Setup before the hands-on

Depending on whether you participate:

- having Autosubmit installed in your own laptop
- or you prefer to use a pre-installed Autosubmit in a VirtualBox machine image.

and you participate:

- having remote access to your own HPC facility (where EC-Earth 3.2beta is installed in)
- or you prefer to have remote access to a BSC MareNostrum temporary account-

you can follow instructions below:

a. **Virtual machine users**
   i. **Download the training session virtual machine**
      ftp://bscesftp.bsc.es/ec-earth.ova
      FTP-user: autosubmit
      FTP-password: you will receive a password after registration.
      1. Open it with VirtualBox and check that everything is working.
         User: autosubmit
         Password: autosubmit
   ii. **MareNostrum users:**
      1. change the MareNostrum user-ID on the .shh/config and put the one provided in the BSC document.
   iii. **If your are going to use your HPC:**
      1. Configure passwordless SSH access to the HPC you are going to use.
      2. Compile EC-Earth 3.2beta at the HPC you are going to use.

b. **Laptop users**
   i. **Install Autosubmit**
      1. Install autosubmit from pip.
         https://pypi.python.org/pypi/autosubmit
      2. Install GraphViz.
   ii. **Get EC-Earth 3.2beta**
      1. Get a local copy of EC-Earth 3.2beta sources.
   iii. **MareNostrum users:**
      1. Configure passwordless SSH access to MareNostrum using credentials provided in the BSC document.
   iv. **If your are going to use your HPC:**

1. Configure passwordless SSH access to the HPC you are going to use.
2. If you are going to use ECMWF's cca machine, install ecaccess web toolkit and run the command ecaccess-certificate-create.
3. Compile EC-Earth 3.2beta at the HPC you are going to use.

Tutorial

1. First step: Configure Autosubmit

Before creating any experiments, you need to configure your Autosubmit installation. There are two main paths that you will want to set up:

- Database path: Autosubmit uses a database to keep track of the experiments. This is the path that contains it.
- Experiment repository path: on this path autosubmit will create the experiments' folders. This is the one that you will need to access to configure and monitor your experiments.

c. Autosubmit configure

We will configure autosubmit to use a folder on your home directory. You will need to create it first:

mkdir ~/autosubmit

Next we will configure Autosubmit to use this folder to store the database and to use it as the experiment repository. The next command will configure it for your user:

autosubmit configure -db ~/autosubmit -lr ~/autosubmit

d. Autosubmit install

On this step we will create a new database for Autosubmit. Bear in mind that this command will overwrite your database if you have already created one, losing all the information it had. Be careful!

autosubmit install

2. Second step: Create a dummy experiment

Now, you are going to create a new dummy experiment: an experiment that will run jobs using a template with just a sleep() call inside. It is a good way to test Autosubmit workflow capabilities and to test platform configurations.

a. Autosubmit expid dummy

To register a new experiment you have to run the expid command:
autosubmit expid -H *HPCNAME* -d “Test for EC-Earth & Autosubmit training” -dm

You will need to substitute *HPCNAME* with the name of the platform you are going to use (e.g. marenostrum3).
Now you can check that in ~/autosubmit there is a new folder named a000 that will be the one that will store your experiment’s configuration and monitoring files.

b. Configure platform

The next step is to configure your platforms. On autosubmit you will always have a platform named LOCAL that corresponds to the machine running Autosubmit. For the HPC you have to edit the file ~/autosubmit/a000/conf/platforms_a000.conf with your prefered text editor. (From now on we will specify the paths relative to ~/autosubmit/a000)

For those who are using the virtual machine, you will have to use this configuration:

```
[marenostrum3]
# Queue type. Options: ps, SGE, LSF, SLURM, PBS, ecaccess
TYPE = lsf
HOST = mn
PROJECT = nct01
BUDGET = nct01:TECE02
USER = nct01XXX
SCRATCH_DIR = /gpfs/scratch
```

If you are using another machine, you will need to change the following parameters:

- TYPE: your scheduler type
- HOST: your host name
- PROJECT: your project name.
- BUDGET: by default, it is your project name. If that is the case, you can remove this line
- USER: your user on the machine
- SCRATCH_DIR: machine’s scratch folder path

c. Configure jobs

Now you need to configure the workflow. To do that, edit the file conf/jobs_a000.conf:

```
[LOCAL_SETUP]
FILE = copy-runtime.sh
PLATFORM = LOCAL

[SIM]
FILE = ece-ifs+nemo.sh
DEPENDENCIES = LOCAL_SETUP SIM-1
RUNNING = chunk
WALLCLOCK = 00:05
PROCESSORS = 2
PLATFORM = marenostrum3
```

d. Autosubmit create

Run “autosubmit create a000”. This command prepares the experiment to run.

e. Autosubmit run

Run “autosubmit run a000”. Now the experiment will start.

3. Third step: Run EC-Earth:

At this step, you have tested your autosubmit’s installation and your connection to the HPC. The time to run EC-Earth with autosubmit has arrived!

a. Configure expdef

Now you will transform your dummy experiment into a one that will run two months of simulation with EC-Earth 3.2beta. Edit conf/expdef_a000.conf:

- DATELIST = 19900101
- NUMCHUNKS = 2
- CHUNKSIZE = 1
- PROJECT_TYPE = local
- PROJECT_PATH = ECEARTH_3.2BETA_FOLDER/runtime/autosubmit (In the virtual machine the EC-Earth folder is ~/ec-earth)
- FILE_PROJECT_CONF = autosubmit.cfg

b. Configure jobs conf

On the previous run, we used a small wallclock and a small number of processors on the SIM jobs to reduce queuing time. Now you have to set up the real number of processors to use for your simulation. Edit again conf/jobs_a000.conf:

[LOCAL_SETUP]
FILE =copy-runtime.sh
PLATFORM = LOCAL

[SIM]
FILE =ece-ifs+nemo.sh
DEPENDENCIES = LOCAL_SETUP SIM-1
RUNNING = chunk
WALLCLOCK = **00:30**
PROCESSORS = **130**
PLATFORM = marenostrum3

c. Autosubmit create

Run “autosubmit create a000”. Autosubmit will create a copy of the runtime at the proj folder at this step and a new conf file that you will have to use.

d. Configure proj_conf

Models can provide a custom conf file for all parameters they need (e.g autosubmit.cfg). This file will serve as a template for autosubmit to create the file conf/proj_a000.conf. Edit it:

- NEM_NUMPROC = 64
- IFS_NUMPROC = 64

e. Run ec-conf

Go to ~/autosubmit/proj/autosubmit/config-run.xml and change this parameters on your machine configuration:

- ECEARTH_SRC_DIR: /gpfs/projects/nct00/nct00003/ec-earth/sources
- RUN_DIR: /gpfs/scratch/nct01/${USER}/${exp_name}/${run_start_date}/${member}/runtime
- INI_DATA_DIR: /gpfs/projects/nct00/nct00003/ec-earth/inidata

Then just run ec-conf:

~/ec-earth/sources/util/ec-conf/ec-conf --platform marenostrum3 config-run.xml

f. Autosubmit run

Execute “autosubmit run a000” and your experiment will start!