

Call for Fiscal Year 2015 High Performance Computing Modernization Program Applications Software Initiative (HASI) Project Pre-Proposals

Introduction

The High Performance Computing Modernization Program (HPCMP) invites pre-proposals for projects to be executed under its new applications software productivity activity, the HPCMP Applications Software Initiative (HASI).

The HPCMP has recognized the need to partner with the Department of Defense (DOD) Services and Agencies to initiate and continue promising applications software productivity activities within the Department. At this point in time, the HASIs have almost completed their mission of developing applications software while instituting a robust computational science and engineering environment within the DOD organizations; and the Computational Research and Engineering Acquisition Tools and Environments (CREATE) (which is approximately halfway through its programmed lifetime of ten years) is effectively producing major applications software products for the acquisition community. With the imminent conclusion of the HASI activity, the CREATE making great progress, and the rise of major new challenges in using future High Performance Computing (HPC) systems with their projected complex architectures, the HPCMP has decided to regenerate an applications software activity consisting of projects of modest size spanning several years to complement the large, mature applications software efforts that CREATE represents.

Scope

Projects under the HASI should address applications software productivity on new classes of the HPC architectures which are expected to mature over the next several years, potentially in all computational technology areas (CTAs), complementing the CREATE applications code development. These projects should draw upon the algorithmic research and development currently being planned by User Productivity Enhancement, Technology, Transfer, and Training (PETTT), when appropriate, to facilitate the refactoring of application codes in order to take better advantage of new hardware architectures. These projects will execute one or more of the following applications software activities:

1. Algorithm development and/or testing
2. Application code development and/or testing
 - a. Implementing new algorithms
 - b. Adding functionality to existing application codes

- c. Increasing scalability of existing application codes
- d. Modifying application codes to run efficiently on new architectures
- 3. Framework development, testing, and implementation
 - a. Developing new frameworks
 - b. Integrating new applications into existing frameworks

The proposed work is expected to produce applications software that runs efficiently and effectively on current and/or future HPC systems.

Proposals will not be accepted:

- 1. From any of the HPCMP components (e.g. PETTT, CREATE, Defense Research and Engineering Network, HPCMP Security, or HPCMP Centers)
- 2. For the large-scale development of entirely new applications code
- 3. For the development of system software

Project Attributes

The HASI projects will typically be awarded for two years. Depending on progress, up to two (one-year) options may be added after the conclusion of the initial two years. The nature of the applications software activities within a project will nominally require a group of three to five full-time software developers, and the total annual project cost is expected to be approximately \$1M.

Project Selection Process

Pre-proposals will be evaluated by the High Performance Computing Modernization Program Office (HPCMPO) staff in consultation with the applicable HPC Advisory Panel members using a broad set of technical, management, relevance, and impact criteria. The principal investigators of the highest ranked pre-proposals will be invited to submit full proposals, which will be evaluated according to the following criteria:

- 1. Technical quality
- 2. Importance of the software gap to be addressed
- 3. Management/execution plan

4. Potential for progress
5. Extent of resources contributed by proposing organization
6. The DOD and Service/Agency impact

A technical review will be conducted by a technical evaluation panel convened by the HPCMPO. The DOD and the Service/Agency impact will be assessed by the appropriate Service, Agency, and Office of the Secretary of Defense representatives. The selection of FY 2015 HASI projects will be made by the HPCMP Director after consideration of all evaluation factors.

Eligibility

All computational scientists and engineers in the DOD Research, Development, Test and Evaluation (RDT&E) organizations may submit HASI project proposals. Principal investigators may be scientists or engineers from government, industry, or academia. All of the HASI projects must be sponsored by a DOD government scientist or engineer.

Submission

All pre-proposal submissions must be at an unclassified level. Pre-proposals must be submitted by e-mail to the HPCMPO at hasi@hpc.mil. Pre-proposals are due by close-of-business on **31 October 2014**.

Questions

Contact Dr. Larry Davis, HPCMP Senior Scientist, via email hasi@hpc.mil or via telephone at 703-812-4422.

Pre-proposal Contents

The HASI project pre-proposals are limited to three pages (single-spaced, standard 12-point font, one-inch margins) and must be a single Word or PDF document. The cover page and any curricula vitae do not count against the three-page limit.

Cover Page: (Length: One-page maximum)

1. Title: Provide the title of the project.
2. Computational Project Number: Provide any applicable computational project numbers (as reflected in the HPCMP requirements database) representing the project requirements associated with this HASI project proposal.

3. CTA: List the primary and associated CTAs that best fit this project (see <http://www.hpc.mil/index.php/technology-areas/computational-tech-areas>), or identify other areas that apply.

4. Government Sponsor: Provide the Government sponsor's name and contact information.

5. HASI Project Principal Investigator: Provide the project's principal investigator's name and contact information. Only one person should be listed here, and that person will be the lead for interactions with the HPCMP during the project.

6. Sponsoring Service/Agency and Organization: Provide the Service/Agency and organization sponsoring the HASI project.

7. External Partners: Provide a list of organizations and/or personnel planning to participate in the project.

8. Funding requested: Provide an estimate of the annual funding required.

9. Technical Goals and DOD Impact: Summarize the technical objectives of the project and the projected DOD impact.

10. Duration: Specify the expected duration of the project.

11. Major Applications Software: List any major applications software that will be addressed as part of this project.

HASI Project Pre-proposal: (Length: Three pages maximum, excluding curricula vitae)

Include explicitly the following sections in the pre-proposal narrative:

1. Technical Approach: Describe the problem and the technical approach that will be used in solving the problem. Include a discussion of the software gap to be addressed, and identify what current and future HPC architectures are the targets of the improved application software that will be the products of this project. The final technical outcome must be clearly defined.

2. The DOD and Service/Agency Impact: Discuss the expected impact of the successful project completion on the DOD and the Service/Agency RDT&E programs. Estimate the magnitude of the benefits of this project to the DOD RDT&E community.

3. Management and Execution Plan: Discuss the overall management of the proposed project. Include the expected project duration and a detailed project schedule.

4. Project Partners: Summarize the contributions expected from each of the project partners listed on the cover page, including the principal investigator's organization.

5. Curricula Vitae (optional): Include curricula vitae (at most two pages each) for key personnel, listing relevant publications. Curricula vitae do not count toward the three-page pre-proposal limit.

Schedule

Activity	Date
Issue call for pre-proposals to the HPCMP community	22 September 2014
Concept proposals due to the HPCMPO	31 October 2014
Down selection of pre-proposals	21 November 2014
Call for proposals sent to potential HASI project principal investigators	24 November 2014
Full proposals submitted to the HPCMPO	9 January 2015
Proposal technical review meeting	18 February 2015
Final selection	27 February 2015
FY 2015 HASI project selections announced	4 March 2015
FY 2015 HASA projects begin	1 April 2015