

Note on general tools



Agenda

- Python
- R



Python

- has MPI interface
- mpi4py - <https://bitbucket.org/mpi4py/>



Hello world

```
#!/usr/bin/env python
```

```
from mpi4py import MPI
```

```
comm = MPI.COMM_WORLD
```

```
size = comm.Get_size()
```

```
rank = comm.Get_rank()
```

```
name = MPI.Get_processor_name()
```

```
parent = comm.Get_parent()
```

```
print "Hello from process {0} of {1} on {2}".\n      format(rank, size, name)
```



Submitting

```
qsub -l mppwidth=32 -I  
cd /work/$USER  
module load python  
aprun -B python ./mpihi.py
```



Tutorials and examples

- <https://www.howtoforge.com/tutorial/distributed-parallel-programming-python-mpi4py/>
- <https://github.com/jbornschein/mpi4py-examples>



Rmpi

- <http://www.stats.uwo.ca/faculty/yu/Rmpi/>
- export TMP in the job script, e.g.

```
cd /work/$USER/$MY_EXPERIMENT  
[ -d tmp ] || mkdir tmp  
export TMP=`pwd`/tmp
```
- Copy .Rprofile from /work/shared/course2015/R



Hello world

```
#Tell all slaves to return a message identifying themselves.
```

```
mpi.remote.exec(paste("I  
am",mpi.comm.rank(),"of",mpi.comm.size()))  
mpi.remote.exec(paste(mpi.comm.get.parent()))
```

```
#Send execution commands to the slaves
```

```
x<-5
```

```
#These would all be pretty correlated one would think
```

```
x<-mpi.remote.exec(rnorm,x)
```

```
length(x)
```

```
x
```



Submitting

```
qsub -l mppwidth=32 -I
```

```
cd /work/$USER
```

```
[ -d tmp ] || mkdir tmp
```

```
export TMP=`pwd`/tmp
```

```
module load R/3.2.2
```

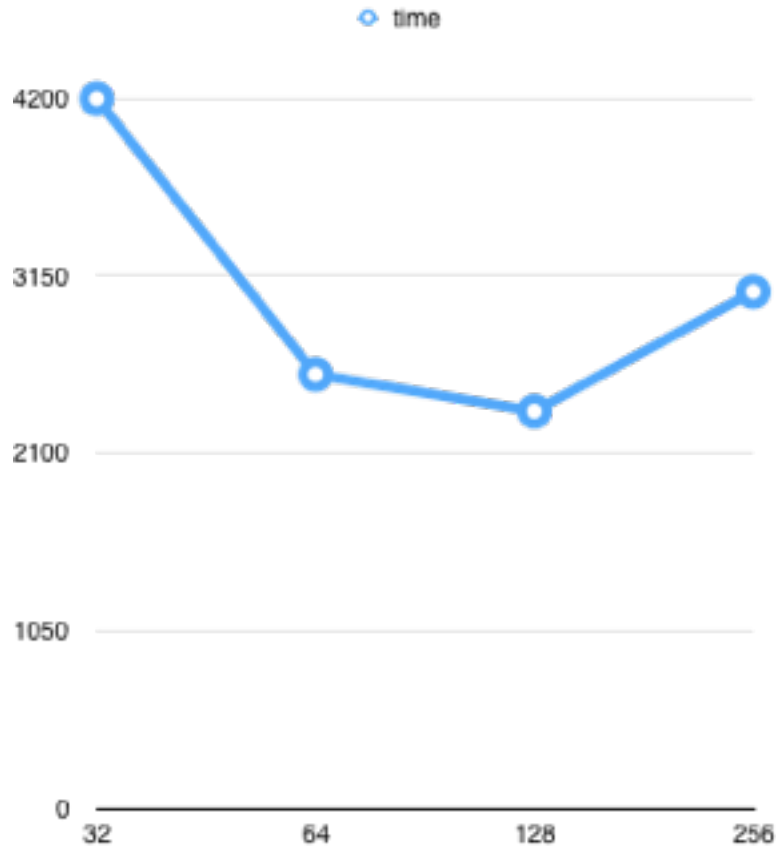
```
aprun -B R CMD BATCH hello.R
```

Important!: Keep .Rprofile in the working directory



Scaling (random.R)

- `mpi.iparReplicate(400, mean(rnorm(1000000)))`



Tutorials and examples

- <https://bioinfomagician.wordpress.com/2013/11/25/mpi-tutorial-for-r-mpi/>
- https://www.sharcnet.ca/help/index.php/Using_R_and_MPI



snow for R

- Supports
 - Sockets
 - PVM
 - MPI
- <https://cran.r-project.org/web/packages/snow/>
- <http://www.sfu.ca/~sblay/R/snow.html>
- Not installed on Hexagon





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