Login and Compute Nodes

Whilst the bulk of an HPC cluster's workload is running simulations, there is also a range of tasks requiring user interaction, such as:

- Writing and compiling code
- Debugging code (but more on this later) (TODO link to interactive jobs and debugging)
- Preparing, submitting, and monitoring batch jobs
- Analyzing and visualizing simulation results
- Moving data to, from, and within the cluster

Such tasks do not have the performance requirements that simulations do, but also must not be allowed to interfere with running jobs. To achieve this, the cluster is divided into two primary components:

- A small number of "login" nodes, for interactive activities
- A large number of "compute" nodes, for running jobs

The diagram below illustrates this division. Note also that different filesystems may be visible to the login nodes as to the compute nodes, specifically at NYU: /archive is not visible to the compute nodes.

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**Important**

Do not run computationally-heavy or long-running jobs on the login nodes! Not only will you have poor performance, the heavy resource usage of such jobs impacts others' ability to use the login nodes for their intended purposes. If you need to run a job interactively (for example, when debugging), please do so through an interactive batch session (TODO link).