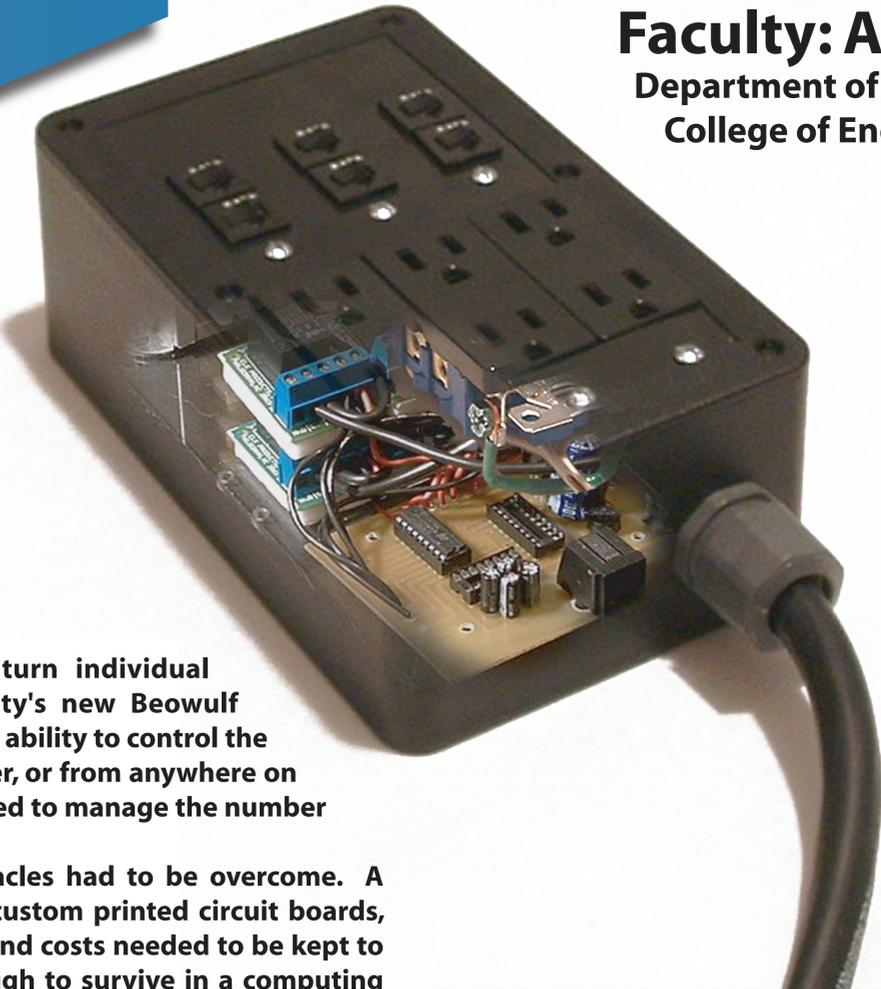


Power Control for a Beowulf Cluster

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The power control system will control the electrical power going to each computer within a Beowulf cluster. A Beowulf cluster is a group of computers working in tandem to make a large super computer.



Graphics by
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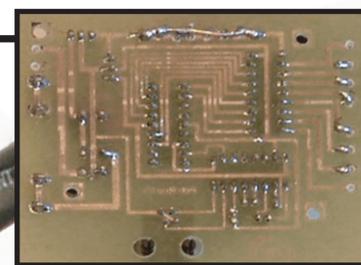
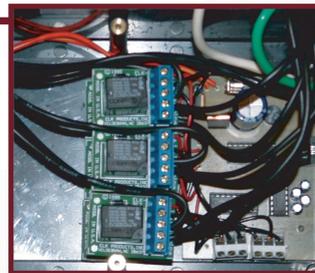
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The power control system was designed to turn individual computers on or off within Boise State University's new Beowulf cluster. This system gives the cluster maintainers the ability to control the power to each system from a single master computer, or from anywhere on the Internet. Automated systems can also be deployed to manage the number of running systems at any given time.

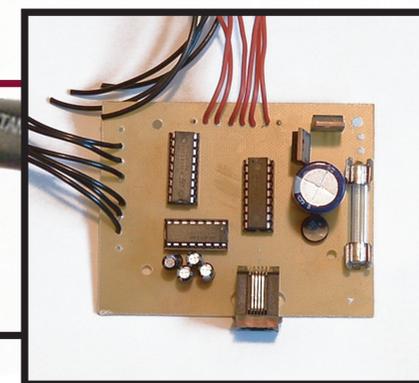
In order to complete this project several obstacles had to be overcome. A system had to be developed to consistently build custom printed circuit boards, space issues within enclosure had to be overcome, and costs needed to be kept to a minimum. The design also had to be robust enough to survive in a computing lab environment for a long period of time.

Building the custom PCBs was one of the most complicated parts of this process. In order to build these PCBs toner needed to be transferred from a very specific kind of paper onto a blank PCB. The PCB then needed to be soaked in an etching solution to remove the unwanted copper.

These inexpensive relays made this project possible. Normally relays capable of handling such large currents are cost prohibitive but these relays were only \$5 each. With 90 relays in the 15 power control boxes the cost of these relays quickly became a large portion of the cost for this project.



Within the power control box there is a logic board that acts as the brains of the box. The logic board has three main components: the microprocessor, the communications system, and a small power supply.



Boise State University's 64-node Beowulf cluster.