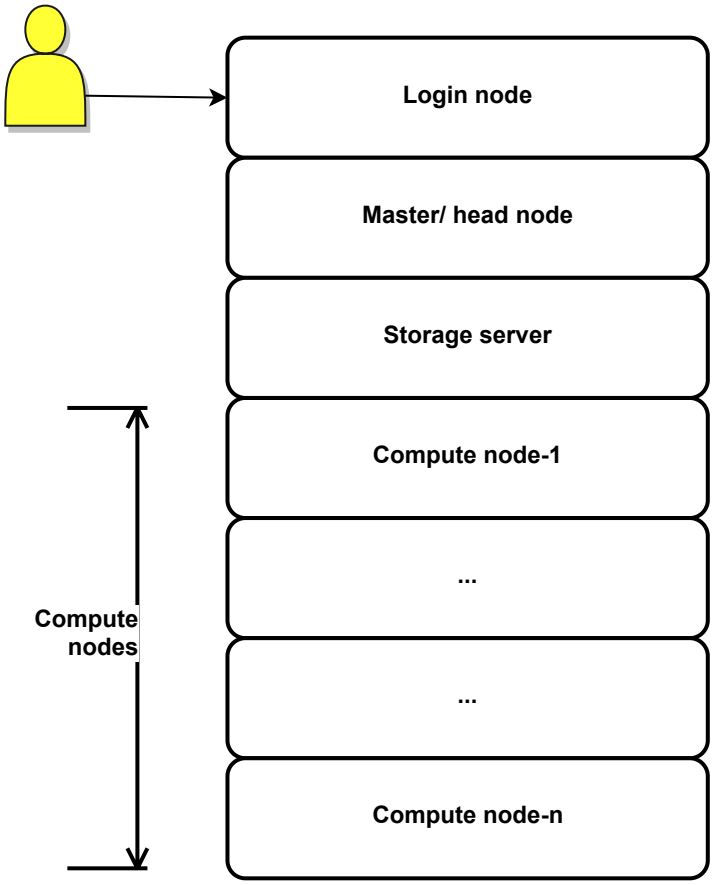
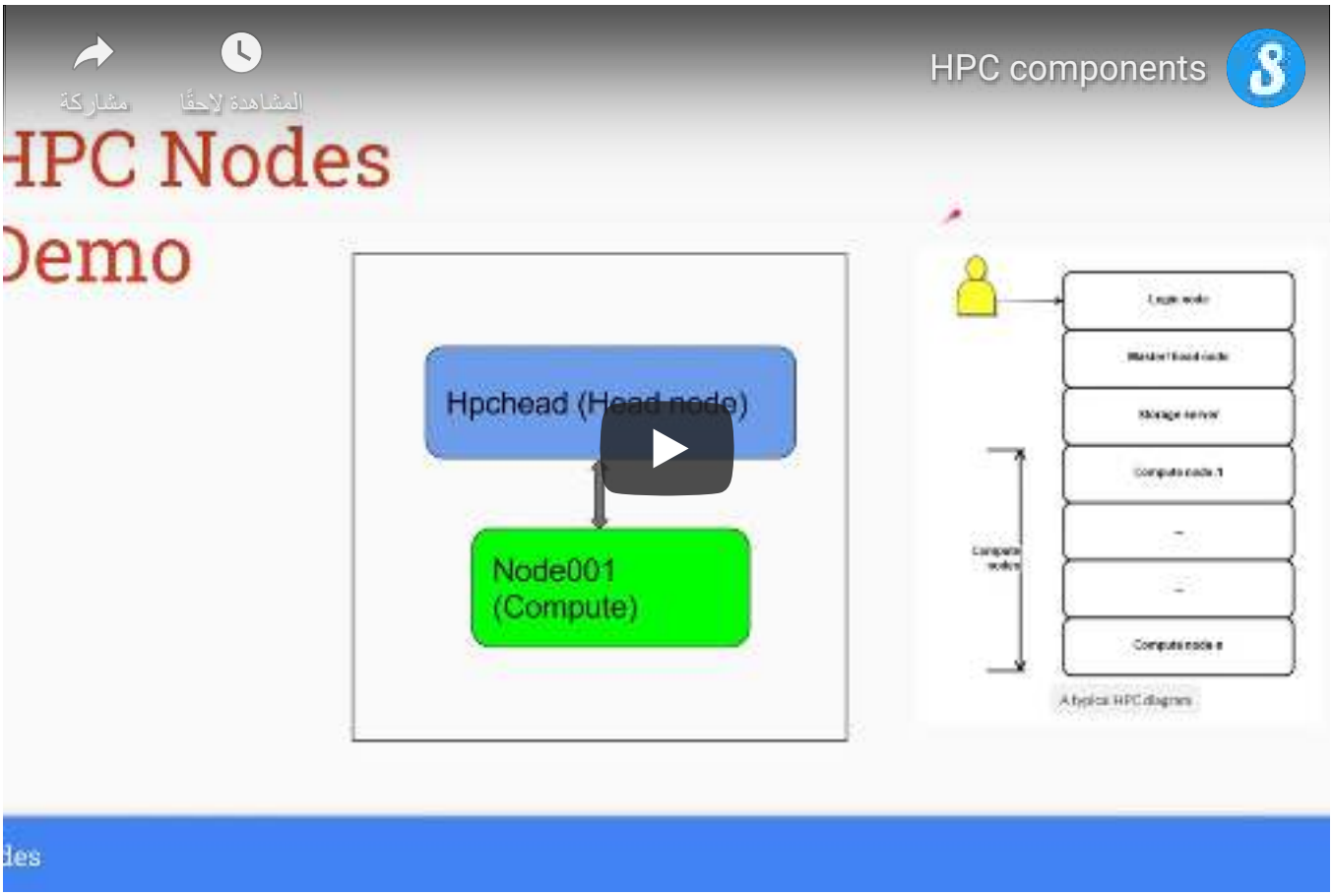
Components of a HPC cluster

A cluster is two or more (often many more) computers working as a single logical system to provide services. Though from the outside the cluster may look like a single system, the internal workings to make this happen can be quite complex.



A typical HPC diagram

The figure above presents the logical functions that a physical node in a cluster can provide. Remember, these are logical functions; in some cases, multiple logical functions may reside on the same physical node, and in other cases, a logical function may be spread across multiple physical nodes.



Aside from the cluster nodes (management node, compute nodes, and storage nodes) that make up a cluster, there are several other key components that must also be considered. The following sub-sections discuss some of these components.

- Ethernet switches Ethernet switches are included to provide the necessary node-to-node (1/10 GB) communication.
- Infiniband switch: For faster networks (56/100 GB), mainly used by MPI enabled software.

Keyboard, video, mouse, etc. connected to a terminal server or master node. Mainly for systems maintenance purposes.