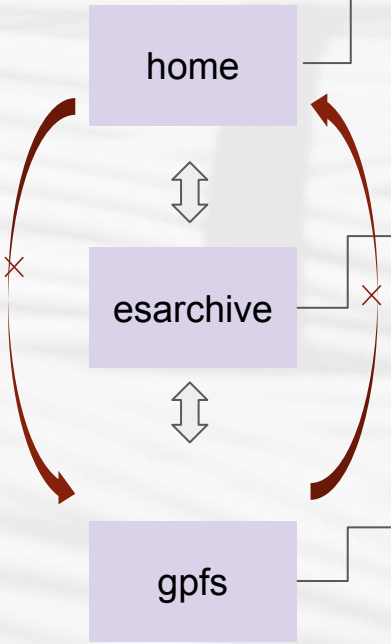
What do we know about BSC-ES infrastructure?

We **access to BSC infrastructure**:

- When we use our workstations in the office
- When we connect to our bscearthXXX.int.bsc.es (with VPN on)
- https://docs.google.com/spreadsheets/d/1PXzbKlh0BVDfLg3HSoq64-3kb-DNgcw5_KeT5vdY3Z4/edit#gid=0
- For windows https://earth.bsc.es/wiki/doku.php?id=computing:sshwindows

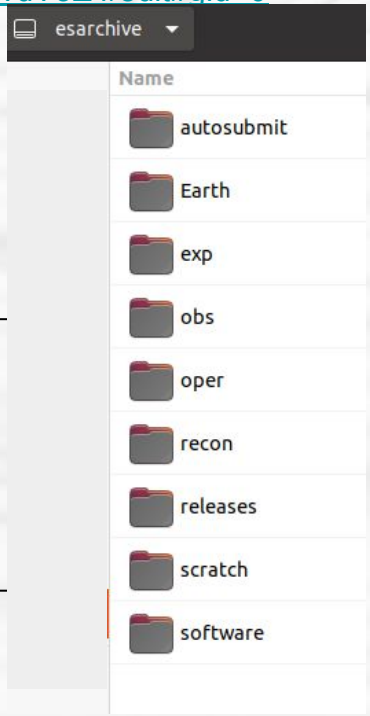
There, we found **partitions**:



First entry point.
/home/Earth/*username*
Internet connexion
Limit space: 50 GB per user
Tips:https://earth.bsc.es/wiki/doku.php?id=computing:workstations
https://earth.bsc.es/wiki/doku.php?id=computing:sharedstorage

Data storage for BSC-ES department
/esarchive/scratch/*username*
Internet connexion
Limit space for all users
Tip: add esarchive partition in a laptop (forbidden in windows):
https://earth.bsc.es/wiki/doku.php?id=computing:addesarchive

Accessible from machines (e.g.: Nord3)
/gpfs/scratch/bsc32/bsc32XXX
No internet connexion
Limit space for all users



PARTITIONS

What do we know about BSC-ES infrastructure?

It is also possible to connect to BSC infrastructure through **servers** (physical machines):

- bscearth000.int.bsc.es/ bscearth001.int.bsc.es
  - download data
  - run the automatic package tests (GitLab CI, see e.g.: https://earth.bsc.es/gitlab/es/s2dv/-/pipelines)
- Shiny server
  - bscesshiny01.bsc.es
- bscesftp.bsc.es
  - share files https://earth.bsc.es/wiki/doku.php?id=computing:public_ftp

SERVERS

What do we know about BSC-ES infrastructure?

Software stack is a collection of programms and modules (including the operating system, architectural layers, protocols, runtime environments, …) that are installed in a machine.

- ★ The software stack at BSC could be different among machines and departments
- ★ We have access to:
  - BSC software stack (not managed by CES)
  - BSC-ES software stack (managed by CES)
    - workstations already using it
    - in some machines, we should edit the **bashrc** to use it (instructions are always in the wiki: https://earth.bsc.es/wiki/doku.php?id=library:computing)
    - It is built on **modules**, useful commands:
      - *module list*
      - *module load R*
      - *module av*
    - other softwares like mendeley can be open in the workstation: */shared/earth/software/mendeley/latest/bin/mendeleydesktop*
- ★ Open an issue in **request** to ask for new software or R packages

SOFTWARE STACK

What do we know about BSC-ES infrastructure?

Which information we need to know for each machine?

- does it have bsc-es software?
- bidirectional connection
- internet
- slurm/lsf
- memory per node ….

Nord3
Marenostrum 4
workstations
Marenostrum 5
AMD cluster
Power 9
Nord3_v2

Find the information: https://earth.bsc.es/wiki/doku.php?id=library:computing

SOFTWARE STACK

What do we know about BSC-ES infrastructure?

workstations

- R 3.6.1
- To be use for debugging code (small data) or running startR workflow in remote machines
- BSC-ES software stack
- access esarchive
-

Nord3

- R 3.6.2
- To be use for running jobs
- **lsf** job scheduler
- No internet connexion
- no bidirectional connexion
- **will be deprecated**
- BSC-ES software stack
- X11 ssh -X

Nord3_v2

- R 3.6.2
- To be use for running jobs
- **slurm** job scheduler
- Internet connexion
- bidirectional?
- BSC-ES software stack

Marenostrum 4

- shared machine in BSC
- R 3.6.1
- To be use for running jobs
- BSC software stack

AMD cluster

- R 3.6.1
- To be use for running jobs
- BSC-ES software stack
- no acces to esarchive

Marenostrum 5

- coming soon?

Power 9

- BSC-ES software stack
- only for GPU users
- Can R use GPUs?
  e.g: gpuR

MACHINES

What do we know about BSC-ES infrastructure?

Recommendations

- ★ Work in the BSC environment (avoid local copies of files)
  Follow steps to **use workstation remotely**:
  https://earth.bsc.es/wiki/doku.php?id=computing:workstationsgraphicallyremotely

- ★ Save your scripts in GitLab (intermediate and final versions)
  - In an existing gitlab project
  - In a personal project
  - Documentation: https://earth.bsc.es/wiki/doku.php?id=library:computing#git
  - Clone the repo under /esarchive/scratch/*username*
    - You will have internet connexion to push your changes
    - The code will be accessible from workstation and Nord3
    - There is no backup copy of esarchive (that's a good reason to use gitlab)

- ★ Don't install local versions of R packages
  - if so, we cannot debug the code an reproduce the errors
  - better to open an issue in request to ask for the installation

- ★ Infrastructure in the wiki:
  https://earth.bsc.es/wiki/doku.php?id=library:best_practices#network_infrastructure

RECOMMENDATIONS

What do we know about BSC-ES infrastructure?

Problems [Núria has, who else? what else?]

- I would like to source() functions from gitlab directly

```
> source("https://earth.bsc.es/gitlab/es/startR/-/blob/master/R/AddStep.R")
Error in source("https://earth.bsc.es/gitlab/es/startR/-/blob/master/R/AddStep.R") :
  https://earth.bsc.es/gitlab/es/startR/-/blob/master/R/AddStep.R:1:1: unexpected '<'
1: <
   ^
```

Solution:

```
> source("https://earth.bsc.es/gitlab/es/s2dv/-/raw/master/R/PlotLayout.R")
```

PROBLEMS

What do we know about BSC-ES infrastructure?

Problems [Núria has, who else? what else?]

- When connecting to Nord3, I don’t see the list of modules availables

```
bsc32339@login3:~> module av
'' for 'reading'ERROR:50: Cannot open file ''
'' for 'reading'ERROR:50: Cannot open file ''
'' for 'reading'ERROR:50: Cannot open file ''
'' for 'reading'ERROR:50: Cannot open file ''
'' for 'reading'ERROR:50: Cannot open file ''
'' for 'reading'ERROR:50: Cannot open file ''
'' for 'reading'ERROR:50: Cannot open file ''
```

- It works correctly for me in Nord3_v2.

- If you find a similar error, ask R team, Albert Vila or Kim.

PROBLEMS

What do we know about BSC-ES infrastructure?

Doubts [Núria has, who else? what else?]

- interactive session is possible from all machines? Yes
- if so, which allow pop-up windows to display plots? Do we need always a X11 terminal?
  - **type “xterm” to check**

PROBLEMS

RStudio

RStudio

1) From the workstation (or ssh -X user@bscearthXXX.int.bsc in a terminal):
   - module load RStudio
   - module load R/3.6.1-foss-2015a-bare
   - rstudio &

2) From laptop:
   - Follow steps to use workstation remotely: https://earth.bsc.es/wiki/doku.php?id=computing:workstationsgraphicallyremotely
   - Follow steps 1 (above)