

1.- Nos conectamos a la raspberry para utilizar las consola de python

```
macbook — pi@rpi-lania4: ~ — ssh pi@rpi-lania4.local — 80x24
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Wed Jun  7 17:51:34 2017 from 192.168.10.227
-bash: PATH: command not found
[pi@rpi-lania4:~ $ python
Python 2.7.9 (default, Sep 17 2016, 20:26:04)
[GCC 4.9.2] on linux2
Type "help", "copyright", "credits" or "license" for more information.
[>>> from mpi4py import mpi
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ImportError: cannot import name mpi
[>>> from mpi4py import MPI
[>>> comm = MPI.COMM_WORLD
[>>> rank = comm.Get_rank()
[>>> size = comm.Get_size()
[>>> Data = [1.0,2.0,3.0,4.0]
[>>> rank
0
[>>> comm.send(Data, dest=0, tag=0)
[>>> Data = comm.recv(source=0, tag=0)
[>>> Data
[1.0, 2.0, 3.0, 4.0]
[>>> ]
```

2.- Salimos de la consola para crear la carpeta "comades" en el directorio raíz.

```
macbook — pi@rpi-lania4: ~ — ssh pi@rpi-lania4.local — 80x24
[>>> rank = comm.Get_rank()
[>>> size = comm.Get_size()
[>>> Data = [1.0,2.0,3.0,4.0]
[>>> rank
0
[>>> comm.send(Data, dest=0, tag=0)
[>>> Data = comm.recv(source=0, tag=0)
[>>> Data
[1.0, 2.0, 3.0, 4.0]
[>>> quit()
[pi@rpi-lania4:~ $ ls
2017-05-24-200504_1440x900_scrot.png Documents Pictures mpi_testing
2017-06-07-174303_656x416_scrot.png Downloads Public mpich2
2017-06-07-174425_656x416_scrot.png Imagenes Scratch mpich_build
2017-06-07-174516_656x416_scrot.png Music Templates python_games
Desktop PATH Videos
[pi@rpi-lania4:~ $ mkdir comades
[pi@rpi-lania4:~ $ ls
2017-05-24-200504_1440x900_scrot.png Documents Pictures comades
2017-06-07-174303_656x416_scrot.png Downloads Public mpi_testing
2017-06-07-174425_656x416_scrot.png Imagenes Scratch mpich2
2017-06-07-174516_656x416_scrot.png Music Templates mpich_build
Desktop PATH Videos python_games
pi@rpi-lania4:~ $ ]
```

3.- Nos posicionamos en la carpeta creada y abrimos un archivo de Python utilizando nano.

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
0
[>>> comm.send(Data, dest=0, tag=0)
[>>> Data = comm.recv(source=0, tag=0)
[>>> Data
[1.0, 2.0, 3.0, 4.0]
[>>> quit()
[pi@rpi-lania4:~ $ ls
2017-05-24-200504_1440x900_scrot.png Documents Pictures mpi_testing
2017-06-07-174303_656x416_scrot.png Downloads Public mpich2
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2017-06-07-174516_656x416_scrot.png Music Templates python_games
Desktop PATH Videos
[pi@rpi-lania4:~ $ mkdir comades
[pi@rpi-lania4:~ $ ls
2017-05-24-200504_1440x900_scrot.png Documents Pictures comades
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2017-06-07-174425_656x416_scrot.png Imagenes Scratch mpich2
2017-06-07-174516_656x416_scrot.png Music Templates mpich_build
Desktop PATH Videos python_games
[pi@rpi-lania4:~ $ cd comades/
[pi@rpi-lania4:~/comades $ ls
[pi@rpi-lania4:~/comades $ mkdir python
[pi@rpi-lania4:~/comades $ cd python/
[pi@rpi-lania4:~/comades/python $ nano primero.py
```

4.- Dentro del archivo escribimos la siguiente instrucción.

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
GNU nano 2.2.6 File: primero.py

#!/usr/bin/env python

from mpi4py import MPI

comm = MPI.COMM_WORLD
rank = comm.Get_rank()

if rank == 0:
    data = {'a':7, 'b':3.14159}
    comm.send(data, dest=1, tag=11)
    print ('de rank 0: ')
    print (data)
else:
    data = comm.recv(source=0, tag=11)
    print ('de ' + str(rank) + ': ')
    print(data)

[ Wrote 16 lines ]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
```

5.- Utilizamos la siguiente instrucción para ejecutar el archivo Python en los clusters.

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
[>>> Data = comm.recv(source=0, tag=0)
[>>> Data
[1.0, 2.0, 3.0, 4.0]
[>>> quit()
[pi@rpi-lania4:~ $ ls
2017-05-24-200504_1440x900_scrot.png Documents Pictures mpi_testing
2017-06-07-174303_656x416_scrot.png Downloads Public mpich2
2017-06-07-174425_656x416_scrot.png Imagenes Scratch mpich_build
2017-06-07-174516_656x416_scrot.png Music Templates python_games
Desktop PATH Videos
[pi@rpi-lania4:~ $ mkdir comades
[pi@rpi-lania4:~ $ ls
2017-05-24-200504_1440x900_scrot.png Documents Pictures comades
2017-06-07-174303_656x416_scrot.png Downloads Public mpi_testing
2017-06-07-174425_656x416_scrot.png Imagenes Scratch mpich2
2017-06-07-174516_656x416_scrot.png Music Templates mpich_build
Desktop PATH Videos python_games
[pi@rpi-lania4:~ $ cd comades/
[pi@rpi-lania4:~/comades $ ls
[pi@rpi-lania4:~/comades $ mkdir python
[pi@rpi-lania4:~/comades $ cd python/
[pi@rpi-lania4:~/comades/python $ nano primero.py
[pi@rpi-lania4:~/comades/python $ mpiexec -n 3 --host rpi-lania4.local, rpi-lania
3.local
```

6.-

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
while attempting to start process rank 0.
-----
3 total processes failed to start
[pi@rpi-lania4:~/comades/python $ export PATH=$PATH:/home/rpimpi/mpich2-install/b]
in
[pi@rpi-lania4:~/comades/python $ which mpicc
/home/rpimpi/mpich2-install/bin/mpicc
[pi@rpi-lania4:~/comades/python $ mpiexec -n 3 --host rpi-lania4.local, rpi-lania
3.local python primero.py
-----
mpiexec was unable to launch the specified application as it could not find an e
xecutable:

Executable: rpi-lania3.local
Node: rpi-lania4

while attempting to start process rank 0.
-----
3 total processes failed to start
[pi@rpi-lania4:~/comades/python $ which mpiexec
/usr/bin/mpiexec
[pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania3
.local python primero.py
```

7.-

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
/home/rpimpi/mpich2-install/bin/mpicc
[pi@rpi-lania4:~/comades/python $ mpiexec -n 3 --host rpi-lania4.local, rpi-lania3.local python primero.py]

-----
mpiexec was unable to launch the specified application as it could not find an executable:

Executable: rpi-lania3.local
Node: rpi-lania4

while attempting to start process rank 0.
-----
3 total processes failed to start
[pi@rpi-lania4:~/comades/python $ which mpiexec]
/usr/bin/mpiexec
[pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania3.local python primero.py]
The authenticity of host 'rpi-lania3.local (192.168.100.98)' can't be established.
ECDSA key fingerprint is 83:43:75:73:60:68:d2:ad:fb:49:94:03:8a:5f:8a:41.
[Are you sure you want to continue connecting (yes/no)? yes]
Warning: Permanently added 'rpi-lania3.local,192.168.100.98' (ECDSA) to the list of known hosts.
pi@rpi-lania3.local's password: █
```

7.-

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
[pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania3.local python primero.py]
[pi@rpi-lania3.local's password: ]
python: can't open file 'primero.py': [Errno 2] No such file or directory
^Cmpiexec: killing job...

[pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania3.local python primero.py]
[pi@rpi-lania3.local's password: ]
python: can't open file 'primero.py': [Errno 2] No such file or directory
^Cmpiexec: killing job...

[pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania1.local python primero.py]
The authenticity of host 'rpi-lania1.local (192.168.100.78)' can't be established.
ECDSA key fingerprint is 0b:8f:70:24:19:a0:6c:88:78:8a:41:3a:f9:e1:20:3a.
[Are you sure you want to continue connecting (yes/no)? yes]
Warning: Permanently added 'rpi-lania1.local,192.168.100.78' (ECDSA) to the list of known hosts.
[pi@rpi-lania1.local's password: ]
de rank 0:
{'a': 7, 'b': 3.14159}
█
```

8.- Se ejecuta el archivo en los clusters indicados.

```
macbook — pi@rpi-lania4: ~/comades/python — ssh pi@rpi-lania4.local — 80...
pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania0
.local python primero.py
The authenticity of host 'rpi-lania0.local (192.168.100.106)' can't be establish
ed.
ECDSA key fingerprint is fe:8e:b1:92:a3:b1:8b:fd:c6:71:8a:f1:4d:d8:c8:7f.
[Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'rpi-lania0.local,192.168.100.106' (ECDSA) to the lis
t of known hosts.
[pi@rpi-lania0.local's password:
Permission denied, please try again.
[pi@rpi-lania0.local's password:
Permission denied, please try again.
[pi@rpi-lania0.local's password:
mpiexec: killing job...

[pi@rpi-lania4:~/comades/python $ nano primero.py
pi@rpi-lania4:~/comades/python $ mpiexec -n 2 --host rpi-lania4.local,rpi-lania2
.local python primero.py
[pi@rpi-lania2.local's password:
de rank 0:
{'a': 7, 'b': 3.14159}
de 1:
{'a': 7, 'b': 3.14159}
pi@rpi-lania4:~/comades/python $
```