

Los Alamos National Laboratory

Computer & Computational Sciences Division

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National Science Foundation
Director, Office of Integrative Activities
4201 Wilson Boulevard
Arlington, Virginia 22230

Dear Dr. Pitts,

We are very excited by the prospect of NSF support for the Center for Grid Application Development Software (CGrADS). CGrADS is a natural, ambitious and critical scientific enterprise that complements our collaborative work with Rice University through the Los Alamos Computer Science Institute. The computational grid is quite likely to be the general computing environment of the future. The obvious challenges - resource negotiation, scheduling, communication, languages, compilers, PSEs - are all very interesting. However, the most intriguing are the fundamental intellectual and research questions posed by this center, specifically the notion of a performance economy and the development of performance and resource forecasts. The results of this work are certainly important from an operational viewpoint, but this new environment may also change the way that applications are constructed forever.

To accomplish this daunting task, CGrADS has assembled a very impressive team. Ian Foster and Carl Kesselman provide expertise and links into the Grid work (e.g. Globus) that provides the foundation for CGrADS. Ken Kennedy is among the nation's leaders in languages and compilers. Jack Dongarra and Lennart Johnsson are world leaders in the construction of mathematical libraries for scientific computation. Now is the time to focus the attention of the computer science community on the issues of grid computation.

Why is this work important to the country? The two highest barriers standing in the way of general adoption of parallel computation are lack of (1) computing resources dedicated to a specific application and (2) powerful domain-specific problem solving environments. CGrADS will provide mechanisms for addressing both of these issues. In our work in crisis forecasting (e.g. wildfire, epidemiology, electrical power), these two issues have seriously affected our ability to transfer technology to parties charged with crisis

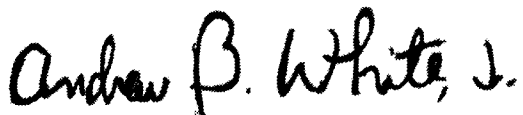
management and mitigation. The existence of the CGrADS execution architecture that can be accessed by a domain PSE and that can then deliver distributed, heterogeneous computing resources not wholly-owned by the domain science organization is exactly what the doctor ordered. This is an essential capability in establishing predictive modeling and simulation as a regular part of the decision-making process.

The Center for Research on Parallel Computation (CRPC) is the perfect model for the management, education and outreach programs in CGrADS. CRPC's successful distributed management structure can also effectively integrate the CGrADS activities. Also, Richard Tapia has developed nationally celebrated programs for underrepresented groups and K-12 education. With Richard directing CGrADS's education and human resources activities they are certain to be innovative and effective.

Not surprisingly, CGrADS is of significant interest to Los Alamos above and beyond its specific technical goals. We are working to establish an Open Collaboration Network (OCN) -- in addition to our production green, yellow, and red partitions -- which will enable more effective collaboration with the external computer science and technology community. The OCN will be the interface at Los Alamos with the CGrADS effort. Also, it is clear that the computer room of the future will be composed of several generations of hardware and software that must effectively work together in solving scientific computing problems. One by-product of CGrADS will be an effective heterogeneous computing environment that will allow more effective utilization of existing computing resources.

In conclusion, we believe that CGrADS brings together the right team at the right time to focus on constructing a usable global computational resource.

Sincerely,



Andrew B. White, Jr.
Director, Computer and Computational Sciences Division (acting)
Los Alamos National Laboratory

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