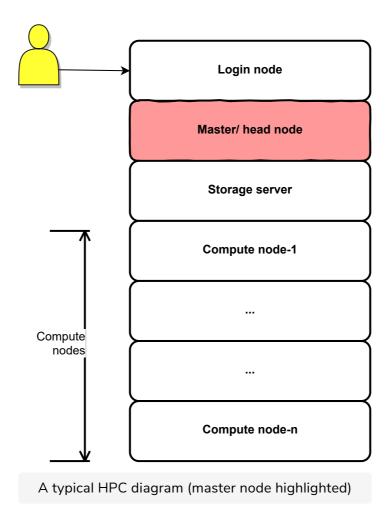
## Master node(s)

## What is a master or head?



Clusters are complex environments, and the management of the individual components is very important. The management node (generally named as the: master or head node) provides many important capabilities, including:

- **Monitoring** the status of individual nodes (typically compute nodes).
- Issuing management commands to individual nodes to correct problems or to provide commands to perform management functions, such as power on/off.
- In most clusters, the compute nodes (and other nodes) may need to be reconfigured and/or reinstalled (**provisioned**) with a new OS image

relatively often. The master node provides the images and the

mechanism for easily and quickly installing or reinstalling software on the cluster nodes.

- The master node can also provide **networking services** that help the other nodes in the cluster work together to obtain the desired result. Control nodes can provide two sets of functions: Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), and other similar functions for the cluster. These functions enable the nodes to easily be added to the cluster and to ensure they can communicate with the other nodes.
- Scheduling tasks (to be discussed in detail soon!) can be another important role for a master node. For instance, if a compute node finishes one task and is available to do additional work, the control node may assign that node the next task requiring work. However, sysadmins may decide to allocate a separate node (Scheduler node) for this purpse to reduce loads on the master node.

To create high availability (HA), the master node can have a backup master node. Also, in some systems, master node's tasks may be distributed over various nodes such as Job-scheduler node, log-server nodes, monitoring node, etc.

A free cluster management software stack like OSCAR can fulfill a lot of the above needs, but there are other commerical software tools, such as **Bright** Cluster Manager from Bright Computing or HPC Cluster Manager from Microsoft that can help sysadmins to deploy and mange a HPC system. Further details on the HPC management is out-of-the-scope for this particular couse.