



National Science Foundation
Computer and Information Science and Engineering Directorate
Division of Advanced Computational Infrastructure and Research

April 25, 2002

Dear Terascale (TCS/DTF) Awardees:

NSF's next step in terascale computing, the Extensible Terascale Facility (ETF), will be a scalable, distributed, heterogeneous computational grid that enables science and engineering researchers and educators to conduct analyses at unprecedented scale, to merge multiple data resources seamlessly, and to advance discovery, learning and innovation across the frontiers of science and engineering. The ETF will serve as a prototype heterogeneous grid computing system that is expected to open a pathway to future high-end computing and information environments.

Building on the successes of our cooperative ventures in creating the Terascale Computing System (TCS) and the Distributed Terascale Facility (DTF), NSF looks forward to working with you in the design, development and implementation of the Extensible Terascale Facility. ETF activities will be funded in FY02 through supplemental awards to the TCS and DTF cooperative agreements. In FY03, NSF will broaden participation in ETF through the integration of additional sites and facilities, as described below.

NSF invites you to submit a proposal for supplemental funding to establish the ETF. Requests must be submitted in the form of a collaborative proposal that includes the partners in each of the three existing terascale cooperative agreements. Proposals should be submitted simultaneously by the lead institutions in each of the terascale cooperative agreements, must be prepared in accordance with the collaborative proposal instructions contained in the Grant Proposal Guide (Chapter II, Section II.C.11.b.2), and must contain identical project summary, project description, and references cited sections. **The collaborative proposal will describe the vision and technical strategy for ETF, and a management plan that ensures the coordination of the activities of the DTF and TCS partners to establish the ETF.**

The collaborative proposal must define the ETF vision, and must describe balanced system characteristics and goals to provide a state-of-the-art grid computing capability that includes, among other things, a high speed backplane network, high end computing, data storage technologies, support for remote use of scientific and engineering instruments, visualization capabilities, and data mining and interpretation.

The proposed ETF implementation strategy must include **all** of the following objectives:

- 1) Create an extensible backplane network that will form the basis for ETF. This backplane network must have a sufficient number of core nodes to effectively and efficiently accommodate the integration of additional sites and facilities into the ETF. Core nodes should be located to minimize the cost of interconnecting present and future sites and facilities, while optimizing ETF performance capabilities, and should enable interconnection at speeds of tens of gigabits per second.
- 2) Integrate DTF and TCS facilities into this backplane network. As core components of the ETF, the DTF and the TCS facilities must be integrated via the extensible scalable backplane network described in 1) above.
- 3) Enhance ETF capabilities to meet the needs of the broad science and engineering community. Resources at the existing five terascale facilities should be enhanced in areas such as computing capability, memory and storage, and I/O capability. Enhancements must be justified in terms of the value they bring to ETF and the capabilities provided to the broadest range of high-end science and engineering research and education activities. Specialization within individual ETF sites may be desirable to achieve a broadly integrated set of ETF capabilities. Proposed enhancements must clearly demonstrate that the whole enhancement package is greater than the sum of its parts.

The collaborative proposal must include a detailed discussion of: the proposed technical and management approach, and related performance goals and timelines; technical and management risks and associated mitigation strategies; and the roles and responsibilities each of the partner organizations will assume in implementation of ETF.

The collaborative proposal will be reviewed in accordance with standard NSF merit review criteria established by the National Science Board as detailed in Chapter II of the Grant Proposal Guide (<http://www.nsf.gov/cgi-bin/getpub?gpg>). In addition, the following additional criteria will be utilized in making funding decisions.

- Does the process of ETF implementation include an appropriate focus on development of a workforce capable of carrying forward distributed high-end computing and communications?
- How well does the proposed management approach support the proposed ETF vision and goals?
- How will the proposed approach foster closer collaboration among the existing terascale facilities and future ETF sites and facilities?
- How effective will the proposed approach be in yielding insights into next generation high-end computing and communications paradigms?
- Does the proposed backplane network support scalability so that additional, geographically distributed sites may efficiently and effectively become part of the ETF?

- How well do the proposed enhancements support the ETF vision and augment the utility of the terascale facilities for the broadest possible range of NSF-supported science and engineering disciplines – is the whole enhancement package greater than the sum of its parts?
- Have the potential risks presented in the proposed approach been adequately identified, and have appropriate mitigation strategies been developed?

The amount of funding available in FY02 to establish ETF is \$35 million. All awards will be made as supplements to the existing terascale cooperative agreements.

Proposals must be submitted to the NSF by 5:00 PM local time, June 3, 2002. A page limitation of 40 pages is permitted for the project description. No letters of endorsement should be included.

You must prepare and submit the collaborative proposal in response to this Letter through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188 or e-mail fastlane@nsf.gov.

General inquiries regarding this Letter should be made to:

- Richard L. Hilderbrandt, PACI, Program Director, CISE, ACIR, 1122, telephone: (703) 292-8970, e-mail: rhilderb@nsf.gov.

Sincerely,

Richard Hirsh
Acting Division Director