WHY A UC SHARED RESEARCH CYBER-INFRASTRUCTURE PILOT?

COUNCIL OF CHANCELLORS—9-3-08

1. What problems are we trying to solve?

First, we have a significant and growing base of researchers who now require computational and data storage resources that exceed what can be provided and managed through individual grants and locally provided resources. Shared research cyber infrastructure allows individual investments to be aggregated for greater research capability and leveraged across the UC system. Shared cyber infrastructure enables UC researchers to more effectively compete for grants involving team-based, interdisciplinary research. Second, there are spiraling energy costs associated with UC's rapidly escalating need for compute and data storage capability that are adversely impacting the competitiveness of our campuses. Our current practice of allowing the proliferation of distributed computer cluster systems throughout our campuses in sub-optimal remodeled locations is costly in terms of facilities, power, cooling, space, and staffing, and is placing us at a competitive disadvantage relative to peer institutions that are making significant investments in institutional computational and data storage resources.

2. What is the pilot and who are its beneficiaries?

The pilot is a collaborative effort of the UC CIOs and VCRs to identify a limited set of projects that will benefit from shared compute resources to demonstrate how greater research capacity and capability can be provided in a shared environment. UC will be among the first to do this as a system. The roughly two dozen projects proposed by teams from across UC were selected on the basis of their capacity to 1) advance research in priority areas, such as global health and environmental science; 2) become more competitive for obtaining extramural support; and 3) nucleate new communities of cyber-enabled research in areas like the social sciences, arts, and humanities. In addition to these benefits to researchers, UC as a whole will benefit by learning how to create research cyber infrastructure that works effectively at the system-wide level and leverages existing resources like the UC Grid and networks like CENIC. The pilot will also address the problem of proliferating sub-optimal locations by consolidation in shared, energy-efficient data centers.

3. What are the one-time and on-going costs?

The preliminary estimate for funding of the CI pilot is $5M for hardware, networking, and storage in existing data center space. Annual recurring costs for staff support will be $1.5M. The costs are relatively modest for this type of project, because we are leveraging existing UC expertise and data center resources provided by the Lawrence Berkeley Laboratory and the San Diego Supercomputer Center.

4. What will be the source of funding?

In May, the Regents approved the establishment of a Total Return Investment Pool (TRIP) to provide campuses and the Office of the President with an investment vehicle to provide additional resources that can be utilized to make strategic investments, such as this proposed pilot for shared research computing support, and investments that significantly reduce on-going costs, such as energy-efficient data centers.

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5. Why a UC investment and why invest now?

Many UC competitors are now investing heavily in common computational resources for their researchers. Institutions like U. Illinois, U. Texas, U. Southern California, and U. New Mexico each recently made investments of $5-15M to centralize their resources and capitalize upon the resulting economies of scale. UC will simply not be competitive without investing in research computing.

6. How will this pilot be governed and how will we measure success?

We propose to establish a Cyber infrastructure Governance Council (CGC), comprising technical staff, faculty, CIOs, and VCRs, which will provide guidance on determining how best to allocate resources, ensure broad participation, and evaluate the success of the pilot projects. The CGC will also advise on future UC investments for advancing research CI, which could include, for example, data storage, visualization and virtualization. Success will be measured through standard metrics used in research computing facilities, such as usage, client satisfaction, additional funding secured by faculty and/or publications stemming from research conducted in facilities. We also anticipate that there will be growth in the number of faculty who use and invest in the pilot facility, and in the transfer of models, practices and lessons learned during the pilot to other UC cyber infrastructure facilities.

7. What investments will campuses need to make?

We expect each campus to be represented on the CGC and to provide a technical point of contact. The pilot project will assist each campus in establishing at least one designated campus location through which it can participate in the pilot.

8. What is the CoC being asked to approve?

We would like the CoC to endorse the expenditure of UC resources to implement this pilot, subject to establishment of a governing structure like the aforementioned CGC to guide its development and regular progress reports that can be used to determine whether future investments are appropriate.

9. When will we be back with the results of the pilot for approval to expand or terminate?

The CGC will report back on an annual basis, with an expected decision point at the end of three years, when the decision to refresh hardware and to continue or expand the support must be made.