

Abstract Submitted  
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**Development of a Computing Cluster At the University of Richmond**  
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— The University of Richmond has developed a computing cluster to support the massive simulation and data analysis requirements for programs in intermediate-energy nuclear physics, and cosmology. It is a 20-node, 240-core system running Red Hat Enterprise Linux 5. We have built and installed the physics software packages (Geant4, gemc, MADmap...) and developed shell and Perl scripts for running those programs on the remote nodes. The system has a theoretical processing peak of about 2500 GFLOPS. Testing with the High Performance Linpack (HPL) benchmarking program (one of the standard benchmarks used by the TOP500 list of fastest supercomputers) resulted in speeds of over 900 GFLOPS. The difference between the maximum and measured speeds is due to limitations in the communication speed among the nodes; creating a bottleneck for large memory problems. As HPL sends data between nodes, the gigabit Ethernet connection cannot keep up with the processing power. We will show how both the theoretical and actual performance of the cluster compares with other current and past clusters, as well as the cost per GFLOP. We will also examine the scaling of the performance when distributed to increasing numbers of nodes.

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