SBU Cluster: SARMAD

Present By:

SARMAD ADMIN

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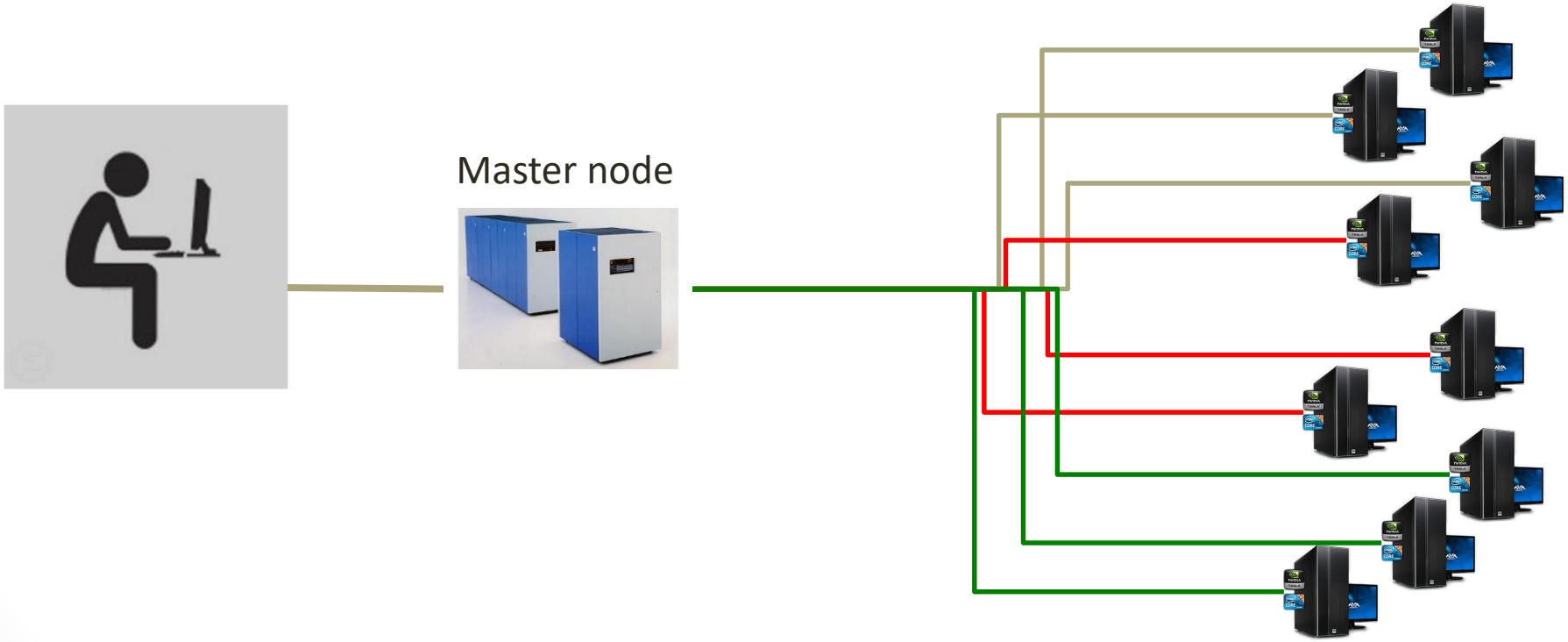
Outline

- Introduction to Cluster and its advantages
- Cluster resources
- How to login
- How to transfer data
- How to use Torque job scheduler
  - Submitting jobs
  - Monitoring jobs
  - Deleting jobs
- Running some samples

What is the Cluster?

- Like a large collection of high-cores and memory computers.
- Controlled by management software (Torque) which allocates tasks to each computer (node).

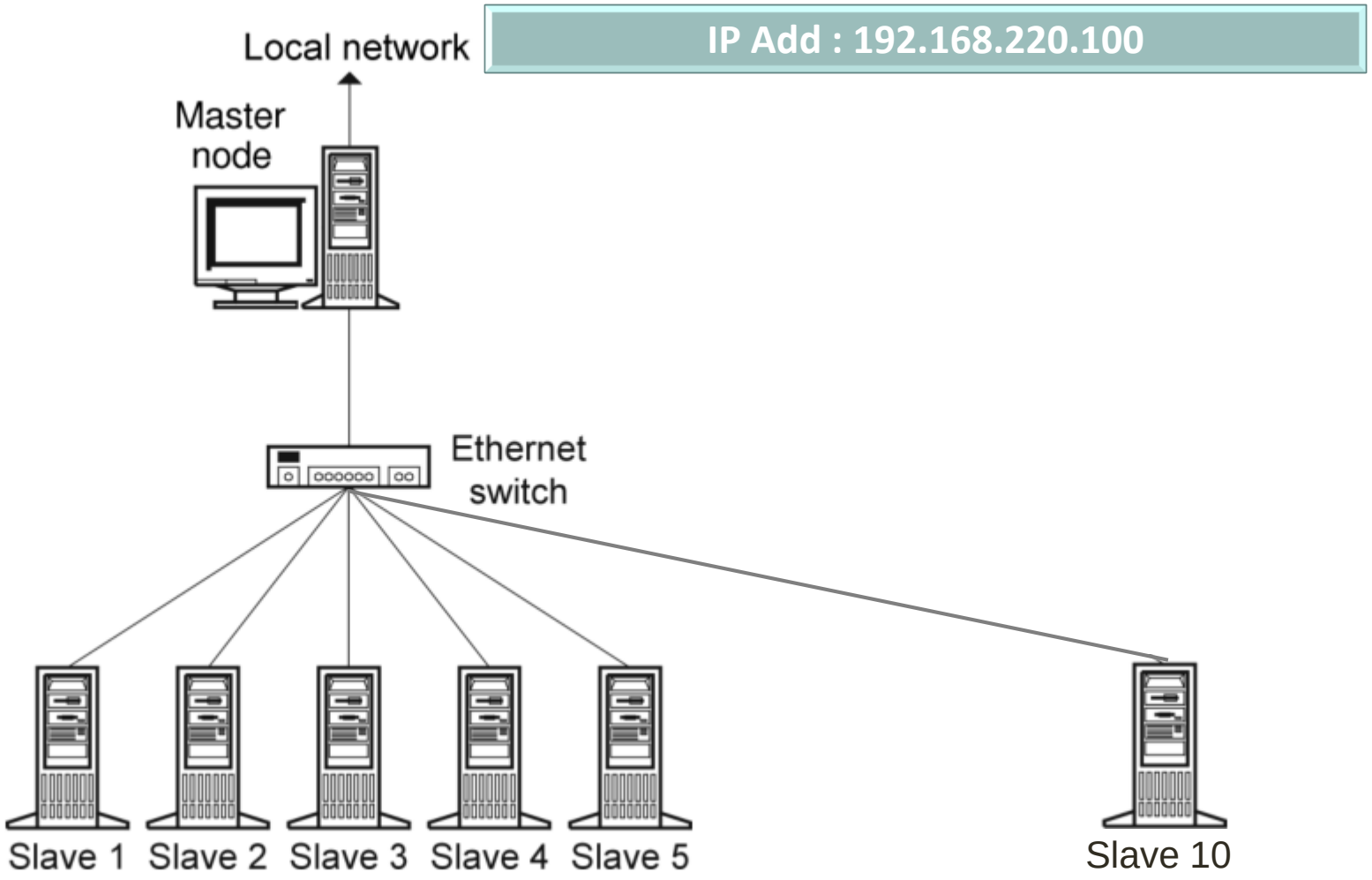


Cluster advantage …

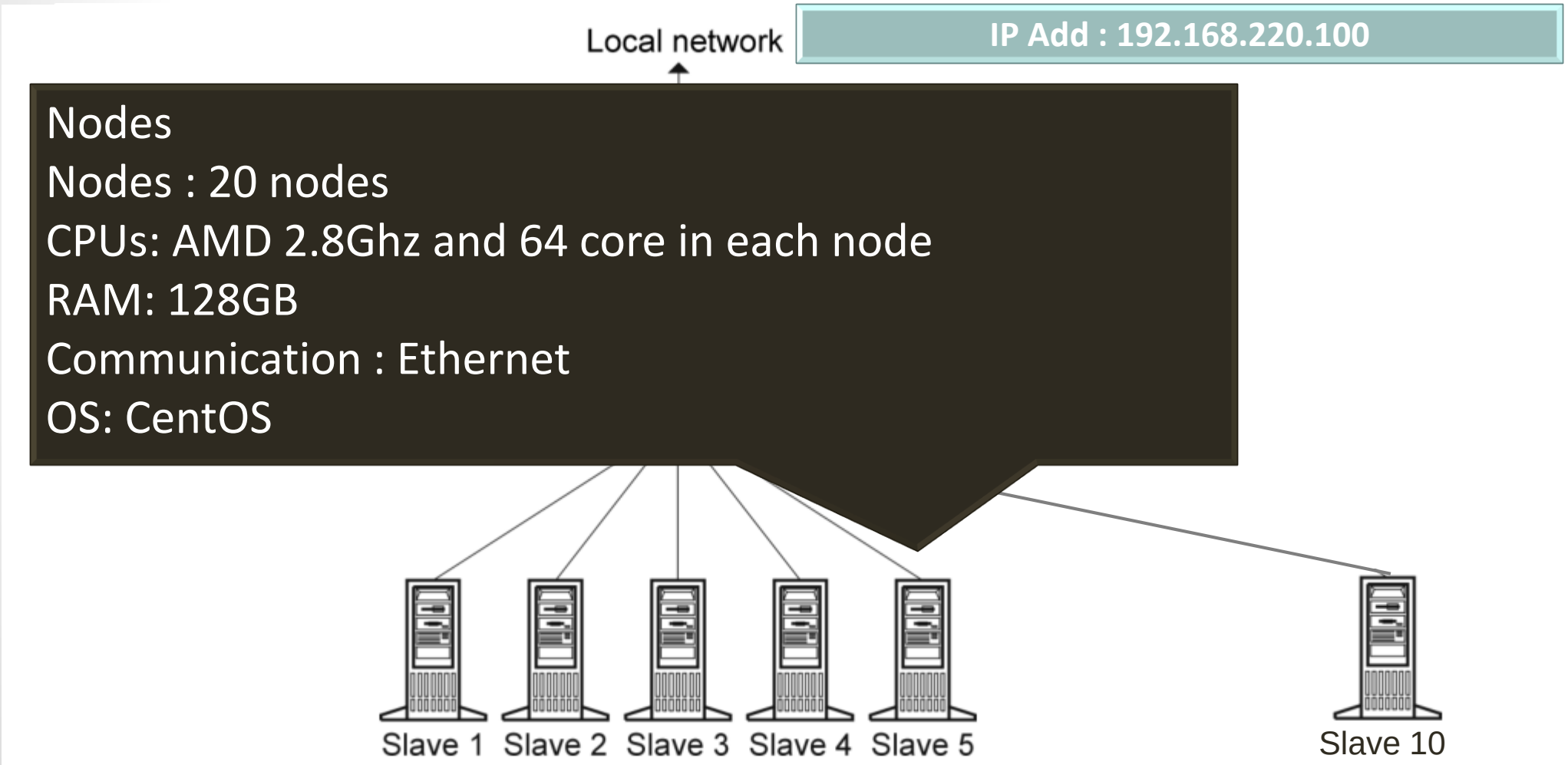
- Send computing tasks somewhere else
  - leave your PC free for other tasks.
- Carry out memory-intensive jobs
  - 4GB RAM on PC, up to 128GB RAM on cluster.
- Faster program execution using parallel coarse
  - Over 30Tflops
- Install programs once, use by everyone.

CLUSTER RESOURCES

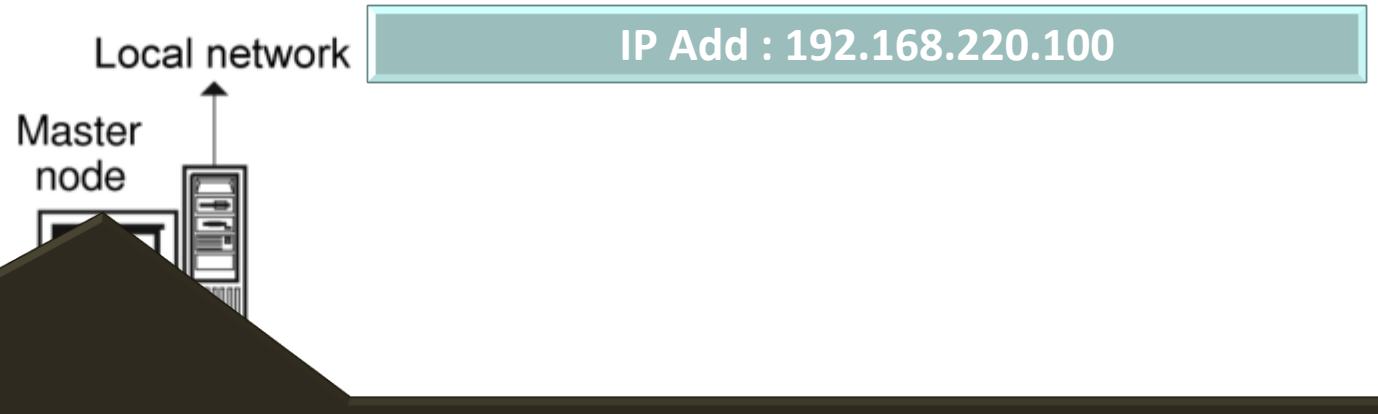
Cluster & Resources



Cluster & Resources



Cluster Config & Resources

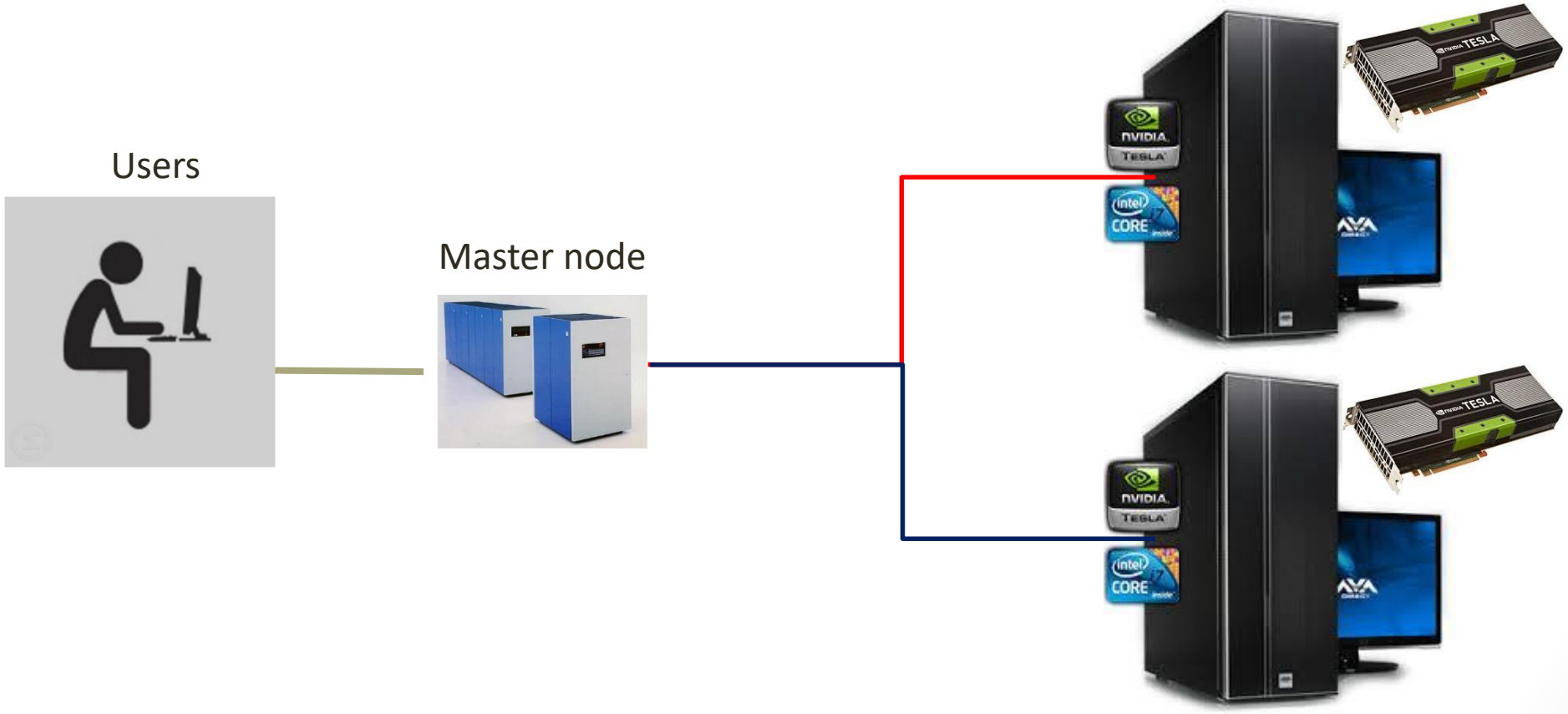


Cluster Policy:

- Hard disk usage is limited to 20 GB.
- Limited allocation of nodes and cores to 64 cores
- Server might be unstable for maintained and etc.

GPU Nodes

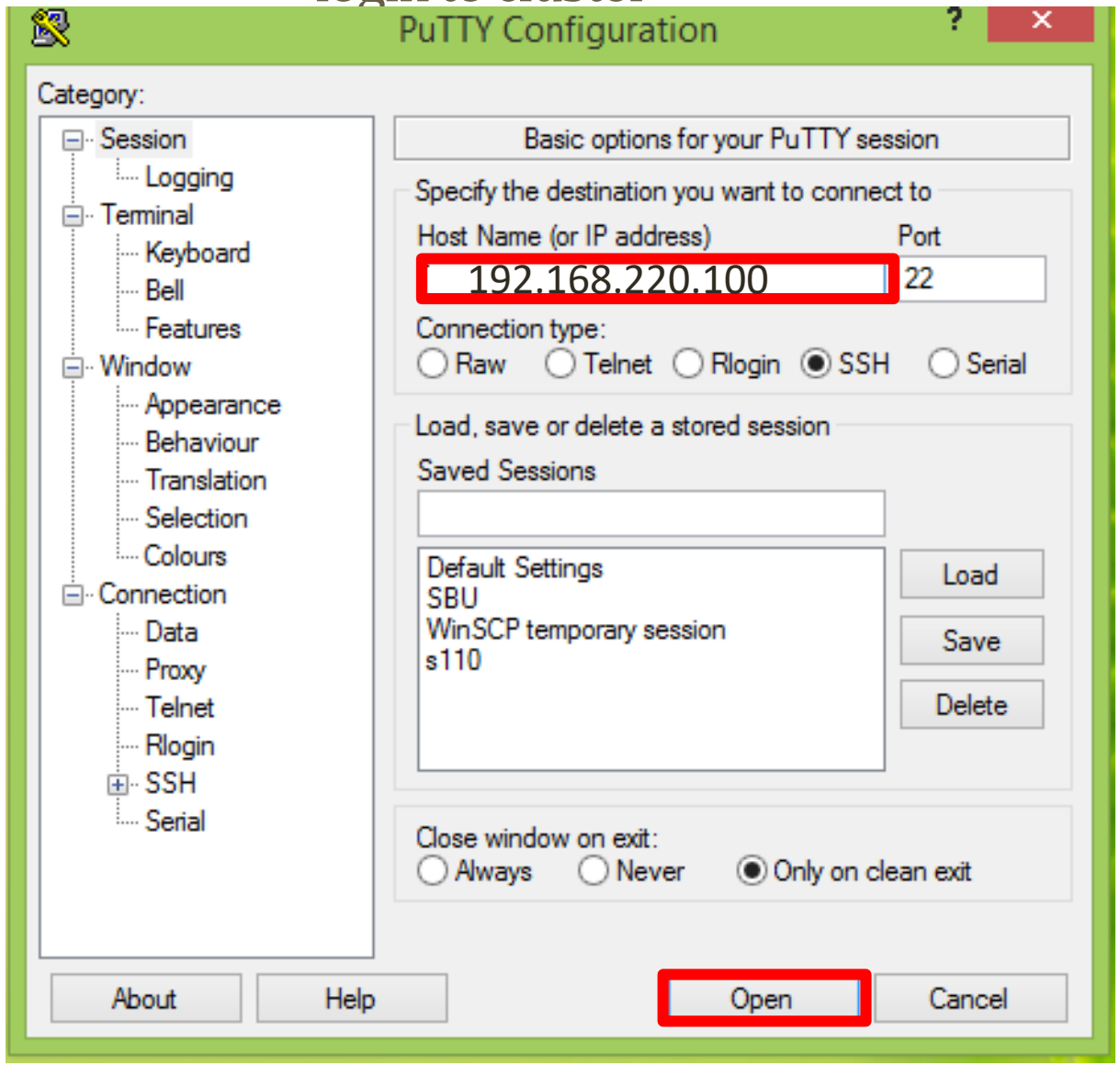
2 Nodes : Tesla K20X (2688 CUDA cores, 8GB GDDDR5)



HOW TO USE…

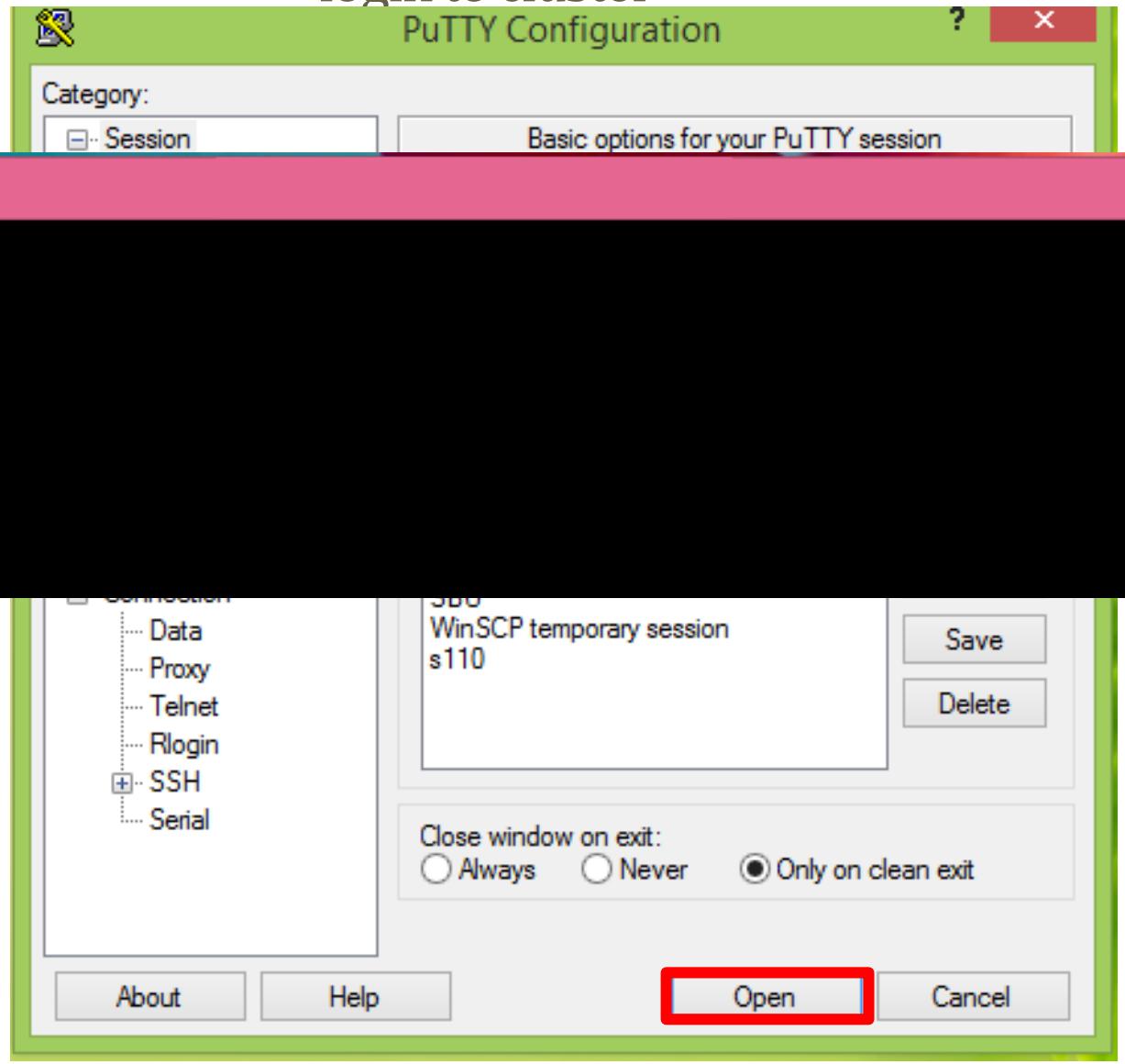
Putty

login to cluster



Putty

login to cluster



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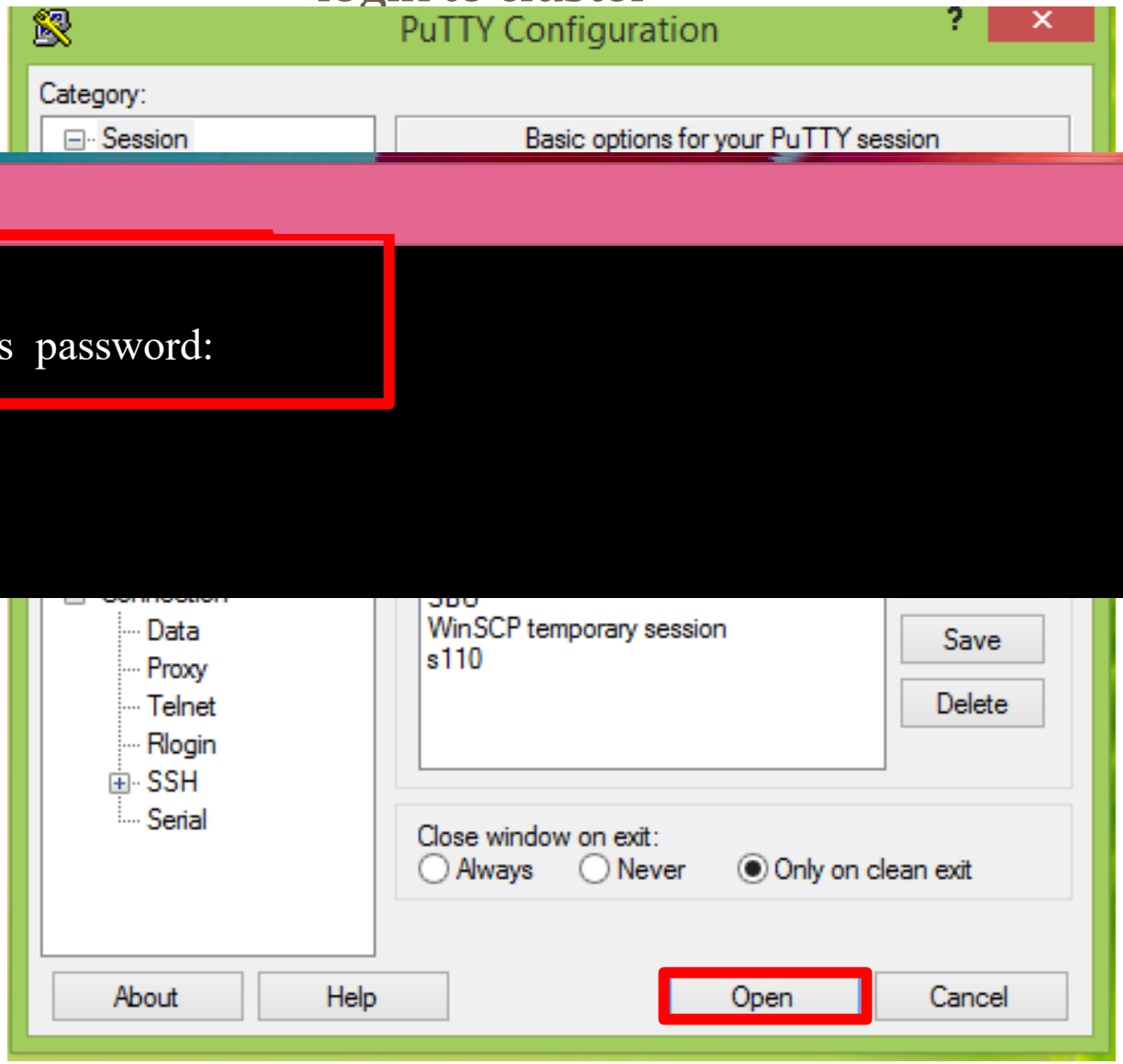
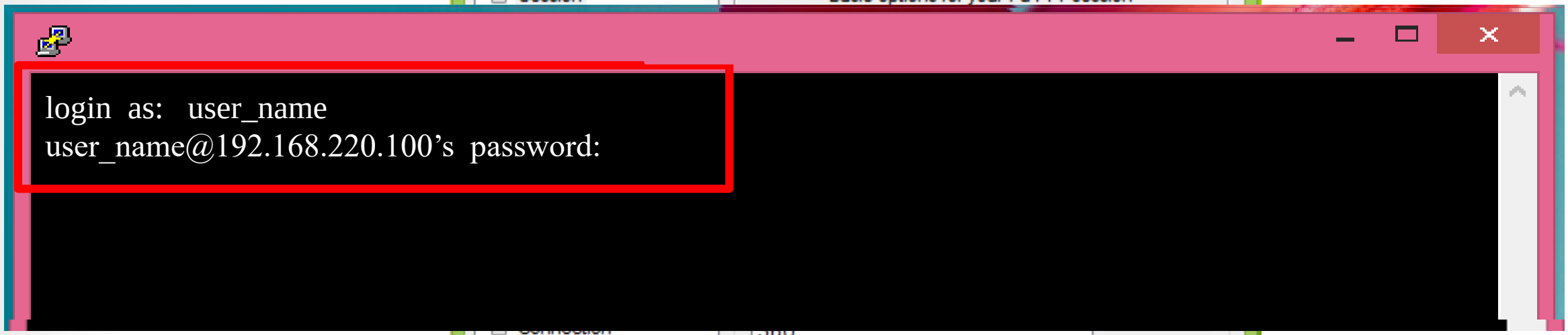
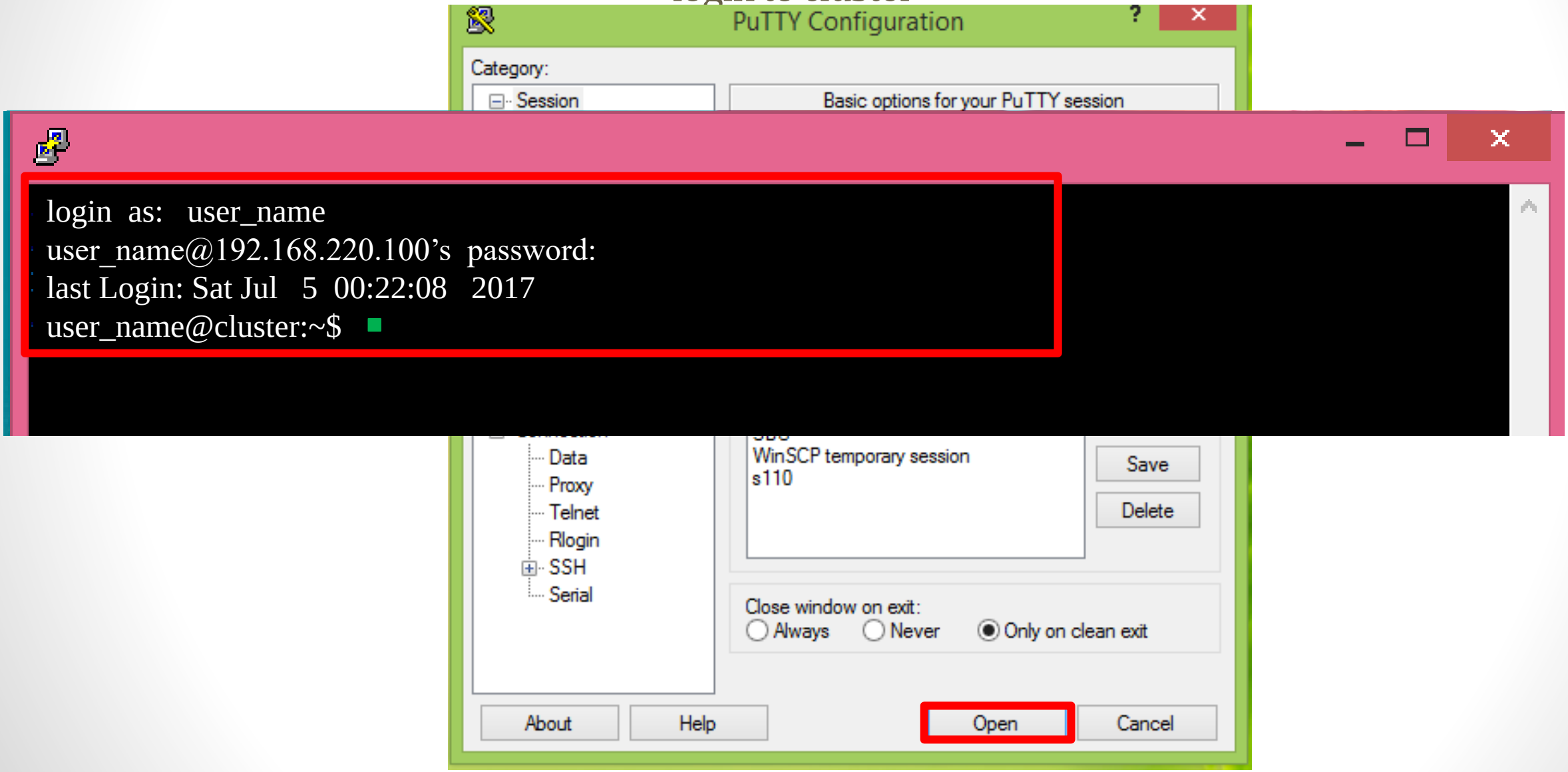
login to cluster





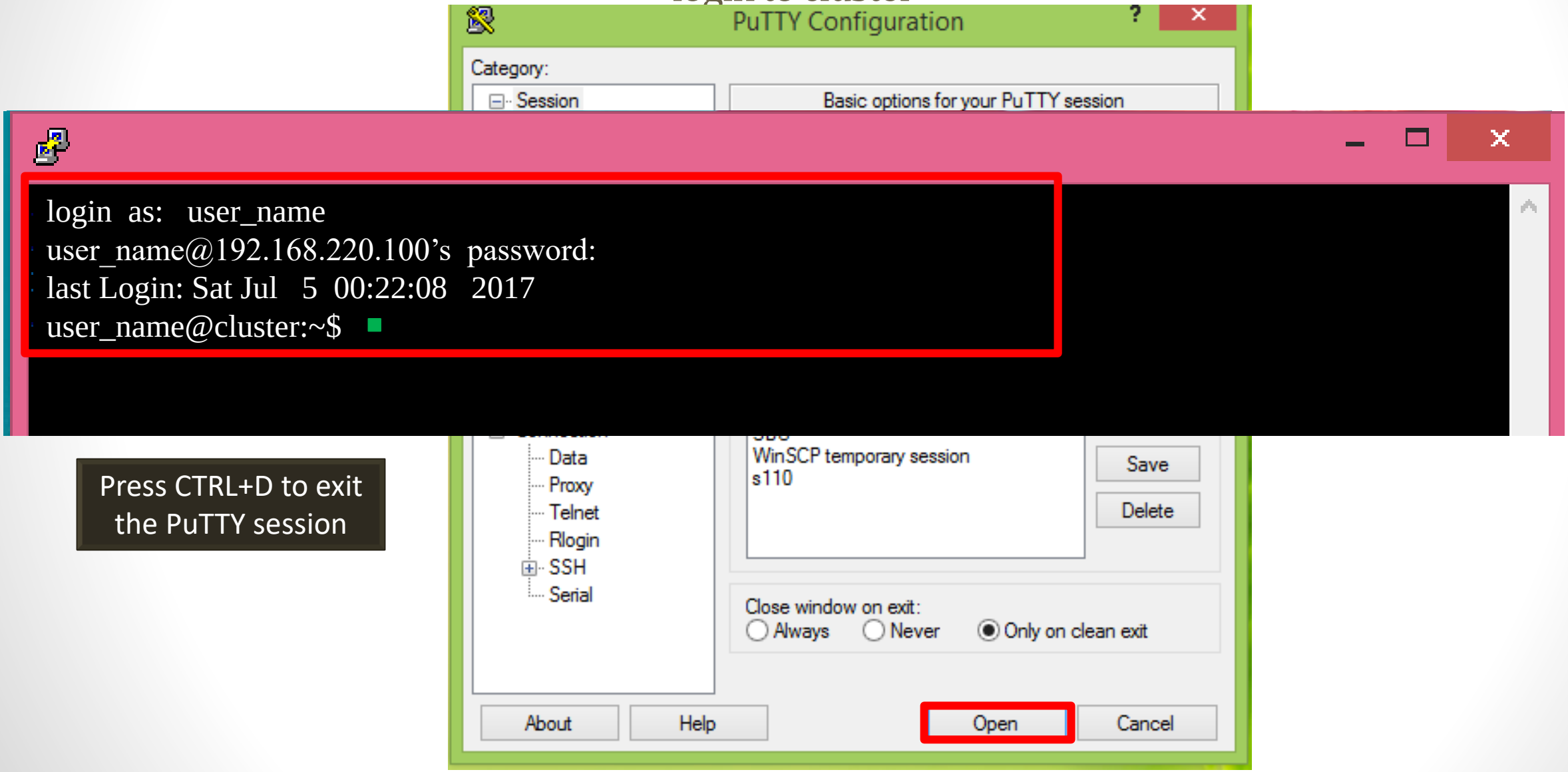
Putty

login to cluster



Putty

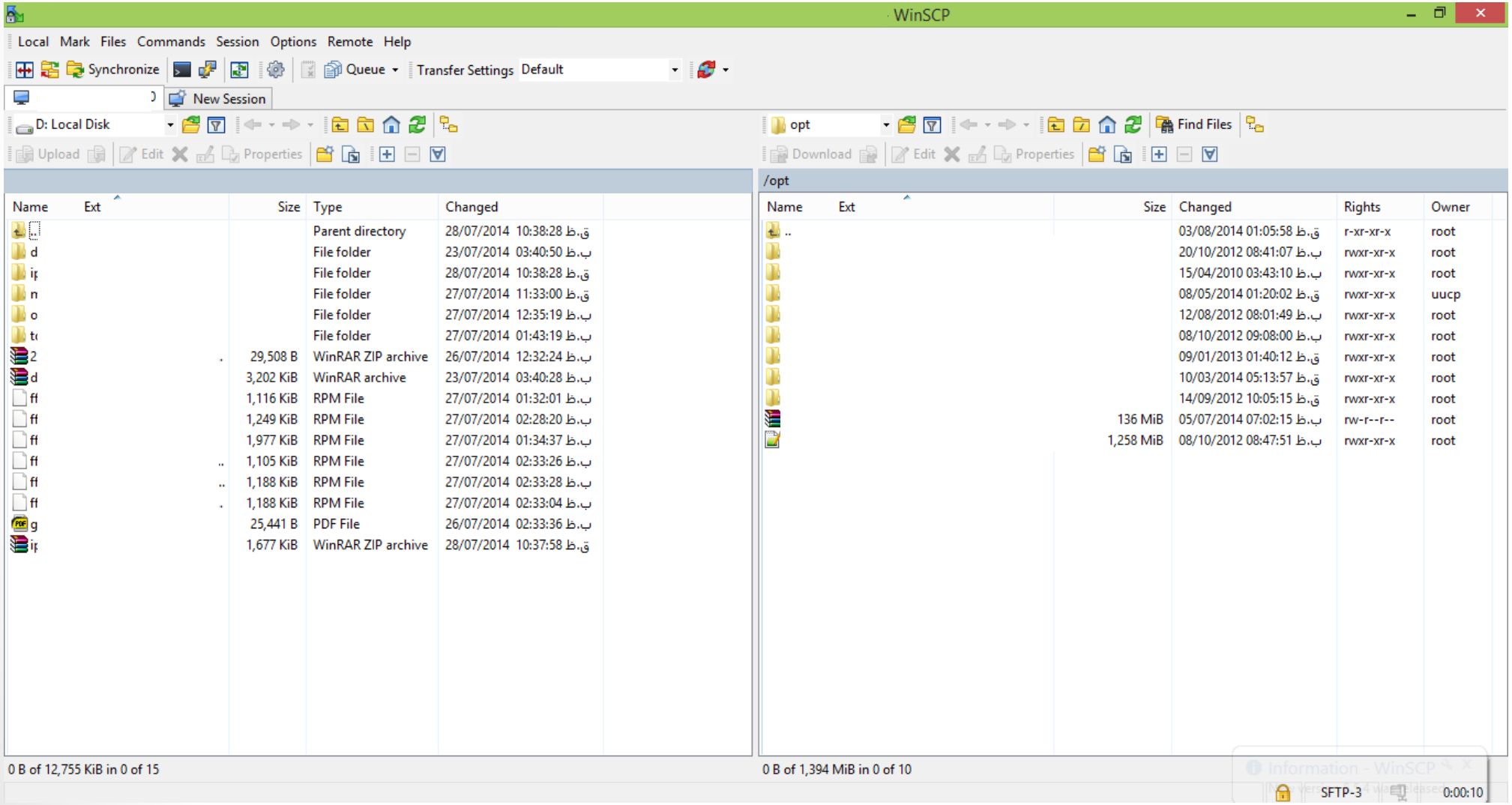
login to cluster



Press CTRL+D to exit the PuTTY session

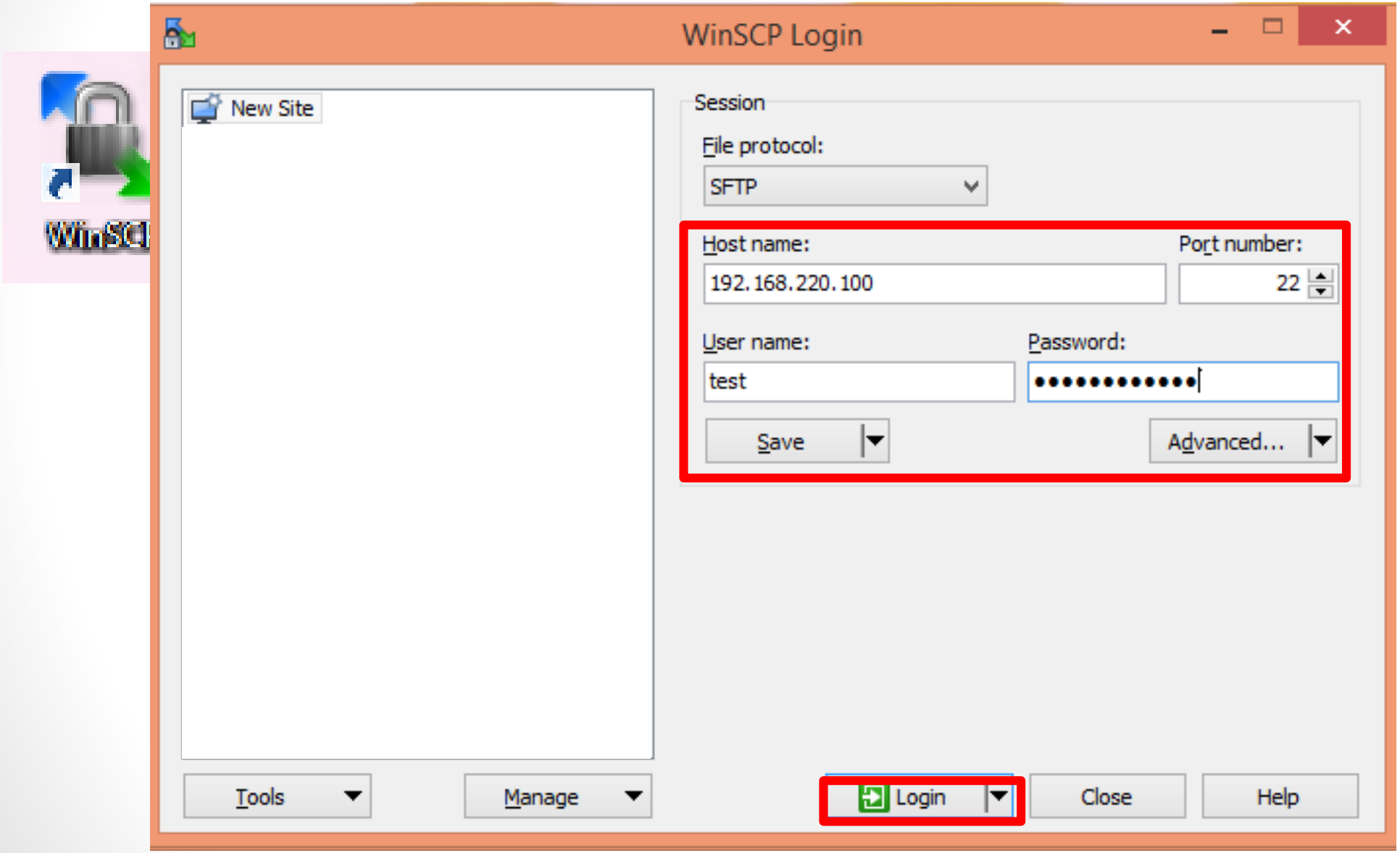
How to Transfer Data

“WinSCP is an open source SFTP client for Windows. Its main function is the secure file transfer between a local and a remote computer

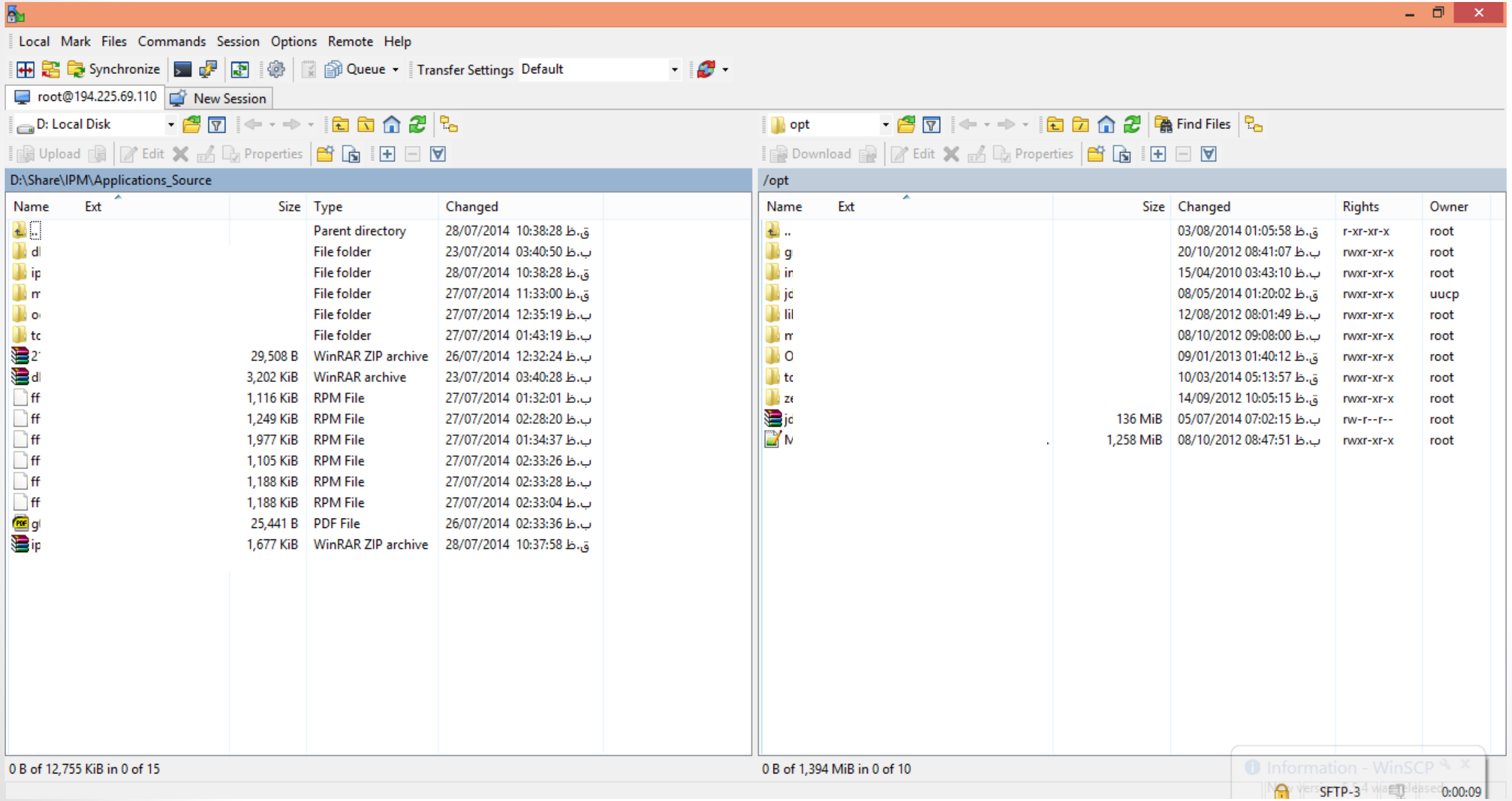


WinSCP

WinSCP


WinSCP Login
New Site
Session
File protocol:
SFTP
Host name:
Port number:
192.168.220.100
22
User name:
Password:
test
Save
Advanced...
Tools
Manage
Login
Close
Help

WinSCP


Local Mark Files Commands Session Options Remote Help
Synchronize
Queue
Transfer Settings Default
root@194.225.69.110
New Session
D: Local Disk
Upload
Edit
Properties
D:\Share\IPM\Applications_Source
Name Ext Size Type Changed
Parent directory 28/07/2014 10:38:28 ق.ظ
File folder 23/07/2014 03:40:50 ب.ظ
File folder 28/07/2014 10:38:28 ق.ظ
File folder 27/07/2014 11:33:00 ق.ظ
File folder 27/07/2014 12:35:19 ب.ظ
File folder 27/07/2014 01:43:19 ب.ظ
29,508 B WinRAR ZIP archive 26/07/2014 12:32:24 ب.ظ
3,202 KiB WinRAR archive 23/07/2014 03:40:28 ب.ظ
1,116 KiB RPM File 27/07/2014 01:32:01 ب.ظ
1,249 KiB RPM File 27/07/2014 02:28:20 ب.ظ
1,977 KiB RPM File 27/07/2014 01:34:37 ب.ظ
1,105 KiB RPM File 27/07/2014 02:33:26 ب.ظ
1,188 KiB RPM File 27/07/2014 02:33:28 ب.ظ
1,188 KiB RPM File 27/07/2014 02:33:04 ب.ظ
25,441 B PDF File 26/07/2014 02:33:36 ب.ظ
1,677 KiB WinRAR ZIP archive 28/07/2014 10:37:58 ق.ظ
0 B of 12,755 KiB in 0 of 15
opt
Find Files
Download
Edit
Properties
/opt
Name Ext Size Changed Rights Owner
.. 03/08/2014 01:05:58 ق.ظ r-xr-xr-x root
g 20/10/2012 08:41:07 ب.ظ rwxr-xr-x root
in 15/04/2010 03:43:10 ب.ظ rwxr-xr-x root
jd 08/05/2014 01:20:02 ق.ظ rwxr-xr-x uucp
lil 12/08/2012 08:01:49 ب.ظ rwxr-xr-x root
m 08/10/2012 09:08:00 ب.ظ rwxr-xr-x root
O 09/01/2013 01:40:12 ق.ظ rwxr-xr-x root
to 10/03/2014 05:13:57 ق.ظ rwxr-xr-x root
ze 14/09/2012 10:05:15 ق.ظ rwxr-xr-x root
jd 136 MiB 05/07/2014 07:02:15 ب.ظ rw-r--r-- root
M 1,258 MiB 08/10/2012 08:47:51 ب.ظ rwxr-xr-x root
0 B of 1,394 MiB in 0 of 10
Information - WinSCP
SFTP-3
0:00:09

Job Scheduler

Torque Job scheduler:
provides a method for handling jobs on a first-come first-served basis. In this manner, all jobs will run more efficiently and finish faster since each is allowed to have all system resources for the duration of its run.

Torque Job Scheduler

- Commonly used TORQUE commands include:

qsub	Submit a job.
qstat	Monitor the status of a job.
qdel	Terminate a job prior to its completion.

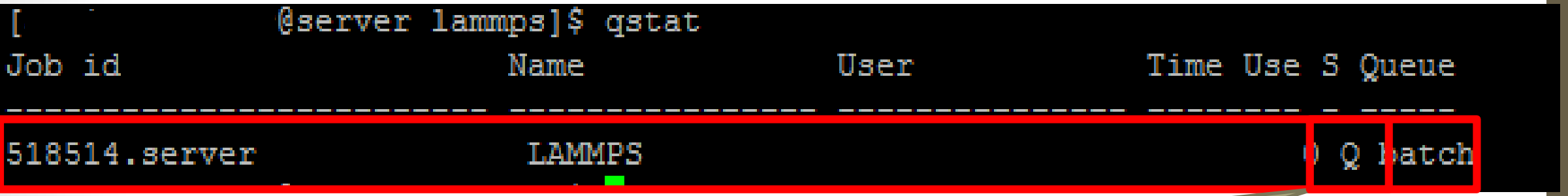
Submitting jobs

- $ qsub <job script>

```
[user_name@cluster  lammps]$ qsub   lammps.sh
518514.cluster.sbu.ac.ir
[user_name@cluster  lammps]$
```

Monitoring jobs

- qstat

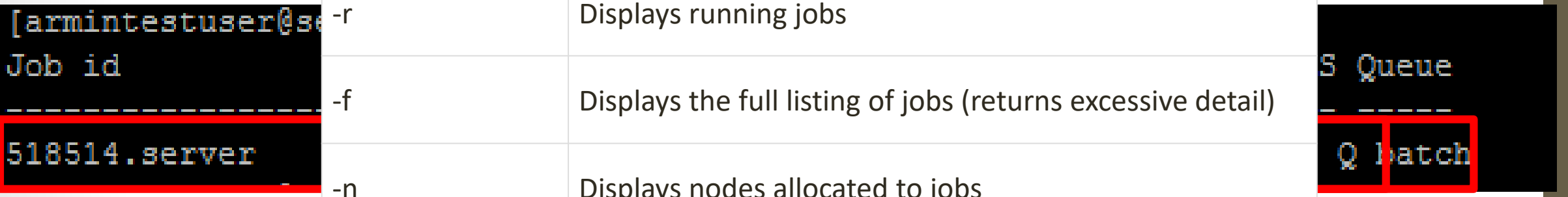


R: Running. E: Error.
C: Completed. Q: Queued

Monitoring jobs

- qstat

qstat option	Description
-a	Displays all jobs
-r	Displays running jobs
-f	Displays the full listing of jobs (returns excessive detail)
-n	Displays nodes allocated to jobs



R: Running. E: Error.
C: Completed. Q: Queued

Deleting jobs

- qdel <jobID>

```
[            @server lammps]$ qstat
Job id                    Name             User            Time Use S Queue
------------------------- ---------------- --------------- -------- - -----
518514.server              LAMMPS                                0 Q batch
[            @server lammps]$ qdel 518514
[            @server lammps]$
```

Torque Script

A TORQUE job script for a job might look like this:

```
#PBS -N   <Job Name>
#PBS -l  nodes= <# of Node : default= 1> :ppn=<# of processor per node e.g.=1>
#PBS -q batch
#PBS -o $HOME/<job folder>/<job output file name>
#PBS -e $HOME/<job folder>/<job Error file name>
#PBS -l walltime=12:00:00

./<running file name and inputs e.g.="a.out">
```

Test

- Simple test
- OpenMp Test
- Lammps (Molecular Dynamics Simulator)

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Thanks for your attention