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NSF 06-551 **06/10/06**

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CNS - GENI CONCEPT/DEVELOPMENT

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0637190

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
06/09/2006	5	05050000 CNS	024F	604064386	06/09/2006 10:53am

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AWARDEE ORGANIZATION CODE (IF KNOWN)

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Computing Research Association
1100 Seventeenth Street, N.W.
Washington, DC. 20036

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TITLE OF PROPOSED PROJECT **The Computing Community Consortium**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **6,092,111**	**36** months	**09/01/06**	

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Executive Summary

We will create the Computing Community Consortium (CCC), a proxy organization for the computing research community, operating under the leadership of the Computing Research Association (CRA), a membership organization of over 250 computing research entities in academia, industry and government. The CCC will facilitate research vision setting by the computing research community and catalyze community thinking regarding major initiatives pursuing audacious research goals, and communicate visions and goals to the broader national community.

The CRA is uniquely qualified to create and oversee a proxy organization for the U. S. computing research community. CRA has a 30-year history in pursuit of its mission to "strengthen research and advanced education in the computing fields, expand opportunities for women and minorities, and improve public and policymaker understanding of the importance of computing and computing research in our society." The CCC will operate under the auspices of the CRA, but will represent a major expansion of the CRA's operations. CCC leadership will be provided by a Council, consisting of a chair and 12–15 members. The Council members will be recognized leaders of the computing research community, spanning a diverse breadth of research expertise, gender, ethnicity, academic age, and institutions, drawing its legitimacy from CRA's well-established and well-recognized role as the representative of all elements of the computing research community.

Intellectual Merit. The CCC will support visioning activities designed to identify potential major opportunities, set priorities, and establish grand challenges for the field. These visioning activities will be based upon proposals by members of the computing research community as well as ideas generated by the CCC itself. They will involve a variety of mechanisms, including workshops similar to the CRA grand challenge workshops and studies conducted by (possibly CCC-sponsored) study boards. Using these mechanisms, the CCC will encourage formulation of major research initiatives targeting new sources of research funding. Planning groups will be selected to refine research agendas and work with NSF and other agencies to identify funding sources. As appropriate, some of these planning groups will target funding from the NSF Major Research Equipment and Facilities Construction (MREFC) account to create large-scale, shared research instruments, while others will aim toward more traditional forms of research funding.

One of the first tasks of the CCC will be to assume the role of proxy organization for the Global Environment for Networking Innovations (GENI) Project, helping guide it toward MREFC funding and providing broad scientific oversight in its construction and operation. The CCC will provide similar oversight for other initiatives, funded both through MREFC and via other mechanisms.

Broader Impact. Innovations in information technology are responsible for the majority of the gains in economic productivity in the U.S. over the past decade. Underlying those innovations is prior decades of computing research, much of it funded by NSF and other government agencies. The CCC is envisioned as a mechanism to promote continued innovation by enhancing the ability of the computing research community to envision and pursue long-term, audacious computing research goals. CCC will serve as a community proxy by working with the scientific community to formulate research programs and realize large-scale, shared research facilities that change the scope and nature of the field. CCC will partner with NSF and other funding agencies to open up new sources of funding for initiatives with exceptional long-term impact, to a greater extent than current funding mechanisms permit. This effort will lay the foundation for new ways in which information technology will continue to improve the quality of life and standard of living for people in the U.S. and worldwide.

A. INTRODUCTION

Historically, the computing research community has been fragmented, lacking generally accepted mechanisms to build community consensus around future research visions. The community conducts many independent, small scale projects on a given theme without the long term research vision and impact that could be achieved through a large scale, collaborative effort. The community has not thought in terms of, nor conducted its research by, building very large test beds, or by exploiting large instruments. This is surprising, as some software systems are the *most* complex engineered systems in existence, and for some research challenges, an instrument may be appropriate.

This culture is attributable to the relative immaturity of a young discipline. It stands in contrast to other research communities such as physics, astronomy, environmental science and geology with rich histories of strategic priority setting and multi-institutional collaborative efforts that often involve large-scale, shared research instruments.

To fill this need, we propose to create the Computing Community Consortium (CCC), a representative proxy organization, to facilitate community vision setting; to foster large-scale projects pursuing audacious, long-term research goals; and to catalyze community thinking regarding the use of large experimental instruments.

A.1. Motivation

Other research communities effectively use *proxy organizations* to establish consensus and national research agendas. For instance, the astronomers and physicists use decadal committees under the auspices of the National Academies (http://www7.nationalacademies.org/bpa/); an example is the physics decadal study (http://www7.nationalacademies.org/bpa/projects_physics_2010.html). A typical result of such studies is the 2003 report *Connecting Quarks with the Cosmos* (http://www.nap.edu/catalog/10079.html), which enunciates eleven physics and astronomy challenges for the new century, including such fundamental questions as "What is dark matter?" and "Was Einstein right about gravity?"

These communities repeatedly and periodically depend on proxy organizations to facilitate their visioning and priority setting process. These proxy organizations facilitate community interaction and produce documents that clearly state consensus choices. There is evidence that the National Science Foundation and the National Science Board find the activities and reports of these proxy organizations to be authoritative and valuable in making choices and commitments. We believe that the computing community would benefit from the existence of such a proxy organization.

The challenge for the Computing Community Consortium (CCC) is to catalyze the computing research community to debate longer range, more audacious research challenges; to build consensus around research visions; to articulate those research visions; to evolve the most promising visions toward clearly defined initiatives; and to work with funding organizations to move the challenges and visions toward funding initiatives.

To us, computing is the broad field which includes computer science, computer engineering, and computational science. Following the successful examples from other research communities, the CCC will use the fundamental questions in our field to frame and support each case. When appropriate, the CCC will work with the community to formulate the case for building large, special purpose research instruments.

As mentioned above, our community does not have a history of processes that lead to consensus, which in turn is accepted by the National Science Foundation, for example, and then funded in an appropriate way. The community must "speak with a clearer voice." This proposal describes a plan to make that happen.

A.2. GENI and Large-Scale Instruments

Given the critical dependence of scientific discovery on networking and software, and the central role that networking and software play in U.S. economic competitiveness and national security, it is essential to increase dramatically the intensity of fundamental research on the behavior of the networks and the software systems themselves. Such study is the purpose of the Global Environment for Networking Innovations (GENI). GENI will be an early focus for the proposed CCC and is discussed later in this proposal as an example.

A.3. This Proposal

With this backdrop, the remainder of this proposal is organized as follows. We begin in §B with a description of the proposed organizational structure for the Computing Community Consortium, followed in §C by a description of the CCC management plan. In §D we describe how the CCC will engage the nascent Global Environment for Networking Innovations (GENI) and support its evolution. This is followed in §E-§I by a summary of the CRA office facilities, budget rationale, broader impacts of the proposed work and prior support.

B. ORGANIZATIONAL STRUCTURE AND PROJECT STAFFING

We propose to create the CCC, building on the community strength and experience of the CRA. The CCC will operate as a standing element of CRA, with broad participation from the academic and industrial computing research communities. As such, the CCC will develop an inclusive and timely strategy for catalyzing community visions and consensus on emerging research agendas and instrumentation needs.

B.1. CRA: Representing Community Needs

CRA was founded in 1973 by early leaders of the field, based on a shared vision of community building and national needs. CRA is the most inclusive representative of the North American computing research community, with membership of over 225 academic institutions, 30 government and industrial laboratories, and the leading professional societies, including the ACM, the IEEE Computer Society, AAAI, SIAM, USENIX and the Canadian Association of Computer Science.

CRA is widely recognized by the U.S. computing research community as its representative organization. For decades, CRA has sponsored the biennial *Snowbird Conference*, a leadership summit of computing research societies and leaders to discuss computing policy and community needs. At the Snowbird Conference, chairs of computer science departments meet to exchange views and to conduct tutorials to help individuals and departments to advance their skills and knowledge and includes the only organized new chairs workshop in the computing field.

CRA helps advance the careers of researchers in academia and industry through our Career Mentoring Workshops, our Committee on the Status of Women and our co-sponsorship of the Coalition to Diversify Computing. CRA works to increase student participation in computing through CRA-W and CDC and a newly initiated effort in education. CRA is the only organization in the computing field with long-standing, direct relationships with academic and industrial researchers and organizations. The value perceived by the community is directly measured by the nearly 100% renewal rate by our membership.

Simply put, CRA has already begun to act as a proxy organization for the community. CRA is regularly asked to organize events and workshops for federal agencies; recent examples include a cyber-learning workshop series for NSF (http://www.cra.org/Activities/workshops/cyberlearning/), the NITRD-funded Workshop on the Roadmap for the Revitalization of High End Computing (http://www.cra.org/Activities/workshops/nitrd/), NSF Town Hall Meetings on GENI, and a series of workshops highlighting the NSF Broadening Participation in Computing Program.

The stature of CRA within the computing research community is further evidenced by the individuals willing to stand for election by the community to the Board (/www.cra.org/main/cra.people.board.html). These individuals represent academia, industry and our society affiliates. As an elected Board, CRA is representative of the broad community. A simple further indication is the stature of the individuals and organizations associated with this proposal.

CRA has also sponsored a series of Computer Science Grand Challenge conferences (http://www.cra.org/grand.challenges/), supported by the National Science Foundation, whose goal is to develop community research agendas in computing. The first two conferences – on information systems and information assurance – completed their work and produced summary documents outlining the research challenges chosen by a consensus of attendees. These documents are accessible to researchers and the interested public. The third conference – on architecture – has been held and a summary document is in press.

However, individual conferences are insufficient to build a truly community-wide consensus and to work with research agencies toward funded initiatives. Hence, CRA is proposing to create the CCC, a group with the stature, the longevity and the staff to help coalesce research visions and initiatives, and move them forward to funded programs. A diverse and broadly representative set of computer science department chairs, lab directors and societies have encouraged the CRA Board to propose this Computing Community Consortium; see the Appendix for expressions of support.

CRA has considerable experience in managing projects that fit within the scope of CCC. As previously discussed, we have organized the only open-participation visioning activities within the community – the CRA Grand Challenge workshops. Biennially, CRA brings together the computing research leadership at our Snowbird conference. In years past, this conference produced a white paper on the state of computing research and education; an activity which we envision CCC as inheriting. Over the last five years, CRA has been awarded $5.25 million in funding for proposals designed to develop the computing research community, including proposals designed to create the researchers of tomorrow, on behalf of, and for, the computing community. With over thirty years of successfully meeting and exceeding its commitments, CRA is ready to undertake the CCC.

B.2. CCC Organization

As Figure 1 shows, a standing CRA committee, the CCC Council, will lead the CCC. The CCC Council will be led by a CCC Chair; we anticipate a 50% time commitment to this activity by the Chair. The primary role of the Council will be to stimulate, coordinate and oversee groups focused on topical areas of community interest. The purpose of those groups is to articulate research visions and, selectively, to foster evolution of the most promising visions toward major funding initiatives. Some funding initiatives will require significant instrumentation; others will not. The Council will work closely with appropriate members of the National Science Foundation and other funding agencies to advance the interests of the community.

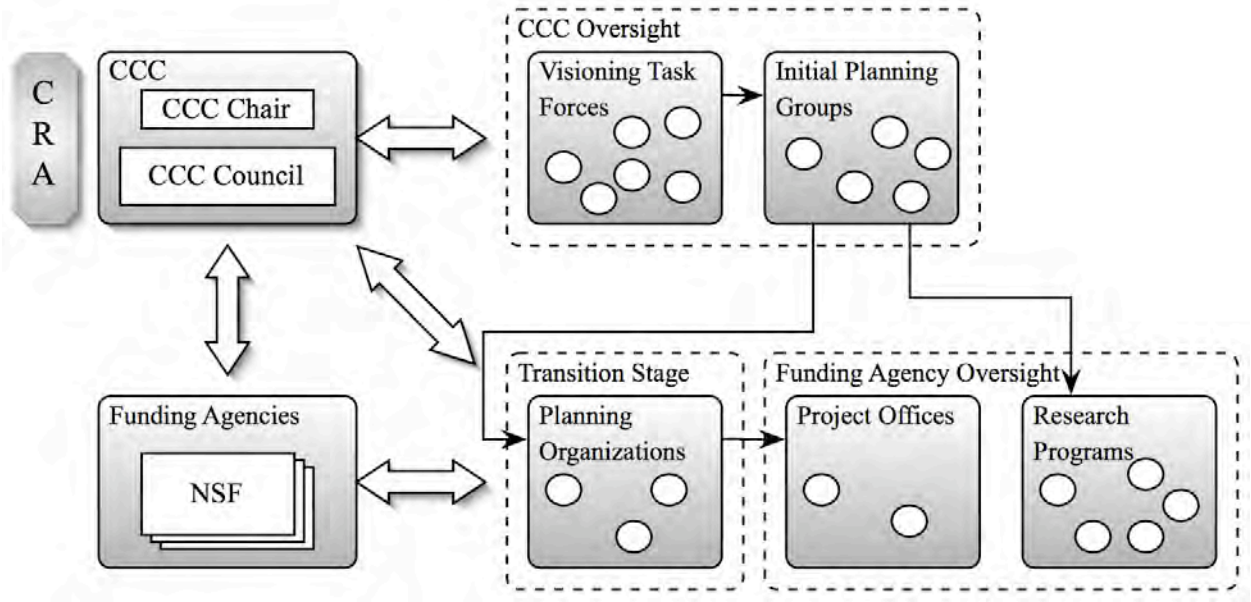

Figure 1. CCC Organization

Because the CCC will be a standing committee of the CRA, the CRA Board will select the CCC Council Chair, in consultation with the community. The Council Chair will have the major responsibility for leading the CCC, both in its processes and in communicating the CCC's proxy role to the computing research community. He or she will be a prominent member of the research community with a proven record of scientific accomplishment and community leadership.

The CCC Council will consist of 12–15 people, serving three-year terms, with the appointments staggered so that one third of the positions are open every year. Members will be eligible to serve at most two consecutive terms. The selection committee for potential Council members will consist of the Council Chair, the CRA Board Chair and representatives from the current Council and the CRA Board. Given the need to balance so many variables, direct election of the CCC Council members is not feasible. In addition to the members of the Council, we envision that a very large number of researchers will be engaged in the activities organized by the CCC workshops, Task Forces, Working Groups, reviewing, etc.

We are confident that the CCC Council will demonstrate the multi-dimensional diversity of our field. CRA has a long history of support for, and inclusion of, women and minorities: CRA-W was established in 1991 and has demonstrated success that has been recognized with the PAESMEM and NSB Community Service Awards. CRA is a co-founder of the Coalition to Diversify Computing and the Tapia Conference Celebrating Diversity in Computing. CRA-W and CDC have recently received a Broadening Participation in Computing award to continue and enhance activities to increase the participation of underrepresented groups in computing advanced education and research. In addition to these factors, Council member selection will consider factors such as vision, technical excellence, research specialty and leadership ability. The collective breadth of the Council will span the field of computing, including computer science, computer engineering and computational science. Diversity considerations will include industrial and international participation, gender and ethnic diversity, academic seniority, institutional diversity, etc.

Council members will be unpaid volunteers, but CCC-related travel costs will be covered by CCC funds. In accordance with the CRA bylaws, at least one of the CCC Council members must be a CRA board member.

Finally, the CCC will leverage the organizational processes and activities of CRA. These include information sharing with members of Congress and staffers, communications to academic and industrial research organizations, administrative infrastructure, education and outreach activities, and convening the community in appropriate ways. All of these organizational aspects are described below.

The CCC Management Team

Position	**Effort**	**Responsibilities**
CRA Board Chair	(as required)	Oversight
CRA Board	(as required)	Oversight
CRA Executive Director	25%	Smooth functioning
CCC Council Chair	50%	Overall
CCC Council	(as required)	Guide the overall process
CCC Visioning Task Forces	(as required)	Public report on research area
CCC Initial Planning Groups	(as required)	Creation of a funding plan

CRA will make use of a sub-award to support the CCC Council Chair to ensure that her/his salary and benefits continue at the home institution. We envision using consultants to gain expertise in media and messaging activities that are outside our core strengths.

C. MANAGEMENT PLAN

As described above, the CCC will be led by a diverse Council whose backgrounds and skills are broadly representative of the computing research community. The Council's Chair will work with the Council and CRA to stimulate and build community consensus around promising ideas and initiatives. This process will track ideas from initial vision to major funding following the stages illustrated in Figure 1.

The process starts with a community activity to identify the key fundamental questions in computing. These questions are not program or facility specific but may ultimately encompass multiple programs or facilities. An example might be "How can we specify task-appropriate security requirements and design and implement systems that are guaranteed to conform to them?" A community-wide effort to develop the list of fundamental questions will occur once every five years. However, a less intensive activity to sustain the list by producing updates and progress reports and updates will occur every year. The CCC will communicate the output of this activity to the broader national community. It is expected that the list of fundamental questions will provide the framework and rationale for large initiatives.

In support of the development of the fundamental questions list, the CCC will charter visioning activities, which will identify potential major opportunities, set priorities or establish grand scientific or engineering challenges for the field. These visioning activities may be based on a topical interest area proposed (either formally or informally) by members of the computing research community or formulated by Council members. Such proposals may be community generated or result from workshops and study groups organized by the CCC.

In response to a visioning activity proposal, the CCC may support establishment of a *Visioning Task Force*, whose members are recruited from the community by both the CCC and the proposers, based on interest and expertise. The task force will conduct one or more workshops and meetings, ideally in conjunction with related conferences. Some task force activities may be conducted in foreign venues, to ensure international participation.

Task force members will generate a public report that describes the prospects for this research area and that estimates the resources required to stimulate sustained activity. We expect these reports, either individually or in collected editions published by the CRA, to constitute authoritative statements of the scope and benefits for major computing research initiatives. They will also form a basis for consensus building, helping establish an agenda for future initiatives and community thinking around audacious research goals. Because research is an international activity, the broader community will participate in these activities.

A key outcome of a Visioning Task Force will be identification of ideas for major instrumentation or research initiatives that enjoy widespread community support. The Council, in such cases, will place the initiative in the context of the computing community's key research questions, and will seek agreement from an appropriate funding agency, e.g., NSF, that the idea is worthy of further exploration. Based on this agreement, the Council will work with the Task Force to form an *Initial Planning Group*. The charter of the Initial Planning Group will be to formulate a plan that outlines major strategic thrusts, identifies possible sources and types of funding and identifies the portion of the scientific community that should participate. The CCC will assist the Initial Planning Group in presenting their findings to appropriate funding agencies (NSF and others) and help them establish committed prospects for funding.

While many of these thrusts primarily require interest and initiation through new coordinated funding programs at agencies, others require the development of large-scale instrumentation and are thus more suitable for NSF Major Research Equipment and Facilities Construction (MREFC) funding. By definition, prospective MREFC initiatives require construction of a large-scale, shared resource to enable the envisioned science. Concomitantly, MREFC initiatives are also dependent on identification of a committed group of researchers who will champion the planning effort and the actual implementation and operation of the project. The CCC, through the Initial Planning Group, plays a key role in the preliminary stages of such efforts.

With CCC guidance and support, these groups will follow the prescribed path for development of MREFC proposals, beginning with the MREFC conceptual design phase. Upon successful completion of this phase, the CCC will work with NSF to establish a *Planning Organization* to continue the preliminary design phase. As this process proceeds, the NSF will become more directly involved in oversight, though the CCC will remain involved to ensure that the project serves the scientific needs of its constituents.

Following successful completion of the preliminary design phase, NSF will establish and fund a *Project Office.* This office will be responsible for completing the NSB approval process and the final design. It will then be responsible for the implementation and operation of the project. The CCC will assist in whatever way is useful once this independent entity is established. The CCC will continue to represent the community in evaluating whether the instrument being planned and built by the Project Office is meeting the research needs that it was envisioned to serve.

In addition to MREFC projects, the CCC mission includes the development of major new research initiatives using other modes of funding. Many areas of computing research do not require large-scale, shared instruments; funding for these initiatives should target the support of people (students, faculty, post-doctoral research associates and staff), rather than shared facilities. In addition, the limited availability of MREFC funding constrains the number of such projects. To serve in its proxy role, it is vital for the CCC to support a broad range of nature, scale, topic, and potential funding source.

For research visions that do not rely on instruments of the kind funded by the NSF MREFC account, the CCC-established Initial Planning Groups will engage program officers in various funding agencies (not limited to NSF). The CCC will work with them to convene groups to discuss potential research program

ideas, aid in building community consensus around such ideas, and explore alternative formulations of funding initiatives that could advance research most creatively and rapidly. Tailored, small groups constituted by CCC will seek to reduce the time needed not just to formulate a consensus around a research vision in the community, but to aid the funding agencies in exploring alternative initiative formulations that reduce the time between vision setting and program initiation. By identifying and sustaining a consensus suite of the computing research community's fundamental research questions, the CCC will provide a ready source of motivation for innovative research programs and a broadly based rationale for their funding.

As the community becomes more adept at formulating visionary research and instrumentation initiatives, the CCC will need to oversee the prioritization of these initiatives. Because the computing community is significantly larger and more diverse than, e.g., the astronomy community, a single mechanism such as a decadal study will not suffice. Prioritization will occur in response to the output of multiple visioning efforts. As in the astronomy community, the reports describing these visions will be widely circulated and discussed so as to build consensus. This topic is discussed further in the next section.

C.1. Priority Setting

Computing has a very diverse range of research thrusts, which the CCC will reflect in the consensus suite of fundamental research questions. At any time many research objectives are being actively pursued. One CCC objective is to catalyze the formulation of new research thrusts – more rapidly than they have formed in the past. For example, we believe that the digital libraries and the learning research efforts that are now in progress could have been formulated more rapidly if there were a change agent outside the funding agencies, such as CCC, actively bringing a community of interest together to define clearly and rapidly the research promise of a new thrust, and then to work actively with funding agencies to find a source of funds for the new ideas. Some of these thrusts will grow and prosper; others will not gain a (sub-)community consensus or will not appeal to funding sources and will disappear. Because we see value in multiplicity, we envision that CCC routinely will be pursuing multiple thrusts simultaneously. Strength of community interest will communicate the priority of a candidate thrust to the funding agencies. In addition to serving in this matchmaking role, the CCC will serve in a high-level oversight role similar to the one envisioned for MREFC projects, ensuring that the scientific mission of the program is serving the broad computing community.

However, CCC will need to choose among many nascent ideas to decide how to structure its activities. The CCC Council will permanently maintain a list of candidate ideas for new avenues to pursue. Each idea will be described in as compelling a way as possible. At least quarterly, the Council will review this candidate list and determine whether to sponsor a new effort to explore an idea. The CCC Council will maintain this list on a public web site and encourage commentary on the candidate topics. For each candidate topic that the Council selects for active support, a small proponent committee of 2-3 people will plan the activities and the community interaction to explore the idea. The committee will post both its plans and the status of activity on the web site so that transparency is maintained, and all who are interested can volunteer to participate in topic development activities.

A major objective for CCC is to facilitate the definition and project planning for large instruments such as can be funded by the NSF MREFC account. At any time, CCC will be pursuing no more than one or two such efforts, with a clear statement of priority if there are multiple such efforts. CCC will stimulate activities that lead to instrument project definitions and will be broadly consultative with the community. Today, CCC is poised to pursue one such instrument-class idea: the Global Environment for Networking Innovations, described below.

C.2. CCC Community Building Process: A Conceptual Summary

The stages depicted in Figure 1 represent evolution from conceptualization of research vision to major funding programs. As the research initiatives evolve, they will require increased staff support as the participants increase the scope of their efforts. For earlier stages, a part-time allocation of CCC staff will be sufficient. Once a group reaches the stage where it has its own funding awarded by NSF or another agency, and is its own administrative entity, dedicated staff will be hired via the funding of that entity.

There will be a progressive transition from CCC oversight to funding agency oversight as an initiative evolves toward fully funded status. After a project completes such a transition, the CCC will not be directly responsible for oversight – we expect that mature projects, once they have received full funding through an agency such as NSF (for example, once a Project Office is established for an MREFC initiative), will each have established an appropriate oversight structure, tailored to the specific project, to provide guidance towards achieving its scientific goals. While the CCC will not be responsible for creating this scientific oversight structure, the CCC will remain engaged by reviewing the outputs of the oversight structure and providing comments reflecting community views.

To be completely clear, the distinction between the roles of the CCC Council and the oversight mechanism is as follows: the oversight structure will be created by the project and funding agency, and will provide technical and scientific evaluation and feedback to the project and funding agency; the CCC Council will advise the funding agency on whether the project is meeting the needs of the community it is intended to serve.

We describe this progressive transition for the specific instance of GENI in §D. GENI is currently in the MREFC Conceptual Design Phase. GENI may either still be in this phase, or it may have transitioned to the Preliminary Design Phase, by the time the CCC is established. In either case, the CCC will begin its oversight role as rapidly as possible. In the vernacular of Figure 1, we consider GENI to be in transition from the Initial Planning Group stage to the Planning Organization stage. However, GENI does not yet possess the full breadth and depth of scientific vision, community endorsement and execution capability that the CCC would impart to future initiatives at similar stages. Addressing these issues will be a top priority for the CCC, working closely with NSF staff and the GENI Planning Group.

C.3. CCC Schedule and Milestones

Date	**Milestone**
1SEP06	CCC Council Chair Named
1OCT06	CCC Council Named
15OCT06	Community outreach begins; Visioning activities solicited
…	Establish Visioning Task Forces
+ 6 months	Ideas released
…	Establish Initial Planning Groups
+ 12 months	Plans published
…	Agencies Establish Funding Programs

D. GENI: SCIENTIFIC LEADERSHIP, PRIORITIES, AND MREFC MILESTONES

Earlier, this proposal described the conceptual role of the CCC in stimulating and coordinating an ongoing process of research visioning within computing disciplines, and in shepherding certain ideas, as appropriate, through a sequence of steps leading to broad community endorsement, expanded research support, and research facility creation, e.g., through the NSF MREFC process, where appropriate.

Below, we focus on the role of the CCC in guiding GENI – the Global Environment for Networking Innovations. Through the extraordinary efforts of CISE and a small group of committed computer scientists, GENI is already moving through the MREFC process. However, GENI does not yet possess the full breadth and depth of scientific vision, community endorsement and execution capability that the CCC would impart to future initiatives at similar stages.

D.1. GENI: Current Status

Culminating more than a year of activity that included a series of NSF-sponsored workshops, NSF CISE announced the GENI Initiative to the research community at the August 2005 SIGCOMM Conference. Concurrently, NSF CISE announced the related Future Internet Network Design (FIND) (http://find.isi.edu/) networking research initiative. FIND seeks "clean slate process" research proposals in the broad area of network architecture, principles and design.

In January 2006, the GENI Planning Group, composed of ten networking and distributed systems researchers (T. Anderson (Washington), D. Blumenthal (UCSB), D. Casey (NGENET Research), D. Clark (MIT), D. Estrin (UCLA), L. Peterson (Princeton), D. Raychaudhuri (Rutgers), J. Rexford (Princeton), S. Shenker (Berkeley) and J. Wroclawski (ISI)) delivered a 124-page "Conceptual Design and Project Execution Plan" (PEP) for GENI (http://www.geni.net/). At the end of January, an NSF panel conducted a Conceptual Design Review and unanimously recommended that GENI move from the Conceptual Design Stage to the Readiness Stage – the first "stage transition" in the NSF MREFC process. Several additional criteria must be satisfied before GENI can formally achieve Readiness status, however.

Since then, the GENI Planning Group has been expanded to 12 members. Six Working Groups have also been established: Research Coordination, Facility Architecture, Distributed Services, Backbone Network, Wireless Subnets, and the Project Management Team. These Working Groups have been populated with Planning Group members and other individuals from the relevant research communities. This group has submitted an NSF proposal entitled *Collaborative Research: Facility for Experimental Network Architecture Research* to advance the Project Execution Plan (PEP) from the MREFC Conceptual Design Stage, to and through the Readiness Stage, to an approved Preliminary Design.

Under NSF sponsorship, CRA has convened the first two in a sequence of NSF "Town Hall" meetings on GENI (www.cra.org/nsf.geni/) to further expose the research community to this initiative and invite broader participation. The GENI web site (http://www.geni.net) contains additional details on GENI.

D.2. Immediate Next Steps

The GENI Initiative, via CISE leadership and the GENI Planning Group, has made major progress in a remarkably short period. Not surprisingly under the circumstances, some intellectual and organizational gaps remain. For example, there has been little participation in GENI from individuals with professional expertise in designing and constructing hardware/software facilities of GENI's scale and complexity, in risk management and in cost estimation.

Additionally, the Planning Group and its Working Groups, while composed of committed and capable individuals, have not been "vetted" by the research community, and they have not devoted equal attention

to all aspects of the Initiative. There is not yet a full community consensus on the research vision, that is, the specific research problems that GENI would make it possible to address. We believe the CCC can catalyze the community to consider these issues. The CCC will seek much broader interest in, and support for, the evolved GENI vision and definition.

NSF CISE has expressed its intention to establish a GENI Project Office (GPO) in the near term, to address the perceived management gaps in the current PEP. *It is our strongly held view – a view communicated to NSF CISE – that it is premature to create a GPO.* Injecting another organization into the GENI mix – an organization asked to fulfill a set of not-yet-fully-defined functional requirements and eventually to serve as the "general contractor" for the construction of a facility that must satisfy not-yet-fully-defined scientific objectives – will create unnecessary confusion. The current process badly needs stabilization, a role the putative CCC can play. Instead, we recommend the operational plan described earlier, transitioning from GENI's current planning activity to the formation of a GENI Planning Organization. That transition can be tailored to satisfy NSF's concern that GENI begin to have the benefit of professional project planning expertise.

In our view, the immediate tasks include the following; these are particularly targeted to give the community ownership of the GENI planning process:

- Establish the Computing Community Consortium as a "proxy" for the computing research community
- Rapidly obtain the support of the computing research community for an ongoing process of visioning for the field, coordinated by the CCC
- Establish a strong partnership among the CCC, NSF CISE, the NSF MREFC organization and the existing GENI Planning Group
- Initiate among these parties a collaborative review of the GENI Planning Group membership, ensuring both comprehensive technical coverage and adequate community participation
- Under the guidance of the CCC, evolve the current GENI Planning Group and its Working Groups into a more formal GENI Planning Organization, involving at least the following steps:
    - Support an expanded version of the proposal submitted to CISE by members of the Planning Group to advance the PEP from the MREFC Conceptual Design Stage, to and through the Readiness Stage, to an approved Preliminary Design
    - Identify and involve the constituencies that will be affected by GENI, and ensure that the Planning Organization, i.e., the Planning Group and its Working Groups, adequately represents these constituencies, together with professional instrumentation planners, and thus can evolve the science plan, facility design, and management plan
    - Ensure that the members of the Planning Group – undoubtedly augmented and perhaps re-named – are generally viewed as the community leadership of the GENI Initiative, reporting to the CCC Council as well as to NSF
    - Significantly increase the frequency of "Town Hall Meetings" (sponsored by the CCC and NSF, with Planning Organization involvement) and open technical workshops (sponsored by the Planning Organization, with CCC and NSF involvement), as well as smaller invited workshops with research community leaders and prospective government partners, industrial partners and international partners (sponsored by the CCC and NSF, with Planning Organization involvement)

In the conceptual model proposed earlier, the CCC and NSF would appoint the Chair of the Planning Organization, and the CCC, the Chair and NSF would jointly appoint the members of the Planning Group, in consultation with external parties as appropriate. This process would ensure comprehensive technical coverage and adequate community participation. In the case of GENI, a highly functional Planning Organization (Chair, Planning Group, and Working Groups) is already in place; we envision judicious augmentation rather than replacement.

D.3. Evolving the Project Execution Plan

Evolving and strengthening the PEP – moving GENI from the MREFC Conceptual Design Stage, to and through the Readiness Stage, to an approved Preliminary Design – is the ultimate responsibility of the GENI Planning Organization, overseen by NSF with the assistance of the CCC. The CCC's responsibility for an initiative at GENI's stage is to ensure close ties between the computing research community and the initiative (and concomitant broad support for the initiative on the part of the research community). The CCC must also ensure the proper composition of the Planning Organization, and must support the funding organization (NSF in the case of GENI) in guiding and overseeing the progress of the Planning Organization. This includes reviews of the PEP, the management plan, risk assessment and mitigation strategies, and the budget. The CCC must ensure that the Planning Organization is properly constituted with broader participation and continues to be effective.

As an immediate task, the evolved GENI Planning Organization described above, working closely with and under the direction of the CCC, NSF CISE and the NSF MREFC organization, must understand the gaps in the current PEP and pay particular attention to addressing these gaps as the planning process moves forward with all possible speed. Among the evident gaps are:

- The maturity of the research plan – that is, a compelling vision statement for the breadth of networking and distributed systems research problems to be solved and why they cannot be solved with existing facilities
- A clearly articulated vision of the relationship of GENI to "bandwidth user communities" – GENI is designed to support research in networking and distributed systems, as opposed to simply providing bandwidth to end users, yet GENI benefits from, and indeed relies upon, traffic generated by "real users"
- Definition of the educational impacts of designing, constructing and utilizing the facility
- Integration of the wireless subnet component into the overall architecture – a particularly difficult issue because of the relative immaturity of wireless technology relative to the expected lifetime of GENI
- Security – both the security of the GENI facility itself and the use of GENI for research in security
- Involvement of international partners
- A process to involve industry so that grounded economic and operational issues associated with commercialization of network rearchitecture are part of the research agenda and output
- Involvement of additional government agencies
- Additional risk identification and risk mitigation strategies
- Project management, including functional requirements, structure, and involvement of appropriate expertise

To summarize, we believe strongly that it is premature to create a GENI Project Office. The gaps above – including the gaps in risk identification, risk mitigation and project management – are best addressed by *augmenting the capabilities of the GENI Planning Organization* and *engaging the CCC as an active partner*. GENI's scientific requirements and the functional requirements of the Project Office must be defined before an organization joins the mix with the intent of becoming the "general contractor" for GENI facility construction.

D.4. How CCC Will Strengthen the GENI Activity

Proposal page limits constrain the detail we can provide; we touch in greater depth on a few issues here:

- *Build the research case for GENI:* The research community beyond networking is not yet sufficiently engaged in GENI and their participation is required in order to build the overall research case. In

particular, it is necessary to involve the networking and computing industrial leaders. These communities need opportunities to make their opinions known throughout the Preliminary Design and Final Design stages.

- *Obtaining a deep external technical review:* A deep outside technical review of the plans (design, research plan and budget) will be required when GENI is ready to exit the Preliminary Design/Readiness stage. As is standard practice, NSF will conduct its own intensive site review. In addition, serious independent review of the design, budget, and schedule – involving industry participants – is needed. The design must be validated against each of the primary requirements from the PEP, e.g., isolation, flexibility and experimenter support, by deep external technical review. This review must answer a fundamental question: does the design achieve the requirements/desiderata?

- *Managing the budget:* The challenge for a community proxy is in arbitration, particularly when provision of specific capabilities may require changes to original budgets. It is critical to characterize the capacity of the facility in basic terms – how many concurrent experiments will it support, of which kinds, and why? Rising budgets signal disagreement on priorities, inability to make the technical compromises necessary to make the system work within the available resources, and inability to manage the project.

- *Identifying a Project Director:* Identifying an individual willing to be a full-time Project Director for the project's duration – in essence, a 10-year commitment – is crucial. The CCC will need to work with NSF CISE and the Planning Organization to identify such an individual. The CCC, NSF CISE and the Planning Organization should first identify a Project Director, and these four entities should have input on the selection of the Project Office.

E. OFFICE FACILITIES

The central resources required for CCC are currently in place within the CRA office in Washington, D.C. Expansion of facilities will be required as CCC increases the CRA office staffing and workload by approximately 50%. Fortunately, space is available for such an increase within the building currently housing CRA. Similarly, office equipment will need to be enhanced. However, all can be accommodated within the fiscal constraints of this proposal.

CCC will involve a number of activities and will include a large number of participants. We anticipate that the policy leadership will take place in a distributed fashion via regular teleconferences among the CCC Council members and via meetings held at locations throughout the country. CRA has extensive experience at organizing and staffing such meetings, and at reimbursing participants in a timely fashion.

Budgeting for CCC

Staff	CCC Travel	GENI Travel	Participants	Dissemination/Media	CCC Council Chair
27%	7%	6%	24%	10%	15%

F. INTEGRATION AND BROADER IMPACTS

The majority of the gain in economic productivity in the U.S. over the past decade is due to innovations in information technology. Underlying those innovations are prior decades of computing research in algorithms, architecture, networking, software systems, telecommunications, and other subfields, much of it funded by NSF and other government agencies. The CCC is envisioned as a mechanism to promote continued innovation by enhancing the ability of the scientific community to envision and pursue long-

term, audacious computing research goals rather than incremental ones. By so doing, CCC will further the value of NSF's investments in research.

One key impact of CCC will come from its role as a proxy for the computing research community. There is currently no such voice for the computing community as a whole. Other scientific fields – most notably physics and astronomy – have vibrant visioning mechanisms at the community level that help move those fields forward in strategic ways. We envision that the CCC will play such a role in engaging the computing research community and interfacing with the broader scientific community to develop visions for the role of computing and information science and technology in tomorrow's world, as well as suggest research strategies for how to realize those visions.

One component of the visioning role of CCC is to work with the scientific community to formulate bold research programs and substantiate large-scale, shared research facilities. CCC will partner with NSF and other funding agencies and serve as an intellectual resource for suggesting new research directions or initiatives with exceptional long-term impact. We expect that CCC will thus influence NSF's funding priorities, especially to identify needs for long-term, high-risk research, perhaps to a greater extent than current organizational and funding mechanisms permit. By nature of the diverse composition of the CCC, spanning a breadth of research expertise, gender, ethnicities, academic age, and institutions, there will be representation on the CCC by the business community, and the CCC will work to engage the business community to leverage investments by government agencies.

Education of future scientists is a critical mission of NSF, and by advancing new programs, infrastructure, and instrumentation, CCC will provide new training opportunities for graduate students who will be tomorrow's innovators. CCC will involve a diverse set of students from a broad spectrum of institutions in workshops and other venues where they can participate with leading scientists and interact on critical research issues. As discussed earlier, CRA has a long history of working to involve underrepresented groups and such inclusion will continue. Although K-12 and undergraduate education are not directly within the scope of CCC's mission, we expect that the ideas and visions that emanate will help entice more students to enter computing-related fields. In addition, CCC's efforts to promote new programs will likely result in some large NSF-funded projects, and such projects generally have significant educational outreach and diversity components.

Part of the CCC's efforts as community proxy will be directed toward communication with the public. In partnership with the Computing Research Association, the CCC will work to develop materials that show the dramatic impact that information technology research is having on society as well as the even greater future potential. Such efforts will help foster understanding and support for how computing research will continue to improve the quality of life and standard of living for people in the U.S. and worldwide.

G. MEASURING THE SUCCESS OF THE CCC

We have five goals:

1. Bring the computing research community together to discuss, prioritize and to envision our future research needs and thrusts.
2. Communicate these challenges, needs and thrusts to the broader national community.
3. Create within the computing research community more audacious thinking.
4. See the ideas developed in (1) and (3) turn into funded research programs and/or instruments.
5. Increase the excitement within computing research and use that excitement to attract students of both genders and all ethnic groups into computing research careers.

Clearly, these are many-year processes. In the short term, we will know if CCC is succeeding if we are able to generate interest and participation in our preliminary visioning activities, particularly by researchers of stature. Progress here will tell us how to modify this process. Next, we will measure our

success by whether we can successfully populate the Visioning Task Forces and, ultimately, the Initial Planning Groups. Each of these activities has concrete products to deliver to the CCC and community.

Thus, our metrics are: populating the CCC, creating the staffing infrastructure, beginning the visioning process and continuing it, creating Visioning Task Forces, seeing them through to idea generation, creating Initial Planning Groups, seeing them through to report generation, working with NSF and other federal agencies to fund programs and instruments based upon these reports, and continuing to monitor the success of these new programs and instruments and of the field of computing research.

It is important to note that ours is a shared responsibility – researchers need to see responses to their activities on behalf of the CCC. NSF and other funding agencies need to be responsive and ensure that the community efforts have real (monetary) impact.

H. THE COMPUTING COMMUNITY CONSORTIUM

The opportunity for the Computing Community Consortium is dramatic – we are at a time when the computing research community is ready to take the next step and assume more responsibility for its own success through the creation of funding programs and instrumentation to drive the next generation of researchers. Moreover, it is clear that the impact of computing on the nation's economy and our citizens' lives will continue to grow dramatically. The Computing Research Association is the right organization to undertake this activity on behalf of the computing research community. In this proposal, we have demonstrated our previous activities and successes and discussed our plan for the future.

I. PERSONNEL QUALIFICATIONS

Daniel A. Reed. Professor Reed, the former Director of NCSA, has extensive experience in managing large cooperative projects; including the NSF ETF TeraGrid, a partnership among NCSA, SDSC, Argonne, Caltech, PSC and other sites to develop a national Grid of commodity clusters, storage systems, and high-performance networks and a large Information Technology Research (ITR) project to support the development of community toolkits for atmospheric science modeling. He has served on PITAC, currently serves on PCAST, and currently chairs the Computing Research Association board.

Andrew Bernat. Andrew Bernat used extensive support from the NSF CISE Minority Institution Infrastructure program to create and build the Computer Science Department at the University of Texas at El Paso into one of the strongest departments at a minority serving institution during his 20-year career as a professor. He was the U.S. lead in a series of workshops with colleagues in Mexico focused on establishing joint research activities at the institutional and federal levels. He is the Computing Research Association Executive Director.

Randal E. Bryant. Prof. Bryant has been a PI on a number of NSF grants during his career, most recently a medium ITR grant on verification tools for autonomous and embedded systems. He currently serves as Dean of the School of Computer Science at Carnegie Mellon University, where he oversees an organization that had over $64 million in sponsored research funding in 2005, including over $20 million from the NSF. He is a CRA board member.

Susan L. Graham. Professor Graham was a founding member of the National Partnership for Advanced Computational Infrastructure (NPACI) and served as its Chief Computer Scientist and as a member of the Leadership Team from 1997 to 2005. She shared responsibility for overseeing multi-university applications/computer science collaborative projects designed to enhance software aspects of the NPACI instrumentation. She has served on PITAC and on numerous advisory and steering committees, including the first NSF Science and Technology Centers committee, and the NSF MPS advisory committee.

Anita Jones. Professor Jones has served on the National Science Board, and chaired its Committee on Programs and Plans, which performs the Board's in depth evaluation of MREFC candidates. She is a member of the Defense Science Board and was the Director of Defense Research and Engineering. She, with NAE President Bill Wulf, formulated the notion of the Computer Science Grand Challenge Conferences as a community visioning exercise and chaired the first of the three conferences in this CRA and NSF sponsored series.

Richard Karp. Member, NAS, NAE, American Philosophical Society; Founding Chair, Section 34 (Computer and Information Sciences) NAS; NSF Waterman Award Committee, NSF (1999-2001,chair 2001); Computer Science and Telecommunications Board, NRC (1976-80, 1992-95); Board of Governors, Weizmann Institute of Science (1987-); Board of Governors, Institute for Mathematics and its Applications (1999-2001, chair 2001); External Advisory Board, DIMACS(1990-).

Ken Kennedy. Professor Kennedy was the founding director of the Center for Research on Parallel Computation (CRPC), one of the first NSF Science and Technology Centers. In that role, he helped pioneer a strategy for distributed management of multi-institutional projects that is widely emulated today. From 1997 to 1999 he served as co-chair of the President's Information Technology Advisory Committee (PITAC), remaining a member until 2001. For the past seven years he has directed the academic component of the Los Alamos Computer Science Institute, a collaboration of five universities with the Los Alamos National Laboratory.

Edward D. Lazowska. Professor Lazowska has studied the design, implementation, and analysis of high-performance computing and communication systems for 30 years. He chaired the Computing Research Association from 1997-2001, the NSF CISE Advisory Committee from 1998-99, the President's Information Technology Advisory Committee from 2003-05, and DARPA ISAT from 2004-06. In 2005, he received the Computing Research Association Distinguished Service Award and the ACM Presidential Award.

Peter Lee. Professor Lee has made numerous research contributions in the area of programming languages and systems for 25 years, in large part with NSF support, most recently through an ITR grant. He is a former Associate Dean for Undergraduate Education in the School of Computer Science at Carnegie Mellon University, overseeing a dramatic increase, from 6% to 40%, in the number of women enrolling in its undergraduate computing programs. He has been a member of numerous government science advisory panels, including DARPA ISAT, DARPA IXO Senior Advisory Group, Army Science Board, and Defense Science Board.

Wim Sweldens. Wim Sweldens is the Technology Commercialization Senior Vice President at Bell Laboratories, Lucent Technologies. MIT's *Technology Review* chose him in 1999 as one of 100 most promising young innovators and he became an IEEE fellow in 2003. He currently heads the new Technology Commercialization group focused on rapidly bringing new Bell Labs innovations to market.

Jeffrey S. Vitter. Prof. Vitter's research has been supported by NSF for each of the past 25 years. In a $4.5 million MURI grant through the Army Research Office, Prof. Vitter and collaborators at Brown and Johns Hopkins formed a center for geometric computing, which among other activities organized workshops and community efforts aimed at building and substantiating important applications of computational geometry. He serves as Dean of Science at Purdue University.

Staffing of the CCC

Several staff will serve the administrative needs of the CCC, as employees of CRA, the parent organization of the CCC. Some will work full-time on CCC matters; others will divide their time between CCC and other CRA activities. The CRA Executive Director will shift staff responsibilities as needed and will ensure that the needs of each organization are met. Similar staffing procedures are used within the CRA, with appropriate mechanisms for tracking staff time and effort across multiple cost centers. CCC-related staff positions will include

- A *Technical Program Director,* who will have expertise in computer science and engineering, together with knowledge of leading individuals and organizations in the research community
- A *Meeting Coordinator,* who will be responsible for managing workshops with the community and meetings of the various planning groups.
- A *Publications Editor,* who will be responsible for pulling together, editing, publishing and disseminating CCC documents.
- An *Accountant,* who will handle the business dealings involved with this large-scale effort.

CRA will also make use of a sub-award to support the CCC Council Chair to ensure that her/his salary and benefits continue at the home institution. We envision using consultants to gain expertise in media and messaging activities which are outside our core strengths.

Senior Personnel

The CCC Director will be an academic research leader housed at her or his home institution; because this individual has not been designated, an appropriate salary, fringe benefit rate and indirect cost rate have been used; see Subaward below.

The CRA Executive Director will devote 25% time working with the CCC to ensure its success and to overseeing the management aspects of the CCC effort

Other Personnel

A full-time staff director for CCC will be hired; we anticipate this individual having a PhD in computer science and interest in policy issues.

Additional/current CRA staff members handling Publications, Meetings, Website management and Dissemination/Outreach will each devote significant time to CCC activities.

An accountant will be added to the CRA staff due to the vastly increased workload to handle CCC.

Secretarial – Clerical

To handle the myriad of details required, we will have a 50% time Administrative Assistant within the CRA office and a full-time Administrative Assistant at the home institution of the CCC Director.

Fringe Benefits

The CRA rate is 32% of Salaries.

Travel

We anticipate 20 national and 10 international trips for CCC related business by CRA staff. The international trips are required because computing research must be understood in the international context and because we envision involving international agencies in research consortia and funding.

Participant Support Costs

We estimate that the CCC Board members, the GENI Technical Advisory Board members will incur considerable travel in the exercise of their responsibilities.

As well we anticipate organizing workshops and mini-workshops co-located with major research conferences to conduct the CCC and GENI TAB missions.

We estimate these expenses.

No members, other than the Director of the CCC, will receive financial renumeration beyond actual travel expenses.

Other Direct Costs

Materials and Supplies/Publication Costs

We anticipate large requirements for the preparation of documents, printing, postage, brochures, etc.

Consultant Services

We anticipate the use of professionals in the field of dissemination to help the CCC present their mission and results to interested parties.

CRA contracts for computer support services and we anticipate CCC paying its share of this cost.

Subawards

This is the funding for the CCC Director at their home institution.

Indirect Costs

CRA's negotiated rate is 19.55%.

Appendix

Statements of Support for CRA's Proposal to Create the Computing Community Consortium

Attached are excerpts from the support the Computing Research Association has received for this proposal.

In addition, draft copies of the proposal were sent to readers selected to represent the diversity of participation envisioned for CCC: Research I institutions that are not actively involved in CRA, mid-tier Research I institutions, research intensive minority serving institutions, and industry; as well as to researchers actively involved in the GENI effort. Their insights have been incorporated into this submission.

Industry Support for CRA's Proposal to create the Computing Community Consortium

Support has been received from:

BBN Technologies
CA Labs
Cisco
Fujitsu Laboratories of America, Inc.
Google, Inc.
Hewlett-Packard Company
IBM Research
Intel Corporation
Microsoft Corporation
Mitsubishi Electric Research Labs
Panasonic Princeton Laboratory
Ricoh Innovations, Inc.
SAP Labs
Sun Microsystems, Inc.
Telcordia Technologies
Yahoo Research

BBN
TECHNOLOGIES

8 June 2006

To the National Science Foundation:

BBN Technologies has been involved computer science research since the early 1960s. Over the years, our scientists have played a key role in the development of operating systems (e.g. TENEX), networking (ARPANET and Internet), artificial intelligence and speech recognition. While we receive almost all of our research funding from companies and agencies other than the National Science Foundation, we have always tried to stay in touch with NSF research directions, as we believe that the research NSF supports is an essential part of the nation's research environment. BBNers routinely serve on NSF panels and advisory committees.

We believe that NSF needs to invest more in computer science infrastructure – research technology that will enable computer scientists to make groundbreaking advances in fields such as networking and scientific computation. Clearly, if we are to invest in such infrastructure, we need the computer science community to speak as one voice about its research needs.

The Computing Research Association (CRA) is an organization in which the computer science community can and does genuinely come together. We believe that the CRA has proven to be an effective organization that can capably assume the responsibility for leading the research community in the Computing Community Consortium (CCC).

Sincerely yours,

Dr. Craig Partridge
Chief Scientist, BBN Technologies
Fellow, IEEE and ACM

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ca.com

May 31, 2005

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

This letter is to express my enthusiastic support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a Computing Community Consortium.

Whereas in the past innovation in computing was largely driven by grand challenges, nowadays we see a shift to a commodity and application focus. In parallel we are seeing a marked decline in interest by students in pursuing careers in Information Technology. A bolder research agenda is needed to both move the field forward, as well as polish its image and attract the next generation of talent.

CRA is the natural organization to lead such an effort, as it would be a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

Our recently organized CA Labs joined as a member of CRA in its support of computer science research. We are pleased to offer this proposal our strong support.

Sincerely,

Gabriel M. Silberman
Senior Vice-President & Head, CA Labs

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
Phone: 408 526-4000
Fax: 408 526-4100
http://www.cisco.com

June 8, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I would like to express my support for the Computing Research Association proposal to create a "Computing Community Consortium." I strongly recommend NSF to fund this proposal as this effort would establish the structure and process that is desired to organize the computing research field in its pursuit of defining a bold research agenda.

This is especially true now with the pending GENI initiative and the need to define and drive a sound research program in networking and distributed systems research to build the future generation Internet. As the networking industry market leader Cisco has a special interest in such research in general and the GENI initiative in particular.

Sincerely,

Javad Boroumand
Senior Manager
Academic Research and Technology Initiatives
Cisco Systems

FUJITSU LABORATORIES OF AMERICA, INC.
1240 East Arques Avenue, M/S 345, Sunnyvale, CA 94085-5401
Telephone: (408) 530-4500 Facsimile: (408) 530-4515

FUJITSU

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort -- it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

Fujitsu Labs of America has long been a member of CRA in its support of computer science research. We're pleased to offer this proposal our strong support.

Sincerely,

H. Matsumoto

Hitoshi Matsumoto
President & CEO, Fujitsu Laboratories of America, Inc.

Google

Wednesday, June 7, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Dr. Bernat,

I am pleased to submit this letter of support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is in great need of a process that will lead to a bolder research agenda, one that will drive the field forward, and attract the brightest students to the field. The Computing Research Association is the natural organization to lead such an effort. CRA has played a key role in representing the computing research and advanced education communities and this proposal presents a valuable extension of that mission.

Google places great value on the research conducted by the computing community. We offer our strong support for this proposal.

Sincerely,

Alan Eustace
Senior Vice President
Engineering and Research
Google Inc.

Hewlett-Packard Company
1501 Page Mill Road
Mail Stop 1367
Palo Alto, CA 94304
www.hp.com

Wayne Johnson
Vice President
University Relations Worldwide

650-857-4257 Tel
650-857-8100 Fax
Wayne_Johnson@hp.com

June 5, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy:

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

The computing research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort - it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

HP has been a CRA member for many years. We're pleased to offer this proposal our strong support.

Sincerely,

Wayne Johnson
Vice President, University Relations Worldwide

Route 100
Somers, NY 10589

June 2, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is an excellent organization to lead such an effort -- it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

IBM via its Research Divison has long been a member of CRA in its support of computer science research. We're pleased to offer this proposal our strong support.

Sincerely,

Alfred

Dr. Alfred Z. Spector
Chief Technology Officer
IBM Software Group
Route 100, Bldg 1, Office 2A02
Somers, NY 10589

AZS:jmb

June 7, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Dr. Bernat.

I am writing to express Intel's strong support of the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward. and attract the brightest students to the field. CRA is the natural organization to lead such an effort – it is a natural extension of CRA's well established and well-recognized role in representing the computing research and advanced education communities.

Intel has long been a member of the CRA, joining in its endorsement of computer science research.
We're pleased to offer this proposal our strong support.

Regards,

Andrew A. Chien
Intel Corporation
Vice President, Corporate Technology Group
Director, Intel Research

Intel Corporation
5200 NE Elam Young Parkway
Hillsboro, OR 97124-5961
www.intel.com

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/

Microsoft

June 2, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort -- it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

Microsoft Research has been a CRA member for many years, and a partner with CRA in many activities. We're pleased to offer this proposal our strong support.

Sincerely,

Richard F. Rashid
Senior Vice President, Microsoft Research

Panasonic
ideas for life

Panasonic Princeton Laboratory
of Panasonic R&D Company of America
Division of Panasonic Corporation of North America

June 1, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort -- it's a natural extension of CRA's well-established and well-recognized role in representing the academic computing research, industrial computing research, and advanced education communities.

Panasonic has been a CRA member for many years, and we're pleased to offer this proposal our strong support.

Sincerely,

Robert S. Fish
Vice President & Director

RSF/lsr

RICOH

RICOH INNOVATIONS

Ricoh Innovations, Inc.
2882 Sand Hill Road, Suite 115
Menlo Park, CA 94025

June 1, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

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Ricoh has been a CRA member for many years, and we're pleased to offer this proposal our strong support.

Sincerely,

Peter Hart, Ph.D.
President and Chairman

PEH/cth

3475 Deer Creek Road
Palo Alto, CA 94304
T 650.849.4000
F 650.849.4200
www.sap.com

June 2, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Dr. Bernat,

I'm writing to express my support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is in need of a process that will lead to a bolder research agenda - a research agenda that will drive the field forward and attract the brightest students to the field. CRA is the natural organization to lead such an effort - it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

We're pleased to offer this proposal our support.

Sincerely,

Ike Nassi
Senior Vice President
SAP Research, America

Sun Microsystems, Inc.
Mailstop UMPK10-244
10 Network Circle
Menlo Park, CA 94025

May 31, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort -- it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

Sun has long been a member of the CRA, joining in its support of computer science research. We're pleased to offer this proposal our strong support.

Sincerely,

Greg Papadopoulos
Chief Technology Officer
EVP of Research and Development
Sun Microsystems

From: "Marek Rusinkiewicz" <marek@research.telcordia.com>
Date: June 5, 2006 6:41:44 PM EDT
To: "'Andrew Bernat'" <abernat@cra.org>, "'Daniel Reed'" <Dan_Reed@unc.edu>
Cc: "Drobot, Adam" <adrobot@telcordia.com>
Subject: Telcordia Support of CRA proposal for creation of CCC
Reply-To: <marek@research.telcordia.com>

Dear Dr. Reed,

We understand that CRA is submitting a proposal to create a Community Computing Consortium (CCC) to act as a proxy organization for the computing research community in identifying high priority research projects. To fulfill this role, the CCC should bring together multiple computing research communities, including academic and industrial research organizations.

Telcordia has long history as a leading innovator of networking and communications technologies, dating to our creation as a consortial R&D center for the Bell Operating Companies. Telcordia employees have generated more than 800 patents, leading to breakthroughs in technologies such as ADSL, ATM, Frame Relay and SONET. Our research spans the spectrum from protocol and algorithm research, through communication and information exchange standards, to large-scale, reliable network management software.

The CRA is well positioned to provide a framework for CCC, which will serve as the representative of all members of the computing research community. As one of the nation's leading industrial R&D centers in the area of communications and networking, Telcordia collaborates in CRA with other computing organizations in universities, government and industry.

We believe that establishment of CCC under CRA auspices will help the scientific community build consensus on long-term goals. Therefore, we fully support the CRA proposal and look forward to working with you on its implementation.

Marek Rusinkiewicz
Vice President and General Manager
Information and Computer Sciences Research Laboratory
Telcordia Technologies, Inc.
One Telcordia Drive, RRC 1N3115
Piscataway, NJ 08854
Voice: (732) 699-8200
Fax: (732) 336-7015
marek@research.telcordia.com

YAHOO!

June 5, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

The computing research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort - it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

We are pleased to offer this proposal our strong support.

Sincerely,

Regards,
Prabhakar Raghavan, Ph.D.
Head of Yahoo! Research Labs
Yahoo! Inc.

701 First Avenue • Sunnyvale, CA 94089 • phone 408 349 3300 • fax 408 349 3301 yahoo.com

Laboratory/Center Support for CRA's Proposal to create the Computing Community Consortium

Support has been received from:

Argonne National Laboratory
IDA Center for Computing Sciences
Lawrence Berkeley National Laboratory
Los Alamos National Laboratory
National Center for Atmospheric Research
San Diego Supercomputing Center
USC Information Sciences Institute

Ewing L. Lusk
Acting Division Director

Mathematics and Computer Science
Argonne National Laboratory
9700 South Cass Avenue, Bldg 221
Argonne, IL 60439-4844

1-630-123-7852 phone
1-630-123-6333 fax
lusk@mcs.anl.gov

June 5, 2006

Dr. Andrew Bernat
Computing Research Association
1100 17th St. NW, Suite 507
Washington, DC 20036-1632

Dear Dr. Bernat:

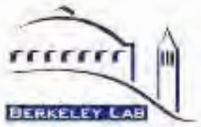
This letter is in support of the NSF proposal by the Computing Research Association to create a Computing Community Consortium.

The CRA is well known in the academic, commercial, and laboratory communities for its continuous leadership in the many aspects of advanced computing research. I can think of no other existing organization that would ring comparable pre-existing legitimacy to such an enterprise, nor do I believe that a newly-created organization would have the community standing required for effective leadership at the level this initiative requires.

I strongly support the concept of the Computing Community Consortium and believe that the Computing Research Association is an ideal choice to create and oversee such an organization.

Yours very truly,

Ewing L. Lusk, Senior Computer Scientist
Acting Division Director, Mathematics and Computer Science



COMPUTING SCIENCES

May 31, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Dr. Bernat,

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda – a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is the natural organization to lead such an effort – it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

We have worked with CRA in many venues over the years, from planning the future of high-end computing to expanding the base of participation. We are pleased to support this important visioning activity.

Sincerely,

Dr. Horst D. Simon
Associate Laboratory Director for Computing Sciences
E-mail: hdsimon@lbl.gov

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY | ONE CYCLOTRON ROAD
MS 50B-4230 | BERKELEY, CALIFORNIA 94720 | TEL: 510.486.7377 | FAX: 510.486.4300

Los Alamos
NATIONAL LABORATORY
EST. 1943

Principal Associate Director for Science, Technology & Engineering Chief Technologist
P. O. Box 1663, MS B297
Los Alamos, New Mexico 87545
505-665-6683/Fax 505-665-0120

Date: June 1, 2006
Refer To: CT-01

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

As you know the National Science Foundation has issued a solicitation to create a Computing Community Consortium. I want lend my strong support to the Computing Research Association proposal in response to this solicitation.

The NSF deserves kudos for their vision to create a consortium that will draw together the many individual groups in the computer science community. This will drive the planning and execution of broader research and infrastructure intensive projects of benefit to all, at a scale that could not be done individually. NSF has followed this path before to great success in other science areas, and this is a great strategy that will drive forward looking research and draw the best minds into the field.

The Computing Research Association is eminently qualified to submit this proposal. It has been the umbrella organization for just this community for thirty years. Its proposal bodes well for success in implementing this far reaching idea. I strongly endorse CRA's proposal.

Sincerely,

William J. Feiereisen
Chief Technologist

cy: CT Office

National Center for
Atmospheric Research

TIMOTHY L. KILLEEN
Director

P. O. Box 3000, Boulder, CO 80307-3000 USA
Phone: 303-497-1111 Fax: 303-497-1184
killeen@ucar.edu www.ncar.ucar.edu

June 8, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, DC 20036-4632

Dear Andy,

I am writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

Our research community is badly in need of a process that will lead to a bolder research agenda – a research agenda that will drive the field forward and attract the brightest students to the field. CRA is the natural organization to lead such an effort – it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

We have worked with CRA in many venues over the years, from planning the future of high-end computing to expanding the base of participation. We are pleased to support this important visioning activity.

Sincerely,

Timothy L. Killeen
Director
National Center for Atmospheric Research

UNIVERSITY OF CALIFORNIA. SAN DIEGO UCSD

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

9500 Gilman Drive
La Jolla, California 92093-0114

May 31, 2006

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy,

I am writing in support of the Computing Research Association's proposal in response to the National Science Foundation's solicitation to create a "Computing Community Consortium" (CCC). The Computing Research Association (CRA) is in an outstanding position to provide leadership for the broader community and to move the field forward – something that has been the subject of intense and important discussion for the last few years.

The CRA's response to the CCC RFP is important. CRA is the premier community organization in Computer Science and represents over 250 computing research organizations in academia, industry, and government. The CRA Board includes some of the most senior and outstanding individuals in the field and has the leadership, experience, and community support to make the CCC program a success and a focus for community advancement.

Both as Professor of Computer Science and Engineering at UCSD, and as Director of the San Diego Supercomputer Center, I have worked with CRA and I believe that they are an outstanding group to lead the Computing Community Consortium. I support this proposal with enthusiasm and hope for its success during NSF's review.

Sincerely,

Francine Berman

Dr. Francine Berman
Director, San Diego Supercomputer Center
High Performance Computing Chaired Professor, U.C. San Diego

USC
UNIVERSITY
OF SOUTHERN
CALIFORNIA

Information Sciences Institute

Divisions
Advanced Systems
Computational Sciences
Computer Networks
Distributed Scalable Systems
Dynamic Systems
Information Processing Center
Integration Sciences
Intelligent Systems
Silicon Systems (MOSIS)

Dr. Andrew Bernat, Executive Director
Computing Research Association
1100 17th Street NW, Suite 507
Washington, D.C. 20036-4632

Dear Andy:

I'm writing to express my strong support for the proposal being submitted by the Computing Research Association in response to the NSF solicitation to create a "Computing Community Consortium."

The computing research community is badly in need of a process that will lead to a bolder research agenda -- a research agenda that will drive the field forward, and attract the brightest students to the field. CRA is an excellent organization to lead such an effort -- it's a natural extension of CRA's well-established and well-recognized role in representing the computing research and advanced education communities.

ISI is pleased to offer this proposal our strong support and looks forward to working with the CCC in the future.

Sincerely,

Herbert Schorr
Senior Associate Dean of Engineering
Executive Director
University of Southern California Information Sciences Institute

University of
Southern California
USC Viterbi School of
Engineering
4676 Admiralty Way
Suite 1001
Marina Del Rey,
California 90292-6601
Tel: 310 822 1511
Fax: 310 823 6714

Society Support for CRA's Proposal to create the Computing Community Consortium

Support has been received from:

AAAI
ACM
IEEE-CS
SIAM
USENIX

Academic Support for CRA's Proposal to create the Computing Community Consortium

Support has been received from (with selected letters following):

Arizona State University, Dept. of Computer Science & Engineering
Auburn University, Computer Science & Software Engineering Dept.
Binghamton University - SUNY, Dept. of Computer Science
Boston College, Dept. of Computer Science
Brigham Young University, Dept. of Computer Science
Brown University, Dept. of Computer Science
Bryn Mawr College, Dept. of Computer Science
Carnegie Mellon University, Dept. of Computer Science
Case Western Reserve University, Dept. of Electrical Engineering & Computer Science
City University of New York - Graduate Center, Dept. of Computer Science
Clemson University, Dept. of Computer Science
Colgate University, Computer Science Dept.
Colorado State University, Dept. of Computer Science
DePaul University, School of CS; Telecommunications & Information Sys
Drexel University, College of Information Science & Technology
Drexel University, Dept. of Computer Science
Duke University, Dept. of Computer Science
Florida Atlantic University, Dept. of Computer Science & Engineering
Florida Institute of Technology, Dept. of Computer Sciences
Florida State University, College of Information
Georgia Institute of Technology, College of Computing
Georgia Southern University, College of Information Technology
Georgia State University, Dept. of Computer Science
Harvard University, Division of Engineering & Applied Sciences
Harvey Mudd College, Computer Science Dept.
Hobart and William Smith Colleges, Mathematics and Computer Science
Illinois Institute of Technology, Computer Science Dept.
Indiana University, School of Informatics
Iowa State University, Dept. of Computer Science
Iowa State University, Dept. of Electrical & Computer Engineering
Johns Hopkins University, Dept. of Computer Science
Johns Hopkins University, Information Security Institute
Kent State University, Dept. of Computer Science
Lafayette College, Computer Science Dept.
Lehigh University, Computer Science & Engineering Dept.
Long Island University, College of Information & Computer Science
Massachusetts Institute of Technology, Dept. of Electrical Engineering & Computer Science
Miami University, Computer Science & Systems Analysis
Michigan State University, Dept. of Computer Science and Engineering
Michigan Technological University, Dept. of Computer Science
Mississippi State University, Dept. of Computer Science & Engineering
Montana State University, Computer Science Department
Montclair State University, Computer Science
New York University, Dept. of Computer Science
Northeastern University, College of Computer & Information Science

Oakland University, Dept. of Computer Science & Engineering
Ohio State University, Dept. of Computer Science & Engineering
Old Dominion University, Dept. of Computer Science
Oregon State University, School of Electrical Engr & Computer Science
Pace University, School of Computer Science & Information Systems
Pennsylvania State University, Dept. of Computer Science & Engineering
Pennsylvania State University, School of Information Sciences & Technology
Pomona College, Mathematics & Computer Science Dept.
Portland State University, Dept. of Computer Science
Princeton University, Dept. of Computer Science
Purdue University, Dept. of Computer Science
Purdue University, School of Electrical & Computer Engineering
Rensselaer Polytechnic Institute, Dept. of Computer Science
Rice University, Dept. of Computer Science
Rochester Institute of Technology, Computer Science Department
Santa Clara University, Dept. of Computer Engineering
Southern Polytechnic State University, School of Computing & Software Engineering
Stevens Institute of Technology, Dept. of Computer Science
Stony Brook University - SUNY, Dept. of Computer Science
Syracuse University, School of Information Studies
Texas A&M University, Dept. of Computer Science
Tufts University, Computer Science Dept.
Union College, Computer Science Dept.
University at Albany - SUNY, College of Computing & Information
University at Buffalo, Dept. of Computer Science & Engineering
University of Alabama - Tuscaloosa, Dept. of Computer Science
University of Alabama - Birmingham, Dept. of Computer & Information Sciences
University of Arizona, Dept. of Computer Science
University of California - Berkeley, Dept. of EECS
University of California - Irvine, Donald Bren School of Information & Computer Sciences
University of California - Los Angeles, Dept. of Computer Science
University of California - San Diego, Dept. of Computer Science & Engineering
University of California - Santa Cruz, Computer Science Dept.
University of California - Santa Cruz, Dept. of Computer Engineering
University of California - Davis, Dept. of Computer Science
University of California - Santa Barbara, Dept. of Computer Science
University of Colorado - Boulder, Dept. of Computer Science
University of Delaware, Dept. of Computer & Information Sciences
University of Georgia, Computer Science Department
University of Hawaii, Dept. of Information and Computer Sciences
University of Idaho, Dept. of Computer Science
University of Illinois - Urbana Champaign, Dept. of Computer Science
University of Illinois - Chicago, Dept. of Computer Science
University of Iowa, Dept. of Computer Science
University of Kansas, Dept. of Electrical Engineering & Computer Science
University of Kentucky, Dept. of Computer Science
University of Maine, Dept. of Computer Science
University of Maryland, Dept. of Computer Science
University of Maryland - Baltimore County, Information Systems Dept.
University of Massachusetts - Boston, Dept. of Computer Science
University of Michigan, Computer Science & Engineering Division

University of Michigan, School of Information
University of Michigan - Dearborn, Dept. of Computer and Information Science
University of Minnesota, Dept. of Computer Science & Engineering
University of Mississippi, Dept. of Computer & Information Science
University of Missouri - Rolla, Dept. of Computer Science
University of Montana, Dept. of Computer Science
University of Nebraska, Lincoln, Dept. of Computer Science & Engineering
University of Nevada - Reno, Dept. of Computer Science & Engineering
University of New Hampshire, Computer Science Dept.
University of New Mexico, Computer Science Dept.
University of North Carolina at Chapel Hill, Dept. of Computer Science
University of North Carolina at Chapel Hill, School of Information and Library Science
University of North Dakota, Dept. of Computer Science
University of Notre Dame, Dept. of Computer Science & Engineering
University of Pittsburgh, Dept. of Computer Science
University of Pittsburgh, School of Information Sciences
University of Rochester, Dept. of Computer Science
University of South Carolina, Dept. of Computer Science & Engineering
University of Southern California, Division of Computer Science
University of Southern California, Dept. of Electrical Engineering-Systems
University of Tennessee, Knoxville, Dept. of Computer Science
University of Texas - Austin, Dept. of Computer Sciences
University of Texas - Dallas, Dept. of Computer Science
University of Texas - Arlington, Dept. of Computer Science & Engineering
University of Texas - El Paso, Dept. of Computer Science
University of Utah, School of Computing
University of Virginia, Dept. of Computer Science
University of Washington, Dept. of Computer Science & Engineering
University of Wisconsin - Madison, Computer Sciences Department
Virginia Commonwealth University, Computer Science Dept.
Wake Forest University, Computer Science Department
Washington State University, School of EE & Computer Science
Washington University in St. Louis, Dept. of Computer Science & Engineering
Wayne State University, Dept. of Computer Science
Williams College, Dept. of Computer Science
Yale University, Dept. of Computer Science

From: DeMillo, Richard <rad@cc.gatech.edu>
Date: June 2, 2006 5:12:35 PM EDT
To: Andrew Bernat <abernat@cra.org>
Subject: Letter of support

Dear Andy,

As head and chief academic officer of one of the nation's largest and most successful computer science programs, I am writing to express my strong support for the CRA proposal to the National Science Foundation to establish a Computing Community Consortium (CCC). As described in the proposal, the CCC will serve as a community proxy for developing and prioritizing infrastructure-intensive initiatives on behalf of the members of CRA and the computing research community in general.

The cost of experimental research in computing has accelerated far beyond the point which can be reasonably carried by any single organization or entity. The next generation of researchers will require access to facilities, instruments and training that utilize infrastructure that can only be funded by the federal government and which will compete with the large instrumentation needs of other sciences such as astronomy, physics, chemistry and biology. We all know the critical role that computing research has played in creating wealth and competitiveness for the US. To continue, computing research needs capabilities that do not exist today but can be developed through widespread collaboration among universities, companies and the federal government. I am hopeful that the CCC will be the catalyst for helping these capabilities come into existence.

CRA is, I believe, the only organization that can lay claim to representing the community and therefore to establishing the proxy. By virtue of its long and successful history of community building among academic and industrial research organizations, CRA has the trust of the mainstream of computing researchers. It can truly speak for the community.

It is my personal belief that such a community proxy is essential to successfully establishing the large scale research initiatives vital to the success of research in the computing sciences.

Sincerely,

Richard A. DeMillo
The John P. Imlay Dean and Distinguished Professor of Computing
Georgia Tech
Atlanta, GA

TEXAS A&M UNIVERSITY
Department of Computer Science

Valerie E. Taylor
Royce E. Wisenbaker Professor and Department Head

June 5, 2006

Dr. Andy Bernat
CRA Executive Director
Computing Research Association
1100 17th Street, NW
Suite 507
Washington, D.C. 20036-4632

Dear Dr. Bernat:

It is with pleasure that I write this letter of support on behalf of the Department of Computer Science at Texas A&M University for the CRA proposal to the NSF Computing Community Consortium (CCC) Program. The Computing Research Association is indeed uniquely qualified to provide the leadership for the creation of a proxy organization for the computing research community, the CCC. CRA has demonstrated leadership in the computing research community via the Grand Challenge meetings and the CRA Government Affairs program, to name a few of the key activities of CRA. It is because of this demonstrated leadership that I fully support the proposal for CRA to provide the much needed research leadership via the Computing Community Consortium.

Sincerely,

Valerie E. Taylor

Dr. Valerie E. Taylor

301 Harvey R. Bright Bldg. • College Station, Texas 77843-3112 • (979) 845-5820; FAX (979) 847-8578 • csdept@cs.tamu.edu

COLLEGE OF NATURAL SCIENCES
THE UNIVERSITY OF TEXAS AT AUSTIN
Department of Computer Sciences • 1 University Station C0500 • Austin, Texas 78712-0233 • (512) 471-7316

June 1, 2006

Andrew Bernat, Ph.D.
Executive Director
Computing Research Association
1100 17th St., NW, Suite 507
Washington, D.C. 20036-4632

Dear Dr. Bernat:

I write to express my Department's support of the CRA's proposal to create the Computing Community Consortium (CCC) to both guide the GENI project and, most importantly, facilitate CS community-wide discussion of comparable endeavors. I am the Chair of the Department of Compute Sciences at the University of Texas at Austin. (In the interests of full disclosure, I am also on the Board of Directors of the CRA.) I found the proposal very exciting. Congratulations on a job well done.

The CS research community has suffered for years from the absence of a community-wide forum in which we could discuss plausible long-range, paradigm-shifting research requiring major infrastructure investments. Partly as a consequence of that absence, our community is somewhat fractured into sub-areas which compete against each other for relatively modest research funding. I say ``partly" because the very nature of CS also encourages this fracturing: CS finds applications in virtually every human activity and since applications often drive scientific research, CS has evolved many specialized subfields.

The competitive specialization of CS is debilitating for computer science -- and science in general -- because it is widely accepted now that the most promising scientific research in the decade ahead will be interdisciplinary. I believe that CCC's regular series of ``visioning" meetings with wide CS participation will do much more than merely let CS compete with the physicists for MREFC funds! It will encourage ``interdisciplinary" research within CS itself, breaking down some of the barriers that have arisen and enabling the same benefits of fresh thinking and diverse collaboration that other sciences are seeing by collaborating with (small parts of) CS. Furthermore, there is no organization besides CRA that can manage this process. CRA has the necessary trust and respect of the community. This is based on an established track record of being neutral with respect to sub-areas and players. It is not an ``old boys club." It has long focused on fostering research, reached out to smaller universities,

sought wide geographic distribution, and taken a leadership role with gender and ethnic diversity. Make no mistake, we all recognize that the CCC will be an extremely difficult challenge. But if it can be done, the CRA is the organization to do it.

The Department of Computer Sciences at the University of Texas at Austin fully supports the CRA's CCC proposal and looks forward to participating with the rest of the computing community setting the course of our field.

Sincerely,

J Strother Moore
Admiral B. R. Inman Chair of Computing Theory and
Department Chair

June 6, 2006

TO WHOM IT MAY CONCERN

The Computer Sciences department at the University of Wisconsin-Madison strongly supports the Computing Research Association's efforts to create the Computing Community Consortium (CCC). It is our belief that the entire computer science and engineering community can benefit from an organization that takes a leadership role in bringing together different parts of the vast community and helps to create visions and define research directions. As the only organization of its type, the proposed CCC has the potential to play a significant role in the development and advancement of the key scientific and engineering knowledge that will provide the foundation of future information- and knowledge-based societies. We are especially interested in the CCC's likely leadership role in identifying and supporting the development of facilities to support experimental computer science and engineering research.

Sincerely,

Gurindar Sohi
John P. Morgridge Professor and Department Chair

Prof. Gurindar S. Sohi
Computer Sciences Department University of Wisconsin-Madison 1210 W. Dayton Street Madison, Wisconsin 53706
Phone: 608-262-7985 Fax: 608-262-9777 E-mail: sohi@cs.wisc.edu Web: http://www.cs.wisc.edu/~sohi

Department of Computer Science
Fuller Laboratories
100 Institute Road
Worcester, MA 01609-2280
508-831-5357, Fax 508-831-5776
www.cs.wpi.edu

May 31, 2006

Dan Reed, Chair
Computing Research Association Board of Directors

Dear Prof. Reed,

As Head of the Worcester Polytechnic Institute Computer Science Department, I wish to convey my enthusiastic support for the Computing Research Association's proposal to create and operate the Computing Community Consortium. The CRA is uniquely positioned to bring together the full range of US computing research institutions to address the critical needs of the GENI project. The CRA draws members from every state, ensuring that the benefits of the CCC will be shared across the nation. I look forward to WPI's participation in this research initiative.

Sincerely,

Michael A. Gennert, Department Head
Department of Computer Science
Worcester Polytechnic Institute