Graphics DCC Cluster User's Guide for MCV

Master in
Computer Vision
Barcelona

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1. HOW TO ACCES THE GRAPHICS DCC CLUSTER?

The Graphics DCC cluster is a resource of computing graphics cards accessible to all users of DCC Department.

To login the cluster you has to connect to:

- 158.109.75.51 –p 55022

We suggest you to use any ssh software like MobaXterm to connect from windows.
http://mobaxterm.mobatek.net/

From linux or mac the client is self-provided by operating system.

To get a user for this cluster you can contact to Jorge Ramírez. Jorge.ramirez@uab.cat. 935813055.

2. GRAPHICS DCC CLUSTER SPECIFICATIONS.

DCC Cluster Specifications are given below:

The cluster is formed by one node with de following specifications:

- 2 x 16 processor cores x64. Hyperthreating enabled.
- 256 GB memory.
- 3,7 TB disk drive.
- 1 GB network connection.

3. HOW TO PROGRAM ON THE CLUSTER?

You will find an example folder with a very little program where you can find your first approach to cluster task queuing on the cluster.

Just type:

sbatch ~/example/mtgpu.qsub

You will get the output of the job in /tmp directory.

```
#!/bin/bash
#SBATCH -n 4 # Number of cores
#SBATCH -N 1 # Ensure that all cores are on one machine
#SBATCH -D /tmp # working directory
#SBATCH -t 0-00:05 # Runtime in D-HH:MM
#SBATCH -p mhigh,mlow # Partition to submit to
#SBATCH --mem 4096 # 4GB solicitados.
#SBATCH --gres gpu:Pascal:1 # To select Pascal MAX 8 or Ti1080 MAX 2
#SBATCH -o %x_%u_%j.out # File to which STDOUT will be written
#SBATCH -e %x_%u_%j.err # File to which STDERR will be written
sleep 5
/usr/local/cuda-9.2/samples/bin/x86_64/linux/release/deviceQuery
nvidia-smi
```

4. Management commands.

The system is an Ubuntu 16.04 LTS using Slurm 17.11.6 to manage the access to the graphics cards.

sinfo : Will show you the current list of partitions and nodes related to those partitions.

squeue : Current status of works in every queue.

scancel : To cancel a work in queue or running.

sacct : List of jobs running and already running.

sshare : Command to display statistics about priority on queues.

scontrol : Command to manage and configure the slurm software.

sreport : Make reports of all features on slurm.

5. Alias to help your day tasks.

Here I list a few alias to help on your day tasks.

alias sq='squeue' # To list the queue

alias sj='scontrol show job' # To show the details of any job in queue

alias sha='sshare -a' # To show the queue priority status

alias usograficas='sreport -tminper cluster utilization --tres="cpu,mem,GRES/gpu,GRES/gpu:pascal, GRES/gpu:ti1080"' # Statistics on gres resources available

alias ns='nvidia-smi' # Check the current status of graphics cards

6. Cluster policies and working rules.

The cluster policies are oriented to maximize the availability and usage of resources.

The structure is the following:

3 partitions/queues available:

```
sinfo
PARTITION AVAIL  TIMELIMIT  NODES  STATE NODELIST
mhigh        up   infinite      1    mix etse-75-51
mlow         up   infinite      1    mix etse-75-51
dcc          up   infinite      1    mix etse-75-51
```

The patitions mhigh and mlow are partitions for Master in Computer Vision students.
The partition dcc is for members of the department.

mhigh -> High priority queue for MCV. Only 1 running job from each master account. Rest of the jobs keep pending until first one finishes. If all graphics cards are in use and the group has no running jobs in this partition, a job running in another partition will be killed. Either mlow or dcc.

mlow -> Low priority queue for MCV. Any number of jobs can be executed in this queue but the priority of the next running job will be managed by the amount of time used by the account running processes in this partition. More time consumed during last 5 days -> lower priority in the partition.
If there are no free graphics card and there is any card being used by the dcc partition, the process will be killed to priorize MCV accounts.

dcc -> The lowest priority partition. If there are free graphics cards in the system, users in this partition can use it with the same rules as mlow.

The command sshare –a or alias sha will show you the RawUsage value that will priorize the next job to be run by a free graphics card.

The command squeue or alias sq will show you the list of jobs queued in partitions.