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Custom Management of a Beowulf Cluster

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Abstract

Beowulf-style Linux clusters currently provide the best CPU performance for the price for compute-intensive calculations. These clusters, made up of from two to thousands of commodity computers, bring new system administration problems not seen on traditional multi-processor servers. Each system in the cluster requires its own copy of the operating system and access to the software performing the calculations. Installing these individual OSes and keeping them up to date can be handled by custom software, such as Rocks, or by native Linux tools. The beowulf cluster at the Delaware Biotechnology Institute is managed in the latter fashion, using network installs, Kickstart scripts, and NFS shares to provide a uniform environment across the cluster. Sun Grid Engine manages the job queues and system accounting. This approach shows its success in the stability of the cluster as a whole, with access to the cluster compute facilities being uninterrupted for over a year.