Sep 27 11:10 atmosphere_model*
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 3.7K Sep 27 11:06 azure-pipelines.yml
drwxrwxr-x 2 eduardo.khamis eduardo.khamis 3 Sep 27 11:10 bin/
-rwxrwxr-x 1 eduardo.khamis eduardo.khamis 226K Sep 27 11:10 build_tables*
drwxrwxr-x 2 eduardo.khamis eduardo.khamis 7 Sep 27 11:10 default_inputs/
drwxrwxr-x 3 eduardo.khamis eduardo.khamis 4 Sep 27 11:06 docs/
-rwxrwxr-x 1 eduardo.khamis eduardo.khamis 4.7M Sep 27 11:10 init_atmosphere_model*
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 3.1K Sep 27 11:06 INSTALL
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 2.3K Sep 27 11:06 LICENSE
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 46K Sep 27 11:06 Makefile
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 80K Sep 27 11:10 make.output
-rwxrwxr-x 1 eduardo.khamis eduardo.khamis 3.9K Sep 27 11:06 make.sh*
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 1.3K Sep 27 11:08 namelist.atmosphere
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 1.5K Sep 27 11:10 namelist.init_atmosphere
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 2.8K Sep 27 11:06 README.md
drwxrwxr-x 14 eduardo.khamis eduardo.khamis 17 Sep 27 11:10 src/
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 1.5K Sep 27 11:08 stream_list.atmosphere.diagnostics
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 927 Sep 27 11:08 stream_list.atmosphere.output
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 9 Sep 27 11:08 stream_list.atmosphere.surface
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 1.6K Sep 27 11:08 streams.atmosphere
-rw-rw-r-- 1 eduardo.khamis eduardo.khamis 920 Sep 27 11:10 streams.init_atmosphere
drwxrwxr-x 5 eduardo.khamis eduardo.khamis 3 Sep 27 11:06 testing_and_setup/
```

3 Passo a passo da instalação do MONAN

Passo 4: `4.pre_monan.bash`

- Executa o pré-processamento do MONAN;
- Na sua área de download dos script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Execute os comando abaixo:
`source spack_wps/env_wps.sh`
`./4.pre_monan.bash`

Validação: após a execução, verifique se foram gerados os arquivos abaixo:

```
./MPAS/testcase/runs/ERA5/static/x1.1024002.static.nc  
./MPAS/testcase/runs/ERA5/2021010100/x1.1024002.init.nc  
./MPAS/testcase/runs/ERA5/2021010100/wpsprd/FILE:2021-01-01_00  
./MPAS/testcase/runs/ERA5/2021010100/wpsprd/FILE2:2021-01-01_00  
./MPAS/testcase/runs/ERA5/2021010100/wpsprd/FILE3:2021-01-01_00  
./MPAS/testcase/runs/ERA5/2021010100/wpsprd/GEO:1979-01-01_00  
./MPAS/testcase/runs/ERA5/2021010100/wpsprd/LSM:1979-01-01_00
```

3 Passo a passo da instalação do MONAN

```
eduardo.khamis@headnode: /mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon [main] $ ./4.pre_monan.bash
```

```
==> Copying ungrib.exe from WPS dir...
```

```
==> It takes several minutes...
```

```
==> Copying and decompressing testcase data...
```

```
==> Copyings scripts from MPAS_ori to MPAS testcase script folders...
```

```
'/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS_ori/testcase/scripts/link_grib.csh' -> '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/testcase/scripts/link_grib.csh'
```

```
'/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS_ori/testcase/scripts/ngrid2latlon.sh' -> '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/testcase/scripts/ngrid2latlon.sh'
```

```
'/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS_ori/testcase/scripts/prec.gs' -> '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/testcase/scripts/prec.gs'
```

```
'/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS_ori/testcase/scripts/run_mpas_gnu_egeon.bash' -> '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/testcase/scripts/run_mpas_gnu_egeon.bash'
```

```
'/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS_ori/testcase/scripts/static.sh' -> '/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/testcase/scripts/static.sh'
```

```
==> Copying and decompressing all data for preprocessing...
```

```
==> Creating make_static.sh for submitting init_atmosphere...
```

```
==> Executing sbatch make_static.sh...
```

```
Submitted batch job 280011
```

```
==> Creating submission scripts degrib, atmosphere_model...
```

```
/mnt/beegfs/eduardo.khamis/MONAN-scripts/egeon/MPAS/testcase/data/ERA5/2021010100  
FORECAST 2021010100
```

```
==> Submitting degrib_exe.sh...
```

```
Submitted batch job 280012
```

```
==> Submitting InitAtmos_exe.sh...
```

```
Submitted batch job 280013
```

3 Passo a passo da instalação do MONAN

Passo 5: `5.monan.bash`

- Executa-se o MONAN.
- Na sua área de download dos script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Execute o comando abaixo:
`./5.monan.bash`

Validação: após a execução, verifique se foram gerados os arquivos abaixo em:

```
./MPAS/testcase/runs/ERA5/2021010100/mpasprd:
```

```
diag.2021-01-01_08.00.00.nc  
diag.2021-01-01_09.00.00.nc  
diag.2021-01-01_10.00.00.nc
```

... até:

```
diag.2021-01-02_00.00.00.nc
```

CI: 2021-01-01 00:00 GMT
Res.: 24km x 55L
Timestep: 180s
Horizonte de previsão: 24h
Recursos: 8 nós com 64 cpn (fila batch)
I/O: Saídas a cada 3 horas

```
history.2021-01-01_00.00.00.nc  
history.2021-01-01_03.00.00.nc  
History.2021-01-01_06.00.00.nc
```

... até:

```
history.2021-01-02_00.00.00.nc
```

E o arquivo gerado no pré:

```
x1.1024002.init.nc
```

3 Passo a passo da instalação do MONAN

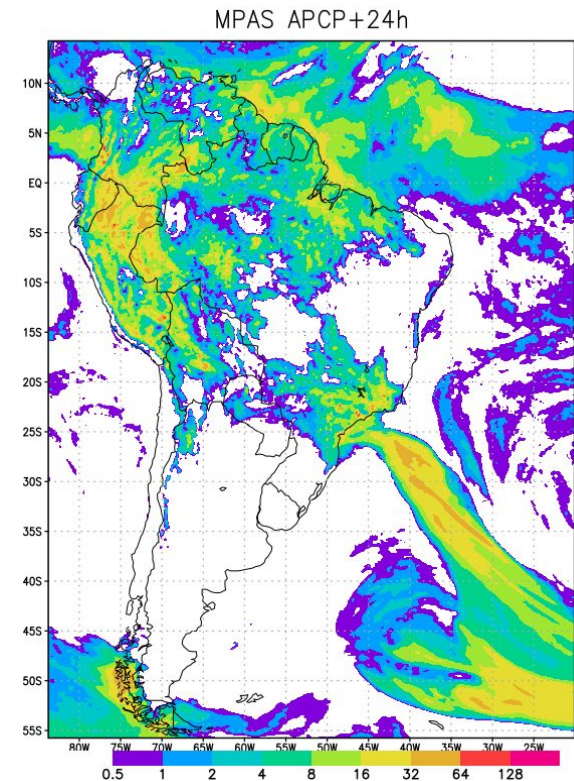
Passo 6: `6.pos_monan.bash`

- Executa-se o pós-processamento do MONAN.
- Na sua área de download dos script, subpasta egeon:
`cd /mnt/beegfs/$USER/MONAN-scripts/egeon`
- Execute o comando abaixo:
`./6.pos_monan.bash`

Validação: Usando o comando abaixo, verifique que a figura foi gerada e que se parece com a figura mais abaixo:

```
module load imagemagick-7.0.8-7-gcc-11.2.0-46pk2go
```

```
display ./MPAS/testcase/runs/ERA5/2021010100/postprd/MPAS.png
```



1. Introdução
2. Ambiente Computacional: Cluster Egeon
3. Passo a passo da instalação do MONAN
4. **Resumo**
5. Referências

4 Resumo

```
$> git clone https://github.com/monanadmin/MONAN-scripts.git

$> cd MONAN-scripts/egeon
$> ./1.install_spack.bash
$> source /mnt/beegfs/$USER/MONAN-scripts/egeon/spack_wps/env_wps.sh

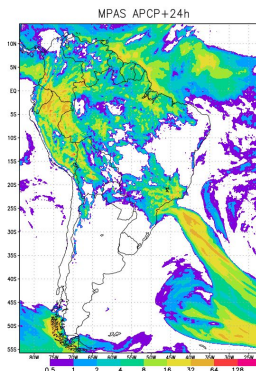
$> ./2.install_wps.bash

$> ./3.install_monan.bash https://github.com/<seu_usuario>/MONAN-Model.git
$> cd MPAS/src/MPAS-Model_v8.0.1_egeon.gnu940 && source make.sh && cd ../../..

$> ./4.pre_monan.bash

$> ./5.monan.bash

$> ./6.pos_monan.bash
$> module load imagemagick-7.0.8-7-gcc-11.2.0-46pk2go
$> display ./MPAS/testcase/runs/ERA5/2021010100/postprd/MPAS.png
```



1. Introdução
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5. **Referências**

5 Referências

- [1] Model for Prediction Across Scales-Atmosphere (MPAS-A) on INPE's EGEON System User's Guide. Julio P R Fernandez et al., 2023 . (Draft)
- [2] MPAS. <https://mpas-dev.github.io/>, de onde se encontra as *public releases*, referências para o repositório GitHub e manual.

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