

Computational Infrastructure for Geodynamics (CIG)

Minutes of the Executive Committee Meeting

Nov. 8-9. 2004, Pasadena, CA

In Attendance: M. Richards (Chair), M. Spiegelman (Vice-Chair), C. Gable, and B. Appelbe. *Ex-officio*: M. Gurnis (Director) and M. Aivazis (Chief Software Architect)

Start: 9 am Nov. 8, 2004

1. Development of the CIG Five Year Strategic Plan, stipulated by the Cooperative Agreement with the NSF, was considered. Guidance for the Plan came from the original NSF proposal (including the 18-month plan in the proposal), proposals from the community submitted to CIG, and direct input from the committee. Overall goals and milestones, as well as allocation of resources by goals, were decided upon.

Goals and milestones will be divided into four parts: the software repository, the computational framework, the organization of community participation, and the training of users. Resources were allocated in terms of these goals; the resources for the coming year are approximately 1.8 FTEs for software engineers (0.5 through a subcontract with the Argonne National Laboratory and the balance from hiring of software designers and software). Other major resources would be a web master and technical writer, supplies and expenses, and participant costs.

The committee decided that the CIG Five Year Strategic Plan should be posted on our web site (geodynamics.org), and that this would occur whenever the plan is updated. Based on the rough draft and committee deliberations, the Chairman instructed the Director to furnish a revised draft to the Executive Committee by Nov. 18. The final Plan is due at NSF by Dec. 1.

2. Support for two technical staff members is available and the committee started the process for their recruitment. Based on the draft Strategic Plan, a search for two software engineers will soon commence, one a numerical analyst/modeler, the other with expertise in software integration. These positions will be posted on our web site, Monster.com, and potentially several trade publications, such as EOS or Physics Today.

As a general philosophical position, the committee thought that our goal should be to hire a few high quality staff members who would work long term for the community through CIG. This will require a stable funding base with the prospect for salary growth.

3. The repository for software was considered in terms of donations of existing software from the community and the licensing of donated and CIG-written software. CIG is expecting donation of software over the next six months, including software currently

being distributed on GeoFramework.org and software soon to be released by GeoFramework (this would include several versions of the citcom finite element codes for mantle dynamics, versions of the SPECFEM codes for seismic wave propagation, and an entirely reengineered code for visco-elastic deformation developed by Charles Williams). It was expected that some of the codes donated would be released under the Gnu Public License (GPL).

The details of a policy for donated software, the different levels of support that CIG will have for distributed software, and the open source license CIG will adopt should await the deliberations of CIG's Science Steering Committee (SSC).

4. The general terms of the subcontract to the Argonne National Laboratory (ANL) for the half-time support of Matt Knepley, as software engineer-CIG staff member, was approved by the Executive Committee. The Committee felt that this was a priority, due to the dependence of the project's immediate goals on the PETSc software library and on Knepley's potential to directly leverage scientific computational expertise at ANL to support CIG goals. The details on tasks, deliverables, and delivery dates for the next 12 months are under going final negotiation.

5. The committee agreed that speedy adoption of the CIG By-Laws was essential. Based on community input, several changes to the By-Laws were considered. A new draft By-Laws (version 1.1) will soon be posted on the web site with the following key changes. First, all committees of CIG would have representation from both geoscience and computational science, consistent with the guiding principals of CIG. Second, the Director would move from being a voting member of the EC to non-voting, *ex-officio* status. Third, instead of two standing committees, a geoscience standing committee and a computational science standing committee, there would be one Science Steering Committee (SSC). The Executive Committee felt strongly that having two major standing committees would be both costly and inefficient, and that the proposed separation of scientific and computational functions was contrary to the purposes of CIG. The proposed By-Laws will soon be posted on the web, a message will be sent to Member Representatives that the proposed By-Laws are there, an invitation will be broadcast for the CIG Business Meeting on Dec. 14 in San Francisco, and a vote on the By-Laws by e-mail should follow soon in the few weeks that follow the Business Meeting. The goal is to have the Science Steering Committee fully functioning before the end of the first year of funding. The Executive Committee will function in a dual role as the Science Steering Committee in the interim, including review of proposals. After the Science Steering Committee is established as an independent body, it will be the primary screening forum for proposals to CIG, and pass its recommendations along to the Executive Committee for formal approval.

A further key amendment reflects the fact that the Executive Committee felt strongly that all committees, working groups, and workshops funded by CIG should contain a balanced representation of both scientists and computational scientists.

6. The home for CIG on a new research campus of Caltech (CIT², or Center for Innovative Technologies, California Institute of Technology) was considered. The committee visited the site in northeast Pasadena and discussed the site renovations with Rick Canny, a project manager from the Caltech Physical Plant Department. The committee also considered the informal proposal that the JPL project, QuakeSim (which would become SERVVO for Solid Earth Research Virtual Observatory in the future) be situated in space adjacent to CIG was an attractive proposition. Locating a NSF and a NASA center in the same building should be synergistic and could lead to a dynamic environment for computational sciences working in support of Earth science. An attraction for the centers is that they would be entirely separate from a funding and a managerial perspective, and although the occupied space would be distinct it would still allow for easy interaction between the groups. Discussions on these issues will remain ongoing for the rest of the year. In the interim, space will be made available on the Caltech main campus to house the staff.

7. Several proposals recently submitted to CIG were considered.

A proposal for a new mantle convection workshop prepared by S. Zhong was viewed as a high priority for CIG and \$15,000 was allocated to this purpose. Planning for the workshop should start immediately with the expectation that it be held in Boulder, CO during the early summer of 2005. The committee requests a revised proposal that more clearly links the workshop to CIG goals and a future generation of mantle convection software.

A proposal for a framework for adaptive meshes prepared by W. Bangerth & L. Lavier was considered. The committee welcomed the participation of the proponents and very much want to encourage their involvement with CIG. Adopting the best practices in mesh generation will be a top priority for the CIG framework. The proponents are encouraged to work with the community to fashion a revision that clearly articulates tasks and time-lines for software deliverables. A clear description of the science objectives will be needed as well as closer coordination with other members of the community. The committee would like to see a revision by April 2005, so that the committee can consider it at its next committee meeting, likely in May 2005.

A proposal for a crustal deformation software suite prepared by B. Hager, M. Simons, C. Williams & C. Gable was viewed highly by the committee. The project involves close coordination with an ongoing community effort to develop finite element models for stress loading of faults on seismic and longer time-scales. CIG would attempt to fund their next workshop in conjunction with other community organizations (most notably SCEC). The EC committed \$6,000 toward the workshop. A number of the clearly articulated tasks and deliverables will be adopted for inclusion in the Strategic Plan. Feedback on all of the proposed requests will be forwarded to the proponents.

The committee discussed ongoing efforts to coordinate a proposal in computational seismology. Based on discussions with seismologists throughout the country, the

committee expects to see such a proposal before its next meeting. The EC hoped that a workshop on computational seismology could be held this summer and that CIG would be seeking co-sponsorship with IRIS.

8. A discussion was held on adopting a policy on proposals submitted to CIG. A draft policy was discussed, and following revisions it will be posted on our web site before the December 14 Business Meeting. The committee hopes that community feedback will be channeled through the future SSC before final adoption.

9. Discussion on a write-up "Guidelines for CIG software development" was tabled for a future meeting and consideration by the SSC.

10. The CIG budget was considered. The constraints on the current funding opportunities were discussed, and the committee agreed that the funding levels starting in year 2 were not close to the levels required to work on all potential projects described in the NSF proposal. The Chairman asked the Director to provide a budget for the rest of our current operating year in two months time.

11. The agenda for the CIG Business meeting to be held on the evening of Dec. 14, 2004, in conjunction with the Fall AGU meeting in San Francisco was considered. The agenda will include an open discussion and plans for adoption of the CIG By-Laws. The agenda will soon be posted on our web site.

12. The next Executive Committee meeting was discussed. It was agreed to hold the meeting in May 2005 in either Berkeley on the campus of the University of California, or in New York City on the campus of Columbia University.

Adjourn 12 noon, Nov. 9, 2004