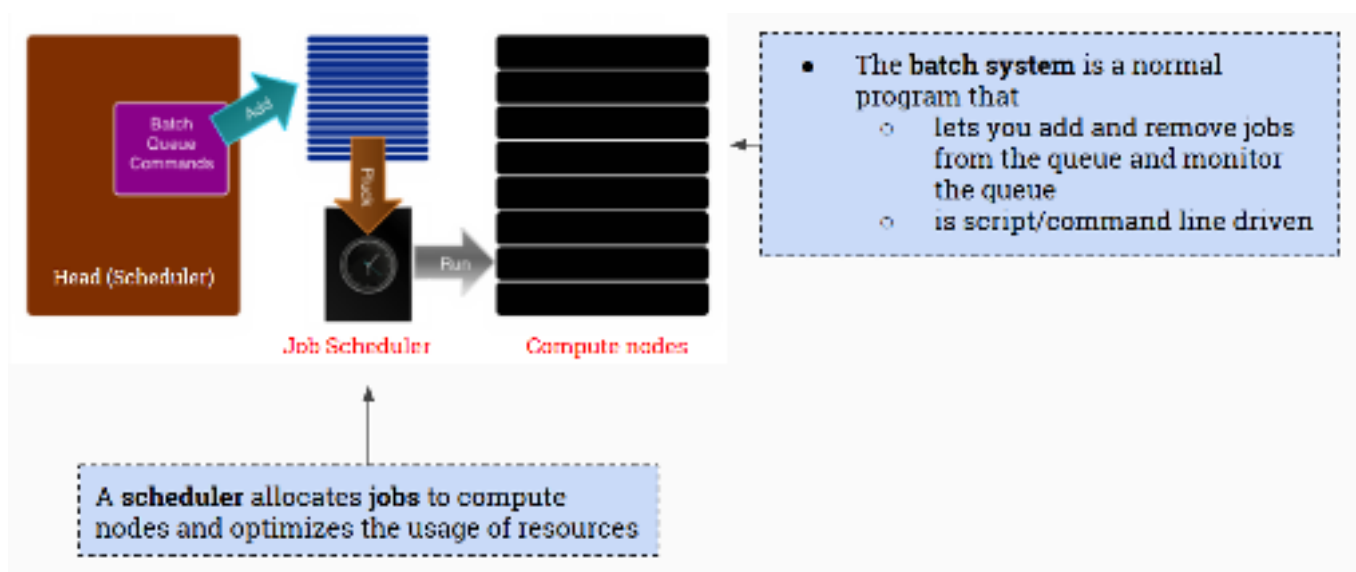# Job Schedulers

What is a HPC Job?

In the arena of HPC, we talk a lot about **jobs**, these are simply commands we wish to run and requests for resources (e.g. `compute time`, `disk space`, `memory amount`, `software environments` etc.). HPC jobs are generally time consuming and resource intensive run **non-interactively**. However, they can be run **interactively**, but mainly for testing purposes.You need add your jobs to a queue and when machines have free resources jobs run. Once jobs are complete, you can inspect their output.

A logical diagram of the HPC batch system and scheduler

Batch queuing systems and job schedulers

The **batch system** is a program (typically resides on the head node) that lets you add and remove jobs from the **queue** and monitor the queue. It's a script/command line driven program.

The **Job schedulers** manages job queues. Typically, the scheduler will schedule jobs from the queue as sufficient resources (more precisely - cluster compute `nodes`) become idle. You do not need to interact with schedulers directly.

Some widely used cluster batch systems are:

- **Portable Batch System (PBS)**
- **Simple Linux Utility for Resource Management (SLURM)**
- Moab
- Univa Grid Engine
- LoadLeveler, Condor
- OpenLava
- IBM's Platform LSF

The first two in the above list are popular. Therefore, in this course we will

restrict our discussion among these two.