Slurm distrbuted MPI and GPU jobs

A MPI job can considered as a cross-node and multi-process job. Sample Slurm MPI job script would look like below:

```
#!/bin/bash
#SBATCH --job-name=MyJob
#SBATCH --account=username
#SBATCH --ntasks=32
#SBATCH --ntasks-per-node=16
#SBATCH --cpus-per-tasks=1

module load openmpi
mpiexec <program>
```

The script above tells Slurm that this is a **multi-processing** job. It requests a total of 32 MPI processes (`ntasks=32`). It will launch 16 MPI processess (`ntasks-per-node=16`) on each node (it implicitly requested 2 nodes). For each MPI process, it needs 1 cpu core to handle (`cpus-per-task=1`).

GPU jobs

If you need 6 nodes with 4 cpu cores (`ntasks=24` and `ntasks-per-node=4`) and 2 GPUs (`gres=gpu:2`) on each node, then the slurm submission script should look like:

```
#!/bin/bash
#SBATCH --job-name=MyJob
#SBATCH --account=username
#SBATCH --time=01:00:00
#SBATCH --ntasks=24
#SBATCH --ntasks-per-node=4
#SBATCH --cpus-per-task=1
#SBATCH --gres=gpu:2

module load openmpi
module load cuda
mpiexec <program>
```