National Center for Supercomputing Applications

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605 East Springfield Avenue
Champaign, IL 61820

September 17, 2001

Professor Ken Kennedy
Department of Computer Science
William Marsh Rice University
HiPerSoft-MS41
6100 South Main Street, MS-16
Houston, TX 77005-1892

Dear Professor Kennedy:

I am writing in support of the proposal "Center for Grid Application Development Software (CGrADS)," a team submission led by Rice University in response to NSF 00-67, the Science and Technology Centers program. The STC program has traditionally supported outstanding teams of nationally recognized leaders to conduct long-term research in critical areas of science and technology, and has promoted the transfer of the resulting knowledge and technology to the scientific and engineering communities at large. You have formed a powerful team and developed an excellent program to address the global need for simple and effective tools to program the rapidly expanding universe of grid-enabled resources available to the computational science and engineering communities.

The earthquake engineering research community is poised to embrace the use of grids and distributed computing to support their interests in merging experimentation and simulation to tackle to most complex research problems in their domain. However, they are concerned that this change in approach contains an insurmountable barrier in the learning curve required to take advantage of it. The CGrADS effort will address the removal of this barrier head on.

The George E. Brown Jr. Network for Earthquake Engineering Simulation (NEES) Program is an NSF initiative to create a national collaboratory that includes advanced experimental facilities, data storage and management systems, multiphysics simulation frameworks needed to study cross-disciplinary issues in earthquake engineering, and the computational engines to support these analyses. Our role leading the NEES System Integration effort is to leverage the advances being made in various national infrastructure initiatives, and to create an integrated IT solution supporting the specific requirements of the earthquake engineering research community.

Earthquake engineering research is where engineering principles are tested against the strongest forces of nature. NEES is providing advanced experimental facilities to the community, and these will be used to study the detailed responses of system components to these forces. However, the system level analysis of, for example, an entire bridge structure – including its foundation and the ground beneath it – cannot be studied experimentally, and very high performance computing, storage and networking will be required to address the computational complexity of the problem and the distributed nature of the data and simulation codes used to solve it. These high performance resources are being made available on middleware-mediated grids such as the TeraGrid effort recently funded as part of the Distributed Terascale Facility program at NSF. The TeraGrid and other sophisticated grid efforts are powerful, but complex. The

CGrADS effort is the logical and essential next step in supporting their use by application communities, such as the NEES community.

The NEESgrid team enthusiastically supports your collaborative proposal to develop a CGrADS software environment for facilitating the use of distributed computing environments submitted by Rice, SDSC, the University of Tennessee at Knoxville, Argonne and NCSA. We look forward to working with you to advance scientific discovery and a new generation of research in earthquake engineering.

Sincerely,

Thomas I. Prudhomme, Ph.D.
Principal Investigator
NEES System Integration Project